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REPORT ON THE

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AIRBORNE GEOPHYSICAL SURVEY

ON THE

PROPERTIES OF A. W. HENNESSEY

MARRIOTT TOWNSHIP, ONT.

BY

H. FERDERBER GEOPHYSICS

RECEIVED

DCT 17 1986

MINING LANDS SECTION

October 10, 1986 Val d'Or, Quebec R. A. CAMPBELL

REPORT ON THE

AIRBORNE GEOPHYSICAL SURVEY

ON THE

PROPERTIES OF A. W. HENNESSEY

MARRIOTT TOWNSHIP, ONT.

INTRODUCTION

On July 27, 1986, an airborne geophysical survey was carried out on the properties of A. W. Hennessey in Marriott 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 47.0 line miles 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 helps define conductive zones which may represent shear zones and/or metallic sulphide deposits containing gold mineralization.

PROPERTY DESCRIPTION, LOCATION AND ACCESS

The A.W. Hennessey properties in Marriott Township, Ontario are comprised of 2 claim groups, A_1 , and A_2 of 22 claims totalling 352 hectares. The west group, A_1 , consists of 10 claims and the eastern group, A_2 , consists of 12 claims. The claims are recorded with the Mining Recorder of Kirkland Lake and are listed in appendix 1.

The properties are located 48 to 53 km northeast of the town of Kirkland Lake and 62 to 67 km east of the town of Matheson. General Access is provided by highway 101 which traverses the northern part of the township.

Group A_2 is 1.6 km south of highway 101 and 0.4 km north of McDiarmid Lake. The topography of A_2 is dominated by gentle rolling hills which are part of more dominent ridges located to the southwest. A small stream trending northerly from McDiarmid Lake passes through claim 857967.

The west claim group, A_1 , is bordered to the west by Holloway Township. It's northern boundary is approximately 3 km south of the highway. Steep abrupt east northeast trending hills dominate the topography. A large elliptical shaped swamp is found near the centre of group A_1 . Outcrop exposure is good along the ridges with approximately 70% of the surface area being forested.

Supplies, services and an experienced labour force are available within the Kirkland Lake - Matheson Rouyn area.

GEOLOGY

The two claim groups are located in the central portion of the Abitibi Volcanic Belt of the Superior Province of the Canadian Shield. The Abitibi Volcanic Belt extends for nearly 350 miles in an east-west 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 diabse dykes cut formations of the belt. The rocks generally strike east-west, have a near vertical dip and are highly folded and faulted.

The main rocks underlying Marriott Township are basaltic and andesitc rocks of the tholeiitic suite. The oldest rocks in the township are comprised of tholeiitic lavas of the Kinojevis Group, a 10 km thick Volcanic sequence located south of the Destor-Porcupine Fault. Overlying this group are the Al enriched Blake Group of calc-alkaline basalts, andesites dacites, rhyolites and Mg enriched tholeiites. The prodiment structural feature in the area is the Destor-Porcupine Fault, a major fault striking E-W across the northern limit of the township, north of highway 101. Unrelated series of northeast striking faults have been delineated in the township.

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The Ontario Geological Survey map 2390 shows that the two properties are underlain by thin bands of volcanic rocks of the tholeiitic suite. The rocks are comprised of magnesium rich basalts, iron rich basalts, fine grained flows, pillowed flows, pillow and flow breccia, gabbroic and diabasic textured flows and tuffs. Two northeasterly trending faults are located on A_1 and one on A_2 .

Mineral exploration in the area dates back to the initial gold discoveries made in Kirkland Lake in 1906. More recent developments in the Harker-Holloway area (Holloway Township is located due west of Marriott Township) have led to the gold discoveries by American Barrick Resources Corporation and Canamax Resources Inc. on properties located approximately 6km west of group A_1 . As of December 1985 American Barrick Resources reports reserves of 2,800,000 tons of 0.197 oz/ton Au and Canamax reports reserves in the Mattawasaga and East Zones of 578,00 tons of 0.246 oz/ton gold.

