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GEOPHYSICAL REPORT

GROUSE MOUNTAIN GROUP
OMINECA M. D., B. C.

for

COPPER RIDGE MINES LTD.
VANCOUVER, B. C.

by

GEO CAL LTD.
WEST VANCOUVER, B.C.

Survey Commenced: - October 8, 1965

Survey Completed: - December 20, 1965

CERTIFICATE OF QUALIFICATIONS

The formal education of Mr. Calbert B. Selmser, P. Eng. consists of undergraduate studies at Union College, Schenectady, N. Y., in engineering and science leading to a B. Sc. degree; Graduate studies at McGill University, Montreal, P. Q., in mining geology were carried out leading to a M. Sc. degree. Also included in graduate study was a year spent at the University of Toronto in the Physics Department, doing graduate study in Mining Geophysics.

The author has had extensive experience in exploration work in the Provinces of Quebec, Ontario, Manitoba, Saskatchewan, Alberta and British Columbia in Canada. He has also worked as a Field Engineer and Geophysicist for International Nickle Company in the Transvaal region of South Africa.

The author has been a member of the Association of Professional Engineers of Ontario and Alberta for a period of 15 years. He is at present an active member of the Association of Professional Engineers of British Columbia, and is a resident engineer in this Province.

My knowledge of the property outlined in this report has been gained by an interpretation of an electromagnetic survey and detailed self potential surveys made in the area. All survey work donewas also under my direct supervision at all times.

The author has no financial interest in the property examined. He is acting wholly as a consultant to the interested principal. The only commercial gain derived by this report by the author is for his specific professional services.

C. B. Selmser

C. B. Selmser, P. Eng.

SUMMARY

A reconnaissance electromagnetic survey with some auxiliary self potential control has revealed three principal drilling locations for possible copper sulphide ore deposits. These locations have been assessed for continuity, principal EM dip relationship, polarity of the self potential curve, and amplitude of both the values for the electromagnetic misorientation and the potential on the self potential curves.

These favored anomalies are located in Claims 26, 6475 and Claims 6477 and 33. Further investigation of this area was curtailed at this time by severe Winter conditions.

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GEOPHYSICAL SURVEY
ELECTROMAGNETIC METHOD
GROUSE MOUNTAIN GROUP
OMINECA M.D., B.C.

INTRODUCTION:

This survey took place on Grouse Mountain, situated between McQuarrie Lake on the east and Thompson Creek on the west. The property is reached from Highway 16 on a gravel road some 16 miles east of Telkwa, B. C. This road is negotiable with 4 wheel drive to an old mining camp, which is located up the mountain and 3 miles off the highway.

This mining property consists of 9 crown grant claims and 30 staked claims as shown on the map, which accompanies this report. This comprises a rectangular area, which is about 1½ miles by 2 miles or 3 square miles in area.

The survey includes all of the patent claims, excepting 6473, and enough marginal claims to insure ample coverage of the main area of interest. This area contains a mining operation that has already been reported on previously.

The main mineral involved in this electromagnetic search is Copper Sulphide. Since this mineral is rather a good conductor, the method has been used to trace main conductive linements. The conductive linements, which show a large amplitude of misorientation have been further assessed by using the Self Potential method to test for the voltage and polarity of possible sulphides of copper and iron.

SUMMARY OF WORK:

The electromagnetic survey party consisted of two men, an operator and helper under the direct supervision of the author. They are:

Operator - Mr. Ernest Szigety

Helper - Mr. Gary Bold

The survey consisted of a total of 41 days worked in the field.

This entailed 37 days of EM survey and 4 days of SP survey.

ELECTROMAGNETIC METHOD:

The use of the electromagnetic method for the detection of subsurface conductors including base metal Sulphide ore bodies is well established and accepted. The fundamental principal on which these methods are based could be described as a conductor placed in an audio frequency alternating magnetic field where secondary currents have been caused to flow. These secondary currents set up a secondary field, which distorts the original field. All electromagnetic methods detect the presence of a subsurface conductor by measuring the distortion of the resultant transmitted field.

The degrees of dip of the receiving coil and the direction, which in this case is east and west, are plotted as profiles. The degrees of dip toward the east is plotted above the base line and the amount of west dip is plotted below the line. On the Electromagnetic Geophysical Map, the east dip is colored in red and the west dip in blue.

The electromagnetic unit used in this survey was an SE-250 Instrument, manufactured by E. J. Sharp Instruments of Canada, Limited. This unit was designed to give greater separation and deeper penetration than any similar battery operated portable EM unit. A standard frequency of 1000 cycles per second is used and since the primary signal is pulsating it can be readily distinguished from any background noise.

A separation of 100 feet was used with an inline configuration for most of the survey. Lines that were layed out at an interval with more than 200 feet of separation were read with a separation between transmitter and receiver of 200 feet.

