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REPORT ON THE AIRBORNE MAGNETIC AND VLF-ELECTROMAGNETIC SURVEYS ON THE PROPERTIES OF OF GOLD FIELDS CANADIAN MINING LTD., MOSS TOWNSHIP, THUNDER BAY MINING DIVISION ONTARIO

RESPECTFULLY SUBMITTED BY,

H. FERDERBER GEOPHYSICS LTD.

VAL D'OR (QUEBEC)
JUNE 12, 1991

R.A. CAMBPELL, B.Sc.
GEOLOGY

SOUTHERN ONTARIO MINING DIVISION
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INTRODUCTION

Between April 10 and 11, 1991 airborne magnetic and VLF-electromagnetic surveys were completed out on the properties of Gold Fields Canadian Mining Ltd. in Moss Township, Thunder Bay Mining Division, Ontario. Magnetic and VLF-electromagnetic data was collected by the airborne division of H. Ferderber Geophysics Ltd. A total of 218.3 miles of data was collected.

The magnetic survey provides data which helps outline the underlying geological structures and helps identify any potential economic concentrations which may contain variations in accessory magnetic minerals. The results of the VLF-electromagnetic survey define conductive zones which may represent shear zones and/or sulphide deposits containing precious metals and/or base metal mineralization.

PROPERTY DESCRIPTION, LOCATION AND ACCESS

The properties of Gold Fields Canadian Mining Ltd. are comprised of 44 claims in three groups, labelled North, Middle and South Groups, in Moss Township, Thunder Bay Mining Division, Ontario. These properties cover approximately 1760 acres in the central part of the township. The claims are registered with the Office of the Mining Recorder in Thunder Bay, outlined on the accompanying maps, and are listed in Appendix 1.

The properties are located 70 miles west of the City of Thunder Bay and 40 miles east-southeast of the town of Atikokan. Provincial Highway 11 lies 5 miles north of the North Group. They are accessed by taking Highway 802 southwest from Highway 11 to Barchell Lake and then travelling on roads of the Great Lakes Paper Company. The Hernia Lake Road and numerous logging roads of the Paper Company cross the Northern and Middle Groups. The Moss Mine bush road also crosses the two northern most groups, ending near the northern boundary of the South Group.

Rainbow and Moss Lakes form the southeastern boundaries of the North and Middle Groups. A pond underlies the southwestern boundaries of the North and Middle Groups. A pond underlies the southwestern corner of the Middle Group. Branches of the Obadinaw River flow through all properties, surrounded by swampy ground. Most of the claims used to be forest covered, but the northern parts of the North and Middle properties have been logged recently. A study of the airphoto mosaics suggests that outcrop exposure is good over the southern claims.

Supplies, services and qualified manpower are available in the Thunder Bay and Atikokan areas.

GEOLOGY AND MINERALIZATION

The claims of Gold Fields Canadian Mining Ltd. in Moss Twp. lie in the western end of the Shebandowan greenstone belt. Geological Compilation Map 2065, Atikokan-Lakehead Sheet, of the Ontario Dept. of Mines and figure 1 in L. Chorlton's report on the Geological Setting of Gold Mineralization in Central Moss Twp., outline the geology and structures underlying the three claim groups. These maps show that most of the claims are underlain by west-southwest trending metavolcanic and metasedimentary rocks. The Moss Lake syenogranite stock, sills of feldspar and hornblende porphyry and metadiorite, hornblende syenite and feldspar dykes intrude the metavolcanic and metasedimentary rocks in the area.

The southern parts of the North and Middle Groups and the most of the South Group are underlain by massive to pillowed metabasalt, interbedded with pyroclastic rocks comprised of tuffs and breccias. Several narrow units of metadiabase have been discovered in mafic metavolcanics west of Moss Lake. The mafic metavolcanics also contain zones of well banded ferrugeneous chert magnetite-rich iron formation in the northwestern corner of the South Group and central part of the Middle Group.

A band of felsic metavolcanics strikes west-southwest between Moss and Shodgrass Lake through the southern part of the Middle Group. Narrow units of felsic metavolcanics have also been found intercalated with the mafic metavolcanics in the Middle and South Groups.

The mafic metavolcanic rocks lie in contact to the north with the metasediments of the Kashabowie group. The contact trends southwest through the two northern properties. Small outcrops of conglomerate are exposed near the Minoletti trenches, just west of the southern group.

The western end of the Moss Lake syenogranite stock underlies the extreme southern and eastern sections of the North and Middle

Groups, respectively. Small dykes, stocks and sills of hornblende and feldspar porphyry intrude the metavolcanic rocks in the vicinity of the Huronium Mine and near the southwestern edge of the Moss Lake Stock.

