

Mining = Opportunity for Indigenous Communities in New Brunswick

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March 2022 - slide deck

Presentation Outline

My Role:

- Share some examples of Indigenous business opportunities related to mining
- Explain mining in everyday language
- Share some insights into this unique sector

Presentation Outline:

1. Opportunities for Indigenous mining jobs, businesses and agreements in New Brunswick
2. Life cycle of mining related to New Brunswick and potential economic opportunities for indigenous communities
3. End with a few key points relevant to economic development officers related to mining

Why Explore for Minerals?

Society is increasingly dependent on minerals!

- **Metals**

- Copper for electrical wires,
 - Zinc to galvanize steel,
 - Gold for jewelry/electronics
 - REE for electronics

- **Aluminum**

- Critical for transportation

- **Minerals**

- Gypsum for wallboard

- **Rocks**

- Gravel for highways and building foundations,
 - Granite for building, Limestone to make cement



Sealed lead acid battery



Lead chimney flashing



Why Talk About Mining Importance to Indigenous Communities?

Indigenous Peoples have long used and traded rocks, metals and minerals that are culturally important

Four reasons:

1. Jobs and contracts
 - mining is #2 employer of Indigenous people in Canada
2. Numerous agreements with Indigenous communities
 - potential for significant benefits
3. Mines are spread across New Brunswick and Canada
 - remote, rural and suburban locations
4. Mining sector not well known:
 - many people have never visited a mine or learned about them



Indigenous Employment in Mining (2019)

- High levels of major mine employees are Indigenous
- Direct and indirect employment exceeds **719,000 jobs** in Canada. **In New Brunswick**, approximately **6,180 people** are employed in the mineral sector
- **Indigenous people make up 12%** of **Canada** labour force in the mineral sector
- Many **attractive jobs** that build work skills
- Jobs exist in all regions of the province



March 2022



Photos : Jerry Asp

PDAC infographics

Typical Mining Jobs



Mine
Workings
Surveyor`s
helper
Miner
Driller
Heavy
Equipment
Operator
Shift

Mill/Shop
Trades
helper/
apprentice
Warehouse
assistant
janitor
Technicians
Certified
Etc.

Offices
Students
Secretarial
Admin
Engineers
Geologists
Technicians
Accountan

Camp
Janitorial
Kitchen
Cook
Admin
Repairs
Safety
Security
Etc.

Roads,
Etc.
Snow
removal
Road work
Trucking
Gravel pit
Supplies
Diesel fuel
Explosives

Over 160 different mining jobs

Goods and Services Contracts

- Mines require a wide variety of **goods**:
 - Food, lumber, gravel, vehicles and parts, signs, pickets, ...
- Mines often contract out specific **services**:
 - Security, environmental monitoring, snow removal, food services, accounting, road maintenance, transportation, ...
- Companies of various sizes bid on these **contracts**:
 - Many mines prefer to contract **local** companies and recognize the value of using **Indigenous companies**

Canadian Mining Sector's Wages and Salaries (2020)

- . With the «Average Weekly Earnings by Industry » at **\$2,099** in 2020, the **Mining**, quarrying, and oil and gas extraction sector boasts the **highest** wages and **salaries** of all industrial sectors in Canada.

<https://www150.statcan.gc.ca/t1/tbl1/en/tv.action?pid=1410020401>

- . Mineral sector represents **1** in every **29 jobs** in Canada.
- . Mineral Industry is the top private sector industrial employer of **Indigenous peoples** with **12%** of the Canadian **labour force**.

Indigenous Community Active Mining Agreements

Active Agreements

- Impact and Benefits Agreement
- Socio- Economic Agreement
- Exploration Agreement
- Participation Agreement
- Cooperation Agreement
- Memorandum of Understanding
- Letter of Intent
- Surface Lease Agreement
- Other Agreement Type



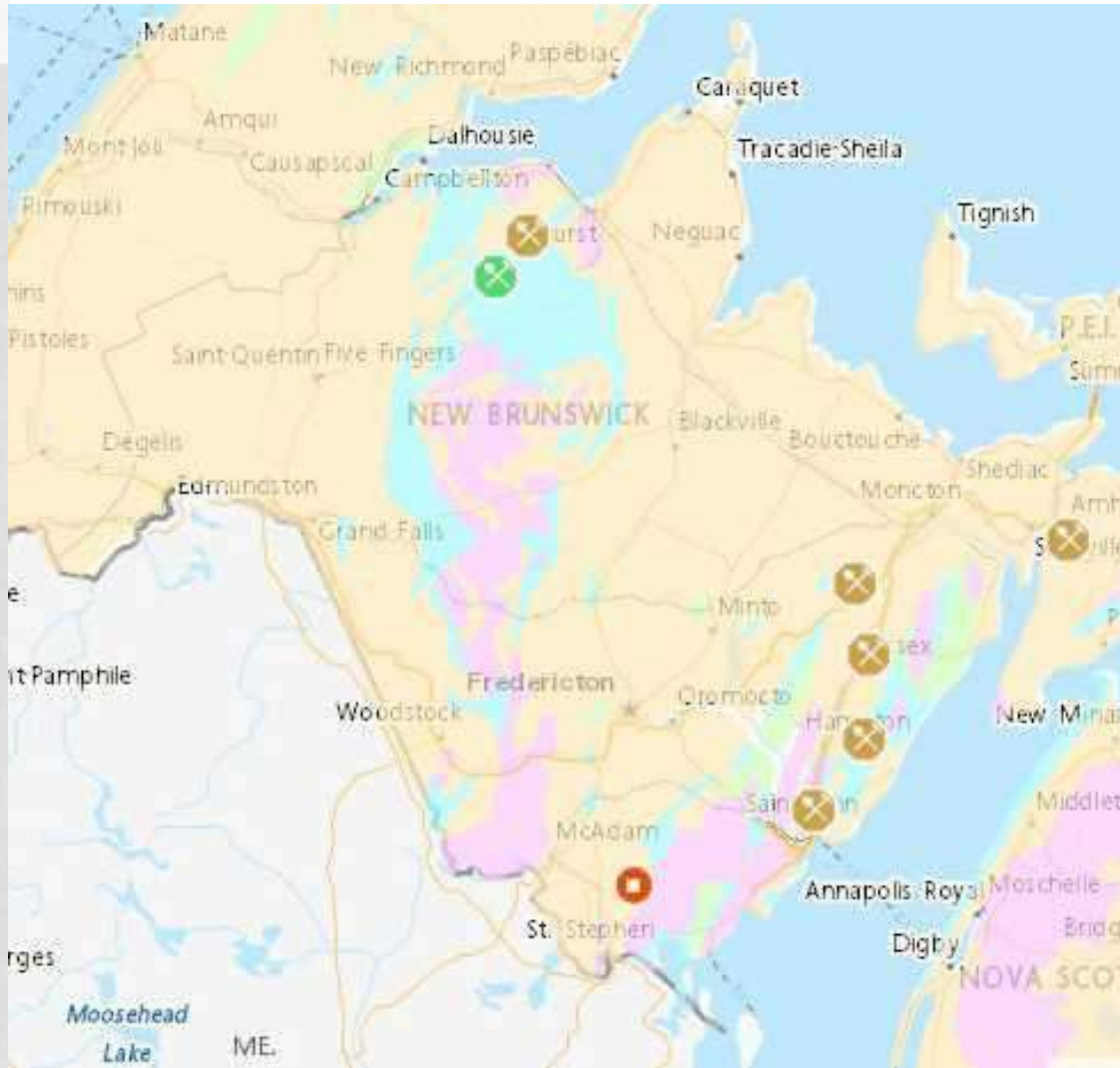
New Brunswick's Capacity-Building Initiatives for Indigenous Communities

- In 2012: **First Nations Underground Core Mining Training Program** : Done through the New Brunswick Community College (NBCC) is a partnership between (AWDI), (PETL), and **Trevali's Halfmile Mine** in the Bathurst Mining Camp. Twelve (12) people from **Elsipogtog, Pabineau, Eel Ground, Esgenoopetitj, Eel River Bar** and **Metepenagiag** were selected and trained.
- In 2017: **Atlantic Canada's first specialized training centre for the mining and drilling** sectors will be headquartered at the NBCC, **Bathurst campus**. NBCC invested **\$265,000** , N.B. government **\$1.3 million** through Regional Development Corporation (RDC) and Department of Post-Secondary Education, Training and Labour (PETL) and, Fed's ACOA, **\$185,000** through their Business Development Program.
- In 2019: **Pabineau First Nation prospectors** received a training course on CCNB's mining simulator.

