6336

GEOPHYSICAL REPORT

of the

INDUCED POLARIZATION SURVEY

on the

B.T.U. MINERAL CLAIMS

PRINCETON, B.C. AREA

SIMILKAMEEN MINING DIVISION

Longitude: 120°27'W Latitude: 49°30'N

N.T.S. 92H-8

on behalf of

QUINTANA MINERALS CORPORATION

CLAIM NAME	RECORD NO.	ANNIVERSARY
BTU 1	67	June 23
BTU 2	79	July 6
BTU 3	80	July 6
BTU 4	81	July 6
BTU 5	82	July 6
BTU 6	183	December 10
BTU 7	184	December 10

by:

P.P. NIELSEN, B.Sc., GEOPHYSICIST

NIELSEN GEOPHYSICS LTD.

VERNON, B.C.

July, 1977

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INTRODUCTION

During the period from April 29 to May 17, 1977 a grid was installed and a dipole-dipole induced polarization survey was carried out over the B.T.U. claims group near Princeton, B.C. The work was done on behalf of Quintana Minerals Corporation Ltd. by Nielsen Geophysics Ltd.

The purpose of the survey was to explore for copper sulphides in an area of few outcrops but thought to be underlain by favourable rock types and structures as observed elsewhere in the area. A total of 10.75 line-kms. of grid was installed and the I.P. survey totalled 9.15 line-kms. (first to last reading).

