Property File 007099 12F 104

Province of British Columbia

Ministry of Energy, Mines and Petroleum Resources
GEOLOGICAL SURVEY BRANCH

MEMORANDUM

Suite 301, 865 Hornby Street, Vancouver, B.C. V6Z 2G3

Telephone: (604) 660-2708 Fax: (604) 660-2653

January 21,1991

File: Texada Island

To: Dan Hora
GSB - Industrial Minerals
Victoria

From: Tom Schroeter
Sr. Regional Geologist

Subject: **Texada Island Limestone - Prospectus**

Enclosed is a Prospectus submitted to the Mine Development Assessment Process and currently under review by the Lower Mainland Regional Resource Committee (chaired by Eric Beresford). Until the new DG (Robert Pinsent) comes on board here on Feb. 1/92, I have been "carrying the ball". I wonder if you would be kind enough to review the Prospectus from your Industrial Minerals expertise and provide your comments back to me so I can relay a unified response back to the committee. Obviously, GSB would like to see a plan and section maps of the reserve calculation and the mineralogy.

I thank you for your assistance in advance.

Tom

Tom Schroeter

Encl. Prospectus

cc: R. Pinsent

TS:JB

Tom

I spoke to Tom about this - If you could please review HSAP and give me your comments, I will communicate to N. Kingsley & Tom Thanks V. AP.

Property File

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(Stage 1 Report?)

C.B.R. Cement Canada Limited
Texada Island Limestone Property

Submitted by:

C.B.R. Cement Canada Limited
Box 950
777 Ross Road
Delta, B.C.
V4K 3G6

Table of contents

Texada

92F 104

Property File

1.0 Project Fact Sheet:

Corporate Data:

Project Name:	Texada Quarry
Company:	CBR Cement Canada Limited

Project Details:

Location:	Texada Island
Extimated Capital Cost:	10-20 Million
Minerals:	Limestone ($CaCO_3$)
Mine System:	Open Quarry
Estimated Production:	1000 Tonnes/Hr.
Process Plant/Mill:	N/A
Proposed Mine Life:	+/- 80 Years

Access/Transportation:

Road:	In Place
Shipping:	Barge

Power Supply:

Requirements:	+/- 1000 Kw.

Workforce Information:

Total Operational workforce:	16
Construction Workforce:	20 Man-Yrs.
Indirect/Induced:	24

Mineral Reserves:

Reserves:	100 Million Tonnes
Grade:	+90% $CaCO_3$

Nov. 20/1991

2.0 Introduction

CBR Cement Canada Limited is a registered company in British Columbia engaging in the manufacturing, production and sales of Portland cement, aggregates, concrete and concrete products in British Columbia and the Pacific Northwest region of the U.S.A..

The company operates a modern one million tonne capacity plant on Tilbury Island adjacent to the Fraser River in Delta. The plant was put into operation in 1978 and replaced an obsolete plant that was located on Vancouver Island at Bamberton, north of Victoria, on the west side of Sannich Inlet.

Limestone is the major raw material used in the manufacture of Portland cement and as such is a critical component of the process. Extensive exploration of District Lots 573 and 589 on Texada Island has established reserves of limestone suitable for the Tilbury plant.

Texada Island District Lots 573 and 589 containing approximately 130 hectars is leased by Indenture 23207 for "Limestone Quarry". These lots have contigious borders with lot 235 which is owned by CBR in Fee Simple and a Crown Foreshore Lease fronting lot 235 has been applied for (file # 2405438). The above lots and Leases comprise the property for the entire project.

CBR is looking to the future development of a limestone quarry on District lots 573 and 589 to supply limestone to it's cement plant in Delta. This involves quarrying, crushing, transporting, stockpiling and barge loading facilities at Davie Bay, Texada Island. The crushing plant, stockpiles and transport system will be on CBR property Lot 235.

3.0 Project Setting

Texada Island, the largest island in the (northern) Strait of Georgia, having a length of thirty miles and width of three to five miles is approximately 100 kilometers northwest of CBR's cement plant in Delta. Davie Bay is a small sheltered bay midway along the west coast of Texada Island.

The main population center is the community of Vananda located on the northeast side of the island with a population of approximatly 500. Gillies Bay fifteen kilometers north of Davie Bay is a declining population centre formerly of 500 people. Population of the island is approximatly 1500.

