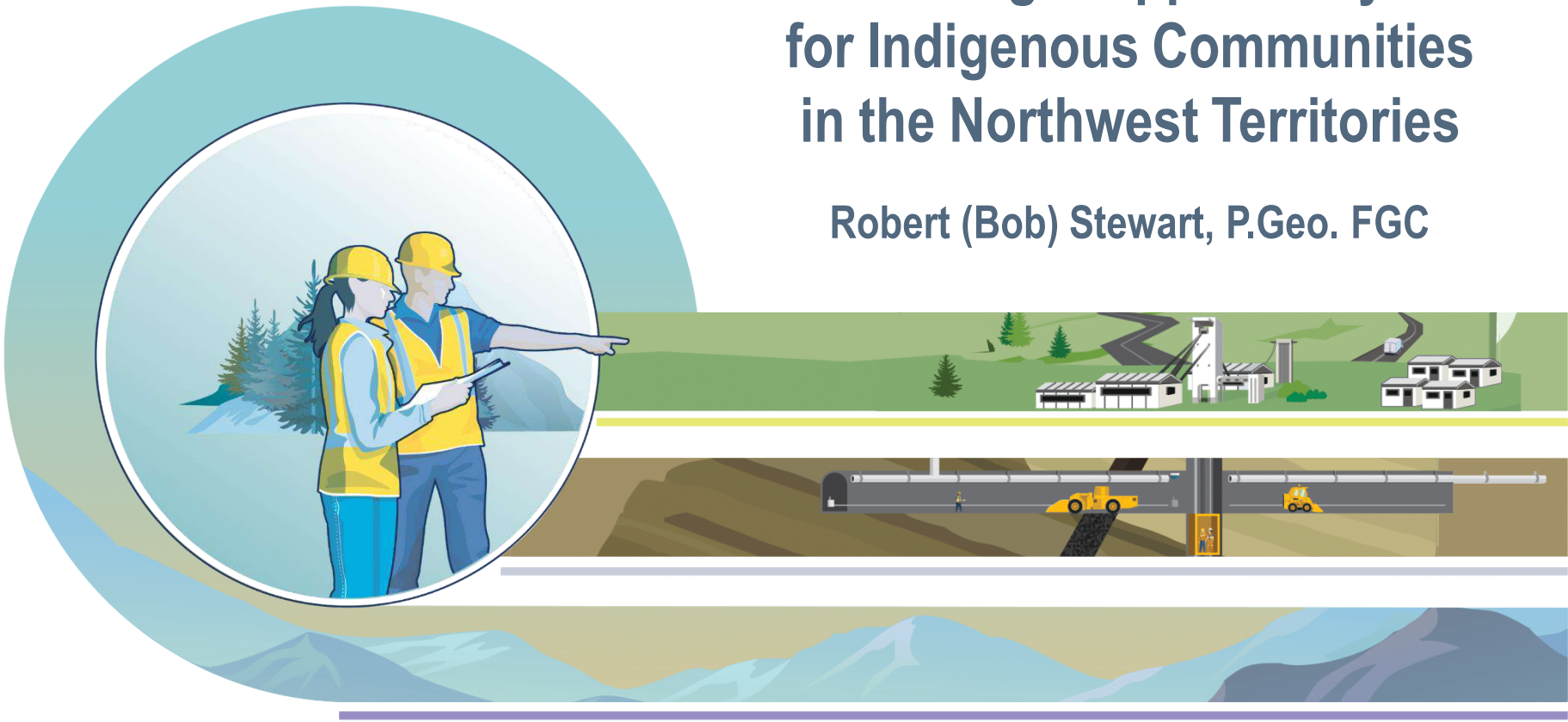
Mining = Opportunity for Indigenous Communities in the Northwest Territories

Robert (Bob) Stewart, P.Geo. FGC



March 21, 2024

THE NORTHWEST TERRITORIES HAS MANY UNKNOWN AND UNDEVELOPED MINERAL RESOURCES NEEDED FOR GLOBAL SOCIETY'S MINERAL SUPPLY.

Let's see why !

ACKNOWLEDGEMENTS

The Northwest Territories is the ancestral homeland of many peoples and communities that have had adaptive relationships with the Land and society .

There are many excellent sources of information from Indigenous, federal government, territorial government, industry advocates, corporations and subject matter experts that have been drawn upon to provide this perspective tuned for **Economic Development Officers**.

There are many doors of **opportunity** already open between Indigenous communities and **their** mining sector.
We are all in this time together within a global environment.

The Land and its peoples can provide opportunity for prosperity.

Thanks to CANDO and Natural Resources Canada for their support.

The presented content is my sole responsibility.

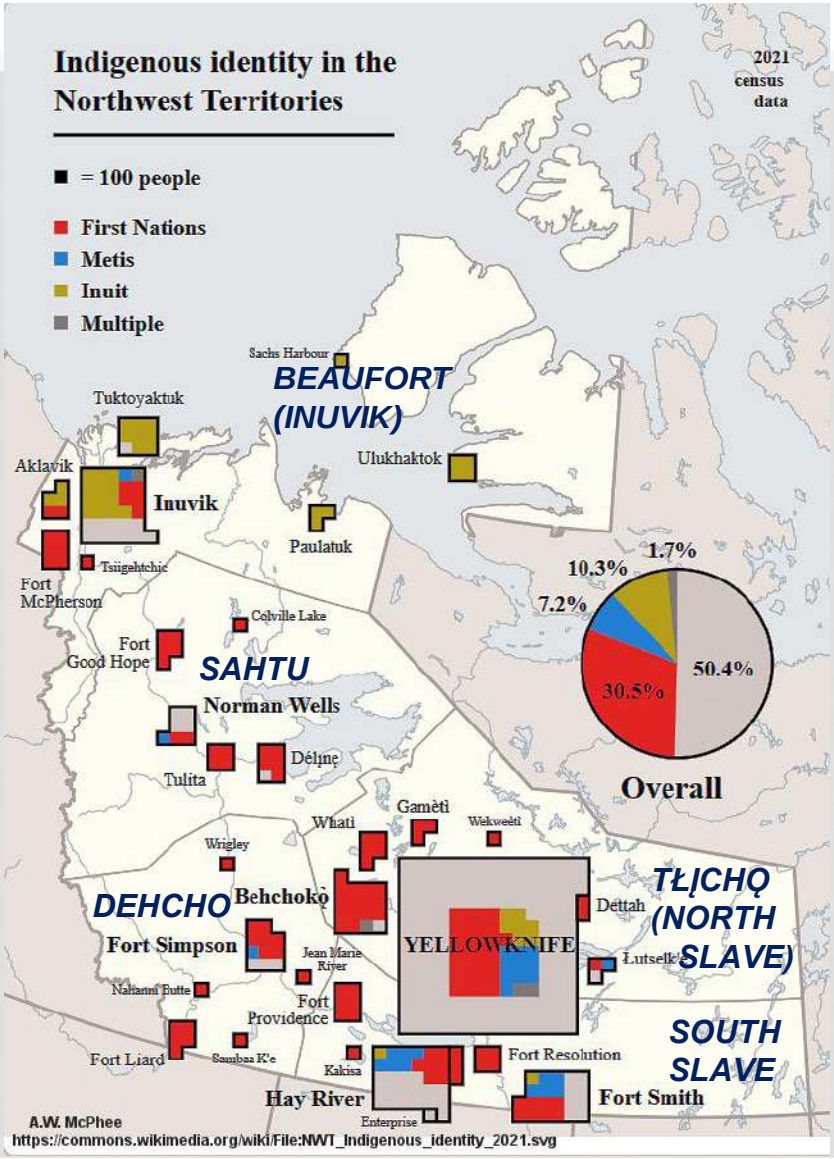
Northwest Territories Geography

1.35 million square km in five Administrative Regions: Beaufort (Inuvik), Sahtu, Dehcho,Tlicho (North Slave), South Slave

45,000 residents in 35 centres with 11 official languages

At 0.033 residents per square kilometre, the Northwest Territories follows Nunavut in being one of the most sparsely populated regions in the world excepting Antarctica and the open oceans.

Indigenous communities have significant control of regional land use and the exploration and development of natural resources.



Presentation Outline

Our Goal Today:

Gain awareness of the Northwest Territories' Mineral Industry and its Opportunities

a 2-part presentation separated by an interactive opportunity

- Use "raise-hand" function at any time for **next** interaction

1: Economic overview of the Northwest Territories' mineral industry

- Interactive opportunities at the end of each subsection

2: Mining activity life cycle related to the NWT and EDO's

- Interactive opportunity

References Cited and Appendices

References and links will be available on the CANDO website (edo.ca) with the recording of this webinar.

- Appendix A: References Indexed By Slide Number
- Appendix B: Additional Resource Material

My Role Today

PART 1: Economic Overview

- Recognizing the basis for Indigenous Opportunities
- Community control throughout the mining cycle

PART 2: the Northwest Territories Mining Today – The Full Cycle

- Explain today's mining stages in everyday language
- Opportunity insights into the mining sector

Part 1: Economic Overview
Why Talk About Mineral Development?

Three sub-sections:

a) Indigenous Participation and Opportunity

- Brief historical review of the Northwest Territories' mineral developments
- Today's regulatory framework overview
- Continued devolution offers more community participation

b) Economic and Environmental Benefits

- Mining is significant to the health of the environment and economy

c) Today's Mineral Developments Across the NWT

- Can provide the raw materials needed today and for the future.
- Major exploration and development projects in progress
- Why is Mining an opportunity in the Northwest Territories ?

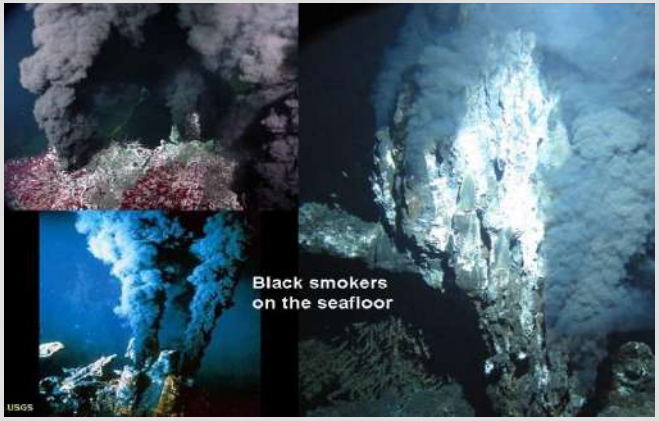
ECONOMIC OVERVIEW
PART 1a:
Indigenous Participation and Opportunity

- Review of the NWT's mineral history and early Indigenous mining
- Today's regulatory framework overview
- Continued devolution offers more community participation

NWT's Mineral Deposits Were Formed By A Few Types of Ancient Natural Events

The Earth and its Moon formed about **4,500,000,000** years ago - **this resulted in Earth becoming enriched with metals** and the moon setting up tidal forces that have been vital to Earth's continuous evolutionary development..

2,700,000,000 years ago (over ~40 million years) **Archean greenstone belts** worldwide included **hot-spring** gold and/or copper-zinc deposits being formed on the seafloor. Some deposits needed **major later events** to concentrate the deposits into ore (e.g.: iron, copper, uranium, lead, zinc).



NWT's Mineral Deposits Were Formed By A Few Types of Ancient Natural Events

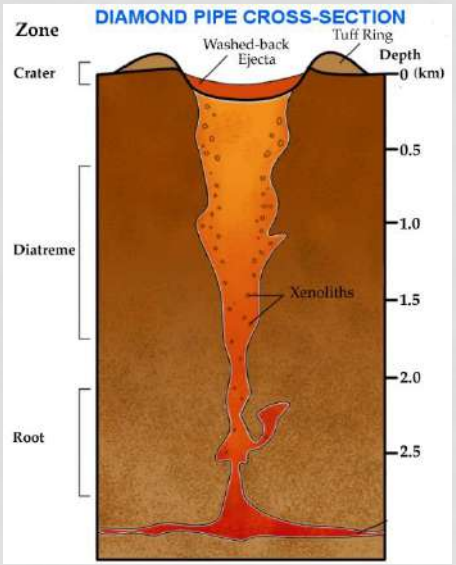
Mantle Plumes / Flood Basalt Events

1,267 Ma: Coppermine Basalts / Muskox Intrusion
720 Ma: Natkusiak flood basalts (Victoria Island)
Ni-Cu-Co-PGE's may occur **hidden** in these formations

Native copper and fire-stone used by Indigenous peoples

Mineralizing Events Within Sedimentary Rocks

442 Ma: Howards Pass Zn-Pb District in Yukon and NWT
367 Ma: Pine Point Pb-Zn mine in NWT



Diamond Pipe Volcanic Events

542 to 531 Ma: Gahcho Kué
523 Ma: Snap Lake
75 to 45 Ma: Ekati
58 to 52 Ma: Diavik

NWT's Mineral Deposits Were Finally Modified Another Ancient Event

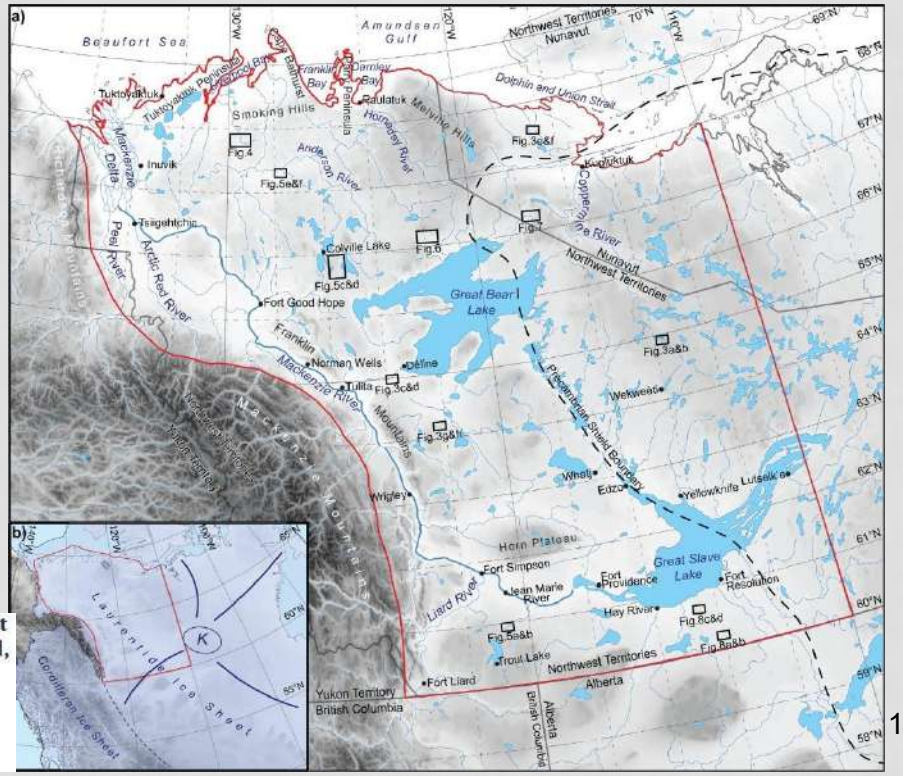
Laurentide Glaciation

2.6 Ma to 21,200 years ago: icecap build-ups and retreats

95,000 to 21,200 years ago: ore was scoured into "trains"

21,200 years ago: Glacial Maximum, start of last retreat.

Icecaps did not cover all the northern latitudes even at 21,200 YBP.



Glacial geomorphology of the northwest Laurentide Ice Sheet on the northern Interior Plains and western Canadian Shield, Canada

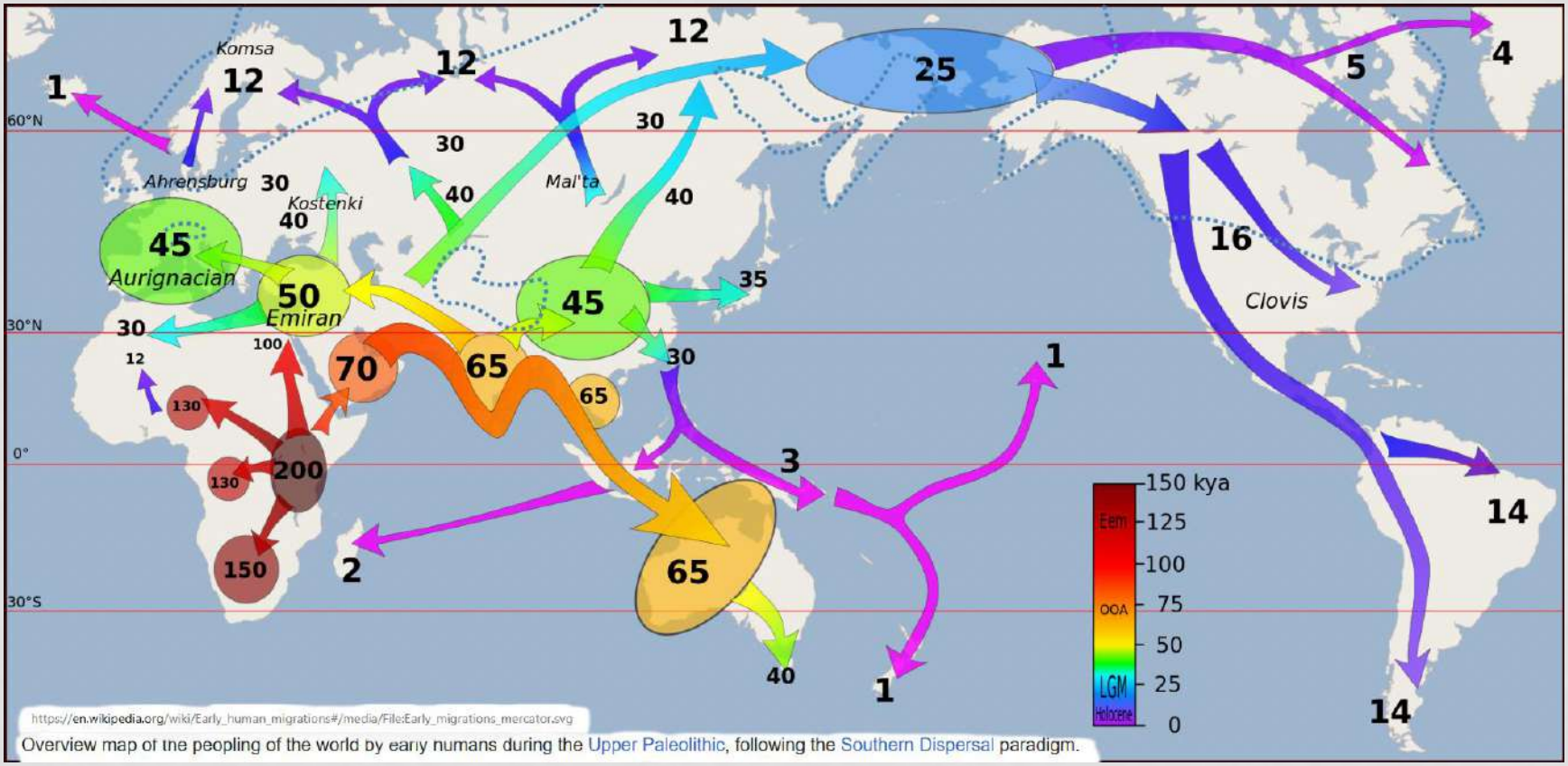
Helen E. Dulfer, Benjamin J. Stoker, Martin Margold & Chris R. Stokes

PUBLISHED ONLINE: 01 March 2023

https://doi.org/10.1080/17445647.2023.2181714

https://www.tandfonline.com/doi/full/10.1080/17445647.2023.2181714

A Human Migration Model



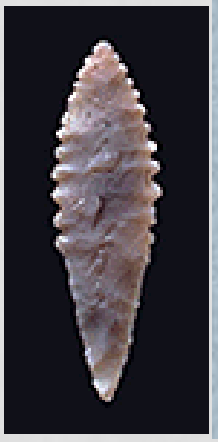
Humans seized the opportunity to cross the Bering Sea and spread through the Americas since the Last Glacial Maximum.

