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REPORT

ON
GEOLOGICAL AND GEOPHYSICAL
SURVEYS

FOR
WESTFIELD MINERALS LIMITED

MOUNTJOY PROJECT

McArthur Township Property
Timmins Area
Ontario

## by

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29 Beaver Cres.
North Bay, Ontario
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# GEOLOGICAL AND GEOPHYSICAL SURVEYS 

## REPORT

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WESTFIELD MINERALS LIMITED MOUNTJOY PROJECT<br>McArthur Township Property Ontario<br>*

INTRODUCTION
Approximately 30 miles of magnetic, electromagnetic, and geological surveying was completed on the 41 claim property of Westfield Minerals Limited between 13 August and 23 September, 1979.

The property is situated in the SWest corner of McArthur Township and overlies two NWest trending bands of iron formation within felsic metavolcanic rock, principally thinly stratified tuffs.

Data obtained during the field programme has been documented on three sets of maps:

1) Magnetometer Survey NW sheet, SE sheet
2) VLF Survey

NW sheet, SE sheet
3) Topographic and geological map NW sheet, SE sheet

A minimum amount of interpretive comment has been used in the report. The data documented on the maps alluded to above is complete enough to provide an assessment of the results
obtained with a view to determining the types of additional exploration work required and the specific anomalous areas where this work should be directed.

Additional exploration work has nevertheless been recommended for the Ll00N-East of base line anomaly. Bulldozer stripping and/or diamond drilling are the preferred methods to be considered.

PROPERTY AND DESCRIPTION
Westfield Minerals Limited holds 41 unpatented mining claims registered with the Ontario Ministry of Natural Resources in the Porcupine Mining Division.

The claim group shown on Sketch No. 1 is oriented NWest-SEast and is situated between Triple Lake and McArthur Lake in the South central portion of McArthur Township.

Claim numbers and essential statistics are as follows:

| Claim No. | No. of Claims |  | Anniversary Date |
| ---: | ---: | ---: | ---: |
| $516802-814$ | 13 |  | 4 October 1978 |
| $517103-108$ | 6 | 4 October 1978 |  |
| $522044-047$ | 4 | 4 October 1978 |  |
| $522056-068$ | 13 | 4 October 1978 |  |
| $522244-248$ | $\underline{5}$ | 4 October 1978 |  |
| Total . | $\underline{41}$ |  |  |

LOCATION AND ACCESS
Convenient access to the property is provided by a good gravel development road which runs south from Timmins toward Muskasenda Lake and the timbering and mining areas in the townships further south. This road traverses the SWest corner of McArthur Township and crosses the McArthur-Bartlett Townships common boundary immediately south of Triple Lake. From here a bush road runs through the central portion of the property in a $\dot{N}$-South direction along the East side of Triple Lake and the Mountjoy River. This bush road is negotiable with motor vehicles to the approximate centre of the property. It can be entirely restored to use through the property by brushing out the overgrowth.

Branch roads from the main bush road traverse the property in a general E-West direction. One in the central portion of the property is useable to an old camp location on the power line, and another through the South portion of the property is overgrown.

The readily accessible central portion of the property is about 27 miles from downtown Timmins.

## TOPOGRAPHY

Map 3, NW and SE sheets, provides an overview of the general topographic setting.

Mountjoy River meanders in a general N-South direction through the NWest portion of the property. It has
carved its course out of fine pleistocene and recent sands. Sand banks are up to $100^{\prime}$ thick or more at the rapids within the property and vary in height along the extent of its course down to five feet or so.

All the terrain West of the river and immediately East of it is gently undulating sand knolls wooded with jackpine, poplar, birch, and some spruce.

The central portion of the property is drained by a meandering stream within a relatively broad, flat, NNWest trending beaver marsh area with random beaver dam basins. To the East of this drainage system lie low sand knolls wooded with jackpine and local pothole bogs wooded with small spruce. The West and Southerly portions of the drainage trough comprises relatively flat terrain supporting a mixture of evergreens and leaf trees, mainly poplar.

The SEast portion of the property contains a mixture of all the features described above but in more limited extent. Broad cedar swamp areas predominate West of the power line.

Outcrops are sparse. Where present they protrude along the edges of broader low knolls. Less than $3 \%$ of the property is outcrop.

