

# **ASSESSMENT REPORT**

## **Results of an Airborne Magnetometer Survey**

### **Lennac Lake Property**

### **West Central British Columbia**

**Omenica Mining Division**

**Tenure Nos.: 504371, 551061, 551062, 897483, 897484, 897486, 897487, 937574**

**NTS Map 93L/9**

**Claim center coordinates**

**Latitude: 54° 44' 19" N**

**Longitude: 126° 18' 29" W**

**UTM Zone 9, 673312E, 6069012N (NAD83)**

**BC Geological Survey  
Assessment Report  
33302**

**Owners: D.G. MacIntyre and V.H. Parsons**

**Operator: Riverside Resources (BC) Inc.**

**Report prepared by:**

**D.G. MacIntyre, Ph.D., P.Eng.**

**October 1, 2012**

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# 1 Summary

The Lennac Lake property is located west of Babine Lake in central British Columbia. This property covers a number of copper-molybdenum showings that were first discovered by Amax Exploration Inc. in 1971. Amax did a limited amount of drilling and allowed the claims to lapse. This work defined two areas of low grade Cu mineralization - the West and East zones. Subsequent operators on the property have included Kennecott, Cominco and Hudson Bay Exploration and Development. These companies did very little work on the property. Subsequently the claims were allowed to expire and the property was re-staked by D.MacIntyre and V.Parsons in September 2004.

The Lennac Lake property is under option to Riverside Resources (BC) Inc. Riverside also holds mineral tenures in the area surrounding the Lennac Lake property (Flute and Lennac project areas). In April 2012 Riverside contracted Aeroquest Airborne to conduct an airborne magnetometer survey over the project area, including the Lennac Lake claims. A total of 4444 line-kilometres was flown over the Riverside claims. Of this 158.5 line-kilometres or 3.56% of the total covered the Lennac Lake property. Survey lines were flown at azimuth 45° and 225° at a spacing of 200 metres; tie lines were flown at azimuth 135° and 315° at a spacing of 2000 metres. The total cost of this work was \$284,344 of which \$10,139.09 (3.56%) is assigned to the lines covering the Lennac Lake property.

This assessment report is in support of a Statement of Work (SOW) submitted on July 17, 2012 (event 5394759) using the Mineral Titles On-Line mineral tenure management system. The total value of the work described in this report is \$13,739.09.

The results of the airborne magnetometer survey are discussed in this report. The survey shows three subcircular doughnut shaped magnetic anomalies oriented in a northwest-southeast trend that roughly correspond to known and suspected intrusive centers and attendant porphyry copper mineralization.

Additional diamond drilling is required to determine the ultimate extent and grade of known mineralization in the West, East and Southeast zones. All of these zones remain open in one or more directions. The Jacob showing should also be diamond drilled as there is no information available on the results of previous exploration drilling.

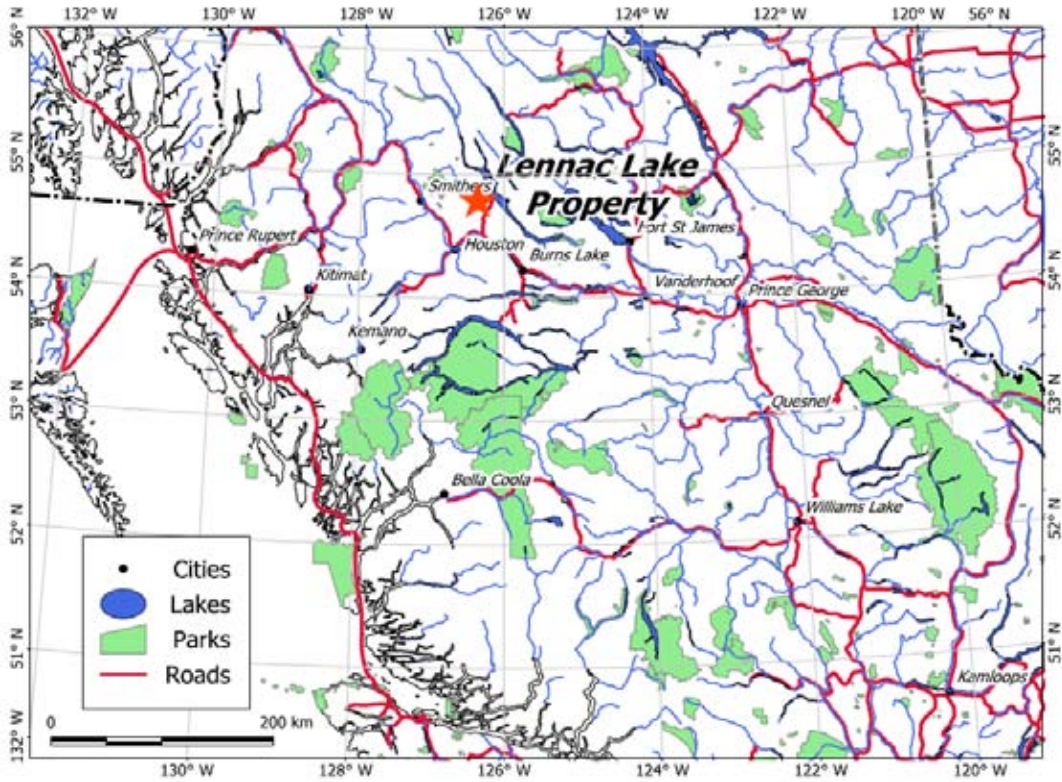


Figure 1. General location map, Lennac Lake property

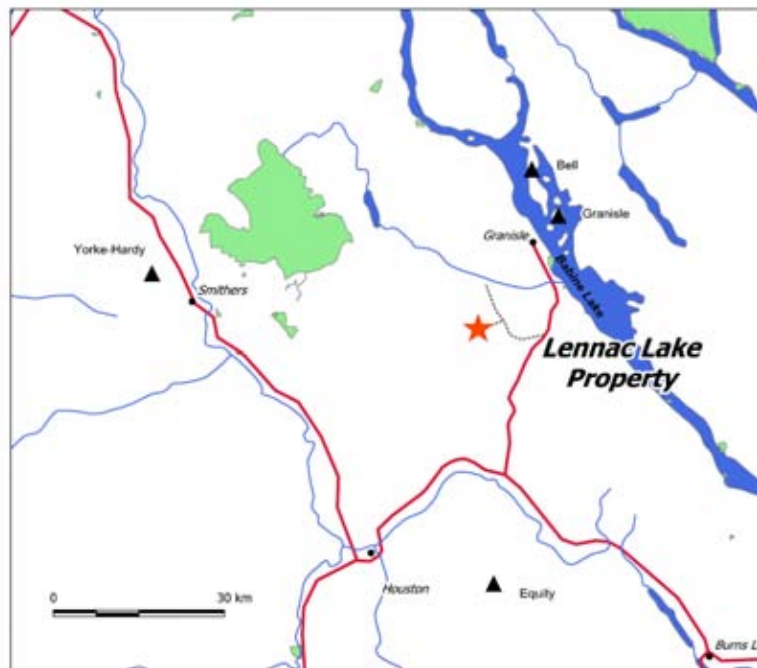


Figure 2. Access routes, Lennac Lake Property. Triangles represent the location of major porphyry Cu and Mo deposits in the area.

## 2 Property Description and Location

The Lennac Lake property is located west of Babine Lake in west central British Columbia (Figure 2). The nearest town is Granisle, about 18 kilometres northeast of the property. The Lennac Lake claims are reached by traveling northeast along the paved Granisle highway from the village of Topley on Highway 16. At kilometre 30, turn left onto a well-maintained logging road for five kilometres to the start of an old four-wheel drive exploration road that extends seven kilometres west to the original showings. The center of the property (Suratt showing) is at latitude  $54^{\circ}44'19''$  N and longitude  $126^{\circ}18'29''$  W. The corresponding UTM coordinates are 673312E, 6069012N (NAD 83, Zone 9). The property is located on NTS map sheet 93L/9.

