# 2911

GEOLOGICAL, GEOPHYSICAL & GEOCHEMICAL REPORT

For

LOBELL MINES LTD.

on the

Spook Claim Group, S.E. of Owen Lake Latitude 54° 2'N Longitude 126° 42'W

93L /2E

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Department of

Mines and Petroleum Resources

ASSESSMENT REPORT

NO 2911

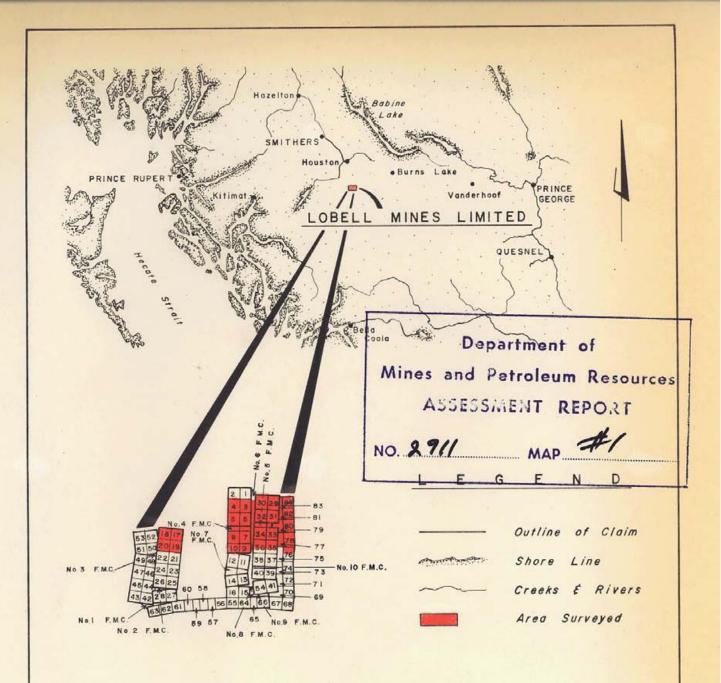
MAP

## CONTENTS

			PAGE
Introduction			1
Location and Acce	ss		1
Property			1
History			2
General Geology			2
Survey Specificat	The The The The	rvey Grid  Geological Survey  Geochemical Survey  Magnetometer Survey  Electromagnetometer Survey  Induced Polarization Survey	2-3 3 3-4 4 5 5-6
Data Presentation	L		6
Discussion of Res	Geo The The The	chemistry (i) Area A	6,7,8 8-9 9 9-10 10 10-11 11-12 12-13
Conclusions	• • • • • • • • •		13
Recommendations	• • • • • • • •	••••••••••••	13-14
Certificates	Glen E. Wh	elmo, President	15 16 17
Instrument Specif	ications	Magnetometer	18 18 19 20
Certificate W. (	. Stevenso	on. P. Eng.	21

## ILLUSTRATIONS

- / Figure (1) Location and Claim Map
- /4 Plate (1) Composite Profiles Line 76 + 00N
- Figure A-2 Geology
- 3 Figure A-3 Geochemical copper
- √ Figure A-4 Geochemical zinc
- 5 Figure A-5 Geochemical silver
- 6 Figure A-6 Magnetic Intensity
- 7 Figure A-7 Electromagnetometer
- % Figure A-8 Induced Polarization Chargeability
- 9 Figure A-9 Induced Polarization Resistivity
- 10 Figure A-10 Interpretation
- // Figure B-2 Geochemical copper
- 12 Figure B-3 Geochemical zinc
- 13 Figure B-4 Magnetic Intensity



# LOBELL MINES LIMITED

SPOOK CLAIMS

LOCATION AND CLAIMS MAP

SCALE: LOCATION MAP: I" = 80 MILES - CLAIMS MAP: N.T.S.



#### INTRODUCTION

During the period April 25-June 21, 1970, Tri-Con Exploration Surveys Ltd. conducted a program of geological mapping, geochemical soil sampling and geophysical surveying which consisted of ground magnetometer, electromagnetometer and induced polarization surveys, on the Spook claim group on behalf of Lobell Mines Ltd.

The purpose of this program was to further explore areas determined anomalous by a reconnaissance geochemical program carried out in the summer of 1969 by Pacific Geochemical Services, and to fulfill assessment requirements on the total claim block.

The purpose of the electromagnetometer survey was to try and delineate any conductors indicative of massive mineralization or fault structures, while the induced polarization survey was undertaken to try to locate either disseminated or massive sulphide mineralization. The ground magneotmeter survey was completed to try and detect any magnetic patterns indicative of structure or lithology which upon correlation with the geological and detail geochemical data would aid in determining the significance of any induced polarization or electromagnetometer anomalies.

#### LOCATION AND ACCESS

The Spook mineral claims are located in the Omineca Mining Division, N.T.S. 93L/2 latitude 54°2' North and longitude 126°42' West, Province of British Columbia. They are situated some 2 miles south of Owen Lake and immediately south of mineral claims held by Nadina Explorations Ltd.

Facile access to the property can be gained by the Morice River Road, leading south some 4 miles, West of Houston B.C. Travel from this junction is by good secondary road for a distance of some 20 miles to the Nadina Mines road, then east for approximately 11 miles past the Nadina Mine site to the Y in the road near "Humpty Dumpty" rock, take the east branch for approximately 2 miles. Here the road traverses a large clearing. Just beyond this clearing the central baseline crosses the road.

#### **PROPERTY**

The Spook claim group, property of Lobell Mines Ltd., consists of some 94 claims listed as follows:

Spook 1 - 84 Spook Fractions 1-10

#### HISTORY

The Spook claims which are now under the auspices of Lobell Mines Ltd. were originally staked by Summit Oils Ltd. In 1969 a series of airborne magnetic maps were released over this area. Based on preliminary aeromagnetic interpretation Summit Oils Ltd. staked the above claims on the flanks of an aeromagnetic anomaly as shown on aeromagnetic map 5301 - G of Owen Lake 93L/2. During 1969 a program of reconnaissance geochemical, geological and geophysical surveying was initiated on the property by Pacific Geochemical Services Ltd. on behalf of Summit Oils Ltd.

#### GENERAL GEOLOGY

The regional geology of this area is shown on B.C. Department of Mines and Petroleum Resources Map 69-1 at a scale of 1"=4 miles.

The local region of the property is reportedly underlain by part of the Hazelton formation, of Jurassic age, consisting of predominately red to green andesitic flows, tuffs and interbedded sedimentary rocks which have been intruded by a number of small igneous bodies bearing mineralizing solutions. One of these is shown just north of the Spook mineral claims. A layer of Tertiary volcanic rock and overlying unconsolidated glacial and alluvial debris, all younger than the Hazelton formation and the intrusive bodies intermittently, mask this exploration area. Mineralization reportedly occurs in a gray coarse fragmental volcanic rock strongly altered, folded and fractured along a northwest-southeast axis and intruded by a dark fine grained prophyritic diorite.

## SURVEY SPECIFICATIONS

## Survey Grid

Two individual areas were surveyed, the larger known as Area A and the smaller as Area B. The relative position of these two survey areas can be seen on Figure 1.

The survey grids consist of east-west traverse lines, flagged at 100 foot intervals, turned off every 400 feet from north-south baselines. Some 21.6 line miles of grid were cut on the large survey area and some 2.6 on the smaller grid. On Area A, the larger survey are, some 21.6 line

miles of geochemical, electromagnetometer, magnetometer and induced polarization surveying were conducted respectively. On the smaller area, Area B 2.6 line miles of geochemical and ground magnetometer surveying were carried out.

#### The Geological Survey

The geological survey was conducted on survey Area A and consisted of systematic traverses across the property using the survey grid for control. Rock exposures were mapped and both hand samples and rock geochemical samples taken. The hand samples were correlated with known rock formations outside the property in attempt to follow rock formation continuity throughout the area.

#### The Geochemical Survey

#### Preliminary Discussion

From sample profiling and Ph data gathered on the property in the summer of 1969, as presented in a report dated December 3, 1969, to fulfill assessment requirements on the property, the following conclusions were drawn:

- (a) A sampling depth of 10 12 inches ("B" horizon) was found to be the most likely sampling medium to give reliable geochemical readings.
- (b) Acidic soils indicated by Ph testing show that copper, silver and zinc ions will travel with relative ease in the surface soils of the property.
- (c) Areas of intensity in copper, silver and zinc are anomalous and there is a possibility of encountering significant copper, silver and zinc mineralization within these anomalies due to the following factors:
  - (1) Glacial debris encountered on the property in the form of round rock, combined with low relief and a deficiency of outcrop indicates substantial overburden being of a depth great enough to impede vertical ion migration thereby increasing the significance of anomalous surface geochemical soil readings.

(2) Outcrop encountered on the property shows a definite cap of Tertiary Volcanics of thickness yet unknown. These volcanics also add to the impedence of vertical ion migration from any mineralized source.

Based on these and other findings significant to the 1969 Reconnaissance program, detailed geochemical surveys were carried out on two areas of the property. These areas will be referred to as Area A which is the larger of the two areas and is located on the eastern sector of the total claim block as shown in red in Figure 1. Area B is the smaller area surveyed and is located on the Western sector of the total claim block as shown in red in Figure 1.

During the 1970 exploration season, there were 664 soil samples taken from the "B" horizon (10 - 12 inches) on the grids previously outlined in this report under <u>Survey Specifications</u> - <u>Survey Grid</u>. This consisted of 587 samples from grid A and 77 samples from grid B. The samples were taken at 200 foot intervals and their locations were flagged and coded.

The sampling medium ("B" horizon) was in the majority of cases encountered from 8 - 14" and is generally described as follows:

A light to medium brown fine clay to sandy clay containing in a few cases angular rock fragments but in the majority of cases containing rounded rock.

