

These new radioactivity maps were produced from the digital archives of the National Gamma Ray Spectrometry Program (NATGAM), from data collected between 1989 and 2000. The surveys were flown by the Geological Survey of Canada (GSC) and contracted aircraft, using Federal and joint Federal-Provincial government funding. All data were originally published in black line contour and stacked profile formats, as 1:250 000 GSC Open Files or Geophysical Series Maps.

The data were collected using 50 litres of sodium iodide detectors, at a nominal terrain clearance of 120 m. For that portion of the map area north of Great Slave Lake and south of 63°N, the data were collected along east-west flight lines spaced at 2500 metre intervals. For the rest of the map area, flight lines were spaced at the normal 5000-metre interval. The effect of reduced line spacing is the appearance of higher frequency variations of all radioactive components within the region of 2500 metre line spacing when compared to the parts of the map area surveyed at 5000 metre spacing.

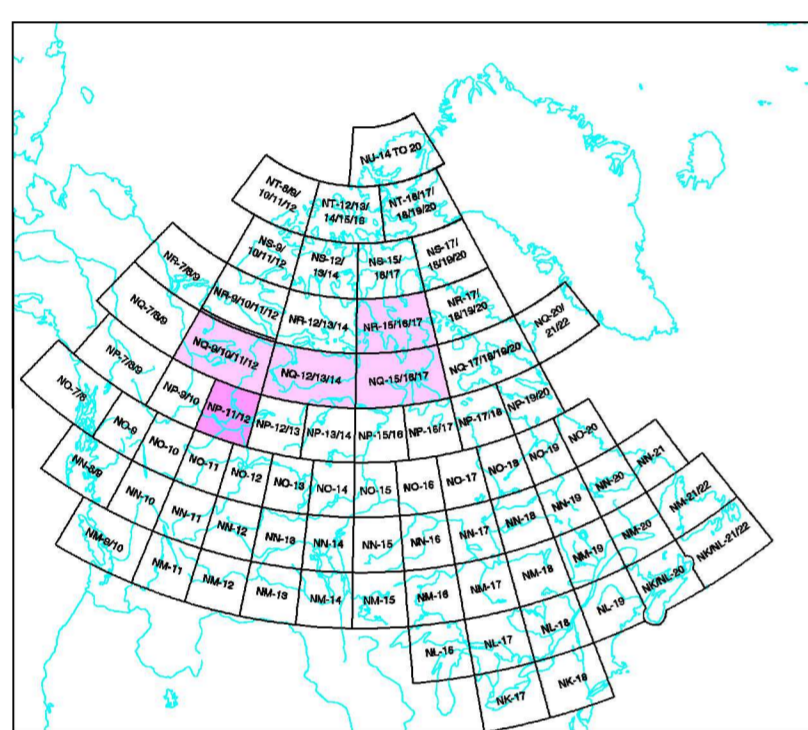
Potassium is measured directly from the 1460 keV gamma ray photons emitted by <sup>40</sup>K. Uranium and thorium, however, are determined indirectly from gamma ray photons emitted by daughter products <sup>214</sup>Pb and <sup>214</sup>Bi, respectively, assuming equilibrium between daughter and parent isotopes. For this reason, gamma ray spectrometric measurements of uranium and thorium are referred to as equivalent uranium (eU) and equivalent thorium (eTh).

Standard energy windows were used to record the gamma ray counts. These are 1070-1570 keV for potassium, 1660-1860 keV for uranium, 2410-2810 keV for thorium and 400-2810 keV for total radioactivity. Several corrections are applied to the raw window counts prior to conversion to standard concentration units, including: system dead time; background activity from cosmic radiation, the aircraft and atmospheric radon decay products; spectral scattering in the ground, air detectors; deviations of altitude from the planned terrain clearance; and temperature and pressure variations.

This Open File consists of eight 1:1 000 000 colour maps of these measured variables (potassium, equivalent uranium and equivalent thorium) and five derived products (the natural air absorbed dose rate derived from a linear combination of K, eU and eTh, and eU/eTh, eU/K, eTh/K and ternary radioelement map).

These maps depict radioactivity emanating from the upper 30 cm of the earth's surface. The data represent average surface concentrations, influenced by varying amounts of outcrop, overburden, vegetation cover, soil moisture and surface water. As a result, measured concentrations are usually lower than underlying bedrock concentrations. The variations shown on these colour interval maps support regional interpretations. More detailed application is possible through the use of the original line data, available from the Geological Survey of Canada.

The Radiation Geophysics Section acknowledges Drs. A. G. Darnley, G. Bristow, K.A. Richardson and R.L. Grasty for their contributions to program development and technical leadership.



