ALASKA DIVISION OF GEOLOGICAL & GEOPHYSICAL SURVEYS
IN COOPERATION WITH THE U.S. BUREAU OF LAND MANAGEMENT

GEOPHYSICAL REPORT 2000-30B
PARTS OF IDITAROD B-4 AND B-5 QUADRANGLES

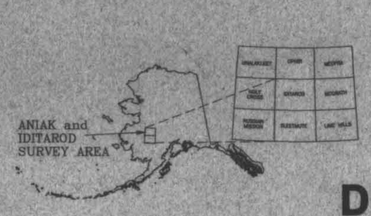
Base from U.S. Geological Survey Iditarod B-4, 1954; B-5, 1954/1953, Quadrangles, Alaska

SCALE 1:31,680

0.5 0 0.5 1 1.5 2 MILES

0.5 0 0.5 1 1.5 2 2.5 KILOMETERS

CONTOUR INTERVAL 100 FEET
DATUM MEAN SEA LEVEL




# TOTAL MAGNETIC FIELD AND DETAILED ELECTROMAGNETIC ANOMALIES OF PARTS OF THE ANIAK AND IDITAROD MINING DISTRICTS, SOUTHWESTERN ALASKA

## PARTS OF IDITAROD B-4 AND B-5 QUADRANGLES

## 2000

### DESCRIPTIVE NOTES

The geophysical data were acquired with a DIGHEM$^{V}$ Electromagnetic (EM) system and a Scintrex cesium magnetometer. Both were flown at a height of 100 feet. In addition the survey recorded data from a radar altimeter, GPS navigation system, 50/60 Hz monitors and video camera. Flights were performed with an AS350B-2 Squirrel helicopter at a mean terrain clearance of 200 feet along NW-SE (340°) 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. The blank regions indicate an area where the survey aircraft had to detour around populated areas.

An Ashtech GG24 NAVSTAR / GLONASS 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 4) spheroid, 1927 North American datum using a central meridian (CM) of 159°, 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.

### ELECTROMAGNETICS

To determine the location of EM anomalies or their boundaries, the DIGHEM$^{V}$ EM system measured inphase and quadrature components at five frequencies. Two vertical coaxial-coil pairs operated at 900 and 5500 Hz while three horizontal coplanar-coil pairs operated at 900, 7200, and 56,000 Hz. EM data were sampled at 0.1 second intervals. The EM system responds to bedrock conductors, conductive overburden, and cultural sources. The type of conductor is indicated on the aeromagnetic map by the interpretive symbol attached to each EM anomaly. Determination of the type of conductor is based on EM anomaly shapes of the coaxial- and coplanar-coil responses, together with conductor and magnetic patterns and topography. The power line monitor and the flight track video were examined to locate cultural sources.

### ELECTROMAGNETIC ANOMALIES

F B
100

Arcs indicate the conductor has a thickness >10m

Magnetic correlation in nT

Dip direction

| Anomaly | Conductance |
|---|---|
| ● | >100 siemens |
| ◐ | 50–100 siemens |
| ◒ | 20–50 siemens |
| ⊕ | 10–20 siemens |
| ⊕ | 5–10 siemens |
| ○ | 1–5 siemens |
| ◯ | < 1 siemens |
| ✳ | Questionable anomaly |
| $\Delta^{M}$ | EM magnetite response |

Anomaly identifier — C H

Interpretive symbol

Depth is greater than: 15 m, 30 m, 45 m, 60 m

Inphase and quadrature of coaxial coil is greater than: 5 ppm, 10 ppm, 15 ppm, 20 ppm

| Interpretive symbol | Conductor ("model") |
|---|---|
| B | Bedrock conductor |
| D | Narrow bedrock conductor ("thin dike") |
| S | Conductive cover ("horizontal thin sheet") |
| H | Broad conductive rock unit, deep conductive weathering, thick conductive cover ("half space") |
| E | Edge of broad conductor ("edge of half space") |
| L | Culture, e.g., power line, metal building or fence |

### TOTAL MAGNETIC FIELD

The total magnetic field data were acquired with a sampling interval of 0.1 seconds, and were (1) corrected for diurnal variations by subtraction of the digitally recorded base station magnetic data, (2) leveled to the tie line data, and (3) interpolated onto a regular 100 m grid using a modified Akima (1970) technique. The regional variation (or IGRF gradient, 2000, updated to May 2000) was removed from the leveled magnetic data.

Akima, H., 1970, A new method of interpolation and smooth curve fitting based on local procedures: Journal of the Association of Computing Machinery, v. 17, no. 4, p. 589–602.

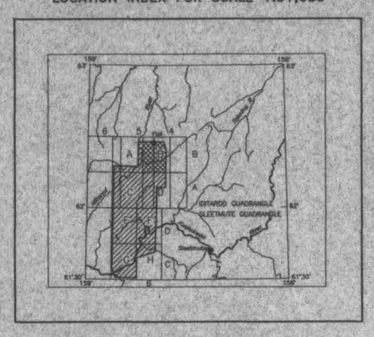
TRUE NORTH — MAGNETIC N 18.4°

APPROXIMATE MEAN DECLINATION, 2000

### MAGNETIC CONTOUR INTERVAL

100 nT
20 nT
4 nT
2 nT
magnetic low
magnetic high

### LOCATION INDEX FOR SCALE 1:31,680




### 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 Stevens Exploration Management Corp. Airborne geophysical data for the area were acquired by Fugro Airborne Surveys in 2000. Funding for the project was provided by the U.S. Department of Interior Bureau of Land Management (BLM). Laurel Burns was the contract manager for DGGS.

This map and other products from this survey are available by mail order or in person from DGGS, 794 University Ave., Suite 200, Fairbanks, Alaska, 99709. Some products are also available in person only at the BLM's Juneau Mineral Information Center, 100 Savikko Road, Douglas, Alaska, 99824.