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## 2021 Drone Magnetics Survey on the Robert Property Ontario, Canada

As Reported By Kirkland Lake Gold Corp.

Samantha Gignac

Kara Byrnes

July 29, 2021

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#### SUMMARY

In February 2021, Kirkland Lake Gold made an agreement to purchase a series of contiguous claims from Mr. Robert. A second series of claims were purchased in May, 2021 to add to the claim standing.

Geologically, the Robert property is located in the southwestern part of the Abitibi greenstone belt in the southeast margin of the Archean Superior Province of the Canadian Shield. The Abitibi belt generally consists of east-trending, folded and faulted successions of volcanic and sedimentary rock, and dome-like granitoid intrusions.

The belt hosts numerous volcanic massive sulfide (VMS) deposits located in clusters and several gold deposits located along major deformation zones. The Robert property is located 25 kilometers west of Timmins, within the rich Timmins-Porcupine Gold Camp, where 70 million ounces of past gold were produced from deposits arranged along the crustal-scale Porcupine-Destor Fault, one of the major deformation corridors of the belt.

The geology of the property is composed mainly of mafic and felsic volcanic rocks intruded by numerous syn-volcanic suites and by later swarms of SSE (Matachewan) and SE (Sudbury) diabase dikes crosscut by an E to ENE trending fault system.

In early spring Kirkland Lake Gold contracted Abitibi geophysics to conduct a high-resolution, drone magnetic (AeroVision<sup>®</sup>) survey over that property. The main objectives of the magnetic surveying are to outline magnetic anomalies, fault/shear zones, lithological contacts, etc., in order to improve the geological understanding of the area to finally highlight possible mineralized structures.

#### LOCATION AND ACCESS

The Robert property is located approximately 25 kilometers west of Timmins, Ontario and is accessible by all-weather roads. Mallette Lumber Road runs E-W just to the south of the property. Several logging roads branch off to the north providing access to the interior part of the property.



#### **PREVIOUS WORK**

The Roberts claims cover an area in the Turnbull township that has seen sporadic exploration work since the 1900's. The earliest recorded work was a ground magnetometer survey around the Lally Mine in 1947.

Since the 1960's, several geophysical surveys have been conducted by Mespi Mines, Hollinger Mines, and Noranda Exploration. In 1976, Conwest Exploration Ltd. conducted a line cutting and magnetometer survey program.

The area sat idle until 1987 when Golden Trio Minerals Ltd. recut the grid for geophysical work and completed a pole-dipole induced polarization survey over the larger grid area.

In 1992, Falconbridge Ltd. conducted a 20-kilometer line cutting and geophysical program. The survey located a main conductive body as well as a north trending dike. Two holes were drilled on the conductor in 1994 to test the northern strike extent of the zone.

An airborne survey was flown in 1998, which was reinterpreted by the Ministry of Northern Development and Mines in 2002 as part of "Operation Treasure Hunt" initiated by the Ontario Government. The Ontario Geological Survey, as part of the "Discover Abitibi Program", flew another airborne geophysical survey in 2003. Five main anomalies were outlined in the south Turnbull area.

First Metals Inc. flew a geophysical survey in 2007 covering a small section in the south area of the previous 2003 survey. This 2007 survey resulted in the modeling of numerous airborne anomalous structures. The #10 anomalous interpretation was drilled by Claim Post Resources in the summer of 2010 (CP10-18). This drillhole was followed up by a downhole geophysical survey in 2010 and resulted in the reinterpretation of the conductor. A follow-up hole was drilled by Claim Post Resources in 2011.

The claims making up the Robert Property were registered in 2018, 2019, and 2020. These claims have since been kept active without work due to exclusions of time from the covid-19 pandemic.

