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CAMP:	034	Bridge River	Camp					
CLAIM(S): OPERATOR(S):	Robin, Levon	CM, Roy, Truax Res.	Gold					
AUTHOR(S): REPORT YEAR: COMMODITIES	Brewer 1988,	, L.C. 21 Pages						
SEARCHED FOR:	Gold,S	ilver,Antimo	ny	· .		2 		
KEYWORDS:	Metase	dimentary,Gr	eywacke	,Bendor	Batho.	lith,Ar	ntimony	
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# GEOPHYSICAL REPORT

ON

## AIRBORNE MAGNETIC AND VLF-EM SURVEYS

OVER THE

## TRUAX GOLD, ROY & ROBIN CLAIMS

FILMED

LILLOOET MINING DIVISION BRITISH COLUMBIA

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Mount Truax area
8 km southeast of Bridge River
50° 48' North Latitude
122° 42' West Longitude



: LEVON RESOURCES LTD. #100 - 455 Granville Street Vancouver, B.C. V6C 1T1

: COLUMBIA AIRBORNE GEOPHYSICAL SERVICES (1984) LTD. #611 - 470 Granville Street Vancouver, B.C. V6C 1V5

: LLOYD C. BREWER COLUMBIA AIRBORNE GEOPHYSICAL SERVICES (1984) LTD.

December 16, 1988

# TABLE OF CONTENTS

SUMMARY	i
CONCLUSIONS /	i,
RECOMMENDATIONS /	11(

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Section 2.

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1

INTRODUCTION			
PROPERTY AND OWNERSHIP	2		
LOCATION AND ACCESS	2		
PHYSIOGRAPHY	3		
HISTORY OF PREVIOUS WORK	3		
GEOLOGY & MINERALIZATION		4	
INSTRUMENTATION AND THEC	DR Y	4	
(a) Magnetic		4	
(b) VLF-EM Survey		5	
SURVEY PROCEDURE		6	
DATA REDUCTION AND COMP	ILATION	٧	7
DISCUSSION OF RESULTS			7
(a) Magnetic Survey			7
(b) VLF-EM Survey			9
(c) Lineations			11
SELECTED BIBLIOGRAPHY			12
AUTHOR'S CERTIFICATION			13
AFFIDAVIT OF COSTS			14

# LIST OF ILLUSTRATIONS

# At back of report

Property Location Map

Claim Map

1:8,600,000 1:50,000 Map 1 🦯

Map 2 /

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Airborne Magnetic & VLF-EM

1:10,000

Map 3 /

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Airborne magnetic and VLF-EM surveys were carried out over the Truax Property and adjoining claims owned by Levon Resources Ltd. of Vancouver B.C., during December 1987 and January, 1988. The claims are located on Mount Truax within the Bendor Mountain Range, some 40 kilometres northwest from the town of Lillooet. Access is gained by helicopter from Goldbridge some 10 kilometres to the west properties. The terrain consists of mainly steep and rugged slopes and alpine hill tops forested with moderately dense coniferous trees at lower elevations to alpine vegetation above 2,000 metres elevation. The purpose to the surveys was to aid in the mapping of geology as well as to locate probable areas for extensions of gold bearing quartz filled faults and shears.

The property occurs within Bridge River series sediments and volcanics, and is intruded by granodiorites of the Coast Plutonic Complex. The contacts of these groups strike northwesterly through the property.

In the area, occurs gold, silver and copper mineralization usually hosted in fault controlled quartz and calcite veins within the Bridge River Series.

The airborne surveys were flown at about 50 metre terrain clearance on contour lines with line separation averaging 200 metres. The instruments used were a Sabre Electronics proton precession magnetometer and a Sabre Electronics VLF-EM receiver. The magnetic data were digitized from strip charts and hand contoured. The contours were drawn on a survey plan on which the VLF-EM anomalies were plotted as well.

#### CONCLUSIONS

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 The magnetic survey shows the entire property is underlain by sediments and volcanics of the Bridge River Series and grano and quartz diorites of the Bendor Pluton as well as limestones of the Hurley Formation.

Mineralization in the Bendor Range is often related to structural controls such as faults and shears. As a results, magnetic lows, which can reflect these structures, indicate important areas for further exploration.

- 2. The VLF-EM survey revealed 9 multi-line conductors as well as several single line conductors; the majority of these conductors are reflecting shears, faults and contact zones, which are important in the placement of gold bearing quartz veins.
- 3. Both the VLF-EM and magnetic surveys revealed lineations within the survey area that are likely caused by fault, shear and/or contact zones. These can be important indicators of sulphide and native gold mineralization especially where the lineations cross.

