ARIS SUMMARY SHEET

District Geologist, Victoria — Off Confidential: 89.03.18

ASSESSMENT REPORT 17223 — MINING DIVISION: Victoria

PROPERTY: Carol
LOCATION: LAT 48 34 03 LONG 124 18 30
UTM 10 5379985 403477
NTS 092C09W
CLAIM(S): Carol,Carol 1
OPERATOR(S): Sumatra Res.
AUTHOR(S): Cukor, V.;Cukor, D.
REPORT YEAR: 1988, 61 Pages
COMMODITIES SEARCHED FOR: Gold
GEOLOGICAL SUMMARY: The claims are underlain by quartzites, argillaceous quartzites and green schists of the Leech River Complex. Foliation is generally 090 degrees/30 degrees North to 090 degrees/50 degrees North. Alteration consists of silicification and chloritization. Mineralization consists of pyrite and hematite with some gold values.
WORK DONE: Geological,Geophysical,Geochemical,Physical
EMGR 38.3 km;VLF
Map(s) - 2; Scale(s) - 1:5000
GEOL 250.0 ha
Map(s) - 1; Scale(s) - 1:5000
LINE 38.3 km
MAGG 38.3 km
Map(s) - 2; Scale(s) - 1:5000
SOIL 337 sample(s) ;AU,AG
Map(s) - 4; Scale(s) - 1:5000
MINFILE: 092C ~~050~~

December 1987

SUMATRA RESOURCES INC.

CAROL & CAROL I MINERAL CLAIMS

Report on 1987 Exploration Program

D. CUKOR, geologist
V. CUKOR, P.Eng.

NVC ENGINEERING LTD. VANCOUVER, B.C.

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SUMATRA RESOURCES INC.

CAROL and CAROL 1 CLAIMS
Vancouver Island

1. INTRODUCTION

This Report is prepared at the request of Sumatra Resources Inc., to be used for submission on the Vancouver Stock Exchange for raising public funds for further exploration of the property.

The Report is based on the results of the exploration program performed by NVC Engineering Ltd. This consisted of linecutting, geological mapping and sampling, geochemical soil survey, VLF-EM survey and ground magnetic survey.

The program was exercised by a five man crew under the field management of D. Cukor, Geologist and the overall supervision of V. Cukor, P. Eng.

All samples were submitted for assay to General Testing Laboratories, Vancouver, British Columbia.

2. REVIEW

2.1 SUMMARY and CONCLUSIONS

The area is underlain by the rocks of the Leech River Complex comprised of metasediments and metavolcanics, intruded by stocks of dioritic rocks. The general area has a history of some gold production, mostly from gold placers. Recently, within the same complex, exploration has been carried out on numerous gold showings of which several have a potential to develop into small scale, high grade producers.

On the Carol Claims, prior to this program, limited prospecting and geochemical reconnaissance produced silt samples with anomalous gold.

The systematic geochemical survey during this program revealed some anomalous gold and/or silver. However, rechecking the geology of these areas and sampling of rock outcrops, where found, has not produced, as yet, any anomalous values. Proper prospecting and geological mapping is greatly hampered by cut timber, which makes access to areas beyond roads and grid lines very difficult.

The presence of electromagnetic anomalies has not yet been explained and these areas should be further prospected.

2.2 RECOMMENDATIONS

It is recommended to file assessment work on the property and follow up with prospecting of the conductive zones outlined by VLF survey. The areas of extreme high magnetic susceptibility should be further examined as well.

2.3 COST ESTIMATE

For the next step of the prospecting on the property it is recommended that a budget of about $10,000 be secured. This budget should allow a junior geologist or senior prospector with a helper to spend about 10 days on each of the two claims and provide sufficient funds for extensive assaying of necessary soil and rock samples.

3. PROPERTY

3.1 LOCATION

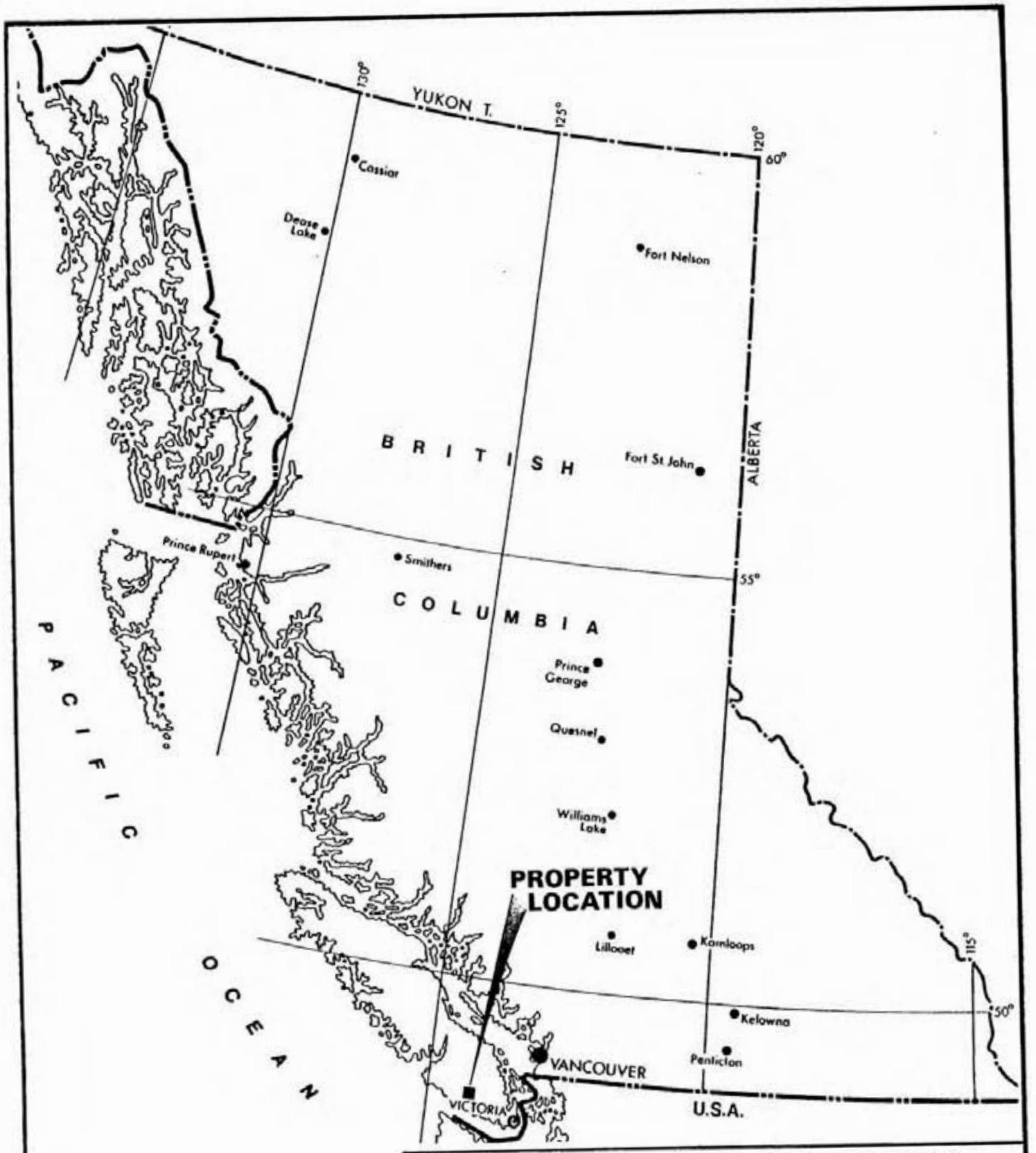
The Carol Claims are located at the southern tip of Vancouver Island, east and south of Port Renfrew. The Carol Claim straddles the West Coast Road (Provincial Highway No. 14) while Carol 1 Claim is located on Mosquito Creek. They are on NTS 92C - 9W in the Victoria Mining Division. The Carol Claim is at latitude 48° 32' N and longitude 124° 21' 30" W; Carol 1 is at latitude 48° 32' N and 124° 18' 30" W.

3.2 ACCESS

The claims are accessible from Victoria by the Victoria Port Renfrew Highway (No. 14) for a distance of 103 kilometres. The Carol Claim lies on the highway. The Carol 1 Claim is accessible via the main logging road (Red Creek Fir) which turns off the highway only a short distance east of Port Renfrew.

3.3 CLAIMS

Two hard rock mineral claims comprise the property. The claims were located on the modified grid system and are not contiguous. The claim and corresponding recording data are as follows:



SUMATRA RESOURCES INC.

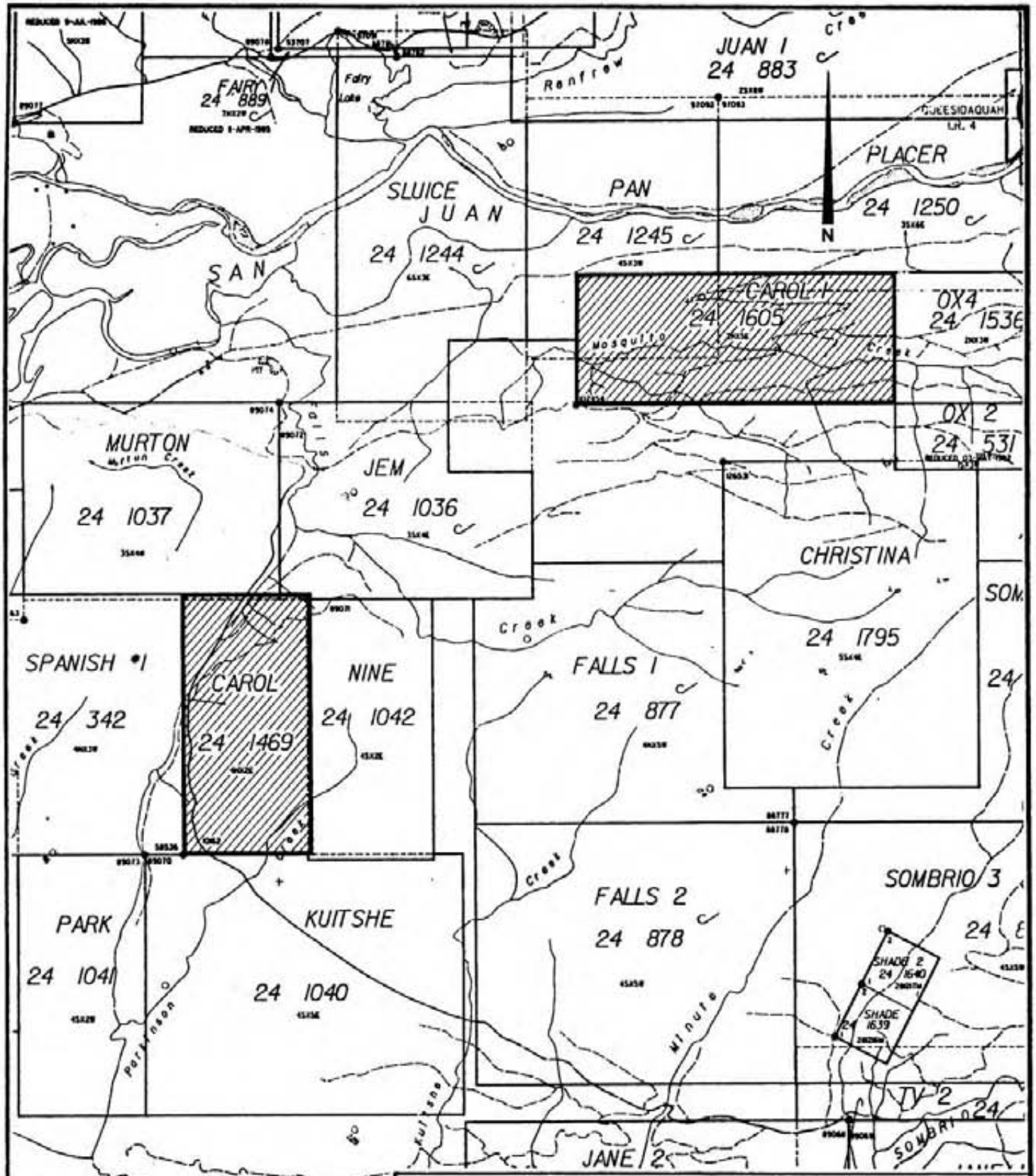
CAROL & CAROL I MINERAL CLAIMS

LOCATION MAP

VICTORIA M.D., B.C. NTS 92 C 9

V. CUKOR, P. Eng. NVC ENGINEERING Ltd. VANCOUVER, B.C.

DATE: Dec. 1987 SCALE: 0 100 200 km FIG: 1



SUMATRA RESOURCES INC.

CAROL & CAROL I MINERAL CLAIMS

CLAIM MAP

VICTORIA M.D., B.C. NTS 92 C 9

V. CUKOR, P. Eng. NVC ENGINEERING Ltd. VANCOUVER, B.C.

DATE: Dec. 1987 SCALE: 0 500 1000 metres FIG: 2

3.3 CLAIMS (Cont'd)

Claim	No. Units	Record No.	Record Date
Carol	8	1469	March 19, 1985
Carol 1	10	1605	November 15, 1985

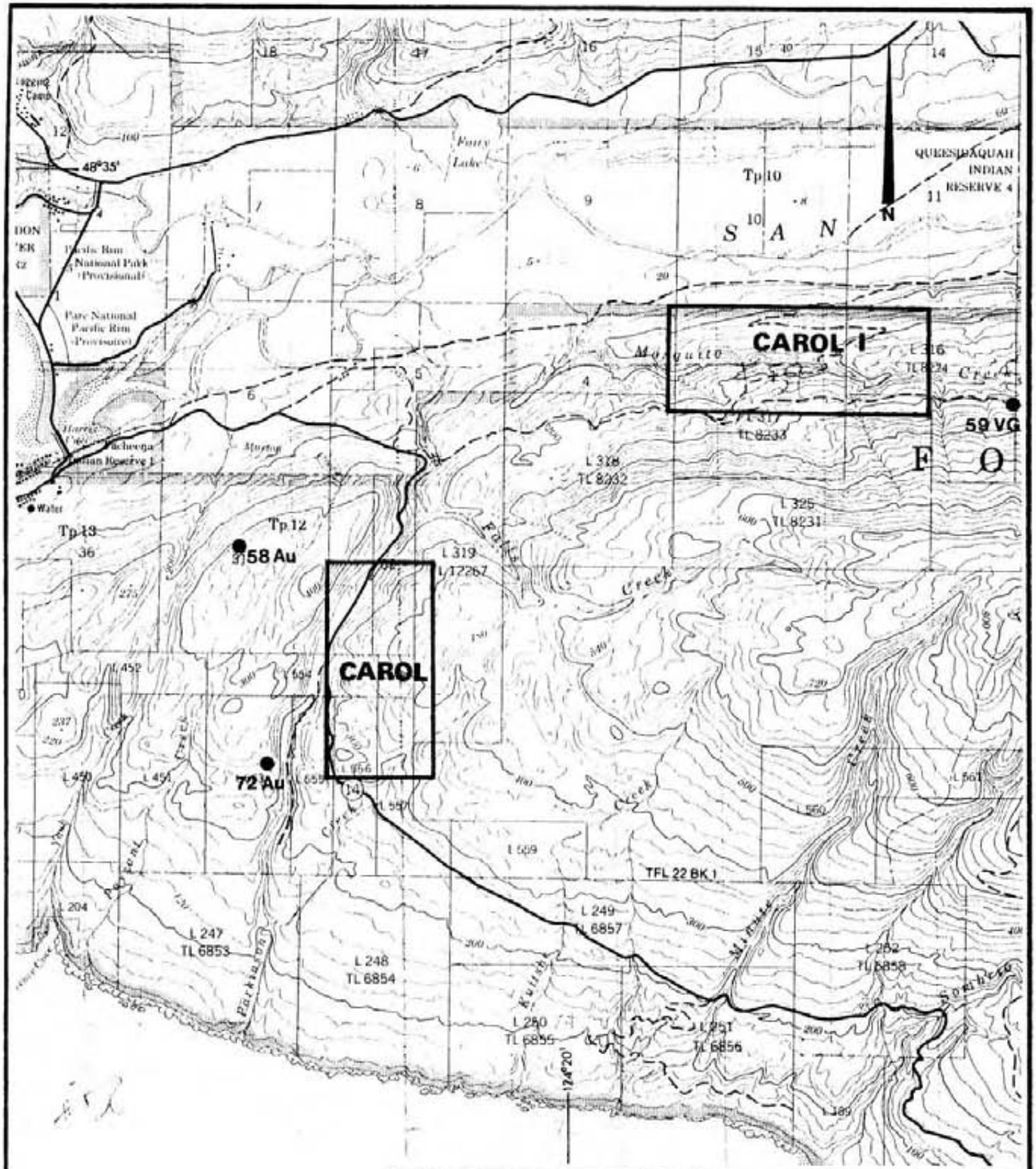
Sumatra Resources Inc. acquired 100% ownership of the claims.

