Economic Evaluation of the Mineral Resources of Cape Breton Island

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Provincial (Nova Scotia Department of Economic Development and Tourism) and federal economic development agencies (Enterprise Cape Breton Corporation) have periodically invested in Nova Scotia's mineral resource developments on Cape Breton Island. They recently expressed interest in continuing and perhaps expanding this investment, but they require a current assessment of the island's mineral resources so they can make strategic investment decisions. In 2011, discussions were initiated among the two economic development agencies, Nova Scotia Department of Natural Resources (DNR) and the Strait-Highlands Regional Development Agency on how to obtain this updated resource analysis and what datasets and support might be required to undertake this study.

The initial plan was to contract a consultant to undertake both local and global analyses of Cape Breton Island's mineral resources to identify the best deposits for potential investment. A budget was set aside by ECBC and NSEDT and a Request for Proposals was prepared and issued. Once the proposals were received, a discussion was held by the project team on the proposed methodology for the economic analyses. During this discussion it was recognized that the analyses should include a GIS-based assessment of the economic, social and environmental factors that might influence development of the mineral resource. This GIS analyses was not included in the original project plan so the decision was made not to proceed with the project as written in the RFP.

Subsequent to making this decision the Advanced Geomatics Research Group (AGRG), at the Nova Scotia Community College in Lawrencetown, was then engaged in a discussion on how to best conduct this GIS analyses. By the time the decision was made to undertake this study it was too late in the year for AGRG to locate students interested in working on the project so the budget was carried forward into 2012.

The Advanced Geomatics Research Group was awarded a contract to undertake the GIS analyses and to initiate the development of a web-based interface to the various databases used in the analyses. The GIS study will assess a number of economic, environmental and social issues that could impact the economic development of the island's mineral resources. These include economic issues such as: (1) distance to port facilities, (2) distance to 100 series highways, (3) distance to 3-phase power, and (4) the available labor pool within 100 km of the exploration site. Social and environmental issues include: (1) proximity to parks or protected areas, (2) distance to residential developments, (3) distance to community water supplies and waterways, and (4) distance to aboriginal special places. All of these are issues that require assessment before a decision is made to proceed with development of a mining project.

A second component of the GIS study is the development of a web-based analysis tool which allows the user to change the dataset used for mineral potential calculations as new data become available. As an example, if a new 100 series highway is constructed near the deposit site, the distance from the deposit to the highway could change. Even a small change like this could impact the economic viability of mining operations because transportation costs have a large impact on mine economics.

The Mineral Team, composed of representatives of the agencies listed above, worked with AGRG to compile a list of criteria that will be used to develop the first analytical model and analyses of the island's mineral resources. The primary database used to conduct the GIS analyses is DNR's Mineral Inventory Database. A series of

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weightings will be applied to each of the attributes in the criteria list. For example, if the deposit is within 10 km of a port it could be assigned 5 points, but if it is 100 km from the port it could be assigned 1 point. Once all of the attributes have been assigned their various point ratings the GIS program will apply the ratings and score each mineral occurrence with a total point value.

Along with the economic, social and environmental attributes, a series of mineral resource values will also be assigned to the mineral occurrences. This will include attributes such as drilled or not drilled, simple occurrence or advanced prospect, and whether or not the deposit type is defined or undefined. These point ratings will be visible on the map so the mineral occurrences with the best potential for development will become apparent. If this initial work shows promise, work will be undertaken on the web-based user interface.

A third component of the study is the purchase and review of selected Industrial Mineral Global Economic Reports for commodities found on Cape Breton Island, and the use of the Mineral Economics Group databases for a review of future global market potential for base and precious metals. Nova Scotia Department of Natural Resources purchased a one year subscription to the Mineral Economics Group databases. These reports and databases will be used to assess which of the mineral commodities identified in the GIS study have the best market potential based on current and future global market demands. Due to licensing agreement restrictions the published industrial mineral reports and Mineral Economics Group data cannot be released for public access, but the data will be used by the Mineral Team to further refine the deposits under consideration for investment.

Phase 1 of the project will be completed by the end of March 2013. It is anticipated that additional work will be required to better refine some of the attribute datasets, point ratings and web-based user interface once the Mineral Team has had a chance to review and assess the data and GIS products. If all goes as planned, this analytical tool could be used to attract mineral resource investments in Nova Scotia.