

MINE DEVELOPMENT

Overview

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Environmental and Social Impacts

**Community Employment and
Other Economic Opportunities**

Community Experiences





2.1 Overview

This section explains the purpose of mine development, identifies the main activities and players, and outlines opportunities for Aboriginal communities to get involved during mine development.

What Is Mine Development?



Mine development is the second phase of the mining cycle. The purposes of this important phase are to learn about the potential value of a mineral deposit, determine if it can be mined profitably to the benefit of the mining company and the region, and if so, to build a mine. In order to build a mine, the ore deposit must be large

and valuable enough to pay for the costs of construction (**capital costs**) and for the costs to operate the mine (operating costs). Factors that determine if a resource is economical to mine include:

- Location of the resource;
- Type of mineral and access to **infrastructure** (roads, airstrips, etc.).

For example, it may be possible to mine diamonds in a remote area with little infrastructure, but not lead/zinc. This is because diamonds are high value/low volume, whereas lead/zinc is lower value and higher volume;

- Accessibility of the resource;
- Size of the resource;
- Value of the resource;
- Market prices;
- Distance from markets and supply points;
- Ability to recover the resource in an environmentally safe way;
- Regulatory regime; and
- Availability of qualified work force.

The main activities of mine development include:

- Collecting more technical, environmental and socio-economic data to increase the company's knowledge of the resources. This means more samples, more drill holes, and more field tests;
- Developing the mine plan and infrastructure;
- Consultations between government and mining companies to make sure that

regulations are met. Mining companies also consult with communities to make sure that their needs and requirements are addressed;

- Evaluating financial, socio-economic and environmental impacts;
- Obtaining permits and licences;
- The final evaluation of the project is carried out and the production decision is taken; and
- The mine and its facilities are built, ready to start operations.

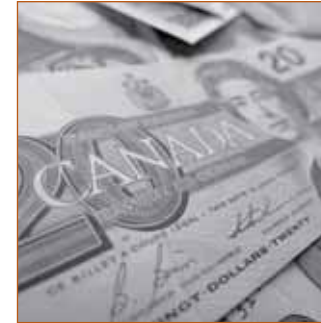
Time Frames

Mine development can take anywhere from 5 to 10 years. The time needed depends on where the mine is located, how large and complex the development is (including infrastructure needs and availability), and the regional regulations and review processes. In general, it takes:

- two to three years for test work and studies (environmental

baseline studies and **feasibility** studies);

- one to three years for environmental assessment and permitting; and
- two to four years to build the mine and infrastructure.



Costs

It generally costs between \$50 million and \$500 million or more to develop a mine. The cost depends on:

- Type of mine;
- Size of the mine (the larger the mine, the higher the cost);
- Location of the mine; and
- Amount of work and time required to do the test work, collect the data, and complete environmental studies and permitting.

Test work, studies and permitting can cost in the \$10 million range (this can climb as high as \$100 million if special facilities are needed on-site for additional testing



Facts & Figures

Ekati and Diavik, two diamond mines built in the Northwest Territories, had start-up costs of \$750 million and \$1.3 billion, respectively. These costs were very high because the mines are large, remote, and had technological challenges. Smaller mines closer to highways, electricity and other infrastructure would have start-up costs closer to \$300 million.

(Source: BHP Billiton Diamonds and Diavik Diamond Mine)





and data collection, as is the case for diamond mines). Construction costs are often in the \$100 million range.

What Are the Mine Development Activities?

If initial exploration leads to positive results, the project moves from exploration to the deposit evaluation and mine planning stage. During this stage, the mining company will increase its activities and investment to determine if the mineral deposit is worthwhile (viable) and if a mine can be developed. It is in this stage that the mining company will prepare the design of the mine. Once evaluation and planning are completed and a decision on building a mine has been taken, construction can start. Depending on the location and the type of mineral, mine development activities may include:

Detailed Drilling

The drilling extracts drill core (cylindrical samples of the rock) for analysis. Detailed drilling (drill holes spaced at close intervals) is required to precisely define the shape and size of the deposits.



Detailed Analysis and Evaluation



Samples are analyzed to find out the grade (the quantity of metals, diamonds or other commodities) and to assess the value of the deposit.

Bulk Sampling

Bulk sampling gives large and representative mineralized samples. It is used to determine the **metallurgical** characteristics of the material. The sample is tested in a testing plant that recovers the minerals. A test mine may be built to identify new technologies



needed to recover the minerals.

Environmental Baseline Studies

Environmental work takes place during this stage along with the other field activities. Environmental baseline studies are a required part of the environmental approval



process. These studies are used to establish the state of the environment, including wildlife, and then to determine if there will be any changes.

Preliminary Design and Engineering (Prefeasibility)

The preliminary design and engineering stage of mine development occurs at the prefeasibility phase. The prefeasibility is an intermediate activity meant to verify a project's potential before investing money into additional detailed work.

