

84-#256-12187 2

GEOPHYSICAL REPORT

ON

AIRBORNE MAGNETIC AND VLF-EM SURVEYS

OVER THE

DOYLE 1 & 2 CLAIMS

FOULGER CREEK, WOODFIBRE AREA

VANCOUVER MINING DIVISION

BRITISH COLUMBIA

PROPERTY : To the immediate south of Woodfibre along western side of Howe Sound
 : 49° 123° NE
 : N.T.S. 92G/11W

WRITTEN FOR : BLACK QUEEN RESOURCES CORP.
 Mezzanine Floor, 744 W. Hastings
 Vancouver, B.C., V6E 2X1

SURVEYED BY : COLUMBIA AIRBORNE GEOPHYSICAL SERVICES LTD.
 #1807-1450 West Georgia Street
 Vancouver, B.C., V6G 1T8

WRITTEN BY : David G. Mark, Geophysicist
 GEOTRONICS SURVEYS LTD.
 #403-750 West Pender Street
 Vancouver, B.C., V6C 2T7

DATED : April 16, 1984



GEOTRONICS SURVEYS LTD.
 Engineering & Mining Geophysicists
 VANCOUVER, CANADA



TABLE OF CONTENTS

SUMMARY	i
CONCLUSIONS	ii
RECOMMENDATIONS	ii
INTRODUCTION AND GENERAL REMARKS	1
PROPERTY AND OWNERSHIP	2
LOCATION AND ACCESS	2
PHYSIOGRAPHY	3
HISTORY OF PREVIOUS WORK	3
GEOLOGY	3
INSTRUMENTATION AND THEORY	6
a) <u>Magnetic Survey</u>	6
b) <u>VLF-EM Survey</u>	7
SURVEY PROCEDURE	9
DATA REDUCTION AND COMPILATION	9
DISCUSSION OF RESULTS	10
SELECTED BIBLIOGRAPHY	13
GEOPHYSICIST'S CERTIFICATE	14
AFFIDAVIT OF COSTS	15

**GEOLOGICAL BRANCH
ASSESSMENT REPORT**

12.187

LIST OF ILLUSTRATIONS

At Back of Report

Property Location Map 1:10,000,000 Sheet 1

Claim Map 1:50,000 Sheet 2

In Back Pocket

Airborne Survey 1:10,000 Sheet 3
Magnetic Contours
& VLF-EM Anomalies

Airborne Survey 1:10,000 Sheet 4
Flightlines with
Magnetic Data

SUMMARY

Airborne magnetic and VLF-EM surveys were carried out over the Woodfibre property owned by Black Queen Resources Corp. of Vancouver, B.C. during the first part of 1984. The claims are located to the immediate south of the industrial site of Woodfibre on the west side of Howe Sound. Access is easily gained by a two-wheel drive vehicle. The terrain consists of very steep slopes forested with moderately dense coniferous trees. The purpose of the surveys was to aid in the mapping of geology as well as to locate probable areas for exploration of gold mineralization.

The property contains the northwesterly-striking extension of the Britannia shear zone. Within the shear zone occur metavolcanics and sediments of the Gambier Group which is considered a roof pendant within diorites and granodiorites of the Coast Intrusives. The Gambier Group in the general region is host to numerous mines and promising prospects. Silver mineralization as well as sulphides of iron, lead, zinc and copper are found on the Black Queen property.

The airborne surveys were flown at about a 50-meter terrain clearance on contour lines with a separation varying from 100 to 200 meters. The instruments used were a Sabre Electronics proton precession magnetometer and a Sabre Electronics VLF-EM receiver. The magnetic data were picked from the strip charts and hand contoured. The contours were drawn on a survey plan on which the VLF-EM anomalies were plotted as well.

CONCLUSIONS

1. The airborne magnetic survey appears to have mapped the contacts between the Coast Intrusive granodiorites and the Gambier Group metavolcanics and sediments within the Britannia shear zone.
2. Magnetic highs that occur in the northwestern corner of the property as well as along the eastern edge on the Howe Sound shoreline are probably caused by capping of Tertiary volcanics.
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 usually are important indicators of sulphide and native gold mineralization especially where the lineations cross.
4. There are also some strong VLF-EM single-line conductors that are possibly caused by gold and/or sulphide mineralization.

