

**LIVENGOOD MINING DISTRICT ELECTROMAGNETIC AND MAGNETIC AIRBORNE  
GEOPHYSICAL SURVEY DATA COMPILATION**

L.E. Burns, Geoterrex-Dighem, Stevens Exploration Management Corp., A.M. Emond, and  
G.R.C. Graham

**Geophysical Report 2015-5**

STATE OF ALASKA  
DEPARTMENT OF NATURAL RESOURCES  
DIVISION OF GEOLOGICAL & GEOPHYSICAL SURVEYS



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# **LIVENGOOD MINING DISTRICT ELECTROMAGNETIC AND MAGNETIC AIRBORNE GEOPHYSICAL SURVEY DATA COMPILATION**

L.E. Burns<sup>1</sup>, Geoterrex-Dighem, Stevens Exploration Management Corp., A.M. Emond<sup>1</sup>, and G.R.C. Graham<sup>1</sup>

## **ABSTRACT**

This geophysical survey is located in interior Alaska in the Livengood mining district, about 100 kilometers north of Fairbanks, Alaska. Frequency domain electromagnetic and magnetic data were collected with the DIGHEM<sup>V</sup> system from September 14 to 18, 1998. A total of 1689 line kilometers were collected covering 607 square kilometers. Line spacing was 400 meters (m). Data were collected 30 m above the ground surface from a helicopter-towed sensor platform (“bird”) on a 30-m-long line.

## **PURPOSE**

This airborne geophysical survey is part of a program to acquire data on Alaska’s most promising mineral belts and districts. The information acquired is aimed at catalyzing new private sector exploration, discovery, and ultimate development and production. The purpose of the survey was to map the magnetic and conductive properties of the survey area. The district is in the northwest part of the Yukon-Tanana upland. The Livengood district has produced over 496,000 ounces of placer gold. Lode prospects having gold, mercury, or antimony mineralization are concentrated on the west end of the ridge south of Livengood known as Money Knob. Ruth, Lillian, and Olive Creeks drain to the west end of the ridge. All hosted placer gold deposits. South of Money Knob, anomalous concentrations of base metals have been noted in the stream sediments of Rainey Hollow.

## **SURVEY OVERVIEW DESCRIPTION**

This document provides an overview of the survey and includes text and figures of select primary and derivative products of this survey. A table of digital data packages available for download is provided to assist users in data selection. For reference, a catalog of the available maps is presented in reduced resolution. Please consult the metadata, project report, and digital data packages for more information and data.

## **ACKNOWLEDGMENTS**

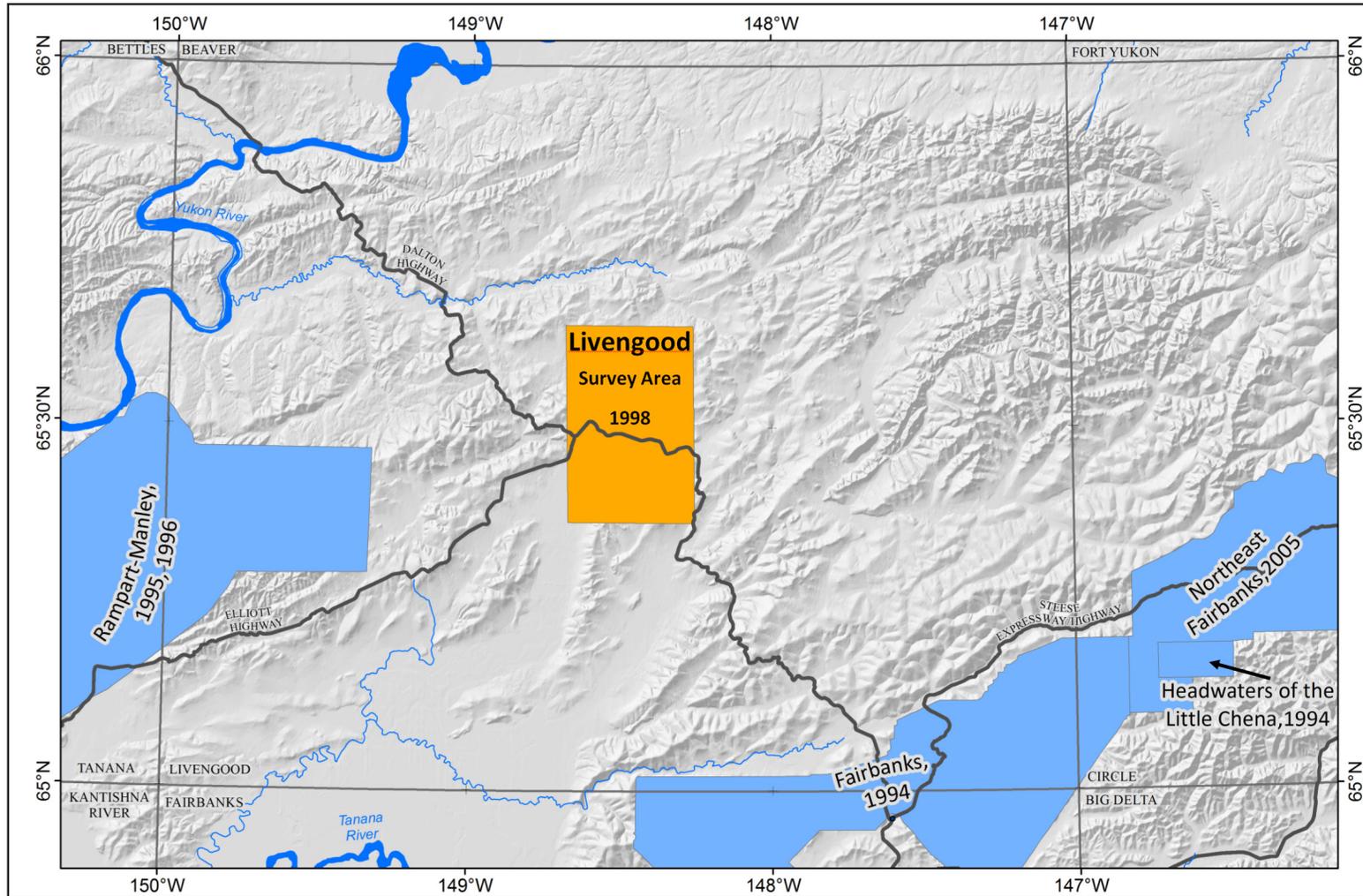
Funding was provided by the Alaska State Legislature as part of the DGGs Airborne Geophysical/Geological Mineral Inventory (AGGMI) program.

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<sup>1</sup> Alaska Division of Geological & Geophysical Surveys, 3354 College Road, Fairbanks, Alaska 99709-3707

**AVAILABLE DATA**

<b>Data Type</b>	<b>Provider</b>	<b>Description</b>
ascii_data	contractor	ASCII format line data, other ASCII data
databases_geosoft	contractor	Geosoft format database of final line data, other Geosoft format databases
documents	contractor and DGGS	Project and field reports, survey background information, gridded data explanations, other documentation
grids_ermapper	contractor and DGGS	Geographically registered gridded data, ER Mapper ERS format
grids_geosoft	contractor and DGGS	Geosoft-format grids, these grids can be viewed in ESRI ArcMap using a free plugin from Geosoft or the free viewer available from Geosoft
images_registered	DGGS	GeoTiff format images of all gridded data
kmz	DGGS	keyhole markup language (kml) kmz archive files of project data. Viewable in Google Earth and other compatible programs
maps_pdf_format	contractor and DGGS	Printable maps in pdf format. Includes a geographically registered pdf (GeoPDF) for use with mobile devices such as GPS enabled smartphones and tablets, other devices, and programs
maps_prn_format	contractor	Printable maps in HPGL/2 printer file format with extension .prn
profiles_stacked	contractor	Distance-based profiles of the digitally recorded geophysical data are generated and plotted at an appropriate scale. The profiles display electromagnetic anomalies with their respective interpretive symbols. Printable in pdf format
vector_data	contractor and DGGS	Line path, data contours, and survey boundary in ESRI shapefile (SHP) format, ESRI Geodatabase format, and/or AutoCAD dxf format
video_flightpath	contractor	Survey flight path downward facing video



**Figure 1.** Livengood survey location shown in interior Alaska (inset). Livengood survey area, nearby DGGs 400m electromagnetic and magnetic surveys, relevant 1:250,000 USGS quadrangle boundaries, major highways, major rivers, and shaded relief.

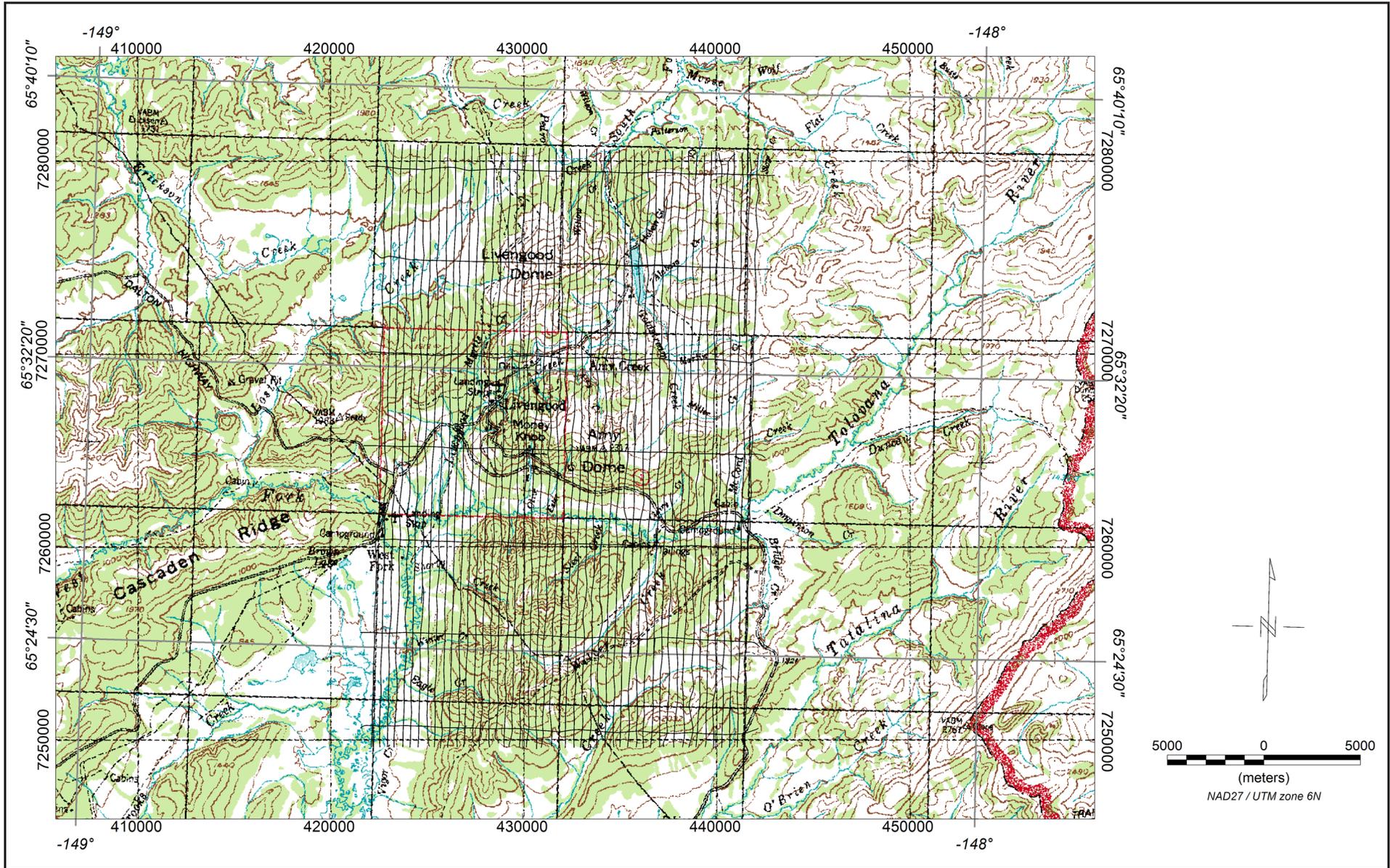


Figure 2. Flight path with topographic base map.

