QUESTOR SURVEYS LIMITED

AIRBORNE ELECTROMAGNETIC SURVEY REPORT

AREA 1970-37

QUEST LAKE AREA

ONTARIO

PREPARED FOR

JULY 1970

RANWORTH EXPLORATIONS LIMITED

CONTENTS

2.145

INTRODUCTION

This report contains our interpretation of the results of an airborne electromagnetic survey and magnetic survey flown in Quest Lake Area, Ontario on June 22nd, 1970. A brief description of the survey procedure together with recommendations for ground follow-up is included.

The survey totalled 145 line miles and was performed by Questor Surveys Limited. The survey aircraft was a Super Canso CF MIR and the operating base was Armstrong, Ontario.

The area outline is shown on a customer supplied map 1" = 1 mile at the end of this report.

MAP COMPILATION

The base maps are uncontrolled mosaics constructed from National Air Photo Library 1" = 1 mile photographs. These mosaics were reproduced at a scale of 1" = 1320' on stable transparent film from which white prints can be made.

Flight path recovery was accomplished by comparison of the prints of the 35mm film with the mosaic in order to locate the fiducial points. These points are approximately one mile apart.

SURVEY PROCEDURE

Terrain clearance was maintained as close to 400 feet as possible, with the E.M. "bird" at approximately 150 feet above the ground. A normal S-pattern flight path using approximately one mile turns was used. The equipment operator logged the flight details and monitored the instruments.

A line spacing of 1/8 mile was used.

INTERPRETATION AND RECOMMENDATIONS

This area consists mainly of basic metavolcanic rocks and metasediments. An iron formation within a band of sediments trends southwest through the area and does not have any conductive material associated with it. The conductors that exist in the area tend to line up in long linears along the contact or within the basic metavolcanics. Portions of these long trends have been selected for ground investigations where changes take place in the trend (i.e. at a fold or at a change in conductivity or magnetic correlation).

Graphite is suspected to be the cause of the long conductors, without magnetic correlation, which exist along the contact of the volcanics and sediments or within the sediments.

The following group of anomalies is offered as a guide to ground follow-up program and it is by no means the absolute targets for investigation. However, they are the higher priority targets.

1) Intercepts 39 A and 40 A are strong good conductivity anomalies within a long trend in the sediments. This zone has been selected because of the good conductivity anomalies.

2) The sharp direct magnetic correlation with these responses suggests that pyrrhotite could be the cause of the E.M. anomalies. This zone is a portion of a longer conductive horizon within the basic volcanic rocks. Ground work is recommended.

3) This zone is a portion of the long trend that zone 2 was a part. There is magnetic correlation with two of the anomalies in this zone and pyrrhotite could again be a cause of the south conductor. Intercepts 24 C and 25 C both are strong, well defined good conductivity responses without magnetic correlation. Graphite or nonmagnetic sulphides is the probable cause.

4) This zone is on the same trend as zone 1. However at this location there is a direct magnetic correlation with the responses. The anomalies are strong and they exhibit good conductivity. Sulphides could be the cause of the conductor. Ground work is recommended.

5) The sharp magnetic correl tion with these responses is the reason for the selec ion of this zone for ground investigation. Magnetite, however, could possibly be the cause of both the E.M. and magnetic anomalies or magnetite with minor amounts of sulphides could be the cause.

6) Both of these conductor intercepts are weak but they have magnetic correlation. Ground work is recommended.

D. Watson

P. G. Lazenby

APPENDIX (i)

EQUIPMENT

The aircraft are equipped with Mark V INPUT airborne E.M. systems and Barringer AM-101 proton precession magnetometers. APN-1 radio altimeters are used for vertical control. The outputs of these instruments together with fiducial timing marks are recorded by means of galvanometer type recorders using light sensitive paper. 35mm continuous strip cameras are used to record the actual flight path.

(I) MARK V INPUT(R) SYSTEM

The Induced Pulse Transient (INPUT) system is particularly well suited to the problems of overburden penetration. Currents are induced into the ground by means of a pulsed primary electromagnetic field which is generated in a transmitting loop around the aircraft. By using half sine wave current pulses, and a loop of large turns-area, the high output power needed for deep penetration is achieved.

