



GEOLOGICAL SURVEY OF CANADA  
DEPARTMENT OF ENERGY, MINES AND RESOURCES

### AIRBORNE GAMMA-RAY SPECTROMETRIC MAP

Airborne gamma-ray spectrometry data collected in Manitoba during the summer of 1976, are presented:

(1) as contour maps of the equivalent uranium and the eU/eTh ratio.

The airborne measurements were made using a four window spectrometer, with twelve 22.86 cm x 10.16 cm NaI(Tl) detectors flown at a mean terrain clearance of 400 feet and 190 km/hr. North-south flight lines were at 1 km line spacing.

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 bismuth-214, and thorium, from 2.62 MeV photons emitted by thallium-208. The energy windows used are as follows:

Uranium	Bi-214	1.66-1.86 MeV
Thorium	Tl-208	2.41-2.81 MeV

Uranium and thorium counts were measured over 2.5-second intervals. The data have been corrected for dead time, ambient temperature changes, background radiation, spectral scattering and deviations of terrain clearance from the planned survey altitude. The computer programs used to produce the contour maps are described by R.L. Grasty, 1972 "Airborne Gamma Spectrometry Data Processing Manual", G.S.C. Open File No. 109.

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 contoured maps are usually considerably lower than the concentrations in the bedrock. However, the radioelement distribution pattern shown by the contour maps reflects the 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 test strips in the Ottawa area to the known ground radioelement concentrations (R.L. Grasty, and B.W. Charbonneau, 1974, Gamma-Ray Spectrometer Calibration Facilities, G.S.C. Paper 74-1B, pp. 69-71).

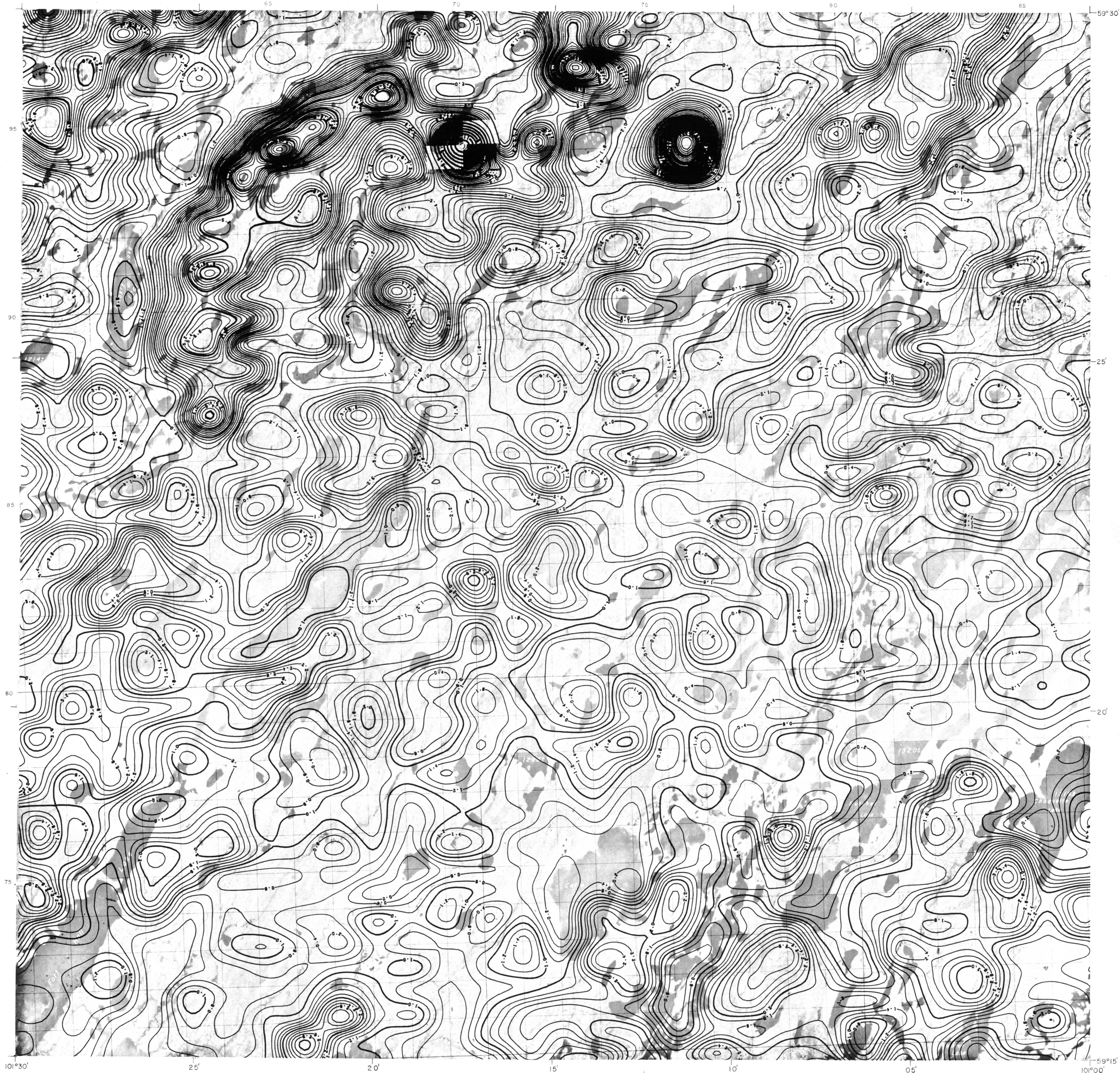
The conversion factors used are approximately those listed below.

1 ppm eU	= 10 c.p.s.
1 ppm eTh	= 7 c.p.s.

Airborne Gamma-Ray Spectrometry Survey 1976  
by  
Resource Geophysics & Geochemistry Division  
Geological Survey of Canada

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EQUIVALENT URANIUM ppm

THANOUT LAKE

MANITOBA

64 N/6

Scale 1:50,000



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