RECOMMENDATIONS

These are as follows:

1. Thorough prospecting and/or geological mapping. This will also greatly aid in the interpretation of any geophysics and geochemistry that have been or may be carried out, especially the airborne magnetic survey.

2. Soil geochemistry sampling. The total sample picked up should be pulverized and not screened in order to preclude the screening out of coarser gold. (The writer considers porphyrite gold occurring on the Doyle Claims to be a good possibility).
3. Ground VLF-EM and magnetic surveys in selected areas as well as possibly low-frequency EM (such as MaxMin II EM system). An induced polarization-resistivity survey should be considered since it may well prove to be one of the best tools available for this area.
4. Trenching and diamond drilling of promising targets resulting from the above work.

GEOPHYSICAL REPORT
ON
AIRBORNE MAGNETIC AND VLF-EM SURVEYS
OVER THE
DOYLE 1 & 2 CLAIMS
FOULGER CREEK, WOODFIBRE AREA
VANCOUVER MINING DIVISION
BRITISH COLUMBIA

INTRODUCTION AND GENERAL REMARKS

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 Doyle claims near Woodfibre during the first few months of 1984. The surveys were carried out by E.A. Dodd, instrument operator and project manager, and Lloyd Brewer, navigator, both of whom are of Columbia Airborne Geophysical Services Ltd. A total of 55.2 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 Britannia area to the east. Magnetic surveys have especially been proven to be a good geological mapping tool.

PROPERTY AND OWNERSHIP

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

<u>Claim Name</u>	<u># Units</u>	<u>Record #</u>	<u>Expiry Date</u>
Doyle 1	20	1327	February 16, 1984
Dolye 2	8	1328	February 16, 1984

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 Black Queen Resources Corp. of Vancouver, British Columbia.

LOCATION AND ACCESS

The property abuts the industrial site of Woodfibre, B.C. and occurs along the western shore of Howe Sound.

The geographical coordinates are 49°46'N latitude and 122°16'W longitude.

Access can be gained by a 2-wheel drive road from Woodfibre which runs westerly within a few hundred meters of the northern boundary of the property. According to a map from Von Rosen's report, some logging(?) roads cross the property that may be 4-wheel drive and that have access from this main road. Woodfibre is serviced continuously by car and passenger ferry. The eastern edge of the property is accessible by boat.

PHYSIOGRAPHY

The property lies at the southern end of the Pacific Ranges which is a physiographic division of the Coast Mountains. The terrain is, in general, steep and mountainous with the general slope facing towards the east. The claims are dissected by major easterly drainage systems.

Elevations vary from sea level on Howe Sound along the eastern edge of the claims to 1,000 m a.s.l. at the southwestern corner of the property.

The main water sources would be Howe Sound as well as the tributaries of Woodfibre Creek, Foulger Creek and one unnamed creek which cross the property flowing easterly.

The forest cover consists of Douglas fir, cedar and spruce and varies from closely growing, immature stands to more widely spaced, mature stands.

HISTORY OF PREVIOUS WORK

Since the claims have been staked, to the writer's knowledge, no work has been done.

GEOLOGY

The following is quoted from Sookochoff's September, 1983 report on the property:

"The geology of the area is of the predominant Coast Range Batholith with contained pendants of sedimentary and volcanic rocks.

The Gambier pendant along which the Britannia shear zone and ore bodies occur consists:

of steeply dipping metamorphosed sediments and igneous rocks covering an area of eleven km long by three km wide. The deposits are in a shear zone up to 600 m wide that occur mainly in quartz sericite schist. It includes five large schists impregnated with and replaced by ore and localized by structure of the shear zone. They have been followed to 2,500 feet in depth.

"On the Horseshoe, three km to the south mineralization of gold, silver and copper at the contact between granodiorite and micaceous schist.

"On the Crofton southwest of the Horseshoe values of up to 3.4 oz Ag/ton, 7.8% Cu, 5% Pb and 11% Zn occur as lenses filling fissures in a shear zone.

"The Doyle claims cover the northwesterly extension of the Britannia shear zone within the Gambier Group of sediments and volcanics. The shear zone is up to 1,700 feet wide with the commonest rock a fine-textured gray, sericite-quartz schist probably representing sheared latite and dacite sills. Previous work on the ground covered by the claims disclosed pyrrhotite, pyrite, chalcopyrite, sphalerite and galena mineralization usually associated with a dark green chlorite schist.