In the immediate vicinity of the properties gold-sulphide mineralization has been found in shear and fault zones, within a ductile deformation zone striking northeast across the northwest corner of the South Group and associated with the fault striking north-northeast through Snodgrass Lake, 1.5 miles east of the Middle Group. The ductile deformation zone is comprised of numerous parallel, northeast trending shear and fault zones generally containing polymetallic quartz veins and hosting the past producing Huronian (Ardeen, Moss, Kerry) Gold Mine and the McKeller Beaver Pond and the Minoletti Trenches. The McKeller trenches uncovering two closely spaced shears, are thought to lie in the northern two claims of the South Group. The Huronian Mine, located just north of the South Group and approximately 1320 feet west of the Middle Group, produced 29,629 ounces of gold and 170,463 ounces of silver between 1932 and 1936. The Beaver Pond and Minoletti trenches lie 1300 to 3500 feet west of the South Group. Generally, the gold occurs with sulphide mineralization and telluride within quartz veins along the major deformation zone, in altered feldspar porphyry adjacent to the veins and in subsidiary veins associated with the folded feldspar porphyry along the same deformation zone.

Approximately 1.5 miles east of the Middle Group, the Tandem Resources-Storimin Exploration-Central Crude deposit gold, is located in pyrite and chalcopyrite within metadiorite and quartz syenite, ductile shear zone and fractures, related to the Snodgrass Lake Fault Zone. Recent estimations of the probable reserves at the Moss Lake Property stand at 82.2 million tons, grading 0.031 oz/ton.

INSTRUMENTATION AND SURVEY METHODS

The survey was completed using a 1972 Cessna 172, fixed wing aircraft, call letters CF-EWK, owned and operated by H. Ferderber Geophysics Ltd. The pilot and navigator/operator were M. Turcotte and D. Monastesse respectively of Val d'Or and Vassan.

Magnetometer

The magnetometer used was a GEM Systems GSM-11, high sensitivity airborne proton (Overhauser) magnetometer. The instrument continuously measures the Earth's magnetic field at a 0.01 gamma sensitivity for 1 reading per second to 10 readings per second at a 0.1 gamma sensitivity. For this survey four readings per second were collected. The analog output is on 3 channels, from 1 to 10,000 gammas full scale.

VLF-EM System

A Herz Totem 2A VLF-EM System was used to measure the changes in the total field and in the vertical quadrature field on two frequencies simultaneously, with an accuracy of 1%. Because of the orientation of the flight lines the primary transmitting station (VLF-1) of Seattle, Washington (NLK) frequency 24.8 kHz was used.

Radar Altimeter

The ground clearance was measured with a King 10/10 A radar altimeter. The survey was flown at a mean clearance of 328 feet with the altimeter producing an accuracy of 5% (16 feet) at this altitude.

Tracking Camera and Video Centre

A RCA TC-200 colour video camera and Galaxy 200 video centre was used to record the flight path on standard VHF type video tapes. Manual fiducials were indicated on the picture frames for reference with digital printout. Flight path recovery was aided using a Panasonic Colour Video Monitor-S1300 and Video Cassette Recorder AG-2500.

Data Acquisition System

A Picodas Group Inc. PDAS 1100 data acquisition system featuring seven analog inputs with two frequency inputs and external interfacing was used. A Termiflex Corp. ST/32 Keyboard control unit and Sharp Corp. LCD display unit are connected to the data acquisition system. At present this system stores the altimeter VLF-1 in-phase, VLF-1 quadrature, VLF-2 in-phase, VLF-2 quadrature, magnetic field (coarse), magnetic field (fine), and the fourth difference (noise), and fiducials on 3.5 inch floppy disk drive. The data is then printed out in digital and profile form.

Survey Parameters

The surveys were conducted on lines oriented at 135-315^{o} flown at an average aircraft altitude of 328 feet and a speed of approximately 90 miles per hour. Geophysical responses were collected at data points spaced at 33 foot intervals along the lines. The lines were spaced at 328 foot intervals. Navigation was visual using airphoto mosaics, at a scale of 1:10,000, manual fiducials, and the flight path recovery system as references.

DATA PRESENTATION

Flight lines, fiducial points and geophysical responses were reproduced from the airphoto mosaics at a scale of 1:10,000. The

computer processing was performed by GeoMicro Services in Toronto, Ontario.

The aeromagnetic data was corrected for diurnal variations by using base lines as reference. The data was then contoured at 20 gamma intervals and presented on Map MG-1.

The VLF-EM was transferred from the Totem 2AG memory to profiled form. Base values were determined for the VLF-EM total field profiled data. These values were used to correct for variations in transmitter strength and the corrected total field values were plotted on Map EM-1. The positive values were contoured at intervals of 2%. The conductor axes were determined and labelled A, B, C etc. No priority was attached to the labelling system.

SURVEY RESULTS AND INTERPRETATION

Magnetic Survey

The data collected by the airborne magnetic survey forms a complex pattern of east-northeast to north-northeast and east-southeast trending isogams. The most prominent features are series of narrow highs that strike east-northeast across the north western part of the Southern Group, north-northeast through the central regions of the Middle Group and east-northeast west of Rainbow Lake in the Northern Group. The magnetic values in the range of 59,800 to 60,000 are probably caused by bands of magnetite rich iron formation. These highs are discontinuous and their general trend is folded in the vicinity of the Middle Group.

