McPHAR GEOPHYSICS LIMITED

REPORT ON
GEOPHYSICAL INVESTIGATIONS
IN THE CHICHAGOF AREA, ALASKA
FOR
BARANOF EXPLORATION & DEVELOPMENT CO. INC.

1. INTRODUCTION

During August and September of 1961 a series of geophysical tests was carried out in the Chichagof Area of Alaska on the property of Baranof Exploration & Development Co. Inc. The area in which the measurements were made is east of the old Chichagof Mining Camp, on the east side of Klag Bay. The old mining operations were in a rich, gold bearing fault zone. The gold mineralization was accompanied by quartz stringers and a certain amount of sulphide mineralization. It has also been observed that the fault zone itself contains graphitic material, although this has not been confirmed.

The purpose of the geophysical measurements was first to attempt to locate and trace the fault east of Klag Bay. This work was facilitated by the fact that the approximate position of some faults could be associated with topographic lows in the area east of Klag Bay. It was felt that the fault zone could be located as a poor electromagnetic conductor. It has been our experience that most major fault structures do conduct, particularly at high frequencies, due to their increased porosity.

If the fault zone is indeed graphitic, as has been reported, it would be expected to be a good conductor.

The gold and sulphide bearing quartz zones were not continuous along the fault, but rather local and controlled by cross structures. Therefore, some induced polarization tests were planned along the EM conductor. These tests were to determine if the small amount of sulphide mineralization with the gold could be detected. Since graphite undoubtedly has some IP effect, its presence along all of the fault would mask the presence of a small amount of sulphide, but the IP tests were planned before the possible presence of graphite was understood.

2. PRESENTATION OF RESULTS

The grids used for the electromagnetic survey and the lines surveyed with induced polarization are shown at a scale of 1" = 400 feet on the accompanying map Dwg. Misc. 3336, in relation to the claim boundaries and discovery posts. The electromagnetic and induced polarization results are shown on the following maps.

E. M. Baseline A	Dwg. E2838-1
E. M. Baseline B	Dwg. E2838-2
E. M. Baseline C	Dwg. E2838-3
E. M. Baseline D	Dwg. E2838-4
I. P. Line A	Dwg. I. P. 2839-1
I. P. Line B	Dwg. I. P. 2839-2

The data is plotted in the manner described in the notes preceding this report.

3. DISCUSSION OF RESULTS

At the time that the electromagnetic measurements were being made, a test line was surveyed west of Klag Bay over the old mining operations in the Chichagof Fault. A definite electromagnetic conductor was indicated at the fault; the 1000 cps and 5000 cps anomalies were quite similar, indicating that the zone is a good conductor. This could be due to graphite in the fault, or the fact that conducting sea water is present in the fault zone.

The baselines for the E. M. work were cut along the topographic depressions that were thought to be the fault continuations. In most cases, the indicated conductors are closely associated with the depressions, but on Baseline C they are not.

Zone A

The electromagnetic results on this grid show a definite, good conductor striking southeast somewhat south of Baseline A. The results are very similar to the test line over the Chichagof Fault west of Klag Bay. If the conductor on this grid is not the same fault, it must be another similar zone.

In addition, there is a second, poorly defined, conductor several hundred feet north of the strong zone. The conductor is indicated on each line traversed, but it would be necessary to survey the lines again with the transmitter set up over the conductor to completely evaluate its importance.

IP Line A was surveyed approximately along the conductor

south of the baseline. The results show moderately low apparent resistivities and slightly anomalous IP effects along the complete line. The IP effects are fairly uniform and any variations could be accounted for by slight changes of positioning between the line and the conductor. The anomalous IP effects could be caused by a small amount of sulphide or graphite in the fault zone.

Zone B

The electromagnetic conductor located along Baseline B is much weaker than Zone A. The conductor lies near the baseline, but is indicated only by the 5000 cps data. The fact that there is no 1000 cps response indicates that the zone is a poor conductor. If it is a fault, it must be of a different character than Zone A.

Zone C

The anomalies on this grid are of the same type as on Zone A, but the conductor does not follow the proposed position of the fault. The conductor axis was located on three lines, and it strikes southeast while the proposed strike was east. The conductor axes do not shift very much when the transmitter is moved; however, the fact that they do move suggests that the conductor has some width.