[Mining and drilling training centre established in Bathurst \(gnb.ca\)](http://gnb.ca)

New Brunswick

Mines & Exploration Projects



Legend:

- Producing Mines
 - Metal mines
 - Nonmetal mines
- Top 100 Exploration Projects
- Geology - Major Rock Categories
 - Intrusive rocks
 - Metamorphic rocks
 - Sedimentary and volcanic rocks
 - Sedimentary rocks
 - Volcanic rocks

Exploration and deposit appraisal expenditures, by province and territory, 2019–2021

2019 Canada total **\$2.3B**

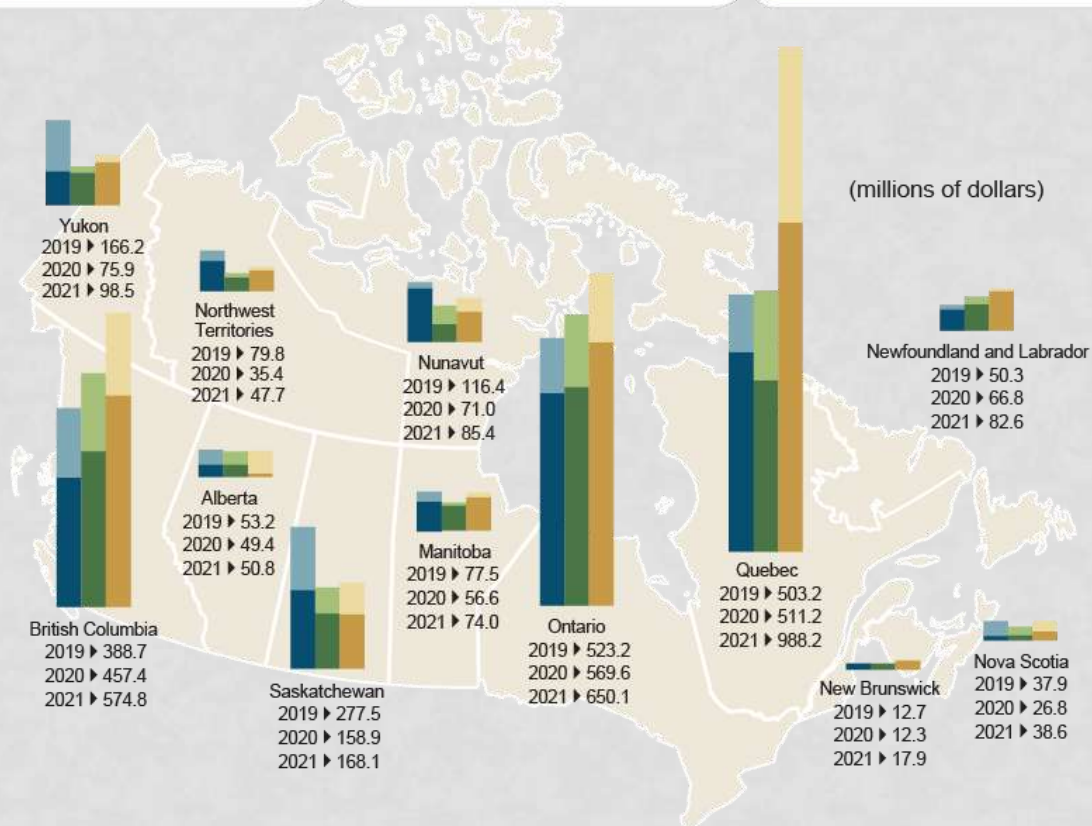
■ Exploration **\$1.6B**
■ Deposit appraisal **\$0.7B**

2020 (p) Canada total **\$2.1B**

■ Exploration **\$1.5B**
■ Deposit appraisal **\$0.6B**

2021 (si) Canada total **\$2.9B**

■ Exploration **\$2.1B**
■ Deposit appraisal **\$0.8B**



Top 10 Mineral products in Canada (2020)

	Canada (\$)
1. Gold	12.3B
2. Iron Ore	5.6B
3. Coal	4.0B
4. Copper	3.9B
5. Potash	3.7B



	Canada (\$)	2019
6. Nickel	3.0B	
7. Sand/gravel	2.3B	
8. Diamonds	2.9B	
9. Stone	2.0B	
10. Platinum GM	1.3B	



Canada produces some **60 minerals** and metals at **200 mines** and **6,500 sand, gravel and stone quarries** a year worth nearly **\$48 billion**

Benefits generated by the New Brunswick's mining industry (2019)

- Approximately **6,180** direct, indirect and induced **jobs** in 2019
- Mineral exploration and deposit appraisal expenditures: **\$12.2 million**
- Mineral development expenditures: **\$24.5 million**
- Value of mineral production: **\$373.9 million**



Underground mining of the antimony vein at the Lake George mine.

New Brunswick's Mines & Mineral Potential Areas

- Mining not well known. Not generally taught in schools!

However,

New Brunswick's mineral potential:

A) **Metallic Minerals:**

Zinc, Lead, Copper and Silver (Bathurst area)

B) **Non-metallic Minerals:**

1) Potash (Sussex area)

2) Limestone (Havelock, Sussex and Sormany areas)

3) Salt (Sussex area)

4) Silica, Sand & gravel (Sussex area)

C) **Peat** (Acadian Peninsula & East Miramichi)

Life Cycle of Mining

Prospecting & Early Exploration



Mineral Exploration

Indigenous Business Opportunities



Mine Development

Mine Closure & Reclamation



Mining

Provincial Government Role in Exploration and Mining

New Brunswick government Role (DERD):

- New Brunswick administers **Mining Claims** & regulate **exploration** activities through **NB e-CLAIMS**, an “electronic mineral claim acquisition” for clients.

