

GEOLOGICAL SURVEY BRANCH
ASSESSMENT REPORT

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Questor Surveys Limited

INTERPRETATION
and
TECHNICAL REPORT

for

CONSOLIDATED LOGAN MINES LTD.

PROJECT #Q7617

HIGH RESOLUTION
HELICOPTER MAGNETIC SURVEY
August, 1996

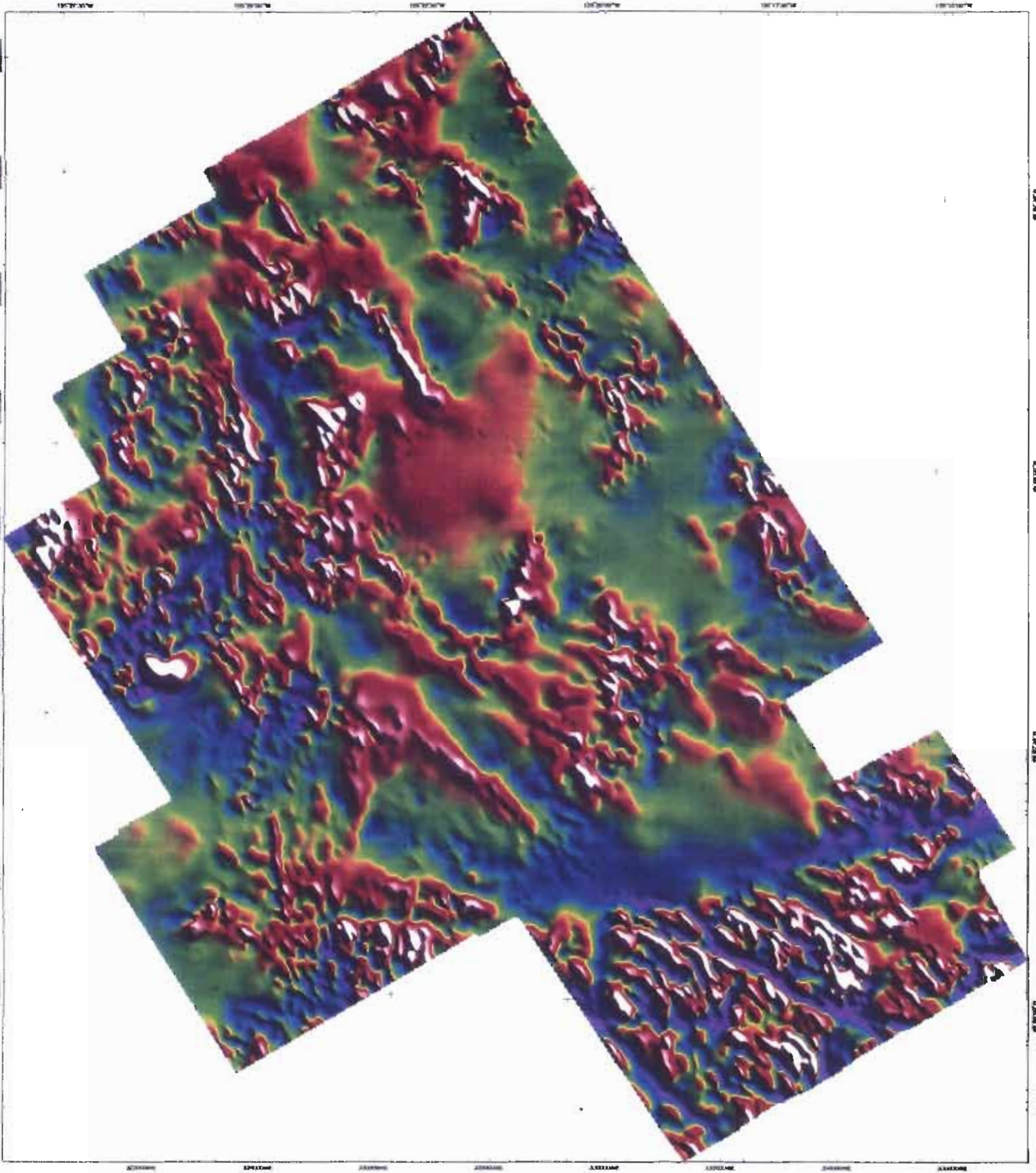
over the

LUCKY PROJECT
British Columbia
(Alberni Mining Division)
NTS 92F/3

FILMED

Ron Sheldrake, Geophysicist
Questor Surveys Limited

October 1996



DATA PROCESSING

Grid Cell Size: 30 metres
 Regional Field: IGRF Model 1995 removed
 Scale Value Added: 65000 International

AIRBORNE SURVEY DETAILS

AIRCRAFT: DILL 206
MAGNETOMETER: Bart Systems Geoscan G2001-48
 RESOLUTION: 0.001 nanotesla
 CYCLE RATE: 2.1 seconds
 SAMPLE INTERVAL: 7 metres (3000)

DATA ACQUISITION: 11 CHANNELS, 16MB GEOSCAN DIGITAL RECORDER
 TRACKING: POLAR 1000 DIGITAL ACQUISITION SYSTEM

FLIGHT LINE SPACING: TRAVEL LINES 100 metres
 TR LINES 400 metres

FLIGHT LINE DIRECTION: TRAVEL LINES 060 - 210 degrees
 TR LINES 147 - 317 degrees

