Province of British Columbia — Ministry of Energy, Mines and Petroleum Resources

ASSESSMENT REPORT TITLE PAGE AND SUMMARY

TYPE OF REPORT/SURVEY(S)	TOTAL COST
GEOPHYSICAL - RESISTIVITY	$ 5,600

AUTHOR(S) V. CUKOR, P. Eng. SIGNATURE(S) [signature]

DATE STATEMENT OF EXPLORATION AND DEVELOPMENT FILED JUNE 15 YEAR OF WORK 1990

PROPERTY NAME(S) BINGO CLAIMS

COMMODITIES PRESENT GOLD - SILVER

B.C. MINERAL INVENTORY NUMBER(S), IF KNOWN

MINING DIVISION VICTORIA NTS 92B - 12W

LATITUDE 48° 36' N LONGITUDE 123° 51' W

NAMES and NUMBERS of all mineral tenures in good standing (when work was done) that form the property [Examples: TAX 1-4, FIRE 2 (12 units); PHOENIX (Lot 1706); Mineral Lease M 123; Mining or Certified Mining Lease ML 12 (claims involved)]:

BINGO (20 units), BANGO (15 units), SQUEAK (20 units)

OWNER(S)

(1) ABACORN RESOURCES (2)

MAILING ADDRESS

1122 - 510 W. HASTINGS ST.
VANCOUVER, B.C.

OPERATOR(S) (that is, Company paying for the work)

(1) SAME (2)

MAILING ADDRESS

SUMMARY GEOLOGY (lithology, age, structure, alteration, mineralization, size, and attitude):

CLAIMS UNDERLAIN BY THE VOLCANICS AND METASEDIMENTS OF THE LEECH RIVER FORMATION and WARK DIORITES. MINERALIZATION IS FOUND IN SHEAR ZONE

REFERENCES TO PREVIOUS WORK

(over)

TYPE OF WORK IN THIS REPORT	EXTENT OF WORK (IN METRIC UNITS)	ON WHICH CLAIMS	COST APPORTIONED
GEOLOGICAL (scale, area)			
Ground			
Photo			
GEOPHYSICAL (line-kilometres)			
Ground			
Magnetic			
Electromagnetic			
Induced Polarization			
Radiometric			
Seismic			5,600.00
Other RESISTIVITY	7 km		
Airborne			
GEOCHEMICAL (number of samples analysed for ....)			
Soil			
Silt			
Rock			
Other			
DRILLING (total metres; number of holes, size)			
Core			
Non-core			
RELATED TECHNICAL			
Sampling/assaying			
Petrographic			
Mineralogic			
Metallurgic			
PROSPECTING (scale, area)			
PREPARATORY/PHYSICAL			
Legal surveys (scale, area)			
Topographic (scale, area)			
Photogrammetric (scale, area)			
Line/grid (kilometres)			
Road, local access (kilometres)			
Trench (metres)			
Underground (metres)			
		TOTAL COST	5,600.00

FOR MINISTRY USE ONLY	NAME OF PAC ACCOUNT	DEBIT	CREDIT	REMARKS:
Value work done (from report)				
Value of work approved				
Value claimed (from statement)				
Value credited to PAC account				
Value debited to PAC account				
Accepted .... Date	Rept. No.			Information Class

LOG NO: 09-11	RD.
ACTION:	
FILE NO:	

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20,254

NVC engineering ltd.

ABACORN RESOURCES INC.

