

14639

GEOLOGICAL AND GEOPHYSICAL REPORT

on the

SAM-3 AND SAM-4 CLAIMS

(FAULT CREEK PROPERTY)

Atlin Mining Division, B.C.

N.T.S. 114 P/10W

Latitude 59°41'

Longitude 135°52'

FILMED

**GEOLOGICAL BRANCH
ASSESSMENT REPORT**

14,639

Author: M. Savell

Noranda Exploration Company, Limited

(No Personal Liability)

December, 1985

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CHAPTER ONE: INTRODUCTION

1-1: GENERAL

This report describes the results of a geological and geophysical survey carried out during September, 1985 on the SAM-3 and SAM-4 mineral claims (Fault Creek Property), Atlin Mining Division, B.C.

The claims were staked by Noranda in 1981 to cover the source area for highly mineralized (Cu, Zn, Pb, Ag) massive sulphide boulders found at the foot of a small glacier.

The geological and magnetometer surveys described in this report were performed by employees of Noranda Exploration Company, Limited. These surveys covered the presumed source area of a few scattered, mineralized boulders found in the terminal moraine of the glacier at the centre of the SAM-3 claim.

1-2: LOCATION AND ACCESS

The property is located in the Tatshenshini River Map Area near the headwaters of Fault Creek (Figure 1).

The "Haines Cut-off Road" passes approximately 15 kilometres east of the property.

Access to date has been by helicopter from Whitehorse, Atlin or the Noranda base camp at Mile 92 on the Haines Road.

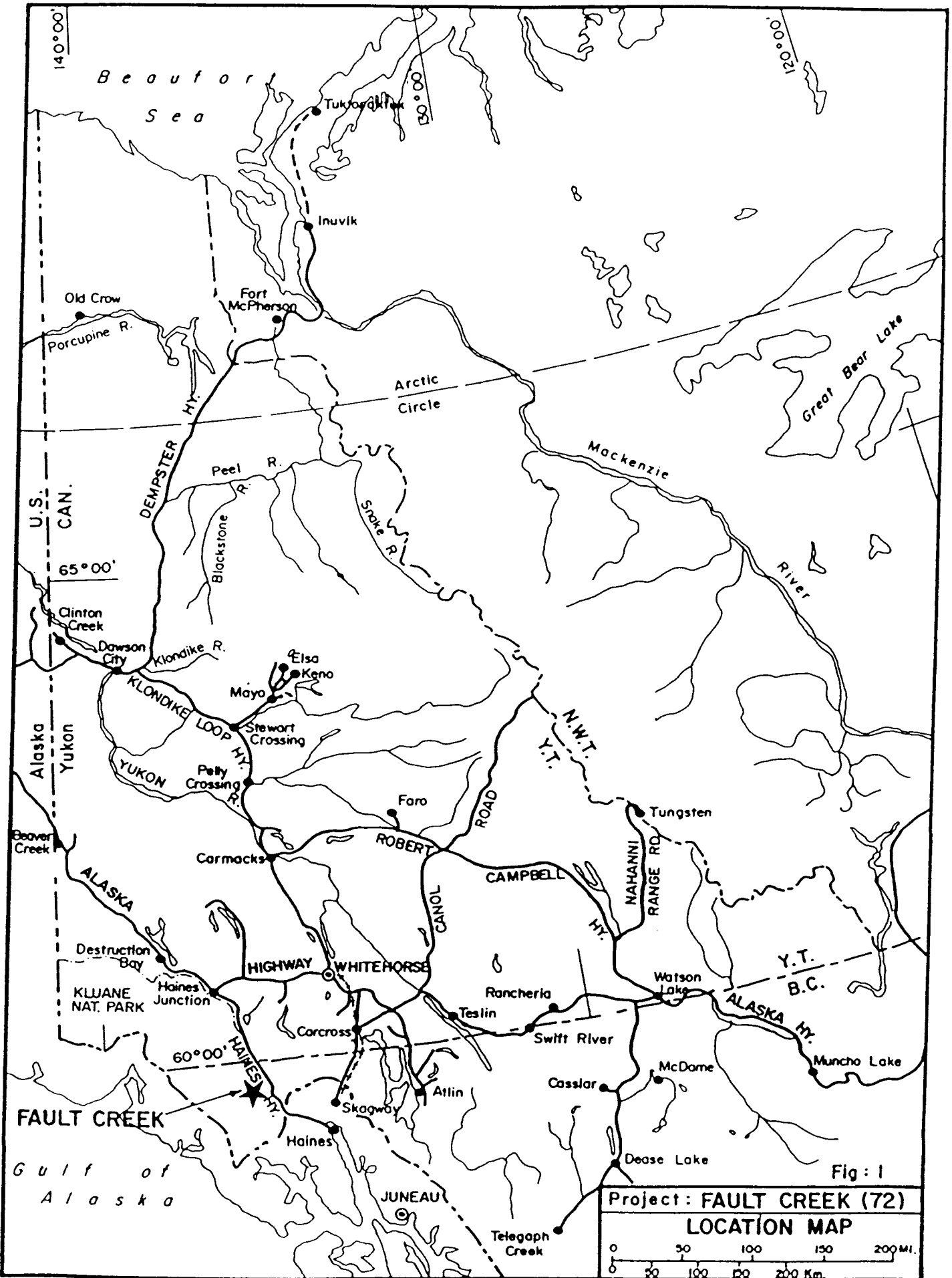


Fig: 1

Project: FAULT CREEK (72)
LOCATION MAP
 0 50 100 150 200 MI.
 0 50 100 150 200 Km

A rough 4-wheel drive road and cat trail runs from the junction of the Parton and Tatahenshini Rivers to approximately 5 kilometres north of the SAM claims.

1-3: PHYSIOGRAPHY AND VEGETATION

The property lies near the eastern edge of the St. Elias Mountains west of the Shakwak Trench. Topography in the area is very rugged with numerous sharp peaks rising above 1800 metre elevation from valleys at 1000 metres elevation or less.

