# GEO $\frac{1}{2}$ RECON inc. 

GEOPHYSICAL EXPLORATIONS


April 17, 1963

## STATEMENT OF QUALIFICATIONS

Sigmund D. Schwarz
Geo-Recon, Inc.
1105 North 38th Street
Seattle 3, Washington

## EDUCATION

B. S. Geology, Oregon State College 1952

## EXPERIENCE

a) 1952-1958

Assistant Geologist for Oregon State Highway Department conducting geophysical investigations of material sources, new highway alignments and landslides.
b) 1956-1958

General partner, Geo-Recon, Oregon Ltd., geophysical consultants.
c) 1958-1962

Chief geophysicist, Geo-Recon, Inc., Seattle, Washington, geo-

d) 1962-present

Vice-President and Manager, Geo-Recon, Inc., Seattle, Washington
e) 1963-present

President, Geo-Recon, Explorations Ltd., Vancouver, B. C. , geophysical consultants.

## PROFESSIONAL ORGANIZATIONS

a) Member Geological Society of America
b) Member American Geophysical Union
c) Associate Member American Institute of Mining and Metallurgican Engineers
d) Member Society of Exploration Geophysicists
e) Member European Association of Exploration Geophysicists
f) Member Association of Engineering. Geologists

Mr. Robert I. Bennett

2800 Thorndyke
Seattle, Washington

## Dear Sir:

As you have requested, we verify the fact that approximately $\$ 575.00$ of total amount spent for our services in exploring the Copper Road Properties was utilized for investigating the western end of the property. This area has since been staked and is identified as claims RIB 1, 2, 3 and 4.

## SDS:hm

Very truly yours, GEO-RECON, INC.

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| $"$ | $"$ |
| $"$ | $"$ |
| $"$ | $"$ |
| $"$ | $"$ |

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## RECONNAISSANCE GEOPHYSICAL INVESTIGATION COPPER ROAD MINING PROPERTY <br> QUADRA ISLAND, B. C.

## A. INTRODUCTION

A reconnaissance geophysical investigation has been completed over several claims of the Copper Road Mining Property, Quadra Island, B. C. The entire property, consisting of fourteen claims, is under lease to Mr. Robert I. Bennett of Heriot Bay.

The property is located near the northern end of the island at an elevation of approximately 1400 feet above sea level and is accessible by vehicle over a rather steep logging road. Deep Water Bay, a potential salt water port, is located approximately two miles to the west of the property.

## B. GENERAL GEOLOGY

The geology of the immediate area does not appear to be complex although a detailed study and description of the geology is beyond the scope of this report. All rock is of volcanic origin consisting primarily of basalt, which at some locations is mantled by a thin veneer of glacial debris. This basalt varies in character from amygdaloidal to dense. A few exposures of highly indurated, interflow agglomerate were also found. These volcanic rocks are reported to have a total thickness of approximately 1100 feet and are relatively flat lying.

Several samples of the basalt were sent to the University of Washington for petrographic analysis and were found to be very slightly altered, coarse grained basalts containing some alteration to Chlorite and carbonates and amygdules of Epidote and Zeolite. Primary Magnetite in these rocks occurs as relatively large, well defined crystals rather than as the usual finely disseminated particles encountered in basalt.

A wide shear zone is exposed at a known ore body which shows considerable mineralization consisting primarily of Calcite, Quartz, Bornite,

Chalcopyrite and Specular Hemette with some Azurite and Malachite. Topographic features in the area indicate that this shear zone probably extends for considerable distance.

## C. GEOPHYSICAL INVESTIGATION

The area explored is shown on the enclosed Plan, Fig. 1. At Area "A" an ore body of commercial grade copper ore is exposed in a trench. This ore body has also been penetrated by several core borings and at the time of this survey a shaft had been sunk approximately 36 feet in preparation for the establishment of an operating mine.

