Cyprus Exploration Corporation, Limited

RONKA EM-16 AND MAGNETOMETER TRAVERSES IN AREAS A, B, AND D, HIGHLAND VALLEY

C. Carew McFall November 5, 1969

92-I-5 811116
SKUHUN CK.

Ver. Office Copy.

CCM

C. CAREW McFALL
GEOLOGIST

1327 SARATOGA AVENUE
SAN JOSE, CALIFORNIA 95129
TEL. 408 252-7411

November 5, 1969

Mr. J. B. P. Sawyer
Manager, Canadian Exploration
Cyprus Exploration Corporation, Ltd.
510 West Hastings Street
Vancouver 2, British Columbia, Canada

Dear Mr. Sawyer:

As you requested, Ronka EM-16 and magnetometer traverses were run across Cyprus' three blocks of claims in the Highland Valley district, Areas A, B, and D. This work was carried out in the field with the considerable help of your Mr. Langlois, October 9-19, except that I returned to the field alone October 21-22.

It is hoped that the accompanying report fulfills your requirements and that I shall have the opportunity to be of service to you in the future.

Regards,

C. Carew McFall

A REPORT

RONKA EM-16 AND MAGNETOMETER TRAVERSES IN

AREAS A, B, AND D

HIGHLAND VALLEY, BRITISH COLUMBIA

FOR

CYPRUS EXPLORATION CORPORATION, LTD.

By

C. Carew McFall

Consulting Geologist

November 5, 1969

SUMMARY

Traverses were made October 9-19 and 21-22, 1969 across Areas A, B, and D in Highland Valley district, British Columbia using a Ronka EM-16 device and a Scintrex magnetometer. Two prospective areas, called here Able and Baker Prospects, were found in Area B. Both areas are covered by glacial till, but bedrock near the Able Prospect shows traces of copper minerals. IP lines are suggested over both to evaluate them further.

A regional attraction on the Ronka EM-16 device by a large, low-grade, disseminated copper ore body such as Lornex was demonstrated but is so subtle as to be easily masked by terrain effects in hilly country.

INTRODUCTION

The consulting mining engineer, Ross Kidd, of Vancouver pointed out in a November 22, 1968 report to Cyprus Exploration Corporation, Ltd. that the known copper ore bodies of the Highland Valley district have essentially the same geologic-magnetic settings. Ultimately, Mr. Kidd selected three areas in this district having this same setting and ranked their prospectiveness in this order: A, B, and D. Claims were staked on any open ground near these targets in the winter of 1968-1969 under adverse conditions.

The present project was designed to explore these three blocks of claims for copper. As the claims are about 95 percent covered by glacial till, a Ronka EM-16 device and a portable Scintrex magnetometer were used. These instruments were walked over 25 traverses during the period October 9-19 and 21-22, 1969. Readings were taken at stations generally 25 yards apart, marked by flagging which is identified every

100 yards. The traverses were generally run either northeast or southwest but are plotted on the accompanying diagrams as though all were traversed from left to right.

Ronka EM-16

Reading the EM (electromagnetic) diagrams is simple. Ordinarily, the "in phase" reading is zero. As a conductor is approached, these readings become increasingly positive and reach a maximum beside the conductor. Over the conductor the readings pass through zero to a minimum and then become decreasingly negative going away from the conductor. Under ideal conditions, the vertical distance between the maximum and the minimum is proportional to the size and conductivity of the conductor and the horizontal distance is equal to the depth to the conductor. High-grade copper veins in the Highland Valley district give an amplitude of from 20° to 60°.

The quadrature curve is generally just opposite of the "in phase" curve. In the Highland Valley district the quadrature curve appears to be damped by the glacial till.

Terrain effects on the Ronka EM-16 are serious; approaching or leaving a hill gives the effect of approaching or leaving a large conductor. In Area B, where the ground slopes steeply south, the zero on the "in phase" curve is shifted about 15 degrees by the attraction of the hill.

Magnetometer

The magnetometer, being affected almost entirely by what is directly beneath, helps pinpoint faults, contacts, and EM anomalies. The magnetometer readings were plotted in the field at 1" equals 100 gammas and replotted on the accompanying diagrams at 1" equals 500 gammas.

LORNEX

Previous work by the writer in the Highland Valley district suggested that there was a subtle regional attraction on the Ronka EM-16 by large, low-grade, disseminated copper ore bodies. A traverse October 12, 1969 confirmed this. As shown on the accompanying Lornex diagram, the traverse started at the east edge of the large, low-grade, disseminated Lornex deposit and went northeastward. A regional attraction on the Ronka by this ore body caused the "in phase" readings to be negative for over three-fourths of a mile, although the terrain was essentially flat. Rugged terrain could easily mask this effect, but otherwise, it offers, in areas like Highland Valley, an inexpensive way to reconnoiter for such deposits. This may apply to the recently developed airborne version of the Ronka EM-16 device.

AREA A

The Cyprus claims in Area A do not show promise according to the appended diagrams. A mildly prospective area, near the southwest end of Traverse A-1 and southward across Traverses A-2 and A-8, has been extensively examined by dozer cuts, induced polarization (IP) surveys, and drilling. It seems unlikely that anything large enough to be of interest to Cyprus was missed.

AREA B

Two prospective areas, labelled Able and Baker Prospects, are stippled on the accompanying 1" equals 300' map of Area B. Able Prospect, which seems by far the more promising, is apparently at the junction of a northwest-trending fracture, an east-trending fracture, and the northeast-trending contact between the Bethlehem and the Bethsaida Phases of the "granites" making up the Guichon batholith. There are no outcrops within the prospective area but minor shows of bornite, chalcopyrite, and malachite were found in the bedrock just to the north. Selected pieces of float collected downhill from the prospect assayed 0.04 percent copper. Reportedly, a silt sample from the gulch at about B8-600 contained 1000 ppm copper.

The 500-600 feet of horizontal distance between the maximum and the minimum "in phase" readings at the Able Prospect could mean 500-600 feet depth to the conductor or a broad, somewhat disseminated conductor.

A 3200-foot IP line is recommended to further evaluate the Able Prospect. This line should center at about B5-900 and trend N. 40° E. (essentially along B-5). A 200-foot electrode spacing would not miss something fairly narrow, but should have sufficient penetration so as not to miss a deep ore body. Given sufficient encouragement, parallel I. P. lines should be run 400 feet apart.

The Baker Prospect, which is along a WNW-trending fracture in Area B, does have nearby outcrops of very highly fractured granite, but shows no copper mineralization at the surface. The "in phase" curve suggests a depth of 250 feet to mineralization. A 3200-foot IP line is recommended to further evaluate the Baker Prospect, centering about B3-1450 and trending N. 40° E. Parallel lines 400 feet apart could be run given encouragement. A 200-foot electrode spacing is recommended.

The Cyprus ground at the B Area is not as extensive as its KU Claims; being overlapped essentially one claim width on the south by the BIN and SKU Claims and an undetermined portion of a claim width on the west by the BIN Claims. However, this leaves most of the Able and all of the Baker Prospects on Cyprus ground, unless there are other valid, predating claims.

During the past summer, Cominco did considerable IP work and drilled 12 holes to about 300 feet adjacent to the KU Claims on the BIN Claims to the south and west. Of course, some of the IP lines traversed the Able Prospect. Their dipole spacing was 400 feet.

AREA D

Outstanding anomalies were not found in Area D and essentially all of the ground is held by either Alwin or Noranda. The anomalies found are ranked as follows: (1) D-1 1500-1600. This is the best anomaly found along the northwest-trending shear zone shown on the accompanying map of Area D. (2) D-2 2400-2500. This anomaly, which may be on Cyprus ground, coincides essentially with a north-south stream but did not show up anomalous on nearby Traverses D-1 and D-3. It is apparently rather small in area. (3) D-5 400-500. (4) D-1 1900-1950, and (5) D-1 2100.

Noranda is winding up a program involving considerable IP work and some drilling in the areas west and south of the Alwin Claims. Noranda's Dan Pegg said they got only "teasers".

The plotting of the Alwin Claim Block on the accompanying map of Area D is of questionable accuracy. A corner post for their RM 3, 4,

5, and 6 Claims was found 200 feet south of D-1 1800. The block as it appears on the recorder's map was then shifted onto this point.

RECOMMENDATIONS

(1) Run IP lines over the Able and the Baker Prospects in Area B.

(2) Record work done on all claims but do not invest further in keeping the claims in Areas A and D.

(3) Explore widely in Highland Valley and similar areas with ground and airborne Ronka devices looking for the regional attraction of a large, disseminated deposit.

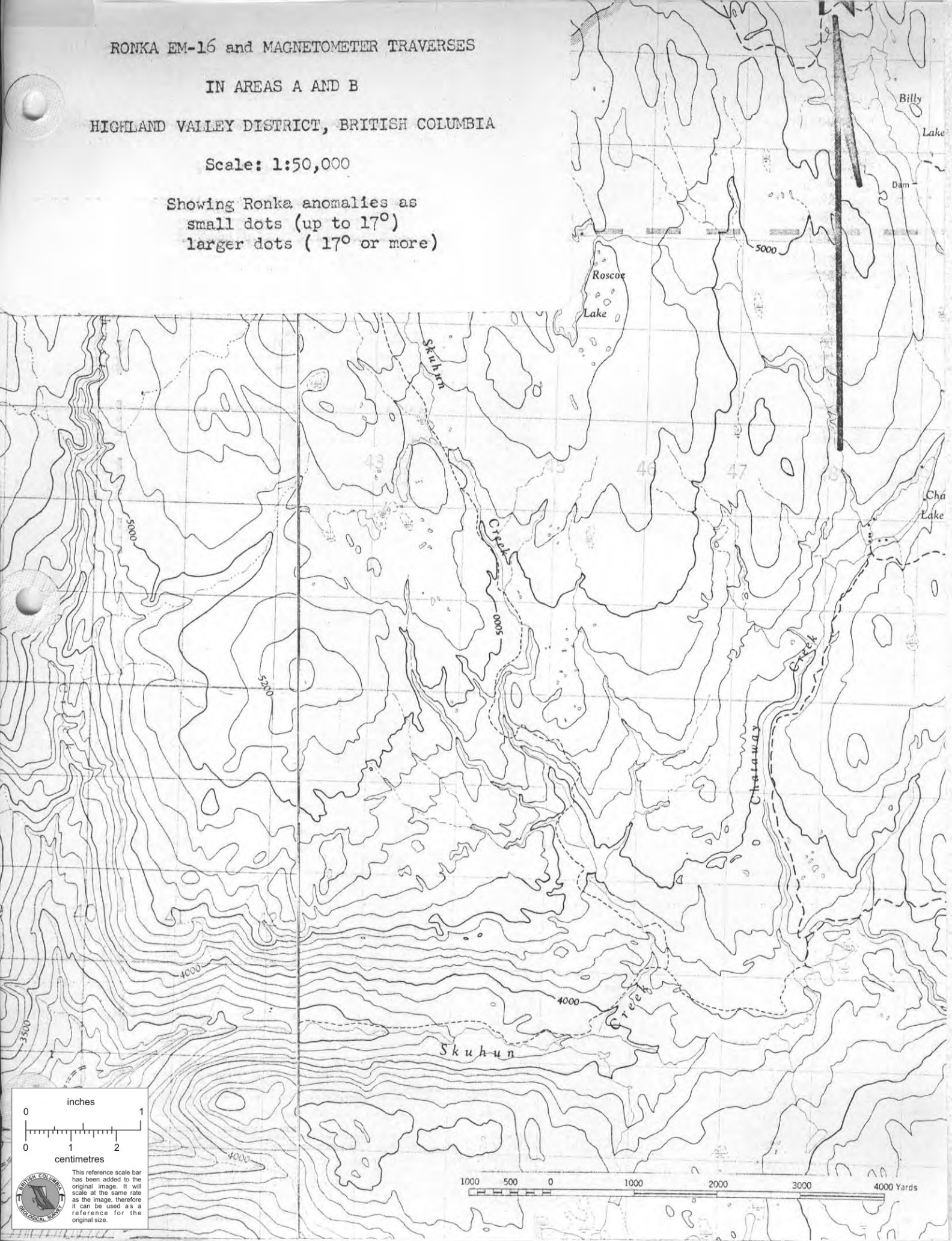
RONKA EM-16 and MAGNETOMETER TRAVERSES

IN AREAS A AND B

HIGHLAND VALLEY DISTRICT, BRITISH COLUMBIA

Scale: 1:50,000

Showing Ronka anomalies as
small dots (up to 17°)
larger dots (17° or more)



inches
0 1
0 1 2
centimetres
This reference scale bar has been added to the original image. It will scale at the same rate as the image, therefore it can be used as a reference for the original size.

