84-1435-13388

Geological, Geochemical Report

ALEX MINERAL CLAIM

Cariboo M.D., British Columbia

N.T.S. 93 H/4

Latitude 53 deg. 10 min. N
Longitude 121 deg. 44 min. W

by: R.G. MacArthur

NORANDA EXPLORATION COMPANY, LIMITED
(No Personal Liability)

January 1985

GEOLOGICAL BRANCH
ASSESSMENT REPORT

13,388

TABLE OF CONTENTS

		Page
Summary		1
Geochemical Sampling		
Collection:	Silts	2
	Rock	2
	Soils	2
Analysis		2
Presentation and Discussion of Results		2/3

APPENDIX I - Report on the Geology and Proposal For Development of the ALEX MINERAL CLAIM 5035 by K.V. Campbell. Ph.D., Dated September 1983

APPENDIX II - Statement of Costs

APPENDIX III - Analytical Procedure

APPENDIX IV - Statement of Qualifications

LIST OF FIGURES

Figure 1 - Location Map, Scale 1:250,000
Figure 2 - Claim Map, Scale 1:50,000
Figure 3 - Geochemistry Silt, Rock and Soil Scale 1:5,000

SUMMARY:

The "ALEX" property consists of 20 units located approximately 13 km northwest of Wells, B.C. The property is owned by Great Central Mines of Vancouver and was subject to a Letter of Agreement with Noranda Exploration during 1984. Road access is available to within easy walking distance of the property.

A brief program of reccy soil, silt and rock geochemistry was carried out on the northeast corner of the claim. Some anomalous values in Pb, Ag, and As were recorded. More extensive sampling to cover the remainder of the property and more detailed sampling around the presently indicated anomalies is recommended.

The geological setting is described in some detail in an appended report by K.V. Campbell, Ph.D. He indicates the property is underlain by Mississippian to Permian clastic sediments, phyllite and schists, mainly Mt. Tom Succession. Potential for three types of mineral deposits is indicated: gold quartz veins, gold bearing pyritic replacement deposits and shale hosted lead, zinc, and silver deposits.

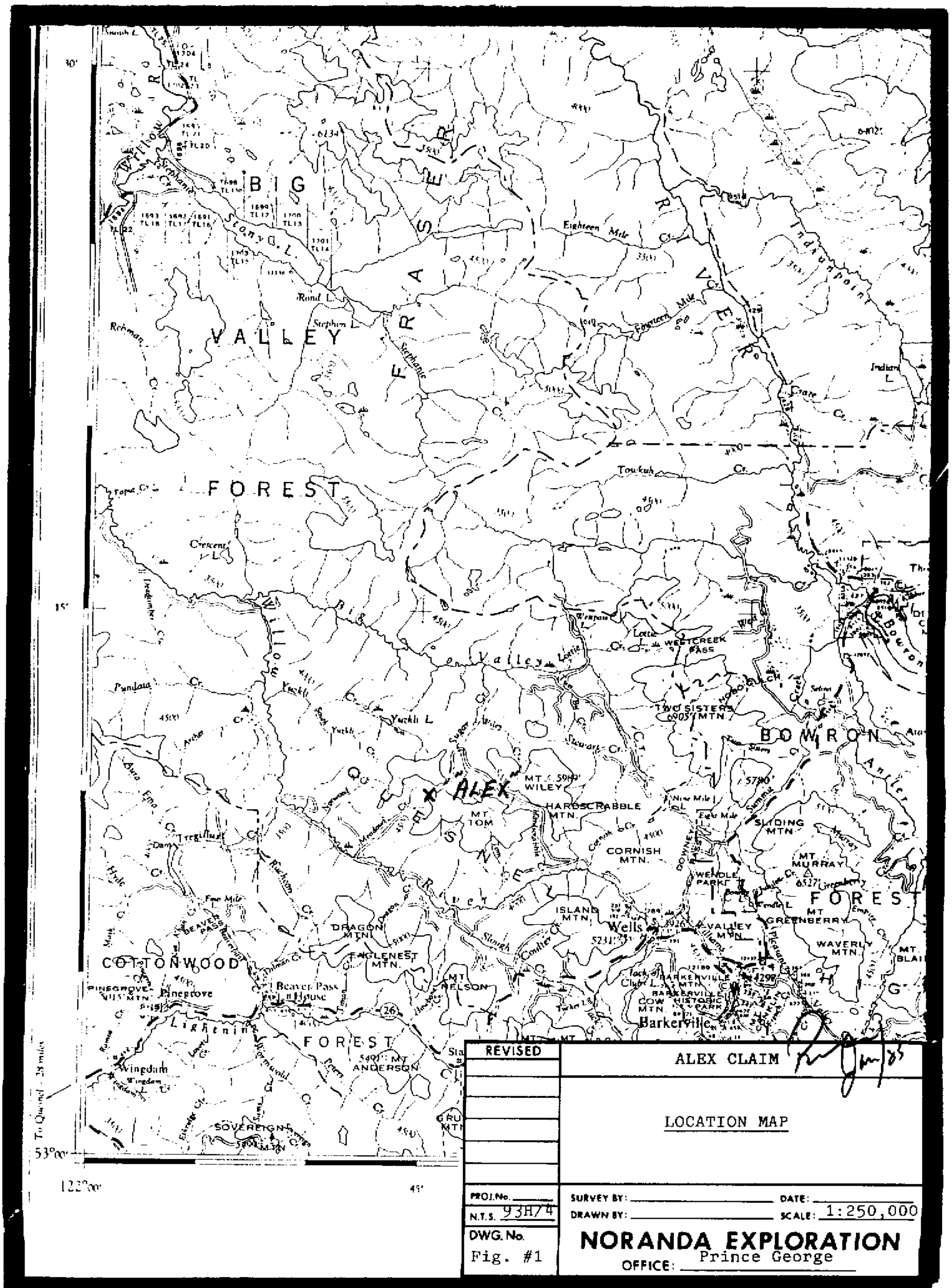
INTRODUCTION:

The "ALEX" property consists of a 20 unit claim located approximately 13 km northwest of Wells, B.C., N.T.S. 93H/4.

The Alex claim is owned by Great Central Mines Ltd. of Vancouver, B.C. and the program described here was carried out under a Letter of Agreement with Noranda Exploration Company, Limited (No Personal Liability), dated March 21, 1984.

Road access is available to the junction of Sugar Creek and Cooper Creek via the Sugar Creek-Hardscrabble Mountain road. From the junction of Cooper and Sugar Creeks an old cat trail runs up along the west side of Cooper Creek to a point a few hundred meters east of the property.

This report describes the results of a brief program of geochemical sampling carried out during July and August of 1984. This work was done in conjunction with work on the SANDI Property to the north. A discussion of the Geology is included in a report prepared by K.V. Campbell, Ph.D., which is appended. The general background information including History, Geomorphology, and Regional Geology are all well covered in the above mentioned report, so they will not be repeated here.



