

3883

1972 Induced Polarization/Resistivity Survey
Report

TITLE Spout Lake Property -
Central Grid of the WC Claims

AUTHORS G.M. Leary, G.M. DePaoli and
J.F. Allan, P.Eng. (B.C.)

DATE July 1972

COMMODITY Cu

LOCATION-Area Lac La Hache
-Mining Division Clinton
-Coordinates Latitude 51°58'N, Longitude 121°22'W
-NTS 92 P/14, 93 A/3

AMAX Vancouver Office

Department of
Mines and Petroleum Resources
ASSESSMENT REPORT
NO. 3883 MAP

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SUMMARY

The "central grid" on the WC claims is located within the Interior Plateau in the southeast side of Spout Lake 14 air-miles north of Lac La Hache, B.C. In 1972, an induced polarization survey totalling $7\frac{1}{2}$ miles was conducted over two of the known copper showings within the grid area.

The property regionally occurs within a belt of Nicola Group rocks intruded by several bodies of diorite to monzonite. The grid area covers a northeasterly dipping sequence of Nicola basalt flows overlain by breccias, tuffs and volcanic sediments. Three skarn-type copper showings occur within the grid area. Showings are characterized by replacement bodies of magnetite-chalcopyrite-pyrite associated with tourmaline, calcite and lime silicate minerals.

INTRODUCTION

The WC claims are located within the Interior Plateau 14 air miles north of Lac La Hache on the northwest and southeast sides of Spout Lake (Figures 1, 2 and 3). Claims are readily accessible by secondary roads. This report covers the results of an induced polarization survey carried out from June 14 to 18, 1972, on parts of the "central grid" lying on the southeast side of Spout Lake. The survey was carried out over known copper showings.

Topography of the "central grid" area consists of a few rounded hills up to 4000 feet altitude separated by low lying relatively-flat ground gently dipping towards Spout Lake to the north at an altitude of 3500 feet. Swamps and marshy ground locally occur in the eastern portion of the grid area mainly adjacent a northerly flowing stream. Vegetation varies from open stands of jackpine on hill tops to small thick jackpine and deciduous trees in low lying areas.

The induced polarization survey is to be applied to one years assessment to each of the following claims (Figure 2).

