

GEOLOGICAL SURVEY BRANCH
ASSESSMENT REPORTS

DATE RECEIVED
MAR 06 1996

ASSESSMENT REPORT

ON A

ROCK SAMPLING PROGRAM

ON THE

MT. COPELAND PROPERTY

COPELAND MINERAL CLAIM

FILMED

REVELSTOKE AREA

REVELSTOKE MINING DIVISION, B.C.

**GEOLOGICAL BRANCH
ASSESSMENT REPORT**

24,328

NTS:
LATITUDE:
LONGITUDE:
OWNER:
OPERATOR:
AUTHORS:
DATE:

082M/01W
51°07'45"N
118°27'15"W
K.L.Daughtry
Discovery Consultants
T.H.Carpenter, P.Geo.
February 01, 1996

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SUMMARY

The Mt. Copeland property is a past producer. Between 1970 and 1973 the Mount Copeland Mine produced 1,190,713 kilograms of molybdenum from 169,729 tonnes of ore milled. Molybdenum mineralization occurs along the northern boundary of a large mass of nepheline syenite gneiss which lies as a concordant sheet within calc-silicate gneisses.

Probable reserves of 163,000 tonnes containing 1.82% molybdenum are reported on the Mt. Copeland property.

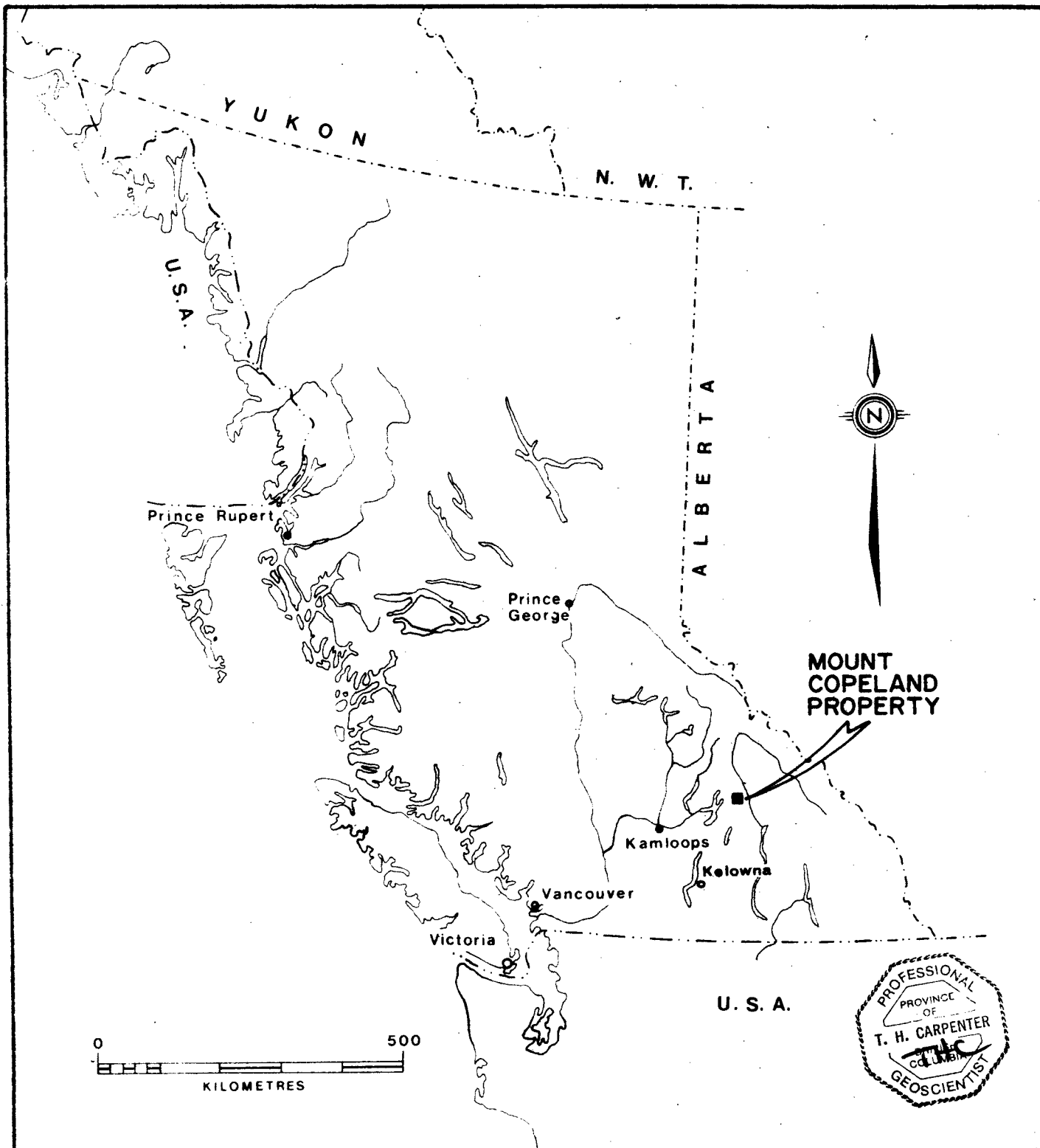
In 1995 a program of rock sampling to assess the industrial mineral potential of the nepheline syenite was carried out on the property.

