

RAMPART–MANLEY ELECTROMAGNETIC AND MAGNETIC AIRBORNE GEOPHYSICAL SURVEY DATA COMPILATION

L.E. Burns, G.R.C. Graham, J.D. Barefoot, Rebecca-Ellen Woods, Dighem, R.A. Pritchard,
WGM, Inc., Stevens Exploration Management Corp., and Fugro Airborne Surveys Corp.

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DIVISION OF GEOLOGICAL & GEOPHYSICAL SURVEYS



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RAMPART–MANLEY ELECTROMAGNETIC AND MAGNETIC AIRBORNE GEOPHYSICAL SURVEY DATA COMPILATION

L.E. Burns¹, G.R.C. Graham¹, J.D. Barefoot¹, Rebecca-Ellen Woods¹, Dighem, R.A. Pritchard², WGM, Inc., Stevens Exploration Management Corp., and Fugro Airborne Surveys Corp.

ABSTRACT

The Rampart-Manley electromagnetic and magnetic airborne geophysical survey is located in interior Alaska in the Rampart and Hot Springs mining districts, about 110 kilometers northwest of Fairbanks, Alaska. Frequency domain electromagnetic and magnetic data were collected with the DIGHEM^V system from September to October 1995, and from August to September 1996. A total of 7510 line kilometers were collected covering 2679.4 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 Rampart-Manley area hosts many small to medium production placer gold mines, such as Eureka Creek. Lode prospects include Elephant Mountain (gold), as well as the Tofty carbonatite-hosted rare earth element, niobium and yttrium mineralization. Other gold and base-metal anomalies, altered zones, favorable lithologies, and structural zones are known to exist throughout the survey area.

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.

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

² Fugro Airborne Surveys Corp.

AVAILABLE DATA

| Data Type | Provider | Description |
|-------------------|----------------------|---|
| 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 DGGGS | Project and field reports, survey background information, gridded data explanations, other documentation |
| grids_ermapper | contractor and DGGGS | Geographically registered gridded data, ER Mapper ERS format |
| grids_geosoft | contractor and DGGGS | 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 | DGGGS | GeoTiff format images of all gridded data |
| kmz | DGGGS | keyhole markup language (kml) kmz archive files of project data. Viewable in Google Earth and other compatible programs |
| maps_pdf_format | contractor and DGGGS | Printable maps in pdf format |
| maps_prn_format | contractor | Printable maps in HPGL/2 printer file format with extension .prn |
| vector_data | contractor and DGGGS | Line path, data contours, and survey boundary in ESRI shapefile (SHP) format, ESRI Geodatabase format, and/or AutoCAD dxf format |

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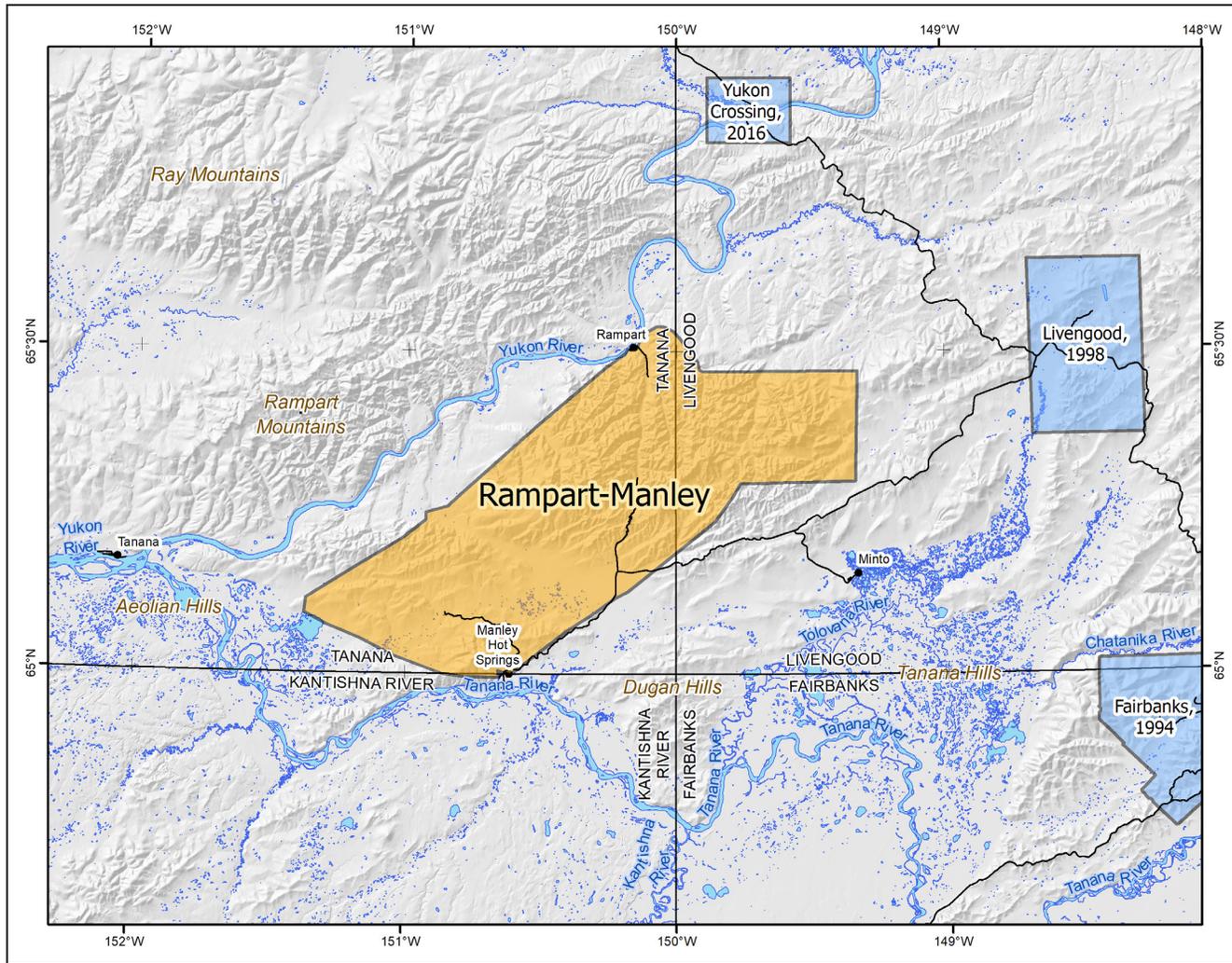


Figure 1. Rampart–Manley electromagnetic and magnetic airborne geophysical survey location shown in interior Alaska (inset). Rampart–Manley survey area shown with adjacent DGGs geophysical surveys, landmarks, relevant 1:250,000-scale quadrangle boundaries, mountain ranges, rivers, and elevation hillshade.



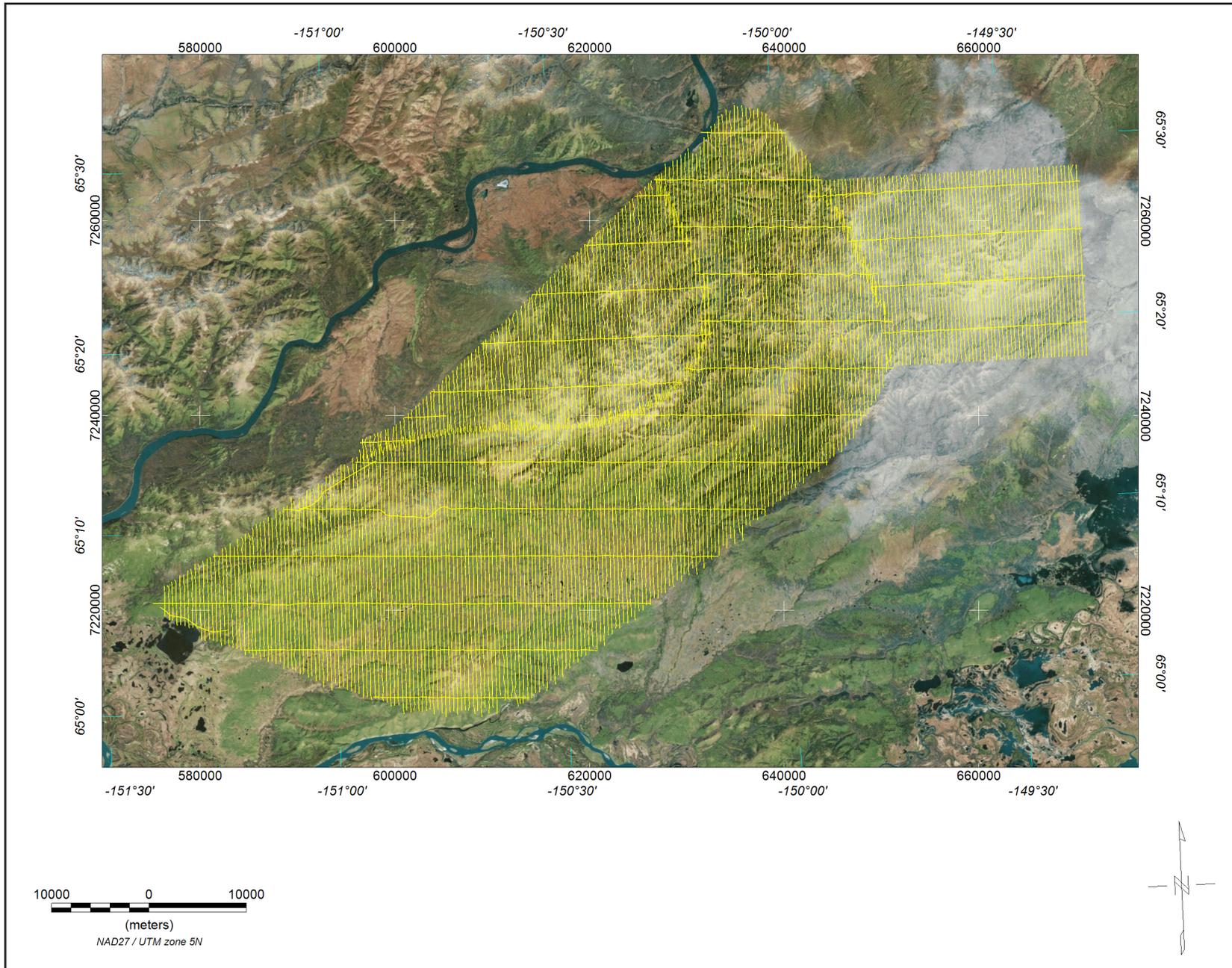


Figure 2. Flight path with orthometric image.

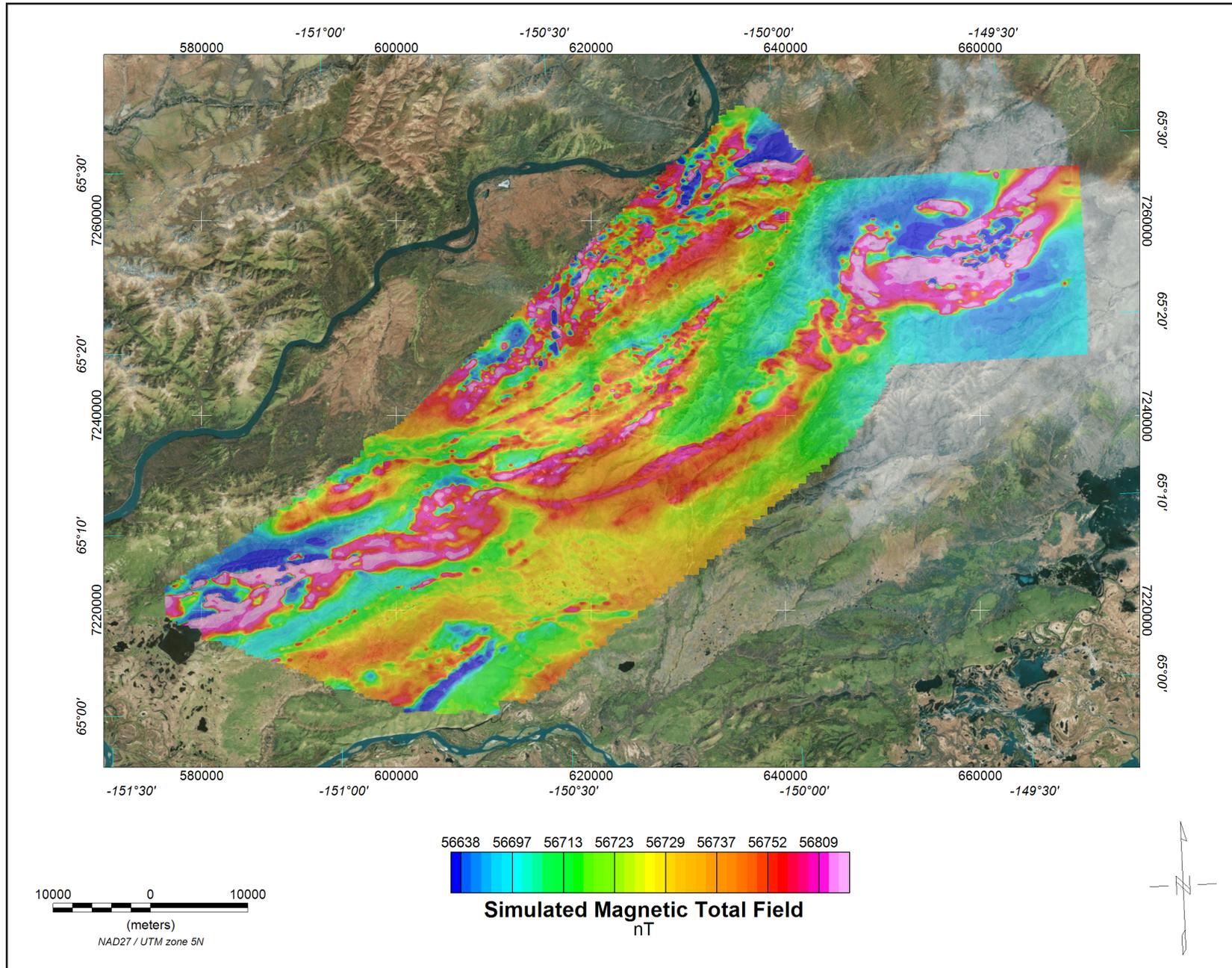


Figure 3. Simulated magnetic total field grid with orthometric image. The magnetic total field data were processed using digitally recorded data from a Scintrex cesium CS2 magnetometer. Data were collected at a sampling interval of 0.1 seconds. The magnetic data were (1) corrected for diurnal variations by subtracting the digitally recorded base station magnetic data, (2) IGRF corrected (IGRF model 1985, updated to October, 1996), (3) leveled to the tie line data, (4) a constant value of approximately 57,000 nT was added to all data, and (5) interpolated onto a regular 100 m grid using a modified Akima (1970) technique

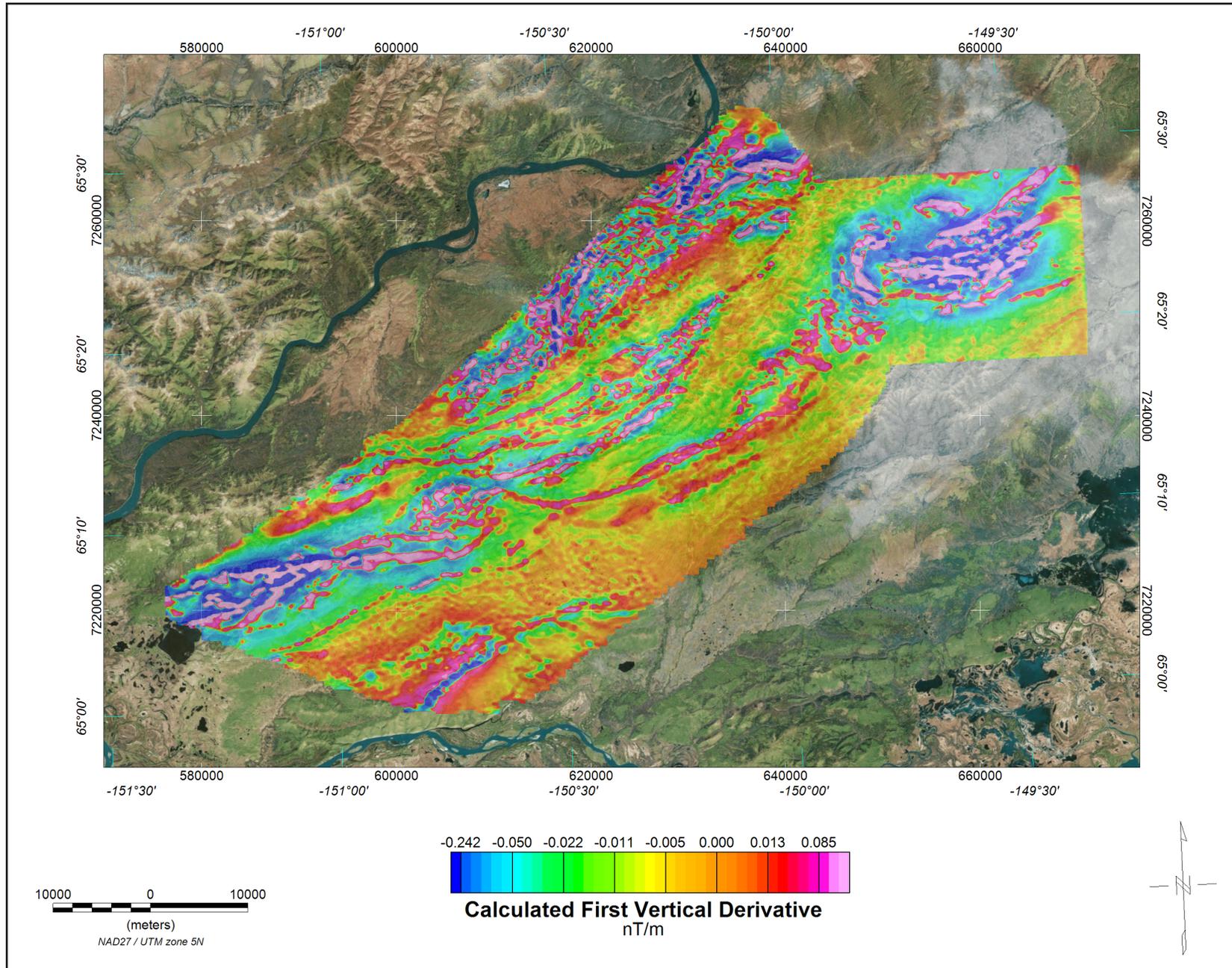


Figure 4. Calculated first vertical derivative grid with orthometric image. The first vertical derivative grid was calculated from the diurnally-corrected, IGRF-corrected total magnetic field grid using a FFT base frequency domain filtering algorithm. The resulting first vertical derivative grid provides better definition and resolution of near-surface magnetic units and helps to identify weak magnetic features that may not be evident on the total field data

