CECLOGICAL and GEOPHYSICAL REPORT

on the

M GROUP of 50 CLAIMS

owned by:

RAYORE MINES LTD.

Located near Aspen Grove,

Nicola M.D., B.C.

Lat.49°50' Long.120°37' N.T.S. 92 H NE

924/15E

On work done between January 10th and February 22nd, 1967

bу

GEO-X SURVEYS LTD.

D. R. COCHRANE, P. Eng. March 15th, 1967 Vancouver, B.C.





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SUMMARY

Over twelve line miles of mag and EM, and a restricted geological survey programme was completed on the M-A and M-B groups of claims, near Aspen Grove, owned by Rayore Mines Ltd., by Geo-X Surveys Ltd., during January and February, 1967.

Two seperate grids were established; over seven miles on grid A, M-A claim group, and five miles on grid B, M-B claim group. A small area of outcrop is located between the two grids. Bedrock consists of course grained, grey hornblende diorite.

Two magnetic anomalies and several moderate to weak conductive zones were outlined. Magnetic anomaly one is a vertical field low, which may be considered an inverse dipole, horizontal cylander, over 1300 feet long and probably less than 400 feet in diameter. Pole depth is estimated between 30 and 150 feet below surface. Several conductive zones near the edge of the anomaly are considered boundary effects.

Magnetic anomaly two is a sharp, circular, vertical field high, 3730 gammas above background. The body responsible for the anomaly is near surface and possibly less than 100 feet in diameter.

A long linear, weakly conductive zone on the west side of zone A is interpreted as a fault.

RECOMMENDATIONS:

Sub-reconnaissance geological, geophysical and geochemical surveys to assess the remainder of the claim group, in conjunction with a drilling programme to test the present geophysical anomalies is recommended.

The programme to consist of the following:

- A. Geological, Geophysical and Geochemical Surveys:
 - 1. Line cutting, maximum line spacing of 800 feet on the remainder of the M Group;
 - 2. A magnetometer survey over the proposed grid, plus
 - 3. An electromagnetic survey over the proposed grid, plus
 - 4. Geological mapping of property;
 - 5. Restricted geochemical soil sampling programme on mag and EM anomalies which may be uncovered.

B. Diamond Drilling:

- Drill test of magnetic anomaly #1;
- 7. One drill hole and/or trenching on magnetic anomaly #2.

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INTRODUCTION:

Three magnetic anomalies were discovered during a mobile magnetometer reconnaissance survey, in mid-July, 1965 by Electronic Geophysical Surveys Ltd, of Burnaby, B.C. Fifty claims were staked to cover the anomalies, by Mr. J.N. Chernoff of Grand Forks, B.C., as agent for Mr. J. Sullivan, Vancouver B.C., on February 20, 21 and 22, 1966. All interests in the 50 claims were transferred to Mineral Mountain Mining Co., Ltd. on August 11th, 1966. The property was purchased by Rayore Mines Ltd. in February, 1967.

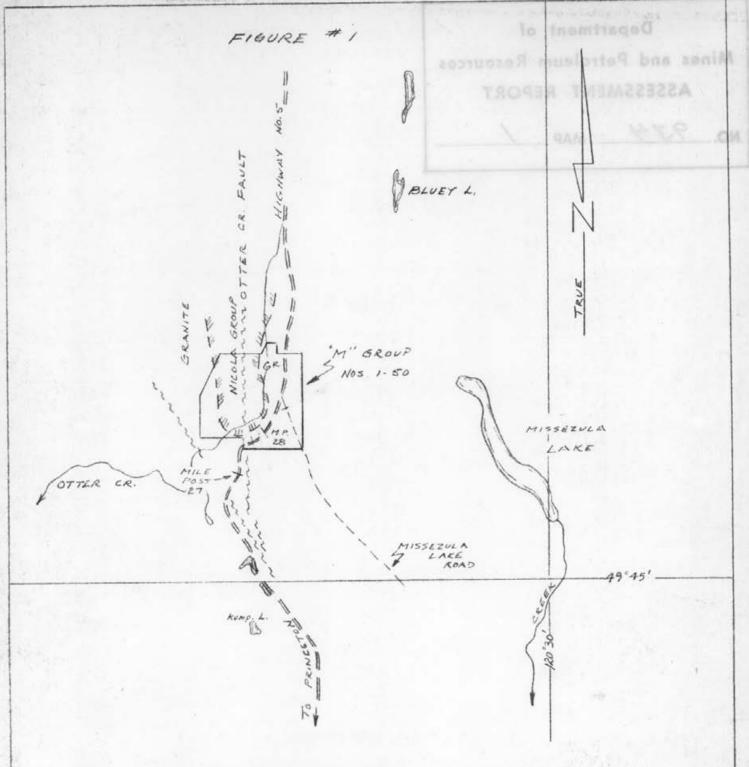
During January and February, 1967, Geo-X Surveys Ltd. of Vancouver, B.C. completed a ground magnetometer, electromagnetic and geological orientation survey on lines cut over the anomalies.

This report describes and discusses the results of the surveys.

Apportionment of costs for assessment work purposes are outlined in Appendix II.

LOCATION and ACCESS (see Fig.1)

The claim group is centered about the mile 28 post on Highway #5, Nicola Mining Division. It is 28 miles north of Princeton, B.C. and 30 miles south of Merritt. Otter Creek, flowing south westerly, divides the property into roughly two equal halves.



NICOLA GROUP - VARICOLOURED LAVA; ARGILLITE, TUFF, LIMESTONE;

GRANITE - MAINLY REDDISH, COARSE GRAINED . SILICEOUS GRANITE

AND GRANDDIORITE.