#### RECOMMENDATIONS

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The airborne geophysics has revealed some target areas throughout the property such as magnetic lows and the VLF-EM highs. It is recommended to check these out by prospecting, geological mapping and possible soil sampling. Soil geochemistry lines should be run in the areas of interest, such as across the VLF-EM conductors that occur near the magnetic lows.

It is not expected, however, that all gold-sulphide mineralization in the area will be reflected by the airborne magnetic and VLF-EM surveys. It is simply a start as far as defining target areas.

However, if one wants to cover the property effectively, the following program is recommended:

- Careful geological mapping and prospecting should be carried out by a geologist and prospector familiar with gold mineralization. One large benefit of this will be a better interpretation of any geophysics that are carried out. Special attention should be paid to the VLF-EM conductors and magnetic lows.
- Soil samples should be carried out on a reconnaissance basis over any area of interest. They should be run on topographical contours across the strike of the zone being investigated.
- 3. Cat trenching should be carried out prior to diamond drilling.

## GEOPHYSICAL REPORT

ON

#### AIRBORNE MAGNETIC AND VLF-EM SURVEYS

#### OVER THE

## TRUAX GOLD, ROY, ROBIN & CM CLAIMS

TRUAX CREEK AREA

LILLOOET MINING DIVISION

BRITISH COLUMBIA

#### INTRODUCTION AND GENERAL REMARKS

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This report discusses the survey procedure, compilation of data and the interpretation of low-level airborne magnetic and VLF-EM surveys carried out over the TRUAX GOLD, ROY, ROBIN & CM claims near Mount Truax in December, 1987. The surveys were carried out by Lloyd C. Brewer, instrument operator and project manager, and John Kime, navigator, both of whom are of Columbia Airborne Geophysical Services (1984) Ltd. A total of 67.6 line km of airborne surveys were done over the property and surrounding area.

The object of the two surveys was to aid in the geological mapping of lithology and structure for the purpose of exploration of the type of gold mineralization as is found in the Gold Bridge and Bralorne area. Magnetic surveys have especially been proven to be a good geological mapping tool.

## **PROPERTY AND OWNERSHIP**

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The property consists of 4 contiguous claims totalling 28 units as shown on Map 2 and as described below:

Claim Name	# Units	Record #	Expiry Date
CM 1	1	882	August 01, 1992
CM 2	1	883	August 01, 1992
ROBIN 1	1	25731	October 13, 1993
ROBIN 2	1	25732	October 13, 1993
ROBIN 3	1	25733	October 13, 1993
ROBIN 4	1	25734	October 13, 1993
ROBIN 5	1	25735	October 13, 1993
ROBIN 6	1	25736	October 13, 1993
ROY 1	1	28725	June 03, 1994
ROY 2	1	28726	June 03, 1994
ROY 3	1	28727	June 03, 1994
ROY 4	1	28728	June 03, 1994
TRUAX GOLD	16	1874	October 13, 1991

The expiry dates shown does not take into account the surveys under discussion as being accepted for assessment credits.

The thirteen claims are owned by Levon Resources Ltd., of Vancouver, British Columbia.

### LOCATION AND ACCESS

The property is located near Truax Mountain, some 10 km south of Carpenter Lake.

The geographical coordinates are 50° 48' north latitude and 122° 42' west longitude.

Access can be gained by a four wheel drive road which runs along Carpenter Lake on the south side and then runs south along Truax Creek. The distance from Gold Bridge to the property is about 11 km.

#### PHYSIOGRAPHY

The property lies just south of Truax Mountain in the Pacific Ranges which is a physiographic division of the Coast Mountains. The terrain is, in general, steep and mountainous.

Elevations vary from 2,500 metres at sea level in the western portion of the property to 2,000 metres at sea level on the eastern side.

The main water source would be Truax Creek which runs through most of the claims and leads to a small lake in the southeastern part of the Truax Gold claim.

The forest cover consists primarily of fir and spruce, moderate in density and with an undergrowth light to moderate.

#### HISTORY OF PREVIOUS WORK

The property was acquired in 1936 by the Gray Rock Syndicate and at that time was examined by E.O. Lovitt and reported to show 'unusual merrit'. Since that time the property has undergone almost continuous exploration. Underground work was started in 1950 with the No. 1 cross-cut driven 400'. In 1952, 7,232 long tonnes of ore containing 50.20% antimony was shipped out. Also in 1952, the Gray Rock Mining Co. mades an agreement with Bralorne Mines Ltd. and a second cross-cut and adit was driven. Bralorne optioned out of the deal in August 1953.