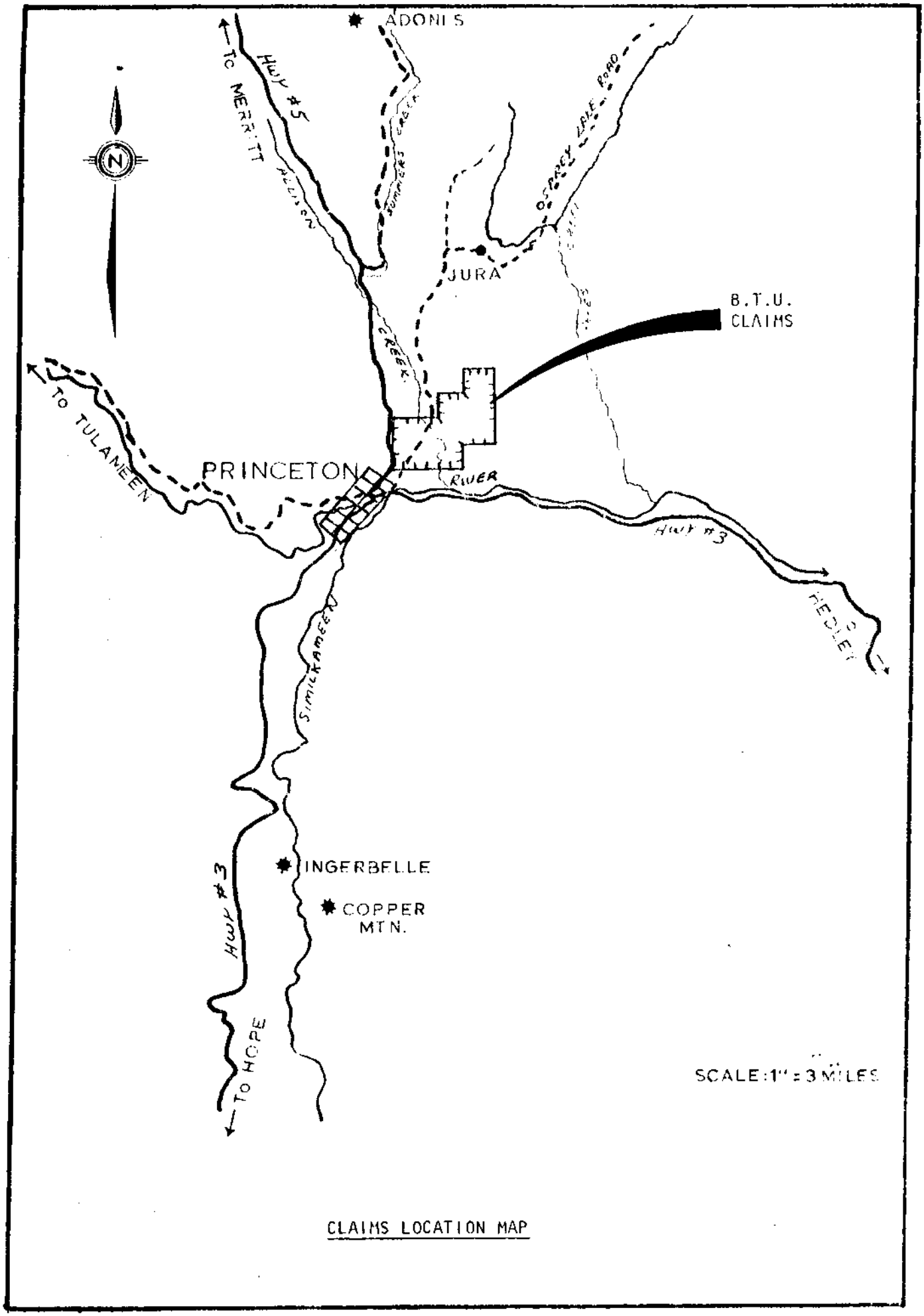
LOCATION AND ACCESS

The survey area is located 2 miles NE of the town of Princeton, B.C. which is 180 miles east of Vancouver, B.C. Access is North from Princeton on Highway #5 (to Merritt) for ½ mile and then northeasterly on the Osprey Lake Road for a distance of about one mile and then east on a gravel road after crossing Allison Creek and unto the property. The main elevation of the Survey area is 3000 feet A.S.L. whereas Princeton is at about 2200 feet A.S.L.

Local access on the property is good due to a number of dirt roads and because most of the grid area occurs on a relatively flat, grassy bench.

PROPERTY LOCATION MAP

SCALE: 1"= 100 miles



CLAIMS LOCATION MAP

GENERAL GEOLOGY (after G.S.C. Memoir 243 by H.M.A. Rice)

The area is mapped underlain by the Nicola Group volcanics cut by the Coast Range intrusions (granodiorite, diorite, granite, and gabbro). Part of the B.T.U. claims area is covered by tertiary sedimentary rocks (Princeton group) and possibly overlain or underlain comformably by tertiary basalts.

The NW edge of the survey grid is bounded by the northeast striking "Deer Valley Fault" believed to be down faulted to the northwest. The Southwest extent of the grid occurs at the NW trending strike-slip fault called the "Mount Miner Fault". Old trenching in this area revealed considerable pyrite mineralization. Other minerals known to occur in the immediate area are chalcopyrite, bornite, chalcocite, cuprite, coal and bentonite.

CLAIMS

The property consists of the B.T.U. claims totalling 44 units. The owner of the claims is Mr. CORBIN J. ROBERTSON of Tucson, Arizona, U.S.A. F.M.C. #152742 issued NOVEMBER 18, 1976

CLAIM NAME	NO. OF UNITS	RECORD NO.	ANNIVERSARY
B.T.U. 1	9	67	June 23
B.T.U. 2	2	79	July 6
B.T.U. 3	9	80	July 6
B.T.U. 4	6	81	July 6
B.T.U. 5	6	82	July 6
B.T.U. 6	6	183	December 10
B.T.U. 7	6	184	December 10

GRID INSTALLATION

Survey grid lines were installed using the chain and compass method with marked flagging used as stations at 50 meter intervals. Survey stakes were driven into the gound at 200 meter intervals.

A 1600 meter baseline was installed on a bearing of 115° thru the center of the area to be surveyed. Nine cross-lines spaced 200 meters apart were turned off normal to the baseline, each line averaging 1000 meters in length.

Due to the lack of vegetation and because the area used as grazing land for cattle, surface disturbance was kept to a minimum. It was felt that the survey stakes set at an interval of 200 meters would serve to relocate the grid at a later date, if necessary.

