3764

92I/7E

GEOPHYSICAL REPORT
ON AN
INDUCED POLARIZATION SURVEY
on behalf of
HIGHHAWK MINES LTD. (N.P.L.)
and
CONSOLIDATED STANDARD MINES LTD. (N.P.L.)

JIG and GJ mineral claims 22 miles southwest of
Kamloops, Homfray Lake area, Kamloops
Mining Division, B.C.
Lat. 50°27'N Long. 120°43'W N.T.S. 92I/7

AUTHOR: Glen E. White B.Sc. Geophysicist
P. ENG: W. G. Stevenson
DATE OF WORK: June 17 - July 4, 1972
DATE OF REPORT: July 21, 1972

Department of
Mines and Petroleum Resources
ASSESSMENT REPORT
NO. 3764 MAP

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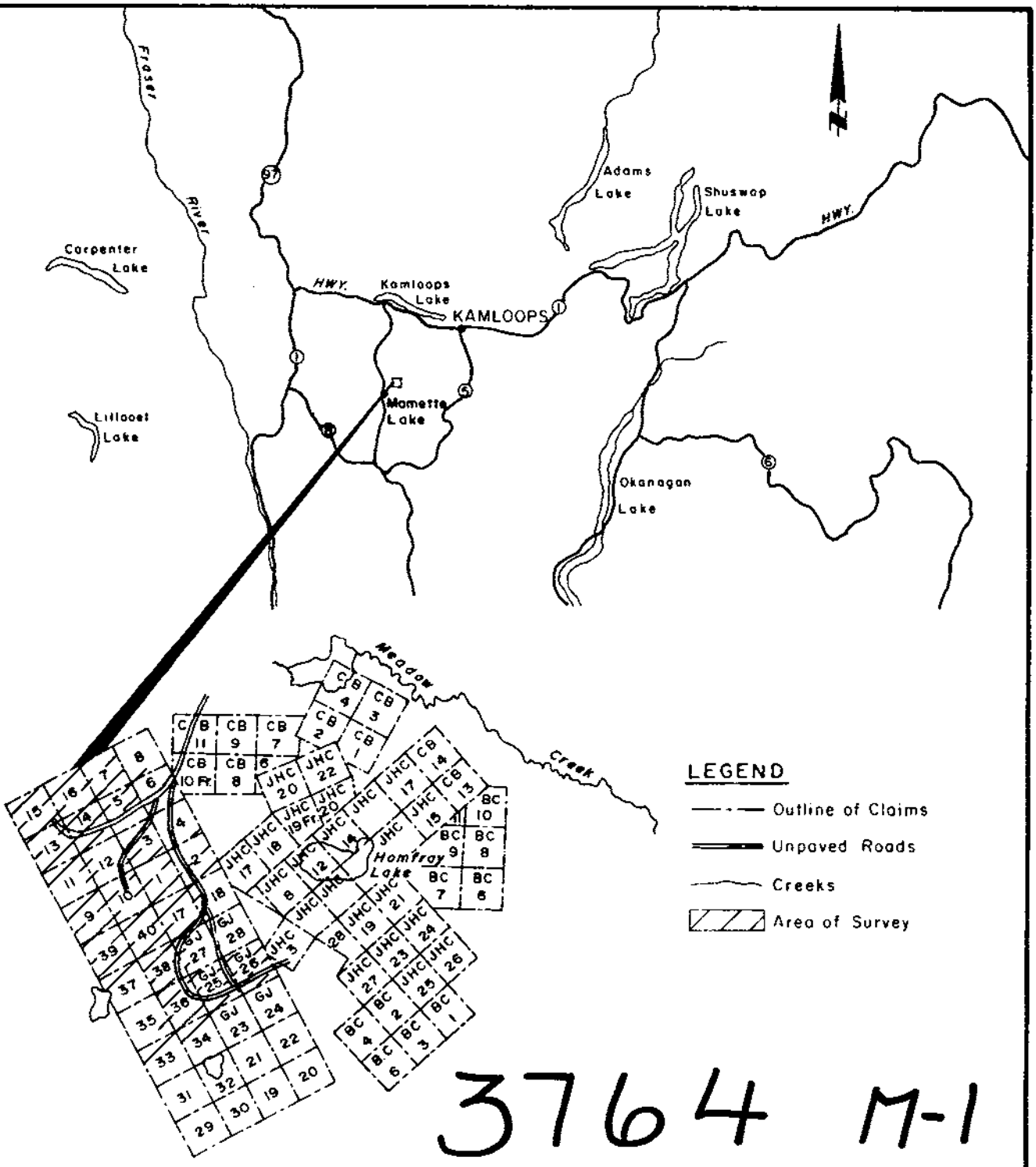

37764 M-1

HIGHHAWK MINES LTD.
CONSOLIDATED STANDARD MINES LTD.

