July 5, 1996

## STATEMENT OF COST HOPE CLAIM

Phase 1: Geological, geochemical \& geophysical reconnaissance (13 man crew, 16 days).


[^0]
## WORK PROPOSAL ON THE

## HOPE 2 \& HOPE 3 CLAIMS

## SONORA ISLAND, B.C.



PREPARED FOR
AQUISTAR VENTURES INO

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## TABLE OF CONTENTS

SUMMARY ..... 1
INTRODUCTION ..... 2
LOCATION, ACCESS \& TOPOGRAPHY ..... 2
CLAIMS ..... 3
CLAIM HISTORY ..... 3
GENERAL GEOLOGY ..... 4
LOCAL GEOLOGY ..... 5
MINERALIZATION ..... 6
REGIONAL ..... 6
HOPE 2 \& 3 PROPERTY ..... 7
GEOCHEMICAL SURVEYS ..... 11
GEOPHYSICAL SURVEYS ..... 12
CONCLUSIONS ..... 12
RECOMMENDATIONS ..... 13
REFERENCES ..... 14
1996 EXPLORATION BUDGET - HOPE PROPERTY ..... 15
CERTIFICATE ..... 16
APPENDICES
I. Petrography
II. Rock sample descriptions and Laboratory analyses
III. 1996 Geochemical soil survey analyses
IV. 1995 Geochemical soil survey plots and geostatisticsV. Geophysical Report on Induced Polarization Resistivity, VLF-EM andMagnetic Surveys over the Hope Claim Group by GEOTRONICS SURVEYSLTD.

1. General Location Map ..... 1
2. Claim Location Map ..... 2
3. General Geology ..... 4
4. General Structural Geology ..... 4
5. Geology and Rock Geochemistry Map ..... pocket
6. Schematic Cross Section of Shoreline ..... 4
7. Mineral Deposit Locations Map ..... 5
8. Adit \#1 ..... 7
9. Adit \#2 ..... 7
10. Adit \#3 ..... 7
11. Adit \#4 ..... 7
12. Composite 1996 Geochem Soil Survey Anomalies ..... 10
13. Composite 1996 Geochemical Soil and Geophysical Survey Anomalies11

## SUMMARY

The HOPE 2 and 3 staked mineral claims comprising 22 units lie on the northwest corner of Sonora Island about 20 kilometers north of Campbell River and 100 km northwest of Vancouver, B.C. Access is by boat or float plane from Campbell River.

The two claims encompass the old Sonora-Nodale property first staked in 1919. Work on the property in 1929 included four adits, and two 60 foot deep shafts. Production from this property recorded in 1939-1941 included 14 tons assaying about 2.07 opt $\mathrm{Au}, 3.3$ opt Ag , and 0.22 per cent Cu .

Mineralization on the Hope property has been generally assumed to comprise quartz-sulfide veining hosted in Late Triassic metasedimentary complex similar to the Doratha Morton, a major gold producer in this area. The sulfide mineralization in the quartz veins comprises mainly pyrite with pyrrhotite and chalcopyrite and is generally marked by rusty alteration. This metasedimentary zone which also includes aplitic and pegmatitic members has been traced 1500 meters and like almost all mineral deposits in the area trends northwesterly within elongated granodiorite and diorite plutons which form part of the west edge of the Coast Plutonic Complex.

Of the 26 mineral deposits known in the immediate area, seven have recorded gold, silver and copper production.

Geochemical soil sampling and four types of geophysical surveys completed during 1996 have produced a number of composite anomalies which have yet to be investigated. As a result of these surveys and geological mapping three potential mineral environments have been outlined for the property similar to those found in the general area. These include schist/amphibolite zones, the complex metasedimentary/igneous screen zone, and the margin of the associated diorite intrusive.

The mineral exploration budget proposed to continue work on the Hope property is estimated at about $\$ 154,000$ for Phase I.


## INTRODUCTION

The HOPE 2 and 3 mineral claims comprising 22 units situated at the northwest end of Sonora Island are located about 100 km northwest of Vancouver, B.C. The island can be reached by boat and float plane from Campbell River, a distance of about 20 km . Accommodation had been utilized at the nearby Shoal Bay Lodge which can also usually supply water taxi service. The property was originally Crown Granted in 1919 but most of the known work was completed during 1929. Four adits were driven in deformed quartz-sulfide veins hosted within an Upper Triassic metasedimentary-igneous deformation zone localized between Mesozoic granodiorite and diorite plutons. Government records also indicate that two 60 foot deep shafts were sunk near Adit \#3 during 1929. During the period 1939 to 1941,14 tons of ore were produced which contained significant gold, silver and copper. Thick slash form past logging operations, very dense secondary and tertiary bush, the small amount of rock exposure, and winter conditions impeded work on the property.

Geochemical, geophysical and geological work on the claims in 1996 has considerably upgraded knowledge of the local geology. Rather than the possibility of only the Doratha Morton type of gold mineralization hosted within a deformed metasedimentary zone, the new work has shown the presence of three different potential environments outlined by composite geochemical and geophysical anomalies.

The 1996 exploration work on the HOPE property is estimated to have cost about $\$ 150,000$.

## LOCATION, ACCESS \& TOPOGRAPHY

The HOPE 2 and 3 staked mineral claims are located at the northerly tip of Sonora Island, about 100 kilometers northwest of Vancouver, B.C. (Figure 1). The claims can be easily reached from Campbell River by float plane and boat from Rock Bay. Accommodation has been available at Shoal Bay Lodge located about 5 km away on the north side of East Thurlow Island where a water taxi is generally available.

Sonora Island is one of many islands which lie between Vancouver


Island and the B.C. mainland sea coast in what is generally described as the Coastal Trough and is considered to lie within the central Bute Inlet map area. Together the major fjords and numerous narrow waterways form a complex waterway studded with steep islands and islets.

In the Hope claims area the land rises from sea level to 865 meters at Mount Tucker. Parts of the claim area, particularly along the waterfront, have been logged several times leaving deep slash, dense second growth and combinations of the two.

## CLAIMS

The HOPE 2, and HOPE 3 staked mineral claims comprising 22 units in the Nanaimo Mining Division (NTS 92K/O6W) are currently owned by Mr. Dave Heyman of Burnaby, B.C. (Figure 2).

| Claim Name | Units | Tenure \# | Record Date | Expiry Date |
| :---: | :---: | :---: | :---: | :---: |
| HOPE 2 | 2 | 343222 | Jan. 30/96 | Jan. 30/97 |
| HOPE 3 | 20 | 343223 | Jan. 31/96 | Jan. 31/97 |

The claims area was explored in 1996 under an agreement with Aquistar Ventures Inc. - Work Approval Number NAN-96-0800992-16.

## CLAIM HISTORY

Part of the current property was recorded as Crown Granted claims, Bobby Burns, Hetty Green, and Daniel Webster in 1919. No recorded work was published until 1929 when two beach adits, a third adit at 300 feet elevation and "a couple of shafts" about 60 feet deep were driven on quartz veins by Sonora Gold Mines Ltd. At that time the property comprised 21 adjoining claims. No further work was recorded and the Crown Granted claims were forfeited in 1947.

In 1983 five of the reverted Crown Granted claims were acquired by Tenajon Silver Corp. of Vancouver. Work on the claim area included limited reconnaissance geology, four stream silt samples and 32 B horizon soil samples.

In 1982 the northeasterly coast of Sonora Island was staked as the ARGO group of claims, now partly covered by the HOPE 3. Work on the ARGO claims in 1984 included some prospecting and geochemical soil sampling along several contours above the waterfront. Work continued on the claims in 1985 included further geochemical soil sampling, prospecting and limited geological studies. A total of 750 soil and shear zone samples were tested for Cu and Zn by colorimetric field tests and 53 rock samples were tested for gold.

In 1996 work on the HOPE 2 and 3 claim area included geological mapping, and sampling along the shoreline and along the new cut line grid which totalled about 13.0 kilometers. A total of 295 geochemical soil samples taken on the grid lines from $B$ horizon material were treated by the ICP and FA/ICP method. In addition a geophysical survey included IP/Resistivity, magnetic, and VLF-EM surveys along 6.44 kilometers of line. The geophysical surveys were not completed over the entire grid area because of various problems. Three general rock types were submitted for petrographic study (Appendix I) and 68 rock and chip samples were taken for examination. All samples were assayed by FA/ICP methods for gold.

## GENERAL GEOLOGY

Sonora Island lies along the western limit of the Coast Plutonic Complex where this major tectonic unit merges with the dominantly volcanic Upper Triassic Karmutsen Formation of Vancouver Island (Figure 3). The contact zone between these tectonic regimes is marked by strong northwesterly trending, narrow, elongated belts of both igneous and metamorphosed country rocks. This complex belt comprises mainly granodiorite and diorite as well as minor quartz monzonite and gabbro of mainly Late Jurassic age. This region of the Coast Plutonic Complex is characterized by the decrease in pluton age from west to east. Stratified country rocks within this transition zone include Karmutsen volcanic, clastic sedimentary and carbonate members. Most of these units have survived as variably altered and recrystallized ribbon-like units marked by strong foliation along the plutonic contacts. This alteration and deformation contrasts strongly with the relative simple, open folding of Karmutsen units on adjacent Vancouver Island.

Roddick (1973) recognized seven narrow discontinuous, northwesterly

Q Alluyial and glacial deposits
dura cartaczods
IKg Greenstone, rolcanic breccia, argillite,
ninor congionerate, lifestone, and schist
JURASSIC

| LOWRR JURASSIC |
| :---: |
| gomalza |

IJb
ORABZA group
hargledon: pornation
IJh
Poldspathic vacke, ilicrouz argillito.
phyllite, quartalie ond minor limettene
trisssic
UPPER fRIASSIC
TRP Dark liay shade, calcaronite, wacke
隹
Rq $\mid$ Bainly thick-bedded, light grey
bioclastic lieestone
garmotsen formation
URKP
pillow lara vithin Quatsino Iinestone


## U1 Kkm <br> MIDDIE KABHDTSEX <br> fillov breccia and aquagene tuff <br> URKI! <br> LOMER KARMOTSEA <br> closely packed pillow lava

PALEOZOTC AMD/OR TAIASSIC
PR ${ }^{\prime}$ Appibolite, schist, quartilite; aino crystalline linestone, greenitone
paleozolc of older
gn granitoid gnelss, anphibolite, and schist

Quartz diorite

Diorite

## Mpabissal rocks

$\square$

Geological boundary (defined, approxinate or assuned) ittitude of bedding or flows (inclined, vertical) ittitude of follation, gieissosity (inclined, vertical)
 Axis of aultiple minor folds (showing plunge direction; farial plare vertical)
rault (defined, approxieate, assumed)
anticline (arial trace defined, approrinate) syacline (axial trace dofined, approxinate)
Dyke suare (lines parallel trend)
Potassiun-argon age deteranation: single $O$; matiple $\quad$.
blotite $=b ;$ horablende $=\mathrm{h}$ : JBC deteraination $=$
observed ninerals: chalcopyrite $n: \square$ garnet $=\otimes$ : nagnetite $=(\mathbb{O}$;
malachite - O: Rol pbdenite $=$ © : prite $=*$ * prythotito $=\nabla$ : sillinanito $=$ (©): sphease $=\mathbf{\Lambda}$.

Fousil locality

Geology by J. A. Roddick, W. W. Hutchison and G. J. Roodsvorth. 1970-76.
vancourer Island and part of Quadra Island by D. Carlisle, 1960-71.
Ht. Raleigh area by G. J. Hoodsvorth, 1971-73.



## LEGEND

FIGURE 6

|  | Chlorite schist | pr | pyrite |
| :---: | :---: | :---: | :---: |
|  |  | cpy | chalcopyrite |
| 兴ご | Diorite | pyrr | pyrrhotite |
|  | Leucogranite | hem | hematite alteration |
|  |  | lim | limonite alteration |
| $\square$ | Basalt／diabase | Si | silicification |
| － | Quartz vein | mu | muscovite |
| ss | Shear zone |  |  |


trending belts of rock within the Bute Inlet map area portion of the Coast Plutonic Complex. Sonora Island lies within the westerly belt where small areas of hornblende schist are associated with irregularly intercalated gneiss, thinly banded quartzite, marble and quartz-silicate lenses.

Rock structure in the narrow altered and deformed belts is mainly expressed as a foliation in the massive plutons and volcanic units, and as tight isoclinal folding in the metasedimentary members (Figure 4). Dike swarms marking major fracture systems and numerous faults on both regional and local scales are abundant geologic features.

## LOCAL GEOLOGY

Regional mapping (Figures 3 \& 4) indicated that Sonora Island is mainly a plutonic complex dominated by a medium grained, massive diorite forming the core area with lesser areas of quartz diorite and granodiorite at the southwest and southeast. In addition, Roddick (1973) indicated the presence of two narrow northwesterly trending metasedimentary zones on the north shore of the island. The southerly zone comprising mainly rusty weathering quartzite, schist and aplite located between Sonora Point and Hall Point, and the northerly zone chiefly comprising contorted marble, intercalated quartzite and schist.

In 1983 and 1984 work on the northeast portion of Sonora Island, that is, from Hall Point southeasterly, indicated that this part of the island was mainly a grey phyllite marked by numerous closely spaced shears and faults, as well as a succession of northwesterly trending, cliff forming dikes. Krutz (1984, 1985) noted that these shear zones included sericite, quartz, pyrite, arsenopyrite, chalcopyrite and sphalerite as mineralization. This unit is shown as part of a Palaeozoic or Triassic member on the regional map.

Geological mapping on the HOPE 2 and 3 claims during 1996 concentrated on the southerly metasedimentary zone located roughly half way between Sonora Point and Hall Point (Figure 5). In addition to the new geological map of the complex metasedimentary zone a cross-section at sea level has been included (Figure 6). This zone was partly explored by adits in 1929 and by reconnaissance geochemical methods in 1984 (MacLeod, 1984).


Two adits were driven on the shoreline in 1929 to test quartz veins. Adit \#1 was driven in an aplitic/granitic metasedimentary unit and Adit \#2 was drifted near the contact with massive medium grained diorite. The contact between the diorite at the south and the mixed unit was traced southeasterly more than 1500 meters. The mixed unit comprises a melange of contorted thin ribbonlike carbonate bands, chlorite schist, leucogranite, aplite, and calc-silicate rocks. This complex zone extends southeasterly with a general width of from 100 to 200 meters towards the east shore of Sonora Island. The northerly contact of this complex is bounded by a massive equigranular granodiorite which has a width of from 200 to 300 meters. Rocks on the north side of this intrusive granodiorite include thinly laminated, contorted andesite and basalt and massive, featureless basalt. Towards Hall Point these altered volcanic rocks have been highly deformed and altered to 'greenstone' and schist. All of these major rock units have been cut by a variety of dikes including basalt and granodiorite, and by numerous faults and shears. So far all the mineralization of note tested on this part of Sonora Island has been localized within the mixed granitic-metasedimentary zone.

## MINERALIZATION

## REGIONAL

Prospecting and mineral development in this general area were greatest between 1897 and 1899 and were abandoned because of the Yukon Gold Rush, then followed by lesser activity in the 1920's and 1930's. The Doratha Morton property which processed more than 10,000 tons of ore was the first cyanide-mill operation in British Columbia.

Mineral deposits, including several producing operations, have been developed along a linear northwesterly belt extending from Sonora Island at the southeast to central Loughborough Inlet at the northwest. In all, 26 mineral systems lie along this trend over a distance of about 30 kilometers and most have been hosted within narrow Palaeozoic/Triassic metasedimentary/metavolcanic bands (Figure 7). The following table summarizes the production record for the mines.

|  | PRODUCER | Year | Tons | Au oz. | Ag oz. | Cu lbs | Pb lbs | Zn lbs |
| :--- | :--- | :--- | ---: | ---: | ---: | ---: | ---: | ---: |
| 18 | HOPE (THURLOW GOLD) | $1929-1941$ | 422 | 95 | 133 | 297 |  |  |
| 23 | DORATHA MORTON | $1898-1925$ | 10,255 | 4,596 | 10,663 | 2,402 |  |  |
| 24 | ENID - JULIE | 1933 | 2 | 2 | 7 |  |  |  |
| 28 | ALEXANDRIA | $1939-1940$ | 1,868 | 715 | 1,305 | 3,883 |  |  |
| 35 | DOUGLAS PINE | 1937 | 10 | 3 | 705 | 240 | 720 | 540 |
| 37 | SONORA (NODALE) | $1939-1941$ | 14 | 29 | 46 | 62 |  |  |
| 48 | LOUGHBOROUGH (GOLOEN GATE) | $1935-1939$ | 135 | 114 | 457 | 185 |  |  |
|  | TOTALS |  | 12,706 | 5,554 | 13,316 | 7,069 | 720 | 540 |

The above auriferous deposits are localized within or adjacent to narrow northwesterly trending metavolcanic/metasedimentary units marked by deformation, shearing, faulting and cut by a variety of dikes. Some are within northwesterly trending faults and shears generally close to the country rock contacts. Most of these deposits comprise quartz veins, and quartz veinlets with minor to common spotty, blebby, streaky to massive pyrite with accessory chalcopyrite and lesser sphalerite and galena. The gold has generally been related to pyrite with gold values as high as 5.5 opt Au at the Doratha Morton in clean pyrite.

The most important deposit in this area, the Doratha Morton, comprised quartz veins, lenses and veinlets localized within a 100-150 foot wide, northwesterly trending shear zone in a deformed country rock screen. This type of occurrence also includes the HOPE 2 and 3 claims on Sonora Island as well as several other deposits.

Deposits reported to lie entirely within plutonic rocks include the Hope, White Pine, and Alexandria. These are also quartz-pyrite vein-types localized within northwesterly trending breccia and shear zones. Because of the general lack of detailed information regarding these properties and showings it is difficult to assign geological controls to each deposit.

## HOPE 2 \& 3 PROPERTY

Records of the B.C. Minister of Mines list the production of 14 tons of material shipped to the Tacoma smelter from 1939-1941 which included 29 ounces gold, 46 ounces silver, and 62 pounds of copper. No mention of the exact location of this ore has yet been found, but several workings have been located. In 1996 geological mapping of the HOPE 2 and 3 property found the two adits on




the shoreline, and one adit reported at about 125 meters elevation mentioned in the 1929 Annual Report of the Minister of Mines, B.C. The two 60 foot shafts mentioned as located just above \#3 adit were not located, but one more adit (\#4) was located at 230 meters above sea level. This adit was not mentioned in any report on the property.

Quartz veining is found in all of the main units outlined by the 1996 field work and is most abundant within the deformed metasedimentary zone. These veins, lenses, pods, and veinlets range from 1 cm to 1 meter in width and are generally discontinuous because of boudinage. The quartz veins and metasedimentary rocks generally contain from 1 to $10 \%$ fine grained pyrite, pyrrhotite and chalcopyrite as streaks and disseminations. The main diorite and granodiorite bodies generally contain less than $5 \%$ disseminated sulfides.

The 1996 geological work on the property included detailed mapping and sampling of the four adits plus sampling of quartz-pyrite as well as other mineralization encountered in outcrop. Results of this sampling have been included on the main geological map (Figure 5), and on diagrams of the four adits included here as Figures $8,9,10$, and 11 . Results of the adit sampling have been tabulated below and the analytical results have been placed in Appendix II along with the sample descriptions.