A number of geophysical tests were completed over the exposed ore body in Area "A" to establish method or methods which could accurately and economically be employed to delineate more precisely the extent of this ore body as well as to detect other areas on the property which might be of interest for further detailed investigation. These tests were made with proton magnetometer, self-potential (SP) and electrical resistivity equipment.

Excellent results were obtained with both the magnetometer and SP tests. The magnetometer test indicated a 400 to 900 gamma positive anomaly and the SP test a 175 millivolt negative anomaly over the known ore body. Even though good indications were obtained in the SP test this method was considered to be unreliable because surface water was present from hard rains and could have produced anomalous SP readings. The magnetometer was selected as the best and most economical method for continuing the investigation.

A reconnais sance magnetometer traverse was made over nearly the entire area shown on the enclosed Plan, Fig. 1, in which readings of magnetic intensity were taken at intervals of from twenty to one hundred feet using an ELSEC Type 592/R/A portable proton magnetometer capable of measuring absolute total field magnetic intensity to plus or minus one gamma.

This survey was made without horizontal control and readings were not recorded. During the course of this investigation, five areas were found where high magnetic readings similar to those recorded over the known ore body were detected. These five areas, designated as Areas "B" through "F", were then set aside for more detalled investigation with the magnetometer to determine
the lateral extent and character of the anomaly.

## D. RESULTS

The enclosed Plan, Fig. 1, shows the location of Area "A", the known ore body and Areas "B" through "F" the areas of high magnetic intensity detected in the reconnaissance survey. In addition, the location of each magnetometer traverse within the areas mapped in detail is also shown and identified on the Plan, Fig. 1.

The results of the detailed investigation are shown graphically on the Magnetometer Profiles, Figures 2 through 7 in units of absolute total field magnetic intensity. The original field data is reproduced in Tables 1 through 6 and is in dial units which are inversely proportional to magnetic intensity. These dial units may be converted to gamma by using the Conversion Chart, Fig. 8, or by dividing the reading into $24,051.0$ and multiplying by 100,000 , ie: $24,051.0 /$ meter reading $x 100,000$.

A long, thin, very high anomaly was detected which extends to the west of Area "D". This feature displays a magnetic intensity of approximately 2,000 gamma above normal background, has a length of 400 feet and width of 25 to 60 feet. A series of readings, designated as traverse 26 , were made along the length of this feature with occasional readings to the right and left. This type of traverse does not lend itself to display in graphical form but the field data is reproduced in Table $G$ and the location shown in dark blue on the Plan, Fig. 1.

## E. SUMMARY AND CONCLUSIONS

The results of this investigation show that a significant and well defined magnetic anomaly was measured over a known ore body of commercial value and five other magnetic anomalies of similar intensity were detected in the vicinity. Three of these anomalies, "B", "C" and "D" appear to be associated with the same shear zone as the known ore body, "A", and anomalles "E" and "F" appear to be assoclated with a structure which intersects the above at nearly right angles.

A study of the Magnetometer Profiles, Figs. 2 through 7, of each area show that the boundaries of the high anomalies are sharp and well defined and that a similarity in profile character is observed between adjacent parallel profiles. The sharpness of the anomaly boundaries suggests that the feature causing each anomaly lies at shallow depth and the similarity in character of the profile suggests that the profiles have been made approximately perpendicular to the strike of the feature. Only at Areas "A" and "C" were there any surface indications of mineralization.

The anomalous magnetic feature recorded over the known ore body is reversed in polarity from what would be expected from a sulfide deposit in basalt. The magnetic susceptibility of basalt is much higher than the sulfides, Calcite and Quartz and a low rather than high anomaly would normally be measured.

Our petrographic analysis of the basalt reveals that the se rocks are relatively fresh and of normal mineralogical composition. A detailed mineralogical examination has not been made of the vein materials but we are of the opinion that such an analysis should be made and expect that it would probably reveal the existence of significant quantities of finely disseminated Magnetite and, or Pyrrhotite.

