

ICY CAPE AIRBORNE MAGNETIC GEOPHYSICAL SURVEY, SOUTHEAST ALASKA

Abraham M. Emond, Gina R.C. Graham, Karsten Eden, and Precision GeoSurveys Inc.

Geophysical Report 2021-1

2021
STATE OF ALASKA
DEPARTMENT OF NATURAL RESOURCES
DIVISION OF GEOLOGICAL & GEOPHYSICAL SURVEYS



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Suggested citation:

Emond, A.M., Graham, G.R.C., Eden, Karsten, and Precision GeoSurveys Inc., 2021, Icy Cape airborne magnetic geophysical survey, southeast, Alaska: Alaska Division of Geological & Geophysical Surveys Geophysical Report 2021-1. <https://doi.org/10.14509/29742>



ICY CAPE AIRBORNE MAGNETIC GEOPHYSICAL SURVEY, SOUTHEAST ALASKA

Abraham M. Emond¹, Gina R.C. Graham¹, Karsten Eden², and Precision GeoSurveys Inc.³

ABSTRACT

The Icy Cape airborne magnetic geophysical survey covers parts of Icy Cape, Alaska, which is located on the coast of the Gulf of Alaska near Icy Bay. Data were acquired by helicopter between August 20th and August 22nd, 2016, by Precision GeoSurveys Inc. The survey helicopter was equipped with a Scintrex cesium vapor CS-3 magnetometer, spectrometer, data acquisition system, magnetic compensation system, pilot guidance unit (PGU), and GPS navigation system. A Garmin VIRB XE video camera integrated with a GPS antenna was used to record the flight path video. In addition, two GEM GSM-19T magnetometer base stations with integrated GPS time synchronization were used to record diurnal magnetic variations. The survey area consists of four contiguous blocks covering an irregular area of 42.5 km by 19.1 km with 173 survey lines and 16 tie lines. The four blocks are centered 130 km northwest of Yakutat, Alaska, and cover a total of 520.8 square km. A total of 846.2 line-km were collected.

PURPOSE

This airborne magnetic survey was performed to evaluate and promote State of Alaska, Mental Health Trust owned lands in the Icy Cape area for accumulations of concentrated heavy mineral sands.

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 State of Alaska, Mental Health Trust Land Office.

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² Alaska Mental Health Trust Authority, Trust Land Office, 3745 Community Park Loop, Suite 200, Anchorage, Alaska 99508

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	Project and field reports
grids_ermapper	DGGS	Geographically registered gridded data, ER Mapper ERS format
grids_geosoft	contractor and DGGS	Geosoft-format grids, these grids can be viewed in ESRI ArcMap using a free plugin from Geosoft, or using the free viewer available from Geosoft
images_registered	DGGS	GeoTiff format images of gridded data
kmz	contractor	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
vector_data	contractor and DGGS	Line path, data contours, and survey boundary in ESRI shapefile (SHP) format
video_flightpath	contractor	Survey flight path downward-facing video

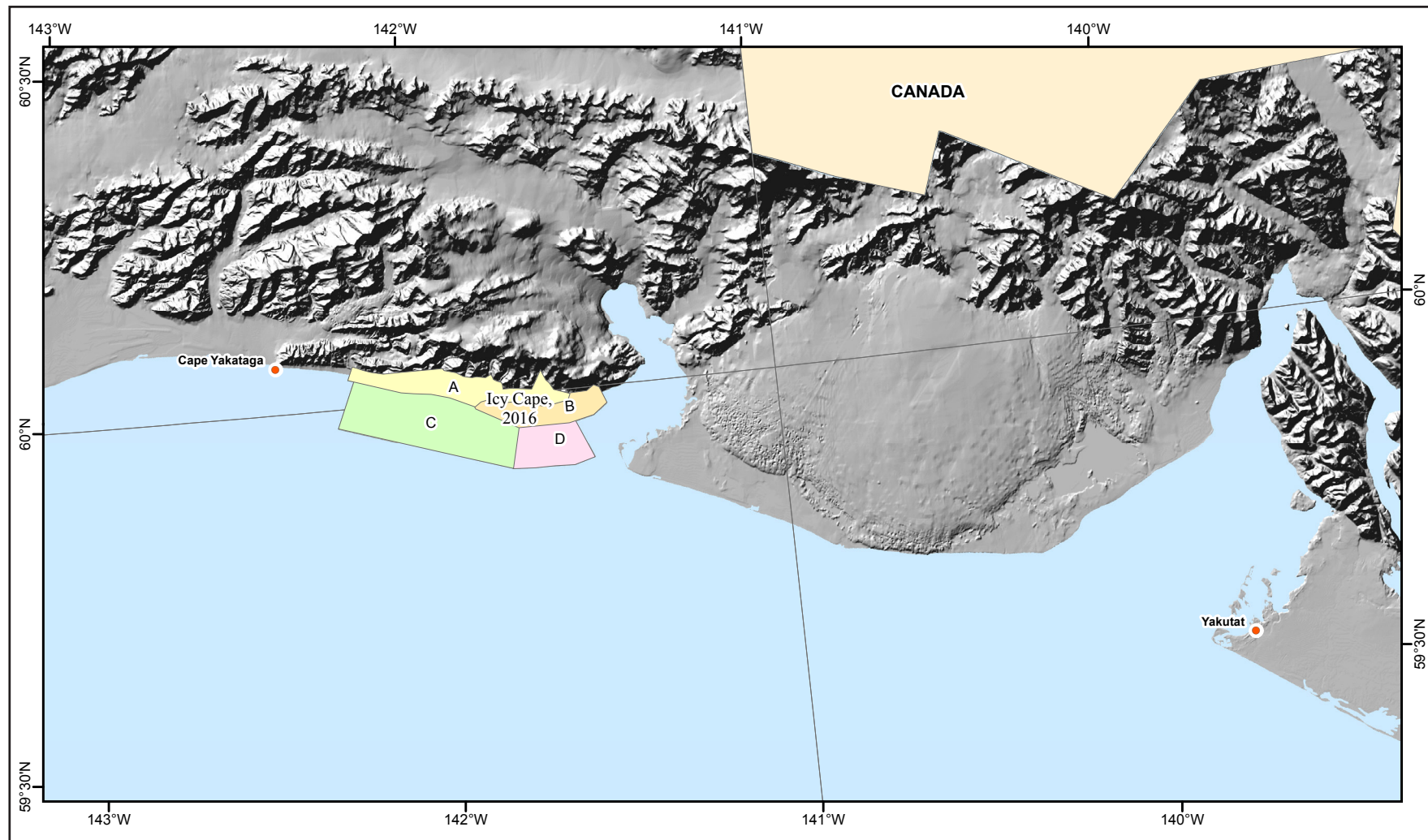


Figure 1. Icy Cape survey location shown in interior Alaska (inset). Survey location in Alaska with relevant 1:250,000 scale USGS quadrangles (above).



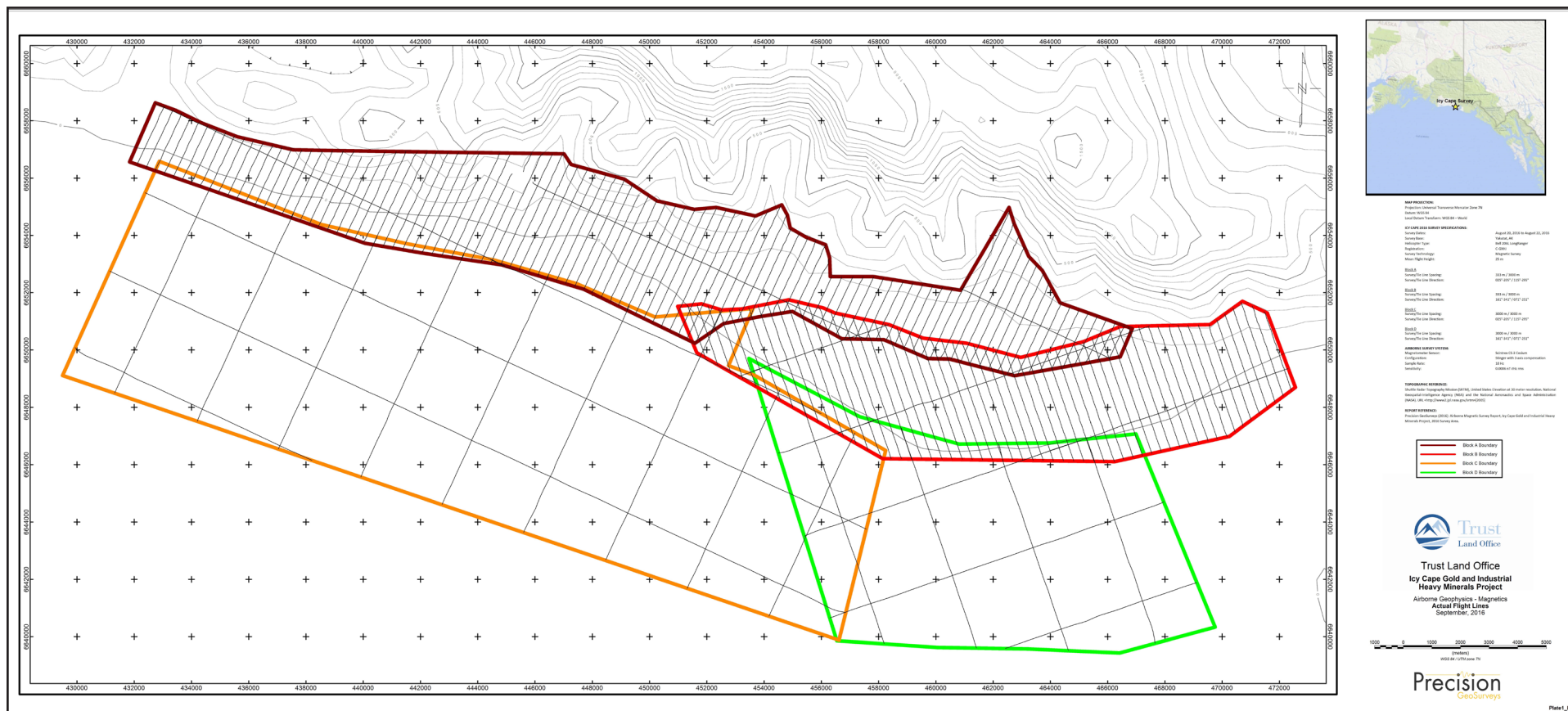


Figure 2. Flightlines, survey blocks, and topography with location map inset.

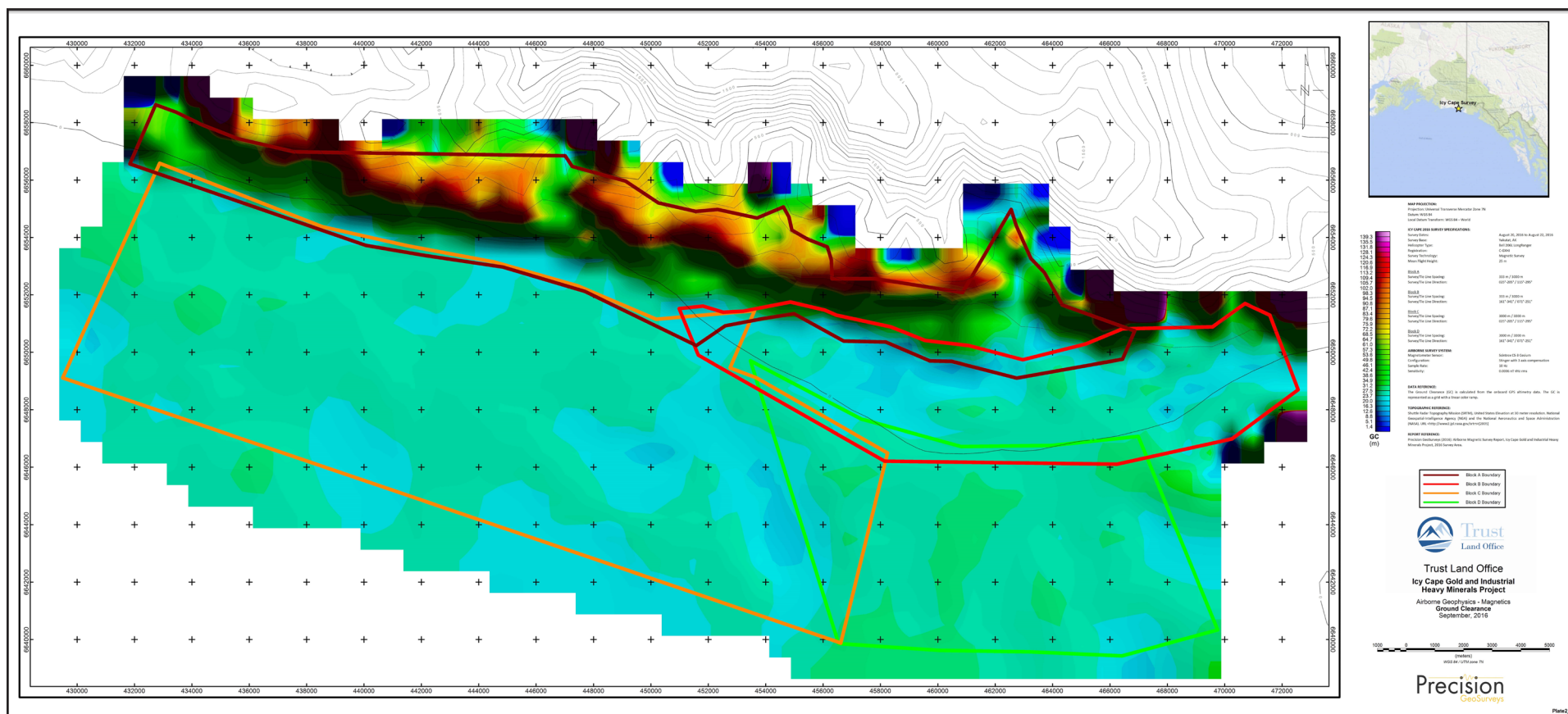
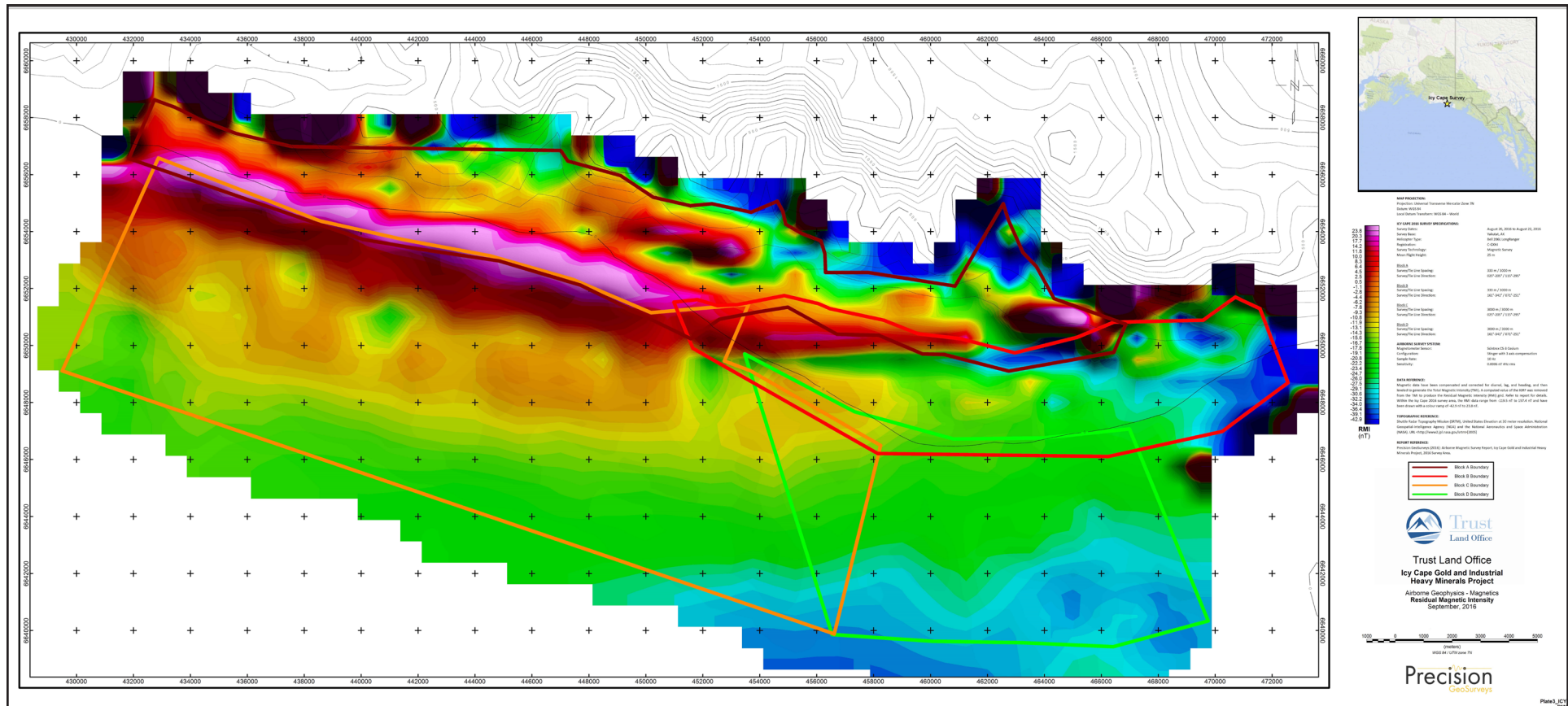


Figure 3. Ground clearance grid, survey blocks, and topography with location map inset.



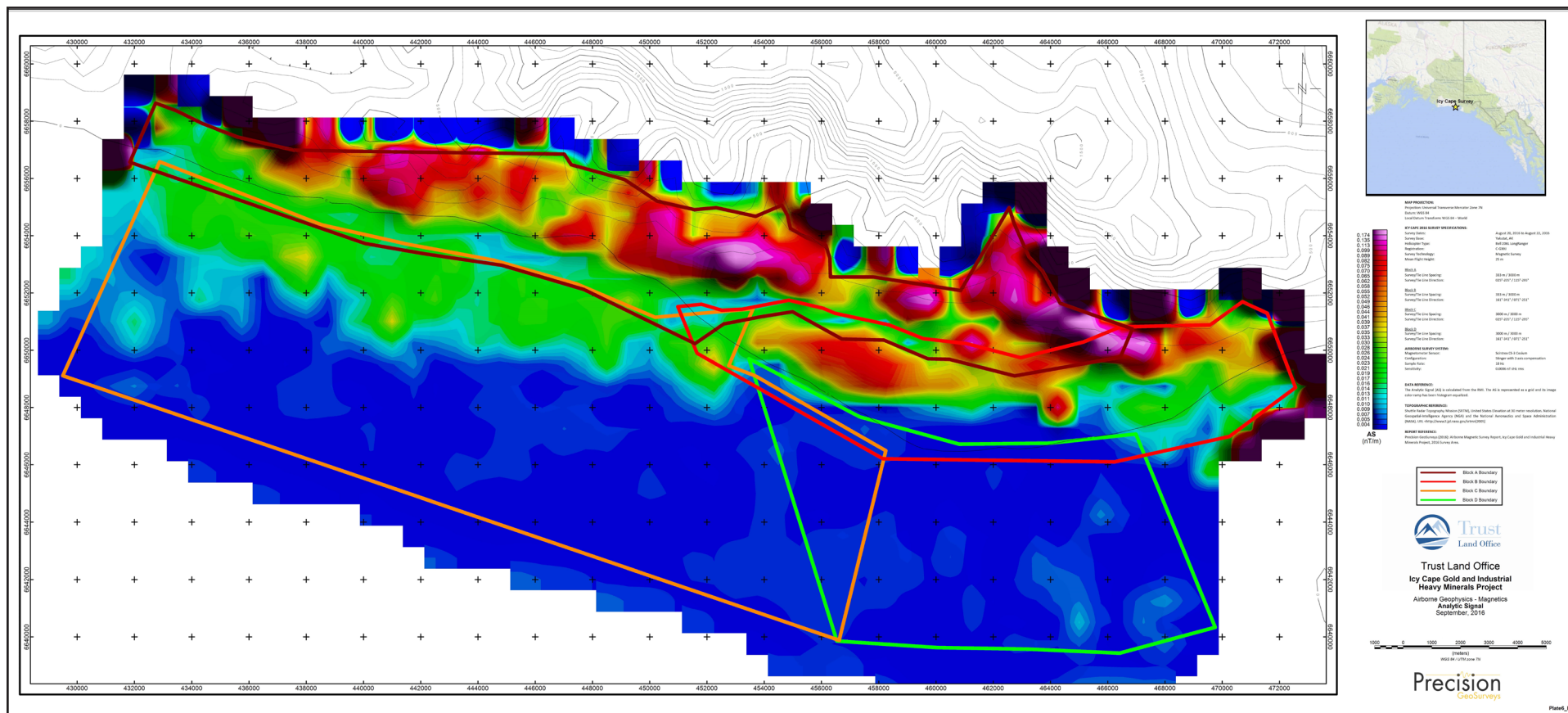


Figure 5. Analytic signal grid, survey blocks, and topography with location map inset.

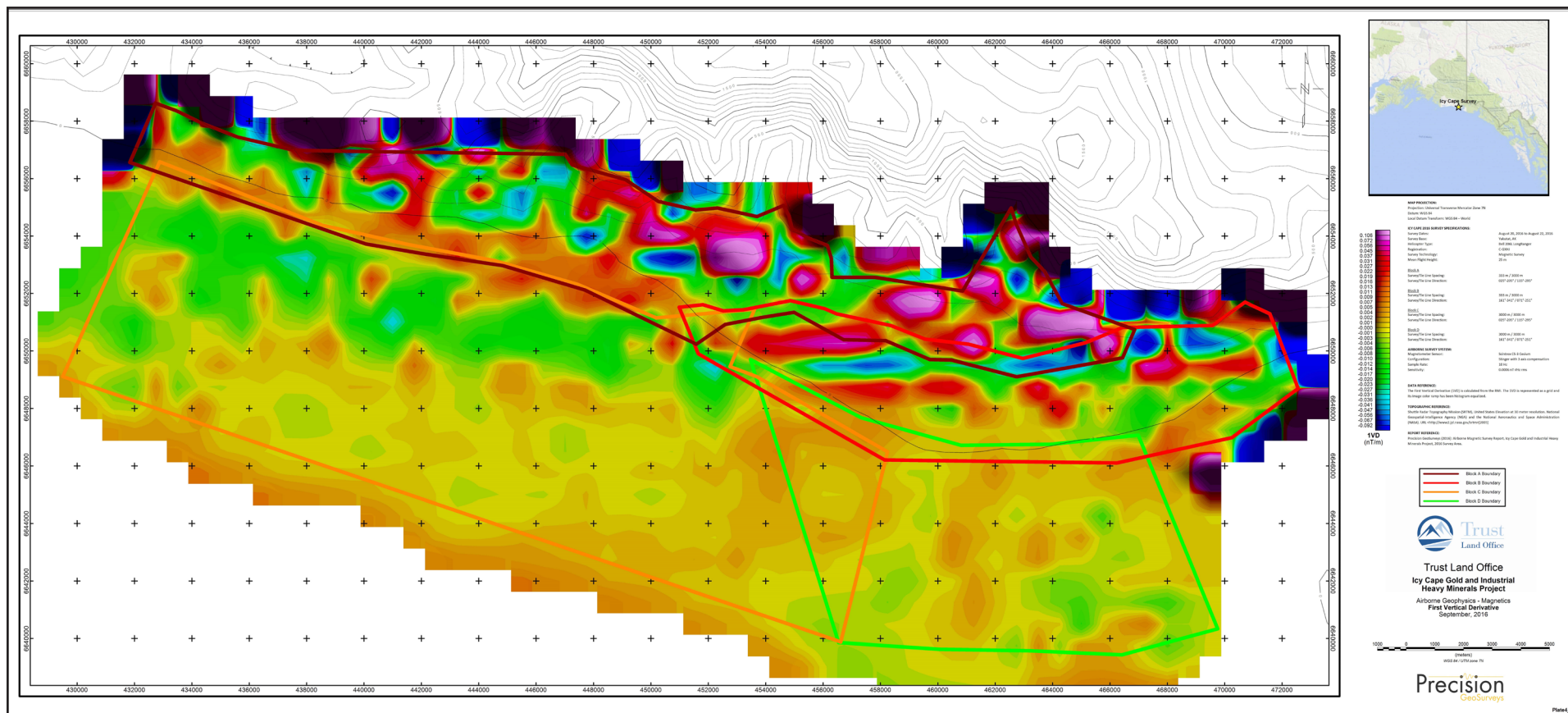
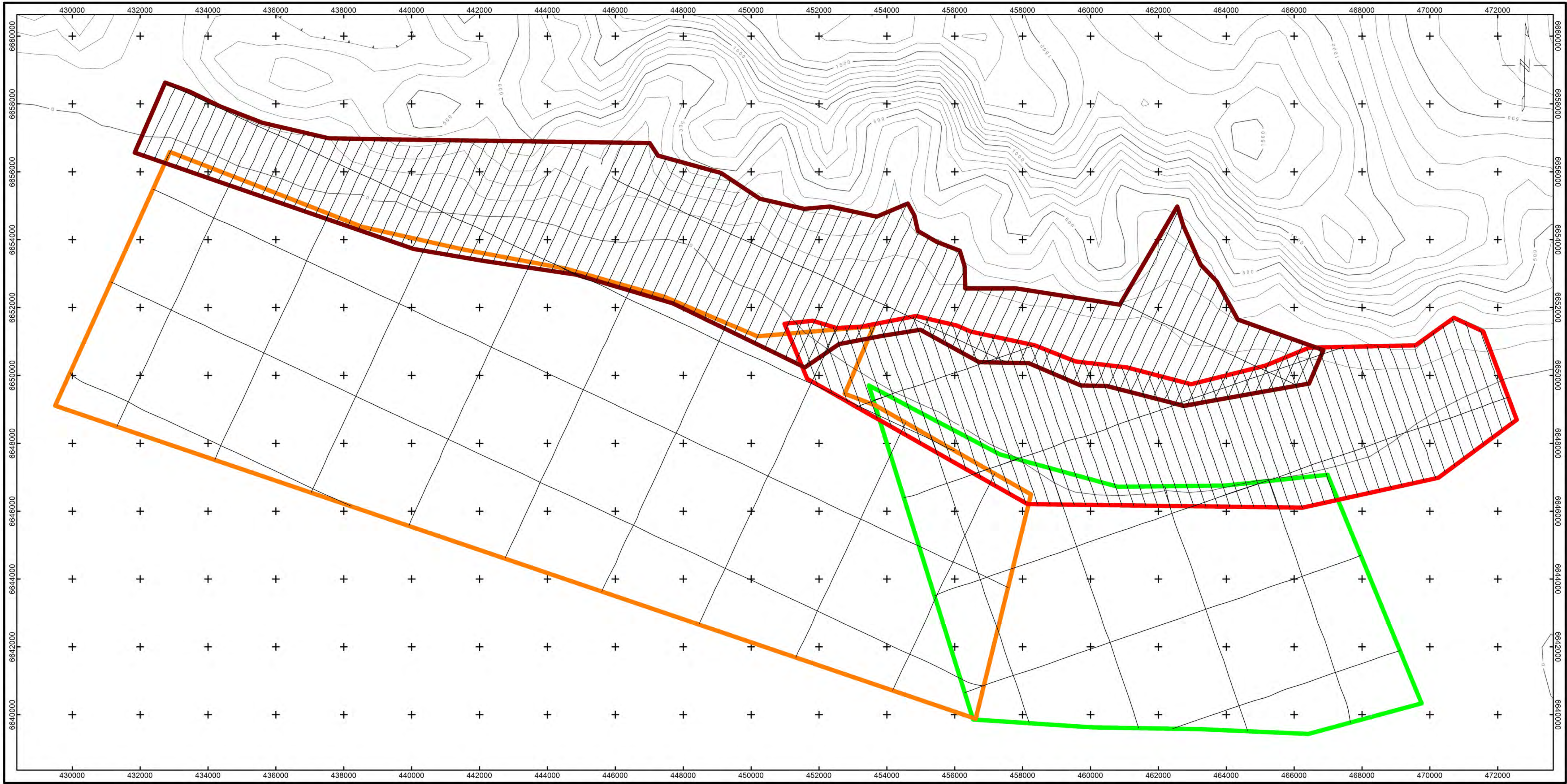


Figure 6. Calculated second vertical derivative grid, survey blocks, and topography with location map inset.



