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BILLITON AUSTRALIA
C.R.A. EXPLORATION PTY. LTD.

LOONGANA E.L. 36/79

Report on Exploration for the 12 Month Period Ending
1st May 1989

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SUMMARY

Exploration carried out within EL 36/79 has focused on the Two Hummocks, Cattley North and Native Track Tier prospects.

TEM surveying has been completed at Two Hummocks and has identified two weak responses that require further definition. Mapping and auger sampling verified the strong alteration in the area and the prospective nature of the sequence.

Auger sampling along strike from previous soil anomalies at Cattley North resulted in scattered base metal anomalies but it is not considered that additional work is warranted. Surface sampling of the Pb-Au anomalous quartz porphyry should be carried out to identify the extent of anomalism.

At Native Track Tier, reconnaissance mapping has identified a strongly altered sequence of epiclastics and lavas which is currently being gridded. Detailed mapping and deep EM surveying will be carried out.

1.0 INTRODUCTION

This report details exploration carried out within EL 36/79 by Billiton Australia for the 12 month period ending 1st May 1989.

The tenement is the subject of a joint venture with CRA Exploration who until 8th May 1988 was elected manager. By mutual agreement, Billiton Australia resumed managerial control on 9th May 1988.

2.0 LOCATION & ACCESS

The tenement is situated 35kms south of Burnie and 15kms ESE of St. Valentines Peak (Fig. 1). Access is via APPM formed roads and logging tracks that transect much of the country. (Fig. 2).

3.0 LAND TENURE

EL 36/79 of 277 km² was granted to The Shell Company of Australia Limited on the 1st May 1980 for a period of 10 years, renewable every 12 months. In accordance with Section 15C(7) of the Mining Act, the licence was reduced to 124km² on 1st May 1985. At this time, partial relinquishment resulted in the tenement being broken into three parts (see Fig. 2).

viz	Part I	66km²	Native Track Tier
	Part II	21km²	High Tor
	Part III	37km²	Two Hummocks - Cattley North

The tenement currently comprises these same parts and prospect names and will be in its final year of renewal after 1st May 1989. Expenditure requirements for this term will be $62,000.

Land ownership is divided between the Crown, APPM and private interests and a State Forest Reserve covers the Native Track area. Figure 2 shows the distribution of land ownership.

4.0 REGIONAL GEOLOGICAL SETTING

The licence is situated at the northern end of the Dundas Trough and western end of the Fossey Mountain Trough and is outside the main belt of Mt. Read Volcanics (see Fig. 3). The Que-Hellyer Complex is located 27kms to the southwest while the Cethana alteration zone is 23 kms to the east-south-east.

Regional strike changes from 030°AMG in the Cattley North area to 110°AMG at Native Track Tier reflecting the transition between the two major troughs. Indeed it is evident from a regional compilation that the Mt. Read Volcanic Arc is continuous during this strike change and that a later deformation may be at least in part responsible for the change in trend.

In terms of paleo environment, it seems likely that the licence area covers Cambrian stratigraphy that is dominantly volcaniclastic and sedimentary, not proximal volcanic as seen in the main arc (Queenstown - Que/Hellyer). Rocks seen consistently in the region are coarse epiclastics (debris flows), fine vitric ash, turbiditic sandstone - siltstone and minor shallow intrusives or lavas. The paleo-environment is therefore interpreted to be high energy, deep water and distal from any major volcanic edifice.

Alteration is widespread throughout the licence and characterised by sericite-chlorite-carbonate-(pyrite) in variable proportions. However, field observations, petrological evidence and oxygen isotopic data from a neighbouring licence suggests that this alteration is regional in nature and more typical of a low temperature hydrothermal system, perhaps even due to burial metamorphism. The intense sericite-carbonate-silica-pyrite alteration characterisically observed around known VMS deposits has not been noted to date. The best developed alteration examples within the licence occur at Two Hummocks (AMG 414000N 401000E) and at Native Track Tier (AMG 421000N 410000E). Both areas display different styles of alteration but are nevertheless characteristic in a regional sense.

Post-Cambrian cover obscures 50-60% of the licence area making correlation between prospects extremely difficult. A generalized distribution of stratigraphy can be summarized as follows:

Two Hummocks-Cattley North : 70% Tertiary basalts
10% Ordovician conglomerates, sandstones.
20% Cambrian volcaniclastics, lavas

High Tor : 90% Ordovician conglomerate
10% Cambrian volcaniclastics

Native Track Tier : 50% Ordovician quartzites, conglomerates
50% Cambrian volcaniclastics, sediments, lavas.

Thickness of cover is probably quite variable and although variations in the Ordovician have not been measured, electrical soundings over Tertiary basalt covered areas have indicated depths of up to 330 metres south of Two Hummocks.

5.0 PREVIOUS WORK

CRAE commenced exploration within the licence during 1985 and in the first year carried out a regional stream sediment survey that highlighted previously known prospects of Shell - Geopeko (viz Challenger I, II, III). At Two Hummocks, two percussion holes (PD TH1,2) tested weak UTEM anomalies from a previous Shell UTEM survey, but failed to intersect any significant mineralization. At Native Track Tier, two lines of

Genie EM were run across a Pb-Zn in soil anomaly identified previously by Shell. No significant anomaly was detected.

During 1986-87, work was carried out almost entirely within the Cattley North prospect. A total of 51 kms gridding was completed, together with geological mapping, rock chip sampling and UTEM surveying (6 loops). Lithologically the sequence is dominated by fine to coarse epiclastics, shales, acid intrusives and one large basic intrusive. Anomalous base metal values were recorded from several shale horizons and a quartz vein stockwork quartz feldspar porphyry contains anomalous gold (0.21ppm). Numerous UTEM anomalies were recorded but most were interpreted to be contact related.

Exploration during 1987-88 again focused on the Cattley North prospect. Additional mapping was carried out together with rock chip sampling to re-interpret the local setting. One drill hole (DD87 CN1) tested a weak UTEM and soil geochemical anomaly but did not intersect significant mineralization. Auger sampling was carried out over the south-western portion of the grid and resulted in delineation of several low order Pb-Zn anomalies. Additional stream sediment sampling was also completed in an area where regional evidence suggested the continuation of the Henty Fault.

6.0 EXPLORATION COMPLETED

Exploration has been carried out at the Two Hummocks, Cattley North and Native Track Tier prospects and this work is summarized below:

Two Hummocks

Depth soundings were carried out using Sirotem 100m² fixed loops (6 loops in total) over Tertiary basalt areas to determine the depth of cover. This work was primarily carried out to determine those areas of shallow cover (<100m) between Two Hummocks and Cattley North.

Detailed geological mapping was completed over the main grid area (9600E-10400E) and eight petrological samples were collected. In addition, a total of 201 C-horizon auger samples were collected and samples despatched for assay (Cu Pb Zn Ag As Ba Au). Compilation maps have also been prepared.

More recently, the original grid has been extended to the NW and SE by an additional 24 line kms. A total area of approximately 8km² is now gridded. A TEM survey has also now been completed over this new grid by a total of 17.8 line kms.

Cattley North

Previous work by CRAE had identified a zone of soil geochemical anomalism that had not been closed off. Additional auger sampling (83 samples) was carried out and samples assayed for Cu Pb Zn Ag As Ba Au. Other work included a geological compilation of exploration completed and preparation of 1:5000 scale topographic base plans.

Native Track Tier

Reconnaissance geological mapping has been carried out and selective rock chip sampling completed (22 samples). This work enabled definition of the most prospective area which is now being gridded (37 line kms), in preparation for detailed mapping and geophysical surveying.

7.0 LOCAL GEOLOGY

7.1 Two Hummocks

Detailed mapping and good exposure in two quarries has enabled a reasonable interpretation of the local setting (see Figs. 4,5).

The sequence mapped occupies a small window of Cambrian surrounded by both Ordovician and Tertiary cover and consists of, from top to base:

TOP	>50m	LAVA	Felsic, probably dacitic.
	30m	SEDIMENT	Fine laminated siltstone, graphitic at base.
	80m	VOLCANICLASTIC	Fine grained strongly sericitized felsic ?ash fall.
	90m	EPICLASTIC	Medium grained dacitic with pebble sized clasts of acid lava. Strongly sericitized and chloritized.
	100m	VOLCANICLASTIC	Fine grained felsic, sericitic with poorly defined rhyolitic ?lavas or chalcedonic ash falls.
	20m	SEDIMENT	Irregularly distributed, lensoidal grey laminated siltstone.
	>100m	LAVA	Quartz phyric rhyodacitic, carbon-
	BASE		ated.

The strength of alteration present is most encouraging and in addition, several occurrences of vein barite are known. There is virtually no exposure left currently except for minor float but old reports vaguely suggest that a stockwork is developed near the contact of rhyodacitic lava and sediment.

Samples that have been submitted for petrological description (Appendix 1) are consistent with field observations and indicate that the volcaniclastics above the rhyodacitic lavas are water lain vitric tuffs and coarse reworked epiclastics. The intense sericite and carbonate alteration is also accompanied by possible fuchsitic alteration.

Bedding measurements from laminated shales and vitric ash beds indicate a consistent strike (300-320° Mag) and dip to the east (55-80°).

7.2 Cattley North

A compilation of previous CRAE mapping (Fig. 6) indicates the presence of a more distal sequence than at Two Hummocks. Dacitic volcaniclastics dominate with lesser but numerous discontinuous laminated siltstones and minor rhyodacitic lavas. Strikes of bedding are variable but predominantly in the range 010-030° AMG with easterly dips. However, cross folding and faulting has complicated the stratigraphy, leading to a tentative interpretation only. In the extreme south-west of the grid massive dirty micaceous sandstones crop out in the Leven River. These lithotypes can be seen further south on an adjoining Billiton tenement and show consistent flat dips. It is interpreted that there is a major fault through this area separating the western greywacke sequence from the eastern volcaniclastics and shales.

In the central northern portion of the grid, CRAE have mapped a basic-intermediate intrusive termed epidiorite. Confusion still exists as to the origin of this unit as either a Tertiary dioritic feeder or Cambrian intrusive.

7.3 Native Track Tier

Reconnaissance mapping and rock chip sampling has been completed in the Native Track Tier area. (Figs. 7,8) The objective of this work was to outline the areas of Cambrian lithologies in relation to younger cover and more specifically to indicate those volcanic lithologies considered more prospective for volcanogenic mineralization. An area of approximately 7.5kms x 6.0kms is suggested from this work as holding potential to host a significant VMS system. Lithologies are dominated by coarse epiclastic debris with lesser confined areas of fine vitroclastic ash and rhyodacitic lavas/intrusives. Strong sericite-carbonate-chlorite alteration is present adjacent to these ?lava outcrops which form an elongate spine trending WNW across the licence. Weak pyrite alteration was also noted but base metal values from selected rock chips (Appendix 2) are disappointingly low. (viz 120ppm Pb, 420ppm Zn). Trace gold (0.14ppm) was detected in one sample close to the Ordovician-Cambrian contact.

Few bedding measurements were taken but where observed, generally gave a strike of 100-110° Mag and dip 40-75° NE.

Quite noticeable flow banding was observed in the rhyodacitic lavas and rocks are moderately magnetic. Ground magnetic surveys will be useful to define the extent of these lavas.

Post Cambrian cover is evident in almost 50% of the licence and although mapping has not been completed, regional interpretation has allowed an approximate distribution of rock sequences to be mapped.

7.4 High Tor

Geological mapping has not been carried out in this area but examination of the Mines Dept. 1:25000 sheet 8 indicates a predominant Ordovician cover with small scree covered windows of Cambrian volcaniclastics and minor lavas. An extensive volcaniclastic conglomerate (?Dora Conglomerate) has also been mapped.

8.0 EXPLORATION RESULTS

8.1 Two Hummocks

Sirotem Sounding

Six Sirotem soundings were carried out by McSkimming Geophysics in April 1988 over the basalt covered area between Two Hummocks and Cattley North (both having exposed Cambrian volcanics). For each sounding a transmitter loop of 200x200m was used with a remote-vector-receiver (RVR) in the centre. As a check on lateral conductivity inhomogeneties readings were taken 10m on either side of the central position. Standard Sirotem channel times were used, with stacks of 2048 and ramp time of 280u sec.

The voltages were inverted to depth/resistivity sections by using the CSIRO/AMIRA program GRENDL, and the results are appended. Three and two layer cases were assumed, but in general the two layer situation gives a better fit between observed and calculated values. Fits in general are not very good, implying a possible considerable error in the final depths.

Qualitatively however the soundings clearly indicate those areas where the basalt is thickest and most conductive, and thus where problems will arise in the interpretation of any future TEM surveys.

Figure 9 shows the locations of the soundings, and an approx-imate outline of "thick" basalt is indicated. The latter has been taken from the sounding results and the aeromag-netics.

The only ground-truth as to the interpretation is the Mines Department drill hole near to TSM-1, which confirmed 140 metres of basalt. The interpreted depth of basalt at each sounding is shown in Table 1.

In general the basalt thickness between Two Hummocks and Cattley North does not preclude the possibility of covering the area with a TEM survey although interpretational problems will definitely arise. As a consequence it is

SIROTEM SOUNDINGS - LOONGANA 4/88
200 x 200m Tx LOOP, RVR, ST. TIMES

SOUNDING NO	2 LAYERS + BASEMENT	APRE	ST. ERROR	1 LAYER + BASEMENT	APRE	ST. ERROR
TSL1	0 1,125 Ωm — 36m 17 — 58m 31,000	28% (Ch 6-22)	22%	0 56 Ωm — 76m 40,000	14% (Ch 7-19)	11%
TSL2	0 1,197 — 41m 30 — 82m 23,500	19% (Ch 6-23)	18%	0 80 — 115m 32,580	19% (Ch 6-23)	20%
TSL3	0 1,154 — 27m 15 — 47m 17,000	84%	50%	0 45 — 60m 23,800	62%	48%
TSL4	0 37 — 4m 7 — 9m 12,850	220% (Ch 7-15)	50%	0 17 — 15m 15,240	63% (Ch 8-15)	53%
TSL6	0 65,850 — 26m 2 — 2m 17,470	95% (Ch 6-21)	70%	0 19 — 27m 17,000	22% (Ch 7-19)	18%
TSL7	0 1,208 — 49m 6 — 62m 7,129	62% (Ch 6-22)	48%	0 42 — 102m 11,480	27% (Ch 7-21)	24%

quite possible that a few possible drill-targets may emerge and that BAUS must be prepared to test them through at least 50 metres of basalt.

Auger Soil Sampling

A total of 201 C-horizon soil samples were collected by contractor J. Baker over the original Shell grid. Coverage was as follows:

9600E 9200N - 10600N

9800E 9600N - 10650N

10000E 10000N - 10750N

10200E 10000N - 11000N

10400E 9975N - 10900N

Samples were submitted to Classic Comlabs in Adelaide for analysis of Cu Pb Zn Ag As Ba Au and results are presented in Appendix 3.

A basic statistical evaluation of the data indicated the followed ranges and thresholds.

	Cu	Zn	Ag	Au	Pb	As	Ba
MEAN(x)	11.19	30.85	0.01	0.01	53.84	8.84	271.12
STD DEV(SD)	26.36	29.82	0.10	0.01	54.20	9.54	118.53
X+SD	37.55	60.67	0.11	0.03	108.04	18.38	389.65
X+2SD(Anom.)	63.91	90.49	0.21	0.04	162.23	27.92	508.17
MAX VALUE	330	200	1	0.08	420	90	730
MIN VALUE	1	4	0.005	0.005	1	2	45

A broad (300m) erratic Pb anomaly is present on three lines over a total strike of 600m in an area of buttongrass plains. Lead values peak at 420ppm. Weak scattered anomalous Cu Pb Zn responses are also present further to the west where a rhyodacitic ?lava/intrusive has been mapped. No anomalous Ba values were recorded despite the presence of several barite vein occurrences immediately south of the main quarry.

Geophysical Surveys

A TEM survey of 17.8 line kms was carried out over the window of Cambrian volcanics and sediments in the Two Hummocks area. In 1984 a single loop UTEM survey was done over a sequence containing black shale horizons associated with baritic and weakly anomalous base metal zones. This survey detected only weak conductors due to the shale units and subsequent drill testing did not intersect any mineralization. The recent TEM surveying was designed to test for mineralization in the same sequence but beneath Ordovician and Tertiary cover. The TEM coverage was restricted to those areas with Tertiary basalt cover of less than about 50 metres, this thickness having been predetermined from several TEM depth soundings around the area, as indicated on Figure 9.

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Within the report period, surveying using two fixed transmitter loops was carried out, with the intention to survey a third loop in the following report year. The fixed loops were positioned for optimum EM coupling assuming dips to the north-east.

Zonge Engineering carried out the TEM surveying using a high voltage, high current generator and transmitter plus a Zonge GDP-12 Receiver and Sirotem RVR coil. The vertical component of the secondary magnetic field was measured over 20 channels, at station spacings of 50 metres. On some lines, there appear to be problems with the early channels near the loop. This may be due to the use of a Sirotem coil with the GDP-12 receiver. There also appear to be consistent base level shifts on all channels, but this does not effect the interpretability of the data.

The black shale conductor detected on the 1984 UTEM survey is apparent on the Zonge survey on line 10600E at 10575N as a weak and shallow response appropriate to its source. This horizon does not appear to continue any further east to line 10800E, possibly because it is obscured by overlying Tertiary basalt.

On loop 1 there appears to be a broad crossover at about 12000N on lines 10800E, 11000E and 11200E. This will be investigated in the future using a closer transmitter loop for better EM coupling.

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The mapped black shale unit on 9600E at 10550N is not detectable on 9800E from loop 2, probably because it is a weak conductor obscured by overlying Ordovician conglomerate. There are no bedrock conductors occurring on the profiles from this loop.

8.2 Cattley North

A total of 83 C-horizon soil samples were collected from the following grid locations:

19800N 50025E - 50450E
21200N 50000E - 50775E
21400N 50000E - 50500E
21600N 50000E - 50425E

Samples were despatched to Classic Comlabs for analysis of Cu Pb Zn Ag As Ba Au and results are reported in Appendix 5.

Previous CRAE sampling had identified a zone of anomalous (200-450ppm) lead in soil values on line 21000N. Sampling to the north by Billiton (see Fig. 6) produced scattered anomalous values only (viz <200Pb, <360Zn, <250As) which are probably attributable to remobilization adjacent to the intrusive epidiorite body.

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8.3 Native Track Tier

Gridding is currently being carried out over the prospective lava/epiclastic sequence identified by reconnaissance mapping (see Figs. 7,8,11). Subsequent work will involve grid mapping, data compilation and EM/CSAMT surveying.

9.0 CONCLUSIONS

At the Two Hummocks prospect, basic geological mapping has identified an intensely altered sequence of rhyodacitic lava, epiclastics and shales in which two periods of quiescence are interpreted. These are potential markers and horizons suitable for VMS development and are expressed geochemically as weakly base/metal anomalous units.

TEM surveying along strike and beneath thin post-Cambrian cover indicated two responses that require follow up from a third loop. Both are weak but poor coupling may be responsible for this apparent resolution.

Follow up surface geochemical work at Cattley North has identified a weak broad base metal anomaly within a sequence of black shales and fine volcaniclastics. Only very weak surficial EM responses occur in this area and are most probably attributable to contact effects. The Pb-Au anomalous quartz vein stockworked quartz porphyry has not been evaluated fully although auger sampling along strike did not produce anomalous results.

Initial mapping at Native Track Tier has identified a strongly altered epiclastic sequence surrounding a linear spine of flow banded rhyodacitic lavas. Limited rock chip sampling, however, has not identified anomalous geochemistry to date.

10.0 RECOMMENDATIONS

The new Two Hummocks grid requires detailed mapping despite the notoriously poor exposure in the area. Geologically, the area is very interesting despite the poor surface base metal anomalism and geophysical response. A third TEM loop is recommended to better define the weak responses from loops 1, 2.