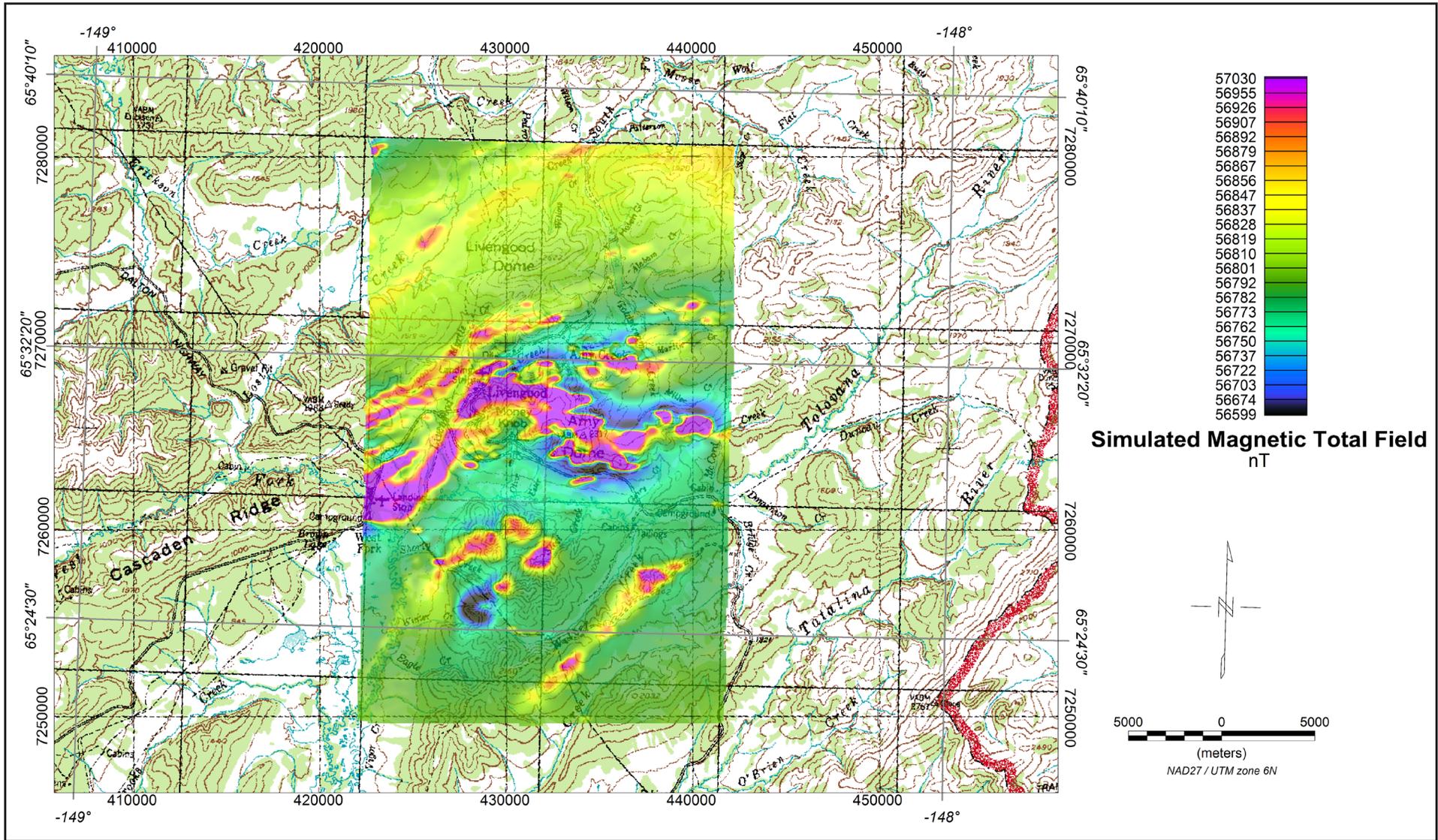


Figure 3. Simulated magnetic total field grid with topographic base map.

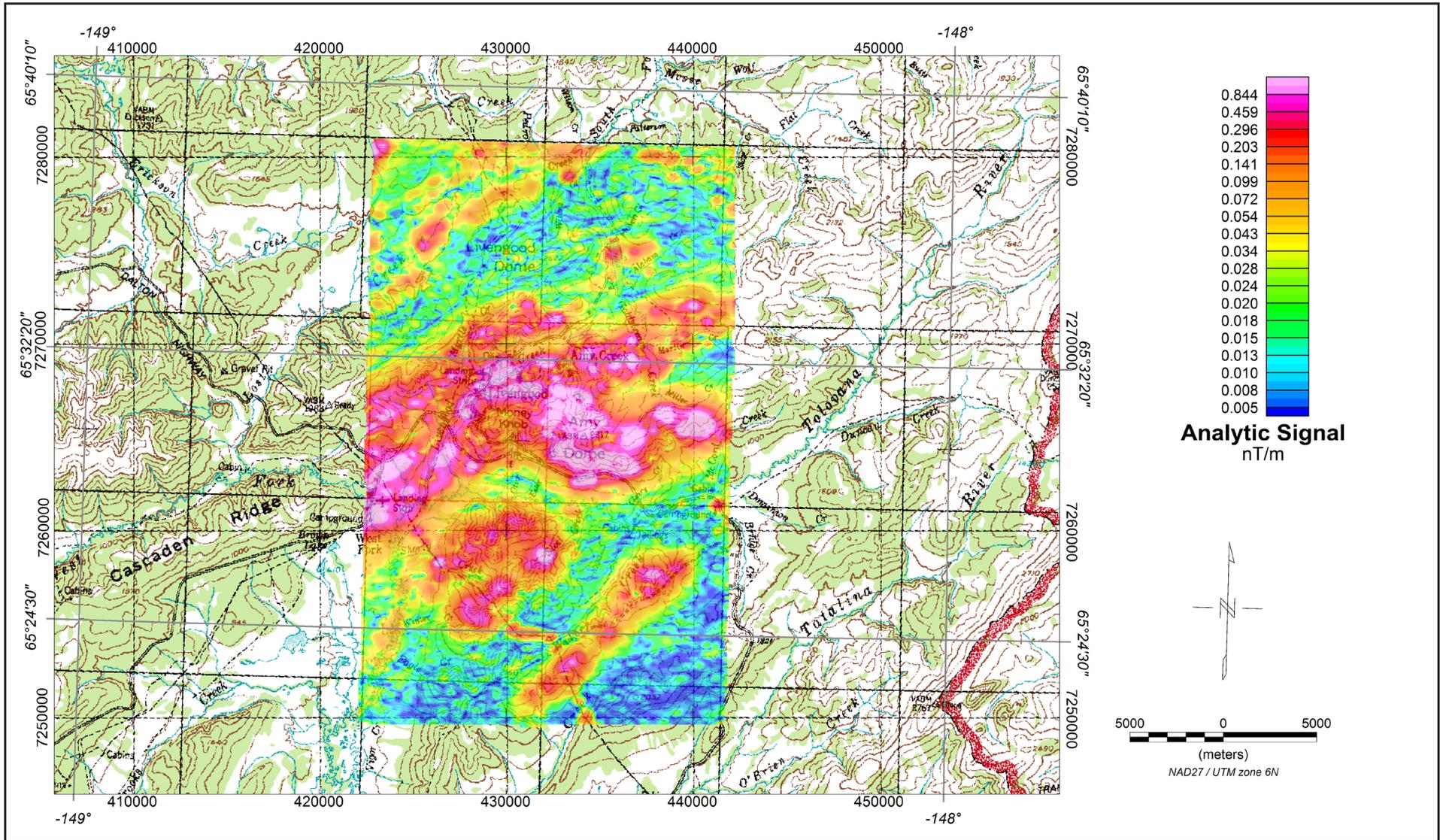


Figure 4. Analytic signal magnetic grid with topographic base map.

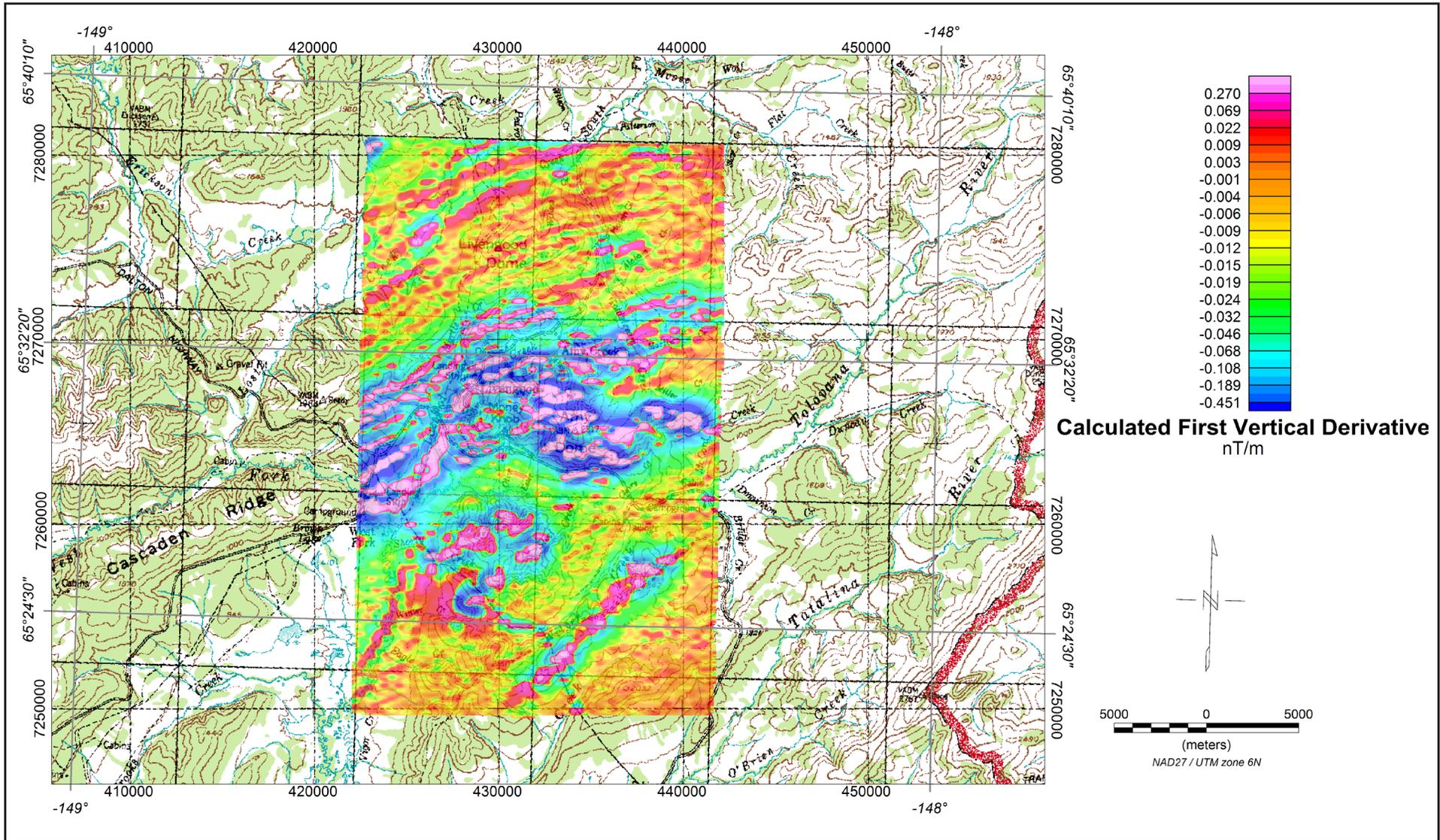


Figure 5. Calculated first vertical derivative magnetic grid with topographic base map.

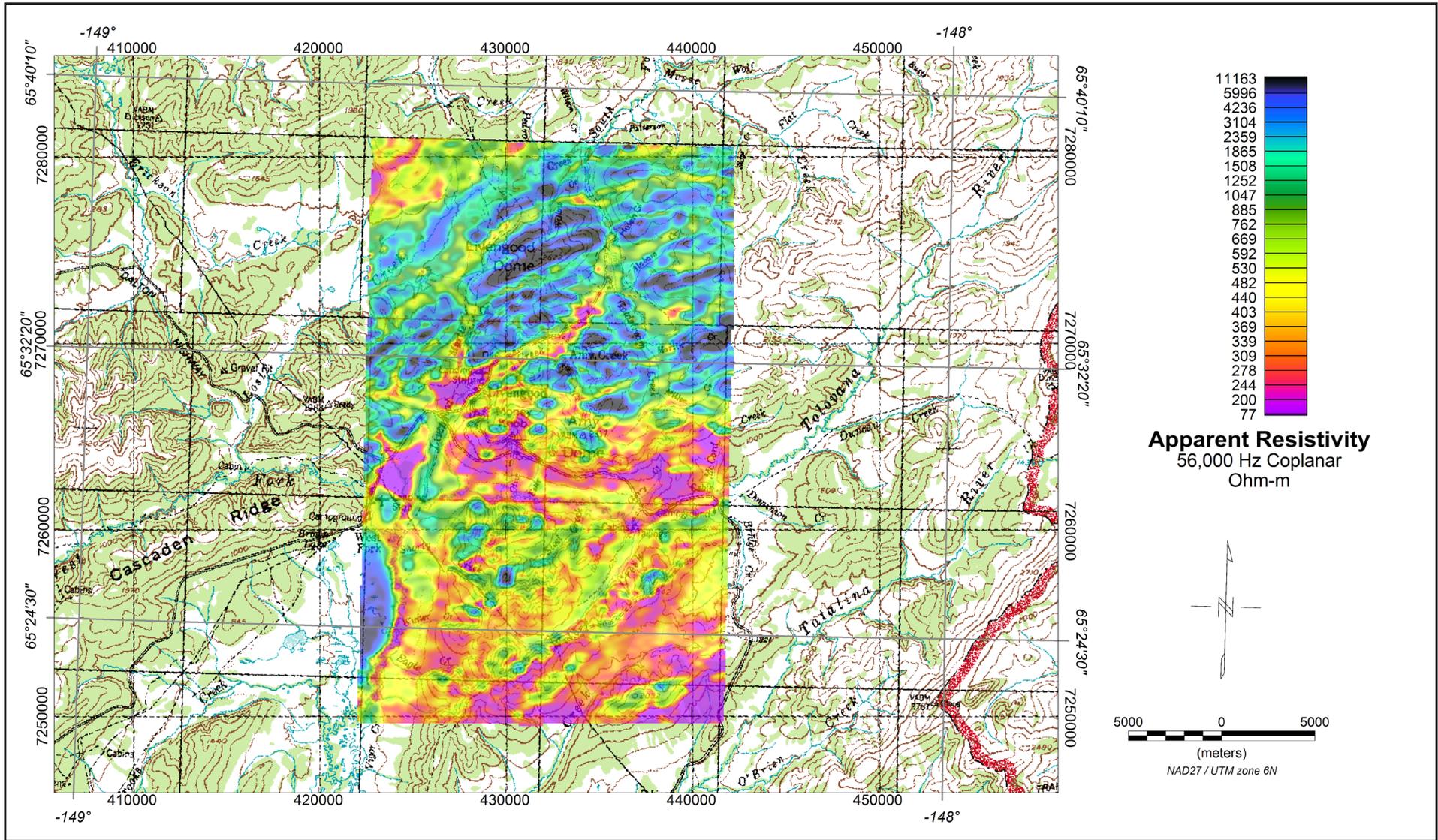


Figure 6. 56,000 Hz apparent resistivity grid with topographic base map.