JIG & GJ CLAIMS

LOCATION AND CLAIMS MAP

SCALE : LOCATION MAP : 1" = 39 MILES APPROX. CLAIM MAP : 1" = 6000' APPROX.

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FIG. 1
JULY 21, 1972

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INTRODUCTION

From June 17, 1972 to July 4, 1972, Glen E. White Geophysical Consulting and Services Ltd. conducted a program of induced polarization surveying over the JIG and GJ mineral claims in the Kamloops area on behalf of Highhawk Mines Ltd. (N.P.L.) and Consolidated Standard Mines Ltd. (N.P.L.).

The purpose of the survey was to search for any anomalous chargeability values which could possibly be associated with several interesting mineral showings as discussed by T. R. Tough, P. ENG, in his Geological Report dated April 29, 1972.

PROPERTY

The survey discussed in this report was conducted over mineral claims JIG 1 - 16, 33 - 40, and GJ 23 - 28, which are part of a larger block of claims as illustrated in Figure 1.

LOCATION AND ACCESS

The JIG and GJ mineral claims are located some 22 miles west of Kamloops B.C. immediately southwest of Homfray Lake. Latitude 50°27'N Longitude 120°43'W N.T.S. 92I/7

Access to the property is via the Lac La Jeune road which leads south from Highway 1 a few miles west of Kamloops and then south along logging roads from Meadow Creek.

GENERAL GEOLOGY

The general geology of the property can be seen on G.S.C. Map 886A which shows the property to be underlain by upper Triassic andesite basalt, agglomerate, breccia, tuff, minor argillite, limestone and conglomerate of the Nicola group. T. Tough reports that the mineralization occurs as chalcocite, cuprite, azurite and malachite in fracture fillings and dissemenations associated with northerly shearing and faulting.

SURVEY SPECIFICATIONS

Electrode Array

The data was obtained using the "three electrode" array. This array consists of one current (C_1) and two potential electrodes (P_1 and P_2) which are moved together along the survey line at a fixed distance apart, which is known as the "a" spacing. The second current electrode (C_2) is placed at "infinity".

Induced Polarization System

The equipment used on this survey was the Huntec pulse-type unit. Power was obtained from a JLO motor, coupled to a 2.5 KW 400 cycle three-phase generator, providing a maximum of 2.5 KW D.C. to the ground. The cycling rate is 1.5 seconds "current on" and 0.5 seconds "current off", the pulses reversing continuously in polarity. Power was transmitted to the ground through two current electrodes C_1 and C_2, and measurements taken across two potential electrodes, P_1 and P_2.

The data recorded in the field consist of careful measurements of the current (I) in amperes flowing through electrodes C_1 and C_2, the primary voltage (V_p) appearing between electrodes P_1 and P_2 during the "current on" part of the cycle, and the secondary voltage (Vs) appearing between electrodes P_1 and P_2 during the "current off" part of the cycle.

The apparent chargeability (M_a), in milliseconds, is calculated by dividing the secondary voltage by the primary voltage and multiplying by 400, which is the sampling time in milliseconds of the receiver unit. The apparent resistivity, in ohm-feet, is proportional to the ratio of the primary voltage to the measured current, the proportionality factor depending on the geometry of the electrode array used. The chargeability and resistivity obtained are called "apparent" as they are values which that portion of the earth sampled by the array would have if it were homogeneous. As the earth sampled is

usually inhomogeneous, the calculated apparent chargeability and apparent resistivity are functions of the actual chargeabilities and resistivities of the rocks sampled and of the geometry of these rocks.

Survey Grid

The induced polarization survey was conducted along a previously established survey grid which consisted of east-west traverse lines spaced 400 feet apart turned off at right angles from a north-south baseline.

Some 18.3 line miles of reconnaissance and some 0.7 line miles of detail induced polarization surveying were conducted. The reconnaissance surveying was conducted with an "a" spacing of 200 feet. Detail surveying consisted of "a" = 200' N = 2 , and "a" = 100' N = 1.

DATA PRESENTATION

The chargeability and apparent resistivity data obtained from this survey are illustrated in contour form at a horizontal scale of 1" = 400' as follows:

Figure 2 - Chargeability contoured at an interval of one millisecond. Reconnaissance data is plotted north of the line and detail data N = 2 is plotted south of the line.

Figure 3 - Apparent resistivity contoured at 300, 500, 750, 1000, 1500, 2000, and 3000 ohm-feet levels.

DISCUSSION OF RESULTS

The resistivity data varied from a low of 304 ohm-feet to a high of 3900 ohm-feet. Such variations in general can be attributed to changes in the physical characteristics of the overburden and depth to bedrock. A contour plan, Figure 3, of the resistivity data shows pronounced NNW trending zones of resistivity low values such as along a line drawn through 21W in a NNW - SSE direction. These

resistivity contours also show a slight bias for the NNE - SSW direction. This would suggest that the NNW - SSE trends represent a major fault direction which is intersected by weaker NNE - SSW faults or shear zones.