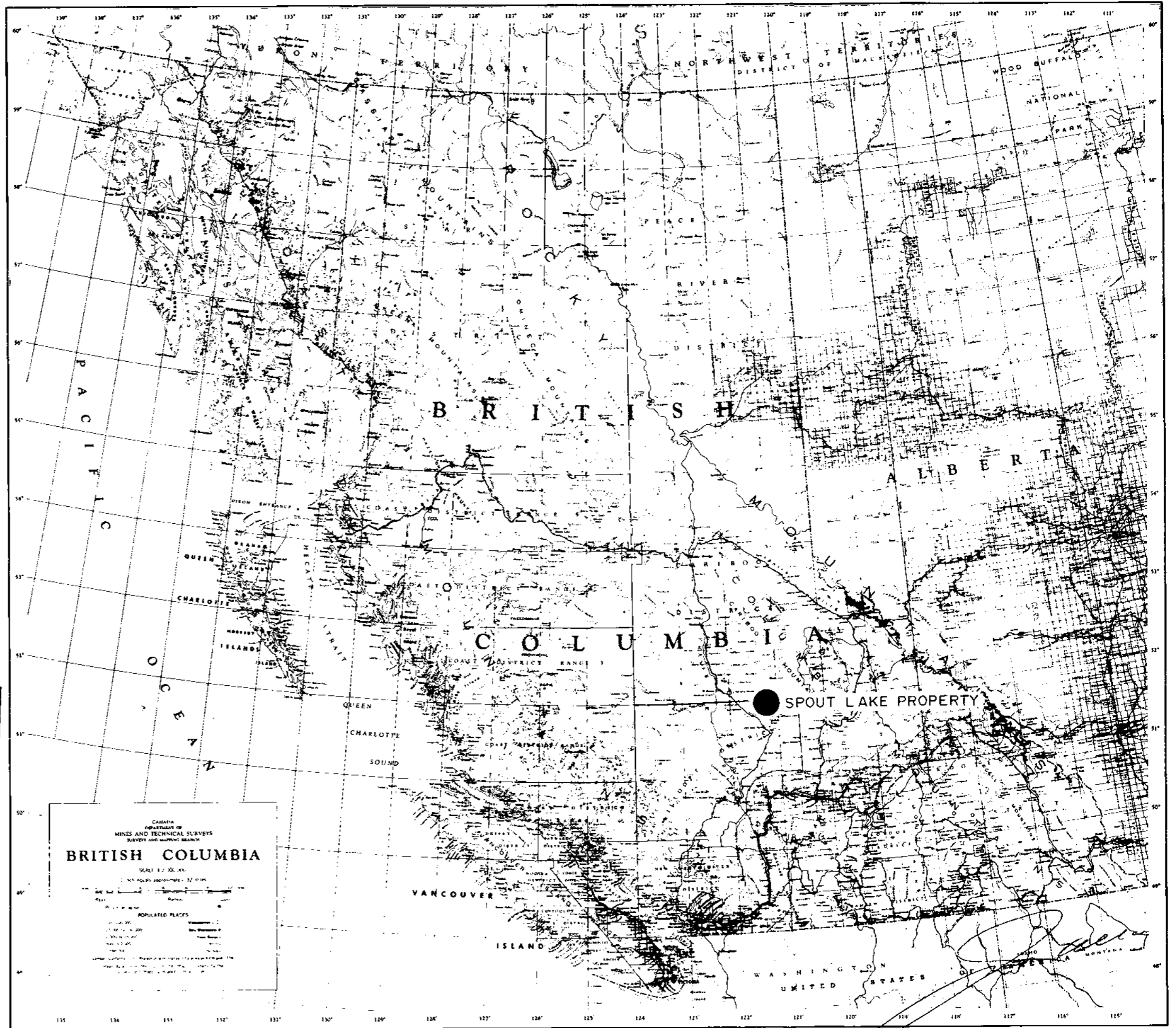
<u>Claim Names</u>	<u>Record Numbers</u>	<u>Anniversary Dates</u>
WC #16-23 incl.	26586-26593 incl.	July 5, 1974
WC #26	26596	July 5, 1974
WC #31-40 incl.	26599-26608 incl.	July 5, 1974
WC #45-52 incl.	26771-26778 incl.	July 22, 1974

PROPERTY GEOLOGY

Property geology is only briefly discussed since it was described in an earlier assessment report (i.e. 1971 Geochemical and Geophysical Report on the Spout Lake Cu property by C.J. Hodgson and G.M. DePaoli).

