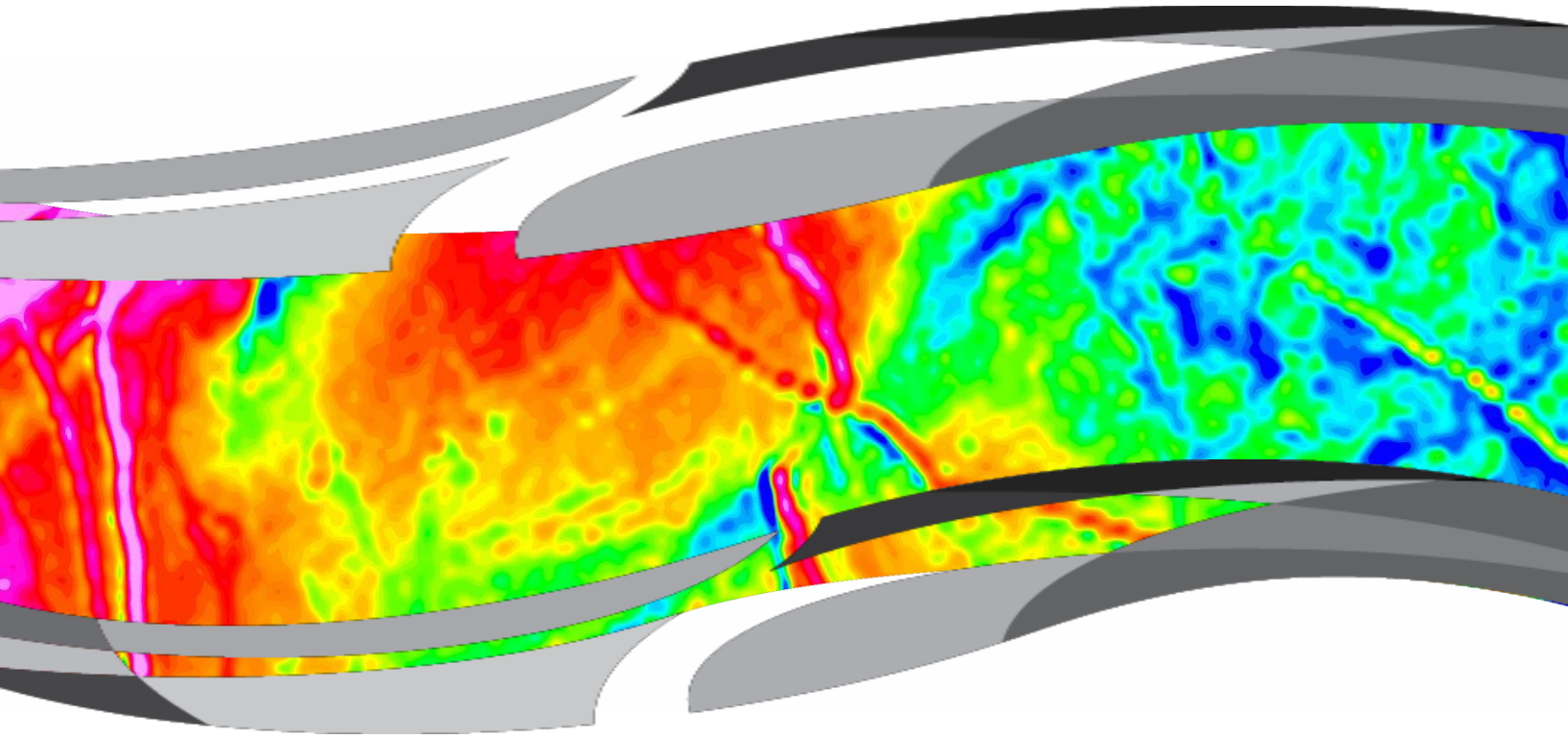
NWT Open Report 2015-15
Enhancements of airborne geophysical data from assessment reports 084555 and 084576, BIO and TG claims, Yamba and Point lakes area, NWT

A.M. Mirza



Recommended Citation: Mirza, A.M., 2015. Enhancements of airborne geophysical data from assessment reports 084555 and 084576, BIO and TG claims, Yamba and Point lakes area, NWT; Northwest Territories Geological Survey, NWT Open Report 2015-015. Digital data.

NORTHWEST TERRITORIES
GEOLOGICAL SURVEY

Government of
Northwest Territories

NWT Open Report 2015-015

Enhancements of airborne geophysical data from assessment reports 084555 and 084576, BIO and TG claims, Yamba and Point lakes area, NWT

Asif Mirza

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Recommended Citation: Mirza, A.M., 2015. Enhancements of airborne geophysical data from assessment reports 084555 and 084576, BIO and TG claims, Yamba and Point lakes area, NWT; Northwest Territories Geological Survey, NWT Open Report 2015-015. Digital data.

INTRODUCTION

This publication provides individual enhancements of the airborne geophysical data submitted as part of assessment report 084555, & assessment report 084576, as well as merged data of both assessment reports and **is intended to be used in conjunction with those assessment reports.**

Assessment reports are submitted to the Government of the Northwest Territories by members of the mineral exploration industry pursuant to the NWT Mining Regulations (and prior to April 2014, to the federal government pursuant to the Canada Mining Regulations). These reports contain the results of exploration work as well as interpretations of those results. Released to the public after a period of confidentiality, they can be downloaded from the Northwest Territories Geological Survey (NTGS) website (www.nwtgeoscience.ca).

Older assessment reports were submitted as paper reports and maps (which are available online as scanned copies). However, starting in the 1980's, geophysical and geochemical surveys began to appear with assessment report submissions as manipulable digital data. These digital data are available online in their originally submitted form. In addition, NTGS is using those data to create useful products that were not provided in the original assessment report (for example, grids of calculated parameters like analytic signal; databases in GDB format if the originals were in ASCII format; merges of adjacent surveys from different assessment reports), and correcting any errors that are found.

These enhancements are being published as NWT Open Reports like this one. Some of these publications, such as this one, contain the enhancements from a number of spatially related assessment reports.