SURVEY HEIGHT: MEAN TERRAIN CLEARANCE 60 metres
NAVIGATION: DIFFERENTIAL GPS SATELLITE POSITIONING
 20x40d system

LUCKY PROJECT
AEROMAGNETIC SURVEY
CONSOLIDATED LOGAN MINES

COLOUR: TOTAL MAGNETIC INTENSITY
REDUCED TO POLE
PSEUDO DEPTH SLICE 1
GREYSCALE: NORTH-EAST ILLUMINATION

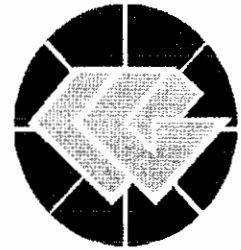


Surveyed and Compiled by
WORLD GEOSCIENCE CORPORATION
 August 1998

WGC 07617

High Resolution Helicopter Aeromagnetic Survey

WORLD GEOSCIENCE
QUESTOR SURVEYS LIMITED



SURVEY LOCATION MAP

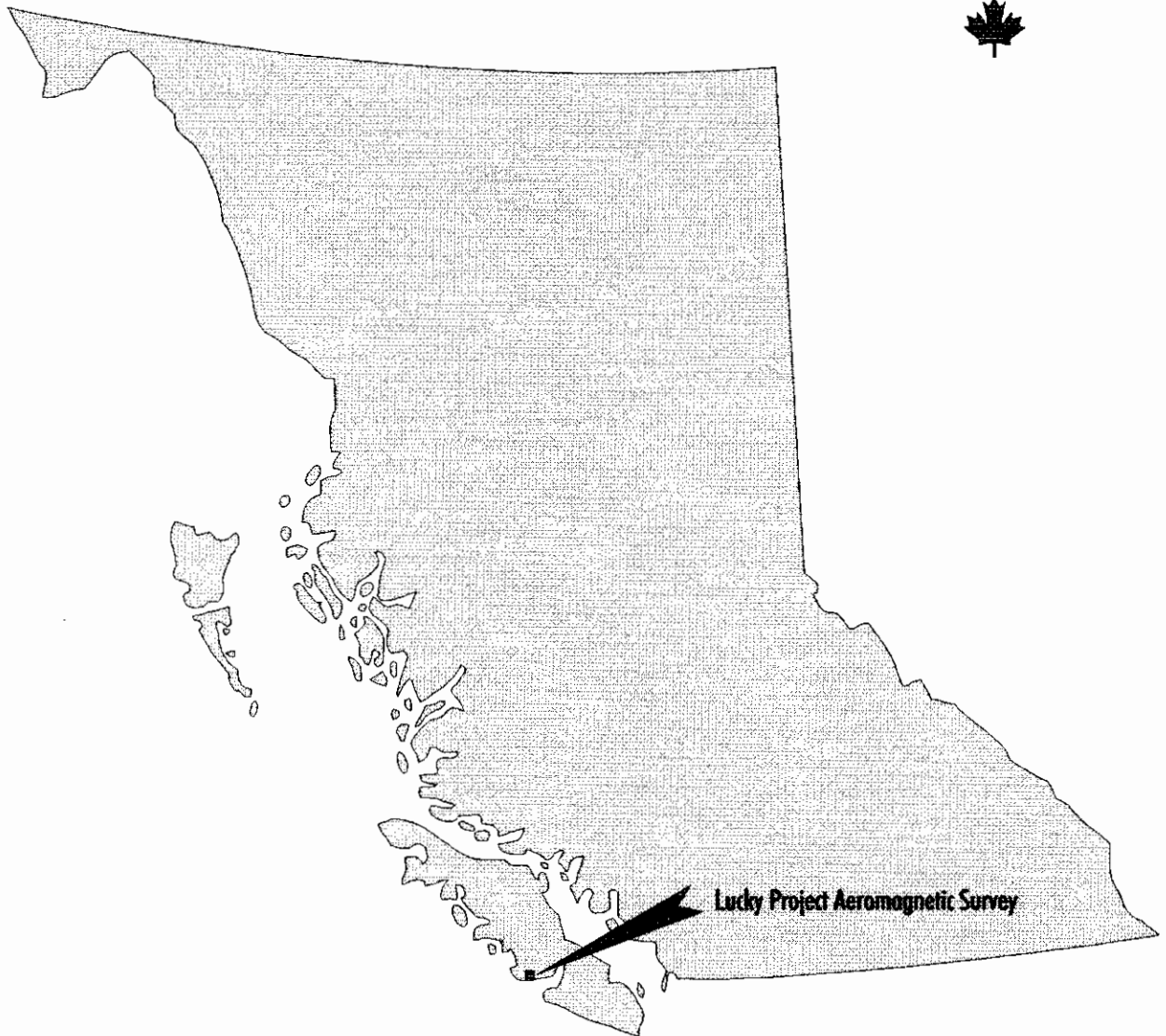


Figure 1

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Attachment A - List of Maps Delivered with report

Spectradepth™ Slicing Technique

1. SYNOPSIS

A High Resolution Helicopter Magnetic Survey of 2,450 linear kilometres was flown in the Kennedy Lake area, Alberni Mining Division, British Columbia.

The purpose of the present study was to map the area geophysically, identify fault and fracture systems that may be sources or conduits for mineralization, and locate any magnetic targets that may be directly due to sulphide/gold mineralization.

The first part of this report, comprising of Sections "4. Data Presentation", "5. Discussion of Results" and "6. Recommendations," are a discussion of the exploration results. The remainder of the report refers to the technical aspects of the survey: specifications, equipment used, calibration procedures, data collection and processing procedures.

2. SURVEY AREA

Coordinates of Survey Boundary:

1.	Latitude 49 09 03	Longitude 125 21 51
2.	Latitude 49 07 37	Longitude 125 25 24
3.	Latitude 49 07 20	Longitude 125 25 08
4.	Latitude 49 06 34	Longitude 125 27 07
5.	Latitude 49 05 52	Longitude 125 26 25
6.	Latitude 49 05 27	Longitude 125 27 35
7.	Latitude 49 04 39	Longitude 125 26 49
8.	Latitude 49 04 08	Longitude 125 28 11
9.	Latitude 49 01 43	Longitude 125 25 29
10.	Latitude 49 01 17	Longitude 125 26 41
11.	Latitude 48 59 15	Longitude 125 24 37
12.	Latitude 49 00 52	Longitude 125 20 31
13.	Latitude 48 58 37	Longitude 125 18 14
14.	Latitude 49 00 34	Longitude 125 13 29
15.	Latitude 49 01 19	Longitude 125 14 23
16.	Latitude 49 01 31	Longitude 125 13 49
17.	Latitude 49 02 34	Longitude 125 14 53
18.	Latitude 49 02 03	Longitude 125 16 20
19.	Latitude 49 02 51	Longitude 125 17 12
20.	Latitude 49 03 22	Longitude 125 15 45

3. FLIGHT SUMMARY

Start of Production: August 12, 1996
End of Production: August 25, 1996

4. DATA PRESENTATION

For this survey the Aeromagnetic data were displayed using a variety of imaging techniques. These techniques allow the detection of very weakly magnetized bodies which permits the mapping of subtle geological features and alteration zones.

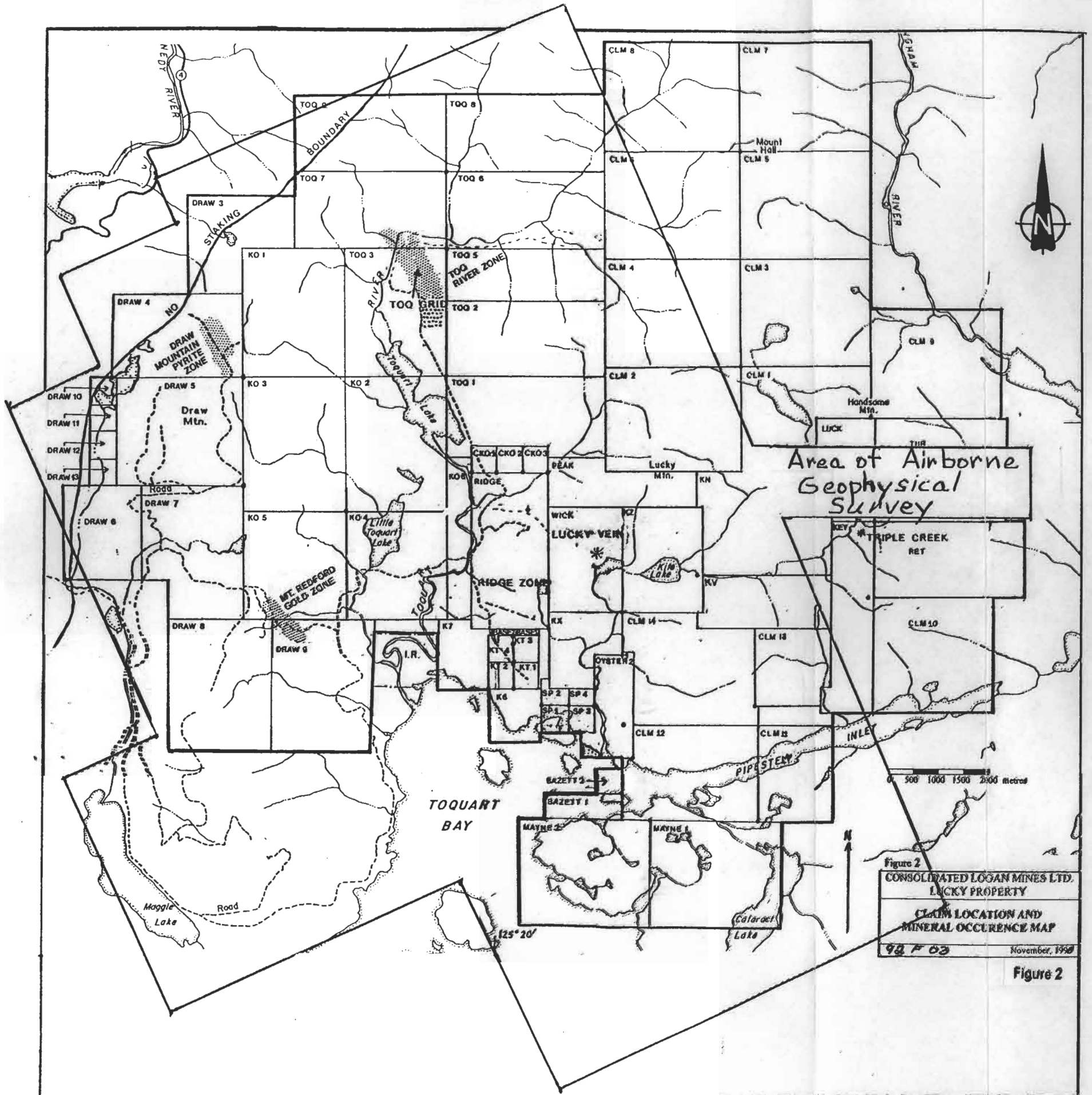


Figure 2
 CONSOLIDATED LOGAN MINES LTD.
 LUCKY PROPERTY
 CLAIM LOCATION AND
 MINERAL OCCURRENCE MAP
 98 F 03 November, 1998

Figure 2

1. Shaded Total Magnetic Intensity images and “Depth Slices”: Shadow maps allow the interpreter to identify linear magnetic features, which are otherwise obscure. The “Depth Slices” are frequency domain filters designed to emphasize susceptibility changes at various depths below the surface. “Depth Slices” are, at least in a qualitative way, able to distinguish between near surface responses from those at depth.
2. Gradient/Derivative Images are produced in gray scale and are traditional products for handling potential field data. They very often act as confirmatory data for interpretations based on the more sophisticated and sensitive “Depth Slices”.
3. Contour Maps of Total Magnetic Intensity and Vertical derivatives are also traditional products for this class of survey, and they provide a basic representation of the geophysical data.

