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ASSAY DATA REPORT OF DRILL CORE SAMPLES
BONANZA CLAIMS GROUP, WHITE CALCITE MARBLE DEPOSIT
VANCOUVER ISLAND, BRITISH COLUMBIA

NTS 92L/7W
NANAIMO MINING DIVISION
BRITISH COLUMBIA

LATITUDE 50 DEGREES 21 MINUTES NORTH
LONGITUDE 126 DEGREES 45 MINUTES

FOR OMYA ST. ARMAND, MONTREAL QUEBEC

ACTIVITY	DATE	PERFORMED BY:
Core splitting	February 1999	G. Melchoir
Sampling	March 1999	Howard Brown (Geologist)
Lab Analysis	May-June 1999	Omya Labs Proctor Vermont
Report	July 1999	Howard Brown (Geologist)

DATE SUBMITTED: JULY 23, 1999

GEOLOGICAL SURVEY BRANCH
ASSESSMENT REPORT

25,958

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INTRODUCTION

Detailed geologic mapping, and core drilling were previously undertaken at the Bonanza Group of mineral claims for Industrial Fillers of Montreal Quebec (Fig. 1). For this assessment work, the core was split, sampled and assayed. This report includes the results of the core drilling and assay data from the samples.

The claims which are located in the Bonanza Lake area of northern Vancouver Island British Columbia, contain a very large and very significant deposit of white, high purity, crystalline limestone.

The purpose of the core drilling and sample analysis was to obtain details of the deposit, continuity at depth, and quality of the limestone and beneficiation techniques, for the continuing evaluation and future mining of the deposit.

PROPERTY STATUS

The Bonanza property currently consists 38 units including modified grid system mineral claims and two post mineral claims. The claims are located in the Nanaimo Mining Division on mineral title map 92L/7W. Figure 2 is a claim map.

TABLE 1. BONANZA GROUP CLAIMS

CLAIM NAME	RECORD NO.	UNITS	NEW EXPIRATION DATE
Bonanza 1	**2773(8)**	**20**	**25 Aug 2001**
Bonanza 2	**2774(8)**	**12**	**25 Aug 2001**
J16-1	**329082**	**1**	**26 July 2001**
J16-2	**329083**	**1**	**26 July 2001**
J16-3	**329084**	**1**	**26 July 2001**

J16-4	**329085**	**1**	**26 July 2001**
KC4	**367208**	**2**	**11 Nov 2001**
TOTAL UNITS		**38**	

All the claims are registered in the name of OMYA St. Armand (formerly Industrial Fillers Ltd.) of Montreal Quebec.

LOCATION AND ACCESS

The Bonanza claims property covers the mountain which is located immediately east of the north end of Bonanza Lake. Port McNeil, the closest town is about 40 Km (by road) to the northwest. Accommodations and supplies are available at Port McNeil.

The property is accessed from Port McNeil by following B.C. Highway 19 south for 10 Km., and Telegraph Cove Road east for 14 Km. Bonanza Lake and the Bonanza claims are then reached by following the major South Main logging road (Timber West) for 15 Km. The South Main runs along the Kokish River and the east side of Bonanza Lake. The claims are accessed from the south main and several branch logging roads which have been constructed during the last 15 years.

PHYSIOGRAPHY AND CLIMATE

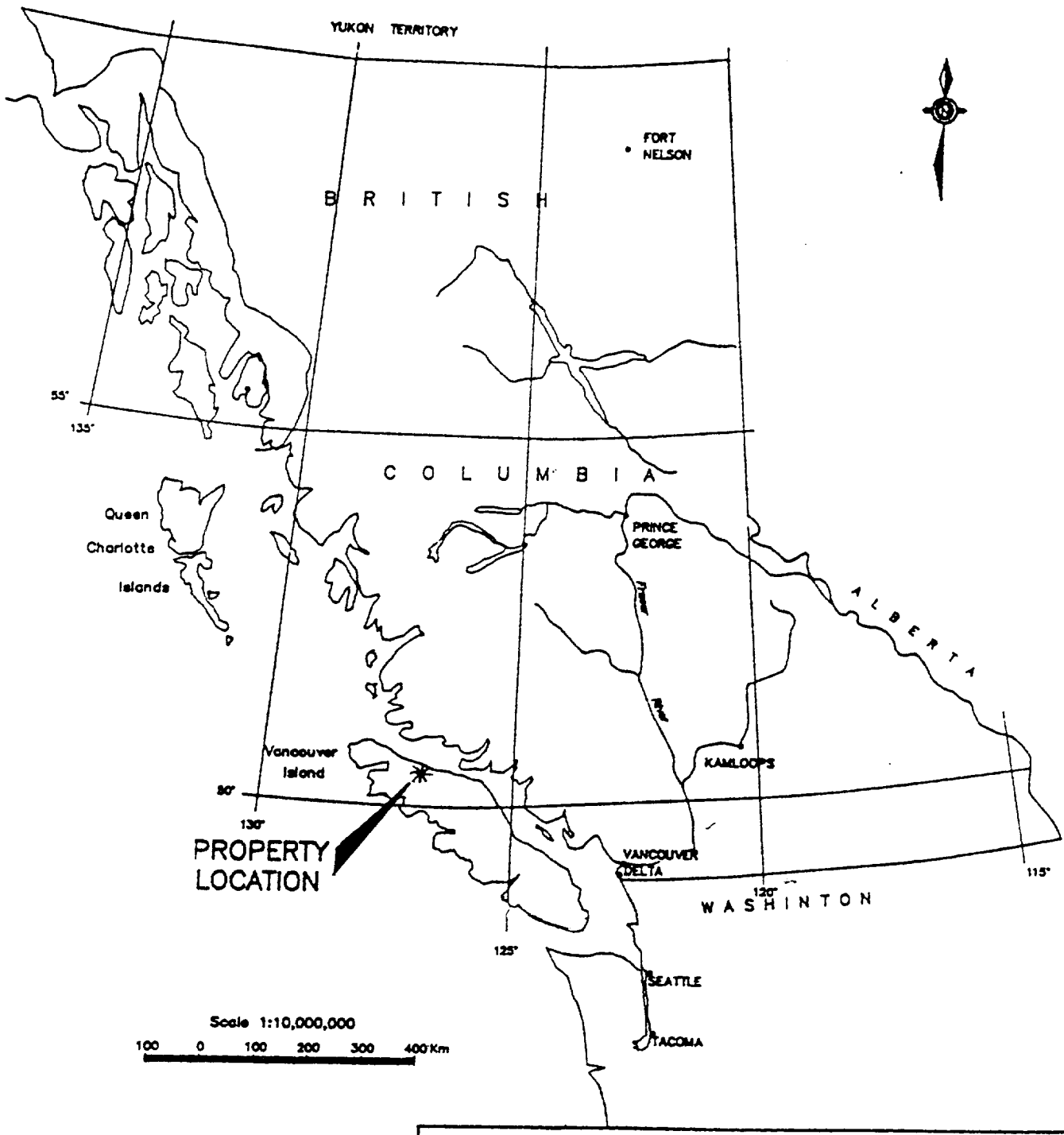
The Bonanza mineral property covers part of a rugged north south trending mountain which is immediately east of Bonanza Lake. Drainages on the west side of the mountain is into Bonanza Lake, and the Bonanza River while drainages on the east side of the mountain drain into the Kokish River.

Elevations on the claims range from about 270 meters at Bonanza Lake to 970 meters at the top of the mountain. Slopes range from very steep and rugged to inaccessible cliffs over 100 meters high.

Portions of the claims have been heavily logged during the past 15 years, and logging continues into the present time. Areas logged within the past 15 years are covered by immature second growth fir. Areas which have not yet been logged are covered by thick first growth fir and cedar.

Bonanza River, and several unnamed creeks which drain the mountain and Bonanza Lake are the major sources of water on the property.

The claims are within the coastal rainforest climatic zone. Precipitation is heavy, occurring as rain during winter, spring, and summer months. Winter snow accumulates at higher elevations.