ADIT ROCK SAMPLE ASSAYS

| Adit/location | Sample No. H96- | Type | Width (m) | $\begin{gathered} \text { Au } \\ \text { ppb } \end{gathered}$ | $\begin{array}{r} \mathrm{Ag} \\ \mathrm{ppm} \end{array}$ | $\underset{\mathrm{ppm}}{\mathrm{Cu}}$ | $\begin{array}{r} \mathrm{Pb} \\ \mathrm{ppm} \end{array}$ | $\begin{array}{r} \mathbf{Z n} \\ \mathrm{ppm} \end{array}$ |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 1 @ entrance | R 10 | Chip | 1.5 | 3 | $<0.3$ | 65 | <3 | 49 |
| 1 @ 7 m | R 16 | Chip | 2.0 | <2 | <0.3 | 37 | 14 | 36 |
| 1 @ 10 m | R 17 | Chip | 1.0 | 2 | $<0.3$ | 18 | <3 | 42 |
| $1 @ 15 \mathrm{~m}$ | R 18 | Chip | 1.5 | 4 | $<0.3$ | 50 | <3 | 79 |
| 1 @ 18 m | R 19 | Chip | 1.0 | <2 | $<0.3$ | 68 | $<3$ | 100 |
| 1 @ 19 m | R 20 | Chip | 2.5 | 3 | $<0.3$ | 19 | $<3$ | 64 |
| 2 @ entrance | R 24 | Chip | 1.5 | 12 | $<0.3$ | 17 | <3 | 68 |
| 2 @ back wall | R 21 | Chip | 1.5 | 14 | $<0.3$ | 14 | <3 | 35 |
| 2 @ 8 m | R 22 | Chip | 1.5 | 21 | 0.3 | 59 | 8 | 79 |
| 2 @ 3 m | R 23 | Chip | 2.0 | 20 | $<0.3$ | 59 | 3 | 89 |
| 3 @ back wall | R 33 | Chip | 1.5 | 48 | 0.9 | 15 | 4 | 57 |
| 3 @ E wall | R 34 | Chip | 2.0 | 29 | $<0.3$ | 35 | 6 | 97 |
| 3 @ 2 mW | R 35 | Chip | 1.0 | 127 | 0.4 | 10 | 7 | 17 |
| 3 @ floor | R 47 | Grab | 5.0 | 11 | $<0.3$ | 10 | 3 | 13 |
| 4 @ back wall | R 38 | Chip | 1.5 | 11 | $<0.3$ | 64 | 5 | 80 |
| 4 @ W wall | R 39 | Chip | 3.0 | 4 | $<0.3$ | 9 | 3 | 10 |


| Adit/location | Sample <br> No. H96- | Type | Width (m) | Au ppb | $\begin{array}{r} \mathbf{A g} \\ \mathrm{ppm} \end{array}$ | $\begin{gathered} \mathrm{Cu} \\ \text { ppm } \end{gathered}$ | $\begin{array}{r} \text { Pb } \\ \text { ppm } \end{array}$ | $\begin{array}{r} \mathrm{Zn} \\ \mathrm{p} p \mathrm{~m} \end{array}$ |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 4 @ entrance | R 40 | Grab | - | <2 | $<0.3$ | 4 | 3 | 4 |
| 4 @ E wall | R 41 | Chip | 1.5 | 3 | $<0.3$ | 25 | 7 | 86 |
| 4 @ face | FR 61 | Chip | 0.2 | 2 | <0.3 | 8 | 5 | 23 |
| 4 @ face | FR 62 | Chip | 2.0 | 2 | $<0.3$ | 27 | 13 | 58 |
| 4 dump inside | FR 63 | Float | - | <2 | <0.3 | 9 | $<3$ | 21 |
| 4 @ entrance | FR 64 | Float | $\bullet$ | $<2$ | $<0.3$ | 7 | 9 | 53 |
| 4 | FR 65 | Chip | 0.6 | 2 | $<0.3$ | 3 | 3 | 2 |
| 4 @ roof | FR 66 | Chip | 0.4 | 17 | <0.3 | 6 | 3 | 7 |
| 4 @ entrance | FR 67 | Chip | 0.3 | 3 | <0.3 | 11 | 3 | 35 |

All four of the adits lie within the altered, folded northwest trending metasedimentary screen which lies between massive diorite and granodiorite. Rock exposed in the three lower adits includes quartz veins and lenses with minor pyrite, pyrrhotite, and rare chalcopyrite enclosed within chloritic schist, with quartzite and occasional marble. Deformation is marked by the strongly boudinaged character of the quartz veins, and metasedimentary rocks. Adit \#4 was drifted on strongly altered 'diorite', or amphibolite cut by quartz veins and also displays shearing and boudinage. Assay results of samples from the four adits suggest that the best mineralization tested ranges as high as 127 ppb Au in adit \#3 over a width of 1.0 meters. Copper values were highest in adits \#1 and \#2 ranging up to 68 ppm in chlorite schist from adit \#1.

General mineralized samples collected from the grid area also include a variety of materials such as pyritic quartz veins, chlorite schist, rusty hematitic and limonitic metasediment, schistose diorite/amphibolite, aplite, leucogranite, and pegmatite. Float samples including pieces of quartz from large boulders found near the end of Line $6+00 E$ were also taken for analysis. All of these field samples have been tabulated in the following table.

ROCK SAMPLE ASSAYS

| Sample <br> No. H-96 | Type | Width <br> $(\mathrm{m})$ | Au <br> $\mathbf{p p b}$ | Ag <br> $\mathbf{p p m}$ | Cu <br> $\mathbf{p p m}$ | Pb <br> ppm | Zn <br> $\mathbf{p p m}$ |
| :--- | :--- | :---: | :---: | :---: | :---: | :---: | :---: |
| R 1 | Grab | - | 3 | $<0.3$ | 13 | 15 | 23 |
| R 2 | Chip | 1.0 | $<2$ | $<0.3$ | 29 | $<3$ | 42 |
| R 3. | Chip | 1.0 | 6 | $<0.3$ | 31 | 5 | 43 |
| R 4 | Chip | 1.0 | 3 | $<0.3$ | 59 | 5 | 24 |
| R 5 | Chip | 1.5 | 3 | $<0.3$ | 63 | 9 | 75 |
| R 6 | Chip | 1.0 | 7 | 0.3 | 13 | 17 | 17 |


| Sample <br> No. H-96 | Type | Width (m) | Au ppb | $\mathbf{A g}$ ppm | $\begin{array}{r} \mathrm{Cu} \\ \mathrm{ppm} \end{array}$ | $\begin{array}{r} \mathrm{Pb} \\ \mathrm{ppm} \end{array}$ | $\begin{array}{r} \mathbf{Z n} \\ \text { ppm } \end{array}$ |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| R 7 | Chip | 2.0 | 2 | $<0.3$ | 61 | 17 | 55 |
| R 8 | Chip | 1.5 | 2 | $<0.3$ | 5 | $<3$ | 66 |
| R 11 | Chip | 0.75 | 2 | 0.5 | 15 | 13 | 20 |
| R 12 | Chip | 1.5 | 6 | $<0.3$ | 50 | <3 | 85 |
| R 13 | Chip | 1.5 | 3 | $<0.3$ | 33 | $<3$ | 51 |
| R 14 | Chip | 1.5 | <2 | $<0.3$ | 2 | 3 | 2 |
| R 15 | Chip | 1.0 | <2 | $<0.3$ | 9 | 8 | 75 |
| R 25 | Chip | 0.75 | 2 | $<0.3$ | 73 | 8 | 36 |
| R 26 | Chip | 0.75 | 2 | $<0.3$ | 52 | 7 | 19 |
| R 27 | Chip | 0.75 | 3 | <0.3 | 85 | 7 | 69 |
| R 28 | Chip | 0.75 | 2 | $<0.3$ | 98 | $<3$ | 55 |
| R 29 | Grab | - | $<2$ | <0.3 | 15 | <3 | 25 |
| R 30 | Chip | 1.5 | <2 | $<0.3$ | 56 | <3 | 44 |
| R 31 | Chip | 1.5 | 2 | <0.3 | 48 | 3 | 45 |
| R 32 | Chip | 1.0 | 4 | $<0.3$ | 59 | 6 | 27 |
| R 36 | Chip | 1.5 | 3 | <0.3 | 67 | 9 | 66 |
| R 37 | Chip | 2.0 | 4 | <0.3 | 6 | $<3$ | 3 |
| R 42 | Chip | 0.20 | 2 | <0.3 | 7 | 3 | 9 |
| R 43 | Grab | - | 4 | <0.3 | 56 | 28 | 171 |
| R 44 | Chip | 1.0 | <2 | <0.3 | 19 | 7 | 20 |
| R 45 | Chip | 0.5 | 34 | <0.3 | 5 | 3 | 3 |
| R 46 | Chip | 0.75 | 2 | $<0.3$ | 37 | 3 | 51 |
| R 48 | Grab | - | 12 | <0.3 | 7 | 4 | 20 |
| R 49 | Chip | 1.0 | <2 | <0.3 | 5 | 5 | 22 |
| R 50 | Chip | 0.5 | 2 | <0.3 | 16 | 5 | 7 |
| R 51 | Chip | 1.5 | <2 | <0.3 | 3 | 7 | 70 |
| R 52 | Chip | 1.0 | 0.001 opt | 1.6 | 44 | 23 | 71 |
| R 53 | Chip | 1.0 | <0.001 opt | 1.5 | 36 | 20 | 54 |
| R 54 | Chip | 0.25 | < 0.001 opt | 0.9 | 11 | 25 | 60 |
| R 55 | Chip | 1.0 | 0.001 opt | 0.8 | 77 | 15 | 79 |
| FR 68 | Chip | 0.3 | 3 | 0.6 | 63 | <3 | 35 |
| FR 69 | Float | - | <2 | 0.5 | 41 | 54 | 116 |
| FR 70 | Chip | 2.5 | 2 | $<0.3$ | 14 | 4 | 10 |
| FR 71 | Float | - | 3 | <0.3 | 36 | 7 | 9 |
| FR 72 | Float | - | <2 | $<0.3$ | 8 | 13 | 15 |
| FR 73 | Chip | 3.0 | <2 | $<0.3$ | 58 | 9 | 54 |
| FR 74 | Float | - | <2 | <0.3 | 9 | 3 | 6 |



Of the above field samples the highest gold values were found in quartz-pyrite veins ( + pyrrhotite), and quartzitic and chloritic rocks at the extreme southeast end of the grid.

## GEOCHEMICAL SURVEYS

Geochemical surveys completed on Sonora Island in 1984 and 1985 along the coast from Hall Point southeast were analyzed in the field by simple colorimetric methods (Krutz, 1984, 1985). This work concentrated on the copper and zinc potential of the shear zone. Values were reported as 75 ppm for both copper and zinc.

In 1984 another survey was completed over a small area immediately southeast of the \#1 and \#2 adits. Of the 32 soil samples submitted for ICP analysis only 6 were reported at 10 ppb Au .

The 1996 soil sample program was considerably more extensive and covered about 1.5 km scutheasterly along the metasediment screen as well as part of the amphibolitized volcanics on the north. The total number of samples taken and analyzed by ICP methods was 295.

Geostatistical evaluation of the 1996 soil results gave anomalous values as: $\mathrm{Au}-9 \mathrm{ppb}, \mathrm{Ag}-0.5 \mathrm{ppm}, \mathrm{As}-8 \mathrm{ppm}, \mathrm{Cu}-82 \mathrm{ppm}, \mathrm{Pb}-36 \mathrm{ppm}$, and Zn-145 ppm. The analytical results, geostatistical calculations, graphs, and individual element plots have been included in this report as Appendices III and IV.

A composite geochemical soil anomaly map for the six elements has been presented here as Figure 12. This map displays a broad, northerly trending anomalous zone crossing both the metasedimentary screen, and the adjacent amphibolite. Silver, the dominant trace element in this anomalous area is accompanied by severai other anomalous elements but only one gold anomaly. Most of the anomalous gold samples lie in a NW-SE line near the metasediment/diorite contact. Of these one anomalous gold value fell near \#4 adit.

## LEGEND

Magnetic low

$\mathrm{L} \quad$| Resistivity high coorelating |
| :--- |
| with IP high |


| Resistivity low coorelating |
| :--- |
| with IP high |

V/EM conductor
$5+00 E \quad 6+00 E \quad 7+00 E \quad 8+00 E \quad 9+00 E \quad 10+00 E 11+00 E 12+00 E 13+00 E$
Au $\Rightarrow 9 \mathrm{ppb}$
As $\Rightarrow 8 \mathrm{ppn}$
$C u \Rightarrow 82 \mathrm{ppm}$
$\mathrm{pb} \Rightarrow 36 \mathrm{ppm}$
$z \mathrm{n} \Rightarrow 145 \mathrm{ppm}$
$\mathrm{ng} \Rightarrow 0.5 \mathrm{ppm}$


## GEOPHYSICAL SURVEYS

Geophysical work performed on the Sonora Island HOPE claims included magnetics, VLF-EM, IP and Resistivity surveys over part of the grid from Line $0+00$ to Line $7+00 E$. The geophysical report and accompanying plans have been included here in total as Appendix $V$. The surveys were not extended over the entire grid, and particularly to the southeast because of a variety of problems. Both the soil geochemistry and geophysical anomalies have been included here as Figure 13.

In summary the geophysical work revealed several IP/resistivity, and VLF-EM anomalies. IP high 'A' which extends from L4+00e TO L7 + 00E lies entirely within the complex screen zone and is roughly paralleled by VLF-EM anomaly ' $a$ '. The southerly contact of the metasediment/diorite contact is marked by a discontinuous magnetic low. IP high ' $C$ ' corresponds closely to a mag high and several anomalous gold sites suggesting a mineralized NW/SE trending zone within 'diorite' adjacent to the metasedimentary screen. Because of the prior assumption that any significant gold mineralization would be found in the central metasedimentary zone and the general lack of outcrop only two rock samples were taken near the diorite contact zone.

## CONCLUSIONS

Geological mapping in 1996 has shown the presence of a complex NW/SE trending metasedimentary/igneous zone about 200 meters wide lying between a generally massive granodiorite at the north and a foliated to massive diorite over a length of at least 1.5 kilometers. The granitic unit has also intruded flow banded to massive basalt which extends towards Hall Point. Along the easterly coast of the island the volcanics have been extensively sheared and cut by faults and dikes. In the northern grid area the volcanic unit has been amphibolitized and marked by a strong foliation.

Four adits probably all driven during 1929 to test quartz-sulfide mineralization localized within the metasedimentary/igneous screen were mapped and sampled in 996. Analyses of materials from these workings produced only low
results. The best results were from samples at the southeast end of the grid with assays as high as 0.001 opt Au. The two 60 foot deep shafts driven in 1929 near Adit \#3 and from which it has been surmised that 14 tons of ore were shipped were not located because of snow, thick slash, and very dense bush.

Geochemical soil survey results indicate the presence of a broad silver anomaly lying north of the metasedimentary zone in amphibolite. A second linear gold anomaly has been indicated to lie within the diorite parallel to the diorite/ metasediment contact.

Geophysical surveys which were completed over only part of the grid indicated one IP high accompanied by a VLF-EM anomaly within the metasedimentary complex along the central adit \#3-adit \#4 zone. Another IP high with a corresponding magnetic high lies entirely within the diorite paralleling the contact. This latter IP-mag anomaly is closely matched by geochemical gold anomaly.

The 1996 work has indicated the presence of at least three potential rock/structural situations in which gold-quartz-sulfide mineralization occur on the Hope property. These are:

- 1) the metasedimentary/igneous zone from which 14 tons containing 29 ounces gold, 46 ounces silver, and 62 pounds copper has been produced and could be similar to the Doratha Morton zone;
- 2) the diorite contact area marked by both geochemical and geophysical anomalies, and could be a Thurlow Gold situation; and
- 3) the amphibolite/schist structural zone marked by a broad silver anomaly.


## RECOMMENDATIONS

The geochemical soil and in particular the composite geochemical/ geophysical anomalies should be tested by extensive trenching accompanied by geological mapping and sampling. These sites are located at L6+00E/11+50N and $L 7+00 E / 8+00 \mathrm{~N}$ and spaced across the IP conductor between adits \#3 and \#4. Sites in the diorite at $\mathrm{L} 5+00 \mathrm{E} / 4+00 \mathrm{~N}, \mathrm{~L} 8+00 \mathrm{E} / 4+50 \mathrm{~N}, \mathrm{~L} 9+00 \mathrm{E} / 4+00 \mathrm{~N}$, $\mathrm{L} 11+00 \mathrm{E} / 4+50 \mathrm{~N}$ and $\mathrm{L} 12+00 \mathrm{E} / 4+50 \mathrm{~N}$.

The geochemical soil survey with accompanying geology and sampling should be extended about 800 meters southeasterly to the claim limit. The area near adit \#3 should be searched carefully for the shafts.

This work will require further trail and line cutting and could be managed using a beach camp.

If results warrant the geophysical surveys should be extended.

It is estimated that this proposed work will cost about \$154,000 for phase I and \$69,500 for phase II.

## REFERENCES

Minister of Mines Annual Reports, B.C. 1919, 1928, 1929, 1936

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Assessment Reports, B.C.: 13179, 14584
Dolmage, V. (1931): Report on the Thurlow Gold Mines.
Harris, C.R. (1983): Report on Doratha Morton Property, Phillips Arm, B.C.
MacLeod, J.W. (1984): Report on the Sonora Group.
Roddick, J.A. (1973): Notes on the Stratified Rocks of Bute Inlet Map Area, G.S.C. Open File 480.

## 1996 EXPLORATION BUDGET - HOPE PROPERTY

## PHASE I

1. Camp, supplies, rentals, fuel, boat, room \& board @ \$80/man/day
$\$ 20,000$
2. Trenching, pluggers, powder, fuel, materials, men 30,000
3. Geology, mapping, sampling, 1 geologist, 1 assistant 15,000
4. Geochemistry, sample prep and analysis soils and rocks 25,000
5. Line cutting 15,000
6. Transportation, to and from property 5,000
7. Project preparation, maps, freight, sundries 6,000
8. Supervision, on property, reports

15,000
Sub-Total $\quad 131,000$
Contingency @ 10\% 13,000
G.S.T. @ 7\% 10,000

TOTAL
$\$ 154,000$

## PHASE II

1. Camp, room \& board

$$
5,000
$$

2. Geophysical Surveys, including mob/demob 35,000
3. Geology, sampling, mapping etc. 5,000
$\begin{array}{ll}\text { 4. Transportation } & \mathbf{4 , 0 0 0}\end{array}$
4. Supervision, reports

Sub-Total
10,000
59,000
Contingency @ 10\$ 6,000
G.S.T. @ 7\% 4,500 TOTAL

## CERTIFICATE

I, Edward W. Grove, of the Municipality of Saanich, do hereby certify
that:

1. I am a consulting geologist with an office at 4581 Boulderwood Drive, Victoria, British Columbia.
2. I am a graduate of the University of British Columbia (1955) with a Master's degree, Honours Geology (M.Sc. Hon. Geol.) and a graduate of McGill University (1973) with a doctorate in Geological Sciences (Ph.D.).
3. I have practised my profession continuously since graduation while being employed by such companies as the Consolidated Mining and Smelting Co. of Canada Ltd., British Yukon Exploration Ltd., the Quebec Department of Natural Resources, and the British Columbia Ministry of Energy Mines and Petroleum Resources. I have been in corporate consulting practice since January 1981.
4. This report is based on the writer's knowledge of the general area, a review of the technical reports, data and maps cited herein, and the writer's visit to the HOPE 2 and 3 claims on February 24, 1996.
5. I have no direct, indirect or contingent interest in Aquistar Ventures Inc. or in the HOPE 2 and 3 claims, or any mineral properties owned by David A. Heyman, or Ashworth Explorations Limited.
6. I am a member in good standing of the Association of Professional Engineers of British Columbia.
7. I consent to the use of this report in a Prospectus or Statement of Material Facts.

June 10, 1996

Victoria, B.C.


## APPENDIX I

## Petrography

# Vancouver Petrographics Ltd. 

PETROGRAPHIC REPORT ON 3 THIN SECTIONS, HOPE CLAIM \# 530

Feport for: Fayz Yacoub Ashwarth Explarations Limited 405-609 West Hastings Street Vancouver, E.I.. VEB ZW4.

Invoice 960293

May 27, 1996.

F1: AMFHIEOLITIC $7 D I A E A S E$ (FINE-GRAINED AMPHIEOLE-EFIDOTE-FELDSFAR) Callected from "volcanic andesitic rock"; hand sample is dark green, fine- to medium-grained, and cut by a stoukwork af thin white veinlets that are harder than steel; some stain yellow for k-feldspar. The rack shows no reaction to cold dilute HOl; traces of sulfide may be weakly magnetic. Modal mineralogy in thin section is approximately:

Amphibale (?hornblende)
Epidate (?clinazaisite)
Flagioclase (?)
Chlarite
Quartz
Sericite (after plagioclase)
K-feldspar (secondary)
Sphene
Dpaque
$60 \%$
$15 \%$
$10 \%$
5\%
$5 \%$
2\%
1-2\%
1-2\%
<1\%
This sample may be roughly described as an amphibolite, composed mostly of fine-grained amphibole, epidote-group mineral and interstitial very fine-grained, partly sericitized ?plagioclase feldspar. In places chicorite and quartz are common; veinlets to 0.5 mm thick are mostly epidote-group mineral and minar K-feldspar.