Various fault lineaments, localized areas of increased magnetic susceptibility are indicated in the upper (near surface) depth slices, and these will provide the key exploration targets from the survey. The more regional features are indicated in the deeper depth slices.

5. DISCUSSION OF RESULTS

Most of the geological information known about the area is rather localized. This helicopter borne high resolution aeromagnetic survey is the first high resolution aeromagnetic study in the area.

Geologically, Vancouver Island occurs within the Insular Tectonic Belt of the Canadian Cordillera. This Belt is composed of 4 groups of Volcanic and Sedimentary Rocks which together comprise a displaced terrane named the Wrangellia which was regionally metamorphosed, folded and extensively intruded by granitoid plutons in the Jurassic Period. This basement is unconformably overlain by Cretaceous clastic sediments and intruded by Tertiary, hypabyssal stocks of mafic to felsic composition. The general area of the Lucky Property is underlain by various Paleozoic and Mesozoic strata, Jurassic plutonic and metamorphic rocks and Tertiary Intrusions. (Taken from Walker, R (M.Sc.), internal report for Consolidated Logan Mines Ltd., “Geological Report on the Lucky Property,” April 2, 1995.)

The purpose of the study was to 1) map the area geophysically, 2) identify fault and fracture systems that may be sources or conduits for mineralization, 3) locate any magnetic targets that may be directly due to sulphide/gold mineralization.

Seventeen maps and images, representing different forms of the geophysical data have been supplied with this report. The helicopter acquired high sensitivity aeromagnetic data that were collected at 100 metre line intervals. Terrain clearance was targeted at tree top level (approximately 50 metres), but averaged, due to topography more than that. Overall sensitivity of the magnetic system was 0.001 nT, and the overall noise in the system was in the order of 0.08 nT.

The aeromagnetic data indicate the area is a very active zone geologically. Regional extensional effects and transform faulting, as well as intrusive activity have played a major role in the

geological history of the area. Many of these elements are well indicated in the magnetic data. The mapped faults, reactivation zones will be the prime sources of mineralization in this regime.

REGIONAL FEATURES:

The predominating feature of the southern portion of the mapsheet is the magnetic low that is associated with Toquart Bay and Pipestem Channel, that proceeds north westward inland. This is interpreted to be a major extensional fault feature that separates 2 geological domains. The data suggest that major extensional forces occur south of Pipestem Channel, while a different geophysical pattern is evident in the magnetic data to the north

Several areas interpreted from the geophysical data to be Intrusive rocks have been indicated on the interpretation overlay. However because of the magnetic variability of intrusive rocks, and the complexity of the geological history their selection is always uncertain. (Several known areas of intrusive rocks are not immediately interpretable from the data, for example) Notwithstanding the above, the zones interpreted in the present survey as “intrusive” have a unique character in the magnetic data. The paucity of high frequency signal in these zones indicated the presence of either a more silicic intrusive to depth, or perhaps a “cap” of less magnetic materials.

Known Mineralization in the Survey Area

Toque Zone

The Toque Zone has been tested with drilling and is an extensive (50 m by 350 m) massive sulphide zone, originally located with induced polarization measurements. The drill results showed no appreciable gold values although elevated gold occurs in stream samples nearby. The Toque mineralizing system is substantial, and along strike, the alteration/reactivation lineaments provide targets for economic mineralization.

Toque Zone - Association With Aeromagnetic Data

The Toque Zone Massive sulphide body is apparently related to a large interpreted zone of alteration/reactivation that is several kilometres long. This feature should be geologically and geochemically evaluated.

Lucky Vein

The Lucky mineralization is a localized narrow quartz vein structure with varying elevated gold values, up to 1.616 oz Au/T. The vein strikes northerly and is within Karmutsen volcanics (Ref: Walker, R., “Geological Report on the Lucky Property, 1995). The known mineralization is apparently too small to be right away economic.

Lucky Vein - Association With Aeromagnetic Data

The Lucky Quartz Vein which cuts Karmutzen Formation basalts appears to be associated with a small localized magnetic response, and appears to be related, only distally, to any alteration/reactivation zones

Mt. Redford Zone

The Mt. Redford zone appears to be the result of contact/alteration phenomenon within Intrusive rocks. An area of approximately 150 metres by 300 metres of altered rock is exposed and contains elevated gold values up to 3.03 grams/tonne. (T. Drown, Internal Memorandum, Consolidated Logan Mines Ltd., September 27, 1996)

Mt Redford Zone - Association With Aeromagnetic Data

The Mt. Redford Zone is associated with major geophysical structures related to faulting and reactivation in the area. Therefore the mineralization could be quite extensive, and further may occur at other locations along the geophysical structure. This is a primary target for commercial mineralization.

Brynnor Magnetite Mine

The Brynnor Mine, now abandoned by Noranda, is a skarn magnetite deposit that produced in excess of 4 million tones of ore from an open pit operation. Underground operations were never completed. The mine gave rise to a substantial magnetic anomaly.

Other mineralized zones such as the Ridge Zone, The Triple Creek Zone are summarized in the geological report by R. Walker, 1995, and a preliminary internal report by R. Chow.

6. RECOMMENDATIONS

The mineralization in the survey area will be mostly related to reactivation/alteration zones within volcanic and sedimentary rocks. The Toque zone, for example, is a substantial massive sulphide system (at least 50 meters by 350 metres) that is only part of an interpreted reactivation system that, along its length, ought to be further evaluated by geological examination and geochemical/stream sampling.

The Mt. Redford Zone, because of the outcropping rocks and gold mineralization in situ it is considered the key exploration target. The mineralization may be a result of the fault/alteration system that extends from the area of the Draw Zone in the North to 2 km South of the Mt. Redford Zone. This is a major mineralizing feature.

1. It is recommended for the Mt. Redford zone that a comprehensive regional geological study be undertaken, and that ground magnetic measurements and geochemical/rock chip survey be undertaken.

2. It is recommended that a detailed geological and geochemical study be made of the Nugget creek area, and any area where gold stream samples or geochemical values are concomitant with interpreted reactivation/fault zones.

7. SURVEY PARAMETERS

Mag Cycle Rate:	10Hz / 0.1sec
Mean Sample Interval:	less than 10 metres
Mean Terrain Clearance:	50 metres

Mag Resolution:	0.001 nT
Total System Noise:	0.20 nT (Maximum)
Navigation Cycle Rate:	1Hz / 1.0sec
Radar Alt. Cycle Rate:	1Hz / 0.1sec
Barometric Alt. cycle rate:	1Hz / 0.1sec
Ground Mag. Cycle Rate:	10 sec
Tracking Method:	Real-time differential GPS
Flight Line Spacing:	100 metres
Tie Line Spacing:	400 metres

8. SURVEY EQUIPMENT

Installed in a Bell 206 Helicopter

Scintrex CS - 2 split beam cesium vapour magnetometer, stinger mounted
 Picodas 486/66 Digital Acquisition System
 Picodas 1000A Power Supply Console
 Panasonic Colour VHS Video tracking camera
 NovAtel 10 Channel GPS Card
 Collins ALT - 50 Radar Altimeter System
 Paro Scientific Digiquartz Barometric Altimeter
 Vaisala Humidity Temperature Transducer
 Bartington 3 axis Fluxgate Magnetometer

Ground Support Equipment

Geometrics G-856 Proton Base station magnetometer
 Ashtech OEM Modual 12 Channel GPS Base Station
 PC 486 Field Computer

9. SURVEY DETAILS

Survey Base:	Port Alberni, British Columbia
Fuel Base(s):	Port Alberni, British Columbia
Ground Mag Location:	Port Alberni, Airport
In-field Tests:	Heading Error / Parallax Error / Dynamic Compensation

10. FIELD CREW

Crew Chief:	John Stewart
Pilots:	Spring Harrison, K. Haines
Operator:	Brendan Scott
Processor:	Lori Moore

11. NAVIGATION

Aircraft navigation was provided using a Novatel GPS receiver unit with output being fed to both the PNAV 2001 navigation computer and to the PDAS 1000 data acquisition computer. The PNAV 2001 is designed specifically for geophysical airborne surveys and has both a heads-up pilots display (left/right of track) and a moving map representation of where the aircraft is in relation to the survey area. The Raw GPS satellite information was restored onto DC2000 data tapes and then used in conjunction with the recorded GPS Base Station to provide a GPS post processed differentially corrected flight path using D3-NAV software. The accuracy obtained was ± 5 metres or better, with a position scan recorded once per second.