FOLDER: 084555_VALUE_ADDED
Enhancements of airborne geophysical data from assessment report 084555, BIO claims, Yamba and Point lakes area, NWT

SURVEY INFORMATION*

Name of Survey	BIO Claims
Contractor	Fugro Airborne Surveys
NTS Sheets	76D/13, 76E/04 & 05, 86A/16, 86H/01 & 08
Line km reported	21,688 km
Dates flown	Nov 2001
Aircraft wing type	Rotary
Nominal bird terrain clearance	25 m
Nominal sample interval	0.1s
Nominal traverse-line spacing	100 m
Traverse-line direction	90-270 degrees
Datum	NAD83
Projection	UTM ZONE 12N

*Information from assessment report 084555, Bio_Claims.pdf, Appendices.pdf

Figure 1 shows the location of the BIO claims survey.

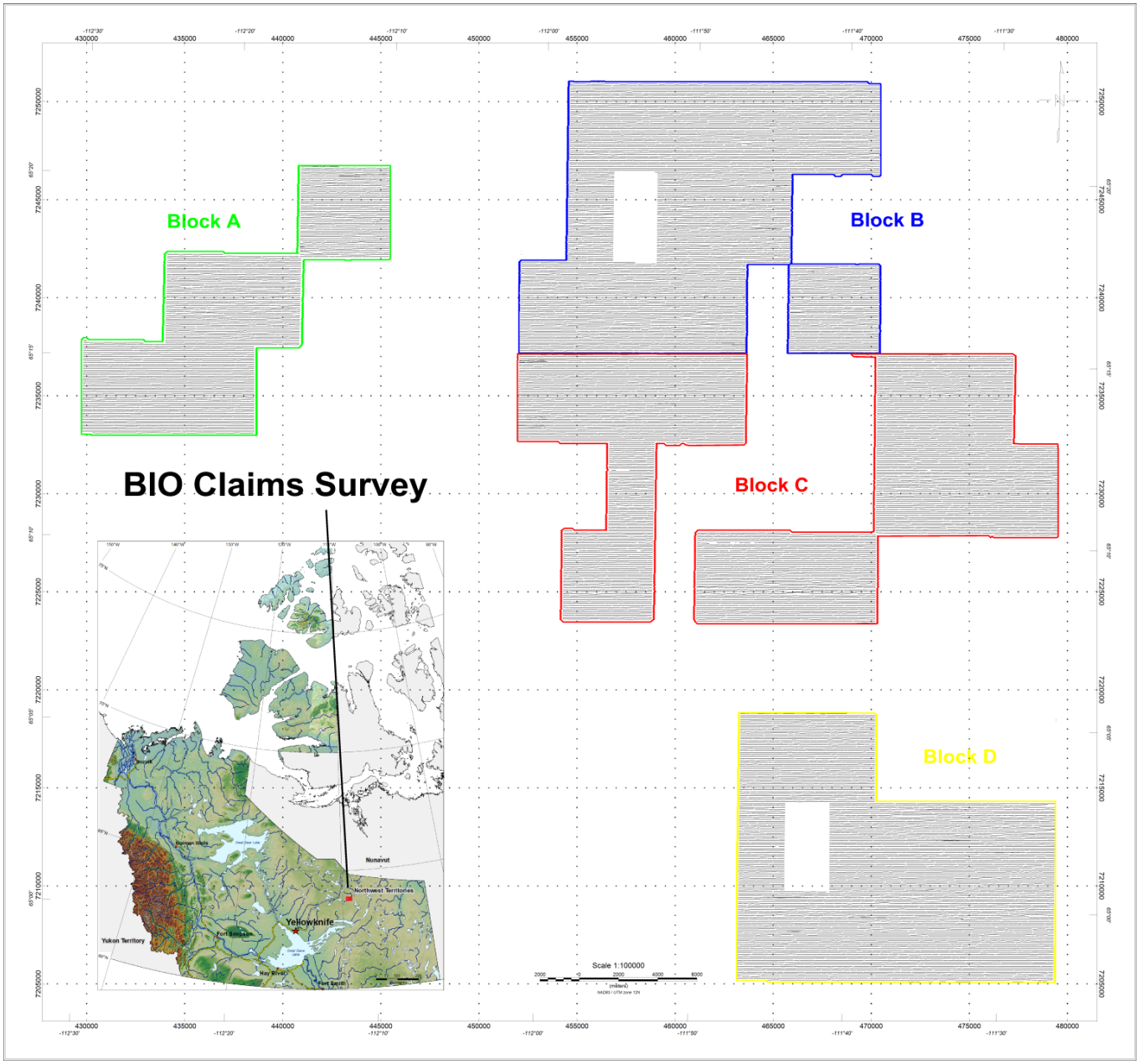

Figure 1. Location Map of BIO survey.

DESCRIPTION OF ENHANCEMENTS OF REPORT 084555

Original data submitted with the assessment report that have been used to generate this publication consist of one file of line data in geosoft XYZ format and one ASCII text-format

readme file containing header and other information. The provided XYZ file contains data for four survey blocks.

The enhancements by NTGS provided herein consist of, for each block, a database derived from the XYZ file, grids of measured and calculated parameters, georeferenced images of the grids, and a boundary polygon file; as well as the same products for the four blocks combined. The enhancements consist of:

GDB\
Database in geosoft binary format

084555_BIO_AEM_BHP.gdb	-combined geosoft database of digital elevation model, magnetic and electromagnetic data
084555_BIO_AEM_BHP_BlockA.gdb	-geosoft database of digital elevation model, magnetic and electromagnetic data (Block A)
084555_BIO_AEM_BHP_BlockB.gdb	-geosoft database of digital elevation model, magnetic and electromagnetic data (Block B)
084555_BIO_AEM_BHP_BlockC.gdb	-geosoft database of digital elevation model, magnetic and electromagnetic data (Block C)
084555_BIO_AEM_BHP_BlockD.gdb	-geosoft database of digital elevation model, magnetic and electromagnetic data (Block D)

