Box 6

REPORT

ON

VERNON LIMESTONE DEPOSITS

TEXADA ISLAND, B. C.

92-F-9

MINING DIVISION

Alexander Smith

MINING ENGINEER

1946

OFFICE OF

Ridgeway R. Wilson

and Associates

MINING ENGINEERS

215 · 602 WEST HASTINGS ST.

VANCOUVER, B. C.

RIDGEWAY R. WILSON & ASSOCIATES
MINING ENGINEERS

REPORT ON THE
VERNON LIMESTONE DEPOSITS
TEXADA ISLAND, B.C.

by

ALEXANDER SMITH.

SUMMARY:

The Davies Bay belt of limestone on Texada Island is 4 miles long by 1 mile wide. It is considered to be the equivalent of the Marble Bay formation outcropping at the north end of the island. The lower 500 feet of the formation is of high calcium limestone and it is in this member that the successful quarries of the north end of the island are located. At Davies Bay this member outcrops on or near the northeast contact of the limestones. Structurally the area appears to be on the northeast limb of a syncline with the limestone beds dipping at medium angles to the southwest i.e. towards the shore. The volcanics outcropping along the beach also dip gently southwest. They may be either faulted into juxtaposition or else overlie the limestones.

On the Vernon holdings our preliminary sampling has outlined a band of high calcium limestone of a size and attitude suitable for low cost quarry operations. Unfortunately this high grade lime is 1½ miles from the beach and at an elevation of 750 feet. Again Davies Bay will require considerable expenditure to make it into a safe harbor.

The high calcium lime is suitable for the manufacture of lime, cement, pulp rock or agricultural lime. Some beds may even be suitable for carbide. Beds of lower grade occur to the southwest to within ¾ of a mile of the beach.

Further testing by trench sampling and diamond drilling is required but the outlook is dependent principally on the economics of hauling, transportation and marketing. An expenditure of about

$250,000 will be required to bring the property into production on an efficient basis at the rate of 300 - 500 tons per day. To justify this outlay the product should have an assured market, particularly as present producers are apparently capable of supplying local B.C. demands.

INTRODUCTION:

The following report covers an examination of the Vernon limestone deposits on Texada Island made during late November and the first half of December 1945. Together, with R. W. Wilson and J. A. Robertson the most important portions of the property were surveyed. A previous report by Mr. Wilson gives a description of the property and uses and specifications for the limestone. As Mr. Wilson is now preparing a detailed report on proposed development and markets these features will be mentioned only briefly herein.

The property is at Davie Bay on the southwest coast of Texada Island. It is 70 miles by water from Vancouver, 27 miles from Powell River and 185 miles from Tacoma. The property now consists of lots 303, 394, 395, 302 and two 40 acre blocks in the S.E.corner of Lot 493. This area of 950 acres is now held under quarry lease or is under application for lease. The Annual rental of $1 per acre is due on Lots 394 and 395 on February 14, 1946.

GEOLOGY:

The geology of Texada Island has been described by R. G. McConnell in G.S.C. Memoir 58, 1914. During the past Two summers W.H. Mathews of the B.C.Department of Mines has made a more detailed study of the limestone deposits. There are two principal limestone areas; that at the North end of the island, and that at Davies Bay.

His report on the north area is to be published next month, that on the Davie Bay area at a later date. Since making our examination the writer has had the opportunity of reading Mathews' paper on the Northern area. As his terminology and descriptions fit in so well with our findings in the Davies Bay area the writer has used them freely herein.

The limestone belongs to the Marble Bay formation of Triassic Age and consisting of a thickness of over 2000 feet of limestone. The Marble Bay overlies conformably andesitic volcanics of the Texada formation, also Triassic. At the northern end of the island these formations are cut by granite and diorite intrusives. Contact metamorphic gold-copper and magnetite deposits occur near the intrusives. The igneous activity has marbleized the limestone of the northern area. At Davie Bay there are no apparent intrusives and the limestone is relatively unaltered and is fine grained.

The Texada formation is the " Porphyrite " of McConnell's map. He believed it to be largely intrusive in character. Matthews considers the formation to be largely of volcanic origin with some dykes and sills. This appears to be the more reasonable interpretation for that part of the formation seen around Davies Bay. Pillow structures, amygduloidal layers, porphyritic textures and thin intercalated beds of limestone all point to a volcanic origin for the formation. Most of the formation is of massive, green, blocky rock with some amygdules or phenocrysts. Structure is not easily discernible. The volcanics appear andesitic in composition.

Small areas of Upper Cretaceous sediments belonging to the coal bearing Nanaimo series occur at Gillies Bay and Davies Bay.

These rocks are flat lying and relatively undisturbed.

A large part of the island up to 900 feet in elevation is covered by a heavy mantle of glacial drift. This consists of a few feet of glacial till and up to 300 feet of interglacial silts and sands. In the area mapped at Davies Bay there are indications that the drift in places is over 50' thick.

MARBLE BAY FORMATION:

Lithology:

Mathews has divided the limestones of the Marble Bay formation into 3 members. For purposes of description he has also classified the limestone on the basis of magnesia content as -

HIGH CALCIUM LIMESTONE	...	0.16% - 1.0%	Mg.O.
CALCIUM "	...	1% - 4%	Mg.O.
MAGNESIAN "	...	4% - 19%	Mg.O.
DOLOMITIC "	...	19% plus	Mg.O.
Pure dolomite is theoretically		21.7%	Mg.O.