REVISED	ALEX CLAIM
	LOCATION MAP

PROJ. No. ______

N.T.S. 93H/4

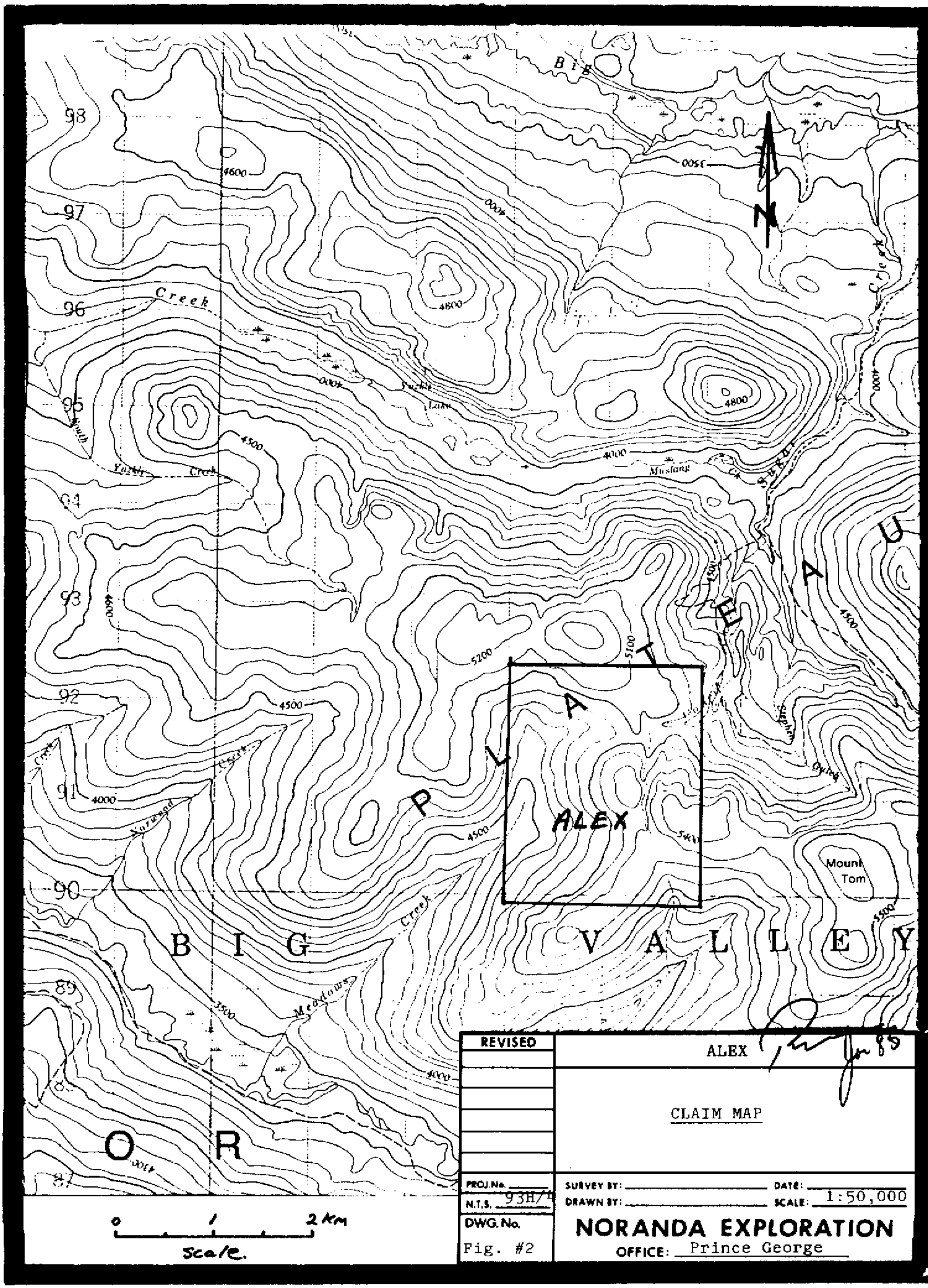
DWG. No. Fig. #1

SURVEY BY: ______ DATE: ______

DRAWN BY: ______ SCALE: 1:250,000

NORANDA EXPLORATION

OFFICE: Prince George


N
ALEX
PLATEAU
BIG VALLEY
Mount Tom
Mustang
Creek
Meadows
4600
4800
4500
4000
5200
5100
3500
98
97
96
95
94
93
92
91
90
89
0 1 2 Km
scale.
REVISED
ALEX
CLAIM MAP
PROJ.No.
N.T.S. 93H/
DWG.No.
Fig. #2
SURVEY BY:
DRAWN BY:
DATE:
SCALE: 1:50,000
NORANDA EXPLORATION
OFFICE: Prince George

GEOCHEMICAL SAMPLING:

Collection

Silt samples were collected at thirteen locations as shown in Figure #3. A "Hi Wet Strength Kraft 3 1/2 X 6 1/8 open end" envelope was filled with the finest clastic sediment available in the stream bed. The sample was assigned a five digit number using numbered sample tickets and an orange flag left at the sample site.

Soil samples were collected from the "B" soil horizon at fourteen locations as indicated on Figure #3. The same envelope sample number system and location marking was used as for silt samples.

Rock samples were collected at two locations as shown in Figure #3. From 200 - 500 gms. of small rock chips were collected from the indicated outcrop and the same envelopes, sample number system and location marking as employed for silts and soils was used.

All samples were air dried and shipped to the Noranda Geochem Lab, 1050 Davie St., Vancouver.

Analysis

All samples were analysed at the Noranda Lab in Vancouver using the analytical techniques described in Appendix III.

Presentation and Discussion of Results

The location and analytical results of all samples are shown on Figure #3.

No anomalous values were recorded for Au.

There were four silt samples and two soil samples with values greater than 20 ppb Pb. All of these silt samples 16329, 16308, 16371, and 16311 were collected on Cooper Creek or small tributaries to Cooper Creek near the east side of the property (Figure #3). The two soil samples with values greater than 20 ppm Pb were collected in the same general area. This suggests a possible zone of high Pb values. However, the cause is unknown.

One soil sample #14743 returned a value of 420 ppm As. This sample was collected from a red/orange clay near a stream bank as shown in Figure #3. The source of this high As value is unknown, however the low Au-Ag and base metal values in this sample is not encouraging.

One soil sample #16380 returned a value of 5 ppm Ag which is greater than five times the background values.

This reccy type sampling limited to the Northeast corner of the property should serve only as a preliminary evaluation of that portion of the property covered. The remainder of the property requires a more extensive sampling program to evaluate it. At the same time, more detailed sampling in the area of the above mentioned anomalous samples is warranted.

R.G. MacArthur

APPENDIX I

REPORT ON THE GEOLOGY AND

PROPOSAL FOR DEVELOPMENT OF

THE ALEX MINERAL CLAIM 5035.

REPORT ON THE GEOLOGY AND
PROPOSAL FOR DEVELOPMENT OF
THE ALEX MINERAL CLAIM 5035.

Cooper Creek Area
Cariboo Mining Division, British Columbia
N.T.S. Map Area 93H/4
Latitude 53° 10' Longitude 121° 45'

for

GREAT CENTRAL MINES LTD.
#600 - 890 W. Pender Street
Vancouver, B.C.
V6J 1J9

by

K.V. Campbell, Ph.D.

September, 1983

TABLE OF CONTENTS

1 INTRODUCTION 1

1.1 Location and Access 1
1.2 Ownership and Claims Status 3
1.3 References 3
1.4 History 5

2 GEOMORPHOLOGY 7

2.1 Regional 7
2.2 Local 8

3 GEOLOGY 10

3.1 Regional 10
3.2 Property 13
3.3 Mineralization 13

4 CONCLUSIONS 17

4.1 Geomorphology 17
4.2 Lithology 17
4.3 Structure 17
4.4 Mineralization 18

5 PROPOSAL FOR DEVELOPMENT 19

5.1 Recommendations 19
5.2 Estimated Cost of Proposed Program 21

6 CERTIFICATE 22

FIGURES

Figure 1. Location Map 2
~~Figure 2. Claim Plan .... 4~~
Figure 3. Gold Occurrences 6
Figure 4. Topographic Map 9
Figure 5. Regional Geology 11
Figure 6. Property Geology 14

TABLES

Table 1. Explanation of Figure 6 - Property Geology 15
Table 2. Known mineral occurrences near the Alex claim 16

1 INTRODUCTION

This report describes what is known about the Alex mineral claim located in the Cariboo Mining Division of central B. C. The Alex claim consists of twenty (20) modified grid claim units held by Great Central Mines Ltd. of Vancouver, B.C., whose president, Mr. Robert Nicholson, requested this report. It is the intention of Great Central Mines Ltd. to explore for and develop gold mineralization on the Alex mineral claim.

The geological setting is such that there is a potential for the occurrence of three types of mineral deposits; gold-quartz veins, gold-bearing pyritic replacement deposits and shale-hosted lead, zinc and silver. To date only gold bearing quartz veins have been explored in the local area by surface workings (c. 1885 to 1964). There has been no modern hard-rock exploration or development on this property. The purpose of this report is to review the history of the claims area, describe the geology and present a proposal for gold exploration. The focus of the gold exploration is along the projection onto the claim of a major fracture zone that is the site of visible gold mineralization to the northeast.

1.1 Location and Access

The Alex mineral claim is located 15 km northwest of the village of Wells in central British Columbia (Figure 1). The claim is situated within National Topographic System area 93H/4 and is centered at approximately 53°10' latitude and 121°45' longitude.

Two roads can be used to reach the area. The better of these is the Beaver Pass route which branches northwest of Highway 26, the Quesnel - Barkerville Highway, about 25 km west of Wells. This gravelled logging road is fairly well maintained. It is about 40 km from Highway 26 to the road's end on Sugar Creek near its confluence with Mustang Creek, about 3 km north of the property. An abondoned mining road also reaches Cooper

Creek, via Wells and Hardscrabble Creek. By following this rough track it is 15 km from Wells to the mouth of Cooper Creek. A 4-wheel drive track goes up the north side of Cooper Creek for about 2 km. From there Alex claim can be reached by hiking up Cooper Creek for another 3/4 km. The track up Cooper Creek is in need of repair.