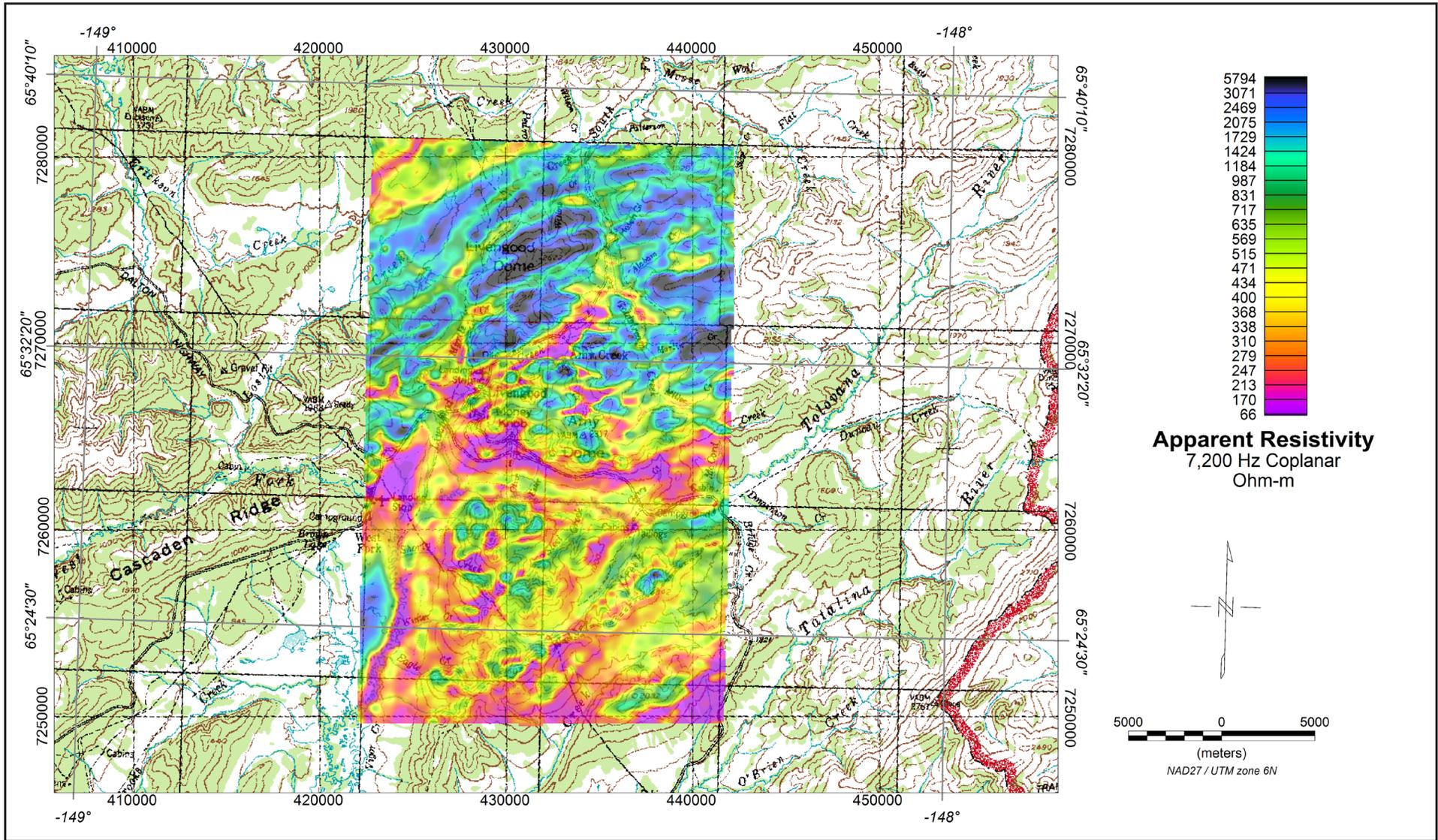


Figure 7. 7,200 Hz apparent resistivity grid with topographic base map.

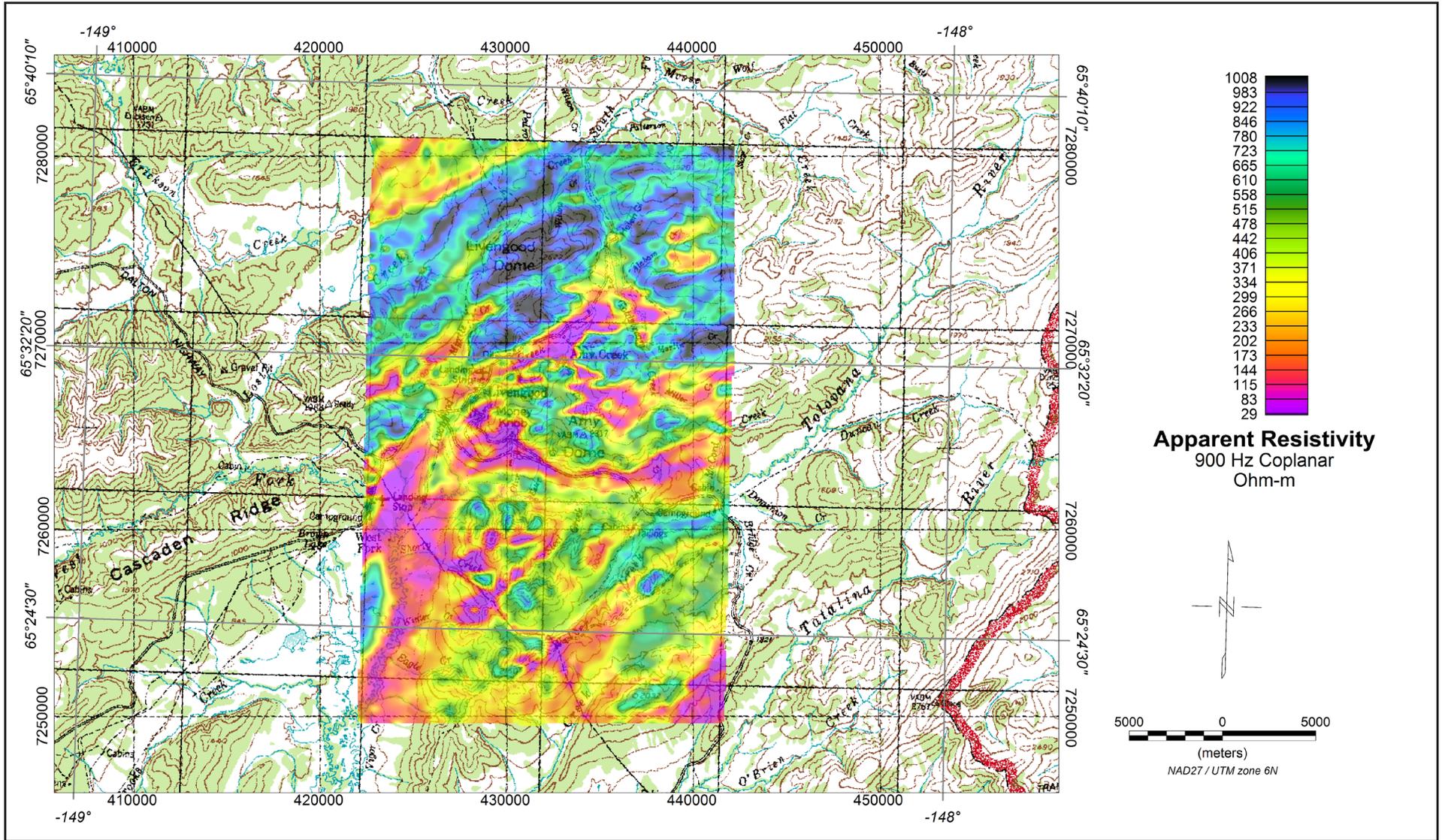
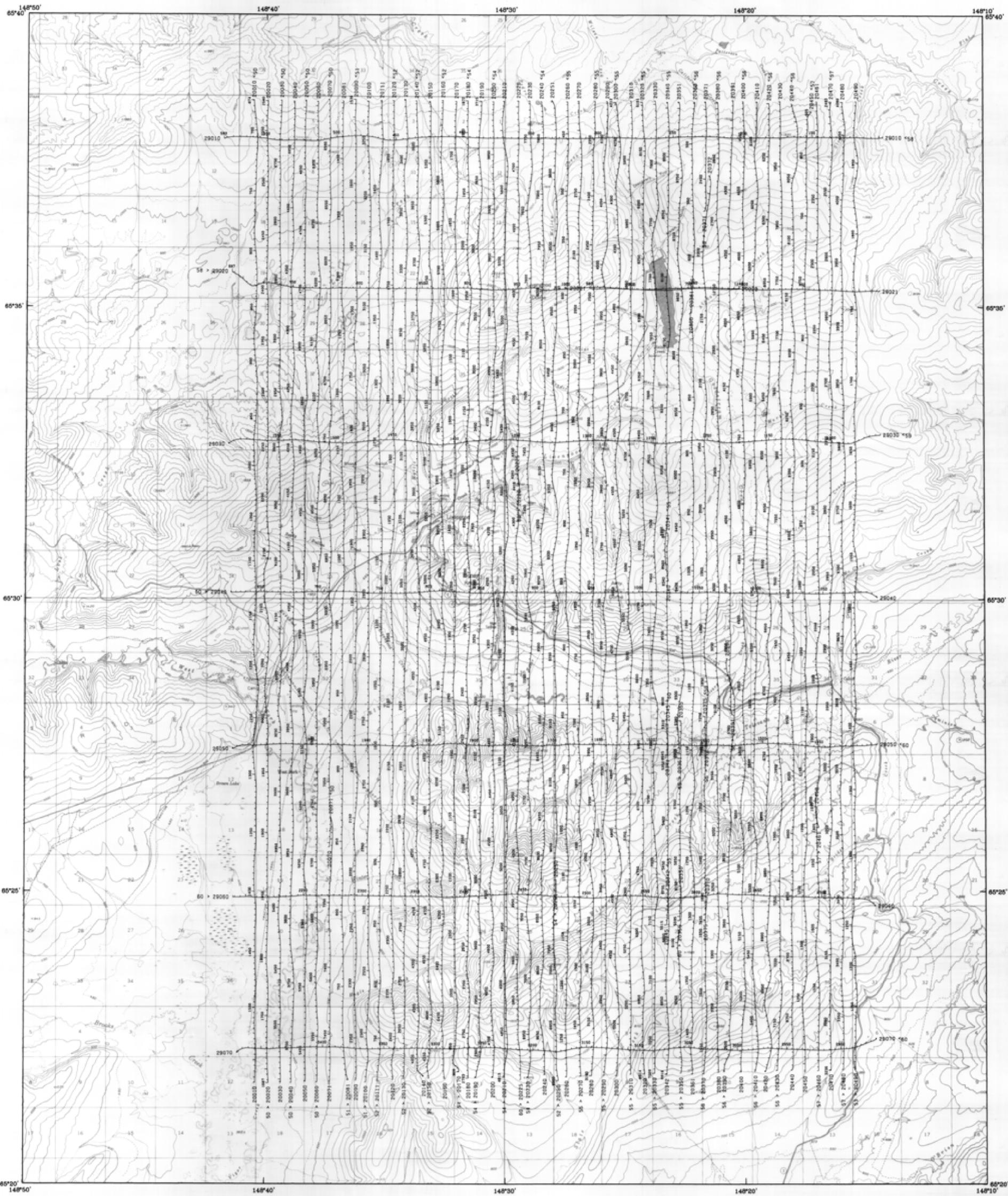


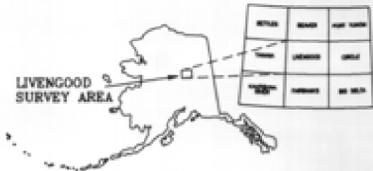
Figure 8. 900 Hz apparent resistivity grid with topographic base map.

**Table 1.** Copies of the following maps are included at the end of this booklet. The low-resolution, page-size maps included in this booklet are intended to be used as a search tool and are not the final product. Large-scale, full-resolution versions of each map are available to download on this publication's citation page: <http://doi.org/10.14509/29412>

Map Title	Content
Flight Lines of Part of the Livengood Mining District, Alaska	topographic map, flightlines
Interpretation Map of Part of the Livengood Mining District, Alaska	township range section, simulated total magnetic field and resistivity interpretations
7200 Hz Coplanar Resistivity of Part of the Livengood Mining District, Alaska	township range section, 7200 Hz apparent resistivity contours, flightlines
7200 Hz Coplanar Resistivity of Part of the Livengood Mining District, Alaska	township range section, 7200 Hz coplanar apparent resistivity grid and contours
7200 Hz Coplanar Resistivity of Part of the Livengood Mining District, Alaska	topographic map, 7200 Hz apparent resistivity grid
900 Hz Coplanar Resistivity of Part of the Livengood Mining District, Alaska	township range section, 900 Hz apparent resistivity contours, flightlines
900 Hz Coplanar Resistivity of Part of the Livengood Mining District, Alaska	topographic map, 900 Hz apparent resistivity grid
Color Shadow Total Field Magnetics of Part of the Livengood Mining District, Alaska	township range section, simulated total magnetic field colorshadow grid
Total Field Magnetics and Electromagnetic Anomalies of Part of the Livengood Mining District, Alaska	township range section, simulated total magnetic field contours, em anomalies
Total Field Magnetics and Detailed Electromagnetic Anomalies of Part of the Livengood Mining District, Alaska, Map A	township range section, simulated total magnetic field contours, em anomalies
Total Field Magnetics and Detailed Electromagnetic Anomalies of Part of the Livengood Mining District, Alaska, Map B	township range section, simulated total magnetic field contours, em anomalies
Total Field Magnetics of Part of the Livengood Mining District, Alaska	township range section, simulated total magnetic field grid and contours
Total Field Magnetics of Part of the Livengood Mining District, Alaska	topographic map, simulated total magnetic field grid and contours



Base from U.S. Geological Survey (unnumbered, B-3, 1976; B-4, 1976; C-3, 1984; C-4, 1976; Quadrangle, Alaska).

