

This airborne geophysical survey and the production of this map were funded by Geomagnetic Resources Inc.

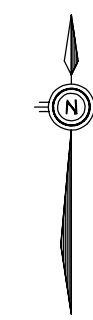


GEOPHYSICAL SERIES - NTS 93N/6, 93N/7, 93N/10, 93N/11 - INDATA LAKE
BRITISH COLUMBIA

URANIUM / THORIUM

Scale 1:50 000 - Échelle 1/50 000

Unstaked Topographic Map Projection
North American Datum 1983
© The National Topographic Data Bank of Canada 2006
Projection: Universal Transverse Mercator
Datum: North American Datum 1983
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Digital Topographic Data provided by Geomatics Canada, Natural Resources Canada



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2006
SHEET 8 OF 10
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High Sensitivity Airborne Gamma-Ray Spectrometric and Aeromagnetic Surveys
Canada: British Columbia, 2004 - 2005

In 2004 and 2005, Fugro Airborne Surveys completed nine multi-sensor, airborne geophysical surveys in the entire region of British Columbia for the Geological Survey of Canada, the British Columbia and Yukon Chapter of Mineral, Paleontological and Geoscience, and the industry partners, including Geomagnetic Resources Inc., Yarrow Hill Mining, Ltd., Northern Ventures Corp., Gold Resources Inc., and Arctic Resources Ltd. The Geological Survey of Canada provided survey supervision and quality control. The purpose of the surveys was to obtain quantitative gamma-ray spectrometric and aeromagnetic data. The surveys were flown over two seasons, from September 16 to November 17, 2004 and June 15 to August 5, 2005, using Airbus AS332 and AS350B3 helicopters, C-550C, and C-550D.

Gamma-ray Spectrometric Data

The airborne gamma-ray measurements were made with an Epsilon-2000 gamma-ray spectrometer using four 102 x 102 x 400 mm NaI (Tl) crystals. The main detector array consisted of eight crystals (total volume 32.8 litres). One crystal (total volume 4.2 litres), shielded by the main array, was used to detect scattered radiation caused by atmospheric radon. The system constantly monitored the natural potassium peak for each crystal, and using a Gaussian least squares algorithm, adjusted the gain for each crystal.

Potassium is measured directly from the 1460 keV gamma-ray photons emitted by ⁴⁰K, whereas uranium and thorium are measured indirectly from gamma-ray photons emitted by daughter products (²¹⁴Pb for uranium and ²¹⁴Pb for thorium). Although these daughters are far down their respective decay chains, they are assumed to be in equilibrium with their parents. The gamma-ray spectrometric measurements of uranium and thorium are referred to as equivalent uranium and equivalent thorium, i.e. 40 and 27%. The energy windows used to measure potassium, uranium and thorium are:

Potassium (K40) 1380 - 1560 keV
Uranium (U235) 1860 - 1865 keV
Thorium (Th232) 2410 - 2810 keV

Gamma-ray spectra were recorded at one-second intervals at a planned terrain clearance of 150m or 30m depending on the survey area and in an aircraft of 100km/h. The total potassium, uranium and thorium counts were derived from the recorded raw channel spectra. During processing, the spectra were energy calibrated and counts were accumulated into the windows described above. Counts from the radon detector were recorded in a 1800 - 1800 keV window and radiation of energies greater than 2000 keV was recorded in the cosmic window. The window counts were corrected for dead time, and for background activity from cosmic radiation, the radioactivity of the aircraft and atmospheric radon decay products. The window data were then corrected for spectral loading in the ground, air and detector. Corrections for deviations of altitude from the planned flight clearance and for variation of atmospheric and pressure were made prior to conversion to ground concentrations of potassium, uranium and thorium, using factors determined from flight over a calibration range over Canada.

Potassium 97.3 cps/km² (2004) 96.3 cps/km² (2005)
Uranium 0.7 cps/km² (2004) 0.4 cps/km² (2005)
Thorium 0.4 cps/km² (2004) 0.7 cps/km² (2005)

Corrected data were filtered and interpolated to a 100m grid for the 1:250 000 scale maps and to a 50m grid for the 1:50 000 and 1:25 000 scale maps. The results of an airborne gamma-ray spectrometric survey represent the average surface concentrations that are influenced by varying amounts of soil, vegetation and rock. The measured concentrations of potassium, uranium and thorium are usually lower than the actual bedrock concentration. The total air dose-rate due to radon in nanograys per hour was produced from measured counts between 410 and 2810 keV.

Magnetic Data

The helicopter was equipped with a Scintrex CS-2 cesium vapour magnetic sensor mounted in a 100m configuration along the aircraft's fuselage. The system recorded magnetic intensity every 0.1 seconds with a noise level of less than 0.01 nT. Magnetic interference caused by aircraft structures was compensated using an HEM-300 magnetic compensation. Diurnal variations and GPS fluctuations were recorded using a Fugro GPS base station.

