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BILLITON AUSTRALIA

E.L. 8/90 - NORTH PINNACLES

Exploration Report for the Period
8-6-90 to 10-10-90

Author : J.P. Randell

Report No : 08.5296

Date : April 1991

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Distribution : 1. Pasminco Exploration, Burnie
2. Pasminco Exploration, Burnie
3. Billiton, Melbourne
4. Billiton, Devonport

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1. INTRODUCTION

This report summarizes the results of exploration completed by Billiton Australia, obtained from the inception of the licence to October 1990. At this time, Pasminco Australia Limited became managers of the tenement under the terms of the Boco Joint Venture.

2. LOCATION & ACCESS

The licence is situated 10kms north of Rosebery and 4kms west of the Murchison Highway on the west coast of Tasmania. (Fig 1).

Access to the licence is gained via Forestry tracks from the Murchison Highway to Burns Peak and then by exploration tracks along "The Pinnacles".

3. LAND TENURE

Exploration Licence 8/90, of 4km^2, was granted to The Shell Company of Australia Limited on the 8th June 1990 for a period of 10 years, renewable every 12 months. The licence was acquired as a result of the company successfully tendering for the property through the Department of Mines tender system.

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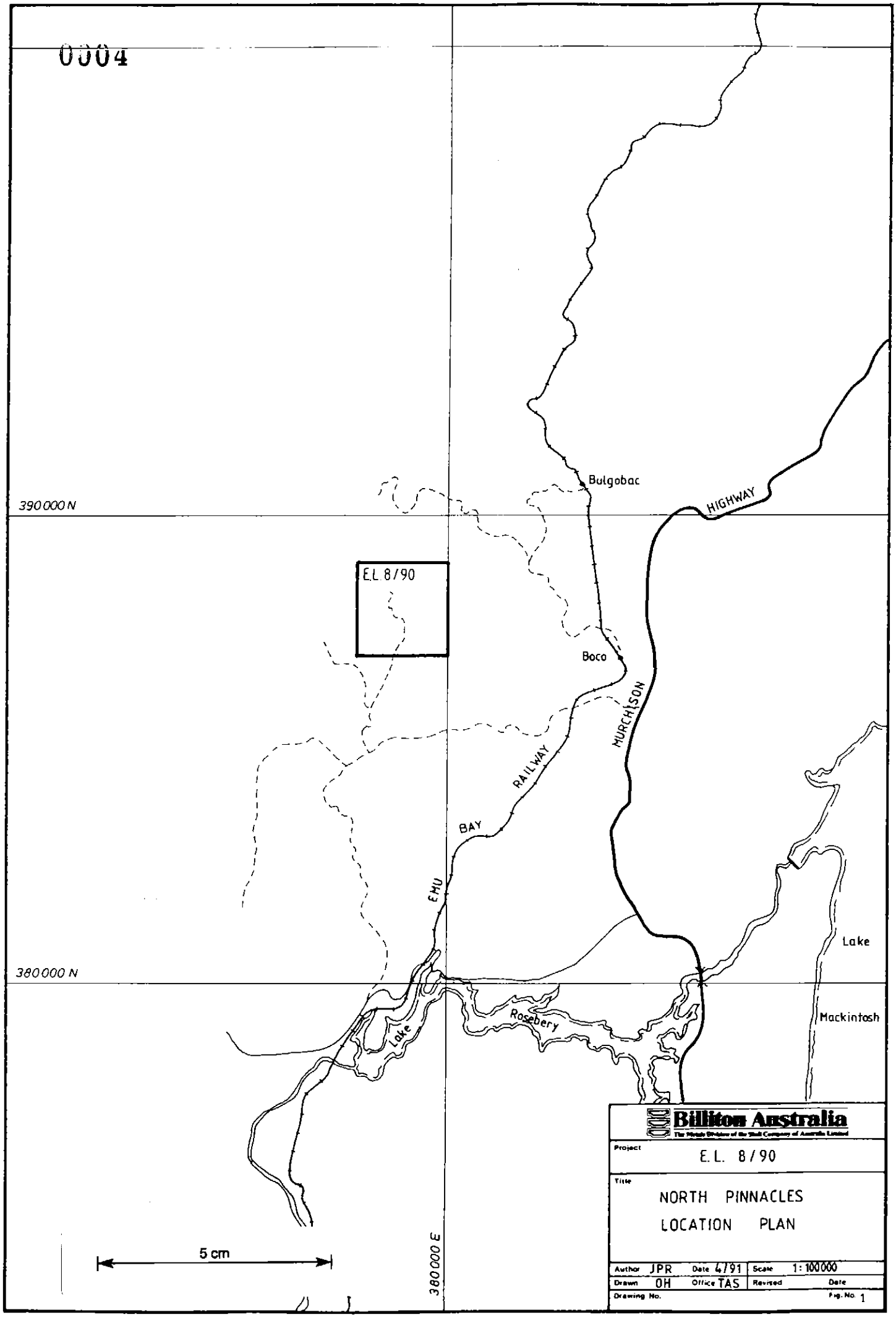
0004


