



42A00NE0249 2.10343 COOK

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REPORT ON THE
AIRBORNE GEOPHYSICAL SURVEY
ON THE PROPERTY OF
C. MARSHALL
COOK TOWNSHIP, ONTARIO

BY

H. FERDERBER GEOPHYSICS LTS.

RECEIVED

SEP 11 1987

August 28, 1987
Val d'Or, Quebec

MINING LANDS SECTION

R.A. Campbell, B.Sc.
Geologist

*Recd.
2.6.609*

**REPORT ON THE
AIRBORNE GEOPHYSICAL SURVEY
ON THE PROPERTY OF
C. MARSHALL
COOK TOWNSHIP, ONTARIO**

INTRODUCTION

On July 29, 1987 an airborne geophysical survey was carried out on the property of C. Marshall in Cook Township, Ontario. Magnetic and VLF-electromagnetic data was collected by the airborne division of H. Ferderber Geophysics Ltd. The survey was flown from a base at Val d'Or, Quebec. A total of 25.9miles of data was collected.

The magnetic survey provides information which helps define the underlying geological structures and identifies any potential economic concentrations which may contain variations in accessory magnetic minerals. The VLF-electromagnetic survey outlines conductive zones which may represent shear zones and/or metallic sulphide deposits containing mineralization.

PROPERTY DESCRIPTION, LOCATION AND ACCESS

The C. Marshall property is comprised of 15 claims, covering 240 hectares in the central part of Cook Township, Larder Lake Mining Division, Ontario. The claims are registered with the office of the Mining Recorder in Kirkland Lake and are listed in Appendix 1. The survey was conducted over the 15 claims and 7 open claims to the north.

The property is located 32 km north-northwest of Kirkland Lake, 20 km southeast of Matheson and 7.7 km east of the village of Ramore. Provincial Highway 11, from Kirkland Lake to Matheson passes within 8 km of the eastern boundary of the property. A road east from Ramore ends 1.3 km east of the property. On the air photos a bush road, from the southeast, crosses the northeastern corner of the claim block.

The property is forested and a swamp is situated in the central part of the claim group. The Pike River flows across the northern boundary of the surveyed area.

Supplies, services and qualified manpower are available in the Kirkland Lake-Matheson area.

GEOLOGY

The property is located in the western portion of the Abitibi Volcanic Belt of the Superior Province of the Canadian Shield. The Abitibi Volcanic Belts extends for nearly 350 miles in a west-east direction from Timmins to Chibougamau. It is host to a variety of precious and base metal deposits including the Timmins, Kirkland Lake, Noranda, Val d'Or and Chibougamau mining camps.

The Abitibi Volcanic Belt is comprised of a complex assemblage of interbedded volcanic and sedimentary rocks intruded by a variety of intrusives from ultra basic to granitic in composition. The rocks are Archean in age and have been metamorphosed to a greenschist facies. Numerous late Precambrian diabase dykes cut formations of the belt. The rocks generally strike east-west, have a near vertical dip and are highly folded and faulted.

The Ontario Division of Mines, Map 2205 - Geological Compilation Series, Timmins-Kirkland Lake Area, outlines the geology underlying the property. This map indicates that the claims are underlain by mafic metavolcanic flows and pyroclastic rocks.

Exploration activity in the area has increased in recent years with the American Barrick Resources and Canamax Resources gold discoveries in Harker-Holloway area, 46 km east-northeast of the property.

The Destor-Porcupine Fault, the most predominant structural feature in the area, strikes southeast and east through Guibord Township, approximately 5 km north of the claim group. Splays strike south-southeast into the northern part of Cook Township.

INSTRUMENTATION AND SURVEY METHODS

The survey was completed using a Cessna 172, fixed wing aircraft (CF-AAV) owned and operated by H. Ferderber Geophysics Ltd. It was piloted by P. Jevremovic of Val d'Or. The navigator/operator was M. Caron, also from Val d'Or. Geophysical sensors were mounted in modified wing tips. A GEM-GSM-9 BA Overhauser Proton Precession Magnetometer and a Herz Totem 2AG VLF-electromagnetic system were used. The magnetometer has a resolution of 0.5 gammas, recorded on analogue tape. The VLF-EM measures the change in total field and vertical quadrature field on two channels simultaneously, with an accuracy of 1%. The data is then transferred to a printer. The transmitting station at Cutler, Maine, (NAA), frequency 24.0 kilohertz was used.

The survey was conducted at an aircraft altitude of 250 feet above ground level. The altitude was measured with a Bonzer Mark 10 radar altimeter. A survey speed of approximately 100 miles per hour was used. Navigation was visual with reference to air photo mosaics at a scale of 1:15840 (one inch to 1320 feet). Lines flown in north-south directions at spacings of 440 feet were recovered from the photo mosaics. Manual fiducials were recorded simultaneously on the geophysical tapes and solid state memory.

DATA PRESENTATION

Flight lines, fiducial points and geophysical responses were reproduced from the air photo mosaics on maps at a scale of 1:15,840 (one inch to 1320 feet). The outline of the claim group and claim map are shown on each sheet.

The aeromagnetic data was corrected for diurnal variations by using base lines as references. The data was then reduced to a base level of 58,500 gammas, contoured at 25 and 100 gamma intervals and presented on Maps MG-1.

The VLF-EM data was transferred from the Totem 2AG memory to printed form. Base values were determined and the change in the total field strength as a percentage of the base values was calculated. The VLF-EM values were plotted on maps EM-1. The positive values were contoured at intervals of 2%. The conductor axes were determined and labelled 1, 2, 3, etc. No priority was attached to the numbering system.

SURVEY RESULTS AND INTERPRETATION

Magnetic survey

The magnetic survey outlined a series of magnetic highs and lows striking 90° to 125° across the property. The magnetic highs outline the location and extent of mafic metavolcanic rocks, flows and pyroclasts. The lows reflect the lower

magnetic susceptibility of the underlying rocks. These are probably intercalated intermediate metavolcanic rocks or metasedimentary horizons. The high and low striking 125° across the middle of the property appear to be slightly folded.