Survey Maps

PDF format maps were delivered by the contractor. Maps are provided in 11 inch by 17 inch paper size and 1:63,360 scale for a total of ten PDF files. PDF file are provided for all survey blocks and each block individually. Each PDF contains six maps: flightlines, ground clearance grid, residual magnetic intensity grid, analytic signal grid, calculated first vertical derivative, and calculated second vertical derivative grid. High-resolution maps available from <https://doi.org/10.14509/29742>.



MAP PROJECTION:
Projection: Universal Transverse Mercator Zone 7N
Datum: WGS 84
Local Datum Transform: WGS 84 - World

ICY CAPE 2016 SURVEY SPECIFICATIONS:

Survey Dates:	August 20, 2016 to August 22, 2016
Survey Base:	Yakutat, AK
Helicopter Type:	Bell 206L LongRanger
Registration:	C-0341
Survey Technology:	Magnetic Survey
Mean Flight Height:	25 m

Block A
Survey/Tie Line Spacing: 333 m / 3000 m
Survey/Tie Line Direction: 025°-205° / 115°-295°

Block B
Survey/Tie Line Spacing: 333 m / 3000 m
Survey/Tie Line Direction: 161°-341° / 071°-251°

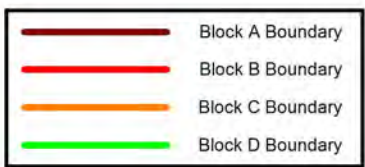
Block C
Survey/Tie Line Spacing: 3000 m / 3000 m
Survey/Tie Line Direction: 025°-205° / 115°-295°

Block D
Survey/Tie Line Spacing: 3000 m / 3000 m
Survey/Tie Line Direction: 161°-341° / 071°-251°

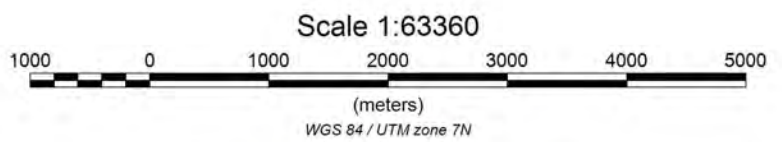
AIRBORNE SURVEY SYSTEM:
Magnetometer Sensor: Scintrex CS-3 Cesium
Configuration: Slinger with 3 axis compensation
Sample Rate: 10 Hz
Sensitivity: 0.0006 nT VHz rms

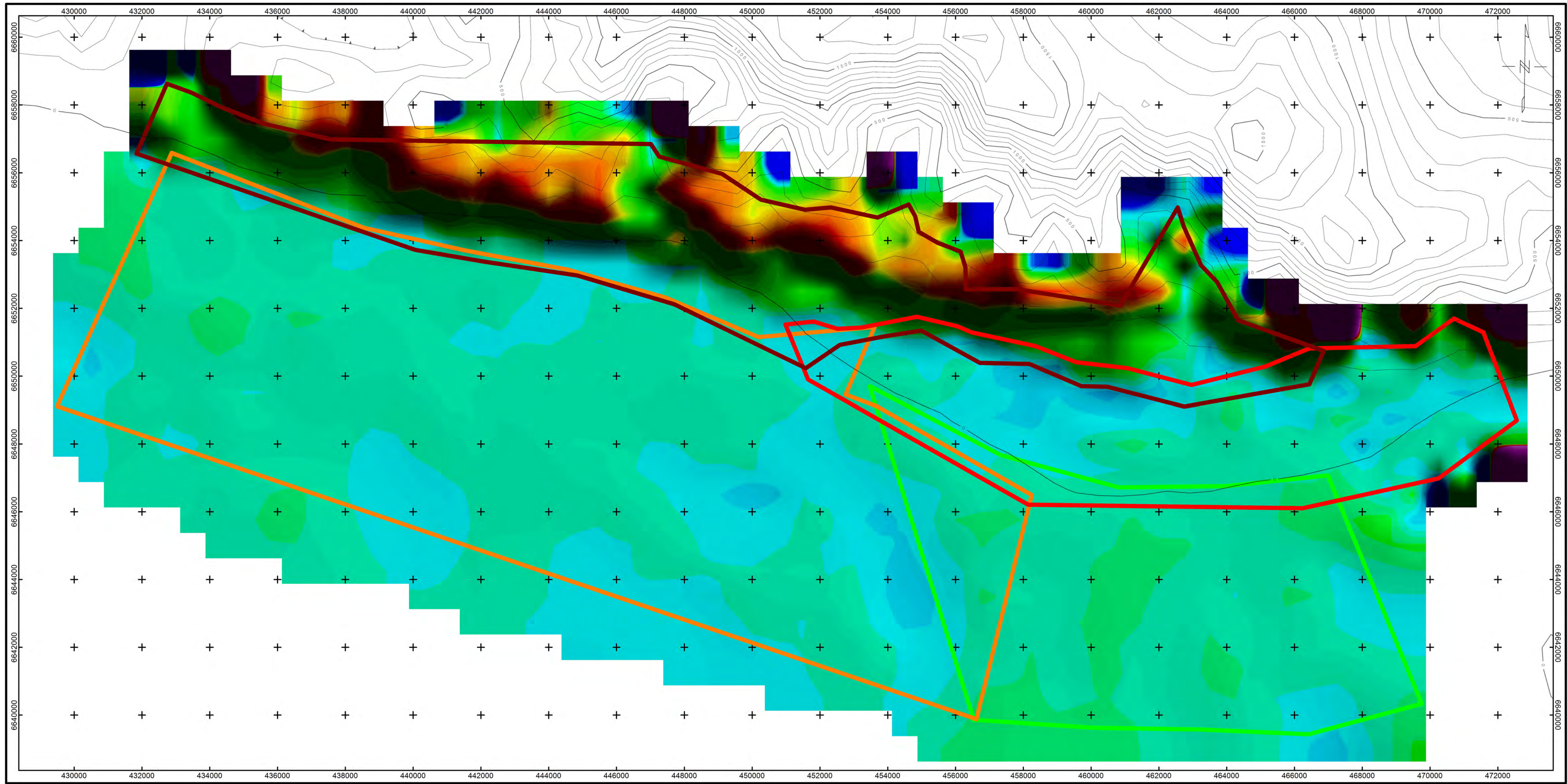
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Shuttle Radar Topography Mission (SRTM), United States Elevation at 30 meter resolution, National Geospatial-Intelligence Agency (NGA) and the National Aeronautics and Space Administration (NASA). URL <<http://www2.jpl.nasa.gov/srtm/>>[2005]

REPORT REFERENCE:
Precision GeoSurveys (2016): Airborne Magnetic Survey Report, Icy Cape Gold and Industrial Heavy Minerals Project, 2016 Survey Area.



Trust Land Office
Icy Cape Gold and Industrial Heavy Minerals Project
Airborne Geophysics - Magnetics
Actual Flight Lines
September, 2016





MAP PROJECTION:

Projection: Universal Transverse Mercator Zone 7N

Datum: WGS 84

Local Datum Transform: WGS 84 - World

ICY CAPE 2016 SURVEY SPECIFICATIONS:

Survey Dates: August 20, 2016 to August 22, 2016

Survey Base: Yakutat, AK

Helicopter Type: Bell 206L LongRanger

Registration: C-0000

Survey Technology: Magnetic Survey

Mean Flight Height: 25 m

Block A

Survey/Tie Line Spacing: 333 m / 3000 m

Survey/Tie Line Direction: 025°-205° / 115°-295°

Block B

Survey/Tie Line Spacing: 333 m / 3000 m

Survey/Tie Line Direction: 161°-341° / 071°-251°

Block C

Survey/Tie Line Spacing: 3000 m / 3000 m

Survey/Tie Line Direction: 025°-205° / 115°-295°

Block D

Survey/Tie Line Spacing: 3000 m / 3000 m

Survey/Tie Line Direction: 161°-341° / 071°-251°

AIRBORNE SURVEY SYSTEM:

Magnetometer Sensor: Scintrex CS-3 Cesium

Configuration: Slinger with 3 axis compensation

Sample Rate: 10 Hz

Sensitivity: 0.0006 nT VHz rms

DATA REFERENCE:

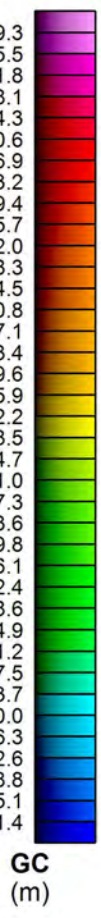
The Ground Clearance (GC) is calculated from the onboard GPS altimetry data. The GC is represented as a grid with a linear color ramp.

TOPOGRAPHIC REFERENCE:

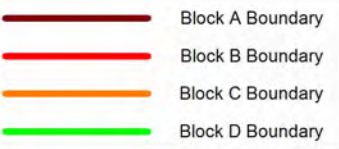
Shuttle Radar Topography Mission (SRTM), United States Elevation at 30 meter resolution, National Geospatial-Intelligence Agency (NGA) and the National Aeronautics and Space Administration (NASA). URL <<http://www2.jpl.nasa.gov/srtm/>>[2005]

REPORT REFERENCE:

Precision GeoSurveys (2016): Airborne Magnetic Survey Report, Icy Cape Gold and Industrial Heavy Minerals Project, 2016 Survey Area.

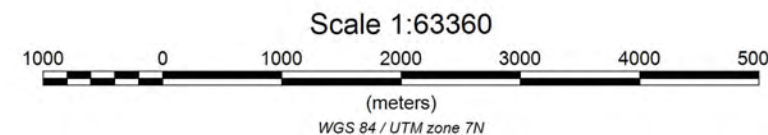


GC (m)

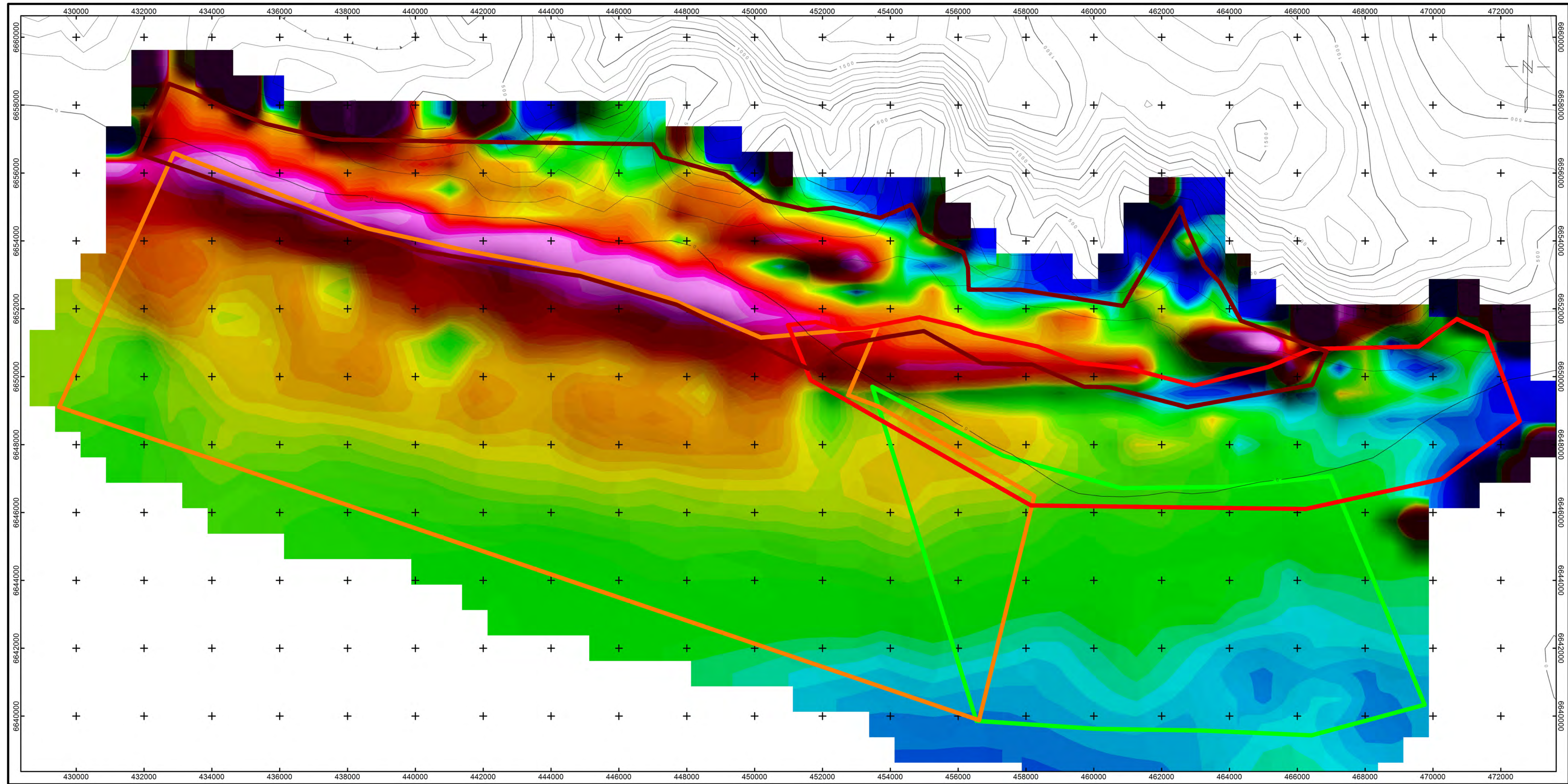


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Icy Cape Gold and Industrial Heavy Minerals Project

Airborne Geophysics - Magnetics
Ground Clearance
September, 2016



Precision
GeoSurveys



MAP PROJECTION:
 Projection: Universal Transverse Mercator Zone 7N
 Datum: WGS 84
 Local Datum Transform: WGS 84 - World

ICY CAPE 2016 SURVEY SPECIFICATIONS:

Survey Dates:	August 20, 2016 to August 22, 2016
Survey Base:	Yakutat, AK
Helicopter Type:	Bell 206L LongRanger
Registration:	C-0000
Survey Technology:	Magnetic Survey
Mean Flight Height:	25 m

Block A
 Survey/Tie Line Spacing: 333 m / 3000 m
 Survey/Tie Line Direction: 025°-205° / 115°-295°

Block B
 Survey/Tie Line Spacing: 333 m / 3000 m
 Survey/Tie Line Direction: 161°-341° / 071°-251°

Block C
 Survey/Tie Line Spacing: 3000 m / 3000 m
 Survey/Tie Line Direction: 025°-205° / 115°-295°

Block D
 Survey/Tie Line Spacing: 3000 m / 3000 m
 Survey/Tie Line Direction: 161°-341° / 071°-251°

AIRBORNE SURVEY SYSTEM:
 Magnetometer Sensor: Scintrex CS-3 Cesium
 Configuration: Single with 3 axis compensation
 Sample Rate: 10 Hz
 Sensitivity: 0.0006 nT vHz rms

DATA REFERENCE:
 Magnetic data have been compensated and corrected for diurnal, lag, and heading, and then leveled to generate the Total Magnetic Intensity (TMI). A computed value of the IGRF was removed from the TMI to produce the Residual Magnetic Intensity (RMI) grid. Refer to report for details. Within the Icy Cape 2016 survey area, the RMI data range from -115.5 nT to 157.4 nT and have been drawn with a colour ramp of -42.9 nT to 23.8 nT.

TOPOGRAPHIC REFERENCE:
 Shuttle Radar Topography Mission (SRTM), United States (Elevation at 30 meter resolution, National Geospatial Intelligence Agency (NGA) and the National Aeronautics and Space Administration (NASA). URL <<http://www2.jpl.nasa.gov/srtm/>>[2005]

REPORT REFERENCE:
 Precision GeoSurveys (2016): Airborne Magnetic Survey Report, Icy Cape Gold and Industrial Heavy Minerals Project, 2016 Survey Area.

Block A Boundary

Block B Boundary

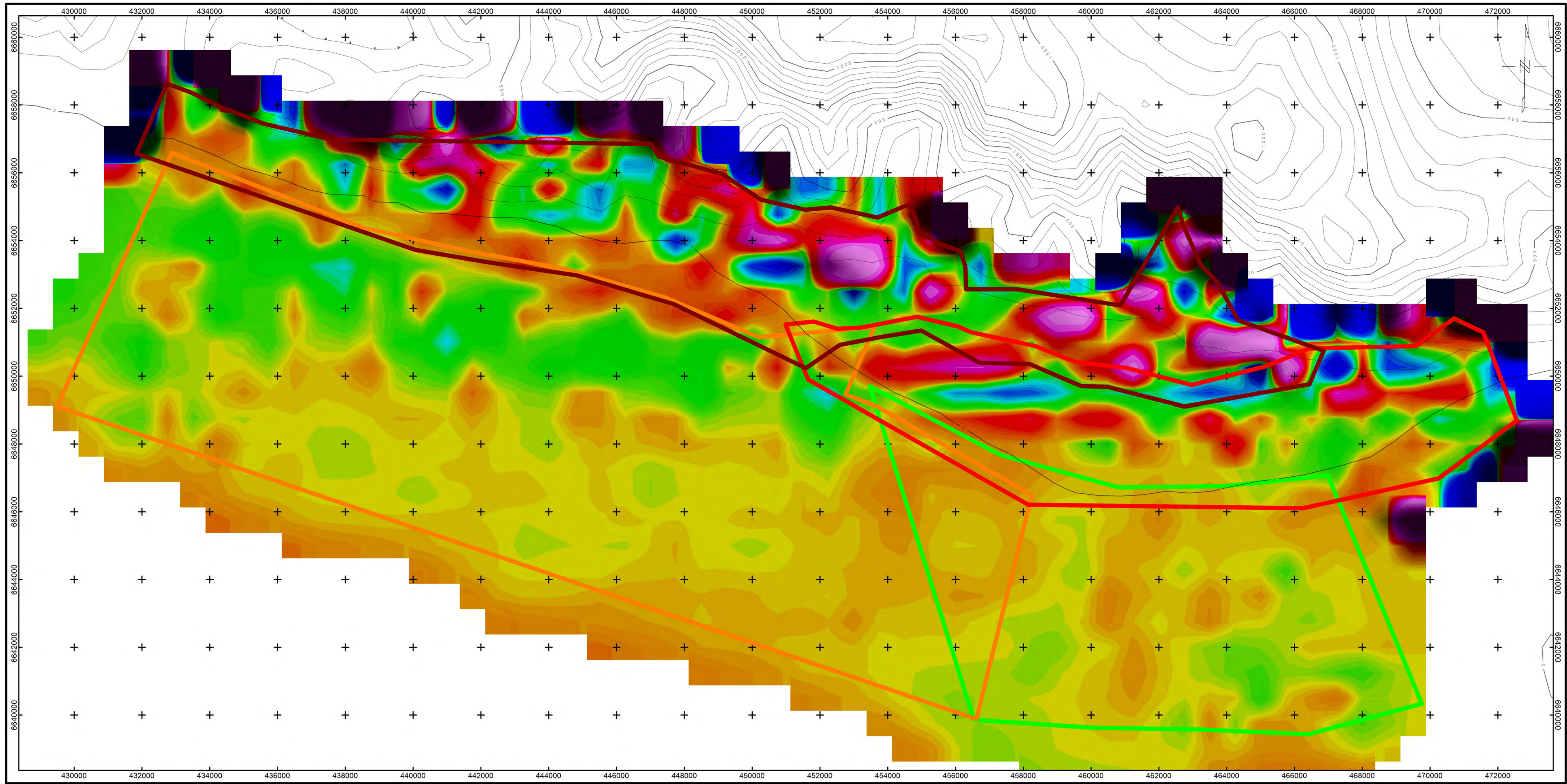
Block C Boundary

Block D Boundary

Trust Land Office
Icy Cape Gold and Industrial Heavy Minerals Project
 Airborne Geophysics - Magnetics
Residual Magnetic Intensity
 September, 2016

Scale 1:63360

(meters)
 WGS 84 / UTM zone 7N



MAP PROJECTION:

Projection: Universal Transverse Mercator Zone 7N

Datum: WGS 84

Local Datum Transform: WGS 84 - World

ICY CAPE 2016 SURVEY SPECIFICATIONS:

Survey Dates:

Survey Base:

Helicopter Type:

Registration:

Survey Technology:

Mean Flight Height:

Block A

Survey/Tie Line Spacing:

Survey/Tie Line Direction:

Block B

Survey/Tie Line Spacing:

Survey/Tie Line Direction:

Block C

Survey/Tie Line Spacing:

Survey/Tie Line Direction:

Block D

Survey/Tie Line Spacing:

Survey/Tie Line Direction:

AIRBORNE SURVEY SYSTEM:

Magnetometer Sensor:

Configuration:

Sample Rate:

Sensitivity:

August 20, 2016 to August 22, 2016

Yakutat, AK

Bell 206L LongRanger

C-0300

Magnetic Survey

25 m

333 m / 3000 m

025°-205° / 115°-295°

333 m / 3000 m

161°-341° / 071°-251°

3000 m / 3000 m

025°-205° / 115°-295°

3000 m / 3000 m

161°-341° / 071°-251°

Scintrex CS-3 Cesium

Shinger with 3 axis compensation

10 Hz

0.0006 nT VHz rms

DATA REFERENCE:

The First Vertical Derivative (1VD) is calculated from the RMI. The 1VD is represented as a grid and its image color ramp has been histogram equalized.

TOPOGRAPHIC REFERENCE:

Shuttle Radar Topography Mission (SRTM), United States Elevation at 30 meter resolution, National Geospatial-Intelligence Agency (NSA) and the National Aeronautics and Space Administration (NASA). URL <<http://www2.jpl.nasa.gov/srtm/>>[2005]

REPORT REFERENCE:

Precision GeoSurveys (2016): Airborne Magnetic Survey Report, Icy Cape Gold and Industrial Heavy Minerals Project, 2016 Survey Area.

1VD

(nT/m)

0.106

0.072

0.056

0.045

0.037

0.031

0.027

0.022

0.019

0.016

0.013

0.009

0.007

0.005

0.004

0.002

0.001

-0.000

-0.001

-0.003

-0.004

-0.006

-0.008

-0.010

-0.012

-0.014

-0.017

-0.020

-0.023

-0.027

-0.031

-0.036

-0.041

-0.047

-0.056

-0.067

-0.092

Block A Boundary

Block B Boundary

Block C Boundary

Block D Boundary

Scale 1:63360

(meters)

WGS 84 / UTM zone 7N

Trust

Land Office

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Icy Cape Gold and Industrial

Heavy Minerals Project

Airborne Geophysics - Magnetics

First Vertical Derivative

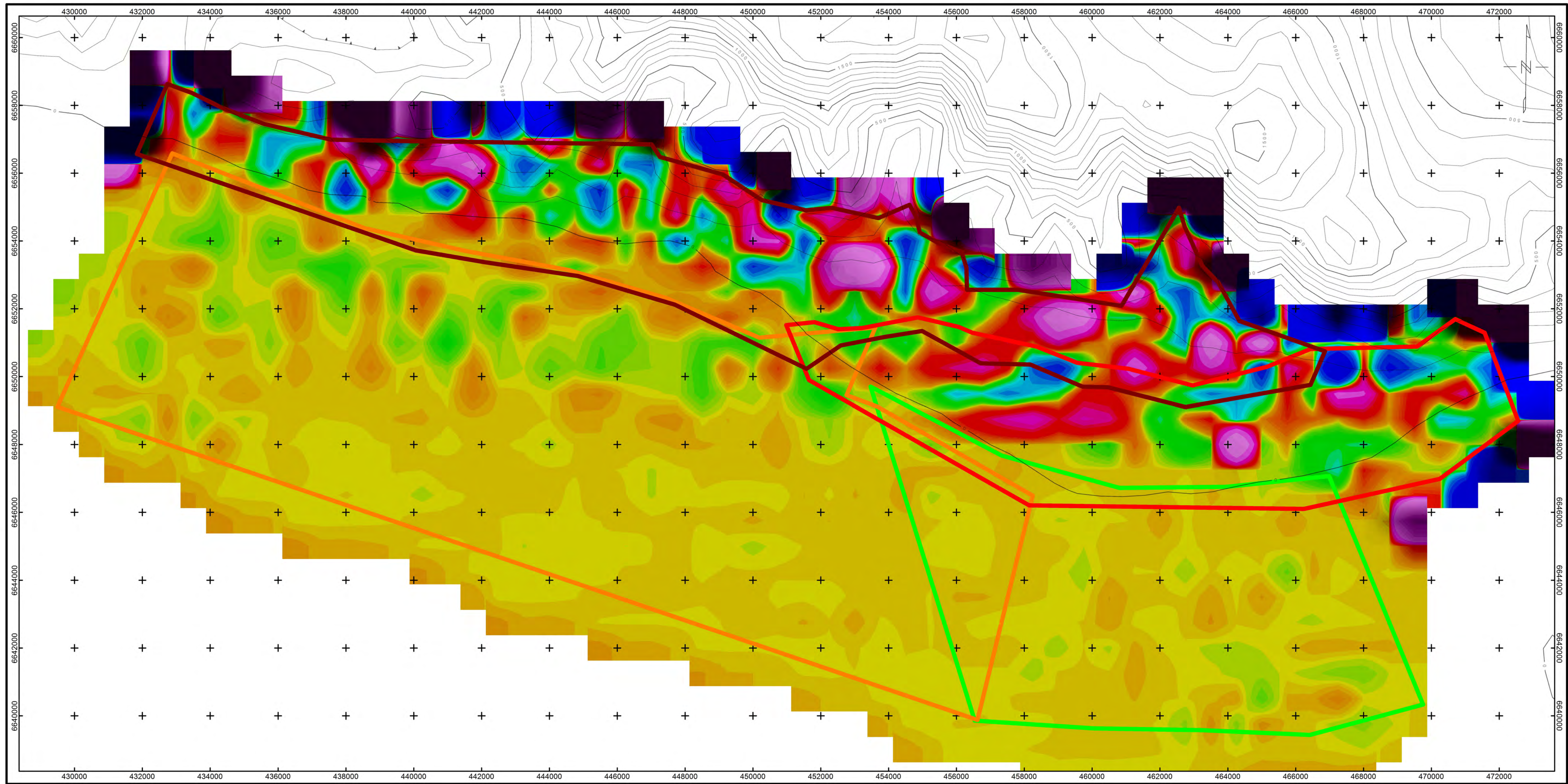
September, 2016

Precision

GeoSurveys

Plate4_ICY

1VD



MAP PROJECTION:

Projection: Universal Transverse Mercator Zone 7N
Datum: WGS 84
Local Datum Transform: WGS 84 - World

ICY CAPE 2016 SURVEY SPECIFICATIONS:

Survey Dates:	August 20, 2016 to August 22, 2016
Survey Base:	Yakutat, AK
Helicopter Type:	Bell 206L LongRanger
Registration:	C-0000
Survey Technology:	Magnetic Survey
Mean Flight Height:	25 m

Block A	
Survey/Tie Line Spacing:	333 m / 3000 m
Survey/Tie Line Direction:	025°-205° / 115°-295°

Block B	
Survey/Tie Line Spacing:	333 m / 3000 m
Survey/Tie Line Direction:	161°-341° / 071°-251°

Block C	
Survey/Tie Line Spacing:	3000 m / 3000 m
Survey/Tie Line Direction:	025°-205° / 115°-295°

Block D	
Survey/Tie Line Spacing:	3000 m / 3000 m
Survey/Tie Line Direction:	161°-341° / 071°-251°

AIRBORNE SURVEY SYSTEM:

Magnetometer Sensor:	Scintrex CS-3 Cesium
Configuration:	Scinger with 3 axis compensation
Sample Rate:	10 Hz
Sensitivity:	0.0006 nT vHz rms

DATA REFERENCE:

The Second Vertical Derivative (ZVD) is calculated from the RMI. The ZVD is represented as a grid and its image color ramp has been histogram equalized.