Earliest Indigenous "Mining"

Traditional knowledge and archaeological evidence has shown:

- **5000 to 4000 years ago**: the first families (**"**Tunit**"**) quickly spread from Alaasika to Kalaallit Nunaat after earlier crossing the Bering Sea on ice from Siberia.
- "Tunit" hunted using bow and arrows, lived in portable hide tents and wore warm, tailored garments sewn from northern mammals.
- Ivory carvings and stone tools were made using knapped stone tools.

TYPICAL STONE AND TENT DWELLING LAYOUT



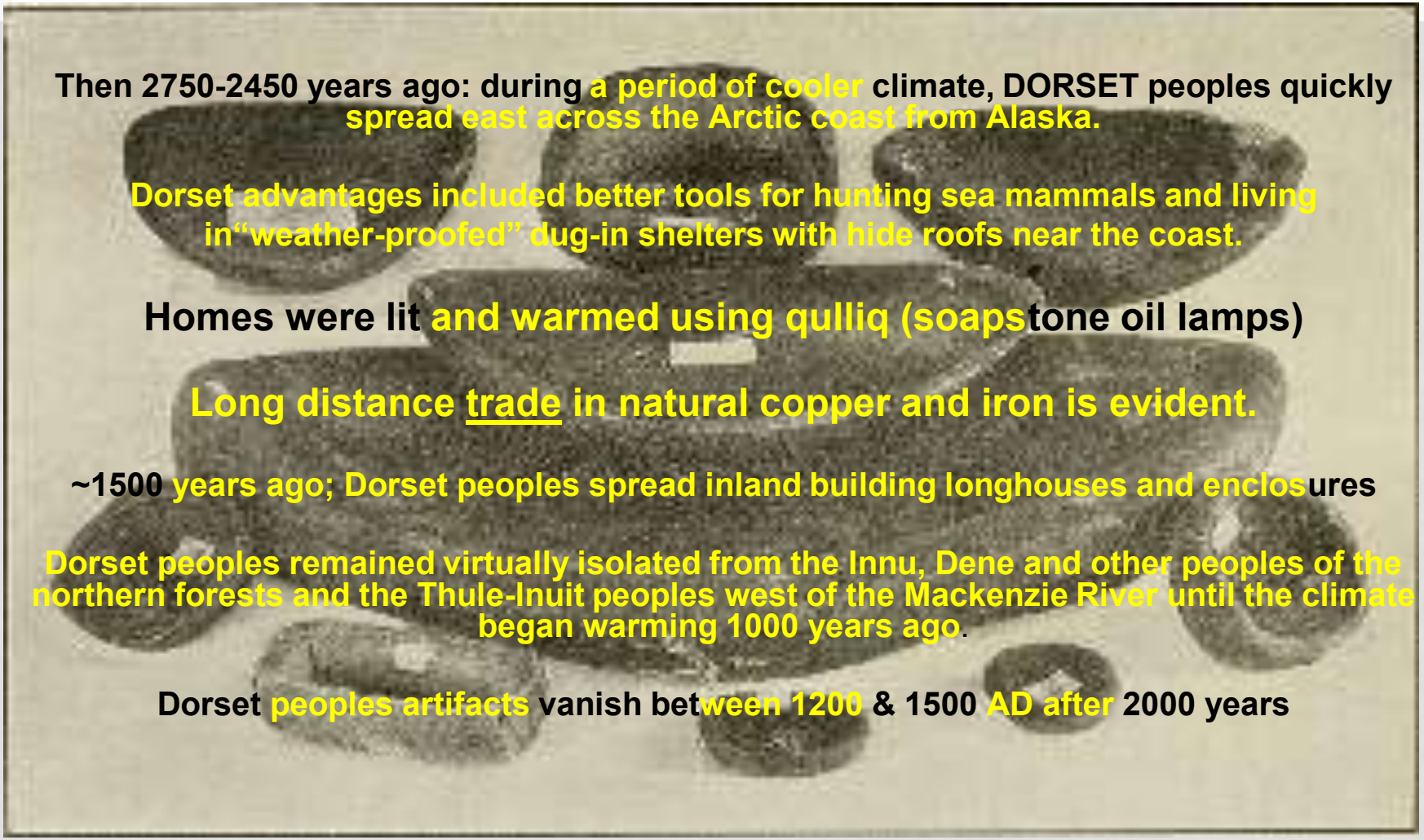
FINELY SERRATED FLINT POINT

TUNIT STONE TOOLS
Hunting, food and hide preparation, sewing, cutting

TUNIT IVORY MASKETTE
3600-3900 Years Old
Oldest Facial Carving Artifact Known in North America

Civilization.ca - Life and Art of an Ancient Arctic People - The Paleo-Eskimos (historymuseum.ca)

Early Indigenous "Mining" (Arctic)



Then 2750-2450 years ago: during a period of cooler climate, DORSET peoples quickly spread east across the Arctic coast from Alaska.

Dorset advantages included better tools for hunting sea mammals and living in"weather-proofed" dug-in shelters with hide roofs near the coast.

Homes were lit and warmed using qulliq (soapstone oil lamps)

Long distance trade in natural copper and iron is evident.

~1500 years ago; Dorset peoples spread inland building longhouses and enclosures

Dorset peoples remained virtually isolated from the Innu, Dene and other peoples of the northern forests and the Thule-Inuit peoples west of the Mackenzie River until the climate began warming 1000 years ago.

Dorset peoples artifacts vanish between 1200 & 1500 AD after 2000 years

Later Indigenous "Mining"

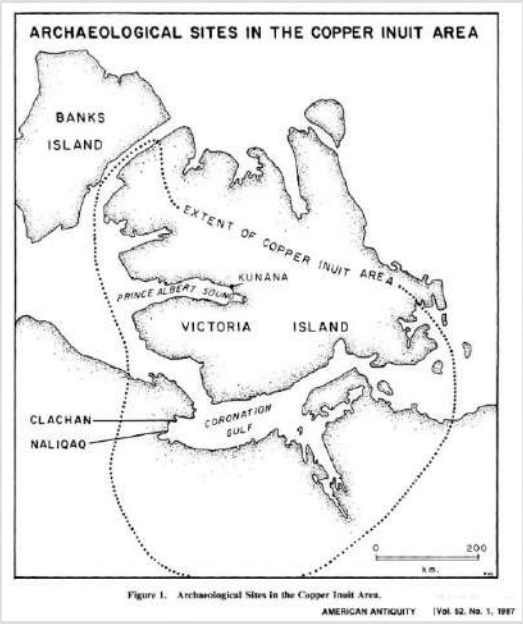
A warming climate from 1200 to 1300 AD changed bowhead whale migration patterns and **"Early Inuit"** peoples quickly spread east from Alaska to Greenland using advanced transportation modes like dog sleds, umiaks and kayaks.

The versatile Inuit adapted to The Little Ice Age (1300-1850 AD) and made use of **natural iron and copper** wherever it was found.

The **Inuinnait**, ("Copper Inuit") gleaned pure **copper** from the shores of the Coppermine River, Coronation Gulf and **Victoria Island** and incorporated it into traditional tools.

Copper was **abundant** enough to **trade** with neighbours.

The ***Athabascan Tradition*** period (1500-100 years BP) includes the trade and use of native copper from **Inuinnaut** sources (Victoria Island) and **Tlingit** sources (Alaska / SW Yukon).



1898 - Klondike Gold Rush Began Global Changes

The element **radium** was only discovered to science in **pitchblende** by Madame Curie **in 1898.**

*"Lead-zinc showings south of the Great Slave Lake were **known to the local First Nations** long before any mineral claims had been staked in the area. They had been using lead obtained from the showings to fashion musket balls. **In 1920, evidence of galena smelting, ashes, and blobs of lead were present around the mineralized outcrops** (Dawson, 1963)."*

*"It was during the **Klondike Gold Rush**, when groups of prospectors bound for the Yukon passed through **Fort Resolution**, the local fur trader Ed Nagle started asking First Nations who traded at his post to bring any "shining stones" they might find. During the summer of **1898**, massive galena samples were brought by a group of Slavey First Nations".*

*from Osisko's 2022 **Pine Point** Preliminary Economic Assessment Report:*

Claims were staked, pits dug, samples taken and assayed but the gold and silver results were disappointing. Dropped claims were re-staked by several others and then lost before a commercial business plan could be established by 1928.

Pine Point's development only became possible through Federal Government infrastructure commitments in 1962-1964.

Some Dene peoples made native copper-bladed knives ("yellow knives").

image credit: Jake Pogrebinsky / bladesmithforum.com

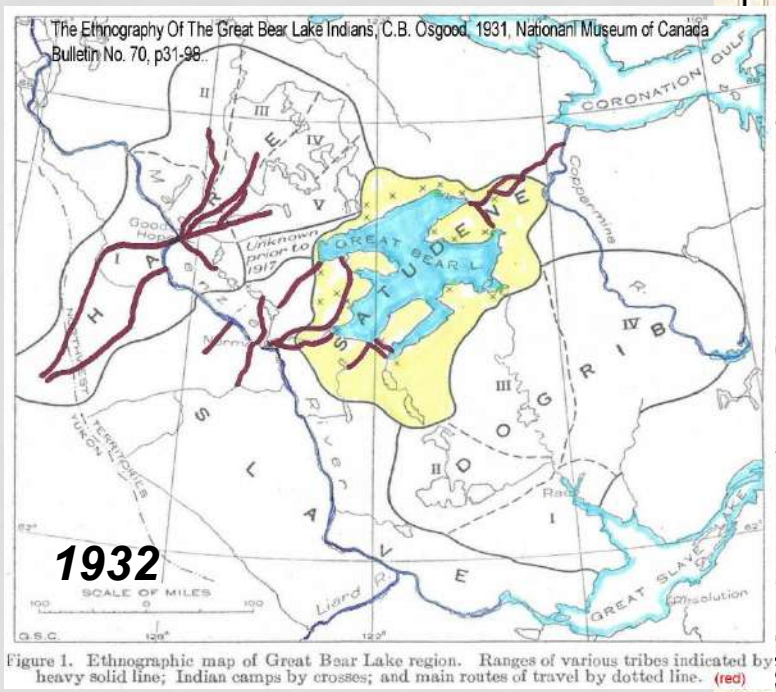
"A **Klondike-bound prospector**, E.A. Blakeney, made the first **discovery of gold** in the Yellowknife Bay area **in 1898**."

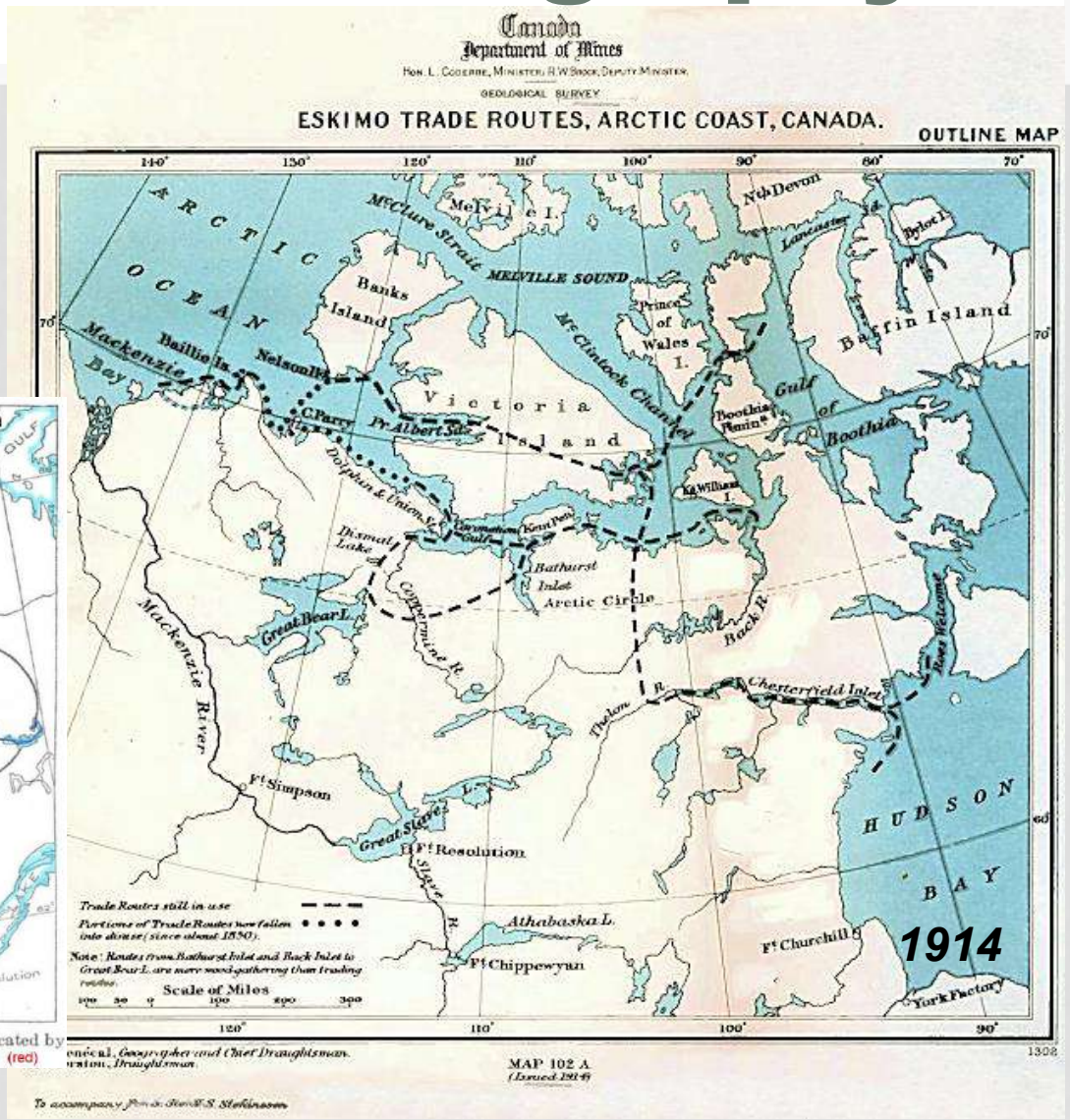
from Wikipedia notes on the "Yellowknife" community

Both "discoveries" were too remote for actual mining for decades but prospecting continued. **Pitchblende** prospecting resulted in radium and uranium developments becoming **the first mines in present day NWT** in the early 1930's **before** Yellowknife gold mines.

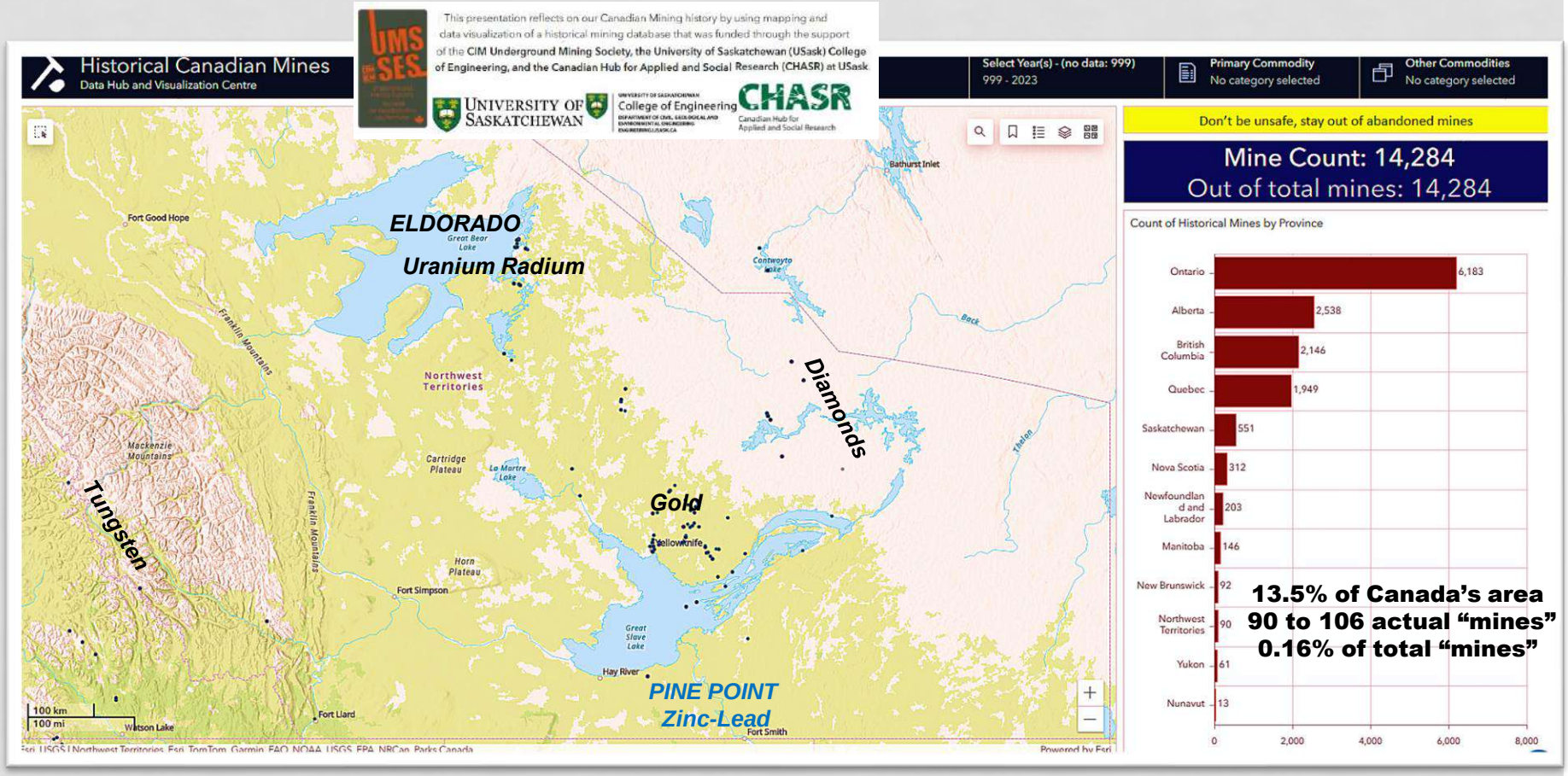
Early 1900's Ethnography

Trade in "mined" copper, iron, stone and pyrite ("fire-stone") by northern peoples were observed and reported from the early 1800's to early 1900's.