His 3 members are -

1. The lowest 500' is of high calcium limestone. In ~~from~~ this member, immediately overlying the volcanics, the successful limestone quarries at the north end of the island are located. Here the beds are thick, the structure massive, and variations in chemical composition slight.

2. The next 1500 feet is of calcium limestone. Thin magnesian and dolomitic beds occur in the lower part. Higher in the section the magnesian and dolomitic beds become thicker, and stratification is conspicuous.

3. Only about 200 - 300 feet of the upper member remains. (Referring to the Marble Bay area) Here there is a marked variation in the composition of the beds with magnesian and dolomitic beds predominating over calcium limestone.

The limestones at Davies Bay were mapped in the field on the basis of color - light, medium and dark grey and light brown. The distinctions between the medium and dark grey shows up more on the map than it does in the field. In general, the medium grey varieties are of the highest grade in CaO. while the light browns are highest in magnesia.

STRUCTURE:

The limestone area at the north end of the island is 8 miles long by 2 miles wide. The limestones here are in a broad syncline plunging gently to the northwest. On the east side of the syncline the lowest member would lie under the sea. A subsidiary anticline extending from Stuart Bay to Grilse Point and a dome at Blubber Bay bring this valuable lowest member to the surface. Transverse normal faults trending northeast displace the limestone beds in some cases as much as several hundred feet.

The Davie Bay limestone area also trends northwest. In length it is 4 miles; in width, 1 mile. It is probably on the northeastern limb of a syncline trending northwest. Mathews considers it has been preserved from erosion by downfaulting along the southwestern side of the area. The volcanics on the northeast side of the limestone belt apparently dip at 35° - 50° to the southwest. Those on the southwest side, at more gentle angles of 10 - 20° to the southwest. The limestone on the northeast side of the belt corresponds in grade, and in massive character to the lowest member of Mathews' classification. Going southwest the limestones become more varied in color and in grade i.e. similar to his middle member. Here the beds apparently dip uniformly to the southwest at 45 - 50°.

On the northeast i.e. in what is taken to be the lowest member (our samples 3, 4, 7, 8, 9) the dips are not apparent. There is a suggestion of steeper dips, some second order folding, and minor transverse faulting.

The northeast contact, where not covered by drift, is commonly marked by a deep narrow draw in which sink holes occur. The holes are conical depressions often 20' deep in the drift on the draw floor. There must be extensive caves along this contact. Steep bluffs at many places along the contact suggest that it dips at over 35°. This northeast contact has irregularities suggestive of both longitudinal and transverse faulting. At the S.W. corner of Lot 396 the contact is stepped about 1000 feet to the west by transverse faulting or subsidiary folding. The northwestern extremity of the belt is embayed as if by folding. The limestone along the northeast side of the belt is on the whole massive medium to dark grey, similar to that in the area samples by us.

Mathews postulates a longitudinal fault on the southwest margin of the belt. To bring the middle member of the limestone in juxtaposition with the volcanics would mean a downthrow on the northeast side of the fault of 800' or so. Whether there is conclusive field evidence of the existence of this fault or not is not known to the writer. McConnell believed that the Texada formation intruded and overlay the limestone; Mathews, that the volcanics underlie the limestones. There are numerous smaller lenses of limestone interbedded with the volcanics. An explanation that would reconcile their findings is that the Marble Bay formation is also a lense underlain and overlain conformably by volcanics. This is a

likely condition as the volcanics were probably in large part of submarine deposition. It would eliminate the necessity of inferring a fault along the southwest side of the lense as the volcanics on that side would then overlie the limestone.

SAMPLING: Our sampling was of a preliminary nature to determine the grade of the various beds. Field tests with acid were of little help. In sampling, a chip of as fresh limestone as possible was taken every 6 inches across the width sampled.

The results of the analyses of 27 samples are shown on the 200 scale map. Copies of the analyses by Eldridge & Co., are appended hereto. Five composite samples ran from 0.006% to 0.011% in phosphorus.

Samples 3, 4, 7, 8, and 9 near the northeast contact ran over 96% $CaCO_3$. The rock here is a uniform massive medium grey limestone. 3 and 4 were the lowest in magnesia and 7, 8, 9 lower in silica. Samples 12 and 13 run 4% $MgCO_3$ but other impurities are low.

The bands of samples 14 and 15 and samples 25, 17, 18, 20, 21, 22 and 23, average about 93% plus $CaCO_3$ and 4% $MgCO_3$ with both insoluble and Alumina plus Iron less than 1%.

To the southwest the bands at samples 27, 28, 29 and at 30, 31 and 35 run only about 90% CaCO3 and with magnesia and the other impurities higher.

Eldridge noted that on ignition all the samples burned white indicating a low Iron content. Sample 12 assayed 1.08% in Alumina plus Iron oxides. Of this the Iron oxides were found to be

only 0.10%, the balance of 0.98% being Alumina. It is thought that the iron content is correspondingly low in the other samples.

The magnesia occurs in laminae or beds of nearly pure dolomite or as disseminated grains of dolomite in certain beds. It is apparently the product of the original sedimentation and was not introduced by later solutions. Hence beds are likely to give a fairly uniform grade for considerable distances along strike.