Most of the rock consists of subhedral amphibole of about 0.2-0.3 mm size, with medium green pleohroism and extinction angle about 20 degrees suggesting Thornblende. Intergrown with the amphibole are patohes and lenses of epidote-group mineral clack af plecochroism suggests Fe-pour composition, or clinozoisite) as sub- to euhedral crystals to 0.5 mm size. Fine-grained sphene as euhedral crystals to 0.1 mm is common mixed with the epidate-group mineral, and there are traces of opaques cpossibly sulfide, partly oxidized to limonite, or ?magnetite) as subhedral crystals to 0.2 mm size. The opaques are not clearly associated with the veining, however.

Between the mafic minerals are smaller, mainly elongate areas of
 diameter. Eecause of the fine grain size and lack of euhedral crystals, it is difficult to be sure of the identity of most of this material, but in places somewhat coarser grains (to 0.1 mm ) are twinned, and some places there is significant alteration to sericite, suggesting plagioclase; rare veinlets have lower relief than epowy, suggesting K-feldspar, as subhedral crystals to 0.1 mm size. It is not possible to be sure, but in some areas where chlorite is most abundant, forming subhedral flakes to 0.2 mm diameter, the clear mineral in interstices between mafic minerals may be quartz. Chlorite is lengthfast with weakly anomalous birefringence, suggesting moderate Fe:Mg ratios near 0.5. All the signs are that this is a mafic igneous rock (abundant amphibole, epidate, sphene; minar plagioclase) but not likely a volcanic unless it has been significantly recrystallized by

FZ: FARTLY CRUSHED, GRANULATED GRANITIE ROCK, FFACTURED AND VEINED BY MINDF: SERICITE-CHLORITE-DFAQUE

Collected from "rhyolitic dike"; hand sample is white, granulated or crushed-looking, harder than steel, non-magnetic, with minor limonite and fracturing but no reaction to cold dilute HCl. The etohed and stained slab shows that it is medium-grained, composed essentially of white (plagioclase), yellow (k-feldspar) and grey (quartz) with a granitic rather than rhyolitic texture. Modal mineralagy in thin section is approximately:

Flagioclase ( 701 l goclase) $\quad 40 \%$
K-feldspar (oorthoclase; partly serondary) 30\%
Quartz (partly secondary) $25 \%$
Llay, sericite $2 \%$
Chlarite $1-2 \%$
Opaque (?limonite, trace rutile) $1 \%$
Apatite <1\%
This is a medium-grained granitig rouk, composed of finely twinned subhedral plagioclase to 3 mm size (partly altered tok-feldspar) and anhedral k-feldspar to 2 mm , cut and veined by anhedral, Grushed and granulated quartz to 0.5 mm size.

Twinning of plagioclase (extinction $\mathrm{Y}^{\circ} 010$ about 5 degrees) and relief near that of quartz suggests a composition near oligoclase, about Anzo. The twinning is commonly bent (deformed) and extinction is undulase, implying strain. K-feldspar erystals do not show the grid twinning of microcline, and therefore may be orthoclase. Eoth feldspars show minor alteration ta fine cloudy elay (1-5 mierons) and subhedral sericite (10-20 microns).

Quartz appears to invade and replame the feldspars, and is strongly strained, with undulose extinction, granulatioin, and sutured boundaries. In places it oceurs in elongated areas that are vein-like, but elsewhere it probably forms the $E$ rushed remnants of primary quarte. Minor accessory apatite forms euhedral prisms ta 0.15 mm long in quartz.

The rock is cut by narrow fractures composed of variable amounts of sericite, chlorite and opaques. Sericite forms subhedral flakes to O. 1 mm ; Ghlorite, pale green length-fast subhedral flakes to 50 microns (probably Fe:Mg ratio near 0.5 ) containing traces of needle-like rutile ta 15 microns long. Dpaques form anhedral aggregates up to 0.5 mm across, possibly sulfides that are mainly oxidized to limonite and are surrounded by limonitic stains.

This appears to be a granitic rock, rather strongly crushed and with minor veining by sericite-chlorite-csulfide coxidized to limonite).

FO: LAMINATED METAMOEFHIC ROCK OF MAFIG COMPOSITION CLINDFYFRXENE-FLAGIOCLASE-K-FELDSFAF--QUAFTZ-AMFHIEDLE); MINOR OXIDIZED PYRITE

Collected from a "metasedimentary, well-banded amphibolite schist"; hand sample is rusty, oxidized, with abundant limonite stain along layering and fractures, but there is minor sulfide remnant in the core of the sample. There is a green (?vegetable) stain on the outside but the rock (fine-grained, white to buff) does not look dark enough to warrant the term amphibolite; it contains significant k-feldspar, but is not magnetic and does not react to cold dilute HEl. Modal mineralogy in polished thin section is approximately:

Elinopyrowene
35\%
Flagiculase (?andesine)
K-feldspar
Quartz
Amphibole (Ttremolitic)
Limonite (goethitic)
Epidote (Oclinozoisite)
Pyrite
$30 \%$ 15\% $10 \%$
$5 \%$
$3 \%$
<1\%
< $1 \%$

This is a fine-grained, metamorphosed manic rock composed mainly af granular pyroxene and feldspar with possible quartz, in places mixed with minor amphibole. Clinapyroxene (extinction angle near 40 degrees) forms sub- ta euhedral crystals of about $0.1-0.2 \mathrm{~mm}$ diameter that are colourless to very pale green and lack pleochroism. In places, amphibole (extinction angle near 15 degrees) does not obviously replace pyroxene; intstead it forms bladed euhedral crystals ta 0.4 mm long that are also very pale green and not obviously pleochroic (possibly tremolitic). Fyroxene shows traces of alteration to fine (<0. 1 mm ) subhedral walcurless epidote (oclinozaisite).

The matrix\% is composed of $50-100$ micron sized, subhedral to anhedral crystals of feldspar and possibly quartz. Fare twinning with extinction angle $\gamma$ of o of around 20 degrees suggests plagioclase of about andesine composition. Lack of twinning in the matrix grains and relief of plagioclase very close to that of quartz makes the identification and quantification of quartz uncertain, but in the etched slab, plagioclase shows up as buff to creamy areas forming the bulk of the sample. K-feldspar, with negative relief, forms clear subhedral Erystals that are abundant in certain layers and absent in others.

Pyrite is the only sulfide noted, forming sub- to anhedral aggregates up to 0.5 mm size, mainly partly to completely oxidized ta limonite along fractures and margins, or rare euthedral rubes to 0.25 mm diameter. Red-brown (goethitic) limonite is common throughout the rock as subhedral crystals to 0.15 mm that possibly pseudomorph former ?sulfides, and amorphous stains (transported limonite) in silicate minerals. Sulfides and limonite are not obviously associated with fracturing.

This is a gneissic rock rich in clingpyrowene and intermediate plagioclase, but with abundant k-feldspar and possibly quartz as well; amphibole is minor. It could be a metamorphosed mafia igneous rock such as gabbro or monzodiorite; sulfide mineralization is minor and mainly oxidized ta limonite.

Craig H. B. Leith, Fha., F. Eng (EO4) 653-9158
492 Isabella Point Road, Salt Spring Island, E.L. V8K 1 VA


I

## APPENDIX II

Rock sample descriptions and Laboratory analyses

HOPE 2 \& 3
Rock Sample Descriptions


| R1 | Shoreline exposure, 100 m . northwest of Line $0 \mathrm{E} / 7+00 \mathrm{~N}$. Recrystallized, moderate to strongly foliated biotite leucogranite. Intruded by openly folded, 50 cm -wide, pyrite-bearing quartz vein. <br> SAMPLE H96-R1, sample across limb of quartz vein. |
| :---: | :---: |
| R2 | Same locality as R1. 10 m -wide enclave of fine-grained, thinly banded, chlorite-rich schist within foliated leucogranite. Schist contains 2-5\% finely disseminated pyrite. SAMPLE H96-R2, sample over $\sim 1 \mathrm{~m}$. of pyritic schist. |
| R3 | Shoreline exposure, near leucogranite - schist contact. Thinly banded chlorite and epidote-rich schist, containing $1-5 \%$ finely disseminated pyrite and thin mm-scale stringers. Banding in schist is folded, about SE-plunging axes. <br> SAMPLE H96-R3, sample across 1 m -wide zone of pyrite-bearing schist. |
| R4 | Shoreline exposure, west of leucogranite - schist contact. Thinly banded, strongly lineated, chlorite-rich schist intruded by abundant discordant and concordant, leucogranite veins. Schist contains 10 's of cm - to m -scale hematitically altered zones, containing 2-3\% disseminated pyrite. <br> SAMPLE H96-R4, chip sample over $\sim 1 \mathrm{~m}$. of hematitically altered zone. |
| R5 | Same locality as R4. Strongly lineated, chlorite-rich schist. Lineations plunge shallowly towards the south. Schist contains 10 's of cm - to m -scale hematitically altered zones with 1-2\% disseminated pyrite. <br> SAMPLE H96-R5, chip sample over 1.5 m . of altered zone. |
| R6 | Shoreline exposure. Thinly banded, chlorite-rich schists intruded by 10 's of m-scale leucogranite sills? Locally, granite sills contain quartz-rich zones, probable deformed veins. <br> SAMPLE H96-R6, sample over $\sim 1 \mathrm{~m}$. of quartz boudin within granite sill. |
| R7 | Shoreline exposure. Contact zone of leucogranite sills and well banded schists. Schist is rusty weathering, hematitically altered and contains $2-5 \%$ pyrite with minor associated chalcopyrite and pyrrhotite, as disseminated grains and mm-scale stringers. SAMPLE H96-R 7, chip sample over 2 m . of rusty zone. |
| R8 | Shoreline exposure. Zone of well banded chlorite- and epidote-rich schist interlayered with 10 's of cm -scale quartzite and carbonate (dolomite?) layers. Carbonate layers contain rotated clasts suggesting a dextral shear sense. Lineations plunge moderately $\left(\sim 40^{\circ}\right)$ towards the southwest. Mylonitic fabric developed in all units with exception of late, discordant leucogranite veins. Exposure contains 10's of cm - to m -scale rusty weathering zones containing 1-2\% disseminated pyrite. <br> SAMPLE H96-R8, chip sample of rusty zone across $\sim 1.5 \mathrm{~m}$. |
| R9 | Entrance of Adit 1. Interlayered chlorite- and epidote-rich schist and cm-scale quartzitic bands. Minor hematitic and limonitic alteration containing 1-2\% disseminated pyrite. <br> SAMPLE H96-R9, sample over 1.5 m . of altered zone. |
| R10 | Entrance of Adit 1.1 .5 m -wide, limonitic altered quartzitic band with $1 \%$ disseminated pyrite. <br> SAMPLE H96-R10, sample over 1.5 m . of altered quartzite. |



| R11 | Shoreline exposure. On strike with Adit 2. Interlayered chloritic schist, quartzite and minor carbonate with well developed mylonitic fabric. Units intruded by cm-scale quartz veins. Mineral lineation is subhorizontal, plunging towards NW. <br> SAMPLE H96-R 11 , chip over $\sim 75 \mathrm{~cm}$. of weakly limonitic altered schist, quartzite, quartz vein zone. |
| :---: | :---: |
| R12 | Shoreline exposure, immediately west of schist/diorite contact. Strongly foliated and sheared diorite containing 2-3\% disseminated pyrite. <br> SAMPLE H96-R12, chip sample of altered diorite $\sim 1.5 \mathrm{~m}$. |
| R13 | Shoreline exposure $\sim 125 \mathrm{~m}$. west of R12. Zone of strongly foliated diorite with sheared mafic-rich matrix, containing 1-2\% disseminated pyrite. <br> SAMPLE H96-R13, chip across 1.5 m . of strongly sheared diorite. |
| R14 | Shoreline exposure. 1.5 m -wide, openly folded, muscovite-bearing, alkali feldspar pegmatite intruding foliated diorite. <br> SAMPLE H96-R14, chip across $\sim 1.5 \mathrm{~m}$-wide pegmatite. |
| R15 | Shoreline exposure. Fine-grained, brecciated diorite, 1-2\% disseminated pyrite. SAMPLE H96-R15, chip over $\sim 1 \mathrm{~m}$-wide, strongly altered zone. |
| R16 Adit 1 | $\sim 7 \mathrm{~m}$. into Adit 1. Interlayered schist and quartzitic bands. Limonitic altered and containing $1 \%$ disseminated pyrite. <br> SAMPLE H96-R 16, chip across 2 m-wide roof zone. |
| $\begin{aligned} & \hline \text { R17 } \\ & \text { Adit } 1 \end{aligned}$ | $\sim 10 \mathrm{~m}$. into Adit 1 . Limonitic and locally hematitically altered SE trending quartzitic layer/lens, with 1-2\% disseminated pyrite. <br> SAMPLE H96-R17, chip across $\sim 1 \mathrm{~m}$. of altered quartzite. |
| $\begin{aligned} & \hline \text { R18 } \\ & \text { Adit } 1 \end{aligned}$ | $\sim 15 \mathrm{~m}$. into Adit 1 (West Wall). Strongly limonitic altered, chlorite-rich schist containing 1-2\% disseminated pyrite. <br> SAMPLE H96-R 18, chip sample over 1.5 m . of altered schist. |
| $\begin{aligned} & \hline \text { R19 } \\ & \text { Adit } 1 \end{aligned}$ | 18 m . into Adit 1 (East Wall). Thinly banded, variably altered (silicified and limonitic) chlorite- and epidote-rich schist with 1-2\% disseminated pyrite. <br> SAMPLE H96-R19, sample over 1 m -wide zone of altered zone. |
| $\begin{aligned} & \hline \text { R20 } \\ & \text { Adit } 1 \end{aligned}$ | Back wall of Adit $1, \sim 19 \mathrm{~m}$. into the adit. Interlayered, thinly banded, submylonitic chlorite schist and quartzitic bands. Quartzitic layers are relatively unaltered, schist is variably limonitic altered. Minor (1-3\%) disseminated pyrite. <br> SAMPLE H96-R20, chip across 2.5 m . |
| R21 Adit 2 | Back wall of Adit 2. Thinly banded, fine-grained, siliceous chlorite schist with a $10-20 \mathrm{~cm}$-wide quartzite layer. Contains $1-3 \%$ finely disseminated pyrite. C-S fabric relationship with mylonitic zone, suggests dextral shear sense. <br> SAMPLE H96-R21, chip $\sim 1.5 \mathrm{~m}$. of back wall. |
| R22 <br> Adit 2 | $\sim 8 \mathrm{~m}$. into Adit 2 along west wall. Interbanded silicified schist and quartzitic layers. Locally limonitic altered with 1-2\% disseminated pyrite. <br> SAMPLE H96-R22, sample across $\sim 1.5 \mathrm{~m}$. |



| R23 <br> Adit 2 | $\sim 3$ m. into Adit 2. Variably limonitic altered and silicified interbanded schist and <br> quartzite. ~1\% disseminated pyrite. <br> SAMPLE H96-R23, sample across 2 m-wide altered roof zone. |
| :--- | :--- |
| R24 | Adit entrance. Strongly altered (limonite and hematite) schist containing 2-3\% <br> disseminated pyrite. <br> SAMPLE H96-R24, sampled over ~1.5 m. of altered zone. |
| R25 | Line 0E/5+00N. 1 m-wide outcrop of brown weathering, fine-grained chloritic schist. <br> 1\% fine-grained, disseminated pyrite. Banding $\rightarrow 178 / 72$. <br> SAMPLE H96-R25, chip across 75 cm. |
| R26 | Line 0E/6+25N. 70 m-long outcrop of recrystallized, foliated leucogranite containing <br> m-scale enclaves of well banded, rusty weathering chloritic schist. Silicification and <br> chloritization pervasive throughout schistose zones. 1-2\% disseminated pyrite. <br> SAMPLE H96-R26, chip sample across 75 cm-wide rusty zone. |
| R27 | 2 m-wide outcrop along stream. Line 1E/5+50N. Fine-grained, silicified chloritic <br> schist to psammite. Contains 3-5\% disseminated and thin pyritic stringers. 1\% <br> chalcopyrite associated. <br> SAMPLE H96-R27, chip sample across $\sim 75 \mathrm{~cm}-$ wide rusty zone. |
| R28 | Medium-grained, chloritized and epidotized diorite. Line 1E/0+25N. Contains 2-3\% <br> fine-grained disseminated pyrite as 0.5-1.0 cm-wide aggregates. <br> SAMPLE H96-R28, chip sample over ~75 cm-wide zone. |
| R29 | White weathering, fine-grained supracrustal rock. Possible enclave of sediment <br> within diorite unit. Line 1E/2+00S. Rock is homogeneous and silicified. <br> SAMPLE H96-R29, |
| R30 | Line 2E/6+25N. 70-80 m-long outcrop of white to rusty weathering, fine-grained, <br> silicified and epidotized, gradational into quartz-rich psammite. Outcrop contains <br> m-scale rusty to ochreous weathered zones. No obvious sulphides. <br> SAMPLE H96-R30, chip sample over 1.5 m-wide rusty alteration zone, ~5 m. from <br> leucogranite. |
| R32 | Line 3E/6+05N. Large cliff face outcrop of chlorite-biotite schist with interlayered <br> quartzitic bands. Intruded by cm-scale quartz veins and abundant leucogranite. <br> Outcrop contains m-scale, rusty weathered, hematitically altered zones with 1-3\% <br> finely disseminated pyrite. <br> SAMPLE H96-R31, chip sample over 1.5 m-wide zone. |
| Line 4E/5+80N. 7 m-long outcrop of interbanded chloritic schist and quartzitic <br> zones. Outcrop is locally hematized and silicified, containing 1-2\% finely <br> disseminated pyrite. <br> SAMPLE H96-R32, sample across 1 m-wide zone of altered pyritic schist. |  |

* Collected from Adit 3 at Line 4+30E/4+80N.

| R33 |
| :--- | :--- |
| *Adit 3 | | Back wall of adit. Interbanded chloritic schist and quartzitic layers, intruded by |
| :--- |
| concordant cm-scale quartz veins. |
| SAMPLE H96-R33, chip sample across 1.5 m. |


| $\begin{aligned} & \text { Sample\# } \\ & \text {-mix-96 } \end{aligned}$ | Description |
| :---: | :---: |
| R34 <br> *Adit 3 | East wall of adit entrance. Interbanded silicified, epidotized, chlorite schist and recrystallized quartzitic layers. Intruded by cm -scale concordant quartz veins. SAMPLE H96-R34, chip sample across 2 m -wide zone. |
| R35 <br> *Adit 3 | 2 m . west of Adit entrance. 1 m -wide, strongly limonitic altered quartz vein. Quartz vein contains $10 \%$ muscovite and 1-2\% fine-grained disseminated pyrite. SAMPLE H96-R35, sample across 1 m -wide zone. |
| R36 | Line $5 \mathrm{E} / 5+25 \mathrm{~N}$, outcrop along stream. 2 m -long outcrop of thinly banded, chloriteand epidote-rich schist. Locally silicified. Contains 1-3\% fine-grained disseminated pyrite and very minor chalcopyrite. <br> SAMPLE H96-R36, chip sample over $\sim 1.5 \mathrm{~m}$. |
| R37 | Line $8+10 \mathrm{E} / 3+00 \mathrm{~N} .15 \mathrm{~m}$-long outcrop of mafic-rich diorite to amphibolite intruded by a N-S trending zoned pegmatite, with 5-20 cm-wide concordant quartz veins. Diorite/amphibolite contains 1-2\% pyrite. No obvious mineralization in quartz veins. <br> SAMPLE H96-R37, chip sample across 2 m -wide zone of quartz veins associated with pegmatite. |

