



# Vananda Gold Ltd.

680381



Vananda Gold Ltd. is an active exploration and development company specializing in precious metal prospects. The company currently controls the claims of all the five former major producing mines on Texada Island, British Columbia. Vananda Gold Ltd. trades on the Vancouver Stock Exchange under the symbol VAG.

U.S.A. 12g3-2 Exemption #82-1883



# Vananda Gold

## The Company

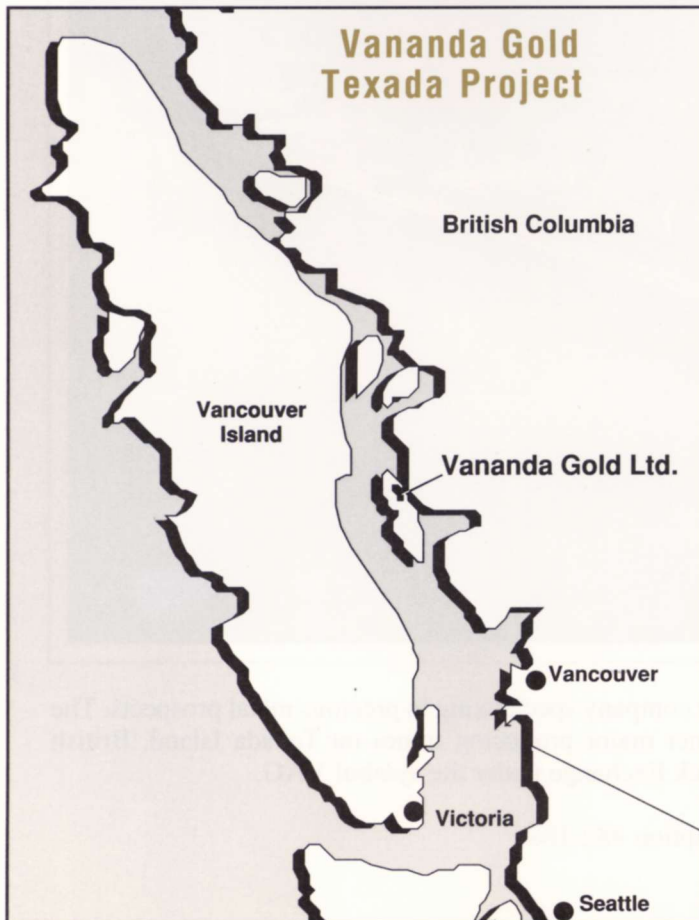
Incorporated in 1986, Vananda Gold was listed on the Vancouver Stock Exchange on September 15, 1987.

Currently Vananda Gold has a low capitalization giving it's shareholders high leverage on likely further discoveries.

### Capitalization

Authorized .....	100,000,000
Outstanding .....	1,650,000
Escrow .....	750,000

President and CEO Stanley L. Beale has assembled an excellent management team with many years of experience in exploration and senior management. This provides the company with the expertise to compete aggressively and successfully in the acquisition, financing and development of precious metal prospects.



## The Project

Vananda Gold's Texada Project is positioned to join the ranks of significant gold discoveries in North America.

The property owned by Vananda Gold on Texada Island, 75 miles northwest of Vancouver, B.C., includes all the former producing mines on the island.

Producing high grade gold, silver, copper and iron since 1880, Texada Island is still a dynamic mining community.

The infrastructure necessary to support a large mining operation already exists on the island: three operating limestone quarries, power-grid, roads, experienced labour force, deep-sea docking and shipping facilities — all this available at no capital cost.

Exploration targets have been qualified and diamond drilling has proven successful in finding high grade gold and copper ore at the first of these targets.

Drilling to define reserves is scheduled for November of 1989.

Joint-venture partner Freeport McMoRan Gold is looking for a deposit of 2 million tons or larger of high grade gold ore. Freeport now has a substantial investment in the Texada Project having spent over \$1.3 million during the 1988-89 program. This is a significant statement as to the merits of this project and the future of Vananda Gold.

## Joint Venture

In June of 1988 Vananda Gold signed a joint venture agreement with American mining major Freeport McMoRan Gold Company. Freeport is a large gold producer with mining operations in Nevada, and throughout the USA and Canada. The parent company, Freeport McMoRan Inc. trades on the NYSE and posted revenues in 1988 of some US \$1.8 Billion. Freeport has the expertise and financial ability to conduct a successful program on Vananda Gold's Texada Island property.

Freeport McMoRan Gold can earn 51% of the Texada property by spending (Can) \$1.3 million and paying \$250,000 to Vananda Gold. Freeport has the right to earn 70% by spending another \$1.3 million and paying \$250,000 cash. As of October 1989 Freeport has spent \$1.26 million and paid \$100,000 in cash.

## Area of Exploration

The gold-copper-silver skarn deposits near the original gold camp of Vananda, operating in the early 1900's produced 86,000 oz. Au, 580,000 oz. Ag and 21,000,000 lbs. Cu.

As of 1989 Freeport has completed 24,000 feet of diamond drilling and an extensive program of mapping and sampling, geophysics and geochemistry. Major intersections of high grade gold and copper show an extension of previously outlined ore zones in the Little Billie mine.

Drilling in the 1988-89 season at the Little Billie Mine indicated significant reserves of high grade gold and copper ore just below the old mine workings. This ore is projected to continue at depth beneath both the Copper Queen and the Marble Bay Mines to the west.