GRIDS\
Grid in geosoft binary (2-byte) format

084555_BIO_DEM.GRD	- Digital Elevation Model
084555_BIO_Mag.GRD	- Calculated Total Magnetic Field grid
084555_BIO_1VD.GRD	- Calculated First Vertical Derivative from Total Magnetic Field grid
084555_BIO_2VD.GRD	- Calculated Second Vertical Derivative from Total Magnetic Field grid
084555_BIO_AS.GRD	- Calculated Analytic Signal from Total Magnetic Field grid
084555_BIO_Susc.GRD	-Calculated Apparent Susceptibility from Total Magnetic Field grid
084555_BIO_Res25KHz.GRD	-Calculated Resistivity (in ohm-metres) for 25,000 Hz coplanar coils
084555_BIO_DEM_BlockA.GRD	-Digital Elevation Model
084555_BIO_Mag_BlockA.GRD	-Calculated Total Magnetic Field grid
084555_BIO_1VD_BlockA.GRD	-Calculated First Vertical Derivative from Total Magnetic Field grid
084555_BIO_2VD_BlockA.GRD	-Calculated Second Vertical Derivative from Total Magnetic Field grid
084555_BIO_AS_BlockA.GRD	-Calculated Analytic Signal from Total Magnetic Field grid
084555_BIO_Susc_BlockA.GRD	-Calculated Apparent Susceptibility from Total Magnetic Field grid

084555_BIO_Res25KHz_BlockA.GRD	-Calculated Resistivity (in ohm-metres) for 25,000 Hz coplanar coils
084555_BIO_DEM_BlockB.GRD	-Digital Elevation Model
084555_BIO_Mag_BlockB.GRD	-Calculated Total Magnetic Field grid
084555_BIO_1VD_BlockB.GRD	-Calculated First Vertical Derivative from Total Magnetic Field grid
084555_BIO_2VD_BlockB.GRD	-Calculated Second Vertical Derivative from Total Magnetic Field grid
084555_BIO_AS_BlockB.GRD	-Calculated Analytic Signal from Total Magnetic Field grid
084555_BIO_Susc_BlockB.GRD	-Calculated Apparent Susceptibility from Total Magnetic Field grid
084555_BIO_Res25KHz_BlockB.GRD	-Calculated Resistivity (in ohm-metres) for 25,000 Hz coplanar coils
084555_BIO_DEM_BlockC.GRD	-Digital Elevation Model
084555_BIO_Mag_BlockC.GRD	-Calculated Total Magnetic Field grid
084555_BIO_1VD_BlockC.GRD	-Calculated First Vertical Derivative from Total Magnetic Field grid
084555_BIO_2VD_BlockC.GRD	-Calculated Second Vertical Derivative from Total Magnetic Field grid
084555_BIO_AS_BlockC.GRD	-Calculated Analytic Signal from Total Magnetic Field grid
084555_BIO_Susc_BlockC.GRD	-Calculated Apparent Susceptibility from Total Magnetic Field grid
084555_BIO_Res25KHz_BlockC.GRD	-Calculated Resistivity (in ohm-metres) for 25,000 Hz coplanar coils
084555_BIO_DEM_BlockD.GRD	-Digital Elevation Model
084555_BIO_Mag_BlockD.GRD	-Calculated Total Magnetic Field grid
084555_BIO_1VD_BlockD.GRD	-Calculated First Vertical Derivative from Total Magnetic Field grid
084555_BIO_2VD_BlockD.GRD	-Calculated Second Vertical Derivative from Total Magnetic Field grid
084555_BIO_AS_BlockD.GRD	-Calculated Analytic Signal from Total Magnetic Field grid
084555_BIO_Susc_BlockD.GRD	-Calculated Apparent Susceptibility from Total Magnetic Field grid
084555_BIO_Res25KHz_BlockD.GRD	-Calculated Resistivity (in ohm-metres) for 25,000 Hz coplanar coils

Additional files with filename extensions of *.gi contain projection information for each grid.

TIFF\
Georeferenced image in Tagged Image File Format

084555_BIO_DEM.tif	-Digital Elevation Model
084555_BIO_Mag.tif	- Calculated Total Magnetic Field

084555_BIO_1VD.tif	-Calculated First Vertical Derivative from Total Magnetic Field
084555_BIO_2VD.tif	-Calculated Second Vertical Derivative from Total Magnetic Field
084555_BIO_AS.tif	-Calculated Analytic Signal from Total Magnetic Field
084555_BIO_Susc.tif	-Calculated Apparent Susceptibility from Total Magnetic Field
084555_BIO_Res25KHz.tif	-Calculated Resistivity (in ohm-metres) for 25,000 Hz coplanar coils
084555_BIO_DEM_BlockA.tif	-Digital Elevation Model
084555_BIO_Mag_BlockA.tif	-Total Magnetic Field
084555_BIO_1VD_BlockA.tif	-Calculated First Vertical Derivative from Total Magnetic Field
084555_BIO_2VD_BlockA.tif	-Calculated Second Vertical Derivative from Total Magnetic Field
084555_BIO_AS_BlockA.tif	-Calculated Analytic Signal from Total Magnetic Field
084555_BIO_Susc_BlockA.tif	-Calculated Apparent Susceptibility from Total Magnetic Field
084555_BIO_Res25KHz_BlockA.tif	-Calculated Resistivity (in ohm-metres) for 25,000 Hz coplanar coils
084555_BIO_DEM_BlockB.tif	-Digital Elevation Model
084555_BIO_Mag_BlockB.tif	-Total Magnetic Field
084555_BIO_1VD_BlockB.tif	-Calculated First Vertical Derivative from Total Magnetic Field
084555_BIO_2VD_BlockB.tif	-Calculated Second Vertical Derivative from Total Magnetic Field
084555_BIO_AS_BlockB.tif	-Calculated Analytic Signal from Total Magnetic Field
084555_BIO_Susc_BlockB.tif	-Calculated Apparent Susceptibility from Total Magnetic Field
084555_BIO_Res25KHz_BlockB.tif	-Calculated Resistivity (in ohm-metres) for 25,000 Hz coplanar coils
084555_BIO_DEM_BlockC.tif	-Digital Elevation Model
084555_BIO_Mag_BlockC.tif	-Total Magnetic Field
084555_BIO_1VD_BlockC.tif	-Calculated First Vertical Derivative from Total Magnetic Field
084555_BIO_2VD_BlockC.tif	-Calculated Second Vertical Derivative from Total Magnetic Field
084555_BIO_AS_BlockC.tif	-Calculated Analytic Signal from Total Magnetic Field
084555_BIO_Susc_BlockC.tif	-Calculated Apparent Susceptibility from Total Magnetic Field
084555_BIO_Res25KHz_BlockC.tif	-Calculated Resistivity (in ohm-metres) for 25,000 Hz coplanar coils
084555_BIO_DEM_BlockD.tif	-Digital Elevation Model
084555_BIO_Mag_BlockD.tif	-Total Magnetic Field
084555_BIO_1VD_BlockD.tif	-Calculated First Vertical Derivative from Total Magnetic Field

