SOUTHEASTERN EXTENSION OF SALCHA RIVER-POGO ELECTROMAGNETIC AND MAGNETIC AIRBORNE GEOPHYSICAL SURVEY DATA COMPILATION

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Geophysical Report 2019-9

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

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ABSTRACT

This geophysical survey is located in interior Alaska in the Goodpaster mining district, about 150 kilometers southeast of Fairbanks. Frequency domain electromagnetic and magnetic data were collected with the DIGHEMV system in August 2001. A total of 729.9 line kilometers were collected covering 237.4 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. Mineral prospects in the survey area are related to Pogo mine. 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.

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

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 DGGS	Project and field reports, survey background information, gridded data explanations, other documentation
grids_ermapper	contractor	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	Printable maps in pdf format
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

REFERENCES

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, n. 4, p. 589–602.

Alaska Division of Geological & Geophysical Surveys, Fugro Airborne Surveys, Stevens Exploration Management Corp., and Burns, L.E., 2002, Plot files of the airborne geophysical survey data of the southeastern extension of Salcha River-Pogo survey, Goodpaster mining district, east-central Alaska: Alaska Division of Geological & Geophysical Surveys Geophysical Report 2002-1, 1 DVD. http://doi.org/10.14509/2775

Alaska Division of Geological & Geophysical Surveys, Fugro Airborne Surveys, Stevens Exploration Management Corp., and Burns, L.E., 2002, Line, gridded, and vector data of airborne geophysical survey data for the southeastern extension of Salcha River-Pogo survey, Goodpaster mining district, east-central Alaska: Alaska Division of Geological & Geophysical Surveys Geophysical Report 2002-2, 1 DVD. http://doi.org/10.14509/2789

Alaska Division of Geological & Geophysical Surveys, Fugro Airborne Surveys, Stevens Exploration Management Corp., and Burns, L.E., 2002, Gridded and vector data of airborne geophysical survey data for the southeastern extension of Salcha River-Pogo survey, Goodpaster mining district, east-central Alaska: Alaska Division of Geological & Geophysical Surveys Geophysical Report 2002-3. http://doi.org/10.14509/2790

Burns, L.E., 1997, Portfolio of aeromagnetic and resistivity maps of the extended coverage of the Rampart-Manley mining district: Alaska Division of Geological & Geophysical Surveys Public Data File 97-23, 13 p. http://doi.org/10.14509/1766

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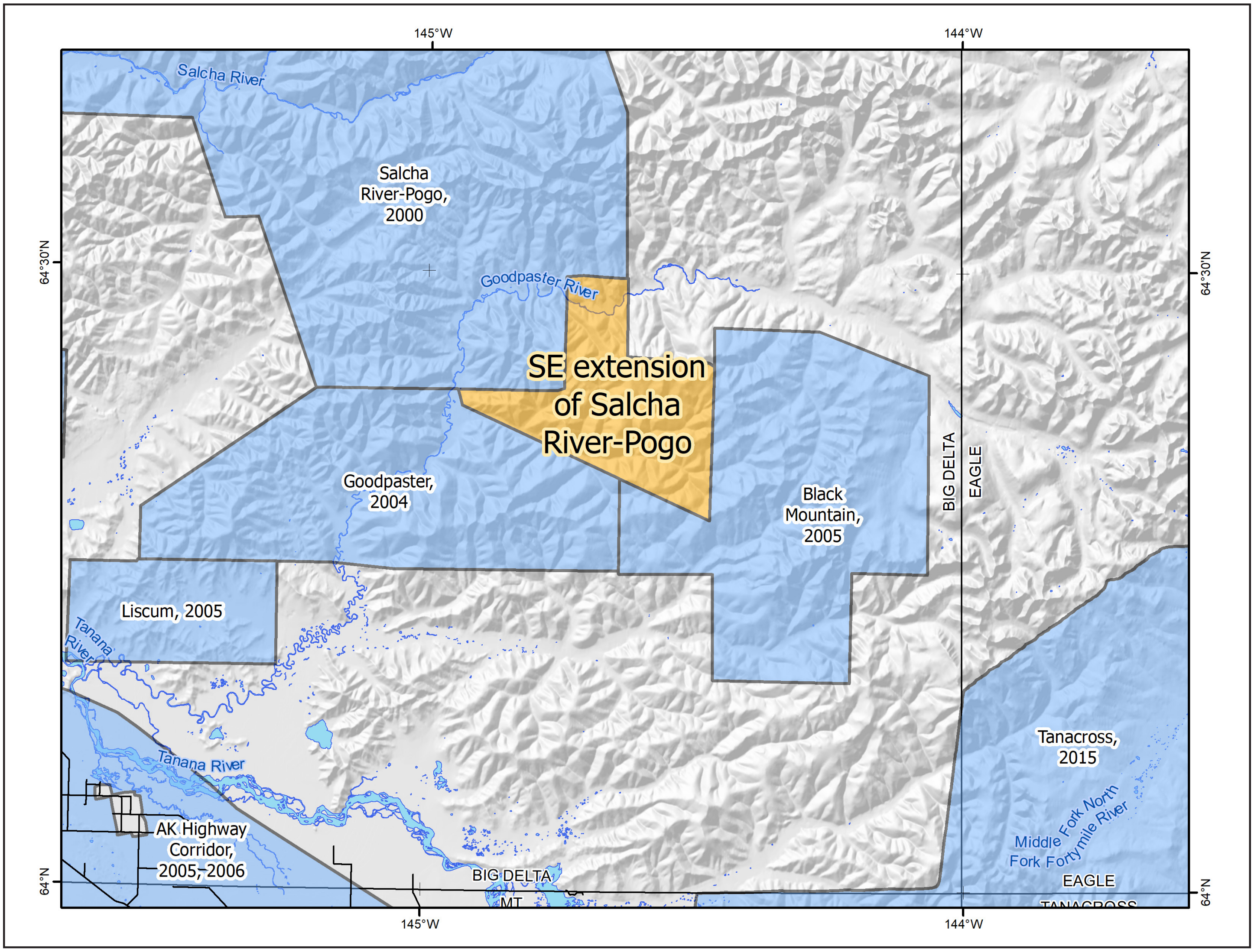
Fraser, D.C., 1978, Resistivity mapping with an airborne multicoil electromagnetic system: Geophysics, v. 43, p. 144-172.

Pritchard, R.A., and Fugro Airborne Surveys, 2002, Project report of the airborne geophysical survey of the southeastern extension of the Salcha River-Pogo survey, Goodpaster mining district, east-central Alaska: Alaska Division of Geological & Geophysical Surveys Geophysical Report 2002-4, 80 p., 1 sheet, scale 1:63,360. http://doi.org/10.14509/2791



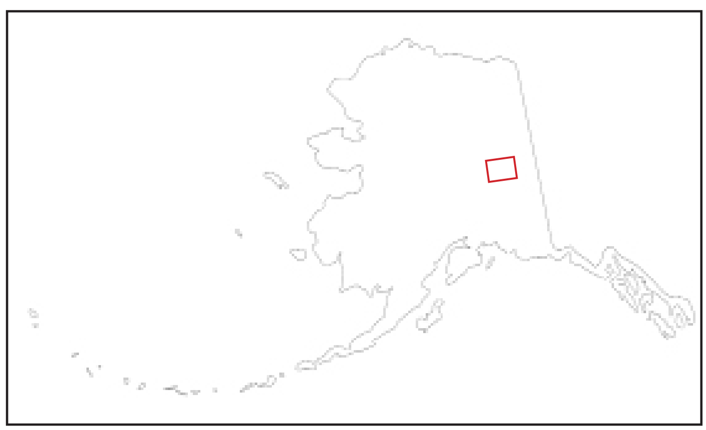


Figure 1. Southeastern extension of Salcha River–Pogo electromagnetic and magnetic airborne geophysical survey location shown in Alaska (right). Southeastern extension of Salcha River - Pogo survey area shown with adjacent DGGS geophysical surveys, landmarks, relevant 1:250,000-scale quadrangle boundaries, mountain ranges, rivers, glaciers, and elevation hillshade.

Figure 2. Flight path with orthometric image.

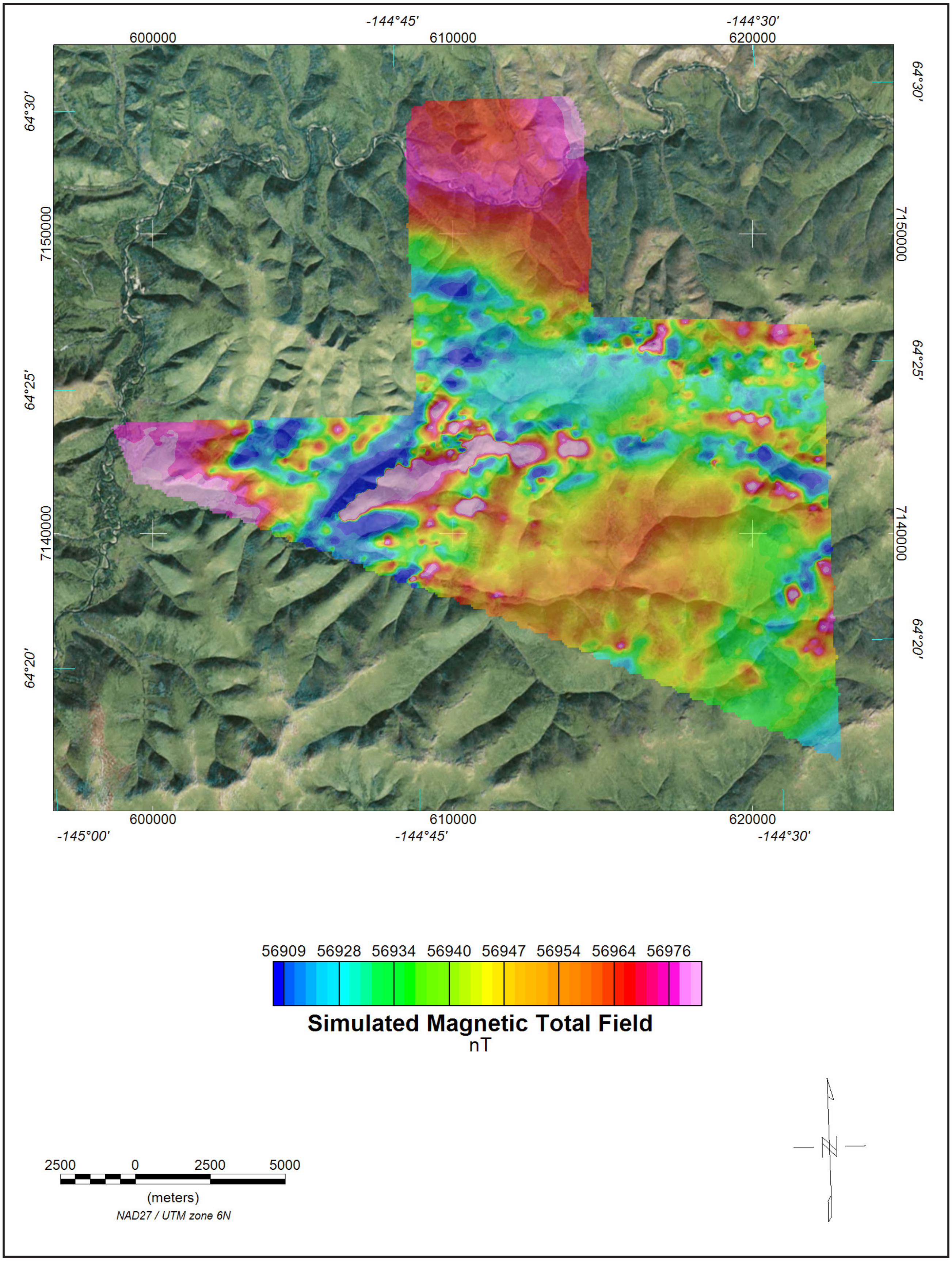


Figure 3. The simulated magnetic total field data were created using digitally recorded data from a Scintrex cesium magnetometer. Data were collected at a sampling interval of 0.1 seconds. The magnetic data were (1) corrected for diurnal variations by subtracting the digitally recorded base station magnetic data, (2) IGRF corrected (IGRF model 2000, updated August 2001, updated for date of flight and altimeter variations), (3) leveled to the tie line data, (4) a constant value of approximately 56,000 nT was added to all data, and (5) interpolated onto a regular 100 m grid using a modified Akima (1970) technique.