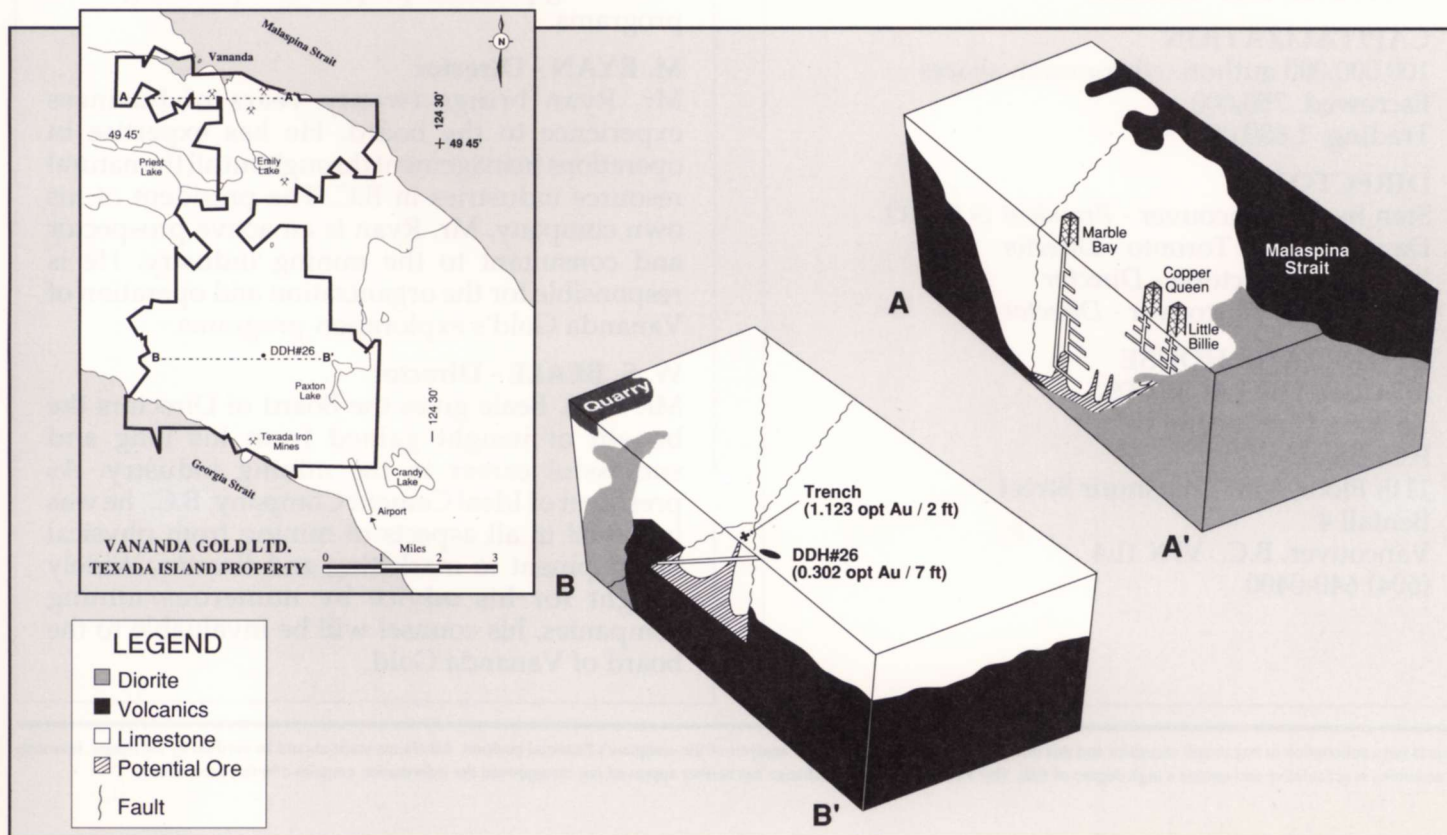
Another target of economic potential on the property is the magnetite skarn deposits of the Texada Iron Mines. These mines produced more than 20 million tons of iron concentrate, 32,000 oz. Au, 850,000 oz. Ag, and 59,000,000 lbs. Cu.

In this region drill hole #26 intersected 7.2 feet of 0.302 opt Au confirming the extension of gold-rich surface workings (running 1.123 opt Au) to a depth of at least 300 feet. Surface geology shows a total strike length of 1,500 feet of massive sulphide veining. This suggests that there is the potential for the development of a significant ore deposit in this area.

Drilling to establish ore reserves at drill hole #26 and the Little Billie Mine as well as numerous other targets is scheduled to begin in November of 1989.

### Recent Drill Results, Little Billie Mine

	DDH	Length (ft)	Au (opt)	Ag (opt)	Cu (%)
1988	T88-1	19.3	0.212	0.85	1.60
		8.2	0.416	2.65	5.92
	T88-3	16.7	0.820	2.16	2.98
	T88-4	15.1	0.508	1.57	2.60





# Vananda Gold Ltd.

## Corporate Data

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### AUDITORS

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Richmond, B.C. V6X 3M1

### SOLICITORS

Maitland & Company  
700-625 Howe Street  
Vancouver, B.C. V6C 2T6

### CAPITALIZATION

100,000,000 authorized common shares  
Escrowed: 750,000  
Trading: 1,650,000

### DIRECTORS

Stan Beale, Vancouver - *President & C.E.O.*  
Dave Watkins, Toronto - *Director*  
Mike Ryan, Victoria - *Director*  
W. S. Beale, Vancouver - *Director*

### BROKERAGE HOUSE /SECURITIES AGENTS

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(604) 640-0400

## Key Personnel

### S. L. BEALE - President and C.E.O.

Mr. Beale has been actively involved in the mining exploration business for twenty years. He established Vananda Gold in 1986 to develop the claim group on Texada Island and to pursue further acquisitions. With his experience in carrying prospects through to successful mining exploration projects Mr. Beale provides the dynamic leadership that will assure Vananda Gold a prosperous future.

### D. WATKINS - Director

Mr. Watkins is Vice-President of Exploration for Minnova, one of the premier mine-finding companies in North America. He has been responsible for directing the exploration programs that have resulted in a number of mines in Canada. His expertise in the exploration business gives the company superior technical guidance in evaluating potential projects and planning work programs.

### M. RYAN - Director

Mr. Ryan brings twenty years of business experience to the board. He has expertise in operations management throughout all the natural resource industries in B.C. The president of his own company, Mr. Ryan is an active prospector and consultant to the mining industry. He is responsible for the organization and operation of Vananda Gold's exploration programs.

### W. S. BEALE - Director

Mr. W. S. Beale gives the Board of Directors the benefit of insight gained from his long and successful career in the mining industry. As president of Ideal Cement Company, B.C., he was involved in all aspects of mining from physical development to marketing and finance. Widely sought for his advice by numerous mining companies, his counsel will be invaluable to the board of Vananda Gold.

TEXADA ISLAND  
PROJECT

April, 1990

VANANDA GOLD LTD.