Surrounding these highs the magnetic values are relatively high, 59,400 to 59,800 gammas. These values indicate that the bands of iron formation are contained within a 0.4 to 1 mile wide unit of mafic metavolcanic rocks that trends east-northeast to northeast across the properties. Geology maps show that these

mafic metavolcanic rocks are intercalated with metadiabase.

North of the highs defining the location of the mafic metavolcanic rocks, linear parallel trending lows were delineated. Geology maps show that these areas contain outcrops of metasediments. Between the highs in the Northern Group, the narrow lows could be caused by metasediments or felsic metavolcanics in contact with mafic metavolcanics to the south. Broader lows also lie south of the highs caused by the mafic metavolcanic units. These lows define the location and extent of the wide felsic metavolcanic band, in contact with mafic metavolcanics to the north.

Narrow lows lie within the highs caused by the mafic metavolcanic rocks in the Southern and Middle Groups and just east of the Northern Group. These lows could be caused by feldspar porphyry intrusive rocks or units of felsic metavolcanics.

The northern part of the Northern Group is also underlain by rocks of high magnetic susceptibilities. The shape of this anomaly suggests that the extreme northeastern corner of the Middle Group and the northern third of the Northern Group is underlain metadiorite or metagabbro intruding the metasedimentary rocks..

The shape and strike of magnetic lows located along the southeastern boundary of the Middle Group, near the western shore of Moss Lake changes from east to southeast. These lows and lows trending northeast along the southern boundary of the Northern Group are caused by the western and northern edges of the Moss Lake syenogranite stock, respectively, lying in contact with mafic and felsic metavolcanic rocks. The syenogranite stock probably contains enclaves of metavolcanic rocks and/or metadiorite-metagabbro.

The magnetic contour pattern underlying the surveyed area is distorted, forming northeast and north trending linear deformation zones crossing the three claim groups. Two potential fault zones

strike northeast across the northern part of the Southern Group, near the mineralized deformation zones, trenches and the Huronian Mine. The southern northeastern fault continues through the Middle Group and into the eastern end of the Northern Group. The two north trending fault zones lie along the eastern and western boundaries of the Middle and Northern Groups.

VLF-Electromagnetic Survey

A total of 15 conductive zones, as defined by the results of the VLF-electromagnetic survey lie on the properties. Descriptions and causes are presented in the following table.

ZONE	TOPOGRAPHY	MAGNETICS	CAUSE
A	Near a creek.	Between two highs.	Shear in 1a, near iron formations, Beaver Pond trenches and a northeast trending fault.
B		In a high.	Shear in iron formation, near a fault zone and the McKellar and Beaver Pond trenches.
C		In a high.	Shear in 5.
D	The Middle conductor lies near a creek.	In a low.	Shears in 1a and 3.
D-1	Along a road, west of Rainbow Lake.	In a high.	Small shear in 1a.
E		Across a high.	Cross-cutting shear in 1a and 2/4, intersecting with a northeast fault zone.
F		In a high.	Shear in 1a.
G		Across two highs and a low.	Cross-cutting shear in 2, 1a, IF and along the western edge of 2 or 4. Intersecting with a fault and zone N at its northern edge.

ZONE	TOPOGRAPHY	MAGNETICS	CAUSE
H		The northern conductor crosses a high and lies along distortions in the contour pattern. The Middle zone crosses the contact between a high and a low. The southern conductor lies in a low.	Shears crossing 2, 1a, and a potential fault zone. Cut-off in the south by a north trending fault zone and intersecting with iron formations in the north. IAcross the boundary between a high and a low.Small shear crossing a contact between 1a.
J	Along a creek.	Across the boundary between a high and a low.	Conductive overburden.
K		Across the contour pattern.	Cross-cutting shear in 1a, 3 or 2 and 5. Cutting off the northern extent of two fault zones.
L		Along the western edge of a high, across the contour pattern.	Shears in 3 or 2 and 5.
M		In a high crossing the contour pattern.	Cross-cutting shear in 5.
N		Along the northern edge of a low along distortion in the contour pattern.	Shear in 1a, trending west across a contact with 3.