The induced current in a conductor produces a secondary electromagnetic field which is detected and measured after the termination of each primary pulse. Detection is accomplished by means of a receiving coil towed behind the aircraft on five hundred feet of cable, and the received signal is processed and recorded by equipment in the aircraft. Since the measurements are in the time domain rather than the frequency domain common to continuous wave systems, interference effects of the primary transmitted field are eliminated. The secondary field is in the form of a decaying voltage transient originating in time at the termination of the transmitted pulse. The amplitude of the transient is of course, proportional to the amount of current induced into the conductor, and in turn, this current is proportional to the dimensions, the conductivity and the depth beneath the aircraft.

The rate of decay of the transient is inversely proportional to conductivity. By sampling the decay curve at six different time intervals, and recording the amplitude of each sample, an estimate of the relative conductivity can be obtained. By this means it is possible to discriminate between the effects due to conductive near surface materials such as swamps and lake-botton silts and those due to genuine bedrock sources.

The transients due to strong conductors such as sulphides exhibit long decay curves and are therefore commonly recorded on all six channels. Sheet like surface materials on the other hand have short decay curves and will normally only show a response in the first two or three channels.

The samples, or gates, are positioned at 300, 500, 700, 1100, 1500 and 1900 microseconds after the cessation of the pulse. The widths of the gates are 200, 300, 400, 600, 600 and 600 microseconds respectively.

For homogeneous conditions, the transient decay will be exponential and the time constant of decay is equal to the time difference at two successive sampling points divided by the log ratio of the amplitudes at these points.

(II) BARRINGER AM-101A PROTON PRECESSION MAGNETOMETER

The AM-101A magnetometer which measures the total magnetic field has a sensitivity of 5 gammas and a range from 20,000 gammas to 100,000 gammas.

Because of the high intensity field produced by the INPUT transmitter, the magnetometer results are recorded on a time sharing basis. The magnetometer head is energized while the transmitter is on, but the readout is obtained during a short perioddwhen the transmitter is off. Using this technique, the head is energized for 1.15 seconds, and then the transmitter is switched off for 0.15 seconds while the precession frequency is being recorded and converted to gammas. Thus a magnetic reading is taken every 1.3 seconds.

DATA PRESENTATION

The symbols used to designate the anomalies are shown in the legend on each map sheet, and the anomalies on each line are lettered in alphabletical order in direction of flight. Their locations are plotted with reference to the fiducial numbers on the visicorder record.

A sample record is included at the end of the report idenfifying the method used to correct for the position of the E.M. "bird" and identifies the parameters recorded on each channel.

Occasionally a question mark may be shown alongside the anomaly symbol. This may occur when the response is very weak and there is some doubt as to whether or not it is caused by turbulence or compensation noise caused by large changes in the position of the "bird" relative to the aircraft.

All the anomaly locations, magnetic correlations, and the amplitudes of channel number 4 are listed on the data sheets accompanying the final maps.

GENERAL INTERPRETATION

The INPUT system will respond to conductive overburden and near surface horizontal conducting layers in addition to bedrock conductors. Differentiation is based on the rate of transient decay, magnetic correlation and anomaly shape together with the conductor pattern and topography.

Power lines sometimes produce spurious anomalies but these can be identified by reference to the monitor channel.

Railroad and pipeline responses are recognized by studying the film strips.