390000 N
380000 N
380000 E
E.L. 8/90
Bulgobac
HIGHWAY
Boco
MURCHISON
RAILWAY
BAY
EMU
Lake
Rosebery
Lake
Mackintosh
5 cm
Billiton Australia
Project
E.L. 8/90
Title
NORTH PINNACLES
LOCATION PLAN
Author JPR
Date 4/91
Scale 1:100000
Drawn OH
Office TAS
Revised
Date
Drawing No.
Fig. No. 1

A joint venture agreement was signed with Pasminco Australia Limited on the 10th October 1990 whereby Pasminco would act as manager of the joint venture. This document is still current.

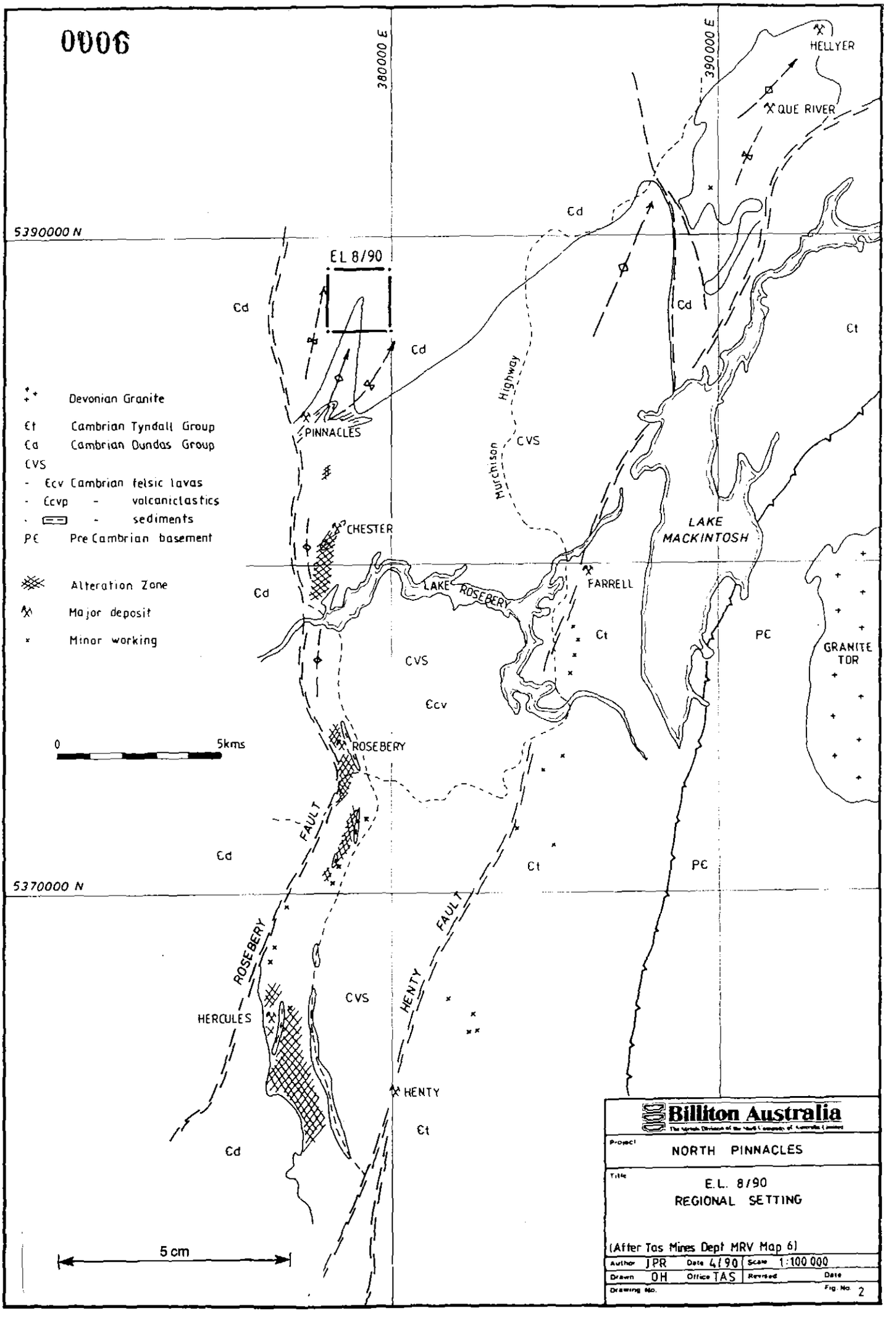
4. REGIONAL SETTING

The licence area covers the northern outcrop extent of the North Pinnacles Anticline, a north-south trending and shallowly north plunging spine of rhyolitic lavas and lava breccias. (see Fig 2) These lavas stratigraphically overlie the host sequence to the Pinnacles mineralization which is commonly regarded as a subeconomic example of Cambrian volcanogenic massive sulphide mineralization.

The North Pinnacles rhyolites occur at the top of the Central Volcanic Sequence and are overlain ?conformably by the Lower Dundas Group epiclastic sandstones, siltstones and greywackes. Along strike to the north east, the Que-Hellyer Volcanic Complex interpreted to lie within Lower Dundas Group stratigraphy, hosts the large polymetallic massive sulphide deposits of Hellyer and Que River.

Geophysically the area is of interest due to the location of a high gradient positive residual gravity anomaly overlying the North Pinnacles ridge. (Tas. Dept. Mines data). The anomaly appears to be a discrete "bullseye" type of approximately 6 mgal and is not merely a single point aberration.