LEGEND

6 - Moss Lake Syenogranite
5 - Metadiorite or Metagabbro
4 - Feldspar Porphyry
3 - Metasediments
IF- Iron Formation
1b- Intermediate Metavolcanic Rocks
1a- Mafic Metavolcanic Rocks

CONCLUSIONS AND RECOMMENDATIONS

The maps produced by the data collected by the airborne magnetic and VLF-electromagnetic surveys were helpful in better

defining the geology and structures underlying the three properties of Gold Fields Canadian Mining Ltd. in Moss Twp., Ontario. It appears that 90% of the Southern Group is underlain by east-northeast trending mafic metavolcanic rocks and minor amounts of metadiabase. This band narrows northeastward continuing through the central and southern parts of the Middle and Northern Groups, respectively. The mafic metavolcanic rocks contain bands of iron formation, and are in contact with similar trending metasedimentary rocks, to the north, and felsic metavolcanic rocks, to the south. The northern contact crosses the northern parts of the Middle and Northern Groups and the southern contact with the wide felsic metavolcanic band trends east-northeast and north-northeast through the southern two claim groups. Small intrusives of feldspar porphyry or units of felsic metavolcanics, crossing the western boundaries of the southern two groups and lying just east of the Northern Group. A body of metadiorite or metagabbro intrudes the metasediments underlying the northern claims of the Northern Group. The northern and western boundaries of the Moss Lake Stock are located across the southern claim of the Northern Group and near the eastern edge of the Middle Group.

The rocks underlying the properties have undergone periods of structural deformation. At least four potential fault zones and 14 shear zones cross the claims. In and near the Southern Group gold mineralization has been found in northeast striking fault and shear zones within a larger ductile deformation zone. The Huronian Mine, and the McKeller, Beaver Pond, and Minoletti Trenches lie in mineralized quartz veins along this deformation zone, generally associated with feldspar porphyry. Good targets for gold deposition lie along the two northeastern trending potential fault zones, along conductive zones A, B, C, D and E, and at the intersections of the faults and conductive zones.

To confirm and further enhance the results of the airborne surveys, ground vertical gradient - total field magnetic and horizontal loop-electromagnetic surveys should be completed and the three properties mapped and sampled in detail. Anomalous areas

could then be tested by a program of mechanical stripping and diamond drilling.

Respectfully submitted by,

H. FERDERBER GEOPHYSICS LTD.

RA

Val d'Or (Québec)
June 12, 1991

R.A. Campbell, B.Sc.
Geology

REFERENCES

Northern Miner, March 18, 1991, page 19.

Northern Miner Magazine, September 1987, page 65

Ontario Department of Mines, 1964
Map 2065, Atikokan-Lakehead Sheet of the Geological Compilation Series, Scale 1 inch equals 4 miles.

Ontario Ministry of Natural Resources, 1971.
Gold Deposits of Ontario, Part 1, by S.A. Ferguson, H.A. Groen and R. Haynes, pp 280-282 and p 299.

Ontario Ministry of Northern Development and Mines, 1985
Summary of Field Work and Other Activities Ontario Geological Survey Miscellaneous Paper 126, pp 54-60, pp 215-221 and pp 222-228.

Ontario Ministry of Northern Development and Mines, 1986
Report of Activities, 1985, Ontario Geological Survey Miscellaneous Paper 128, pp 70-135.

APPENDIX 1 - CLAIM LIST

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TB	1172360		

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Ministry of Northern Development Mines
Ontario

DOCUMENT
W9140.14

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Report of Work
Mining Act
(Geophysical, Geological and Geochemical Surveys)

attach a list.
- Technical Reports and maps in duplicate should be submitte
Mining Lands Section, Mineral Development and Lands Branc

Type of Survey(s)	Mining Division	Township or Area
Airborne Magnetic and VLF-EM	Thunder Bay	Moss Township

2.14186

Recorded Holder(s)	Prospector's Licence No
Gold Fields Canadian Mining Ltd.	T-1195
Address	**Telephone No.**
123 Front Street West, Suite 909, Toronto (Ontario) M5J 2M2	(416) 865-0945
Survey Company	
H. Ferderber Geophysics Ltd.	
Name and Address of Author (of Geo-Technical Report)	**Date of Survey (from & to)**
R.A. Campbell, 169 Perreault Avenue, Val d'Or (Qc) J9P 2H1	Day 04 Mo 91 Yr 11 04 9

Credits Requested per Each Claim in Columns at right

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

Total miles flown over claim(s). ~~230~~ 49.6

Date: Apr. 15/91

Recorded Holder or Agent (Signature): R. Campbell

Mining Claims Traversed (List in numerical sequence)

Mining Claim Prefix	Mining Claim Number	Mining Claim Prefix	Mining Claim Number	Mining Claim Prefix	Mining Claim Number
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TB	1172346				

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MAY 16 1991

Total number of mining claims covered by this report of work: 44

Certification Verifying Report of Work

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

MINING LANDS SECTION

Name and Address of Person Certifying			
Robert Campbell, 169 Perreault Avenue, Val d'Or (Québec) J9P 2H1			
	Telephone No. (819) 824-2075	Date April 12, 1991	Certified By (Signature) RA

For Office Use Only

Total Days Cr. Recorded	Date Recorded	Mining Recorder
3520	Apr 15/91	
	Date Approved as Recorded	Mining Lands Branch
	July 23/91	Ron Gashinski

Received Stamp

91 APR 15 PM 3 55

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JUL 26 1991

STATION USED: SEATTLE, Wa USA (24.8 kHz)

CONTOUR INTERVALS: 2 %

TYPE OF WORK: TOTAL VLF FIELD SURVEY

CLIENT: GOLD FIELDS CANADIAN MINING LTD.