BINGO, BANGO and SQUEAK CLAIMS

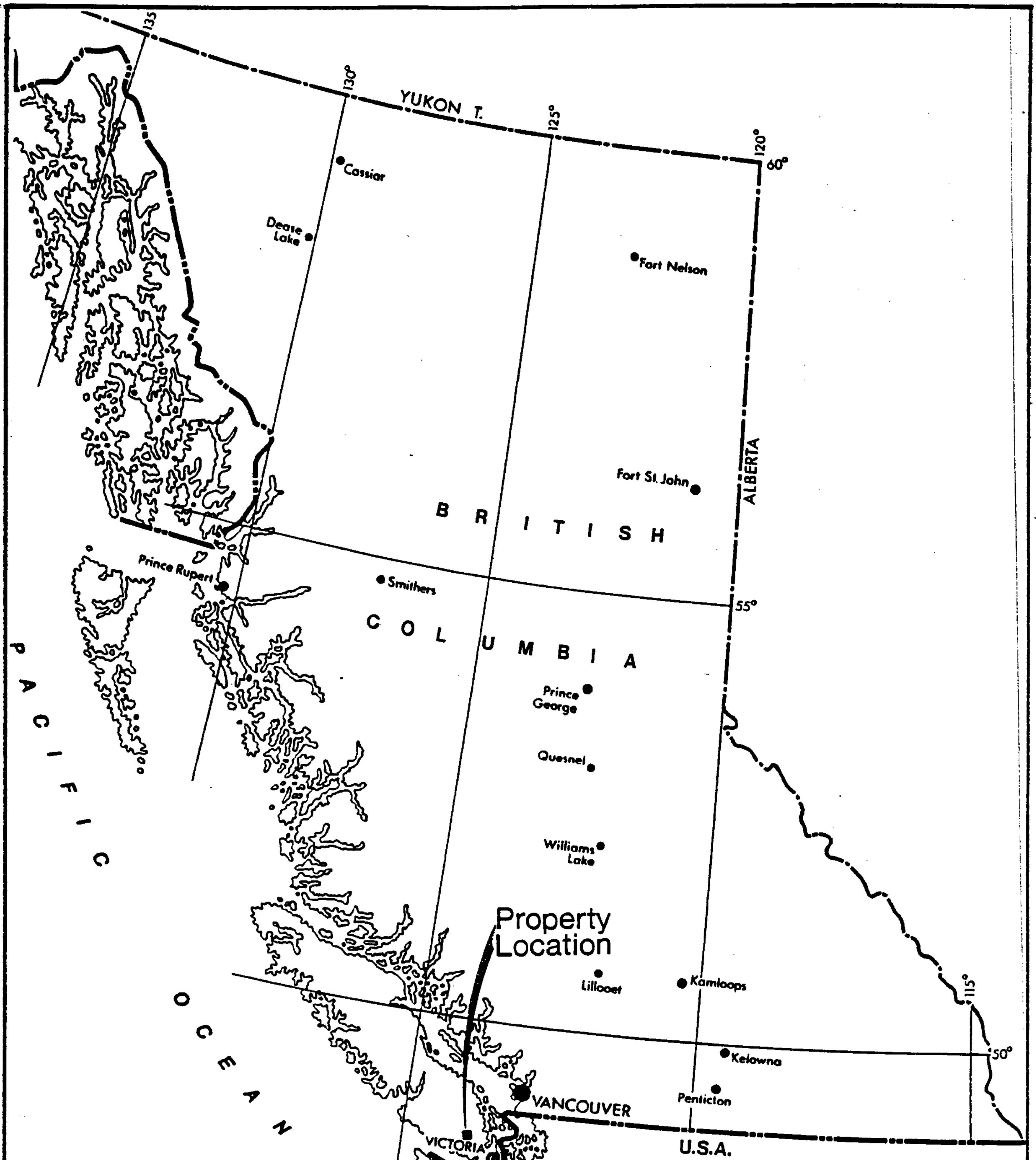
VANCOUVER ISLAND, B.C.

1.0 INTRODUCTION

This survey was conducted upon the request of the directors of ABACORN RESOURCES INC., a Vancouver based company, and is to be used as assessment credit.

A two man crew mobilized from Vancouver and camped on the property for the duration of the program.

The original grid, cut in 1987, was utilized for this survey, but lines had to be rechained and remarked by the helper since a portion of the flagging had weathered, with the markings either faded or washed off, or the flagging had completely disappeared. The helper also assisted in setting the pots during the survey.