** Collected from Adit 4 at Line $8+10 \mathrm{E} / 5+30 \mathrm{~N}$.

| R38 <br> **Adit 4 | Back wall of Adit 4. Epidotized and chloritized diorite containing 2-3\% disseminated pyrite. <br> SAMPLE H96-R38, chip sample across 1.5 m . |
| :---: | :---: |
| $\begin{aligned} & \text { R39 } \\ & \text { **Adit } 4 \end{aligned}$ | Quartz vein along west wall and roof of adit. Vein varies from 25 cm . to $\sim 1 \mathrm{~m}$-wide and trends $108^{\circ}$ to $116^{\circ}$, dipping steeply towards the southwest. Contains very minor ( $1 \%$ ) fine-grained disseminated pyrite. <br> SAMPLE H96-R39, chip sample of quartz vein along $\sim 3 \mathrm{~m}$. of strike length. |
| $\begin{aligned} & \text { R40 } \\ & * * \text { Adit } 4 \end{aligned}$ | Quartz vein fragments collected along floor of adit and at the adit entrance. SAMPLE H96-R40, |
| $\begin{aligned} & \text { R41 } \\ & \text { **Adit } 4 \end{aligned}$ | East wall of Adit 4.1 .5 m -wide zone of strongly chloritized, locally hematitically altered dioritic rock, adjacent to the quartz vein. Contains $1-3 \%$ disseminated pyrite. SAMPLE H96-R41, chip across 1.5 m -wide zone. |
| R42 | 25 m . east of Adit 4 , in a small stream. Outcrop of well banded chlorite- and quartzrich metasediments intruded by $10-20 \mathrm{~cm}$-wide concordant quartz veins. <br> SAMPLE H96-R42, chip across $\sim 20 \mathrm{~cm}$-wide quartz vein. |
| R43 | 10 m . west of Adit 4 , along small stream. 2.5 m -long outcrop of strongly hematitically and locally limonitic altered schist. 1-2\% fine-grained disseminated pyrite. <br> SAMPLE H96-R43, |
| R44 | Line $6 \mathrm{E} / 6+00 \mathrm{~N}$. Interbanded chlorite- and epidote-rich schist and cm-scale quartzitic layers. $2-4 \%$ disseminated pyrite associated with more siliceous zones of the outcrop. SAMPLE H96-R44, chip across $\sim 1 \mathrm{~m}$. of siliceous bands. |



| R45 | Line $2+50 \mathrm{E} / 4+50 \mathrm{~N}$. 1-1.5 m-long outcrop of epidotized, mafic-rich diorite intruded by a $50-80 \mathrm{~cm}$-wide quartz vein. Vein trends $\sim 148^{\circ}$, dips steeply to the $S W$ and contains $1-2 \%$ disseminated pyrite and $1 \%$ pyrrhotite. <br> SAMPLE H96-R45, chip sample taken over $\sim 50 \mathrm{~cm}$. POOR EXPOSURE! |
| :---: | :---: |
| R46 | Line $33+50 \mathrm{E} / 5+00 \mathrm{~N}$. Small outcrop of well banded, chloritic schist and quartzite. Relatively unaltered. Contains 1-3\% disseminated pyrite and locally mm-scale stringers. <br> SAMPLE H96-R46, chip sample across $\sim 75 \mathrm{~cm}$. |
| $\begin{array}{\|l\|} \hline \text { R47 } \\ \text { *Adit 3 } \end{array}$ | Grab sample of quartz vein fragments along floor of Adit 3. SAMPLE H96-R47, sampled along 5 m . |
| R48 | Line $8+35 \mathrm{E} / 5+40 \mathrm{~N}$. Outcrop of well banded, silicified chlorite- and epidote-rich schist containing abundant concordant quartzite and amphibolite bands. Intruded by a $10-25 \mathrm{~cm}$-wide concordant quartz vein (trending $158^{\circ} / 86^{\circ} \mathrm{SW}$ ). Quartz vein contains 2-3\% disseminated pyrite and $1 \%$ pyrrhotite. <br> SAMPLE H96-R48, |
| R49 | 20 m . downstream (northwest) of R48. Looks to be extension of quartz vein sampled at R48. Vein is 1-1.5 m-wide, with cm -scale concordant quartz veins. <br> SAMPLE H96-R49, chip across $\sim 1 \mathrm{~m}$. of quartz vein. |
| R50 | Same locality as R44 (Line $6 \mathrm{E} / 6+00 \mathrm{~N}$ ). 10 cm -wide quartz vein within chlorite- and epidote-rich schist. <br> SAMPLE H96-R50, chip across $\sim 50 \mathrm{~cm}$., vein and schist contact. |
| R51 | Shoreline exposure, 200 m . west of baseline. 15 m -long of strongly chloritized and epidotized diorite. Locally silicified and brittly-sheared. <br> SAMPLE H96-R51, sample across $\sim 1.5 \mathrm{~m}$-wide zone. |
| R52 | Line $9 \mathrm{E} / 5+35 \mathrm{~N}$. 2.5 m-long outcrop along small stream. Fine-grained, thinly banded chloritic schist with interbanded cm -scale quartzitic layers. $10-80 \mathrm{~cm}$-wide, limonitic altered zones contains 2-5\% pyrite and minor pyrrhotite. <br> SAMPLE H96-R52, chip sample across $\sim 1 \mathrm{~m}$-wide of limonitically altered zone. |
| R53 | Line $10+30 \mathrm{E} / 5+50 \mathrm{~N} .2 \mathrm{~m} . \times 2 \mathrm{~m}$. outcrop along stream. Fine-grained, thinly banded chloritic schist with interbanded quartzitic layers. $\sim 1 \mathrm{~m}$-wide mylonite zone contains 2-5\% disseminated pyrite and pyrrhotite. <br> SAMPLE H96-R53, chip sample across $\sim 1 \mathrm{~m}$. of mylonitic zone. |
| $\begin{aligned} & \hline \text { R54 } \\ & \text { R55 } \end{aligned}$ | Line $12+60 \mathrm{E} / 5+20 \mathrm{~N}$. Vertical cliff face along small stream. Thinly banded, mylonitic, chloritic schist interbanded with quartzitic layers. Chlorite schist and quartzitic layers are locally folded about SE-trending, subhorizontal axes with parallel mineral lineation. Schist and quartzitic layers are strongly limonitic altered, particularly within mylonitic zone. 25 cm -wide concordant quartz vein intrudes schist/quartzite zone. <br> SAMPLE H96-R54, chip sample across 25 cm-wide quartz vein. Contains $2-4 \%$ pyrite. <br> SAMPLE H96-R55, chip sample across $\sim 1 \mathrm{~m}$-wide strongly limonitic altered zone. Contains 1-4\% disseminated pyrite. |

Sample \# Description

| FR61 | White, massive quartz vein strikes $148^{\circ}$, steeply dipping southwest, hosted by thinly banded chlorite-rich schist, contains 1-2\% fine-grained pyrite. <br> SAMPLE H96-FR61, chip across 20 cm ., collected from the face of Adit 4. |
| :---: | :---: |
| FR62 | Banded chlorite schist, strongly silicified, locally hematitically altered, hosting several small quartz veins and veinlets $2-20 \mathrm{~cm}$-wide, minor pyrite dissemination. <br> SAMPLE H96-FR62, chip across 2 m . of the adit face. |
| FR63 | Angular, local quartz vein material, 1-2\% fine-grained pyrite, cavities filled with hematite, iron oxides. <br> SAMPLE H96-FR63, float taken from dump material inside Adit 4. |
| FR64 | Float, light grey massive quartz vein material (dump), 1-2\% very fine-grained pyrite dissemination inclusions of chlorite schist. <br> SAMPLE H96-FR64, float taken at the entrance of Adit 4. |
| FR65 | Massive, white, creamy quartz (pod) $1.5-2$ feet wide, strikes $350^{\circ}$, dipping $20^{\circ} \mathrm{E}$, exposed inside Adit 4 and hosted by chloritic schist. <br> SAMPLE H96-FR65, chip across 60 cm . of the pod, mineralization is $1 \%$ finegrained pyrite. |
| FR66 | Quartz vein exposed across the roof of Adit 4 , trends $110^{\circ} / 80^{\circ}-85^{\circ}$ southwest, white-massive quartz, minor pyrite dissemination ( $>1 \%$ ). <br> SAMPLE H96-FR66, chip across ( 40 cm .) the vein. |
| FR67 | Massive, white quartz vein 15 cm -wide, disseminated with 2-3\% very fine-grained pyrite-pyrrhotite. Hosted by strongly weathered quartz-rich metasediments. <br> SAMPLE H96-FR67, chip over 30 cm . of the vein and the host rock collected at the entrance of Adit 4. |
| FR68 | Rusty, mineralized volcanic basalt outcrop, contains 3-4\% sulphide dissemination, mainly pyrite, pyrrhotite and minor chalcopyrite. <br> SAMPLE H96-FR68, chip across 30 cm ., taken at Line 7+50E-0+75S, above the road. |
| FR69 | Angular local, milky quartz vein material, contains 2\% combined fine-grained pyrite, chalcopyrite as blebs and disseminated sulphides. <br> SAMPLE H96-FR69, float taken at Line 4+00E-0+50S. |
| FR70 | White, creamy medium-grained granitic dyke, strikes $68^{\circ}-190^{\circ}, 2-5 \mathrm{~m}$-wide exposed at Line $9+00 \mathrm{E}-8+25 \mathrm{~N}$. $>1 \%$ very fine-grained pyrite. <br> SAMPLE H96-FR70, chip across 2.5 m . of the dyke. |
| FR71 | Local angular quartz vein material, blebs of pyrite and chalcopyrite in light grey to white massive quartz. <br> SAMPLE H96-FR71, float sample collected on the road at Line $0+00 \mathrm{E}-0+50 \mathrm{~N}$. |
| FR72 | Rusty-dark brown massive quartz, $3^{\prime} \times 4^{\prime}$, trace of pyrite, abundant $\mathrm{FeO}_{2}$. <br> SAMPLE H96-FR72, float sample from local angular boulder on L5+75E - $11+00 \mathrm{~N}$. |



| FR73 | Massive white to creamy, medium-grained granitic dyke, strikes $345^{\circ} / 90^{\prime}, 1-2 \%$ very <br> fine-grained pyrite hosted by strongly weathered chlorite schist. <br> SAMPLE H96-FR73, chip across 3 m. |
| :--- | :--- |
| FR74 | Local angular dark brown to reddish quartz with abundant $\mathrm{FeO}_{2}$, trace of pyrite. <br> SAMPLE H96-FR74, float quartz material. |





ICP - . 500 GRAM SAMPLE IS DIGESTED WITH 3ML 3-1-2 HCL-HNO3-H2O AT 95 DEG. C FOR ONE HOUR AND IS DILUTED TO 10 ML WITH WATER.
THIS LEACH IS PARTIAL FOR MN FE SR CA P LA CR MG BA TI B $W$ AND LIMITED FOR NA X AND AL.
ASSAY RECOMMENDED FOR ROCK AND CORE SAMPLES IF CU PB ZK AS > $1 \%$, AG $>30$ PPM \& AU $>1000$ PPB

- SAMPLE TYPE: ROCK AU** BY FIRE ASSAY FROM 1 A.T. SAMPLE.

Samples beginning 'RE' are Reruns and 'RRE' are Reject Reruns.



[^1]DRTE RECEIVBD: APR 20 1996 DATE REPORE MAILED, fifay $7 / 96$
GIGKBD BY. A: HO. TOYE, C.LEONG, JHMAN: CERTIFIED B.C. MSSAYERS




IP - . 500 GRAM SAMPLE IS DIGESTED WITH 3ML 3-1-2 HCL-HNO3-H2O AT 95 DEG. C FOR ONE HOUR AND IS DILUTED TO 10 ML WITH WATER.
THIS LEACH IS PARTIAL FOR MN FE SR CA P LA CR MG BA TI B $W$ AND LIMITED FOR NA $K$ AND AL.
ASSAY RECOMMENDED FOR ROCK AND CORE SAMPLES IF CU PB ZN AS $>1 \%$, AG $>30$ PPM 8 AU $>1000$ PPR

- SAMPLE TYPE: PI ROCK PR TO PL SOIL AU** ANALYSIS BY FA/ICP FROM 30 GM SAMPLE.

Samples beginning 'RE' are Reruns and 'RRE' are Reject Reruns.
DATE RECEIVED: MAY 211996 DATE REPORT MAILED: $149 \% 29 / 96$



