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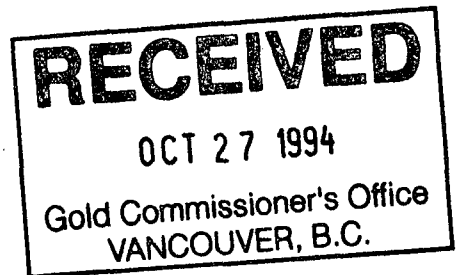
**R. Somerville Geological & Mining Engineering Ltd.**

Suite 1440 - 1188 West Georgia St., Vancouver, B.C. Canada V6E 4A2 • Tel: (604) 684-6677 Fax: (604) 684-6678

A GEOLOGICAL AND ENGINEERING  
ON THE  
CART 1 MINERAL CLAIM  
BABINE LAKE AREA

LOG NO:	OCT 31 1994	RD.
REPORT	ACTION.	
FILE NO:		

Omineca Mining Division, British Columbia  
NTS 93L/16W  
Latitude 54°54'N  
Longitude 126°18'W



on behalf of

**NEW CANAMIN RESOURCES LTD.**

by

Richard Somerville, P.Eng., F.G.A.C.  
**R.SOMERVILLE GEOLOGICAL & MINING ENGINEERING LTD.**  
#1440 - 1188 West Georgia St.  
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V7M 3K9

October 15, 1994

**GEOLOGICAL BRANCH  
ASSESSMENT REPORT**

**23,560**

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## INTRODUCTION

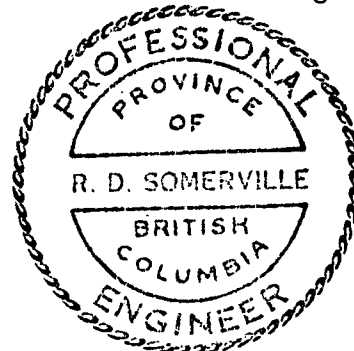
### SUMMARY

A prominent ridge of Permian limestone occupies the central portion of the Cart claim. In earlier grab sample tests and two 100 kilogram bulk samples, the limestone was shown to be a possible source for shaft kiln feed. On May 2nd and May 3rd the authors examined and sampled the limestone exposures on the south half of the ridge. A total of twenty systematic samples were taken over a 600 meter strike length and submitted to Min-En Laboratories in Vancouver for whole rock analysis. The results suggest that the area sampled is underlain by limestone of a consistent quality and sufficiently elevated calcium oxide content to be of economic interest. As a result, the authors recommend that the property be further tested by closely spaced drilling to confirm both the grade of the limestone.

Respectfully Submitted

R. Johnston P.Eng.

R. Somerville P.Eng.



LOCATION, PHYSIOGRAPHY, ACCESS

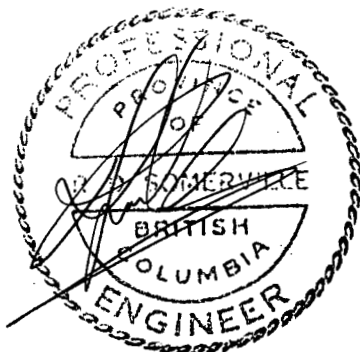
The CART claim property is situated approximately 6.8 kilometres due west of Granisle, B.C. (Figures 1 & 2). The claim lies about 600km north-northeast of Vancouver. The NTS map sheet number is 93L/16W and the latitude and longitude is as follows:

LATITUDE: 54 54'N  
LONGITUDE: 126 18'W

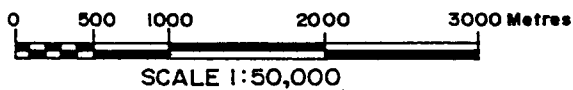
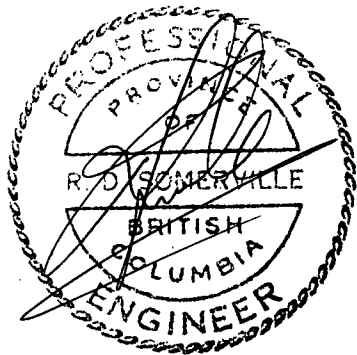
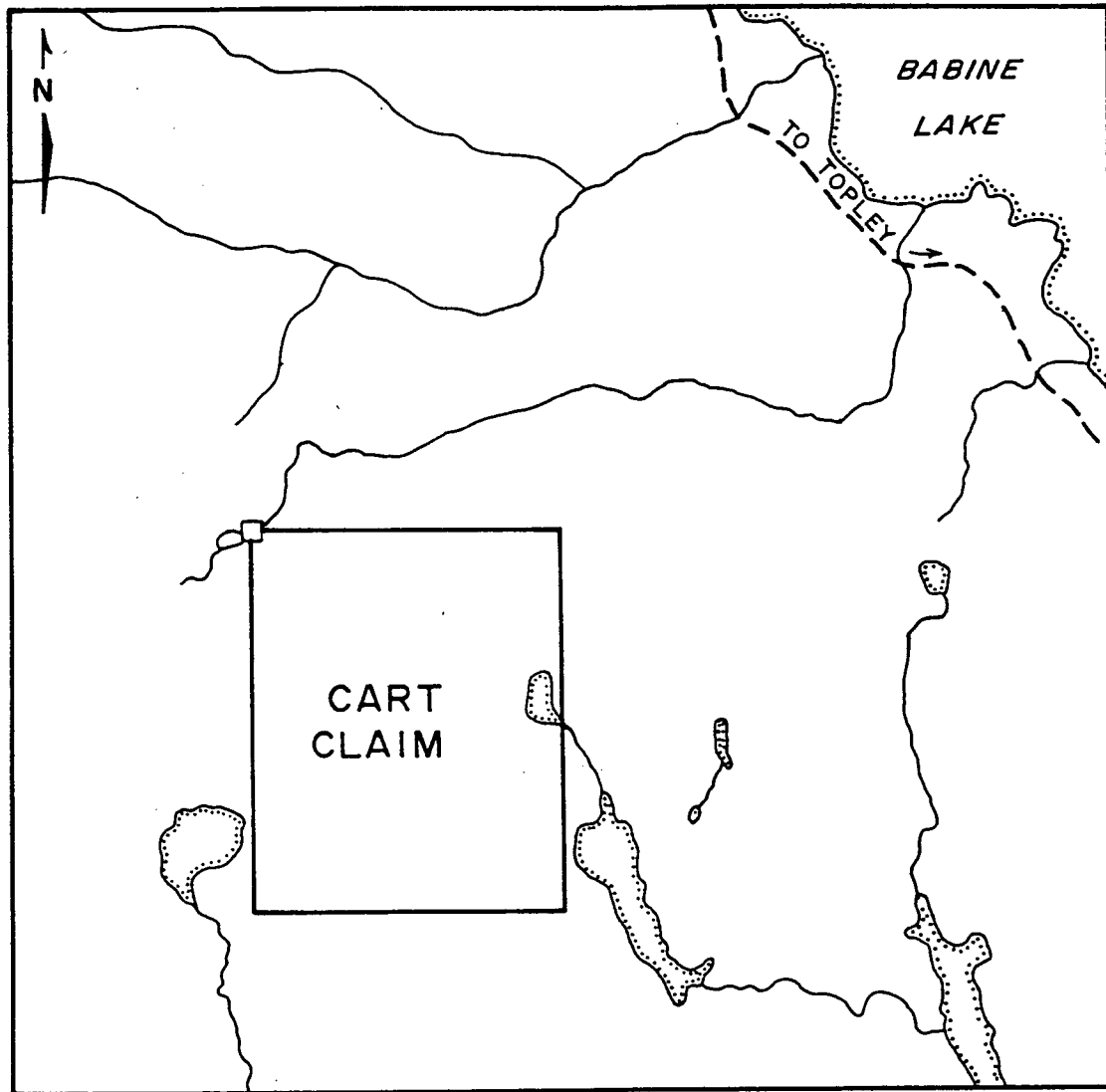
The property can be reached by a total of 12.5 km of mainly disused gravel logging access roads which lead from Topley Landing to the southwest corner of the claim. A very rough bulldozer trail leads from the end of the road to the top of the limestone ridge in the center of the property. Topley Landing is 43 kilometers north of Topley which is situated on Highway 16, 262 km west of Prince George. The access road commences from the paved road which connects Granisle and Topley about 1.5km north of Topley Landing.

The road rises from Babine Lake which has an elevation of 712 metres asl. to the property which has a maximum elevation of 1128 metres asl. The topography is moderately rugged, and a large part of the area between Babine Lake and the property has been clearcut. The southwest corner of the claim has been clearcut but the remainder is covered with mature spruce and pine trees.

Water for drilling etc. would be readily available from an unnamed lake on the west side of the claim.



