

LYELL E.Z. EXPLORATIONS
Queenstown

REPORT ON THE AFMAG SURVEY
IN MOORE'S VALLEY

March 1960

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4th March,

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To: Mr. G.F. Hudspeth.

Audio Frequency Magnetic Orientation Survey

The Aftmag survey was commenced on 9th February and was completed on 24th February. A total of 75,000 feet was surveyed primarily along existing tracks and roads in the western edge of Moore's Valley and the adjacent valley of the Wanderer River.

The object of the survey was to test the intensity of the naturally occurring electro-magnetic fields in S.W. Tasmania and to detect any conductor which may be present beneath the Cainozoic sediments. It will be remembered that the location of induced polarisation anomalies A, B and C in Moore's Valley was first determined by the Aftmag unit used in February, 1959.

1. Applicability of Method

The Aftmag makes use of naturally occurring electro-magnetic fields which are thought to have their source in the equatorial thunderstorm belt. These fields have a pronounced diurnal variation and for this reason the surveys last year had to be carried out at night with the obvious drawbacks to this hour of working. This year the sensitivity of the instrument had been increased two-fold with the result that surveys could usually be commenced by 2 p.m. and completed by nightfall. In keeping with last year's results the high frequency of 475 cps gave a stronger signal than the low frequency of 175 cps.

The results of the survey which are presented in the accompanying report and plans indicate that the Aftmag has been successful in detecting conductors which are covered by several hundred feet of sediments.

2. Results (Plan R9)

The presence of the conductor located by last year's Aftmag survey on Baseline/11N and associated with the induced polarisation anomalies was again confirmed by the consistent southerly azimuths recorded on line 12N. The northwesterly continuation of this conductor is considered to have been located by the results of the survey along the main jeep road which crosses

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The Conder River and the track from this road to the Wanderer and Conder River junctions.

A test survey across the Great Lyell Fault north of Moore's Valley near the D'Aguiar Range established the largest anomaly detected in the field programme.

The results have prompted the testing of the following areas by the induced polarisation technique:

- A. Line 76 North extended) To test the northerly continuation
- Line 93 North extended) of the shear associated with I.P.
- Line 14⁵ North extended) anomalies A, B and C.
- B. Three east-west lines to cover the crossover detected at the northern extremity of the map, near the D'Aguiar Range.

Further Afmag work is also warranted on the crossover established on the Wanderer Jeep road and at the south ^d edge of the area to the southwest of Moore's Valley.

3. Summary

The Afmag has successfully detected conductors which are covered by several hundred feet of sediments and which provide targets for detailed I.P. work. Further Afmag work is warranted in the general area of this survey and indeed along the entire length of the Great Lyell Fault from Gordon River to Moore's Valley and the parallel fault to the west which is considered to extend from Birch Inlet to the Wanderer River. Apart from noting that these surveys should be carried out during December and January when the naturally occurring field are at their strongest, no further specific proposals are made since the applicability of aerial Afmag to this broad area will first have to be evaluated.

Chief Geologist, L.E.E.

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4th March,

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Report on the AFMAG Survey in Moore's Valley, Tasmania

for

Lyell-E.Z. Explorations

1. Introduction

The limited amount of information obtained last year about the use of the AFMAG method in Tasmania indicated that it was ideally suited to the terrain, bush and exploration problems of the area. However, the field strengths were so low that, with the equipment used last year, measurements were only possible a few times, mostly at night. Therefore, it was obviously unsatisfactory as an exploration tool.

The equipment designed for the AFMAG test program during the 1959-60 field season uses a larger coil system giving about twice the pick-up of the older unit. The greater pick-up factor has made it possible to take AFMAG measurements in Moore's Valley during the afternoon of almost every day it was tried.

The discussion of the field strengths in Moore's Valley, as well as in the other areas studied, will follow in the general report to be submitted to both the participants in the test program. The purpose of this report is to discuss the results of the AFMAG measurements made in Moore's Valley.

2. Presentation of Results

The results of the AFMAG survey are shown on the enclosed map. Instead of being shown as profiles, the AFMAG results are shown as arrows on the plan map. The direction of the arrow shows the direction of the maximum field strength, the sense of the arrow shows the direction of the dip of the field, and the length of the arrow shows the magnitude of the dip angle. The arrow points in the same direction as the bottom of the signal coil at null, and therefore in the direction of the conductor. The presence of an anomaly is indicated by a change in the direction in dip in such a way as to cause the arrows to point to a common axis.

3. Discussion of Results

During the time available for the AFMAG survey in Moore's Valley, measurements were made along the roads and along brush-free ridges which gave easy access. This was done in order to cover, by a reconnaissance survey, as much of the area as possible. It was hoped that the reconnaissance survey would delineate any areas in which a detailed survey should be carried out.

As shown on the map, there are several places where the results indicate a conductor. Additional measurements would be necessary to completely evaluate these conductors, and the best locations for the detail lines can be seen from the map itself.

