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REPORT ON INDUCED POLARIZATION SURVEY M-39 LEASE AREA PRINCETON, BRITISH COLUMBIA ON BEHALF OF CUMONT MINES LTD.

by

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

January 23, 1969

CLAIMS:

L374	L2010	L2264, 5
L2291, 2	L2578	L2048
L2301, 2, 3, 4	L2630	
L2006	L3193, 4, 5	

Location:
Near Copper Mountain
About 10 miles south of Princeton, B.C.
Similkameen Mining Division
120° 49° SW

DATES:
November 10 to November 18, 1968

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SUMMARY

The present induced polarization survey has revealed one area of sufficiently increased chargeability response which warrants further investigation. The main responses may be caused by concentrations of less than 1% by volume of polarizable material such as sulphide mineralization, serpentine, or magnetite in unknown relative proportions.

If a review of the geological and geochemical data reveals that the present area of increased chargeabilities may be underlain by sulphide mineralization, then the anomalous zone should be investigated by trenching or drilling.

Further induced polarization surveying may be warranted to allow precise quantitative interpretations of the present anomalous source.

REPORT ON
INDUCED POLARIZATION SURVEY
M-39 LEASE AREA
PRINCETON, BRITISH COLUMBIA
ON BEHALF OF
CUMONT MINES LTD.

INTRODUCTION

During the period from November 10 to November 18, 1968, a geophysical field party under the direction of Mr. Christian Zogg executed an induced polarization survey on the M-39 LEASE claim group near Princeton, British Columbia on behalf of Cumont Mines Ltd.

The property lies approximately 10 miles south of Princeton and one mile south of the mine pits of the inactive Copper Mountain Mine. The property location is shown on Plate 1 on the scale of 1" = 1000'

The property is wooded and the topography may be described as rolling although some steep hillsides occur. The mean elevation is about 3800' above sea level. The property is reached by good gravel roads from Princeton or by a steep winding road crossing the Similkameen River Valley from the Hope-Princeton Highway.

Seigel Mk VI time domain (pulse-type) induced polarization equipment has been employed on this property. The transmitting unit had a rating of 10 kw and equal on and off times of 2.0 seconds. The receiving unit was a remote, ground-pulse type triggered by the rising and falling 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 beneath the grids covered. In the present area such mineralization could include chalcopyrite, pyrite, and other metallic sulphide minerals. As well, magnetite, serpentine, and other minerals give responses not always distinguishable from sulphides by their electrical characteristics alone.

The accompanying copy of H. O. Seigel's paper entitled "Three Recent Irish Discovery Case Histories Using Pulse Type Induced Polarization" gives a description of the phenomena involved in this type of survey, the equipment employed, the field procedures and the nature of the results obtained over various base metal ore bodies.

As shown on the accompanying plates, a grid system of lines oriented N 25° E and spaced 400' apart was used for the present survey. Approximately 9.7 line miles cover the survey area.

The three electrode with an electrode spacing of 400' was employed for reconnaissance purposes. The station interval was 200'.

GEOLOGY

In the Copper Mountain area andesitic rocks of Triassic age are intruded by dioritic-gabbroic rocks of Jurassic or Cretaceous age. The best copper mineralization in the area has been found within the volcanic rock unit along its northwesterly trending contact with a syenogabbroic phase of the intrusive. Faulting and shearing appear to be important structural controls for mineralization. Chalcopyrite, bornite, pyrite and magnetite are conductive minerals which occur within the volcanic rocks.

As shown on Plate 1, the present survey area is largely underlain by the intrusive rocks however a contact with volcanic rocks is believed to occur in the northeast corner of the grid.

DISCUSSION OF RESULTS

Plate 1, on the scale of 1" = 1000', shows the generalized geology of the Copper Mountain area and the locations of the Cumont survey grids. The M-39 LEASE area has been indicated.

Plate 2, on the scale of 1" = 300', shows the induced polarization results in contour form. The actual chargeability values are given and a contour interval of 5.0 milliseconds has been chosen. Areas exhibiting chargeabilities in excess of 5.0 milliseconds have been shaded.

Plate 3, also on the scale of 1" = 300', shows the resistivity results. The resistivity values are given in ohm-metres and a logarithmic contour interval has been adopted by showing the 200, 400, 800 and 1600 ohm-metre contours.

As shown on Plate 2, the chargeability values are very low and uniform over much of the area surveyed. The average background chargeability level is approximately 2.0 milliseconds which would indicate that the rocks underlying most of the survey area have a very low content of metallic mineralization. With this background a uniform distribution of 1% by volume of metallically conducting material in the subsurface is expected to increase chargeabilities to about the 8.0 millisecond level.

A number of chargeability observations in excess of 5.0 milliseconds occur in the northeast corner of the grid. Aside from two isolated values of 15.5 and 20.5 milliseconds all of the values are less than 10.0 milliseconds. The two highest readings may possibly be due to narrow near surface lenses of metallically conducting material and the overall increased chargeabilities to a broad distribution of less than 1% by volume of metallically conducting material in the subsurface. The area of high chargeabilities may coincide with an area mapped as underlain by andesitic rocks and the change in chargeabilities may reflect this change in rock type.

Two chargeability values slightly in excess of 5.0 milliseconds are noted on the north end of L 60 W. These are of relatively low amplitude and probably not indicative of any large body of disseminated sulphide mineralization.

Plate 3 reveals that the apparent resistivity values range from below 100 to above 2000 ohm-metres. The average value is several hundred ohm-metres. The resistivity pattern is random and may bear more relation to changes in the type or thickness of overburden than to changes in the character of the bedrock. The high chargeability area exhibits moderate resistivities; however, it is noted that resistivity values of less than 200 ohm-metres accompany the high chargeabilities on L 0.

CONCLUSIONS AND RECOMMENDATIONS

The present induced polarization survey has revealed one area exhibiting slightly increased chargeability responses. Two isolated values in excess of 15.0 milliseconds may be due to narrow near surface concentrations of relatively high metallically conducting content however most of the responses may be due to a broad dissemination of less than

1% by volume of metallically conducting material which, in the present geological environment, may be sulphide mineralization, serpentine, or possibly magnetite. The exact nature of the conducting mineralization cannot be determined from the geo-electrical data alone however further induced polarization surveying executed in the anomalous areas would provide the detailed data necessary for precise interpretation of the location, attitude, depth below surface and possible metallically conducting content of the anomalous bodies.

