



GEOLOGICAL SURVEY OF CANADA  
DEPARTMENT OF ENERGY, MINES AND RESOURCES

# TOTAL COUNT MOUNT AVERIL

BRITISH COLUMBIA

93J-8

## AIRBORNE GAMMA-RAY SPECTROMETRIC MAP

Experimental airborne gamma-ray spectrometry data collected in the Prince George area of central British Columbia during the summer of 1977, are presented:

- (1) as contour maps of the total count, the potassium, equivalent uranium and equivalent thorium concentrations, and the  $\text{eU}/\text{eTh}$ ,  $\text{eU}/\text{K}$  and  $\text{eTh}/\text{K}$  ratios; and
- (2) as stacked profiles of the seven radiometric parameters plotted for each of the flight lines.

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 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 potassium-40, 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 bismuth-214, and thorium, from 2.62 MeV photons emitted by thallium-208. The energy windows used are as follows:

Total Count	0.41-2.81 MeV
Potassium	$^{40}\text{K}$ 1.37-1.57 MeV
Uranium	$^{214}\text{Bi}$ 1.66-1.86 MeV
Thorium	$^{208}\text{Tl}$ 2.41-2.81 MeV

Uranium, thorium and potassium counts were measured over 2.5-second intervals, total counts over 0.5-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. A number of the stacked profiles have zones where no data are plotted. These represent areas where the terrain clearance exceeded 800 feet and as such the data are considered invalid. These areas are represented on the contour maps by shading. The computer programs used to produce the contour maps and profiles are described by McL. Grasty, 1972, "Airborne Gamma Spectrometry Data Processing Manual", W.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 contour maps are usually considerably lower than the concentrations in the bedrock. However, the radioelement distribution 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.N. Charbonneau, 1974, Gamma-Ray Spectrometry Calibration Facilities, W.S.C. Paper 74-19, pp. 69-71).

The conversion factors used are approximately those listed below:

Total Count	1 ur = 170 cps
15 K	= 207 cps
1 ppm eU	= 22 cps
1 ppm eTh	= 16 cps

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

Airborne Gamma-Ray Spectrometry Survey 1977

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Resource Geophysics & Geochemistry Division  
Geological Survey of Canada

