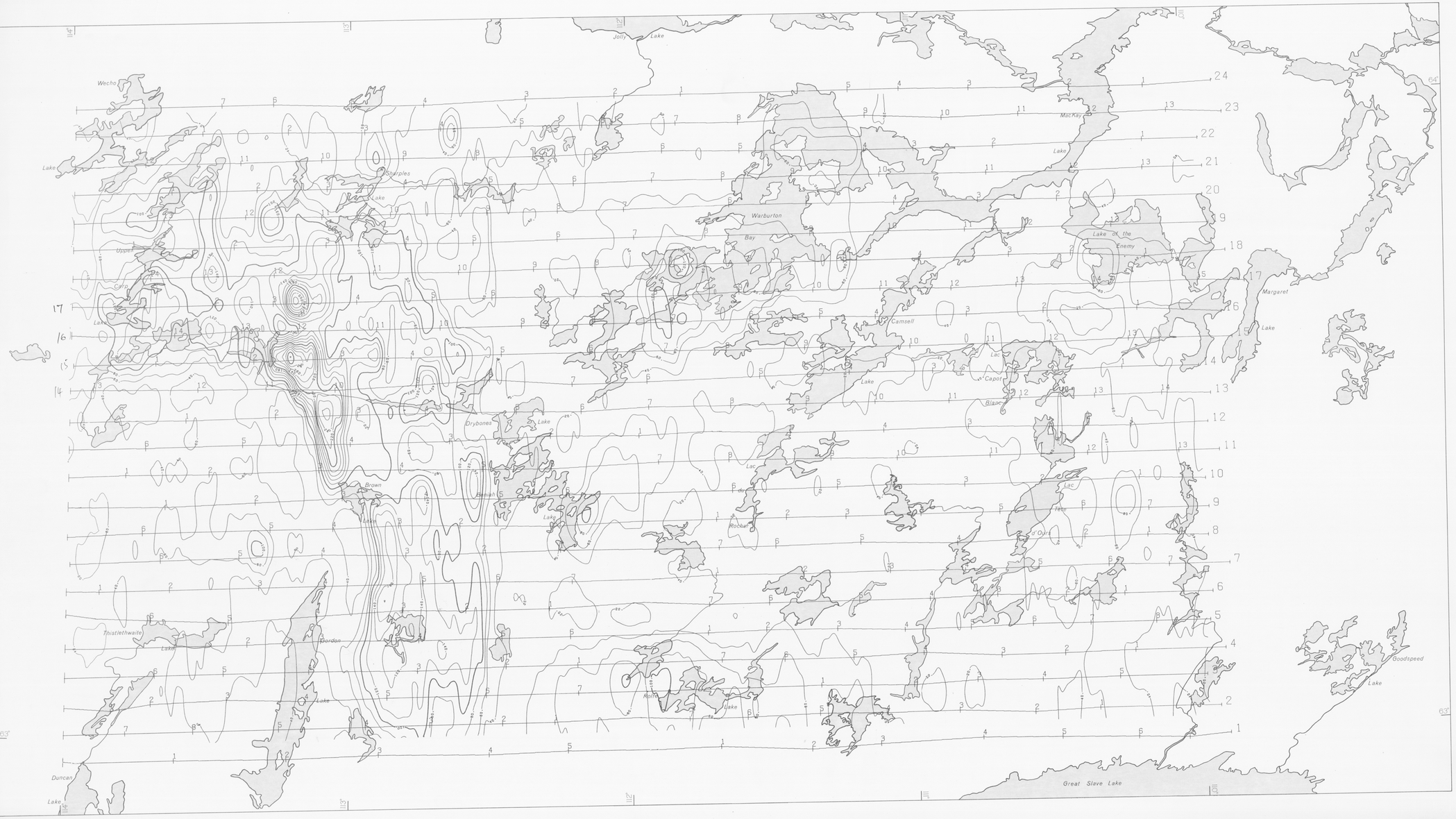

GEOLOGICAL SURVEY OF CANADA
DEPARTMENT OF ENERGY, MINES AND RESOURCES

AIRBORNE RADIOACTIVITY MAP

DISTRICT OF MACKENZIE
NORTHWEST TERRITORIES
85P, 75M

URANIUM

Airborne gamma-ray spectrometry data collected by the Geological Survey of Canada in the District of Mackenzie, N.W.T., in the summer of 1973 are presented as 7 contour maps and profiles along 24 flight lines, plotted at a scale of 1:250,000. A geological map of the area, compiled by J.C. McGlynn accompanies this Open File rglease. The maps and profiles are divided at Longitude 114°W and presented as east and west halves of the survey.

Airborne radioactivity measurements were made using a four-window spectrometer, with twelve, 22.86 cm by 10.16 cm NaI(Tl) detectors, flown at a mean terrain clearance of 120 metres and 190 km/hour. East-west flight lines were at 5 kilometre spacing, and the numbered flight lines are plotted on each map.

Uranium, thorium and potassium counts were measured over 2.5-second intervals; integral counts over 0.5-second intervals. The data have been corrected for background, height variation and Compton scattering. The computer programs used to produce the contour maps and profiles are described by R.L. Grasty, 1972, "Airborne Gamma Spectrometry Data Processing Manual", GSC Open File No. 109.

Values shown on the maps and profiles represent counts per 0.5 seconds for the integral, and counts per 2.5 seconds for uranium, thorium and potassium. An approximate ground concentration may be obtained using the relation:

1 ppm Uranium	28 counts
1 ppm Thorium	15 counts
1% Potassium	190 counts

The ratio maps represent the ratio of the counts of the respective elements multiplied by a factor of 1000. Thus uranium-to-thorium ratio values of 500 and 1000 represent count ratios of 0.5 and 1.0, or element concentration ratios of approximately 0.27 and 0.54, respectively.

