#### ARIS SUMMARY SHEET

District Geologist, Kamloops Off Confidential: 90.01.20 ASSESSMENT REPORT 18280 MINING DIVISION: Lillooet **UPROPERTY:** Silverside LOCATION: LAT 50 47 30 LONG 122 33 30 UTM 10 5626532 531131 Sector Sector NTS 092J15E CAMP: 034 Bridge River Camp CLAIM(S): Silverside, Silverside Ext. OPERATOR(S): Levon Res. AUTHOR(S): Brewer, L. REPORT YEAR: 1988, 22 Pages COMMODITIES SEARCHED FOR: Gold, Silver, Antimony GEOLOGICAL **SUMMARY:** The Silverside property is underlain by sedimentary rocks of the Bridge River Group which are intruded by the Bendor Pltuon to the south and within the claims. Gold and silver mineralization are found in quartz-calcite veins with occasional stibnite, along with defined fracture planes in greenstones. Bridge River Group, Sedimentary, Bendor Pluton, Greenstone, Fractures **KEYWORDS:** Quartz-calcite veins, Gold, Silver, Stibnite WORK DONE: Geophysical EMAB 77.6 km; VLF Map(s) - 1; Scale(s) - 1:10000**MANNA** 77.6 km MAGA Map(s) - 1; Scale(s) - 1:10 000RELATED REPORTS: 14670 MINFILE: 092JNE042 

18280

## GEOPHYSICAL REPORT

ON

AIRBORNE MAGNETICS AND VLF-EM SURVEYS

OVER THE

SILVERSIDE MINERAL CLAIMS

TOMMY CREEK

LILLOOET MINING DIVISION

BRITISH COLUMBIA

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DATED

: 40 km northwest of Lillooet, B.C. on Tommy Creek, Bendor Mountain Range on the South Shore of Carpenter Lake.

FILMED

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.

: JUNE 30, 1988

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## LIST OF ILLUSTRATIONS

## At back of report

Property Location Map Claim Map 1:8,600.000Map 11:50,000Map 2

In back pocket

Airborne Magnetic & VLF-EM

1:10,000

Map 3

#### SUMMARY

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Airborne magnetic and VLF-EM surveys were carried out over the Silverside Gold Property and adjoining claims owned by Levon Resources Ltd. of Vancouver B.C., during December 1987 and January 1988. The claims are located on the Bendor Mountain Range in the Tommy Creek Drainage, some 40 kilometers northwest from the town of Lillooet. Access is gained by helicopter from Goldbridge some 18 kilometers 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 meters 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.

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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 viens within the Bridge River Series.

The airborne surveys were flown at about 50 meter terrain clearance on contour lines with line separation averaging 200 meters. 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 contoures were drawn on a survey plan on which the VLF-EM anomalies were plotted as well.

#### CONCLUSIONS

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1. 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. The area under the southern portion of the survey area is reflecting rock units of the Bendor Pluton.

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

- 2. The VLF-EM survey revealed 13 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. Conductor 'l' is located on the southern section of the survey area; this is reflecting the contact zone between the Bendor Pluton and the Bridge River Group series.
- 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 linations 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.
- 2. 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

#### SILVERSIDE CLAIMS

TOMMY 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 SILVERSIDE claims in the Tommy Creek area 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 77.6 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 2 contiguous claims totalling 32 units as shown on Map 2 and as described below:

Claim Name	# Units	Record #	Expiry Date
SILVERSIDE EXT	20	<b>3</b> 554	September 17, 1987
SILVERSIDE	12	<b>2</b> 792	March 08, 1995

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

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

## LOCATION AND ACCESS

The property is located about 4 km south of Carpenter lake along Tommy Creek, on the eastern flank of Mount Bobb.

The geographical coordinates are 50°48'N latitude and 122°33' W longitude.

Access to the claims can be reached only by helicopter. The distance to the property from Gold Bridge is about 18 km.

#### PHYSIOGRAPHY

- Jacobson

The property lies approximately 4 km from Carpenter Lake on the western side of Tommy Creek. The terrain is, in general, steep and mountainous.

Elevations vary from 2,500 m a.s.l. on the north west side of the claims and drops to about 1,500 m a.s.l. on the south east side of the property near Tommy Creek.

The main water source is from Tommy Creek, which runs along the western side of the claims.

The forest cover is made up primarily of fir and spruce trees, moderate in density and with an undergrowth light to moderate.

