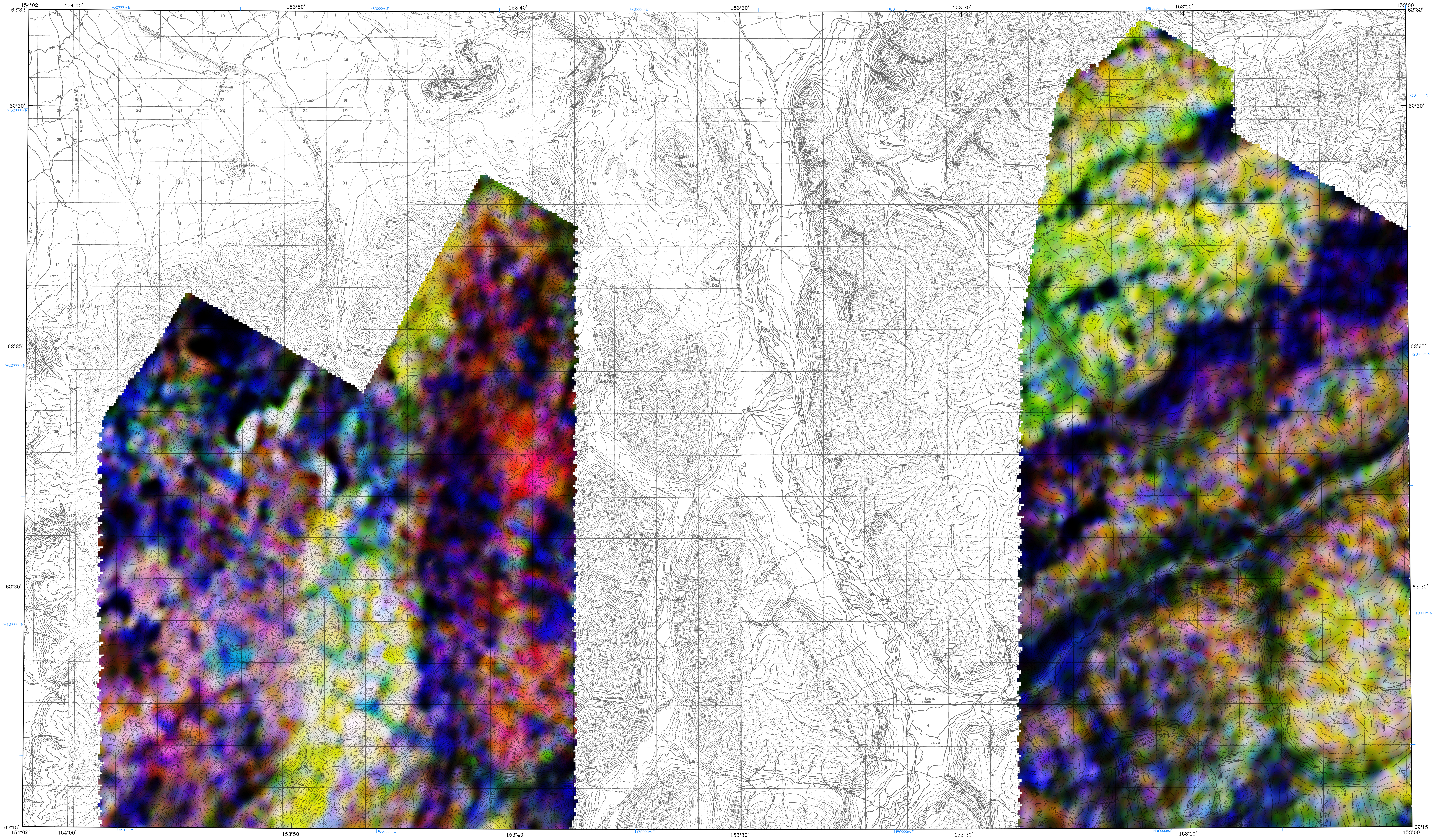
ALASKA DIVISION OF GEOLOGICAL & GEOPHYSICAL SURVEYS