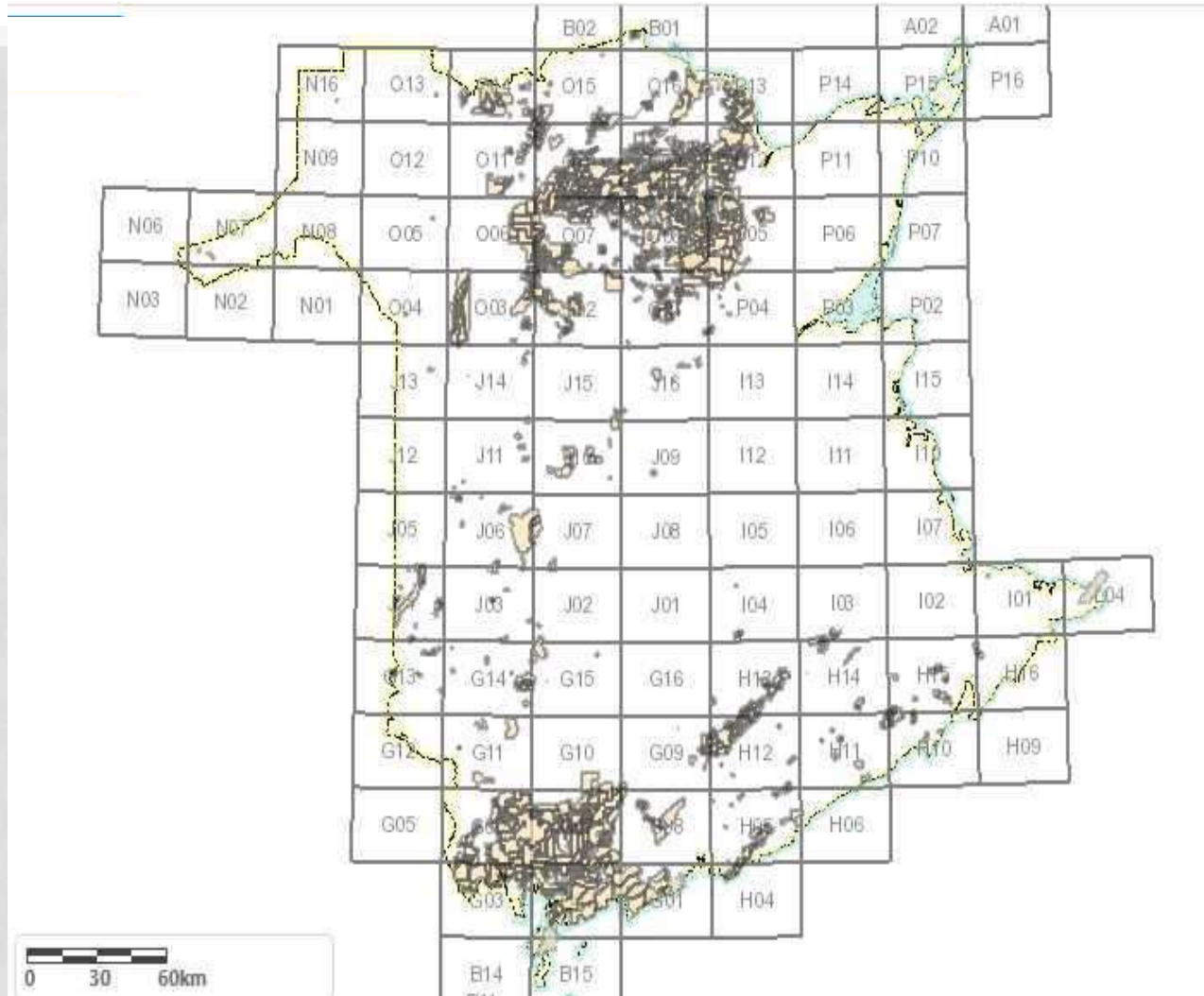
[NB e-CLAIMS \(gnb.ca\)](http://gnb.ca)

- Generate **geoscientific maps** and **reports** to support exploration through a Bedrock and Surficial « **Geological Search Tool** » or, Related Databases (Mineral Occurrences and Aggregates).

[Bedrock Geology Maps 1:50 000 Scale \(gnb.ca\)](http://gnb.ca)

- **Permit** mine developments and mines
- Enforce **safety** regulations and assist with mine training
- Require **reclamation plans** and reclamation **bonds** for mines

New Brunswick Mining Claims Titles



Restrictions on Online Claim Staking

No staking

- Indian **Reserves**
- Parks and some special protected areas
- Temporary areas under study by government

Staking Allowed on Private Land

- More regulations apply for claims on private land
- Mineral sector companies often avoid private land

Mineral Exploration Path



**Geology/
Prospecting**



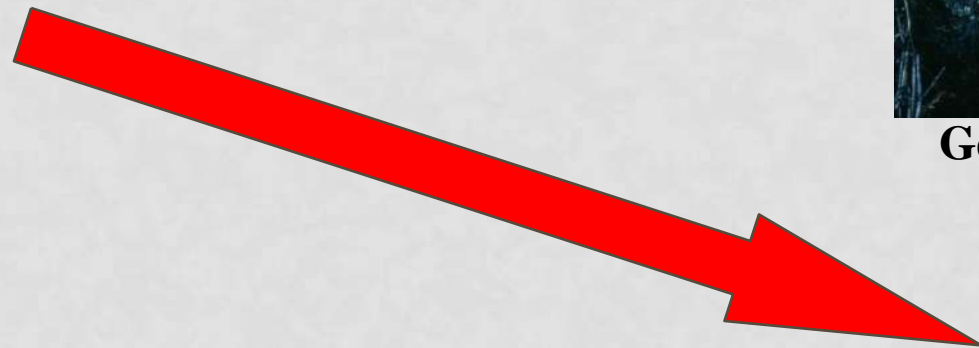
Geochemistry



Geophysics



Drilling





Early
Exploration

Prospector (a Find or an Idea)



Prospector Emilio Doiron
Sheba Pit occurrence

- A prospector finding an **interesting rock**.
- New Brunswick **Prospector's licence** is purchased for a **one-time fee** of **\$100** from the **NB e-CLAIMS** website.
- Used to make discoveries of most New Brunswick metal and industrial mineral deposits
- . Often work alone spending own \$. Hike through the bush, walk new **logging roads**, follow creek beds, etc.
- . Use a geological rock hammer and gold pan. Collect rock and stream silt samples
- . Hope to find a property to **option** (& negotiate a **Net Smelter Return**) or **sell** to a company.



Early
Exploration

Geological Mapping, Rock Sampling

- **Office work** - reviewing previous **assessment works**, reading government publications
- Geologist examination, regional traverses, sampling, visiting known mineral localities, **mapping**



Geology:

1) **Igneous rocks:**

- a. Plutonic/Granitic;
- b. Volcanic/Basaltic (« *Greenstone belt* » with Metallic minerals potential)

2) **Sedimentary rocks:**

Sandstone, Limestone
(with Oil & gas, Potash potential)