On the basis of information gathered in the course of this investigation, we are of the opinion that there is sufficient evidence to support the conclusion that there are several ore bodies other than those presently exposed at the Copper Road Property and that it would be worthwhile to investigate further the areas detected by this survey.

GEO-RECON INC.


SIGMUND D. SCHWARZ

## MAGNETOMETER READINGS

AREA "A"

## (1) STA. $\mathrm{D}+30 \mathrm{BL}$.

$0+00 \quad 42,139$ (Base Iine)
$0+07$ 41,941
$0+10$ 41,917
$0+12$ 41,901
$0+15$ 41,562
$0+17.5 \quad 41,465$
$0+20$ 41,382
$0+22.541,355$
0+25 41,345
$0+27.5$ 41,372
$0+30 \quad 41,484$
$0+35$ 41, 800
(2) $0+70$
$0+40 \quad 42,352$
$0+42.5 \quad 42,291$
$0+45 \quad 42,280$
$0+47.5 \quad 42,035$
$0+52.541,396$
$0+55$ 41,340 (Base line)
$0+60 \quad 41,331$
$0+70 \quad 41,494$
$0+80 \quad 41,876$
(3) STA, $1+70$ BL
$0=40$, S BL
$0+00 \quad 42,014$
$0+15 \quad 41,974$
$0+30 \quad 41,907$
$0+32.541,694$
$0+35$ 41,599
$0+35 \quad 41,417 \quad\left(20^{\circ} \mathrm{E} \quad 16 \mathrm{~S}\right)$
$0+40$ 41,545 (Base line-S. edge of pit)
0+46 63,319 (Bottom of pit)
$0+46 \quad 56,342$ (Top of pit)
$0+55$ 41,936 (Over pit)
$0+60 \quad 41,938$
$0+75$ 41,769
$1+05$ 41,896

$$
\text { (4) STAe } 2+44
$$

$0+00 \quad 42,148$
$0+15$ 42,159
$0+30 \quad 42,145$
$0+40 \quad 42,034$
$0+45 \quad 41,889$
$0+55$ 41,963
$0+65$ 41,813; 41,833

TABLE 1
(p. 1 of 2)


MAGNETOMETER READINGS
0
AREA "B"
(7) 100' Es of Lake
$0-145 \quad 41,318$
$0-135 \quad 41,438$
0-125 41,605
$0+50 \quad 42,158$
0-115 41,727
$0+60$ 42,047
0-105 41,664
$0-95 \quad 41,627$
$0-85$ 41,537
$0-70 \quad 41,438$
$0-60 \quad 41,442$
0-50 41,385
$0-40 \quad 41,510$
0-30 41,681
0-20 41,844
0-15 41,845
0-10 41,943
$0+00 \quad 42,051$
$0+05 \quad 42,035$
$0+07.542,017$
$0+10 \quad 42,023$
$0+12.542,038$
0+15: 42,087
$0+17.5 \quad 42,165$
$0+20 \quad 42.160$



TABLE 2
(p. 3 of 3)

AREA "C"