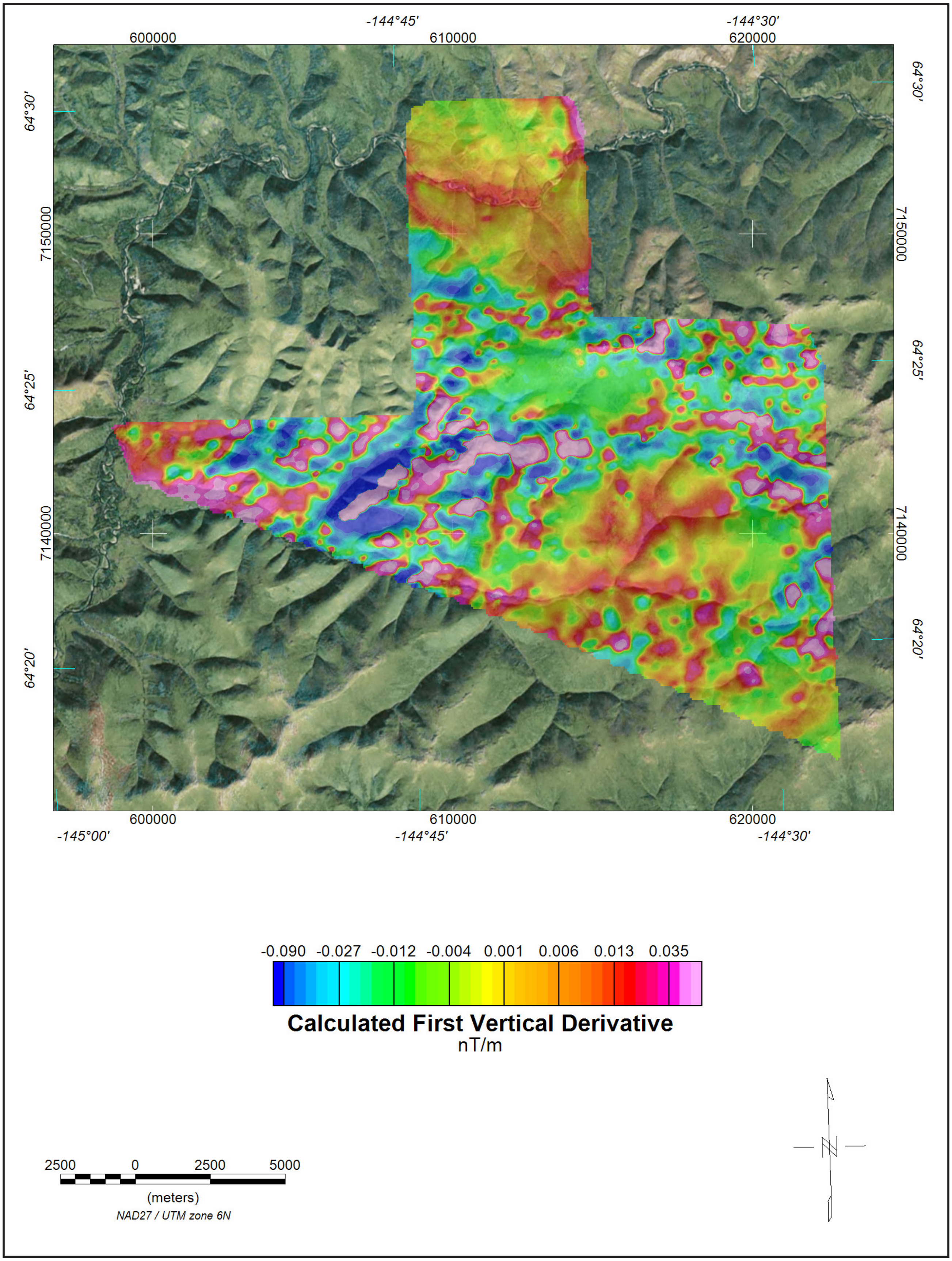


Figure 4. The first vertical derivative grid was calculated from the diurnally-corrected, IGRF-corrected total magnetic field grid using a FFT base frequency domain filtering algorithm. The resulting first vertical derivative grid provides better definition and resolution of near- surface magnetic units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

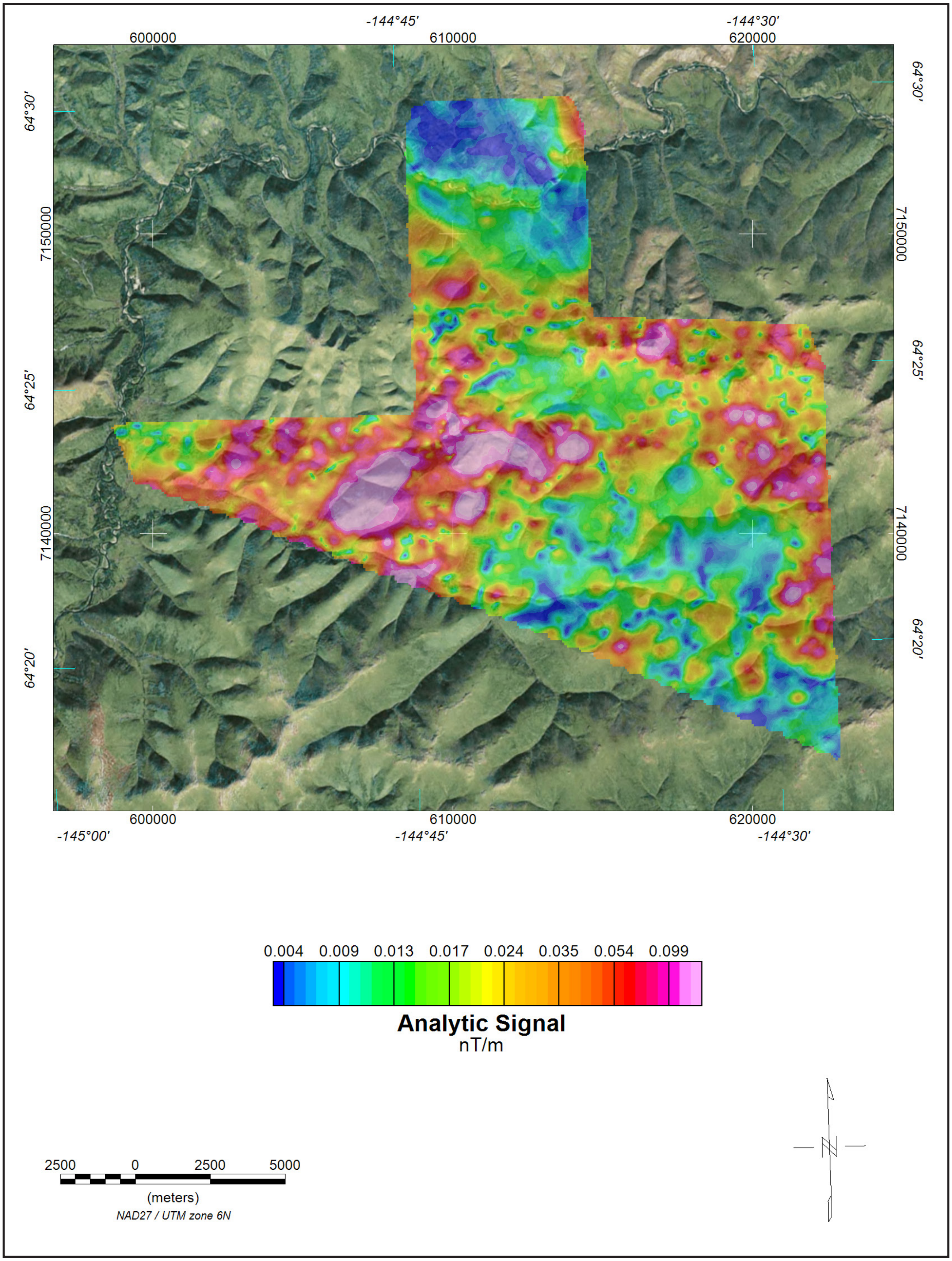


Figure 5. Analytic signal is the total amplitude of all directions of magnetic gradient calculated from the sum of the squares of the three orthogonal gradients. Mapped highs in the calculated analytic signal of magnetic parameter locate the anomalous source body edges and corners (such as contacts, 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.

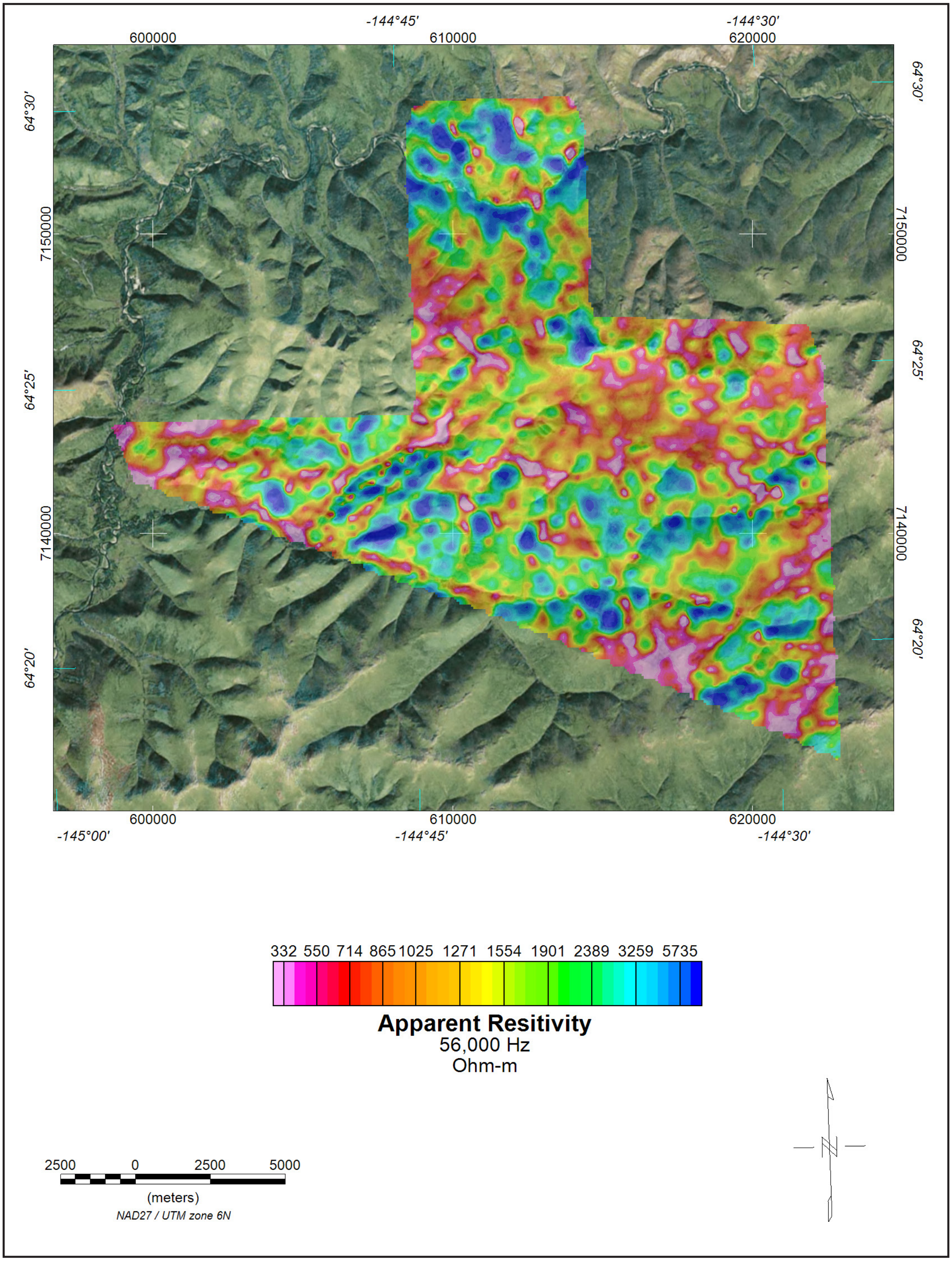


Figure 6. The DIGHEM[V] EM system measured inphase and quadrature components at five frequencies. Two vertical coaxial coil-pairs operated at 1000 and 5500 Hz while three horizontal coplanar coil-pairs operated at 900, 7,200, and 56,000 Hz. EM data were sampled at 0.1 second intervals. The EM system 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 (Fraser 1978). The data were interpolated onto a regular 100 m grid using a modified Akima (1970) technique.

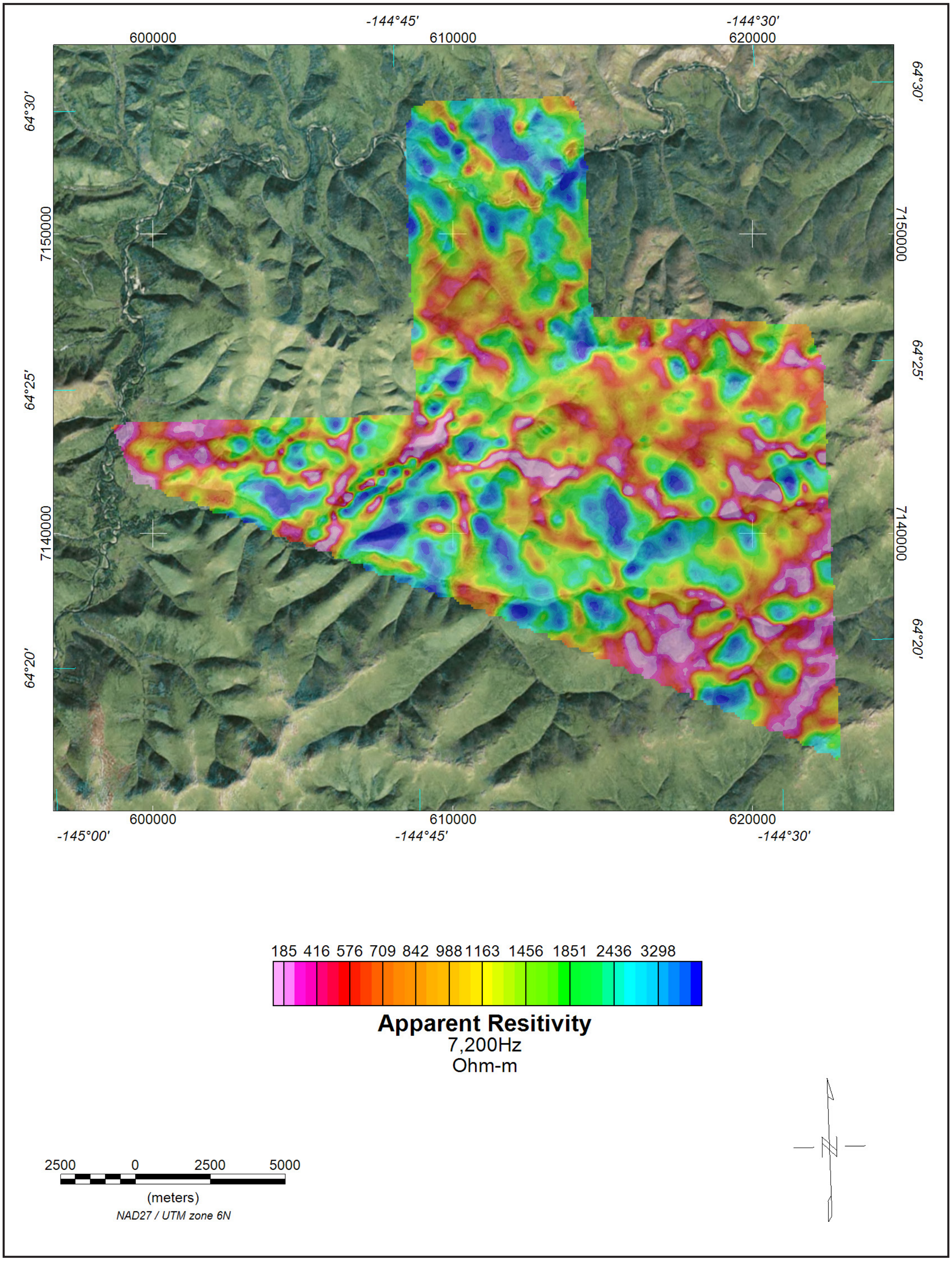


Figure 7. The DIGHEM[V] EM system measured inphase and quadrature components at five frequencies. Two vertical coaxial coil-pairs operated at 1000 and 5500 Hz while three horizontal coplanar coil-pairs operated at 900, 7,200, and 56,000 Hz. EM data were sampled at 0.1 second intervals. The EM system 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 (Fraser 1978). The data were interpolated onto a regular 100 m grid using a modified Akima (1970) technique.