Topography of the island is fairly uniform, the result of long term erosion of volcanics, shales, sandstones and limestone. Low broken cliffs forming narrow sand and gravel shorelines or rock shoulders characterize the coastal area. Davie Bay is one of the small bays resulting from this worn shoreline.

CBR owns the upland property on the east side of Davie Bay, Lot 235 containing approximatly 250 hectares, and leases the adjacent lots 573 and 589 from Crown Lands, containing approximatly 130 hectares. Lots 573 and 589 will contain the active quarry site.

The project will extend from a barge dock at tide water on the east side of Davie Bay, along a conveyor system to limestone stockpiles, then along conveyors, up the hillside to a crushing plant just below the quarry. The active quarry area has very litte to no soils overlying.

The property and extensive surrounding area is mostly unsettled and mountainous, first growth logged with second growth hemlock and fir, some logged again, and immature growth and bare rock. BC Hydro and logging/exploration roads criss-cross the property.

Access to the property is by ferry from Powell River or Comox to Blubber Bay. Then via Texada Island Highway, gravel road and close to the site a B.C. Hydro maintainence road parallel to power transmission lines that cross the lower portion of Lot 235.

Logging has removed trees from a large area of the quarry site. Vananda Logging and Charles Klein Logging plan on logging the balance of Timber Sale Licence's A20507 and A20489 covering the quarry area in the next few years.

4.0 Geology and Exploration

Geologically, Texada Island is of folded and faulted sedimentary and volcanic rock. Limestone deposits in the Marble Bay formation in the vicinity of Davie Bay are surrounded by porphyrites to the northeast.

An examination of the general geology on site shows high grade limestone in contact with igneous material to the northeast, exposed or with very low amounts of overburden (0' to less than 20'). Drill holes determined 100 million tonnes reserves in an area 300 meters wide extending 2,000 meters in a southeast direction from the quarry's northwest extremity.

The limestone consists mainly of calcium carbonate (CaCO3) in a concentration greater than ninty percent; a marine deposit of massive thickness, originally of horizontal bedding, now somewhat faulted, bent and dipping to the northeast about fourty to fifty degrees. Surface samples were taken systematically over the area and cores were taken from drill holes to determine the extent of the deposit. The correlation and analysis was done by two laboratories, one at Bamberton and the other by Associated Portland Cement in England.

5.0 Project Description

Portland cement manufacturing is a process of bringing together raw materials rich in lime (Ca) , silica (Si), alumina (Al), Iron (Fe) and Gypsum (CaSo4: 2H20). Then grinding the limestone (lime), shale and sand (silica), shale (alumina) and iron ore or mill scale from the steel industry (iron) to extreme finess for intimate mixing and to meet precise chemistry. The powder produced by grinding is then heated or "burned' in a rotary kiln to a temperature of 3000° F., liquidifying part of the powder and binding it together in what is called "clinker". Clinker consists of new compounds called hydralic compounds. Hydralic compounds enter into solution when water is added, forming a gel that binds to other minerals when set. The burned material clinker and added gypsum is then ground to extreme fineness. The resulting Portland cement becomes the "glue" to bond sand and aggregates together to form concrete.

The project proposed is a quarry with crushing plant of 1,000 tons per hour including phased alternates of 5.5 kilometers trucking and 1.2 kilometers of belt conveyors to transport stone from the crusher to stockpiles and a barge loading facility at Davie Bay. The projected annual output is one million two hundred thousand tonnes.

5.1 QUARRY DEVELOPMENT

The deposit, shaded on the Development plan included, depicts approximately the quarry area to be developed. Starting near the boundry of lots 235 and 573 at elevation 260 meters bench's with backwalls of about 15 meters will develop as required to accomodate increasing elevation of about 60 meters, producing about 30,000,000 tonnes.

Additional tonnage will be produced by two benches below the 260 meter level.

Overburden consisting of a mix of soil, sand, gravel and boulders mainly in the southwest of the developing quarry will be stored in a berm along the quarry edge, to be utilized as filter beds for precipitation runoff and in the reclamation where possible of exhasted quarry areas. The removal of up to ten meters of overburden will enlarge the quarry floor and provide the materials for reseeding.

5.2 CRUSHING PLANT

A general description of development below the quarry is, a crushing plant including a feeder, impact or gyratory crusher, conveyors, surge pile for 5,000 tonnes crushed stone, haul road to Davie Bay (developed during initial work), an overland conveyor to a 25,000 tonnes stockpile near Davie Bay and conveyor system to a barge loading dock on a foreshore lease.