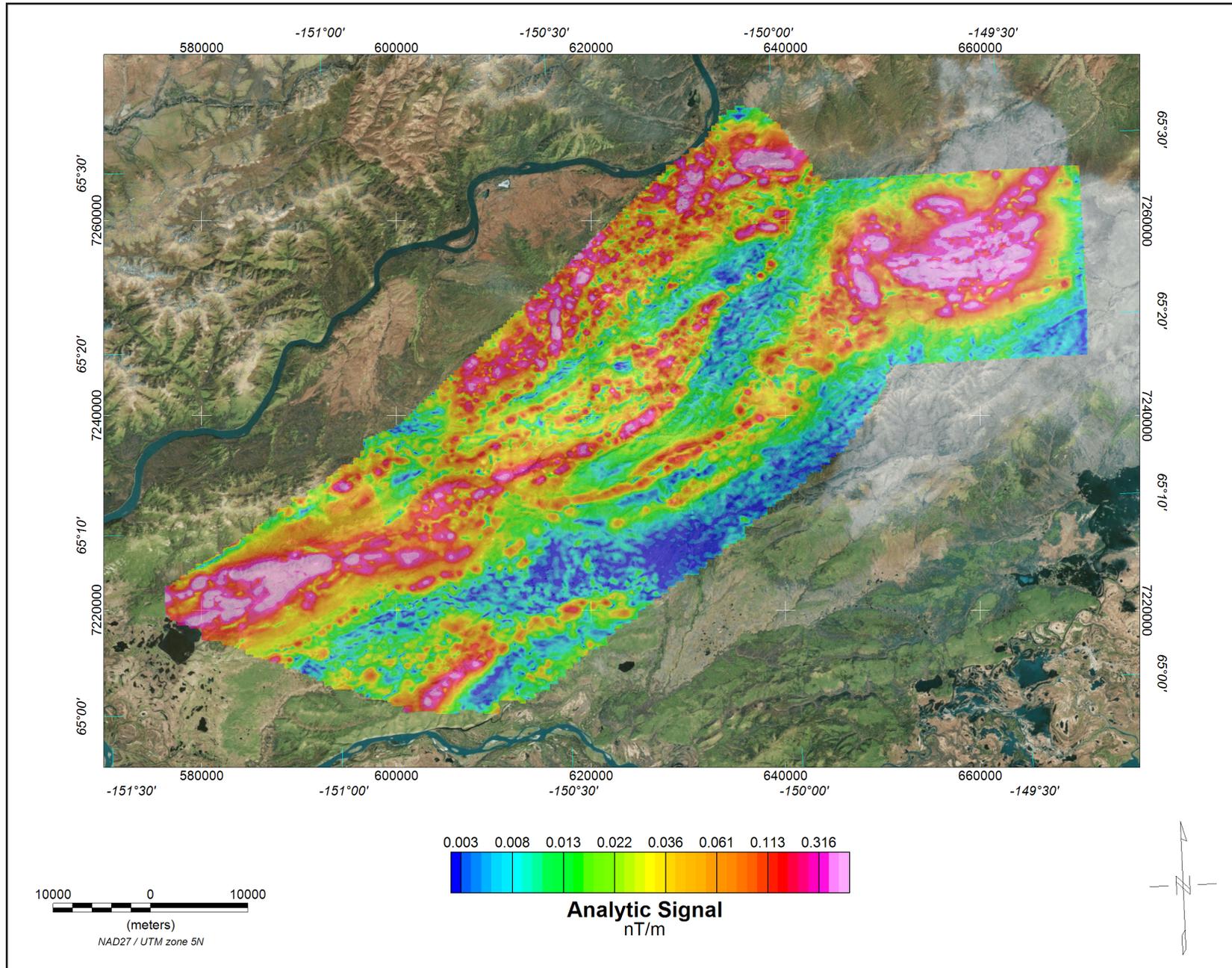


Figure 5. Analytic signal grid with orthometric image. Analytic signal is the total amplitude of all directions of magnetic gradient calculated from the sum of the squares of the three orthogonal gradients. Mapped highs in the calculated analytic signal of magnetic parameter locate the anomalous source body edges and corners (such as contacts, fault/shear zones, etc.). Analytic signal maxima are located directly over faults and contacts, regardless of structural dip, and independent of the direction of the induced and/or remanent magnetizations.

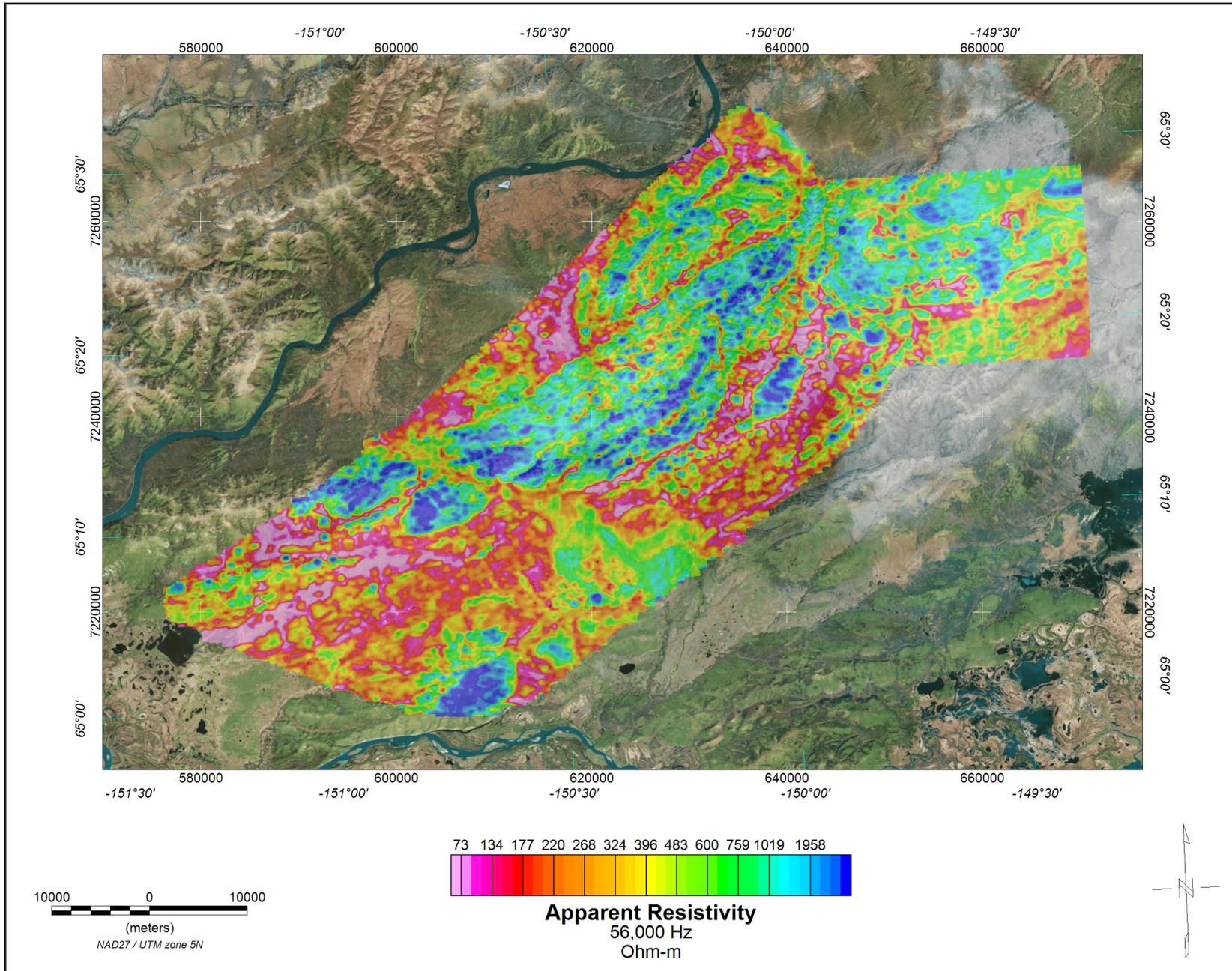


Figure 6. 56,000 Hz coplanar apparent resistivity grid with orthometric image. The DIGHEM^Y EM system measured inphase and quadrature components at five frequencies. Two vertical coaxial coil-pairs operated at 900 and 5000 Hz while three horizontal coplanar coil-pairs operated at 900, 7,200, and 56,000 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 56,000 Hz using the pseudo-layer half space model. The data were interpolated onto a regular 100 m grid using a modified Akima (1970) technique.

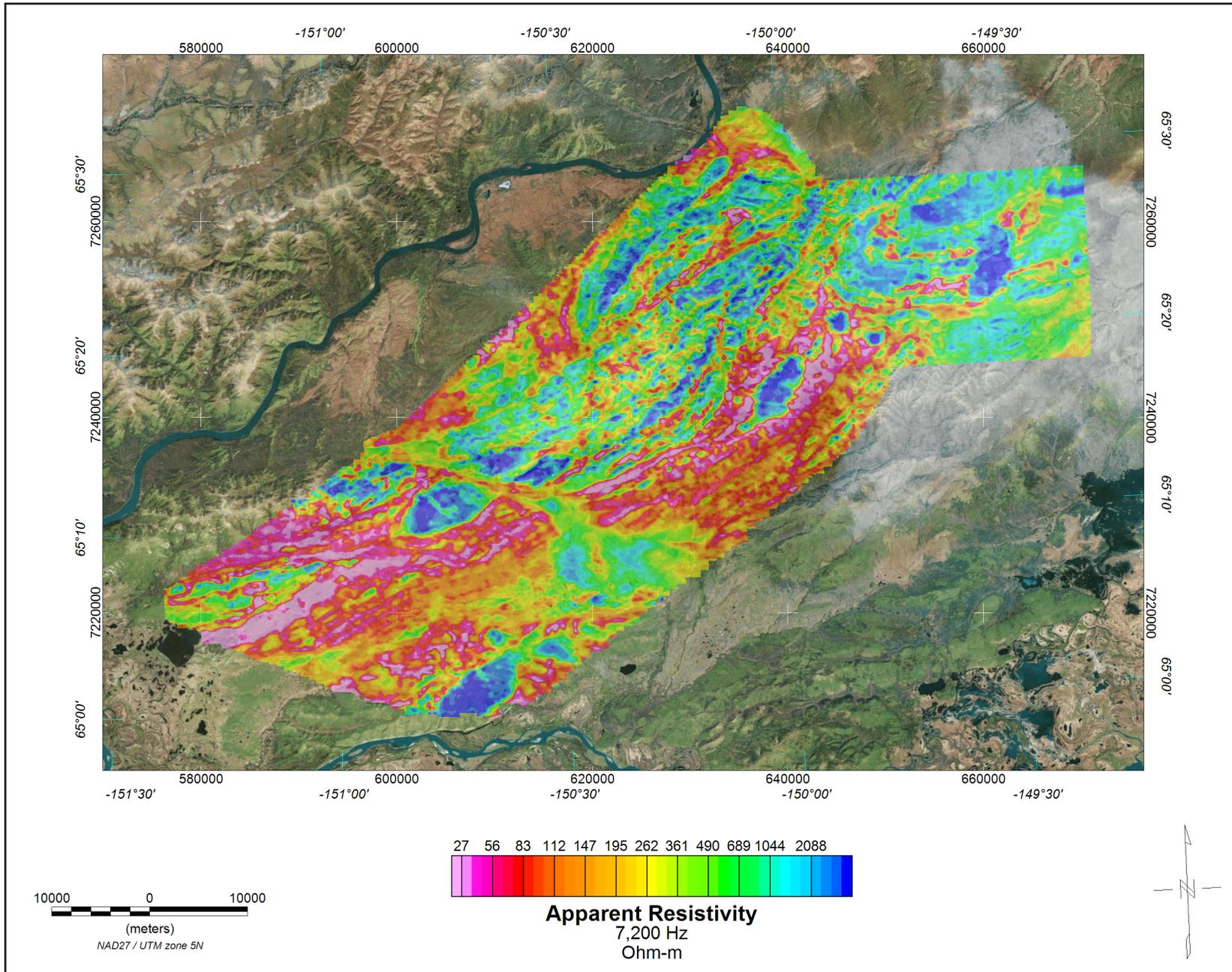


Figure 7. 7,200 Hz coplanar apparent resistivity grid with orthometric image. The DIGHEM[®] EM system measured inphase and quadrature components at five frequencies. Two vertical coaxial coil-pairs operated at 900 and 5000 Hz while three horizontal coplanar coil-pairs operated at 900, 7,200, and 56,000 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 7,200 Hz using the pseudo-layer half space model. The data were interpolated onto a regular 100 m grid using a modified Akima (1970) technique.

