November 1987

Antony Resources ltd.

LOGAN MINERAL CLAIMS

Report on 1987 Exploration Program

D. CUKOR, GEOLOGIST ■ V. CUKOR, P. ENG. ■ NVC ENGINEERING LTD. ■ VANCOUVER, B.C.

ARIS SUMMARY SHEET

District Geologist, Victoria — Off Confidential: 89.01.27

ASSESSMENT REPORT 16982 — MINING DIVISION: Victoria

PROPERTY: Logan
LOCATION: LAT 49 00 00 LONG 124 35 10
UTM 10 5428448 383986
NTS 092F02E 092C15E
CLAIM(S): Logan,Logan I-II
OPERATOR(S): Antony Res.
AUTHOR(S): Cukor, V.
REPORT YEAR: 1987, 70 Pages
COMMODITIES SEARCHED FOR: Gold,Silver
GEOLOGICAL SUMMARY:

Volcanics and sediments of the Upper Triassic Vancouver Group and Paleozoic Sicker Group are intruded by Saanich granodiorite. Gold occurs in pyritic and silicified volcanics and in quartz-carbonate veins and/or stockwork.

WORK DONE: Geophysical,Geochemical
EMGR 52.0 km;VLF
Map(s) - 1; Scale(s) - 1:5000
MAGG 52.0 km
Map(s) - 1; Scale(s) - 1:5000
SOIL 687 sample(s) ;AU,AG,NI,CU
Map(s) - 4; Scale(s) - 1:5000

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ANTONY RESOURCES LTD.

LOGAN MINERAL CLAIMS
Vancouver Island

1. INTRODUCTION

The Vancouver based private company, Antony Resources Ltd., contracted NVC Engineering Ltd. to perform a grass root exploration program to evaluate the property potential. This Report is based on results of the program as well as on the published data on the general area.

The program consisting of geological, geochemical soil and geophysical magnetic and VLF-Electromagnetic surveys as well as extensive rock sampling was managed in the field by D. Cukor, geologist under the overall supervision of V. Cukor, P. Eng. A total of over $80,000 was spent on these surveys.

All rock and soil samples were submitted for assays to General Testing Laboratories of Vancouver.

2. REVIEW

2.1 SUMMARY and CONCLUSIONS

The property consists of 3 contiguous Logan claims, comprising 40 units. Extensive exploration was carried out on the neighbouring properties, but no evidence of past exploration was found on the ground during the 1987 program. Part of the claims are underlain by the Sicker Volcanics, which host significant gold-silver base metal deposits, some of which were past producers elsewhere within the same volcanic belt. On the Logan Claims within this unit, samples containing gold values were collected; the best assay ran .372 oz/t gold and .25 oz/t silver. Gold bearing rock outcrops were found to be associated with extensive gold geochemical soil anomalies and zones of intensive fracturing, shearing and alterations. These zones are of such size that they could easily contain economically important bodies, covered by extensive but mostly shallow overburden cover. Such areas should be considered valuable exploration targets and further work on them is fully warranted.

2.2 RECOMMENDATIONS

Further work on the Logan Property should consist of at least two stages. During the first stage all areas with gold bearing outcrops should be trenched, mapped in

2.2 RECOMMENDATIONS (Cont'd)

detail and extensively sampled. The same technique should be applied in the localities where very high gold values were encountered in the soil. If any mineralized structures are recognized in these localities, they should be followed by trenching and sampled.

During the second stage, diamond drilling should be applied to explore extensions of mineralization at depth and thus evaluate the potential of the property.

2.3 COST ESTIMATE

The following budget is estimated to be necessary for completion of the recommended program:

Stage 1

Bulldozer trenching, 300 hrs @ $100/hr	$ 30,000
Mobilization, demobilization	3,000
Geological mapping, sampling	6,000
Assays, 250 samples @ $12 ea.	3,000
Room, board, transportation	5,000
Data correlation, report	7,500
Stage 1 Subtotal	$ 54,500
Contingencies	5,500
Stage 1 Total	$ 60,000

2.3 COST ESTIMATE (Cont'd)

Stage 2 (Contingent on results of Stage 1)

Diamond drilling, 2,000 ft. @ $30/ft.	$ 60,000
Bulldozer support	10,000
Geological supervision, logging, sampling	10,000
Room, board, transportation	7,500
Assays	3,000
Data correlation, report	10,000
Stage 2 Subtotal	$100,500
Contingencies	19,500
Stage 2 Total	$120,000

3. PROPERTY

3.1 LOCATION

The Logan Claims are located in the southern part of Vancouver Island, about 25 kilometres southeast of Port Alberni. They are in the Victoria Mining Division on NTS maps 92 F - 2 E and 92 C - 15 E. The property is centered at approximate north latitude 49° 00' and west longitude 124° 35'.

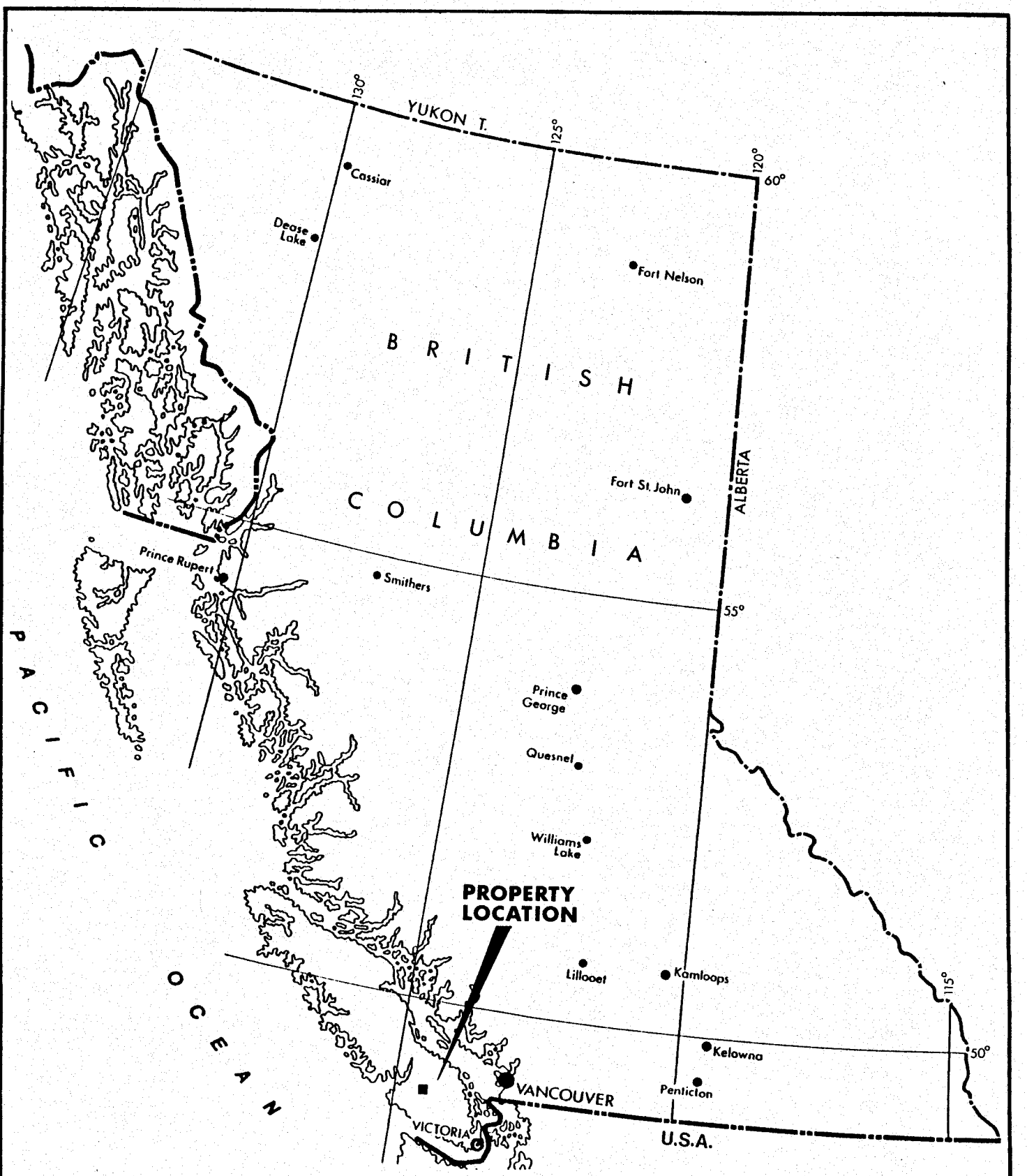
The largest part of the claims is located over the area covered by the MacMillan Bloedel Tree Farm and the performance bond had to be posted with the company prior to commencement of work.

Property location and claims are shown on Figures 1 and 2.

3.2 ACCESS

The Logan Property is readily accessible by roads. The northern and western portion of the claims can be reached from Port Alberni along Alberni Inlet and along Franklin Museum Creek. The eastern part of the property is easily reached from the lumber camp on Nitinat Lake by a good quality gravel road following Nitinat River.

A network of unused logging roads provide access to various parts of the claims.



ANTONY RESOURCES LTD.

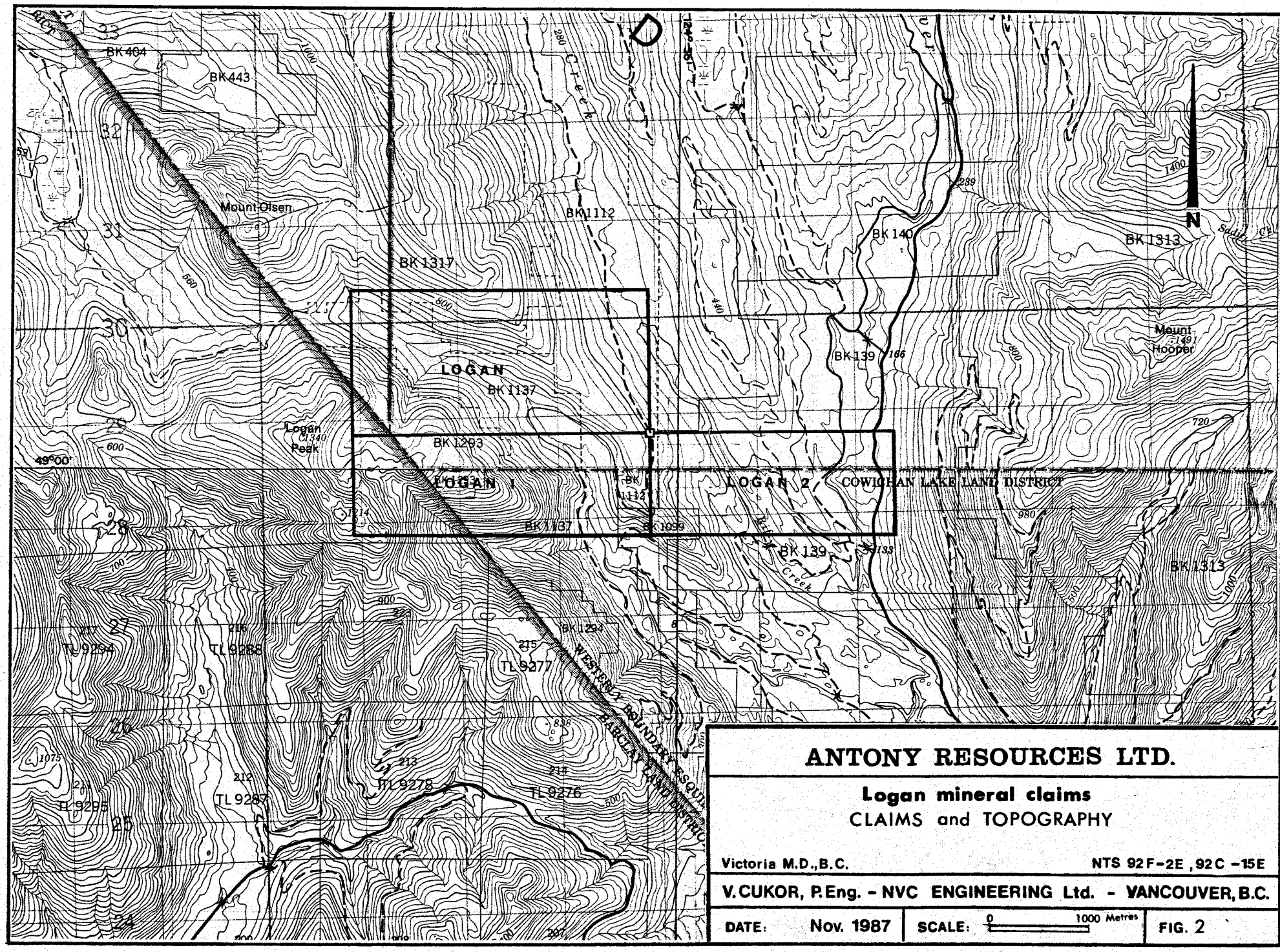
Logan mineral claims

LOCATION MAP

Victoria M.D., B.C. NTS 92 F-2E , 92 C -15E

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

DATE: Nov. 1987 | SCALE: 0 100 Km | FIG. 1



ANTONY RESOURCES LTD.