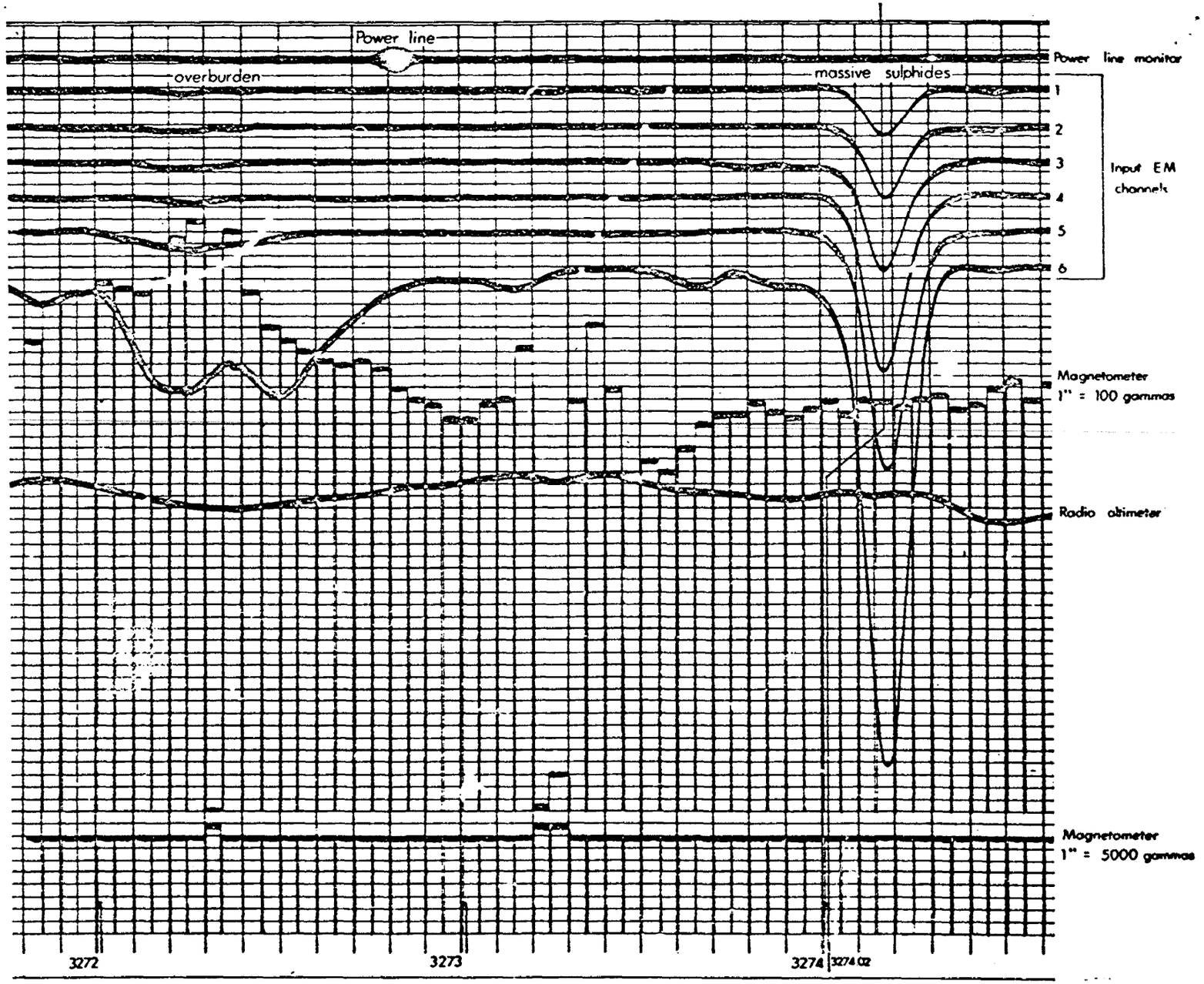
Graphite or carbonaceous material exhibits a wide range of conductivity. When long conductors without magnetic correlation are located on or parallel to known faults or photographic linears, graphite is most likely to be the cause.

Contact zones can often by predicted when anomaly trends coincide with the lines of maximum gradient along a flanking magnetic anomaly. It is unfortunate that graphite can also occur as relatively short conductors, and produce attractive looking anomalies. With no other information than the airborne results, these must be examined on the ground.

Serpentinized peridotites often produce anomalies with a character that is fairly easy to recognize. The conductivity which is probably caused in part by magnetite, is fairly low so that the anomalies often have a fairly large response on channel number 1, they decay rapidly, and they have strong magnetic correlation.