BONANZA GROUP CLAIMS

LIMESTONE DEPOSIT

LOCATION MAP

SCALE	DATE	N.T.S.		Figure:
as shown				

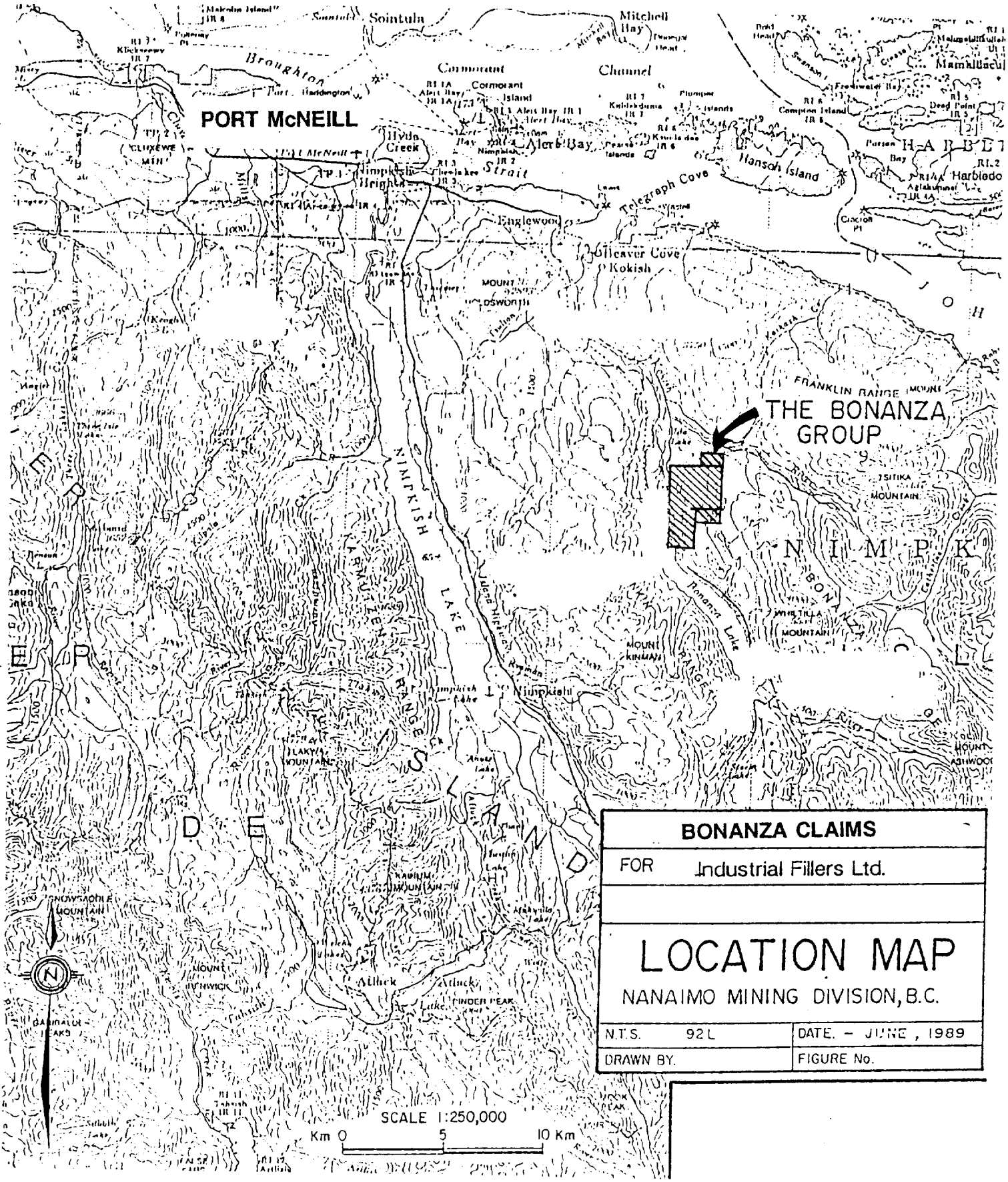


Figure 2. Index map showing location of Bonanza Claims area.

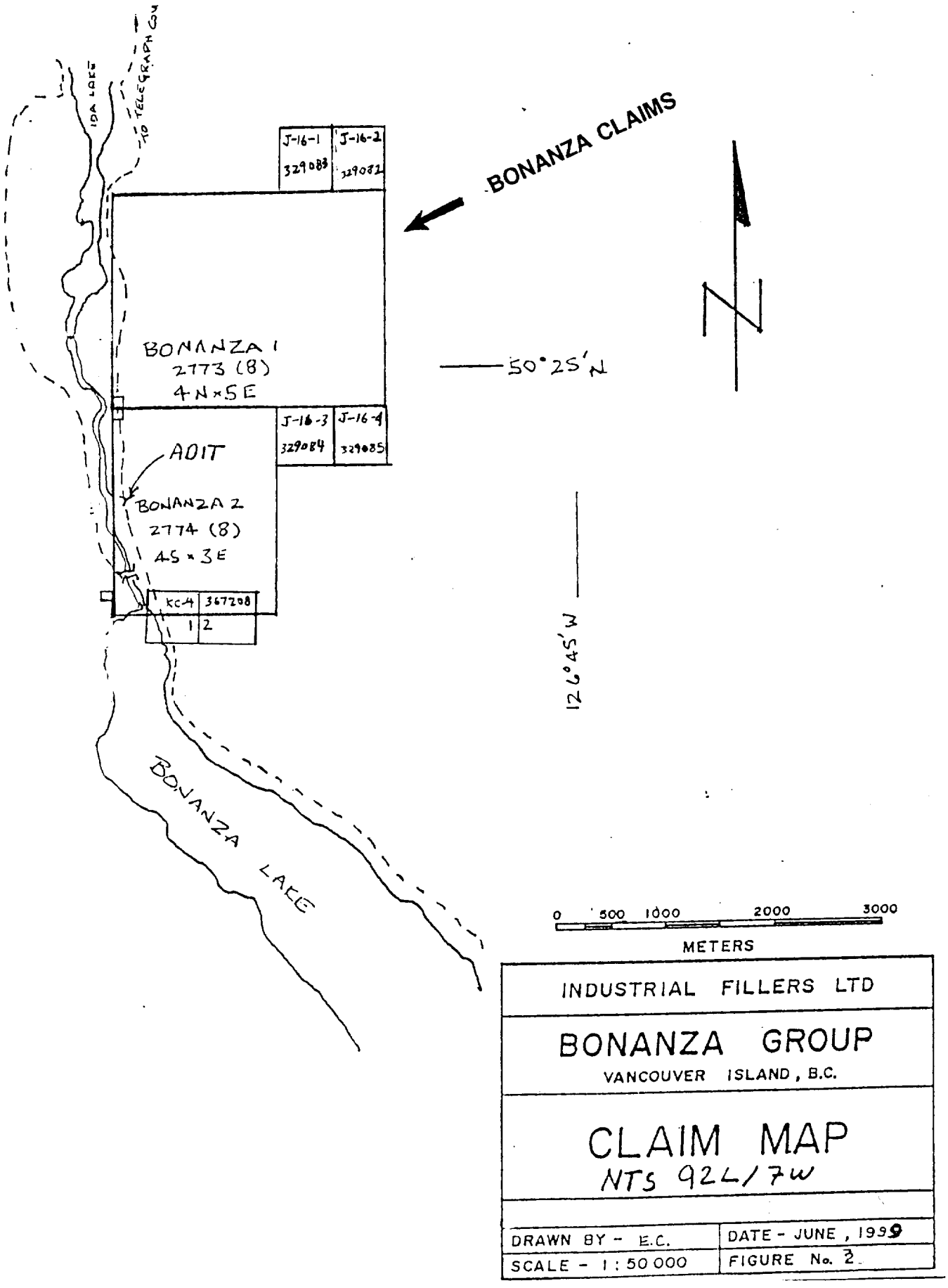


Figure 3. Claim map, Bonanza Calims.

REGIONAL GEOLOGY

The northern Vancouver Island region is primarily composed of thick island arc type intermediate volcanic rock sequences, and limestone and clastic rocks of Triassic and Jurassic age, which have been intruded by Mesozoic age batholithic rocks. Figure 3 is a generalized regional geologic map.

A thick sequence of andesite and basalt of the Triassic Karmutsen Formation is overlain by limestone of the Quatsino Formation, also of Triassic age. The Quatsino is overlain by the Parsons Bay Formation, a mixed but largely fine grained clastic sedimentary sequence of latest Triassic age, which is in turn overlain by the Bonanza Group, composed of intermediate to felsic volcanic rocks of Lower Jurassic age.

All of the previous (older) rocks have been intruded by Upper Jurassic batholithic intrusive rocks of the Island intrusive series, and which range from diorite to quartz monzonite in composition. The intrusive rocks are thought to be responsible for the formation of skarns, some metalliferous deposits, and bleaching and recrystallization of susceptible limestones of the Quatsino Limestone to form white, high calcium, crystalline limestone deposits in the Bonanza Lake area.

LOCAL (PROPERTY) GEOLOGY

The Bonanza Claims property has been previously mapped at a scale of 1:5000 on an orthophoto topographic base map, in order to accurately define the large white, high purity crystalline limestone deposit on the property. Over the past 15 years several core holes have also been drilled on the property. The following descriptions are based on the mapping and core drilling.

The property contains Triassic Karmutsen volcanic rocks, which are overlain by white and grey Quatsino Limestone of Triassic age, which in turn is overlain by Parsons Bay Formation. These rocks have been intruded by hornblende, biotite granodiorite of the island intrusive series. Thin intermediate dikes and felsic sills have also intruded the limestone. Sparsely mineralized skarn has formed along the contact between granitic intrusives and the Quatsino Limestone.