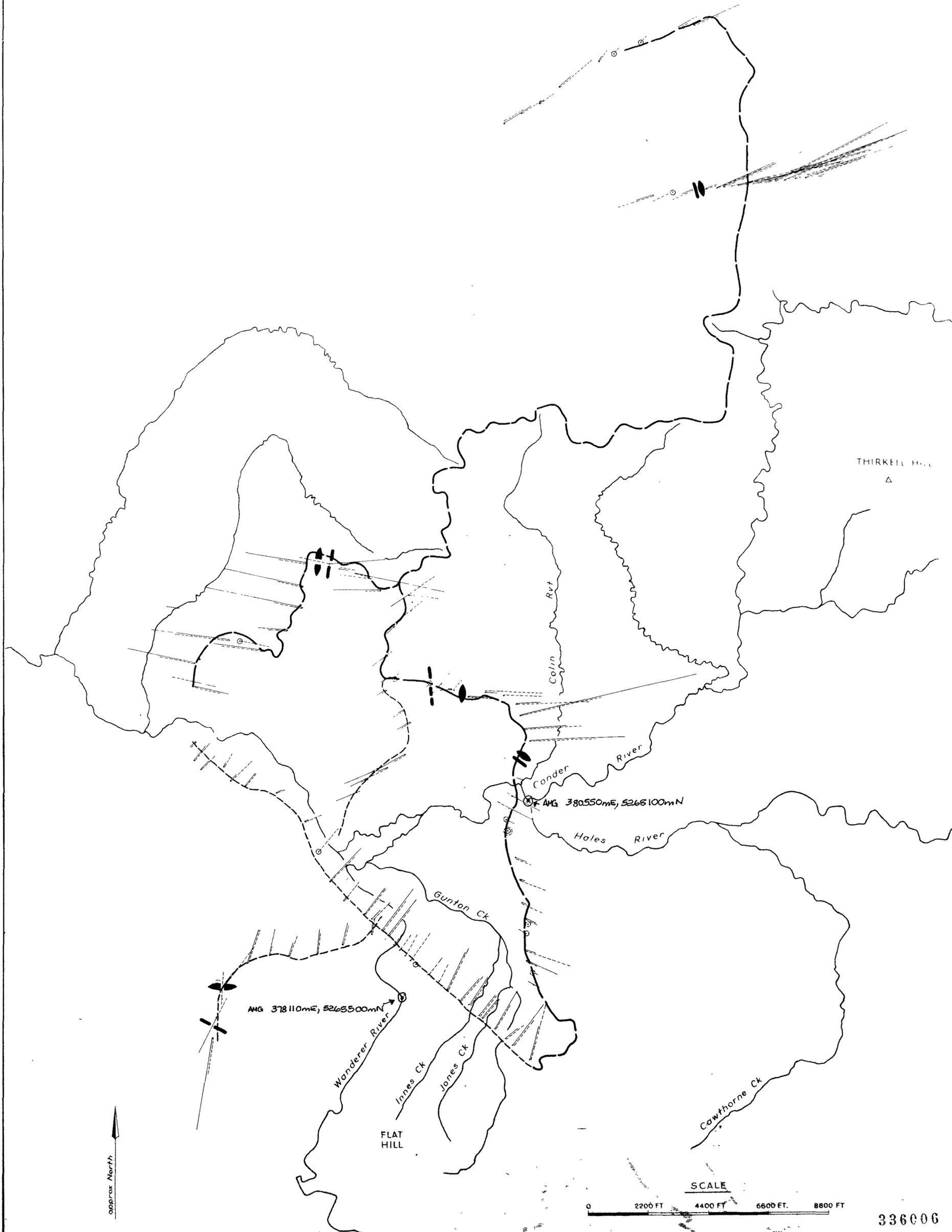
At the southern end of the survey, the data agrees well with the results of last year's survey. The southernmost readings indicate a conductor to the south which is probably an extension of the conductor found last year at about 10N on the base line. The other conductors located by this reconnaissance survey appear to be of equal importance, with the conductor north of Thirkell Hill being the strongest.

4. Conclusions and Recommendations

The AFMAG tests of the February, 1960 field season show that with proper instrumentation the AFMAG method is a useful exploration tool in Tasmania. In the limited time available a reconnaissance survey was carried out over a large area in Moore's Valley. This survey located general conducting zones of definite interest. It is recommended that further information about all of these zones be obtained by carrying out a detailed AFMAG survey. When this detailed information is obtained the conductors should be checked with Induced Polarization to determine the possible presence of sulfide mineralization.

McPHAR GEOPHYSICS LTD.

sgd. Harold Linder
Philip G. Hallof

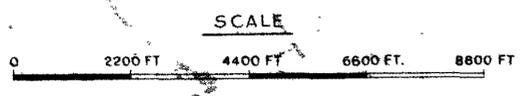


Approx North

LEGEND

- Jeep Road
- Tracks
- AFMAG**
- Low Frequency
- High Frequency
- Low Frequency Crossover
- High Frequency Crossover

5 cm
AMG REFERENCE POINTS ADDED



336006

References		LYELL EZ EXPLORATIONS		QUEENSTOWN	
Photomosaic 1c		MOORES VALLEY			
		AFMAG			
Survey	Adastra	1957	Scale	2200 ft. to 1 inch AFMAG 1" = 10" dip	R 9 Sheet No. 12
Geology					
Geophysics	Mc Phar	1960			
Geochemistry					
Drawn	P.R. B.	March '60			
Traced	R.E. D.S.	March '60			004

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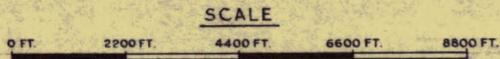
Photomosaic 1c

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LYELL E.Z. EXPLORATIONS QUEENSTOWN

MOORES VALLEY GENERAL GEOLOGY

Survey			Scale		
Geology	B.S., R.G.E., P.R.	1957/1960	2200 ft. to 1 inch	R 10	Sheet No. a
Geophysics	Mc Phar	1959/1960			
Geochemistry					
Drawn	P.R., B.S.	March 1960			
Traced	R.E., D.S.	March 1960			



approx. North

LEGEND

- Bedding
- Boundary
- I.P. Lines completed
- I.P. Lines proposed
- I.P. Anomaly
- Fault
- Anticline
- Syncline
- Afmag Crossover
- Resistivity Trend / Probable Fault