Historical NWT “Mining” 1928 to present



No “modern” NWT mines yet north of Great Bear Lake.

https://www.arcgis.com/apps/dashboards/780a4bc0aa524cc38e10a4699bc3511e

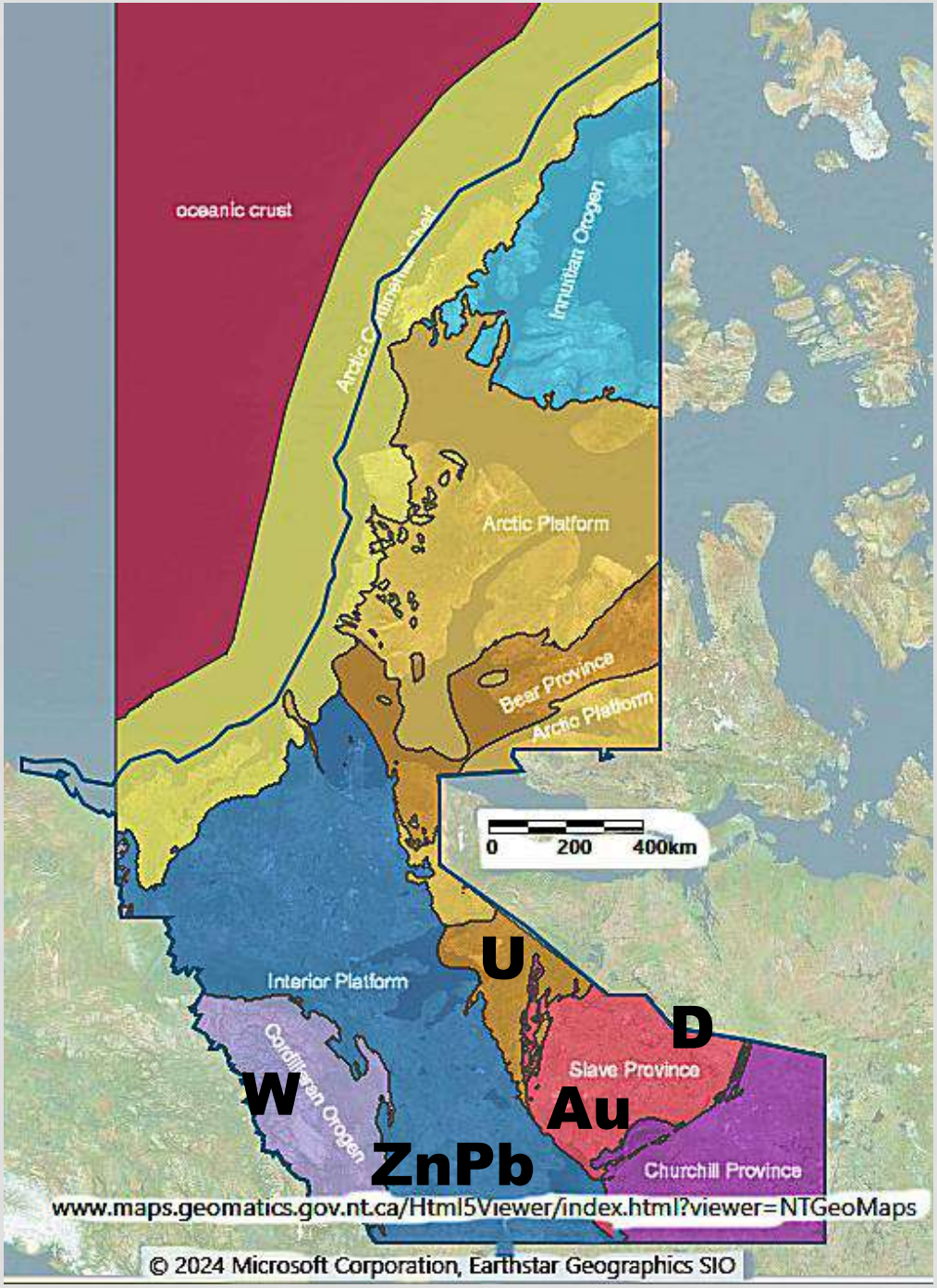
NORTHWEST TERRITORIES GEOLOGICAL PROVINCES

Most gold mines are in the oldest (**2700 Ma**) Archean Slave Province which was later cut by diamond pipe eruptions at **530 Ma** and **200 Ma**

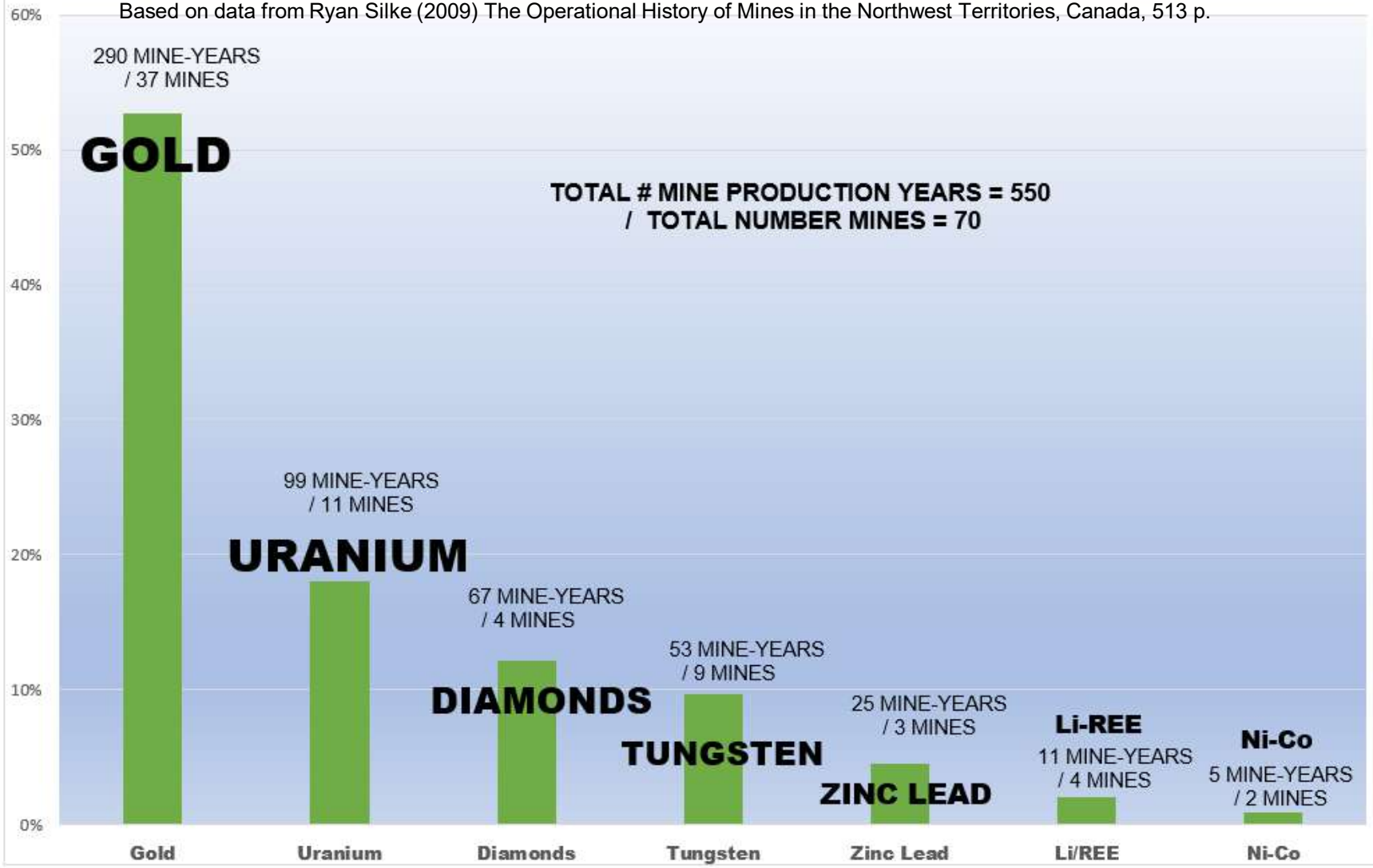
Uranium and other mines near Great Bear Lake are in Proterozoic rocks were cut by **1400 Ma** faults and mineralizing hydrothermal veining.

Pine Point zinc-lead (Zn-Pb) mineralization within the Interior Platform took place about **360 Ma**.

Tungsten (W) skarn mineralization unique to North America formed in a brief episode at **91 Ma** along the NWT-Yukon border.



NWT RELATIVE MINE PRODUCTION-YEARS BY COMMODITY (1933-2023)



NWT's "106 Mines" By Region

Beaufort (Inuvik) Administrative Region = 0%

No historical "mines"

Sahtu Administrative Region = 13%

14 historical "mines": 13 uranium, 1 tungsten

Dehcho Administrative Region = 2%

2 historical "mines": 1 tungsten, 1 zinc-lead

Tlicho and North Slave Administrative Region = 80% of NWT's mines

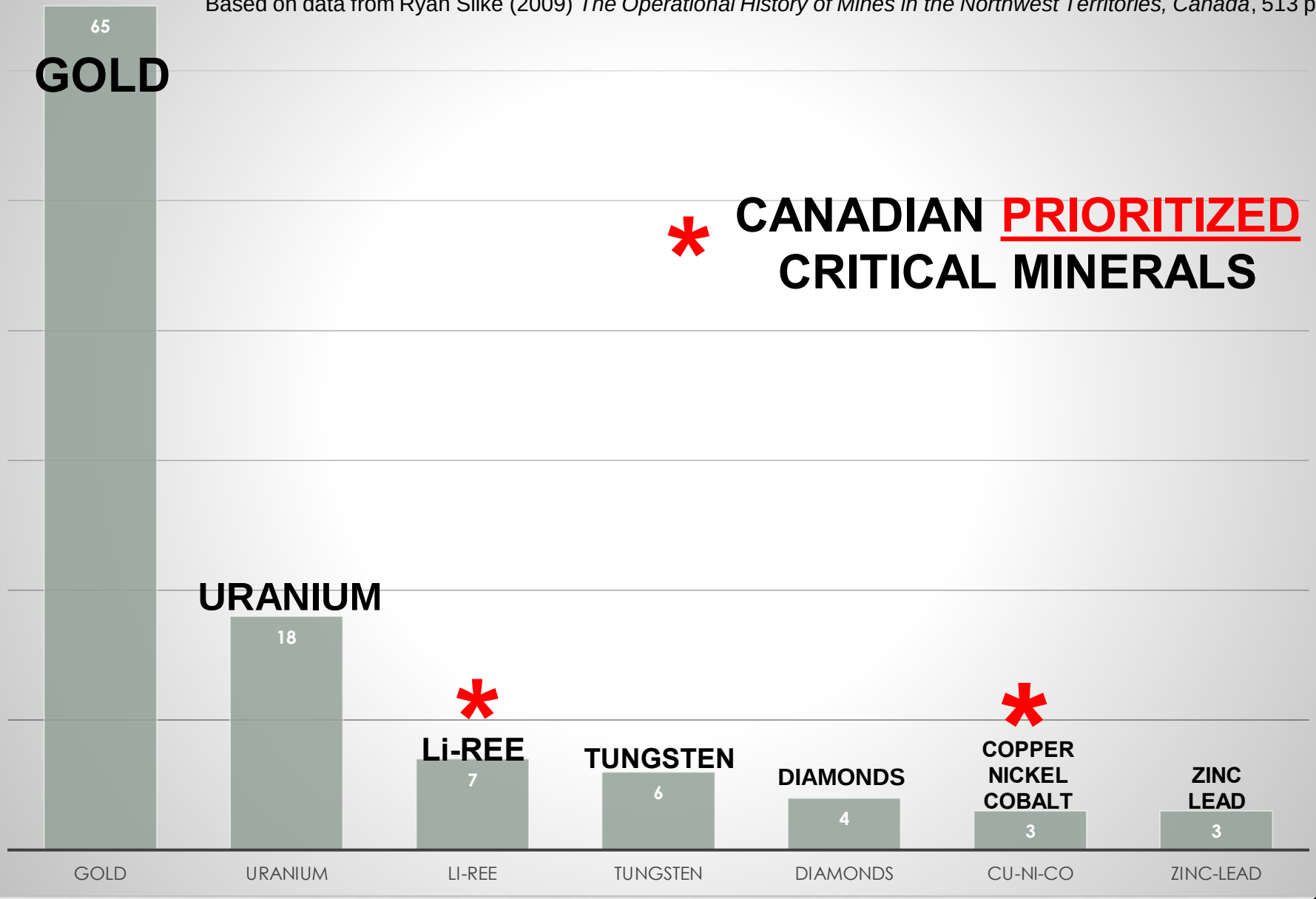
85 historical "mines": **63 gold, 7 Li-REE**, 5 U, 4 W, 4 diamonds, 1 Cu-Ni-Co

South Slave Administrative Region = 5%

5 historical "mines": 2 tungsten, 2 zinc-lead, 1 Ni-Co-As-U

NUMBER OF NWT'S "106 HISTORICAL MINESITES"

Based on data from Ryan Silke (2009) *The Operational History of Mines in the Northwest Territories, Canada*, 513 p.



* CANADIAN PRIORITIZED CRITICAL MINERALS

3 Currently Producing NWT Mines

All 3 are in the eastern Tlicho Administrative Area

- **Diavik Diamond Mine** by Rio Tinto
- **Ekati Diamond Mine** by Burgundy Diamond Mines
- **Gahcho Kué Diamond Mine** by De Beers Canada (51%) and Mountain Province Diamonds (49%)

Also 1 “Pre-Production” Mine

<u>Also</u> in the Tlicho Administrative Area

Nechalaco Mine: Rare Earth Element’s (REE’s) had some open pit mining since 2021 by Vital Metals (VM) / Cheetah Resources which was stockpiled.

Another VM subsidiary building the Saskatoon REE processing facility sought bankruptcy protection in October 2023.

The REE-bearing stockpile was sold in late 2023 for about C$2.25 million to a minority shareholder for early 2024 delivery.

What are two key factors for maintaining mining investments of billions of dollars in the NWT?

They are:

- **large, under-developed world class mineral deposits**
- **a regime with a maturing regulatory framework that respects a balance between sustainability and prosperity.**

"THE NWT ADVANTAGE"

Let's dig deeper into the NWT's mining regulatory framework

Today's Regulatory Framework For Mining Projects

1. Financing
2. Social License
3. Title
4. Permitting
5. Contracting
6. Sustainable Fieldwork
7. Reporting
8. … repeat annually

1. FINANCING

A Proponent's mineral investment capital is "liquid" annually.

- Investment capital is controlled by shareholders and financial regulators
- Proponents are responsible for professionally managed projects
- Projects are often challenged by seasonality, timelines and deadlines

Low "political risk" is earned by fair regulatory decisions.

The Northwest Territories has a foundation for mineral investment

- Integrated Management of Land and Resources system (territorial level)
- Land use plans – preliminary to advanced-stage plans on a local level.
- Clear mineral opportunity – NWT Geological Survey NWTGeoscience.ca
- Clear mineral title law – ***Mineral Resources Act (2019)***
- Evolving community expectations – land use plans/ **permitting**
- Clear regulator expectations – set out in Acts and Regulations, permitting
- Clear environmental review - set out in Acts and Regulations, permitting

2. SOCIAL LICENSE

In the past 40 years, there have been a wide variety of **forward-looking agreements** made for mineral exploration and development projects **between communities and mining industry proponents** and many more agreements are still in progress.

Project proponents prefer working with community businesses near their project whenever possible.

Community businesses make themselves more attractive to proponents when the businesses can demonstrate significant Indigenous ownership and participation. **(Is this an opportunity for EDO's ?).**

Indigenous community businesses can maximize the benefits of set-aside contracts for procurement of goods and services that may be included in a variety of Indigenous Mining Agreements (IMA's).

ATLAS OF CANADA INTERACTIVE MAP

NWT

Indigenous Mining Agreements Database is current to 2020: Canada-wide = 434 IMA's

NWT: 16 Total Projects with 41 Agreements, 19 Signatories, 14 Proponents

NWT: 12 Active Projects with 37 Agreements, 17 Signatories, 10 Companies

Active Project Agreements: De Beers (8), Burgundy (6), Rio Tinto (5), Vital Metals (4),Osisko (4), Fortune Minerals (3), Norzinc (3), Mountain Province Diamonds (1), Cornish Metals (1), Gold Mining (1), Government of Canada (1)

46 More Projects With Potential Indigenous Mining Agreements

Inuvik Region: 2 projects

Sahtu Region: 6 projects

Dehcho Region: 3 projects

South Slave Region: 2 projects

North Slave Region: 33 projects

For Project Details See The March 2024

NWT Geoscience's Annual Overview:

2023explo_overview_01032024.pdf (nwtgeoscience.ca)

Another regular publication is Unlocking our Potential expressing the Territorial vision

GNWT ITI Unlocking Our Potential - March 2023 (gov.nt.ca)

3. TITLE
Surface and Subsurface

- Under devolution, the ***Mineral Resources Act (MRA)*** was revised in 2019 and its Regulations are still being finalized with the appropriate capacity-building within industry, regulators and Northern society.

- The ***MRA*** has **many unique elements** compared to the rest of Canada which reflects its “made in the Northwest Territories by all communities” roots.

- Prospector Licenses are required and require passing an examination about the MRA and other expectations for working with communities.

- Indigenous communities hold large areas with surface-only or surface and subsurface rights.

- Communities are consulted for 30 days before mineral claims are **“issued”**.