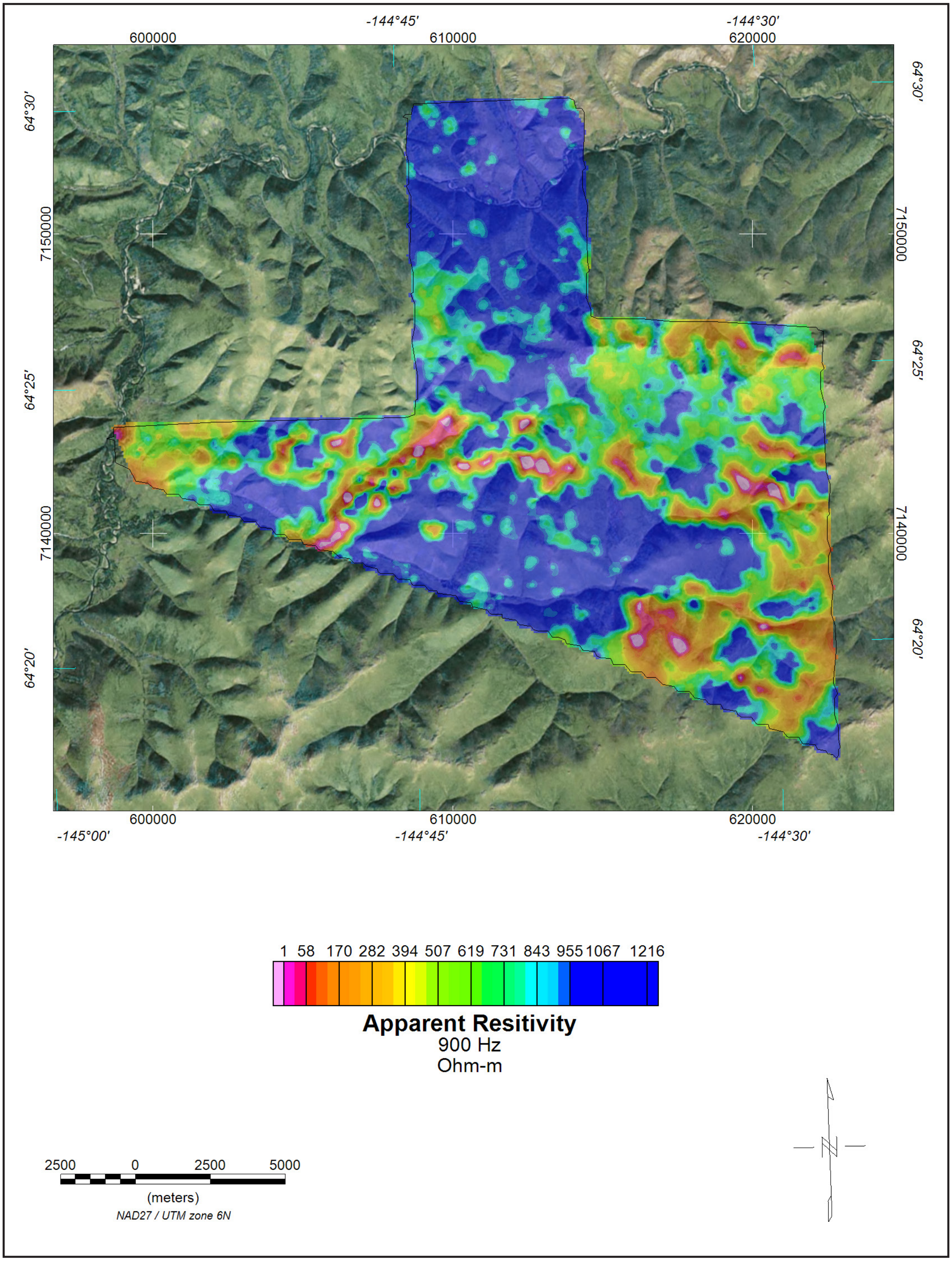
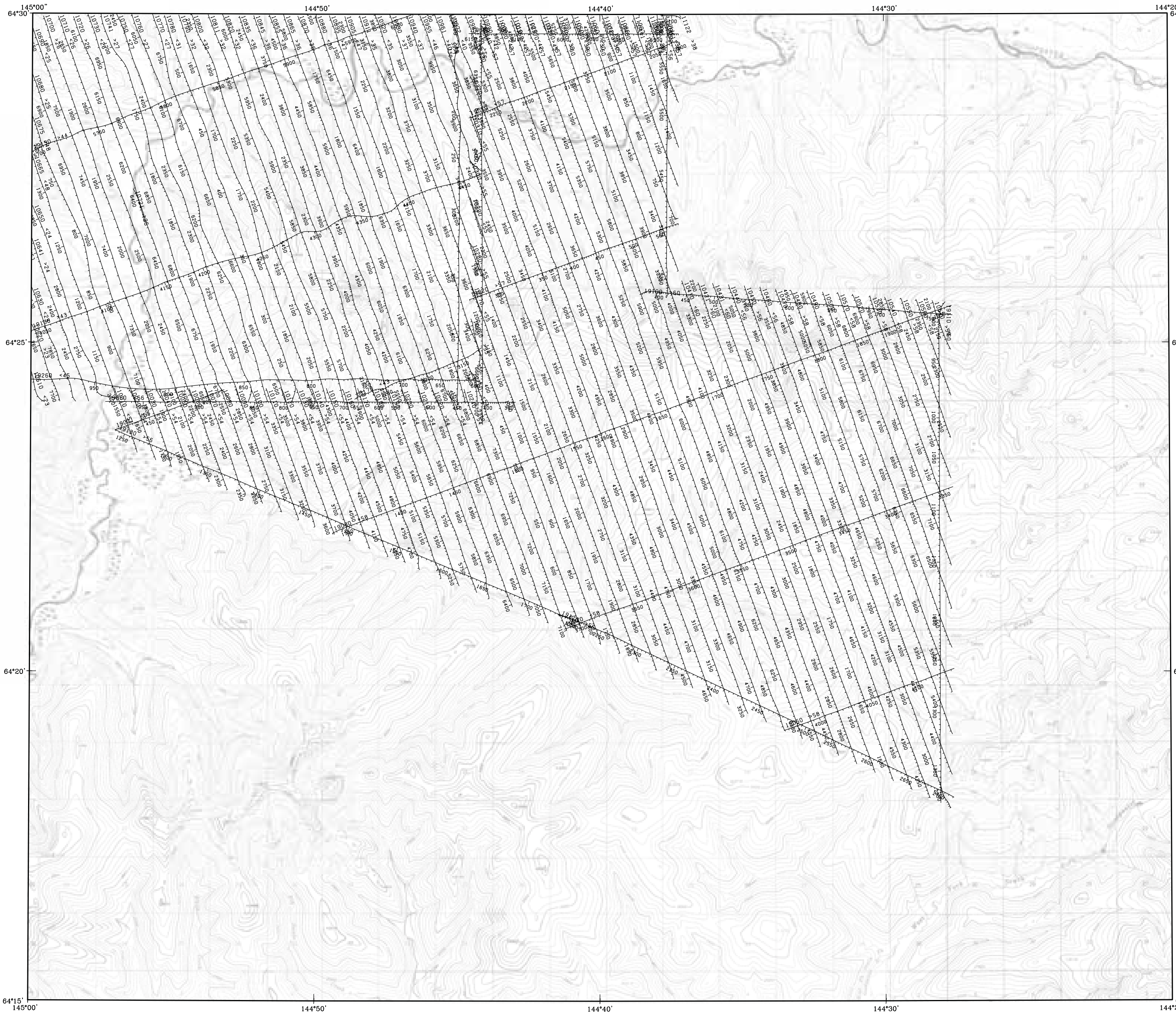


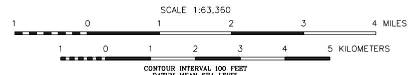
Figure 8. The DIGHEM^{V} EM system measured inphase and quadrature components at five frequencies. Two vertical coaxial coil-pairs operated at 1000 and 5500 Hz while three horizontal coplanar coil-pairs operated at 900, 7,200, and 56,000 Hz. EM data were sampled at 0.1 second intervals. The EM system 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 (Fraser 1978). The data were interpolated onto a regular 100 m grid using a modified Akima (1970) technique.

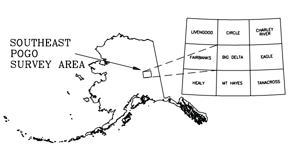
Table 1. Copies of the following maps are included at the end of this booklet. The low-resolution, page-size maps included in this booklet are intended to be used as a search tool and are not the final product. Large-scale, full-resolution versions of each map are available to download on this publication's citation page: http://doi.org/10.14509/30185.

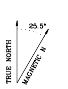
Map Title	Description
salchapogo_ext_flightlines_topo_map.pdf	Flight lines with topographic base map
salchapogo_ext_sim_magtf_topo_map.pdf	Simulated total magnetic field grid with topographic base map
salchapogo_ext_sim_magtf_contours_plss_map.pdf	Simulated total magnetic field grid with contours and public land survey system base layer
salchapogo_ext_sim_magtf_shaded_plss_map.pdf	Color shaded simulated total magnetic field grid with public land survey system base layer
salchapogo_ext_res7200hz_topo_map.pdf	7,200 Hz coplanar apparent resistivity grid with topographic base map
salchapogo_ext_res7200hz_contours_plss_map.pdf	7,200 Hz coplanar apparent resistivity grid with contours and public land survey system base layer
salchapogo_ext_res7200hz_bw_contours_plss_map.pdf	Black and white 7,200 Hz coplanar apparent resistitity contours with public land survey system base layer
salchapogo_ext_res900hz_topo_map.pdf	900 Hz coplanar apparent resistivity grid with topographic base map
salchapogo_ext_res900hz_contours_plss_map.pdf	900 Hz coplanar apparent resistivity grid with contours and public land survey system base layer
salchapogo_ext_res900hz_bw_contours_plss_map.pdf	Black and white 900 Hz coplanar apparent resistivity contours with public land survey system base layer
salchapogo_ext_interpretation_plss_map.pdf	Interpretation map with public land survey system base layer
salchapogo_ext_emanomalies_sim_magtf_contours_plss_map.pdf	EM anomalies and simulated total magnetic field contours with flight lines and public land survey system base layer
salchapogo_ext_emanomalies_sim_magtf_contours_detailed_topo_map_1of2.pdf	Detailed EM anomalies and simulated total magnetic field contours with flight lines and topographic base map
salchapogo_ext_emanomalies_sim_magtf_contours_detailed_topo_map_2of2.pdf	Detailed EM anomalies and simulated total magnetic field contours with flight lines and topographic base map



Base from U.S. Geological Survey Big Delta B-1, 1973; Big Delta B-2, 1975; Quadrangles, Alaska







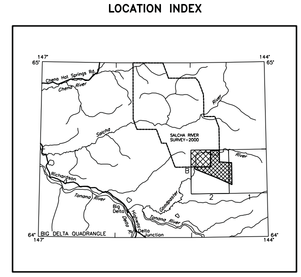
APPROXIMATE MEAN DECLINATION, 2001

FLIGHT LINES OF THE SOUTHEASTERN EXTENSION OF SALCHA RIVER — POGO SURVEY, GOODPASTER MINING DISTRICT, EAST-CENTRAL ALASKA

PARTS OF BIG DELTA QUADRANGLE

2002

LOCATION INDEX



DESCRIPTIVE NOTES

The geophysical data were acquired with a DIGHEM^V Electromagnetic (EM) system and a Scintrex cesium magnetometer. Both were flown at a height of 100 feet. In addition the survey recorded data from a radar altimeter, GPS navigation system, 50/60 Hz monitors and video camera. Flights were performed with an AS350B-2 Squirrel helicopter at a mean terrain clearance of 200 feet along NW–SE (340°) survey flight lines with a spacing of a quarter of a mile. Tie lines were flown perpendicular to the flight lines at intervals of approximately 3 miles. The blank regions indicate an area where the survey aircraft had to detour around populated areas.

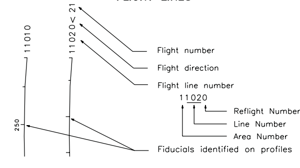
An Ashtech GG24 NAVSTAR / GLONASS Global Positioning System was used for navigation. The helicopter position was derived every 0.5 seconds using post–flight differential positioning to a relative accuracy of better than 5 m. Flight path positions were projected onto the Clarke 1866 (UTM zone 6) spheroid, 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.