INPUT E.M. anomalies over massive magnetites show a relationship to the total Fe. content. Below 25-30% very little or no response at all is obtained, but as the percentage increases the anomalies become quite strong, with a characteristic rate of decay which is usually greater than that produced by massive sulphides.

Commercial sulphide ore bodies are rare, and those that respond to airborne survey methods usually have medium to high conductivity. Limited lateral dimensions are to be expected and many have magnetic correlation caused by magnetite or pyrrhotite. Provided that the ore bodies do not occur within formational conductive zones as mentioned above, the anomalies caused by them will usually be recognized on an E.M. map as priority targets.

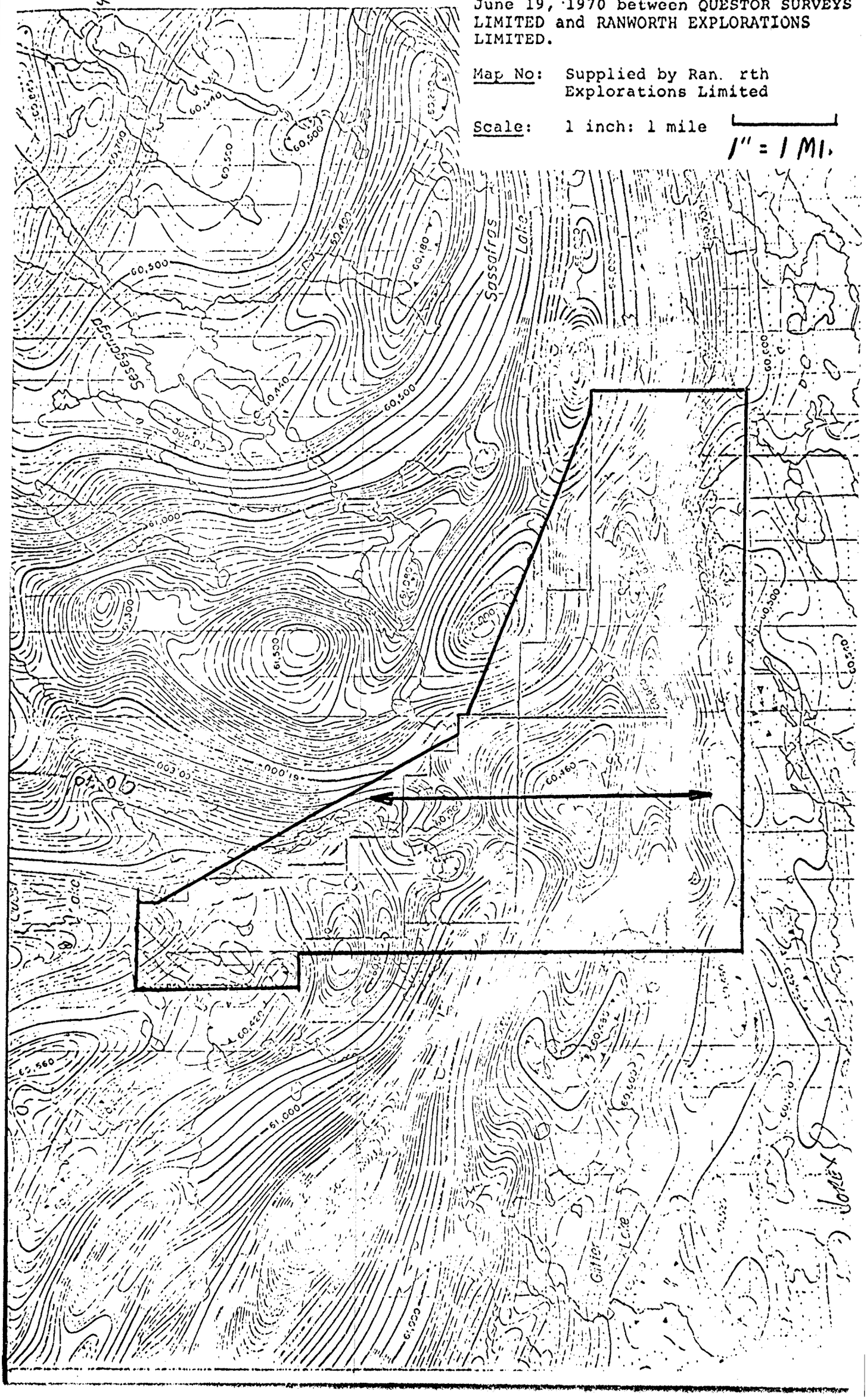

Power line
overburden
massive sulphides
Power line monitor
1
2
3
4
5
6
Input EM channels
Magnetometer
1" = 100 gammas
Radio altimeter
Magnetometer
1" = 5000 gammas
3272
3273
3274
3274.02

June 19, 1970 between QUESTOR SURVEYS LIMITED and RANWORTH EXPLORATIONS LIMITED.

Map No: Supplied by Ranworth Explorations Limited

Scale: 1 inch: 1 mile

1" = 1 MI.



2.145

STATEMENT OF SURVEY MILEAGE

Total mileage flown during survey 145 miles.

Mileage flown over claims only 93.5 miles.

EM
93.5 × 4 = 374 ÷ 177 = 21.13 days per claim

EM
93.5 × 4 = 374 ÷ 177 = 21.13 days per claim

CLAIM SCHEDULE

Claim No.	Days	Claim No.	Days	Claim No.	Days	Claim No.	Days	Claim No.	Days
Pa 247150	42	Pa 247253	42	Pa 248692	42	Pa 249514	42	Pa 249558	42
-51	42	-54	42	-93	42	-15	42	-59	42
-52	42	-55	42	-94	42	-16	42	-60	42
