

**GEOPHYSICAL SERIES (AIRBORNE GAMMA-RAY SPECTROMETRIC)  
 SÉRIES GÉOPHYSIQUES (SPECTROMÉTRIE GAMMA-AÉRIENNE)**

**AIRBORNE GAMMA RAY SPECTROMETRIC MAP**

In 1987 a multi-parameter geophysical survey was flown over the Great Northern Peninsula region of Newfoundland. The area surveyed is shown on the index map. The main purpose of the survey was to produce quantitative gamma ray spectrometric information. VLF electromagnetic and total field magnetic data were also recorded and compiled. The survey was flown by Sander Geophysics Ltd. under contract to the Geological Survey of Canada.

For each 1:50 000 NTS sheet, data are presented as a set of seven radioelement contour maps (total count, potassium, equivalent uranium and equivalent thorium concentrations and the eU/eTh, eU/K and eTh/K ratios) and a booklet of stacked profiles at 1:150 000 scale. Profile data include the seven radioelement parameters, radar terrain clearance, magnetic total field and VLF total field and quadrature components for each flight line.

Two 1:250 000 scale VLF profile maps of the entire survey area are also available as G.S.C. Geophysical Series Map 39013G.

All data were sampled at 1 second intervals. The airborne radiometric measurements were made using a 4 channel spectrometer, with twelve 102.102450 mm NaI (Tl) detectors, flown at a mean terrain clearance of 125 m at 185 km/h. East-west flight lines were at 1 km line spacing and the numbered flight lines are plotted on each of the contour maps.

Potassium is measured directly from the 1.46 MeV gamma ray photons emitted by <sup>40</sup>K, whereas uranium and thorium are measured indirectly from gamma ray photons emitted by daughter products in their decay chains. Uranium is monitored by means of gamma ray photons at approximately 1.76 MeV from <sup>214</sup>Pb, and thorium, from 2.62 MeV photons emitted by <sup>208</sup>Tl. The energy windows used are as follows:

Total Count	0.40-2.82 MeV
Potassium <sup>40</sup> K	1.36-1.56 MeV
Uranium <sup>214</sup> Pb	1.66-1.86 MeV
Thorium <sup>208</sup> Tl	2.42-2.82 MeV

Total count, uranium, thorium and potassium counts have been corrected for dead time, ambient temperature changes, background radiation, spectral scattering and deviations of terrain clearance from the planned survey altitude. In areas of extreme topographic variations accurate terrain corrections are difficult. Thus, estimates of radioelement concentrations may be inaccurate in these areas. Shaded areas on the map represent a terrain clearance exceeding 305 m.

The values for the radioelement concentrations shown on the contour maps are "average surface concentrations", that is, an average of the area on the ground viewed by the spectrometer, an area which may contain varying amounts of outcrop, overburden and surface waters. As a result the concentrations as shown on the contour maps are usually considerably lower than the concentrations in the bedrock. However, the radioelement distribution shown by the contour maps reflects the relative distribution of the elements in the bedrock.

Factors for converting airborne measurements to element concentration were determined by relating the corrected airborne count rates over a test strip in the Ottawa area to the known ground radioelement concentrations (R. L. Grasty and B. W. Charbonneau, 1974, Gamma-Ray Spectrometry Calibration Facilities, G.S.C. Paper 74-18, pp. 69-71).

The conversion factors used are those listed below:

1 Ur Total Count	215.2 cps
1% K	95.2 cps
1 ppm eU	10.9 cps
1 ppm eTh	6.7 cps

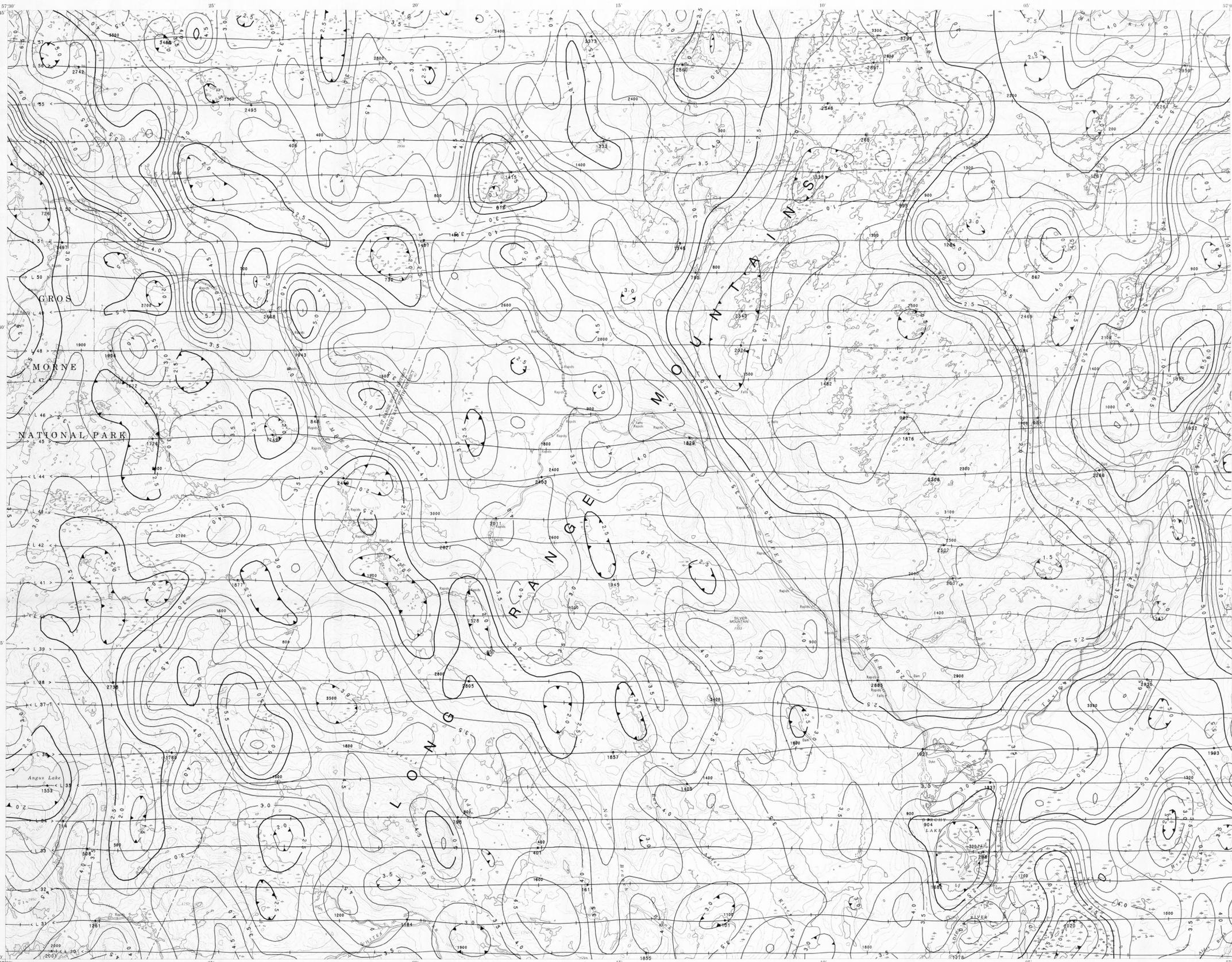
Total count measurements are presented as units of radioelement concentration (Bq), as defined in International Atomic Energy Agency Technical Report Series No. 174, 1976.

Copies of gamma ray spectrometric contour maps, stacked profile booklets and VLF profile maps for this survey may be purchased from: Publications and Information Section, Mineral Development Division, Department of Mines, Government of Newfoundland and Labrador, P.O. Box 4750, Saint John's, Newfoundland, A1C 5T7. Telephone (709)576-3159.

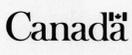
Base map material supplied by Surveys and Mapping Branch

Data processing, plotting and cartography by Sander Geophysics Ltd.

Airborne gamma ray spectrometric, VLF and magnetic survey flown and compiled by Sander Geophysics Ltd.



DEPARTMENT OF MINES  
 GOVERNMENT OF NEWFOUNDLAND AND LABRADOR  
 Energy, Mines and Resources Canada  
 Énergie, Mines et Ressources Canada



Flight line and fiducial  
 Ligne de vol et point de repère ..... 95  
 Contour interval  
 Intervalle de contour..... 0.5

TOTAL COUNT Ur  
 COMPTE TOTAL Ur  
 MAP 35812(11)G CARTE  
**SILVER MOUNTAIN**  
 NEWFOUNDLAND / TERRE-NEUVE  
 Scale 1:50 000 - Échelle 1/50 000  
 Kilometres  
 Universal Transverse Mercator Projection  
 Crown Copyrights reserved  
 Projection transverse universelle de Mercator  
 Droits de la Couronne réservés

12/1/74	12/1/75	12/1/76	12/1/77
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12/1/94	12/1/95	12/1/96	12/1/97
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