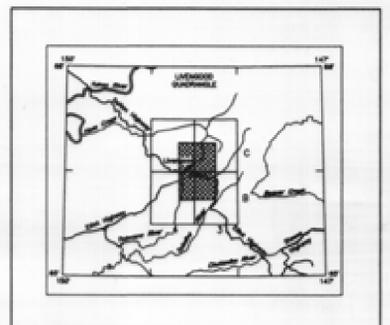


# FLIGHT LINES OF PART OF THE LIVENGOOD MINING DISTRICT, ALASKA

CENTRAL LIVENGOOD QUADRANGLE

1999

LOCATION INDEX



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 (DGG), and Stevens Exploration Management Corp. Airborne geophysical data for the area were acquired by Geotrex-Digheem, a division of CGG Canada Ltd., in 1998.

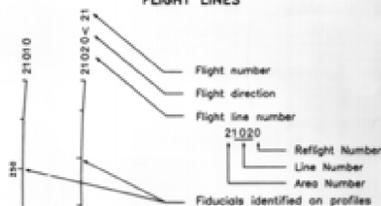
This map and other products from this survey are available by mail order or in person from DGG, 714 University Ave., Suite 200, Fairbanks, Alaska, 99709.

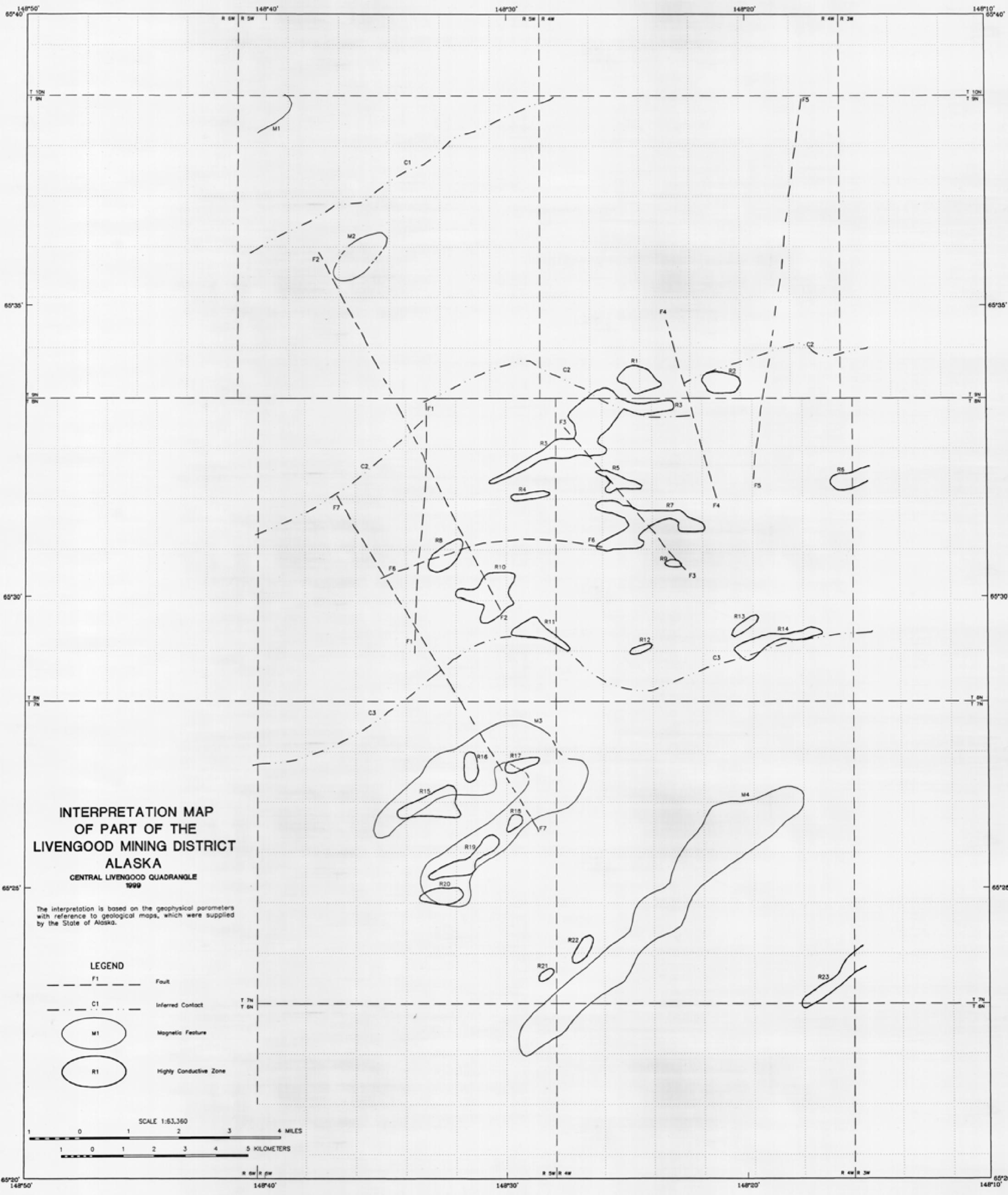
DESCRIPTIVE NOTES

The geophysical data were acquired with a DIGHEM<sup>Y</sup> 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 AS-350B-2 Squirrel helicopter at a mean terrain clearance of 200 feet along survey flight lines with a spacing of a quarter of a mile. The lines were flown perpendicular to the flight lines at intervals of approximately 3 miles.

An Ashtech/Racal Real-Time Differential Global Positioning System (RT-DGPS) was used for both navigation and flight path recovery. The helicopter position was derived every 0.5 seconds using real-time differential positioning to a relative accuracy of better than 10 m. Flight path positions were projected onto the Clarke 1866 (UTM zone 6) spheroid, 1927 North American datum using a central meridian (CM) of 147, 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.

FLIGHT LINES





**INTERPRETATION MAP  
OF PART OF THE  
LIVENGOOD MINING DISTRICT  
ALASKA**  
CENTRAL LIVENGOOD QUADRANGLE  
1999

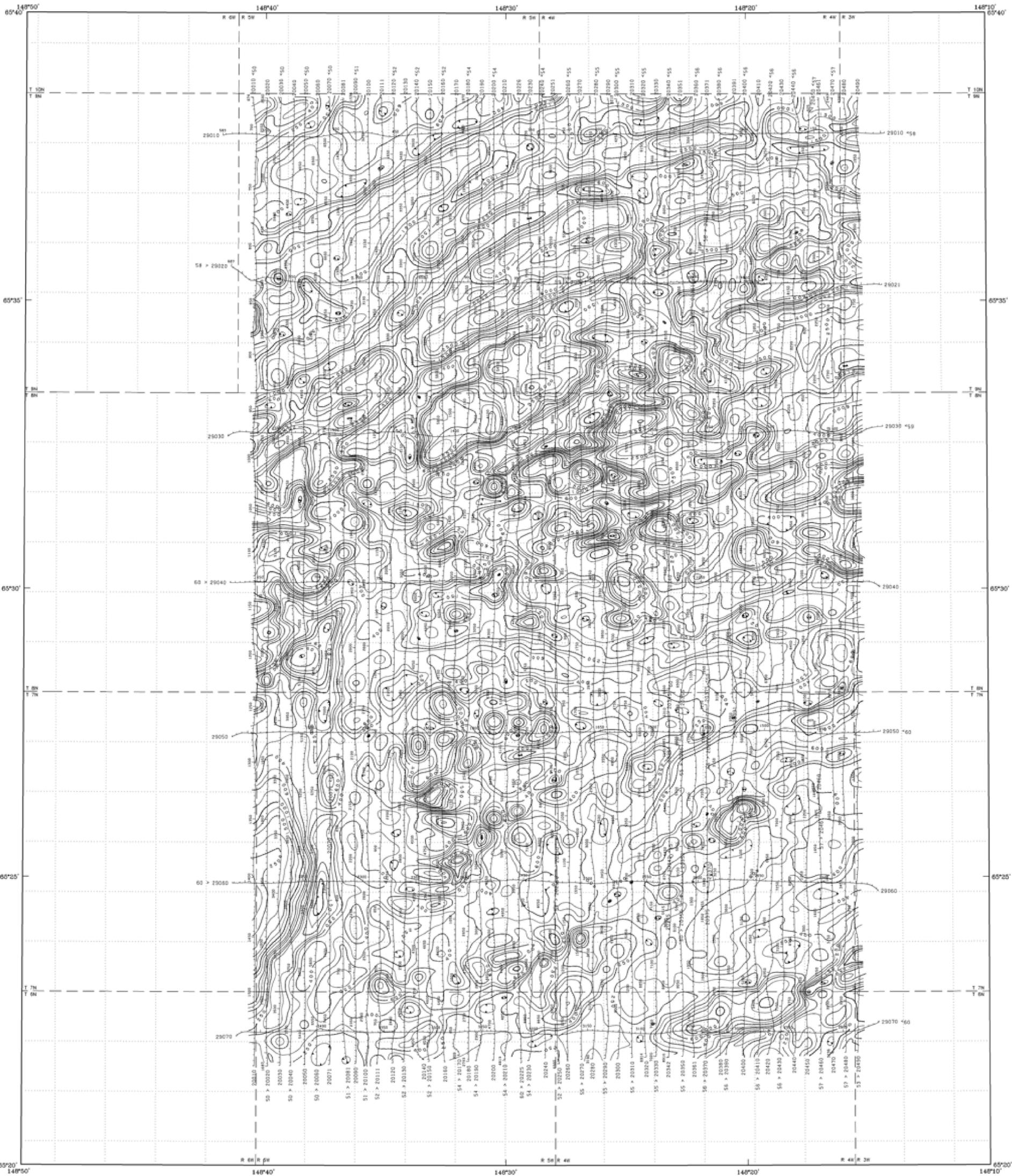
The interpretation is based on the geophysical parameters with reference to geological maps, which were supplied by the State of Alaska.

**LEGEND**

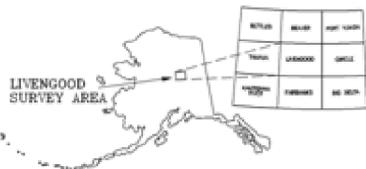
-  F1 Fault
-  C1 Inferred Contact
-  M1 Magnetic Feature
-  R1 Highly Conductive Zone

SCALE 1:53,360





Section outlines from U.S. Geological Survey, *Livengood B-5, 1975, B-4, 1976, C-3, 1974, C-4, 1976, Quadrangles, Alaska*.

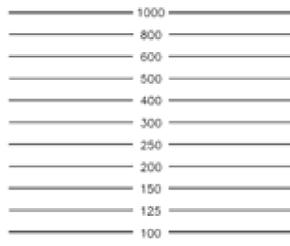


# 7200 Hz COPLANAR RESISTIVITY OF PART OF THE LIVENGOOD MINING DISTRICT, ALASKA

## CENTRAL LIVENGOOD QUADRANGLE

1999

### RESISTIVITY CONTOURS



Contours in ohm-m at 10 intervals per decade

..... resistivity low

### DESCRIPTIVE NOTES

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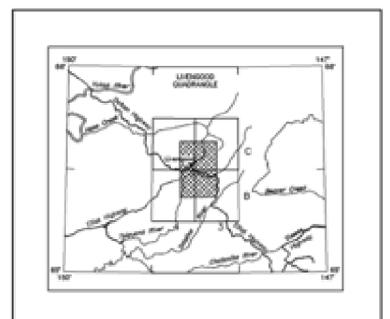
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### RESISTIVITY

The DIGHEM<sup>®</sup> 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. Apparent resistivity is generated from the inphase and quadrature component of the coplanar 7200 Hz using the pseudo-layer half space model. The data were interpolated onto a regular 100 m grid using a modified Akima (1970) technique.

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.