Further assessment work has continued on the property since 1952. The most recent published record is 294.43 metres of diamond drilling done in August and September of 1985. The drilling targets were 3 electromagnetic conductors delineated in 1976. The conductors were found to be a graphitic zone with some minor pyrite.

#### PROPERTY GEOLOGY

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The property is underlain with metasediments in contact with a medium grained granodiorite belonging to the Bendor Batholith. The metasediments are dark grey to greenish grey greywacke with varying propositions of horneblende, biotite, chlorite, quartz and plagioclase.

Mineralized quartz veins are found on the property within the metasediments. The mineralization occurs mainly as galena and stibnite. These occur as lenses within the quartz veins.

#### INSTRUMENTATION AND THEORY

## a) Magnetic Survey

The magnetic data are detected using a nuclear free precession proton magnetometer, manufactured by Sabre Electronic Instruments Ltd. of Burnaby, B.C. The magnetometer measures the total count of the earth's magnetic field intensity with a sensitivity of one gamma. The data are recorded on magnetic tape and 12 cm analog strip chart.

The magnetic patterns obtained from a regional airborne survey are directly related to the distribution of magnetite in the survey area. However, the geology cannot be deduced from isomagnetic maps by simply assuming that all magnetic highs are underlain by gabbro or ultramafic rocks, and that all magnetic lows are caused by limestone or chert. The problem with such a simplistic approach is that magnetite is not uniformly distributed in any type of rock. Other problems arise from the fact that most geologic terrains have rocks of high susceptibility superimposed on less 'magnetic' rocks, and vice versa. Cultural features such as powerlines, pipelines and railways also complicate matters. So many variables can be involved that it may be impossible to make a strictly accurate analysis of the geology of an area from magnetic data alone. It is preferable to use other information such as geological, photogeological and electromagnetic in combination with magnetic data to obtain a more accurate geological analysis.

#### b) VLF-EM Survey

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A two-frequency omni-directional receiver unit, manufactured by Sabre Electronic Instruments Ltd., of Burnaby, B.C., was used for the VLF-EM survey. The transmitters used are NLK Arlington (Seattle), Washington, operating on 24.8 KHz, and Annapolis, Maryland, transmitting at 21.4 KHz. These signals are used due to their ideal orientation with respect to northwest and east-west geological structures, and their good signal strengths. The measurement taken during the survey is the variation in the horizontal component of the signal strength.

The VLF (Very Low Frequency) method uses powerful radio transmitters set up in various parts of the world for military communications. These powerful transmitters can induce electric currents in conductive bodies thousands of kilometres away from the radio source. The induced currents set up secondary magnetic fields which can be detected at surface through deviations in the normal VLF field. The VLF method is inexpensive and can be a useful initial tool for mapping structure and prospecting. Successful use of the VLF requires that the strike of the conductor be in the direction of the transmitting station so that the lines of magnetic field from the transmitter cut the conductor. Thus, conductors with northeast to southeast strikes will respond to Annapolis transmissions, while conductors striking north to west will respond to both stations, giving coincident field strength peaks.

The theory of VLF-EM interpretation is quite simple. Conductors are located at field strength maxima. In the Gold Bridge area, one may assume that a Seattle field strength peak represents a conductor with a generally north trend, and an Annapolis peak will be a conductor with an east-west trend. This, of course, only applies to conductors with clearly linear trends and cannot be assumed for single line anomalies.

It is impossible to determine the quality of conductors with any reliability, using field strength data alone. The question of linearity is in doubt if the conductors does not appear to cross the adjacent flight lines. The relatively high frequency results in a multitude of anomalies from unwanted sources such as swamps, creeks an cultural debris. However, the same characteristic also results in the detection of poor conductors such as faults, shear zones, and rock contacts, making the VLF-EM a powerful mapping tool.

The interpretive technique requires information about magnetic surveys, airphoto analyses, and ground traverses to aid in discrimination between important and unwanted anomalies. Even armed with this information the interpreter can easily be misled.

#### SURVEY PROCEDURES

A two metre bird was fitted with a magnetometer coil and 2 omni-directional EM receivers and towed beneath the helicopter on a 10 metre cable. The terrain clearance for the bird was 50 m.

The surveys were contour flown at a line spacing varying from 100 to 200 m. Navigation was visual, using 1:50,000 scale maps blown up to 1:10,000.

The aircraft used to conduct this survey was a Bell 206 Jet Ranger, owned and operated by Bob Holt. Airspeed was a constant 60 kph so that creek valleys and canyons were penetrated thoroughly. The slow airspeed provided safely, detailed coverage of boxed-in areas, and consistency of data retrieval, which is critical in rugged terrain.