THE INDUCED POLARIZATION SURVEY

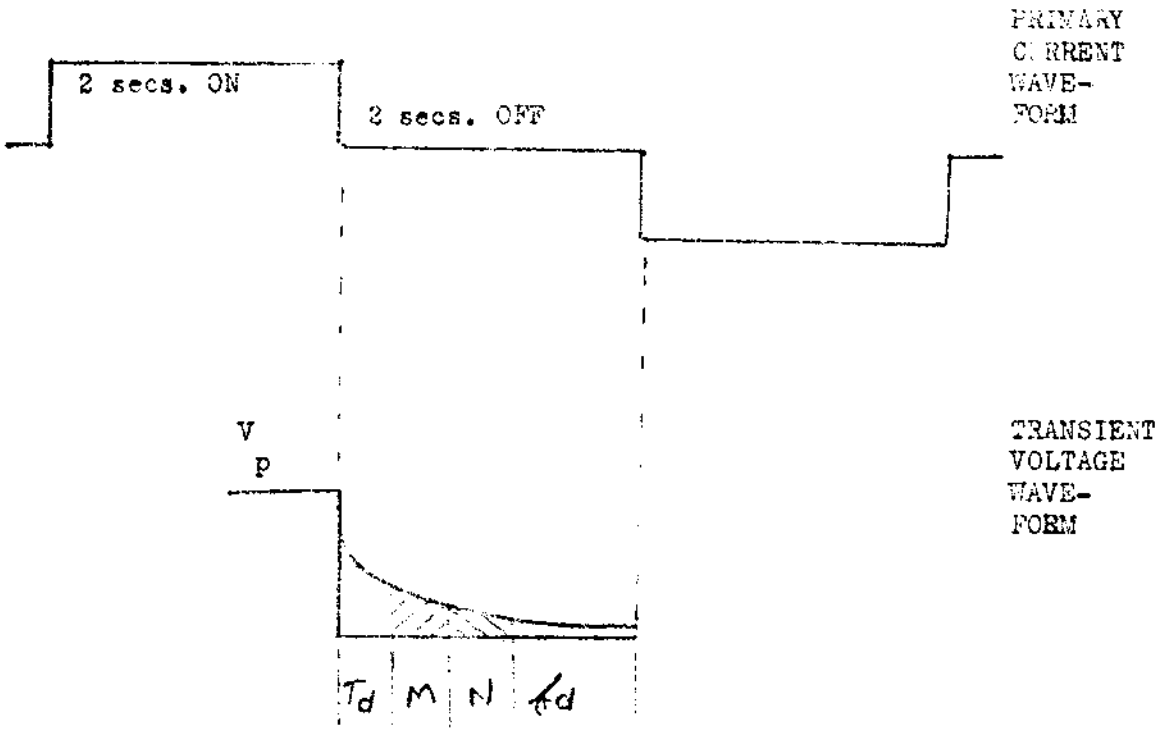
Theory of Method Used

Induced Polarization refers to the polarized distribution of electrical charges throughout a medium to which an electric field has been applied.

When current is passed across an interface between an electrolyte and a metallic conducting body, double layers of charge build up at the interface creating the phenomeum known as "overvoltage" or the "I.P. effect".

This effect can be used for the detection of conducting metallic material such as disseminated sulphides ("porphyry" copper deposits) or massive sulphides containing appreciable amounts of non-conducting sphalerite. Other materials likely to give rise to anomalous responses are pyrite, magnetite, specular hematite, graphite and certain clay-micas such as montmorillonite, vermiculite, saponite and bentonite.

In time-domain (Pulse) I.P., a transmitter injects an alternating square wave signal into the ground at two electrodes C_1 and C_2. The signal seen by the receiver at two other electrodes P_1 and P_2 provides an indication of the apparent chargeability (M_a). By observing the input current (I_g) and primary "on-time" voltage, (V_p) the apparent resistivity (ρ) is calculated using Ohm's Law and a geometric factor dependent upon the electrode array used and the units (ohm-meters or ohm-feet) desired.