The chargeability values rise to a high of 10.3 milliseconds on line 44N at 23W above a background of 2.5 milliseconds. The high chargeability values in this area form an anomaly some 2000 feet long, 100 to 400 feet wide which trends in a northerly direction. To the north of this anomaly on trend, is a smaller chargeability high which reaches a high of 6.1 on line 84N at 17W. To the southeast of the large anomaly is a broad chargeability feature (around 5.5 milliseconds) which reaches a high of 9.3 milliseconds on line 20N at 5W. This general area, in the southern part of the survey grid, has a slightly higher level of background values than in the middle, or northern parts of the survey grid which may possibly be caused by a slight variation in rock type.

Correlation of the resistivity and chargeability data indicates that each of the three chargeability anomalies are situated on or near an intersection of the NNW - SSE and NNE - SSW resistivity linears.

The detail induced polarization profiles, Plates I, II, and III suggest narrow possibly structure-controlled chargeable bodies.

Mineral showings numbers 2 and 3 discussed by T. R. Tough in his Geological Report of April 29, 1972 are located in the broad 5.5 millisecond zone of the chargeability anomaly on line 20N - 5W. These showings appear to be controlled by northerly trending structures which trend in the direction of the high anomalous chargeability values.

CONCLUSIONS

During the latter part of June to early July, 1972 an induced polarization survey was conducted on the JIG and JG mineral claims under a joint venture by Highhawk Mines Ltd. (N.P.L.) and Consolidated Standard Mines Ltd. (N.P.L.).

The survey located three anomalous chargeability zones which trend in a northerly direction. The largest

chargeability anomaly is some 2000 feet in length and rises to a high of 10.5 milliseconds, Interesting copper bearing mineralization occurs in two showings along the flank of the anomalous chargeability trend.

RECOMMENDATIONS

It is recommended that a minimum diamond drilling program be undertaken to investigate the anomalous chargeability values as follows:

(1) Collared on line 44N at 24W, drilled easterly at an angle of -60° for a length of some 500'.

(2) Collared on line 20N at 8W, drilled easterly at an angle of -50° for a length of some 500'.

Respectfully submitted,
GLEN E. WHITE GEOPHYSICAL
CONSULTING AND SERVICES LTD.

Glen E. White B.Sc.
Geophysicist

STATEMENT OF QUALIFICATIONS

Name: WHITE, Glen E.

Profession: Geophysicist

Education: B.Sc. Geophysics - Geology
University of British Columbia.

Professional Associations: Associate member of Society of Exploration Geophysicists.
Active member B.C. Society of Mining Geophysicists.

Experience: Pre-Graduate experience in Geology - Geochemistry - Geophysics with Anaconda American Brass.

Two years Mining Geophysicist with Sulmac Explorations Ltd. and Airborne Geophysics with Spartan Air Services Ltd.

One year Mining Geophysicist and technical Sales Manager in the Pacific north-west for W. P. McGill and Associates.

Two years Mining Geophysicist and supervisor Airborne and Ground Geophysical Divisions, with Geo-X Surveys Ltd.

Two years Chief Geophysicist Tri-Con Exploration Surveys Ltd.

One year Consulting Geophysicist.

Active experience in all Geologic provinces of Canada.

A P P E N D I X

Instrument Specifications

Method of Survey - Induced Polarization

A. Instruments

(a) Type - Pulse
(b) Make - Huntec
(c) Serial No. - transmitter #107 - receiver #207

B. Specifications

(a) Size and Power - 2.5 KW
(b) Sensitivity - 300 x 10.5 volts
(c) Power Sources - 2.5 KW 400 cycle - three-phase generator
(d) Power by JLO motor, 5.2 H.P. @ 3,600 R.P.M.
(e) Timing - electronic, remote and direct
(f) Readings - (i) amps (ii) volts primary and secondary
(g) Calculate (i) Resistivity - ohm-feet
(ii) Chargeability - milliseconds

C. Survey Procedures

(a) method - power supplied to mobile probe along TW 18 stranded wire from stationary set-up.
(b) configuration - Pole - dipole (three electrode array) Plot point midway between C_1 and P_1.

D. Presentation

Contour Maps (i) Chargeability - milliseconds
(ii) Resistivity - ohm-feet

C E R T I F I C A T E

I, William G. Stevenson, DO HEREBY CERTIFY AS FOLLOWS:

(1) That I am a Consulting Geological Engineer with offices at Suite 209 Stock Exchange Building, 275 Howe St., Vancouver 1, B.C.

(2) That I am a graduate of the University of Utah, 1946, with a B.Sc. Degree.

(3) That I am a registered Professional Engineer in the Association in British Columbia.

(4) That I have practised my profession for 22 years.

