104 K 5/6
11/12

GEOPHYSICAL REPORT
ON TAP & PAT Mineral Claims
Mt Ogden, B.C. 58°24'N 133 22W
for
MT OGDEN MINES LTD.
by
C.B. Selmser, P. Eng
MAY 7 to 8, 1967

1627

C. L. ERICKSON
1625 OAK STREET
PRINCE GEORGE, B.C.
TELEPHONE 564-5085

August 19, 1968.

Mining Recorder,
Box 100,
Atlin, B. C.

Dear Sir:

Re: Geophysical Report -
TAP & PAT Group.

Herewith detailed statement of expenditures together with P.O. Money Order for $20.00; being penalty for recording of Supplementary affidavits, as requested in your letter of June 27, 1968.

Fees - Geo - Cal	$5,169.19
Maps	400.00
Aircraft	1, 570.00
Fuel	410.62
Ancillary Services & Wages	2,500.00
Camp	190.00
	$10,239.81

I draw attention to my letter of March 8, 1968., (to accompany original affidavits), in which statement of costs to Mt Ogden Mines Ltd. in amount of $54, 576.57 was included. was

I trust the foregoing will be found satisfactory.

Yours truly,

C. L. Erickson

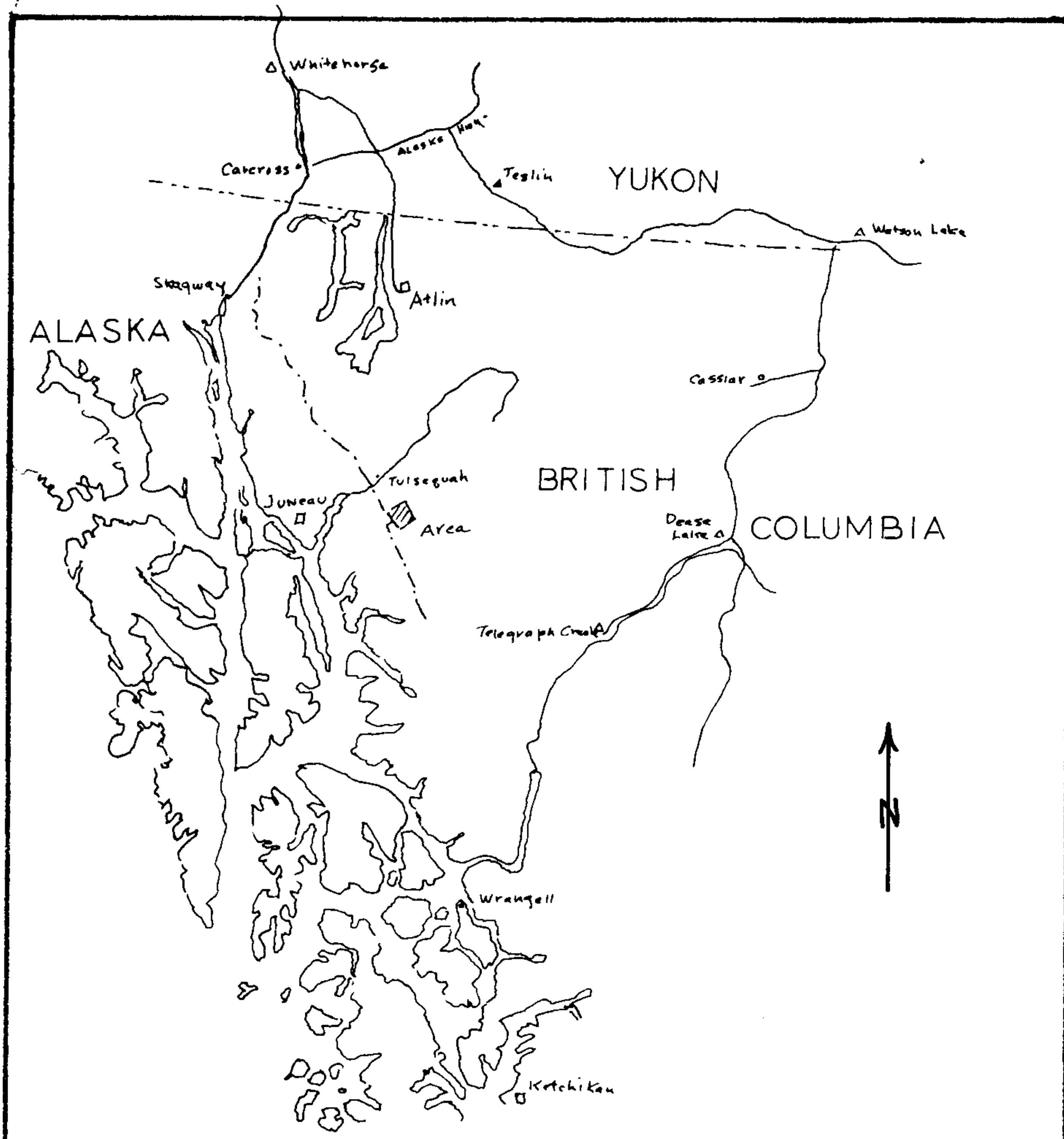
AUG 23 '68 PM

c.c. Chief Gold Commissioner
encls. (2)

8585

DEPT. OF MINES
AND PETROLEUM RESOURCES

REFERRED TO	DATE	INITIAL
D.M.		
C.G.C. ✓		
.C.		
.C.G.C.		
.C.		
ACCTS.		
.A.B.		
.I.		
C.A.		
.T.		
.P.E.		



LOCATION MAP
scale: 1 in. = 50 mi.

