

ASSESSMENT REPORT
GEOLOGICAL AND GEOCHEMICAL REPORT ON THE
SANDI PROPERTY

Located in the Cariboo Mining Division
at coordinates
53 deg. 10' 30" N 121 deg. 43' W

by
Robert J. Baerg

Noranda Exploration Company, Limited
(No Personal Liability)

Dec. 1984

N.T.S. 93 H/4

**GEOLOGICAL BRANCH
ASSESSMENT REPORT**

13,669

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SUMMARY:

The Sandi property is situated 12.5 km northwest of Wells, B.C. The claims lie at the northwest end of the Barkerville Gold Belt and are underlain by Paleozoic rocks similar to those in the Wells Gold Camp. The underlying rocks consist of Devonian to Mississippian black phyllites and micaceous quartzites and Mississippian to Permian metavolcanic rocks.

There are several gold occurrences on the property consisting of quartz veins carrying auriferous iron oxides, pyrite, galena and sphalerite. Assays of quartz vein material are reported to range from trace up to 0.80 oz/ton Au and trace to 102.5 oz/ton Ag. Massive pyrite float found in some of the creeks on the property has returned values up to 0.03 oz/ton Au.

During May and August 1984, Noranda Exploration Company Ltd. conducted geologic mapping and geochemical sampling programs on the Sandi property. These programs involved collecting soil samples at 200 m intervals along north-south lines 500 m apart, silt sampling of creeks and streams and rock chip sampling. The work done during August 1984 was the completion of work which was commenced in May 1984 but which had to be curtailed due to extensive snow cover.

Samples collected during May 1984 consisted of 41 soil samples, 38 silt samples and 6 rock chip samples. Samples collected during August 1984 consisted of: 53 soil samples, 32 silt samples and 28 rock chip samples. Geologic mapping covered Sugar and Cooper Creeks, Stephen's Gulch, roadcuts and soil lines.

The purpose of the programs was to define areas of potential gold mineralization. The results of the August sampling program indicated several weak Zn-Pb-Ag anomalies and several one sample Au anomalies ranging from 30 ppb to 1200 ppb.

Rock chip sampling along Cooper Creek did not reproduce the high Pb values obtained by Campbell (1983) but did reproduce the Au values associated with the "upper vein" mineralization.

The work completed to date on the Sandi-Jo claims has not yielded very encouraging results. This however does not greatly reduce the potential for this property, as the target being sought, a Mosquitoe Creek type deposit, is generally small and may have been missed with the wide sample spacings.

INTRODUCTION:

This report covers work done by Noranda Exploration Company, Ltd. on the Sandi mineral claim group located in the Cariboo Mining Division of central B.C. The Sandi Group consists of twenty-six (26) modified grid units and two (2) post claims held under option by Clearbrook Mining Ltd. of Chilliwack, B.C.

The geological setting on the property is such that there is potential for the occurrence of three types of mineral deposits: gold-quartz veins, gold-bearing pyritic replacement deposits and shale-hosted lead and zinc.

Placer gold was discovered on Sugar Creek in 1934 by prospector Lorne Bater. Subsequently, Sugar Creek and its main tributaries, Stephens Gulch and Cooper Creek were extensively worked for placer gold.

To date, only the quartz veins have been explored for hard-rock mineral potential. There has been no modern, systematic exploration-evaluation done on this property.

During May and August 1984, Noranda Exploration conducted a geological mapping and geochemical sampling program on the Sandi property. The field operations were supervised by R. Baerg, under the supervision of T. Lewis, a geologist with Noranda Exploration. Field assistants were P. Collens and D. Klein.

LOCATION AND ACCESS:

The Sandi property is located 12.5 km northwest of Wells, British Columbia (Figure 1). Wells is situated in central British Columbia, approximately 70 km east of Quesnel.

Access to the property is obtained by good logging roads branching from Highway 26 between Quesnel and Wells. At Beaver Pass House, located approximately 20 km west of Wells on Highway 26, one drives 27.5 km north along logging road #2400 to logging road #2400A. Proceed on logging road #2400A to kilometer 38. A good road leaves #2400A and leads to Sugar Creek, a 4-wheel drive track heads south through the property of Ralph and Faye Macpherson. This track follows in and along Sugar Creek to the junction of Cooper and Sugar Creeks. There the track forks to the southeast and southwest. The southeast track gives access to the middle southeastern part of the property and continues over Hardscrabble Mountain to Wells. The southwest fork gives access to the western and southwestern portions of the property west of Cooper Creek.

CLAIM STATISTICS:

The Sandi Group of claims consists of four claim blocks

located in the Cariboo Mining District (Figure 2). Claim description follows:

<u>Claim name</u>	<u># Units</u>	<u>Record No.</u>	<u>Expiry Date</u>
JJF	20	1652(6)	June, 1984
BJ Group	2	1654(6)	
		1655(6)	June, 1984
JDM	6	3958(9)	Sept. 1985
SANDI 4	6	4933(6)	June, 1984

GEOLOGICAL MAPPING AND GEOCHEMICAL SAMPLING:

Soil samples were collected from the "B" soil horizon, with the use of a grub hoe. The depth of the sample holes varied from 25 to 38 cm. The samples were placed in Kraft wet strength paper bags, dried and then shipped to Noranda Labs in Vancouver, B.C. for analysis. (For analytical procedure, see Appendix III).