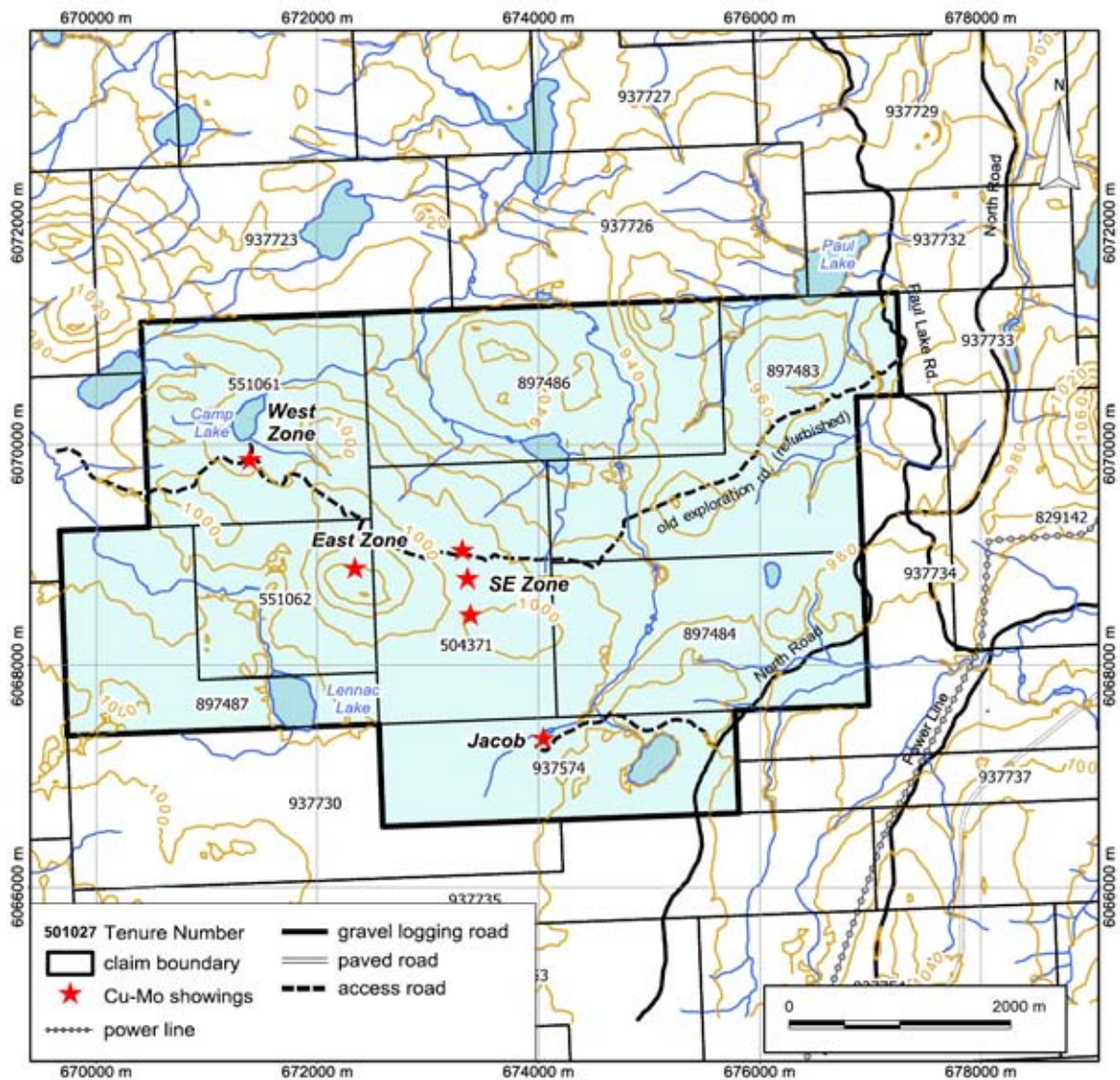


Figure 3. Mineral tenure map, Lennac Lake property.



The Lennac Lake claim group consists of eight (8) contiguous mineral tenures that are located within the Omégon Mining Division (Table 1 & Figure 3). The total area of the tenures within the property boundary shown in Figure 3 is calculated to be 2875.46 hectares. These tenures are held by Donald George MacIntyre (50%) and Harold Victor Parsons (50%).

The mineral tenures comprising the Lennac Lake property are shown in Figure 3 and listed in Table 1. The claim map shown in Figure 3 was generated from GIS spatial data downloaded from the Government of BC, Integrated Land Management Branch (ILMB), Land and Resource Data Warehouse (LRDW) (<http://archive.ilmb.gov.bc.ca/lrdw/>). These spatial layers are generated by the Mineral-Titles-Online (MTO) electronic mapping system that is used to locate and record mineral tenures in British Columbia.

**Table 1. List of Mineral Tenures, Lennac Lake Property**

Tenure Number	Claim Name	Issue Date	Good To Date	Area (ha)
504371		2005 Jan 20	2013 Sep 07	373.47
551061	LENNAC WEST	2007 Feb 03	2013 Sep 07	373.34
551062	LENNAC EAST	2007 Feb 03	2013 Sep 07	224.08
897483	LENNAC NORTHEAST	2011 Sep 14	2013 Sep 07	466.72
897484	LENNAC SOUTHEAST	2011 Sep 14	2013 Sep 07	392.18
897486	LENNAC NORTH	2011 Sep 14	2013 Sep 07	447.99
897487	LENNAC SOUTHWEST	2011 Sep 14	2013 Sep 07	298.80
937574	JACOB	2011 Dec 14	2013 Sep 07	298.88

2875.46

Claim details given in Table 1 were obtained using an online mineral tenure search engine available on the MTO web site. All the mineral tenures listed in the table are held jointly by D.G. MacIntyre (50%) and H.V. Parsons (50%).

### 3 Accessibility, Climate, Local Resources, Infrastructure and Physiography

The claims are in a relatively flat area west of Babine Lake. Elevations range from 880 to 1050 metres. Lower areas on the property, especially to the south, are swampy but there are also low rises covered by open pine forest and shallow overburden. Outcrop is scarce but the southeast showings were exposed by trenching into glacial deposits less than a metre deep. In some areas, deep glacial outwash sands and gravels have buried bedrock.

The Lennac Lake property is ideally located for development. An all weather paved highway is within a few kilometers of the showings as is a transmission line that serves the community of Granisle (Figure 3). The CN railway line is located approximately 40 kilometres south of the property and is accessible via the Granisle Highway or Houston Forest products haulage road. The property is relatively flat and is largely covered by pine forest growing on thin gravel outwash deposits. Much of the pine is infected with pine beetle and will probably die within the next few years. Much of this pine may be logged as part of a salvage operation.

## 4 History

The Lennac Lake copper-molybdenum prospect was first discovered by Amax Exploration Inc. in 1971 and staked as the Thezar claims (Leary and Allen, 1972). (Minfile Nos. 93L 190, 191). Work on the property defined four areas of low-grade copper mineralization. After completing an IP survey (Depaoli and Allen, 1972) Amax drilled 44 percussion holes in 1973 (Silversides, 1973) and five diamond drill holes in 1974 (Hodgson, 1974). At the same time, British Newfoundland Exploration Ltd. drilled 11 percussion and three diamond-drill holes on the Jacob showing south of the Thezar claims. The claims were in both cases allowed to lapse.

In 1990, L. Bourgh restaked the property and it was optioned to Kennecott Exploration (Canada) Ltd. Kennecott completed geological mapping, prospecting and trenching and found additional copper showings on the east side of the property (the southeast showings) (Smit and Harizal, 1992). Cominco Ltd. optioned the property in 1993 and did additional prospecting, soil geochemistry and trench sampling in the southeast showing (Callan, 1993; Jackisch, 1993).

Hudson Bay Exploration and Development held the property in 1998. After airborne electromagnetic surveys, it was concluded that grids should be investigated for outcrop and soil geochemistry in the vicinity of several EM anomalies (Bidwell, 1998). However, Hudson Bay dropped the claims in July 2004.

Six two-post legacy claims were staked over the southeast showings in September 2004 by D.G. MacIntyre and V.H. Parsons of Victoria. Additional claims to cover the original Thezar and Jacob showings were added on Jan. 12, 2005 when electronic staking was inaugurated. The original two-post claims were subsequently converted to cell claims.

In February 2007, Dentonia Resources Inc. optioned the Lennac Lake property from the current property owners. The main focus of Dentonia's exploration program was the



Southeast Zone, which was discovered in the early 1990's, and had not been previously drill tested. Between August 15 and October 15, 639 metres of AQ diamond drilling in 9 short drill holes (none of which exceeded 100 metres in vertical depth) was completed in the Southeast Zone. Results of this drilling were disclosed in news releases dated November 16, 2007 and January 26, 2008. This drilling indicated anomalous concentrations of Mo, Cu, Ag and to a lesser extent Au occur in clay altered volcanic rocks and feldspar porphyry dykes over a distance of 800 metres. Dentonia, encouraged by the extensive alteration and fine-grained sulphide mineralization intersected in the 9 short AQ drill holes, contracted Driftwood Diamond Drilling of Smithers B.C. to do additional drilling on the property. A total of 2,650 metres of NQ diamond drilling was completed in 9 drill holes between early December 2007 and January 18, 2008 when the drilling program was halted due to insufficient funds. Dentonia subsequently dropped its option on the property.