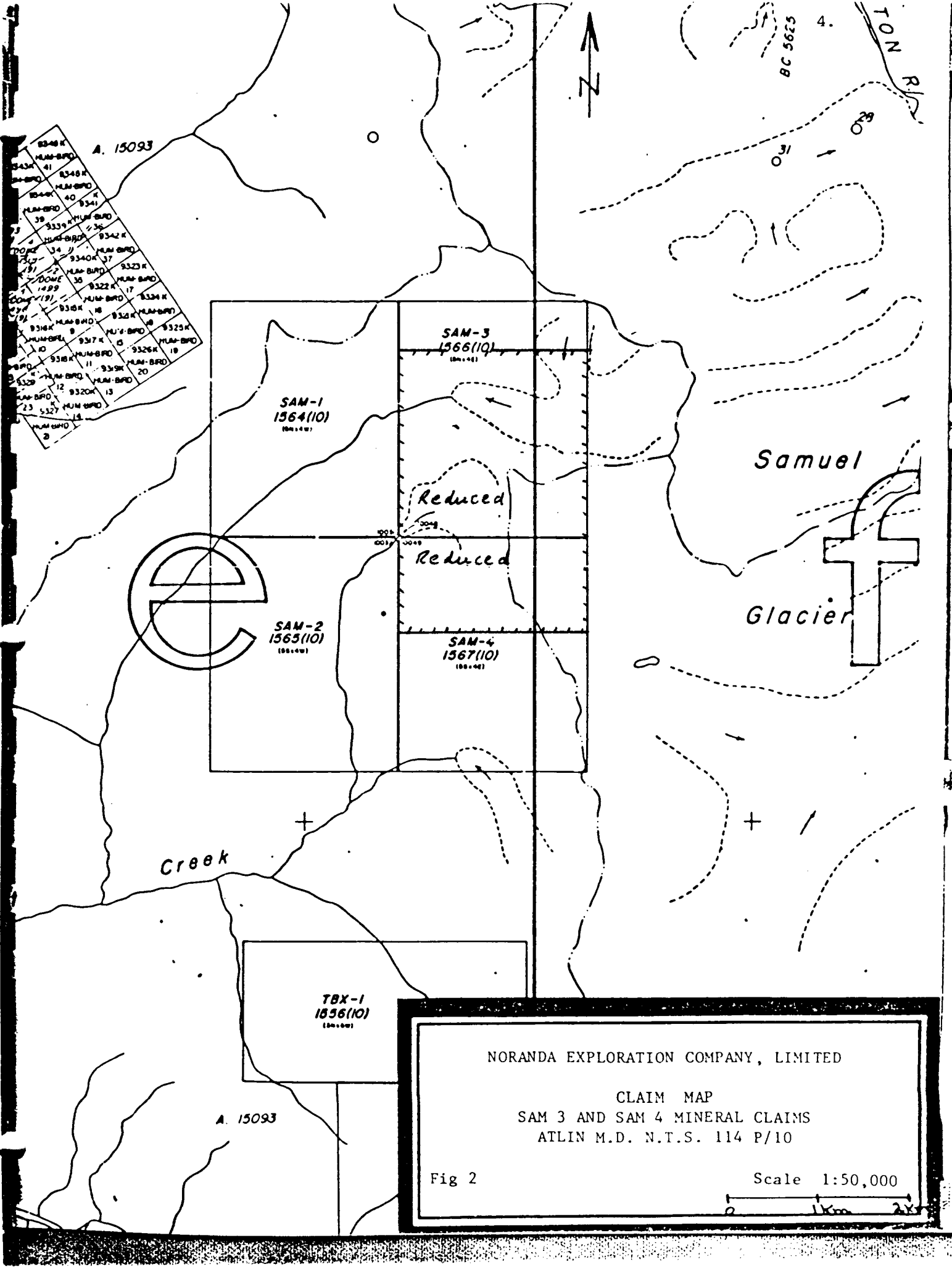
The Samuel Glacier and its branches cover a large area along the east side of the claims. Three smaller glaciers lie within the claim area (Figure 2).

The entire area of the claims is above tree line, the only vegetation being grasses and moss.

Foot travel on the property is very difficult, being hindered by ice, steep cliffs, and the constant threat of falling rock and ice.

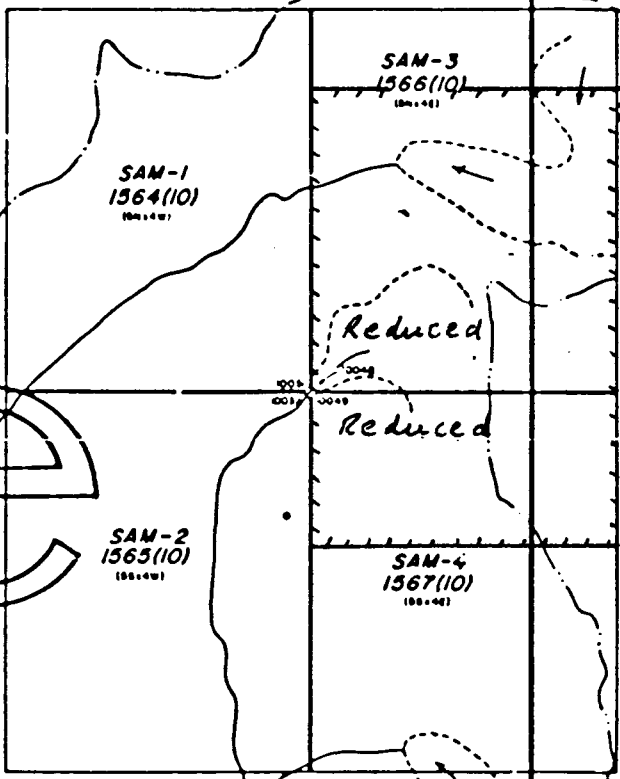
1-4: HISTORY OF THE CLAIMS

The SAM claims were acquired by staking in 1981. The following are the relevant details.



A. 15093

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8365 K	8341 K
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8379 K	8341 K
8380 K	8341 K
8381 K	8341 K
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8397 K	8341 K
8398 K	8341 K
8399 K	8341 K
8400 K	8341 K



Samuel
Glacier

Creek

A. 15093

TBX-1
1856(10)
(185-001)

NORANDA EXPLORATION COMPANY, LIMITED

CLAIM MAP

SAM 3 AND SAM 4 MINERAL CLAIMS

ATLIN M.D. N.T.S. 114 P/10

Fig 2

Scale 1:50,000

0 1 Km 2 Km

TABLE 1: CLAIM STATUS

<u>CLAIM NAME</u>	<u>UNITS</u>	<u>RECORD #</u>	<u>RECORD DATE</u>	<u>EXPIRY DATE</u>
SAM-3	16 (reduced)	1566	October 9, 1981	October 9, 1986
SAM-4	8 (reduced)	1567	October 9, 1981	October 9, 1986

The claims are owned by Noranda Exploration Company, Limited (No Personal Liability) and will be in good standing until the above expiry date upon acceptance of this report.