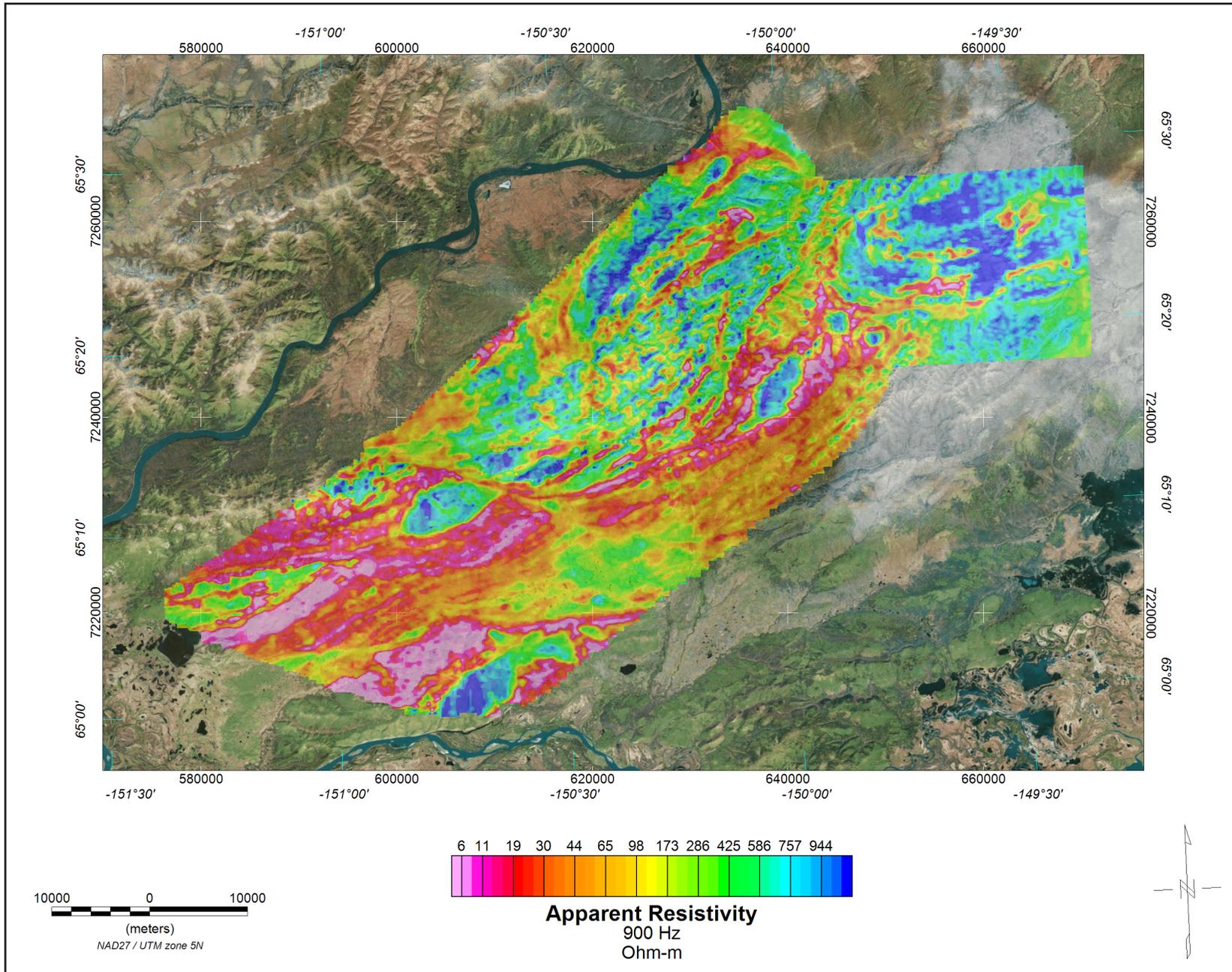
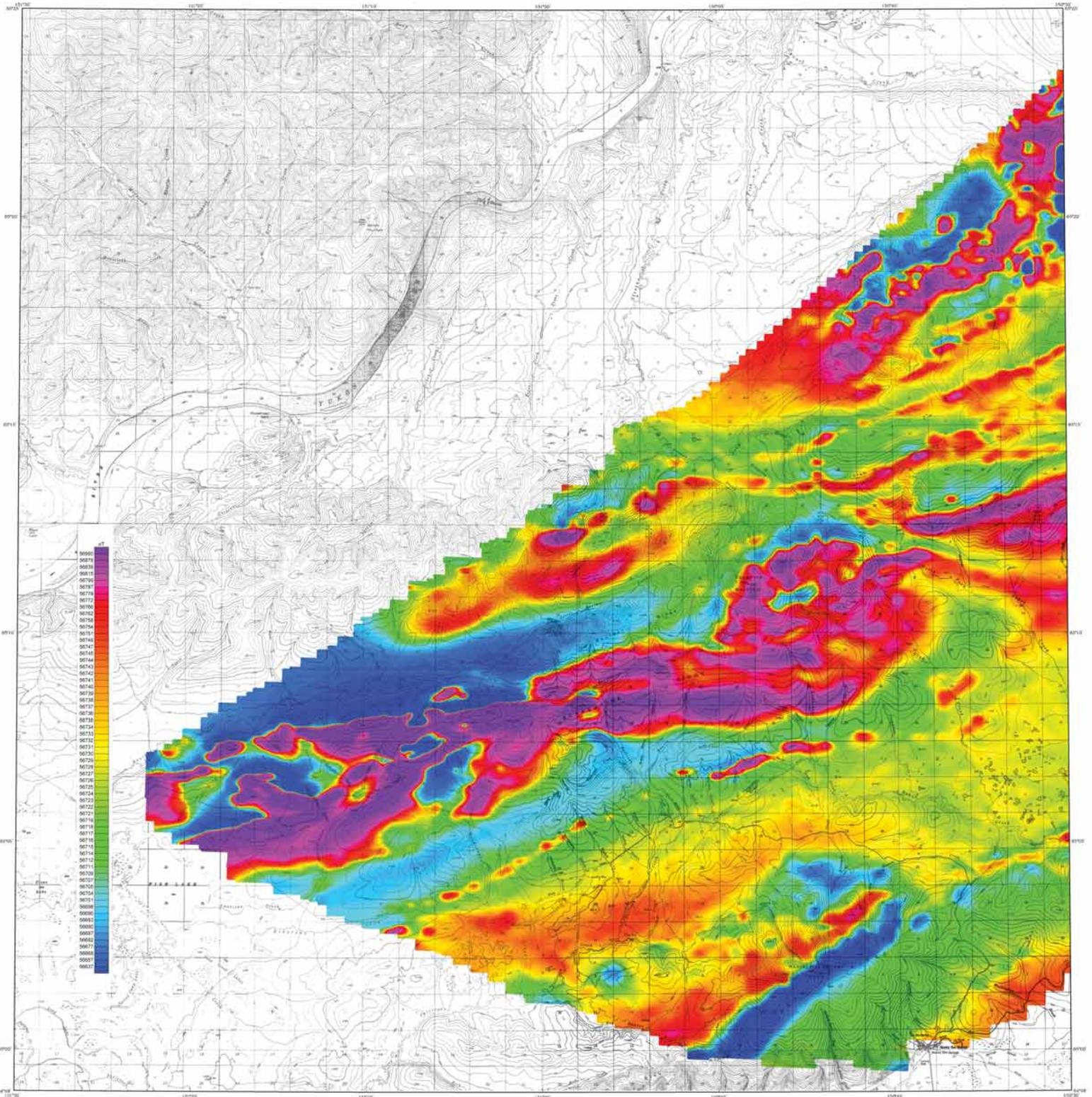


Figure 8. 900 Hz coplanar apparent resistivity grid with orthometric image. The DIGHEM[®] EM system measured inphase and quadrature components at five frequencies. Two vertical coaxial coil-pairs operated at 900 and 5000 Hz while three horizontal coplanar coil-pairs operated at 900, 7,200, and 56,000 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 900 Hz using the pseudo-layer half space model. The data were interpolated onto a regular 100 m grid using a modified Akima (1970) technique.

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/10.14509/30417>

| Map Title | Description |
|--|--|
| rampartmanley_sim_magtf_topo_map_1of3.pdf | simulated magnetic total field grid with topographic base map |
| rampartmanley_sim_magtf_topo_map_2of3.pdf | simulated magnetic total field grid with topographic base map |
| rampartmanley_sim_magtf_topo_map_3of3.pdf | simulated magnetic total field grid with topographic base map |
| rampartmanley_sim_magtf_contours_plss_map_1of3.pdf | simulated magnetic total field grid and contours with public land survey system base layer |
| rampartmanley_sim_magtf_contours_plss_map_2of3.pdf | simulated magnetic total field grid and contours with public land survey system base layer |
| rampartmanley_sim_magtf_contours_plss_map_3of3.pdf | simulated magnetic total field grid and contours with public land survey system base layer |
| rampartmanley_res7200hz_topo_map_1of3.pdf | 7,200 Hz apparent resistivity grid with topographic base map |
| rampartmanley_res7200hz_topo_map_2of3.pdf | 7,200 Hz apparent resistivity grid with topographic base map |
| rampartmanley_res7200hz_topo_map_3of3.pdf | 7,200 Hz apparent resistivity grid with topographic base map |
| rampartmanley_res7200hz_contours_plss_map_1of3.pdf | 7,200 Hz apparent resistivity grid with contours and public land survey system base layer |
| rampartmanley_res7200hz_contours_plss_map_2of3.pdf | 7,200 Hz apparent resistivity grid with contours and public land survey system base layer |
| rampartmanley_res7200hz_contours_plss_map_3of3.pdf | 7,200 Hz apparent resistivity grid with contours and public land survey system base layer |
| rampartmanley_res900hz_topo_map_1of3.pdf | 900 Hz apparent resistivity grid with topographic base map |
| rampartmanley_res900hz_topo_map_2of3.pdf | 900 Hz apparent resistivity grid with topographic base map |
| rampartmanley_res900hz_topo_map_3of3.pdf | 900 Hz apparent resistivity grid with topographic base map |
| rampartmanley_res900hz_contours_plss_map_1of3.pdf | 900 Hz apparent resistivity grid with contours and public land survey system base layer |
| rampartmanley_res900hz_contours_plss_map_2of3.pdf | 900 Hz apparent resistivity grid with contours and public land survey system base layer |
| rampartmanley_res900hz_contours_plss_map_3of3.pdf | 900 Hz apparent resistivity grid with contours and public land survey system base layer |
| rampartmanley_emanomalies_sim_magtf_contours_topo_map_1of3.pdf | electromagnetic anomaly map with simulated magnetic total field grid contours and topographic base map |
| rampartmanley_emanomalies_sim_magtf_contours_topo_map_2of3.pdf | electromagnetic anomaly map with simulated magnetic total field grid contours and topographic base map |
| rampartmanley_emanomalies_sim_magtf_contours_topo_map_3of3.pdf | electromagnetic anomaly map with simulated magnetic total field grid contours and topographic base map |
| rampartmanley_interpretation_plss_map_1of3.pdf | interpretation based on geophysical data with public land survey system base layer |
| rampartmanley_interpretation_plss_map_2of3.pdf | interpretation based on geophysical data with public land survey system base layer |
| rampartmanley_interpretation_plss_map_3of3.pdf | interpretation based on geophysical data with public land survey system base layer |



**TOTAL MAGNETIC FIELD
OF THE RAMPART-MANLEY MINING DISTRICT,
ALASKA**

PARTS OF FAIRBANKS, KANTISHNA RIVER, LIVENGOOD AND TANANA QUADRANGLES

by
**Laurel E. Burns, Fugro Altona Surveys Corp., and Stevens Exploration Management Corp.,
2004**

DESCRIPTIVE NOTES

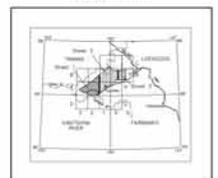
The data for this report were acquired with a GEOMAG Electromagnetic (EM) system, a Scripps Institute of Oceanography (SIO) system, with a sampling interval of 0.5 seconds. The magnetic data were (1) corrected for diurnal variations, by subtraction of the digital magnetic data and (2) corrected for the 10 m line data, and (3) interpolated onto a regular 100 m grid using a modified Akima (1978) technique. The regional version (see 608) drafted, 1985, available in Geodata, 1985 was removed from the dataset. Magnetic data were removed from the dataset. Magnetic data were removed from the dataset.

TOTAL MAGNETIC FIELD

The magnetic field data were produced using software developed at the Scripps Institute of Oceanography (SIO) system, with a sampling interval of 0.5 seconds. The magnetic data were (1) corrected for diurnal variations, by subtraction of the digital magnetic data and (2) corrected for the 10 m line data, and (3) interpolated onto a regular 100 m grid using a modified Akima (1978) technique. The regional version (see 608) drafted, 1985, available in Geodata, 1985 was removed from the dataset. Magnetic data were removed from the dataset. Magnetic data were removed from the dataset.



LOCATION INDEX



SURVEY HISTORY

The area has been surveyed and other work completed between the State of Alaska Department of Natural Resources, Division of Geologic & Geophysical Surveys, and Stevens Exploration Management Corp. The work was conducted by Fugro Altona Surveys and Stevens Exploration Management Corp. The work was conducted by Fugro Altona Surveys and Stevens Exploration Management Corp. The work was conducted by Fugro Altona Surveys and Stevens Exploration Management Corp.

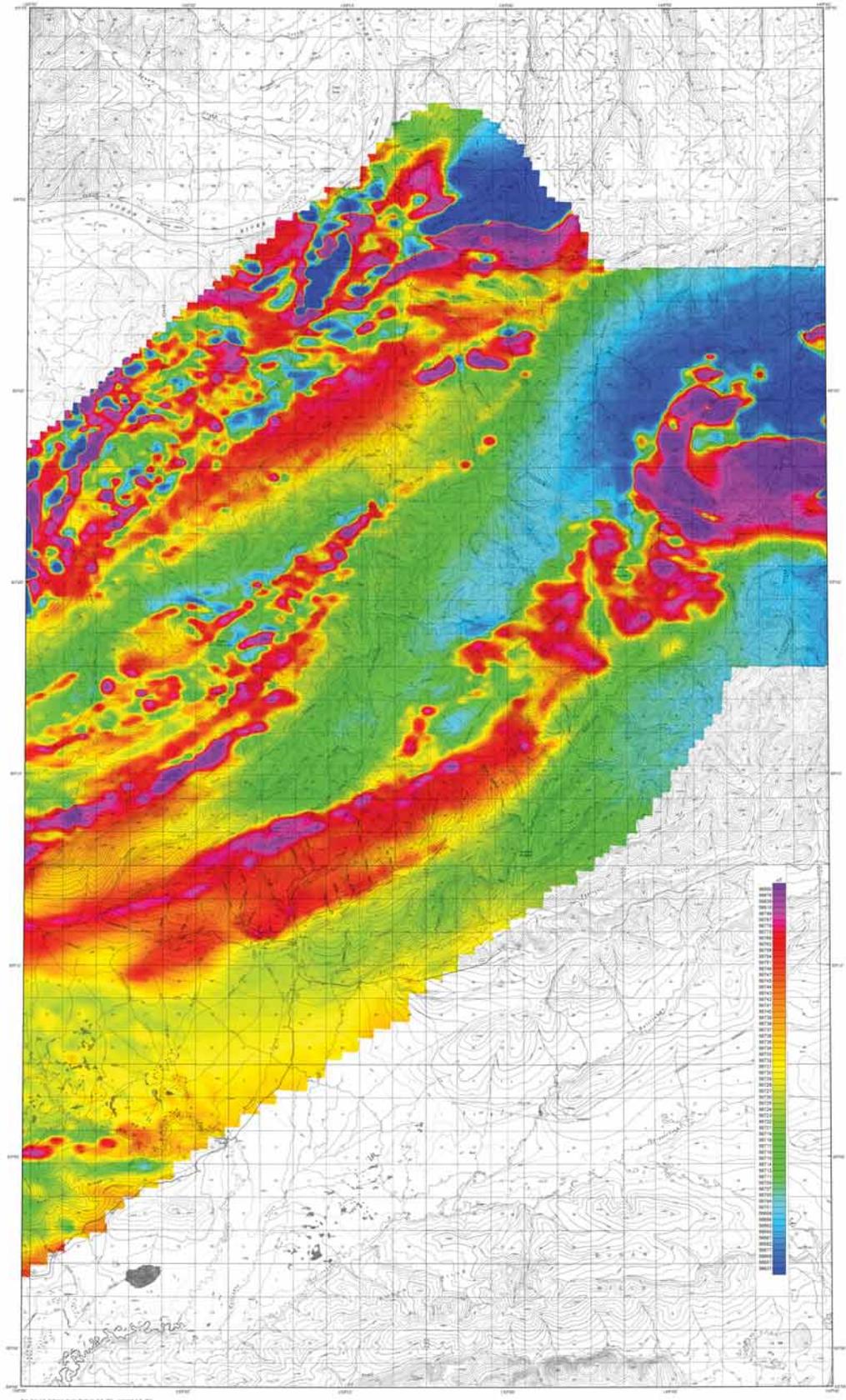


FIG. 17-10. TOTAL MAGNETIC FIELD, 2004-10-1a



**TOTAL MAGNETIC FIELD
OF THE RAMPART-MANLEY MINING DISTRICT,
ALASKA**
PARTS OF FAIRBANKS, KANTISHNA RIVER, LIVEGOOD AND TAHANA QUADRANGLES

by
Lauri E. Bama, Fugro Alaska Surveys Corp., and Stevens Exploration Management Corp.
2004

LOCATION INDEX



DESCRIPTIVE NOTES

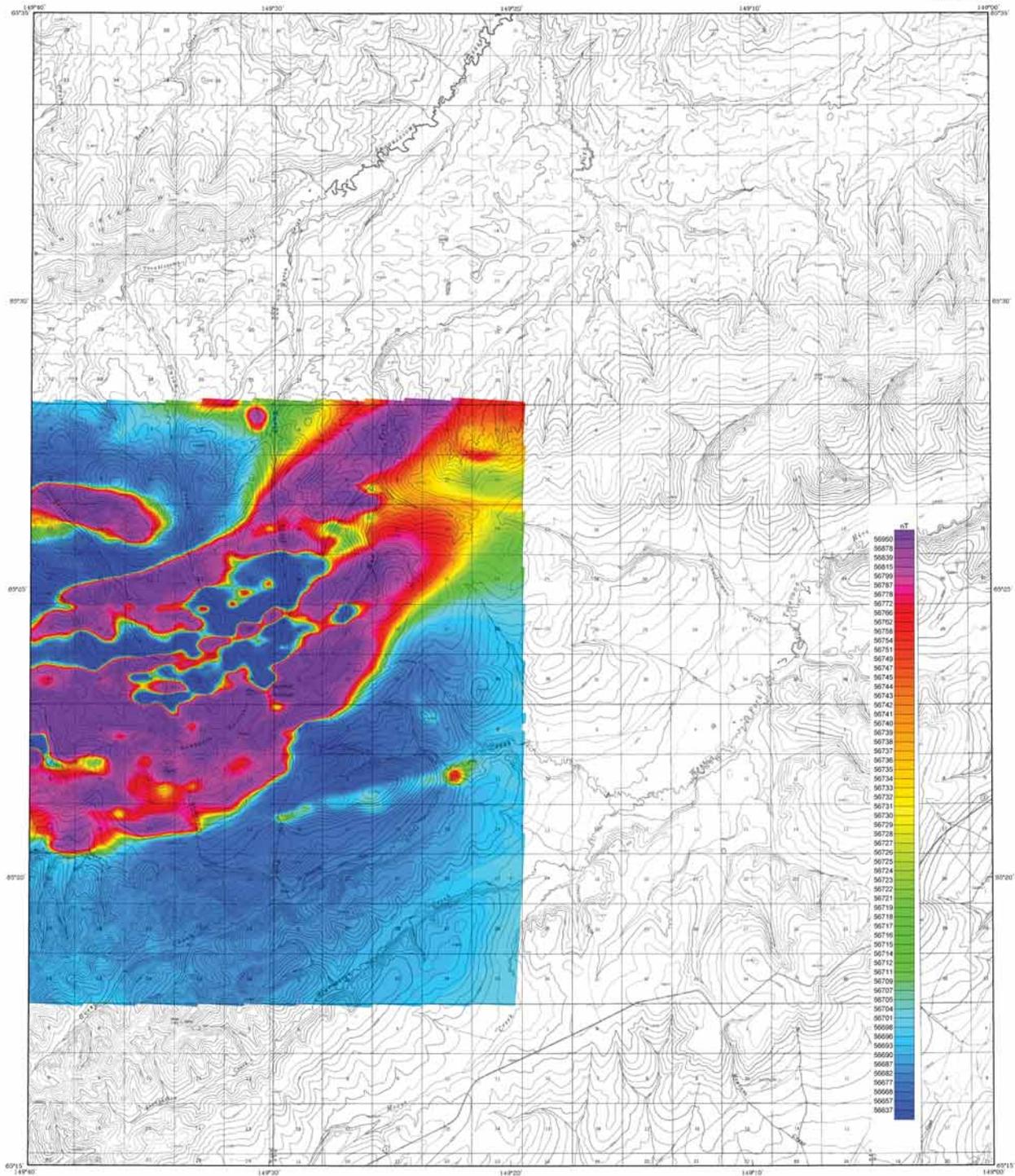
The information on this report is based on data collected during the survey. The data were collected using a digital magnetic field recording system with a sampling interval of 0.1 seconds. The magnetic field was measured in nanotesla (nT) and the magnetic declination was measured in degrees. The magnetic declination was measured at the time of the survey. The magnetic declination was measured at the time of the survey. The magnetic declination was measured at the time of the survey.