Since bodies of sufficient dimensions containing low concentrations of sulphide mineralization may have more economic significance than bodies of high sulphide content, the amplitude of the chargeability responses is not necessarily the best way to grade induced polarization anomalies. In addition, since an asymmetric electrode array has been used, the chargeability contours may bear little relation to the size or shape of a possible mineralized body.

All available geological, geochemical and magnetic data should be compared with the present chargeability-resistivity results. If there is even a residual possibility that the present responses may be due to sulphide mineralization, trenching or drilling would be warranted.

Respectfully submitted,

SEIGEL ASSOCIATES LIMITED

per Jon G. Baird

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

Richard O. Crosby, P.Eng

Vancouver, B.C.
January 23, 1969

Harold O. Seigel

President,
Harold O. Seigel & Assoc., Ltd.,
Downsview, Ontario

Annual General Meeting,
Toronto, March, 1965

Three Recent Irish Discovery Case Histories Using Pulse-Type Induced Polarization

Transactions, Volume LXVIII, 1965, pp. 343-348

ABSTRACT

In the intensive Irish exploration program which has followed the discovery of the Tynagh deposit (Northgate Exploration, Ltd.) in 1962, three base metal discoveries have been made to date. These include the lead-zinc-silver deposits at Silvermines (Consolidated Mogul Mines, Ltd.), which are now being readied for production, the copper-silver deposit at Gortdrum (Gortdrum Mines, Ltd.) and the lead-zinc deposits near Keel (Rio Tinto-Zinc Ltd.). Each of these discoveries is the result of a combined geological-geochemical-geophysical exploration sequence in which pulse-type induced polarization surveys defined the precise location and lateral extent of the near-surface metallic sulphide mineralization and guided the initial drilling program. Whereas the Silvermines mineralization is, in part, composed of massive sulphides, the other two deposits are characterized by generally less than 5 per cent conducting sulphides and constitute an excellent demonstration of the unique merits of the pulse-type induced polarization system.

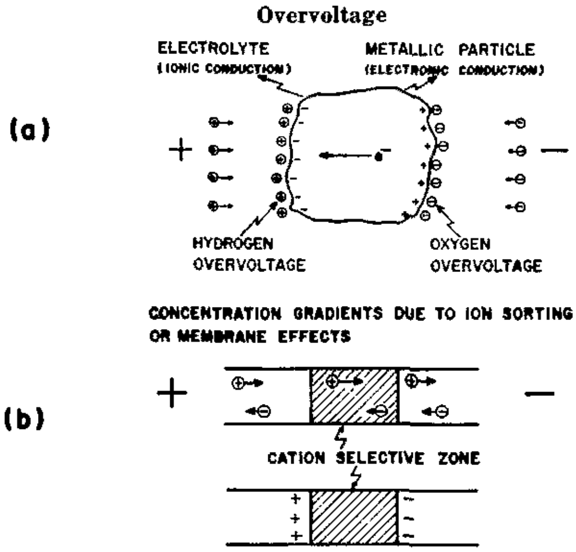


Figure 1.—Induced Polarization Agents.

Introduction

FOR the benefit of those who are unfamiliar with the induced polarization method in general or with the pulse-type method in particular, a few introductory remarks will be directed on the system employed in the present case histories. Those who wish a fuller treatment of the subject are directed to Seigel (1962),* which paper also includes an extensive list of references.

Induced polarization, in its broadest sense, means a separation of charge to form an effective dipolar (polarized) distribution of electrical charges throughout a medium under the action of an applied electric field. When current is caused to pass across the interface between an electrolyte and a metallic conducting body (Figure 1a) double layers of charge are built up at the interface, in the phenomenon known to the electrochemists as "overvoltage." This is the phenomenon which can be utilized for the detection of the metallic conducting rock-forming minerals such as most sulphides, arsenides, a few oxides and, unfortunately, graphite. In addition, effective dipolar charge distributions occur to some extent in all rocks, due to ion-sorting or membrane effects in the fine capillaries in which the current is passing (Figure 1b). Induced polarization responses may therefore arise from metallic or non-metallic agencies. Fortunately, the latter generally fall within fairly low and narrow limits for almost all rock types, although there is still no reliable general criterion for differentiating overvoltage responses from graphite and metallic sulphides, or for distinguishing between the responses of one type of sulphide and another. Despite these limitations, the induced polarization method has amply demonstrated its value in mineral exploration since its initial development as a useful exploration tool in 1948. (Wait *et al.*, 1953).**

*Seigel, H. O., "Induced Polarization and its Role in Mineral Exploration," C.I.M. *Bulletin*, Vol. 55, No. 600, pp. 242-249; *Transactions*, Vol. LXV, pp. 151-158; 1962.

**"Overvoltage Research and Geophysical Applications," *Pergamon Press*, 1959, edited by J. R. Wait.

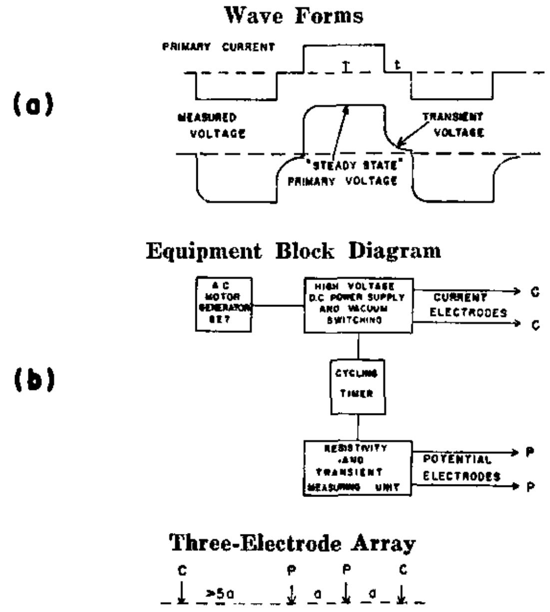


Figure 2.—The Pulse System.

Description of Method

For the present program, the pulse or time-domain system was employed. As shown on Figure 2a, the primary current wave form consists of square wave pulses of 1.5 seconds duration, separated by a 0.5-second gap and alternately reversed in direction. The polarization voltages established during the current-on time decay slowly during the current-off time. They are amplified, integrated over the current-off time and divided by the amplitude of the steady-state voltage measured during the current-on time. In this way, we determine the "chargeability;" i.e., the induced polarization property of the region under investigation. The units of chargeability are milliseconds. Normal (non-metallic) background chargeabilities in most rocks range from 1 millisecond to 5 milliseconds. A distribution of 1 per cent, by volume, of metallic conducting material of an average range of particle size may be expected to increase the response level by about 3 milliseconds, which is readily visible.