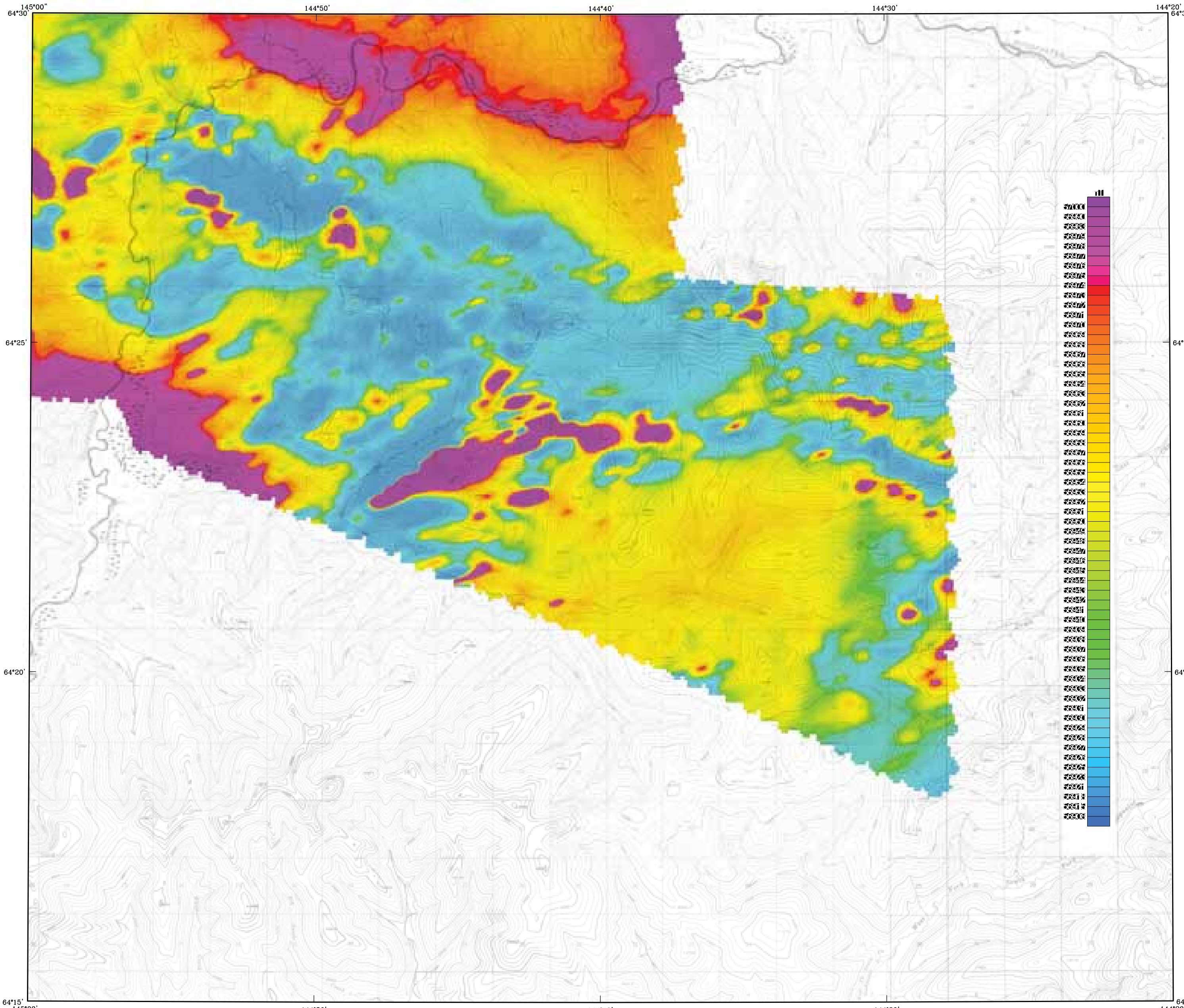
SURVEY HISTORY

This map has been compiled and drawn under contract between the State of Alaska, Department of Natural Resources, Division of Geological & Geophysical Surveys (DGGS), and Stevens Exploration Management Corp. Airborne geophysical data for the area were acquired and processed by Fugro Airborne Surveys in 2001. Laurel Burns was the contract manager for DGGS.

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

FLIGHT LINES





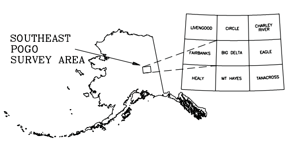
Base from U.S. Geological Survey Big Delta B-1, 1973; Big Delta B-2, 1975; Quadrangles, Alaska

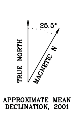
SCALE 1:63,360

1 0 1 2 3 4 MILES

1 0 1 2 3 4 5 KILOMETERS

CONTOUR INTERVAL 100 FEET
DATUM MEAN SEA LEVEL





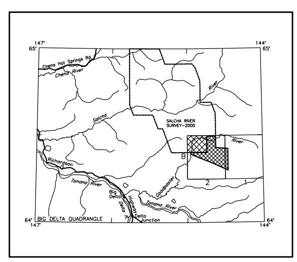
APPROXIMATE MEAN
DECLINATION, 2001

TOTAL MAGNETIC FIELD OF THE SOUTHEASTERN EXTENSION OF SALCHA RIVER — POGO SURVEY, GOODPASTER MINING DISTRICT, EAST-CENTRAL ALASKA

PARTS OF BIG DELTA QUADRANGLE

2002

LOCATION INDEX



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TOTAL MAGNETIC FIELD

The total magnetic field data were acquired with a sampling interval of 0.1 seconds, and were (1) corrected for diurnal variations by subtraction of the digitally recorded base station magnetic data, (2) leveled to the tie line data, and (3) interpolated onto a regular 100 m grid using a modified Akima (1970) technique. The regional variation (or IGRF gradient, 2000, updated to August, 2001) was removed from the leveled magnetic data.

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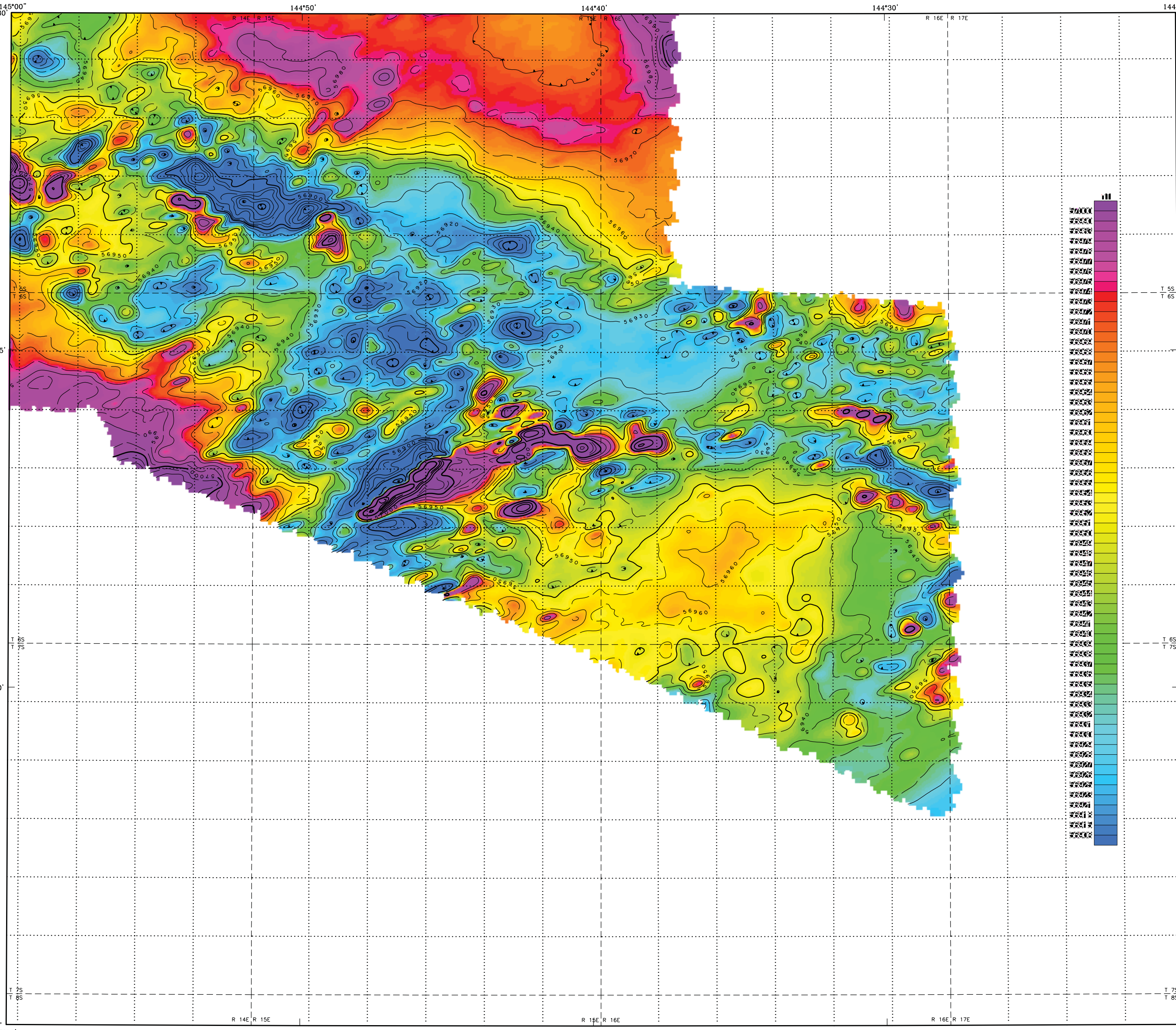
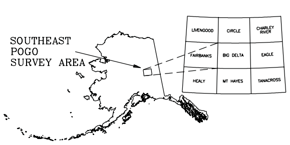


Section outlines from U.S. Geological Survey Big Delta B-1, 1973; Big Delta B-2, 1975; Quadrangles, Alaska

SCALE 1:63,360

1 0 1 2 3 4 MILES

1 0 1 2 3 4 5 KILOMETERS



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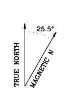
TOTAL MAGNETIC FIELD OF THE SOUTHEASTERN EXTENSION OF SALCHA RIVER — POGO SURVEY, GOODPASTER MINING DISTRICT, EAST-CENTRAL ALASKA

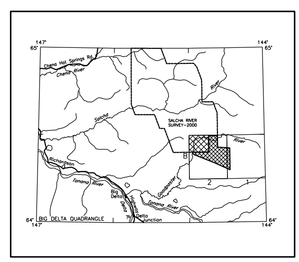
PARTS OF BIG DELTA QUADRANGLE

2002



APPROXIMATE MEAN DECLINATION, 2001

LOCATION INDEX



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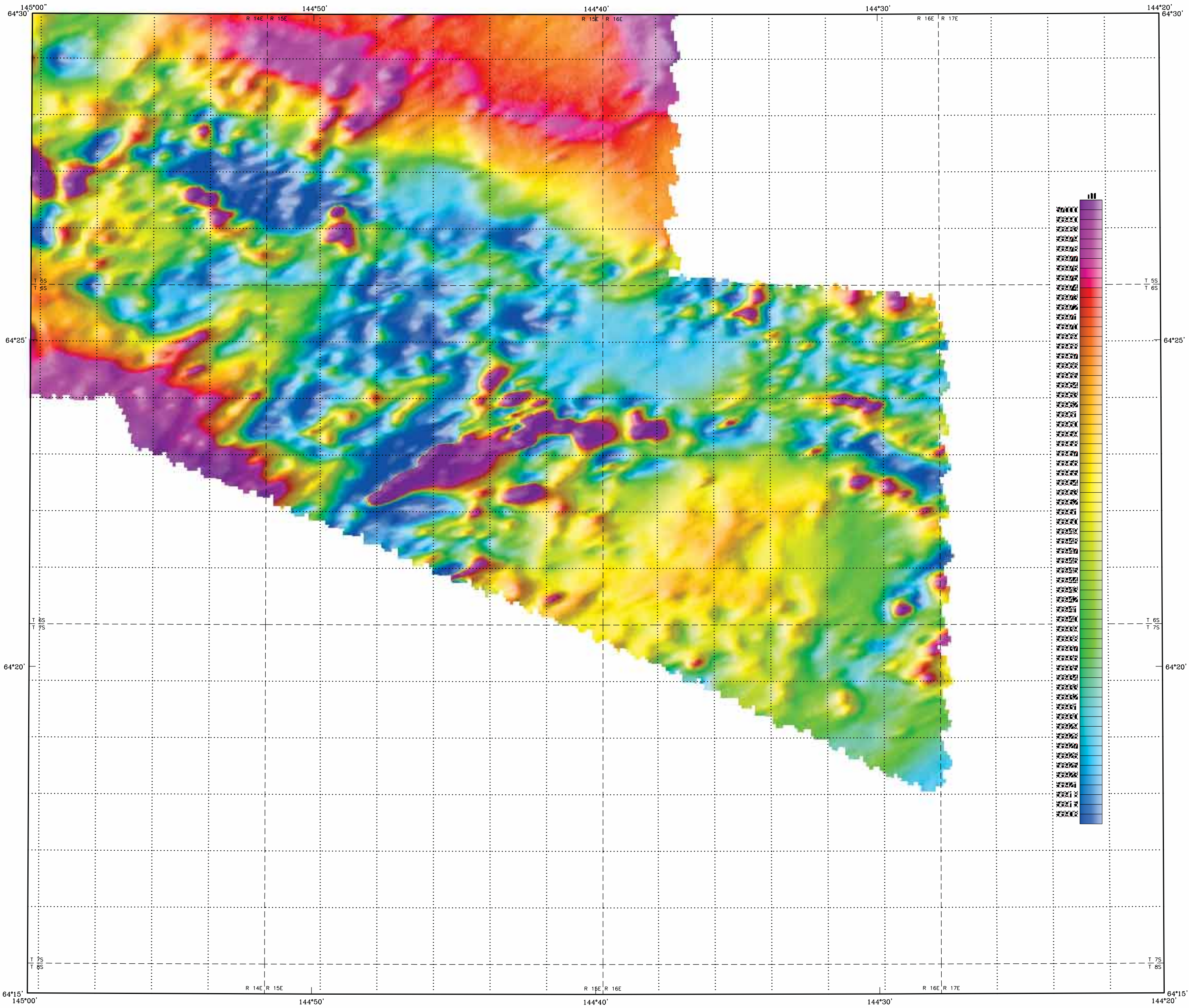
MAGNETIC CONTOUR INTERVAL

———	.... 250 nT
———	.... 50 nT
———	.... 10 nT
— — — —	.... 5 nT



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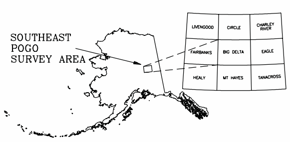
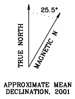




APPROXIMATE MEAN DECLINATION, 2001

COLOR SHADOW TOTAL MAGNETIC FIELD OF THE SOUTHEASTERN EXTENSION OF SALCHA RIVER — POGO SURVEY, GOODPASTER MINING DISTRICT, EAST-CENTRAL ALASKA

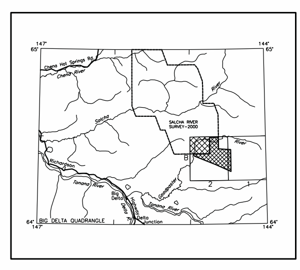
PARTS OF BIG DELTA QUADRANGLE

2002

Sun Azimuth: 270 degrees

Sun Inclination: 35 degrees

LOCATION INDEX



DESCRIPTIVE NOTES

The geophysical data were acquired with a DIGHEM[V] Electromagnetic (EM) system and a Scintrex cesium magnetometer. Both were flown at a height of 100 feet. In addition the survey recorded data from a radar altimeter, GPS navigation system, 50/60 Hz monitors and video camera. Flights were performed with an AS350B-2 Squirrel helicopter at a mean terrain clearance of 200 feet along NW-SE (340°) survey flight lines with a spacing of a quarter of a mile. Tie lines were flown perpendicular to the flight lines at intervals of approximately 3 miles. The blank regions indicate an area where the survey aircraft had to detour around populated areas.