PROJECT: MOSS LAKE 2.14186

AREA: MOSS TOWNSHIP ONT.

H. FERDERBER GEOPHYSICS LTD.

SCALE: 1:10000

DATE: MAY 1991

DRAWN BY:

MAP OR SHEET NO.: VLF-1

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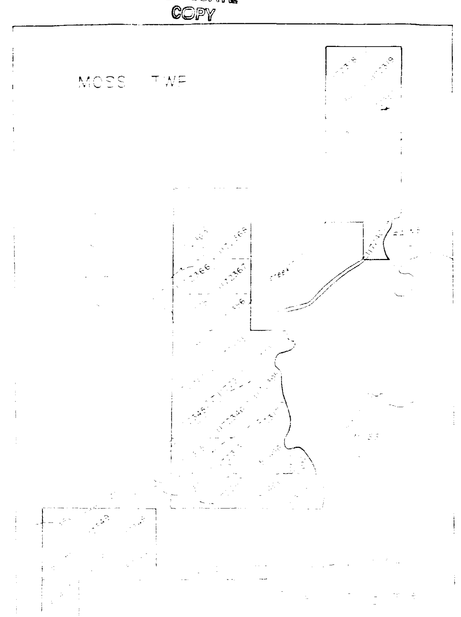

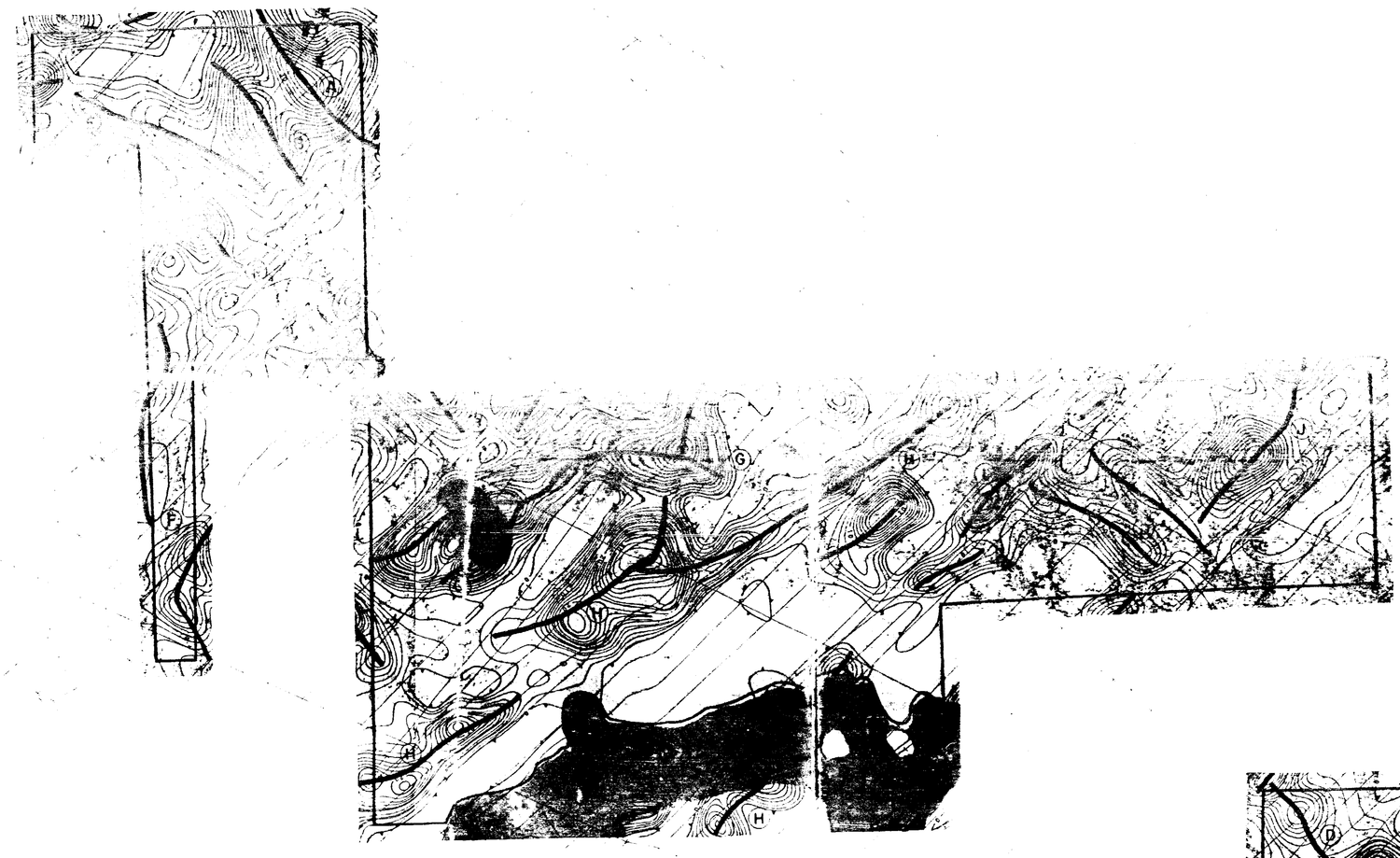