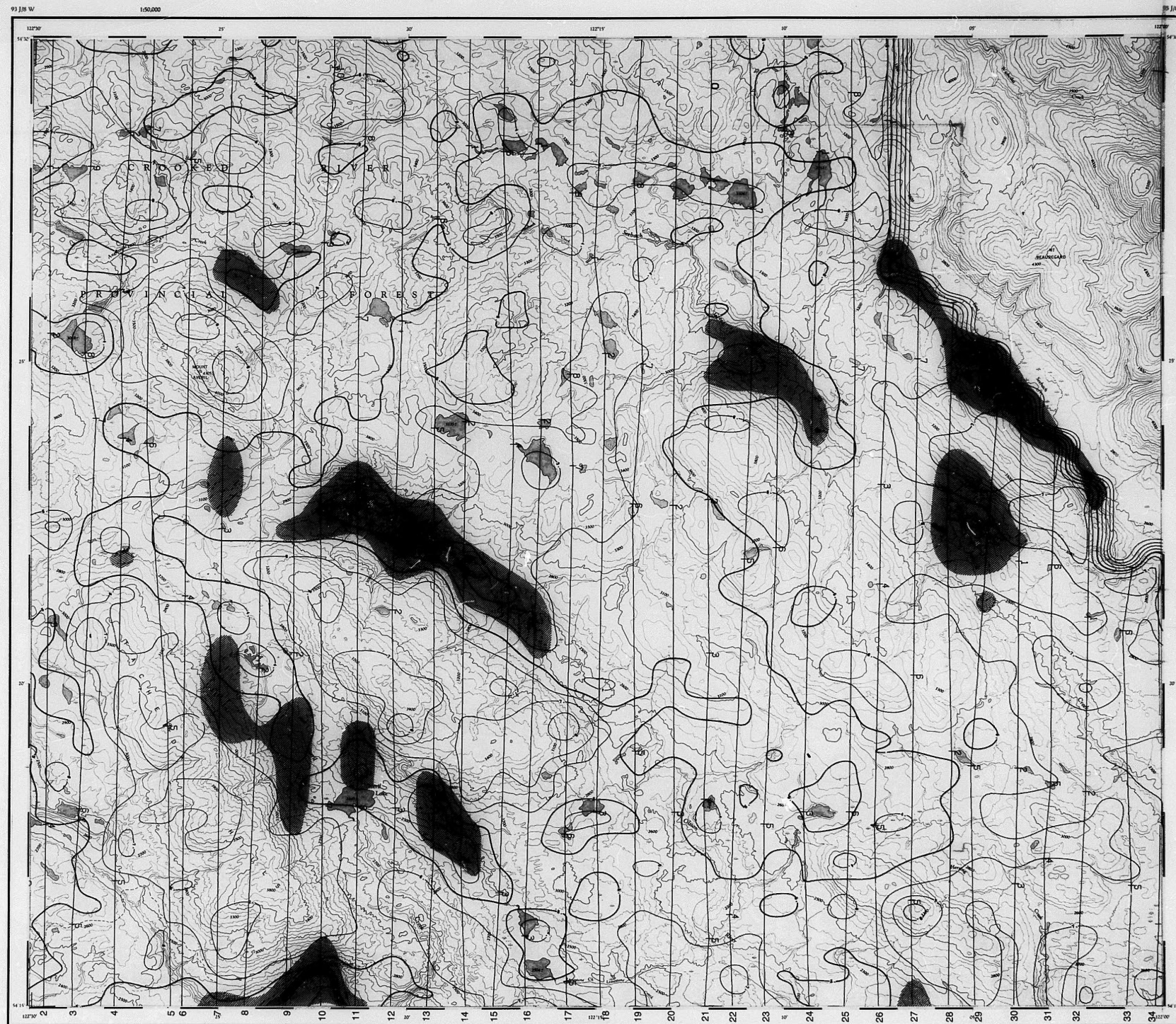
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DEPARTMENT OF ENERGY, MINES AND RESOURCES

POTASSIUM %  
**MOUNT AVERIL**  
BRITISH COLUMBIA  
93J-8

**AIRBORNE GAMMA-RAY SPECTROMETRIC MAP**

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- (2) as stacked profiles of the seven radiometric parameters plotted for each of the flight lines.

The airborne measurements were made using a four window spectrometer, with twelve  $22.86 \text{ cm} \times 17.16 \text{ cm}$  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 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 potassium-40, 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 bismuth-214, and thorium, from 2.62 MeV photons emitted by thallium-208. The energy windows used are as follows:

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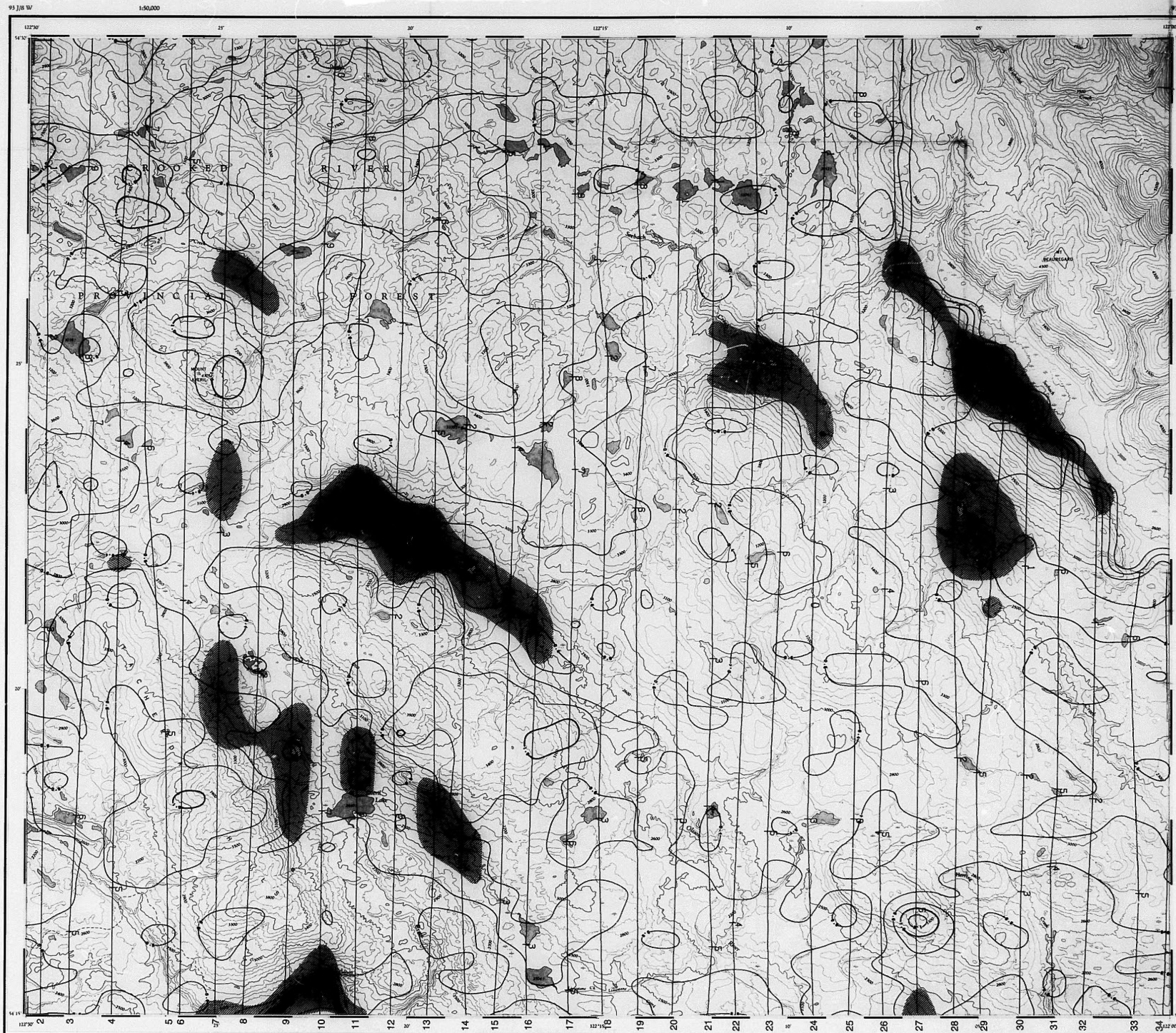
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DEPARTMENT OF ENERGY, MINES AND TECHNOLOGY

EQUIVALENT URANIUM ppm

## MOUNT AVERIL

BRITISH COLUMBIA

93J-8

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Experimental airborne gamma-ray spectrometry data collected in the Prince George area of central British Columbia during the summer of 1977, are presented:

- (1) as contour maps of the total count, the potassium, equivalent uranium and equivalent thorium concentrations, and the  $eU/K$  and  $eTh/K$  ratios; and
- (2) as stacked profiles of the seven radiometric parameters plotted for each of the flight lines.

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 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 potassium-40, 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 bismuth-214, and thorium, from 2.62 MeV photons emitted by thallium-208. The energy windows used are as follows:

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Airborne Gamma-Ray Spectrometry Survey 1977