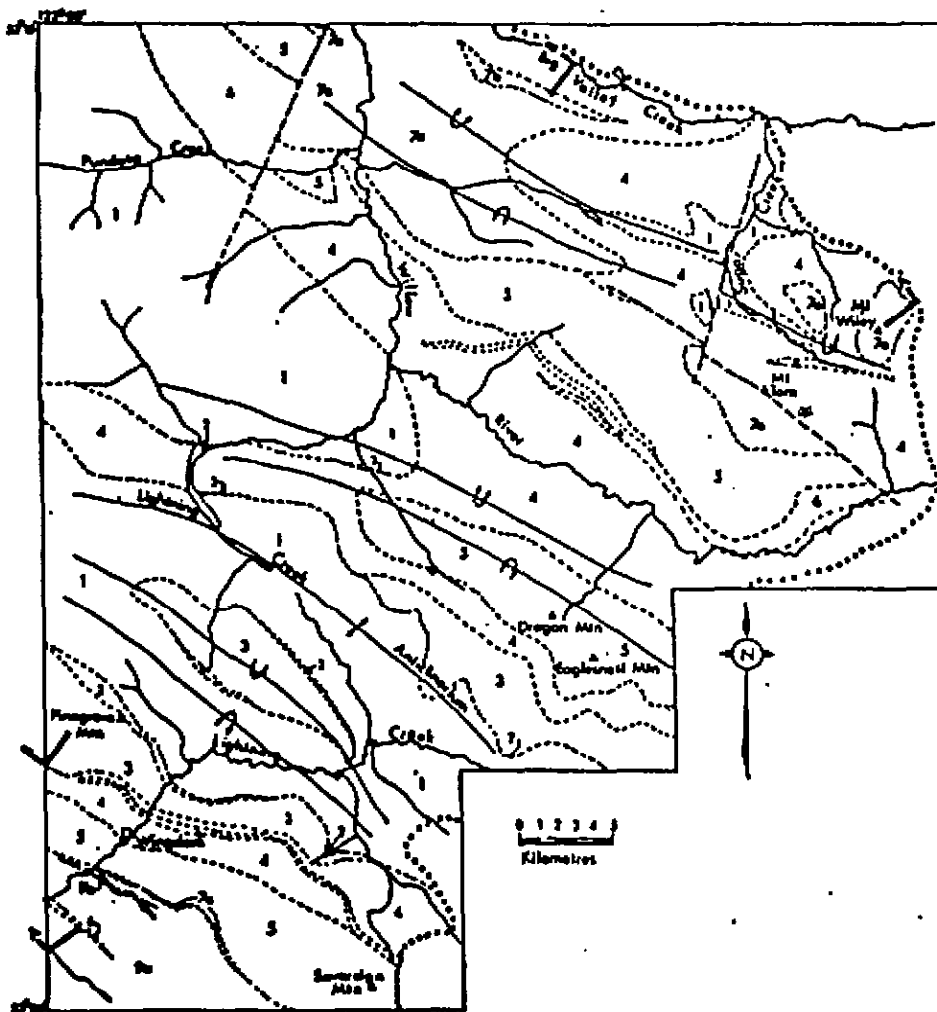
The samples, upon receipt at the Lab, are dried at 80 degrees C and sieved with an 80 mesh sieve. 0.20 grams of the greater than 80 mesh material is then digested with concentrated perchloric and nitric acid (3:1) for 5 hours at reflux temperature. The concentrations of Ag, Pb, Zn, Cu can be determined directly from the digest with a conventional atomic absorption spectrometric procedure. A Varian-Techtron, Model AA-5 or AA-475 is used to measure elemental concentrations. For Au analyses a 10 g sample is digested with aqua regia (1 part nitric and 3 parts hydrochloric acid). Gold is extracted with MIBK from the aqueous solution. Atomic absorption is then used to determine Au concentrations. For As analyses 0.2-0.3 grams is digested with 1.5 ml of perchloric 70% and 0.5 ml of concentrated nitric acid. A Varian AA-475 equipped with an As-EDL is used to measure arsenic content in the digest.

Rock samples are pulverized to -120 mesh before digestion.

Soil samples were collected at 200 m intervals along north-south lines spaced 500 m apart. Silt samples were collected on streams which crossed the soil lines and along the mail drainages. A total of 53 soil samples and 32 silt samples were collected during August 1984. Rock chip samples were collected along Cooper and Sugar Creeks and on mineralized quartz veins.