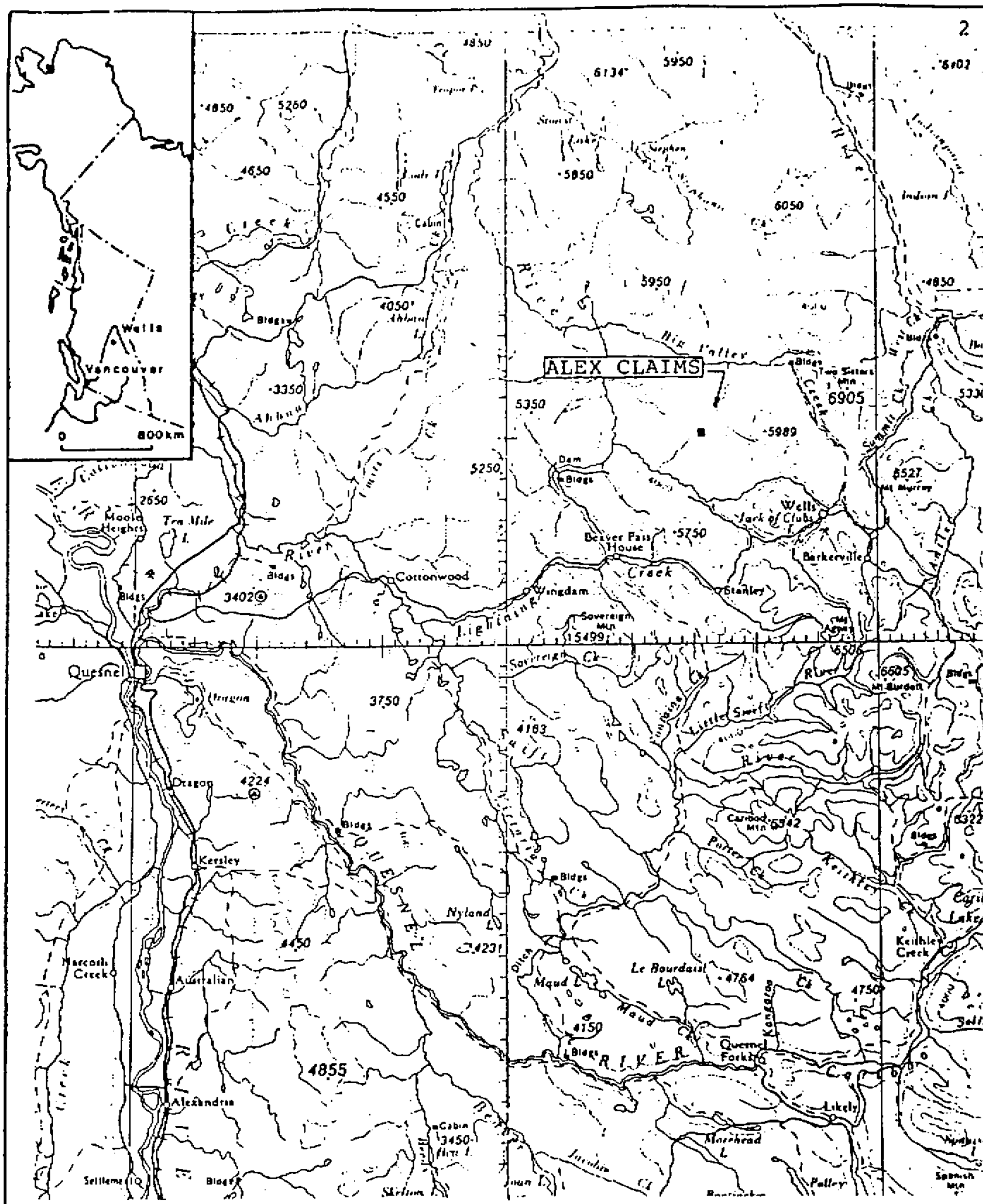
1.2 Ownership and Claims Status

Figure 2 is a recent claim plan of the area, copied at the Quesnel sub-recorders office on September 9, 1983. The Alex claim, Record No. 5035 (8) consists of twenty (20) modified grid claim units and was recorded on August 22, 1983. The recorded owner of the claim is Great Central Mines Ltd. of Vancouver, B.C.

1.3 References

The following is a list of publications relevant to the area of the Alex claim. None of these specifically references the claim area.

- Alldrick, D.J., 1983; The Mosquito Creek Mine, Cariboo Gold Belt, B.C. Ministry of Mines, Geological Fieldwork, 1982.
- B.C. Minister of Mines Annual Report, 1934; pages 26, 27.
- B. C. Minister of Mines Annual Report, 1947; Holland, S.S., pages 117-123.
- Bowman, A.,1898; Report on the Geology of the Mining District of Cariboo, B.C., Geological Survey of Canada, Annual Report 1888, v.3, pt. 1.
- Boyle, R.W., 1979; The Geochemistry of Gold and its Deposits, Geological Survey of Canada, Bulletin 280.
- Campbell, R.B., Mountjoy, E.W. and Young, F.G., 1973; Geology of the McBride map area, Geological Survey of Canada, Paper 72-35.
- Hanson, G., 1935; Barkerville Gold Belt, Cariboo District, B.C., Geological Survey of Canada, Memoir 181.
- Hanson, G., 1938; Geological Map, Willow River, West Half, Geological Survey of Canada, Map 335A.
- Hanson, G., 1938; Geological Map, Willow River, East Half, Geological Survey of Canada, Map 336A.



CAMPBELL & ASSOCIATES
GEOLOGICAL CONSULTANTS

GREAT CENTRAL MINES LTD.

Scale 1:500,000

0 5km

Sept 6/83

NTS 93

FIGURE 1

ALEX CLAIMS

LOCATION MAP

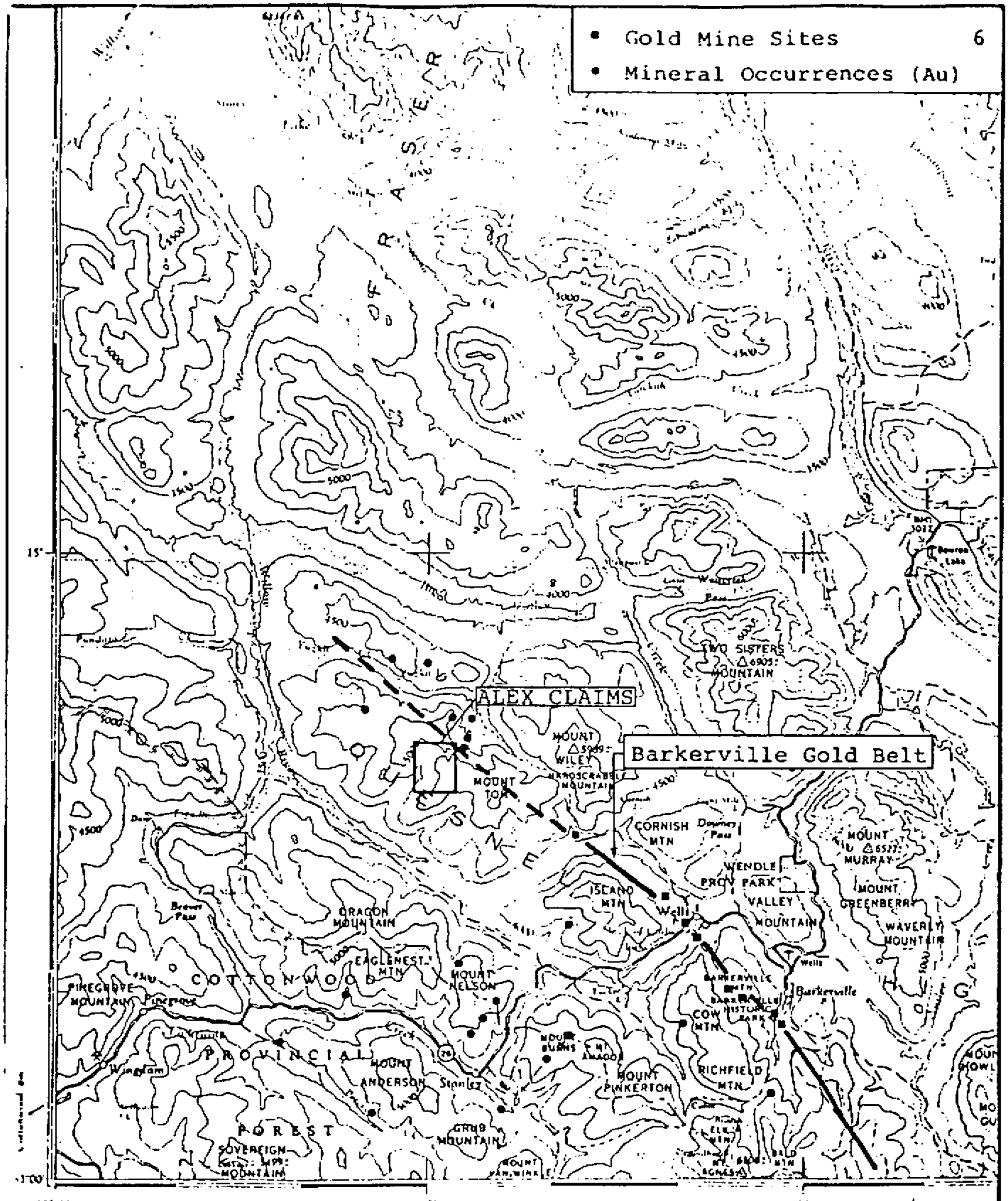
- Johnston, W. A. and Uglow, W. L. 1926; Placer and Vein Gold Deposits of Barkerville, Cariboo District, B.C., Geological Survey of Canada, Memoir 149.
- Little, H. W., 1959; Tungsten Deposits of Canada, Geological Survey of Canada, Economic Geology Series No. 17.
- Struik, L.C., 1981a; Snowshoe Formation, Central B.C., Geological Survey of Canada, Paper 81-1a, pages 213-216.
- Struik, L.C., 1981b; Type area of the Devono-Mississippian Cariboo Orogeny, Canadian Journal of Earth Sciences, v. 18, pages 1767-1775.
- Struik, L.C., 1982a; Bedrock Geology (of) Cariboo Lake, Spectacle Lakes, Swift River and Wells map areas, British Columbia, Geological Survey of Canada, Open File 858.
- Struik, L.C., 1982b; Snowshoe Formation (1982), Central British Columbia, Current Research, Part B, Geological Survey of Canada, Paper 82-1b, pages 117-124.
- Sutherland Brown, A., 1957; Geology of the Antler Creek area, Cariboo District, B.C., B.C. Department of Mines, Bulletin No. 38.
- Tipper, H. W., Glacial Geomorphology and Pleistocene History of Central B. C., Geological Survey of Canada, Bulletin 196.

1.4 History

The Cariboo district is one of the oldest gold mining camps in British Columbia, the first prospectors arriving c. 1858. The early miners focused on placer deposits but by the 1890's gold-quartz veins were being mined.

The Alex mineral claim lies at the northwest end of the Barkerville Gold Belt, a northwest alignment of gold-quartz veins, gold bearing pyrite ore bodies and placer deposits. Figure 3 shows the location of gold occurrences and gold mines of the Cariboo district. The axis of the Barkerville Gold Belt is shown on this figure, extending through Mt. Tom, Island Mtn. and Barkerville, The belt extends southeast of the area shown in Figure 3. Most of the gold occurrences shown in Figure 3 were discovered before 1940.

Historical lode gold mines located along this belt, 11 to 20 km east-southeast of the Alex property, were the Island Mtn., Cariboo Gold Quartz, Canusa and Williams Creek Gold Mines. Gold was won from both gold-quartz veins and pyritic replacement



6

CAMPBELL & ASSOCIATES GEOLOGICAL CONSULTANTS		GREAT CENTRAL MINES LTD.
Scale 1:250,000	Sept 6/83 — 93H	ALEX CLAIMS
0 — 5 km	FIGURE 3	GOLD OCCURRENCES (after B.C. Ministry of Mines)

bodies in limestone. The only currently active mine in the area is the Mosquito Creek Gold Mine, 11 km southeast of the Alex property, which has had a continuous production since October 1980 of about 2,000 tons per month of replacement ore with a head grade of 0.45 oz gold per ton, (Northern Miner, December 16, 1982).