The crushing plant and surge pile will be located at and below the 240 meter level on lot 235 midway of the east boundry of lot 235. Road, conveyors and stockpiles will be on lot 235.

5.3 BARGE FACILITIES

An examination of soundings taken at Davie Bay, and a review of barge docking with tug operators, indicates that barges can be successfully manoeuvered in and out of the bay, under all but the more severe weather conditions. When particularly poor weather exists, barges may need to lay off shore until conditions improve.

An examination of the material underlying the bay was not carried out and therefore the type of dock structure cannot be firmly established at this time. For estimating purposes, it is assumed that four rock and concrete filled steel caisson docking dolphins, and one additional tug mooring dolphin, would be placed off the rocky shoreline and a structural steel framed loadout tower and conveyor support would be constructed.

Barges are anticipated to be 5,000 to 10,000 tonnes capacity. Barges of this capacity are about 360 feet long and 75 feet wide. The loading conveyor would fill at the middle of the barge, and the loading conveyor will be either a shuttle or 60 degree oscillating type, supported with a steel tower.

The barge may be moved into different positions during filling by winch or by tug. Barge filling may be assisted by loader placed on the barge.

At this time an application for a Crown Foreshore Lease has been submitted to the Ministry of Crown Lands.

6.0 Environmental Considerations

In consideration of the fact that the limestone quarry site is already partially exposed rock and that the area has been extensivally logged, it would appear that very little further disturbance would be required. Exposed outcroppings, recently logged areas and continued logging by others (already contracted) of the balance of the site, along with the arid conditions in summer has held wildlife activities to relatively low populations and will not likley be significantly affected.

This project entails an open pit quarry, having flat floors and back walls of about fifteen meters in height at each level. There is no permanent running water on the quarry site. Exposure of any watershed areas to possible quality concern is thereby reduced.

Precipitation accumulation will be contained in the quarry in a pond and excess water allowed to perculate through a berm of overburden somewhat as occurs now in uncontrolled fashion. Dust management water will be drawn from the pond.

Total annual precipitation on Texada Island is 98.5 cm (38.8 inches), with potential evaporation of 56.5 cm (22.2 inches), with a mean annual deficit of 12.8 cm (5 inches) concentrated in the months of July, August, September and marginally in October, using a soil moisture storage of 7.6 cm (3 inches). Soil storage is next to zero in the bare rock of existing terrain.

Little is known about the hydrologic environment. No wells are on record to give yields, depth to water table, aquifer charecteristics or quality of water in important watershed areas let alone the remote area involved.

Birdlife is notable for conspicuous omissions. Scarce populations of blue grouse and band tailed pidgeons during the time of nesting and migration are seen off the quarry area in lower altitudes and heavier brush cover. Black tail deer populations are high on the island; however, none have been observed on the quarry site. Other quarry operators have stated they see deer all the time, even in quarries, implying the deer are little affected by quarry activities.

The quarry site and associated stockpiles are to be located some distance from Davie Bay due to the terrain at the shore and to accomodate B.C. Hydro transmission lines on the lower portion of Lot 235. This will assist in reducing any shoreline impact. The barge loadout facility would be the only disturbance. Currently the Crown Foreshore Application is being processed by Crown Lands and any recommendations they or other concerned Ministries may have will help shape how barge dock facilities are introduced.

Hydro power lines are in place, crossing through lot 235 and major transmission lines linking the mainland and Vancouver Island pass just south of the site.

Dust control will be by water sprays during crushing, hauling and conveying.

7.0 Social and Economic Consideration

The majority of permanent and seasonal residential dwelling units are located at Vananda and Gillies Bay. In outlying areas as in the district of Davie Bay residences are few, some squatters shacks, and summer accommodations.

Commercial establishments tend to be small and few in number. Main shopping needs are met in Powell River a one half hour ferry ride from Blubber Bay at the north end of Texada Island. Vananda is the only community having a hotel. No other tourist facilities exist, except Harwood Regional Park.