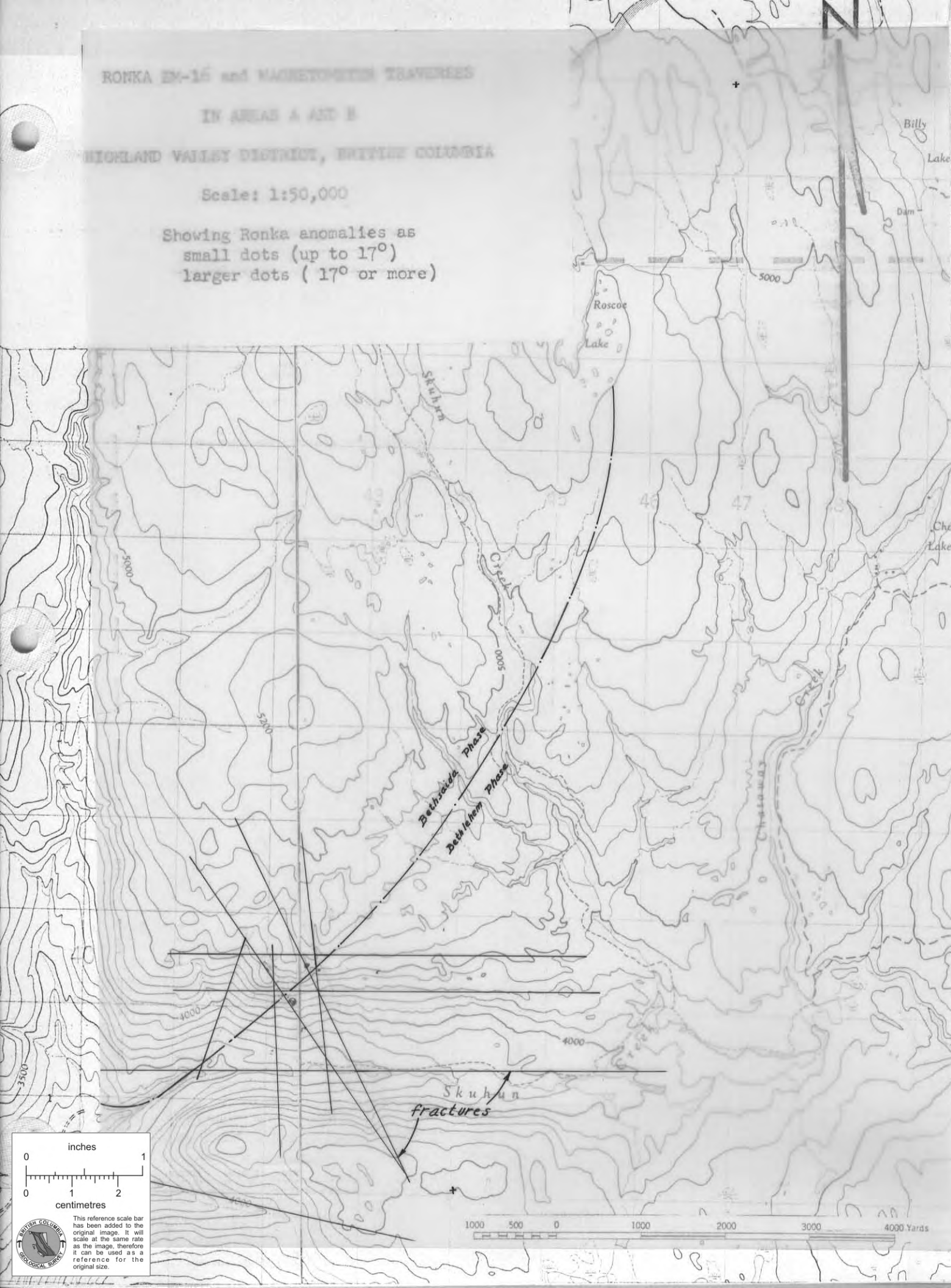
RONKA EM-16 and MAGNETOMETER TRAVERSES

IN AREAS A AND B

HIGHLAND VALLEY DISTRICT, BRITISH COLUMBIA

Scale: 1:50,000

Showing Ronka anomalies as
small dots (up to 17°)
larger dots (17° or more)



inches
0 1
0 1 2
centimetres

This reference scale bar has been added to the original image. It will scale at the same rate as the image, therefore it can be used as a reference for the original size.

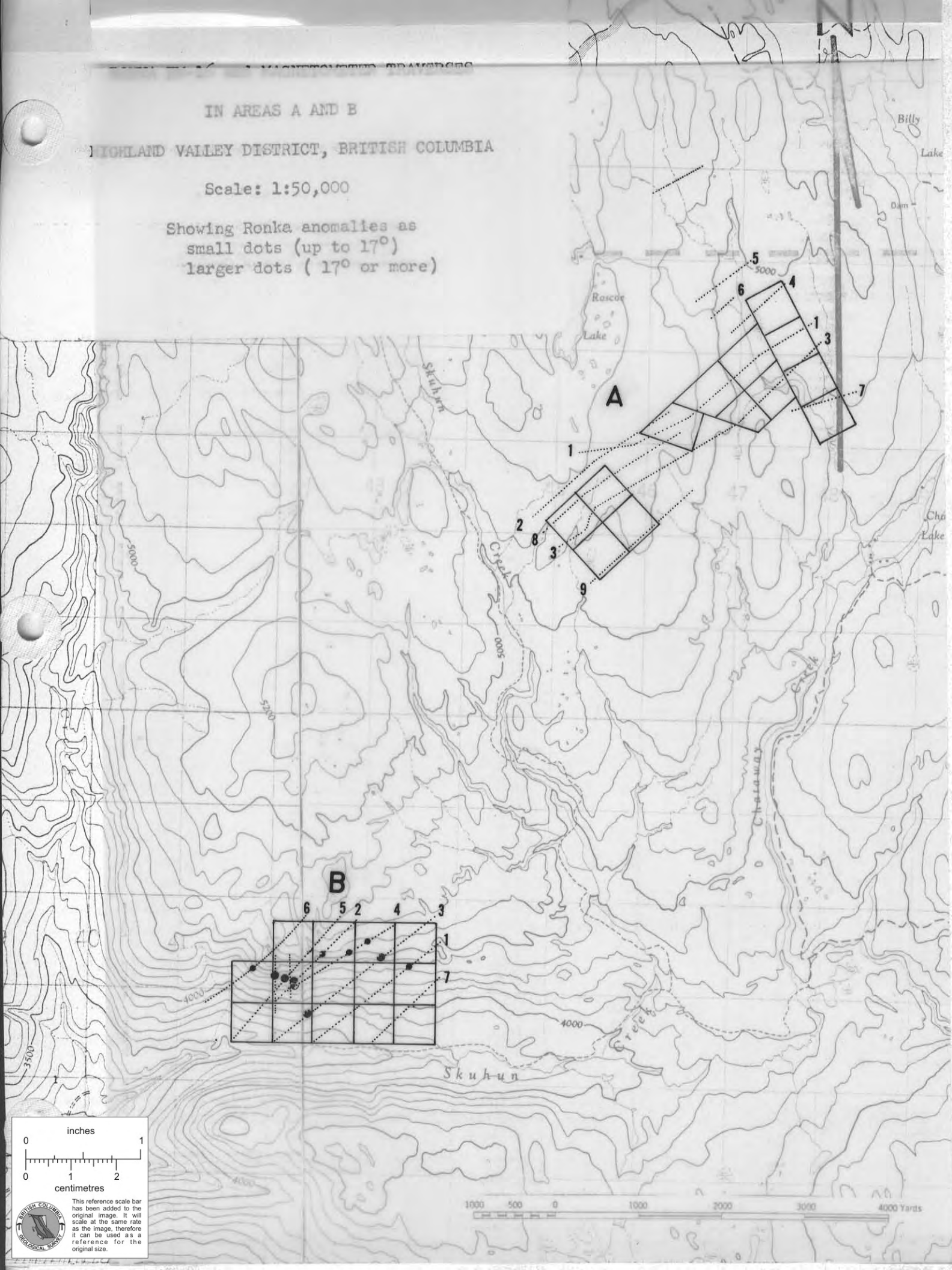
BRITISH COLUMBIA GEOLOGICAL SURVEY

IN AREAS A AND B

HIGHLAND VALLEY DISTRICT, BRITISH COLUMBIA

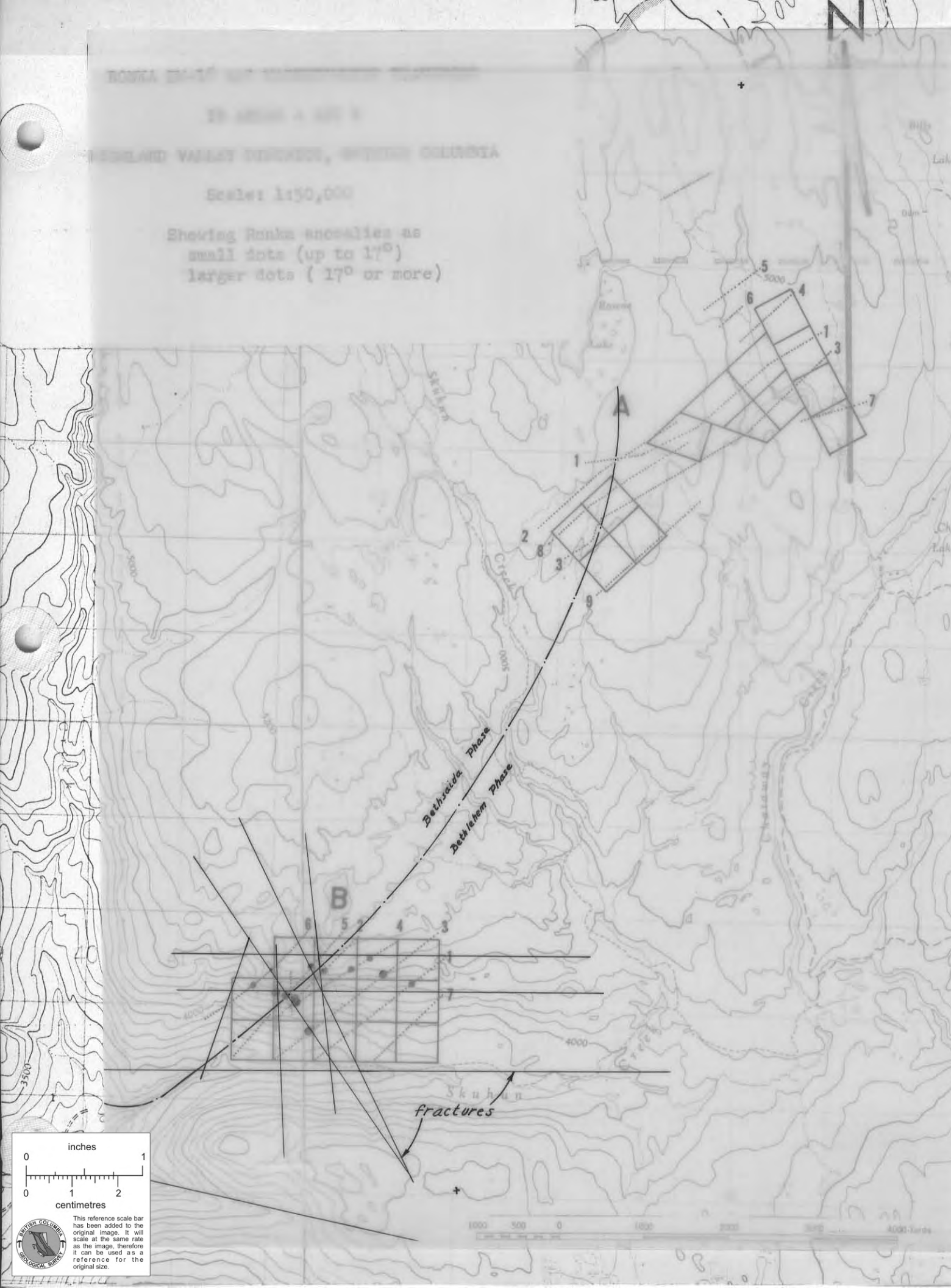
Scale: 1:50,000

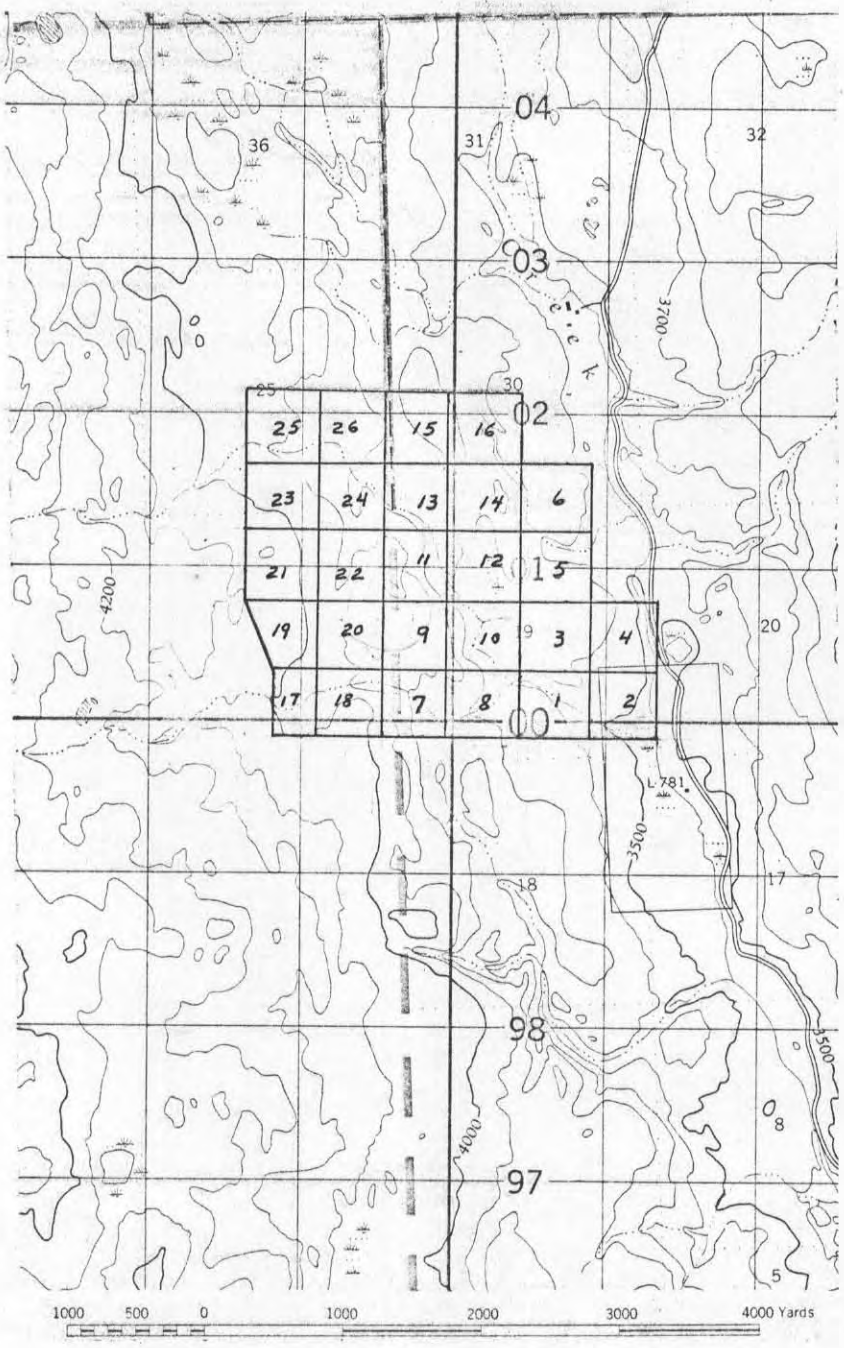
Showing Ronka anomalies as
small dots (up to 17°)
larger dots (17° or more)



inches
0 1
0 1 2
centimetres

This reference scale bar has been added to the original image. It will scale at the same rate as the image, therefore it can be used as a reference for the original size.