TOTAL MAGNETIC FIELD

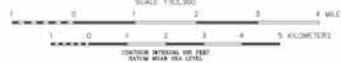
The magnetic field data were collected using a digital magnetic field recording system with a sampling interval of 0.1 seconds. The magnetic field was measured in nanotesla (nT) and the magnetic declination was measured in degrees. The magnetic declination was measured at the time of the survey. The magnetic declination was measured at the time of the survey.

SURVEY HISTORY

The survey was conducted by Fugro Alaska Surveys Corp. and Stevens Exploration Management Corp. in 2004. The survey was conducted in the Rampart-Manley Mining District, Alaska. The survey was conducted in the Rampart-Manley Mining District, Alaska.



Base Map: U.S. Geological Survey Catalog # 1:63,500 3-4, 1986
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TOTAL MAGNETIC FIELD OF THE RAMPART-MANLEY MINING DISTRICT, ALASKA

PARTS OF FAIRBANKS, KANTISHNA RIVER, LIVNGOOD AND TANANA QUADRANGLES

by
Laurel E. Burns, Fugro Airborne Surveys Corp., and Stevens Exploration Management Corp.
2004

DESCRIPTIVE NOTES

The geophysical data were acquired with a DIGHEM[®] Electromagnetics (EM) system, a Scintrex caesium Cs132 magnetometer, and a Sierra VLS system installed in an AS350B-1 Squirrel helicopter. In addition, the survey recorded data from a rotor altimeter, GPS navigation system, 20/20 Hz monitors, and video camera. Flights were performed at a mean terrain clearance of 300 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.

A Garmin 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 Clark 1860 (UTM) projection, 1987 North American datum using a central meridian (CM) of 153.7, a north constant of 0 and an east constant of 300,000. Positional accuracy of the projected data is better than 10 m with respect to the UTM grid.

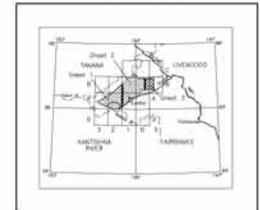
TOTAL MAGNETIC FIELD

The magnetic total field contours were produced using digitally recorded data from a Scintrex caesium Cs132 magnetometer, with a sampling interval of 0.1 seconds. The magnetic data 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 IGF gradient, 1985, updated to October, 1996) was removed from the leveled magnetic data.

NOTE: In 1970, a new method of interpolation and smooth curve fitting based on local procedures, as of the Association of Geophysical Geographers, a 10, no. 4, p. 588-603.

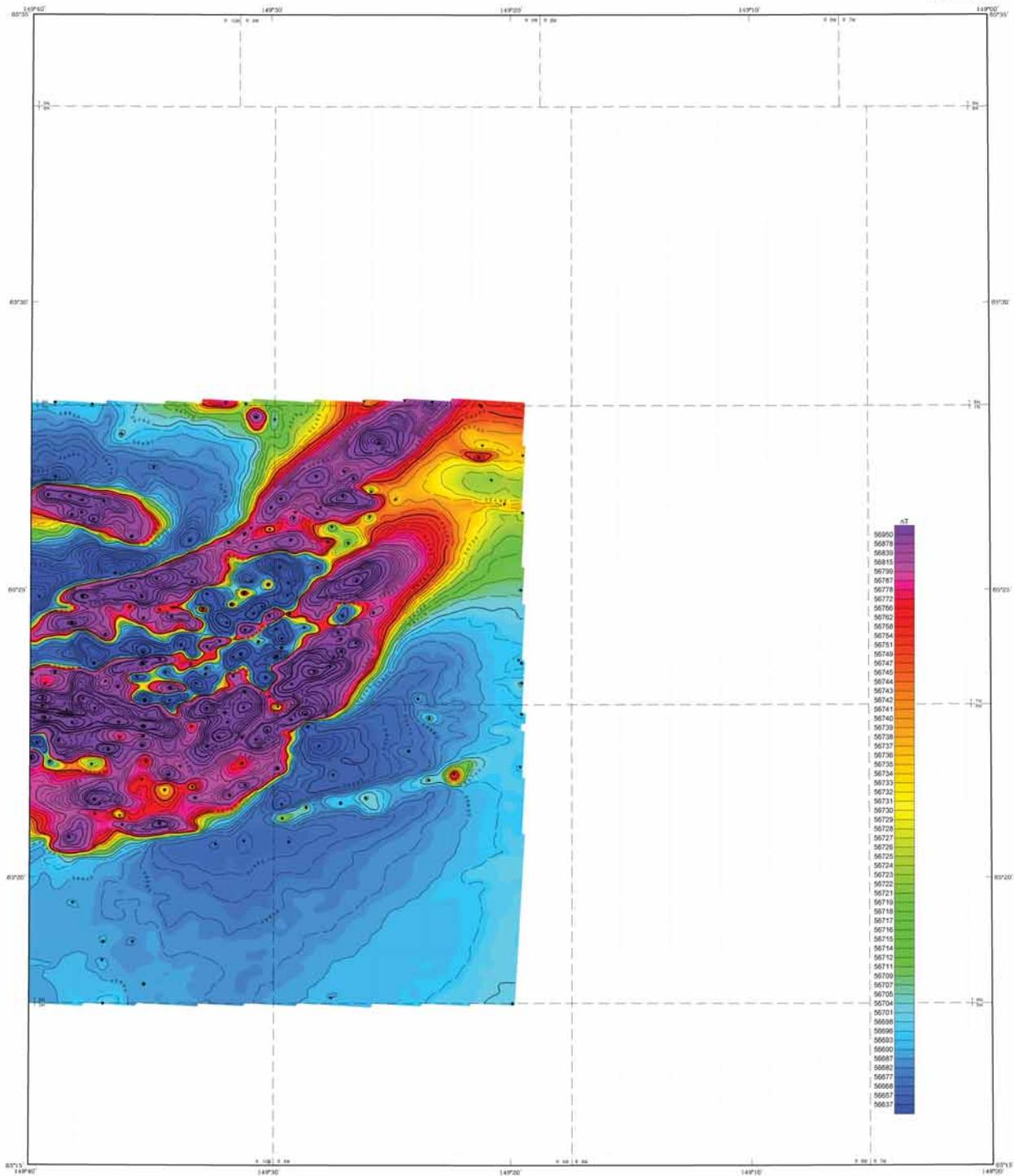


LOCATION INDEX



SURVEY HISTORY

The map has been compiled and drawn under contract between the State of Alaska, Department of Natural Resources, Division of Geological & Geophysical Surveys, and Stevens Exploration Management Corp. The map was produced by Fugro Airborne Surveys and supervised the earlier full color version released by DGS in 1987. Airborne geophysical data for the area were acquired and processed in 1996 under contract between DGS and WDM, Mining and Geological Consultants, Inc. The subcontractor acquiring and processing the data was DIGHEM, a division of CGO Canada Ltd. Other products from this survey are available from DGS, 3354 Conroy Road, Fairbanks, Alaska, 99708-3707.



Derives outline from U.S. Geological Survey (Langford B-1, 1961; B-4, 1961; Langford C-1, 1961; C-2, 1961; Sutherland, 1961).



TOTAL MAGNETIC FIELD OF THE RAMPART-MANLEY MINING DISTRICT, ALASKA

PARTS OF FAIRBANKS, KANTISHNA RIVER, LIVNGOOD AND TANANA QUADRANGLES

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Laurel E. Burns, Fugro Airborne Surveys Corp., and Stevens Exploration Management Corp.
2004

DESCRIPTIVE NOTES

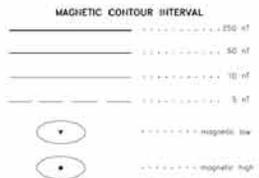
The geophysical data were acquired with a DIGHEW® Electromagnetic (EM) system, a Sinterex cesium CS2 magnetometer, and a four VLF system installed in an AG-550B-1 Squirrel helicopter. In addition, the survey recorded data from a radio altimeter, GPS navigation system, 50700 Hz magnetron and video camera. Flights were performed at a mean terrain altitude of 200 feet using 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.

A General Real-Time Differential Global Positioning System (RT-DGPS) was used for both navigation and flight path recovery. The helicopter position was derived every 0.3 seconds using real-time differential positioning to a relative accuracy of better than 10 m. Flight path positions were projected onto the GDA82 datum (UTM) system, 1977 North American datum using a central meridian (CM) of 152° 0' 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.

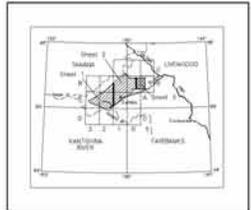
TOTAL MAGNETIC FIELD

The magnetic total field contours were produced using digitally recorded data from a Sinterex cesium CS2 magnetometer, with a sampling interval of 0.1 seconds. The magnetic data 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 Jansa (1970) technique. The regional variation (or IGRF gradient, 1985, updated to October, 1996) was removed from the leveled magnetic data.

Arino, 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. 580-582.

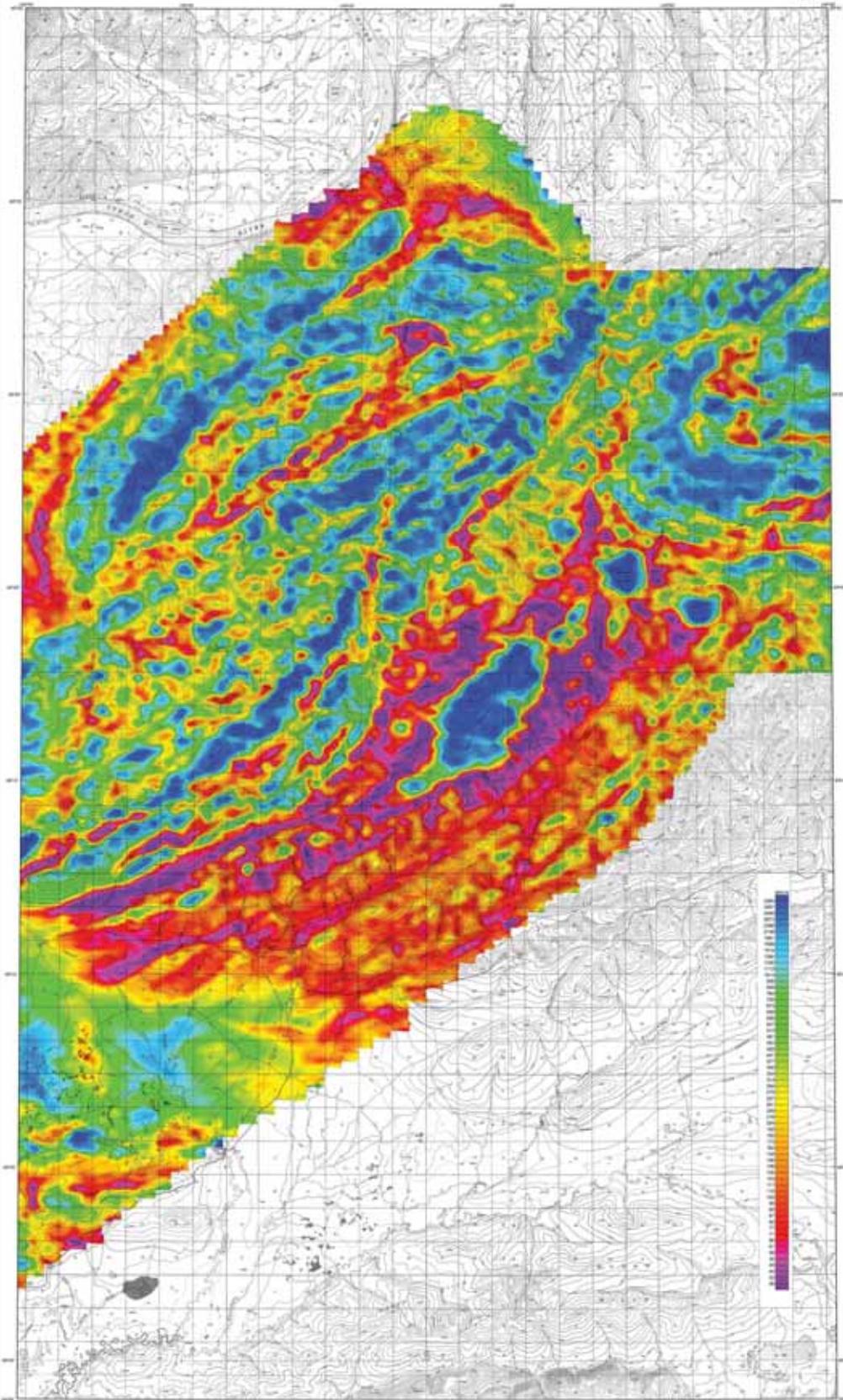


LOCATION INDEX



SURVEY HISTORY

The map has been compiled and drawn under contract between the State of Alaska, Department of Natural Resources, Division of Geological & Geophysical Surveys, and Stevens Exploration Management Corp. The map was produced by Fugro Airborne Surveys and supersedes the earlier full color version released by DGGIS in 1987. Airborne geophysical data for the area were acquired and processed in 1996 under contract between DGGIS and WGM, Mining and Geological Consultants, Inc. The subcontractor acquiring and processing the data was GDEM, a division of CGG Canada Ltd. Other products from this survey are available from DGGIS, 3354 College Road, Fairbanks, Alaska, 99709-3707.