Current Mineral Titles

February 2024 (2023)

15 Prospecting Permits (21)

1210 Claims (1053)

1274 Leases (1418)

16,167 square kilometres, **1.2% of NWT**

Mineral Exploration & Deposit Appraisals

2023 Expenditures = CA$118.8 million

2022 Expenditures = CA$107.0 million

2023 Projects (2022)

3 Diamond Mining (3)

7 Gold Exploration (**6**)

7 Base Metals Exploration (7)

3 Diamonds Exploration (**4**)

22 Lithium Exploration (**12**)

3 REE Exploration (3)

1 Tungsten Exploration (1)

46 PROJECTS (36)

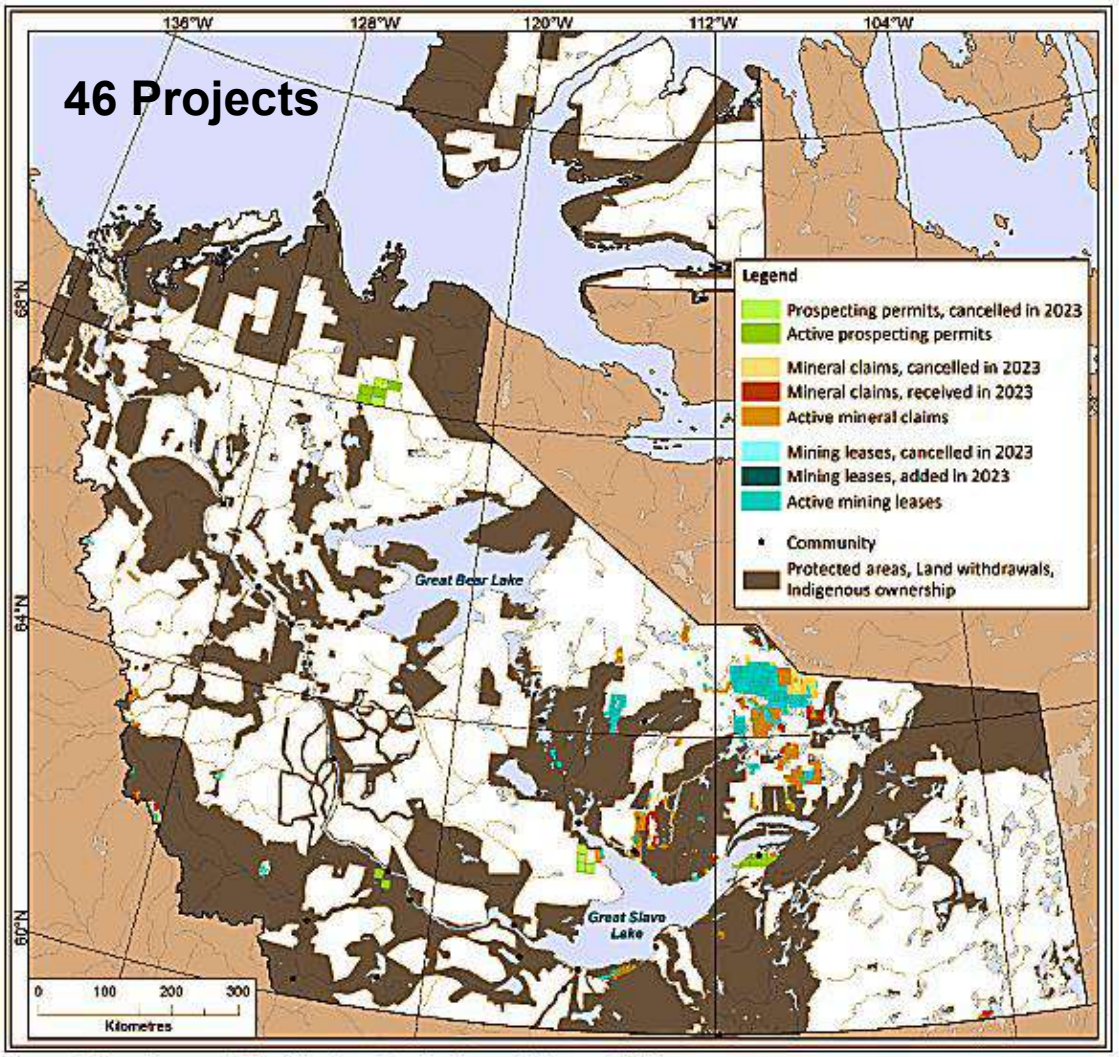


Figure 2. Mineral tenures in the Northwest Territories as of February 2024.

2023 Northwest Territories Exploration and Mining Overview – March 2024

4. PERMITTING

- The ***Mineral Resources Act*** and its pending Regulations require a fee and assessment work report for **the right to hold a mineral claim and assess its mineral potential.**

- This requires average **claim holder expenditures of >$40,000 per year** per claim (15 to 25 square km area).

- **Field work** also requires several **permits** to be in place from **several regulators** before it can begin. (land and water access/use)

- Project Leaders are typically professional geoscientists and engineers.

- **Northwest Territories and Nunavut Association of Professional Engineers and Geoscientists (NAPEG) :** register and regulate the professional engineers, geoscientists and permit holder companies so they can be held responsible for their professional work in the Northwest Territories.

5. CONTRACTING

Project professionals want capable local contractors and persons willing to learn on the job.

Building skills and experience will enable success.

The Chamber of Mines websites outline job opportunity work types. (miningnorth.com, miningnorthworks.com)

These websites include 36 common roles for exploration projects and 173 common roles for minesite projects

Are there EDO initiatives possible here?

6. SUSTAINABLE FIELDWORK

Logistical support services are very well-suited for NWT-made regulations.
These services are needed by regulators, suppliers and industry.

Rotational work and supplying remote camps is mainly on a fly-in / fly-out basis.
Water, waste management and other activity permits/agreements are required.

Seasonal operations are normal for early project stages. Permitting needs to begin at least 6 months in advance, probably longer as exploration activity increases.

When on-line staking begins there will be a surge in staking, permitting and field activity.

Advanced exploration with resource definition drilling and environmental studies are the first year-round activity which will require annual re-permitting.

Mining Development and Commercial Operations are typically year-round with increased activity during spring and summer. Permitting will be on-going.

Reclamation and ongoing monitoring is seasonal over many years and requires permits.

7. REPORTING

Project professionals must provide timely reports to:

- Corporate officers, share-holders and stake-holders
- Stake-holders include Communities
- Licence and Permit regulators
- Environmental regulators
- Mineral title regulators
- Securities regulators

8. REPEAT

For a variety of reasons, mineral resource exploration and development budgets are vulnerable annually.

- The entire “financing to reporting” sequence repeats annually.
- Only some licences and permits are easily renewable.
- Multi-year project agreements tied to mineral title can help ensure project commitments are met.
- Performance bonds for final reclamation may be required.

COMMUNITY PARTICIPATION AND OPPORTUNITY

Territorial control of resources requires **informed choices** by the territorial government, regulators, and project proponents.

Community's participation is essential:

- **in elected governments**
- **in the public service**
- **on regulator boards**
- **in Indigenous-owned companies**
- **within projects**.

Regional Economic Development Plans (REDP's)

- 5 out of 6 plans tabled October 3, 2023 to guide development (Tlicho pending)

Other capacity-building initiatives include government programs:

$1.5 million over 3 years through the Canadian Northern Economic Development Agency

$2 million over 3 years with Indigenous Natural Resource Partnership Program

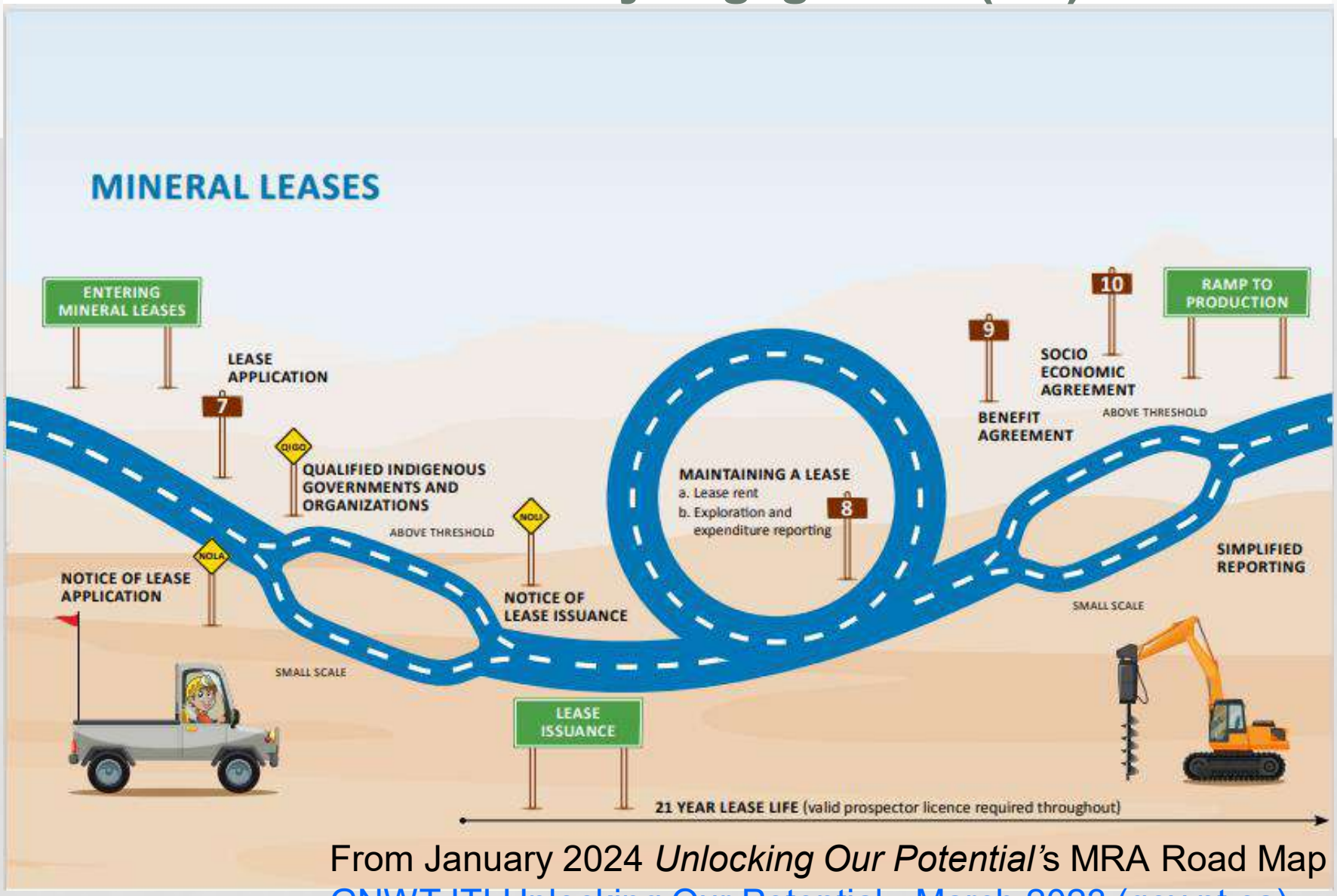
These robust regulatory and capacity-building systems **should** create prosperity.

MRA Community Engagement (1/3)

From January 2024 *Unlocking Our Potential*'s MRA Road Map

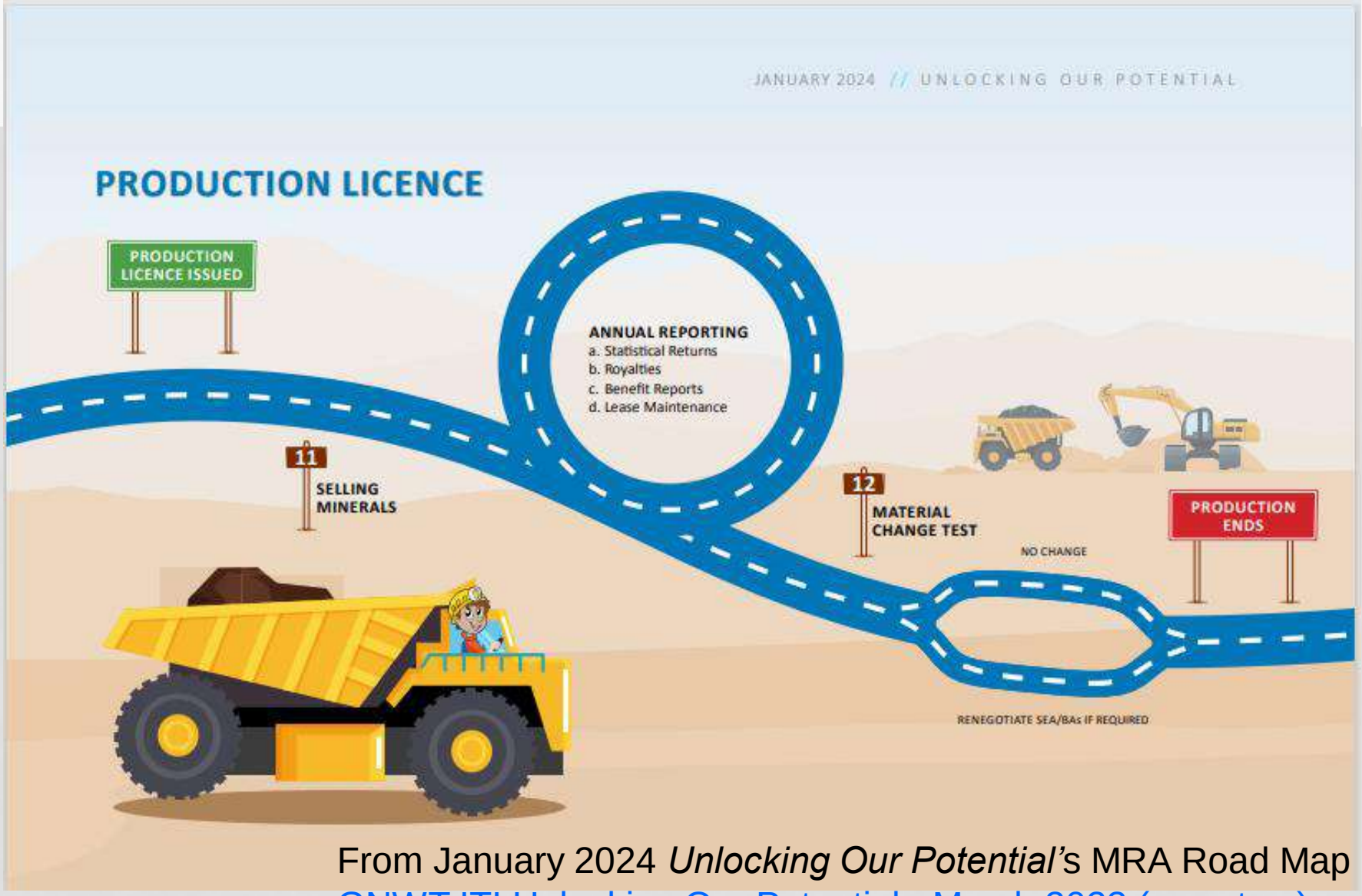
[GNWT ITI Unlocking Our Potential - March 2023 (gov.nt.ca)]

MRA Community Engagement (2/3)



From January 2024 *Unlocking Our Potential*'s MRA Road Map
[GNWT ITI Unlocking Our Potential - March 2023 (gov.nt.ca)]

MRA Community Engagement (3/3)



From January 2024 *Unlocking Our Potential*'s MRA Road Map
[GNWT ITI Unlocking Our Potential - March 2023 (gov.nt.ca)]

Part 1a Summary

- NWT's natural resources (wildlife, rocks, metals) have been **used** for millennia
- Natural resources have been widely **traded** for millennia
- Indigenous **authority** is now much greater with modern treaties and agreements
- Indigenous **responsibility** for the Land is still being finalized
- Regulations and regulators have **changed** how the mineral industry operates

The NWT Advantage

- Globally significant mineral **opportunities** continue to be identified
- The "made-in-the-NWT" regulatory system is continually **refined** for prosperity
- The regulatory road map is essential for a safe journey to **prosperity**

Realizing opportunity is a shared journey

End of Part 1 a

Questions ?

PART 1b:
Economic and Environmental Benefits For Canada

- "Canadian mining" employs 665,000 people; 403,000 directly (2022 figures)
- 106,000 in "mining" (near mine) versus 297,000 in "mineral processing" (away from mine; smelters/refineries, corporate)
- Inter-provincial/territorial work for professionals and others is common in mining.
- Mineral exploration and development projects naturally have high staff turnover because of seasonality and specialized skillsets for each project stage.
- 16,500 Indigenous people are employed in mining country-wide which is the most employed in any non-governmental sector.
- minerals represent 22% of merchandise exports; $127 billion
- 155 million tonnes of minerals move on trains annually (53% of tonnage)

Mineral Economics "By-The-Numbers"

- In 2021; the Canadian mining sector accounted for $125 billion or 5% of Canada's Gross Domestic Product.

- 2022: Canadian **mineral** production value was $61.4 billion

Mining is part of the **Primary "Resource" Sector** in the Canadian Economy

- Primary "Resource" Sector = 13% ($247 billion)
- Secondary "Manufacturing Sector = 17% ($319 billion)
- Tertiary "Services" Sector = 70% ($1318 billion)

Sources: Statscan, NRCAN, MAC

Canadian Primary "Resource" Sector Components (% Value in Sector; 13% of Canadian GDP)

The 2022 Canadian Primary "Resource" Sector

48%: Fossil fuel industries ($114 billion)

18%: Electrical, gas, water utilities ($42 billion)

17%: Agriculture ($41 billion)

15%: Mining ($35 billion)

1.6% Forestry ($3.6 billion)

0.5% Wildlife ($0.5 billion)

GRAPHIC COMPARISON OF THE 2022 ENTIRE CANADIAN ECONOMY BASED ON GDP CONTRIBUTIONS

						% Economy
TERTIARY "SERVICES" SECTORS	SERVICES					70%
SECONDARY "MANUFACTURING" SECTORS	MANUFACTURING					17%
PRIMARY "RESOURCE" SECTORS		MINING	AGRICULTURE	UTILITIES	FOSSIL FUELS	13%
WILDLIFE						
FORESTRY						
Percentage of Primary Resource Sector	1 2	15%	17%	18%	48%	100%

Economic and Environmental Benefits for the NWT

The 2016 Census found the Canadian mining industry workforce was 9% Indigenous and 13% women.

"Mining is the largest private sector employer in the North and the largest employer of Indigenous peoples… 2,150 northern residents currently work at the six mines operating in the NWT and Nunavut… In the NWT, northern employment at the mines is 46% while in Nunavut it is 20%. Mining companies remain committed to employing and training local residents."

Employment - Mining North Works

Today's mining industry **is** safer, better-paid and better-regulated than 30 years ago.

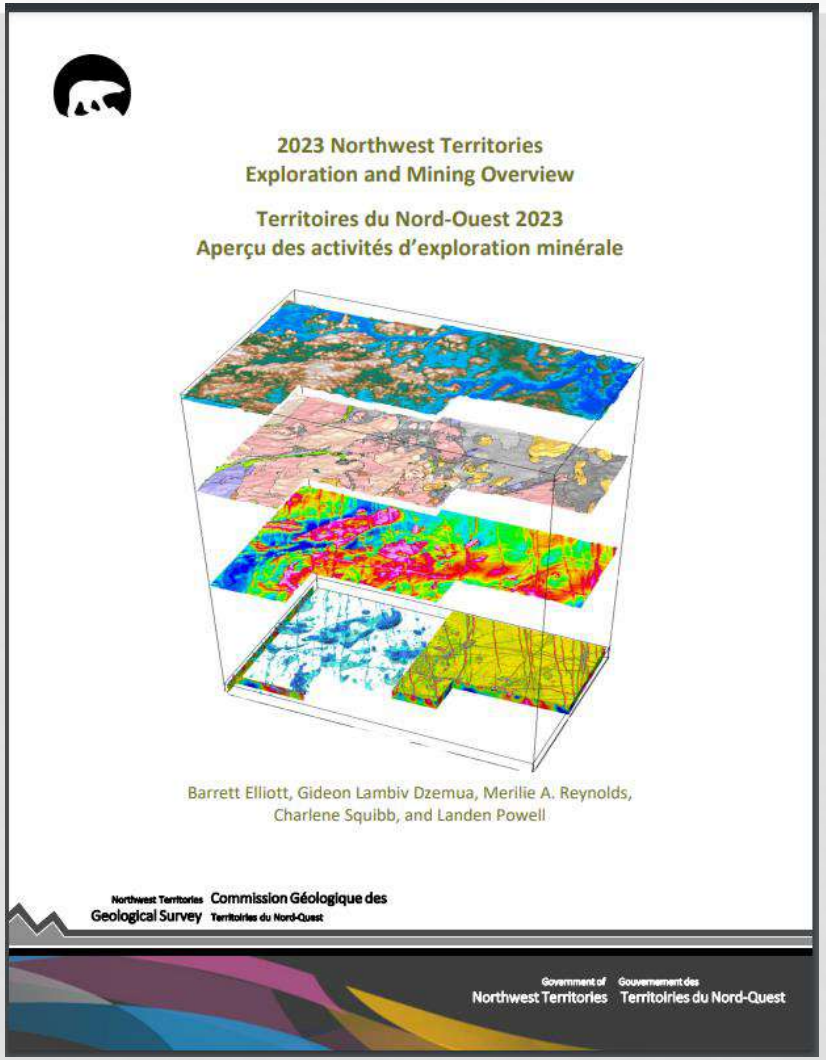
Today's mining industry has an evolving and highly regulated professional sub-culture whose primary duty is protection of the public and the environment.

