ABACORN RESOURCES INC

BINGO - PESO, PROPERTIES

GEOLOGICAL BRANCH ASSESSMENT REPORT

1886

Engineering Report

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ABACORN RESOURCES INC.

Bingo and Peso Properties Vancouver Island, British Columbia

1. INTRODUCTION

The owner of the property, Abacorn Resources Inc., has contracted NVC Engineering Ltd. to carry out geological, geochemical and geophysical evaluation of the property's potential. The exploration work, which consisted of linecutting, geological mapping, geochemical soil survey, magnetic and VLF-EM surveys, commenced in November 1987.

To cover the whole area of interest, the Squeak claim was located as part of the program.

During the late part of December, and through January, frequent snowfalls impeded the program, making soil sampling very difficult. Logging on the Peso claims also interfered with the program. Part of the grid constructed on this claim has subsequently thus been destroyed.

D. Cukor, Geologist, was in charge of the field program. James Wieck, Geologist, carried out part of the geological mapping and geophysical surveys. Overall supervision was by V. Cukor, P. Eng.

The program covered two separate claim groups: the Bingo Group and the Peso Claims, located about 2.5 kilometres apart. Although the area saw some exploration in the past, the work done by NVC Engineering Ltd. was a grass root program. A total of \$82,000 was spent.

The location of the LCP for the Bingo claim was found to be fairly accurate, in comparison to the staking record, however the location on the map for the LCP for the Bango claim differs considerably from its real position in the field. Thus the Squeak claim had been located during the program to cover the area of interest.

2. REVIEW

2.1 SUMMARY and CONCLUSIONS

The Bingo property is underlain by metasediments of the Leech River Formation and metadiorite of the Wark Gneiss Formation, and the Peso claim geology is mostly represented by the Jurassic Bonanza Group. The San Juan and Survey Mountain faults are the major structural elements in the area and they are mainly responsible for today's distribution of geological units. The Survey Mountain fault also appears to have provided the environment for emplacement of gold mineralization on the Bingo property. The graphitic, silicified shears were indeed found elsewhere to enhance precipitation of gold and produce extraordinary rich gold mines. The Survey Mountain fault is just such a zone, 3 - 30 metres wide, and limited sampling (soil and rock) indicated the presence of gold. One of the samples (JW - 6) assayed as high as .28 oz/t gold and .3 oz/t silver. This entire zone should be further explored in great detail.

On the Peso claim there is a presence of widespread pyrite mineralization in sheared volcanics. The pyrite content in such localities reaches up to 20%; numerous samples assayed between .01 and .07 oz/t gold and .1 to .2 oz/t silver. This claim represents another valuable target and warrants further detailed exploratory work.

2.2 RECOMMENDATIONS

The Bingo-Peso properties definitely warrant further work, which should be carried out in two stages.

2.2 RECOMMENDATIONS (Cont'd)

During the first stage on the Bingo claim grid lines, spaced at 50 metres, should be interpolated between existing lines over the graphitic shear in the contact zone between the intrusive and metasediments. These lines should be about 600 metres long. This newly constructed grid and the equivalent portion of the old grid should then be soil sampled at 25 metre intervals. The entire contact zone should be geologically mapped in great detail. Where overburden covered, it should be trenched by backhoe and rocks extensively sampled. Special attention should be given to the area of sample JW - 6.

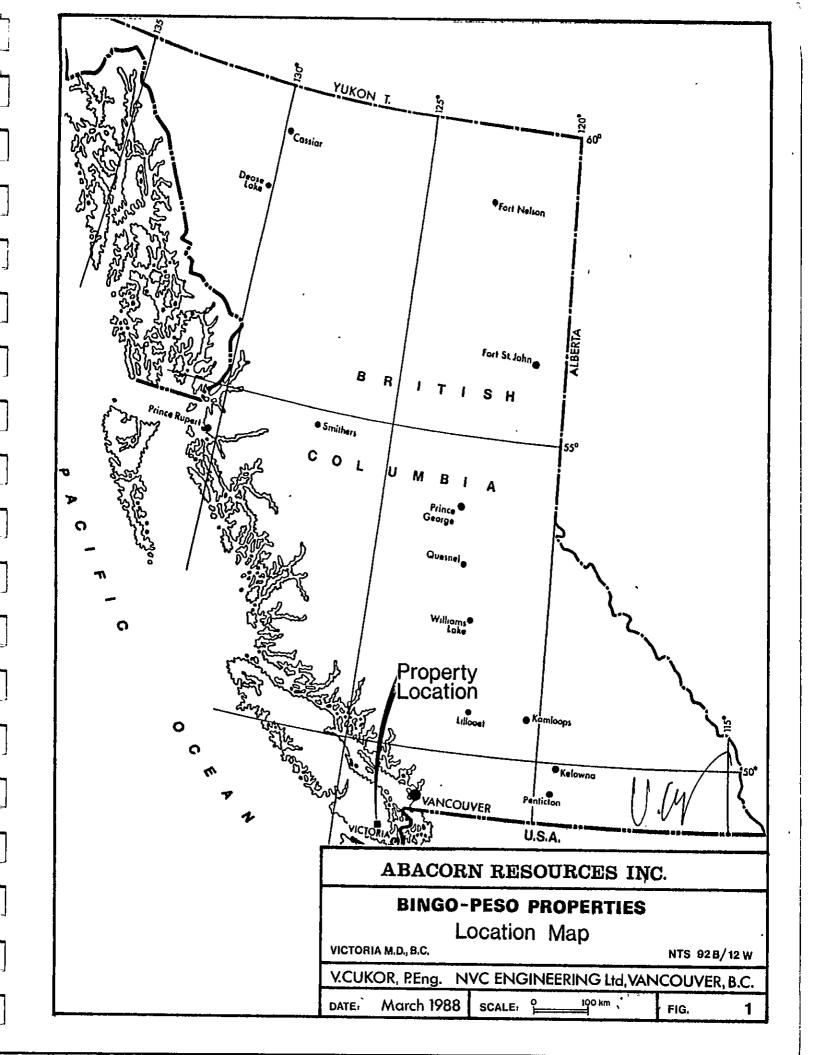
On the Peso claim the entire grid should be soil sampled at 50 metre intervals. The localities of all rock samples (collected during the last program) should be hoe trenched, mapped in detail and extensively sampled.

The second stage should be contingent on the results of the first stage. If positive results are achieved, the second stage should diamond drill test all areas of interest. It is estimated that about 3,000 feet of B.Q. drilling should be sufficient for that purpose.

2.3 COST ESTIMATE

Stage 1	
Linecutting (Bingo), 15 km	\$ 5,000
Soil sampling (Bingo-Peso) 700 @ \$8 ea.	5,600
Trenching (hoe: 50 hrs.@ \$600)	30,000
Sampling, mapping	12,000
Assays	10,000
Data compilation, Report	10,000
Contingencies	5,000
Stage 1 Budget	\$ 77,600
Stage 2	
Diamond drilling, 3,000 @ \$25 ea.	\$ 75,000
Bulldozer Support	5,000
Geological Supervision	8,000
Assays, 300 samples @ \$15 ea.	4,500
Mobilization, demobilization	5,000
Data compilation, Report	12,000
Contingencies	15,000
Stage 2 Budget	124,500
Summary of Estimated Costs	
Stage 1 \$ 77,600	
Stage 2 124,500	
m / 2 m / 1 / 2 m	

Total Estimated Budget \$ 202,100



PROPERTY

3.1 LOCATION

The properties are located about 15 km west of Shawnigan Lake on the southern part of Vancouver Island, and about 40 km northwest of Victoria, B. C.

The property is located in the Victoria Mining Division, on NTS Sheet 92 B - 12 W. The centre of the Bingo group is at the north latitude 48° 36' and west longitude 123° 51'. The Peso claim is located at approximate latitude 48° 38' N and longitude 123° 50'.

3.2 ACCESS

The access to the property area is provided by the all weather Port Renfrew road from Shawnigan Lake. Low quality logging roads provide 4×4 access to various parts of the claims.

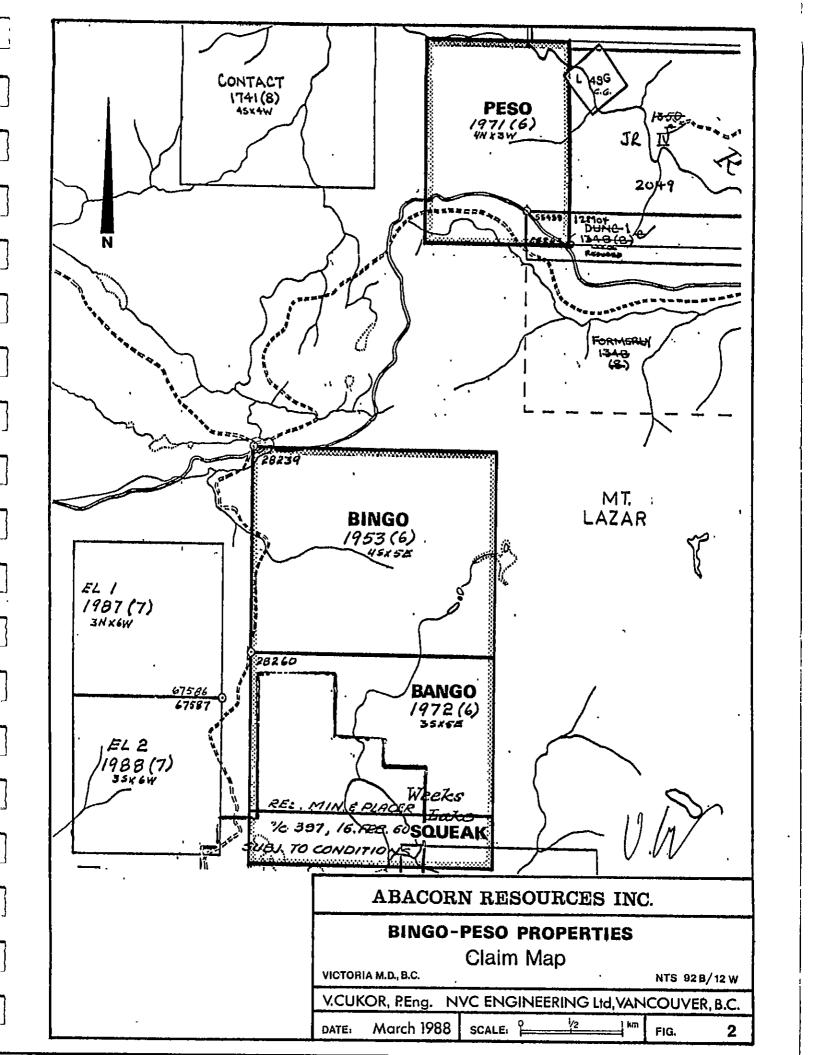
The best accommodation is provided in Duncan, B. C. at a distance of 45 km from the property. This is also a good supply centre for field necessities and for machinery contracting.

