4631

SUPPLEMENTARY REPORT ON THE GEOLOGY AND GEOCHEMISTRY

OF THE

MOOSEHORN, SUM AND JUG CLAIM GROUPS

OMINECA MINING DIVISION

PIT: 69, 71 - 75

JUG: 1 - 10

WAS: 1 - 4, 17 - 19, 21, 23

RIP: 1 - 11, 13, 15, 17 - 19, 21 - 22, 31, 33

SUM: 5, 7, 9, 12 - 20

ELEVEN MILES S.W. OF CHUKACHIDA LAKE

127° 18' E, 57° 32' N

BY

T. RODGERS, P. ENG.

FOR

SUMAC MINES LIMITED

3rd June - 10th July 1973

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LIST OF ILLUSTRATIONS

(in text)

Introduction

The work described in this report and that in the companion geophysical report is a continuation of work done on the Moosehorn property in previous years. In effect it extends the geochemical and geophysical features of interest as far as the border of the McClair property so that both should now be considered as a unit. Previous work was confined mainly to upland areas. Work in 1973 filled in the lowland area between them.

Geology

The data obtained by field work from outcrop and float considered to be close to its origin is plotted on background photo-mosaics maps numbered 211-G-1A and 1B. They show that the claims are underlain by thick sequences of intermediate volcanic rocks. Two types predominate; they are (i) green hornblende andesite (in which the green color is due to chloritisation) and (ii) purple hornblende andesite. The latter occurs predominantly in the south-eastern sector of the property, under the Pit claims. Intercalated with both types are agglomeratic varieties occasionally containing accidental brecciated material (e.g. Sample #61506).

The green andesites overlie the purple andesites and are part of a volcanic suite tentatively named the Toodoggone Group by Carter. This group is post-Takla and pre-Sustut, and hence Upper Jurassic/Lower Cretaceous in age. Because the unconformity between Takla and Toodoggone is very severe, whereas that between Toodoggone and Sustut is slight,

the rocks are more probably Lower Cretaceous.

Other rock types found on the property are basaltic dykes and dacitic varieties of green hornblende andesite (e.g. 72E-40N). The dacitic rock appears to intrude the green andesite but this relationship is not proven.

In order to study the alteration characteristics of the suite, thirty-four thin sections were examined under a petrographic microscope. From this work, the following conclusions were arrived at:-

a) Alteration is so extensive that no original mafic minerals such as hornblende or biolite have survived; in most cases they are completely altered to chlorite and/or carbonate/ sericite.

b) Plagioclase crystals were more resistant to alteration so that the composition of some of them could be determined. It ranged from An28 to An42.

c) K-felspar occurs in some andesite varieties (e.g. #70306, #70302, #62302, #62304, #71E-41N); these samples come from the general area of 71E to 80E and 40N-46N.

Carbonate alteration is predominant throughout the area, replacing mafic minerals and plagioclase; it also occurs in the groundmass of the rocks as minute veinlets. The amount of carbonate reaches 30-40% of the whole rock (e.g. Sample #62901).

Quartz phenocrysts are rare but do occur in small amounts in the green hornblende andesite in some localities (e.g. Sample #70304). Chloritisation is ubiquitous, replacing hornblende and plagioclase. Alteration zoning could not be determined.

Micro-xenoliths of shale and sandstone occur in andesite specimens from 71E/41N and 139E/45S respectively. Their origin is a puzzle as older sedimentary sequences are not known to exist anywhere in the vicinity. Either the Toodoggone group is in part underlain by Bowser equivalents or the fragments were brought up volcanic vents from formations below the Takla.

Table of Thin Sections

Sample #	Rock Name	Feldspar		Alterations							
		Pl.	K-spar	Carb.	Chl	Se.	Ep.	Sil.	Py.	Mt.	Hm.
74E-41N	grey Ad.			no	str	wk	str	med	med	med	no
74E-41N-2				str	str	str	no	no	wk	wk	no
80E-39N				med	str	nil	v-str	nil	med	no	no
84E-41N		An38	no	wk	str	str	no	str	nil	nil	no
136E-44S	green Ad.			str	str	str	no	str	med	nil	no
71E-41N	green Ad.		yes	str	str	wk	str	no	wk	med	no
80E-32N	green Ad.	An36	no	no	str	wk	v-str	no	med	med	no
32E-38S		An20?		wk	str	wk	str	med	med	med	no
61401	purple Ad.			v-str	str	no	med	med	med	no	str
61402	grey Ad.			v-str	wk	med	no	no	nil	str	no
61403	green Ad.			str	str	wk	str	med	no	str	nil
61404				str	str	wk	no	med	no	no	med
61405	biot. Dac.		yes	str	str	med	no	no		no	str
61406	agglom.			str			no	no	no	no	str
62301	basalt			str	str			no	no	str	no
62302	purple Ad.		yes	str	str	str	no	no	wk	no	str
62303	green Ad.			wk	str	str	str	med	str	no	no
62304	arg.wh.Ad.		yes	wk	str	wk	str	no	no	med	no
62305	basalt			str	str	wk	str	no	wk	str	no
62801	green Ad.	An35	no	wk	wk	str	str	str	nil	wk	no
62802		An42	no	str	str			v-str	nil	nil	nil
62803	pyrox. Ad.			wk	str	str	nil	nil	nil	str	med
62804	arg.wh.Ad.			no	str	str	no		nil	nil	no
62808	arg.wh.Ad.	An28	nil	str	str	str	no		str	wk	no
62809	green Ad.			v-str	str	str	no	wk	med	nil	no
62811				str	str	str	no	no	str	nil	no
62901	silic Ad.			v-str	wk	wk	no	str	v-str	nil	nil
70251	green Ad.			wk	str	str	no	no	str	nil	nil
70252				v-str	str	str	no	str	str	nil	nil
70253	grey Ad.	An35		v-str	str	str	no	med	wk	wk	nil
70301	arg.wh.Ad.			wk	str	str	med	no	med	nil	nil
70302	green Ad.		yes	wk	str	med	str	no	med	nil	nil
70304				wk	str	wk	str	str	wk	nil	nil
70306		An33		str	str	wk	str	str	str	nil	nil

Ad - andesite str. - strong med. - medium v-str. - very strong

The above table shows the main alteration features of each thin sections examined.