12. TERRAIN CLEARANCE

The mean terrain clearance of the helicopter and magnetometer sensor was just above tree top terrain clearance with a mean of 80 metres. In conjunction with the Radar Altimeter, a Barometric Altimeter Transducer was also recorded.

13. DIURNAL VARIATIONS

The earth's natural magnetic field was monitored and recorded during the survey. The tolerance for diurnal activity was 10 nT over a linear cord in ten minutes. The aeromagnetic data were subsequently corrected for these variations.

14. MAGNETIC BASE STATION

A Geometrics G-856 memory magnetometer recorded diurnal activity during the day. This unit was located at Port Alberni airport. The magnetometer was set up in a known magnetically quiet location, free from cultural interference.

Type:	Geometrics G-856 memory magnetometer
Resolution:	0.1nT
Sample rate:	10 seconds
Noise Envelope:	0.5nT (Maximum)

The magnetometer records the Julian Day/Time in the local time zone, the reading number and the corresponding magnetic value. Time was synchronized daily to the aircraft acquisition system which is in turn synchronized to the GPS receiver which is in turn synchronized to the GPS satellites Atomic clock.

15. AIRCRAFT

The data acquisition platform used was, a Bell Jet Ranger 206 helicopter, registration CGDXC. This aircraft is owned and operated by Vancouver Island Helicopters and complies to all Department of Transport regulations and was secured and insured accordingly.

16. AIRBORNE MAGNETOMETER

The magnetometer sensor is located at the end of a stinger protruding in front of the helicopter. The signal received by the magnetometer travels through a pre-amplifier located at the base of the stinger then through an interface board into the acquisition system (PDAS 1000).

Type:	Scintrex V-201 H-8 cesium vapour
Resolution:	0.001nT
Operating Range:	20,000 - 95,000nT

17. ALTIMETERS

The sensor height was recorded using both a Radar Altimeter and Barometric Altimeter. The radar altimeter has a circular analog indicator of the typical aircraft type which the pilot uses to maintain a constant ground clearance. The readout is also digitally recorded. This altimeter was calibrated by recording data at different heights over a flat surface and then determining the voltage output for a given height. This voltage is recorded and displayed to the operator on the acquisition display as a converted height to indicate feet AGL (above ground level).

The Barometric Altimeter (which is a pressure transducer) records the pressure altitude above sea level. It is also both recorded digitally and displayed for the operator.

18. ACQUISITION SYSTEM

The Picodas PDAS 1000 data acquisition system computer is the heart of the airborne acquisition system. All data acquired in the aircraft is stored onto a hard disk contained within the PDAS 1000. This data is then transferred at the end of each flight or days production onto a DC2000 magnetic data cartridge, which in turn is transferred to the field office PC, then onward to the Sun Systems Sparc II.

The software used in this system has been developed in-house by Questor. Most of the hardware involved is commercially available, however some printed circuit boards, power supplies etc. have been specifically designed and manufactured by Questor.

19. SYSTEM CHECK AND CALIBRATION

19.1 Heading Check

To compensate the magnetometer data for the effect of the aircraft's magnetic field on the readings both static and dynamic compensation are used. This compensation was done prior to commencement of the first survey flight and then each time after that when it was considered that a possible change to the magnetic field of the aircraft had occurred.

Static Compensation

Winglets are mounted on either side of the magnetic sensor housing. A thin strip of a highly permeable amorphous glass metal, trade name Vitrovac, about 4 cm long and 0.25 cm wide has been taped to each winglet. The purpose of these metal strips is to equalize the magnetometer readings in the north/south directions to the readings obtained in the east/west directions.

The diurnal base station is recording during this time to allow for magnetic variations while recording these heading in the aircraft. This diurnal is then applied to the raw magnetic aircraft data to obtain a true indication of heading error. Any residual heading error can be determined by processing and removed by adding an accurate constant offset value.

19.2 Dynamic Compensation

The basis of this compensation is the reduction of motion induced noise on the measured magnetic field. This motion noise comes from the complex three dimensional magnetic signature of the airframe as it changes attitude with respect to the earth's magnetic vector. The noise comes from permanent, induced and eddy current effects of the airframe plus additional heading effects of the Cesium vapor sensor itself. The approach used by Questor has been developed by Picodas Group Inc. and consists of using four individual sets of coefficients, one for each heading flown on the survey. A Develco three axis fluxgate magnetometer mounted in the aircraft stinger is used to measure the coupling of the three axes with the background magnetic field. This sensor is very sensitive to attitude changes and is used to accurately monitor the aircraft reference frame. The frequency response and sample rate of the Picodas Analog Processor card used to measure the fluxgate signals is the same as that of the Picodas Magnetometer Processor card. This ensures

that there is no phase distortion of these synchronized measurements. This leads to improved compensation throughout the passband of the system.

A series of Pitch, Roll and Yaw maneuvers are carried out on each of the survey directions to vary this coupling and gather fluxgate and measured raw magnetic field data. This data is then processed using a ridge regression technique to find a stable set of coefficients for the model. When the compensation algorithm is run using the model and coefficients, either in real-time or post-processing, a magnetically compensated data set is generated. The compensation maneuver "boxes" are flown at high altitude over magnetically quiet area. The pitch, roll and yaw maneuvers are approximately 12° to 15° in amplitude of about 30 seconds duration each. A set of maneuvers is carried out in each survey line direction as well as ~15° either side of each direction. A compensation "box" is flown each time re-compensation is required. The reduction of the data to calculate the coefficients was carried out on a 486 based personal computer using a program developed by Questor..

19.3 System Parallax

One of the processing parameters required to process the digital data is the parallax or offset in time, between the time the digital reading was taken by the instrument and the time the position fix for the fiducial of the reading was obtained. Each instrument - magnetometer, and altimeter may have a different parallax so the parallax must be computed for each instrument. A position fix may be obtained either by GPS position or by using the video to determine location. The parallax between the instrument and the GPS and the instrument and the video may be different.

To obtain this parameter two lines are flown in opposite directions over an anomaly. Stacked profiles of the lines are then done and the parallax adjusted till the anomaly position is the same for each line. The parallax correction derived is the correction to be applied to each survey line. A positive parallax indicates the instrument reading is ahead of the position for the fiducial. Each integer fiducial occurs every second so the parallax can be expressed in either fiducials or seconds.

The correct fiducial is computed by :

$$F_c = F_r - I_p$$

where

F_c = Parallax corrected fiducial

F_r = Fiducial for recorded reading

I_p = Instrument parallax

20. **MONITORING FLIGHT PATH**

GPS flight path was recovered and plotted daily to ensure it was within specifications. Any data not within specification was re-flown at the earliest possible opportunity. The evaluation process uses the differentially corrected flight path, and the system is set up such that it shows the number of satellites used, the quality of positioning and the amount of definite position fix's.

21. **DAILY OPERATIONS REPORT**

A daily report was compiled by the crew chief for the duration of the survey. The report documents the date, kilometres flown and accepted, and reasons for any downtime, and a comments column stating weather condition, equipment condition.

22. VALIDATION AND VERIFICATION PROCEDURES

Each evening or after the day's production the data was transferred onto the field office computer system for verification of the day's flying. This consisted of the following:

1. Checking the statistics for each line.
2. Plotting the day's diurnal to ensure the variation was within specifications.
3. Plotting profiles of any lines that could have potential problems.
4. Noise plots were created and profiled for each line.
5. Calibration test line data were plotted to ensure equipment was operating within tolerances.