-53	42	-56	42	-95	42	-17	42	-61	42
-54	42	-57	42	-96	42	-18	42	-62	42
-59	42	-58	42	-97	42	-19	42	-63	42
-60	42	-59	42	-98	42	-20	42	-64	42
-69	42	-60	42	-99	42	-21	42	249890	42
-70	42	-61	42	248700	42	-22	42	-91	42
-71	42	-62	42	-01	42	-23	42	-92	42
-72	42	-63	42	-02	42	-24	42	-93	42
-73	42	-64	42	-03	42	-25	42	-94	42
-74	42	-65	42	-04	42	-26	42	-95	42
-75	42	-66	42	-05	42	-27	42	-96	42
-76	42	-67	42	-06	42	-28	42	-97	42
-77	42	-68	42	-07	42	-29	42	-98	42
-78	42	-69	42	-08	42	-30	42	-99	42
-79	42	-70	42	-09	42	-31	42		
247231	42	-71	42	-10	42	-32	42		
-32	42	-72	42	-11	42	-33	42		
-33	42	-73	42	-12	42	249538	42		
-34	42	-74	42	-13	42	-39	42	Total Number of Claims - 177	
-35	42	-75	42	-14	42	-40	42		
-36	42	-76	42	-15	42	-41	42	Total Number of Days - 7,434	
-37	42	-77	42	-16	42	-42	42		
-38	42	-78	42	-17	42	-43	42		
-39	42	-79	42	-18	42	-44	42		
-40	42	-80	42	-19	42	-45	42		
-41	42	-81	42	-20	42	-46	42		
-42	42	-82	42	-21	42	-47	42		
-43	42	248682	42	-22	42	-48	42		
-44	42	-83	42	-23	42	-49	42		
-45	42	-84	42	-24	42	-50	42		
-46	42	-85	42	-25	42	-51	42		
-47	42	-86	42	-26	42	-52	42		
-48	42	-87	42	-27	42	-53	42		
-49	42	-88	42	-28	42	-54	42		
-50	42	-89	42	-29	42	-55	42		
-51	42	-90	42	-30	42	-56	42		
-52	42	-91	42	249513	42	-57	42		

900

2.145

AREA CODE — 807
TELEPHONE — 737-2100

ONTARIO

DEPARTMENT OF MINES AND NORTHERN AFFAIRS
MINING LANDS BRANCH
OFFICE OF THE MINING RECORDER

Box 669
Sioux Lookout, Ontario
December 1, 1970

Fred W. Matthews,
Supervisor, Projects Section,
Ontario Department of Mines,
Whitney Block,
Parliament Buildings, Toronto.