After adding the survey data, the intersections of traverse and control lines were determined and the differences in the magnetic values were corrected, weighted and manually verified to obtain the leveling network. The International Geomagnetic Reference Field was calculated and removed using a base date of August 6, 2005 and an altitude of 100m. The corrected GPS height for each data point, the corrected magnetic data and the variation of atmospheric and pressure were made prior to conversion to ground concentrations of potassium, uranium and thorium, using factors determined from flight over a calibration range over Canada.

Positional Data

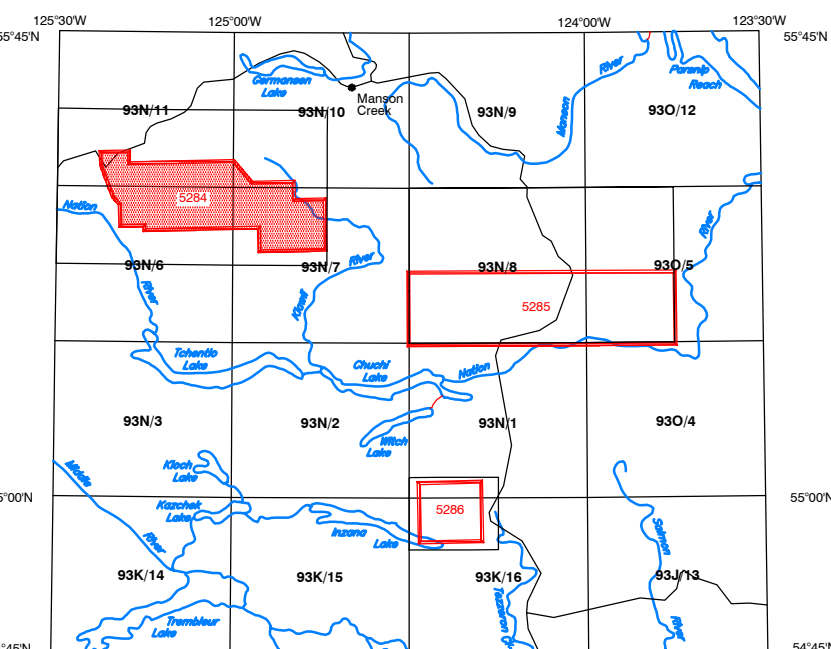
Line spacing and direction for survey and control lines were selected for each block to ensure the best representation of local geological features. Terrain clearance was monitored by radio altimeter. Positional data were recorded using a dual frequency Novatel Miniature system. GPS groundstation data were combined with airborne GPS data to produce orthorectified positional data with an accuracy of 2 to 5 m.

Data Presentation

Colour levels and contours were calculated for each grid and combined with map surround information to create postscript plot files, which were plotted using HP DesignJet colour plotters.

Planimetric Symbols

Topographic Contour
Drainage
Roads
Canals
Railways
Figure 1: Symbols



NATIONAL TOPOGRAPHICAL SYSTEM REFERENCE AND GEOPHYSICAL MAP INDEX
SYSTÈME NATIONAL DE RÉFÉRENCE CARTOGRAPHIQUE ET INDEX DES CARTES GÉOPHYSIQUES

Geomatics Canada
David, L.M., Lavoie, R., Poir, J., Smith, R.B., Hynes, R.A. and Boudle, J.L.
2006. Geophysical Series 5284, 5285, 5286, 5287, 5288, 5289, 5290, 5291, 5292, 5293, 5294, 5295, 5296, 5297, 5298, 5299, 5300, 5301, 5302, 5303, 5304, 5305, 5306, 5307, 5308, 5309, 5310, 5311, 5312, 5313, 5314, 5315, 5316, 5317, 5318, 5319, 5320, 5321, 5322, 5323, 5324, 5325, 5326, 5327, 5328, 5329, 5330, 5331, 5332, 5333, 5334, 5335, 5336, 5337, 5338, 5339, 5340, 5341, 5342, 5343, 5344, 5345, 5346, 5347, 5348, 5349, 5350, 5351, 5352, 5353, 5354, 5355, 5356, 5357, 5358, 5359, 5360, 5361, 5362, 5363, 5364, 5365, 5366, 5367, 5368, 5369, 5370, 5371, 5372, 5373, 5374, 5375, 5376, 5377, 5378, 5379, 5380, 5381, 5382, 5383, 5384, 5385, 5386, 5387, 5388, 5389, 5390, 5391, 5392, 5393, 5394, 5395, 5396, 5397, 5398, 5399, 5400, 5401, 5402, 5403, 5404, 5405, 5406, 5407, 5408, 5409, 5410, 5411, 5412, 5413, 5414, 5415, 5416, 5417, 5418, 5419, 5420, 5421, 5422, 5423, 5424, 5425, 5426, 5427, 5428, 5429, 5430, 5431, 5432, 5433, 5434, 5435, 5436, 5437, 5438, 5439, 5440, 5441, 5442, 5443, 5444, 5445, 5446, 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