3) **Metamorphic rocks:**

Gneiss



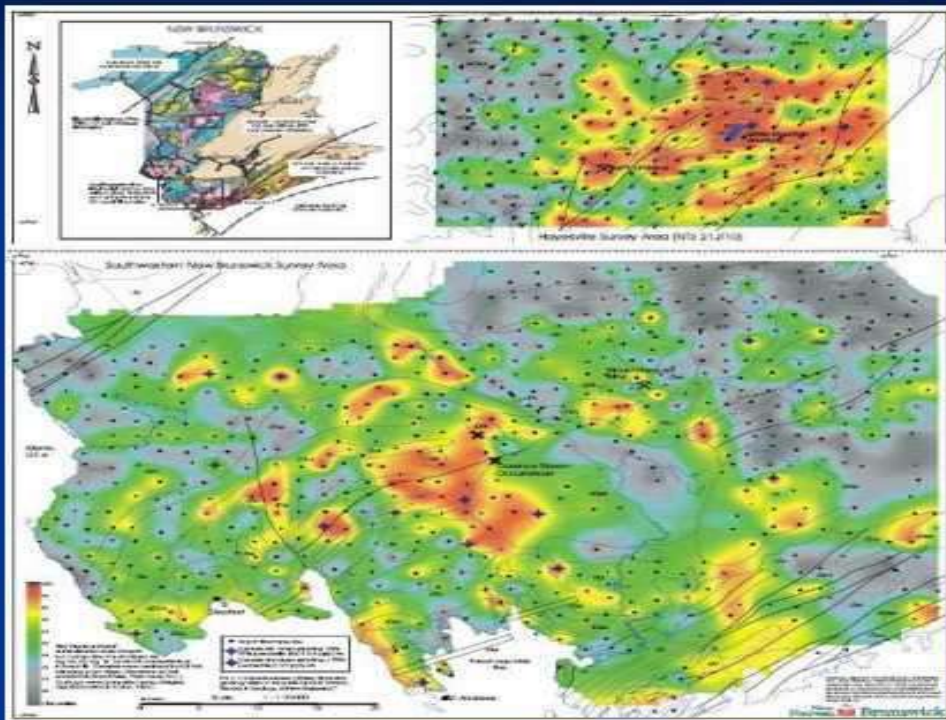


Early
Exploration

Till Geochemistry Anomalies

Till Geochemistry: Precious Metals

Au, Ag, As, Sb, Hg, Tc, Sc, U



Seaman et al., 2005

Precious metal anomalies in the Clarence Stream-Mount Pleasant area (Bottom slide & mined in the past) Vs Burnthill anomaly larger and more widespread (upper right). [Microsoft PowerPoint - Burnthill Web FinalVersion.ppt \(gnb.ca\)](#)



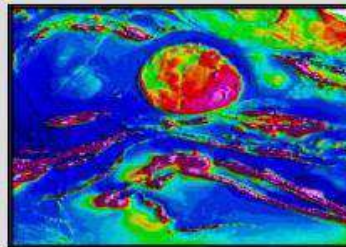
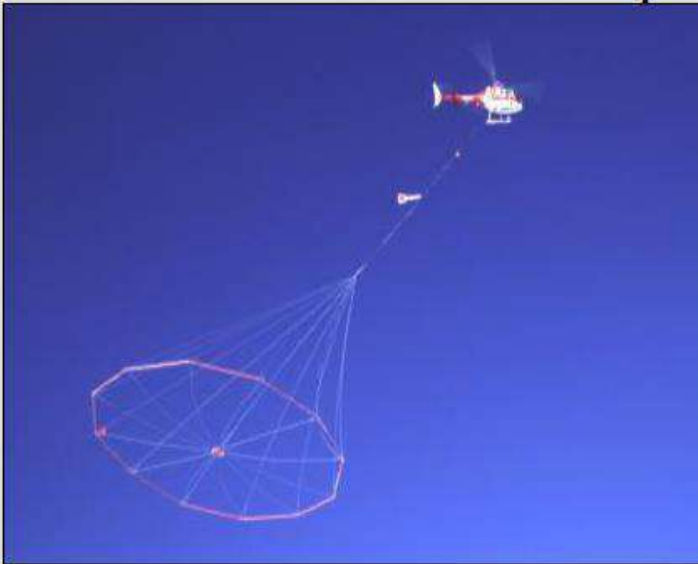
Early
Exploration

Airborne Geophysical Surveys

a. Magnetic (Mag) b. Electromagnetic (EM) c. Radiometric

- Collection of data from above or below the earth's surface using a sensing instrument to measure a characteristic like Magnetism.

Airborne Geophysical Surveys

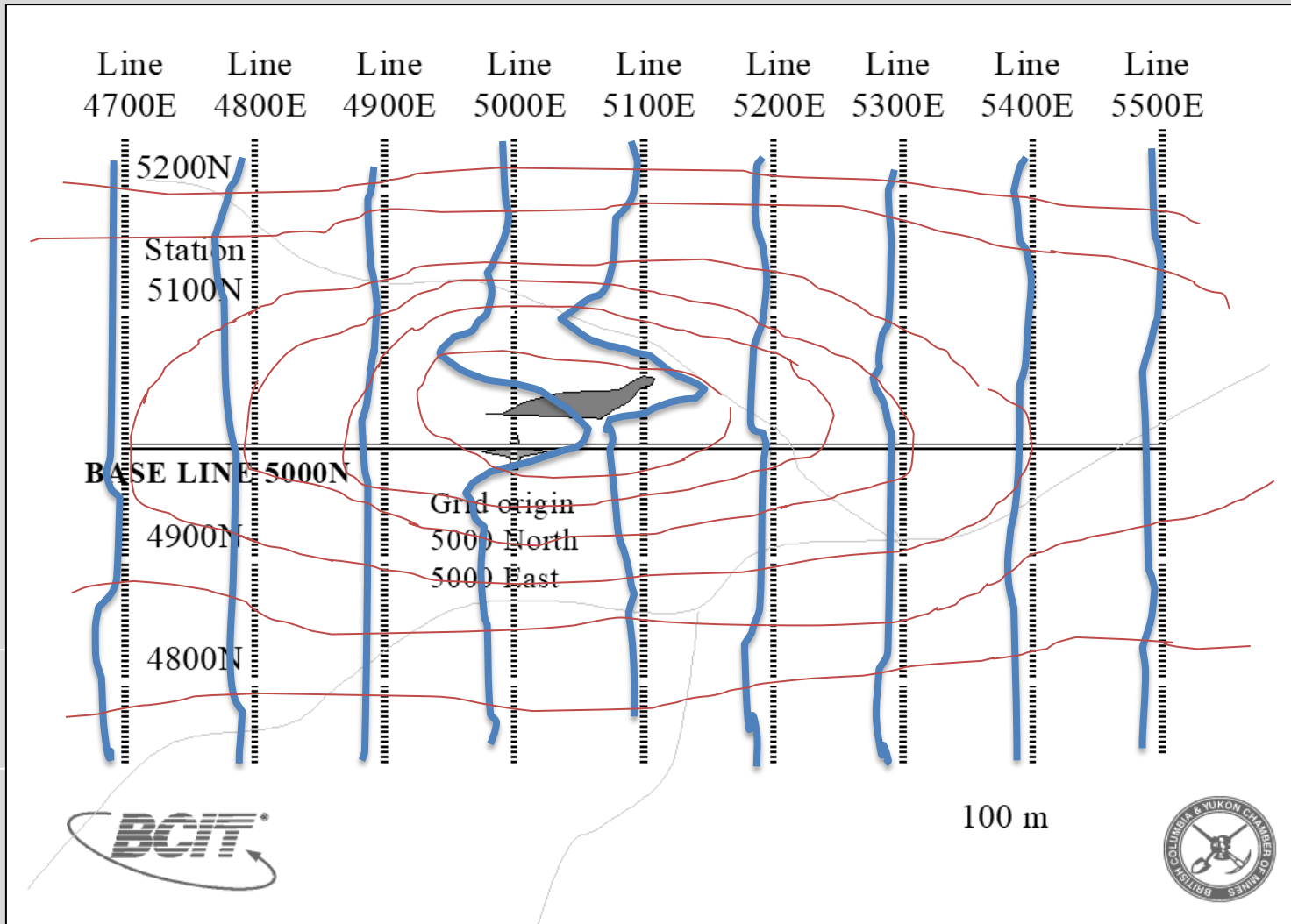




Early
Exploration

Ground Geophysics Exploration Property Grid

EM  & Mag  Surveys (“Anomaly”)