3.4 TOPOGRAPHY and CLIMATE

Both claims are at low elevations which range between 120 - 400 metres above sea level. The topography is moderately rugged.

The claim area has the typical West Coast climate which is characterized with hot summers, moderately cold winters and an abundance of atmospheric precipitation. Snowfall on the property is very rare.

The area is overgrown by thick forest cover consisting mostly of cedar, spruce, fir and hemlock with thick underbrush. Both claims have been logged and then thickly overgrown by a dense second growth. This has been subsequently subjected to industrial thinning which now causes great difficulty for traversing the property. In preparation for surveys it caused extensive and expensive line cutting through the tangle of small timber cut and left on the site.



SUMATRA RESOURCES INC.

CAROL & CAROL I MINERAL CLAIMS

TOPOGRAPHY AND CLAIMS

VICTORIA M.D., B.C. NTS 92 C 9

V. CUKOR, P. Eng. NVC ENGINEERING Ltd. VANCOUVER, B.C.

DATE:	Dec. 1987	SCALE: 0 500 1000 metres	FIG: 3

4. HISTORY

The first placer gold discovery on the Leech River was made in 1864. Since that time gold has been recovered from a number of rivers and numerous small creeks. Although no production records were kept until 1924, it is estimated that gold production from the Sooke and Leech River areas, until 1974, exceeded $200,000.

From the start it was assumed that the gold had been brought by the glaciers and deposited in the glacial debris and later reworked and redeposited in the stream sediments as placer gold. Subsequently, metallic gold was found on numerous locations within the Leech River Complex. The best known within this complex are the showings of Beaupre Resources on Valentine Mountain where numerous samples containing visible gold were collected. One sample from the 17 cm. wide vein was reported to assay 24.95 oz/ton gold.

The immediate area of both Carol and Carol 1 Claims has been explored in the past. The Carol Claim was part of the Spanish Group which was prospected by JMT Services Corp. During that program numerous silt, soil and rock samples were collected, of which several were taken off the Carol Claim. The highest assay of the silt samples from the Carol Claim returned 140 ppb gold and 55 ppm arsenic. The claim was also surveyed as a part of the regional airborne EM survey, which outlined the short, east-west conductor in the middle of the

4. HISTORY (CONT'D)

claim. Just a short distance west of the Carol Claim two quartz veins, in slates, host gold values. The showings are listed in the B. C. Mineral Inventory under numbers 58 and 72.

The Carol 1 Claim was part of the Ox Group, where limited exploration was carried out in 1981 by Utah Mines. This consisted of limited sampling and some magnetic reconnaissance. Only a small portion of this work covered the Carol 1 Claim; most of the work was carried out on the surrounding claims. This work produced some excellent gold values from the area west of the claim, while several geochemical samples on the claim returned from 160 - 890 ppb gold. The Ox gold showing east of the Carol 1 Claim consists of quartz veins and aplitic dykes containing visible gold and is shown on the B. C. Mineral Inventory Map under number 59.

5. GEOLOGY

5.1 REGIONAL GEOLOGY

The regional geology of southern Vancouver Island is shown on the GSC Geology Map 1553 A, Geology, Victoria, by J. E. Muller 1980, scale 1:100,000 and on the GSC Map 821, Geology of Nitinat Lake by J. E. Muller, 1973-81, scale 1:125,000. A simplified map based on Muller is shown in the Report as Figure 4.

This map shows that the general area surrounding the Carol and Carol 1 mineral claims is underlain by the rocks of the Leech River Complex. This 75 km. long and generally east/west trending belt of late Jurassic to Cretaceous age consists mostly of metasediments and metavolcanics. The original rocks were metamorphosed to low temperature, moderate pressure facies - phyllite for metasediments and greenschist for the metavolcanics. The complex also includes metamorphosed pelites, sandstone, chert and conglomerate.

The rocks of the Leech River Belt are intruded by aplitic sills and dykes, mostly paralleling the schistosity. Numerous quartz veins carry pyrrhotite, arsenopyrite, pyrite mineralization which often host gold values. Some attractive samples with visible gold were found in this area.

Two major east/west fault zones are separating the

5.1 REGIONAL GEOLOGY (Cont'd)

Leech River Complex from the other stratigraphic units. To the north is San Juan Fault and to the south is Leech River Fault. Other secondary structures as well as schistosity of rock is mostly parallel to these major zones.

5.2 LOCAL GEOLOGY

The Carol Claim is generally underlain by quartzites and argillaceous quartzites; greenschist occurs in the northwest corner of the claim. The quartzites are a buff to grey colour and the greenschist is a dark green to almost black. On the Carol claim a fault is inferred to run at about 90°. It was observed on line 5 200 S with the metamorphic layers dipping at roughly 50° N on the south side of the fault and roughly 30° on the north side. Geophysics imply that this fault runs the width of the property. Another fault is inferred to run at approximately 340° and is located somewhere between 300 N and 500 N on line 3, separating the greenschist and the quartzites.

The Carol 1 Claim geology consists of a series of metasediments and metavolcanics with some minor intrusive. The metasediments are represented by the phyllites, shales and quartzites. Metasediments underlie the largest area of the property. The phyllites are a dark greenish-brown colour with fine grained mica between the foliated layers. Foliation

5.2 LOCAL GEOLOGY (Cont'd)

occurs in layers up to 3 mm wide. The phyllite varies from shaley phyllite to a true fully metamorphic rock, indeed the gradiation starts from the shale, all of which has been metamorphosed to varying degrees. The shale is dark grey to dark grey-brown to black. The dark grey shale is the most homogenous while the dark grey-brown contains some thin carbonaceous layers which appear through the rock. All of the shale and phyllite observed on the property had been subjected to drag folding which is 1 cm in amplitude and 5 to 10 cm. in width. The light grey quartzite varies in the degree of metamorphism and silicification. Most of this unit shows foliation. The chlorite schist and greenschist unit again vary in the severity of metamorphism from a greenschist, a product of a sheared greenstone, drab olive green in colour, to a severely sheared chlorite schist, in which chlorite is the main constituent. The colour of the chlorite schist varies from a dark olive to a fairly vivid dark green. The chlorite schist is a recessive unit.

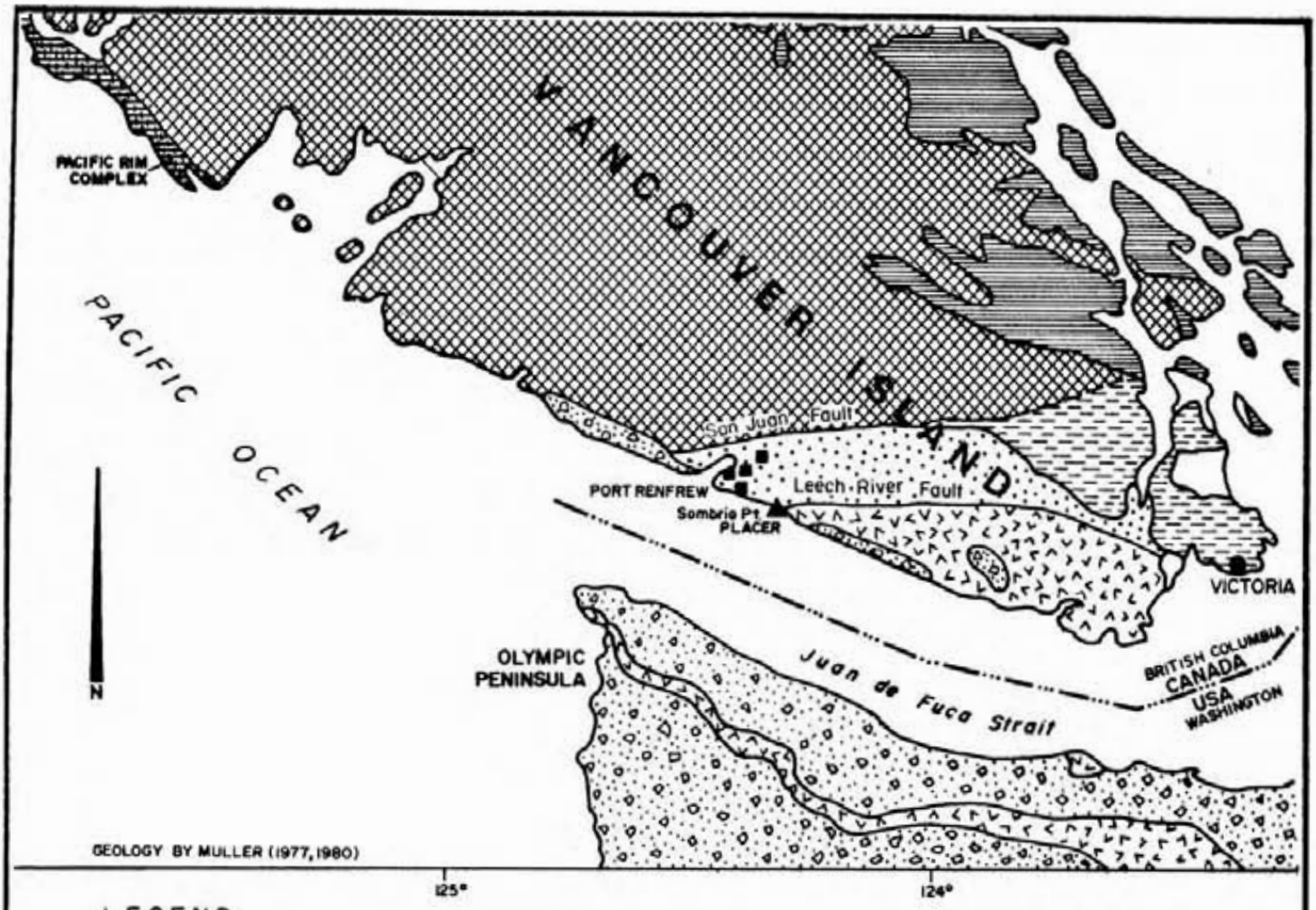
The intrusive varies from a diorite to a dioritic mylonite. The diorite is fine to medium grained with the mafics as 1 cm long plates of biotite or rods of hornblende. The intrusive is sheared to varying degrees from jointed and slightly sheared rock which is still recognizable as diorite to a light grey or a buff-grey mylonite with all primary

5.2 LOCAL GEOLOGY (Cont'd)

features destroyed.

Structurally, the geology of the Carol 1 Claim is dominated by the Mosquito Creek fault, likely a branch or a secondary fault between the San Juan and the Leech River faults. The metamorphic layering in the rocks on the property is semi parallel with the Mosquito Creek fault. The rock packages on the north and south sides of the creek appear to have been juxtapositioned; on the north side of the creek the rocks are more layered and occur in bands from tens to up to a couple of hundred metres wide. Moreover, the rock units do not continue across the creek canyon.

Several areas, where silicification was noted, were sampled but returned low values in both silver and gold.



LEGEND

- PALEOZOIC AND MEZOIC SEDIMENTARY AND INTRUSIVE ROCKS
- PALEOZOIC TO JURASSIC METAMORPHIC AND INTRUSIVE ROCKS
- LEECH RIVER COMPLEX
- MIDDLE JURASSIC TO MID CRETACEOUS SEDIMENTS
- UPPER CRETACEOUS STRATA (NANAIMO GROUP)
- LOWER TO MIDDLE EOCENE BASALTS
- TERTIARY CLASTIC SEDIMENTARY ROCKS
- ■ Au prospect
- ▲ Placer

SUMATRA RESOURCES INC.

CAROL & CAROL I MINERAL CLAIMS
GENERAL GEOLOGY

VICTORIA M.D., B.C. NTS 92 C 9

V. CUKOR, P. Eng. NVC ENGINEERING Ltd. VANCOUVER, B.C.

DATE: Dec. 1987 | SCALE: 0 25 km | FIG: 4

6. MAGNETIC SURVEY

6.1 FIELD METHOD

In preparation for geophysical and geochemical surveys a grid was cut on each of the Carol and Carol 1 claims. All lines had to be cut by a chain saw through a maze of the fallen timber left on the site after thinning of the second growth. This caused not only costly and time consuming cutting, but also made the attempts to prospect or sample areas beyond the cut grid lines, very difficult.

Survey lines were cut at 100 metre intervals and stations along the lines were picketed or flagged at 50 metre spacing. Readings were taken at 25 metre spacing.

The ground magnetic survey was run simultaneously with the VLF survey, both surveys utilizing the Scintrex IGS-II system. The part of the system dedicated to magnetics utilizes two console units, one set up as the base station, the other as the portable unit and two similar proton precession sensors measuring total magnetic field. A detailed description of the instrument is found in Appendix 1 at the end of this Report.

The base station and field unit are time synchronized so that the background field, diurnal variations and micropulses can be filtered from the data. The base station was programmed to measure the field and record the readings every two seconds.

6.2 DATA PRESENTATION

Two Magnetic Survey Plans, in the scale 1:5000 were prepared, one for each claim. The plans display magnetic readings, corrected for diurnal variations and then reduced by about 55000 gammas for easier handling. These relative readings were then contoured at 50, 100, 500 and 1000 gammas to outline general magnetic trends.