The samples were packaged and delivered to Chemex Laboratories Ltd. of North Vancouver, B.C., where drying, sieving and analysis by atomic absorption was carried out under the supervision of professional chemists.

All samples were analysed for copper, silver and zinc. Intensities ranged from 4 ppm to 127 ppm copper; less than 0.5 ppm to 4 ppm silver; and 44 ppm to 925 ppm zinc.

#### The Magnetometer Survey

The magnetometer survey was conducted using a Sharpe MF-1 Fluxgate magnetometer. This instrument measures the vertical component of the earth's magnetic field to an accuracy of 10 gammas. Corrections for diurnal variation were made by tying into previously established base stations at intervals not exceeding one and one half hours. Readings were taken at 100 foot intervals along the traverse lines.

#### The Electromagnetometer Survey

This survey was conducted using a Geotronics V.L.F. Electromagnetometer. This instrument acts as a receiver only. It utilizes the primary electromagnetic fields generated by VLF marine communication stations. These stations operate at a frequency between 15-25 KHZ, and have a vertical antenna-current resulting in a primary horizontal field. Thus, this V.L.F. - E.M. measures the dip-angle of the secondary field induced in a conductor.

For maximum coupling, a transmitter station located in the same direction as the geological strike should be selected, since the direction of the horizontal electromagnetic field is perpendicular to the direction of the transmitting station.

Readings were taken at 50 foot intervals and the data filtered in the field by the operator as described by D. C. Fraser, Geophysics Vol. 34, No. 6 (December 1969). The advantage of this method is that it removes the dc and attenuates long spatical wave lengths to increase resolution of local anomalies, and phase shifts the dip-angle data by 90 degrees so that crossovers and inflections will be transformed into peaks to yield contourable quantities.

#### The Induced Polarization Survey

The induced polarization survey was conducted with a Hewitt 1KW I.P. transient pulse type unit deployed in the Wenner electrode configuration with an "a" spacing and traverse interval of 200 feet. In the pulse (also known as time domain) method a steady direct current is impressed into the ground for a few seconds, abruptly terminated for a short time (usually equal to the length of pulse time) and then a steady current is impressed in the reverse direction for a few seconds and then abruptly terminated for a few seconds. This is one cycle which can be repeated. A fraction of a second after each cessation of the current pulse the decay voltage is integrated and measured. The current and total integrated primary voltage and total integrated decay voltage are then recorded for the given number of cycles. From these three measurements the chargeability in millivolts/volt and apparent resistivity in ohm-feet are calculated. The values calculated are then plotted at the center position

of the array for a given set of readings.

#### DATA PRESENTATION

The survey data for Areas A and B have been plotted at a horizontal scale of 1"=400 feet and accompany this report as follows:

Area A Figure A-2 - Geology

Figure A-3 - Geochemical - copper map contoured at 20, 30, and 40 ppm levels.

Figure A-4 - Geochemical - Zinc map contoured at 300, 400 and 500 ppm levels.

Figure A-5 - Geochemical - Silver map contoured at 0.8, 1.6 and 2.4 ppm levels.

Figure A-6 - Magnetic Intensity contoured at an interval of 200 gammas.

Figure A-7 - Filtered electromagnetic dip-angle contoured at 10, 20, and 30 degrees.

Figure A-8 - Induced polarization - chargeability contoured at one mv/v levels to 6 mv/v.

Figure A-9 - Induced polarization - resistivity contoured at an interval of 100 ohm-feet.

Figure A-10 Interpretation map.

Area B Figure B-2 - Geochemical - copper contoured at 20, 30 and 40 ppm levels.

Figure B-3 - Geochemical - Zinc contoured at 300, 400 and 500 ppm levels.

Figure B-4 - Magnetic intensity contoured at an interval of 200 gammas.

#### DICUSSION OF RESULTS

#### Geology

Approximately 10% of the property consisted of outcrop which was scattered through 80% of the survey area. Geological examination indicated that the majority of the rock exposed consisted of fine to medium grained andesites of the Hazelton formation.

No major geological structules were directly observed on the property.

Rock geochemistry analysis showed low assay results for copper and zinc. These low values may be accredited to capping of mineralization by volcanic flows. However, higher values for copper and zinc occur in the north-western portion of the main grid area. These higher values lie on trend with soil geochemistry trends. These values also lie on the general structural trend and also coincide with a strong magnetometer anomaly in this area. It is hypothesized, that elsewhere on the property, the source of the geochemical and geophysical anomalies may possibly be found beneath the surface volcanic capping. This capping would account for the low rock geochemistry values over most of the survey area.

A description of the common rock types identified on the property is as follows:

- 1. Andesite The most common volcanic rock identified was the fine to medium grained grey to green-grey andesites. This rock type is typical across the entire property. The fine grain varieties grade into the coarser grained andesite porphyry. Both the fine grained and porphyry type andesites belong to the Hazelton formation. Inclusions of zeolite, hematite and red coloured biotite (phlogopite) were also observed in several chip samples. A banded structure was also noted in green andesites on Line 112 + 00N in the eastern part of the grid area, probably due to flowage mechanisms of the liquid lava. Vesicular andesites grading to amygdaloidal lavas were also common on the property. Andesites including almost all other rocks types located were coated with a manganese oxide staining.
- 2. Rhyolite Breccia A white to buff coloured rhyolite breccia was located in outcrop in the northwestern part of the property. This rock type denotes a distinct rock change from the common lava and andesite rock types found over most of the grid area. The rayolite did not show sulphide mineralization, but did contain hematite inclusions.
- 3. <u>Vesicular Lava</u> Lavas were observed in the western and eastern part of the grid area. These lavas were typical brown-purplish Tertiary age volcanics common throughout the Smithers-Houston area. In certain instances these lavas contained amygdaloidal zeolite inclusions. These lavas were not associated with any surface sulphide mineralization.

It should be noted that sulphide mineralization was not noted in any of the observed outcrop. However, ion pyrite has been noted in rock float samples dug from pits on the property. Fresh mineralized and angular rhyolite breccia samples indicate that these float samples are in close proximity to bedrock.

Mineralization if present may be associated with a nearby or subsurface igneous intrusion. Sulphide mineralization may also be associated with a possible fault structure running in a NW-SE direction across the property. In this case, mineralization would lie in direct trend with ore bodies found on the Nadina Explorations Ltd. property.

#### Geochemistry

#### Area A

By detailed sampling of specific areas as outlined by the 1969 reconnaissance program, definite geochemically anomalous copper, zinc and silver trends were discovered on the property. The copper and silver anomalies contain in general, average values; whereas the zinc anomalies contain exceptionally high values. As stated under the "Preliminary Discussion on Geochemistry" the lack of exceptional intensity in the copper and silver anomalies is suspected to be attributed to clay overburden and volcanic cover.

The high copper, zinc and silver values are coincident. The major copper trends running northwest-southeast as seen in Figure A-3 are considered to be the main areas of interest and correlation of these trends with zinc and silver trends, as well as the correlation with magnetic trends and anomalous electromagnetic and induced polarization readings creates a high probability for encountering significant mineralization within the areas of these anomalies.

The relatively low amount of copper and zinc and the non-existance of silver in the majority of rocks on the property, both in place and float, indicates that the anomalous soil values are due to a source other than the surface volcanics. This again points to the conclusion that the areas of interest are likely related to mineralization.

Moreover due to the relative ease in which the copper, zinc and silver ions will travel in the surface soils of the property, surface anomalous areas in these metals will be slightly shifted down slope from their respective ion source.

Also, anomalous values in copper, zinc and silver are of greater significance than may be first interpreted. This is due to the impedence of vertical ion migration through the volcanic rock and clay soils. Low background count of copper, zinc and silver in the outcrop and float rock on the property would tend to illiminate these rocks as the source material of anomalous soils.

#### Area B

Though there were some exceptionally high zinc values obtained from the soil analysis of Area B as shown in Figure B-3, the area is considered to be of secondary importance. Copper values in Area B were of minor significance as shown in Figure B-2. Further work in this area may be warranted at a later date.

#### The Magnetometer Survey Area A

The ground magnetometer survey located considerable variation in magnetic intensity from a low of some 2700 gammas to a high of some 6700 gammas. Good correlation is obtained with the government airborne magnetic data as shown on Map 5301 - G. The magnetic high shown on the west side of the survey area lies on the eastern flank of a magnetic high located approximately 1.5 miles southeast of Owen Lake as shown on the aeromagnetic map. Excellent correlation is also obtained between the large magnetic depression, located by the ground survey and shown on the aeromagnetic map.

Regionally, as shown on magnetic map 5301 - G the area is disected primarily by NE-SW and NW-SE magnetic linears. Two of these linears form a major intersection at the SE end of Owen Lake. Owen Lake also turns sharply north under the influence of these same directional features.

Locally on the survey area the patterns of magnetic intensity are weakly biased in a NE-SW direction and strongly in a NW-SE direction with the northeast section of the property indicating the former trend direction and the northwestern section the latter. The two most apparently significant magnetic trends delineated are first, the strong slightly NNW directed linear which crosses the survey area at 60N - 6W to 124N - 18W and appears to be disected by the NW-SE and NE-SW magnetic linears. The second magnetic feature is the broad magnetic depression which also trends slightly NNW-SSE through the survey area.

#### The Magnetometer Survey Area B

The magnetic intensity in this area varied from a minimum of 3840 gammas to a maximum of 5700 gammas. The magnetic contours are definitely biased in a northsouth direction possibly indicating the trend of the lithology. The magnetic intensity is also increasing from the west to the east, from around 4100 gammas to some 5200 gammas indicating possibly an area of high magnetic intensity just to the east of the survey area.