The pulse system provides an absolute measurement of induced polarization; i.e., the significant measurement is made in the absence of the primary field. As such, it is inherently more sensitive than the frequency variation system, wherein two measurements are compared, both of which are made in the presence of the primary field. This is a critical consideration when mineralized bodies of low sulphide content, small size or great depth are being sought.

Figure 2b shows a block diagram of the apparatus employed and the electrode array used. The spacing "a" of the three-electrode array determines the effective depth of penetration of the survey and is selected to give adequate penetration to the depth desired. By varying the electrode spacing over an anomalous area and comparing the responses on the various spacings, one may obtain an estimate of the depth of burial of the source and its dip, etc.

A photograph of the type of apparatus employed on these surveys is shown in Figure 3. This is known as Seigel Mk V equipment and consists of the following major components: (a) a 1,200-watt A.C. motor-generator set, (b) a power control unit capable of supplying up to 1000 volts and 2 amperes D.C. output current and (c) a measuring unit. All of these items are packboard-mounted for maximum portability.

Figure 4 shows a typical instrumental set-up in Ireland. In the normal operating procedure, the electronic chassis are set up in a tent and cables are fed out to the line being surveyed. As the line crew is prepared, both mentally and by apparel, to work under all types of weather conditions, the survey is not stopped by rain, etc. This is important in Ireland, where, traditionally, there are no more than 60 rain-free days a year.

For the primary survey coverage on most properties, an electrode spacing of 200 to 300 ft. was generally employed, with a station interval of 200 ft. and a line separation of 300 to 500 ft. On anomalous areas located by the primary coverage, more closely spaced stations and lines are employed, as well as additional spacings to supply the detail necessary for subsequent drilling, etc.

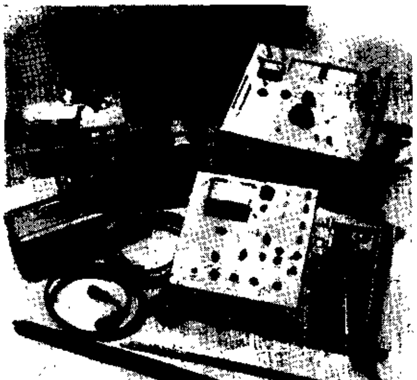


Figure 3.—(above)—The Seigel Mk V Induced Polarization Unit.

Figure 4.—(right)—Typical Field Operational Base in Ireland.

Case Histories

In presenting the three case histories that follow, it must be made perfectly clear at the outset that these mineral discoveries are the product of teamwork, involving geological, geochemical and geophysical phases. It is on the basis of the first two phases that the areas for geophysical investigation have been selected. As the writer and his organization have been concerned only with the geophysical phase, this paper will, naturally, appear to emphasize it. The contribution of others to the broader exploration program must not be minimized, however.

In January, 1962, a large lead-zinc-silver deposit of a very unusual type was discovered near Tynagh, Co. Galway, in the Republic of Ireland. This deposit includes both a supergene enriched, partly oxidized upper zone and a sulphide primary zone and lies in dolomitic reef limestones of Carboniferous age near a fault contact with Devonian sandstones. Similar rock types and contacts occur in many parts of Ireland, so that an extensive program of exploration was initiated by a number of mining companies, starting in the summer of 1962. Although the pace has slowed up somewhat from the hectic days of 1962 and early 1963, this exploration program continues to the present time.

The usual exploration sequence, although not followed in detail by all companies, is as follows:

1 . . . .

A selection of areas is made, based on the good government geological maps available. As nearly as possible, rock types and structures similar to those of the Tynagh deposit are sought. Those areas with known mineral showings are given high priority, of course.

2 . . . .

The stream sediments in the drainage pattern are sampled and analyzed for significant amounts of copper, lead and zinc. Soil samples may also be taken, often on a regular grid basis, and analyzed. In this fashion, areas of abnormal metal content may be broadly defined. In detail, such geochemical sampling has often been hampered by man-made contamination and confused by soil transport by glacial, fluvial or human agencies.

3 . . . .

Geophysical surveys, primarily the induced polarization type, are then conducted to map the subsurface distribution of sulphide mineralization and to provide guidance for a drilling program thereon.

This exploration program has already been remarkably successful, resulting, to date, in a new lead-zinc-silver mine-to-be at Silvermines, Co. Tipperary, for Consolidated Mogul Mines, Ltd., the probable copper-silver mine-to-be at Gortdrum, Cos. Tipperary and Limerick, for Gortdrum Mines, Ltd., and the interesting lead-zinc prospect at Keel, Co. Longford, for the Rio Tinto-Zinc group (Riofinex Ltd.). Figure 5 shows the location of the various recent mineral discoveries in Ireland. Despite a remarkable similarity in geological setting, the deposits are widely separated geographically, over a length of 80 miles, and no two are located on what can be called the same structure. This bodes well for the possibility of further discoveries being made in Ireland.

Each of the three case histories will be discussed below.

Silvermines Deposit

As the very name of the area implies, the Silvermines region had been known, for many centuries, as a locality mineralized with lead, zinc and silver. Metal production had taken place at several periods in the past, although at the time of the present investigations the mines were dormant. The very prominent Silvermines fault, striking about N 70°E, was known to be the significant control in the region, with the old mines and prospect pits scattered along its length over a distance of about 2 miles. Due to the past mining activity and transport by both drainage and man, a very extensive area gave rise to extremely high geochemical indications in lead and zinc. The induced polarization survey executed in late 1962 and early 1963 covered much of the concession area on 800-ft. sections and the geologically interesting portion thereof on 400-ft. sections. The three-electrode array, with 200-ft. electrode spacing, was employed on all lines, and spacings of 100 ft. and 400 ft. were also employed on the 400-ft. detail lines. In all, approximately 5 miles of the strike length of the Silvermines fault were covered by the present survey, 2½ miles in detail. At least ten distinct zones of abnormally high polarization were indicated, of which about half lay in the Silvermines mineralized belt and its extensions to the west and east.