Logan mineral claims

CLAIMS and TOPOGRAPHY

Victoria M.D., B.C. NTS 92F-2E, 92C-15E

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

DATE: Nov. 1987 | SCALE: 0 1000 Metres | FIG. 2

3.3 CLAIMS

Three contiguous mineral claims comprise the property. Claim names and corresponding record data are as follows:

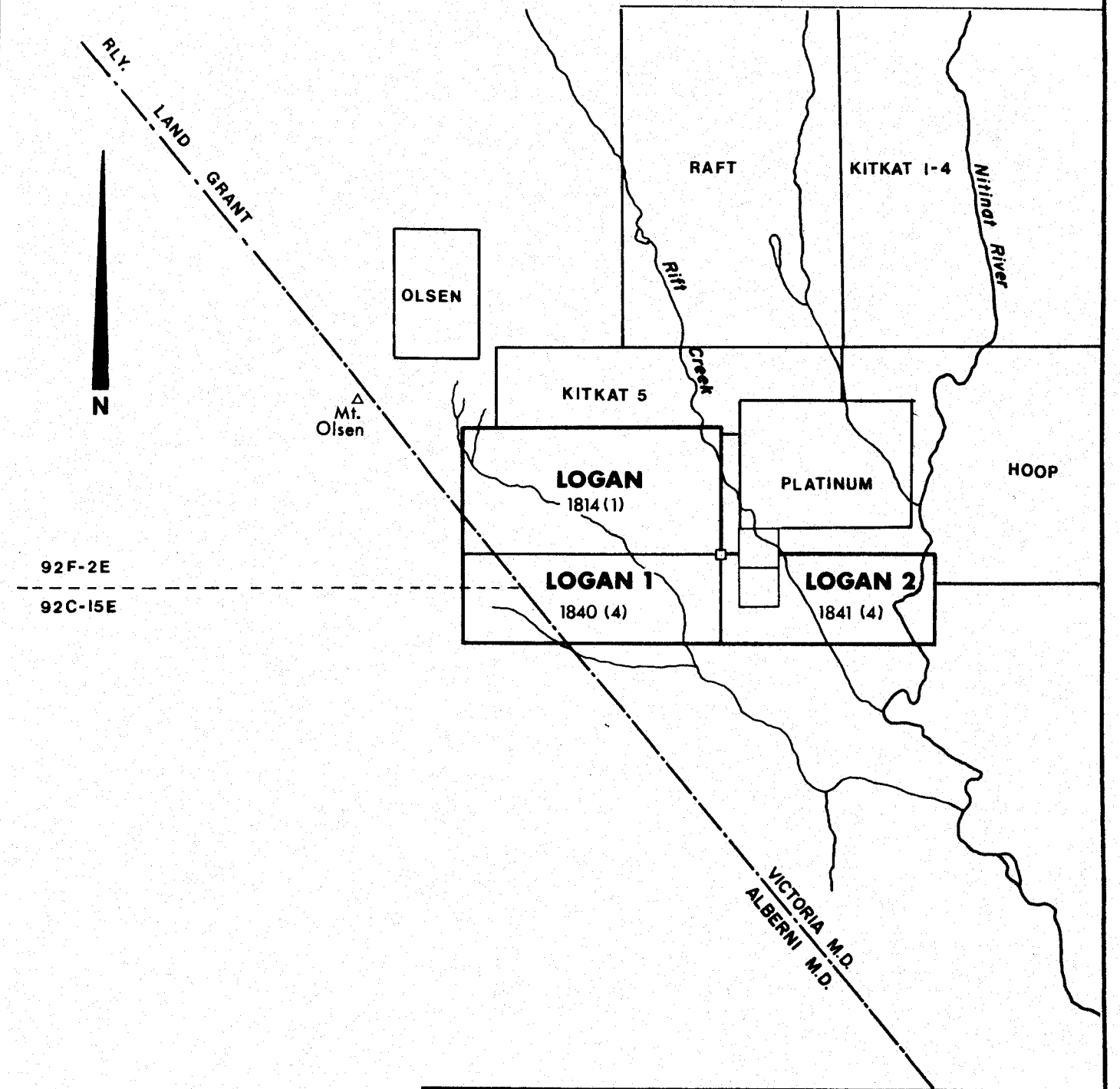
Claim Name	No. Units	Record No.	Recording Date
Logan	18	1814	January 16, 1987
Logan I	10	1840	March 4, 1987
Logan II	12	1841	March 4, 1987
Total Units	40		

The claims were located on the modified grid system by Ruza Resources Ltd., from whom 100% interest was acquired by Antony Resources Ltd. The property is shown on Claim Map, Figure 3.

3.4 TOPOGRAPHY and CLIMATE

The property lies within the insular mountain belt of British Columbia, between elevations of 100 and 1,300 metres above sea level, for the total topographical relief of about 1,200 metres. The lowest elevations are at the eastern end of the property at the Nitinat River valley, and the highest are along the western claim border where Logan Peak lies just off the claims. Two northeast creeks, Rift Creek and the other unnamed tributary of Nitinat River, both running in a northwesterly direction, carved into the property's topography, forming steep canyons.

The climate of the property area is typical for the West Coast region. It is characterized with mild winters



ANTONY RESOURCES LTD.

Logan mineral claims

CLAIM MAP

Victoria M.D., B.C. NTS 92F-2E, 92C-15E

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

DATE: Nov. 1987 | SCALE: 0 1 km | FIG. 3

3.4 TOPOGRAPHY and CLIMATE (Cont'd)

and moderately high summer temperatures with high humidity and high atmospheric precipitation. It is also characterized with dense forest growths.

The property area was logged some 20 years ago and is now covered by thick second growth and dense underbrush which hampers greatly surface examinations and imposes extensive and costly line cutting.

Topographical features of the property are shown on Figure 2.

4. GEOLOGY

4.1 GENERAL GEOLOGY

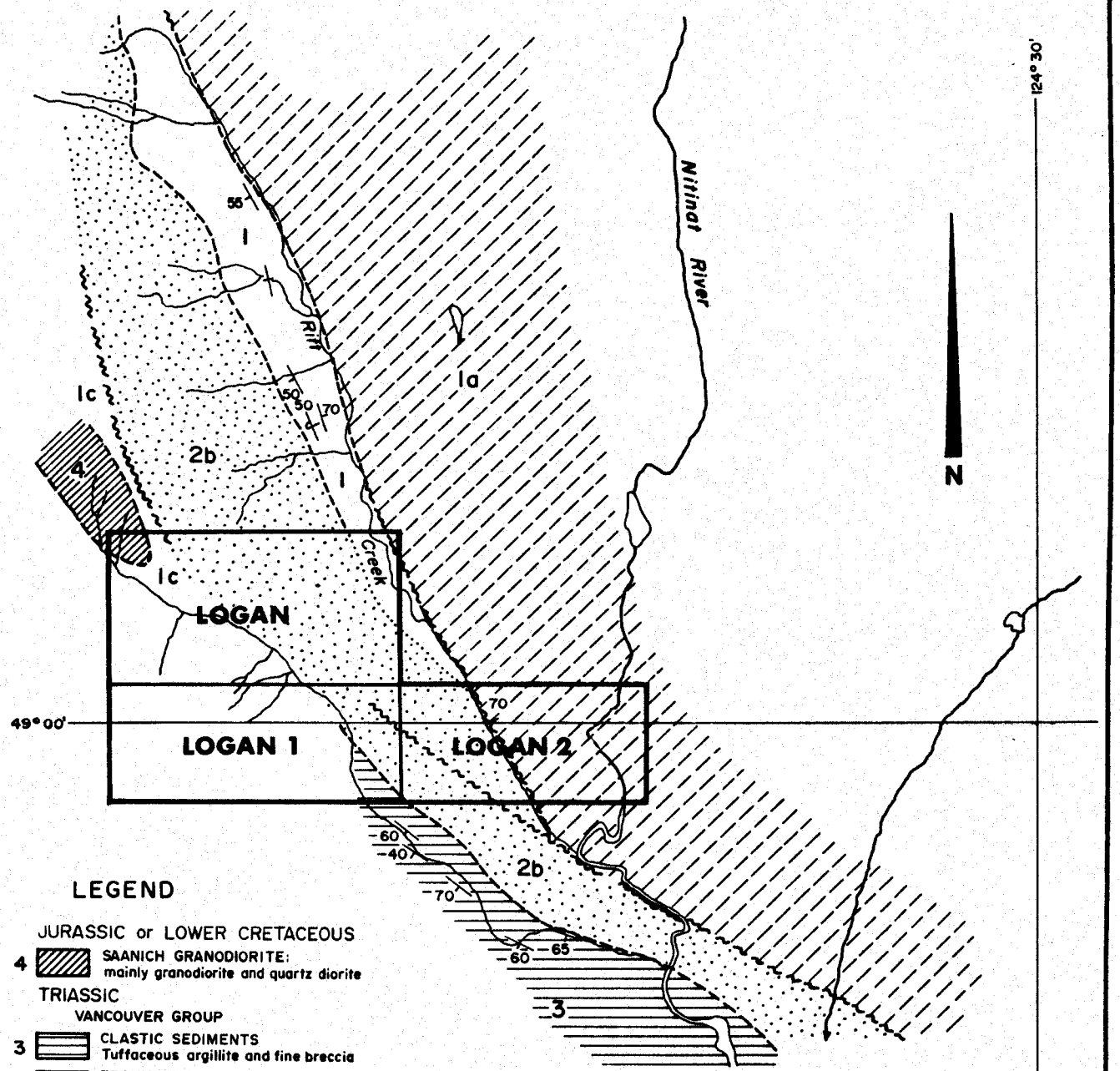
The Logan Claims lie at the edge of the recent geological mapping on Vancouver Island (BCDM - 1987/2). The map produced by Fyles (1955) covers most of the property area (see Figure 4). This map shows geological units striking northwest/southeast. The oldest are volcanics of the Permian Sicker Group, which are overlain by the Triassic Franklin Creek volcanics and tuffaceous rocks both of the Vancouver Group. In the northwest corner of the claims, Jurassic intrusives of Saanich granodiorites appear.

Two fault zones appear within the property area, one following Rift Creek Valley. This is interpreted as a regional trust by J. Fyles, with a wide area of fracturing, brecciation and shearing.

4.2 LOCAL GEOLOGY

Geological work on the property consisted of examinations of the rock outcrops, examination of alterations and rock sampling. Most of this work was concentrated on the Logan II Claim which is underlain mainly by Sicker Volcanics.

Numerous outcrops in this area showed intensive shearing, brecciation and fracturing. Most prominent type alterations included silicification, epidotization and



LEGEND

JURASSIC or LOWER CRETACEOUS

4 SAANICH GRANODIORITE: mainly granodiorite and quartz diorite

TRIASSIC

VANCOUVER GROUP

3 CLASTIC SEDIMENTS Tuffaceous argillite and fine breccia

2b FRANKLIN CREEK VOLCANICS Mainly basalt flows

PERMIAN and OLDER

SICKER GROUP SEDIMENTS

1 Mainly limestone

1c Cherty tuff, crystal tuff, and thin bedded sediments

VOLCANICS

1a Mainly amydaloidal flows

Geology by J.T. Fyles

ANTONY RESOURCES LTD.

Logan mineral claims

GEOLOGICAL MAP

Victoria M.D., B.C. NTS 92F-2E, 92C-15E

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

DATE: Nov. 1987 SCALE: 0 1 M FIG. 4.

4.2 LOCAL GEOLOGY (Cont'd)

pyritization. Silicification appears as a stockwork of quartz veinlets and locally as narrow quartz veins. Pyrite was observed in the rock as disseminations in silicified zones, vugs fillings and as fillings of narrow fractures.

On the northern part of the Logan 2 Claim high magnetic anomaly indicates underlying ultramafic rocks. However an extensive overburden mantle masks the bedrock and hampers mapping in this area.