#### **REGIONAL GEOLOGY**

The Robert Property lies on the western edge of the Abitibi Greenstone Belt. In the Timmins District, three volcanic (Deloro, Kidd-Munro, and Tisdale) and two sedimentary (Porcupine and Timiskaming) assemblages comprise the Abitibi Greenstone Belt, all of Archean age. The Deloro assemblage is the oldest, and consists of mafic to felsic, calc-alkalic metavolcanic rocks and associated iron formation. The Kidd-Munro assemblage (dominantly tholeiitic to komatiitic) unconformably overlies the Deloro assemblage. The Tisdale assemblage overlies the Kidd-Munro assemblage and ranges from tholeiitic to mafic to komatiitic metavolcanic rocks with minor rhyolite, grading up to calc-alkalic pyroclastic rocks and local iron formation. The Porcupine assemblage is the oldest sedimentary package and consists mostly of turbiditic sediments; it unconformably overlies the volcanic assemblages. The Timiskaming assemblage consists of coarse clastic metasediments and overlies the Porcupine Assemblage.

The most important regional structural element is the Porcupine-Destor Fault Zone (PDFZ), which is traceable for more than 450km. The belt hosts numerous volcanic massive sulfide (VMS) deposits located in clusters and several gold deposits located along major deformation zones. The Robert property is located 25 kilometers west of Timmins, within the rich Timmins-Porcupine Gold Camp, where 70 million ounces of past gold were produced from deposits arranged along the crustal-scale PDFZ. The Robert Property lies about 10km north of this deformation zone.



#### **PROPERTY GEOLOGY**

The Robert Property is composed mainly of mafic and felsic volcanic rocks intruded by numerous synvolcanic suites and by later swarms of SSE (Matachewan) and SE (Sudbury) diabase dikes crosscut by an E to ENE trending fault system. The property is highly prospective for both orogenic gold and VMS deposits with the primary commodity encountered being gold, some copper-zinc, and sometimes silver and lead.

Orogenic deposits are structurally controlled and are often related to faults and shear zones which allow the transport and deposition of minerals through hydrothermal fluids. The gold mineralization usually occurs in quartz and quartz-carbonate veins or stockworks and are often associated with pyrite, chalcopyrite, and pyrrhotite.

The copper-zinc VMS deposits occur as dense sulphide bodies composed of mainly pyrite as well as other sulphides such as pyrrhotite, chalcopyrite, sphalerite, and galena, and are usually underlain by discordant stockworks of vein-type sulphide mineralization and hydrothermal alteration.

### **EXPLORATION**

In March 2021, Kirkland Lake Gold commissioned Abitibi Geophysics Inc. to conduct a high-resolution drone magnetic (AeroVision<sup>®</sup>) survey over the Robert Property. The main objectives of the survey are to outline magnetic anomalies, fault/shear zones, lithological contacts, etc., in order to improve the geological understanding of the area, and to highlight possible mineralized structures. Follow up work will include field checking the highlighted anomalies from the survey to test for their gold bearing potential. The full version of this report is included in Appendix A.

#### REFERENCES

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APPENDIX A

UNMANNED AERIAL MAGNETIC SURVEY



LOGISTICS AND INTERPRETATION REPORT



## **ROBERT PROPERTY**

Turnbull Township, Ontario, Canada May 2021



Abitibi Geophysics, Head Office 1740, Sullivan road, suite 1400 Val-d'Or, QC, Canada, J9P 7H1 Phone: 1.819.874.8800 Fax: 1.819.874.8801 info@ageophysics.com





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### **1. RESEARCH OBJECTIVES**

Geologically, the Robert property is located in the southwestern part of the Abitibi greenstone belt in the southeast margin of the Archean Superior Province of the Canadian Shield. The Abitibi belt generally consists of east-trending, folded and faulted successions of volcanic and sedimentary rock, and dome-like granitoid intrusions.

The belt hosts numerous volcanic massive sulfide (VMS) deposits located in clusters and several gold deposits located along major deformation zones. The Robert property is located 25 kilometres west of Timmins, within the rich Timmins-Porcupine Gold Camp, where 70 million ounces of past gold were produced from deposits arranged along the crustal-scale Porcupine-Destor Fault, one of the major deformation corridors of the belt.