23. DATA PROCESSING PROCEDURE

Magnetic Diurnal Data

All magnetic diurnal data was obtained from the Geometric magnetometer base station set up at the airstrip in Port Alberni. Data from the magnetometer was recorded every 5.0 seconds. The data was downloaded from the magnetometer to a 486 based personal computer. It was transferred by modem to the Sun processing computer, at the data processing centre in Calgary. The data were checked and corrected for spikes. Single reading spikes were either manually or automatically edited and replaced with an interpolated result. The diurnal data were also checked to see that the change in diurnal readings during the course of the survey flight did not exceed survey specifications. When this occurred the affected survey lines or line segments were reflown.

Radar Altimeter Data

The height of the aircraft above the ground was recorded every 0.1 second using a radar altimeter. A fourth difference program was used to identify spikes prior to either manual or automatic correction. The altimeter data was used as a validation control of each crossover during tie line leveling of the magnetic data and to correct the radiometric data for atmospheric attenuation effects above or below the nominated survey height.

Barometric Altimeter Data

The height of the aircraft above sea level was recorded every 0.1 second using a barometric altimeter. A fourth difference program was used to identify spikes prior to either manual or automatic correction. The barometric altimeter data was not used in the basic processing.

Flight Path Location

The aircraft's position was determined using a Novatel GPS navigation system. GPS positions were recorded every second. A colour VHS video camera was used for verification but was not used in any stage of the processing. The GPS data was recorded in the WGS84 geodetic datum. During the first processing stage the GPS data were transformed into eastings and northings of the local geodetic datum. A speed check was then run on the data. The resulting velocities were checked and any data causing abnormal speeds were deleted and reflown.

Magnetic Data Processing

Real-time compensated and uncompensated magnetic data, were recorded digitally every 0.1 of a second. Both channels were transferred from the aircraft to the processing computer system where the fourth difference program for the identification of possible spikes. Single reading spikes were either manually or automatically edited. Multiple reading spikes were flagged as invalid and if necessary that section of the line was reflown. The same digital compensation co-efficients as

used in the aircraft were then applied to the edited uncompensated magnetic data to produce a post flight compensated magnetic data channel.

The following correction and leveling procedures were then applied to the raw edited compensated data to produce preliminary leveled magnetic data:

a) Diurnal

The synchronized digital diurnal data was first subtracted from a base level of 58,200 nT. The resultant values were then added to the airborne magnetic readings by synchronizing the time from the start and end of each line, to produce a diurnally corrected reading.

b) Parallax

A parallax correction of 0.3 seconds was then applied to the diurnally corrected data.

c) International Geomagnetic Reference Field (IGRF)

The International geomagnetic reference field was calculated at every recovery point then a base value (58,400 nT) is added to the airborne magnetic readings.

d) Tie Line Leveling

A crossover program was then used to compute the magnetic difference between each tie line and the traverse line intersection. These differences were applied to the traverse line data to level the traverse lines to the tie lines.

e) Preliminary Gridding and Inspection

The data was then gridded and from the computed grid image enhancements were displayed on the processing computer screen. These were inspected for inconsistencies and /or errors which were investigated by the data processor and geophysicist. Appropriate corrections and / or adjustments were made if required.

f) Micro Leveling

After corrections had been applied to the data, a correction was applied to remove some remaining sub-nano tesla distortions evident only after applying image enhancing algorithms to the gridded data. These distortions are usually the residual noise of the crossover corrections.

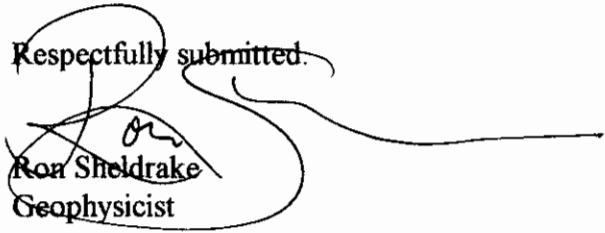
g) Gridding

The corrected and leveled magnetic data was gridded to interpolate along line to obtain grid column intersection values. These were then sorted into columns and a polynomial interpolation was used to determine row values along each column. Grid cell size 70 metres.

24. SUMMARY

The present high resolution aeromagnetic survey was successful in identifying a number of magnetic responses evident in the survey data that may be related to mineralizing systems. The survey was successful in geophysically mapping the property and providing exploration targets for gold mineralization.

Recommendations for evaluation of the geophysical anomalies have been made.

Respectfully submitted,

Ron Sheldrake
Geophysicist

REFERENCES

Walker, R.R. (M.Sc.), Internal report for Consolidated Logan Mines Ltd., "Geological Report on the Lucky Property," April 2, 1995.

Walker, R.R. (M.Sc.), "Report on Diamond Drilling - 1995 Toq Grid Drill Program on Toq 3 Claim," December 28, 1995.

T. Drown, Internal Memorandum, Consolidated Logan Mines Ltd., September 27, 1996

Chow, R., "Geological, Geochemical, and Prospecting Report on the Lucky Property," February 5, 1996.

Attachment A

List of Maps Delivered with this report

Scale 1:25,000

Maps

1. Total Magnetic Intensity (RTP) mylar
2. Stacked Profiles - First Vertical Derivative
3. Flight Path - mylar

November 14, 1996

COST STATEMENT FOR LUCKY PROPERTY
Costs arising from 1996 airborne geophysical survey.

Total costs of survey \$95,500 apportioned equally to all claim units covered by the survey. The number of claim units flown total 521 units, giving \$183.30 per claim unit.

GROUP	CLAIMS	UNITS	YRS.	CLAIMS WK'D	\$ REQ'D	\$ SPENT	\$ EXCESS	TO PAC.	FEES
96-1	Toq 8		1	Toq 8	\$1,800.00	\$3,299.40			
	Toq 9	36	1	Toq 9	\$1,800.00	\$366.60			
	Group total				\$3,600.00	\$3,666.00	\$66.00	\$66.00	\$360.00
96-2	Toq 6			Toq 6		\$1,466.40			
	Toq 7			Toq 7		\$3,299.40			
	CLM 6		1		\$2,000.00				
	CLM 8	76	1		\$2,000.00				
Group total				\$4,000.00	\$4,765.80	\$765.80	\$765.80	\$400.00	
96-3	Toq 2			Toq 2		\$3,116.10			
	Toq 5			Toq 5		\$1,833.00			
	CLM 4		1		\$2,000.00				
	CLM 5	70	1		\$2,000.00				
Group total				\$4,000.00	\$4,949.10	\$949.10	\$949.10	\$400.00	
96-4	Toq 1			Toq 1		\$3,299.40			
	CLM 2			CLM 2		\$1,466.40			
	CLM 4								
	CLM 5								
	CLM 7	98	1		\$2,000.00				
Group total				\$2,000.00	\$4,765.80	\$2,765.80		\$200.00	
96-5	Toq 1	58							
	CLM 2					\$2,765.80	<i>Left over Group 96-3</i>		
	CLM 3		1		\$2,000.00				
Group total				\$2,000.00	\$2,765.80	\$765.80		\$200.00	
96-6	Toq 1		1		\$3,600.00				
	CLM 2		1		\$2,000.00	\$765.80	<i>Left over Group 96-4</i>		
	Toq 3			Toq 3		\$3,666.00			
	KO 2	78	1	KO 2	\$2,000.00	\$3,666.00			
	Group total				\$7,600.00	\$8,097.80	\$497.80	\$497.80	\$580.00
96-7	CLM 9		1		\$2,000.00				
	CLM 1		1		\$2,000.00				
	KN								
	KZ			KZ		\$1,466.40			
	PEAK			PEAK		\$2,566.20			
	LUCK	90							
Group total				\$4,000.00	\$4,032.60	\$32.60	\$32.60	\$400.00	
96-8	Mayne 1		1	Mayne 1	\$2,000.00	\$3,666.00			
	Mayne 2		1	Mayne 2	\$2,000.00	\$3,666.00			
	KV		1		\$800.00				
	KN		1		\$1,600.00				
	CLM 11		1	CLM 11 (PAC)	\$1,200.00	\$268.00			
	CLM 14	96							
	Group total				\$7,600.00	\$7,600.00	\$0.00	\$0.00	\$760.00