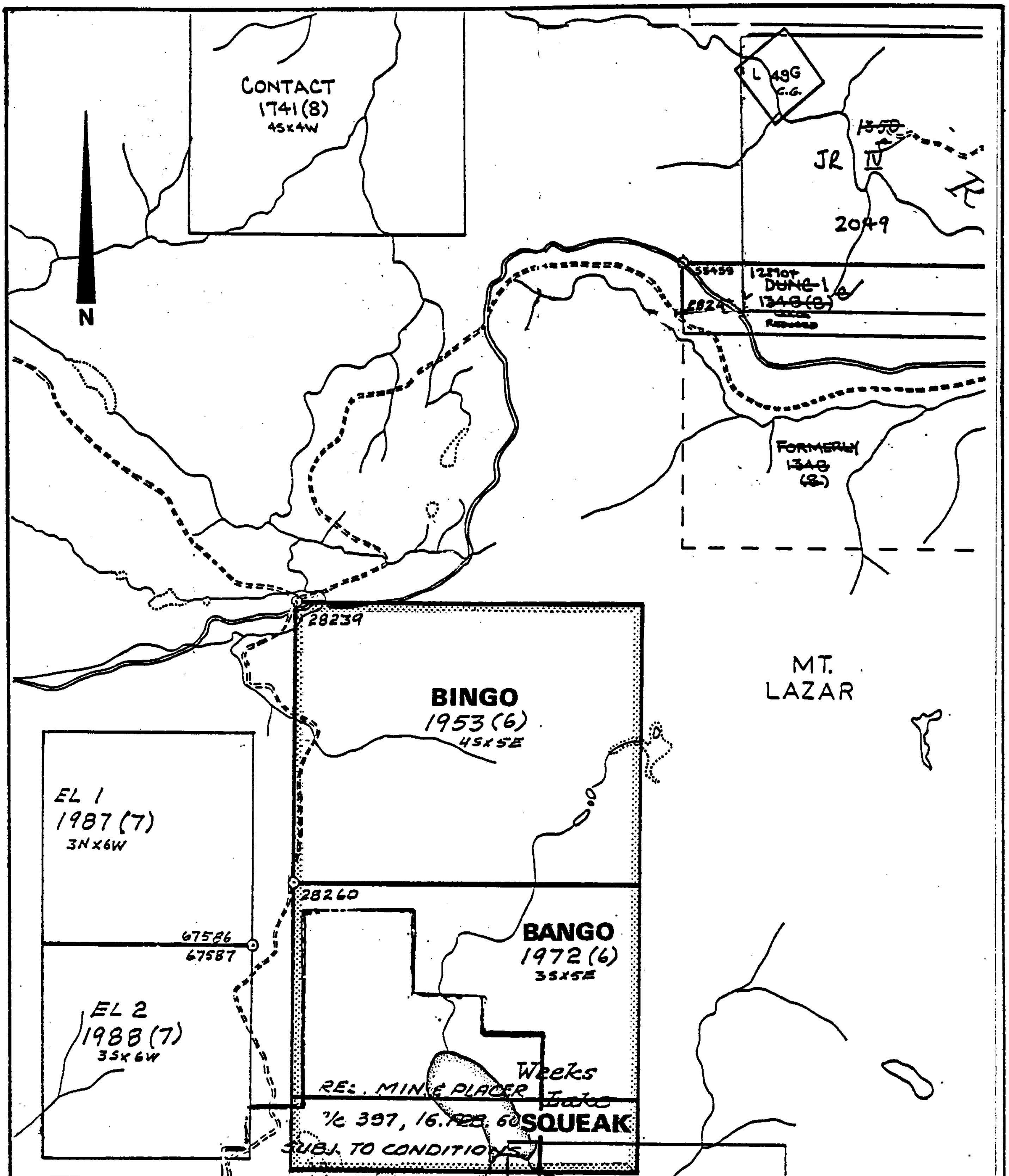
ABACORN RESOURCES INC.

BINGO CLAIM
Location Map

VICTORIA M.D., B.C. | NTS 92 B/12 W

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

DATE: AUG 1990	SCALE: 0 — 100 km	FIG. 1



ABACORN RESOURCES INC.