Several rock units were defined during mapping and drilling, and a brief description is included in Table 2, from oldest to youngest.

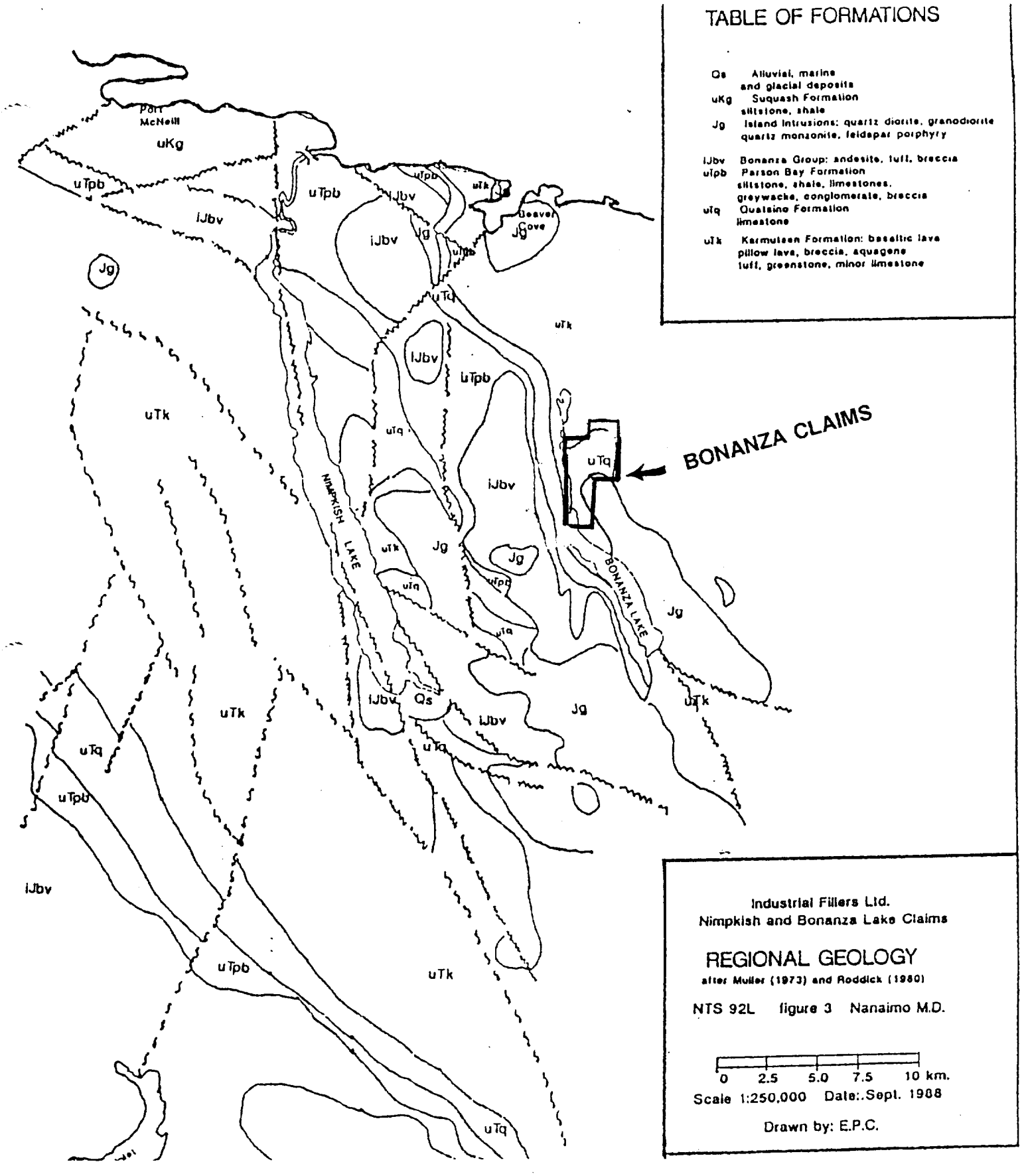


Figure 4. Regional geologic map.

TABLE 2. DESCRIPTION OF ROCK UNITS BONANZA CLAIMS PROPERTY

UNIT NUMBER	AGE	DESCRIPTION
UNIT 1	Triassic	**KARMUTSEN FORMATION** Buff to Greenish-grey weathering, dark green to dark grey and black, fine grained to porphyritic, massive andesite and basalt flows, sills, and dikes. Occasional pyrite present near upper contact. Upper contact ranges from conformable to unconformable and in some places is a fault, and or has been intruded.
UNIT 1A	Triassic	Light grey limestone lenses up to 10 feet thick near upper contact.
UNIT 2A	Triassic	**QUATSINO LIMESTONE LOWER MEMBER** Thick bedded to massive, white, light grey to black weathering, light grey, off white, and white crystalline limestone, sometimes sucrossic, and medium grained calcite marble. Limestone often contains stylolites which contain pyrite. When oxidized contains occasional iron oxide stain. Unit contains occasional grey silica blebs, which may be silicified fossils. The white limestone occurs in layers 20 to 50 feet thick and is interbedded with units 2B, 2C. Degree of metamorphism (recrystallization) increases toward the south, and in proximity to granitic intrusives.
UNIT 2B	Triassic	Thin to thick bedded, medium to dark grey limestone and marble, in layers 10 to 15 feet thick. Occurs interbedded with Units 2A and 2C.
UNIT 2C	Triassic	Off white to white marble with irregular chert and silica nodules, which weather in relief to irregular shaped small knobs. Occurs in southern 1/2 of area.
UNIT 2D	Triassic	Interbedded white and grey limestone (UNITS 2A and 2B) undivided.
UNIT 3	Triassic	**QUATSINO LIMESTONE UPPER MEMBER** Thick bedded to massive medium to very dark grey limestone and marble occasionally cherty and or silty and muddy. Occasional silica blebs (fossils), and occasional tremolite when metamorphosed to marble.

UNIT 3A	Triassic	UPPER WHITE MARBLE Coarse grained off white to white calcite marble. Occurs in southern portion of map area.
UNIT 4	Triassic	**PARSONS BAY FORMATION** Brown, black, rusty-brown and grey weathering thinly interbedded clastic sediments, including argillite, mudstone, siltstone, shale, chert and muddy limestone. Bedding planes often contain pyrite, which colors the rocks rusty brown when oxidized.
UNIT 5	Jurassic (?)	**INTRUSIVE** Dark green to black diabase sills, dikes and intrusives.
UNIT 6	Jurassic (?)	**INTRUSIVE** Brown to red brown weathering, fine grained siliceous, pyrite bearing felsite sills.
UNIT 7	Jurassic	**INTRUSIVE** Coarse grained biotite quartz monzonite, and quartz diorite granitic batholithic rocks of the Island Intrusive Series.
UNIT 8	Jurassic (?)	**SKARN** Brown weathering, vuggy, garnet, epidote, chlorite, quartz, calcite skarn. Occurs along contact with granite and or felsite with Quatsino Limestone.
UNIT 9	Pleistocene - Quaternary-Recent	**UNCONSOLIDATED SEDIMENTS** Alluvium, glacial deposits, talus, soil, fill, stream bed deposits, mud flows, and or other recent unconsolidated sediments.

SEDIMENTARY AND VOLCANIC ROCKS

Karmutsen Formation volcanic rocks of Triassic age form the basement and generally dip gently (0-15 degrees) to the southwest. The Karmutsen is mostly composed of dark colored , fine grained to porphyritic andesite volcanic rocks. Thin (3 meters) limestone layers or lenses were noted near the top of the formation in several areas. The top of the Formation ranges from conformable to unconformable or possibly a low angle fault. In some outcrops near the base of the Quatsino, the limestone contains clasts of the Karmutsen, suggesting an unconformity. In other places in the general area off the Bonanza Claims, the Karmutsen underlies the middle portion of the Quatsino Limestone and the lower part is missing suggesting the contact is a fault.

Quatsino Limestone of Triassic age, can be divided into two members, a Lower Member composed dominantly of white limestone and calcite marble, with interbeds of grey limestone, and an Upper Member composed almost entirely of dark grey limestone. The lower Member may be up to 300

meters thick. The Upper Member may be up to 300 meters thick on the west side of Bonanza River. Dips of the limestone are generally shallow, ranging from 0 to 18 degrees to the south west. Steep dips (near vertical) were noted adjacent to some high angle faults.

Both the Lower and Upper Members of the Quatsino Limestone are prominently exposed on the Mountain east of the Bonanza River and Bonanza Lake.

Parsons Bay Formation of Triassic age overlies the Quatsino Limestone, and outcrops on the west side of the Bonanza River. The rocks dip shallow to the west, and are composed of dark grey to black and rusty brown fine grained clastic rocks, including argillite, shale, siltstone, chert, and minor impure muddy limestone.