Mineralisation

A new mineralised showing containing lead, zinc, copper, silver and gold was discovered in the bank of a stream at approximately 66E-32S. It is slightly under four feet in width and dips at 70° to the south-east. It is best described by the accompanying sketch. It's boundaries are heavily pyritised and there are several sporadic clay bands. This showing is at the western margin of I.P. anomaly B (see accompanying geophysical report) and might represent peripheral mineralization to that which has its centre at anomaly B.

At approximately 79E-40N there is a basaltic andesite dyke containing fine grained chalcopyrite (Specimen #62305). I.P. anomaly 'C' is just east of the dyke but could not be caused by material similar to that of the dyke because the latter does not contain sufficient sulphide or other conductive minerals.

Geochemistry

The geochemical survey continues that done in previous years. Because that work had diminished the gold potential of the property but had encouraging base metal results emphasis was placed upon these metals and samples were analysed for their cold extractable content as well as total metal. 273 rock and soil samples were analysed by Chemex Labs in North Vancouver.

Soil samples weighing at least 200 grams were normally taken

from the B1 Horizon using a stainless steel trowel from a hole dug by mattock. After collection the samples were packaged in standard high wet strength kraft bags.

Geochemical Results

These are illustrated on the accompanying maps and show Pb enrichment over a large area with some zones of high level cold extractable (2N HNO_3) lead in low lying areas. This suggests ground-water movement with Pb saturation.

This enrichment could be derived from complex vein type mineralisation, in the area of 112-120E/40-64N, especially when considered in conjuction with the geophysical result.

T. Roger
19.X.73

DECLARATION OF EXPENSES

Geological, Geochemical, Geophysical Surveys 1973

Moosehorn, Sum and Jug Groups

Men Employed on Survey

T. C. Scott	3 June - 10 July	38 @ $36.73	$ 1395.74
M. Ramalingaswami	" "	38 @ $27.62	1049.56
I. Jackisch	" "	38 @ $20.43	776.34
P. Gray	" "	38 @ $24.05	913.90
V. Sudhakar	" "	38 @ $17.50	665.00
V. Hogan	" "	38 @ $27.62	1049.56
I. Abe	6 June - 10 July	N/C	--
H. Yoshida	" "	35 @ $40.37	1412.95
K. Kawasaki	" "	35 @ $33.08	1157.80
D. Quock	5 June - 21 June	17 @ $25.00	425.00
C. Quash	" "	17 @ $25.00	425.00
K. Hashimoto	18 June - 10 July	23 @ $55.00	1265.00
		355 man days	$ 5850.10

Direct Field Expenditures

(see Schedule 'A')	355 man days @ 70.73	25,109.15

Geochemical Analysis

	273 rock and soil samples	1,198.00

Grid Construction

	20 line-miles (time and wages included in tables above)	--

Drafting, reproduction, typing, etc.	200.00
	$32,357.25

T. Rogers
19.X.73.

Schedule A

SUMAC 210/220 PROJECTS

Allocatable Costs - 1973		$
Camp equipment & supplies		4,605
Equipment rental		4,000
Fuel		1,806
Catering		4,522
Communications		1,416
Transportation		11,407
Helicopter charter		20,804
	Total	48,660

Man-days

Property	Period	Max. No. of Men	Man-days
Moosehorn	3 June - 10 July	12	355
Alberts Hump	11 July - 18 Aug.	10	206
Kutcho	19 Aug. - 9 Sept.	8	127
		Total	688

Cost per man-day

$= \frac{48,660}{688} = \$70.73$

T. Rogers
19.X.73

Schedule B

CHEMEX LABS LTD.

212 Brooksbank Avenue, North Vancouver, B.C.

Description of preparatory and analytical procedures.

PREPARATION PROCEDURE FOR ROCK GEOCHEM SAMPLES - Weighing less than 450 gms.

(1) Samples are sorted, recorded and dried @ approx. 120°F.

(2) Dried samples are processed to -1/8" through geochem crusher only.

(3) The entire crushed sample is pulverized to -100 mesh using rotary pulverizer.

(4) Pulverized sample is rolled 100 times to produce a homogeneous pulp.

(5) 0.5 grams of pulp is weighed into test tube for $HClO_4$-HNO_3 digestion and final analyses of ppm Cu, Mo, Pb, Zn, Ag etc. A 5 gram sample is digested to dryness with aqua-regia for the ppb gold analyses.

The Pulverizer and crusher are thoroughly cleaned between samples to reduce contamination problems.

PROCEDURE FOR THE ANALYSIS OF TRACE GOLD IN SOIL AND SILT MATERIALS.

Step 1. The sample is dried at 110°F, sieved to -80 mesh and stored in a coin envelope.

Step 2. A 2 gm sample is weighed into a 100 ml beaker.