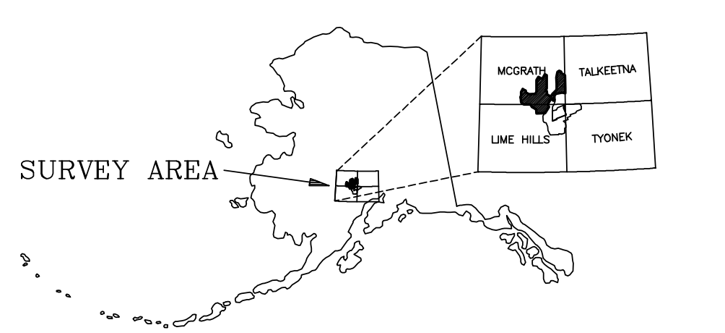
GEOPHYSICAL REPORT 2014-2-28A

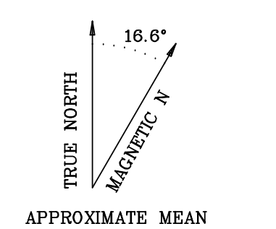


Base from U.S. Geological Survey McGrath B–1, 1958; B–2, 1958; B–3, 1958; McGrath C–1, 1958; C–2, 1958; C–3, 1983; Quadrangles, Alaska

SCALE 1:63,360

CONTOUR INTERVAL 100 FEET
DATUM MEAN SEA LEVEL





APPROXIMATE MEAN
DECLINATION, 2010

DESCRIPTIVE NOTES

The geophysical data were acquired with a DIGHEM^{V} Electromagnetic (EM) system, a Fugro D1344 magnetometer with a Scintrex CS3 cesium sensor, and a Radiation Solutions RS–500 gamma–ray spectrometer. Some flights acquired the radiometric data with an Exploranium GR–820 spectrometer. The EM and magnetic sensors were flown at a height of 100 feet. The gamma–ray spectrometers were flown at a height of 200 feet. In addition the survey recorded data from radar and laser altimeters, GPS navigation system, 50/60 Hz monitors and video camera. Flights were performed with an AS–350–B3 Squirrel helicopter at a mean terrain clearance of 200 feet along NW–SE (120°) survey flight lines with a spacing of a quarter of a mile. Tie lines were flown perpendicular to the flight lines at intervals of approximately 3 miles.

A Novatel OEM5–G2L Global Positioning System was used for navigation. The helicopter position was derived every 0.5 seconds using post–flight differential positioning to a relative accuracy of better than 5 m. Flight path positions were projected onto the Clarke 1866 (UTM zone 5) spheroid, 1927 North American datum using a central meridian (CM) of 153°, a north constant of 0 and an east constant of 500,000. Positional accuracy of the presented data is better than 10 m with respect to the UTM grid.

RADIOMETRICS

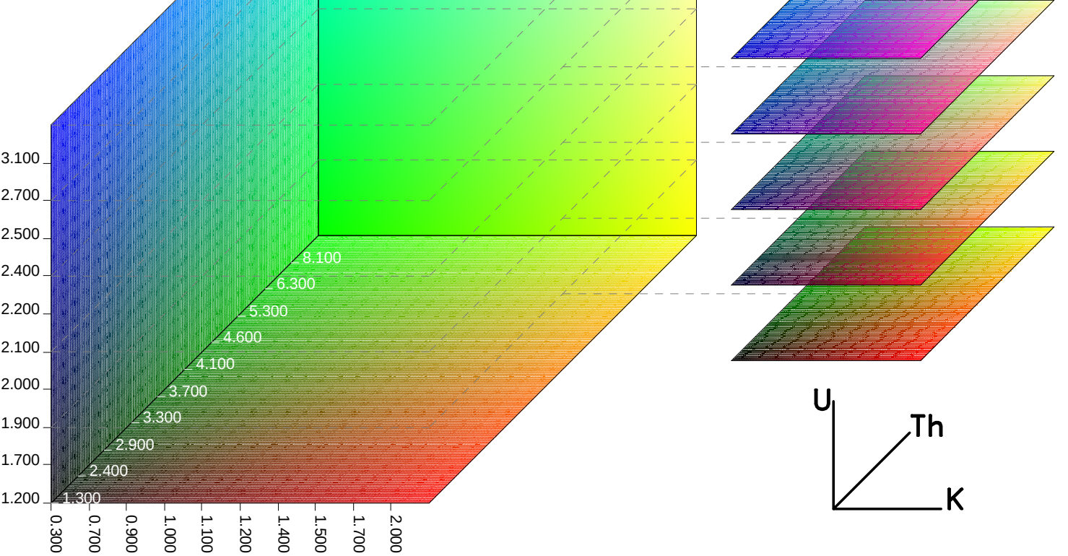
The gamma–ray spectrometry data were recorded at a 1.0 second sample rate. A Radiation Solutions RS–500 gamma–ray spectrometer was the primary instrument used, however an Exploranium GR–820 spectrometer was used for some flights. Both were configured with 16.8L (1024 cubic inches) of main (downward) NaI crystal detector, and 4.2L (256 cubic inches) of upward looking (radon) detector. After application of Noise Adjusted Singular Value Decomposition to the spectra, counts from the main detector were recorded in five windows corresponding to thorium (2410–2810 keV), uranium (1660–1860 keV), potassium (1370–1570 keV), total radioactivity (400–2815 keV) and cosmic radiation (3000–>6000 keV). Counts from the radon detector were recorded in the radon window (1660–1860 keV). The radon detection system was calibrated following methods outlined in IAEA Report 323. After removal of the background, the data were corrected for spectral interferences, changes in temperature, pressure, and departures from the planned survey elevation of 200 feet. The data were then converted to standard concentration units which were interpolated to a 100 m grid using a minimum curvature technique. All grids were then resampled from the 100 m cell size down to a 25 m cell size to produce the maps and final grids contained in this publication.