4.3 MINERAL SHOWINGS

The Sicker Volcanic Belt is host to several gold-silver and base metals deposits. The best known are Lara, Lynx-Myra (1979 announced reserves of 15 million tons of 5.3% Zn., 2.2% Cu., .3% Pb., 1.1 oz/t Ag. and .07 oz/t Au.); Twin J. Mine (produced 300,000 tons averaging 6.12% Zn., 1.32% Cu., .6% Pb., 2.05 oz/t Ag. and .075 oz/t Au.).

The closest to the Logan Property are showings known as the Olsen Claims where extensive drilling and trenching returned gold values and assays of up to 3 oz/t gold reported from the Canon Vein. On the Kitkat Claim, grab samples assayed gold-silver-platinum, and the area of Mt. Olsen has a large gossan zone.

On the Logan Claims soil samples indicated the presence of gold in several localities and a number of rocks

4.3 MINERAL SHOWINGS (Cont'd)

samples returned excellent values. The following table summarizes sampling on the property:

Sample No.	Claim	Description	Oz/t Au.	Oz/t Ag.
951	Logan 2	Random chip contact	.008	.15
952	Logan 2	Pyritized volcanic - chip	.016	.16
953	Logan 2	Several pieces of rusty volcanic	.006	.20
954	Logan 2	Chip - 8" pyritized quartz vein	.006	.05
955	Logan 2	Chip - sheared, silicified rusty volcanic	.012	.08
956	Logan 2	Random - select silicified volcanic	.004	.10
957	Logan 2	Select - silicified volcanic and quartz	.102	.18
958	Logan 2	Select, float from small stream	.114	.15
959	Logan 2	6" quartz vein and silicified walls	.372	.25
960	Logan 2	Zone of quartz carbonate stockwork, pyritized	.280	.30
961	Logan 2	Select sample of silicified, pyritized volcanic	.276	.29
962	Logan 2	Select quartz stockwork and narrow veins	.352	.32
963	Logan	Select pyritized, silicious volcanic	.016	.10
964	Logan	5" wide quartz vein, chip	.008	.20

For location of samples see Figure 5.

Samples 951 - 962 were all taken from the Logan 2 Claim, from the silicified and pyritized outcrops of Sicker Volcanics. In addition, the samples 957, 960, 961 and 962, all showing good gold values, are also within the outline of geochemical gold anomalies. The follow-up work of trenching, detailed geological mapping

4.3 MINERAL SHOWINGS (Cont'd)

and sampling is well warranted in these areas.

Although the samples with highest gold values show better silver content as well, from the limited number of samples taken so far it does not appear that there is a constant silver to gold ratio.

To date no samples have been assayed for platinum. Some soil samples assayed anomalous values in nickel, which should indicate the possible presence of an ultra-mafic intrusive, and therefore possibly a platinum content. During the surveys no outcrops of ultrabasic rocks were encountered, but very high magnetic readings at the northern end of the Logan 2 Claim should suggest the presence of such a body under the overburden cover. Any rock outcrops found in this area should be carefully examined.

5. GEOCHEMICAL SOIL SURVEY

In preparation for the survey extensive linecutting was performed. The broken topography, layout of the claims and complicated access to some parts of the property made the layout of the grid difficult. Subsequently, the grid was cut from four different baselines. The western part of the property has a very rugged topography, and this portion of the property was left unsurveyed.

5.1 FIELD METHOD

15-25 cm sample depths

A total of 687 soil samples were taken along 100 metre spaced lines and at 50 metre intervals. Soil samples were taken from shallow holes dug by mattock, preferably from the B horizon. On a few locations there was poor soil development and the corresponding samples comprise of any fine material as was found.

Samples were packed in the kraft soil envelopes and partially dried in the field. All samples were then shipped to General Testing Laboratories in Vancouver to be assayed for gold, silver, copper and nickel.

5.2 LABORATORY PROCEDURE

All samples were oven dried and screened to -200 mesh. Different assaying procedures were then followed for gold and for the other elements.

5. 2 LABORATORY PROCEDURE (Cont'd)

Assays for gold were run on a 10 g portion of the -200 mesh fraction, which was processed by fire assay to produce a bead. This was crushed, dissolved and assayed by Atomic Absorption.

Assays for silver, copper and nickel were done on a 1 g portion of the -200 mesh fraction. This was dissolved in aqua regia, diluted and assayed by Atomic Absorption. Results were presented in parts per million.

5.3 DATA PRESENTATION

Four geochemical plans were prepared, one for each element assayed. They are appended in the pockets at the end of this Report as Figures 5, 6, 7 and 8.

Each Plan shows the grid, sample locations and assay values. Anomalous and significantly anomalous values were established and contoured.

5.4 DISCUSSION OF RESULTS

Gold

All results were grouped in four categories: background values below 30 ppb anomalous values, from the anomalous threshold (30 ppb) to 50 ppb, significantly anomalous values between 50 and 70 ppb and highly anomalous values over 70 ppb Au. (see Figure 5).

5.4 DISCUSSION OF RESULTS (Cont'd)

Several zones of anomalous values are recognized and some of them seem to be aligned along the northwest/southeast trend, which is also the main structural trend in the area. Some of the geochemical anomalous zones are identified in the same areas, where significant gold assays were also obtained from the rock samples (see sample locations 957, 959, 960, 961 and 962).

Although every zone with identified anomalous gold geochemical values should be further examined, the most promising target for gold exploration seems to be the large anomaly at the west part of the Logan 2 Claim. Rock samples taken from pyritized and silicified outcrops and float in this area (sample locations 957, 958, 960 and 961) assayed between .102 to .280 oz/ton gold and between .18 and .30 oz/ton silver.

Silver

Although no significantly high silver values were encountered in any of the rock samples so far, the anomalous threshold for silver is fairly high on the property (see Figure 6). The anomalies are conspicuously aligned along the northwest/southeast trend and most of the anomalous values are located on the Logan and Logan 1 Claims. The size of these anomalies as well as the high anomalous

5.4 DISCUSSION OF RESULTS (Cont'd)

threshold indicates the probable presence of low silver values in the pyritized volcanics which are encountered in most of these areas.

Copper

All copper assays are presented on Figure 7. A number of copper anomalies are outlined, most of them following major structural trends. The significance of the copper anomalies is in the fact that gold carrying rock in the area also often contains small amounts of chalcopyrite. Some of the copper anomalies, indeed, coincide with the gold anomalies (especially on the Logan 2 Claim) which makes them excellent exploration targets. It is definitely recommended to further explore and sample all areas of high anomalous copper values.

Nickel

The nickel geochemical values are shown on Figure 8. Since the area immediately north of the Logan Claims was explored for platinum, the samples were assayed for nickel to possibly indicate the areas underlain by ultramafic intrusives as potential targets for platinum prospecting. It was expected that anomalous nickel geochemical areas might correlate with zones of high magnetic readings. However, although some anomalous nickel values were

5.4 DISCUSSION OF RESULTS (Cont'd)

received from the northern part of the Logan 2 Claim, where a high magnetic anomaly is outlined, there is not a good correlation between results of the two surveys. Anomalous nickel geochemical values are present in other parts of the surveyed area, and they seem to follow the main structural trends. No further follow-up is recommended for the nickel at this time.

6. GEOPHYSICAL VLF-EM SURVEY

6.1 FIELD METHOD

The grid used for the geochemical surveys and the magnetometer was also used for the VLF-EM Survey. The instrument used was a Scintrex IGS-2, measuring both ground VLF-EM and ground magnetics. The VLF-EM readings comprise of measurements of the horizontal field strength and of the amplitudes of the vertical in-phase and quadrature (out-of-phase) components. For a more detailed description of the instrument, see Appendix A.

Readings in the field were taken along the cut lines with 100 metres spacing at 50 metre stations.

The instrument was programmed to receive two stations: Seattle, Washington, 24.8 KHz and Lualualei, Hawaii, 23.4 KHz.

6.2 DATA PRESENTATION

Profiles were generated in the field for both stations Seattle and Hawaii, however since the structures responded to Hawaii and not to Seattle, only the Hawaii data is presented as a plan (see Figure 10). The values for the in-phase component and quadrature were plotted as profiles along the lines. These were then interpreted and the cross-overs and reverse cross-overs were drawn.

6. GEOPHYSICAL VLF-EM SURVEY

6.3 DISCUSSION OF RESULTS

The VLF-EM data shows two semi-parallel cross-overs on the Logan property. The trend of these anomalies parallels the geological structure, the ground magnetic trends and the geochemical trends.

Both anomalies are located on the Logan and Logan 1 Claims (see Figure 9) and are separated by about 300 metres. The westernmost of the anomalies does not seem to be a conductor, since the anomalous readings occur only in the in-phase component and not in the quadrature. The easternmost of the anomalies is quite strong and deserves a detailed follow-up.

7. GEOPHYSICAL GROUND MAGNETIC SURVEY

7.1 FIELD METHOD

The grid used for the geochemical survey and VLF-EM survey was also used for magnetometer survey. The same instrument, described under "VLF-EM Survey" (see Appendix A) was also used to take readings of the total magnetic field. Along the cut and flagged grid lines, with 100 metre spacing, readings were taken at 50 metre intervals. For diurnal corrections a base station was used, with continuous readings taken at two second periods.

7.2 DATA PRESENTATION

All readings were corrected and from the total magnetic field a value of 57,000 gammas was deducted. Such obtained relative values were then plotted on the Grid Map appended as Magnetic Survey Plan, Figure 10 in the pocket at the end of the Report. For better evaluation of results, the map was contoured.

7.3 DISCUSSION OF RESULTS

Two distinct media are obviously present on the Logan Claims. At the north limit of the Logan 2 Claim there is an area with distinctively higher magnetic susceptibility than over the majority of the claims. The relative values in that area jump sharply from 200 - 300 gammas to over 10,000 gammas. The most plausible interpretation for the

7.3 DISCUSSION OF RESULTS (Cont'd)

cause of those high values are possible underlying basic intrusive rocks. Since the adjoining property to the north was explored for platinum, it is possible that the same ultrabasic intrusive extends to the northern part of the Logan 2 Claim.

The rest of the property shows a moderately low magnetic relief (a total of about 350 gammas). Contours in these areas follow the northwest/southeast trend, with a distinct low anomaly following the Rift Creek fault, with relative highs flanking both, then northeast and southwest sides. Geochemical nickel, copper and to some extent gold anomalies coincide fairly closely to those magnetic highs.

Although not directly associated with the potentially economic mineralization of the property, the distribution and trends of the magnetic high and low anomalies will be of great assistance to better understand and explain geological structure on the property and thus assist in further exploration.

Respectfully Submitted,

D. Cukor, Geologist

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

November 1987

CERTIFICATE

I, DAMIR CUKOR, of 976 East 26th Avenue, Vancouver, British Columbia, DO HEREBY CERTIFY that:

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

2. Since 1983 I have been employed as a geologist with NVC Engineering Ltd.;

3. I have worked in the field of exploration geology and geophysics for 11 seasons and have held positions of responsibility since 1982;

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

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

November, 1987

CERTIFICATE

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

1. I am a Consulting Geological Engineer with NVC ENGINEERING LTD. and 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;

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

5. I have personally examined the property described in this Report and I have reviewed information on the general area available to me;

6. I have no interest, direct or indirect, in ANTONY RESOURCES LTD., nor do I expect to receive or acquire any.

7. I hereby consent to the use of this report for the Company Prospectus.

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

November 1987

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Fyles, J. T., 1955: Geology of the Cowichan Lake Area, Vancouver Island, B. C., BCDM Bull. 37.

Wahl, H., 1987: Evaluation Report on the Logan Mineral Claims for Ruza Resources.

BCDM Mineral Inventory Maps 92C, 92F and Minfile.

Open File 1987-2: Geology of the Cowichan Lake Area, Vancouver Island, B. C., Department of Mines.

NVC engineering ltd.

304 - 1720 Barclay Street, Vancouver, B.C. V6G 1K4
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ANTONY RESOURCES LTD
Vancouver, B.C.