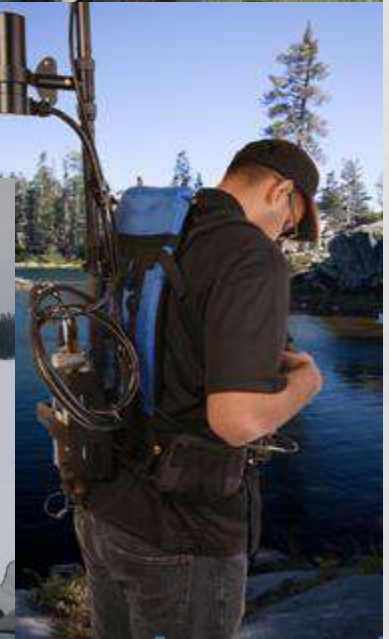


Early Exploration Jobs

Photos from Andreas Lichtblau

Early
Exploration

- Prospector
- Line Cutters
- Samplers (soil, etc.)
- Geophysical Crew
- Geologist
- Drillers
- Kitchen Helper
- Cook
- Camp Expediter
- Jack of All Trades
- Camp Set-Up





Early
Exploration

Provincial Exploration Assistance Program

The New Brunswick Exploration Assistance Program (NBEAP) encompasses:

- 1) The New Brunswick **Prospectors Assistance Program**,
- 2) the New Brunswick **Junior Mining Assistance Program**, and
- 3) the **Prospectors Promotion Program**.

NBEAP's budget is of **\$877,000** in 2021-2022 and funded by the New Brunswick's Department of Natural Resources and Energy Development



Participants of the Pabineau First Nation prospector training course receiving instructions on CCNB's mining simulator.



Advanced
Exploration

Drilling and drill core



Winter drilling & Removing drill core
from tube



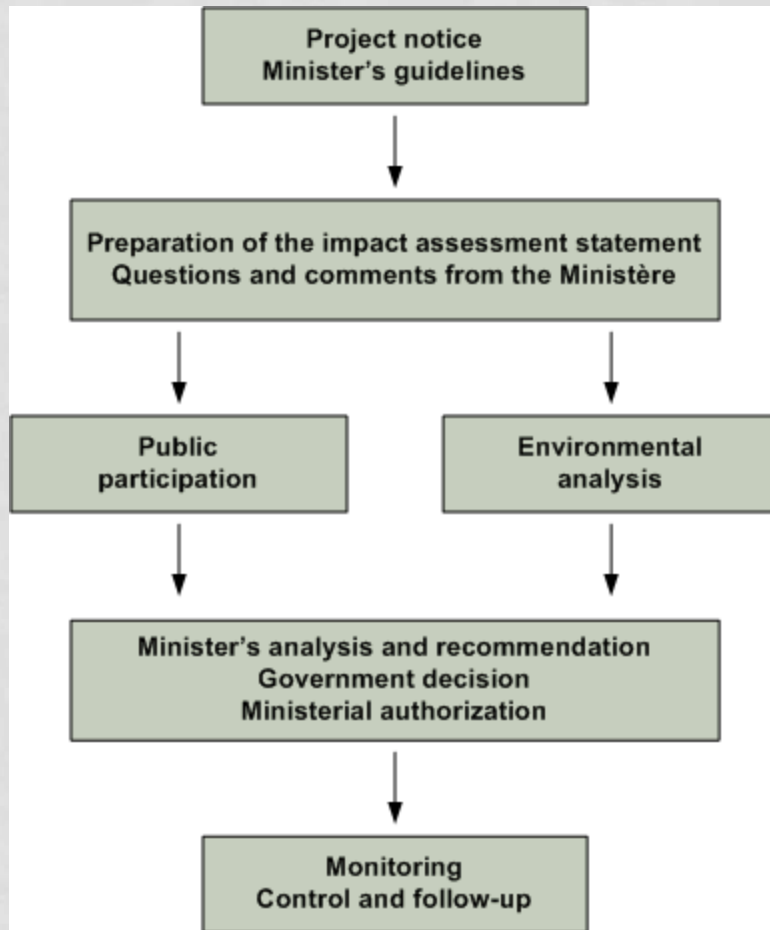
Geologist Logging (Describing) Drill Core
& Cutting of drill core





Advanced
Exploration

New Brunswick's Environmental and Social Impacts



- **Environmental assessment** process should begin **as soon as possible**. If project falls under both (N.B. & Fed) responsibility, usually, a single **cooperative EA** is carry out.
- Description of **environmental impacts and mitigation**: (N.B's EA + Fed's EA obligations under CEAA (2002) or IIA (2018) & **Responsible Authority**); Advanced Exploration **Closure Plan**.
- **Guidelines** (or, PDAC's E3Plus)
- **Due diligence**; N.B's **EIA, Public Consultation** & accommodation; **Baseline environmental studies**.
- Opportunities for community **participation**.

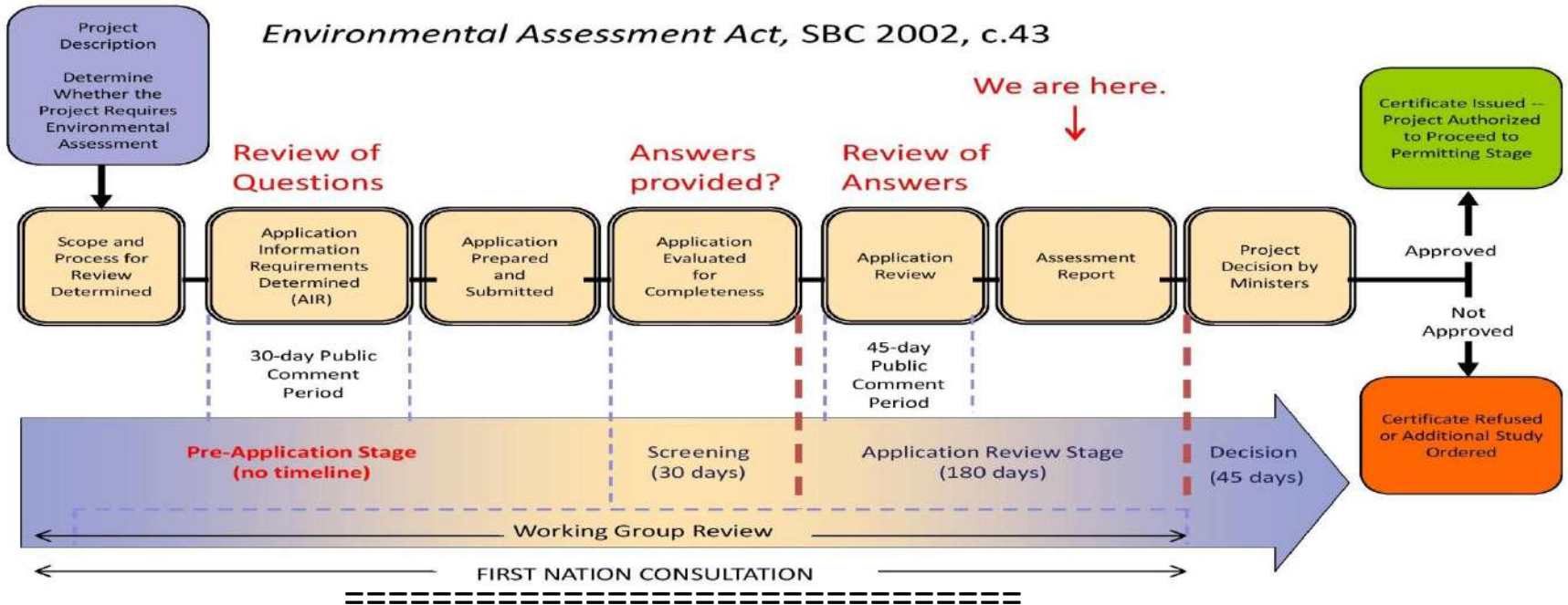
Environmental Impact Assessment (EIA) and Review process