0006



Billiton Australia

Project: NORTH PINNACLES

Title: E.L. 8/90
REGIONAL SETTING

(After Tas Mines Dept MRV Map 6)

Author	JPR	Date	4/90	Scale	1:100 000
Drawn	OH	Office	TAS	Revised	Date
Drawing No.				Fig. No.	2

5. PREVIOUS EXPLORATION

E.Z. Co. had completed a programme of soil sampling, mapping, IP surveying and diamond drilling (3 holes NPP 213, 214, 215) prior to the latest Pancontinental joint venture. Weak base/precious metal mineralization was intersected, especially in drill hole NPP 215 (20.3m @ 0.25gt Au), within altered rhyolitic lava breccias. (see Fig 3).

During the period 1987-88, Pancontinential reviewed previous results and considered that the auriferous mineralization could represent part of a footwall alteration envelope to a VMS deposit and focused their efforts on evaluating this premise. Survey methods included gridding, geological mapping, rock chip sampling, bedrock Wacker sampling and EM 37. Anomalous geochemistry was recorded over an area of 400m x 200m corresponding to the interpreted extent of the altered rhyolitic breccias, as intersected in NPP 215. Maximum values from bedrock Wacker samples were 3.1gt Au, 33gt Ag, 1200ppm Pb (non-coincident) while rock chips peaked at 1800ppm Pb, 4.5gt Ag, 1.9gt Au (non-coincident). Anomalous rock chip values (max. 0.27% Pb, 15gt Ag, 0.1gt Au) were also obtained from samples collected at the North Pinnacles Rhyolite/Lower Dundas Group contact.

The interpretation of the EM 37 survey by Pancon. did not result in the recognition of any anomalous responses and no follow up was recommended.