The induced polarization results from Line C, along the conductor, are very similar to those from Line A. They show slightly anomalous results along the whole line, with some variations. Since the line did not follow the conducting zone exactly, these variations could be

explained by changes in the relative position of the electrodes and the source.

Zone D

This zone is east of the others, and only a limited amount of EM data was taken. A conductor was indicated near the baseline on each line except Line O. Apparently the zone does not continue that far east. The limited amount of data available would indicate that the conductivity of Zone D lies between that of Zone A and Zone B.

4. CONCLUSIONS

There seems to be little doubt that the electromagnetic results have located the fault zones between Klag Bay and Lake Anna. However, they are not always where expected, and their indicated conductivities are variable.

The good conductivities could be due to the presence of salt water in the zones, or the graphitic material that has been reported to be present. The good conductivity could also be due to massive sulphide, of course, but the IP results do not indicate the presence of large amounts of metallic minerals.

Since graphite tends to occur along slip surfaces in faults, it usually forms long thin conductors. Smaller volume of material is necessary to give a good EM conductor than is usually necessary for sulphide mineralization. The two lines surveyed with IP indicated a reasonably uniform amount of metallic mineralization associated with

the conductors along their entire length. The amount of polarizable material indicated is not large, and it could be either graphite or sulphide mineralization; probably it is both.

McPHAR GEOPHYSICS LIMITED

Philip G. Hallof,
Geophysicist.

Robert A. Bell,
Geologist.

Dated: August 30, 1962.

SUMMARY OF COSTS

September 1961

E. M. Survey

3-1/2 days Operating		@ $100.00/day	$ 350.00
1 day Bad Weather)			
4 days Travel)	6	@ $ 50.00/day	300.00
1 day Standby)			

L P. Survey

2 days Operating		@ $170.00/day	340.00
1 day Bad Weather)	3	@ $ 50.00/day	150.00
2 days Travel)			

Expenses prorated actual September time

Meals and Accommodation	$133.20	
Airfare and Taxis, Air Freight	277.34	
Supplies and Brokerage	31.01	
Telephone and Telegraph	50.05	491.60
		$1,631.60

McPHAR GEOPHYSICS LIMITED

Robert A. Bell,
Geologist.

Dated: September 18, 1962.

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Sitka Recording District

CERTIFICATE

I, Philip George Hallof, of the City of Toronto, Province of Ontario, do hereby certify that:

1. I am a geophysicist residing at 5 Minorca Place, Don Mills (Toronto) Ontario.

2. I am a graduate of the Massachusetts Institute of Technology with a B.S. Degree (1952) in Geology and Geophysics, and a Ph.D. Degree (1957) in Geophysics.

3. I am a member of the Society of Exploration Geophysicists and the European Association of Exploration Geophysicists.

4. I have been practising my profession for ten years.

5. I have no direct or indirect interest, nor do I expect to receive any interest, direct or indirect, in the property or securities of Baranof Exploration & Development Co. Inc.

6. The statements made in this report are based on a study of published literature and unpublished private reports and geophysical data.

Dated at Toronto

This 30th day of August 1962

Philip G. Hallof

Philip G. Hallof, Ph.D.

BOOK 13 PAGE 14
Sitka Recording District

CERTIFICATE

I, Robert Alan Bell, of the City of Toronto, Province of Ontario, do hereby certify that :

1. I am a geologist residing at 12 Cottonwood Drive, Don Mills (Toronto) Ontario.

2. I am a graduate of the University of Toronto in Physics and Geology with the degree of Bachelor of Arts (1949); and a graduate of the University of Wisconsin in Economic Geology with the degree of Ph. D. (1952).

3. I am a member of the Society of Economic Geologists and a fellow of the Geological Association of Canada.

4. I have been practising my profession for over ten years.

5. I have no direct or indirect interest, nor do I expect to receive any interest directly or indirectly, in the property or securities of Baranof Exploration & Development Co. Inc.

6. The statements made in this report are based on a study of published geological literature and unpublished private reports.

Dated at Toronto

This 30th day of August 1962

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Sitka REC. DIST.
DATE 10-29 1962
TIME 5:00 P.M.
Requested by F.C. Eastaugh
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Juneau

Robert A. Bell, Ph. D.