Step 3. 15 ml of aqua regia (3 parts HCl to 1 part HNO_3) is added to the pulp.

Step 4. After sitting for 15 minutes, the sample is heated to dryness.

Step 5. More aqua regia is added and the sample is again evaporated to dryness.

Step 6. The soluble salts are dissolved in 25% HCl and mixed.

Step 7. The gold is extracted as the bromide in 5 ml. of methyl isobutyl ketone.

Step 8. The organic layer is then analysed on the Atomic Absorption Spectrophotometer against prepared standards.

GEOCHEMICAL LABORATORY PROCEDURE FOR THE HANDLING AND ANALYSES OF SOIL AND SILT MATERIALS CONTAINING TRACES OF Cu, Mo, Pb, Zn, Ni, Co and Ag.

Step 1. Samples are dried @ 110°F and then sieved to -80 mesh consistency through a nylon and stainless steel sieve. Presieved materials are processed starting at Step 2.

Step 2. 0.50 grams of the dry pulp is weighed into a calibrated test tube.

Step 3. 3 mls. of perchloric acid and 1 ml. of nitric acid is added to sample.

Step 4. Samples are digested at low heat initially and then the temperature is raised to 203°C. Digestion time 2 to 3 hours.

Step 5. Digested samples are cooled, made up to 25 ml. volume with distilled water and solutions are thoroughly mixed.

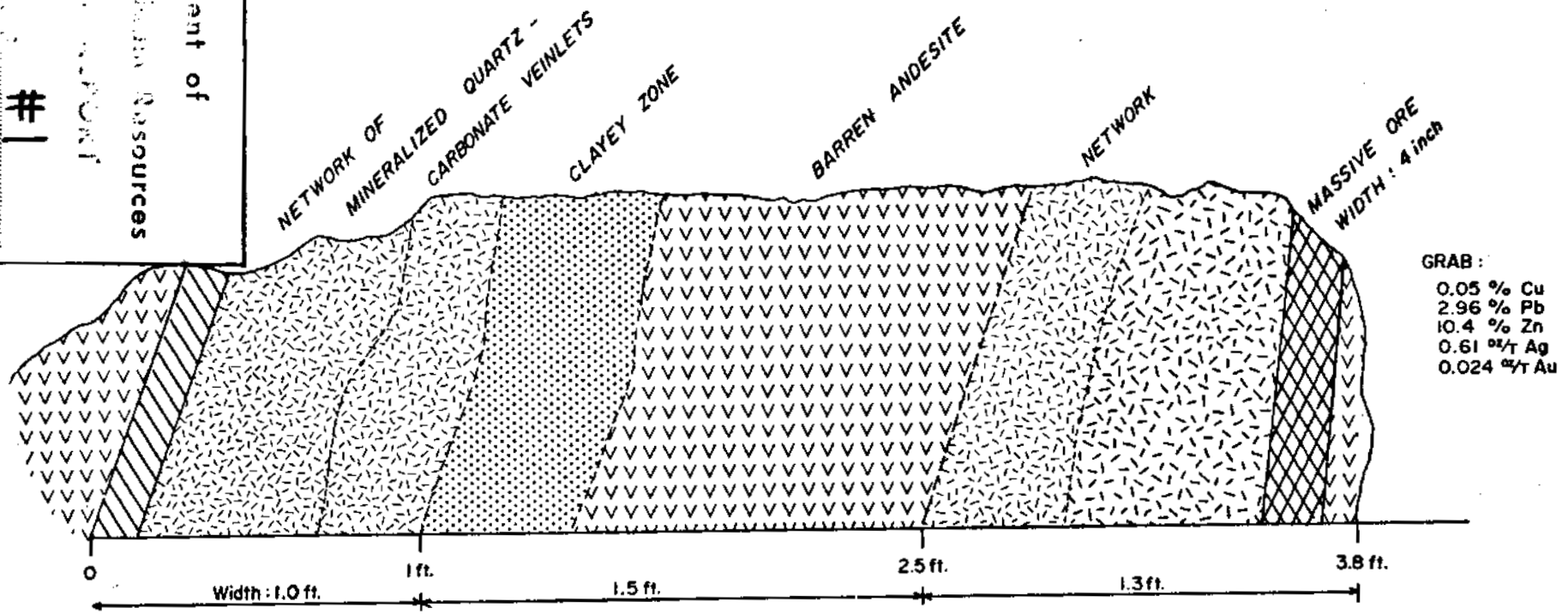
Step 6. Analyses for Cu, Mo, Pb, Zn, Ni, Co and Ag by Atomic Absorption procedures. Detection limits as per our brochure.

Bruce W. Brown,
Manager Laboratory Division.

MOOSEHORN PROPERTY

SKETCH OF MINERALIZATION ON LINE 66E - 32S

SCALE: 1" = 1/2 FT



LEGEND

SYMBOLS

- Bedding (strike and dip)
- Jointing
- Fault
- Geological boundaries
- Pyritic rock
- Andesite
- Agglomerate
- Bedding outcrops
- Float
- Rock sample location
- Claim post

ABBREVIATIONS

arg	Argillic
bg	Bearing
bi	Biotite
chl	Chlorite
dk	Dark
epi	Epidote
fn	Fine
grn	Green
hb	Hornblend
imp	Impregnated
limo	Limonite
mt	Magnetite
med	Medium
pheno	Phenocryst
pl	Plagioclase
porph	Porphyritic
py	Pyrite
v	Very
wh	White
agglo	Agglomerate
Ad	Andesite
dac	Dacite (docitic)
Cu	Copper
hm	Hematite
Pb	Lead
Qtz	Quartz
Zn	Zinc