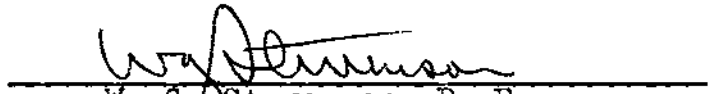
(5) That I have reviewed a report dated July 21, 1972 based on work conducted by Glen E. White Geophysical Consulting and Services Ltd. under the supervision of Glen E. White B.Sc. Geophysicist, and concur with the findings therein.

(6) That this report consists of 8 typewritten pages and two maps.

(7) That I have no direct, indirect or contingent interest in the JIG and GJ mineral claims or in the securities of Highhawk Mines Ltd. (N.P.L.) or Consolidated Standard Mines Ltd. (N.P.L.).

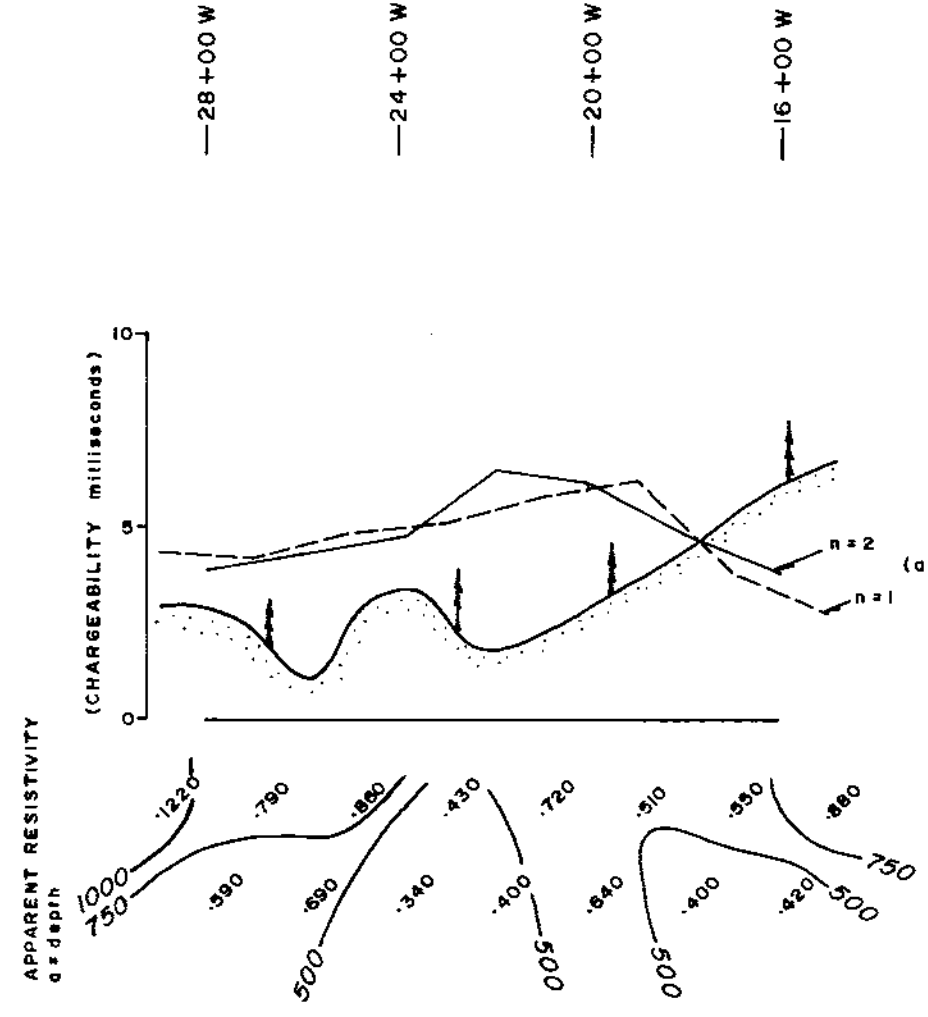
DATED at Vancouver, British Columbia, this 21st day of July, 1972.