The entire property is predominantly low in relief. An extra high voltage power line cuts across the Easterly edge of the property. The right of way cuts a 300' wide swath through the extreme Eastern edge of the property.

A brief, generalized review of recorded past exploration work on the property and immediate vicinity is documented below. The information listed here has been derived from supplied copies of documents obtained from the Resident Geologist's Files in Timmins as well as Ministry of Natural Resources Geological Reports:

1. Triple Lake Porcupine Gold Mines Limited 1938

Adjoins the SWest portion of the McArthur claims. Shaft to 55 feet. Quartz vein from $1.5-3.5^{\prime}$ wide striking $N 50^{\circ} \mathrm{E}$, and dipping at $60^{\circ}$ South on East shore of Triple Lake.
Free gold and values up to $\$ 50.00$ Au reported. Band of NW trending intercallated iron formation traverses the NEast corner of the claim group near the boundary with the McArthur Township claims of Westfield Minerals Limited.
2. Erie Canadian Mines Limited 1938

Two claims near the 2 mile،post between McArthur and Bartlett Townships.
On SEast projection of a band of iron formation running through the McArthur Township property. Visible gold reported in narrow quartz veins filling cross fractures in iron formation. Small shaft sunk to $120^{\prime}$.
3.

Paymaster Consolidated Mines Limited 1957-1960
Two claim groups worked on: NEast group, and South group. The Neast group overlaps the NEast portion of the McArthur Twp. property. The South group overlaps the Southern portion of the McArthur Township property.

Aeromagnetic surveying.
Ground magnetic and electromagnetic surveying.
Diamond drilling:
NEast group: 4 DDHs - 2266'
No significant assay results for precious or base metals.
South group: 6 DDHs - 2645'.
Varying lengths of iron formation intersected. Sulphides of pyrrhotite with minor chalcopyrite intersected.
Best assay was $27.4 \%$ iron across 29'.

Acme Gas and Oil Company Ltd. 1966.
The current McArthur Twp. group lies within a larger group of claims held by Acme in the Township. Short grids were cut over anomalies that lie within the NWest portion, and Centre portion of the current McArthur Twp. group. Magnetic and airborne electromagnetic surveying carried out.
A series of magnetic and electromagnetic anomalies lie along NWest tending iron formation bands. Diamond Drilling: 2DDHs - 764'.
Iron formation with pyrrhotite and minor chalcopyrite intersected.
Hostrocks comprise sediments and some meta-diorite.
Abitibi Asbestos Company Limited, 1973.
A large group of claims held by Abitibi would barely overlap the East edge of the current McArthur Twp. group. Ground Magnetic and Electromagnetic surveying carried out.

Texas Gulf. Incorporated, 1972
A large group of claims, formerly held in the Southern part of McArthur Township and the Northern part of Bartlett Township, overly two parallel bands of iron formation intercallated with intermediate and felsic metavolcanics..
The Texas Gulf claims occupied the SEast portion of the current McArthur Township group.
Texas Gulf completed magnetic and electromagnetic surveys on the claims.
Magnetic and electromagnetic anomalies are attributed to the iron formations which contain magnetite, minor sulphides and graphite.
No data available from an indicated 5 DDHs put down in what is now the extreme sEast portion of the McArthur claim group.

## GENERAL GEOLOGY

Reference: 1) Map \#2363, McArthur and Douglas Twps.
2) Map \#2345, Peterlong Lake.

The McArthur Township claim group overlies a NWest trending band of intermediate to felsic metavolcanics comprising massive, tuffaceous, brecciated, and lapilli units.

Two narrow bands of metasediments containing iron formation, chert, and siltstone lie at the approximate centre of the felsic metavolcanic horizon snaking in a NWesterly course through it. Narrow, discontinuous mafic intrusive sills and dykes of the gabbro clan, and olivene diabase dykes, trend NWesterly within the metavolcanics generally conformable with the iron formation host structures.

The felsic metavolcanics are flanked on the West by mafic metavolcanics and broad mafic intrusives. A broad area of serpentinized ultramafics are located on the East flank..

All these units; the felsic and mafic metavolcanics, and the ultramafics, are sandwiched between the Peterlong Lake felsic intrusive complex on the West and the Adams and Geikie granodioritic plutons on the East.