The geology of the property is composed mainly of mafic and felsic volcanic rocks intruded by numerous syn-volcanic suites and by later swarms of SSE (Matachewan) and SE (Sudbury) diabase dikes crosscut by an E to ENE trending fault system. Many mineral occurrences are found within (*Goldburst Resources Sample 5319, Pyrotex DDH C-24, and Lally Shaft*) and around the property. Some of the closest ones in the vicinity of the property include the Conwest DDH-3, R. Meikle Sample S-6, and Mespi Mines DDH T-2 (Figure 1). The primary commodity encountered is usually gold, some copper- zinc and sometimes silver and lead. The property is highly prospective for both orogenic gold and VMS deposits.

Orogenic deposits are structurally controlled and are often related to faults and shear zones which allow the transport and deposition of minerals through hydrothermal fluids and the gold mineralization usually occurs in quartz and quartz-carbonate veins or vein stockworks and are often associated with pyrite, chalcopyrite, and pyrrhotite.

The copper-zinc VMS deposits occur as dense sulphide bodies composed of mainly pyrite as well as other sulfides such as pyrrhotite, chalcopyrite, sphalerite, and galena, and are usually underlain by discordant stockwork of vein-type sulphide mineralization and hydrothermal alteration.

In March 2021, Kirkland Lake Gold commissioned Abitibi Geophysics Inc. to conduct a high-resolution, drone magnetic (AeroVision<sup>®</sup>) survey over that property. The main objectives of the magnetic surveying are to outline magnetic anomalies, fault/shear zones, lithological contacts, etc., in order to improve the geological understanding of the area to finally highlight possible mineralized structures.



Figure 1. Simplified geology of the survey area.



### 2. IMPLEMENTED SOLUTION

The magnetic method is one of the most commonly applied techniques in mineral exploration, mainly because of its sensitivity to lithologic and structural variations in igneous and metamorphic terranes that commonly host mineral deposits. In addition, the method can be readily applied using aircraft or drone for aeromagnetic surveying, thereby allowing large areas to be covered rapidly and efficiently.

With the AeroVision<sup>®</sup> drone-magnetic survey, Abitibi Geophysics offers a high-end geophysical survey with unmatched resolution, relying on a ground-breaking flight control system, unique in North America. The  $AimLow^{TM}$  navigation and obstacle avoidance system, developed in close collaboration with Devbrio Geophysics, allows us to maintain the lowest achievable altitude throughout the survey, even in the most rugged conditions. With advanced control algorithms the UAV can maintain a constant *At Ground Level* (AGL) altitude while continuously avoiding occasional obstacles, like higher trees or structures. The resulting data has the resolution of a ground survey but collected with the effectiveness of an airborne survey.

As described in the previous section, the Robert property has potential for greenstone-hosted VMS mineralization and orogenic gold deposits. In this context, the AeroVision<sup>®</sup> magnetic survey can play a key role in improving the structural and geological understanding (mapping) of the property and delineate magnetic features that could be linked to key elements (structures and geological signatures) of those deposit types.

To achieve the geophysical objectives of this project the following steps were carried out:

- Processing magnetic data to provide a high-quality image of the total magnetic intensity, its reduction to the pole (RTP) and residual anomaly.
- Generating the high-resolution first vertical derivative to help trace the magnetic trends and dike structures.
- Outlining of the tectonic features.
- Delineating magnetic features.

### **3. GEOPHYSICAL INTERPRETATION**



### ANALYSIS OF THE REGIONAL GEOPHYSICAL DATA

Before initiating analysis of the collected drone magnetic data, it is useful to examine the existing regional magnetic dataset over a larger scale than the detailed survey area. This is to establish the context and to identify structures that may only be recognized with the benefit of a larger field of view.

The analysis of the aeromagnetic data compilation of Abitibi (Abitibi, QC-ON - MAG - Residual Total Field) presented in Figure 2, shows that the Robert property is located within a low magnetic environment, reflecting the felsic rock type underlaying the property.

The geological map of the study area (Figure 1) presents a swarm of diabase dykes striking NNW to NW. Those features have been overlain onto the regional magnetic map as shown in Figure 2 to review their correlations. Most of the dykes found in the eastern part of the geological map correlate well with the high magnetic lineaments observed. Also, a diabase dyke that runs along the northern part of the property is well defined within the semi-detailed magnetic grid. We labelled this high magnetic trend as **RH2**.