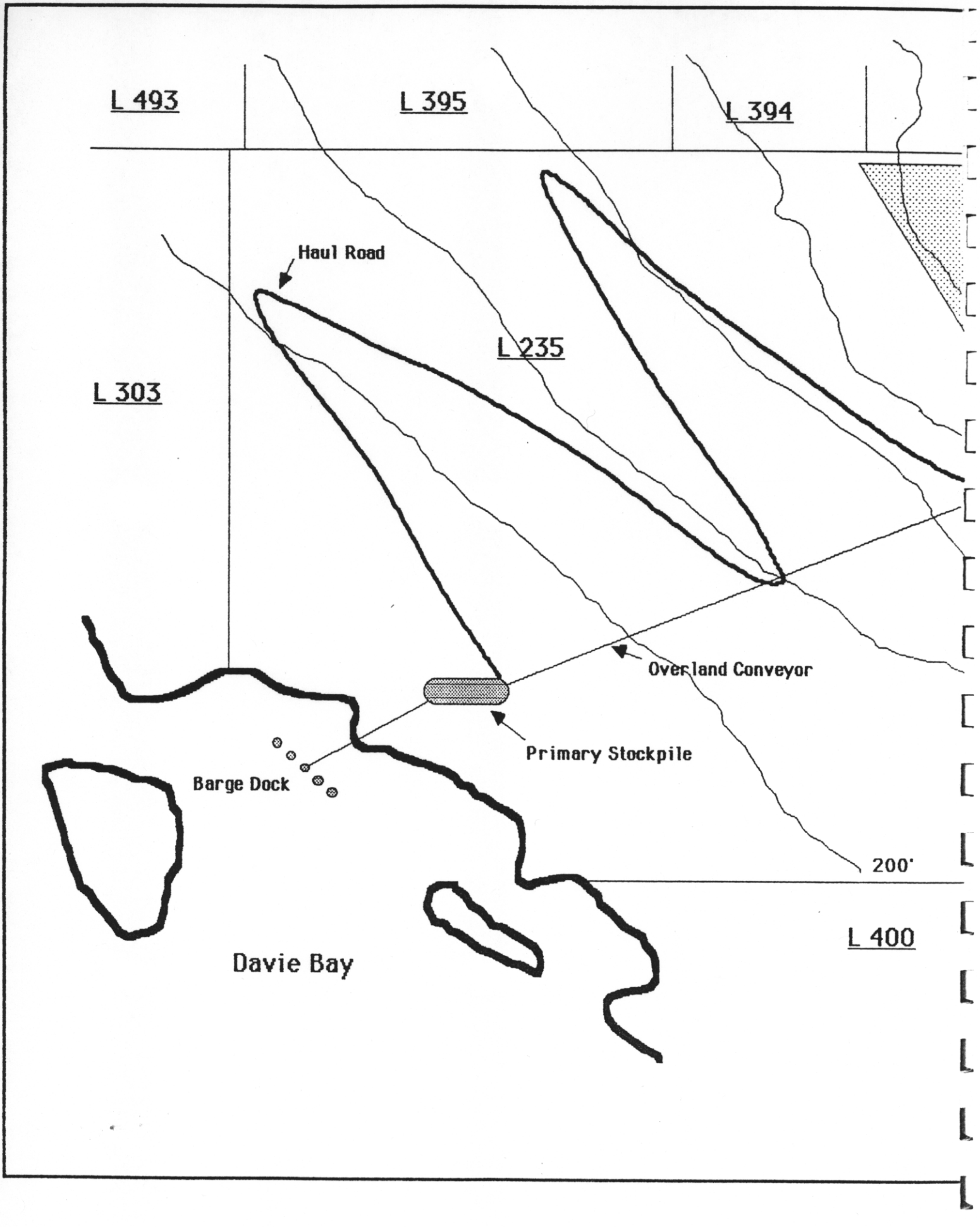
Agriculture is almost nonexisting for several kilometers from the quarry site and only then in the form of improved pasture forage, open grassland, minor orchards and domestic gardens close to low-lying basin areas in proximity to swamps and lakes.