Further work at Cattley North is recommended in the vicinity of the stockworked quartz porphyry. Additional surface sampling may identify a consistently anomalous zone along strike from the main outcrop.

The main thrust of work is recommended in the Native Track Tier area. Additional reconnaissance mapping is required as well as a detailed compelation of previous work. Detailed grid mapping should be carried out and auger sampling at specific localities of interest. Deep EM surveying is recommended to search for buried VMS mineralization.

APPENDIX 1

Petrological Report, Two Hummocks

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Geochempet Services

PETROLOGICAL and GEOCHEMICAL CONSULTANTS

REGISTERED IN QUEENSLAND
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MZ02

PETROLOGICAL REPORT ON EIGHT SAMPLES

FROM THE TWO HUMMOCKS AREA, TASMANIA

prepared for

BILLITON AUSTRALIA

Ref : J.P. Randell

Order Code : 11630/MZ02/JPR

Stan Joyce

A. S. Joyce, B.Sc.(Hons), Ph.D.

8th June, 1988.

GENERAL COMMENTS

1. Four of the samples are interpreted to have originated as water-laid, unwelded vitric tuff, composed mainly of platy, moderately delicate vitric shards derived from an acid source. Three of them (14365, 14366 and 14367) contained only a few, small mineral clasts of feldspar, quartz and probably mica. The other sample (14368) carried more and larger clasts of feldspar but was also composed mainly of vitric shards.

   All four samples show intense alteration, resulting in sericite, fine quartz, leucoxene or rutile and generally a distinctly green sericitic mineral which may be fuchsite. The (?)fuchsite has a colour, similar to chlorite, but birefringence and textures similar to sericite. Positive identification as fuchsite (rather than an unusual chlorite or fine biotite) would necessitate microprobe or EDAX assisted electron microscopy.

   Fine fissure veining by quartz is also displayed. In 14367 the veins seem to have carried some pyrite and there was also some disseminated fine pyrite.

2. Sample 14369 is interpreted to display disturbed layers of mudstone and vitroclastic mudstone. Alteration again involves sericite, fine quartz and some quartz fissure veining.

   Sample 14364 seems to be finely sericitic and siliceous mudstone with some quartz fracture veinlets. It lacks recognisably tuffaceous or volcaniclastic characteristics.

3. The two coarsely fragmental samples 14370 and 14371 are regarded as pumice breccia probably deposited near a subaqueous acid eruption or by slumping of water-logged pumice fragments.

   The alteration style is similar to that in the finer vitroclastic samples; namely, intense alteration to sericite, fine quartz, leucoxene, and possible fuchsite. One sample is finely quartz veined.

Sample Number : 14364

Identification : Finely sericitic and siliceous mudstone cut by siliceous fracture veinlets

Description :

The sample is a moderately weathered hand specimen. The freshest part is light greenish grey and moderately soft.

A cobaltinitrite staining test revealed no K-feldspar.

In thin section the sample displays very finely siliceous and sericitic rock cut by irregular siliceous fissure veinlets.

The host rock comprises disseminated coarse silt and fine sand sized clasts (about 0.05 to 0.1mm) of quartz and muscovite or coarse sericite set in a very finely siliceous and sericitic matrix (less than 0.01mm grainsizes).

The veins are about 0.03 to 0.2mm in thickness and carry proportionally fine quartz. Some veins are porous and in parts of the sample limonite has penetrated along fractures and veins.

An approximate mode of the least weathered part of the sample is :

2-3%	sand and coarse silt of quartz
2-3%	muscovite or coarse sericite clasts
45-50%	fine quartz
45-50%	fine sericite
3-4%	quartz veins
0.3-0.5%	leucoxene

Comments and Interpretations :

This is quite a fine-grained rock which seems to represent very finely siliceous and sericitic mudstone. There are no recognisable tuffaceous or volcaniclastic features.

The rock is cut by an irregular network of very fine quartz fissure veins. Perhaps it has been silicified to some extent.

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656029

Sample Number : 14365

Identification : Possibly fuchsitic, intensely sericitized, water-laid vitric tuff

Description :

The sample is a lightly weathered hand specimen of moderately soft, greenish grey rock with finely fragmental textures.

A cobaltinitrite staining test revealed no K-feldspar.

In thin section the sample displays intense finely sericitic alteration but there are obvious remnant textures of unwelded vitroclastic style. The vitric shards were moderately aligned but undeformed and they had fairly delicate platy and cuspate shapes, about 0.1 to 0.5mm long. Some of the shards have been pseudomorphed by aggregates of fine quartz, but most have altered to fine sericite or sericite plus quartz, along with a dusting of leucoxene.

There are only a few, small mineral clasts (mainly 0.1 to 0.2mm). Some are quartz, a few were probably feldspar (now completely sericitized) and a few were ilmenite or titaniferous magnetite (now leucoxene). There are other more abundant clasts (0.3 to 1mm long) with textures suggestive of biotite or possibly stringy pumice : they have been pseudomorphed by distinctly green sericite (possibly fuchsite) and leucoxene.

An approximate mode is :

60-70%	sericite, developed from vitric shards
30-40%	quartz, developed from vitric shards
0.5-1%	leucoxene, developed from vitric shards
0.1%	quartz clasts
0.1%	sericite pseudomorphs of feldspar clasts
0.1%	leucoxenized oxide clasts
2-3%	(?)fuchsite pseudomorphs of mica or pumice clasts

Comments and Interpretations :

This rock clearly originated as an unwelded accumulation of vitric shards. The shards are aligned, but there is no deformation which might be attributed to welding, no laminations which might be expected in airfall tuff, and no bombs or phenoclasts which might be expected in a directly tuffaceous accumulation. Thus the vitric tuff is interpreted to have been deposited after aqueous sorting and transport.

The rock has been altered to fine sericite, fine quartz (no more than might be expected to form by devitrification of acid glass), leucoxene, and several percent of a sericitic green mica which may be fuchsite.

Sample Number : 14366

Identification : Intensely silicified and sericitized, water-laid vitric tuff, cut by vuggy quartz veins

Description :

The sample is a virtually unweathered hand specimen of very hard, light greenish grey rock with subtle finely fragmental textures and some thin siliceous veins.

A staining test revealed no K-feldspar.

In thin section the sample displays remnant textures of unwelded vitroclastic style. Shards were about 0.1 to 0.5mm long and of platy, moderately delicate shape. Some have been highlighted by sericitic alteration, but more have been replaced by "cherty" fine quartz. Dustings of fine rutile are also prominent.

There are rare, angular clasts of quartz (about 0.2mm) and a few angular to tabular, sericitic pseudomorphs of inferred feldspar. Clasts of probable biotite have been pseudomorphed generally by fine, colourless sericite, quartz and rutile; there are a few mica pseudomorphs which display a pale green sericite, possibly fuchsitic.

A crudely parallel set of fissure veins (0.1 to 1mm wide) contains quartz and some irregular, small weathering pores.

An approximate mode is :

65-70%	fine quartz, replacing vitric shards
25-30%	sericite, replacing vitric shards
0.5-1%	fine rutile
0.2-0.3%	sericite pseudomorphs of feldspar clasts
rare	quartz clasts
0.2-0.3%	sericitic and siliceous, rarely (?)fuchsitic pseudomorphs of mica clasts
3-4%	quartz veins

Comments and Interpretations :

The primary textures of this sample are similar to those of Sample 14365 and it is interpreted to have originated as water-laid, unwelded vitric tuff.

There has been pervasive fine silicification (more silica than would be expected from devitrification) and sericitization. There is also a subparallel set of quartz fissure veins with some irregular small pores (probably residual vugs). There are rare examples of a green sericitic mineral, which may be fuchsite, apparently replacing mica clasts.

Sample Number : 14367

Identification : Intensely silicified and sericitized, water-laid vitric tuff, cut by several quartz veins with contained and nearby disseminated hematite after pyrite

Description :

The sample is a slightly weathered but very hard specimen of light olive grey, fine-grained rock.

A staining test revealed no K-feldspar.

In thin section the sample displays remnant textures of vitroclastic style. Shards were about 0.1 to 0.5mm long, of moderately delicate, platy shape, and moderately aligned. Some have been highlighted by sericite alteration, but most have altered to "cherty" fine quartz and less abundant sericite. Rutile occurs as small grains and simple aggregates.

There are rare, angular clasts of quartz (0.1 to 0.3mm) and some sericite pseudomorphs of probable feldspar clasts of similar size. Clasts of probable biotite have been pseudomorphed by sericite which is slightly iron-stained.

A finely quartzose fissure vein (less than 0.5mm wide) carries hematitic pores. Nearby there are disseminated hematitic cubes and related shapes after inferred pyrite about 0.05 to 0.2mm in size. Similar cubes are more sparsely disseminated elsewhere. Another quartz vein is more finely siliceous and free of pores and hematite.

An approximate mode is :

60-70%	quartz, replacing vitric shards
30-35%	sericite, replacing vitric shards
0.1-0.2%	fine rutile
0.2-0.3%	sericite pseudomorphs of feldspar clasts
rare	quartz clasts
1-2%	sericitic pseudomorphs of mica clasts
0.5-1%	quartz veins
0.1%	hematite pseudomorphs of disseminated pyrite

Comments and Interpretations :

This rock is similar in remnant textures and in alteration style to Sample 14366. It is regarded as intensely silicified and sericitized, water-laid vitric tuff.

It differs in carrying less rutile, having hematitic pseudomorphs after traces of fine pyrite mainly in and near fine quartz veins, and in having pervasive slight pigmentation attributable to incipient weathering.

31

Sample Number : 14368

Identification : Possibly fuchsitic, intensely sericitized water-laid vitric tuff with veins of sericite and fine quartz

Description :

The sample is a lightly weathered hand specimen of greenish grey, moderately hard rock with finely fragmental textures.

A staining test revealed no K-feldspar.

In thin section the sample is seen to be finely sericitized, but its obvious remnant primary textures involve angular mineral clasts (about 0.1 to 0.7mm) scattered through a matrix of aligned but unwelded former vitric shards with moderately delicate cuspate and platy shapes (about 0.1 to 0.5mm long).

The largest mineral clasts have shapes consistent with feldspar, but they are now completely sericitized. Quartz clasts are less abundant and generally smaller. Slim plates of probable mica have been replaced in most cases by colourless sericite and leucoxene, but a few have been replaced by a green sericitic mineral (possibly fuchsite). Some vitric shards have been selectively sericitized, but most have altered to a mixture of sericite, fine quartz and leucoxene.

An iron-stained, cracked vein about 2mm wide contains mainly fine sericite, but some cherty, fine quartz is developed along one edge. Other thinner veins are variously domianted by sericite or fine quartz.

An approximate mode is :

60-65%	sericite, developed from vitric shards
30-35%	quartz, developed from vitric shards
0.5-1%	leucoxene
2-3%	sericite pseudomorphs of feldspar clasts
0.1-0.2%	quartz clasts
0.3-0.5%	sericitic and less commonly (?)fuchsitic pseudomorphs of mica clasts
1-2%	veins of sericite and fine quartz

Comments and Interpretations :

This rock is interpreted to have formed as water-laid, unwelded vitric tuff, similar to Samples 14365, 14366 and 14367, but carrying more clasts of feldspar.

The rock has been pervasively sericitized, but the amount of fine quartz developed is no more than might be expected to form during devitrification of acid glass. Thus, its alteration assemblage is more similar to 14365 than to the siliceous samples 14366 and 14367. Similarly, it displays a small amount of possible fuchsite after mica. Thin fissure veins carry sericite and fine quartz.

32

Sample Number : 14369

Identification : Disturbed layers of finely silicified and sericitized mudstone and vitroclastic tuffaceous mudstone

Description :

The sample is a lightly weathered hand specimen of very hard, light greenish grey, fine-grained rock. Sawn surfaces reveal disturbed, subtle layering (thickness of about 5 to 15mm).

A staining test revealed no K-feldspar.

In thin section the sample is confirmed to have disturbed layering. The thickest layers display sericitic pseudomorphs of randomly orientated vitric shards and pumice fragments (0.05 to 1.5mm) dispersed abundantly through a very finely siliceous and sericitic matrix; there are a few clasts of quartz (0.05 to 0.2mm).

The intervening and generally thinner layers display very fine quartz, sericite and leucoxene; it is indistinguishable from the matrix of the tuffaceous layers. The sericite has a mild tectonic alignment acute to the bedding.

There are a few goethite cubes after inferred pyrite (about 0.01 to 0.1mm), mainly within sericitized vitric clasts.

Thin fissure veins (less than 0.05mm) cut the rock with diverse orientations. They carry fine quartz; the thickest carries some ferruginous pores after fine pyrite.

An approximate mode of the tuffaceous layers is :

35-45%	sericite pseudomorphs of vitric shards and pumice
0.1%	quartz clasts
55-65%	muddy matrix
tr	oxidized pyrite

The muddy layers and the muddy matrix consist of about :

55-65%	quartz
35-45%	sericite
0.3-0.5%	leucoxene

The siliceous veins amount to about 1%.

Comments and Interpretations :

This rock is interpreted to have originated as mudstone with layers alternately barren and enriched in vitroclastic, tuffaceous material. The textures are consistent with the tuffaceous material being periodically flushed into a muddy setting : the textures do not seem consistent with terrestrial airfall deposition.

The vitroclastic components have been finely sericitized and slightly impregnated with fine pyrite. The hard, muddy component seems to have been finely silicified : this interpretation is supported by the recognition of some very fine veining by silica.

Bedding laminations have been disturbed probably by incipient tectonic foliation.

Sample Number : 14370

Identification : Possibly fuchsitic and intensely sericitized pumice breccia

Description :

The sample is a lightly weathered hand speicmen displaying densely packed, poorly sorted cvlasts of mainly pumiceous style. Some pumiceous clasts are ragged and dark greenish grey; other clasts are light greenish grey and yellowish grey and there are some olive grey altered phenocrysts of former feldspar.

A staining test revealed no K-feldspar.

In thin section the sample displays densely packed, poorly sorted clasts of pumiceous style and with equant to ovoid but irregular shapes. The clasts are about 1 to 15mm in size.

The pumiceous clasts are commonly richly sericitic but also carry fine quartz and some leucoxene; internal structures are filamentous and there are commonly sericite pseudomorphs of tabular feldspar phenocrysts about 1 to 2mm in size. Some of the most elongate and internally filamentous clasts have been replaced by a distinctly green sericitic mineral which may be fuchsite; such clasts also carry sericitized phenocrysts (colourless in section, olive grey in hand specimen). There are rare phenocrysts of quartz (up to 0.5mm). There do not seem to be any phenoclasts. There are a few equant clasts of siliceous mildly sericitic, unwelded vitric tuff.

An approximate mineralogical mode is :

55-65%	sericite
25-35%	quartz
8-10%	(?)fuchsite
2-3%	leucoxene

An approximate "textural mode" is :

75-80%	sericitic and siliceous pumice
8-10%	(?)fuchsitic pumice
10-12%	completely sericitized feldspar phenocrysts
2-3%	siliceous vitric tuff
rare	quartz phenocrysts

Comments and Interpretations :

This rock is interpreted to be a pumice breccia. Its textures are not suggestive of a terrestrial pumice lava flow, nor of a tuff. They show some sorting and dense packing suggestive of epiclastic or at least subaqueous processes. Perhaps the rock has been produced near a subaqueous pumice eruption or by subaqueous slumping of water-logged pumiceous debris.

Alteration involved intense sericitization, production of fine silica and leucoxene (both in abundances which need not imply metasomatic additions), and a distinctly green sericitic mineral which may be fuchsite.

Sample Number : 14371

Identification : Possibly fuchsitic and intensely sericitized pumice breccia

Description :

The sample is a bag of crumbling, weathered rock with poorly sorted, coarsely fragmental, immature textures. There are dark greenish grey clasts of pumiceous style and much light greenish grey material.

A cobaltinitrite staining test revealed that fine K-feldspar is a variable, but in some cases substantial component of the clasts.

In thin section the sample displays densely packed, poorly sorted clasts of pumiceous style. The clasts are equant to ovoid but irregular in detail; sizes are commonly 1 to 10mm.

The most common clasts consist of sericite, very fine quartz and K-feldspar and leucoxene and have sericite pseudomorphs of tabular phenocrysts of inferred feldspar; there are remnants of filamentous to less regular pumiceous structures. Quartz phenocrysts are rare. Less common clasts with quite filamentous remnant textures consist of a distinctly green sericitic mineral (possibly fuchsite) and some leucoxene. A few clasts which are relatively rich in fine silica have remnant textures consistent with unwelded vitric tuff.

There are some thin fissure veins (less than 0.3mm) of quartz.

An approximate mineralogical mode is :

50-60%	sericite
30-35%	quartz
5-7%	fine K-feldspar
5-7%	(?)fuchsite
2-3%	leucoxene

An approximate "textural mode" is :

80-85%	sericitic and siliceous pumice
5-7%	(?)fuchsitic pumice
10-12%	completely sericitized feldspar phenocrysts
1-2%	siliceous vitric tuff
rare	quartz phenocrysts
0.5-0.7%	quartz veins

Comments and Interpretations :

This rock is more weathered, but essentially similar to Sample 14370. It is considered to be a pumice breccia and it may have formed near a subaqueous eruption or by slumping of water-logged pumice.

The alteration assemblage is sericite-quartz-K-feldspar-leucoxene and there is some fine fissure veining by quartz.

APPENDIX 2

Rock Chip Assays, Native Track Tier

656037

CLASSIC COMLABS LTD

Analytical Laboratories (INC IN W.A.)

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File M202 845

Mr. Jeff Randell
Billiton Australia Ltd
30 Mersey Main Rd
Spreyton
DEVONPORT
TAS 7310 Australia

JOB NUMBER: 8AD3314

Your Reference: 11641/M202/JPR

Date Received: 14-OCT-1988 Turnaround 6 days
Date Relayed: 20-OCT-1988
Date Reported: 20-OCT-1988

Number of Samples: 22

Report Analyte Codes
N.A. - Not Analysed.
L.N.R. - Listed But Not Received.
I.S. - Insufficent Sample for Analysis.

Report Comprising: Cover Sheet
Pages 1 to 2

Comments:

Report Dist'n: Carbon Copies(CC),Electronic Media(EM),Magnetic Media(MM)

Type	Recipient	Location	Date	Copies

Approved Signature:

for Harry Fishman

Harry Fishman
Managing Director.
CLASSIC COMLABS LTD
(Please address any enquiries to Mr. Trevor Francis)

This report relates specifically to the sample(s) tested in so far as that the sample(s) is truly representative of the sample source as supplied.