The Magnetic Survey Plan for the Carol Claim is appended to this Report as Figure 6, and the Magnetic Plan for the Carol 1 claim is Figure 7. Both plans are placed in the pocket at the end of this Report.

6.3 DISCUSSION OF RESULTS

Carol Claim

Most readings show moderate magnetic relief, except for the northeast corner of the claim where very high readings of up to 49,193.9 gammas were recorded. In general, magnetic trends follow the east-west direction coinciding with the geological structural trends in the area.

The zone of high reading, at the northeast claim corner also follows the same general east-west trend. This area of very high magnetic susceptibility coincides roughly with the VLF anomaly. However both gold and silver geochemical readings remained within the background values in this area.

6.3 DISCUSSION OF RESULTS (Cont'd)

Carol 1 Claim

The magnetic susceptibility on the Carol 1 claim well reflects the geology of the area. In the area south of Mosquito Creek the majority of readings are below 100 gammas, except for several smaller zones. This area is underlain generally by metasediments. North of the creek the majority of the readings are in the range between 100 - 500 gammas, well reflecting green schist (or chlorite schist) and volcanics. Several zones of over 500 gammas probably reflect underlying dioritic plugs. The sharp change in magnetic susceptibility of underlying rocks along Mosquito Creek shows most likely the presence of a strong, east-west trending fault zone, dividing the two different rock types.

Where any magnetic trends were suggested they seem to mostly follow the north-south direction, which in the area does not coincide with the general trend of geologic structure. This phenomenon has yet to be explored and explained.

7. VLF - ELETROMAGNETIC SURVEY

7.1 FIELD METHOD

The VLF - Electromagnetic Survey was run on the same grid as the soil geochemistry and magnetic surveys. Indeed the VLF and magnetics were run simultaneously utilizing the same Scintrex IGS-II system.

The Scintrex IGS unit was set up to receive two stations, NKL Seattle, Washington, 24.8 kHz and NAA Cutler, Maine, 24.0 kHz, measuring the horizontal field strength and the in-phase and out-of-phase or quadrature components of the vertical field. The instrumentuses a three coil system, one horizontal coil and two vertical coils, all at 90° angles to each other. The horizontal coil is used to scale the in-phase and quadrature readings to correct for changes in the strength of the VLF signal at different points on the property. The frequency reference needed to obtain quadrature readings is accomplished by using the magnetic field frequency, see Appendix 2.

7.2 DATA PRESENTATION

Two plans with stacked VLF profiles were drawn, one for each property. Scales for both are 1:5000. For the Carol 1 claim Seattle has been presented and for the Carol claim Hawaii has been presented.

The conductors have been interpreted and drawn, and the major ones labelled and described below.

7.3 DISCUSSION OF RESULTS

Carol Claim

This claim has a number of good conductors and a swarm of smaller, lesser conductors, see Figure 8.

Conductor 1 occurs in the vicinity of the cliff which is located at approximately 200 N on lines 4 through 8. A fault is interpreted to be coincident with this cliff and a stream runs through the gully at the base of the cliff. Some iron sulfides were noted in the area. However, soil geochemistry and rock sampling in the area have not been encouraging. The best corroboration of in phase and quadrature is found on lines 7 and 8 at about 150 N.

Conductor 2 gains strength toward the west. Again, no correlative support from the soil geochemistry or geology.

Conductor 3 is fairly weak and discontinuous, parallelling Conductor 1.

Conductor 4 is a 400 metre long conductor with a fairly poor corroboration of in phase and quadrature and is most likely caused by water.

Conductor 5 is a discontinuous conductor, with the strongest correlation of in phase and quadrature signals occurring on its western end near line 5. Again, no geological or soil geochemical support.

Conductor 6 is similar to Conductor 5, a discontinuous conductor with the best correlation of in phase and quadrature signals again on line 5.

7.3 DISCUSSION OF RESULTS (Cont'd)

Carol 1 Claim

Fairly poor response has been gained from the VLF survey over this claim. Only four conductors of any length occur on the property, see Figure 9.

Conductor A has a length of over 200 metres, but no correlation between in phase and quadrature readings. A small soil geochemical anomaly appears in the vicinity of the south end of the conductor, but with the lack of in phase and quadrature correlation it is unlikely that the conductor and the soil anomaly are connected.

Conductors B, C and D have lengths of over 100 metres each, but very poor correlation between in phase and quadrature signals. Conductor C has the best correlation of the signals but it is still poor, at best. No correlation with geology; a small silver soil geochemical anomaly close to Conductor B appears to be unrelated again due to no correlation between the in phase and quadrature.

8. GEOCHEMICAL SOIL SURVEY

8.1 FIELD METHOD

In preparation for sampling a grid was prepared on both the Carol and Carol 1 Claims. Lines were cut at 100 metre spacing with 50 metre intervals flagged as survey stations. Industrial thinning of the young forest made the cutting excessive, time consuming and costly.

Samples were taken from shallow pits dug by mattock, from the "B" horizon where developed. On some locations where poor soil was developed any fine material found was sampled. On several locations no sample was taken, where swampy ground or rock outcroppings were located.

All samples were packed in standard paper envelopes, marked and dried in the field. They were subsequently delivered to General Testing for further processing.

8.2 LABORATORY PROCEDURE

General Testing Laboratories reported to have processed samples in the following manner:

All samples were first oven dried. They were then screened to -200 mesh. A 10 gram portion of the fine fraction was then taken for fire assay. The bead produced was crushed, dissolved in aqua regia and assayed by Atomic Absorption for gold and silver.

8.3 DATA PRESENTATION

The claims, grid lines and all sample locations are shown on Geochemical Plans, scale 1:5000. Separate plans were prepared for gold and for silver values for the Carol and Carol 1 Claims, for a total of four plans.

All silver and gold assay results are plotted and anomalous values are contoured. Gold is expressed in parts per billion and silver assays are in parts per million.

8.4 DISCUSSION OF RESULTS

The assay results for both Carol and Carol 1 Claims were combined for a statistical evaluation. It was established that an anomalous threshold for gold is 30 ppb and significantly anomalous are all values larger than 50 ppb gold. For silver, anomalous threshold is 1.0 ppm and significantly anomalous are considered values over 1.5 ppm silver.

On the Carol Claim there are several small gold anomalies scattered over the grid area. The largest one is on the north side of the baseline along lines 3 and 4. The highest value in that anomaly is 180 ppb gold. The total size of the anomaly is about 600 metres length and about 100 - 120 metres in width.

The silver stayed in the background values over most

8.4 DISCUSSION OF RESULTS (Cont'd)

of the grid area. Several moderately high small anomalies are scattered over the northern part of the grid. None of these anomalies however coincide with any of the gold anomalies.

The Carol 1 grid also shows a number of gold and silver anomalies. The best gold anomalies seem to be in the northeast and northwest parts of the grid. The northeastern anomaly has a high reading of 260 ppb gold. It runs off the grid at its northeast corner, and to the south it runs toward Mosquito Creek gravel deposit. The northwestern anomaly might be connected with transported material in Mosquito Creek. The highest assay within this anomaly was 690 ppb gold.

Silver anomalies are mostly smaller in size and the values were not very high.

Subsequently high gold anomalies were examined in the field. Where outcrops were found and sampled very low gold and silver values were encountered.

Respectfully submitted,

D. Cukor, Geologist

V. Cukor, P. Eng.
NVC ENGINEERING LTD.

January, 1988

NVC engineering ltd.

304 - 1720 Barclay Street, Vancouver, B.C. V6G 1K4
Tel. (604) 688-7959

SUMATRA RESOURCES LTD

Vancouver, B.C.

December 30, 1987
Invoice # 509

Geological, geophysical and geochemical programs on the Carol and Carol 1 mineral claims - Vancouver Island;

Linecutting.....	$ 19,500.00
Geochemical soil sampling.....	4,600.00
Geophysical EM and Magnetic surveys, 44 km @ 500	22,000.00
Geological mapping, sampling, supervision of surveys	7,850.00
Equipment rental.....	2,500.00
Assays.....	6,760.00
Data compilation, drafting, report	6,175.00
Recording fee	150.00
Subtotal	$ 69,535.00
Engineering and management 15%	10,450.00
Total charges	$ 79,985.00

C E R T I F I C A T E

I, VLADIMIR CUKOR, of 304 - 1720 Barclay Street in the City of Vancouver, Province of British Columbia, DO HEREBY CERTIFY that:

1. I am a Consulting Geological Engineer with NVC Engineering Ltd., with business address as above;

2. I graduated from the University of Zagreb, Yugoslavia in 1963 as a Graduated Geological Engineer;

3. I am a Registered Professional Engineer in the Geological Section of the Association of Professional Engineers in the Province of British Columbia, Registration No. 7444;

4. I have practiced my profession as a Geological Engineer for the past 24 years in Europe, North America and South America in engineering geology, hydrogeology and exploration for base metals and precious metals;

5. I have supervised the work program on the Carol and Carol 1 claims;

6. I have no interest, direct or indirect, in the properties of Sumatra Resources Inc.;

7. I hereby consent to the use of this Report for the purpose of public financing.

V. Cukor, P. Eng.

December 1987

NVC ENGINEERING LTD.

CERTIFICATE

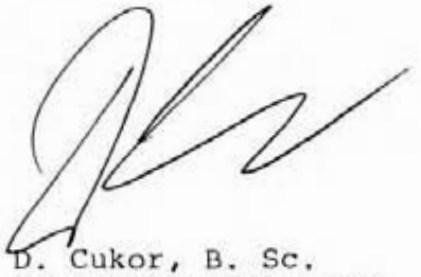
I, DAMIR CUKOR, of 6108 McKee Street, Burnaby, British Columbia, DO HEREBY CERTIFY that:

1. I graduated from the University of British Columbia in 1984 as a Bachelor of Science in Geology;

2. Since 1983 I have been employed as a geologist with NVC ENGINEERING LTD.;

3. I have worked in the field of exploration geology and geophysics for 12 seasons and have held positions of responsibility since 1982;

4. I performed and/or executed work as documented in this Report.



D. Cukor, B. Sc.
NVC ENGINEERING LTD.

January, 1988

APPENDIX 1

INSTRUMENTATION

THE IGS-2 SYSTEM

1.0 INTRODUCTION

1.1 General Information

The IGS-2 Integrated Geophysical System is a portable microprocessor-based instrument which allows more than one type of survey measurement to be performed by a single operator during a survey.

The IGS-2 is a modular system which can easily be configured to suit different and changing survey requirements. Reconfiguring the system is easy and offers both operational flexibility and minimal redundancy with a minimum number of spare consoles and/or modules.

When configured with any of the available sensor options, the IGS-2 System Control Console becomes a method-specific instrument according to the sensor option(s) utilized. In addition, the IGS-2 Console is an electronic notebook into which geophysical, geological or other data may be manually entered and digitally stored.

Data is stored in the IGS-2 in an expandable, solid state memory and can be output in the field by connecting the instrument to a printer, tape recorder, modem or microcomputer.

The 32 character digital display uses full words in most cases, ensuring clear communication. Both present and previous data are displayed simultaneously, allowing comparisons to be made at a glance during a survey.

The IGS-2 records header information, data values, station number, line number, grid number and the time of each observation in its internal memory. Data are first sorted by grid number, then in order of increasing line number and, within each line, by increasing station number. In this way, the data are organized logically regardless of the sequence in which they were taken. Ancillary data can also be manually entered and recorded at a given station, along with the survey parameters.

The IGS-2 may appear complex because of the new microprocessor-based technology employed in its design. However, it does not perform any operation that is, in principle, unfamiliar to an experienced operator. Only the procedures have changed. For instance, data can now be recorded in the memory of the IGS-2 by a

Figure IGS:1
The IGS-2 as Worn by an Operator

series of simple keystrokes, rather than recording measurements by hand in a notebook. Likewise, an error spotted in the records, which would be corrected or erased by hand, is now corrected by means of the Edit function which allows the error to be removed from memory, corrected, and then refiled, or erased altogether.

1.2 Product Updates

At Scintrex we are continually working in improve our line of products. You may be notified as important changes occur to either the software or hardware of our products. We would appreciate hearing from you if you are interested in our latest developments. We would also value hearing from you about any successes, or problems you may have encountered so that we may advise you.

THE MP-3/4 MAGNETOMETER

1.0 INTRODUCTION

1.1 General Outline

This section of the manual describes in detail the proton magnetometer method.

A theoretical explanation of the magnetic method is given first. Then the table MAG SETUP MENUS is presented for reference. After this, the following topics are dealt with in detail:

1) method enabling procedures,
2) measuring procedures,
3) warning messages,
4) equipment setup procedures,
5) troubleshooting information,
6) specifications and
7) parts list.

1.2 The Magnetic Method

The magnetic method consists of measuring the magnetic field of the earth as influenced by rock formations having different magnetic properties and configurations. The measured field is the vector sum of induced and remanent magnetic effects. Thus, there are three factors, excluding geometrical factors, which determine the magnetic field. These are the strength of the earth's magnetic field, the magnetic susceptibilities of the rocks present and their remanent magnetism.

The earth's magnetic field is similar in form to that of a bar magnet's. The flux lines of the geomagnetic field are vertical at the north and south magnetic poles where the strength is approximately 60,000 nT. In the equatorial region, the field is horizontal and its strength is approximately 30,000 nT.

The primary geomagnetic field is, for the purposes of normal mineral exploration surveys, constant in space and time. Magnetic field measurements may, however, vary considerably due to short term external magnetic influences. The magnitude of these variations is unpredictable. In the case of sudden magnetic storms, it may reach several hundred gammas over a few minutes. It may be

necessary, therefore, to take continuous readings of the geomagnetic field with a base station magnetometer while the magnetic survey is being done. An alternative field procedure is to make periodic repeat measurements at convenient traverse points, although this is a very unreliable method during active magnetic storms when it is important to have proper reference data.

The intensity of magnetization induced in rocks by the geomagnetic field F is given by:

$$I = kF$$

where I is the induced magnetization
k is the volume magnetic susceptibility
F is the strength of the geomagnetic field

For most materials, k is very much less than 1. If k is negative, the body is said to be diamagnetic. Examples are quartz, marble, graphite and rock salt. If k is a small positive value, the body is said to be paramagnetic, examples of which are gneiss ($k = 0.002$), pegmatite, dolomite and syenite. If k is a large positive value, the body is strongly magnetic and it is said to be ferromagnetic, for example, magnetite ($k = 0.3$), ilmenite and pyrrhotite.

The susceptibilities of rocks are determined primarily by their magnetite content since this mineral is so strongly magnetic and so widely distributed in the various rock types. (Of considerable importance, as well, is the pyrrhotite content.)

The remanent magnetization of rocks depends both on their composition and their previous history. Whereas the induced magnetization is nearly always parallel to the direction of the geomagnetic field, the natural remanent magnetization may bear no relation to the present direction and intensity of the earth's field. The remanent magnetization is related to the direction of the earth's field at the time the rocks were last magnetized. Movement of the body through folding, etc., and the chemical history since the previous magnetization are additional factors which affect the magnitude and direction of the remanent magnetic vector.