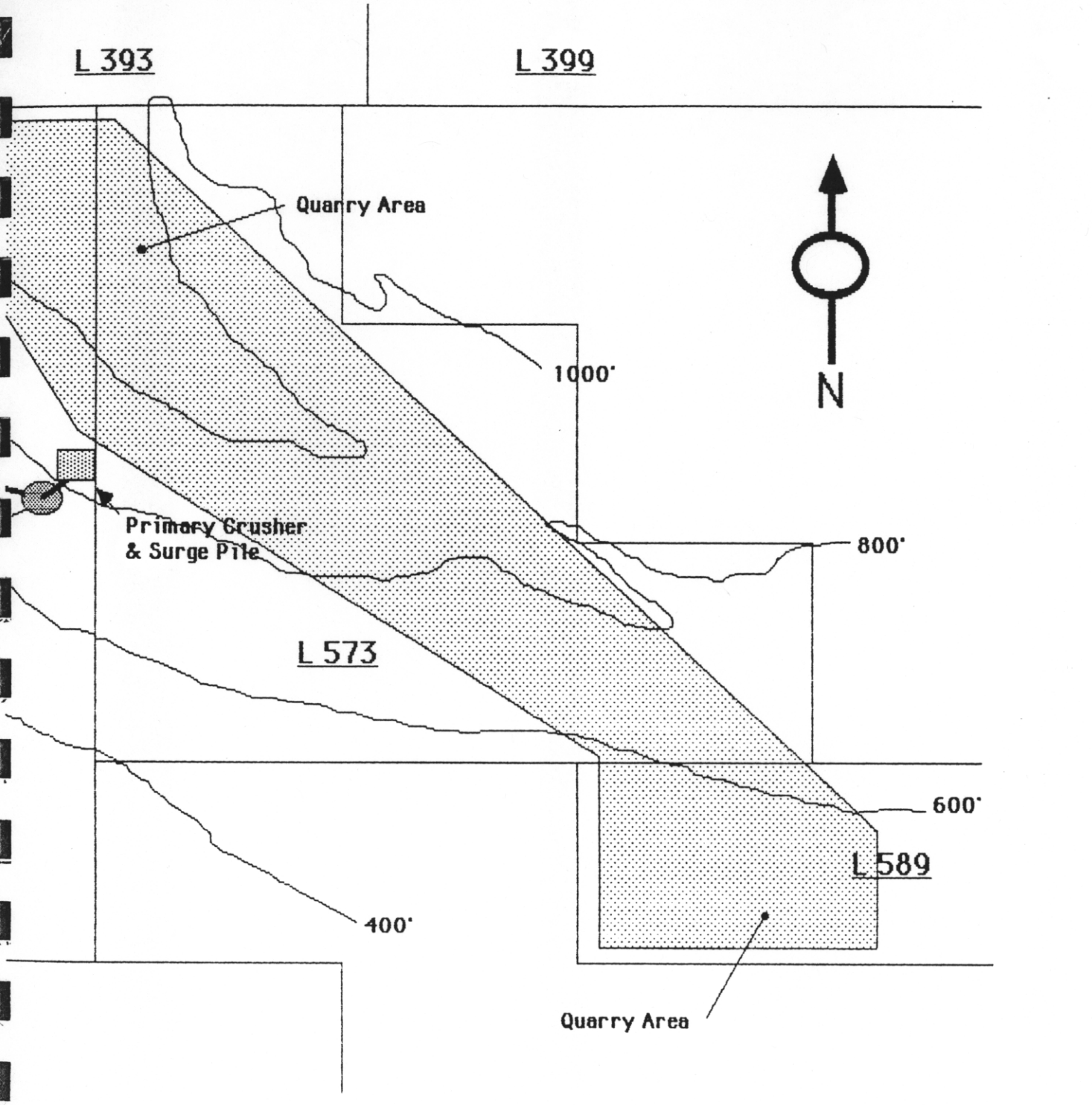
Currently Texada Island is experiencing a loss of work available in industry due to the closing of the Lafarge quarry and a general reduction in activity in the area over the last ten years. There is an abundance of experienced and qualified people in the area from which CBR may draw. It is estimated that the Quarry would require a total of about 200 operating days a year to supply the required tonnage. This equates to a total of approximatly sixteen employees and an income increase in the order of eight hundred thousand dollars each year.

Unemployment is a serious problem on Texada Island. People living there will fill most needs of this quarry, thereby incurring no substantial negative influence to schooling, medical, municipal, policeing or other such support systems. Contact with residents to date has been encouraging and helpful.

Economics indicate justifcation by CBR to invest an estimated ten to twenty million dollars in the project. Benefits in the community to the extent of about nine hundred thousand dollars per year, including taxes, local contracts for services and supplies, etc., will continue annually.