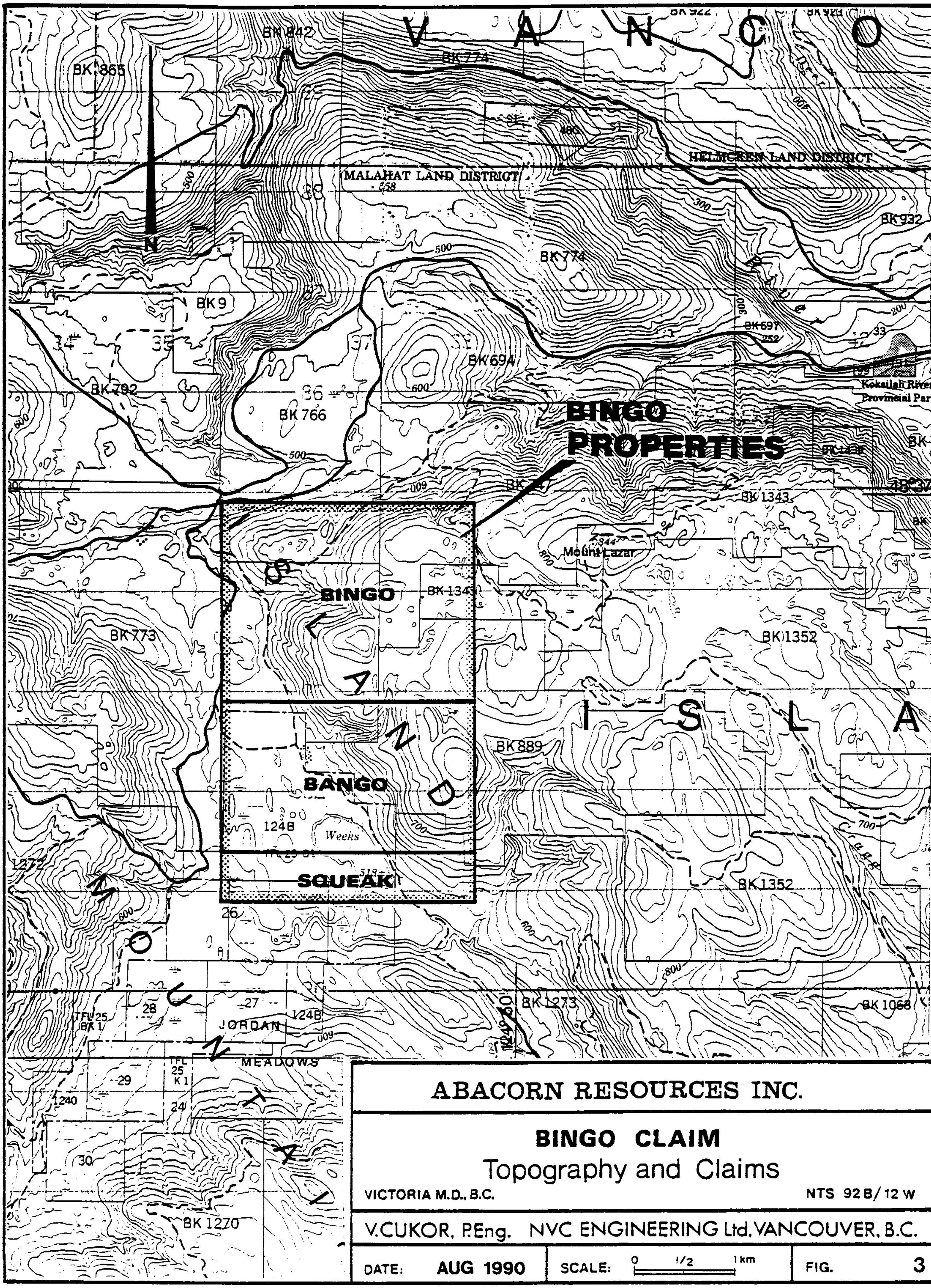
BINGO CLAIM

Claim Map

VICTORIA M.D., B.C. | NTS 92 B/12 W

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

DATE: **AUG 1990** | SCALE: 0 — 1/2 — 1 km | FIG. 2



ABACORN RESOURCES INC.