Thus, the resultant magnetization M of a rock is given by:

$$M = M_n + kF$$

where M_n is the natural remanent magnetization, and F is a vector which can be completely specified by its horizontal (H) and vertical (Z) components and by the declination (D) from true north. Similarly, M_n is specified when its magnitude and direction are known. Thus, considerable simplification results if $M_n = 0$, whereupon M merely reduces to kF. In the early days of magnetic

prospecting, it was usually assumed that there was no remanent magnetization. However, it has now been established that both igneous and sedimentary rocks possess remanent magnetization, and that the phenomenon is a widespread one.

1.2 Theory of Operation

The Very Low Frequency (VLF) Electromagnetic Method measures variations in the components of the electromagnetic fields, set up by communication stations operating in the 15 to 30 kHz frequency range. These stations, located around the world, generate signals for the purposes of navigation and communication with submarines.

In far field, above uniform earth, the groundwave of the vertically polarized VLF radiowave has three field components:

1) a radial, horizontal electrical field,
2) a vertical electrical field, and
3) a tangential, horizontal magnetic field.

When these three fields meet conductive bodies in the ground, eddy currents are induced causing secondary fields to radiate outwards from these conductors. In the Magnetic Field mode, the IGS-2/ VLF-4 measures the horizontal field and two components of the

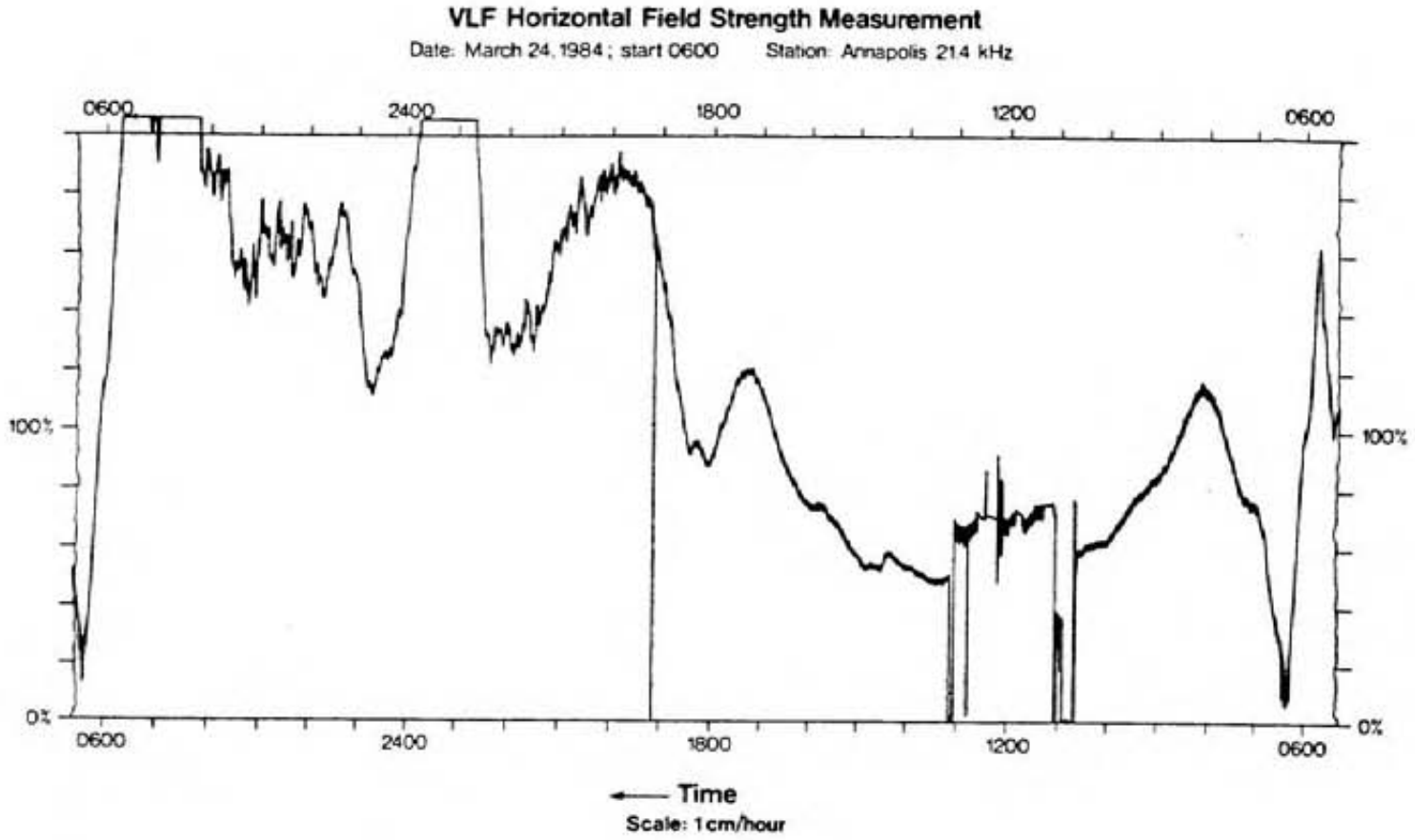


Figure VLF:1
Chart Recording of Primary Field Changing with Time

vertical field, normalized by the horizontal field measurement. In the Electrical Field mode, it measures the horizontal magnetic and electrical fields.

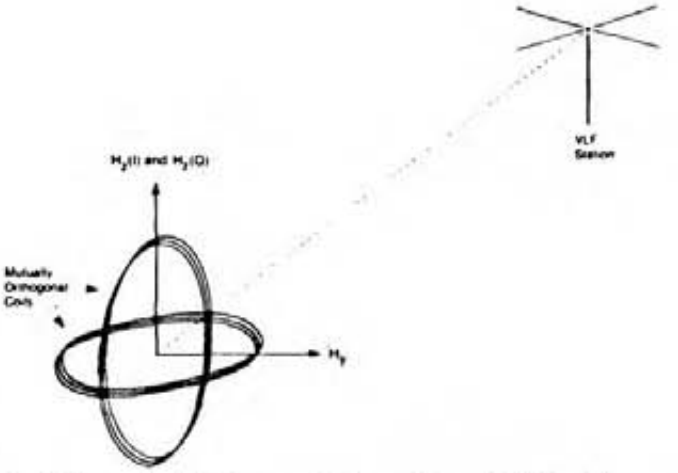
1.3 What the IGS-2/VLF-4 Measures

As its primary measurement, the IGS-2/VLF-4 employs two mutually orthogonal receive coils to determine three parameters of the VLF-magnetic field. These are: 1) the horizontal amplitude vector in a direction perpendicular to a line joining the operator to the station; 2) the amplitude of the component of the vertical field vector which is in phase with the horizontal vector; and 3) the amplitude of the component of the vertical field vector which is 90° out of phase with the horizontal vector. These three parameters, for the given VLF transmitter, are recorded simultaneously. Since the vertical components are expressed as a percentage of the horizontal vector, they are automatically normalized for any changes in the amplitude of the transmitted primary field.

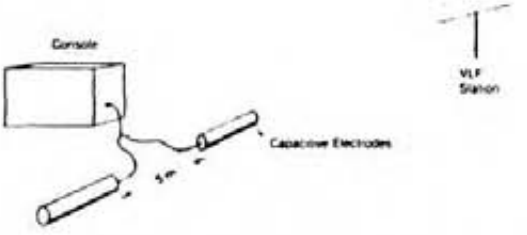
The primary field from a VLF station can in fact, vary considerably. Figure VLF:1 is a recording of the horizontal field strength from the Annapolis VLF station made in Toronto, Canada. For the most part, the field fluctuates moderately during the course of the day due to changes in atmospheric conditions. There are, however, more dramatic changes indicated on the recording. Towards evening there is a large upwards swing in the field strength, and at several points during the day, both partial and total drops in the field amplitude can be observed. In the light of these irregularities, the horizontal field data should always be considered with reservation as it is difficult to know whether changes are caused by conductors or by variations in the station's signal.

If the primary field strength is constant, changes in the amplitude of the horizontal magnetic field mainly reflect variations in the conductivity of the earth. Normally there will be no vertical magnetic field. However, near a conductor, a vertical field will be observed. The relative amplitudes of the in-phase and quadrature components may be used to interpret the conductivity-size characteristics of the conductor.

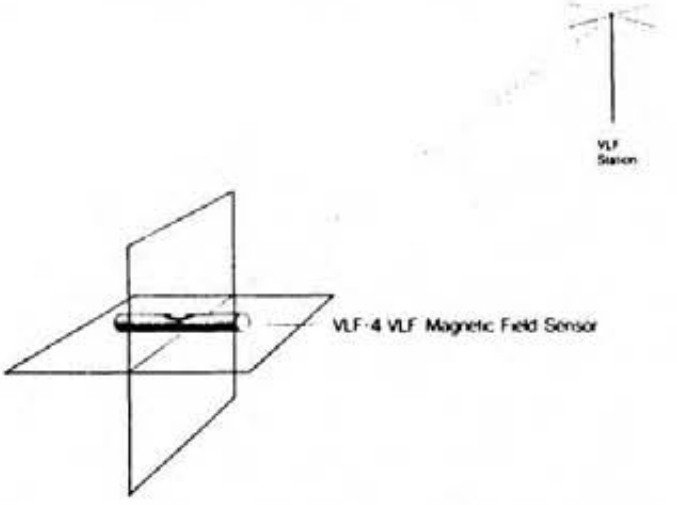
To permit measurement of the VLF-electric field, a dipole consisting of two cylindrical electrodes and 5 meters of wire is used. When this dipole is correctly laid out, the IGS-2/VLF-4 measures the in-phase and quadrature components of the horizontal electric field in the direction of the line joining the operator and the transmitter station. The phase reference is the horizontal magnetic field.



The VLF-magnetic field measurement comprises: 1) horizontal amplitude H_y, 2) the amplitude of $H_z(I)$ (the vertical field component which is in-phase with H_y) and 3) the amplitude of $H_z(Q)$ (the vertical field component which is 90° out-of-phase with H_y.



The VLF-4 is used to measure the in-phase $E_x(I)$, and quadrature $E_x(Q)$, components of the horizontal electric field, E_x, in the line joining the operator and the transmitter station. The phase is referenced to that of the horizontal magnetic field H_y. These components are not recorded but are used in the calculations of resistivity and phase made by the VLF-4.



An electronic level sensor on the axis of the horizontal vector receiver coil provides automatic side-to-side tilt compensation. The error in the vertical in-phase component is less than 1% for tilts up to 15° provided that the operator is facing the VLF station directly. Tilts in any other direction of up to 10° produce no significant error (1%) in the other components and, therefore, require no compensation.

Figure VLF:2
What the VLF-4 Measures

The IGS-2/VLF-4 uses the magnetic and electric field measurements to automatically calculate the apparent resistivity of the earth as well as the phase angle between the magnetic and electric field components. If the earth is uniform (not layered) within the depth of the VLF measurement, the phase angle between the horizontal magnetic and electric VLF fields will be 45 degrees. A non-uniform earth will give rise to other phase angles.

The following formulae are used for resistivity and phase calculations:

Apparent Resistivity Calculation:

$$\rho = \frac{1}{2\pi f \mu_o} \left| \frac{E_x}{H_y} \right|^2$$

where:

ρ = apparent resistivity in ohm-meters
E_x = horizontal electric amplitude, calculated
$E_x = (E_x(I)^2 + E_x(Q)^2)^{\frac{1}{2}}$
H_y = horizontal magnetic amplitude, measured
f = VLF station frequency in Hertz
μ_o = permeability of the ground in Henries/meter, a constant

The resistivity calculation has a range of 1 to 100,000 ohm-meters with a resolution of 1 ohm-meter.

Phase Angle Calculation
The phase angle ϕ is expressed as:

$$\phi = \text{arc tan} \frac{E_x(Q)}{E_x(I)}$$

where:

$E_x(Q)$ = horizontal quadrature VLF electric field.
$E_x(I)$ = horizontal in-phase VLF electric field, phase rferenced to the horizontal magnetic field, Hy.

The phase angle calculation has a range of -180° to +180° with a resolution of 1°. By definition the angle is positive when the electrical field leads the magnetic field.

9.0 SPECIFICATIONS

9.1 Standard Console Specifications

Digital Display	32 character, 2 line LCD display
Keyboard Input	14 keys for entering all commands, coordinates, header and ancillary information.
Languages	English plus French is standard.
Standard Memory	16K RAM. More than sufficient for a day's data in most applications.
Clock	Real time clock with day, month, year, hour, minute and second. One second resolution, ±1 second stability over 12 hours. Needs keyboard initialization only after battery replacement.
Digital Data Output	RS-232C serial interface for digital printer, modem, microcomputer or cassette tape recorder. Data outputs in 7 bit ASCII, no parity format. Baud rate is keyboard selectable at 110, 300, 600 and 1200 baud. Carriage return delay is keyboard selectable in increments of one from 0 through 999. Handshaking is done through X-ON/X-OFF protocol. Allows IGS-2 to act as a master for other instrumentation.
Analog Output	For a strip chart recorder. 0 to 999 mV full scale with keyboard selectable sensitivities of 10, 100 or 1000 units full scale.

Console Dimensions	240 x 90 x 240 mm includes mounted battery pack.
Weights	Console: 2.2 kg Console with Non-rechargeable Battery Pack; 3.2 kg. Console with Rechargeable Battery Pack: 3.6 kg.
Operating Temperature Range	-40°C to +50°C provided optional Display Heater is used below -20°C.
Power Requirements	Can be powered by external 12 V DC or one of the Battery Pack Options listed below.

9.2 Battery Pack Options

Battery Pack lifetime depends on which Battery Pack is selected, sensor(s) used, reading time and ambient temperature. Life expectancy would be 1 to 10, eight hour survey days.

Non-Rechargeable Battery Pack	Includes battery holder and 10 disposable 'C' cell batteries for installation on console. Used in low sensitivity total field magnetometry or VLF in temperatures above 0°C. Weight is 0.9 kg.
Rechargeable Battery Pack and Charger	Includes battery holder, 6 rechargeable, non-magnetic, sealed lead-acid batteries and charger for installation on console. Best for high sensitivity total field measurements, all gradient measurements and operation below 0°C. Pack weighs 1.3 kg. Charger specifications are: 140 x 95 x 65 mm, 115/230 V AC, 50/60 Hz, 20 VA, overload protected.

8.0 SPECIFICATIONS

8.1 Magnetometry Specifications

Total Field Operating Range	20,000 to 100,000 nT (1 nT = 1 gamma).
Gradient Tolerance For Total Field:	±5000 nT/m.
Total Field Absolute Accuracy	±1 nT at 50,000 nT ±2 nT over total field operating and temperature range.
Resolution	0.1 nT.
Tuning	Fully solid-state. Manual or automatic mode is keyboard selectable.
Reading Time	2 seconds. For portable readings this is the time taken from the push of a button to the display of the measured value.
Continuous Cycle Times	Keyboard selectable in 1 second increments upwards from 2 seconds to 999 seconds.