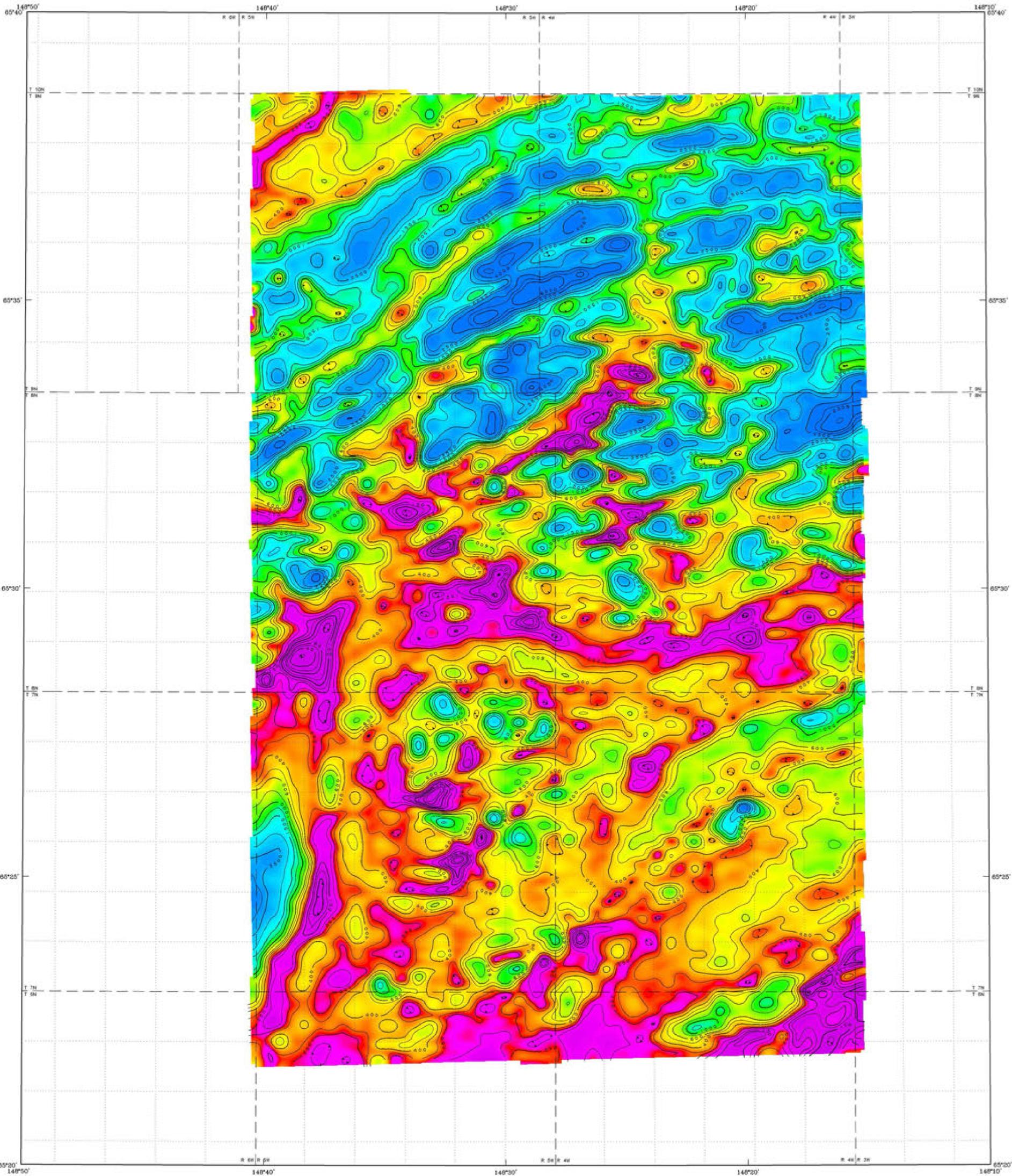
### LOCATION INDEX



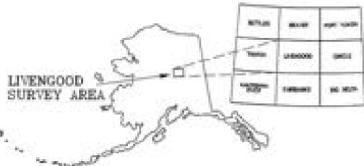
### SURVEY HISTORY

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Section outlines from U.S. Geological Survey Livengood 3-5, 1975, 3-A, 1976, C-3, 1974, C-4, 1976, Quadrangles, Alaska.



**DESCRIPTIVE NOTES**

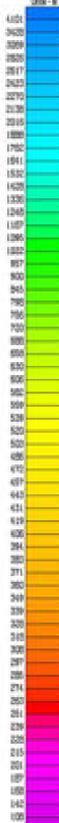
The geophysical data were acquired with a DIGHEM<sup>®</sup> Electromagnetic (EM) system and a Scintrex cesium magnetometer. Both were flown at a height of 100 feet. In addition the survey recorded data from a radar altimeter, GPS navigation system, 50/50 Hz monitors and video camera. Flights were performed with an AS350B-2 Squirrel helicopter at a mean terrain clearance of 200 feet along 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.

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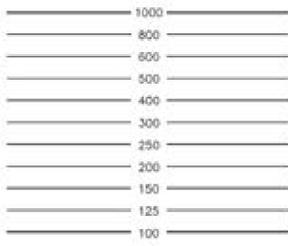


**7200 Hz COPLANAR RESISTIVITY OF PART OF THE LIVENGOOD MINING DISTRICT, ALASKA**

**CENTRAL LIVENGOOD QUADRANGLE**

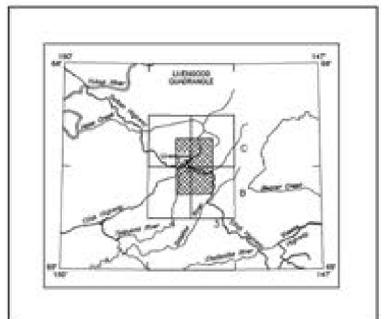
**1999**

**RESISTIVITY CONTOURS**



..... resistivity low

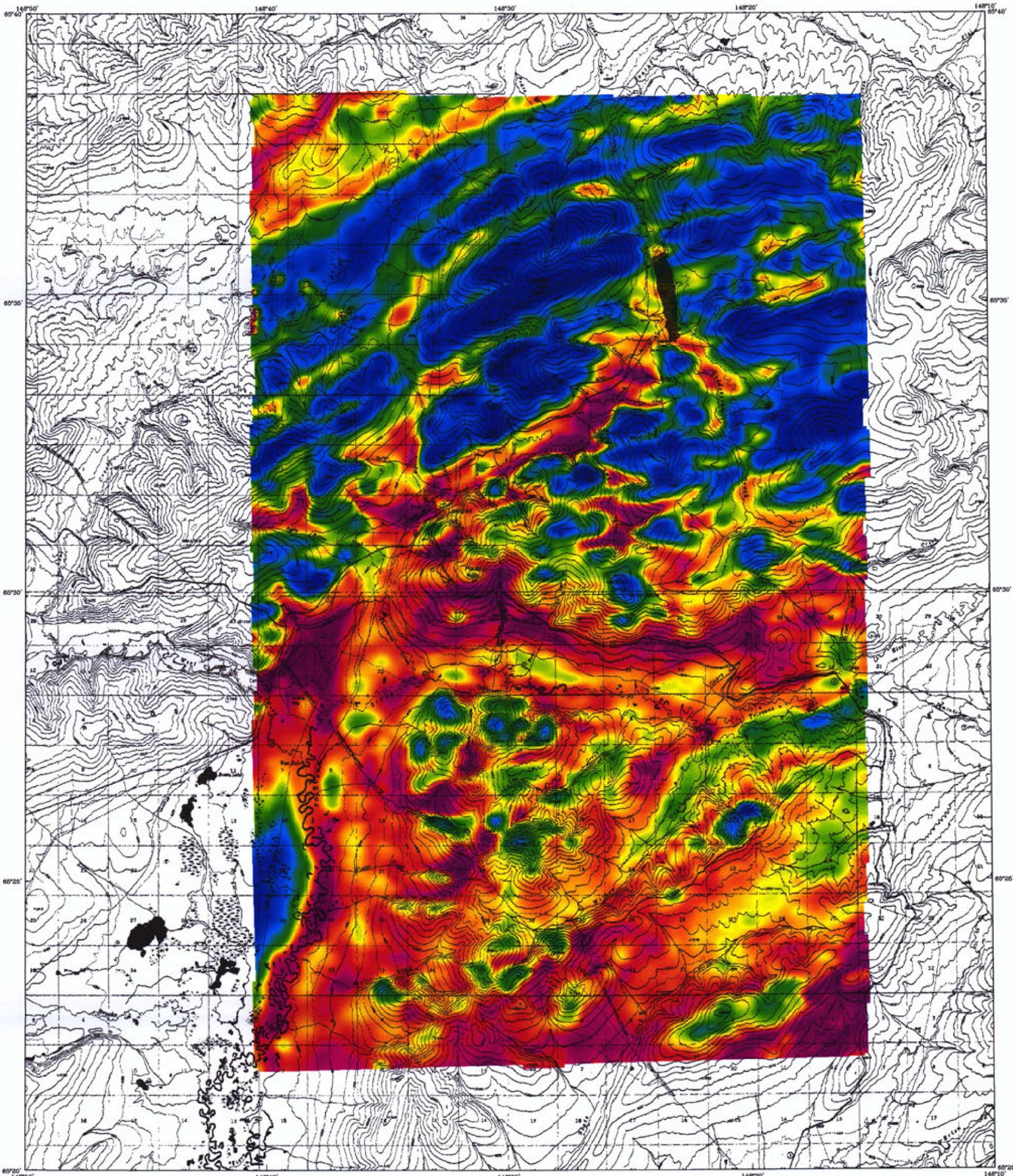
**LOCATION INDEX**



**SURVEY HISTORY**

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See from U.S. Geological Survey Livengood 2-S, 1975, 3-A, 1976, C-3, 1984, C-4, 1976, Quadrangles, Alaska.



**DESCRIPTIVE NOTES**

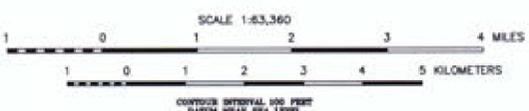
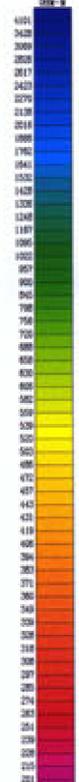
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**RESISTIVITY**

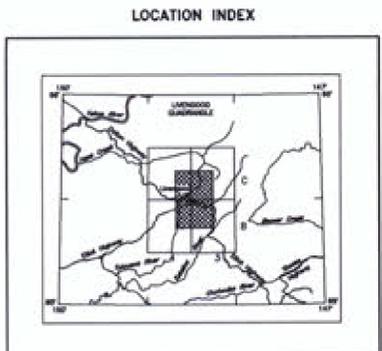
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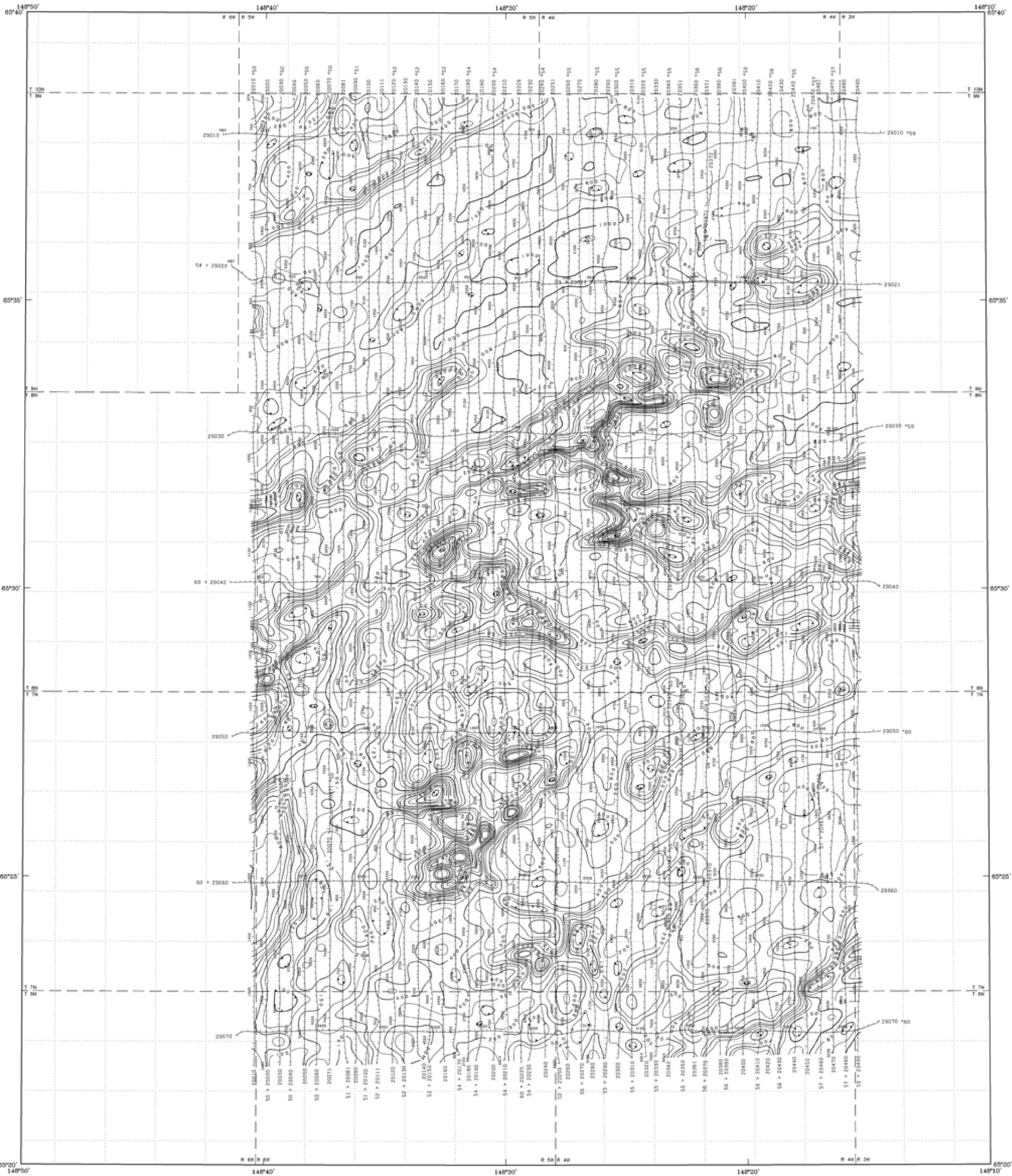
CENTRAL LIVENGOOD QUADRANGLE  
1999



**SURVEY HISTORY**

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Section outlines from U.S. Geological Survey Livengood B-3, 1976, B-4, 1976, C-3, 1974, C-4, 1970, Quadrangles, Alaska.