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SURVEY HISTORY

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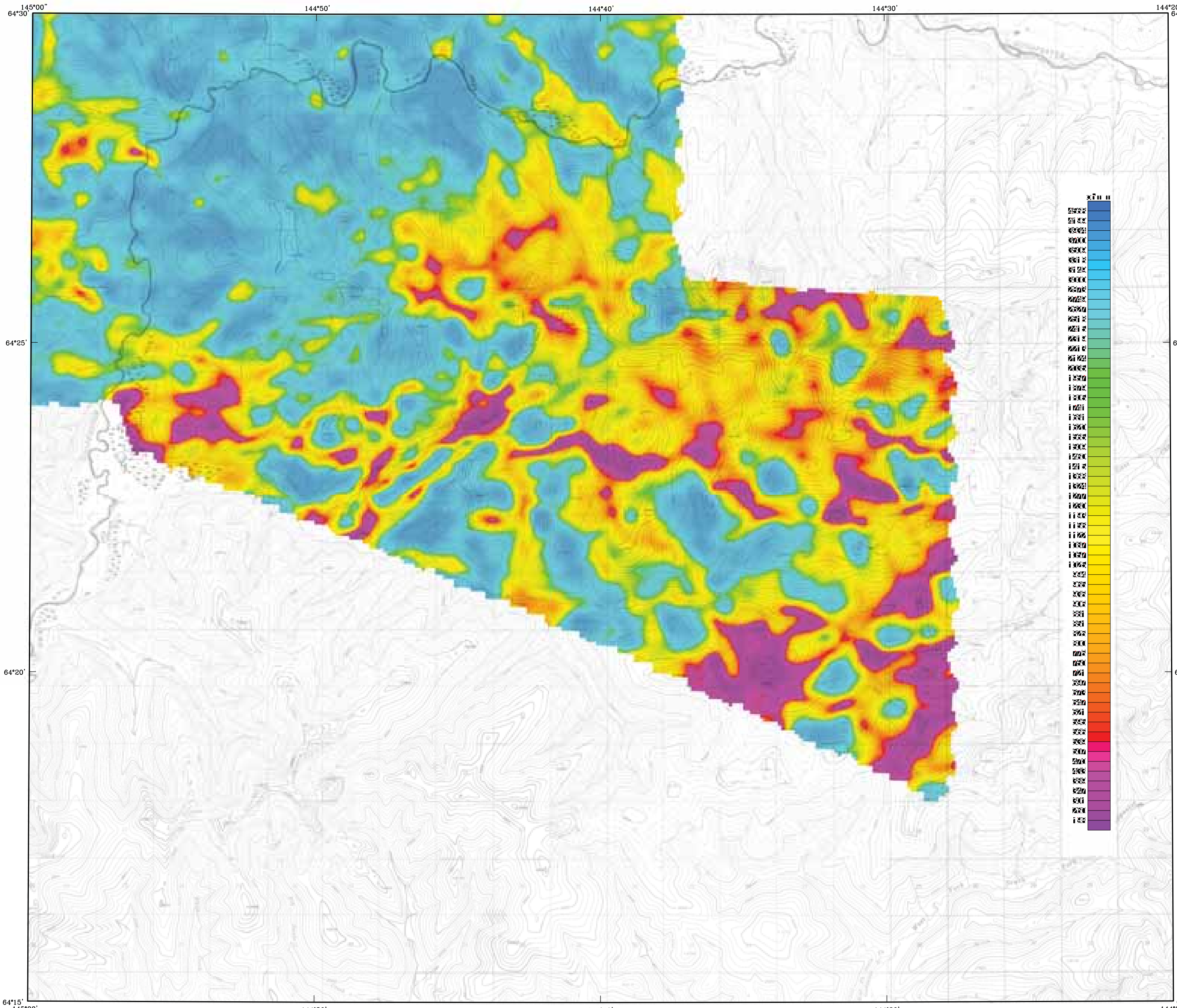
TOTAL MAGNETIC FIELD

The total magnetic field data were acquired with a sampling interval of 0.1 seconds, and were (1) corrected for diurnal variations by subtraction of the digitally recorded base station magnetic data, (2) leveled to the tie line data, and (3) interpolated onto a regular 100 m grid using a modified Akima (1970) technique. The regional variation (or IGRF gradient, 2000, updated to August, 2001) was removed from the leveled magnetic data.

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



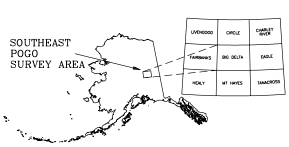
Base from U.S. Geological Survey Big Delta B-1, 1973; Big Delta B-2, 1975; Quadrangles, Alaska

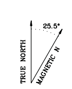
SCALE 1:63,360

1 0 1 2 3 4 MILES

1 0 1 2 3 4 5 KILOMETERS

CONTOUR INTERVAL 100 FEET
DATUM MEAN SEA LEVEL





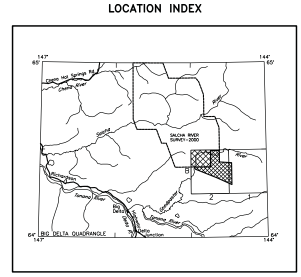
APPROXIMATE MEAN DECLINATION, 2001

7200 Hz COPLANAR RESISTIVITY OF THE SOUTHEASTERN EXTENSION OF SALCHA RIVER — POGO SURVEY, GOODPASTER MINING DISTRICT, EAST-CENTRAL ALASKA

PARTS OF BIG DELTA QUADRANGLE

2002

LOCATION INDEX



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RESISTIVITY

The DIGHEM^V EM system measured inphase and quadrature components at five frequencies. Two vertical coaxial-coil pairs operated at 1000 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 components of the coplanar 7200 Hz using the pseudo-layer half space model (Fraser 1978). The data were interpolated onto a regular 100 m grid using a modified Akima (1970) technique.

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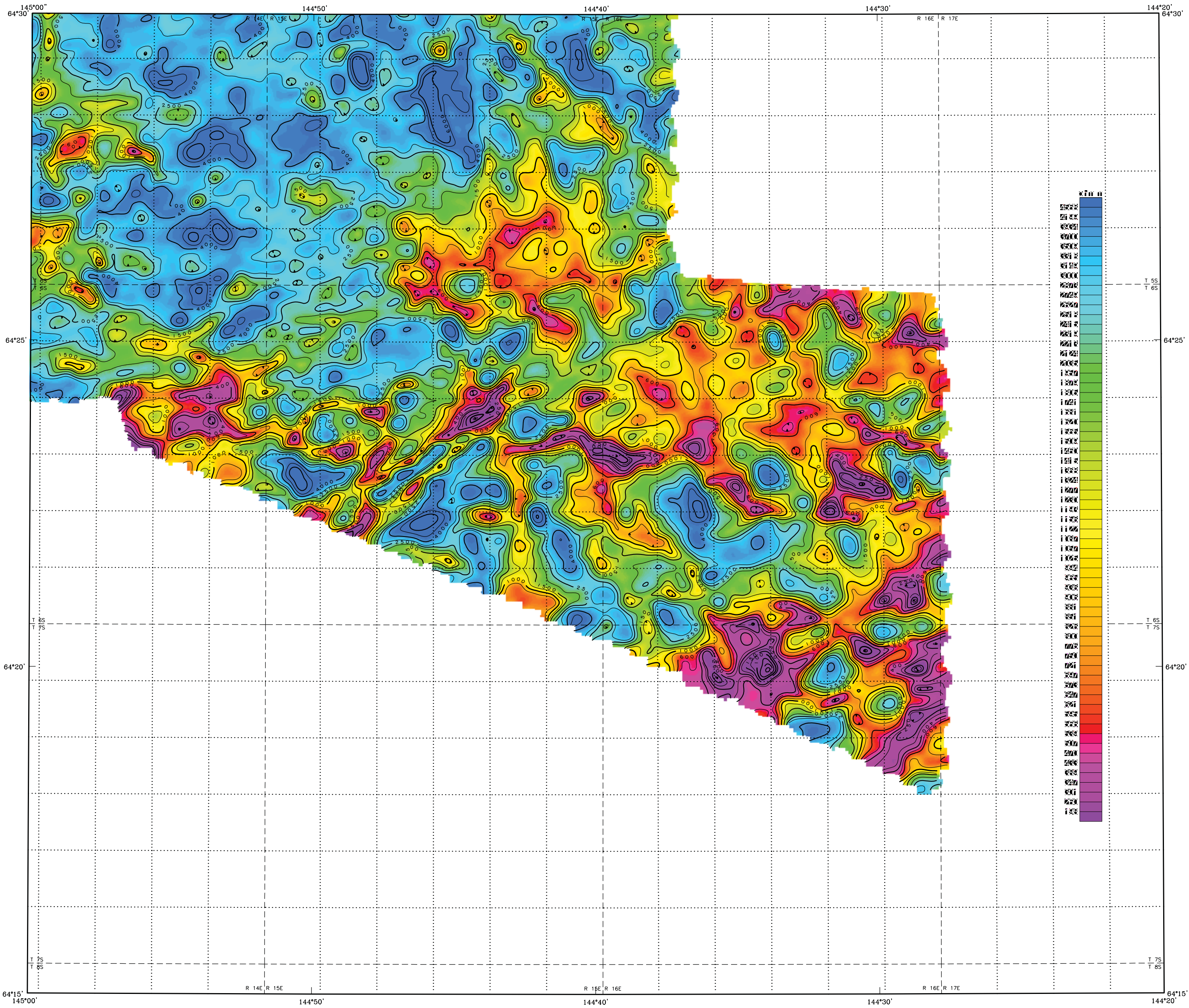
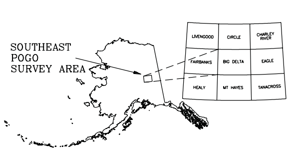


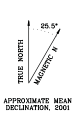
Section outlines from U.S. Geological Survey Big Delta B-1, 1973; Big Delta B-2, 1975; Quadrangles, Alaska

SCALE 1:63,360

1 0 1 2 3 4 MILES

1 0 1 2 3 4 5 KILOMETERS





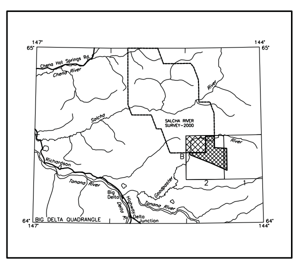
APPROXIMATE MEAN DECLINATION, 2001

7200 Hz COPLANAR RESISTIVITY OF THE SOUTHEASTERN EXTENSION OF SALCHA RIVER — POGO SURVEY, GOODPASTER MINING DISTRICT, EAST-CENTRAL ALASKA

PARTS OF BIG DELTA QUADRANGLE

2002

LOCATION INDEX



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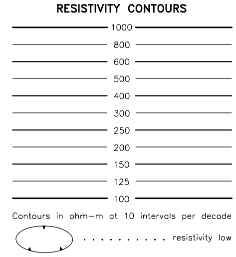
RESISTIVITY CONTOURS