BINGO CLAIM

Topography and Claims

VICTORIA M.D., B.C.   NTS 92 B/12 W

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

DATE:	AUG 1990	SCALE:	0 1/2 1 km	FIG.	3

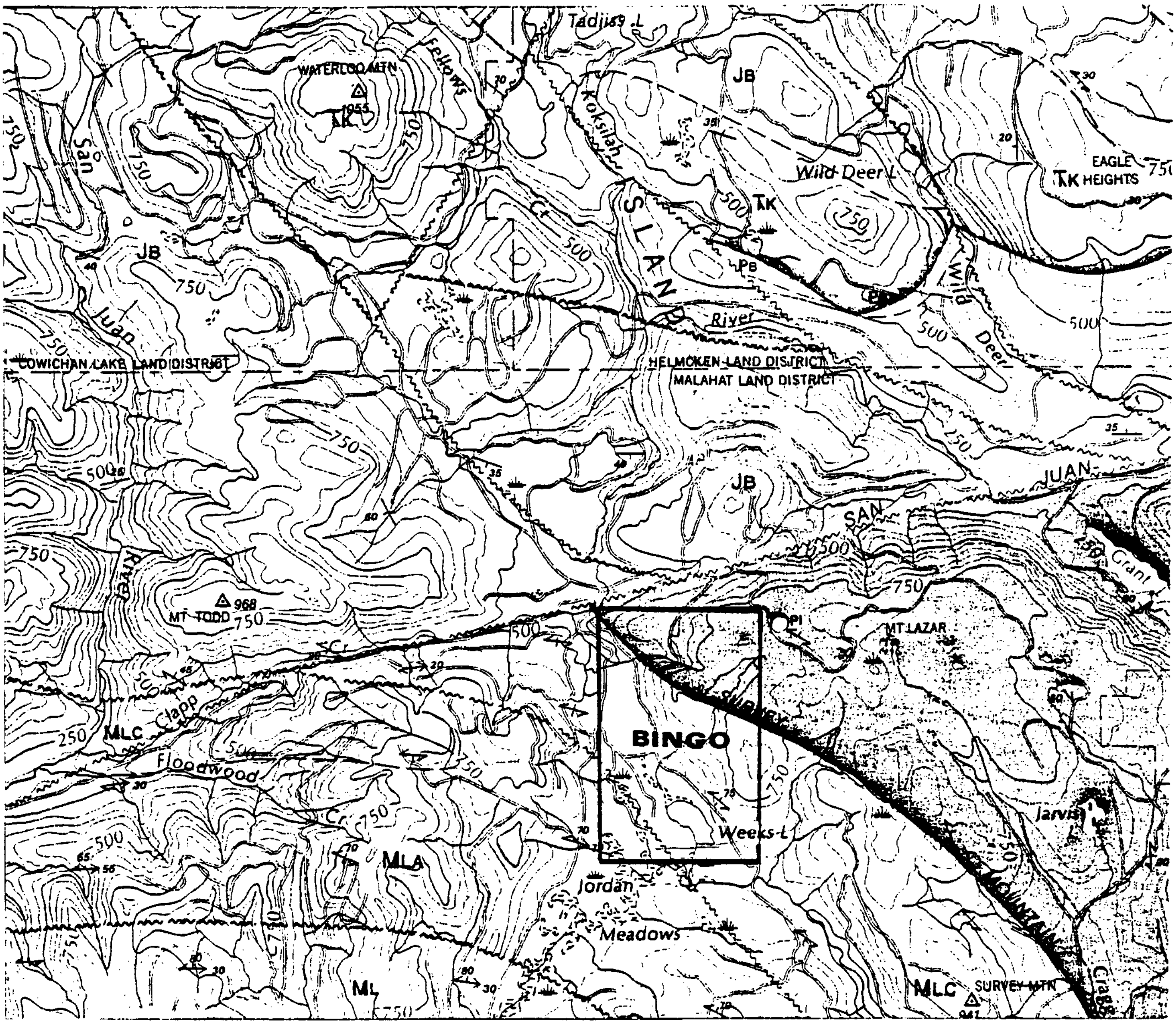
2. PROPERTY, LOCATION and ACCESS

The property consists of three contiguous claims, staked on the modified grid system. The claim names and respective recording data are as follows:

Claim Name	No. Units	Record No.	Anniversary Date
BINGO	20	1953	June 26
BANGO	15	1972	June 29
SQUEAK	20	2074	Feb. 4

The property is located about 15 km west of Shawnigan Lake in the southern part of Vancouver Island, about 40 km northwest of Victoria, B.C. It is in the Victoria Mining Division, on NTS 92B/12W. The claim group is centered at approximate latitude 48 36' and west longitude 123 50' (see fig. 1).

The access to the claims area is provided by an all weather gravel road from Shawnigan Lake. The main logging road follows the western border of the claims, from where a number of abandoned secondary logging roads, mostly passable by 4X4 vehicle provide access to different parts of the claims.



TRIASSIC TO CRETACEOUS

LEECH RIVER FORMATION: (MLC to ML)

ML	*METAGREYWACKE UNIT: metagreywacke, meta-arkose, quartz-feldspar-biotite schist*
MLA	*ARGILLITE-METAGREYWACKE UNIT: thinly bedded greywacke and argillite, slate, phyllite, quartz-biotite schist*
MLC	*CHERT-ARGILLITE-VOLCANIC UNIT: ribbon chert, cherty argillite, metarhyolite, metabasalt, chlorite schist*

TRIASSIC

VANCOUVER GROUP

TK	*KARMUTSEN FORMATION: pillow basalt, breccia tuff, minor flows*

JURASSIC

BONANZA GROUP

JB	*Basaltic to rhyolitic tuff, breccia, flows, minor argillite, greywacke*

LOWER PALEOZOIC (OR YOUNGER?)

PW	*WARK GNEISS: massive and gneissic metadiorite, metagrabbro, amphibolite*

ABACORN RESOURCES INC.

BINGO CLAIM
REGIONAL GEOLOGY

VICTORIA M.D., B.C. NTS 92 B/12 W

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

DATE: AUG 1990 | SCALE: Kilometres 0 — 2 | FIG. 4

3. GEOLOGY

3.1 Regional Geology

General geologic features of the area are shown on the geology map entitled "Geology, Victoria Map Area", Open FIle 701, by J.E. Muller, scale 1:100,000.

Two major fault zones dominate the area, the east-west San Juan Fault and the northwest-southeast Survey Mountain Fault. These are structural features of major proportions, separating geological regions in the area (the Survey Mountain Fault separates the Inner Pacific and Insular Geological Belts.

As shown on fig. 3, the area is underlain by geologic units from Paleozoic to Upper Cretaceous ages.

3.2 Property Geology

Two main rock assemblages are represented on the claim group: chloritized diorite and gneissic diorite of the Wark Gneissic Complex and the metasediments and volcanics of the Leech River Formation. Diorites outcrop at the northern and northeastern portion of the claims, while the Leech River Complex covers the rest of the area. They are separated by the Survey Mountain Fault Zone, the main cause of fracturing, silicification and pyritization in the area; this fault zone represents a fair exploration target for mineral occurences.