September 28, 1987
Invoice # 501

Field Program and Report on the Logan Mineral Claims

Surveys

Linecutting, 52 km @ 300	$ 15,600.00
Geochemical soil sampling 52 km @ 150	7,800.00
Magnetometer Survey 52 km @ 125	6,500.00
VLF-EM survey 52 km @ 150	7,800.00
Geological mapping and rock samplig	7,000.00
Engineering, supervision, management	10,000.00

Disbursements

Equipment rental (Madnetometer, electromag, truck- 4x4)	9,000.00
Mobilization, demobilization, communications	2,300.00

Data compilation and Reports

Assays	9,850.00
Constructipn of maps, contouring	3,750.00
Drafting 110.00 Hrs @ 25	2,750.00
Reports	3,500.00
Licences, permits, reclamation	1,500.00
Total expenditure	$ 87,350.00

V. W

APPENDIX "A"

THE IGS-2 SYSTEM

1.0 INTRODUCTION

1.1 General Information

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

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

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

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

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

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

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

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

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

1.2 Product Updates

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

THE MP-3/4 MAGNETOMETER

1.0 INTRODUCTION

1.1 General Outline

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

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

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

1.2 The Magnetic Method

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

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

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

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

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

$$I = kF$$

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

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

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

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

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

$$M = M_n + kF$$

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

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

1.2 Theory of Operation

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

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

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

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

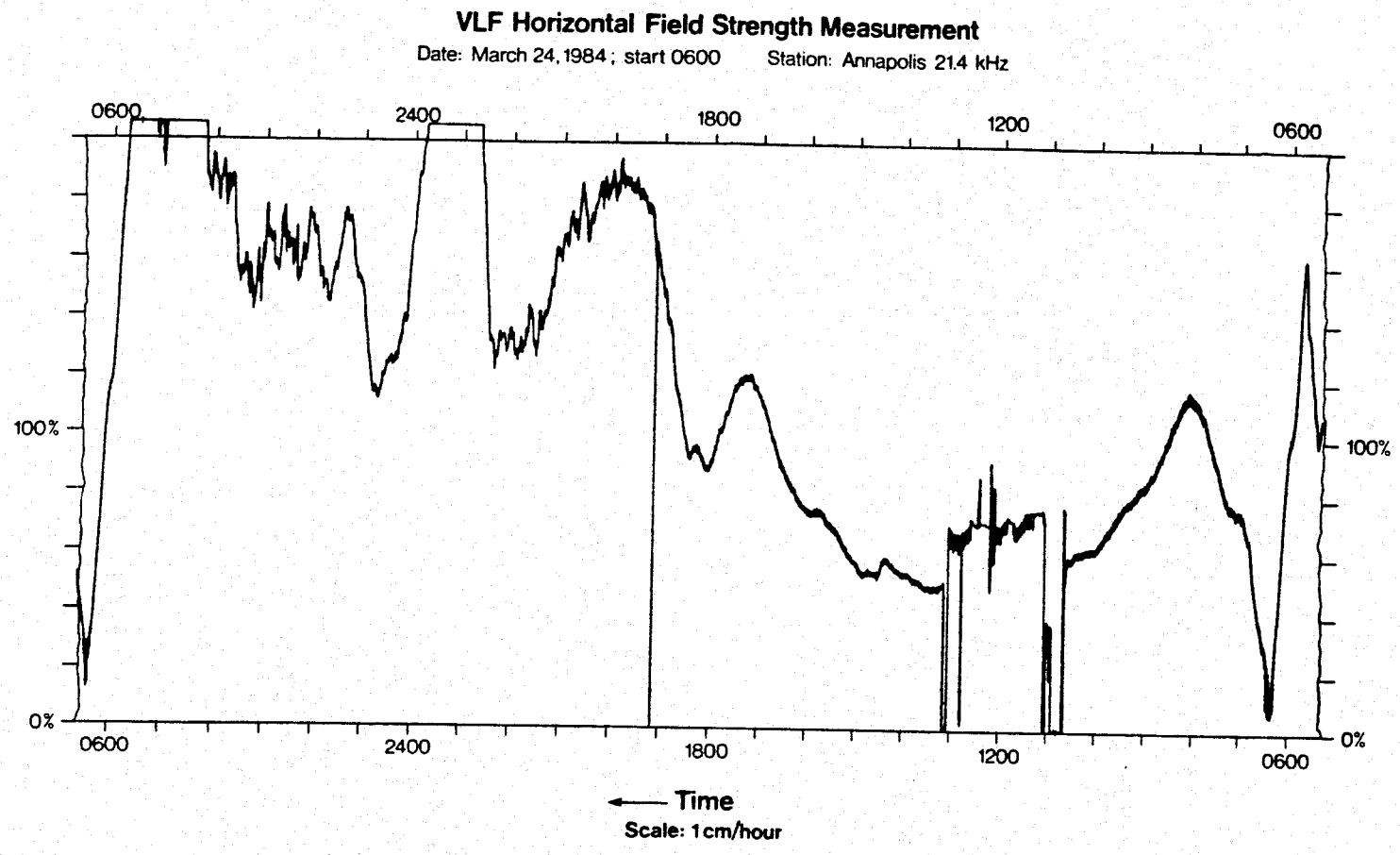


Figure VLF:1
Chart Recording of Primary Field Changing with Time

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

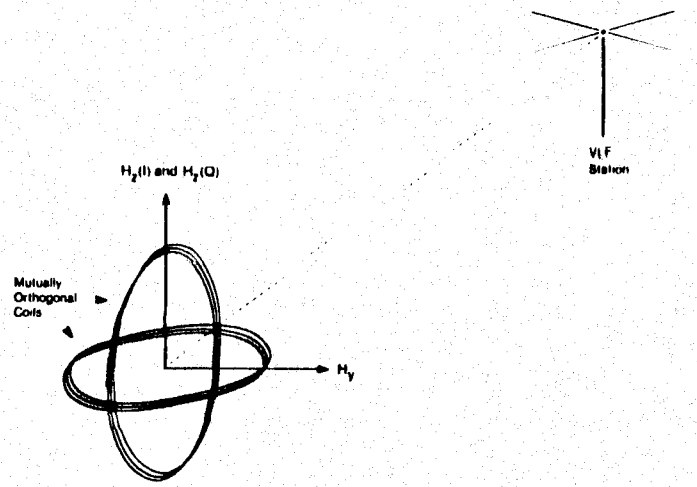
1.3 What the IGS-2/VLF-4 Measures

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

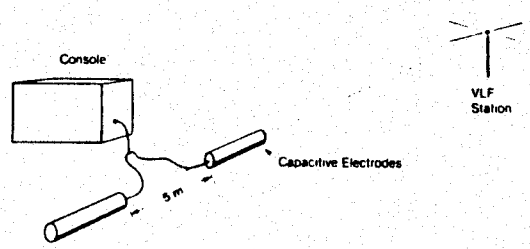
The primary field from a VLF station can in fact, vary considerably. Figure VLF:1 is a recording of the horizontal field strength from the Annapolis VLF station made in Toronto, Canada. For the most part, the field fluctuates moderately during the course of the day due to changes in atmospheric conditions.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

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

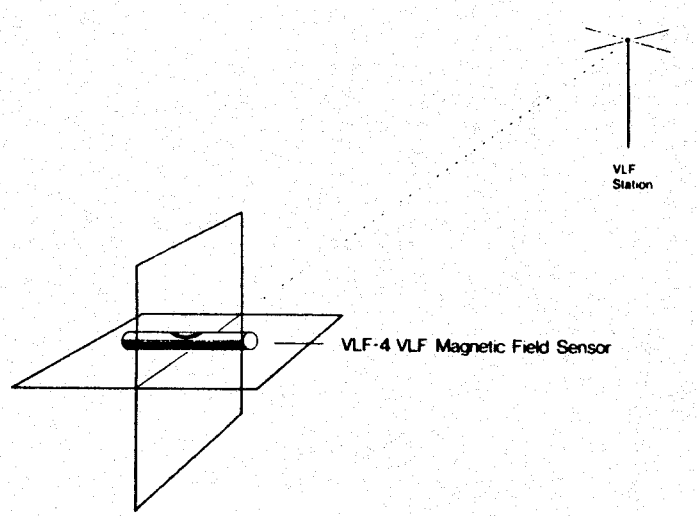
To permit measurement of the VLF-electric field, a dipole consisting of two cylindrical electrodes and 5 meters of wire is used. When this dipole is correctly laid out, the IGS-2/VLF-4 measures the in-phase and quadrature components of the horizontal electric field in the direction of the line joining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



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



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



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

Figure VLF:2
What the VLF-4 Measures

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

The following formulae are used for resistivity and phase calculations:

Apparent Resistivity Calculation:

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

where:

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

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

Phase Angle Calculation
The phase angle ϕ is expressed as:

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

where:

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

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

9.0 SPECIFICATIONS

9.1 Standard Console Specifications

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

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

9.2 Battery Pack Options

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

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

9.0 SPECIFICATIONS

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

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.

CERTIFICATE OF ASSAY

Date: August 25, 1987
File: 8708-1151

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

(page 13)

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

MARKED	GOLD Au(ppm)	SILVER Ag(ppm)	Copper Cu (ppm)	Nickel Ni (ppm)	xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx			
L #10								
5+50W	0.02	2.0	80	27				
6+00W	0.02	2.0	124	34				
6+50W	0.02	2.1	109	26				
7+00W	0.05	1.6	100	24				
8+00W	0.03	2.0	122	41				
9+25W	0.03	1.6	149	40				
L #11								
0+50W	0.02	1.6	53	14				
1+00W	0.02	1.5	45	10				
1+50W	0.02	0.8	34	8				
2+00W	0.02	0.8	45	10				
2+50W	0.02	1.1	73	13				
3+00W	0.02	0.8	38	6				
3+50W	0.02	1.5	117	28				
4+00W	0.02	1.9	88	21				
4+50W	0.02	1.1	82	24				
5+00W	0.05	0.8	117	31				
L#5 BL 5+00N 0+00W	0.02	0.7	38	8				

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

L. Wong
PROVINCIAL ASSAYER

CERTIFICATE OF ASSAY

Date: August 25, 1987

File: 8708-1151

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1001 East Pender Street,
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TO: N.V.C. ENGINEERING

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MARKED	GOLD Au (ppm)	SILVER Ag(ppm)	Copper Cu (ppm)	Nickel Ni (ppm)	xxxxxxxxxxxxxxxxxxxxxxxxxxxxx			
L #8								
5+00W	0.02	1.6	111	36				
5+00W	0.02	2.1	83	24				
7+00W	0.02	1.4	61	15				
7+50W	0.02	2.0	79	29				
8+00W	0.02	1.6	70	24				
L #9								
0+50W	0.02	1.3	31	10				
1+00W	0.02	1.0	104	21				
1+50W	0.02	1.1	89	19				
2+00W	0.02	1.7	34	6				
2+50W	0.02	0.6	116	32				
3+00W	0.02	1.6	191	37				
3+50W	0.02	1.7	191	40				
4+00W	0.02	2.8	112	32				
4+50W	0.02	1.9	118	31				
5+00W	0.02	1.6	95	30				
5+50W	0.02	2.0	138	40				
6+00W	0.02	1.7	134	41				
6+50W	0.02	1.9	90	21				
L #10								
0+50W	0.02	2.1	42	13				
1+00W	0.02	1.4	65	15				
1+50W	0.02	1.2	78	24				
2+00W	0.02	1.2	34	7				
2+50W	0.02	0.8	80	16				
3+00W	0.02	1.1	81	19				
3+50W	0.02	1.6	161	36				
4+00W	0.02	2.0	65	25				
4+50W	0.06	1.5	143	48				
5+00W	0.02	1.4	139	35				

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Telephone: (604) 254-1647
Telex: 04-507514

TO: N.V.C. ENGINEERING

(page 11)

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

MARKED	GOLD Au (ppm)	SILVER Ag(ppm)	Copper Cu (ppm)	Nickel Ni (ppm)	xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx
L #6					
0+50W	0.02	1.1	103	35	
1+00W	0.02	1.4	126	36	
1+50W	0.02	1.3	70	28	
2+00W	0.02	1.5	122	41	
2+50W	0.02	0.8	40	13	
3+00W	0.02	1.3	122	35	
3+50W	0.02	1.4	38	18	
4+00W	0.06	1.7	108	49	
4+50W	0.02	1.4	87	27	
5+00W	0.02	0.8	53	21	
L #7					
0+50W	0.02	1.5	97	25	
1+00W	0.03	1.6	66	17	
2+00W	0.02	1.1	111	34	
2+50W	0.02	1.3	69	19	
3+00W	0.02	1.5	161	41	
3+50W	0.02	1.6	61	18	
4+00W	0.02	1.6	138	39	
4+50W	0.02	1.7	104	36	
5+00W	0.02	1.6	127	40	
6+50W	0.02	2.1	114	35	
7+50W	0.02	1.9	89	28	
L #8					
0+50W	0.02	1.3	38	14	
1+00W	0.02	1.1	61	15	
1+50W	0.02	2.1	105	32	
2+00W	0.02	0.6	39	12	
2+50W	0.02	1.3	131	30	
3+50W	0.02	1.6	73	23	
4+00W	0.02	1.4	91	30	
4+50W	0.02	1.7	210	51	