Feasibility Studies

Feasibility studies are a series of planning studies and evaluation reports of the geological, engineering, economic, legal and site data. The purpose of feasibility studies is to evaluate all aspects of a project, review the plans, identify risks, refine the cost estimates, and decide whether a mineral deposit can be mined profitably.

Feasibility studies usually include the following (see table):

Feasibility Studies	
Geology and resource determination	How large is the deposit or resource? What is the grade of the minerals or metals in the deposit?
Mine planning	What will be mined? How will it be mined (open pit/surface or underground)? What equipment will be used to mine it?
Process plant test work and plant design	What is the best way to extract the minerals or metals (for example) from the host rock? Will there be a smelter ?
Infrastructure planning	What roads, airstrips, camps and complexes will be needed?
Water and waste management planning	What are the water supply needs? What are the discharge quality requirements? How can waste be safely disposed of?
Environmental and socio-economic planning	What are the main issues from the environmental and socio-economic studies? How can plans address these issues?
Mine closure and reclamation plan	What are the best approaches for reclamation and closure?
Operating cost estimates	How many workers are required? What types and amounts of equipment and supplies are required during operations? What are the annual operating costs?
Capital costs	What are the costs to plan, design, permit and construct the facilities?
Financial analysis	What are the costs to borrow money to build and operate the mine? What is the yearly cost and annual earnings? What is the expected profit or loss?



Mine Closure and Reclamation Plan

An important step in planning is the mine closure and **reclamation** plan. This plan is a detailed report on how the mine site will be cleaned up and restored once mining operations are completed. The direct closure impact of all areas of a mine site should be addressed as an integral part of the design criteria during the detailed engineering phase of the project. This includes removal of structures, how to handle tailings, how to dispose of chemicals and hydrocarbons, waste rock slope stability, pit shut-down, and revegetation of terrain.

Governments now usually insist that the company provide a financial assurance (e.g., a **bond**) to cover unexpected closure problems or failures. This financial assurance can be required before the start of construction (i.e., before liability is created). If mine closure and reclamation are too expensive, the proposed mine may not move on to production.

Facts & Figures

*Most important in the planning process is the safety and consideration of workers and the local environment. A closure and reclamation plan explains how the company will **rehabilitate** the mine site once the ore runs out and the mine closes.*



Permitting and Environmental Assessment

As the mine development activities increase and

become more intense, permits will be required. The mining company will submit a project description to governments or local boards if feasibility studies are encouraging and show that there is a potential project. This will start the environmental assessment process. This process must be completed before moving to final feasibility and the start of construction.



Negotiation of Agreements

The types of agreements negotiated between a mining company and the community at this stage vary and may include Impact and Benefits Agreements, Memoranda of Understanding, and Participation Agreements.

Even if formal agreements are in general not legally required, this is still an excellent time for the mining company and Aboriginal groups to develop a good relationship.

Sales Contracts

During early feasibility, assumptions are made on sales of the mineral(s) to be mined. However, before final feasibility, the actual terms and conditions of sales must be negotiated and defined. This is the role of a sales contract – which is the sale of a product to a customer.

In addition to sales contracts, a very important activity is to establish affordable transportation to get the product to the customer. This may require the use of ports and ships.



Agreements		
Type of Agreement	Definition	Example
Memorandum of Understanding (MOU)	MOUs are simply a way of creating an understanding between a community and a mining or exploration company. The MOU defines principles for working together for mutual benefit. MOUs are not legally binding contractual arrangements (like IBAs).	The Timiskaming First Nation (TFN) and Tres-Or Resources signed a Memorandum of Understanding covering exploration on lands the TFN claims as its traditional territory. The MOU provides a framework in which the company and the First Nation can mutually participate in exploration and potential discoveries.
Impact and Benefits Agreement (IBA)	An IBA is a contractual agreement between an Aboriginal community or entity and a mining company. It defines agreements made between the two parties about employment opportunities, business opportunities, and training. The IBA spells out the obligations of each party in these areas and the funding arrangements as appropriate to the development. The content of an IBA varies depending on current important issues.	In 1994, Inmet Mining Company and the Cree of Mistassini signed an IBA related to operation of the Troilus gold mine, located near James Bay, with particular emphasis on employment. As of 2005, the Troilus mine employs 285 people of whom 17% are Cree. Another example is the Raglan Agreement between Falconbridge and the Inuit of northern Quebec. This is an historic agreement that saw the introduction of “revenue sharing.”
Participation Agreement (PA)	PAs are essentially the same as IBAs.	The Diavik Diamond mine has four PAs in place covering the construction and operation phases of the mine.



Final/Bankable Feasibility

During final/**bankable feasibility**, all existing feasibility studies are reviewed. The permitting, environmental assessment, closure costs, and negotiated agreements are also reviewed. The objective is to determine a final costing for the project so that the final investment decision can go ahead.