# TABLE OF CONTENTS

	<u>PAGE</u>
<b>SUMMARY</b>	
<b>1.0 INTRODUCTION</b>	1
1.1 Location & Access	1
1.2 Infrastructure	1
1.3 Topography and Climate	2
1.4 Claim Holdings	2
1.5 Underlying Agreements	2
1.6 Sandy Claim Agreement	4
1.7 Marble Bay Fraction No. 1 Agreement	4
<b>2.0 HISTORY</b>	5
2.1 Exploration History	
2.1.1 Early History	6
2.1.2 Middle History (1942-1952)	6
2.1.3 Recent History (1976-1978)	7
2.2 Vananda Gold/Freeport Joint Venture 1988 Program	8
2.3 1989 Program	8
<b>3.0 REGIONAL GEOLOGY</b>	9
<b>4.0 PROPERTY GEOLOGY</b>	10
4.1 Karmutsen Formation	10
4.2 Quatsino Formation	10
4.3 Intrusives	11
4.4 Structural Geology	12
<b>5.0 ECONOMIC GEOLOGY</b>	
5.1 Mineralization	12
<b>6.0 GEOCHEMISTRY</b>	
6.1 Soil Geochemistry	14
6.2 Rock Geochemistry	14
<b>7.0 GEOPHYSICS</b>	15
<b>8.0 DIAMOND DRILLING</b>	16

## SUMMARY

The Texada Island property contains several past producing Au-Cu-Fe mines and many prospected gold occurrences. This mineralization is contained in a 3 km wide belt of limestone extending from the town of Vananda, southward to the village of Gillies Bay (Figures 1 and 2). Skarn forms the dominant deposit type with Cu-Au skarns occurring in the Vananda area, and Fe-Au skarns in the Texada Iron Mines area near Gillies Bay. The Fe-Au skarns produced over 30,000 oz of Au as a by product of magnetite production. These deposits formed proximal to the Gillies quartz monzonite stock. Recent soil geochemistry and geophysical surveys indicate that this mineralization may be surrounded by gold skarn mineralization, more distal to the Gillies stock, to the north.

Copper-gold skarns in the Vananda area produced over 85,000 oz of gold. Auriferous garnet-wollastonite - bornite skarn in the Little Billie mine forms along a quartz diorite-marble contact and is open to depth. A drill indicated resource of 170,000 tons grading 0.211 opt Au is identified within the Little Billie ore body.

### Recent Drill Results, Little Billie Mine

	DDH	Length (ft)	Au (opt)	Ag (opt)	Cu (%)
1988	T88-1	19.3	0.212	0.85	1.60
		8.2	0.416	2.65	5.92
	T88-3	16.7	0.820	2.16	2.98
	T88-4	15.1	0.508	1.57	2.60

Still to be drill-tested is the favourable area between the Marble Bay, Little Billie and Copper Queen mines. To the west of the Little Billie mine, sulphide-rich garnet skarn, exhibiting intense retrograde alteration occurs in the Florence-Security area. Chip sampling returned up to 0.8 opt Au over 1 m and gold bearing skarn mineralization has been exposed by trenching over an area 700 m long by approximately 50 m wide. Mineralization in the Florence-Security area and Little Billie mine may be analogous to the zoned skarn system in the Battle Mountain district. Proximal Cu-Au skarn at the Little Billie Mine may be similar to mineralization at the Copper Canyon and Minnie-Tomboy areas at Battle Mountain, with the auriferous, sulphide-rich skarn in the Florence-Security area being similar to the more distal gold skarn in the Fortitude ore body.

The massive sulphide replacement deposits may well have a close genetic link to the skarns and are therefore indicative of deep-seated skarn targets. At Texada the relationship of the base and precious metal replacement manto deposits with respect to the skarns has not been directly established. However, considerable speculation has been made as to their importance, particularly as the soil geochemistry has outlined extensive areas of anomalous zinc values with associated lead, cadmium, arsenic and lesser copper and gold. Clearly, the proximity of these showings and anomalies to the major fault structures (i.e., the Holly and Marble Bay), as well as to the intrusive bodies like the Northwest Diorite must be considered important. The more distal occurrences, such as the Lucky Jack, Vauxhall, Sandy veins and Sentinel are also structurally related to north-south and northwest-southeast fracture and/or breccia systems. These sulphide showings could be the upper expression of a deep seated skarn system.

For the present, exploration must focus on the major structures, particularly the Holly/Lake structure and the sulphide and skarn occurrences along it, as well as the Marble Bay fault; and the overhanging intrusive contacts, particularly the Northwest Diorite, the Volunteer Sill and the Little Billie Stock.



## I N T R O D U C T I O N

From June 1986 to December 1989, Vananda Gold Ltd. has spent over \$1.8 million in exploration on its Texada Island property. This figure includes 25,000 feet (7,620 m) of diamond drilling completed between late 1988 and 1989 by Freeport - McMoRan Gold. A recent engineering report (Peatfield, 1990) has estimated that drilling at the Little Billie Mine has outlined 170,000 tons at 0.211 opt Au and 1.5% Cu. This zone is open to the southeast, to the north and at depth.

Vananda Gold has a 100% interest in the 120 mineral claims on 5,200 acres comprising the entire Texada gold camp.