## HISTORY OF PREVIOUS WORK

Exploration in the area probably dates back to the turn of the century when the Tommy Creek area was undoubtedly prospected. There are several sets of workings in the Tommy Creek basin, some of these have shipped gold and silver ore, although the amounts are unknown to the author.

On the Silverside claims themselves, several sets of old workings were observed from the air during the course of this survey.

## GEOLOGY AND MINERALIZATION

The Silverside property is underlain by sedimentary rocks of the Bridge River Group which are intruded by the Bendor Pluton to the south and within the claims. Gold and silver mineralization are found in quartz-calcite veins with occasional stibuite, along will defined fracture planes in greenstones.

#### INSTRUMENTATION AND THEORY

## a) <u>Magnetic Survey</u>

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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.

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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

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 orientaiton with respect to northwest and eastwest 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 kilometers 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 Seattle transmissions. Conductors striking east to northeast may 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 a 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 conductor does not appear to cross the adjacent flight lines. The relatively high frequencey results in a multitude of anomalies from unwanted sources such as swamps, creeks and 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 from magnetic surveys, air photo analyses, and ground traverses to aid in discrimination between important and unwanted anomalies. Even armed with this information the interpreter can easily be misled.

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## SURVEY PROCEDURES

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A two meter bird was fitted with a magnetometer coil and 2 omni-directional EM receivers and towed beneath the helicopter on a 10 meter 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 77.6 km.

I have over 7 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

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 and '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) Magnetic

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The magnetic field over the Tommy Creek survey is fairly active, varying from less than 1400 gammas to over 3100 gammas. There is a definite pattern in the magnetics that correlate closely with underlying rock units as mapped by several G.S.C. geologists (G.S.C. O/F 482).

A broad magnetic low characterized by a quiet magnetic field occurs within the southern central portion of the claims. The magnetic field consists of values ranging generally from 1600 gammas to 2000 gammas. The low strikes north westerly and runs through the claim boundaries, over 4000 meters, and has a width of 1500 metres, as defined on Map 3. This feature is reflecting sediments of the Bridge River Group. The magnetic expression correlates closely with G.S.C. geology map of the area. On the southern area of the survey, just off the Silverside claim, occurs an intense magnetic high with values ranging up to 3100 gammas. This high directly correlates with the Bendor Pluton. A southerly flowing creek on the north side of the Tommy Creek valley runs down the contact of the Bendor Pluton and Bridge River sediments. In the northern half of the survey there are three intense magnetic highs all over 2500 + gammas (labeled a,b,c on figure 3). One of these correlates with a small G.S.C. mapped granodiorite stock. The other two highs are most likely caused by the same small units of granodiorite material. Surrounding these highs is a broad, moderately high magnetic anomaly some 2200-2300 gammas. Its causitve source appears to be deeper laying or partially covered granodiorite. The three highs therefore being expressions of closer to surface or at surface 'fingers' of basic material with the broad moderate high being the large underlying unit.

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

- 1. Valleys almost always contain 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. Gullies and valley are often caused by faults or shear zones which are often reflecting by magneitc lows.

## (b) VLF-EM

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The major cause of VLF-EM anomalies, as a rule, are geological structrue 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 causitive source. But in the writer's experience, when VLF-EM anomalies correlate with sulpide mineralization, the anomalies are ussually 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 of 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.

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The Silverside 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 'm' respectively. Some of the conductors, such as 'b' and 'c' are 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 indicitive of geological structure. However, the longer conductors are much more indicitive. These include conductors 'a', 'b', 'c', 'g', 'j' 'i' & 'm', where lengths vary from 900 to over 3000 meters. Any part of this anomalies could be reflecting mineralization that is associated with geological structure.

Conductor 'a' strikes in a northwesterly by westerly direction along a similar striking creek valley. It is some 2200 meters in length be 200+ meters wide. This anomaly is most likely reflecting geological structure such as a shear or fault zone related to the creek flowing within the majority of this conductors strike length.

Conductor 'b' and 'c' are of prime interest since they have a combined strike length over 3500 meters. A maximum width of 600 meters runs through an intense magnetic high. As well, this zone passes through an area covered by crown grants with numerous gold bearing workings within them. This anomaly is most likely reflecting a large conductive shear/mineralized zone associated with the known showings.

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Conductor 'd' strikes north westerly and is 800 meters long and 200 meters wide. It is a high order anomaly as an intense magnetic high occurs at the eastern end of it, and there is an apparent off setting of this anomaly. There fore, this anomaly is most likely caused by the placement of mineralized fluids along a small fault or shear zone running between the magnetic high and Tommy Creek.