084555_BIO_2VD_BlockD.tif	-Calculated Second Vertical Derivative from Total Magnetic Field
084555_BIO_AS_BlockD.tif	-Calculated Analytic Signal from Total Magnetic Field
084555_BIO_Susc_BlockD.tif	-Calculated Apparent Susceptibility from Total Magnetic Field
084555_BIO_Res25KHz_BlockD.tif	-Calculated Resistivity (in ohm-metres) for 25,000 Hz coplanar coils

Additional files with filename extensions of *.gi contain projection information for each TIFF image.

SHP\
Shapefile (a set of four binary files with extensions .shp, .dbf, .prj, and .shx, collectively called a shapefile, that contain spatial and attribute information for points, lines, or polygons; for use in ESRI ArcMap software)

084555_BIO_AG_AGMag_AGFEM_pg.shp	-Boundary of the four combined blocks
084555_BIO_Mag_BlockA_pg.shp	-Boundary of the survey area (Block A)
084555_BIO_Mag_BlockB_pg.shp	-Boundary of the survey area (Block B)
084555_BIO_Mag_BlockC_pg.shp	-Boundary of the survey area (Block C)
084555_BIO_Mag_BlockD_pg.shp	-Boundary of the survey area (Block D)

FOLDER: 084576_VALUE_ADDED
Enhancements of airborne geophysical data from assessment report 084576, TG claims, Yamba and Point lakes area, NWT

SURVEY INFORMATION*

Name of Survey	TG Claims
Contractor	Fugro Airborne Surveys
NTS Sheets	76D/13, 76E/04 & 05, 86A/16, 86H/01 & 08
Line km reported	7294.69 km
Dates flown	Nov 2001
Aircraft wing type	Rotary
Nominal bird terrain clearance	25 m
Nominal sample interval	0.1s
Nominal traverse-line spacing	100 m
Traverse-line direction	90-270 degrees
Nominal tie-line spacing	1000 m
Tie-line direction	0-180 degrees
Datum	NAD83
Projection	UTM ZONE 12N

*Information from assessment report 084576, Geochem_&_Geophys_Expln_Programs.pdf, Appx.pdf

Figure 2 shows the location of the TG Claims survey.

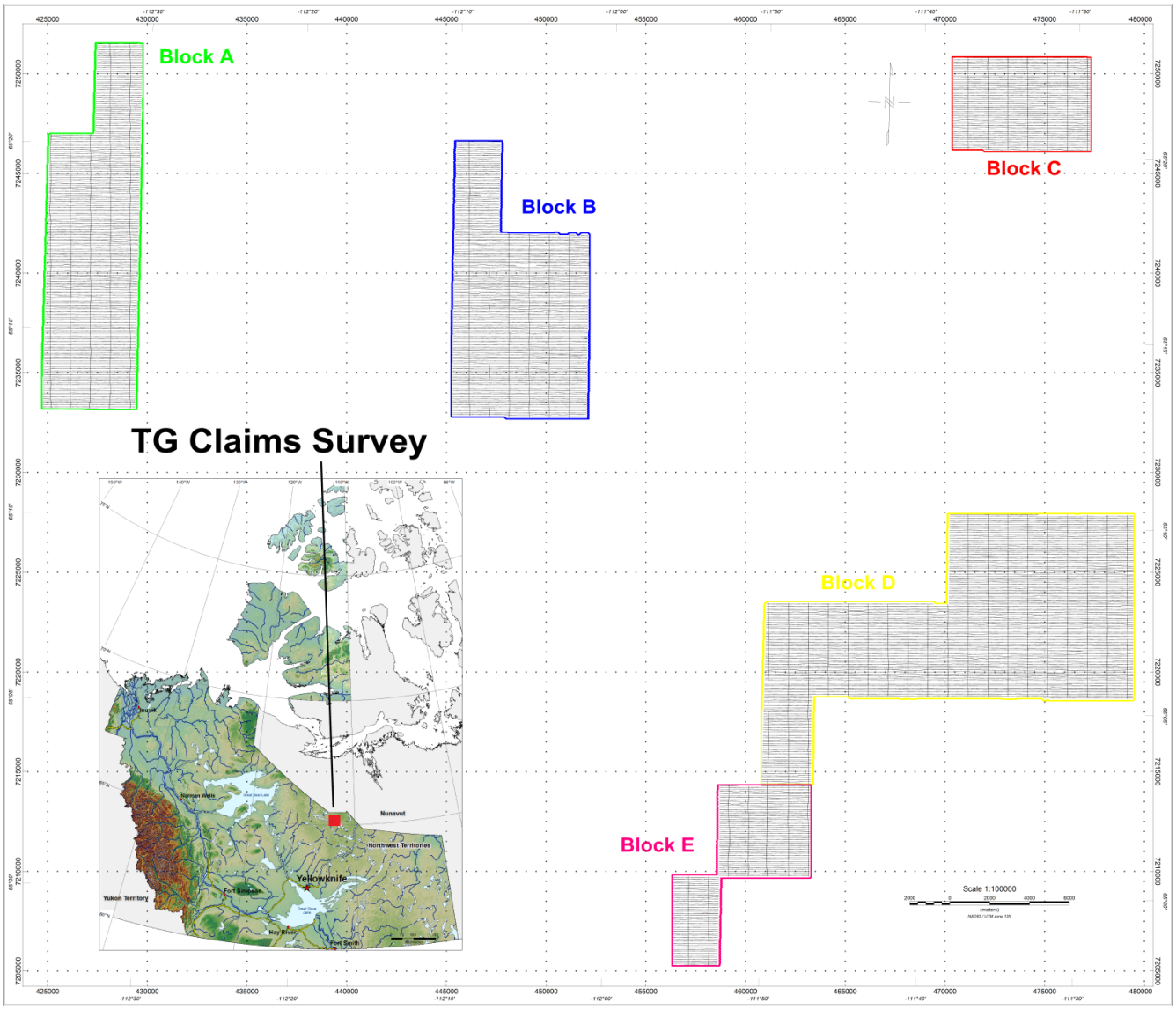

Figure 2. Location map of TG survey.