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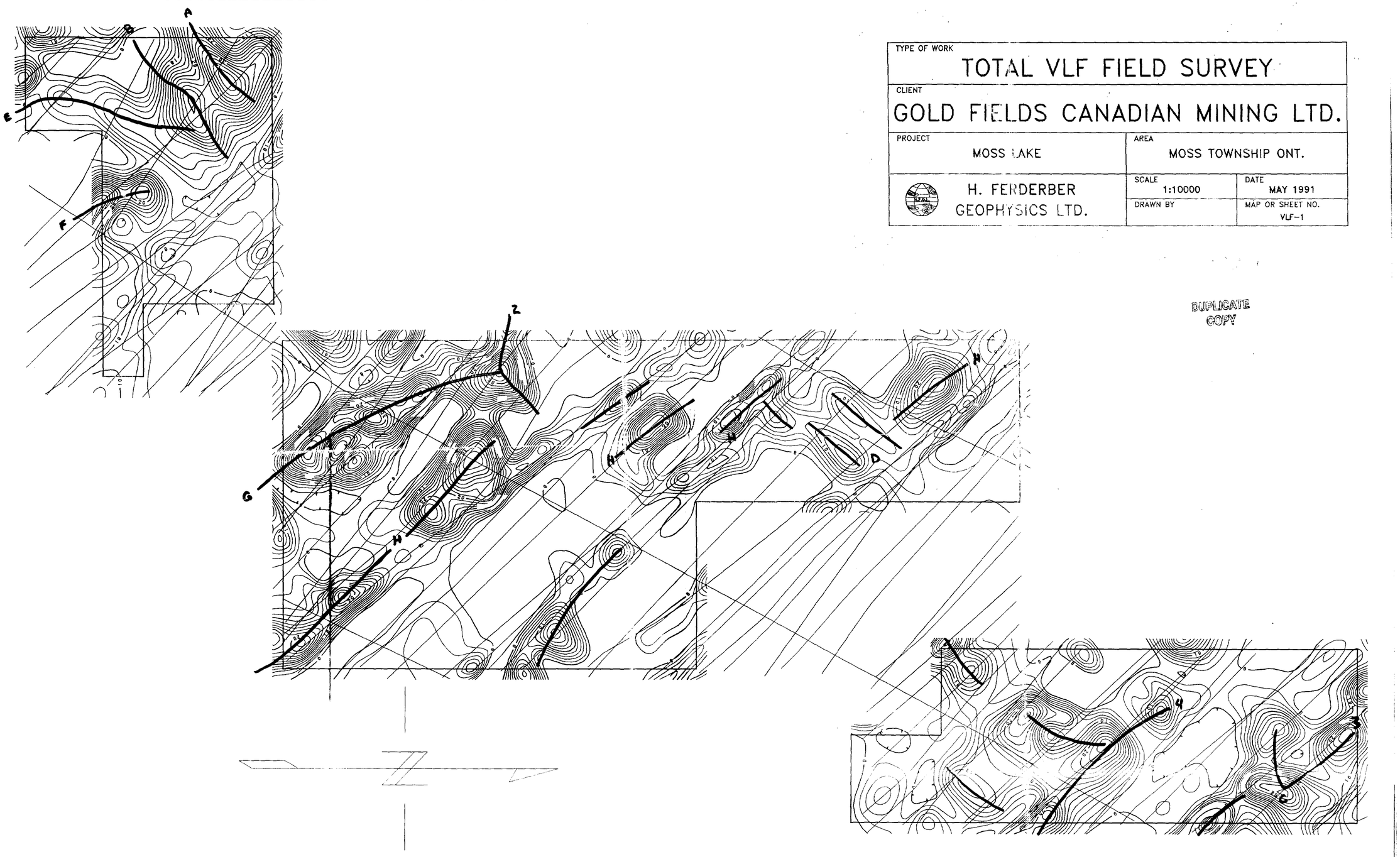

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PROJECT: MOSS LAKE	AREA: MOSS TOWNSHIP ONT.
H. FERDERBER GEOPHYSICS LTD.	SCALE: 1:10000 / DATE: MAY 1991
	DRAWN BY / MAP OR SHEET NO.: VLF-1

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TYPE OF WORK
TOTAL MAGNETIC FIELD S