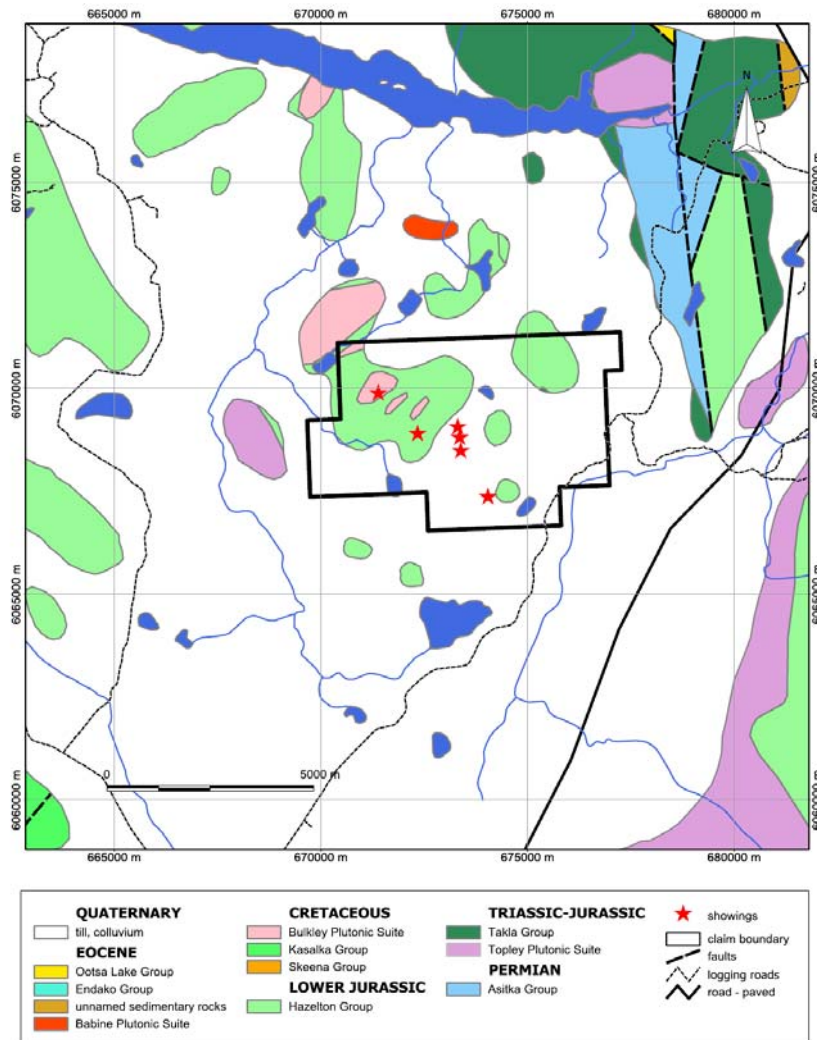


Figure 4. Regional geology, Lennac Lake Property.

## 5 Regional Geology

The area surrounding the Lennac Lake property is mainly underlain by Jurassic Hazelton Group volcanics and lesser sediments (Figure 4). To the east of the property, Triassic Takla Group volcanics and sediments are in fault contact with the Hazelton Group. To the north Cretaceous sediments overlie the Hazelton Group, and to the south Tertiary volcanics of the Ootsa Lake and Endako Groups overlie the Hazelton rocks.

There are three ages of intrusives in the area. Jurassic Topley quartz monzonites and granodiorites underlie a large area south of the property. Late Cretaceous Bulkley intrusions, quartz monzonite and quartz diorite, occur as plugs throughout the area. Finally, Tertiary Babine intrusives occurring as small plugs and dikes are found around Babine Lake. They are often described as biotite-feldspar porphyries. Mineralization occurs in porphyries associated with all three ages of intrusives. The former Granisle and Bell mines about 25 kilometres north of Lennac Lake are associated with Babine intrusives.

## 6 Property Geology and Mineral Occurrences

On the Lennac Lake property, porphyry copper mineralization and alteration are associated with a series of northeast-trending dikes of biotite-hornblende-feldspar-quartz porphyry that intrude maroon lapilli tuffs and volcanoclastic rocks of the Lower Jurassic Telkwa Formation (Figure 5). The porphyry, which is quartz monzonite to granodiorite in composition and is typical of the Late Cretaceous Bulkley intrusions, contains euhedral biotite books, hornblende, plagioclase and locally quartz eyes up to one centimetre in diameter. Phenocrysts comprise up to 30 per cent of the rock.

The four main areas of mineralization on the property are the West, East, Southeast and Jacob zones (Figure 5). The West zone, discovered first, is mostly disseminated and fracture-coated pyrite, chalcopyrite and trace molybdenite in relatively fresh, coarse-grained porphyry and hornfelsed volcanics. The East zone is mainly fracture coatings and veinlets of pyrite and chalcopyrite with associated chlorite-epidote alteration. This alteration is superimposed on biotite hornfelsed Telkwa volcanics.

The Southeast zone has three separate mineralized occurrences, the Suratt showing, and trenched areas 230 and 530 metres respectively further south (Figure 6). There is no outcrop between these showings. The Suratt showing includes chalcopyrite, pyrite and some tetrahedrite in what has been variously described as a rhyolite breccia or a silicified and bleached originally dark-green andesite. This is exposed in trenching along the old exploration road.

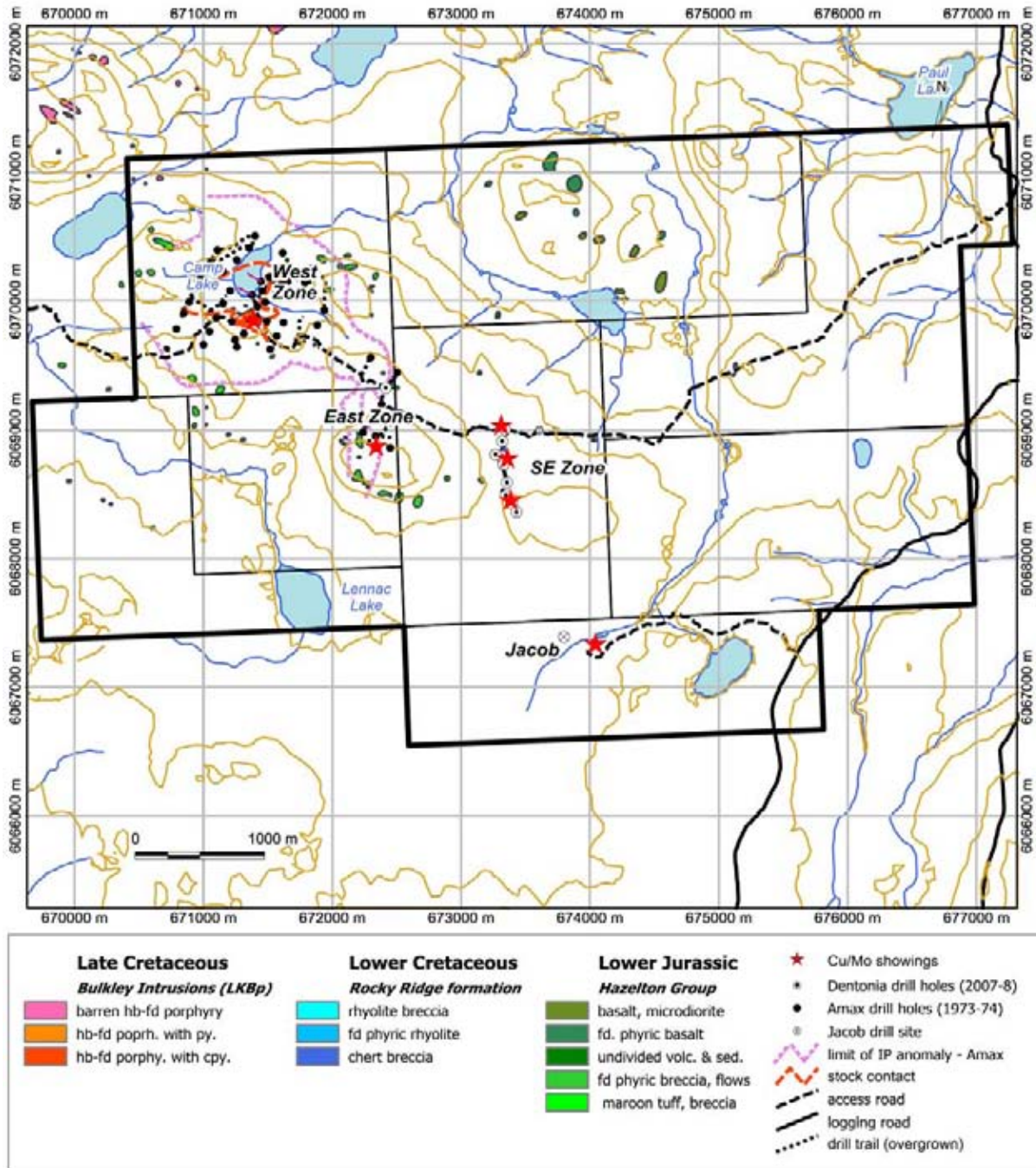


Figure 5. Property geology and mineral occurrences. After Silversides, 1972, 1973.

The trenches further south exposed a quartz-molybdenite stockwork in a quartz-sericite altered quartz-biotite-feldspar porphyry, and further on disseminated and fracture-controlled chalcopyrite and pyrite in a fine-grained quartz-sericite-altered feldspar porphyry and a medium to coarse-grained quartz-biotite-feldspar porphyry intrusion.

At the Jacob showing, Hazelton volcanics are intruded by granodiorite and associated biotite-feldspar porphyry. Quartz veining and quartz-carbonate stringers host pyrite with



minor chalcopyrite, molybdenite and bornite. Traces of magnetite and sphalerite were noted in some quartz-carbonate stringers. (Minfile No. 93L 243).