DESCRIPTION OF ENHANCEMENTS OF REPORT 084576

Original data submitted with the assessment report that have been used to generate this publication consist of one file of line data in geosoft XYZ format and one ASCII text-format readme file containing header and other information. The provided XYZ file contains data for five survey blocks.

The enhancements by NTGS provided herein consist of, for each block, a database derived from the XYZ file, grids of measured and calculated parameters, georeferenced images of the grids

and a boundary polygon file; as well as the same products for the five blocks combined. The enhancements consist of:

GDB\
Database in geosoft binary format

084576_TG_Claims.gdb	-combined geosoft database of digital elevation model, magnetic and electromagnetic data
084576_TG_Claims_BlockA.gdb	-geosoft database of digital elevation model, magnetic and electromagnetic data (Block A)
084576_TG_Claims_BlockB.gdb	-geosoft database of digital elevation model, magnetic and electromagnetic data (Block B)
084576_TG_Claims_BlockC.gdb	-geosoft database of digital elevation model, magnetic and electromagnetic data (Block C)
084576_TG_Claims_BlockD.gdb	-geosoft database of digital elevation model, magnetic and electromagnetic data (Block D)

GRIDS\
Grid in geosoft binary (2-byte) format

084576_TG_Claims_DEM.GRD	-Digital Elevation Model
084576_TG_Claims_Mag.GRD	-Calculated Total Magnetic Field grid
084576_TG_Claims_1VD.GRD	-Calculated First Vertical Derivative from Total Magnetic Field grid
084576_TG_Claims_2VD.GRD	-Calculated Second Vertical Derivative from Total Magnetic Field grid
084576_TG_Claims_AS.GRD	-Calculated Analytic Signal from Total Magnetic Field grid
084576_TG_Claims_Susc.GRD	-Calculated Apparent Susceptibility from Total Magnetic Field grid
084576_TG_Claims_Res25KHz.GRD	-Calculated Resistivity (in ohm-metres) for 25,000 Hz coplanar coils
084576_TG_Claims_DEM_BlockA.GRD	-Digital Elevation Model
084576_TG_Claims_Mag_BlockA.GRD	-Calculated Total Magnetic Field grid
084576_TG_Claims_1VD_BlockA.GRD	-Calculated First Vertical Derivative from Total Magnetic Field grid
084576_TG_Claims_2VD_BlockA.GRD	-Calculated Second Vertical Derivative from Total Magnetic Field grid
084576_TG_Claims_AS_BlockA.GRD	-Calculated Analytic Signal from Total Magnetic Field grid
084576_TG_Claims_Susc_BlockA.GRD	-Calculated Apparent Susceptibility from Total Magnetic Field grid
084576_TG_Claims_Res25KHz_BlockA.GRD	-Calculated Resistivity (in ohm-metres) for 25,000 Hz coplanar coils
084576_TG_Claims_DEM_BlockB.GRD	-Digital Elevation Model
084576_TG_Claims_Mag_BlockB.GRD	-Calculated Total Magnetic Field grid

084576_TG_Claims_1VD_BlockB.GRD	-Calculated First Vertical Derivative from Total Magnetic Field grid
084576_TG_Claims_2VD_BlockB.GRD	-Calculated Second Vertical Derivative from Total Magnetic Field grid
084576_TG_Claims_AS_BlockB.GRD	-Calculated Analytic Signal from Total Magnetic Field grid
084576_TG_Claims_Susc_BlockB.GRD	-Calculated Apparent Susceptibility from Total Magnetic Field grid
084576_TG_Claims_Res25KHz_BlockB.GRD	-Calculated Resistivity (in ohm-metres) for 25,000 Hz coplanar coils
084576_TG_Claims_DEM_BlockC.GRD	-Digital Elevation Model
084576_TG_Claims_Mag_BlockC.GRD	-Calculated Total Magnetic Field grid
084576_TG_Claims_1VD_BlockC.GRD	-Calculated First Vertical Derivative from Total Magnetic Field grid
084576_TG_Claims_2VD_BlockC.GRD	-Calculated Second Vertical Derivative from Total Magnetic Field grid
084576_TG_Claims_AS_BlockC.GRD	-Calculated Analytic Signal from Total Magnetic Field grid
084576_TG_Claims_Susc_BlockC.GRD	-Calculated Apparent Susceptibility from Total Magnetic Field grid
084576_TG_Claims_Res25KHz_BlockC.GRD	-Calculated Resistivity (in ohm-metres) for 25,000 Hz coplanar coils
084576_TG_Claims_DEM_BlockD.GRD	-Digital Elevation Model
084576_TG_Claims_Mag_BlockD.GRD	-Calculated Total Magnetic Field grid
084576_TG_Claims_1VD_BlockD.GRD	-Calculated First Vertical Derivative from Total Magnetic Field grid
084576_TG_Claims_2VD_BlockD.GRD	-Calculated Second Vertical Derivative from Total Magnetic Field grid
084576_TG_Claims_AS_BlockD.GRD	-Calculated Analytic Signal from Total Magnetic Field grid
084576_TG_Claims_Susc_BlockD.GRD	-Calculated Apparent Susceptibility from Total Magnetic Field grid
084576_TG_Claims_Res25KHz_BlockD.GRD	-Calculated Resistivity (in ohm-metres) for 25,000 Hz coplanar coils
084576_TG_Claims_DEM_BlockE.GRD	-Digital Elevation Model
084576_TG_Claims_Mag_BlockE.GRD	-Calculated Total Magnetic Field grid
084576_TG_Claims_1VD_BlockE.GRD	-Calculated First Vertical Derivative from Total Magnetic Field grid
084576_TG_Claims_2VD_BlockE.GRD	-Calculated Second Vertical Derivative from Total Magnetic Field grid
084576_TG_Claims_AS_BlockE.GRD	-Calculated Analytic Signal from Total Magnetic Field grid
084576_TG_Claims_Susc_BlockE.GRD	-Calculated Apparent Susceptibility from Total Magnetic Field grid
084576_TG_Claims_Res25KHz_BlockE.GRD	-Calculated Resistivity (in ohm-metres) for 25,000 Hz coplanar coils

Additional files with filename extensions of *.gi contain projection information for each grid.

