REPORT ON DHEM SURVEYS

BURNS PEAK

(E.L. 44 /88)

DDH’S BPD67-70

02_4808
CONTENTS

SURVEY DETAILS
INTERPRETATION
   BPD67
   BPD68
   BPD69
   BPD70
   QR1060A
RECOMMENDATIONS
LIST OF FIGURES

TABLES

1. BURNS PEAK DHEM SURVEY DETAILS
REPORT ON DHEM SURVEYS, BURNS PEAK (E.L. 44/88),

DDH'S BPD67-70.

for

Pasminco Exploration, Tasmania

SURVEY DETAILS

DHEM surveys were carried out down DDH's BPD67, BPD68, BPD69 and BPD70 in November, 1990. The work was carried out by McSkimming Geophysics using a Mk2 Sirotem. Both early- and standard-time measurements were made, at 10m intervals down the holes. Two loops were used for each hole: one maximally and the other minimally coupled. The loop locations are given in Figures 1a & 1b. The results were plotted logarithmically by the contractor and copies are included in this report (Figures 2, 3, 4 & 5). To verify that the equipment was working properly, a survey was also carried out down the Que River hole QR1060A. This work was done using Tx loop 7, with standard times at a 20m reading interval (Figure 6). (The loop numbers for holes BPD69 & BPD70 have all been increased by 2 since McSkimming's survey. The figures have been changed for this report, but not the digital records.)

INTERPRETATION

To assist the interpretation, cross-sections of the EM field patterns have been produced for the four holes (Figures 7-10). (The positions of the proposed loops were used for these calculations, which in some cases vary slightly from the actual positions.) The results were generally disappointing, however an off-hole source is indicated in one hole and repeat surveying is required down another. A summary of the results is given in Table 1.

BPD67

Despite the successful testing of the equipment at Que River, the results from both loops are suspect for this hole and resurveying
is recommended. A very persistent (in-hole) response was recorded near 50m from the maximally coupled loop 67/1. This section of the hole contained minor disseminated pyrite, but insufficient to produce the strong, local response shown on Figure 2a. The results from loop 67/2 (Figure 2b) show no sign of the strong self-response expected in this area (or of the shallow 'anomaly' seen in 67/1) and the shallow section of the hole shows the wrong (ie, unexpected) sign (compare with the results from the other three holes). Although these results are suspect, it is worth mentioning that a subtle concave character can be seen in some early channels from 67/1 with a corresponding convex character in 67/2. These may suggest a distant conductor (possibly the overlying Chester pyrite deposit) and should be looked for in the repeat work.

**BPD68**

This hole was drilled near to the S.W. Chester workings. Very high positive and negative values were recorded near the top of the hole from loops 68/1 and 68/2 respectively. These are attributed to self-response of the probe and possibly to conductive surface conditions. A very subtle convexity can be seen in some intermediate time channels from 68/2 below 200m. If due to an off-hole conductor, this is interpreted to be due to a surficial source lying outside of the 68/2 loop edges and thus of no interest.

**BPD69**

A possible response was recorded in this hole from the maximally coupled loop (#17), centred at 360m. Removal of best fitting straight line background responses to channels 6-14 between 250m and 410m produces the result shown in Figure 11. Modelling of this anomaly (Figure 12) indicates an off-hole source, probably above the hole. The model is not a very good fit to the data, but does show similar characteristics. The ratios of positive to negative response are different and these are highly dependent upon the removed 'regional' and it is quite possible that an overly simple approach has been used here. This ratio also varies with dip and although a less well fitting model is obtained from a westerly dip, it seems likely that the source is close to, if not coincident with, the steeply west dipping tuff-porphyry contact logged at 403m down the hole. BPD69 intersected broken ground here and the anomaly may be due to a high porosity zone along the contact. The model conductance of 200S is high for such a source, however no great effort has been made to match amplitudes and decay rates. Similarly the model plate dimensions of 100m (long) x 50m (deep) are not definitive.

If, despite the above, this response is considered to be of potential interest, a more thorough interpretation is required and resurveying with differently placed loops is recommended to help position the source. A DHMMR survey would determine
unambiguously whether the source was above or below the hole.

**BPD70**

No anomalies were recorded down this hole and the profiles, with the exception of excess noise around 200m from loop 20, are as expected.