LOCATION AND ACCESS

The Mt. Copeland property is centred at latitude $51^{\circ}07'45''\text{N}$ and longitude $118^{\circ}27'15''\text{W}$, some 21 km northwest of Revelstoke (Figure 1). The property is accessible from Revelstoke by helicopter. The condition of a road up Hiren Creek to the former millsite to the south of the property is unknown.

TOPOGRAPHY

The property is centred 2.2 km west-northwest of Mt. Copeland along the steep northern slope of Copeland Ridge. Elevations range from 6000' (1830 m) at the north side of the property to 8000' (2440 m) at the eastern edge of the property.



DISCOVERY Consultants	PHOENIX SYNDICATE				
MOUNT COPELAND PROPERTY	LOCATION MAP				
DATE: MAR. 13/1995	PROJECT: 624	SCALE: As Shown	N.T.S. 82M/IW	M.D.: REVELSTOKE	FIGURE: 1

DWG-624-003

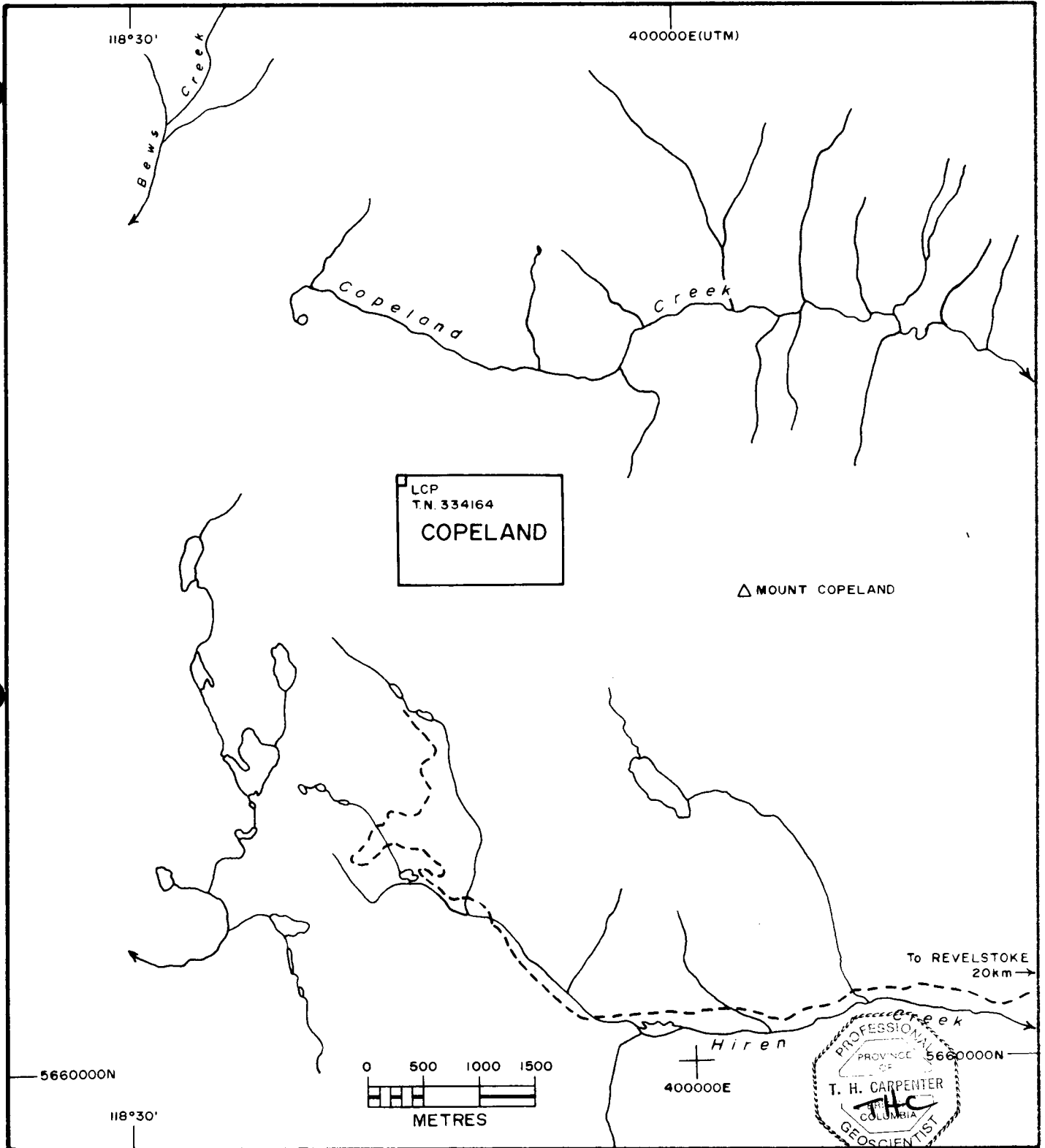
PROPERTY

The Mt. Copeland property comprises a single four post claim (Figure 2) staked by John H. Osterhagen on March 01, 1995 and recorded in Vernon on March 07, 1995.

<u>Claim Name</u>	<u>Record No.</u>	<u>Owner of Record</u>	<u>Anniversary Date *</u>
Copeland	334164	K.L. Daughtry	March 01, 2000

The claim is owned by K.L. Daughtry in trust for the Phoenix Syndicate.

* Pending acceptance of this report.



DISCOVERY Consultants

PHOENIX SYNDICATE

MOUNT COPELAND PROPERTY

CLAIM LOCATION MAP

DATE MAR.13/1995	PROJECT: 624	SCALE: 1:50000	NTS 82M/IW	M.D.: REVELSTOKE	FIGURE 2