N
A
B
1
2
3
4
5
6
7
8
9
Bethsaida Phase
Bethlehem Phase
fractures
5000
4000
3500
inches
0
1
0
1
2
centimetres
This reference scale bar has been added to the original image. It will scale at the same rate as the image, therefore it can be used as a reference for the original size.
BRITISH COLUMBIA GEOLOGICAL SURVEY

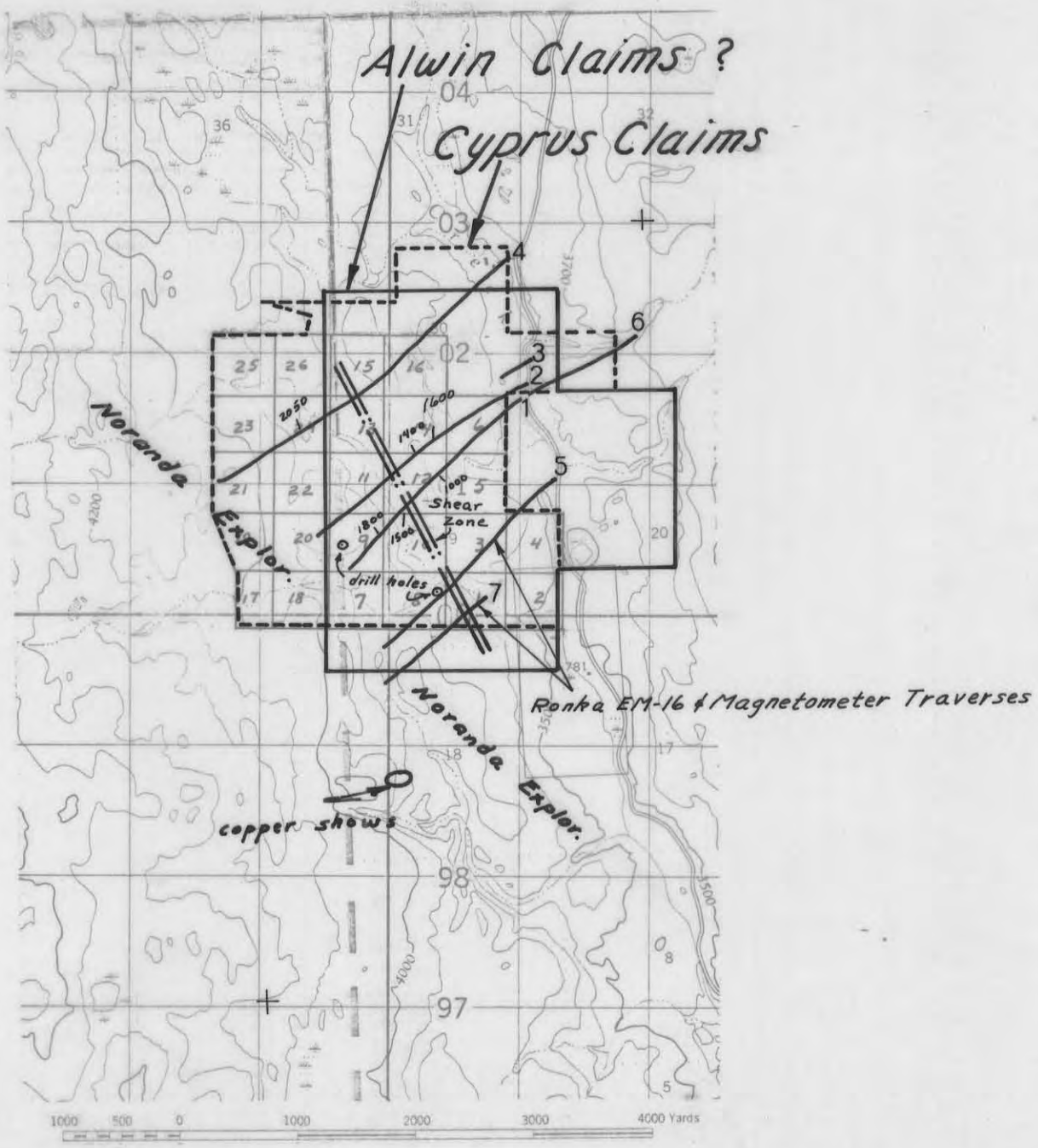


inches
0 1
0 1 2
centimetres

This reference scale bar has been added to the original image. It will scale at the same rate as the image, therefore it can be used as a reference for the original size.

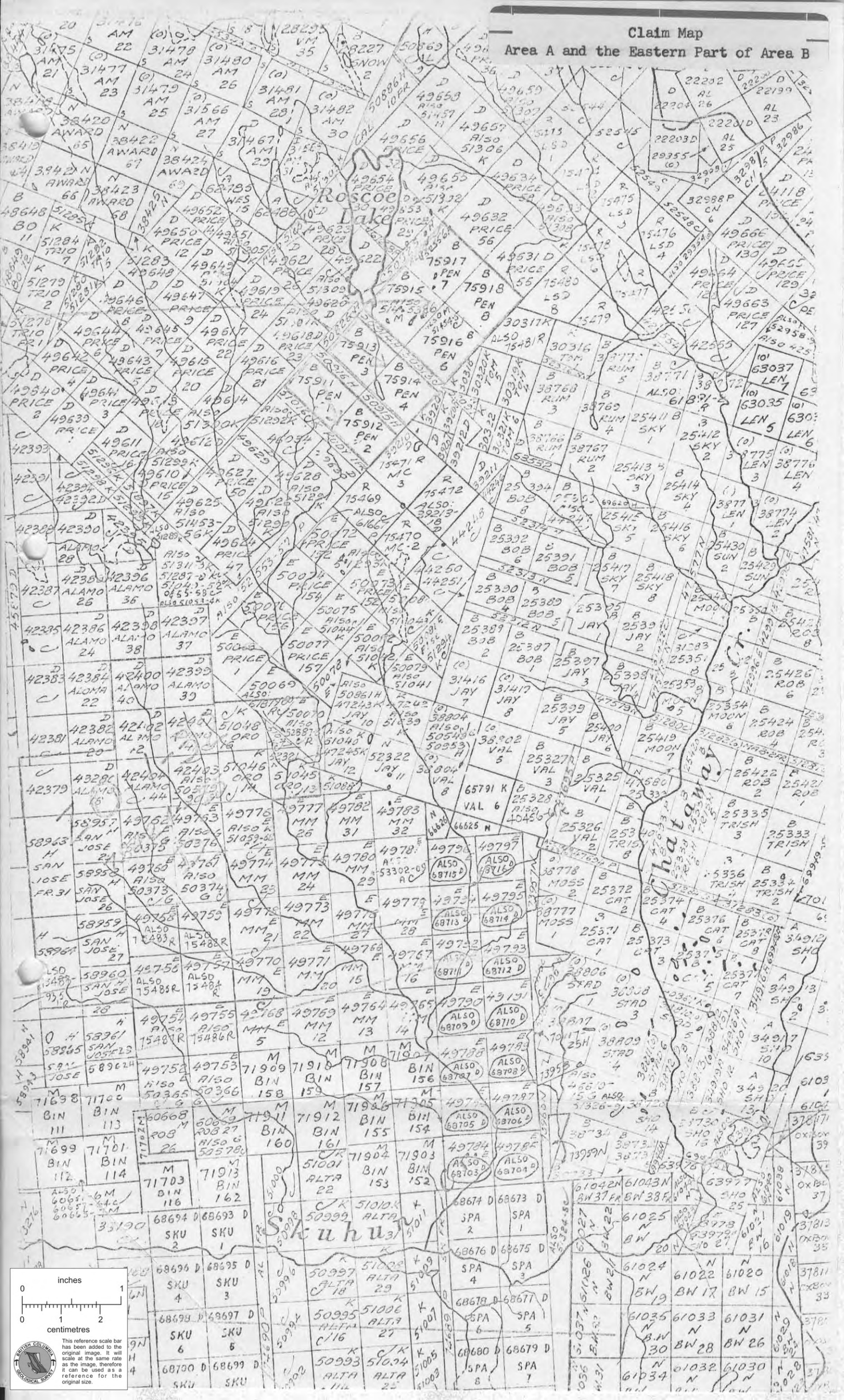
BRITISH COLUMBIA GEOLOGICAL SURVEY

Area D



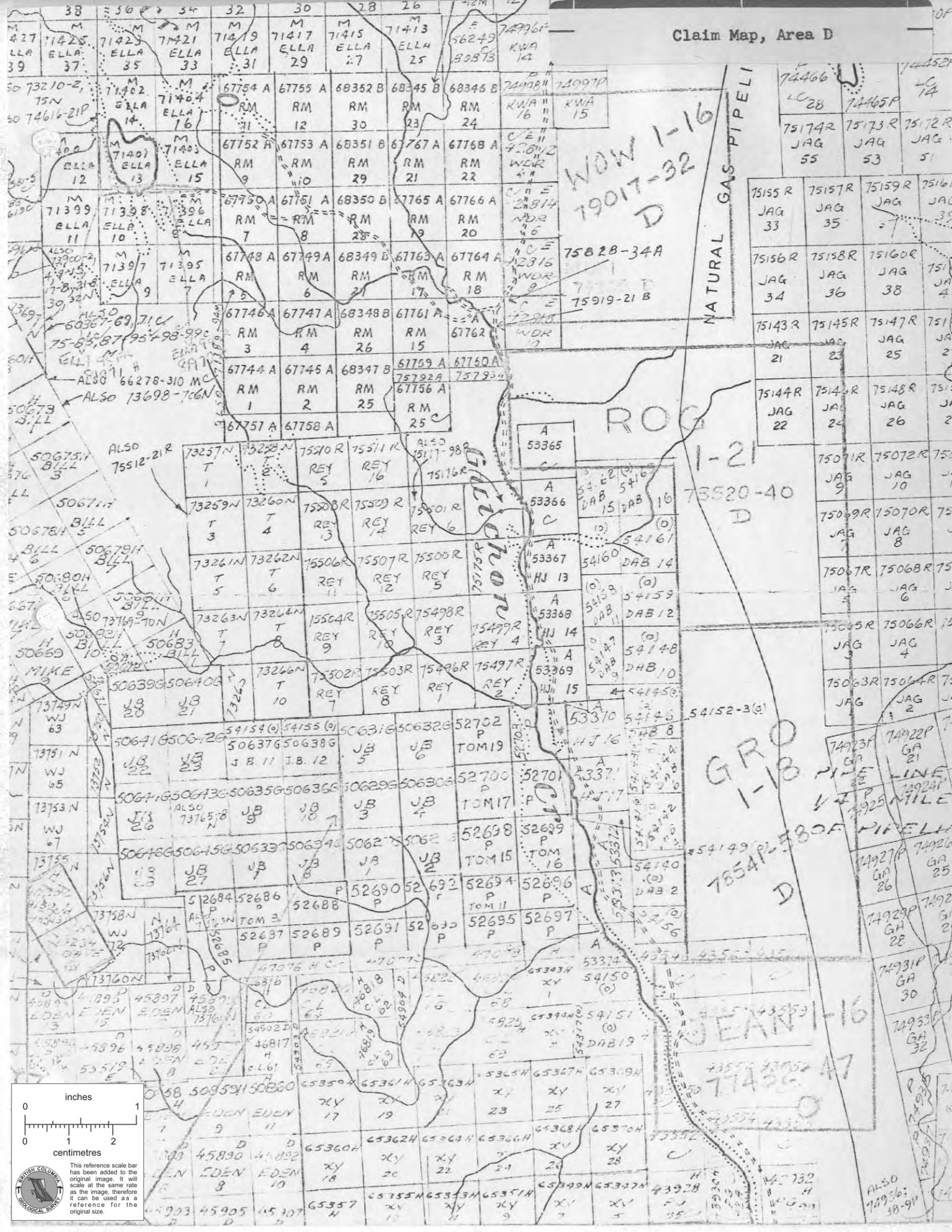
inches
0 1
0 1 2
centimetres
This reference scale bar has been added to the original image. It will scale at the same rate as the image, therefore it can be used as a reference for the original size.
BRITISH COLUMBIA GEOLOGICAL SURVEY