VLF-Electromagnetic Survey

Six conductive zones were delineated on the claim group by the VLF-electromagnetic survey. Four of the zones (1 to 4) strike roughly east-west and two, 5 and 6, strike north-south.

Zone 1 is a 1.4 km long, continuous conductor located in the north part of the claim block. It is situated along a magnetic high and represents a potential shear zone within mafic metavolcanic rocks.

Conductive zone 2 is comprised of 2 conductors having a total strike length of 1 km. The eastern conductor is located in a swamp and the west end follows a small creek. The zone is situated in a magnetic low. The conductor could be caused by conductive overburden following the trend of a possible bedrock feature, a shear, within intermediate metavolcanics or metasedimentary rocks.

Conductor 3 strikes 115° across the southern part of the property. It lies along the north edge of a magnetic low and could be a small shear associated with a contact between intermediate metavolcanic or sedimentary rocks and mafic metavolcanics rocks.

Zone 4, comprised of two conductors, strikes east-west along the southern boundary of the property. The conductors are situated in a magnetic low, representing a possible shear within intermediate metavolcanic rocks or a metasedimentary horizon.

Conductor 5, striking 350° appears to cut-off the eastern end of the eastern conductor of zone 2. It lies over distortions in the contours of a magnetic low and may be a short cross-cutting shear within intermediate metavolcanics or metasediments.

Conductor 6 strikes north-south for 0.4 km across the southern part of the property. The north end is cut-off by conductor 3. This zone cuts across the contours of a magnetic low and high and ends near contour distortions. It could be small shear cutting across intercalated mafic metavolcanic and intermediate metavolcanic or metasedimentary rocks.

CONCLUSIONS AND RECOMMENDATIONS

The airborne magnetic and VLF-electromagnetic surveys were successful in helping outline the underlying geology and in delineating conductive zones on the C. Marshall property in Cook Township. A series of linear magnetic highs and lows striking 90° to 125° , representing possible units of intercalated mafic metavolcanics and intermediate metavolcanics or metasedimentary rocks. In the Harker-Holloway area gold deposits and occurrences have been found in metasedimentary horizons near mafic metavolcanic contacts.

Six conductive zones, representing possible shear zones, were outlined. Four zones were delineated striking parallel to the local geology and 2 were outlined striking south across the local and regional strike. Good targets for sulphide mineralization and/or gold deposition are: conductive zones located within magnetic lows, zones 2 and 4, zone 3 along the boundary of magnetic highs and lows, representing contacts between mafic metavolcanics and metasediments or intermediate metavolcanics, and the intersections of zones 2 and 5 and zones 3 and 6.

Further work is warranted on the claim group. Ground vertical gradient and total field magnetic and horizontal loop-electromagnetic surveys should be performed. These surveys will better define the underlying geology and outline and classify conductive zones.

Respectfully submitted,

H. FERDERBER GEOPHYSICS LTD.

A handwritten signature in cursive script, appearing to read "R.A. Campbell".

R.A. Campbell, B.Sc.
Geologis

APPENDIX I - CLAIM LIST

L 843114
843115
843116
843117
843118
843119
843121
843122
843123
843856
971279
971280
971281
971282
971283



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900

The Minin

Type of Survey(s) AIRBORNE ULF-EM & MAGNETOMETER.	Township or Area COOK TWP.
Claim Holder(s) CHARLIE MARSHALL	Prospector's Licence No. K-15629
Address 25 CARLTON ST. APT #3, ST. CATHARINES, ONT.	
Survey Company H. FERDERBER GEOPHYSICS LTD.	Date of Survey (from & to) 29 7 87
Name and Address of Author (of Geo-Technical report) H. FERDERBER GEOPHYSICS - 169 PERRAULT, VALDOR, QUE.	

Credits Requested per Each Claim in Columns at right

Mining Claims Traversed (List in numerical sequence)

Special Provisions	Geophysical	Days per Claim
For first survey: Enter 40 days. (This includes line cutting)	- Electromagnetic	
	- Magnetometer	
	- Radiometric	
	- Other	
For each additional survey: using the same grid: Enter 20 days (for each)	Geological	
	Geochemical	
Man Days	Geophysical	Days per Claim
Complete reverse side and enter total(s) here	- Electromagnetic	
	- Magnetometer	
	- Radiometric	
	- Other	
	Geological	
	Geochemical	
Airborne Credits		Days per Claim
Note: Special provisions credits do not apply to Airborne Surveys.	Electromagnetic	40
	Magnetometer	20
	Radiometric	

Prefix	Mining Claim Number	Expend. Days Cr.	Prefix	Mining Claim Number	Expend. Days Cr.
L	843114 ✓				
L	843115 ✓				
L	843116 ✓				
L	843117 ✓				
L	843118 ✓				
L	843119 ✓				
L	843121 ✓				
L	843122 ✓				
L	843123 ✓				
L	843856 ✓				
L	971279 ✓				
L	971280 ✓				
L	971281 ✓				
L	971282 ✓				
L	971283 ✓				

RECEIVED
AUG 28 1987
MINING LANDS SECTION
JUL 31 1987
10:11:02 AM
1115

Expenditures (excludes power stripping)

Type of Work Performed

Performed on Claim(s)

Calculation of Expenditure Days Credits

Total Expenditures \$ ÷ 15 = Total Days Credits

Instructions
Total Days Credits may be apportioned at the claim holder's choice. Enter number of days credits per claim selected in columns at right.

Total number of mining claims covered by this report of work. **15**

Date **JULY 31-87** Recorded Holder or Agent (Signature) **Ron Crickton**

For Office Use Only

Total Days Cr. Recorded **900** Date Recorded **JULY 31 1987** Mining Recorder **Acting J. B...**

Date Approved as Recorded **JULY 31 1987** Branch Director

Certification Verifying Report of Work

I hereby certify that I have a personal and intimate knowledge of the facts set forth in the Report of Work annexed hereto, having performed the work or witnessed same during and/or after its completion and the annexed report is true.