1-5: PREVIOUS WORK

Prospecting in the area of the SAM claims led to staking in September, 1981. The following year, a detailed prospecting and preliminary geological mapping program was undertaken. This has been reported in "Prospecting Report on SAM-3 and SAM-4 Claims" by R. MacArthur, submitted for assessment purposes. In 1983, the perimeter of the glacier on the SAM-4 claim was mapped with the aid of a mountaineering guide, and steep areas were prospected by helicopter. A total of 49 line-kilometres of DIGHEM electromagnetic and magnetometer surveys were flown at a line spacing of 200 metres. This survey has been reported in "Airborne Geophysical Report of the SAM-3 and SAM-4 Claims" by M. Savell and Z. Dvorak submitted for assessment purposes.

In 1984, approximately 15 line-kilometres of grid were surveyed, and geological mapping, 5.5 line-kilometres of Crone deep E.M., and 14 line-kilometres of magnetometer surveys were completed. This work was

concentrated in the area where the most promising float was found. It is reported in "Geological and Geophysical Report on the SAM-3 and SAM-4 Claims" by M. Savell (see company files).

1-6: 1985 WORK PROGRAM

The 1985 program consisted of further magnetometer (7.35 kilometres) and geological surveys, and petrographic studies. This work was done on the north half of the SAM-3 claim which to date had not been surveyed in detail. For sake of convenience, the geology map (Figure 3) also includes the location of the south grid (10,000 series) and surrounding geologic data obtained from earlier surveys.

CHAPTER TWO: GEOLOGY

2-1: REGIONAL

A preliminary 1:125,000 scale geology map of the 114 P mapsheet is available as open file map #926. The area east of the property toward the Haines Road was mapped in 1948 by K. Dep Watson (Bulletin #25 B.C.D.M. 1948).

The property lies within the Alexander Terrane of the Insular Belt, between the Hubbard Fault and Denali Fault Systems. This consists of complexly deformed, generally low grade metamorphosed, predominately Paleozoic rocks. On the property, these consist mainly of limey sediments and volcanics which have been thermally metamorphosed to skarns and hornfels by Tertiary granites and associated mafic and felsic dykes.

2-2: PROPERTY

The geological plan has been plotted on Figure 3. The predominant rock types are carbonates and volcanics. Limestones vary from pure cream to pale grey, massive and finely crystalline, to dark grey, very fine grained and laminated (Units 1 and 5). They are commonly impure with phyllitic and schistose pelitic or tuffaceous beds (Unit 2). Where thermally altered, these rocks are intensely striped and banded, siliceous, and host typical skarn mineralogy including calcite, actinolite, epidote, tremolite, chlorite, diopside and garnet (see Appendix 4 - Units 3, 4, 7). Dark green,

pyritic, chloritic and somewhat silicified schists are interpreted to be metamorphosed tuffs (Unit 6). Phyllitic, chloritic, and calcareous schists found above the volcanics are probably volcanic derived sediments and/or tuffaceous sediments (Unit 8). Shales, which occur in the upper northeast corner (Unit 9) of the property, are variably schistose to hornfelsed, and graphitic, and thus account for a number of parallel conductors picked up by the Dighem airborne survey in this area. The generalized stratigraphic sequence from apparent bottom to top is 1) limestones, 2) limestones interbedded with impure or silty limestones, 3) volcanics, 4) calcareous tuffs, and 5) shales. No fossils or evidence for younging directions were observed.

These stratified rocks are intruded by dykes and sills which are assumed to be associated with a large Tertiary pluton to the east. This pluton must crop out underneath the glacier, as evidenced by granitic rocks (Unit 11) in the medial moraine exposed at the foot of the ice. This was not observed to outcrop on the property. A steeply east dipping quartz-feldspar porphyry dyke (Unit 12) cuts through the centre of the property. Petrographic work has determined this to be a porphyritic quartz latite (see Appendix 4). Black, fine-grained, irregular mafic sills (Unit 10) occur along bedding planes throughout the property. Petrographic work has determined these to be porphyritic andesite. All of these intrusions in some way are responsible for the thermal alteration observed in the older rocks. A number of thin quartz and quartz-calcite veins observed are also assumed to be related to hydrothermal solutions associated with the intrusives.

A north striking normal fault cuts the ridge on the east side of the main glacier and dips steeply to the west. Quartz-carbonate veins fill parts of the fault, suggesting that it pre-dates the intrusive activity.

A sample of the mineralized float found on the south grid was petrographically analyzed (#70471, see Appendix 4). This rock was found to consist of banded sphalerite, chalcopyrite, galena, with minor covellite and hematite in a ground mass of very fine quartz, diopside, epidote, and minor garnet and plagioclase. It is most likely of a pyrometasomatic or skarn origin.

CHAPTER THREE: GEOPHYSICS3-1: MAGNETOMETER SURVEY

The computer contoured results of the magnetometer survey completed on the north grid ("25,000" series) is shown on Figure 4. The instrumentation is described in Appendix 5.

The magnetic survey over most of the grid recorded a generally featureless area with amplitudes of between 100 nT and 279 nT above the background of 57,000 nT. The survey was not helpful in extrapolating geology under the ice and moraine deposits which cover most of the surveyed area. In contrast to the majority of the grid, the northeast end of lines 25200E and 25300E display higher magnetic susceptibilities, with amplitudes of between -53 nT and 1,026 nT below and above the background of 57,000 nT, respectively. This area is underlain by bedrock exposures of banded skarn and graphitic, phyllitic shales. The high amplitudes may be due to high susceptibilities in these lithologies and/or closeness to bedrock.

CHAPTER FOUR: CONCLUSIONS AND RECOMMENDATIONS

No significant in situ economic mineralization was located on the north half of the SAM-3 claim. The geological and geophysical surveys failed to produce targets worthy of further detailed exploration. The mineralogy of the representative samples as determined by petrographic studies confirms a thermal metamorphic or skarn origin of the mineralized float boulders found in the initial prospecting survey.

The potential of the north half of the SAM-3 claim to host a significant ore body appears to be low. Further work on the Fault Creek property should concentrate on the apparent source area of the float mineralization found at the foot of the south glacier near the SAM-3 and 4 L.C.P.

Respectfully submitted,

A handwritten signature in cursive script, appearing to read "Mike Savell".