9.0 SPECIFICATIONS

Frequency Tuning	Automatic digital tuning. Can be tuned to any frequency in the range 15.0 to 29.0 kHz with a bandwidth of 150 Hz. Up to three frequencies can be chosen by keyboard entry for sequential measurements.
Field Strength Range	Fields as low as 100 mA/m can be received. In practice, background noise may require fields up to 5-10 times this level. Maximum received field is 2 mA/metre. These values are specified for 20 kHz. For any other frequency, calculate the above limits by multiplying by the station frequency in kHz and dividing by 20.
Signal Filtering	Narrow bandpass, low pass and sharp cut-off high pass filters.
Measuring Time	0.5 seconds sample interval. As many as 2^{16} samples can be stacked to improve measurement accuracy.
VLF-Magnetic Field Components Measured	1) Horizontal amplitude, 2) vertical in-phase component, and 3) vertical quadrature components. Vertical components are displayed as a percentage of horizontal component and are related in phase to the horizontal component. Their range is ±120%; reading resolution 1%.
VLF-Magnetic Field Sensor	Two air-cored coils in a backpack mounted housing with an electronic level for automatic tilt compensation. The error in the vertical in-phase component is less than 1% for tilts up to ±15°.

APPENDIX 2

VLF THEORY

APPENDIX 2

VLF THEORY

The signal transmitted by the VLF station is recorded by the vertical coils as:

$$Hp = A \sin wt; \quad Hs = B \cos (wt-\phi) \qquad (1.0)$$

where: Hp = primary signal
A = amplitude of primary signal
Hs = secondary (phase laged) signal
w = frequency
B = amplitude of secondary signal
t = time
ϕ = phase lag

These two received signals combine giving an ellipse, which has two axis corresponding to the maximum length and minimum width of the ellipse.

i.e. $$\frac{Hp^2}{A^2} + \frac{Hs^2}{B^2} - \frac{2\,HpHs \sin \phi}{AB} = \cos^2 \phi \qquad (2.0)$$

By measuring the angle from horizontal of the long axis of the ellipse, a conductor is located when this tilt angle is zero.

The Scintrex IGS VLF measures the primary vertical (in phase) Hp and the secondary (quadrature) Hs to obtain a conductor's location (from Hp) and the conductor's quality using both Hp and Hs.

i.e. $$o = \tfrac{1}{2} \tan^{-1} (2\,Hp/100\,(1 - e^2))$$

where o = tilt angle (degrees)
Hp = vertical in phase, expressed as a o/o
$$\phi = \tan^{-1} \frac{(Hp)}{(Hs)}$$

VLF THEORY (Continued)

where ϕ = phase lag (degrees)
Hp = vertical in phase (any units)
Hs = vertical quadrature (same units as Hp)

Since the quadrature readings require a magnetic field phase reference, using unpublished means, the phase lag value is untested and should be considered qualatative only, but it is likely reasonably precise (the readings are repeatable), but may or may not be accurate (the correct value).

CERTIFICATE OF ASSAY

Date: October 22, 1987
File: 8710-1652

SGS SUPERVISION SERVICES INC.
General Testing Laboratories Division
1001 East Pender Street,
Vancouver, B.C., Canada. V6A 1W2
Telephone: (604) 254-1647
Telex: 04-507514

TO: N.V.C. ENGINEEIRNG LTD.
Ste. 304 - 1720 Barclay Street
Vancouver, B.C.
V6G 2Y1

We hereby certify that the following are the results of assays on: Ore samples

MARKED	GOLD oz/st	SILVER oz/st	xxxx	xxxxxxxxx	xxxxxxxxx	xxxxxxxxx	xxxxxxxxx	xxxxx
976 QQ	0.002	0.06						
977 QQ	0.005	0.08						
978 QQ	0.002	0.05						
979 QQ	0.002	0.10						

NOTE: REJECTS RETAINED ONE MONTH. PULPS RETAINED THREE MONTHS ON REQUEST PULPS AND AND REJECTS WILL BE STORE FOR A MAXIMUM OF ONE YEAR.

L. Wong
PROVINCIAL ASSAYER

CERTIFICATE OF ASSAY

Date: October 5, 1987

File: 8709-2356

SGS SUPERVISION SERVICES INC.
General Testing Laboratories Division
1001 East Pender Street,
Vancouver, B.C., Canada. V6A 1W2
Telephone: (604) 254-1647
Telex: 04-507514

TO: N.V.C. ENGINEERING LTD.
Ste. 304 - 1720 Barclay St.,
Vancouver, B.C.
V6G 2Y1

We hereby certify that the following are the results of assays on: soil samples

MARKED	GOLD Au (ppm)	SILVER Ag(ppm)	Copper Cu (ppm)	xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx
Base Line L#1 :				
0+00W	0.05	1.0	8	
0+50W	0.03	0.9	9	
L #1 :				
1+00W	0.02	0.8	17	
1+50W (side creek)	0.02	0.8	21	
2+00W	0.02	0.6	10	
2+00 creek W	0.02	0.5	11	
2+50W	0.02	1.3	8	
3+00W	0.03	0.6	11	
3+50W	0.02	0.4	18	
4+00W	0.03	0.6	14	
4+50W	0.04	0.8	24	
5+00W	0.02	0.8	18	
5+50W	0.02	0.5	15	
6+00W	0.02	0.8	19	
6+50W	0.03	1.3	15	
7+00W (A)	0.02	0.9	14	
7+00W (B)	0.03	1.0	11	
7+50W	0.02	0.8	10	
8+00W	0.02	0.9	10	
9+00W	0.02	1.0	9	
9+50W	0.02	0.5	15	
10+00W	0.02	0.6	14	
10+50W	0.02	0.6	11	
11+00W	0.02	0.6	13	
11+50W	0.03	0.5	19	
12+00W	0.02	0.4	16	
12+50W	0.03	0.8	15	
B.L. C-1 :				
0+50S	0.02	0.8	28	
2+50S	0.02	1.0	19	
3+50S	0.03	0.6	15	
4+50S	0.03	1.2	23	
5+00S	0.03	1.0	20	

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NOTE REJECTS RETAINED ONE MONTH PULPS RETAINED THREE MONTHS ON REQUEST PULPS AND REJECTS WILL BE STORE FOR A MAXIMUM OF ONE YEAR

L. Wong
PROVINCIAL ASSAYER

CERTIFICATE OF ASSAY

Date October 5, 1987

File 8709-2356

SGS SUPERVISION SERVICES INC.
General Testing Laboratories Division
1001 East Pender Street,
Vancouver, B.C., Canada V6A 1W2
Telephone (604) 254-1647
Telex 04-507514

TO: N.V.C. ENGINEERING LTD.
Ste. 304 - 1720 Barclay St.,
Vancouver, B.C.
V6G 2Y1

32470

We hereby certify that the following are the results of assays on: soil samples

MARKED	GOLD Au (ppm)	SILVER Ag(ppm)	Copper Cu (ppm)	xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx
L#1, C-1 :				
0+50E	0.01	1.5	9	
1+00E	0.02	1.0	15	
1+50E	0.02	0.4	8	
2+00E	0.02	0.4	10	
2+50E	0.03	0.9	9	
3+00E	0.03	0.5	17	
3+50E	0.02	0.8	14	
4+50E	0.02	0.5	8	
5+00E	0.06	0.3	7	
6+00E	0.04	0.5	7	
6+50E	0.02	0.5	6	
7+00E	0.03	0.4	8	
7+50E	0.03	0.3	12	
8+50E	0.01	0.5	25	
9+00E	0.03	0.5	18	
9+50E	0.02	0.3	20	
10+00E	0.03	0.5	11	
B.L. #2 0+00W	0.03	0.5	35	
L #2 :				
0+50W	0.02	0.3	13	
1+00	0.08	0.3	9	
1+50W	0.02	0.8	9	
2+00W	0.03	0.3	8	
2+50W	0.03	0.4	10	
3+00W	0.03	0.4	9	
3+50W	0.02	0.2	5	
4+00W	0.03	0.3	5	
4+50W	0.01	0.6	30	
5+50W	0.03	0.8	19	
6+00W	0.01	1.2	21	
7+00W	0.02	0.9	9	
7+50W	0.03	0.9	10	

/ contined on page 3 .....

NOTE: REJECTS RETAINED ONE MONTH. PULPS RETAINED THREE MONTHS. ON REQUEST PULPS AND REJECTS WILL BE STORE FOR A MAXIMUM OF ONE YEAR.

L. Wong
PROVINCIAL ASSAYER

CERTIFICATE OF ASSAY

Date: October 5, 1987

File: 8709-2356

SGS SUPERVISION SERVICES INC.
General Testing Laboratories Division
1001 East Pender Street,
Vancouver, B.C., Canada V6A 1W2
Telephone: (604) 254-1647
Telex: 04-507514

TO: N.V.C. ENGINEERING LTD.

(page 3)

We hereby certify that the following are the results of assays on: soil samples

MARKED	GOLD Au (ppm)	SILVER Ag(ppm)	Copper Cu (ppm)	xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx
L #2 :				
8+00W	0.03	0.6	8	
8+50W	0.02	0.6	7	
9+00W	0.02	0.5	8	
9+50W	0.04	0.8	12	
10+00W	0.02	0.6	10	
10+50W	0.02	0.6	9	
11+00W	0.02	0.5	11	
11+50W	0.02	0.4	7	
12+00W	0.02	0.9	6	
12+50W	0.02	0.9	12	
13+00W	0.02	1.3	10	
L #2 C-1 :				
0+50E	0.03	1.2	8	
1+00E	0.02	0.6	5	
1+50E	0.02	0.8	6	
2+00E	0.03	0.6	6	
3+00E	0.02	0.9	11	
4+00E	0.03	0.8	13	
4+50E	0.02	1.2	19	
5+00E	0.02	0.8	9	
6+00E	0.03	0.8	22	
6+50E	0.02	0.8	24	
7+00E	0.02	0.6	11	
7+50E	0.03	0.5	21	
8+00E	0.04	0.9	18	
8+50E	0.03	0.9	15	
9+00E	0.02	0.6	7	
9+50E	0.03	0.5	14	
10+00E	0.06	0.8	13	
11+00E	0.03	1.0	12	
11+50E	0.03	0.8	21	
12+00E	0.03	0.9	11	

/ continued on page 4 .....

NOTE REJECTS RETAINED ONE MONTH PULPS RETAINED THREE MONTHS ON REQUEST PULPS AND REJECTS WILL BE STORE FOR A MAXIMUM OF ONE YEAR

L. Wong
PROVINCIAL ASSAYER

CERTIFICATE OF ASSAY

Date October 5, 1987

File 8709-2356

SGS SUPERVISION SERVICES INC.
General Testing Laboratories Division
1001 East Pender Street
Vancouver, B.C., Canada V6A 1W2
Telephone (604) 254-1647
Telex: 04-507514

TO: N.V.C. ENGINEERING LTD.

(page 4)

We hereby certify that the following are the results of assays on: soil samples

MARKED	GOLD Au (ppm)	SILVER Ag(ppm)	Copper Cu (ppm)	xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx
L #3 :				
0+50W	0.03	0.9	15	
1+00W	0.01	0.6	21	
1+50W	0.03	0.6	16	
2+00W	0.02	1.0	27	
2+50W	0.03	0.9	13	
3+00W	0.04	0.8	32	
3+50W	0.03	0.6	13	
4+50W	0.03	0.9	8	
5+00 W	0.03	0.8	12	
5+50W	0.01	0.6	23	
6+00W	0.04	0.6	25	
11+00W	0.03	1.0	9	
11+50W	0.03	0.8	7	
L #4 :				
0+50W	0.03	0.5	14	
1+00W	0.02	0.8	11	
1+50W	0.03	0.6	6	
2+00W	0.03	0.5	6	
2+50W	0.04	0.3	2	
3+00W	0.03	0.3	2	
3+50W	0.03	0.4	1	
4+00W	0.03	0.5	3	
4+50W	0.03	0.4	3	
5+00W	0.02	0.6	5	
5+50W	0.03	0.3	7	
6+00W	0.02	0.4	4	
L #4 C-1 :				
6+50W	0.02	0.5	4	
7+00W	0.02	0.6	3	
7+50W	0.02	0.4	2	
8+00W	0.02	1.0	14	

/ contined on page 5 ....

NOTE REJECTS RETAINED ONE MONTH PULPS RETAINED THREE MONTHS ON REQUEST PULPS AND REJECTS WILL BE STORE FOR A MAXIMUM OF ONE YEAR

L. Wong
PROVINCIAL ASSAYER

CERTIFICATE OF ASSAY

SGS SUPERVISION SERVICES INC.
General Testing Laboratories Division
1001 East Pender Street
Vancouver, B.C., Canada V6A 1W2
Telephone (604) 254-1647
Telex 04-507514

Date October 5, 1987
File 8709-2356

TO: N.V.C. ENGINEERING LTD.

(page 5)

We hereby certify that the following are the results of assays on soil samples

MARKED	GOLD Au(ppm)	SILVER Ag(ppm)	Copper Cu (ppm)	xxxxxx	xxxxxxxxx	xxxxxxxxx	xxxxxxxxx	xxxxxxxxx
L #4, C-1 :								
8+50W	0.03	0.8	18					
9+00W	0.04	0.8	8					
9+50W	0.04	0.9	12					
10+00W	0.02	1.2	21					
10+50W	0.02	0.6	5					
11+00W	0.02	0.6	5					
12+00W	0.02	0.5	9					
L #5 :								
2+00W	0.02	0.4	3					
2+50W	0.02	0.4	3					
3+00W	0.02	0.5	6					
3+50W	0.02	0.6	7					
4+00W	0.02	0.5	7					
4+50W	0.02	0.6	8					
5+00W	0.03	0.9	3					
5+50W	0.03	0.4	5					
7+00W	0.02	0.5	3					
7+50W	0.02	0.4	7					
8+00W	0.02	0.4	4					
8+50W	0.03	0.8	9					
9+00W	0.03	1.2	16					

L. Wong
PROVINCIAL ASSAYER

CERTIFICATE OF ASSAY

Date: November 9, 1987
File: 8710-1651

SGS SUPERVISION SERVICES INC.
General Testing Laboratories Division
1001 East Pender Street,
Vancouver, B.C., Canada. V6A 1W2
Telephone: (604) 254-1647
Telex: 04-507514

TO: N.V.C. ENGINEERING LTD.
Ste. 304 - 1720 Barclay Street
Vancouver, B.C.
V6G 2Y1

We hereby certify that the following are the results of assays on: soil samples

MARKED	GOLD Au (ppm)	SILVER Ag(ppm)
L 6 0+00 BL	0.02	0.2
BL 6+50S(C1)	0.03	0.2
BL 7+50S (C1)	0.03	0.4
L#1 (C1) 10+50E	0.03	1.5
11+00E	0.03	0.3
11+50E	0.05	0.9
L#1 (C1) 12+00E	0.03	0.4
L#3 (C1) 0+50E	0.03	0.3
1+00E	0.05	0.3
1+50E	0.05	0.4
2+00E	0.08	1.0
2+50E	0.03	0.5
3+00E	0.02	0.4
3+50E	0.02	0.4
4+00E	0.03	0.5
4+50E	0.03	0.6
5+00E	0.03	0.7
5+50E	0.02	0.7
6+00E	0.02	0.4
6+50E	0.05	0.7
7+00E	0.03	0.6
7+50E	0.02	0.9
8+00E	0.02	0.7
8+50E	0.03	1.2
9+00E	0.03	0.9
9+50E	0.03	0.8
10+00E	0.03	0.7
10+50E	0.02	0.8
11+00E	0.03	0.3
11+50E	0.03	0.5
L#4 0+50E	0.02	0.2
1+00E	0.02	0.7
1+50E	0.02	0.5
2+00E	0.02	0.5

SAMPLE MARKED:	GOLD Au (ppm)	SILVER Ag (ppm)
L#4		
2+50E	0.03	0.8
3+00E	0.04	0.5
3+50E	0.03	0.4
4+00E	0.03	0.4
6+00E	0.04	0.5
6+50E	0.02	0.3
7+00E	0.02	0.4
7+50E	0.03	0.3
8+50E	0.03	0.3
9+00E	0.04	0.2
9+50E	0.04	0.8
10+00E	0.26	1.5
10+50E	0.03	0.3
11+00E	0.02	0.5
L#5		
9+50W	0.69	1.8
10+00W	0.22	0.6
10+50W	0.02	0.2
11+00W	0.10	0.9
11+50W	0.04	0.5
12+50W	0.03	0.5
1+00E	0.03	0.4
1+50E	0.04	0.2
2+00E	0.02	0.3
2+50E	0.03	0.2
3+00E	0.02	0.4
3+50E	0.03	0.3
4+00E	0.04	0.4
4+50E	0.02	0.4

/ continued on page 2 .....