CLASSIC COMLABS LTD
Analytical Laboratories (INC. IN WA)

37

Job: 8AD3314
O/N: 11641/M202/JPR

ANALYTICAL REPORT

SAMPLE	Pb	As	Ba	Sn	W
16044	12	3	810	12	<10
16045	<2	11	1200	6	15
16046	16	9	530	4	<10
16047	10	11	510	10	15
16048	54	10	700	6	<10
16049	10	12	750	<4	<10
16050	10	11	1100	<4	15
16051	6	12	1000	<4	<10
16052	6	10	1540	<4	<10
16053	19	13	570	4	<10
16054	88	8	900	4	10
16055	15	13	790	<4	<10
16056	16	12	400	<4	20
16057	<2	9	630	<4	<10
16058	10	4	640	<4	20
16059	9	9	600	<4	<10
16060	17	4	310	4	15
16061	90	22	290	4	<10
16062	60	11	240	6	20
16063	120	13	280	4	20
16064	76	13	660	<4	<10
16065	98	13	230	6	<10
UNITS	ppm	ppm	ppm	ppm	ppm
SCHEME	XRF1	XRF1	XRF1	XRF1	XRF1

38

Job: 8AD3314
O/N: 11641/M202/JPR

ANALYTICAL REPORT

SAMPLE	Au Avg	Au Dp1	Au Dp2	Au Dp3	Cu	Zn	Ag
16044	<0.01	--	--	--	20	300	<1
16045	<0.01	--	--	--	10	160	<1
16046	<0.01	--	--	--	14	54	<1
16047	<0.01	--	--	--	17	78	<1
16048	0.01	--	--	--	10	50	<1
16049	<0.01	--	--	--	24	62	<1
16050	<0.01	--	--	--	12	300	<1
16051	0.01	--	--	--	12	300	<1
16052	<0.01	--	--	--	13	310	<1
16053	<0.01	--	--	--	16	350	<1
16054	0.03	0.05	0.01	--	11	130	<1
16055	0.01	--	--	--	46	125	<1
16056	<0.01	--	--	--	11	115	<1
16057	<0.01	--	--	--	11	230	<1
16058	0.01	--	--	--	8	155	<1
16059	0.01	--	--	--	82	115	<1
16060	<0.01	--	--	--	15	180	<1
16061	<0.01	--	--	--	16	120	<1
16062	0.03	0.03	0.03	--	13	380	<1
16063	<0.01	--	--	--	13	46	<1
16064	0.14	0.07	0.13	0.22	36	420	<1
16065	<0.01	--	--	--	1240	260	2
UNITS	ppm	ppm	ppm	ppm	ppm	ppm	ppm
SCHEME	FA1	FA1	FA1	FA1	AAS1	AAS1	AAS2

APPENDIX 3

Auger Sample Results, Two Hummocks

CLASSIC COMLABS LTD
Analytical Laboratories (INC. IN W.A.)

305 South Road, Mile End South, South Australia, 5031
Telephone: (08) 43 5722 Fax: (08) 234 0321 Telex: LABCOM AA89323

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656041

Mr. Jeff Randell
Billiton Australia Ltd
30 Mersey Main Road
Spreyton
Devonport
TAS 7310 Australia

JOB NUMBER: 8AD3650

Your Reference: 11644/MZ02/JPR

Date Received: 16-NOV-1988 Turnaround 16 days
Date Relayed: 2-DEC-1988
Date Reported: 2-DEC-1988

Number of Samples: 201

Report Analyte Codes
N.A. - Not Analysed.
L.N.R. - Listed But Not Received.
I.S. - Insufficent Sample for Analysis.

Report Comprising: Cover Sheet
Pages 1 to 18

Comments:

Report Dist'n: Carbon Copies(CC),Electronic Media(EM),Magnetic Media(MM)

Type	Recipient	Location	Date	Copies
MM	Mr. Jeff Randell	Devonport	2-DEC-1988	1

Approved Signature:

for Harry Fishman

Harry Fishman
Managing Director.
CLASSIC COMLABS LTD
(Please address any enquiries to Mr. Trevor Francis)

This report relates specifically to the sample(s) tested in so far as that the sample(s) is truly representative of the sample source as supplied.

CLASSIC COMLABS LTD

Analytical Laboratories (INC. IN W.A.)

47

Job: 8AD3650 656042

O/N: 11644/MZ02/JPR

ANALYTICAL REPORT

SAMPLE	Au Avg	Au Dp1	Au Dp2	Au Dp3	Cu	Zn	Ag
9600E 9200N	<0.01	--	--	--	10	82	<1
9600E 9225N	<0.01	--	--	--	7	38	<1
9600E 9250N	<0.01	--	--	--	12	30	<1
9600E 9275N	<0.01	--	--	--	38	96	<1
9600E 9300N	0.01	--	--	--	36	30	<1
9600E 9325N	<0.01	--	--	--	22	68	<1
9600E 9350N	0.02	0.03	<0.01	--	7	17	<1
9600E 9375N	<0.01	--	--	--	8	18	<1
9600E 9400N	<0.01	--	--	--	3	10	<1
9600E 9450N	<0.01	--	--	--	6	13	<1
9600E 9475N	0.01	--	--	--	3	12	<1
9600E 9500N	<0.01	--	--	--	17	24	<1
9600E 9550N	<0.01	--	--	--	2	7	<1
9600E 9575N	0.01	--	--	--	<2	10	<1
9600E 9600N	<0.01	--	--	--	2	7	<1
9600E 9625N	0.01	--	--	--	<2	5	<1
9600E 9700N	0.01	--	--	--	4	8	<1
9600E 9775N	0.01	--	--	--	4	13	<1
9600E 9800N	<0.01	--	--	--	3	9	<1
9600E 9850N	0.01	0.02	<0.01	--	5	17	<1
9600E 09900N	<0.01	--	--	--	9	24	<1
9600E 09925N	<0.01	--	--	--	9	19	<1
9600E 09950N	0.01	--	--	--	7	22	<1
9600E 09975N	<0.01	--	--	--	4	15	<1
9600E 10000N	<0.01	--	--	--	10	20	<1
UNITS	ppm	ppm	ppm	ppm	ppm	ppm	ppm
SCHEME	FA1	FA1	FA1	FA1	AAS1	AAS1	AAS2

CLASSIC COMLABS LTD
Analytical Laboratories (INC. IN W.A.)

42

Job: 8AD3650
O/N: 11644/MZ02/JPR

6560 43

ANALYTICAL REPORT

SAMPLE	Au Avg	Au Dp1	Au Dp2	Au Dp3	Cu	Zn	Ag
9600E 10025N	<0.01	--	--	--	12	19	<1
9600E 10050N	0.02	--	--	--	6	15	<1
9600E 10075N	0.02	0.03	<0.01	--	4	13	<1
9600E 10100N	<0.01	--	--	--	3	12	<1
9600E 10125N	0.01	--	--	--	2	14	<1
9600E 10150N	0.01	--	--	--	2	14	<1
9600E 10175N	0.01	--	--	--	2	11	<1
9600E 10200N	<0.01	--	--	--	5	15	<1
9600E 10225N	<0.01	--	--	--	3	16	<1
9600E 10250N	0.01	--	--	--	2	10	<1
9600E 10275N	<0.01	--	--	--	2	10	<1
9600E 10300N	0.01	--	--	--	2	11	<1
9600E 10325N	<0.01	--	--	--	3	9	<1
9600E 10350N	0.02	0.01	0.02	--	5	10	<1
9600E 10375N	<0.01	--	--	--	4	11	<1
9600E 10400N	<0.01	--	--	--	4	11	<1
9600E 10425N	<0.01	--	--	--	2	8	<1
9600E 10450N	0.01	--	--	--	3	7	<1
9600E 10475N	<0.01	--	--	--	3	9	<1
9600E 10500N	0.03	--	--	--	3	9	<1
9600E 10525N	0.02	--	--	--	40	7	1
9600E 10550N	0.03	0.04	0.02	--	3	4	<1
9600E 10575N	0.01	--	--	--	6	4	1
9600E 10600N	<0.01	--	--	--	7	6	<1
9800E 09600N	0.03	--	--	--	4	11	<1
UNITS	ppm	ppm	ppm	ppm	ppm	ppm	ppm
SCHEME	FA1	FA1	FA1	FA1	AAS1	AAS1	AAS2

CLASSIC COMLABS LTD
Analytical Laboratories (INC. IN WA.)

Job: 8AD3650
O/N: 11644/MZ02/JPR

6560 44

ANALYTICAL REPORT

SAMPLE	Au Avg	Au Dp1	Au Dp2	Au Dp3	Cu	Zn	Ag
9800E 09625N	0.03	--	--	--	8	13	<1
9800E 09650N	0.03	--	--	--	15	48	<1
9800E 09675N	0.03	--	--	--	15	80	<1
9800E 09700N	0.02	--	--	--	9	26	<1
9800E 09725N	0.01	--	--	--	<2	24	<1
9800E 09750N	<0.01	--	--	--	12	30	<1
9800E 09775N	<0.01	--	--	--	5	38	<1
9800E 09800N	0.05	--	--	--	5	12	<1
9800E 09825N	0.03	--	--	--	15	24	<1
9800E 09850N	0.01	--	--	--	9	24	<1
9800E 09875N	0.08	--	--	--	5	19	<1
9800E 09900N	<0.01	--	--	--	6	17	<1
9800E 09925N	<0.01	--	--	--	5	24	<1
9800E 09950N	<0.01	<0.01	<0.01	--	4	22	<1
9800E 09975N	<0.01	--	--	--	5	22	<1
9800E 10000N	<0.01	<0.01	<0.01	--	4	24	<1
9800E 10025N	0.02	--	--	--	3	26	<1
9800E 10050N	<0.01	--	--	--	2	24	<1
9800E 10075N	0.02	--	--	--	5	24	<1
9800E 10100N	<0.01	--	--	--	3	20	<1
9800E 10125N	0.01	--	--	--	3	26	<1
9800E 10150N	0.04	--	--	--	5	48	<1
9800E 10175N	0.04	--	--	--	3	19	<1
9800E 10200N	<0.01	--	--	--	<2	13	<1
9800E 10225N	<0.01	--	--	--	2	15	<1
UNITS	ppm	ppm	ppm	ppm	ppm	ppm	ppm
SCHEME	FA1	FA1	FA1	FA1	AAS1	AAS1	AAS2

44

Job: 8AD3650
O/N: 11644/MZ02/JPR

656045

ANALYTICAL REPORT

SAMPLE	Au Avg	Au Dp1	Au Dp2	Au Dp3	Cu	Zn	Ag
9800E 10250N	0.03	--	--	--	4	17	<1
9800E 10275N	<0.01	<0.01	<0.01	--	2	18	<1
9800E 10300N	0.01	--	--	--	4	11	<1
9800E 10325N	0.02	--	--	--	4	26	<1
9800E 10350N	<0.01	--	--	--	2	18	<1
9800E 10375N	<0.01	--	--	--	2	12	<1
9800E 10400N	0.01	--	--	--	<2	15	<1
9800E 10425N	<0.01	--	--	--	<2	16	<1
9800E 10450N	0.01	--	--	--	<2	15	<1
9800E 10475N	0.02	--	--	--	<2	17	<1
9800E 10500N	0.04	--	--	--	2	20	<1
9800E 10525N	0.02	--	--	--	3	15	<1
9800E 10550N	0.02	--	--	--	3	15	<1
9800E 10575N	0.02	0.04	<0.01	--	8	18	<1
9800E 10600N	0.03	--	--	--	7	16	<1
9800E 10625N	0.01	--	--	--	8	15	<1
9800E 10650N	0.02	--	--	--	6	14	<1
10000E 10000N	0.04	--	--	--	6	78	<1
10000E 10025N	0.01	--	--	--	10	15	<1
10000E 10050N	<0.01	--	--	--	9	78	<1
10000E 10075N	0.02	--	--	--	9	92	<1
10000E 10100N	<0.01	--	--	--	15	100	<1
10000E 10125N	0.02	--	--	--	11	135	<1
10000E 10150N	0.03	--	--	--	18	120	<1
10000E 10175N	0.03	--	--	--	70	105	<1
UNITS	ppm	ppm	ppm	ppm	ppm	ppm	ppm
SCHEME	FA1	FA1	FA1	FA1	AAS1	AAS1	AAS2

45

Job: 8AD3650
O/N: 11644/MZ02/JPR

656046

ANALYTICAL REPORT

SAMPLE	Au Avg	Au Dp1	Au Dp2	Au Dp3	Cu	Zn	Ag
10000E 10200N	0.02	--	--	--	5	16	<1
10000E 10225N	0.02	--	--	--	4	14	<1
10000E 10250N	0.02	--	--	--	4	13	<1
10000E 10275N	0.03	--	--	--	3	18	<1
10000E 10300N	L.N.R.	--	--	--	L.N.R.	L.N.R.	L.N.R.
10000E 10325N	<0.01	<0.01	<0.01	--	3	9	<1
10000E 10350N	<0.01	0.01	<0.01	--	2	15	<1
10000E 10375N	0.01	--	--	--	2	15	<1
10000E 10400N	<0.01	--	--	--	5	18	<1
10000E 10425N	<0.01	--	--	--	7	20	<1
10000E 10450N	0.01	--	--	--	3	15	<1
10000E 10475N	0.01	--	--	--	8	24	<1
10000E 10500N	<0.01	--	--	--	4	19	<1
10000E 10525N	<0.01	--	--	--	5	24	<1
10000E 10550N	0.03	0.04	0.02	--	4	200	<1
10000E 10575N	0.01	--	--	--	15	34	<1
10000E 10600N	<0.01	--	--	--	6	26	<1
10000E 10625N	0.01	--	--	--	4	20	<1
10000E 10650N	0.01	--	--	--	68	180	<1
10000E 10675N	<0.01	--	--	--	76	105	<1
10000E 10700N	0.01	--	--	--	84	92	<1
10000E 10725N	<0.01	--	--	--	68	84	<1
10000E 10750N	<0.01	--	--	--	50	86	<1
10200E 10000N	0.01	0.02	<0.01	--	13	50	<1
10200E 10025N	<0.01	--	--	--	16	94	<1
UNITS	ppm	ppm	ppm	ppm	ppm	ppm	ppm
SCHEME	FA1	FA1	FA1	FA1	AAS1	AAS1	AAS2

Job: 8AD3650
O/N: 11644/MZ02/JPR

6560047

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ANALYTICAL REPORT

SAMPLE	Au Avg	Au Dp1	Au Dp2	Au Dp3	Cu	Zn	Ag
10200E 10050N	<0.01	--	--	--	10	46	<1
10200E 10075N	<0.01	--	--	--	9	58	<1
10200E 10100N	0.02	0.02	0.02	--	16	50	<1
10200E 10125N	<0.01	--	--	--	11	48	<1
10200E 10150N	0.01	--	--	--	8	46	<1
10200E 10175N	<0.01	--	--	--	5	24	<1
10200E 10200N	0.01	--	--	--	5	20	<1
10200E 10225N	<0.01	--	--	--	2	12	<1
10200E 10250N	<0.01	--	--	--	2	12	<1
10200E 10275N	<0.01	--	--	--	2	22	<1
10200E 10300N	<0.01	--	--	--	3	18	<1
10200E 10325N	<0.01	--	--	--	2	12	<1
10200E 10350N	<0.01	--	--	--	<2	18	<1
10200E 10375N	0.01	--	--	--	<2	30	<1
10200E 10400N	0.04	0.03	0.05	--	<2	22	<1
10200E 10425N	0.01	--	--	--	<2	16	<1
10200E 10450N	0.01	--	--	--	<2	12	<1
10200E 10475N	<0.01	--	--	--	<2	15	<1
10200E 10500N	<0.01	--	--	--	4	24	<1
10200E 10525N	<0.01	--	--	--	3	22	<1
10200E 10550N	0.05	0.04	0.05	--	5	17	<1
10200E 10575N	0.01	0.02	<0.01	--	7	22	<1
10200E 10600N	0.01	--	--	--	11	34	<1
10200E 10625N	<0.01	--	--	--	6	24	<1
10200E 10650N	<0.01	--	--	--	8	24	<1
UNITS	ppm	ppm	ppm	ppm	ppm	ppm	ppm
SCHEME	FA1	FA1	FA1	FA1	AAS1	AAS1	AAS2

Job: 8AD3650
O/N: 11644/MZ02/JPR 656048

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ANALYTICAL REPORT

SAMPLE	Au Avg	Au Dp1	Au Dp2	Au Dp3	Cu	Zn	Ag
10200E 10675N	<0.01	--	--	--	6	44	<1
10200E 10700N	0.01	--	--	--	26	42	<1
10200E 10725N	<0.01	--	--	--	16	42	<1
10200E 10750N	0.01	--	--	--	5	24	<1
10200E 10775N	0.02	--	--	--	32	52	<1
10200E 10800N	0.02	--	--	--	9	14	<1
10200E 10825N	0.02	--	--	--	12	38	<1
10200E 10850N	<0.01	<0.01	<0.01	--	26	38	<1
10200E 10875N	<0.01	--	--	--	6	26	<1
10200E 10900N	0.01	--	--	--	26	34	<1
10200E 10925N	0.01	--	--	--	15	34	<1
10200E 10950N	<0.01	--	--	--	8	17	<1
10200E 10975N	0.05	--	--	--	42	48	<1
10200E 11000N	0.01	--	--	--	56	82	<1
10400E 09975N	0.04	0.03	0.05	--	24	40	<1
10400E 10000N	0.01	--	--	--	16	54	<1
10400E 10025N	<0.01	--	--	--	330	140	<1
10400E 10050N	<0.01	--	--	--	10	56	<1
10400E 10075N	0.01	--	--	--	15	72	<1
10400E 10100N	0.02	--	--	--	44	36	<1
10400E 10125N	0.01	--	--	--	12	58	<1
10400E 10150N	0.02	--	--	--	26	86	<1
10400E 10200N	0.02	<0.01	0.03	--	6	24	<1
10400E 10225N	0.08	0.06	0.10	--	3	24	<1
10400E 10250N	0.02	--	--	--	4	28	<1
UNITS	ppm	ppm	ppm	ppm	ppm	ppm	ppm
SCHEME	FA1	FA1	FA1	FA1	AAS1	AAS1	AAS2

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Job: 8AD3650
O/N: 11644/MZ02/JPR 656049

ANALYTICAL REPORT

SAMPLE	Au Avg	Au Dp1	Au Dp2	Au Dp3	Cu	Zn	Ag
10400E 10275N	<0.01	--	--	--	3	20	<1
10400E 10300N	<0.01	--	--	--	2	18	<1
10400E 10325N	0.03	--	--	--	5	24	<1
10400E 10350N	<0.01	<0.01	<0.01	--	4	19	<1
10400E 10375N	<0.01	0.01	<0.01	--	5	22	<1
10400E 10400N	<0.01	--	--	--	5	16	<1
10400E 10425N	0.01	--	--	--	6	24	<1
10400E 10450N	0.01	--	--	--	4	20	<1
10400E 10475N	0.03	--	--	--	2	24	<1
10400E 10500N	0.02	--	--	--	3	14	<1
10400E 10525N	0.01	--	--	--	4	28	<1
10400E 10550N	<0.01	0.01	<0.01	--	12	34	<1
10400E 10575N	<0.01	<0.01	<0.01	--	12	38	<1
10400E 10600N	0.08	0.10	0.05	--	30	50	<1
10400E 10625N	<0.01	--	--	--	11	30	<1
10400E 10650N	<0.01	--	--	--	2	10	<1
10400E 10675N	0.01	--	--	--	4	46	<1
10400E 10700N	<0.01	<0.01	<0.01	--	5	34	<1
10400E 10725N	0.02	0.03	0.01	--	13	48	<1
10400E 10750N	0.01	--	--	--	14	58	<1
10400E 10775N	<0.01	--	--	--	8	20	<1
10400E 10800N	0.01	--	--	--	5	22	<1
10400E 10825N	0.01	--	--	--	4	9	<1
10400E 10850N	0.02	--	--	--	3	13	<1
10400E 10875N	0.02	--	--	--	2	12	<1
UNITS	ppm	ppm	ppm	ppm	ppm	ppm	ppm
SCHEME	FA1	FA1	FA1	FA1	AAS1	AAS1	AAS2

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Job: 8AD3650
O/N: 11644/MZ02/JPR 656050

ANALYTICAL REPORT

SAMPLE	Au Avg	Au Dp1	Au Dp2	Au Dp3	Cu	Zn	Ag
10400E 10900N	0.02	--	--	--	3	13	<1
UNITS	ppm	ppm	ppm	ppm	ppm	ppm	ppm
SCHEME	FA1	FA1	FA1	FA1	AAS1	AAS1	AAS2