3.3 CLAIMS

The property consists of two separate non-contiguous groups:

Bingo Group

Claim Name	No. Units	Record No.	Anniversary Date
BINGO	20	1953	June 26, 1987
BANGO	15	1972	June 29, 1987
SQUEAK	20	2074	February 4, 1988



3.3 CLAIMS (Cont'd)

Peso Group

Claim Name No. Units Record No. Anniversary Date
PESO 12 1971 June 29, 1987

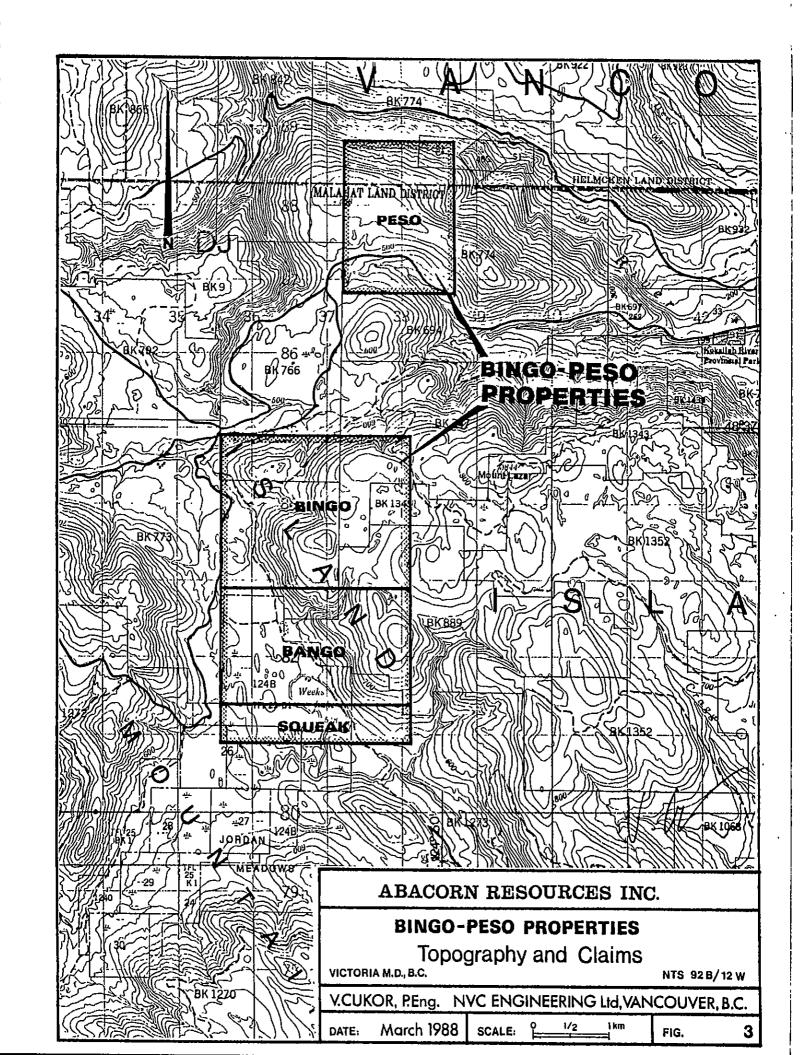
The Bingo, Bango and Peso claims were acquired by the Company from Ruza Resources Ltd., while the Squeak claim was located during the program.

3.4 TOPOGRAPHY and CLIMATE

The Bingo, Bango and Squeak claims are located on the peaks to the west of Mt. Lazar, its southwest slopes and the Weeks Lake Valley. Elevations are between 520 m and 820 m above sea level, for a total relief of 300 m. The topography is varied: virtually flat in the valley and on the plateau on top of the hill. The side hill is moderately steep, transected by deeply carved and steep sided gullies.

The vegetation on the claims is second growth timber. The regenerating forest is thickest and tallest in the valley with the trees up to 10 m in height. On the hilltop the trees are 1.5 metres in height on average. Old logging slash covers most of the property.

The Peso claim covers ground between the Koksilah River bottom over the ridge to the south and down into the valley of a creek which is a tributary of the Koksilah. The claim is situated between 220 and 550 m above sea level, for a total relief of 330 m. The north-facing slope of the Koksilah River valley is steep to very steep. In some places



3.4 TOPOGRAPHY and CLIMATE (Cont'd)

slopes are nearly cliffs. The ridge top is relatively flat and the south slope is moderate.

The vegetation on the Peso claim varies; some areas are forested by first growth (parts of these areas are under active logging), some by regenerating second growth. Much of the claim is covered by fresh logging slash.

Climate of the Bingo-Peso properties is fairly typical for the West Coast. The summers are usually hot and relatively dry. Atmospheric precipitation is high in the other seasons. Winters are cool to moderately cold with variable amounts of snowfall year to year. The tops of the hills, made bare by logging, are subject to fairly high winds during winter storms. The generally moderate climate and high precipitation are condusive to fast vegetation growth.

Timber and water for exploration purposes is available on the property.

4. HISTORY

Placer gold was discovered on the southern part of Vancouver Island around 1864, first on the Leech River and then on the Sooke, San Juan, Sombrio and Jordan Rivers and Meadow and Floodwood Creeks. Subsequent production was carried out on several locations, but the records were poorly kept.

The potential for the presence of the lode gold deposits was mentioned for the first time in GSC Memoir 96, H. C. Cooke in 1917. A number of gold showings were discovered in the area since; the most promising to date is the Valentine Mountain deposit of Valentine Gold Corporation, located about 6 km southwest of the Squeak claim. On that property narrow quartz veins were reported to contain free gold; one of the veins assayed 34.95 oz/ton Au. over 17 cm width. Visible gold was also reported from the drill core.

The area now covered by the Bingo and Peso claims was explored in the past to only a very limited extent. Prior to 1987 no ground survey was carried out on the Bingo group. However, in 1981 Gulf Minerals, Canada Ltd. held a large block of claims to the southeast, and completed a Dighem airborne EM survey. A large, northwest striking conductor, outlined on these claims, extended also over the area, now covered by the Bingo group. No follow-up work was carried out and the claims were allowed to lapse.

The earliest recorded exploration and development in the area of the Peso relates to the Robertson Crown Grant; immediately to the northeast of the Peso claim boundary (see L 48 G on the Claim Map). Silver bearing rocks were discovered in the bed of the Koksilah River by Robertson in 1865 prior to the acquisition of the claim in 1880.

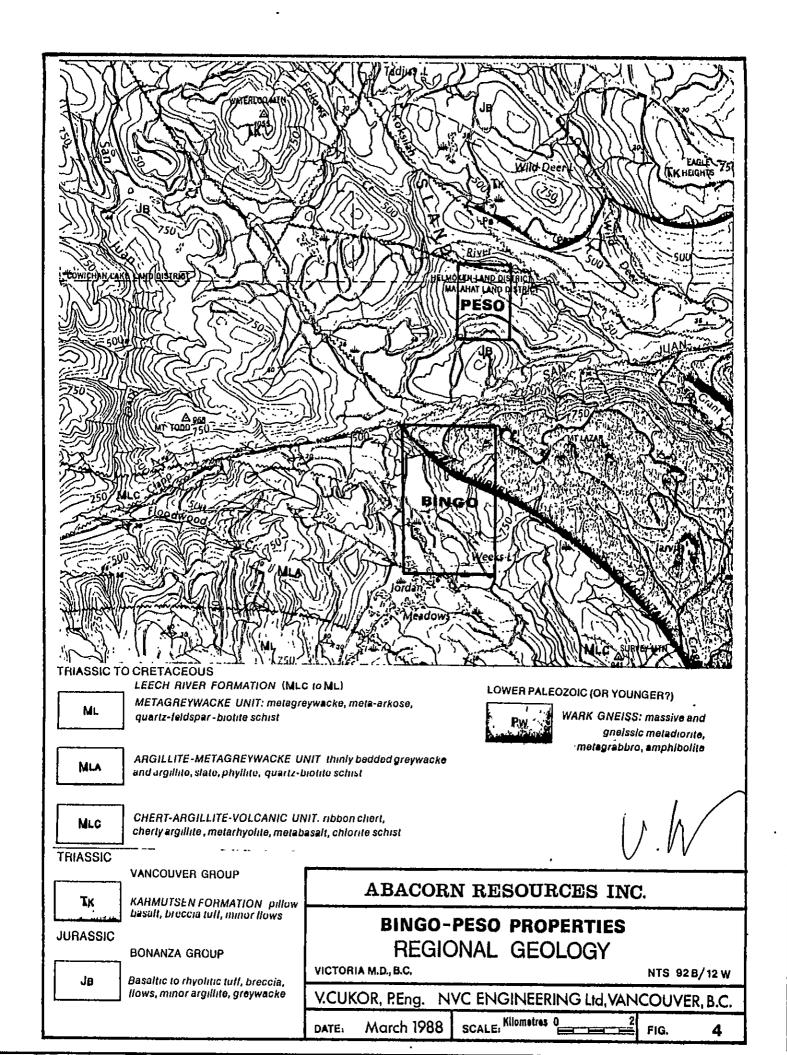
4. HISTORY (Cont'd)

By 1917 approximately 250 feet of drifting was completed on the Robertson Crown Grant. Workings consisted of an upper and lower adit driven on two steeply dipping sheared vein structures trending roughly northeast and ranging in width from 18 inches to 4 feet. The same year a prospecting trench was completed 200 feet above the level of the Koksilah River.

Mineralization in these sheared veins consisted of disseminated argentiferous galena and sphalerite in small seams or lenses (BCDM MMAR, 1917). Samples of ore material collected in 1928 from the lowest dumpsite produced assays of 0.4 oz/ton silver, 2.6% lead and 7% zinc (BCDM MMAR, 1928).

In 1978 the Peso and surrounding ground was held by the Union Miniere Explorations and Mining Corporation Ltd. The same year a reconnaissance scale geochemical survey outlined several irregular but roughly north trending lead and zinc soil anomalies in the central area of the Peso claim.

In 1985 Imperial Metals Ltd. conducted a reconnaissance silt sampling program on the north and south forks of the Koksilah River to the east (downstream) from the Peso claim. The survey reconfirmed the anomalous concentrations of gold on the north fork of the Koksilah, suggesting a local source for the gold in the area of the Peso claim (Assessment Report #14528).



5. GEOLOGY

5.1 REGIONAL GEOLOGY

Three major lithostratigraphic regions meet in the property area, separated by regional fault zones. These regions include the Northern Insular Belt, the Inner Pacific Belt and the Outer Pacific Belt, brought together in the Late Mesozoic to Early Tertiary ages by a combination of strike slip and thrust faulting.