GEOLOGY & PLAN

GEOLOGY FROM MAP 889 A "PRINCETION"
BY H.M. A RICE 1939, 1941, 1944

angles because her see

SCALE I INCH = 2 MILES

CLAIMS and OWNERSHIP:

The claims are owned outright by Rayore Mines Ltd., F.M.L. #55538, 925 West Georgia Street, Vancouver, B.C...
Claim data is tabulated below:

Name of Claim(s): <u>Tag. No's</u> <u>Record No's</u> <u>Recording Date</u>
"M" No.'s 1 to 50 incl. 65551-65600 27730-27779 Feb.23rd, 1967

Grouping of claims, and claims surveyed information is included in Appendix V.

<u>LINECUTTING</u>: (see Fig.2)

Two seperate grids were established, both on the west half of the property. The first, called zone A on claims M 1, 2, 3, 4, 6, 26 and 28 of group "M-A" Base line A, azimuth 40° was cut, chained, picketed and surveyed by transit from 5 + 00 south to 35 + 00 North. A total of 24 cross lines, 100 feet apart and 1600 feet long were cut at right angles to base line A. Total footage on zone A is 39,900 feet or over 7 miles.

The second grid, zone B, was completed on claims M 27, 29, 31 42 and 40, of group "M-B". The base line on this zone (base line B) was cut, chained, picketed and surveyed by transit from 0 +00 to 35 + 00 south, at azimuth 163°. Cross lines on the B zone were cut 100 feet apart and 1600 feet long, between 12 + 00 South and 23 + 00 south. A total of 26,400 feet of line or 5.0 miles was established over this zone.

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GENERAL GEOLOGY: (see fig. 1)

G.S.C. map 888A, shows that the "M" group is underlain by Upper Triassic Nicola group rocks, intruded by Jurassic (?) Coast Intrusions. Nicola rocks are dominantly volcanic in this area. Intermediate tuffs, agglomerates, fragmental volcanics and andesites were observed. These rocks are altered, sheared and weathered near surface. The "M" group section of the Mt. Pike batholith is a course grained intermediate intrusive.

A tongue of Nicola volcanic rocks loops south into the claim group, with a north-south axis west of, but nearly parallel to, Otter Creek. A major fault is indicated by H.M.A. Rice along this axis. The intrusive is horseshoeshaped, open to the north, about the volcanic tongue.

LOCAL GEOLOGY: (see fig. 2)

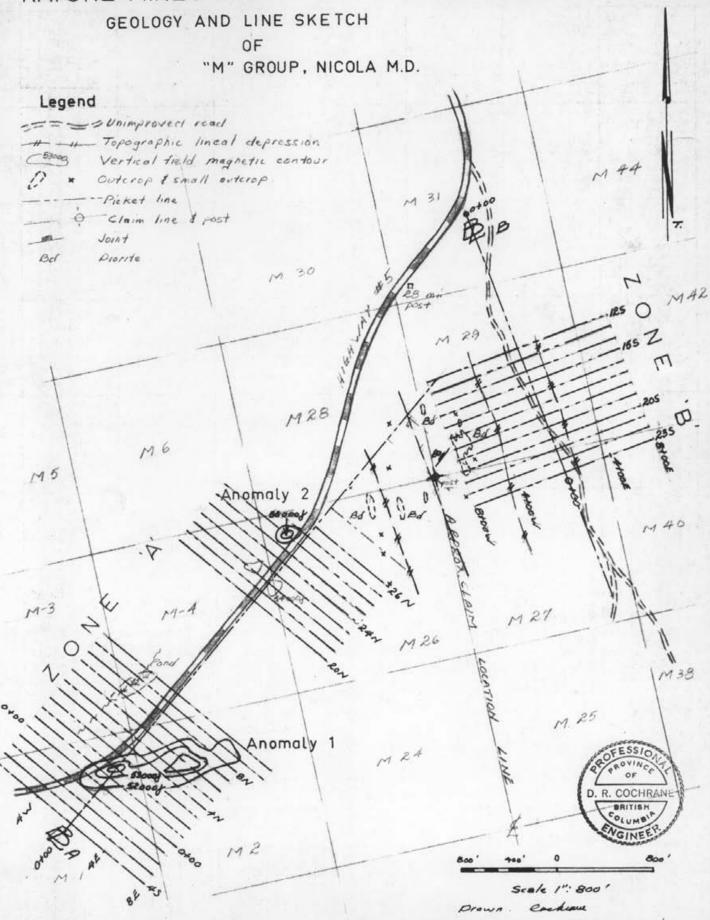
One small area of bedrock exposure was located near the grids. The outcrop area is in and around the M-A, M-B group boundary, between zones A and B. A series of linear depressions, striking 340°, divides the outcroparea into a parallel to sub-parallel sequence of narrow ridges and draws.

Bedrock consists of course grained, grey hornblende diorite. Some phases of the intrusive shawed noticeable biotitic alteration of the amphibole, and other phases are epidotitic. Slight disseminated magnetite was observed and very minor pyrite.

Mar. 6/67

Date.

RAYORE MINES Ltd. 627 HORNBY ST., VANCOUVER 1, B.C.



Outcrops close to the draws have both open tensional fractures and healed fractures striking 40°, dipping 80°NW. Another well developed joint set strikes 340° and dips at moderate angles to the east. Many of the joints are slightly silicified and epidotized.