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DWG-624-004

HISTORY

In the late nineteenth century a stratigraphically-controlled silver-lead-zinc deposit was discovered on the northeastern flank of Copeland Ridge east of the Copeland deposit. Intermittent work has been carried out on this property since its discovery.

Similar mineralization occurs on the west side of Frisby Ridge opposite the mouth of Copeland Creek.

In 1964 prospectors found chalcopyrite in float in Copeland Creek and traced the float to outcrop. Molybdenite was later reported in samples. King Resources carried out mapping, sampling and drilling from 1965 to 1967, primarily on a zone of high-grade molybdenite mineralization on the north side of Copeland Ridge.

A road was begun along the north side of Hiren Creek in 1968 and an adit was driven north through Copeland Ridge to allow production of the deposit.

Recorded production from 1970 to 1973 comprised 191,126 tonnes of ore. A total of 169,729 tonnes of ore was milled and produced 1,190,713 kilograms of molybdenum.

GENERAL GEOLOGY

The Mt. Copeland property lies within the Shuswap Metamorphic Complex, a narrow belt of high grade metamorphic rocks in the Columbian orogen of southeastern B.C. The Shuswap Complex is flanked by the Frenchman Cap Dome, one of a series of gneiss domes that occur along the eastern border of the Precambrian-Paleozoic(?) metamorphic complex.