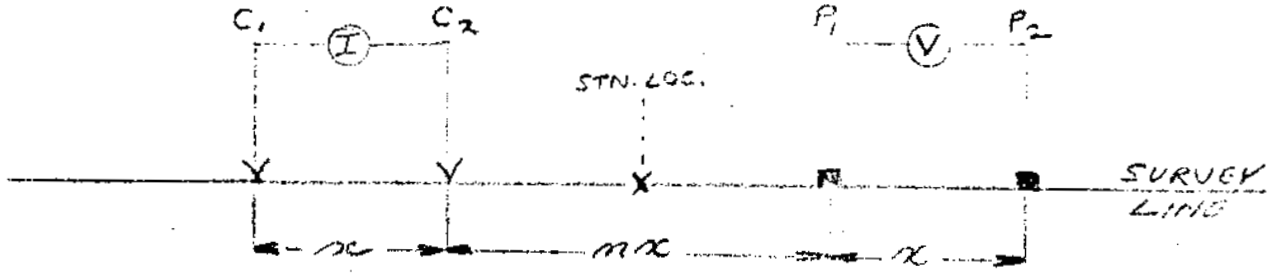


The polarization voltages established during the current "on" time decay (discharge) slowly during the current "off" time. The receiver amplifies and integrates the decay curve at two positions in time, normalizes these amplitudes with respect to the primary voltage Vp and presents the results as M and N chargeability (in msecs.) on a meter.

Theory of the Dipole - Dipole Array

The I.P. response due to a particular distribution of polarizable material is dependent upon the electrode array employed, the geometry of the polarized body and its location relative to the array, and on the resistivity and polarization contrast between the body and surrounding environment.

The dipole-dipole array was chosen primarily because of logistics considerations in that a portable transmitter was used. In addition, this array yields symmetrical anomalies, the station being read is located at the center of the array, and inductive coupling is minimal.



The dipole-dipole configuration is illustrated above. The current is applied at two points C_1 and C_2 a distance (x)meters apart and the potential is measured at P_1 and P_2 also (x)meters apart and colinear to the current electrodes. The distance between the nearest current and potential electrodes is (nx) where n is a variable integer. For this survey x = 50 meters and n = 2. Therefore, nx = 100 meters.

The choice of line spacing and electrode array parameters is determined by the presumed size, shape and depth of the body sought.

Instrument Specifications

(a) Receiver:

The Crone (Newmont designed) Pulse Type N-IV I.P. Receiver is a portable, remote-sensing, crystal-timed receiver incorporating the following features;

----- Automatic time lock to ground signal

----- Temperature range $-30^{o}C$ to $+ 55^{o}C$.

----- Direct readout of chargeability(M + N) values in msecs.

----- Manual and automatic S.P. buckout.

----- Automatic sampling of 3 cycles and readings stored.

Specifications:

----- Vp range	-	.0005 - 60 volts $\pm$ 5% accuracy.
----- Sp range	-	0 - 1 volt digital callbrated readout and 0 - 2 volts uncalibrated.
----- Dimensions	-	20 x 11 x 31 cm.
----- Weight	-	4.5 Kg.
----- Timing	-	Cycle Period Tc = 8 secs.
		Time on(T_{on})and Time off(T_{off})= 2 secs.
		Delay time T_d = 450 msecs.
		Period of M T_M = 450 msecs.
		Period of N T_N = 450 msecs.
		Final time T_f = 650 msecs.

(b) Transmitter:

The Huntec LOPO M-3 is a portable, pulse-type transmitter.

Some features of this unit are:

----- operates from rechargeable batteries.

----- automatic output current regulation.

----- adjustable timing cycle (internal crystal clock).

----- Instrument and battery pack can be carried by one person.