#### The Electromagnetometer Survey Area A

The filtered VLF EM data is a useful tool in locating near surface massive sulphide mineralization and fault zones. Examination of the filtered dip-angle data Figure A-7 confirms the NW-SE and NE-SW trending structural features. Three areas of particularily strong electromagnetic response were located, the first at 72 + 00N - 6W and at 76 + 00N - 9W, the second at 120 + 00N - 12 W and the third at 84 + 00N - 38E. The first two areas of high electromagnetic response are interesting in that they reflect the strong slightly NNW directed magnetic linears located by the ground magnetometer survey.

## The Induced Polarization Survey Area A

The resistivity data showed only moderate variations in resistivity from 30 ohm-feet to 860 ohm-feet which in general can be attributed to changes in the conductivity of the overburden and in the overburden to bedrock depth. The resistivity data on the other hand shows a generally north-south directed resistivity high in the center of the survey area which is flanked by weak

electromagnetic conductors. (See figures A-7 and A-9) This would indicate that possibly the high resistivity area reflects near surface bedrock which may be partially controlled by fault structures.

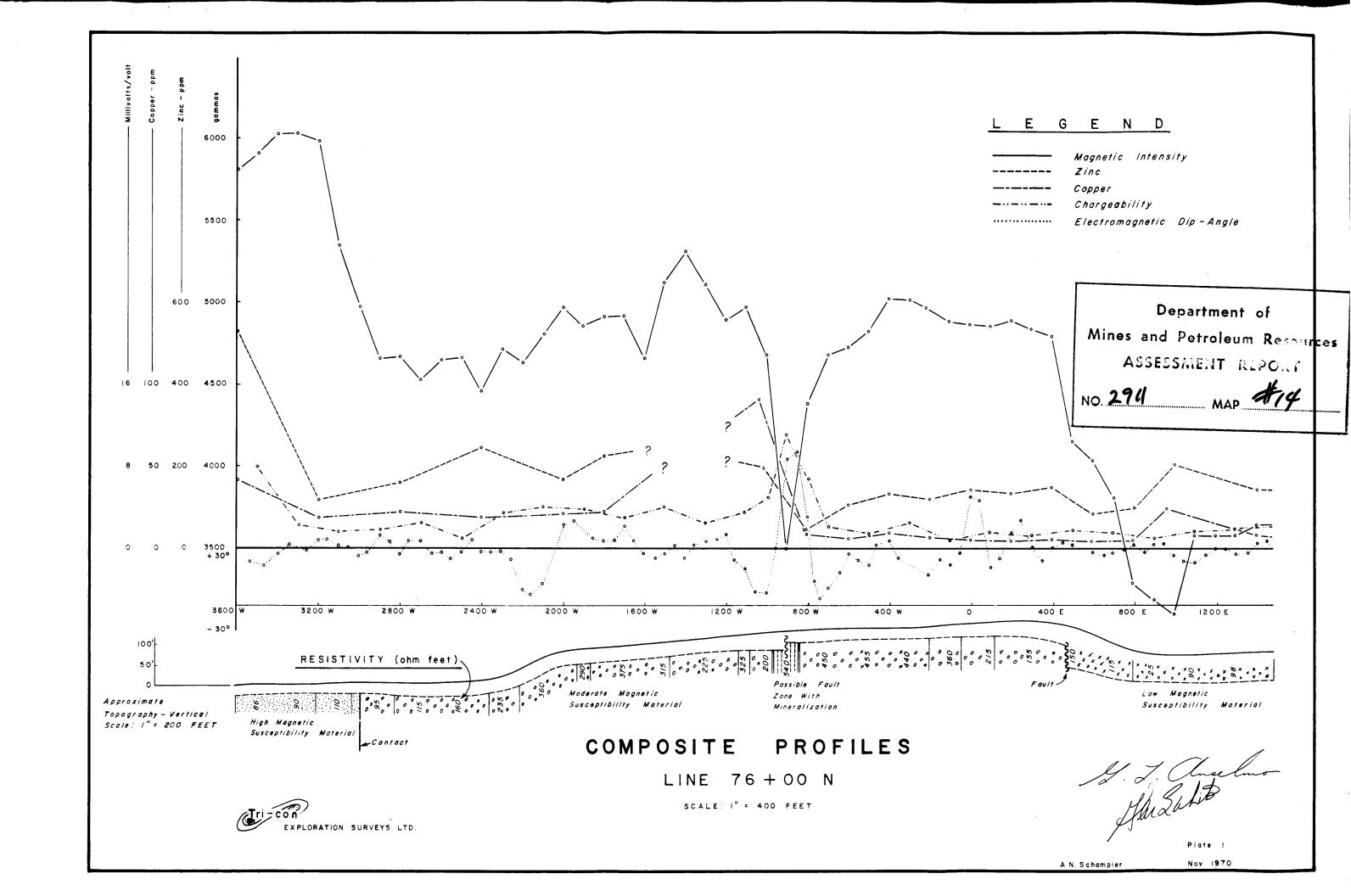
The chargeability data located several areas of moderate increases in chargeability. The maximum variation was to a high of 13.0 mv/v above a background of some 1.5 mv/v in the southwest section of the survey area. The chargeability trends in general reflect the NE-SW and NW-SE trends delineated by the other geophysical methods. In particular the chargeability data in the southwest quadrant of the property trends NW-SE and in the northeast quadrant it trends NE-SW.

#### Data Correlation Area A

For facile correlation and presentation the primary magnetic, electromagnetic, geochemical and induced polarization features are shown on the interpretation map. Figure A-10.

In general the survey area can be sub-divided into three broad areas of interest which in turn contain specific target zones. The first broad area consists of the four claims in the southwestern section of the survey area, the second consists of the four claims in the northwest section and the third consists of the four claims and two fractions in the northeastern corner of the survey area.

In the first broad area of interest there is a predominance of high induced polarization chargeability data which appears to be biased in a NW-SE direction parallel to the magnetic intensity trends. The largest two chargeability anomalies are located in this area in the southwestern most claims and flank a large magnetic anomaly. The chargeability anomaly in the southwestern most claim is also directly coincident with high zinc and weak copper values. Plate 1 shows the various survey data obtained along line 76N from 36W-14E. The primary target in the complete survey area is located on this line at 76N - 9W. Here, as can be seen from Figures A-10 and Plate 1, there is a definite coincidence of high induced polarization chargeability, an electromagnetic conductor, a well defined magnetic low and anomalous copper-silver geochemical values. It is also interesting to note that here the strong electromagnetic conductor trends from a strong NW-SE dir-



ection to a more NNW-SSE direction reflecting a near surface structural feature while the chargeability data continues in the NW-SE direction under a ridge of moderate magnetic values, thus raising the possibility that part of the induced polarization anomaly may be covered by a thin layer of Tertiary volcanic material. The copper geochemical values from this area in general parallel the induced polarization chargeability data and trend NW-SE into the second area of interest.

This second area of interest is dominated by strong copper, zinc and silver geochemical trends supported by weak induced polarization charge-ability data of twice or almost twice background values.

The most interesting target in this area of interest is located on line 112N-34W. Here there is a coincidence of strong copper, zinc and silver values lying midway between a magnetic depression and a magnetic high and supported by weak chargeability values. To the immediate southeast of this zone centered around 104N-25W are chargeability values of 3.1 and 3.9 mv/v flanked by exceptionally high zinc values with definitely anomalous values of copper.

The third area of interest particularly around 112N - 38E shows a moderate induced polarization chargeability anomaly surrounded by high geochemical values of zinc. The zinc anomaly actually occurs slightly downhill of the high chargeability data. Also in this area on lines 100N - 18E, 104N - 22E and line 112N - 16E are three coincidental copper, zinc, silver and weak chargeability anomalies. These three anomalies lie in an area of intersecting magnetic linears as can be seen on Figure A-6. Here the weak NE-SW trends intersect the stronger NW-SE linears.

Correlation of the magnetic intensity and geological data in general indicates that high magnetic intensity values appear to be associated with vesicular lava of probably Tertiary age, while the areas of very low magnetic intensity, shown as magnetic depressions, appear to coincide with fine grained green andesites high in biotite.

#### Data Correlation Area B

The magnetic intensity data of this area, shown in figure B-4, and as discussed previously shows a pattern of North-South trending magnetic ridges which may possibly represent the local lithology. Both the copper

and zinc data show excellent correlation in the southwestern section of the survey area. Here they trend in a north-south direction and appear to be associated with a band of lower magnetic intensity.

#### CONCLUSIONS

During the summer of 1970, exploration programs were conducted on two areas designated areas A and B of the Spook Claim group near Owen Lake, Omineca Mining Division B.C. The former was surveyed by geochemical, geological and geophysical methods while the latter by geochemical and geophysical methods.

On the smaller of the two areas, Area B, coincident values of copper and zinc were located trending north-south in an area of lower magnetic intensity.

On the larger of the two exploration areas, Area A, three major areas of interest were delineated and have been referred to as Areas of interest 1, 2, and 3 in order of apparent significance. Area 1 contains the highest induced polarization chargeability responses in the survey area. The primary target zone is on line 76N - 9W where there is a direct correlation of interesting chargeability, magnetic, and electromagnetic data with geochemical values of copper-silver.

The second area of interest shows favourable correlation between strong geochemical values of copper-silver and zinc with weak induced polarization chargeability data.

The third area of interest is one of coincident moderate chargeability data with strong geochemical values of zinc. Several small areas of weak chargeability coincident with geochemical values of copper-silver and zinc were also delineated in this area of interest.

In general, anomalous soil geochemical values and trends appear to relate directly to interesting geophysical features. Thus correlation of the geochemical data with the chargeability and electromagnetic anomalies and magnetic trends strongly indicates that the geochemical copper, zinc and silver anomalies are caused by copper, zinc and silver mineralization.