TIFF\
Georeferenced image in Tagged Image File Format

084576_TG_Claims_DEM.tif	-Digital Elevation Model
084576_TG_Claims_Mag.tif	-Calculated Total Magnetic Field
084576_TG_Claims_1VD.tif	-Calculated First Vertical Derivative from Total Magnetic Field
084576_TG_Claims_2VD.tif	-Calculated Second Vertical Derivative from Total Magnetic Field
084576_TG_Claims_AS.tif	-Calculated Analytic Signal from Total Magnetic Field
084576_TG_Claims_Susc.tif	-Calculated Apparent Susceptibility from Total Magnetic Field
084576_TG_Claims_Res25KHz.tif	-Calculated Resistivity (in ohm-metres) for 25,000 Hz coplanar coils
084576_TG_Claims_DEM_BlockA.tif	-Digital Elevation Model
084576_TG_Claims_Mag_BlockA.tif	-Calculated Total Magnetic Field
084576_TG_Claims_1VD_BlockA.tif	-Calculated First Vertical Derivative from Total Magnetic Field
084576_TG_Claims_2VD_BlockA.tif	-Calculated Second Vertical Derivative from Total Magnetic Field
084576_TG_Claims_AS_BlockA.tif	-Calculated Analytic Signal from Total Magnetic Field
084576_TG_Claims_Susc_BlockA.tif	-Calculated Apparent Susceptibility from Total Magnetic Field
084576_TG_Claims_Res25KHz_BlockA.tif	-Calculated Resistivity (in ohm-metres) for 25,000 Hz coplanar coils
084576_TG_Claims_DEM_BlockB.tif	-Digital Elevation Model
084576_TG_Claims_Mag_BlockB.tif	-Calculated Total Magnetic Field
084576_TG_Claims_1VD_BlockB.tif	-Calculated First Vertical Derivative from Total Magnetic Field
084576_TG_Claims_2VD_BlockB.tif	-Calculated Second Vertical Derivative from Total Magnetic Field
084576_TG_Claims_AS_BlockB.tif	-Calculated Analytic Signal from Total Magnetic Field
084576_TG_Claims_Susc_BlockB.tif	-Calculated Apparent Susceptibility from Total Magnetic Field
084576_TG_Claims_Res25KHz_BlockB.tif	-Calculated Resistivity (in ohm-metres) for 25,000 Hz coplanar coils
084576_TG_Claims_DEM_BlockC.tif	-Digital Elevation Model
084576_TG_Claims_Mag_BlockC.tif	-Calculated Total Magnetic Field
084576_TG_Claims_1VD_BlockC.tif	-Calculated First Vertical Derivative from Total Magnetic Field
084576_TG_Claims_2VD_BlockC.tif	-Calculated Second Vertical Derivative from Total Magnetic Field
084576_TG_Claims_AS_BlockC.tif	-Calculated Analytic Signal from Total Magnetic Field

084576_TG_Claims_Susc_BlockC.tif	-Calculated Apparent Susceptibility from Total Magnetic Field
084576_TG_Claims_Res25KHz_BlockC.tif	-Calculated Resistivity (in ohm-metres) for 25,000 Hz coplanar coils
084576_TG_Claims_DEM_BlockD.tif	-Digital Elevation Model
084576_TG_Claims_Mag_BlockD.tif	-Calculated Total Magnetic Field
084576_TG_Claims_1VD_BlockD.tif	-Calculated First Vertical Derivative from Total Magnetic Field
084576_TG_Claims_2VD_BlockD.tif	-Calculated Second Vertical Derivative from Total Magnetic Field
084576_TG_Claims_AS_BlockD.tif	-Calculated Analytic Signal from Total Magnetic Field
084576_TG_Claims_Susc_BlockD.tif	-Calculated Apparent Susceptibility from Total Magnetic Field
084576_TG_Claims_Res25KHz_BlockD.tif	-Calculated Resistivity (in ohm-metres) for 25,000 Hz coplanar coils
084576_TG_Claims_DEM_BlockE.tif	-Digital Elevation Model
084576_TG_Claims_Mag_BlockE.tif	-Total Magnetic Field
084576_TG_Claims_1VD_BlockE.tif	-Calculated First Vertical Derivative from Total Magnetic Field
084576_TG_Claims_2VD_BlockE.tif	-Calculated Second Vertical Derivative from Total Magnetic Field
084576_TG_Claims_AS_BlockE.tif	-Calculated Analytic Signal from Total Magnetic Field
084576_TG_Claims_Susc_BlockE.tif	-Calculated Apparent Susceptibility from Total Magnetic Field
084576_TG_Claims_Res25KHz_BlockE.tif	-Calculated Resistivity (in ohm-metres) for 25,000 Hz coplanar coils

Additional files with filename extensions of *.gi contain projection information for each TIFF image.

