

MINERAL ASSESSMENT- UPDATE JANUARY 2000

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Mineral Resource Assessment - Definition and requirements

Mineral Resource Assessment (MRA) is a process that has been developed by geoscientists over the years in order to assist decision-makers in land-use planning. By providing an understanding of the mineral potential of a given area before making land use decisions that might affect the amount and type of activity permitted in an area, potential conflict may be avoided and conservation objectives may be met while still preserving access to resources. A mineral potential map displays the results of the assessment by showing the relative mineral potential of different parts of an area under study.

Assessments are based on the compilation of the best available regional and local geology maps, geochemical and geophysical surveys, known mineral occurrences for the area (Minfile database) and the current state of knowledge on mineral deposits. If needed, new surveys are conducted to expand the database. The results of the assessments are presented as maps showing the relative ranking of the potential of different groups of rocks to host specific types of mineral deposits, from highest to lowest.

MRA's offer a valuable tool in any comprehensive land use planning process by providing a politically unbiased scientific perspective on mineral potential. Incorporating essential information on mineral resources into a multidisciplinary approach contributes to informed decision making and helps alleviate potential land use conflicts.

This program now responds to a variety of requests for information. Our main focus is our contribution to the Protected Areas Strategy where we provide regional and site-specific mineral assessments. We provide information to land claim negotiators and we assist land-based decisions in the framework of urban as well as general land use planning.

Two different phases of assessment are required under the Protected Area Strategy. First, a regional-scale assessment is used to help identify initial areas of interest for protection. Once specific study areas have been selected, a detailed mineral assessment of the area, with fieldwork if needed, is then conducted.

We follow two methodologies depending on the scale of the project. Both consist of data compilation, gap analysis, additional fieldwork (if necessary and if possible), final compilation and an assessment phase conducted by an expert panel of government and industry geologists. The area under study is divided in areas of similar geology called tracts. The tracts are evaluated as to their potential to host mineral deposits. The final

product is an overall relative ranking of the tracts, from highest to lowest, displayed as a mineral potential map.

For the regional-scale projects, such as those leading to the Yukon-wide mineral potential map, the expert estimators estimate the probability of finding undiscovered mineral deposits in each geological tract. Their estimates are then digitized and tabulated using the Monte Carlo computer program that converts the experts' estimation into probability graphs. The program then combines the estimates with known grade and tonnage data to predict the amount of each commodity that is estimated for each tract. This is used as a means to compare one tract to another.

For the site-specific and therefore more detailed projects, such as mineral assessments of park candidates, the estimators rank the tracts with respect to one another, without the probabilistic estimation.

The minimum requirements to undergo a mineral assessment are as follows:

- Adequate geological mapping (coverage at 1:250 000 scale for regional assessments, at 1:50 000 scale for site-specific assessments). The adequacy is determined by the vintage of the map and the amount of groundtruthing done at the time of the mapping.
- Regional geochemical stream sediment (RGS) surveys, at an adequate density (minimum 1 per 13 sq. km.) and with analysis of an appropriate suite of elements.
- Groundtruthing to test the quality of the data and additional surveys if deemed necessary. This need will be established on a case by case basis.
- Access to experts with experience with the geology and types of mineral deposits to be found in the area under study.
- GIS capability for data integration.
- Adequate time frame.

Geophysical coverage is important and useful for assessments. Although not listed as an essential requirement, they greatly enhance the ability of the assessors to estimate the likelihood of finding certain types of mineral deposits. We may recommend specific geophysical surveys in certain situations where the geology and mineral deposit types warrant it.

The time frame for assessments will vary from project to project. It will depend on the quality and completeness of the available database, the scale of the study, the size of the area under study, whether or not additional fieldwork is required as well the amount of information available. The time allowed for fieldwork, in addition to the reasons listed above, will be related to how well the project is funded, as helicopter time is the most expensive component of a field project. It may take between 2 and 8 months to complete a study, and, if fieldwork is needed, a few of those months have to be in summer.

Having adequate lead-time will ensure resources can be dedicated to specific projects.

When time constraints do not permit a proper assessment, we still comment on mineral values, land tenure and access considerations. We have done more cursory geological compilations in order to provide some information to decision-makers. Such compilations are not considered to be proper mineral assessments.

The mineral assessment program at YTG has been producing quality analyses in order to assist land-use planning. Other valuable products derived from mineral assessments include products of benefit to the geoscientific community, including the exploration industry:

- Update of geoscientific database.
- Compilation of mineral deposit models specific to the Yukon.
- Evaluation of the quality of the database. This will assist in guiding future work for the YGP.
- GIS compilations and statistical analyses. These will be made available to the public, providing an extra exploration tool.
- Metallogenic bulletin and maps.
- Buy-in from industry due to their participation in the process.