

MEMORANDUM



**PASMINCO
EXPLORATION**

21 September 2001

TO Terry Briggs
COPY Andrew McNeill
FROM Chris Dauth
SUBJECT Dundas EL 21/96 HEM anomaly comparison with aeromagnetic data

INTRODUCTION

Pasminco are currently exploring EL 21/96 (Dundas) for Rosebery style Pb-Zg-Ag mineralisation. During April 1999 a helicopter electromagnetic survey was completed over the Dundas EL a part of ongoing exploration. The results of this survey are written up by Dauth 2000. At the request of the project geologist this MEMO was written to summarise the aeromagnetic responses observed over each of 14 HEM anomalies determined to warrant further investigation. The aim is to determine whether EM anomalies have corresponding magnetic anomalies.

SURVEY PARAMETERS

The magnetic data were acquired at the same time as the heli-EM data. The survey had the following technical specifications:

Date of Survey:	March 1999
Contractor:	Geo Instruments Pty Ltd
Aircraft:	Aerospatiale AS350BA "Squirrel"
Magnetometer:	Geometrics G822A (within the towed bird)
EM System:	GeoTech Hummingbird 5-frequency
Co-Axial Coil Freq.:	980 Hz and 7001 Hz
Co-Planar Coil Freq.:	385 Hz, 6606 Hz, and 34133 Hz
Recording Interval:	0.1 second (approx. 1-4 m)
Helicopter Clearance:	60 metres
Towed Bird Clearance:	30 metres
Line Spacing:	100 metres
Line Direction:	090-270°
Tie Line Spacing:	1000 metres
Tie Line Direction:	000-180°
Navigation:	Real Time GPS
GPS Receiver:	Novatel 951R
Altimeter:	Sperry AA210
Acquisition System:	Geo Instruments G2002
Processing By:	Geo Instruments Pty Ltd
Total Line km's:	987

These data are most certainly regarded as being of high quality and well spatially located.

RESULTS

A total of 15 HEM anomalies were delineated from the HEM survey (Dauth 1999). These are listed below:

Anomaly	Easting AMG	Northing AMG	Interpreted Source	Recommended Followup
D1	374900	5373600	Shale / mineralisation	Historical data + ground check
D2	376500	5373400	Shale / mineralisation	Historical data + ground check
D3	374100	5373200	Culture?	Historical data + ground check
D4	374350	5372200	Shale / mineralisation	Historical data + ground check
D5	375000	5371500	Collbrook Hill	Historical data + ground check
D6	375750	5370900	Shale / mineralisation	Historical data + ground check
D7	372750	5367400	Shale / mineralisation	Historical data + ground check
D8	370150	5367800	Po veining	Historical data + ground check
D9	370900	5367900	Po veining	Historical data + ground check
D10	370300	5366200	Shale / mineralisation	Historical data + ground check
D11	373000	5365300	Shale / mineralisation	Historical data + ground check
D12	373850	5365000	Glacials	None
D13	371500	5364800	Shale / mineralisation	Historical data + ground check
D14	372950	5364000	Shale / mineralisation	Historical data + ground check
D15	371750	5361900	Shale / mineralisation	Historical data + ground check

All anomalies with the exception of D12 have been recommended for follow-up (generally by looking at historical exploration data). The corresponding magnetic anomalies with each of these HEM anomalies is discussed separately below.

D1

D1 lies on a small 40 nT “pimple” of a magnetic anomaly. The EM anomaly was described as “the northern extension of the Colbrrok Hill” mineralisation. It is therefore unsurprising that the anomaly has a coincident magnetic expression due to the association of the Collbrook Hill mineralisation with pyrrhotite. The EM anomaly also appears to lie within a NW-SE structure that can be delineated from the magnetic data.

D2

D2 was described as “perhaps the most prospective of all responses for Pb-Zn mineralisation”. Investigation of existing geophysical and drilling data from this prospect suggests the anomaly was drilled and determined to be formational black shale, (pers com T Briggs). The EM response is situated within a broad low magnetic response showing no apparent correlation to the EM response.

