

2845

Department of  
Mines and Petroleum Resources  
ASSESSMENT REPORT  
NO. 2845 MAP.....

82E/20 E

REPORT ON  
INDUCED POLARIZATION AND  
MAGNETOMETER SURVEYS  
GREENWOOD AREA, BRITISH COLUMBIA  
ON BEHALF OF  
GREYHOUND MINES LIMITED

by  
Jon G. Baird, B.Sc., P.Eng.

October 5, 1970

LOCATION:  
About 3 miles northwest of Greenwood, B. C.  
Greenwood Mining Division  
118°                      49°                      SW

DATES:  
July 1 to August 1, 1970

CLAIMS

<u>Name</u>	<u>Record Number</u>
JOHNSON	L 1961
ANTHERE	L 1960
GREYHOUND	L 1014
PLUTO	L 2393✓
HOUND No. 1	22640✓
ECB	L 827✓
MT 4	27036✓
GREAT HOPE	L 602
BUCKINGHAM Fr.	22643✓
LS	1223
BUTTE CITY	L 1230✓
PEACOCK	L 1245
PLUTONIA	L 884✓
TORONTO	1013✓
RAGMOROCK Fr.	22451
SUNFLOWER	916✓
GEM	L 697
HIDDEN TREASURE	L 896✓
GOLD BUG	L 895✓
DEER HORN	L 1714✓
LOST 1	27071
LOST 3	27073
SUNSET	L 188
PRIMROSE	L 927✓
TENDERBROCK Fr.	
T. EUGENE Fr.	L 2321✓
	2907 Z
	27074
ST LAWRENCE	L 1255
MOTHERLODE	L 704✓
	15443
	15444
	13259
CROWN SILVER	L 789
FLORENCE Fr.	L 1470
BONANZA	L 928
MTI	26832
NMI	21994
BIRTHDAY	14997✓
MT 16 Fr.	

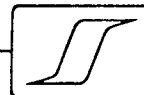


TABLE OF CONTENTS

	<u>Page No.</u>
SUMMARY	
INTRODUCTION	1
GEOLOGY	2
PRESENTATION OF RESULTS	3
DISCUSSION OF RESULTS	4
CONCLUSIONS AND RECOMMENDATIONS	6
PLATES:	
(in text)	
#1 Plate 1 - Location Map	1" = 4 miles
(in envelope)	
#2 Plate 2 - Survey Grid, Claims and Geology	1" = 400'
#3 Plate 3 - Geophysical Interpretation	1" = 400'
4 Plate 4 - Magnetometer Survey	1" = 400'
5 Plate 5 - Chargeability Profiles	1" = 400'
6 Plate 6 - Resistivity Profiles	1" = 400'

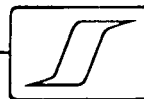


### SUMMARY

An induced polarization survey on the present property has revealed extensive areas of increased chargeability responses. The amplitude of the present responses could arise from bedrock containing 1% to 5% by volume of metallicly conducting mineralization such as sulphides, graphite or other minerals known to give induced polarization responses.

The Mother Lode, Greyhound and to a lesser, extent, the Sunset Zones of mineralization all give rise to increased chargeability responses.

Exploration by diamond drilling appears to be warranted in an area east of the Mother Lode Zone and in another area south of the Greyhound Zone. In addition, drilling may be warranted in other areas of increased chargeability if the surface geology does not fully explain the geophysical responses.



REPORT ON  
INDUCED POLARIZATION AND  
MAGNETOMETER SURVEYS  
GREENWOOD AREA, BRITISH COLUMBIA  
ON BEHALF OF  
GREYHOUND MINES LIMITED

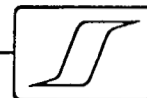
INTRODUCTION

During the period from July 1 to August 1, 1970, a geophysical field party under the direction of Mr. Francis Bourqui cut grid lines and executed induced polarization and magnetometer surveys in the Greenwood area, British Columbia, on behalf of Greyhound Mines Limited.

As shown on Plate 1, on a scale of 1" = 4 miles, the claims lie about 3 miles northwest of Greenwood and are reached from Greenwood along a good gravel road. The claims area is lightly treed and very hilly. The claims covered, in whole or part, by these surveys are listed on the title page of this report and are shown on Plate 2.

Seigel Mk VI time-domain (pulse-type) induced polarization equipment has been employed on this property. The transmitting unit had a rating of 2.5 kw. and equal on and off times of 2.0 seconds. The receiving unit was a remote, ground-pulse type triggered by the primary voltages set up in the ground by the transmitter. The integration of the transient polarization voltages takes place for 0.65 seconds after a 0.45 second delay time following the termination of the current-on pulse.

The purpose of an induced polarization survey is to map the subsurface distribution of metallically conducting mineralization near the lines covered. In the present area such mineralization could include pyrite, pyrrhotite, chalcopyrite and other sulphide minerals. As well, metallic conductors such as magnetite and graphite can give chargeability



responses not always distinguishable from sulphide mineralization.

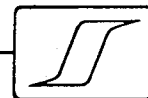
The three electrode array was employed for the survey. For this electrode array, one current electrode and two potential electrodes traverse the profiles with an interelectrode spacing called "a". The second or "infinite" current electrode is placed a distance greater than 5a from the measuring point which is defined as the midpoint between the moving current electrode and the near potential electrode. For the reconnaissance survey observations were taken for a = 200' and a = 400', the distance between observations being 200'. For additional detail on two profiles observations were taken with a = 100' and 100' station intervals.

For the present survey a baseline was laid out oriented N 35° E and grid lines were established perpendicular thereto at 200' intervals. The present survey totalled approximately 22 line miles.