Glacial drift, soil, and unconsolidated sediments cover large portions of the gentle slopes to the west of the Bonanza River. Bedrock outcrops are rare in the gentle terrane, only being present in some of the creek beds. Steep slopes are often covered by a mantle of soil and decomposing organic material, which in some cases may mask the underlying bedrock geology.

INTRUSIVE ROCKS

Several varieties of intrusive rocks are present on the claims, or in the area of the claims. Intrusive rocks on the claims include diabase, felsite and batholithic rocks.

Thin (less than 2 meters thick) dark greenish grey diabase dikes and sills, were noted to have intruded the limestone. Dikes are generally steeply dipping (near vertical), while the sills are gently dipping. Skarn zones are common adjacent to some of the dikes and sills.

Brownish colored fine grained pyrite bearing felsite sills were noted in several locations. At the south east limit of the claims, a pyrite bearing felsite sill is exposed along a logging road. The sill has intruded along the contact between the top of the Karmutsen and the base of the Quatsino Limestone. The sill was followed to the contact with batholithic rocks. Core drilling encountered this rock in drill hole 95-1. Examination of the drill core suggests that the rock is a fine grained border phase of the batholithic rocks into which it gradationally merged.

On the west side of the mountain, several rusty brown sills were noted in the limestone, and off the claims to the south, at the contact with the batholithic rocks a large rusty brown mass appears to have sills of felsite "shooting off" into the limestone. The felsite sills are interpreted to be a fine grained contact intrusive which are off shoots from the main batholithic mass which forms the core of the mountain to the south.

The core of the mountain (south of the claim boundary) is composed of the northern end of a much larger pluton which is widely exposed to the south of the claims. The batholithic rocks are thought to be Jurassic age (and the felsite and diabase sills are also inferred to be of Jurassic age), and are composed of medium grained biotite quartz diorite, and granodiorite. The intrusive rocks are

correlated with the Island Intrusive Series, which is widely exposed on northern Vancouver Island.

METAMORPHIC ROCKS

Garnet - epidote skarn is present along the contact with the Quatsino Limestone at the north end of the intrusive plutonic mass. The rock is medium brown in color, and weathers readily in the wet climate, but is exposed along a logging road near the southeastern claim boundary.

Several skarn zones were encountered in drilling through the thin diabase dikes. The skarn zones often contain up to 10 % pyrite and other sulfide mineralization.

As noted previously, Mesozoic granitic rocks have intruded the Quatsino Limestone. The Quatsino Limestone in the southern part of the claims area is close to the granitic contact and has been recrystallized to medium grained calcite marble. Quatsino in the northern and western part of the claims is greater distance from the intrusive mass, and is not recrystallized, or is recrystallized to a lesser degree. Clearly, close proximity to the granitic intrusive contact has resulted in a greater degree of recrystallization and metamorphism of the limestone to marble.

STRUCTURAL GEOLOGY

Structure in the vicinity of the claims is dominated by the gently west dipping upright homoclinal volcanic-limestone sequence, (which apparently forms the limb of a large synform), which has been cut by several high angle faults. The lower contact of the Quatsino against the Karmutsen may in some places be unconformable or a low angle fault.

FOLDS

Mapping shows that the volcanic and sedimentary rocks form an upright homoclinal sequence which dips gently to the southwest. Regional mapping by this author and several other workers has defined a series of large regional map scale northwest trending open folds. The sedimentary and volcanic rocks in the Bonanza lake area dip west and form the east limb of a large syncline. Small scale folds in the Parsons Bay Formation were noted adjacent to some faults and high angle mafic dikes.

HIGH ANGLE FAULTS

Several mapped and suspected high angle faults are present in the claims area. Fault trends can be grouped into two dominant trends; generally north-south trending high angle faults, and generally east-west trending high angle faults.

North-south trending high angle faults and suspected faults, are defined by abrupt linear topographic ridges and or breaks in topography. The faults appear to be high angle features, and the down dropped block is toward the Bonanza River , and Bonanza River and Bonanza lake may themselves occupy a fault controlled valley.

Several suspected east-west trending possibly south dipping high angle faults are also present in the claims area. The suspected faults are defined by apparently offset contacts and abrupt linear topographic "walls". In the vicinity of one of the faults, rocks adjacent are dipping nearly vertical. It is inferred that these faults are related to intrusion of the granitic batholithic rocks.

OTHER STRUCTURES

As previously noted the contact between underlying Karmutsen Formation and the overlying Quatsino Limestone is in general conformable, however the presence of Karmutsen clasts in basal units of the Quatsino suggests an unconformity is present at least locally. In addition, mapping outside the Bonanza claims suggests that the contact between the formations is a low angle fault, as significant portions of the Lower Member of the Quatsino are often missing, having been faulted out along the low angle contact. Where this has occurred, a low angle thrust fault is inferred.

WHITE, HIGH PURITY CRYSTALLINE LIMESTONE DEPOSIT

The Bonanza Claims have been staked over a very large and very significant white, high purity crystalline limestone deposit. The deposit is very large, with fairly good existing road access due to extensive logging. Several roads allow access to limestone outcrops, and logging has removed much of the timber in the area of the white limestone (although in some places replanting has occurred). Description of the deposit is based on geologic mapping and the drilling and examination of 5 core holes totaling approximately 1500 feet of core. Drilling during 1995 concentrated on the southern portion of the claim block.

DESCRIPTION OF WHITE LIMESTONE DEPOSIT

LITHOLOGIC DESCRIPTION

The Quatsino Limestone in the Bonanza area is approximately 500 meters thick. The Lower Member is up to 250 meters thick, and is composed of generally light grey to white limestone with interbeds of grey limestone, and an Upper member up to 300 meters thick, composed of dark grey variably cherty limestone.

The Lower Member of the Quatsino is of economic interest, and will be described in detail.

The Lower Member of the Quatsino Limestone may be up to 250 meters thick and weathers off-white to white and grey to black. Color on the fresh surface is often different from weathered color. The rock is massively layered, but jointed. Weathering and solution along joints has in some places formed open fissures, some of which are up to 2 meters across, 10 meters long, and more than 3 meters deep. Larger solution cavities may be present.

Color on fresh surface ranges from white to off white and light grey, and creamy buff color. In the north portion of the claims, the rock is sugary textured, and just incipiently recrystallized and

incompletely bleached. To the south the rock is more metamorphosed and ranges from sugary to a more recrystallized medium grained calcite marble. In general rock to the south is more recrystallized and is a more uniform white color. Core drilling during 1995 concentrated on the southern area where the rock is more coarse grained. Much of the rock encountered in the 1995 core drilling is composed of medium to coarse grained calcite marble. Grain size is typically 1/4", and is equigranular.

The rock commonly contains stylolites, and in some places is highly stylolitic. Stylolites contain fresh and oxidized iron pyrite, giving some of the rock a brown iron oxide stain on stylolite surfaces. Several well developed joint sets are also present, and in some places are also iron oxide stained. In the southern part of the claims the rock is more recrystallized and stylolites are less common, occurring as thin dark grey or black and or iron stained seams.

In places the white rock contains grey silica blebs. The blebs, which are most likely silicified fossil debris, occur as bunches, as if concentrated by currents, and then subsequently silicified. Where most concentrated, they compose up to several percent or more of the rock, but most often comprise less than 1%. Most outcrops do not contain silicified fossil debris.

Interbedded with the white marble are numerous layers of medium to dark grey limestone and marble. Thickness of the grey layers ranges from 2 to 6 meters, and they occur at intervals ranging from 5 to 20 meters. At least 8 layers of grey limestone are present. Toward the south the grey layers are also more highly recrystallized, forming layers of light to medium grey calcite marble.

Also present within the white limestone/marble sequence, and most commonly toward the footwall, and near the southernmost exposures (particularly on the Leo D'or claims) are at least two layers of white marble with irregularly shaped silica nodules, and several thin (up to 1 meter) red brown weathering pyrite bearing felsite intrusive sills, and pods. A diabase sill is present in the old IMASCO adit area, and core drilling in the adit and during 1995 indicated that several thin diabase sills are present.

Overall, up to 250 meters of Lower Member is present. The rock is generally off white to white in color and pure limestone and or calcite marble, forming layers up to 20 meters thick. In general, rock to the south is whiter and more highly recrystallized. Interbedded are grey layers ranging to 6 meters thick, and several thin felsite and or diabase sills have intruded the limestone.

SIZE OF DEPOSIT OUTCROP AREA

The Bonanza Lake white limestone deposit covers a large area. The deposit may be up to 250 meters thick not counting interbedded off color grey layers or dikes, sills or other non useable material, which could amount to nearly 50% of the total thickness.

Within the Bonanza Claims the white limestone of the Lower Member of the Quatsino Limestone outcrops continuously on the east side of the Bonanza River for over 4000 meters. On the east side

of the mountain the white limestone is exposed for an additional 2000 meters. Although the mountain side is very steep, the outcrop width of the white limestone is from 200 to 350 meters or more.