SHP\
Shapefile (a set of four binary files with extensions .shp, .dbf, .prj, and .shx, collectively called a shapefile, that contain spatial and attribute information for points, lines, or polygons; for use in ESRI ArcMap software)

084576_TG_Claims_pg.shp	-Boundary of the four combined blocks
084576_TG_Claims_BlockA_pg.shp	-Boundary of the survey area (Block A)
084576_TG_Claims_BlockB_pg.shp	-Boundary of the survey area (Block B)
084576_TG_Claims_BlockC_pg.shp	-Boundary of the survey area (Block C)
084576_TG_Claims_BlockD_pg.shp	-Boundary of the survey area (Block D)
084576_TG_Claims_BlockE_pg.shp	-Boundary of the survey area (Block E)

FOLDER: MERGED_084555_084576

Merged Enhancements of airborne geophysical data from assessment reports 084555 and 084576, BIO and TG claims, Yamba and Point lakes area, NWT

SURVEY INFORMATION*

Name of Survey	BIO & TD Claims
Contractor	Fugro Airborne Surveys
NTS Sheets	76D/13, 76E/03, 04, 05 & 06, 86A/16, 86H/01, 02, 07 & 08
Dates flown	Nov 2001
Aircraft wing type	Rotary
Nominal bird terrain clearance	25 m
Nominal sample interval	0.1s
Nominal traverse-line spacing	100 m
Traverse-line direction	90-270 degrees
Nominal tie-line spacing	1000 m
Tie-line direction	0-180 degrees
Datum	NAD83
Projection	UTM ZONE 12N

*Information from assessment reports 084555, Bio_Claims.pdf, Appendices.pdf and 084576, Geochem_&_Geophys_Expln_Programs.pdf, Appx.pdf

Figure 3 shows the location of the merged BIO and TG surveys.

DESCRIPTION OF ENHANCEMENTS

Original submitted data that have been used to generate this publication are from two assessment reports 084555 & 084576 and consist of two files of line data in geosoft XYZ format and two ASCII text-format readme files containing header and other information. The provided XYZ file for report 084555 contains data for four survey blocks, and that for 084576 contains data for five blocks.

The enhancements by NTGS provided herein consist of a single database containing combined data for all blocks from both assessment reports, single grids of measured and calculated parameters for the full area of nine combined blocks, georeferenced images of the grids, and a boundary polygon file of all blocks, as follows:

GDB\
Database in geosoft binary format

084555_084576_BIO_TG_Claims.gdb	-Combined geosoft database of digital elevation model, magnetic and electromagnetic data

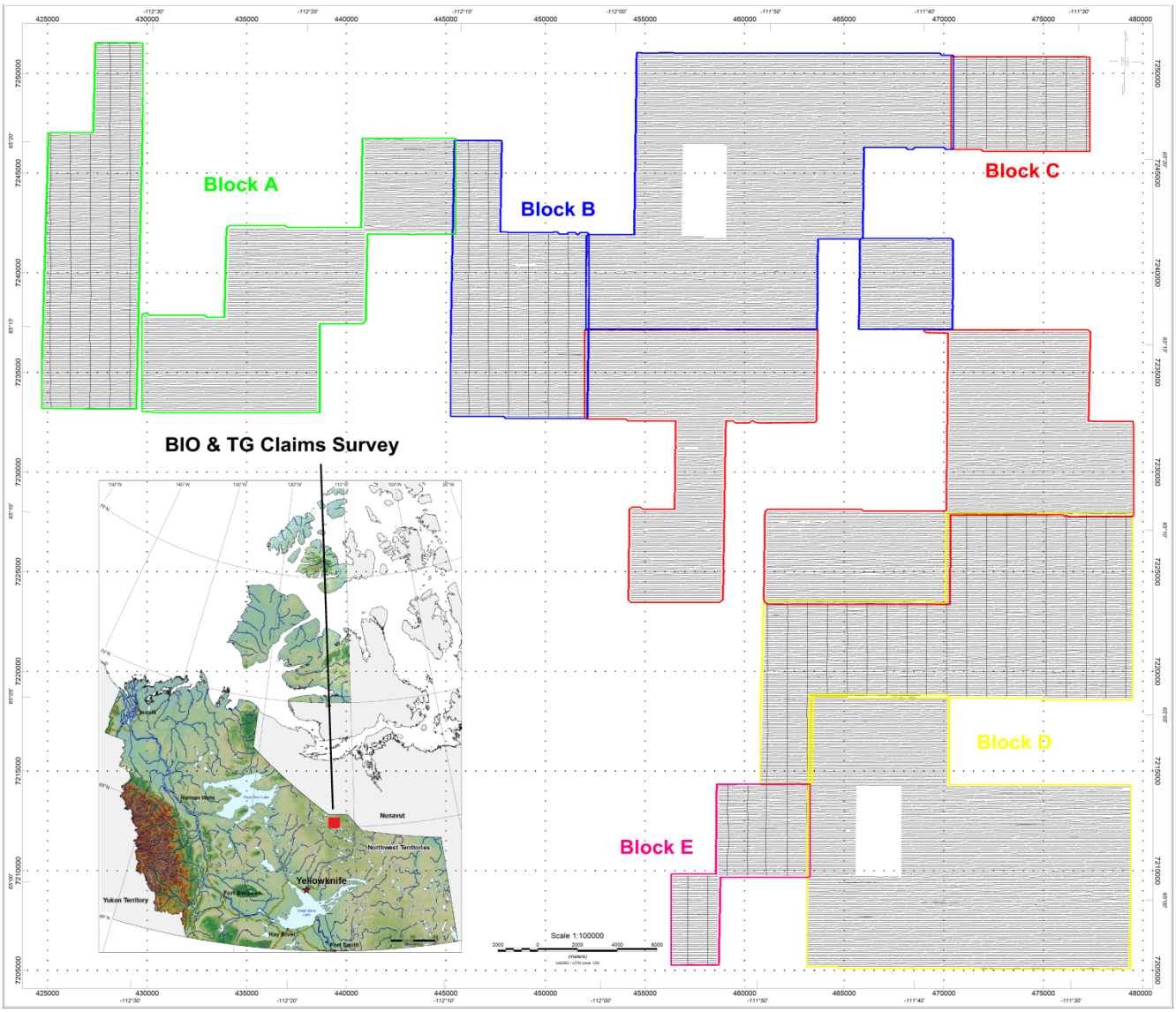

Figure 3. Location map of merged BIO and TG surveys.