Where to Find Information About Recent Mining Activities In The Northwest Territories ?

The ***first*** source for annually updated information is the:

NWT Geological Survey "Exploration and Mining Overview"

and its map



Annually Updated Mining Activity Overview Map

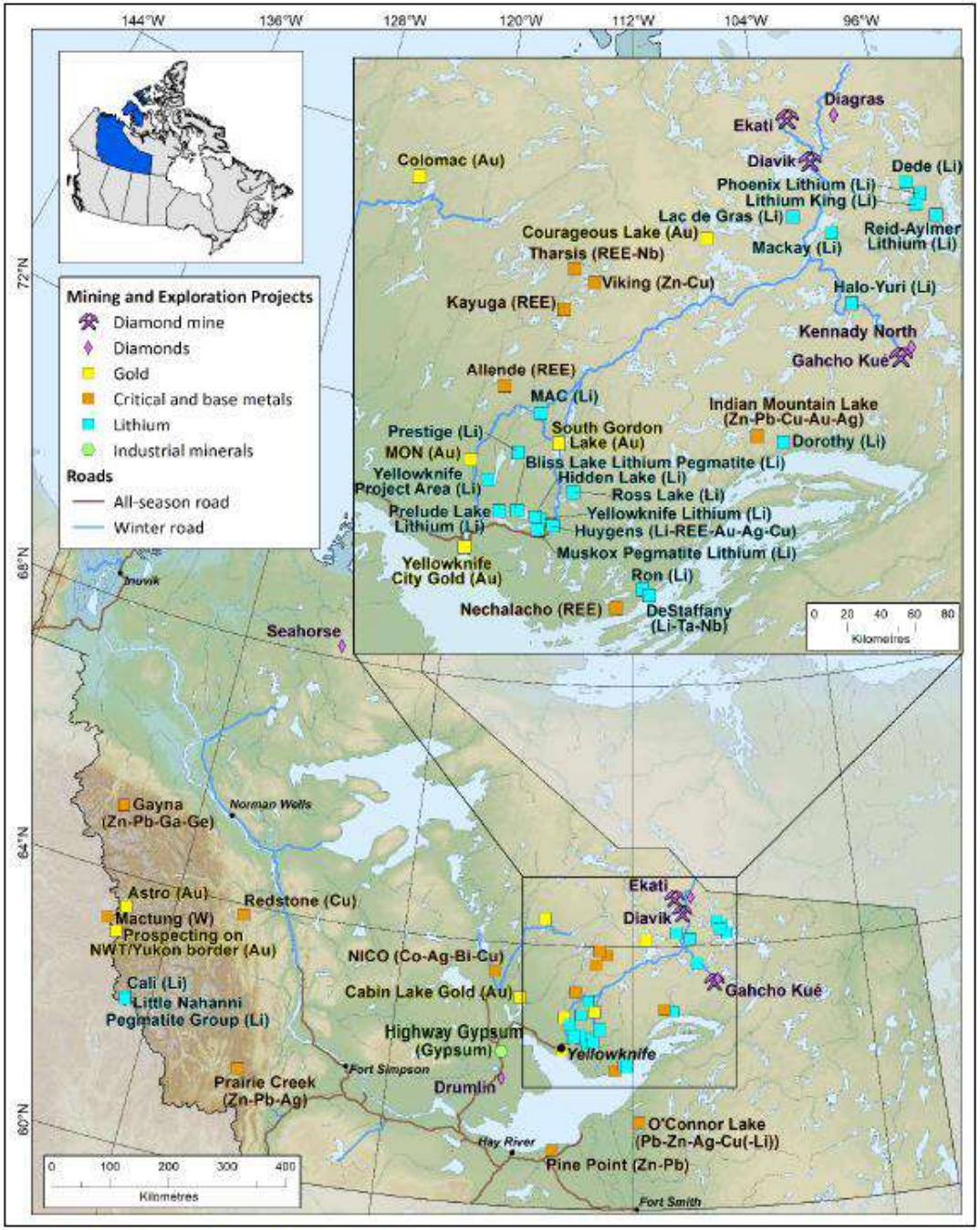


Figure 1. The locations of 2023 mining and exploration projects.

2023 Northwest Territories Exploration and Mining Overview – March 2024

Where to Find Information About Current Mining News In the Northwest Territories ?

Community discussions benefit from input from responsible professionals.

- Northwest Territories Geological Survey, Yellowknife
- Companies, the NWT and NU Chamber of Mines, Regulators and Politicians want to consult the public on current events in their mining sector. They do this by:
  - Websites, Social Media, news releases, newsletters
  - Community meetings about projects
  - Call / email through their contact portals
  - Participate in community consultations
- any news media available: e.g. cabinradio.ca , CBC but as always, use discretion.
- Major Mining Conferences:
  - **Yellowknife Geoscience Forum, November 26-28, 2024**
  - Association for Mineral Exploration (AME) Roundup, January 2025 (Vancouver)
  - PDAC March 2025 (Toronto)

Current News To Follow

- West Kitikmeot Resources' Grays Bay Road and Port Project proposal is a **critical** infrastructure project with many unrealized benefits and opportunities for all Canadians.
- An all-weather extension through to Yellowknife would unlock even more known resource potential for the Northwest Territories.

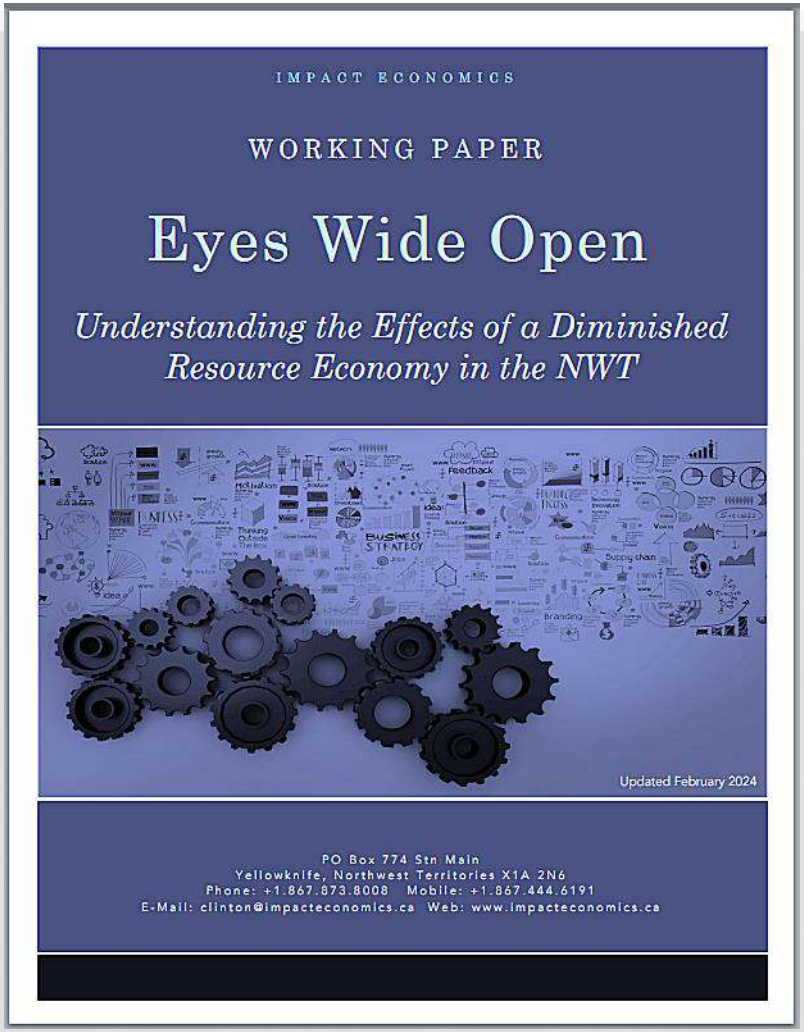
Developing News To Follow

The Northwest Territories and its immediate neighbours have long term resources ready to be developed at projects like:

Nechalacho (REE-plus)
Pine Point (Zinc-Lead-plus)
Prairie Creek (Zinc-Lead-plus)
NICO (Nickel-Cobalt-plus)
Yukon's Selwyn/Howards Pass (Zinc-Lead-plus)
Nunavut's Hood River, Izok Lake, Gondor (Cu-Zn-plus) …

<u>"Headframe Exploration Wisdom"</u>
Yellowknife region gold exploration will yield new mines
Great Bear Lake region exploration will yield new mines
Yukon border region exploration will yield new mines
Diamond minesite exploration will yield new mines

Developing News To Follow



Yellowknife-based economist Graeme Clinton updated this 36 page report which is available free from the NWT & Nunavut Chamber of Mines website (miningnorth.com) under “Chamber News”.

It provides an objective view on a future based on past, **present and very-near future decisions.**

Well-informed decisions and support with a traditional understanding of the opportunity that the land still offers is needed for geoscientists, engineers, biologists, regulators and investors to lead a way forward to sustainable prosperity.

Economic and Environmental Benefits in the NWT

In 2022; the NWT's diamond mining sector accounted for

14% of the NWT's Gross Domestic Product (GDP)

Diamond mining was the largest single contributor to the GDP

Diamond mining contributed $598.9 million to the economy

Mining was 73% of the NWT's Natural Resource Industries Production

(Statscan Table: 36-10-0400-01, Release date: 2023-11-08)

Multiple Mine Development and Infrastructure Projects
Are Undergoing Financing and Permit Reviews

Part 1b Summary

Mining is an essential part of the Canadian economy.

Mining's contribution to the NWT economy can grow significantly.

Capacity systems have been "built in the NWT" by Northerners that include communities, regulators, prospectors, mining professionals…

Local awareness and consultation is now freely available.

Devolution has authorized communities to work with the mineral industry to create prosperity for the NWT economy and Northerners

The Bottom Line for Part 1b ….

All projects are <u>endangered</u> without continued support from Northerners.

End of Part 1b

Questions ?

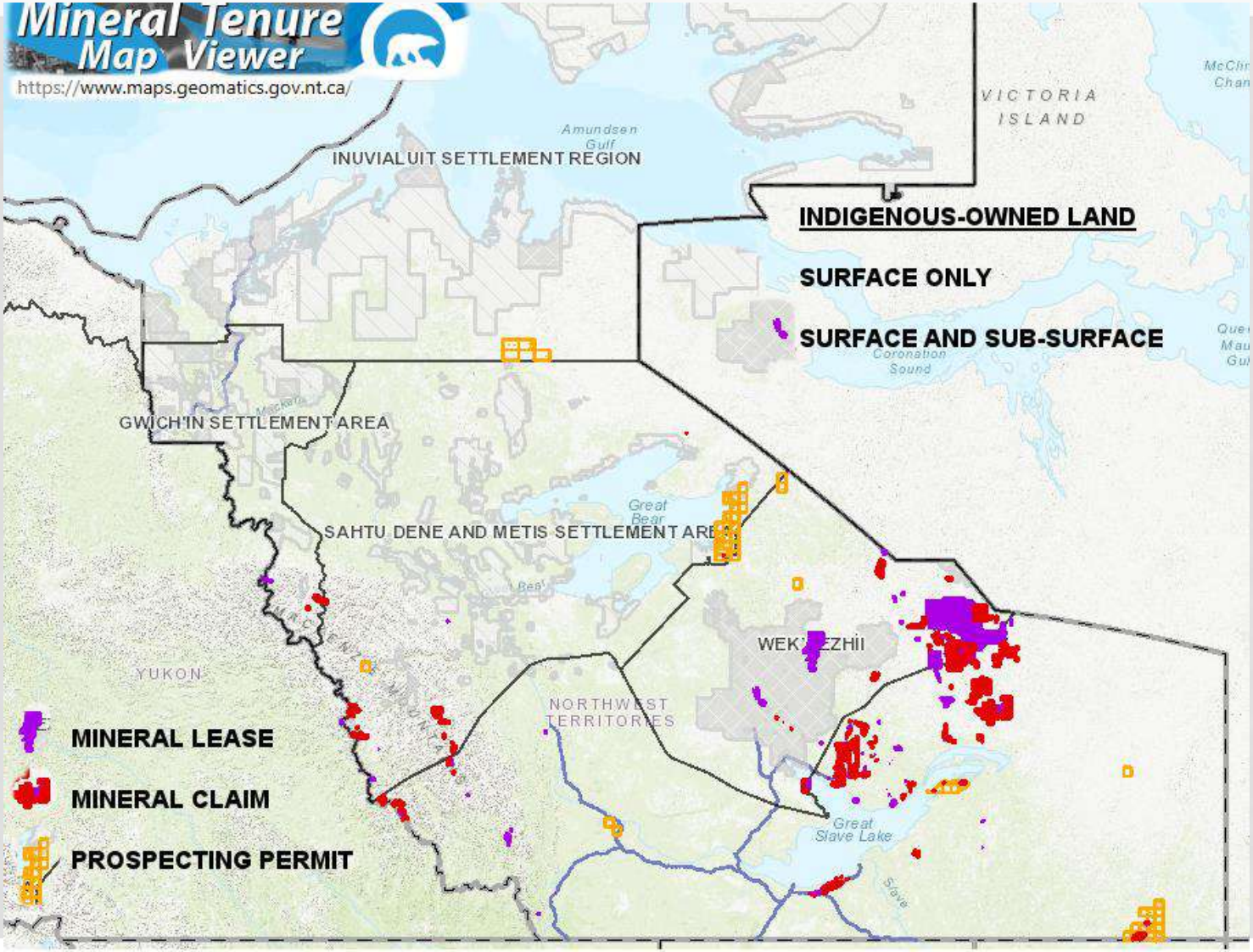
ECONOMIC OVERVIEW
Part 1c: Sub-surface

The Following Topics Are Not Shown At This Scale:

Community Concerns

Parks and Protected Lands

Species At Risk Concerns



ECONOMIC OVERVIEW

Part 1c: Today's Mineral Developments Across the Northwest Territories

$ 598.9 million value from NWT diamond mines production (2022)

2023 Production (million carats)

DeBeers' Gahcho Kué minesite	5.56
Burgundy's Ekati minesite	5.14
Rio Tinto's Diavik minesite	3.34

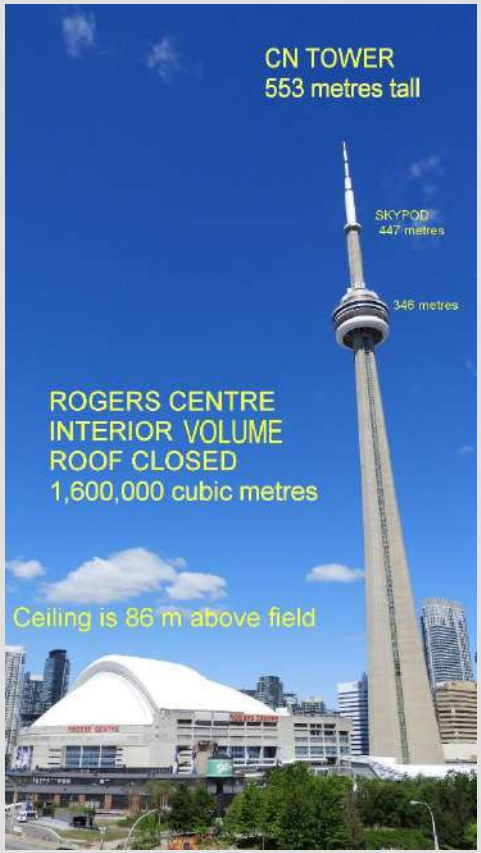
2023 $118.8 million invested in mineral exploration and deposit appraisal.

2023 Exploration:
46 projects by 39 operators
60%=Lithium-REE-Tungsten, 16%= Gold, 16%= Base Metals, 7%= Diamonds

March 8, 2024: 1176 claims and 1033 leases held by 106 "owners"
Claims and leases are **1.2%** of the NWT's subsurface

"Top 25 Sub-surface area" "owners" hold 87% of staked area
37 individuals/prospectors hold 1%

Some Comparisons for Unfamiliar Units Commonly Used In Discussing Mineral Economics



Today's precious metal mines have very large tonnages with very low grades that can only be reliably determined by systematic sampling and accurate assaying.

"High grade" precious metal results are **6 grams per tonne** which can also be stated as 6 parts per million (ppm) or 0.2 troy ounces per tonne.