REGIONAL GEOLOGY:

The Sandi property is underlain by Upper Paleozoic metasedimentary rocks similar to those that host the gold deposits near Wells, B.C. These rocks, previously described by Holland (1954), Sutherland Brown (1957), Campbell et al (1973) and Struik (1980, 1982) are highly deformed and regionally metamorphosed to greenschist facies. Regional folds trend northwesterly and are overturned to the southwest. Dip range between 40 and 55 degree



- LEGEND**
- TRASSIC AND JURASSIC**
- 9 dark grey slate and phyllite, sandstone
minor limestone, bryozoa
- PO-POSTYLVANIAN**
- 8 biotitic limestone
- 7 Archaean Formation in diabase, basalt,
serpentine, ls, dark greywacke
- 6 amphibolite, diabase, and phoned
equivalents
- PALEOZOIC AND/OR OLDER**
- 5 olive micaceous quartzite, dark grey
phyllite
- 4 black argillite, slate, and white
muddy conglomerate, limestone
- 3 grey siltite and quartzite
- 2 marble, calcareous sandstone, quartzite
calcareous phyllite, phyllite
- 1 olive micaceous quartzite, light olive
grey phyllite and slate, garnet-biotite
marble schist

- Geologic contact (oppos. and same.)
- f- Anticline (overhead)
- f- Syncline (overhead)
- Fault (oppos. and same.)

REVISED	REGIONAL GEOLOGY - SUGAR CRK. AREA	
	(After Struik, 1982)	
	SANDI	
	Clearbrook Mining Ltd. Option	
PROJ. No.	SURVEY BY: R. Baerg	DATE: Dec./84
N.T.S. 93H/4	DRAWN BY: R. Baerg	SCALE: 1:500,000
DWG. No.	NORANDA EXPLORATION	
3	OFFICE: Prince George	

northeasterly (Alldrick, 1983). The rock units have been most recently mapped by Struik (1982) and he has divided the rocks in the Sandi area into two main units (Figure 3):

- Unit (1) Snowshoe Formation - consisting of olive micaceous quartzite, light olive grey phyllite, and slate, garnet-biotite-muscovite schist; and
- Unit (4) Antler Formation - consisting of black argillite, slate and siltite.

LOCAL GEOLOGY:

Drawing 1 illustrates geological information obtained through mapping during May 1984. Two main rock units were identified (1) olive-grey-brown micaceous quartzite, grey phyllite and slate, garnet-biotite muscovite schist, which correlates with Struik's Unit 1, and (2) black-grey argillite, slate and siltite, muddy conglomerate, which correlates with Struik's Unit 4. The conglomerate, which appears to mark the contact between the two units, contains abundant rounded quartz, schist and argillaceous pebbles.

The two units indicate a shallow marine basin depositional environment with a distinct period of uplift or tilting separating the two at least locally. In addition, the sequence has undergone folding and regional metamorphism to a greenschist facies. Regional fold axes parallel the stratigraphy, and are overturned towards the southwest. Dips range from 40 to 55 degrees northeasterly (Alldrick, 1983).

Mineralization:

Gold ore in the Wells camp occurs as relatively small deposits along a strike length of 45 km that includes the Mosquito Creek, Island Mountain and Cariboo Gold Quartz mines. The gold occurs as either:

1. Auriferous pyrite in quartz veins in the Rainbow Member, as described by Alldrick (1983); or
2. As stratabound massive auriferous pyrite lenses, termed replacement ore, hosted within and at the contacts of limestone beds of the Baker member, as described by Alldrick (1983).

On the Sandi property there are two types of sulphide mineralization. Firstly, disseminated pyrite in the quartzites and phyllites. Previous sampling has found this mineralization to be barren of precious metals, although values up to 0.26% Pb have been reported in the phyllites. These values however, were not reproduced in follow-up sampling. Secondly, quartz veins with

variable amounts of pyrite, sphalerite, galena and/or iron oxides. Gold values are reported to be erratic and generally low.

GEOCHEMISTRY:

Soil_Geochem

Soil geochemistry did not indicate any significant anomalies. There are several weak Ag, Zn, and Pb anomalies which are locally coincident but these are not considered significant enough for follow up. More detailed sampling should be considered in these areas.

Silt_Geochem

Silt geochem values are generally slightly higher than the soil values but again the values in general are low and no distinct anomalies were located. The silts were weakly anomalous in Ag, Zn, and Pb with some of these anomalies locally coincident. One sample, to the north of the JDM claim, ran 110 ppm Cu, 520 ppm Zn and 2.8 ppm Ag. Also, one sample in the NW corner of the JDM claim ran 1200 ppb Au. However, this creek is a previously worked placer creek and this probably explains the high Au values.

Rock_Geochem

Results of the rock chip sampling were generally low. Chip samples from the MPd and DMs rock units showed locally elevated Zn-Pb-As levels but nothing of any significance. The higher Zn background may in part explain the Zn silt-soil anomalies. A chip sample of sphalerite-galena in quartz from the dump at the "upper vein" returned values of 1.44 oz/t Au, 13.20 oz/t Ag, 17.0% Pb and 36.4% Zn. A sample of several 1-5 cm quartz veins mineralized with galena along the southern portion of Sugar Creek returned values of 1.02% Pb, 1.52% Zn and 9.4 ppm Ag. As well, a sample of massive sulphide float found along Sugar Creek returned values of 28.40 oz/t Ag, 19.20% Pb and 120 ppb Au. Sampling along the northern end of Cooper Creek did not reproduce the high Pb values reported by Campbell (1983).