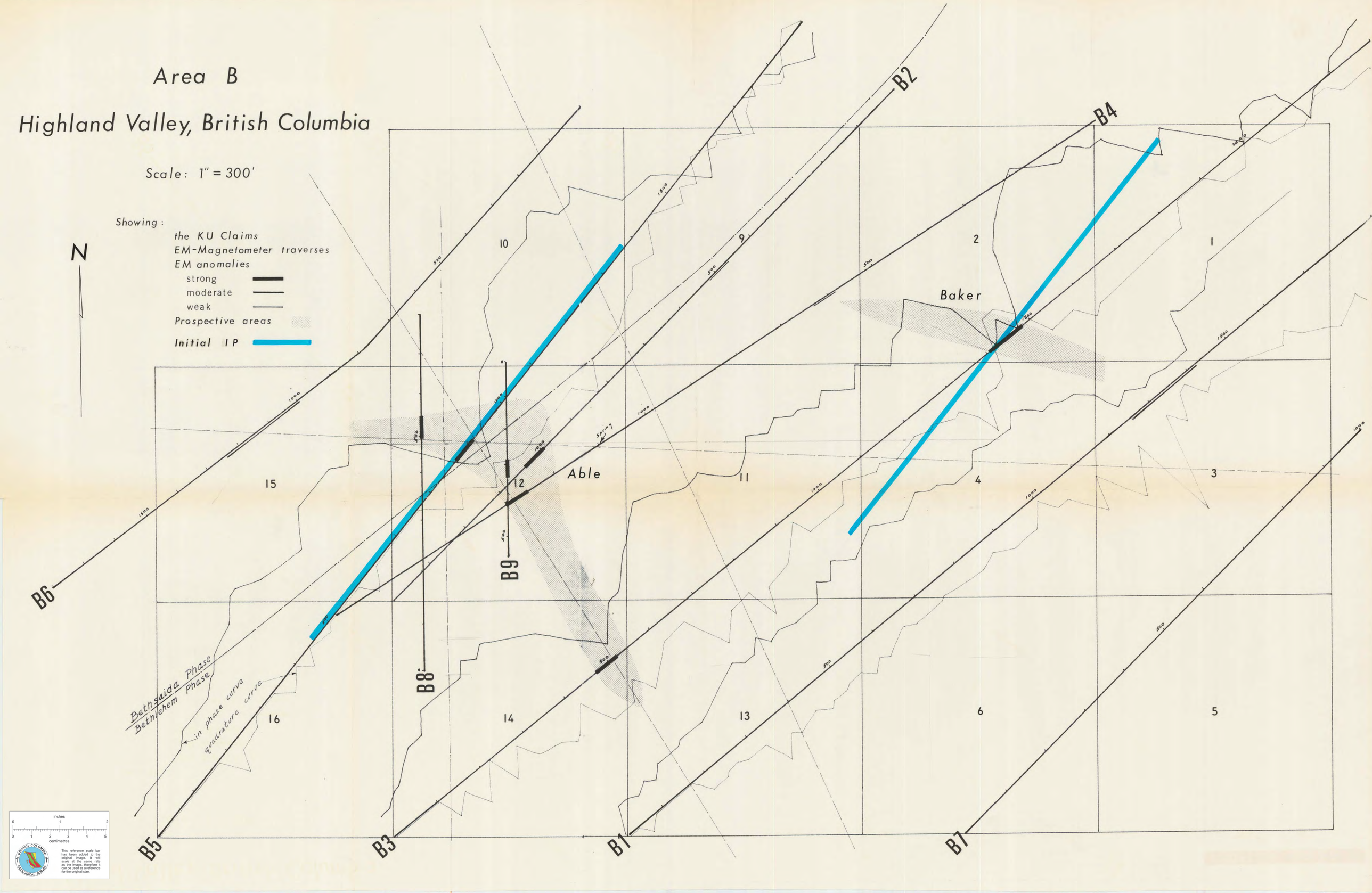
Claim Map
Area A and the Eastern Part of Area B



Claim Map, Western Part of Area B
VINCE 20-21
82237-38 G
VINCE 1-19
82305-23 G
TO EAST SEE MAP 92 I/7 W
BUNNY 1 FR.
80900 G
3
Skuhun Cr.
inches
0
1
0
1
2
centimetres
This reference scale bar has been added to the original image. It will scale at the same rate as the image, therefore it can be used as a reference for the original size.
BRITISH COLUMBIA GEOLOGICAL SURVEY

Claim Map, Area D





Area B
Highland Valley, British Columbia
Scale: 1" = 300'
Showing:
the KU Claims
EM-Magnetometer traverses
EM anomalies
strong
moderate
weak
Prospective areas
Initial IP
N
B1
B2
B3
B4
B5
B6
B7
B8
B9
Baker
Able
Bethsaida Phase
Bethlehem Phase
in phase curve
quadrature curve
1
2
3
4
5
6
9
10
11
12
13
14
15
16
inches
centimetres
BRITISH COLUMBIA GEOLOGICAL SURVEY
This reference scale bar has been added to the original image. It will scale at the same rate as the image, therefore it can be used as a reference for the original size.

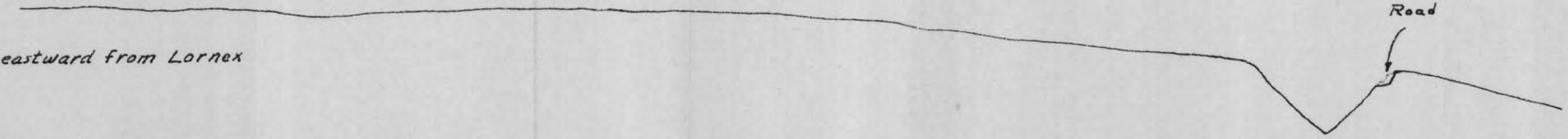
SW

NE

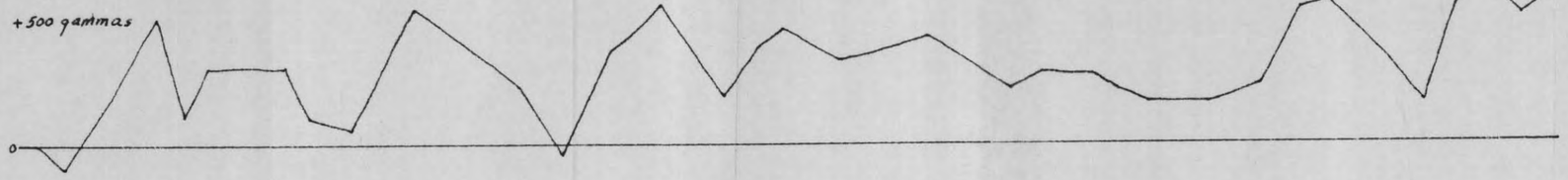
Profile

Traverse northeastward from Lornex

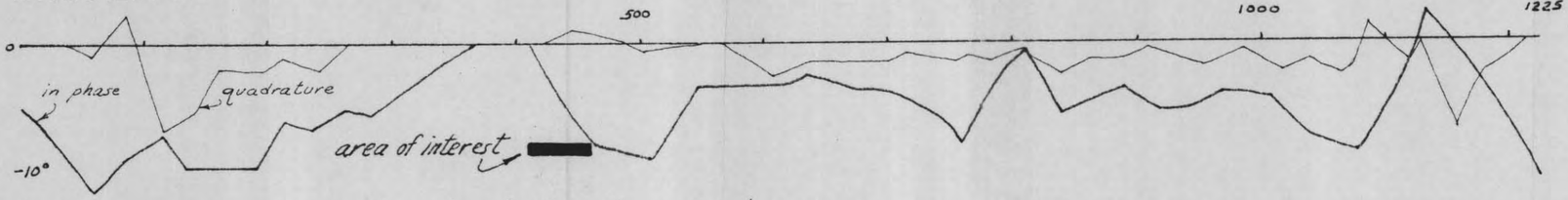
Road



Magnetometer

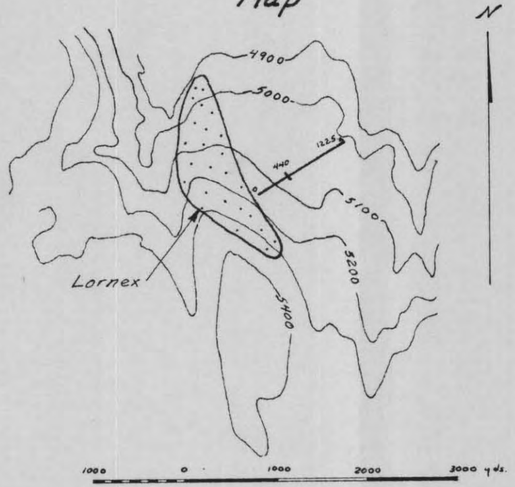


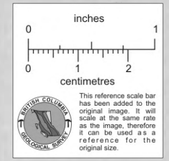
Ronka EM-16



Scale: 1" = 100 yds (approx.)

Lornex Area Map





SW

A-1

boulders in cut
cuts w/ bornite

marsh

Profile

Main Road

marsh

Road

Road

marsh

Road

Small stream

marsh to S.

NE

A-1

Magnetometer

+500 gammas

Ronka EM-16

+10°

0°

-10°

500

1000

1500

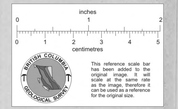
2000

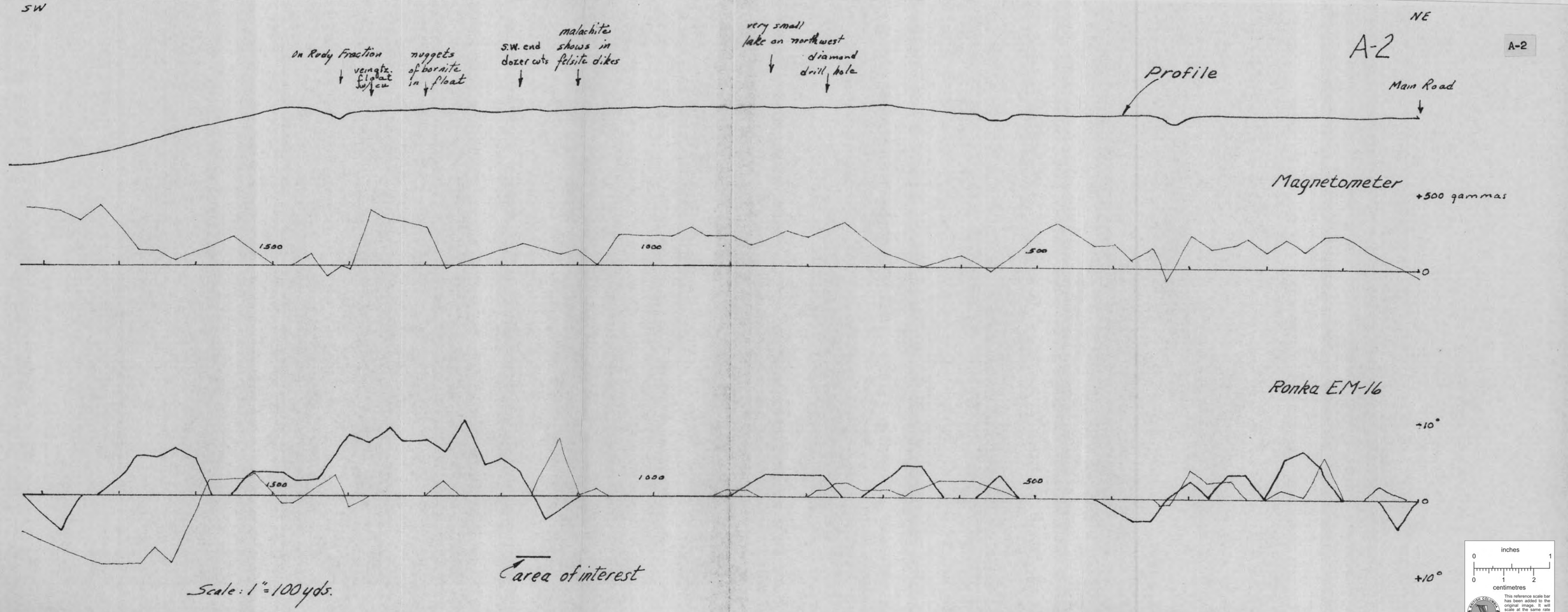
2500

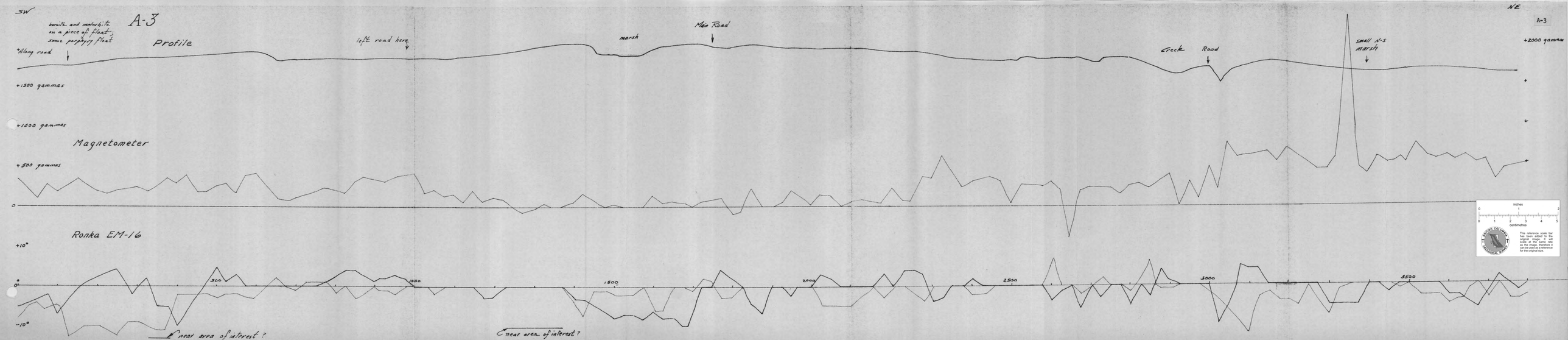
3000

area of interest

Scale: 1" = 100 yds.