#### RECOMMENDATIONS

- 1. Conduct a limited amount of hammer seismic surveying in areas of interest
- 1 3 to evaluate overburden conditions.

- 2. Conduct a program of 3000 feet of reconnaissance diamond drilling in the following manner:
- Hole #1 to be collared at 76N 8 + 50W drilled West at an angle of  $60^{\circ}$  to a length of 400 feet. An additional 600 feet of drilling to be based on the above hole.
- Hole #2 to be collared at 112N 34W drilled East at an angle of  $60^{\circ}$  to a length of 400 feet. An additional 600 feet of drilling to be based on the above hole.
- Hole #3 to be collared at 112N-40E drilled West at an angle of 60° to a length of 400 feet. An additional 600 feet of drilling to be based on the above hole.
- 3. Due to the existing geochemical and geophysical trends in area A, extend the geochemical, geological and geophysical surveys into the southern portion of the claim group.
- 4. The total claim group should be kept in good standing until the full potential of the property has been determined.

Respectfully submitted,
TRI-CON EXPLORATION SURVEYS LTD.

Larry J. Anselmo-

G. L. Anselmo, President

Glen E. White, B.Sc.

Chief Geophysicist

### CERTIFICATE

- I, Garry L. Anselmo, DO HEREBY CERTIFY:
- That I am president of Tri-Con Exploration Surveys Ltd. with offices at Suite 200 1405 Hunter Street, North Vancouver, British Columbia, and a Consultant in Geochemical Exploration.
- That I studied Geology and Geochemistry at the University of British Columbia for three years and am a graduate of Simon Fraser University with the Degree of Bachelor of Arts.
- That I have been engaged in Mining Exploration for six years.
- That I have no direct, indirect or contingent interest in the Spook Claim Group or in Lobell Mines Ltd., nor do I intend to receive any such interest.
- That this report dated December 8, 1970 is based on information derived from a geochemical soil sampling program, induced polarization, ground electromagnetometer, magnetometer and geological surveys carried out by Tri-Con Exploration Surveys Ltd.

DATED at Vancouver, British Columbia, this 8th day of December, 1970.

TRI-CON EXPLORATION SURVEYS LTD.

G. L. Anselmo, B.A.

President

## CERTIFICATION

#### TO WHOM IT MAY CONCERN:

- I, GLEN ELMO WHITE, of the City of Richmond in the Province of British Columbia, hereby certify:
- That I am a Geophysicist and reside at 112 641 Gilbert Road, Richmond, B.C.
- That I studied Geophysics and Geology and graduated from the University of British Columbia with the degree of Bachelor of Science.
- 3. That I have been engaged in Mining Exploration for eight years.
- 4. That I do not have, nor do I expect to receive, either directly or indirectly, any interest in the property, or in the securities of Lobell Mines Ltd.
- 5. That this report is based on information derived from geological, induced polarization, ground electromagnetometer, magnetometer and geochemical soil sampling surveys carried out by Tri-Con Exploration Surveys Ltd.

Dated this 8th day of December, 1970.

G/ E. White, B.Sc. Chief Geophysicist

Buhb

## CERTIFICATE

- I Gregory R. Thomson, do hereby certify:
  - 1. That I am a graduate of the University of British Columbia with a Bachelor of Science Degree in Geology.
  - 2. That I have had exploration experience with a mining company as a field assistant.
  - 3. That the geology in this report is based on studies of maps and my personal field observations.
  - 4. That I am permanently employed by Tri-Con Exploration Surveys Ltd. in my professional capacity as geologist.

Dated at North Vancouver, British Columbia, this 8th day of December, 1970.

TRI-CON EXPLORATION SURVEYS LTD.

Geologist

G. R. Thomson, BSc.

## APPENDIX

## Instrument Specification

## MAGNETOMETER

## A Instrument

- (a) Type Fluxgate
- (b) Make Sharpe MF-1

## B Specifications

- (a) Measurement Vertical Magnetic Field
- (b) Range ±100 K gammas in 5 ranges
- (c) Sensitivity Maximum 20 gammas per scale division
- (d) Accuracy ±10 gammas

## C Survey Prodecures

- (a) Method One and one half hour loops
- (b) Corrections (i) Base
  - (ii) Diurnal
- (c) Station relationship each station read for intensity of vertical magnetic field.

### APPENDIX

#### Instrument Specification

## ELECTROMAGNETIC

## A. <u>Instrument</u>

(a) Type - Geotronics VLF - EM

## B. Specifications

Measurement

- (i) Utilizing the VLF primary magnetic fields generated by marine communication stations. Measures the dip-angle at the resultant magnetic field.
- (ii) Frequency range 12 24 KC's
- (iii) Sensitivity ± degree
- (iv) Method of reading-null detection visual means of an averaging field strength meter and dip-angle meter.

## C. Survey Procedures

- (i) Select VLF transmitting station in direction of geologic strike.
- (ii) Station plot-plot values read at station surveyed.

#### APPENDIX

## Instrument Specification

#### INDUCED POLARIZATION

#### A Instrument

- (a) Type Transient Pulse Prospecting Equipment
- (b) Make Hewitt Enterprises 200
- (c) Size  $13\frac{1}{2}$ "W x  $15\frac{1}{2}$ "L x  $9\frac{1}{2}$ " Deep

## B Specifications

- (a) Transmitter
  - (i) 1,000 Watt nickle cadnium battery supply
  - (ii) operation mode 2 seconds on, 2 seconds off, 2 seconds reverse
    - 4 seconds on, 4 seconds off, 4 seconds reverse
  - (iii) Cycles .5, 1, 2, 3, 4. selected on switch.
  - (iv) Timing solid state logic circuitry
  - (v) Current Ranges 10, 50, 100, 500, 1,000, 5,000, milliampere
- (b) Receiver
  - (i) Solid State
  - (ii) dV and I.P. solid state memory storage.
  - (iii) dV ranges 10, 50, 100, 1,000, 1,500 millivolts
  - (iv) I.P. ranges .1, .5, 1.0, 5, 10, 15, millivolts
  - (v) Self-potential-direct dial reading from polartometer
  - (vi) A.C. filtering-low pass active filter
  - (vii) Transient delay period .4 seconds
  - (viii) Integrating period 1.2 seconds
  - (ix) Power supply-four 9 volt transistor radio batteries.
- C Survey Procedure
  - (i) Wenner, pole-dipole or schlumberger array
- D Data Presentation
  - (i) chargeability percent chargeability in milliseconds or millivolts
    volt
  - (ii) Resistivity ohmn feet
  - (iii) Self-potential-millivolts often not used

## CERTIFICATE

- I, William G. Stevenson, DO HEREBY CERTIFY:
- That I am a Consulting Geological Engineer with offices at Suite 209 Stock Exchange Building, 475 Howe Street, Vancouver 1, B.C.
- That I am a graduate of the University of Utah 1946, with a B.Sc. Degree.
- That I am a registered Professional Engineer in the Association in British Columbia.
- That I have practised my profession for 22 years.
- That I have no direct, indirect or contingent interest in the Spook Mineral Claims or in the securities of Lobell Mines Ltd., nor do I intend to receive any such interest.
- That I have reviewed a geological, geophysical and geochemical report dated December 8, 1970 based on work conducted by Tri-Con Exploration Surveys Ltd. under the supervision of G. L. Anselmo, President and Glen E. White, B.Sc. Chief Geophysicist.

DATED at Vancouver, British Columbia, this th day of December, 1970.

W. G. STEVENSON & ASSOCIATES LIMITED Consulting Geologists

W. G. Stevenson, P. Eng.

## DOMINION OF CANADA:

PROVINCE OF BRITISH COLUMBIA.

# In the Matter of

To WIT:

GEOLOGICAL, GEOPHYSICAL & GEOCHEMICAL SURVEYS:

- ł, Garry L. Anselmo, president of Tri-Con Exploration Surveys Ltd.
- of #200 - 1405 Hunter Street, North Vancouver

in the Province of British Columbia, do solemnly declare that the following is a true statement of cost of combined surveys for report enclosed:

PERSONNEL	PERIOD	MAN DAYS	WAGES/DAY	TOTAL		
R. Mascoe	May 7-30, 1970	24	\$75	\$ 1800.00		
G. Thomson	May 7-30, 1970	24	\$60	\$ 1440.00		
J. Sheppe	May 7-June 19	44	\$65	\$ 2860.00		
K. Witherly	May 7-June 21	46	\$60	\$ 2760.00		
T. Swann	June 15-19	5	\$60	\$ 300.00		
R. Kimmins	May 7-June 21	46	\$40	\$ 1840.00		
E. Longland	May 7-June 21	46	\$40	\$ 1840.00		
H. Larson	May 7-June 21	46	\$40	\$ 1840.00		
C. Lahmer	May 7-June 19	44	\$40	\$ 1760.00		
G. McArthur	April 25-May 30	36	\$50	\$ 1800.00		
G. Gray	April 25-May 28	34	\$40	\$ 1360.00		
T. Atkins	April 25-May 28	34	\$40	\$ 1360.00		
D. Wallace	June 6-June 21	16	\$40	\$ 640.00		
	5/day/man					
	ays @ \$50/day					
	tal @ 30 days @ \$25/day					
Electromagnetometer Rental @30 days @ \$25/day						
Maps & Reports						
Secretarial			TOTAL	\$ 150.00 \$33893.00		
				177		