A Scintrex MF-1 vertical force fluxgate magnetometer was employed for the magnetometer survey. Observations were taken each 100' along grid lines spaced 400' apart except in the central part of the grid where the line spacing was 200'. Base stations along the baseline were used to control the data for baselevel and diurnal variations.

#### GEOLOGY

A description of the geology of a large area including and surrounding the present property is found on G.S.C. Map 6-1957, "Kettle River (East Half)" on the scale of 1" = 4 miles. This map shows the Greenwood area as underlain by the Permian Anarchist Group comprising sediments and volcanics which has been intruded by acidic



rocks of the Cretaceous Nelson Intrusives. West of the survey area, younger rocks belonging to the Phoenix Volcanic Group occur. Copper is found within scarn zones in limestone members of the Anarchist Group near the contact of the Nelson Intrusive rocks.

The geology of the survey grid has been studied in detail by Mr. G. C. Singhai who has provided the writer with the geological information shown on Plate 2. Scarn and quartzite are the main rock types of the Anarchist Group occurring within the grid. Granite and volcanic rocks are seen at the east and west ends of the grid as suggested by the regional geology shown on the G.S.C. Map. In places the quartzite approaches conglomerate and in places it is pyritic.

Copper mining is presently underway in the Greyhound deposit. The Mother Lode deposit and to a minor extent, the Sunset deposit have produced ore at various times during the first part of this century.

The goal of the present surveys was to explore for sulphide mineralization in scarn zones which might be expected to contain magnetite.

#### PRESENTATION OF RESULTS

Plate 2, on the scale of 1" = 400', shows the survey grid, claims and the geological information provided by Mr. Singhai.

Plate 3, also on the scale of 1" = 400', shows an interpretation of the chargeability, resistivity and magnetic data.

Plate 4 is a contour plan of the magnetic data. The actual observations are shown in gammas for each station. A logarithmic contour interval has been used by showing the 0,  $\pm$  400,  $\pm$  800,  $\pm$  1600,  $\pm$  3200 and  $\pm$  6400 gamma contours. The plan scale is 1" = 400'.

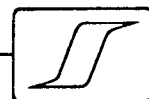


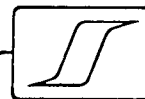
Plate 5 shows the chargeability results in profile form. The vertical scale is 1" = 10.0 milliseconds. The plan scale is 1" = 400' however in order to accommodate the profiles, the interline spacing is not to scale.

Plate 6 shows the resistivity profiles. The vertical scale is 2" = 1 logarithmic scale with the line trace taken as 100 ohm-metres. An example of this logarithmic scale is shown on the plate. The plan scale is 1" = 400' however the interline spacing is not to scale.

#### DISCUSSION OF RESULTS

The chargeability results indicate that only the extreme eastern part of the grid exhibits uniform background chargeabilities of less than 10.0 milliseconds. The chargeabilities over the rest of the grid generally range between 10.0 and 30.0 milliseconds and in places rise to in excess of 40.0 milliseconds. Since a uniform subsurface distribution of 1% by volume of metallicly conducting material may be expected to increase background chargeability levels by about 10.0 milliseconds, the present responses may be explained by subsurface concentrations of from 1% to nearly 5% by volume of metallicly conducting material such as sulphides or graphite. The interpreted contacts of the bodies exhibiting the highest chargeabilities are shown on Plate 3. Nearly everywhere the high chargeability material appears to approach to within 25' and perhaps closer to the ground surface.

The resistivity values over much of the property are between 200 and 500 ohm-metres however some distinct zones exhibiting resistivities outside this range are seen. Two zones of resistivity between 100 and

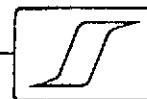




200 ohm-metres, two zones of resistivity about 1000 ohm-metres and one zone of resistivity of much less than 100 ohm-metres have been shown on Plate 3. While changes in resistivity may arise from changes in the type and thickness of overburden, this does not appear to be an important factor on the present property since similar amplitudes are seen for both narrow and wider electrode spacings. It is likely, therefore, that the zones of different resistivities are indicative of changes in the character of the bedrocks.

Much of the survey area exhibits a rather uniform magnetic field with broad relief of a few hundred gammas. The area between the baseline and 32 W bounded by lines 2 S and 8 N exhibits many relatively high amplitude positive and negative distortions of the magnetic field. Three other limited areas exhibiting similar distortions have been indicated on Plate 3. All of the observed magnetic features appear to arise from narrow, near-surface concentrations of magnetic material, possibly lenses of magnetite or pyrrhotite. Mr. Singhai reports the occurrence of a narrow dike near 3 E on L 16 N which corresponds to a very local, high amplitude magnetic feature.

Normally the results of ground magnetic surveys can be interpreted to reveal the strike, attitude and content of magnetic material of the bodies causing magnetic anomalies. Such interpretation can only be made for the small bodies revealed by the present survey if observations are taken on closely spaced grids, possibly with 25' or even 10' between stations. Since small bodies are not the target of the present survey such detail work is probably not warranted.



## CONCLUSIONS AND RECOMMENDATIONS

The present induced polarization survey has revealed extensive areas of increased chargeability responses which may arise from subsurface distributions from 1% to 5% by volume of metallicly conducting material, possibly sulphides. The Mother lode and Greyhound and to a lesser extent, the Sunset zones all exhibit increased chargeabilities. Except for the area of low uniform chargeability on the east ends of the lines which corresponds to the area mapped as underlain by granite, there is little relation between changes in chargeability and geological contacts.