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Geological Survey of Canada

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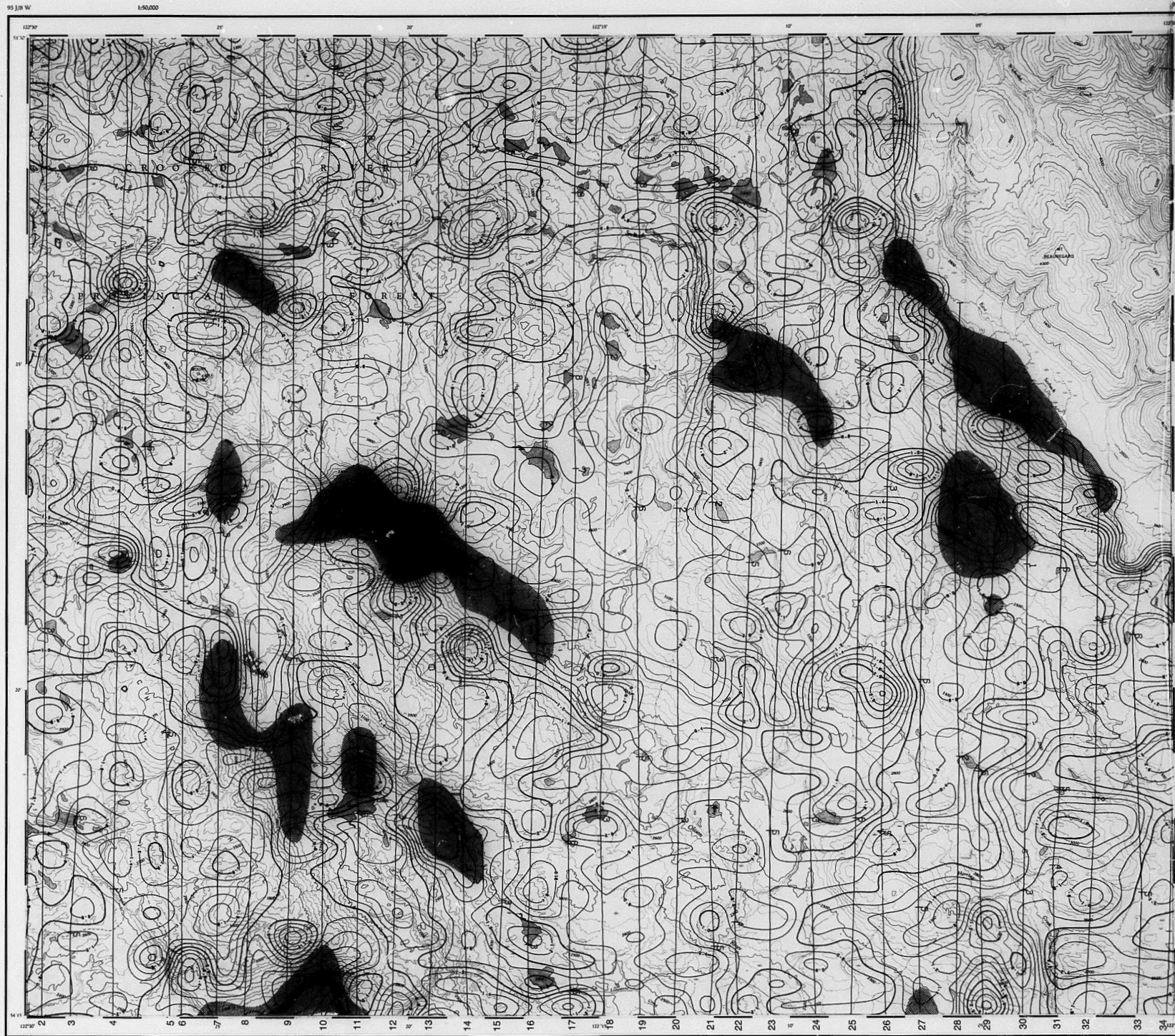
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# EQUIVALENT THORIUM ppm

## MOUNT AVERIL

BRITISH COLUMBIA

93J-8

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Airborne Gamma-Ray Spectrometry Survey 1977