Another magnetic high trends NW-SE across the "south-middle" part of the property; we refer to that one as **RH1**. The two distinctive known fault zones, both trending approximately E-W, also have their signature well defined in the semi-detailed magnetic grid. As shown in Figure 2, **RF1** could be extended to the southwest while **RF2** to the northeast.

Please note that we only outlined magnetic and tectonic features that are in the AeroVision survey areas.





Figure 2. Semi-detailed residual total field map (Abitibi, QC-ON) of the survey area.



#### ANALYSIS OF THE AEROVISION® SURVEY

The AeroVision<sup>®</sup> magnetic survey conducted on the Robert property comprises two blocks; the southern block consists of 20 lines (L 20+00E to L 39+00E), while the northern block of 27 lines (L 0+00E to L 26+00E). On both blocks, the AeroVision<sup>®</sup> magnetic survey was conducted using a multirotor DJI M 600 drone flown with an average magnetic bird terrain clearance of 34 m with SE-NW flight lines regularly spaced at 100 m apart. Further information on instrument and survey specifications is included in Appendix B.

The recorded total magnetic field over the Robert Property ranges from 54 875 nT to 55 375 nT, with an average of approximately 54 950 nT. The most dominant features observed on this property are described below. Please refer to the following figures (Figure 3 to Figure 6) and the *Geophysical Interpretation Map* (10.0).

- Two highly magnetic lineaments, labelled RH1 and RH2, oriented respectfully NW-SE in the southern block and N-S in the northern block. These outlined magnetic signatures correspond to diabase dikes. The magnetic amplitudes of these lineaments range from 100 to 350 nT. According to the geological map of the study area (Figure 1), RH2 was already known and RH1 was mapped up to the property boundary. These dykes are also defined in the semi-detailed Abitibi, QC-ON magnetic map shown in Figure 2. This AeroVision survey helped in refining their position; RH1 is being extended through the property while RH2 is moved (shifted) about 50 100 m to the east.
- Trending parallel and just west of RH2 is found another high magnetic lineament that we labelled H3. This lineament is not very well-defined and is divided (broken) into many segments.
- A NW-SE trending magnetic lineament, labelled **H4** occurs in the eastern part of the northern grid. This lineament appears to coincide with a very obvious break through the RH2 diabase dyke and could be interpreted as a mafic dyke intruded into a pre-existing fault zone.
- The eastern boundary of the northern block is characterized by a high magnetic zone, marked **H5**, which correlates with the Lally Shaft and Pyrotex DDH C-24 mineralized zones.
- A highly magnetic lineament (**H6**) was identified at the extreme southwestern end of the survey grid. This ill-defined anomaly seems to trend northward and could reflect the signature of a diabase dyke. This interpretation also correlates with the high magnetic trend observed just outside the property boundary (southwestern corner) in the "regional mag" shown in Figure 2.
- A few short, ill-defined and/or weakly magnetic trends/anomalies are also highlighted in this project. These magnetic features were not labelled but are still marked as black or green lines in the various figures.
- In addition to the faults interpreted from the semi-regional magnetic survey and the fault along the **H4** magnetic lineament described above, a few other short local faults were interpreted. Confidence in their interpretation is low due to the limited extent of this survey.
- It is worth noting the presence of three magnetic lows (negative anomalies of -50 nT in amplitude) within the study grid. These anomalies, labelled L1 and L2, deserve some attention as they may reflect hydrothermal alteration zones. L1 is located just to the north of a regional fault zone, while L2 is just east of the Goldburst Resources Sample 5319 mineralized zone. Other negative anomalies could be worth investigating in the southern survey block.



Figure 3. High-resolution AeroVision<sup>®</sup> total magnetic field with geophysical interpretation.



Figure 4. High-resolution AeroVision<sup>®</sup> total magnetic field reduced to the pole with geophysical interpretation.







Figure 6. High-resolution AeroVision<sup>®</sup> residual anomlay reduced to the pole with geophysical interpretation.



### 4. CONCLUSION AND RECOMMENDATIONS

High-resolution airborne magnetic datasets are considered essential components of mineral exploration programs. Generally, they are indirectly used to map structures (feeder faults/shear zones) and lithological units where mineralization could be located.