TOPOGRAPHIC REFERENCE:

Shuttle Radar Topography Mission (SRTM), United States Elevation at 30 meter resolution, National Geospatial-Intelligence Agency (NGA) and the National Aeronautics and Space Administration (NASA). URL <<http://www2.jpl.nasa.gov/srtm/>>[2005]

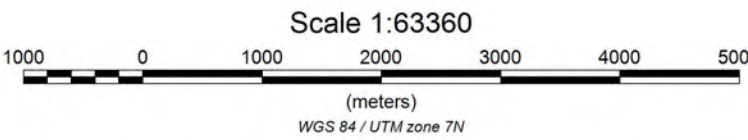
REPORT REFERENCE:

Precision GeoSurveys (2016): Airborne Magnetic Survey Report, Icy Cape Gold and Industrial Heavy Minerals Project, 2016 Survey Area.

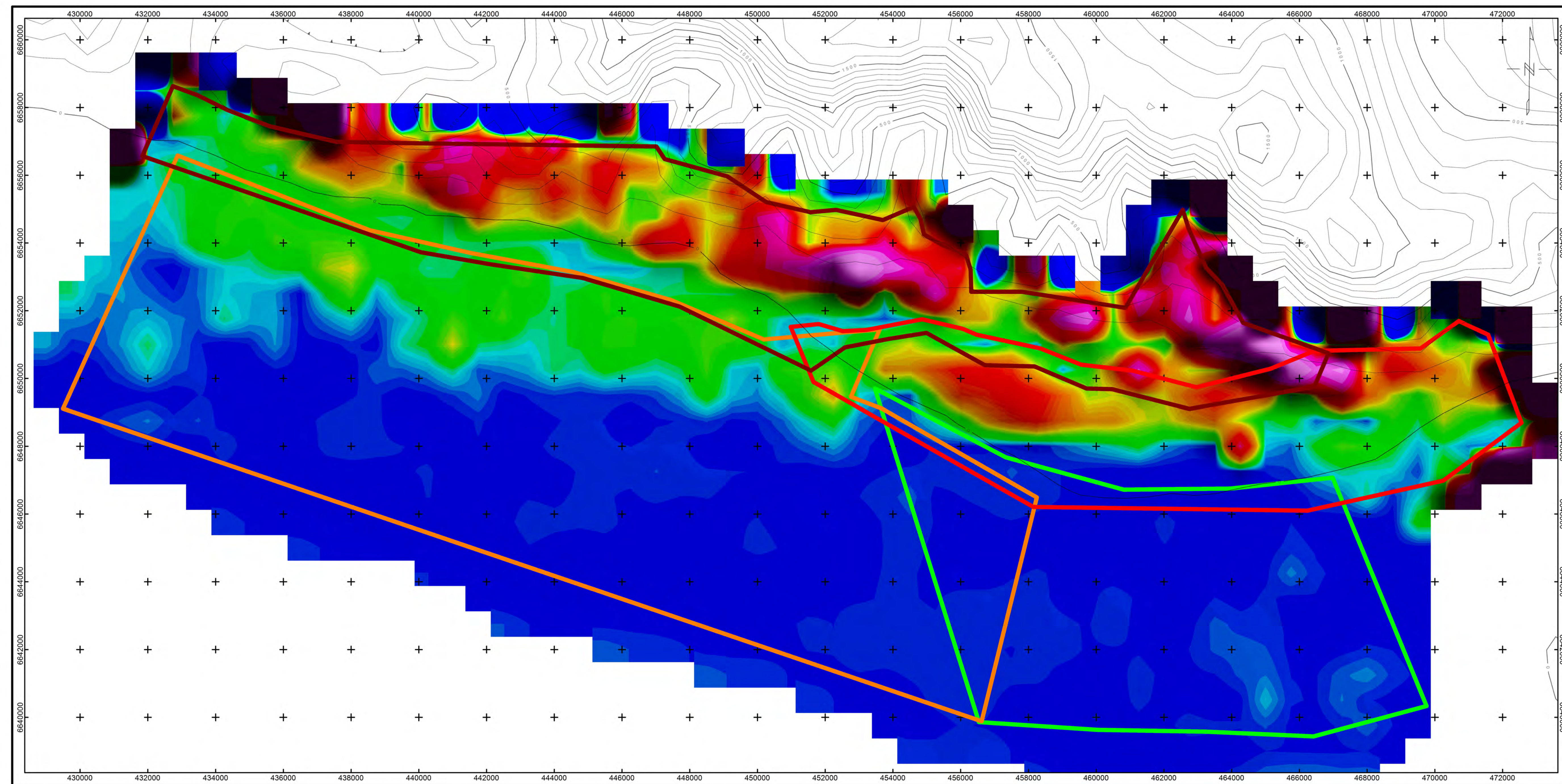


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Icy Cape Gold and Industrial Heavy Minerals Project

Airborne Geophysics - Magnetics
Second Vertical Derivative
September, 2016



Precision
GeoSurveys



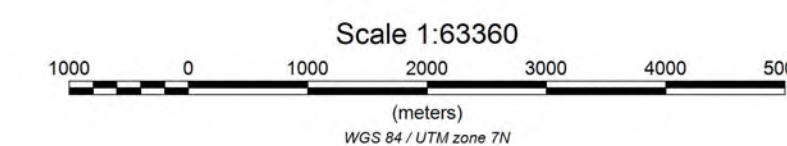
MAP PROJECTION:
Projection: Universal Transverse Mercator Zone 7N
Datum: WGS 84
Local Datum Transform: WGS 84 - World

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0.174		Survey Dates:	August 20, 2016 to August 22, 2016
0.135		Survey Base:	Yakutat, AK
0.113		Helicopter Type:	Bell 206L LongRanger
0.099		Registration:	C-GWU
0.089		Survey Technology:	Magnetic Survey
0.082		Mean Flight Height:	25 m
0.075			
0.070		Block A	
0.065		Survey/Tie Line Spacing:	333 m / 3000 m
0.062		Survey/Tie Line Direction:	025°-205° / 115°-295°
0.058			
0.055		Block B	
0.052		Survey/Tie Line Spacing:	333 m / 3000 m
0.049		Survey/Tie Line Direction:	161°-341° / 071°-251°
0.046			
0.044		Block C	
0.041		Survey/Tie Line Spacing:	3000 m / 3000 m
0.039		Survey/Tie Line Direction:	025°-205° / 115°-295°
0.037			
0.035		Block D	
0.033		Survey/Tie Line Spacing:	3000 m / 3000 m
0.030		Survey/Tie Line Direction:	161°-341° / 071°-251°
0.028			
0.026		AIRBORNE SURVEY SYSTEM:	
0.024		Magnetometer Sensor:	Scintrex CS-3 Cesium
0.023		Configuration:	Slinger with 3 axis compensation
0.021		Sample Rate:	10 Hz
0.019		Sensitivity:	0.0006 nT vHz rms
0.017			
0.016			
0.014		DATA REFERENCE:	
0.013		The Analytic Signal (AS) is calculated from the RMI. The AS is represented as a grid and its image color ramp has been histogram equalized.	
0.011			
0.010		TOPOGRAPHIC REFERENCE:	
0.009		Shuttle Radar Topography Mission (SRTM), United States Elevation at 30 meter resolution, National Geospatial-Intelligence Agency (NSA) and the National Aeronautics and Space Administration (NASA). URL < http://www2.jpl.nasa.gov/srtm/ >[2005]	
0.007			
0.005			
0.004			

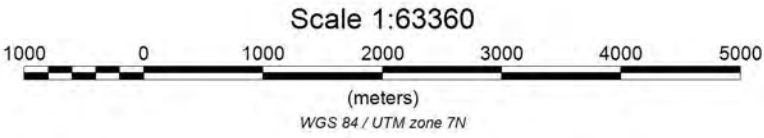
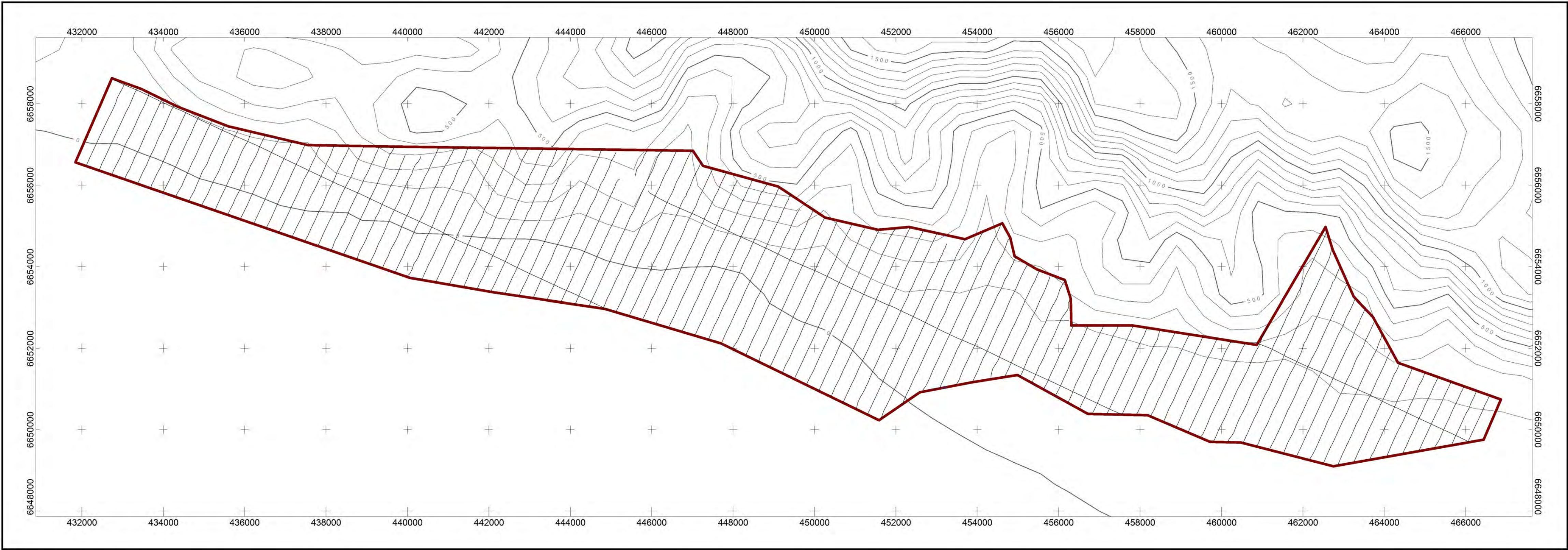
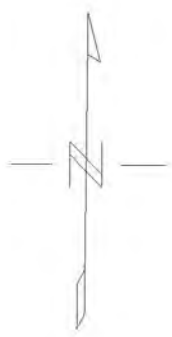
AS
(nT/m)



Trust Land Office
Icy Cape Gold and Industrial
Heavy Minerals Project
Airborne Geophysics - Magnetics
Analytic Signal
September, 2016



Precision
GeoSurveys



MAP PROJECTION:

Projection: Universal Transverse Mercator Zone 7N
Datum: WGS 84
Local Datum Transform: WGS 84 – World

ICY CAPE 2016 SURVEY SPECIFICATIONS:

Survey Dates:	August 20, 2016 to August 22, 2016
Survey Base:	Yakutat, AK
Helicopter Type:	Bell 206L LongRanger
Registration:	C-GXHJ
Survey Technology:	Magnetic Survey
Mean Flight Height:	25 m

Block A

Survey/Tie Line Spacing:	333 m / 3000 m
Survey/Tie Line Direction:	025°-205° / 115°-295°

AIRBORNE SURVEY SYSTEM:

Magnetometer Sensor:	Scintrex CS-3 Cesium
Configuration:	Stinger with 3 axis compensation
Sample Rate:	10 Hz
Sensitivity:	0.0006 nT VHz rms

TOPOGRAPHIC REFERENCE:

Shuttle Radar Topography Mission (SRTM), United States Elevation at 30 meter resolution. National Geospatial-Intelligence Agency (NGA) and the National Aeronautics and Space Administration (NASA). URL <<http://www2.jpl.nasa.gov/srtm>>[2005]

REPORT REFERENCE:

Precision GeoSurveys (2016): Airborne Magnetic Survey Report, Icy Cape Gold and Industrial Heavy Minerals Project, 2016 Survey Area.



Trust Land Office

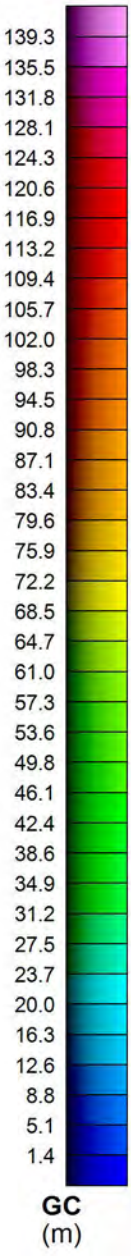
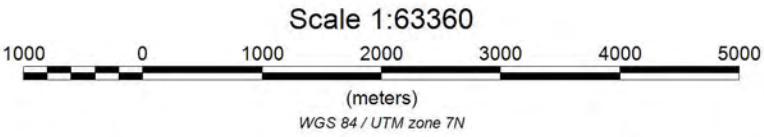
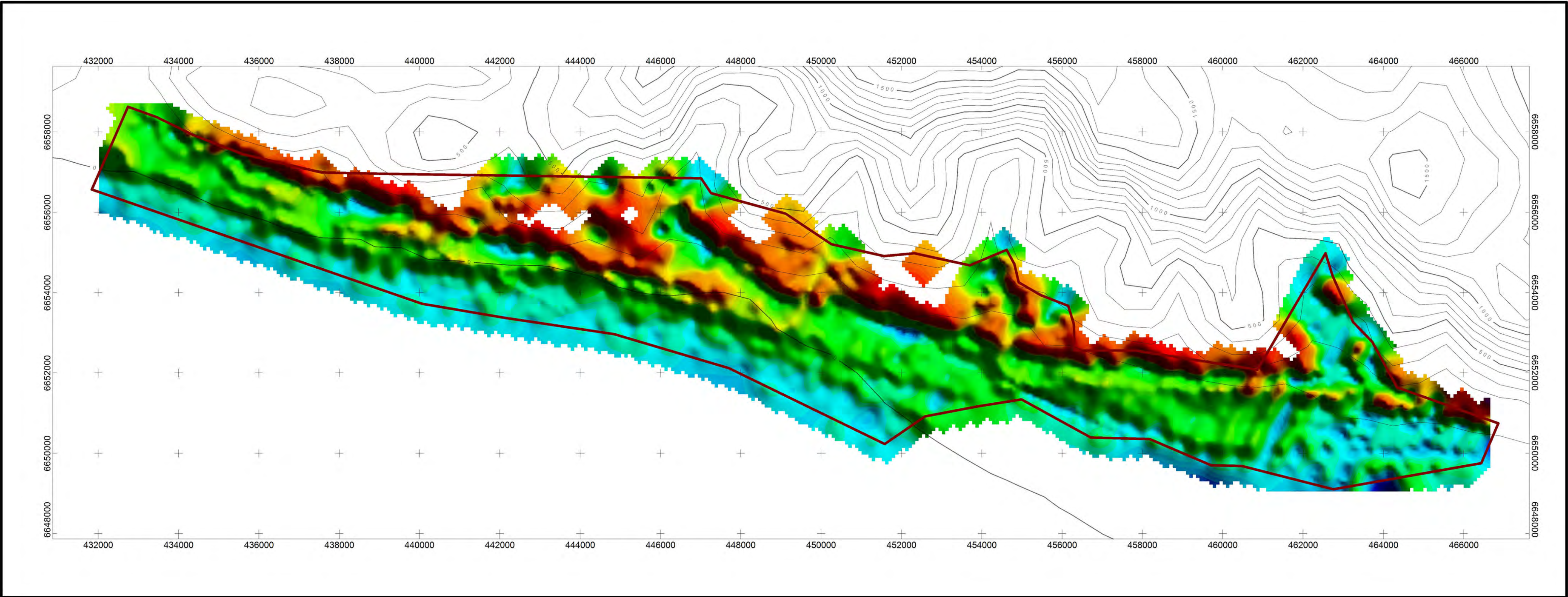
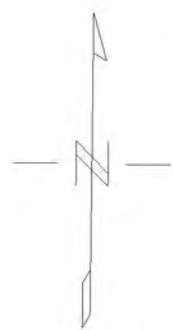
Icy Cape Gold and Industrial Heavy Minerals Project

Airborne Geophysics - Magnetics

Block A - Actual Flight Lines

September, 2016





MAP PROJECTION:

Projection: Universal Transverse Mercator Zone 7N
Datum: WGS 84
Local Datum Transform: WGS 84 – World

ICY CAPE 2016 SURVEY SPECIFICATIONS:

Survey Dates:	August 20, 2016 to August 22, 2016
Survey Base:	Yakutat, AK
Helicopter Type:	Bell 206L LongRanger
Registration:	C-GXHJ
Survey Technology:	Magnetic Survey
Mean Flight Height:	25 m

Block A

Survey/Tie Line Spacing:	333 m / 3000 m
Survey/Tie Line Direction:	025°-205° / 115°-295°

AIRBORNE SURVEY SYSTEM:

Magnetometer Sensor:	Scintrex CS-3 Cesium
Configuration:	Stinger with 3 axis compensation
Sample Rate:	10 Hz
Sensitivity:	0.0006 nT vHz rms

DATA REFERENCE:

The Ground Clearance (GC) is calculated from the onboard GPS altimetry data. The GC is represented as a grid with a linear color ramp.

TOPOGRAPHIC REFERENCE:

Shuttle Radar Topography Mission (SRTM), United States Elevation at 30 meter resolution. National Geospatial-Intelligence Agency (NGA) and the National Aeronautics and Space Administration (NASA). URL <<http://www2.jpl.nasa.gov/srtm>>[2005]

REPORT REFERENCE:

Precision GeoSurveys (2016): Airborne Magnetic Survey Report, Icy Cape Gold and Industrial Heavy Minerals Project, 2016 Survey Area.



Trust Land Office

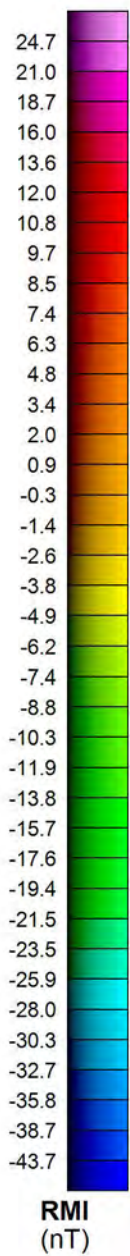
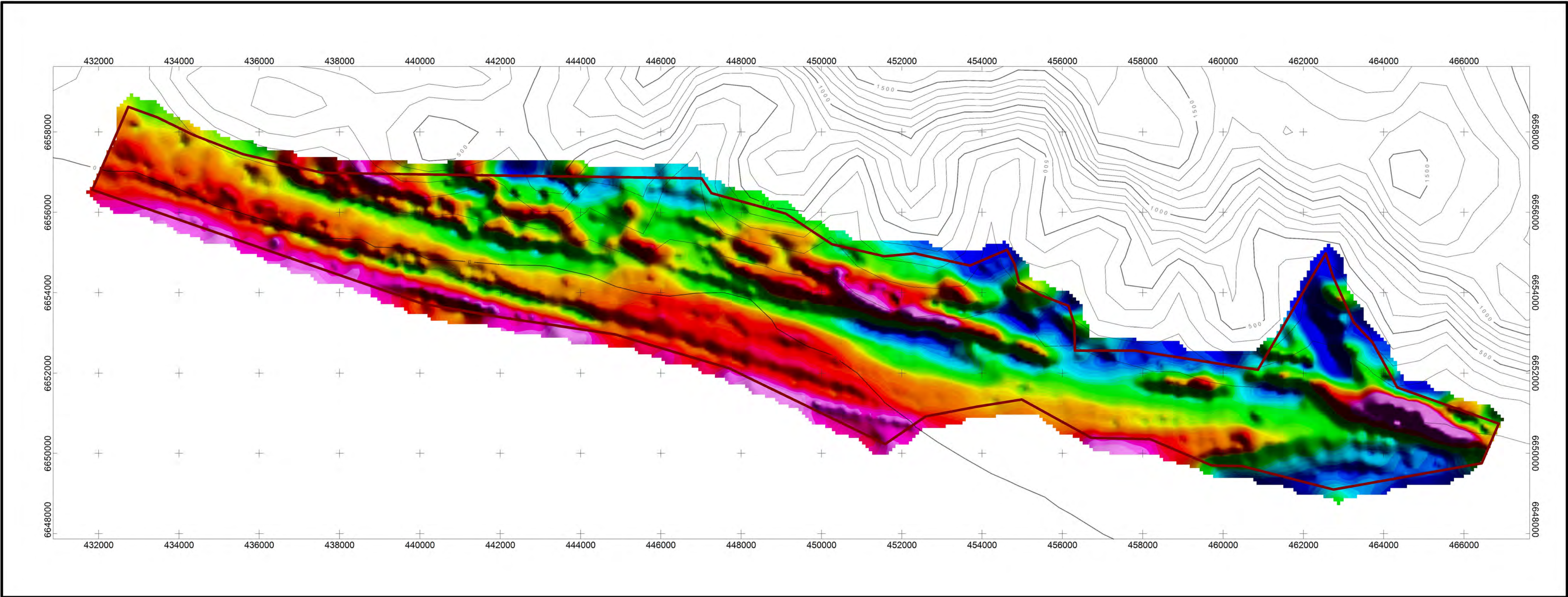
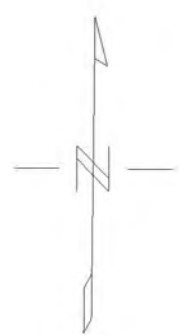
**Icy Cape Gold and Industrial
Heavy Minerals Project**

Airborne Geophysics - Magnetics

Block A - Ground Clearance

September, 2016





MAP PROJECTION:

Projection: Universal Transverse Mercator Zone 7N
Datum: WGS 84
Local Datum Transform: WGS 84 – World

ICY CAPE 2016 SURVEY SPECIFICATIONS:

Survey Dates:	August 20, 2016 to August 22, 2016
Survey Base:	Yakutat, AK
Helicopter Type:	Bell 206L LongRanger
Registration:	C-GXHJ
Survey Technology:	Magnetic Survey
Mean Flight Height:	25 m

Block A

Survey/Tie Line Spacing:	333 m / 3000 m
Survey/Tie Line Direction:	025°-205° / 115°-295°

AIRBORNE SURVEY SYSTEM:

Magnetometer Sensor:	Scintrex CS-3 Cesium
Configuration:	Stinger with 3 axis compensation
Sample Rate:	10 Hz
Sensitivity:	0.0006 nT VHz rms

DATA REFERENCE:

Magnetic data have been compensated and corrected for diurnal, lag, and heading, and then leveled to generate the Total Magnetic Intensity (TMI). A computed value of the IGRF was removed from the TMI to produce the Residual Magnetic Intensity (RMI) grid. Refer to report for details. Within Block A of the Icy Cape 2016 survey area, the RMI data range from -73.4 nT to 157.4 nT and have been drawn with a colour ramp of -43.7 nT to 24.7 nT.

TOPOGRAPHIC REFERENCE:

Shuttle Radar Topography Mission (SRTM), United States Elevation at 30 meter resolution. National Geospatial-Intelligence Agency (NGA) and the National Aeronautics and Space Administration (NASA). URL <<http://www2.jpl.nasa.gov/srtm>>[2005]

REPORT REFERENCE:

Precision GeoSurveys (2016): Airborne Magnetic Survey Report, Icy Cape Gold and Industrial Heavy Minerals Project, 2016 Survey Area.