The Hardscrabble tungsten mine, located at the mouth of Hardscrabble Creek, 6 km southeast of the Alex claim, was developed between 1904 and 1938, (Little, 1959). Free gold-bearing quartz veins were reported there but never mined.

Cooper Creek, just east of the Alex claims, is the location of several gold-bearing quartz veins, (B.C.D.M. Annual Report, 1947),which were the scene of minor development between 1885 and 1965.

2 GEOMORPHOLOGY

2.1 Regional

The Alex mineral claim lies within the Quesnel Highland physiographic region. A characteristic of this region are upland areas which are remnants of a highly dissected plateau of moderate relief lying at an elevation of 5,500 to 6,300 ft (1,675 to 1,920 m). The plateau was formed in Tertiary times prior to the formation of Pleistocene ice which covered most of the high areas during the Continental Ice Sheet Stage of glaciation. Most summits in the region are rounded. Incipient and weakly developed cirques formed on the northern slopes of most of the higher hills during interglacial and/or late stages of the glaciation. Valley glaciers truncated spurs and deposited materials over most of the area. In many places, glacial drift or till mantles the sides of the valleys up to more than 1,000 ft (300 m) above the valley floor. The till is mostly local in origin though foreign boulders do occur.

The regional drainage pattern indicates pronounced structural control by bedrock fractures. There are two main alignments;

(1) trending northwest-southeast, for example Yuzkli Creek and upper Sugar Creek, and (2) northwest-southeast, for example lower Sugar Creek and Meadows Creek (Figure 4).

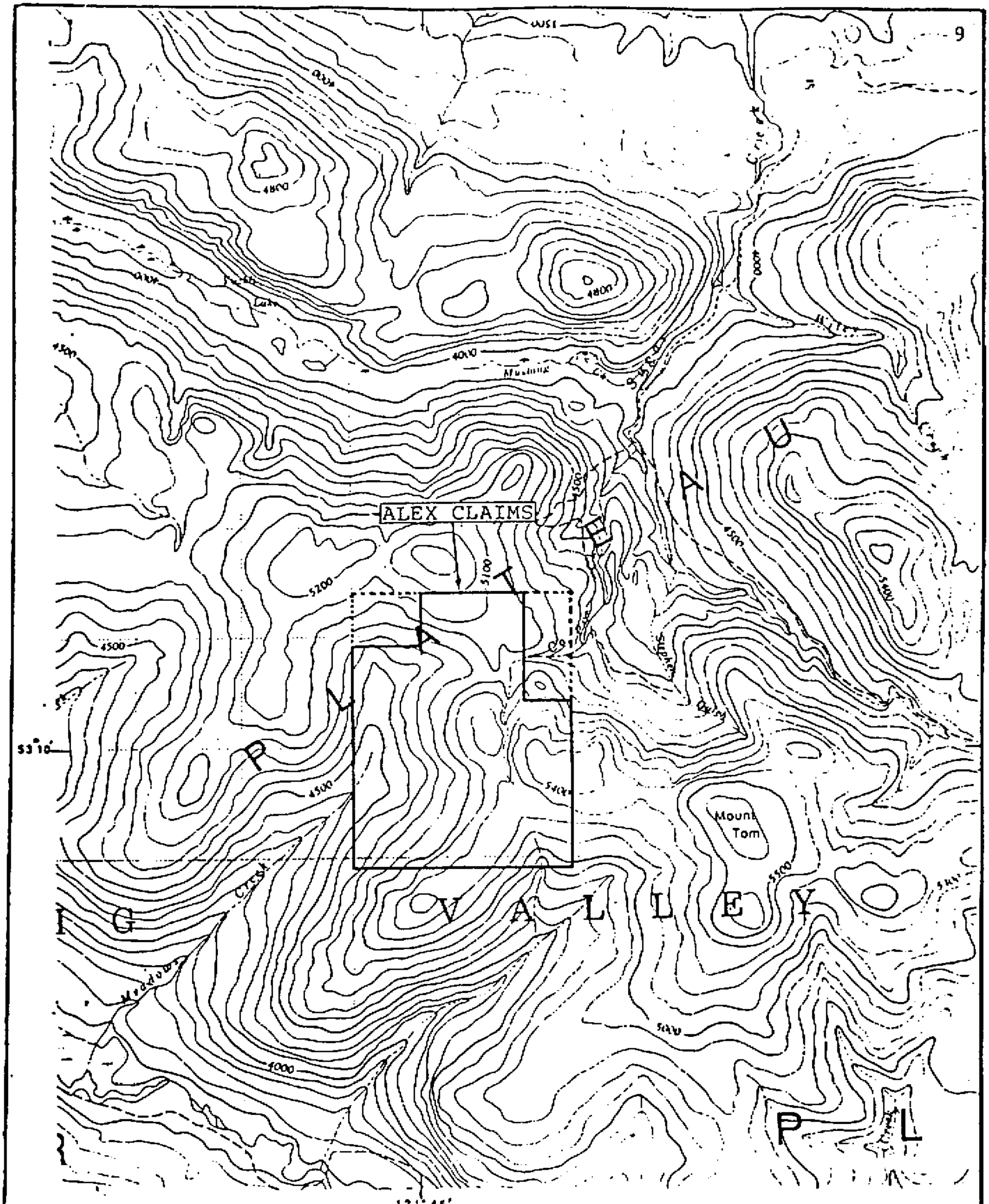
2.2 Local

Figure 4 is a topographic map of the Sugar Creek area. Relief is about 1,000 ft (300 m) from the rounded hill (5,400 ft or 1,645 m) northwest of Mt. Tom to the upper valley of Meadows Creek (4,400 ft or 1,340 m) in the southeast corner of the claim.

The streams draining the north facing slopes of the Mt. Tom ridge lie in deeply cut gullies formed by meltwaters from a wasting ice cap that lay on the upland surface. This latter surface was part of the pre-glacial Tertiary plateau. Individual streams lie in deep (30 to 60 m) V-shaped valleys, many of which have flat bottoms several times as wide as their creeks. The glacial and glaciofluvial deposits through which the streams have cut are boulder till and fairly well stratified, in places partly cemented, alluvial gravels. There are numerous active slumps of colluvium and moraine into the drainageways.

The ice sheet that lay on the upland surface, the gentle rolling hills forming the northwest trending ridge in the eastern part of the claim did not transport materials any great distance. The till it deposited on the slopes above the valley glacier complex that occupied Cooper Creek and tributaries of Sugar Creek is mostly a lodgement till. This consists of gravelly boulder clay with angular gravels and boulders of local origin. There are occasional sand and gravel layers within this till.

Few rock exposures were seen in a traverse around the claim boundary and along the principal drainage basin; Meadows and Cooper Creek valleys. The property has several water courses that could be used for development purposes. The ground is thickly timbered with spruce and balsam. There are numerous thickets of slide alder, willow and Devil's Club.



CAMPBELL & ASSOCIATES
GEOLOGICAL CONSULTANTS

Scale 1:50,000	Sept 6/83	NTS 93H/4
0 —— 1km	FIGURE 4	

GREAT CENTRAL MINES LTD.