APPENDIX III
1996 Geochemical soil survey analyses

| SAMPLE\# | $\begin{array}{r} \text { Mo } \\ \text { ppm } \end{array}$ | $\begin{gathered} \mathrm{Cu} \\ \mathrm{ppm} \end{gathered}$ | $\begin{array}{r} \mathrm{Pb} \\ \mathrm{ppm} \end{array}$ | $\begin{array}{r} 2 n \\ \text { ppm } \end{array}$ | $\begin{array}{r} \mathrm{Ag} \\ \mathrm{ppm} \end{array}$ | $\underset{\substack{\mathrm{Ni} \\ \text { ppm }}}{ }$ | $\begin{array}{r} \text { Co } \\ \text { ppm } \end{array}$ | $\begin{array}{r} \text { Mn } \\ \text { ppm } \end{array}$ | $\begin{gathered} \mathrm{Fe} \\ \mathrm{Z} \end{gathered}$ | $\begin{array}{r} \text { As } \\ \text { ppm } \end{array}$ | $\begin{array}{r} \text { U } \\ \text { pon } \end{array}$ | $\begin{array}{r} \text { Au } \\ \text { Ppm } \end{array}$ | Th ppm | $\begin{array}{r} \text { Sr } \\ \text { ppm } \end{array}$ | $\begin{gathered} \mathrm{Cd} \\ \mathrm{ppm} \end{gathered}$ | $\begin{array}{r} \text { Sb } \\ \text { ppm } \end{array}$ | $\begin{array}{r} \mathrm{Bi} \\ \mathrm{PpPm} \end{array}$ | $\begin{array}{r} v \\ \text { ppm } \end{array}$ | $\begin{gathered} \mathrm{Ca} \\ \% \end{gathered}$ | $\begin{aligned} & P \\ & \% \end{aligned}$ | $\begin{array}{r} \text { La } \\ \text { Pppm } \end{array}$ | $\begin{gathered} \mathrm{Cr} \\ \mathrm{ppm} \end{gathered}$ | $\begin{gathered} \mathrm{Mg} \\ \% \end{gathered}$ | $\begin{array}{r} \mathrm{Ba} \\ \mathrm{ppm} \end{array}$ | $\begin{array}{r} \mathrm{Ti} \\ \mathbf{\%} \end{array}$ | $\begin{array}{r} \text { B } \\ \text { ppm } \end{array}$ | $\begin{gathered} \text { Al } \\ \text { \% } \end{gathered}$ | $\begin{gathered} \mathrm{Na} \\ \% \end{gathered}$ | $\begin{aligned} & K \\ & \% \end{aligned}$ | $\begin{array}{r} W \\ \text { ppm } \end{array}$ | $\begin{aligned} & \text { AU** } \\ & \text { ppb } \end{aligned}$ |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| H96 LO+00 7+00N | 1 | 7 | 10 | 79 | <. 3 | 3 | 1 | 245 | . 34 | $<2$ | $<5$ | $<2$ | $<2$ | 25 | . 3 | $<2$ | $<2$ | 11 | . 45 | . 046 | $<1$ | 3 | . 07 | 52 | . 01 | $<3$ | . 30 | . 04 | . 04 | $<2$ | $<2$ |
| H96 L0+00 6+50N | 6 | 8 | 16 | 38 | <. 3 | 4 | 2 | 71 | 2.38 | 4 | $<5$ | <2 | $<2$ | 12 | <. 2 | <2 | $<2$ | 121 | . 20 | . 047 | 2 | 16 | . 08 | 20 | . 16 | $<3$ | . 55 | . 01 | . 03 | $<2$ | $<2$ |
| H96 L0+00 6+00N | 7 | 37 | 67 | 113 | . 4 | 34 | 17 | 772 | 4.37 | 4 | 5 | $<2$ | $<2$ | 13 | . 5 | 2 | $<2$ | 135 | . 24 | . 065 | 7 | 75 | . 71 | 28 | . 18 | $<3$ | 2.71 | . 02 | . 08 | $<2$ | $<2$ |
| H96 L0 0 +00 5+50N | 4 | 30 | 13 | 69 | <. 3 | 12 | 11 | 1158 | 2.94 | 7 | $<5$ | $<2$ | $<2$ | 17 | . 3 | $<2$ | $<2$ | 90 | . 30 | . 092 | 8 | 19 | . 45 | 56 | . 10 | $<3$ | 3.21 | . 03 | . 09 | $<2$ | $<2$ |
| H96 LO+00 5+00N | 4 | 16 | 14 | 30 | <. 3 | 14 | 8 | 191 | 1.20 | 3 | 7 | $<2$ | 2 | 15 | $<.2$ | $<2$ | $<2$ | 66 | . 28 | . 034 | 6 | 23 | . 07 | 18 | . 19 | $<3$ | . 53 | . 01 | . 02 | $<2$ | $<2$ |
| H96 LO+00 4+50N | 9 | 38 | 12 | 74 | . 3 | 11 | 30 | 3739 | 4.18 | 4 | $<5$ | $<2$ | $<2$ | 20 | <. 2 | 4 | 2 | 131 | . 32 | . 073 | 15 | 23 | . 40 | 74 | . 24 | < 3 | 3.36 | . 02 | . 07 | <2 | $<2$ |
| H96 L0+00 4+00N | 3 | 17 | 14 | 47 | <. 3 | 4 | 3 | 454 | 3.22 | $<2$ | $<5$ | $<2$ | $<2$ | 9 | <. 2 | 2 | 3 | 132 | . 15 | . 059 | 4 | 12 | . 10 | 39 | . 32 | $<3$ | . 88 | . 01 | . 03 | $<2$ | 3 |
| H96 L0+00 3+50N | $<1$ | 14 | 13 | 33 | <.3 | 4 | 3 | 225 | 2.39 | 2 | 5 | $<2$ | $<2$ | 11 | <. 2 | $<2$ | $<2$ | 88 | . 14 | . 057 | 3 | 14 | . 11 | 33 | . 12 | $<3$ | . 98 | . 01 | . 03 | $<2$ | $<2$ |
| H96 LO+00 3+00N | 1 | 21 | 12 | 49 | <. 3 | 7 | 7 | 925 | 3.78 | 6 | $<5$ | $<2$ | $<2$ | 11 | <. 2 | 2 | $<2$ | 121 | . 18 | . 124 | 6 | 22 | . 21 | 35 | . 20 |  | 4.04 | . 02 | . 03 | $<2$ | 2 |
| H96 L0+00 $2+50 \mathrm{~N}$ | 1 | 25 | 12 | 57 | <. 3 | 9 | 8 | 455 | 3.27 | 4 | $<5$ | $<2$ | $<2$ | 16 | <. 2 | 2 | $<2$ | 102 | . 31 | . 078 | 5 | 20 | . 38 | 45 | . 14 | <3 | 2.73 | . 02 | . 05 | <2 | 4 |
| H96 L0 0 +00 $2+00 \mathrm{~N}$ | 17 | 33 | 8 | 77 | <. 3 | 13 | 11 | 252 | 4.06 | 5 | 9 | $<2$ | 3 | 14 | <. 2 | $<2$ | $<2$ | 113 | . 27 | . 059 | 8 | 24 | . 52 | 41 | . 24 |  | 5.21 | . 02 | . 06 | <2 | $<2$ |
| H96 L0+00 1+50N | 7 | 34 | 10 | 69 | <. 3 | 13 | 14 | 329 | 4.26 | 9 | 9 | $<2$ | 2 | 22 | <. 2 | 3 | $<2$ | 111 | . 50 | . 078 | 11 | 28 | . 39 | 60 | . 19 |  | 6.69 | . 02 | . 05 | <2 | $<2$ |
| H96 L0+00 1+00N | 12 | 38 | 14 | 88 | <. 3 | 13 | 20 | 2387 | 5.10 | <2 | $<5$ | $<2$ | 2 | 13 | . 6 | $<2$ | $<2$ | 121 | . 22 | . 056 | 13 | 23 | . 38 | 72 | . 31 |  | 4.01 | . 02 | . 05 | $<2$ | $<2$ |
| RE H96 LiE 1+50S | 33 | 24 | 11 | 38 | <. 3 | 10 | 13 | 278 | 5.17 | 2 | $<5$ | $<2$ | $<2$ | 17 | <. 2 | 2 | $<2$ | 169 | . 23 | . 040 | 6 | 29 | . 32 | 44 | . 25 |  | 2.41 | . 02 | . 05 | $<2$ | $<2$ |
| H96 LO+00 0+50N | 2 | 34 | 12 | 69 | <. 3 | 13 | 16 | 1053 | 4.46 | 6 | 8 | $<2$ | 2 | 19 | . 3 | 2 | $<2$ | 114 | . 31 | . 073 | 9 | 26 | . 50 | 66 | . 20 | $<3$ | 4.19 | . 02 | . 08 | $<2$ | $<2$ |
| H96 L0+00 0+00 | 1 | 31 | 13 | 49 | <. 3 | 8 | 5 | 216 | 3.54 | 6 | $<5$ | $<2$ | 2 | 11 | <. 2 | 2 | $<2$ | 111 | . 18 | . 050 | 5 | 21 | . 29 | 40 | . 20 | $<3$ | 3.34 | . 02 | . 05 | $<2$ | $<2$ |
| H96 LO+00 0+50S | 1 | 34 | 13 | 22 | <. 3 | 4 | 3 | 85 | . 96 | <2 | $<5$ | $<2$ | $<2$ | 9 | . 2 | $<2$ | $<2$ | 33 | . 21 | . 024 | 2 | 9 | . 12 | 24 | . 05 | $<3$ | . 54 | . 02 | . 02 | $<2$ | $<2$ |
| H96 LTE 7+00N | 3 | 18 | 15 | 49 | <. 3 | 6 | 3 | 181 | 3.42 | 5 | $<5$ | $<2$ | $<2$ | 12 | <. 2 | 2 | $<2$ | 107 | . 17 | . 042 | 4 | 23 | . 20 | 26 | . 22 |  | 2.79 | . 02 | . 03 | $<2$ | $<2$ |
| H96 LIE 6+50N | 5 | 58 | 17 | 154 | <. 3 | 28 | 13 | 669 | 2.68 | 7 | 9 | $<2$ | $<2$ | 37 | . 9 | 4 | $<2$ | 86 | 1.14 | . 086 | 13 | 29 | . 77 | 112 | . 18 | $<3$ | 3.29 | . 04 | . 13 | <2 | 2 |
| H96 LTE 6+00N | 11 | 12 | 10 | 47 | <. 3 | 10 | 1 | 68 | 2.20 | 2 | $<5$ | $<2$ | $<2$ | 11 | $<.2$ | $<2$ | 2 | 142 | . 26 | . 026 | 2 | 12 | . 04 | 27 | . 28 | $<3$ | . 24 | . 01 | . 02 | $<2$ | $<2$ |
| H96 L1E 5+00N | 3 | 16 | 15 | 62 | <. 3 | 6 | 2 | 92 | . 38 | <2 | $<5$ | $<2$ | <2 | 31 | . 3 | $<2$ | 2 | 20 | . 50 | . 053 | 2 | 1 | . 07 | 48 | . 02 | $<3$ | . 20 | . 01 | . 03 | <2 | $<2$ |
| H96 LIE 4+00N | 6 | 13 | 11 | 36 | < 3 | 4 | 4 | 147 | 3.37 | $<2$ | $<5$ | $<2$ | $<2$ | 10 | <. 2 | 2 | $<2$ | 102 | . 15 | . 033 | 3 | 14 | . 08 | 25 | . 17 | $<3$ | 1.34 | . 01 | . 02 | $<2$ | 2 |
| H96 L1E 3+50N | 3 | 34 | 6 | 52 | <. 3 | 14 | 11 | 338 | 3.97 | 7 | $<5$ | $<2$ | 3 | 12 | <. 2 | 3 | $<2$ | 124 | . 19 | . 068 | 8 | 26 | . 56 | 54 | . 24 |  | 4.64 | . 02 | . 08 | $<2$ | $<2$ |
| H96 L1E 3+00N | $<1$ | 19 | 13 | 57 | <. 3 | 5 | 6 | 421 | 4.02 | 2 | $<5$ | $<2$ | $<2$ | 9 | . 3 | $<2$ | $<2$ | 113 | . 14 | . 120 | 5 | 23 | . 13 | 23 | . 17 |  | 4.48 | . 01 | . 03 | $<2$ | $<2$ |
| H96 LIE 2+50N | 1 | 12 | 16 | 61 | $<.3$ | 6 | 5 | 141 | 1.48 | 3 | $<5$ | $<2$ | $<2$ | 28 | . 2 | 2 | $<2$ | 46 | . 32 | . 049 | 2 | 8 | . 19 | 62 | . 06 | $<3$ | 1.24 | . 02 | . 05 | $<2$ | $<2$ |
| H96 LiE 2+00N | 6 | 21 | 6 | 42 | $<.3$ | 5 | 3 | 112 | . 87 | 2 | $<5$ | <2 | $<2$ | 21 | $<.2$ | 2 | $<2$ | 42 | . 39 | . 028 | 8 | 12 | . 20 | 57 | . 10 |  | 1.43 | . 01 | . 02 | $<2$ | $<2$ |
| H96 LiE 1+50N | 1 | 49 | 10 | 71 | < 3 | 19 | 13 | 550 | 3.24 | 6 | $<5$ | $<2$ | $<2$ | 27 | <. 2 | 2 | $<2$ | 95 | . 65 | . 096 | 7 | 25 | . 84 | 174 | . 18 | <3 | 3.37 | . 04 | . 23 | $<2$ | 2 |
| H96 LIE 1+00N | 3 | 30 | 12 | 58 | < 3 | 12 | 12 | 555 | 4.39 | 3 | $<5$ | <2 | 2 | 12 | <. 2 | 2 | 2 | 124 | . 23 | . 055 | 8 | 26 | . 40 | 46 | . 27 |  | 3.81 | . 02 | . 05 | $<2$ | 15 |
| H96 LIE $0+50 \mathrm{~N}$ | 5 | 39 | 10 | 82 | < 3 | 15 | 22 | 2039 | 4.24 | 2 | $<5$ | $<2$ | $<2$ | 37 | . 5 | 2 | $<2$ | 103 | . 78 | . 072 | 11 | 20 | . 61 | 153 | . 17 | $<3$ | 3.29 | . 03 | . 18 | $<2$ | $<2$ |
| H96 L1E 0+00 | $<1$ | 9 | 4. | 24 | <. 3 | 2 | 3 | 139 | 2.45 | $<2$ | $<5$ | $<2$ | $<2$ | 22 | $<.2$ | $<2$ | $<2$ | 76 | . 18 | . 029 | 3 | 2 | . 26 | 31 | .17 | $<3$ | 1.06 | . 02 | . 04 | $<2$ | 2 |
| H96 LTE O+50S | 3 | 33 | 6 | 34 | $<.3$ | 8 | 3 | 129 | 4.24 | 3 | $<5$ | $<2$ | 2 | 12 | . 2 | 2 | 3 | 122 | . 21 | . 098 | 3 | 43 | . 22 | 15 | . 19 |  | 4.01 | . 02 | . 02 | $<2$ | $<2$ |
| H96 LTE $1+005$ | 7 | 23 | 11 | 40 | < 3 | 5 | 4 | 111 | 2.75 | 3 | $<5$ | $<2$ | $<2$ | 16 | . 2 | $<2$ | $<2$ | 91 | . 29 | . 033 | 3 | 7 | . 16 | 46 | . 11 | $<3$ | 2.61 | . 02 | . 03 | $<2$ | 2 |
| H96 L1E $1+505$ | 31 | 21 | 5 | 36 | <. 3 | 9 | 13 | 240 | 4.94 | 3 | $<5$ | $<2$ | $<2$ | 16 | < 2 | 2 | 2 | 158 | . 21 | . 038 | 5 | 25 | . 30 | 41 | . 24 | $<3$ | 2.27 | . 02 | . 05 | $<2$ | 4 |
| H96 LIE 2+00s | $<1$ | 64 | 7 | 56 | <. 3 | 13 | 9 | 290 | 3.29 | $<2$ | $<5$ | $<2$ | $<2$ | 27 | . 3 | 2 | $<2$ | 90 | . 26 | . 045 | 8 | 17 | . 41 | 84 | . 09 | < | 2.54 | . 02 | . 03 | $<2$ | 9 |
| H96 L2E 7+00N | $<1$ | 5 | 4 | 64 | <. 3 | 2 | 1 | 22 | . 07 | $<2$ | $<5$ | $<2$ | $<2$ | 35 | . 3 | $<2$ | $<2$ | 1 | . 34 | . 035 | 2 | <1 | . 05 | 71 | <. 01 | $<3$ | . 10 | . 01 | . 03 | $<2$ | $<2$ |
| STANDARD C2/AU-S | 25 | 64 | 42 | 131 | 6.8 | 85 | 41 | 1199 | 4.16 | 43 | 21 | 9 | 40 | 55 | 21.9 | 20 | 19 | 82 | . 57 | . 108 | 47 | 68 | . 95 | 189 | . 08 | 22 | 1.98 | . 07 | . 15 | 16 | 51 |


| SAMPLE\# | $\begin{array}{r} \text { Mo } \\ \text { ppm } \end{array}$ | $\underset{\underset{\mathrm{pp}}{\mathrm{Cu}}}{ }$ | $\begin{array}{r} \mathrm{Pb} \\ \mathrm{ppm} \end{array}$ | $\begin{array}{r} 2 n \\ \mathrm{ppm} \end{array}$ | $\begin{array}{r} \text { Ag } \\ \mathbf{p p m} \end{array}$ | $\underset{\substack{\mathrm{Ni} \\ \mathrm{ppm}}}{ }$ | $\begin{array}{r} \text { Co } \\ \text { ppm } \end{array}$ | $\begin{gathered} \mathrm{Mn} \\ \mathrm{ppm} \end{gathered}$ | $\begin{gathered} \mathrm{Fe} \\ \% \end{gathered}$ | $\begin{aligned} & \text { As } \\ & \text { ppm } \end{aligned}$ | $\begin{array}{r} u \\ \text { pprn } \end{array}$ | $\begin{array}{r} \mathrm{Au} \\ \mathrm{ppm} \end{array}$ | Th ppm | $\begin{gathered} \mathrm{Sr} \\ \mathrm{ppm} \end{gathered}$ | $\begin{gathered} \mathrm{cd} \\ \mathrm{ppm} \end{gathered}$ | $\begin{array}{r} \text { Sb } \\ \text { ppom } \end{array}$ | $\begin{array}{r} \mathrm{Bi} \\ \mathrm{ppm} \end{array}$ | $\begin{array}{r} v \\ \text { pprn } \end{array}$ | $\begin{gathered} \mathrm{Ca} \\ \% \end{gathered}$ | $\begin{aligned} & \mathbf{P} \\ & \mathbf{X} \end{aligned}$ | $\begin{array}{r} \text { La } \\ \text { ppm } \end{array}$ | $\begin{array}{r} \mathrm{Cr} \\ \mathrm{ppm} \end{array}$ | $\begin{gathered} \mathrm{Mg} \\ \% \end{gathered}$ | $\begin{array}{r} \mathrm{Ba} \\ \mathrm{ppm} \end{array}$ | $\begin{gathered} \mathrm{Ti} \\ \% \end{gathered}$ | $\begin{array}{r} B \\ \text { ppn } \end{array}$ | $\begin{gathered} A! \\ \% \end{gathered}$ | $\begin{gathered} \mathrm{Na} \\ \% \end{gathered}$ | $\begin{aligned} & \mathrm{K} \\ & \% \end{aligned}$ | $\begin{array}{r} H \\ \text { ppm } \end{array}$ | $A u^{\star \star}$ ppb |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| H96 L2E 6+00N | 2 | 27 | 7 | 53 | <. 3 | 9 | 4 | 218 | 3.33 | 3 | $<5$ | $<2$ | 2 | 10 | $<.2$ | $<2$ | $<2$ | 107 | . 15 | . 051 | 4 | 22 | . 18 | 29 | . 20 |  | 3.45 | . 01 | . 03 | $<2$ | $<2$ |
| H96 L2E 5+50N | 2 | 20 | 7 | 42 | <. 3 | 7 | 5 | 145 | 3.59 | 2 | $<5$ | $<2$ | 2 | 9 | . 2 | $<2$ | $<2$ | 103 | . 12 | . 054 | 4 | 21 | . 19 | 31 | . 17 |  | 4.58 | . 01 | . 03 | $<2$ | $<2$ |
| H96 L2E 4+50N | 10 | 16 | 6 | 47 | <. 3 | 8 | 5 | 250 | 4.56 | 5 | $<5$ | $<2$ |  | 10 | <. 2 | $<2$ | $<2$ | 134 | . 13 | . 051 | 5 | 23 | . 24 | 40 | . 24 |  | 4.81 | . 01 | . 05 | <2 | $<2$ |
| H96 L2E 4+00N | 19 | 21 | 11 | 82 | <. 3 | 11 | 16 | 4030 | 3.29 | 3 | $<5$ | <2 | 2 | 27 | 1.0 | 2 | 2 | 88 | . 48 | . 061 | 12 | 17 | . 32 | 90 | . 17 | <3 | 2.80 | . 02 | . 05 | <2 | $<2$ |
| H96 L2E 3+50N | 4 | 15 | 10 | 39 | <. 3 | 5 | 6 | 227 | 2.99 | 3 | $<5$ | $<2$ | $<2$ | 13 | <. 2 | $<2$ | $<2$ | 98 | . 18 | . 033 | 4 | 15 | . 13 | 29 | . 16 | 3 | 1.21 | . 01 | . 03 | $<2$ | $<2$ |
| H96 L2E 3+00N | 5 | 27 | 6 | 68 | <. 3 | 10 | 8 | 326 | 3.77 | 4 | $<5$ | $<2$ | 2 | 13 | . 2 | $<2$ | <2 | 107 | . 23 | . 077 | 6 | 22 | . 38 | 55 | . 19 |  | 4.58 | . 02 | . 06 | $<2$ | $<2$ |
| H96 L2E 2+50N | 5 | 54 | 12 | 73 | < 3 | 11 | 34 | 2554 | 3.33 | 4 | $<5$ | $<2$ | $<2$ | 18 | . 6 | $<2$ | <2 | 89 | . 31 | . 077 | 10 | 20 | . 30 | 65 | . 13 | $<3$ | 3.19 | . 02 | . 04 | $<2$ | $<2$ |
| H96 L2E 2+00N | 5 | 39 | 14 | 91 | <. 3 | 11 | 12 | 1147 | 3.41 | 2 | $<5$ | $<2$ | 2 | 19 | . 2 | $<2$ | 2 | 99 | . 43 | . 074 | 9 | 20 | . 33 | 72 | . 19 | 3 | 3.57 | . 02 | . 05 | $<2$ | $<2$ |
| H96 L2E 1+50N | <1 | 8 | 10 | 156 | <. 3 | 1 | 1 | 66 | . 14 | 2 | $<5$ | $<2$ | $<2$ | 20 | . 3 | $<2$ | $<2$ | 4 | . 47 | . 038 | $<1$ | <1 | . 04 | 19 | <. 01 | $<3$ | . 14 | . 02 | . 03 | $<2$ | 18 |
| H96 L2E 1+00N | 3 | 29 | $<3$ | 103 | <. 3 | 19 | 20 | 564 | 4.52 | 5 | $<5$ | $<2$ | 3 | 12 | <. 2 | 5 | <2 | 113 | . 24 | . 041 | 4 | 26 | . 79 | 51 | . 29 | $<3$ | 4.47 | . 02 | . 05 | <2 | $<2$ |
| H96 L2E O+50N | 1 | 3 | 3 | 39 | <. 3 | 2 | 2 |  | 1.02 | 2 | $<5$ | $<2$ | $<2$ | 16 | . 2 | $<2$ | <2 | 33 | . 18 | . 020 | 2 | 4 | . 10 | 54 | . 02 |  | 1.56 | . 01 | . 04 | $<2$ | $<2$ |
| H96 L2E 0+00 | 2 | 17 | 7 | 51 | <. 3 | 8 | 5 | 173 | 4.74 | 8 | $<5$ | $<2$ | 2 | 16 | <. 2 | $<2$ | $<2$ | 147 | . 23 | . 059 | 6 | 21 | . 22 | 42 | . 27 |  | 3.26 | . 02 | . 05 | $<2$ | $<2$ |
| RE H96 L2E 3+00N | 4 | 28 | 11 | 74 | <. 3 | 11 | 9 | 364 | 4.06 | 5 | $<5$ | $<2$ | 2 | 15 | . 3 | $<2$ | $<2$ | 114 | . 25 | . 083 | 6 | 23 | . 41 | 59 | . 21 |  | 4.95 | . 02 | . 06 | $<2$ | <2 |
| H96 L2E 0+50S | <1 | 17 | 10 | 59 | <. 3 | 8 | 5 | 207 | 3.78 | 5 | $<5$ | $<2$ | 2 | 11 | <. 2 | 2 | $<2$ | 122 | . 20 | . 056 | 3 | 23 | . 25 | 36 | . 25 |  | 3.12 | . 02 | . 04 | $<2$ | 25 |
| H96 L2E 1+00S | 3 | 12 | 6 | 54 | <. 3 | 10 | 12 | 295 | 4.22 | 2 | $<5$ | $<2$ | $<2$ | 16 | . 2 | $<2$ | $<2$ | 123 | . 21 | . 043 | 3 | 20 | . 31 | 34 | . 19 | $<3$ | 2.72 | . 02 | . 03 | <2 | $<2$ |
| H96 L2E 1+50S | 3 | 52 | 5 | 54 | <. 3 | 12 | 12 | 488 | 4.29 | 4 | 7 | <2 | 3 | 21 | . 3 | 3 | $<2$ | 129 | . 23 | . 095 | 7 | 23 | . 43 | 49 | . 13 |  | 4.54 | . 02 | . 03 | $<2$ | 3 |
| H96 L2E 2+00S | 1 | 46 | 9 | 71 | <. 3 | 18 | 15 | 708 | 3.40 | $<2$ | $<5$ | $<2$ | 2 | 39 | . 3 | 2 | $<2$ | 86 | . 59 | . 054 | 6 | 24 | 1.13 | 58 | . 11 | 3 | 2.24 | . 05 | . 08 | $<2$ | 2 |
| H96 L3E 6+00N | 1 | 7 | 9 | 23 | <. 3 | 3 | 3 |  | 2.10 | 3 | < | $<2$ | $<2$ | 7 | < 2 | $<2$ | $<2$ | 142 | . 12 | . 024 | 2 | 11 | . 20 | 21 | . 27 | $<3$ | . 58 | . 01 | . 05 | $<2$ | $<2$ |
| H96 L3E 5+50N | 2 | 13 | 11 | 32 | $<.3$ | 5 | 3 | 144 | 2.98 | 6 | $<5$ | $<2$ | 2 | 12 | < 2 | 2 | $<2$ | 100 | . 19 | . 037 | 3 | 19 | . 17 | 23 | . 12 | $<3$ | 2.99 | . 01 | . 02 | $<2$ | $<2$ |
| H96 L3E 5+00N | 7 | 16 | 7 | 38 | $<.3$ | 7 | 4 | 186 | 3.94 | 7 | 5 | <2 | 3 | 13 | <. 2 | $<2$ | $<2$ | 123 | . 19 | . 055 | 7 | 27 | . 20 | 27 | . 20 | 4 | 4.30 | . 02 | . 04 | <2 | <2 |
| H966 L3E 4+50N | 4 | 23 | 19 | 51 | <. 3 | 12 | 5 | 210 | 4.13 | 8 | $<5$ | $<2$ | 2 | 15 | < 2 | 3 | $<2$ | 139 | . 36 | . 030 | 4 | 25 | . 36 | 56 | . 40 |  | 2.01 | . 02 | . 07 | $<2$ | 2 |
| H96 L3E 4+00N | 7 | 20 | 16 | 73 | < 3 | 10 | 9 | 1359 | 2.51 | 6 | $<5$ | $<2$ | $<2$ | 22 | < 2 | $<2$ | $<2$ | 75 | . 37 | . 053 | 6 | 14 | . 39 | 87 | .17 | $<3$ | 2.17 | . 02 | . 07 | $<2$ | 2 |
| H96 L3E 3+50N | 4 | 25 | 8 | 57 | < 3 | 11 | 10 | 430 | 3.13 | $<2$ | $<5$ | <2 | $<2$ | 19 | < 2 | $<2$ | $<2$ | 97 | . 41 | . 056 | 5 | 21 | . 47 | 70 | . 16 | $<3$ | 2.96 | . 02 | . 09 | $<2$ | <2 |
| H96 L3E 2+00N | 4 | 26 | 11 | 69 | <. 3 | 7 | 14 | 407 | 4.30 | 5 | 6 | $<2$ | 2 | 18 | < 2 | $<2$ | $<2$ | 116 | . 24 | . 066 | 4 | 17 | . 21 | 47 | . 28 | $<3$ | 1.41 | . 01 | . 05 | $<2$ | $<2$ |
| H96 L3E 1+00N | 2 | 8 | 8 | 23 | <. 3 | 3 | 3 | 106 | 2.85 | 4 | $<5$ | $<2$ | $<2$ | 13 | < 2 | $<2$ | $<2$ | 134 | . 17 | . 027 | 3 | 13 | . 13 | 18 | . 23 | $<3$ | . 88 | . 02 | . 02 | $<2$ | $<2$ |
| H96 L3E 0+50N | 2 | 19 | 7 | 37 | <. 3 | 5 | 5 | 181 | 3.42 | 5 | 6 | <2 | 3 | 13 | < 2 | 5 | $<2$ | 116 | . 18 | . 053 | 4 | 19 | . 32 | 24 | . 21 |  | 3.02 | . 02 | . 04 | $<2$ | <2 |
| H96 L3E 0+00 | 3 | 14 | 11 | 40 | <. 3 | 7 | 5 | 103 | 2.49 | 2 | $<5$ | $<2$ | $<2$ | 46 | < 2 | $<2$ | $<2$ | 99 | . 67 | . 034 | 5 | 15 | . 12 | 84 | . 16 | $<3$ | 1.04 | . 02 | . 03 | $<2$ | <2 |
| H96 L3E 0+50S | 2 | 17 | 10 | 42 | <. 3 | 12 | 9 | 303 | 2.87 | 4 | $<5$ | $<2$ | $<2$ | 23 | . 3 | 3 | $<2$ | 85 | . 33 | . 030 | 4 | 17 | . 61 | 70 | . 15 | $<3$ | 2.35 | . 02 | . 08 | $<2$ | $<2$ |
| H96 L3E 1+00S | 3 | 81 | 9 | 46 | <. 3 | 6 | 6 | 154 | 3.36 | $<2$ | $<5$ | $<2$ | 2 | 14 | <. 2 | 2 | $<2$ | 118 | . 21 | . 037 | 6 | 20 | . 19 | 32 | .17 | $<3$ | 2.72 | . 01 | . 03 | $<2$ | $<2$ |
| H96 L3E 1+50S | 1 | 43 | 8 | 37 | $<.3$ | 6 | 5 | 154 | 2.55 | 4 | 8 | $<2$ | $<2$ | 19 | <. 2 | $<2$ | $<2$ | 107 | . 17 | . 025 | 4 | 14 | . 11 | 53 | . 15 | <3 | . 73 | . 02 | . 04 | $<2$ | <2 |
| H96 L4E 7+00N | 1 | 6 | 6 | 26 | <. 3 | 3 | 2 | 87 | 2.22 | 2 | $<5$ | <2 | $<2$ | 7 | <. 2 | $<2$ | $<2$ | 121 | . 10 | . 015 | 2 | 15 | . 10 | 13 | .16 | <3 | . 85 | . 01 | . 02 | $<2$ | <2 |
| H96 L4E 6+50N | 10 | 21 | 3 | 64 | <. 3 | 12 | 20 | 560 | 3.04 | 7 | $<5$ | $<2$ | 2 | 13 | . 4 | <2 | $<2$ | 75 | . 21 | . 082 | 6 | 18 | . 35 | 44 | . 13 | $<3$ | 6.69 | . 02 | . 06 | $<2$ | $<2$ |
| H96 L4E 6+00N | 1 | 7 | 34 | 115 | . 4 | 8 | 2 | 38 | . 15 | 5 | 12 | $<2$ | $<2$ | 32 | . 9 | 2 | $<2$ | 5 | . 82 | . 061 | 2 | 3 | . 05 | 104 | <. 01 | 3 | . 29 | . 02 | . 05 | $<2$ | 5 |
| H96 L4E 5+50N | 2 | 23 | 6 | 73 | <. 3 | 12 | 9 | 214 | 2.43 | 3 | $<5$ | $<2$ | $<2$ | 23 | . 4 | 2 | $<2$ | 63 | . 41 | . 036 | 9 | 18 | . 32 | 33 | . 08 | $<3$ | 1.82 | . 03 | . 04 | $<2$ | $<2$ |
| H96 L4E 5+00N | 5 | 18 | 9 | 67 | <. 3 | 7 | 86 | 2089 | 3.36 | 3 | $<5$ | $<2$ | $<2$ | 39 | $<.2$ | 2 | $<2$ | 97 | . 61 | . 032 | 8 | 17 | . 22 | 79 | . 22 | $<3$ | 1.64 | . 02 | . 03 | $<2$ | <2 |
| STANDARD C2/AU-S | 23 | 58 | 43 | 125 | 6.4 | 79 | 38 | 1131 | 3.95 | 42 | 16 | 8 | 40 | 51 | 22.1 | 21 | 18 | 74 | . 54 | . 102 | 44 | 66 | . 88 | 183 | . 08 | 22 | 1.83 | . 06 | . 14 | 15 | 46 |