4631
M2

To accompany assessment report by
T. Rodgers P.Eng., October 1973

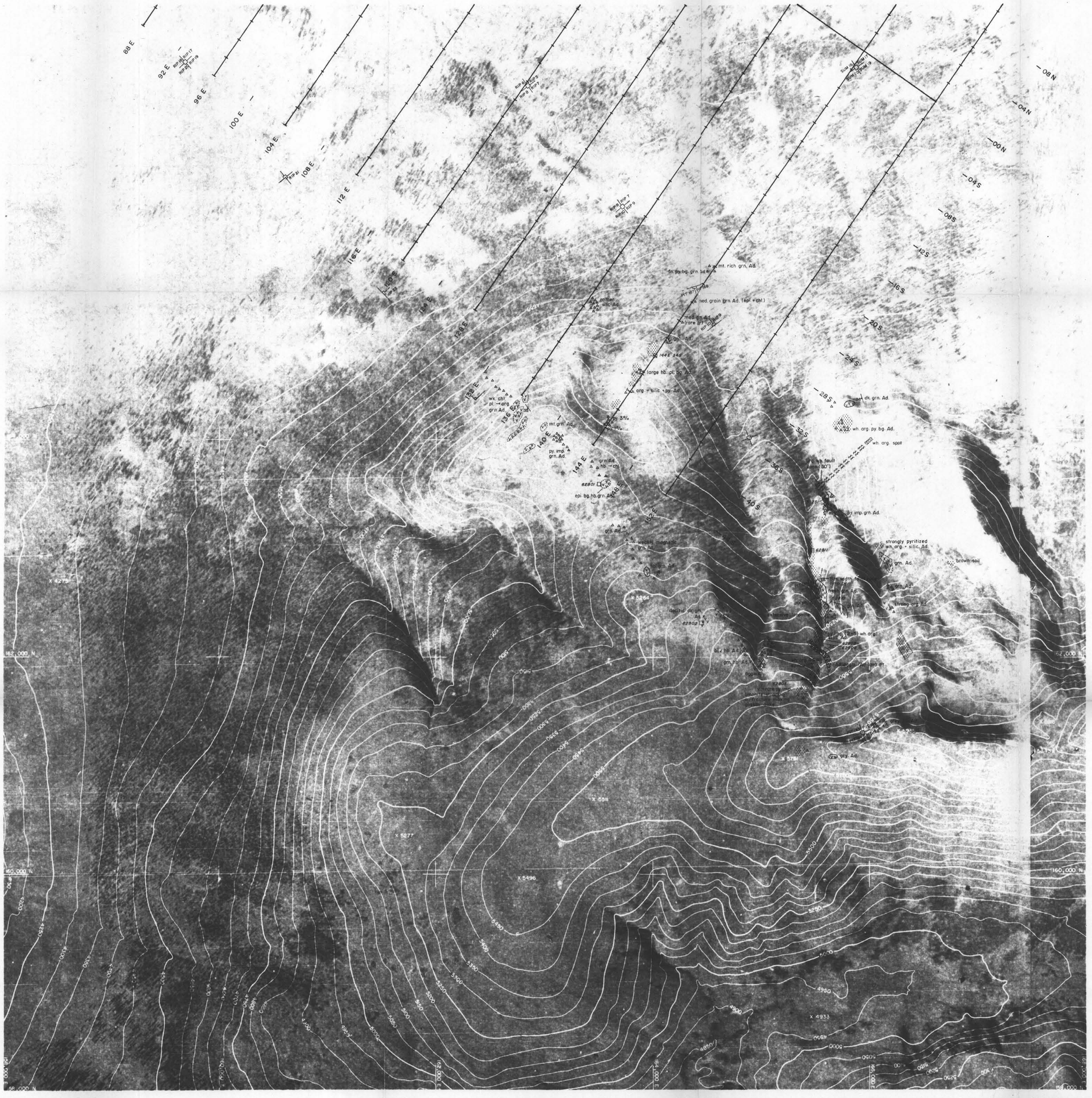
SULLIVAN RODGERS

SUMAC - 211

MOOSE HORN - JUG - SUM GROUPS

GEOLOGY

FEET 0 400 800			
METERS 0 50 100 200			
AUGUST 1973	1" = 400'	N.T.S. 94 E 6/E	Mac No. 211-G-1A



LEGEND

SYMBOLS

- Bedding (strike and dip)
- Jointing
- Fault
- Geological boundaries
- Pyritic rock
- Andesite
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- Bedding outcrops
- Float
- 62802 Rock sample location
- Claim post

ABBREVIATIONS

arg	Argillic
bg	Bearing
bi	Biotite
chl	Chlorite
dk	Dark
epi	Epidote
fn	Fine
grn	Green
hb	Hornblend
imp	Impregnated
limo	Limonite
mt	Magnotite
med	Medium
pheno	Phenocryst
pl	Plagioclase
porph	Porphyritic
py	Pyrite
v	Very
wh	White
agglo	Agglomerate
Ad	Andesite
dac	Dacite (dacitic)
Cu	Copper
hm	Hematite
Pb	Lead
Qtz	Quartz
Zn	Zinc

4631
M3

To accompany assessment report by
T. Rodgers P.Eng., October 1973

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MOOSEHORN - JUG - SUM GROUPS

GEOLOGY

FEET 0 400 800
METERS 0 50 100 200

DATE AUGUST 1973 | SCALE 1" = 400' | N.T.S. 94 E 6/E | DRAWING NO. 211-G-1B

LEGEND

46 — Cu (PPM)
46 — Pb (PPM)
117 — Zn (PPM)