| (12) | 260' E. of W. Ore Occe | 0+80 | 41,919 |
| :---: | :---: | :---: | :---: |
| $0+00$ | 42,042 | $0+90$ | 41,907 |
| $0+10$ | 42,042 | 1+00 | 41,897 |
| 0+20 | 41,973 | (14) 185 ${ }^{\circ} \mathrm{E}$, of W. Ore Occe |  |
| $0+30$ | 41,972 | 0+00 | 41,968 |
| $0+40$ | 41,941 | $0+10$ | 42,039 |
| 0+50 | 41,939 | 0+20 | 41,964 |
| $0+60$ | 41,903 | $0+30$ | 41,907 |
| $0+70$ | 41,894 | $0+40$ | 41,939 |
| $0+80$ | 41,946 | $0+50$ | 41,836 |
| $0+90$ | 41,875 | 0+60 | 41,66? |
| 1+00 | 41,975 | $0+70$ | 41,629 |
| $2+10$ | 41,862 | $0+80$ | 41,571 |
| (13) | 220' ie of We Ore Occe | 0+90 | 41,745 |
| 0-10 | 42,026 | 1+00 | 41,946 |
| 0+00 | 42,004 | $1+10$ | 41,950 |
| $0+10$ | 41,948 | (15) | From Traverse 12 to 14 $0=0+70$ traverse 12 |
| $0+20$ | 41,950 |  |  |
| $0+30$ | 41,921 | 0+00 | 41,906 |
| $0+40$ | 41,873 | 0+10 | 41,901 |
| $0+50$ | 41,839 | 0+20 | 41,869 |
| $0+60$ | 41,863 | 0+30 | 41,858 |
| 0+65 | 41,888 | $0+40$ | 41,858 |
| $0+70$ | 41,901 | $0+50$ | 41,867 |


|  | 0+60 | 41,830 | 41,633 |
| :---: | :---: | :---: | :---: |
| $\square$ | $0+70$ | 41,661 | 41,520 |
|  | $0+80$ | 41,556 | 41,476 |
|  | $0+90$ | 41,525 | 41,457 |
|  | 1+00 | 41,481 | 41,352 |
|  | $1+10$ | 41,525 | 41,649 |
|  | $1+20$ | 41,542 | 41,930 |
|  | (16) | 85' Ee_of We Ore Occ. | 41,954 |
|  | 0-100 | 41,987 | We Ore Occe at Face of Cliff |
|  | 0-90 | 41.952 | 4],874 |
|  | 0-80 | 41,984 | 41,923 |
|  | 0-70 | 41,935 | 42,003 |
|  | 0-60 | 42,458; 42,911 | 41,996 |
| $\square$ | 0-50 | 42,981 | 41,747 |
|  | 0-45 | 42,930 | 41,602 |
|  | 0-40 | 41,294 | 41,610 |
|  | 0-20 | 41,698 | 41,807 |
|  | $0+\infty$ | 42,053 | 41,907 |
|  | O+10 | 42,095 | 42,017 |
|  | 0+20 | 42,042 | 42,032 |
|  | $0+30$ | 41,989 | 41,975 |
|  | $0+35$ | 41,989 | 50. We of We Ore Occe |
|  | 0+40 | 41,903 | 42,067 |
|  | $0+45$ | 41,901 | 42,111 |
|  | $0+50$ | 41,837 | 42,064. |
| $\checkmark$ | $\begin{gathered} \text { TABLE } 3 \\ (\mathrm{p} \cdot 2 \text { of } 3) \end{gathered}$ |  |  |



| (22) | Stump Marked "M" 1,000' We | 0-90 | 42,000 |
| :---: | :---: | :---: | :---: |
|  | of West Ore Occurrence $=0$ | 0-80 | 41,915 |
| 0+00 | 42,261 | 0-70 | 41,974 |
| $0+10$ | 42,313 | 0-60 | 41,810 |
| 0+20 | 42,139 | 0-50 | 41,860 |
| 0+25 | 41,931 | 0-40 | 41,839 |
| $0+30$ | 41,880 | 0-30 | 41,940 |
| 0+35 | 41,545 | 0-20 | 41,919 |
| $0+40$ | 41,455 | 0-10 | 41,960 |
| 0+45 | 41,425 | $0+00$ | 42,158 |
| $0+50$ | 41,400 | $0+10$ | 42,391 |
| $0+60$ | 41,430 | 0+20 | 42,336 |
| $0+70$ | 41,625 | $0+30$ | 42,118 |
| 0+80 | 41,819 | $0+40$ | 41,898 |
| $0+90$ | 41,807! | $0+45$ | 41,670 |
| $1+00$ | 41,820 | $0+50$ | 41,555 |
| $1+10$ | 41,895 | $0+55$ | 41,508 |
| $1+20$ | 41,979 | $0+60$ | 41,549 |
| $1+30$ | 42,021 | 0+70 | 41,842 |
| (23) | 100. We of Stump "M" | $0+80$ | 41,877 |
| 1-20 | 41,937 | 0+90 | 41,851 |
| 1-10 | 41,964 | 1+00 | 41,837 |
| 1-00 | 41,996 | 1+10 | 41,937 |