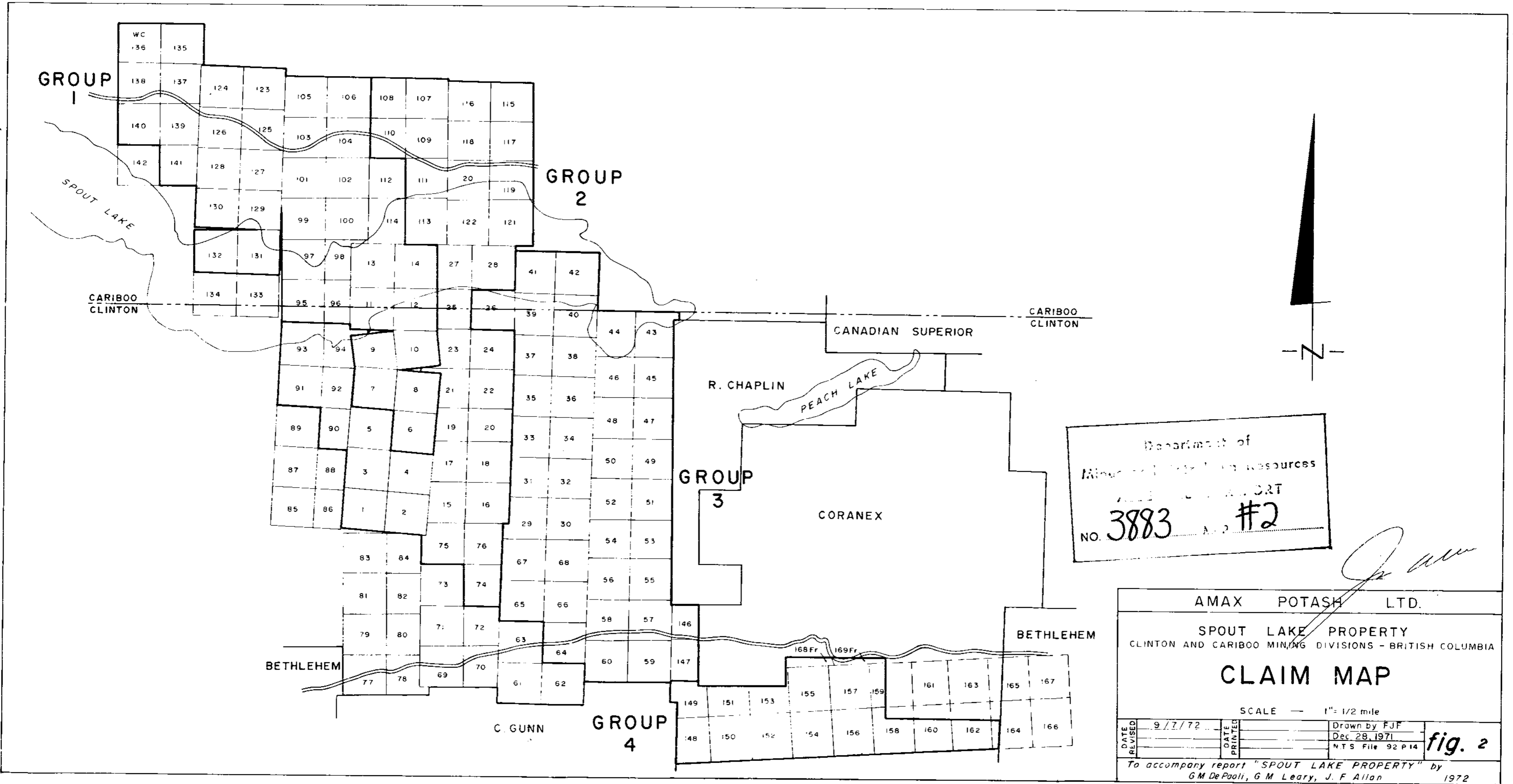
The "central grid" area is underlain by a moderately to steeply northeast-dipping sequence of Nicola rocks comprised of a "lower unit" of augite basalt flows and an "upper unit" of inter-bedded augite basalt flows, volcanic sandstone, greywacke, thinly

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CANADA
 DEPARTMENT OF
 MINES AND TECHNICAL SURVEYS
 SURVEY AND MAPPING BRANCH
BRITISH COLUMBIA
 SCALE 1:50,000
 1 INCH REPRESENTS 1.25 MILES