Conductors 'e' and 'f' are smaller conductors both striking north westerly and having strike lengths of less than 500 meters.

Conductor 'g' has north westerly strike of over 3200 meters. This is an interesting anomaly as it is through a strong magnetic high. This conductor is most likely caused by a fault/shear zone.

Conductor 'h' and 'i' both strike northerly and have a strike length of less than 400 meters. These conductors could be caused by mineralized zones (meta-sediments), with the Bridge River Group.

Conductor 'j' has an open westerly strike of over 1000 meters. It occurs along steep escarpment and strikes into a creek valley. It's causitive source is most likely fault related.

Conductor 'k' has a northwesterly strike of 400 meters. It occurs along a creek valley near a fork in this creek. It's causitive source is most likely a fault/shear zone.

Conductor 'l' occurs along a strong magnetic transitional zone thought to be reflecting the geological contact of the Bendor Pluton with the Bridge River Group sediments. It has a north westerly strike of 1200 meters.

Conductor 'm' runs westerly and has an open strike length of over 900 meters. It occurs on the flanks of the highest magnetic reading on this property within the Bendor Pluton. It's causitive source is unknown. There are also some single-line anomalies any of which could easily be reflecting bedrock conductors associated with mineralization. For each anomaly, the strike of the causitive source is unknown.

(c) Lineations

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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.

June 30, 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 1800 line kilometers.
- 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

JUNE 30, 1988

## AFFIDAVIT OF COSTS

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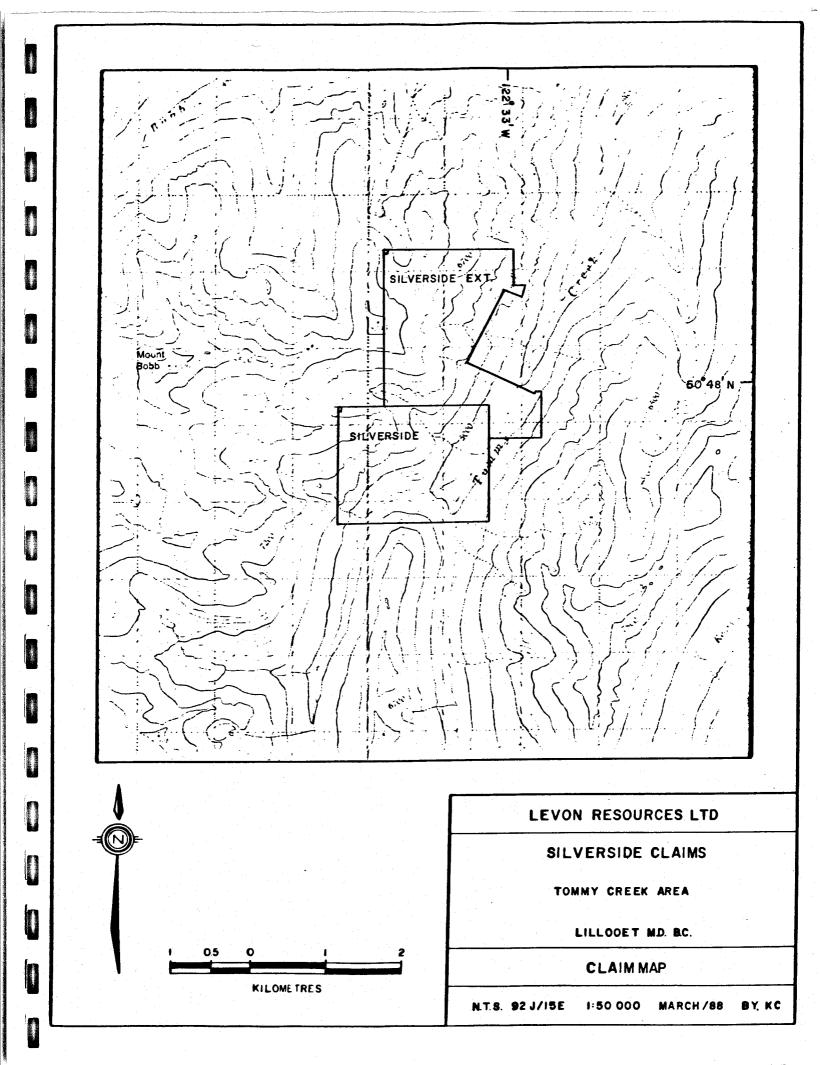
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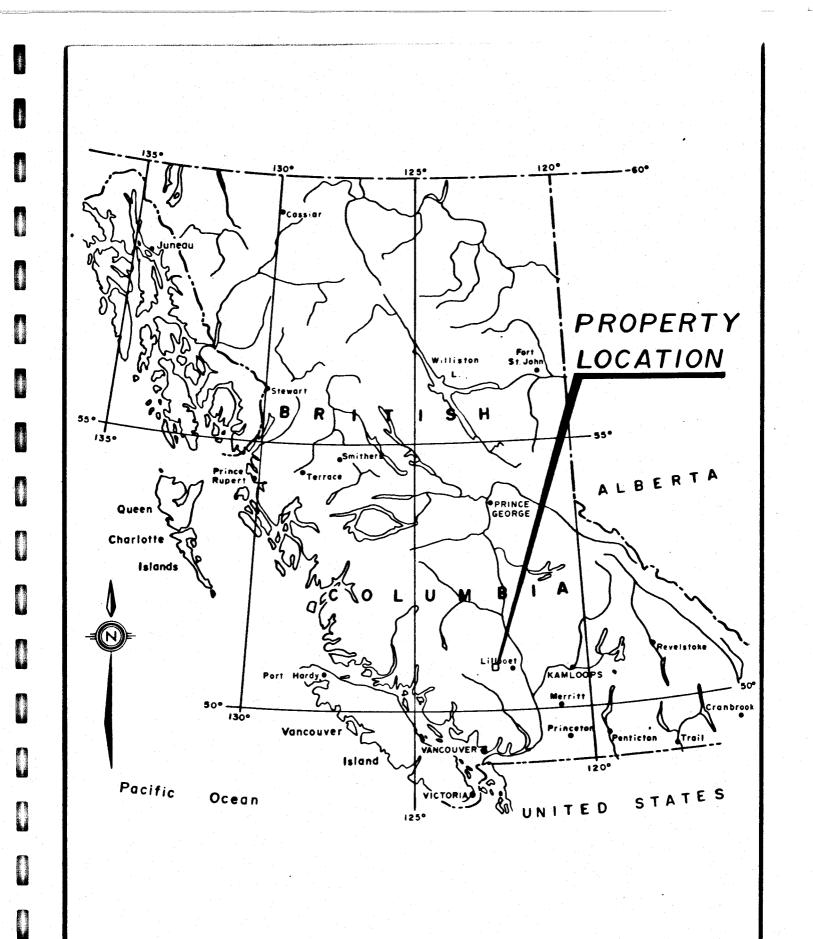
I, Lloyd C. Brewer, president of Columbia Airborne Geophysical Services (1984) Ltd., certify that the airborne magnetic and VLF-EM surveys were flown in December 1987 and January 1988, and that they were flown at a cost of \$100.00/km, the total number of km being 77.6 to give a total cost of \$7,760.00.