A NWT diamond ore grades is 1.5 carats per tonne
…What's that mean?
……

A hockey puck on a NHL rink = 3 parts per million

Six Canadian dimes on a hockey rink is = 1 ppm

A diamond concentration of one carat per tonne = 0.2 ppm
that equivalent to a penny on a NHL rink

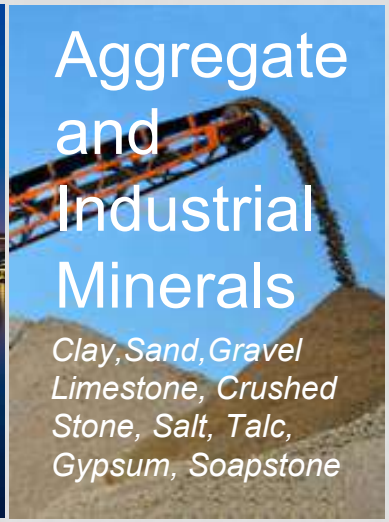
NWT's Mining Industry Major Components

2023 "Investments"

1.2% area of NWT in claims (20240308)

2022 Exploration: $ 107 m
2023 Exploration: $ 118.8 m

Mining
14% GDP (2022)
2022 = $598.9 million

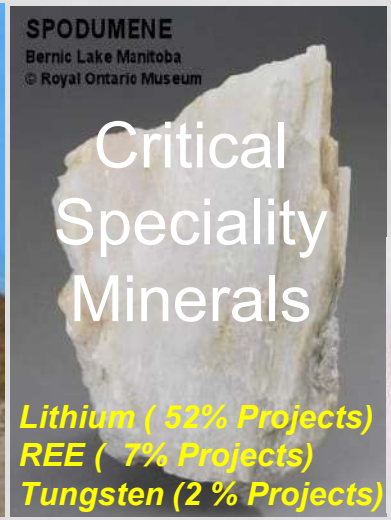


2023 Revenue
CDN $ unknown

Nil % exploration

76 million tonnes mined from diamond mines reused as aggregate on mine-sites

18 "Rogers Centre



2023 Revenue
CDN $ 2.25 million
REE Stockpile sale

61 % Exploration
0.1 % Revenue

Pending Mines
Nechalaco
NICO
Mactung

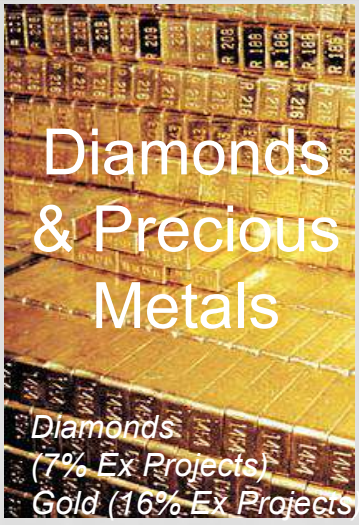
no development

2023 Revenue
CDN $ nil

16% Exploration

Pending New Mines
Pine Point
Prairie Creek

no development



2023 Revenue $1.26 billion
2023 Diamond Production
14 million carats

23% **Exploration**
99.9% Revenue

3 minesites,
3 operators
9.9 million tonnes ore

0.8 cubic metres diamonds
WON from ~2.6 "Rogers Centres" of ore

Mineral Commodity Value Per Kilogram (Ontario 2022; CDN$/kg)

COMMODITY	PRODUCT VALUE CDN$ / kg	SUB-SECTOR	SHIPPED VALUE ($ CDN MILLION)	% Shipped Ontario Mineral Value (2022p)	OVERALL SUB-SECTOR VALUE
Platinum Group Elements (Pd & Pt)	$ 96,585.80	Precious Metals **$ 66,809 per kg**	$ 1,644	12%	**52%**
Gold	$ 57,672.93		**$ 5,358**	40%	
Cobalt	$ 77.71	Base Metals **$ 20.59 per kg**	$ 96	1%	**29%**
Nickel	$ 26.42		$ 1,883	14%	
Copper	$ 12.04		**$ 1,926**	14%	
Wollastonite	$ 0.41	Industrial Minerals **$ 0.12 per kg**	$ 8	0.1%	**7%**
Clay products	$ 0.29		$ 119	1%	
Nepheline syenite	$ 0.20		$ 140	1%	
Lime	$ 0.19		$ 161	1%	
Salt	$ 0.04		**$ 568**	4%	
Stone	$ 0.010	Aggregate **$ 0.01 per kg**	**$ 809**	6%	**12%**
Sand and gravel	$ 0.009		$ 779	6%	
Clay	$ 0.005		$ 0.4	0.003%	
			$ 13,493		**100%**

Derived From: Projected 2022 NRCAN Shipment Values For Ontario

1 kg ~

----- 3X

2X

----- 4X

2X

Raw diamonds are valued @ $500,000/kg @ CDN$100/carat

2023 VOLUMES MINED AND SOLD

The volume of the "Rogers Centre" with the roof closed is 1,600,000 cubic metres.

Annual (2023) mined volumes from the 3 NWT diamond mines were:

AGGREGATE: diamond mine by-product 18 filled "Roger's Centres"

DIAMONDS: 0.8 cubic metres WON from **2.6 filled "Rogers Centres" ore**

Total diamond volume recovered from all 3 NWT mines in 2023 was the size of a washer and dryer.

Why is Mining an OPPORTUNITY in the NWT?

In Canada, **minerals are shared by the public** under clear agreements.

Modern treaties with Indigenous-owned land and clear provisions for sharing in resource development on traditional lands is an under-developed opportunity.

Regulatory systems are for the well-being of Northerners and the environment.

Mining is already the largest single component for the NWT's GDP.
It could triple its impact from 14% to the GDP levels seen now in Nunavut (38%)

Low population density and frontier-stage mineral opportunities allow projects to create **planned legacy infrastructure** at no cost to the public which can then **generate more opportunities for future generations**

It is "The NWT Advantage"

Part 1c Summary

The mineral industry has access to only 1.2% of the NWT at this time but it is the single largest contributor to the NWT's GDP.

Diamond mining by-product rock is being sustainably used on the mine-sites to create road infrastructure to future mines. Minesite footprints are small.

Exploration continues to find new diamond resources on and off mine-sites.

Exploration continues on other projects with major resources that can benefit greatly from infrastructure project approvals.

Diamond mining involves removing the equivalent of 20.5 filled Roger's Centres to **win** only a washer and dryer sized equivalent in diamonds annually.

Skilled professionals are needed to consult, permit, prospect, explore, discover, drill, prove resources, build infrastructure, develop-operate-reclaim mines and mills to recover minute amounts of payables from very large volumes of rock.

End of Part 1c

The NWT has skilled Northerners now and can train or attract more to accommodate the rapid economic growth to be generated from “The NWT Advantage”

Questions ?

PART TWO:
MINING TODAY – THE FULL CYCLE

1. Pre-Exploration = **3 KEY TURNING POINTS**
2. Early Exploration (Surveys, drill targets, drilling)
3. Discovery (drilling results) = **KEY TURNING POINT**
4. Advanced Exploration (Evaluation, Validation, Planning)
5. Feasibility = **KEY TURNING POINT**
6. Lease, Construction
7. **PRODUCTION: project's only revenue-generating phase**
8. Closure = **KEY TURNING POINT**
9. Reclamation
10. Repurposed Land Usage = **KEY TURNING POINT**

Pre-Exploration / Project Generation: Stage 1/10

Experience, public geoscience information and other information are diligently integrated to generate a potential mineral opportunity concept which can be considered intangible **Intellectual Property**.

Confidentiality is still the only protection for intangible Intellectual Property.

Meaningful Indigenous consultation by new project proponents can be difficult due to their unprotected Intellectual Property at this early stage.

Consultation and land use permission may be required prior to staking

Early meaningful consultation is a project's first key turning point.

Pre-Exploration / Project Generation: Stage 1/10

The NWT Mining Recorders Office currently administers physically staked mineral claims and surveyed leases.

A 30 day consultation period before claims are issued is unique.

Mineral tenure acquisition is a project's second key turning point.

March 8, 2024: 1176 claims,1033 leases on 16,167 sq. km
7.32 sq. km per tenure and 736 tenures per mine

Maximum area per physically staked claim is 12.5 sq. km

Pre-Exploration / Project Generation: Stage 1/10

Mineral tenure (claims), the Intellectual Property, a reasonable exploration action plan and a clear understanding of project risk mitigation are needed for project financing, optioning or sale.

Prospectors and junior companies may self-finance their own prospecting activity to try to advance the project.

Initial financing is a project's third key turning point.

Security regulators may require a NI43-101 technical report.

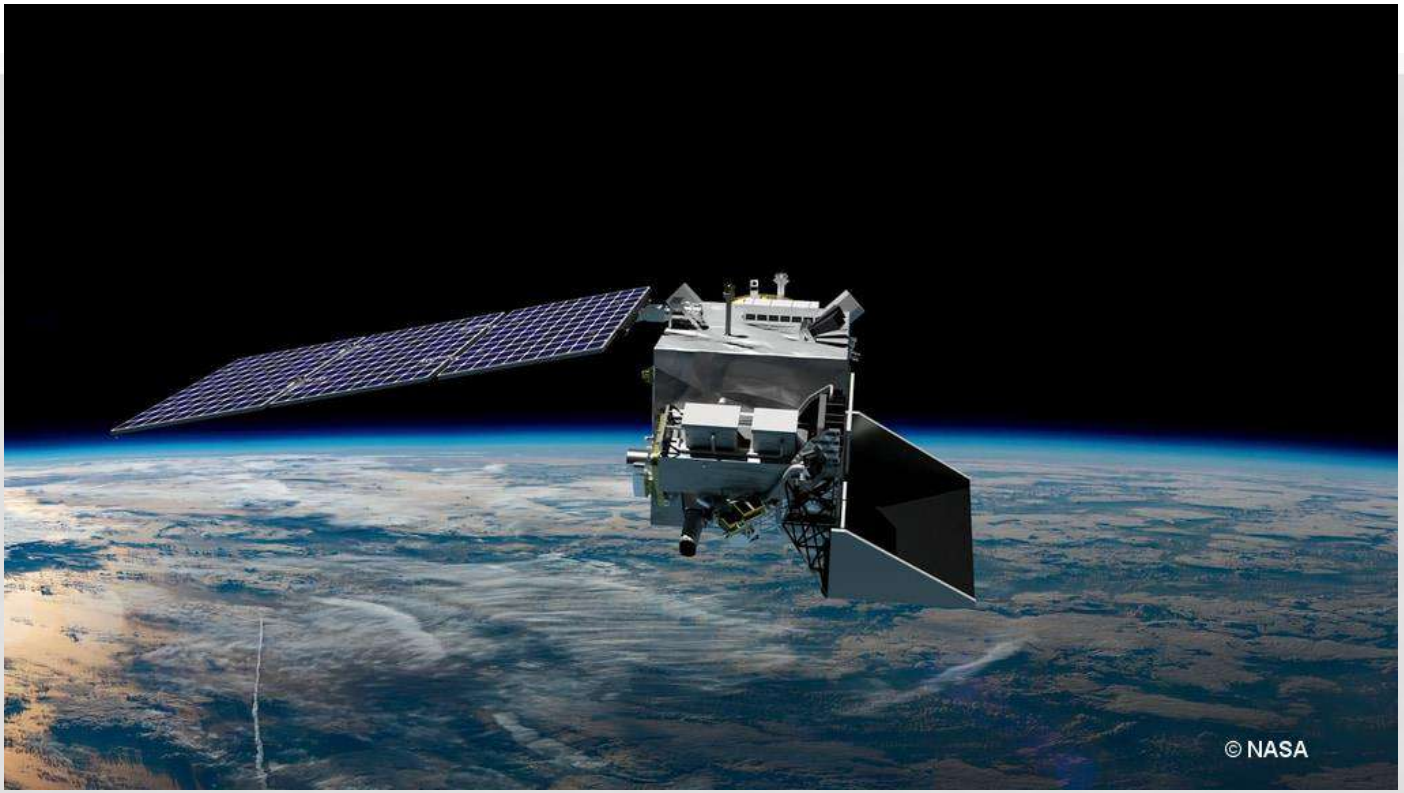
Early Exploration: Stage 2/10

- Early exploration programs require an exploration action plan used to obtain field work permits when necessary from land and water use boards, communities and other regulators prior to undertaking field work.

- The goal of early exploration programs is to get an indication of a mineral deposit discovery through integrated surveys that define reasonable targets for testing with an exploration drill hole.

- Environmental impacts are expected to be minimal and short term with project management using qualified professionals.

Passive Remote Sensing



NASA launched **PACE** on **February 8, 2024** into a **polar** orbit with full VIS-NIR hyperspectral capability at 1 kilometre spatial resolution. Airborne hyperspectral systems can “map” with less than 5 metre resolution **under ideal conditions**
Historical data archives provide material for progressive environmental monitoring.
Companies are using satellite data to identify potential-lithium staking-targets

Airborne Geophysical Surveys

- Geophysical Survey – the collection of data from above or below the earth's surface using a sensing instrument to measure a characteristic like magnetism

Passive: hyperspectral, magnetic and gravity surveys

Active: LIDAR and EM surveys

Early Exploration

Collect Rock and Sediment Samples to Identify Drill Target Areas

Rock saws can channel-sample mineralized outcrop and soil-covered terrain can be sampled to detect eroded mineralization.

Ground geophysical surveys are recommended targeting definition methods in all terrains.

SCIENCE-BASED TARGETS ARE PRIORITIZED FOR TESTING WITH DRILLING

Geologists describe the cored rock noting features and selecting samples for analysis.

Geophysical surveys down the drill hole can allow geophysicists to refine targets.

Discovery: Stage 3/10

A **maiden drill hole discovery** is one that encounters a region's typical ore grade mineralization over mineable true widths.

Drilling continues in the advanced exploration stage to **build** a mineral deposit resource around the maiden drill hole discovery.

Around the world, after more than a century of discoveries and mine developments, over the past 50 years, the rate of **discoveries that resulted in mines have steadily declined** due to several factors.

The Northwest Territories is one of the last places globally where exploration potential is truly still at the "very early days" or "frontier" stage.

A mineral deposit resource that merits consideration for development is a project's fourth key turning point.

Advanced Exploration: Stage 4/10

Drilling programs and advanced geophysical, geochemical and metallurgical studies are **focused on resource definition, evaluation and validation**.

Environmental baseline studies continue.

Northwest Territories drill programs can **progress quickly** to the advanced exploration stage because of the high quality targets.

Feasibility: Stage 5/10

All technical resource and mine planning data is integrated with financial data to obtain a estimated return on investment for the project.

Development decisions are a project's fifth key turning point.

This marks the **end to exploration stages 2 to 5** and the **start of development stages 6 to 9**.

Claims are converted to leases and advanced consultation agreements with Indigenous communities are made.

Mine Development

Mine Lease, Construction, Infrastructure: Stage 6/10

More Extensive Environmental Assessments

Bulk Sampling

Feasibility
Funding
Permitting

Justify Mine

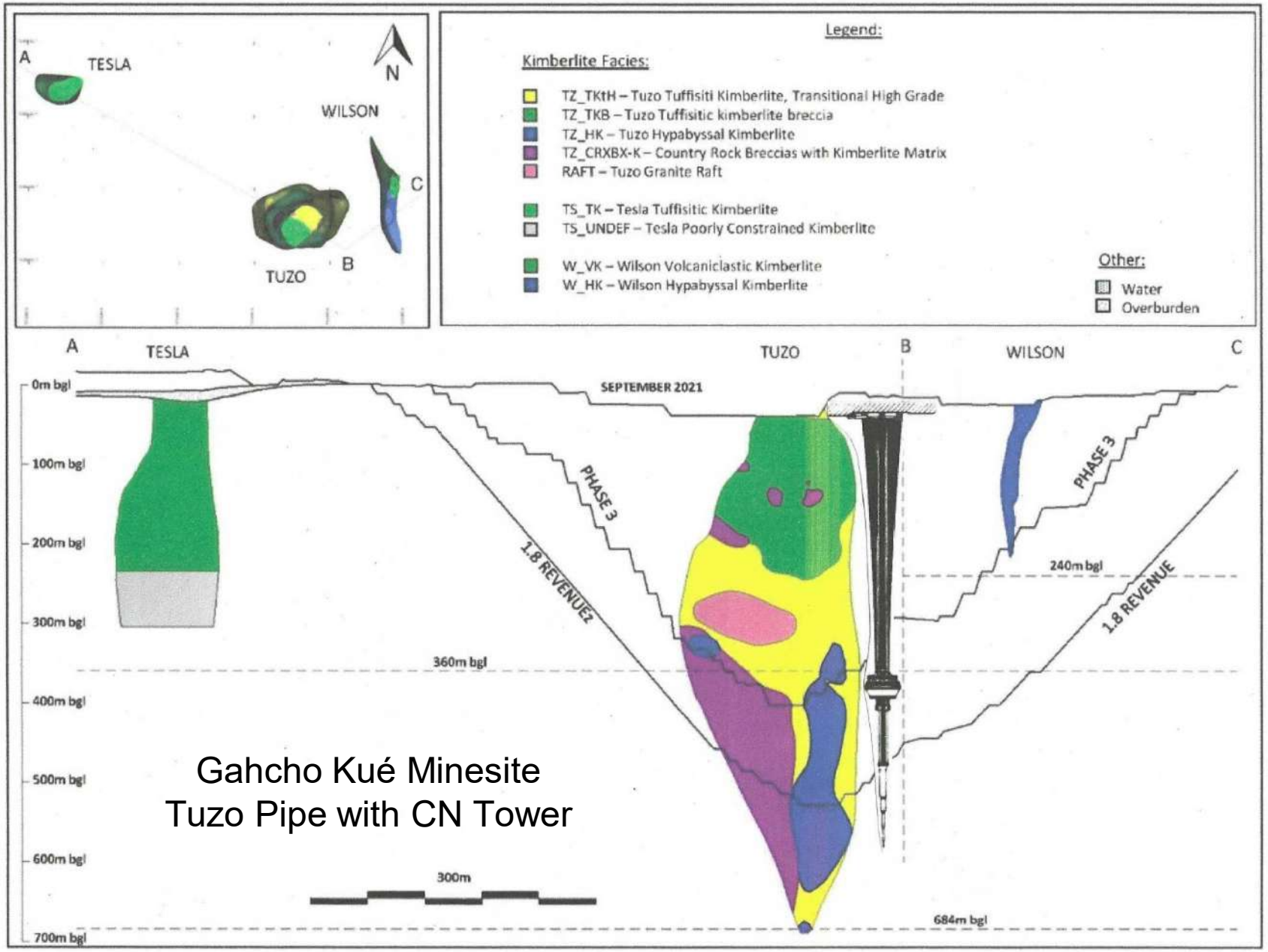
Prepare for Mining

Production: Stage 7/10

The production stage is the main revenue-generating stage related to mineral resource development.

The Northwest Territories has 3 **active producing mine-sites.**

Producing mining operations **may not be** profitable due to adverse events and economic conditions.



Source: De Beers (2021)

Closure: Stage 8/10

The closure decision is a project's sixth key turning point.

Exploration, development and mining projects may pause and go on "care and maintenance" to weather adverse conditions.

(eg: Vital Metals Nechalacho Project)

Mine closure plans are developed and approved back in Stage 6.

Companies, communities and government can refine the closure plan and other agreements to accommodate change including cooperating to avoid closure.

Reclamation: Stage 9/10

Environmental impact minimization and reclamation applies to all mining stages from early exploration to mine closure for any activities that disturb the land.

Reclamation plans are included as part of permit applications.

Inspections, on-going reclamation, and compliance reporting are now common day-to-day procedures.