LOCATION MAP **Figure 1**



GROUP 1

GROUP 2

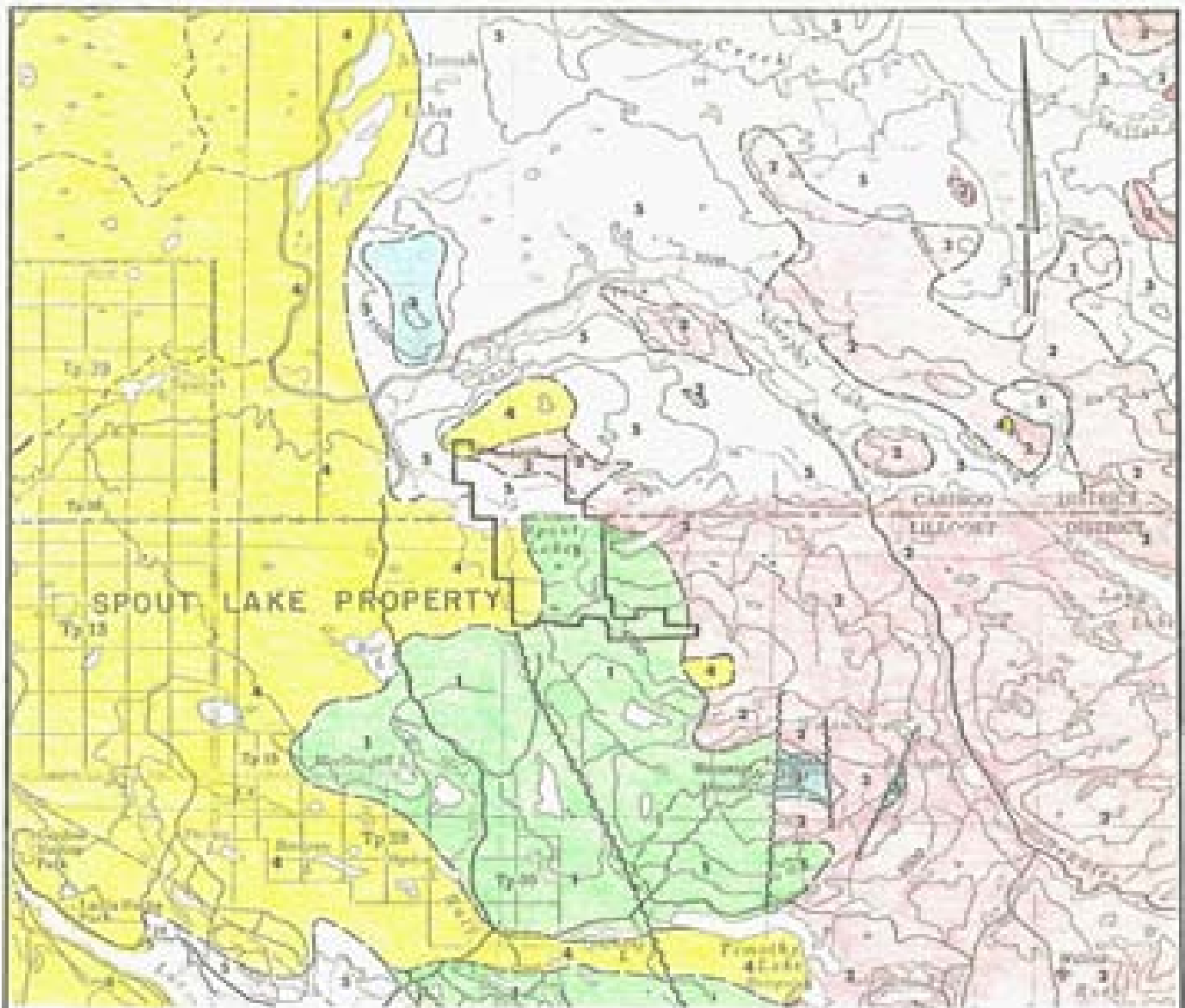
GROUP 3

GROUP 4

Department of
Mineral Resources and Technical Services
REPORT
NO. 3883 #2

AMAX POTASH LTD.
SPOUT LAKE PROPERTY
CLINTON AND CARIBOO MINING DIVISIONS - BRITISH COLUMBIA
CLAIM MAP
SCALE — 1" = 1/2 mile
DATE REVISED 9/7/72
DATE PRINTED Dec 28, 1971
Drawn by FJF
N.T.S. File 92 P 14
To accompany report "SPOUT LAKE PROPERTY" by
G.M. DePaoli, G.M. Leary, J.F. Allan 1972

fig. 2



— L E G E N D —

QUATERNARY

1 Glacial deposits and alluvium.

TERTIARY

4 Plateau basalts.

3 KAMLOOPS GROUP - Basic to acid volcanic rocks.

JURASSIC

2 TANOMKANE BATHOLITH - Basic to acid granitic rocks.

UPPER TRIASSIC - LOWER JURASSIC

1 NICOLA GROUP - Volcanic and sedimentary rocks.

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SPOUT LAKE PROPERTY
WC CLAIMS

CLIXTON AND CARIBOO MINING DIVISIONS - BRITISH COLUMBIA

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REGIONAL GEOLOGICAL MAP

SCALE 1 : 250,000

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bedded argillite and limy argillite, tuffs and breccia.

Three skarn-type copper showings are present within the grid area. They consist of chalcopyrite-magnetite-pyrite mineralized horizons within the "upper unit" or within rocks interbedded with the "lower unit" that are similar to those of the "upper unit". Calcite, tourmaline and several lime silicate minerals are associated with mineralized horizons.

The best showing within the grid area occurs within claims WC #24 and #26. Here, minor sulphides occur throughout a north-south trending zone measuring up to 1000 feet wide and 2200 feet long. Sulphides mainly occur in skarned limy basaltic breccias. Higher grade magnetite-rich beds occur locally within the mineralized zone.

Minor sulphides, including pyrite, pyrrhotite and chalcopyrite with associated magnetite, occur disseminated in thinly bedded argillite and lime silicates over a 400 foot square area within claims WC #48 and #50 in the southeastern portion of the grid.