Rocks underlying the property consists of metasedimentary rocks including quartzite, calc-silicate gneiss, marble and grey gneiss. Concordant bodies of nepheline syenite/nepheline syenite gneiss occur within the calc-silicate gneiss and marble units. Evidence suggests that the syenite was emplaced as a series of sills before the Shuswap deformation and metamorphism.

Three main alkaline units have been defined in the area. These are: basinal nepheline syenite gneiss, overlain by alkaline amphibolite which is in turn overlain by calcareous and saturated syenite.

The rocks have been subjected to three complex phases of deformation which have resulted in large overturned antiform structures with axes dipping steeply to the south and southwest. Lithologies generally strike 110° and dip $30-50^{\circ}$ south.

WORK COMPLETED

The 1995 sampling program was undertaken to sample fresh, unaltered nepheline syenite and/or nepheline syenite gneiss in order to assess its potential as an industrial mineral.

A). Program

A total of six samples of unaltered nepheline syenite were collected on the southern slope of Copeland Ridge and two samples were collected on the north slope.

On the north side of the ridge molybdenite mineralization occurs at the margins and within the syenite and nepheline syenite gneiss. As a result most of the host rocks are intensely iron stained and have undergone various degrees of alteration.

The two samples from the north side of Copeland Ridge were collected from relatively fresh nepheline syenite.

B). Program Parameters

Nepheline-bearing rocks are not uncommon on a world scale, but few are able to be beneficiated to a composition sufficiently low in iron to be used in the making of glass. Typical glass-grade compositions are as follows:

Nepheline Syenite: Typical Glass-grade Compositions

Unimin Canada Ltd.

Elkem Nefelin
North Cape

Chemical Composition:	A Grade %	B Grade %	%
SiO ₂	60.2	60.1	55.9
Al ₂ O ₃	23.5	23.4	24.2
Fe ₂ O ₃	0.08	0.35	0.1
CaO	0.3	0.3	1.3
MgO	trace	trace	trace
Na ₂ O	10.6	10.5	7.9
K ₂ O	5.1	4.9	9.0
BaO	--	--	--
SrO	--	--	--
P ₂ O ₅	--	--	--
Loss on ignition	0.4	0.3	1.0

In Ontario, the composition of a commercial nepheline syenite deposit is as follows:

Typical Raw Composition of Blue Mountain Nepheline Syenite

	%
SiO ₂	59.18
Al ₂ O ₃	23.06
Fe ₂ O ₃	2.15
Na ₂ O	10.48
K ₂ O	3.94
CaO	0.76
MgO	0.17
TiO ₂	0.064
ZrO ₂	0.05
P ₂ O ₅	0.021
Loss on ignition	0.40

An open texture, free of mineral intergrowth is typical of commercial deposits where good liberation of the mafic minerals (biotite, hornblende and magnetite) is essential for their removal by a dry magnetic process.

b). Program Results

Rock descriptions are contained in Appendix A and analyses in Appendix B. In general the average SiO_2 content of the eight samples is below that at Blue Mountain. Fe_2O_3 content however is slightly higher except in sample MC95-3.

Comparison of Fe_2O_3 content to rock descriptions shows that the Fe_2O_3 content is directly proportional to hornblende and biotite content.

CONCLUSIONS

The Mt. Copeland property contains probable reserves of 163,000 tonnes grading 1.82% molybdenum.

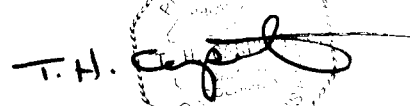
Sampling of nepheline syenite and nepheline syenite gneiss on the property shows that several samples fall within the range of commercial deposits exploited for use as an industrial mineral.

RECOMMENDATIONS

Detailed mapping and sampling on the property is necessary to define the grade and assess the extent of potential industrial grade nepheline syenite on the Mt. Copeland property.

An evaluation of the old workings on the property should be undertaken with a view to eventual exploitation of molybdenum reserves on the property.

Respectfully submitted,


T.H. Carpenter

T.H. Carpenter, P.Geo.

February 1, 1996
Vernon, B.C.