The major east/west trending San Juan Fault separates the Peso claim area from the rest of the property. This major structural lineament trends from Mount Todd eastward to Cobble Hill. The Peso claim, lying north of the fault, is underlain by pillow basalts, breccia tuffs, and, in some flows of the Karmutsen formation, overlying the Bonanza tuffs and flows.

The Bingo group of claims lie south of the San Juan Fault and are located along the northwest portion of the Survey Mountain Fault which separates the Inner Pacific and Insular geological belts. This fault appears as a major northwest trending structural unconformity separating the highly deformed cherts, argillites and volcanic units of the Leach River Formation from the diorite, gneissic metadiorite and amphibolite associated with the Wark Gneiss complex.

5.2 LOCAL GEOLOGY

Geology on the Bingo property consists of two main rock assemblages. Chloritized diorite and gneissic diorite of the Wark Gneissic Complex outcrop in the northern half of the property while well foliated chlorite sericite schist, sheared argillite, chert and volcanic sediments of the Leech River Formation are found outcropping in the southern half (see Figure 5).

The Survey Mountain Fault separates the Wark Gneiss and the Leech River Formation. This fault was found actually to be a fault zone, almost 300 m wide at its widest, striking approximately 130° and dipping near vertically. The zone consists of several large graphitic shears and faults, three main ones, all hosted by the volcanic units of the Leech River Formation. These structures are well exposed in numerous roadcuts and can be traced for several hundreds of metres along strike through the fault scarp on the eastern half of the Bingo property. The steep inclination of these faults and shears, repetitive bedding and structural features observed in chert, pelitic and volcanic schists suggest that the Wark Gneiss was upthrust with respect to the sediments of the Leech River Formation.

Of the three main structures aforementioned, the most prominent one is the active thrust of the Survey Mountain Fault. It forms a prominent ridge that breaks the western slope of the fault scarp trending north along the centre of the claim group. This fault is surrounded on both sides by silicified graphite schist and light green sheared lapilli tuff. These units are crosscut by numerous discordant slightly oxidized calc-silicate stringers.

5.2 LOCAL GEOLOGY (Cont'd)

Geology of the Peso claim consists almost exclusively of the Bonanza Group volcanics except for the northern boundary of the claim, where the Karmutzen Volcanics to the north are brought into fault contact with the Bonanza Group to the south.

Outcrops of the Bonanza Group volcanics consist of basaltic and rhyolitic tuff, breccia and resistive flows of silicified vesicular basalt. These rocks have been intruded along regional bedding planes by a shallow southeast dipping dioritic sill approximately 25 metres in thickness. Sill intrusive rocks consist of fine to medium grained chloritized diorite and porphyritic diorite.

The main fault bounding the Karmutsen Formation from the Bonanza Group splays into at least two subsidiary faults which trend southwest from the main zone and cut upward through the hillside forming slight topographic depressions in the centre of the plateau at the centre of the claim.

The main fault zone is composed of several distinct shears exposed in road cuts over a width of approximately 50 metres. These shears generally contain rocks that are heavily fractured, well oxidized and contain numerous anastomosing shears.

Mineralization on the Peso property is associated with shear and fault structures and consists of finely disseminated pyrite in clay altered, silicified gouge and fine to medium grained disseminations of euhedral pyrite, chalcopyrite and sphalerite in the well fractured, oxidized basalts and basaltic breccia.

5.2 LOCAL GEOLOGY (Cont'd)

The centre of the main fault contains an antiformal drag structure along the hanging wall (north) side of the break. This structure is well exposed in road cuts below the west side of the fault scarp and is defined in semi-competent retrograde graphitic schist layered with moderately to heavily oxidized vuggy quartz stringers.

A less active (possibly dormant) subsidiary shear 50 metres to the north of the main thrust zone consists of a 10 to 20 metre wide zone of alternating silicified graphitic schist, graphitic schist, sheared argillite and minor chloritic schist. This same sequence of units is also repeated approximately 75 to 100 metres south of the main thrust in outcrop exposed along the roadside.

Toward the centre of the subsidiary shear to the north a large irregular network of stained and oxidized quartz stringers and veins appear to have been injected into a zone of brecciation within graphitic units.

Mineralization associated with these structures consists of minor amounts of pyrite commonly replaced by limonite and hematite in association with chlorite contained in fractures adjacent to silicified stringers and fractures containing fine druzy euhedral pyrite in graphitic schist.

The Peso claim is located approximately 2 kilometres north of the Bingo and Bango claims, immediately west of the Robertson Crown Granted mineral claim (Lot No. 48G). The western portion of the claim consists of a low lying plateau that terminates in a ridge toward the eastern boundary of the claim.

5.3 MINERALIZATION

Gold lode exploration on the properties within the Leech River Complex were so far geared toward the quartz veins in the metasediments and metavolcanics. These mostly represent metamorphic "sweats" with gold usually present in the zones rich in pyrite, pyrrhotite and/or arsenopyrite. Such mineralization type seems to be prevalent on the Peso claim found in and associated with major shears. Presence of copper-zinc-silver mineralization in quartz veins is also possible.

In the Leech River Complex very little or no attention was given to carbon and/or graphite zones as potential gold precipitants. The significance of carbon-graphite gold lodes was well established in Witwatersrand in South Africa and in the gold deposit of Carlin, Nevada.

The graphitic shear zone mapped at 3 - 30 metre widths on the Bingo claims could indeed represent a gdld reducing media which could precipitate gold remobilized during the regional metamorphism process.

The presence of gold in this particular structure has been established by both geochemical soil sampling and limited rock sampling (the best sample assayed .280 oz/t gold and .30 oz/t silver.

Rock samples taken on the Bingo claims and Peso claim returned the following values:

Bingo Claims

Sample #	Au. oz/t	Ag. oz/t	Cu. %	Pb. %	Zn. %
JW-01	.008	.13	.009	.017	.011
JW-02	.010	.16	.007	.037	.006
JW-03	.008	.07	.007	.006	.004
JW-04	.003	.05	.004	.005	.003
JW-05	.007	.14	.007	.007	.009
JW-06	.280	.30	.010	.005	.007

5.3 MINERALIZATION (Cont'd)

Bingo Claims (Cont'd)

Sample #	Au. oz/t	Ag. oz/t	<u>Cu. %</u>	Pb. %	Zn. %
JW-07 JW-08 JW-09 JW-10 JW-11	.002 .002 .002 .002 .002	.06 .05 .08 .08	.006 .005 .009 .004 .003	.005 .004 .009 .004 .003	.003 .005 .007 .003
Peso Claim					
PJW-12 PJW-13 PJW-14 PJW-15 PJW-16 PJW-17 PJW-18 PJW-19 *PJW-12	.002 .050 .016 .072 .014 .074 .014 .074	.07 .15 .14 .24 .28 .30 .27 .28	.004 .006 .007 .005 .007 .014 .009 .010	.007 .011 .005 .007 .015 .018 .007 .009	.011 .016 .010 .011 .011 .088 .006 .010

^{*}Sample rerun

The sample locations are shown on the Local Geology Plans (Figures 5 and 6) and description of individual samples is given in the Appendix A. All assay certificates are appended in Appendix B.

6. GEOCHEMICAL SURVEY

A total of 339 soil samples were collected on the Bingo group and 73 samples were taken on the Peso claim. Samples were collected along the cut and surveyed grid lines. Extensive snowfall caused the suspension of the geochemical survey on the Peso claim after completion of sampling over only a small portion of the claim area. Subsequently this portion of the grid had been greatly obliterated by the logging operations in January 1988.

Soil samples were taken from the B horizon wherever a good soil development was encountered. General Testing of Vancouver processed all samples by drying, screening to -50 mesh and producing the metallic bead by fire assay. This bead was crushed, dissolved in aqua regia and assayed for gold and silver by atomic absorption.

Geochemical gold assays produced several areas of decisively anomalous results on the Bingo group of claims. Most of the anomalies are encountered over the contact zone between intrusive and metasediments and a number of highly anomalous readings appear to be associated with the graphitic and silicified shear (see Figures 7 and 8).

Silver results seem to be somewhat erratic, and are scattered over the whole grid area. On the average, it appears that the background for silver is fairly low in the general area of the Bingo group as well as in the surveyed part of the Peso claim.

The future exploration program should definitely include the construction of fill in grid lines on the Bingo claims and resampling of the area of interest (the entire contact zone) at 25 m spacing. The entire Peso grid should be geochemically sampled at 50 m intervals.

7. GEOPHYSICAL SURVEYS

These consisted of Ground Magnetic and VLF-EM surveys. The Magnetic and VLF surveys were run simultaneously, both 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. The base station and field unit are time synchronized so that the background field, diurnal variations and micro pulsations can be filtered from the data. The base station was programmed to measure the field and record the readings at five second intervals.

The VLF unit was set up to receive signals from two stations:

NKL Seattle, Washington, 24.8 KHz and NPM Lualualei, Hawaii, 23.4 KHz,

measuring the horizontal field strength and the inphase and out-of-phase

or quadrature components of the vertical field. The instrument uses a three

coil system, one horizontal and two vertical coils, all at 90° angles to

each other. The system is set to automatically adjust for topographical

shadowing of signals.

7.1 MAGNETIC SURVEY

On both the Bingo and Peso claims the survey was done on a precut grid with 100 metre spaced lines and 25 metre stations. Readings are shown on two 1:5,000 plans (see Figures 9 and 10). Relative readings shown on the plans were arrived at by deducting 55,700 gammas from the corrected total magnetic field values.

The magnetic relief on the Bingo claims grid is generally low.

7.1 MAGNETIC SURVEY (Cont'd)

Prior to the survey it was expected that the part of the property underlain by metasediments would show considerably lower readings than the area underlain by the intrusive. However, the survey data are fairly flat with only several small areas with the relative readings of over 200 gammas. If any structural trends are indicated, they show an almost east/west orientation which also does not conform to the general orientation of the geological structures.

Ground magnetics responded much better on the Peso claim. Total magnetic relief is nearly 2700 gammas. The intrusive is quite clearly delineated with values of over 1000 gammas in general associated with it. The highest and the lowest values, however, seem to be associated with shears. The highest value, at 2+00 W, BL is about 125 m south of the mineralized shear where sample PJW 12 and PJW 13 (.05 oz/t Au.) were taken. The lowest is associated with the most northerly of the shears which trend at 65°.

The magnetic pattern follows the lithostratigraphic trend most closely in the southwestern portion of the map area, where faulting and shearing was not observed.

7.2 VLF-EM SURVEY

On both the Bingo property and the Peso claim the VLF-EM Survey was run utilizing two stations, Seattle and Hawaii. The Hawaii data did not reveal any significant conductors on either property, as was to be expected since the structures run at roughly 90° to the direction to Hawaii. Thus, the Hawaii plots have been omitted from this Report.