One of these zones, designated the Garryard, has responded favourably to the subsequent drilling, resulting in the discovery of a mineable orebody.

To date, the announced proven tonnage figures include 12 million tons averaging approximately 8 per cent zinc, 3 per cent lead and 1 ounce of silver in the Garryard zone. This zone lies to the west of the zone from which the previous production had taken place.

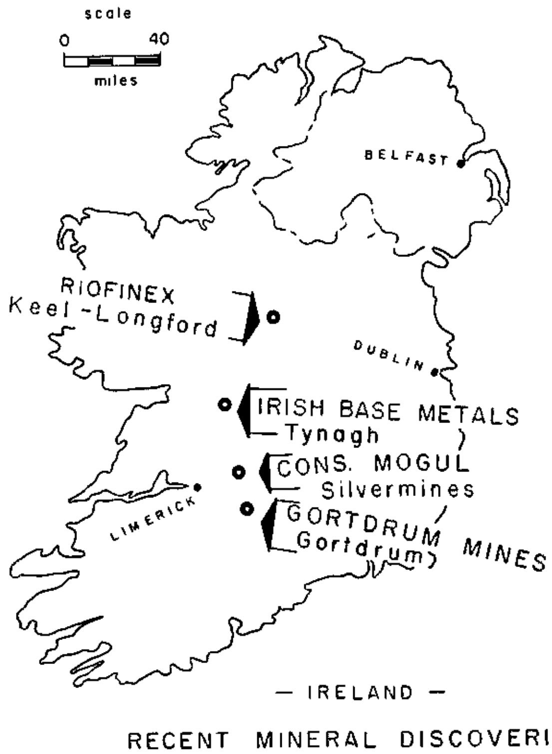


Figure 5.—Location Plan of Recent Mineral Discoveries in Ireland.

Figure 6 shows a typical discovery profile across the main ore zone, on the section 38,400E. The 200-ft. electrode spacing results, both chargeability and resistivity, are shown in profile form. The geologic section, as deduced from nine drill holes, is shown below the geophysical profiles. In a fashion almost identical to that of the Tynagh deposit, the Silvermines orebody is located in gently north-dipping dolomitic limestones adajacent to a fault contact with the Devonian "Old Red" sandstone. The mineralization here is composed of both massive and disseminated sulphides, with the former composed of a high percentage of pyrite. The mineralization is essentially conformable, in two distinct horizons, and is therefore flatly dipping except in the vicinity of the fault, where the dips are much steeper, perhaps due to "drag folding" on the fault.

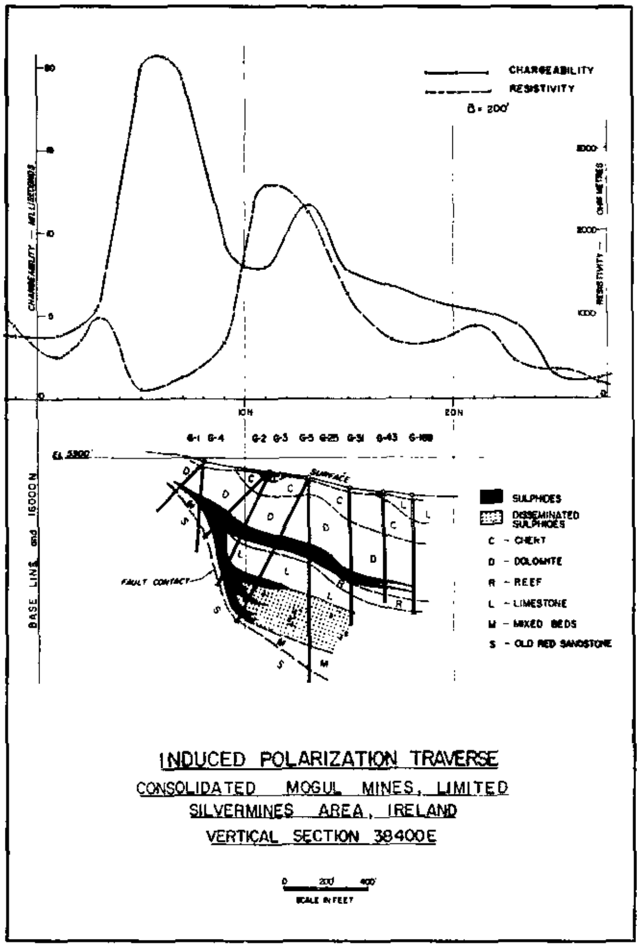


Figure 6.—Typical Discovery Traverse, Silvermines Deposit.

Because of the high pyritic content of the mineralization near the fault, along which it comes closest to the ground surface, we see both a marked increase in chargeability and a sharp decrease in resistivity in that vicinity. From a normal background of 2-4 milliseconds, the chargeability curve rises to a peak response of 20 milliseconds over the sub-outcrop of the body on this section. The subsidiary peak of about 12 milliseconds near 11N is believed to be due to disseminated pyrite in the chert horizon.

Figure 7 shows the multiple spacing chargeability results on the same section, using electrode spacing of 100, 200 and 400 ft. and the three-electrode array. On comparing the results with the various spacings, two items of interest may be noted; firstly, the progressive increase in peak amplitude with spacing, testifying to the increase of mineralization with depth, even down to a depth of 300 ft., and, secondly, the presence of buried material of high polarization at depth beneath section 10N to 18N on this line. The latter is undoubtedly due to the down-dip extension of the upper mineralized horizon, which is present at depths of 300 to 400 ft. over this region.

The induced polarization results on the Silvermines deposit were quite definitive and have provided good guidance for the exploratory drilling. It is true, however, that the massive sulphide portions of this deposit would be amenable to detection by the more conventional electrical methods, such as electromagnetic induction or resistivity. As such, it is not as good a test of the capabilities of the induced polarization method as are the two case histories which follow.