NEW CANAMIN RESOURCES LTD.	
CART LIMESTONE PROPERTY	
LOCATION MAP	
DATE: AUG. 1994	FIGURE NO.: 1



NEW CANAMIN RESOURCES LTD.	
CART LIMESTONE PROPERTY	
PROJECT CLAIM MAP	
N.T.S. 93 L/16	
DATE: AUG. 1994	FIGURE NO.: 2

## TENURE AND OWNERSHIP

The CART claim property comprises one 20 unit claim which is held in the name of Equity Silver Mines Ltd. The claim status of the property is as follows:

(see Figure 3):

<u>Claim Name</u>	<u>Tenure No.</u>	<u>No. of Units</u>	<u>Expiry</u>
CART 1	10006	20	25 Nov. 1994

## PREVIOUS WORK

The Cart claim was located in 1988 to acquire the mineral rights on a northwest striking ridge of Permian limestone, approximately four hundred feet high and four and one half kilometers long which lies centred on the claim. In 1989, laboratory analysis on a series of chip samples indicated that the limestone was of a very high purity. (Aziz, 1990) As a result of this a program of bedrock trenching was initiated in late 1989. A baseline trench some 600m was bulldozed and seven cross-trenches were cut at approximately 100m intervals. In 1991, two bulk samples (100 kilograms) were collected from these trenches and were analyzed and were sent for muffle furnace testing in both Australia and Italy. The results suggest that the limestone "may be acceptable as a shaft kiln feed" (Hanson, 1991).

## GEOLOGY

### REGIONAL GEOLOGY

The Cart Claim lies in the center of the Smithers map area (NTS 93L). The map sheet is underlain by the lower to middle Jurassic Hazelton Group, a complex group of sedimentary and volcanic rocks which comprise an island arc complex. The complex lies west of the successor Bowser Basin of the intermontane Tectonic Belt and east of the Coast Plutonic Complex. Regionally the Hazelton rocks are in places unconformably overlain by sediments of the Bowser Group. The Hazelton Group is mainly an island arc complex of sub-aerial volcanics of differentiated andesitic to dacitic calc-alkaline composition with interbedded sedimentary facies. The Jurassic rocks are all capped by Skeena marine basin turbidites of Early Cretaceous age, as well as the Tertiary volcanic Endako and Ootsa Lake Groups.

Subsequent to the sedimentary and volcanic activity, the rocks have been complexly folded and faulted and intruded by a succession of small to medium sized intrusives whose ages range from Upper Cretaceous to Eocene. The early Jurassic Topley Intrusions cut the lower part of the Hazelton Group.

The regional metamorphic grade is of the lower greenschist facies. The regional scale alteration assemblage consists of moderate chloritic alteration with trace to minor disseminated pyrite. This regional metamorphic event peaked during the mid-Cretaceous time (approximately 110 - 90 Ma). Regionally, in the immediate vicinity of ore deposits and economic showings a pervasive alteration comprising silica-carbonate-sericite/clay-pyrite is common. This alteration appears to have preceded, accompanied, and followed, sulphide deposition probably along long-lived or reactivated channel within the stratovolcano. Commonly, accompanying the porphyry sulphide mineralization, are areas of intense to moderate biotization and albitization.



Structurally, the area is dominated by a multitude of steep normal faults. Few contacts between map units are unfaulted and these are mainly intrusive. Folding is uncommon and generally related to Eocene thrust faults.

#### PROPERTY GEOLOGY

A northwest-oriented prominent ridge of Permian limestone occupies the central portion of the Cart claim. Surrounding the ridge, the lowlands appear to be underlain by volcanics of the Upper Triassic (Takla) formation. The contacts between the two distinctive rock-types appear to be northwest trending normal faults. (Tipper, 1976) The west side of the ridge of limestone is characterized by a steep fault scarp along which approximately sixty feet of near vertical exposure of limestone is exposed. Since the limestone is very nearly recrystallized, only remnant bedding is observable. Generally, the limestone was light grey on a fresh unweathered surface but on the south end of the ridge the colour became a medium grey. Since the south end of the ridge was lower in elevation and bedding, this colour change could be a factor of bedding composition rather than random impurities. Fossils, normally found in Permian limestone elsewhere in British Columbia, have apparently been destroyed by the recrystallization process. Bedding is rarely observable only along the faultscarp. The author observed the bedding to strike at 145 degrees and dip 53 degrees to the northeast. Hanson (1991) reports a strike and dip of 170 and 40 degrees northeast respectively.