The survey for Seattle on the Bingo properties is presented as a trace of the conductors (see Figure 11). The three conductors occupying the centre of the plot correspond directly with the known shear zones of the Survey Mountain Fault. As expected, the graphitic shear zones, which host the target quartz veins, act as excellent conductors and their alignment is optimal for being picked up by the Seattle station. The two southernmost conductors occur in areas of little outcrop and shears could not have been picked up by geological mapping. However, these two conductors are also significant since both traverse areas of gold soil geochem anomalies, L8 + 00E, 2 + 00 S and L18 + 00 E, 7 + 00 S for one and L13 + 00 E, 7 + 50 S for the other.

The survey on the Peso claim did not reveal any significant conductors. The shear zones are not graphitic and the sulphides are fine grained and disseminated, thus the expected conductivity of the targets is low. The data on this claim is presented as stacked profiles (see Figure 12).

VW

STATEMENT OF COSTS ON THE ABACORN RESOURCES INC. PROJECT ON THE PESO AND BINGO-BANGO-SQUEAK MINERAL CLAIMS:

Total expenditure on entire project: \$83,860.00

Since the projects were identical for both the Peso and the Bingo Bango-Squeak properties, the expenditure toward the individual properties is allocated according to property size:

Peso, 12 units = 18% of total area, \$ 15,094.80 Bingo-Bango-Squeak, 55 units = 82% of total area, \$ 68,765.20

TOTAL COSTS, \$ 83,860.00

engineering ltd.

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

ABACORN RESOURCES INC.

Vancouver, B.C.

March 5, 1988 Invoice # 523

Exploration program on the Bingo and Peso claims, Vancouver Island:

Staking and recording Squeak Claim	\$ 4.500	×
Linecutting 412	14,500	
Geochemical soil sampling 520 samples @ 12	6,980	4944 5
Magnetic and electromagnetic surveys	17,500	
Geological mapping, rock sampling	8,500	
Asseys	5,850	
Equipment rental	8,550	
Data correlation, preparing report, drafting etc.	12,000	
Engineering, supervision, management	7,500	

Total charges

\$ 83,860 79344

CERTIFICATE

- I, VLADIMIR CUKOR, of 304 1720 Barclay Street in the City of Vancouver, Province of British Columbia, DO HEREBY CERTIFY that:
- 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;
- I have practiced my profession as a Geological Engineer for the past twenty-five years in Europe, North America and South America in engineering geology, hydrogeology and exploration for base metals and precious metals;
- 5. I have personally supervised the work described in this Report and have reviewed all available information on these properties;
- 6. I have no interest, direct or indirect, in the properties of Abacorn Resources Inc., nor do I expect to receive any:
- 7. I hereby consent to the use of this Report, by Abacorn Resources Inc., for organizing public financing.

March 9th, 1988

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

APPENDIX A

DESCRIPTIONS OF ROCK SAMPLES

ROCK SAMPLE DESCRIPTIONS: BINGO BANGO CLAIMS

Sample	# Description
JW 01	 light grey crystalline quartz stringer (approximately 4-5 cm thick) exposed in dark grey, fine chlorite sericite, graphite schist. rock chip sample of material exposed in road cut.
JW 02	slightly oxidized, vuggy crystalline quartz float.grab sample of float from road side.
JW 03	 silicified shears in medium to fine grained (slightly gneissic) fractured chloritized granodiorite. rock chip sample of material exposed in road cut.
JW - 04	 discordant silicified tension fracture exposed in fine grained phyllitic chlorite sericite schist. lightly stained and oxidized. rock chip sample of material exposed in road cut.
JW 05	 irregular discordant quartz stringers exposed in well foliated layered chlorite sericite and graphite schist. rock chip sample of material exposed in road cut.
JW 06	 irregular yellowish quartz stringers in brecciated graphitic schist. rock chip sample of material exposed in road cut. sample taken over 2 metre interval.
JW 07	 dark grey to black, fine grained, graphitic schist; gossanous on weathered surface. rock chip sample of material exposed in road cut.
JW 08	silicified contact dark grey to black graphitic schist and light green chlorite schist.rock chip sample of material exposed in road cut.
JW 09	 quartz stringers (tension fractures) in fine grained chlorite serecite schist. slightly gossanous in appearance. rock chip sample of material exposed in road cut.
JW 10	 large irregular quartz stringers in sheared black argillite and chlorite schist. vuggy appearance large quartz crystals, hematite, limonite replacing pyrite. rock chip sample of material exposed in road cut.
JW 11	rusty exposure of graphitic chlorite sericite schist.rock chip sample of material exposed in road cut.

ROCK SAMPLE DESCRIPTIONS: PESO CLAIMS

Sample #	Description
PJW 12	 oxidized subcrop consisting of fine to medium grained brecciated basalt. heavily oxidized along fractures; soil and talus dark reddish brown. fine to medium grained disseminated euhedral pyrite up to 15%. grab sample of float.
PJW 13	 fine grained chloritized brecciated vesicular basalt. heavily fractured, oxidized. fine to medium disseminated pyrite 15%.
PJW 14	 dark green, fine to medium grained chloritized basalt. fine disseminated euhedral pyrite 10%. rock chip sample of material exposed in road cut.
PJW 15	green gossanous talus and soil sample.sample of material exposed in road cut.
PJW 16	 dark green brecciated basalt; irregular quartz carbonated stringers. fine disseminated euhedral pyrite up to 10%. rock chip sample of material exposed in road cut.
PJW 17	 light grey siliceous gouge with irregular anastomosing chloritized stringers. fine disseminated euhedral pyrite 10%. rock chip sample of material exposed in road cut.
PJW 18	heavily oxidized and fractured basalt, adjacent to shear zone.rock chip sample of material exposed in road cut.
PJW 19	 light grey silicified basalt adjacent to sheared contact between diorite and basalt. fine diseminated pyrite 10 - 15%. rock chip sample of material exposed in road cut.

Date:

March 3, 1988

File:

8802-2960



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. 304 - 1720 Barclay Street Vancouver, B.C.

V6G 2Y1

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

0re

MARKED	GOLD	SILVER	Copper	Lead	Zinc			
	oz/st	oz/st	Cu (%)			XXXXX	******	XXXXX
······································			Cu (%)	Pb (%)	Zn (%)		<u> </u>	<u> </u>
			i					
JW - 01 JW- 02	0.008	0.13	0.009	0.017	0.011			
JW− 02 JW − 03	0.010	0.16 0.07	0.007 0.007	0.037 0.006	0.006 0.004			
JW - 04	0.003	0.05	0.007	0.005	0.004			
JW - 05 JW - 06	0.007	0.14	0.007	0.007	0.009			
JW - 06 JW - 07	0.280	0.30 0.06	0.010 0.006	0.005 0.005	0.003 0.003			
JW - 08	0.002	0.05	0.005	0.003	0.005			
JW - 09	0.002	0.08	0.009	0.009	0.007			
JW - 10 JW - 11	0.002	0.08 0.05	0.004 0.003	0.004 0.003	0.003 0.003			ļ
PJW - 12	0.002	0.07	0.003	0.003	0.003			
PJW - 13	0.050	0.15	0.006	0.011	0.016			
PJW - 14 PJW - 15	0.016	0.14 0.24	0.007 0.005	0.005 0.007	0.010 0.011			
PJW - 16	0.014	0.28	0.003	0.015	0.011			
PJW - 17	0.074	0.30	0.014	0.018	0.088			1
PJW - 18 PJW - 19	0.014	0.27 0.28	0.004 0.010	0.007 0.009	0.006 0.010			
LVJW - 20	0.002	0.16	0.003	0.005	0.004			
				İ				
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]							
			ļ					
			}					
]							
								ł

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

ALL REPORTS ARE THE CONFIDENTIAL PROPERTY OF CLIENTS. PUBLICATION OF STATE-MENTS CONCLUSION OR EXTRACTS FROM OR REGARDING OUR REPORTS IN NOT PERMITTED WITHOUT OUR WRITTEN APPROVAL. ANY LIABILITY ATTACHED THERETO IS LIMITED TO THE FEE CHARGED.

L Wong

PROVINCIAL ASSAYER

Date:

February 17, 1988

File: 8801-2157

%5GS

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.1

N.V.C. ENGINEERING LTD. 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	SILVER	xxxxxxxx	xxxxxxxx	KXXXXXXXX	XXXXXXXXX	xxxxxxxx	KXXXVVV
<u> </u>		Au(ppm)	Ag(ppm)						PARAKA
3.L. E	22+50	0.10	0.4						
E	23+50	0.13	0.5						
.L.#13	0+00 S	0.02	0.7		i i				
	1+00	0.03	0.5			; }			
	2+00	0.03	0.2			1 1			
	3+00	0.03	0.3			11			
	4+00	0.02	0.5			[{ 			
	5+00	0.02	0.3		.	· - ·	[ŀ	
	6+00	0.02	0.4		İ	\		ļ	
	7+00	1.06	1.3				1/1		
	8+00	0.41	0.7	ļ			\sim		
	9+00	0.12	0.3	, l	ٳ	,			
	10+00	0.08	0.5						
J#14	0+00 S	0.02	0.5			4			
	1+00	0.02	0.5						
	4+00	0.02	0.7	ļ					
	5+00	0.02	0.8			j		ł	
	6+00	0.02	0.8						
	7+00	0.02	0.7				1		
	8+00	0.02	0.8			 			
	9+00	0.03	0.3				Ţ	ŀ	
	10+00	0,03	0.4						
. #18	1+00 S B-2	0.43	1 1 1						
.,, 10	3+00 S B-2	0.22	0.8	1	ļ		[i	
	4+00 S	0,14	0.4		İ		Ì		
	6+00 S B-2	0,10	9.4						
	7+00 S B-2	0.09	0.3						
	8+00 S B-2	0.02	0.4	Ì					
	9+00	0.02	0.4	}					
	10+00	0.03	0.3						
#20	1+00 S B-2	0.02	0.4	.			i		
	2+00 S B-2	0.03	0.5	ļ					
	3+00 S B-2	0.03	0.5	i			ŀ	!	
					/ cont	inued 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

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PROVINCIAL ASSAYER

Date: February 17, 1988

File: 8801-2157



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. ENGINERING LTD .