CLAIM POST

4631
M4

To accompany assessment report by
T. Rodgers P.Eng., October 1973

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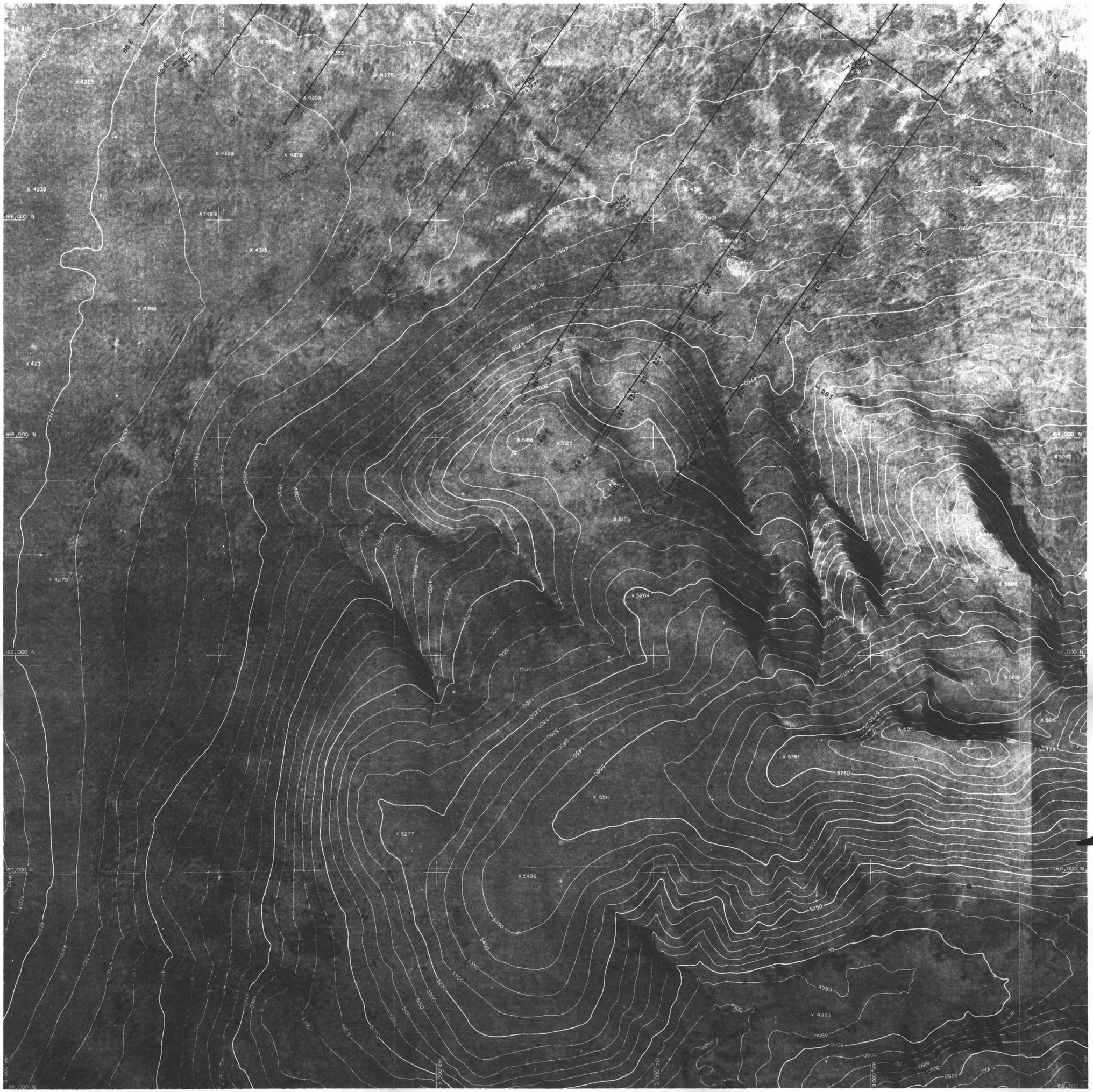
MOOSEHORN - JUG - SUM GROUPS

SOIL GEOCHEMISTRY
(TOTAL EXT. - COLD EXT.)