Trust Land Office

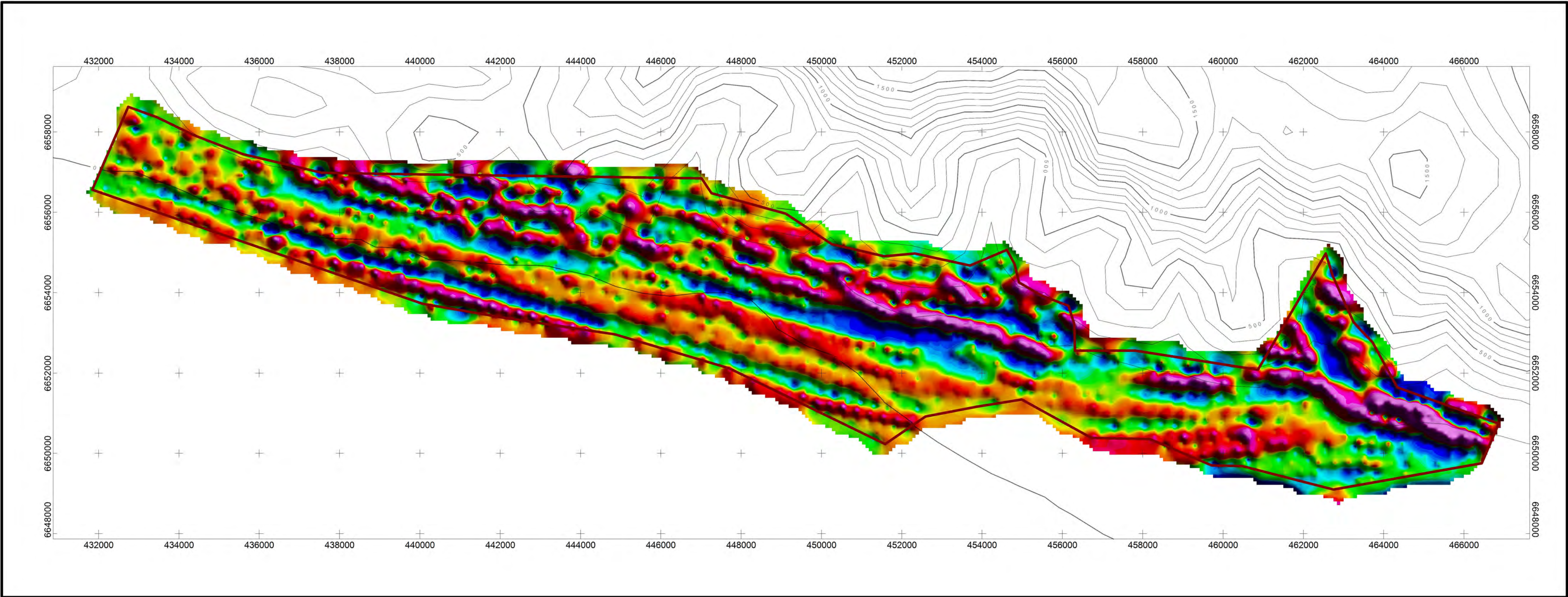
Icy Cape Gold and Industrial
Heavy Minerals Project

Airborne Geophysics - Magnetics

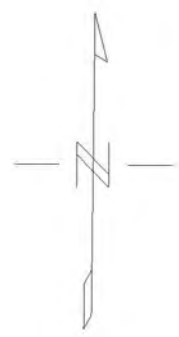
Block A - Residual Magnetic Intensity

September, 2016





Scale 1:63360
1000 0 1000 2000 3000 4000 5000
(meters)
WGS 84 / UTM zone 7N



MAP PROJECTION:

Projection: Universal Transverse Mercator Zone 7N
Datum: WGS 84
Local Datum Transform: WGS 84 – World

ICY CAPE 2016 SURVEY SPECIFICATIONS:

Survey Dates:	August 20, 2016 to August 22, 2016
Survey Base:	Yakutat, AK
Helicopter Type:	Bell 206L LongRanger
Registration:	C-GXHJ
Survey Technology:	Magnetic Survey
Mean Flight Height:	25 m

Block A

Survey/Tie Line Spacing:	333 m / 3000 m
Survey/Tie Line Direction:	025°-205° / 115°-295°

AIRBORNE SURVEY SYSTEM:

Magnetometer Sensor:	Scintrex CS-3 Cesium
Configuration:	Stinger with 3 axis compensation
Sample Rate:	10 Hz
Sensitivity:	0.0006 nT VHz rms

DATA REFERENCE:

The First Vertical Derivative (1VD) is calculated from the RMI. The 1VD is represented as a grid and its image color ramp has been histogram equalized.

TOPOGRAPHIC REFERENCE:

Shuttle Radar Topography Mission (SRTM), United States Elevation at 30 meter resolution. National Geospatial-Intelligence Agency (NGA) and the National Aeronautics and Space Administration (NASA). URL <<http://www2.jpl.nasa.gov/srtm/>>[2005]

REPORT REFERENCE:

Precision GeoSurveys (2016): Airborne Magnetic Survey Report, Icy Cape Gold and Industrial Heavy Minerals Project, 2016 Survey Area.



Trust Land Office

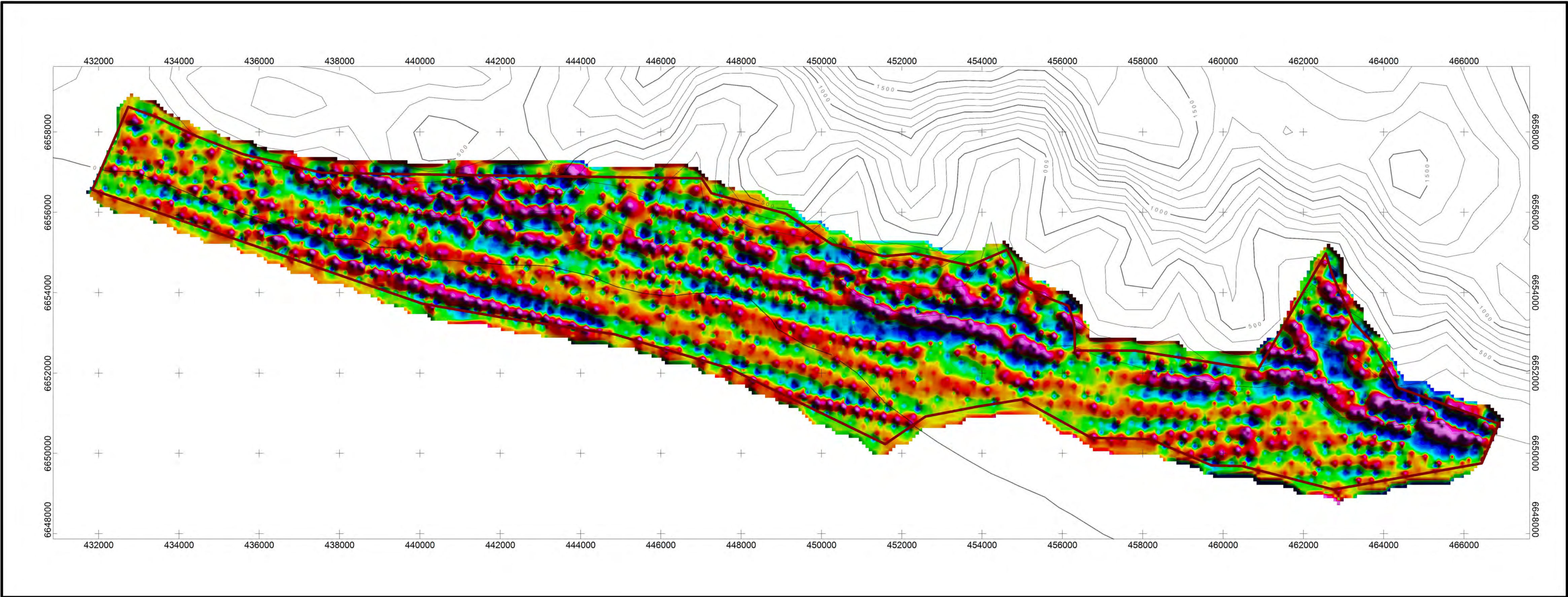
**Icy Cape Gold and Industrial
Heavy Minerals Project**

Airborne Geophysics - Magnetics

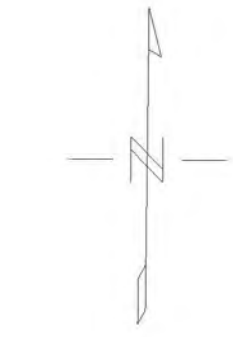
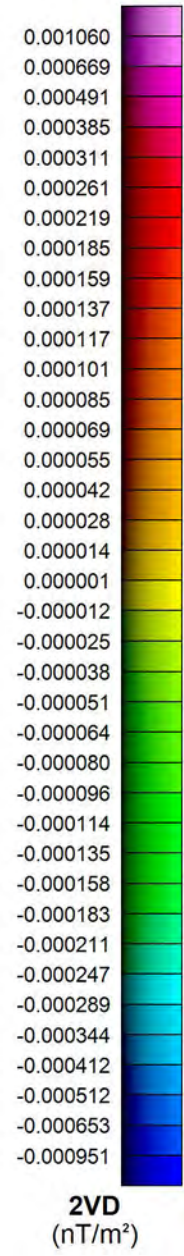
Block A - First Vertical Derivative

September, 2016





Scale 1:63360
(meters)
WGS 84 / UTM zone 7N



MAP PROJECTION:

Projection: Universal Transverse Mercator Zone 7N
Datum: WGS 84
Local Datum Transform: WGS 84 – World

ICY CAPE 2016 SURVEY SPECIFICATIONS:

Survey Dates:	August 20, 2016 to August 22, 2016
Survey Base:	Yakutat, AK
Helicopter Type:	Bell 206L LongRanger
Registration:	C-GXHJ
Survey Technology:	Magnetic Survey
Mean Flight Height:	25 m

Block A

Survey/Tie Line Spacing:	333 m / 3000 m
Survey/Tie Line Direction:	025°-205° / 115°-295°

AIRBORNE SURVEY SYSTEM:

Magnetometer Sensor:	Scintrex CS-3 Cesium
Configuration:	Stinger with 3 axis compensation
Sample Rate:	10 Hz
Sensitivity:	0.0006 nT VHz rms

DATA REFERENCE:

The Second Vertical Derivative (2VD) is calculated from the RMI. The 2VD is represented as a grid and its image color ramp has been histogram equalized.

TOPOGRAPHIC REFERENCE:

Shuttle Radar Topography Mission (SRTM), United States Elevation at 30 meter resolution. National Geospatial-Intelligence Agency (NGA) and the National Aeronautics and Space Administration (NASA). URL <<http://www2.jpl.nasa.gov/srtm>>[2005]

REPORT REFERENCE:

Precision GeoSurveys (2016): Airborne Magnetic Survey Report, Icy Cape Gold and Industrial Heavy Minerals Project, 2016 Survey Area.



Trust Land Office

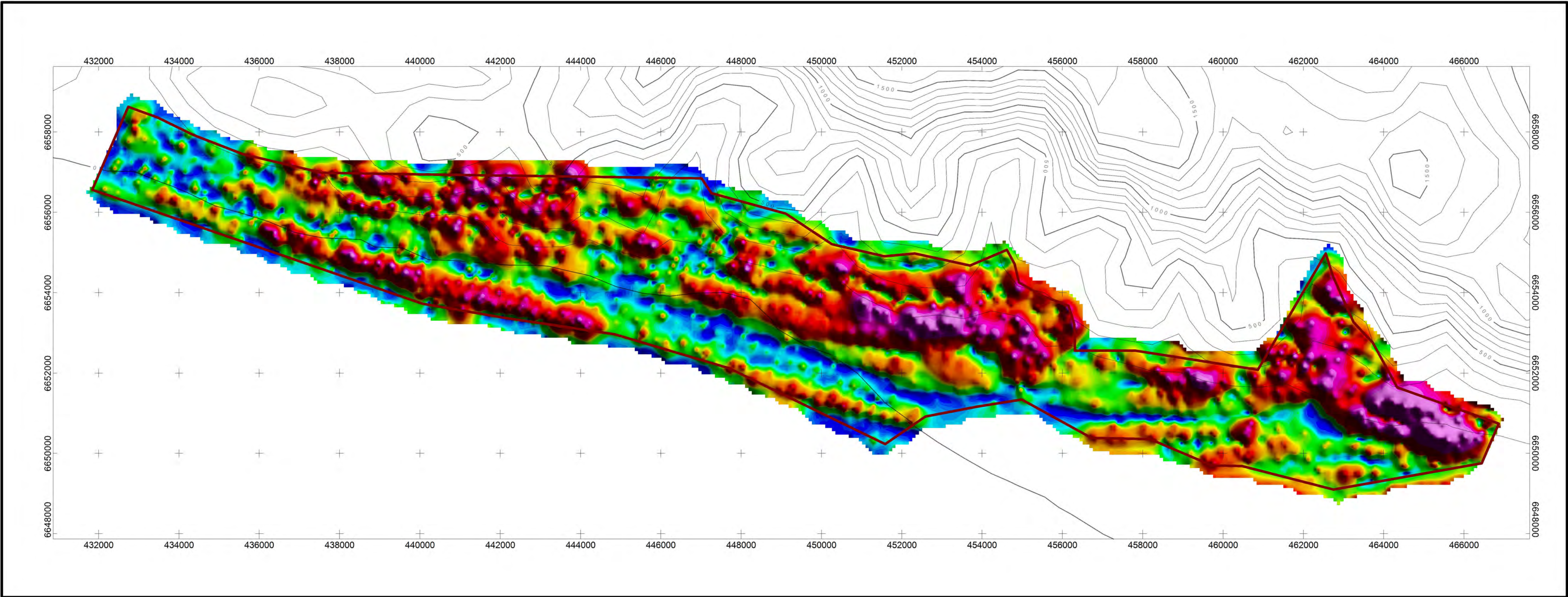
**Icy Cape Gold and Industrial
Heavy Minerals Project**

Airborne Geophysics - Magnetics

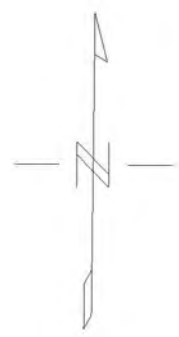
Block A - Second Vertical Derivative

September, 2016





Scale 1:63360
(meters)
WGS 84 / UTM zone 7N



MAP PROJECTION:

Projection: Universal Transverse Mercator Zone 7N
Datum: WGS 84
Local Datum Transform: WGS 84 – World

ICY CAPE 2016 SURVEY SPECIFICATIONS:

Survey Dates:	August 20, 2016 to August 22, 2016
Survey Base:	Yakutat, AK
Helicopter Type:	Bell 206L LongRanger
Registration:	C-GXHJ
Survey Technology:	Magnetic Survey
Mean Flight Height:	25 m

Block A

Survey/Tie Line Spacing:	333 m / 3000 m
Survey/Tie Line Direction:	025°-205° / 115°-295°

AIRBORNE SURVEY SYSTEM:

Magnetometer Sensor:	Scintrex CS-3 Cesium
Configuration:	Stinger with 3 axis compensation
Sample Rate:	10 Hz
Sensitivity:	0.0006 nT VHz rms

DATA REFERENCE:

The Analytic Signal (AS) is calculated from the RMI. The AS is represented as a grid and its image color ramp has been histogram equalized.

TOPOGRAPHIC REFERENCE:

Shuttle Radar Topography Mission (SRTM), United States Elevation at 30 meter resolution. National Geospatial-Intelligence Agency (NGA) and the National Aeronautics and Space Administration (NASA). URL <<http://www2.jpl.nasa.gov/srtm>>[2005]

REPORT REFERENCE:

Precision GeoSurveys (2016): Airborne Magnetic Survey Report, Icy Cape Gold and Industrial Heavy Minerals Project, 2016 Survey Area.



Trust Land Office

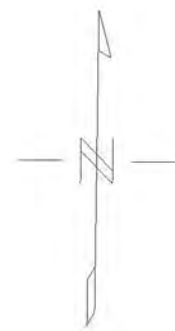
**Icy Cape Gold and Industrial
Heavy Minerals Project**

Airborne Geophysics - Magnetics

Block A - Analytic Signal

September, 2016





MAP PROJECTION:
Projection: Universal Transverse Mercator Zone 7N
Datum: WGS 84
Local Datum Transform: WGS 84 – World

ICY CAPE 2016 SURVEY SPECIFICATIONS:

Survey Dates:	August 20, 2016 to August 22, 2016
Survey Base:	Yakutat, AK
Helicopter Type:	Bell 206L LongRanger
Registration:	C-GXHJ
Survey Technology:	Magnetic Survey
Mean Flight Height:	25 m

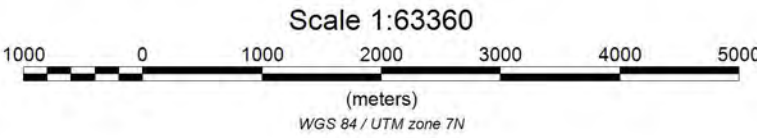
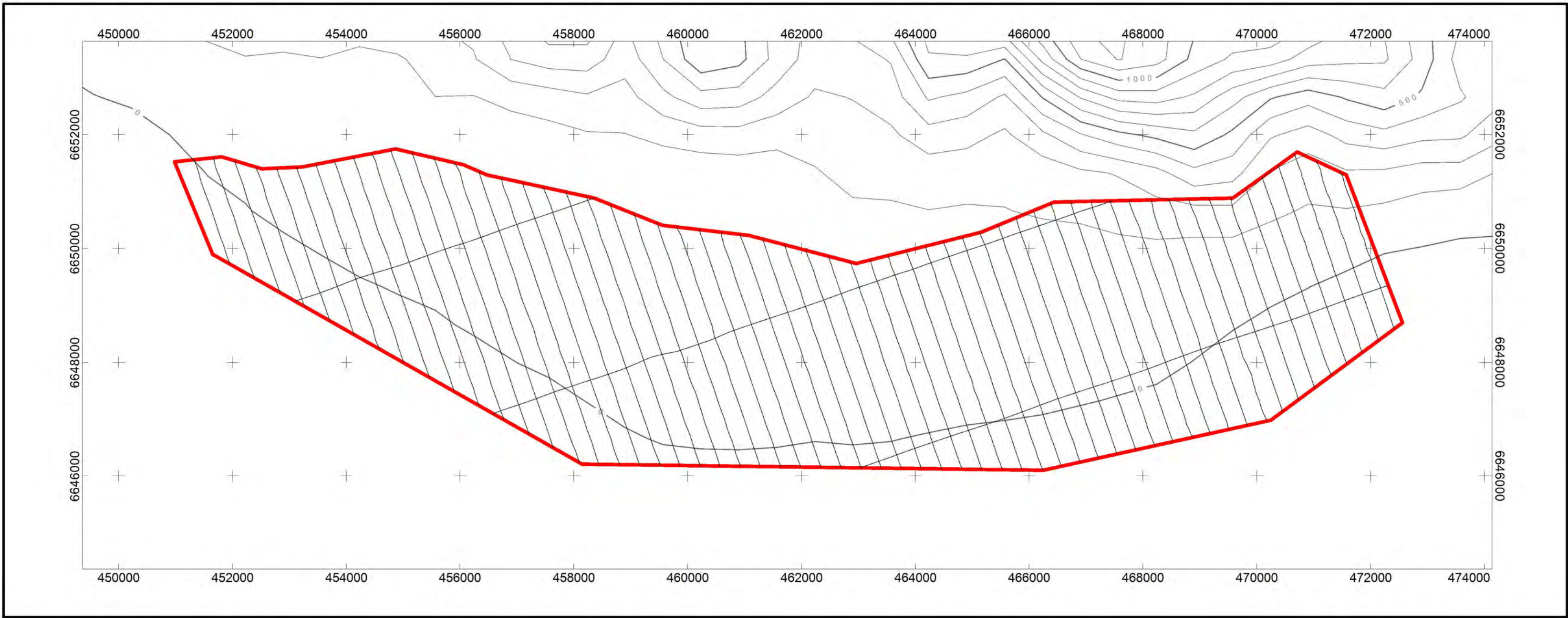
Block B
Survey/Tie Line Spacing: 333 m / 3000 m
Survey/Tie Line Direction: 161°-341° / 071°-251°

AIRBORNE SURVEY SYSTEM:

Magnetometer Sensor:	Scintrex CS-3 Cesium
Configuration:	Stinger with 3 axis compensation
Sample Rate:	10 Hz
Sensitivity:	0.0006 nT vHz rms

TOPOGRAPHIC REFERENCE:
Shuttle Radar Topography Mission (SRTM), United States Elevation at 30 meter resolution. National Geospatial-Intelligence Agency (NGA) and the National Aeronautics and Space Administration (NASA). URL <<http://www2.jpl.nasa.gov/srtm>>[2005]

REPORT REFERENCE:
Precision GeoSurveys (2016): Airborne Magnetic Survey Report, Icy Cape Gold and Industrial Heavy Minerals Project, 2016 Survey Area.



Trust Land Office

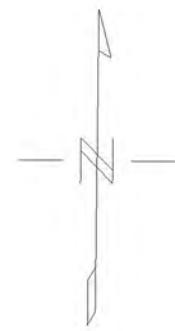
Icy Cape Gold and Industrial Heavy Minerals Project

Airborne Geophysics - Magnetics

Block B - Actual Flight Lines

September, 2016





MAP PROJECTION:
Projection: Universal Transverse Mercator Zone 7N
Datum: WGS 84
Local Datum Transform: WGS 84 – World

ICY CAPE 2016 SURVEY SPECIFICATIONS:
Survey Dates: August 20, 2016 to August 22, 2016
Survey Base: Yakutat, AK
Helicopter Type: Bell 206L LongRanger
Registration: C-GXHJ
Survey Technology: Magnetic Survey
Mean Flight Height: 25 m

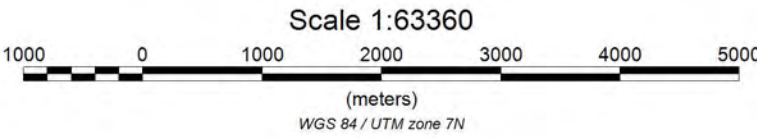
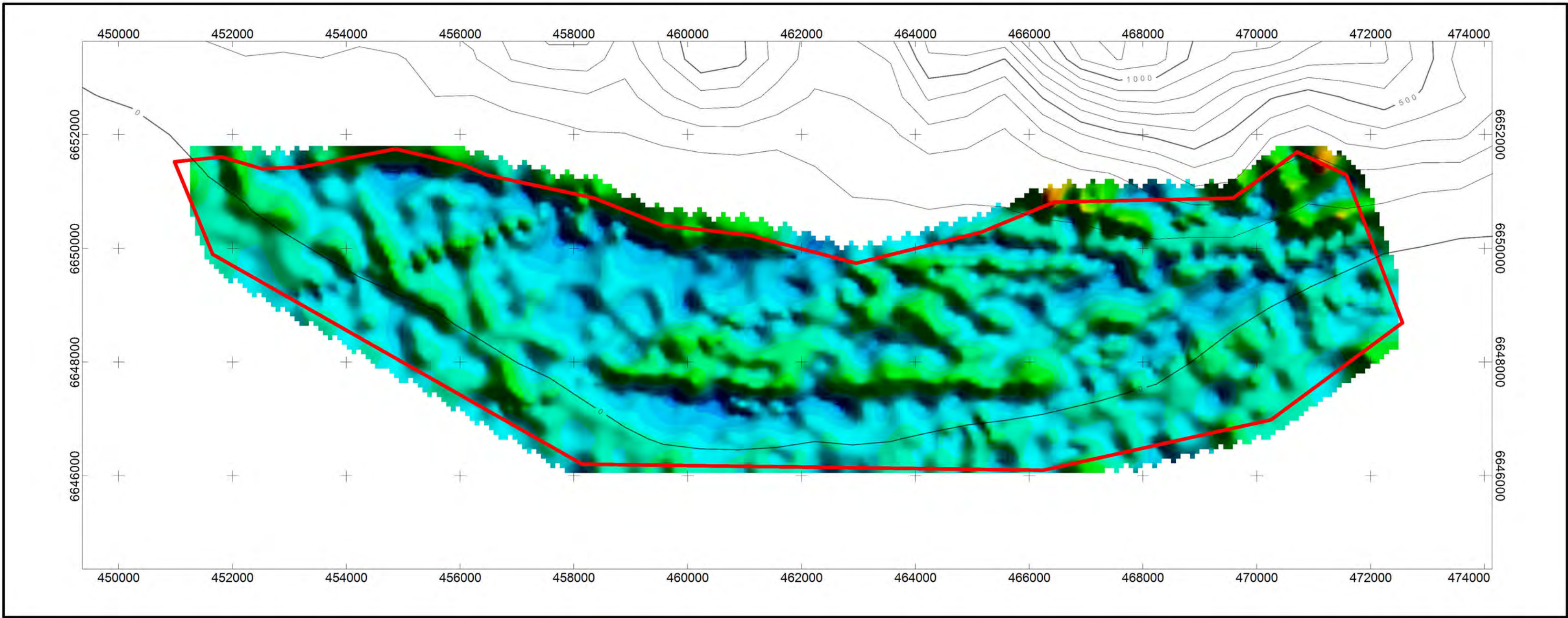
Block B
Survey/Tie Line Spacing: 333 m / 3000 m
Survey/Tie Line Direction: 161°-341° / 071°-251°

AIRBORNE SURVEY SYSTEM:
Magnetometer Sensor: Scintrex CS-3 Cesium
Configuration: Stinger with 3 axis compensation
Sample Rate: 10 Hz
Sensitivity: 0.0006 nT vHz rms

DATA REFERENCE:
The Ground Clearance (GC) is calculated from the onboard GPS altimetry data. The GC is represented as a grid with a linear color ramp.

TOPOGRAPHIC REFERENCE:
Shuttle Radar Topography Mission (SRTM), United States Elevation at 30 meter resolution. National Geospatial-Intelligence Agency (NGA) and the National Aeronautics and Space Administration (NASA). URL <<http://www2.jpl.nasa.gov/srtm>>[2005]

REPORT REFERENCE:
Precision GeoSurveys (2016): Airborne Magnetic Survey Report, Icy Cape Gold and Industrial Heavy Minerals Project, 2016 Survey Area.



Trust Land Office

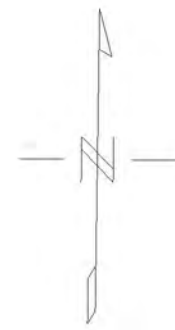
Icy Cape Gold and Industrial Heavy Minerals Project

Airborne Geophysics - Magnetics

Block B - Ground Clearance

September, 2016





MAP PROJECTION:

Projection: Universal Transverse Mercator Zone 7N
Datum: WGS 84
Local Datum Transform: WGS 84 – World

ICY CAPE 2016 SURVEY SPECIFICATIONS:

Survey Dates:	August 20, 2016 to August 22, 2016
Survey Base:	Yakutat, AK
Helicopter Type:	Bell 206L LongRanger
Registration:	C-GXHJ
Survey Technology:	Magnetic Survey
Mean Flight Height:	25 m

Block B

Survey/Tie Line Spacing:	333 m / 3000 m
Survey/Tie Line Direction:	161°-341° / 071°-251°

AIRBORNE SURVEY SYSTEM:

Magnetometer Sensor:	Scintrex CS-3 Cesium
Configuration:	Stinger with 3 axis compensation
Sample Rate:	10 Hz
Sensitivity:	0.0006 nT vHz rms

DATA REFERENCE:

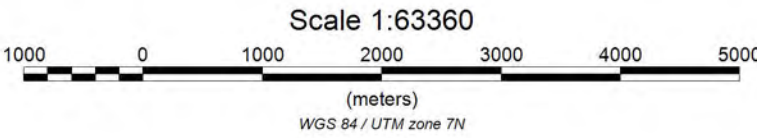
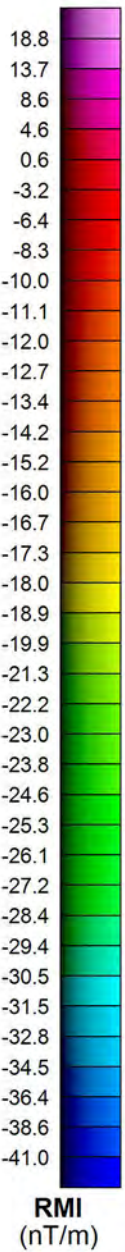
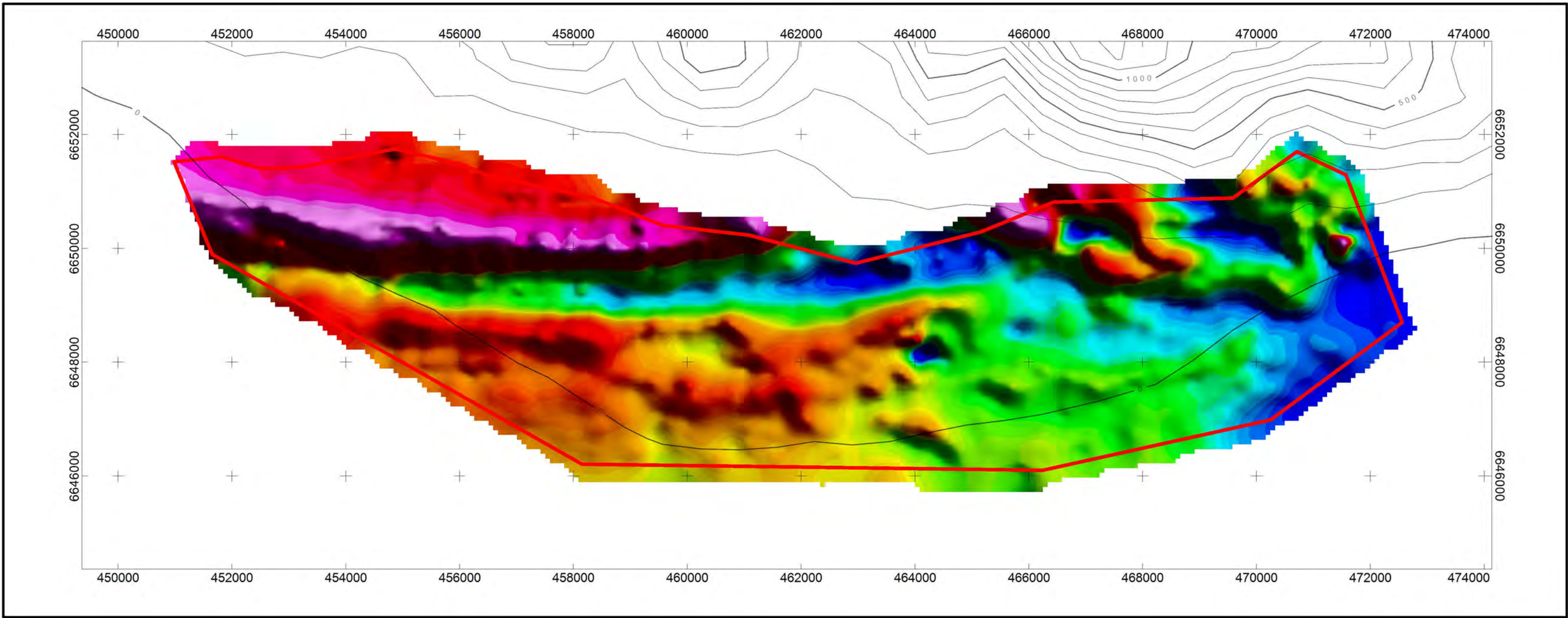
Magnetic data have been compensated and corrected for diurnal, lag, and heading, and then leveled to generate the Total Magnetic Intensity (TMI). A computed value of the IGRF was removed from the TMI to produce the Residual Magnetic Intensity (RMI) grid. Refer to report for details. Within Block B of the Icy Cape 2016 survey area, the RMI data range from -119.5 nT to 130.3 nT and have been drawn with a colour ramp of -41.0 nT to 18.8 nT.