Several prominent NWest trending fault structures parallel or sub-parallel the NWest formational trend in McArthur and Fripp Townships.

A large trondhjemite intrusive body in the sEast corner of McArthur Township and the NEast corner of Bartlett Township penetrates the felsic metavolcanics and ultramafic rocks. This unit may represent a feeder for the felsic volcanics.

LOCAL GEOLOGY
Outcrops are sparse and of limited size within the property. They comprise no more, but perhaps less than $3 \%$ of the property.

Outcrops intersected by the grid have been located on Map 3(2). Small samples from each exposure have been collected and labelled for reference and identification. Tuffaceous (Tf) rock units predominate. For the móst part these rocks are thinly bedded and all trend NWest SEast with dips invariably steeply to the NEast. Individual observations are as shown on Map 3. Varieties include minor massive unstratified ( $T$ ) types and more abundant lapilli (T1) varieties. One small Tuff breccia (TA) occurrence was observed in the SWest end of the property. Sills or dykes of the gabbrodiorite (G) clan are next in abundance as shown on Map 3. These rocks are characteristically granular ranging from medium to fine grained. They vary from leuco to melanocratic in composition. Disseminated pyrite is sometimes present in these mafic intrusives as indicated.

An exposure of fine grained, black, peridotite, that is noteably magnetic, occurrs on the extreme East end of line 100 N .

A very small questionable felsic intrusive on LIl2N, East of the base line is pale pink, fine grained granular and sparsely mineralized with very fine pyrite. It is probably a small narrow dyke.

A wedge of pale pink aphanitic felsic material is exposed on the outcrops on the rapids in the Mountjoy River. It is situated between the lapilli tuffs and gabbro.

Iron formation is predominantly exposed at three locations as shown on Map 3. The iron formation is essentially finèly laminated pyritic and cherty material. This material is occasionally intercallated with fine seams of magnetite in white chert. Pyrite is the predominant and most pervasive sulphide noted but pyrrhotite was observed to occur in discreet lenses or patches on the exposure on the power line right of way.

The iron formations trend generally NWest - SEast but are locally contorted and folded.

Two narrow chloritic shears zones generally conformable with the regional trend of the rock formations are exposed at the rapids on the Moungjoy River.

SHOWING AND SAMPLING
A small local exposure of sulphide facies iron formation occurs East of the base line between lines 100 N and 104 N .

The iron formation here strikes $\mathrm{N} 80^{\circ} \mathrm{W}$ and dips steeply Westerly. Both strike and dip are different from observations made on other areas of the property. Sample results are shown on Sketch No. 2 and tabulated below:

| Sample | Width | 08 |  | ppm |  | on clam |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  | $\underline{A u}$ | Ag | Cu | $\underline{L n}$ |  |
| 3 | 31 | . 002 | . 28 | 500 | 810 | Slesoc |
| 2 | $3{ }^{\prime}$ | . 002 | . 12 | 240 | 3400 |  |
| 1 | $4^{1}$ | . 002 | . 04 | 217 | 3200 |  |

Sulphide iron formation is also exposed at the
following locations:

1. On some small outcrop exposures between $L 4 N$ and LI2NWest of the base line but adjacent and East of the power line right of way.
2. Within the power line right of way between Ll2N and L20N.
3. In an old trenched area on Ll2N $27+50 \mathrm{~W}$.

GEOPHYSICAL SURVEYS
A statistical presentation of the geophysical surveys
is tabulated below:

## Line. Cutting

Grid: 400' interval grid lines - whole property.
Stations: $\quad 100^{\prime}$ interval pickets.
Mileage: Base Line: 2.92 miles ( $310^{\circ}$ 士) Grid Lines: 26.70 miles Total: $\quad 29.62$ miles

## Electromagnetic Survey

Instrument: Crone Radem VLF EM
Parameters: 1) dip angle - degrees
2) out of phase - \% of normal field

Sources of
Primary Field: 1) Annapolis, Maryland 21.4 kHz
2) Seattle, Washington 17.8 kHz

Base Stations: Between 150 and 200 on field strength meter. Readings: $\quad 50^{\prime}$ interval on grid lines.

