MERA Field Studies

Four types of field studies were designed, completed and interpreted as part of this MERA: bedrock geology mapping, investigation of mineral and hydrocarbon occurrences, teleseismic geophysics data collection and analysis, and mapping surficial materials.

Bedrock Geology Study

A total of 566 field sites were documented over two field seasons resulting in an updated bedrock geology map that provided the key geological context for assessing the mineral potential.

Mineral and Hydrocarbon Occurrences

During two field seasons, 51 mineral occurrences were examined to verify the type of mineralization and investigate the geological setting. Based on the data compiled from existing sources and site visits the mineral occurrences were interpreted to represent fifteen deposit types, thirteen of which were qualitatively assessed.

Mantle Teleseismic

Ten teleseismic stations were installed in a northwest trending linear array crossing Artillery Lake approximately in the middle of the study area. These stations collected data from earthquake waves for two years. Though not conclusive, interpretation of the data suggests that the mantle lithosphere, which is likely to be the source of the diamond bearing kimberlites of Gahcho Kué, would underlie all of the area of interest.

Quaternary Geology

Data obtained from 526 till and esker samples resulted in an updated surficial materials map, a till geochemistry database, a diamond indicator mineral data base and a more comprehensive understanding of glacial and fluvial flow directions. These data are important for identifying areas that may have potential for mineral deposits.

GIS Database compilation and deposit potential modelling

A GIS-based method was used to assess the mineral potential in the Thaidene Nëné area of interest. The method was applied for thirteen mineral-deposit types, considered to be the most likely to be present in the area.

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Source

Information in this document was provided by the Geological Survey of Canada, Earth Sciences Sector, Natural Resources Canada.

Publication Information

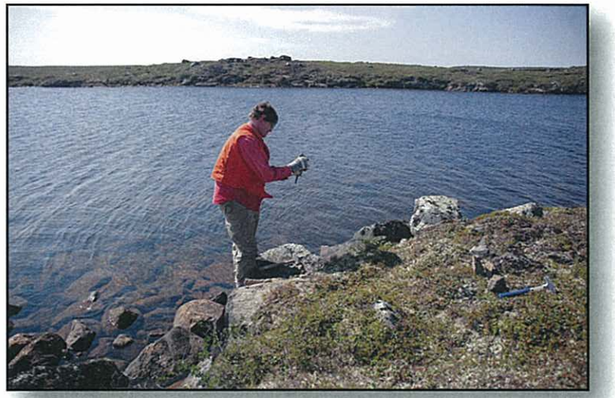
A detailed report is available for free download through GEOSCAN (http://geoscan.ess.nrcan.gc.ca/)

Wright, D.F., Ambrose, E.J., Lemkow, D., and Bonham-Carter, G.F. (ed.), 2013. Mineral and energy resource assessment of the proposed Thaidene Nene National park Reserve in the area of the East Arm of Great Slave Lake, Northwest Territories.

Proposed Thaidene Nëné National Park Reserve MERA Study

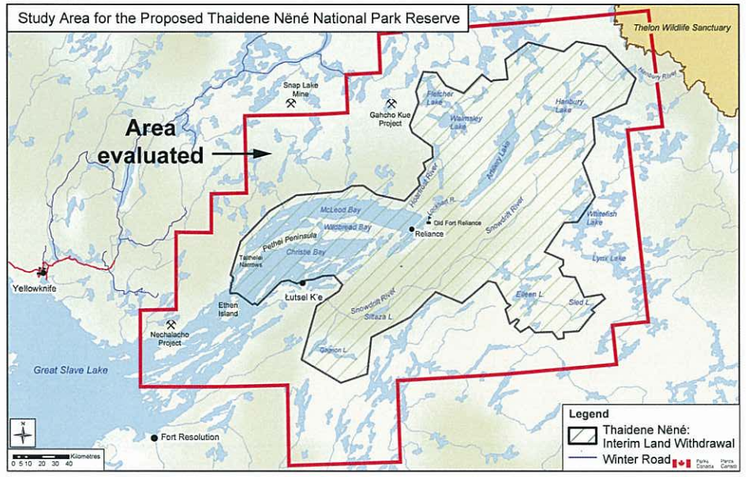
What is MERA?