ALEX CLAIMS

TOPOGRAPHIC MAP

3 GEOLOGY

3.1 Regional

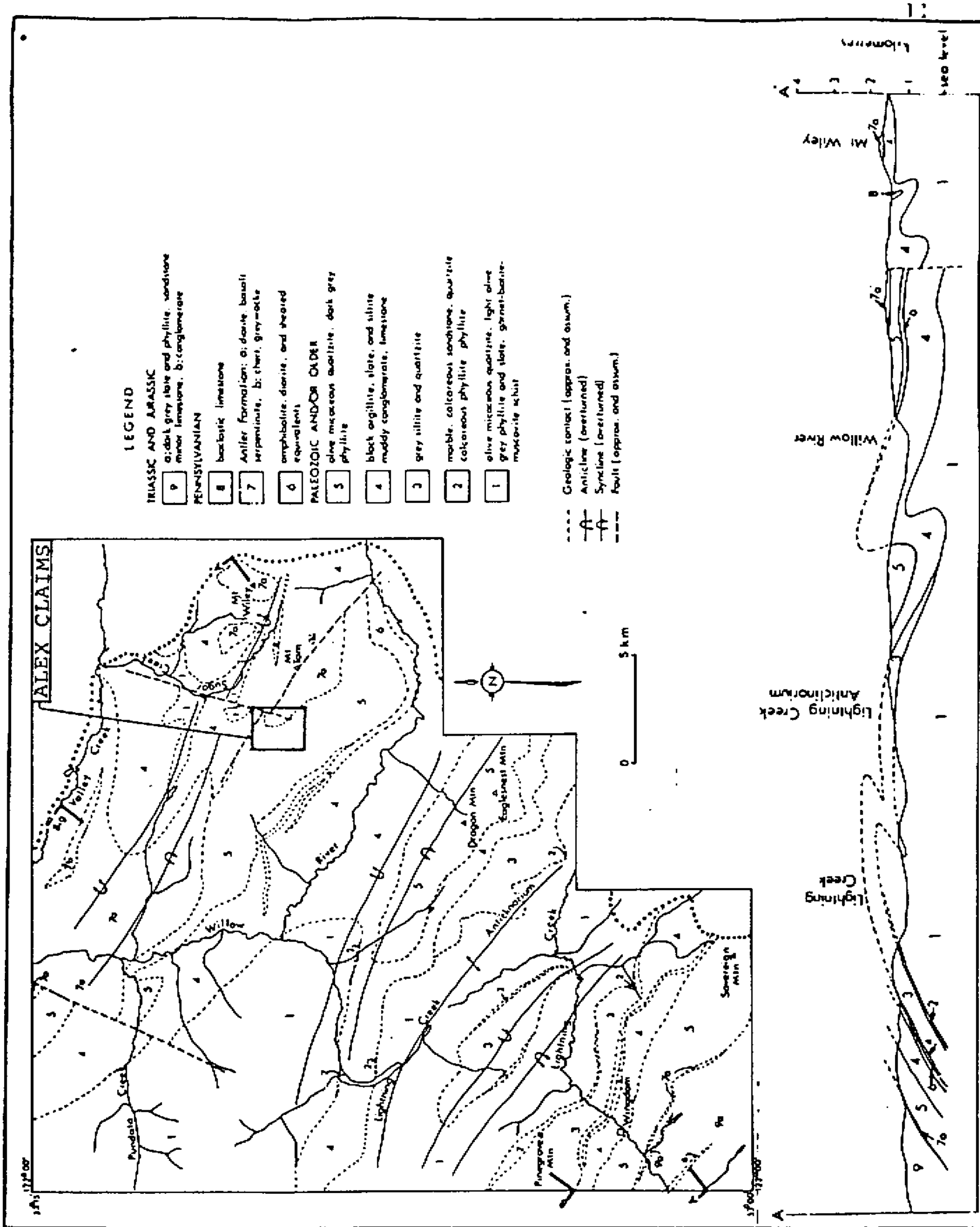
Figure 5 illustrates a recent interpretation of the regional geology, (L.C. Struik, 1981a), with a tentative stratigraphy outlined in the legend. The area lies along the western part of the Omineca Tectonic Belt, known for its prevalence of gold and tungsten mineral occurrences. Two regional tectonostratigraphic sequences are shown in Figure 5. These are (1) Upper Ordovician to Permain shale, dolostone, basalt, conglomerate and limestone (units 1 to 6 and 8, Figure 5) and (2) Permian and Pennsylvanian oceanic chert and mafic and ultramafic volcanic and intrusive rocks (unit 7, Figure 5). The latter sequence, the Antler Formation, has been thrust from the west over the basinal sequence. A third tectonostratigraphic sequence, Hadrynian to Cambrian quartzite, carbonate and shale, representing a continental terrace wedge is exposed to the east of the area shown in Figure 5.

Eastward thrusting of the Antler Formation commenced in post-Permain time and predated the folding and regional metamorphism of Jura-Cretaceous age that affected all rock units in the area. The major folds, such as the Lightning Creek anticlinorium, 15 km southwest of the property, are relatively open.

Several phases of faulting have affected the area. These are, listed from youngest to oldest, as follows (Struik, 1981b, 1982b):

- northerly and north-northeasterly right lateral strike slip faults,
- transverse northeast trending normal faults,
- east dipping high angle reverse and normal faults, and
- east dipping thrust faults.

Quartz veins are common and widely distributed in the area. In general, the sulphide content is low, but in certain areas they contain a fairly consistent quantity of pyrite with



CAMPBELL & ASSOCIATES
GEOLOGICAL CONSULTANTS

Scale as shown	Sept 6/83	93H/4,5
	FIGURE **5**	

GREAT CENTRAL MINES LTD.

ALEX CLAIMS:

REGIONAL GEOLOGY
(after Struik, 1981)

attendant gold (Sutherland Brown, 1957). Previous workers have all noted the pattern of occurrence of quartz veins. Four types of veins are recognized, as follows:

(1) transverse veins; northeast strike, smallest and most numerous type, at the Cariboo Gold Quartz mine provided 60-75% of the quartz ore,

(2) diagonal veins; east-northeast strike, larger and fewer than transverse veins; at the Island Mtn. Mine only the diagonal veins were mineable,

(3) northerly veins; north-northeasterly strike, occur within faults, commonly crushed and difficult to mine, and

(4) strike veins; northwest strike, subparallel to foliation, largest and fewest type, normally barren.

Earlier workers termed the strike veins 'A veins' and the transverse and diagonal veins 'B veins'.

The principal axis of the Barkerville Gold Belt, that passing through Island Mtn. and Barkerville is located on the overturned limb of a northwest trending fold at or near the contact between Devonian-Mississippian black phyllites and micaceous quartzites containing limestone and dolomite. This is the same fold structure that passes just north of the Alex claim and that affects the same rock units.

The gold occurrences consist of auriferous pyrite in quartz veins in the black metaclastic rocks or stratabound, massive auriferous pyrite lenses, termed 'replacement ore', within and at the contacts of limestone beds in the micaceous quartzite unit (Alldrick, 1983).

Recently, (Struik, 1981b), it has been recognized that the Paleozoic sedimentary units making up most of the area contain straitgraphic equivalents of the major divisions of the Selwyn basin; the Ordovician to Devonian Road River Formation and the Devono-Mississippian Earn Group, informally called the "black clastics". These units are hosts for stratiform lead and zinc deposits in the northern Cordillera. In the Cariboo district the Black Stuart Formation (equivalent to unit 4 in Figure 5), and the Greenberry Limestone Member (unit 8 in Figure 5) are time and lithologic correlatives of the black clastic units in the northern Omineca and Mackenzie-Rocky Mtn. belt. The recognition of this correlation gives the Alex claim the potential of having similar deposits.

3.2 Property

Figure 6 illustrates the geology of the local area as mapped by Struik (1982a). Table 1 provides an explanation of the rock units in Figure 6 and their correlation to those shown in the earlier work (Figure 5).

The Mt. Tom Succession (MPt) underlies most of the claims area. It consists of gray micaceous quartzite, phyllite and schist. Black phyllite and argillite are inferred in the northeast corner of the claim, on the north side of a steep fault. Paleozoic (?) carbonate and amphibolite are mapped in the southeast corner of the claim.

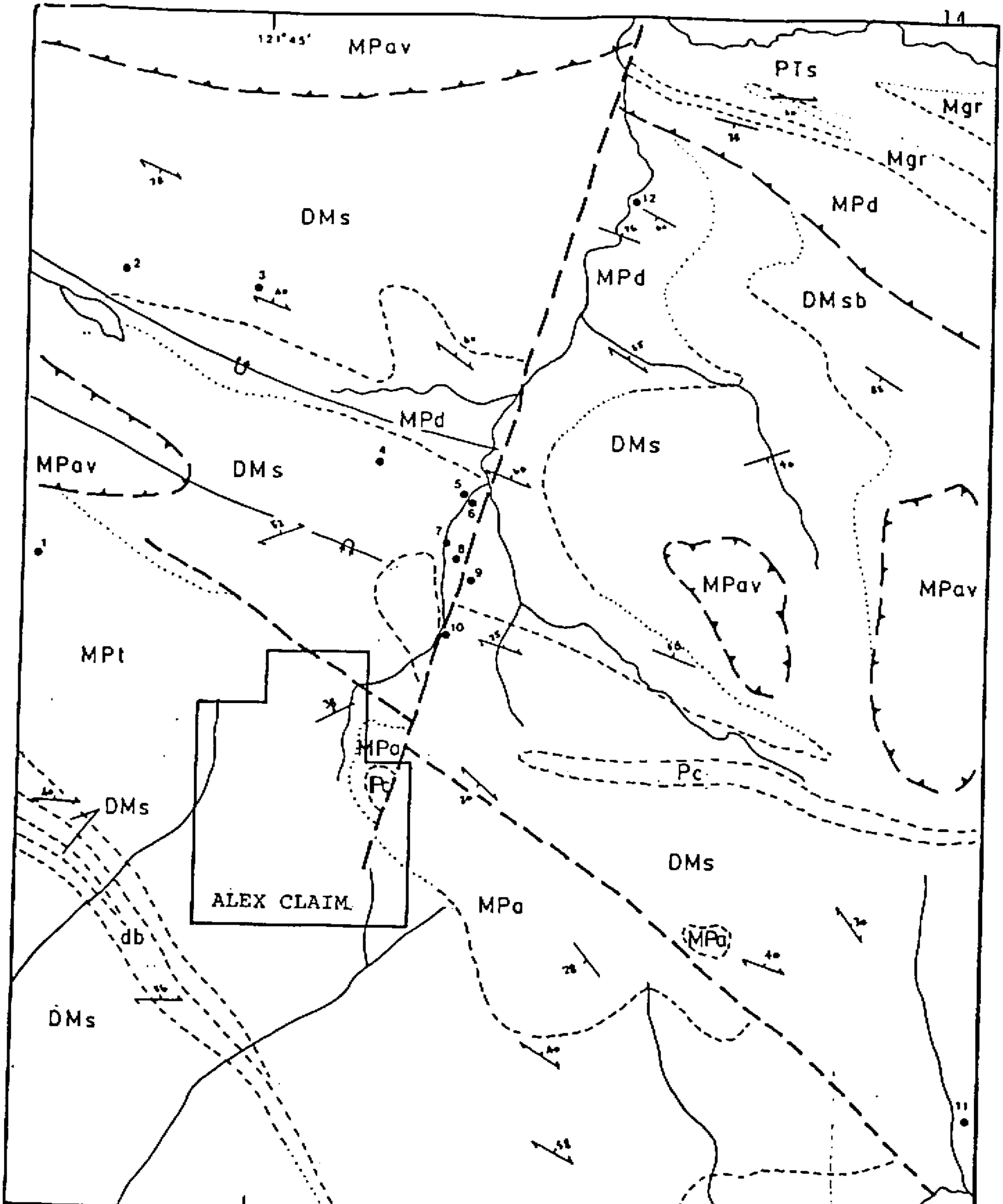
The author observed several large vein quartz boulders and outcrops in the uppermost sections of Cooper Creek during a transverse across the claim in August of 1983. These are considered to be part of the zone of quartz veining that extends along the valley of Cooper and lower Sugar Creek.