4. GEOPHYSICAL SURVEY

4.1 Field Method

The instrument used for the survey was the Scintrex IGS-2. Only several lines of the large grid were surveyed, with the intention to test the survey method on the claims in the hope that the results would complement the previous surveys (VLF-EM and magnetometer). If positive results were to achieved, the resistivity survey would then be recommended to be run over the whole grid area.

A total of 7 km of survey were run on 100m spaced lines at 25m station intervals. A two man crew carried out the field work over the grid lines cut in 1987. Since some flagging along the lines was broken off by wind or animals, and most of the markings on the flagging was faded, the field helper chained lines and marked stations for the engineer. The helper would first assist the engineer to set up the resistivity pots for taking the readings and then proceed to chain along the line to the next station.

The instrument used, a Scintrex IGS-2 can be set up to perform magnetic, VLF-EM and resistivity surveys. Since the magnetic and VLF-EM surveys were completed as a part of the 1987 program, only the resistivity survey was carried out now.

For the resistivity survey, the IGS-2 makes measurements of the VLF electric field, utilizing a dipole with an electrode spacing of five meters. The instrument then automatically calculates apparent resistivity from the in-phase and quadrature components of the horizontal electric field, using the horizontal magnetic field as a phase reference. See Appendix B for the apparent resistivity calculation.

For this survey, signals from the VLF station Seattle, 24.8 kHz were used.

4.2 Data Presentation and Discussion of Results

All survey results are shown on the Resistivity Survey Plan (figure 5), presented in a scale of 1:5000. Values, expressed in ohmmeters, were plotted on this grid map and then the map was contoured.

For this preliminary survey, the northern parts of lines 3 to 9 were selected. Lines 1 and 2 were avoided, since they run for most of their length through the swamp and the shear structure was lost in that area, due to a lack of outcrop. The surveyed lines, on the other hand, contain sufficient outcrop to interpret the structure from geologic mapping. Thus, in this area the validity of the survey results can easily be evaluated.

The survey plan shows great relief; the values range from a low of 5 to a high of 7400 ohmmeters. The contours on the plan are conspicuously parallel to both the geological structures and the VLF-EM conductors. Moreover, the plan clearly outlines two geologic units with contrasting resistivity signatures. The southwestern part, with distinct low resistivity is underlain by diorite. In the middle is an area of moderately low resistivity, approximately bordered by the 100 ohmmeter contour line to the southwest (coinciding with one fault plane), and a narrow low anomaly to the northeast (coinciding roughly with the other fault plane). Most of the readings in this zone fall within the range of between 100 and 300 ohmmeters, and likely correspond to highly altered volcanics, where most of the magnetite and pyrite have been destroyed, and thus the signature is one of somewhat higher resistivity. This area is the most likely target for further exploration; good assay results and geochemical gold anomalies have been located in this zone.

5. RECOMMENDATIONS

The resistivity survey appears to be a very effective tool in this instance, and has the potential to outline in detail the target zone in areas where a lack of outcrop prevents geological mapping. Thus, the survey should cover the entire grid area; the grid should be expanded to the west, to the claimline (the Bango claim covers more ground to the northwest than is shown on the claim map). In the same time more detailed geological mapping and intensive sampling of the zone of interest should be carried out.

Respectfully submitted,

August 1990

V. Cukor, P.Eng.

CERTIFICATE

I, VLADIMIR CUKOR, of 304-1720 Barclay Street, 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 in 1963 as a Graduated Geological Engineer;

3. I am a Registered Geological 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 twenty-seven years in Europe, North America and South America in engineering geology, hydrogeology, and exploration for base and precious metals;

5. I have performed and/or supervised the work program as documented in this Report.

August 1990

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

APPENDIX A

COSTS OF THE WORK PROGRAM

APPENDIX A

COSTS OF THE PROGRAM

FIELD WORK

V. Cukor, P.Eng.	5 days @ $500	$ 2,500.00
Assistant	5 days @ $130	650.00
4X4 Rental	5 days @ $60	300.00
B.C. Ferry		66.00
Gasoline		76.00
Campimg Costs	5 days @ $60	300.00
Field Supplies		130.00
	Field Work	$ 4,022.00

REPORT

V. Cukor, P.Eng.	2 days @ $500	$ 1,000.00
Drafting	19 hrs @ $20	380.00
Printing, Typing, Binding		200.00
	Report	$ 1,500.00

Field Work	$ 4,022.00
Report	$ 1,580.00
Total Expenditure	$ 5,602.00

V.C.

APPENDIX B

INSTRUMENT SPECIFICATIONS

1. THE IGS-2 SYSTEM

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 senor options, the IGS-2 System Control Console becomes a method-specific instrument according to the senor 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.

1.2 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.