Zones of different resistivities have been observed which are believed to arise from differences in the bedrock however except for the granite which exhibits high resistivities, there is very little correspondence of the boundaries of these zones with the mapped geological contacts. The Mother Lode Zone is noted to occur within an area of increased resistivities while the other two zones of known mineralization exhibit relatively low resistivities.

The magnetometer survey has revealed the presence of a large area in the central portion of the grid which contains many localized concentrations of magnetic material. This material may well be magnetite in a scarn environment.

Since ~~s~~carn rocks are the most favourable host for ore minerals, zones of increased chargeability within areas mapped as underlain by scarn rocks must certainly take priority for further investigation. In the interests of completeness however, some attention should be paid to the high chargeability zones within the quartzites. One area of particular interest would be directly east of the Mother Lode zone where

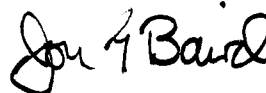


high chargeabilities, high resistivities and magnetic distortions within scarn rocks provide the same geological and geophysical environment as near the deposit which has yielded a few million tons of ore to date. Although further induced polarization surveying would be desirable to outline the high chargeability area, the area of high chargeabilities south of the Greyhound zone may also be of interest. These two most favourable areas are shown on Plate 3.

Since the present high chargeability zones are so large, there is no need to precisely locate drill holes based on the geophysical data. Since it is understood that the next stage of exploration will consist of drilling rather shallow holes with a percussive type drill, it is recommended that an attempt be made to sample all high chargeability zones beginning with the area east of the Mother Lode zone.

Respectfully submitted,

SEIGEL ASSOCIATES LIMITED



Jon G. Baird, B.Sc., P.Eng.  
Geophysicist

Vancouver, B.C.  
October 5, 1970



DOMINION OF CANADA:  
PROVINCE OF BRITISH COLUMBIA.  
To Wit:

In the Matter of line cutting on behalf of  
Greyhound Mines Ltd. (N.P.L.)

I, L. A. Merrifield for Seigel Associates Limited

of 750 - 890 West Pender Street, Vancouver

in the Province of British Columbia, do solemnly declare that line cutting has been executed on some claims as noted in the attached report dated October 5, 1970, in the Greenwood area, British Columbia between July 1 to August 1, 1970. The following expenses were incurred:

(1) Wages:			
	F. Bourqui	14 days @ \$35.00/day	\$490.00
	R. Dupenthaler	14 days @ \$27.50/day	385.00
	B. Paradis	14 days @ \$27.50/day	385.00
	R. Albert	14 days @ \$27.50/day	385.00
	G. Franz	14 days @ \$27.50/day	385.00
			<u>\$2,030.00</u>
			\$2,030.00
(2)	Transporation on the job		140.00
(3)	Food and living expenses		180.00
(4)	Paid to Seigel Associates Limited to cover supervision and fairdrawing of maps.		<u>752.50</u>
			\$3,102.50

And I make this solemn declaration conscientiously believing it to be true, and knowing that it is of the same force and effect as if made under oath and by virtue of the "Canada Evidence Act."

Declared before me at the City  
of Vancouver, in the  
Province of British Columbia, this 4th,  
day of February, 1971, A.D.

*L.A. Merrifield*

*S. Grenette*  
A Commissioner for taking Affidavits within British Columbia or  
A Notary Public in and for the Province of British Columbia.

SUB-MINING RECORDER

DOMINION OF CANADA: }  
PROVINCE OF BRITISH COLUMBIA. }  
To Wit: }

**In the Matter of** a geophysical survey on behalf of  
Greyhound Mines Ltd. (N.P.L.)

I, L. A. Merrifield for Seigel Associates Limited

of 750 - 890 West Pender Street, Vancouver

in the Province of British Columbia, do solemnly declare that a magnetometer survey has been executed on some claims as noted in the attached report dated October 5, 1970, in the Greenwood area, British Columbia between July 1 to August 1, 1970. The following expenses were incurred:

(1) Wages:		
C. Zogg	7 days @ \$35.00/day	\$245.00
(2) Transportation on the job.		155.00
(3) Food and living expenses		35.00
(4) Use of geophysical equipment		
7 days @ \$60.00/day		420.00
(5) Paid to Seigel Associates Limited to cover geophysicist's supervision, calculating, plotting and fairdrawing data and preparation of final reports.		<u>753.00</u>
		\$1,608.00

And I make this solemn declaration conscientiously believing it to be true, and knowing that it is of the same force and effect as if made under oath and by virtue of the "Canada Evidence Act."

Declared before me at the City  
of Vancouver, in the  
Province of British Columbia, this 4th  
day of February, 1971, A.D.

*L. A. Merrifield*

*L. Gravette*  
A Commissioner for taking Affidavits within British Columbia or  
A Notary Public in and for the Province of British Columbia.

SUB-MINING RECORDER

DOMINION OF CANADA:  
PROVINCE OF BRITISH COLUMBIA.  
To Wit:

**In the Matter of**

a geophysical survey on behalf of  
Greyhound Mines Ltd. (N.P.L.)