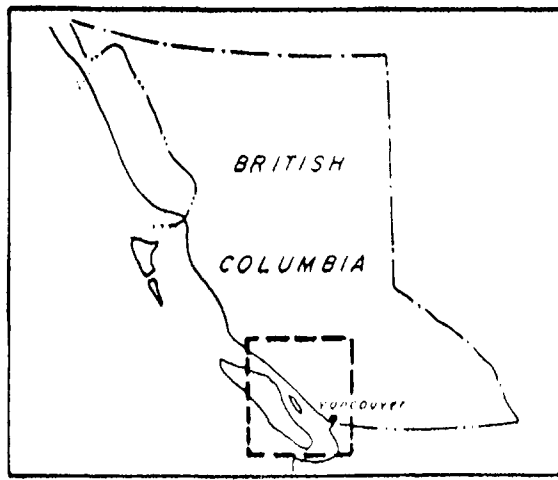
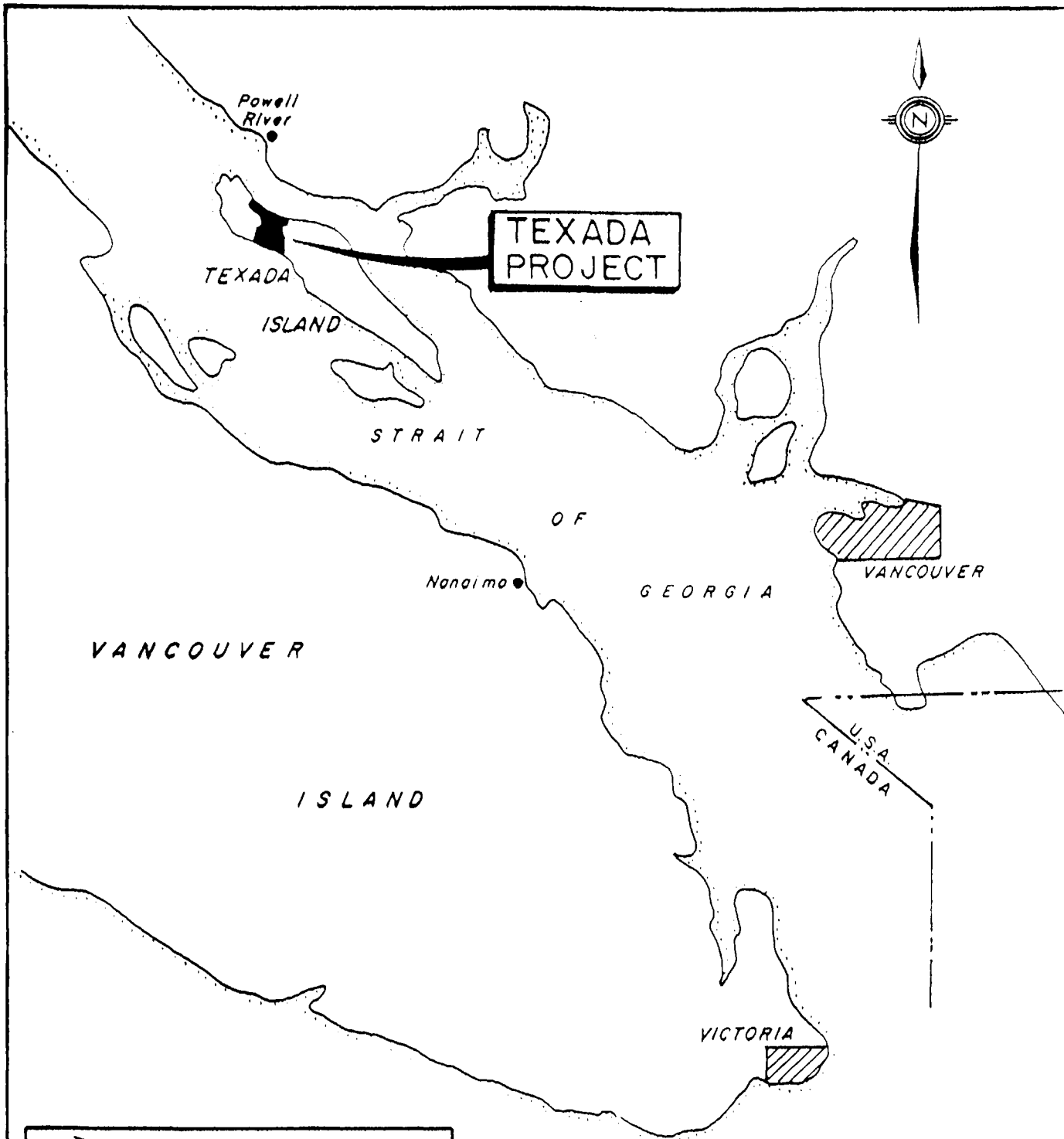
### 1.1. Location and Access

The claim block is situated near the northern end of Texada Island, (Figure 1), encompassing the small town of Vananda, 120 km northwest of Vancouver, B.C. Well serviced by road and ferry from Powell River, as well as scheduled air service into a 3,300 foot asphalt air strip. Three operating limestone quarries ship approximately 4 million tons of limestone annually. The now dormant Texada Iron Mines, located at the southern end of the claim block has a deep water port facility that allowed ocean-going ships to transport concentrate directly to Japan.

### 1.2. Infrastructure

The principal settlements of Texada Island are Vananda and Gillies Bay, each with approximately 700 and 400 residents, respectively. Situated at the northern and southern ends of the claim block, the towns are connected by a paved highway and power lines through the central portion of the claims. Powell River, a city of 14,000 people, is the ferry terminus of the island and the main population centre of the region.

The southwest portion of the claim block is actively quarried by Ideal Cement Company, producing 2.6 million tons of limestone annually. The northeast corner of the claims encompass a large, dormant limestone quarry, owned by Lafarge Cement, with a small, chemical grade, limestone quarry operating immediately to the south and adjacent to the eastern boundary of the property. At the most northerly end of the island, near the ferry terminal, the third operating quarry, owned by Ashgrove Cement Company, produces one million tons of limestone per annum.



VANANDA GOLD LTD.	
TEXADA PROJECT	
LOCATION	
SCALE 1:1,000,000	DATE MARCH 1989
NTS 92F-10E,15E	FIGURE NR 1

Logging is an important secondary industry for the Island, with two small companies sharing the harvest. The two small logging companies often provide heavy machinery and timber clearing services to the quarries and for road and drill site preparation. Tourism and other activities normally adversely affected by mining are virtually nonexistent.

The island is well serviced with electric power as the main electrical transmission line between Vancouver Island and the mainland crosses Texada Island. The extension of the Transmountain Gas Pipeline to Vancouver Island has recently started and will traverse the island.

### **1.3 Topography and Climate**

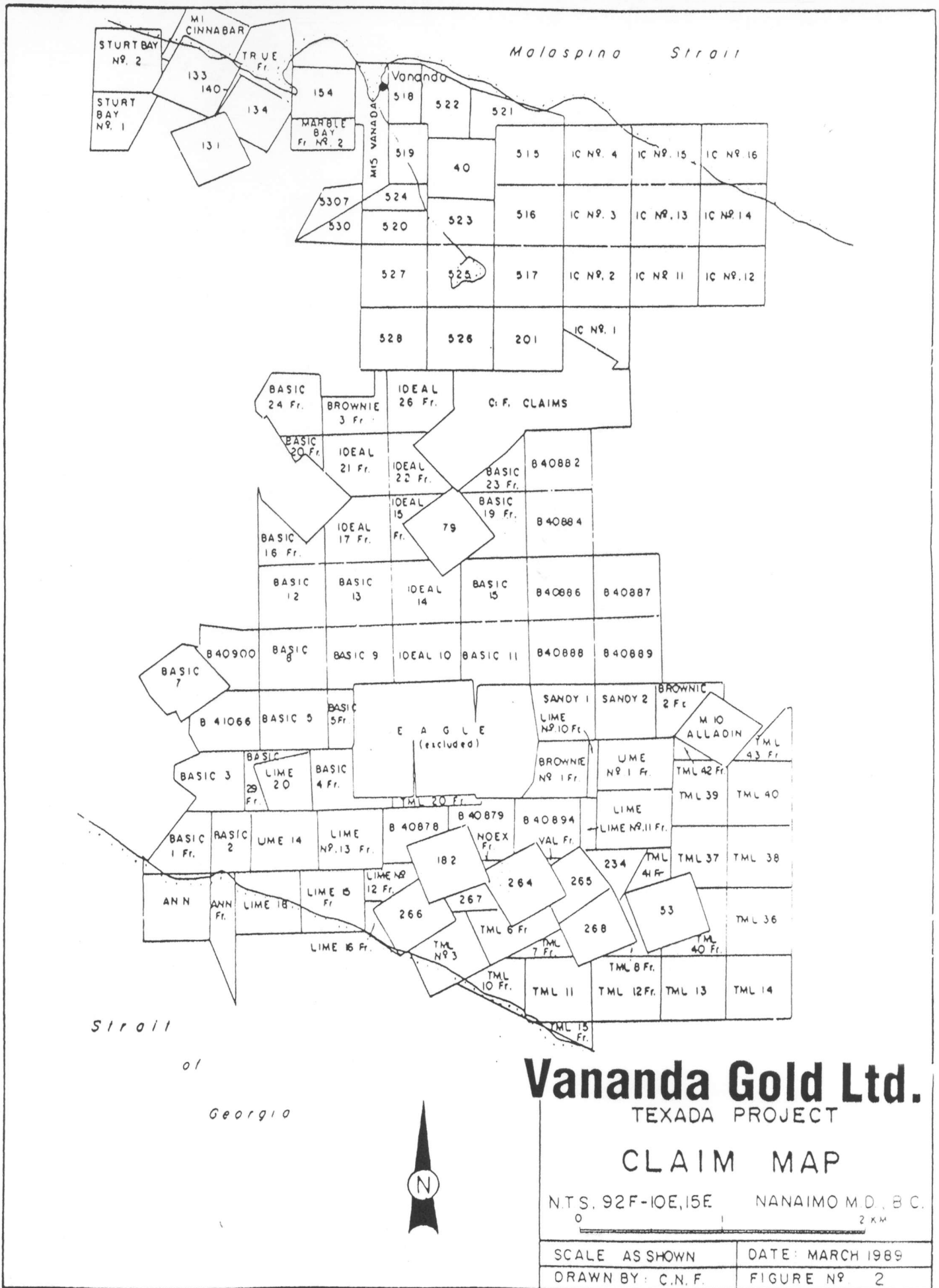
The northern half of the island has moderate topography with up to 500 feet of relief on the claim block. Climate is cool and wet in the winter and warm and dry in the summer. Snowfall and protracted cold weather are uncommon, hence year round exploration and development is possible. Yearly rainfall averages 30 inches.