Project Financing

Once a final costing is known, the mining company needs to secure project financing. The bankable study is used to demonstrate a project's feasibility and to help secure investment. Companies may need to borrow the money from a bank or raise money by issuing stocks on the stock market. Large mining companies may be self-funding.

Investment Decision by Mining Company

The final investment decision – whether to build the mine – happens when the final feasibility study is finished, project financing is secured, and permits are received. The Board of Directors of the mining company will make the final decision on whether to move ahead and build the mine.

Although it is hard to imagine, given how much work, money and time have been invested to get to this point, the decision could be to

NOT go ahead with the project because of uncertainty in the markets. This means that all agreements negotiated to this point are conditional agreements that depend on whether the company decides to go ahead.



Construction

Construction refers to the development of the entire facility, including the mine, processing plant (mill), and all related infrastructure.



Infrastructure development includes all facilities needed to support the operation, other than the mine

and process plant (mill). This stage requires most of the money and provides most of the jobs. A company does not usually commit to construction until the details of all permitting and regulatory requirements have been confirmed. Common activities during construction include:

- Site preparation;
- Clearing and initial preparation for mining (i.e., overburden removal);
- Construction of accommodations;

- Construction of process and site facilities (i.e., mills, offices, etc.);
- Building roads and airstrips (installation of power lines and railway);
- Training programs for personnel; and
- Installation of environmental protection equipment.

Who Are the Main Players in Mine Development?



Junior Exploration Companies

Junior exploration companies are not usually directly involved in mine development. They do not have the resources, neither money nor people, to develop and build a mine. Typically, when they find something promising during exploration, they will seek a senior mining company to invest in the property and take on the role of manager and operator. In some cases, the junior company or prospector that did the exploration work may become a partner or sell its stake to a larger company.

There are some exceptions. Tahera Diamond Corporation is a junior mining company that is developing the Jericho diamond mine in Nunavut.



Senior Mining Companies

Senior mining companies are the main players in mine development. They are the manager and operator, and are involved in all activities from exploration through construction and operations.



Consulting Firms

Consulting firms could be hired by the mining company to help them with feasibility studies, detail design, construction management, and project management activities.



Equipment Suppliers

Equipment suppliers manufacture and sell equipment to the mining company and often provide maintenance services in the operating phase.



Governments

Governments set the rules for permitting, manage the permitting process, and issue the required permits. They conduct the environmental assessment process.

In Canada, the provinces are the primary regulators of mine development. The provinces are responsible for granting most permits. Since 2001, the Yukon now exercises provincial-type responsibilities. In the Northwest Territories and Nunavut, the



federal government plays a major role through Indian and Northern Affairs Canada (INAC). The main federal departments involved in environmental assessments and permitting are Natural Resources Canada (NRCan), the Department of Fisheries and Oceans (DFO), Environment Canada (EC), Transport Canada, and INAC.



Financial Institutions

Once a project has reached the development stage, the cost of proceeding through development and production is very high compared to the initial exploration stage. Depending on the size of the mineral deposit and the eventual mine, the cost can range from \$10 million to \$2 billion. Most mining companies will raise these funds through a combination of individual and institutional investors through the markets (equity financing) and by borrowing money from the banks (debt financing). For very large deposits that cost billions of dollars to develop, large mining companies will sometimes pool their resources into a partnership.



Construction Companies

Construction companies and contractors are hired to build the roads and plant sites, put up the buildings, and construct the process plant and

infrastructure needed for a mine operation to go into production. They provide skilled workers, heavy mobile equipment, tools and supplies, and a history of successful construction in similar industries.

Construction companies and other contractors often provide employment for local workers, which can often lead to permanent employment at the mine.



Communities

The mine development phase offers communities the greatest opportunity for involvement. The environmental assessment process and the many consultations required to determine if the project can develop into a mine are opportune times for the community and the mine developer to identify community opportunities.



How Can Aboriginal Communities Get Involved in Mine Development?

A wide range of community **consultations** often take place during the mine development process, including:

- Public meetings and hearings;
- Open houses;
- Workshops;
- Focus groups;
- Interviews; and
- Meetings and consultations related to environmental assessment and licence and permit applications.

Communities provide input and feedback on a proposed project during the consultations, raise issues and concerns, and identify potential impacts.

Consultations allow communities to participate in a meaningful way and to experience a sense of ownership of the project.

Anyone potentially affected by the mine development would attend the consultations, including:

- Chiefs or mayors;
- Band councils and band members;
- Aboriginal community organizations;
- Renewable resource boards/committees;
- Aboriginal land corporations;
- Local and regional governments;
- Community members;

- Non-governmental organizations (NGOs); and
- Media.

The results of consultations may affect the decisions of Aboriginal/ community organizations and even co-management boards in land claim jurisdictions (i.e., Mackenzie Valley Land and Water Board).