U.S. GEOLOGICAL SURVEY (1:250,000), 1987-1992, 10



**7200 Hz COPLANAR APPARENT RESISTIVITY
OF THE RAMPART-MANLEY MINING DISTRICT,
ALASKA**

PARTS OF FAIRBANKS, KANTISHNA RIVER, LIVENOOD AND TAKANA QUADRANGLES

by
Laural E. Stone, Fugro Alaska Services Corp., and Steven E. Heston, Heston Management Corp.
2004



DESCRIPTIVE NOTES

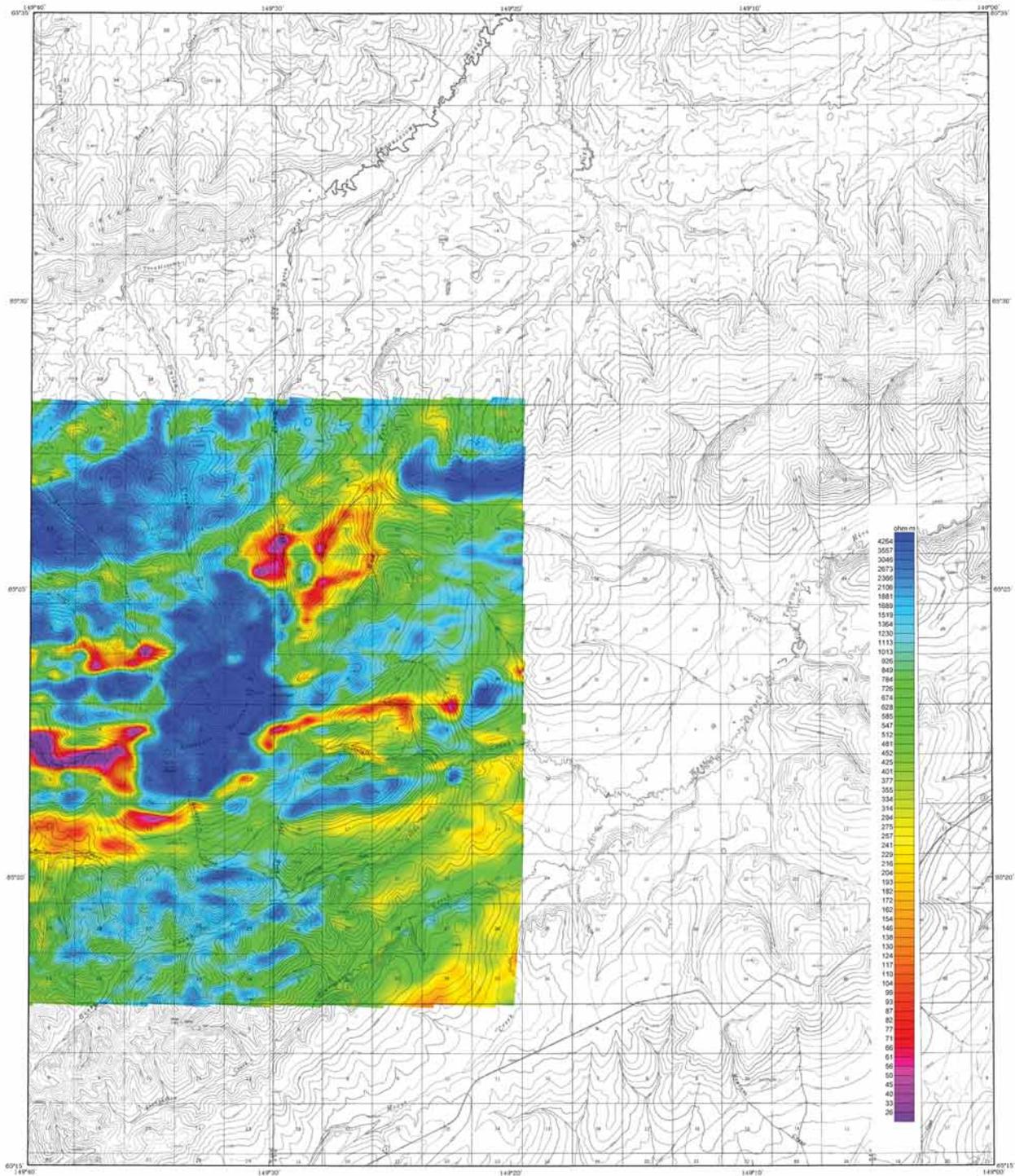
This report contains the results of a 7200 Hz coplanar resistivity survey conducted in the Rampart-Manley Mining District, Alaska. The survey was conducted by Fugro Alaska Services Corp. and Heston Management Corp. in 2004. The data were processed using the RES2DINV software package. The resulting resistivity map is shown on this sheet. The map is overlaid on a topographic contour map. The color scale on the right indicates resistivity values in Ohm-meters. The map shows complex resistivity patterns with high resistivity (red/orange) and low resistivity (blue) areas. The high resistivity areas are generally oriented north-south, while the low resistivity areas are generally oriented east-west. The map is overlaid on a grid with a spacing of 100 meters. The grid coordinates are given in UTM (Universal Transverse Mercator) projection. The map is overlaid on a topographic contour map with a contour interval of 10 meters. The topographic map is overlaid on a grid with a spacing of 100 meters. The grid coordinates are given in UTM (Universal Transverse Mercator) projection. The map is overlaid on a topographic contour map with a contour interval of 10 meters. The topographic map is overlaid on a grid with a spacing of 100 meters. The grid coordinates are given in UTM (Universal Transverse Mercator) projection.

REMARKS

The resistivity data were collected using a 7200 Hz coplanar resistivity survey. The survey was conducted in the Rampart-Manley Mining District, Alaska. The data were processed using the RES2DINV software package. The resulting resistivity map is shown on this sheet. The map is overlaid on a topographic contour map. The color scale on the right indicates resistivity values in Ohm-meters. The map shows complex resistivity patterns with high resistivity (red/orange) and low resistivity (blue) areas. The high resistivity areas are generally oriented north-south, while the low resistivity areas are generally oriented east-west. The map is overlaid on a grid with a spacing of 100 meters. The grid coordinates are given in UTM (Universal Transverse Mercator) projection. The map is overlaid on a topographic contour map with a contour interval of 10 meters. The topographic map is overlaid on a grid with a spacing of 100 meters. The grid coordinates are given in UTM (Universal Transverse Mercator) projection.

SURVEY METHOD

The resistivity data were collected using a 7200 Hz coplanar resistivity survey. The survey was conducted in the Rampart-Manley Mining District, Alaska. The data were processed using the RES2DINV software package. The resulting resistivity map is shown on this sheet. The map is overlaid on a topographic contour map. The color scale on the right indicates resistivity values in Ohm-meters. The map shows complex resistivity patterns with high resistivity (red/orange) and low resistivity (blue) areas. The high resistivity areas are generally oriented north-south, while the low resistivity areas are generally oriented east-west. The map is overlaid on a grid with a spacing of 100 meters. The grid coordinates are given in UTM (Universal Transverse Mercator) projection. The map is overlaid on a topographic contour map with a contour interval of 10 meters. The topographic map is overlaid on a grid with a spacing of 100 meters. The grid coordinates are given in UTM (Universal Transverse Mercator) projection.



Base Map: U.S. Geological Survey (Copyright © U.S. GEO. 1984, 1988, 1994, 1998, 2002)
Copyright © U.S. GEO. 1984, 1988, 1994, 1998, 2002



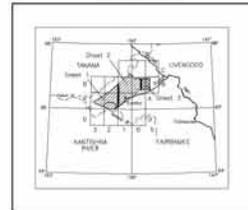
7200 Hz COPLANAR APPARENT RESISTIVITY OF THE RAMPART-MANLEY MINING DISTRICT, ALASKA

PARTS OF FAIRBANKS, KANTISHNA RIVER, LIVNGOOD AND TANANA QUADRANGLES

by
Laurel E. Burns, Fugro Airborne Surveys Corp., and Stevens Exploration Management Corp.
2004



LOCATION INDEX



DESCRIPTIVE NOTES

The geophysical data were acquired with a DIGHM[®] Electromagnetics (EM) system, a Spintrea caesium Cs2 magnetometer, and a Sierra VLI system installed in an AC308B-1 Squirrel helicopter. In addition, the survey recorded data from a rotor altimeter, GPS navigation system, 20/20 Hz monitors and video camera. Flights were performed 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.

A Garmin 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 Clark 1860 (UTM) projection, 1987 North American datum using a central meridian (CM) of 153.7, a north constant of 0 and an east constant of 300,000. Positional accuracy of the projected data is better than 10 m with respect to the UTM grid.

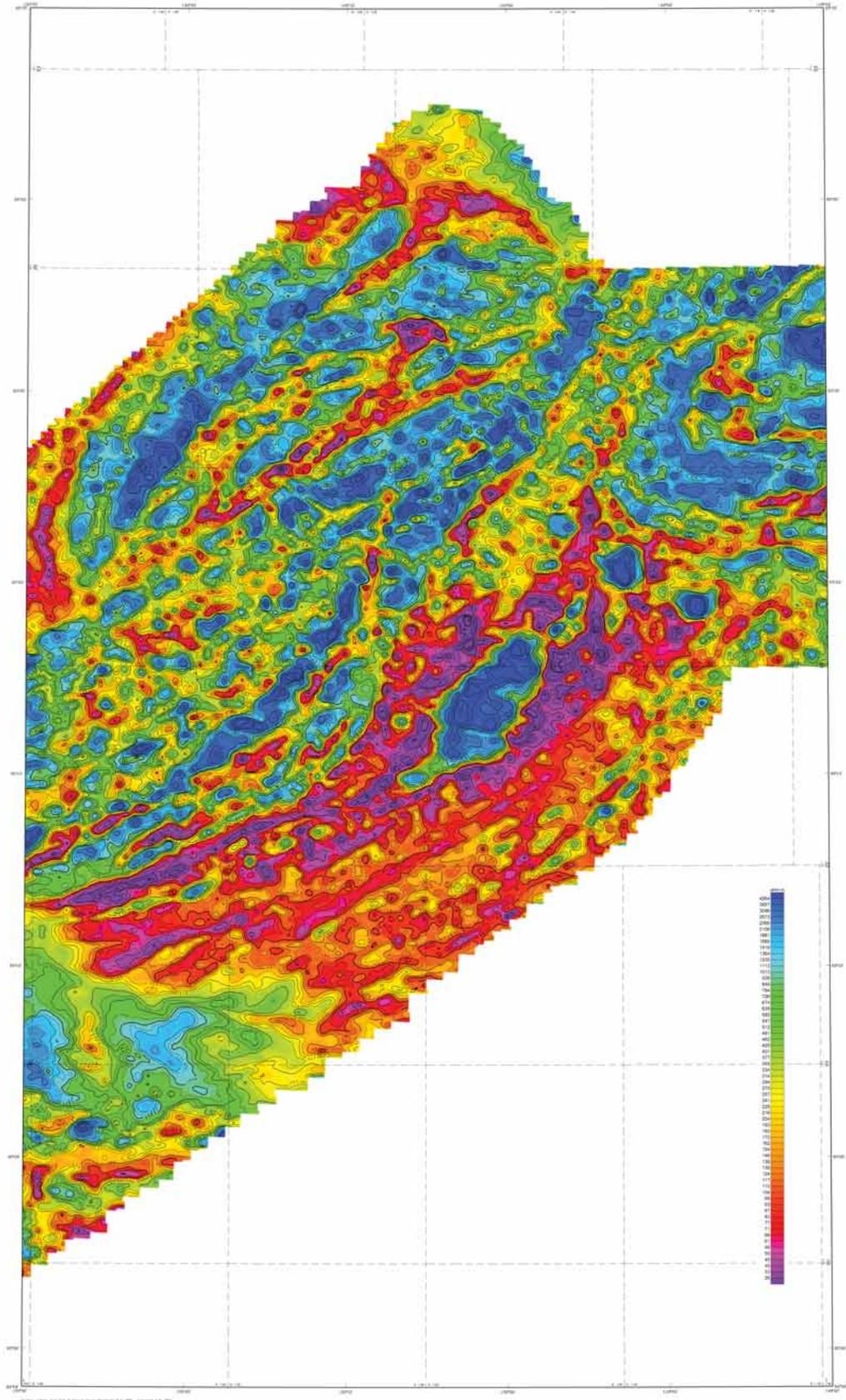
RESISTIVITY

The DIGHM[®] EM system measured in-phase and quadrature components at five frequencies: two vertical coplanar coil-pairs operated at 300 and 3000 Hz while three horizontal coplanar coil-pairs operated at 300, 750 and 36,000 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 in-phase and quadrature component of the 7200 Hz data using the pseudo-layer method. The data were interpolated onto a regular 100 m grid using a modified Akima (1970) technique.

Smith, H. 1970. A new method of interpolation and weight curve fitting based on data distribution. *Journal of the Association of Computing Machinery*, 17, 4: 571-580.

SURVEY HISTORY

The map has been compiled and drawn under contract between the State of Alaska, Department of Natural Resources, Division of Geological & Geophysical Surveys, and Stevens Exploration Management Corp. The map was produced by Fugro Airborne Surveys and supervised the earlier full color version released by DGS in 1987. Airborne geophysical data for the area were acquired and processed in 1996 under contract between DGS and WDM, Mining and Geological Consultants, Inc. The subcontractor acquiring and processing the data was DIGHM, a division of CGO Canada Ltd. Other products from this survey are available from DGS, 3354 Conroy Road, Fairbanks, Alaska, 99708-3707.



U.S. GEOLOGICAL SURVEY, RESTON, VA 20192-1199
 1:50,000 SCALE
 1:50,000 SCALE
 1:50,000 SCALE



**7200 Hz COPLANAR APPARENT RESISTIVITY
 OF THE RAMPART-MANLEY MINING DISTRICT,
 ALASKA**

PARTS OF FAIRBANKS, KANTISHNA RIVER, LIVENGOOD AND TAHANA QUADRANGLES
 by
 Laurel E. Burns, Fugro Alaska Surveys Corp., and Stevens Exploration Management Corp.
 2004

DESCRIPTIVE NOTES
 This geophysical report was prepared for Stevens Exploration Management Corp. and Fugro Alaska Surveys Corp. The data were collected during a 7200 Hz coplanar resistivity survey of the Rampart-Manley Mining District, Alaska, in 2004. The survey was conducted by Laurel E. Burns and Steven E. Stevens. The data were processed and interpreted by Laurel E. Burns and Steven E. Stevens. The results are presented in this report.

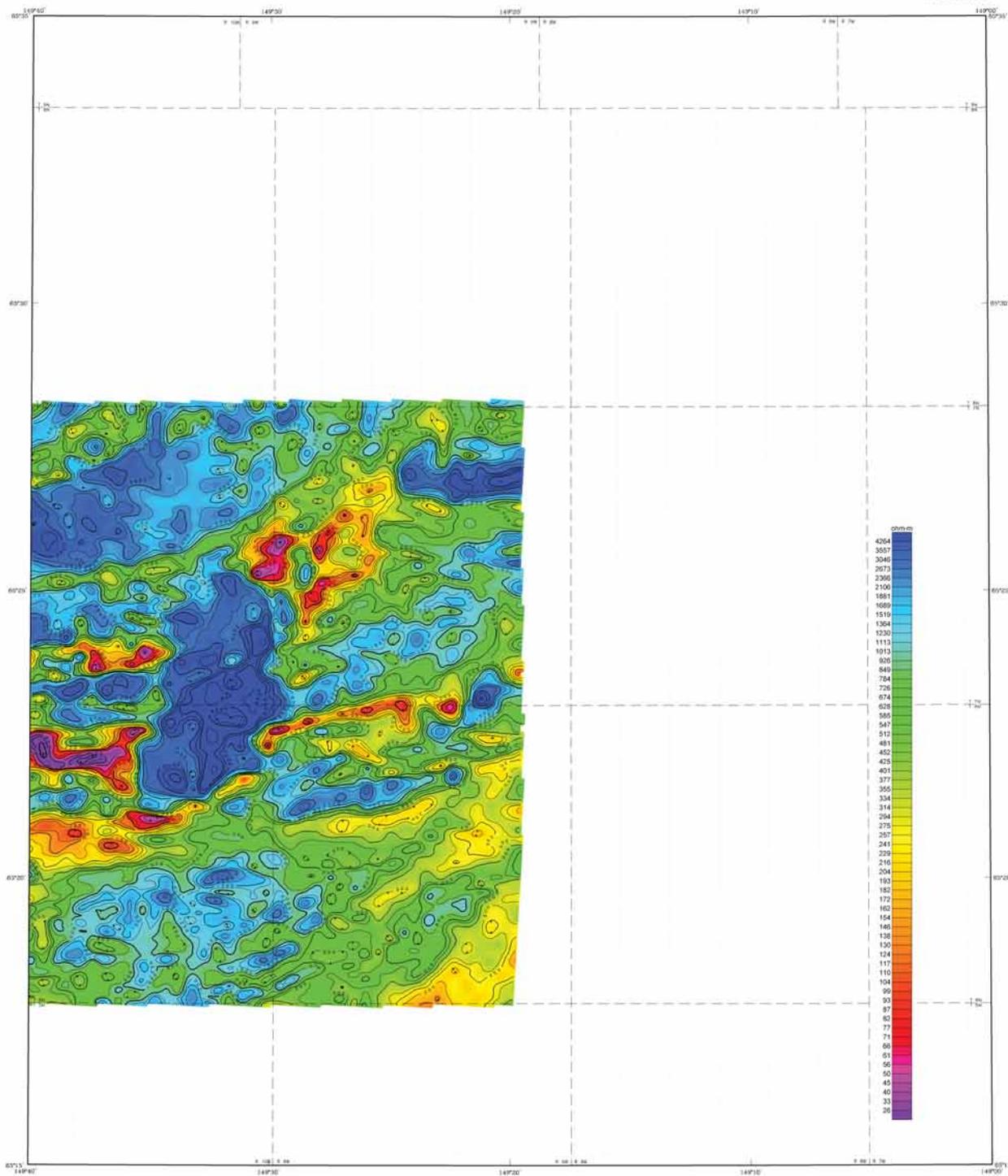
RESISTIVITY
 The resistivity values shown on this map are apparent resistivity values. They are not true resistivity values. The resistivity values are in ohm-meters. The resistivity values are shown in ohm-meters on the color scale legend.