MAGNETOMETER SURVEY:

A. General

The two component portable magnetometer, manufactured by Sabre Electronics, Burnaby, B.C. was used exclusively on the project. The entire grid area, over 12 line miles, was surveyed, stations established every 100 feet, this interval being reduced to 50 feet in anomalous areas. Field operations and specifications of the instrument are described in Appendix III.

Readings taken at seventeen stations on line 4+00S, and seventeen stations on line 20+00N, zone A, were utilized for background calculations. The average vertical component intensity ($\overline{\mathbf{V}}$) is 52,800 gammas, the average horizontal field intensity ($\overline{\mathbf{H}}$) is 17,040 gammas, The average total field intensity ($\overline{\mathbf{F}}$) is 55,270 gammas, inclination 72° north, declination azimuth 23°.

The magnetic plans have a distinct approximately eastwest trend, and a less well developed trend at right angles.

The most outstanding magnetic feature is an east-west elongated vertical component low, with a corresponding horizontal low

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and sharp horizontal high on the north edge. This feature is centered near 6+00 north, 4+00 east, zone A and is referred to as anomaly one. A distinct, somewhat isolated vertical component high, enclosed in a broad ^tU^t shaped high, centered on 26+00 north, 1+00 west, zone A, is referred to as anomaly 2.

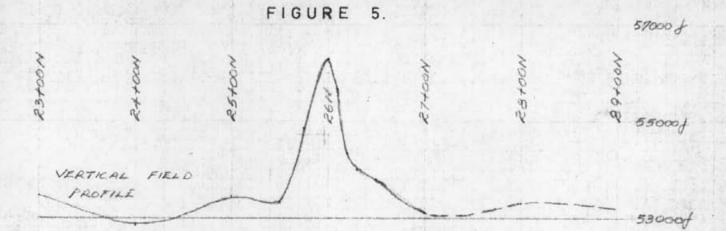
Zone B has very little magnetic amplitude. A weak coincident horizontal and vertical field high is located at the west edge of the grid, near diorite outcrop. A more diffuse high is present on the east portion of the grid.

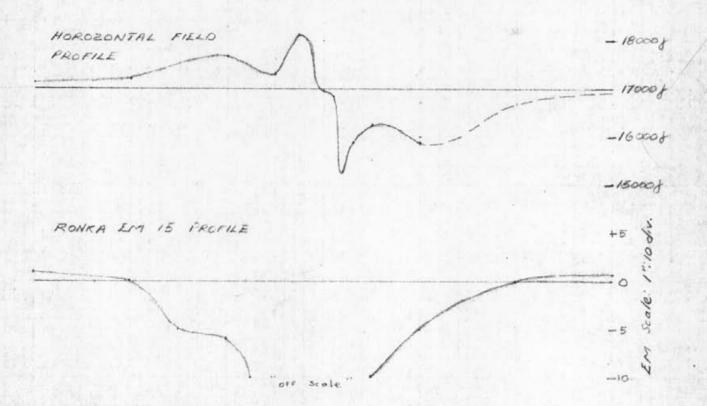
Anomaly 1: (see Figs.3 & 4, and maps in pocket)

The vertical field anomaly is roughly 1300 feet long, 300 feet wide and strikes north 85° east. The lowest reading obtained was 45,430 gammas, 7370 gammas below background. The maximum horizontal component reading was, 30,470 gammas, 13,430 gammas above background and the minimum 5,340 gammas below background.

Anomaly 2: (see Fig. 5 and maps in pocket)

Anomaly 2 is less than 200 feet in diameter—the Maximum vertical component observation was 3730 gammas above background, and the horizontal component changes south to north, from a high of 600 gammas above background, to a low, 880 gammas below background.





MAGNETOMETER & EM PROFILES

OVER

ANOMALY #2, ZONE A"