"Assays of samples taken from pits and trenches along the mineralized zone is reported as up to 0.36 oz Ag/ton, 0.75% Cu and 2.39% Zn. Mineralization occurs within numerous zones, one of which is along a 200 meter long shear zone."

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

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 19.0 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 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 Woodfibre area, one may assume that a Seattle field strength peak represents a conductor with a generally northwest 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 conductor 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 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.

SURVEY PROCEDURE

A two-meter bird was fitted with a magnetometer coil and 2 omnidirectional 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 Jet Ranger helicopter. Airspeed was a constant 60 KPH so that creek valleys and canyons were penetrated thoroughly. The slow airspeed provided safety, detailed coverage of boxed-in areas, and consistency of data retrieval, which is critical in rugged terrain.

The number of line km flown as shown on Sheet 4 is 55.2.

The project supervisor, Mr. Dodd, has over 14 years of experience in conducting aerial magnetic, electromagnetic and radiometric 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 on Sheet 4 at a scale of 1:10,000 (1 cm = 100 m). The data were then contoured at a 100-gamma interval onto Sheet 3.

The VLF-EM anomalies were taken from the strip charts and plotted on Sheet 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 indicate average responses. Other symbols are explained on the sheets.

DISCUSSION OF RESULTS

The magnetic field over the Doyle 1 and 2 claims is generally fairly quiet with the amplitude varying from 1,850 to 2,400 gammas to give a range of 550 gammas. Rocks with this magnetic

signature are the metavolcanics and sediments(?) of the Gambier Group as well as Coast Intrusives.

The Britannia shear zone, for which the claims were staked, strikes through the center of the property in a northwesterly direction. It is about 600 m wide on the shore of Howe Sound and thins down to almost no width at the northern border. The Britannia shear zone contains Gambier Group rocks.

The magnetic field within the shear zone as well as north of it appears to have the same signature - fairly quiet with the amplitude varying from 2,200 to 2,400 gammas. The rock-types north of the Britannia shear are Coast Intrusive diorites.

South of the shear the magnetic field is almost as quiet but of lower amplitude, that is, 1,850 to 2,200 gammas. The rock-types in this area have been mapped as granodiorites. It is possible, considering the low amplitude of the magnetic field, that these rocks are actually of the Gambier Group.

Thumbprint highs up to 3,900 gammas occur along the Howe Sound shoreline. Also a 5,000-gamma thumbprint high occurs within the northwestern corner of the property. These highs, considering their nature, are probably reflecting cappings of Tertiary andesites and basalts.

The major cause of VLF-EM anomalies, as a rule, are geologic structure 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 to 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.

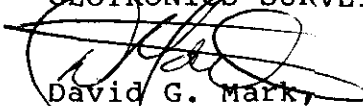
Lineal trends considered to be indicative of geological structure have been drawn on Sheet 3 taking into account:

- a) Magnetic lows which are often caused by the magnetite within the rocks being altered by 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 have been mapped across the property striking in virtually all directions. The lineations cross each other on the property in different areas. Structure is often important for the emplacement of mineralizing fluids especially where lineations intersect. Thus these areas may have greater exploration interest.

There are also some strong EM conductors occurring on the Black Queen property that could well be related to mineralization. These conductors are marked as such on Sheet 3.

Respectfully submitted,
GEOTRONICS SURVEYS LTD.