2. IGS-2/MP MAGNETOMETER

2.1 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.

2.2 Magnetometer 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.

3. IGS/VLF-4 ELECTROMAGNETIC RECEIVER

3.1 VLF Theory

VLF stations (total of 12 stations located around the world) radiate electromagnetic waves on the VLF band in the range between 15 to 29 kHz. The signals are transmitted for purposes of navigation and ommunication with submarines. The VLF Electromagnetic Receiver picks up the magnetic and electric fields of these signals to provide information about the electrical properties of the earth.

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

$$H_p = A \sin w \; ; \; H_s = B \cos (w - \phi) \quad (1.0)$$

where H_p = primary signal

A = amplitude of primary signal

H_s = secondary (phase laged) signal

B = amplitude of secondary signal

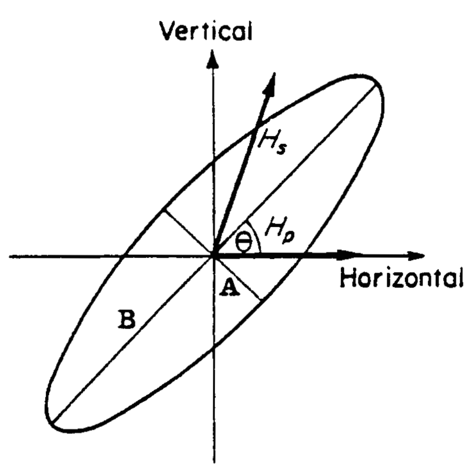
w = frequency

t = time

ϕ = phase lag

These two received signals combine giving an ellipse (see fig. A), which two axis correspond to the length and width of the ellipse.

i.e. $$\frac{H_p^2}{A^2} + \frac{H_s^2}{B^2} - \frac{2 H_p H_s \sin \phi}{AB} = \cos^2 \phi$$



By measuring the angle from the horizontal to the longaxis of the ellipse (θ), a conductor is located when this tilt angle is zero.

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. 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. 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.

3.2 IGS/VLF-4 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 kHz.

	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 216 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°.

3.3 Fraser Filtering

This technique for filtering VLF-EM data was proposed by Dr. D. C. Fraser in 1969. The reason for applying this filter is that there is a dynamic range problem when presenting the data as profiles. In the same area that a 5° peak to peak anomaly may be significant, anomalies of 100° may also occur. This filtering operation transforms the zero cross-overs into peaks and noise is reduced by application of a low-pass filter. The data may be presented as profiles or the positive values may be contoured.

This filter was originally applied to dip angle data as collected by VLF receivers such as the Radem by Crone Geophysics. It is equally applicable to vertical in-phase and quadrature data.

The filter phase-shifts the data by 90° so that zero cross overs and inflections are transformed into peaks. It removes dc and attenuates long spatial wavelengths to increase resolution of local anomalies.

These requirements are met by the difference operator $(R(n+1)-R(n))$, where $R(n)$ and $R(n+1)$ are any two consecutive readings.

The filter does not exaggerate the random noise. This is achieved by applying a low-pass operator to the differences as follows:

$0.25(R(n+1)-R(n)+0.50(R(n+2)-R(n+1)+0.25(R(n+3)-r(n+2))$.

The filtered output is then $0.25(R(n+2)+R(n+3)-R(n)-R(n+1))$.

As this filtering process was originally designed to be simple so it could be applied by field personnel with limited facilities, the constant is eliminated.

The plotted function then becomes $F(n+1,n+2)=(R(n+2)+R(n+3)-(R(n)+R(n+1))$.

The interpretation of filter plots is qualitative. Since the filter retains relative amplitudes, large responses can be equated with large and/or highly conductive zones. Very sharp responses indicate shallow sources, and, conversely, broader anomalies indicate progressively deeper sources. The contouring connects responses from line to line and serves to delineate the trend of conductive zones.

An additional interpretive tool is a pseudo-section of the filter outputs. This is produced by processing a given data profile with filters of various lengths or spans. As the length of the filter increases, responses from increasing depths are successively emphasized. Therefore, if these outputs are arranged on a section such that greater depths correspond to longer filters, then the section should approximately resemble the current pattern in the ground. However, it must be emphasized that this is only an approximation to the section (i.e. pseudo-section). Construction of the section follows a number of steps.

3.4 Resistivity

To permit measurement of the VLF-electric field, a dipole consisting of two cylindrical electrodes and five metres 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 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°. 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 on ohm metres

E_x = horizontal electric amplitude, calculated

$$E_x = (E_x(I)^2 + E_x(Q)^2)1/2$$

H_y = horizontal magnetic amplitude, measured

f = VLF station frequency in Hertz

μ_o = permeability of the ground in Henries/metre, a constant

The resistivity calculation has a range of 1 to 100,000 ohm metres with a resolution of 1 ohm metre.