THE SELF POTENTIAL METHOD:

A micro-ammeter capable of reading to the nearest unit for 100 scale divisions in both directions and with an increment switch, which enables the meter to read up to 10,000 micro amperes was used to read the small currents generated in the ground through electrode pots containing Copper Sulphate solution. The circuit resistance was read with an ohmeter, thus enabling values to be assessed in millivolts for the ground voltage. The pot separation was kept at 50 feet and the configuration was inline.

The millivolts of ground voltage is plotted on profiles along with the detailed EM values. The values above the base line have a positive polarity and those below the line are negative. The profiles are interpreted for amplitude and polarity as required effects of certain materials on potential differences in the overburden and bedrock. Elevation differences and pot potential differences can play an important part in these readings unless they are kept at a minimum by careful positioning of the electrodes.

The ground voltameter method is unique among electrical prospecting techniques since natural voltages in the ground are measured directly and no electrical generating system is required. These natural ground voltages are produced by the battery-like action of slightly acid groundwaters reacting with sulphide mineralization and other electro-chemical potentials developed between bodies of highly conductive mineralization and their environment.

GENERAL GEOLOGY AND TERRAINE:

The predominent rock group represented on Grouse Mountain is the Hazelton Group composed of acid and intermediate flow rocks and related breccias and tuffs. These rocks are of Jurassic and Cretaceous age and are cut by younger intrusives consisting of diorites. Interbedded with the country rocks and Slaty Tuffs. Mineralizing solutions eminating from the

younger intrusives have permeated and mineralized shear and fracture systems in the surrounding wall rocks.

Dikes of diorite extend northwest and southeast, while vein systems (Ruby Vein) strike northeast and southwest. Some mineralization occurs along the walls of the dikes (Schorn Vein), but the predominant direction of strike for the mineralization is northeast and southwest, which is obviously the most well established regional structural pattern.

The slope of the mountain faces the southwest and rises to nearly 5000 feet above sea level at the top. Some cliffs extend over stream banks and around lake margins. However, most of the area is more even in slope, while the region south of Copper Mine Lake is very flat and open.

Higher slopes are covered with Spruce trees of intermediate size. The lower slopes are overgrown by Poplar trees with the odd Spruce and Jack Pine grove.

ELECTROMAGNETIC GEOPHYSICAL MAP:

The cross-over effect, which is the point where the dip angle reverses, has been marked in heavy dashed lines. The correlation and continuity of these dashed lines depicts the regional structures and the points of high conductivity are outlined by the red and blue colored profiles. There are a number of locations where the continuity and amplitude of the misorientation curves shows good conductors to be present. These have been illustrated with detailed figures and can be found in the Appendix.

The cross-over axes extend in a northeast to southeast direction excepting a few which strike in a more easterly and westerly direction. This is the observed direction of the exploited mineralization such as the Ruby Vein.

The areas with high misorientation dips are concentrated in a few localities and have values in excess of 15 degrees either in a west or east direction. These locations are listed in accordance with claim locations as follows:

Claim No.	Description
2	South of Copper Mine Lake
6474	South of Adits No. 1 & No. 2
6475	Southeast Corner (Fig.5)
9	West central part (Fig.3)
33	Southeast corner (Fig.2)
6477	Center (Fig.6)
7254	East side (Fig.6)
6471	East side (Fig.6)
26	Center (Fig.1)
29	Northeast Corner (Fig.6)

The above were selected not only for the amplitude of the orientation but also for continuity. In the north part of the area streams and cliffs are coincident with some of the lineaments. These may represent faulted sections that influenced drainage patterns. Anomalies existing in Claims 26, 6475, 6474 and 9 have the most merit, since they have continuity, large dips, and the correct response to the self potential surveys.

The anomaly shown on Fig. 1 has an EM continuity for at least 200 feet. The self potential curve on line No. 14 shows a shift of 380 millivolts toward a negative polarity. This could mean 15% Sulphide mineralization. The SP curve for line 14 shows a change of 150 millivolts, which could represent 8% sulphides.

There is a line of continuity between the two locations on Fig. 1 which traverses the two lines in an east to west direction. The possible dip from the SP curve is toward the south.

The EM detail on Fig. 2 shows a high amplitude and restricted area. The SP curve, however, is quite broadly negative with an amplitude of over 300 millivolts. This could mean the presence of 15% sulphides.

The EM plot for Fig. 3 is broad but of low amplitude. The SP curve is not encouraging with less than 10% of sulphides indicated at the south side of the EM anomaly.

The plot for Fig. 4 is actually in plan out of proportion because of the change in plan of the lines on the map. For this reason no SP survey was made, and the location is significant only for a west dipping anomaly of large magnitude. Since this location is coincident with a stream valley its unusual polarity may be suspect and caused by misorientation effects other than the existence of Sulphide conductors.

The plot for Fig. 5 is quite interesting since it may possibly be a southward extension of the Ruby Vein. The amplitude of the EM is fairly broad and of high value with an east dip. The SP curve with a broad curve and amplitude of about 350 millivolts (negative) indicates about 15% sulphides.