MERA stands for **Mineral and Energy Resource Assessment.** MERA is a study that determines the potential for metals, gems, or oil and gas in an area. MERA is a required study for all new national park proposals in northern Canada. Understanding the potential for mineral wealth provides information to the Government of Canada and all stakeholders to make the best decision on a park boundary.



Geologist collecting rock sample

Thaidene Nëné and MERA



Location of MERA study area

In February 2008, a work plan for the Thaidene Nëné MERA was approved by the Senior MERA Committee. The work was carried out by the Geological Survey of Canada (GSC), with Parks Canada providing $1.3 million in funding and the GSC providing the equivalent in salaries and support. The area evaluated for mineral and energy potential includes the expanded area of interest (1970 land withdrawal and 2007 Interim Land withdrawal – approximately 35,000 km²) plus surrounding lands up to 30 km outside the area of interest (see location map). The combined area of study for MERA covers approximately 79,300 km². The report for the MERA study is available to the public as GSC Open File 7196 (see end of this fact sheet).

The MERA study used available information from existing publications as well as new data collected by field studies, laboratory studies and analyses in order to develop improved geochemical and geological knowledge. This additional knowledge reduces uncertainty in assessing the mineral potential.

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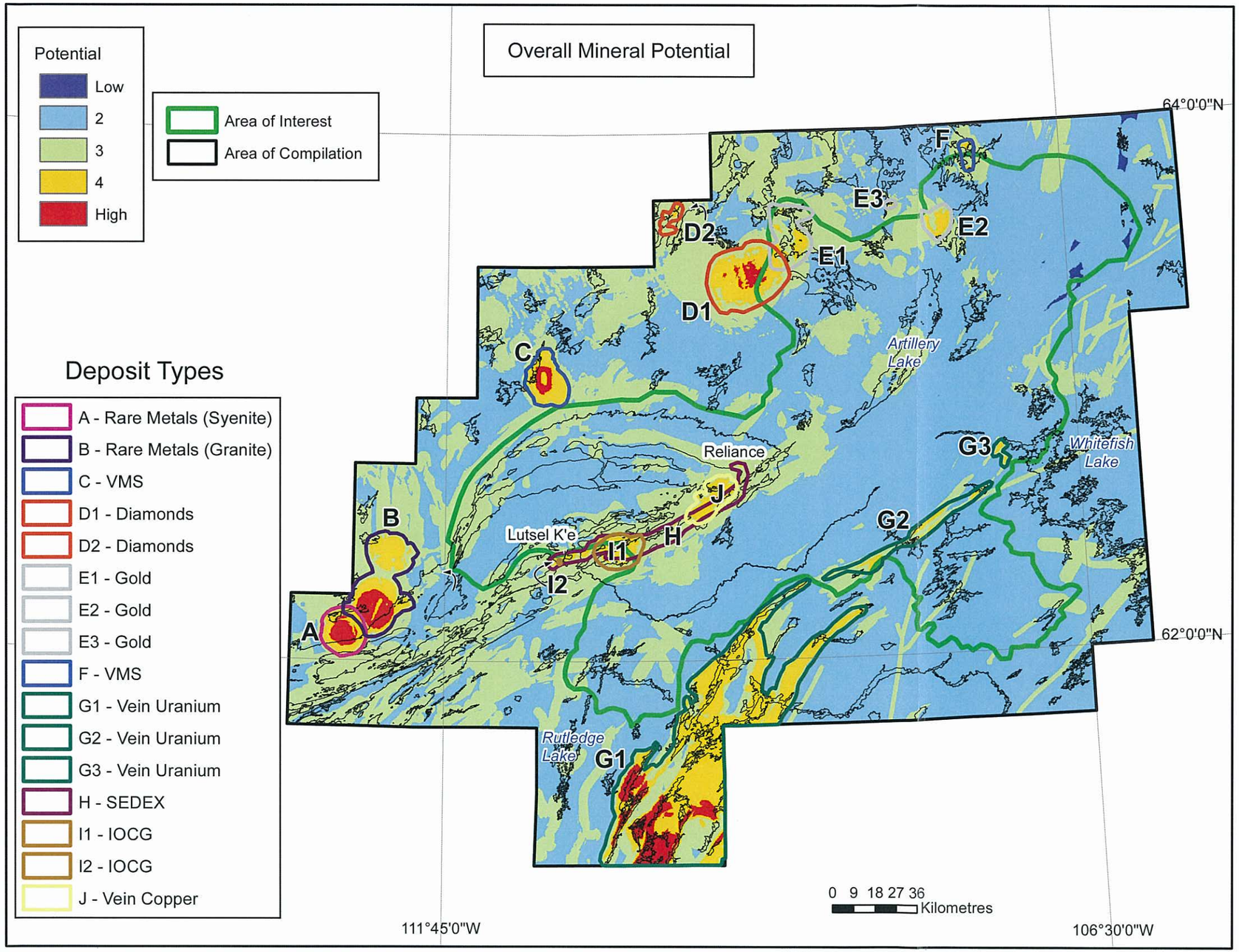
MERA Results