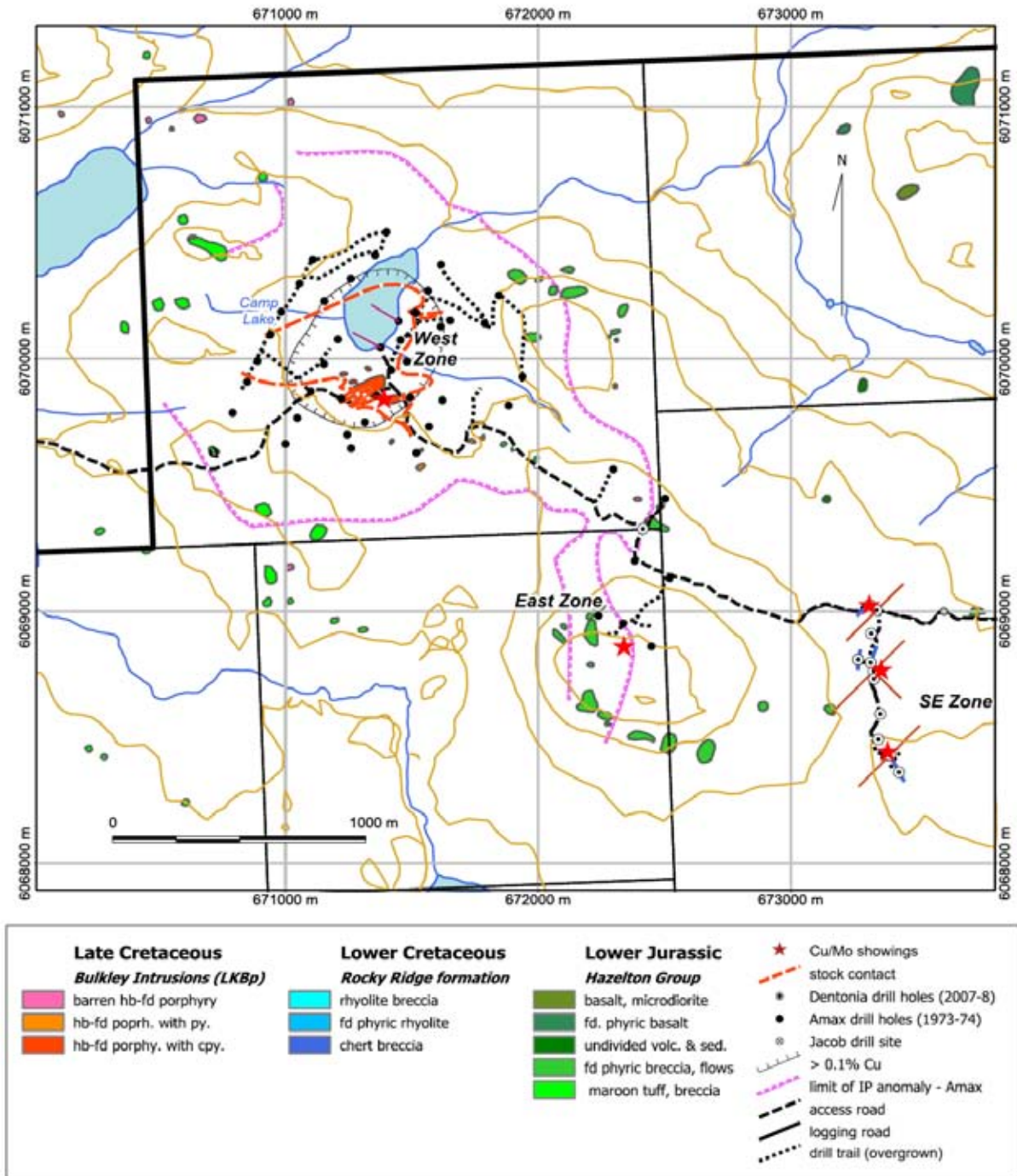


Figure 6. Geology and drill hole locations, West, East and Southeast zones. After Silversides (1972, 1973) and Hodgson (1974).

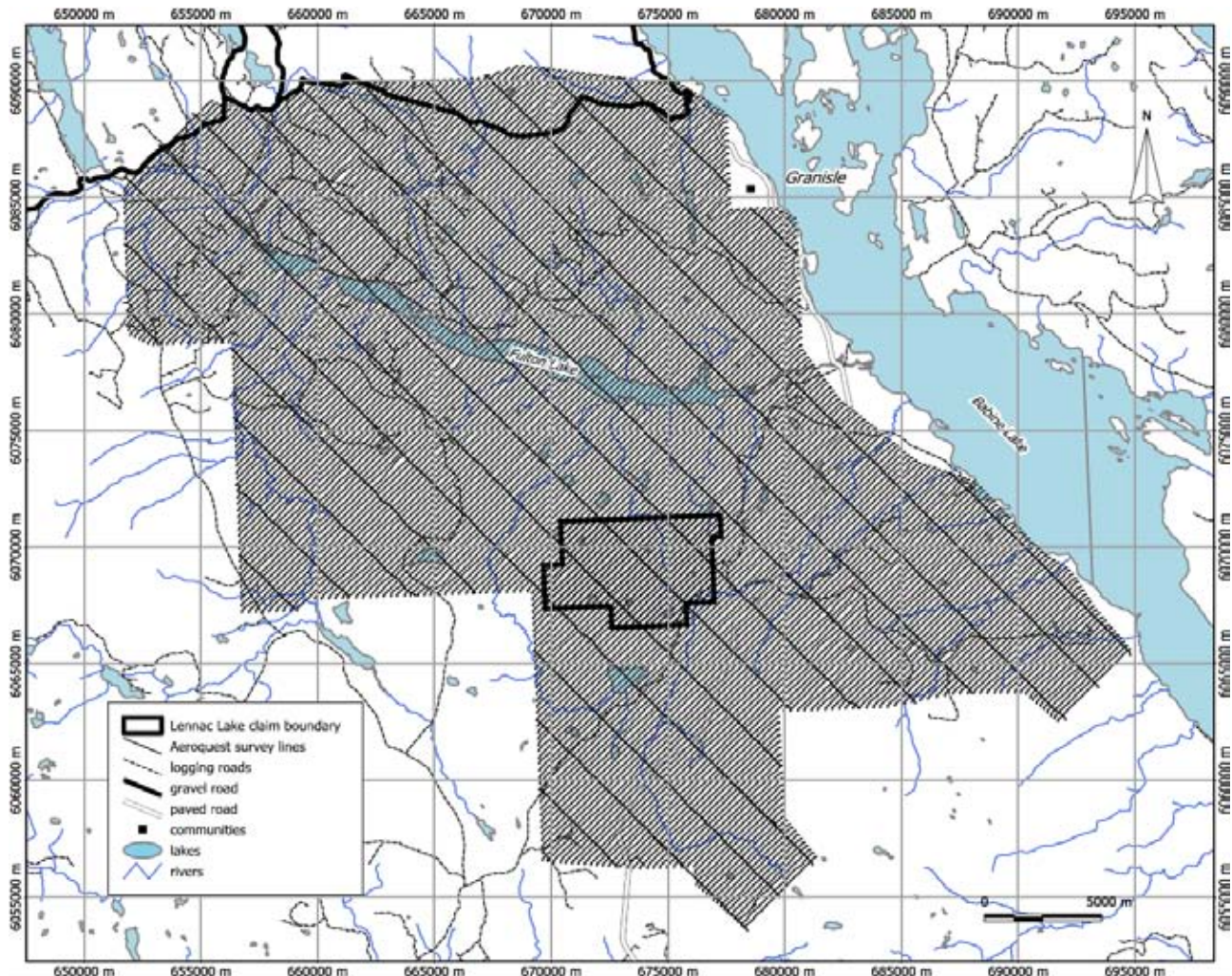


Figure 7. Location of Aeroquest airborne magnetometer survey flight lines relative to the Lennac Lake property (bold outline).

## 7 Airborne Magnetometer Survey

The Lennac Lake property is under option to Riverside Resources (BC) Inc. Riverside also holds mineral tenures in the area surrounding the Lennac Lake property (Flute and Lennac project areas). In April 2012 Riverside contracted Aeroquest Airborne to conduct an airborne magnetometer survey over the project area, including the Lennac Lake claims. A summary report of this survey is included in Appendix C. This report describes the technical and logistical details of the survey carried out on behalf of Riverside. The principal geophysical sensor used was a helicopter-mounted cesium vapor magnetometer. Ancillary equipment included a GPS navigation system, radar altimeter, digital video acquisition system, and a base station magnetometer.