GROUP	CLAIMS	UNITS	YRS.	CLAIMS WK'D	\$ REQ'D	\$ SPENT	\$ EXCESS	TO PAC.	FEES	
96-9	CLM 12			CLM 12		\$2,932.80				
	Bazett 1			Bazett 1		\$549.90				
	Bazett 2			Bazett 2		\$183.30				
	Oyster 2		1	Oyster 2	\$1,600.00	\$1,466.40				
	CLM 14			CLM 14		\$1,099.80				
	KZ		1		\$2,400.00					
	Peak		1		\$2,800.00					
	KX		1	KX	\$1,800.00	\$1,649.70				
	SP 1			SP 1		\$183.30				
	SP 2			SP 2		\$183.30				
	SP 3			SP 3		\$183.30				
	SP 4			SP 4		\$183.30				
			91		Group total	\$8,600.00	\$8,615.10	\$15.10	\$15.10	\$430.00
	96-10	Ridge		1	Ridge	\$1,800.00	\$3,299.40			
CKO 1			1	CKO 1	\$100.00	\$183.30				
CKO 2			1	CKO 2	\$100.00	\$183.30				
CKO 3			1	CKO 3	\$100.00	\$183.30				
Wick			1	Wick	\$2,400.00	\$2,199.60				
Lucky 81			2	Lucky 81	\$400.00	\$183.30				
Lucky 82			2	Lucky 82	\$400.00	\$183.30				
Lucky Fr			2	Lucky Fr	\$400.00	\$183.30				
Lucky 2 Fr			2	Lucky 2 Fr	\$400.00	\$183.30				
KT 1			1	KT 1	\$200.00	\$183.30				
KT 2			1	KT 2	\$200.00	\$183.30				
KT 3			1	KT 3	\$200.00	\$183.30				
KT 4			1	KT 4	\$200.00	\$183.30				
Base 1				Base 1		\$183.30				
Base 2				Base 2		\$183.30				
			75	1	CLM 13 (PAC)	\$1,200.00	\$218.10			
					Group total	\$8,100.00	\$8,100.00	\$0.00	\$0.00	\$570.00
96-11	CLM 12		1		\$2,000.00					
	CLM 14		1	CLM 14 (PAC)	\$2,000.00	\$501.40				
	Oyster 2									
	SP 1									
	SP 2									
	SP 3									
	SP 4									
	K6		1	K6	\$400.00	\$733.20				
	K7		1	K7	\$600.00	\$1,099.80				
	KO4		1	KO4	\$1,600.00	\$2,932.80				
		94	1	KO5	\$1,600.00	\$2,932.80				
				Group total	\$8,200.00	\$8,200.00	\$0.00	\$0.00	\$820.00	
96-12	SP 1		1		\$100.00					
	SP 2		1		\$100.00					
	SP 3		1		\$100.00					
	SP 4		1		\$100.00					
	Bazett 1		1		\$300.00					
	Bazett 2		1		\$100.00					
	Oyster 2									
	CLM 12									
	K6									
	K7									
KO4										

GROUP	CLAIMS	UNITS	YRS.	CLAIMS WK'D	\$ REQ'D	\$ SPENT	\$ EXCESS	TO PAC.	FEEES
	KO6		1	KO6	\$600.00	\$1,099.80			
	Draw 9	88	1	Draw 9	\$2,000.00	\$3,666.00			
				Group total	\$3,400.00	\$4,765.80	\$1,365.80	\$1,365.80	\$340.00
96-13	Draw 5		1	Draw 5	\$2,000.00	\$3,666.00			
	Draw 6		1	Draw 6	\$1,500.00	\$2,749.50			
	Draw 7		1	Draw 7	\$2,000.00	\$3,666.00			
	Draw 8	75	1	Draw 8	\$2,000.00	\$3,666.00			
				Group total	\$7,500.00	\$13,747.50	\$6,247.50	\$0.00	\$750.00
96-14	Draw 5		1		\$2,000.00				
	Draw 6		1		\$1,500.00				
	Draw 7		1		\$2,000.00				
	Draw 8		1		\$2,000.00	\$6,247.50	Left over	Group 96-13	
	KO3	95	1	KO3	\$2,000.00	\$3,666.00			
				Group total	\$9,500.00	\$9,913.50	\$413.50	\$413.50	\$950.00
96-15	Draw 3		2	Draw 3	\$3,200.00	\$2,932.80			
	Draw 4		2	Draw 4	\$3,000.00	\$2,749.50			
	Draw 5								
	Draw 10		3	Draw 10	\$300.00	\$183.30			
	Draw 11		3	Draw 11	\$300.00	\$183.30			
	Draw 12		3	Draw 12	\$300.00	\$183.30			
	Draw 13		3	Draw 13	\$300.00	\$183.30			
	KO1		1	KO1	\$2,000.00	\$3,666.00			
	Rita 1		2	Rita 1	\$200.00	\$183.30			
	Rita 2		2	Rita 2	\$200.00	\$183.30			
	Rita 3		2	Rita 3	\$200.00	\$183.30			
	Rita 4		2	Rita 4	\$200.00	\$183.30			
	Rita 5		2	Rita 5	\$200.00	\$183.30			
	Rita 6		2	Rita 6	\$200.00	\$183.30			
	Rita 7		2	Rita 7	\$200.00	\$183.30			
	Rita 8	83	2	Rita 8	\$200.00	\$183.30			
				Group total	\$11,000.00	\$11,547.90	\$547.90	\$547.90	\$1,100.00
96-16	CLM 10		1						
	CLM 11			CLM 11	\$2,000.00	\$2,199.60			
	CLM 12								
	CLM 13								
	CLM 14								
	KEY	98							
				Group total	\$2,000.00	\$2,199.60	\$199.60	\$199.60	\$200.00
									\$8,460.00

CONSOLIDATED
LOGAN
 MINES LTD.
 V.S.E. - CKO



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 Exploration Manager

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SPECTRADEPTH™ SLICING TECHNIQUE

Spectradepth™ slicing is a technique that allows the magnetic response of different levels within the rock section to be identified, extracted from the total data and displayed as images or contour maps. The Spectradepth™ slices which can be extracted from the data are controlled by the distribution of magnetic material within the section. A particular slice can be identified only if there is a magnetic material present in the depth interval. The depth intervals are difficult to define precisely because of the apparent ambiguity in potential field techniques.

The technique has no application for precise depth to magnetic body studies. The power of the method lies in examining how the trends in lithology and structure vary as a function of depth. Typically, two or three slices can be identified within the sedimentary section, with the deepest slice being associated with magnetic crystalline basement.

The selection of Spectradepth™ slices relies on an understanding of the magnetic response in the Fourier Domain. Figure A below shows the general shape of the power spectra for a typical data set.

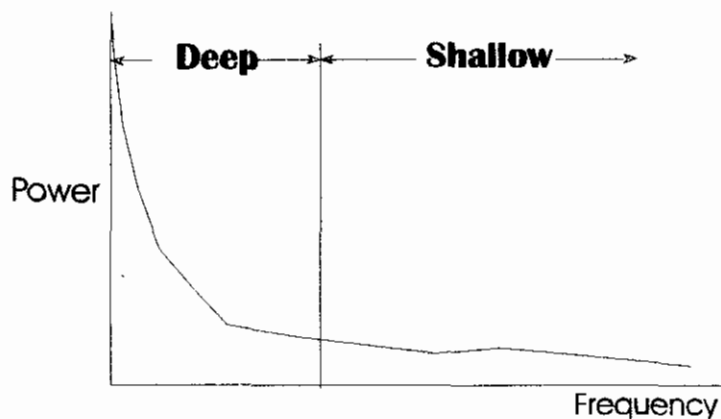


Figure A

The deep, magnetic basement response is the long wavelength, high power component of the spectra, while the shallower sources of magnetic material will produce a higher frequency response. The changes in slope of the magnetic power spectra curve are proportional to the depth of burial of the magnetic material. This is a well accepted theory that has had geophysicists designing frequency filters to attempt to extract depth information from magnetic responses.