Most of the curves with only one exception on Fig. 6 indicate no existence of sulphides. The exception is line 9 between 255 and 285. The EM curve has mostly a west dip and a narrow SP negative value of 150 millivolts coincident with the cross-over effect. This might indicate less than 10% sulphides at this location.

CONCLUSION:

The information set out above indicates that the following anomalies are most prospective:

Precident	Figure	Claim Number
(1)	1	26
(2)	5	6475
(3)	2	33 & 6477

No. 1 would seem to have the best continuity on the EM map and also a chance of a fairly large amount of Sulphides or Sulphides mixed with magnetite. Access to this location from the road is fairly clear of heavy growth.

No. 2 also has good continuity on the EM map and is important for being on strike with the Ruby Vein. The amount of indicated Sulphide is good, but the accessibility is not quite as easy as in the first case.

No. 3 has poor continuity on the EM map, but shows a good relationship onthe SP curve with fairly good amounts of possible Sulphide. It is also quite accessible from the road.

RECOMMENDATION:

It is recommended that the 3 locations outlined above should be drilled and assessed for the presence of Copper bearing Sulphide ores. No. 1 should be drilled from the south side to intersect the principal EM anomaly on line 13. No. 2 should be drilled from the southside to intersect the principal EM anomaly on line 9. No. 3 should be drilled from the north side to intersect the principal EM anomaly situated on line 16.

Respectfully submitted,

GEO CAL LIMITED

C. B. Salmser

C. B. Salmser, P. Eng.

Horiz. Scale: 1in. = 100 Ft.
Vert. Scale: 1in. = 100 M.V.