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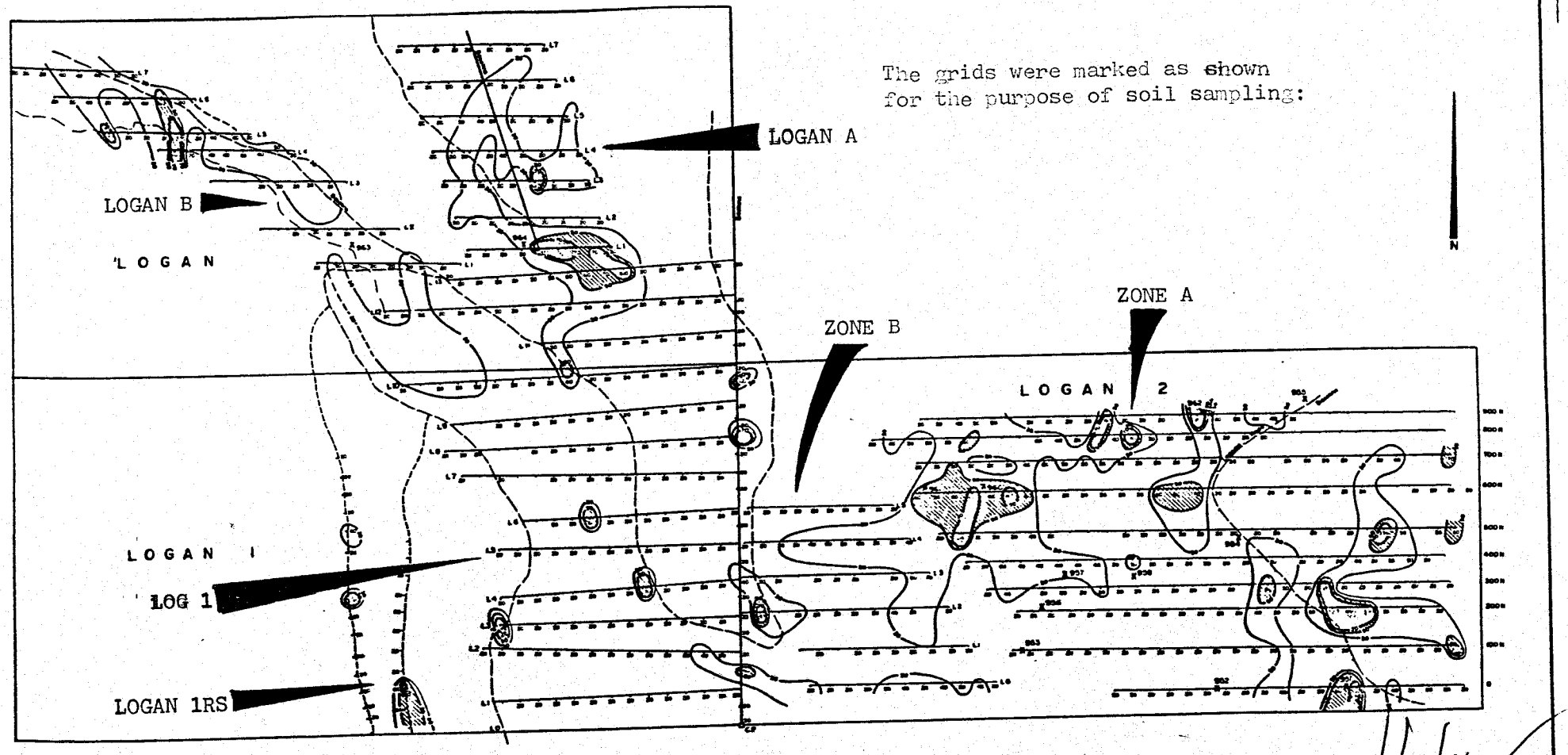
L. Wong
PROVINCIAL ASSAYER

The grids were marked as ~~shown~~
for the purpose of soil sampling:



LEGEND

Anomalous threshold	30 ppb Au
Significantly anomalous	>50 ppb Au
Highly anomalous	>70 ppb Au

Rock samples

To accompany report by B.Cotter and V.Cotter, P.Eng.

ANTONY RESOURCES LTD.
LOGAN MINERAL CLAIMS
GEOCHEMICAL PLAN - GOLD
V. COTTER, P.Eng. - CVC ENGINEERING LTD. - VANCOUVER, B.C.

CERTIFICATE OF ASSAY

Date: August 10, 1987

File: 8707-2452

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

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

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

MARKED	GOLD Au (ppm)	SILVER Ag(ppm)	Nickel Ni (ppm)	Copper Cu (ppm)
ZONE - A :				
L #0 - 0+50W	5.02	1.2	60	126
1+00W	0.06	0.7	25	18
1+50W	0.02	0.8	50	188
2+00W	0.02	0.8	29	88
2+50W	0.04	1.7	30	107
3+00W	0.03	1.3	38	145
3+50W	0.02	1.3	25	299
4+00W	0.02	0.7	14	25
4+50W	0.03	0.7	55	65
5+00W	0.02	0.3	11	29
6+00W	0.02	0.7	31	47
6+50W	0.02	0.5	29	57
7+00W	0.02	0.8	42	57
7+50W	0.02	0.8	37	50
L #1 - 0+50W	0.02	0.5	18	42
1+00W	0.02	0.3	14	27
1+50W	0.03	0.7	26	39
2+00W	0.02	0.5	16	15
2+50W	0.02	0.7	36	54
3+00W	0.02	0.7	42	89
3+50W	0.02	1.2	53	150
4+00W	0.02	1.3	55	116
5+00W	0.02	0.5	18	29
6+00W	0.02	0.7	40	44
6+50W	0.02	0.5	21	29
7+50W	0.02	0.5	21	25
8+00W	0.02	0.5	24	36
8+50W	0.02	0.7	15	10
9+00W	0.02	0.7	30	38
L #2 0+50W	0.02	1.3	36	76
1+00W	0.03	1.3	27	47
1+50W	0.04	0.7	38	51
2+00W	0.02	1.0	24	21
2+50W	0.02	0.7	52	58
3+00W	0.02	0.3	16	10

/continued on page 2 .....

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

J. Wong
PROVINCIAL ASSAYER

CERTIFICATE OF ASSAY

Date: August 10, 1987

File: 8707-2452

SGS SUPERVISION SERVICES INC.
General Testing Laboratories Division
1001 East Pender Street,
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Ste. 304 - 1720 Barclay Street
Vancouver, B.C.

(page 2)

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

MARKED		GOLD Au(ppm)	SILVER Ag(ppm)	Nickel Ni (ppm)	Copper Cu (ppm)	xxxxxxxxxx	xxxxxxxxxx	xxxxxxxxxx	xxxxxxxxx
L #2	3+50W	0.02	0.3	23	41				
	4+00W	0.02	0.5	40	104				
	4+50W	0.02	0.5	22	33				
	5+50W	0.02	0.5	49	139				
	6+50W	0.02	0.3	11	10				
	7+00W	0.02	1.0	23	58				
	7+50W	0.02	1.2	20	38				
	8+00W	0.02	1.0	10	26				
L #3	0+50W	0.06	1.7	45	194				
	1+50W	0.02	1.5	41	118				
	2+00W	0.02	1.3	20	54				
	2+50W	0.02	0.7	12	30				
	3+00W	0.02	1.7	34	66				
	3+50W	0.02	1.2	24	47				
	4+00W	0.02	1.0	19	29				
	4+50W	0.02	1.0	23	29				
	5+00W	0.03	1.3	33	66				
	5+50W	0.02	0.7	7	25				
	6+00W	0.02	0.4	3	18				
	6+50W	0.02	0.8	4	16				
	7+50W	0.04	0.5	26	33				
	8+00W	0.02	1.7	34	62				
L #4	0+50W	0.02	1.2	21	54				
	1+00W	0.02	0.7	14	29				
	1+50W	0.02	1.0	27	50				
	2+00W	0.02	0.5	9	17				
	2+50W (X)	0.02	1.3	29	63				
	2+50W (Y)	0.02	1.2	87	100				
	3+00W	0.02	1.0	22	45				
	3+50W	0.02	0.8	57	101				
	4+00W	0.04	0.8	28	63				
	4+50W	0.04	1.0	29	47				
	5+00W	0.04	1.5	54	136				
	5+50W	0.04	0.8	82	61				
	6+00W	0.04	0.5	24	54				

/ continued on page 3 .....

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

L. Wong
PROVINCIAL ASSAYER

CERTIFICATE OF ASSAY

Date: August 10, 1987

File: 8707-2452

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

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

(page 3)

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

MARKED		GOLD Au (ppm)	SILVER Ag(ppm)	Nickel Ni (ppm)	Copper Cu (ppm)	xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx
L #4	6+50W	0.06	0.4	6	18	
	7+00W	0.02	0.5	20	42	
	8+00W	0.02	1.2	79	72	
L #5	0+50W	0.02	0.8	22	45	
	1+00W	0.03	0.4	2	13	
	1+50W	0.03	0.8	24	41	
	2+00W	0.02	0.4	8	29	
	2+50W	0.02	0.8	44	57	
	3+00W	0.02	0.8	50	129	
	5+00W	0.02	1.0	42	188	
	5+50W	0.04	0.8	61	41	
	6+00W	0.03	2.0	59	181	
	6+50W	0.03	0.7	14	14	
	7+00W	0.02	0.4	6	22	
	7+50W	1.04	1.2	30	46	
	8+35W	0.03	1.0	76	121	
L #6	0+50W	0.07	1.5	33	72	
	1+00W	0.06	1.3	24	48	
	1+50W	0.06	0.7	13	18	
	2+00W	0.02	0.7	20	49	
	2+50W	0.02	0.5	26	35	
	3+00W	0 .02	0.8	110	106	
	3+50W	0.02	0.8	49	109	
	4+00W	0.02	1.5	81	97	
	4+50W	0.02	2.2	67	158	
	5+00W	0.06	1.0	37	86	
	5+50W	0.08	1.0	43	60	
	6+00W	0.06	0.7	16	18	
	6+50W	0.11	0.5	16	18	
	7+00W	0.06	0.5	23	33	
	7+50W	0.05	1.5	68	76	
	8+00W	0.06	1.3	33	63	

/ continued on page 4 ...

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

L. Wong
PROVINCIAL ASSAYER

CERTIFICATE OF ASSAY

Date: August 10, 1987

File: 8707-2452

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.

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

MARKED		GOLD Au (ppm)	SILVER Ag(ppm)	Nickel Ni (ppm)	Copper Cu (ppm)	xxxxxxxxxxxxxxxxxxxxxxxxxxxxxx
L #7	0+50W	0.03	0.8	25	59	
	1+00W	0.02	1.5	45	74	
	1+50W	0.02	1.2	33	61	
	2+00W	0.02	0.9	20	33	
	2+50W	0.02	1.2	33	99	
	3+00W	0.02	0.8	37	82	
	3+50W	0.03	1.0	53	72	
	4+00W	0.02	1.2	50	92	
	4+50W	0.03	0.3	11	23	
	5+00W	0.02	0.8	88	139	
	5+50W	0.04	1.8	36	100	
	6+00W	0.02	1.5	48	130	
	6+50W	0.02	0.8	39	50	
	7+00W	0.02	0.4	20	18	
	7+50W	0.05	0.9	42	63	
	8+00W	0.03	0.4	8	12	
	8+50W	0.02	0.5	64	38	
L #8	0+50W	0.02	0.6	20	42	
	1+00W	0.02	2.0	14	32	
	1+50W	0.03	1.0	9	11	
	2+00W	0.02	1.0	14	33	
	2+50W	0.02	1.5	27	27	
	3+00W	0.03	0.8	20	27	
	3+50W	0.07	1.3	14	54	
	4+00W	0.04	0.8	20	15	
	4+50W	0.77	0.7	42	36	
	5+00W	0.02	0.8	56	74	
	5+50W	0.04	0.7	34	22	
	6+50W	0.06	1.2	28	113	
	8+00W	0.06	1.2	44	79	
	8+50W	0.03	1.0	45	69	
	9+00W	0.02	0.8	20	10	
	9+50W	0.02	0.8	27	14	
	10+00W	0.04	1.2	49	58	
	10+50W	0.02	1.3	33	63	

/ continued on page 5 .....

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

L. Wong
PROVINCIAL ASSAYER

CERTIFICATE OF ASSAY

Date: August 10, 1987
File: 8707-2452

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.