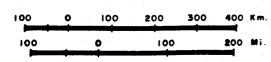
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LLOYD C. BREWER PRESIDENT

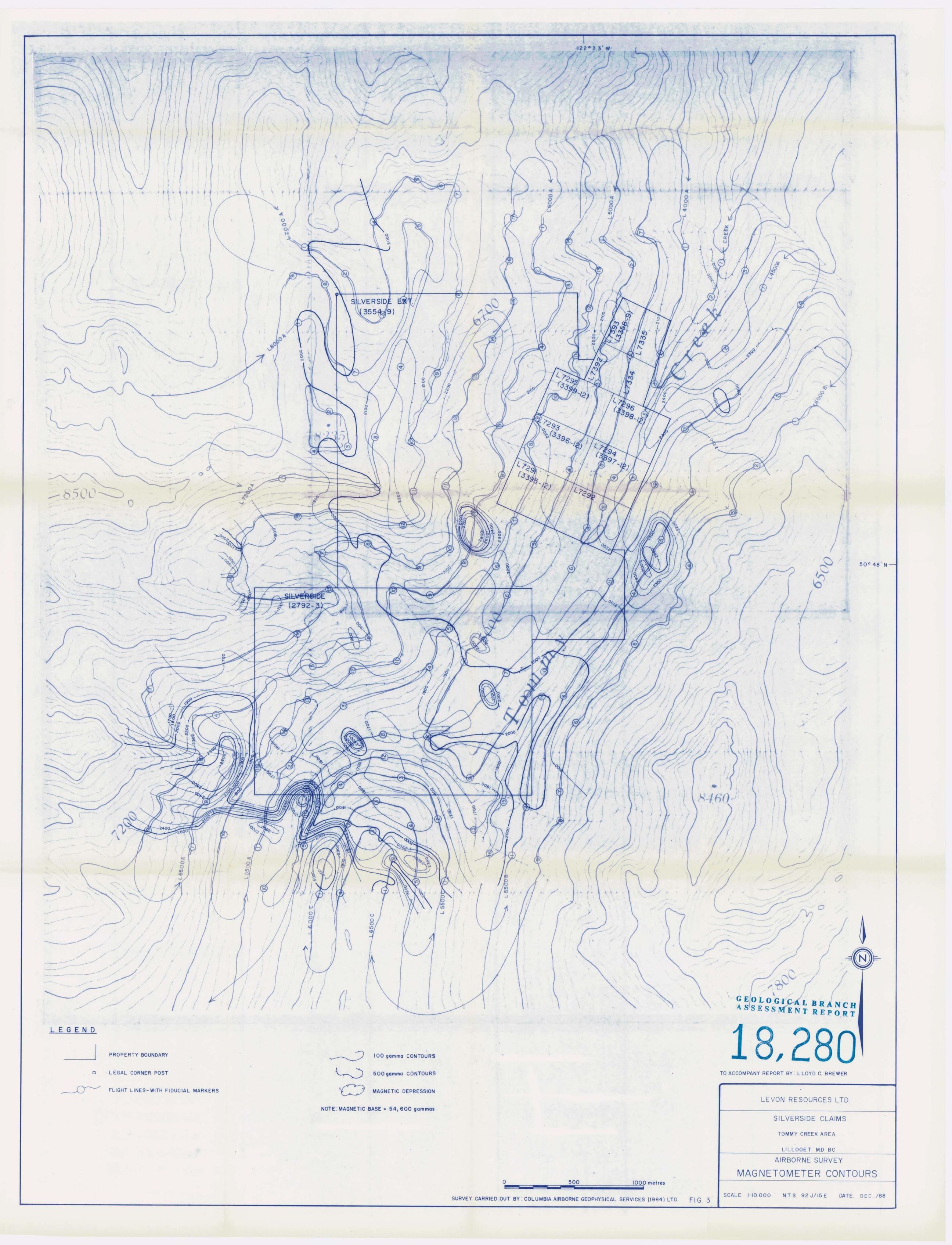
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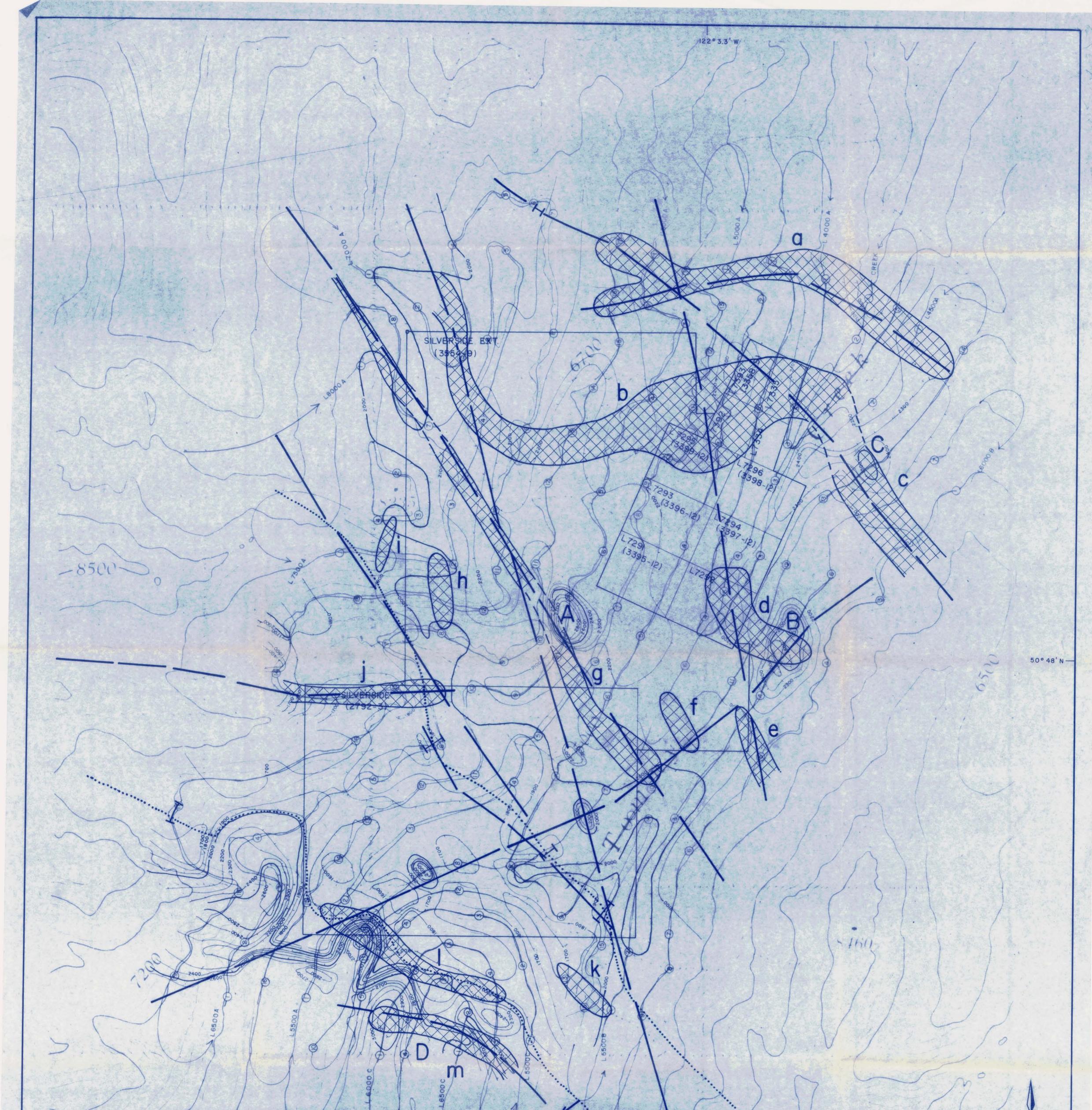