In this project, the interpretation of the collected drone magnetic data successfully improved the understanding of the Robert property.

However, the magnetic method alone cannot solve the outlined objective and the support of other geophysical methods is paramount.

An Induced Polarization survey such as **OreVision**<sup>®</sup> would ensure the potential targets are associated with a sulfide-rich quartz vein gold deposit (typical of orogenic gold), while a ground **TDEM** survey would be a better option if targets are suspected to be semi-massive to massive in nature (VMS type). These types of geophysical surveys would also help to better define the geometry of the targets prior to drilling.



The author is confident that the Robert Property offers potential for discovering new mineralized zones and our investigation of the anomalous sources identified by the present survey will be positive.

However, our knowledge of the property's geology is not as thorough as the geologists of Kirkland Lake Gold and our interpretation is mainly based on the observed geophysical responses.

To maximize the outcome of the present results, Kirkland Lake Gold should ensure all available geoscience information are compiled, assessed and, if necessary, redefine the priority and nature of the interpretation proposed in this report.



Pam Coles, P.Geo. PGO # 2612 Chief Geophysicist Respectfully submitted, Abitibi Geophysics Inc.



Catherine Phaneuf, P.Geo. OGQ # 1860 Project Geophysicist

CP/sl



### **APPENDIX A – PROJECT OVERVIEW**

PROJECT ID	Robert Property (Our reference: 21NT021-MU)
GENERAL LOCATION	Timmins, Ontario
CUSTOMER	Kirkland Lake Gold Ltd. Timmins Regional Office PO Box 1070 823 Birch Street South Timmins, Ontario, Canada, P4N 7C5 www.kl.gold
Representative	Kara Byrnes, P.Geo. Regional Exploration Superintendent kbyrnes@kl.gold
SURVEY TYPE	AeroVision <sup>®</sup> (UAV-MAG) Survey
GEOPHYSICAL OBJECTIVES	To improve the geological understanding of the property





Figure 7. General location of the Robert Property.



LOCATION	Turnbull Township, Ontario, Canada Centred on 48°28'42.65" N, and 81°38'28.75" W NAD83 / UTM zone 17N: 452 605 mE, 5 369 685 mN NTS sheet: <b>42A/05 &amp; 42A/12</b>
NEAREST SETTLEMENT	Timmins: approximately 25 km east of the survey area.
Access	From Timmins, the survey area is accessible via ON-101E, Malette Lumber Road and then side roads.
Physiography	The survey grid is in a region of little to moderate topographic relief, with elevations ranging from 290 to 340 m above sea level.
	Hydrographically, there is only one N-S stream in the study area.
CULTURAL FEATURES	Trails, old borehole casings and other debris were observed on the survey grid. These features do not seem to have affected the quality of the data.
MINING LAND TENURE	The covered claims in the present project are wholly (100%) owned by Kirkland Lake Gold. These claims are illustrated in Figure 8.
SURVEY GRIDS	The AeroVision <sup>®</sup> survey consists of two blocks regularly spaced at 100 metres and oriented N45°.
	The southern block consists of 20 lines (L 20+00E to L 39+00E) and four tie-lines (TL 0+00N to TL 15+00N).
	The northern block consists of 27 lines (L 0+00E to L 26+00E) and five tie-lines (TL 30+00N to TL 50+00N).
	Refer to Figure 8 for a plan view of the zone covered by the present survey.
COORDINATE SYSTEM	Local datum: NAD83 Projection type: Universal Transverse Mercator (UTM) Zone: 17N





Figure 8. Index of claims and AeroVision® flight coverage within the Robert Property.



### **APPENDIX B – TECHNICAL SPECIFICATIONS**

- □ *TYPE OF SURVEY* Measurement of the total magnetic intensity (TMI) with RTK-GPS readings recorded every 0.1 second (10 Hz sample rate) using an unmanned aerial vehicle (UAV). The plotted total magnetic values were corrected for diurnal variations using readings taken every 3 seconds by a synchronized local base station.
- DATA ACQUISITION March 15<sup>th</sup> and 16<sup>th</sup>, 2021
- SURVEY COVERAGE 78.5 km



Figure 9. Devbrio UAV-Multirotor with CS-VL magnetometer.