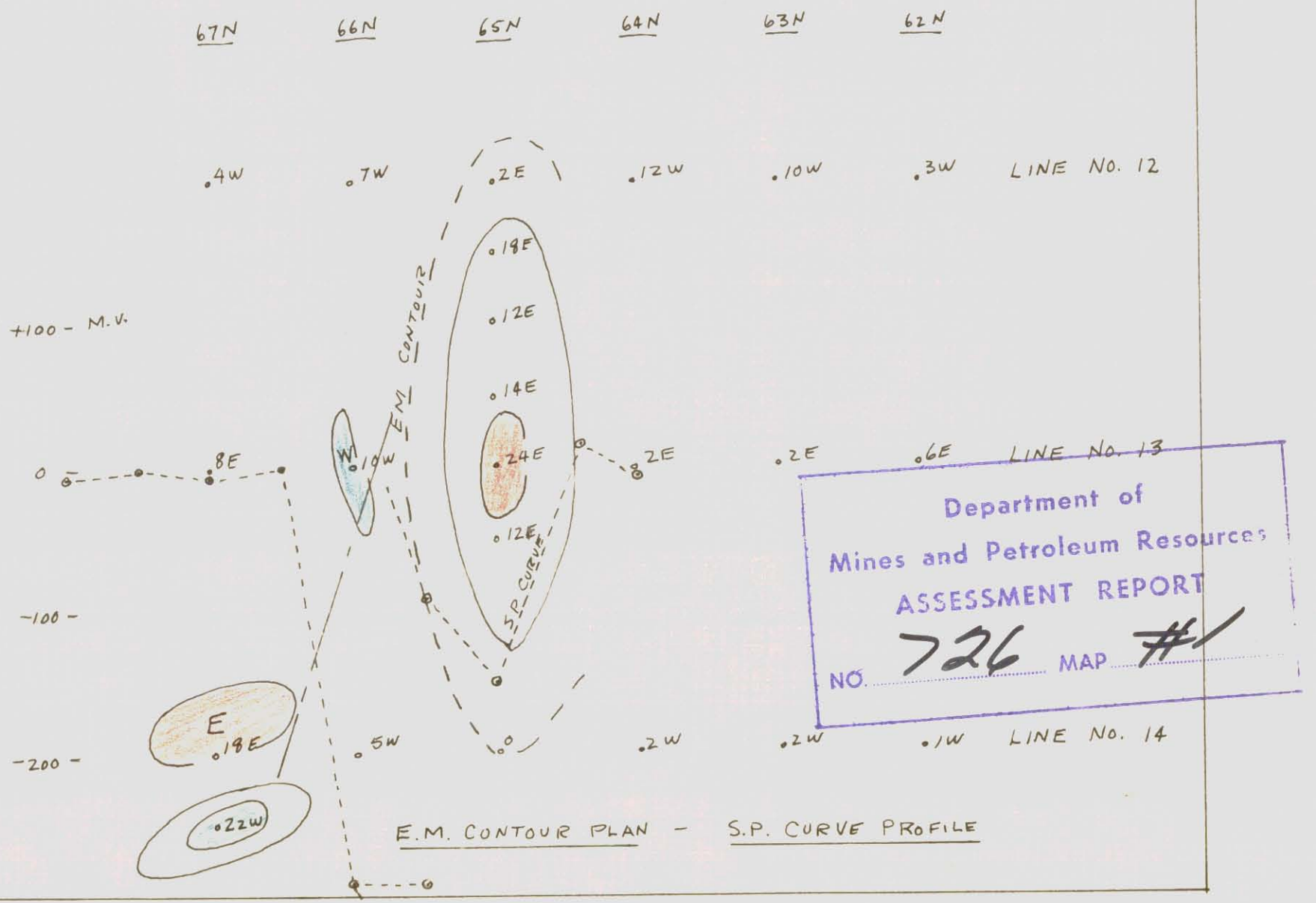

Fig. No. 1

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NO. 726 MAP #1

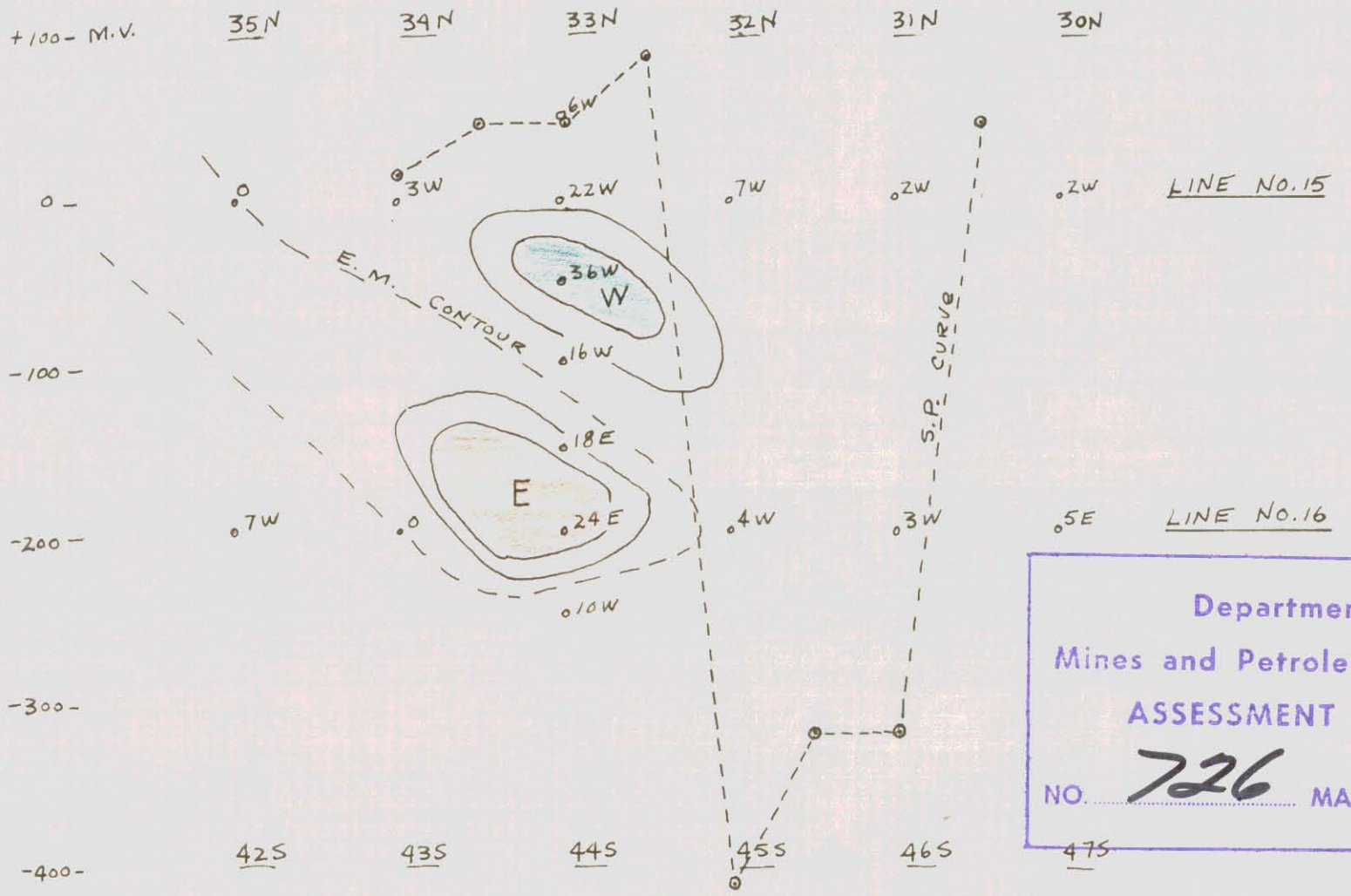

Fig. No. 2

Horiz. Scale: 1 in. = 100 ft.
Vert. Scale: 1 in. = 100 M.V.