USES & SPECIFICATIONS:

Mathews gives the following specifications as applying to the industry in B.C.

1. For Builders Lime and Plaster.	MgO	less than 1%
	Iron oxides	" " 1%
	Manganese oxides	" " 0.03%
2. For manufacture of carbide.	MgO	less than 2%
	SiO_2	" " 3%
	Phosphorus	" " 0.006%
3. For pulp and paper industry.	MgO	less than 4%
	No carbon or mica and low insoluble.	
4. For cement.	MgO	less than 4%
	with Alumina & Silica o.k. up to several per cent each.	
5. For agricultural limestone.	Specifications lenient, magnesian limestone is not as good as high Calcium limestone but still is beneficial.	

(Note: To convert % CaO to % $CaCO_3$ multiply by 1.785)
To convert % MgO to % $MgCO_3$ multiply by 2.09).

Applying these specifications to the Vernon Limestone we find:-

1. For Builders Lime and Plaster:-
Only the northeast area i.e. the lowest member in the vicinity of samples 3, 4, 7, 8, 9 are sufficiently low in magnesia to meet the above specification. Whether magnesia really has to be that low should be looked into. Certain plasters are made with high magnesia rock. The Vernon limestone burns white and should have strength sufficient to avoid crumbling in the kiln.

2. For manufacture of Carbide:-
The composite samples ranged from 0.006% to 0.011% Phosphorus. This is not much above the allowable limit of 0.006%. One composite of samples 3, 12 and 13 averaged 0.006%. It is likely that more detailed sampling will show areas in the northeast section below the limit.

3. For Pulp and Paper Industry:-
Most of the northeast portion of the limestone would meet the above requirements of less than 4% MgO and low Silica. R.W.Wilson obtained the following specifications from one of the pulp companies.

SiO_2	less than	1.5%
Iron and Alumina	" "	1.0%
$MgCO_3$	" "	3%
$CaCO_3$	not " "	95%

To meet the more exacting requirements only the northeast section in the area of samples 3, 4, 7, 8, 9 would be suitable chemically. The rock required is known as "one man rock" and has to be in pieces of not less than 6 inches in diameter or over 100 pounds in weight. It appears that in the vicinity mentioned the rock would break sufficiently blocky.

4. For Cement manufacture:-
Chemically most of the limestone would be suitable for cement. Uniformity in grade is an essential and would most likely be obtained in the lowest member i.e on the northeast. Here samples 3, 4, 7, 8, 9 would be of excellent grade for cement manufacture. One factor that would have to be looked into is the grindability of the rock.

5. Agricultural limestone:-
Most of the limestone, but particularly the northeast section, is suitable.

GENERAL OUTLOOK:

It is understood from Mr. R.R.Wilson that the problem of costs, markets and competition are being looked into and checked by 3 separate investigations. Hence the writer has not studied these aspects. Our sampling has determined in a general way the location of the better limestone. Parts of the lowest member on the northeast side give promise of being excellent in grade and uniformity for the manufacture of plaster, pulp rock or cement. There is every indication that the area is ample for quarrying operations.

The dip is not definitely determined but whether it is at medium angles to the southwest or nearly vertical will not greatly affect the quarrying of the rock. Some of the beds to the southwest may also be suitable but they are more likely to be thin beds and across quarry widths the difficulty may be in maintaining a uniform grade.

Mathews mentions three factors as being essential to a successful quarry on the north end of the island. (1) Grade (2) Depth and lateral extent sufficient to permit efficient extraction and (3) Access to a sheltered harbour. The pattern of operating and abandoned quarries shows a marked correlation to proximity to sheltered harbours. Of 6 quarries on the lowest member, 3 are in continuous operation, 2 were abandoned for a more favorable location, while 1 is 3½ miles by road from Vananda. Eight quarries have been attempted on the middle member but 7 have been abandoned because of difficulty in getting good grade. It is not proven that a deposit of excellent grade but several miles from a sheltered harbour can be worked economically. The present producers have a capacity capable of supplying the local market and taking care of any likely expansion. Because of the cost of breakwaters and bunkers any deposit not near a good harbor could hardly at present compete with more favorably situated deposits.

The established industry at the north end of the island produces limestone products to the value of over a quarter of a million dollars annually. At present there are three principal producers, the Pacific LimeCompany at Blubber Bay; the B.C. Cement, which haul their rock ½ mile along the shore by narrow gauge railway to Blubber Bay; and, the Beale Quarries, which are on tidewater in a

poor shelter. They operate with a standby tug to tow the scows the short distance to harbour. Both the B.C.Cement and the Beale quarries are said to be cut by dykes.

The Vernon deposits have in their favor the fact that they apparently contain a large tonnage of high calcium lime free from dykes and so situated that it can be quarried cheaply. The disadvantages are two. First, that the favorable beds are situated at a distance of 1½ miles from Davies Bay at elevations of 700 - 1000 ft. This will require over two miles of truck road, a conveyor belt, or tramline installation. Second, that Davie Bay is not a natural harbor. It would have to be made into a safe anchorage for scows, barges and tugs.

Davies Bay is exposed to the southeast, southwest and northwest (Qualicum) gales. A cribwork or some kind of breakwater out to the northwest end of Goat Island would provide shelter for scows etc. loading from bunkers located on the northeast shore or Goat island. Some further protection such as a hulk may be necessary at the southeast point of the island.