TECHNICAL SPECIFICATIONS

Multirotor DJI M 600 UAV platform equipped with collision avoidance system.

•	Diagonal Wheelbase	1133 mm
•	Dimensions	1668 x 1518 x 727 mm
•	Weight	9.1 kg
•	Max Takeoff Weight	15.5 kg
•	Hovering Accuracy (P-GPS)	Vertical ±0.5 m, Horiz. ±1.5 m
•	Max Angular Velocity	Pitch: 300°/s, Yaw: 150°/s
•	Max Pitch Angle	25°
•	Max Wind Resistance	8 m/s
•	Max Ascent Speed	5 m/s
•	Max Descent Speed	3 m/s
•	Max Speed	65 km/h / (40 mph), no wind
•	Max Service Ceiling ASL	2500 m
•	Hovering Time	No payload: 38 mn, 5.5 kg
		payload: 18 mn
•	Flight Control System	A3 Pro
•	Nacelles DJI compatibles	Ronin-MX, ZENMUSETM Z30,
		Zenmuse X5/X5R, Zenmuse X3,
•	Operating Temperature	-10 à 40 °C (14 à 104 °F)
-	Remote Controller:	

#### • Operating Frequency 920,6 MHz to 928 MHz (Japon); 5,725 GHz to 5,825 GHz: 2,400 GHz to 2,483 GHz • Max Transmission Distance FCC Compliant: 5 km (3,1 miles); CE compliant: 3,5 km (2,2 miles) (Unobstructed, free of interference) • Transmitter Power (EIRP) 10 dBm @ 900 M, 13 dBm @ 5,8 G, 20 dBm @ 2,4 G • Video Output Port HDMI, SDI, USB Operating Temperature 10 à 40 °C (14 à 104 °F) Battery 6000 mAh LiPo 2S ٠ - Standard Battery (Model TB48S):

Capacity	5700 mAh
Voltage	22.8 V
<ul> <li>Battery Type</li> </ul>	LiPo 6S
Energy	129.96 Wh
<ul> <li>Net Weight</li> </ul>	680 g
<ul> <li>Max Charging Power</li> </ul>	180 Ŵ



#### □ ROVER MAGNETOMETER

**CS-VL** from Scintrex,

Sensor: Self-oscillation split-beam Cesium Vapor (non-radioactive Cs-133)

Resolution:
Sensitivity:
Operating zones:
Noise envelope:
Absolute accuracy:
Sampling rate:
Gradient tolerance:
Operating range:
Heading error:
Weight:

0,001 nT 0.0006 nT @ 1Hz 15° à 75° & 105° à 165° Typically 0.002 nT P-P < 2.5 nT 0.1 sec (10 Hz) > 40 000 nT/m 15 000 – 100 000 nT ± 0,2 nT 890 g (3 m cable)



BASE STATION	GSM-19W from GEM Systems,	
MAGNETOMETER	Sampling rate:	3 seconds
	Reference Field:	55 000 nT
	Location (Long., Lat):	48.4494, -81.6797
Collision avoidance	Devbrio ANCAS,	
SYSTEM	Collision avoidance rate:	50 Hz
	Obstacle detection:	Up to 70 m