I, L. A. Merrifield for Seigel Associates Limited

of 750 - 890 West Pender Street, Vancouver

in the Province of British Columbia, do solemnly declare that an induced polarization survey has been executed on some claims as noted in the attached report, dated October 5, 1970, in the Greenwood area, British Columbia between July 1 to August 1, 1970. The following expenses were incurred:

(1) Wages:			
	F. Bourqui	16 days @ \$35.00/day	\$800.00
	R. Duppenthaler	16 days @ \$27.50/day	440.00
	B. Paradis	16 days @ \$27.50/day	440.00
	R. Albert	16 days @ \$27.50/day	440.00
	G. Franz	16 days @ \$27.50/day	440.00
			<u>\$2,560.00</u>
			\$2,560.00
(2)	Transporation & shipping to the job.		104.00
(3)	Transportation on the job.		349.50
(4)	Food & living expenses		400.00
(5)	Use of geophysical equipment		
		16 days @ \$60.00/day	960.00
(6)	Paid to Seigel Associates Limited to cover geophysicist's supervision, calculating, plotting and fairdrawing data and preparation of final reports.		<u>4,376.00</u>
			\$8,749.50

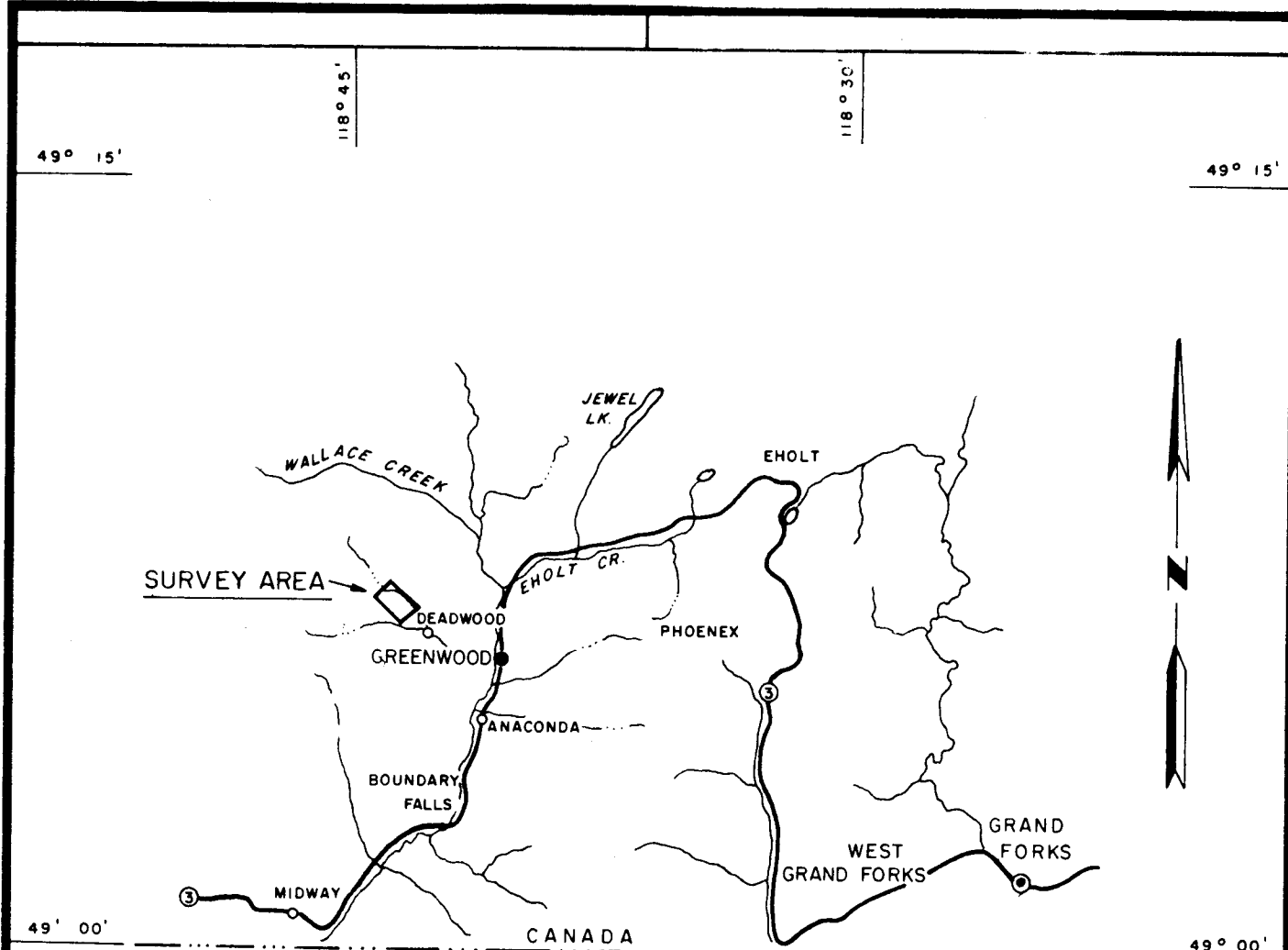
And I make this solemn declaration conscientiously believing it to be true, and knowing that it is of the same force and effect as if made under oath and by virtue of the "Canada Evidence Act."

Declared before me at the City  
of Vancouver, in the  
Province of British Columbia, this 4th  
day of February, 1971, A.D.