CLIENT
GOLD FIELDS CANADIAN M

PROJECT	AREA
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H. FERDERBER GEOPHYSICS LTD.	SCALE 1:10000
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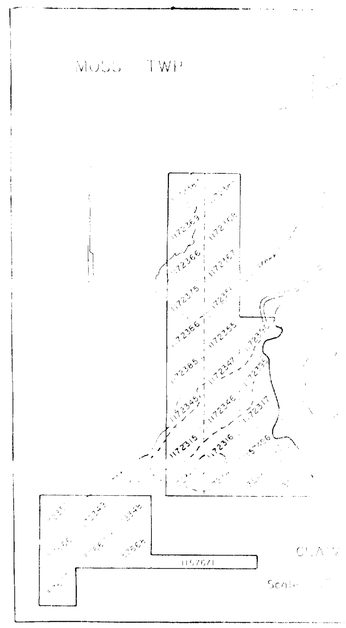

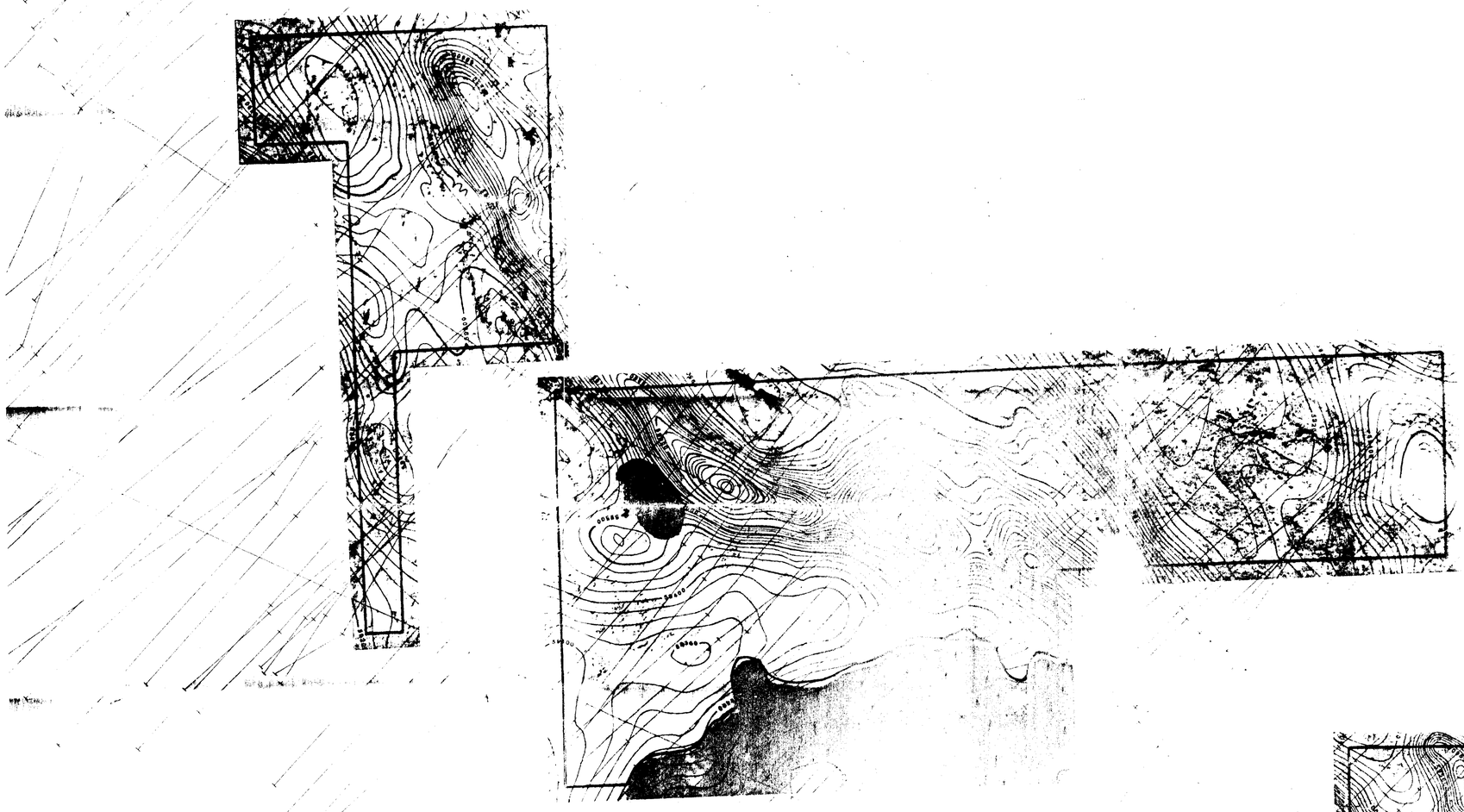

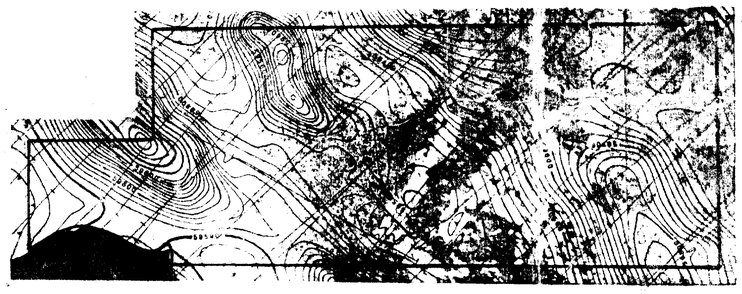