Although Hanson also reports the presence of "a few medium green aphanitic andesite dykes", a careful examination of all the available exposures along the bulldozer bedrock trenches by the author did not reveal a single occurrence in this area. This suggests that the dykes may be concentrated elsewhere along the ridge or are very rare indeed.

## DESCRIPTION OF MAY 1994 WORK PROGRAM

### GENERAL

A prominent ridge of limestone approximately 2500 meters long and 150 meters high occupies the central part of the Cart claim. Work completed by previous owners of the property has suggested that this limestone occurrence was exceptionally pure and possibly suitable as shaft kiln feed. On May 2nd and 3rd, the authors examined the prospect and did a detailed examination of all the outcrops and exposures on the southern 600 meter portion of the ridge which had been tested by bulldozer trenches. A total of twenty systematic samples were taken and submitted to Min-En Laboratories in Vancouver B.C. for whole rock analysis. The results of this analysis is located in Appendix #1 and the location of the samples is plotted on Map #1 in the pocket of this report.

### PURPOSE

The purpose of this sampling and analysis program was to determine the LIME content of the limestone and to ascertain the level of certain impurities such as silica and iron. Two samples were also submitted for 31 element ICP analysis. The results of this are also located in Appendix #1

### DISCUSSION OF RESULTS

It is generally accepted by a number of lime producers (Hanson, 1989) that the following criteria be used to evaluate limestone for calcining purposes:

Minimum	95% CaCO <sub>3</sub> (53.2% CaO)
Maximum	4000ppm Mg (0.67% MgO)
Maximum	1.25% residual oxides (iron and aluminium)
Maximum	2.25% insoluble (SiO <sub>2</sub> )
Maximum	0.01% phosphorous (0.02% P <sub>2</sub> O <sub>5</sub> )

Based on these criteria, only one of the twenty samples taken was too low in lime and extremely (19.51%) too high in silica. The magnesia content and the residual oxides content fall within criteria for all the samples tested. Although all but two of the

samples were marginally too high in phosphorous the authors feel that it may be possible to handle this problem by blending during a commercial operation.

Sampling carried out previously by Equity Silver Mines showed that the deposit contained high quality limestone. Two samples taken by New Canamin Resources were adjacent to locations previously sampled by Equity Silver Mines. A comparison of the results is as follows:

SAMPLE	SAMPLER	SAMPLE NUMBER	ASSAYS %		
			Co.0	Mgo	Fe <sup>2</sup> O <sup>3</sup>
1	EQUITY SILVER	4305	53.5	0.27	0.10
1	NEW CANAMIN	653	53.8	0.35	0.19
2	EQUITY SILVER	4361	53.2	0.27	0.11
2	NEW CANAMIN	654	53.8	0.32	0.23

The assays are in reasonable agreement taking into account that the Equity Silver results were carried out by their own laboratory & adjusted to reflect the oxis values while the New Canamin results were carried out by Minen Laboratories, a reputable commercial assayer.

It was noted that both Equity Silver (sample 4218) & New Canamin (sample 655) each collected a single sample that was high in silica from approximately the same location. The extent of the high silica zone is unknown as there was visually no apparent difference in the samples.

#### RECOMMENDATIONS

The authors recommend that a detailed drill program be started as soon as possible in order to confirm the existence of approximately one million tonnes of limestone suitable for

calcining. Drilling on 30 m (100 ft.) centers has been suggested in Industrial Minerals & Rocks, Editor S.J. Lefond as giving an adequate drilling density. The assay results from the drilling combined with additional calcination testwork will enable an estimate of the lime quality which can be made from the cart property limestone.

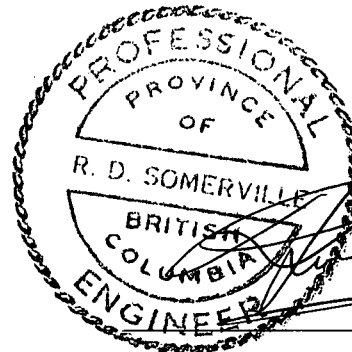
The market for lime to be used in the mineral industry for process control & the alleviation of acid mine drainage will be insufficient to allow for a viable lime plant in the area. Additional markets for chemical grade lime in the pulp, paper & aluminium smelting industries as well as the potential for agricultural consumption need to be evaluated. Initial cost estimates suggest that a plant producing 50-100 tonnes per day of lime might be economic provided the material can be sold within an economic transportation radius to be competitive with other plants in the Province.