The number of line km flown covering the area as shown on Map 3 is 67.6.

I have over seven years of experience in conducting aerial magnetic and electromagnetic surveys from fixed and rotary wing aircraft, under all types of terrain conditions.

#### DATA REDUCTION AND COMPILATION

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The observant magnetic total field was recorded on analogue strip charts. These were played back together with audio recordings containing fiducial markers, and the fiducial markers were transferred to the strip charts. The fiducial markers were identified with topographic features along the flight lines.

The magnetic data were taken from the strip charts and plotted. It was then contoured at a 100 gamma interval onto Map 3 at a scale of 1:10,000 (1 cm = 100 m).

The VLF-EM anomalies were taken from the strip charts and plotted on Map 3 with the magnetic contours. For each anomaly, a heavy line along the flight line was drawn showing its half-width. An 'S' or an 'A' designated the anomaly as being from the Seattle transmitter or the Annapolis transmitter.

A question mark on the anomaly indicates that it could be caused by terrain. The survey area was somewhat rugged causing numerous VLF-EM anomalous responses most of which was easily sorted out as being caused by terrain. However, some were difficult to sort out and they were therefore plotted with a question mark.

Strong anomalies were plotted with exclamation marks, and anomalies without any marks indicated average responses. Other symbols are explained on the sheets.

#### DISCUSSION OF RESULTS

#### a) Magnetics

The magnetic field over the property has a very distinctive character that is caused by the contact of the two major rock units, which are the Bridge River Group volcanics and sediments and the Bendor Pluton granodiorites.

As can be seen on map 3, the magnetic field over the northwestern and the extreme southern part of the survey area is characterized by a relatively high

intensity magnetic gradient. Being in the order of 500 gammas, and by an inconsistent horizontal gradient (that is, high variation in the contours). These areas are underlain by Bendor Pluton granodiorites.

The magnetic field over the rest of the property, central and northeastern parts, is characterized by a much quieter intensity with magnetics being fairly constant and of quiet horizontal gradient, the general being about 2,200 gammas.

These magnetics are undoubtedly reflecting the sediments and volcanics of the Bridge River Group.

The contact between the Bendor Pluton granodiorites and the Bridge River Group sediments and volcanics may well occur between 2,100 and 2,200 gamma contours. However, the granites could easily be altered close to the contact and thus the contact could be around the 2,000 gamma contour.

Within the area mapped by magnetics is a local magnetic anomally (within the Roy 2 claim) this is possibly caused by a granodiorite or gabbro stock which has not fully intruded the Bridge River Group units.

The magnetic anomalies of less than 1,900 gammas correlate closely with GSC mapped units of the Hurley limestones.

Magnetic lows often occur along creek valleys, and/or areas of low topography. The reasons for this are as follows:

- 1. Valleys almost always containing deeper overburden which means the detecting element is further from the bedrock causing the magnetic field.
- 2. If the survey is flown across the valley or gully, then the detecting element is also further from the bedrock.
- 3. Gulleys and valleys are often caused by faults or shear zones which are often reflected by magnetic lows.

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#### b) VLF-EM

The major cause of VLF-EM anomalies, as a rule, are geologic structures such as fault, shear and breccia zones. It is therefore logical to interpret VLF-EM anomalies to likely be caused by these structural zones. Of course, sulphides may also be a causative source. But in the writer's experience, when VLF-EM anomalies correlate with sulphide mineralization, the anomalies are usually reflecting the structure associated with the mineralization rather than the mineralization itself.

There is some variation in intensity from one VLF-EM anomaly to the next. This is not only due to the conductivity of a causative source, but also the direction it strikes relative to the direction to the transmitter. In other words, those conductors lying close to the same direction as the direction of the transmitter can be picked up easier than those that are lying at a greater angle. Depending upon its conductivity, a conductor may not be picked up at all if it is at too great an angle.

The Gregrock property occurs in extremely rough topography which adversely affects VLF-EM results. The noise level is greatly increased which can thus obliterate the more subtle signals from EM conductors such as geological structure, and/or mineralized zones. Therefore, the VLF-EM system may have responded to some known mineral zones but the signal may have been masked by the noise level. However, a number of VLF-EM conductors (or anomalies) occur throughout the survey area. These have been plotted and labeled on Figure 3 using lower case letters 'a' thru 'i' respectively. Conductor 'c' is connected with dashed lines. This occurs simply because the conductor was not picked up on all flight lines. In other words, where ever there is a space within the line marking the axis of a conductor is when a flight line did not respond to the conductor. As mentioned above, any VLF-EM conductor is indicative of geological structure. However, the longer conductors are much more indicative. These include conductors 'a', 'c', 'd' and 'e', where lengths vary from 1,000 to over 3,500 metres. Any part of this anomalies could be reflecting mineralization that is associated with geological structure.