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 D. Fauvelle of Val d'Or. The navigator/operator was G. Mullan, also from Val d'Or. Geophysical sensors were mounted in modified wing tips. GEM-CSM-9 BA Overhauser Proton Precession Magnetometer and Herz Totem 2AG VLF-Electromagnetic system were used. The Magnetometer has resolution of 0.5 gammas and a sampling rate of 0.5 seconds. The magnetic data was recorded on analogue

-4-

tape. The VLF-EM measures the change in total field and vertical quadrature field on two channels simultaneously. The data is then transferred to a printer. The transmitting station at Culter, Maine (NAA), frequency 24.0 kilo hertz 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 one inch to 1320 feet. A north-south line direction at spacing of 440 feet was 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 1:15840 (one inch to 1320 feet). The outline of the claim groups and claim maps are shown on each sheet.

The aeromagnetic data was corrected for diurnal variation by using a base line as reference. The data was then reduced to a base level of 58,000 gammas, contoured at 25 and 50 gamma intervals and presented on map MG-1.

The VLF-EM was transferred from the Totem 2AG memory to printed from. A base value was determined and the change in the total field strenght as a percentage of the base value was calculated. The values were plotted on map EM-1 and the positive values were contured at intervals of 5%. The conductor axes were determined and labelled 1, 2, 3, etc. No priority was attached to the lettering system.

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DISCUSSION OF RESULTS

Magnetic Survey Group A,

The magnetic survey outlined 3 linear magnetic zones (two highs and one low trending 60° to 70°) across group A₁. The magnetic low is located in the centre of the property between the two highs. The low is located over a fault zone delineated on O.G.S. map 2390 and probably represents a zone of altered mafic volcanic rocks associated with the fault. Alternatively, this zone could possibly be a felsic intrusive body.

The magnetic contours are slightly folded suggesting that crosscutting shear zones may be present on the property.

VLF-EM Survey Group A

Four VLF-EM anomalous zones were outlined by the survey. Conductive zones 2,3, and 4 strike roughly parallel to the underlying geology and magnetic anomalies. Zone 1 striking 300[°] to 310[°] cuts across conductor 2, through the lower half of the property. It is made up on 2 conductors separated by 1320 feet of non-conductive material.

Zone 2 is comprised of 2 one half mile long conductors striking 50° across the bottom of the property. The western limb is located near a probable fault and a small magnetic low.

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Zone 3 strikes 70° across the central part of the claim group. It is situated close to the zone of magnetic lows and near a fault outlined on O.G.S. map 2390. The centre of this anomaly is located over a swamp and probably caused by an underlying linear overburden trend reflecting a fault-shear-fracture zone.

Zone 4 is located near the shore of a small lake, north of the property boundary. It is probably caused by conductive overburden.

Magnetic Survey A.

The magnetic survey outlined a series of magnetic highs striking approximately 70[°] representing small changes in the magnetite content of the underlying volcanic rocks. A zone of magnetic lows is located approximately 1 mile north of the property near a fault outlined on map 2390. The contour shapes are distorted in the central part of the property suggesting the possbility of a northsouth fracture-shear zone.

VLF-EM Survey A

Numerous conductors were delineated by the aiborne VLF-EM survey. It appears that two sets of conductive axes exist on the property, possibly representing a set of joints.

Zones 1,2,3,4 and 5 strike approximately $40^{\circ} - 50^{\circ}$, trending roughly parallel to the underlying geology. Zone 1 is comprised of 6 conductors trending across the central part of the property. The western end is located near a zone of magnetic highs and a small creek.

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Zone 2 is located one quarter of a mile south of the western conductor of Zone 1 while Zone 3 is situated the same distance north of the eastern end of Zone 1.

Conductive zones 4 and 5 are comprised of 4 conductors each, joining at their northeast ends.

Anomalies 6,7 and 8 trend approximately 300° , cutting across the strike of the known geology on the property.

Conductor 6 is a short anomaly located in the southeast corner cf the property. Zone 7 trends northwest across the property and is comprised of 4 conductors for a total strike lenght of over 1.5 miles. It appears to be cut off and slightly displaced by conductors 1,3, and 5. Conductor 8 is located north of the property and its lateral extent seems to be controlled by conductors 3 and 4.

Various small isolated conductors were also located in the surveyed area.