RESISTIVITY CONTOURS

| |
|-----|
| 50 |
| 60 |
| 70 |
| 80 |
| 90 |
| 100 |
| 110 |
| 120 |
| 130 |
| 140 |
| 150 |
| 160 |
| 170 |
| 180 |
| 190 |
| 200 |
| 210 |
| 220 |
| 230 |
| 240 |
| 250 |
| 260 |
| 270 |
| 280 |
| 290 |
| 300 |
| 310 |
| 320 |
| 330 |
| 340 |
| 350 |
| 360 |
| 370 |
| 380 |
| 390 |
| 400 |
| 410 |
| 420 |
| 430 |
| 440 |
| 450 |
| 460 |
| 470 |
| 480 |
| 490 |
| 500 |
| 510 |
| 520 |
| 530 |
| 540 |
| 550 |
| 560 |
| 570 |
| 580 |
| 590 |
| 600 |



SURVEY HISTORY
 This survey was conducted by Laurel E. Burns and Steven E. Stevens in 2004. The survey was part of a larger geophysical survey of the Rampart-Manley Mining District. The survey was conducted using a 7200 Hz coplanar resistivity method. The data were collected using a Geonics EM31-MP resistivity meter. The data were processed using Geonics EM31-MP software. The results are presented in this report.



DESCRIPTIVE NOTES

The geophysical data were acquired with a DIGHEM[®] Electromagnetic (EM) system, a Sontrex cesium CS2 magnetometer, and a VLF system installed in an AG-350B-1 Squirrel helicopter. In addition, the survey recorded data from a radio altimeter, GPS navigation system, 50700 Hz magnetometer, and video camera. Flights were performed at a mean terrain altitude of 200 feet using survey flight lines with a spacing of 0.25 quarter of a mile. The lines were flown perpendicular to the flight lines at intervals of approximately 3 miles.

A General Real-Time Differential Global Positioning System (RT-DGPS) was used for both navigation and flight path recovery. The helicopter position was derived every 0.3 seconds using real-time differential positioning to a relative accuracy of better than 10 m. Flight path positions were projected onto the GDA83 datum (UTM) system, 1977 North American datum using a central meridian (CM) of 152° W 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.

RESISTIVITY

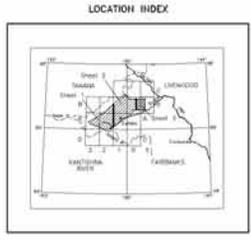
The DIGHEM[®] EM system measured in-phase and quadrature components at five frequencies: two vertical-coil loop-coil pairs separated at 900 and 5000 Hz, while three horizontal-coil loop-coil pairs operated at 800, 7500 and 56,000 Hz. EM data were sampled at 0.1 second intervals. The EM system responds to buried conductive, conductive overburden, and cultural sources. Apparent resistivity is generated from the in-phase and quadrature component of the coil pair 7200 Hz using the Wenner-type half-space model. The data were interpolated onto a regular 100 m grid using a modified Akima (1970) technique.

Alaska, N-131C: A new series of interpretation and smooth curve fitting using a modified Akima (1970) technique. The accuracy of the curve fitting is ±1% to ±2%.

7200 Hz COPLANAR APPARENT RESISTIVITY OF THE RAMPART-MANLEY MINING DISTRICT, ALASKA

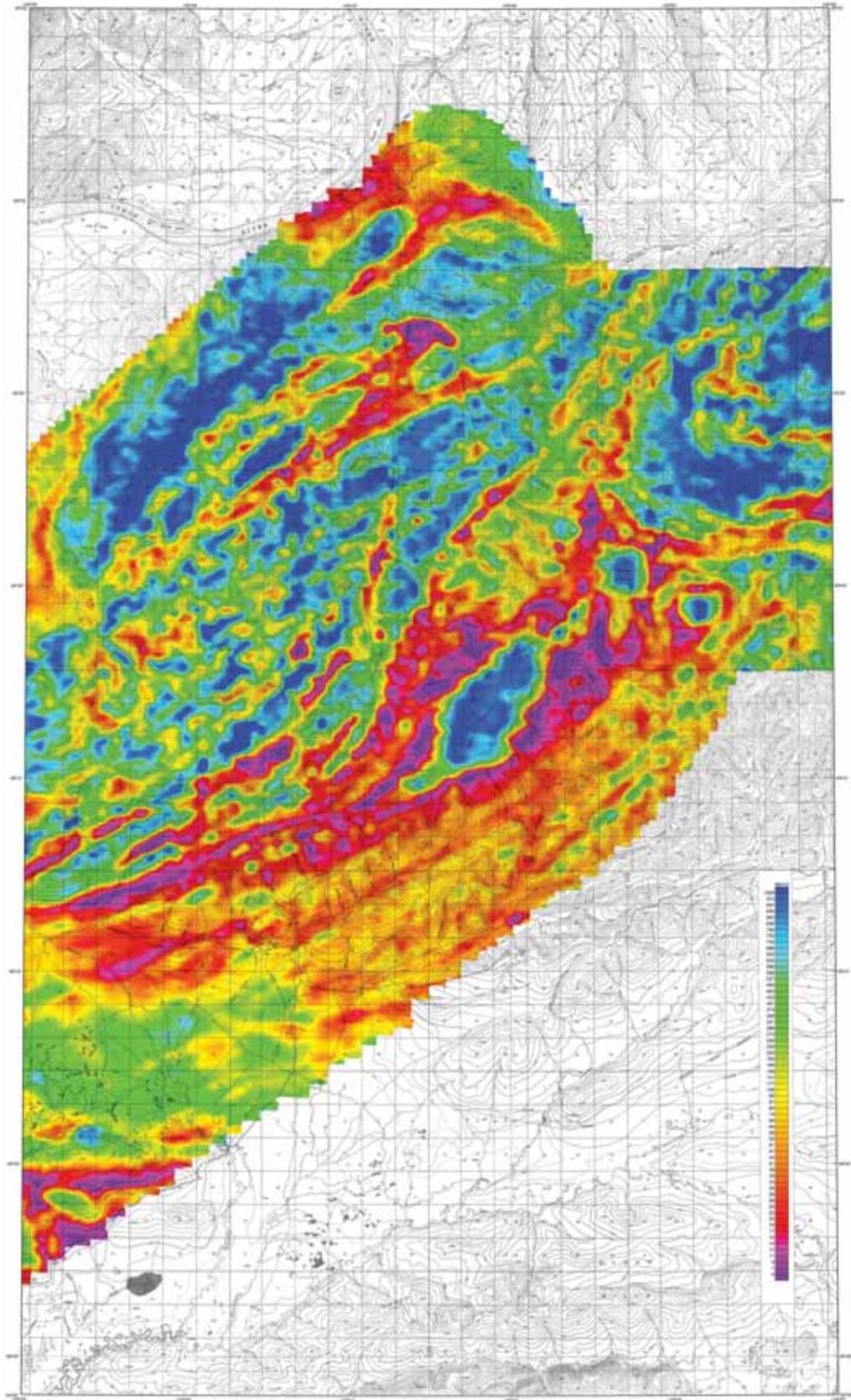
PARTS OF FAIRBANKS, KANTISHNA RIVER, LIVNGOOD AND TANANA QUADRANGLES

by
Laurel E. Burns, Fugro Airborne Surveys Corp., and Stevens Exploration Management Corp.
2004



SURVEY HISTORY

The map has been compiled and drawn under contract between the State of Alaska, Department of Natural Resources, Division of Geological & Geophysical Surveys, and Stevens Exploration Management Corp. The map was produced by Fugro Airborne Surveys and supersedes the earlier full color version released by DGGIS in 1987. Airborne geophysical data for the area were acquired and processed in 1995 under contract between DGGIS and WGM, Mining and Geological Consultants, Inc. The subcontractor acquiring and processing the data was DIGHEM, a division of CGG Canada Ltd. Other products from this survey are available from DGGIS, 5354 College Road, Fairbanks, Alaska, 99709-3707.



U.S. GEOLOGICAL SURVEY (1:250,000), 1987-1991, 1993, 1994, 1995, 1996, 1997, 1998, 1999, 2000, 2001, 2002, 2003, 2004, 2005, 2006, 2007, 2008, 2009, 2010, 2011, 2012, 2013, 2014, 2015, 2016, 2017, 2018, 2019, 2020, 2021, 2022, 2023, 2024, 2025



**900 Hz COPLANAR APPARENT RESISTIVITY
OF THE RAMPART-MANLEY MINING DISTRICT,
ALASKA**

PARTS OF FAIRBANKS, KANTISHNA RIVER, LIVEGOOD AND TAKANA QUADRANGLES
by
Laural E. Banta, Fugro Alaska Survey Corp., and Steven E. Heston, Heston Management Corp.
2004



DESCRIPTIVE NOTES

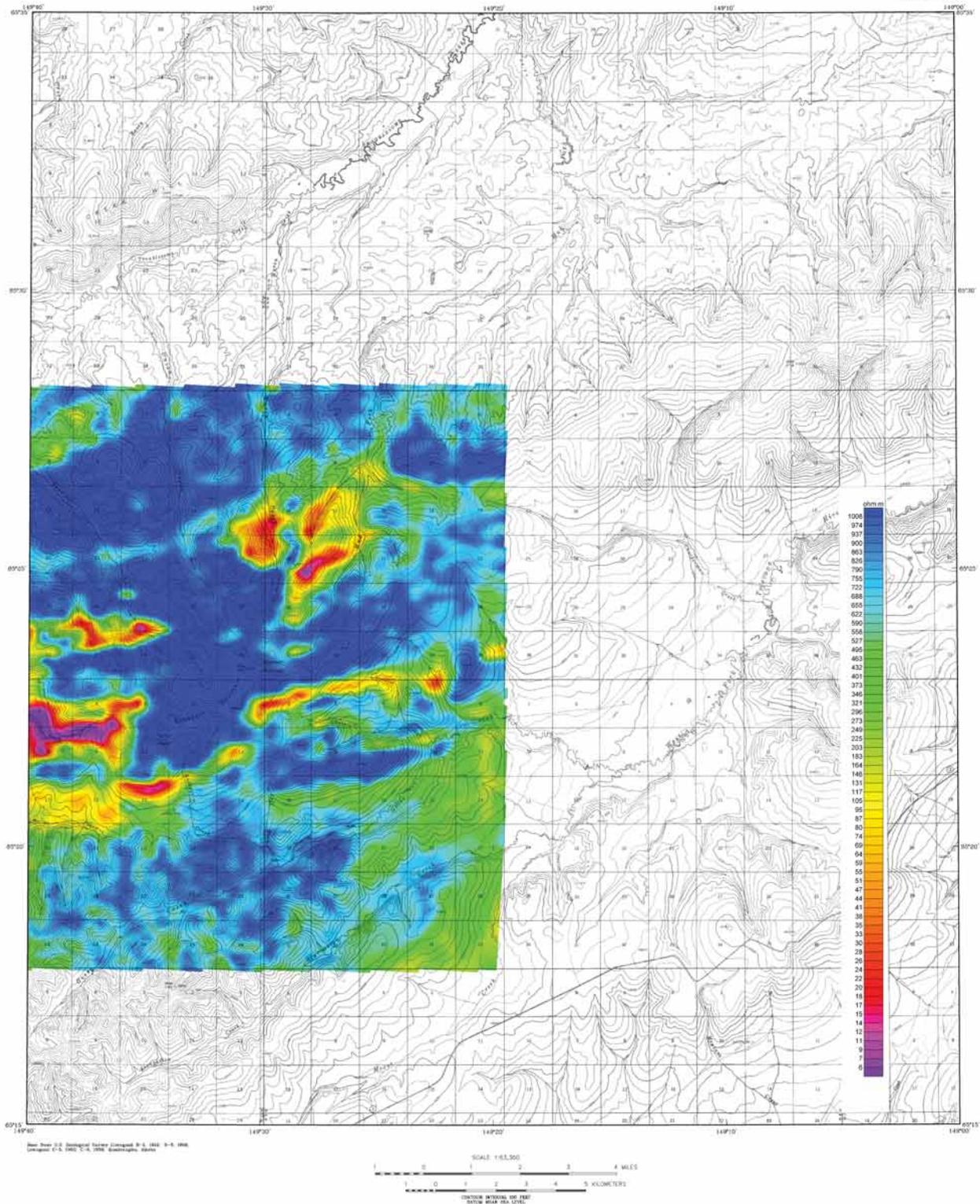
This report is a geophysical survey of the Rampart-Manley Mining District, Alaska. The survey was conducted by Fugro Alaska Survey Corp. and Heston Management Corp. in 2004. The survey area is located in the central-northern part of Alaska, within the Fairbanks, Kantishna River, Livegood, and Takana quadrangles. The survey was conducted using a 900 Hz coplanar resistivity method. The data were collected on a grid with a spacing of 100 meters. The data were processed using a resistivity inversion algorithm. The resulting resistivity map is shown on this sheet. The resistivity map shows a complex pattern of resistivity anomalies. Higher resistivity (red/orange) is generally trending from the northwest to the southeast. Lower resistivity (blue) is in more localized areas. The resistivity map is overlaid on a topographic contour map. The topographic map shows the terrain of the area. The resistivity map is a color scale from 10 Ohm-m (dark blue) to 1000 Ohm-m (dark red). The resistivity map is a geophysical survey of the Rampart-Manley Mining District, Alaska. The survey was conducted by Fugro Alaska Survey Corp. and Heston Management Corp. in 2004. The survey area is located in the central-northern part of Alaska, within the Fairbanks, Kantishna River, Livegood, and Takana quadrangles. The survey was conducted using a 900 Hz coplanar resistivity method. The data were collected on a grid with a spacing of 100 meters. The data were processed using a resistivity inversion algorithm. The resulting resistivity map is shown on this sheet. The resistivity map shows a complex pattern of resistivity anomalies. Higher resistivity (red/orange) is generally trending from the northwest to the southeast. Lower resistivity (blue) is in more localized areas. The resistivity map is overlaid on a topographic contour map. The topographic map shows the terrain of the area. The resistivity map is a color scale from 10 Ohm-m (dark blue) to 1000 Ohm-m (dark red). The resistivity map is a geophysical survey of the Rampart-Manley Mining District, Alaska. The survey was conducted by Fugro Alaska Survey Corp. and Heston Management Corp. in 2004. The survey area is located in the central-northern part of Alaska, within the Fairbanks, Kantishna River, Livegood, and Takana quadrangles. The survey was conducted using a 900 Hz coplanar resistivity method. The data were collected on a grid with a spacing of 100 meters. The data were processed using a resistivity inversion algorithm. The resulting resistivity map is shown on this sheet. The resistivity map shows a complex pattern of resistivity anomalies. Higher resistivity (red/orange) is generally trending from the northwest to the southeast. Lower resistivity (blue) is in more localized areas. The resistivity map is overlaid on a topographic contour map. The topographic map shows the terrain of the area. The resistivity map is a color scale from 10 Ohm-m (dark blue) to 1000 Ohm-m (dark red).

REMARKS

This report is a geophysical survey of the Rampart-Manley Mining District, Alaska. The survey was conducted by Fugro Alaska Survey Corp. and Heston Management Corp. in 2004. The survey area is located in the central-northern part of Alaska, within the Fairbanks, Kantishna River, Livegood, and Takana quadrangles. The survey was conducted using a 900 Hz coplanar resistivity method. The data were collected on a grid with a spacing of 100 meters. The data were processed using a resistivity inversion algorithm. The resulting resistivity map is shown on this sheet. The resistivity map shows a complex pattern of resistivity anomalies. Higher resistivity (red/orange) is generally trending from the northwest to the southeast. Lower resistivity (blue) is in more localized areas. The resistivity map is overlaid on a topographic contour map. The topographic map shows the terrain of the area. The resistivity map is a color scale from 10 Ohm-m (dark blue) to 1000 Ohm-m (dark red). The resistivity map is a geophysical survey of the Rampart-Manley Mining District, Alaska. The survey was conducted by Fugro Alaska Survey Corp. and Heston Management Corp. in 2004. The survey area is located in the central-northern part of Alaska, within the Fairbanks, Kantishna River, Livegood, and Takana quadrangles. The survey was conducted using a 900 Hz coplanar resistivity method. The data were collected on a grid with a spacing of 100 meters. The data were processed using a resistivity inversion algorithm. The resulting resistivity map is shown on this sheet. The resistivity map shows a complex pattern of resistivity anomalies. Higher resistivity (red/orange) is generally trending from the northwest to the southeast. Lower resistivity (blue) is in more localized areas. The resistivity map is overlaid on a topographic contour map. The topographic map shows the terrain of the area. The resistivity map is a color scale from 10 Ohm-m (dark blue) to 1000 Ohm-m (dark red).

SURVEY METHOD

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Base Map: U.S. Geological Survey (unpublished) 1:63,500, 1964. Contouring: G.S. Smith, 5/4, 1966. Geographical: Alaska.

DESCRIPTIVE NOTES

The geophysical data were acquired with a DICHEM[®] Electromagnetics (EM) system, a Spintrea caesium Cs132 magnetometer, and a Sierra KV system installed in an AS350B-1 Squirrel helicopter. In addition, the survey recorded data from a rotor altimeter, GPS navigation system, 200 Hz magnetometer, and video camera. Flights were performed at a mean terrain clearance of 300 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.

A Garmin 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 Clark 1860 (UTM) projection, 1927 North American datum using a central meridian (CM) of 153.7, a north constant of 0 and an east constant of 300,000. Positional accuracy of the projected data is better than 10 m with respect to the UTM grid.