Another typical result from consultations is scheduled site visits to actually see the land where the development is proposed. Elders often visit the site so that they can better see what is being proposed on what may be considered traditional lands. From an environmental monitoring standpoint, site visits also serve to monitor development.

Communities also provide input during the mine development process by reviewing project descriptions, leading traditional knowledge studies, and developing participation or impact and benefits agreements with the mining company.

INAC provides financial assistance to enable First Nations and Inuit groups to enter into various types of negotiations with a mining company.

Facts & Figures

Exploration and mining companies, in addition to complying with regulatory regimes at the federal, provincial and territorial levels, are voluntarily adopting environmental management practices, including the application of traditional knowledge, to respond to community concerns about the potential effects of mining.





2.2 Acts and Regulations

This section identifies the general regulatory requirements, licences, permits and leases that may apply during mine development.

Mine development regulations are complex and vary between provinces, territories and Indian Reserves. The purpose of all regulations is to develop the mine in a way that will benefit people and minimize potential negative impacts on the environment.

The *Canadian Environmental Assessment Act* and the requirement to include traditional knowledge as part of the mine planning process are particularly important. They provide Aboriginal communities with the opportunity to get involved early in the process.

What Licences and Permits Are Required?

Permit and licence requirements, and their application processes, vary in different regulatory jurisdictions in Canada. Provincial and territorial regulatory authorities generally administer permits. The federal government through INAC administers permits and licences in Nunavut, the Northwest Territories, and on Indian Reserves. Several federal departments have permits, licences or authorizations that apply to mining projects.

Key permits include those related to land and water use, mine closure and reclamation plans, and camp construction permits. The following table outlines the general licences and permits required during mine development.

Key Development Permits	
Water	Provincial and territorial agencies (guided by the Council of Ministers of the Environment [CCME] guidelines) generally control water discharge criteria and water licences Water crossings permits are issued under the <i>Navigable Waters Protection Act</i>
Fish	Authorization under Section 35 of the <i>Fisheries Act</i> is required if impacts on fish habitat are expected Fisheries and Oceans Canada (DFO) has developed various guidelines to make sure that there is no net loss to fish habitat
Wildlife	In the case of potential effects on migratory wildlife, the <i>Canadian Migratory Bird Convention Act</i> applies and, in the case of endangered and threatened species, the <i>Canadian Species at Risk Act</i> applies The provinces and territories also have a range of policies and legislation addressing wildlife and species at risk issues
Mine construction and development	Construction permits for buildings Explosives permits Authorization from provincial/territorial departments to allow excavation to go ahead

What Is a Mining Lease?

A mining lease is “a legal contract for the right to work a mine and extract the mineral or other valuable deposits done under prescribed conditions of time, price, rental, or royalties.” A mining lease is required to develop a property into a mine. Mining leases require a surveyor to survey claim boundaries. Leases are valid in most provinces/territories for 20 or 21 years and can be renewed. Some jurisdictions impose certain conditions upon the renewal of mining leases (for example, the property must be the site of an active or closed mine).

Mineral rights have been government-owned since the early 1900s and cannot be purchased, only leased, by individuals or companies. Different owners can hold surface and mineral rights on the same property. The regulation of mining activities on publicly owned mineral leases falls under provincial/territorial/federal government jurisdiction. There is separate mining rights legislation for each of the 10 Canadian provinces and the Yukon, with the Canada Mining Regulations applying in the Northwest Territories and Nunavut. Indian Mining Regulations apply on Indian Reserves.

2.3 Environmental and Social Impacts

This section identifies the potential environmental and social impacts a community may experience during mine development. It also explains the purpose of an environmental assessment. Types of environmental monitoring, mitigation measures, and opportunities for community input are included.

What Are the Potential Environmental Impacts?

Every mine development is unique and will affect the environment in different ways. Using modern technologies, sound planning, and rigorous impact monitoring, specialists can reduce these impacts.

The permission to develop a mining project is decided on its eventual environmental **legacy** and community sustainability. The environmental impact assessment is meant to demonstrate how the development will affect the environment during mine operations and mine closure. The socio-economic assessment evaluates the social and economic **sustainability** during development, operations, and beyond closure of the mine.



The following chart outlines the types of environmental impacts possible during mine development.