E M CONTOUR PLAN - S.P. CURVE PROFILE

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NO. 726 MAP #2

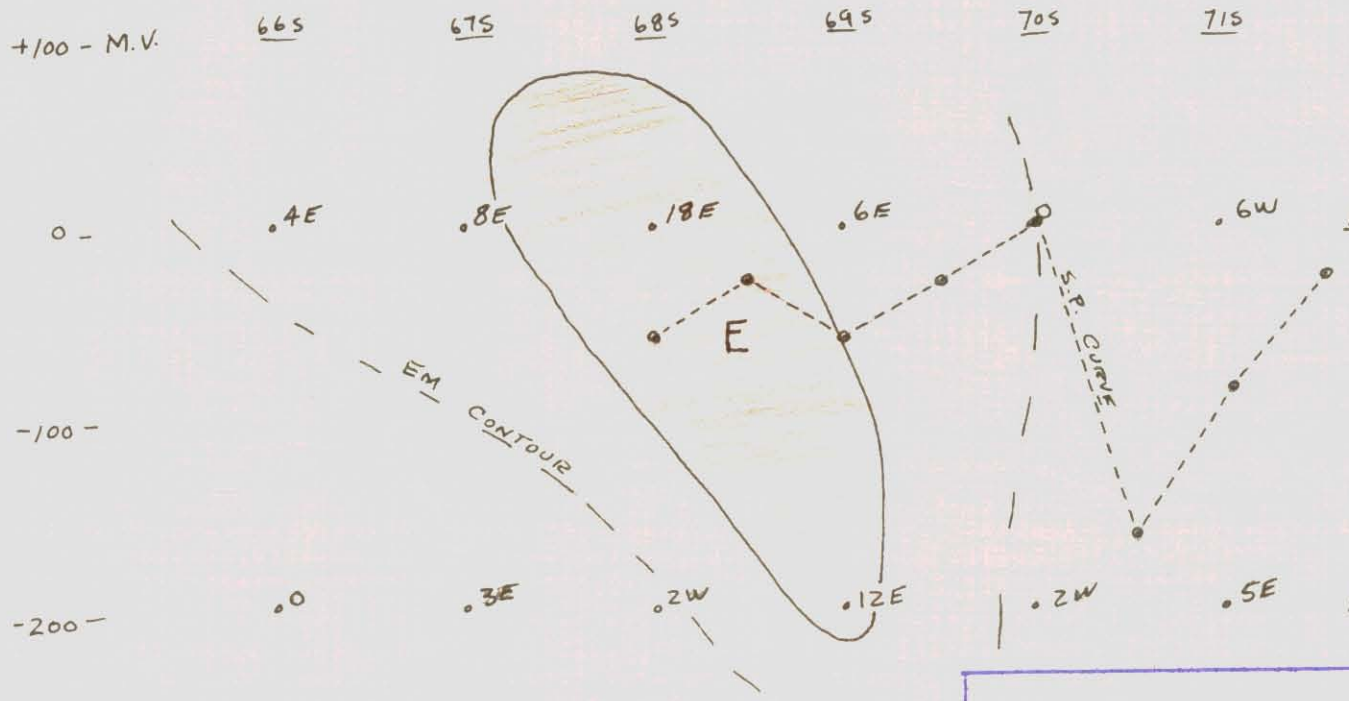

Fig. No.3

Horiz. Scale: 1 in. = 100 Ft.
Vert. Scale: 1 in. = 100 M.V.

EM CONTOUR PLAN - S.P. CURVE PROFILE

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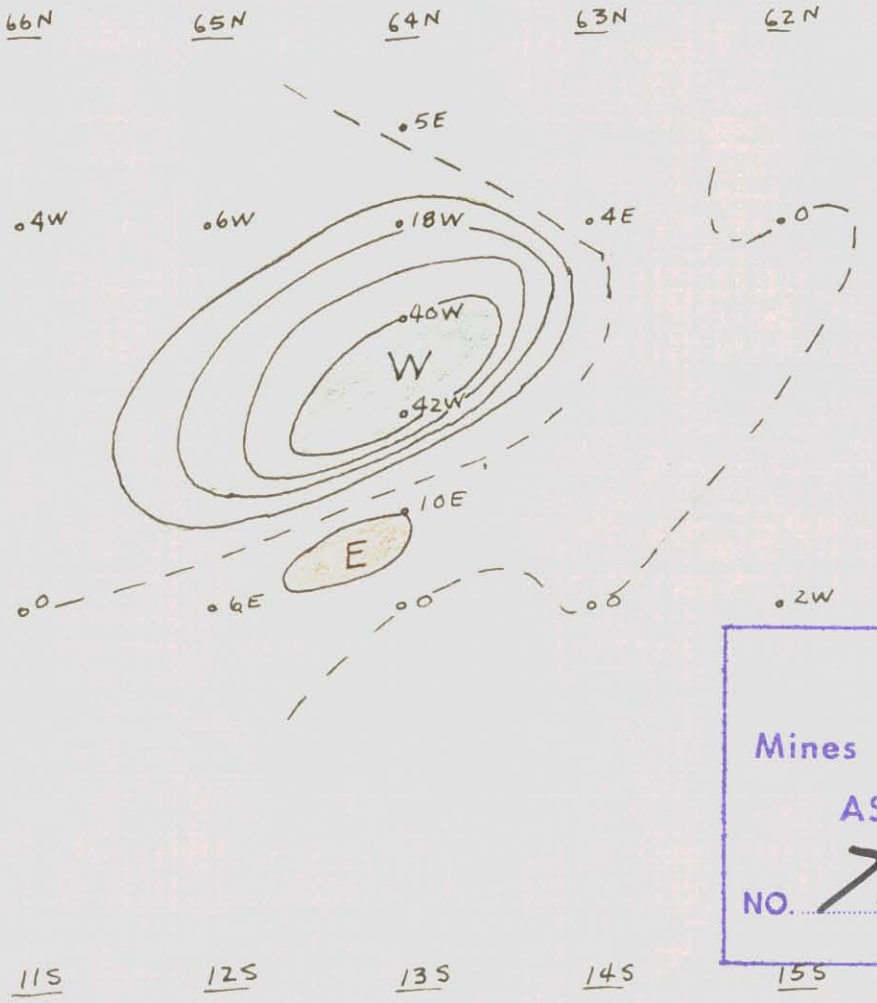
NO. 726 MAP #3