Mike Savell
Project Geologist

APPENDIX 1

PERSONNEL

Mike Savell
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Whitehorse, Y.T.
Y1A 2A7

Project Geologist

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Geologist

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Geophysical Technician

Tony Lippert
1050 Davie Street
Vancouver, B.C.
V6B 3T5

Field Assistant

Tim Kellerman
1050 Davie Street
Vancouver, B.C.
V6B 3T5

Field Assistant

APPENDIX 2

STATEMENT OF QUALIFICATIONS

I, Michael Savell of the City of Whitehorse, Yukon Territory, do hereby certify that:

1. I have been an employee of Noranda Exploration Company, Limited (No Personal Liability) since May 1980.
2. I am a graduate of Dalhousie University with a Bachelor of Science Degree in Geology.
3. I am a member of the Geological Association of Canada, the Canadian Institute of Mining and Metallurgy, the Prospector's and Developers Association, and the B.C./Yukon Chamber of Mines.



Michael Savell
Project Geologist
Noranda Exploration Co., Ltd.
(No Personal Liability)

APPENDIX 3

STATEMENT OF COST

PROJECT: Fault Creek

TYPE OF REPORT: Geological/Geophysical

a)	Wages:		
	No. of Days	10	
	Rate per Day	119.00	
	Dates from	Sept. 7, 8, 1985	
	Total Wages	10 x 119.00	1190.00
b)	Food and Accommodation:		
	No. of Days	10	
	Rate per Day	34.70	
	Total Cost	10 x 34.70	347.00
c)	Transportation:		
	No. of Days	2	
	Rate per Day	500.00	
	Total Cost	2 x 500.00	1000.00
d)	Instrument Rental:		
	Type of Instrument	MAG	
	No. of Days	2	
	Rate per Day	130.00	
	Total Cost	2 x 130.00	260.00
e)	Cost of Preparation of Report:		
	Author	100.00	
	Drafting	100.00	
	Typing	100.00	
	Total		300.00
f)	Other:		
	Petrographic Reports		<u>628.00</u>
		TOTAL COST	<u>\$3725.00</u>

APPENDIX 4:

PETROGRAPHIC REPORT



Vancouver Petrographics Ltd.

JAMES ZINNELI M.Sc.
JOHN G. PAYNE Ph.D.

P.O. BOX 39
8887 NASH STREET
FORT LANGLEY B.C.
V0X 1J0

Report for: Mike Savell,
Noranda Exploration Co., Ltd.,
203 - 107 Main Street,
Whitehorse, Yukon, Y1A 2A7

PHONE (604) 888-1323

Invoice 5561
December 1985

Samples: 9 samples
70209, 70213, 70465-70471

Summary:

Sample 70465 is a porphyritic dike with phenocrysts of plagioclase, quartz, biotite, and K-feldspar in a groundmass dominated by plagioclase with spots of ankerite, and replacement patches of calcite-pyrite-(muscovite).

Sample 70466 is a porphyritic andesite, with phenocrysts of plagioclase and lesser hornblende in a groundmass dominated by plagioclase, epidote, and tremolite/actinolite, with scattered small porphyroblasts of biotite.


Sample 70467 is a metamorphosed dacite tuff with fragments of plagioclase and lesser quartz, and porphyroblasts of biotite and pyrite in a groundmass dominated by feldspar and sericite/muscovite.

Sample 70468 is a deformed dacite/latite tuffaceous sediment, which was strongly kink folded, and replaced by porphyroblasts of actinolite and minor epidote, and by veins and lenses of epidote-actinolite-(calcite).

Sample 70469 contains the contact of a rhyolite flow and dacitic tuffaceous sediments as in 70468. The sediments are strongly contorted and replaced by patches and veins of epidote-actinolite-(calcite). The rock is cut by a major quartz vein.

Sample 70470 is a banded calcsilicate rock composed of epidote with lesser calcite, quartz, tremolite, and chlorite. It is cut by veins of quartz and calcite. Quartz veins may in part be metamorphic segregations.

Sample 70471 is a slightly banded sulfide-bearing skarn composed of about equal amounts of non-sulfides (quartz with lesser diopside and epidote and minor garnet) and sulfides (sphalerite with lesser chalcopyrite and still lesser galena). Secondary minerals after primary sulfides are minor covellite, hematite, and possibly secondary Pb-minerals intergrown with covellite.


John G. Payne

The rock contains phenocrysts up to a few mm across of plagioclase, quartz, and lesser biotite and K-feldspar in a very fine grained groundmass dominated by plagioclase, with replacement patches of ankerite and of calcite-pyrite-(sericite/muscovite). It is cut by veinlets of albite and of calcite.

phenocrysts		veinlets	
plagioclase	15-17%	1) calcite	0.3%
quartz	8-10	2) albite-(calcite) minor	
biotite	3- 4		
K-feldspar	2- 3		
apatite	minor		
zircon	trace		
groundmass			
plagioclase	55-60		
ankerite	5- 7		
calcite	2- 3		
opaque	1		
sericite/muscovite	0.3		
apatite	trace		
zircon	trace		

Plagioclase forms subhedral to euhedral phenocrysts and clusters of phenocrysts averaging 0.7-1.5 mm in size, with a few over 2 mm long. These are moderately altered to very fine grained sericite and minor dusty opaque. Phenocrysts are unzoned and uniformly altered. A few phenocrysts contain replacement patches of calcite, with or without minor opaque.

Quartz forms rounded to euhedral grains and clusters of a few grains, averaging 0.3-1.5 mm in grain size. A few grains show moderately embayed borders against the groundmass.

Biotite forms flakes up to 3 mm in size, averaging 0.5-1.5 mm. It is completely replaced by pseudomorphic muscovite and abundant lenses of ankerite and patches of opaque and/or Ti-oxide. Some grains are strongly replaced by irregular opaque patches.

K-feldspar forms scattered phenocrysts up to 5 mm in length. These are subhedral to euhedral in outline. Alteration is moderate to strong to irregular patches of fine to very fine grained calcite, and dusty to extremely fine grained opaque is abundant.

Apatite forms a few elongated prismatic grains up to 0.4 mm in length, commonly associated with biotite phenocrysts.

Zircon forms one elongate, euhedral prismatic grain 0.3 mm in length.