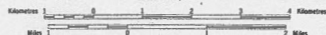
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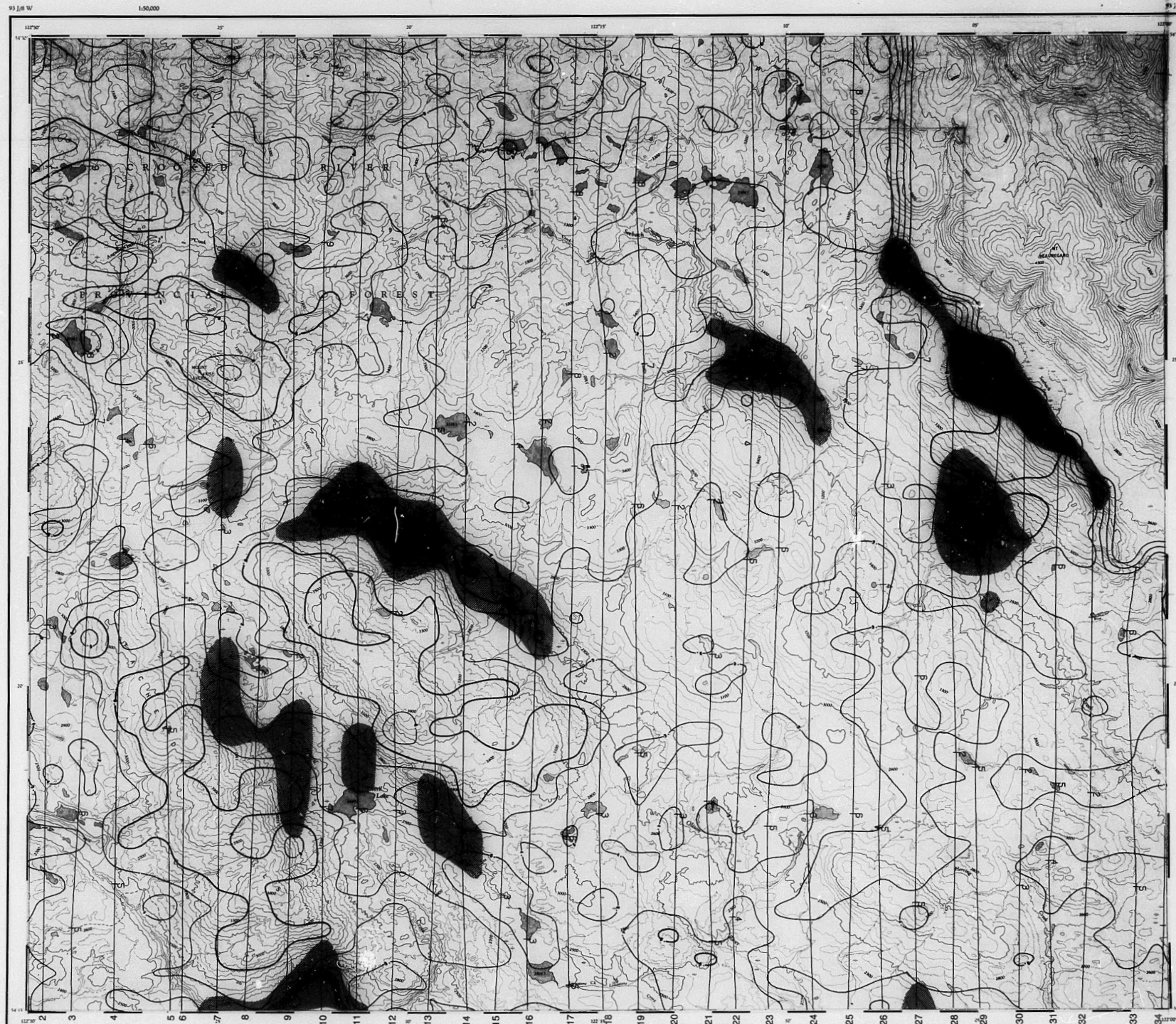
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# EQUIVALENT URANIUM/EQUIVALENT THORIUM