9982

389000 N

388000 N

387000 N

378000 E

379000 E

380000 E

ETA 153

MIXED SEQUENCE
EPICLASTIC SANDSTONES,
SILTSTONES

80

70

75

NO OUTCROP

Rock Chips up to
0·27% Pb, 15gt Ag
0·1gt Au

16941
(CL)

MIXED SEQUENCE
QTZ-FELDS EPICLASTIC SANDSTONES,
SILTSTONES, GREYWACKES

NO OUTCROP
(Interpreted Dundas Group Volcaniclastics/
Sediments)

NORTH PINNACLES RHYOLITE
(CENTRAL VOLCANICS)

16940
(CL)

AREA OF ANOMALOUS BEDROCK
GEOCHEMISTRY (max 3·1gt Au
33gt Ag
1200ppm Pb)

3m - 1·76% Pb

Rock Chips up to
0·18% Pb, 4·5gt Ag
1·9gt Au

NPP 213

NPP214

NPD004

ALTERED AURIFEROUS
PYRITIC RHYOLITE BRECCIA

CHh

CL

EM37
RESPONSE

5·58 ppb Au
BLEG

NPP 215

20m - 0·2gt Au

FAVOURABLE LITHO-
GEOCHEMICAL CONTACT

14898
(CL)

EPICLASTIC
SANDSTONES

2·90ppb Au
BLEG

LEGEND

- TRACK
- CREEK
- ANTICLINAL AXIS WITH PLUNGE
- RHYOLITE LAVA AND LAVA BRECCIA
- (CHh) HIGH Sr, Ti, Zr VOLCANICS
- (CL) LOW Ti, Zr VOLCANICS
- DDH
- GRIDDED AREA + EM37 COVERAGE
- LITHOGEOCHEMICAL SAMPLE

366009

5 cm

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

Project: E. L. 8/90

Title: NORTH PINNACLES
GEOLOGICAL COMPILATION

Author JPR	Dept. TAS	Scale 1:5000	
Drawn OH	Date 2/90	Revised	Date
Checked	Date	S'ceded	Date
Sheet No. FIG 3		Drawing No.	

During the 1989 season, Geopeko reinterpreted the earlier IP survey results and drill tested (NPD 004) a coincident IP and rock chip/Wacker sample gold anomaly. Weak lead mineralization was intersected (3m @ 1.76% Pb) but gold values were background only. A visual log of sulphide content indicated that the IP anomaly could not be explained by this parameter alone.

Geopeko concluded that there is insufficient evidence to suggest the presence of a "large body of economic gold mineralization" and the licence was recommended for relinquishment.

6. EXPLORATION COMPLETED JUNE-OCTOBER 1990

The licence was acquired on the basis of conceptual thinking largely, along similar lines to the adjacent Boco licence EL 2/90.

There are several lines of evidence to suggest that there is good potential for the development of a significant body of base metal mineralization at depth beneath the North Pinnacles ridge.

1. Structural and stratigraphic considerations of the regional setting of the Pinnacles mineralization (3km to the south) indicate that it is located within the keel and limbs of a complexly folded sequence stratigraphically beneath the North Pinnacles Rhyolite. In simplistic terms, a shallow northerly plunge (20°N) would place the outcropping Pinnacles position at 1000m below surface at the southern

boundary of EL 8/90. At this depth, EM 37 penetration would not be effective but at the same time economic considerations would preclude exploration on the basis of such a loose concept. Realistically, it must be hoped that the mineralized position will be structurally or volcanologically emplaced closer to the present surface.

2. Whilst Pancontinental regard the auriferous alteration envelope to possibly represent a footwall alteration phenomenon, evidence presented at Hellyer indicates that hydrothermal activity may persist for some time after massive sulphide development as a "plume type" feature immediately in the hanging wall of the mineralization. It is therefore possible that the North Pinnacles altered breccia could represent this post-massive sulphide phase.

3. In time stratigraphic terms, mineralization at Pinnacles and Que-Hellyer appear to be closely related: viz Pinnacles occurs at the top of the Central Volcanic Sequence while Que and Hellyer apparently occupy the Lower Dundas Group sequence overlying the CVC. It is reasonable to conclude then that mineralizing events span late CVC-early Dundas Group time between the geographic positions of Pinnacles and Que-Hellyer. Within EL 8/90, this time/stratigraphic interval would be represented by the footwall sequence beneath the North Pinnacles Rhyolite, the Rhyolite itself and the overlying Lower Dundas Group sediments.

4. Billiton has developed a geochemical mapping tool that locates significant stratigraphic breaks in volcanic regimes that can be shown to be prospective for base metal mineralization. The technique has been utilized in Spain, Canada and more recently a comprehensive regional study has been completed within the Mt. Read Volcanics (R. Beeson, 1988: Company Report). Extensive sampling and geochemical analysis indicates that a small suite of elements can be used to geochemically map volcanic sequences.