AUTHOR'S QUALIFICATIONS

I, Richard D. Somerville, residing at #1704 2016 Fullerton Avenue, North Vancouver, British Columbia, V7P 1E6, certify that:

1. I am a practising Consulting Geologist with offices at 1440-1188 West Georgia St., Vancouver, B.C., V6E 4A2.
2. I am President of R. Somerville Geological and Mining Engineering Ltd.
3. I am a Registered Professional Engineer of the Provinces of Ontario and British Columbia.
4. I am a Fellow of the Geological Association of Canada and a Member of the Canadian Institute of Mining and Metallurgy.
5. I am a graduate of Queen's University at Kingston, Ontario, having received a B.Sc. (honours) degree majoring in Geology, and a B.A. degree majoring in Physics and Mathematics.
6. I visited the Cart claim on May 2 and 3, 1994 and performed the work covered in this report.

Vancouver, British Columbia  
October 15, 1994



R. Somerville, P. Eng.

AUTHOR'S QUALIFICATIONS

I, Robert J. Johnston, residing at #1615 Cornell Avenue, Coquitlam, British Columbia, V3J 3A2, certify that:

1. I am Vice President, Process & Design for New Canamin Resources Ltd.
2. I am a Registered Professional Engineer in the Provinces of British Columbia and Alberta and Registered as a Chartered Engineer in the United Kingdom.
3. I am a graduate of Camborne School of Mines in England in 1961 and received a Diploma of Mineral Technology from the same institution in 1965.
4. I visited the Cart claim on May 2 & 3, 1994 with Richard D. Somerville and assisted in the work performing for his report.

Vancouver, British Columbia  
October 15, 1994



Robert J. Johnston P. Eng.

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- Armstrong, J.E. (1944).  
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GSC Open File No. 351, Smithers B.C. 93L. Geological  
Compilation

APPENDIX #1

WHOLE ROCK ANALYSIS  
& ICP ANALYSIS







APPENDIX #2

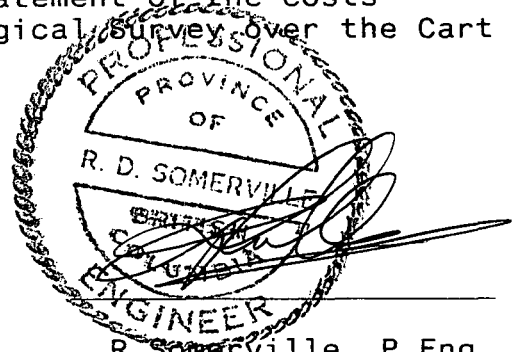
COST STATEMENT  
STATEMENT OF WORK

EXPENSES:

Airline tickets Vancouver- Smithers & return (2)	980.00
Truck rental and gasoline ( 3 days)	407.40
Miscellaneous Travel Expenses, Parking, Taxi, Airport Tax etc.	93.68
Accommodation 3 days 2 people	230.00
Meals 3 days 2 people	175.36
Casual labour to help with road	100.00
Maps and air photos	74.46
Miscellaneous supplies and telephone	21.92
Assaying charges	644.94
R. Somerville 3 days @ \$350	1,050.00
R. Johnston 3 days @ \$350	1,050.00
Report preparation 1 day @ \$350	350.00
Typing and drafting	<u>100.00</u>
TOTAL	\$5,277.76

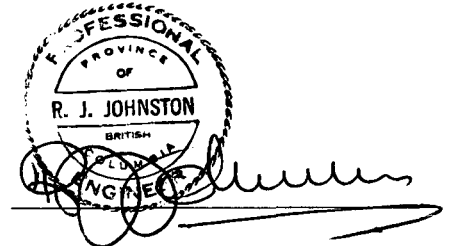
COST STATEMENT - AREA A

The above constitutes a true cost statement of the costs involved in the Geological and Metallurgical Survey over the Cart Claim.



A circular professional seal for R. D. Somerville. The outer ring contains the text "PROFESSIONAL ENGINEER". The inner ring contains "PROVINCE OF BRITISH COLUMBIA". The center of the seal contains the name "R. D. SOMERVILLE". A handwritten signature is written across the seal.

R. Somerville, P.Eng.



A circular professional seal for R. J. Johnston. The outer ring contains the text "PROFESSIONAL ENGINEER". The inner ring contains "PROVINCE OF BRITISH COLUMBIA". The center of the seal contains the name "R. J. JOHNSTON". A handwritten signature is written across the seal.

R. Johnston, P.Eng.

6,088,000 m. N.