Also, another small showing of limited extent occurs in skarned limy basaltic breccia in the northwestern portion of the grid on WC #10 and #12.

INDUCED POLARIZATION/RESISTIVITY SURVEY

Introduction and Theory

During the period June 14 to June 18, 1972 approximately 7.5 line miles of induced polarization/resistivity surveying was completed on the "central grid" of the WC claims. The surveyed area encompasses copper showings exposed on claims WC #24 and #26 in the north-central portion of the grid and on WC #48 and #50 to the southeast. The survey was executed by AMAX personnel with G.M. DePaoli operating the receiver. A dipole-dipole configuration was employed utilizing a two hundred foot dipole length and reading only the first separation ($a = 200$ feet, $n = 1$).

The term induced polarization means electrical polarization (i.e. separation of charges) induced by an applied electric field. The cause of this polarization is changes in the mobilities of ions within a rock. At the interfaces between zones of different mobilities, excesses or deficiencies of ions occur; the concentration gradients developed oppose the current flow and cause a polarizing effect. When mineral grains block the pore passages of rocks and a current is applied, a concentration of ions builds up at the electrolyte (water)-metal interface while awaiting an electrochemical reaction which must occur before the electric charge can be transferred from an ion in the electrolyte to a free electron in the metal. This storage of electrochemical energy at an electrolyte-metal interface is the most important cause of induced polarization in rocks.

In the pulse-transient or time domain method that was employed, the interfaces within the rock were polarized by applying a steady direct current. The current was then abruptly terminated and measurement was made of the small decaying voltage caused by the polarized charges returning to equilibrium.

Instrument and Procedure

AMAX's portable induced polarization unit was used for

the survey. The equipment consists of the IPR-7 Newmont-type receiver (15 pounds) and the IPC-7 25 watt battery powered transmitter (13 pounds). The receiving dipole consisted of a 200 foot length of wire connected to porous pots filled with a saturated solution of CuSO_4 . The transmitting dipole employed a 200 foot length of wire connecting four foot stainless steel rock electrodes.

Survey procedure required four men equi-spaced 200 feet apart along the line. The advance man prepared the electrode site for the lead potential electrode by digging a small hole. When moving the array the lead man advanced the potential dipole wire two hundred feet. The second man operated the receiver. He normally situated his electrode in the same site the lead man prepared. Because distance permits, the receiver operator signals moves and transmitter "on" periods by voice. The third man operates the transmitter. He establishes his current electrode and advances the 200 foot current dipole wire. The trailing man prepares the second current electrode site. Using vicegrip pliers the last two "current" men retract the stainless steel rods they have hammered into the ground and re-use them on the next set-up.

Results and Discussion

The chargeability in milliseconds and the resistivity in ohm-meters have been plotted and contoured in plan view as presented on Figures 4 and 5 respectively.

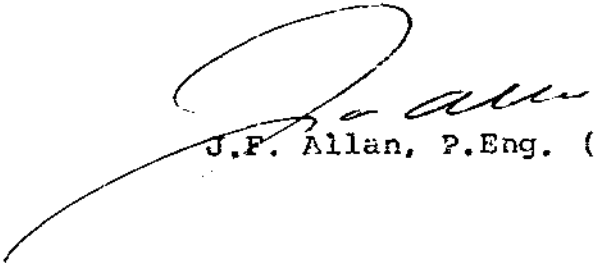
The chargeability map outlines two small polarizable bodies. The northern most body centered around station 8S, 8E, yielding the highest response (42 milliseconds). Picking the 20 millisecond contour as being significant this body has an extension trending southeast. The southern most body is more equi-dimensional in shape and is centered about coordinates 22S, 15E. These chargeability anomalies as defined by the 20 millisecond contour generally indicate $1\frac{1}{2}$ to $2\frac{1}{2}\%$ metallicly polarizable material by volume. Mineralization evident in

outcrop in the vicinity of 50S, 48E did not yield a chargeability response above background.

AMAX Vancouver Office

G.M. Leary

G.M. DePaoli



J.F. Allan, P.Eng. (B.C.)