| $\square$ | $1+20$ (24) | $41,941$ <br> 200. We of Stump "M" | $\begin{aligned} & 2+10 \\ & 2+20 \end{aligned}$ | $\begin{aligned} & 41,672 \\ & 41,759 \end{aligned}$ |  |
| :---: | :---: | :---: | :---: | :---: | :---: |
|  | 0+00 | 41,907 | (25) | 280, F . of Stump |  |
|  | $0+10$ | 41,984 | 0+00 | 41,969 |  |
|  | 0+20 | 42,249 | $0+10$ | 41,941 |  |
|  | $0+30$ | 42,310 (Claim post) | 0+2.0 | 41,613 |  |
|  | $0+40$ | 42,108 | $0+30$ | 41,456 |  |
|  | 0+50 | 41,956 | 0+40 | 41,424 |  |
|  | 0+60 | 41,819 | 0+50 | 41,503 |  |
|  | 0+65 | 41,683 | 0+60 | 41,425 |  |
|  | $0+70$ | 41,657 | $0+70$ | 41,457 |  |
|  | $0+75$ | 41,612 | 0+80 | 41,439 |  |
|  | $0+80$ | 41,580 | $0+90$ | 41,384 |  |
| $\omega$ | $0+90$ | 41,535 | $1+00$ | 41,2.74 |  |
|  | $1+00$ | 41,432 | $1+10$ | 41,282 |  |
|  | 1+10 | 41,162 | $1+20$ | 41,299 |  |
|  | $1+15$ | 41,209 | $1+30$ | 41,327 |  |
|  | $1+20$ | 41,174 | $1+40$ | 41,339 |  |
|  | $1+30$ | 40,903 | $1+50$ | 41,388 |  |
|  | $1+40$ | 40,976 | $1+60$ | 41,313 |  |
|  | $1+50$ | 40,959 | $1+70$ | 41,062 |  |
|  | $1+60$ | 41,021 | $1+80$ | 40,851 |  |
|  | 1+70 | 41,211 | 1+90 | 40,864 |  |
|  | $1+80$ | 41,210 | $2+00$ | 40,232 |  |
|  | $1+90$ | 41,256 | $2+10$ | 41,108 |  |
|  | $2+00$ | 41,496 | $2+20$ | 41,626 |  |
|  |  |  |  |  |  |



TABLE 4

## MAGNETOMETER RFADINGS

AREA "E"

| (27) | 280'N of Lake E-H | 0+70 | 41,663 |
| :---: | :---: | :---: | :---: |
| $0+00$ | 41,929 | 0+80 | 41,599 |
| $0+10$ | 41,936 | $0+90$ | 41,574 |
| $0+20$ | 41,671 | $1+00$ | 41,60? |
| $0+30$ | 41,570 | $1+10$ | 41,684 |
| 0+40 | 41,544 | $1+? 0$ | 41,813 |
| $0+50$ | 41,622 | $1+30$ | 41,602 |
| 0+60 | 41,806 | $1+40$ | 41,950 |
| $0+70$ | 41,885 | $1+50$ | 41,954 |
| $0+80$ | 41,973 | $1+60$ | 41,92? |
| $0+90$ | 41,902. | $1+70$ | 41,996 |
| $1+00$ | 41,950 | $1+80$ | 41,968 |
| High Ixtends Approx. 150' on to North, Almost to Road. |  | $1+90$ | 41,990 |
|  |  | $2+00$ | 41,972 |
| (28) 150' He of Lake |  |  |  |
| 0-10 | 41,984 |  |  |
| $0+00$ | 41,866 |  |  |
| 0+10 | 41,840 |  |  |
| 0+20 | 41,89? |  |  |
| 0+30 | 41,625 |  |  |
| $0+40$ | 41,694 |  |  |
| $0+50$ | 41,895 |  |  |
| $0+60$ | 41,821 |  |  |

