



This airborne geophysical survey and the production of this map were funded by the British Columbia & Yukon Chamber of Mines - Rodda to Riches Program.

ROCKS TO RICHES

Geophysical Series - NTS 93N/8, 93O/5 - SYLVESTER CREEK BRITISH COLUMBIA

NATURAL AIR ABSORBED DOSE RATE

5285

Scale 1:50 000 - Échelle 1/50 000

United Topographic Map Projection
NAD 83 UTM Zone 18N
© Her Majesty the Queen in Right of Canada 2008

Projetion cartographique universelle de Mercator
NAD 83 UTM Zone 18N
© Son Altesse le Prince de Galles en 2008

Digital Topographic Data provided by Geobase Canada, Natural Resources Canada

OPEN FILE
DOSSIER PUBLIC
5285
GEOLOGICAL SURVEY OF CANADA
GÉOLOGIQUE DU QUÉBEC
2008
SHEET 1 OF 10
FÉVRIER 1 DE 10

Open file and products are not for sale. Please contact the GSC Natural Resources Canada for more information.

Les données publiques sont des produits de l'État et ne sont pas à vendre. Veuillez contacter le GSC Ressources naturelles Canada pour plus d'information.

NATURAL AIR ABSORBED DOSE RATE
SYLVESTER CREEK
BRITISH COLUMBIA
93N/8, 93O/5

High Sensitivity Airborne Gamma-Ray Spectrometric and Aeromagnetic Surveys
Central British Columbia, 2004 - 2005

In 2004 and 2005, four Airborne Surveys completed nine multi-sensor, airborne geophysical surveys in the central region of British Columbia. For the Geological Survey of Canada, the British Columbia and Yukon Chamber of Mines, Rodda to Riches Program and the Ministry of Energy, Mineral and Geoscience, the surveys were completed by the following companies: Serrault Resources Inc., Vanasse Haeckel Associates Ltd., Portwest Ventures Corp., GMR Resources Inc. and Artec 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 8, 2005, using Airbus AS332 and AS350B3 helicopters, G-DEGL and G-FSBC.

Gamma-ray Spectrometric Data

The airborne gamma-ray measurements were made with an Epsilon-2000 gamma-ray spectrometer using nine 100 x 100 x 400 mm NaI (Tl) crystals. The main detector array consisted of eight crystals that viewed 80° x 80° fields. One crystal (total volume 42" thick) shielded by the main array was used to detect variations in background radiation caused by atmospheric radon. The system constantly monitored the natural potassium peak for each crystal and, using a Gaussian least square algorithm, adjusted the gain for each crystal.

Potassium (K-40) 1360 - 1560 keV
Uranium (U-238) 1840 - 1960 keV
Thorium (Th-232) 2610 - 2810 keV

Gamma-ray spectra were recorded at one-second intervals at a planned terrain clearance of 120m or 80m depending on the survey area and an air speed of 150km/h. The total potassium, uranium and thorium window counts were divided from the recorded 360° 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 1400 - 1600 keV window and radon activity greater than 3000 cps was recorded in the cosmic window. The window counts were corrected for dead time and for background activity from cosmic radiation. The radon activity was corrected for atmospheric radon decay products. The window data were then corrected for spectral scattering in the ground, air and detector. Corrections for deviations of altitude from the planned terrain clearance and for variation of topography and pressure were made prior to conversion to ground concentrations of potassium, uranium and thorium, using factors determined from flights over a calibration range near Ottawa.

Potassium 0.73 cps/km² (2004) 0.83 cps/km² (2005)
Uranium 0.7 cps/km² (2004) 0.8 cps/km² (2005)
Thorium 0.6 cps/km² (2004) 0.7 cps/km² (2005)

Corrected data were filtered and interpolated to a 100m grid for the 1:50 000 scale maps and to a 250m grid for the 1:250 000 and 1:50 000 scale maps. The results of an airborne gamma-ray spectrometric survey reported in the form of ground concentrations are displayed as varying amounts of outcrop, vegetation cover, soil moisture and surface water. As a result, the measured concentrations are usually lower than the actual surface concentrations. The total air absorbed dose rate in maps was produced from measured counts between 470 and 2810 keV.

Magnetic Data

The helicopter was equipped with a Scintrex CS2 cesium vapour magnetic sensor mounted in a 194° high-resolution, single-sensor, single recording system. The system recorded readings every 0.1 seconds and was able to store 1000 magnetic measurements. Corrections for aircraft magnetic interference were compensated using a 194° high-resolution, single-sensor, single recording system. Diurnal variations and GPS fluctuations were recorded using a 194° high-resolution, single-sensor, single recording system.

After editing the survey data, the intersections of traverse and control lines were determined and the differences in the magnetic values were computed, analysed and manually verified to obtain the leveling network. The International Geomagnetic Reference Field was calculated and removed using a level date of October 3, 2004 and an altitude of the differentially corrected GPS height for each data point. The corrected magnetic data was interpolated to a 100m grid using a minimum variance algorithm. The final vertical intensity map was calculated from the corrected data magnetic intensity grid using a FFT based frequency domain filtering algorithm.

Positional Data

Line spacing and direction for survey and control lines were selected for each block to ensure the best intersection of local geological features. Terrain clearance was monitored by radar altimeter. Positional data were recorded using a dual frequency Novatel Altimeter system. GPS groundstation data were combined with airborne GPS data to produce differentially corrected positional data with an accuracy of 2.5m.

Data Presentation

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

Plasmatic Symbols

Topographic Contour
Drainage
Road
Cultural
Relief
Flight lines, total
10000

NATURAL AIR ABSORBED DOSE RATE

SYLVESTER CREEK
BRITISH COLUMBIA
93N/8, 93O/5