Environmental Impacts		
Type	Condition	Mitigation
Land use	Construction of access roads and power lines; uncontrolled access to mine site	Plan to minimize land disturbance due to roads Install security gates
	Construction of buildings, workshops, processing plant, and permanent camp	Use community feedback in design and layout of buildings Minimize land use
	Bulk sampling and extensive drilling programs	Detailed planning to minimize land disturbance
	Fuel and chemical storage	Fuel storage standards Spill plans Fuel management programs
Air quality	Dust from roads and mining activities	Water roads to minimize dust emissions
Water quality	Chemicals in water discharge, mud or dirt getting into water bodies; erosion Clean the water; control drainage	Control drainage Make sure discharge criteria are met
Wildlife	Animals attracted to garbage and food waste	Waste management programs
	Migratory patterns affected by presence of humans, noise from aircraft, noise from blasting	Use environmental baseline work to understand wildlife activity in the area Educate employees and contractors to understand their responsibilities towards wildlife

Other environmental impacts and mitigation, depending on where a development is located, may include:

Potential Impacts:

- Loss of archaeological and heritage sites;
- Impacts on traditional and non-traditional land use;
- Impacts on water flows and quality; and
- Impacts on fish and fisheries.



Mitigation:

- Protection of land and identification and protection of archaeological and heritage sites;
- No hunting/ fishing zones and wildlife protection;



- Water quality monitoring and flow supplementation; and
- Protection of spawning and rearing areas and fish farming.

What Environmental Studies Are Required?

Environmental baseline studies are generally required to complete an environmental impact assessment. They start as early as during the advanced exploration stage. These studies include developing a detailed description of the environment. Examples of surveys that may be completed include:

- Archaeology *
- Land use
- Water quality
- Surface and ground water hydrology
- Vegetation
- Wildlife
- Administrators
- Traditional knowledge
- Terrain
- Socio-economic
- Air quality
- Aquatic resources (fisheries)
- Hydrogeology
- Noise
- Soils
- Acid rock drainage/metal leaching
- Fish habitats

* Example: A scientist may survey the land for burial sites and historical land use patterns.

What Is an Environmental Assessment?

An environmental assessment (EA) is a government-mandated (provincial, territorial, federal) process to identify and assess the potential environmental effects of a project before it is built. The purpose of the assessment is to minimize or prevent any negative environmental effects before they occur, and to mitigate the effects in order to reduce overall impacts. Both federal and provincial laws require some form of EA process to be conducted due to the nature of regulatory authorizations required by mining projects. This typically leads to concurrent provincial and federal EAs harmonized under one EA. In the North, most mining projects are assessed by impact review boards established by federal statutes.

The result of the environmental assessment is not to approve the project, but to show to responsible authorities that the environmental impacts are understood and can be mitigated. At the end of the assessment, the project may be approved in principle, but it will still need permits before it can be built.

In a typical environmental assessment process, there are mandatory elements for public participation. For federal environmental assessments, public participation is mandatory for comprehensive assessments, but not for



screenings. This involvement is required to start when an application (project submission) is submitted. Usually, the public and Aboriginal groups are contacted earlier in the process.

The *Canadian Environmental Assessment Act* (CEA Act) explains the full process that must be followed for federal environmental assessments. It explains when an environmental assessment is necessary and the responsibilities of the federal departments. Some of the departments of the Government of Canada have to give approvals for certain components of a project. These departments, called Responsible Authorities, are in charge of making sure that an environmental assessment is completed. They cannot give approvals for any part of the project until the environmental assessment is finished.

Typically, the federal environmental assessment process includes:

- Determining if an environmental assessment is required. It does not consider the likely effects of the project, simply whether or not the legislation or act applies;
- Identifying who could be involved;
- Planning the environmental assessment;

- Conducting analysis and preparing an environmental assessment report;
- Reviewing the environmental assessment report by federal departments;
- Making of environmental assessment decisions by Responsible Authorities; and
- Implementing mitigation program and monitoring (if required).



Environmental assessments may make full use of the traditional knowledge of Aboriginal people. The mining company is responsible for collecting traditional knowledge or making possible its inclusion. Traditional knowledge can be used to determine the environmental effects and evaluate how serious they are. Traditional knowledge will also be used to select the ways to reduce environmental effects.

Laws at the federal, provincial and territorial (Yukon) levels specify when environmental assessments or impact reviews are required and how to do them. The Government of

Facts & Figures

Aboriginal people can work with the mining company to ensure that great care is taken to protect historical and sacred sites, as well as migration routes and traplines, before mining starts.



Canada will do an environmental assessment when certain federal authorizations are required. The provinces and territories will do environmental assessments when permits are needed under their laws.

In the case of a mining project, this means that there are often federal and provincial environmental assessments that are needed which are harmonized into one joint panel review. At the federal level, mining projects most often require an environmental assessment or impact review (in the North) because federal permits, authorizations or licences are required.

What Environmental Monitoring Is Required?

Environmental monitoring is in place to provide early warning of negative impacts so that corrective actions can be quickly put in place. Environmental monitoring is usually a condition of the environmental permitting process. Environmental

Facts & Figures

The West Kitikmeot/Slave Study Society is a made-in-the-north success story. It is a partnership of Aboriginal and environmental organizations, government and industry that wishes to make sure the effects of development on the environment, wildlife and people of the WKSS area are minimal and that northern people get the maximum benefits.