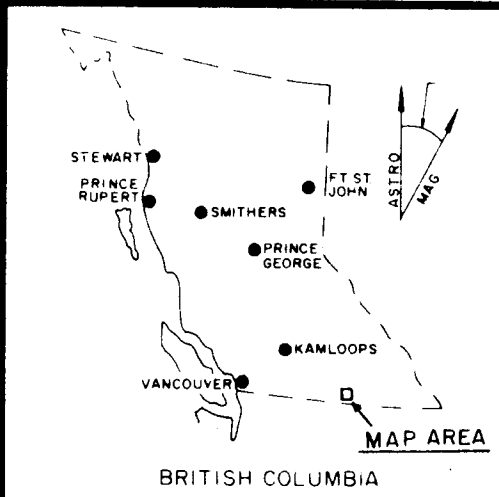
*L. A. Merrifield*

*L. Gearnette*

~~A Commissioner for taking Affidavits within British Columbia or  
A Notary Public in and for the Province of British Columbia.~~



Department of  
 Mines and Petroleum Resources  
 ACCESSIBLE REPORT  
 NO. **2845** MAP #1



**GREYHOUND MINES LIMITED (N.P.L.)**

LOCATION MAP

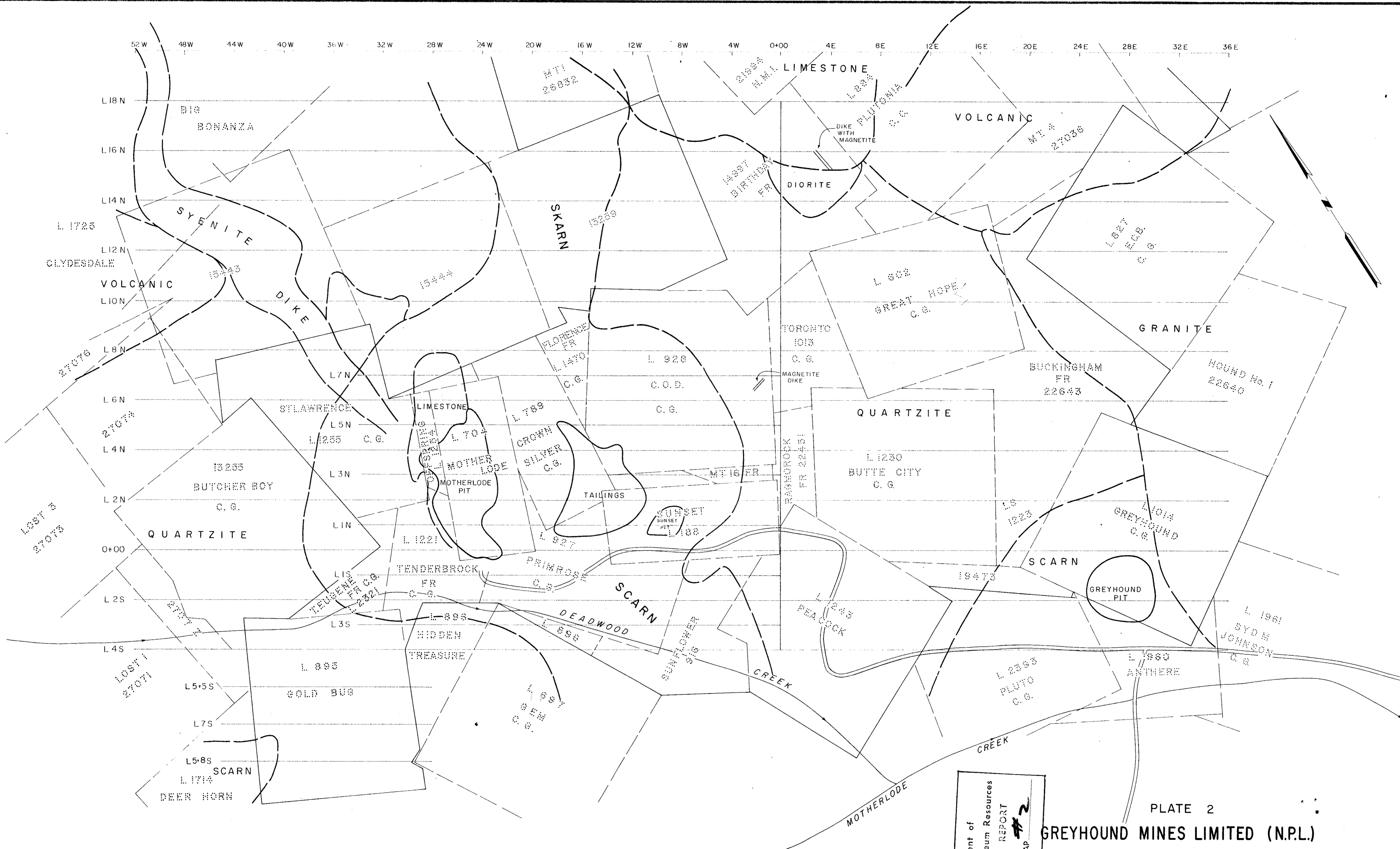
*J.P. Baird*

**GREENWOOD AREA, B. C.**

4 0 4 8  
 SCALE IN MILES

SURVEY BY:  
**SEIGEL ASSOCIATES LIMITED**  
 JULY 1970

**PLATE I**



**LEGEND**

- CREEK
- ROAD
- PROPERTY LIMIT
- CLAIMS
- GEOLOGICAL CONTACT FROM INFORMATION SUPPLIED BY  
MR. G.C. SINGHAI OF GREYHOUND MINES LIMITED.

2845

M-2

Department of  
Mines and Petroleum Resources  
ASSESSMENT REPORT  
NO. 2845 MAP #2

PLATE 2  
**GREYHOUND MINES LIMITED (N.P.L.)**  
MOTHERLODE CREEK PROPERTY  
GREENWOOD AREA, BRITISH COLUMBIA  
**INDUCED POLARIZATION SURVEY**  
GRID AND CLAIMS  
SCALE: 1" = 400'



TO ACCOMPANY A GEOPHYSICAL REPORT BY  
J.G. BAIRD, DATED OCTOBER 5, 1970.