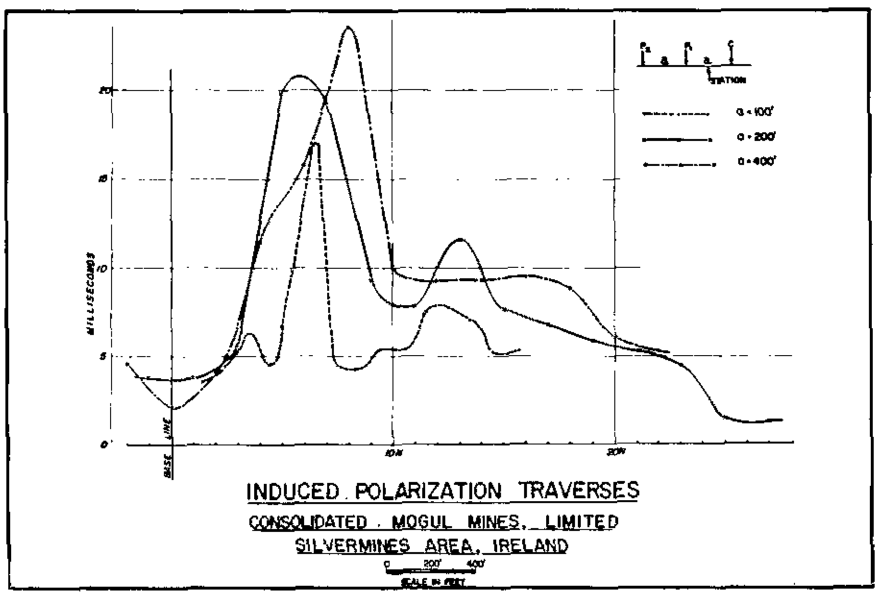


Figure 7.—Multiple Spacing Results, Silvermines Deposit.

Gortdrum Deposit

The Gortdrum area, near the mutual border of Cos. Limerick and Tipperary, was originally selected to cover the eastern extension of the former Oola Mines lead-zinc deposit, some 3 miles to the west. Regional geochemical sampling of the stream sediments in this area, followed by soil traverses, indicated a moderately strong copper soil anomaly. Induced polarization surveys were carried out in May, 1963, and January, 1964, leading to the localization of the sulphide mineralization associated with the geochemical anomaly. As there was a 300-ft. lateral displacement between the centers of the geophysical and geochemical indications and the surface topography is very gentle, it was initially queried as to whether the two indications

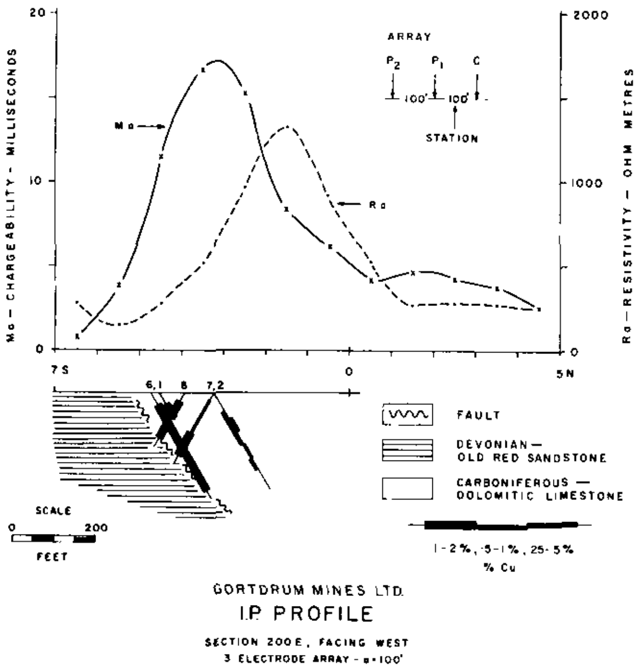


Figure 8.—Typical Discovery Traverse, Gortdrum Deposit.

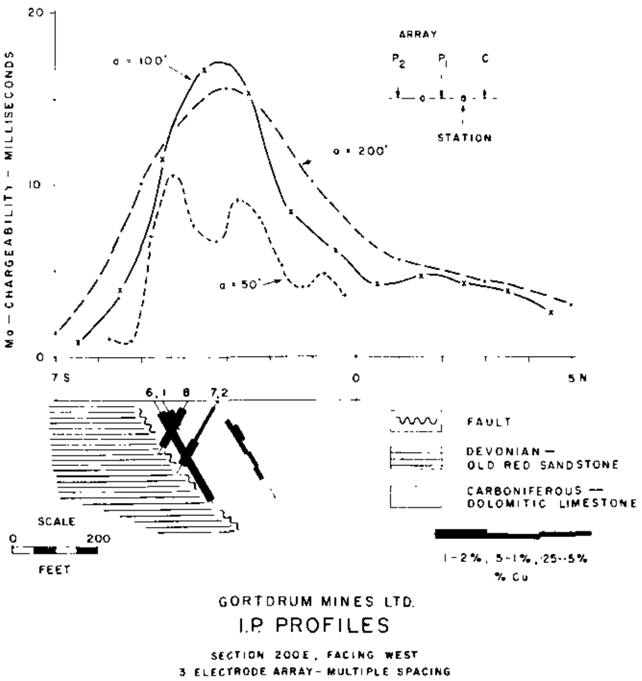


Figure 9.—Multiple Spacing Results, Gortdrum Deposit.

were related. The subsequent drilling has fully confirmed the geophysical predictions.

On the initial two geophysical programs, the three-electrode array with 100-ft. spacing was employed, as a relatively shallow source of the geochemical anomaly was expected. The survey lines were at 200-ft. intervals. Figure 8 presents a typical discovery traverse, showing both the chargeability and resistivity profiles as well as the corresponding geologic section. A peak chargeability of about 17 milliseconds is observed, rising from the normal background of 2-4 milliseconds. There is no resistivity expression of the mineralized zone, lying as it does on the flank of a high-resistivity area.

Figure 9 shows the chargeability profiles for electrode spacings of 50, 100 and 200 ft. Points of special interest deduced from these profiles include the following:

1.—The extremely sharp cut-off of the high chargeability levels on the south side of the area and the gradual drop-off in level on the north side. This was inconsistent with the thought of a bedded-type deposit conformable with the limestones, which are known to dip flatly to the south. A fault or other contact was postulated, dipping steeply, probably to the north. The initial drill holes on the section (Nos. 1, 2 and 6) were drilled to the north on the original geologic-dip premise, but the later holes (e.g., Nos. 7 and 8) have all been drilled to the south.

2.—The high-polarization material does not quite outcrop, but still comes within about 25 ft. of the ground surface across a width of about 200 ft., including two or more lenses. This material extends to at least 200 ft. in depth.