## MAGNETOIETPR READINGS

$u$

| (29) Line ${ }^{\text {ce }}$ of pond $0=E$ |  |  | $0+10$ | 41,957 |
| :---: | :---: | :---: | :---: | :---: |
|  | 0-10 | 41,427 | $0+20$ | 41.875 |
|  | 0+00 | 41,102 | $0+30$ | 41,655 |
|  | $0+10$ | 41,693 | 0+40 | 41,551. |
|  | $0+20$ | 41,903 | $0+50$ | 41,549 |
|  | O+30 | 141,75? | 0+60 | 41,557 |
|  | $0+40$ | 41,904 | $0+70$ | 42,517 |
|  | $0+50$ | 41,964 | $0+80$ | 41,576 |
|  | $0+60$ | 41.973 | $0+90$ | 41,568 |
|  | $0+70$ | 42,090 | $1+00$ | 41,576 |
|  | 0+80 | 41,046 | 1+10 | 41,839 |
| $\bigcirc$ | $0+90$ | 41,638 | $1+20$ | $41,929$ |
| - | 1+00 | 41,466 | (31) | 200' 5. of rond |
|  | $1+10$ | 41,31.4 | $0+00$ | 42,016 |
|  | $1+20$ | 41,380 | $0+10$ | 41,999 |
|  | $1+30$ | 41,650 | 0+20 | 42,02.4 |
|  | $1+40$ | 41,651 | $0+30$ | 42,025 |
|  | $1+50$ | 41,554 | $0+40$ | 42,0414 |
|  | $1+60$ | 41,557 | 0+50 | 41,991 |
|  | $1+70$ | 41,562 | $0+60$ | 41,910 |
|  | $1+80$ | 41,863 | $0+70$ | 41,93? |
|  | $1+90$ | 42,522 | 0+80 | 41,995 |
|  | $2+00$ | 42,212 | $0+90$ | 42,039 |
|  | (30) | 100'S. of Pond | $1+00$ | 42,037 |
| 3 | 0+00 | 41,996 |  |  |

ARFA "F"
$0+10 \quad 41,957$1. Mobilization of personnel and equipment fromSeattle to Quadra Island and return - Lump Sum
2. Field Exploration
a) Services of geophysicist from April 20 through 23, 1962.
23 hrs @ $\$ 10.00 / \mathrm{hr}$. \$ 230.00
b) Automobile expenses on Quadra 66 miles @ \$.10/mile
\$ 6.60
c) Geophysical equipment from April 20 through 23, 1962
3 days @ $\$ 30.00 /$ day
$\$ \quad 90.00$
3. Interpretation and Report
a) Services of geophysicist from April 25 through May 14, 1962

35 hours @ \$10.00/hr. \$ 350.00
b) Services of draftsman on May 13 and 14, 1962

9 hrs.@ $\$ 6.00 / \mathrm{hr}$.
$\$ \quad 54.00$
4. Miscellaneous Services
a) Preparation of thin sections and petrographic analysis
\$ 5.40
b) Labor and field assistants
furnished
c) Transportation on Quadra excent as indicated
furnished
d) Meals and lodgings
furnished
\$ $1,036.00$







PROFILE 28 AREA "E"
n


Department of
Mines and Petroleum Resources A.: SilENT REPORT

NO. $\qquad$

$?$

$\square 8=$ An An