SCALE IN FEET  
SURVEY BY SEIGEL ASSOCIATES LIMITED  
JULY 1970






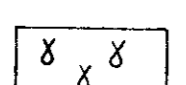
*J.Baird*



52W 48W 44W 40W 36W 32W 28W 24W 20W 16W 12W 8W 4W 0+00 4E 8E 12E 16E 20E 24E 28E 32E 36E

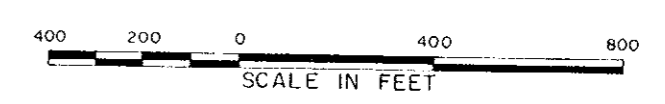


**LEGEND**

-  AREA RECOMMENDED FOR FURTHER EXPLORATION.
-  ZONE OF INCREASED CHARGEABILITIES
-  ZONE OF LOW RESISTIVITY (LESS THAN ABOUT 100 OHM-METRES)
-  ZONE OF MODERATELY LOWER RESISTIVITY (ABOUT 200 OHM-METRES)
-  ZONE OF HIGHER RESISTIVITY (ABOUT 1000 OHM-METRES)
-  ZONE OF MAGNETIC DISTORTIONS

Department of  
 Mines and Petroleum Resources  
 ASSESSMENT REPORT  
 NO. 2845 MAP #3

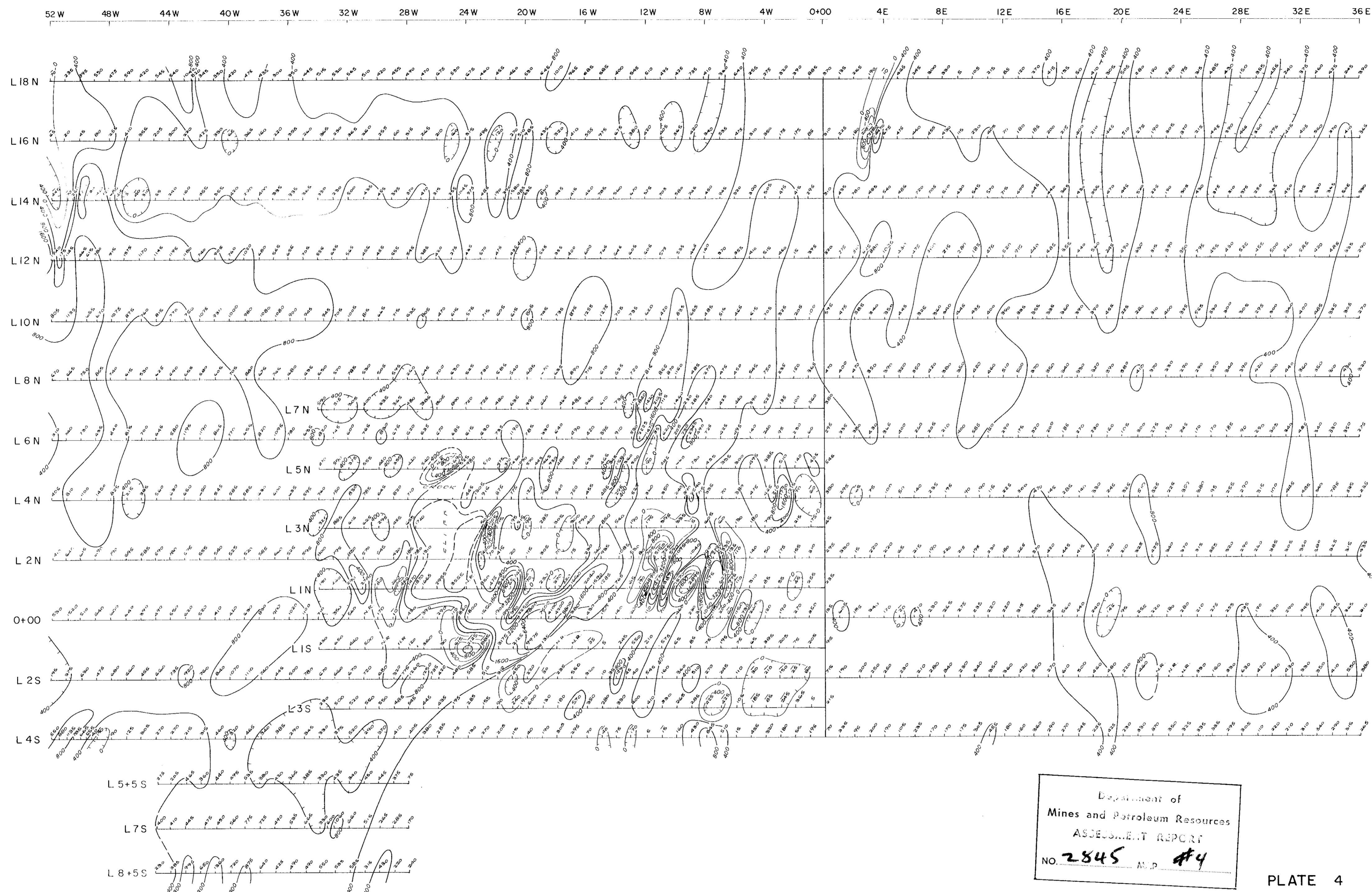
PLATE 3  
 GREYHOUND MINES LIMITED (N.P.L.)  
 MOTHERLODE CREEK PROPERTY  
 GREENWOOD AREA, BRITISH COLUMBIA  
 INDUCED POLARIZATION SURVEY  
 GEOPHYSICAL INTERPRETATION  
 SCALE: 1" = 400'