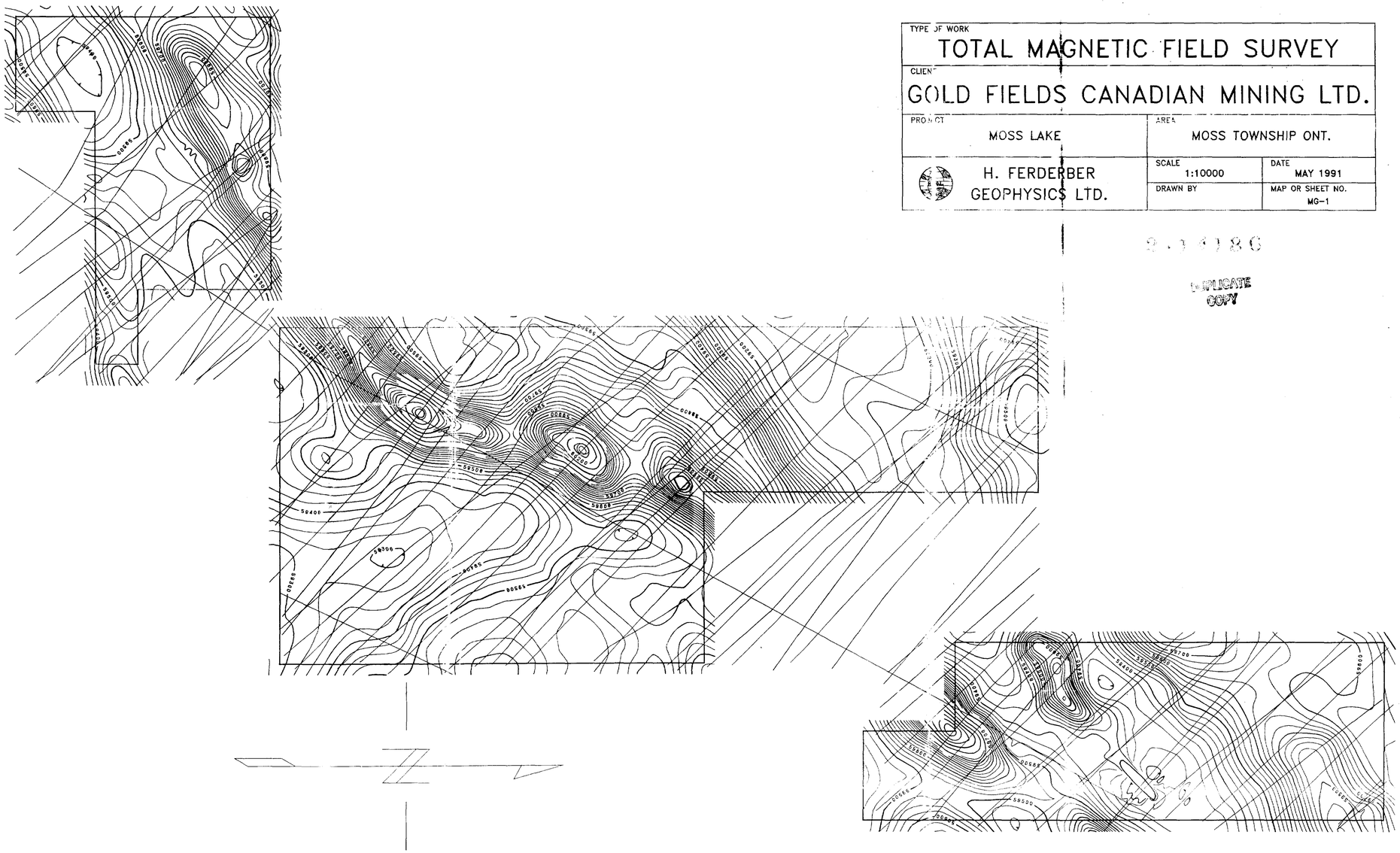

TYPE OF WORK

TOTAL MAGNETIC FIELD SURVEY

CLIENT

GOLD FIELDS CANADIAN MINING LTD.

PROJECT	AREA	
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H. FERDERBER GEOPHYSICS LTD.	SCALE 1:10000	DATE MAY 1991
	DRAWN BY	MAP OR SHEET NO. MG-1

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