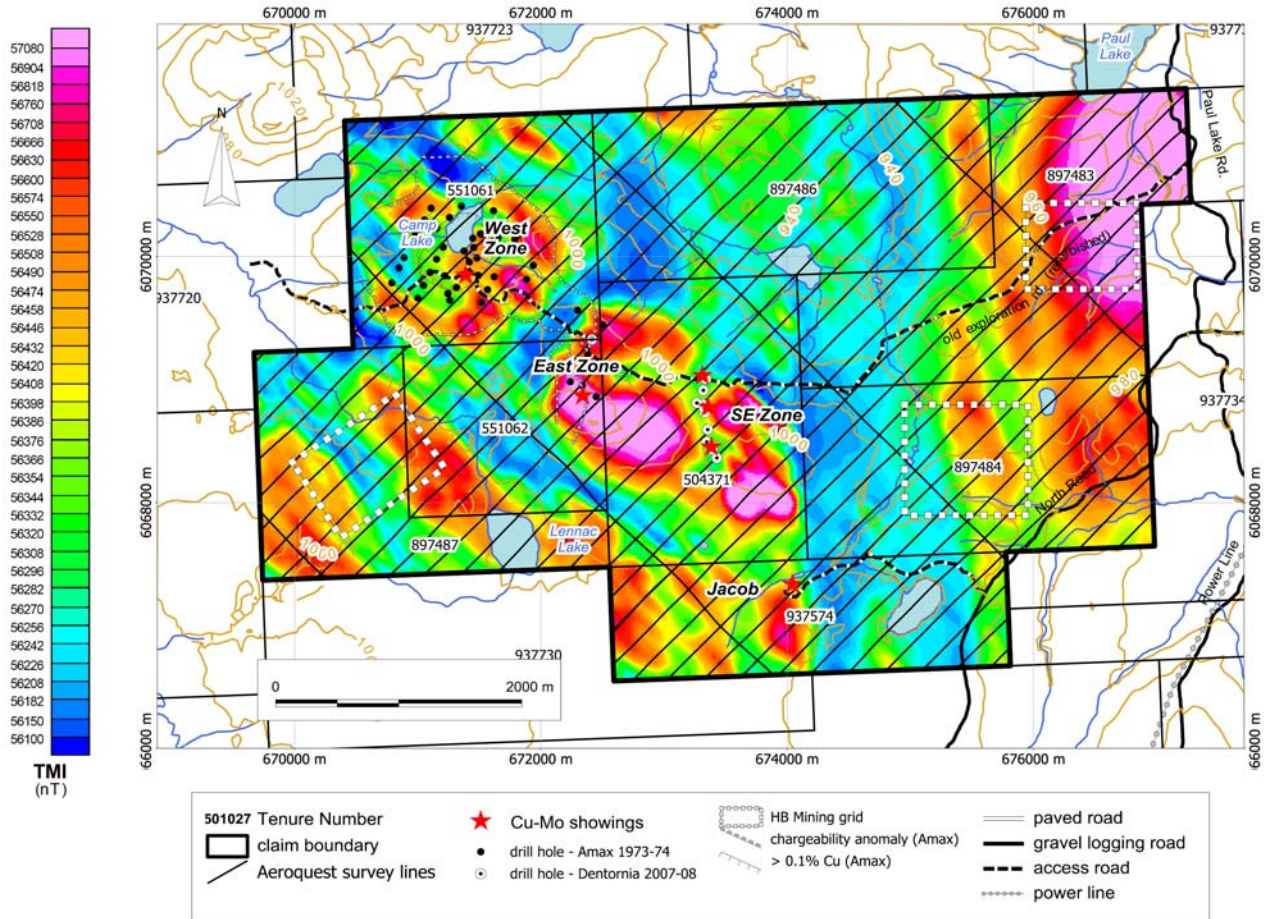


Figure 8. Geology and mineral occurrences superimposed on Total Magnetic Intensity (TMI). Map created by D.G. MacIntyre using Aeroquest aeromagnetic data..

A total of 4444 line-kilometres was flown over the Riverside claims between April 8th and April 17<sup>th</sup>, 2012 (Figure 7). Of this total, 158.5 line-kilometres or 3.56% covered the Lennac Lake property. Survey lines were flown at azimuth 45° and 225° at a spacing of 200 metres; tie lines were flown at azimuth 135° and 315° at a spacing of 2000 metres. The total cost of this work was \$284,344 of which \$10,139.09 (3.56%) is assigned to the lines covering the Lennac Lake property. The location of flight lines covering the property are shown in Figures 8 and 9.

This assessment report is in support of a Statement of Work (SOW) submitted on July 17, 2012 (event 5394759) using the Mineral Titles On-Line mineral tenure management system. The total value of the work described in this report is \$13,739.09.

The final deliverables for the aeromagnetic survey included maps and grid files in Geosoft GIS format. The author used this data to produce Total Magnetic Intensity (TMI) and First



Vertical Derivative (1 VD) maps covering the Lennac Lake property (Figures 8 & 9; Appendix C) using Manfold GIS.

The survey shows three subcircular doughnut shaped magnetic anomalies oriented in a northwest-southeast trend that roughly correspond to known and suspected intrusive centers and attendant porphyry copper mineralization.

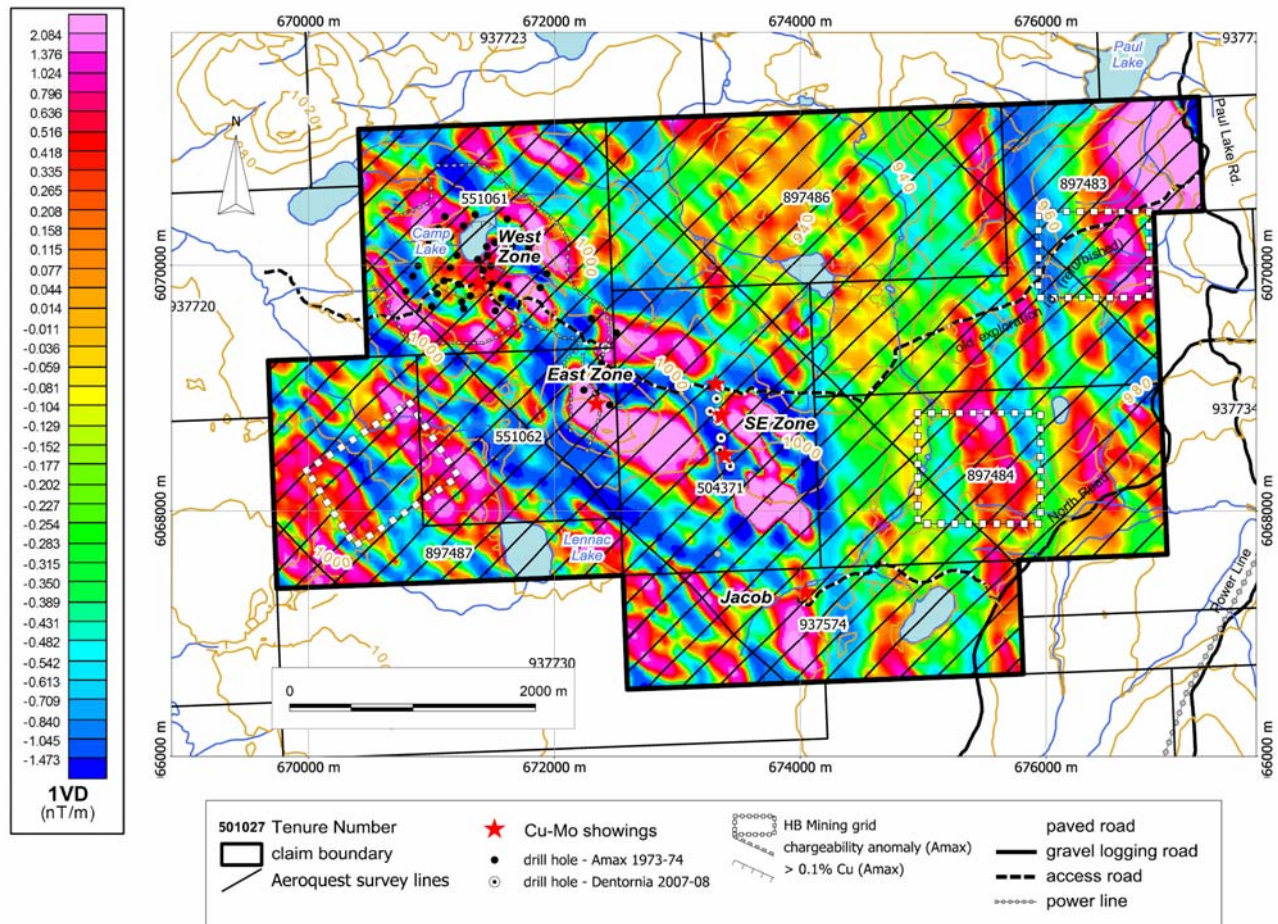


Figure 9. Geology and mineral occurrences superimposed on First Vertical Derivative of the aeromagnetic data. Map created by D.G. MacIntyre using data from the Aeroquest aeromagnetic survey.

## 8 Conclusions and Recommendations

The Lennac Lake property covers several zones of low-grade copper-molybdenum mineralization associated with porphyritic phases of Late Cretaceous Bulkley intrusions, similar to those hosting the Davidson deposit at Smithers (48 km west) and the Huckleberry mine (130 km southwest). Isolated outcrops and trenching have indicated that mineralization may be low-grade but is widespread over a large under-explored area.

The recent aeromagnetic survey conducted by Aeroquest Airborne on behalf of Riverside Resources, the property operator, shows two distinct doughnut shaped anomalies corresponding to the West and East-Southeast zones respectively. Elevated magnetic response is believed to be related to the presence of magnetite in the propylitic and potassic alteration zones associated with two distinct intrusive centers. Areas of low magnetic response within the doughnut shaped anomalies are interpreted to represent areas of magnetite destructive hydrothermal alteration dominated by sericite and pyrite. This correlation is consistent with the known extent of phyllic alteration on the property, particularly around the East and West zones. The Southeast zone also shows up as a zone of low magnetic response and this is consistent with the extent of siliceous, non-magnetic clay altered rocks that were encountered in drill holes that tested this zone. The low magnetic core of the East zone doughnut may also represent the occurrence of siliceous, clay altered rocks similar to those in the Southeast zone.