1) Annapolis, Maryland
a) Dip Angle
700
b) Out of Phase 700 Total
1400
2) Seattle, Washington
a) Dip Angle - 2100
b) Out of Phase - $\frac{2100}{4200}$ Total 4200

Total All Parameters 5600
Operator: Frank P. Tagliamonte, P.Eng.
Dates: 13 August - 23 September 1979
Plans 2 - 200 scale plans NW sheet, SE sheet.

Magnetic Survey
Instrument: Barringer GM-122 Protomag.
Sensitivity: 1 gamma ${ }^{+}$
Parameters: Vertical component of earth's magnetic field in gammas.

Readings:
Grid Lines - 50' interval 2803
Base Line - 100' " 76 Total

2879
Corrections: 1) Diurnal
2) Base Stations

Base Stations: 400' intervals along base line.
Plans: $\quad 2-200$ scale plans.
Contour
Interval: Irregular - 1000, 3000, 5000
Operators: Peter Tagliamonti
Clifford McLeod
Frank P. Tagliamonte, P.Eng.
Dates: 13 August - 23 September, 1979.

Supplementary Data
Duplicate
Readings: Approximately 300 duplicate readings were taken along portions of several lines to compare dip angle and out of phase response from each transmitter station. Results were not deemed complete enough to provide meaningful conclusions.

Fraser Filter: Anomalous areas were filtered by the Fraser process.
Very strong results were obtained on the line 4 N -West of base line VLF anomaly, whereas the other anomalies produced relatively weaker results.
The supplementary data has been recorded on work sheets only.

Power Line Interference:

The Extra High Voltage power line which runs through the Eastern portion of the property interferes to varying degrees both with the VLF and magnetic equipment. Anomalous features along the power line are consequently suspect. The Line 4 N -West base line, VLF and magnetic anomalies are, however, real and to some extent confirmable since iron formations and sulphides are observable on adjacent outcrop exposures on the power line right of way.

MAGNETIC SURVEY RESULTS
A gross review of magnetic data with minimal
interpretive comment follows. The review is based on data and magnetic contours on Map 2, NW and SE sheets.

Two generally parallel gently arcuate bands (East and West bands) of iron formation lie along the $310^{\circ}$ trending base line. The iron formation bands are $1600^{\prime}$ apart in the South portion of the property but remain about 1200 ' apart NWesterly through the property.

The most prominent magnetic anomaly is identified as Ll00N-East of base line. This anomaly is a narrow dipole
feature up to 2400' long on the East band iron formation. The L4N-West of base line anomaly is a narrow, perhaps short magnetic dipole anomaly possibly distorted somewhat by power line interference. It also lies within the East band iron formation.

A somewhat broader dipole anomaly is situated between lines 56 N and 80 N West of the base line on the West band iron formation.

A weaker, narrow, linear expression of the East band iron formation lies along the base line between $L 36 \mathrm{~N}$ and L 64 N .

ELECTROMAGNETIC SURVEY RESULTS
As indicated on Map 3, NW and SE sheets, there are 4 prominent conductors present in the survey area. An in depth review of the data will likely produce other not so obvious conductors and cross-overs.

Those conductors or cross-overs that lie within, or immediately adjacent to the power line right of way are to be treated with reservation because of very apparent interference from the power line.

Two transmitter stations were used during the survey in order to avoid delay during transmitter shut down periods. The more prominent conductors are as identified below:

1. Ll00N-East of base line conductor.

This conductor is co-incjdent with a magnetic anomaly and adjacent to a showing of sulphide facies iron formation that contains anomalous amounts of precious and base metals. See sketch No. 2. The conductor axis is segmented or displaced in the
area of the showing between LIOON and Ll04N. The Southerly projection of the anomaly becomes very weak toward L84N where it is again segmented and possibly displaced.
2. L4N-West of base line conductor.

This is a strong conductor along the scarp edge of a hill and South of prominent iron formation exposures on the power line right of way which contain pyrite and pyrrhotite.
3. L56-L60N along base line conductor. This conductor lies along a weak linear magnetic anomaly. No surface exposures were observed.
All prominent conductors encountered appear to be confined to the East band iron formation. These intermittent conductors are segmented as noted.

SUMMARY AND CONCLUSIONS
Magnetic, Electromagnetic and geological surveys were carried out over the Westfield Minerals Limited claim group in McArthur Township, Timmins, area during August and September, 1979.