'M" GROUP

NICOLA M.D. PESSION



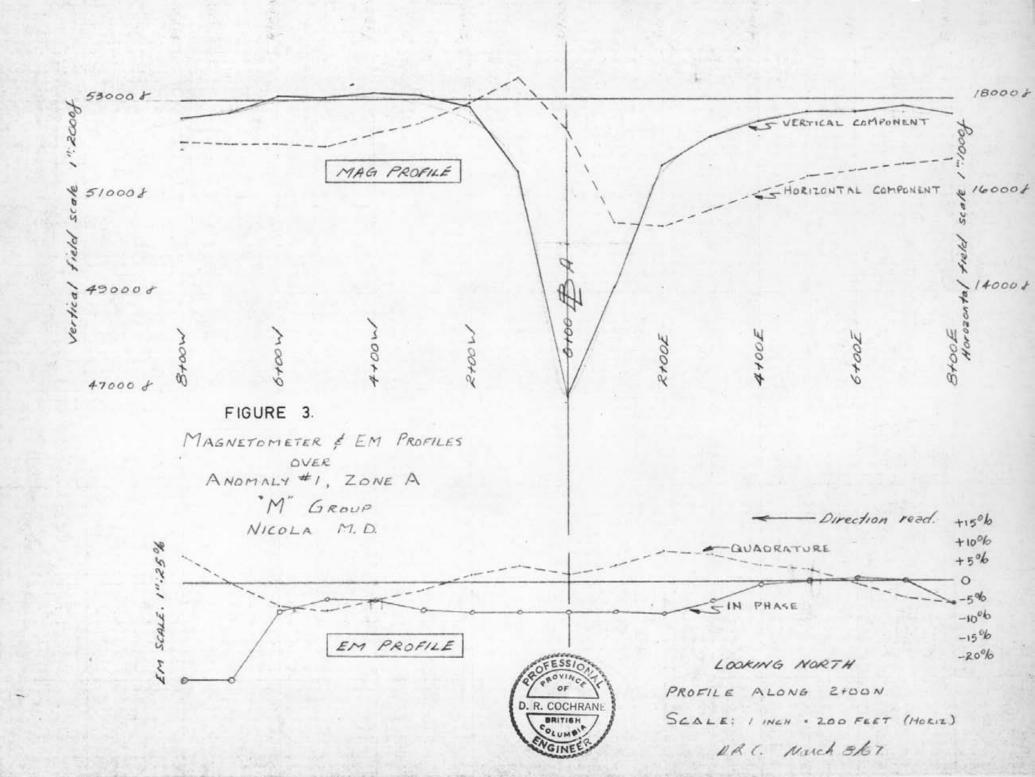
PROFILE ALONG

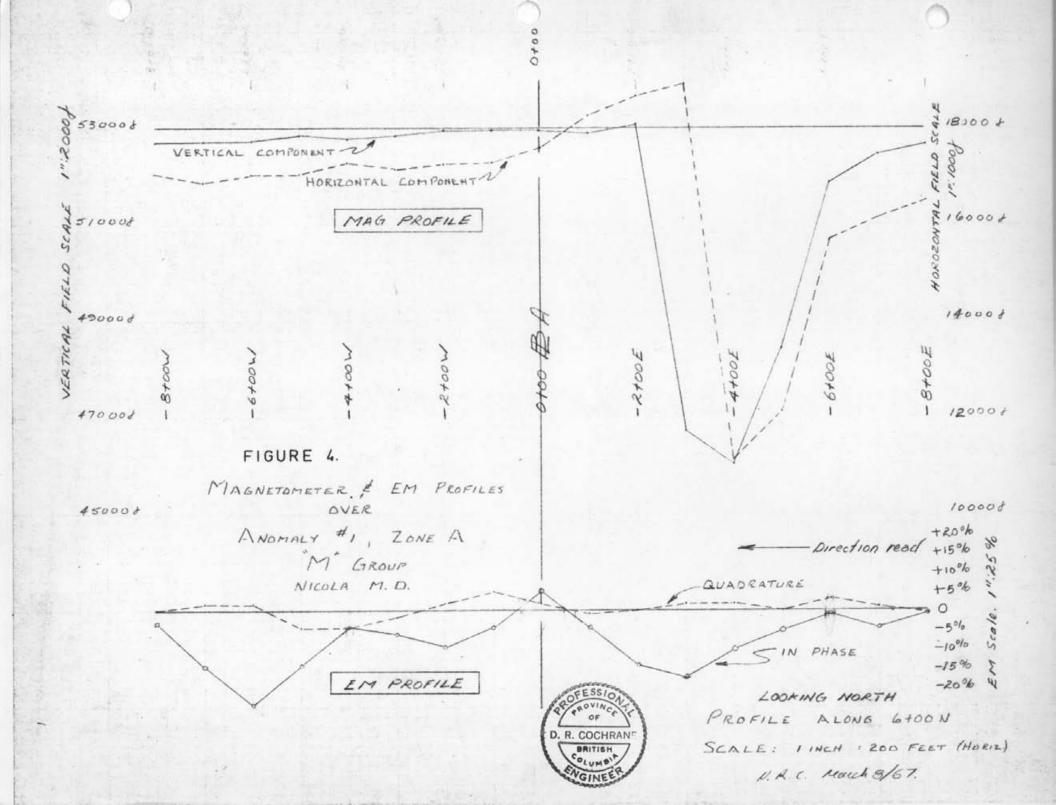
1+00 W

LOOKING NORTHWEST

SCALE: 1": 100' hor.

L.R.C. March 6/67.





ELECTROMAGNETIC SURVEY:

The Ronka Em 16 and Em 15 were utalized on the M group survey. Zone B was surveyed mainly with the Em 15, and Zone A was surveyed mainly with the EM 16. Field operation and specifications are described in appendix IV. The station selected for the 16 survey was Seattle, sta.NPG, frequency 18.6 kc. All readings were taken while facing north westerly.

A number of conductors are indicated from the electromagnetic survey. Most trend north east, and are arculate. The strongest conductor is just east of the base line, near anomaly 2, zone A, where the in phase component changes from -20% to +5% within 300 feet. EM anomaly 2 contains two strong crossovers and two weaker crossovers. It is semi-elliptical in shape at the south end of zone A.

EM anomaly 3 is characterized by a series of weak crossovers near and along a line 400 feet west of base line A then tailing off southwesterly between 0 and 7N, Zone A. Several other EM anomalies are less distinct.

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INTERPRETATION OF MAGNETIC AND ELECTROMAGNETIC SURVEYS:

For interpretive purposes, the large vertical field magnetic low, named anomaly one, may be considered a series of reverse dipoles. It can be regarded as a buried horizontal cylinder, 1300 feet long probably 400 or so feet in diameter. Half width vertical profile measurements indicate a pole depth of between 80 and 130 feet below surface. Vector analysis of horizontal and vertical field observations suggest a pole depth between 30 and 100 feet at 5 + 00west; 7 + 00 north, and a pole depth between 110 and 150 feet at 2 + 00 north on base line A, therefore a very slight westerly plunge is assumed. Susceptability calculations with a cylinder radius of 200 feet show a susceptibility contrast of 5.0 x 10^{-3} c.g.s. units for the cylinder, relative to the enclosing rock. This difference is what may be expected between an intermediate intensive and a sediment such as sandstone.