W. G. STEVENSON & ASSOCIATES LIMITED
Consulting Geologists



W. G. Stevenson, P. Eng.

DETAIL PROFILES
CHARGEABILITY & RESISTIVITY



LINE 84+00 N

Department of
Mines and Petroleum Resources
ASSESSMENT REPORT
NO. 3764 MAP #2

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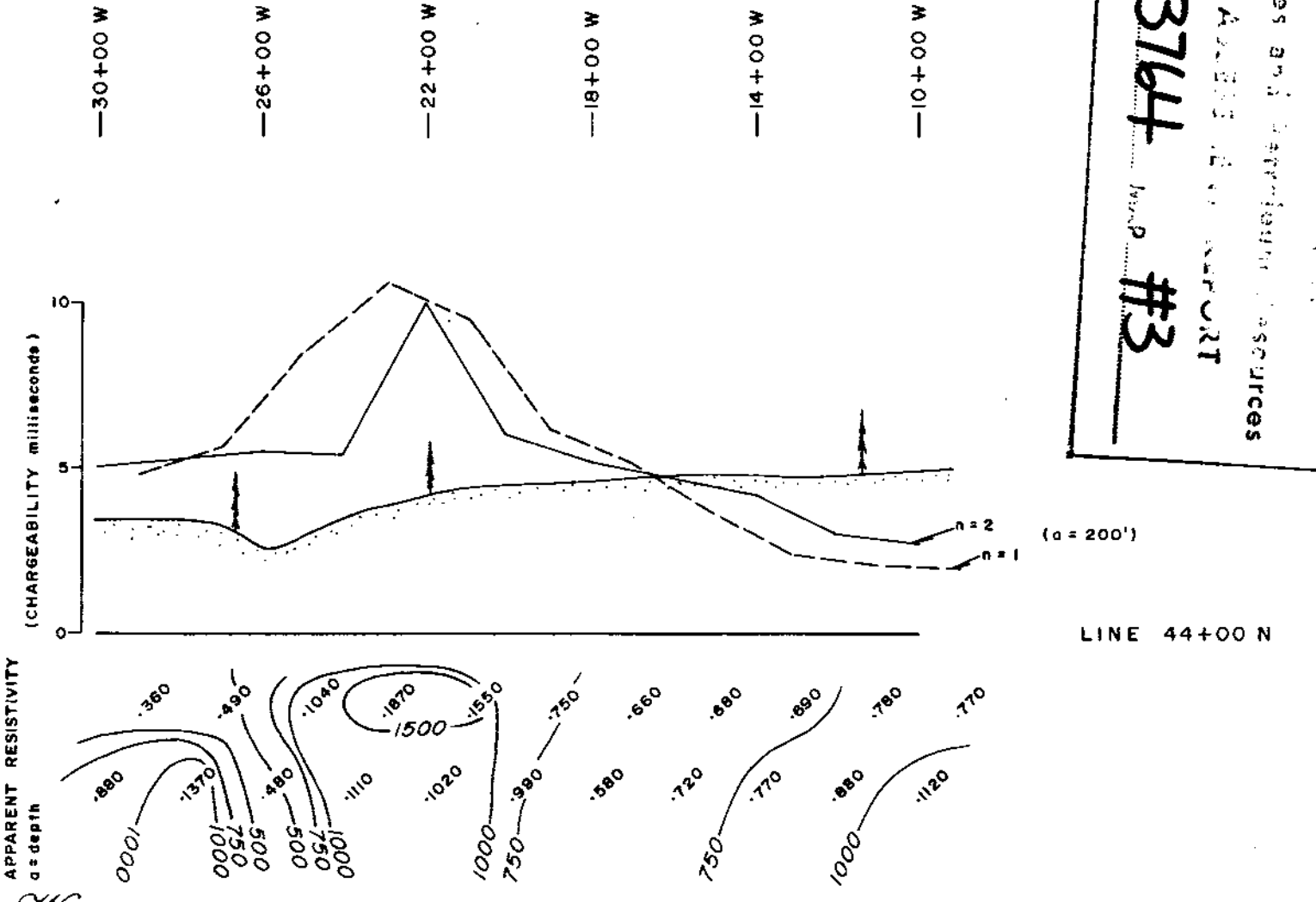
services ltd.

SCALE: 1" = 400'

