

Chapter 12 : Mining in NL

Defined as the extraction of valuable minerals from Earth from an **ore** body, vein, or seam. A mineral is any chemical substance arranged in some crystalline structure.

- must have a commercial use, and the current market prices must make the concentration of minerals and the cost of their refinement “**viable**”....if so, its an “**ore body**”.

(Technically, the definition could be expanded to include gas and oil extraction. Already includes up to 2000 identified minerals. Most have little / no economic value. Others like hematite, halite, or nickel sulfides are quite useful.)

Ex. Iron ore to make steel
 limestone for cement
 gypsum for gyproc and plaster
 quartz for glass and crushed stone
 Marble and granite for dimension
 stone

Minerals are usually found impure....mixed with other minerals or some type of “host rock”.

Ex. Sudbury, Ontario -
silver initially, switching to copper when market prices changed. nickel and

Hope Brook gold mine, NL -
Copper, then switched to gold

Other minerals can be processed as a “by product” of another higher concentration mineral, like titanium.

Impacts on Society and Economy :

Public Perception -

Seen as a dirty, environmentally degrading industry, but a lot has changed. The owners generally look for the cheapest way to extract minerals, maximizing profits, and this has historically led to large scale environmental impacts.

ES + awareness + perspective shift + Govt

Increased NL GDP :

1.75 B to 3.75 B a year depending on market value and production rates

Employs 3,000 to 5,000 people with salaries 25% above Canadian average

Community infrastructure :

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The driving force behind establishing towns like Lab City, Buchans, Schefferville, PQ, older operations built towns next to mine sites. Many secondary businesses established to support mining operations. Grants, donations, taxes, and Government royalties.

Modern mines tend to use **FI/FO** operations to minimize impacts.....issues ?

- tax base, transportation demands, fewer economic impacts on local towns (IOC issues with

FI/FO)...money spent elsewhere by people working here

- building new towns is expensive, especially in remote areas, this is a cheaper alternative. The distances workers travel is limited only by company spending. (Ex. Atlantic Canada to Alberta for a 3 week shift.)

Historical mining - page 408 examples

Mineral / ore uses, page 409

Current mining operations, page 410

<http://www.nr.gov.nl.ca/mines&en/mining/>

The Mining Process : (life history of an average mine) 411

THE ESSENTIAL PHASES OF MINING

DUCK POND MINE, Teck Resources Limited

GEOSCIENCE

Geoscience surveys provide critical information to aid exploration.

EXPLORATION

Exploration by prospectors and companies leads to discoveries that could become mines.

DISCOVERY

Discovery depends on investment, detailed field surveys and innovative technical studies.

DEVELOPMENT

Development includes feasibility, geoscience and engineering studies, raising capital and construction.

PRODUCTION

Production includes extraction, milling and processing to produce metals, industrial minerals and aggregate.

RECLAMATION

Reclamation of sites to productive use begins during operation and continues after closure.

In Newfoundland and Labrador for 2008...

GEOSCIENCE	EXPLORATION / DISCOVERY	DEVELOPMENT	PRODUCTION
<p>\$6,000,000 invested in operational costs and salaries.</p>	<p>\$146,000,000 spent by companies on supplies, services and contractors, generating significant local employment and purchasing.</p>	<p>\$408,000,000 in capital investment on construction and equipment, with substantial local employment, purchasing and rentals.</p>	<p>\$4,650,000,000 in mineral shipments, represents an important contribution to the provincial GDP, and a significant component of the resource sector.</p>

BUSINESS OPPORTUNITIES IN THE NL MINING SECTOR

1. Discovery of a mineral body through exploration (mineral exploration file)

Geological map study for probable areas of host rock, sediment /water samples from lakes and ground surfaces. Aerial photos,

satellite imaging, eskers and glacier movement, geiger counters, magnetism fly overs

Prospectors, grab samples, assay analysis
(determining the proportion of mineral present in host rock)

<http://www.youtube.com/watch?v=rsCkWhojcJI&feature=fvsrc>

Remove any overlying sediment or rock, drill test holes, core sampling, assays, 3d modelling

When an ore body is “viable”, all environmental requirements met, blasting, drilling, digging, washing can begin.

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2. Ore Extraction Process -

Which technique to use depends on the ore body, geology, geography, social and political concerns.

Placer Mining - river gravel and beaches
(Au, Pt, Sn, Cr, Diamonds)

Involves filtering sediment to remove heavier valuables.

Hard Rock Mining - valuable ore is locked in place inside a host rock

Underground mining - when ore is concentrated into pure concentrated layers or veins - or when large amounts of rock must be removed. Most dangerous.

Open Pit mining -

quarries - dimension stone block cutting or rock crushing

Excavating ore located close to the surface, and / or when ore is mixed throughout host rock.