EM anomalies 2, 4 and 5, and a number of smaller conductors in the anomaly one area are regarded as boundary effects, indicating a change of rock type at and near the outer edge of anomaly one.

Magnetic anomaly two, a sharp vertical field high, is circular in plan, and may be interpreted as a near surface sphere, probably much less than 100 feet in diameter. Half width measurements, and EM profiles suggest that the top of the sphere is less than 20 feet below surface.

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EM anomaly three lies in a lineal, topographic depression and probably indicates a fault.

EM anomaly one is parallel and very close to a barb wire fence. It is suspected that this anomaly may be at least partially due to the barb wire fence.

Some of the weak conductors on zone B are related to topographic lows which may be fault zones.

Respectfully submitted,

D. R. Lackionie

March 15th, 1967 Vancouver, B.C. D. R. Cochrane, P.Eng.

APPENDIX I

PERSONNEL:

The following personnel, employed by Geo-X Surveys Ltd., 627 Hornby Street, Vancouver B.C., were employed on the M Group project as set out below:

Date:	Personnel:	Work done:
Feb.1617/67	R. Robillard, J.P.Marshall, D.Cochrane,	Layout of A grid, Mag & EM orientation.
Feb.1\$-22/67	R.Robillard, J.P.Marshall,	Mag & EM
Jan.10-16/67	R.Robillard, J.P.Marshall,	Linecutting, mag orientation
Feb.23-Mar.15/67	D.Cochrane, D. Fritz	Data Processing

APPENDIX II

Total Cost Breakdown:

L.	Line cutting: 12.1 mi.@ \$125/line mile	\$1,512.50
2.	Two component mag survey: 12.1 mi.@ \$125/line mile	\$1,512.50
3.	Ronka EM survey: 12.1 mi.@ \$125/line mile	\$1,512.50
4.	Supervision, surveying grid, geological control, data processing: 12.1 mi.@ \$50/line mile	\$ 605.00
	Grand total	\$5,142.50

Cost Breakdown for M-A Group of 30 claims:

7.1 line miles of line cutting, two component mag survey, EM survey and geology:

@ total of \$425/line mile \$3,017.50

To be applied to hold the 30 claims of M-A group for one year.

Cost Breakdown for M-B Group of 20 claims:

5.0 line miles of linecutting, two component mag survey, EM survey and geology:

@ total of \$425/line mile \$2,125.00

To be applied to hold the 20 claims of M-B group for one year.

APPENDIX III

Grouping of claims and claims covered in survey:

For assessment work purposes, the claims have been divided into two groups. The "M-A" group of 30 claims consists of the following:

Claims	Record No.			
M 1 - 21 incl. M 2 ₃ M 24 M 26 M 28 M 30 M 32 M 34 M35 M 50	27730 - 27750 incl. 27752 27753 27755 27757 27759 27761 27763 27764 27779			

The M-B group consists of the following:

<u>Cla</u>	<u>ims</u>				Recor	rd 1	<u> 10.</u>	
M 2	2				27751			
M 2	5				27754			
M 2	7				27756			
M 2	9				27758			
M 3	1				27760			
M 3	3				27762			
M 3	6 to	49	incl.		27765	to	78	incl.

<u>Claims Surveyed</u>:

All or parts of:	Record No.		
M 1 to 4 incl M 6	27730 to 27733 incl. 27735		
M 26 to 29 incl M 31	27755 to 27758 incl. 27760		
M 40 M 42	27767 27771		

APPENDIX IV

Specifications and Field Operation of two component magnetometer:

Manufactured by Sabre Electronics Ltd, Burnaby, B.C. INSTRUMENT DATA:

Specifications:

Sensitivity: Vertical: 20 gammas per dial division

Horizontal: 30 gammas per dial division

0 - 100,000 gammas Range: Vertical:

Horizontal: 0 - 30,000 gammas

(these ranges can be increased or decreased for specific application)

Vertical: 10 gammas $(\frac{1}{2} \text{ dial division})$ Horizontal: 15 gammas $(\frac{1}{2} \text{ dial division})$ Readability:

Latitude adjustment:

None required in northern magnetic latitudes

Type of readout: Meter to indicate null, plus two digital counting dials to indicate magnetic field intensity at null.

Principle of Operation:

Dual flux-gate element, one in each plane, plus

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seperate neutralizing coil for each section. Neutralization is indicated by sharp meter null which is found by adjustment of digital dials. Each dial controls current through neutralizing coil and dial reading is direct indication of current required for neutralization (and therefore of magnetic field).

Levelling System:

Automatically self-levelling, no levels or bubbles required. Vertical reading is non-directional, horizontal reading requires orientation to magnetic north Regardless of the orientation requirement for the direction. horizontal reading, accurate measurement is possible because of properly shaped horizontal response patterns and unique mull-finding system.

Dimensions:

Wooden case 4" x 7" x 11"

Weight: Approx. 10 lbs., including seperate battery pack.

APPENDIX IV con t

Field Proceedure:

The magnetometer is oriented approximately in the direction of magnetic north, and rested on a monopod over the station to be measured. The selector switch is turned to vertical and the circuit button depressed. The vertical neutralizing coil dial is turned until the microampmeter needle is at its lowest position, and the vertical magnetic component is read and recorded directly from the vertical digital counting dial. The selector switch is rotated to horizontal and the circuit button depressed as before. time, the horizontal neutralizing coil dial is rotated until the needle is at a maximum reading. The above proceedure for horizontal field is repeated several times, with the instrument rotated slightly each time, in order to orient the instrument precisely to magnetic north, at which time the microamp needle will register an absolute minimum value. When orientation is complete, the horizontal component value is read directly from the horizontal digital counting dial.