TOPOGRAPHIC REFERENCE:

Shuttle Radar Topography Mission (SRTM), United States Elevation at 30 meter resolution. National Geospatial-Intelligence Agency (NGA) and the National Aeronautics and Space Administration (NASA). URL <<http://www2.jpl.nasa.gov/srtm>>[2005]

REPORT REFERENCE:

Precision GeoSurveys (2016): Airborne Magnetic Survey Report, Icy Cape Gold and Industrial Heavy Minerals Project, 2016 Survey Area.



Trust Land Office

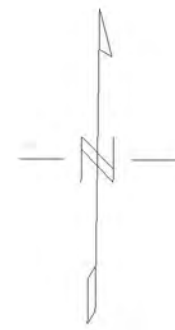
**Icy Cape Gold and Industrial
Heavy Minerals Project**

Airborne Geophysics - Magnetics

Block B - Residual Magnetic Intensity

September, 2016





MAP PROJECTION:
Projection: Universal Transverse Mercator Zone 7N
Datum: WGS 84
Local Datum Transform: WGS 84 – World

ICY CAPE 2016 SURVEY SPECIFICATIONS:

Survey Dates:	August 20, 2016 to August 22, 2016
Survey Base:	Yakutat, AK
Helicopter Type:	Bell 206L LongRanger
Registration:	C-GXHJ
Survey Technology:	Magnetic Survey
Mean Flight Height:	25 m

Block B

Survey/Tie Line Spacing:	333 m / 3000 m
Survey/Tie Line Direction:	161°-341° / 071°-251°

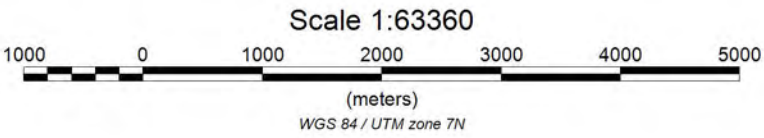
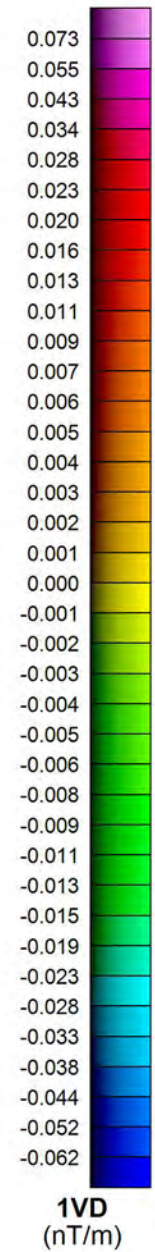
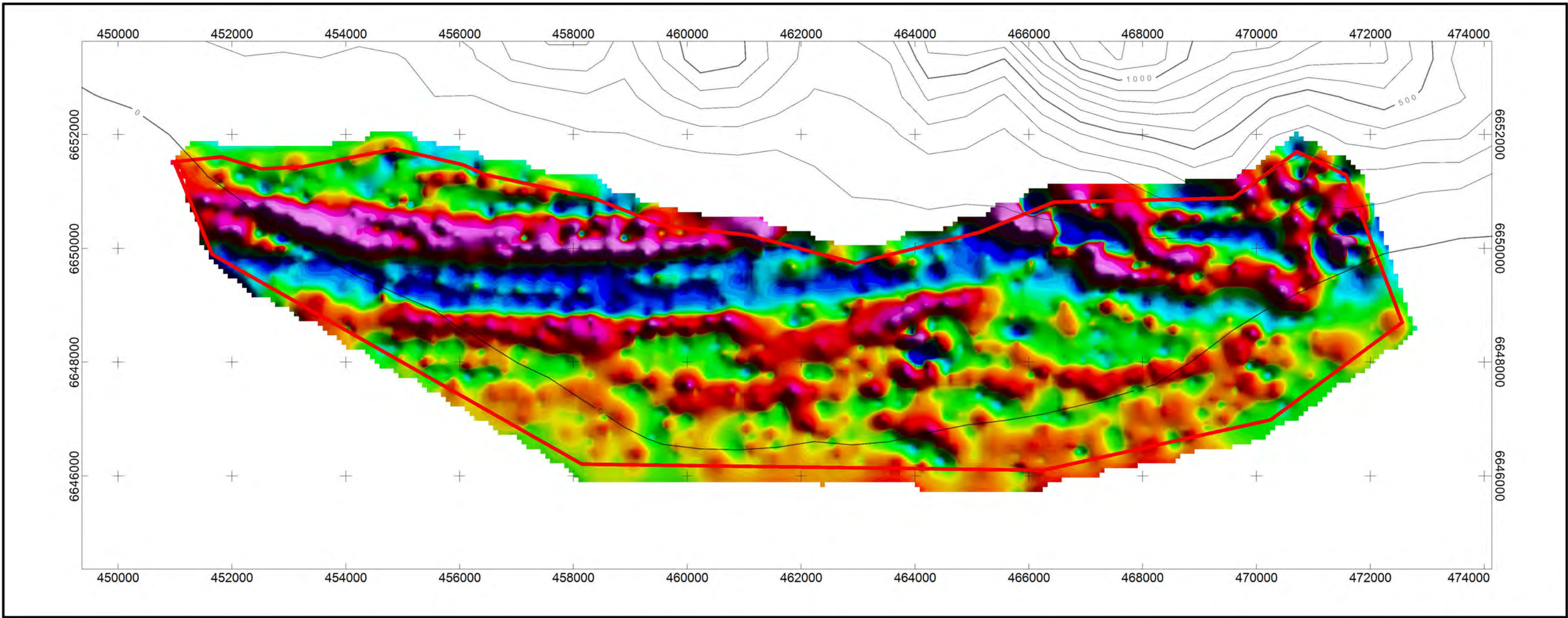
AIRBORNE SURVEY SYSTEM:

Magnetometer Sensor:	Scintrex CS-3 Cesium
Configuration:	Stinger with 3 axis compensation
Sample Rate:	10 Hz
Sensitivity:	0.0006 nT VHz rms

DATA REFERENCE:
The First Vertical Derivative (1VD) is calculated from the RMI. The 1VD is represented as a grid and its image color ramp has been histogram equalized.

TOPOGRAPHIC REFERENCE:
Shuttle Radar Topography Mission (SRTM), United States Elevation at 30 meter resolution. National Geospatial-Intelligence Agency (NGA) and the National Aeronautics and Space Administration (NASA). URL <<http://www2.jpl.nasa.gov/srtm>>[2005]

REPORT REFERENCE:
Precision GeoSurveys (2016): Airborne Magnetic Survey Report, Icy Cape Gold and Industrial Heavy Minerals Project, 2016 Survey Area.



Trust Land Office

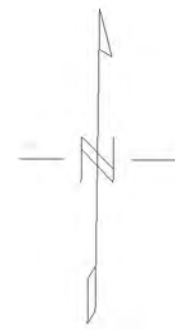
Icy Cape Gold and Industrial Heavy Minerals Project

Airborne Geophysics - Magnetics

Block B - First Vertical Derivative

September, 2016





MAP PROJECTION:

Projection: Universal Transverse Mercator Zone 7N
Datum: WGS 84
Local Datum Transform: WGS 84 – World

ICY CAPE 2016 SURVEY SPECIFICATIONS:

Survey Dates:	August 20, 2016 to August 22, 2016
Survey Base:	Yakutat, AK
Helicopter Type:	Bell 206L LongRanger
Registration:	C-GXHJ
Survey Technology:	Magnetic Survey
Mean Flight Height:	25 m

Block B

Survey/Tie Line Spacing:	333 m / 3000 m
Survey/Tie Line Direction:	161°-341° / 071°-251°

AIRBORNE SURVEY SYSTEM:

Magnetometer Sensor:	Scintrex CS-3 Cesium
Configuration:	Stinger with 3 axis compensation
Sample Rate:	10 Hz
Sensitivity:	0.0006 nT VHz rms

DATA REFERENCE:

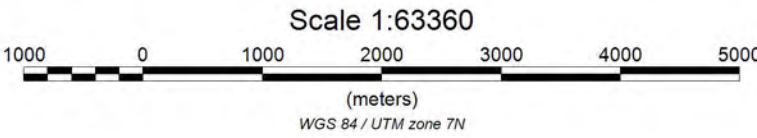
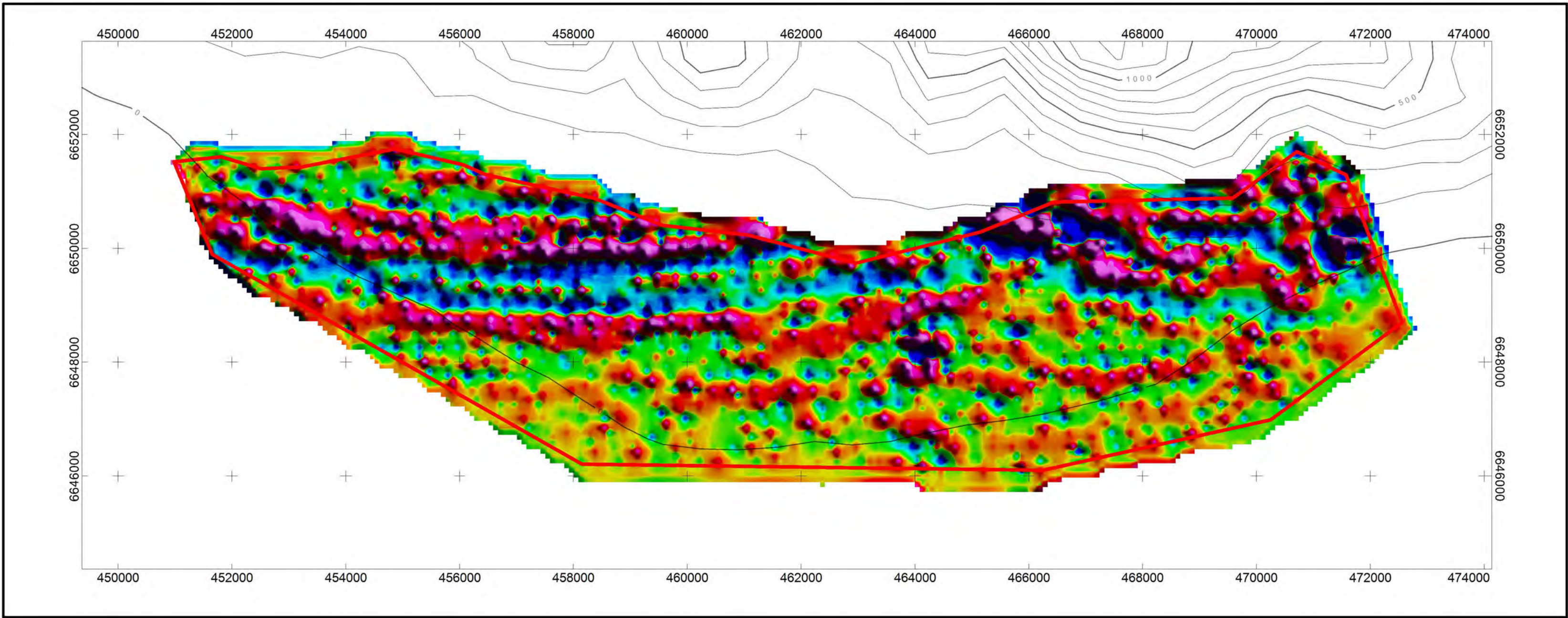
The Second Vertical Derivative (2VD) is calculated from the RMI. The 2VD is represented as a grid and its image color ramp has been histogram equalized.

TOPOGRAPHIC REFERENCE:

Shuttle Radar Topography Mission (SRTM), United States Elevation at 30 meter resolution. National Geospatial-Intelligence Agency (NGA) and the National Aeronautics and Space Administration (NASA). URL <<http://www2.jpl.nasa.gov/srtm>>[2005]

REPORT REFERENCE:

Precision GeoSurveys (2016): Airborne Magnetic Survey Report, Icy Cape Gold and Industrial Heavy Minerals Project, 2016 Survey Area.



Trust Land Office

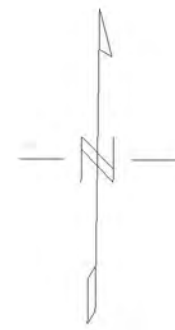
Icy Cape Gold and Industrial Heavy Minerals Project

Airborne Geophysics - Magnetics

Block B - Second Vertical Derivative

September, 2016





MAP PROJECTION:

Projection: Universal Transverse Mercator Zone 7N
Datum: WGS 84
Local Datum Transform: WGS 84 – World

ICY CAPE 2016 SURVEY SPECIFICATIONS:

Survey Dates:	August 20, 2016 to August 22, 2016
Survey Base:	Yakutat, AK
Helicopter Type:	Bell 206L LongRanger
Registration:	C-GXHJ
Survey Technology:	Magnetic Survey
Mean Flight Height:	25 m

Block B

Survey/Tie Line Spacing:	333 m / 3000 m
Survey/Tie Line Direction:	161°-341° / 071°-251°

AIRBORNE SURVEY SYSTEM:

Magnetometer Sensor:	Scintrex CS-3 Cesium
Configuration:	Stinger with 3 axis compensation
Sample Rate:	10 Hz
Sensitivity:	0.0006 nT vHz rms

DATA REFERENCE:

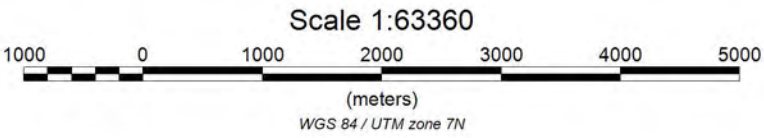
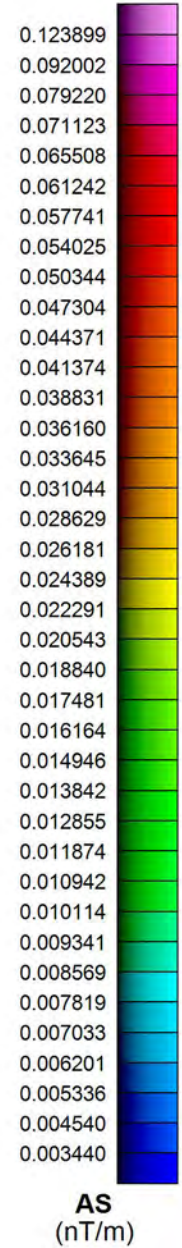
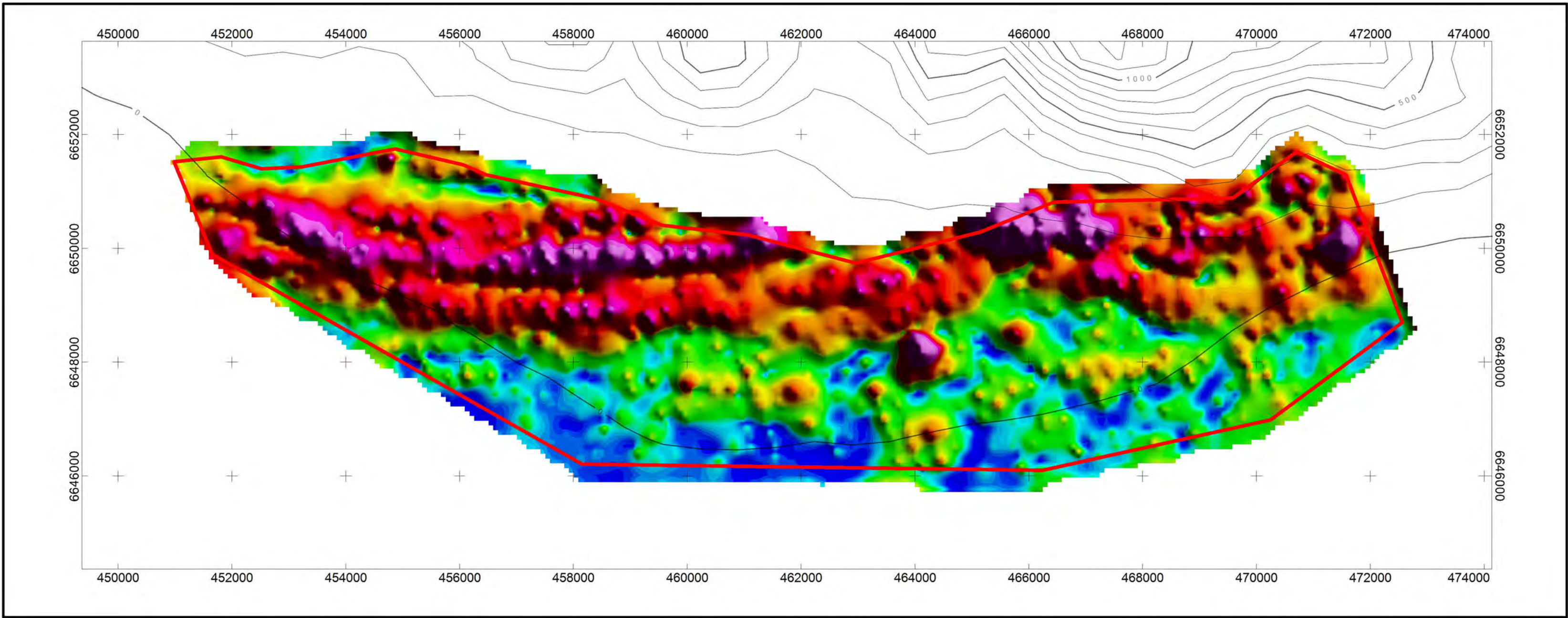
The Analytic Signal (AS) is calculated from the RMI. The AS is represented as a grid and its image color ramp has been histogram equalized.

TOPOGRAPHIC REFERENCE:

Shuttle Radar Topography Mission (SRTM), United States Elevation at 30 meter resolution. National Geospatial-Intelligence Agency (NGA) and the National Aeronautics and Space Administration (NASA). URL <<http://www2.jpl.nasa.gov/srtm>>[2005]

REPORT REFERENCE:

Precision GeoSurveys (2016): Airborne Magnetic Survey Report, Icy Cape Gold and Industrial Heavy Minerals Project, 2016 Survey Area.



Trust Land Office

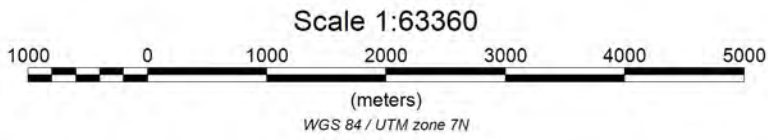
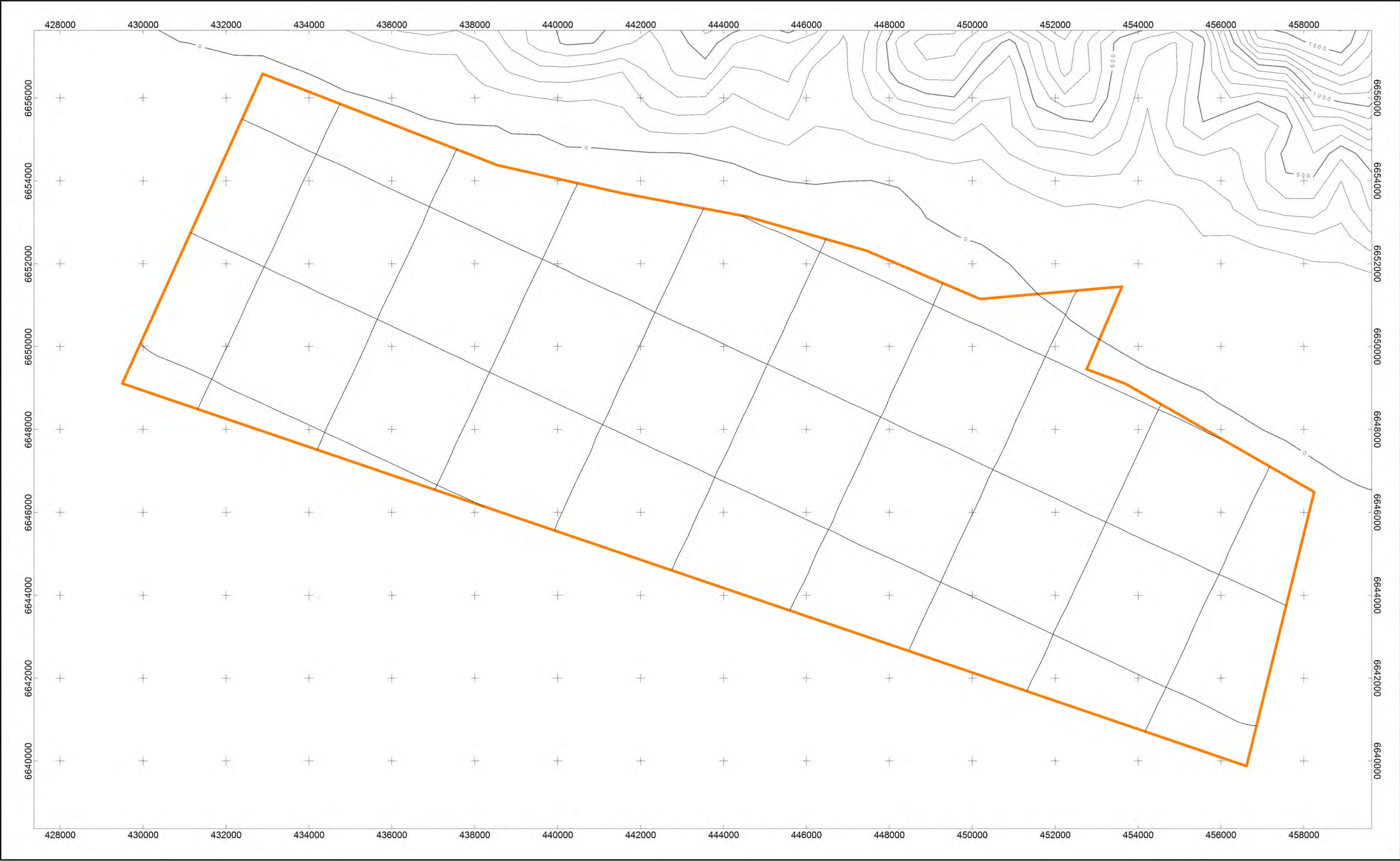
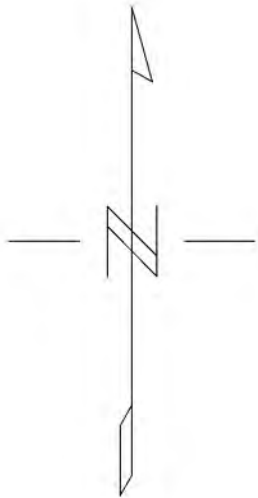
**Icy Cape Gold and Industrial
Heavy Minerals Project**

Airborne Geophysics - Magnetics

Block B - Analytic Signal

September, 2016





MAP PROJECTION:

Projection: Universal Transverse Mercator Zone 7N
Datum: WGS 84
Local Datum Transform: WGS 84 – World

ICY CAPE 2016 SURVEY SPECIFICATIONS:

Survey Dates:	August 20, 2016 to August 22, 2016
Survey Base:	Yakutat, AK
Helicopter Type:	Bell 206L LongRanger
Registration:	C-GXHJ
Survey Technology:	Magnetic Survey
Mean Flight Height:	25 m

Block C

Survey/Tie Line Spacing:	3000 m / 3000 m
Survey/Tie Line Direction:	025°-205° / 115°-295°

AIRBORNE SURVEY SYSTEM:

Magnetometer Sensor:	Scintrex CS-3 Cesium
Configuration:	Stinger with 3 axis compensation
Sample Rate:	10 Hz
Sensitivity:	0.0006 nT VHz rms

TOPOGRAPHIC REFERENCE:

Shuttle Radar Topography Mission (SRTM), United States Elevation at 30 meter resolution. National Geospatial-Intelligence Agency (NGA) and the National Aeronautics and Space Administration (NASA). URL <<http://www2.jpl.nasa.gov/srtm>>[2005]

REPORT REFERENCE:

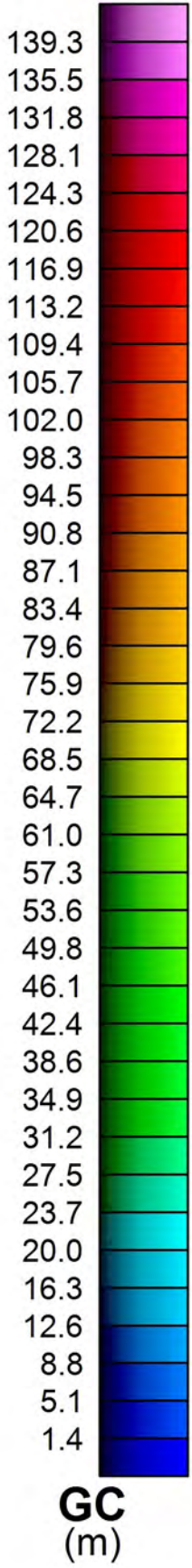
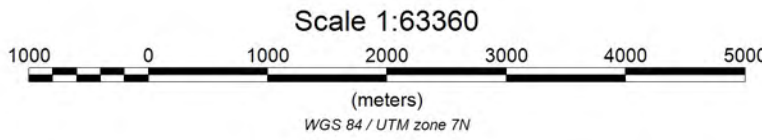
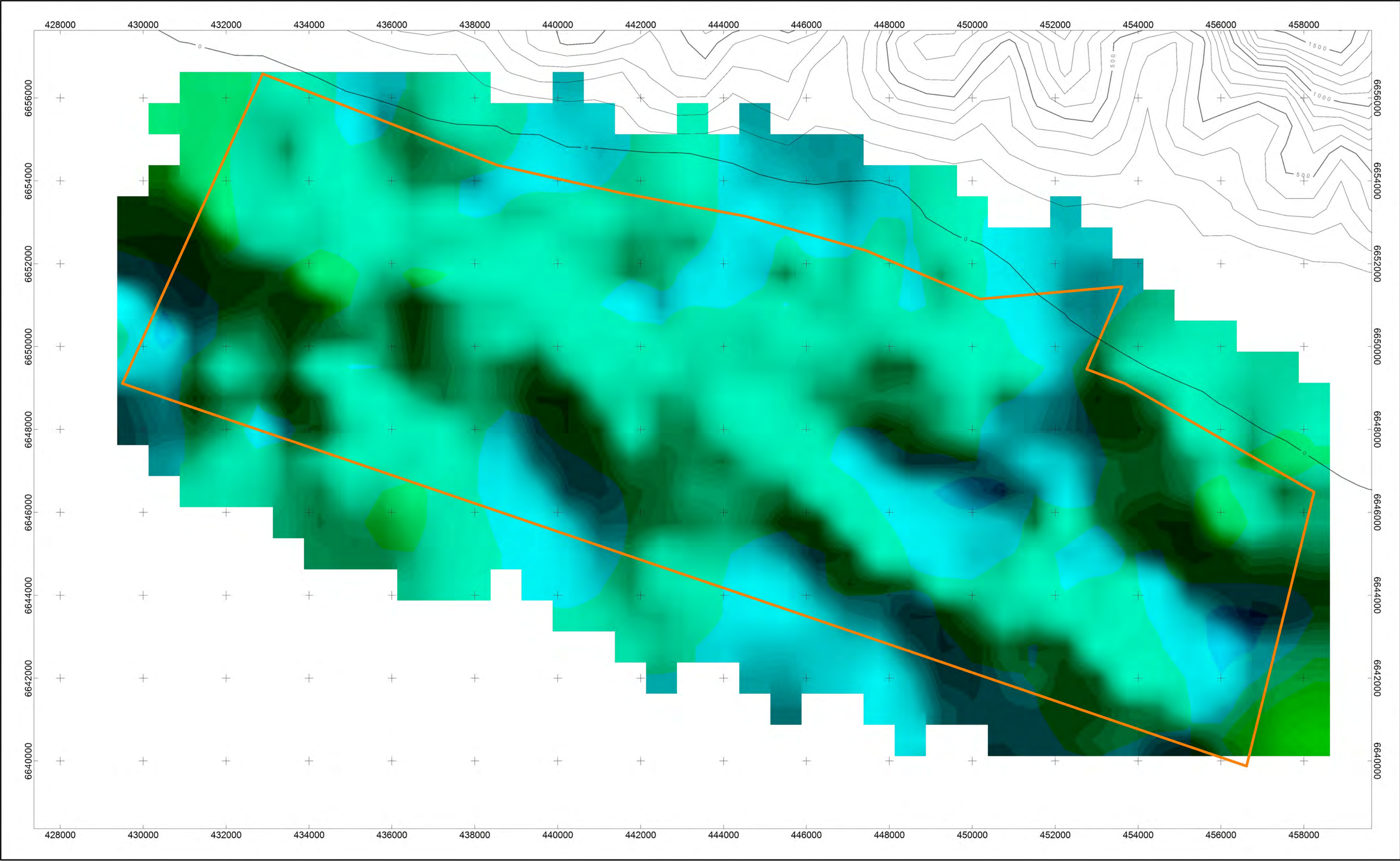
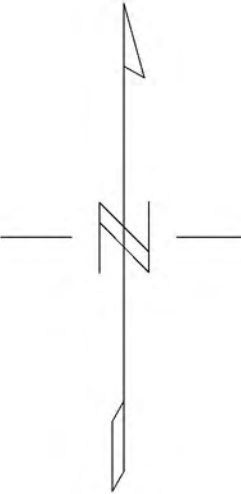
Precision GeoSurveys (2016): Airborne Magnetic Survey Report, Icy Cape Gold and Industrial Heavy Minerals Project, 2016 Survey Area.



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Icy Cape Gold and Industrial
Heavy Minerals Project

Airborne Geophysics - Magnetics
Block C - Actual Flight Lines
September, 2016





MAP PROJECTION:	
Projection:	Universal Transverse Mercator Zone 7N
Datum:	WGS 84
Local Datum Transform:	WGS 84 – World
ICY CAPE 2016 SURVEY SPECIFICATIONS:	
Survey Dates:	August 20, 2016 to August 22, 2016
Survey Base:	Yakutat, AK
Helicopter Type:	Bell 206L LongRanger
Registration:	C-GXHJ
Survey Technology:	Magnetic Survey
Mean Flight Height:	25 m
AIRBORNE SURVEY SYSTEM:	
Magnetometer Sensor:	Scintrex CS-3 Cesium
Configuration:	Stinger with 3 axis compensation
Sample Rate:	10 Hz
Sensitivity:	0.0006 nT VHz rms
DATA REFERENCE:	
The Ground Clearance (GC) is calculated from the onboard GPS altimetry data. The GC is represented as a grid with a linear color ramp.	
TOPOGRAPHIC REFERENCE:	
Shuttle Radar Topography Mission (SRTM), United States Elevation at 30 meter resolution. National Geospatial-Intelligence Agency (NGA) and the National Aeronautics and Space Administration (NASA). URL < http://www2.jpl.nasa.gov/srtm >[2005]	
REPORT REFERENCE:	
Precision GeoSurveys (2016): Airborne Magnetic Survey Report, Icy Cape Gold and Industrial Heavy Minerals Project, 2016 Survey Area.	



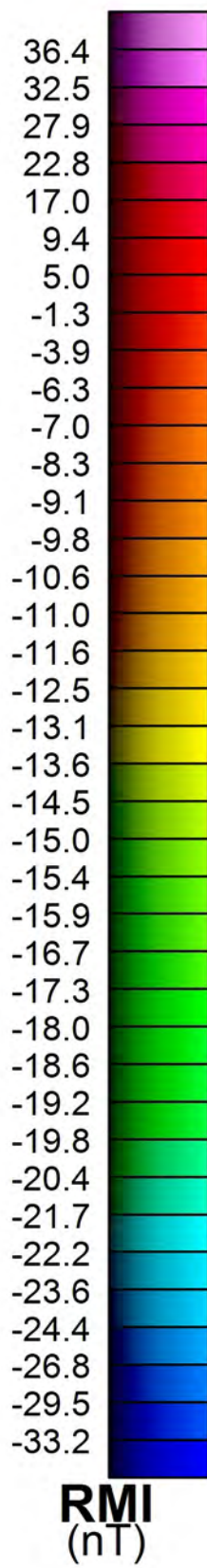
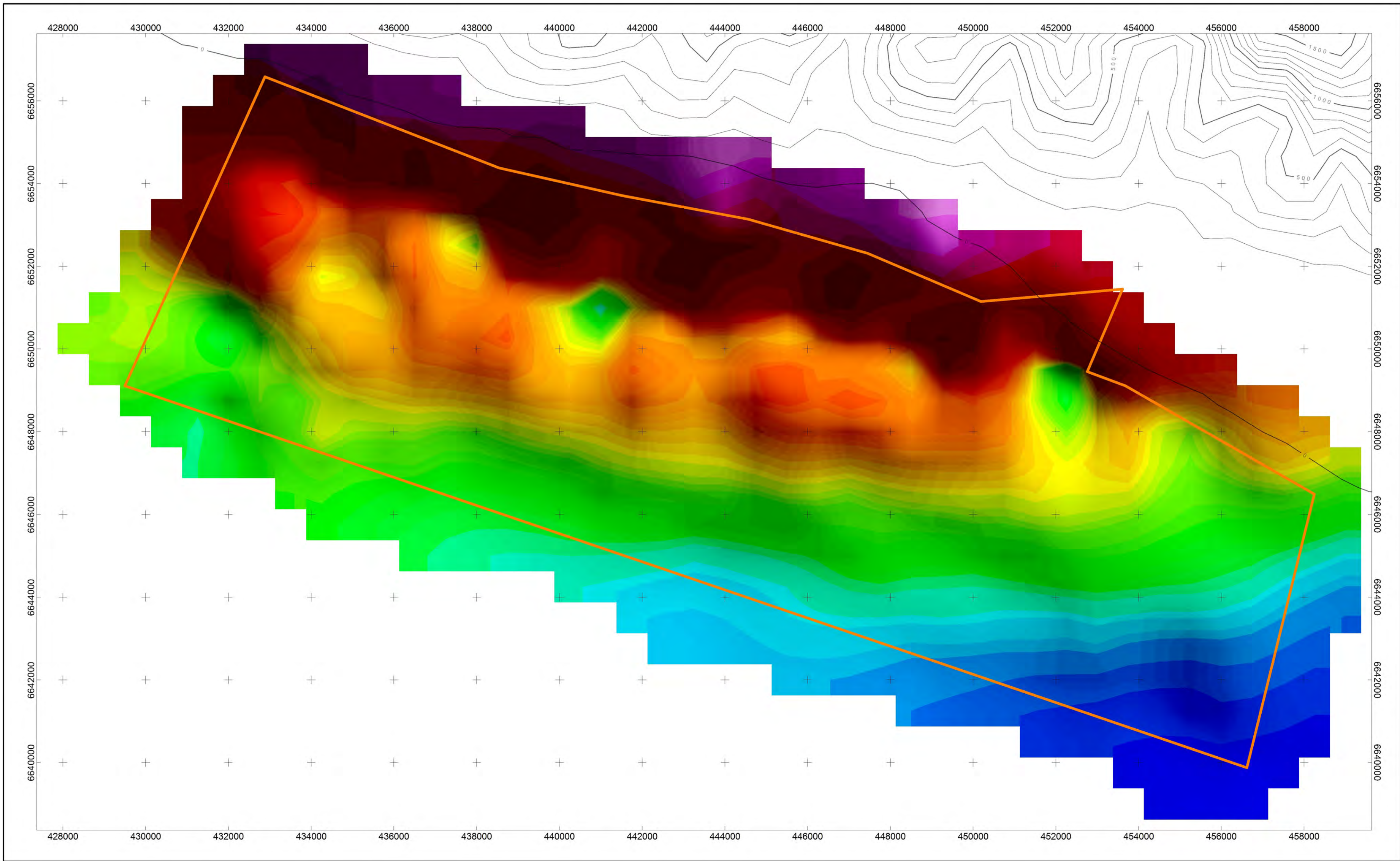
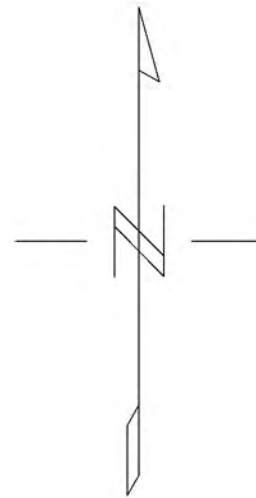
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Icy Cape Gold and Industrial Heavy Minerals Project

Airborne Geophysics - Magnetics
Block C - Ground Clearance
September, 2016





MAP PROJECTION:

Projection: Universal Transverse Mercator Zone 7N
Datum: WGS 84
Local Datum Transform: WGS 84 – World

ICY CAPE 2016 SURVEY SPECIFICATIONS:

Survey Dates:	August 20, 2016 to August 22, 2016
Survey Base:	Yakutat, AK
Helicopter Type:	Bell 206L LongRanger
Registration:	C-GXHJ
Survey Technology:	Magnetic Survey
Mean Flight Height:	25 m

Block C

Survey/Tie Line Spacing:	3000 m / 3000 m
Survey/Tie Line Direction:	025°-205° / 115°-295°

AIRBORNE SURVEY SYSTEM:

Magnetometer Sensor:	Scintrex CS-3 Cesium
Configuration:	Stinger with 3 axis compensation
Sample Rate:	10 Hz
Sensitivity:	0.0006 nT vHz rms

DATA REFERENCE:

Magnetic data have been compensated and corrected for diurnal, lag, and heading, and then leveled to generate the Total Magnetic Intensity (TMI). A computed value of the IGRF was removed from the TMI to produce the Residual Magnetic Intensity (RMI) grid. Refer to report for details. Within Block C of the Icy Cape 2016 survey area, the RMI data range from -33.4 nT to 45.8 nT and have been drawn with a colour ramp of -33.2 nT to 36.4 nT.

TOPOGRAPHIC REFERENCE:

Shuttle Radar Topography Mission (SRTM), United States Elevation at 30 meter resolution. National Geospatial-Intelligence Agency (NGA) and the National Aeronautics and Space Administration (NASA). URL <<http://www2.jpl.nasa.gov/srtm>>[2005]

REPORT REFERENCE:

Precision GeoSurveys (2016): Airborne Magnetic Survey Report, Icy Cape Gold and Industrial Heavy Minerals Project, 2016 Survey Area.

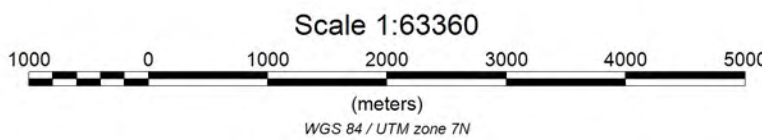


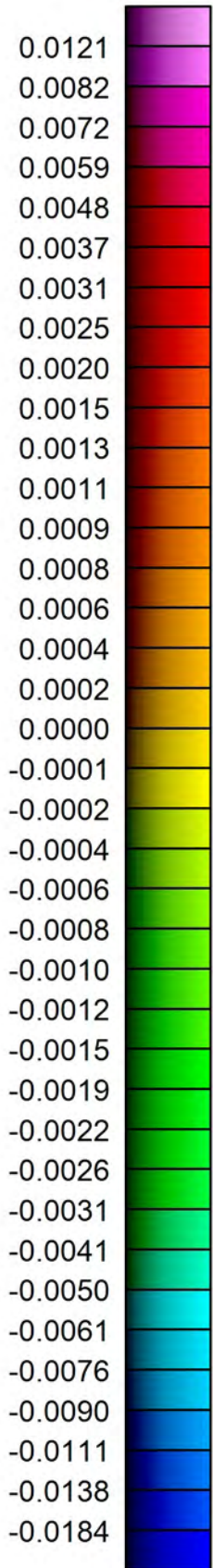
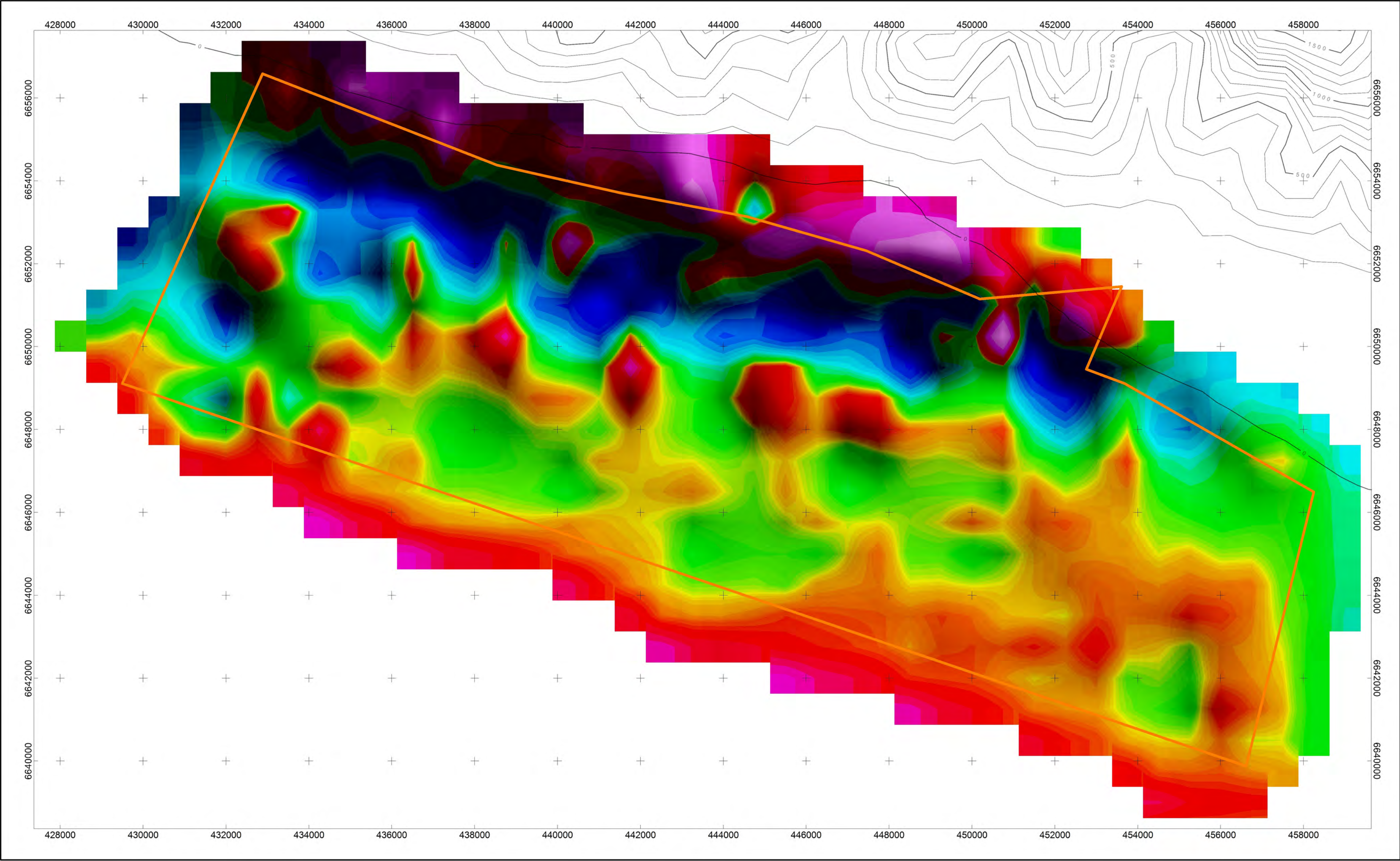
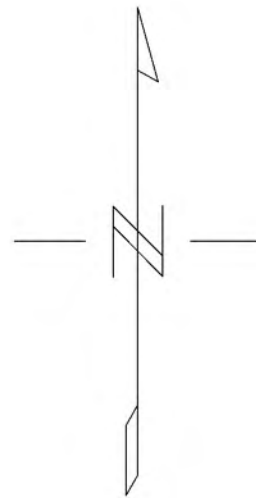
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Icy Cape Gold and Industrial
Heavy Minerals Project

Airborne Geophysics - Magnetics
Block C - Residual Magnetic Intensity
September, 2016

Precision
GeoSurveys





MAP PROJECTION:
Projection: Universal Transverse Mercator Zone 7N
Datum: WGS 84
Local Datum Transform: WGS 84 – World

ICY CAPE 2016 SURVEY SPECIFICATIONS:

Survey Dates:	August 20, 2016 to August 22, 2016
Survey Base:	Yakutat, AK
Helicopter Type:	Bell 206L LongRanger
Registration:	C-GXHJ
Survey Technology:	Magnetic Survey
Mean Flight Height:	25 m

Block C

Survey/Tie Line Spacing:	3000 m / 3000 m
Survey/Tie Line Direction:	025°-205° / 115°-295°

AIRBORNE SURVEY SYSTEM:

Magnetometer Sensor:	Scintrex CS-3 Cesium
Configuration:	Stinger with 3 axis compensation
Sample Rate:	10 Hz
Sensitivity:	0.0006 nT VHz rms

DATA REFERENCE:
The First Vertical Derivative (1VD) is calculated from the RMI. The 1VD is represented as a grid and its image color ramp has been histogram equalized.

TOPOGRAPHIC REFERENCE:
Shuttle Radar Topography Mission (SRTM), United States Elevation at 30 meter resolution. National Geospatial-Intelligence Agency (NGA) and the National Aeronautics and Space Administration (NASA). URL <<http://www2.jpl.nasa.gov/srtm>>[2005]

REPORT REFERENCE:
Precision GeoSurveys (2016): Airborne Magnetic Survey Report, Icy Cape Gold and Industrial Heavy Minerals Project, 2016 Survey Area.

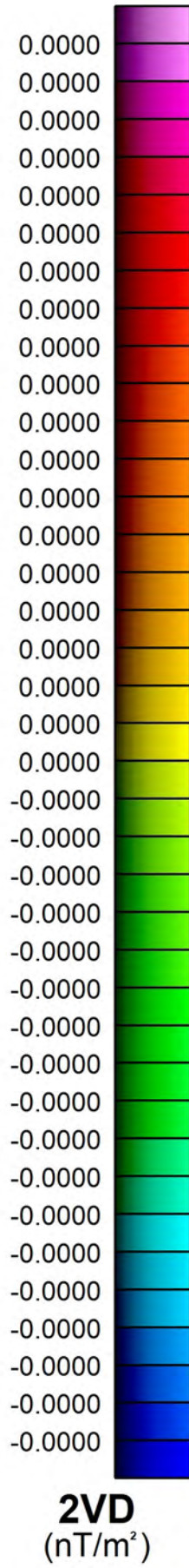
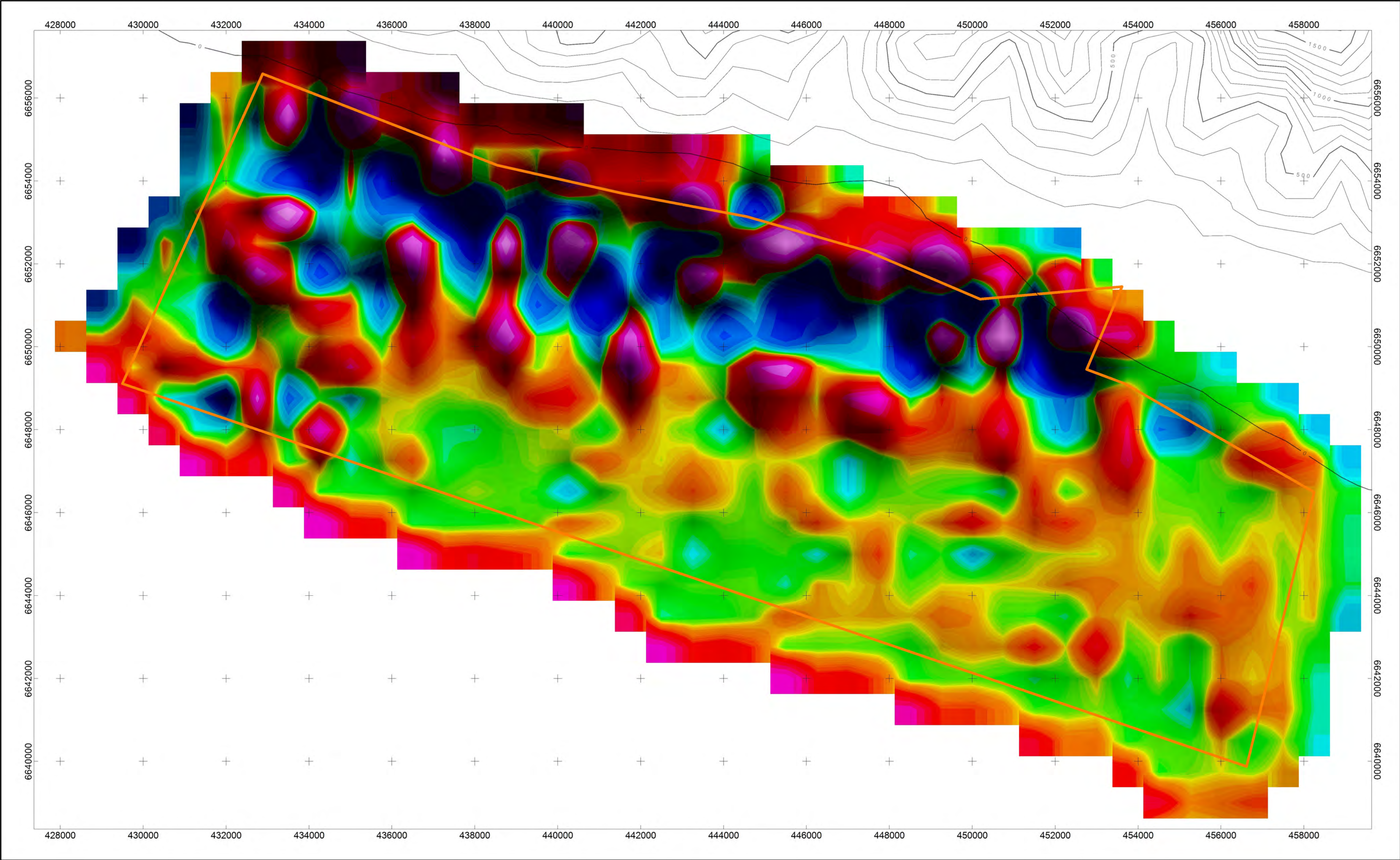
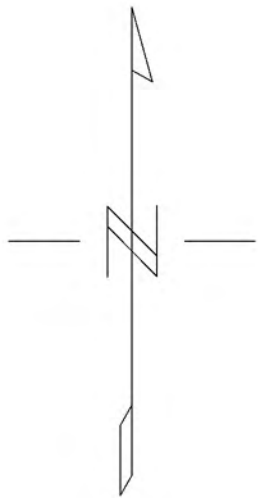


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Icy Cape Gold and Industrial Heavy Minerals Project

Airborne Geophysics - Magnetics
Block C - First Vertical Derivative
September, 2016





MAP PROJECTION:

Projection: Universal Transverse Mercator Zone 7N
Datum: WGS 84
Local Datum Transform: WGS 84 – World

ICY CAPE 2016 SURVEY SPECIFICATIONS:

Survey Dates:	August 20, 2016 to August 22, 2016
Survey Base:	Yakutat, AK
Helicopter Type:	Bell 206L LongRanger
Registration:	C-GXHJ
Survey Technology:	Magnetic Survey
Mean Flight Height:	25 m

Block C

Survey/Tie Line Spacing:	3000 m / 3000 m
Survey/Tie Line Direction:	025°-205° / 115°-295°

AIRBORNE SURVEY SYSTEM:

Magnetometer Sensor:	Scintrex CS-3 Cesium
Configuration:	Stinger with 3 axis compensation
Sample Rate:	10 Hz
Sensitivity:	0.0006 nT vHz rms

DATA REFERENCE:

The Second Vertical Derivative (2VD) is calculated from the RMI. The 2VD is represented as a grid and its image color ramp has been histogram equalized.