Name and Postal Address of Person Certifying **65 TWEEDSMuir RD. KIRKLAND LAKE ONT.**

Date Certified **JULY 31-87** Certified by (Signature) **Ron Crickton**



Ministry of
Natural
Resources
Ontario

Department of Work
(Physical, Geological,
Chemical and Structures)

320/87

Instructions: - Please type or print.
- If number of mining claims traversed exceeds space on this form, attach a list.
Note: - Only days credits calculated in the "Expenditures" section may be entered in the "Expend. Days Cr." columns.
- Do not use shaded areas below.

The Mining Act

Type of Survey(s) AIRBORNE VLF 1 m & MAGNETOMETER Township or Area COOK TWP.
Claim Holder(s) _____ Prospector's Licence No. K-15629

Address CHARLIE MINERALI
25 CARLTON ST. UNIT #3, CATARINES, ONT.

Survey Company H. FERDERBER GEOPHYSICAL LTD. Date of Survey (from & to) 29 7 87 Total Miles of line Cut _____
Name and Address of Author (for Geophysical) H. FERDERBER GEOPHYSICAL LTD. - 169 PERRAULT, VALDOR, QUE.

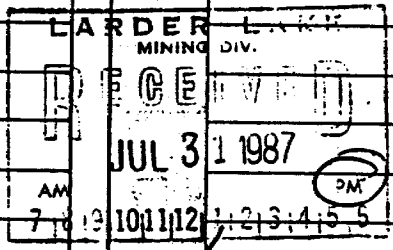
Credits Requested per Earth Claim in Column _____ Mining Claims Traversed (List in numerical sequence)

Special Provisions	Days per Claim
For first survey: Enter 40 days. (This includes line cutting)	
For each additional survey using the same grid: Enter 20 days (for each)	

Man Days	Days per Claim
Complete reverse side and enter total(s) here	

Airborne Credits	Days per Claim
Note: Special provisions credits do not apply to Airborne Surveys.	
Electromagnetic	40
Magnetometer	20
Radiometric	

Mining Claim			Mining Claim		
Prefix	Number	Expend. Days Cr.	Prefix	Number	Expend. Days Cr.
L	843114				
L	843115				
L	843116				
L	843117				
L	843118				
L	843119				
L	843121				
L	843122				
L	843123				
L	843856				
L	971279				
L	971280				
L	971281				
L	971282				
L	971283				



Expenditures (excludes power stripping)

Type of Work Performed _____

Performed on Claim(s) _____

Calculation of Expenditure Days Credits

Total Expenditures \$ _____ ÷ 15 = Total Credits _____

Instructions: Total Days Credits may be apportioned at the claim holder's choice. Enter number of days credits per claim in columns at right.

Date JULY 31-87 Recorded Holder of Agent (Signature) Ron Creighton

For Office Use Only

Total Days Cr. Recorded 900 Date Recorded JULY 31 1987 Mining Recorder Acting [Signature]
Date Approved as Recorded _____ Branch Director

Total number of mining claims covered by this report of work. 15

Certification Verifying Report of Work

I hereby certify that I have a personal and intimate knowledge of the facts set forth in the Report of Work annexed hereto, having performed the work or witnessed same during and/or after its completion and the annexed report is true.

Name and Postal Address of Person Certifying 65 TWEEDSMuir RD. WARKLAND LAKE ONT. P2R 1T3

Date Certified JULY 31 1987 Certified by (Signature) [Signature]



TO BE ATTACHED AS AN APPENDIX TO TECHNICAL REPORT
FACTS SHOWN HERE NEED NOT BE REPEATED IN REPORT
TECHNICAL REPORT MUST CONTAIN INTERPRETATION, CONCLUSIONS ETC.

Type of Survey(s) Airborne Magnetic and VLF-Electromagnetic

Township or Area Cook Township

Claim Holder(s) C. Marshall

Survey Company H. Ferderber Geophysics Ltd.

Author of Report R.A. Campbell

Address of Author 169 Perreault Ave, Val d'Or, Quebec

Covering Dates of Survey July 29, 1987
(linecutting to office)

Total Miles of Line Cut-Flown 25.9

MINING CLAIMS TRAVERSED
List numerically

L	843114
(prefix)	(number)
	843115
	843116
	843117
	843118
	843119
	843121
	843122
	843123
	843856
	971279
	971280
	971281
	971282
	971283
TOTAL CLAIMS <u>15</u>	

If space insufficient, attach list

SPECIAL PROVISIONS
CREDITS REQUESTED

ENTER 40 days (includes line cutting) for first survey.

ENTER 20 days for each additional survey using same grid.

	DAYS per claim
Geophysical	
-Electromagnetic	_____
-Magnetometer	_____
-Radiometric	_____
-Other	_____
Geological	_____
Geochemical	_____

AIRBORNE CREDITS (Special provision credits do not apply to airborne surveys)

Magnetometer 36 Electromagnetic 36 Radiometric _____
(enter days per claim)

DATE: August 28, 1987 SIGNATURE: R.A. Campbell
Author of Report or Agent

Res. Geol. _____ Qualifications _____

Previous Surveys

File No.	Type	Date	Claim Holder

SELF POTENTIAL

Instrument _____ Range _____

Survey Method _____

Corrections made _____

RADIOMETRIC

Instrument _____

Values measured _____

Energy windows (levels) _____

Height of instrument _____ Background Count _____

Size of detector _____

Overburden _____

(type, depth - include outcrop map)

OTHERS (SEISMIC, DRILL WELL LOGGING ETC.)