FEET 0 400 800
METERS 0 50 100 200

Date AUGUST 1973 Scale 1" = 400' N.T.S. 54 E 6/E Map No. 211-GE-2A



4631
M5

To accompany assessment report by
T. Rodgers P.Eng., October 1973

SULLIVAN RODGERS

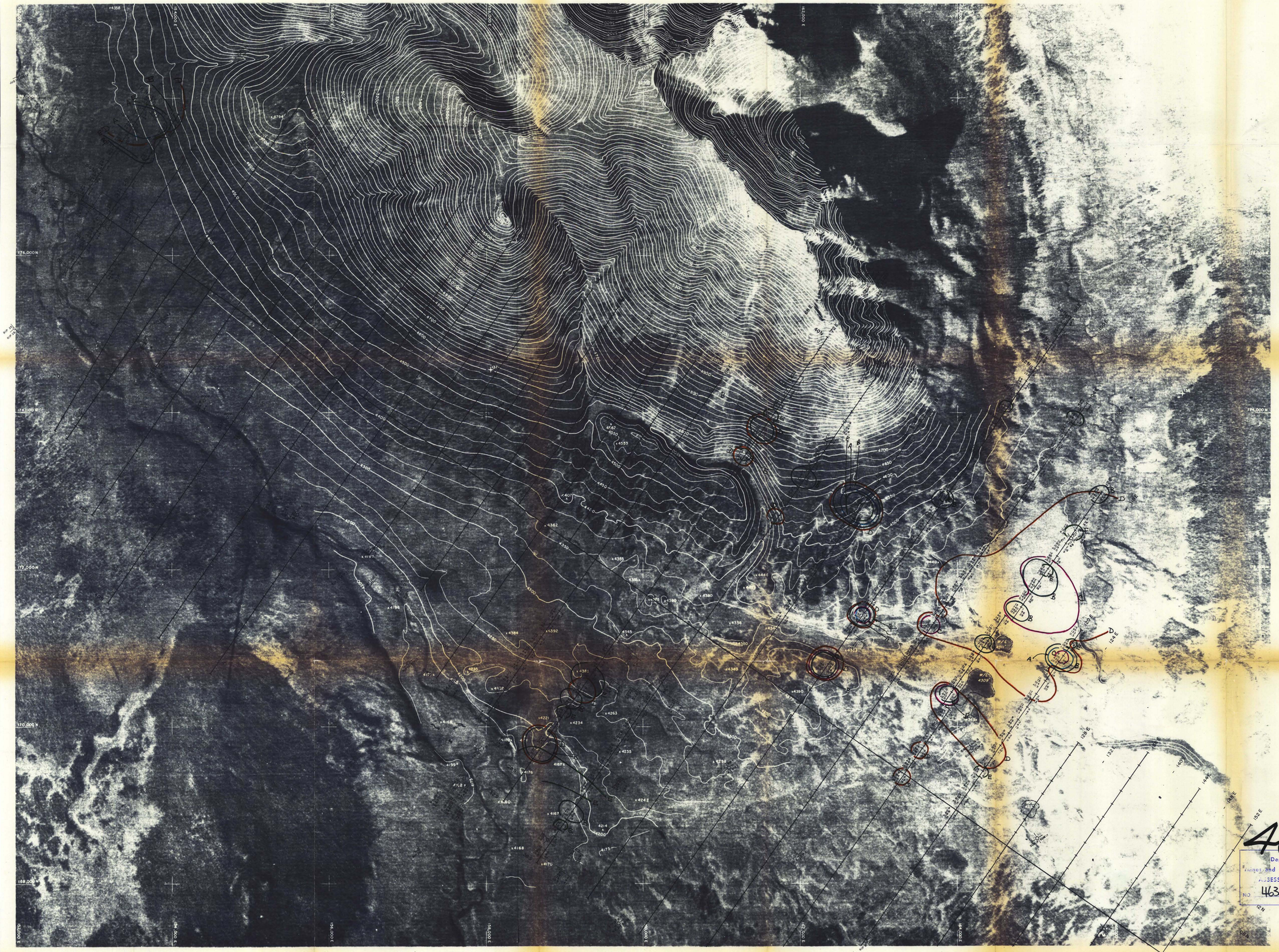
SUMAC - 211

MOOSEHORN - JUG - SUM GROUPS

SOIL GEOCHEMISTRY
(TOTAL EXT. - COLD EXT.)