SW
NE
A-2
A-2
On Rudy Fraction
veingtz. float w/cu
nuggets of bornite in float
S.W. end dozer cuts
malachite shows in felsite dikes
very small lake on northwest
diamond drill hole
Profile
Main Road
Magnetometer
+500 gammas
1500
1000
500
0
Ronka EM-16
+10°
1500
1000
500
0
+10°
area of interest
Scale: 1" = 100 yds.
inches
0
1
0
1
2
centimetres
This reference scale bar has been added to the original image. It will scale at the same rate as the image, therefore it can be used as a reference for the original size.


SW
NE
A-3
A-3
bornite and malachite on a piece of float; some porphyry float
Profile
+Along road
left road here
marsh
Main Road
Creek
Road
small N-S marsh
+2000 gammas
+1500 gammas
+1000 gammas
Magnetometer
+500 gammas
0
Ronka EM-16
+10°
0
-10°
500
1000
1500
2000
2500
3000
3500
near area of interest?
near area of interest?
inches
0
1
2
0
1
2
3
4
5
centimetres
BRITISH COLUMBIA GEOLOGICAL SURVEY
This reference scale bar has been added to the original image. It will scale at the same rate as the image, therefore it can be used as a reference for the original size.

A-4

SW NE

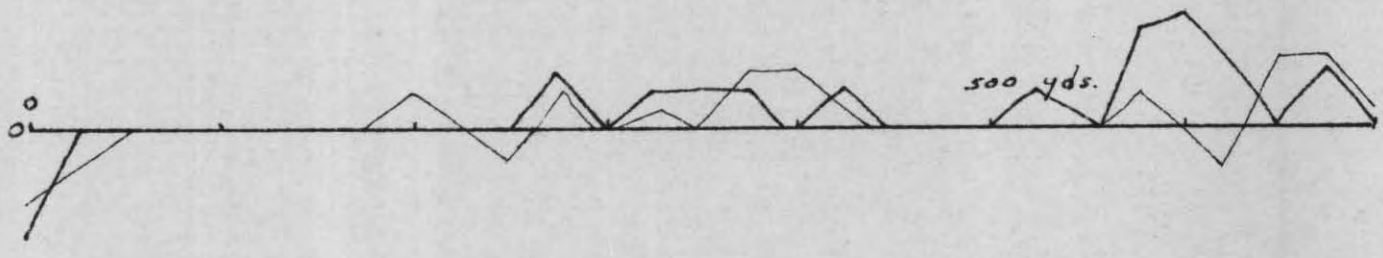
Profile

Magnetometer

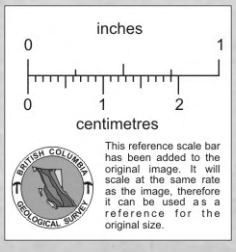
+1000 gammas

Ronka EM-16

+10°

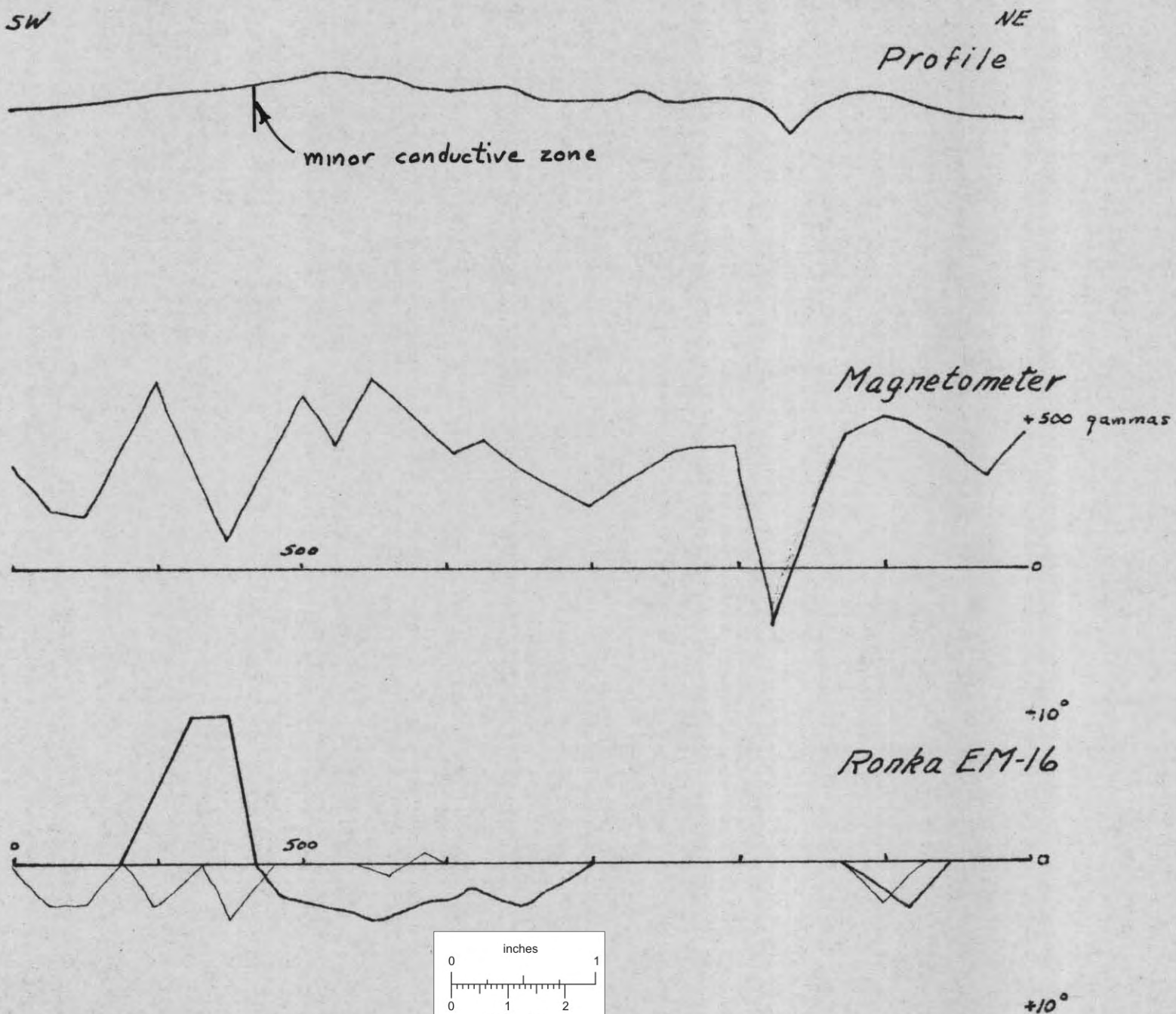


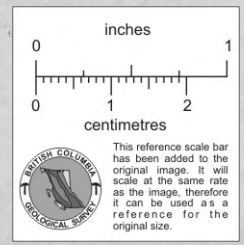
-10°



This reference scale bar has been added to the original image. It will scale at the same rate as the image, therefore it can be used as a reference for the original size.

A-5

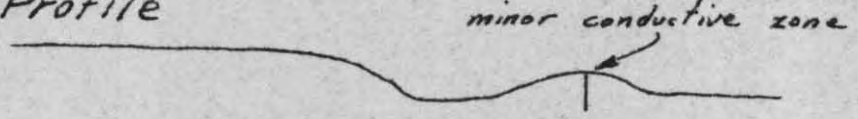




Scale: 1" = 100 yds.

A-6 SW NE

Profile

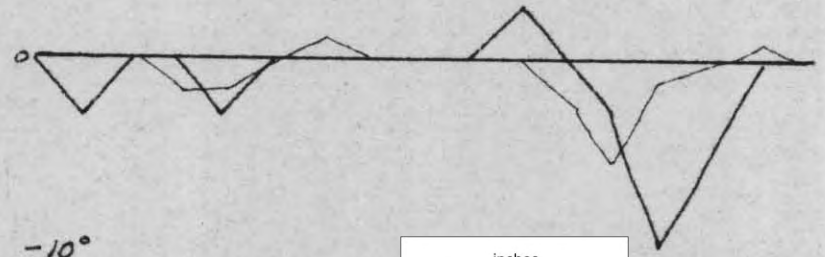


Magnetometer

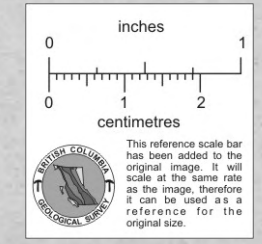
+500 gammas

+10°

Ronka EM-16



-10°



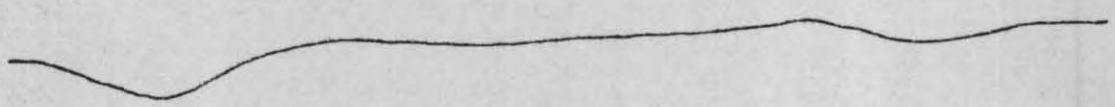
Scale 1" = 100 yds.

SW NE

A-7

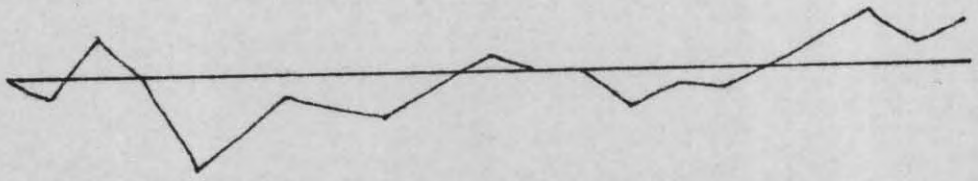
Profile

small creek big marsh



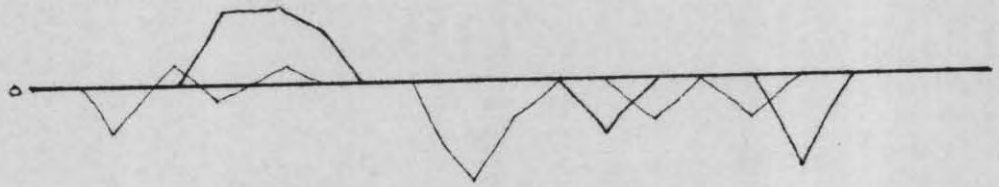
+500 gammas

Magnetometer



+10°

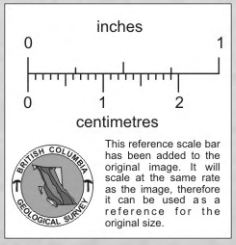
Ronka EM-16



0

-10°

Scale: 1" = 100 yds



quartz float w/ some copper shows

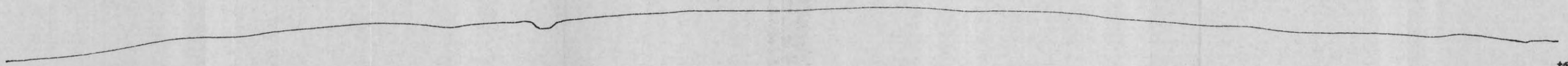
small marsh

drill site to NW

diamond drill hole July 1968

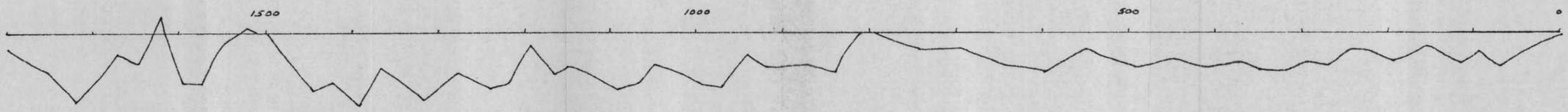
A-8

Profile



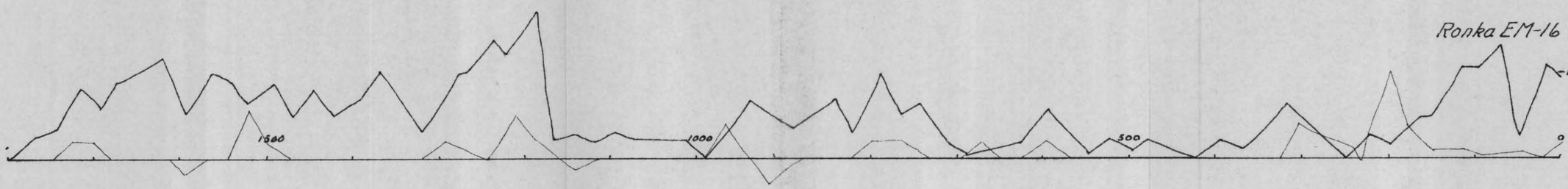
+600 gammas

Magnetometer



+20°

Ronka EM-16



+10°

0

-10°

area of interest

inches
0 1
0 1 2
centimetres

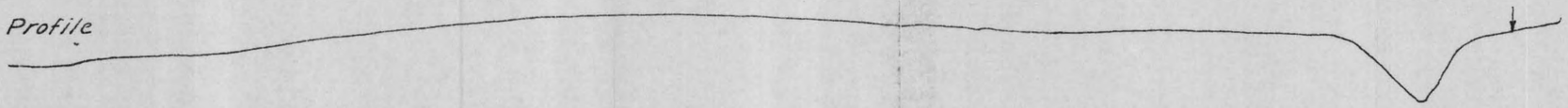
This reference scale bar has been added to the original image. It will scale at the same rate as the image, therefore it can be used as a reference for the original size.