REFERENCES

British Columbia Ministry of Energy, Mines and Petroleum Resources (MEMPR) Annual Reports

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Guillet, G. Robert, 1994, "Nepheline Syenite" in Industrial Minerals and Rocks, 6th Edition, Donald G. Carr, Ed., Society for Mining, Metallurgy, and Exploration, Inc.

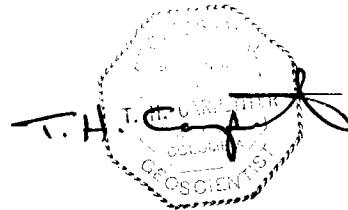
STATEMENT OF COSTS

1.	Professional Services		
	D. Duba:		
	Planning & field work		
	1.5 days @ \$368/day	\$ 552	
	0.5 days @ \$320/day	160	
	T. Carpenter		
	Supervision & report writing		
	1.5 days @ \$380/day	<u>570</u>	\$ 1282.00
2.	Field Personnel		
	Rock Sampling		
	M. Beenen		
	1 day @ \$222.56/day		222.56
3.	Transportation		
	Truck (mob/demob)	94.50	
	Helicopter	<u>1251.19</u>	1345.69
4.	Lodging & Meals		90.96
5.	Geochemical Analyses		
	a) Sample preparation		
	8 samples @ \$5/sample	40.00	
	b) Whole rock analyses		
	8 samples @ \$20.80/sample	<u>166.40</u>	206.40
6.	Drafting		207.90
7.	Data compilation, secretarial		350.00
8.	Field supplies and equipment rental		12.00
9.	Printing, data processing, telephone, shipping		<u>50.00</u>
		Total	<u>\$3767.51</u>

STATEMENT OF QUALIFICATIONS

I, THOMAS H. CARPENTER of 3902 14th Street, Vernon, B.C.,
V1T 3V2, DO HEREBY CERTIFY that:

1. I am a consulting geologist in mineral exploration associated with Discovery Consultants, Vernon, B.C.
2. I have been practising my profession for 24 years.
3. I am a graduate of the Memorial University of Newfoundland with a Bachelor of Science degree in geology.
4. I am a Professional Geoscientist with the Association of Professional Engineers and Geoscientists of British Columbia.
5. This report is based upon knowledge of the Mt. Copeland property gained from supervision.
6. I hold no interest either directly or indirectly in the Mt. Copeland property.

A circular professional seal for a geoscientist. The seal features a central emblem with a compass and a pickaxe. The text around the perimeter of the seal reads "ASSOCIATION OF PROFESSIONAL ENGINEERS AND GEOSCIENTISTS OF BRITISH COLUMBIA". The name "T.H. CARPENTER" is written across the seal in a cursive script.

T.H. Carpenter, P.Geo.

February 1, 1996
Vernon, B.C.

APPENDIX 1

ROCK SAMPLE DESCRIPTION

- MC-95-1 Pinkish grey, medium grained, equigranular nepheline syenite, 5-7% biotite
- MC-95-2 Grey to pinkish grey, medium grained, equigranular nepheline syenite, 3-5% biotite
- MC-95-3 Light grey, leucocratic, equigranular, medium to coarse grained nepheline syenite, 2-3% biotite
- MC-95-4 Pinkish grey, medium grained nepheline syenite, 8% biotite
- MC-95-5 Pinkish grey, medium grained, equigranular nepheline syenite, 3-4% hornblende, typically blady and tabular crystals, 5% biotite
- MC-95-6 Medium grey, medium grained, equigranular nepheline syenite, 10% biotite in clusters and patchy bands
- MC-95-7 Medium grey, medium grained, equigranular nepheline syenite, 12-14% biotite, slightly foliated
- MC-95-8 Float; medium grey, fine to medium grained, equigranular nepheline syenite, to 15% biotite

APPENDIX 2

ANALYTICAL PROCEDURES

Whole Rock Analysis

by Bondar-Clegg :