CONCLUSIONS AND RECOMMENDATIONS

Group A1

The most interesting geophysical signature on property A_1 is in the area of conductor 3 and the magneitc low. This is of particular interest since a fault has been mapped by the O.G.S. in this location. The magnetic low suggests that this area could represent alteration zone of a felsic intrusive body located between parallel units of mafic volcanics. Both of these are known to contain gold

mineralization in the surrounding areas. This magnetic low is probably an alteration zone containing possible sulphide mineralization since it coincides with conductor 3 and the fault.

Conductor 1, a possible shear zone or fault striking northwest is cut-off by the western end of this fault-alteration zone. A good gold exploration target is where these two zones intersect.

A further program of exploration is recommended. Work should be concentrated in the central area of the property over the magnetic low and conductor 3. Horizontal loop-Em, gradient magnetic and geological surveys should be performed. The EM survey will better outline the conductive zone while the gradient magnetic and survey will define any geological contacts associated with this alteration zone. The geological survey should concentrate on areas of alteration and shearing and samples should be collected and assayed for gold. A few northeast lines of geophysics should be run in an attempt to delineate conductor 1, with emphasis placed on the intersection of conductors 3 and 1.

Group A.

The magnetic survey indicates that claim group A_2 is inderlain by 3 or more units of the tholeiitic suite of volcanic rocks. Two sets of possible fractures/shear zones representing a joint system exist on the property.

These possible joints warrant further ground investigation. Horizontal loop-EM or EM-16 surveys should be run at northeastsouthwest and northwest-southeast directions to better define the location and extent of the airborne conductors. A geological survey should be undertaken in an attempt to delineate mineralized shear zones alteration zones in outcrop.

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Respectfully submitted,

H. Ferderber Geophysics Ltc.

RA Comun

R. A. Campbell B. Sc.

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Val d'Or, Que. October 1986

APPENDIX 1

Claim List

Group Al

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Group A2

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Ministry of Natural Resources

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GEOPHYSICAL – GEOLOGICAL – GEOCHEMICAL TECHNICAL DATA STATEMENT

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) <u> </u>	rborne	VLF-EM and Magnetomete	r
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Ministry of Natural Resources

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GEOPHYSICAL – GEOLOGICAL – GEOCHEMICAL TECHNICAL DATA STATEMENT

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.

File No. Type Date Claim Holder	Type of Survey(s)Airbon	ne VLF-EM and Magnetom	eter
Claim Holder(s) A. W. Hennessey List numerically Survey Company H. Ferderber Geophysics Ltd. I	Township or AreaMarrie	ott	MINING CLAIMS TRAVERSED
Author of Report R. A. Campbell Address of Author 169 Perreault Ave, Val d'Or, Oue, Covering Dates of Survey 357,957	Claim Holder(s) A. W.	Hennessey	
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Address of Author169 Perreault Ave, Val d'Or, Que, Covering Dates of SurveyJUV 27, 1986	Author of Report <u>R. A.</u>	Campbell	
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TOTAL CLAIMS 12			
			TOTAL CLAIMS 12

If space insufficient, attach list

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SELF POTENTIAL

Instrument	Range
•	
RADIOMETRIC	
Instrument	
Values measured	
Energy windows (levels)	
Height of instrument	Background Count
Size of detector	
Overburden	
	(type, depth include outcrop map)
OTHERS (SEISMIC, D	RILL 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
Accuracy	(specify for each type of survey) 1% and 0.5 gammas
	(specify for each type of survey)
	Cessna 172
Sensor altitude	250 feet

Navigation and flight path recovery method <u>Visual navigation on airphoto</u> Mosaic, manual fiducial points Line Spacing 440 feet Aircraft altitude _____ 250 feet ____Over claims only_____12.3

Miles flown over total area 32.0

February 20, 1987

Your File Nos.334/86,447/86 Our File: 2.9554

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

Dear Sir:

RE: Notice of Intent dated February 4, 1987 Geophysical (Electromagnetic & Magnetometer) Surveys on Mining Claims L 857956, et al, in Marriott Township

The assessment work credits, as listed with the above-mentioned Notice of Intent, have been approved as of the above date.