CONCLUSIONS:

Placer operations in the Sugar Creek valley confirm the presence of massive pyrite and coarse placer gold. However, exploration for the source of this mineralization is hampered by deep glacial deposits and very limited bedrock exposure. Further, more detailed geological mapping and prospecting, and geochemical sampling is required.

RECOMMENDATIONS:

The Sandi property continues to hold potential for gold-bearing pyritic massive sulphides. This is supported by the presence of massive pyrite float and coarse placer gold in Sugar and Cooper Creeks. In addition, the geologic environment is similar to the Wells gold camp.

Future exploration should continue to search for the source of the massive sulphides in the Sugar Creek drainage. This should include:

1. More detailed geochemical sampling, particularly in the areas surrounding the weak geochem anomalies.
2. Detailed geological mapping of the sample areas.

BIBLIOGRAPHY

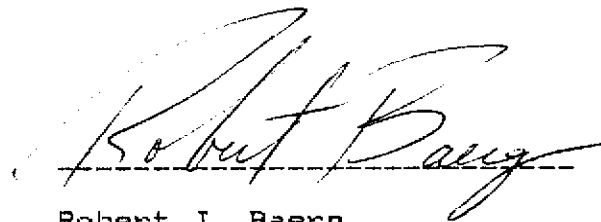
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APPENDIX I

STATEMENT OF QUALIFICATIONS

I, Robert J. Baerg of the City of Prince George, Province of British Columbia, do certify that:

1. I have been employed as a geologist by Noranda Exploration Company, Limited since May, 1984.
2. I am a graduate of the University of British Columbia with a Bachelor of Science (Honors) in Geology (1984).
3. I supervised and assisted with the work described in this report.

A handwritten signature in cursive script, reading "Robert Baerg", written over a horizontal dashed line.

Robert J. Baerg
Geologist
Noranda Exploration Company, Limited
(No Personal Liability)

APPENDIX II

STATEMENT OF COSTS

NORANDA EXPLORATION COMPANY, LIMITED

STATEMENT OF COST

PROJECT - Sandi

DATE - Dec. 1984

TYPE OF REPORT - Geological and Geochemical

a) Wages: (R. Baerg, D. Klein)

No. of Days	-	13 Mandays		
Rate per Day	-	\$150.00		
Dates	-	August 1984		
Total Wages	-	13 X \$150.00	=	\$ 1950.00

b) Food, Accomodation and Supplies:

No. of Days	-	8		
Rate per Day	-	\$81.45		
Dates	-	August 1984		
Total Cost	-	8 X \$81.45	=	\$ 651.60

c) Transportation:

No. of Days	-	8		
Rate per Day	-	\$75.00		
Dates	-	August 1984		
Total Cost	-	8 X \$75.00	=	\$ 600.00

d) Analysis:

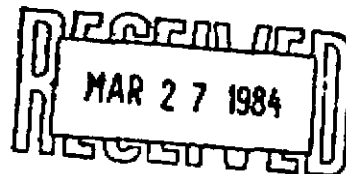
<u>Sample Type</u>	<u>#</u>	<u>Analysis For</u>		
Silt	30	Cu/Zn/Pb/Ag/As/Au	\$ 13.65/ea.	= \$ 409.50
Soil	42	" " "	\$ 13.65/ea.	= \$ 573.30
Rock	25	" " "	\$ 15.45/ea.	= \$ 386.25
		(Per Chemex Fee Schedule 1984)		----- \$ 1369.05

e) Cost of Preparation of Report:

Author	=	\$ 450.00
Drafting	=	\$ 300.00
Typing	=	\$ 100.00

f) Other:

TOTAL COST = \$ 5420.65



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.