TO ACCOMPANY A GEOPHYSICAL REPORT BY  
 J.G. BAIRD DATED OCTOBER 5, 1970

SURVEY BY SEIGEL ASSOCIATES LIMITED  
 JULY 1970

*J.G. Baird*



Department of  
 Mines and Petroleum Resources  
 ASSESSMENT REPORT  
 NO. 2845 M.P. #4

PLATE 4

GREYHOUND MINES LIMITED (N.P.L.)  
 MOTHERLODE CREEK PROPERTY  
 GREENWOOD AREA, BRITISH COLUMBIA  
 GROUND MAGNETOMETER SURVEY  
 MAGNETIC CONTOUR PLAN  
 SCALE: 1" = 400'



SURVEY BY SEIGEL ASSOCIATES LIMITED  
 JULY 1970

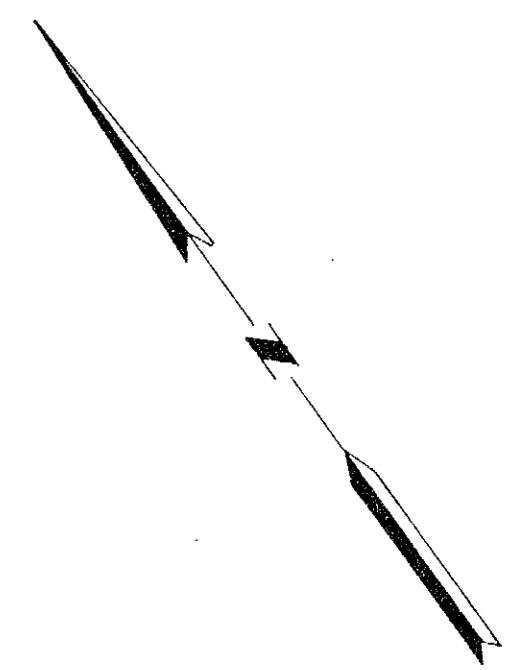
*Handwritten signature*

LEGEND

- LINE TRACE WITH MAGNETIC VALUES IN GAMMAS
- 400, 800, 1600, 3200, 6400 GAMMA CONTOURS
- 0, 400, 800, 1600, 3200, 6400 GAMMA CONTOURS

TO ACCOMPANY A GEOPHYSICAL REPORT BY  
 J. G. BAIRD DATED OCTOBER 5, 1970

52 W 48 W 44 W 40 W 36 W 32 W 28 W 24 W 20 W 16 W 12 W 8 W 4 W 0 4 E 8 E 12 E 16 E 20 E 24 E 28 E 32 E 36 E



BASE LINE

L 18 N

L 16 N

L 14 N

L 12 N

L 10 N

L 8 N

L 7 N

L 6 N

L 4 N

L 2 N

L 0

L 2 S

L 4 S

OPEN PIT

OPEN PIT

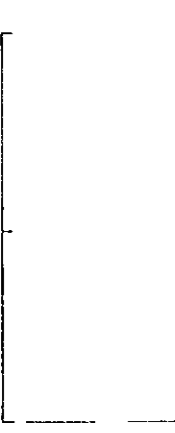
BASE LINE

L 5+5 S

L 7 S

L 8+5 S

CHARGEABILITY SCALE IN  
MILLISECONDS



LEGEND:

CHARGEABILITY SCALE 1" = 10 MILLISECONDS  
ELECTRODE SPACING  
o = 100'    Δ    Δ    Δ  
o = 200'    ×    ×    ×  
o = 400'    —    —    —

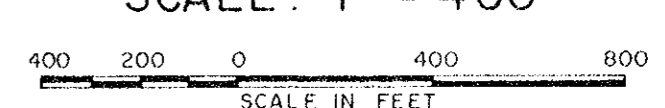
NOTES:

SEIGEL MK VI INDUCED POLARIZATION INSTRUMENTATION  
THREE ELECTRODE ARRAY  
INTERLINE SPACING NOT TO SCALE

TO ACCOMPANY A GEOPHYSICAL REPORT BY  
J.G. BAIRD DATED OCTOBER 5, 1970

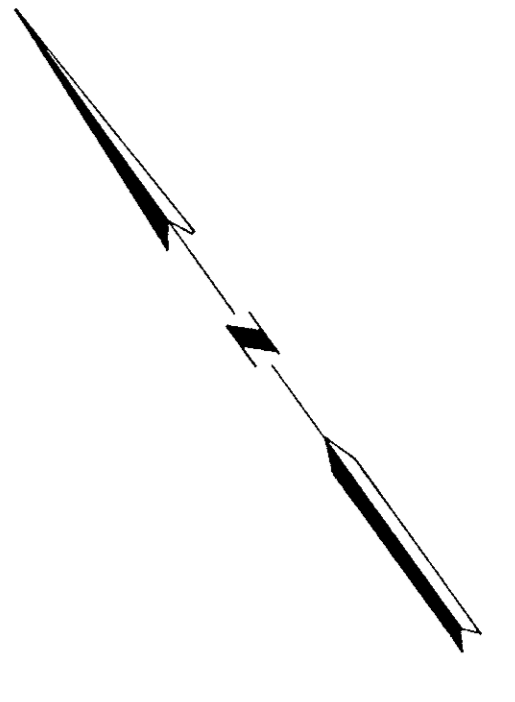
Department of  
Mines and Petroleum Resources  
ASSESSMENT REPORT  
NO. 2545  
M.A.R. 7/5

PLATE 5  
GREYHOUND MINES LIMITED (N.P.L.)  
MOTHERLODE CREEK PROPERTY  
GREENWOOD AREA, BRITISH COLUMBIA  
INDUCED POLARIZATION SURVEY  
CHARGEABILITY PROFILES  
SCALE: 1" = 400'  
SURVEY BY SEIGEL ASSOCIATES LIMITED  
JULY 1970