FEET 0 400 800
METERS 0 50 100 200

Date AUGUST 1973 | Scale 1" = 400' | N.T.S. 94 E 6/E | Map No. 211-GC-28



LEGEND

SOIL

TOTAL EXT.		COLD EXT.
Cu (PPM)	13	Cu (PPM)
Pb (PPM)	44	Pb (PPM)
Zn (PPM)	350	Zn (PPM)
Ag (PPM)	0.9	

SILT

TOTAL EXT.		COLD EXT.
Cu (PPM)	16	Cu (PPM)
Pb (PPM)	90	Pb (PPM)
Zn (PPM)	360	Zn (PPM)
Ag (PPM)	0.5	

ROCK

7	Cu (PPM)
72	Pb (PPM)
41	Zn (PPM)
<0.5	Ag (PPM)
<30	As (PPM)

CLAIM POST

A — Zn >400 PPM
B — Zn >200 PPM
C — Pb >100 PPM
D — Pb >50 PPM
E — Ag >1 PPM

4631-M6

To accompany assessment report by T. Rodgers P.Eng., October 1973

Department of Mines and Petroleum Resources
ASSESSMENT REPORT NO. 4631 MAP #6

SULLIVAN RODGERS

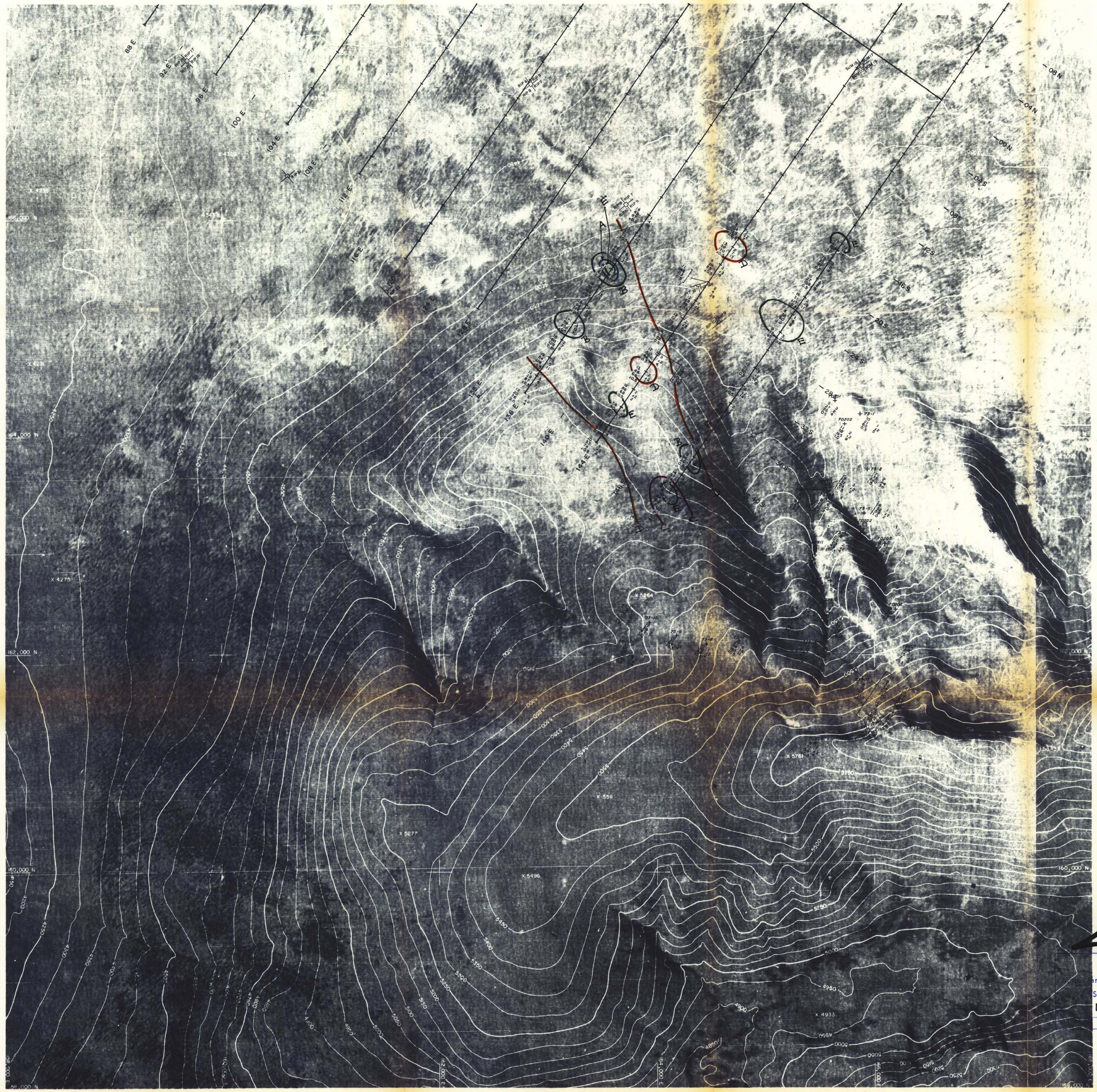
SUMAC - 211

MOOSEHORN-JUG-SUM GROUPS

GEOCHEMISTRY
INTERPRETATION
(TOTAL EXTRACTABLE)

FEET 0 400 800
METERS 0 50 100 200

AUGUST 1973 Scale 1" = 400' N.T.S. 94 E 6/E Map No. 211-SC-M



LEGEND

SOIL

TOTAL EXT.			COLD EXT.
Cu. (PPM)	13	2	Cu. (PPM)
Pb. (PPM)	86	16	Pb. (PPM)
Zn. (PPM)	260	16	Zn. (PPM)
Ag. (PPM)	0.5	—	

SILT

TOTAL EXT.			COLD EXT.
Cu. (PPM)	16	6	Cu. (PPM)
Pb. (PPM)	80	28	Pb. (PPM)
Zn. (PPM)	360	105	Zn. (PPM)
Ag. (PPM)	0.5	—	

ROCK

7	Cu. (PPM)
72	Pb. (PPM)
41	Zn. (PPM)
<0.5	Ag. (PPM)
<30	Au. (PPM)

CLAIM POST

A — Zn. > 400 PPM
B — Zn. > 200 PPM
C — Pb. > 100 PPM
D — Pb. > 50 PPM
E — Ag. ≥ 1 PPM

4631-M7

To accompany assessment report by T.Rodgers P.Eng., October 1973

SULLIVAN RODGERS

SUMAC - 211

MOOSEHORN - JUG - SUM GROUPS

GEOCHEMISTRY

INTERPRETATION
(TOTAL EXTRACTABLE)

FEET 0 400 800
METERS 0 50 100 200

Date	Scale	N.T.S.	Map No.
AUGUST 1973	1" = 400'	94 E 6/E	211-GC-1B

LEGEND

SOIL

TOTAL EXT.		COLD EXT.
Cu (PPM)	15 -	Cu (PPM)
Pb (PPM)	66 -	Pb (PPM)
Zn (PPM)	260 -	Zn (PPM)
Ag (PPM)	0.5 -	

SILT

TOTAL EXT.		COLD EXT.
Cu (PPM)	16 △ 6	Cu (PPM)
Pb (PPM)	80 -	Pb (PPM)
Zn (PPM)	360 -	Zn (PPM)
Ag (PPM)	0.5 -	

ROCK

□ 7 - Cu (PPM)
72 - Pb (PPM)
>10 - Zn (PPM)
<.50 - Ag (PPM)