David G. Mark,
Geophysicist

April 16, 1984

SELECTED BIBLIOGRAPHY

- Hopkins, H.H., President, News Release, undated, News Release, February 20, 1981, News Release, May 15, 1981.
- Nevin, Andrew E., Ph.D., P.Eng., Report on 1978 and 1979 Work on the War Eagle and Adjacent Claims, and Recommendations for Continued Work, June 1980.
- Nevin, Andrew E., Ph.D., P.Eng., Summary Report on War Eagle, Clarke and Janette Claims, Indian River Headwaters, Vancouver M.D., B.C., September 18, 1980.
- Payne, J.C., Bratt, J.A., Stone, B.G., Deformed Mesozoic Volcanogenic Cu-Zn Sulphide Deposits in the Britannia District, British Columbia, Economic Geology, Vol. 75, pg. 700-721, 1980.
- Roddick, J.A., and Woodsworth, G.J., Geology of Vancouver West Half and Mainland Part of Alberni; Geological Survey of Canada, Open File 611, 1979.
- Seraphim, R.H., Ph.D., P.Eng., Report on Clarke Claim, Indian River, Vancouver M.D., for Maggie Mines Ltd., August 12, 1977.
- Seraphim, R.H., Ph.D., P.Eng., Addendum on War Eagle Claim for Maggie Mines Ltd., May 4, 1978.
- Skerl, A.C., Geology of the Property of the Howe Sound Copper Syndicate, Howe Sound, B.C.; British Columbia Department of Mines, Assessment Report Number 288. 1958.
- Sookochoff, Larry, Geological Engineering Letter on Doyle 1 and 2 Claims, Vancouver, M.D., B.C., for Black Queen Resources Corp., Pan American Consultants Ltd., September 9, 1983.
- Sutherland Brown, A., Britannia Mine; British Columbia, Department of Mines, Annual Report for 1976, pp 190. 1976.
- von Rosen, Gerhard E.A., Report on "McLeod-Snow" Mineral Wood-fibre Area, B.C., September 5, 1979.


GEOPHYSICIST'S CERTIFICATE

I, DAVID G. MARK, of the City of Vancouver, in the Province of British Columbia, do hereby certify:

That I am a Consulting Geophysicist of Geotronics Surveys Ltd., with offices located at #403-750 West Pender Street, Vancouver, British Columbia.

I further certify:


1. That I am a graduate of the University of British Columbia (1968) and hold a B.Sc. degree in Geophysics.
2. I have been practising my profession for the past 16 years and have been active in the mining industry for the past 19 years.
3. That I am an active member of the Society of Exploration Geophysicists and a member of the European Association for Exploration Geophysicists.
4. This report is compiled from data obtained from airborne magnetic and VLF-EM surveys carried out by Columbia Airborne Geophysical Services Ltd., under the supervision of E.A. Dodd during the first few months of 1984.
5. I have no direct or indirect interest in any of the properties mentioned within this report, nor in Black Queen Resources Corp., nor do I expect to receive any interest as a result of writing this report.