Contours in ohm–m at 10 intervals per decade

. . . . resistivity low

SURVEY HISTORY

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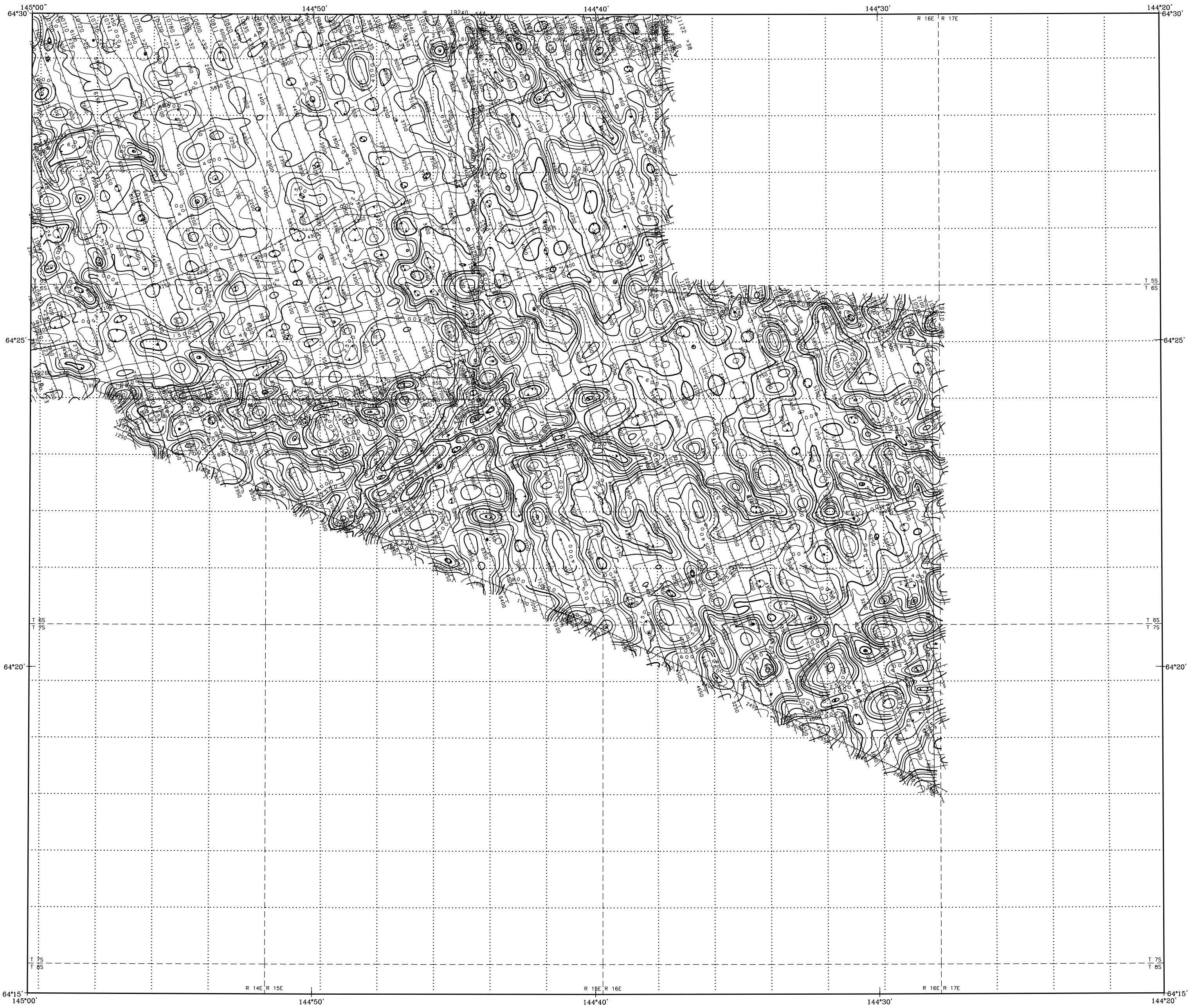
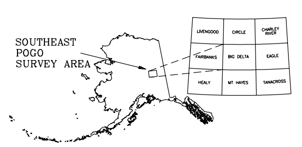


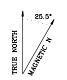
Section outlines from U.S. Geological Survey Big Delta B-1, 1973; Big Delta B-2, 1975; Quadrangles, Alaska

SCALE 1:63,360

1 0 1 2 3 4 MILES

1 0 1 2 3 4 5 KILOMETERS





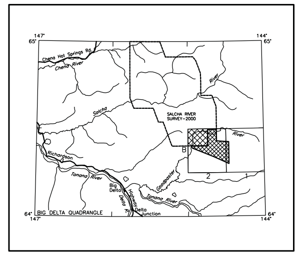
APPROXIMATE MEAN DECLINATION, 2001

7200 Hz COPLANAR RESISTIVITY OF THE SOUTHEASTERN EXTENSION OF SALCHA RIVER — POGO SURVEY, GOODPASTER MINING DISTRICT, EAST-CENTRAL ALASKA

PARTS OF BIG DELTA QUADRANGLE

2002

LOCATION INDEX



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RESISTIVITY CONTOURS

1000
800
600
500
400
300
250
200
150
125
100

Contours in ohm-m at 10 intervals per decade

. . . . resistivity low

SURVEY HISTORY

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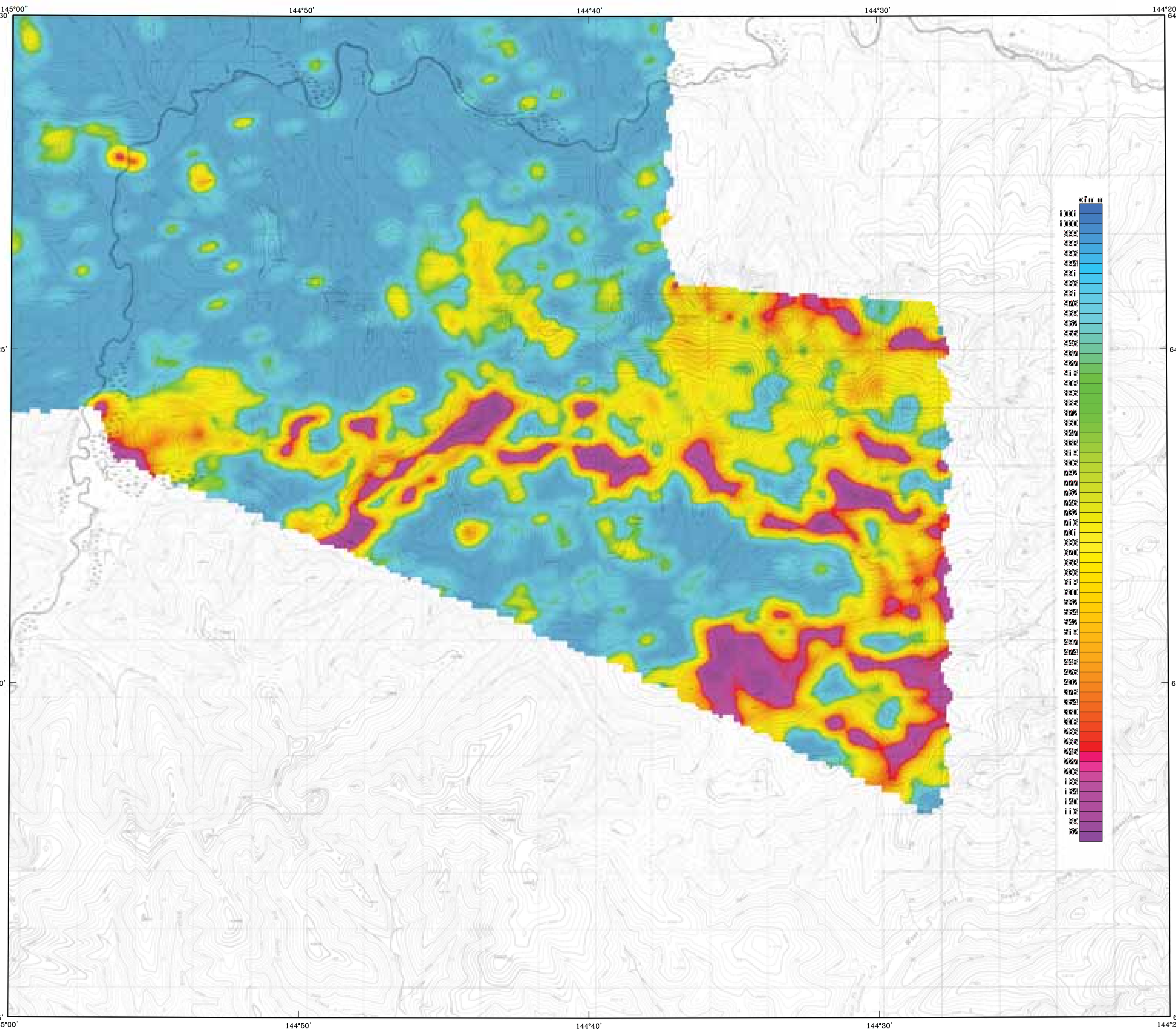
ALASKA DIVISION OF GEOLOGICAL & GEOPHYSICAL SURVEYS

GEOPHYSICAL REPORT 2002_1_4a



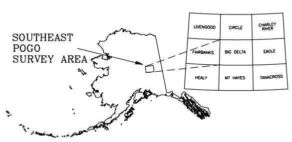
Base from U.S. Geological Survey Big Delta B-1, 1973; Big Delta B-2, 1975; Quadrangles, Alaska

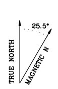
SCALE 1:63,360

1 0 1 2 3 4 MILES

1 0 1 2 3 4 5 KILOMETERS

CONTOUR INTERVAL 100 FEET
DATUM MEAN SEA LEVEL





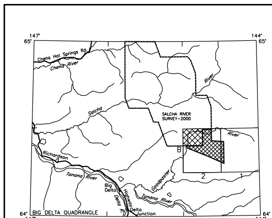
APPROXIMATE MEAN
DECLINATION, 2001

900 Hz COPLANAR RESISTIVITY OF THE SOUTHEASTERN EXTENSION OF SALCHA RIVER — POGO SURVEY, GOODPASTER MINING DISTRICT, EAST-CENTRAL ALASKA

PARTS OF BIG DELTA QUADRANGLE

2002

LOCATION INDEX



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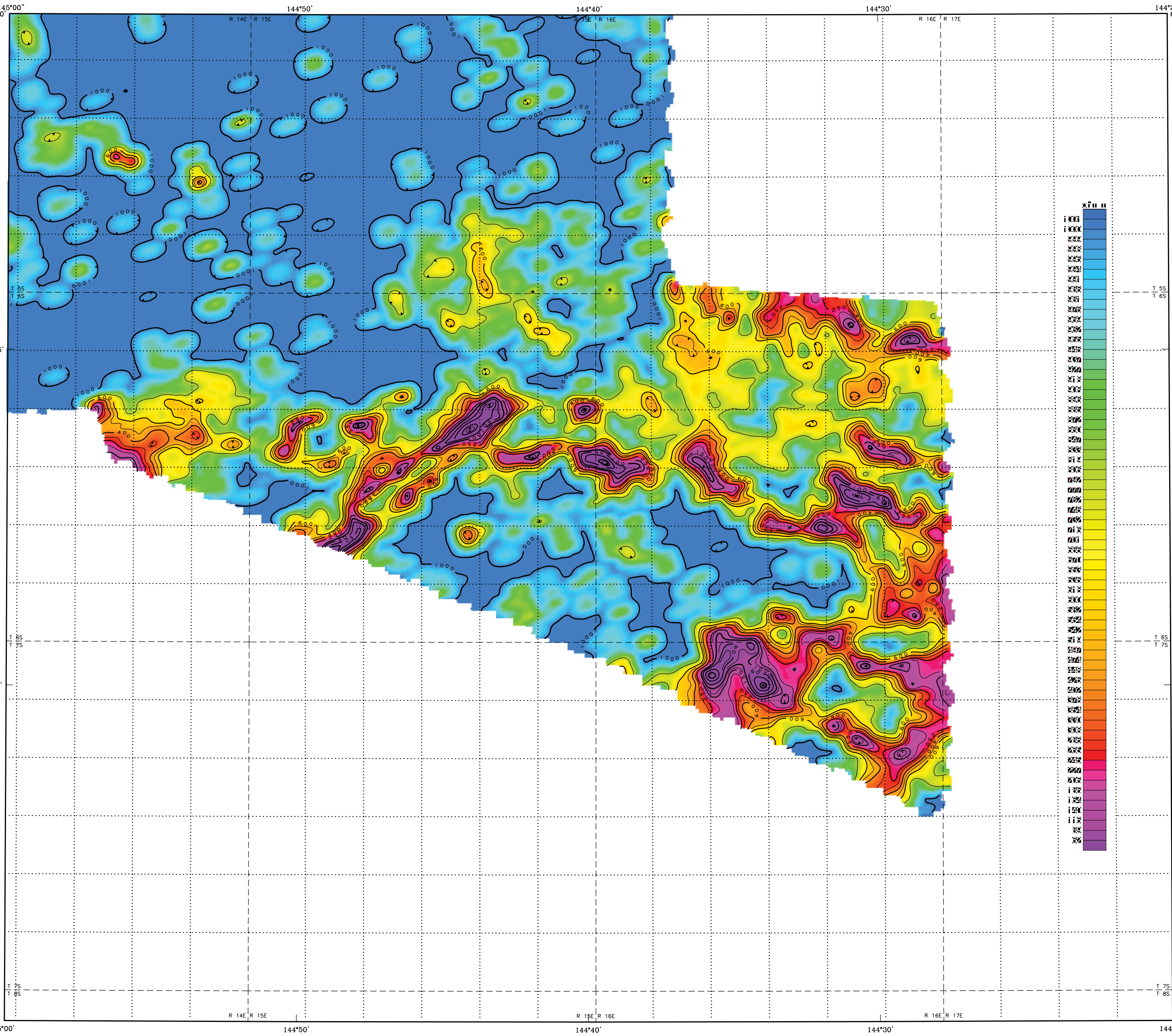

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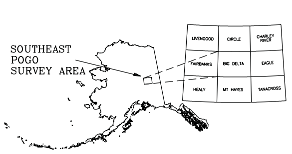
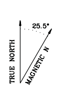




APPROXIMATE MEAN DECLINATION, 2001

SCALE 1:63,360

1 0 1 2 3 4 MILES

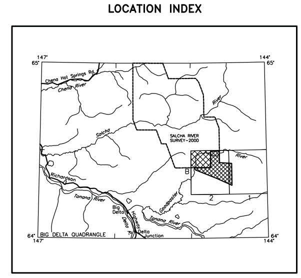
1 0 1 2 3 4 5 KILOMETERS

900 Hz COPLANAR RESISTIVITY OF THE SOUTHEASTERN EXTENSION OF SALCHA RIVER — POGO SURVEY, GOODPASTER MINING DISTRICT, EAST-CENTRAL ALASKA