NOTE: REJECTS RETAINED ONE MONTH. PULPS RETAINED THREE MONTHS. ON REQUEST PULPS AND REJECTS WILL BE STORE FOR A MAXIMUM OF ONE YEAR.

L. Wong
PROVINCIAL ASSAYER

CERTIFICATE OF ASSAY

Date: November 9, 1987

File: 8710-1651

SGS SUPERVISION SERVICES INC.
General Testing Laboratories Division
1001 East Pender Street,
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TO: N.V.C. ENGINEERING LTD.

(page 2)

We hereby certify that the following are the results of assays on: soil samples

MARKED		GOLD Au (ppm)	SILVER Ag(ppm)
L#6	1+00W	0.04	0.6
	2+00W	0.03	0.4
	2+50W	0.05	0.5
	3+00W	0.02	0.3
	3+50W	0.03	0.3
	0+50E	0.03	0.2
	1+00E	0.02	0.2
	1+50E	0.02	0.2
	2+00E	0.02	0.2
	2+50E	0.03	0.6
	3+00E	0.03	0.2
	3+50E	0.02	0.3
	4+00E	0.03	0.7
	5+50E	0.04	0.2
	6+00E	0.02	0.3
L#7 (C1)	00+50W	0.02	0.3
	1+00W	0.02	0.3
	1+50W	0.03	0.2
	2+00W	0.03	0.5
	2+50W	0.03	0.4
	3+00W	0.05	1.5
	3+50W	0.03	2.0
	4+00W	0.03	1.2
	5+00W	0.03	1.3
L#7	0+50E	0.03	0.8
	2+00E	0.03	0.3
	2+50E	0.02	0.5
	3+00E	0.02	0.7
	3+50E	0.04	1.0
	4+00E	0.06	0.7
	5+00E	0.02	1.3
	5+50E	0.03	0.7
	6+00E	0.03	0.8
	6+50E	0.03	1.2

SAMPLE MARKED:	GOLD Au (ppm)	SILVER Ag (ppm)
L#7		
7+00E	0.03	0.9
8+00E	0.03	1.4
9+00E	0.03	0.4
10+00E	0.03	0.7
11+00E	0.03	1.1
11+50E	0.03	1.3
BL L #8		
00+00W	0.03	0.9
L#8 (C1)		
0+50W	0.03	0.7
2+00W	0.03	0.8
2+50W	0.05	1.1
3+00W	0.02	1.0
3+50W	0.02	1.1
4+00W	0.03	1.2
5+00W	0.03	0.9
6+50W	0.03	0.8
7+00W	0.04	0.4
7+50W	0.02	0.7
8+00W	0.04	0.5
8+50W	0.03	0.9
9+00W	0.03	0.8
9+50W	0.02	0.9
10+00W	0.03	0.4
10+50W	0.04	0.5
11+00W	0.03	0.7
11+50W	0.02	0.3
12+00W	0.04	1.5

/ continued on page 3 .....

NOTE: REJECTS RETAINED ONE MONTH. PULPS RETAINED THREE MONTHS. ON REQUEST PULPS AND REJECTS WILL BE STORE FOR A MAXIMUM OF ONE YEAR.

L. Wong
PROVINCIAL ASSAYER

CERTIFICATE OF ASSAY

Date: NOVEMBER 9, 1987

File: 8710-1651

SGS SUPERVISION SERVICES INC.
General Testing Laboratories Division
1001 East Pender Street,
Vancouver, B.C., Canada. V6A 1W2
Telephone: (604) 254-1647
Telex: 04-507514

TO: N.V.C. ENGINEERING LTD.
Ste. 304 - 1720 Barclay St.
Vancouver, B.C.
V6G 2Y1

(page 3)

We hereby certify that the following are the results of assays on: soil samples

MARKED		GOLD Au (ppm)	SILVER Ag(ppm)
L#8	0+50E	0.06	0.3
	1+50E	0.05	0.5
	2+00E	0.05	0.4
	2+50E	0.03	0.4
	3+50E	0.05	0.4
	4+00E	0.03	0.4
	4+50E	0.02	0.2
	5+00E	0.02	0.3
	5+50E	0.04	0.4
	6+00E	0.02	0.3
	6+50E	0.08	0.4
	8+50E	0.02	0.3
	9+00E	0.03	0.5
	10+00E	0.02	0.5
	10+50E	0.04	0.3
L#3	6+50W	0.02	0.5
	7+00W	0.02	0.5
	7+50W	0.02	0.7
	8+00W	0.03	0.6
	8+50W	0.02	0.6
L#5	5+00E	0.02	0.5
	5+50E	0.02	0.5
	6+00E	0.02	0.6
	6+50E	0.02	0.6
	7+00E	0.02	0.7
	7+50E	0.02	0.5
	10+00E	0.02	0.6
	10+50E	0.02	0.5
	11+00E	0.02	0.4
	11+50E	0.02	0.4

SAMPLE MARKED:	GOLD Au (ppm)	SILVER Ag (ppm)
L#7		
5+50W	0.02	0.8
6+00W	0.02	0.7
6+50W	0.02	0.6
7+00W	0.02	0.5
7+50W	0.03	0.7
8+00W	0.03	0.8
8+50W	0.02	0.9
9+00W	0.02	0.5
9+50W	0.03	0.4
10+00W	0.04	0.4
10+50W	0.04	0.5
11+00W	0.02	0.5
11+50W	0.02	0.5

NOTE: REJECTS RETAINED ONE MONTH. PULPS RETAINED THREE MONTHS. ON REQUEST PULPS AND REJECTS WILL BE STORE FOR A MAXIMUM OF ONE YEAR.

L. Wong

PROVINCIAL ASSAYER

CERTIFICATE OF ASSAY

Date: November 25, 1987
File: 8710-3057

SGS SUPERVISION SERVICES INC.
General Testing Laboratories Division
1001 East Pender Street,
Vancouver, B.C., Canada. V6A 1W2
Telephone: (604) 254-1647
Telex: 04-507514

TO: N.V.C. ENGINEERING LTD.
Ste. 304 - 1720 Barclay Street
Vancouver, B.C.
V6G 2Y1

We hereby certify that the following are the results of assays on: soil samples

MARKED		GOLD Au (ppm)	SILVER Ag(ppm)
B.L.	6+50E	0.02	0.9
L 1	00+50 - N	0.02	0.8
	1+00	0.02	1.1
	1+50	0.02	0.9
	2+00	0.02	0.5
	2+50	0.02	0.7
	3+00	0.02	0.3
	3+50	0.02	0.2
	3+90	0.02	0.3
L 2	2+00 - N	0.03	0.7
	2+50	0.02	0.8
	4+00	0.02	1.3
	4+50	0.02	0.7
	5+00	0.02	0.5
	5+50	0.02	0.9
	6+00	0.02	1.0
L 3	1+00 - N	0.04	0.2
	1+50 (A)	0.04	0.2
	1+50 (B)	0.04	0.2
	2+00	0.13	1.0
	2+50	0.04	0.9
	4+00	0.07	0.4
	5+00	0.18	0.2
	5+50	0.02	0.9
	6+00	0.06	0.8
	7+00	0.02	1.2
	7+50	0.04	1.0
L 4	0+50 - N	0.02	0.5
	2+00	0.02	0.7
	2+50	0.03	0.4
	3+00	0.03	0.2
	5+50	0.04	0.5
	6+00	0.02	0.8
	7+00	0.02	0.9

xxxxxxxxxxxxxxx

SAMPLE MARKED:		GOLD Au (ppm)	SILVER Ag (ppm)
L 4	7+50 - N	0.02	0.9
	8+00	0.02	0.8
	8+50	0.02	1.0
	9+00	0.02	0.7
	9+50	0.02	0.2
	10+00	0.02	0.7
	4+00 - S	0.02	0.4
	4+50	0.02	0.2
	5+50	0.02	0.2
	6+00	0.02	0.2
	6+50	0.02	0.2
	7+00	0.02	0.2
	7+50	0.02	0.4
L 5	0+50 - N	0.03	1.1
	1+00	0.06	0.5
	2+00	0.02	0.7
	2+50	0.02	0.8
	3+50	0.02	0.2
	4+50	0.02	0.5
	5+50	0.02	0.7
	6+00	0.04	0.9
	6+50	0.02	0.2
	7+50	0.02	0.2
	8+00	0.06	1.1
	8+50	0.03	0.9
	9+00	0.02	0.8
	9+50	0.02	0.7
	10+00	0.02	0.7
	1+00 - S	0.02	0.9
	2+00	0.02	0.5
	2+50	0.02	0.2
	3+00	0.02	0.3

/ continued on page 2 .....

NOTE: REJECTS RETAINED ONE MONTH. PULPS RETAINED THREE MONTHS. ON REQUEST PULPS AND REJECTS WILL BE STORE FOR A MAXIMUM OF ONE YEAR.

L. Wong
PROVINCIAL ASSAYER

CERTIFICATE OF ASSAY

Date: Novemver 25, 1987

File: 8710-3057

SGS SUPERVISION SERVICES INC.
General Testing Laboratories Division
1001 East Pender Street,
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Telephone: (604) 254-1647
Telex: 04-507514

TO: N.V.C. ENGINEERING LTD.

We hereby certify that the following are the results of assays on: soil samples

MARKED		GOLD Au (ppm)	SILVER Ag(ppm)
L 5	3+50 - S (A)	0.02	0.2
	3+50 (B)	0.02	0.2
	4+00 (A)	0.02	0.3
	4+00 (B)	0.02	0.2
	4+50 (A)	0.02	0.4
	4+50 (B)	0.02	0.2
	5+50	0.02	0.3
	6+00	0.02	0.2
	6+50	0.02	0.3
	7+00	0.02	0.4
	7+50	0.02	0.3
	8+00	0.02	0.9
L 6	1+50 - N	0.02	0.7
	2+00	0.02	1.2
	3+00	0.03	0.3
	3+50	0.03	0.9
	4+00	0.02	0.8
	4+50	0.02	1.3
	5+00	0.02	0.8
	5+50	0.02	0.8
	6+00	0.02	1.4
	6+50	0.03	0.9
	7+00	0.04	0.5
	7+50	0.02	0.8
	8+00	0.02	0.3
	9+50	0.02	0.8
	10+00	0.02	0.4
L 7	0+50 - N	0.02	0.7
	1+50	0.02	1.3
	2+00	0.02	1.4
	2+50	0.02	0.5
	3+00	0.02	1.5
	3+50	0.02	0.3
	4+00	0.02	0.5
	4+50	0.02	0.9

xxxxxxxxxxxxxxxxx

SAMPLE MARKED:		GOLD Au (ppm)	SILVER Ag (ppm)
L 7	5+00 - N	0.02	1.1
	5+50	0.02	1.6
	6+50	0.03	1.4
	7+00	0.02	1.0
	7+50	0.02	0.8
	8+00	0.02	1.3
	8+50	0.03	1.1
	9+00	0.02	0.8
L 7	0+00S 7+00E B4	0.02	0.5
L 7	0+00 - S	0.02	0.3
	1+00	0.02	0.2
	1+50	0.02	0.2
	3+00	0.02	1.2
	3+50	0.02	0.2
	4+00	0.02	0.4
	4+50	0.02	0.4
	5+00	0.03	0.8
	6+00	0.02	0.7
	7+00	0.04	0.3
L 8	0+50 - N	0.04	0.2
	1+00	0.02	0.2
	1+50	0.02	0.3
	1+90	0.02	0.8
	2+50	0.02	0. 7
	4+00	0.02	0.3
	6+00	0.02	0.9
	6+50	0.02	1.1
	8+00	0.02	0.8
	8+50	0.02	0.9
	9+00	0.03	1.1
	9+50	0.02	1.4
	10+00N	0.02	1.3

/ continued on page 3 .....

NOTE. REJECTS RETAINED ONE MONTH. PULPS RETAINED THREE MONTHS. ON REQUEST PULPS AND REJECTS WILL BE STORE FOR A MAXIMUM OF ONE YEAR.

L. Wong
PROVINCIAL ASSAYER

CERTIFICATE OF ASSAY

Date: November 25, 1987

File: 6710-3057

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TO: N.V.C. ENGINEERING LTD.