NOTIFICATION OF RECORDING
OF ASSESSMENT WORK CREDITS

Date of Recording of Work ..... November 3, 1970

Recorded Holder ..... Jorex Limited

Suite 904 - 85 Richmond St. W. Toronto 110, Ontario
(address)

Township or Area ..... Bell & Chibaq Lakes S. of Sturgeon Lake M-1888
Quest Lake M-2875

Type of Survey and number of Assessment Days Credits per claim	
GEOPHYSICAL Airborne ☒ Ground ☐	
Magnetometer	42 days
Electromagnetic	days
Radiometric	days
.....	days
GEOLOGICAL	days
GEOCHEMICAL	days
SECTION 84 (14)	days

Mining Claims

Pa-247150-54 Incl.
~~247154~~-247159-60 Incl.
247169-79 Incl.
247231-82 Incl.
248682-730 Incl.
249513-33 Incl.
249538-64 Incl.
249890-99 Incl.

NOTICE TO RECORDED HOLDER

☒ Survey reports and maps in duplicate must be submitted to the Projects Section, Toronto within 60 days from the date of recording of this work.

☐ Reports and maps are being forwarded to Projects Section with this letter.

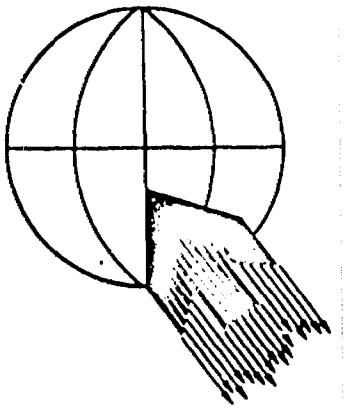
W. Buchan
.....
Mining Recorder.

c.c. Jorex Limited
Suite 904-85 Richmond St. W.
Toronto 110, Ontario

Mr. N. H. C. Fras

#335

Questor Surveys Limited. 20 Canso Road, Rexdale, Ontario. (416) 249-3357.



August 17, 1970

Mr. N. H. C. Fraser
Ranworth Explorations Limited
Suite 904
85 Richmond Street West
Toronto 1, Ontario

Dear Mr. Fraser:

This letter is to accompany the report on Area 1970-37, the Quest Lake Area, Ontario.

The names and addresses of men employed on the project with dates is as follows:

AIRCREW

J. Nedeau - Captain
J. Potvin - Copilot
D. Cruickshank - Instrument Operator

all of 20 Canso Road, Rexdale, Ontario

The date this area was flown is June 22nd, 1970.

Flight path recovery was done by M. Chan.
Data reduction was done by R. Kennedy.
This was completed on July 30th, 1970.
The report was written by D. Watson.

Yours sincerely,

D. Watson
Chief Geophysicist

2.145

AREA CODE — 416
TELEPHONE — 365-6918

ONTARIO

DEPARTMENT OF MINES AND NORTHERN AFFAIRS
MINING LANDS BRANCH

February 4th, 1971.

Mr. W.A. Buchan,
Mining Recorder,
Court House,
Sioux Lookout, Ontario.

Re: Mining Claim No. PA.247150 et al,
Bell & Shikag Lakes and Quest Lake Areas

Dear Sir:

The Airborne (Magnetometer and Electromagnetic) assessment work credits as shown on the attached list have been approved as of the date above. Please inform the recorded holder and so indicate on your records.

Yours very truly,

Fred W. Matthews,
Supervisor,
Projects Section.

c.c. Jorex Limited,
Suite 904,
85 Richmond St. W.,
Toronto 110, Ontario.

c.c. Mr. H.L. King,
Resident Geologist,
808 Robertson Street,
Kenora, Ontario.