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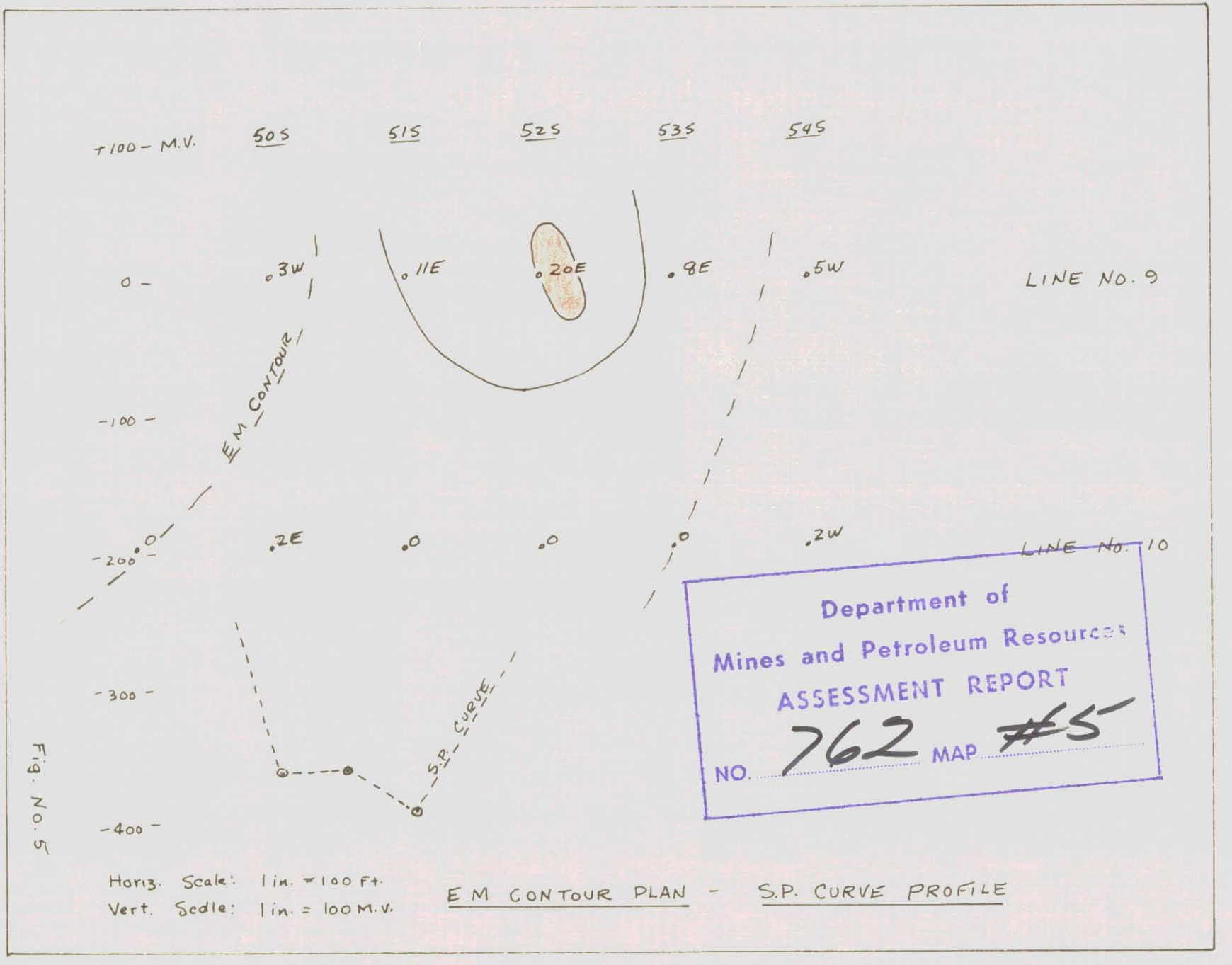
NO. 726 MAP #4

Fig. No. 4

Horiz. Scale: 1 in. = 100 ft.
Vert. Scale: 1 in. = 100 M.V.