Conductor 'a' has a north by northwesterly strike length, open to the north, of over 1,500 metres. This conductor occurs with a moderately quiet zone adjacent to a

low amplitude local magnetic high. The causative source could be a small diorite or synetite dyke, or a sulphide bearing shear zone.

Conductor 'b' has a north-south strike with an axis length of approximately 700 metres. This conductor occurs within an area of moderate magnetic amplitude over and adjacent to two low amplitude local magnetic highs. Again, the causative source could be a diorite or synite dyke or a sulphide bearing shear zone.

Conductor 'c' (reference to conductor 'f' on. Truax Gold I & II survey, 3,500 m @ N.W.).

Conductor 'd' is located in the northern portion of the survey area. It has a northwest strike and is 1,000 metres long. This conductor occurs within the Bridge River Group units with the northwestern end extending over a strong local magnetic anomaly. The causative source could well be a mineralized shear zone.

Conductor 'e' occurs within the Bridge River Group sediments and volcanics on the western edge of the survey. It has a strike varying from 40° to 80° and a length of 1,000 metres.

This conductor occurs adjacent to a low amplitude local magnetic high. The source could be a sulphide bearing shear zone.

Conductor 'f' is a strong conductor located within the Robin 1 & 2 claims. It has a northeast strike length of 300 metres. This conductor is thought to be reflecting the sulphide mineralization as reported within the old 'Greyrock' workings.

Conductor 'g' is an open ended conductor with an east-west strike length of at least 400 metres. This conductor occurs within a relatively low gradient magnetic zone, with values occurring from 1,700 - 2,000 gammas. It could be reflecting the contact between the Bridge River Group sediments and volcanics with the Hurley Formation limestones.

Conductor 'h' and 'i' occur at the southern edge of the survey area within an area of intense local magnetic activity. Both of these conductors have a north-south strike

length of at least 200 metres and are thought to be reflecting a fault or shear zone within the Bendor Pluton granodiorites.

Along with these mapped conductors, there are a number of smaller, spot occurrences of very weak and weak VLF-EM responses. These could be reflecting very narrow shear zones, but because they lack structural identity, it is difficult to speculate on their causative sources.

#### (c) Lineations

Lineal trends considered to be indicative of geological structure have been drawn on Figure 3, taking into account:

- (a) Magnetic lows which are often caused by the magnetite within the rocks being altered be geological structure processes.
- (b) VLF-EM anomalies which more often than not are reflecting structure.
- (c) Topographic depressions such as creek valleys which are usually caused by structure.

Several lineations that are indicative of faults and contacts have been mapped across the property striking primarily northwesterly and also northerly. Some or parts of the lineations in other areas have been known to correlate directly with lithologic contacts and shear zones.

The lineations cross each other on the property in different areas. Structure is often important for the emplacement of mineralizing fluid especially where lineations intersect. Thus these areas may have greater exploration interest.

Respectfully submitted

Lloyd C. Brewer, President Columbia Airborne Geophysical Services (1984) Ltd.

December 16, 1988

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#### CERTIFICATION

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I, Lloyd C. Brewer, of the City of Vancouver, in the Province of British Columbia, Canada, do hereby certify:

That I am owner and president of Columbia Airborne Geophysical Services (1984) Ltd., with offices located at #611 - 470 Granville Street, Vancouver, B.C.

I further certify:

- I am president of Columbia Airborne Geophysical Services (1984) Ltd., and have been employed full-time in the mineral exploration industry for the past 7 years, both in Canada, U.S.A. and Mexico.
- 2. I was project manager and instrument operator for the Levon Group property aerial survey program, which covered over 1,800 line kilometres.
- 3. This report was compiled from data obtained from the airborne survey carried out by Columbia Airborne Geophysical Services (1984) Ltd., under my direct supervision, during December 1987 and January 1988.

Lloyd C. Brewer President

December 16, 1988

## AFFIDAVIT OF COSTS

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I, Lloyd C. Brewer, president of Columbia Airborne Geophysical Services (1984) Ltd., certify that the airborne magnetic and VLF-EM surveys were flown in December, 1987 and January, 1988, and that they were flown at a cost of \$100.00/km, the total number of km being 67.6 to give a total cost of \$6,760.00.

Lloyd C. Brewer President

December 16, 1988



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