GPS NAVIGATION SYSTEM	<ul> <li>ZED-F9P module</li> <li>u-blox F9 high precision GNSS module / Dual Frequency</li> <li>Concurrent reception of GPS, GLONASS, Galileo and BeiDou</li> <li>Multi-band RTK with fast convergence times and reliable performance</li> <li>High update rate for highly dynamic applications</li> <li>Centimeter accuracy in a small and energy efficient module</li> <li>Easy integration of RTK for fast time-to-market</li> </ul>		
SURVEY SPECIFICATIONS	<ul> <li>Nominal survey speed:</li> <li>Average terrain clearance:</li> <li>Flight direction:</li> <li>Line interval:</li> <li>Tie-line interval:</li> </ul>	12 m/s 34 m (AGL) N 45° / N135° 100 m 500 m	
Personnel	Simon Thiboutot-Boivin, Pierre-Olivier Dostie, Eng. Carole Picard, Tech. Catherine Phaneuf, P.Geo. Pam Coles, P.Geo.	UAV System Operator QA-QC and Operator Plotting Processing and Report Final validation of product conformity	
DATA QUALITY CONTROLS	Before the survey:		
	<ul> <li>✓ All magnetometers were successfully field-tested and automatically synchronized with GPS time.</li> <li>✓ The pilot uploads the flight plan to the AutoCopter via a laptor computer and ensure no errors in the GPS waypoints.</li> <li>✓ The pilot estimates the number of lines to survey before switching to the manual mode to return the AutoCopter to the field base operation to change the batteries.</li> </ul>		
	During data acquisition:		
<ul> <li>✓ The QA/QC geophysicist had to successfully magnetic contamination before each take-off.</li> <li>✓ Clover leaf test should show a standard deviat across eight intersections.</li> <li>✓ The QA/QC geophysicist reviewed (validated) th recorded data every time the AutoCopter returns operations.</li> </ul>		had to successfully test for any ore each take-off. w a standard deviation within 1 nT viewed (validated) the quality of the e AutoCopter returns to the base of	

✓ The QA/QC geophysicist ensure no active geomagnetic activity would be encountered during the survey by visiting the Space Weather Canada website:

(www.spaceweather.gc.ca/forecast-prevision).



# DATA QUALITY CONTROLS (CONTINUED)

#### At the Base of Operations:

- ✓ Field QCs were inspected & validated.
- ✓ The data set was viewed on a line-by-line basis to check for errors (spikes), doubled measures (overlaps), using a profile editor.
- $\checkmark$  Fill in by interpolation of the short-missed sections in the raw data.
- ✓ Diurnal correction
- ✓ Low-pass / B-spline filter to remove the high frequency noise.
- ✓ Conventional microlevelling of the magnetic data using:
  - <u>Statistical levelling</u>: this operation which levels the tie lines to the flight lines of tie lines.
  - <u>Full levelling</u>: this operation levels the flight lines to the ties.
  - <u>Microlevelling</u>: applied to remove persistent low-amplitude components of flight-line noise remaining in the data.



### APPENDIX C – DELIVERABLES

□ *TOTAL FIELD CONTOURS* The total magnetic field (TMF) was gridded using a Bi-Directional Line Gridding (BIGRID GX) algorithm with grid cell size of 25 m. One pass of a 3 x 3 Hanning filter was applied to the resulting grid, which was then re-gridded with a cell size of 5 m to improve the overall appearance of the final map (1.2).

The Oasis Montaj colour table (Clrb64.tbl) was used with linear intervals of 5 nT from 54 885 nT to 55 205 nT.

□ CALCULATED VERTICAL GRADIENT CONTOURS Using a convolution filter method, the vertical gradient (first vertical derivative) of the total magnetic field is calculated to enhance the high frequency component of the magnetic data and eliminate long wavelength regional effects. This high frequency enhancement resolves the contacts of magnetic features more accurately than the total field response (map 1.4)

The Oasis Montaj color table (Clra64.tbl) was used with linear intervals of 0.10 nT/m from -2.5 nT/m to +2.5 nT/m.

□ *MAPS PRODUCED* Three (3) magnetic maps at a scale of 1:5000, are inserted in pouches at the end of this report.

All plan maps are registered to the NAD83 / UTM zone 17N grid coordinate system, as collected in the field.

Our Quality System requires that at least two qualified persons inspect every final map before being approved and included in a final report.

DIGITAL DATA The above-described maps are delivered in the Oasis Montaj map, PDF, PNG, MapInfo, GeoTIFF, DXF and ArcView file formats on DVD-Rom.

The processed data (Oasis Montaj databases) is also delivered on DVD-Rom.

### Table 1. Maps Produced

Map number	AeroVision <sup>®</sup> (Drone-MAG) Survey	Scale		
Robert Project				
1.2	Total Field Contours (nT)	1:5000		
1.4	Calculated Vertical Gradient Contours (nT/m)	1:5000		
10.0	Geophysical Interpretation	1:5000		