Specifications:

-----	Max Current	-	1.5 amps D.C.
-----	Max Voltage	-	1800 V.D.C.
-----	Max Power	-	160 Watts D.C.
-----	Cycle Times	-	2, 4, 8, or 16 secs.
-----	Duty Ratio	-	1:1, 1.28:1, 1.67:1, 2.2:1
-----	Battery Pack	-	24 to 36 volts D.C.
-----	Operating Temperature Range	-	$-35^{o}C$ to $50^{o}C$.
-----	Dimensions: Transmitter	-	37 x 15.2 x 22.5 cm.
	Battery Pack	-	37 x 22.5 x 14.7 cm.
-----	Weight	-	8.4 Kg. (with batteries - 20.7 Kg.)

Data Treatment:

(a) Calculations: The apparent chargeability (Ma) is determined by directly reading from the face of the meter on the receiver. The apparent resistivity (ρ_a) is calculated from the formula: $\rho_a = K \frac{Vp}{Ig}$

where K = geometrical constant for array used

In this case,
$K = \pi (\frac{a^3}{X^2} - a)$ where $a = x(n + 1)$
$= 50(2 + 1)$
$= 150$ meters

Therefore $K = (\frac{150^3}{50^2} - 150)$
$= 3770$ meters

(b) Presentation: Due to the reconnaissance nature of the survey, the readings Ma and ρ_a are plotted and contoured in plan only at a scale of 1 inch = 100 meters. The contour interval of the Ma map is 1 msec. That of the ρ_a map is Logarithmic. Lows and highs are distinguised by "ticks" and "hachures" respectively.

DISCUSSION OF RESULTS AND INTERPRETATION

A. Chargeability Map:

The apparent chargeability values (Ma) vary from 1.0 msecs. at many stations to a single value high of 8.0 msecs. at L 4N; Stn.2 + 00E. Background is istimated to be 4.0 msecs. That is, areas above that value could be underlain by metallically conducting sulphides.

Due to the known occurence of pyrite in the southerly end of the present I.P. grid it is extremely doubtful if these chargeability values of up to only 8.0 msecs. could be related to economic sulphides. Even a background of 3 msecs, the single peak value represents less than 0.5% total metallically conducting sulphides by volume.

A low Ma linear interpreted as a fault but possibly due only to increased overburden thickness is observed striking northerly from the east end of Line 0 through L 16S; Stn, 1 + 25W. A local E-W discontinuity is also observed from the Ma contours running a short distance westerly from the pond at the east end of L 6N.

B. Resistivity Map:

The apparent resistivity values (ρ_a) range from 20 ohm. meters at L 14N; Stn.7 + 00W to 2976 ohm. meters at L 0; Stn. 0 + 50E. The variations in ρ_a appear to be mainly due to water content of the sub-surface except possibly in the southeast quadrant of the grid where the lower values appear to be, at least in part, due to a sub-anomalous sulphide content in the underlying rocks.

The areas coincident with resistivities above 800 ohm. meters (shown hachured) are outcropping greenstones where readings were difficult to obtain due to poor (high) contact resistances at the electrodes.

The long low resisivity gradient along the western edge of the grid conforms with a steep slope with the "Deer valley fault" occuring just to the west. The 200 ohm. meter contour here (from L 2N to L 16N) roughly coincides with the top break in slope.

Had the chargeability values been somewhat higher, a useful exercise would be to calculate and plot the static capacitance (called "normalized I.P." or" metal factor" by others) which is simply obtained by dividing the Ma value by ρ_a and multiplying by a suitable constant. This method might then have been of assistance in directing further exploration such as trenching and/or drilling as there does appear to be an inverse relationship between Ma and ρ_a in the area of higher chargealiities.

CONCLUSIONS AND RECOMMENDATIONS

The Induced Polarization survey has effectively searched for metallically conducting sulphides to a depth of 75 meters. The line spacing and station interval were such that no economic sulphide deposit likely to occur in this enviroment could be missed down to this depth.