GRIDS\
Grid in geosoft binary (2-byte) format

084555_084576_BIO_TG_Claims_DEM.GRD	- Combined Digital Elevation Model
084555_084576_BIO_TG_Claims_Mag.GRD	- Combined Total Magnetic Field
084555_084576_BIO_TG_Claims_1VD.GRD	- Combined Calculated First Vertical Derivative from Total Magnetic Field
084555_084576_BIO_TG_Claims_2VD.GRD	- Combined Calculated Second Vertical Derivative from Total Magnetic Field
084555_084576_BIO_TG_Claims_AS.GRD	- Combined Calculated Analytic Signal from Total Magnetic Field
084555_084576_BIO_TG_Claims_Susc.GRD	- Combined Calculated Apparent Susceptibility from Total Magnetic Field

084555_084576_BIO_TG_Claims_Res25KHz.GRD	- Combined Calculated Resistivity (in ohm-metres) for 25,000 Hz coplanar coils

Additional files with filename extensions of *.gi contain projection information for each grid.

TIFF\
Georeferenced image in Tagged Image File Format

084555_084576_BIO_TG_Claims_DEM.tif	- Combined Digital Elevation Model
084555_084576_BIO_TG_Claims_Mag.tif	- Combined Total Magnetic Field
084555_084576_BIO_TG_Claims_1VD.tif	- Combined Calculated First Vertical Derivative from Total Magnetic Field
084555_084576_BIO_TG_Claims_2VD.tif	- Combined Calculated Second Vertical Derivative from Total Magnetic Field
084555_084576_BIO_TG_Claims_AS.tif	- Combined Calculated Analytic Signal from Total Magnetic Field
084555_084576_BIO_TG_Claims_Susc.tif	- Combined Calculated Apparent Susceptibility from Total Magnetic Field
084555_084576_BIO_TG_Claims_Res25KHz.tif	- Combined Calculated Resistivity (in ohm-metres) for 25,000 Hz coplanar coils

Additional files with filename extensions of *.gi contain projection information for each TIFF image.

SHP\
Shapefile (a set of four binary files with extensions .shp, .dbf, .prj, and .shx, collectively called a shapefile, that contain spatial and attribute information for points, lines, or polygons; for use in ESRI ArcMap software)

084555_084576_BIO_TG_Claims_pg.shp	-Boundary of the combined blocks

CREATION OF GRIDS

Total Magnetic Field and Resistivity

These grids were generated by using Geosoft's (styling itself as geosoft) Rangrid minimum-curvature algorithm with 25 m grid cell size.

Analytic Signal

The total magnetic field grid was used to calculate the analytic signal grid using a fast Fourier transform method.

The analytic signal does not depend on the direction of magnetization or the direction of the Earth's magnetic field. As a result, bodies of the same geometry will have the same analytic

signal shape, even where their total-field shapes would differ. The analytic signal is also useful in locating the edges of magnetic source bodies, particularly where remanence and/or low magnetic latitude complicates interpretation. The analytic signal is the square root of the sum of the squares of the derivatives in the x, y, and z directions of the total magnetic field.

First Vertical Derivative

The total magnetic field grid was used to calculate the first vertical derivative grid by applying the following filters:

1. Derivative
    a. Direction = Z
    b. Order of differentiation = 1
2. Butterworth:
    a. Cutoff wavelength = 200
    b. Filter order = 8

The vertical derivative indicates the rate of change of the magnetic field with height. The first vertical derivative (1VD) has the effect of sharpening anomalies, allowing improved spatial location of source axes and contacts. It also provides better definition and resolution of near-surface magnetic units as well as defines weak features that may not be evident in the total magnetic field.

Second Vertical Derivative

The total magnetic field grid was used to calculate the second vertical derivative grid by applying the following filters:

1. Derivative
    a. Direction = Z
    b. Order of differentiation = 2
2. Butterworth:
    a. Cutoff wavelength = 200
    b. Filter order = 8

The second vertical derivative is the rate of change of the 1VD with height. It is used to enhance local anomalies and help outline the edges of anomalous bodies. A second vertical derivative map is a powerful interpretive tool that can be used to assist in the delineation of causative bodies and accurately locate changes in the magnetic field gradients. Better definition of discontinuities and their relation to geology can be gained from the use of this tool. A second vertical derivative map will show steep gradients over faults and positive closures over up-thrown blocks.

Apparent Magnetic Susceptibility

The total magnetic field grid was used to calculate the apparent susceptibility grid by applying the following filters:

1. Apparent Susceptibility

    a. Field strength = 59696 nT
    b. Inclination = 83.6^{o}
    c. Declination = 23.6^{o}
    d. Depth of source = 25m
2. Butterworth:
    a. Cutoff wavelength = 200
    b. Filter order = 8

The magnetic susceptibility is a dimensionless number that represents the degree to which a body can be magnetized in response to the presence of a magnetic field. (It is the ratio of magnetization within the material to the strength of the applied magnetic field.) It is the fundamental parameter in magnetic prospecting, since the magnetic response of the rocks is a combination of the strength of the earth's field at a given point and the amount and type of magnetic material in them.

In the absence of being able to directly measure magnetic susceptibility, apparent susceptibility values can be calculated by making certain assumptions. Typically, the geometry of the source is represented by a collection of vertical, square-ended prisms of infinite depth extent, the horizontal dimensions of which are taken to be equal to the cell size of the input grid. To calculate susceptibility, a compound filter is applied that performs: a reduction to the pole (see below), downward continuation to the chosen source depth, correction for the geometric effect of the prisms, and division by the total magnetic field. The first three operations estimate the magnetization of the rocks, and the last generates the susceptibility ratio. The resulting apparent susceptibility data is in SI units.

Reduction to the pole attempts to eliminate the effect of the direction of the Earth's magnetic field, which points more downward near the poles and closer to horizontal near the equator. The reduction to the pole operation recalculates total magnetic intensity data as if the inducing magnetic field was vertical, transforming some types of asymmetrical magnetic anomalies to symmetrical ones centered over their causative bodies. Reduction to the pole makes the simplifying assumption that the rocks in the survey area are all magnetized parallel to the earth's magnetic field, and performs best at middle to high latitudes.

Downward continuation is a method of estimating the magnetic field at a datum lower than that at which it was measured. A number of calculation methods are available, but all require the assumption that the field is continuous, which can be misleading if there are anomalies between the measured surface and the new datum. The method increases the horizontal resolution of anomalies but noise can be exaggerated.

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