ELEMENT		LOWER DETECTION LIMIT	EXTRACTION	METHOD
SiO ₂	Silica	0.01 pct	Borate Fusion	Induc. Coup. Plasma
TiO ₂	Titanium	0.01 pct	Borate Fusion	Induc. Coup. Plasma
Al ₂ O ₃	Alumina	0.01 pct	Borate Fusion	Induc. Coup. Plasma
Fe ₂ O ₃	Total Iron	0.01 pct	Borate Fusion	Induc. Coup. Plasma
MnO	Manganese	0.01 pct	Borate Fusion	Induc. Coup. Plasma
MgO	Magnesium	0.01 pct	Borate Fusion	Induc. Coup. Plasma
CaO	Calcium	0.01 pct	Borate Fusion	Induc. Coup. Plasma
Na ₂ O	Sodium	0.01 pct	Borate Fusion	Induc. Coup. Plasma
K ₂ O	Potassium	0.05 pct	Borate Fusion	Induc. Coup. Plasma
P ₂ O ₅	Phosphorous	0.03 pct	Borate Fusion	Induc. Coup. Plasma
LOI	Loss on Ignition	0.05 pct	Ignition 1000 Deg. C	Gravimetric
Total	Whole Rock Total	0.01 pct		
Cr ₂ O ₃	Chromium Oxide	0.01 pct	Borate Fusion	Induc. Coup. Plasma

Project 624

Mount Copeland

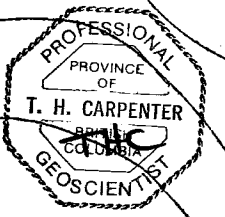
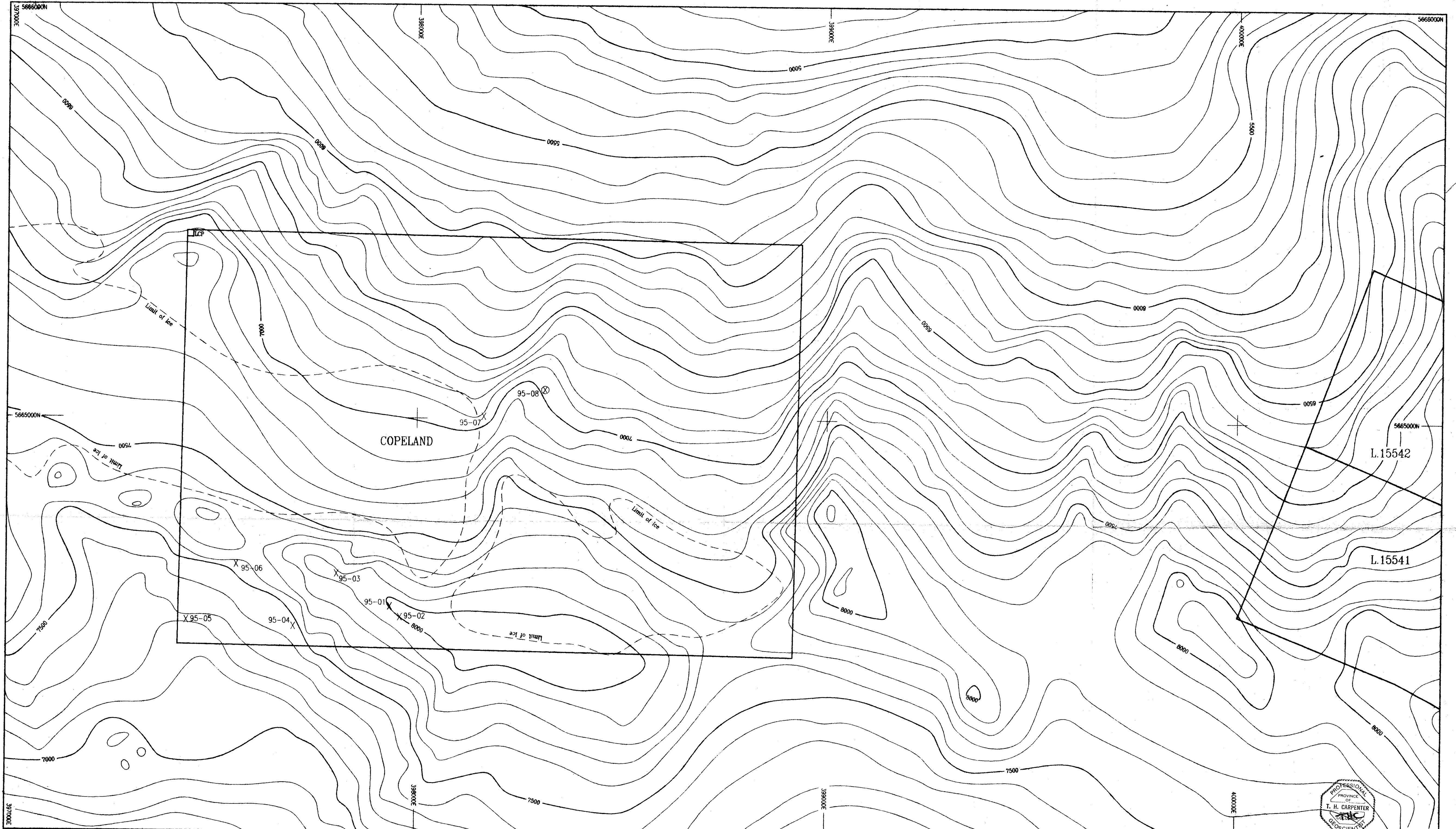
file: 624Vrock_95.wk1