FWM/mr

PROJECTS SECTION DEPARTMENT OF MINES AND NORTHERN AFFAIRS FILE: 2.145

TECHNICAL ASSESSMENT WORK CREDITS

Recorder Holder Jorex Limited

Township or Area Bell & Shikag Lakes and Quest Lake Areas

Type of Survey and number of Assessment Days Credits per claim	
GEOPHYSICAL Airborne [X]	Ground [ ]
Magnetometer	21 days
Electromagnetic	21 days
Radiometric	days
GEOLOGICAL	days
GEOCHEMICAL	days
SECTION 84 (14)	days
Special Provision [ ]	Man days [ ]

NOTICE OF INTENT TO BE ISSUED

- [ ] Credits have been reduced because of partial coverage of claims.
- [ ] Credits have been reduced because of corrections to work dates and figures of applicant.
- [ ] NO CREDITS have been allowed for the following mining claims as they were not sufficiently covered by the survey:

Mining Claims
PA. 247150 to 54 Inclusive
247159 - 60
247169 to 79 Inclusive
247231 to 82 Inclusive
248682 to 730 Inclusive
249513 to 33 Inclusive
249538 to 64 Inclusive
249890 to 99 Inclusive

The Mining Recorder may reduce the above credits if necessary in order that the total number of approved assessment days recorded on each claim does not exceed the maximum allowed as follows: Geophysical – 80; Geological – 40; Geochemical – 40;

SEE

M. 2875

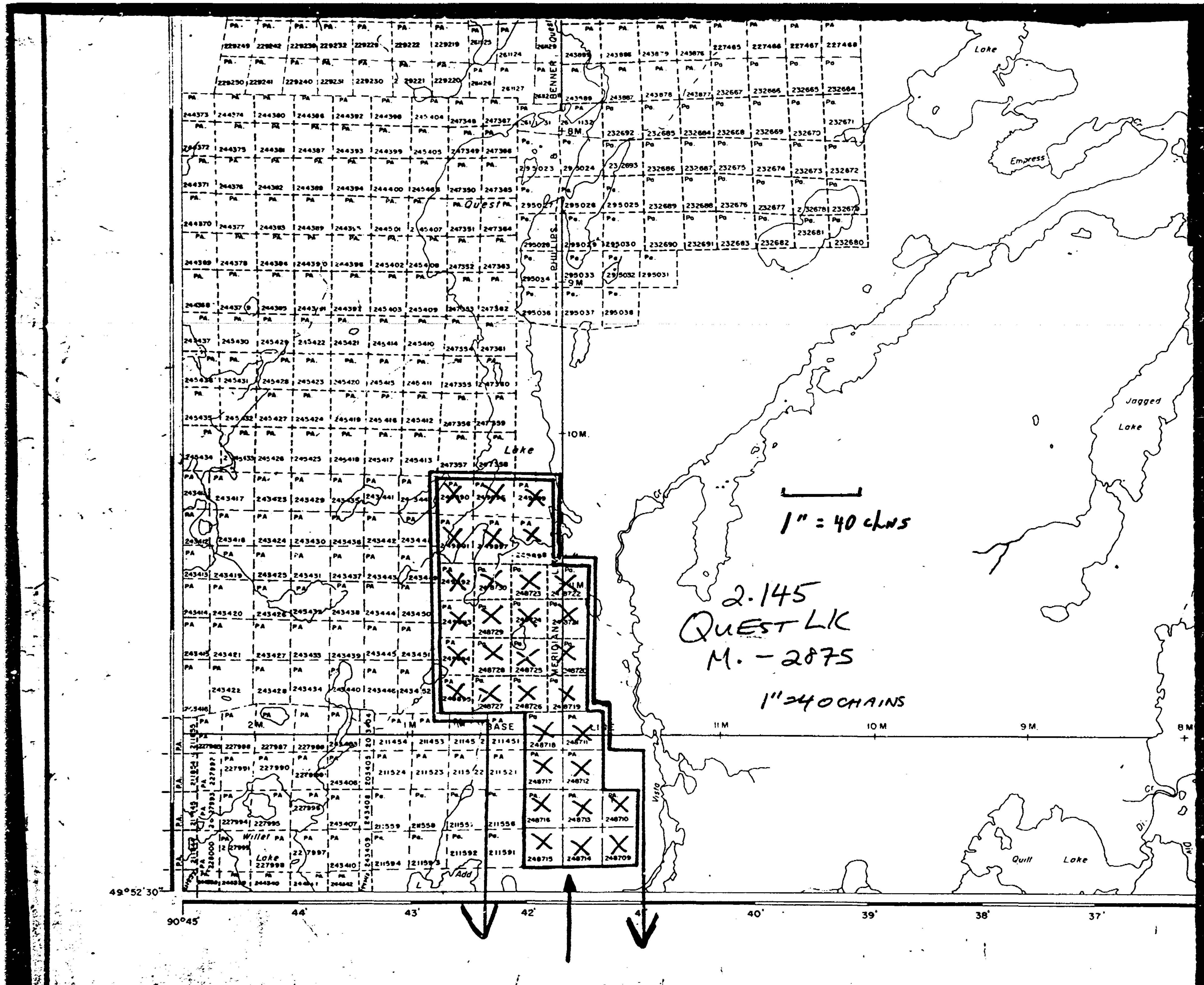
"Claim Map"