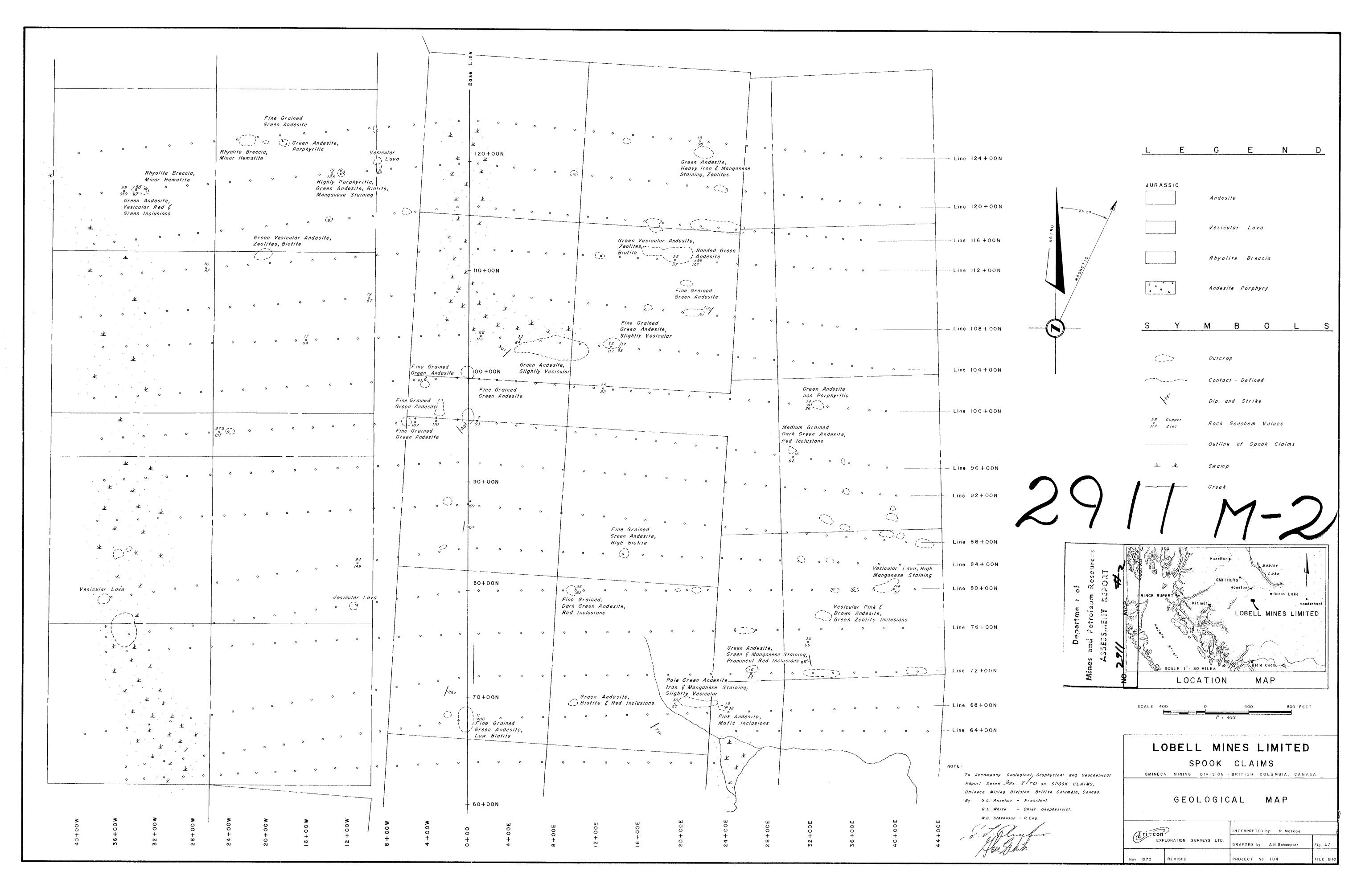
And I make this solemn declaration conscientiously believing it to be true, and knowing that it is of the same force and effect as if made under oath and by virtue of the "Canada Evidence Act."

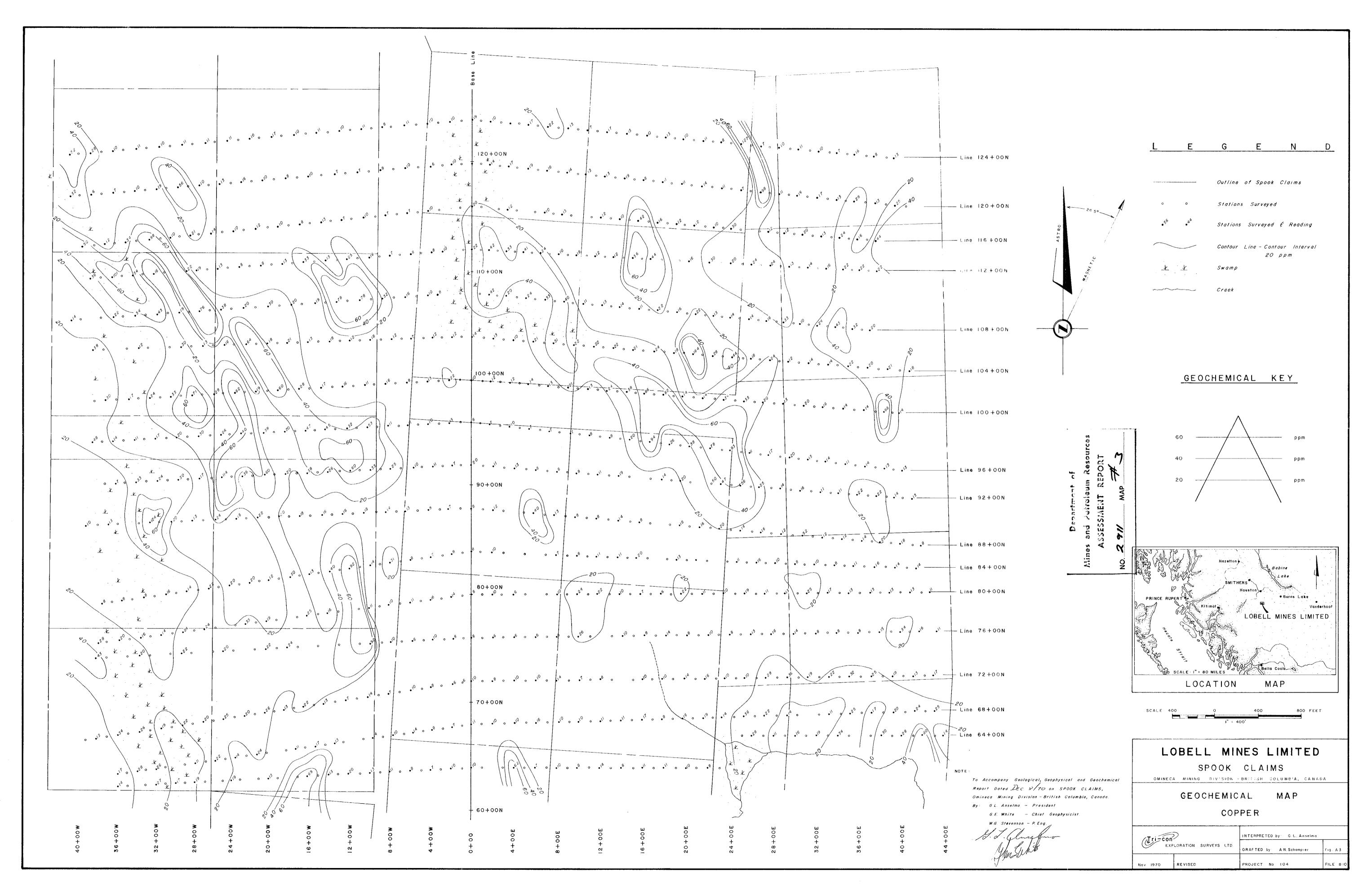
Declared before me at the let of Nancouver , in the Province of British Columbia, this