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

MARKED		GOLD Au (ppm)	SILVER Ag (ppm)	Nickel Ni (ppm)	Copper Cu (ppm)	xxxxxxxxxx
L #9 -	0+50W (X)	0.03	0.4	8	15	
	0+50W (Y)	0.04	1.2	18	49	
	1+00W	0.04	0.8	16	46	
	1+50W (X)	0.02	1.0	18	43	
	1+50W (Y)	0.02	0.8	13	28	
	2+00W	0.02	0.8	17	25	
	2+50W	0.08	0.8	8	41	
	3+50W	0.02	1.2	22	41	
	4+00W	0.02	0.3	9	16	
	4+50W	0.02	0.5	13	8	
	5+00W	0.02	0.5	19	28	
	5+50W	0.08	0.8	16	20	
	6+00W	0.02	0.4	20	24	
	6+50W	0.02	0.5	13	15	
	7+00W	0.02	0.5	23	8	
	7+50W	0.02	1.2	10	13	
	8+50W	0.05	0.4	38	75	
	9+00W	0.04	0.8	12	15	
	9+50W	0.03	0.4	26	49	
	10+00W	0.03	0.7	4	9	
0+00N	0+50E	0.04	0.4	26	49	
	1+00E	0.02	0.7	60	92	
	1+50E	0.02	0.3	17	57	
	2+00E	0.02	0.7	22	64	
	2+50E	0.02	1.3	52	184	
BL	0+00N	0.02	0.7	64	271	
	0+50N	0.02	1.5	26	96	
	1+00N	0.02	1.0	26	45	
	1+50N	0.13	0.7	42	82	
	2+00N	0.03	0.7	41	144	
	2+50N	0.02	0.7	31	55	
	3+00N	0.03	0.7	37	45	
	3+50N	0.03	0.3	31	61	
	4+00N	0.03	0.3	12	21	
	4+50N	0.03	0.3	24	114	

/ continued on page 6 .....

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

L. Wong
PROVINCIAL ASSAYER

CERTIFICATE OF ASSAY

Date: August 10, 1987

File: 8707-2452

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.

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

MARKED		GOLD Au (ppm)	SILVER Ag(ppm)	Nickel Ni (ppm)	Copper Cu (ppm)	xxxxxxxxxx	xxxxxxxxxx	xxxxxxxxxx	xxxx
BL	5+00N	0.02	0.7	29	81				
	5+50N	0.02	0.5	38	116				
	6+00N	0.02	0.3	22	52				
	6+50N	0.02	0.7	34	82				
	7+00N	0.02	0.7	19	50				
	7+50N	0.02	0.5	44	96				
	8+00N	0.02	0.5	34	76				
	8+50N	0.04	0.7	32	113				
	9+00N	0.02	0.5	48	109				
L #1	0+50E	0.02	0.5	29	39				
	1+00E	0.02	0.7	29	59				
	1+50E	0.02	0.4	21	17				
	2+00E	0.02	0.4	49	73				
	2+50E	0.02	2.0	50	187				
	3+00E	0.20	0.7	50	206				
L #2	0+50E	0.52	0.7	44	45				
	1+00E	0.89	0.3	24	23				
	1+50E	0.30	0.8	53	64				
	2+00E	0.03	1.2	25	57				
	2+50E	0.03	0.5	24	30				
	3+00E	0.03	0.3	12	16				
	3+45E	0.03	0.3	37	145				
L #3	0+50E	0.02	1.5	76	25				
	1+00E	0.08	0.4	23	19				
	1+50E	0.02	0.4	25	24				
	2+00E	0.02	0.4	20	30				
	2+50E	0.02	0.8	28	89				
	3+00E	0.02	0.8	27	62				
	4+00E	0.02	0.8	27	130				
	4+50E	0.02	0.7	29	100				
L #4	1+00E	0.02	0.4	12	28				
	1+50E	0.02	0.7	26	54				
	2+00E (X)	0.02	0.5	39	59				
	2+00E (Y)	0.02	0.4	20	48				

/ continued on page 7 .....

L. Wong
PROVINCIAL ASSAYER

CERTIFICATE OF ASSAY

Date: August 10, 1987

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

TO: N.V.C. ENGINEERING LTD.

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

MARKED		GOLD Au (ppm)	SILVER Ag(ppm)	Nickel Ni (ppm)	Copper Cu (ppm)	xxxxxxxxxx	xxxxxxxxxx	xxxxxxxxxx	xxxxxxxxx
L #4	2+50E	0.04	0.4	31	46				
	3+00E	0.03	0.5	20	46				
	3+50E	0.03	0.3	31	107				
	4+00E	0.03	0.3	16	82				
	4+50E	0.02	0.7	39	91				
L #5	0+50E	0.02	0.5	26	15				
	1+00E	0.02	0.5	8	14				
	2+00E	0.02	0.3	7	13				
	2+50E	0.02	0.7	49	42				
	3+00E	0.02	0.5	16	19				
	4+50E	3.36	0.8	29	59				
	5+00E	0.05	0.7	14	15				
	6+00E	0.03	0.5	10	24				
	6+50E	0.06	0.7	29	166				
L #6									
L #6	0+50E	0.02	1.0	18	74				
	1+00E	0.02	0.7	20	36				
	1+50E	0.02	0.9	34	54				
	2+00E	0.02	1.2	37	59				
	2+50E	0.02	1.2	51	69				
	3+00E	0.02	0.8	22	41				
	3+50E	0.02	1.0	28	24				
	4+00E	0.03	0.8	17	24				
	5+50E	0.02	0.7	18	64				
	6+50E	0.02	0.5	18	30				
	7+00E	0.02	0.7	25	38				
	7+50E	0.02	0.7	32	54				
	4+50E	0.03	0.7	20	71				
L #7	0+50E	0.02	0.8	111	77				
	1+50E	0.02	1.0	37	81				
	2+00E	0.02	0.7	18	27				
	2+50E	0.02	0.3	11	10				
	3+00E	0.02	0.8	18	30				
	4+00E	0.03	0.8	20	41				
	4+50E	0.04	0.7	21	80				
	6+00E	0.07	0.5	29	100				

/ continued on page 8 .....

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

L. Wong
PROVINCIAL ASSAYER

CERTIFICATE OF ASSAY

Date: August 10, 1987

File: 8707-2452

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.

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

MARKED		GOLD Au (ppm)	SILVER Ag (ppm)	Nickel Ni (ppm)	Copper Cu (ppm)	xxxxxxxxxx
ZONE "B" :						
L #0	0+00W	0.02	0.5	10	13	
	0+50W	0.04	1.7	21	31	
	1+00W	0.02	1.2	26	78	
	1+50W	0.04	0.8	26	35	
	2+00W	0.03	0.7	14	13	
	2+50W	0.04	0.5	11	13	
	3+00W	0.05	0.7	25	87	
	3+50W	0.02	0.7	10	19	
	4+00W	0.02	1.3	30	416	
	4+50W	0.02	1.3	26	138	
	5+00W	0.03	1.0	25	96	
L #1	0+00W	0.02	0.8	17	20	
	0+50W	0.02	0.7	42	80	
	1+00W	0.03	0.6	23	21	
	1+50W	0.02	0.5	23	29	
	2+00W	0.02	0.4	13	9	
	2+50W	0.02	0.4	7	5	
	3+00W	0.02	0.7	13	52	
	4+50W	0.02	0.9	22	59	
BL #2	0+00W	0.02	0.7	16	17	
	1+00W	0.03	0.8	15	22	
	1+50W	0.04	0.8	6	8	
	2+00W	0.02	0.8	10	19	
	2+50W	0.02	0.6	16	27	
	3+00W	0.02	0.5	9	15	
	3+50W	0.02	0.5	13	24	
	4+00W	0.02	0.8	12	34	
	5+00W	0.03	0.8	17	49	
	5+50W	0.08	1.5	21	97	
BL #3	0+00W	0.07	0.5	12	15	
	0+50W	0.09	0.7	20	38	
	1+00W	0.02	0.7	16	24	

/ continued on page 9 .....

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

L. Wong
PROVINCIAL ASSAYER

CERTIFICATE OF ASSAY

Date: August 10, 1987

File: 8707-2452

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

TO: N.V.C. ENGINEERING LTD.

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

MARKED		GOLD Au (ppm)	SILVER Ag (ppm)	Nickel Ni (ppm)	Copper Cu (ppm)	xxxxxxxxx	xxxxxxxxx	xxxxxxxxx	xxxxxxxxx
BL #3	2+00W	0.02	1.0	22	68				
	2+50W	0.02	0.7	6	5				
	3+00W	0.02	0.7	9	10				
	4+00W	0.02	0.5	9	27				
	4+50W	0.02	0.7	6	12				
	7+00W	0.03	0.9	26	56				
	7+50W	0.04	0.9	29	78				
BL #4	0+00W	0.04	0.3	16	10				
L #4	0+50W	0.03	0.8	26	29				
	1+00W	0.03	0.7	28	61				
	2+00W	0.05	0.4	20	19				
	2+50W	0.06	0.4	11	10				
	3+00W	0.04	0.4	16	26				
	3+50W	0.03	0.6	14	22				
	4+00W	0.03	0.3	13	27				
	4+50W	0.02	1.5	17	54				
	5+00W	0.02	0.8	14	34				
	5+50W	0.02	0.5	16	21				
	6+00W	0.02	0.9	27	70				
	7+00W	0.03	0.8	31	61				
	7+50W	0.05	0.8	31	57				
	8+00W	0.04	1.3	28	84				
	8+50W	0.02	1.3	46	118				
	9+00W	0.02	1.0	40	42				
L #5	0+00W	0.02	1.0	26	25				
	0+50W	0.02	0.8	22	25				
	1+00W	0.02	1.0	29	33				
	1+50W	0.02	0.8	18	21				
	2+00W	0.02	0.8	22	32				
	2+50W	0.02	0.5	17	17				
	3+00W	0.02	0.4	10	8				
	3+50W	0.02	0.4	14	22				
	4+00W	0.02	0.7	16	12				

/ continued on page 10.....

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

L. Wong
PROVINCIAL ASSAYER

CERTIFICATE OF ASSAY

Date: August 10, 1987

File: 8707-2452

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 10)

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

MARKED		GOLD Au(ppm)	SILVER Ag(ppm)	Nickel Ni (ppm)	Copper Cu (ppm)	xxxxxxxxx	xxxxxxxxx	xxxxxxxxx	xxxxxxx
L #5	5+00W	0.02	0.5	16	49				
	5+50W	0.04	0.9	20	34				
	6+00W	0.07	0.9	14	23				
	6+50W	0.02	1.0	14	38				

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

L. Wong
PROVINCIAL ASSAYER

CERTIFICATE OF ASSAY

Date: August 24, 1987

File: 8708-1151

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

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

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

MARKED	GOLD Au (ppm)	SILVER Ag(ppm)	Copper Cu (ppm)	Nickel Ni (ppm)	xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx			
Logan A BL R.S.								
L #1	0.10	2.1	67	36				
0+50E	0.10	2.0	151	42				
1+00E	0.07	2.1	129	42				
1+50E	0.07	2.3	57	20				
2+00E	0.03	2.0	42	18				
1+00W	0.02	3.0	158	48				
1+50W	0.02	2.0	184	47				
2+00W	0.02	1.0	94	35				
L #2	0.02	1.3	121	29				
0+50E	0.02	2.4	100	32				
1+00E	0.02	2.7	185	63				
1+50E	0.02	1.9	82	32				
2+00E	0.02	2.3	74	28				
0+50W	0.02	1.7	54	31				
1+00W	0.03	2.3	113	28				
1+50W	0.03	1.4	67	21				
2+00W	0.05	2.7	78	30				
L #3	0.02	1.9	130	36				
0+50E	0.10	2.7	139	34				
1+00E	0.03	2.6	152	36				
1+50E	0.03	2.4	159	53				
2+00E	0.03	2.1	188	58				
0+50W	0.03	2.4	188	54				
1+00W	0.02	1.4	59	24				
1+50W	0.03	2.0	144	35				
2+00W	0.02	2.1	87	33				
L #4	0.04	2.4	135	32				
0+50E	0.02	2.6	97	30				
1+00E	0.02	1.4	66	20				
1+50E	0.03	1.9	126	34				
2+00E	0.02	2.1	78	24				
0+50W	0.02	1.7	41	16				

/ continued on page 2 .....

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

L. Wong
PROVINCIAL ASSAYER

CERTIFICATE OF ASSAY

Date: August 24, 1987

File: 8708-1151

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: NV.C. ENGINEERING LTD.