To overcome these disadvantages considerable capital will be required. The operation would have to be conducted on the scale of at least several hundred tons per day to get sufficiently low operating costs. Probably over $250,000 capital would be needed. As the present producers seem capable of filling the present local market, they would probably offer stiff competition to anyone encroaching on their preserves. Before starting on the development of the Vernon limestone deposits a market for the product at a suitable contract price would have to be assured. It is understood that the

best market is in the Puget Sound area.

Extracts from the B.C. Minister of Mines Annual Report for 1944 are appended hereto. They give information on the present operators.

RECOMMENDATIONS:

Before proceeding with the development of the deposits further testing should be carried out. This should include -

1. A more detailed mapping and sampling of the northeast portion of the limestone area and of any other beds to the southwest that might be suitable for the product required.

2. Some diamond drilling for checks on geology and sampling in the above area.

3. A drill hole from Sta. 106 southwest to the volcanics to test the possibility that the lower member might lie there on the southwest flank of a syncline.

4. Look into the possibilities of alternate quarry sites to the northwest and southeast of the Vernon holdings. They might be more suitable for us, or they might be acquired to eliminate competitors later.

5. Have an expert on harbors examine the situation at Davies Bay.

6. Send representative samples of the limestone to possible users for testing.

CONCLUSIONS:

There is every indication of a deposit of high calcium limestone of a size sufficient for cheap extraction by large scale quarrying operations. This is situated at about 1½ miles from Davies Bay at any elevation of about 700 feet.

The operation would have to be on the scale of several hundred tons per day to warrant the capital expenditures necessary for road and harbor. Markets would have to be assured before embarking on the project, as present producers would likely offer stiff competition to anyone trying to break into their local markets.

Alex'r. Smith.

Alex'r. Smith,
Geologist.

January 19,1946.

PHONE PACIFIC 7034

REPRESENTATIVES IN
LONDON, ENG., UNITED STATES AND EUROPE

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FILE NO. 54840

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AMERICAN CHEMICAL SOCIETY

January 4th, 1946.

Messrs. St. Eugene Mining Corporation Ltd.,
602 West Hastings St.,
VANCOUVER - B.C.

Dear Sirs:

We made composites of the twenty-two samples of LIMESTONE submitted by you, as set out below, and in accordance with your instructions have tested the same for PHOSPHORUS content, with the following results:

		PHOSPHORUS (P)
(1)	Composite of Nos. 403, 412, 413	0.006 %
(2)	Composite of Nos. 407, 408, 409	0.009 %
(3)	Composite of Nos. 417, 418, 422, 425, 432, 433	0.008 %
(4)	Composite of Nos. 427, 428, 429, 434	0.011 %
(5)	Composite of Nos. 431, 430, 435	0.008 %

G. S. ELDRIDGE & CO. LTD.,

By G S Eldridge

PHONE PACIFIC 7034

REPRESENTATIVES IN
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CABLE ADDRESS "ELDRICO"
FILE NO. 54906

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AMERICAN CHEMICAL SOCIETY

January 16th, 1946

Messrs. St. Eugene Mining Corporation Ltd.,
602 West Hastings St.,
VANCOUVER - B.C.

Dear Sirs:

We have analyzed the five samples of LIMESTONE submitted by you and report as follows:

MARKS	INSOLUBLE	IRON OXIDE AND ALUMINA	LOSS ON IGNITION	LIME (CaO)	LIME ($CaCO_3$)	MAGNESIA (MgO)	MAGNESIA ($MgCO_3$)
401	0.98	0.74	44.42	46.24	82.6	7.50	15.70
405	0.53	0.24	43.92	52.90	94.5	2.12	4.44
406	0.56	0.34	44.22	51.60	92.2	3.20	6.70
420	0.98	0.43	43.96	51.72	92.5	2.78	5.82
421	0.33	0.29	43.90	53.14	94.9	2.13	4.45

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By G S Eldridge

PHONE PACIFIC 7034

REPRESENTATIVES IN
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January 4th, 1946

Messrs. St. Eugene Mining Corp. Ltd.,
602 West Hastings St.,
VANCOUVER - B.C.

Dear Sirs:

We have analyzed the 22 samples of LIMESTONE submitted by you and report as follows:

MARKS	INSOLUBLE.	IRON OXIDE AND ALUMINA	LOSS ON IGNITION	LIME (CaO)	LIME ($CaCO_3$)	MAGNESIA (MgO)	MAGNESIA ($MgCO_3$)
403	1.24	0.68	43.26	53.95	96.3	.64	1.34
404	1.28	0.56	43.06	54.10	96.5	.76	1.59
405	0.64	0.52	43.08	54.70	97.7	1.02	2.14
406	0.72	0.64	43.04	54.20	96.8	1.18	2.48
409	0.72	0.64	43.14	54.15	96.7	1.16	2.44
412	0.76	1.08	43.16	52.90	94.5	1.88	3.95
413	0.60	0.52	43.40	53.30	95.2	1.94	4.07
414	1.12	0.80	43.40	52.40	93.7	2.12	4.45
415	1.00	1.36	43.68	52.11	93.0	1.65	3.46
417	0.56	0.32	42.82	53.80	96.1	1.26	2.65
418	0.74	1.08	43.06	52.90	94.5	2.03	4.25
422	0.42	1.52	43.82	51.80	92.6	2.15	4.52
425	0.48	0.58	43.74	52.85	94.4	2.10	4.41
427	2.54	1.12	42.92	51.40	91.8	1.91	4.00
428	2.18	1.20	43.80	47.80	85.4	4.90	10.30
429	3.60	1.68	43.84	48.70	87.0	2.00	4.20
430	2.20	1.92	43.84	51.10	91.3	0.77	1.62
431	2.14	1.60	43.28	50.60	90.3	2.10	4.41
432	0.48	0.48	43.94	50.60	90.3	4.34	9.12
433	0.76	0.96	43.72	52.50	93.8	1.82	3.82
434	2.76	0.96	43.80	48.50	86.6	3.84	8.05
435	1.90	1.02	43.72	50.90	90.9	2.17	4.55