Job: 8AD3650
O/N: 11644/MZ02/JPR 656051

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ANALYTICAL REPORT

SAMPLE	Pb	As	Ba
9600E 9200N	48	17	200
9600E 9225N	40	22	130
9600E 9250N	18	19	195
9600E 9275N	22	18	500
9600E 9300N	32	11	180
9600E 9325N	52	10	250
9600E 9350N	48	8	310
9600E 9375N	38	8	300
9600E 9400N	42	9	185
9600E 9450N	13	6	200
9600E 9475N	17	4	170
9600E 9500N	15	10	340
9600E 9550N	2	4	170
9600E 9575N	<2	9	195
9600E 9600N	42	16	340
9600E 9625N	220	3	260
9600E 9700N	120	10	170
9600E 9775N	64	6	250
9600E 9800N	68	7	195
9600E 9850N	96	9	240
9600E 09900N	50	9	270
9600E 09925N	54	4	260
9600E 09950N	48	6	280
9600E 09975N	42	7	210
9600E 10000N	50	5	230
UNITS	ppm	ppm	ppm
SCHEME	XRF1	XRF1	XRF1

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Job: 8AD3650 656052
O/N: 11644/MZ02/JPR

ANALYTICAL REPORT

SAMPLE	Pb	As	Ba
9600E 10025N	46	8	660
9600E 10050N	40	8	185
9600E 10075N	36	6	150
9600E 10100N	32	3	150
9600E 10125N	44	9	200
9600E 10150N	36	10	130
9600E 10175N	72	7	240
9600E 10200N	64	9	140
9600E 10225N	22	6	210
9600E 10250N	48	6	200
9600E 10275N	78	3	300
9600E 10300N	54	4	240
9600E 10325N	80	8	260
9600E 10350N	40	5	200
9600E 10375N	52	7	250
9600E 10400N	15	7	280
9600E 10425N	20	6	300
9600E 10450N	14	7	210
9600E 10475N	22	2	650
9600E 10500N	12	8	260
9600E 10525N	56	42	220
9600E 10550N	8	8	70
9600E 10575N	36	3	45
9600E 10600N	30	4	50
9800E 09600N	84	9	320
UNITS	ppm	ppm	ppm
SCHEME	XRF1	XRF1	XRF1

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Job: 8AD3650
O/N: 11644/MZ02/JPR

656053

ANALYTICAL REPORT

SAMPLE	Pb	As	Ba
9800E 09625N	78	4	310
9800E 09650N	78	10	230
9800E 09675N	195	13	350
9800E 09700N	66	12	250
9800E 09725N	19	15	135
9800E 09750N	20	10	175
9800E 09775N	30	24	180
9800E 09800N	105	8	220
9800E 09825N	13	5	520
9800E 09850N	9	12	520
9800E 09875N	28	6	175
9800E 09900N	42	6	180
9800E 09925N	34	5	240
9800E 09950N	44	8	210
9800E 09975N	48	5	220
9800E 10000N	50	4	220
9800E 10025N	40	5	320
9800E 10050N	52	3	185
9800E 10075N	70	8	270
9800E 10100N	80	8	200
9800E 10125N	90	4	350
9800E 10150N	110	6	310
9800E 10175N	60	11	195
9800E 10200N	58	4	155
9800E 10225N	28	5	160
UNITS	ppm	ppm	ppm
SCHEME	XRF1	XRF1	XRF1

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Job: 8AD3650
O/N: 11644/MZ02/JPR

656054

ANALYTICAL REPORT

SAMPLE	Pb	As	Ba
9800E 10250N	50	10	240
9800E 10275N	44	5	210
9800E 10300N	6	4	230
9800E 10325N	42	9	340
9800E 10350N	20	7	190
9800E 10375N	54	7	260
9800E 10400N	62	5	250
9800E 10425N	20	6	185
9800E 10450N	13	6	210
9800E 10475N	28	7	175
9800E 10500N	50	8	210
9800E 10525N	48	5	230
9800E 10550N	40	5	220
9800E 10575N	24	4	480
9800E 10600N	50	6	540
9800E 10625N	56	9	230
9800E 10650N	20	2	125
10000E 10000N	12	5	450
10000E 10025N	12	6	165
10000E 10050N	19	4	380
10000E 10075N	26	8	460
10000E 10100N	26	7	290
10000E 10125N	36	6	270
10000E 10150N	66	20	370
10000E 10175N	190	12	480
UNITS	ppm	ppm	ppm
SCHEME	XRF1	XRF1	XRF1

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Job: 8AD3650
O/N: 11644/MZ02/JPR 656055

ANALYTICAL REPORT

SAMPLE	Pb	As	Ba
10000E 10200N	44	13	185
10000E 10225N	34	8	155
10000E 10250N	32	6	175
10000E 10275N	70	4	260
10000E 10300N	L.N.R.	L.N.R.	L.N.R.
10000E 10325N	11	5	170
10000E 10350N	12	4	250
10000E 10375N	13	6	440
10000E 10400N	56	5	290
10000E 10425N	52	7	270
10000E 10450N	32	5	250
10000E 10475N	125	10	280
10000E 10500N	44	6	300
10000E 10525N	58	7	220
10000E 10550N	200	90	510
10000E 10575N	24	16	410
10000E 10600N	18	8	360
10000E 10625N	46	12	230
10000E 10650N	<2	8	640
10000E 10675N	14	2	220
10000E 10700N	13	4	380
10000E 10725N	3	3	250
10000E 10750N	16	6	135
10200E 10000N	15	12	330
10200E 10025N	36	13	500
UNITS	ppm	ppm	ppm
SCHEME	XRF1	XRF1	XRF1

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Job: 8AD3650
O/N: 11644/MZ02/JPR

656056

ANALYTICAL REPORT

SAMPLE	Pb	As	Ba
10200E 10050N	42	7	270
10200E 10075N	60	8	390
10200E 10100N	220	3	270
10200E 10125N	110	11	270
10200E 10150N	72	8	230
10200E 10175N	42	6	200
10200E 10200N	30	5	125
10200E 10225N	38	5	290
10200E 10250N	42	4	95
10200E 10275N	34	2	170
10200E 10300N	46	4	270
10200E 10325N	42	2	190
10200E 10350N	42	6	410
10200E 10375N	6	6	410
10200E 10400N	22	9	380
10200E 10425N	26	7	250
10200E 10450N	20	9	280
10200E 10475N	9	7	290
10200E 10500N	105	2	300
10200E 10525N	70	9	340
10200E 10550N	56	4	250
10200E 10575N	46	10	250
10200E 10600N	64	26	230
10200E 10625N	20	9	130
10200E 10650N	185	7	175
UNITS	ppm	ppm	ppm
SCHEME	XRF1	XRF1	XRF1

Job: 8AD3650
O/N: 11644/MZ02/JPR

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ANALYTICAL REPORT

SAMPLE	Pb	As	Ba
10200E 10675N	82	7	610
10200E 10700N	74	7	250
10200E 10725N	125	8	210
10200E 10750N	240	3	310
10200E 10775N	30	9	140
10200E 10800N	420	6	260
10200E 10825N	26	12	260
10200E 10850N	15	9	160
10200E 10875N	32	5	360
10200E 10900N	20	5	125
10200E 10925N	13	6	220
10200E 10950N	8	8	140
10200E 10975N	4	26	115
10200E 11000N	4	12	210
10400E 09975N	<2	3	210
10400E 10000N	7	6	730
10400E 10025N	20	9	480
10400E 10050N	5	7	280
10400E 10075N	8	7	260
10400E 10100N	24	4	270
10400E 10125N	44	12	220
10400E 10150N	160	12	440
10400E 10200N	36	6	360
10400E 10225N	12	4	290
10400E 10250N	34	4	270
UNITS	ppm	ppm	ppm
SCHEME	XRF1	XRF1	XRF1

57

Job: 8AD3650
O/N: 11644/MZ02/JPR

656058

ANALYTICAL REPORT

SAMPLE	Pb	As	Ba
10400E 10275N	14	8	340
10400E 10300N	40	7	330
10400E 10325N	40	4	230
10400E 10350N	160	8	410
10400E 10375N	56	7	420
10400E 10400N	56	2	340
10400E 10425N	72	7	400
10400E 10450N	28	9	260
10400E 10475N	32	4	270
10400E 10500N	42	3	240
10400E 10525N	40	8	195
10400E 10550N	150	62	230
10400E 10575N	74	14	230
10400E 10600N	66	9	185
10400E 10625N	66	6	290
10400E 10650N	16	3	460
10400E 10675N	42	9	550
10400E 10700N	150	11	700
10400E 10725N	105	24	270
10400E 10750N	115	40	400
10400E 10775N	240	14	260
10400E 10800N	78	62	210
10400E 10825N	270	5	340
10400E 10850N	82	5	230
10400E 10875N	72	2	280
UNITS	ppm	ppm	ppm
SCHEME	XRF1	XRF1	XRF1

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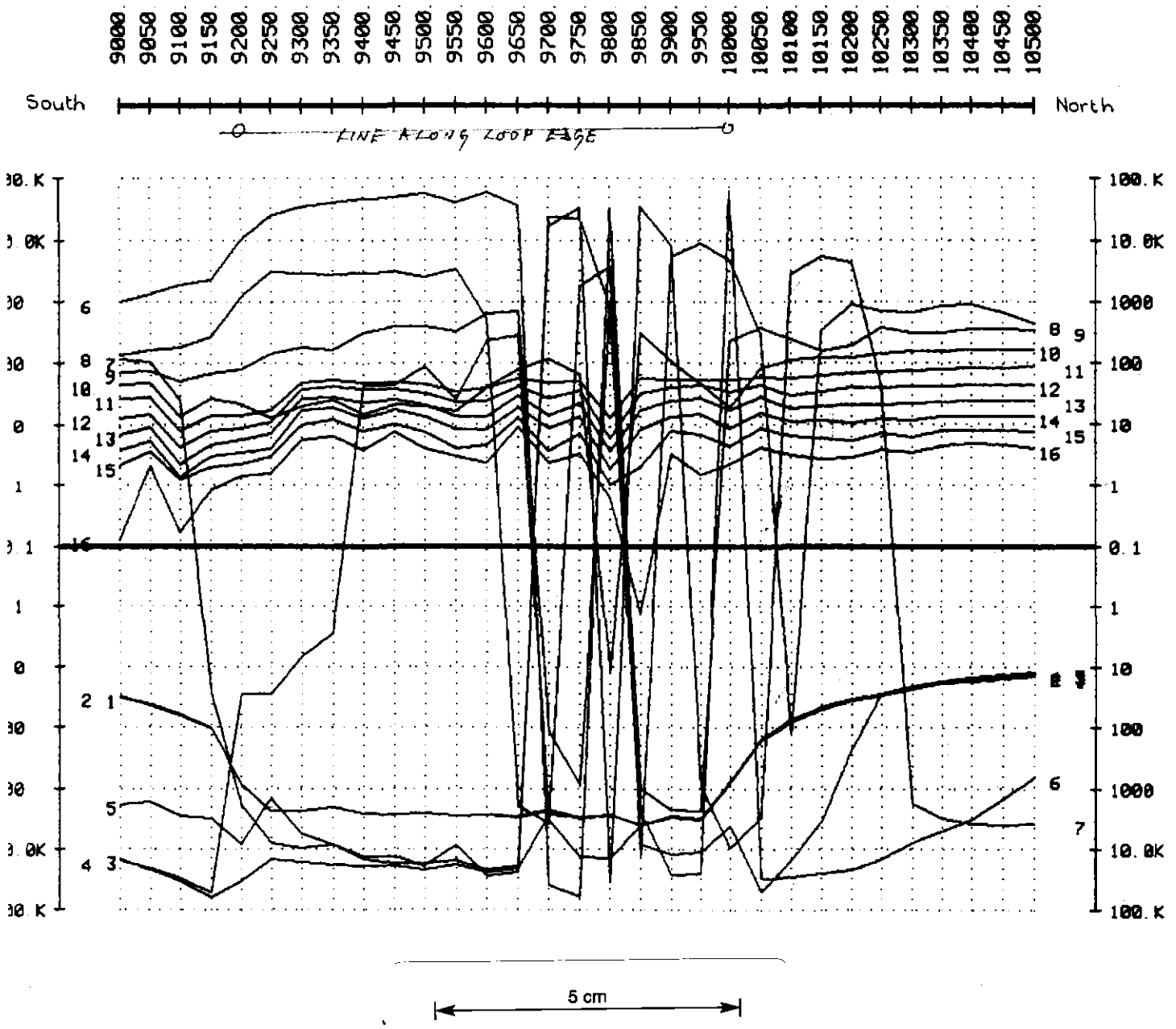
Job: 8AD3650 656059
O/N: 11644/MZ02/JPR