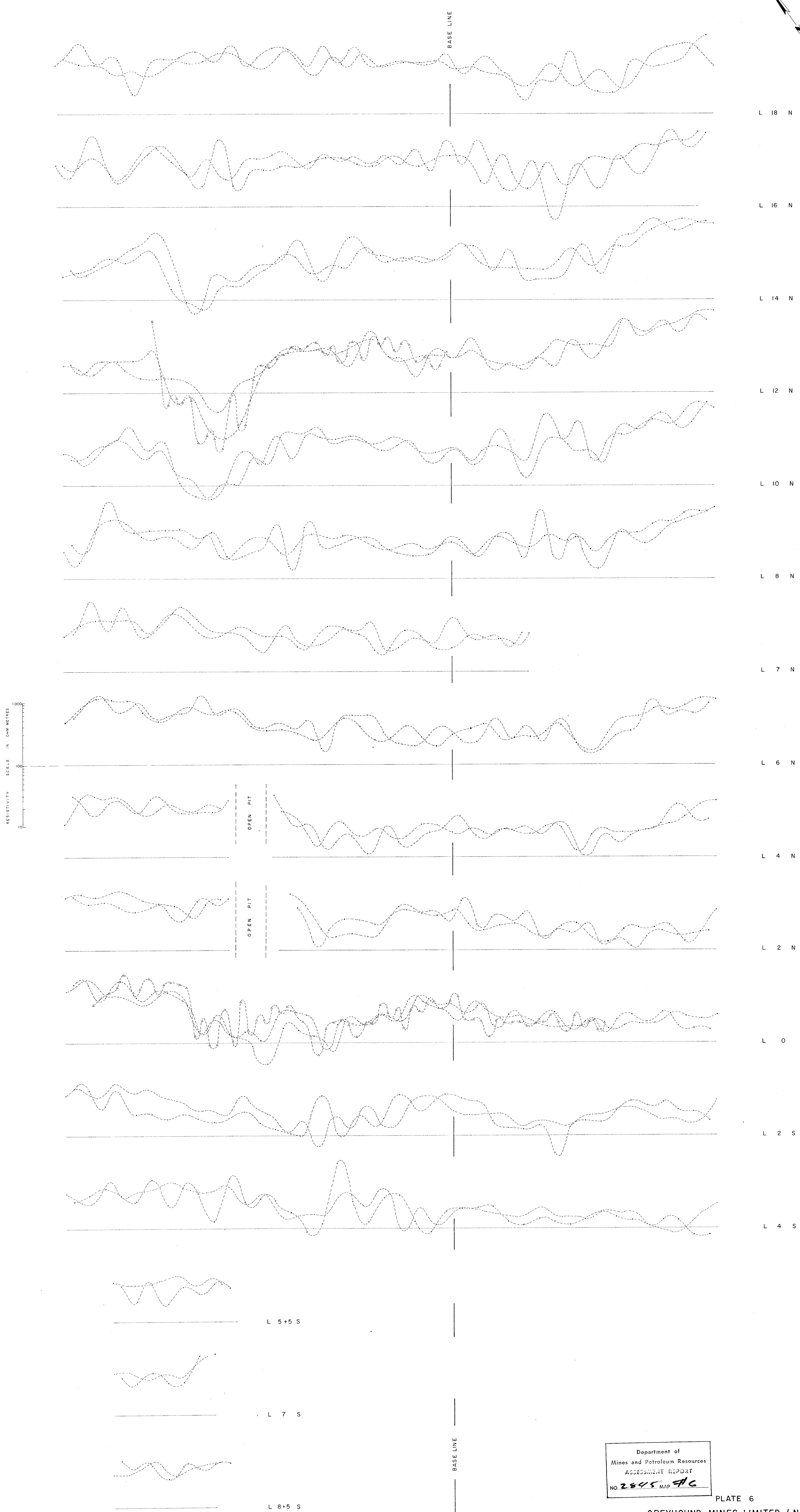


*J.G. Baird*

52W 48W 44W 40W 36W 32W 28W 24W 20W 16W 12W 8W 4W 0 4E 8E 12E 16E 20E 24E 28E 32E 36E



BASE LINE



RESISTIVITY SCALE IN OHM-METRES

Department of  
Mines and Petroleum Resources  
ASSESSMENT REPORT  
NO. 2845 MAP 46

PLATE 6  
GREYHOUND MINES LIMITED (N.P.L.)  
MOTHERLODE CREEK PROPERTY  
GREENWOOD AREA, BRITISH COLUMBIA  
INDUCED POLARIZATION SURVEY  
RESISTIVITY PROFILES  
SCALE: 1" = 400'

400 200 0 200 400 800  
SCALE IN FEET

LEGEND:  
RESISTIVITY SCALE: 2" = LOGARITHMIC CYCLE WITH LINE TRACE  
TAKEN AS 100 OHM-METRES  
ELECTRODE SPACING: a = 100' ----- Δ  
a = 200' ----- Δ  
a = 400' ----- Δ

NOTES:  
SEIGEL MK VI INDUCED POLARIZATION INSTRUMENTATION  
THREE ELECTRODE ARRAY  
INTERLINE SPACING NOT TO SCALE

TO ACCOMPANY A GEOPHYSICAL REPORT BY  
J.G. BAIRD DATED OCTOBER 5, 1970

SURVEY BY SEIGEL ASSOCIATES LIMITED  
JULY 1970