### **1.4 Claim Holdings**

The claim block includes three mining leases, thirty-one crown granted mineral claims, and eighty-nine located claims and fractions. Owned by Ideal Cement Company and leased to Vananda Gold Ltd., the claims are subject to underlying Net Profit and Net Smelter Returns described below. The irregular shaped claim block, (Figure 2), is roughly four miles long (N-S), three miles wide, and totals approximately 5,200 acres. Assessment work has recently extended expiration dates on all staked claims to 1999.

### **1.5 Underlying Agreements**

The property is subject to a lease agreement, dated December 28, 1978, between Ideal Cement and Shima Resources Ltd., and re-assigned and amended July 25, 1983, to Marble Bay Holdings Ltd. and it's parent company, Cartier Resources.



Strait

of

Georgia



# Vananda Gold Ltd.

TEXADA PROJECT

## CLAIM MAP

N.T.S. 92F-10E, 15E NANAIMO M.D., B.C.

0 1 2 KM

SCALE AS SHOWN DATE: MARCH 1989

DRAWN BY: C.N.F. FIGURE NO. 2

Provisions include:

- a) \$200,000 due Ideal Cement during the twenty month period commencing on the second anniversary of commercial production;
- b) a 6% net profit interest, subject to a \$10,000 minimum annual payment.

Cartier Resources subsequently entered into an agreement, dated June 30, 1986, with Vananda Gold Ltd. (VGL) that allowed VGL the right to earn 100 percent interest in the lease by spending \$425,000 before July 31, 1988. This was accomplished and recognized by Cartier by letter.

However, Cartier retains a 2.5% Net Smelter Royalty, subject to a \$2,000,000 buy-out.

Cartier Resources reserves the right to recover a 20% working interest in the lease by paying to Vananda, by bank draft, an amount equal to the aggregate of all the Expenditures incurred by Vananda on the property after Vananda has earned its 100% interest. Cartier can only exercise this right after it has received a copy of a feasibility study recommending that the Mineral Properties be placed into production and has 180 days to make their declaration. This is a one time option and pertains only to the first feasibility study. If not exercised, the right does not apply to subsequent feasibility studies.

Expenditures referred to above are defined in the June 30, 1986 agreement as:

"those pertaining to Mining Operations, including every kind of work done on or in respect of, the Mineral Properties or the products therefrom by or under the direction of Vananda and all expenditures in respect of, or incidental to such work."

It is assumed that all expenditures by any joint venture partners on the property are deemed to be Vananda expenditures for the purpose of calculating the payment.

**1.6 Sandy Claim Agreement**

Freeport-McMoRan Gold Co. (Canada) Ltd., on September 12, 1988 optioned two claims, Sandy 1 & 2, within the main property from Messrs. Johanson, Perry and Duker of Vananda. Terms of this agreement include:

\$ 4,500	Paid September 12, 1988
\$ 6,000	Paid September 12, 1989
\$ 9,000	Due September 12, 1990
\$12,000	Due September 12, 1991
\$15,000	due September 12, 1992

3% Net Smelter Return, subject to:

\$1,500,000 buy-out of the Net Smelter Return.

**1.7 Marble Bay Fraction No. 1 Agreement**

An option agreement between Freeport-McMoRan Gold and Messrs. M. Donald and R. Kimball was signed May 5, 1989 regarding the Marble Bay Fraction No. 1 mineral claim. Terms of the agreement include:

\$ 5,000	Paid May 5, 1989
\$ 5,000	Due May 5, 1990
\$ 5,000	Due May 5, 1991

3% Net Smelter Return from commencement of commercial production, subject to a \$500,000 buy-out of Net Smelter Return.

Both the Sandy Claim Agreement and the Marble Bay Fraction No. 1 Agreement became part of the Vananda Gold, Freeport McMoRan Gold joint venture agreement and have been transferred directly to Vananda Gold since the termination of the joint venture.

2.0 HISTORY

The property includes:

1. Four past-producing gold/copper skarn deposits of the Vananda Camp, which includes the Marble Bay Mine, the Little Billie Mine, the Copper Queen Mine and the Cornell Mine.
2. Four open pit iron/copper skarn deposits referred to collectively as Texada Iron Mines. These include the Prescott, the Yellow Kidd, the Paxton and the Lake Deposits. In addition, there were at least four horizontal underground deposits mined beneath, and peripheral to the open pits.
3. Two limestone quarries, one of which has been shut down.

Gold production totalled 85,500 ounces from the four gold mines and 31,300 ounces from the iron deposits. Copper production from Texada Iron was 59 million pounds and 23 million pounds from the Vananda deposits. Texada Iron also produced 10,000,000 long tons of iron concentrate from 20,000,000 long tons of ore. The limestone quarries have produced approximately 50 million tons with with Ideal Cement continuing to produce 3 million tons per annum.