## MOUNT AVERIL BRITISH COLUMBIA

93J-8

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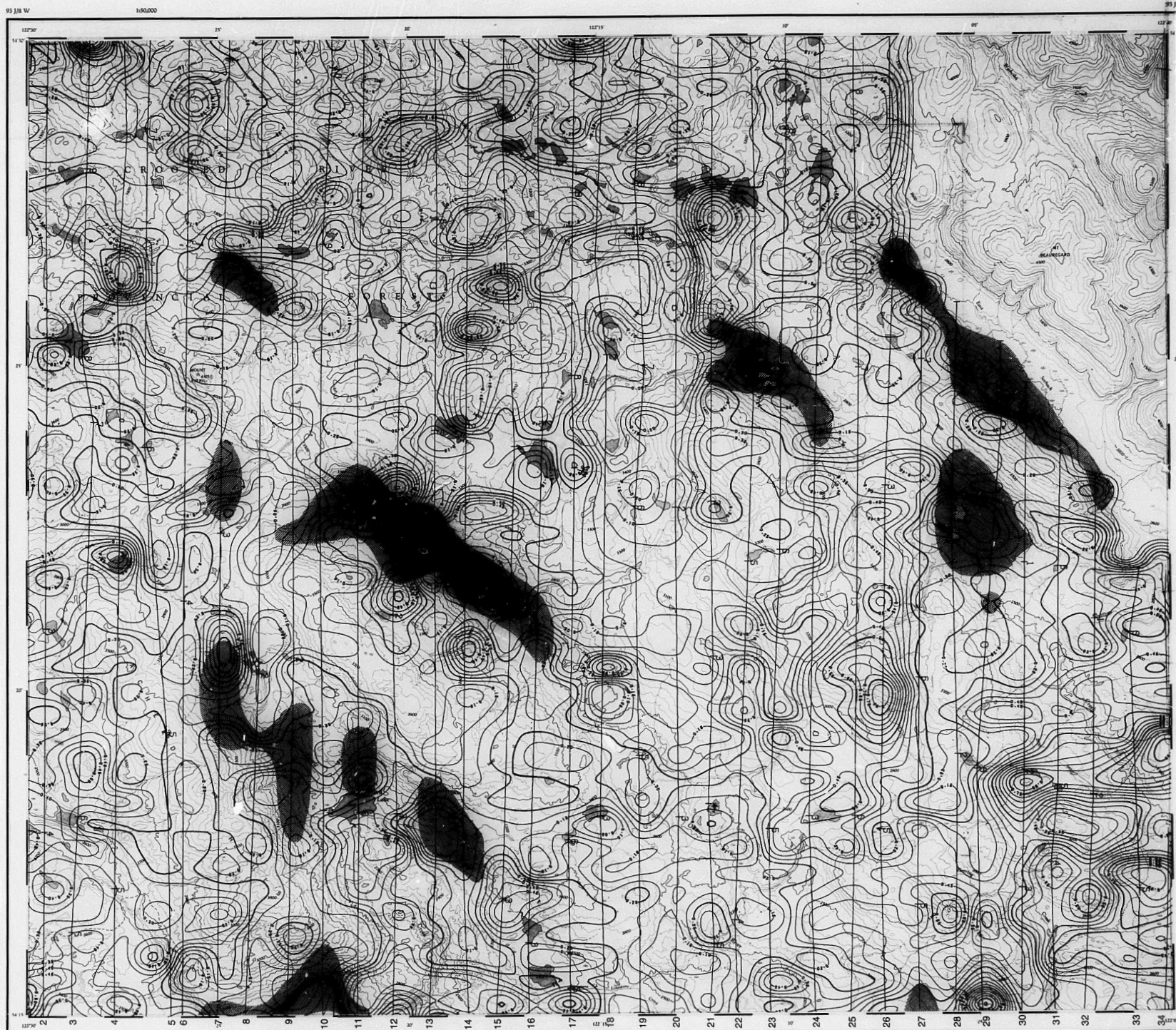
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(EQUIVALENT URANIUM / POTASSIUM)  $10^4$

## MOUNT AVERIL

BRITISH COLUMBIA

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