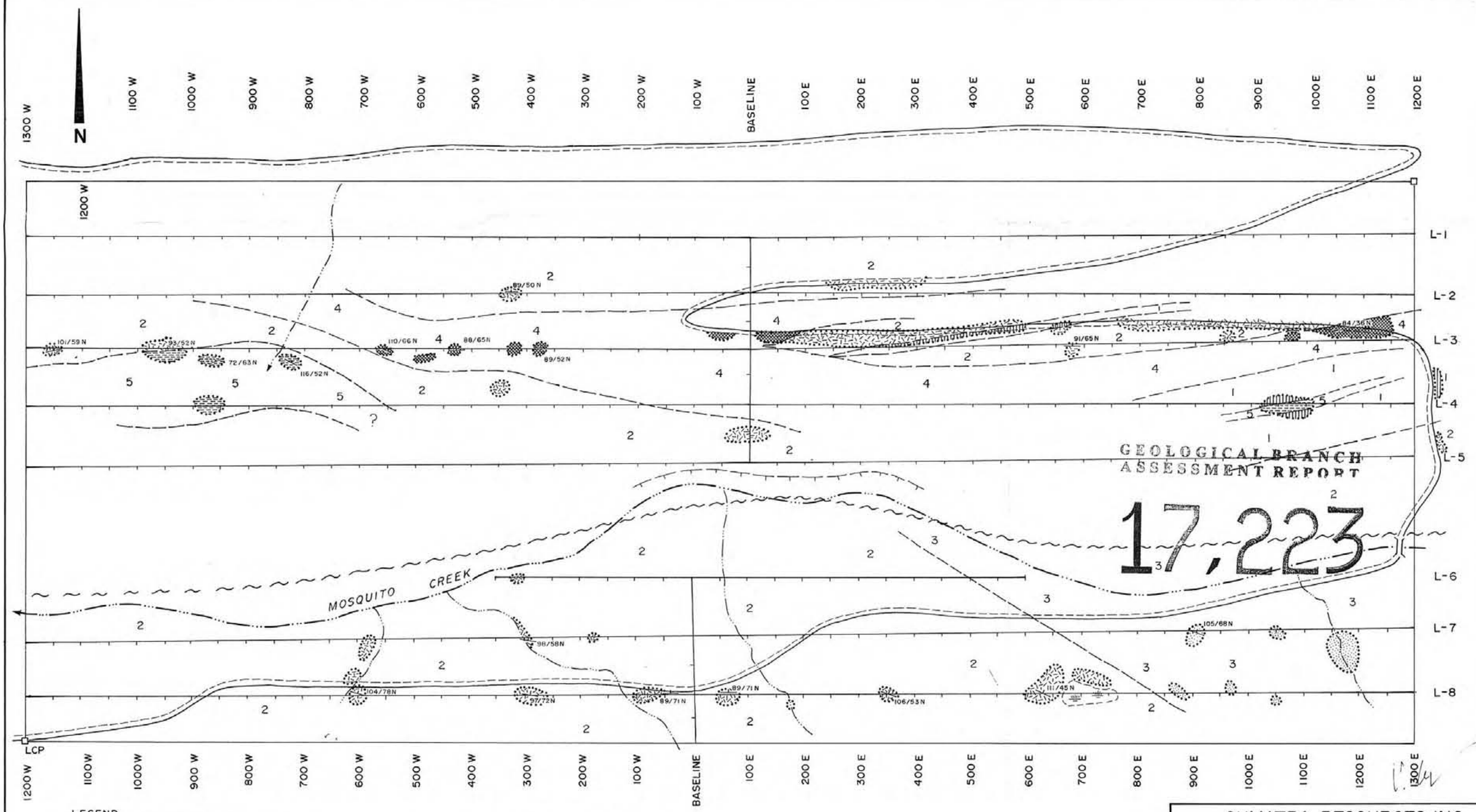
We hereby certify that the following are the results of assays on: soil samples

MARKED		GOLD Au(ppm)	SILVER Ag(ppm)	xxxxxxx	xxxxxxxxx	xxxxxxxxx	xxxxxxxxx	xxxxxxxxx	xxxxxxxxx
L 9	0+50 - N	0.02	0.4						
	1+00	0.02	0.4						
	1+50	0.02	0.2						
	1+90	0.02	0.5						
	3+00	0.02	0.9						
	3+50	0.02	0.2						
	4+50	0.02	0.5						
	5+00	0.02	0.7						
	5+50	0.02	0.2						
	6+00	0.02	0.8						
	6+50	0.02	0.5						
	7+00	0.02	1.0						
	7+50	0.02	0.9						
	8+00	0.04	0.8						
	8+50	0.02	0.5						
	9+00	0.02	1.5						
	9+50	0.02	0.9						
	10+00	0.02	0.4						
L 9	0+50 - S	0.02	0.2						
	1+00	0.03	0.2						
	1+50	0.03	0.2						
	2+00	0.03	0.2						
	3+00	0.03	0.2						
	3+50	0.04	0.5						
	4+00	0.02	0.3						
	4+50	0.02	0.2						
	6+00	0.02	0.2						

NOTE REJECTS RETAINED ONE MONTH PULPS RETAINED THREE MONTHS ON REQUEST PULPS AND REJECTS WILL BE STORE FOR A MAXIMUM OF ONE YEAR

L. Wong

PROVINCIAL ASSAYER



GEOLOGICAL BRANCH
ASSESSMENT REPORT

17,223

LEGEND

1 Phyllite, slaty phyllite
2 Shale, shistose shale, slaty shale black to medium grey
3 Light grey quartzite
4 Chlorite schist, green schist
5 Intrusive, mylonitic intrusive

Geological contact, observed, assumed
Outcrop
Fault
91/65N Attitude of metamorphic layering
Cliff
Stream

0 50 100 200 300 meters

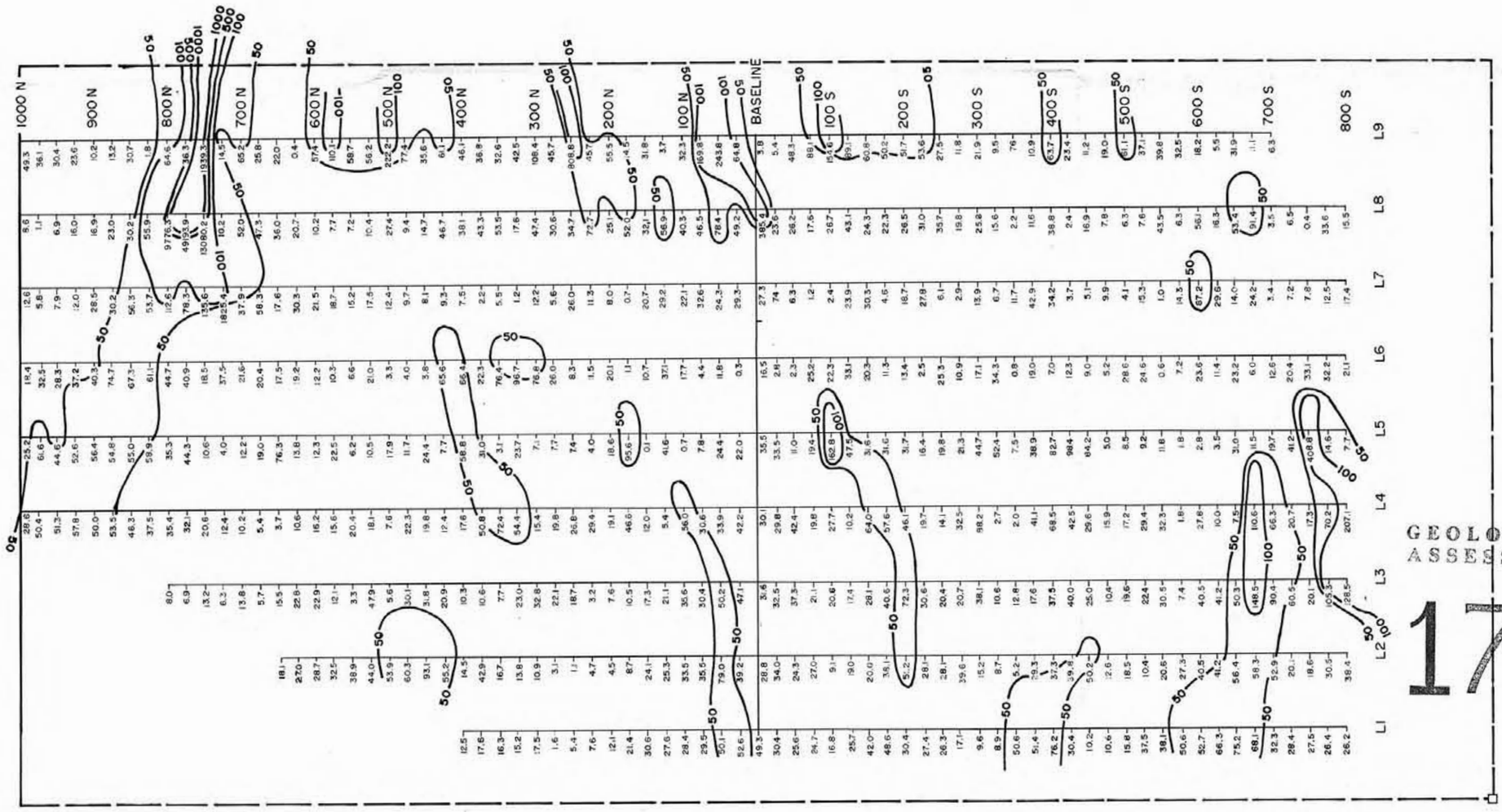
SUMATRA RESOURCES INC.

CAROL I CLAIM
GEOLOGICAL MAP

VICTORIA M.D. NTS 92 C/9

V. CUKOR, P.Eng. - NVC ENGINEERING Ltd. - VANCOUVER, B.C.

DATE: Dec. 1987 | SCALE: 1:5 000 | FIG. 5



All readings in gammas

0 50 100 200 300 meters

GEOLOGICAL BRANCH
ASSESSMENT REPORT

17,223

SUMATRA RESOURCES INC.

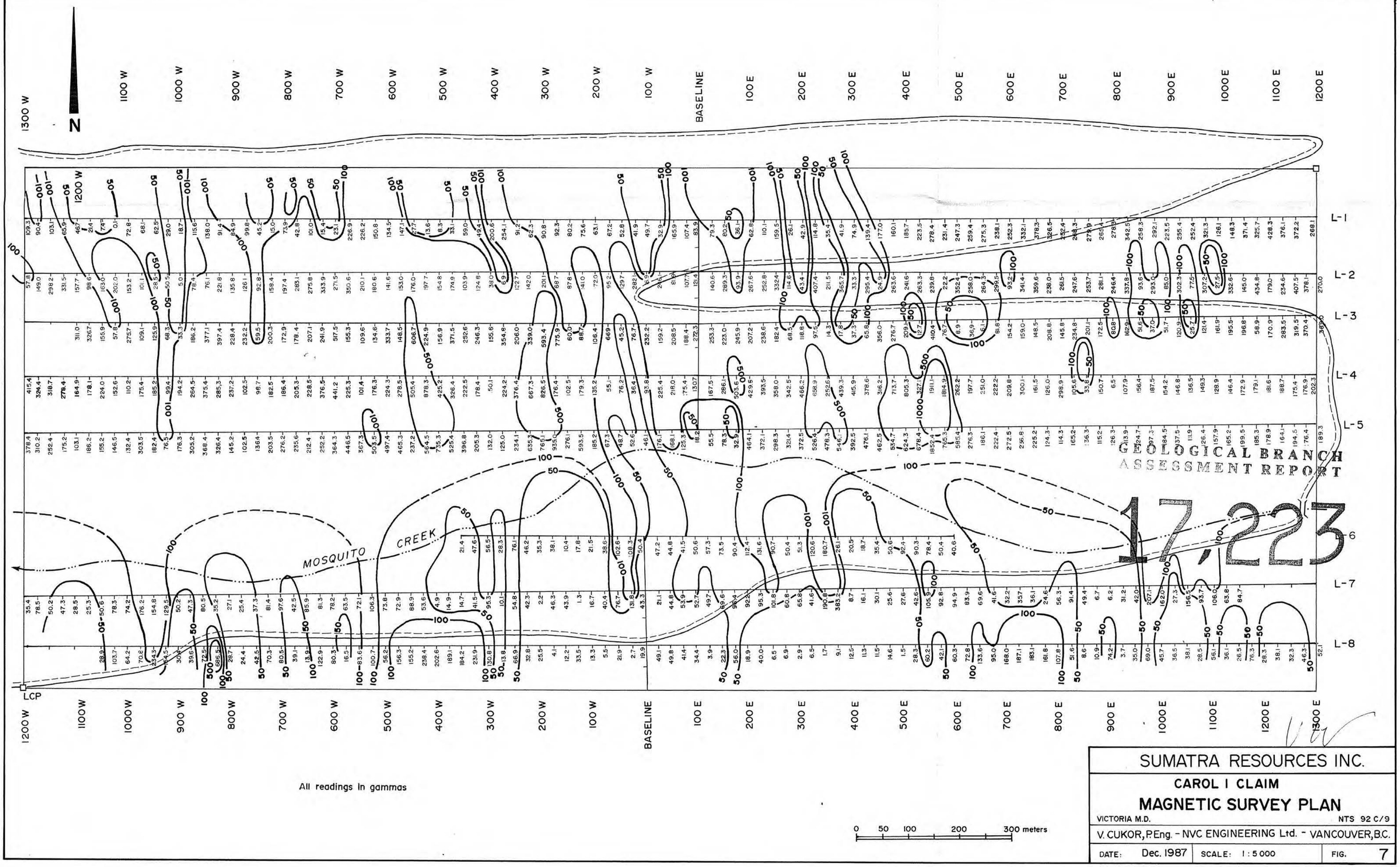
CAROL CLAIM

MAGNETIC SURVEY PLAN

VICTORIA M.D., B.C. NTS. 92 C/9

V. CUKOR, P.Eng. - NVC ENGINEERING Ltd. - VANCOUVER, B.C.

DATE: Dec. 1987	SCALE: 1:5000	FIG. 6



SUMATRA RESOURCES INC.