Table 1, from Peatfield, 1986, summarizes the production history of the individual deposits.

TABLE 1 - PRODUCTION HISTORY OF TEXADA ISLAND MINES

Mine	Period	Prod. (tons)	Au (M oz)	Ag (M oz)	Cu (M lbs)	Fe Conc. (tons)
Cu Queen	1903-17	4,500	1,660	12,500	398,000	
Cornell	1897-1917	44,750	16,600	77,400	3,016,000	
Little Billie	1896-1952	70,000	12,800	42,260	4,446,350	
<u>Marble Bay</u>	<u>1899-1929</u>	<u>220,000</u>	<u>54,460</u>	<u>445,000</u>	<u>15,000,000</u>	
Total Vananda		339,250	85,520	577,160	22,860,350	
Texada Mines	1952-1976	23,000,000	31,300	833,900	58,900,000	11,400,000

## **2.1 Exploration History**

### **2.1.1 Early History**

After production ceased in the Vananda Camp in 1919 the Camp received only one significant exploration campaign prior to 1942. In 1929, A.W. Lakes directed a program of geological mapping and diamond drilled 25 holes in the Florence, Security and Cornell areas for the Central Copper and Gold Company. The report dated May 1930 describes the individual ore deposits and their ore controls considered important at the time, and summarizes the results of the drilling. Unfortunately, no drill logs are included and the location of the collars are plotted on a 1" = 300' scale map. Lakes reported that coring in the wollastonite skarns was very poor and that analytical results often relied on sludge samples. The mineralized intersections, with three exceptions, generally had very high copper values with sub-economic gold values. Recent analytical studies have shown gold freely associated with bornite and indications are that the gold may not have been recovered with the sludge sampling. The exceptions were holes 6, 8 and 15, in the Cornell area, which encountered 23 feet of 0.43 opt Au, 11% Cu; 23 feet of 0.2 opt Au, 2.8% Cu; and 6 feet of 0.24 opt Au and 19.1% Cu, respectively.

Lakes concluded his lengthy report with a strong recommendation to continue work on the property, but this was not followed by the Central Copper and Gold Company because of the stock market crash in 1929 (Dolmage, 1944).

### **2.1.2 Middle History (1942-1952)**

L.A. Prosser optioned the Little Billie Mine in 1942, commenced work in 1943 and by 1944 had consolidated the three remaining Vananda mines into Industrial Metals Mining Co. Ltd. Through to 1944, IMMC de-watered the Little Billie and Copper Queen mines, rehabilitated both shafts, reconstructed the head frames, and diamond drilled 76 holes, totalling 7,700 feet from both surface and underground locations. (Dolmage, 1944; James, 1944, 1946; Stevenson, 1945).



In January, 1945, IMMC sold the Little Billie, the Copper Queen and the Cornell to Vananda Mining Company (Stevenson, 1945). VMC Deepened the Little Billie shaft from 280 feet to the present depth of 600 feet and drove cross-cuts at the 480 and 600 feet. In 1950 and 1951, VMC extended the 600 level drift south to the 720 level of the Copper Queen workings, where they drilled several underground holes.

At the close of operations in 1952, 17,500 tons of ore remained above the 600 foot level in the Little Billie, while drilling below this level intersected significant copper and gold mineralization.

### **2.1.3 Recent History (1976-1978)**

From 1955 to 1974, Ideal Cement, under the direction of W.S. Beale Sr., (now a director of Vananda Gold), acquired the crown grants and claims that comprise the Vananda Camp and in 1976 purchased the rights to the Texada Mines after it's closure in 1976 and consolidation of the property was complete.

In December, 1978 Shima Resources optioned the ground and undertook gravity, IP, VLF, and magnetic surveys covering most of the Vananda claims with 1,000 foot spaced lines. Three targets based on coincident residual gravity, IP and magnetic anomalies were recommended for drilling (Ager & Berreta, 1979).

Six holes in 1979 and ten holes in 1980, tested the three targets; one east of the Little Billie, one immediately north of the Eagle Claims, and the third on the northern extension of the Lake Deposit. DDH 79-1, in the Little Billie area encountered ore: 2 metres of 0.102 opt Au within 12 metres of 1.55% Cu, 0.052 opt Au. DDH 80-7 north of the Lake Deposit had a one metre section which assayed 0.082 opt Au.

In 1984, Cartier Resources acquired the lease from Shima and conducted IP surveys over the Cornell Mine and the Florence, Security zones. Nine holes were drilled near the Cornell Mine to locate the high-grade intercepts of Lakes, and the tenth hole was drilled to intercept the mineralization beneath the 600 level in the Little Billie Mine. DDH 84-10 at the Little Billie intersected 12 feet of 0.23 opt gold and 2.00% Cu 40 feet above the 600 level drift.

In 1986, Vananda Gold Company was formed by S.L. Beale Jr. and optioned the lease from Cartier. Vananda Gold undertook extensive stripping and soil geochemical surveys in the Florence Security, Little Billie, Copper Queen and Cornell areas (Hardy, 1988).

## 2.2 Vananda Gold/Freeport Joint Venture 1988 Program

Initially, both aerial photography and airborne geophysics were flown over the property. Ground work then commenced with the rehabilitation of 1984 cut grids (Cornell Grid) at the north end of the property and the cutting of the 23 line kilometre Sandy grid at the south end of the property. Induced polarization and soil sample surveys were then conducted on the two grids. Geological work included 1:2000 scale mapping in the Little Billie, Copper Queen, Cornell and Florence Security areas and 1:5000 scale mapping regionally. Chip/channel sampling of the open pits and the re-sampling of drill core at Texada Mines was also carried out. The program concluded with seven diamond drill holes totalling 2391.6 metres in the Little Billie/Copper Queen area.

## 2.3 1989 Program

The 1989 field program commenced with 1:2000 scale structural mapping of the Marble Bay Fault Zone (Glover, 1989) and 1:5000 scale geological mapping of the property (Bradford, 1989). This followed with 1:2000 scale geological mapping in the Volunteer, Vananda, Sandy and Eagle map areas, and detailed prospecting and sampling in selected areas.

To provide control for geological mapping and ground surveys, a total of 60.6 km of line were cut in 1989.

Both geophysical and geochemical surveys were carried out on cut grids. Geophysics included a follow-up induced polarization survey in the Little Billie area and magnetics-VLF surveying of all grids on the property. Soil sampling involved initial sampling of the Eagle and Volunteer Grids and fill-in sampling on the Cornell Grid.