**GR1060A**

This hole has been surveyed many times by Aberfoyle Resources to check DHEM equipment. It is a deep hole (1250m+) and has a subtle response at around 950m (Silic and Eadie, 1989)*. McSkimming's equipment for this survey was limited to around 1000m, but the results show very good agreement with a previous Sirotem (standard time) survey by the same company which extended down to 1260m (Figure 13) and thus the survey verified that the equipment was functioning correctly at the commencement of the Burns Peak contract.

**RECOMMENDATIONS**

It is recommended that BPD67 be repeated using both loops.

If the region near the tuff/porphyry contact at the bottom of BPD69 has any potential on other, independent criteria, it is recommended that the results from loop 17 be more thoroughly interpreted and that the hole be resurveyed from another set of loops to better define its position.

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LIST OF FIGURES

Figure 1a. DHEM loop location plan: BPD67 & BPD68.
Figure 1b. DHEM loop location plan: BPD69 & BPD70.
Figure 2a. BPD67 Sirotem profile: loop 67/1.
Figure 2b. BPD67 Sirotem profile: loop 67/2.
Figure 3a. BPD68 Sirotem profile: loop 68/1.
Figure 3b. BPD68 Sirotem profile: loop 68/2.
Figure 4a. BPD69 Sirotem profile: loop 17.
Figure 4b. BPD69 Sirotem profile: loop 18.
Figure 5a. BPD70 Sirotem profile: loop 19.
Figure 5b. BPD70 Sirotem profile: loop 20.
Figure 6. QR1060A Sirotem profile: loop 7.
Figure 7. EM field patterns: BPD67.
Figure 8. EM field patterns: BPD68.
Figure 9. EM field patterns: BPD69.
Figure 10. EM field patterns: BPD70.
Figure 11. BPD69: residual responses.
Figure 12. DHEM model: BPD69, loop 17.
Figure 13a to c. QR1060A: Earlier Sirotem profile: loop 7.
### Table 1

**BURNS PEAK DHEM SURVEY DETAILS**

**Contractor:** McSkimming Geophysics  
**Equipment:** Sirotom Mk 2 (ET & ST)  
**Date:** Nov., 1990.

<table>
<thead>
<tr>
<th>Hole</th>
<th>EOH/Survey depth</th>
<th>Survey loops</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>BPD67</td>
<td>464/450</td>
<td>67/1 &amp; 67/2</td>
<td>Suspect data: to be resurveyed</td>
</tr>
<tr>
<td>BPD68</td>
<td>474/470</td>
<td>68/1 &amp; 68/2</td>
<td>-</td>
</tr>
<tr>
<td>BPD69</td>
<td>421/410</td>
<td>17 &amp; 18</td>
<td>Probable off-hole response at tuff-porphyry contact.</td>
</tr>
<tr>
<td>BPD70</td>
<td>497/490</td>
<td>19 &amp; 20</td>
<td>-</td>
</tr>
<tr>
<td>QR1060A</td>
<td>1250+/1010</td>
<td>#7</td>
<td>Surveyed to check equipment.</td>
</tr>
</tbody>
</table>
Nitre Geophysics Plc.
Burns Peak, E.L.4/88
DHEM Loop Locations
BPD69 & BP070
700000

scale 1:5000
ref: PET/1691/03
Fig 1b.
SURVEY SPECIFICATIONS

DATA ACQUIS'N : W'SKIMMING GEOPHYSICS

SURVEY DATE : NOV. 1990
CONFIGURATION : 45° SQUARE TX. LOOP, DRILL HOLE SURVEY
READING INT. : 20 METRES
NO. OF STACKS : 1024
TRANSMITTER : MEDIUM POWER
RECEIVER : SIROTEM II S/N 1224
CURRENT : 5.2 AMPS
OPERATOR : P W'SKIMMING

PLOT SPECIFICATIONS

HORIZONTAL SCALE - 1:2000
VERTICAL SCALE - LOGARITHMIC
0.32 (E6)
0.42 (E7)
0.51 (E8)
0.61 (E9)
0.71 (E10)
0.90 (S2)
1.20 (S3)
1.60 (S4)
2.00 (S5)
2.60 (S6)
3.40 (S7)
TIME DELAYS IN MILLISECONDS
E - EARLY TIME WINDOW
S - STANDARD TIME WINDOW