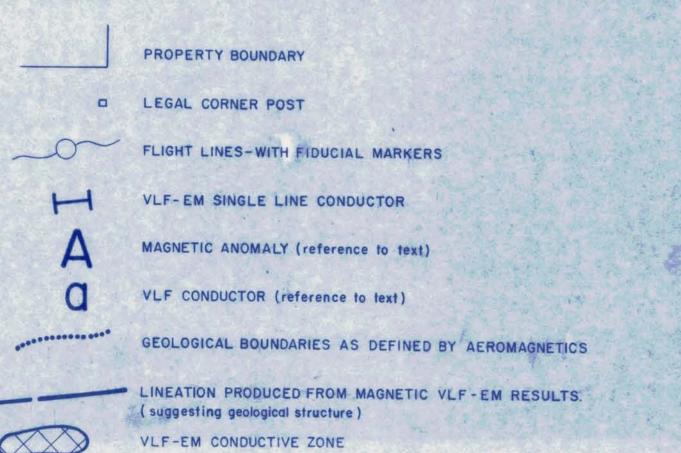


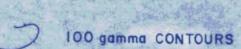
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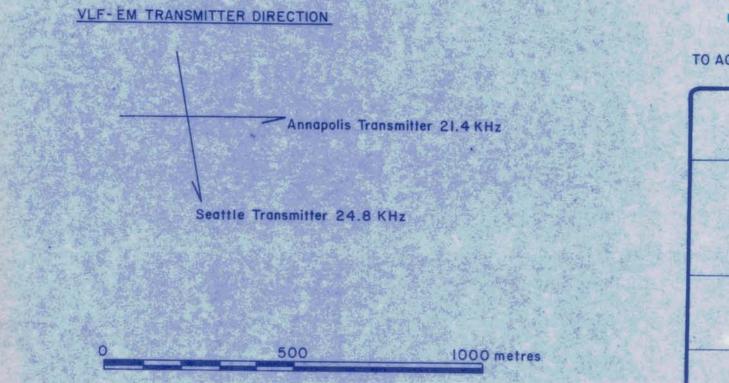




) 500 gamma CONTOURS

MAGNETIC DEPRESSION

NOTE: MAGNETIC BASE = 54,600 gammas



SURVEY CARRIED OUT BY COLUMBIA AIRBORNE GEOPHYSICAL SERVICES (1984) LTD. FIG. 4



# TO ACCOMPANY REPORT BY : LLOYD C. BREWER

LEVON RESOURCES LTD.

SILVERSIDE CLAIMS

TOMMY CREEK AREA

LILLOOET M.D. BC

AIRBORNE SURVEY

VLF-EM ANOMALIES

SCALE. 1:10 000 N.T.S. 92 J/15E DATE. DEC./88