Type of survey _____

Instrument _____

Accuracy _____

Parameters measured _____

Additional information (for understanding results) _____

AIRBORNE SURVEYS

Type of survey(s) VLF-EM and Magnetometer

Instrument(s) Herz Totem 2AG and GEM GSM-9BA
(specify for each type of survey)

Accuracy 1% and 0.5 gammas
(specify for each type of survey)

Aircraft used Cessna 172

Sensor altitude 250 feet

Navigation and flight path recovery method Visual navigation on airphoto-mosaic
manual fiducial points

Aircraft altitude 250 feet Line Spacing 440 feet

Miles flown over total area 25.9 Over claims only 13.5



Ministry of
Northern Development
and Mines

Ontario

Ministère du
Développement du Nord
et des Mines

October 19, 1987

Your File: 320
Our File: 2.10343

Mining Recorder
Ministry of Northern Development and Mines
4 Government Road East
Kirkland Lake, Ontario
P2N 1A2

Dear Sir:

RE: Airborne Geophysical (Electromagnetic and Magnetometer)
Survey on Mining Claims L-843114, et al, in Cook Township

The assessment work credits, as listed on the enclosed Technical Assessment Work Credit form, have been approved as of the above date. Please disregard the Notice of Intent dated October 7, 1987.

Please inform the recorded holder of these mining claims and so indicate on your records.

Yours sincerely,

OK R.M. Charnesky (Mrs.)
Acting Manager
Mining Lands Section
Mineral Development & Lands Branch
Mines & Minerals Division

Whitney Block, Room 6610
Queen's Park
Toronto, Ontario
M7A 1W3

DK:p1
Enc.

cc: Mr. Charlie Marshall
25 Carlton St., Apt #3
St. Catherines, Ontario
L2R 1P5

Mr. Ron Crichton
65 Tweedsmuir Road
Kirkland Lake, Ontario
P2N 1J3

Mr. G.H. Ferguson
Mining & Lands Commissioner
Toronto, Ontario

Resident Geologist
Kirkland Lake, Ontario



Recorded Holder	Charlie Marshall
Township or Area	Cook Township

Type of survey and number of Assessment days credit per claim	Mining Claims Assessed	
Geophysical	L 843114 to 119 inclusive 843121 to 123 inclusive 843856 971279 to 283 inclusive	
Electromagnetic 36 days		
Magnetometer 36 days		
Radiometric _____ days		
Induced polarization _____ days		
Other _____ days		
Section 77 (19) See "Mining Claims Assessed" column		
Geological _____ days		
Geochemical _____ days		
Man days <input type="checkbox"/> Airborne <input checked="" type="checkbox"/>		
Special provision <input type="checkbox"/> Ground <input type="checkbox"/>		
<input type="checkbox"/> Credits have been reduced because of partial coverage of claims. <input checked="" type="checkbox"/> Credits have been reduced because of corrections to work dates and figures of applicant.		

Special credits under section 77 (16) for the following mining claims

No credits have been allowed for the following mining claims

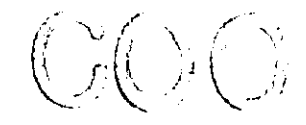
not sufficiently covered by the survey insufficient technical data filed

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; Section 77(19) - 60.

200010

Guibord Twp.

THE TOWN OF
COOK TWP.



DISTRICT
COCHRAN

LARDER
MINING DIV.

SCALE: 1-INCH = 4

LEGEND

- PATENTED LAND
- CROWN LAND SALE
- LEASES
- LOCATED LAND
- LICENSE OF OCCUPATION
- MINING RIGHTS ONLY
- SURFACE RIGHTS ONLY
- ROADS
- IMPROVED ROADS
- KING'S HIGHWAYS
- RAILWAYS
- POWER LINES
- MARSH OR MUSKEG
- SWAMP

NOTES

Prepared for staking
Area Withdrawn From SRO
Act, 5 April 1951 Clause 1
Gravel Reserve Shown Thus
400' Surface rights reservation
rivers.