PARTS OF BIG DELTA QUADRANGLE

2002

LOCATION INDEX



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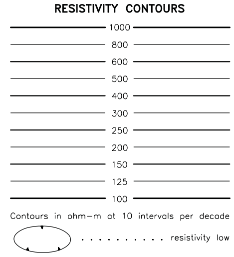
RESISTIVITY CONTOURS



Contours in ohm-m at 10 intervals per decade

SURVEY HISTORY

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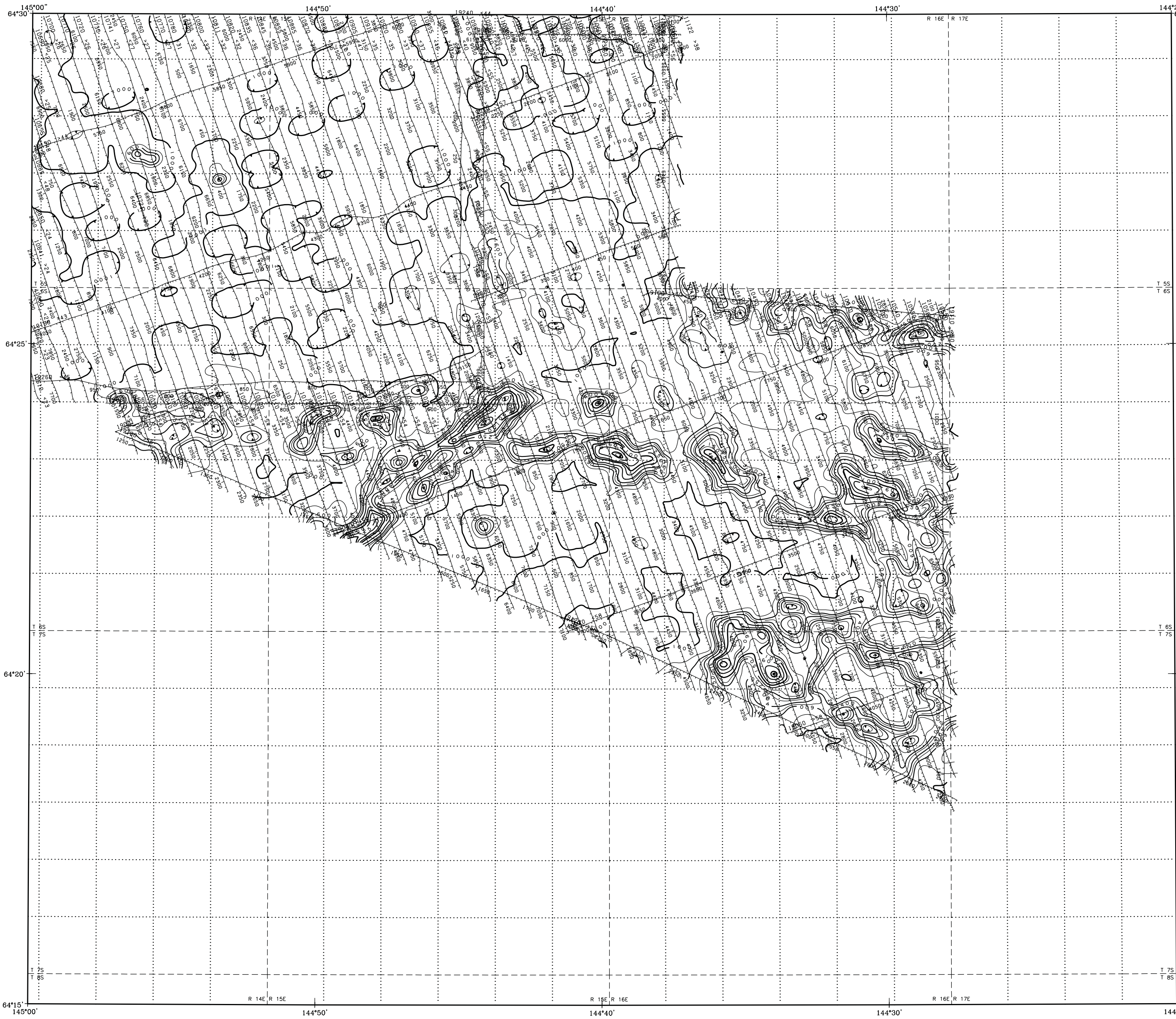
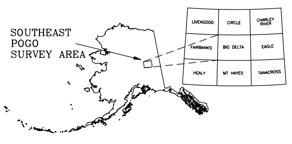
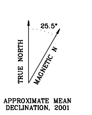
ALASKA DIVISION OF GEOLOGICAL & GEOPHYSICAL SURVEYS

GEOPHYSICAL REPORT 2002_1_4c

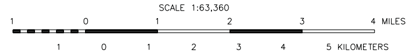


Section outlines from U.S. Geological Survey Big Delta B-1, 1973; Big Delta B-2, 1975; Quadrangles, Alaska





APPROXIMATE MEAN DECLINATION, 2001

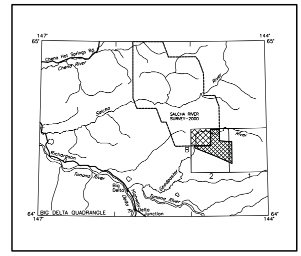


900 Hz COPLANAR RESISTIVITY OF THE SOUTHEASTERN EXTENSION OF SALCHA RIVER — POGO SURVEY, GOODPASTER MINING DISTRICT, EAST-CENTRAL ALASKA

PARTS OF BIG DELTA QUADRANGLE

2002

LOCATION INDEX



DESCRIPTIVE NOTES

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RESISTIVITY CONTOURS

1000
800
600
500
400
300
250
200
150
125
100

Contours in ohm-m at 10 intervals per decade

. . . . resistivity low

SURVEY HISTORY

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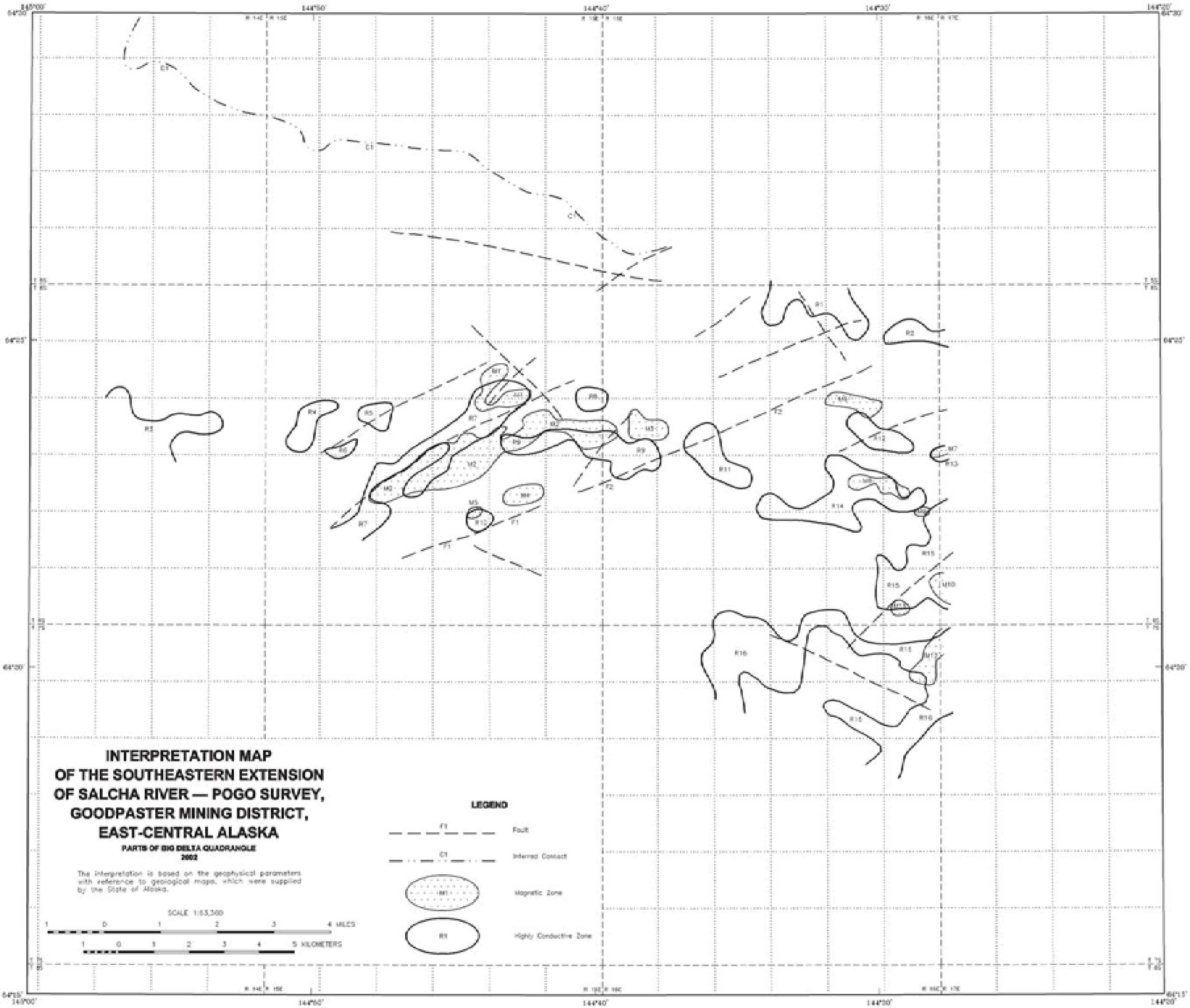
RESISTIVITY

The DIGHEM^{V} EM system measured inphase and quadrature components at five frequencies. Two vertical coaxial-coil pairs operated at 1000 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 components of the coplanar 900 Hz using the pseudo-layer half space model (Fraser 1978). 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.

Fraser, D.C., 1978, Resistivity mapping with an airborne multicoil electromagnetic system: Geophysics, v. 43, p. 144-172.


INTERPRETATION MAP
OF THE SOUTHEASTERN EXTENSION
OF SALCHA RIVER — POGO SURVEY,
GOODPASTER MINING DISTRICT,
EAST-CENTRAL ALASKA
PARTS OF BIG DELTA QUADRANGLE
2002
The interpretation is based on the geophysical parameters with reference to geological maps, which were supplied by the State of Alaska.
SCALE 1:63,360
1 0 1 2 3 4 MILES
1 0 1 2 3 4 5 KILOMETERS
LEGEND
Fault
Inferred Contact
Magnetic Zone
Highly Conductive Zone
145°00'
144°50'
144°40'
144°30'
144°20'
64°25'
64°20'
64°15'
F1
F2
C1
R1
R2
R3
R4
R5
R6
R7
R8
R9
R10
R11
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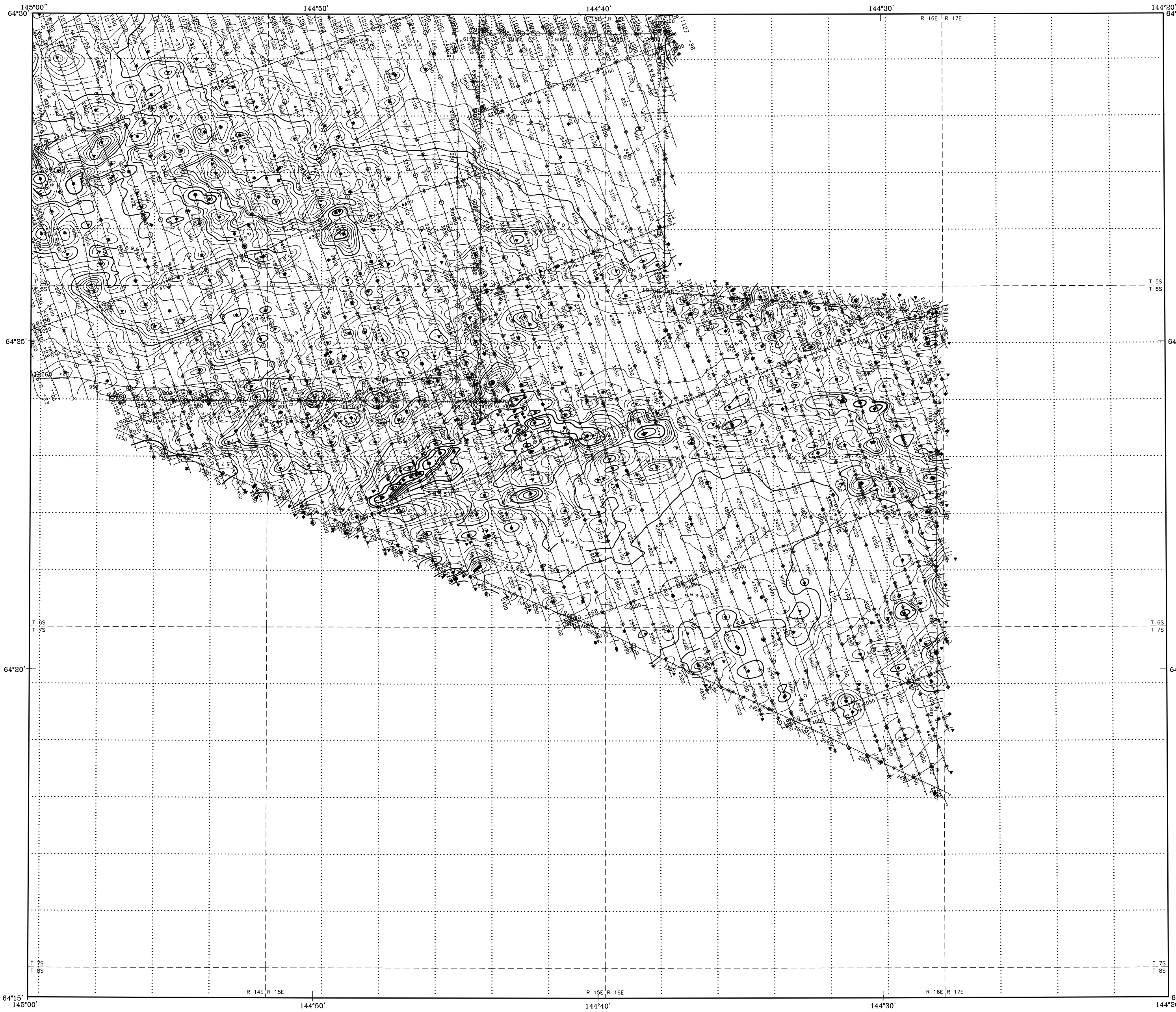
M6
M7
M8
M10