TOPOGRAPHIC REFERENCE:

Shuttle Radar Topography Mission (SRTM), United States Elevation at 30 meter resolution. National Geospatial-Intelligence Agency (NGA) and the National Aeronautics and Space Administration (NASA). URL <<http://www2.jpl.nasa.gov/srtm>>[2005]

REPORT REFERENCE:

Precision GeoSurveys (2016): Airborne Magnetic Survey Report, Icy Cape Gold and Industrial Heavy Minerals Project, 2016 Survey Area.

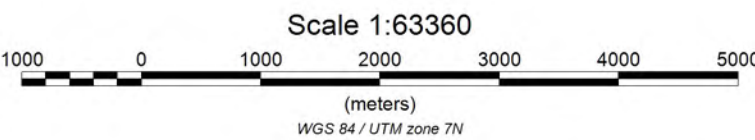


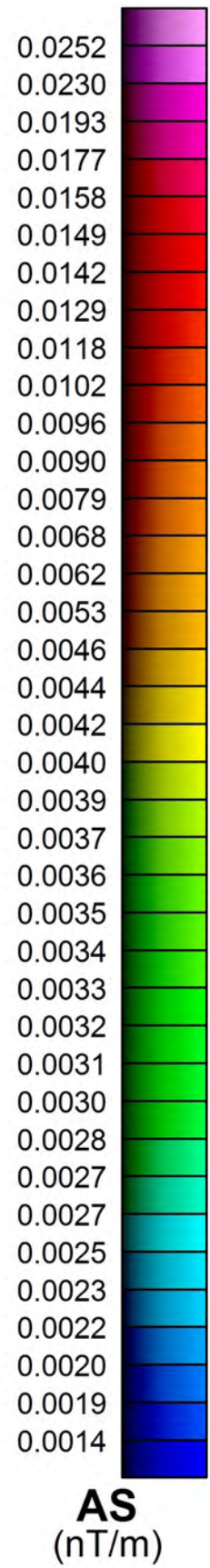
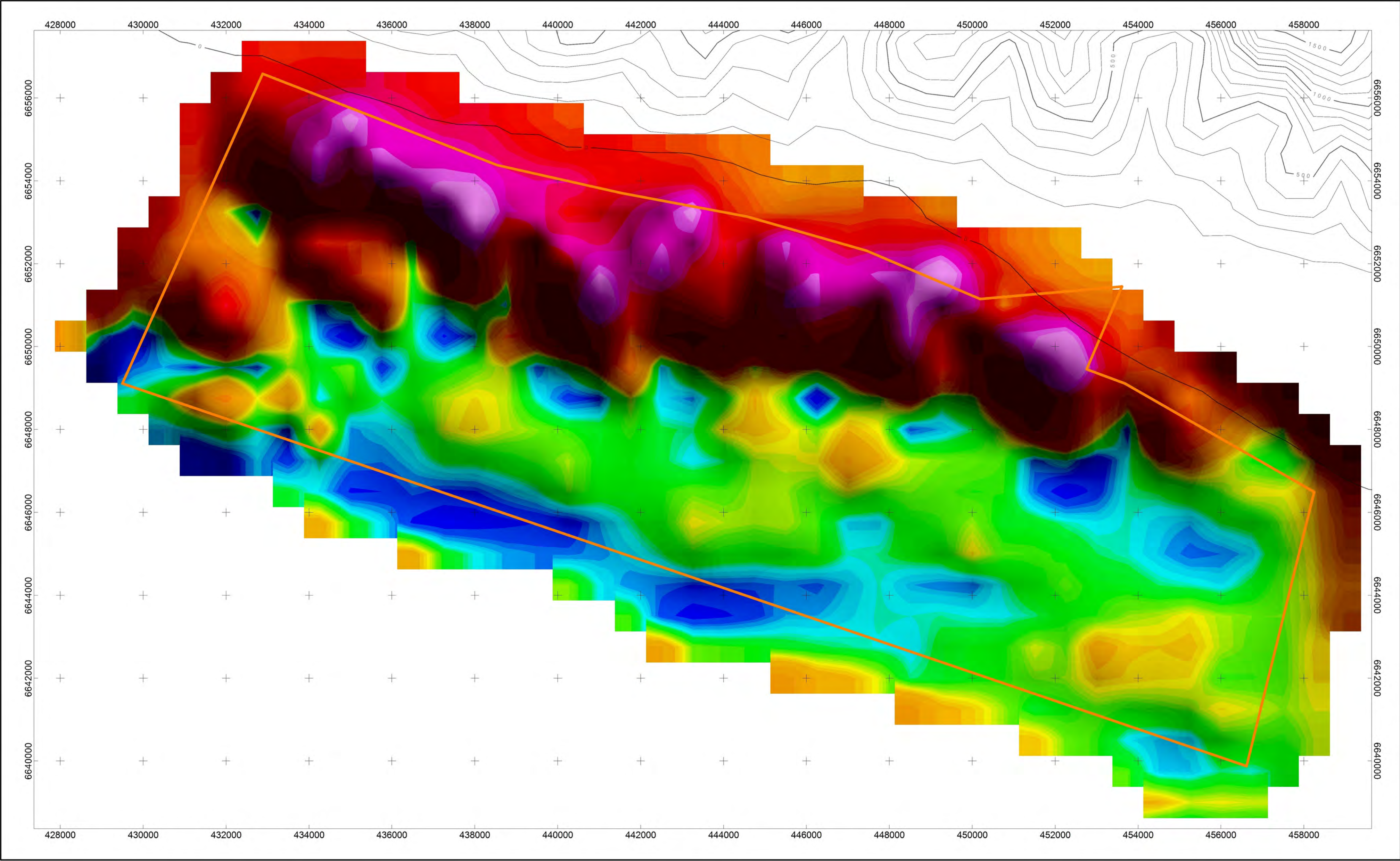
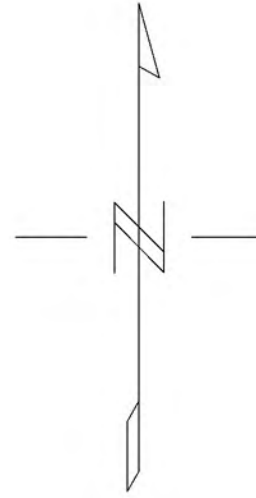
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Heavy Minerals Project

Airborne Geophysics - Magnetics
Block C - Second Vertical Derivative
September, 2016

Precision
GeoSurveys





MAP PROJECTION:
Projection: Universal Transverse Mercator Zone 7N
Datum: WGS 84
Local Datum Transform: WGS 84 – World

ICY CAPE 2016 SURVEY SPECIFICATIONS:

Survey Dates:	August 20, 2016 to August 22, 2016
Survey Base:	Yakutat, AK
Helicopter Type:	Bell 206L LongRanger
Registration:	C-GXHJ
Survey Technology:	Magnetic Survey
Mean Flight Height:	25 m

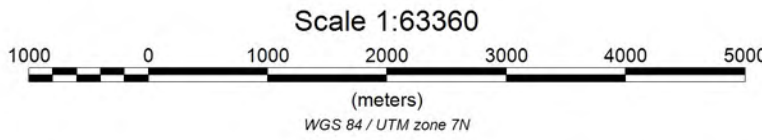
AIRBORNE SURVEY SYSTEM:

Magnetometer Sensor:	Scintrex CS-3 Cesium
Configuration:	Stinger with 3 axis compensation
Sample Rate:	10 Hz
Sensitivity:	0.0006 nT VHz rms

DATA REFERENCE:
The Analytic Signal (AS) is calculated from the RMI. The AS is represented as a grid and its image color ramp has been histogram equalized.

TOPOGRAPHIC REFERENCE:
Shuttle Radar Topography Mission (SRTM), United States Elevation at 30 meter resolution. National Geospatial-Intelligence Agency (NGA) and the National Aeronautics and Space Administration (NASA). URL <<http://www2.jpl.nasa.gov/srtm>>[2005]

REPORT REFERENCE:
Precision GeoSurveys (2016): Airborne Magnetic Survey Report, Icy Cape Gold and Industrial Heavy Minerals Project, 2016 Survey Area.

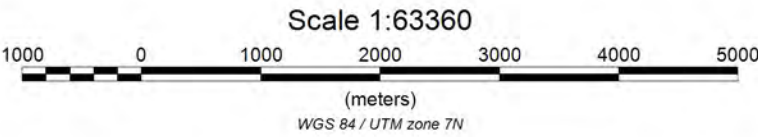
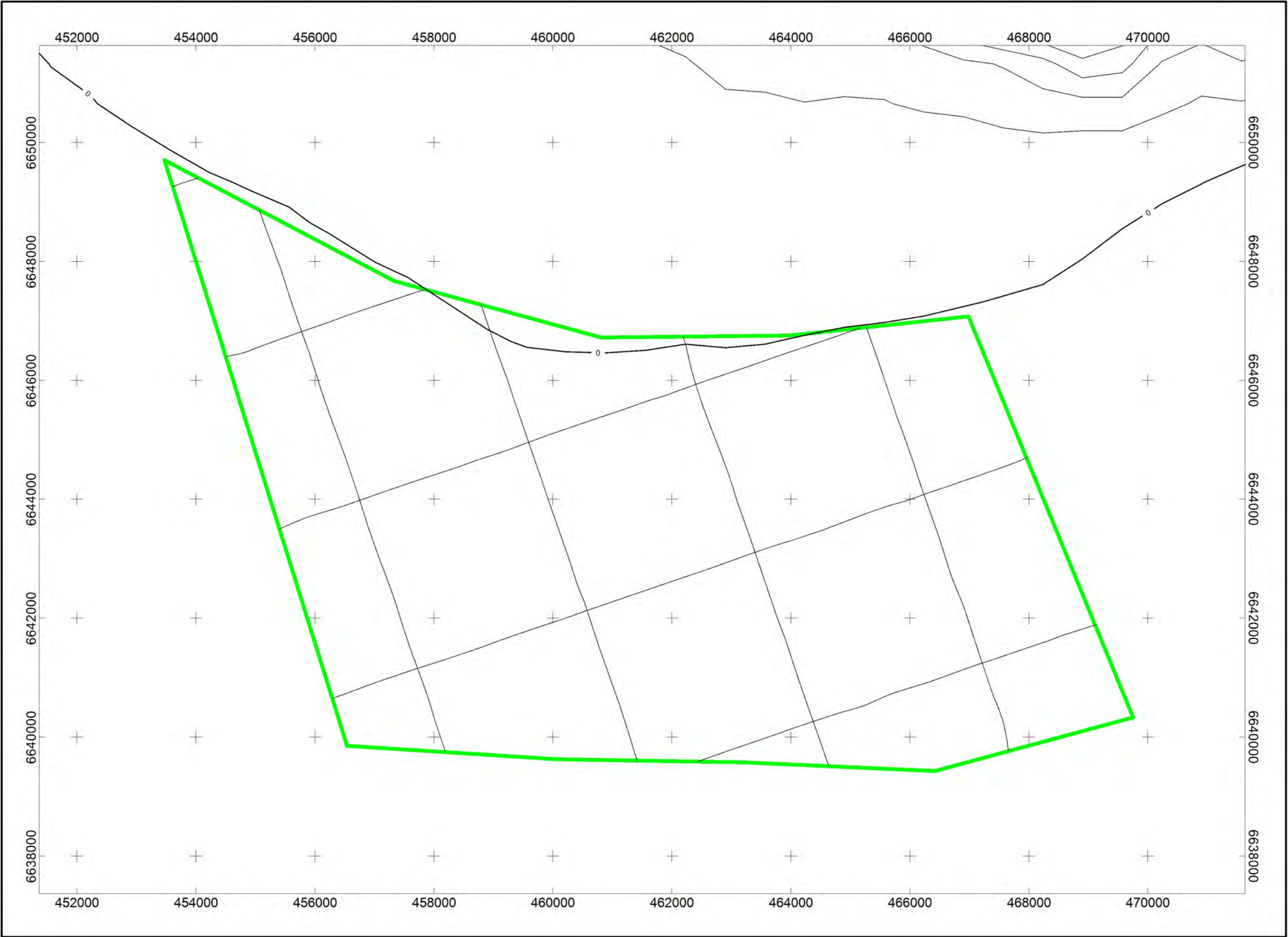
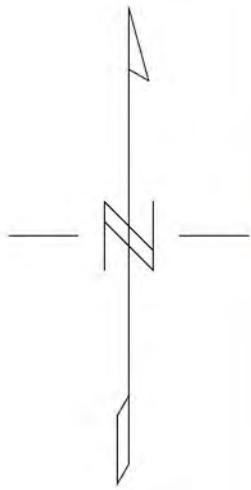


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Icy Cape Gold and Industrial Heavy Minerals Project

Airborne Geophysics - Magnetics
Block C - Analytic Signal
September, 2016





MAP PROJECTION:
Projection: Universal Transverse Mercator Zone 7N
Datum: WGS 84
Local Datum Transform: WGS 84 – World

ICY CAPE 2016 SURVEY SPECIFICATIONS:
Survey Dates: August 20, 2016 to August 22, 2016
Survey Base: Yakutat, AK
Helicopter Type: Bell 206L LongRanger
Registration: C-GXHJ
Survey Technology: Magnetic Survey
Mean Flight Height: 25 m

Block D
Survey/Tie Line Spacing: 3000 m / 3000 m
Survey/Tie Line Direction: 161°-341° / 071°-251°

AIRBORNE SURVEY SYSTEM:
Magnetometer Sensor: Scintrex CS-3 Cesium
Configuration: Stinger with 3 axis compensation
Sample Rate: 10 Hz
Sensitivity: 0.0006 nT VHz rms

TOPOGRAPHIC REFERENCE:
Shuttle Radar Topography Mission (SRTM), United States Elevation at 30 meter resolution. National Geospatial-Intelligence Agency (NGA) and the National Aeronautics and Space Administration (NASA). URL <<http://www2.jpl.nasa.gov/srtm>>[2005]

REPORT REFERENCE:
Precision GeoSurveys (2016): Airborne Magnetic Survey Report, Icy Cape Gold and Industrial Heavy Minerals Project, 2016 Survey Area.

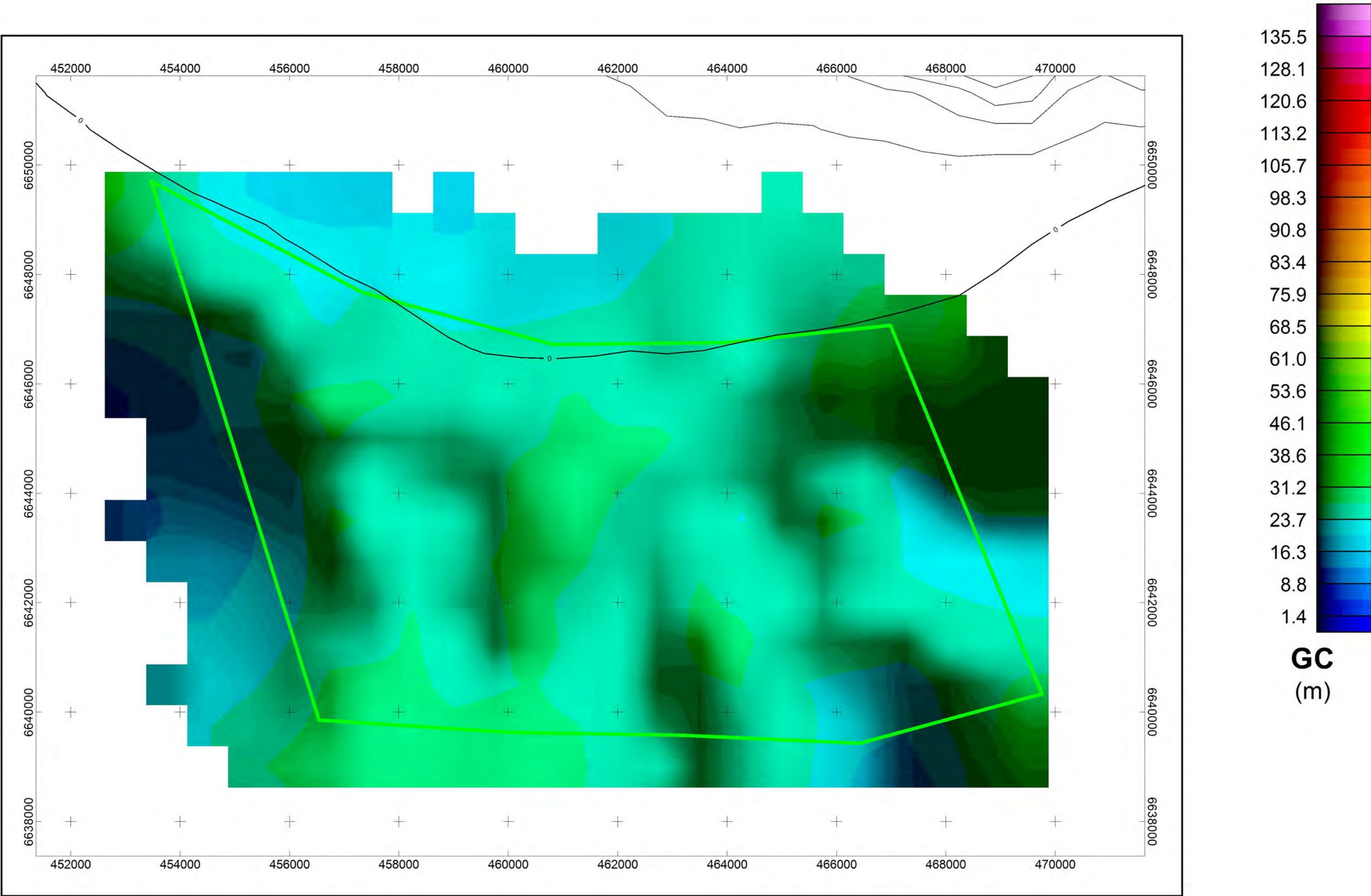


Trust Land Office

Icy Cape Gold and Industrial Heavy Minerals Project

Airborne Geophysics - Magnetics
Block D - Actual Flight Lines
September, 2016





MAP PROJECTION:
Projection: Universal Transverse Mercator Zone 7N
Datum: WGS 84
Local Datum Transform: WGS 84 – World

ICY CAPE 2016 SURVEY SPECIFICATIONS:

Survey Dates:	August 20, 2016 to August 22, 2016
Survey Base:	Yakutat, AK
Helicopter Type:	Bell 206L LongRanger
Registration:	C-GXHJ
Survey Technology:	Magnetic Survey
Mean Flight Height:	25 m

AIRBORNE SURVEY SYSTEM:

Magnetometer Sensor:	Scintrex CS-3 Cesium
Configuration:	Stinger with 3 axis compensation
Sample Rate:	10 Hz
Sensitivity:	0.0006 nT VHz rms

DATA REFERENCE:
The Ground Clearance (GC) is calculated from the onboard GPS altimetry data. The GC is represented as a grid with a linear color ramp.

TOPOGRAPHIC REFERENCE:
Shuttle Radar Topography Mission (SRTM), United States Elevation at 30 meter resolution. National Geospatial-Intelligence Agency (NGA) and the National Aeronautics and Space Administration (NASA). URL <<http://www2.jpl.nasa.gov/srtm>>[2005]

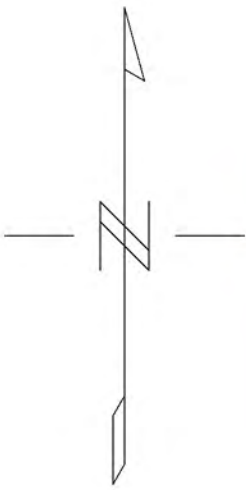
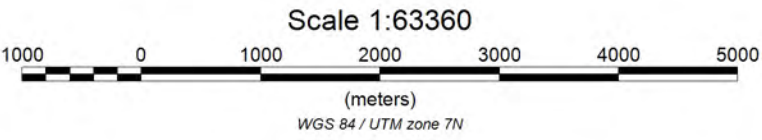
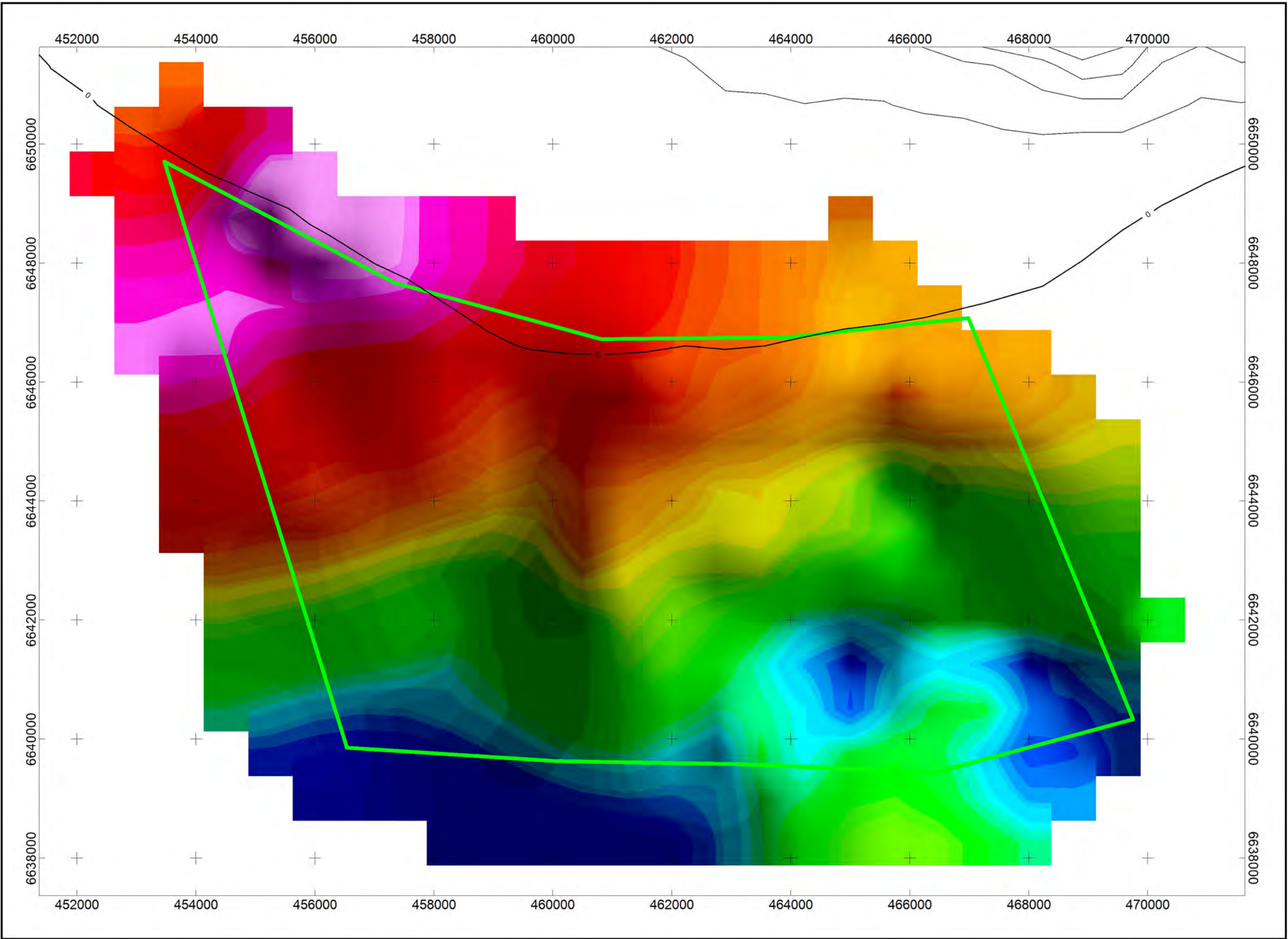
REPORT REFERENCE:
Precision GeoSurveys (2016): Airborne Magnetic Survey Report, Icy Cape Gold and Industrial Heavy Minerals Project, 2016 Survey Area.



Trust Land Office
Icy Cape Gold and Industrial Heavy Minerals Project

Airborne Geophysics - Magnetics
Block D - Ground Clearance
September, 2016





MAP PROJECTION:
Projection: Universal Transverse Mercator Zone 7N
Datum: WGS 84
Local Datum Transform: WGS 84 – World

ICY CAPE 2016 SURVEY SPECIFICATIONS:

Survey Dates:	August 20, 2016 to August 22, 2016
Survey Base:	Yakutat, AK
Helicopter Type:	Bell 206L LongRanger
Registration:	C-GXHJ
Survey Technology:	Magnetic Survey
Mean Flight Height:	25 m

AIRBORNE SURVEY SYSTEM:

Magnetometer Sensor:	Scintrex CS-3 Cesium
Configuration:	Stinger with 3 axis compensation
Sample Rate:	10 Hz
Sensitivity:	0.0006 nT VHz rms

DATA REFERENCE:
Magnetic data have been compensated and corrected for diurnal, lag, and heading, and then leveled to generate the Total Magnetic Intensity (TMI). A computed value of the IGRF was removed from the TMI to produce the Residual Magnetic Intensity (RMI) grid. Refer to report for details. Within Block D of the Icy Cape 2016 survey area, the RMI data range from -38.5 nT to -2.9 nT and have been drawn with a colour ramp of -35.7 nT to -11.1 nT.

