

PETER LAKE AND WOLLASTON LAKE AREAS, SASKATCHEWAN
In 2004, Flight Airborne Surveys completed a multi-sensor airborne geophysical survey of the Peter Lake and Wollaston Lake areas, Saskatchewan, for the Geological Survey of Canada and Saskatchewan Industry and Resources. The purpose of the survey was to obtain quantitative gamma-ray spectrometric and aeromagnetic data. The survey was flown over two seasons, from August 31 to September 29, 2003 and July 15 to September 31, 2004 using Cessna Grand Caravan 258-B aircraft (C-NCNA).

Gamma-ray Spectrometric Data
The airborne gamma-ray measurements were made with an ESRAMCO CR820 gamma-ray spectrometer using three 152.4 x 102 x 488 mm NaI(Tl) crystals. The main detector array consisted of twelve crystals (total volume 50.4 litres). Three crystals (total volume 12.6 litres), shielded by the main array, were used to detect variations in background radiation caused by atmospheric radon. The system constantly monitored the natural thorium peak for each crystal, and using a Gaussian least squares algorithm, adjusted the gain for each crystal. Potassium is measured directly from the 1460 keV gamma-ray photons emitted by ⁴⁰K, whereas uranium and thorium are measured indirectly from gamma-ray photons emitted by daughter products (214Pb for uranium and 208Tl for thorium). Although these daughters are far down their respective decay chains, they are assumed to be in equilibrium with their parents; thus gamma-ray spectrometric measurements of uranium and thorium are referred to as equivalent uranium and equivalent thorium, i.e. eU and eTh. The energy windows used to measure potassium, uranium and thorium are:
Potassium (40K) 1370 - 1570 keV
Uranium (238U) 1660 - 1960 keV
Thorium (232Th) 2410 - 2810 keV

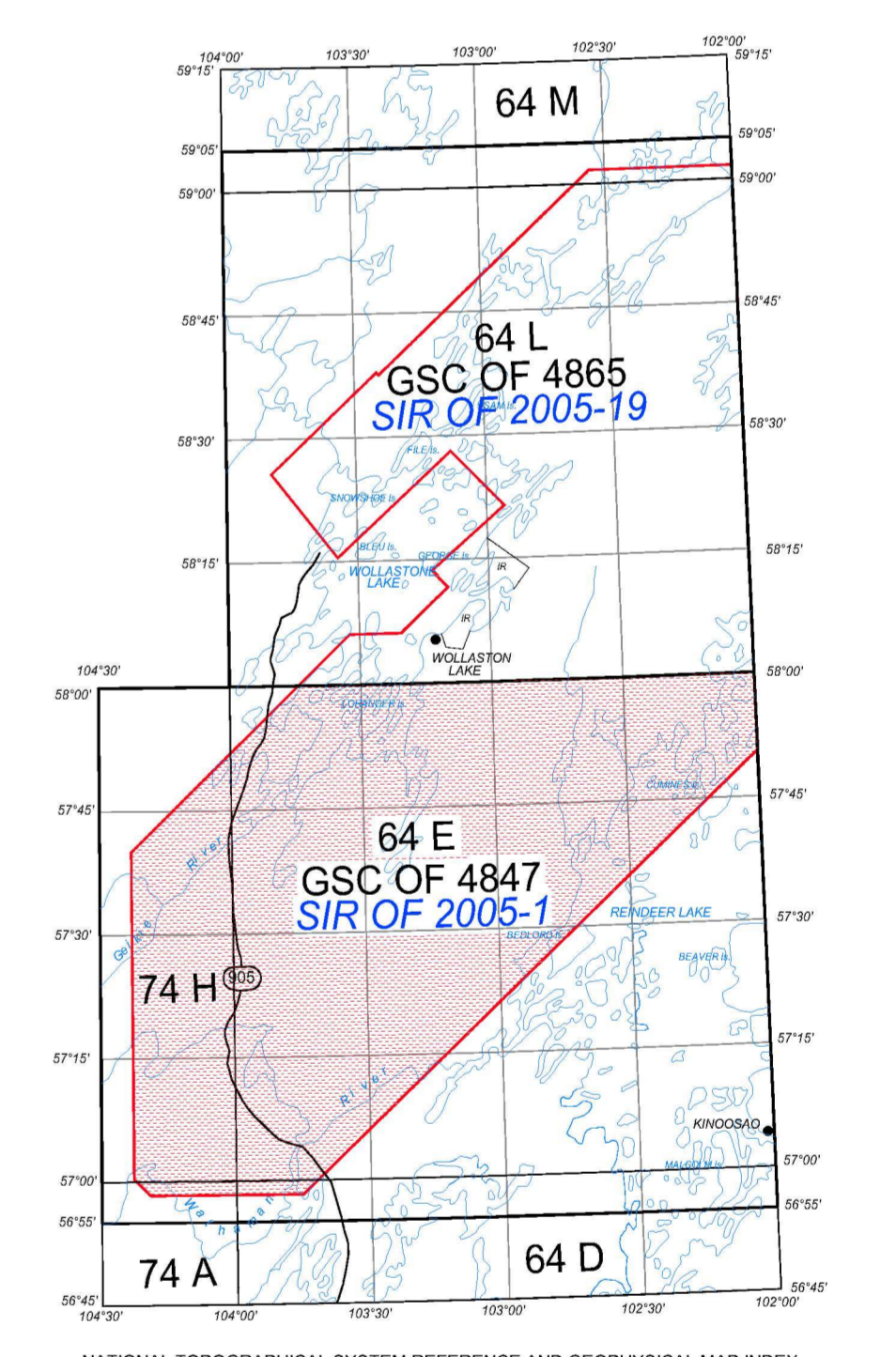
Magnetic Data
The Grand Caravan aircraft was equipped with a Scripps CS-2 cesium vapour magnetic sensor mounted in a stinger to the rear of the aircraft. The system recorded readings every 0.1 seconds with a noise level of less than 0.1 nT. Magnetic intensities caused by aircraft structures were corrected using an RMS AADCR magnetic compensation. Current variations were recorded using a Fugro CF-1 cesium vapour magnetometer.
After editing the survey data, low-pass filtered digital readings were subtracted from each unfiltered aeromagnetic reading. The intersections of traverse and control lines were determined and the differences in the magnetic values were compared and manually verified to obtain the leveling network. The International Geomagnetic Reference Field was calculated and removed using a field file (IGRF05) at an altitude of 545 m for each data point. The corrected magnetic data was interpolated to a 100 m grid using a minimum curvature algorithm. The first vertical derivative grid was calculated from the corrected total magnetic intensity grid using a FFT based frequency domain filtering algorithm.