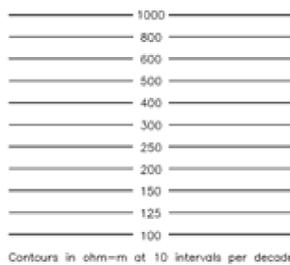


# 900 Hz COPLANAR RESISTIVITY OF PART OF THE LIVENGOOD MINING DISTRICT, ALASKA

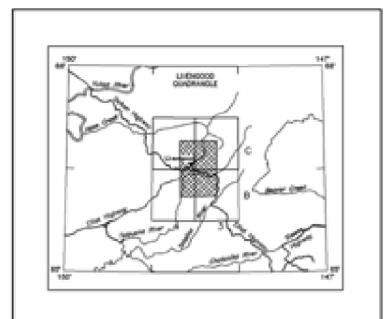
CENTRAL LIVENGOOD QUADRANGLE

1999

RESISTIVITY CONTOURS



LOCATION INDEX



SURVEY HISTORY

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DESCRIPTIVE NOTES

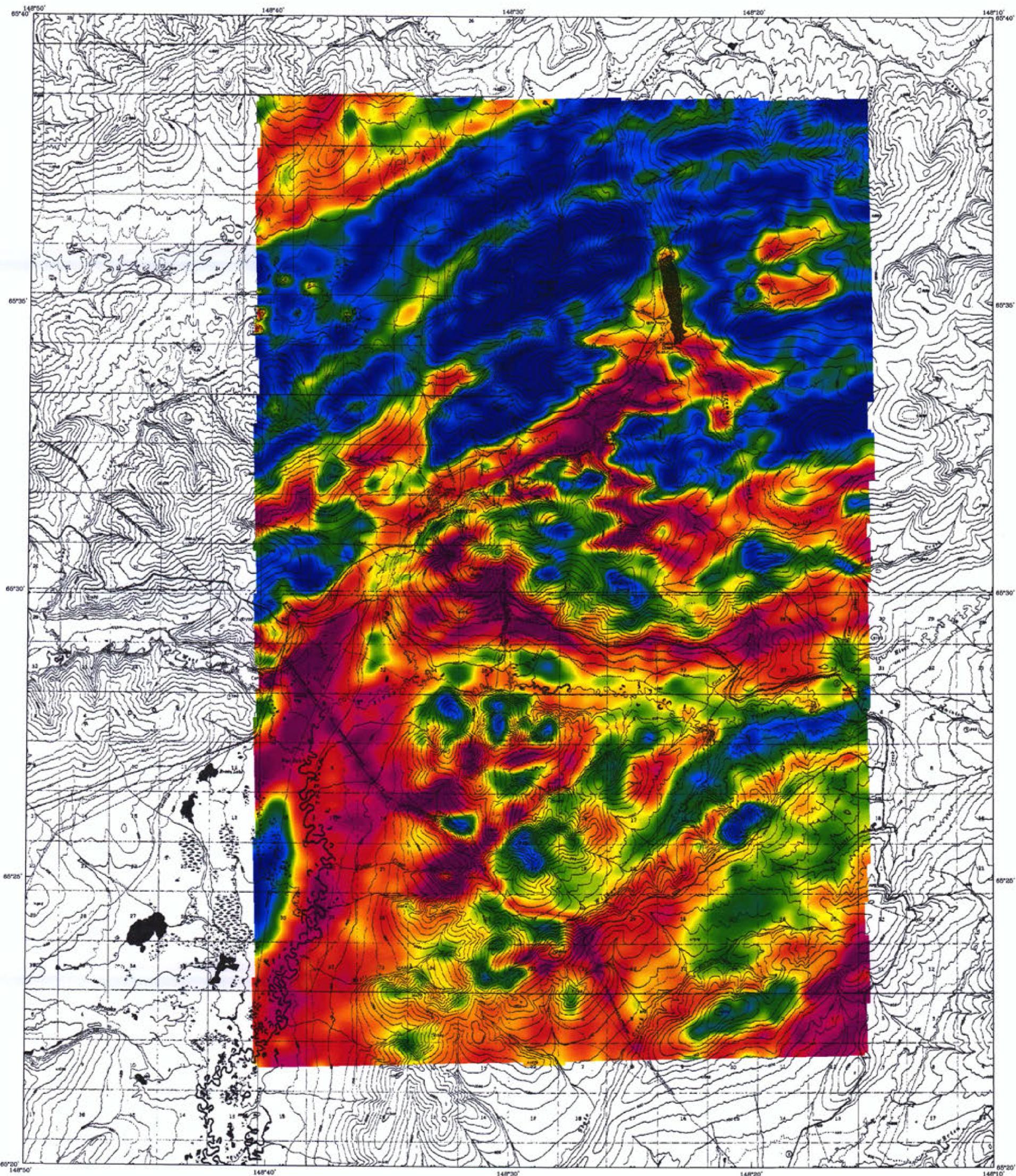
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RESISTIVITY

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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.



Base from U.S. Geological Survey Livengood 3-6, 1975, 3-4, 1979, C-3, 1984, C-4, 1979, quadrangles, Alaska.



**DESCRIPTIVE NOTES**

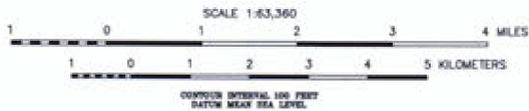
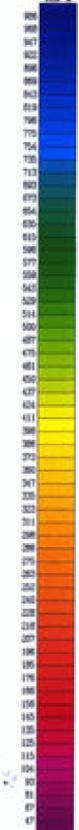
The geophysical data were acquired with a DIGHEM<sup>®</sup> Electromagnetic (EM) system and a Scintrex cesium magnetometer. Both were flown at a height of 100 feet. In addition the survey recorded data from a radar altimeter, GPS navigation system, 50/60 Hz monitors and video camera. Flights were performed with an AS350B-2 Squirrel helicopter at a mean terrain clearance of 200 feet along 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.

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**RESISTIVITY**

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CONVERSION: 100 FEET DATUM MEAN SEA LEVEL



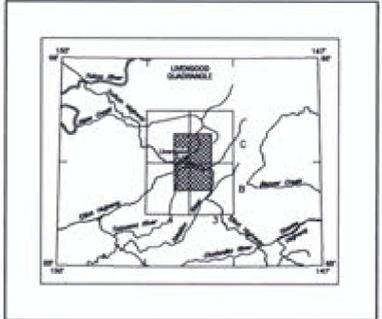
APPROXIMATE MEAN DECLINATION, 1998

# 900 Hz COPLANAR RESISTIVITY OF PART OF THE LIVENGOOD MINING DISTRICT, ALASKA

CENTRAL LIVENGOOD QUADRANGLE

1999

**LOCATION INDEX**

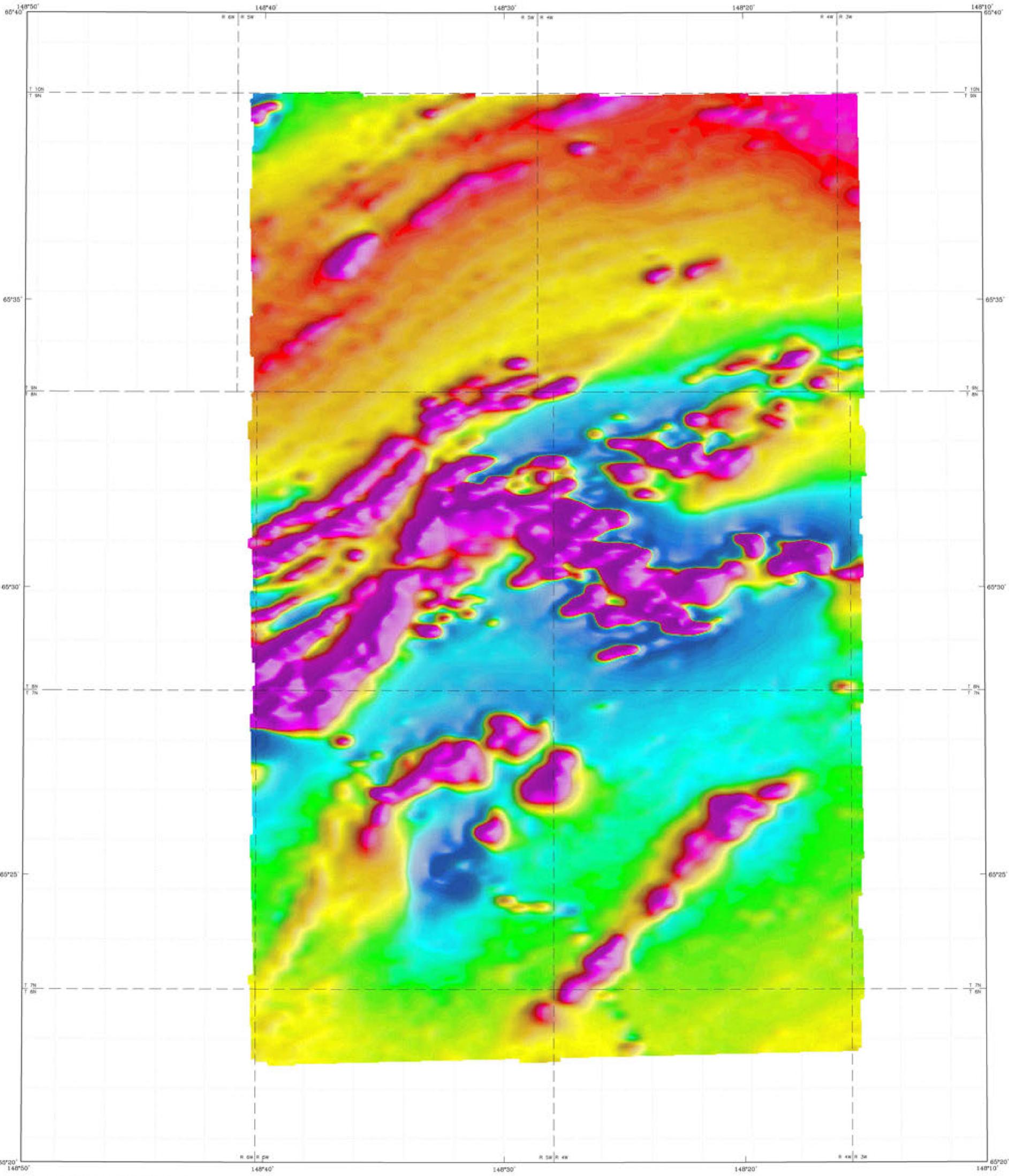


**SURVEY HISTORY**

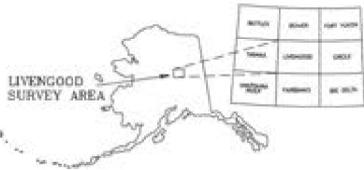
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ALASKA DIVISION OF GEOLOGICAL & GEOPHYSICAL SURVEYS



Section outlines from U.S. Geological Survey Livengood 8-5, 1975, 8-4, 1975, C-3, 1984, C-4, 1975, Fairbanks, Alaska.



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COLOR SHADOW TOTAL FIELD MAGNETICS  
OF PART OF THE  
LIVENGOOD MINING DISTRICT,  
ALASKA