APPENDIX I - STATEMENT OF COSTS

Claim Name WC #16-23 inclusive	Record Number 26586-26593 inclusive
#26	26596
#31-40 inclusive	26599-26608
#45-52 inclusive	26771-26778

Period of Work June 14 - 18, 1972

Summary of Work Line Refurbishing - 8.8 line miles
 Induced Polarization Survey - 7.5 line miles

Personnel and Salaries

G.M. Leary, M.Sc.Geologist I/C, 601-535 Thurlow Street, Vancouver, B.C.	
2 days @ \$54.36/day	\$ 108.72
G.M. DePaoli, B.Sc.Geophysicist, 601-535 Thurlow St., Vancouver, B.C.	
5 days @ \$51.21/day	256.05
M.J. Meneghetti, Jr.Assistant, 247 West 2nd, North Vancouver, B.C.	
5 days @ \$15.60/day	78.00
G.C. Stock, Jr.Assistant, 1725 W 16th, Vancouver, B.C.	
5 days @ \$22.53/day	112.65
E.A. Antoniuk, Jr.Assistant, 6311 Denhigh Ave., S.Burnaby, B.C.	
5 days @ \$30.00/day	150.00

<u>Packsack Drilling</u> (7/8" diameter core)	
36 feet @ \$7.50/day	270.00

<u>Line Refurbishing</u>	
8.8 miles @ \$170.00/line mile	1,496.00

<u>Board</u> - 22 man days @ \$10.00/day	220.00
------------------------------------------	--------

<u>Vehicle</u> - 5 days @ \$20.00/day	100.00
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<u>Report Preparation and Drafting</u>	<u>200.00</u>
----------------------------------------	---------------

\$2,991.42

This work is to be applied for one year on

WC #16-23 inclusive
WC #26
WC #31-40 inclusive
WC #45-52 inclusive



Declared before me at the *City*
Vancouver, in the
Province of British Columbia, this *4*
day of *August* 1972, A.D.

Ed K Boyd

Jill Turan

A Commissioner for Taking Affidavits within British Columbia
A Notary Public in and for the Province of British Columbia.
Subjuring Recorder.

S P O U T L A K E
(Elev. 3535')



S Y M B O L S

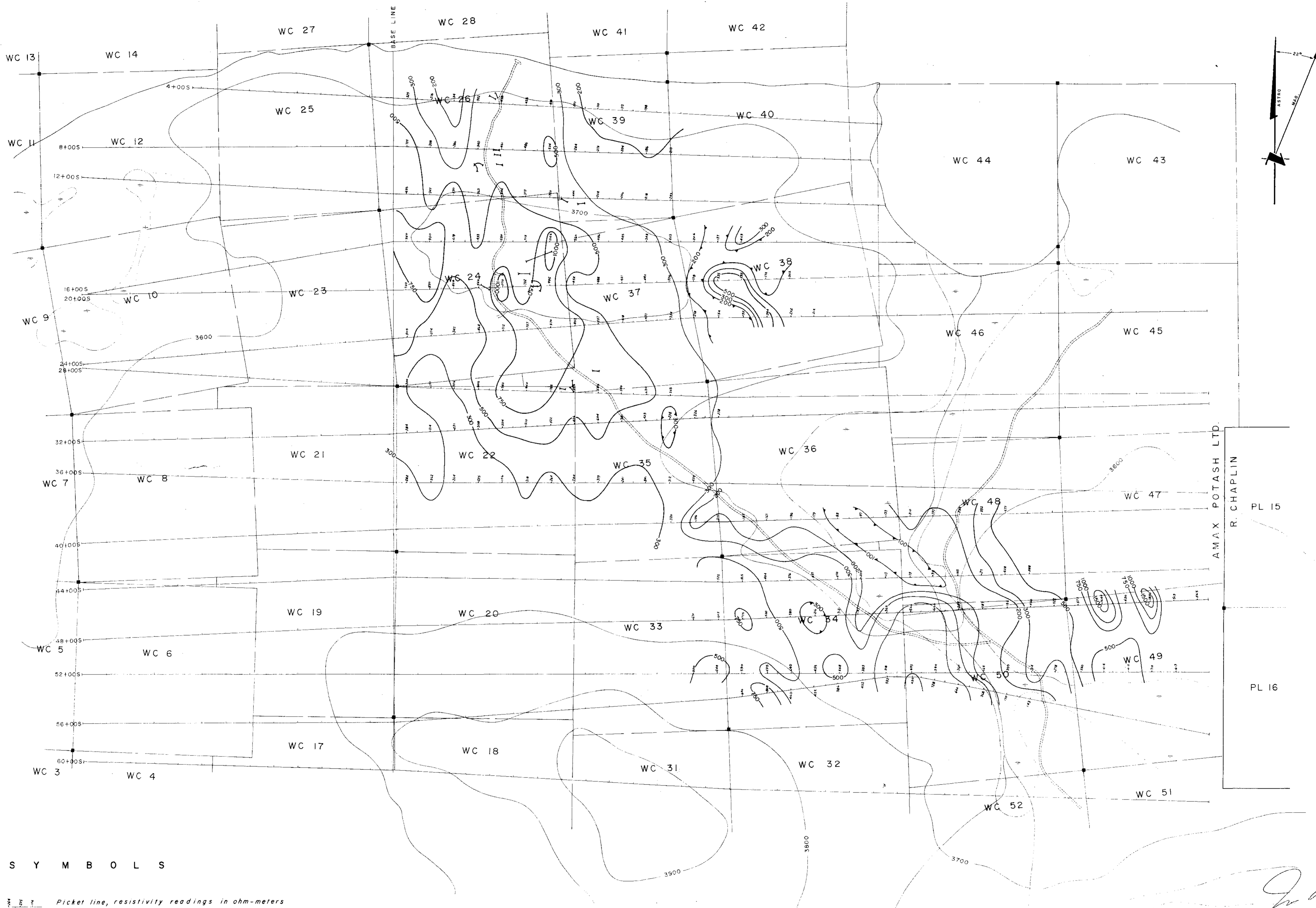
- Picket line, chargeability readings in milliseconds.
- Claim post, claim location line
- Claim boundary line.
- Road.
- Stream.
- Swamp, swamp boundary.
- Topographic contour, contour interval 100'.