Fig. 1

GEOPHYSICAL REPORT
MAGNETIC AND ELECTROMAGNETIC SURVEY
PAT GROUP
TULSEQUAH, B. C.

for

MT. OGDEN MINES LTD.
VANCOUVER, B. C.

by

GEO CAL LIMITED
WEST VANCOUVER, B.C.

May 7 to 8, 1967

C. B. Selmser, P.Eng.
Geophysicist

TABLE OF CONTENTS

GEOPHYSICAL REPORT
MAGNETIC AND ELECTROMAGNETIC METHODS
PAT GROUP, ATLIN, M.D.

May 19, 1967
C. B. Salmser, P. Eng.

INTRODUCTION:

These surveys were made over an area of more than 156 claims in the Atlin Mining Division, 13 miles southeast of Tulsequah, B.C. The area encompasses a rectangle whose sides are 3.2 by 3.8 miles and is situated at the international boundary between Alaska and British Columbia.

Access to the area consists of a gravel road from the Trans-Canada Highway at Whitehorse to Atlin, B. C. From there transportation must be made with an aircraft to an emergency flying field near Tulsequah.

Living accommodation was provided for the survey party at the Polaris Taku Mine under the caretakership of Mr. E. Feldman. The helicopter used for the survey was also based at the mine with enough fuel for the survey dumped at the airstrip.

The route flown from the mine to the property followed the Taku River valley to the Sittakanay River valley. The aircraft then turned east and flew between Sittakanay Mountain on the north and Wright Peaks on the south. At the parting of Sittakanay Glacier a turn was made to the south and the property was reached at the head of the glacier.

WORK SUMMARY:

The work commenced on the 7th of May in the morning and a 2 hour flight was made on the property. The next flight was made in the afternoon for another 2 hour period. On the morning of the 8th of May another 2 hour flight was made and the airborne magnetometer survey was finished. At midday another 2½ hour flight was made at which time the airborne magnetometer survey was made. The crew was at the mine on the 6th of May but only one short reconnaissance survey could be made before the weather deteriorated.

Three days, May 3, 4 and 5 were spent moving personnel and supplies into the area. May 9th was used to ship equipment and personnel back to Vancouver, which is the base of operations of the survey company.

CONDITIONS OF THE SURVEY:

During the first part of the survey, when the magnetic survey was made, high winds were encountered over the survey area. This made flying conditions for a flight elevation of 100 feet above the terrain very difficult. On the last lap of the survey the weather was very clear and wind conditions were very favourable.

The elevation at the fork of the Taku and Sittakaney Rivers is about 250 feet above mean sea level, while the elevation of Mount Ogden is about 7,500 feet. Elevations throughout the area are exceedingly steep, which made it obligatory to use a helicopter as the transport medium.

INSTRUMENTATION:

The magnetometer used was a type 592 ELSEC Proton Magnetometer manufactured by the Littlemore Scientific Engineering Company, Railway Lane, Littlemore, Oxford, England. This instrument has a range of 24,000 to 70,000 gamma and a sensitivity of ± 0.5 gamma. This, being a proton type instrument, misorientation errors are at a minimum, which is obligatory when flying an airborne survey in mountainous country. This instrument reads out the total magnetic intensity of the earth's field, which in the area flown was approximately 54,000 gamma.

The electromagnetic instrumentation consisted of a receiver, earphones and search coil manufactured by E. J. Sharpe Instruments of Canada, Limited. The gaussed rotor of the aircraft furnished the transmission field for producing an audio electromagnetic signal. This technique is amply described in the reference attached to this report by the author.

GENERAL GEOLOGY:

The youngest sedimentary rocks in the area are the Stuhini group of Upper Triassic age. These consist of various sedimentary types containing volcanic andesites. The top 500 feet of this group contains Tuff, greywacke, argillite, sandstone, and conglomerate. The lower part, which is credited with a thickness of 2,000 to 4,500 feet, dominantly consists of greywacke, tuff, volcanic breccia, and andesite flow rocks. These beds are prominently displayed in the northeast corner of the area.

The Stuhini group is underlain by Permian limestone beds, which have chert inclusions and have been silicified in places by alteration products.

The contact between the above groups is an unconformity. At least 5000 feet of the King Salmon group appears to be missing.

The main intrusive rock in this area is a quartz monzonite of late lower Cretaceous or early Upper Cretaceous age. This has formed into good sized batholithic bodies with numerous satellitic apophysis. This intrusive has welled up from deep levels stoping into the sediments leaving pendants of sedimentary rock suspended in the former melt. These features are very typical in the development of mineralized emplacements of sulphides.

In the moraine material in the valley, just north of the area, there is found Molybdenum sulphide, lead and zinc sulphides and calcopyrite associated with quartz carbonate veins. The mineral sequence given by Dr. F. A. Kerr (1) is that pyrite was the first mineral deposited in massive shoots and disseminated grains. This was accompanied by fluorite and calcite with quartz and albite. There followed a sequence of mineralization, which included chalcopyrite, galena and zinc blende. This often replaced the pyrite and some of the gangue minerals.

Some acidic dykes were seen to cut the sedimentary rocks. Their main constituent minerals are quartz and albite. The mineralization sometimes cuts these structures forming chalcopyrite and galena deposits.

A large regional fault seems to cross the area in an east and west direction. Since most of its length is covered with ice, it will be hard to trace in the area.

Mr. G. A. Noel (2) concludes that gold deposits that will be found in this district will be associated with the volcanic sedimentary belts of the Mesozoic era. Copper deposits, however, will be found in the Paleozoic rocks along bedding plane shears and in the proximity of intrusives of Mesozoic age.

There are no iron deposits present in this area. The low magnetic intensity changes verify this conclusion.