In addition the white limestone underlies an area approximately 1600 meters by 1800 meters at the north end of the mountain. Although overlain by up to 200 meters of dark grey limestone overburden, it may be possible to recover the white limestone by underground mining methods.

FORMATION OF THE LIMESTONE DEPOSIT

Several processes contributed to the formation of the white, high purity limestone deposit. Limestone is a common rock type, found all over the earth, but white, high purity crystalline limestone deposits are uncommon in nature, are found only in restricted areas, and require several geologic processes over a long period of geologic time to form.

Among the processes are:

1) Deposition of originally pure limestone in high energy agitated, shallow marine environment.
2) Post depositional changes including metamorphism and/or magmatic processes to bleach and recrystallize the rock, and disperse any impurities which may have been present.
3) Structural controls including folding, faulting and orogenic processes to place the rocks in desirable structural settings.
4) Uplift and erosion.
5) Preservation thru geologic time.

Because all the geologic processes are required, deposits of high calcium white crystalline limestone are relatively uncommon in nature, and are vastly different from common limestone. Deposits of high purity, high brightness crystalline limestone suitable for high quality filler and extender applications are limited and only occur in restricted areas.

USES AND SPECIFICATIONS OF HIGH BRIGHTNESS, HIGH PURITY LIMESTONE

High purity white crystalline limestones have a large number of uses and are classified as white fillers and extenders with value added characteristics. The products are finely ground, high brightness, high purity limestone, and are the whitest, purest, and most valuable per ton of all limestone products.

Desirable characteristics are high brightness (white color), low tint, uniform fine particle size, freedom from grit, and chemical purity. Color and purity are of utmost importance in virtually all applications. Limestone suitable for white fillers and extenders is limited to a minimum of 98% $CaCO_3$, and a maximum of 2% combined $MgCO_3$, SiO_2, and all other impurities combined. Brightness requirements range from low 90's to greater than 95. Tint values are generally below 2.0.

The greatest uses of fillers and extenders are paint, rubber products, putty, pottery, paper, a variety

of plastics, food, flooring, PVC pipe, white ink, tooth paste, wire coating, glue, caulking compounds, resins, and polyesters. Uses in the housing industry include ceiling and wall textures, dry wall mud, joint compounds, stucco, and fiberglass roofing shingles.

As can be seen, for most uses, white fillers and extenders requires not only the most pure limestone, but also the whitest color of all limestone. The restricted nature of the deposits and the fact that products are shipped as far as 2000 miles from currently mined sources, indicates a large demand by our society for these valuable products.

SUMMARY OF 1995 CORE DRILLING

Three BX core holes were drilled during June of 1995 at the Bonanza Claims. The drilling totaled 840 feet and was concentrated in the southern portion of the claims. Figure 4 is a map showing location of the 1995 drill holes.

The area chosen for drilling had been recently logged (1994), and existing logging roads provided access. Drill holes were located along the existing logging roads and thus no new disturbance was created. Water from a nearby creek was utilized, and pumped directly to the drill, eliminating the need for a water truck. Drilling ran 24 hours a day and was completed in approximately 2 weeks.

All holes were collared in limestone near or within the hanging wall grey limestone. One of the holes drilled into the granitic material which forms the footwall near the batholith contact. The other two holes drilled thru the hanging wall into the white calcite marble and bottomed in ore. Drill hole # 3 bottomed in white marble ore at a depth of 420 feet.

As noted elsewhere, rock in the southern portion of the deposit is near the main batholith intrusive contact and is coarser grained than at the north end of the deposit. The area chosen for drilling forms a large outcrop of medium to coarse grained white calcite marble, with limited hanging wall grey limestone, and may be suitable for open pit mining.

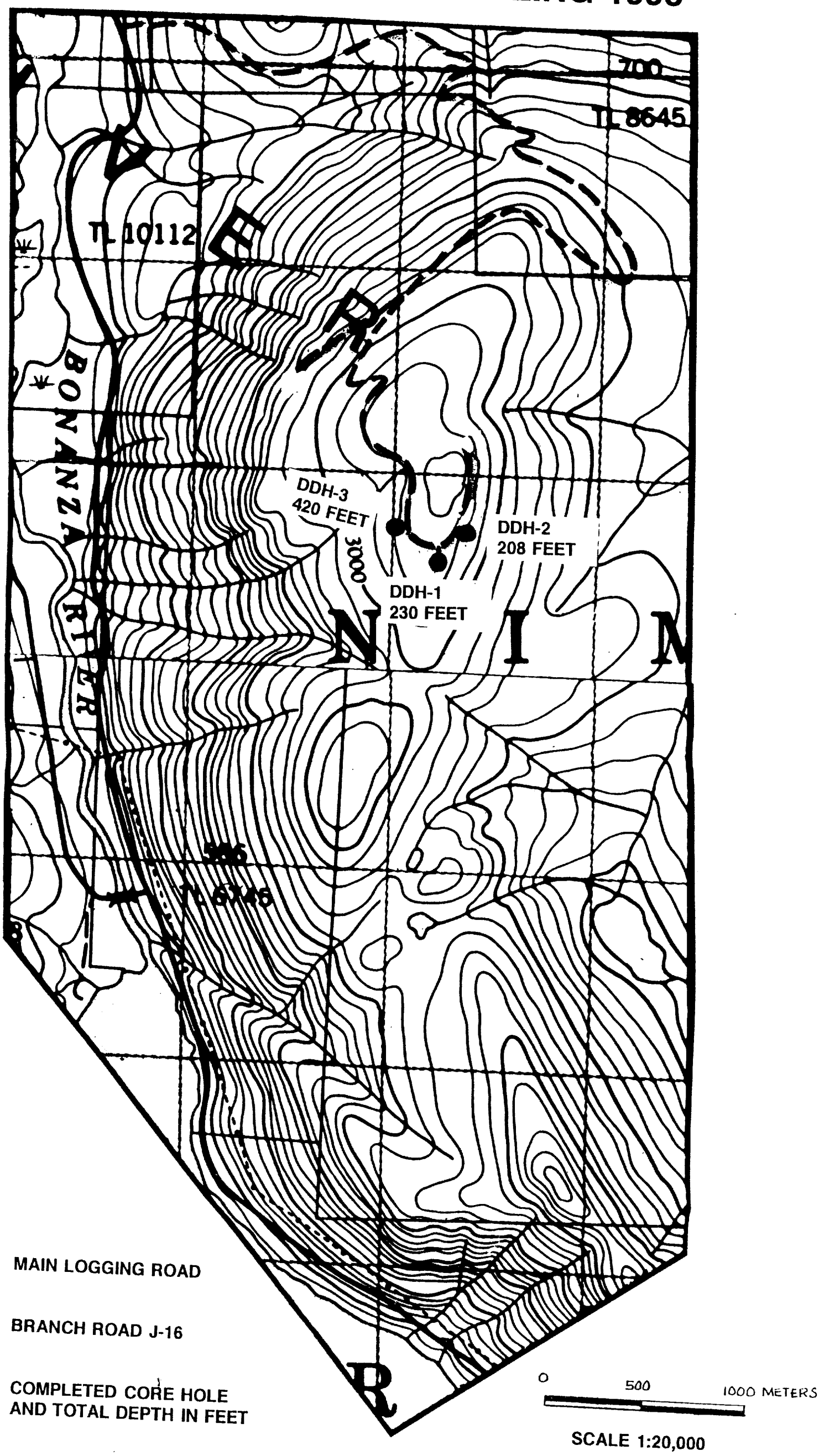
ASSAY DATA FROM 1995 DRILL CORE SAMPLES

This section will discuss the sampling and assay results of the core samples. Appendix 1 includes core logs of the core drilled in 1995. Appendix 2 contains results of the core sample analysis.

Drill core was split lengthwise, and 1/2 of the core was sampled at geologic and or logical mining intervals. Most samples correspond to the full bench interval for a conceptual future mine. A total of 41 core sample intervals were analyzed.

The core samples were crushed and split. The split samples were ground to -270 mesh for brightness testing. The pulverized samples were also analyzed for tint (yellowness), % $CaCO_3$, % $MgCO_3$, and % acid insols. Flotation tests were run on several similar composite samples from each of the cores.

BONANZA LAKE CORE DRILLING 1995



ASSAY RESULTS OF THE CORE SAMPLES

Analysis Of the drill core indicates that the white limestone is generally of high purity most often averaging >95% $CaCO_3$ and often greater than 98% $CaCO_3$. Sample analysis indicates that $MgCO_3$ is generally uniformly low, less than 2% in most samples . Acid insolubles are generally low, but do show some variation, most often ranging from 0.5% to 3%.

Mineral analysis of acid insolubles from drill core shows them to be composed of quartz, mica, feldspar, and pyrite. Pyrite and quartz are the dominant acid insolubles. No tremolite has been detected in the acid insoluble fraction. Pyrite occurs in the stylolites as previously noted. Quartz is present as silicified fossil blebs. See previous discussion of stylolites and silica blebs.