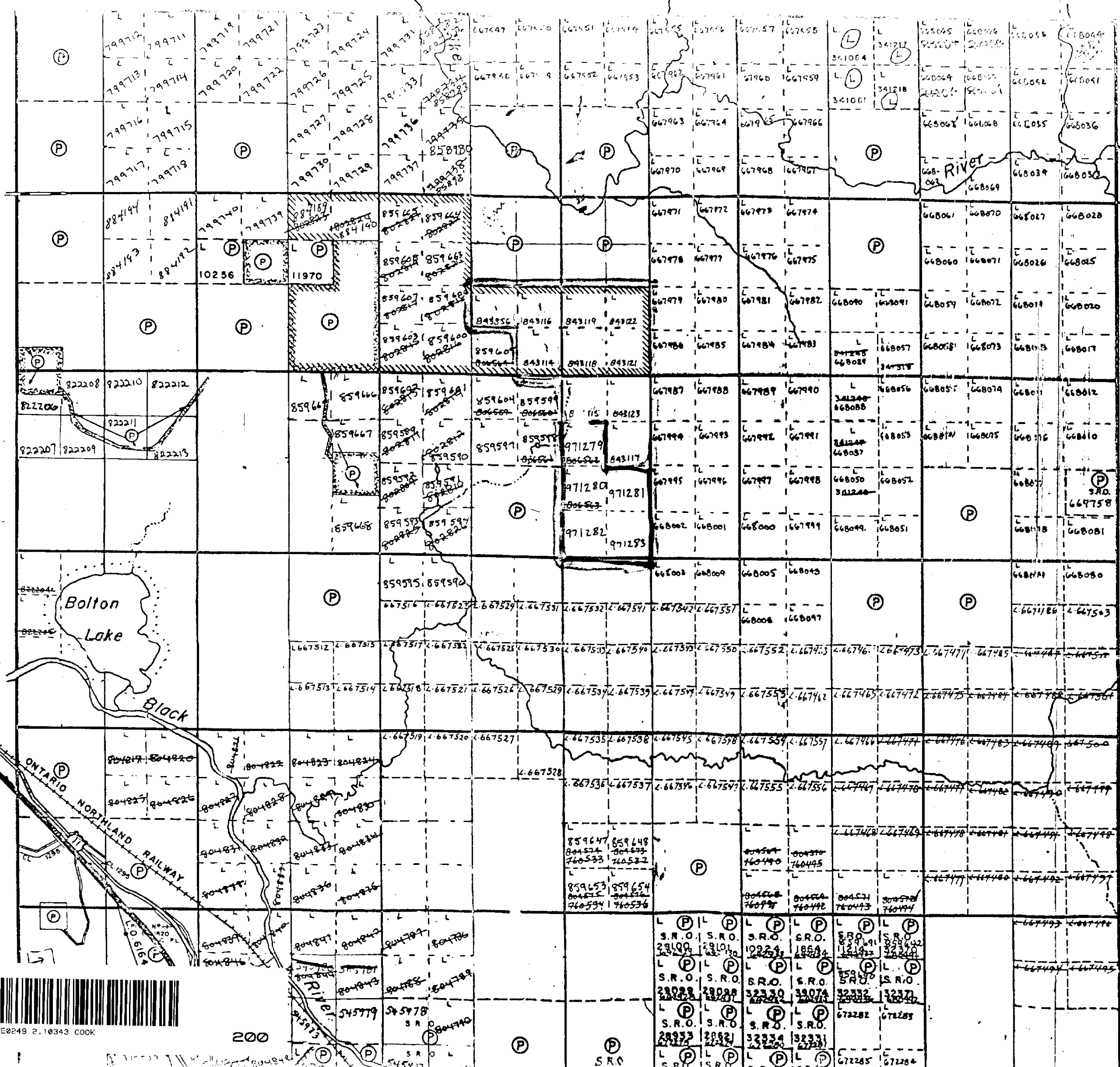
DATE OF ISSUE

JUN 26 1981

LARDER LAKE
MINING RECORDER'S OFFICE

Playfair Twp.

Barnet Twp.

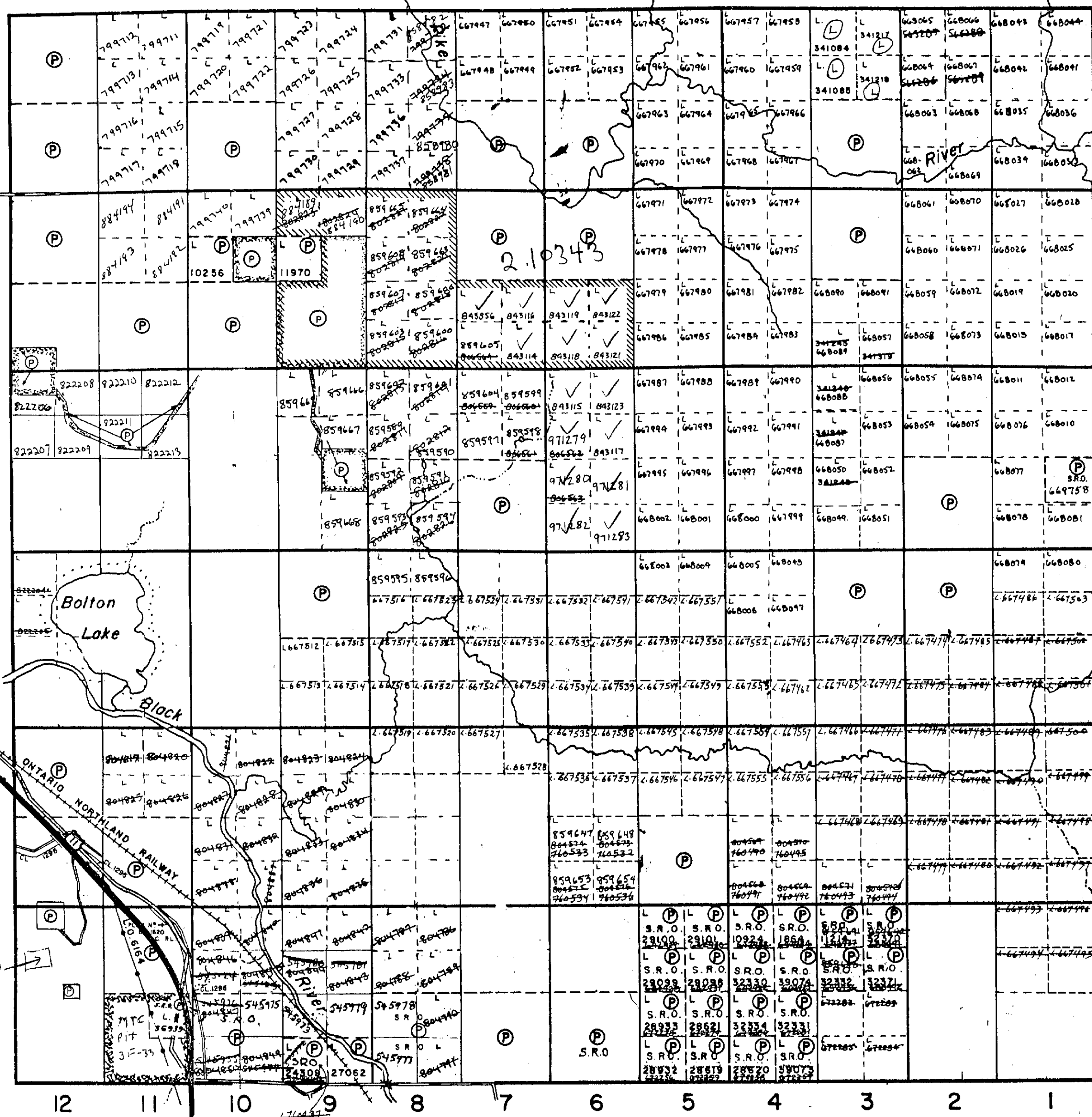


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Guibord Twp.

Playfair Twp.



Benoit Twp.