GEOPHYSICAL INTERPRETATION:

The magnetic changes denote for the most part the amount of magnetite contained in the various rocks as accessory minerals. When a second derivitive calculation is made of the ambient total magnetic readings a rough determination of the rock types found in the survey area can be made. The laboratory determinations (3) for the rocks of this area are as follows:

	(K) Susceptibility
	c.g.s. Units per
Granite	9.5×10^{-3} Cm.^{3}
Andesite	1.6×10^{-3} " "
Sediments	10^{-4} to 10^{-3}

It is readily seen that the sediments are non-magnetic; that the volcanics are moderately magnetic and that the acid intrusives are part way between. These properties along with the mathematical analysis are the basic means of differentiating the types of rocks. Zero contours will denote possible contacts. Plus values indicate volcanic rocks and minus values of 0 to -100 gamma denote granite intrusives. Minus values of -100 to -200 gammas denote sedimentary rocks.

It must be remembered when using an interpretation of this sort that often the sedimentary rocks may be greatly altered and granitized by the enveloping intrusive rock. This most likely is the case in this area where pendants of sedimentary rocks are immersed in the plutonic melt.

With regard to the electromagnetic survey, the tonal effect and change noted on the tape when played back in the oscilloscope shows that certain areas are more conductive then others. The out-of-phase condition of the route survey is about 30 electrical degrees, while the out-of-phase relationship for the conductive areas is nearly zero electrical degrees. At many of the locations shearing and gossan effects were noted. This could mean the presence of sulphide mineralization. Other alternatives could be wet bolder clay or graphite. Only follow up ground work will prove or disprove the locations.

MAGNETIC AND ELECTROMAGNETIC SURVEY MAP:

The dash and arrow lines are the paths followed in the magnetic surveys. The electromagnetic path only includes the outcrop areas and has twice the density of control. The magnetic control has been used to denote possible boundaries for the intrusives (1), the sediments (3), and the volcanics (5). All readings have been read within 100 feet of the surface.

The magnetometer was also run to and from the area to establish the magnetic datum and to give representative values over known rock types in the immediate area.

The intrusive in the northwest corner of the map area is a continuation of a large batholithic intrusive covering most of the

Wright Peaks area. The Volcanics in the northeast corner of the map area includes a large area covering Sittakanay Mountain. The contact with the limestone sediment is easily visible on the aerial photographs. A satellitic body of quartz monzonite is found in the southwest part of the map area and a large mass of limestone is pendant into the intrusive. The 3 electromagnetic anomaly locations shown in this satellitic intrusive may be deposits of molybdenum sulphide. The anomalies in the large sedimentary deposit of limestone are most probably replacement deposits of lead and zinc. The anomalies found in the volcanics are more apt to be vein deposits of quartz containing copper sulphides.

TOTAL MAGNETIC VARIATION MAP:

The ambient input values on this map have been calculated by drawing profiles across the sedimentary axis and using the values from the magnetic tapes. This distributes the control evenly over the area. This may also be performed by the IBM calculator to give a least squares fit for the data. The eighth mile corners are used for input data to the IBM calculator to give a second derivitive map for the area. Negative high values are colored blue and the positive high values are coloured red.

SECOND DERIVATIVE MAP:

The second derivative map has been calculated on the IBM system using the appropriate formula. All of the zero values on the Total Magnetic Variation Map have been carried forward and only values dealing with the sedimentary and volcanic separations are figured and entered on the map.

The configuration of the separations between the facies is representative of a deeper medium than that illustrated in Fig. 2. The latter gives the actual photo interpretation of the outcrops. The configuration of the present map gives structural representations which are independent of surface conformation.

The fault zone depicted in Fig. 2 is confirmed on this map and in addition some folding axes are developed in the north and south regions of the map. The intrusive appears to have entered the area from the east and west sides and to have intruded a satellitic mass in the southern sector. The largest sedimentary area is pendant near the centre of the area. The volcanics are infolded in the north and south portions being errosional reminents situated in synclinal folds.

CONCLUSION:

The (M) electromagnetic anomalies are thought to be representative of areas which might produce deposits of molybdenite. The (LZ) anomalies may be replacement zones in the limestone of zinc and lead minerals. The (Cu) anomalies are probably contact zones in mineralized quartz carbonate veins with copper minerals.

The fault zone probably dips steeply toward the north and the sedimentary contacts dip either northeast or southeast with shallow gradients. The shear zone seems to be nearly vertical.

RECOMMENDATIONS:

(1) That drilling be done from the shear zone toward the west working along the ridge and including the three EM anomalies in the intrusive satellite and any gossan areas.

(2) That all of the replacement zones in the limestone sediments be thoroughly prospected using the EM locations as a guide. Where warrented these zones should be drilled.

(3) That all of the contact zones in the andesite volcanics be prospected for copper showings. This would include all of the ridges in the northwest part of the area.

(4) That acid dikes be prospected in the sedimentary zones for fracturing and the deposition of the albite quartz veins.

Respectfully submitted,

GEO CAL LIMITED

C. B. Selmser

C. B. Selmser, P. Eng.
Chief Geophysicist

REFERENCES

1. Geological Survey Memoir 248
   by F. A. Kerr - 1948 p.p. 20 to 26

2. Tectonic History and Mineral Deposits of
   the Western Cordillera - Vol. 8, 1966
   (a) The Productive Mineral Deposits of
       Southeast Alaska by G. A. Noel p. 215

3. Handbook of Physical Constants - Birch p. 297

CERTIFICATE OF QUALIFICATIONS

The formal education of the author consists of undergraduate studies at Union College, Schenectady, N. Y., in engineering and science, with a degree conferred as B. Sc. Graduate study was taken at McGill University and at the University of Toronto in mining geology and geophysics with a degree conferred as M. Sc. He is qualified both in engineering geology and geophysics as a professional engineer.