PASMINCO
TASMANIA
BURNS PEAK
SIROTEM PROFILE
BPD67 LOOP 1
SCALE - 1:2000
ref: 700010
SURVEY SPECIFICATIONS

DATA ACQUISITION: McSKINKING GEOPHYSICS

SURVEY DATE: NOV. 1990
CONFIGURATION: 55CM SQUARE TX. LOOP
DRILL HOLE SURVEY
READING INT.: 20 METRES
NO. OF STACKS: 1024
TRANSMITTER: MEDIUM POWER
RECEIVER: SIROTEM II S/N 1224
CURRENT: 7.8 AMPS
OPERATOR: P McSKINKING

PLOT SPECIFICATIONS

HORIZONTAL SCALE - 1:2000
VERTICAL SCALE - LOGARITHMIC
4CM PER DECADE
LINEAR BETWEEN -1 AND 1

TIME DELAYS IN MICROSECONDS
E - EARLY TIME WINDOW
S - STANDARD TIME WINDOW

PASMINCO
TASMANIA
BURNS PEAK
SIROTEM PROFILE
BPD67 LOOP 2
SCALE: 1:2000
Fig. 2b.
**SURVEY SPECIFICATIONS**

DATA ACQUISITION: McSKIMMING GEOPHYSICS

SURVEY DATE: NOV. 1980

CONFIGURATION: 400M SQUARE TX. LOOP, DRILL HOLE SURVEY

READING INT.: 20 METRES

NO. OF STACKS: 1024

TRANSMITTER: MEDIUM POWER

RECEIVER: SIROTEM II S/N 1224

CURRENT: 7.6 AMPS

OPERATOR: P. McSKIMMING

**PLOT SPECIFICATIONS**

HORIZONTAL SCALE: -1:2000

VERTICAL SCALE: LOGARITHMIC

4 CM. PER DECADE

LINEAR BETWEEN -1 AND 1

TIME DELAYS IN MILISECONDS

E - EARLY TIME WINDOW

S - STANDARD TIME WINDOW

**PASMINCO**

TASMANIA

BURNS PEAK

SIROTEM PROFILE

BPD68 LOOP 1

SCALE - 1:2000

Fig. 3a.
SURVEY SPECIFICATIONS
DATA ACQUS'N: McSKIMMING GEOPHYSICS
SURVEY DATE: NOV. 1980
CONFIGURATION: 300W SQUARE TX. LOOP, DRILL HOLE SURVEY
READING INT.: 20 METRES
NO. OF STACKS: 1024
TRANSMITTER: MEDIUM POWER
RECEIVER: SIROTEM II S/N 1224
CURRENT: 7.5 AMPS
OPERATOR: P. McSKIMMING

PLOT SPECIFICATIONS
HORIZONTAL SCALE: 1:2000
VERTICAL SCALE: LOGARITHMIC
40X PER DECADE
LINEAR BETWEEN -1 AND 1
TIME DELAYS IN MILISECONDS
E - EARLY TIME WINDOW
S - STANDARD TIME WINDOW

PASMINCO
TASMANIA
BURNS PEAK
SIROTEM PROFILE
BPD69 LOOP 17
SCALE: 1:2000
SURVEY SPECIFICATIONS

DATA ACQUISITION: McSKINNING GEOPHYSICS

SURVEY DATE: NOV. 1990
CONFIGURATION: 300M SQUARE TX. LOOP, DRILL HOLE SURVEY
READING INT.: 20 METRES
NO. OF STACKS: 1024
TRANSMITTER: MEDIUM POWER
RECEIVER: SIROTEM II S/N 1224
CURRENT: 8.4 AMPS
OPERATOR: P McSKINNING

PLOT SPECIFICATIONS

HORIZONTAL SCALE - 1:2000
VERTICAL SCALE - LOGARITHMIC
4CM. PER DECADE
LINEAR BETWEEN -1 AND #1

TIME DELAYS IN MILLISECONDS
E - EARLY TIME WINDOW
S - STANDARD TIME WINDOW

PASMINCO

TASMANIA
BURNS PEAK
SIROTEM PROFILE

BPD69 LOOP 18

SCALE - 1:2000

Fig. 4b.
SURVEY SPECIFICATIONS

DATA ACQUISITION: MacSKimming Geophysics

SURVEY DATE: Nov. 1980
CONFIGURATION: 300m SQUARE TX. LOOP, DRILL HOLE SURVEY
READING INT. : 20 METRES
NO. OF STACKS: 1024
TRANSMITTER: MEDIUM POWER
RECEIVER: SIROTEM II S/N 1224
CURRENT: 6.7 AMPS
OPERATOR: P MacSKimming