David G. Mark
Geophysicist

April 16, 1984

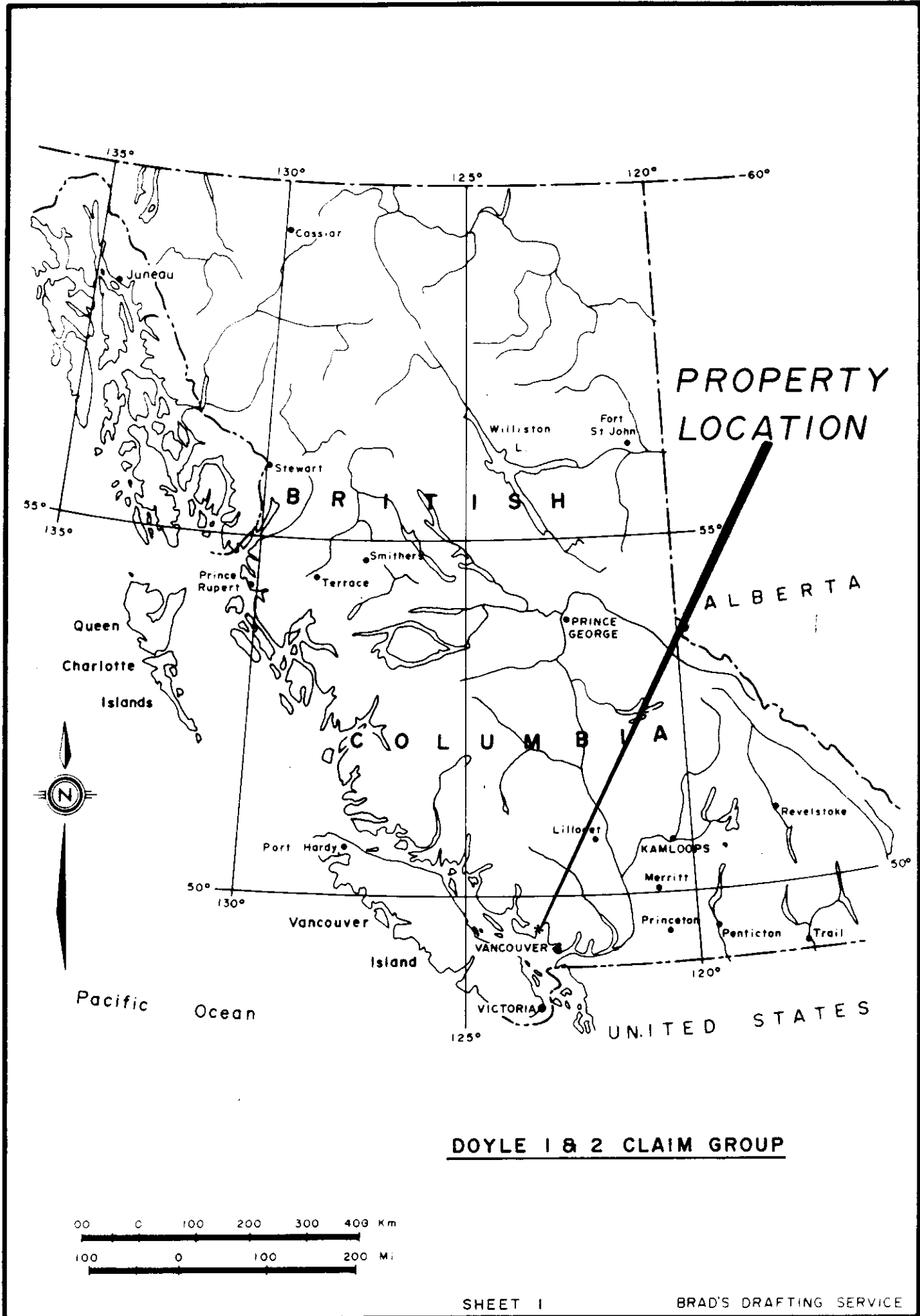
AFFIDAVIT OF COSTS

I, Eugene A. Dodd, president of Columbia Airborne Geophysical Services Ltd., certify that the airborne magnetic and VLF-EM surveys were flown in the early part of 1984, and that they were flown at an all inclusive cost of \$7,500.00