The author has had some twenty years' experience in the fields of geology and geophysics doing exploration work throughout Canada. He has also worked for a short period of time in the Transvaal region of South Africa.

The author has been a member of the Association of Professional Engineers of Ontario, Alberta and British Columbia for the past 14 years. He is at present an active member of the Association of Professional Engineers of British Columbia with certificate No. 4683.

His knowledge of the property outlined in this report has been gained from the surveys. Reference has also been made to government reports and pertinent texts.

The author has no financial interest in this property other than the survey work, and is acting wholly as a consultant to the interested principal. Any remuneration received has been for expenses incurred during the survey and for his professional services.

C. B. Selmser

C. B. Selmser, P. Eng.

New Primary Field

Electromagnetic Aerial Survey

By C. B. SELMSER, P.Eng.

REPRINTED FROM WESTERN MINER

APRIL, 1966

JULY, 1966

New Primary Field

By C. B. SELMSER, P.Eng.

Electromagnetic Aerial Survey

PART I

THE author while making installation tests on a 47G-3B-1 Bell helicopter discovered an interesting primary field developed by the rotors on this aircraft. It was found that this field is adequate for searching near the surface of the ground with an operator using an electromagnetic search coil.

This primary field has an effective size to reach at least 150 feet below the elevation of the search coil. It also has an approximate frequency of 1000 cycles per second, which provides maximum penetration into overburden and rock material to a depth of about 100 feet.

Search is made in mountain country by flying lines along contour levels and on more level terrain with a parallel configuration. With the aircraft at a 50- to 75-foot elevation above the terrain the path covered is about 100 feet wide.

Practical Theory

A careful examination of figures 1 and 2 will show that because of the shape of the rotor blades on the aircraft, two distinctive fields are generated when the rotor is turning. These fields are generated from eddy currents in the rotors as they turn rapidly across the earth's magnetic field, which in northern latitudes is nearly vertical to the earth's surface.

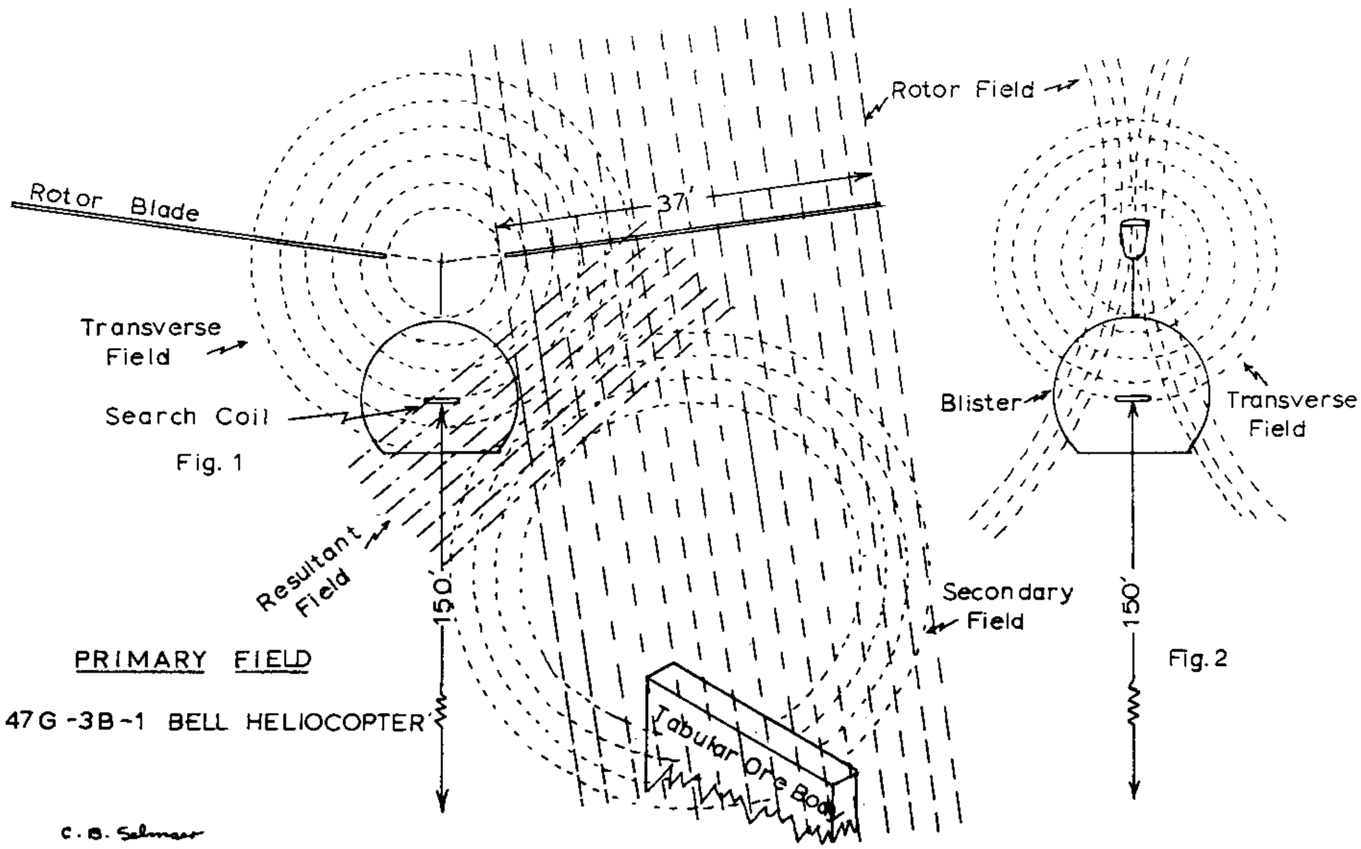
An elementary study of physics tells us that a conductor cutting across a magnetic field will generate electric current. If this current is not drawn off then eddy currents will form and a secondary field which has a frequency depending on the speed of the rotors will be developed.