Advanced Exploration

Federal Environmental Assessment Process Chart

Old CEAA (2002) recently replaced by IIA (2018)



New Impact Assessment Act, 2018 Process





Advanced
Exploration

Exploration Camp & Environmental studies

- **Environmental sampling and monitoring start as soon as possible**
- **Major focus on studying surface water, fish and wildlife for baseline data**



Credit: Sirius Resources



Early
Exploration

Aboriginal Exploration and Environmental Initiatives and Services



Advanced
Exploration



IKANAWTIKET is an initiative of the Maritime Aboriginal Peoples Council through the collaboration of the **Native Council of Nova Scotia**, the **New Brunswick Aboriginal Peoples Council**, the **Native Council of PEI**, **Fisheries and Oceans Canada**, and **Environment Canada** to serve as a regional ***Species at Risk focal point*** for **Aboriginal Peoples** residing on their **Traditional Ancestral Homelands** in the Maritimes.

IKANAWTIKET helps the Councils and community members find **preferred path** in the **implementation of the Species At Risk Act** throughout **Mi'kma'ki**.

[Maritime Aboriginal Peoples Council \[MAPC\] - Species at Risk Ikanawtiket Initiative](#)



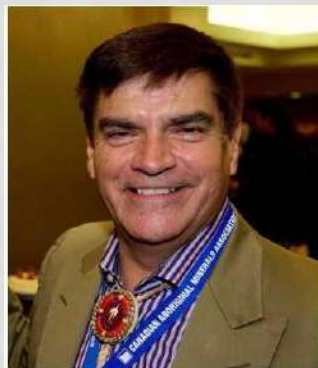
Exploration

Exploration et environment: PDAC's Skookum Jim Awards



Hans Matthews, winner of the **2020 Skookum Jim Award** is an experienced geologist and member of the **Wahnapiitae First Nation** in Ontario.

As a founder and **President** of the **Canadian Aboriginal Minerals Association (CAMA)**, he has played a key role in the evolution of Indigenous communities as equal partners in the mining industry, bringing together industry and Indigenous leaders, government representatives and youth.



**Skookum Jim Award
PDAC 2020**

March 2022

Jim MacLeod was the winner of the **2014 Skookum Jim Award** for aboriginal achievement in the mineral industry and environment. President of **EnviroCree Ltd** and **JA MacLeodExploration**.

Founder of the **Mistissini Geological Resources Centre**, MacLeod also serves on the board **Cree Mineral Exploration** and **Canadian Aboriginal Minerals Association**.

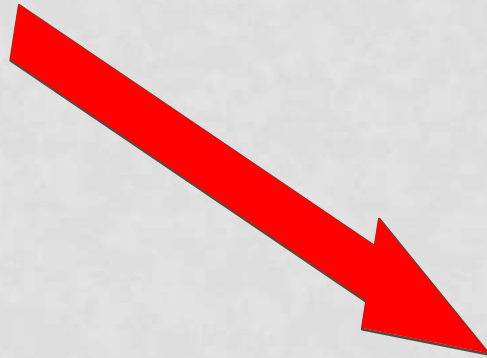


**Skookum Jim Award
PDAC 2014**

Mining Cycle

Mineral Industry Sequence

Prospecting / Early Exploration



Mineral Exploration



Mine Development



**Bulk Sampling
& Environmental Assessments**

- Government permits
- Economic feasibility studies
- Raise funds

Evaluation of Potential Value

Factors that determine if a resource is economical include:

- Type of mineral
- Market price of the minerals and metals
- Grade
- Location, accessibility, size and value of the resource
- Access to infrastructure: roads, airstrips
- Distance from markets and supply points
- Regulatory regime: taxes, royalty taxes
- Environmentally safe and socially responsible mining
- Availability of a qualified work force

Agreements between Mining Companies, Province and Aboriginal Communities New Brunswick

- New Brunswick Agreements:

1. **Halfmile Mine** - O, IBA - **Mi'kmaq** FNs of: Amlamgog (Fort Folly), Esgenoopetitj, Elsipogtog, L'nui Menikuk (Indian island), Metepenagiag, Natoaganeg (Eel ground), Oinpegitjoig (Pabineau), Tjipogtotjg (Bouctouche), Ugpi'ganjig.
2. **Sisson Project** – AA - Province of New Brunswick and New Brunswick's six **Maliseet** First Nations.

IBA = Impact and Benefits Agreement; AA = Accommodation Agreement; O = Other.

[aam-eac-e2013.pdf \(nrcan.gc.ca\)](#)

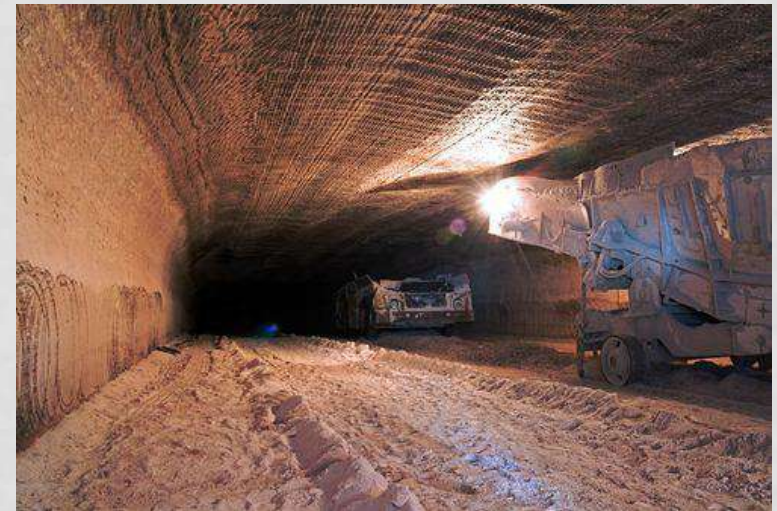


Mine
Development

Atlantic Potash's Millstream Mine Development

Atlantic Potash's exploration project and potential mine and infrastructure **development** would bring significant economic benefits to New Brunswickers:

- **\$4.5 million** in capital costs during the exploration phase.
- More than **16,700 direct and indirect jobs** during the construction phase, and about **900 direct and indirect jobs** during regular operation.
- Approximately **\$674 million in wages and salaries** during construction, and about **\$40 million annually** during operation.
- An estimated **\$1.3-billion contribution to GDP** during the construction phase, and about **\$193 million annually** during **operation**.
- Approximately \$160 million in taxes during construction, and about **\$23 million in annual taxes** during operation.





Mine
Development

Sisson Mine Development & Maliseet Accommodation Agreement

-Sisson Mines Ltd.: Development of an **open pit tungsten and molybdenum mine**, and an **ore processing facility**, northwest of **Fredericton**.

-Sisson Mines Ltd's project will result in:

- 500 jobs created during the construction phase. **300 jobs** over the life of the mine.

. In 2017, the province and **six Maliseet First Nations** reached an **Accommodation agreement** to share economic opportunities. A projected **9.8 per cent of provincial royalty revenue** that will be generated by the Sisson Mine project under the ***Metallic Minerals Tax Act*** will be shared with Maliseet F.Ns.