(page 2)

-4/e hereby certify that the following are the results of assays on:

Soil samples

<u> </u>			GOLD	SILVER	<u> </u>	T .		Γ		
•	MARKED					XXXXXXXX	XXXXXXXXX	XXXXXXXX	xxxxxxxx	XXXXXXXX
		· - · ·	Au (ppm)	Ag(ppm)						
L#20	4+00 S	B-2	0.03	0.5				,	T	
•	5+00 S	B-2	0.06	0.3			•			
	6+00 S		0.02	0.3						
]	7+00 S		0.03	0.4					l .	
	9+00 S		0.02	0.3			1 21			
1	10+00 S		0.03	0.3				•		
]										
L#21	1+00 S		0.02	0.4						
1	2+00 S		0.02	0.5					<u> </u>	
	4+00 S		0.02	0.5			` l			
	5+00 S		0.02	0.8				11	ļ	
	6+00 S		0.03	0.8				\sim		
	7+00 S		0.02	0.7			ا ،			
	9+00 S	B-2	0.03	0.5	i		;			
-	10+00 S	B-2	0.06	0.5				i		
 止#22	1+00 S		0.02	0.7						
111 Z Z				0.7	i					
	2+00		0.02	0.3						
Ì	3+00		0.02	0.4					į	
]	4+00	i	0.02	0.7		ļ				
	5+00		0.02	9.8	}	, · İ	1	}		
1	6+00		0.02	0.4	ł	´•				
	-7+00		0.02	0.5	ľ			i	Į.	
,	8+00		0.02	.0.8		ļ			1	
	9+00	1	0,24	0.7		1	i			
	10+00		19:04	0.7]	
J	4+00 N		10 00	0 5			1			
1			\0,02	0.5	i	i			ļ	
	6+00	i	0.02	0.4			ļ	Į	{	
J	7+00		0.02	0.5		ŀ	İ			
	9+00		0.02	0.2	į				ĺ	
#23	1+00 S	B-2	0.02	0.5						
,	2+00 S	r	0.06	0.5]	
	3+00 S		0.03	1.1		f				
	6+00 S		0.05	0.4					ļ	
i	8+00 S		0.03	0.7			1		-	
	9+00 S	· ·	0.02	0.4					ì	
	10+00 S		0.02	0.7			/ continue	d on poor	اصدح	
							, continue	a on page		
AID	CTS RETAINED ON REJECTS WILL BE	SIUNEFU	H A MAXIMUM U	F ONE YEAR						
L REPORT	TS ARE THE CONFI ON OR EXTRACTS F EN APPROVAL AN	IDENTIAL PI	ROPERTY OF CL	ENTS PUBLICA	TION OF STATE-M	ENTS		•		
JR WRITTI	EN APPROVAL AN	YLIABILITY	ATTACHED THE	RETO IS LIMITED	TO THE FEE CHA	RGED		L. Wong	· ·····	
								<u> </u>	PROV	INCIAL ASSAYER
		A	Insiviical an	id Consultii	na Chemists	Bulk Cargo	Conninlinto C			

Date: February 17, 1988

File: 8801-2157

%5GS

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

	GOLD	SILVER	R XXXXXXX	XXXXXXXXX	(XXXXXXXXXX	XXXXXXXX	xxxxxxxx	**********
MARKED	Au (ppm)	Ag (ppm						
1 1104						,		
L#24 2+00 S	0.02	0.5						
3+00 4+00	0.03	0.4						
	0.04	0.3						
5+00 6+00	0.03	0.4			, }		·	
7+00	0.03	0.3			11	i		
8+00	0.03	0.5 0.6	į					
9+00	0.03	1.0	-		1 1			
10+00	0.03	0.8			· - · - · · · · · · · · · · · · · · · ·			
25,00	0,02					``		
1+00 N	0.03	0.9				` ',		
2+00	0.03	0.5	į	İ		∨′		
3+00	0.03	0.6		٠,				
3+50	0.02	0.8						
5+00	0.02	0.9	}	,				
6+00	0.02	0.8				ŀ		
7+00	0.02	1.0						
8+00	0.03	0.4						
9+00	0.05	0,6	1	,				
10+00	0.03	9.8	į					
	1	₹,	[j		
L#1 3+00 N	0.02	0.5	i			i		
4+00	0.02	0.5						
5+00 6 - 00	0.02	1.0	İ					
6+00 7+00	/,0.02	0.9	i		J		- 1	
7+00	0.02	0.4					Ì	
L#2 2+00 N	1,000	0.6	ļ	İ				
3+00 N	\`0.02 0.02	0.6	ļ	ł		}		
4+00	0.02	0.8						
5+00	0.02	0.6		}				
			1			}		
L#5 1+00 S B-2	0.02	0.6			j		}	
4+00 S B-2	0.02	1.0						
5+00 S B-2	0.02	0.6					}	
7+00 S B-2	0.02	0.8	İ					
10+00 S B-2	0.02	0,9				, ,	ntinued q	3 2000 A
					1		nctined 01	ı page 4
NOTE REJECTS RETAINED ONE MONTH AND REJECTS WILL BE STORE FO	PULPS RETAINE	D THREE MONTI	HS ON REQUEST F	PULPS				
ALL REPORTS ARE THE CONFIDENTIAL O	ON A MAXIMUM C	FONE YEAR	TION OF STATE ::			k.	-	•
ALL REPORTS ARE THE CONFIDENTIAL P CONCLUSION OR EXTRACTS FROM OR P OUR WRITTEN APPROVAL ANY LIABILITY	REGARDING OUR ATTACHED THE	REPORTS IN NO REPORTS IN NO RETO IS LIMITED	THON OF STATE M OT PERMITTED WIT O THE FEE CHAI	ENTS HOUT RGED		L. Wong		
							PROV	INCIAL ASSAYER

Date: February 17, 1988

File: 8801-2157

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

(pag 4)

Te hereby certify that the following are the results of assays on:

soil samples

		GOLD	SILVER	XXXXXXX	XXXXXXXXX	********	~~~~~	xxxxxxxx	
]	MARKED	Au(ppm)	Ag(ppm)				^^^	*******	XXXX
L#5	1+00 B-1 2+00 B-1 3+00 B-1 4+00 B-1 5+00 B-1 6+00 B-1 7+00 B-1 8+00 B-1 9+00 B-1	0.02 0.02 0.03 0.04 0.02 0.02 0.02 0.02 0.02	0.4 0.4 0.9 0.8 0.5 0.5 0.4 0.4				,		
]]]	1+00 S B-2 2+00 S B-2 1 0 +00 S B-2	0.02 0.02 0.02	0.6 0.6 0.5			`			
L#7]	1+00 S 2+00 S B-2 3+00 S B-2 4+00 S B-2 5+00 S B-2 6+00 S B-2 7+00 S B-2 8+00 S B-2 10+00 S B-2	0.02 0.02 0.02 0.02 0.02 0.02 0.02 0.02	0.5 0.6 0.5 0.8 0.5 0.8 0.9 0.4			,			
]	1+00 N 2+00 3+00 4+00 5+00 6+00 7+00 8+00 9+00 10+00	0.02 /0.02 0.06 0.02 0.02 0.02 0.02 0.02 0.02 0.02 0.02 0.02	0.3 0.3 0.6 0.5 0.5 0.5 0.4 0.6 0.8 0.4			•			
#8	1+00 S B-2 2+00 S B-2 4+00 S B-2 5+00 S B-2	0.02 0.08 0.02 0.02	0.5 0.9 0.4 0.8			/ conti	nued on p	age 5	•••
LL REPORT	CTS RETAINED ONE MONTH I REJECTS WILL BE STORE FO S ARE THE CONFIDENTIAL PI N OR EXTRACTS FROM OR R IN APPROVAL ANY LIABILITY	ROPERTY OF CL	JENTS PUBLICA	TION OF STATE M	ENTS		Wong	age 5	· · · · · · · · · · · · · · · · · · ·

Date: February 17, 1988

8801-2157 File:



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 5)

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

soil samples

		GOLD	SILVER		L			I	I
1 7	MARKED	Au (ppm	<u> </u>			********	XXXXXXXX	xxxxxxxx	xxxxxxxxx
		Au (ppiii)Ag(ppm)			 			
L#8	6+00 S B-2	0.02	0.4	,			•		
Ì	7+00 S B-2	0.02	0.3	į					
	8+00 S B-2	0.02	0.5			ļ			
Ţ	9+00 S B-2	0.02	0.4						
Ť	10+00 S B-2	0.02	0.5						•
1 #0	1+00 N	0.00	0.4						
7 L#8	2+00 N	0.02	0.4 0.4			1 1			
7	3+00	0.02	0.4			}			
}	4+00	0.02	0.3			,	1		
!	5+00	0.02	0.5				```		
רֿ ר	6+00	0.02	0.4				`\		
]	7+00	0.04	0.5		,		Ì		
Ī	8+00	0.02	0.4						
†	9+00	0.02	0.6			i			
] L#9	1+00 S B-2	0.02	0.9						,
	2+00 S B-2	0.02	0.5		į				
}	3+00 S B-2	0.02	0.4						
Į Į	4+00 S B-2	0.02	0,5	Į				ļ	
<u> </u>	5+00 S B-2	0.02	0,5		į				
ļ	6+00 S B-2	0.02	0.5						
.} 	7+00 S B-2	0.02	0.4						
7	9+00 S B-2	0,02	0.6					i	
L#9	1+00 N	/,0.02	0.4.						
	2+00	0.02	0.5						
}	3+00	\`Q.02	0,5/						
]	4+00	Q.Q2	0.5						
	5+00	0.02	0.5						
ן	6+00	0.02	0.6		i				
]	7+00	0.02	0.4						
	8+00 9+00	0.02 0.52	0.4			ļ	1		
1	10+00	0.03	0.3		1	İ	İ		
j	10100	0.05	0.5						
,						/ c	ntinued o	n page 6	• • • • • • •
<u> </u>									
NOTE RE	JECTS RETAINED ONE MONTH ID REJECTS WILL BE STORE FO	PULPS RETAINE	D THREE MONT	HS ON REQUEST	PULPS	<u></u> L	1	and the same of	
ALL REPO	ORTS ARE THE CONFIDENTIAL P	ROPERTY OF C	LIENTS PUBLICA	ATION OF STATE-M	IENTS		į	W Z	
OUR WRI	SION OR EXTRACTS FROM OR F TTEN APPROVAL ANY LIABILITY	REGARDING OUF ATTACHED THE	REPORTS IN N RETO IS LIMITE	OT PERMITTED WIT D TO THE FEE CHA	THOUT AGED		L. Wong	ALL STREET	

Date:

February 17,

File:

8801-2157



SGS

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 6)

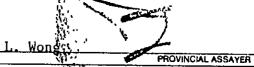
We hereby certify that the following are the results of assays on:

soil samples

	GOLD	SILVER	VVVVVVVV					
MARKED	Au(ppm)	Ag(ppm)	******		******	******	XXXXXXXXX	
L#10 1+00 S B-2 2+00 S B-2 3+00 S B-2 4+00 S B-2 5+00 S B-2 6+00 S B-2 7+00 S B-2 9+00 S B-2	0.02 0.02 0.02 0.02 0.02 0.02 0.02 0.02	0.6 0.6 0.4 0.5 0.4 0.4 0.5						
1+00 N B-1 2+00 N B-1 3+00 N B-1 4+00 N B-1 5+00 N B-1 7+00 N B-1 8+00 N B-1 10+00 N B-1	0.02 0.02 0.02 0.02 0.02 0.02 0.02 0.02	0.4 0.5 1.0 0.8 0.6 0.5 0.5						
L#11 1+00 N 2+00 3+00 4+00 5+00 6+00 7+00 8+00 9+00 10+00	0.02 0.02 0.02 0.02 0.02 0.02 0.02 0.02	0.5 0.5 0.8 0.8 0.8 0.4 0.3 0.4						
L#12 1+00 N 3+00 4+00 5+00 6+00 8+00 9+00 10+00	0.02 0.02 0.02 0.02 0.03 0.02 0.02 0.02	0.4 0.3 0.4 0.4 0.8 1.1 0.9 0.6						
			/	continue	l on page	7		