Since the two blades are turning and will reach opposite sides of the shaft, the currents and thus the field will be changing direction with every revolution of a blade. The blades rotate at a speed of 320 rpm and since there are two blades the primary rotor field has a frequency of approximately 10 cycles per second (100 and 1000 cycle multiples).

The blades which are made of aluminum alloy are long and thin. This shape promotes a rotor field, which is normal to the flat surface of the blade. As the blade turns, the field which is effectively about 150 feet in radius, forms a conicle shape. A second field is built up transverse to the rotor field. This field as it turns with the blades forms a sphere shaped configuration.

When the rotor field comes in contact with a tabular orebody it sets up a secondary field from the conducting orebody. This field then joins the transverse field to give a resultant

Patent applied for.



field direction that is quite different from the original and now no longer perpendicular to the axis of the search coil. Thus out of phase harmonic multiple signals are picked up in place of the secondary field.

The Detector Coil

The operator sits in the seat beside the pilot and holds a search coil with its axis vertical. Attached to the tuned coil is an audio amplifier. This is in turn attached to a pair of headphones, which the operator wears over his ears.

The audio amplifier, which is tuned to a signal of 1000 cps has a gain switch and a feedback squelcher switch. The gain switch is regulated so that the signal is just audible when the coil is held with its axis vertical. The squelcher circuit is adjusted so that only the 1000 cps signal goes through the amplifier.

When the aircraft is flown close to the surface of the ground without a conductor present the field signal will have minimum amplitude. When a conductor is present in the rotor field the signal strength will suddenly increase in amplitude warning the operator that he is crossing a conductor. The aircraft then hovers over the spot until the observer has investigated the change in signal reception.

Tests Made in the Field

1. Tests were made for extraneous fields inside and outside of the aircraft.
2. Tests were made of the rotor and transverse fields inside and outside the bubble.
3. The aircraft was flown at various elevations over the observer so that he could measure the amplitude of the rotor field at the various levels.
4. A known external field was mounted below the rotor using a motor generator set for power. Tests were made both on the ground and in the aircraft, and while the aircraft was airborne. This enabled the author to study the relative strength of the magnetic field.
5. Tests flown over Keno Hill orebodies gave positive verification with orientation changes of 10 degrees.

Conclusion

The primary field generated by the 47G-3B-1 Bell aircraft may be used for reconnaissance electromagnetic surveys. The search is not as deep as some ground methods, but is deep enough for bodies exposed in outcrops or under light overburden. The method is as effective for finding conductors as the self potential method, but with greater speed and mobility.

It is obvious that since the method can be used in an aircraft such as this it is very adaptable to surveys over all kinds of terrain. The survey requires no line cutting and coverage may be done rapidly and with as much detail as required.

Cost Relative to Ground Methods

The survey which is continuous in nature may be flown at a cost of $12.50 per mile. Surveys on the ground could cost as much as $100.00 per mile in very rough and inaccessible locations.

The cost of the aircraft, which in most cases amounts to $3.00 per mile is much less than that for line cutting. Line cutting and marking costs usually amount to $40.00 per mile.

The total cost of the survey then is $15.50 per mile. This means that the claim is totally covered with continuous reading on lines 100 feet apart. The equivalent cost on the ground would be $250.00 with readings 100 feet apart and lines having a 200-foot separation.

Electromagnetic Aerial Survey PART II

SINCE the writing of the last article on this subject, the principal of this airborne EM method has been tested on many ore occurrences in northern British Columbia and the Yukon Territory. Also the technical aspects of the method have been overhauled and conclusions have been made to make this method much more effective than was first thought possible.

Recordings have been made on magnetic tape, which have been played back on the oscillograph to study the wave form of the signals. Records were made over both very mountainous and less rugged terrain to discover what effect odd angular reflections would have on the signal. Many recordings were made over known ore occurrences and anomalies found elsewhere were assessed by surveys on the ground.

The receiver has also been tested for the tuning qualities of the circuits and the ability of the circuits to filter out the correct signal strength and quality for the purpose of the survey. A portable collapsible coil has been added to strengthen the earth's magnetic field to many times its natural value. This increases the signal strength of the various multiple harmonic signals produced by the rotor. By adding automatic frequency filter systems any desired frequency can be locked in and used to vary the depth of penetration of the audio wave energy.

The operator now records all surveys made on magnetic tape so that they can be later reviewed by the geophysicist. This not only provides a cross-check on the survey method, but enables the geophysicist to more intelligently interpret the anomalies and advise the operator on further ground surveys used to check out these anomalies.

Signal Characteristics

In the photographs taken of the replay of magnetic tapes on the oscillograph the modulated signal is compared with a 1000 cycle per second signal, which has been driven through the receiver. In the three comparisons please note the harmonics of the signals in examples 1, 2 and 3, while in photograph 4 there are no harmonics, but just the pure modulated signal. Photograph 2 shows merely the in-phase and out of phase relationship of a basic signal.

Photograph 1 shows many out of phase harmonics of the signal, which give a very rough sound to the signal in the earphones. This is the signal heard when the aircraft passes over terrain which contains no conducting bodies.