E.M. CONTOUR PLAN - BETWEEN LINES DETAIL



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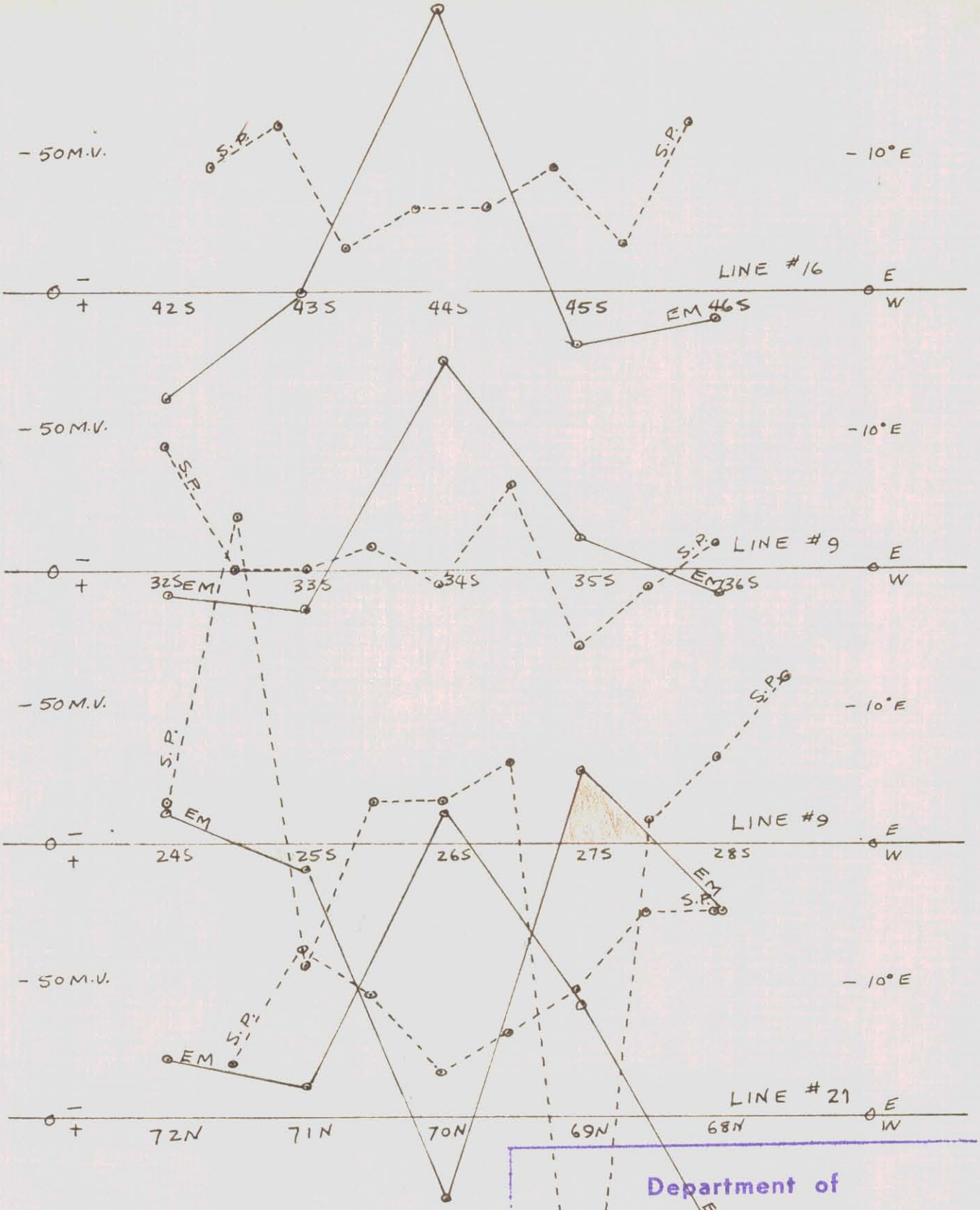
NO. 762 MAP #5

Fig. No. 5

Horiz. Scale: 1 in. = 100 Ft.
Vert. Scale: 1 in. = 100 M.V.

E M CONTOUR PLAN - S.P. CURVE PROFILE



Horiz. Scale: 1 in. = 100 Ft.

VERT. Scale: 1 in. = 10°, 50 M.V.