Whole Rock Analyses
1995Date of Report: 95.10.23
Reference: v95-01377.0

Sample ID	SiO2 %	TiO2 %	Al2O3 %	Fe2O3* %	MnO %	MgO %	CaO %	Na2O %	K2O %	P2O5 %	LOI %	Total %	Cr2O3 %
MC95-1	53.85	0.48	22.51	3.22	0.07	0.20	2.55	7.01	9.31	<0.03	0.79	100.00	0.01
MC95-2	53.92	0.41	22.37	2.67	0.07	0.16	2.46	6.75	9.57	<0.03	1.84	100.21	<0.01
MC95-3	49.66	0.03	28.75	0.66	0.02	0.06	0.65	11.02	8.21	0.06	0.96	100.10	0.01
MC95-4	56.13	0.43	22.59	2.79	0.08	0.14	1.96	6.10	9.71	<0.03	0.92	100.84	<0.01
MC95-5	54.15	0.48	22.51	3.12	0.08	0.15	2.24	6.42	9.37	0.04	1.84	100.42	<0.01
MC95-6	56.51	0.44	21.79	2.49	0.10	0.26	1.45	3.07	11.49	0.07	2.68	100.35	<0.01
MC95-7	55.11	0.65	17.45	5.11	0.21	0.45	3.25	3.76	10.35	0.04	2.57	98.94	<0.01
MC95-8	57.40	0.47	18.30	6.27	0.34	0.35	2.35	4.41	7.60	0.11	1.56	99.18	<0.01

Re-Run:

MC95-1											0.77		
MC95-8	57.58	0.47	18.45	6.33	0.34	0.37	2.40	4.46	7.65	0.11			<0.01

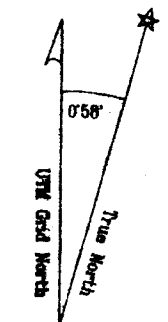


LEGEND

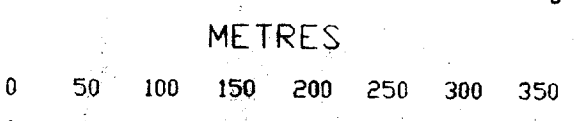
- X 95-01 Rock sample
- ⊗ 95-08 Float sample

**GEOLOGICAL BRANCH
ASSESSMENT REPORT**

24,328



Topographic contour interval = 100 feet



SCALE 1:5000

DRAWN: r.13/1995
Revised:
Oct 20/1995

DISCOVERY Consultants

PHOENIX SYNDICATE

**MOUNT COPELAND PROPERTY
WHOLE ROCK GEOCHEMISTRY
SAMPLE LOCATION MAP**

DATE: Feb. 1/1996	SCALE: 1:5000
PROJECT: 624	NTS: 82M/1W
FIGURE: 3	Revelstoke Mining Division