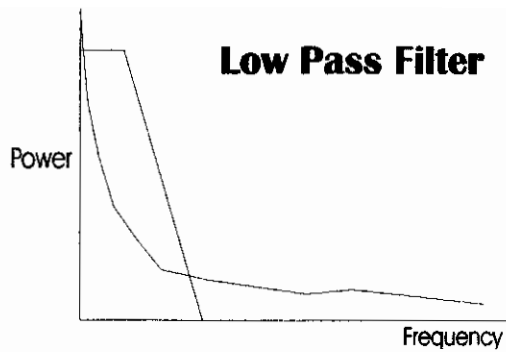


Figure B

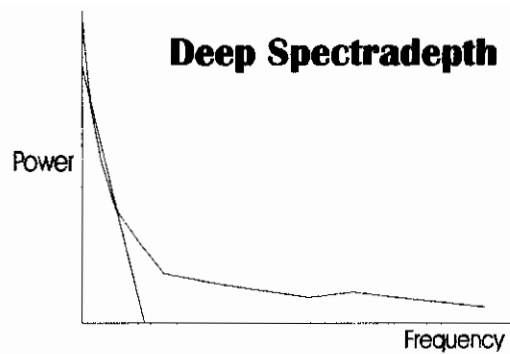


Figure C

Figure B and C illustrate a low pass filter and a deep Spectradepth™ slice filter respectively. The cutoff frequency for the low pass filter and the gradient of the depth slice filter are determined from the gradient change of the slope of the power spectrum. Figures D and E illustrate a band pass filter and a middle Spectradepth™ slice filter. Again, the change in gradient of the power spectrum curve is determining the filter parameters.

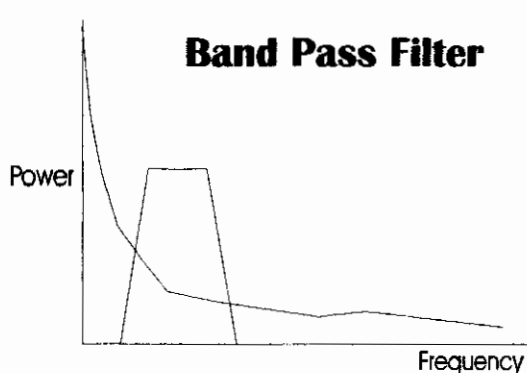


Figure D

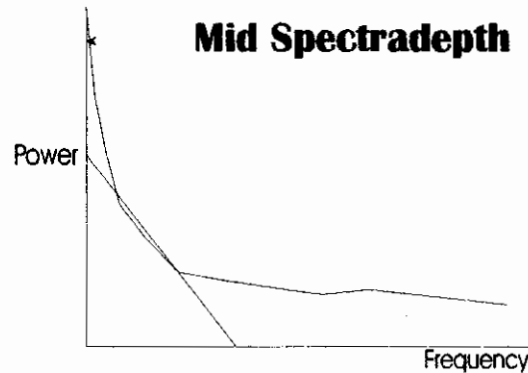


Figure E

Spectradepth™ slicing has a number of advantages over conventional high pass, low pass and band pass filtering of magnetic data. Application of these techniques is invariably accompanied by the phenomena of “ringing”, where large amplitude responses in the original data give rise to low amplitude fluctuations in the filtered data. This is due to the unavoidable “edge” around the cutoff frequency of the filter. While these effects were not noticeable in the traditional contour display of magnetic data, image enhancements of the data designed to reveal subtle information about the geology highlight artifacts of the filtering. The Spectradepth™ slicing technique employs a filter with no “edges”, hence, no “ringing”.

Furthermore, application of these traditional techniques generally result in maps that are not physically representative in that filtered information cannot usually be created by a distribution of magnetic material within the earth. Magnetic Spectradepth™ slicing on the other hand, attempts to extract information from a particular depth interval and both the extracted data and the residual data can be meaningfully interpreted in terms of geology. The approach can be described as an holistic or natural way to analyze magnetic data. In practice, a contour map of a high frequency filtered grid will only consist of high frequencies, and the result is a map of “bulls-eyes” over an anomaly. In an image, this effect manifests itself as almost “white noise”. This is to be compared

to a shallow Spectradepth™ slice which contains the longer wavelength responses of anomalies(although their power has been suppressed) giving rise to a much more coherent response over anomalies.

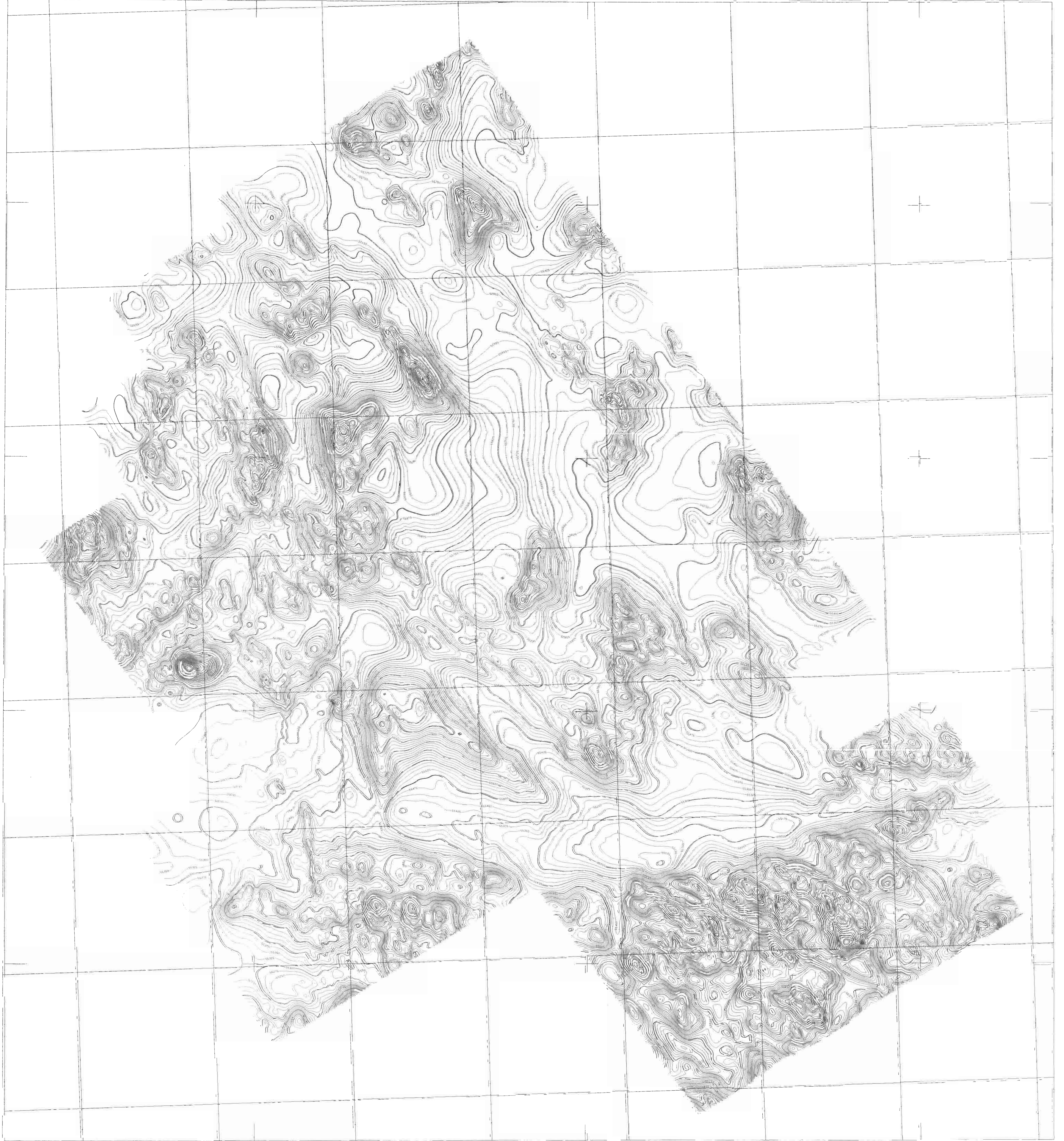
125°25'

125°20'

125°15'

547500 mN
544500 mN
541500 mN
538500 mN
535500 mN
532500 mN
529500 mN
526500 mN
523500 mN
520500 mN

49°00'
48°00'
47°00'