The aeromagnetic data acquired by Aeroquest Airborne has defined a number of interesting magnetic highs and lows within the area covered by the Lennac Lake claims. There is very little outcrop in these areas. Additional work is needed to fully evaluate the significance of these anomalies. This work should include diamond or reverse circulation drilling in areas where there is no bedrock exposure.

## 9 References

- Bidwell, G., 1998: Line Cutting and Geophysical Report on the Len 3, 4 and 5 claims, B.C. Ministry of Energy and Mines Assessment Report 25,628.
- Callan, N., 1993: Geology and Geochemistry, Lennac Property, B.C. Ministry of Energy and Mines Assessment Report 23,048.
- Depaoli, G.M. and Allan, J.F., 1972: Geophysical report on Ground Magnetometer and Induced Polarization Surveys on the Lennac Lake Copper Property, B.C. Ministry of Energy and Mines Assessment Report 3808.
- Hodgson, C.J., 1974: Lennac Lake Drill Program, B.C. Ministry of Energy and Mines Assessment Report 5031.
- Hodgson, C.J., 1974: 1974 Property Report - Lennac Lake Drill Program, internal Ammax report, 80p.
- Jackisch, I., 1993: I.P./Resistivity Survey on the Lennac Property, B.C. Ministry of Energy and Mines Assessment Report 23048.
- Leary, G.M. and Allan, J.F., 1972: Lennac Lake Copper Property, B.C. Ministry of Energy and Mines Assessment Report 3807.

- MacIntyre, D.G. and Parsons, H.V., 2005: Geology and Geochemistry, Southeast Zone, Lennac Lake, B.C. Ministry of Energy and Mines Assessment Report 27987, 19 p.
- MacIntyre, D.G., 2007: Diamond Drilling, Lennac Lake Property, Drill Holes LL07-1 to LL07-3, B.C. Ministry of Energy and Mines Assessment Report 29459, 65 p.
- Silversides, D.A., 1972: 1972 Property Report - Lennac Lake Copper Prospect, internal Amax report, 43 p.
- Silversides, D.A., 1973: 1973 Property Report - Lennac Lake Copper Prospect, internal Amax report, 78 p.
- Smit, H. and Harival, C., 1992: Geology and Trenching on the Lennac Lake Property, B.C. Ministry of Energy and Mines Assessment Report 22,181.

## Appendix A – Statement of Expenditures

Exploration Work type	Comment	Days			Totals
<b>Personnel (Name)* / Position</b>	<b>Field Days</b>	<b>Days</b>	<b>Rate</b>	<b>Subtotal*</b>	
D.G. MacIntyre	May 28, 2012	1	\$600.00	\$600.00	
				\$600.00	<b>\$600.00</b>
<b>Office Studies</b>	<b>Personnel</b>				
Report preparation	D.G. MacIntyre	5.0	\$600.00	\$3,000.00	
Other (specify)					
				\$3,000.00	<b>\$3,000.00</b>
<b>Airborne Exploration Surveys</b>	<b>Line Kilometres / Enter total invoiced amount</b>				
Aeromagnetics - Aeroquest	total survey 4444 line-km - invoiced amt. \$248,864; survey lines over Lennac Lake property - 158.5 line km = 3.56% of total	158.5	\$56.00	\$8,876.00	
Other (specify)	mobilization - \$20,000;	3.56%	\$20,000.00	\$712.00	
Other (specify)	unused min. helicopter hours - \$15,480	3.56%	\$15,480.00	\$551.09	
				\$10,139.09	<b>\$10,139.09</b>
<b>TOTAL Expenditures</b>					<b>\$13,739.09</b>

## Appendix B – Statement of Qualifications

I, Donald George MacIntyre, Ph.D., P.Eng., do hereby certify that:

1. I am a consulting geologist, with residence and business address at 4129 San Miguel Close, Victoria, British Columbia, Canada.
2. I obtained an honours B.Sc. degree in geology from the University of British Columbia in 1971 and M.Sc. and Ph.D. degrees specializing in Economic Geology from the University of Western Ontario in 1975 and 1977 respectively.
3. I have been a registered Professional Engineer in good standing with the Association of Professional Engineers and Geoscientists of British Columbia since September, 1979 (registration number 11970).
4. I have practiced my profession as a geologist, both within government and the private sector, in British Columbia and parts of the Yukon for over 35 years. Work has included detailed geological investigations of mineral districts, geological mapping, mineral deposit modeling and building of geoscientific databases. I have directly supervised and conducted geologic mapping and mineral property evaluations, published reports and maps on different mineral districts and deposit models and compiled and analyzed data for mineral potential evaluations.

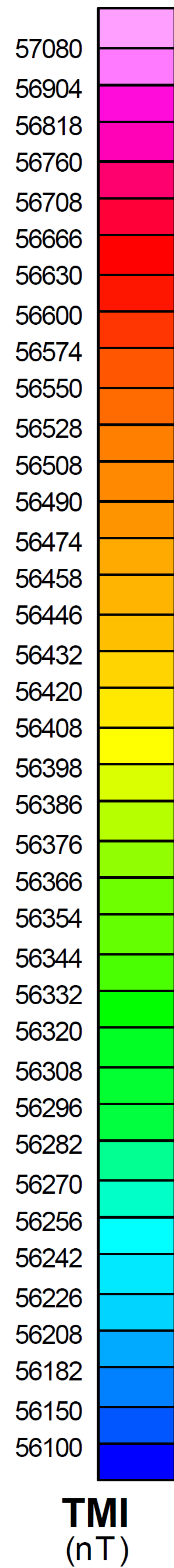
Dated this 1<sup>st</sup> day of October, 2012



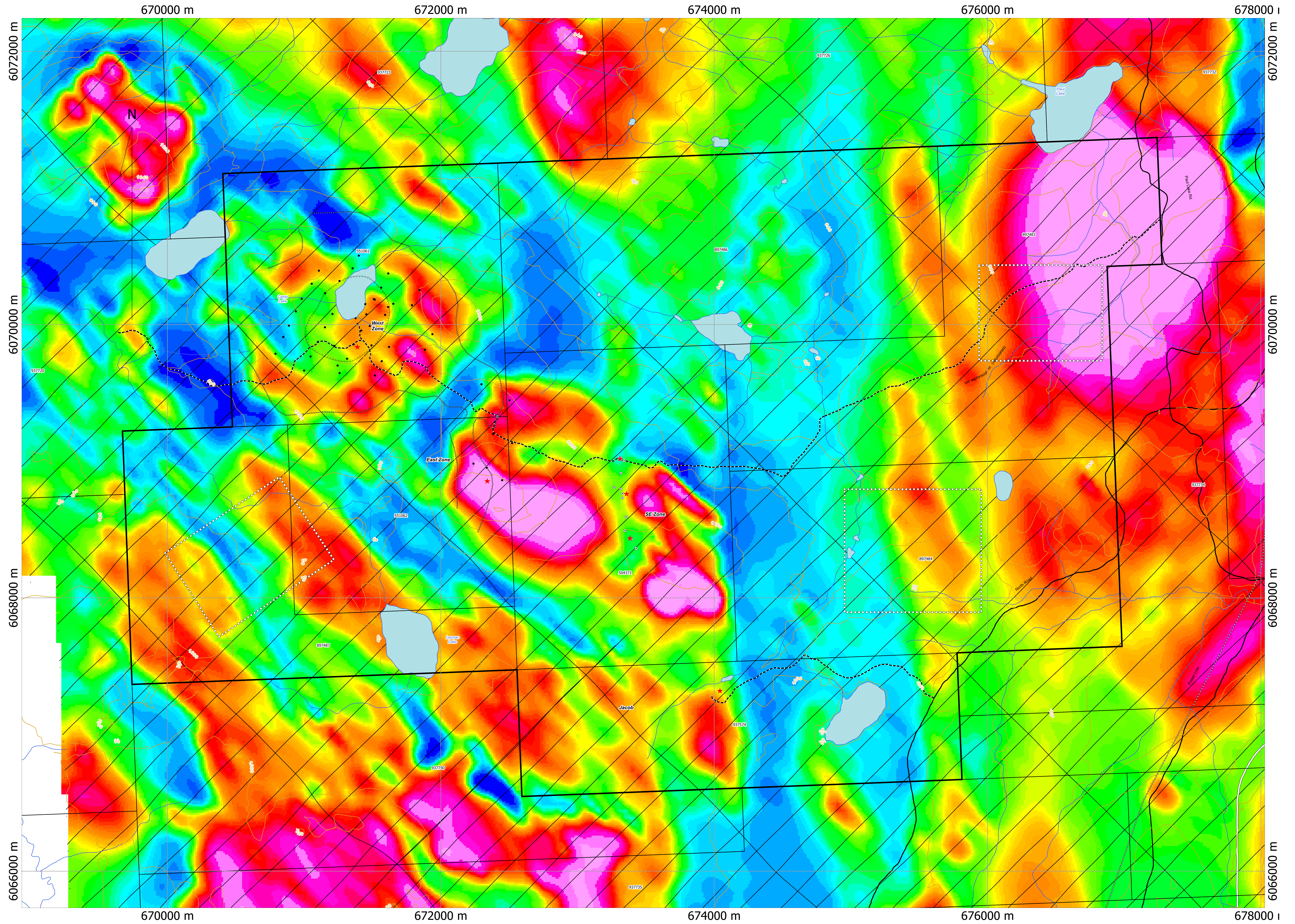
D. MacIntyre, Ph.D., P.Eng.