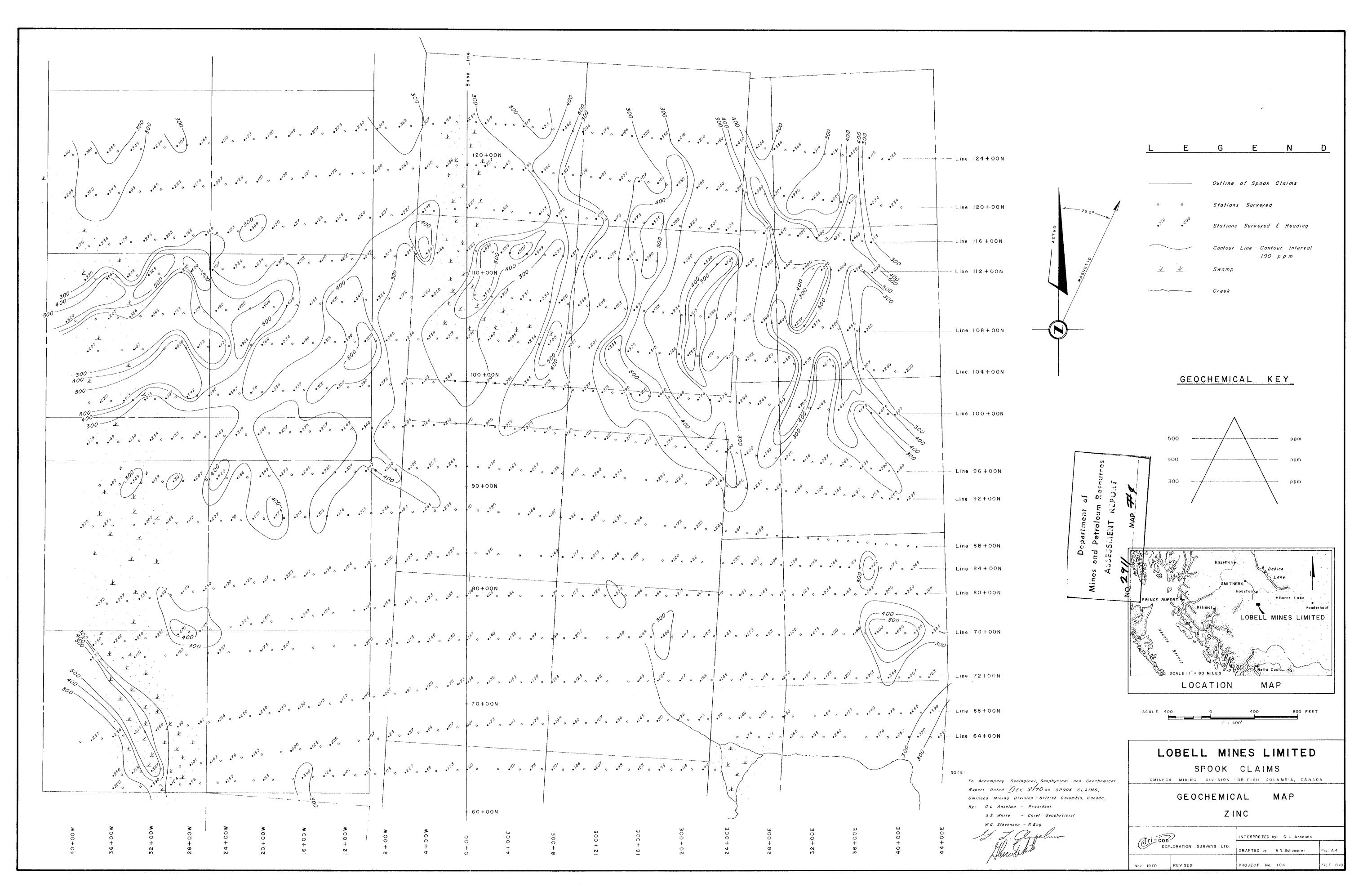
day of teturare

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

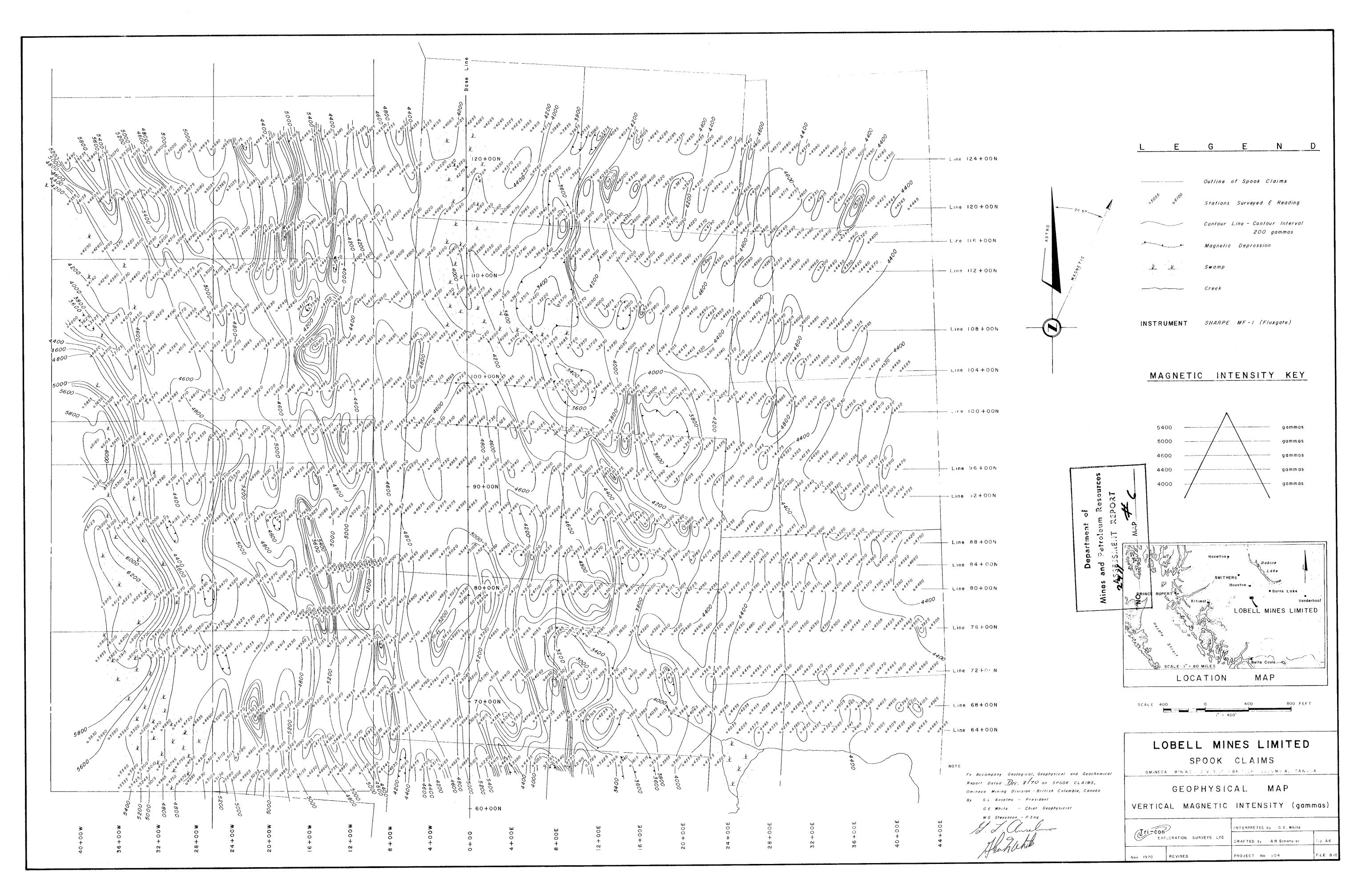
SUB - MINING RECORDER