Mine
Development

Infrastructure Construction Mine & Plant Site

- . If developed, the **Sisson (tungsten, molybdenum) mine**, New Brunswick would be in operation for **27 years**.
- . Will cost an estimated **\$579 million** to build.
- . Has been hampered by **low metal prices**.

Credit: Northcliff Resources Ltd., 2021





Mine
Development

Onsite Accommodation Cafeteria, Gym



Credit: VCC General Contractor - Eleonore Mine

Metal Mine Marathon

Mineral Industry Sequence

Prospecting / Early Exploration

1,000 properties
staked



hundreds of mineral
exploration
properties



Mineral Exploration



Several mine
development
projects

Mine Development



Results in one or
more
metal mines



Mining



Mine
Production

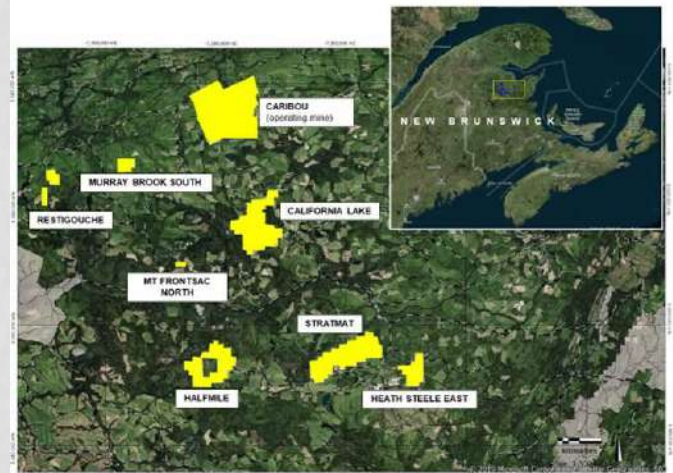
Trevali's Caribou Mine, Bathurst Mining Camp, N.B.

The only **metallic mineral** mine in operation in **New Brunswick** is the zinc-copper-lead-silver-gold **Caribou Mine** and consists of:

- An **underground mine**
- A 3,000 T/day sulphide **flotation recovery plant**
- **14% workforce** of **Mi'kmag First Nation** at the mine;
- Concentrate **trucking** from site to smelter is contracted to **Pabineau First Nations Trucking**.



Trevali-owned Caribou Mine, Bathurst, New Brunswick. From Trevali.





Mine
Production

Oil and Gas New Brunswick

. New Brunswick is one of the **oldest ‘oil provinces’ in the world**. One of the first oil wells in North America was drilled in **1859** southeast of **Moncton**.

However, in 2018 New Brunswick does **not have** any **commercial crude oil production**.

. All **oil and natural gas** is declared to be property **separate from the soil** and **vested in the Crown** in the right of the **Province**.

However, the [Irving Oil Refinery](#) in Saint John is the **largest refinery in Canada** of refined petroleum products.

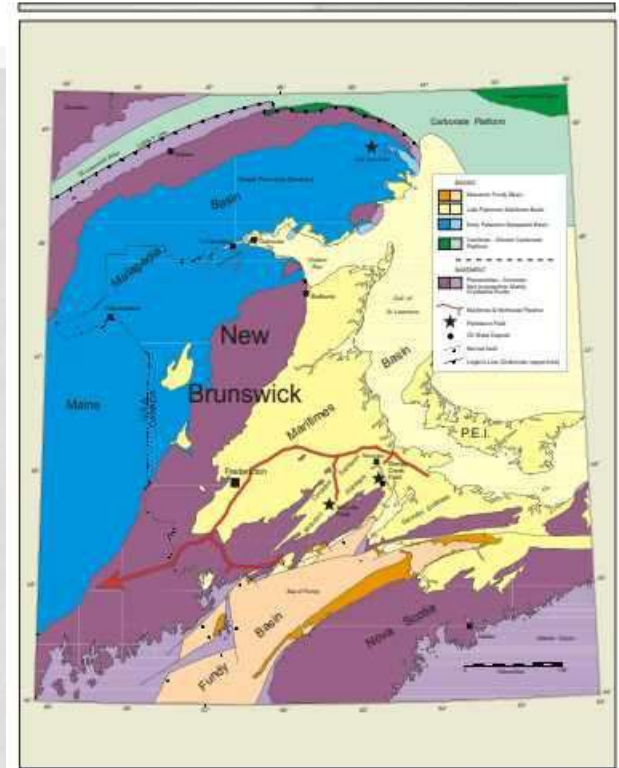


Figure 1. Basin distribution map indicating the location of the Maritimes & Northwest Pipeline, known petroleum fields, and oil shale deposits.

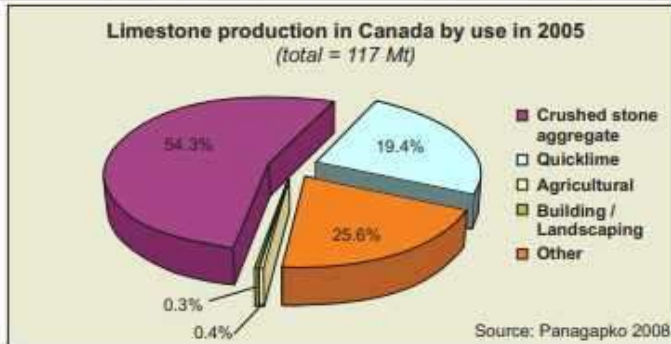


January 2001 test flare at the McCully Natural Gas Field.



Mine
Production

Limestone Quarries New Brunswick



Although **limestone** is a relatively **plentiful resource**, not all limestone is capable of meeting the high standards required for certain applications. Strategically located, **high-quality deposits** are **limited**.

Combined **production** from all the quarry operations in New Brunswick is estimated between 700 000 and **1 000 000 tonnes annually**.

- **Producing Quarries** (2019):

- 1) Graymont Inc.'s Havelock mine, **Limestone & lime**
- 2) Brookville Manufacturing Company's Brookville mine, **Dolomitic lime**
- 3) Elmtree Resources Ltd.'s Sormany mine, **Limestone**.

New Brunswick Silica Deposits

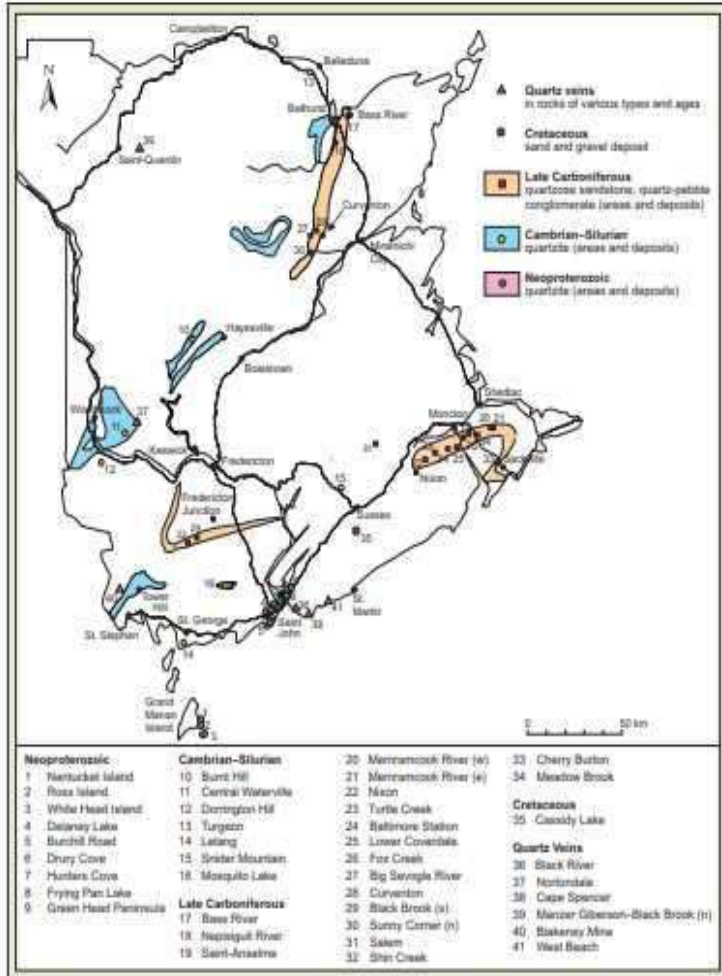


Figure 1. Types and locations of selected New Brunswick silica deposits (see also NBDNR 2008a, 2008b). Numbered symbols represent silica deposits. Coloured areas show geological districts containing silica-enriched rocks.