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

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Date: February 17, 1988

File: 8801-2157



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 7)

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

Soil samples

	······································	GOLD	SILVER	<u> </u>	 		т		
	MARKED	. ,		xxxxxxx	XXXXXXXX	XXXXXXXX	xxxxxxxx	XXXXXXXX	xxxxx
		Au (ppm	Ag (ppm) 					
L#13	1+00 N	0.02	1.0				,	 	
	2+00	0.02	0.3						
	3+00	0.02	0.4					!	
	4+00	0.02	0.4				ļ		ĺ
	5+00	0.02	0,5			, 1			
	6+00	0.02	0.8]	
	7+00	0.02	0.5						
	8+00	0.02	0.4						
	9+00	0.02	1.3				l,		
	10+00	0.02	0.4			`	l`.	ļ	
1 #1 /	0.00.11	1					` >		
L#14	0+00 N	0.02	0.4	ļ			ĺ		
	1+00	0.02	0.6		1				
	2+00 3+00	0.02	0.4						
	4+00	0.02	0.5						İ
	5 + 00	0.02	0.6						!
	6+00	0.02	0.8		ĺ				1
	7+00	0.02	0.5						}
	8+00	0.03	0,5						
	9+00	0.02	0,4	ļ		ĺ			
	10+00	0.02	0.4	1					
L#15	1+00 N B-1	0.02	0.4						
	2+00 N B-1	0.02	0.5	ŀ	İ	i			
	3+00 N B-1	0.02	0.3						
	4+00 N B-1	0.02	0.6		ļ	İ			•
	5+00 N B-1	\ Q.02	0.6						
	6+00 N B-1	Q.Q2	0,6		i				
	7+00 N B-1	0.02	0.4			ŀ	1		
	8+00 N B-1	0.02	0.4	1		1	ļ		
	9+00 N B-1	0.02	0.5	ĺ			ĺ		
	10+00 N B-1	0.02	0.5				ļ		
L#15	1+00 S B-2	0.02	0.5						
_,,	2+00 S B-2	0.02	0.9]					
	3+00 S B-2	0.02	0.9						
	4+00 S B-2	0.03	0.5		/ 000	tinued on	2005: 0		
			0.5		, соп	ctuded Ou	hage	••••	
NOTE REJE	CTS RETAINED ONE MONTH	PHI PS DETAINED	THREE MANY	ID ON 250/					
AND	CTS RETAINED ONE MONTH REJECTS WILL BE STORE FO	O MUMIXAM A RC	F ONE YEAR	15 ON HEQUEST P	ULPS			/	
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UH WHIT	EN APPROVAL ANY LIABILITY	ATTACHED THE	RETO IS LIMITED	TO THE FEE CHAP	RGED		L. Wong		

SGS SUPERVISION SERVICES INC. General Testing Laboratories Division

February 17, 1988

Date: File:

8801-2157

1001 East Pender Street,

Vancouver, B.C., Canada. V6A 1W2

Telephone: (604) 254-1647

Telex: 04-507514

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

		GOLD	SILVER	xxxxxxxx	xxxxxxxx	XXXXXXXX	XXXXXXX	XXXXXXXXX	
	MARKED	Au (ppm)	Ag(ppm)					AAAAAAXX	XXXXXXXX
L#15	5+00 S B-2 7+00 S B-2 8+00 S B-2 9+00 S B-2 10+00 S B-2	0.02 0.02 0.02 0.03 0.03	0.5 0.4 0.6 0.6 0.3			(1)	,		
L#16	1+00 N B-1 2+00 N B-1 3+00 N B-1 4+00 N B-1 5+00 N B-1 6+00 N B-1 7+00 N B-1 8+00 N B-1 9+00 N B-1 10+00 N B-1	0.03 0.02 0.02 0.02 0.03 0.02 0.02 0.02	0.5 0.8 0.2 0.3 0.6 0.2 0.2 0.3 0.5 0.3						
	0+00 S B-2 1+00 S B-2 2+00 S B-2 3+00 S B-3 4+00 S B-2 5+00 S B-2 6+00 S B-2 7+00 S B-2 8+00 S B-2 9+00 S B-2 10+00 S B-2	0.02 0.02 0.02 0.12 0.02 0.03 0.02 0.03 0.05 0.05	0.3 0.2 0.3 0.3 0.2 0.3 0.2 0.3 0.3					,	
#17	1+00 N 2+00 3+00 4+00 5+00 6+00 7+00 8+00 9+00	0.02 0.02 0.02 0.02 0.03 0.02 0.02 0.02	0.2 0.3 0.2 0.3 0.3 0.3 0.2 0.2 0.3 0.2				nued on p		

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

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1		СОГО	SILVER	XXXXXXX	xxxxxxxx	xxxxxxxx	XXXXXXXX	*xxxxxxxx	XXXXX
	MARKED	Au (ppm)	Ag(ppm)						
L#17	1+00 S B-2 2+00 S B-2 4+00 S B-2 5+00 S B-2 6+00 S B-2 7+00 S B-2 8+00 S B-2 9+00 S B-2 10+00 S B-2	0.02 0.02 0.02 0.02 0.02 0.02 0.02 0.02	0.5 0.6 0.3 0.2 0.3 0.3 0.3 0.3						
L#18	1+00 N 2+00 3+00 4+00 5+50 6+00 7+50 8+00 9+00	0.02 0.34 0.02 0.02 0.02 0.02 0.02 0.02 0.02	0.2 0.8 0.3 0.3 0.3 0.2 0.6 0.3 0.5 0.3						
L#19	0+00 N B-1 1+00 N B-1 2+00 N B-1 3+00 N B-1 6+00 N B-1 8+00 N B-1 9+00 N B-1 10+00 N B-1	0.02 0.02 0.02 0.02 (0.02 0.02 0.02 0.02	0.2 0.3 0.5 0.3 0.3 0.3 0.2						
	2+00 S B-2 2+00 S B-1 3+00 S B-2 4+00 S B-2 7+00 S B-2 8+00 S B-2 9+00 S B-2 10+00 S B-2	0.02 0.02 0.02 0.02 0.02 0.02 0.02	0.3 0.3 0.2 0.2 0.2				continus	ed on page	10

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soil samples

J		GOLD	SILVER	· <u> </u>					
1	MARKED	Au (ppm)		XXXXXXX	XXXXXXXX	XXXXXXXXX	XXXXXXXX	xxxxxxxx	xxxxx
	L#20 1+00 N B-1 2+00 N B-1 3+00 N B-1 4+00 N B-1 5+00 N B-1 6+00 N B-1 8+00 N B-1 9+00 N B-1 10+00 N B-1	0.02 0.02 0.02 0.02 0.02 0.02 0.02 0.02	0.5 0.2 0.3 0.2 0.3 0.2 0.3 0.2						
	B.L. 5+50E O+00N 6+00E 6+50E 7+00E 7+50E 8+00E 8+50E 9+00E 9+50E 10+00E 15+00E	0.02 0.02 0.02 0.02 0.02 0.02 0.02 0.02	0.2 0.3 0.2 0.3 0.2 0.3 0.3 0.3 0.3						•
	B.L. 15+50E (A) B.L. 15+50E (B) B.L. 18+50E B.L. L#16E 0+00N B.L. L#17 0+00N L#18 0+00N 18+00E B.L. L#20E 0+00N B-1 B.L. 5+00 - 0+00 B.L. 13+00- 0+00	0.02 0.02 0.02 0.02 0.02 0.02 0.02 0.02	0.2 0.2 0.3 0.3 0.3 0.3 0.3 0.3						
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AND REJECTS WILL BE STORE FOR A MAXIMUM OF ONE YEAR

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V6G 2Y1

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

	1150	GOLD	SILVER	XXXXXXXX	KXXXXXXXX	XXXXXXXXX	XXXXXXXXX	xxxxxxxx	XXXXXX
MAF	IKED	Au(ppm)	Ag (ppm)					
L#2 PESO	1+00 N	0.20	0 "			·	 		
DIL I DOO	2+00 N	0.38	0.5				Ì		
	3+00	0.14	0.4	i					
	4+00	0.02	0.9						
		0.02	0.8		-	И			
	4+50	0.02	0.7			[]		İ	
	5+00	0.03	0.7			11			
	7+00	0.02	0.8						
L#3 PESO	1+00 N	0.02	0.5		;	}			
	2+00	0.02	0.5			` `			
	3+00	0.02	0.7						
	4+00	0.02	0.5	ļ			\ <u>`</u> \?	İ	
	5+00	0.03	0.4	j		1			
	6+00	0.02	0.4	ľ		'			
	7+00	0.02	0.5		·				
L#4 PESO	1+00 N	0.03	0.7						
+	2+00	0.02	0.4	_]	٠				
	3+00	0.02	0.8						
	4+00	0.02	~~~ I	` }					
	5+00	0.03	0,4	}	ļ				
	7+00	0.18	0,4 0,5.						
#S DECO	1.00 1								
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Telex: 04-507514

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soil samples

1		GOLD	SILVER	XXXXXXXX	XXXXXXXX		***********	XXXXXXXX	222211
ا 1	MARKED	Au (ppm	Ag (ppm)					AAAAXXXXX	*****
]	L #1 PESO 7+00 N 8+00 9+00 10+00	0.02 0.02 0.02 0.02	0.8 0.7 0.3 0.4				•		
	L#3 PESO 3+00 N 4+00 5+00 6+00	0.02 0.02 0.02 0.02 0.02	0.3 0.5 0.4 0.4						
	L#6 PESO 1+00 2+00 3+00 4+00 5+00 6+00 8+00 9+00 10+00	0.02 0.02 0.02 0.02 0.02 0.02 0.02 0.02	0.3 0.3 0.7 0.3 0.3 0.4 0.5 0.4	•		:			
	B.L. 0+00W - 0+00N 1+00W 1+50W 2+00W 2+50W 3+00W 3+50W 4+00W 4+50W 5+00W 5+50W 6+00W 6+50W 7+50W 8+00W	0.03 0.03 0.02 0.02 0.02 0.02 0.02 0.02	0.4 0.3 0.4 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3						
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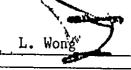
We hereby certify that the following are the results of assays on:

soil samples

	GOLD	SILVER	xxxxxxxx	xxxxxxxx	XXXXXXXX	XXXXXXXX	xxxxxxxx	VVVV
MARKEO	Au (ppm)	Ag(ppm)					******	****
B.L. 11+50e 13+50E 17+50E 0+50W 12+50 14+50E	0.02 0.02 0.02 0.02 0.02 0.02 0.02	0.3 0.4 0.5 0.4 0.7						
B.L. 19+50E 0+00N	0.02	0.4						
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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:

- method enabling procedures,
- 2) measuring procedures,
- 3) warning messages,
- 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

VLF Horizontal Field Strength Measurement

Date. March 24,1984, start 0600 Station Annapolis 214 kHz

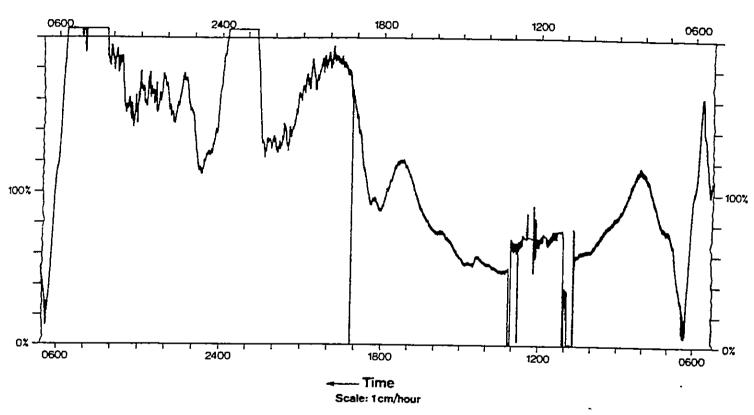


Figure VLF:1 Chart Recording of Primary Field Changing with Time

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

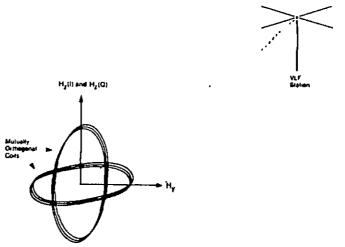
1.3 What the IGS-2/VLF-4 Measures

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.

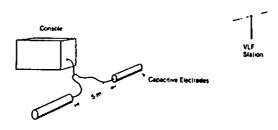
The primary field from a VLF station can in fact, vary considerably. Figure VLF:1 is a recording of the horizontal field strength from the Annapolis VLF station made in Toronto, Canada. For the most part, the field fluctuates moderately during the course of the day due to changes in atmospheric conditions. 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.

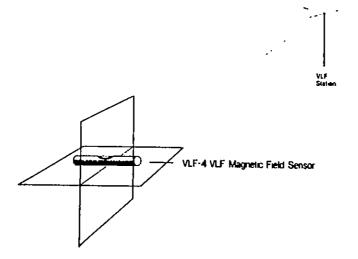
To permit measurement of the VLF-electric field, a dipole consisting of two cylindrical electrodes and 5 meters of wire is used. When this dipole is correctly laid out, the IGS-2/VLF-4 measures the in-phase and quadrature components of the horizontal electric field in the direction of the line joining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



The VLF-magnetic field measurement comprises: 1) horizontal amplitude Hy, 2) the amplitude of $\rm H_2(I)$ (the vertical field component which is in-phase with Hy) and 3) the amplitude of $\rm H_2(Q)$ (the vertical field component which is 90° out-of-phase with Hy.



The VLF-4 is used to measure the in-phase $E_\chi(1)$, and quadrature $E_\chi(Q)$, components of the horizontal electric field, E_χ , in the line joining the operator and the transmitter station. The phase is referenced to that of the horizontal magnetic field H_{γ} . 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:

$$\rho = \frac{1}{2\pi f \mu_{0}} \left| \frac{E_{x}}{H_{y}} \right|^{2}$$

where:

 ρ = apparent resistivity in ohm-meters

 E_{x} = horizontal electric amplitude, calculated

 $E_{x} = (E_{x}(1)^{2} + E_{x}(Q)^{2})^{\frac{1}{2}}$

Hy = horizontal magnetic amplitude, measured

f' = VLF station frequency in Hertz

 μ_0 = 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:

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

where:

 $E_{x}(Q)$ = horizontal quadrature VLF electric field.

 $E_{\rm X}(I)$ = horizontal in-phase VLF electric field, phase rferenced to the horizontal magnetic field, Hy.

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

VLF THEORY

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

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

where: Hp = primary signal A = amplitude of primary signal

IIs = secondary (phase laged) signal

= frequency B = amplitude of

secondary signal

= 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.
$$\frac{\text{Hp}^2}{\text{A}^2} + \frac{\text{Hs}^2}{\text{B}^2} - \frac{2 \text{ HpHs sin } \phi}{\text{AB}} = \cos^2 \emptyset \text{ (2.0)}$$

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.
$$o = \frac{1}{2} \tan^{-1} (2 \text{ Hp/100 (1 - e}^2))$$

where o = tilt angle (degrees) Hp = vertical in phase, expressed as a o/o $\emptyset = \tan^{-1} \left(\underline{Hp} \right)$

VLF THEORY (Continued)

where

ø = 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).

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	l6K 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 instrumenta-tion.
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.

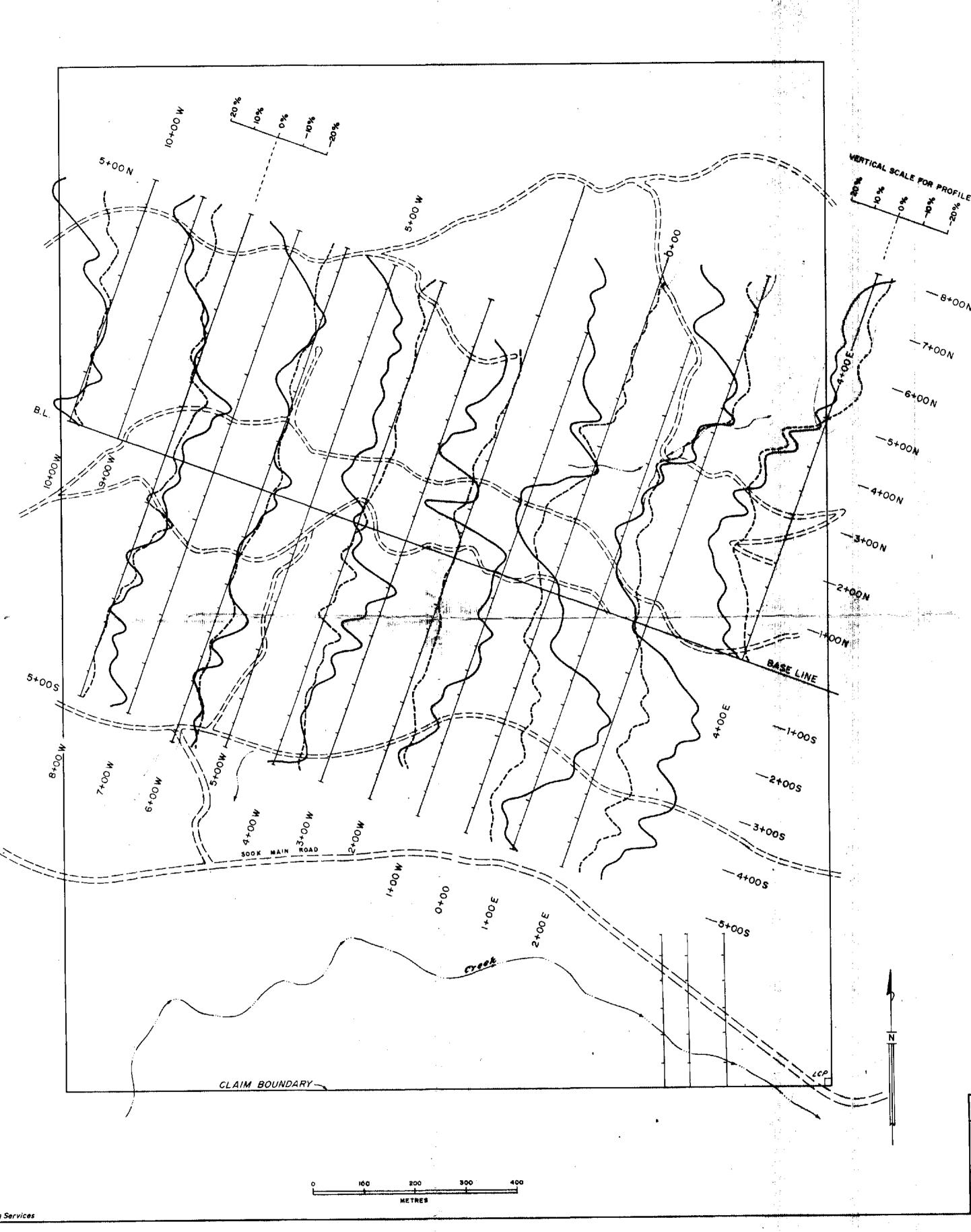
8.0 SPECIFICATIONS

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

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.
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.
Narrow bandpass, low pass and sharp cut-off high pass filters.
0.5 seconds sample interval. As many as 2 ¹⁶ samples can be stacked to improve measurement accuracy.
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%.
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°.



GEOLOGICAL BRANCH ASSESSMENT REPORT

18,848

_____ In phase (%)

Quadrature (%)

Station: Seattle 24.8 kHz

U W

FIG.