THE TOWNSHIP OF

COOK

DISTRICT OF COCHRANE

LARDER LAKE MINING DIVISION

SCALE: 1-INCH= 40 CHAINS

LEGEND

- | | |
|------------------------|--------|
| PATENTED LAND | Ⓟ |
| CROWN LAND SALE LEASES | Ⓢ or Ⓛ |
| LOCATED LAND | Ⓛ |
| LICENSE OF OCCUPATION | L.O. |
| MINING RIGHTS ONLY | M.R.O. |
| SURFACE RIGHTS ONLY | S.R.O. |
| ROADS | — |
| IMPROVED ROADS | — |
| KING'S HIGHWAYS | — |
| RAILWAYS | — |
| POWER LINES | — |
| MARSH OR MUSKEG | — |
| MINES | — |

NOTES

Reopened for staking
 Area Withdrawn from Staking Under Mg.
 Act, 5 April 1951 Clause (d) Section 39

Gravel Reserve Shown Thus: [Symbol]

400' Surface rights reservation around all lakes & rivers.

DATE OF ISSUE

MAR 22 1987

LARDER LAKE
 MINING RECORDER'S OFFICE

PLAN NO. M.339

ONTARIO
 MINISTRY OF NATURAL RESOURCES
 SURVEYS AND MAPPING BRANCH

VI

V

IV

III

II

I

Barnet Twp.

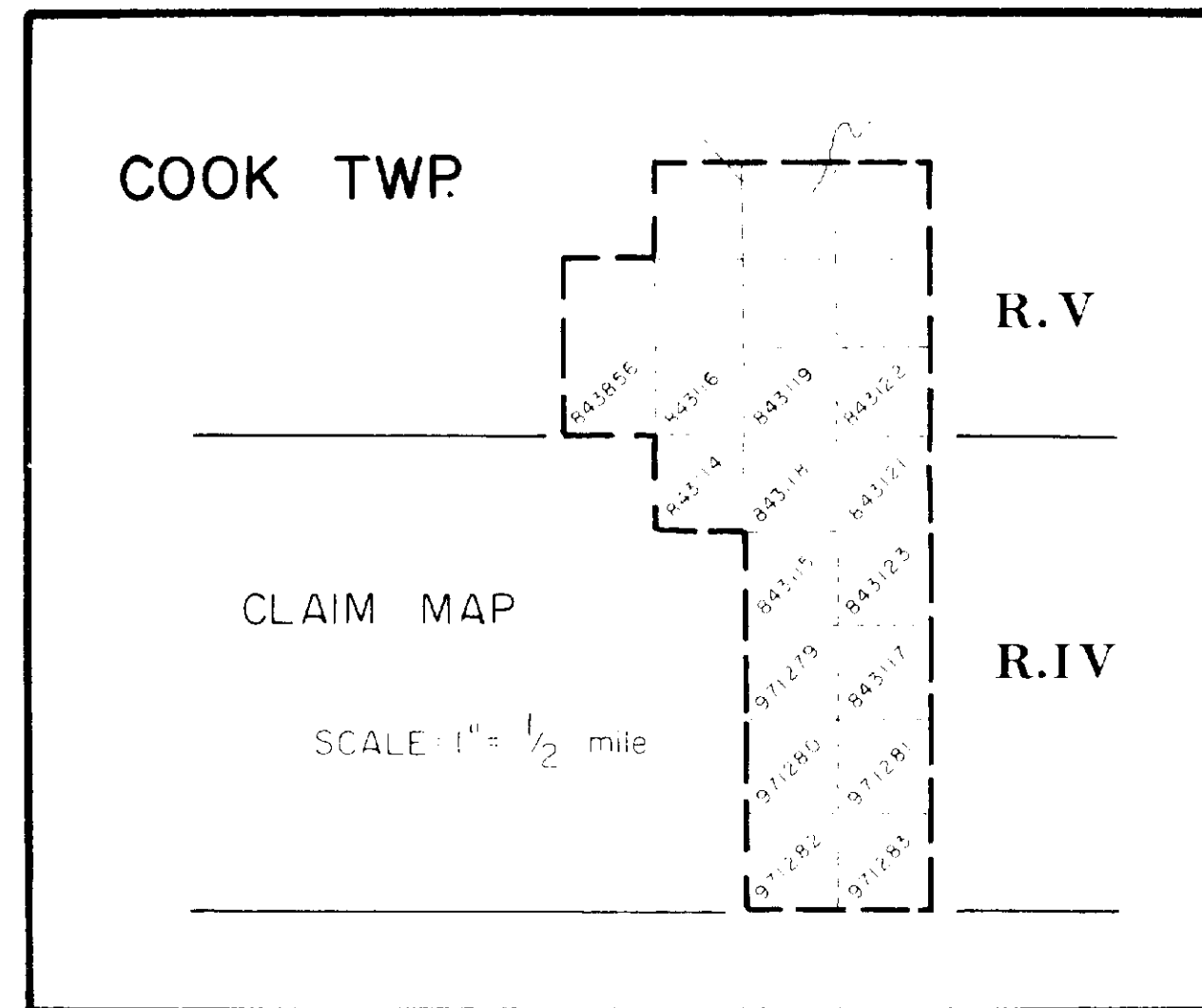
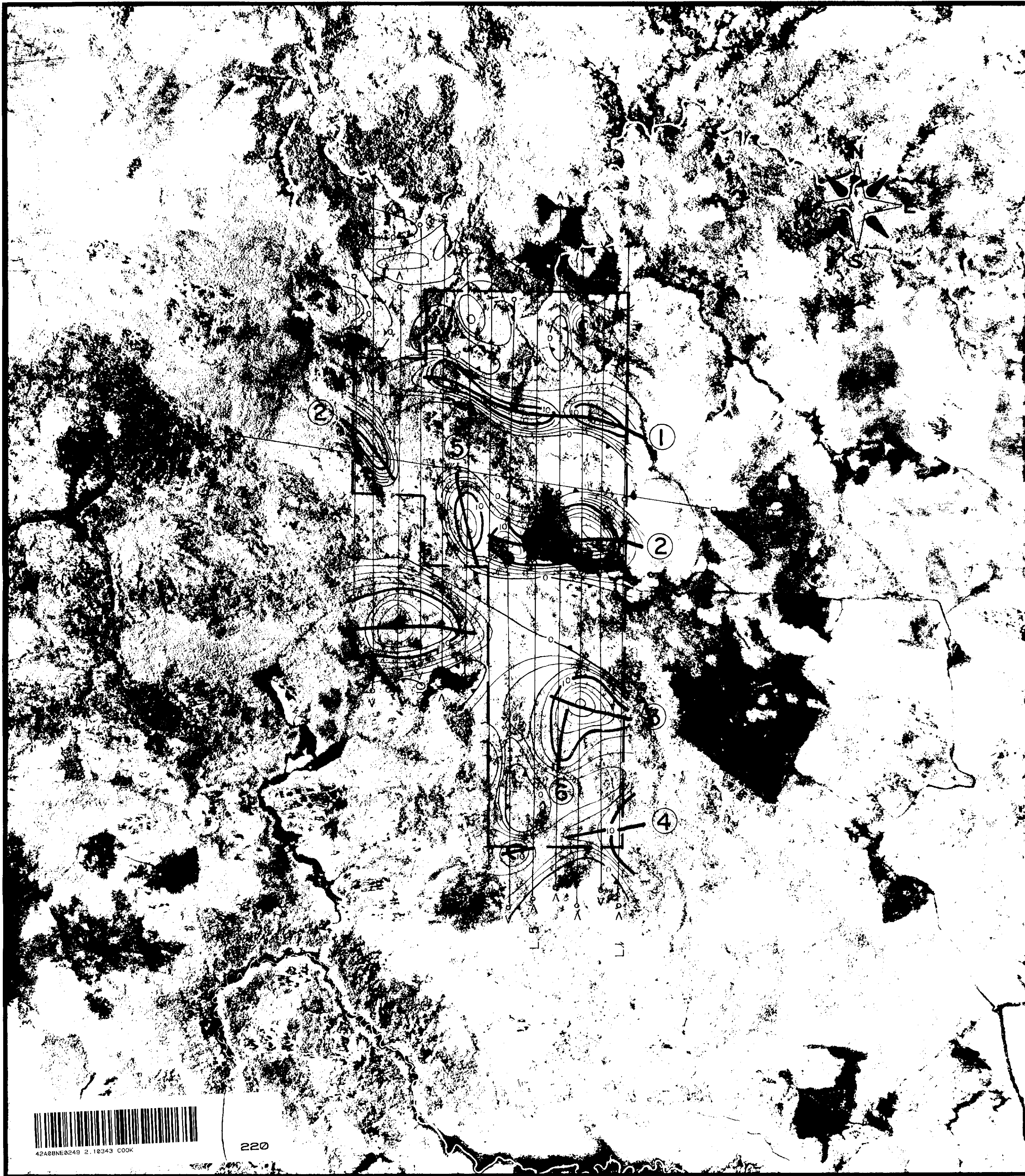