RECEIVER I.P.R. - 7
 TRANSMITTER 25 Watt
 ARRAY Dipole - Dipole a = 200' n = 1
 OPERATOR G.M. De Paoli
 DATE June 1972
 CONTOUR INTERVAL 5 Milliseconds.

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AMAX POTASH LIMITED		SPOUT LAKE PROPERTY	
CENTRAL GRID		CLINTON MINING DIVISION — BRITISH COLUMBIA	
INDUCED POLARIZATION SURVEY CHARGEABILITY MAP			
SCALE 1" = 400'			
DATE	REVISED	DATE	REVISED
		Drawn by:	
		Date	
		N.T.S. File	
		92 P 14	
			FIG. 4
To accompany report "SPOUT LAKE PROPERTY" by G.M. De Paoli, G.M. Leary, J.F. Allan. 1972			

SPOUT LAKE
(Elev. 3535')



S Y M B O L S

- Picket line, resistivity readings in ohm-meters
- Claim post, claim location line
- Claim boundary line
- Road
- Stream
- Swamp, swamp boundary
- Topographic contour, contour interval 100'

RECEIVER I.P.R. - 7
 TRANSMITTER 25 Watt
 ARRAY Dipole - Dipole a = 200' n = 1
 OPERATOR G.M. De Paoli
 DATE June 1972
 CONTOUR INTERVAL Semilogarithmic in ohm-meters (1, 2, 3, 5, 7.5, 10, 15, 20)

Department of
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 ACCESSORY REPORT
 3883 MAP #5