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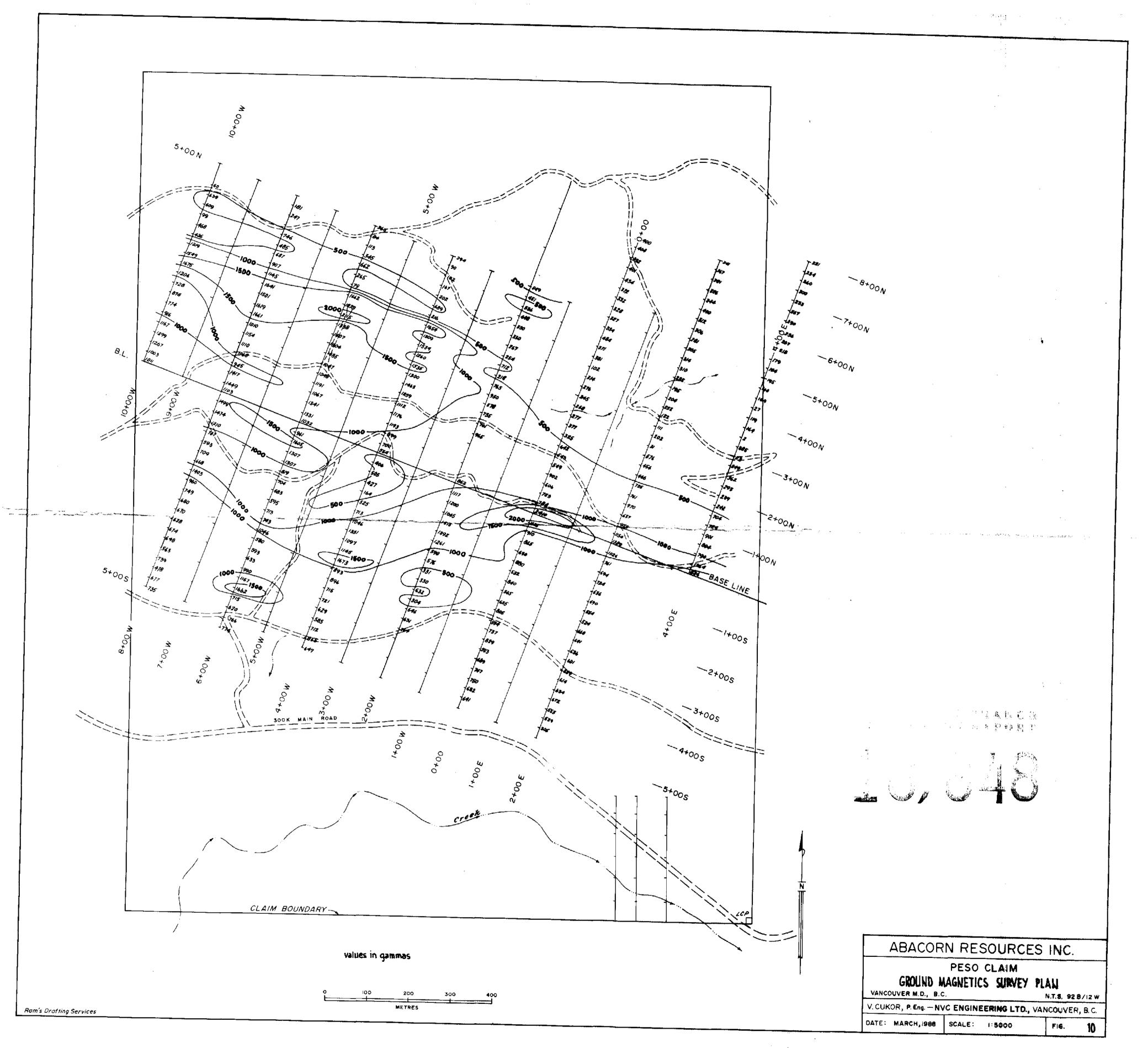
PESO CLAIM

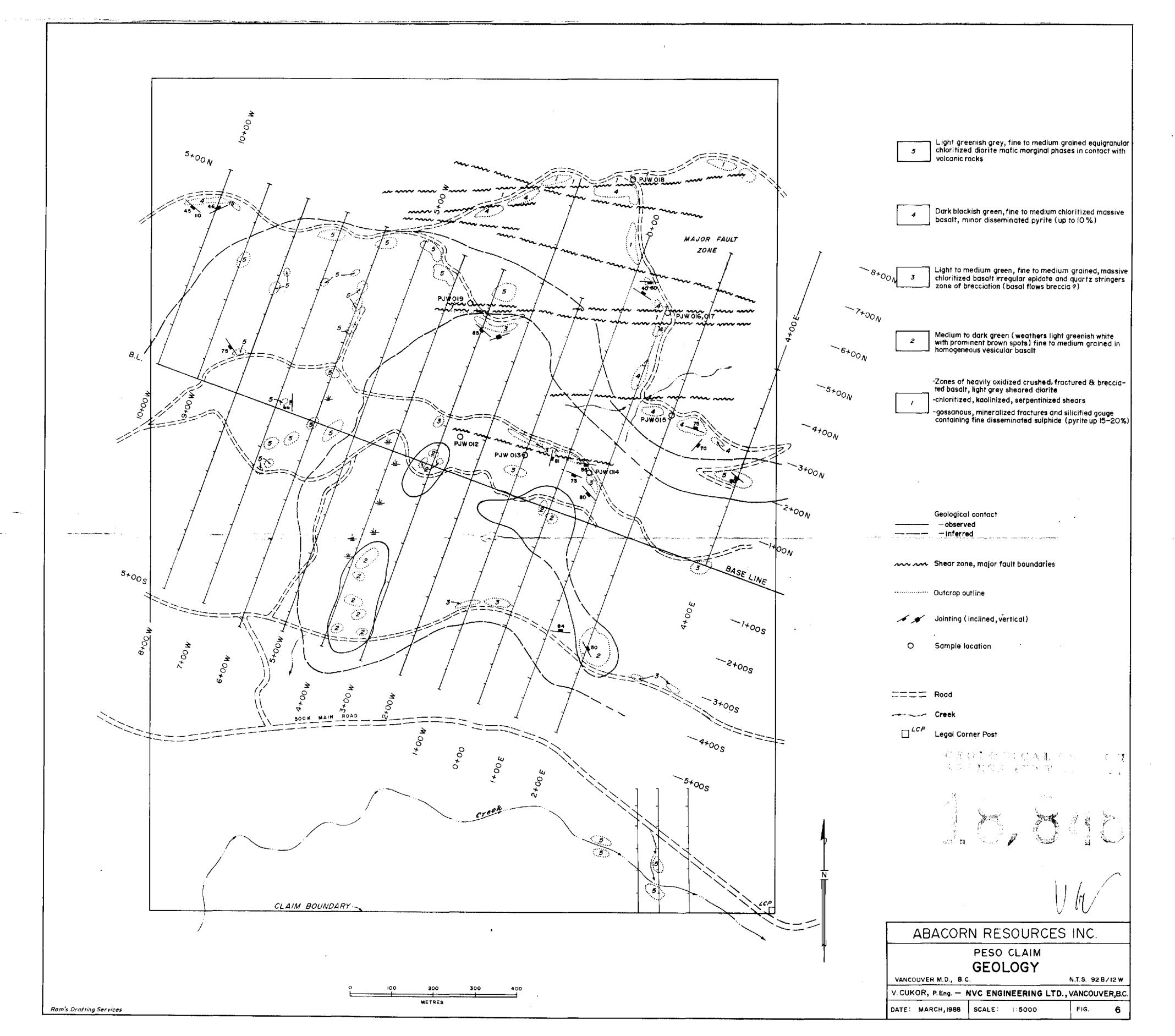
VLF - EM SURVEY PROFILES
VER M.D., B.C. N.T.S. 928/12W

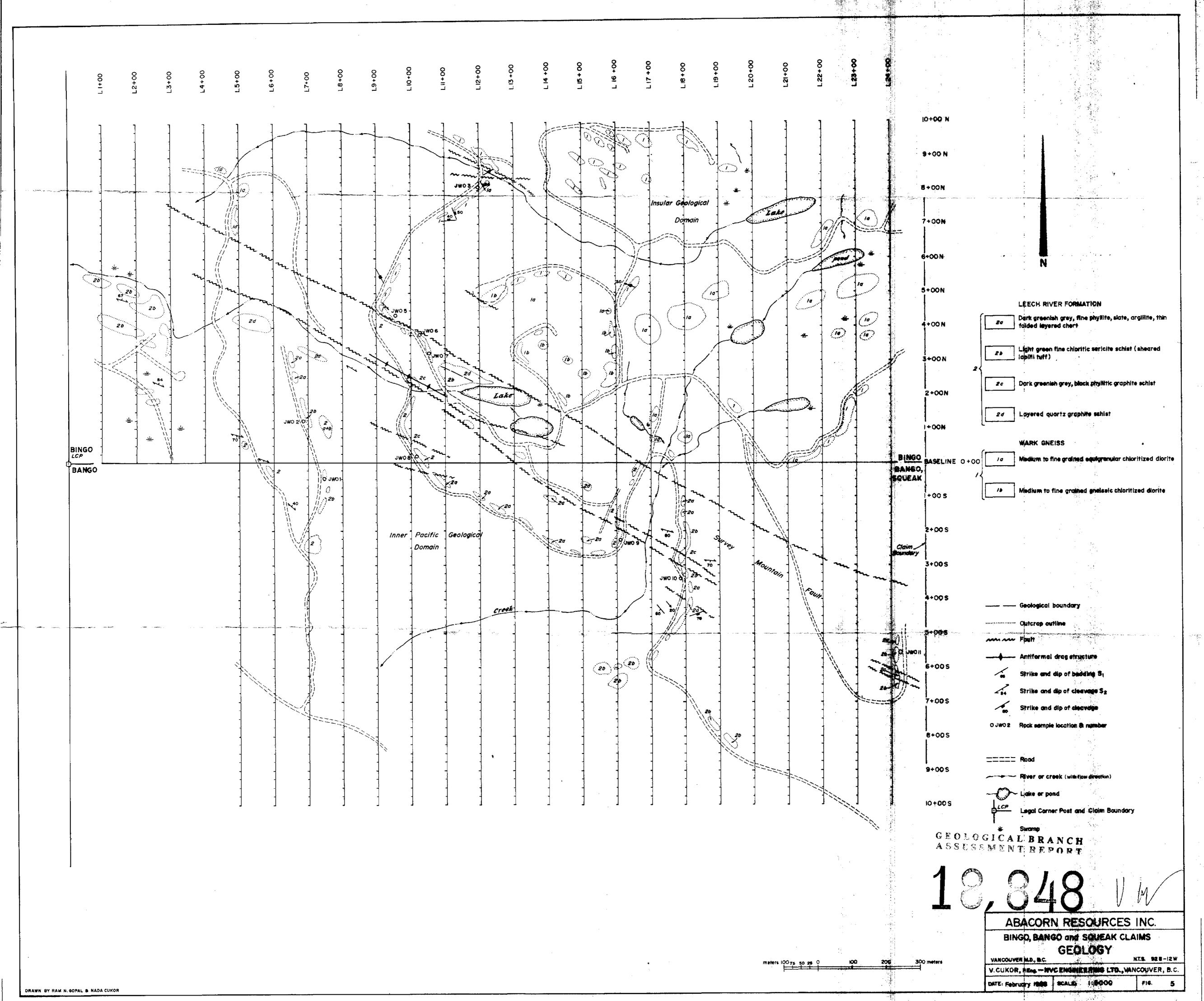
VANCOUVER M.D., B.C. N.T.S. 92 B/12 W
V.CUKOR, P.Eng. - NVC ENGINEERING LTD., VANCOUVER, B.C.

DATE: MARCH, 1988 SCALE: 1:5000

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ABACORN RESOURCES INC.

BINGO, BANGO and SQUEAK CLAIMS

GEOCHEMICAL SURVEY—GOLD

VANCOUVER M.D., B.C.

NTS. 928-12W

VANCOUVER M.D., B.C.

V. CUKOR, P.Eng. — NVC ENGINEERING LTD., VANCOUVER, B.C.

DATE: February 1988 SCALE: 1:5000 Fig. 7

Drawn by Ram N. Gopal & Nada Cukor