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210

B.D.

#18



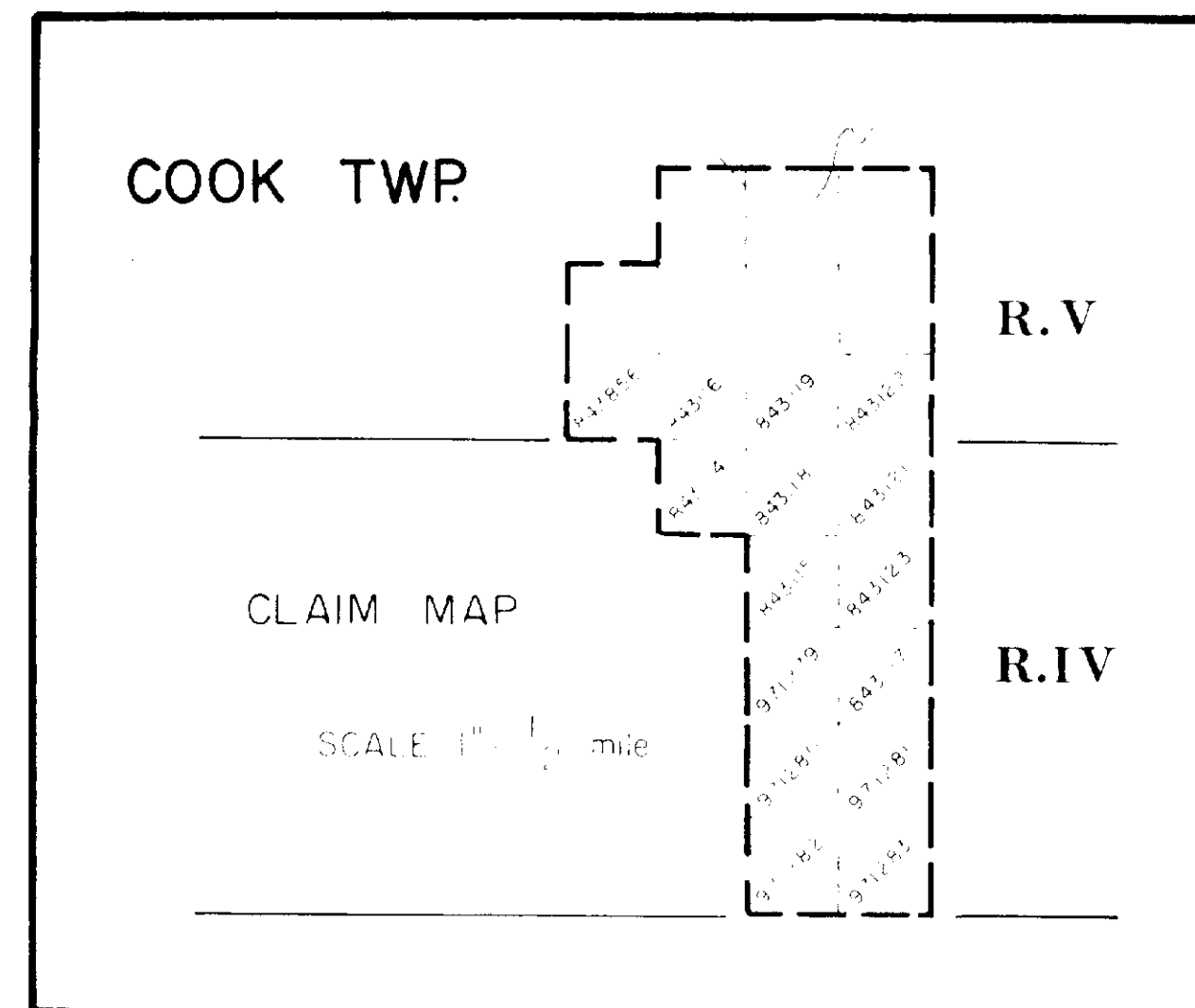
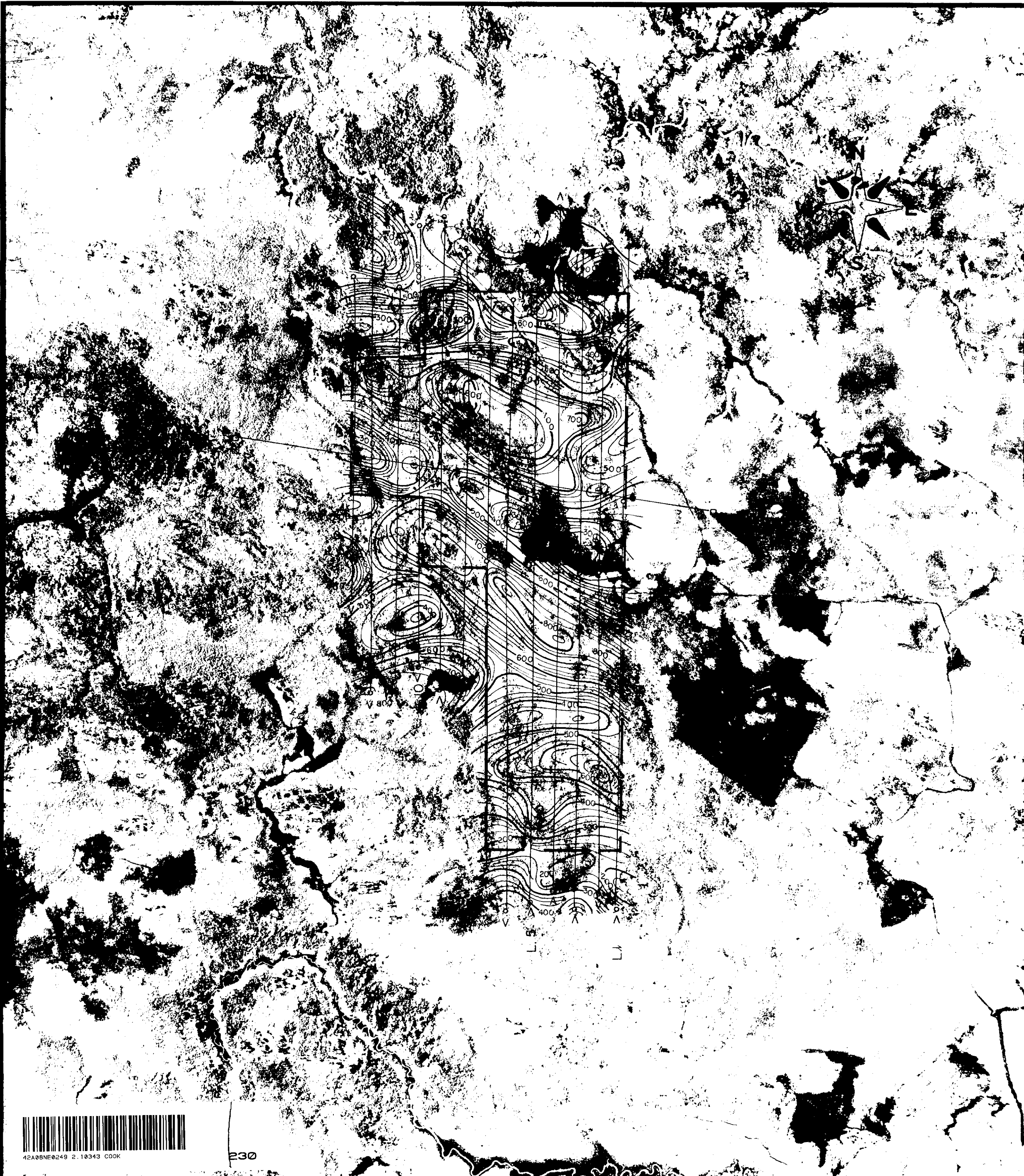
LEGEND

- TOTAL FIELD CONTOUR INTERVAL 2 %
- CONDUCTOR AXIS
- FIDUCIAL POINT
- > LINE DIRECTION
- ⊕ STATION USED: CUTLER, MAINE, U.S.A. (N.A.A. 24.0 kHz)
- ⊖ LESS THAN ZERO
- 10%
- 2%
- 0%

TYPE OF WORK		AIRBORNE V.L.F.-EM SURVEY		
CLIENT		C. MARSHALL 210343		
PROJECT	AREA	COOK TWP. ONT.		
H. Ferderber Geophysics Ltd. <i>R.A. Grew</i>	SCALE	1" = 1/4 mile	DATE	AUGUST 1987
	DRAWN BY	<i>R.A. Grew</i>	MAP OR SHEET NO.	EM-1




220



LEGEND

- TOTAL FIELD CONTOUR INTERVAL 25 GAMMAS
- FIDUCIAL POINT
- > LINE DIRECTION
- BASE VALUE 58500 GAMMAS
- ⊖ MAGNETIC LOW
- 100 GAMMAS
- 25 GAMMAS

TYPE OF WORK		AIRBORNE MAGNETIC SURVEY	
CLIENT		C. MARSHALL 210343	
PROJECT	AREA	COOK TWP. ONT.	
 <i>RA</i> H. Ferderber Geophysics Ltd.	SCALE	DATE	
	1" = 1/4 mile	AUGUST 1987	
DRAWN BY	MAP OR SHEET NO.		
<i>W.M.</i>	MG-1		



42A08NE0248 2.10343 COOK

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