With the wide flight line spacing, data along the flight lines were smoothed by averaging over 17 points (2.2 km), and the effect of background count rates over lakes was removed in order to produce coherent contour maps of Integral, Uranium, Thorium and Potassium distribution. Smoothing was performed for the ratio maps, by summing counts along the flight lines to accumulate a minimum of 1000 counts for each element before calculating the value of the ratio. As a result of these smoothing techniques, the contour maps show the regional radioelement distribution pattern, while more detailed information can be seen on the profiles.

Highest levels of radioactivity in the eastern half of the survey area coincide with an area of granitic rocks that trends in a northerly direction between 112°30'W and 113°15'W. All three radioelements are concentrated within this granitic area. Uranium count rate reaches a maximum on flight line 15 between fiducials 2 and 3, equivalent to 18 ppm. Uranium-to-thorium ratios show an increase towards the western margin of the granitic body on the profiles for flight lines 12 to 15, with the uranium-to-thorium element concentration ratios in the order of 0.6 in the vicinity of 63°35'N and 113°10'W.

The uranium-to-thorium contour map shows another prominent anomaly near 63°40'N and 110°20'W. This ratio anomaly, located near fiducial 14 on flight line 17, results from a uranium concentration of about 5 ppm and a very low thorium concentration. Since the flight line at this point is approximately over the south shoreline of Lake of the Enemy, the radioactivity values shown here may be decreased due to water in the area being sampled, and some further investigation of this area may be warranted.

The results of this survey show that regional uranium levels in the central part of map sheet 85 P in the Slave Province are higher than those in the part of the Bear Province covered by this survey.

Airborne Radioactivity Survey 1973

K.A. Richardson
P.B. Holman
B. Elliott

Resource Geophysics & Geochemistry Division
Geological Survey of Canada

Scale 1:250,000

Miles 6 0 6 12 Miles
Kilometres 6 0 6 12 16 Kilometres

OPEN FILE
188
MAR. 1974
GEOLOGICAL SURVEY
OTTAWA

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