RESISTIVITY

The DICHEM[®] EM system measured in-phase and quadrature components at five frequencies: two vertical coplanar coil-pairs operated at 300 and 5000 Hz while three horizontal coplanar coil-pairs operated at 300, 750 and 50,000 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 in-phase and quadrature component of the coplanar 300 Hz using the pseudo-layer root space model. The data were interpolated onto a regular 100 m grid using a modified Akima (1970) technique.

Smith, H., 1970, A new method of interpolation and weight curve fitting based on user distribution, Journal of the Association of Computing Machinery, 17, 16-24.

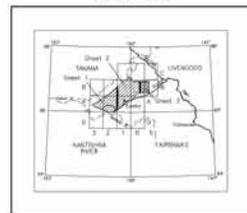
900 Hz COPLANAR APPARENT RESISTIVITY OF THE RAMPART-MANLEY MINING DISTRICT, ALASKA

PARTS OF FAIRBANKS, KANTISHNA RIVER, LIVNGOOD AND TANANA QUADRANGLES

by
Laurel E. Burns, Fugro Airborne Surveys Corp., and Stevens Exploration Management Corp.
2004

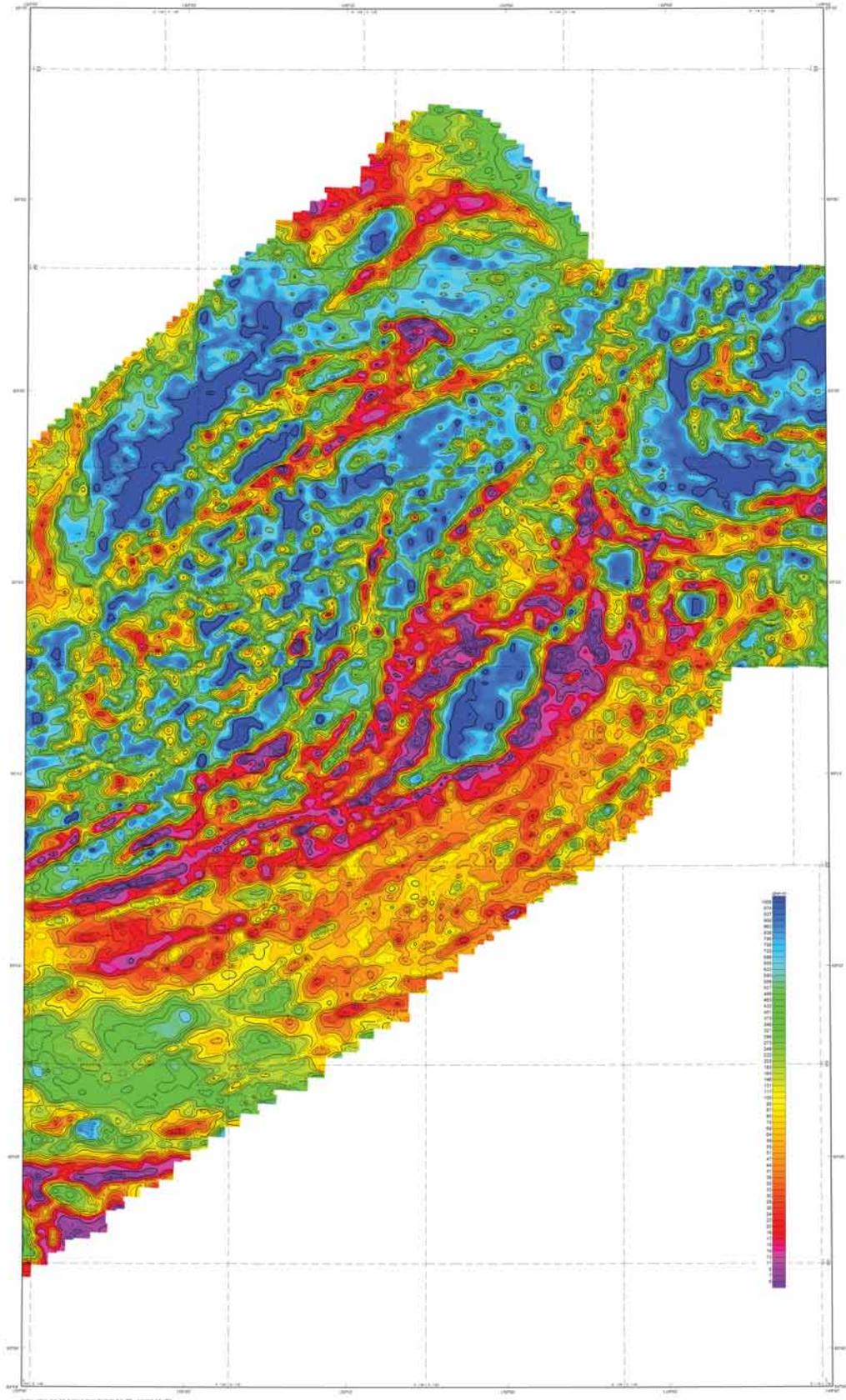


LOCATION INDEX



SURVEY HISTORY

The map has been compiled and drawn under contract between the State of Alaska, Department of Natural Resources, Division of Geological & Geophysical Surveys, and Stevens Exploration Management Corp. The map was produced by Fugro Airborne Surveys and superseded the earlier full color version released by DGS in 1987. Airborne geophysical data for the area were acquired and processed in 1996 under contract between DGS and WDM, Mining and Geological Consultants, Inc. The subcontractor acquiring and processing the data was DICHEM, a division of CGO Canada Ltd. Other products from this survey are available from DGS, 3354 Conroy Road, Fairbanks, Alaska, 99708-3707.



U.S. GEOLOGICAL SURVEY, RESTON, VA 20192-1199
 1:50,000 SCALE
 1:50,000 SCALE



**900 Hz COPLANAR APPARENT RESISTIVITY
 OF THE RAMPART-MANLEY MINING DISTRICT,
 ALASKA**
 PARTS OF FAIRBANKS, KANTISHNA RIVER, LIVENGOOD AND TAHANA QUADRANGLES

by
 Laurel E. Burns, Fugro Alaska Surveys Corp., and Stevens Exploration Management Corp.
 2004

DESCRIPTIVE NOTES

The apparent resistivity data were collected using a Schlumberger array with a 100 m electrode spacing. The data were processed using a standard resistivity inversion algorithm. The resulting resistivity contours are shown on this map. The map is a color-coded contour plot with a grid overlay. The colors range from dark blue (low resistivity) to dark red (high resistivity). A vertical color scale legend on the right side of the map indicates resistivity values from 0 to 1000. The map shows complex resistivity patterns across the study area.

RESISTIVITY

The resistivity values are in ohm-meters. The map is a color-coded contour plot with a grid overlay. The colors range from dark blue (low resistivity) to dark red (high resistivity). A vertical color scale legend on the right side of the map indicates resistivity values from 0 to 1000. The map shows complex resistivity patterns across the study area.

RESISTIVITY CONTOURS

| |
|------|
| 100 |
| 200 |
| 300 |
| 400 |
| 500 |
| 600 |
| 700 |
| 800 |
| 900 |
| 1000 |

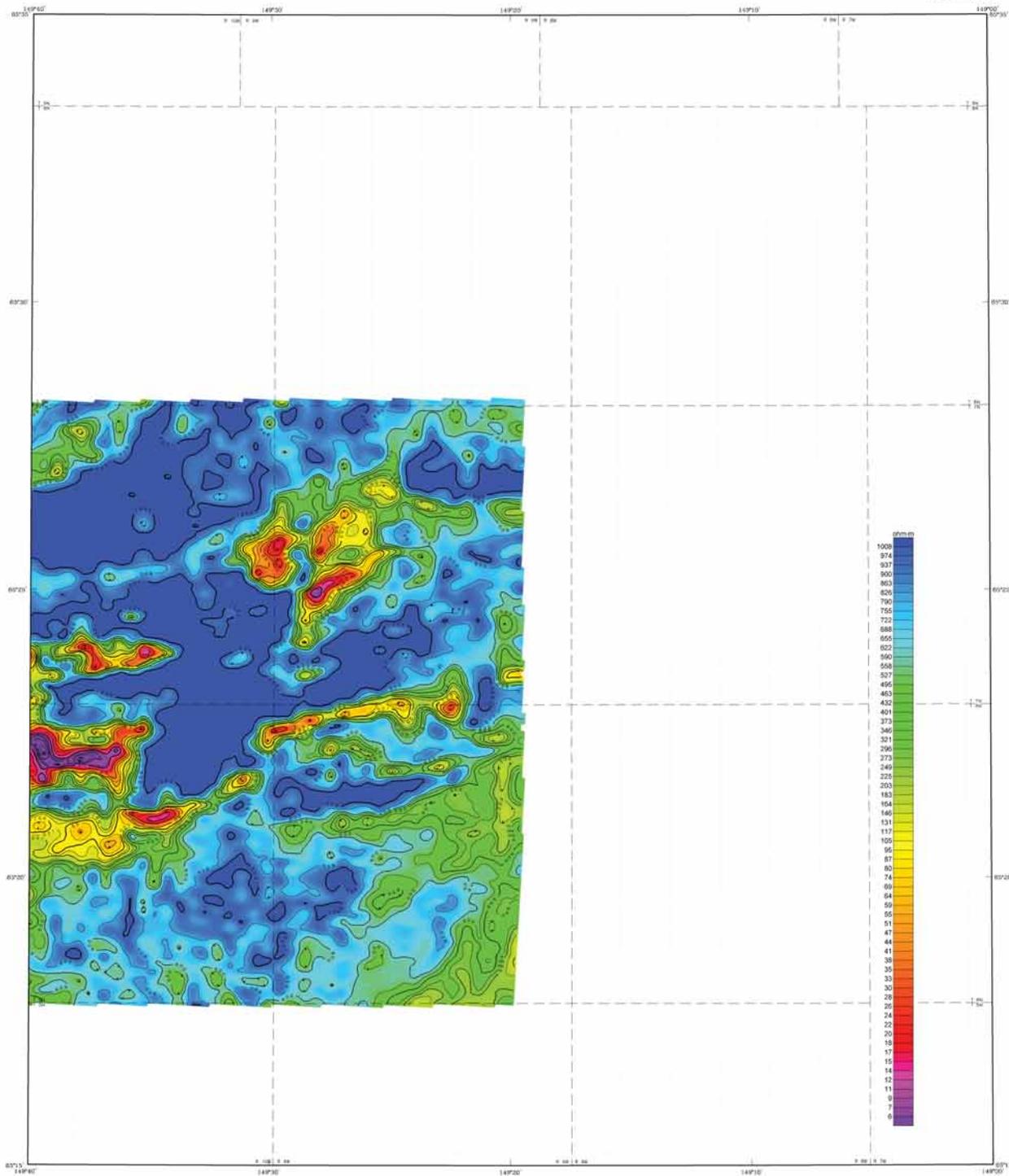


LOCATION INDEX



SURVEY HISTORY

The survey was conducted in 2004. The data were collected using a Schlumberger array with a 100 m electrode spacing. The data were processed using a standard resistivity inversion algorithm. The resulting resistivity contours are shown on this map. The map is a color-coded contour plot with a grid overlay. The colors range from dark blue (low resistivity) to dark red (high resistivity). A vertical color scale legend on the right side of the map indicates resistivity values from 0 to 1000. The map shows complex resistivity patterns across the study area.



Section outline from U.S. Geological Survey (reprinted from G-1, 1960, p. 4, 2000).
Geographic C.T.S. 1983, N. 20th, 20th, 20th, 20th.



DESCRIPTIVE NOTES

The geophysical data were acquired with a DIGHW[®] Electromagnetic (EM) system, a Sinterex cesium CS2 magnetometer, and a three VLF system installed in an AG-350B-1 Squirrel helicopter. In addition, the survey recorded data from a radio altimeter, GPS navigation system, 50700 Hz magnetometer and video camera. Flights were performed at a mean terrain altitude of 200 feet using 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.

A General Real-Time Differential 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 GDA/1983 (UTM) system, 1977 North American datum using a central meridian (CM) of 152° W 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.

RESISTIVITY

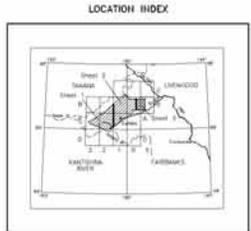
The DIGHW[®] EM system measured in-phase and quadrature components of five frequencies. Two vertical coplanar coil-pairs separated 01 900 and 2000 Hz while three horizontal coplanar coil-pairs operated at 500, 750 and 50,000 Hz. EM data were sampled at 0.1 second intervals. The EM system responds to subsurface conductive overburden, and cultural sources. Apparent resistivity is generated from the in-phase and quadrature component of the 900 Hz using the Wenner-Schlumberger half-spread mode. The data were interpolated onto a regular 100 m grid using a modified Akima (1970) technique.

Alma, N. 1970. A new method of interpolation and smooth curve fitting using a modified Akima (1970) technique.

900 Hz COPLANAR APPARENT RESISTIVITY OF THE RAMPART-MANLEY MINING DISTRICT, ALASKA

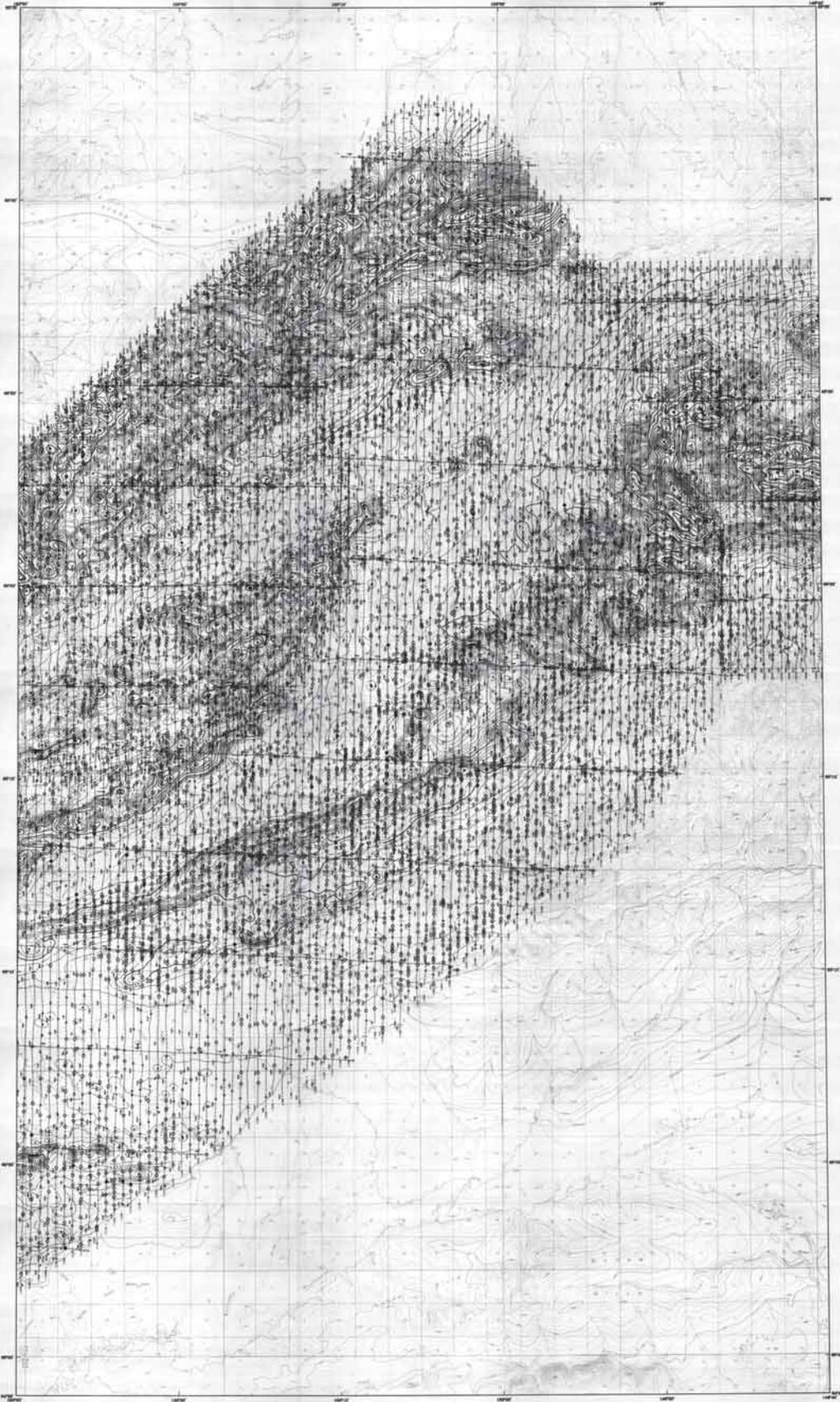
PARTS OF FAIRBANKS, KANTISHNA RIVER, LIVNGOOD AND TANANA QUADRANGLES

by
Laurel E. Burns, Fugro Airborne Surveys Corp., and Stevens Exploration Management Corp.
2004



SURVEY HISTORY

The map has been compiled and drawn under contract between the State of Alaska, Department of Natural Resources, Division of Geological & Geophysical Surveys, and Stevens Exploration Management Corp. The map was produced by Fugro Airborne Surveys and supersedes the earlier full color version released by DGGG in 1987. Airborne geophysical data for the area were acquired and processed in 1995 under contract between DGGG and WGM, Mining and Geological Consultants, Inc. The subcontractor acquiring and processing the data was DIGHW, a division of DGGG Canada Ltd. Other products from this survey are available from DGGG, 3354 College Road, Fairbanks, Alaska, 99709-3707.