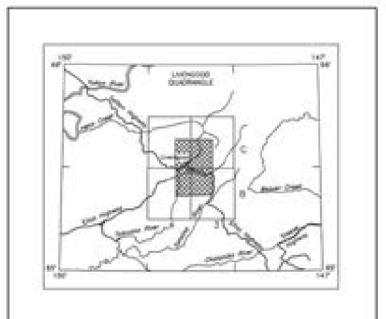
CENTRAL LIVENGOOD QUADRANGLE

1999

Sun Azimuth: 105 degrees

Inclination: 30 degrees

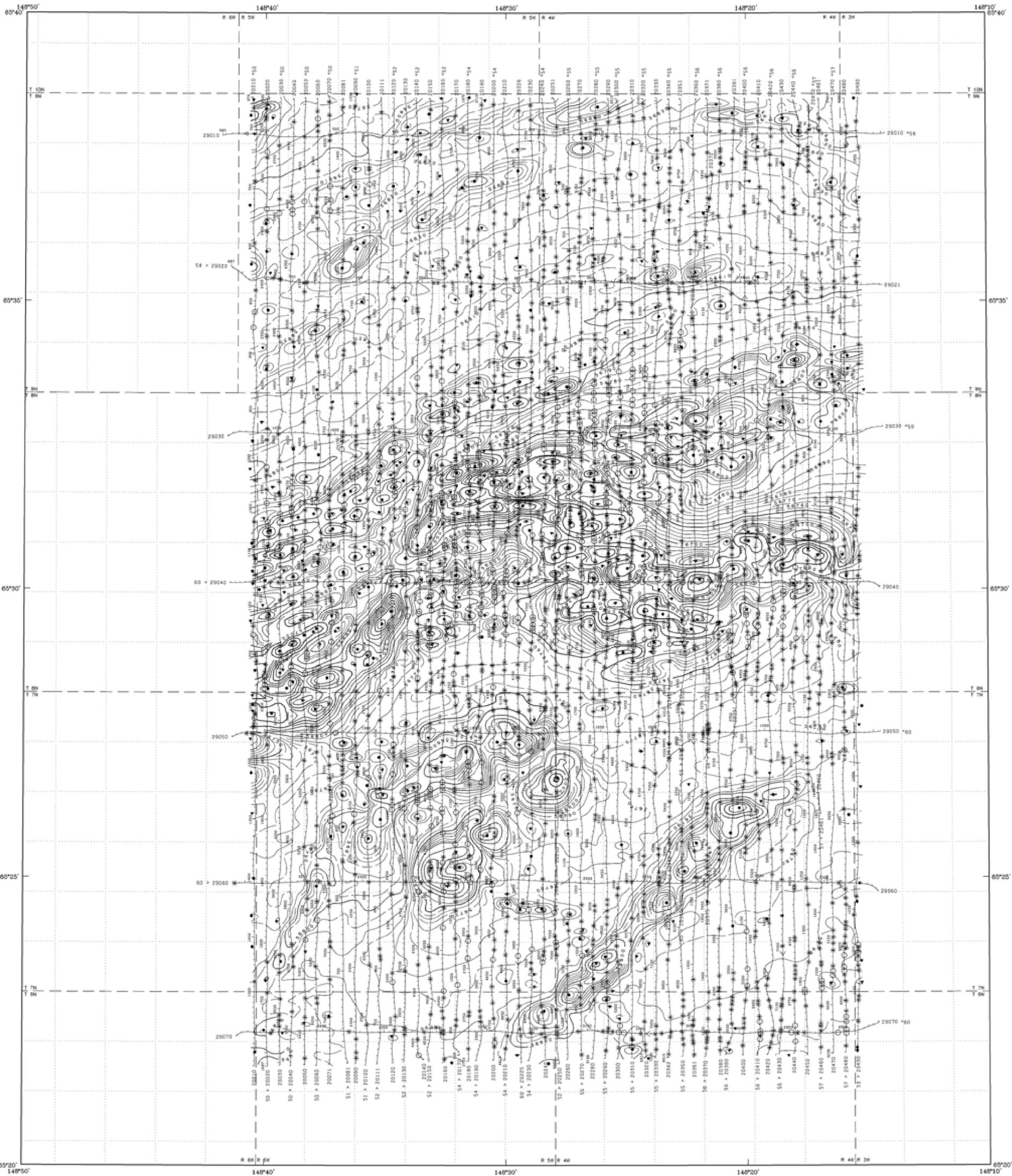
LOCATION INDEX



SURVEY HISTORY

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Section outlines from U.S. Geological Survey, *Livengood B-3, 1975*; *B-4, 1976*; *C-3, 1974*; *C-4, 1976*; *Quadrangles, Alaska*.



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**ELECTROMAGNETIC ANOMALIES**

- Anomaly
- Questionable anomaly
- △ Weak conductivity associated with an EM magnetite response
- >50 siemens
- <50 siemens
- Questionable anomaly
- Weak conductivity associated with an EM magnetite response



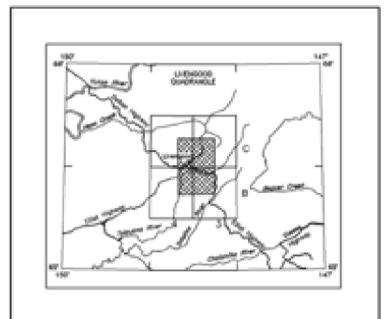
**TOTAL FIELD MAGNETICS AND ELECTROMAGNETIC ANOMALIES OF PART OF THE LIVENGOOD MINING DISTRICT, ALASKA**

**CENTRAL LIVENGOOD QUADRANGLE**  
1999

**MAGNETIC CONTOUR INTERVAL**

- ..... 250 nT
- ..... 50 nT
- ..... 10 nT
- ..... 5 nT
- magnetic low
- magnetic high

**LOCATION INDEX**



**SURVEY HISTORY**

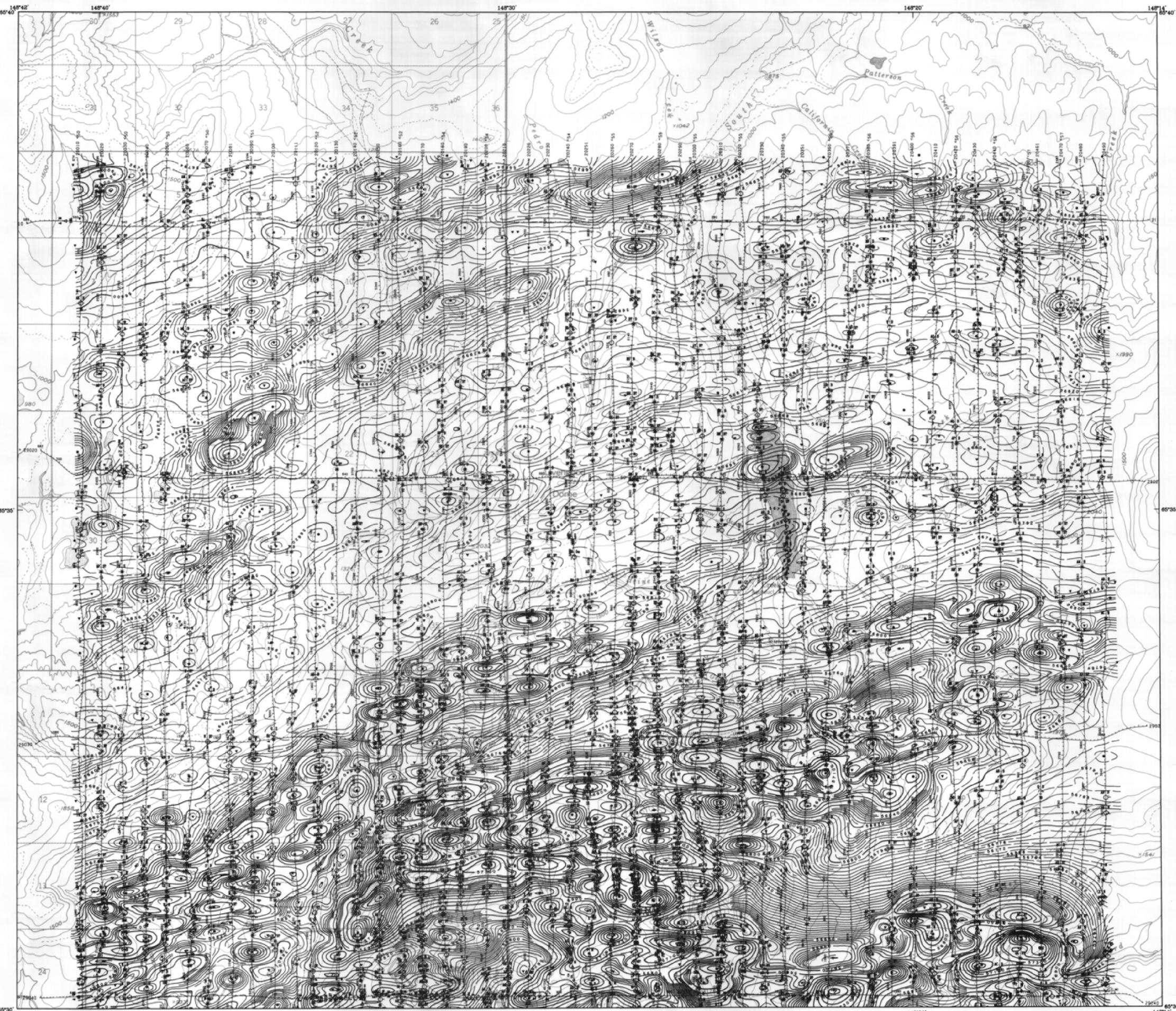
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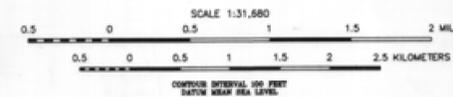
**TOTAL FIELD MAGNETICS**

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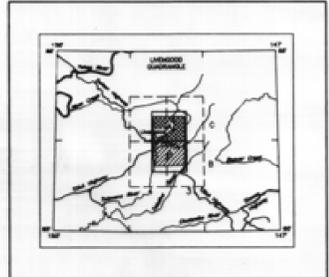
Akima, H., 1970, A new method of interpolation and smooth curve fitting based on local procedures: *Journal of the Association of Computing Machinery*, v. 17, no. 4, p. 589-602.



Base from U.S. Geological Survey Unconform C-3, 1954, C-4, 1970, Quadrangles, Alaska



LOCATION INDEX FOR SCALE 1:31,680



# TOTAL FIELD MAGNETICS AND DETAILED ELECTROMAGNETIC ANOMALIES OF PART OF THE LIVENGOOD MINING DISTRICT, ALASKA

CENTRAL LIVENGOOD QUADRANGLE

MAP A  
1999

**DESCRIPTIVE NOTES**

The geophysical data were acquired with a DIGHEM<sup>®</sup> 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 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.

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**ELECTROMAGNETICS**

To determine the location of EM anomalies or their boundaries, the DIGHEM<sup>®</sup> 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**

- |  |   |
|--|---|
|  | Arcs indicate the conductor has a thickness >10m              |
|  | Magnetic correlation in RT                                    |
|  | Dip direction   |
|  | Depth is greater than 15 m                                    |
|  | 30 m  |
|  | 45 m  |
|  | 60 m  |
|  | Inphase and quadrature of coaxial coil is greater than 10 ppm |
|  | 5 ppm   |
|  | 10 ppm  |
|  | 15 ppm  |
|  | 20 ppm  |

- |  |   |
|--|---|
|  | Conductivity >100 siemens   |
|  | 50-100 siemens  |
|  | 20-50 siemens   |
|  | 10-20 siemens   |
|  | 5-10 siemens  |
|  | 1-5 siemens   |
|  | < 1 siemens   |
|  | Questionable anomaly  |
|  | EM magnetic response  |
|  | Conductor ("mode")  |
|  | Bedrock conductor   |
|  | Narrow bedrock conductor ("thin ore")   |
|  | Conductive cover ("horizontal thin sheet")  |
|  | Broad conductive rock unit, deep conductive weathering, thick conductive cover ("half space") |
|  | Edge of broad conductor ("edge of half space")  |
|  | Cultural, e.g. power line, metal building or fence  |

**MAGNETIC CONTOUR INTERVAL**

- 100 nT
- 20 nT
- 4 nT
- 2 nT
- 
- 

**SURVEY HISTORY**

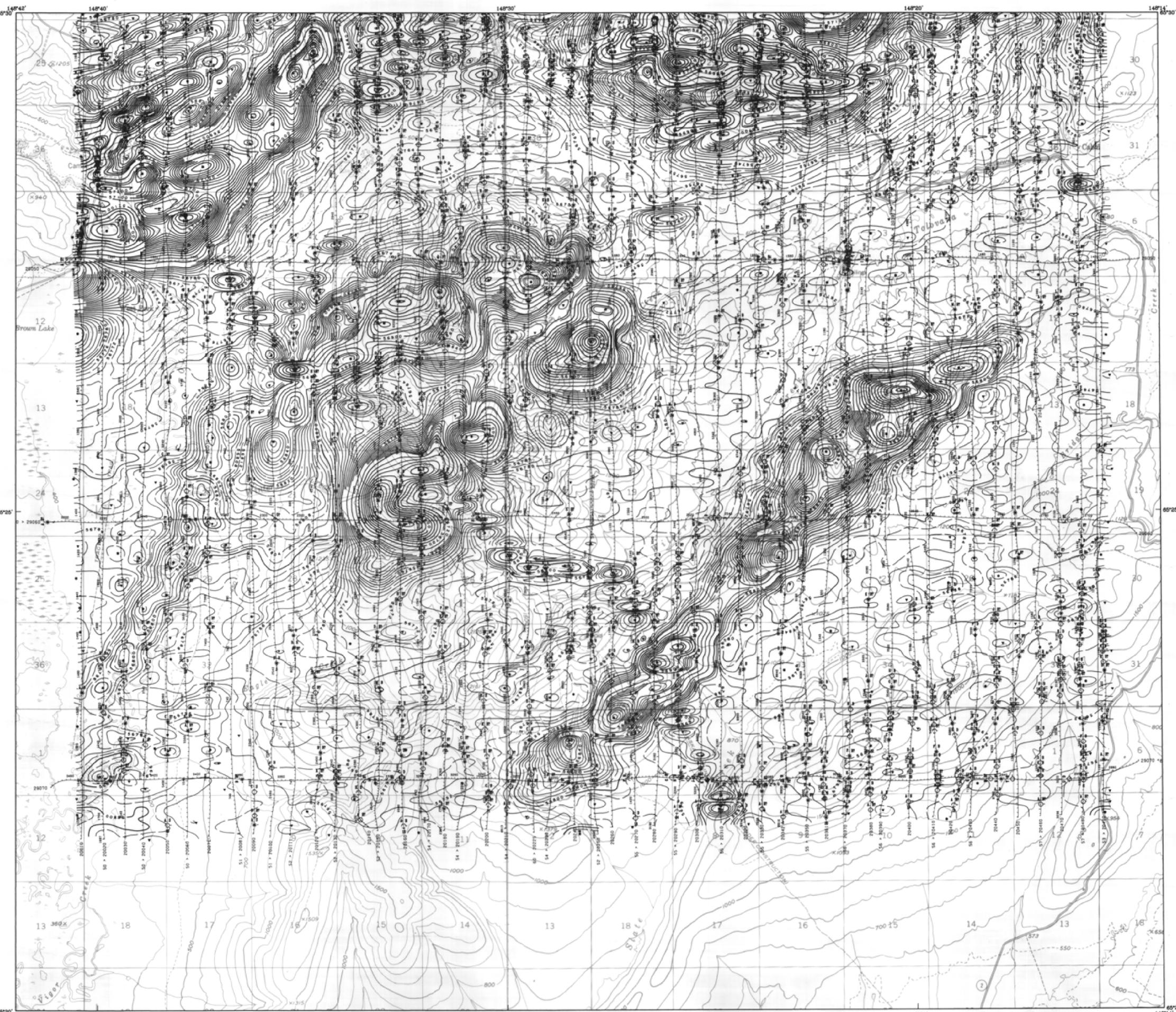
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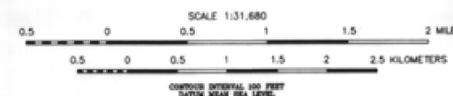
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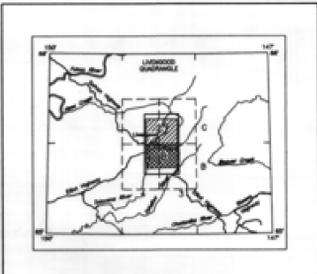
Akima, H., 1970. A new method of interpolation and smooth curve fitting based on local procedures. *Journal of the Association of Computing Machinery*, v. 17, no. 4, p. 589-602.