Due to known pyrite in the vicinity of the highest Ma's encountered and because these chargeabilities were spot highs and, at most, only two times estimated background it is highly unlikely that an economic sulphide deposit exists within the confines of the survey area to a depth of 100 meters.

It is therefore recommended that no further work be carried out within the present survey area.

Respectfully submitted,

P.P. Nielsen

P.P. Nielsen, B.Sc., Geophysicist

PERSONNEL

P.P. Nielsen	-	Geophysicist, transmitter operator and report author.
G. Shore	-	Receiver operator and data compiler.
A. Bay	-	Linecutter and I.P. survey stake-man.
L. Libeortore	-	Linecutter and I,P. survey stake-man.

STATEMENT OF COSTS

The following are the charges of Nielsen Geophysics to carry out the work described in this report.

1.	Grid Installation:	6.6 miles @ $60/mile	$ 396.00
2.	I.P. Survey:	6.3 miles @ $540/mile	3,402.00
3.	Report and Administration:		635.00
		TOTAL	$4,433.00

STATEMENT OF AUTHOR'S QUALIFICATIONS

I DO HEREBY STATE:

1. I am the author of this report and carried out the work described herein.

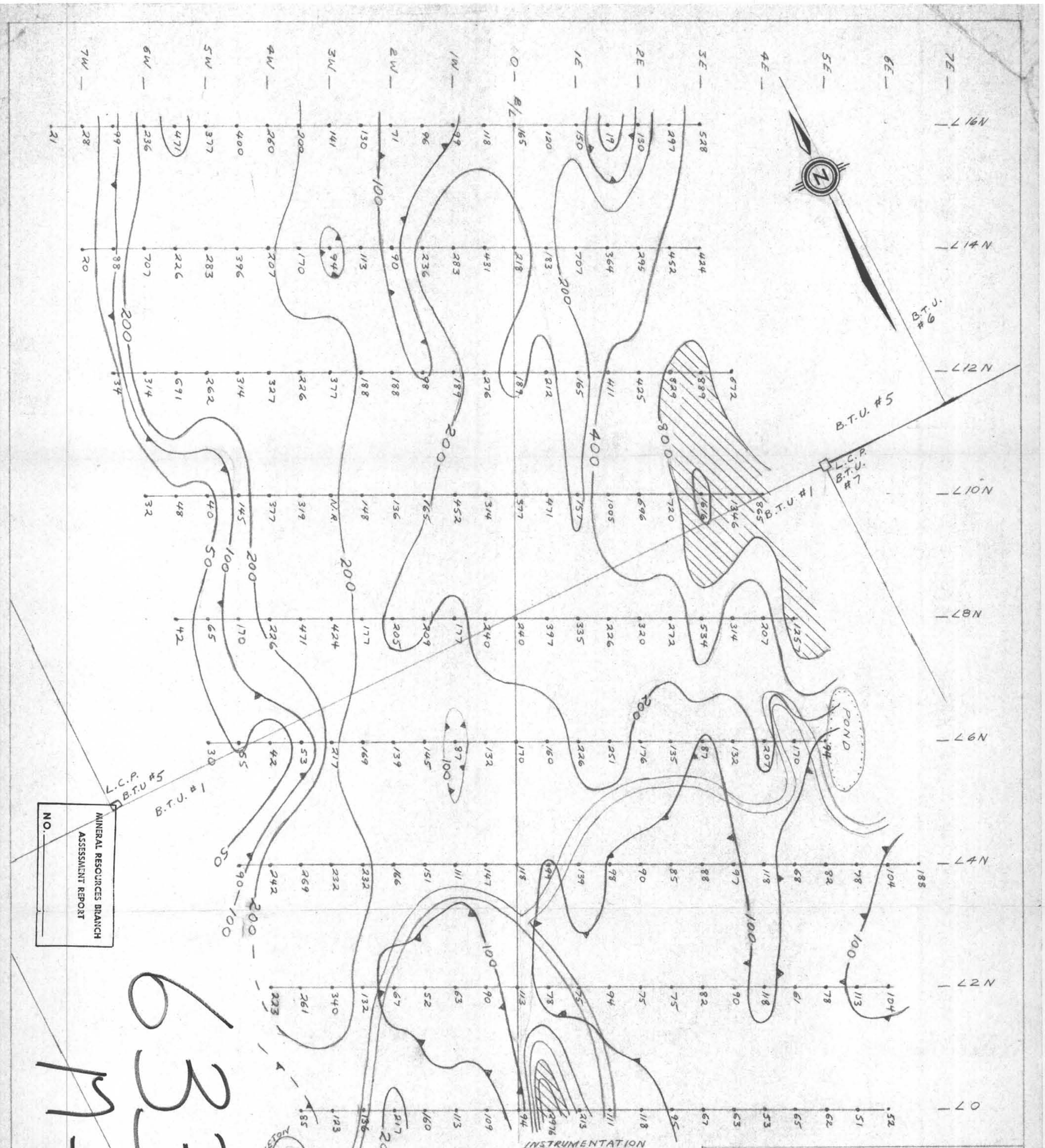
2. I have been actively and responsibly involved in all aspects of mining geophysics in Canada, the United States, Africa and Australia over the past 12 years.