320000 mE 325000 mE 330000 mE 335000 mE 340000 mE 345000 mE 350000 mE

TITLE
PROJECT
78-1-2000
SHEET NUMBER
SHEET TOTAL
SCALE
DATE
PROJECT NUMBER
PROJECT TITLE
PROJECT LOCATION
PROJECT AREA
PROJECT STATUS
PROJECT OWNER
PROJECT CONTACT
PROJECT PHONE
PROJECT FAX
PROJECT EMAIL
PROJECT WEBSITE
PROJECT ADDRESS
PROJECT CITY
PROJECT STATE
PROJECT COUNTRY
PROJECT ZIP
PROJECT COUNTY
PROJECT TOWNSHIP
PROJECT RANGE
PROJECT SECTION
PROJECT QUARTER
PROJECT CORNER
PROJECT MONUMENT
PROJECT SURVEY
PROJECT METHOD
PROJECT INSTRUMENT
PROJECT DATE
PROJECT TIME
PROJECT PERSONNEL
PROJECT COST
PROJECT BUDGET
PROJECT EXPENDITURE
PROJECT REVENUE
PROJECT PROFIT
PROJECT LOSS
PROJECT BREAK-EVEN
PROJECT RISK
PROJECT RETURN
PROJECT IRR
PROJECT NPV
PROJECT PV
PROJECT FV
PROJECT PMT
PROJECT RATE
PROJECT PERIOD
PROJECT TYPE
PROJECT CLASS
PROJECT CATEGORY
PROJECT SUB-CATEGORY
PROJECT TAG
PROJECT CODE
PROJECT ID
PROJECT KEYWORD
PROJECT META-KEYWORD
PROJECT META-DESCRIPTION
PROJECT META-TITLE
PROJECT META-URL
PROJECT META-ROBOTS
PROJECT META-VISIBILITY
PROJECT META-RATING
PROJECT META-PRICE
PROJECT META-CURRENCY
PROJECT META-UNIT
PROJECT META-DIMENSION
PROJECT META-WEIGHT
PROJECT META-MATERIAL
PROJECT META-COLOR
PROJECT META-TEXT
PROJECT META-IMAGE
PROJECT META-AUDIO
PROJECT META-VIDEO
PROJECT META-DOCUMENT
PROJECT META-APPLICATION
PROJECT META-PROGRAM
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PROJECT META-VERSION
PROJECT META-CREATOR
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PROJECT META-COMMENT
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PROJECT META-DIMENSION
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PROJECT META-LANGUAGE
PROJECT META-VERSION
PROJECT META-CREATOR
PROJECT META-PRODUCED
PROJECT META-COMMENT

LUCKY PROJECT
AIRBORNE GEOPHYSICAL SURVEY
CONSOLIDATED LOGAN MINES

CONDUCTED BY: [unreadable]
DATE: [unreadable]

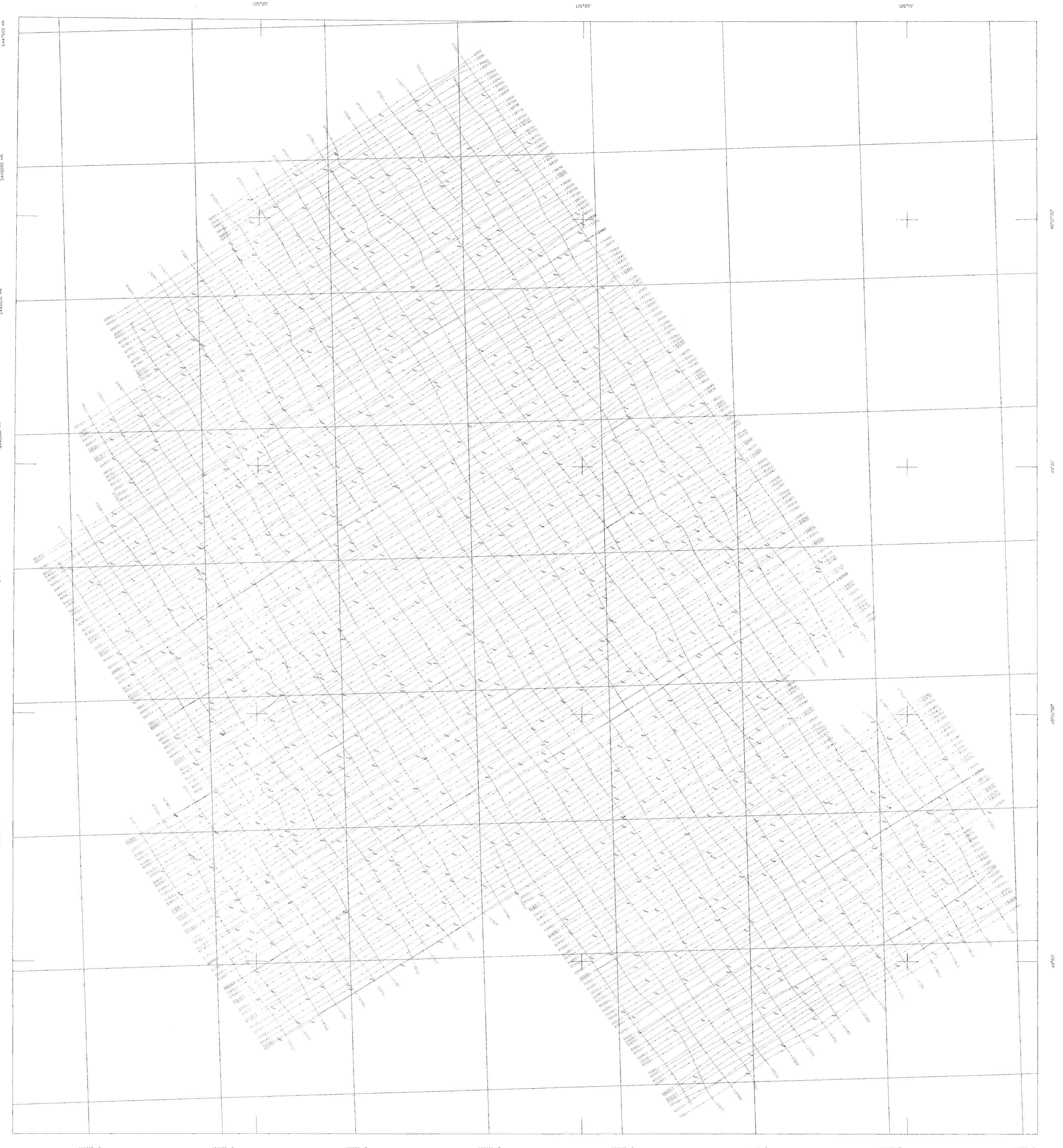
TOTAL MAGNETIC INTENSITY
REDUCED TO POLE

GRID CELL SIZE: 50 meters
CONDUCTED BY: [unreadable]
DATE: [unreadable]



North arrow indicating True North and Magnetic North.
Magnetic declination is [unreadable] East of True North.
Scale: 1:25,000





320000 mE 322500 mE 325000 mE 327500 mE 330000 mE 332500 mE 335000 mE 337500 mE

5427500 mN 5430000 mN 5432500 mN 5435000 mN 5437500 mN 5440000 mN 5442500 mN 5445000 mN 5447500 mN

LUCKY PROJECT
AIRBORNE GEOPHYSICAL SURVEY
CONSOLIDATED LOGAN MINES

Surveyed and compiled by WORLD GEOGRAPHIC
 August 1998
 Job number 47617



FLIGHT PATH

LEGEND
 --- 100 fical interval
 --- 10 fical interval



North point relationship one
 shown for the centre of the map
 Magnetic north is true for 1985

GRID/MAGNETIC ANGLE 18°02'44"
 GRID CONVERGENCE 174026.88"
 SCALE VARIATION 0.00021% west per year

ICR1980 values at 1985 (map centre)
 TRUE FIELD 89049.21
 DECLINATION 20°42'24"
 INCLINATION 72°51'17"

AIRCRAFT
 BIL-208
MICROMETETER
 SPLIT BEAM CTS/AM SCINTREX V2321 - H9
 RESOLUTION 0.001 millirads
 CYCLE RATE 0.1 second
 SAMPLE INTERVAL 7 metres (mag)

DATA ACQUISITION
 PICOPRS PDRS 1000 DIGITAL ACQUISITION SYSTEM

FLIGHT LINE SPACING
 TRAVERSAL LINES 100 metres
 TIE LINES 400 metres

FLIGHT LINE DIRECTION
 TRAVERSAL LINES 100 - 243 degrees
 TIE LINES 147 - 327 degrees

SURVEY HEIGHT
 40 metres above terrain clearance

NAVIGATION
 NovAta GPS System

