

Baseline Geophysical Data Collected Along Great Northern High Voltage Transmission Line Route

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DNR Contact: Dave Dahl, MnDNR Mineral Potential Evaluation Section
(dave.dahl@state.mn.us , ph. 218-231-8445)

The Great Northern High Voltage Transmission Line project (GN-HVTL) established a 500 KV electrical transmission line to carry hydropower-generated electricity from Manitoba to Blackberry (near Grand Rapids), Minnesota. Due to the project's preferential routing across state-owned lands (predominately School Trust, Consolidated Conservation lands), the project's license to cross state lands included terms for collection of baseline geophysical data prior to installation of project structures and conductors along the route.

Project proposer Minnesota Power contracted Geotech, Ltd. Airborne Geophysical Surveys to conduct the data collect. Geotech deployed equipment and staff during October-November, 2017, acquiring 457 line-kilometers of data using helicopter-borne Versatile Time Domain Electromagnetic (VTEM) and Horizontal Magnetic Gradiometer instrumentation and methods. The report and data were forwarded to DNR in August, 2018 and are being added to open-file notice as part of a larger effort to modernize DNR's inventory of publicly available airborne geophysical survey data holdings.

Route segments targeted for GN-HVTL baseline geophysical data collection met the following criteria:

- Crossing sites have known metallic mineral occurrence or have known potential to host undiscovered metallic mineral resources.
- Crossing new HVTL corridor – those route segments located adjacent to existing installed HVTL routes were dropped from consideration for operational and safety reasons (conductive responses of existing HVTL structures and conductors tend to overwhelm the much smaller signal of bedrock conductor responses during geophysical survey work, and low-altitude aircraft operations in close proximity to existing large transmission lines during data collects would present a safety concern).
- Crossing depth-to-bedrock areas shallow enough to be within detection limits of the contracted geophysical survey method and instrumentation.

Based on these criteria, baseline geophysical data were collected at four locations. Three locations are in the Wabigoon bedrock Subprovince - two in northwestern Koochiching County and one in central Lake of the Woods County. The fourth site is located along the southern margin of the Wawa bedrock Subprovince in eastern Itasca County.

The baseline geophysical data collected at the four sites is intended to serve as infill in future mineral exploration geophysical data collects for zones where bedrock conductive responses will be newly masked by presence of GN-HVTL structures and conductors. These baseline data may also hold geoscientific research value for geologic mapping work by state, federal, academic and other research organizations.

The report and data from this project, entailing a survey report in PDF format; site specific maps and profiles compiled in Geosoft MAP, PDF, and GeoTIFF formats; Geosoft Montaj formatted line data files in Geosoft GDB format, Geosoft GRD grid files; a Google Earth KMZ file; and RDI and Waveform files can be accessed at https://www.dnr.state.mn.us/lands_minerals/mpes_projects/index.html.