In photograph 3, the aircraft is just entering the influence of a conductive body, and is not yet in close range. Some of the harmonics which are closely in phase with the signal are still present.

In photograph 4 the aircraft is flying

directly over a conducting ore body and all out of phase harmonics of the signal have disappeared. This condition gives a very clear tone in the earphones, which is quite distinguishable from the usual harmonic ridden signal.

The modulated signal shown in the illustrations have an approximate frequency of 875 cycles per second. The actual signal from the rotors will be less, but must be greater than 600 cycles, which is the lower limitation of the oscillograph setting.

Theory on the Rotor Signal

In the previous article it was explained that a preliminary sine wave signal from the rotor would be oscillating at 10 cycles per second, which of course is below the audio range. Now in addition to the earth's magnetic flux the rotor is turning through a 10 cycle per second pulsating field, which is tuned to the pulsations in the rotor from the eddy currents. This is the same condition that exists in a Goldschmidt alternator, which is used to produce high frequency wave energy. In this case a frequency multiplication is made when the blades of the rotor turn at a synchronous speed to produce a 100 cycle per second signal. This signal is in the audio range, but has not a frequency great enough for the best signal ranging in this type of survey. If the receiver used is tuned to resonate at some higher frequency such as 1000 cycles per second, which may be generated by the rotor in a higher frequency environment, then a more correct frequency value may be used in the survey.

The only additional factor, which must be considered is the increase of the signal strength to an amount, which will allow ample penetration into the overburden and rock layers where conductors will be discovered. This also must be done without adding any great weight factor to the aircraft. This goal has been achieved by using a flexible coil of over 100 turns and introducing direct current into it from the aircraft's service system. The area of this coil is adjusted so that it fits between the landing gear struts of the aircraft. This coil then is capable of providing a preliminary direct field of approximately 20 gauss, which is 40 times the magnetic field strength of the earth's vertical component.

Possible Penetration

Since the original penetration was considered to be 150 feet below the elevation of the search coil when the receiver was tuned to a working frequency of 100 cycles per second, it follows that with the increase of the working frequency and the field strength a much greater penetration will be achieved. The isotropic condition of the transmitted signal will also overcome conditions of misorientation weaknesses in detection, which effect other methods of EM detection.

The anisotropic response to the presence of a conductor in the rotor field span is subject to the return of out of phase signals from the conducting body itself. These are notably weak in other methods of EM detection where a signal of low energy is evolved from the transmitting coil. By using the alternator principal of the rotor field in a high primary field strength, several watts of power may be generated.

It is quite possible that penetrations into the bedrock and overburden would now be over 1000 feet from an aircraft with the flexibility of a helicopter. This can also be done without a weight factor greater than ferrying a passenger and his baggage. With the characteristics of the 47G-3B-1 Bell helicopter or the Hiller very rough mountainous terrain may be surveyed quickly, economically and safely.

Ore Bearing Provinces Flown Over to Date

1. Mayo District, Yukon Territory
2. Vangorda District, Yukon Territory
3. Ross River District, Yukon Territory
4. Watson Lake District, Yukon Territory
5. Taku District, British Columbia.

The areas flown over involve several thousand miles of line. In every case the anomalies have been assessed and found to be caused only by conducting ore bodies in the bedrock. This has been done during the past six months by one operator who having avoided using time for installation of instruments has used this time in checking results on the ground. He has been closely supervised by several other engineers besides the author who are generously enthusiastic about this method of survey.