(page 2)

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

MARKED		GOLD Au (ppm)	SILVER Ag(ppm)	Copper Cu (ppm)	Nickel Ni (ppm)	xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx
Logan A BL R.S.						
L #4	1+00W	0.03	2.4	125	36	
	1+50W	0.03	2.1	99	38	
	2+00W	0.02	1.9	110	36	
L #5		0.03	2.4	148	44	
	0+50E	0.02	2.1	105	25	
	1+00E	0.02	1.4	62	15	
	1+50E	0.02	2.4	71	21	
	2+00E	0.03	2.8	83	27	
	0+50W	0.04	2.1	61	22	
	1+00W	0.03	2.6	99	34	
	1+50W	0.02	2.4	80	27	
	2+00W	0.02	1.9	42	18	
L #6		0.02	2.3	126	28	
	0+50E	0.03	2.1	128	38	
	1+00E	0.03	2.7	160	41	
	1+50E	0.02	2.0	71	20	
	2+00E	0.02	2.1	97	31	
	0+50W	0.02	2.0	53	16	
	1+00W	0.02	2.4	64	21	
	1+50W	0.02	2.4	98	31	
	2+00W	0.02	1.9	88	26	
L #7		0.02	3.1	77	31	
	0+50E	0.02	3.0	77	18	
	1+00E	0.02	3.6	72	24	
	1+50E	0.02	2.4	67	22	
	2+00E	0.02	2.6	74	24	
	0+50W	0.02	2.4	88	21	
	1+00W	0.02	2.1	70	22	
	1+50W	0.02	2.6	131	33	
	2+00W	0.02	2.0	61	14	

/ continued on page 3 ....

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

L. Wong
PROVINCIAL ASSAYER

CERTIFICATE OF ASSAY

Date: August 25, 1987

File: 8708-1151

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

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

MARKED	GOLD Au(ppm)	SILVER Ag(ppm)	Copper Cu (ppm)	Nickel Ni (ppm)	xxxxxxxxxxxxxxxxxxxxxxxxxxxxxx
LOGAN B B.L. R.S.					
L #0	0.03	2.7	186	62	
L #1	0.03	3.4	165	45	
0+50E	0.02	2.0	111	30	
1+00E	0.02	2.4	75	28	
0+50W	0.05	2.6	111	36	
1+00W	0.02	2.4	102	26	
1+50W	0.02	2.6	131	28	
2+00W	0.02	2.4	53	15	
2+50W	0.05	2.5	60	12	
3+00W	0.02	2.7	71	15	
L #2	0.02	3.1	142	39	
0+50E	0.02	2.6	150	32	
0+50W	0.02	2.0	155	45	
1+00W	0.02	2.1	65	26	
1+50W	0.03	1.4	47	15	
2+00W	0.02	2.4	57	15	
L #3	0.03	2.7	160	44	
0+50E	0.03	2.0	170	43	
West 0+50	0.03	1.4	141	40	
1+00W	0.03	1.4	58	24	
West 3+00	0.02	2.0	110	28	
L #4	0.04	2.0	230	59	
0+50E	0.05	1.9	89	26	
0+50W	0.05	2.0	179	52	
1+00W	0.04	2.0	227	50	
1+50W	0.04	1.4	161	41	
2+00W	0.02	1.6	111	27	
2+50W	0.16	1.4	142	24	
L #5	0.04	2.1	185	45	
E0+50	0.04	2.6	111	36	
E1+00	0.02	2.0	126	41	

/ continued on page 4 .....

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

L. Wong
PROVINCIAL ASSAYER

CERTIFICATE OF ASSAY

Date: August 25. 1987
File: 8708-1151

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

TO: N.V.C. ENGINEERING LTD.

(page 4)

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

MARKED		GOLD Au(ppm)	SILVER Ag(ppm)	Copper Cu (ppm)	Nickel Ni (ppm)	xxxxxxxxxxxxxxxxxxxxxxxxxxxxxx			
LOGAN B B.L. R.S.									
L #5	3+00	0.07	1.4	111	20				
	0+50W	0.02	1.9	168	45				
	1+00W	0.33	1.4	174	46				
	1+50W	0.03	1.1	100	33				
	2+00W	0.03	0.9	89	22				
	2+50W	0.02	1.1	116	27				
L #6		0.06	2.6	180	53				
	E0+50	0.04	1.9	186	63				
	0+50W	0.04	2.4	227	82				
	1+00W	0.02	2.0	111	46				
	1+50W	0.02	1.9	178	29				
	2+00W	0.04	1.4	63	20				
	2+50W	0.03	1.9	124	38				
	3+00W	0.02	2.1	222	72				
L #7		0.04	2.4	302	79				
	0+50E	0.03	2.0	175	50				
	1+00E	0.02	2.6	160	48				
	0+50W	0.04	2.4	214	43				
	1+00W	0.04	2.7	156	52				
	1+50W	0.02	2.4	183	45				
	2+00W	0.03	2.1	141	34				
	2+50W	0.03	1.6	108	34				
	3+00W	0.06	2.0	93	44				
	870830	0.04	2.7	169	50				
	870831	0.02	2.0	164	53				
	870832	0.02	2.1	254	77				
	870833	0.02	2.8	141	46				
	870834	0.02	2.3	156	41				
	870835	0.04	2.3	126	36				
	870836	0.02	2.8	144	51				
MONTE	870805	0.03	2.1	105	34				
MONTE	870806	0.03	2.6	105	33				

/ Continued on page 5 .....

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L. Wong
PROVINCIAL ASSAYER

CERTIFICATE OF ASSAY

Date: August 25, 1987

File: 8708-1151

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General Testing Laboratories Division
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TO: N.V.C. ENGINEERING

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

MARKED	GOLD Au (ppm)	SILVER Ag(ppm)	Copper Cu (ppm)	Nickel Ni (ppm)	xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx
MONTE 870807	0.02	2.3	53	28	
870808	0.02	2.6	72	19	
870810	0.07	5.1	281	62	
870811	0.32	2.8	121	32	
LOGAN R.S. 870727	0.02	2.6	136	41	
870728	0.03	2.7	146	75	
870729	0.03	3.3	127	32	
L #0 6+50W	0.02	2.7	62	21	
7+00W	0.03	1.9	37	15	
7+50W	0.02	2.6	55	20	
8+00W	0.03	2.0	60	15	
8+50W	0.02	2.1	140	43	
9+00W	0.03	2.1	131	40	
9+50W	0.02	2.3	111	32	
10+00W	0.02	1.9	50	22	
L #13 0+50W	0.02	2.1	35	9	
1+00W	0.02	2.7	99	18	
1+50W	0.02	2.6	50	21	
2+00W	0.02	2.3	34	14	
2+50W	0.03	2.1	42	14	
3+00W	0.03	2.7	99	30	
3+50W	0.03	2.4	128	38	
4+00W	0.05	2.1	82	30	
4+50W	0.02	2.1	38	17	
5+00W	0.02	1.6	52	21	
5+50W	0.02	2.4	113	39	
6+00W	0.03	2.6	209	46	
6+50W	0.03	2.6	330	56	
7+00W	0.02	2.4	165	37	
7+50W	0.02	2.5	150	36	
8+00W	0.02	2.1	136	40	
8+50W	0.05	2.4	139	40	
9+00W	0.02	2.6	177	46	
9+50W	0.02	2.7	175	62	

/continued on page 6 .....

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L. Wong
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TO: N.V.C. ENGINEERING

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

MARKED		GOLD Au (ppm)	SILVER Ag(ppm)	Copper Cu (ppm)	Nickel Ni (ppm)	xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx
L #15	0+50W	0.02	1.7	48	16	
	1+50W	0.02	1.4	67	15	
	2+00W	0.02	1.6	40	12	
	2+50W	0.02	2.0	41	11	
	3+00W	0.61	1.7	32	11	
	3+50W	0.02	2.0	56	15	
	4+00W	0.02	1.7	56	10	
	4+50W	0.02	1.7	82	23	
	5+00W	0.02	1.6	98	32	
	5+50W	0.02	2.6	137	66	
	6+00W	0.02	2.0	91	32	
	6+50W	0.02	1.5	105	43	
	7+00W	0.02	1.4	72	28	
	7+50W	0.02	1.4	72	37	
	8+00W	0.02	1.3	72	28	
TONY R.S.						
	870810	0.03	2.0	80	40	
	870811	0.02	2.1	145	47	
	870812	0.02	3.6	459	59	
	870813	0.02	2.3	111	34	
	870814	0.02	1.7	94	31	
	870815	0.02	1.9	129	35	
	870816	0.02	1.7	85	26	
	870817	0.02	2.0	151	24	
	870818	0.03	1.7	208	42	
	870819	0.02	1.9	184	41	
	870820	0.02	1.7	87	26	
	870821	0.03	1.9	137	40	
	870822	0.02	2.1	80	36	
LOGAN 1 R.S.						
	8707-3	0.02	2.7	108	36	
	8707-4	0.02	2.0	96	44	
	8707-5	0.02	1.4	44	20	

/ continued on page 7 ....

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TO: N.V.C. ENGINEERING

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

MARKED	GOLD Au(ppm)	SILVER Ag (ppm)	Copper Cu (ppm)	Nickel Ni (ppm)	xxxxxxxxxxxxxxxxxxxxxxxxxxxxxx
LOGAN 1 R.S.					
8707-6	0.02	1.7	90	34	
8707-7	0.02	2.1	130	49	
8707-8	0.07	2.1	100	38	
8707-9	0.02	1.4	42	66	
8707-10	0.02	1.4	99	19	
8707-11	0.04	2.1	219	71	
8707-12	0.02	2.3	121	53	
8707-13	0.02	2.1	121	41	
8707-14	0.02	2.7	87	40	
8707-15	0.02	1.6	78	15	
LOG - 1 R.S.					
8707-1	0.02	1.9	82	16	
8707-2	0.02	1,6	85	18	
8707-18	0.06	1.6	105	24	
8707-19	0.11	1.4	77	16	
8707-20	0.02	1.6	48	19	
8707-21	0.02	1.1	108	16	
8707-22	0.02	1.4	138	30	
8707-23	0.02	1.1	70	17	
8707-24	0.02	1.0	26	9	
8707-25	0.02	1.0	19	6	
LOG - 1 B.L.					
0+50N	0.02	0.8	89	19	
1+50N	0.06	0.6	27	4	
2+50N	0.02	0.6	22	8	
3+50N	0.02	0.6	44	9	
4+50N	0.02	1.0	105	22	
5+50N	0.02	0.8	22	3	
6+50N	0.02	0.6	78	8	
9+50N	0.06	0.8	46	7	
10+50N	0.02	0.6	17	3	
11+50N	0.02	0.5	29	3	

/ continued on page 8 .....

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L. Wong
PROVINCIAL ASSAYER

CERTIFICATE OF ASSAY

Date: August 25, 1987

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General Testing Laboratories Division
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Telephone: (604) 254-1647
Telex: 04-507514

TO: N.V.C. ENGINEERING

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

MARKED	GOLD Au (ppm)	SILVER Ag (ppm)	Copper Cu (ppm)	Nickel Ni (ppm)	xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx			
LOG - 1 B.L.								
1+00N - 0+00W	0.02	1.1	63	9				
2+00N	0.02	0.6	19	5				
3+00N	0.02	0.8	54	9				
10+00N	0.02	0.6	39	6				
12+00N	0.02	1.1	31	4				
LOGAN #1 B L #0 0+00W	0.02	1.3	66	21				
LOGAN #1 BL 7+50N 0+00W	0.02	1.7	74	8				
LOG-1 BL L6	0.02	1.4	99	10				
LOG-1 BL L7	0.02	1.4	56	9				
L#8 BL 8+00N 0+00W	0.16	1.6	46	9				
LOG-1 L#6 6+25W	0.02	1.6	50	17				
LOGAN 1 4+00N 0+00W	0.02	1.6	52	14				
LOGAN 1 L#9 9+00N 0+00W	0.02	1.5	74	15				
LOGAN 1 L #0								
0+50W	0.02	1.6	62	21				
1+00W	0.02	2.1	60	25				
2+00W	0.02	1.6	90	30				
3+00W	0.03	1.6	42	16				
3+50W	0.02	1.5	71	22				
4+00W	0.02	1.7	74	17				
5+00W	0.02	1.3	78	31				
L #1								
0+50W	0.02	1.0	41	14				
1+00W	0.02	0.8	22	9				
1+50W	0.02	1.3	49	12				
2+00W	0.02	1.5	62	17				

/ continued on page 9 .....