Sample type: SOIL. Samples beginning 'RE' are Reruns and 'RRE' are Reject Reruns.


Sample type: SOIL. Samples beginning 'RE' are Reruns and 'RRE' are Reject Reruns.



Samole thpe: SOli, SEAPles beniming 'RE' are Renus and 'RRE' are Reject Reruns.

Ashworth Exploration Ltd.
FILE \# 96-1558
Page 3

| SAKPLEA | $\begin{gathered} \text { Mo } \\ \text { ppm } \end{gathered}$ | $\begin{gathered} \text { cu } \\ \text { ppron } \end{gathered}$ | $\begin{gathered} \text { Pb } \\ \text { ppra. } \end{gathered}$ | $\begin{array}{r} 2 n \\ \text { ppon } \end{array}$ | $\begin{aligned} & \text { Ag } \\ & \text { Pppm } \end{aligned}$ | $\begin{gathered} \mathrm{Ni} \\ \text { ppon } \end{gathered}$ | $\begin{gathered} \text { Co } \\ \text { ppon } \end{gathered}$ | $\begin{array}{r} \mathrm{Mn} \\ \mathrm{ppm} \end{array}$ | $\begin{gathered} \text { Fe } \\ X \end{gathered}$ | $\begin{gathered} \text { AS } \\ \text { pprin } \end{gathered}$ | ppin | $\begin{gathered} \text { Ru, } \\ \text { por. } \end{gathered}$ | $\begin{array}{r} \text { Ih } \\ \text { ppon } \end{array}$ | $\begin{array}{r} \text { Sr } \\ \text { pris } \end{array}$ | $\begin{array}{r} \text { Cd } \\ \text { pppr } \end{array}$ | $\begin{array}{r} \$ b \\ \text { ppan } \end{array}$ | $\begin{array}{r} 8 i \\ \mathrm{pppm} \end{array}$ | $\begin{array}{r} \text { Y } \\ \text { ppm } \end{array}$ | $\mathrm{Co}$ | $\begin{aligned} & p \\ & X \end{aligned}$ | $\begin{gathered} \text { La } \\ \text { ppm } \end{gathered}$ | $\begin{array}{r} \mathrm{Ar} \\ \mathrm{DPm} \end{array}$ | $\begin{gathered} \mathrm{Kg} \\ \mathrm{Z} \end{gathered}$ | $\begin{array}{r} \mathbf{8 a} \\ \text { ppm } \end{array}$ | $\begin{aligned} & 71 \\ & x \end{aligned}$ | $\begin{array}{r} 8 \\ \text { ppnn } \\ \hline \end{array}$ | $\begin{gathered} \mathrm{Al} \\ \mathrm{~K} \end{gathered}$ | $\begin{array}{r} \mu \mathrm{x} \\ \mathrm{x} \end{array}$ | $\begin{aligned} & K \\ & x \end{aligned}$ |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| L19COE 3+504 | 6 | 35 | 3 | 50 | ¢. 3 | 3 | 1 | 211 | 5.47 | 3 | $<5$ | E | 3 | 11 | . 3 |  | $<2$ | 150 | . 19 | . 388 | 4 | 33 | . 45 | 15 | . 27 | <3 | 4.97 | . $\mathrm{C2}$ | . 02 | 2 | 3 |
| L11rOOE 3+00n | 1 | 8 | 9 | 29 | <. 3 | 2 | 2 | 90 | 1.23 | 2 | $<5$ | <2 | 22 | 5 | <. 2 | 2 | $<2$ | 35 | . 16 | . 326 | 2 | 4 | . 21 | 15 | . 6 | < 3 | . 58 | . 62 | . 06 | <2 | $<2$ |
| L1t-ODE 2+50才 | 2 | 4 | 19 | 46 | <.3 | 3 | 2 | 845 | 2.94 | < | $<5$ | < | <2 | 14 | . 5 | 2 | 2 | 88 | . 25 | . 036 | 3 | 7 | . 36 | 55 | . 22 | < | 1.07 | . 02 | . 07 | <2 | 3 |
| 111+00E 2+00N | $: 3$ | 28 | 3 | 77 | <.3 | 10 | 6 | 324 | 5.23 | -2 | $\checkmark 5$ | $<2$ | 3 | 10 | -6 | 6 | 5 | 131 | . 18 | . 066 | 6 | 28 | . 36 | 35 | . 26 | c | 6.01 | . 01 | . 03 | $\leqslant 2$ | $<2$ |
| L11+COEE 1+50N | 6 | 38 | 10 | 62 | . 5 | 9 | 5 | 526 | 4.87 | 3 | $<5$ | < | 22 | 16 | . 5 | 3 | $<2$ | 143 | . 19 | . 058 | 5 | 25 | . 34 | 31 | . 15 | $\leqslant$ | 2.13 | . 81 | . 03 | $<2$ | 5 |
| 111+00E 1+00\% | <1 | 3 | $\langle$ | : 6 | 8.3 | 1 | 2 | :28 | 1.65 | 2 | $<5$ | $<2$ | <2 | 25 | <. 2 | $<2$ | $<2$ | 49 | . 28 | . 009 | 2 | 2 | . 13 | 9 | . 09 | 3 | . 50 | . 03 | . 62 | $<2$ | $<2$ |
| 111+00E 0+50n | 1 | 14 | 31 | 37 | <.3 | 4 | 2 | : $: 4$ | 1.34 | 2 | $\leqslant 5$ | $<2$ | - 2 | 18 | . 2 | $<2$ | $<2$ | 43 | . 48 | . 038 | 1 | 3 | . 21 | 13 | . 05 | 3 | . 65 | .04 | . 44 | < | $<2$ |
| 111+00E C+00n | 13 | 8 | 4 | 30 | <.3 | 4 | 1 | 99 | 3.56 | 5 | < | $<2$ | $<2$ | 16 | . 6 | 2 | 2 | 182 | .25 | . 027 | 3 | 12 | . 15 | 11 | . 24 | 3 | . 94 | . 09 | . L | < | 2 |
| 611+00E $\mathrm{C}+50 \mathrm{E}$ | 3 | 30 | 10 | 58 | . 3 | 7 | 5 | 362 | 3.87 | $<2$ | < | $<2$ | 12 | 15 | . 3 | 2 | 3 | 115 | . 22 | .068 | 3 | 19 | . 30 | 36 | . 14 | 3 | 3.20 | . 01 | . 33 | < | $<2$ |
| Li $1+00 \mathrm{E}$ 1-2iJS | 3 | 42 | 3 | 67 | . 3 | 8 | 5 | 285 | 6.42 | $<2$ | 45 | $<2$ | 2 | 19 | . 4 | 5 | $<2$ | 118 | . 23 | . 062 | 5 | 28 | . 46 | 43 | . 18 | <3 | 5.49 | . 02 | . 03 | $<2$ | 7 |
| L11-00E 1+505 | 2 | 89 | 10 | Os | $<.3$ | 20 | 34 | 1341 | 5.13 | $<2$ | < | $<2$ | $\leqslant 2$ | 51 | . 5 | 4 | $<2$ | 160 | . 32 | . 035 | 3 | : 8 | 1.79 | 57 | . 08 | < | 3.14 | . 22 | . 05 | $<2$ | 3 |
| L12-00E 6+004 | 3 | 25 | 9 | 42 | $<.3$ | 6 | 2 | 153 | 6.11 | $<2$ | < | $<2$ | 3 | $\cdots$ | 8.2 | 2 | $<2$ | 115 | . 18 | . 062 | 4 | 26 | . 28 | 18 | . 19 | $\checkmark$ | 4.31 | . 32 | . 02 | <2 | 42 |
| L12-00E S+504 | 2 | 11 | 10 | 36 | . 3 | 4 | 4 | 86 | 3.74 | 6 | $\leqslant$ | < | 2 | 9 | . 4 | 2 | 2 | 157 | . 14 | . 035 | 3 | 29 | . 8 | 10 | . 84 | 6 | 2.25 | . $5:$ | . 09 | $<2$ | 4 |
| $\therefore 12+00 E 5+004$ | 14 | 15 | 8 | 75 | . 3 | 7 | 5 | 278 | 3.83 | $<2$ | $\leqslant$ | <2 | 2 | 15 | -2 | 5 | 2 | 204 | . 14 | . 246 | 4 | 21 | . 49 | 31 | . 13 | $\cdots$ | 4.49 | . $3:$ | . 03 | $<2$ | $<2$ |
| L12-00E 4+50\% | 12 | 21 | 9 | 60 | - 6 | 8 | 8 | 559 | 4.16 | $<2$ | $\leqslant$ | <2 | 4 | 13 | -2 | 4 | $<2$ | 102 | . 20 | . 063 | 4 | 22 | -39 | 24 | . 12 | $<3$ | 3.64 | . 01 | . 02 | 4 | (4) |
| L12-00E 4+00\% | 14 | 20 | 7 | 48 | . 3 | 5 | 2 | 185 | 4.32 | 2 | < | $<2$ | $<2$ | 22 | . 5 | 2 | $<2$ | :58 | . 23 | . 038 | 4 | 16 | . 40 | 20 | . 20 | <3 | 2.3: | . 01 | . 22 | $<2$ | 2 |
| RE 112400E 3-50M | , | 2 | 9 | :2 | $<.3$ | $<1$ | < | 102 | . 80 | 42 | $<5$ | $<2$ | 2 | 11 | $<.2$ | $<2$ | $<2$ | 69 | . 20 | . 008 | 3 | 3 | . 09 | 7 | . 24 | $\leqslant$ | . 53 | . 02 | . 32 | 4 | <2 |
| LJ2+00E 3+50N | , | 2 | 9 | 11 | <. 3 | 1 | <1 | 98 | . 58 | $<2$ | < 5 | <2 | 2 | 11 | $<.2$ | $<2$ | $<2$ | 47 | . 20 | . 007 | 3 | 3 | . 09 | 7 | . 23 | < 3 | . 52 | . 01 | . 32 | $<2$ | <2- |
| L12-00E 3-004 | 7 | 36 | 63 | 37 | < 3.3 | 6 | $<1$ | 163 | 7.06 | $<2$ | $<5$ | $<2$ | 6 | 11 | . 3 | 4 | 2 | 157 | . 14 | . 050 | 3 | 32 | . 40 | 15 | . 28 | 3 | 5.01 | . 01 | . 32 | $<2$ | 2 |
| W12400E 2450N | 2 | 4 | 7 | 18 | < 3 | 2 | 4 | 86 | 2.57 | 2 | $<5$ | $<2$ | $<2$ | 12 | . 3 | $<2$ | 2 | 97 | . 17 | . 022 | 4 | 10 | . 07 | 14 | . 20 | $J$ | 1.08 | . 01 | . 02 | $<2$ | 2 |
| 142,00E $2+0004$ | 2 | 8 | 11 | 25 | <- $\frac{1}{3}$ | 2 | <1 | 100 | 2.67 | 3 | 5 | $<2$ | $<2$ | 11 | . 3 | 2 | 2 | 85 | . 17 | . 327 | 6 | 9 | . 11 | 18 | . 27 | <3 | -92 | . 01 | . 02 | $<2$ | <2 |
| 142400E 1+504 | 5 | 20 | 10 | 34 | 4. 3 | 3 | 2 | 108 | 3.83 | 4 | $\checkmark$ | $<2$ | 2 | 15 | . 4 | 3 | 3 | 128 | . 15 | . 327 | 4 | 22 | . 12 | 27 | . 14 | -3 | 3.12 | . 01 | . 01 | $<2$ | 5 |
| 112400E 1400w | 4 | 45 | 6 | 49 | <. 3 | 11 | 2 | 266 | 5.57 | 42 | $<5$ | $<2$ | 2 | 13 | . 6 | 2 | 3 | 170 | . 20 | . 056 | S | 37 | . 56 | 21 | . 38 | $\leqslant$ | 3.85 | . 02 | . 03 | 2 | 4 |
| L12+00E 0450H | 4 | 5 | 3 | 18 | <. 3 | 2 | 1 | 73 | 2.00 | $<2$ | $<5$ | $<2$ | c2 | 10 | . 2 | 2 | $<2$ | 116 | . 13 | . 013 | 2 | 9 | . 07 | 8 | . 15 | $<3$ | . 48 | . 01 | . 02 | 8 | 2 |
| L12+00E 0+00w | 17 | 47 | 10 | 272 | <. 3 | 16 | 280 | 8418 | 12.62 | $<2$ | $<5$ | $<2$ | $<2$ | 16 | . 7 | $<2$ | $<2$ | 149 | . 30 | . 096 | 8 | 30 | . 16 | 69 | . 15 | $\leqslant$ | 9.09 | . 01 | . 02 | 4 | 5 |
| L12+00E 0+50S | 1 | 15 | 15 | 33 | <. 3 | 5 | 5 | 166 | : 26 | 4 | $\checkmark 5$ | 2 | c2 | 21 | . 4 | $\times 2$ | $<2$ | 64 | . 33 | . 023 |  | 13 | . 26 | 26 | . 07 | $\checkmark$ | . 62 | . 02 | . 03 | 4 | 4 |
| L12+00E 1+00S | 7 | 55 | <3 | 60 | . 3 | 6 | 4 | 240 | 5.20 | 2 | $<5$ | $\stackrel{*}{2}$ | 2 | 32 | . 3 | 5 | 4 | 160 | . 16 | . 027 | 4 | 25 | . 55 | 31 | . 30 | 3 | 4.27 | . 01 | . 02 | 3 | i |
| L12+C0E 9+50s | 2 | 57 | 5 | 7 | <. 3 | 19 | 15 | 723 | 3.85 | 2 | $<5$ | $<2$ | $\stackrel{2}{2}$ | 20 | . 6 | 3 | $<2$ | 95 | . 36 | . 071 | 6 | 34 | 1.12 | 35 | . 69 | 4 | 3.23 | . 02 | . 03 | 4 | 9 |
| L12+00E $2+005$ | 3 | 46 | 4 | 39 | < 3 | 5 | 9 | 175 | 6.71 | 2 | $<5$ | 2 | 2 | 14 | <. 2 | $<2$ | $<2$ | 215 | . 10 | . 080 | 3 | 20 | . 28 | 60 | . 02 | 5 | 3.64 | . 01 | . 02 | 42 | 4 |
| 113+00E3 $3+00 \mathrm{~K}$ | 3 | 26 | 3 | I5 | 8.5 | 5 | 2 | 220 | 4.12 | ${ }^{2}$ | $\pm$ | 2 | 2 | 12 | . 3 | 2 | 2 | 190 | .98 | . 06 | 3 | 23 | .30 | is | .19 | 5 | 3.53 | . 02 | . $2 \hat{2}$ | 2 | $J$ |
| C13+00E $2+5 \mathrm{~cm}$ | 3 | 21 | 3 | 36 | <,3 | 5 | 1 | 155 | 5.04 | 5 | $\leqslant$ | $<2$ | 3 | 11 | . 4 | 8 | $<2$ | 131 | . 7 | . 094 | 3 | 29 | . 32 | 15 | . 23 | $\checkmark$ | 4.77 | . 01 | . 02 | 2 | $<2$ |
| 213+00E 2+00M | , | 2 | 4 | 13 | $<.3$ | 1 | 1 | 76 | 1.02 | $<2$ | < | 4 | 2 | 12 | <.2 | 2 | $<2$ | 26 | . 16 | . 008 | 2 | 3 | . 03 | 8 | . 05 | 3 | . 31 | . 02 | . 02 | 2 | $<2$ |
| L13+005 $9+504$ | 2 | 11 | 7 | 26 | <.3 | 2 | 2 | 64 | 1.98 | 4 | $<5$ | 2 | 2 | 8 | <. 2 | 2 | c | 107 | . 11 | .02s | 3 | 10 | . 12 | 22 | . 07 | $\leqslant$ | 1.20 | . 01 | . 03 | <2 | 5 |
| C13+00E 1+00n | 2 | 21 | 6 | 34 | < 3 | 3 | 41 | 139 | 3.99 | $<2$ | 5 | 2 | 2 | 10 | . 4 | 2 | $<2$ | 127 | . 16 | . 042 | 3 | 18 | . 19 | 24 | . 26 | 4 | 2.59 | . 01 | . 02 | $<2$ |  |
| L13+00E D+SOR | 3 | 24 | $<3$ | 46 | <. 3 | 5 | 2 | 166 | 5.26 | 4 | $<5$ | 4 | <2 | 13 | . 2 | 2 | 8 | 17 | . 22 | . 048 | 3 | 20 | . 31 | 21 | . 20 | $\leqslant$ | 3.06 | . 04 | . 02 | $<2$ | 4 |
| $123+0050+004$ | 2 | 25 | 3 | 34 | <, 3 | 3 | 1 | 146 | 3.98 | $<2$ | 5 | 2 | 2 | 12 | . 4 | 3 | 3 | 141 | . 19 | . 042 | 3 | 17 | . 26 | 16 | . 20 |  | 2.83 | . 01 | . 02 | 82 | 42 |
| STANDAROL C2/AJJ-S | 20 | 59 | 36 | 146 | 6.5 | 72 | 35 | 1122 | 4.03 | 44 | 22 | 7 | 35 |  | 20.9 | 17 | 17 | 73 | . 57 | . 102 | 40 | 64 | 1.01 | 187 | .08 | 27 | 1.93 | . 8 | . 15 | 16 | 52 |

Samole type: soll, semer beglming 'RE' are Reruns and "RRE' are Reject Rerunse


Sample type: SOIL. Samples beginning 'RE' are Reruns and 'RRE' are Reject Reruns.
AU* - IGNITED, AQUA-REGIA/MIBK EXTRACT, GF/AA FINISHED.