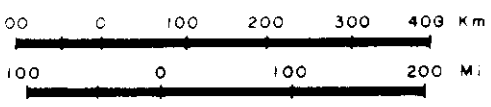
Eugene A. Dodd

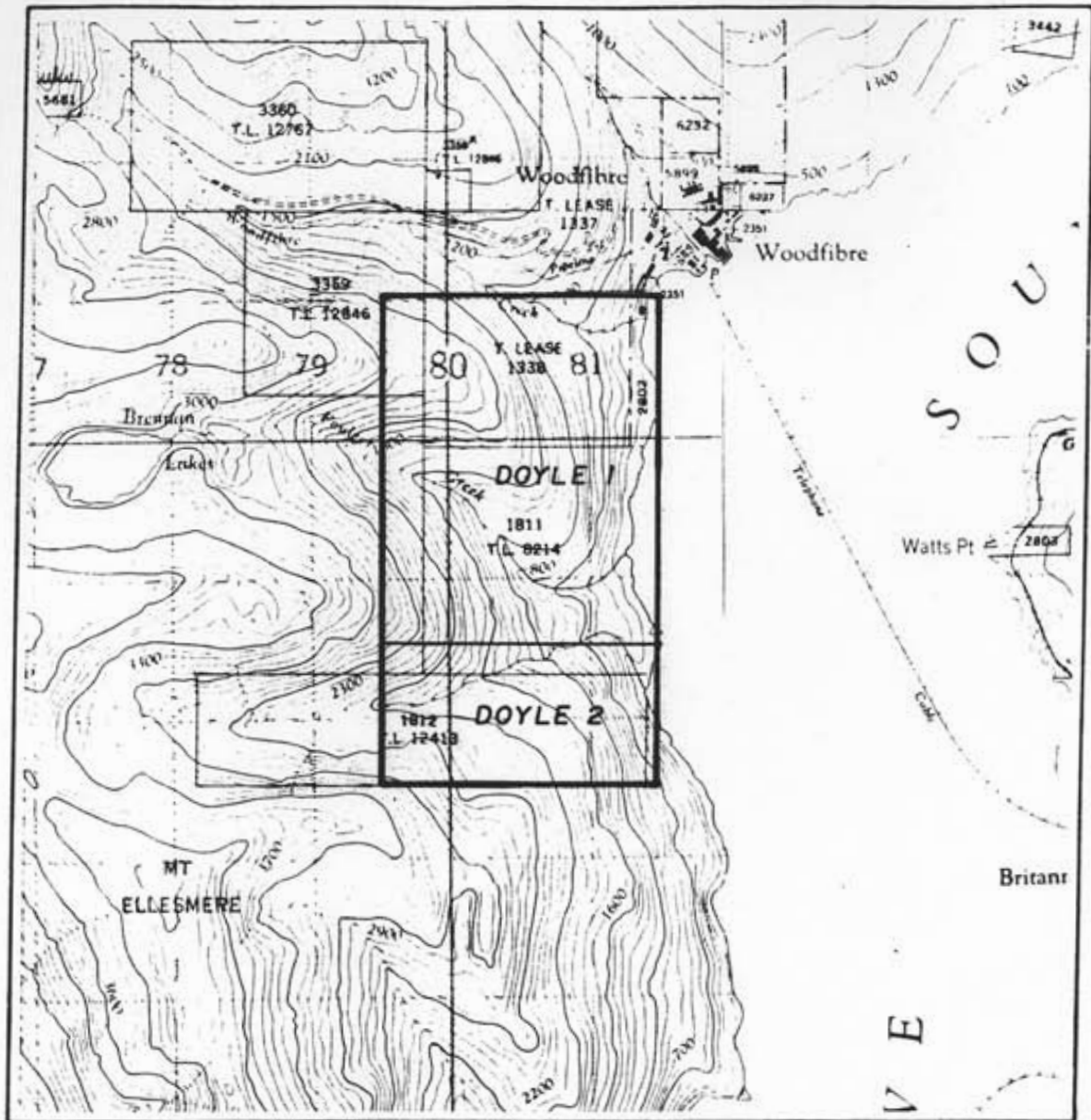
April 16, 1984



**PROPERTY
LOCATION**

DOYLE 1 & 2 CLAIM GROUP





To Accompany Report By: D.G. MARK, Geophysicist.

BLACK QUEEN RESOURCES CORP.

DOYLE 1 & 2 CLAIM GROUP

FOULGER CK., WOODFIBRE AREA

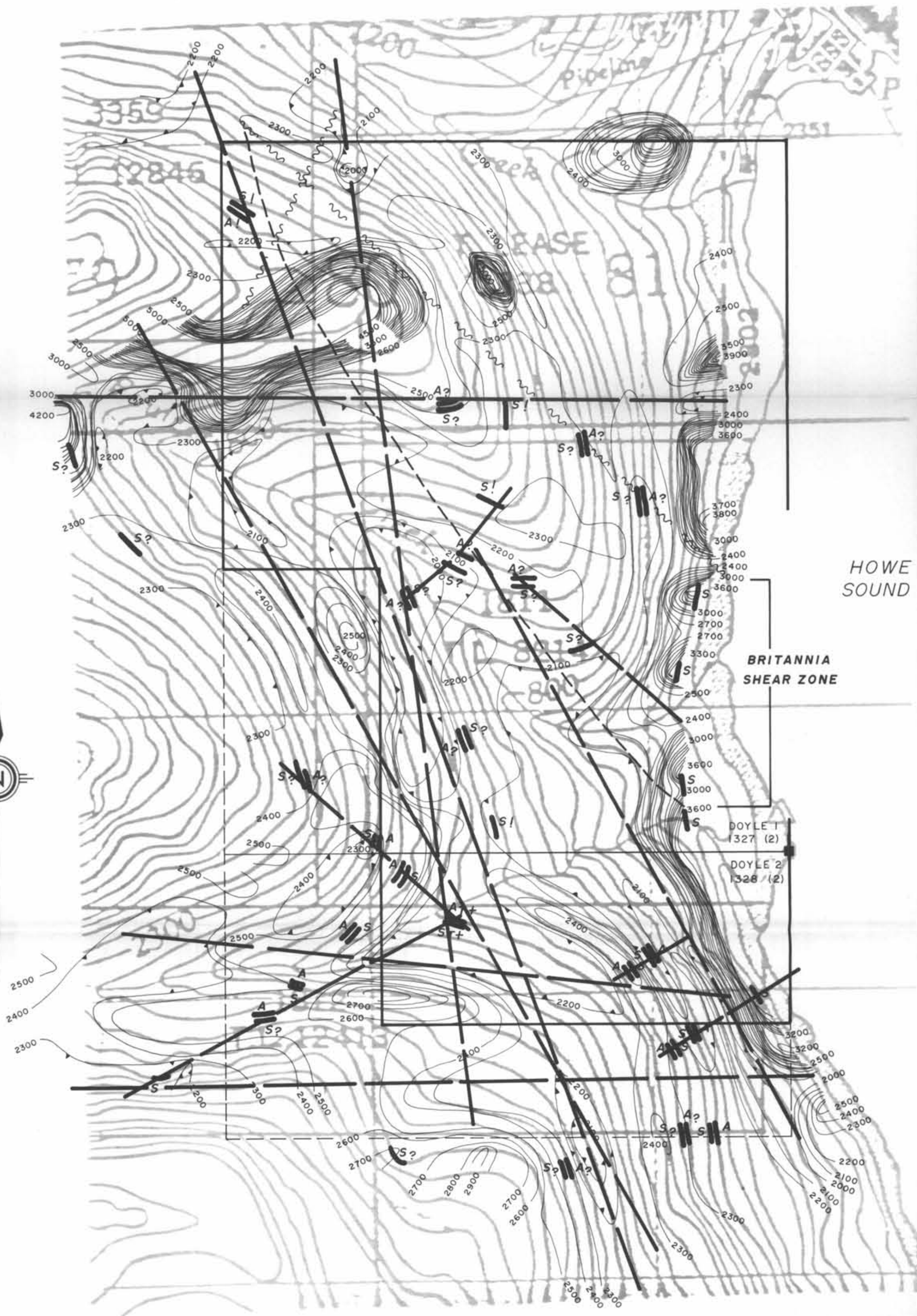
VANCOUVER M.D.