3. I graduated with a B.Sc. degree in Geophysics from the University of B.C. in 1969.

4. I am President of Nielsen Geophysics Ltd. with business address at #205 - 2910-30th Avenue, Vernon, B.C. V1t 2B7

5. I am a member of the S.E.G., CIMM and the B.C.G.S.

K.P. Nielsen
July 20/77.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1W
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4W
5W
6W
7W
L16N
L14N
L12N
L10N
L8N
L6N
L4N
L2N
L0
B/L
N
B.T.U. #5
L.C.P. B.T.U. #7
B.T.U #1
POND
TO PRINCETON
L.C.P. B.T.U #5
B.T.U. #1
MINERAL RESOURCES BRANCH
ASSESSMENT REPORT
NO.
INSTRUMENTATION
CRONE N-IV R_x
HUNTEC LOPO T_x
2 SECS ON – 2 SECS. OFF
R_x DELAY (T_d) = 450 msecs.
R_x INTEGRATE PERIOD = 450 msecs.
NOTE
VALUES IN OHM-METERS
LOGARITHMIC CONTOUR INTERVAL
C_2 C_1 P_1 P_2
STN.
x = 50m
n = 2
DIPOLE – DIPOLE ARRAY
QUINTANA MINERALS CORP.
B.T.U. CLAIMS
PRINCETON, B.C.
INDUCED POLARIZATION SURVEY
APPARENT RESISTIVITY
VALUES & CONTOUR MAP
SIMILKAMEEN M.D.
N.T.S.:- 92H/8
NIELSEN GEOPHYSICS LTD
VERNON, B.C.
100 50 0 100 200
JULY '77
SCALE IN METERS
By:- P.P.N.