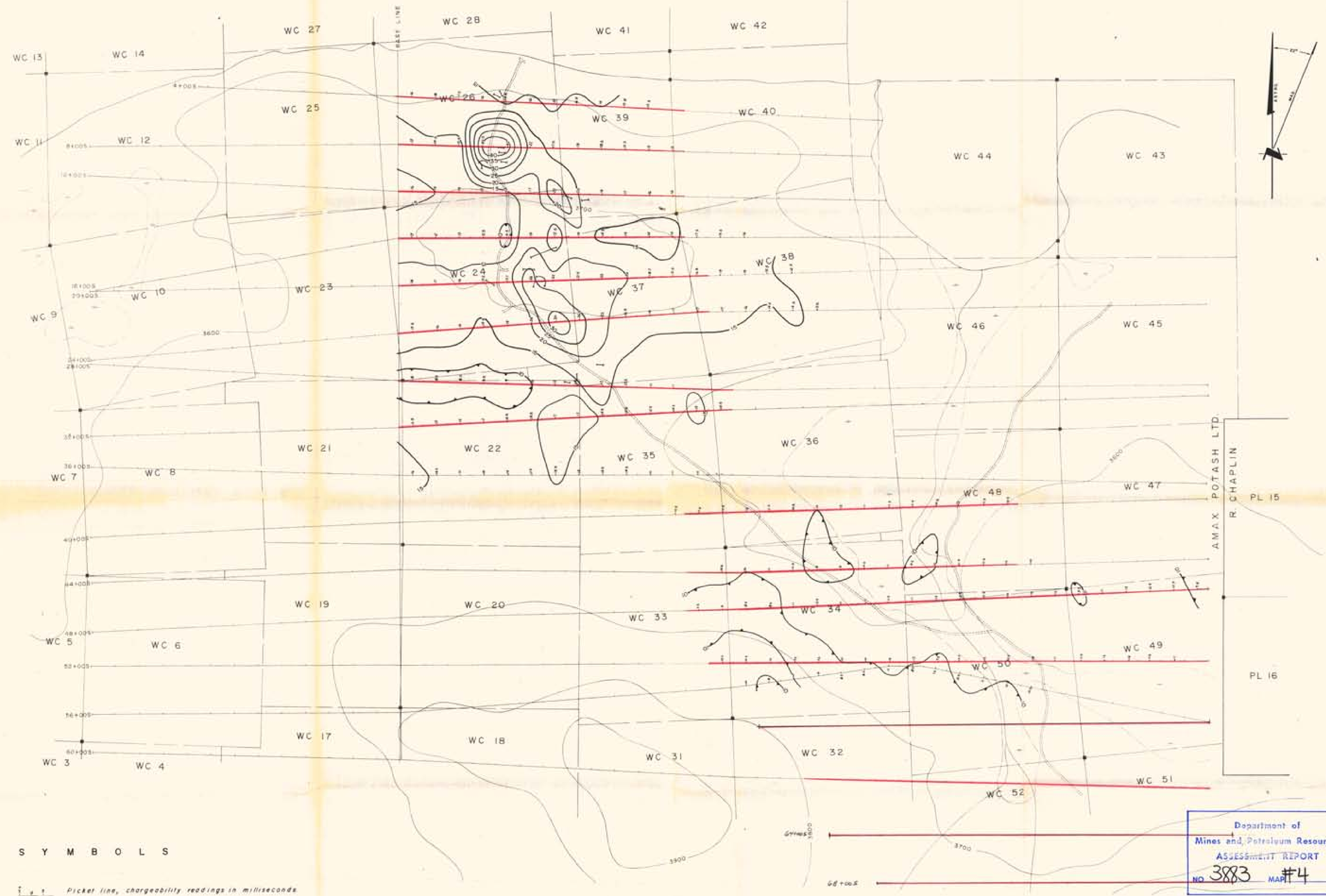
AMAX POTASH LIMITED
 SPOUT LAKE PROPERTY
 CENTRAL GRID
 CLINTON MINING DIVISION - BRITISH COLUMBIA
INDUCED POLARIZATION SURVEY
RESISTIVITY MAP
 SCALE 1" = 400'

DATE	DRAWN BY	FIG. 5
REVISED	DATE	
PRINTED	N.T.S. File	
	92 P. 14	

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AMAX POTASH LTD.
 R. CHAPLIN
 PL 15
 PL 16

SPOUT LAKE
(Elev. 3535')



S Y M B O L S

- Picket line, chargeability readings in milliseconds
- Claim post, claim location line
- Claim boundary line
- Road
- Stream
- Swamp, swamp boundary
- Topographic contour, contour interval 100'
- Refurbished Picket Line

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RECEIVER L.P.R. - 2
 TRANSMITTER 25 Watt
 ARRAY Dipole - Dipole Q = 200' A = 1
 OPERATOR G.M. De Paoli
 DATE June 1972
 CONTOUR INTERVAL 5 Milliseconds

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AMAX POTASH LIMITED
 SPOUT LAKE PROPERTY
 CENTRAL GRID
 CLINTON MINING DIVISION BRITISH COLUMBIA
 INDUCED POLARIZATION SURVEY
 CHARGEABILITY MAP
 SCALE 1" = 400'

DATE REVISED	DATE PRINTED	Drawn by	FIG. 4
		N.T.S. File	

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