CLAIM LOCATION MAP













SCALE:	DATE:	SHEET:	NTS
1:50,000	Apr. 84	2	92 G/11 W

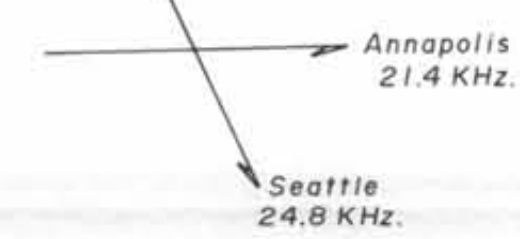
123°16'

49°39'



LEGEND

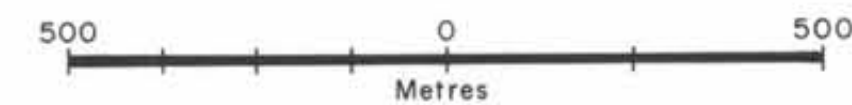
-  Lineation produced from magnetic and E.M. results suggesting geological structure.
-  VLF-EM anomaly.
-  Seattle anomaly.
-  Annapolis anomaly.
-  Strong anomaly.
-  Questionable anomaly.
-  Fault.
-  Magnetic depression.
-  Property boundary.
-  Claim boundary.
-  Claim overlap.
-  Legal corner post.



Mean terrain clearance - 30 metres.

Contour interval - 100 ppmms. **BLANCH**
REPORT

12,187



To accompany report by D.G. MARK, Geophysicist.

BLACK QUEEN RESOURCES CORP.

DOYLE 1 & 2 CLAIM GROUP

FOULGER CK., WOODFIBRE AREA

VANCOUVER M.D.