D3

D3 was described as “D3 is a single line anomaly on the wall of a wall and is quite possibly cultural in origin”. Although the author of this MEMO was the author of the HEM report the comment “wall of a wall” is an astounding curiosity and it is arguably entirely unclear as to what the hell this comment means! Subsequent analysis suggests that the comment should

have read “wall of a dam” thus explaining the proposed cultural source for the anomaly. A very high amplitude magnetic anomaly is situated 200m to the north of this EM response however it is unlikely related and the EM anomaly can only be explained as having no associated magnetic response.

D4

HEM anomaly D4 is described as similar in nature to the Collbrook Hill mineralisation EM anomaly (and the close spatial relationship suggests the sources are likely to be similar). The D4 anomaly lies within a NW-SE striking lineament (structural break) delineated from the magnetic data. The D5 Collbrook Hill EM anomaly lies on the same lineament. Although the EM anomalies have a N-S strike direction it may be possible that the structure has acted as a fluid pathway? Given these are not considered as Pasminco targets the significance, if any, is purely academic.

D5

The Collbrook Hill EM anomaly is situated directly on a high amplitude (several 100's of nT) magnetic anomaly and lies within a NW-SE lineament.

D6

The D6 anomaly is described as “a repetition of the Collbrook Hill anomaly, D5, but deeper”. The D6 EM anomaly has a corresponding magnetic anomaly that definitely supports this claim. The anomaly also lies within the same NW-SE lineament (as a structural break) as the D5 and D4 anomalies.

D7

This anomaly is a large NE-SW striking anomaly with a strike length of 2.5 km and has thus has a high chance of being lithological. The anomaly lies directly on the eastern side of a high amplitude magnetic lineament with the same strike orientation. The high amplitude magnetic anomaly is possibly ultramafics. The EM anomaly has no real associated magnetic anomaly.

D8

D8 was described as “D8 is situated near the Renison Mine Lease and is characteristic of a narrow pyrrhotite style body”. The anomaly has a coincident high amplitude magnetic anomaly and thus has every chance of being a pyrrhotite occurrence which may or may not have associated tin (ie Renison style mineralisation).

D9

D9 was described in EM terms the same as D8, however the two anomalies have very different magnetic characteristics. Whereas D8 lies on a magnetic anomalies (and thus is most definitely Renison style, D9 lies on a strong N-S striking lineament with which it is most likely related.

D10

D10 has a small coincident 40 nT anomaly (as an inflection in the TMI). The anomaly is in an area of numerous small magnetic anomalies and the coincidence could be unrelated.

D11

This EM anomaly is a suite of 4 separate EM responses. There are no associated magnetic responses.

D12

Anomaly is interpreted as glacial cover and has no associated magnetic response.

D13

This EM anomaly has a coincident small magnetic anomaly (40-50 nT) and lies on a N-S striking magnetic lineament that possibly represents a structural break or a magnetic dyke (which could also have intruded along a structural break).

D14

Anomaly D14 has no associated magnetic anomaly and occurs on the south-western side of a broad high amplitude magnetic response.

D15

This EM anomaly lies within a broad E-W magnetic gradient and really has no apparent discrete associated magnetic anomaly or structure.

CONCLUSIONS

A striking conclusion is that there really are no conclusions. The EM anomalies do not generally have definite associated magnetic responses other than at Collbrook Hill and one of the Renison style EM targets (D8). Thus the magnetic data are perhaps not a good method for discriminating or prioritising EM anomalies for follow-up. Many of the world-wide VHMS deposits have associated magnetic responses used for targeting, however, none of the Tasmanian deposits discovered thus far have an easily distinguished magnetic response. It is therefore difficult to suggest use of the technique for classing of anomalies (either way). All EM anomalies lie within 1km of structural lineaments that could be interpreted from the magnetic data which also may preclude use of this type of analysis for anomaly discrimination. It is possible that trying to preclude EM anomalies on the basis of associated magnetic response could well have the consequence of throwing a baby out with the bathwater.

REFERENCES

Dauth, C., 2000, Interpretation of helicopter-borne electromagnetic survey data acquired over the Dundas region, Western Tasmania, May 1999, EL 21/96; Pasmenco Internal Report