Two populations have been identified that have both geograph-ical continuity and geological credibility: viz CL and CH type volcanics. Sampling of the footwall to hanging wall sequences at Que-Hellyer, Rosebery and Chester-Pinnacles indicates that the mineralization is contained within a 250m wide zone of interdigitating CL- and CH- type volcanics. No CL- type volcanics have been identified in the hanging wall sequences in these areas. Moreover, the prospective CL/CH contact can be mapped along strike from known mineralization to other exploration areas.

Sr has been shown to be particularly useful in tracing miner-alized horizons, provided a stringent alteration discriminant is used. At Rosebery, Sr bearing CH- type volcanics are confined to the zone between CL- type volcanics and the ore horizon while other CH- type rocks occur in the hanging wall Mt. Black sequence. Similar observations are made at Que-Hellyer and Pinnacles.

5. The coincidence of a regional positive gravity anomaly with the North Pinnacles ridge is intriguing and while the source may well be lithological, the possibility of a sulphide source cannot be discounted. There has been insufficient time either to model this response or to collect additional data but a plausible account of the source is required.

6. Pancontinental have concluded that there are no bedrock EM conductors of significance within the surveyed area. Billiton, however, suggest that a subtle late channel anomaly occurs on line 10200N at 10000E. This occurs near a favourable lithogeochemical contact, enhancing the interest in the anomaly. Modelling of the anomaly has not been carried out but it would appear from its moderate breadth to be at moderate depth only. Further detailing is required to quantify the anomaly position and characteristics.

7. On the adjoining licence (former EL 5/63) BHP carried out a regional bulk leach extractable gold (BLEG) stream sediment survey from which several anomalous sites were highlighted. One of these is coincident with the drainage system from the auriferous rhyolite breccia zone at North Pinnacles and values of 2.9, 5.58ppb Au respectively were obtained (background <0.5ppb Au).

7. EXPLORATION RESULTS

Field work completed within the licence has been limited to lith -ogeochemical sampling as part of the much larger programme within the Mt. Read Volcanics. A total of three samples (14898, 16940, 16941) were collected and analysed (see Appendix 1). The results indicate that the favourable lithogeochemical contact extends along the North Pinnacles ridge and is coincident with the Central Volcanic Complex/Dundas Group contact. (Fig 4).

8. CONCLUSIONS

Within the licence area Billiton has recognized the presence of volcanic stratigraphy that hosts, 3km to the south and 10kms to the northeast respectively, volcanogenic massive sulphide mineralization. Alteration assemblages, base/precious metal anomalism and lithogeochemical characteristics are all favourable indicators of mineralization. Furthermore structural interpretation would suggest that the North Pinnacles Rhyolite occupies the hanging wall to potential mineralization at depth beneath the ridge. The interpreted EM 37 anomaly may be a reflection of this mineralization or alternatively, of remobilized mineralization along a structural conduit.

In essence, Billiton's target is a large polymetallic massive sulphide deposit which on current knowledge is expected to occur beneath or flanking the North Pinnacles ridge at a depth of up to 1000 metres.