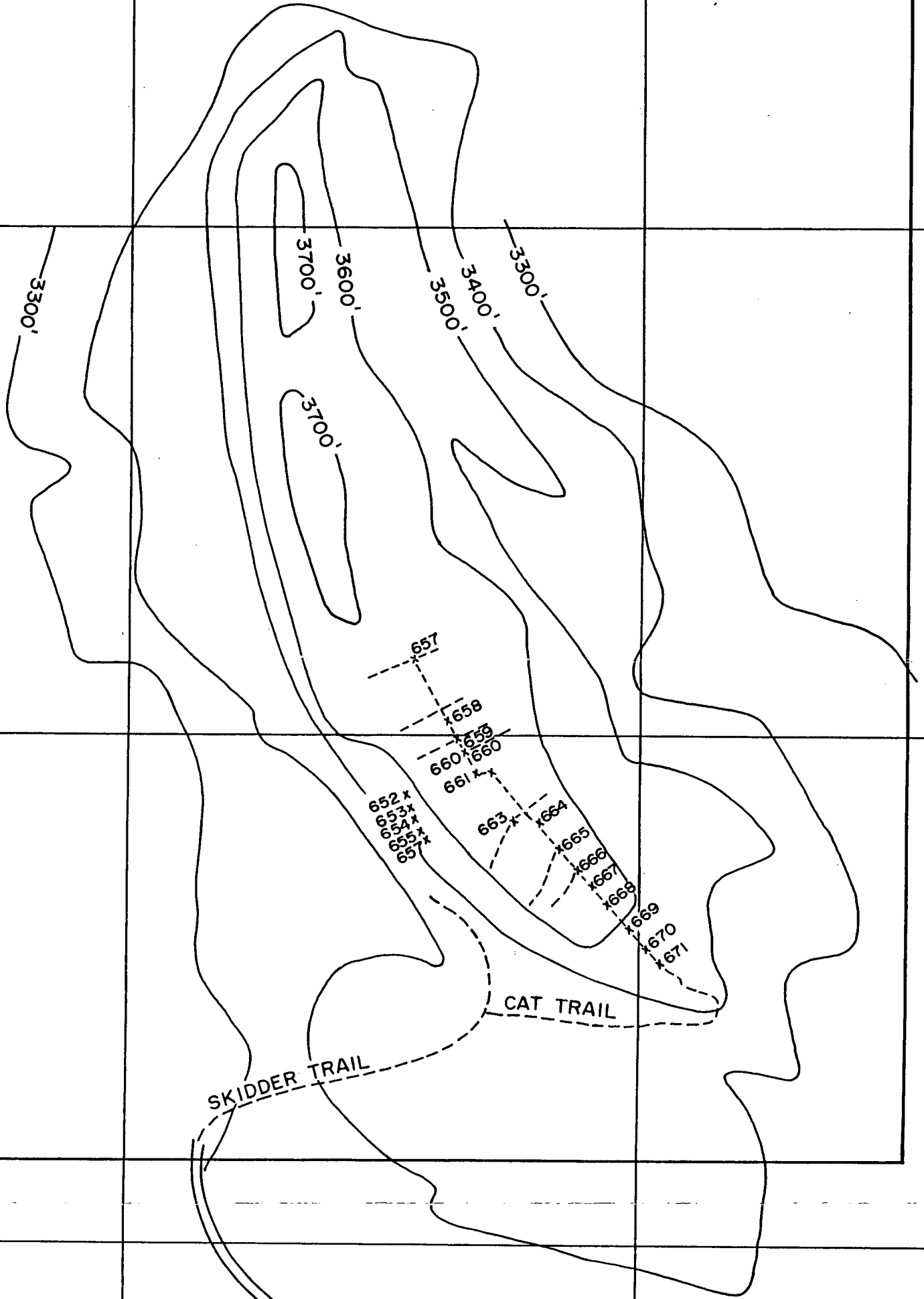


LCP □ **CART I**

CLAIM BOUNDARY

6,087,000 m. N.

6,086,000 m. N.



x664 SAMPLE LOCATION & NUMBER

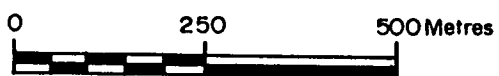
NEW CANAMIN RESOURCES LTD.

CART LIMESTONE PROPERTY

1994 SAMPLE LOCATION MAP

DATE: AUG.1994 SCALE 1:10,000 FIGURE NO. 3

672,000 m. E



673,000 m. E