APPENDIX V

A. Field Operation - EM 15:

The meter is zeroed on the first day of operation by selecting a station away from interference, turning equipment on, loosening the zero adjustment knob and sliding the knob in the direction the meter needle must move to approach zero. The pointer is positioned at zero, and the adjusting knob is locked.

The equipment is normaly kept continuously "on" so that in effect a continuous reading is observed. The operator stops at each station, and records the reading, directly from the meter dial. If an anomolous condition is encountered between stations, intermediate stations and readings are established and recorded.

B. Specifications of EM 15:

Measured quantity: the real component of the secondary field at 16 kHz.

Accuracy: 3×10^{-5} Hp per one small division on the direct reading meter. Total of 20 divisions.

Coil separation: 83 cm.

Coil orientation: Axes 35° off the vertical

Readout: Meter indicates negative or positive secondary field, thus identifying conductors or magnetically susceptive targets.

Controls: ON/OFF switch, zeroing adjustment.

Battery: 7 volts, 1 ah. mercury battery. Operational life 80 hours.

Accessories: External battery holder for cold weather operation. canvas carrying case, wooden shipping container.

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Dimensions: $96 \times 12 \times 2.5 \text{ cm} (36 \times 5 \times 1 \text{ in})$

Weight: 1.2 kg (2.6 1bs)

APPENDIX V contt

C. Field Operation of EM 16

Rotate switch to select station. The operator predetermines two suitable VLF stations and crystals are inserted into the instrument for these stations (station selection depends on the direction of the line grid; i.e. direction of geology, frequency desired and availability and distance of stations). The on/off switch is turned to on and the gain control rotated to govern the sound level of the output signal. The instrument is oriented so that the lower coil is perpendicular to the direction of the station. phase component is measured by rocking the instrument forward and back, finding a minimum noise null. The out of phase (quadrature) component is read by rotating the quadrature dial until a minimum noise level is found. Both readings are recorded and the operator repeats this proceedure at the next station.

APPENDIX V contt

D. Specifications of EM 16

Primary field: Horizontal from any selected VLF-

transmitting station.

Frequency range: Approximately 15 - 25 kc

Station selection: By plug-in units. Two stations selected

by a switch on fromt panel.

Measured field: Vertical field, in-phase and quadrature

components.

Accuracy of readings: ± 1% resolution.

Range of measurements: In-phase \pm 150% or \pm 90°, quadrature \pm 40%

Output readout: Null-detection by an earphone, real and

quadrature components from mechanical

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dials.

Batteries: 6, size AA penlight cells. Life about 200 hours.

Size: $16 \times 5.5 \times 3.5 \text{ in.}$

Weight: 2.4 lbs.

DOMINION OF CANADA:

PROVINCE OF BRITISH COLUMBIA.

To WIT:

In the Matter of Geophysical Surveys on the "M" Group of claims;

Ŧ. Donald Robert Cochrane

of 627 Hornby Street, Vancouver, B.C.

in the Province of British Columbia, do solemnly declare that the following summary of expenditures ensued since the 23rd day of February, 1966:

1. Linecutting 12.1 miles @ \$125.00/ line mile
2. Two component ground mag. survey 12.1 mi @ \$125/
3. Ronka EM16 survey 12.1 mi @ \$125.00/line mile \$1,512.50 1,512.50 1,512.50 4. Supervision, surveying grid, geological control data processing and interpretation 12.1 mi @\$ 50/ 605.00 \$5,1\$2.50 Grand Total

and the following personnel were employed on the dates set out below:

Date	Personnel	Address	Work Done
Feb.16,17/*67	Marshall, Cochrane, Robillard		Layout of grid, Mag & EM orientation
Feb.18-22/167	Marshall, Robillard	627 Hornby St., Vancouver, B.C.	Linecutting, EM &
Jan.10-16/*67	Marshall, Robillard		Lineculling and Mag orientation

P. A. Callone

And I make this solemn declaration conscientiously believing it to be true, and knowing that it is of the same force and effect as if made under oath and by virtue of the "Canada Evidence Act."