ANALYTICAL REPORT

SAMPLE	Pb	As	Ba
10400E 10900N	110	4	150
UNITS	ppm	ppm	ppm
SCHEME	XRF1	XRF1	XRF1

APPENDIX 4

TEM Profiles, Two Hummocks



Window MAGNITUDE
values in microV/amPere
ComPonent: "CH1 Z , Rxna= 1000

TRANSIENT EM SURVEY DATA
Window MAGNITUDE

Line 8600E
TWO HUMMOCKS
for
BILLITON AUSTRALIA

SURVEY LINE DATA
Line Orient= East
A - SPacing= 50.m

Date of survey= JAN 89

ZONGE Job 867
PLOT BY CPLOT 5.40
PLOTTED 27 Jan 89

TRANSIENT EM SURVEY DATA

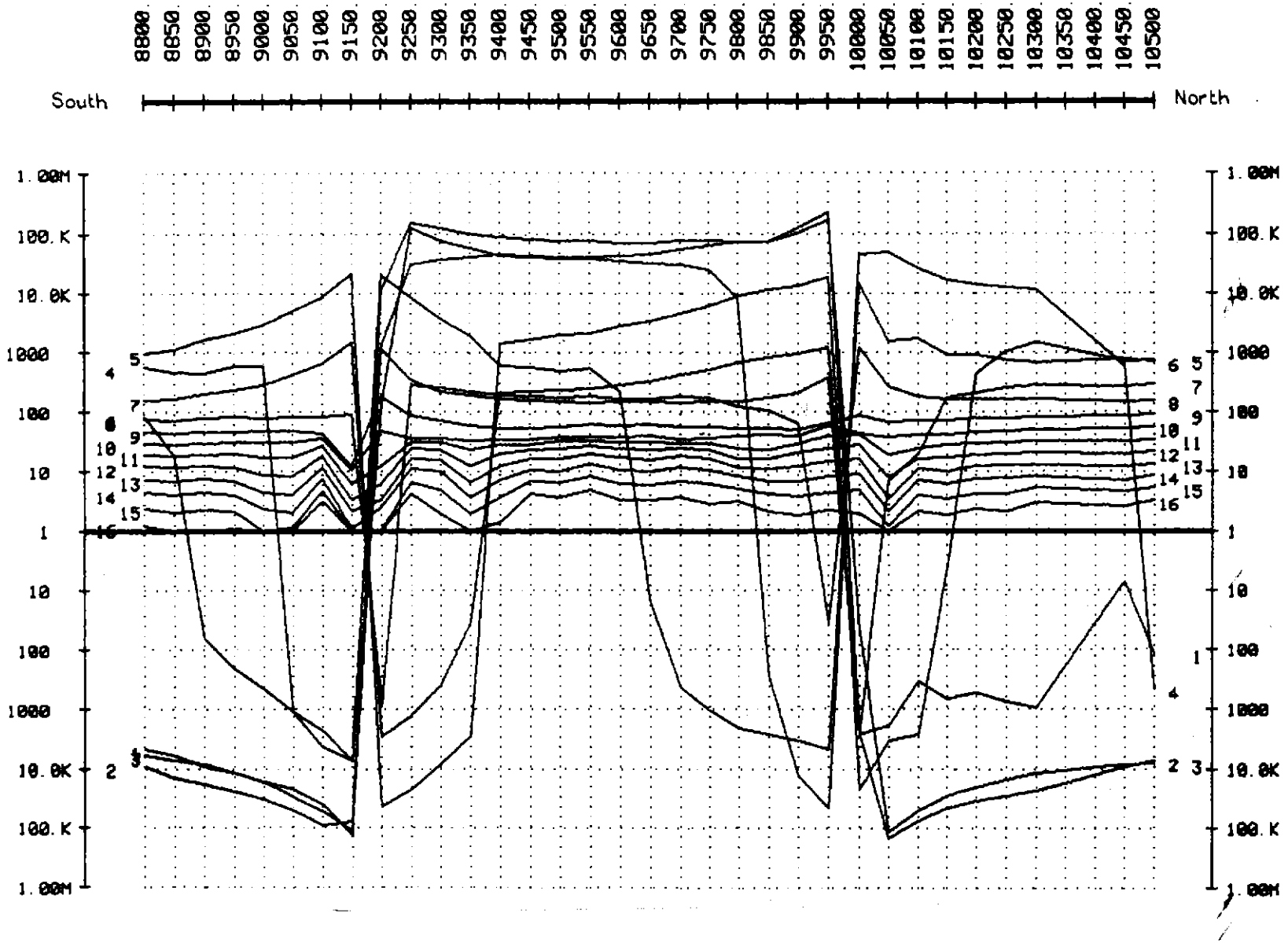
Window MAGNITUDE 61

Line 8800E

TWO HUMMOCKS

for

BILLITON AUSTRALIA



Window MAGNITUDE
values in microV/amPere
ComPonent: "CHI Z , Rxno= 1000

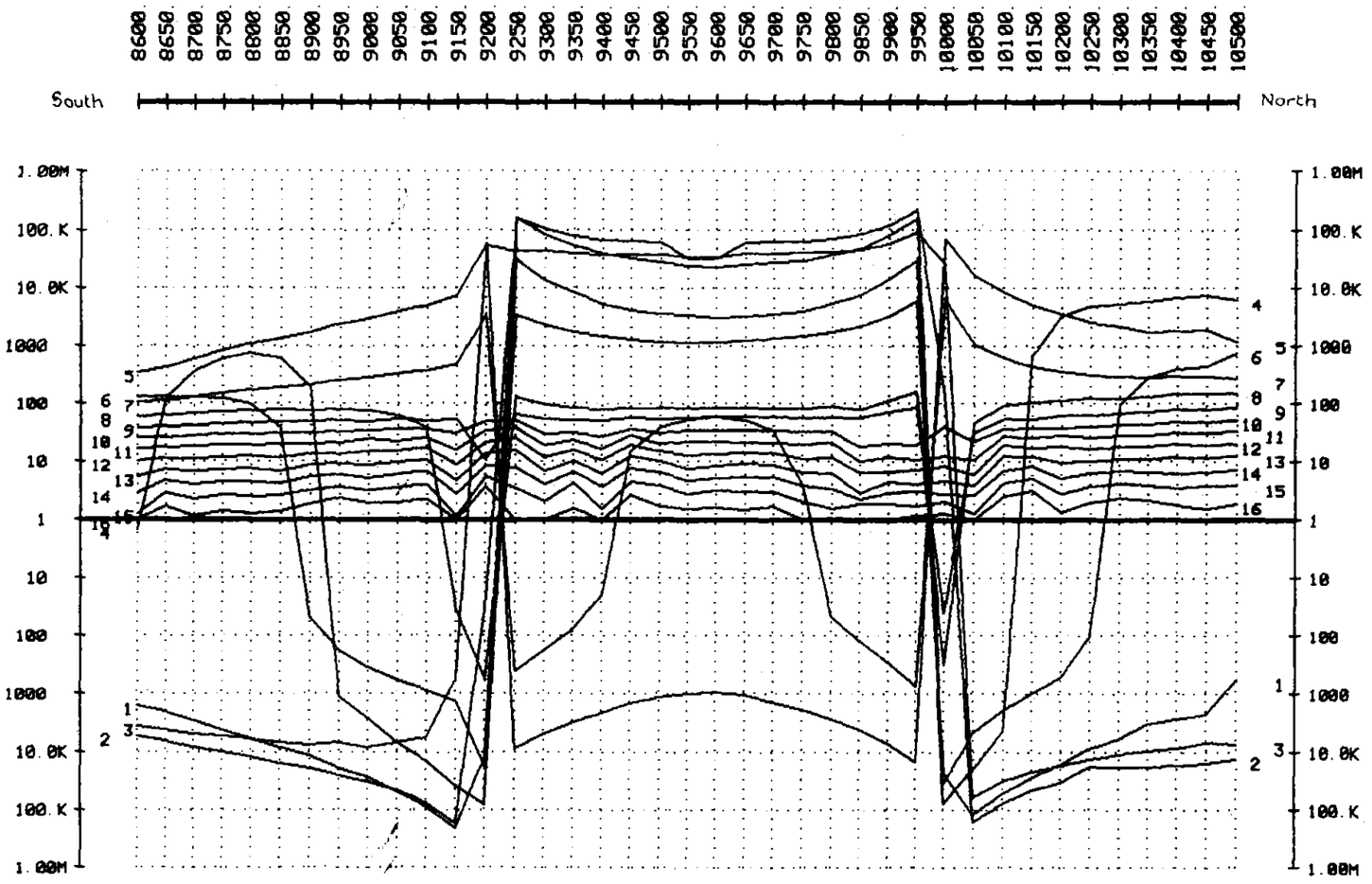
5 cm

SURVEY LINE DATA
Line Orient= East
A - SPacing= 50.m

Date of survey= JAN 89

6560062

ZONGE Job 867
PLOT BY CPLOT 5.40
PLOTTED 26 Jan 89



5 cm

Window MAGNITUDE
values in microV/amPere
ComPonent: "CH1 Z", Rxna= 1000

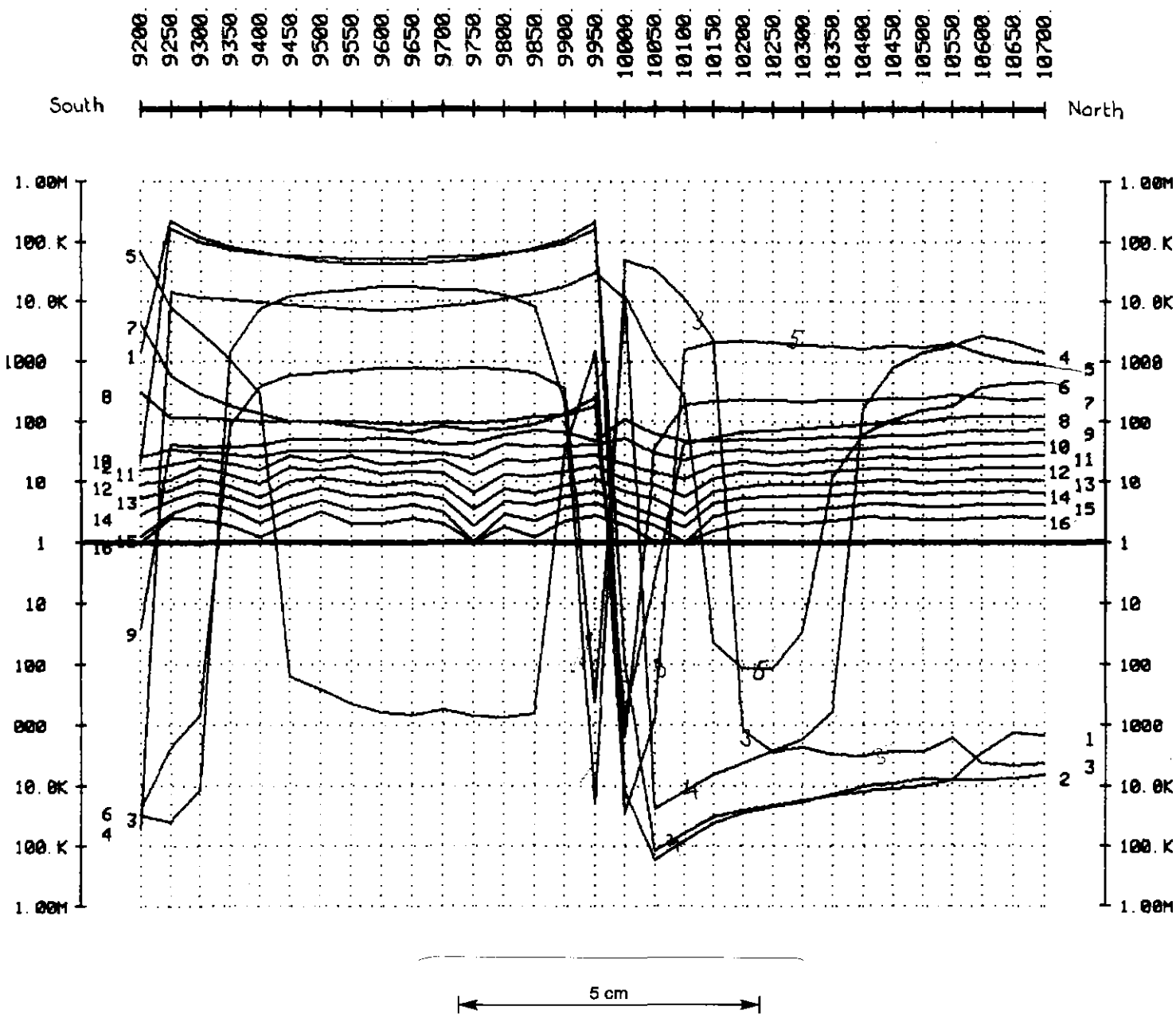
TRANSIENT EM SURVEY DATA
Window MAGNITUDE

Line 9000E
TWO HUMMOCKS
for
BILLITON AUSTRALIA

SURVEY LINE DATA
Line Orient= East
A - Spacing= 50.m

Date of survey= JAN 89

ZONGE Job 867
PLOT BY CPLOT 5.40
PLOTTED 26 Jan 89



Window MAGNITUDE
values in microV/amPere
ComPonent: "CH1" Z , Rxna= 10

TRANSIENT EM SURVEY DATA
Window MAGNITUDE

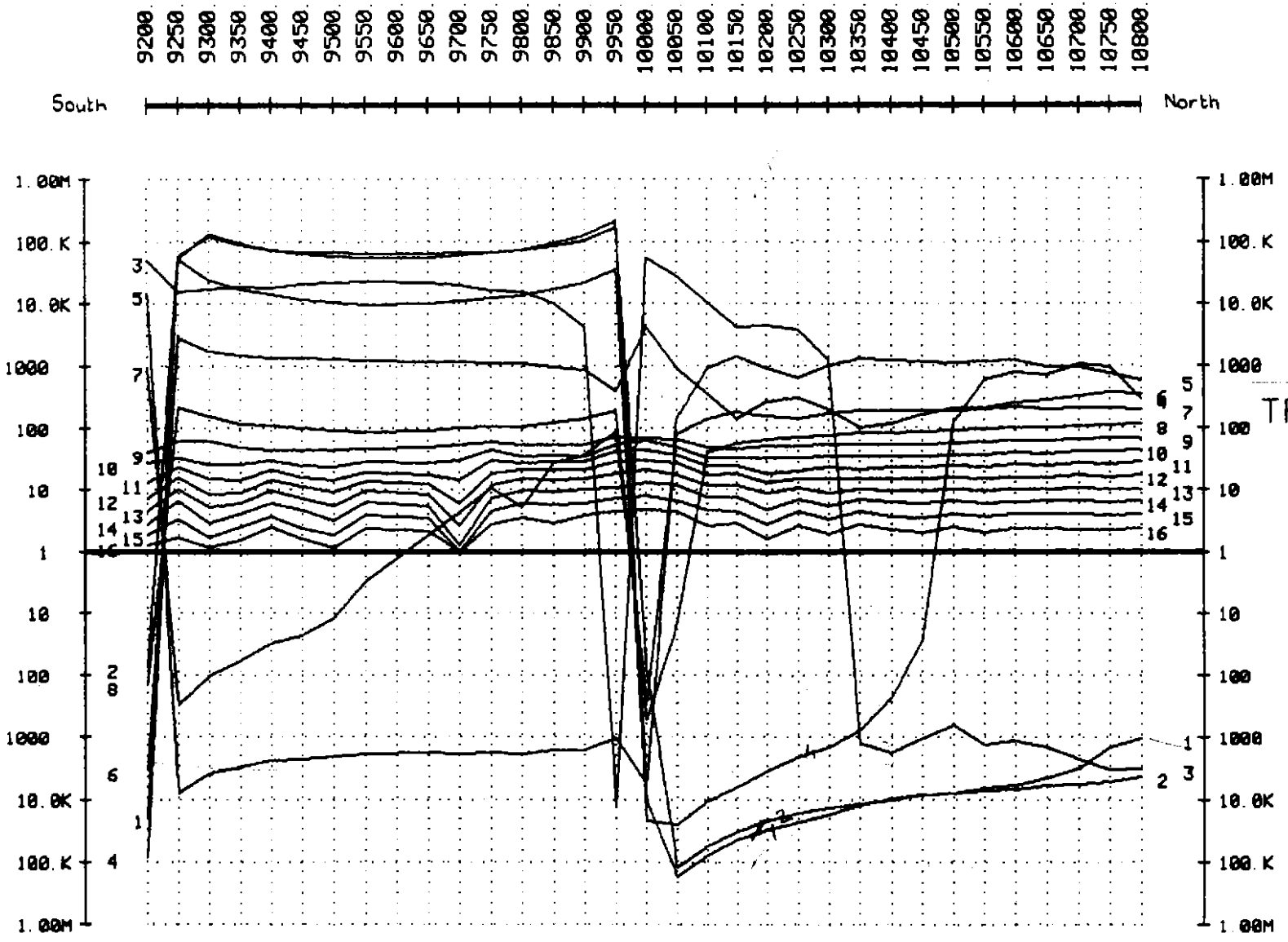
Line 9200E
TWO HUMMOCKS
for
BILLITON AUSTRALIA

SURVEY LINE DATA
Line Orient= East
A - SPacing= 50.m

Date of survey= JAN 89

6900694

ZONGE Job 867
PLOT BY CPLOT 5.40
PLOTTED 26 Jan :0



TRANSIENT EM SURVEY DATA
Window MAGNITUDE

Line 9400E
TWO HUMMOCKS
for
BILLITON AUSTRALIA

SURVEY LINE DATA
Line Orient= East
A - SPacing= 50.m

Date of survey= JAN 89

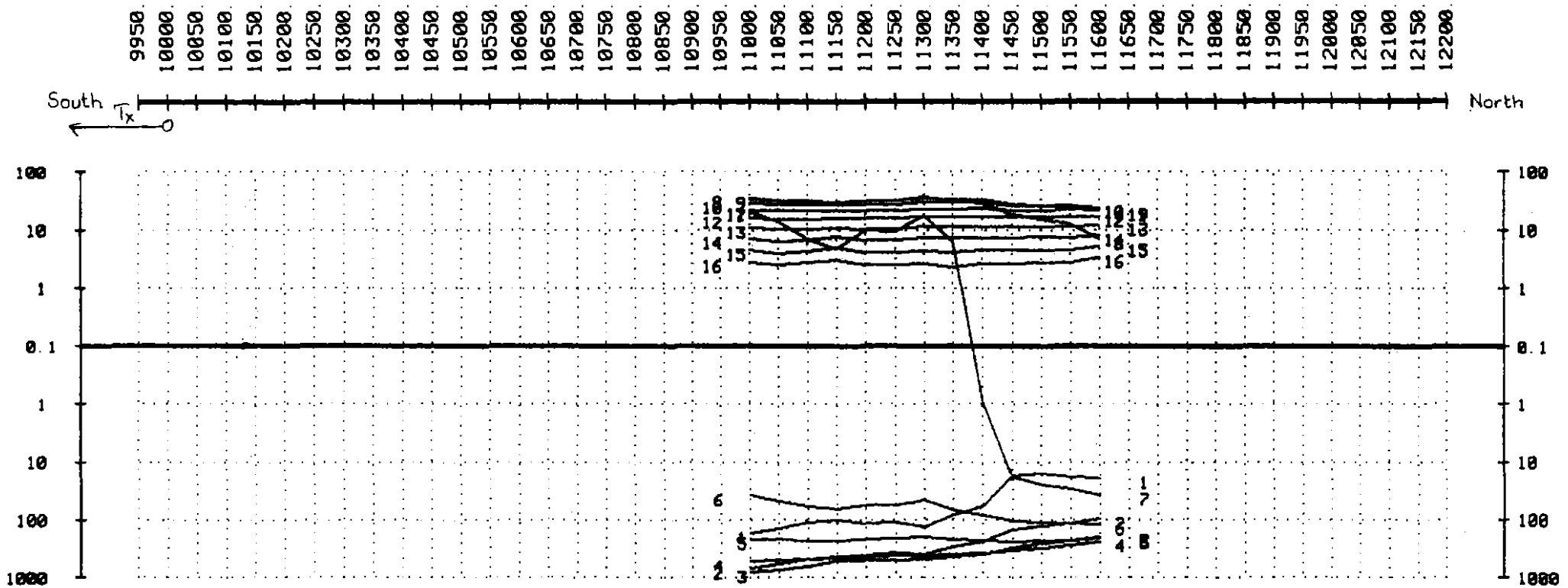
Window MAGNITUDE
values in microV/amPere
ComPonent: "CH1 Z", Rxna= 1000

5 cm

ZONGE Job 867
PLOT BY CPLOT 5.40
PLOTTED 26 Jan :0

TRANSIENT EM SURVEY DATA
Window MAGNITUDE

Line 10400E
TWO HUMMOCKS
for
BILLITON AUSTRALIA



SURVEY LINE DATA
Line Orient= East
A - SPacing= 50.m

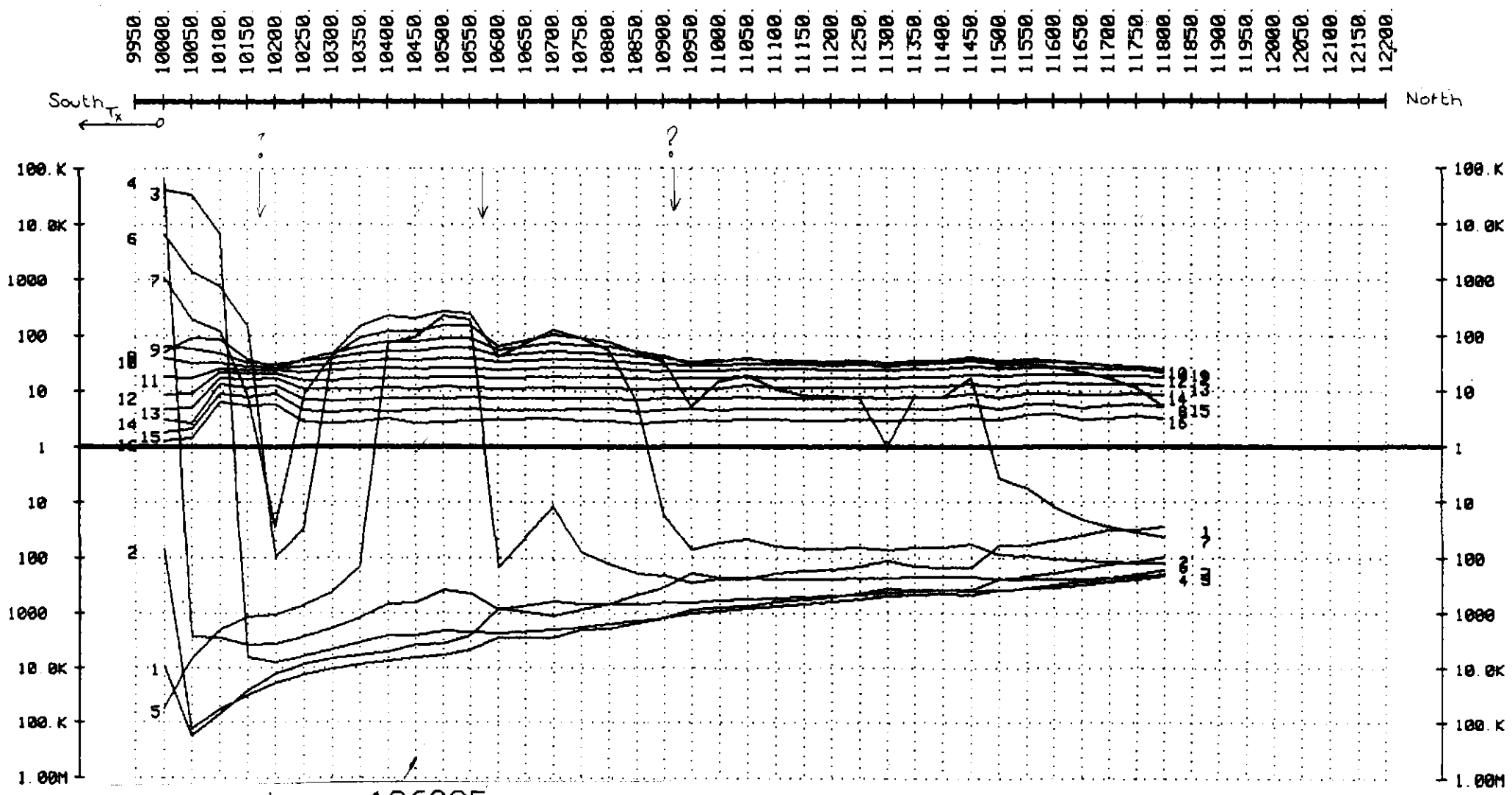
Date of survey= JAN 89

Window MAGNITUDE
values in microV/amPere
ComPonent "CH1 Z , Rxna= 1000

5 cm

ZONGE Job 867
PLOT BY CPLOT 5.40
PLOTTED 23 Jan :0

TRANSIENT EM SURVEY DATA
Window MAGNITUDE



Line 10600E
TWO HUMMOCKS
for
BILLITON AUSTRALIA

SURVEY LINE DATA
Line Orient= East
A - SPacing= 50.m

Date of survey= JAN 89

5 cm

ZONGE Job 867
PLOT BY CPLOT 5.40
PLOTTED 23 Jan :0

TRANSIENT EM SURVEY DATA

Window MAGNITUDE

Line 10800E

TWO HUMMOCKS

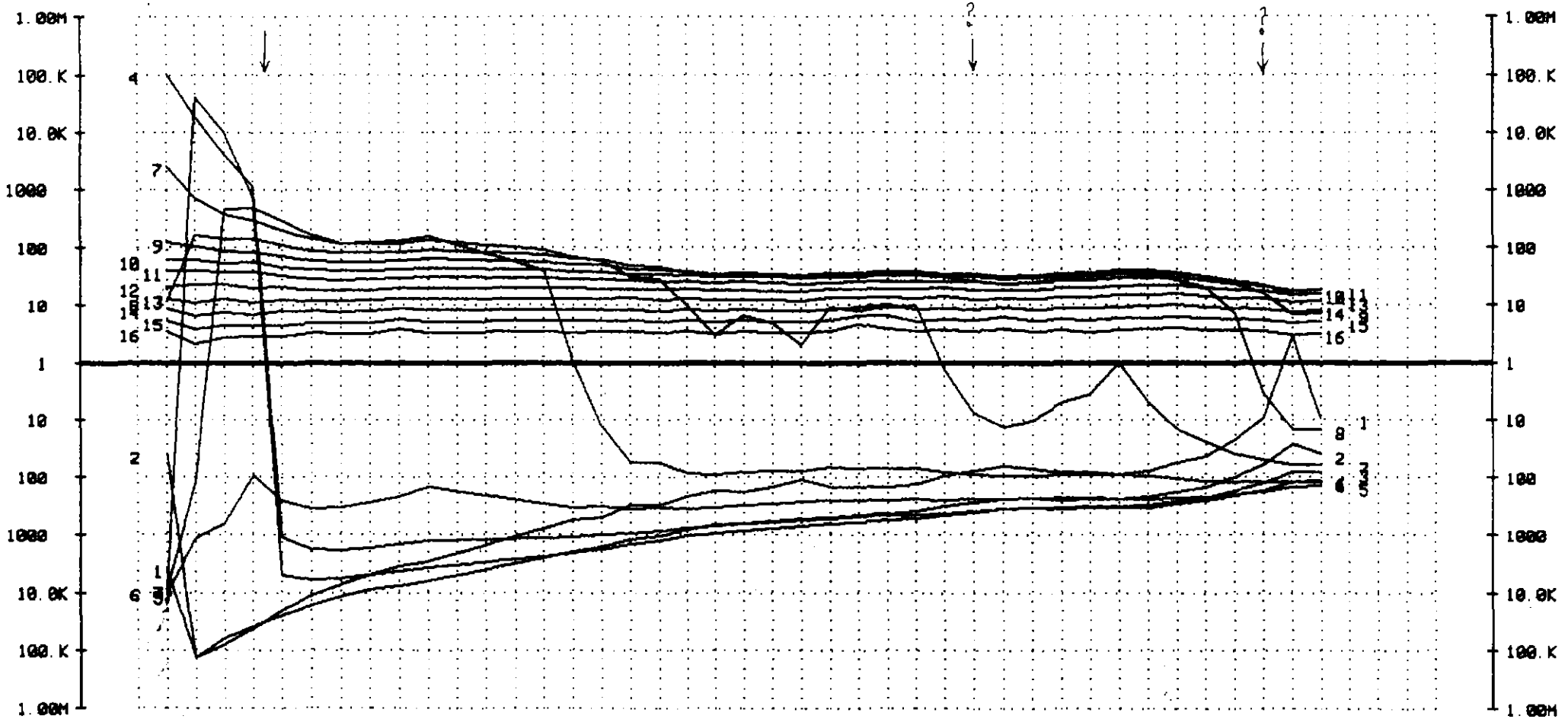
for

BILLITON AUSTRALIA

9950 10000 10050 10100 10150 10200 10250 10300 10350 10400 10450 10500 10550 10600 10650 10700 10750 10800 10850 10900 10950 11000 11050 11100 11150 11200 11250 11300 11350 11400 11450 11500 11550 11600 11650 11700 11750 11800 11850 11900 11950 12000 12050 12100 12150 12200