G.S. ELDRIDGE & COMPANY LTD.

By G S Eldridge

has been stock-piled and the remainder shipped to the coast. In addition to this tonnage, seven 50-ton cars have been loaded for the Summit Lime Works' operation at Lethbridge, as the Northern Construction Company's contract called for the filling of the requirements of this company.

CLAY AND SHALE.

NEW WESTMINSTER AREA.

Clayburn Co., Ltd. (49° 121° S.W.) Company office, 850 Hastings Street West, Vancouver, B.C.; W. C. Cummings, Secretary-Treasurer; J. W. Ball, Manager. The mines and plant of this company are at Kilgard, about 50 miles east of Vancouver. The mines are operated on the room-and-pillar system. The fireclay from the Kilgard mine is hauled by storage-battery electric locomotive to the plant, and from 4B and No. 9 mine by truck. About thirteen men are steadily employed underground. The production for 1944 amounted to: Fireclay from Kilgard, 15,479 tons; No. 4B, 1,695 tons; No. 9 mine, 2,295 tons; and shale from quarry, 2,170 tons; total production, 21,639 tons.

Richmix Clay Co.—(49° 121° S.W.) 2891 Twelfth Avenue East, Vancouver, B.C.; Geo. Richmond, Manager. A small mine has been opened up by this company near the eastern boundary of the Clayburn company. A slope has been driven down about 200 feet and two men are employed. Production for 1944 was 5,189 tons of fireclay.

GABRIOLA ISLAND.

Gabriola Shale Products Quarry.—(49° 123° S.W.) Evans, Coleman and Evans, Operators, Vancouver, B.C.; F. A. Higgs, Manager, Gabriola Island, B.C. This quarry was idle in 1943 but resumed operations on May 15th, 1944. With a crew of six men employed at the quarry and five men around the surface plant, work was carried on for the rest of the year.

GYPSUM.

FALKLAND AREA.

Gypsum, Lime and Alabastine, Canada, Ltd. (50° 119° N.W.) Head office, Paris, Ontario; British Columbia office, 509 Richards Street, Vancouver, B.C.; British Columbia Manager, Norman Jessiman, Vancouver, B.C.; Quarry Superintendent, Alex. Jessiman, Falkland, B.C. Capital: 500,000 shares, no par value; issued, 440,043. This company again confined its Falkland operation to the No. 2 and No. 5 quarries, 40 miles south of Kamloops, near the Vernon–Kamloops Highway. Shipping facilities are provided by the Canadian National Railways at Falkland, over which normally the gypsum is shipped to the calcining and board mill at Port Mann, B.C. However, because of the destruction of this mill by fire early in July, most of the subsequent output was shipped to the Calgary mill, which in turn supplied part of the west coast requirements of processed gypsum. Shipments were also made to the Canada Cement Company at Exshaw, Alta., and the Pacific Coast Cement Company at Bamberton, B.C.

The gypsum is mined in open quarries. The overburden is thin and with the quarrying advancing into the hillside the walls rise to a considerable height above the quarry-floors. This makes it necessary to keep the walls at a safe angle of inclination, and well barred down, for the safety of workmen. Drilling is done by compressed-air operated jack-hammers. In addition to the actual quarrying a drag-line scraper was used to remove overburden above the No. 5 quarry during the summer. The quarries are 500 to 600 feet higher than the railway-bunkers, to which the gypsum is transported by trucks.

A crew of eleven men was employed and 26,000 tons of gypsum was produced. This is a reduction of approximately 7,000 tons below the 1943 output. The destruction of the Port Mann mill was chiefly responsible for the decreased output.

LIMESTONE.

KOEYE RIVER AREA.

Koeye Limestone Co.—(51° 127° N.W.) P. Christensen, Manager. The quarry is on Koeye River, about 7 miles south of Namu. It was worked for 321 days and produced 13,374 tons of limestone. The entire output was taken by Pacific Mills at Ocean Falls.

GRAND FORKS AREA.

Fife Limestone Quarry, Consolidated Mining and Smelting Company of Canada, Ltd.—(49° 118° S.E.) This company owns and operates the Fife Limestone Quarry, near Christina Lake. A crew of nine men was employed during the summer under the direction of G. E. Clayton, of Trail. No development-work was done during 1944, all the material mined being taken from the glory-hole which was opened up in 1943. This working is practically exhausted and it is planned to mine by open-cut and gas-shovels in the future. A total of 15,700 tons of limestone was mined and shipped to Trail during the season. This material is used chiefly for fluxing purposes in the smelter.