International Atomic Energy Agency, 1991, Airborne Gamma Ray Spectrometer Surveying. Technical Report 323, International Atomic Energy Agency, Vienna.

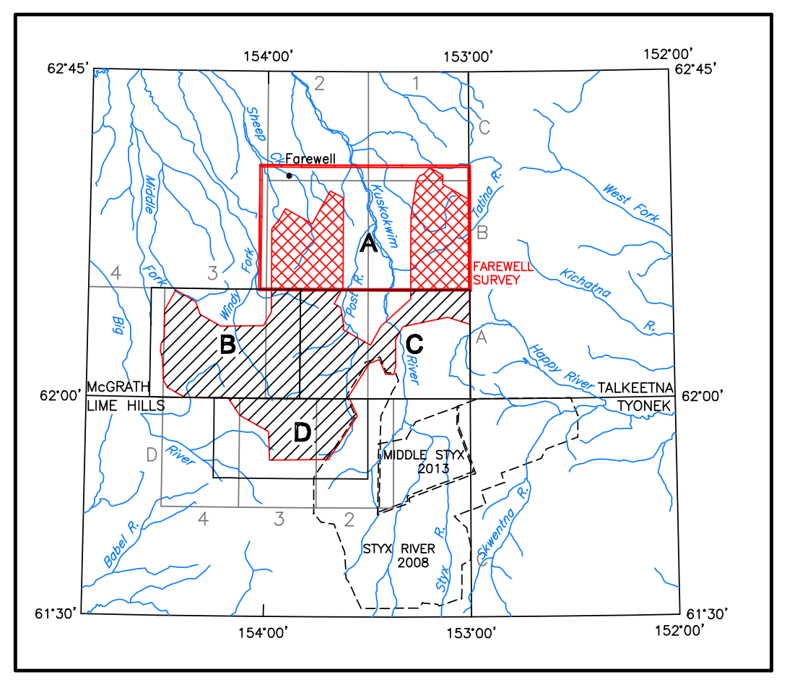
RADIOELEMENT - TERNARY WITH TOPOGRAPHY, FAREWELL SURVEY AREA, SOUTH-CENTRAL ALASKA

PARTS OF MCGRATH AND LIME HILLS QUADRANGLES

by
Laurel E. Burns, CGG, and Fugro GeoServices, Inc.
2014



LOCATION INDEX OF 1:63,360–SCALE MAPS



SURVEY HISTORY

This map has been compiled and drawn under contract between the State of Alaska, Department of Natural Resources, Division of Geological & Geophysical Surveys (DGGS), and Fugro GeoServices, Inc. Airborne geophysical data for the area were acquired and processed by CGG in 2012, 2013, and 2014. Previously flown DGGS surveys adjacent to the current survey are shown in the location map by dashed lines, survey name, and date of publication. The project was funded by the Alaska State Legislature as part of the Alaska Strategic and Critical Minerals Assessment project, which is part of the Alaska Airborne Geophysical and Geological Mineral Inventory Program. Cook Inlet Region, Inc. (CIRI) contributed funding for a portion of the area.

All data and maps produced to date from this survey are available in digital format on DVD for a nominal fee through DGGS, 3354 College Road, Fairbanks, Alaska, 99709–3707, and are downloadable for free from the DGGS website (www.dggs.alaska.gov/pubs). Maps are also available on paper through the DGGS office, and are viewable online at the website in Adobe Acrobat .PDF file format.