Major faults in the area, as mapped by Struik, are the north-northeasterly fault in the valley occupied by Cooper Creek and the lower section of Sugar Creek and the northwest fault crossing the northeast corner of the claim.

3.3 Mineralization

Figure 6 shows the location of mineral occurrences reported by the B.C. Ministry of Mines with the addition of a recently discovered free gold-bearing quartz vein in lower Sugar Creek. Table 2 gives assays for these occurrences where they have been reported.

All of the mineral occurrences are quartz veins with or without pyrite, galena and sphalerite. Both parallel (or bedded)



CAMPBELL & ASSOCIATES
GEOLOGICAL CONSULTANTS

Scale 1:50,000 (0 — 1 km)	Sept 6/83	93H/4	GREAT CENTRAL MINES LTD.
	FIGURE 6		ALEX CLAIM PROPERTY GEOLOGY (after Struik, 1982) - see Table 1 for explanation

Table 1. Explanation of Figure 6 - Property Geology

Rock Units	Description
PERMIAN and/or TRIASSIC	
PTs	- gray and green slate and phyllite
PERMIAN	
Pc	- gray crinoidal limestone, minor gray chert
MISSISSIPPIAN ?, PENNSYLVANIAN and PERMIAN	
MPav	- Antler Formation; diorite, basalt, gabbro
LOWER MISSISSIPPIAN	
Mgr	- Greenberry Formation; gray crinoidal limestone, chert, slate
MISSISSIPPIAN ? to PERMIAN ?	
MPt	- Tom Creek Succession; olive gray micaceous quartzite, phyllite and schist
MPd	- Downey Creek Succession; olive and gray micaceous quartzite, phyllite, gray olive and green slate, limestone, marble
MPa	- amphibolite
db	- diabase
DEVONIAN ? and MISSISSIPPIAN ?	
DMs	- black siltite, phyllite, gray micaceous quartzite, limestone
PALEOZOIC ?	
Pc	- orange weathering, ankeritic carbonate

— — —	Fracture
— —	Thrust Fault
----........	Geological Contact (approximate, assumed)
	Anticline, overturned
	Syncline, overturned
•	Known mineral occurrence (see Table 2)

Correlation to Figure 5:

Figure 5	Figure 6
Unit 8	Pc
Unit 7	MPav
Unit 6	db
Unit 5	MPt
Unit 4	DMs
Unit 1	MPd

Table 2. Known mineral occurrences near the Alex Claim

Reference No. (Fig. 6)	Prospect Name or Location	Publication	Description	Assays
1	South Yuzkli Creek	Hanson, 1938a	located on map only, noted as quartz vein	-
2	Cosalite	BCDM Annual Report 1934	quartz veins in sheared sediments, A and B types, pyrite, galena	Au - trace
3	Moonlight, Comstock, Big Twelve	BCDM Annual Report 1934; Hanson, 1935	quartz veins in schistose sediments, A and B types, pyrite, galena, sphalerite	Au - trace Ag - 10.2 oz/ton Pb - 25.1%
4	K.V.	BCDM Annual Report 1934	quartz vein, A type, pyrite	Au - trace
5	Cooper Creek	BCDM Annual Report 1947	group of quartz veins up to 2 ft wide crossing foliation, selected galena	Au - trace Ag - 21.9 oz/ton Pb - 53.1%
6	Cooper Creek	BCDM Annual Report 1947	2.5 ft quartz vein narrowing to 6 inches, very little visible mineralization; selected pyrite	Au - 0.01 oz/ton Ag - nil
7	Cooper Creek	BCDM Annual Report 1947	two quartz veins to 16 inches wide mineralized with pyrite and galena; selected pyrite	Au - 0.09 oz/ton Ag - 0.90 oz/ton
			3 inch quartz vein traced 100 ft; selected pyrite	Au - 0.06 oz/ton Ag - 0.60 oz/ton
8	Cooper Creek	BCDM Annual Report 1947	quartz vein 14 inches wide exposed for 40 ft; sample across 12 inches	Au - 0.07 oz/ton Ag - 4.7 oz/ton

Table 2, continued. Known mineral occurrences near the Alex Claim

Reference No. (Fig.6)	Prospect Name or Location	Publication	Description	Assays
9	SE of Cooper Creek	BCDM Annual Report 1947	quartz vein 15-24 inches wide with disseminations and clots of pyrite and galena; selected sulphide	Au - 0.10 oz/ton Ag - 102.5 oz/ton Pb - 25.7%
			quartz vein 6-12 inches wide sparsely mineralized with scattered galena; selected galena	Au - 0.02 oz/ton Ag - 40.4 oz/ton Pb - 9.5%
10	Cooper Creek	BCDM Annual Report, 1948	quartz vein 2 to 5 ft wide exposed for 50 ft, clots of galena, sphalerite and pyrite seen on dump; electrum (silver-gold alloy) is reported from this occurrence. (J. McKelvie, personal communication, 1981); selected galena	Au - 0.10 oz/ton Ag - 47.0 oz/ton Pb - 56.7%
			selected galena from dump	Au - 4.28 oz/ton Ag - 6.1 oz/ton Zn - 39%
11	Hardscrabble Mine site	Little, 1959	quartz veins, both A and B types in interlayered limestone, sericite schist and argillite	- carried visible gold
12	Lower Sugar Creek	personal observation	visible fine crystalline gold in quartz vein of uncertain width	-?-

and transverse veins are reportedly mineralized. Typically the sulphides are sparsely developed with local concentrations up to 10 and 20 cm diameter. Silver assays of galena reach 102.5 oz/ton in 25.7% Pb. The highest gold assay reported is that from selected sphalerite, 4.28 oz/ton. Commonly, gold assays of vein quartz with little sulphides are less than 0.10 oz/ton.

4 CONCLUSIONS

4.1 Geomorphology

The Alex claim is situated on gentle to moderate slopes between 4,400 and 5,400 ft elevation covered by dense brush and forest. The area is covered by glacial till deposits derived from a wasting and stagnant ice cap. The depth of overburden can be expected to be in the order of 3-6m (10-20 ft).

4.2 Lithology

The property is underlain mostly by Paleozoic gray micaceous quartzite, phyllite and schist with some black phyllite, amphibolite and carbonate. Very large boulders and outcrops of quartz in the upper sections of Cooper Creek indicate that quartz veining is widespread there.

4.3 Structure

Due to the lack of rock outcrops, it is difficult to ascertain the geological structure of the claim area. In general however, it appears the property is located on the northeast flank of a broad anticlinorium. It is possible that on the northeast side of an inferred, steeply dipping northwest trending fault that crosses the northernmost part of the claim the strata are overturned.

The major fault in the area is a north-northeasterly fault at least 8 km long that projects onto the Alex claim.

4.4 Mineralization

There are several reported occurrences of gold-bearing quartz veins in the immediate vicinity of the Alex claim, although none have yet been found on the claim. Assays of up to 102.5 oz/ton silver with 25.7% lead are reported in galena-rich samples. Gold assays are generally low and 0.05 to 0.10 oz/ton gold in sulphide-poor samples represent a common assay across 3 to 24 inches of quartz vein.

The distribution of many gold occurrences along Cooper Creek suggests that the north-northeast fault there could exert a structural control of the distrubution of gold mineralization. Rather than one discrete fault, the author believes that this alignment marks a fault zone some 500-750 m wide along which quartz solutions (bearing sulphides and gold) have been emplaced. If this is correct, then there is an excellent potential for similar deposits being found on the Alex claim, at the southwest end of the fault zone.

Ten to fifteen km to the southeast of the claim, limestone hosted pyritic replacement ore bodies are an important source of gold. These occur at the base of a quartzitic unit that has affinities with that underlying most of the Alex claim. The carbonate in the eastern part of the claim may have some relation to that hosting the ore bodies to the southeast and should be examined. The stratigraphically lowermost part of the quartzitic unit on the Alex claim should also be prospected to determine whether or not there is a possibility of limestone being present.

There is also the chance that the black phyllites and argillites in the northeast corner of the claim could host stratabound lead, zinc and silver deposits. This type of deposit is of least significance on the property because of the very small area probably underlain by the black rocks.

5 PROPOSAL FOR DEVELOPMENT

5.1 Recommendations

A three stage program of gold exploration is recommended. The type of targets that are considered most likely to occur on the Alex claim are gold-bearing quartz veins. Depending on the presence of favorable limestone beds, pyritic replacement ore bodies in those rocks could also occur. Accordingly, a simple three stage program of gold exploration is recommended.

Stage 1

This stage of work includes reconnaissance mapping, prospecting and geochemical sampling of the property.

Stage 1a - The location, lithology and structure of all outcrops along the stream courses and gullies should be mapped on a scale of 1:5,000. Boulder mapping is also recommended and the presence of limestone, vein quartz and pyrite float should be noted.

Stage 2b - Reconnaissance stream sediment sampling is recommended on all the gullies and streams on the property. A 100 m interval is suggested. Sampling should be done as soon as possible after the property is clear of snow during the period of high run-off. This will ensure that the sediment being sampled is part of the active load. Where gullies are not occupied by streams soil samples should be collected from the floor of the gully in the finest material available.

From exploration work elsewhere along the Barkerville Gold Belt, the author recommends analyzing the geochemical samples for arsenic, gold, lead, silver and zinc, these being the most effective pathfinder elements.