## **Appendix C – Maps**





**TMI**  
(nT)



**Legend**

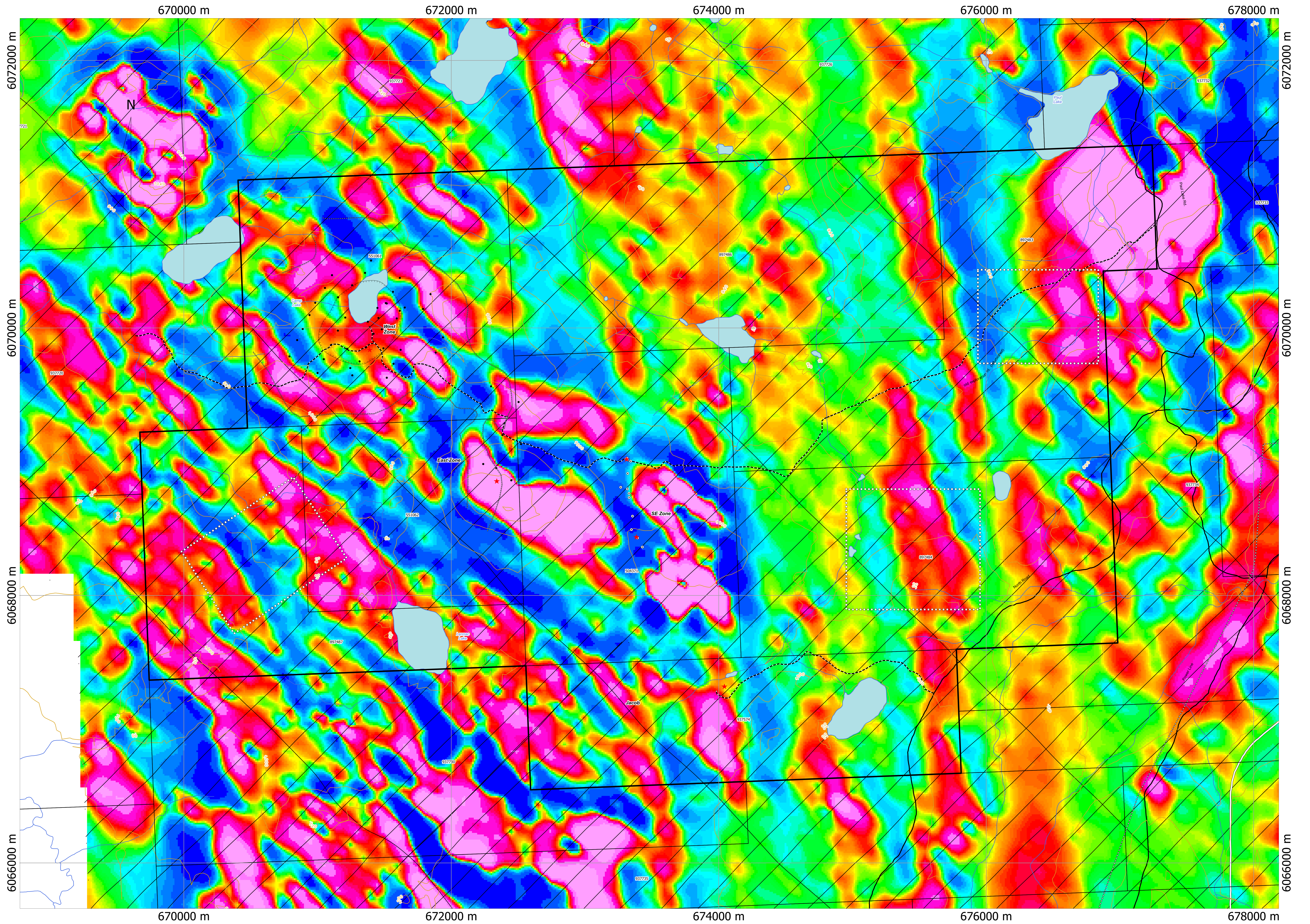
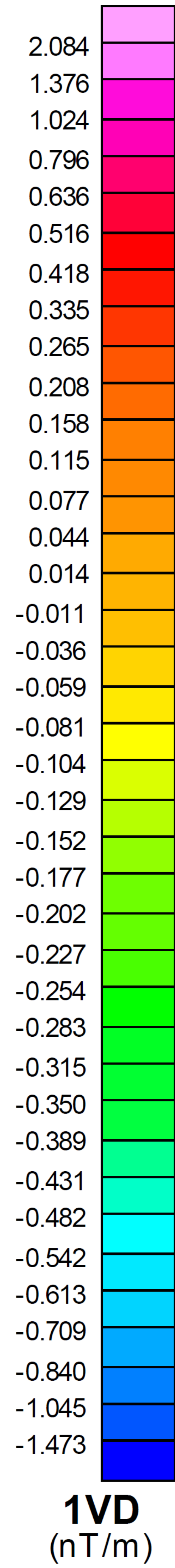
- Aeroquest airborne survey lines
- 01027 tenure number
- claim boundary
- ★ Cu-Mo showings
- power line
- gravel logging road
- paved road
- access road
- DDH collar - Amax (1973-74)
- DDH collar - Dentonia (2007-08)
- Amax chargeability anomaly
- West zone >0.1% Cu
- Text HB Mining grid

**Riverside Resources Inc.**  
**Lenac Lake Project**

Airborne Geophysics - Total Magnetic Intensity

Map No.: 1	Scale: 1:10,000
Projection: UTM Zone 9	Datum: North American Datum 1983
Mapping by: Aeroquest Airborne	Date of Mapping: April 2012
Map prepared by: D.G. MacIntyre	Last Revised: July 24, 2012
D.G. MacIntyre & Associates, Victoria, B.C., Canada	





**Legend**

- Aeroquest airborne survey lines
- 01027 tenure number
- claim boundary
- ★ Cu-Mo showings
- power line
- gravel logging road
- paved road
- access road
- DDH collar - Amax (1973-74)
- DDH collar - Dentonia (2007-08)
- ⚡ Amax chargeability anomaly
- ⚡ West zone >0.1% Cu
- HB Mining grid

**Riverside Resources Inc.**  
**Lennac Lake Project**

0 1000 m

Airborne Geophysics - 1st Vertical Derivative Aeromagnetics

Map No.: 2	Scale: 1:10,000
Projection: UTM Zone 9	Datum: North American Datum 1983
Mapping by: Aeroquest Airborne	Date of Mapping: April 2012
Map prepared by: D.G. MacIntyre	Last Revised: July 24, 2012
D.G. MacIntyre & Associates, Victoria, B.C., Canada	



## **Appendix D – Aeroquest Summary Report**

# Report on a Helicopter-Borne Magnetic Survey



**Aeroquest Job # 12-020**

For

**Riverside Resources Inc.**

by



245 Industrial Parkway North  
Aurora, ON L4G 4C4

Report date: June 2012

# **Report on a Helicopter-Borne Magnetic Survey**

**Aeroquest Job # 12-020**

For

## **Riverside Resources Inc.**

Suite 1110 – 1111 West Georgia Street

VANCOUVER, BRITISH COLUMBIA

V6E 4M3

by



245 Industrial Parkway North  
Aurora, ON L4G 4C4

Report date: June 2012

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## LIST OF MAPS (1:50,000)

- TMI – Coloured Total Magnetic Intensity (TMI) with contours.
- 1VD – Calculated First Vertical Derivative of TMI colour grid with contours.

## 1. INTRODUCTION

This report describes a helicopter-borne geophysical survey carried out on behalf of Riverside Resources Inc on their property in British Columbia, Canada. The principal geophysical sensor was a helicopter stinger mounted cesium vapor magnetometer. Ancillary equipment included a GPS navigation system, radar altimeter, digital video acquisition system, and a base station magnetometer.

The total survey coverage is 4483 km, of which 4444 line-km fell within the defined project areas (Appendix 1), flown specific line direction for each block. Survey flying described in this report took place on April 8<sup>th</sup> to April 17<sup>th</sup>, 2012. This report describes the survey logistics, the data processing, presentation, and provides the specifications of the survey.

## 2. SURVEY AREA

The project contains one block named as Flute and Lennac Projects located approximately 12km north of Topley, BC (Figure 1). The detail description of each block with line direction has been described in the table 1.

The survey blocks corner-coordinates are tabulated in Appendix 1. The base of survey operations was Topley, BC.



Figure 1 – Survey block overview



Figure 2 - Survey Flight Path over Google Image

### 3. SURVEY SPECIFICATIONS AND PROCEDURES

The survey specifications are summarised in the following table:

Block name	Line Spacing (metres)	Line Direction	Tie Line Spacing (metres)	Line Direction	Survey Coverage (line-km)	Dates flown
Flute & Lennac	200	45°/225°	2000	135°/315°	4483	Apr 8 <sup>th</sup> to 17 <sup>th</sup> , 2012

Table 1 - Survey specifications summary

The survey coverage was calculated by adding up the survey and control (tie) line lengths as presented in the final Geosoft database.

The nominal helicopter stinger terrain clearance was 50 m but was periodically higher or lower over due to the rugged terrain and the capability of the aircraft. The scan rate of the helicopter stinger data acquisition was 0.10 seconds.