South ← Tx

N North



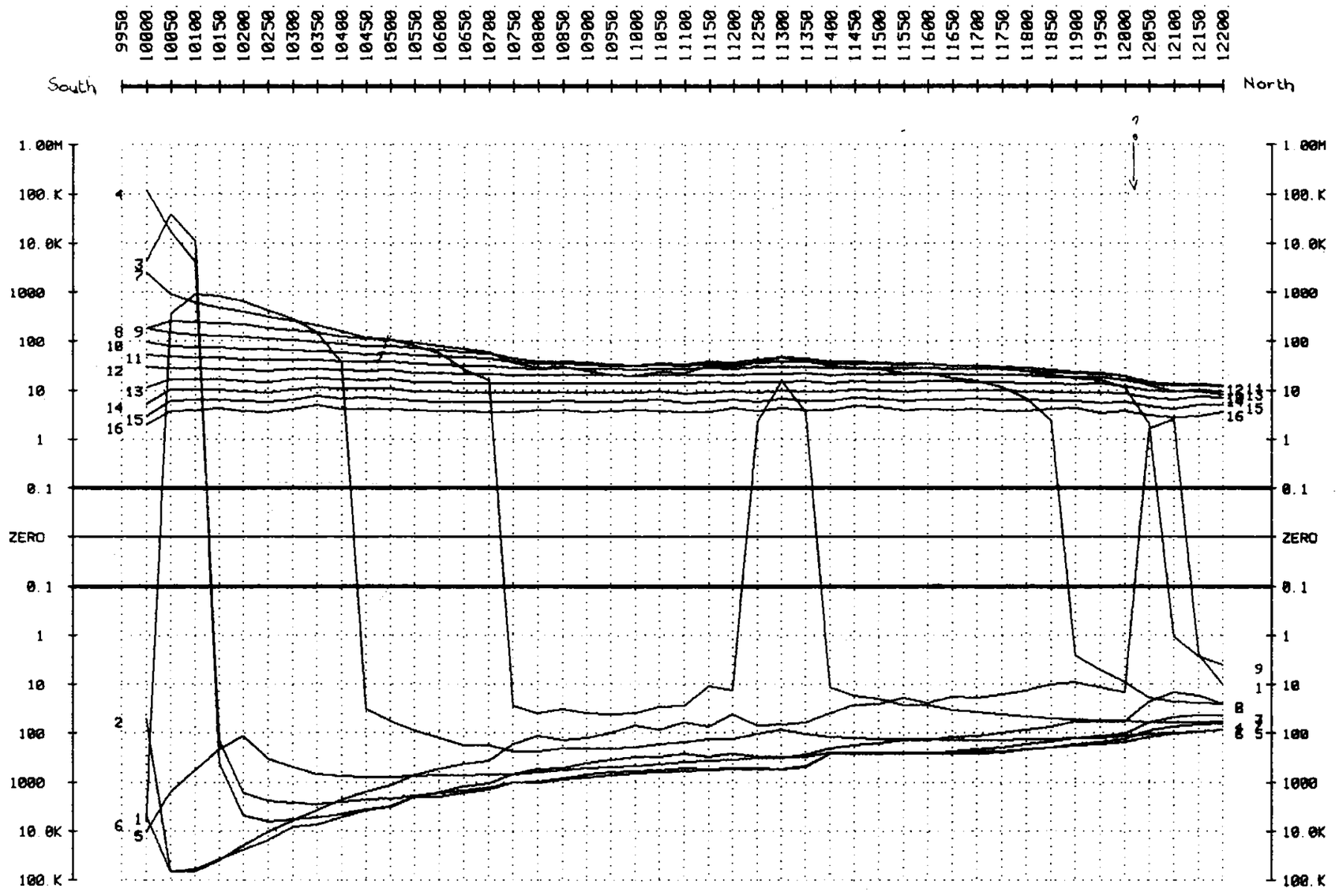
5 cm

SURVEY LINE DATA
Line Orient= East
A - SPacing= 50 m

Date of survey= JAN 89

Window MAGNITUDE
values in microV/amPere
ComPonent: "CH1 Z , Rxna= 1000

ZONGE Job 867
PLOT BY CPLOT 5.40
PLOTTED 23 Jan .0



Window MAGNITUDE
values in microV/gmPere
ComPonent "CH1 Z", Rxno= 1000

TRANSIENT EM SURVEY DATA
Window MAGNITUDE

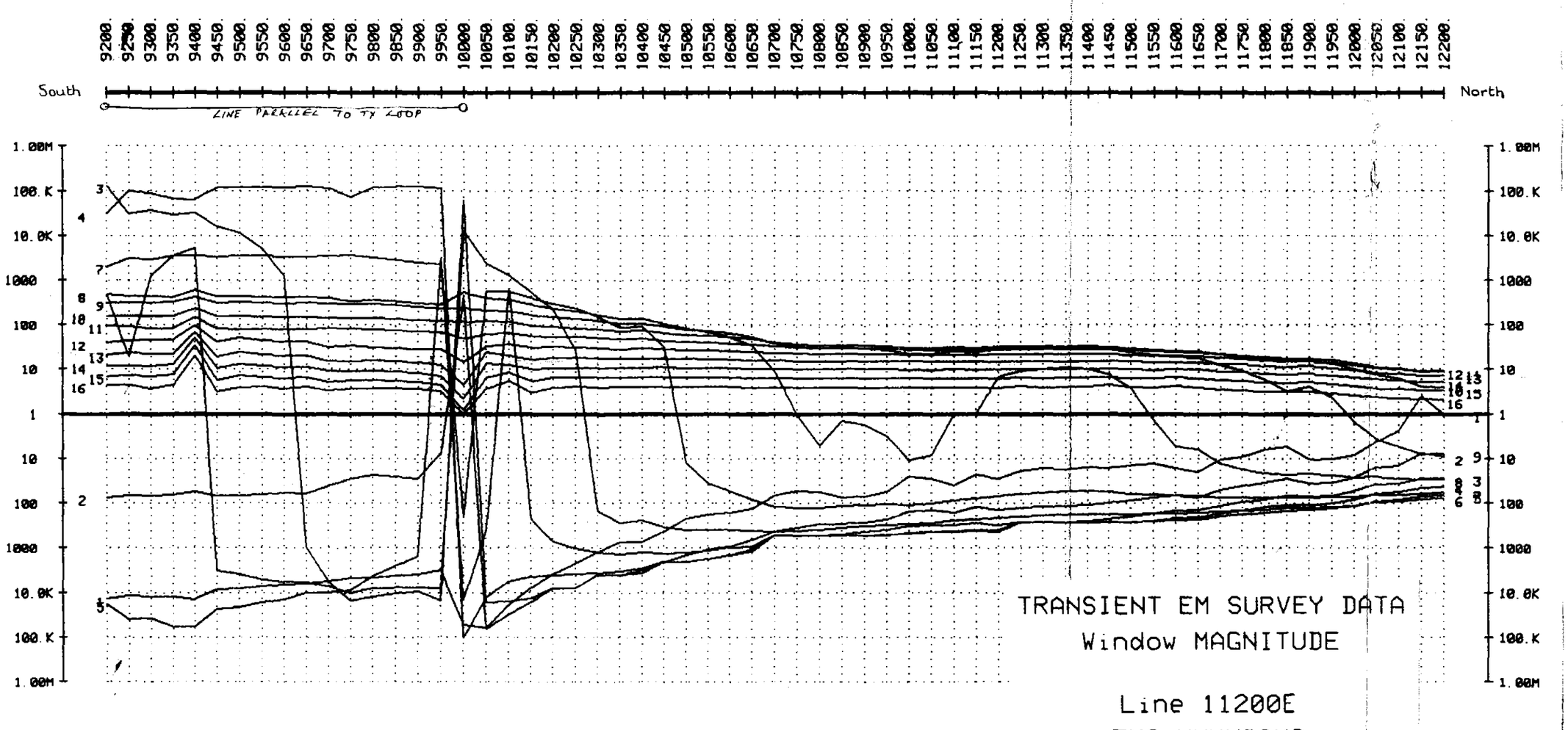
Line 11000E
TWO HUMMOCKS
for
BILLITON AUSTRALIA

SURVEY LINE DATA
Line Orient= East
A - SPacing= 50.m

Date of survey= JAN 89

5 cm

ZONGE Job 867
PLOT BY CPLOT 5.40
PLOTTED 23 Jan :0



TRANSIENT EM SURVEY DATA
Window MAGNITUDE

Line 11200E
TWO HUMMOCKS
for
BILLITON AUSTRALIA

Window MAGNITUDE
values in microV/amPere
ComPonent: "CH1 Z , Rxno= 1000

SURVEY LINE DATA
Line Orient= East
A - SPacing= 50.m

Date of survey= JAN 89

5 cm

ZONGE Job 867
PLOT BY CPLOT 5.40 UNAVERAGED
PLOTTED 23 Jan :0

APPENDIX 5
Auger Sample Results, Cattley North

CLASSIC COMLABS LTD
Analytical Laboratories (INC. IN W.A.)

305 South Road, Mile End South, South Australia, 5031
Telephone: (08) 43 5722 Fax: (08) 234 0321 Telex: LABCOM AA89323

656072

File

Mr. David Hall
Billiton Australia Ltd
30 Mersey Main Rd
Spreyton
DEVONPORT
TAS 7310 Australia

JOB NUMBER: 8AD1930

Your Reference: 11632/MZ02/JPR

Date Received: 6-JUN-1988 Turnaround 8 days
Date Relayed: 14-JUN-1988
Date Reported: 14-JUN-1988

Number of Samples: 83

Report Analyte Codes
N.A. - Not Analysed.
L.N.R. - Listed But Not Received.
I.S. - Insufficent Sample for Analysis.

Report Comprising: Cover Sheet
Pages 1 to 8

Comments:

Report Dist'n: Carbon Copies(CC),Electronic Media(EM),Magnetic Media(MM)

Type	Recipient	Location	Date	Copies

Approved Signature:

for

Harry Fishman
Managing Director.
CLASSIC COMLABS LTD
(Please address any enquiries to Mr. Trevor Francis)

This report relates specifically to the sample(s) tested in so far as that the sample(s) is truly representative of the sample source as supplied.

656073

CLASSIC COMLABS LTD

Analytical Laboratories (INC. IN W.A.)

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Job: 8AD1930
O/N: 11632/MZ02/JPR

ANALYTICAL REPORT

SAMPLE	Au Avg	Au Dp1	Au Dp2	Au Dp3	Cu	Zn	Ag
19800N 50025E	0.03	0.05	<0.01	--	18	125	<1
19800N 50050E	0.04	--	--	--	11	100	<1
19800N 50075E	0.03	--	--	--	12	110	<1
19800N 50100E	0.03	--	--	--	12	92	<1
19800N 50150E	0.02	--	--	--	7	44	<1
19800N 50175E	0.04	--	--	--	5	26	<1
19800N 50200E	0.04	--	--	--	6	24	<1
19800N 50225E	0.02	--	--	--	9	30	<1
19800N 50250E	0.02	--	--	--	4	26	<1
19800N 50275E	0.02	--	--	--	8	48	<1
19800N 50300E	0.02	--	--	--	3	22	<1
19800N 50325E	0.02	--	--	--	8	20	<1
19800N 50375E	0.01	--	--	--	6	22	<1
19800N 50400E	0.01	--	--	--	6	26	<1
19800N 50425E	0.04	--	--	--	5	16	<1
19800N 50450E	0.03	--	--	--	3	20	<1
21200N 50000E	0.03	--	--	--	4	15	<1
21200N 50050E	0.03	--	--	--	30	66	<1
21200N 50075E	0.01	--	--	--	11	72	<1
21200N 50100E	<0.01	--	--	--	24	78	<1
21200N 50125E	0.03	0.01	0.04	--	30	90	<1
21200N 50150E	0.02	--	--	--	4	100	<1
21200N 50175E	0.01	--	--	--	7	98	<1
21200N 50200E	0.01	--	--	--	8	125	<1
21200N 50275E	0.02	--	--	--	7	340	<1
UNITS	ppm	ppm	ppm	ppm	ppm	ppm	ppm
SCHEME	FA1	FA1	FA1	FA1	AAS1	AAS1	AAS2

656074

CLASSIC COMLABS LTD

Analytical Laboratories (INC. IN W.A.)

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Job: 8AD1930
O/N: 11632/MZ02/JPR

ANALYTICAL REPORT

SAMPLE	Au Avg	Au Dp1	Au Dp2	Au Dp3	Cu	Zn	Ag
21200N 50300E	0.01	--	--	--	13	360	1
21200N 50325E	0.01	--	--	--	4	80	<1
21200N 50350E	<0.01	--	--	--	4	56	<1
21200N 50375E	<0.01	--	--	--	3	78	<1
21200N 50400E	<0.01	--	--	--	4	70	<1
21200N 50425E	<0.01	--	--	--	15	300	<1
21200N 50450E	<0.01	--	--	--	15	290	<1
21200N 50475E	<0.01	--	--	--	13	280	<1
21200N 50500E	<0.01	--	--	--	11	170	<1
21200N 50525E	0.02	--	--	--	12	260	<1
21200N 50550E	0.02	--	--	--	8	260	<1
21200N 50575E	0.01	--	--	--	13	370	<1
21200N 50600E	0.01	--	--	--	13	92	<1
21200N 50625E	0.01	--	--	--	13	36	<1
21200N 50650E	0.01	--	--	--	14	32	<1
21200N 50675E	<0.01	<0.01	0.01	--	8	44	<1
21200N 50700E	0.02	--	--	--	9	26	<1
21200N 50725E	0.04	--	--	--	9	68	<1
21200N 50750E	0.02	--	--	--	6	13	<1
21200N 50775E	0.01	--	--	--	7	22	<1
21400N 50000E	0.01	--	--	--	15	110	<1
21400N 50025E	0.01	--	--	--	26	160	<1
21400N 50050E	0.01	--	--	--	22	110	<1
21400N 50075E	<0.01	--	--	--	24	220	<1
21400N 50100E	<0.01	--	--	--	18	290	<1
UNITS	ppm	ppm	ppm	ppm	ppm	ppm	ppm
SCHEME	FA1	FA1	FA1	FA1	AAS1	AAS1	AAS2

CLASSIC COMLABS LTD
Analytical Laboratories (INC. IN WA.)

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Job: 8AD1930
O/N: 11632/MZ02/JPR

ANALYTICAL REPORT

SAMPLE	Au Avg	Au Dp1	Au Dp2	Au Dp3	Cu	Zn	Ag
21400N 50125E	<0.01	--	--	--	16	130	<1
21400N 50150E	<0.01	--	--	--	15	100	<1
21400N 50175E	<0.01	--	--	--	16	290	<1
21400N 50200E	<0.01	--	--	--	14	88	<1
21400N 50225E	<0.01	--	--	--	14	125	<1
21400N 50250E	<0.01	--	--	--	14	240	<1
21400N 50275E	<0.01	--	--	--	26	115	<1
21400N 50300E	<0.01	--	--	--	17	105	<1
21400N 50350E	<0.01	--	--	--	7	38	<1
21400N 50375E	<0.01	--	--	--	16	200	<1
21400N 50400E	<0.01	--	--	--	18	330	<1
21400N 50425E	<0.01	<0.01	0.01	--	12	240	<1
21400N 50450E	<0.01	--	--	--	7	300	<1
21400N 50475E	<0.01	--	--	--	16	430	<1
21400N 50500E	<0.01	--	--	--	16	290	<1
21600N 50000E	0.01	--	--	--	13	110	<1
21600N 50025E	<0.01	--	--	--	13	105	<1
21600N 50050E	<0.01	--	--	--	11	120	<1
21600N 50075E	<0.01	--	--	--	300	58	<1
21600N 50100E	<0.01	--	--	--	18	74	<1
21600N 50125E	0.01	--	--	--	16	64	<1
21600N 50150E	0.01	--	--	--	12	38	<1
21600N 50175E	0.01	--	--	--	14	40	<1
21600N 50200E	0.01	--	--	--	18	40	<1
21600N 50225E	<0.01	--	--	--	20	46	<1
UNITS	ppm	ppm	ppm	ppm	ppm	ppm	ppm
SCHEME	FA1	FA1	FA1	FA1	AAS1	AAS1	AAS2

CLASSIC COMLABS LTD
Analytical Laboratories (INC. IN W.A.)

75

Job: 8AD1930
O/N: 11632/MZ02/JPR

ANALYTICAL REPORT

SAMPLE	Au Avg	Au Dp1	Au Dp2	Au Dp3	Cu	Zn	Ag
21600N 50250E	<0.01	--	--	--	16	80	<1
21600N 50275E	<0.01	--	--	--	44	90	<1
21600N 50300E	<0.01	--	--	--	19	210	<1
21600N 50325E	<0.01	--	--	--	22	160	<1
21600N 50350E	<0.01	--	--	--	13	62	<1
21600N 50375E	0.01	--	--	--	14	86	<1
21600N 50400E	0.01	--	--	--	13	78	<1
21600N 50425E	<0.01	<0.01	0.01	--	20	120	<1
UNITS	ppm	ppm	ppm	ppm	ppm	ppm	ppm
SCHEME	FA1	FA1	FA1	FA1	AAS1	AAS1	AAS2

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Analytical Laboratories (INC. IN W.A.)