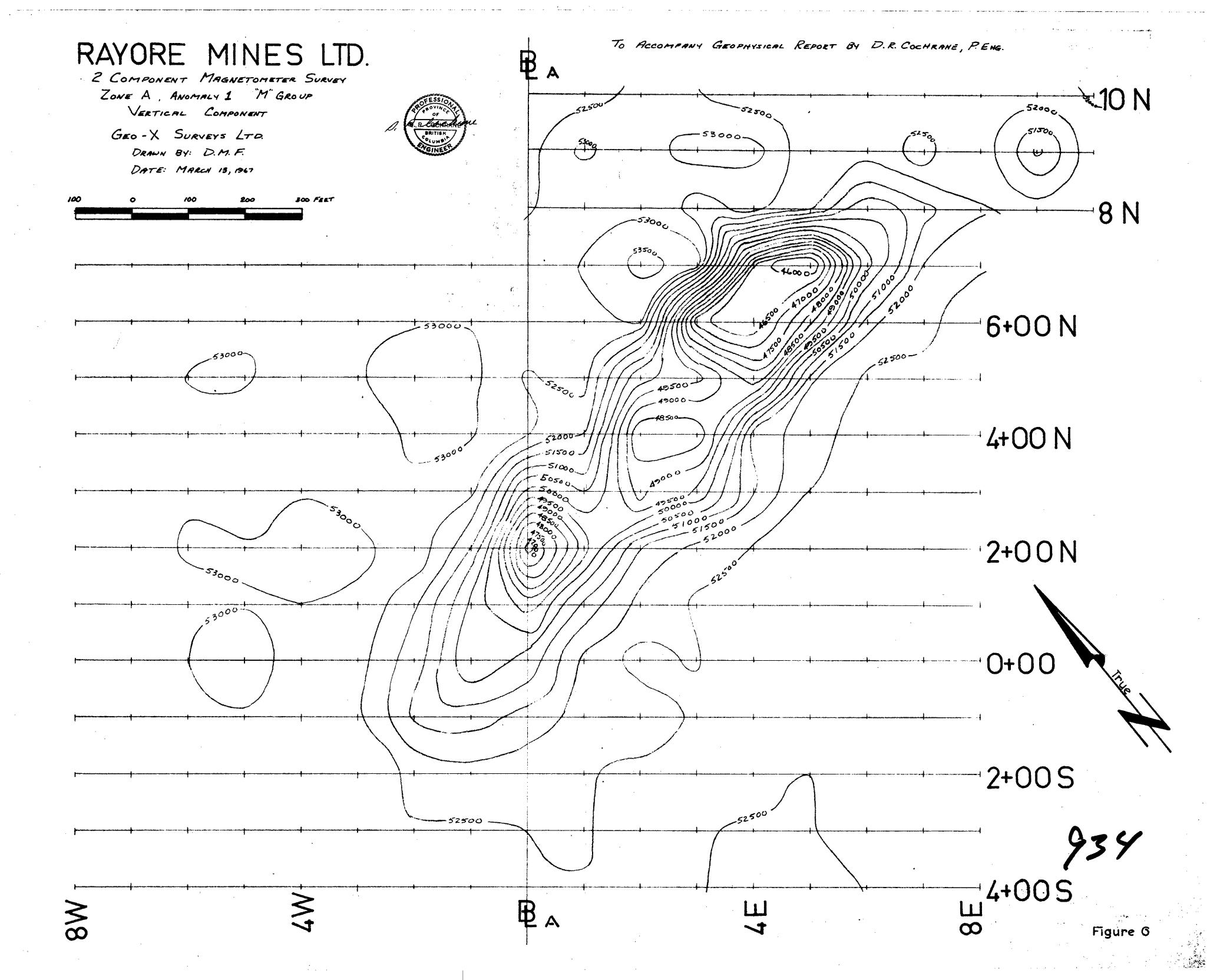
Declared before me at the

Province of British Columbia, this

February 1967, A.D.

A Commissioner for taking Affidavits within British Columbia or A Notary Public in and for the Province of British Columbia.