CLAIM POST

Zn. 100 PPM
Zn. 50 PPM
Pb. 40 PPM
Pb. 20 PPM

4631-M8

To accompany assessment report by
T. Rodgers P.Eng., October 1973

SULLIVAN RODGERS

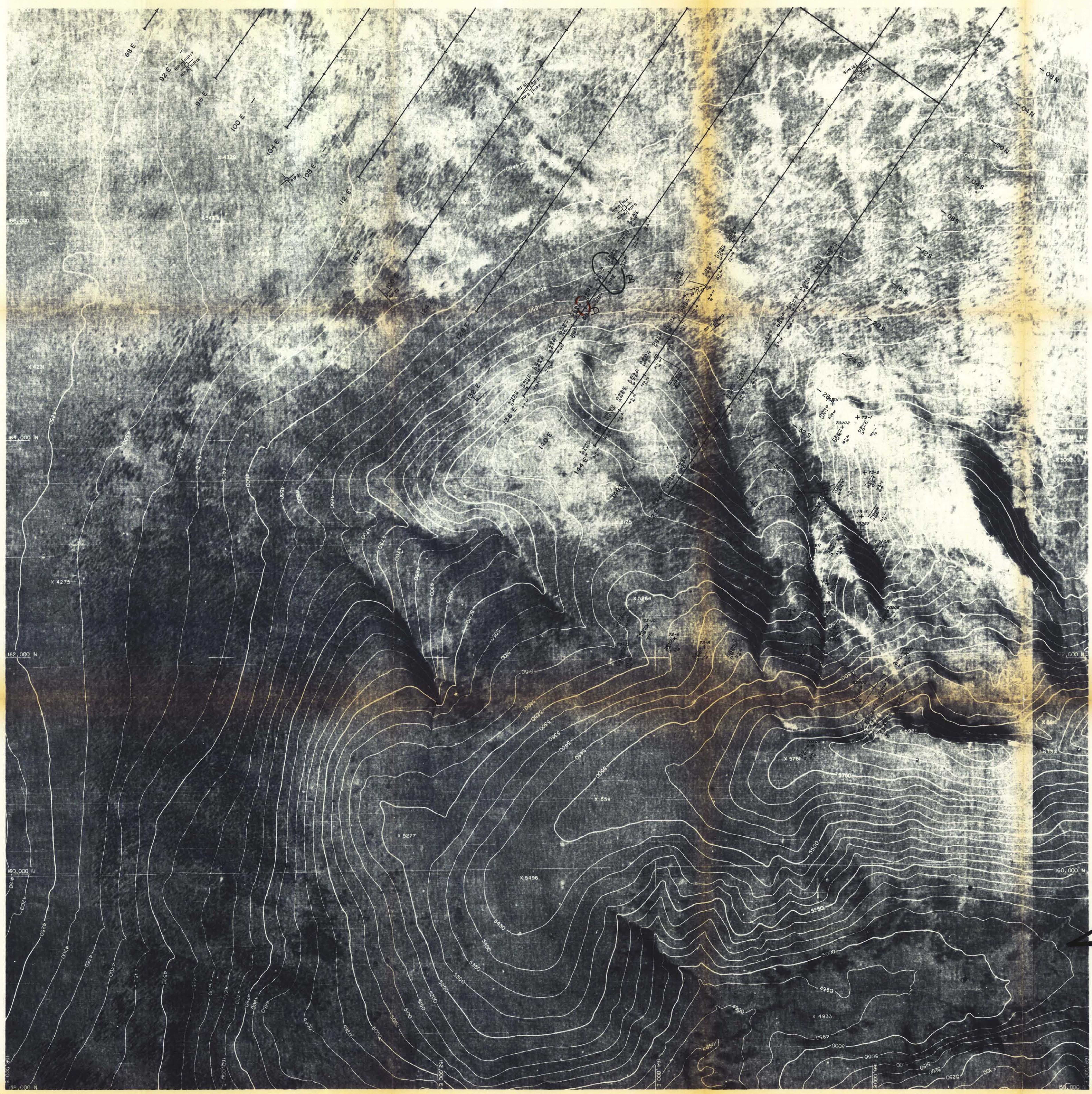
SUMAC - 211

MOSEHORN-JUG-SUM GROUPS

GEOCHEMISTRY
INTERPRETATION
(COLD EXTRACTABLE)

FEET 0 400 800
METERS 0 50 100 200

AUGUST 1973 | scale 1"= 400' | N.T.S. 94 E 6/E | drg. no. 211-GC-2A



LEGEND

SOIL

TOTAL EXT.			COLD EXT.
Cu. (PPM)	13	2	Cu. (PPM)
Pb. (PPM)	86	16	Pb. (PPM)
Zn. (PPM)	260	16	Zn. (PPM)
Ag. (PPM)	0.5	—	

SILT

TOTAL EXT.		△	COLD EXT.
Cu. (PPM)	16	6	Cu. (PPM)
Pb. (PPM)	80	28	Pb. (PPM)
Zn. (PPM)	360	105	Zn. (PPM)
Ag. (PPM)	0.5	–	

ROCK

□	
7	Cu. (PPM)
72	Pb. (PPM)
41	Zn. (PPM)
0.5	Ag. (PPM)
30	Au. (PPM)

CLAIM POST

A — Zn. > 100 PPM
B — Zn > 50 PPM
C — Pb. > 40 PPM
D — Pb. > 20 PPM

4631-M9

T. Rodgers

To accompany assessment report by
T. Rodgers P.Eng., October 1973

SULLIVAN RODGERS

SUMAC - 211

MOOSEHORN - JUG - SUM GROUPS

GEOCHEMISTRY

INTERPRETATION

(COLD EXTRACTABLE)

FEET 0 400 800
METERS 0 50 100 200

Date AUGUST 1973	Scale 1" = 400'	N.T.S. 94 E 6/E	Map No. 211-GC-3B