A-8

A-9

Profile

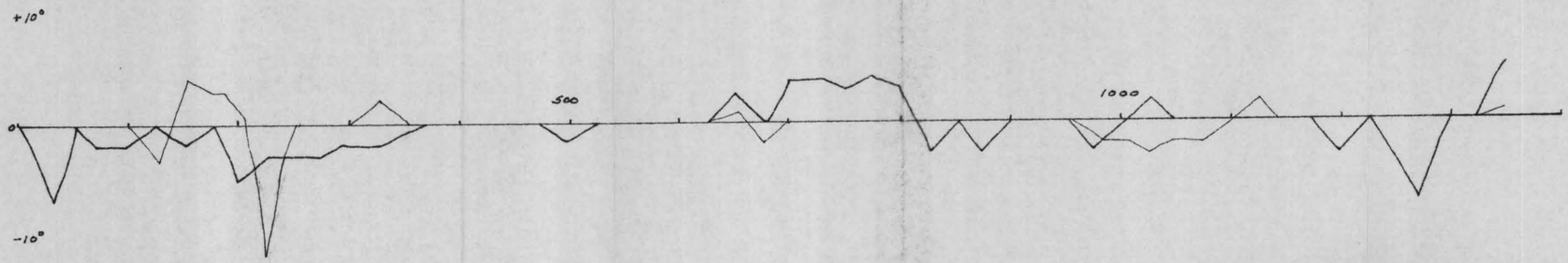
Main Road

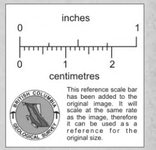


Magnetometer

+500 gammas

Ronka EM-16





SW

till ←→ bedrock

NE

B-1

B-1

Profile

Magnetometer

+500 gammas

0

+20° Ronka EM-16

+10°

0.0°

-10°

-20°

in phase

quadrature

500

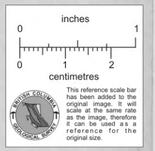
1000

1500

area of interest

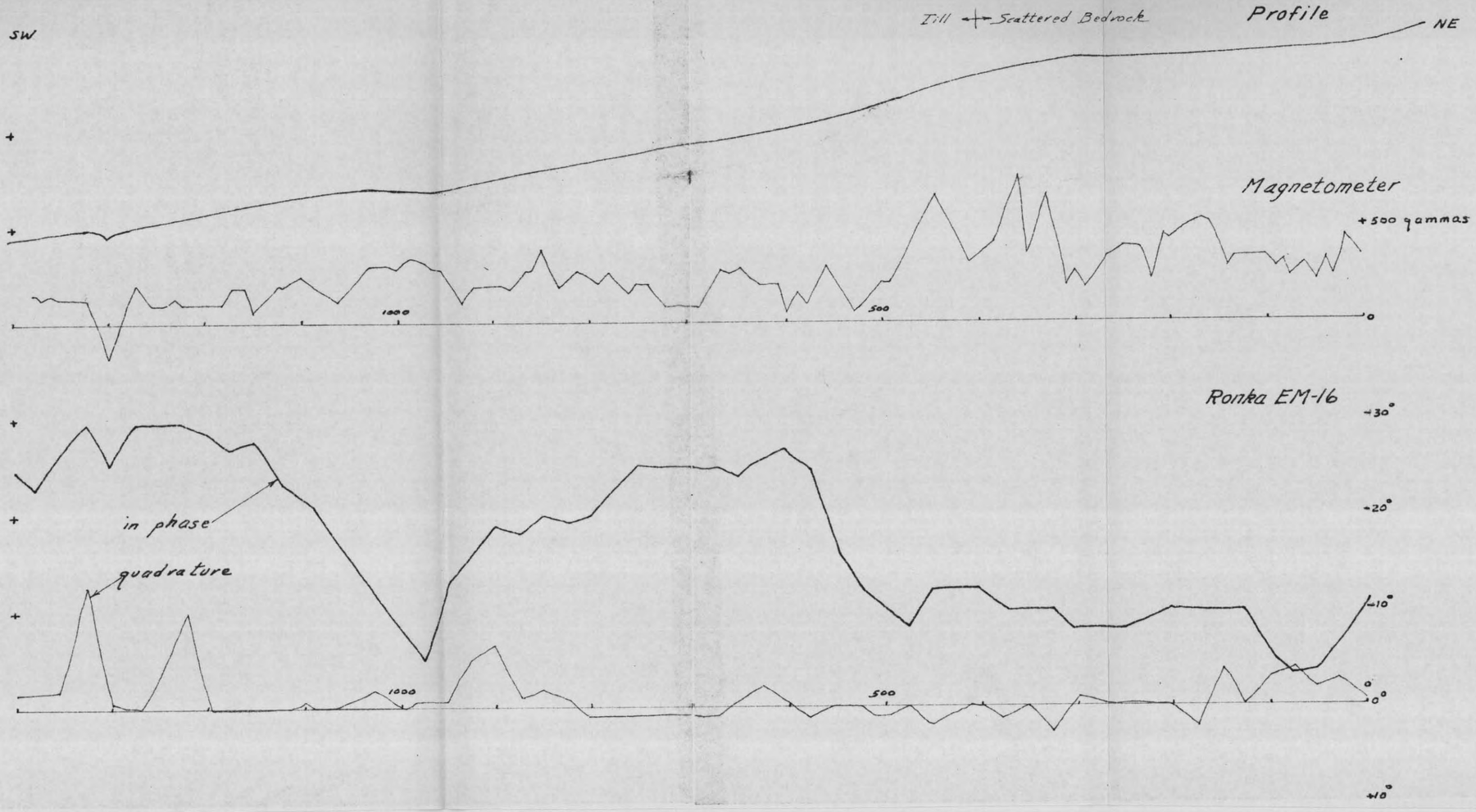
-27

Scale: 1" = approx. 300' (100 yds.)



This reference scale bar has been added to the original image. It will scale at the same rate as the image, therefore it can be used as a reference for the original size.

B-2



inches
0 1
0 1 2
centimetres

This reference scale bar has been added to the original image. It will scale at the same rate as the image, therefore it can be used as a reference for the original size.

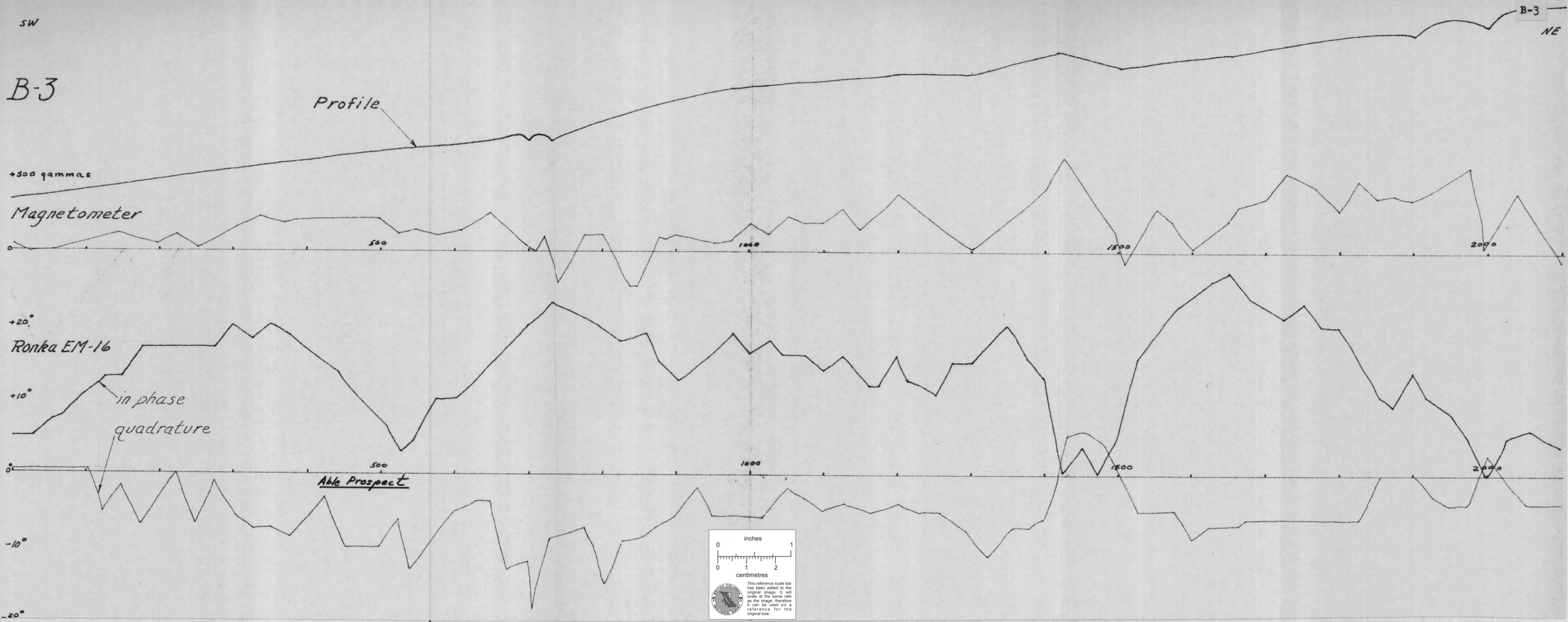
B-2

SW

B-3

NE

B-3



inches
0 1
0 1 2
centimetres
This reference scale bar has been added to the original image. It will scale at the same rate as the image, therefore it can be used as a reference for the original size.

SW

NE

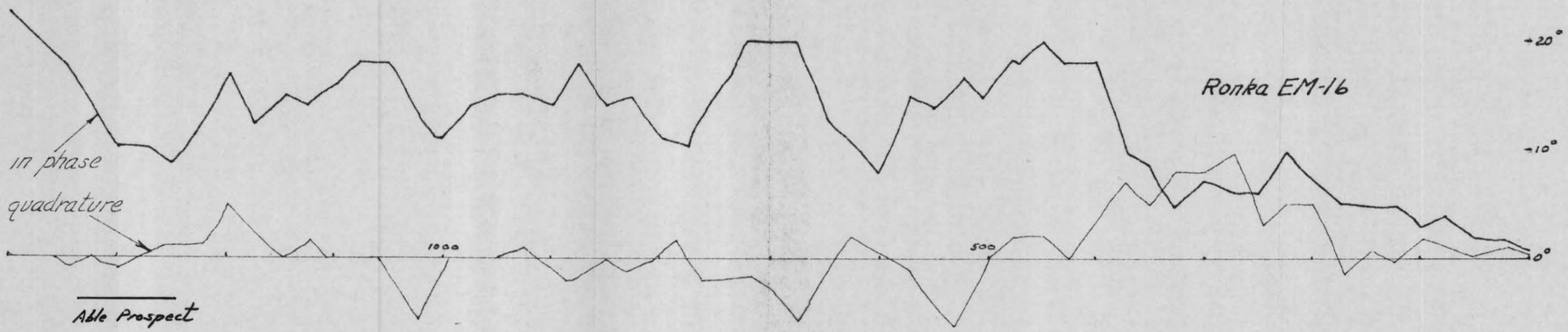
B-4

Profile

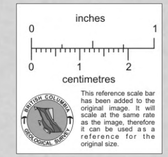
Magnetometer

1000

500



Able Prospect



Scale: 1" = 100 yds (approx.)

B-5

+400 gammas

Magnetometer

GRAVEL SL P-5

+300 gammas

Southwest

Northeast

+200 gammas

+20°

Ronka EM-16

+10°

in phase curve

700 800 900 1000 1100 1200 1300

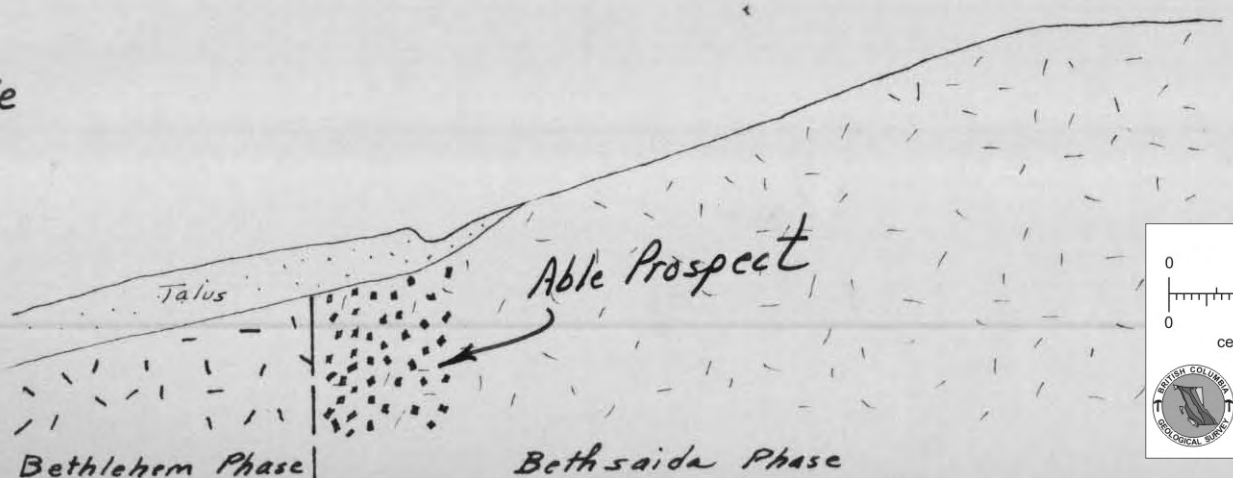
0

quadrature curve

-10°

-20°

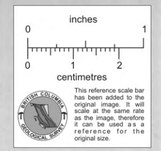
Profile



inches
0 1
0 1 2
centimetres
This reference scale bar has been added to the original image. It will scale at the same rate as the image, therefore it can be used as a reference for the original size.