TEXADA ISLAND.

Pacific Lime Co.—(49° 124° N.W.) Chas. W. Lowman, Manager. Capital: 5,000 preferred, $100 par, 10,000 common, $100 par; issued, 2,500 preferred, 7,500 common. No. 2 quarry is the only operation carried on at present by this company at Blubber Bay. Six kilns are working, producing quicklime and hydrated lime. In addition, other limestone products are marketed. More than 40,000 tons of limestone is quarried per year. Thirty-four men are employed in the quarry. This plant has been worked continuously throughout 1944, and if more men had been available it could have had a higher production.

Texada Quarry, B.C. Cement Co.—(49° 124° N.W.) The company operated a limestone quarry on the opposite shore of Blubber Bay from the Pacific Lime Company. A new 36- by 48-inch Dominion jaw-crusher driven by a 160-horse-power motor has been installed. This will allow increased production. The limestone is shipped to the company's cement plant at Bamberton. R. Hamilton is in charge of operations. Nineteen men are employed.

Vananda Quarries.—(49° 124° N.W.) Operated by Beale Quarries, Limited. This quarry is situated a short distance from Vananda. An agricultural lime plant capable of producing 60 tons per day is being operated. Limestone is shipped to various pulp-mills and crushed limestone is produced for various purposes, including limestone-dust

for the coal mines, stucco dash, explosives, etc. Twenty men are employed under the supervision of W. D. Webster.

VANCOUVER ISLAND.

Bamberton, B.C. Cement Co.—(48° 123° N.W.) Company office, corner of Fort and Wharf Streets, Victoria, B.C. Capital: 15,995 "A" preferred, $100 par; 15,995 "B" preferred, $100 par; 10 common, $100 par; issued, 32,000. This company operates quarries at Bamberton and Texada Island and a cement plant at Bamberton. At Bamberton the total crew employed in the cement plant and quarry averages 120 men. A shortage of labour hindered production during 1944.

SILICA.

GRAND FORKS AREA.

Bailey Silica, Consolidated M. and S. Co. of Canada, Ltd

(49° 118° S.E.) This property, 3 miles south of Grand Forks, is owned by the Consolidated Mining and Smelting Company of Canada, Limited. A crew of nine men was employed during the summer under the direction of G. E. Clayton, of Trail. Mining was carried on in the same manner as in 1943; that is, by loading into trucks with a small gasoline-shovel. A new siding on the Great Northern Railway, about ¼ mile from the quarry, greatly facilitated the handling of the material and did away with the necessity of the 3-mile haul into Grand Forks. A total of 24,000 tons of high-grade silica was mined and shipped to Trail to be used as a flux in smelting operations. At the end of the season's operation the property was closed and the shovel, Diesel plant, and all other equipment were removed.

STONE, SAND, AND GRAVEL.

VANCOUVER AREA.

NORTH VANCOUVER.

Deeks Sand and Gravel Co., Ltd.—(49° 123° S.E.) Company office, 101 First Avenue, Vancouver, B.C.; T. O. Burgess, Superintendent. Seven men are employed.

Highland Sand and Gravel Co.—(49° 123° S.E.) North Vancouver. About nine men are employed.

Road Materials, Ltd.—(49° 123° S.E.) North Vancouver. Seven men are employed.

NEW WESTMINSTER AREA.

Gilley Bros. Quarry.—(49° 122° S.W.) A granite quarry and crushing plant is operated at Silver Valley, Pitt River. The stone is used for construction-work. About twenty men are employed.

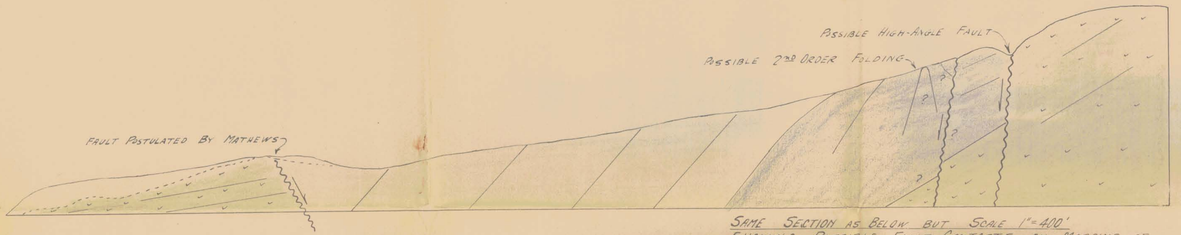
Maryhill Sand and Gravel Co.—(49° 122° S.W.) This quarry and screening plant is operated by Gilley Brothers on the Fraser River bank, about 3 miles from Coquitlam. More than twenty men are employed regularly.

NELSON ISLAND.