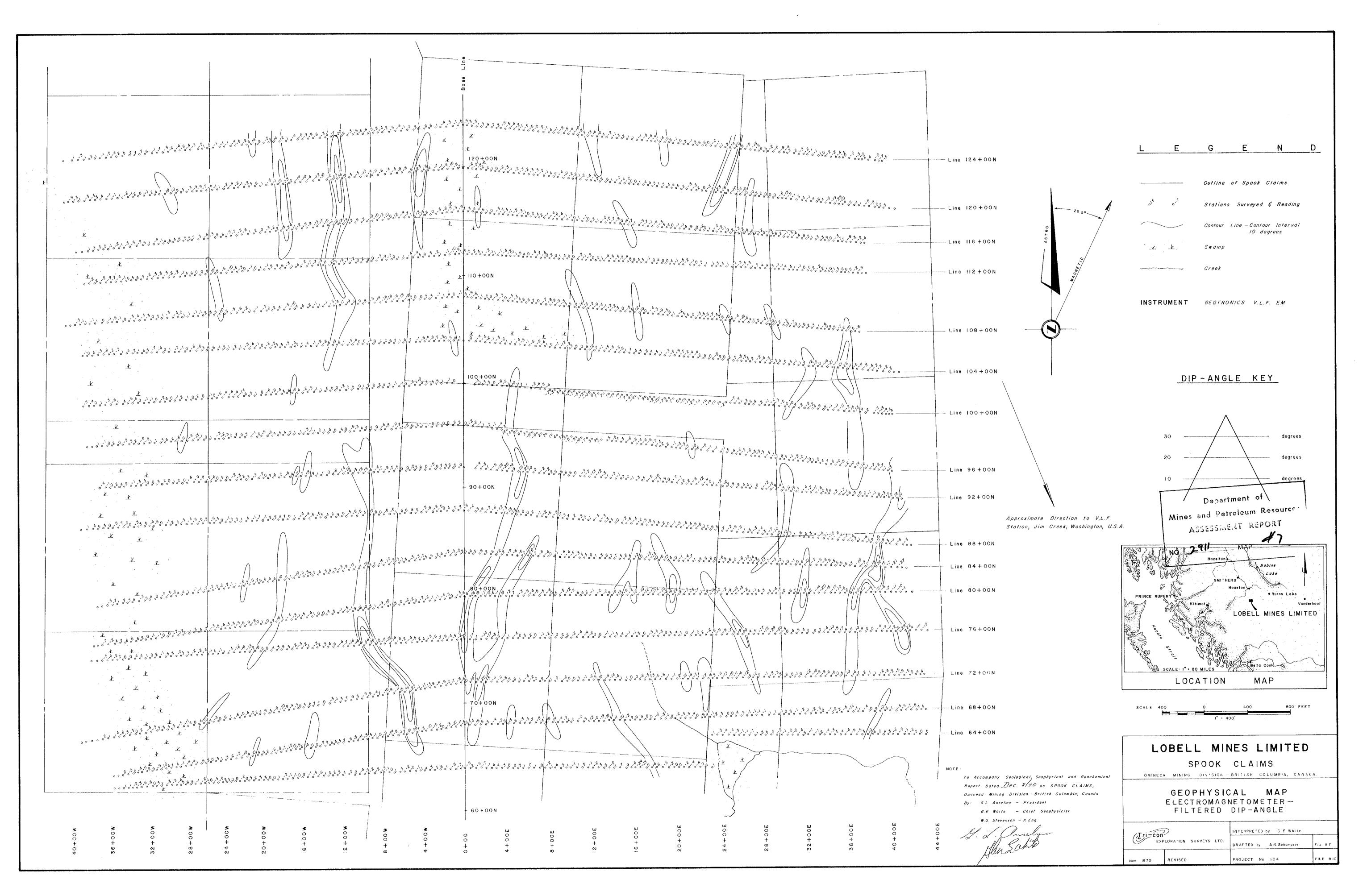


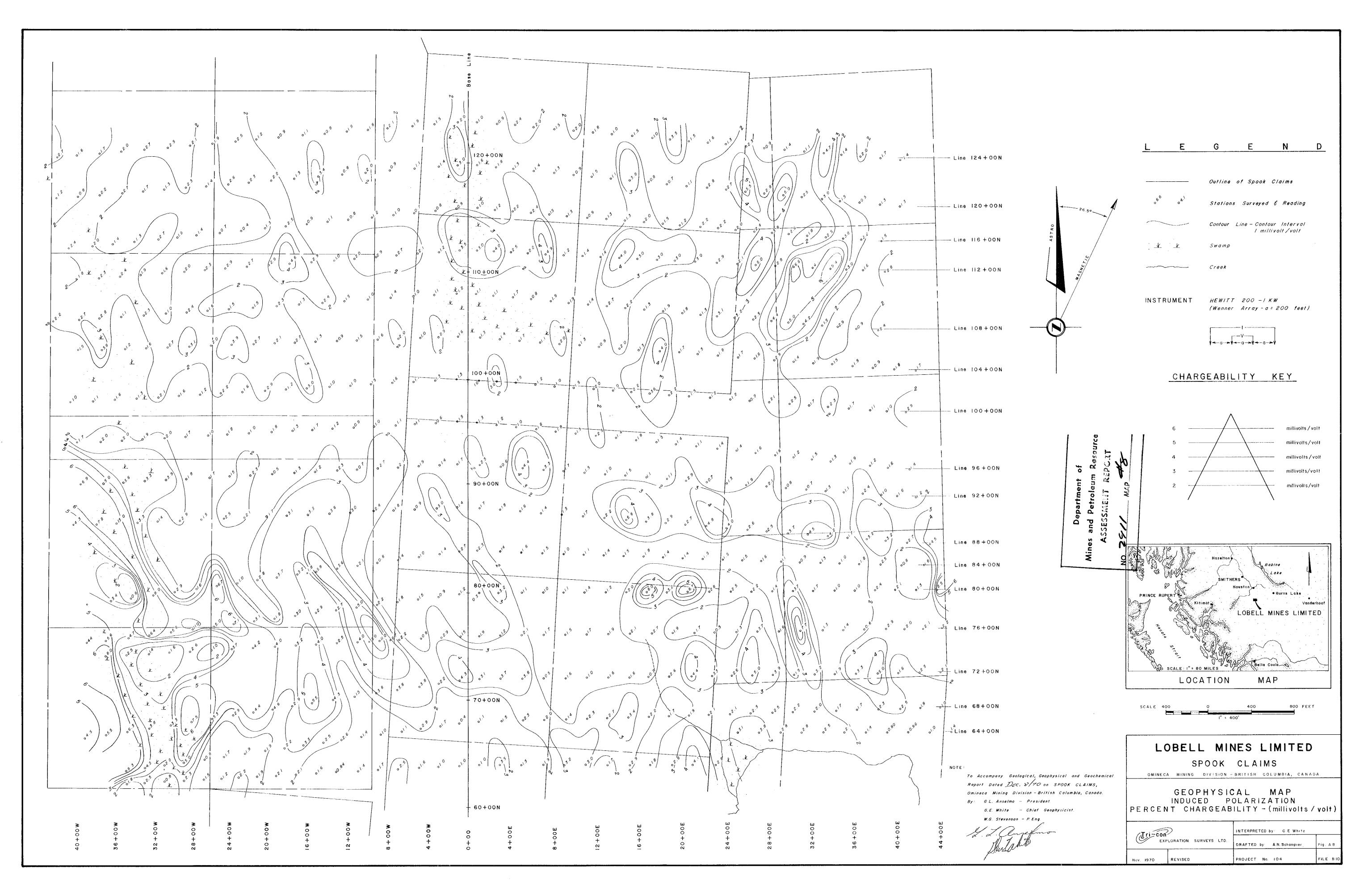


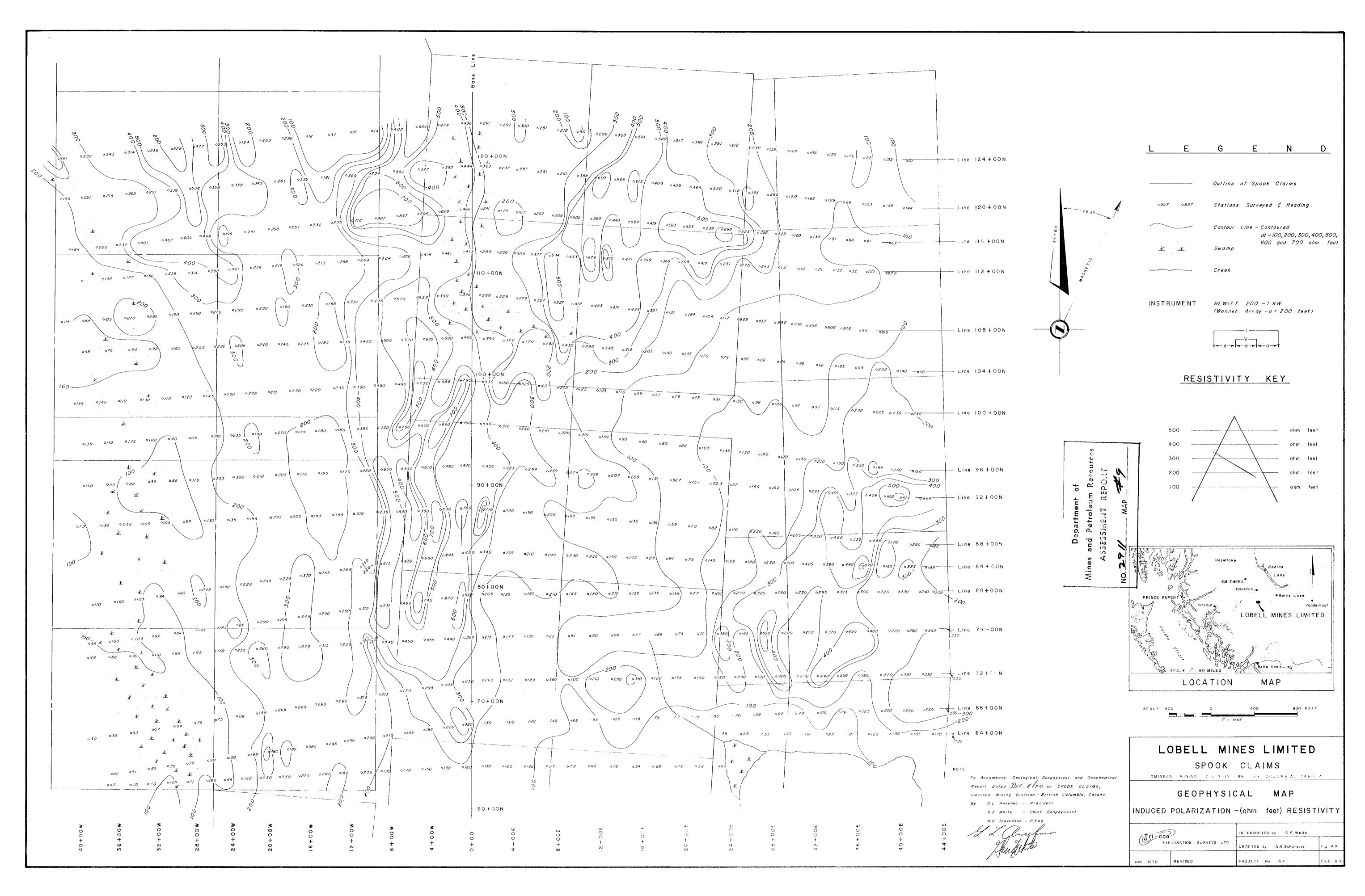


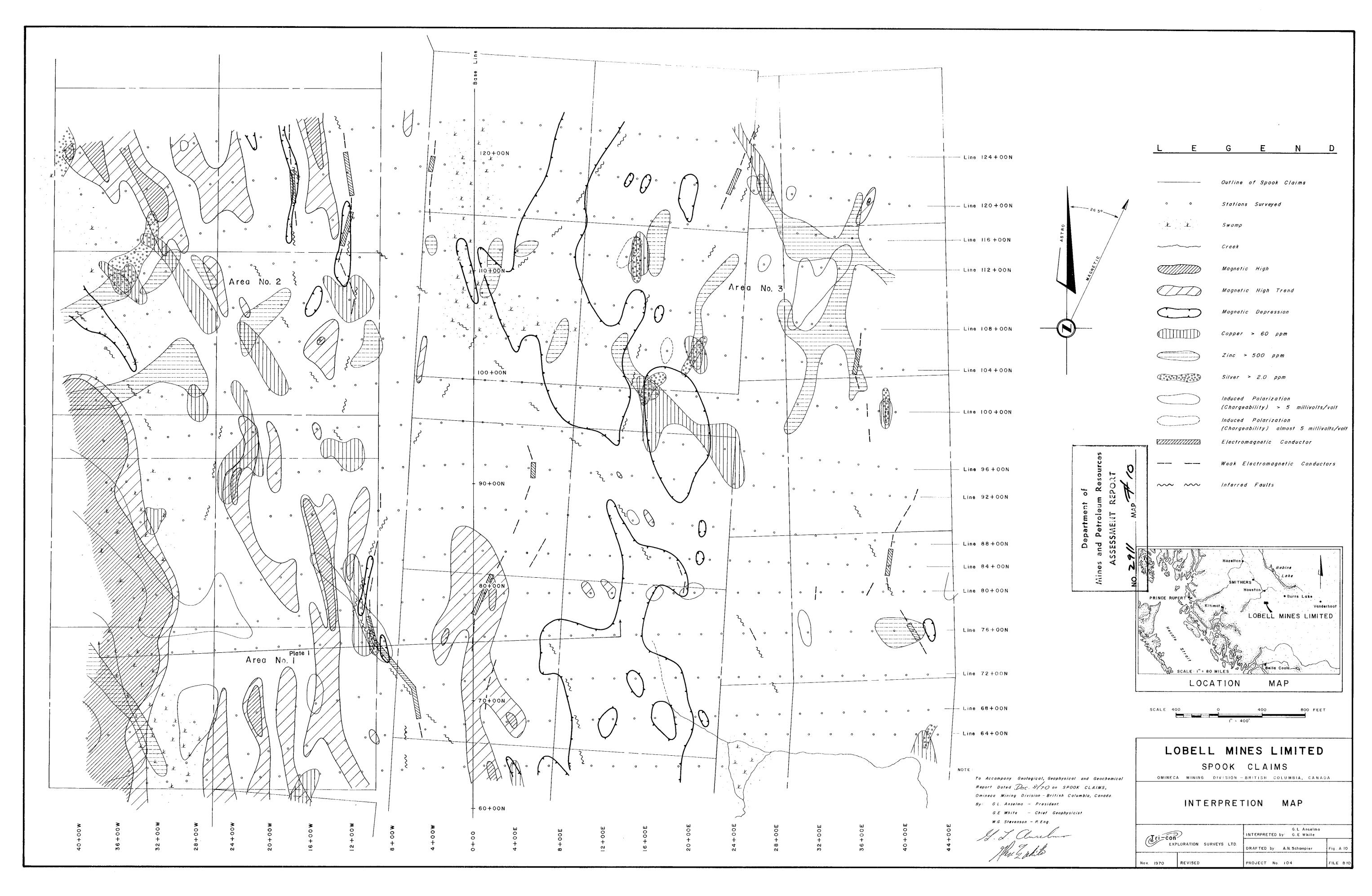