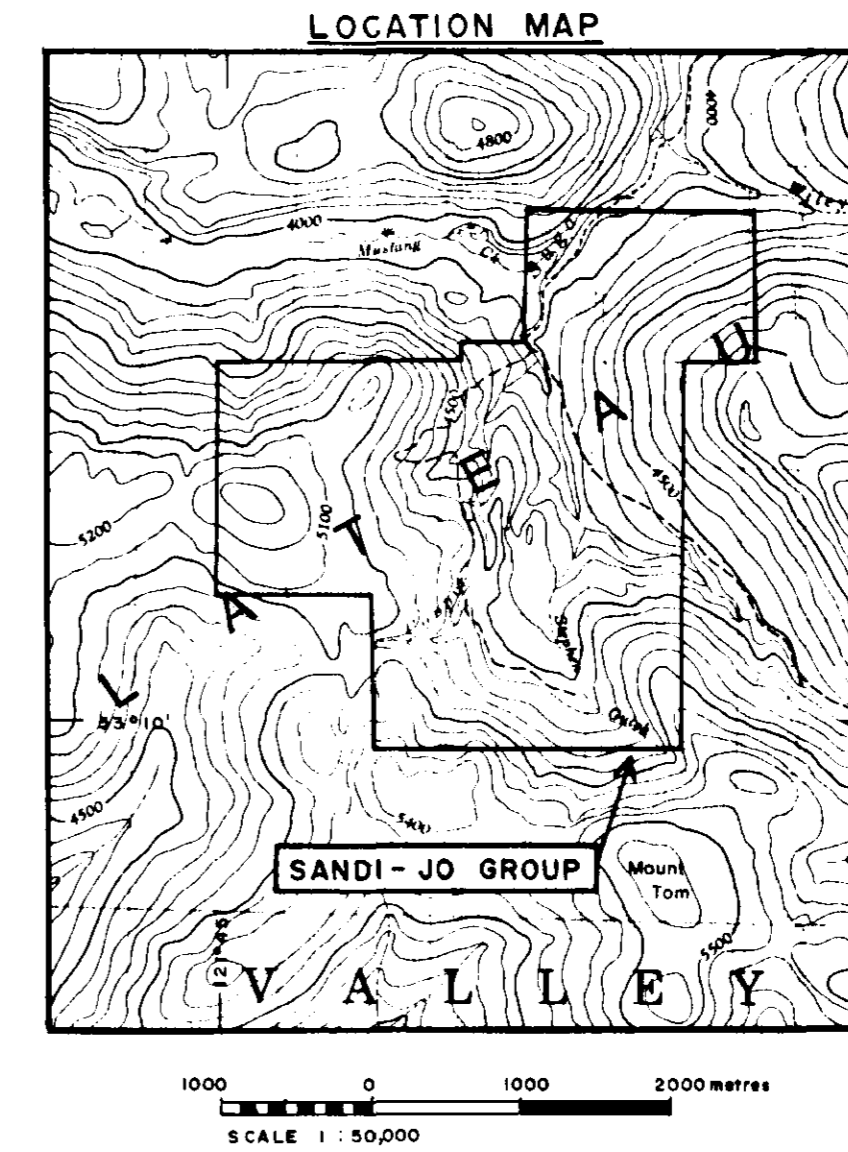
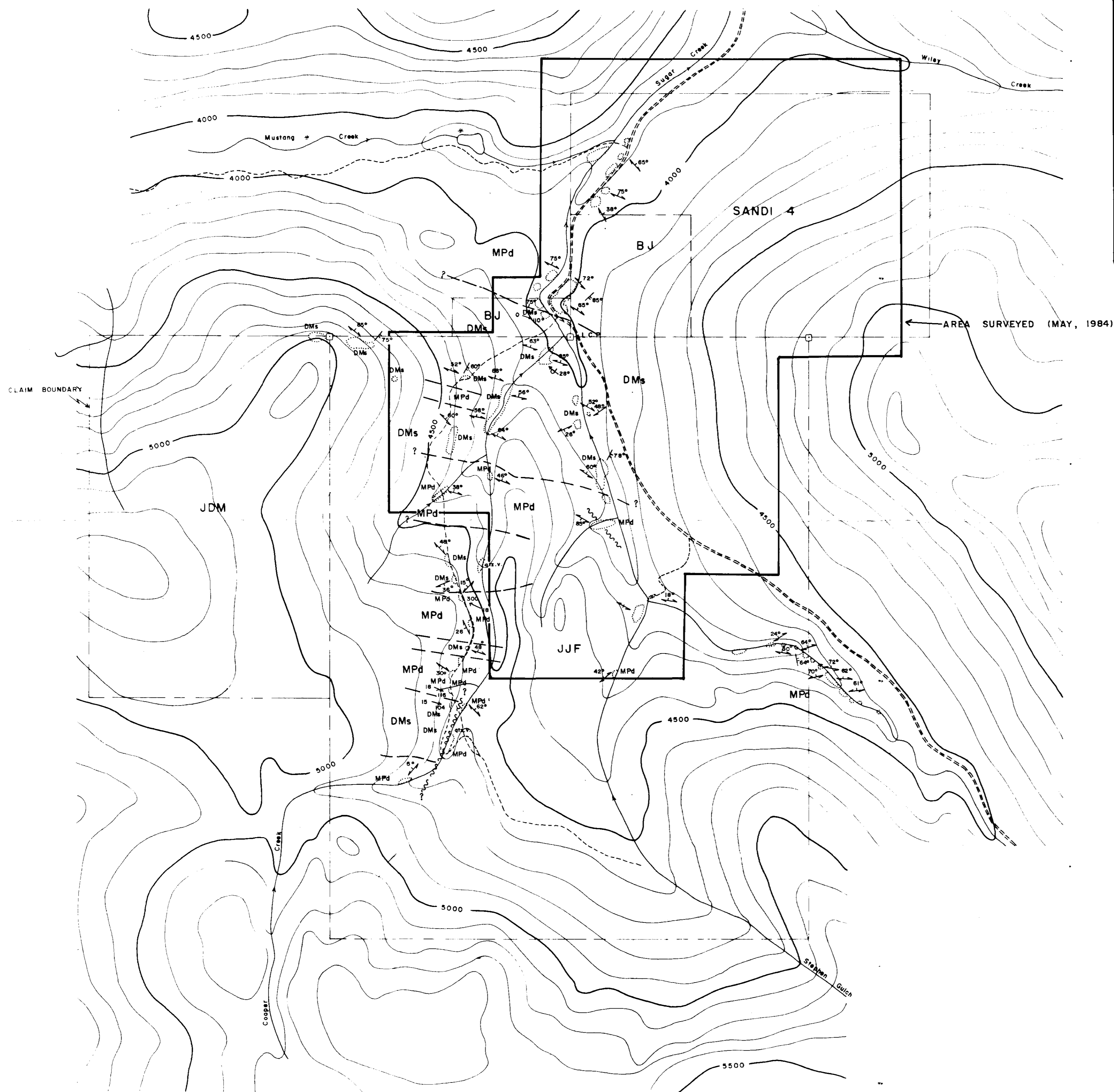
Uranium - U: An aliquot from a perchloric-nitric decomposition, usually from the multi-element digestion, is buffered. The aqueous solution is exposed to laser light, and the luminescence of the uranyl ion is quantitatively measured on the UA-3 (Scintrex).