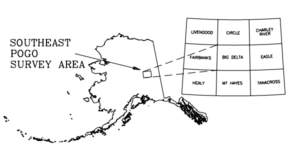


Section outlines from U.S. Geological Survey Big Delta B-1, 1973; Big Delta B-2, 1975; Quadrangles, Alaska

SCALE 1:63,360

1 0 1 2 3 4 MILES

1 0 1 2 3 4 5 KILOMETERS

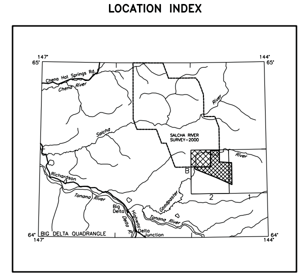


TOTAL MAGNETIC FIELD AND ELECTROMAGNETIC ANOMALIES OF THE SOUTHEASTERN EXTENSION OF SALCHA RIVER — POGO SURVEY, GOODPASTER MINING DISTRICT, EAST-CENTRAL ALASKA

PARTS OF BIG DELTA QUADRANGLE

2002

LOCATION INDEX



DESCRIPTIVE NOTES

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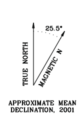
ELECTROMAGNETICS

To determine the location of EM anomalies or their boundaries, the DIGHEM^{V} EM system measured inphase and quadrature components at five frequencies. Two vertical coaxial-coil pairs operated at 1000 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 power line monitor and the flight track video were examined to locate cultural sources. The EM anomalies that are indicated are classified by conductance.



APPROXIMATE MEAN DECLINATION, 2001

ELECTROMAGNETIC ANOMALIES

Anomaly	Conductance
●	>50 siemens
○	<50 siemens
✳	Questionable anomaly
△	Weak conductivity associated with an EM magnetite response

MAGNETIC CONTOUR INTERVAL

. . . . 250 nT

. . . . 50 nT

. . . . 10 nT

. . . . 5 nT

. . . . magnetic low

. . . . magnetic high

SURVEY HISTORY

This map has been compiled and drawn under contract between the State of Alaska, Department of Natural Resources, Division of Geological & Geophysical Surveys (DGGS), and Stevens Exploration Management Corp. Airborne geophysical data for the area were acquired and processed by Fugro Airborne Surveys in 2001. Laurel Burns was the contract manager for DGGS.

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TOTAL MAGNETIC FIELD

The total magnetic field data were acquired with a sampling interval of 0.1 seconds, and were (1) corrected for diurnal variations by subtraction of the digitally recorded base station magnetic data, (2) leveled to the tie line data, and (3) interpolated onto a regular 100 m grid using a modified Akima (1970) technique. The regional variation (or IGRF gradient, 2000, updated to August, 2001) was removed from the leveled magnetic data.

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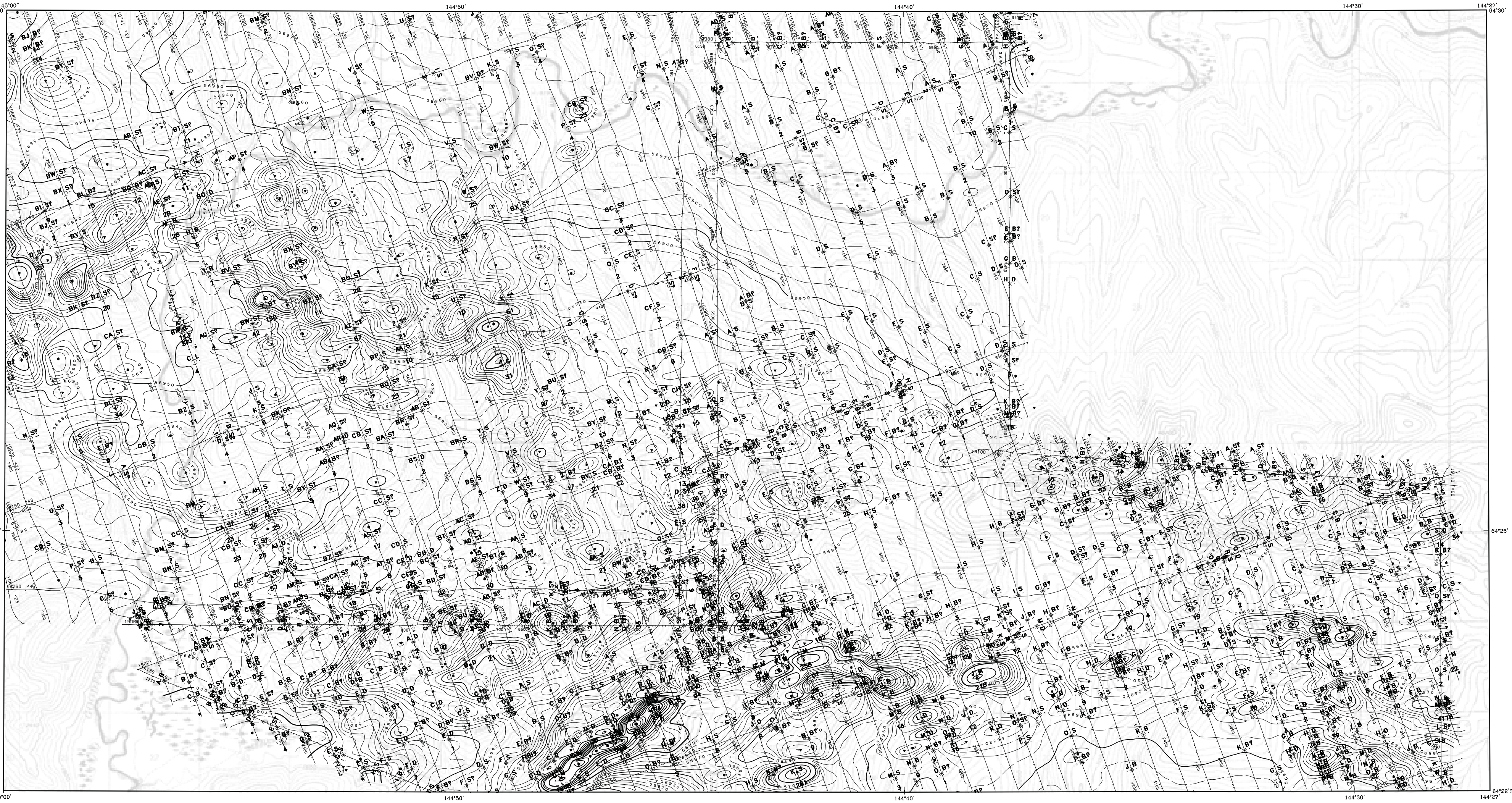
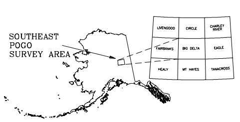


Base from U.S. Geological Survey Big Delta B-1, 1973; Big Delta B-2, 1975; Quadrangles, Alaska



SCALE 1:31,680

0.5 0 0.5 1 1.5 2 MILES

0.5 0 0.5 1 1.5 2 2.5 KILOMETERS

CONTOUR INTERVAL 100 FEET
DATUM MEAN SEA LEVEL

TOTAL MAGNETIC FIELD AND DETAILED ELECTROMAGNETIC ANOMALIES OF THE SOUTHEASTERN EXTENSION OF SALCHA RIVER — POGO SURVEY, GOODPASTER MINING DISTRICT, EAST-CENTRAL ALASKA

PARTS OF BIG DELTA B-1 AND B-2 QUADRANGLES

2002

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ELECTROMAGNETIC ANOMALIES

Arcs indicate the conductor has a thickness >10m
Magnetic correlation in nT
Dip direction

Anomaly	Conductance
●	>100 siemens
◕	50–100 siemens
◒	20–50 siemens
⊕ (filled)	10–20 siemens
⊕	5–10 siemens
○	1–5 siemens
◌	< 1 siemens
✳	Questionable anomaly
△ M	EM magnetite response

Anomaly identifier
Interpretive symbol
Depth is greater than
· 15 m
: 30 m
⋮ 45 m
⁞ 60 m
Inphase and quadrature of coaxial coil is greater than
. 5 ppm
.. 10 ppm
... 15 ppm
.... 20 ppm

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

TRUE NORTH
MAGNETIC N
25.5°
APPROXIMATE MEAN DECLINATION, 2001

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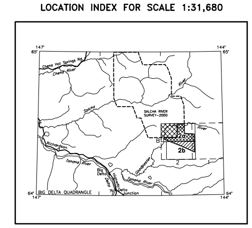
MAGNETIC CONTOUR INTERVAL

Line	Interval
thick solid	250 nT
solid	50 nT
thin solid	10 nT
dashed	5 nT
▼	magnetic low
✸	magnetic high

LOCATION INDEX FOR SCALE 1:31,680



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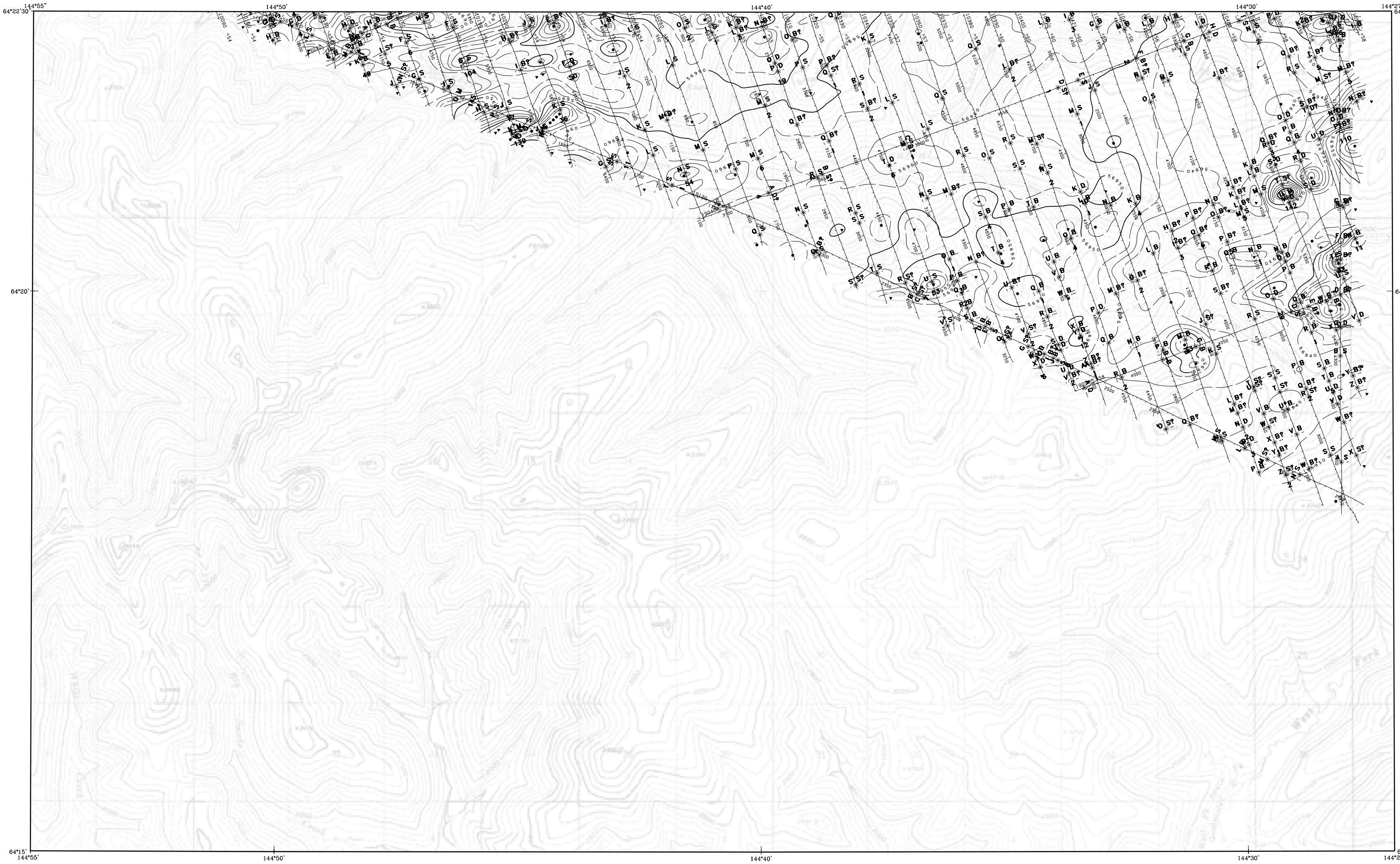

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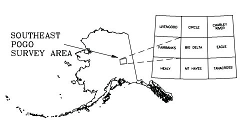

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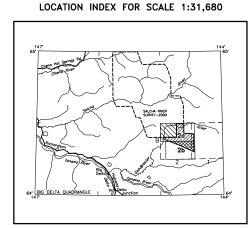
MAGNETIC CONTOUR INTERVAL

(heavy solid line)	250 nT
(solid line)	50 nT
(thin solid line)	10 nT
(dashed line)	5 nT
(ellipse with ▼)	magnetic low
(ellipse with ✱)	magnetic high

LOCATION INDEX FOR SCALE 1:31,680



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