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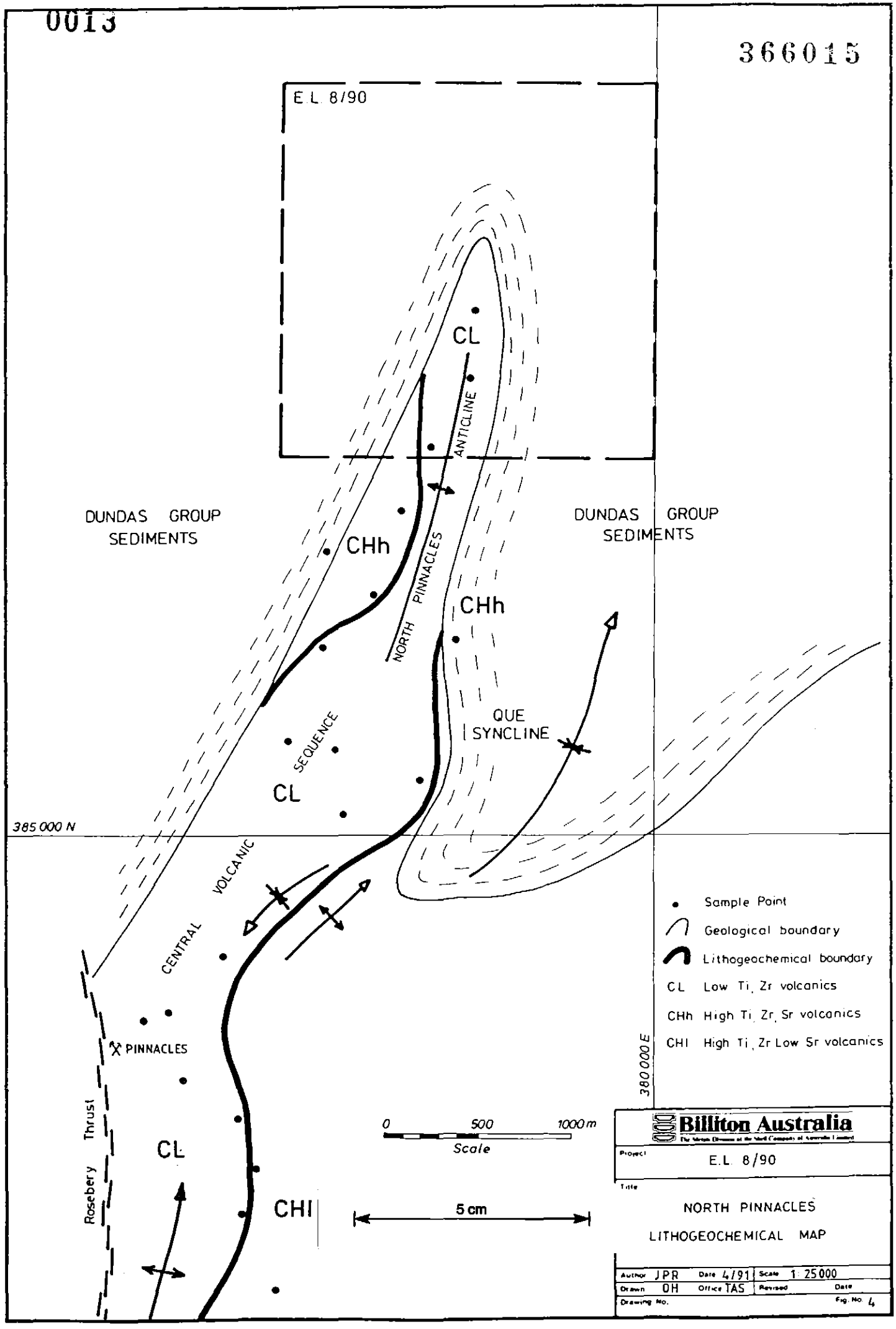
E.L. 8/90
CL
ANTICLINE
DUNDAS GROUP SEDIMENTS
DUNDAS GROUP SEDIMENTS
CHh
NORTH PINNACLES
CHh
QUE SYNCLINE
SEQUENCE
CL
385 000 N
CENTRAL VOLCANIC
PINNACLES
Rosebery Thrust
CL
CHl
380 000 E
0 500 1000 m
Scale
5 cm
Sample Point
Geological boundary
Lithogeochemical boundary
CL Low Ti, Zr volcanics
CHh High Ti, Zr, Sr volcanics
CHl High Ti, Zr Low Sr volcanics
Billiton Australia
Project
E.L. 8/90
Title
NORTH PINNACLES
LITHOGEOCHEMICAL MAP
Author JPR Date 4/91 Scale 1:25000
Drawn OH Office TAS Revised Date
Drawing No. Fig. No. 4

9. RECOMMENDATIONS

As the expected target is very deep, it is considered that a more detailed appreciation of the ?hanging wall alteration system (extent, zonation, type, geochemical anomalism) is required. A BLEG stream sediment and soil survey would define the extent of the precious metal zone. Samples of core should be analysed for lead and oxygen isotope characteristics and litho-geochemical features. The isotopic work should result in an accurate dating of the mineralization and provide evidence for the temperature of the hydrothermal fluids.

The EM 37 anomaly needs to be verified and the deep seeking CSAMT method is proposed to achieve this as it has greater penetration ability. In addition, resolution of the regional gravity anomaly is required both to verify its presence (is it a real anomaly?) and to define its characteristics.

Additional lithogeochemical sampling should be carried out to define the nature of the North Pinnacles rhyolite both in outcrop and in core. The trace of the favourable horizon will also be investigated.