PLOT SPECIFICATIONS
HORIZONTAL SCALE: 1:2000
VERTICAL SCALE: LOGARITHMIC
40V. PER DECADE
LINEAR BETWEEN -1 AND 1
TIME DELAYS IN MILLISECONDS
E - EARLY TIME WINDOW
S - STANDARD TIME WINDOW

PASMINCO
TASMANIA
BURNS PEAK
SIROTEM PROFILE
BPD70 LOOP 19
SCALE: 1:2000

700616
5 cm
SURVEY SPECIFICATIONS

DATA ACQUISITION: WdSKIMMING GEOPHYSICS

SURVEY DATE: NOV. 1990

CONFIGURATION: 200M SQUARE TX, LOOP, DRILL HOLE SURVEY

READING INT.: 20 METRES

NO. OF STACKS: 1024

TRANSMITTER: MEOIUM POWER

RECEIVER: SIROTEM II S/N 1224

CURRENT: 7.3 AMPS

OPERATOR: P Mc5KIWWING

PLOT SPECIFICATIONS

HORIZONTAL SCALE: 1:2000

VERTICAL SCALE: LOGARITHMIC

TIME DELAYS IN MILLISECONDS

E - EARLY TIME WINDOW

S - STANDARD TIME WINDOW

PASMINCO

TASMANIA
BURNS PEAK
SIROTEM PROFILE
BPD70 LOOP 20

SCALE: 1:2000 [Ref. Pet/Mar/03]

Fig. 5b.
Projected Section from (1000.0N, 8000.0E) on Bearing 100.0 Length 900.0

Bums Peak, EL 44/88
DHSM SURVEYS
EM FIELD PATTERNS
BP067/1 & BP067/2

ref: BT/ME91/03

Fig. 7.
Projected Section from (550.0E, 7600.0E) on Bearing 90.0 Length 800.0

Burns PK, E.L. 44/88
DHEM SURVEYS
EM FIELD PATTERNS
BPD 68/1 & BPD 68/2

of: PET/H691/03
Projected Section from (5570.0N, 4500.0E) on Bearing 90.0 Length 750.0

Burns Peak, EL. 44/88
DHEM SURVEYS
EM FIELD PATTERNS
#17 & #18

ref: PET/1691/03

Fig. 9.
Projected Section from (5775.8N, 4650.8E) on Bearing 90.8 Length 720.8

Burns Peak, E.L.44/88
DHEM SURVEYS
EM FIELD PATTERNS
#19 & #20

Fig. 10
Burns Peak, E.L. 44/98
DHM Survey
BPO 69/17 Residual Response
strike length: 100 m
Dip length: 50 m
Strike: 200° S
Dip: 75° East

Model Program: Multiloop

Burns Peak, E.L. 44/88
DHEM Survey
Model Response: BPD 69

Ref: PET/MG91/03

Fig. 12
FIG. 13c.

QUE RIVER MINES
TASMANIA
QUE RIVER
SIROMEN PROFILE
LINE OR 1060A LOOP 7

SURVEY SPECIFICATIONS

DATE
ACQ. FREQ.
CONF. SYSTEM
DEPTH RANGE
NO. OF STACKS
TRANSMITTER GR.
RECEIVER MODE
CURRENT
POWER

PLOT SPECIFICATIONS

HORIZONTAL SCALE
VERTICAL SCALE

5 cm

SCALE - 1:1000
DIS 3C

REF. R277/169/03
ADDENDUM TO

REPORT ON DHEM SURVEYS, BURNS PEAK (E.L. 44/88),

DDH’S BPD67-70

for

Pasminco Exploration

by

Dr J.R. Bishop

INTRODUCTION

Suspect results were recorded during the DHEM survey of BP067 in November, 1990 and resurveying was recommended. The results of the repeat work are given here as an addendum to the original report.

SURVEY DETAILS

The work was carried out in March 1991, again by McSkimming Geophysics using a Mk 2 Sirotem. Similar specifications to the original work were applied, except that only standard times were recorded. The results for loops 67/1 and 67/2 are given in Figures 1 and 2 respectively.