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Job: 8AD1930
O/N: 11632/MZ02/JPR

ANALYTICAL REPORT

SAMPLE	As	Pb	Ba
19800N 50025E	19	32	330
19800N 50050E	19	11	180
19800N 50075E	17	22	230
19800N 50100E	12	24	210
19800N 50150E	6	26	150
19800N 50175E	11	11	105
19800N 50200E	<2	380	100
19800N 50225E	12	22	145
19800N 50250E	12	18	125
19800N 50275E	9	30	105
19800N 50300E	9	20	145
19800N 50325E	68	26	150
19800N 50375E	13	28	135
19800N 50400E	20	22	130
19800N 50425E	13	30	125
19800N 50450E	13	22	115
21200N 50000E	11	14	320
21200N 50050E	14	10	250
21200N 50075E	14	12	240
21200N 50100E	14	12	190
21200N 50125E	14	16	150
21200N 50150E	16	125	560
21200N 50175E	18	115	290
21200N 50200E	15	74	175
21200N 50275E	28	92	280
UNITS	ppm	ppm	ppm
SCHEME	XRF1	XRF1	XRF1

656078

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Analytical Laboratories (INC. IN WA.)

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Job: 8AD1930
O/N: 11632/MZ02/JPR

ANALYTICAL REPORT

SAMPLE	As	Pb	Ba
21200N 50300E	62	165	350
21200N 50325E	14	38	250
21200N 50350E	9	13	370
21200N 50375E	11	17	200
21200N 50400E	16	40	300
21200N 50425E	30	150	360
21200N 50450E	30	200	200
21200N 50475E	36	165	190
21200N 50500E	19	50	440
21200N 50525E	22	30	520
21200N 50550E	19	155	1160
21200N 50575E	40	185	400
21200N 50600E	64	110	390
21200N 50625E	290	100	310
21200N 50650E	66	24	430
21200N 50675E	250	84	460
21200N 50700E	120	110	630
21200N 50725E	32	26	390
21200N 50750E	8	5	390
21200N 50775E	11	78	450
21400N 50000E	94	100	320
21400N 50025E	19	100	460
21400N 50050E	7	70	420
21400N 50075E	22	170	490
21400N 50100E	7	125	590
UNITS	ppm	ppm	ppm
SCHEME	XRF1	XRF1	XRF1

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656079

Job: 8AD1930
O/N: 11632/MZ02/JPR

ANALYTICAL REPORT

SAMPLE	As	Pb	Ba
21400N 50125E	13	80	490
21400N 50150E	18	52	390
21400N 50175E	12	260	720
21400N 50200E	15	66	280
21400N 50225E	14	66	660
21400N 50250E	38	360	300
21400N 50275E	10	62	195
21400N 50300E	13	36	210
21400N 50350E	11	22	150
21400N 50375E	13	46	270
21400N 50400E	16	80	145
21400N 50425E	15	19	210
21400N 50450E	6	94	480
21400N 50475E	14	92	360
21400N 50500E	10	94	270
21600N 50000E	12	5	460
21600N 50025E	10	22	470
21600N 50050E	11	17	420
21600N 50075E	16	32	270
21600N 50100E	15	32	240
21600N 50125E	16	70	65
21600N 50150E	22	36	105
21600N 50175E	11	94	110
21600N 50200E	19	32	165
21600N 50225E	22	44	135
UNITS	ppm	ppm	ppm
SCHEME	XRF1	XRF1	XRF1

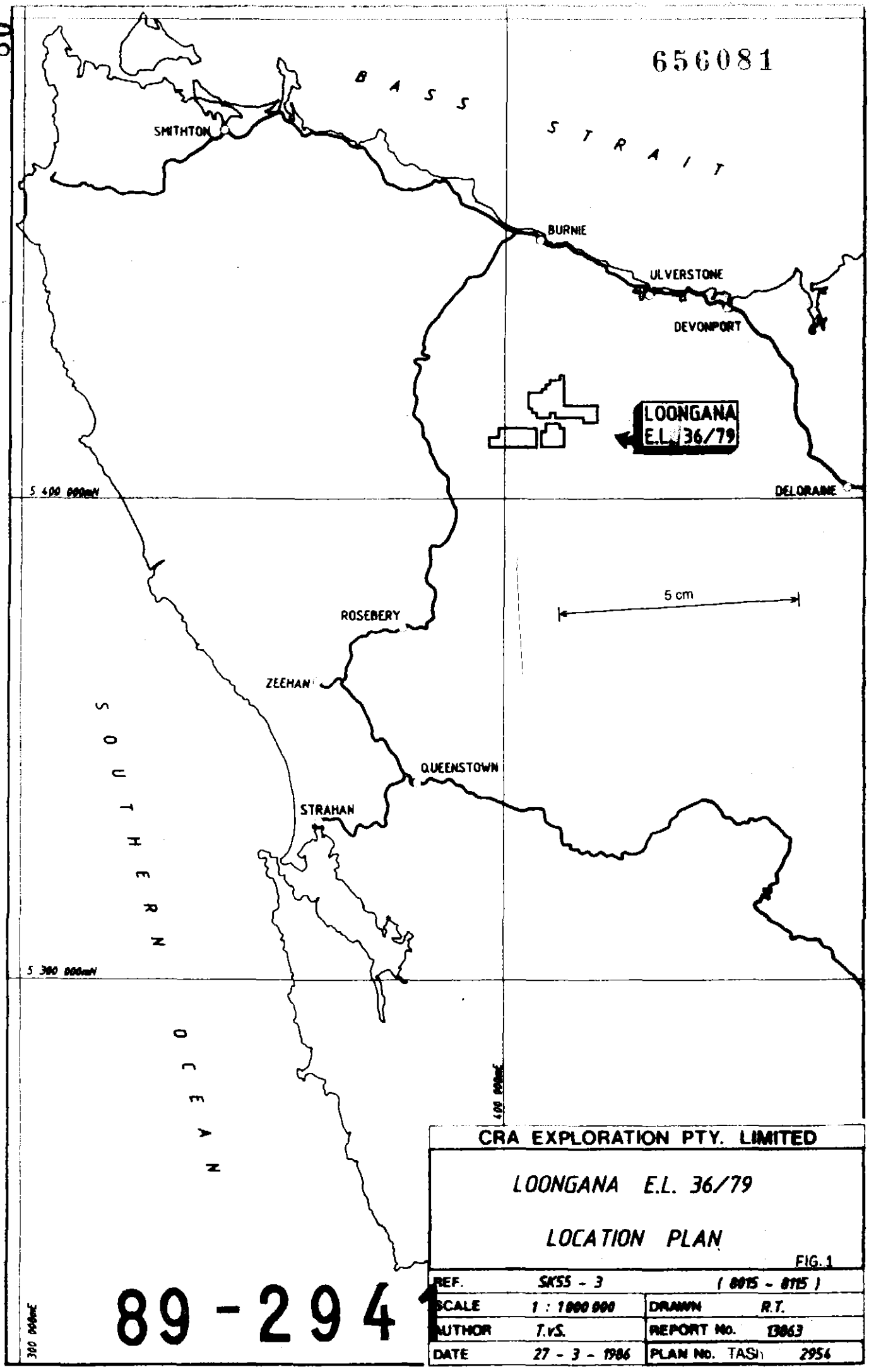
CLASSIC COMLABS LTD
Analytical Laboratories (INC. IN W.A.)

19

Job: 8AD1930
O/N: 11632/MZ02/JPR

ANALYTICAL REPORT

SAMPLE	As	Pb	Ba
21600N 50250E	17	48	270
21600N 50275E	24	100	600
21600N 50300E	46	70	330
21600N 50325E	40	92	290
21600N 50350E	20	30	220
21600N 50375E	30	44	220
21600N 50400E	18	58	230
21600N 50425E	14	42	160
UNITS	ppm	ppm	ppm
SCHEME	XRF1	XRF1	XRF1



89-2941

CRA EXPLORATION PTY. LIMITED

LOONGANA E.L. 36/79

LOCATION PLAN

FIG. 1

REF.	SK55 - 3		(8015 - 8115)
SCALE	1 : 1 000 000	DRAWN	R.T.
AUTHOR	T.vS.	REPORT No.	13863
DATE	27 - 3 - 1986	PLAN No. TASI	2954

81

656082

STATE FOREST RESERVE

PART I

NATIVE TRACK TIER

APPM CONCESSION

PRIVATE OWNERSHIP

407 000mE
5 415 000mN

412 700mE
5 415 000mN

420 000mE
5 416 000mN

PART III

TWO HUMMOCKS

CATTLEY NORTH

HIGH TOR

PART II

APPM CONCESSION

V Cambrian Volcanics

Prospect Areas

5 cm

CRA EXPLORATION PTY. LIMITED

LOONGANA E.L. 36/79

PROSPECT LOCATIONS

REF	SK55 - 3		
SCALE	1 100 000	DRAWN	R.T.
AUTHOR	I.M.C.	REPORT No.	Fig.2
DATE	14 - 6 - 1985	PLAN No. TASH	2647

LOYETEA

△ St.Valentines Peak

NATIVE TRACK TIER ALTERATION

TWO HUMMOCKS ALTERATION ZONE

EL 36/79

Talbots Lagoon

HIGH TOR

△ Black Bluff

CATTLEY ANDESITE VOLCANIC COMPLEX

Lake Lea

POSTULATED CATTLEY FAULT

Murchison Highway

Cradle Mountain Link Road

HELLYER

QUE RIVER

QUE HELLYER COMPLEX

HENTY FAULT ZONE

MT.CRIPPS TRANSFER FAULT

410000N

400000N

390000N

395000E

400000E

405000E

0 5 10km

SCALE 1:100,000

5 cm

T	TERTIARY	Vesicular basalt
S–D	SILURO–DEVONIAN	Quartzite shales
Θ	ORDOVICIAN	Siliciclastics
Cvv	CATTLEY/LOONGANA	Mixed volcaniclastics, minor porphyry, lava andesitic lavas
Cvla		
Cvlr		acid volcanics, probably lava
Css		Micaceous greywacke
Ct	CAMBRIAN QUE/HELLYER	Fine to coarse epiclastics
Cps		Intrusive porphyry epiclastics
Cdt		Mixed volcaniclastics
Cds		Sediments, shales, silts
Cdb		Basaltic lavas
Cdm		Mixed epiclastic, breccias, mineralized horison
Cdal		Andesitic lavas
Cbdal		Mixed basalt–andesite volcaniclastics
+ +	CAMBRIAN	Intrusive granitoid
PC	PRE–CAMBRIAN	Tyennan basement
O	EM SOUNDING	

656083

89-2941

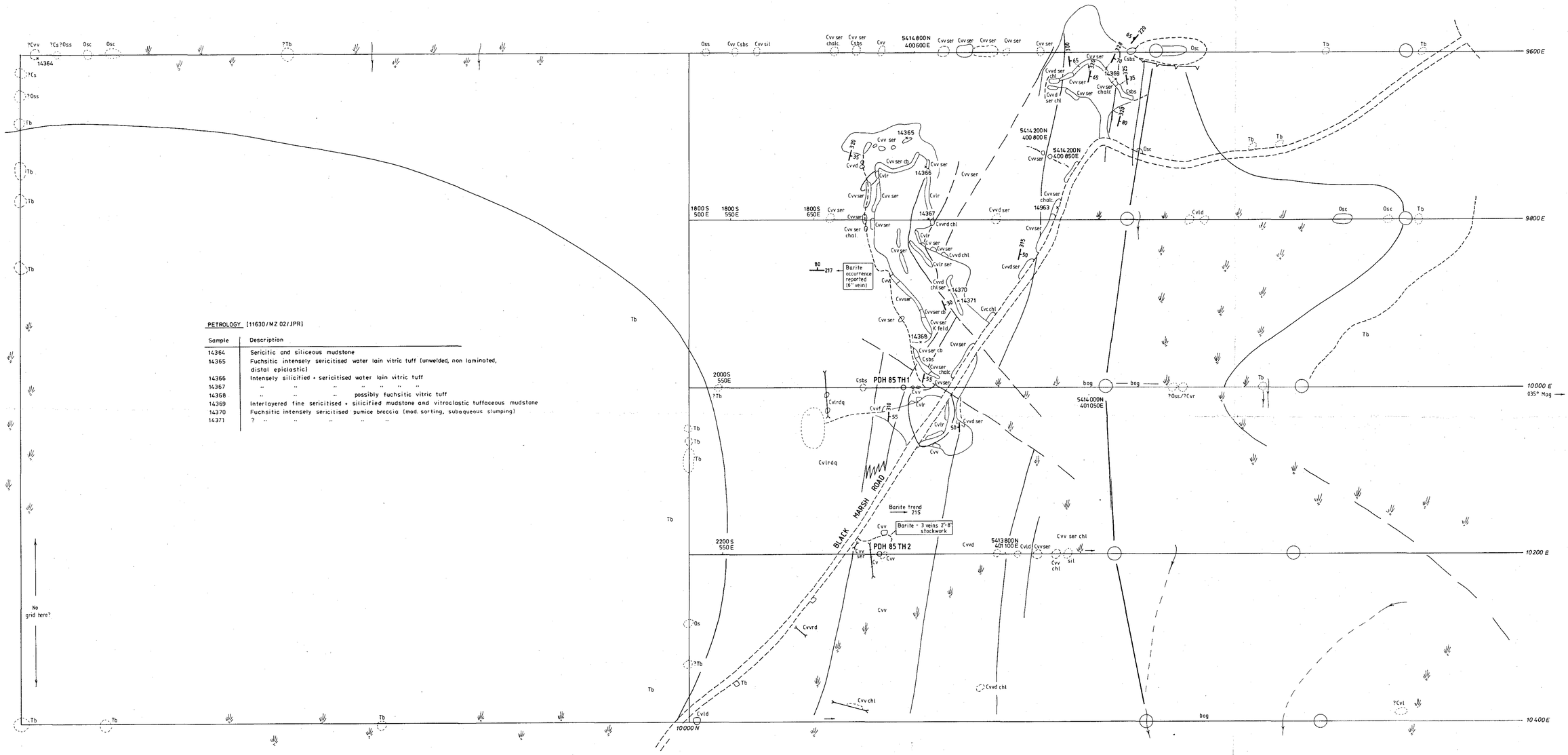
Billiton Australia
The Metals Division of the Shell Company of Australia Limited

Project: LOONGANA EL 36/79

Title: **REGIONAL GEOLOGICAL SETTING**

Author JPR	Dept. DEV	Scale 1:100,000	
Drawn HS	Date 3/89	Revised	Date
Checked	Date	S'ceded	Date
Sheet No. FIG.3		Drawing No. MZ02/1051	

8118



PETROLOGY [11630/MZ 02/JPR]

Sample	Description
14364	Sericitic and siliceous mudstone
14365	Fuchsitic intensely sericitised water lain vitric tuff (unwelded, non laminated, distal epiclastic)
14366	Intensely silicified + sericitised water lain vitric tuff
14367	" " " " " " "
14368	" " " possibly fuchsitic vitric tuff
14369	Interlayered fine sericitised + silicified mudstone and vitroclastic tuffaceous mudstone
14370	Fuchsitic intensely sericitised pumice breccia (mod. sorting, subaqueous slumping)
14371	? " " " "

LEGEND

TERTIARY	Tb	Fine grained vesicular basalt lava.
ORDOVICIAN	Osc	Mixed siliciclastics, predominantly pebble to cobble conglomerate.
CAMBRIAN	Cvld	Feldspar phyric dacitic lava.
	Csbs	Fine grained laminated siltstone with strong graphitic content at base. Non pyritic.
	Cvv ser	Pale green strongly sericitized fine grained felsic volcaniclastic. Strongly siliceous types (Cvv ser chalc) and some chlorite (chl) + carbonate (cb) alteration.
	Cvvd ser	Dark green chloritic medium grained feldspar phyric dacitic volcaniclastic. More siliceous types (Cvvrd ser)
	Cvlr	Massive rhyolitic volcanic, probably lava, moderately sericitic.
	Cvlrdq	Massive orange-pink quartz phyric rhyodacitic volcanic ?lava.

- Main access road
- Track
- Creek
- Button grass bog
- Costean
- Drill hole collar
- UTEM Anomaly

89-2941

656084

Billiton Australia
The Metals Division of the Shell Company of Australia Limited

Project	LOONGANA EL 36/79
Title	TWO HUMMOCKS PROSPECT DETAILED GEOLOGY OF SHELL/CRA GRID
Author JPR Dept. TAS	Scale 1:2500
Drawn OH Date 7/88	Revised Date
Checked Date	S'ceded Date
Sheet No. FIG. 4	Drawing No. O/MZ 02/001

415 000 N

E.L. 36/79 BOUNDARY

414 000 N

E.L. 36/79 BOUNDARY

399 000 E

413 000 N

400 000 E

401 000 E

402 000 E

1200 S

1400 S

1600 S

1800 S

2000 S

2200 S

2400 S

2600 S

2800 S PENZOIL GRID

3000 S

3200 S

3400 S

3600 S

1000 E

9600 E

9800 E

10 000 E

10 200E CRAE / SHELL GRID

10 400 E

100000 N

LEVEN ROAD

MARSH ROAD

BLACK

TWO HUMMOCKS

PEKO GRID

LOOP 2

Tb 100m

LOOP 3

Tb 50m

PD 85 TH 1

PD 85 TH 2

Channel 5 UTEM

Channel 6 UTEM

Tb

Osc

Cvv

Cvvq

Cvvf

Cvv c

Cvvf c

Cvv sid c

Cvv qz

Cvv fcs

Cvv sid

Cvv sidc

Csbs

Cvlr

Cvlrdq

Cvvd

Cvld

Ba

35

55

5 cm

LEGEND

TERTIARY	Tb	Fine grained vesicular basalt lava.
ORDOVICIAN	Osc	Mixed siliciclastic, predominantly pebble to cobble conglomerate.
	Cvld	Feldspar phyric dacitic lava.
	Csbs	Fine grained laminated siltstone with strong graphitic content at base. Non pyritic.
	Cvv ser	Pale green strongly sericitized fine grained felsic volcaniclastic. Strongly siliceous types (Cvv ser chalc) and some chlorite (chl) + carbonate (cb) alteration.
CAMBRIAN	Cvvd ser	Dark green chloritic medium grained feldspar phyric dacitic volcaniclastic. More siliceous types (Cvvrd ser)
	Cvlr	Massive rhyolitic volcanic, probably lava, moderately sericitic.
	Cvlrdq	Massive orange-pink quartz phyric rhyodacitic volcanic ?lava.