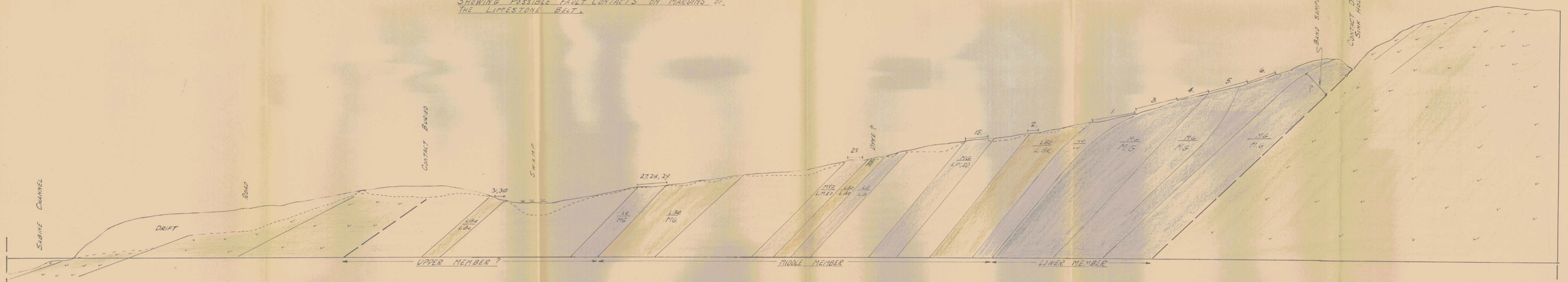
Vancouver Granite Co.—(49° 124° S.E.) A dimension stone granite quarry is operated by this company on Nelson Island, when there is a demand for stone. About ten men are employed when it is operating.

VANCOUVER ISLAND.

Cassidy Gravel-pit.—(49° 123° S.W.) A. Galloway, Foreman. This quarry is in the Cassidy district, convenient to the main Island Highway, and is operated by the Public Works Department to supply gravel and other supplies when required for highway construction and repairs. A crew of four men was employed during 1944 as occasion demanded. No explosives were necessary in this operation. The various benches in the quarry proper have been kept fairly well trimmed and working conditions were found satisfactory.



SAME SECTION AS BELOW BUT SCALE 1"=400' SHOWING POSSIBLE FAULT CONTACTS ON MARGINS OF THE LIMESTONE BELT.



VERTICAL SECTION VERNON LIMESTONE SCALE 1"=200'

FOR LEGEND SEE 200 SCALE PLAN.

L20 L18 L21 L311

L397

L19 L22

L396

Mouat Bay

L493 L395

L394 L393

L302 L303

L235

L400

Davies Bay

STRAIT OF GEORGIA

LEGEND

- Limestone
- Volcanics
- Drift
- Strike and dip of bedding
- Fossil locality
- Glacial striae