Chemical analysis of the drill core therefore indicates that the rock is a uniformly high calcium limestone averaging greater than 96% $CaCO_3$ with low Magnesium, and generally very low acid insolubles.

Brightness tests have included grinding to various specifications, as well as flotation to test beneficiation techniques.

Overall, dry grinding to a -270 mesh grind indicates the brightness of the white limestone layers ranges from 87 to 92 G.F. Zones with numerous stylolites and higher pyrite content had lower brightness, and of course rock with more grey colored mottling had lower brightness.

Flotation tests to remove the impurities usually resulted in higher brightness than dry grinding, and in some cases raised the G.F. brightness by as much as 5 points, although in most cases brightness was improved by about 2 points. . For some samples however, flotation brightness was lower than the dry grind brightness. This may be due to smearing of pyrite during the grinding, but the finely ground particles were not removed by flotation and the brightness lowered. Flotation at a coarser grind may remove a greater proportion of the pyrite before smearing and yield better results.

Acid insolubles and abrasion were significantly reduced as a result of flotation. Samples with less than 1% insolubles to start with, were reduced to levels as low as 0.12%. Samples with up to 2% insolubles were reduced to well under 1%, and samples which started with >2% insolubles, were reduced to much lower levels. Flotation reduced insol levels in almost all samples to less than 1%.

Based on the core drilling analysis to date, it appears that the rock is generally quite pure and ranges from moderate to high brightness on dry grind. Fine Grind and Flotation results in a quite pure end product (99% $CaCO_3$), and for most samples had improved brightness. The existing Columbia River Carbonate (CRC) plant in Washington produces both flotation as well as non floated products. It would seem that additional beneficiation tests may refine the flotation process for Bonanza Lake white limestone, but that sampling data to date suggests a high brightness, high purity product can be produced with proper beneficiation from the existing facilities at CRC.

APPENDIX 1
DRILL CORE LOGS
1995 CORE DRILLING

BONANZA CLAIMS Drilling 1995

PLUESS-STAUFER (CALIFORNIA) INC.
DRILL LOG

Drill Hole # DDH-B-95-1 Property BONANZA CLAIMS Date Start 5-27-95 Logged
Drilling Method VERTICAL BX CORE Total Depth 210' Date Finish 5-29-95 By H BROWN

Elevation 935 METERS 3020 FEET

ASSAY DATA

Feet

Log	Description	Core Rec	Grind	R.F.	G.F.	B.F.	Tappi	$CaCO_3$	$MgCO_3$	A.Insol

0

0-19 WHITE TO off WHITE MEDIUM GRAIN CALCITE MARBLE WITH OCCASIONAL LIGHT GREY STREAKS AND MOTTLING

10

OXIDISED PYRITIC STYLOLITES
2" @ 12'
1" @ 17'
DIP 15°

20

19-32 LIGHT GREY STREAKY MARBLE WITH SOME OFF WHITE MOTTLING
NOTE SEVERAL GREENISH-BLACK PYRITIC STYLOLITES
NOTE 3" HORNFELS @ 25'

30

32-53 MOTTLED WHITE OFF WHITE AND LIGHT GREY MARBLE
OCCASIONAL OXIDISED PYRITIC STYLOLITES AND STREAKS. NOTE STAIN ON FRACTURES AND YELLOW TINT

40

50

53-95 WHITE TO OFF WHITE MEDIUM GRAINED MARBLE
OCCASIONAL LIGHT GREY MOTTLING AND OCCASIONAL OXIDISED PYRITIC STYLOLITES

60

cont sheet 2

PLUESS-STAUFER (CALIFORNIA) INC.
DRILL LOG

Drill Hole # DDH-B-95-1 Property BONANZA Date Start 5-27-95 Logged
Drilling Method VERTICAL BX CORE Total Depth 210 feet Date Finish 5-29-95 By H Brown
Elevation 935 METERS 3020 feet

ASSAY DATA

Feet	Log	Description	Core Rec	Grind	R.F.	G.F.	B.F.	Tappi	$CaCO_3$	$MgCO_3$	A.Insol
75		53-95 CONT WHITE - off WHITE mbl									
80		78' BRECCIA AND BLACK SILICEOUS STYLOLITE 5"									
90											
		95-108 INTERBEDDED TO MOTTLED off WHITE AND LIGHT GREY mbl MOTTLING DECREASING 99-108 OCCASIONAL STAIN ON FRACTURES									
100											
110		108-126 VERY Light Grey marble Medium grain OCCASIONAL IRON OXIDE STAIN ON FRACTURES									
120											
130		126-130 BLACK DIABASE DIKE UP TO 5% PYRITE									
		130-131 off white marble									
		131-132 BLACK DIKE									
		132-139 LIMESTONE									
		134-135 DIKE									
		135-136 LIMESTONE									
		136-139 BLACK DIKE									
140		139-161 off white TO white marble OCCASIONAL grey STREAKS TO 1" THICK OCCASIONAL OXIDISED PYRITIC STYLOLITES									
150		1" CALC SILICATE @ 146, 150, 161									

cont sheet 3

PLUESS-STAUFER (CALIFORNIA) INC.
DRILL LOG

Drill Hole # DDH-B-95-1 Property BONANZA CLAIMS Date Start 5-27-95 Logged
Drilling Method VERTICAL BX CORE Total Depth 210 FEET Date Finish 5-29-95 By H BROWN

Elevation

ASSAY DATA

Feet	Log	Description	Core Rec	Grind	R.F.	G.F.	B.F.	Tappi	$CaCO_3$	$MgCO_3$	A.Insol
150		139-161 CONT WHITE - OFF WHITE MBL									
160		161-174 MOTTLED OFF WHITE TO LIGHT GREY-GREEN AND ORANGE TINTED (OXIDISED) MARBLE GREY GREEN STREAKS CONTAIN PYRITE AND CALC SILICATE 167-170 THN LAYERED									
170											
180		174-181 ALTERED SILICEOUS FELSITE INTRUSIVE AND BRECCIATED INTRUSIVE									
190		181-192 GREY TO PINK BIOTITE GRANITE INTRUSIVE UNALTERED									
200		192-210 BROWN FINE GRAINED SILICEOUS INTRUSIVE WITH SMALL AMOUNT OF PYRITE									
210		EOH 210'									

- white to off white mbl
- light grey mbl
- BLACK DIABASE DIKE
- GRANITE AND FELSITE INTRUSIVE
- PYRITIC STYLOLITE
- OXIDISED STYLOLITE

Honeycs

PLUESS-STAUFER (CALIFORNIA) INC.
DRILL LOG

Drill Hole # DDH-B-95-2 Property BONANZA CLAIMS Date Start 5-30-95 Logged
Drilling Method VERTICAL BX CORE Total Depth 208 FEET Date Finish 6-1-95 By H J BROWN
Elevation 940 meters 3055 FEET

ASSAY DATA

Feet	Log	Description	Core Rec	Grind	R.F.	G.F.	B.F.	Tappi	$CaCO_3$	$MgCO_3$	A.Insol
0		0-45 MEDIUM GREY MEDIUM COARSE GRAINED CALCITE mbl									
10											
20											
30											
40											
45		45-46 white mbl									
46		46-46.5 SULFIDE PYRITE									
		46-50 white marble with green silicate streaks									
50	SK P SK	50-52 SKARN +5% PYRITE									
		52-54 white mbl									
	V S V V S V	54-59 FINE GRAIN INTRUSIVE WITH 5-10% PYRITE									
60	S	59-64 OFF WHITE mbl 1" BLACK STYLOLITE WITH PYRITE AT 61'									
	S	64-67 INTRUSIVE +5% PYRITE									
		67-82 white - off white mbl grey mottling @ 69, 70, 71 Brown oxidized pyrite 75-76 occasional green silicate streaks									

CONT NEXT sheet

PLUESS-STAUFER (CALIFORNIA) INC.
DRILL LOG

Drill Hole # DDH-B-95-2 Property BONANZA CLAIMS Date Start 5-30-95 Logged
Drilling Method VERTICAL BX CORE Total Depth 208 feet Date Finish 6-1-95 By H BROWN
Elevation 940 METERS 3055 Feet

ASSAY DATA

Feet	Log	Description	Core Rec	Grind	R.F.	G.F.	B.F.	Tappi	$CaCO_3$	$MgCO_3$	A.Insol
75		CONT 67-82 off white mbl									
80		82-84 mottled grey-white mbl 84-90 OFF white mbl with some grey mottling AND greenish STREAKS									
90		90-102 LIGHT TO MEDIUM GREY MARBLE									
100		102-133 WHITE MARBLE TRACE LIGHT GREY MOTTLING 123, 124, 126 108-110									
110		OCCASIONAL STYLOLITES									
120											
130											
	M	133-147 BLACK MAFIC DIKE WITH PYRITE STREAKS AND VEINLETS DIP 55°									
140	M										
	M										
150		147-158 OFF WHITE mbl WITH OCCASIONAL GREY MOTTLING AND STYLOLITES									
		CONT NEXT SHEET									