EM & SP CURVES

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NO. 726 MAP #6

Fig. No. 6

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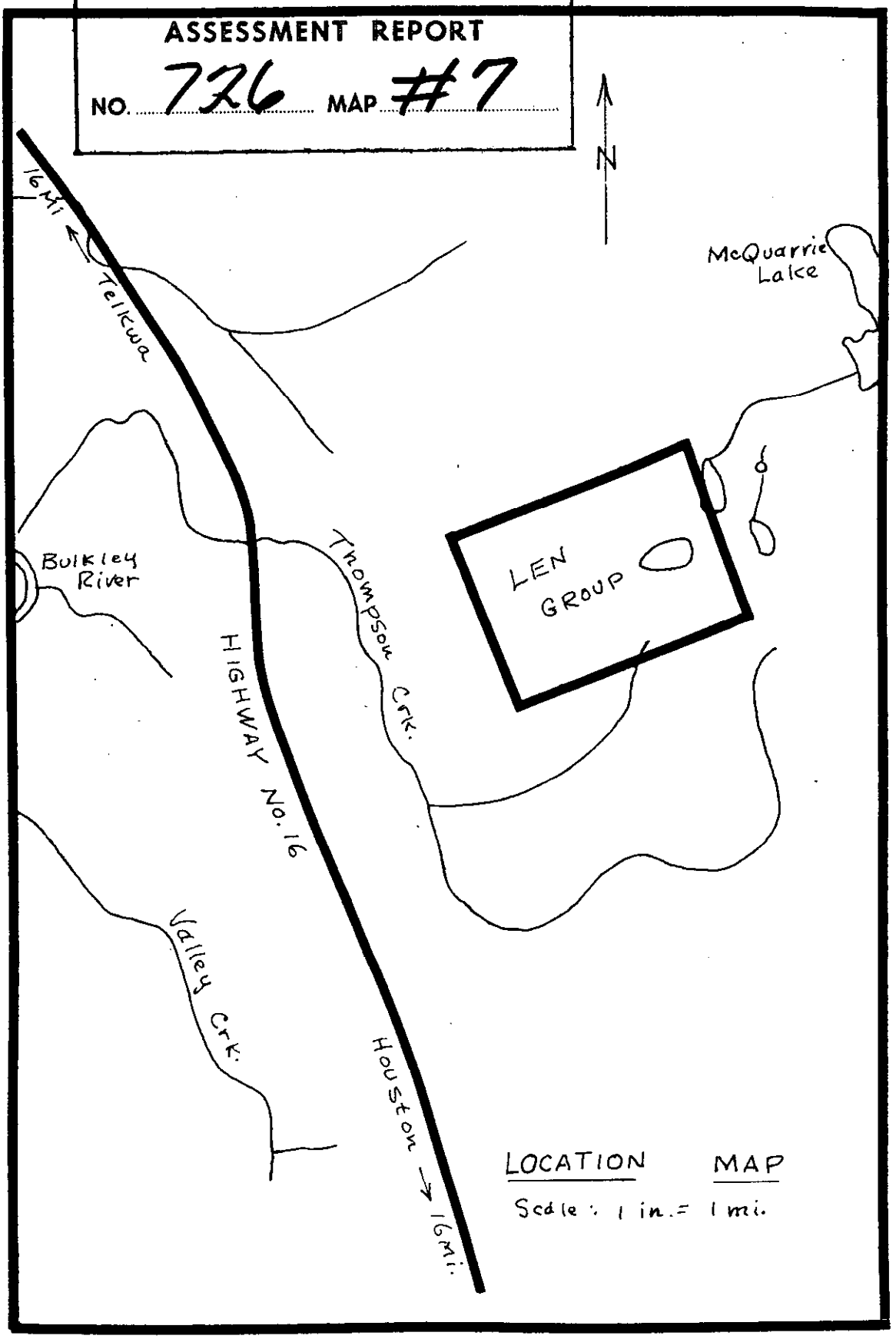
NO. 726 MAP #7



North Lake

ELEV. 4800'

South Lake

El. 4800'

Copper Mine Lake

ELEV. 4650'

ELEV. 5000'

ELEV. 4760'

4600'

4800'

Cabin

Camp

No. 1

No. 2

6472

6473

6474

6476

6477

6284

6275

6254

Fig. 1

Fig. 2

Fig. 3

Fig. 4

Fig. 5

Fig. 6

Fig. 6

Fig. 6

Fig. 6

20 18 16 1 3

19 17 15 2 4

22 21 5

24 23 8 7

26 10 9

28 27 33 12 11

30 29 34 14 13

726 (M1)

726

ELECTROMAGNETIC GEOPHYSICAL MAP

LEGEND

Trend of conductor or cross-over effect.

Orientation of the Field.

Copper Ridge Mines Limited
Grouse Mountain Group
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GEO CAL LIMITED
2552 NELSON AVE.
WEST VANCOUVER, B. C.

Scale: 1 in. = 500 ft. Horiz.; ½ Cm. = 10° Vert.

To accompany a report by C. B. Selmser, P. Eng.
on the Grouse Mountain group, Omineca M.D.

C. B. Selmser

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PROVINCE OF
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Department of
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ASSESSMENT REPORT
NO. 726 MAP #8

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