The claim group overlies a NWest trending horizon of intermediate to felsic metavolcanics containing two parallel bands of iron formation.

The immediate area and some anomalous features within or adjacent to the iron formation have been sporadically explored by a variety of companies over the years. The Westfield programme of geophysical and geological surveying on $400^{\prime}$ interval grid lines is the only comprehensive exploration work carried out over a continuous three mile stretch of favourably regarded metavolcanics and iron formation.

Anomalous features comprising the Ll00N-East of base line anomaly suggest one specific area where detailed exploration investigations should be carried out. There is no field evidence of any extensive work having previously been done in this area.

The anomaly may be further investigated by prospecting, by fill-in geophysical work on 100 interval grid lines, by bulldozer stripping and rock trenching, or simply and most expeditiously by a series of diamond drill holes.

A programme of reasonably detailed exploration on the Ll00N-East of base line anomaly will determine the economic importance of this and similar geophysical and geological anomolies within or adjacent to the iron formations particularly the East band, which appears to be most responsive to geophysics as shown by the current exploration work. Data thus derived will dictate the most effective exploration approach to be considered for other anomalous areas on the property.



1) Magnetometer Survey
(2)

NW sheet, SE sheet
2) V. L. F. Survey (2)

NW sheet, SE sheet
3) Topographic \& Geological Map (2)

NW sheet, SE sheet
















## GEOPHYSICAL－GEC ${ }^{-}$

Ontario

## TECHNICAL

## TO BE ATTACHED AS AN A FACTS SHOWN HERE NEE TECHNICAL REPORT MUST CONTA



900

# Type of Survey（s）Magnetic，Electromegnetic，Siedogical Township or Area MCArth vr Tounship Claim Holder（s）WESTFIELD M CNERALS hiHuEED Sulve 3104，First OINADAN PAACE．POBOX 143  Author of Report Froak P．Teglismende ，P．Eing Address of Author Ci9 Brover Cres．Nortab Bay，Ont． Covering Dates of Survey 13 Aug－17 NOU． 19 Zg PIA ZNI Total Miles of Line Cut＿＿39＋ 

| SPECIAL PROVISIONS |  | DAYS <br> per claim |  |
| :--- | :--- | :--- | :--- |
| CREDITS REQUESTED |  | Geophysical |  |
| ENTER 40 days（includes |  | －－Electromagnetic | 20 |
| line cutting）for first |  | －Magnetometer | 40 |
| survey． | －Radiometric＿ |  |  |
| ENTER 20 days for each  －Other  <br> additional survey using Geological 20  <br> same grid．    | Geochemical |  |  |

AIRBORNE CREDITS（Special provision credits do not apply to airborne surveys） Magnetometer $\qquad$ Electromagnetic $\qquad$ Radiometric （enter days per claim）

## DATE： 17 Nov． 1979 signatureitendletreg anioulo

Res．Geol． $\qquad$ Qualifications $\qquad$
Previous Surveys


## GEOPHYSICAL TECHNICAL DATA

GROUND SURVEYS - If more than one survey, specify data for each type of survey


Profile scale
Contour interval Irregular-: 1000 o $2000 \gamma 3000 \gamma+5000 \%$. ( $5 E E=A \angle S O$ REpORT \& PLANS)
Instrument Barringer GM-122. Protomeg.
Accuracy - Scale constant \& gezuond I
Diurnal correction method $\operatorname{loop}$ closures de mg bouseleire. Grid loop closures convected to Bare Base Station check-in interval (hours) wi then (hoe station Values Base Station location and value Base stations at gid intersections along hose lane (sere Map - NW + SE sheets)

Instrument Crone $R$ diem VLF
Coil configuration Vertical loop
Coil separation infin cite
Accuracy $\qquad$
Method:
Fixed transmitter
$\square$ Shoot back
$\square$ In line
$\square$ Parallel line

Parameters measured. Dip Angle-degrecs. Soot of phase- - of of Nor mol (Excel:

Instrument
Scale constant
Corrections made

Base station value and location

Elevation accuracy

Instrument


Power
Electrode array
Electrode spacing
Type of electrode

* Electromagnetic. Does not indude duplicate readeñg along severed lines.
* Magnetic: Does not include loops to establish hose stations.