SW

B-5



NE

B-5

Profile

+500 gammas

Magnetometer

500

1000

1500

+20°

Ronka EM-16

+10°

in phase

quadrature

0

500

1000

1500

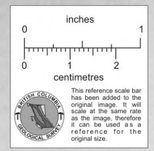
-10

Able Prospect

SW

NE

B-6



+500 gammas

1500

1000

500

0

-500 gammas

+20°

+10°

1500

1000

500

0

Able Prospect

B-6

+10

inches
0 1
0 1 2
centimetres
This reference scale bar has been added to the original image. It will scale at the same rate as the image, therefore it can be used as a reference for the original size.

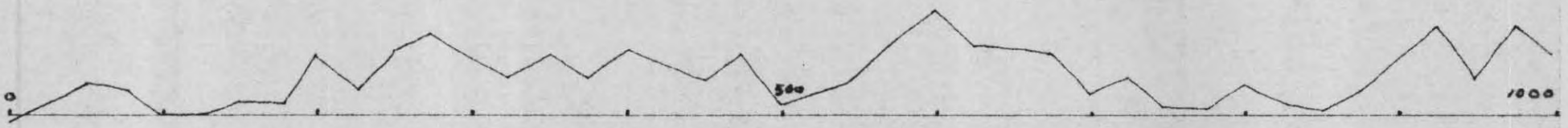
SW NE

B-7

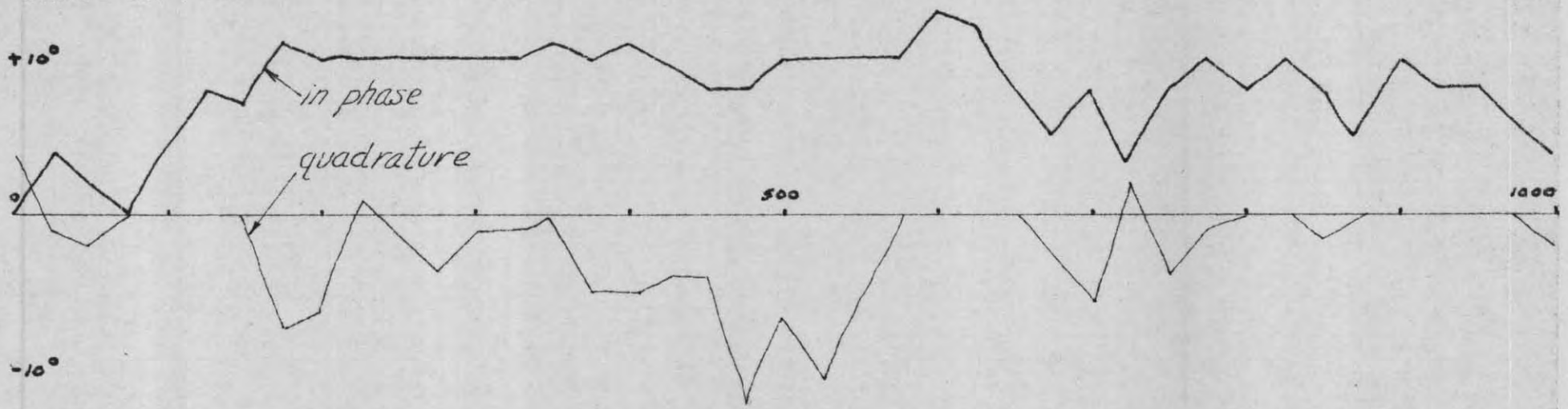
Profile

Magnetometer

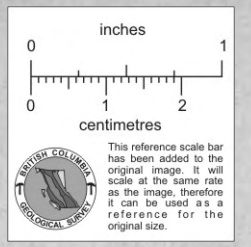
+500 gammas



Ronka EM-16



B-8



S

+200 gammas

+100

gully

N-S ? fault in rocky gorge

N

-100 gammas

+20°

+10°

Able Prospect

0

500 yds

-10°

-20°

B-8

TRAVERSE B-8

Ronka EM-16 and Magnetometer Survey
Area B, Highland Valley

South North

+100 Gammas

Magnetometer

0

-100 gammas

Scale: 1 inch = 100 yards

inches
0 1
0 1 2
centimetres

This reference scale bar has been added to the original image. It will scale at the same rate as the image, therefore it can be used as a reference for the original size.

EM in phase curve

+20°

+10°

0 0 500 yds 800

EM quadrature curve

-10°

-20°

Able Prospect

granite

Surface

Talus

Possible copper ore body

probable fault

= Bethlehem Phase

Bethsaida Phase

S

N

B-9

+200 gammas

Magnetometer

+100

500

0

Ronka EM-16

+20°

+10°

in phase

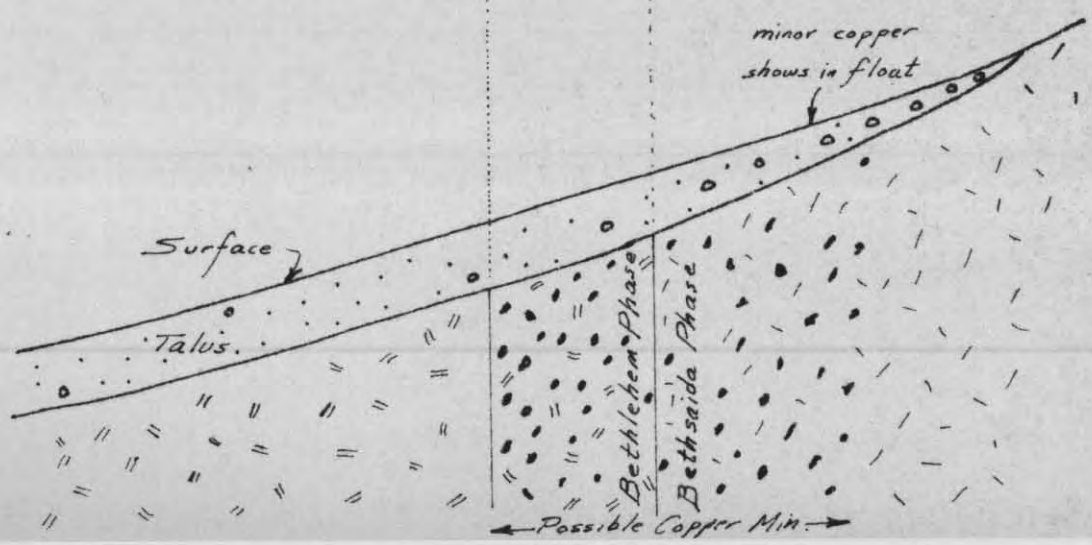
500 yds

0

quadrature

+10°

Able Prospect



inches

0 1

0 1 2

centimetres

This reference scale bar has been added to the original image. It will scale at the same rate as the image, therefore it can be used as a reference for the original size.

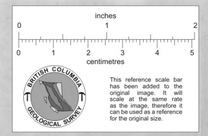
B-9

NE

D-1

SW

D-1



+1500 gammas

+1000

+500

Profile

Magnetometer

0

500

1000

1500

2000

2500

+10°

Ronka EM-16

0

500

1000

1500

2000

2500

-10°

Scale: 1" = 100 yds.

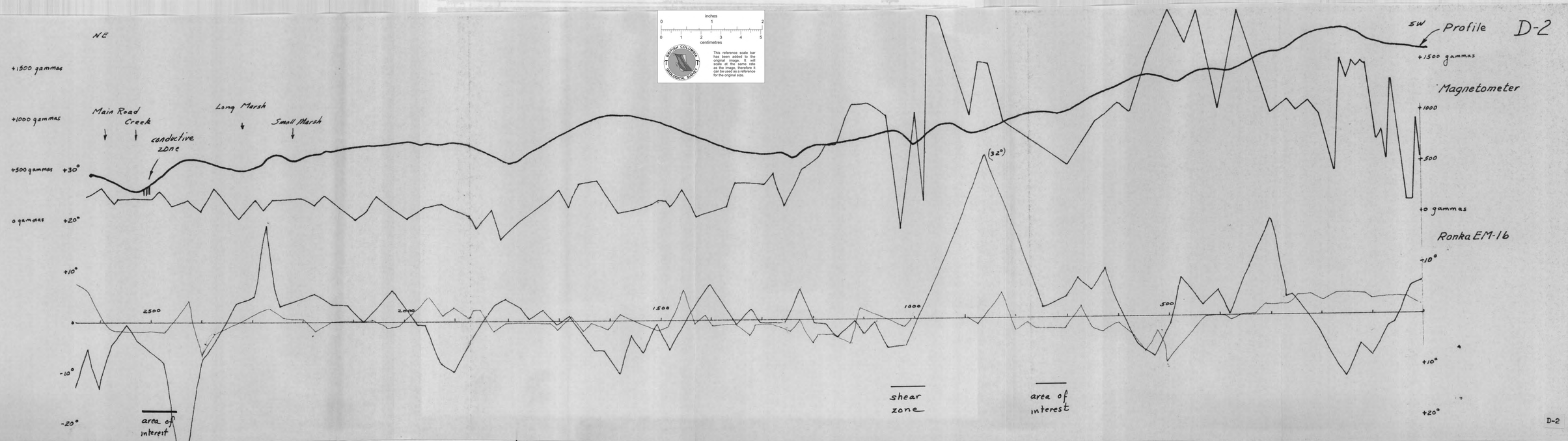
-20°

topographic (false anomaly)

two mineralized N-W trending faults

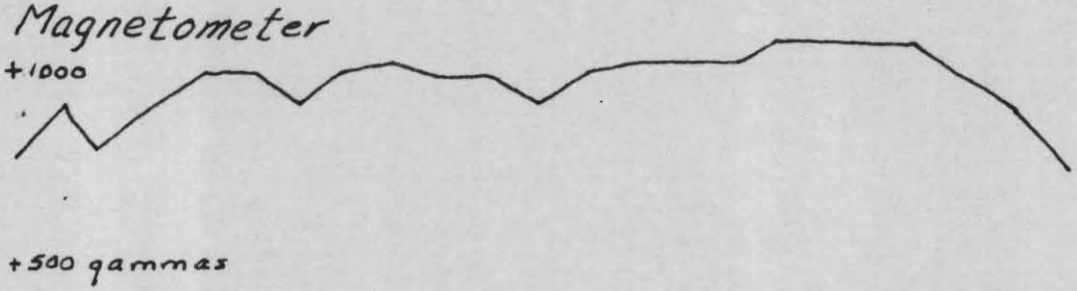
anomalies

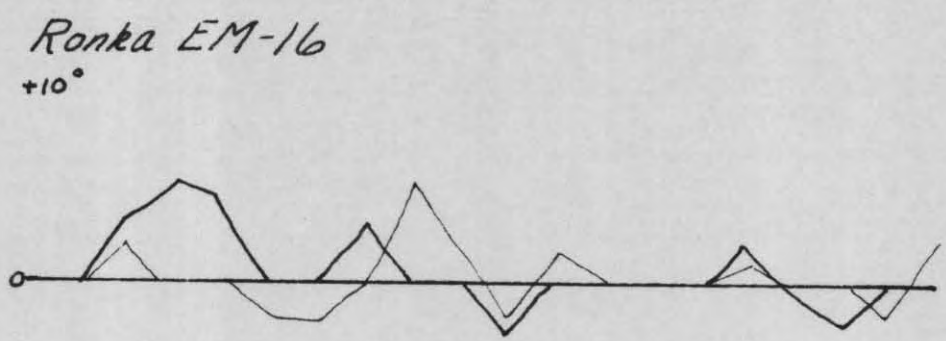
partly topographic

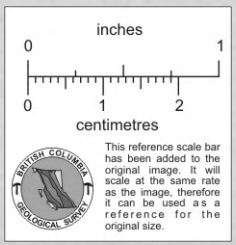

NE
SW
Profile
D-2
+1500 gammas
+1000 gammas
+500 gammas
0 gammas
Main Road
Creek
Long Marsh
Small Marsh
conductive zone
+30°
+20°
+10°
0
-10°
-20°
2500
2000
1500
1000
500
(32°)
area of interest
shear zone
area of interest
Magnetometer
+1000
+500
0 gammas
Ronka EM-16
+10°
+10°
+20°
inches
centimetres
BRITISH COLUMBIA GEOLOGICAL SURVEY
This reference scale bar has been added to the original image. It will scale the image correctly if it is printed at 100% and can be used as a reference for the original size.
D-2

D-3

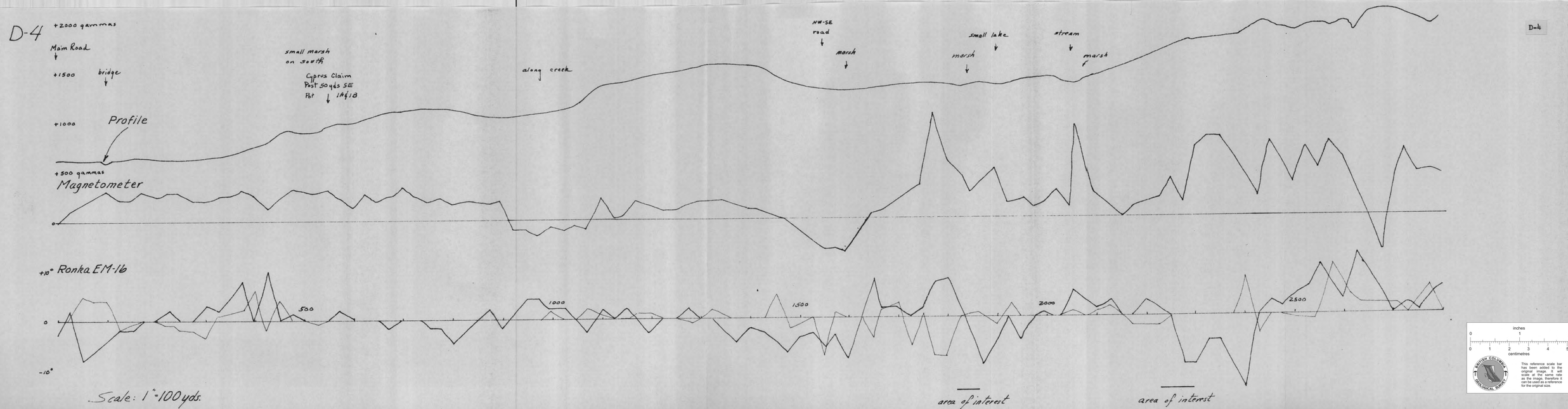
Profile
Creek
Main Road


Magnetometer
+1000
+500 gammas


Ronka EM-16
+10°
-10°


inches
0
1
0
1
2
centimetres
BRITISH COLUMBIA
GEOLOGICAL SURVEY
This reference scale bar has been added to the original image. It will scale at the same rate as the image, therefore it can be used as a reference for the original size.