TOPOGRAPHIC REFERENCE:
Shuttle Radar Topography Mission (SRTM), United States Elevation at 30 meter resolution. National Geospatial-Intelligence Agency (NGA) and the National Aeronautics and Space Administration (NASA). URL <<http://www2.jpl.nasa.gov/srtm>>[2005]

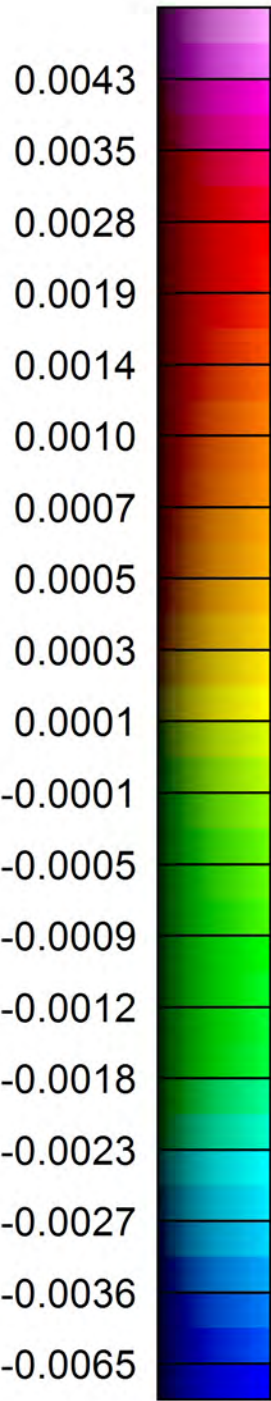
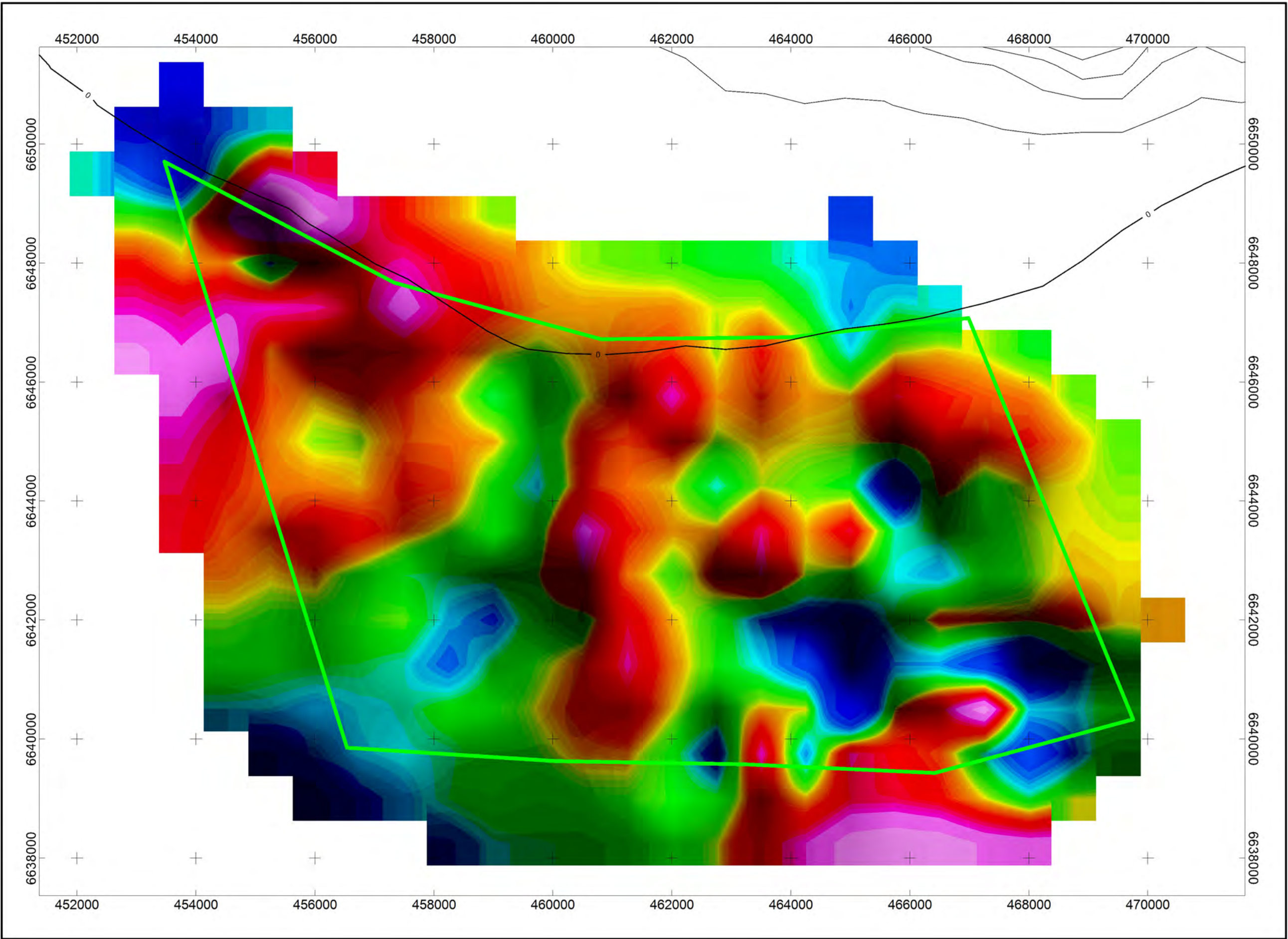
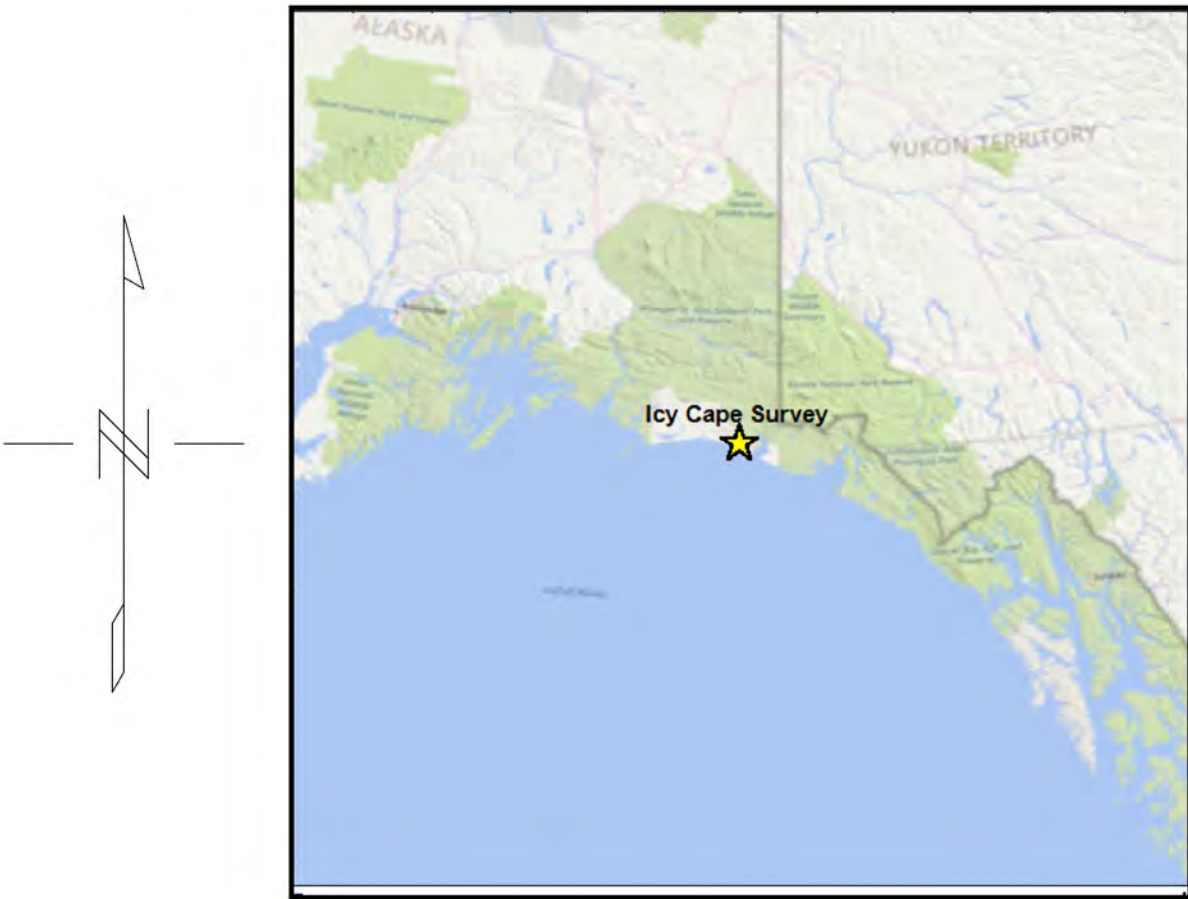
REPORT REFERENCE:
Precision GeoSurveys (2016): Airborne Magnetic Survey Report, Icy Cape Gold and Industrial Heavy Minerals Project, 2016 Survey Area.



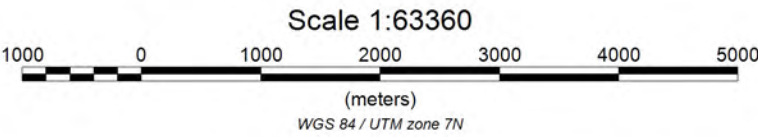
Trust Land Office
Icy Cape Gold and Industrial Heavy Minerals Project

Airborne Geophysics - Magnetics
Block D - Residual Magnetic Intensity
September, 2016





1VD
(nT/m)



MAP PROJECTION:
Projection: Universal Transverse Mercator Zone 7N
Datum: WGS 84
Local Datum Transform: WGS 84 – World

ICY CAPE 2016 SURVEY SPECIFICATIONS:
Survey Dates: August 20, 2016 to August 22, 2016
Survey Base: Yakutat, AK
Helicopter Type: Bell 206L LongRanger
Registration: C-GXHJ
Survey Technology: Magnetic Survey
Mean Flight Height: 25 m

Block D
Survey/Tie Line Spacing: 3000 m / 3000 m
Survey/Tie Line Direction: 161°-341° / 071°-251°

AIRBORNE SURVEY SYSTEM:
Magnetometer Sensor: Scintrex CS-3 Cesium
Configuration: Stinger with 3 axis compensation
Sample Rate: 10 Hz
Sensitivity: 0.0006 nT $\sqrt{\text{Hz}}$ rms

DATA REFERENCE:
The First Vertical Derivative (1VD) is calculated from the RMI. The 1VD is represented as a grid and its image color ramp has been histogram equalized.

TOPOGRAPHIC REFERENCE:
Shuttle Radar Topography Mission (SRTM), United States Elevation at 30 meter resolution. National Geospatial-Intelligence Agency (NGA) and the National Aeronautics and Space Administration (NASA). URL <<http://www2.jpl.nasa.gov/srtm>>[2005]

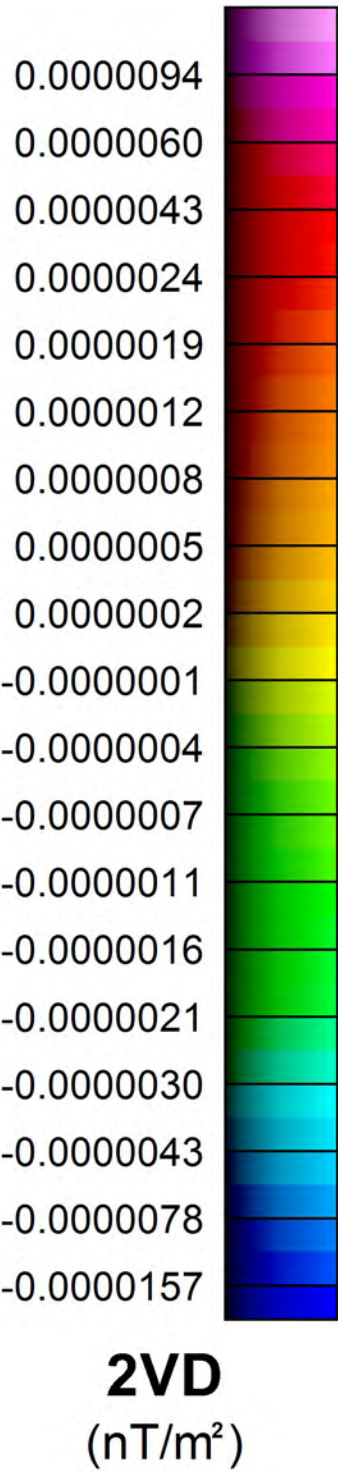
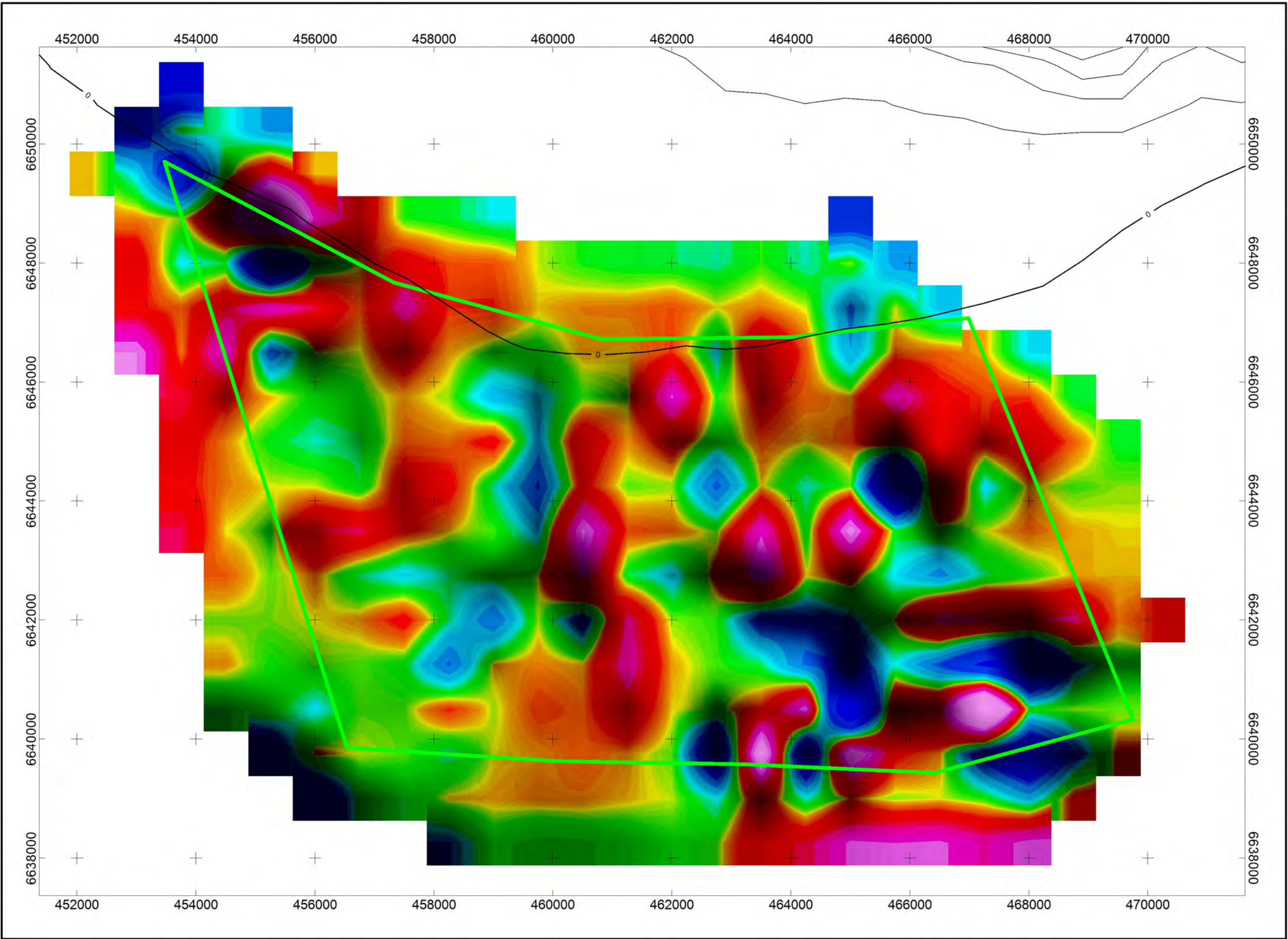
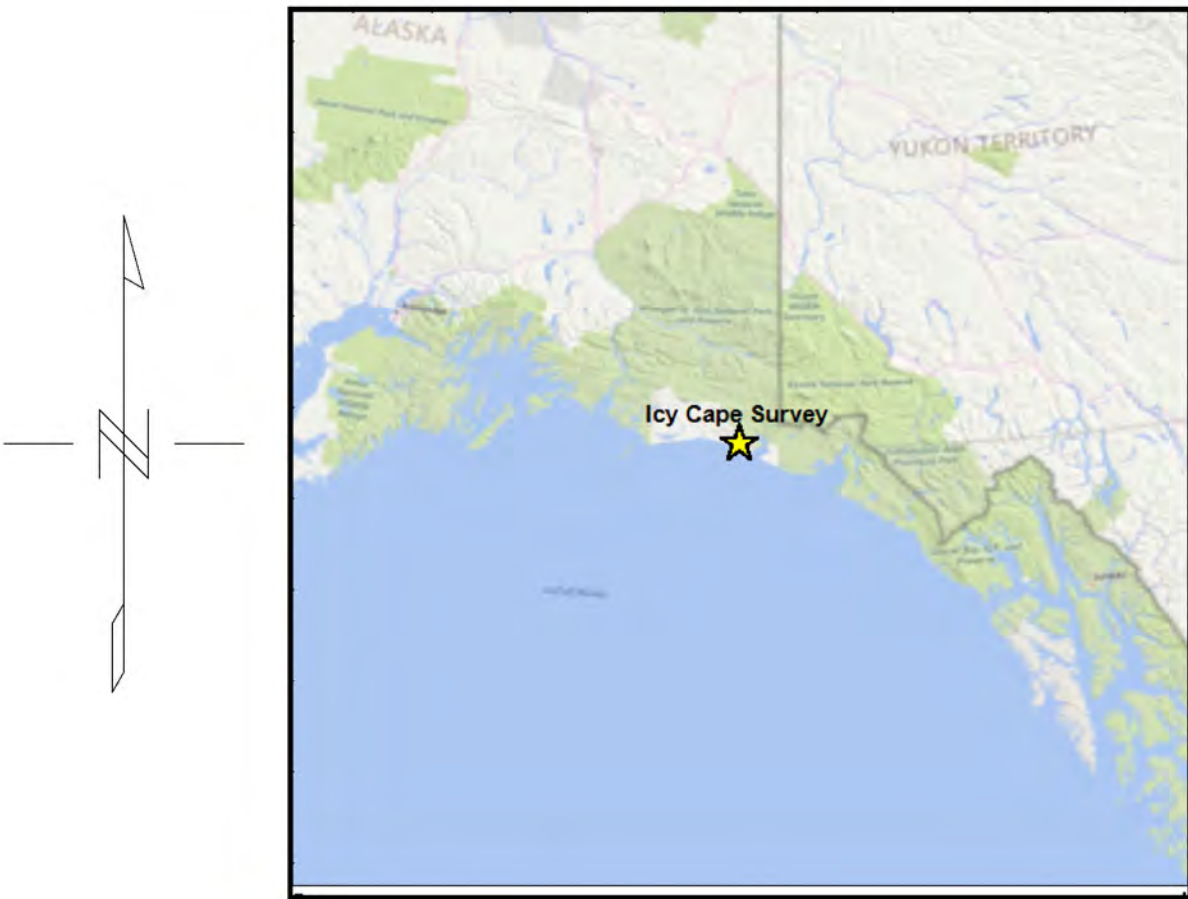
REPORT REFERENCE:
Precision GeoSurveys (2016): Airborne Magnetic Survey Report, Icy Cape Gold and Industrial Heavy Minerals Project, 2016 Survey Area.



Trust Land Office
Icy Cape Gold and Industrial
Heavy Minerals Project

Airborne Geophysics - Magnetics
Block D - First Vertical Derivative
September, 2016





MAP PROJECTION:

Projection: Universal Transverse Mercator Zone 7N
Datum: WGS 84
Local Datum Transform: WGS 84 – World

ICY CAPE 2016 SURVEY SPECIFICATIONS:

Survey Dates:	August 20, 2016 to August 22, 2016
Survey Base:	Yakutat, AK
Helicopter Type:	Bell 206L LongRanger
Registration:	C-GXHJ
Survey Technology:	Magnetic Survey
Mean Flight Height:	25 m

Block D

Survey/Tie Line Spacing:	3000 m / 3000 m
Survey/Tie Line Direction:	161°-341° / 071°-251°

AIRBORNE SURVEY SYSTEM:

Magnetometer Sensor:	Scintrex CS-3 Cesium
Configuration:	Stinger with 3 axis compensation
Sample Rate:	10 Hz
Sensitivity:	0.0006 nT VHz rms

DATA REFERENCE:

The Second Vertical Derivative (2VD) is calculated from the RMI. The 2VD is represented as a grid and its image color ramp has been histogram equalized.

TOPOGRAPHIC REFERENCE:

Shuttle Radar Topography Mission (SRTM), United States Elevation at 30 meter resolution. National Geospatial-Intelligence Agency (NGA) and the National Aeronautics and Space Administration (NASA). URL <<http://www2.jpl.nasa.gov/srtm>>[2005]

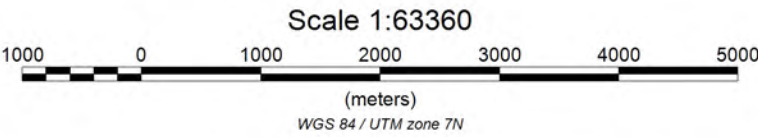
REPORT REFERENCE:

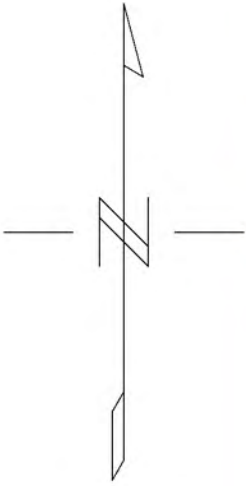
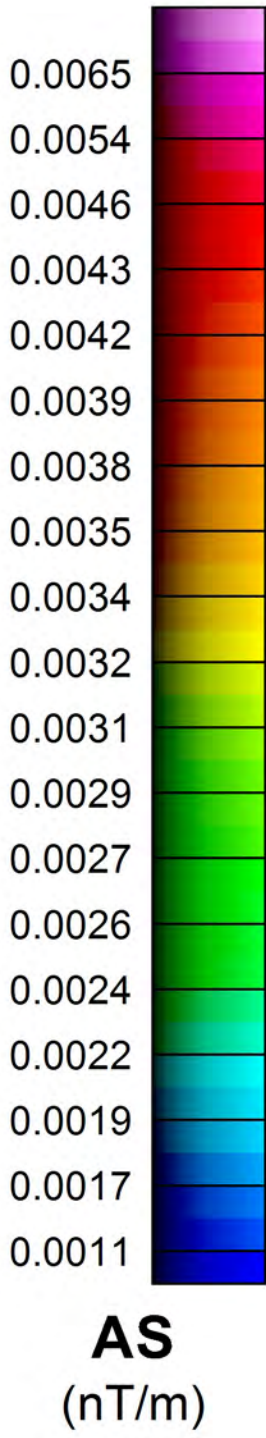
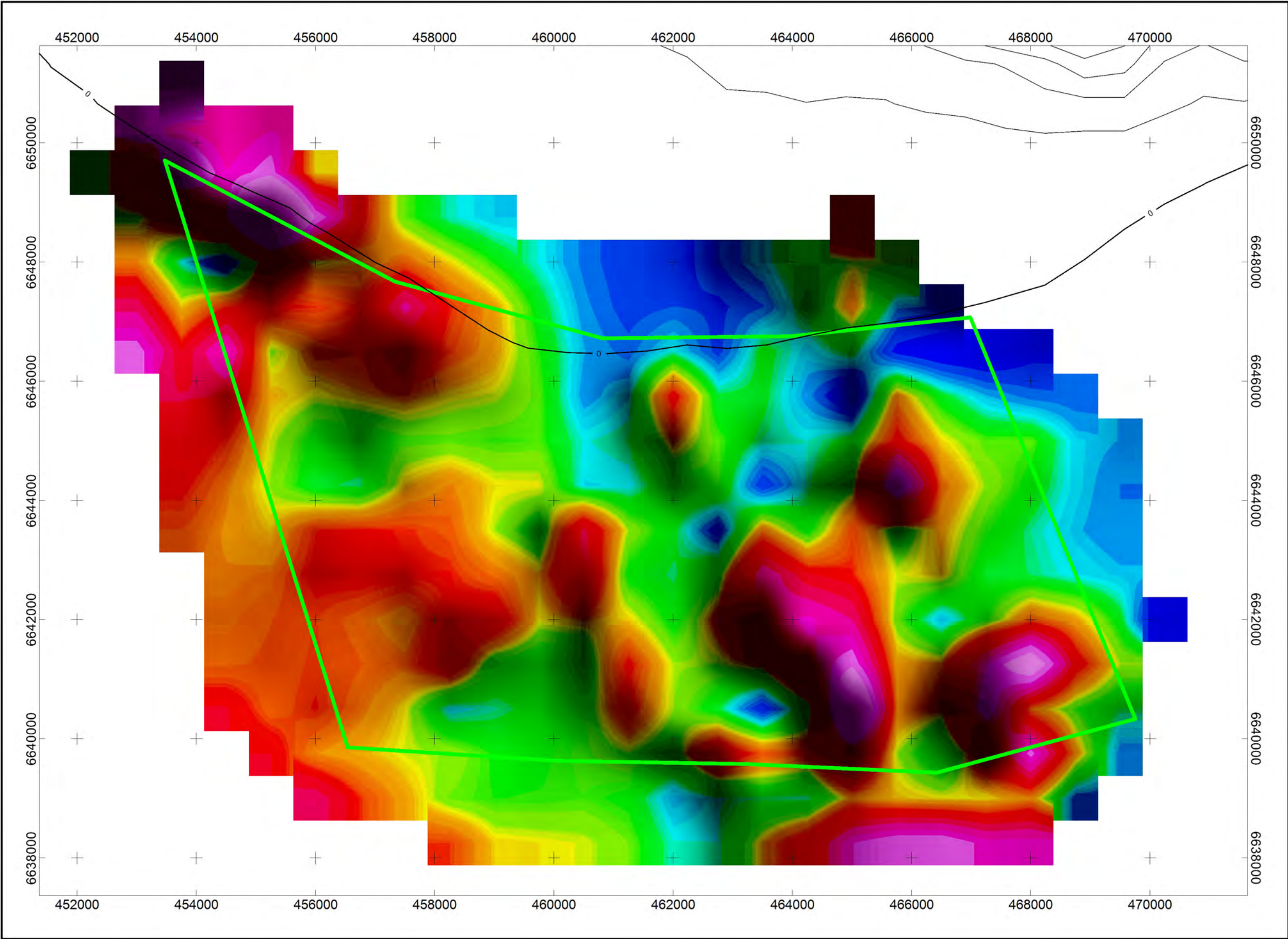
Precision GeoSurveys (2016): Airborne Magnetic Survey Report, Icy Cape Gold and Industrial Heavy Minerals Project, 2016 Survey Area.



Trust Land Office
Icy Cape Gold and Industrial
Heavy Minerals Project

Airborne Geophysics - Magnetics
Block D - Second Vertical Derivative
September, 2016





MAP PROJECTION:

Projection: Universal Transverse Mercator Zone 7N
Datum: WGS 84
Local Datum Transform: WGS 84 – World

ICY CAPE 2016 SURVEY SPECIFICATIONS:

Survey Dates:	August 20, 2016 to August 22, 2016
Survey Base:	Yakutat, AK
Helicopter Type:	Bell 206L LongRanger
Registration:	C-GXHJ
Survey Technology:	Magnetic Survey
Mean Flight Height:	25 m

Block D

Survey/Tie Line Spacing:	3000 m / 3000 m
Survey/Tie Line Direction:	161°-341° / 071°-251°

AIRBORNE SURVEY SYSTEM:

Magnetometer Sensor:	Scintrex CS-3 Cesium
Configuration:	Stinger with 3 axis compensation
Sample Rate:	10 Hz
Sensitivity:	0.0006 nT vHz rms

DATA REFERENCE:

The Analytic Signal (AS) is calculated from the RMI. The AS is represented as a grid and its image color ramp has been histogram equalized.

TOPOGRAPHIC REFERENCE:

Shuttle Radar Topography Mission (SRTM), United States Elevation at 30 meter resolution. National Geospatial-Intelligence Agency (NGA) and the National Aeronautics and Space Administration (NASA). URL <<http://www2.jpl.nasa.gov/srtm>>[2005]

REPORT REFERENCE:

Precision GeoSurveys (2016): Airborne Magnetic Survey Report, Icy Cape Gold and Industrial Heavy Minerals Project, 2016 Survey Area.



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Icy Cape Gold and Industrial
Heavy Minerals Project

Airborne Geophysics - Magnetics

Block D - Analytic Signal

September, 2016