A total of 6216.4 metres in 22 holes were diamond drilled in 1989. This included 4 holes at the Little Billie, 2 holes in the Copper Queen area, 4 holes at the Cornell, and 11 holes on the Sandy Grid.

Petrographic work was carried out on selected samples from drilling and geological mapping.

### 3.0 REGIONAL GEOLOGY

The regional geology of Texada Island was last described in full by McConnell in 1974, since then only Muller, in his Alberni Map sheet on Vancouver Island (1969), has touched on Texada geology (Figure 3). Recognizing this fact, as well as the recent activity by major exploration companies, Gerry Ray of the B.C. Geological Survey has embarked on a mapping program of the north end of the island.

Texada Island is 80% underlain by an unknown thickness of undifferentiated basalts correlated with the middle to upper Triassic Karmutsen Formation of Vancouver Island (Muller, 1969). Overlying these, exposed principally in the northwestern and central areas of the island, are upper Triassic equivalents of the Quatsino limestones on Vancouver Island (Muller, 1969). Of lesser significance, Cretaceous sandstones and shales of the Cedar District Formation unconformably overlie Karmutsen volcanics north of Gillies Bay while middle to upper Paleozoic Sicker volcanics and sediments are unconformably overlain by Karmutsen volcanics at the southern tip of the island.

Intrusive into both the Karmutsen and Quatsino Formations are middle to upper Jurassic quartz diorite (Little Billie) to quartz monzonite (Gillies Bay) stocks belonging to the Island Intrusive suite. A variety of dykes and small stocks with compositions ranging from basalt to hornblende diorite are possibly lower to middle Jurassic Bonanza Sub-group equivalents while a swarm of north-trending dykes north of Texada Mines are related to the Gillies Bay Stock.

Structurally, the island is dominated by northwest-trending left-lateral strike-slip faults (Glover, 1989). Folding is restricted to a broad syncline between Texada Mines and Vananda and local tight folds associated with the contacts of intrusives.

Metamorphism is restricted to contact metamorphic marble development in limestone and hornfelsing in volcanics peripheral to stocks and dykes.

#### 4.0 PROPERTY GEOLOGY

The Texada property is underlain by Middle (?) - Upper Triassic Karmutsen Formation basalts and Upper Triassic Quatsino Formation limestones which have been gently folded into a broad, north-plunging syncline. This sequence has been cut by three major northwest-trending fault zones (Little Billie, Marble Bay (Glover, 1989), and Holly) and intruded by numerous stocks, dykes and sills (Figure 3).

For an in-depth description of property geology see Bradford, 1989: "Geology of the Vananda Gold Property."

#### 4.1 Karmutsen Formation

Volcanics of the Karmutsen Formation are exposed along the eastern and western boundaries of the property as well as in an uplifted block around Priest Lake. They consist of amygdaloidal, massive and pillowed basalts, pillow breccias, hyaloclastites, tuffs and submarine debris flows.

Karmutsen volcanics occur in both normal and faulted contacts with the overlying Quatsino limestones on the property. Contact dips of 30 degrees or less are suggested from surface outcrops and drilling. Where the contact is not visible, the presence of a 1-3 m intermittent lensoidal limestone horizon (located within metres of the upper contact) within the volcanics is indicative of a normal contact.

The Karmutsen frequently contains abundant disseminated pyrite + chalcopyrite and magnetite giving it both an above average IP signature and a strong magnetic signature. Geochemically, it is high in both copper and gold.

Epidote alteration and hornfelsing are common peripheral to stocks and dykes.

#### 4.2 Quatsino Formation

With thickness of up to 2,000 feet (Muller, 1969), the Quatsino limestones underlie 80% of the property. They are generally non-descript, fine grained and dark grey, but have frequently been bleached and recrystallized. Bleaching ranges from light grey to white, while recrystallization produces crystals up to 1 cm across in the most extreme case. Both bleaching and recrystallization are indicative of intrusive, faulting and/or hydrothermal activity.

Its featureless nature, combined with extensive recrystallization, make it difficult to designate market units in the Quatsino. Notable features, such as well-developed bedding, are not continuous enough to follow, with the only distinguishable unit found to date being a thinly-laminated siliceous fragmental unit, identified from drilling, that marks the bottom 60 metres of the limestones. This unit has also been noted in outcrop in the Volunteer, Security and Sandy areas.

#### 4.3 Intrusives

Two major stocks belonging to the Island Intrusive suite (Carson, 1972) intrude the property. The biotite-quartz diorite Little Billie Stock intrudes limestone at the north end of the island, while the quartz monzonite Gillies Bay Stock intrudes both volcanics and limestone at the south end of the island.

A series of smaller stocks and sills intrude both the volcanics and limestone on the property. These range in composition from hornblende diorite to hornblende-quartz diorite and are probably related to the larger intrusives on the property. The Volunteer intrusive is designated a sill-like body from magnetic modelling of the total field ground magnetometer survey, which show it to be a 200 metre thick, tabular body, dipping southwest at 30 degrees. While not a sill in the true sense, the carbonates and the underlying basalt dip northeast at approximately 30 degrees, the term distinguishes it from a stock-like body and has some economic significance.

Dykes and sills are generally feldspar (hornblende, biotite) porphyries. North of the Marble Bay Fault dykes are northeast-trending, while nearer to the fault they trend more northwest. At the south end of the property, a distinct north-trending dyke swarm radiates northward from the Gillies Bay Stock.

#### **4.4. Structural Geology**

Three major left-lateral strike-slip faults have been outlined on the property, the Little Billie, Marble Bay and Holly Faults, Figure 3. The northernmost Little Billie Fault, defined by airborne magnetics, offsets the limestone/volcanic contact along the northeast property boundary. Immediately south, the complex Marble Bay Fault Zone offsets the limestone/volcanic contact south of the Imperial quarry and extends through the town of Vananda in a series of splays. Within these splays are horsts, grabens and several fault-bounded (controlled?) hornblende diorite stocks. In the south central area of the claims lies the Holly Fault. It offsets two limestone/volcanic contacts and, along with the Lake Fault, bounds a graben block in the vicinity of Texada Mines.

Abundant minor faults of varying attitude also occur on the property. Many of these have been resealed by later dykes.

The broad, north-plunging fold between Vananda and Texada Mines is the major fold structure on the property. Local tight folds are associated with the contacts of intrusives.

### **5.0 ECONOMIC GEOLOGY**

#### **5.1 Mineralization**

The four principal deposits of the Vananda Camp, Marble Bay, Little Billie, Copper Queen and Cornell, are all garnet, pyroxene, wollastonite skarns. Occurring as steeply plunging pipes, the bornite-rich deposits are mostly developed in contact with either feldspar porphyry dykes or hornblende diorite and biotite quartz diorite stocks. Pyrite, molybdenite, sphalerite, chalcocite, digenite and traces of a silver telluride, Hesseite, are also present. Gold occurs as free, fine to coarse grains, along the contacts of the bornite, pyrite and silicate minerals.