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

Yours sincerely,

J.C. Smith, A/Manager Mining Lands Section Mineral Development and Lands Branch Mines and Minerals Division

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

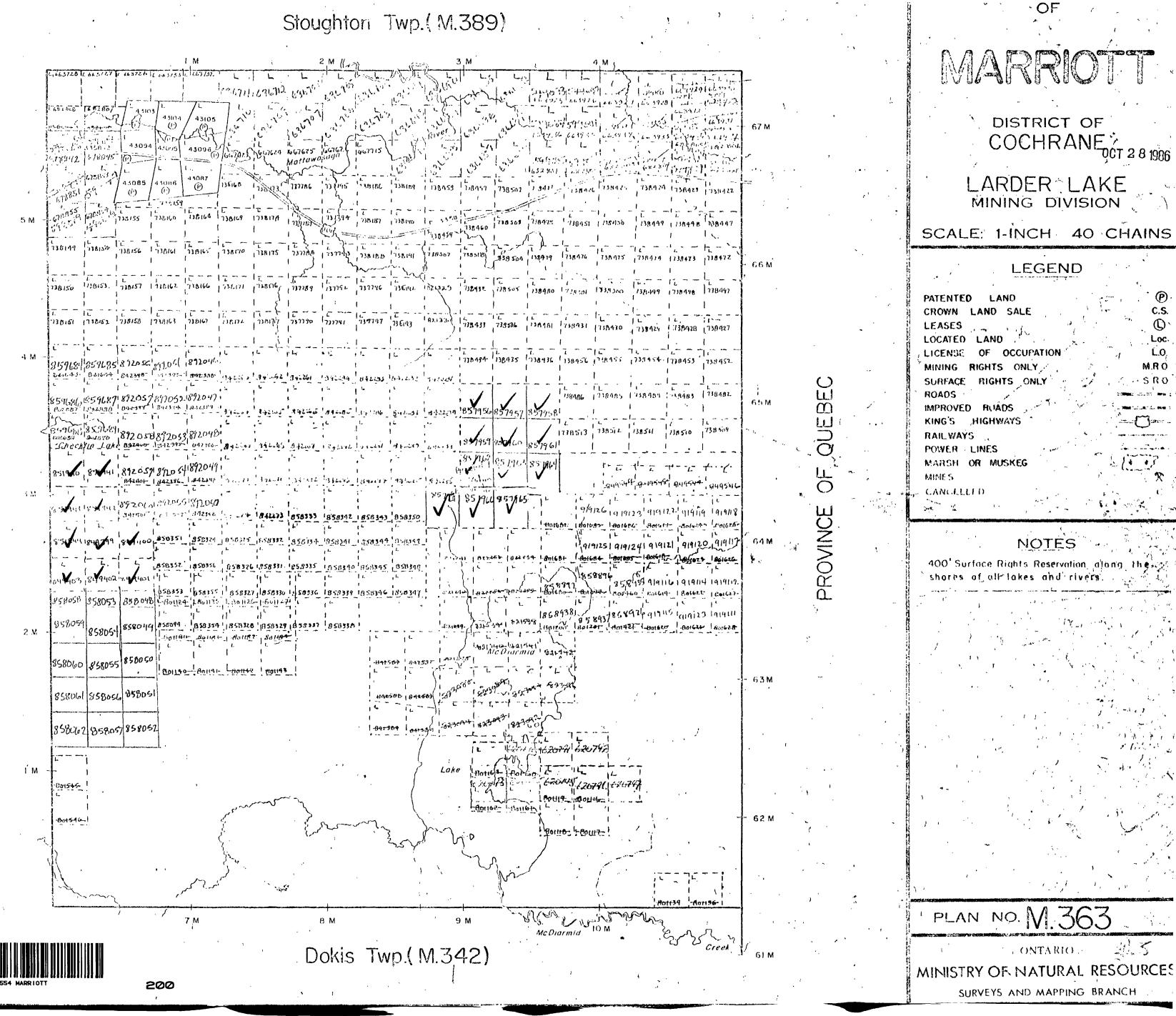
Telephone: (416) 965-4888

DK/mc

cc: Mr. A.W. Hennessy 10 Karen Crescent Hamilton, Ontario L9C 5M6 R.A. Campbell 169 Perreault Avenue Val d'Or, Quebec J9P 2H1 Resident Geologist Kirkland Lake, Ontario

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

Encl.



 (Ω) 13 \mathbb{N} Twp.(M. H olloway