Base from U.S. Geological Survey Unconform B-5, 1975; B-4, 1975; Quadrangle, Alaska



LOCATION INDEX FOR SCALE 1:31,680



# TOTAL FIELD MAGNETICS AND DETAILED ELECTROMAGNETIC ANOMALIES OF PART OF THE LIVENGOOD MINING DISTRICT, ALASKA

CENTRAL LIVENGOOD QUADRANGLE

MAP B  
1999

**DESCRIPTIVE NOTES**

The geophysical data were acquired with a DIGEM<sup>®</sup> Electromagnetic (EM) system measured in phase and quadrature components of 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.

**ELECTROMAGNETICS**

To determine the location of EM anomalies or their boundaries, the DIGEM<sup>®</sup> EM system measured in phase and quadrature components of 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**

●	Conductance >100 siemens
○	50-100 siemens
○	20-50 siemens
○	10-20 siemens
○	5-10 siemens
○	1-5 siemens
○	<1 siemens
*	Questionable anomaly
△	EM magnetic response

**Interpretive symbol**

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

**Anomaly Identifier**

Depth is greater than:

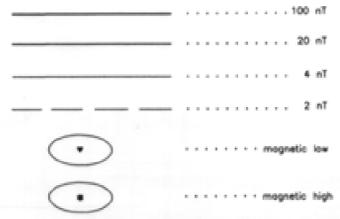
- 15 m
- 30 m
- 45 m
- 60 m

**Interpretive symbol**

In-phase and quadrature of coaxial coil is greater than:

- 5 ppm
- 10 ppm
- 15 ppm
- 20 ppm

**MAGNETIC CONTOUR INTERVAL**



**SURVEY HISTORY**

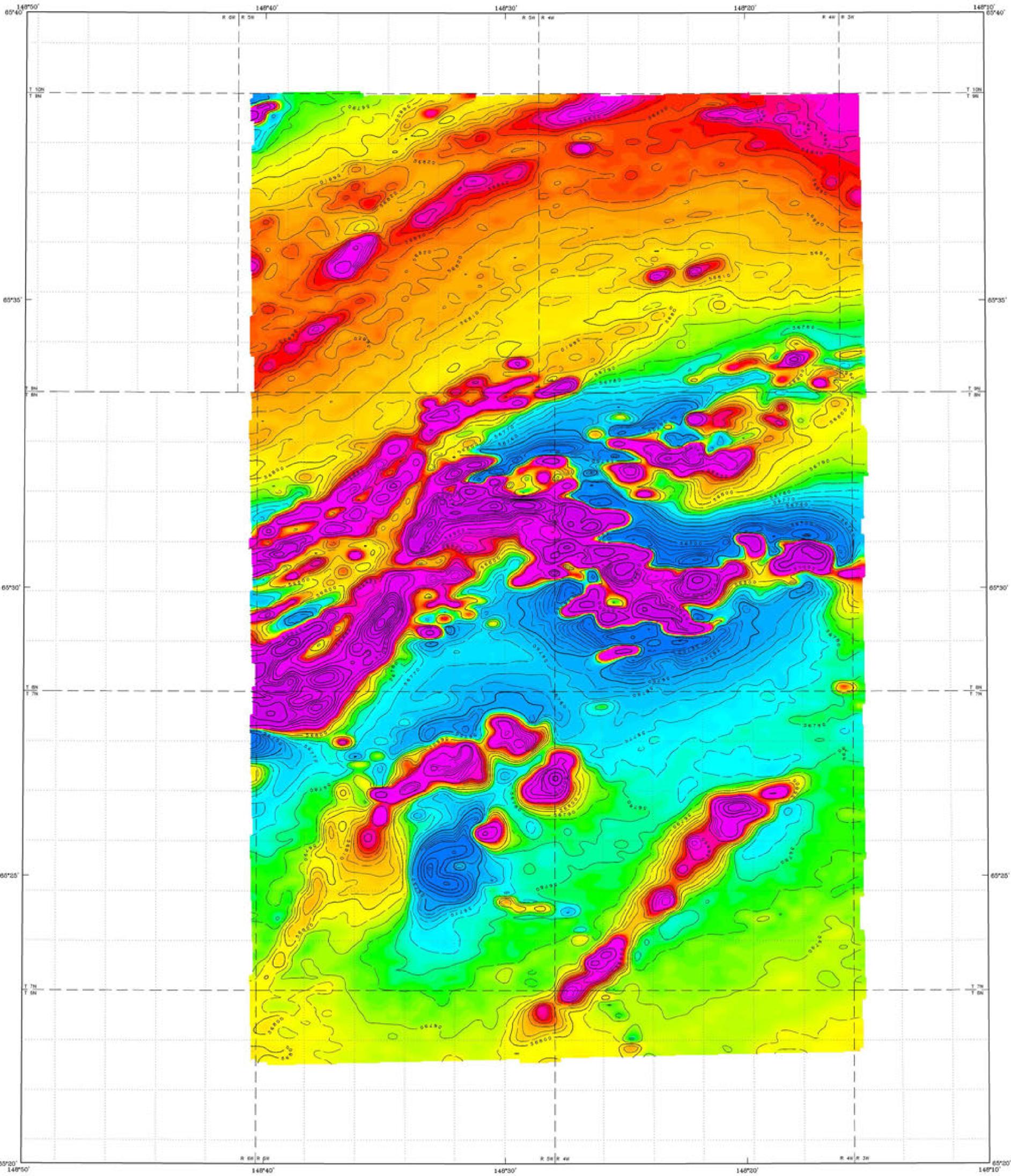
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**TOTAL FIELD MAGNETICS**

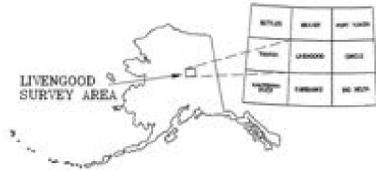
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ALASKA DIVISION OF GEOLOGICAL & GEOPHYSICAL SURVEYS



Section outlines from U.S. Geological Survey: Livengood 3-5, 1975; 3-4, 1976; C-3, 1974; C-4, 1976; Quadrangles, Alaska.



DESCRIPTIVE NOTES

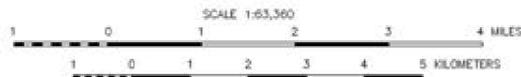
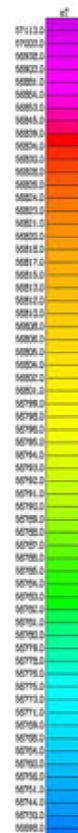
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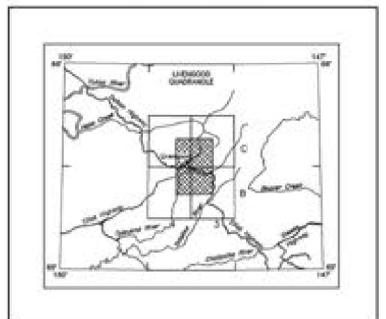
TOTAL FIELD MAGNETICS  
OF PART OF THE  
LIVENGOOD MINING DISTRICT,  
ALASKA

CENTRAL LIVENGOOD QUADRANGLE  
1999

MAGNETIC CONTOUR INTERVAL



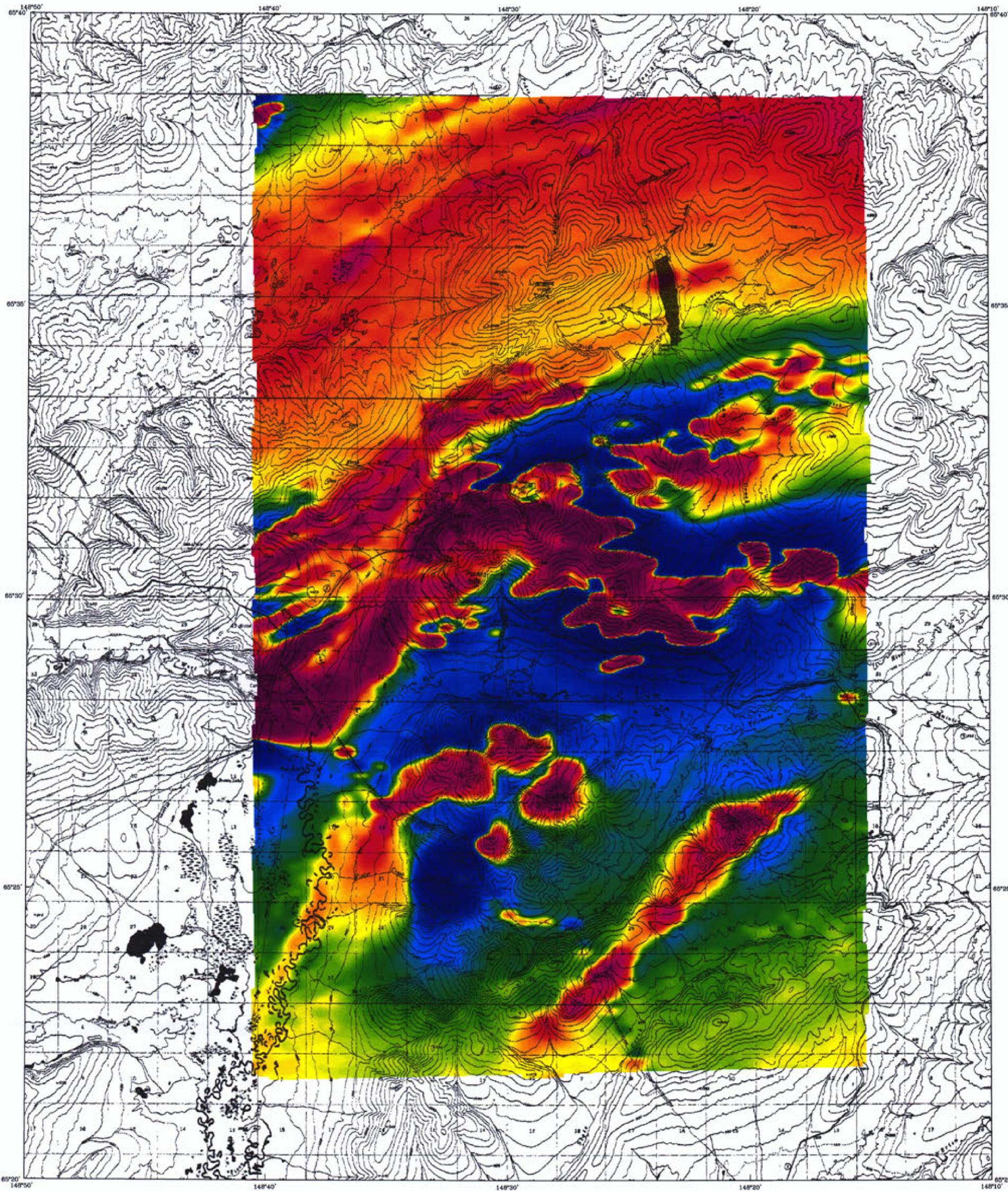
LOCATION INDEX



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Base from U.S. Geological Survey Livengood 8-3, 1975; 8-4, 1976; C-3, 1964; C-4, 1976; Quadrangle, Alaska



**DESCRIPTIVE NOTES**

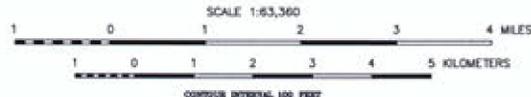
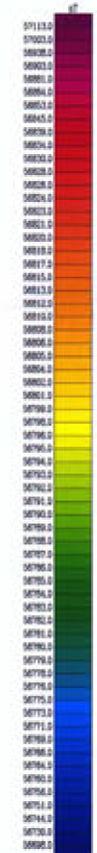
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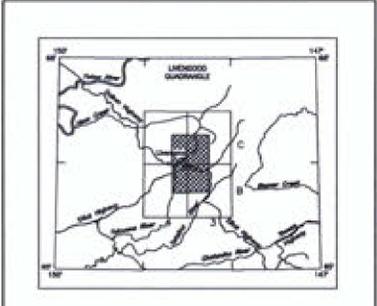


CONTOUR INTERVAL 100 FEET DATUM MEAN SEA LEVEL



**TOTAL FIELD MAGNETICS  
OF PART OF THE  
LIVENGOOD MINING DISTRICT,  
ALASKA  
CENTRAL LIVENGOOD QUADRANGLE  
1999**

**LOCATION INDEX**



**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 (DGGG), and Stevens Exploration Management Corp. Airborne geophysical data for the area were acquired by Geoterrax-Digheim, a division of CGG Canada Ltd., in 1995.

This map and other products from this survey are available by mail order or in person from DGGG, 794 University Ave., Suite 200, Fairbanks, Alaska, 99709.