Positional Data
The 400 m spaced survey lines were oriented southeast - northwest and 4000 m spaced control lines were oriented southwest - northeast. Survey and control line positions and elevations were pre-planned using G.S.I. Smooth Drape software. Positional data were recorded using a Novatel ProXp 1800/101. GPS ground station data were combined with airborne GPS data to produce differentially corrected positional data with an accuracy of 2.5 m.

Data Presentation
Colour levels and contours were calculated for each grid and combined with map summit information to create postscript plot files, which were plotted using Fugro's HP DesignJet colour plotters.

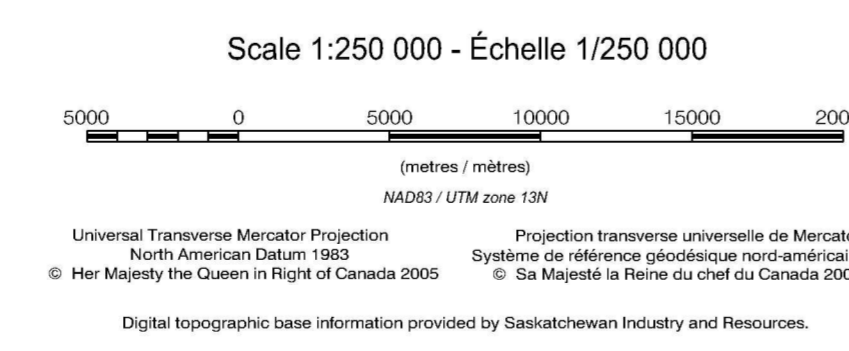
PLANIMETRIC SYMBOLS

Topographic Contour
Railway
Power lines
Drainage
Route



This airborne geophysical survey and the production of this map were funded by the Government of Saskatchewan's Mineral Exploration Incentive Program.

**GEOPHYSICAL SERIES - 64E - COMPULSION BAY
SASKATCHEWAN
MAGNETIC FIRST VERTICAL DERIVATIVE MAP**



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**MAGNETIC FIRST VERTICAL DERIVATIVE MAP
COMPULSION BAY
SASKATCHEWAN
NTS 64E**

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