The groundmass is dominated by a very fine grained (0.02-0.03 mm) slightly interlocking aggregate of plagioclase, with moderately abundant irregular patches up to 1 mm in size of extremely fine grained ankerite, and minor to moderately abundant dusty opaque. Sericite/muscovite forms scattered patches up to 0.25 mm in size of very fine grained aggregates. Apatite and zircon form scattered subhedral to euhedral prismatic grains less than 0.1 mm in length.

The rock contains replacement patches up to 1.5 mm in size of fine to medium grained calcite with moderately abundant to minor pyrite. The latter forms clusters of subhedral cubic grains up to 0.7 mm in size. Anhedral opaque patches up to 0.7 mm long are scattered through the groundmass; some are rimmed by ankerite. Some patches contain minor muscovite.

The rock is cut at one end by a vein up to 0.3 mm wide of very fine grained calcite (0.05-0.1 mm). It is also cut by a veinlet up to 0.05 mm wide of very fine grained albite with minor calcite.

The rock is a metamorphosed, porphyritic andesite with phenocrysts of plagioclase and lesser hornblende in a groundmass dominated by plagioclase, epidote, and tremolite/actinolite, with scattered, small porphyroblasts of biotite and abundant patches of Ti-oxide. The rock is cut by a vein of epidote-(calcite).

phenocrysts	
plagioclase	7- 8%
hornblende	1½-2
groundmass	
plagioclase	20-25
epidote	20-25
tremolite/actinolite	35-40
biotite porphyroblasts	2- 3
Ti-oxide	1½-2
apatite	minor
chlorite	minor
tourmaline	trace
veins	
epidote-(calcite)	1- 2

Plagioclase forms subhedral to euhedral phenocrysts up to 1.5 mm in length. They are recrystallized in part to extremely fine to very fine grained aggregates of plagioclase, with minor to abundant porphyroblasts up to 0.2 mm in length of biotite and minor radiating aggregates of tremolite needles. Completely recrystallized phenocrysts can be distinguished from groundmass plagioclase only in their low content of mafic minerals.

Hornblende forms anhedral to euhedral prismatic phenocrysts up to 2 mm in length. Some grains are replaced by actinolite pseudomorphs, and a few are replaced by extremely fine to very fine grained patches of epidote. Some show paler green cores surrounded by irregular rims of slightly darker green color.

The groundmass is dominated by very fine to extremely fine grained aggregates of plagioclase and tremolite/actinolite, with patches and trains of extremely fine grained epidote. Plagioclase aggregates are anhedral and slightly interlocking. Tremolite/actinolite patches are of anhedral to subhedral prismatic grains of pale green color.

Biotite forms subhedral porphyroblasts averaging 0.15-0.5 mm in size, and mainly with equant habit. Pleochroism is from light to medium/dark green. Along cleavage planes in some grains are lenses of pale green chlorite. One patch 1.5 mm in size, with a vaguely rectangular outline, may represent an original mafic phenocryst completely replaced by a fine grained aggregate of biotite similar in texture to the biotite porphyroblasts.

Ti-oxide forms ragged patches averaging 0.1-0.3 mm in size, with a few up to 0.5 mm long. They may be after original sphene. Some contain a trace of opaque in the core, suggesting that they may be secondary after ilmenite.

Apatite forms scattered subhedral to euhedral prismatic grains up to 0.3 mm in length.

Chlorite forms a few very fine to extremely fine grained patches scattered through the groundmass.

Tourmaline forms a very few subhedral prismatic grains up to 0.2 mm long. Pleochroism is from light to medium olive green.

The rock is cut by a vein averaging 0.4 mm in width of very fine grained epidote with much less calcite.

The rock is a strongly foliated dacite of probable tuffaceous origin, with coarser grains of plagioclase and lesser quartz in a groundmass of feldspar, quartz, sericite/muscovite, chlorite, and calcite. Several veins of calcite-quartz are parallel to or slightly crosscutting foliation. The rock contains scattered porphyroblasts of biotite (altered to chlorite-Ti-oxide) and pyrite (partly altered to hematite).

coarser fragments

plagioclase 7- 8%

quartz 1½-2

porphyroblasts

biotite 1- 1½

pyrite 1

groundmass

feldspar 45-50

quartz 5- 7

calcite 5- 7

chlorite 4- 5

muscovite/sericite 12-15

Ti-oxide ½- 1

apatite minor

veins

calcite-quartz-(chlorite) 7- 8

Plagioclase forms angular fragments of grains averaging 0.1-0.25 mm in size. Alteration is slight to extremely fine grained, disseminated sericite and locally to minor calcite.

Quartz forms similar fragments averaging 0.15-0.3 mm in size, with a few up to 0.5 mm across.

Biotite forms ragged, commonly skeletal porphyroblasts up to 0.8 mm in size, with intergrown extremely fine grained groundmass minerals. Porphyroblasts cut across foliation in random orientation. Biotite is completely altered to pseudomorphs of chlorite with acicular Ti-oxide and a few equant patches of Ti-oxide.

Pyrite forms subhedral aggregates up to 1 mm in size, commonly with thin rims and patches of very fine grained chlorite. Pyrite may be moderately to strongly altered to hematite; some translucent red-brown hematite is present along borders of the opaque grains.

The groundmass is mainly extremely fine grained, and dominated by plagioclase with sericite/muscovite concentrated in aggregates of thin flakes oriented parallel to foliation. Groundmass plagioclase grades up in size to that of the fragments. Sericite/muscovite locally forms coarser grained flakes and aggregates up to 0.3 mm in length.

Calcite forms disseminated grains averaging 0.05-0.07 mm in size, and locally is concentrated in calcite-rich zones.

Chlorite forms single flakes averaging 0.03-0.07 mm in length associated with sericite/muscovite, and also forms patches of very fine grained aggregates alone or along borders of pyrite.

Ti-oxide forms anhedral to subhedral patches averaging 0.05-0.1 mm across, and less abundantly occurs as wispy seams parallel to foliation.

Apatite forms scattered equant grains averaging 0.05-0.07 mm in size.

The rock is cut by a few veins up to 2.5 mm in width (average 0.7-1 mm) of very fine to fine grained calcite and lesser quartz, with minor chlorite along vein borders.