PLATE 1
JULY 21, 1972

DETAIL PROFILES
CHARGEABILITY & RESISTIVITY

Department of Mines and Petroleum Resources
ASSESSMENT REPORT
NO. 3744 Map #3



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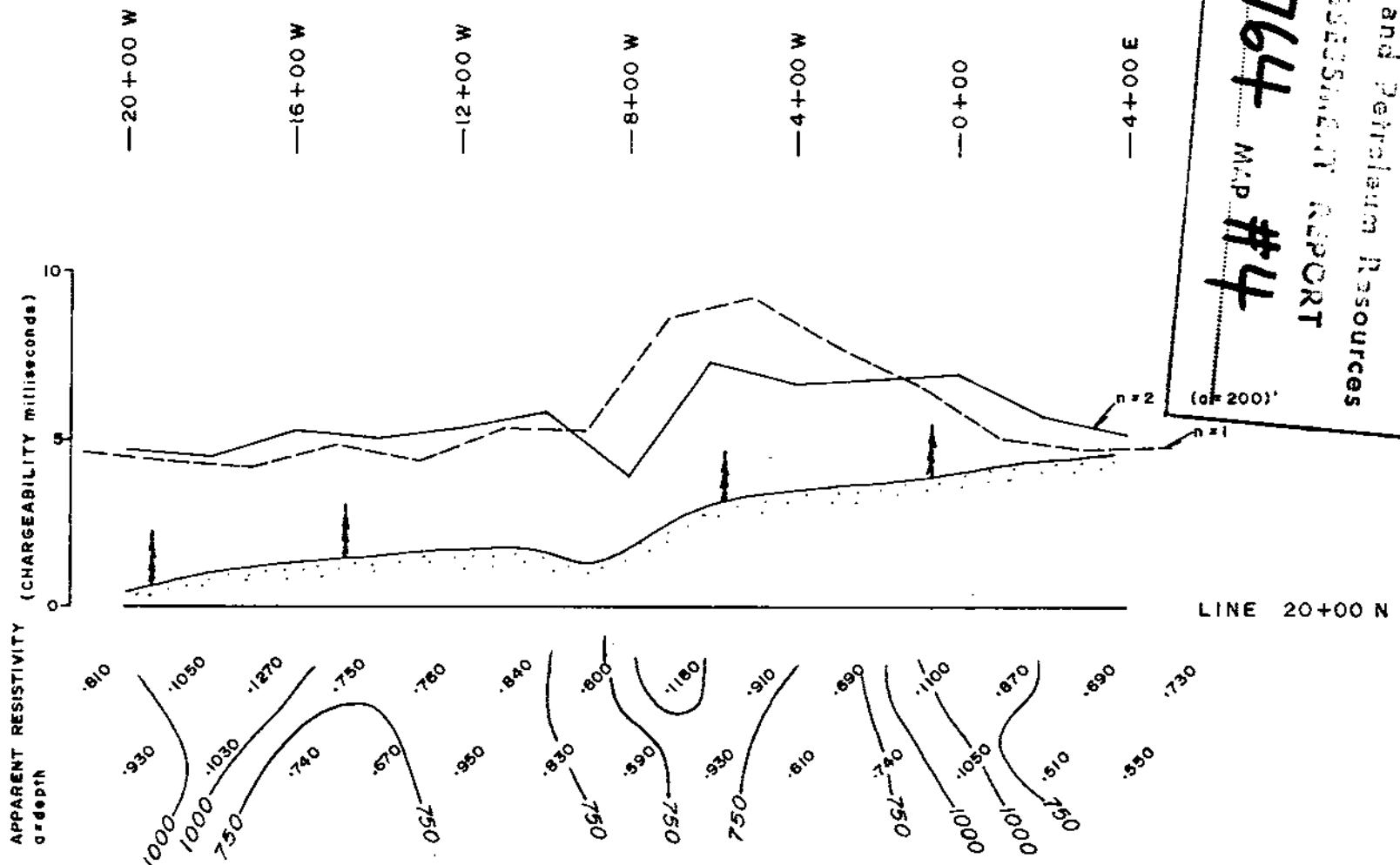
SCALE : 1" = 400'