Stage 2

This stage is the follow-up geochemical sampling of anomalous areas identified in Stage 1. Silt sampling and contour soil sampling on 50 m intervals is a cost effective technique that works well in the area.

The gullies that trend north-northeast through the east central part of the property, and that form the headwaters of Cooper Creek should be contour soil sampled whether or not sediment anomalies are revealed in Stage 1b. This is because that area is considered by the author to have the greatest potential for mineralization. The geological features make this area an attractive target zone are the presence of a north-northeast trending fracture set that is believed to control or localize mineralization.

Stage 3

This stage is detailed surface exploration of anomalous areas. There are three methods that have proven effective for locating pyritic replacement ore elsewhere along the Barkerville Gold Belt; soil sampling on a grid, VLF-EM16R surveying and magnetometer surveying. All of these are relatively fast and inexpensive techniques. Multielement soil sampling on a 25 m grid will delineate soil anomalies. Because of a great difference in the electromagnetic conductivity between the black phyllite and limestone or quartzite units in the area, this survey method works very well in locating geological contacts in buried areas. Enhanced conductivity in fractures also permits the mapping of faults and other fractures, which might be related to mineralization, in covered areas. The magnetic susceptibility of the pyritic replacement ore is many times greater than that of the enclosing host limestone. Therefore, a magnetometer survey over geochemically anomalous areas is another way to rate or to assign relative importance to an anomaly.

The Stage 3 surface work is strongly recommended before subsequent and contingent subsurface exploration proceeds. Drilling without adequate geological, geochemical and geophysical knowledge is often very costly, risky and gives discouraging results.

5.2 Estimated Costs

Stage 1 - Reconnaissance Exploration

Stage 1a - Prospecting and Mapping

Geological mapping, stream prospecting	$	2,000.
Drafting	$	200.
Expendable materials	$	100.
Transportation	$	300.
	$	2,600.

Stage 1b - Reconnaissance Geochemical Sampling

Collection of samples	$	1,000.
Analyses (ICP - Au, Ag, Pb, An, As) of 100 samples @$4.50/sample	$	450.
Data compilation and analysis	$	400.
Drafting	$	200.
Expendable materials and freight	$	200.
Transportation	$	350.
	$	2,600.
Total Stage 1	$	5,200.

Stage 2 - Follow-Up Geochemical Sampling

Estimated cost of 4-8 man days of follow-up stream sediment and contour soil sampling, including geochemical and data analysis	$	8,000.
Total Stage 2	$	8,000.

Stage 3 - Detailed Surface Exploration

Soil sampling on grid; 800 samples	$	12,300.
VLF-EM16R survey; 30 line km	$	7,500.
Magnetometer survey; 30 line km	$	7,500.
Total Stage 3	$	27,300.

Total exploration costs for the Alex mineral claim is then estimated to be about $40,500. In order to reduce the transportation costs and to increase the number of work hours per day on the site the access road should be improved. This is estimated to cost $5,000. The surface exploration program would then be in the neighbourhood of $45,000.

K.V. Campbell, Ph.D.

6 CERTIFICATE

I, KENNETH VINCENT CAMPBELL, resident of Wells, Province of British Columbia, hereby certify as follows:

1. I am a Consulting Geologist with an office at the corner of Dawson and Blair Avenues, Wells, B. C.
2. I graduated with a degree of Bachelor of Science, Honours Geology, from the University of British Columbia in 1966, a degree of Master of Science, Geology, from the University of Washington in 1969, and a degree of Doctor of Philosophy, Geology, from the University of Washington in 1971.
3. I have practiced my profession for 11 years. I have been a member of the Geological Association of Canada since 1969.
4. I am a member in good standing with the following professional societies; American Society of Photogrammetry and Remote Sensing and the International Association of Engineering Geologists.
5. I have no direct, indirect, or contingent interest in the shares or business of Great Central Mines Ltd., nor do I intend to have any interest.
6. This report, dated September 10, 1983, is based on my examination of available reports and air photos and notes taken during traverses across the Alex mineral claim on August 11th and 12th, 1983.
7. Permission is given by the author to use this report dated September 10, 1983, in any Prospectus or Statement of Material Facts of Great Central Mines Ltd.

DATED at Wells, Province of British Columbia, this 10th day of September, 1983.

K.V. Campbell, Ph.D.
Geologist

APPENDIX II

NORANDA EXPLORATION COMPANY, LIMITED

STATEMENT OF COST

DATE FEBRUARY 1985

PROJECT - ALEX MINERAL CLAIM
TYPE OF REPORT Geology, Geochem & Linecutting

a) Wages:

No. of Days -	4	
Rate per Day -	$110.94	
Dates From -	July/Aug. 1984	
Total Wages	$443.76	$ 443.76

b) Food and Accommodation:

No. of Days -	4	
Rate per Day -	$35.00	
Dates From -	July/Aug. 1984	
Total Cost -	$140.00	$ 140.00

c) Transportation:

No. of Days -	3	
Rate per Day -	$75.00	
Dates From -	July/Aug. 1984	
Total cost	$225.00	$ 225.00

d) Analysis	$ 397.30
e) Cost of Preparation of Report	
Author	$ 270.70
Drafting	$ 114.00
Typing	50.00
f) Other:	
Contractor - Geological Report Prepared by K.V. Campbell for Great Central Mines Ltd.	$ 400.00
Total Cost	$ 2040.76

ANALYSIS

SILTS/SOILS:

8 X Cu, Zn, Pb, Ag, Mo, Co, Ni, As, Au	
8 X $16.35	$ 130.80
19 X Cu, Zn, Pb, Ag, Au, As	
19 X $12.95	$ 246.05

ROCK GEOCHEM

1 X Au	
1 X $7.50	$ 7.50
1 X Cu, Zn, Pb, Ag, Au, As	
1 X $12.95	$ 12.95
TOTAL	**$ 397.30**

(As per Chemex Fee Schedule 1984)

APPENDIX III

ANALYTICAL METHOD DESCRIPTIONS FOR GEOCHEMICAL ASSESSMENT REPORTS

The methods listed are presently applied to analyse geological materials by the Noranda Geochemical Laboratory at Vancouver.

Preparation of Samples

Sediments and soils are dried at approximately 80°C and sieved with a 80 mesh nylon screen. The -80 mesh (0.18 mm) fraction is used for geochemical analysis.

Rock specimens are pulverized to -120 mesh (0.13 mm). Heavy mineral fractions (panned samples * from constant volume), are analysed in its entirety, when it is to be determined for gold without further sample preparation.

Analysis of Samples

Decomposition of a 0.200 g sample is done with concentrated perchloric and nitric acid (3:1), digested for 5 hours at reflux temperature. Pulps of rock or core are weighed out at 0.4 g and chemical quantities are doubled relative to the above noted method for digestion.

The concentrations of Ag, Cd, Co, Cu, Fe, Mn, Mo, Ni, Pb, V and Zn can be determined directly from the digest (dissolution) with a conventional atomic absorption spectrometric procedure. A Varian-Techtron, Model AA-5 or Model AA-475 is used to measure elemental concentrations.

Elements Requiring Specific Decomposition Method:

Antimony - Sb: 0.2 g sample is attacked with 3.3 ml of 6% tartaric acid, 1.5 ml conc. hydrochloric acid and 0.5 ml of conc. nitric acid, then heated in a water bath for 3 hours at 95°C. Sb is determined directly from the dissolution with an AA-475 equipped with electrodeless discharge lamp (EDL).

Arsenic - As: 0.2 - 0.3 g sample is digested with 1.5 ml of perchloric 70% and 0.5 ml of conc. nitric acid. A Varian AA-475 equipped with an As-EDL is used to measure arsenic content in the digest.

Barium - Ba: 0.1 g sample digested overnight with conc. perchloric,nitric and hydrofluoric acid; Potassium chloride added to prevent ionization. Atomic absorption using a nitrous oxide-acetylene flame determines Ba from the aqueous solution.

Bismuth - Bi: 0.2 g - 0.3 g is digested with 2.0 ml of perchloric 70% and 1.0 ml of conc. nitric acid. Bismuth is determined directly from the digest with an AA-475 complete with EDL.

Gold - Au: 10.0 g sample is digested with aqua regia(1 part nitric and 3 parts hydrochloric acid). Gold is extracted with MIBK from the aqueous solution. AA is used to determine Au.

Magnesium - Mg: 0.05 - 0.10 g sample is digested with 4 ml perchloric/nitric acid (3:1). An aliquot is taken to reduce the concentration to within the range of atomic absorption. The AA-475 with the use of a nitrous oxide flame determines Mg from the aqueous solution.

Tungsten - W: 1.0 g sample sintered with a carbonate flux and thereafter leached with water. The leachate is treated with potassium thiocyanate. The yellow tungsten thiocyanate is extracted into tri-n-butyl phosphate. This permits colourimetric comparison with standards to measure tungsten concentration.

Uranium - U: An aliquot from a perchloric-nitric decomposition, usually from the multi-element digestion, is buffered. The aqueous solution is exposed to laser light, and the luminescence of the uranyl ion is quantitatively measured on the UA-3 (Scintrex).

* N.B. If additional elemental determinations are required on panned samples, state this at the time of sample submission. Requests after gold determinations would be futile.