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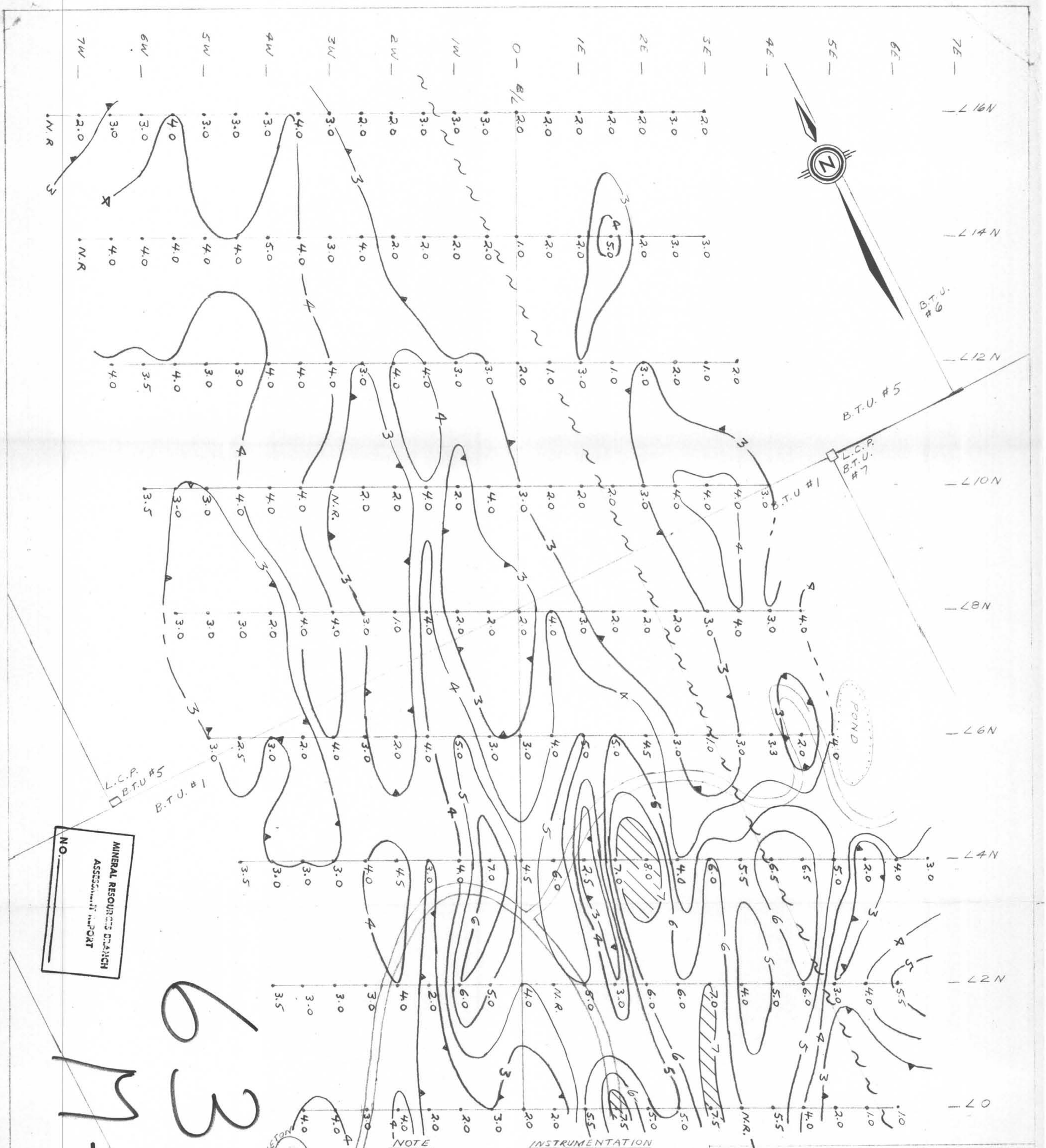
92H-1



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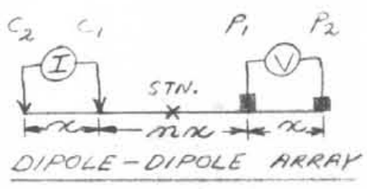
NOTE

VALUES IN MILLISECS.
CONTOUR INTERVAL IS
1 msecs ABOVE 3 msecs

INSTRUMENTATION

CRONE N-IV R_x
HUNTEC LOPO T_x
2 SECS ON – 2 SECS OFF
R_x DELAY (T_d) = 450 msecs.
R_x INTEGRATE PERIOD = 450 msecs.



x = 50 m
n = 2

QUINTANA MINERALS CORP.

B.T.U. CLAIMS
PRINCETON, B.C.

INDUCED POLARIZATION SURVEY
APPARENT CHARGEABILITY
VALUES & CONTOUR MAP

SIMILKAMEEN M.D. P.R. Nielsen N.T.S.:- 92H/8

NIELSEN GEOPHYSICS LTD
VERNON, B.C.

100 50 0 100 200
SCALE IN METERS

JULY '77 BY:- P.R.N.

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