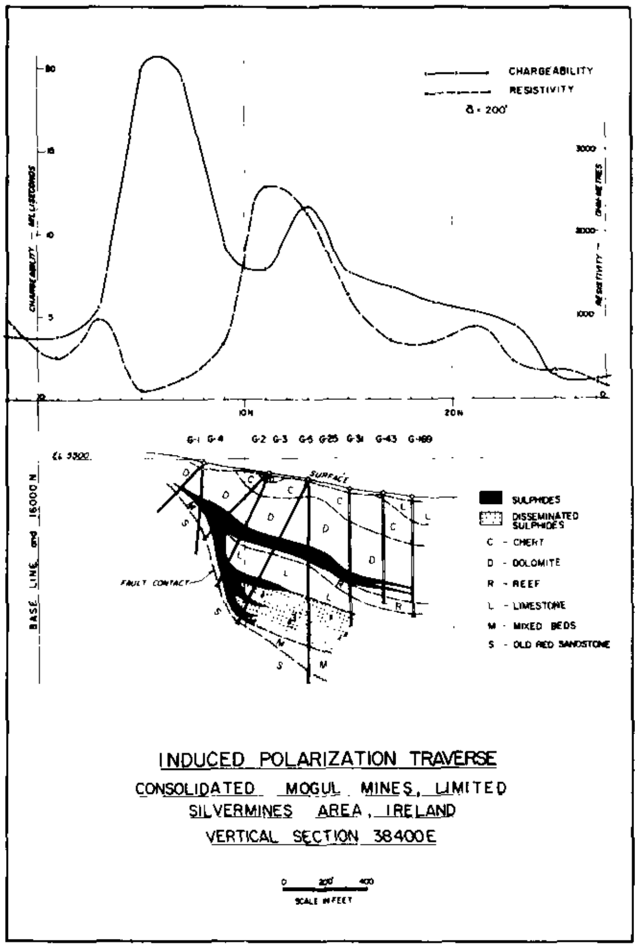
The actual drilling results confirm the presence of a zone of finely disseminated chalcocite and bornite, with very minor chalcopyrite, in dolomitic limestones. The mineralization is somewhat erratically distributed but, in general, increases as one approaches a north-dipping fault, which brings the limestones into contact with the Devonian Old Red sandstones. This fault has been found to strike about N 70°E. Geologically, therefore, this environment is almost identical to that of the Tynagh and Silvermines deposits. The mineralization in the Gortdrum area is quite different, however, both in type and amount. The average grade of the deposit is less than 2 per cent copper, with about 0.65 ounce of silver for each 1 per cent copper (although considerable potential open-pit tonnage may exist), so that the average sulphide content, by volume, is 3 per cent or less. The high chargeability responses observed over this deposit are a remarkable tribute to the sensitivity of the pulse-type induced polarization method, particularly when dealing with truly disseminated-type sulphide mineralization with a small average particle size.

As development drilling is still in progress on this deposit, no over-all grade or tonnage figures have as yet been released.

Keel Deposit

The deposits near Keel and Longford, Co. Longford, occur on a known limestone-sandstone contact, which is, no doubt, one of the reasons why exploration interest was attracted thereto. Soil sampling traverses by Riofinex Ltd., an exploration subsidiary of Rio Tinto-Zinc Corporation, Ltd., established the presence of anomalous lead and zinc concentrations. A horizontal-loop electromagnetic survey was initially executed in another attempt to determine the source of the geochemical indications, but with negative results. This was followed by induced polarization surveys in November and December, 1962. The three-electrode array, with an electrode spacing of 200 ft., was employed on the reconnaissance survey. Anomalous chargeability zones were indicated and exploratory drilling commenced shortly thereafter. Although no publication of results has been made, they are of some potential interest, as drilling has continued, at intervals, to the present time.

Figure 6 shows a typical discovery profile across the main ore zone, on the section 38,400E. The 200-ft. electrode spacing results, both chargeability and resistivity, are shown in profile form. The geologic section, as deduced from nine drill holes, is shown below the geophysical profiles. In a fashion almost identical to that of the Tynagh deposit, the Silvermines orebody is located in gently north-dipping dolomitic limestones adajacent to a fault contact with the Devonian "Old Red" sandstone. The mineralization here is composed of both massive and disseminated sulphides, with the former composed of a high percentage of pyrite. The mineralization is essentially conformable, in two distinct horizons, and is therefore flatly dipping except in the vicinity of the fault, where the dips are much steeper, perhaps due to "drag folding" on the fault.



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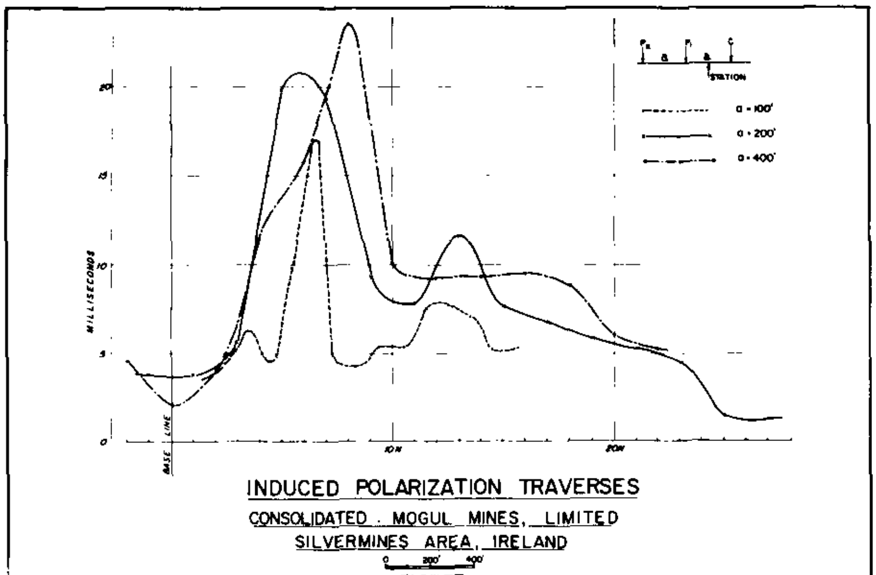

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(*Reprinted from The Canadian Mining and Metallurgical Bulletin, November*, 1965)
Printed in Canada

DOMINION OF CANADA:
PROVINCE OF BRITISH COLUMBIA.
TO WIT:

In the Matter of a geophysical survey on behalf of Cumont Mines Ltd.