LOWEST VALUES REPORTED IN PPM

Ag - 0.2	Mn - 20	Zn - 1	Au - 0.01
Cd - 0.2	Mo - 1	Sb - 1	W - 2
Co - 1	Ni - 1	As - 1	U - 0.1
Cu - 1	Pb - 1	Ba - 10	
Fe - 100	V - 10	Bi - 1	

EJvL/ie
March 14, 1984

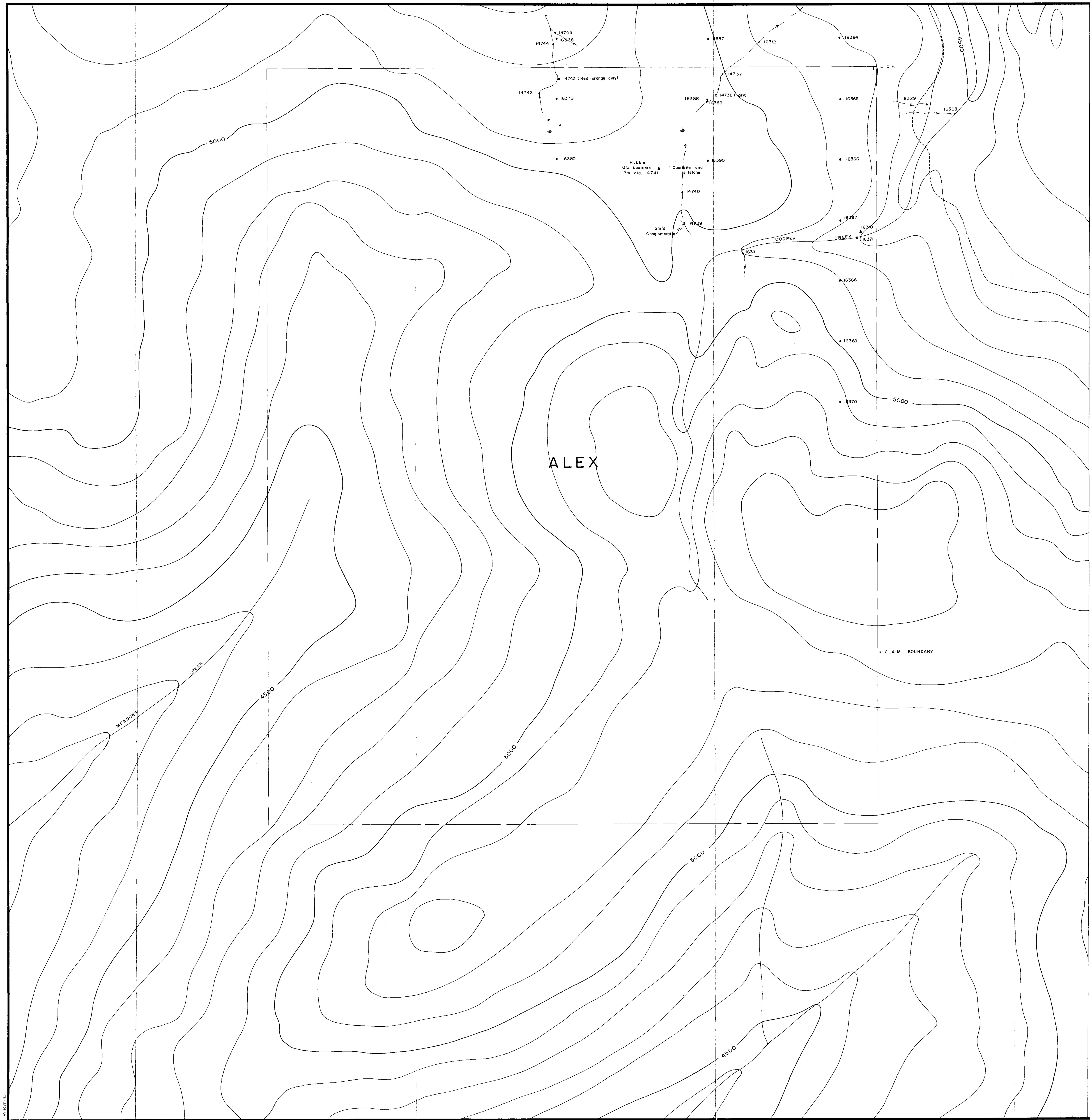
APPENDIX IV

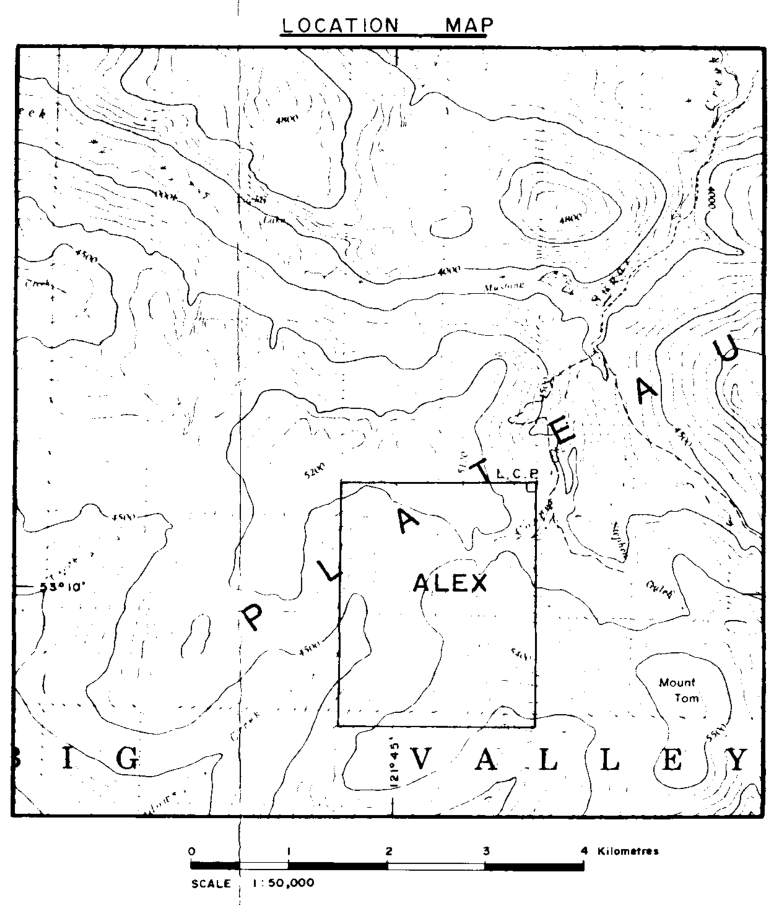
STATEMENT OF QUALIFICATIONS

I, Ronald G. MacArthur hereby certify that:

1. I am a graduate of Dalhousie University with a Bachelor of Science Degree in Geology (1972).
2. I have been employed as a Geologist by Noranda Exploration since 1972.
3. I am a member of the Canadian Institute of Mining and Metallurgy.
4. I am a member of the Geological Association of Canada.

Ronald G. MacArthur
District Geologist,
Central Cordillera District
NORANDA EXPLORATION COMPANY LIMITED
(No Personal Liability)





LEGEND

● 16364 Soil Sample

x 16371 Silt Sample

▲ 16310 Rock Sample

GEOCHEM RESULTS

(ppm except Au in ppb)

SILT SAMPLES:

Sample No.	Cu	Zn	Pb	Ag	Mo	Co	Ni	As	Au
14737	18	92	10	0.6	<2	14	40	4	10
14738	30	110	12	1.0	<2	18	34	12	10
14739	12	130	8	0.6	<2	14	44	16	10
14740	10	120	4	0.4	2	12	56	28	10
14742	16	56	6	0.4	<2	10	28	<2	10
14744	18	90	10	0.4	<2	22	34	20	10
14745	10	72	6	0.2	<2	16	30	16	10
16308	30	210	26	0.4	N/A	N/A	N/A	2	10
16311	40	110	20	0.6	N/A	N/A	N/A	14	10
16312	14	68	6	0.6	N/A	N/A	N/A	<2	10
16329	42	68	32	0.4	N/A	N/A	N/A	<2	10
16371	36	120	26	0.4	N/A	N/A	N/A	8	10
16389	20	110	10	0.6	N/A	N/A	N/A	6	10

SOIL SAMPLES:

Sample No.	Cu	Zn	Pb	Ag	Mo	Co	Ni	As	Au
16364	16	56	10	0.2	N/A	N/A	N/A	<2	10
16365	8	36	8	0.2	N/A	N/A	N/A	<2	10
16366	4	30	4	0.4	N/A	N/A	N/A	<2	10
16367	14	56	34	1.0	N/A	N/A	N/A	12	10
16368	12	46	10	0.4	N/A	N/A	N/A	6	10
16369	18	50	24	0.6	N/A	N/A	N/A	<2	10
16370	4	28	10	0.2	N/A	N.A	N/A	<2	10
16378	20	68	16	0.2	N/A	N/A	N/A	<2	10
16379	26	84	14	0.2	N/A	N/A	N/A	4	10
16380	20	110	10	5.0	N/A	N/A	N/A	2	10
16387	2	24	8	0.2	N/A	N/A	N/A	<2	10
16388	14	84	12	0.2	N/A	N/A	N/A	<2	10
16390	2	20	6	0.2	N/A	N/A	N/A	<2	10
14743	18	70	16	0.2	<2	18	24	420	10

ROCK SAMPLES:

Sample No.	Cu	Zn	Pb	Ag	Mo	Co	Ni	As	Au
14741	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	10
16310	14	56	8	0.2	N/A	N/A	N/A	26	10

GEOLOGICAL BRANCH ASSESSMENT REPORT

13,388

0 100 200 300 400 500 m.
SCALE 1:5,000

NOTE: Topography based on photocopy enlargement of N.T.S. 1:50,000 scale map 93H/4

REVISED	ALEX PROPERTY
	GEOCHEMISTRY SILT, SOIL AND ROCK (1)
PROJ. No.	SURVEY BY: R. MacArthur DATE: AUG. 1984
N.T.S. 93H/4	DRAWN BY: S.K.B. SCALE: 1:5000
DWG. No.	**NORANDA EXPLORATION** OFFICE: PRINCE GEORGE, B.C.