PLATE 2
JULY 21, 1972

DETAIL PROFILES
CHARGEABILITY & RESISTIVITY

Department of
Mines and Petroleum Resources
ASSESSMENT REPORT
No. 3764 MAP #4



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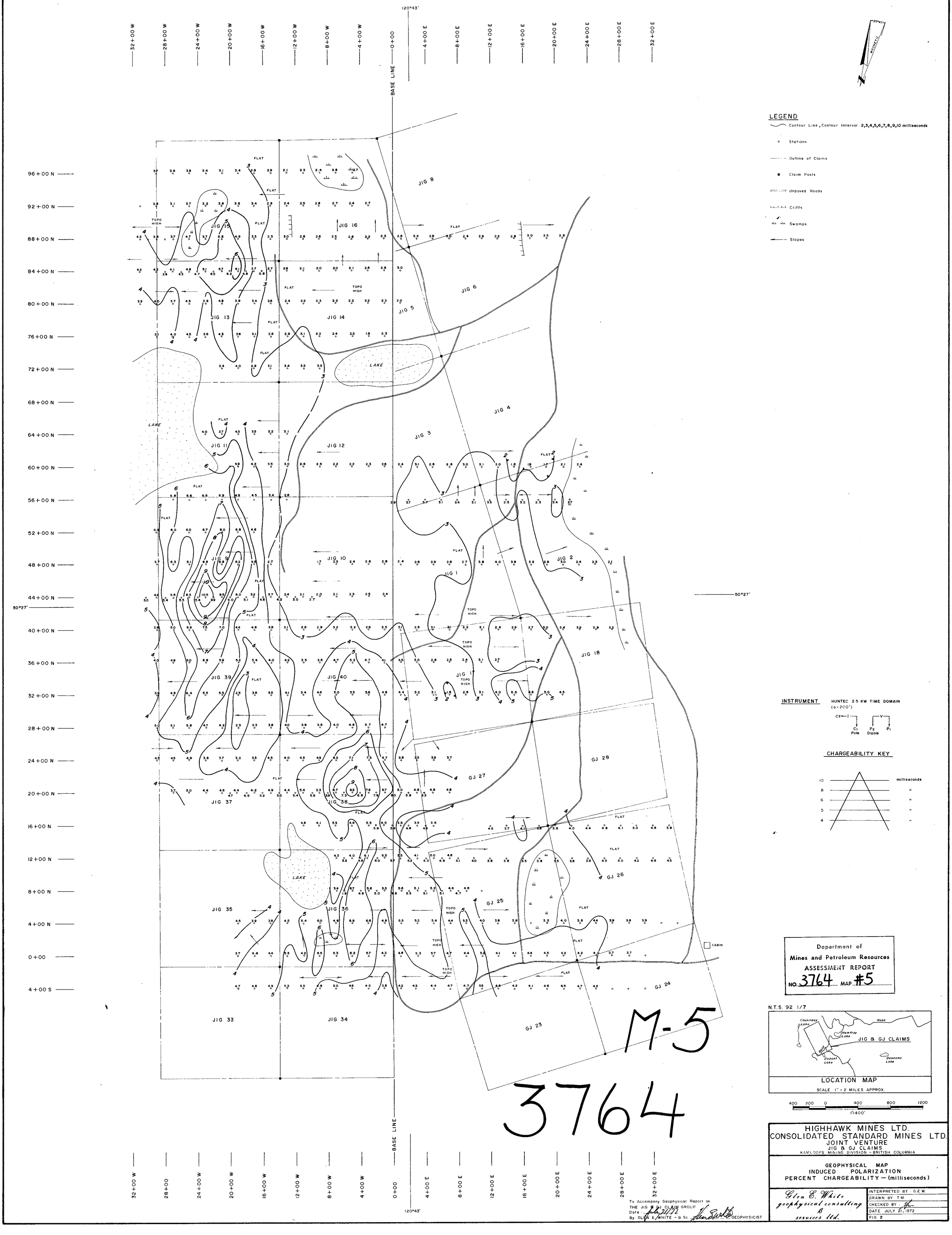
SCALE : 1" = 400'