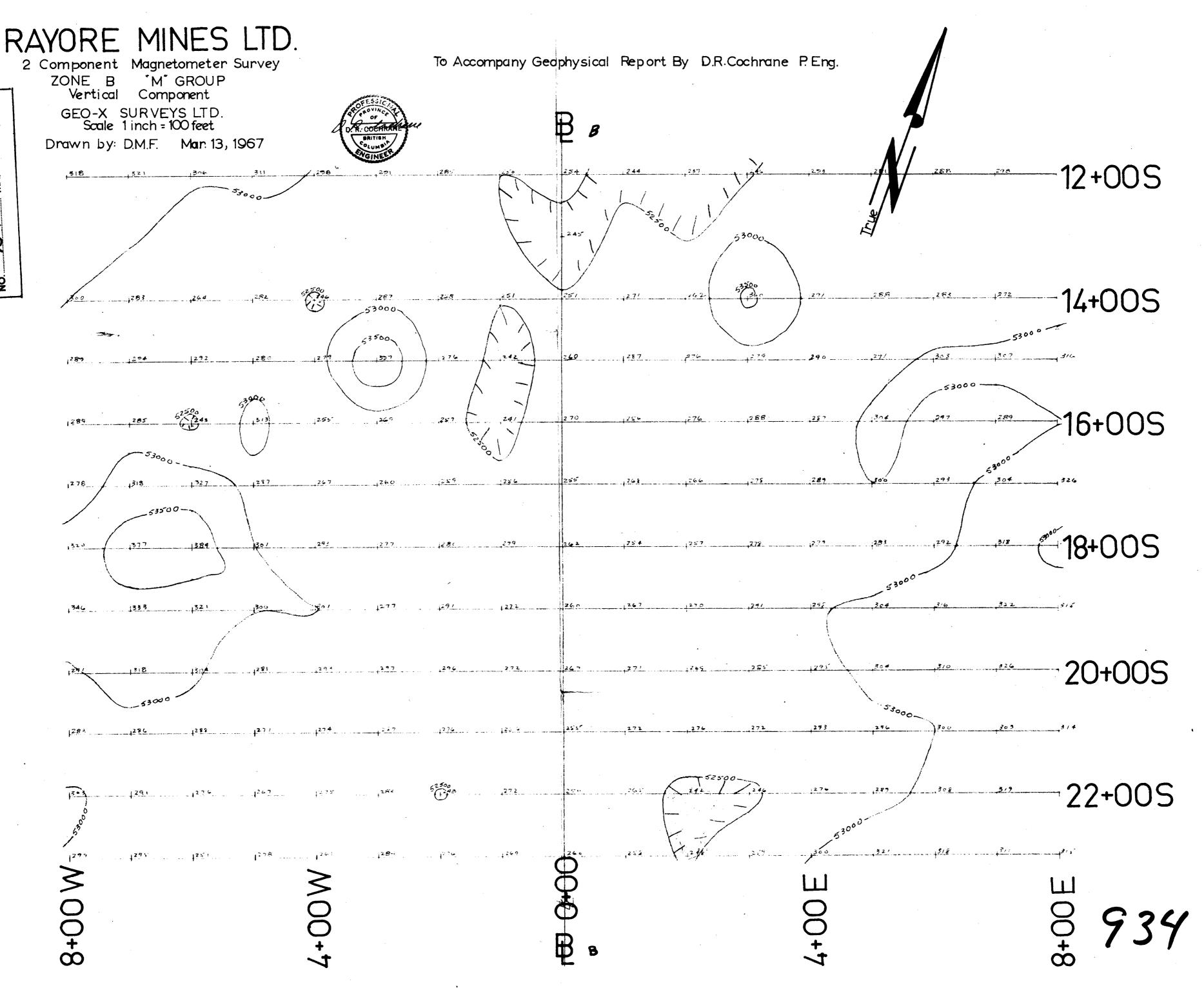
Sub-mining Recorder



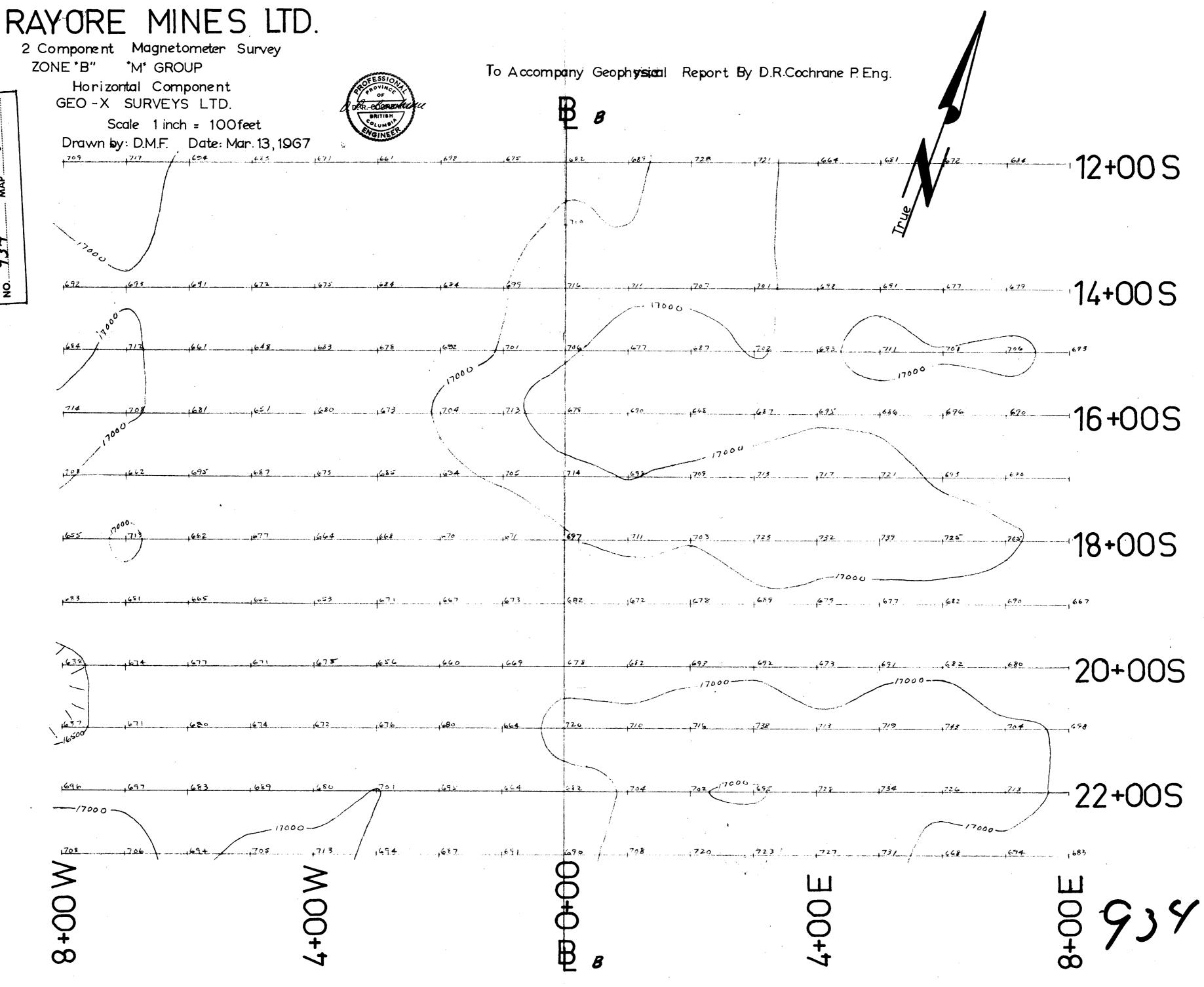
ASSESSMENT REPORT

M00+8

Rayore Mines Ltd. Ronka EM 16 Survey Zone A. anomaly 2. LEGEND. GEO- X SURVEYS LTD. Moderate Crossover SCALE / INCH = 100 FEET Moderate-Weak Crossover DRAWN BY: D.R.C. DATE: MARCH 13, 1967 C rossover 26+00N EM J ANOMALY 9 25+00 N 24+00N 23+00N EM ANOMALY 22+00N EM ANOMALY 6 20+00 N 8+00 E



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ASSESSMENT