PLUESS-STAUFER (CALIFORNIA) INC.
DRILL LOG

Drill Hole # DDH-B-95-2 Property BONANZA CLAIMS Date Start 5-30-95 Logged
Drilling Method VERTICAL BX CORE Total Depth 208 feet Date Finish 6-2-95 By H BROWN
Elevation 940 METERS 3055 feet

ASSAY DATA

Feet	Log	Description	Core Rec	Grind	R.F.	G.F.	B.F.	Tappi	$CaCO_3$	$MgCO_3$	A.Insol
150		147-158 CONT OFF WHITE mbl 151 3" BROWN mbl									
160	V V V M VM V V V MV	158-166 BLACK MAFIC DIKE DIP 55°									
		166-180 WHITE TO LIGHT GREY mbl COMMON STREAKY DARK GREY GREEN STYLOLITES 167-169									
170											
180	V M V V M V M	180-187 BLACK MAFIC DIKE NOTE ¼" CONTACT SKARN ZONE									
190		187-206 WHITE TO OFF WHITE mbl OCCASIONAL LIGHT GREY MOTTLING AT 1' SPACING									
200		STYLOLITES 195, 199									
		206-208 LIGHT GREY mbl									
		EOH 208' BIT BROKE UNABLE TO CONTINUE DRILLING HOLE TERMINATED									

- WHITE-OFF WHITE MARBLE
- MOTTLED WHITE-LT GREY
- LIGHT GREY mbl
- LIGHT TO MEDIUM GREY
- M V M V DIKE ROCK MAFIC / BLACK
- V M V DIKE ROCK SILICEOUS
- STYLOLITES
- P PYRITE

PLUESS-STAUFER (CALIFORNIA) INC.
DRILL LOG

Drill Hole # DDH-B-95-3 Property BONANZA CLAIMS Date Start 6-1-95 Logged
Drilling Method VERTICAL BX CORE Total Depth 420 FEET Date Finish 6-6-95 By H Brown
Elevation 930 METERS 3022 FEET

ASSAY DATA

Feet	Log	Description	Core Rec	Grind	R.F.	G.F.	B.F.	Tappi	$CaCO_3$	$MgCO_3$	A.Insol
0		0-36 VERY LIGHT GREY TRANSLUCENT MEDIUM GRAIN MARBLE THICK BEDDED TO MASSIVE OCCASIONAL DISSIMINATED PYRITE									
10											
20											
30											
40		36-40 OFF WHITE MARBLE									
50		40-72 VERY LIGHT GREY MARBLE									
60											
		72-102 STREAKY LIGHT TO MEDIUM GREY MBL 72-73 STYLOLITES AND 3" BLACK SILICA									

Cont NEXT SHEET

PLUESS-STAUFER (CALIFORNIA) INC.
DRILL LOG

Drill Hole # DDH-B-95-3 | Property BONANZA CLAIMS | Date Start 6-1-95 | Logged
Drilling Method VERTICAL BX CORE | Total Depth 420 FEET | Date Finish 6-6-95 | By H BROWN
Elevation 930 METERS 3022 FEET

ASSAY DATA

Feet	Log	Description	Core Rec	Grind	R.F.	G.F.	B.F.	Tappi	$CaCO_3$	$MgCO_3$	A.Insol
75		72-102 cont STREAKY MEDIUM GREY MARBLE									
80											
90											
100		102-105 THICK BEDDED LIGHT-MEDIUM GREY MBL									
		105-113 STREAKY LIGHT TO MEDIUM GREY MARBLE									
110		113-140 WHITE MBL OCCASIONAL TRACE IRON OXIDE STAIN ON FRACTURES 2" LT GREY @ 120									
120											
130											
140		140-142 LIGHT GREY									
		142-152 WHITE TO OFF WHITE MBL									
150		CONT NEXT SHEET									

PLUESS-STAUFER (CALIFORNIA) INC.
DRILL LOG

Drill Hole # DDH-B-95-3 Property BONANZA CLAIMS Date Start 6-1-95 Logged
Drilling Method VERTICAL RX CORE Total Depth 420 FEET Date Finish 6-6-95 By H BROWN
Elevation 930 METERS 3022 FEET

ASSAY DATA

Feet	Log	Description	Core Rec	Grind	R.F.	G.F.	B.F.	Tappi	$CaCO_3$	$MgCO_3$	A.Insol
150		142-152 CONT white TO off white mbl									
		152-159 white TO very Light grey mottled occ STYLOLITES									
160		159-169 Light grey mbl common BLACK STYLOLITES									
170		169-172 mottled white - Light grey									
		172-185 Light grey TRANSLUCENT marble minor white mottling AND BANDS									
180											
		185- gradational over 1' TO white - off white marble MEDIUM TO COARSE grain occasional trace Light to 5% grey mottling 197, 204, 207, 209, 212, 215									
190											
200											
210											
2											
		CONT NEXT Sheet									

PLUESS-STAUFER (CALIFORNIA) INC.
DRILL LOG

Drill Hole # DDH-B-95-3 Property BONANZA CLAIMS Date Start 6-1-95 Logged
Drilling Method VERTICAL BX CORE Total Depth 420 feet Date Finish 6-6-95 By H BROWN
Elevation 930 METERS 3022 feet

ASSAY DATA

feet	Log	Description	Core Rec	Grind	R.F.	G.F.	B.F.	Tappi	$CaCO_3$	$MgCO_3$	A.Insol
225		185-252 cont white to off white mbl occasional light grey mottling									
230											
240											
250		252-253 siliceous dike									
		253-289 white to off white marble occasional light grey mottling occasional trace dissiminated pyrite									
260		269-265 iron oxide stain on fractures									
270											
280											
290		289-293 light grey marble									
		293-297 white mbl slight light grey mottling									
		297-299 grey/white banded mbl									
300		cont next sheet									

PLUESS-STAUFER (CALIFORNIA) INC.
DRILL LOG

Drill Hole # DDH-B-95-3 Property BONANZA CLAIMS Date Start 6-1-95 Logged
Drilling Method VERTICAL BX CORE Total Depth 420 feet Date Finish 6-6-95 By H J BROWN
Elevation 930 METERS 3022 feet

ASSAY DATA

Log Description Core Rec Grind R.F. G.F. B.F. Tappi $CaCO_3$ $MgCO_3$ A.Insol

300
310
320
330
340
350
360
370

299-321
WHITE MARBLE
SOLID CORE
MASSIVE

321-375
WHITE MARBLE
WITH IRREGULAR
OCCASIONAL GREY
MOTTLING
AT 322, 328, 333
351 346 365 367
371
NOTE BLACK STYLOLITES
AT 353, 359 (HEAVY)
361

S S
S S
S

CONT
NEXT
SHEET

PLUESS-STAUFER (CALIFORNIA) INC.
DRILL LOG

Drill Hole # DDH-B-95-3 Property BONANZA CLAIMS Date Start 6-1-95 Logged
Drilling Method VERTICAL BX CORE Total Depth 420 FEET Date Finish 6-6-95 By H BROWN

Elevation

ASSAY DATA

Log	Description	Core Rec	Grind	R.F.	G.F.	B.F.	Tappi	$CaCO_3$	$MgCO_3$	A.Insol

370
321-375 CONT WHITE MARBLE WITH IRREGULAR OCCASIONAL GREY MOTTLING
375-379 WHITE MARBLE HEAVY GREY MOTTLING
380
379-420 MEDIUM TO COARSE GRAIN WHITE TO OFF WHITE MARBLE OCCASIONAL LIGHT GREY MOTTLING
S
390
385 3" STYLOLITE
395 MOTTLING
400
406 STYLOLITE
406 MOTTLING
S S
408 3" STYLOLITE
410
418 MOTTLING
420 MOTTLING
420
EOH 420
HOLE BOTTOM IN WHITE MARBLE

WHITE - OFF WHITE MARBLE
MOTTLED WHITE LIGHT GREY MARBLE — IRON OXIDE STAIN
LIGHT GREY MARBLE
MEDIUM GREY MARBLE
SILICEOUS DIKE
SS BLACK STYLOLITES
P DISIMINATED PYRITE