AIRBORNE SURVEY

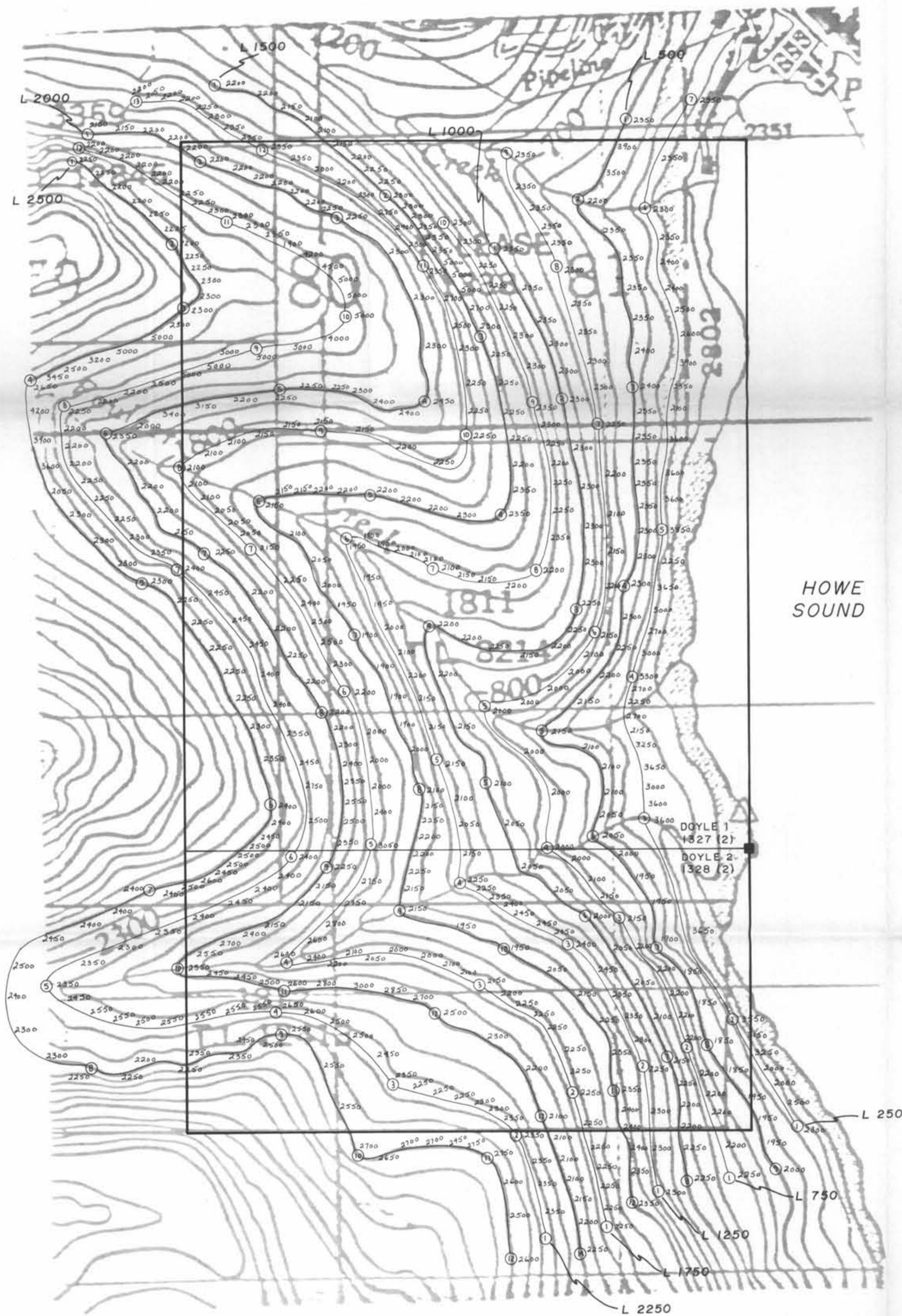
MAGNETIC CONTOURS & VLF-EM ANOMALIES

SCALE: 1:10,000	DATE: April 84	SHEET: 3	DRAWN BY: B. D. S.
-----------------	----------------	----------	--------------------

SURVEY CARRIED OUT BY: COLUMBIA AIRBORNE GEOPHYSICAL SERVICES LTD.

123°16'

49°39'

**LEGEND**

- Flight line.
- Fiducial marker.
- Magnetic value.
- Property boundary.
- Legal corner post.

Annapolis
21.4 KHz.

Seattle
24.8 KHz.

12187

500 0 500
Metres

To accompany report by D.G. MARK, Geophysicist.

BLACK QUEEN RESOURCES CORP.**DOYLE 1 & 2 CLAIM GROUP**

FOULGER CK., WOODFIBRE AREA

VANCOUVER M.D.

AIRBORNE SURVEY

FLIGHTLINES WITH MAGNETIC DATA

SCALE: 1:10,000	DATE: April 84	SHEET: 4	DRAWN BY: B. D. S.
SURVEY CARRIED OUT BY: COLUMBIA AIRBORNE GEOPHYSICAL SERVICES LTD.			