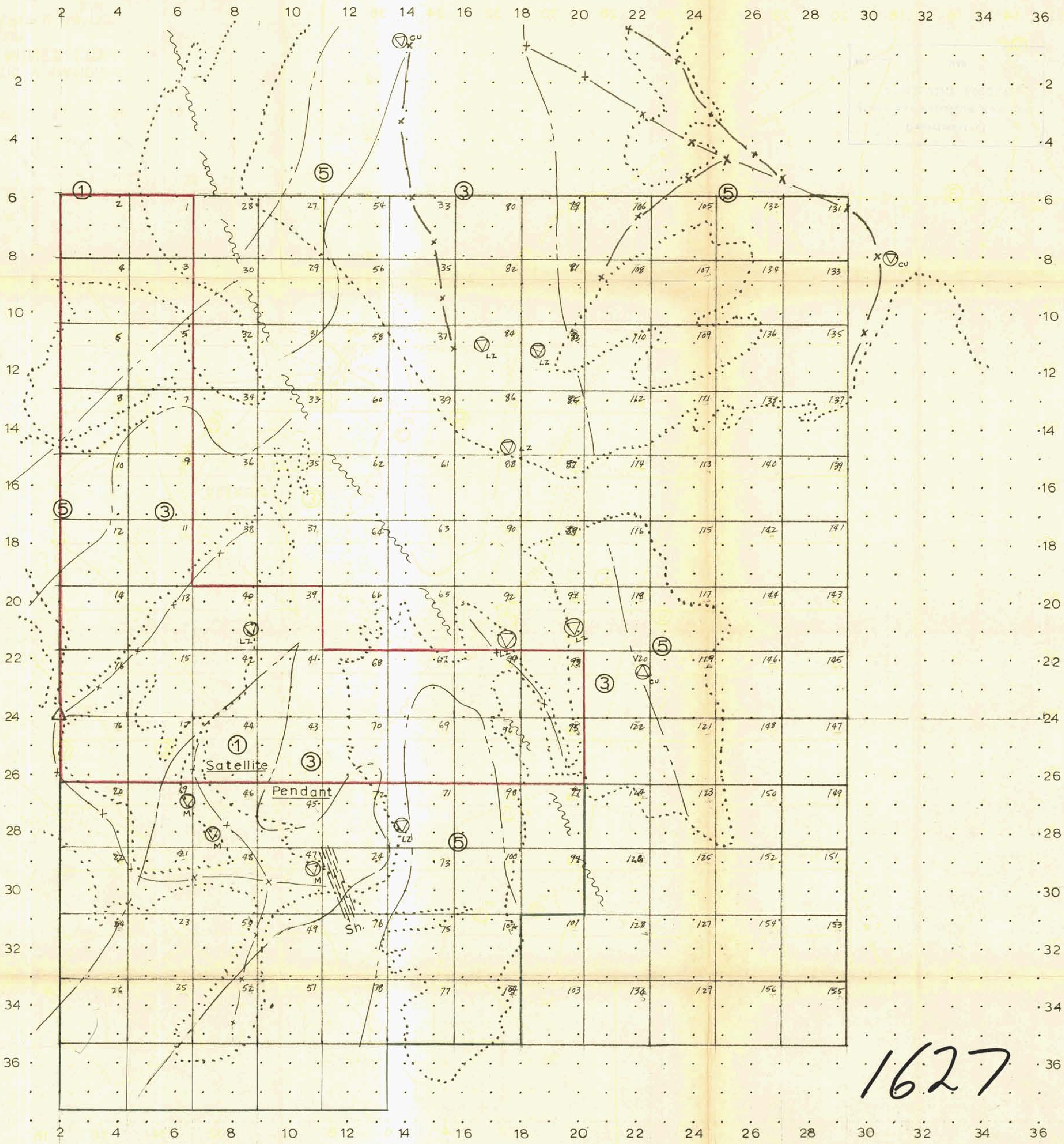
PATENT APPLIED FOR

1. Modulated signal (no conductor)

2. Receiver driving signal

3. Modulated signal (near conductor)

4. Modulated signal (over conductor)



LEGEND

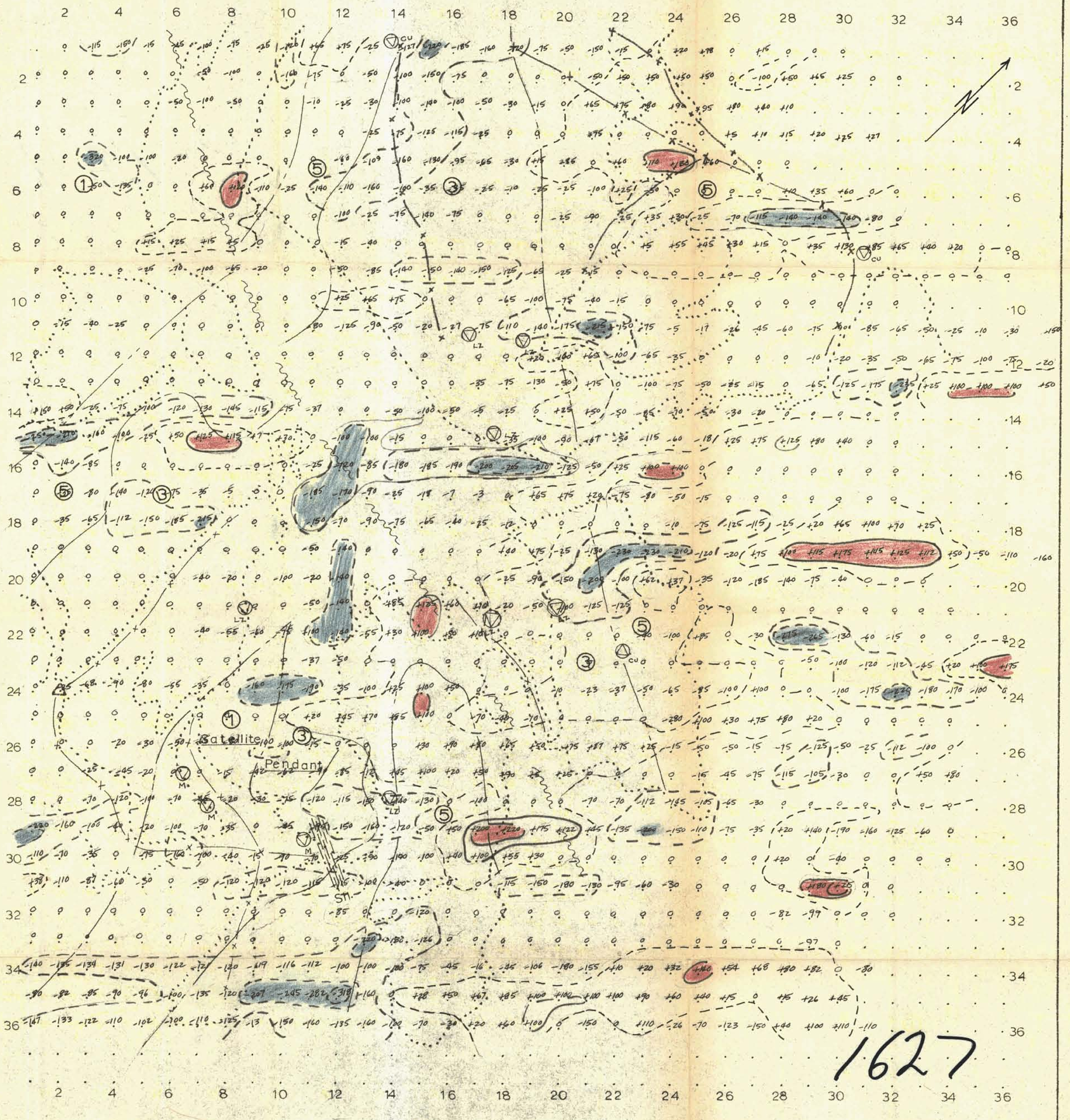
① Intrusive Plutonic
③ Sedimentary Deposit
⑤ Volcanic Flow
△ E.M. Conductor
∿∿ ∿∿ Fault

□ Group no 1
□ Group no 2

To accompany
a geophysical report by:
C. B. Selmser
C.B. Selmser, P. Eng.