The rock is a banded tuffaceous sediment, with layers alternately dominated by plagioclase or K-feldspar. It was strongly kink folded during a second deformation period, with abundant sericite/muscovite formed, mainly on limbs of folds. The folded rock was replaced by porphyroblastic patches dominated by actinolite, and by veins and irregular patches of epidote and actinolite, with patches of calcite in cores of larger replacement zones.

plagioclase	15-17%
K-feldspar	15-17
quartz	1- 1½
sericite/muscovite	15-17
apatite	minor
Ti-oxide	1- 1½
replacement minerals	
actinolite	25-30
epidote	20-25
calcite	2- 3

The rock is finely foliated, with grains of feldspars and minor quartz averaging 0.02-0.05 mm in size showing a predominant orientation parallel to foliation. The foliation is marked by wispy lenses of Ti-oxide, and by elongation of subhedral apatite grains up to 0.1 mm in length. K-feldspar-rich and plagioclase-rich zones are best distinguished in the stained offcut block.

The rock was tightly kink folded, and abundant sericite/muscovite was formed parallel to foliation, mainly along limbs of the kinks, where the transposed foliation makes a small angle with the axial plane of the kink folds. Where the original foliation is at a high angle to the axial plane of the kink folds, sericite/muscovite is much less abundant and much finer grained.

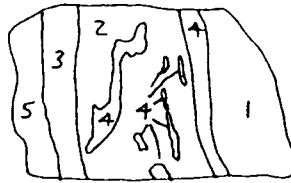
The rock is replaced in two main textural zones. Scattered through the rock are spheroidal patches from 0.8-1.5 mm in size. Most of these consist of unoriented aggregates of prismatic to slightly feathery actinolite of very fine grain size. A few of these patches consist of very fine to fine grained epidote. These occur both in the host rock and in vein-like replacement zones of epidote-actinolite, suggesting that they were formed before the vein replacement zones.

Veins and lensey replacement zones consist of either intergrowths of very fine grained actinolite and epidote, or by very fine to locally medium grained epidote and much less actinolite. Grain size commonly is larger in larger replacement patches. Coarser actinolite commonly has a subradiating to feathery prismatic habit. In the core of the larger alteration zones are patches up to 1.5 mm in size of very fine to medium grained calcite, in part interstitial to much finer grained epidote and lesser actinolite.

70469

Meta-volcanic Banded Rock: Dacitic tuffaceous sediment, Rhyolite flow, Veins and alteration patches of Actinolite and Actinolite-Epidote, Vein of Quartz.

The rock is a complex mixture of two main rock types, skarny alteration patches and veins, and a quartz vein. Zonation is as in the sketch below:



Zone 1 Rhyolite flow

The rock contains scattered angular plagioclase grains averaging 0.05 mm in size in a finer grained groundmass dominated by interlocking K-feldspar (0.02-0.03 mm), with disseminated Ti-oxide patches and lenses, and disseminated grains of apatite. Actinolite forms disseminated patches and lenses, possibly of replacement origin; these are more abundant nearer the actinolite vein, and a second replacement vein which cuts across the rock. The latter vein has diffuse margins. Epidote forms scattered replacement patches up to 0.3 mm in size near the actinolite vein. Calcite forms irregular lenses and patches, and one wispy veinlet with lesser quartz; these are probably of secondary replacement origin as well.

Zone 2 Dacite tuffaceous sediment

This unit is strongly deformed. The original rock is a very fine to extremely fine grained aggregate dominated by plagioclase with much lesser quartz. It has a moderate foliation. This is strongly deformed by a second deformation event parallel to major banding in the rock. Tight kink and shear folds are loci of extremely fine grained epidote alteration along fold axes and minor shear zones. Some zones up to 0.5 mm wide parallel to the late folds show strong alteration to sericite. Others contain coarser grained patches and lenses of epidote, locally with plagioclase and actinolite. The unit is cut by abundant veins of actinolite and lesser ones of epidote-actinolite (Zone 4).

Zone 3 Epidote-Actinolite-(Calcite) Skarn

This zone along the border of the quartz vein consist of a fine to locally medium grained aggregate of feathery to prismatic actinolite, anhedral epidote, and minor interstitial calcite. Epidote and actinolite each are concentrated in monomineralic patches, with epidote more abundant and concentrated nearer the quartz vein and towards one side of the section. Zone 3 probably is closely related in origin to Zone 4.

Zone 4 Actinolite Veins

The veins are up to a few mm wide and consist mainly of very fine to fine grained feathery aggregates of actinolite, with irregular patches of coarser grained feathery to prismatic actinolite. Some veins within Zone 2 contain minor to moderately abundant epidote, and one has a partial halo of K-feldspar.

Zone 5 Quartz vein

At one end of the sample is a medium to coarse grained quartz vein. It is cut by wispy veinlets of gypsum. The vein contains a few irregular patches of very fine grained of actinolite and one coarser patch of plagioclase. Quartz shows moderately strained extinction.

The rock is a well banded calc-silicate rock dominated by epidote; with lesser bands and lenses rich in calcite-tremolite, in quartz, and in chlorite. Quartz with much less epidote forms veins parallel to banding (these may be metamorphic segregations). The rock is cut by late calcite veins which transect the banding. Some bands are lensy and others are sharply truncated along strike.

epidote	50-55%
calcite	15-17
quartz	10-12
tremolite	5- 7
chlorite	3- 4
Ti-oxide	0.5
veins	
1) quartz	12-15
2) calcite	1- 2

The rock is dominated by bands rich in epidote. Grain size varies strongly between bands, generally averaging 0.05-0.2 mm, with a few coarser grained layers and scattered grains, and a few much finer grained layers. The latter are intergrown with quartz and lesser calcite. Layers grade from almost pure epidote to epidote with patches, lenses, and interstitial zones of calcite, of chlorite, and of quartz.

Other layers and lenses are dominated by fine to very fine grained calcite, with minor to abundant intimate intergrowths of clusters of acicular tremolite. A few of these aggregates consist almost entirely of tremolite in patches up to 0.1 mm across of subparallel acicular aggregates. The calcite-tremolite-rich layers grade with increasing epidote content into epidote-rich layers.

Quartz is intergrown with epidote and calcite in the above layers, mainly as very fine to fine grained interstitial patches. These grade with coarsening grain size and abundance of quartz into quartz-rich lenses and layers. Quartz-rich layers are medium grained, with minor to abundant intergrowths of extremely fine to very fine grained epidote.

Chlorite forms irregular patches and lenses of extremely fine to very fine grained aggregates. These are light yellowish-green in color in thin section, and medium to dark green in hand sample. Chlorite also forms irregular interstitial patches in some epidote-rich layers.

Ti-oxide forms wispy lenses parallel to banding, and scattered eugant patches up to 0.5 mm across.