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L. Wong
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TO: N.V.C. ENGINEERING

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

MARKED	GOLD Au(ppm)	SILVER Ag(ppm)	Copper Cu (ppm)	Nickel Ni (ppm)	xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx			
L #1								
2+50W	0.02	1.4	105	35				
3+00W	0.02	1.6	36	10				
3+50W	0.02	1.6	32	11				
4+00W	0.02	1.4	98	27				
4+50W	0.02	1.3	74	19				
5+00W	0.02	1.3	56	13				
5+50W	0.02	1.0	81	22				
6+00W	0.02	1.3	73	23				
6+50W	0.02	1.3	68	24				
L #2								
0+50W	0.02	1.4	43	11				
1+00W	0.04	0.8	31	12				
1+50W	0.02	0.6	14	4				
2+00W	0.02	1.3	45	17				
2+50W	0.02	1.1	49	14				
3+00W	0.02	1.4	96	35				
3+50W	0.02	1.4	50	13				
4+00W	0.02	2.3	75	25				
4+50W	0.02	2.3	80	27				
5+00W	0.02	2.1	70	25				
5+50W	0.02	2.0	76	25				
6+00W	0.02	2.9	68	18				
7+00W	0.02	2.3	90	26				
L #3								
0+50W	0.02	2.3	57	19				
1+00W	0.02	2.8	60	40				
2+00W	0.02	1.4	25	7				
2+50W	0.02	1.6	41	15				
3+00W	0.02	2.0	65	26				
3+50W	0.02	1.6	65	23				
4+00W	0.02	1.9	70	25				

/ continued on page 10 .....

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Telephone: (604) 254-1647
Telex: 04-507514

TO: N.V.C. ENGINEERING

(page 10)

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

MARKED	GOLD Au (ppm)	SILVER Ag (ppm)	Copper Cu (ppm)	Nickel Ni (ppm)	xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx			
L #3								
4+50W	0.02	1.6	78	28				
5+00W	0.02	1.5	74	28				
5+50W	0.02	1.9	77	19				
6+00W	0.02	2.3	62	13				
6+50W	0.19	2.0	52	17				
L #4								
0+50W	0.02	1.6	36	12				
1+00W	0.02	1.3	61	22				
1+50W	0.02	0.8	12	4				
2+00W	0.02	0.8	13	8				
2+50W	0.07	1.7	52	15				
3+00W	0.02	1.9	63	15				
3+50W	0.02	1.7	100	35				
4+00W	0.02	1.6	126	48				
5+50W	0.02	1.9	135	46				
6+00W	0.02	1.5	61	16				
6+50W	0.02	1.9	55	22				
L #5								
0+50W	0.02	1.5	109	48				
1+00W	0.02	1.6	52	25				
1+50W	0.02	1.5	74	19				
2+00W	0.02	0.6	9	6				
2+50W	0.02	1.1	29	10				
3+00W	0.02	1.0	44	14				
3+50W	0.02	1.7	82	33				
4+00W	0.02	1.7	90	26				
4+50W	0.02	1.5	126	41				
5+00W	0.02	2.0	59	20				
5+50W	0.02	1.6	61	30				
6+00W	0.02	2.3	141	46				
6+50W	0.02	2.0	57	22				

/ continued on page 11 .....

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L. Wong
PROVINCIAL ASSAYER

LOGAN 1

LOGAN 2

Baseline

963 964 961 960 962 955 954 957 958 956 953 952 951

L7 L6 L5 L4 L3 L2 L1 L0 L13 L12 L11 L10 L9 L8

900 N 800 N 700 N 600N 500N 400N 300N 200N 100N 0

C.P.

N

SCALE meters 50 0 100 200 meters

LEGEND

30	Anomalous threshold	30 ppb Au
50	Significantly anomalous	> 50 ppb Au
70	Highly anomalous	> 70 ppb Au

X964 Rock samples

To accompany report by D.Cukor and V.Cukor, P. Eng.

ANTONY RESOURCES LTD.

LOGAN MINERAL CLAIMS

GEOCHEMICAL PLAN - GOLD

VICTORIA M.D., B.C. NTS 92 F/2E, 92 C/15E

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

DATE: Nov. 1987 | SCALE: as shown | FIG. 5

LOGAN

LOGAN 1

LOGAN 2

Baseline

Logging Road

900 N
800 N
700 N
600 N
500 N
400 N
300 N
200 N
100 N
0

N

SCALE meters 50 0 100 200 meters

LEGEND

1.2	Anomalous threshold	1.2 ppm Ag
1.5	Significantly anomalous	> 1.5 ppm Ag
2.2	Highly anomalous	> 2.2 ppm Ag

ANTONY RESOURCES LTD.

LOGAN MINERAL CLAIMS

GEOCHEMICAL PLAN – SILVER

VICTORIA M.D., B.C. NTS 92 F/2E, 92 C/15E

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

DATE: Nov. 1987 | SCALE: as shown | FIG. 6

To accompany report by D. Cukor and V. Cukor, P. Eng.

LOGAN

LOGAN 1

LOGAN 2

Baseline

Logging Road

N

900 N
800 N
700 N
600 N
500 N
400 N
300 N
200 N
100 N
0

SCALE meters 50 0 100 200 meters

LEGEND

Anomalous threshold — 100 ppm Cu

Significantly anomalous — > 150 ppm Cu

To accompany report by D. Cukor and V. Cukor, P. Eng.

ANTONY RESOURCES LTD.			
LOGAN MINERAL CLAIMS			
GEOCHEMICAL PLAN - COPPER			
VICTORIA M.D., B.C.			NTS 92 F/2E, 92 C/15E
V. CUKOR, P.Eng. - NVC ENGINEERING Ltd. - VANCOUVER, B.C.			
DATE: Nov. 1987	SCALE: as shown	FIG. 7	

LOGAN

LOGAN 1

LOGAN 2

Baseline

Logging Road

N

900 N
800 N
700 N
600 N
500 N
400 N
300 N
200 N
100 N
0

C.P

SCALE meters 50 0 100 200 meters

LEGEND

35 — Anomalous threshold — 35 ppm Ni

50 — Significantly anomalous — > 50 ppm Ni

To accompany report by D. Cukor and V. Cukor, P. Eng.

ANTONY RESOURCES LTD.

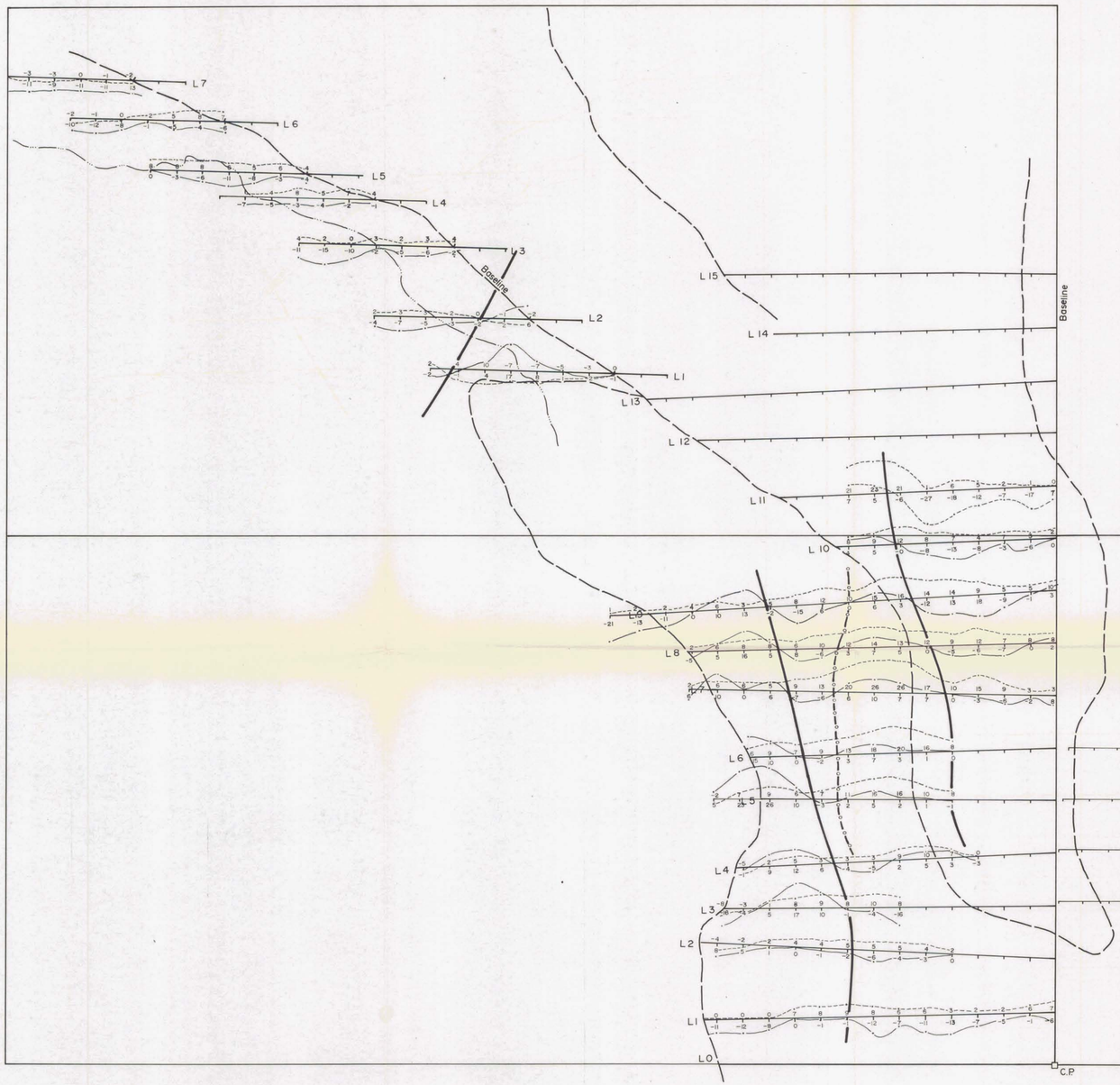
LOGAN MINERAL CLAIMS

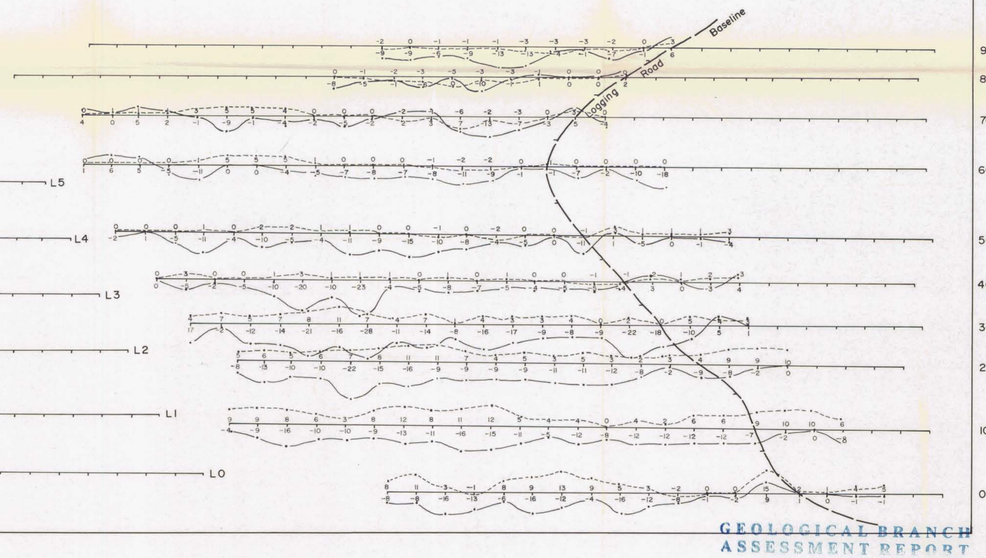
GEOCHEMICAL PLAN – NICKEL

VICTORIA M.D., B.C. NTS 92 F/2E, 92 C/15E

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

DATE: Nov. 1987 | SCALE: as shown | FIG. 8





N

SCALE meters 50 0 100 200 meters

LEGEND

Quadratura
In phase

Crossover

Reverse crossover

St. Hawaii, 23.4 KHz

To accompany report by D. Cukor and V. Cukor, P. Eng.

ANTONY RESOURCES LTD.

LOGAN MINERAL CLAIMS

VLF-EM SURVEY PROFILE PLAN

VICTORIA M.D., B.C. NTS 92 F/2E, 92 C/15E

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DATE: Nov. 1987 | SCALE: as shown | FIG. 9

LOGAN

LOGAN 1

LOGAN 2

N

Readings in gammas

SCALE meters 50 0 100 200 meters

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LOGAN MINERAL CLAIMS

MAGNETIC SURVEY PLAN

VICTORIA M.D., B.C. NTS 92 F/2E, 92 C/15E

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

DATE: Nov. 1987 | SCALE: as shown | FIG. 10

To accompany report by D. Cukor and V. Cukor, P. Eng.