* 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



LEGEND

SYMBOLS

- Logging Road
- Cat Trail
- Claim Post and Claim Boundary
- Stream
- Outcrop
- Cleavage (strike/dip)
- Jointing (strike/dip)
- Strike and dip of beds
- Strike and dip of overturned beds
- Fold axis (dip/direction)
- Inferred Fault
- Inferred Geological Contact

ROCK TYPES

- Olive-grey-brown Micaceous Quartzite, light olive grey Phyllite and Slate, Garnet - Biotite - Muscovite Schist
- Black Argillite, Slate, Siltite, Conglomerate Limestone

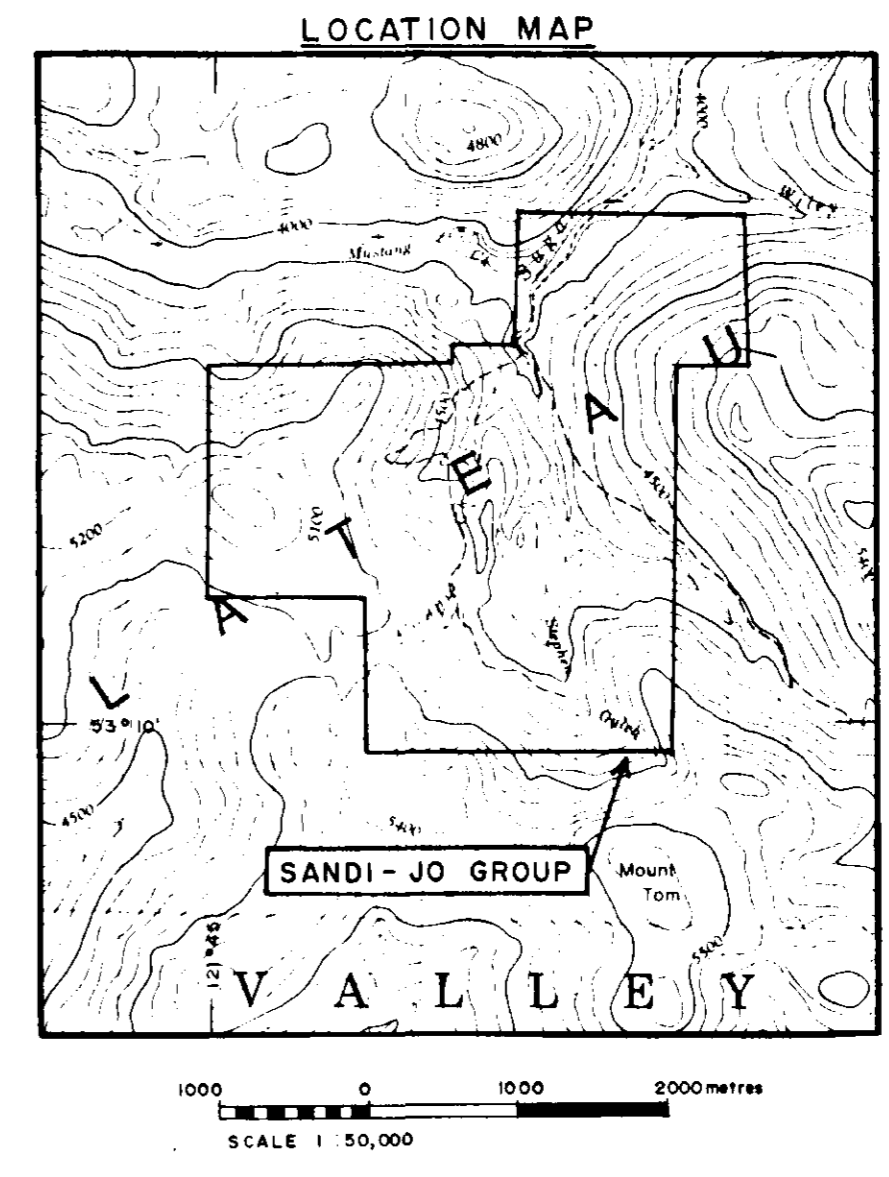
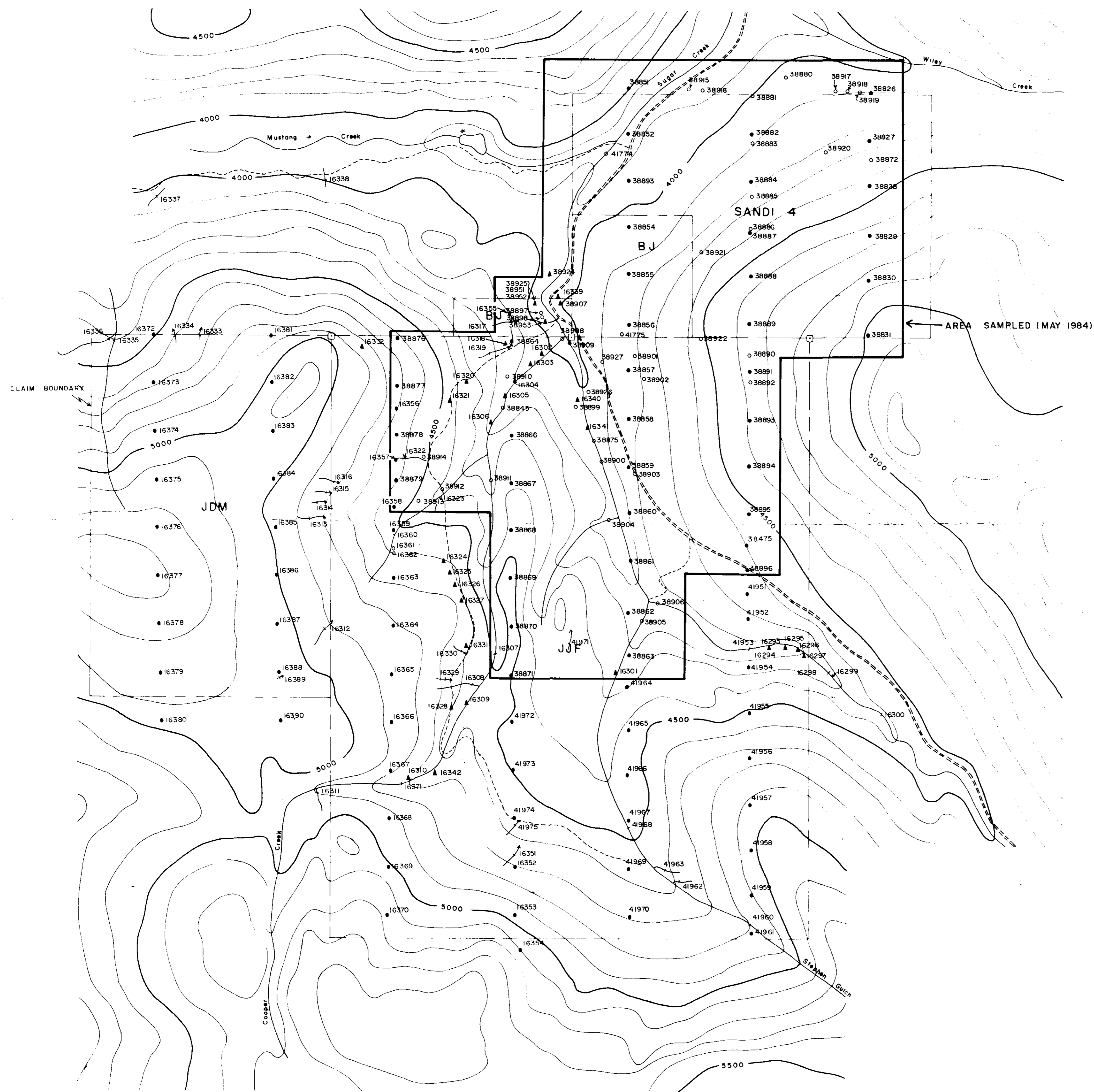
GEOLOGICAL BRANCH ASSESSMENT REPORT

Robert Bay
Jan 7/85

13,669

SCALE 1:10,000

REVISED	COOPER CREEK - CLEARBROOK MINING LTD. OPTION	
AUG. 29, 1984, SK B		
	GEOLOGY ①	
PROJ No 53	SURVEY BY: R. BAERG	DATE MAY 1984
NTS 93H/4	DRAWN BY: SK B	SCALE 1:10,000
DWG No	NORANDA EXPLORATION	
Map 1	OFFICE PRINCE GEORGE, B.C.	