Sometimes the mine operator goes out of business before reclamation is complete. (eg: Cantung)

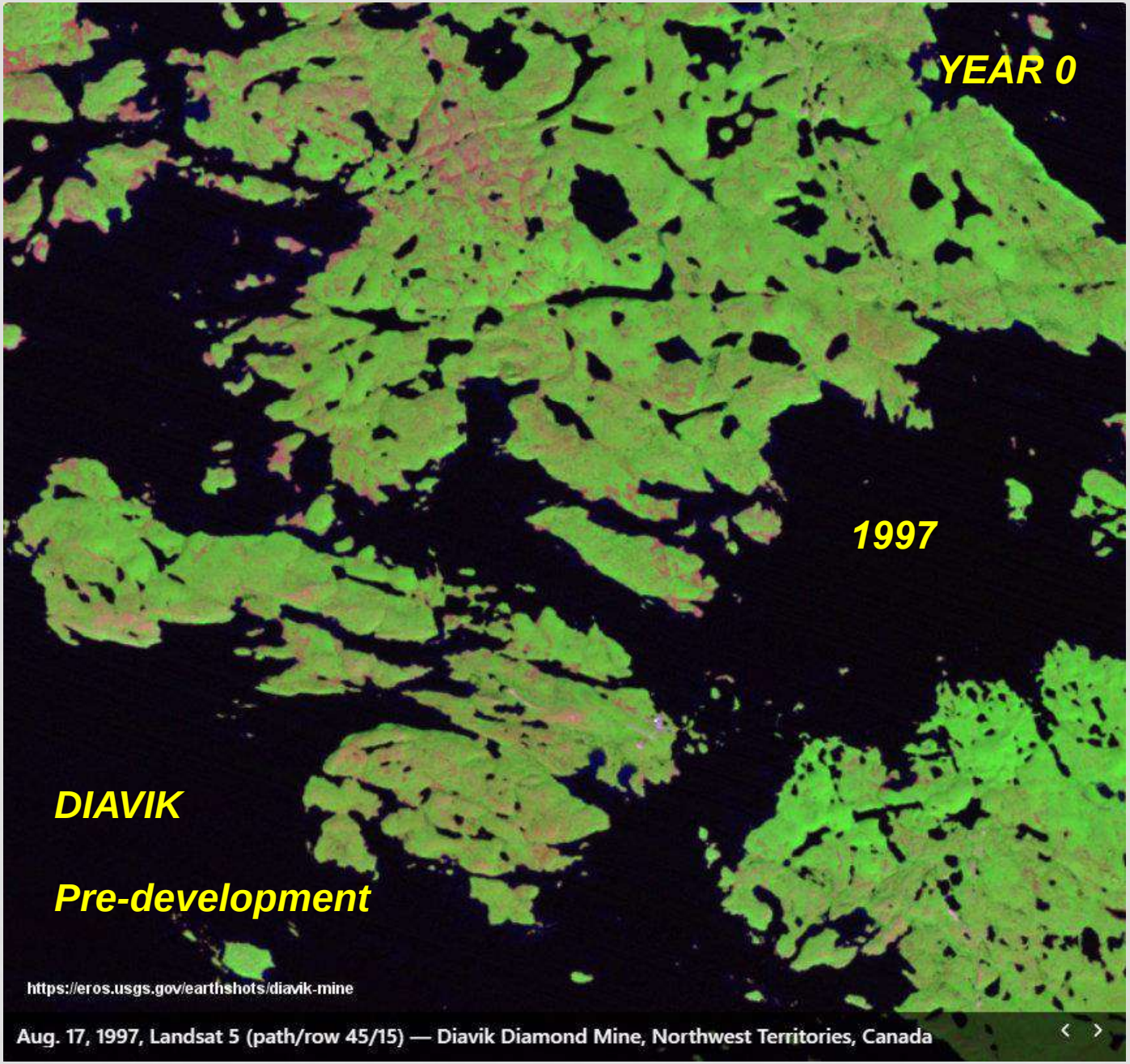
Repurposed Land Usage: Stage 10/10

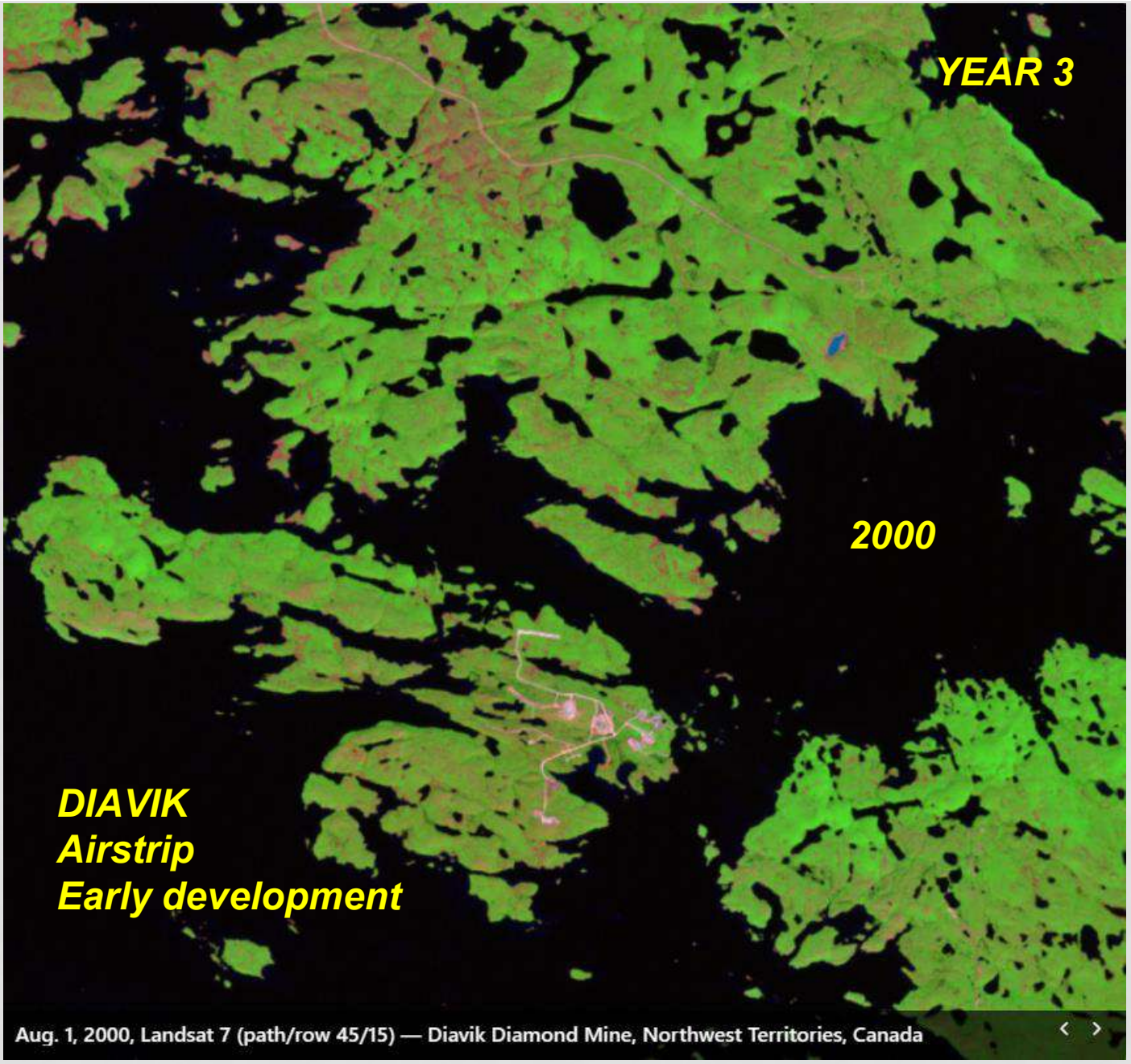
Community consultations before modern mine construction are used to plan how the land will be repurposed after mining.

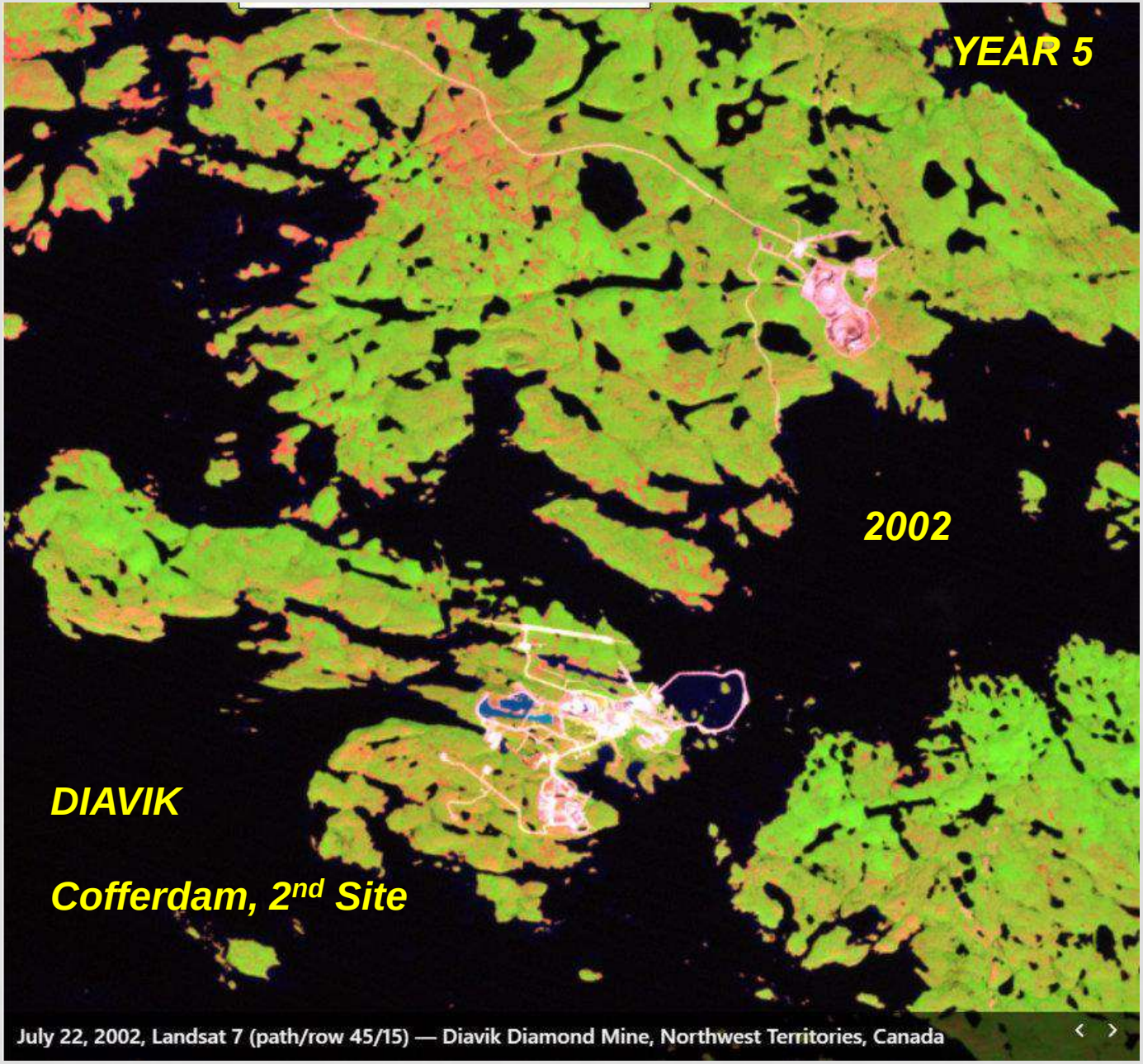
Repurposed land use decisions by the Public are a project's seventh key turning point.

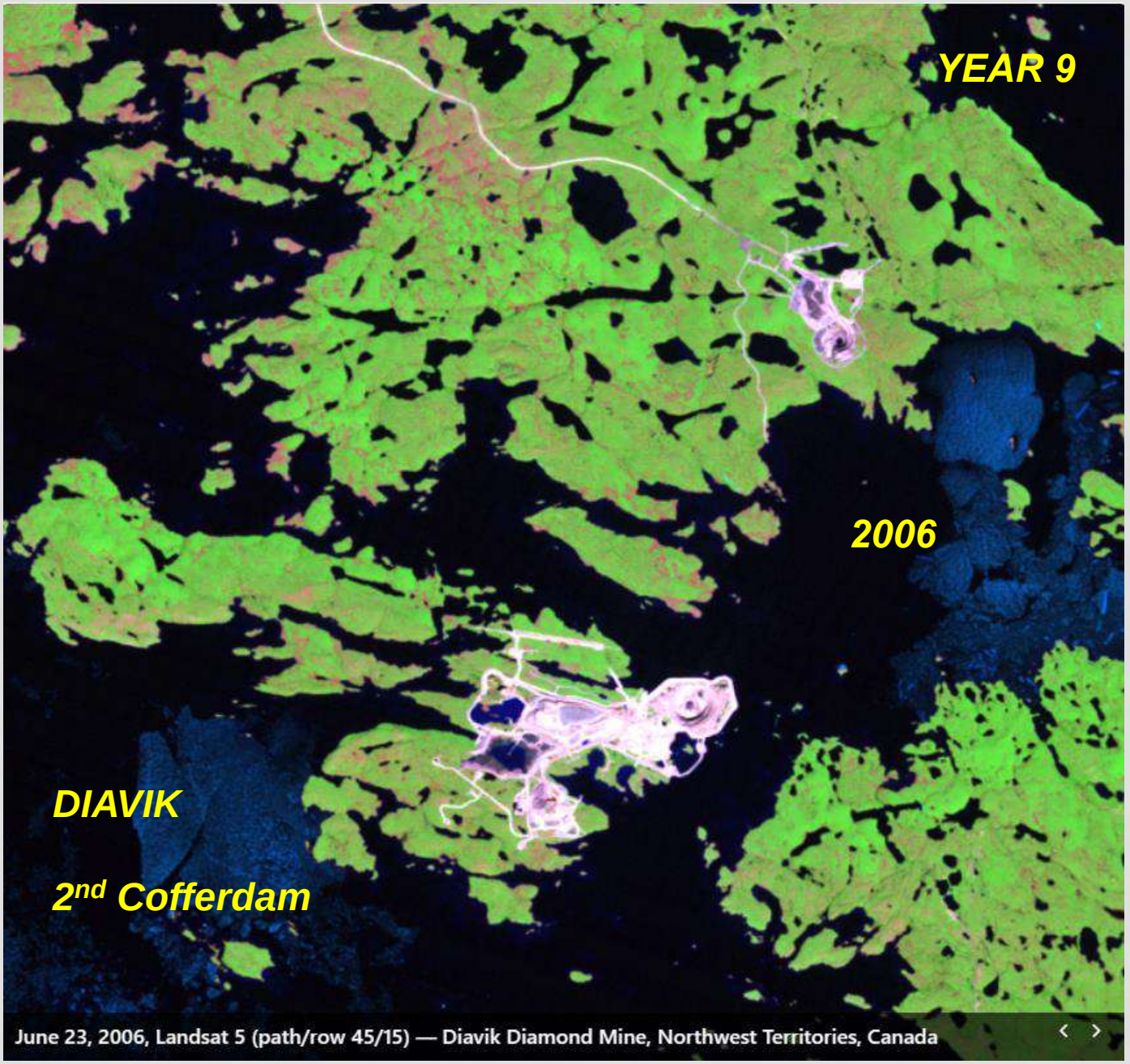
Historical mining sites can remain a public concern because they did not have closure, reclamation and repurposing plans.

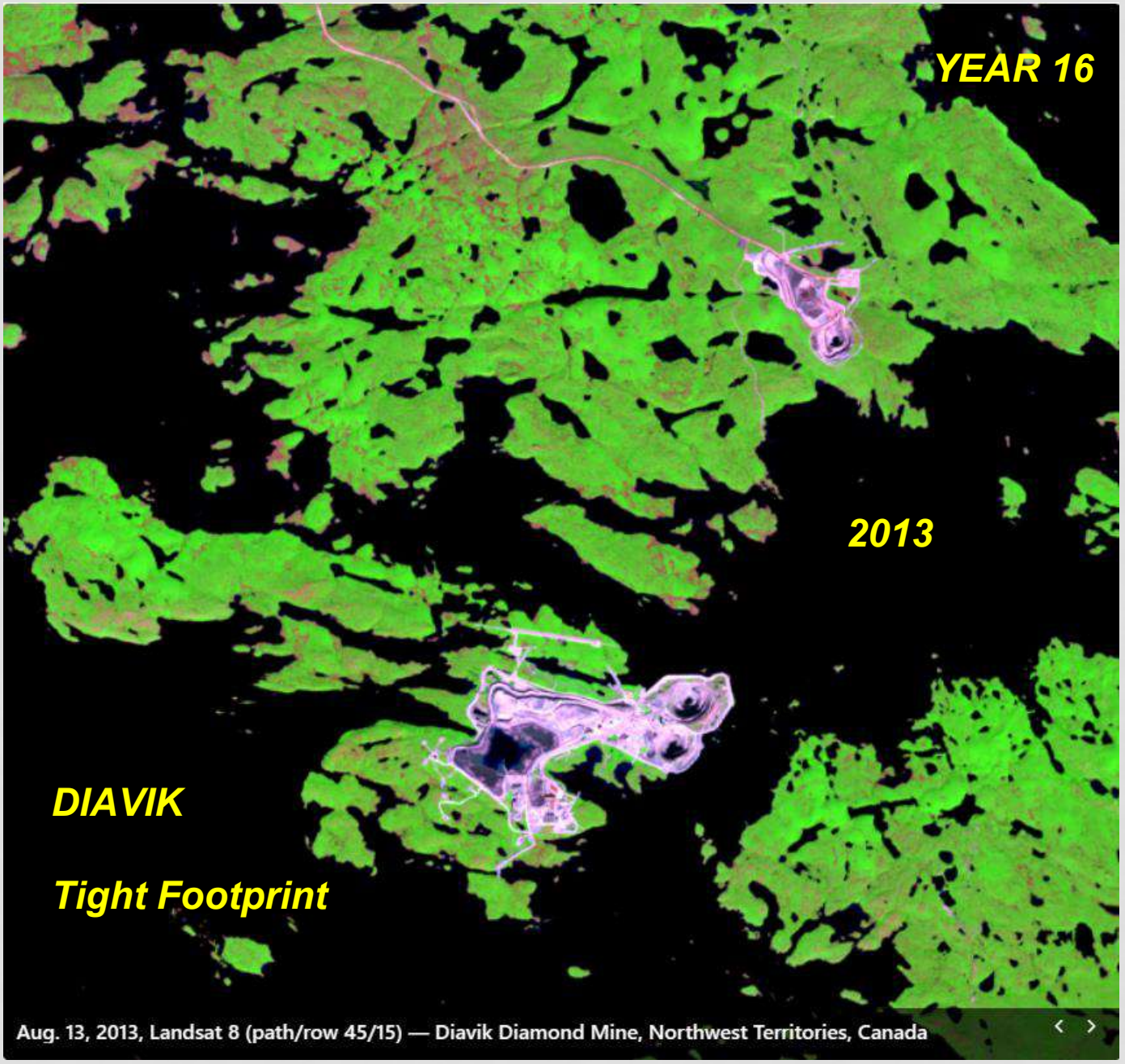
Minesite monitoring has never been easier.