DUNNE
LC
M-3274

2.145

1" = 40 chains

1 in = 40 CHAINS

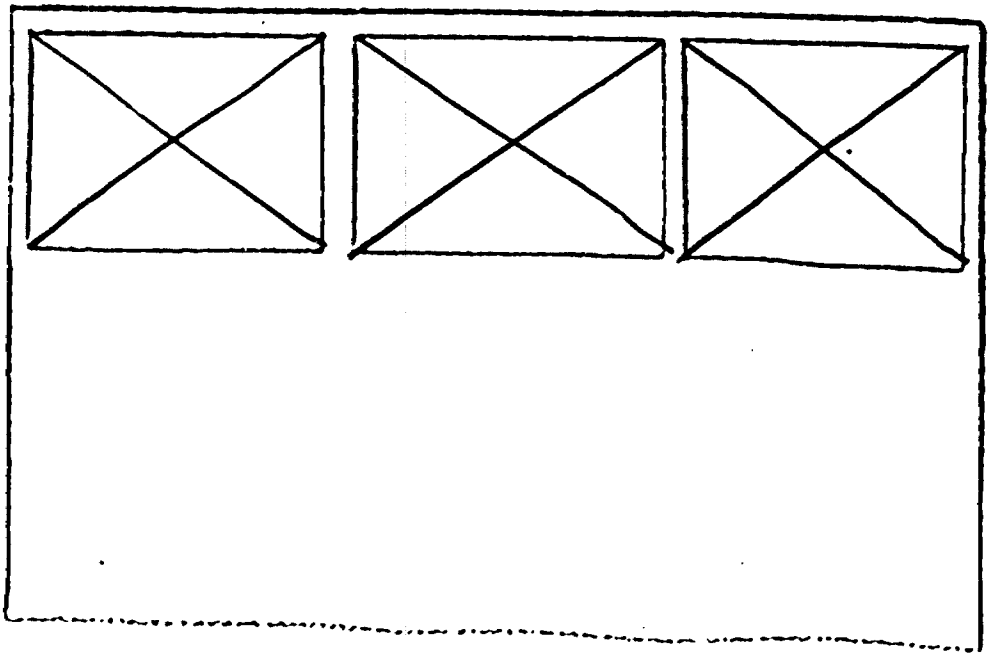


2.145
QUEST LK
M. - 2875
1"=40 CHAINS
1" = 40 chns
Quest
Lake
Empress
Jagged Lake
Quill Lake
Willet Lake
BASE
LINE
11M
10M
9M
8M
49°52'30"
90°45'
44'
43'
42'
40'
39'
38'
37'

SEE ACCOMPANYING MAP(S) IDENTIFIED AS

52G/15SE-0016, #1, #2

LOCATED IN THE MAP CHANNEL IN THE FOLLOWING SEQUENCE (X)



FOR ADDITIONAL

INFORMATION

SEE MAPS:

52G/15SE-0016 #2