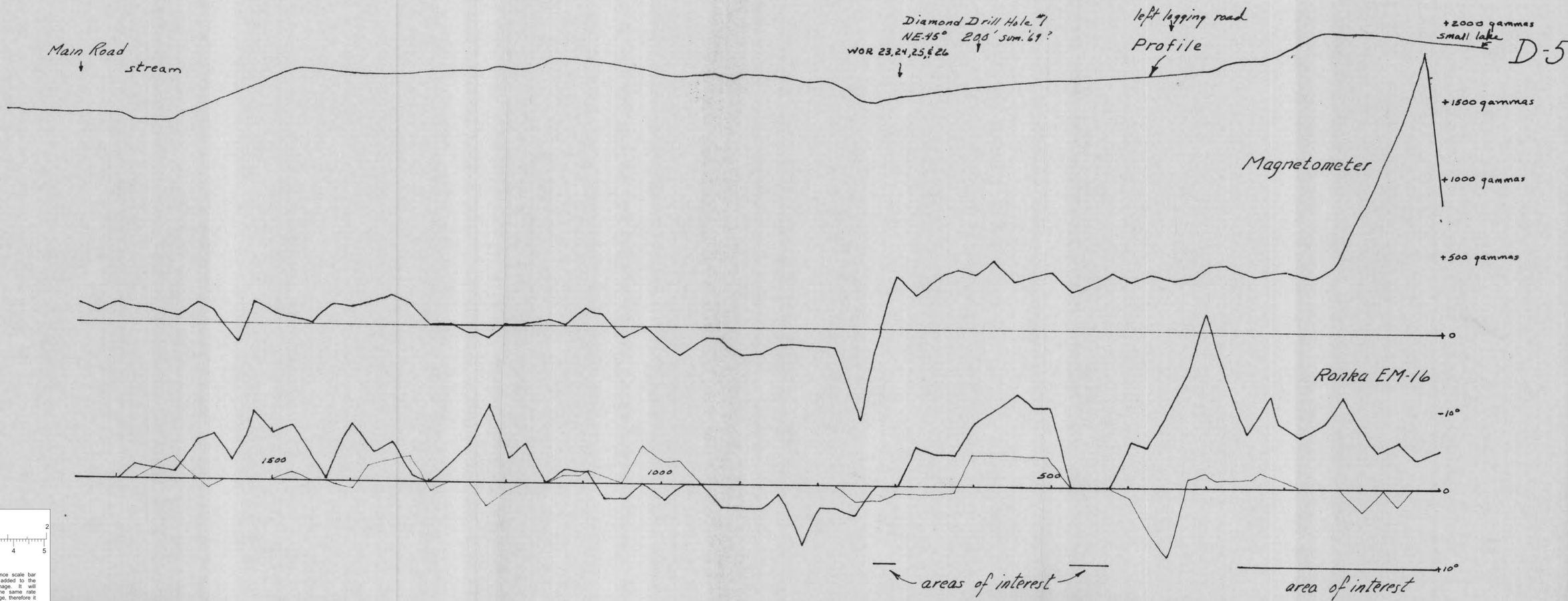
D-4



Scale: 1" = 100 yds.

inches
0 1 2
centimetres
0 1 2 3 4 5
BRITISH COLUMBIA GEOLOGICAL SURVEY
This reference scale bar has been added to the original image. It will scale at the same rate as the image, therefore it can be used as a reference for the original size.

D-4



inches
0 1 2
0 1 2 3 4 5
centimetres

BRITISH COLUMBIA GEOLOGICAL SURVEY

This reference scale bar has been added to the original image. It will scale at the same rate as the image, therefore it can be used as a reference for the original size.

skirted along s. side of ravine

D-6

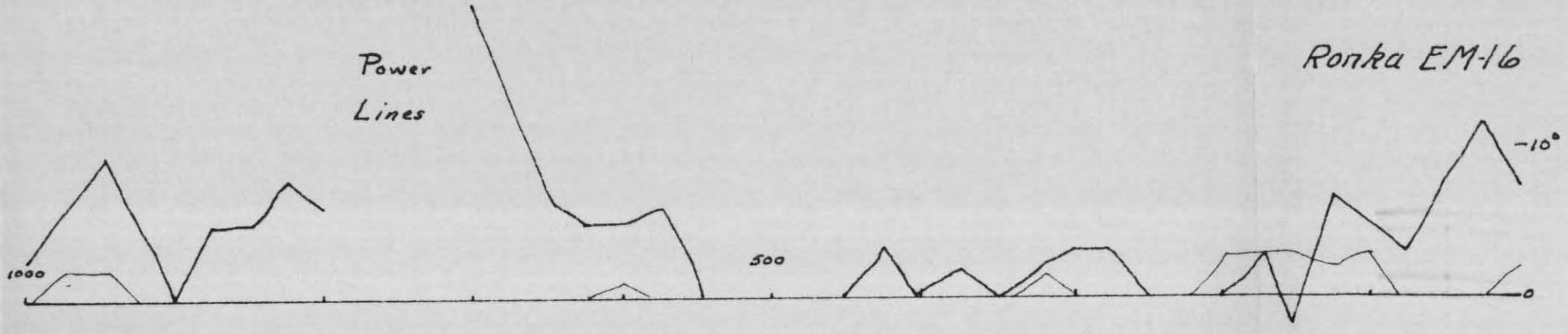
Profile

+500 gammas

Magnetometer

Power Lines

Ronka EM-16



+10°

inches
0 1
0 1 2
centimetres
This reference scale bar has been added to the original image. It will scale at the same rate as the image, therefore it can be used as a reference for the original size.
BRITISH COLUMBIA GEOLOGICAL SURVEY

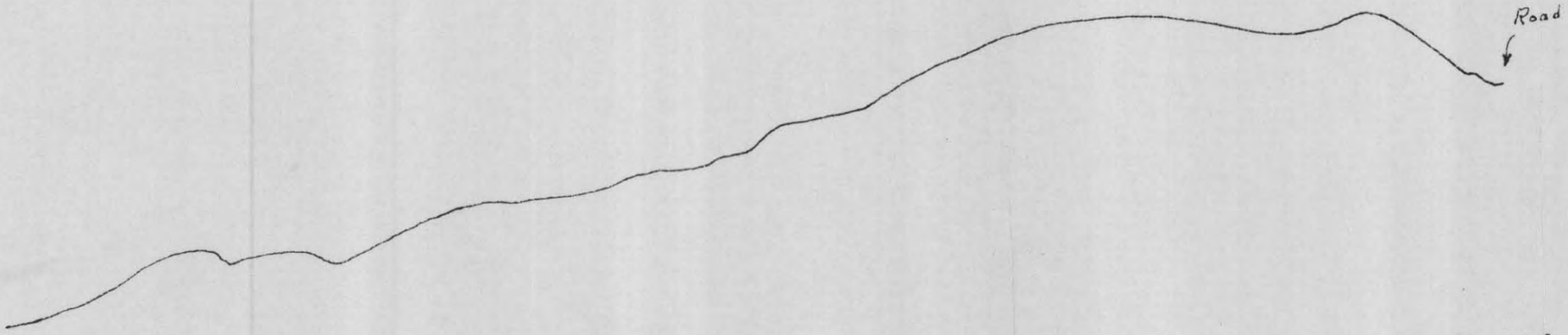
D-7

NE

SW

Profile

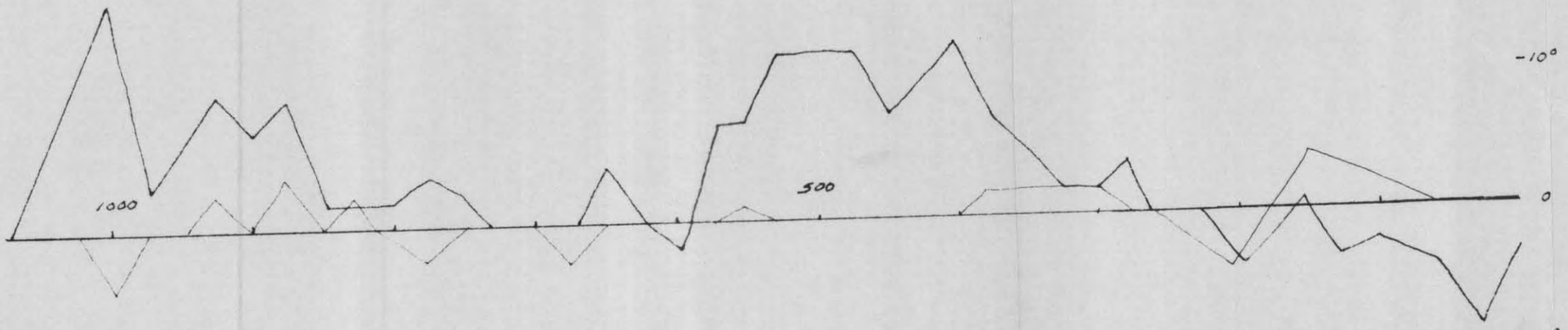
Road



-20°

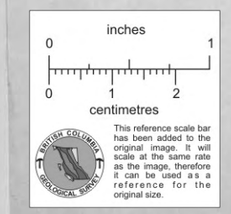
Ronka EM-16

-10°



0

+10°



CCM

C. CAREW McFALL
GEOLOGIST

1327 SARATOGA AVENUE
SAN JOSE, CALIFORNIA 95129
TEL. 408 252-7411

November 8, 1969

Mr. J. B. P. Sawyer
Manager, Canadian Exploration
Cyprus Exploration Corporation, Ltd.
510 West Hastings Street
Vancouver 2, British Columbia

Dear Mr. Sawyer:

Thank you for sending the results of the soil sampling I did recently in Highland Valley, British Columbia. These results are plotted on the accompanying map of Area B.

The anomalous samples are dark, wet, clayey loam, rich in organic material, whereas, almost all of the samples taken were light-colored granitic silt and sand. I suggest that these geochem anomalies are valid but that the lack of anomalous samples over most of the prospective areas of Area B is due to the lack of clay in those samples to adsorb copper.

Most of the soil samples taken near the end of line 2 in Area D were accidentally destroyed. One of the two survivors, D-2 2500, showed 174 ppm. This is probably about background considering that this sample was a clay-rich loam from a creek bed. It was taken, however, essentially over a fairly good Ronka EM-16 anomaly. I believe this anomaly is too small in area to be of interest to Cyprus, but if you decide to put an IP line across it, it should be east-west, center at the main road about 2625 along line D-2, and have 200-foot electrode spacings.

RECEIVED
NOV 11 1969

Yours truly,

C. Carew McFall

Area B

Highland Valley, British Columbia

Scale: 1" = 300'

Showing:

- the KU Claims
- EM-Magnetometer traverses
- EM anomalies
  - strong
  - moderate
  - weak
- Prospective areas

Soil Samples ppm Cu: 0-100; 100-200; 200-500; 500-1000; 1000-1500; over 1500

B1 B2 B3 B4 B5 B6 B7 B8 B9

1 2 3 4 5 6 9 10 11 12 13 14 15 16

Baker

Able

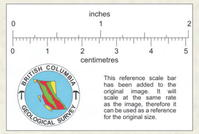
Bethsaida Phase

Bethlehem Phase

in phase curve

quadrature curve

fracture



BARRINGER RESEARCH

Geochemical Laboratory Report

BARRINGER RESEARCH LIMITED
304 CARLINGVIEW DRIVE
METROPOLITAN TORONTO
REXDALE, ONTARIO, CANADA
PHONE: 416-677-2491
CABLE: BARESEARCH

DATE November 4, 1969.

Cyprus Exploration Co. Ltd.,
822-510 West Hastings St.,
VANCOUVER 1, B.C.
ATT: P. Sawyer.

REPORT NUMBER 365

GM Hazeldene

SAMPLE NUMBER	Total Cu ppm		Sample Number	Total Cu ppm		Sample Number	Total Cu ppm		Sample Number	Total Cu ppm
Line B-2 1200	11		1100	19		1250	22		200	5
1300	64		1250	433		1300	16		300	101
1400	16		1300	17		1325	18		400	765
B-3 0	25		1400	73		1350	27		500	1250
100	17		1450	18		1400	13		600	1460
200	72		1500	21	B-5	0	15	B-9	25	24
300	14		1515	428		100	15		100	153
400	18		1525	55		200	18		150	41
425	15		1600	20		300	14		175	21
450	13		1700	16		350	20		225	16
475	14	B-4	400	15		450	19		425	15
500	21		500	46	B-6	1000	19		500	15
525	9		600	32		1050	16	D-2	2500	174
550	22		700	12		1100	23		2625	35
575	25		800	14		1125	13	Y	274	439
600	74		825	22		1200	15			
700	16		900	23		1300	14			
740	167		1000	20		1400	12			
800	15		1100	1580	B-8	0	22			
1000	17		1200	32		100	16			

Note: Y274 is the pulp from the slip sample from Skuhun Creek originally sent for assay to J R Williams and Sons, Vancouver. The result (439 ppm) agrees well with Williams assay of 0.04 %