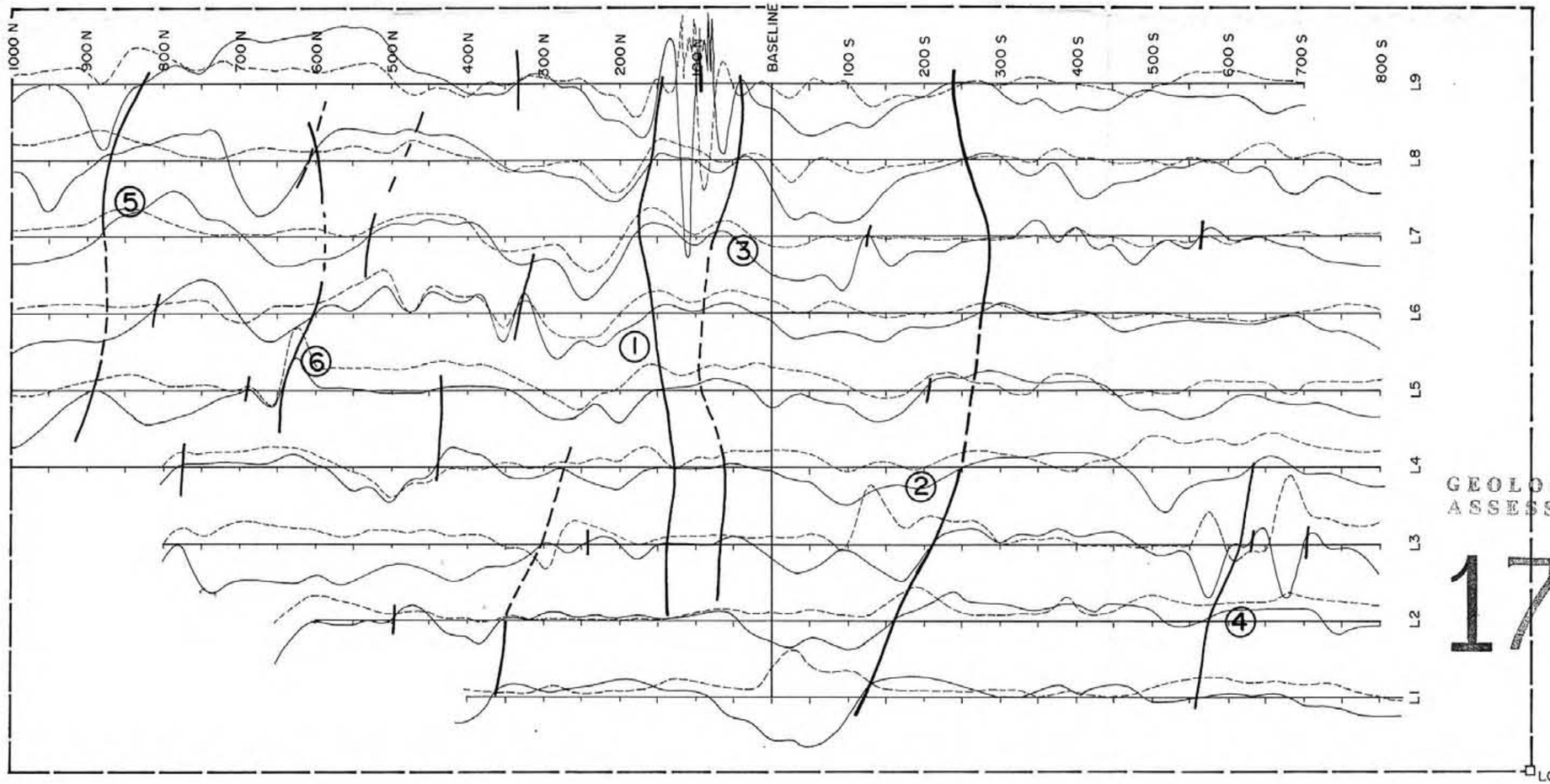
CAROL I CLAIM

MAGNETIC SURVEY PLAN

VICTORIA M.D. NTS 92 C/9

V. CUKOR, P.Eng. - NVC ENGINEERING Ltd. - VANCOUVER, B.C.

DATE: Dec. 1987	SCALE: 1 : 5 000	FIG. 7



N

-40 -20 0 20 40

vertical scale (in phase and quadrature components of VLF field expressed as percentage of horizontal component)

——— in phase
- - - - - - - - quadrature

Station: NLK Seattle, Wa. 24.8 kHz

0 50 100 200 300 meters

SUMATRA RESOURCES INC.

CAROL CLAIM
VLF ELECTROMAGNETIC
SURVEY PLAN

VICTORIA M.D., B.C. NTS. 92 C/9

V. CUKOR, P.Eng. - NVC ENGINEERING Ltd. - VANCOUVER, B.C.

DATE: Dec. 1987 | SCALE: 1:5000 | FIG. 8

N

1300 W 1200 W 1100 W 1000 W 900 W 800 W 700 W 600 W 500 W 400 W 300 W 200 W 100 W BASELINE 100 E 200 E 300 E 400 E 500 E 600 E 700 E 800 E 900 E 1000 E 1100 E 1200 E

L-1
L-2
L-3
L-4
L-5
L-6
L-7
L-8

Ⓑ Ⓓ Ⓒ Ⓐ

MOSQUITO CREEK

LCP

1200 W 1100 W 1000 W 900 W 800 W 700 W 600 W 500 W 400 W 300 W 200 W 100 W BASELINE 100 E 200 E 300 E 400 E 500 E 600 E 700 E 800 E 900 E 1000 E 1100 E 1200 E 1300 E

40
20
0
-20
-40

vertical scale (in phase and quadrature components of VLF field expressed as percentage of horizontal component)

——— in phase
– – – – – – quadrature

Station: NPM, Lualualei, Hawaii, kHz

0 50 100 200 300 meters

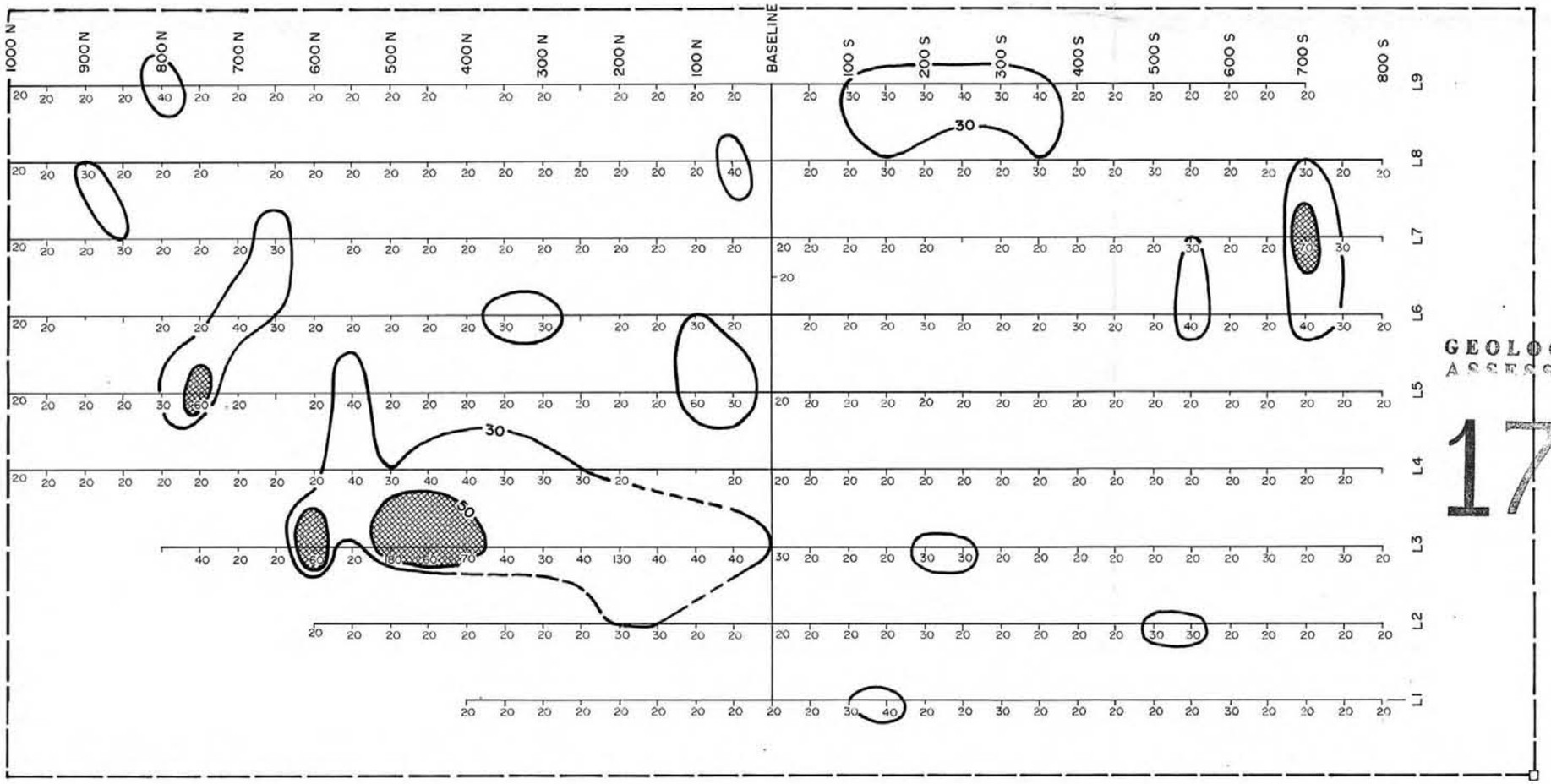
SUMATRA RESOURCES INC.

CAROL I CLAIM
VLF ELECTROMAGNETIC SURVEY PLAN

VICTORIA M.D. NTS 92 C/9

V. CUKOR, P.Eng. - NVC ENGINEERING Ltd. - VANCOUVER, B.C.

DATE: Dec. 1987 | SCALE: 1:5 000 | FIG. 9



LEGEND

Anomalous threshold —— 30 ppb Au

Significantly anomalous ▨ >50 ppb Au

N

0 50 100 200 300 meters

GEOLOGICAL BRANCH
ASSESSMENT REPORT

17,223

V. W

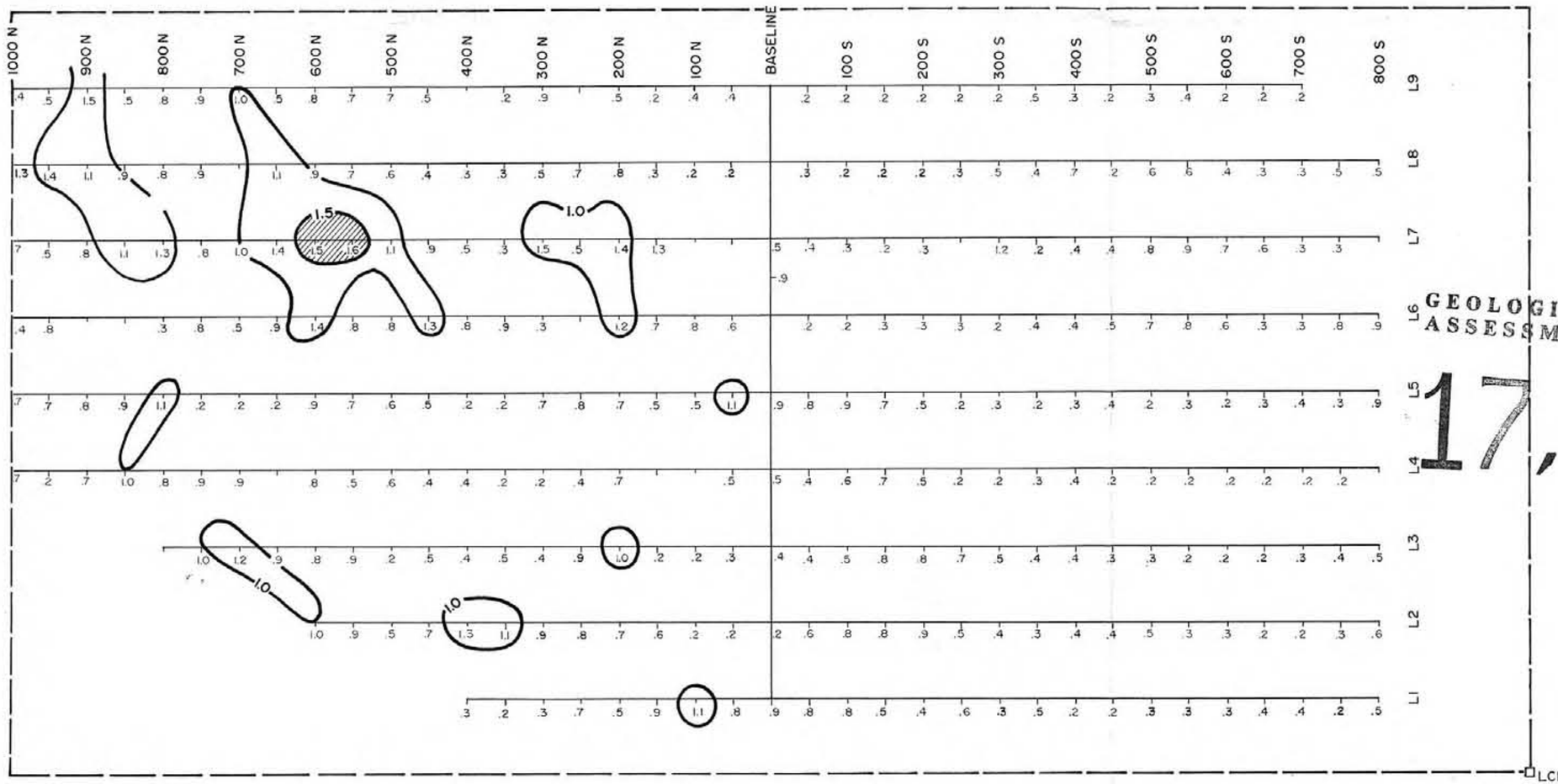
SUMATRA RESOURCES INC.

CAROL CLAIM
GEOCHEMICAL SURVEY PLAN
GOLD

VICTORIA M.D., B.C. NTS. 92 C/9

V. CUKOR, P.Eng. - NVC ENGINEERING Ltd. - VANCOUVER, B.C.

DATE: Dec. 1987 | SCALE: 1:5000 | FIG. 10



LEGEND

Anomalous threshold —— 1.0 ppm Ag

Significantly anomalous ▨ >1.5 ppm Ag

N

0 50 100 200 300 meters

GEOLOGICAL BRANCH
ASSESSMENT REPORT

17,223

V. Cu

SUMATRA RESOURCES INC.

CAROL CLAIM

GEOCHEMICAL SURVEY PLAN

SILVER

VICTORIA M.D., B.C. NTS. 92 C/9

V. CUKOR, P.Eng. - NVC ENGINEERING Ltd. - VANCOUVER, B.C.

DATE: Dec. 1987 | SCALE: 1:5000 | FIG. 11

N

1300 W 1200 W 1100 W 1000 W 900 W 800 W 700 W 600 W 500 W 400 W 300 W 200 W 100 W BASELINE 100 E 200 E 300 E 400 E 500 E 600 E 700 E 800 E 900 E 1000 E 1100 E 1200 E

L-1 L-2 L-3 L-4 L-5 L-6 L-7 L-8

MOSQUITO CREEK

LCP

LEGEND

Anomalous threshold —— 30 ppb Au

Significantly anomalous >50 ppb Au

0 50 100 200 300 meters

SUMATRA RESOURCES INC.

CAROL 1 CLAIM
GEOCHEMICAL SURVEY PLAN
GOLD

VICTORIA M.D. NTS 92 C/9

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DATE: Dec. 1987 | SCALE: 1:5 000 | FIG. 12

N

1300 W 1200 W 1100 W 1000 W 900 W 800 W 700 W 600 W 500 W 400 W 300 W 200 W 100 W BASELINE 100 E 200 E 300 E 400 E 500 E 600 E 700 E 800 E 900 E 1000 E 1100 E 1200 E

L-1 L-2 L-3 L-4 L-5 L-6 L-7 L-8

MOSQUITO CREEK

LCP

LEGEND

Anomalous threshold ——— 1.0 ppm Ag

Significantly anomalous ▨ 1.5>ppm Ag

0 50 100 200 300 meters

SUMATRA RESOURCES INC.

CAROL I CLAIM
GEOCHEMICAL SURVEY PLAN
SILVER

VICTORIA M.D. NTS 92 C/9

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DATE: Dec. 1987 | SCALE: 1:5 000 | FIG. 13