APPENDIX 2
LAB ANALYSIS RESULTS

GEOLOGY DEPARTMENT

Report # **preliminary**

CHEMICAL ANALYSES

BRIGHTNESS

LAB #	SAMPLE ID	CaCO3 %	MgCO3 %	Fe2O3 %	Acid Insols %	Fineness	Rx	Ry	Rz	Tappi	Index
	BRITISH COLUMBIA										
	Bonanza Lake Core BC-BZ-95-1										
99-0835	0 - 19'	95.93	2.83	0.07	1.16	-270	90.71	89.40	84.82	84.77	6.54
99-0836	19 - 32'	94.10	3.57	0.16	2.16	-270	84.46	83.29	78.78	78.42	6.45
99-0837	32 - 53'	95.69	3.05	0.08	1.17	-270	89.15	87.85	83.10	83.05	6.84
	Composite 0-53'				1.62						
	Flotation Yield 87%				0.91	-270	84.39	82.76	76.66	76.87	9.45
99-0838	53 - 95'	96.34	2.57	0.07	1.01	-270	90.88	89.83	85.66	85.65	5.78
99-0839	95 - 108'	98.38	0.29	0.05	1.27	-270	89.77	88.79	84.85	84.81	5.51
99-0840	108 - 126'	98.57	0.34	0.07	1.01	-270	89.71	88.72	84.76	84.73	5.55
99-0841	140 - 161'	97.36	0.32	0.09	2.22	-270	89.77	89.08	85.95	85.88	4.26
	Composite 53-161'				1.38						
	Flotation Yield 84 %				0.60	-270	89.80	88.66	83.84	84.03	6.82
99-0842	161 - 174'	94.04	0.73	0.27	4.95	-270	84.45	82.93	76.60	76.62	9.46
	Flotation Yield 90%				3.91	-270	73.02	70.93	63.34	63.54	13.76

GEOLOGY DEPARTMENT

Report # **preliminary**

CHEMICAL ANALYSES

BRIGHTNESS

LAB #	SAMPLE ID	CaCO3 %	MgCO3 %	Fe2O3 %	Acid Insols %	Fineness	Rx	Ry	Rz	Tappi	Index
	Core BC-BZ-95-2										
99-0843	0 - 45'	98.61	0.63	0.04	0.71	-270	70.88	70.74	69.54	69.60	1.97
99-0844	45 - 67'	93.27	0.42	0.42	5.88	-270	67.86	67.43	65.31	65.39	3.84
	Composite 0-67'			1.63	4.07						
	Flotation Yield 86%			0.60		-270	81.42	80.92	78.41	78.52	3.80
99-0845	67 - 80'	98.13	0.35	0.11	1.40	-270	84.16	83.39	79.04	79.27	6.28
99-0846	80 - 100'	98.46	0.43	0.08	1.03	-270	80.20	79.52	75.57	75.76	5.98
	Composite 67-100'				1.02						
	Flotation Yield 80%				0.80	-270	77.70	76.42	71.27	71.44	8.52
99-0847	100 - 133'	90.84	0.35	0.04	8.77	-270	88.70	87.90	84.01	84.18	5.44
99-0848	147 - 208'	98.27	0.35	0.06	1.32	-270	89.17	88.70	86.09	86.23	3.56
	Composite 100-208'				0.82						
	Flotation Yield 76%				0.28	-270	91.77	91.28	88.99	89.13	3.11
	Core BC-BZ-95-3										
99-0849	0 - 35'	99.04	0.41	0.02	0.53	-270	87.79	87.74	87.31	87.33	0.57
99-0850	35 - 70'	99.29	0.42	0.04	0.25	-270	82.04	81.86	80.80	80.85	1.56
99-0851	70 - 100'	98.86	0.41	0.04	0.68	-270	74.59	74.34	72.84	72.91	2.41
99-0852	100 - 115'	98.90	0.48	0.04	0.58	-270	74.02	73.99	73.43	73.47	0.85
	Composite 0-115'				0.55						
	Flotation Yield 77%				0.12	-270	87.66	87.49	86.07	86.19	1.90

GEOLOGY DEPARTMENT

Report # **preliminary**

CHEMICAL ANALYSES

BRIGHTNESS

LAB #	SAMPLE ID	CaCO3 %	MgCO3 %	Fe2O3 %	Acid Insols %	Fineness	Rx	Ry	Rz	Tappi	Index
	Core BC-BZ-95-3										
99-0853	115 - 140'	99.02	0.38	0.04	0.56	-270	90.96	90.11	86.46	86.60	5.07
99-0854	140 - 160'	98.34	0.32	0.05	1.29	-270	88.08	87.38	84.30	84.41	4.40
99-0855	160 - 185'	95.60	0.39	0.04	3.96	-270	81.84	81.41	79.12	79.22	3.42
99-0856	185 - 215'	98.96	0.38	0.03	0.62	-270	90.57	90.04	87.47	87.59	3.51
99-0857	215 - 252'	98.70	0.38	0.02	0.89	-270	91.53	91.24	89.73	89.82	2.02
99-0858	253 - 289'	98.59	0.36	0.03	1.01	-270	91.46	91.23	90.00	90.07	1.64
	Composite 115-160, 185-289'				0.95						
	Flotation Yield 96%				0.48	-270	92.22	91.59	88.56	88.71	4.07
99-0859	289 - 299'	97.98	0.53	0.03	1.45	-270	88.30	88.17	87.54	87.58	0.88
99-0860	300 - 320'	98.66	0.38	0.03	0.92	-270	90.74	90.61	89.91	89.95	0.93
99-0861	320 - 345'	97.96	0.43	0.04	1.56	-270	78.90	78.32	77.52	77.57	1.67
99-0862	345 - 375'	98.62	0.36	0.04	0.97	-270	89.73	89.47	87.77	87.88	2.26
99-0863	379 - 420'	98.52	0.42	0.06	0.99	-270	90.63	90.51	89.77	89.82	0.97
	Composite 289-320, 345-420				1.13						
	Flotation Yield 95%				0.39	-270	91.83	91.49	89.59	89.70	2.51
	Core BC-BZ-95-3										
99-0855	160 - 185'	95.60	0.39	0.04	3.96	-270	81.84	81.41	79.12	79.22	3.42
99-0861	320 - 345'	97.96	0.43	0.04	1.56	-270	78.90	78.32	77.52	77.57	1.67
	Composite160-185, 320-345'				1.03						
	Flotation Yield 77%				0.25	-270	90.87	90.62	89.01	89.13	2.13

APPENDIX 3
STATEMENT OF WORK PERFORMED AND COSTS

STATEMENT OF WORK PERFORMED AND COSTS

Office Costs	**Quantity (days)**	**Unit cost/day**	**Total cost**
Supervision, Analysis of lab results Assessment Report preparation, copies	2.5 days	$615/day	$1,537.50
Shipping of samples		$ 50.00	$ 50.00
Laboratory costs	**Quantity of samples**	**Unit cost/Hr**	**total cost**
Sample preparation (split, crush riffle)	29 samples	$75/hr	$2,175.00
Pulverize, sieve, dry grind chemical analysis brightness and tint	29 samples	$180/hr	$5,220.00
Flotation testing chemical analysis, brightness and tint	10 samples	$205/hr	$2,050.00
Lab report preparation	1 report		
Subtotal			**$11,032.50**
+ 10% overhead			**$ 1,103.25**
TOTAL COSTS DIRECTLY APPLICABLE TO ASSESSMENT			**$12,135.75**

APPENDIX 4
SUMMARY OF AUTHORS PROFESSIONAL EXPERIENCE

HOWARD J. BROWN, OMYA (CALIFORNIA) INC.
SUMMARY OF PROFESSIONAL EXPERIENCE
April 10, 1999

Graduate of California State University, Northridge, receiving a Bachelor Degree in in 1975.

More than 22 years professional experience in positions of responsibility as an Exploration and Mining Geologist/Mining Engineer in the mining industry in Western North America. Experience includes Uranium, Gold, and a large variety of Industrial Minerals during the last 20 years.

Currently employed by OMYA (California) Inc. since 1979. Previously employed by Noranda Exploration, and Freeport Gold Co. (FMC).

I have participated in over 110 industrial mineral evaluation and exploration projects in North America, ranging from local to regional in extent from British Columbia to Southern Mexico. Projects have included all phases of conceptual model development thru discovery and orebody delineation, of both metallic and a large number of industrial mineral deposits.

More than 15 geologic mapping, sampling and drilling projects involving white crystalline limestone deposits in British Columbia.

Mine permitting experiences include preparation and approval of Plans of Operations and Reclamation Plans, application and permitting for several large scale currently active industrial mineral mines, and preparation and approval of comprehensive phased reclamation plans for large scale multi-mine operations in several states, and thru several regulatory agencies at Federal, State and Local levels.

Mine design and engineering experience includes all mine development aspects of ten (10) currently operational mines including, compliance with regulations, geotechnical analysis, geology and reserve definition, mine engineering and planning including conceptual and detailed short and long term engineering design, equipment selection, economics, and reclamation planning.

Mine management and production experience includes long and short term production and development planning, scheduling, mine mapping, equipment selection, inventory calculations and management, cost analysis, and budget preparation.

Author of more than 22 published papers and abstracts on a variety of geological and economic geology topics for various professional societies and technical journals.

Considered by peers to be an expert on Paleozoic stratigraphy and geology of the Mojave Desert region, of southern California, and an expert on limestone limestone deposits in western North America.