- The **Cassidy Lake deposit** near **Sussex** is New Brunswick's only known Cretaceous sand and gravel occurrence, most productive and **longstanding silica operation**.

- Cassidy Lake sand and gravel (20 Mt of high-grade material averaging >99% SiO) deposit supports a major operation.



Cretaceous sand and gravel deposit at Cassidy Lake.

[MCP_No_02-f.cdr\(gnb.ca\)](http://MCP_No_02-f.cdr(gnb.ca))

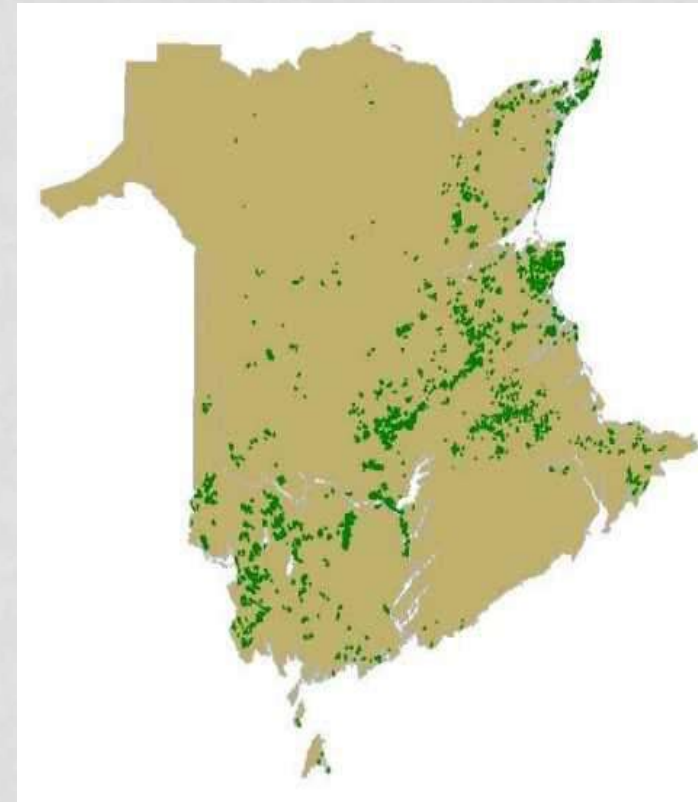


Mine
Production

Peat Moss Quarries New Brunswick



- . **Peat** is a substance that **belongs to the landowner**. About **70%** of the **peatlands** with commercial potential are located **on Crown lands**.
- . New Brunswick is one of the leading producers of peat in Canada.
- . In 2013, the **production** of peat, including the cost of packaging, was **valued at \$150 million** and, **52 peat leases** were in good standing..



Credit: [Summary 2016 2017 Indutry Statistic AREAS WEB.pdf \(tourbehorticoles.com\)](#)

Life Cycle of Mining

Prospecting & Early Exploration



Mine Closure & Reclamation



Indigenous Business Opportunities



Mineral Exploration



Mine Development



Mining



Mine Closure
Reclamation

Mining and Exploration Reclamation

The requirements for reclamation are set forth in the ***New Brunswick Mining Act*** and this legislation regards mining as a **temporary use** of the land.



Peat: Sideways straw spreader
Credit: **F. Quinty**



Mine Closure
Reclamation

Abandoned Mining Sites New Brunswick

There are more than **377 mine openings** at **63 separate mine sites** in New Brunswick. Most of these openings are on **private lands**.

The Province recorded a liability of **\$44 million** for the remediation of **79 contaminated sites** in 2019.

Approximately **\$37 million** relates to **three mines** in the Department of Natural Resources and Energy Development (**DNRED**), New Brunswick.

[Chap7e.pdf \(agnb-vgnb.ca\)](#)



[ABANDONED MINE SITES POLICY \(gnb.ca\)](#)





Mine Closure
Reclamation

Reclaimed Mine Site



. **Reclamation site** of former **Heath Steele** underground/open pit zinc-lead mine, closed in 1999, located in the **Bathurst mining camp**, N.B.

[untitled \(bc-mlard.ca\)](http://bc-mlard.ca)

Credit: Xstrata



Mine Closure
Reclamation

Progressive Reclamation Lamaque Mine, Val D'Or

- - **Organic approach** to mine's **tailing sites progressive reclamation.**
- - **Eldorado Gold Quebec** has entered into a four-year partnership with [Vallée-de-l'Or Regional County Municipality \(MRCVO\)](#) enabling **Lamaque Mine** to acquire more than 15,000 metric tons/year of **compost** for \$100,000/year.



A. Quarry of Wright Crushed Stone Company, Ltd., Hull, Que.



Credit: Eldorado Gold

A unique Canadian invention: Capital Pool Company Program (CPC) & TSX Venture Exchange

CPC, with its origins in **the junior mining** and oil and gas industries, this program supports earlier stage private companies to complete a **go public** transaction.

The CPC program is a **unique listing vehicle** exclusively offered by TSXV and accounted for almost **50% of new TSXV listings in the past 10 years**.

THE 2-STEP CPC PROCESS

Step 1 / *CPC Initial Public Offering*

- The CPC program introduces **investors** with financial market **experience** to **entrepreneurs** whose growth and **development-stage companies** require capital and public company management expertise.
- The CPC program enables seasoned directors and officers to form a Capital Pool Company with no assets other than cash and no commercial operations, **list it on TSX Venture Exchange**, and **raise a pool of capital**.

Step 2 / *Qualifying Transaction*

- The CPC then **uses these funds** to seek out an **investment opportunity** in a growing business.
- Once the **CPC** has acquired an **operating company**, its shares **continue trading as a regular listing** on TSX Venture Exchange.

Increased Indigenous Involvement in Mining



Exploration
and Resource
Definition
> 3 - 5 years

March 2022

- . Shared Benefits or Ownership
- . Infrastructure Co-operation
- . Various Agreements with Companies
- . Indigenous Company Contracts
- . Approvals for Exploration & Mine Development
- . Employment



Mine Permits
> 3 - 6 years

Construction
> 2 - 4 years

Window of opportunity
Investment funds available

New Brunswick's Report on Geoscience Projects and Mineral Activities



- Summarizes **exploration**, mine **development** and **mining** activities of companies
 - Published **annually** by the New Brunswick's **Geological Surveys Branch** (GSB) of the Department of Energy and Resource Development (ERD)
 - More descriptive and less promotional than most online info summarizing mining activities
- **Staff of GSB** are a good source of **free advice** and expertise

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