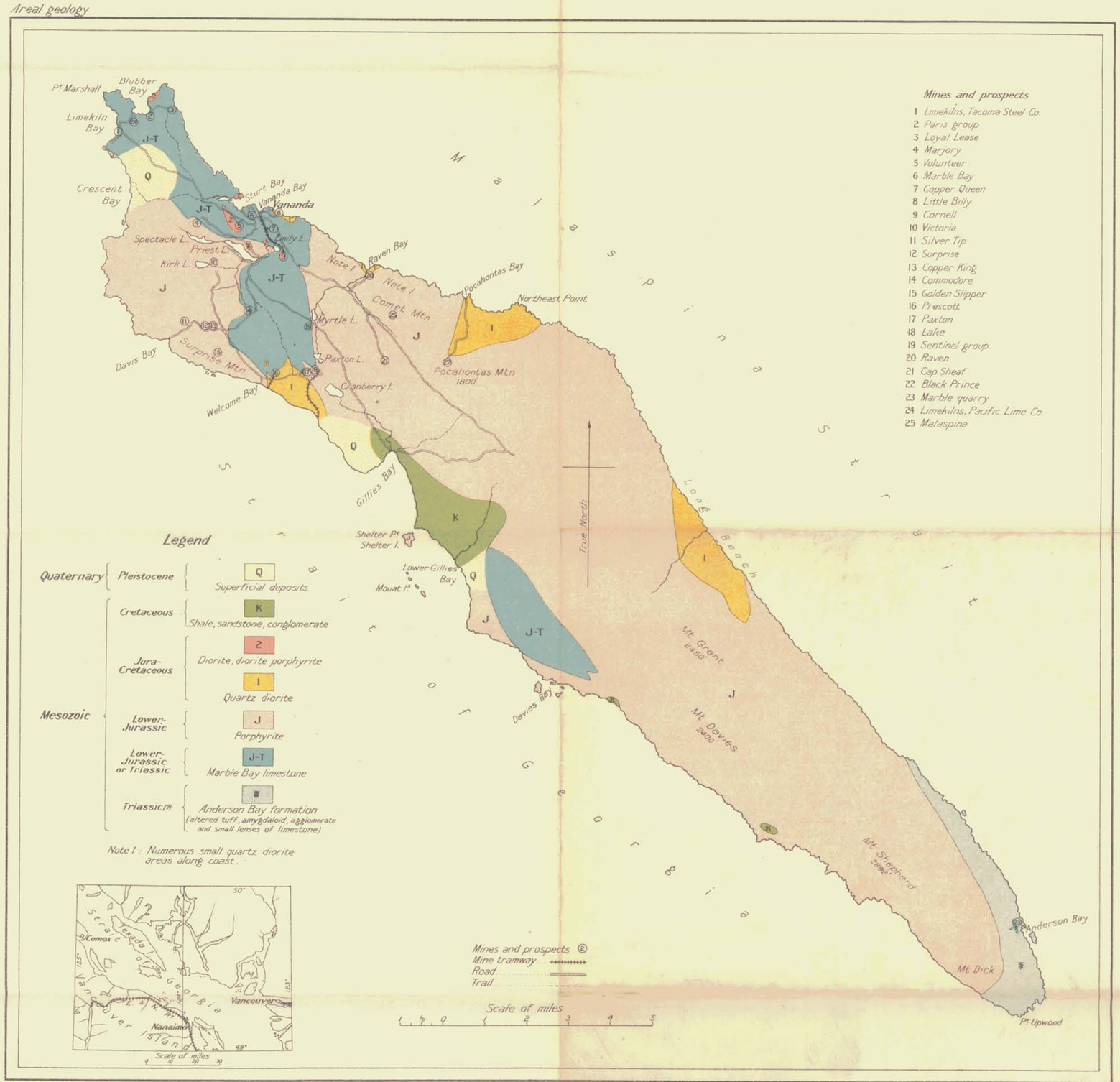
DAVIES BAY AREA

TEXADA ISLAND, B.C.

Miles

1 3/4 1/2 1/4 0 1

Areal geology



Geological Survey, Canada.

Diagram showing the geology of Texada Island, British Columbia.

To accompany memoir by R.G. McConnell 1912

1321

-1,000 | 000 | 1,000 | 2,000 | 3,000 | 4,000 | 5,000 | 6,000

11,000 | 10,000 | 9,000 | 8,000 | 7,000 | 6,000

L 493 | L 395 | L 389 | L 391 | L 394 | L 393 | L 302

CONTACT IN 20' DRAW SOUTH 5 SIM HOLES

CONTACT OFFSET BY CROSS FAULT OR 2ND ORDER FOLD

CONTACT IN DRAW 70' DEEP GOOD OUTCROPS

CONTACT L.S. - VOLC. SKETCHED IN. NOT SURVEYED NORTH OF Δ47

N 40° W

VOLCANICS

2' FAULT BRECCIA

6-146°-04-03-922-47

5-180°-05-07-945-46

4-150°-13-06-965-16

3-200°-12-07-963-13

9-150°-07-06-967-24

8-120°-07-08-948-25

1-140°-10-07-826-157-

7-180°-06-05-977-21

2-50°

SINK HOLE

DRIFT

CONTACT - LIMESTONE - VOLCANICS - DRIFT - GOOD OUTCROPS

DYKE?

25-60°-05-06-944-44

24-70°

23-30°

15-70°-10-14-930-35

14-110°-11-08-937-44

13-100°-06-05-952-41

12-210°-08-11-945-40

11-20°

10-100°

16-60°

16-100°

27-80°-25-11-918-40

28-35°-22-12-854-113

29-30°-36-17-870-42

17-100°-06-03-961-27

18-75°-07-11-945-43

21-85°-03-03-949-45

20-120°-10-04-925-58

22-185°-04-15-926-45

33-60°-08-10-938-38

32-80°-05-05-903-91

34-120°-28-10-866-81

30-50°-22-19-913-16

31-45°-21-16-903-44

35-50°-19-10-909-46

Spring & Ce.

Top of Bench.

HEAVY DRIFT

30'+ DRIFT

M.G. SIMI SAMPLES 8 TO 9

NOT SURVEYED IN

SMALL OUTCROP VOLCANICS POSITION APPROX.

LINE OF SECTION

S89°15'E

S89°12'E

N&S

VERNON LIMESTONE

DAVIES BAY TEXADA ISLAND

SCALE 1" = 200' DECEMBER 1945

MAP R.W.W.

GEOL A.S.

L303

L235

GOOD OUTCROPS OF VOLCANICS ALONG THE SHORELINE. SOME THIN INTERCALATED LIMESTONE BEDS IN THE VOLCANICS. THE SERIES HAS A GENERAL DIP of 20° TO THE SOUTHWEST.

THE AREA BETWEEN THE SHORELINE & THE LOWEST LIMESTONE OUTCROP IS COVERED WITH DRIFT, - PROBABLY IN SOME PLACES 50'-100' THICK.

LEGEND

DRIFT

LIMESTONE — Light Grey L.G. — Medium Grey M.G. — Dark Grey D.G. — Light Brown L.Br.

High Calcium Limestone — 1% MgO

Calcium " — 1 - 2% " "

" " — 2 - 4% " "

Magnesian " — 4 - 19% " "

Dolomitic " — +19% " "

VOLCANICS

Contact Limestone & Volcanics

" " " with Sink Holes

Joints (Dip & Strike) 70°

Bedding Joints 345°

Weathered Surface — LG / MG — Light Grey Weathered Surface on a Medium Grey Limestone

Assay Sequence e.g. 14-110'-11-0.8-93.7-4.4 = Sample No. - Horiz. Distance Sampled - % Insoluble (SiO_2) - % Alumina + Iron Oxides - % $CaCO_3$ - % $MgCO_3$.

Abbreviations: STR. = Calcite Stringers in Limestone; CALC SP. = " Specks Like Amygdules in Ls; T.B. = Thin Bedded Ls.

CAT ROAD

FOOT TRAIL

DAVIES BAY

SABINE CHANNEL

5,000 4,000 3,000 2,000 1,000 000

-1,000 000 1,000 2,000 3,000 4,000 5,000 6,000