The Texada Mines' iron-copper deposits are also skarns, but an order of magnitude larger in size. Developed along the extremely irregular contact of the Gillies Bay quartz monzonite stock, the mine consisted of five open pits and six underground deposits. The open pit deposits include the Prescott and Yellow Kid which are principally vertical, massive magnetite pipes developed in the marbles adjacent to, but not at, the contacts of the quartz monzonite. The Paxton, and Paxton south which are magnetite, chalcopyrite skarns developed on the foot wall volcanic contact and as vertical, tabular bodies extending up the overhanging quartz monzonite contact. The Lake consisted of massive amphibole, magnetite, pyrrhotite skarn along a reverse faulted contact of the marble and basalt, such that the basalt is in both the foot wall and the hanging wall. The underground skarn zones were formed along the flat volcanic-marble contact underlying the quartz monzonite intrusive. Although primarily magnetite-rich, chalcopyrite was considerably enhanced along the marble, skarn interface.

In addition to the skarn deposits there are a number of massive base metal and iron sulphide replacement deposits that occur in mostly unaltered limestone. In the Ideal Quarry, a two metre thick, flat lying body of megacrystic calcite, massive sphalerite and pyrite replaces fine grained, dark grey limestone and is referred to as the Manto deposit. The only alteration of note is a halo of silica that affected the chemical quality of the limestone. Chip sampling along the face of the body returned 0.22 ounces per ton gold along 17 feet.

Other replacement occurrences include the Alladin, Sentinel, Sandy and Lucky Jack. One previously unreported occurrence is the Vauxhall showing, just north of the Gillies Bay road in the central portion of the property. Old trenching, now grown over, exposed a flat lying band of massive pyrite and sphalerite in a vertical fracture system in unaltered limestone. Samples of the mineralization returned gold assays to 0.23 ounces per ton. As in all of the zinc occurrences, cadmium is >100 ppm.

## 6.0 GEOCHEMISTRY

Approximately 1,200 soil samples were collected in 1988 from the Cornell Grid South and the Sandy Grid. Elements plotted were copper, gold, lead, arsenic, zinc and silver. Included in the plotting were an additional 800 samples taken by Vananda Gold from the Cornell Grid in 1987. Also part of the 1988 program was chip/channel sampling of the Paxton, Lake, Boulder Nest and Goodall open pits and re-sampling of drill core and coarse rejects from the underground workings at Texada Mines.

A total of 1,534 soil samples and 243 rock chip samples were collected in 1989. These were analyzed for gold by fire assay with an atomic absorption finish and for 32 additional elements by ICP. Samples with >1,000 ppb Au were fire assayed for greater accuracy, while drill core with suspected coarse gold was screened for metallics prior to assay. Analytical work was conducted by Chemex Labs in North Vancouver.

### 6.1 Soil Geochemistry

Although areas of 100% outcrop had sparse soil, the sampling has proven very useful on the property, detecting possible leakage from blind mineralization, defining broad base metal haloes and extending known mineralization.

On a property scale, a few trends are evident. Copper-gold + arsenic anomalies are frequent over the volcanics, while zinc-arsenic + gold, copper, lead anomalies are frequent over the limestone. All elements analyzed for, dominated by copper, gold, arsenic and zinc, are commonly anomalous near intrusives. Silver is rarely anomalous throughout the property.

### 6.2 Rock Geochemistry

A total of 243 rock samples were taken during the course of prospecting and mapping in 1989. In addition, because of a lack of soil and abundant outcrop, 142 rock samples were taken at 10 metre intervals over an anomalous zone between the Aladdin and Sentinel showings. This revealed weakly anomalous copper, gold, zinc and lead near the known mineralization plus a few scattered spot highs.



## 7.0 GEOPHYSICS

Geophysical surveys undertaken on the property include airborne total field magnetics, electro-magnetics and VLF electromagnetics; gradient and pole-dipole IP; total field and gradiometer magnetics; VLF electro-magnetics and gravity.

In 1977, Ager and Beretta conducted a regional gravity survey on 400 metre spaced lines with 60 metre station intervals. Detailed follow-up of three areas was undertaken in 1979 with gravity, IP, magnetics and VLF-EM. The gravity was tightly controlled in elevation (0.03 m) and terrain corrected to a 600 metre radius. The Bouger gravity was reduced to a residual gravity map by computer processing.

The 1988 program was initiated with a multi-sensor airborne geophysical survey flown by Aerodat of Toronto. The 750 kilometre survey, flown in conjunction with surrounding property holders Echo Bay Mines and BP Resources, consisted of total field magnetics, electro-magnetics and VLF electro-magnetics. Of these, the total field magnetics have proven very useful. Specifically, the magnetics detected well defined contrasts between the volcanic, sedimentary and intrusive rocks and the faults that traverse the property and survey area. Bonniwell (1988) identified twelve magnetic features that could be indicative of buried skarn deposits.

Also in 1988, P. Walcott and Associates, conducted IP surveys over the Cornell and Sandy Grids using a gradient array with a 3.4 kilometer current electrode spacing and a 25 metre "a"-spacing. Selected lines with strong chargeability highs were detailed with the pole-dipole method. These surveys outlined a number of anomalies, three of which were drilled in 1989.

Delta Geosciences conducted the 1989 geophysical program which included 7.7 kms of gradient IP, using a 1.5 kilometer dipole spacing and an "a"-spacing of 25 metres, in the Little Billie area. Additionally, all grids were surveyed with total field and gradiometre magnetics and VLF-EM, for a total of 105 line kilometres. The magnetics and 21.4 and 24.8 kHz VLF, were collected in one pass using an EDA Omni IV Plus system at 12.5 metre intervals. A grid by grid breakdown of the Mag-VLF work includes 32.25 km on the Cornell Grid, 11.25 km on the Volunteer Grid, 31.55 km on the Eagle Grid and 21.2 km on the Sandy Grid.

## 8.0 DIAMOND DRILLING

Seven NQ diamond drill holes totalling 2391.6 metres and twenty-two NQ diamond drill holes totalling 5216.4 were completed in 1988 and 1989, respectively. Burwash Contract Drilling of Cobble Hill, B.C. performed the work with one, and later two, Longyear 38 unitized skid drills drilling NQ diameter core. Total drill contractor costs averaged \$19.85 per foot while total cost per foot drilled, including site preparation, geological drill supervision, core management, assays and core rack construction, averaged \$23.08.