Sample type: SOIL. Samples beginning 'RE' are Reruns and 'RRE' are Reject Reruns.
AU* - IGNITED, AQUA-REGIA/MIBK EXTRACT, GF/AA FINISHED.



## APPENDIX IV

1996 Geochemical soil survey plots and geostatistics

EW Grove Consultants ..... :
Victoria Office :
GEMCOM Services PCX_404: DB=C: $\backslash$ PXDBAQ ${ }^{\text {REPORTS }}$ ..... :
Extraction File : C: \PXDBAQ\EXTRACT\SAUPPB.MEX
Data Description : HOPE SOIL GEOCHEM - GOLD
Minimum Cutoff Value ..... 1.000000
Maximum Cutoff Value ..... 30.000100
Number of Samples <=0 ..... 0
Total Number of Samples Used ..... 294
Minimum Histogram Value ..... 1.000000
Maximum Histogram Value ..... 30.000100
Number of Class ..... 30
Class Interval ..... 0.966700
Minimum Population Data point 1.000000
Maximum Population Data point ..... 548.000000
Total Population ..... 295
Mean
MedianGeometric MeanNatural LOG Mean
Standard Deviation
Variance
Ungrouped Data Grouped Data
2.605442 ..... 3.035331
N/A ..... 2.430934
2.046605 ..... 2.552546
0.716182 ..... 0.937091
3.124531 ..... 3.020484
9.762691 ..... 9.123322
Log Variance0.3278360.230125
Coefficient of Variation
1.199232 ..... 0.995109
Moment 1 about Arithmetic Mean
Moment 2 about Arithmetic Mean
0.000000 ..... 0.000000
9.762691 9.123322
Moment 3 about Arithmetic Mean$162.977806 \quad 147.232479$
Moment 4 about Arithmetic Mean3342.0735462918.655772
35.06524535.065245
Moment Coefficient of Skewness
Moment Coefficient of Kurtosis




Extraction File : C: \PXDBAQ Data Description : HOPE SOIL GEOCHEM - SILVER

Minimum Cutoff Value
0.300000

Maximum Cutoff Value 1.000100
Number of Samples <=0 0
Total Number of Samples Used 295

Minimum Histogram Value 0.300000

Maximum Histogram Value Number of class
1.000100

Class Interval
0.023300

Minimum Population Data point
0.300000

Maximum Population Data point
1.000000

Total Population
295

Mean
Median
Geometric Mean
Natural LOG Mean
Standard Deviation
Variance
Log Variance
Coefficient of Variation
Moment 1 about Arithmetic Mean
Moment 2 about Arithmetic Mean
Moment 3 about Arithmetic Mean
Moment 4 about Arithmetic Mean
Moment Coefficient of Skewness
Moment Coefficient of Kurtosis

| Ungrouped Data | Grouped Data |
| ---: | ---: |
| 0.326102 | 0.336214 |
| $\mathrm{~N} / \mathrm{A}$ | 0.313692 |
| 0.319937 | 0.330711 |
| -1.139632 | -1.106509 |
| 0.080022 | 0.076200 |
| 0.006403 | 0.005806 |
| 0.030978 | 0.026951 |
| 0.245388 | 0.226641 |
| 0.000000 | 0.000000 |
| 0.006403 | 0.005806 |
| 0.002386 | 0.002126 |
| 0.001260 | 0.001097 |
| 30.716709 | 32.549977 |
| 4.656158 | 4.804838 |





Extraction File : C: \PXDBAQ\EXTRACT\SCUPPM.MEX Data Description : HOPE SOIL GEOCHEM - COPPER

Minimum Cutoff Value
2.000000

Maximum Cutoff Value 300.000100
Number of Samples < $=0$
0
Total Number of Samples Used
295
Minimum Histogram Value 2.000000
Maximum Histogram Value 300.000100
Number of Class
30
Class Interval
9.933300

Minimum Population Data point
2.000000

Maximum Population Data point
300.000000

Total Population
295

Mean
Median
Geometric Mean
Natural LOG Mean
Standard Deviation
Variance
Log Variance
Coefficient of Variation
Moment 1 about Arithmetic Mean
Moment 2 about Arithmetic Mean
Moment 3 about Arithmetic Mean
Moment 4 about Arithmetic Mean
Moment Coefficient of Skewness
Moment Coefficient of Kurtosis

| Ungrouped Data | Grouped Data |
| ---: | ---: |
| 30.132203 | 30.301487 |
| $\mathrm{~N} / \mathrm{A}$ | 25.074228 |
| 22.746402 | 23.148307 |
| 3.124407 | 3.141922 |
| 25.830861 | 25.702194 |
| 667.233370 | 660.602765 |
| 0.613077 | 0.558409 |
| 0.857251 | 0.848216 |
| 0.000000 | 0.000000 |
| 667.233370 | 660.602765 |
| 77240.528861 | 73564.641805 |
| 18853444.078466 | 17534005.251727 |
| 42.348222 | 40.179114 |
| 4.481554 | 4.332699 |





Extraction File : C: \PXDBAQ\EXTRACT\SPBPPM.MEX
Data Description : HOPE SOIL GEOCHEM - LEAD

Minimum Cutoff Value
Maximum Cutoff Value
3.000000

Number of Samples <=0
Total Number of Samples Used 105.000100

0

Minimum Histogram Value
3.000000

Maximum Histogram Value
Number of Class
105.000100

30
Class Interval
3.400000
$\begin{array}{lr}\text { Minimum Population Data point } & 3.000000 \\ \text { Maximum Population Data point } & 105.000000 \\ \text { Total Population } & 295\end{array}$
Total Population
Ungrouped Data
Mean
Median
Geometric Mean
Natural LOG Mean
Standard Deviation
Variance
Log Variance
Coefficient of Variation
Moment 1 about Arithmetic Mean
Moment 2 about Arithmetic Mean
Moment 3 about Arithmetic Mean
Moment 4 about Arithmetic Mean
Moment Coefficient of Skewness
Moment Coefficient of Kurtosis
13.284746

| 13.284746 | 13.493898 |
| ---: | ---: |
| $\mathrm{~N} / \mathrm{A}$ | 10.908696 |
| 10.655681 | 11.005057 |
| 2.366093 | 2.398355 |
| 11.498870 | 11.388122 |
| 132.224005 | 129.689319 |
| 0.403236 | 0.357903 |
| 0.865569 | 0.843946 |
| 0.000000 | 0.000000 |
| 132.224005 | 129.689319 |
| 6341.948272 | 6118.226693 |
| 488902.839756 | 462471.596375 |
| 27.964171 | 27.496451 |
| 4.171164 | 4.142564 |

10.655681
2.366093
11.498870
32.224005
. 803236
0.000000
132.224005
6341.948272
27.964171
4.171164
4.142564



EW Grove Consultants ..... :
GEMCOM Services PCX_404: DB=C: \PXDBAQ\REPORTS
Extraction File : C: \PXDBAQ\EXTRACT\SZNPPM.MEX Data Description : HOPE SOIL GEOCHEM - ZINC
Minimum Cutoff Value ..... 5.000000
Maximum Cutoff Value ..... 362.000100
Number of Samples <=0 ..... 0
Total Number of Samples Used ..... 295
Minimum Histogram Value ..... 5.000000
Maximum Histogram Value ..... 362.000100
Number of Class ..... 30
Class Interval ..... 11.900000
Minimum Population Data point ..... 5.000000
Maximum Population Data point ..... 362.000000
Total Population ..... 295
MeanMedian
Geometric MeanNatural LOG Mean
Standard Deviation
Variance
Log Variance
Coefficient of Variation
Moment 1 about Arithmetic Mean
Moment 2 about Arithmetic Mean
Moment 3 about Arithmetic MeanMoment 4 about Arithmetic MeanMoment Coefficient of SkewnessMoment Coefficient of KurtosisUngrouped Data
Grouped Data62.006780
N/A
52.57702662.01915353.1833333.96227952.39474741.8112783.958806
41.771869

| 5.000000 |  |
| :---: | :---: |
| 362.000100 |  |
| 0 |  |
| 295 |  |
| 5.000000 |  |
| 362.000100 |  |
| 30 |  |
| 11.900000 |  |
| 5.000000 |  |
| 362.000000 |  |
| 295 |  |
| Ungrouped Data | Grouped Data |
| 62.006780 | 62.019153 |
| N/A | 53.183333 |
| 52.577026 | 52.394747 |
| 3.962279 | 3.958806 |
| 41.811278 | 41.771869 |
| 1748.183005 | 1744.889048 |
| 0.321425 | 0.332780 |
| 0.674302 | 0.673532 |
| 0.000000 | 0.000000 |
| 1748.183005 | 1744.889048 |
| 222577.833566 | 215012.970640 |
| 53686808.261378 | 50990314.527442 |
| 17.566846 | 16.747580 |
| 3.045100 | 2.949938 |








$\begin{array}{llllll}75 & 0 & 75 & 150 \quad 225 & 300\end{array}$

EW Grove Consultants 4881 Bouldermodod Crive


AQUISTAR VENTURES INC. - HOPE 2 \& 3 CLAIMS
SONORA ISLAND, B.C.; NANAIMO M.D.
1996 GEOCHEMICAL SOIL SUAVEY - ARSENIC (PPM)

Extraction File : C: \PXDBAQ\EXTRACT\SASPPM.MEX Data Description : HOPE SOIL GEOCHEM - ARSENIC

| Minimum Cutoff Value | 2.000000 |
| :--- | ---: |
| Maximum Cutoff Value | 18.000100 |
| Number of Samples <=0 | 0 |
| Total Number of Samples Used | 295 |
|  |  |
| Minimum Histogram Value | 2.000000 |
| Maximum Histogram Value | 18.000100 |
| Number of Class | 30 |
| Class Interval | 0.533300 |
| Minimum Population Data point | 2.000000 |
| Maximum Population Data point | 18.000000 |
| Total Population | 295 |

## Mean

Median
Geometric Mean
Natural LOG Mean
Standard Deviation
Variance
Log Variance
Coefficient of Variation
Moment 1 about Arithmetic Mean
Moment 2 about Arithmetic Mean
Moment 3 about Arithmetic Mean
Moment 4 about Arithmetic Mean
Moment Coefficient of Skewness
Moment Coefficient of Kurtosis

| Ungrouped Data | Grouped Data |
| ---: | ---: |
| 3.688136 | 3.765313 |
| $\mathrm{~N} / \mathrm{A}$ | 2.742811 |
| 3.210012 | 3.345680 |
| 1.166275 | 1.207670 |
| 2.224142 | 2.165801 |
| 4.946808 | 4.690693 |
| 0.252990 | 0.207247 |
| 0.603053 | 0.575198 |
| 0.000000 | 0.000000 |
| 4.946808 | 4.690693 |
| 24.685651 | 24.965648 |
| 291.654034 | 283.463149 |
| 11.918396 | 12.883167 |
| 2.243659 | 2.457465 |





## ADDENDUM

# GEOPHYSICAL REPORT <br> ON <br> INDUCED POLARIZATION, RESISTIVITY, VLF-EM AND MAGNETIC SURVEYS 

OVER THE
HOPE CLAMM GROUP
SONORA POINT, SONORA ISLAND NANAIMO MINING DIVISION, BRITISH COLUMBIA

| SURVEY PERIOD | $:$ February, 1996 |
| :--- | :--- |
| WRITTEN FOR | $:$ AQUSTAR VENTURES INC. |
|  | Vancouver, British Columbia |
| WRITTEN BY | $:$David G. Mark, P.Geo., Geophysicist <br>  <br>  <br>  <br>  <br> GEOTRONICS SURVEYS LTD. <br> Vancouver, British Columbia |
| DATED | $:$ April 8, 1996 |

GEOTRONICS SURVEYS LTD. Engineering \& Mining Geophysicists

## TABLE OF CONTENTS

SUMMARY ..... i
CONCLUSIONS ..... $i i$
RECOMMENDATIONS ..... iii
INTRODUCTION AND GENERAL REMARKS ..... 1
MAGNETOMETER AND VLF-EM SURVEYS ..... 2
(a) Instrumentation ..... 2
(b) Theory .....  2
(c) Survey Procedure .....  3
(d) Compilation of Data .....  3
INDUCED POLARIZATION AND RESISTIVITY SURVEYS ..... 4
(a) Instrumentation .....  .4
(b) Theory ..... 4
(c) Survey Procedure .....  5
(d) Compilation of Data .....  6
DISCUSSION OF RESULTS ..... 7
(a) Magnetics .....  7
(b) VLF-EM ..... 7
(c) IP and Resistivity .....  8
REFERENCES ..... 11
GEOPHYSICIST'S CERTIFICATE ..... 12

## LIST OF LLLUSTRATIONS

| MAPS IN POCKET | Scale |  |
| :--- | :---: | :---: |
|  |  | Map\# |
|  |  |  |
| Magnetic Survey |  |  |
| Contour Plan | 5000 | GP-1 |
| Profile Plan | 5000 | GP-2 |
| VLF-EM Survey |  |  |
| Fraser Filter Contour Plan | 5000 | GP-3 |
| Tilt Angle and Quadrature Profile Plan | 5000 | GP-4 |
| IP and Resistivity Survey Plans |  |  |
| IP Survey Plan, n=1 | 5000 | GP-5 |
| Resistivity Survey Plan, n=1 | 5000 | GP-6 |
| IP Survey Plan, n=4 | 5000 | GP-7 |
| Resistivity Survey Plan, n=4 | 5000 | GP-8 |
| IP and Resistivity Pseudosections with Magnetic and VLF-EM Profiles |  |  |
| Line 0+00E | 1250 | GP-9 |
| Line 4+00E | 1250 | GP-10 |
| Line 6+00E | 1250 | GP-11 |
| Line 7+00E | 1250 | GP-12 |
|  |  |  |
| Compilation Map | $1250 \ldots \ldots . .$. GP-13 |  |

Compilation Map
1250
GP-13

## SUMMARY

Induced polarization, resistivity, VLF-EM and magnetic surveys were carried out over the west central part of the Hope Claim Group belonging to Aquistar Ventures Inc.

The magnetic and VLF-EM surveys were carried out using a Scintrex/EDA Omni-Plus proton precession magnetometer/VLF-EM unit with readings taken every 12.5 m on 9 lines for a total survey length of $6,437.5 \mathrm{~m}$. The results for each survey were plotted and contoured on two base maps, respectively, as well as profiled on two additional base maps, respectively. In addition, the magnetic results and the VLF-EM Fraser-filtered results within the IP/resistivity survey area were each profiled and plotted above the $\mathrm{P} /$ resistivity pseudosections.

The IP and resistivity surveys were carried out using a BRGM Elrec IP-6 or an Androtex TDR-6 with each instrument being a 6 -channel receiver operating in the time-domain mode. The array used was dipole-dipole, read to six separations, with a dipole length and reading interval of 15 m . Four lines were carried out within the magnetic/VLF-EM survey area for a total survey length of $2,300 \mathrm{~m}$. The results were plotted both in pseudosection and plan, and contoured.

The purpose of the work was: (1) to determine the geophysical response to known mineralization on the property, especially the gold/copper-sulphide mineralized shear zone trending northeasterly at about $5+00 \mathrm{E}$ across the grid, (2) to determine the extent of the mineralization, and (3) to locate other mineralized zones.

## CONCLUSIONS

1. The $\mathbb{P} /$ resistivity survey revealed several anomalies within the grid area. The $\mathbb{P}$ anomalies that are of exploration interest, all of which are likely reflecting sulphides, have been labeled by the upper case letters $A$ to $D$. There were also some strong responses from the VLF-EM survey and these have been labeled by the lower case letters ' $a$ ' to ' $c$ '.
2. IP anomaly A occurs within the main shear zone and correlates with a resistivity low, a magnetic low, and VLF-EM conductor ' $a$ '. Also adit \#3 containing sulphide mineralization occurs along $\mathbb{P}$ anomaly A . Therefore, the interpretation of this geophysical signature is a mineralized shear zone. The minimum strike length is 300 meters with it being open to the southeast and to the northwest. Anomaly B', or possibly $B$, could be the northwest extension of A which would extend the minimum strike length to 700 meters. The dip of the causative source appears to be northeasterly.
3. IP anomalies B and B' occur at the northwest edge of the grid area. Both correlate with resistivity highs suggesting the causative sources are sulphide zones within intrusives, or possibly wide quartz veins.
4. IP anomaly C correlates with a strong resistivity low and a magnetic high. VLF-EM conductor ' $b$ ' occurs to its immediate southwest. The causative source, like A, is likely a mineralized shear zone, but one that may contain magnetite.
5. IP anomaly D correlates with a resistivity high and a magnetic low. It likely reflects sulphides possibly within a magmatic phase of the diorite intrusive.
6. VLF-EM conductor ' $c$ ' is a relatively strong conductor that correlates with a weak $\mathbb{P}$ anomalous response and a relatively strong resistivity low. The causative source is likely a shear zone that may be mineralized with sulphides lower in amount than that of anomaly A.
7. The magnetic field over the grid area occurs as a series of lineal-shaped highs and lows trending northwesterly which is perpendicular to the survey line direction. The most prominent feature is a strong resistivity low that is reflecting the main shear zone.

## RECOMMENDATIONS

All four geophysical surveys proved very useful in locating probable mineralization as well as extending known mineral zones. It is therefore recommended that the surveys be extended over the rest of the property. This is assuming that other portions of the exploration programme have encouraging results.