- Main access track
- Track
- Creek
- Button grass bog
- Costean
- Drill hole collar
- UTEM Anomaly
- RRMIP Anomaly position

656085

89-2941

Billiton Australia
The Metals Division of the Shell Company of Australia Limited

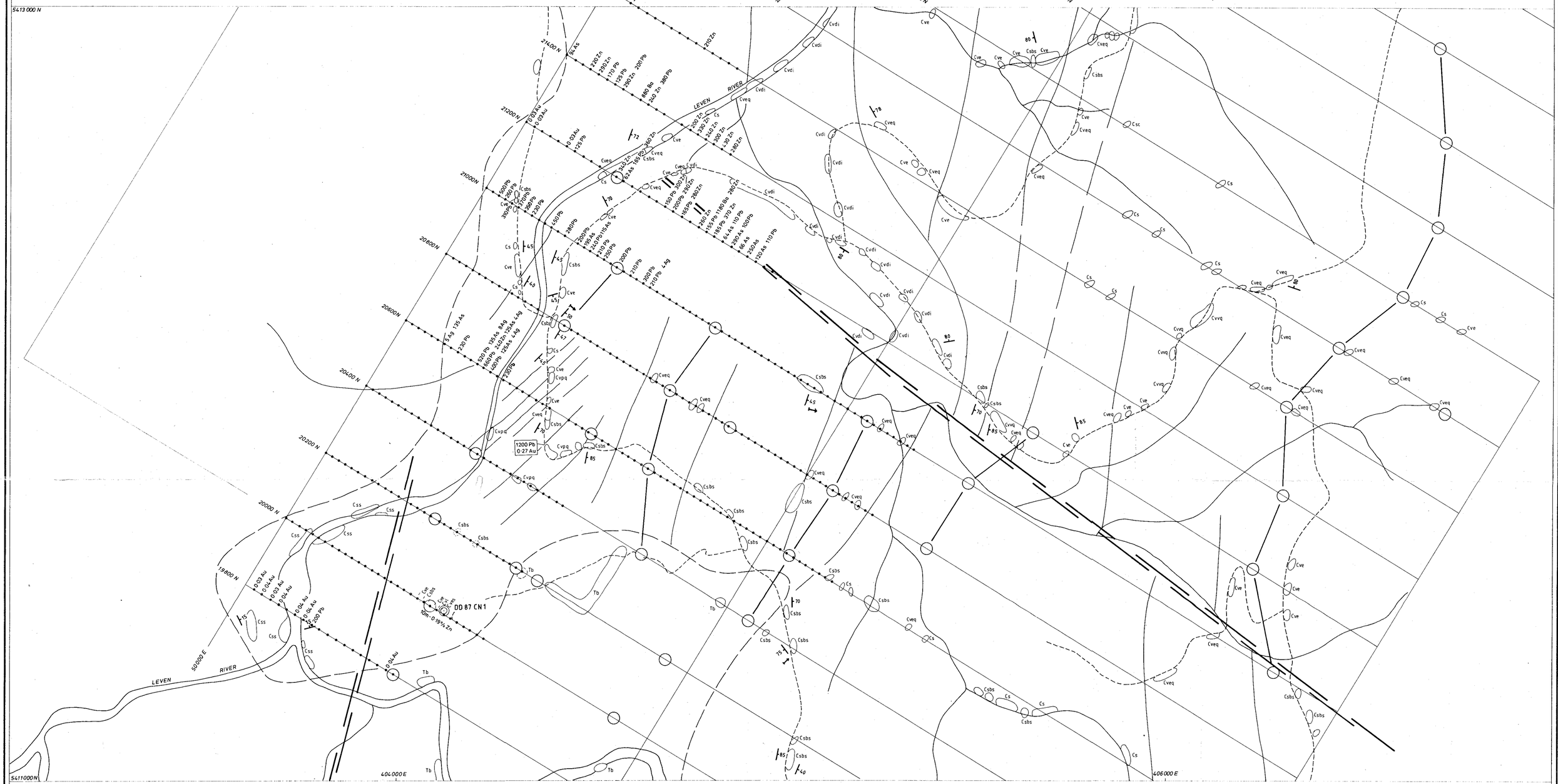
Project: LOONGANA EL 36/79

Title: GEOLOGICAL GEOPHYSICAL COMPILATION

SHEET 3

Author J P R	Dept. TAS	Scale 1:5000	
Drawn O H	Date 7/88	Revised	Date
Checked	Date	S'ceded	Date
Sheet No. FIG. 5		Drawing No. O / MZ 02/002	

8120



LEGEND

TERTIARY	Tb	Fine grained vesicular basalt lava.
ORDOVICIAN	Osc	Mixed siliciclastic, predominantly pebble to cobble conglomerate.
CAMBRIAN	Cvld	Feldspar phyric dacitic lava.
	Csbs	Fine grained laminated siltstone with strong graphitic content at base Non pyritic
	Cvv ser	Pale green strongly sericitized fine grained felsic volcaniclastic. Strongly siliceous types (Cvv ser chalc) and some chlorite (chl) + carbonate (cb) alteration.
	Cvvd ser	Dark green chloritic medium grained feldspar phyric dacitic volcaniclastic More siliceous types (Cvvrd ser)
	Cvlr	Massive rhyolitic volcanic, probably lava, moderately sericitic.
	Cvlrdq	Massive orange-pink quartz phyric rhyodacitic volcanic ?lava.

- Main access track
- Track
- Creek
- Button grass bog
- Costean
- Drill hole collar
- UTEM Anomaly

656086

5 cm

89-2941

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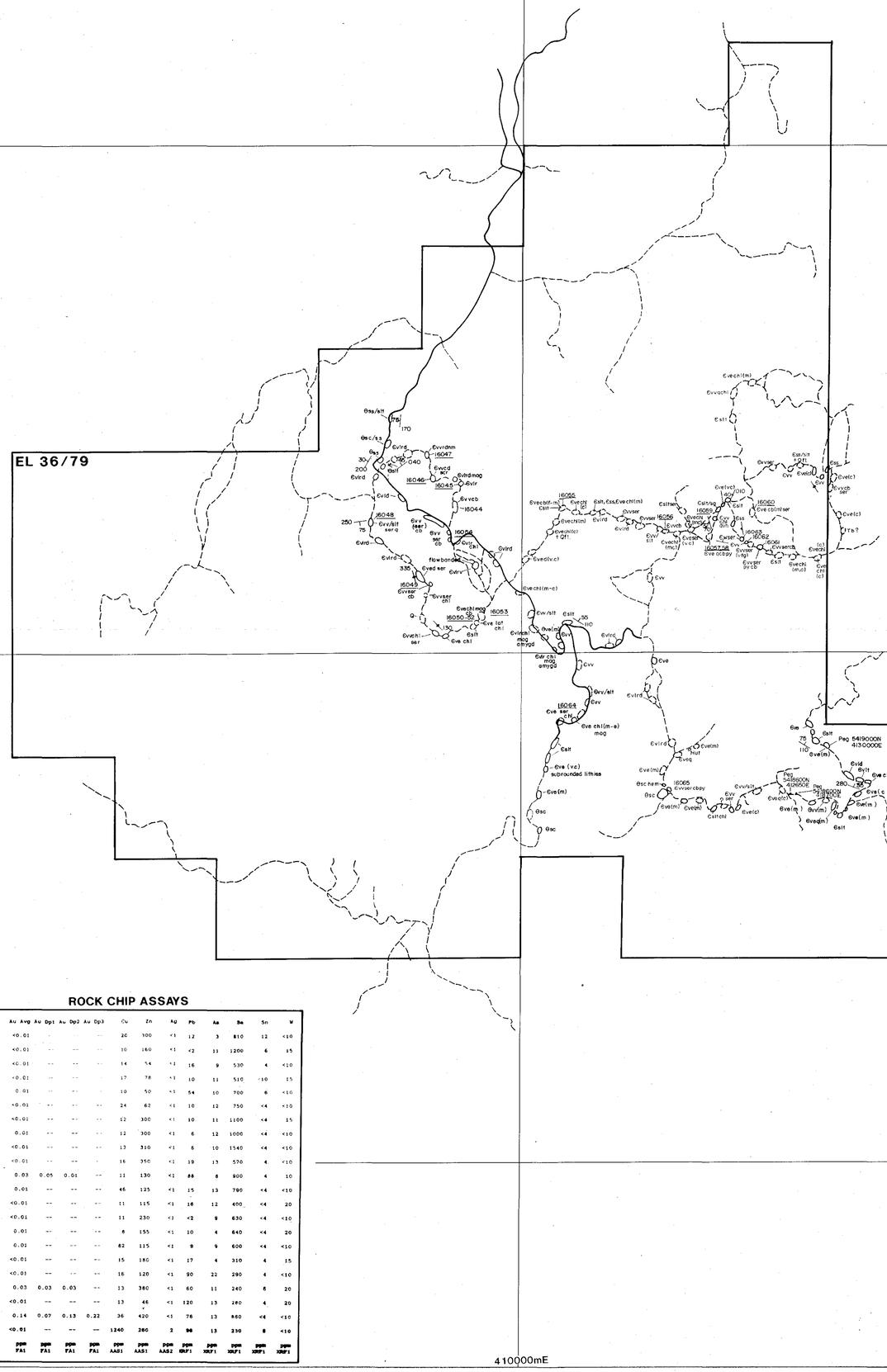
Project	LOONGANA E.L. 36/79		
Title	GEOLOGICAL GEOPHYSICAL COMPILATION		
	SHEET 6		
Author J P R	Dept. TAS	Scale 1:5000	
Drawn O H	Date 8/88	Revised	Date
Checked	Date	S'ceded	Date
Sheet No. FIG. 6		Drawing No. D / MZ 02 / 003	

8121



Tb	TERTIARY	Basalt	- vesicular fine grained
Θ slt	ORDOVICIAN	Siltstone	- fine grained massive often interbedded with Θss
Θ ss		Sandstone	- dirty yellow brown, generally massive
Θ sc		Conglomerate	- grit to pebble size well rounded sorted polymict
€ vv	CAMBRIAN	Volcaniclastic	- generally fine grained often fissile poorly layered, feldspar phyric alteration often intrusive
€ ve		Epiclastic	- fine to coarse lithic, angular to subrounded, poor sorting. Alteration often strong
€ slt		Siltstone	- poor to moderate laminated fine grained
€ ss		Sandstone	- gradational to €slt, dirty brown
€ sg		Grit	- minor component, gradational to €ss
€ vlr		Rhyolite	- massive often chloritic, may be flow banded and amygdaloidal
€ vlrd		Rhyodacitic lava	- as above
€ vld		Dacitic lava	- feldspar phyric massive

chl	ALTERATION	CHLORITE
ser		SERICITE
cb		CARBONATE
py		PYRITE
(f)		FINE LITHICS
(m)		MEDIUM LITHICS
(c)		COARSE LITHICS
q		QUARTZ PHYRIC
mag		MAGNETIC
amygd		AMYGDALOIDAL
qvn		QUARTZ VEINING

- 040/60 STRIKE/DIP BEDDING
- 040/60 STRIKE/DIP CLEAVAGE
- 040 STRIKE/DIP CLEAVAGE (VERTICAL)
- FORMED ROAD
- LOGGING TRACK
- LICENCE BOUNDARY

5 cm

0 1 2km

SCALE 1: 25.000

89-2941

ROCK CHIP ASSAYS

SAMPLE	Au Avg	Au Dp1	Au Dp2	Au Dp3	Cu	Zn	Ag	Pb	As	Ba	Sn	W
16044	<0.01	--	--	--	20	300	<1	12	3	810	12	<10
16045	<0.01	--	--	--	10	160	<1	<2	11	1200	6	15
16046	<0.01	--	--	--	14	54	<1	16	9	530	4	<10
16047	<0.01	--	--	--	17	78	<1	10	11	510	<10	15
16048	0.01	--	--	--	10	50	<1	54	10	700	6	<10
16049	<0.01	--	--	--	24	62	<1	10	12	750	<4	<10
16050	<0.01	--	--	--	12	300	<1	10	11	1100	<4	15
16051	0.01	--	--	--	12	300	<1	6	12	1000	<4	<10
16052	<0.01	--	--	--	13	310	<1	6	10	1540	<4	<10
16053	<0.01	--	--	--	16	350	<1	19	13	570	4	<10
16054	0.03	0.05	0.01	--	11	130	<1	86	6	900	4	10
16055	0.01	--	--	--	46	125	<1	15	13	780	<4	<10
16056	<0.01	--	--	--	11	115	<1	16	12	400	<4	20
16057	<0.01	--	--	--	11	230	<1	<2	9	630	<4	<10
16058	0.01	--	--	--	8	155	<1	10	4	640	<4	20
16059	0.01	--	--	--	82	115	<1	9	9	600	<4	<10
16060	<0.01	--	--	--	15	180	<1	17	4	310	4	15
16061	<0.01	--	--	--	18	120	<1	90	22	290	4	<10
16062	0.03	0.03	0.03	--	13	380	<1	60	11	240	8	20
16063	<0.01	--	--	--	13	46	<1	120	13	280	4	20
16064	0.14	0.07	0.13	0.22	36	420	<1	76	13	860	<4	<10
16065	<0.01	--	--	--	1240	280	2	90	13	230	8	<10
UNITS	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
METHOD	FA1	FA1	FA1	FA1	AAS1	AAS1	AAS2	XRF1	XRF1	XRF1	XRF1	XRF1

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Project	LOONGANA EL 36/79		
Title	NATIVE TRACK TIER		
	656087		
Author JPR	Dept. DEV	Scale 1:25.000	
Drawn HS	Date 3/89	Revised	Date
Checked	Date	S'ceded	Date
Sheet No. FIG.7		Drawing No. MZ02/1052	

8122

5425000mN

5420000mN

5415000mN

410000mE

415000mE

EL 36/79

Tb

Θdc

Θds

Θdu

Qpts

€ms

€m

Tb	TERTIARY	Basalt flows
Dg	DEVONIAN	Granitoid intrusives
Θdu	ORDOVICIAN	Mixed sands, conglomerate
Θdc	LATE CAMBRIAN	Pebble conglomerate
Θds		Quartz sandstone
€ms	MID CAMBRIAN	Undiff. sediments
	MID CAMBRIAN	Rhyolitic–rhyodactic volcanics, possible lavas
		Siltstone, sandstone
		Epiclastics, fine to coarse lithics
		Volcaniclastics, fine grained, ashes
SER	Sericite	Alteration
CHL	Chlorite	
CB	Carbonate	
PY	Pyrite	

5 cm

0 1 2km

SCALE 1: 25,000

89-2941

Billiton Australia
The Metals Division of the Shell Companies of Australia Limited

Project: LOONGANA EL 36/79

Title: **NATIVE TRACK TIER GEOLOGICAL INTERPRETATION**

Author JPR	Dept. DEV	Scale 1:25.000	
Drawn HS	Date 3/89	Revised	Date
Checked	Date	S'ceded	Date
Sheet No. FIG.8		Drawing No. MZ02/1052	

656088

8123

TSL-2
(100m, 80Ωm)

TSL-3
(50m, 40Ωm)

TSL-4
(15m, 20Ωm)

TSL-7
(100m, 40Ωm)

TSL-1
(70m, 60Ωm)

TSL-6
(27m, 20Ωm)

TSM-1
(140m, 60Ωm)

TSM-5
(190m, 60Ωm)

5 413 000 N

5 411 000 N

656089

5 cm

TEM SOUNDING
200m IN-LOOP
TSM (EM-37)
TSL (SIROTEM ST)

AREA OF THICK (>50m?)
TERTIARY BASALT, FROM
TEM SOUNDING & AEROMAG
& GEOLOGY

89-2941

Billiton Australia
The Metals Division of the Shell Company of Australia Limited

Project	N.W. TASMANIA
Title	LOONGANA BASALT THICKNESS MAP & GEOLOGY (After GeoPeko 1977)
Author N H	Date 5/88 — Scale 1:20 000
Drawn A M	Office AHO — Revised — Date
Drawing No. MZ02/1041	Fig. No. 9

8124

Tb > 50m

PREVIOUS SHELL GRID

NEW SHELL GRID

5 cm

400000E

405000E

5415000N

Leven Road

8600E 8800E 9000E 9200E 9400E 9600E 9800E 10000E 10200E 10400E 10600E 10800E 11000E 11200E

9200N

Tb

Tb 100m

Tb 50m

Tb 15m

Tb 70m

Tb 140m

Tb 100m

Tb 27m

Tb

LOOP 1

LOOP 2

LOOP 3

shale

Epiclastic

Acid Volcanics

Hummocks Road

Black Marsh Road

22800N 23000E 5000E

21400N

20000N

EL 36/79 LOONGANA
(MZO2)

EL 39/83 CATTLEY RANGE
(LD51)

0 1km

656090

89-2941

8125

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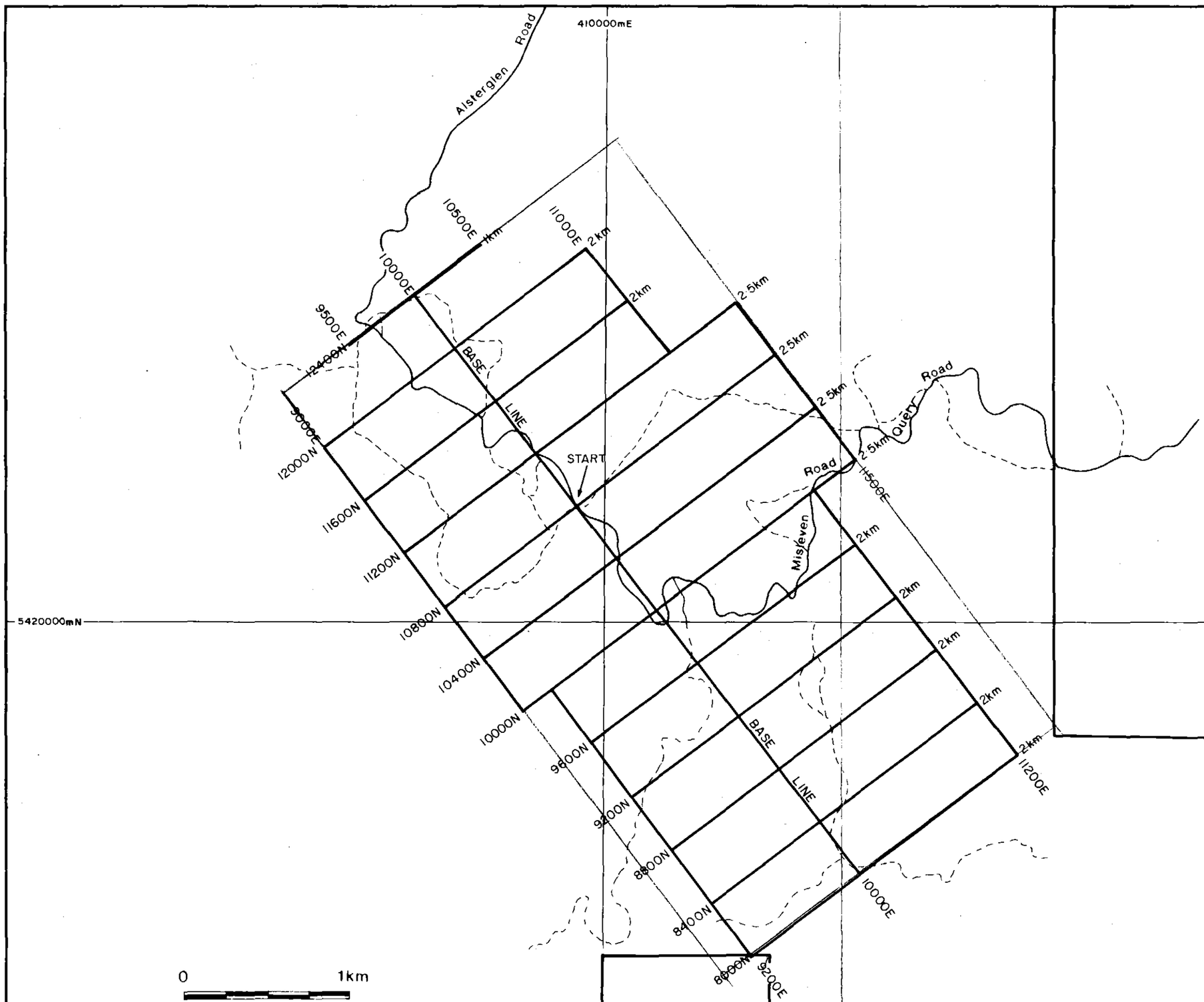
The Metals Division of the Shell Company of Australia Limited

Project: LOONGANA

Title: TWO HUMMOCKS NEW GRID AND TEM COVERAGE

Author	JPR	Date	2/89	Scale	1:25.000
Drawn	HS	Office	AHO	Revised	Date
Drawing No	MZO2/1050			Fig No	10



AZIM 310° MAG.

400m LINE SPACING

BASE LINE	4.4KM
CROSS LINE	25 KM
TIE LINE	8 KM
	37.4KM

656091

Billiton Australia
The Metals Division of the Shell Company of Australia Limited

Project	LOONGANA
Title	NATIVE TRACK TIER GRIDDING SURVEY
Author JPR	Date 2/89 — Scale 1:25,000
Drawn HS	Office AHO — Revised — Date
Drawing No. MZO2/1049	Fig No. 11

89-2941

8126