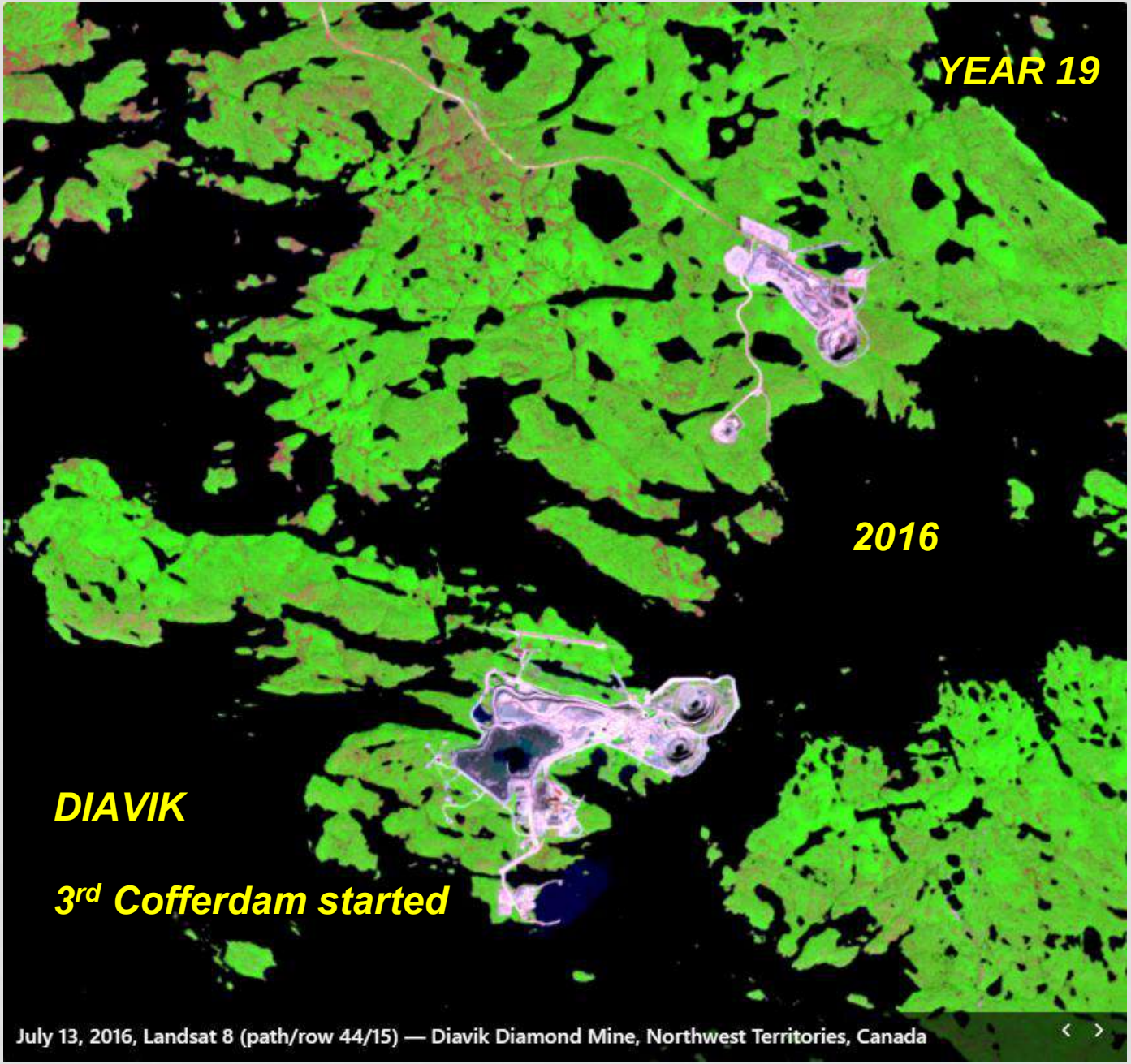

YEAR 0
1997
DIAVIK
Pre-development
https://eros.usgs.gov/earthshots/diavik-mine
Aug. 17, 1997, Landsat 5 (path/row 45/15) — Diavik Diamond Mine, Northwest Territories, Canada

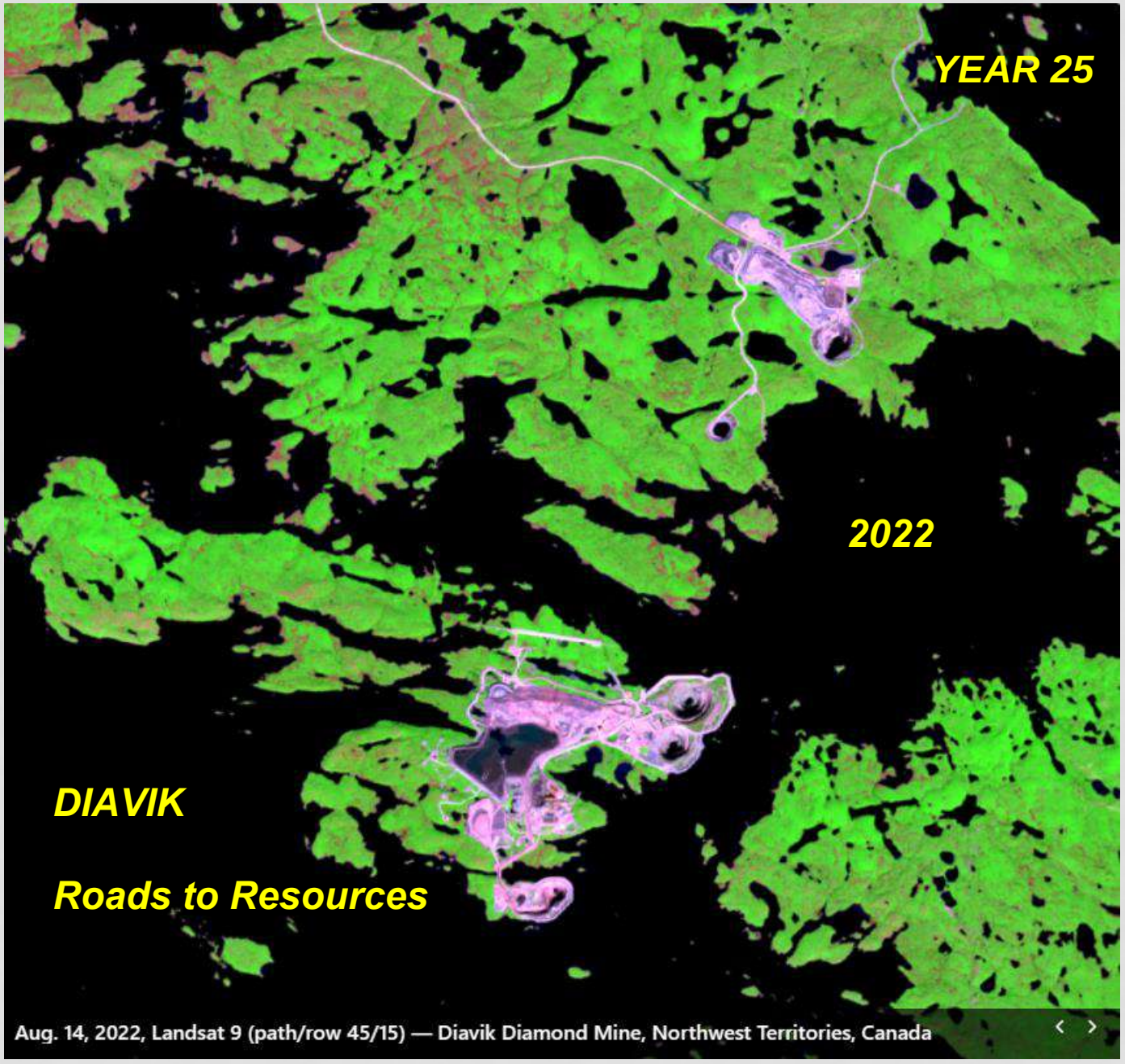

YEAR 3
2000
DIAVIK
Airstrip
Early development
Aug. 1, 2000, Landsat 7 (path/row 45/15) — Diavik Diamond Mine, Northwest Territories, Canada

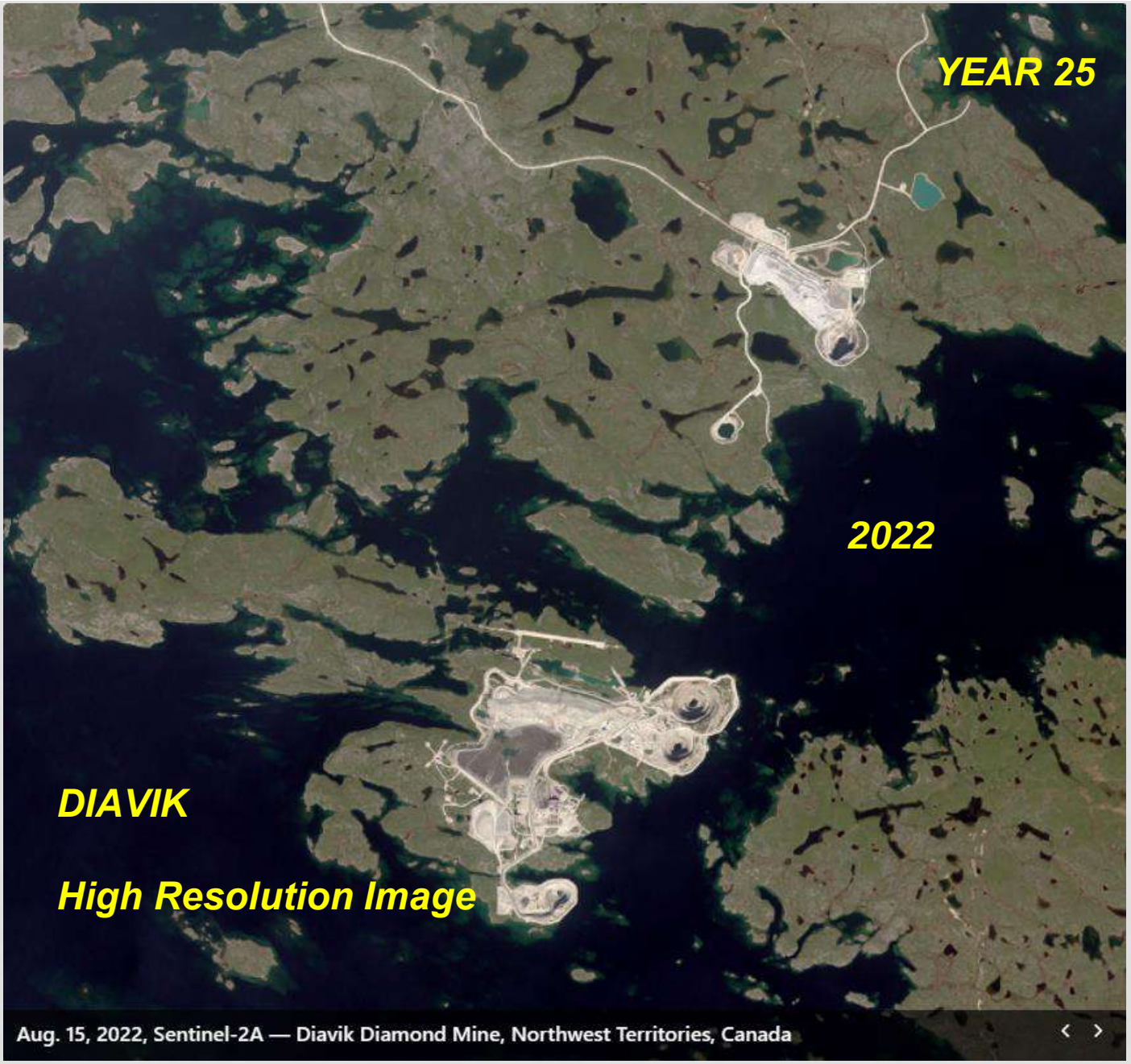

YEAR 5
2002
DIAVIK
Cofferdam, 2nd Site
July 22, 2002, Landsat 7 (path/row 45/15) — Diavik Diamond Mine, Northwest Territories, Canada


YEAR 9
2006
DIAVIK
2nd Cofferdam
June 23, 2006, Landsat 5 (path/row 45/15) — Diavik Diamond Mine, Northwest Territories, Canada


YEAR 16
2013
DIAVIK
Tight Footprint
Aug. 13, 2013, Landsat 8 (path/row 45/15) — Diavik Diamond Mine, Northwest Territories, Canada


YEAR 19
2016
DIAVIK
3rd Cofferdam started
July 13, 2016, Landsat 8 (path/row 44/15) — Diavik Diamond Mine, Northwest Territories, Canada

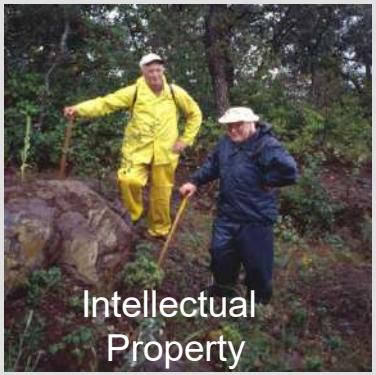

YEAR 25
2022
DIAVIK
Roads to Resources
Aug. 14, 2022, Landsat 9 (path/row 45/15) — Diavik Diamond Mine, Northwest Territories, Canada


YEAR 25
2022
DIAVIK
High Resolution Image
Aug. 15, 2022, Sentinel-2A — Diavik Diamond Mine, Northwest Territories, Canada

Life Cycle of Mining

Indigenous Business is Central to Mining

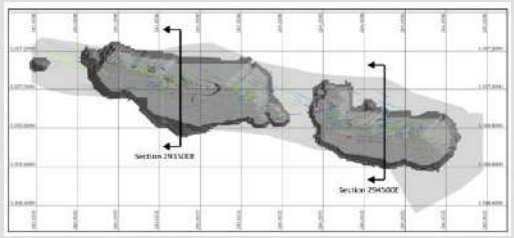
“Early Exploration”
(Pre-Exploration, Research, Prospecting)



“Exploration”

D I S C O V E R Y

Indigenous Business Opportunities



Development

F E A S I B I L I T Y

Reclamation

Wide Variety Of Mineral Exploration and Development Jobs

Mine Workings

Surveyor`s helper

Miner

Driller

Heavy Equipment Operator

Shift Foreman

Etc.

Mill/Shop

Trades helper/ apprentice

Warehouse assistant

janitor

Technicians

Certified trades

Etc.

Offices

Students

Assistants

Administration

Engineers

Geologists

Technicians

Accountant

Etc.

Camp

Janitorial

Kitchen

Cook

Admin

Repairs

Safety

Security

Etc.

Roads, Etc.

Snow removal

Road work

Trucking

Gravel pit Supplies

Diesel fuel

Explosives

Etc.

Over 160 different exploration and mining jobs

Check out the Careers Tab at miningnorthworks.com

Canadian Economic Opportunity

Generational Economic Opportunity

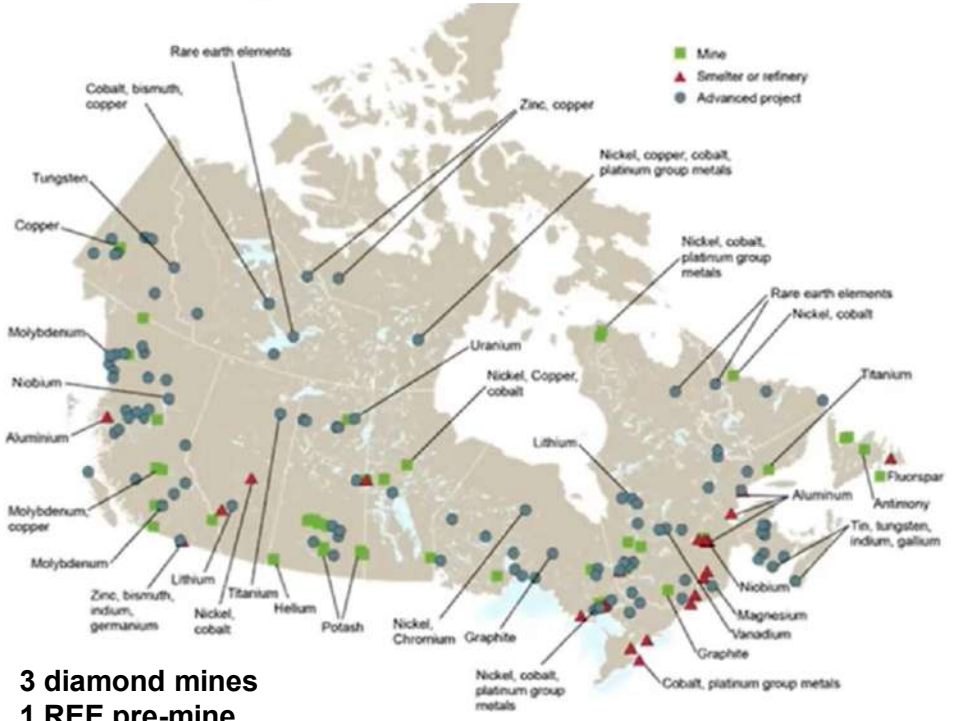
Leveraging Canada's advantages:

- ✓ World-class mineral resource wealth
- ✓ Longstanding mining expertise
- ✓ Extensive technology and manufacturing capabilities
- ✓ Abundant clean energy resources
- ✓ Strong environmental, social and governance (ESG) credentials

Domestic critical minerals can fuel Canadian manufacturing, **employment opportunities**, reduce import dependency, and build economic security.

Focus on 6 priority minerals to develop full Canadian value chains – **from mines to manufacturing** – including recycling waste and end-of-life products

Critical mineral deposits and processing facilities



- ➢ **3 diamond mines**
- ➢ **1 REE pre-mine**
- ➢ **Exploration projects include critical minerals**

Natural Resources Canada | Ressources naturelles Canada

Canada

Watch Out For Next Opportunity!
Indigenous Natural Resource Partnerships

Canadian government $80m program launched Nov 2022.

Projects funded under the renewed and expanded Indigenous Natural Resource Partnership Program:

Organization name	Description	Years	Sector	Location	NRCan Funding Amount
Łíídlıı̨ Kų́ę́ First Nation	This project aims to increase Łíídlıı̨ Kų́ę́ First Nation (LKFN)'s capacity to train and hire members and develop band-owned businesses and partnerships to capitalize on the opportunities from the Prairie Creek Mine. LKFN will use the internal capacity developed through this project to take full advantage of future development in the territory.	2023/24-2026/27	Critical minerals	Northwest Territories	$1,974,675

Indigenous Natural Resource Partnerships (canada.ca)

Mining Incentive Program

Northwest Territories Geological Survey

www.gov.nt.ca » Geological Survey » Research and Activities » Mining Incentive Program

Support for NWT Mineral Exploration

Newly discovered massive sulphide deposits near Ferrion Lake on the Cameron River. Credit: NTGS.

The Mining Incentive Program (MIP) provides funding to prospectors and exploration companies who propose new exploration projects or are already carrying out NWT mineral exploration work. The total MIP budget is $1.5 million, and all levels of exploration, from grassroots to advanced, are eligible for funding.

Prospector Mining Incentive Program

Prospectors licenced to operate in the NWT can apply for up to $25,000 in funding. For updated program information, please see the Prospector MIP Guide.

Up to $25,000

Corporate Mining Incentive Program

Mineral exploration companies licensed to operate in the NWT can apply for up to $240,000 in funding representing up to 60% of eligible project expenses. For updated program information, please see the Corporate MIP

Up to $240,000

MIP Contact Information

Phone: (867) 767-9211 x 63469

Email: NTGS@gov.nt.ca

Mail: Mining Incentive Program
c/o Northwest Territories Geological Survey
PO Box 1320, Yellowknife, NT
X1A 2L9, Canada

Part 2: Summary Opportunities

EDO's can **recognize opportunity through awareness** of:

The NWT mineral industry
Community capacity and resources
Community consultations in progress
Community consent and agreements
Mineral projects in and adjacent their community
Aggregate potential and un-staked mineral potential
Local project's key turning points and anticipating needs

Know that industry professionals are willing to fully engage with Indigenous partners, businesses and individuals in exploring and developing mineral opportunities.

FINAL BREAK FOR QUESTIONS OR COMMENTS

Thank you.

Appendix A:
REFERENCES INDEXED BY SLIDE NUMBER

Included separately on the Cando Website

Home - Cando (edo.ca)

Watch or download other mining webinars from the Cando website for examples of Indigenous companies or partnerships related to mining.

Appendix B: Additional Resource Material

Included separately on the Cando Website

Home - Cando (edo.ca)

Watch or download other mining webinars from the Cando website for examples of Indigenous companies or partnerships related to mining.