# ADDENDUM GEOPHYSICAL REPORT <br> ON <br> INDUCED POLARIZATION, RESISTIVITY, VLF-EM AND MAGNETIC SURVEYS OVER THE HOPE CLAIM GROUP SONORA POINT, SONORA ISLAND NANAIMO MINING DIVISION, BRITISH COLUMBIA 

## INTRODUCTION AND GENERAL REMARKS

This report discusses the instrumentation, theory, field procedure and results of induced polarization ("IP"), resistivity, VLF-EM, and magnetic surveys carried out over the west central part of the Hope 3 claim which is part of the Hope Claim Group.

All geophysics were carried out during February, 1996, under the direction of the writer. For the $\mathrm{IP} /$ resistivity surveys, two geophysical technicians as well as three helpers comprised the crew of five. The magnetic/VLF-EM surveys were carried out by Andrew Molnar, an employee of Ashworth Exploration Services using a combination magnetic/VLF-EM unit. The exploration program was under the field supervision of Fayz Yacoub, P. Geo., of Ashworth Explorations.

The main purpose of the geophysics was: (1) to determine its response over known mineralized zones, especially a 100 -to 200 -meter shear zone mineralized with pyrite, pyrrhotite, and chalcopyrite containing gold mineralization, some within quartz veins; (2) to determine the strike length of the mineralization; and (3) to locate other mineralized zones. It was thought that the IP (chargeability) survey was the most likely to respond to the mineralized zones. It was also known that alteration was associated with the mineralization and therefore it was expected that these would respond as resistivity lows.

It was also anticipated that the resistivity, magnetic, and VLF-EM surveys would assist in the mapping of the bedrock geology. For the resistivity survey, it was expected that faults and
shear zones may show up as lineal-shaped resistivity lows; intrusive dykes as lineal-shaped resistivity highs, and siliceous zones as resistivity highs. The magnetic survey was expected to map lithology as well as possibly structure. The VLF-EM survey was expected to map geological structure as conductors.

## MAGNETOMETER AND VLF-EM SURVEYS

## (a) Instrumentation

Both the magnetic survey and the VLF-EM survey were carried out with a Scintrex/EDA Omni-Plus unit which consists of a proton precession magnetometer and a VLF-EM receiver. It is a memory system capable of storing up to 1,300 readings. This unit was used with a Scintrex/EDA Omni base station unit for the purpose of monitoring the diurnal variation of the magnetic field. The magnetometer part reads directly in gammas the Earth's total magnetic field to an accuracy of $\pm 0.1$ gamma, over a range of $18,000-110,000$ gammas. The VLF-EM part can read up to three transmitters at the same time in the 15 to 30 kHz range. For each transmitter station, the readings consist of (a) the in-phase, (b) the quadrature, (c) the tilt angle, and (d) the field strength. Also the instrument calculates both a 4 -point and a 5 -point Fraser- filter value automatically as the survey progresses. Operating temperature range is $-40^{\circ}$ to $+55^{\circ} \mathrm{C}$.
(b) Theory
(i) Magnetics

Only two commonly occurring minerals are strongly magnetic -- magnetite and pyrrhotite. Magnetic surveys are therefore used to detect the presence of these minerals in varying concentrations. Therefore, if magnetite or pyrrhotite occurs with economic mineralization, magnetic surveys are used to locate this type of mineralization. Magnetic surveys are also useful as a reconnaissance tool for mapping geologic lithology and structure since different rock types have different background amounts of magnetite and/or pyrrhotite.

## (ii) Electromagnetics

In all electromagnetic prospecting, a transmitter produces an alternating magnetic field (primary) by a strong alternating current usually through a coil of wire. If a conductive mass such as a sulphide body is within this magnetic field, a secondary alternating current is induced within it which in turn induces a secondary magnetic field that
distorts the primary magnetic field. It is this distortion that the EM receiver measures. The VLF-EM uses a frequency range from 13 to 30 kHz , whereas most EM instruments use frequencies ranging from a few hundred to a few thousand Hz . Because of its relatively high frequency, the VLF-EM can pick up bodies of a much lower conductivity and therefore is more susceptible to clay beds, electrolyte-filled fault or shear zones and porous horizons, graphite, carbonaceous sediments, lithological contacts as well as sulphide bodies of too low a conductivity for other EM methods to pick up. Consequently, the VLF-EM has additional uses in mapping structure and in picking up sulphide bodies of too low a conductivity for conventional EM methods and too small for induced polarization. (In places it can be used instead of IP). However, its susceptibility to lower conductive bodies results in a number of anomalies, many of them difficult to explain and, thus, VLF-EM preferably should not be interpreted without a good geological knowledge of the property and/or other geophysical and geochemical surveys.

## (c) Survey Procedure

The readings of the earth's total magnetic field as well as the electromagnetic field from 3 transmitter stations, Seattle (Jim Creek) at 24.8 kHz , Annapolis at 23.4 kHz , and Cutler at 24.0 kHz , were taken at 12.5 m stations along 9 survey lines 100 m apart, and running in a $\mathrm{N} 40^{\circ} \mathrm{E}-\mathrm{S} 40^{\circ} \mathrm{W}\left(040^{\circ} \mathrm{E}-220^{\circ} \mathrm{E}\right)$ direction. The amount surveyed totaled $6,437.5 \mathrm{~m}$.

The diurnal variation of the magnetic field was monitored in the field by a base station which was set up on the property. Each day at the beginning of the surveying, the surveying unit was initialized with the base station unit. The data was then dumped in the evening with the surveying unit interconnected with the base station unit thus enabling the magnetic data to be automatically corrected for diurnal variation.

## (d) Compilation of Data

The magnetic data were edited, and then plotted and contoured onto a plan map with a scale of $1: 5000$ and numbered GP-1. The contour interval chosen was 100 gammas ( nT ). The data were also profiled onto a plan map of the same scale, numbered GP-2, but with a vertical scale of $1 \mathrm{~cm}=400$ gammas ( nT ) using a base of 54,000 gammas.

The 4-point Fraser-filtered Seattle VLF-EM data were also edited, and then plotted and contoured onto a plan map at a scale of 1:5000 and numbered GP-3. The contour interval chosen was $5^{\circ}$. The same tilt-angle data as well as the quadrature data were profiled onto a plan map of the same scale numbered GP-4, but with a vertical scale of 1 $\mathrm{cm}=15^{\circ}$.

All of the above data reduction was carried out using software produced by Geosoft of Toronto, Ontario.

## INDUCED POLARIZATION AND RESISTIVITY SURVEYS

## (a) Instrumentation

The transmitter used for the first part of the induced polarization/resistivity survey was a Model IPT-1 manufactured by Phoenix Geophysics Ltd. of Markham, Ontario, powered by a 2.5 kW motor generator, Model MG-2, also manufactured by Phoenix. The receiver used was a six-channel BRGM, model Elrec 6. The motor generator broke down and thus for the second part of the survey, the transmitter used was a BRGM VIP 3000 , and the receiver, an Androtex TDR-6. Both receivers are state-of-the-art equipment, with software-controlled functions, programmable through a keyboard located on the front of the instrument. They can measure up to 10 chargeability windows and store up to 2,500 measurements within the internal memory.
(b) Theory

When a voltage is applied to the ground, electrical current flows, mainly in the electrolyte-filled capillaries within the rock. If the capillaries also contain certain mineral particles that transport current by electrons (mostly sulphides, some oxides and graphite), then the ionic charges build up at the particle-electrolyte interface, positive ones where the current enters the particle and negative ones where it leaves. This accumulation of charge creates a voltage that tends to oppose the current flow across the interface. When the current is switched off, the created voltage slowly decreases as the accumulated ions diffuse back into the electrolyte. This type of induced polarization phenomena is known as electrode polarization.

A similar effect occurs if clay particles are present in the conducting medium. Charged clay particles attract oppositely-charged ions from the surrounding electrolyte; when the current stops, the ions slowly diffuse back to their equilibrium state. This process is known as membrane polarization and gives rise to induced polarization effects even in the absence of metallic-type conductors.

Most $\mathbb{I P}$ surveys are carried out by taking measurements in the "time-domain" or the "frequency-domain".

Time-domain measurements involve sampling the waveform at intervals after the current is switched off, to derive a dimensionless parameter, the chargeability " M ", which is a measure of the strength of the induced polarization effect. Measurements in the frequency domain are based on the fact that the resistance produced at the
electrolyte-charged particle interface decreases with increasing frequency. The difference between apparent resistivity readings at a high and low frequency is expressed as the percentage frequency effect, or "PFE".

The quantity, apparent resistivity, $\rho_{\mathrm{a}}$, computed from electrical survey results is only the true earth resistivity in a homogenous sub-surface. When vertical (and lateral) variations in electrical properties occur, as they almost always will, the apparent resistivity will be influenced by the various layers, depending on their depth relative to the electrode spacing. A single reading, therefore, cannot be attributed to a particular depth.


The ability of the ground to transmit electricity is, in the absence of metallic-type conductors, almost completely dependent on the volume, nature and content of the pore space. Empirical relationships can be derived linking the formation resistivity to the pore water resistivity, as a function of porosity. Such a formula is Archie's Law, which states (assuming complete saturation) in clean formations:

$$
\frac{\mathrm{R}_{o}}{\mathrm{R}_{\mathrm{w}}}=\mathrm{O}^{-2}
$$

Where: $R_{0}$ is formation resistivity $R_{w}$ is pore water resistivity O is porosity
(c) Survey Procedure

The $\mathbb{P}$ and resistivity measurements were taken in the time-domain mode using an 8second square wave charge cycle ( 2 -seconds positive charge, 2 -seconds off, 2 -seconds negative charge, 2 -seconds off). The delay time used after the charge shuts off was 240 milliseconds and the integration time used was 1,600 milliseconds divided into 10 windows.

The array chosen was the dipole-dipole, shown as follows:


Stainless steel stakes were used for current electrodes as well as for the potential electrodes.

The reading interval and electrode separation chosen was 15 meters and was carried out on the following grids.

There was considerable problems with the precipitation of wet snow which would often short out connections resulting in erroneous readings. Thus many readings had to be retaken.

## (d) Compilation of Data

All the data were reduced by a computer software program developed by Geosoft Inc. of Toronto, Ontario. Parts of this program have been modified by Geotronics Surveys Inc. for its own applications. The computerized data reduction included the resistivity calculations, pseudosection plotting, survey plan plotting and contouring.

The chargeability (IP) values are read directly from the instrument and no data processing is therefore required prior to plotting. The resistivity values are derived from current and voltage readings taken in the field. These values are combined with the geometrical factor appropriate for the dipole-dipole array to compute the apparent resistivities.

All the data has been plotted in pseudosection form at a scale of 1:1250. One map has been plotted for each line are numbered GP-9 to GP-12, re'spectively. The pseudosection is formed by each value being plotted at a point formed from the intersection of a line drawn from the mid-point of each of the two dipoles. The result of this method of plotting is that the farther the dipoles are separated, the deeper the reading is plotted. The resistivity pseudosection is plotted on the upper part of the map for each of the lines, and the chargeability pseudosection is plotted on the lower part.

All pseudosections were contoured at an interval of 5 milliseconds for the chargeability results, and at an interval of logarithmic to the base 10 for the resistivity results.

Also, plan maps were prepared for level $1(n=1)$ and level $4(n=4)$ each for IP and resistivity, each at a scale of 1:5000. The data were plotted and contoured at the same
contour interval as that of the pseudosections. The four plans were numbered GP-5 to GP-8, respectively.

## DISCUSSION OF RESULTS

## (a) Magnetics

The magnetic field over the survey grid varies from a low of 55,737 gammas at $(1+00 \mathrm{E}$, $4+87.5 \mathrm{~N})$, to a high of 56,832 gammas at $(4+00 \mathrm{E}, 0+12.5 \mathrm{~S})$, but the background appears to be about 56,100 gammas.

The most noticeable aspect of the data is its northwesterly trend which parallels the major structural trend across the property. This is easily seen on both the contour map, GP-1, and the profile map, GP-2. Contributing to this trend is a significant low that trends in this direction at about $4+00 \mathrm{~N}$ to $5+00 \mathrm{~N}$. The low correlates directly with the main shear zone (which contains mineralization) and thus is probably a reflection of a lack of magnetite within the shear indicating it was altered by the shear action. The correlation is especially strong with the southwest half of the shear which therefore probably means that this half is more intensely sheared.

Southwest of the low, there is a marked increase in the magnetic field which is undoubtedly reflecting the diorite intrusive. The magnetic field across the diorite has a definite northwest trend, that is, it occurs as a series of highs and lows, many of them lineal-shaped and trending across the entire grid area. The series of highs and lows are probably reflecting magmatic phases within the diorite, or possibly, but less likely, the highs may be reflecting basalt/diabase dykes. However, the 'sharper' lineal highs such as occurs on line $7+00 \mathrm{E}$ at $0+75 \mathrm{~N}$ and on line $4+00 \mathrm{E}$ at $0+12.5 \mathrm{~S}$ (see the profile map) certainly are more likely reflecting basalt/diabase dykes.

The magnetic field over the leucogranite northwest of the shear zone is lower in amplitude than that over the diorite. It also occurs as a series of highs and lows trending northwesterly across the grid area and therefore also is probably reflecting different phases within the intrusive.

There is no direct correlation with any known mineralization on the property other than the magnetic low reflecting the shear zone that is mineralized as mentioned above. Correlations with the other surveys are mentioned below.
(b) VLF-EM

Several VLF-EM conductors have been identified as occurring throughout grid area. Some are strong but short in length, occurring on only one line, while others are weak
but having definite continuity across several lines. The probable causative source in most cases is geologic structure such as faults, shears or lithologic contacts.

For ease of discussion, three conductors, because of their strength and/or length, have been labeled by the lower case letters ' $a$ ' to ' $c$ '.

Conductor ' $a$ ' correlates with the southwestern part of the main shear zone and thus correlates with the associated magnetic low as well. Therefore, as mentioned above, the southwestern part is probably the most intensely sheared.

In addition, on line $4+00 \mathrm{E}$, adit \#3 occurs directly on conductor ' $a$ '. This would suggest that the mineralization that the adit was put in to explore may extend along the total length of conductor ' $a$ ' which potentially could be along the total width of the grid, a distance of 700 meters. However, the probability is that the conductor is reflecting the shear zone itself rather than the mineralization with which it is associated.

Also conductor 'a' correlates directly with a strong resistivity low and IP high A. As discussed below, the resistivity low is probably reflecting the shear zone and the IP high is undoubtedly reflecting sulphide mineralization.

The conductor shown at about $4+00 \mathrm{~N}$ on line $0+00$ also occurs along the southwestern edge of the shear zone and thus it could be an extension of conductor ' $a$ '.

Conductor ' $\mathbf{b}$ ' is relatively strong, having a minimum strike length of 300 m , being open to the southeast. It occurs within the diorite and correlates with a lineal-shaped magnetic high and a resistivity low. The causative source is probably a shear zone as well, or possibly a fault. There is no known mineralization along its strike length but it is associated with an IP anomaly on line $4+00 \mathrm{E}$ that is likely caused by sulphide mineralization. Line $4+00 \mathrm{E}$ is the only line along which IP was done that crosses conductor ' $b$ '.

Conductor ' $\mathbf{c}$ ' is a strong conductor occurring on only one line, $6+00 \mathrm{E}$, at $4+10 \mathrm{~N}$. However, it does correlate with a strong resistivity low and a weak IP high. Conductor ' $c$ ' and the correlating resistivity low are probably due to a shear zone whereas the IP anomaly is probably caused by sulphides. The IP anomaly continues onto line 7+00S whereas the VLF-EM conductor and the resistivity low do not. The minimum strike length of the $\mathbb{P}$ anomaly is therefore 100 meters with it being open to both the northwest and the southeast.

## (c) IP and Resistivity

There are two very prominent and two less prominant IP anomalies and these have been labeled by the upper case letters A and D for ease of discussion.

IP anomaly A consists of an $\mathbb{P}$ high correlating with a resistivity low and occurs along the main shear zone. As mentioned above, it correlates with VLF-EM conductor ' $a$ ' as well as a magnetic low. On line $4+00 \mathrm{E}$, adit \#3 with its associated sulphide mineralization occurs on anomaly A. The minimum strike length is 300 meters with it being open to the southeast. It may also extend to line $0+00 \mathrm{E}$ to the northwest connecting with anomaly B and thus the minimum strike length would become 700 meters. The geophysics suggest that the causative source probably dips to the northeast.

The causative source of $\mathbb{P}$ anomaly A is undoubtedly sulphides especially considering the correlation with adit \#3. The cause of the resistivity low as well as the VLF-EM conductor and the magnetic low is, in all likelihood, the shear zone.

IP anomalies $\mathbf{B}$ and $\mathbf{B}$ ' are both one-line anomalies occurring on line $0+00$. The pseudosection suggests that their causative sources are connected which could well be the case. However, an alternative interpretive model is two or three separate causative sources. Two would subcrop at $4+55 \mathrm{~N}$ and $6+05 \mathrm{~N}$, respectively, dipping to the northeast. Possibly, a third would occur at depth between the other two.

It is quite possible that anomalies $B$ and $B^{\prime}$ are the northwestern extension(s) of anomaly $A$. This is especially possible for anomaly $B$ ' which occurs along the southwest part of the shear zone and correlates with a magnetic low as does anomaly $A$. However, anomalies B and $\mathrm{B}^{\prime}$ correlate with resistivity highs and no VLF-EM conductors, whereas anomaly A correlates with a resistivity low and a VLF-EM conductor. Furthermore, IP anomaly B correlates with a magnetic high. Therefore, it would appear that since the geophysical signatures of the IP anomalies are different, then the causative sources are different.

The causative sources of B and $\mathrm{B}^{\prime}$, considering the resistivity high correlation of each, may be sulphide-mineralized zones that are not sheared (anomaly B occurs just outside the main shear zone).

IP anomaly $\mathbf{C}$ occurs at the southwest end of line $4+00 \mathrm{E}$ very close to the baseline. It consists of a weaker IP high correlating with a very strong resistivity low and a magnetic high. VLF-EM conductor ' $b$ ' occurs to the immediate southwest. The causative source appears to be sulphide mineralization occurring within a shear zone. The magnetic high is somewhat unexpected since one would expect a magnetic low to occur with such a strong resistivity low. Therefore, possibly the causative source is magnetite and/or pyrrhotite occurring with other sulphides such as pyrite and chalcopyrite.

IP anomaly D is located on line $0+00 \mathrm{E}$ at about $3+35 \mathrm{~N}$. It correlates with a resistivity high and a minor magnetic low. There is no VLF-EM correlation. It probably reflects sulphides occurring within a phase of the diorite intrusive.

A number of small IP anomalies occur within the southwestern part of line $0+00 \mathrm{E}$. Most occur at depth and correlate with resistivity highs. The exploration interest of these IP anomalies would depend on the success of exploration over the rest of the property.

Many of the resistivity pseudosections show lineal-shaped resistivity lows. These are indicative of shear zones or faults and thus have been labeled by the word "shear?".

Yours sincerely,


## REFERENCES

Yacoub, Fayz, P.Geo., Personal Communication, February to April, 1996.
Van Nostrand, Tim, geologist, Handwritten Geological Report on the Hope Claim Group, Sonora Island, Nanaimo M.D., B.C., from field work carried out from February 4 to 14, 1996, Ashworth Explorations Ltd.

## GEOPHYSICIST'S CERTIFICATE

I, DAVID G. MARK, of the City of Vancouver, in the Province of British Columbia, do hereby certify that:

I am registered as a Professional Geoscientist with the Association of Professional Engineers and Geoscientists of the Province of British Columbia.

I am a Consulting Geophysicist of Geotronics Surveys Ltd., with offices at \#405-535 Howe Street, Vancouver, British Columbia.

I further certify that:

1. I am a graduate of the University of British Columbia (1968) and hold a B.Sc. degree in Geophysics.
2. I have been practicing my profession for the past 28 years, and have been active in the mining industry for the past 31 years.
3. This report is compiled from data obtained from IP, resistivity, magnetic, and VLF-EM surveys carried out over a portion of the Hope 3 claim during February, 1996. All geophysical surveys were carried out under my supervision with the general exploration program being under the direction of Fayz Yacoub, P.Geo.
4. I do not hold any interest in Aquistar Ventures Inc., nor in the property discussed in this report, nor do I expect to receive any interest as a result of writing this report.

April 8, 1996




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