The partners formed a registered society in 1996 and developed an initial five-year research program called the West Kitikmeot/Slave Study (WKSS) to provide an information base necessary to examine the long- and short-term effects of development in the WKSS area. The initial WKSS research program ended on March 31, 2001. Since that time, the WKSS has continued to fund several key projects during the interim period until regional monitoring systems are in place.

(Source: www.wkss.nt.ca)



monitoring makes sure that a company's Environmental Management Plan is being implemented as proposed. The objective of environmental monitoring is to make sure that all impacts are mitigated. A mining company usually performs the monitoring, analyzes the results, and reports them to government agencies or sometimes to community monitoring agencies.

Environmental monitoring during mine development includes monitoring water flows and quality, air quality, and fish habitat, and can include vegetation changes. Air quality is monitored for its potential impact on wildlife and humans. Scientists analyze these tests. Local people are often trained to carry out sampling and analysis procedures. As an example, direct changes in plant communities are watched for, as well as the presence or absence of non-native species. Vegetation is sampled and analyzed in a lab, particularly





for metal mines, for potential metals uptake and transfer to wildlife.

What Are the Potential Social Impacts?

While mine development brings opportunities for employment and business to a community, it may also create new social issues or concerns for the community. The table below illustrates some of the positive and negative impacts of mine development.

What Are the Opportunities for Community Participation?

Community input and information exchange should occur during each phase of the mining cycle starting with exploration. During mine development, the importance of meaningful community input is critical. This is the time, before a project goes into operation, for communities to “get their issues on the table” and “say what they mean.” In other words, this is when communities can gain a complete

Social Impacts			
Type		Positive and Negative Effects	Community Response
Social	Shift work/rotational work	Less time to spend on traditional activities Workers and their families are separated for several days or weeks	Plan activities around work schedule Create support groups or programs to minimize the separation stress experienced by families
Economic	Community partnerships and alliances developed	Increased business opportunities Employment Training opportunities Adds wealth to a community	Improve and enhance community infrastructure Work with the changing dynamics of the community
	Increased employment	Increased training and skill development opportunities Increased income Creates positive role models Widens the gap between the employed and unemployed	Use the positive working role models within the community Need to provide workshops on money management, saving of wages, banking, etc.
Cultural	Strangers in the community	Increased population Strains existing services Worsens existing social problems	Offer cultural awareness training, delivered by members of the community, to make sure new people in the community understand its values and traditions



understanding of the project, ensure that the developer understands the potential impacts from their perspective and knowledge base, and raise issues of community concern. In this

way, an environmental assessment can address deficiencies in information and incorporate necessary changes in mine planning. Once a mine is operating, community input and consultation focuses on monitoring the effectiveness of impact management plans (mitigation) established during the environmental assessment.

Traditional knowledge is an area where Aboriginal community input is significant. Traditional knowledge provides information about traditional land uses, alerts developers to migratory patterns of wildlife, and can inform developers about sensitive areas (hunting areas, cultural sites, migratory routes, etc.). Traditional knowledge may also be used to help identify environmental impacts, evaluate how

serious they are, and select ways to reduce any negative effects.

Consultation processes are designed to incorporate input from communities and promote the sharing of information. To get the most out of consultations, communities can prepare in advance by doing the following:

- Identifying potential impacts that need to be considered in project development;
- Conducting a skills inventory of residents interested in working at the mine;
- Beginning skills training;
- Identifying community business opportunities and capacities;
- Identifying the service and labour needs of the project;
- Setting up ways to communicate for current and ongoing consultations (i.e., key contacts); and
- Assessing needs for advice and information gathering.

Additionally, having community development and infrastructure plans in place before development will be of great value to the community throughout the mine development process. Communities should enter into discussions with government agencies as early



as possible during the licensing and permitting process.

To help communities in this area, provincial/territorial authorities and federal government departments may have programs to help communities and individuals take advantage of opportunities during mine development. Communities may decide to set up a number of committees during the mine development process to ensure impacts are recognized and mitigated. Possible committees include:

- A committee to review the environmental impact statement;
- Environmental and socio-economic monitoring committees;
- Community wellness committee;
- Business development opportunities committee;
- Training/hiring committee; and
- Community sustainability upon mine closure.

2.4 Community Employment and Other Economic Opportunities

This section identifies the employment and economic opportunities available to Aboriginal communities during mine development. It briefly describes the role of **Impact and Benefits Agreements, Joint Ventures, and Memoranda of Understanding**. Ideas for maximizing benefits are also included.

Facts & Figures

The Voisey's Bay Nickel Mine in Labrador surpassed all expectations for Aboriginal employment during its mine development phase. Since 2002, Aboriginal employees have filled more than 1100 construction jobs. At its peak, nearly 500 Innu or Inuit were working at the construction site.

(Source: Voisey's Bay Nickel Company, www.vbnc.com)



What Are the Employment Opportunities?