U.S. GEOLOGICAL SURVEY



**EXTENDED COVERAGE OF THE
TOTAL FIELD MAGNETICS AND
ELECTROMAGNETIC ANOMALIES,
RAMPART-MANLEY MINING DISTRICT, ALASKA**
1997
IGRF GRADIENT REMOVED

DESCRIPTIVE NOTES
The geophysical data were acquired with a 2000-gauss...
A Survey Report-Type 2000-m Gauss Gradient-Removed...
IGRF GRADIENT REMOVED

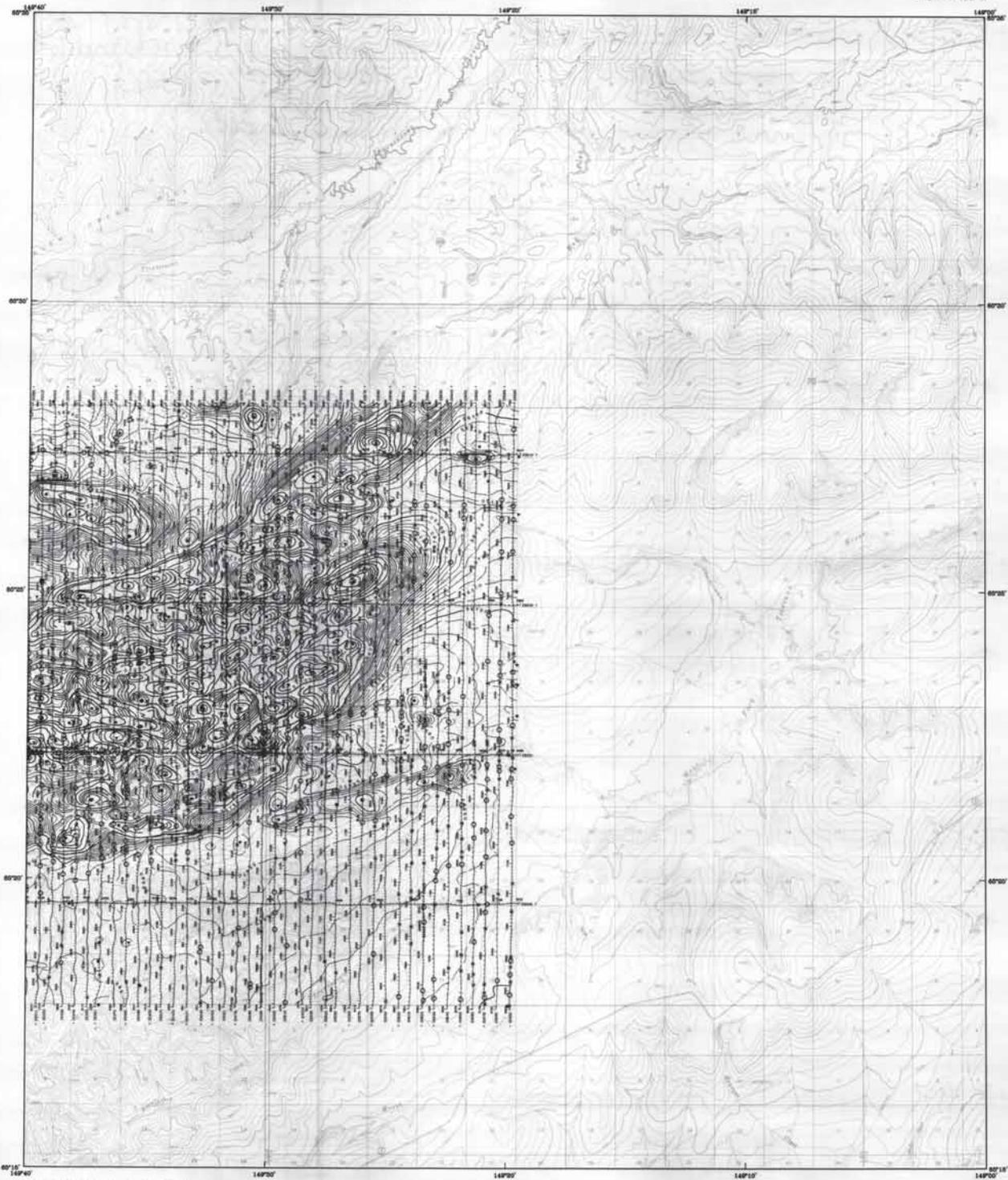
ELECTROMAGNETICS
To determine the location of the anomalies of the...
The anomalies are shown as small circles with...
The anomalies are shown as small circles with...

ELECTROMAGNETIC ANOMALIES
Legend for electromagnetic anomalies:
• 100 nT
• 200 nT
• 300 nT
• 400 nT
• 500 nT
• 600 nT
• 700 nT
• 800 nT
• 900 nT
• 1000 nT

MAGNETIC CONTOUR INTERVAL
Legend for magnetic contour intervals:
..... 50 nT
..... 100 nT
..... 200 nT
..... 500 nT
..... 1000 nT

SURVEY HISTORY
The area has been surveyed and data were acquired...
The area has been surveyed and data were acquired...
The area has been surveyed and data were acquired...

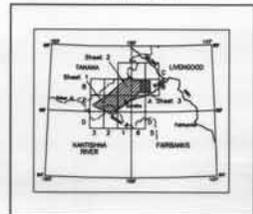
TOTAL FIELD MAGNETICS
The total field magnetic data were acquired with...
The total field magnetic data were acquired with...
The total field magnetic data were acquired...



From U.S. Geological Survey (Original G-4, 1966, 8-4, 1966; Original G-4, 1966, 7-4, 1966; Geologic Atlas)



LOCATION INDEX



EXTENDED COVERAGE OF THE TOTAL FIELD MAGNETICS AND ELECTROMAGNETIC ANOMALIES, RAMPART-MANLEY MINING DISTRICT, ALASKA

1997
IGRF GRADIENT REMOVED

DESCRIPTIVE NOTES

The geophysical data were acquired with a DIGEM[®] Electromagnetic (EM) system, a Solinst cesium CS2 magnetometer, and a Hertz VLF system installed in an AS500B-1 Squirrel helicopter. In addition, the survey recorded data from a radio altimeter, GPS navigation system, 50/60 Hz monitors and video camera. Flights were performed 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.

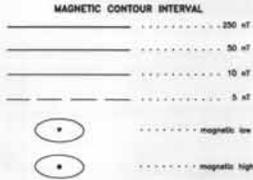
A Serial Real-Time Differential Global Positioning System (RT-DGPS) was used for both navigation and flight path recovery. The helicopter position was derived every 0.5 seconds using real-time differential positioning to a relative accuracy of better than 10 m. Flight path positions were projected onto the Clark 1858 (CMA) 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.

ELECTROMAGNETICS

To determine the location of EM anomalies or their boundaries, the DIGEM EM system measured in-phase and quadrature components of five frequencies. Two vertical coil-coupled pairs operated at 900 and 5000 Hz while three horizontal coil-coupled pairs operated at 500, 7200, and 56,000 Hz. EM data were sampled at 0.1 second intervals. The EM system responds to conductive, conductive overburden, and cultural sources. The power the monitor and the flight track video were assumed to locate cultural sources. The EM anomalies that are indicated are classified by conductance.

ELECTROMAGNETIC ANOMALIES

- | | |
|---|---|
| ● | Conductance |
| ○ | >50 Siemens |
| ○ | >50 Siemens |
| ● | Questionable anomaly |
| △ | Weak conductivity associated with an EM magnetic response |



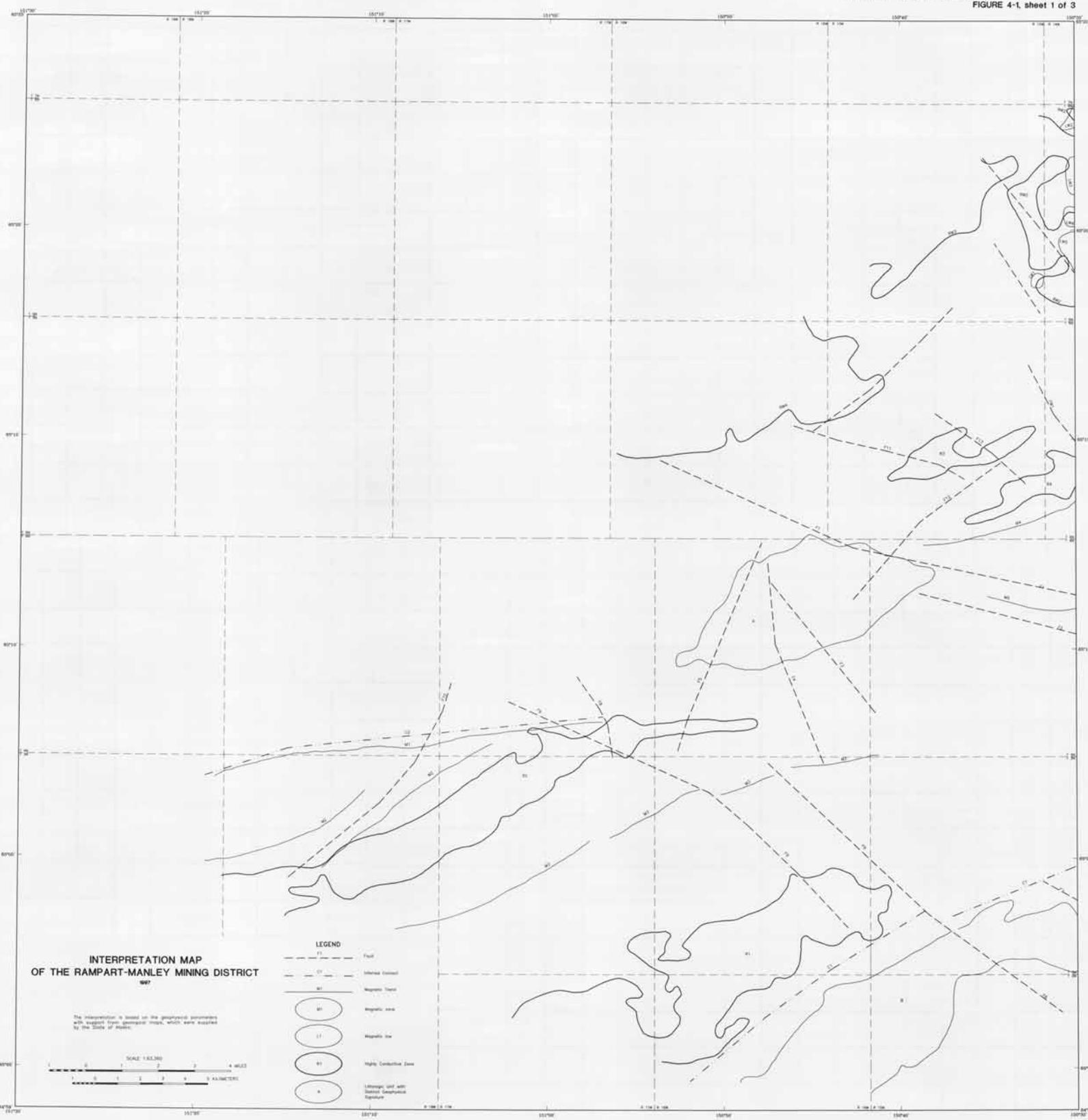
SURVEY HISTORY

This map has been compiled and drawn under contract between the State of Alaska, Department of Natural Resources, Division of Geological & Geophysical Surveys, and RGM Inc., Mining and Geophysical Consultants. Airborne geophysical data for the area were acquired by DIGEM, a division of CGG Canada Ltd., in 1996. Other products from this survey are available from the Alaska Division of Geological & Geophysical Surveys, 794 University Ave., Suite 200, Fairbanks, Alaska, 99709.

TOTAL FIELD MAGNETICS

The total field magnetic 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 Alamo (1970) technique. The regional variation (or IGRF gradient, 1985, updated to October 1996) was removed from the leveled magnetic data.

Alamo, 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. 588-592.



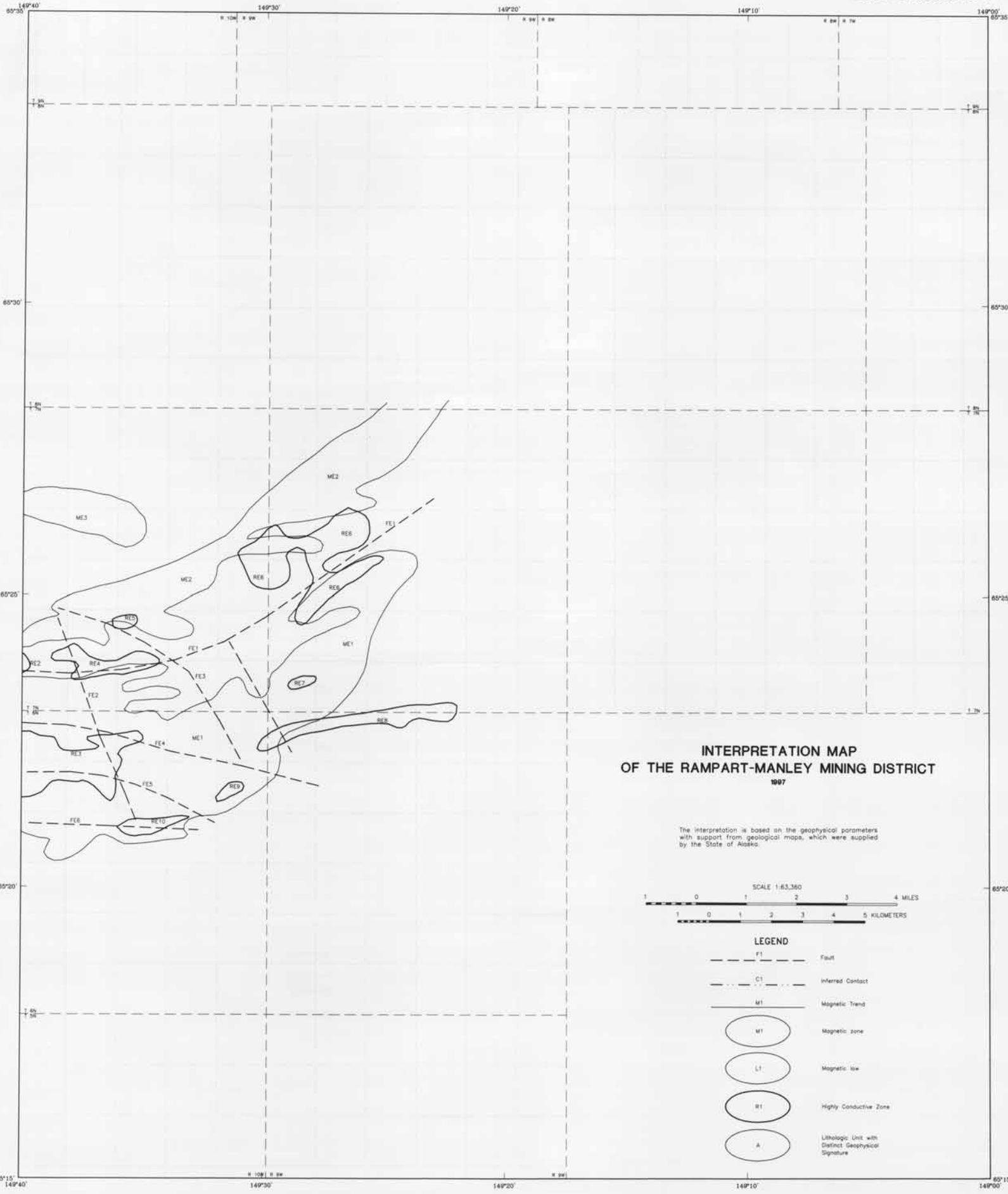
**INTERPRETATION MAP
 OF THE RAMPART-MANLEY MINING DISTRICT**

The interpretation is based on the geophysical parameters with support from geological maps, which were supplied by the State of Idaho.



LEGEND

| | |
|-----|------------------------------|
| --- | Fault |
| --- | Internal Contact |
| --- | Magnetic Trace |
| --- | Magnetic Area |
| --- | Magnetic Line |
| --- | High Conductive Zone |
| --- | Structure and other features |



**INTERPRETATION MAP
 OF THE RAMPART-MANLEY MINING DISTRICT**

1997

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



LEGEND

- Fault
- · - · - Inferred Contact
- Magnetic Trend
- M1 Magnetic zone
- L1 Magnetic low
- R1 Highly Conductive Zone
- A Lithologic Unit with Distinct Geophysical Signature