I, E. M. Flett for Seigel Associates Limited

of 750 - 890 West Pender St., Vancouver

in the Province of British Columbia, do solemnly declare that an induced polarization survey has been executed on M-39 LEASE AREA claims, Princton, British Columbia between November 10 - 18, 1968. The following expenses were incurred:

(1)	Wages:		
	C. Zogg	9 days @ $35.00/day	$ 315.00
	M. Lengweiler	9 days	
	R. Paradis	9 days	
	S. Rosteski	9 days	
	A. Sehagic	9 days	
		36 days @ $27.50/day	990.00
(2)	Transportation & Shipping		67.32
(3)	Food & Living Expenses		683.37
(4)	Consulting Fees		1,096.81
			$3,152.50

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."

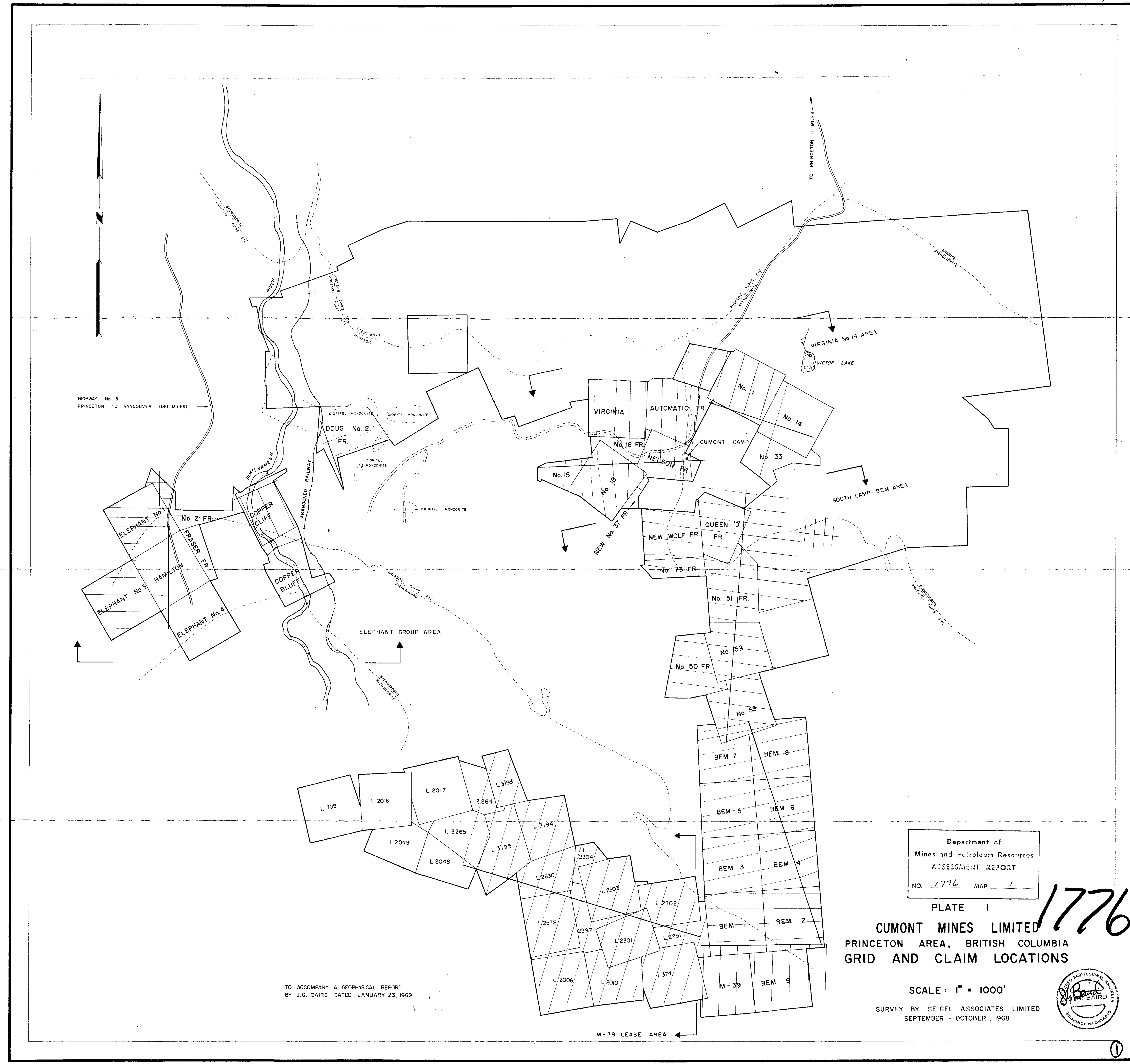
Declared before me at the City of Vancouver, in the Province of British Columbia, this 7th day of March, 1969, A.D.

E M Flett

J. Paul SUB - MINING RECORDER

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

★o



TO PRINCETON 11 MILES
HIGHWAY No. 3
PRINCETON TO VANCOUVER (180 MILES)
SIMILKAMEEN RIVER
ABANDONED RAILWAY
VIRGINIA No. 14 AREA
VICTOR LAKE
VIRGINIA
AUTOMATIC FR.
No. 1
No. 14
CUMONT CAMP
No. 33
No. 18 FR.
NELSON FR.
No. 5
No. 18
NEW No. 37 FR.
SOUTH CAMP - BEM AREA
NEW WOLF FR.
QUEEN 'D' FR.
No. 73 FR.
No. 51 FR.
No. 52
No. 50 FR.
No. 53
DOUG No. 2 FR.
ELEPHANT No. 1
No. 2 FR.
FRASER FR.
HAMILTON
ELEPHANT No. 3
ELEPHANT No. 4
COPPER CLIFF
COPPER BLUFF
ELEPHANT GROUP AREA
DIORITE, MONZONITE
ANDESITE, TUFFS ETC.
SYENODIORITE
GRANITE
SYENOGABBRO
(TERTIARY)
(MESOZOIC)
BEM 7
BEM 8
BEM 5
BEM 6
BEM 3
BEM 4
BEM 1
BEM 2
M-39
BEM 9
L 708
L 2016
L 2017
2264
L 3193
L 2049
L 2265
L 2048
L 3195
L 3194
L 2304
L 2630
L 2303
L 2302
L 2578
L 2292
L 2301
L 2291
L 2006
L 2010
L 374
M-39 LEASE AREA
TO ACCOMPANY A GEOPHYSICAL REPORT
BY J.G. BAIRD DATED JANUARY 23, 1969
Department of
Mines and Petroleum Resources
ASSESSMENT REPORT
NO. 1776 MAP 1
1776
PLATE 1
CUMONT MINES LIMITED
PRINCETON AREA, BRITISH COLUMBIA
GRID AND CLAIM LOCATIONS
SCALE: 1" = 1000'
SURVEY BY SEIGEL ASSOCIATES LIMITED
SEPTEMBER - OCTOBER, 1968
J.G. BAIRD
PROVINCE OF ONTARIO
1