INTERPRETATION

There is no indication in the loop 67/1 repeat data of the persistent response recorded at 60m in the original survey, which was the prime reason for the repeat work. The loop 67/2 repeat data is similar to the original, but does not show the (unexpected) increase in amplitude with depth which can be seen in the earlier work. One can speculate that the results of the earlier survey of BP067 were caused by equipment malfunction, although this section was apparently repeated at the time by McSkimming.

BP067 was sited to search for massive sulphides beneath the Chester pyrite deposit and it was expected that such a significant amount of sulphide would give a DHEM response. Given the apparent lack of a response, it was decided to carry out some modelling to determine what sort of anomaly might be expected. The modelling has simulated EM37 data operating at 25Hz and channels 6 to 20 of the EM37 cover approximately the same time span as channels 1 to 11 of Sirotem. The EM37 unit of $\text{inv} / \text{a-m}^2$ is equivalent to $10 \mu \text{V} / \text{a}$ in the Sirotem data.

The modelling assumed a 150m x 150m plate dipping shallowly to the west with the relatively low conductance of 10 $\text{S}$. Figure 3 shows a plan view of the model conductor with respect to the drill hole and transmitter loops. Strong responses were obtained from both loops (Figures 4 and 5). Although these decay quite rapidly, they are still recognisable in the later time data (channel 6 has been emphasised in the Figures).

Thus the modelling has shown that if Chester were conductive, a recognisable response would have been obtained from BP067. These results reinforce those from an earlier UTEM survey, which also failed to record any responses.

J.R. Bishop
LIST OF FIGURES

Figure 1. BPD67 DHEM profile, loop 67/1.

Figure 2. BPD67 DHEM profile, loop 67/2.

Figure 3. Chester DHEM modelling, plan view.

Figure 4. Chester modelling, loop 67/1 results.

Figure 5. Chester modelling, loop 67/2 results.
**SURVEY SPECIFICATIONS**

**DATA ACQUS'N :** McSKIMMING GEOPHYSICS

**SURVEY DATE :** MARCH 1991

**CONFIGURATION :** SODW SQUARE TX, LOOP, DRILL HOLE SURVEY

**READING INT. :** 10 METRES

**NO. OF STACKS :** 1024

**TRANSMITTER :** MEDIUM POWER

**RECEIVER :** SIROTEM II S/N 1224

**CURRENT :** 5.9 AMPS

**OPERATOR :** P McSKIMMING

**PLOT SPECIFICATIONS**

**HORIZONTAL SCALE :** 1:2000

**VERTICAL SCALE :** LOGARITHMIC

**TIME DELAYS IN MILLISECONDS**

- E - EARLY TIME WINDOW
- S - STANDARD TIME WINDOW

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**PASMINCO**

**ROSEBERY**

**BURNS PEAK**

**SIROTEM PROFILE**

**LINE BPD 67 LP1**

**SCALE :** 1:2000

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**BPD 67**

**LP1 bdrj 67/1**

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**Fig 1.**
**SURVEY SPECIFICATIONS**

DATA ACQUISITION: McSKIMMING GEOPHYSICS

SURVEY DATE: MARCH 1991
CONFIGURATION: 500m SQUARE TX. LOOP, DRILL HOLE SURVEY
READING INT.: 10 METRES
NO. OF STACKS: 1024
TRANSMITTER: MEDIUM POWER
RECEIVER: SIROTEM II S/N 1224
CURRENT: 6.0 AMPS
OPERATOR: P McSKIMMING

**PLOT SPECIFICATIONS**

HORIZONTAL SCALE: 1:2000
VERTICAL SCALE: LOGARITHMIC

TIME DELAYS IN MILLISECONDS
E - EARLY TIME WINDOW
S - STANDARD TIME WINDOW

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**PASMINCO**

ROSEBERY
BURNS PEAK
SIROTEM PROFILE
LINE BPD 67 LP2
SCALE: 1:2000

Fig 2
BURKE PENG OiHEN
BPK 67

DIP 25.00
STRIKE 40.00
LENGTH 150.00
DIP LENGTH 150.00
CONDUCTANCE 10.00
POSITION NORD. ENS. BUD.

CENTRE OF TOP COIIE

BP067 OHEM
CHESTER MODELLING

REGISTERED USER
MITRE GEOPHYSICS

MultiLoop

Fig. 5