The rock is cut by a very coarse grained quartz vein several mm in width. It contains a few irregular patches of calcite less than 0.05 mm in size. Other quartz-rich lenses of similar composition and texture grade into quartz-epidote layers with lesser epidote (as described above).

Late veins and veinlets up to 0.5 mm in width consist of very fine to fine grained calcite with minor patches containing moderately abundant limonite (giving the vein a medium brownish yellow color).

Slightly Banded Skarn: Quartz-Diopside-Epidote-Garnet-
Plagioclase with Sphalerite-Chalcopyrite-Galena

The rock is a very fine to medium grained skarn showing patchy to banded compositional variation. Sulfides and silicates are finely intergrown in textures indicating that they were formed together. Silicates commonly are concentrated in monomineralic patches.

quartz	25-30%	sphalerite	20-25%
diopside	12-15	chalcopyrite	12-15
epidote	12-15	galena	7- 8
garnet	2- 3	covellite	0.2
plagioclase	½- 1	hematite	minor

Quartz forms anhedral to euhedral grains averaging 0.2-0.8 mm in grain size. Some contain extremely fine grained aggregates of epidote and/or diopside. It is concentrated in one half of the section along with patches of diopside and of epidote, and irregular patches of sulfides with about equal amounts of chalcopyrite and sphalerite.

Diopside forms subhedral prismatic aggregates of grains up to 1 mm in length, and lesser very fine to extremely fine grained aggregates. These are irregularly intergrown with sulfides.

Epidote forms extremely fine to fine grained patches, in part intimately intergrown with sulfides, and in part free of sulfides.

Garnet forms anhedral to subhedral grains up to 1 mm in size intimately intergrown with sulfides in the sulfide-rich part of the section.

Plagioclase occurs in one corner of the section as anhedral, equant grains from 0.5-1 mm in average size.

Alteration of silicates is minor, with plagioclase altered to irregular patches of green chlorite, and diopside locally altered to patches of pale green, extremely fine grained chlorite.

Sphalerite with lesser chalcopyrite and galena form irregular, very fine to locally medium grained intergrowths with smoothly curved grain borders. They are intergrown finely to mediumly with silicates, and locally, especially galena, are extremely finely intergrown with silicates. Scattered sphalerite grains contain moderately abundant, extremely fine grained (0.003-0.01 mm) blebs of chalcopyrite.

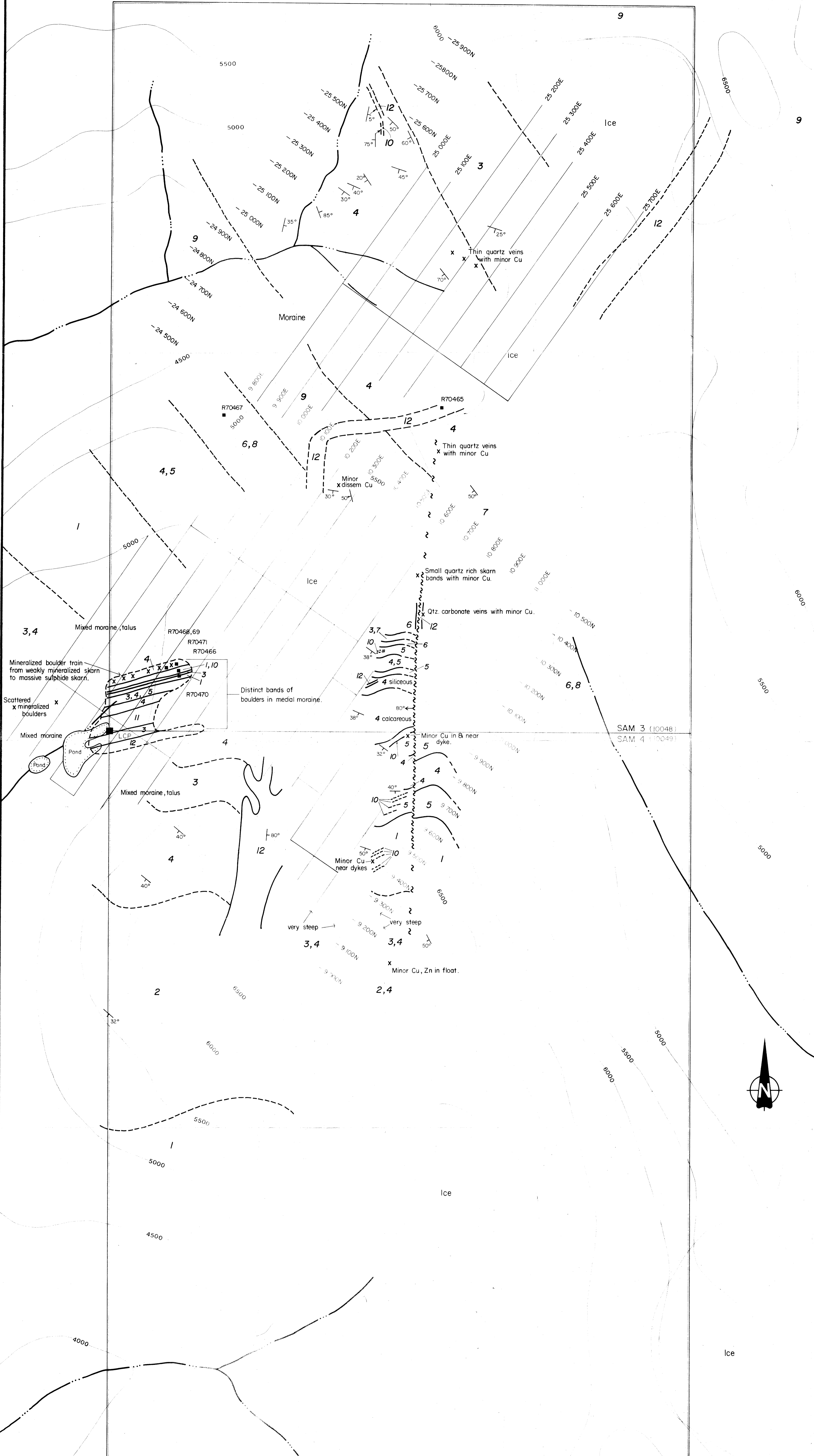
Alteration of sulfides is minor, with chalcopyrite partly replaced by hematite, and chalcopyrite and galena partly replaced by extremely fine grained intergrowths of covellite and secondary Pb-minerals.

Sphalerite is light creamy grey in color, indicating a low Fe-content, in keeping with the low Fe-content of the sulfide assemblage.