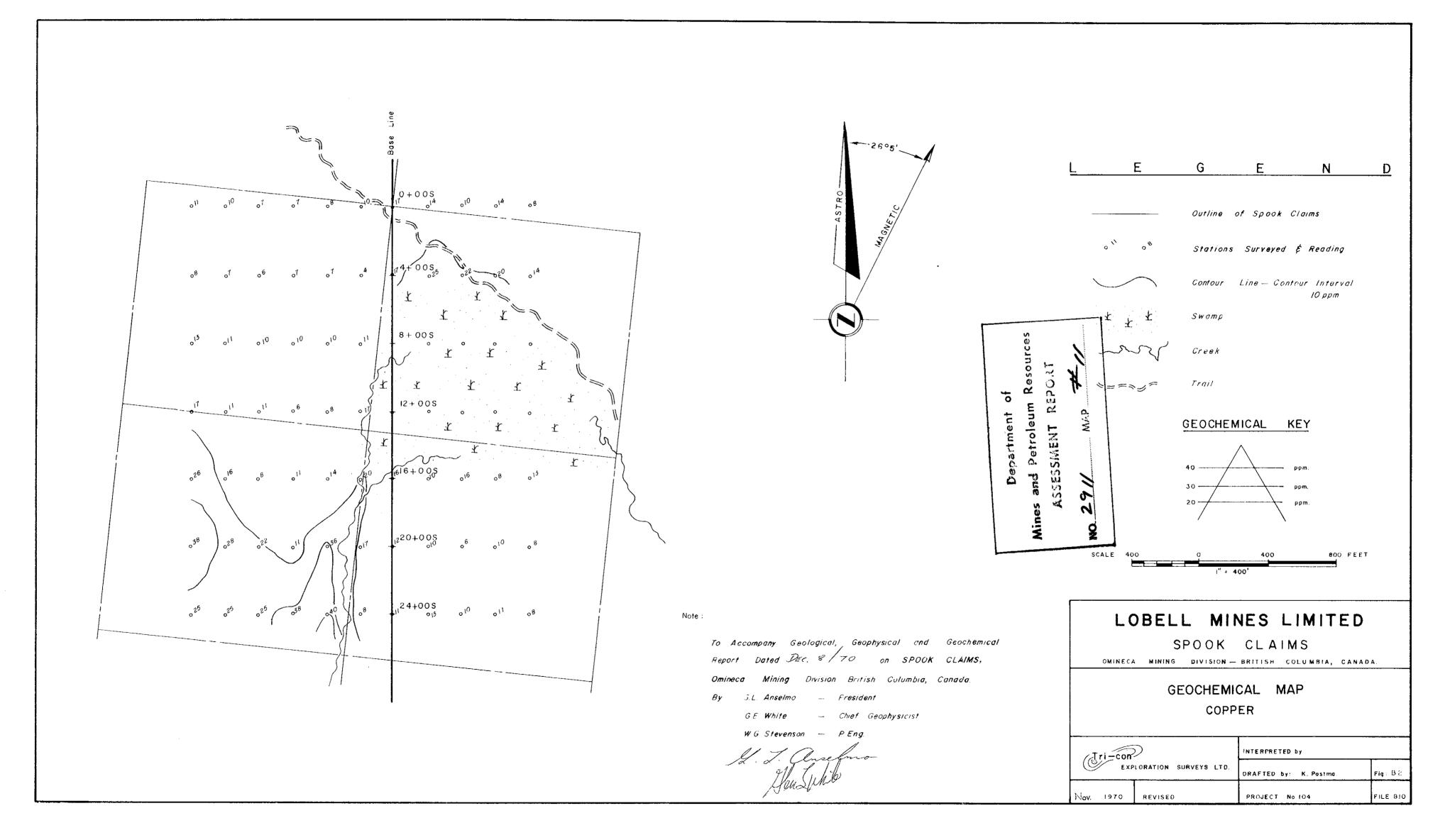


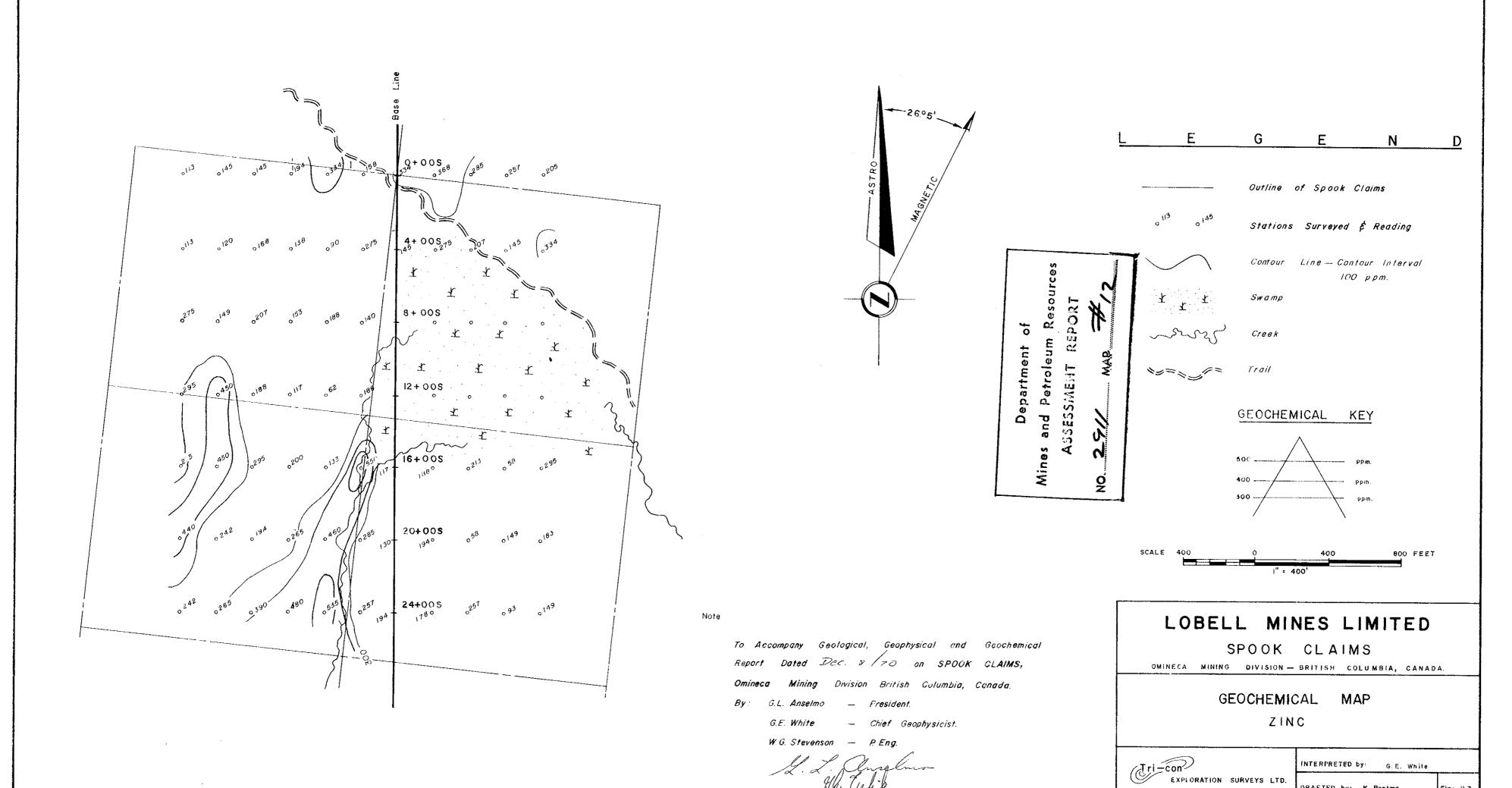












DRAFTED by: K. Postmo.

PROJECT No 104

Nov. 1970

REVISED