Communities can experience huge increases in employment during mine development depending on the size of the mine. A wide variety of jobs, from entry-level to professional, are available during mine development (see Jobs and Education Table). The mine developer and its contractors are the major employers.

Other employment sources are secondary support industries and service providers.

The economic impacts due to increased employment are significant to a community. Since many of the skills learned during mine development are transferable, a community can also benefit from the increased skill base of its residents.

Jobs and Education		
Type of Job	Education Requirements	Examples
Entry-level	Grade 12 education or equivalent If a community does not meet this, they can talk to the mining company about waiving the requirement for a period This can encourage young people to stay in school and allow time to meet the requirement	Trades helpers Heavy equipment operators Housekeeping services
Semi-skilled	Grade 12 education or equivalent Some work experience	Warehouse technicians Administrative assistants Trades occupations
Skilled	College diploma or trades certification	Trades occupations Safety coordinators Environmental technicians
Professional	University degree	Managers Engineers Geologists Scientists Accountants

What Are the Other Economic Opportunities?

Communities can experience significant economic benefits during mine development. The main benefits come from increased economic opportunities. Communities and the mining company should work closely at the earliest opportunity to develop alliances and partnerships in the areas of training, employment and business opportunities.

A number of economic opportunities for communities exist during mine development, including infrastructure development and the provision of utilities. The following list identifies just a few of the



potential business opportunities available to communities. It includes:

- Camp catering and housekeeping;
- Site services;
- Surveying;
- Construction services;
- Contract mining – both underground and open pit;
- Supply of goods (e.g., safety equipment, oil, gas);
- Aircraft support – helicopters – fixed wing;
- Airport maintenance;
- Laboratory services;
- Environmental consulting; and
- A legacy project, like an arena or swimming pool.

Business opportunities will increase as a project moves through the steps of mine development. Communities should prepare to take part by asking these questions:

- “What businesses are currently available?”
- “What businesses are required?”
- “What are the capabilities of the community?”

- “Are there good joint-venture partners available?”

The process of building a business base in a community takes time as capacity is developed. A good example of this comes from the Northwest Territories where two large diamond mines were developed within five years of each other. As communities and local businesses gained experience, they increased their capacity and were much better equipped to take advantage of the opportunities presented by the second development.

Businesses may grow when longer-term contracts become available during mine operation.

Memoranda of Understanding (MOUs) may be negotiated during the early stages of mine development. They are typically an agreement between a mining company and the community and include information about the role of each party. MOUs may develop into an accord and possibly a legal agreement (e.g., an Impact and Benefits Agreement [IBA]) as the project progresses.

Once a company has made a commitment to develop a property, it should begin the process of developing IBAs or Participation Agreements (PAs) with local affected Aboriginal communities. IBAs or PAs are often created

between Aboriginal communities and mining companies. These agreements might include guidelines for hiring, business opportunities, and training and scholarships. An IBA or PA may make provisions for the preferential hiring of Aboriginal persons and may discuss how and when community members will receive training. An agreement will also likely explain the tendering process for business contracts and will outline any preferential treatment for Aboriginal/community businesses and require unbundling (breaking up) of larger contracts.

These agreements become confidential legal contracts. They will only be made public if agreed to by the community and the mining company.

Aboriginal businesses can enter into a joint venture with established businesses. A joint venture (JV) is a simple business arrangement between two companies or between an Aboriginal community and a company capable of supplying services or materials to an exploration or mining company.

A JV agreement defines the relationship between the two parties and specifies the training and employment opportunities. It also defines how profits from the JV business activities will be distributed.

There are many successful JVs. These can provide:

- Helicopter support;
- Catering; and
- Contract mining services.

One of the largest and most successful JVs is the NUNA group where a contract mining company has established a working relationship with the Inuit of Nunavut. Another example is Rescan Tahltan Environmental Consultants (RTEC). It is an environmental consulting joint venture between Rescan and the Tahltan Nation.

JVs are an excellent way to develop local business capacity to prepare for and take advantage of business opportunities related to mine development. Through a JV, a community business can increase the scope of its current services in order to help meet the service and support needs of the mine developer. JVs may be developed related to logistics support, the provision of goods and services, and a number of other areas, such as catering, fuel supply, housekeeping, and environmental consulting. In addition to increased business opportunities, JVs can also increase training opportunities for community residents.

Facts & Figures

The Voisey's Bay Nickel Company negotiated separate Impact and Benefits Agreements with the Innu Nation and the Labrador Inuit Association (LIA). These agreements establish specific employment objectives for Aboriginal people and identify specific business opportunities for Aboriginal companies and joint ventures.

Aboriginal companies were awarded procurement/construction contracts worth more than \$500 million.

(Source: Voisey's Bay Nickel Company, www.vbnc.com)





2.5 Community Experiences: Musselwhite Mine

The Musselwhite mine is located in northwestern Ontario on traditional First Nation land. Mine construction began in early 1996 and was completed by April 1997. The mine started commercial gold production in 1997. As of 2005, cumulative production exceeded 1.7 million ounces.