Department of
Mines and Petroleum Resources
ASSESSMENT REPORT
NO. 1776 MAP 2

1776

LEGEND:

SEIGEL MK VI INDUCED POLARIZATION DATA
THREE ELECTRODE ARRAY
ELECTRODE SPACING a = 400'
CHARGEABILITY VALUES SHOWN IN MILLISECONDS

—5— 5, 10, 15 AND 20 MILLISECOND CONTOURS

TO ACCOMPANY A GEOPHYSICAL REPORT
BY J. G. BAIRD DATED JANUARY 23, 1969

PLATE 2
M-39 LEASE AREA

CUMONT MINES LIMITED

PRINCETON AREA, BRITISH COLUMBIA

INDUCED POLARIZATION SURVEY

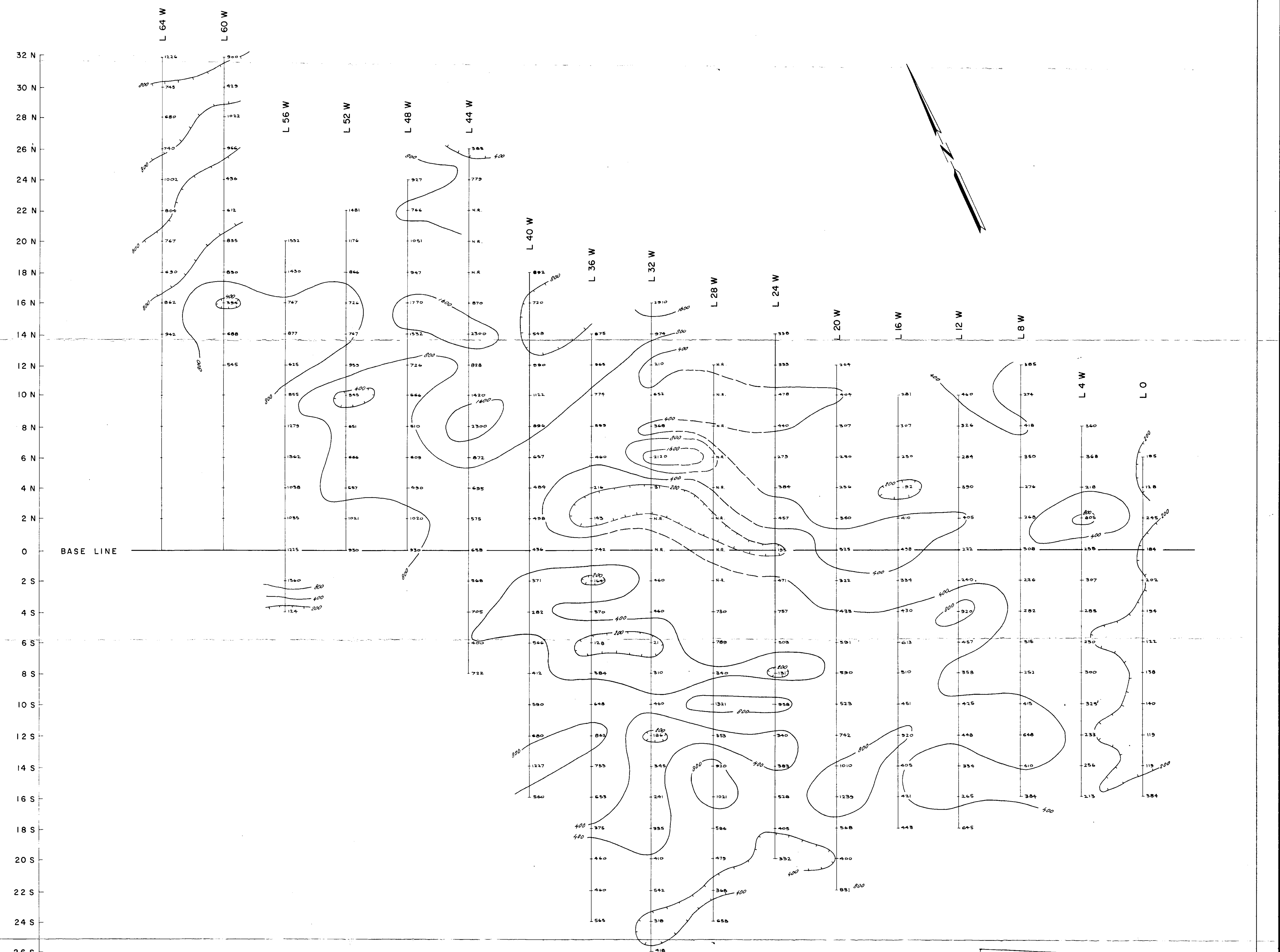
CHARGEABILITY CONTOUR PLAN

SCALE : 1" = 300'

SURVEY BY SEIGEL ASSOCIATES LIMITED
NOVEMBER, 1968

REGISTERED PROFESSIONAL ENGINEER
J. G. BAIRD
PROVINCE OF ONTARIO

2



1776

LEGEND:
SEIGEL MK VI INDUCED POLARIZATION DATA
THREE ELECTRODE ARRAY
ELECTRODE SPACING a = 400'
RESISTIVITY VALUES SHOWN IN OHM - METRES
LOGARITHMIC CONTOUR INTERVAL
—200— 200, 400, 800, 1,600, OHM-METRE CONTOURS

TO ACCOMPANY A GEOPHYSICAL REPORT
BY J. G. BAIRD DATED JANUARY 23, 1969

PLATE 3
M-39 LEASE AREA

CUMONT MINES LIMITED
PRINCETON AREA, BRITISH COLUMBIA

INDUCED POLARIZATION SURVEY
RESISTIVITY CONTOUR PLAN
SCALE : 1" = 300'

SURVEY BY SEIGEL ASSOCIATES LIMITED
NOVEMBER, 1968

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