Phase Angle Calculation:

The phase angle ϕ is expressed as:

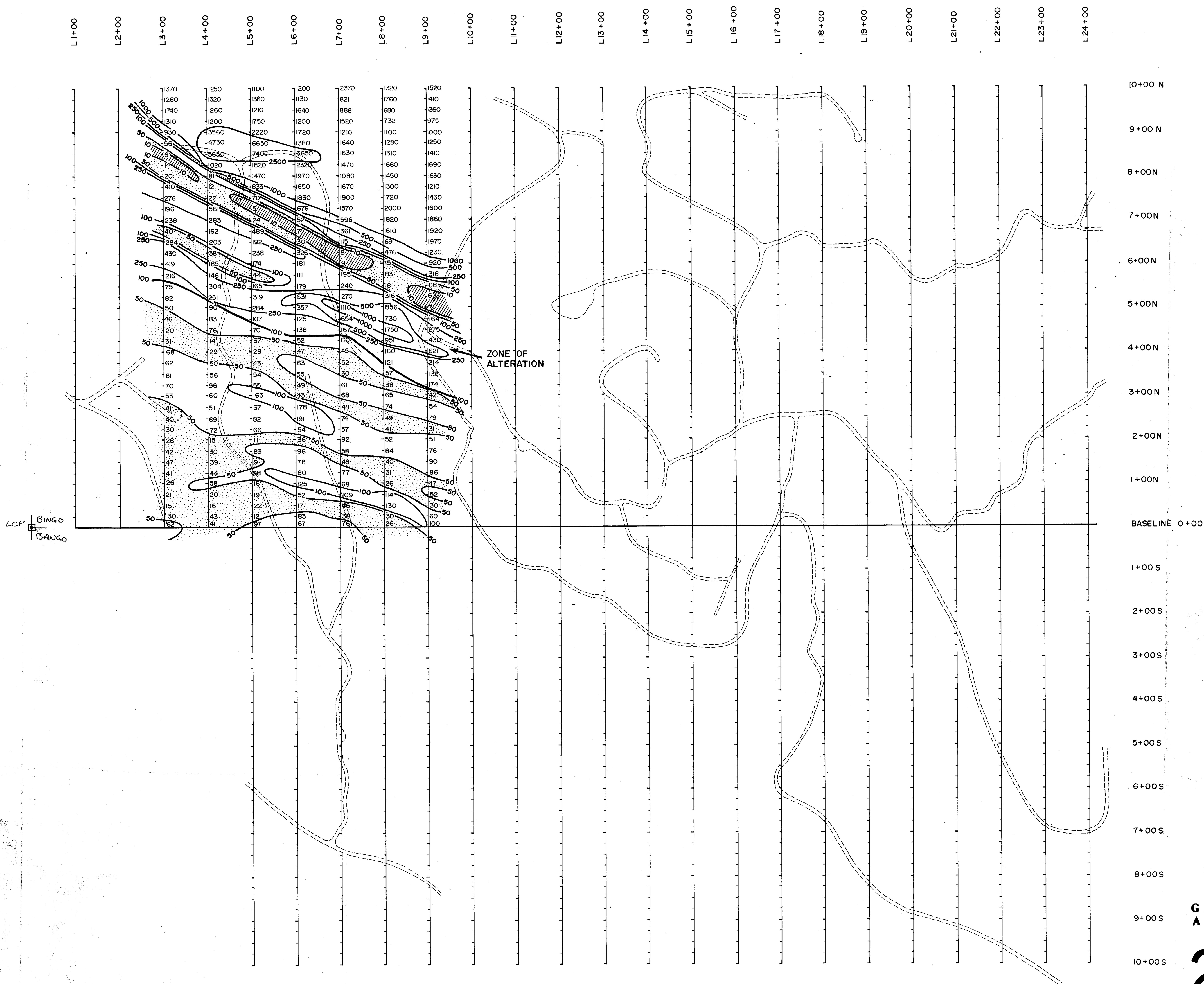
$$\phi = \text{arc tan} \frac{E_x(Q)}{E_x(I)}$$

where:

$E_x(Q)$ = horizontal quadrature VLF electric field

$E_x(I)$ = horizontal in-phase VLF electric field, phase referenced 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.



GEOLOGICAL BRANCH
ASSESSMENT REPORT

20,254

VLF STATION: SEATTLE 24.8 kHz

ABACORN RESOURCES INC.

BINGO PROPERTY
RESISTIVITY SURVEY PLAN

VANCOUVER M.D., B.C. N.T.S. 92B-12W

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

DATE: August 1990 SCALE: 1:5000 FIG. 5