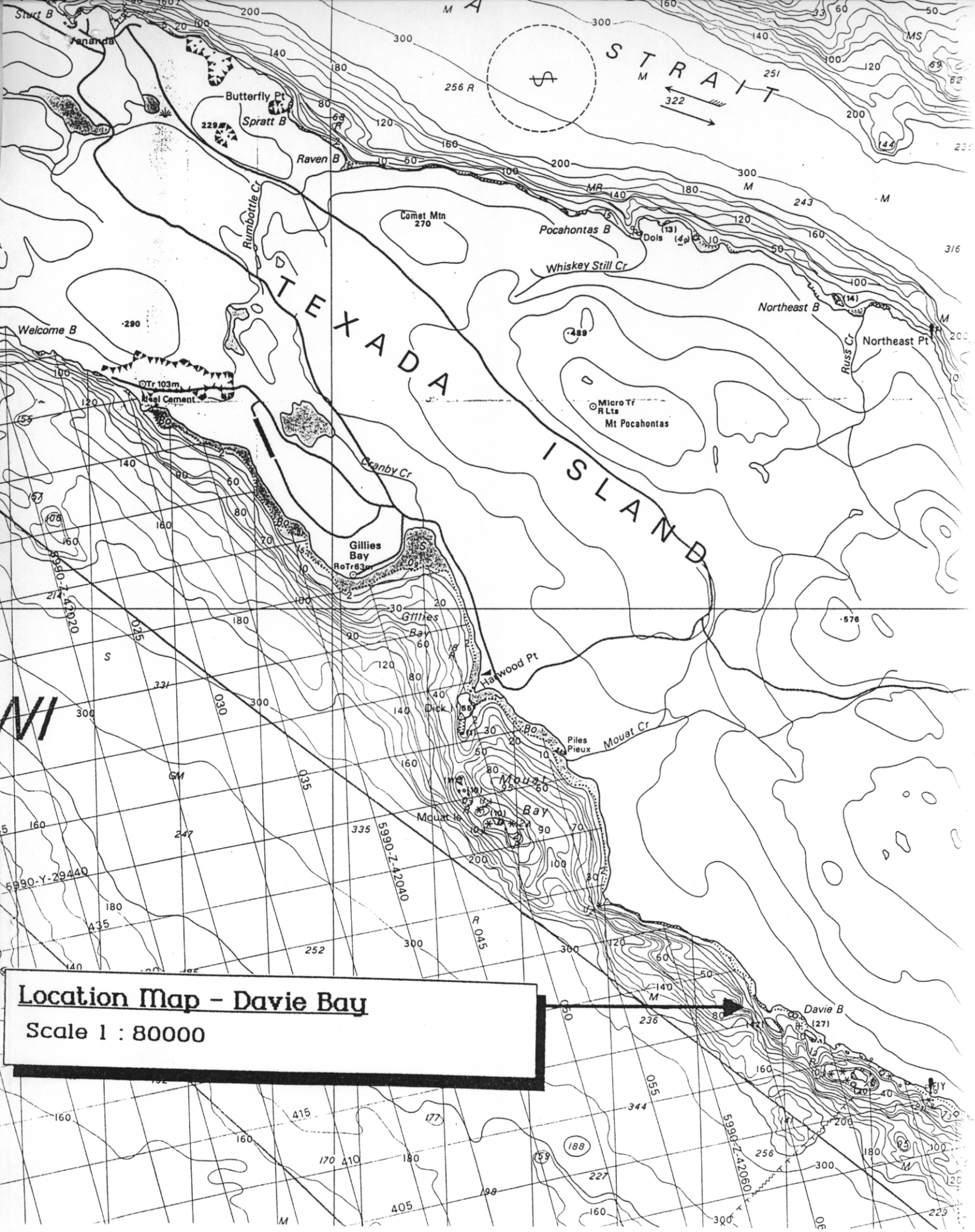
CBR are major exporters of cement to the USA. Competitors in that market include owners of the quarries that currently supply limestone to CBR. An advantage is thereby given to the American cement producers. Exports are significant to the overall economy of British Columbia.


L 493
L 395
L 394
Haul Road
L 235
L 303
Overland Conveyor
Primary Stockpile
Barge Dock
200'
L 400
Davie Bay



Development Plan - Davie Bay

Scale 1" = 800'



Location Map - Davie Bay

Scale 1 : 80000