APPENDIX 5:

MAGNETOMETER SURVEY - INSTRUMENTATION

The magnetometer survey employed the MP.3 system manufactured by Scintrex of Concord, Ontario. The MP.3 magnetometers internally record the Total Field measurement at each 25 metre station. This internally recorded data is automatically corrected for both diurnal and daily drift in the magnetic field by the automatic recording base station. The field data is corrected and is accurate to 0.1 nT. The data is reduced to a datum of 57,000 nT.



Legend

- TERTIARY (Intrusive rocks)**
- 12 Buff weathered, quartz-feldspar porphyry.
 - 11 Grey-white, coarse grained granite.
 - 10 Black to dark green, very fine grained, irregular, poddy mafic sills and dykes.
- PALEOZOIC (Stratified rocks)**
- 9 Black schistose to hornfelsed, graphitic to phyllitic shale.
 - 8 Grey-green, limy, chloritic, phyllite and schist.
 - 7 Intensely striped, intricately folded, calcite-actinolite skarn.
 - 6 Dark green, siliceous to schistose, chloritic, pyritic, hornfelsed volcanics.
 - 5 Dark grey, laminated limestone.
 - 4 Well banded, green calcite-silicate skarn.
 - 3 Finely banded, green & white, skarn and marble.
 - 2 Phyllitic limestone with chloritic, schistose hornfelsed beds.
 - 1 Cream to pale grey, finely crystalline limestone.

Symbols

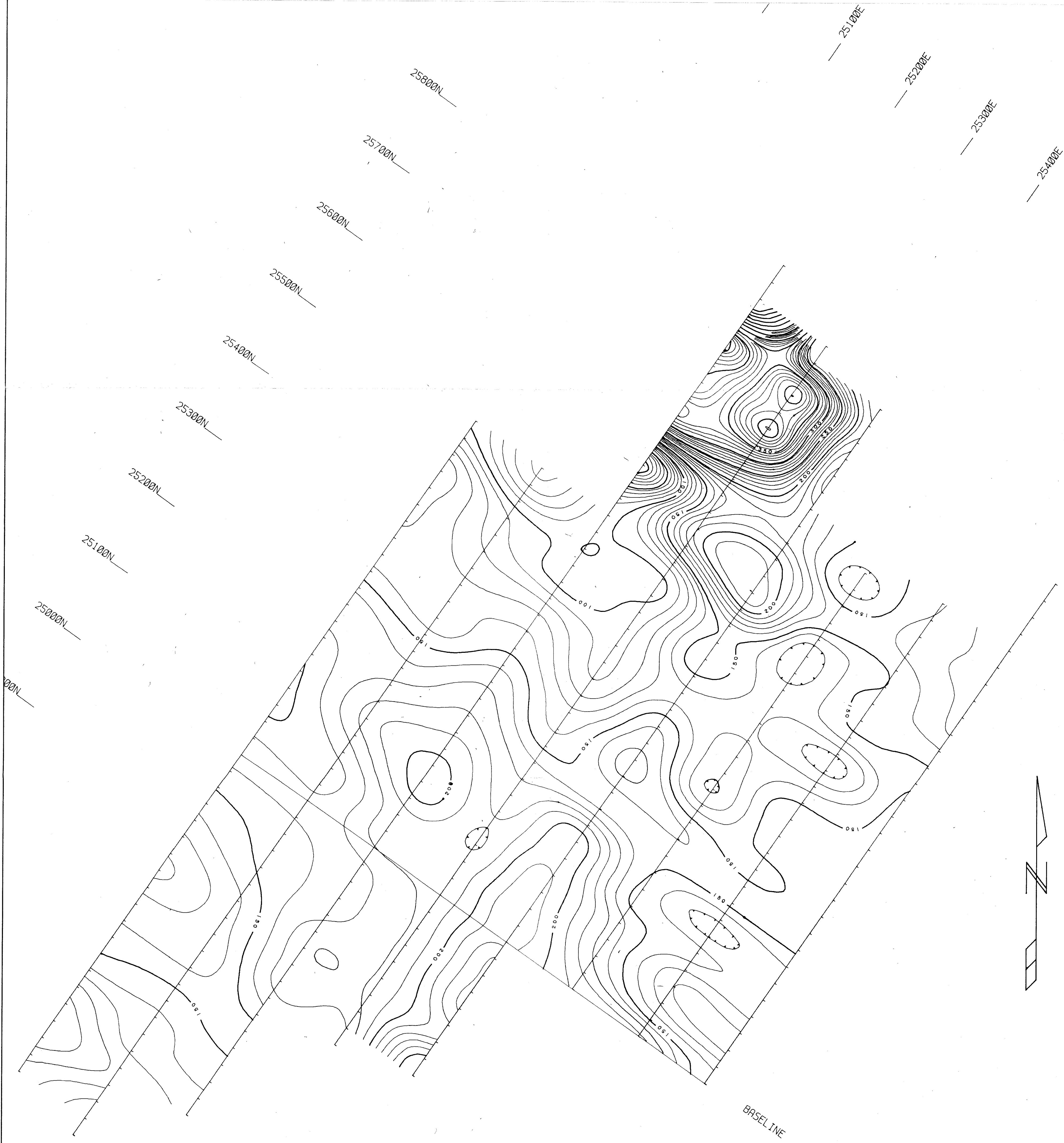
- Geological contact (defined, approximate)
- Fault (defined, approximate)
- Bedding or dyke attitude
- Mineralization
- Glacial boundary
- Rock sample for Thin Section

GEOLOGICAL BRANCH ASSESSMENT REPORT

14,639

Fig. 3

DATE	FA
MAR 85	
Geology	
REV. NO.	NOV 83 / MAR 85



**GEOLOGICAL BRANCH
ASSESSMENT REPORT**

14,639

Instrument	: NP-3
Datum	: 57000.0 nT
Contour Interval	: 10 nT (2 passes through a 9 pt. Hanning Filter.)
Conductor Axis	:



FIG. 4

FAULT CREEK	
MAGNETOMETER SURVEY	
(FILTERED CONTOUR PRESENTATION)	
PROJECT: FAULT CREEK PROJECT # : 73	
BASELINE AZIMUTH : 125 Deg.	
SCALE = 1 : 2500	DATE : 7/ 9/85
SURVEY BY: WK/TK NTS :	
FILE: M73FAU.ZAT	
NORANDA EXPLORATION	