The Musselwhite mine is a joint venture owned by Placer Dome (68%) and Kinross Gold Corporation (32%). Placer Dome is the operator of the Musselwhite joint venture.

Musselwhite's relationships and agreements with the local communities are recognized as leading practices.

Community Summary and Involvement

The Cat Lake First Nation, North Caribou Lake First Nation, Kingfisher Lake First Nation, Wunnumin Lake First Nation, Shibogama First Nations Council, and Windigo First Nations Council signed the first Musselwhite Agreement in 1992 with the Musselwhite Joint Venturers (JVs). The federal and provincial governments also participated and signed the Agreement.

Musselwhite Agreement

The Musselwhite Agreement addressed these important topics:

- Preservation of the environment and heritage of the mine area;
- Local employment and business development opportunities; and
- Ensuring that communities received economic and other benefits from the mine.

The Agreement contained sections relating to:

- Financing of community projects;
- A preferred hiring policy for members of the signatory First Nations; and

- A maximum production capacity to ensure the benefit of the mine extended over a substantial period of time.

The Agreement also outlined compensation arrangements for North Caribou Lake First Nation trappers whose livelihood would be affected by mine development.

The Musselwhite Agreement was vital in establishing the terms for the development of the mine. Essentially, it represented that the local First Nations communities were giving the JVs a “social licence to operate.” This agreement ensured local First Nations support for the project throughout the permitting process.

Construction (1996–1997)

Having completed the mine design, developed a financially viable plan and obtained the necessary permitting, the JVs started the construction phase of mine development. Although the construction phase was relatively brief, it had the greatest impact in the short term and, if mishandled, had long-term implications. During construction, the JVs identified five key objectives:

1. To build the mine safely;
2. To build the mine in an environmentally sensitive manner;
3. To build the mine in harmony with surrounding communities;
4. To build the mine on budget; and
5. To build the mine on schedule.

JVs, First Nation communities, employees, contractors and government all worked together, within the terms specified in the Agreement, to achieve the goals.

Lessons Learned

The mine operator and First Nations communities learned a number of lessons during the mine development phase.

1. *The Value of a Healthy Relationship*

This was a lesson learned many times over. Problems that happened during the mine development phase were identified and resolved amicably. Resources and valuable time were not wasted due to unnecessary work stoppage or by resolving issues in court.

Dialogue between the mine operator and First Nations that started during the exploration phase carried on throughout mine development and beyond. This ongoing communication led to a respectful relationship between the two parties. Cultural and historic awareness of the local context was an important realization in forming a relationship.

2. *The Musselwhite Agreement*

This agreement became a guide for participants on how the mine would be built and operated.

Because the document contained input from the JV and First Nations, both parties had ownership for the outcome of mine development and were committed to its success. Misunderstandings did occur and the intent of the Agreement became the basis for resolving issues. To help resolve issues, the Agreement stipulated that various committees be formed to monitor performance and ensure the spirit of the Agreement was being fulfilled.

The following are two examples of how disputes were resolved:

- Discovery of a tar-like substance found in a river draining the property led to concern that an oil spill into the environment had gone unreported. A commitment to operate a joint monitoring program with JV and First Nation personnel restored faith in the program and trust in the relationship when it was discovered that the unknown substance was mosquito larva.
- Achieving First Nation employment as specified in the Agreement was problematic. Ambitious training programs were undertaken for First Nation people

seeking work. Additionally, the JV insisted that outside contractors hire and train First Nation residents as a requirement to working on the construction site.

Both First Nation and Musselwhite representatives stress personal relationships as crucial to making the Agreement work. Most people agree that the mutual respect between both parties was essential to resolving disputes.

A First Nation negotiator is credited with saying “It is not what is in the agreement. You can write what you want. It is about the special personal relationship that helps to overcome legal obstacles.” On the other side, a JV representative stated, “Simply sticking to the narrowly defined terms of the agreement does not work. In order to make the agreement work you also need to address issues that are not directly related. You need to be seen as a flexible, concerned and trustworthy partner.”

3. *A Commitment to a Long-Term Partnership*

The sense that the JV and First Nation people are in a long-term committed partnership is the glue that holds the relationship together. JV management publicly committed to accept its corporate responsibility to make Musselwhite a safe and profitable mine while respecting the environment and social progress, and without compromising communities, wellness or security. They also committed to the integration of best-practice standards for occupational health, safety, and environmental protection for all activities at the mine site from development through to closure. In return, First Nation communities supported the JV during the mine development phase by providing labour, goods and services, and their much-needed support for mine development during the formal permitting process.

For more information, contact:

www.kinross.com/op/mine-musselwhite/index.html

www.goldcorp.com/gold_projects/musselwhite