MT. OGDEN MINES LTD.
PAT GROUP
TULSEQUAH, ATLIN M.D., 58° 132° S.W.
Scale: 1 in. = 1/4 mi. May 19, 1967

Fig. 1



LEGEND

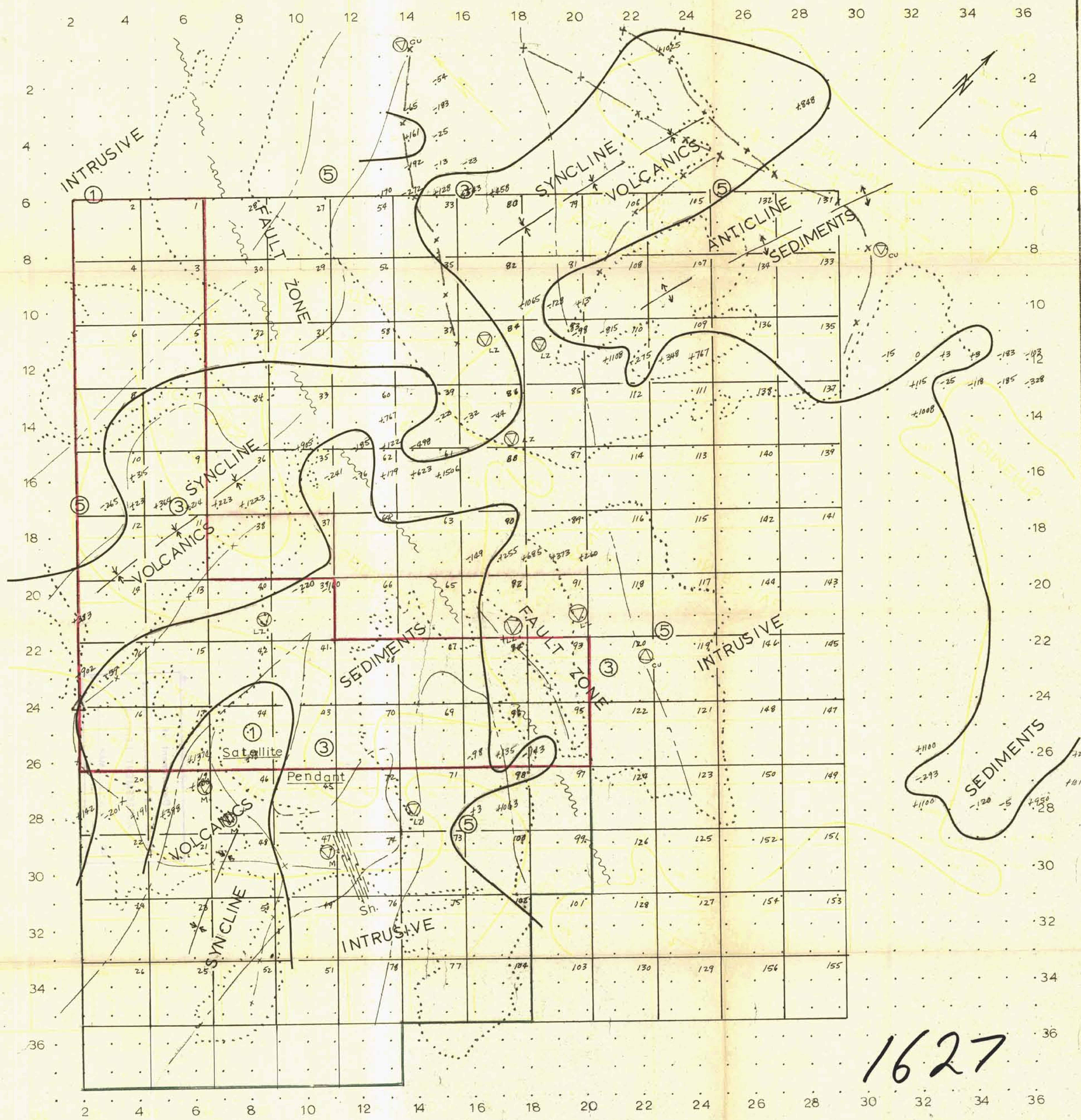
① Intrusive Plutonic
③ Sedimentary Deposit
⑤ Volcanic Flow
△ E.M. Conductor
〰 Fault

Ambient input values in gamma.

To accompany
a geophysical report by:
C. B. Selmser
C.B. Selmser, P. Eng.

TOTAL MAGNETIC VARIATION
MT. OGDEN MINES LTD.
PAT GROUP
TULSEQUAH, ATLIN M.D., 58° 132°
S.W.
Scale: 1 in. = 1/4 mi. May 19, 1967

Fig. 3



LEGEND

① Intrusive Plutonic
③ Sedimentary Deposit
⑤ Volcanic Flow
△ E.M. Conductor
〰 〰 Fault

Input whole numbers increased by 500.

□ Group no 1
□ Group no 2

To accompany
a geophysical report by:
C. B. Selmser
C.B. Selmser, P. Eng.

2nd DERIVATIVE MAP
MT. OGDEN MINES LTD.
PAT GROUP
TULSEQUAH ATLIN M.D., 58° 132° S.W.
Scale: 1 in. = 1/4 mi. May 19, 1967

Fig. 4