#### **4. AIRCRAFT AND EQUIPMENT**

This section provides a brief description of the geophysical and auxiliary instruments used to acquire the survey data:

##### **4.1. AIRCRAFT**

An A-star 350B3 helicopter – registration C-FNWE was used as a survey platform. The helicopter was owned and operated by Mustang Helicopters Inc. The helicopter flew at an average airspeed of 70 knots per hour.



Figure 3. Helicopter type used during survey

##### **4.2. MAGNETOMETER**

The following magnetometer was installed inside the stinger:

Model: Geometrics G823A

Type: Airborne cesium-vapor magnetometer

Sensitivity: 0.01 nT

Sample rate: 10Hz



**Magnetic Compensator:**

The compensator employed was a RMS Data Acquisition & Adaptive Aeromagnetic Real-Time Compensator (DAARC500). Compensation is achieved by combining the frequency measurement from a ny continuous readings sensor (Cs, K, He) with the measurements of analog outputs of a tri-axial fluxgate magnetometer. A proprietary algorithm combines these measurements and eliminates most of the influence caused by airframe movement through the magnetic field – pitch, roll yaw and aircraft heading.

**4.3. MAGNETIC BASE STATION**

Model: Geometrics G823A  
Type: Portable Cesium magnetometer  
Sensitivity: 0.01nT  
Sample rate: 1 Hz

A digital recorder is operated in conjunction with the base station magnetometer to record the diurnal variations of the earth's magnetic field. The clock of the base station is synchronized with that of the airborne system using GPS data to permit subsequent removal of diurnal drift.

**4.4. ALTIMETERS**

**Radar altimeter**

Manufacturer: Terra  
Type: TRA 3000 Radar Altimeter and TRI 40 Indicator  
Sensitivity: 5% @200ft

**Barometric altimeter**

Manufacturer: Honeywell  
Type: PPT  
High Accuracy: Achieves +/-0.05 Full-Scale, Including Temperature Effects over -40 to +85°C

**4.5. VIDEO TRACKING AND RECORDING SYSTEM**

A wide angle Sanyo video camera was connected to Archos video recorder to provide the image. Using a video overlay board (Overland Technology Inc.) the GPS time is recorded continuously and is displayed on the margin of each image. This procedure ensures accurate correlation of digital data with respect to visible features on the ground.



Figure 4. Digital video camera typical mounting location

#### **4.6. GPS NAVIGATION SYSTEM**

Navigation is carried out using a GPS receiver, an AGNAV GUIA system for navigation control, and AeroDAS data acquisition system which records the GPS coordinates. The x-y-z position of the aircraft, as reported by the GPS, is recorded at 0.2 second intervals. The system has a published accuracy of less than 3 metres. A recent static ground test of the Mid-Tech WAAS GPS yielded a standard deviation in x and y of less than 0.6 metres and for z less than 1.5 metres over a two-hour period.

#### **5. PERSONNEL**

The following Aeroquest personnel were involved in the project:

- Senior Project Manager: Troy Will
- Field Data Processor: Josh Poirier
- Field Operator: Leonard Luke
- Office Data Processor: Marta Orta
- Map Preparation and Reporting: Wendy Acorn

The survey pilot, Alex Potter-Cogan was employed directly by the helicopter operator – Mustang Helicopters Inc.

#### **6. DELIVERABLES**

##### **6.1. HARDCOPY DELIVERABLES**

The report includes a set of 1:50,000 scale maps. The survey area is covered by one map plate and two geophysical data products are delivered as listed below:

- TMI – Coloured Total Magnetic Intensity (TMI) with contours.
- 1VG – Calculated First Vertical Derivative of TMI colour grid with contours.

The coordinate/projection system for the maps is WGS84 – UTM Zone 09N. For reference, the latitude and longitude in WGS84 are noted on the maps.

##### **6.2. DIGITAL DELIVERABLES**

###### **6.2.1. Final Database of Survey Data (.GDB)**

The geophysical profile data is archived digitally in Geosoft GDB binary database format. A description of the contents of the individual channels in the database can be found in Appendix 2.

###### **6.2.2. Geosoft Grid files (.GRD)**

- DTM.grd
- TMI.grd
- VertGrad.grd



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### 6.2.3. Digital Versions of Final Maps (.MAP, .PDF)

- 1VD\_50K.map
- TMI\_50K.map

### 6.2.4. Free Viewing Software

- Geosoft Oasis Montaj Viewing Software
- Adobe Acrobat Reader

### 6.2.5. Digital Copy of this Document (.PDF)

## 7. DATA PROCESSING AND PRESENTATION

### 7.1. BASE MAP

The geophysical maps accompanying this report are based on positioning in the WGS84 datum. The survey geodetic GPS positions have been projected using the Universal Transverse Mercator projection in Zone 09 North. A summary of the map datum and projection specifications is given following:

- Ellipse major axis: 6378137
- Inverse Flattening: 298.25722
- Datum: WGS84
- Map Projection: Universal Transverse Mercator Zone 09 North
- Central Scale Factor: 0.9996
- False Easting, Northing: 500,000m, 0m

For reference, the latitude and longitude in WGS84 are noted on the maps.

### 7.2. MAGNETIC COMPENSATION TEST

Test lines were flown to check the real time magnetic compensation, in four cardinal directions corresponding to the survey line direction. The compensation test was carried out near Dease Lake, BC and flown approximately 10,000 ft AGL to ensure the sensor was completely removed of ground effect.

### 7.3. TOTAL FIELD MAGNETICS

The total field aeromagnetic data are corrected for the diurnal variation, by subtracting the base station magnetic data (low pass filtered to remove spikes due to cultural interference). Then the line data was corrected for any remaining small levelling errors. The geophysical data are interpolated onto a regular grid using bi-directional interpolation technique. The gridded data was micro-levelled to remove small amplitude, in between flight line, levelling errors. The resulting grid is suitable for generating contour maps of excellent quality.

## 8. CONCLUSIONS AND RECOMMENDATIONS

An AeroMAG S tinger geophysical survey has been completed over the Flute and Lennac properties, located in British Columbia, Canada.

The total area coverage is 813 km<sup>2</sup>. Total survey line coverage is 4,444 line kilometers. The principal sensor included an optical-pumped cesium vapour magnetometer. Results have been presented as contour color images at a scale of 1: 50,000. A formal Interpretation has not been included or requested.

Based on the geophysical results obtained, a magnetic trend is observed mostly in north-northwest to south-southeast direction. Relevant information is detected in the magnetic gradients, highlighting the lithology and several structures which appear to be the focus of known mineralization in the district.

It is recommended more study of the identified magnetics domains using 3D inversions. Prior to ground follow up and drill testing, it is also recommended the application of other geophysical techniques ( such as AFMAG) with proved success in detecting upper – porphyry mineralization.

## APPENDIX 1: SURVEY BOUNDARIES

The following table presents the project block boundaries. All geophysical data presented in this report have been windowed to 100m outside these outlines.

X and Y positions are in WGS84 UTM Zone 09N.

X	Y
651691.1	6085808
652515.7	6086322
655306.7	6089208
656127.5	6088787
658076.6	6088855
659645.6	6089839
664878.3	6090028
666866.1	6090102
668450.1	6090625
668872.4	6090641
674513.3	6089929
675337.3	6089962
677464.9	6088605
677627	6084481
679585.3	6084549
680453.6	6084087
680660.9	6078932
680678.6	6078499
682352.2	6076282
685655.6	6073651
688112.6	6072823
691069.1	6069691
691894.1	6069262
692334.2	6068796

continued

X	Y
693199.7	6067439
694854.9	6065487
691826.8	6062468
690248.5	6063835
687227.1	6063780
684428.2	6063201
679686	6063010
679700.9	6062647
679942	6058399
681354.9	6056668
678392.7	6053630
676198.4	6055595
676120	6056371
673788.1	6056281
669641.4	6056599
669360.1	6064103
669178.5	6068168
667734.7	6068112
659348.6	6067816
659365.6	6067353
656750.5	6067262
656347.5	6078849
652807.6	6078727
651915	6079203

## APPENDIX 2: DESCRIPTION OF DATABASE FIELDS

The GDB file is a Geosoft binary database. In the database, the Survey lines and Tie Lines are prefixed with an "L" for "Line" and "T" for "Tie".

### Magnetic databases:

Column	Units	Description
X	m	UTM Easting (WGS84, Zone 09N)
Y	m	UTM Northing (WGS84, Zone 09N)
Ralt m		Radar Altitude
Galt	m a.s.l.	GPS Elevation
DTM	m a.s.l.	Digital Terrain Model using radar altimeter data
Lalt m		Laser Altitude
Long_wgs84		Longitude WGS84 (decimals degree)
Lat_wgs84		Latitude WGS84 (decimals degree)
UTC Time HH	:MM:SS.ss	UTC Time
BASEMAG n	T	Basemag value
Mag_raw nT		Raw uncompensated mag
Mag_cmp nT		Compensated mag
Mag	nT	Diurnal Corrected compensated Magnetic data
TMI nT	Lev	Levelled Magnetic data
Fid		Fiducial
Flight		Survey flight number
Line		Line number
Vx	pT	Magnetic vector x component
Vy	pT	Magnetic vector y component
Vz	pT	Magnetic vector z component