PLATE 3
JULY 21, 1972


120°43'
32+00 W
28+00 W
24+00 W
20+00 W
16+00 W
12+00 W
8+00 W
4+00 W
BASE LINE
0+00
4+00 E
8+00 E
12+00 E
16+00 E
20+00 E
24+00 E
28+00 E
32+00 E
96+00 N
92+00 N
88+00 N
84+00 N
80+00 N
76+00 N
72+00 N
68+00 N
64+00 N
60+00 N
56+00 N
52+00 N
48+00 N
44+00 N
50°27'
40+00 N
36+00 N
32+00 N
28+00 N
24+00 N
20+00 N
16+00 N
12+00 N
8+00 N
4+00 N
0+00
4+00 S
MAGNETIC
23°45'
LEGEND
Contour Line, Contour Interval - 2,3,4,5,6,7,8,9,10 milliseconds
Stations
Outline of Claims
Claim Posts
Unpaved Roads
Cliffs
Swamps
Slopes
JIG 1
JIG 2
JIG 3
JIG 4
JIG 5
JIG 6
JIG 8
JIG 9
JIG 10
JIG 11
JIG 12
JIG 13
JIG 14
JIG 15
JIG 16
JIG 17
JIG 18
JIG 33
JIG 34
JIG 35
JIG 36
JIG 37
JIG 38
JIG 39
JIG 40
GJ 23
GJ 24
GJ 25
GJ 26
GJ 27
GJ 28
FLAT
TOPO HIGH
LAKE
CABIN
INSTRUMENT
HUNTEC 2.5 KW TIME DOMAIN
(a = 200')
C2 — I — C1 Pole
V — P2 Dipole — P1
CHARGEABILITY KEY
10 milliseconds
8 "
6 "
5 "
4 "
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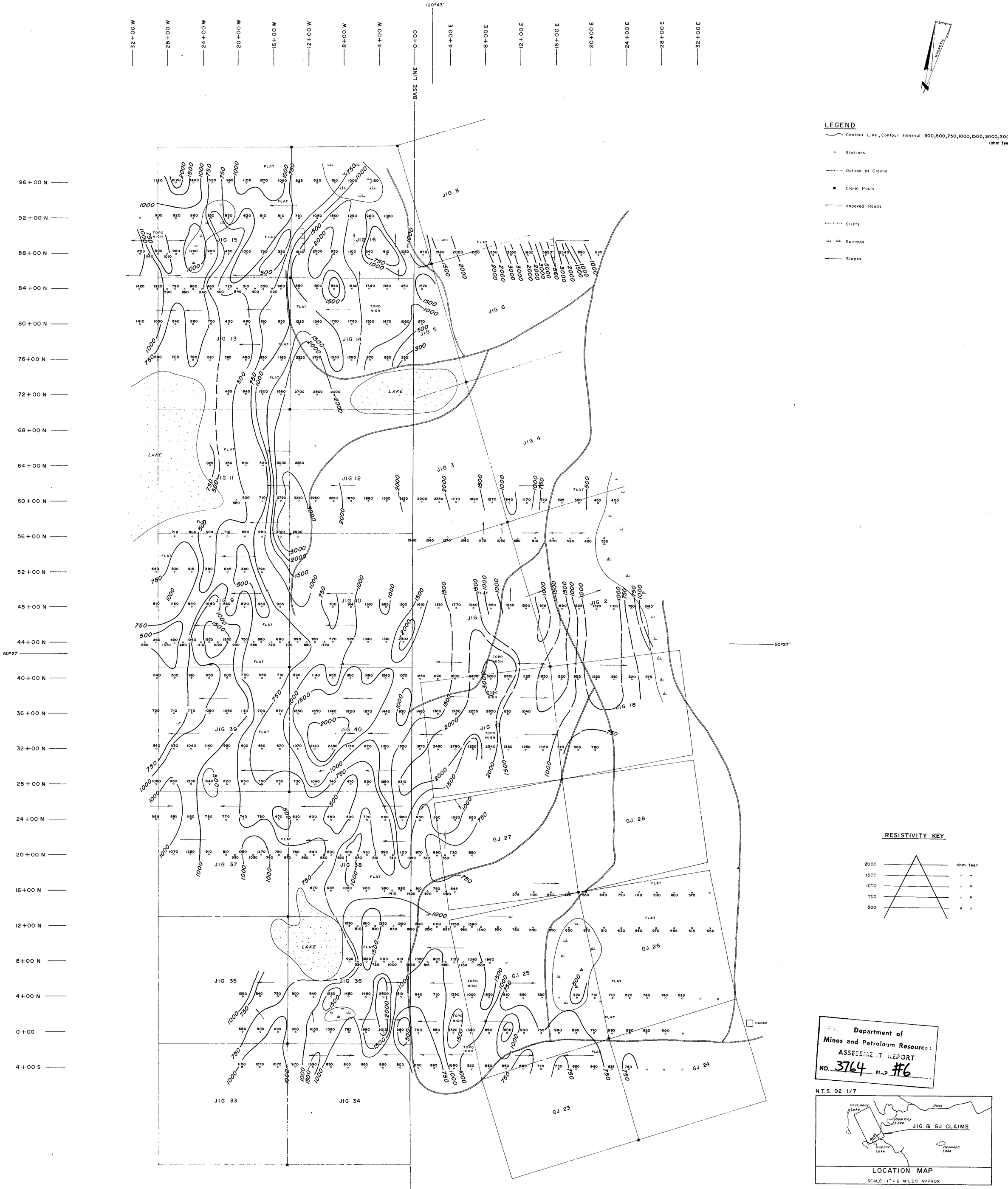
NO. 3764 MAP #5
N.T.S. 92 I/7
Cousineau Lake
Road
Homfray Lake
JIG & GJ CLAIMS
Dupont Lake
Desmond Lake
LOCATION MAP
SCALE 1" = 2 MILES APPROX.
400 200 0 400 800 1200
1"=400'
M-5
3764
HIGHHAWK MINES LTD.
CONSOLIDATED STANDARD MINES LTD.
JOINT VENTURE
JIG & GJ CLAIMS
KAMLOOPS MINING DIVISION - BRITISH COLUMBIA
GEOPHYSICAL MAP
INDUCED POLARIZATION
PERCENT CHARGEABILITY — (milliseconds)
Glen E. White geophysical consulting & services ltd.
INTERPRETED BY : G.E.W.
DRAWN BY : T.M.
CHECKED BY :
DATE : JULY 21, 1972
FIG. 2
To Accompany Geophysical Report on
THE JIG & GJ CLAIM GROUP
Date : July 21/72
By GLEN E. WHITE - B.Sc. GEOPHYSICIST



LEGEND

- Contour Line, Contour Interval - 300,500,750,1000,1500,2000,3000 (ohm feet)
- Stations
- Outline of Claims
- Claim Posts
- Unpaved Roads
- Cliffs
- Swamps
- Slopes

RESISTIVITY KEY

2000 ohm feet
1500 " "
1000 " "
750 " "
500 " "

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ASSESSMENT REPORT
NO. 3764 MAP #6

N.T.S. 92 I/7

LOCATION MAP
SCALE 1" = 2 MILES APPROX

400 200 0 400 800 1200
1"=400'

HIGHHAWK MINES LTD.
CONSOLIDATED STANDARD MINES LTD.
JOINT VENTURE
JIG & GJ CLAIMS
KAMLOOPS MINING DIVISION - BRITISH COLUMBIA

GEOPHYSICAL MAP
INDUCED POLARIZATION
APPARENT RESISTIVITY — (ohm feet)

To Accompany Geophysical Report on
THE JIG & GJ CLAIM GROUP
Date July 21/72
By GLEN E. WHITE - B.Sc. PROFESSIONAL ENGINEER PHYSICIST

Glen E. White geophysical consulting services ltd.

INTERPRETED BY	G.E.W
DRAWN BY	T.M.
CHECKED BY	G.E.W
DATE	JULY 21, 1972
FIG.	3