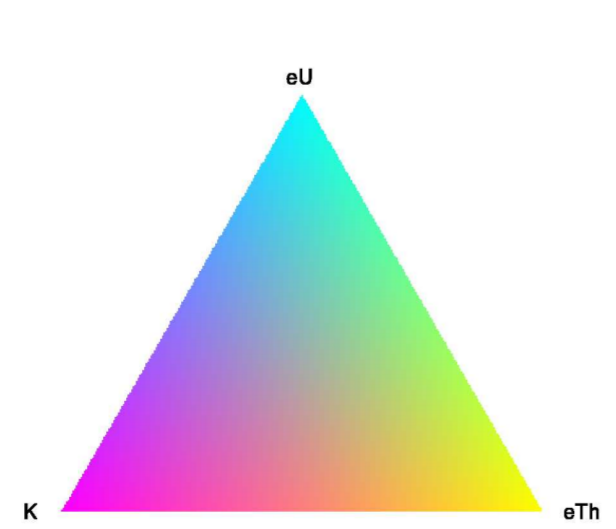
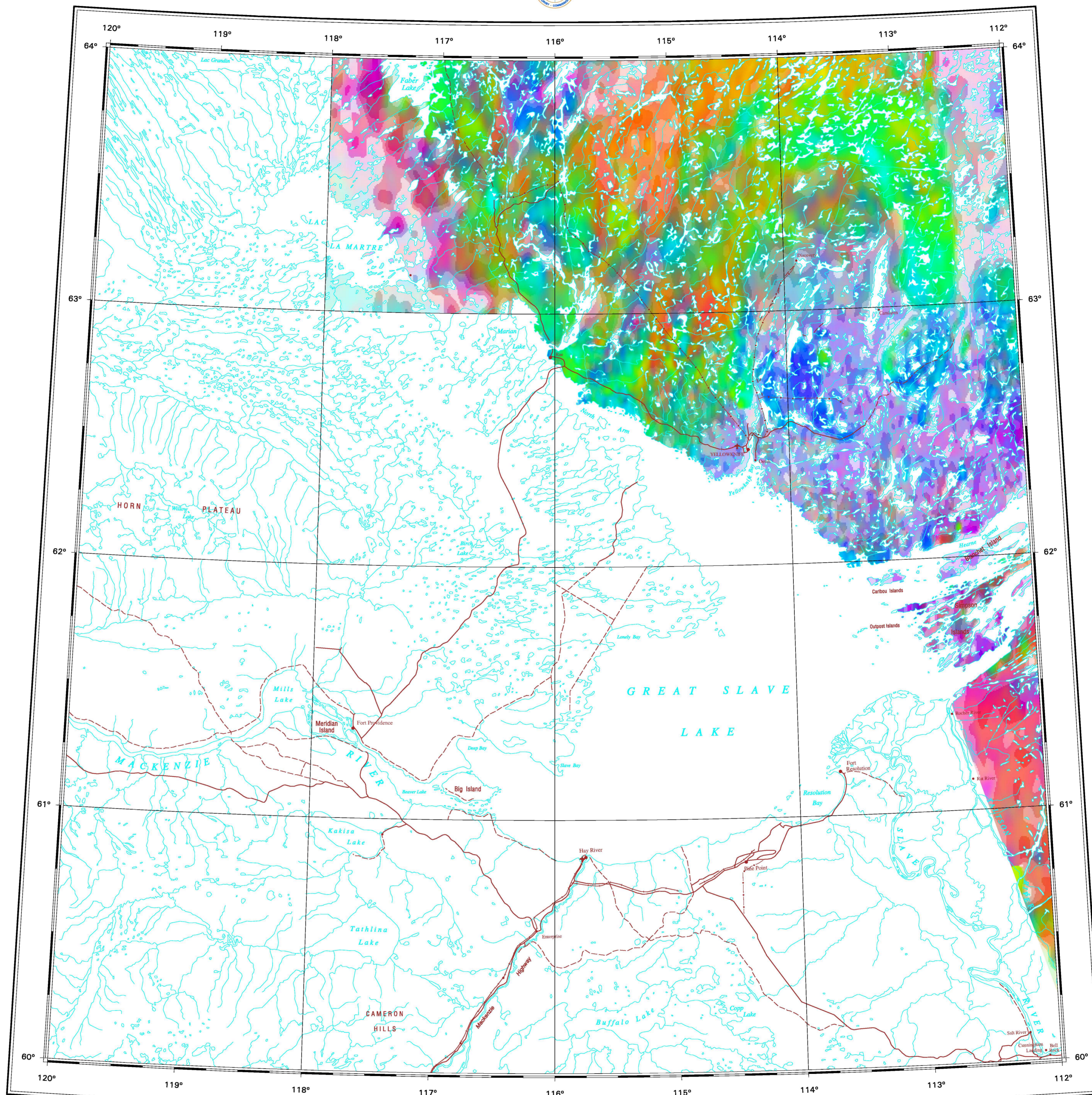
Geophysical compilation by J.M. Carson, P.B. Holman, K.L. Ford, J.A. Grant, and R.B.K. Shives

Digital cartography by J.A.Y. Pratt, Earth Sciences Sector Information Division (ESS Info)

This map was produced from processes in conformance with the Cartographic Services Section Quality Management System, Ottawa, registered to the Quality System ISO 9001:1994 standards

Any revisions known to the user would be welcomed by the Geological Survey of Canada

Digital base map at the scale of 1:1 000 000 from the Digital Chart of the World (DCW) from Environment Systems Research Institute (ESRI), with modifications by ESS Info



**Ternary Radioelement Map**  
OPEN FILE 4162

AIRBORNE GAMMA RAY SPECTROMETRY COMPILATION SERIES

**SLAVE RIVER**  
NORTHWEST TERRITORIES

Scale 1:1 000 000/Échelle 1/1 000 000

kilometres 25 0 25 50 75 kilometres

Lambert Conformal Conic Projection  
Standard Parallels 60°40' N and 63°20' N  
North American Datum 1927  
© Her Majesty the Queen in Right of Canada, 2001

Projection conique conforme de Lambert  
Parallèles d'échelle conservés : 60° 40' N et 63° 20' N  
Système de référence géodésique nord-américain, 1927  
© Sa Majesté la Reine du chef du Canada, 2001

**OPEN FILE DOSSIER PUBLIC 4162**  
GEOLOGICAL SURVEY OF CANADA / COMMISSION GÉOLOGIQUE DU CANADA  
2001

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Les dossiers publics sont des produits qui n'ont pas été soumis au processus officiel de publication de la CGC.

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