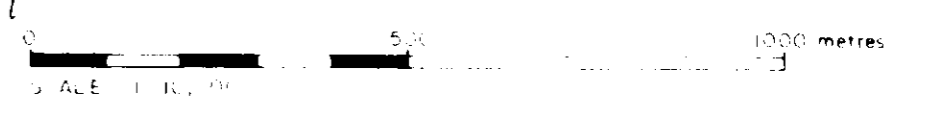


- LEGEND**
- - - Logging Road
 - - - - - Pit Trail
 - - - - - Claim Post and Claim Boundary
 - 38856 Soil Sample Location
 - 41775 Silt Sample Location
 - ▲ 38953 Rock Sample Location

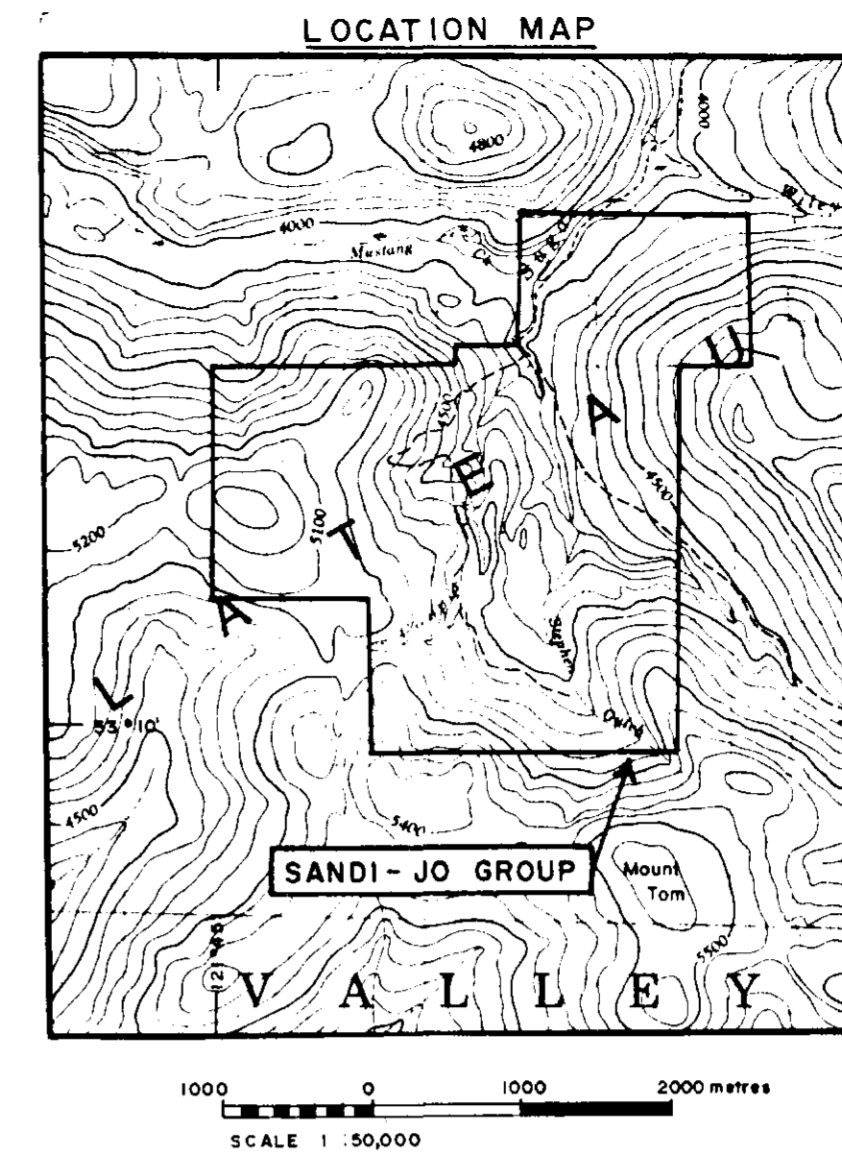
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*Robert Baerg
Jan 7/85*



REVISED AUG 30, 1984, S.K.B.	COOPER CREEK - CLEARBROOK MINING LTD. OPTION	
	SILT, SOIL & ROCK ⁽²⁾ GEOCHEM SAMPLE LOCATIONS	
PROJ No 53 N.T. 93H/4 EWS No	SURVEY BY R. BAERG DRAWN BY K.B.	DATE MAY 1984 SCALE 1:13,000
Map 2	NORANDA EXPLORATION OFFICE PRINCE GEORGE, B.C.	

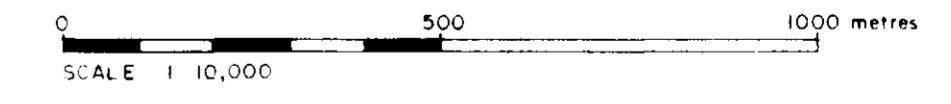


- LEGEND**
- Logging Road
 - - - Cat Trail
 - Claim Post and Claim Boundary
 - 38856 Soil Sample Location ; Cu, Zn, Pb, Ag, Mo, Au, As
 - 41775 Silt Sample Location ; Cu, Zn, Pb, Ag, Mo, Au, As
 - ▲ 38953 Rock Sample Location ; Cu, Zn, Pb, Ag, Mo, Au, As

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*Robert Baerg
Jan 7/85*



REVISED	COOPER CREEK - CLEARBROOK MINING LTD. OPTION		
AUG. 30, 1984, S.K.B.	SILT, SOIL & ROCK GEOCHEM ASSAYS (3)		
PROJ. No 53	SURVEY BY R. BAERG	DATE MAY 1984	
NTS 93M/4	DRAWN BY S.K.B.	SCALE 1:10,000	
DWG No	NORANDA EXPLORATION		
Map 3	OFFICE PRINCE GEORGE, B.C.		