Considerations

The results of this mineral and energy resource assessment are based on the best geoscience information currently available. However, it should be noted that geological knowledge and understanding is always changing, the amount of data available in the study area varies and the models used to evaluate the mineral potential are based on the expert's opinion. As a result uncertainties are associated with these results. It is important to understand that areas identified as having high potential may not contain a mineral deposit and that it is possible that areas identified as having low potential could contain one or more mineral deposits.

Mineral Resource Assessment Results

Mineral potential maps showing locations in the Thaidene Nëné area of interest that are promising for finding metal minerals were produced for 13 different deposit types. Making these maps involved 4 steps: 1) researching scientific reports that describe how the deposits form and what geologic evidence suggest that they may be buried in the rocks. 2) collecting the geologic information associated with each deposit type and making maps that show the relevant geology for each deposit type, 3) adding related geochemical, mineralogical and geophysical information and 4) consulting experts and using a Geographic Information System to combine all the information to show where the best evidence for metal deposits is located. The mineral potential maps for the 13 different deposit types and the details on how they were created are fully described in the MERA report which is available to the public for free (see next page for details).

Overall Mineral Potential

An overall mineral potential map that summarizes the results of the MERA was created by identifying the areas where the potential is high or moderate-to-high for any of the 13 deposit types within and surrounding the area of interest. This map is shown on the opposite page.

Five deposit types have the highest mineral potential and are coloured red on the map: volcanic massive sulphides (VMS – see Area C on map), kimberlite-hosted diamonds (see area D1, D2 on map), granite-pegmatite rare metals (Area B on map), syenite rare metals (see Area A on map) and vein hosted uranium (see area G1, G2, G3 on map). Only the high potential for kimberlite hosted diamonds extends into the area of interest (see part of area D1). The VMS deposit type has a small area associated with moderate-to-high potential that extends into the area of interest (see area F on map).

Four deposit types have a maximum mineral potential of moderate-to-high (coloured orange on the map). Some portions of these lie within the area of interest. These deposit types are: lode gold (see areas E1, E2), vein-hosted uranium (see areas G1, G2, G3), Iron-Oxide Copper Gold (IOCG – see area I1) and Sedimentary Exhalative (Sedex – see area H)

The remaining 4 deposit types: Mississippi Valley Type (MVT), magmatic nickel-copper sulphide, sandstone-hosted uranium and chromite were considered to have moderate potential and thus are not identified on the map.

Hydrocarbon (Oil and Gas) Potential

In addition to existing written reports, field and laboratory studies were carried out on the Union Island Formation rocks to help assess the oil and gas potential. The conclusion of this MERA is that the potential for commercial hydrocarbon deposits in the Thaidene Nëné area of interest is extremely low.