A deep target and stratigraphic oriented diamond drill hole is recommended when the geophysical anomalies have been resolved. An initial specific target test may be extended to provide strat-graphic information or alternatively, a separate deep strati-graphic hole should be drilled.

APPENDIX 1

Geochemical Sample Results

0016

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CLASSIC LABORATORIES LTD
Incorporated in WA; a wholly owned subsidiary of Amdel Ltd
Osman Place, Thebarton, South Australia 5031
Telephone: (08) 43 5722 Facsimile: (08) 234 0321

LD58
845

Mr. Jeff Randell
Billiton Australia Ltd
PO Box 860
DEVONPORT
TAS 7310

FINAL ANALYSIS REPORT

Your Order No: 11722/LD58/JPR Our Job Number : 0AD1119

Samples received : 17-APR-1990 Results reported : 26-APR-1990
No. of samples : 17
Report comprises a cover sheet and pages I1 to I3, 1 to 3

This report relates specifically to the samples tested in so far as that the samples as supplied are truly representative of the sample source.

Note:
If you have any enquiries please contact Mr David Eardley-Harris quoting the above job number.

16930-36 Boco
37-42 Nth. Pinnacles
16940-41 EC 8/90

Approved Signatory:

Dr John Kikkert
General Manager - Adelaide

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

Distribution Codes:
CC - Carbon Copy
EM - Electronic Media
MM - Magnetic Media

"RELIABLE ANALYSES AT COMPETITIVE COST"

NATA Certificate Results in percentages

	16936	16937	16938	16939	16940
SiO2	67.1	77.9	75.3	70.2	75.1
TiO2	0.41	0.23	0.26	0.55	0.32
Al2O3	16.5	11.2	12.7	14.6	12.2
Fe2O3	2.68	1.78	1.37	3.00	0.80
MnO	0.08	0.08	0.02	0.06	0.01
MgO	1.18	0.89	0.72	1.31	0.55
CaO	0.84	0.70	0.81	1.00	0.88
Na2O	1.00	2.56	1.66	4.58	2.42
K2O	2.26	2.52	5.50	1.40	4.56
P2O5	0.28	0.22	0.25	0.29	0.29
LOI	6.50	2.32	1.76	3.38	1.88
Totals	98.8	100.4	100.3	100.4	99.0

Total FE as Fe2O3

0018

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366020

Analysis code ICP 5 Report AC 0AD1119 Page I3

NATA Certificate Results in percentages

	16941	16942
SiO2	75.3	67.7
TiO2	0.35	0.50
Al2O3	12.5	15.2
Fe2O3	1.91	3.56
MnO	0.03	0.03
MgO	0.92	0.82
CaO	0.82	1.51
Na2O	0.24	2.36
K2O	4.18	1.59
P2O5	0.26	0.27
LOI	3.08	4.84
Totals	99.6	98.4

Total FE as Fe2O3

CLASSIC LABORATORIES LTD

366021

0019

ANALYTICAL REPORT

Job: 0AD1119
O/N: 11722/LD58/JPR

Sample	Zr	Sr	Rb	Y	Nb
16930	175	300	120	18	10
16931	180	70	155	24	16
16933	230	78	210	36	13
16934	300	220	75	35	16
16935	260	18	120	16	15
16936	200	78	70	22	14
16937	140	130	95	24	14
16938	145	115	125	25	15
16939	190	200	42	16	11
16940	125	96	84	16	11
16941	155	30	175	22	10
16942	170	320	62	22	10
Units	ppm	ppm	ppm	ppm	ppm
Detn Limit	4	2	2	4	2
Scheme	XRF1	XRF1	XRF1	XRF1	XRF1

	SAMPLE		EASTING	NORTHING	SiO2	Al2O3	TiO2	Fe2O3
46	14845	21	377200	5331200	75.70	13.20	0.290	4.27
47	14847	21	383600	5331150	71.40	13.00	0.290	3.89
48	14848	21	383600	5331150	67.60	11.50	0.210	8.11
49	14849	21	383750	5330850	74.90	13.60	0.270	4.12
50	14850	20	378800	5336350	54.80	17.60	0.970	10.50
51	14851	20	378800	5336350	56.90	16.30	0.880	9.99
52	14852	18	387250	5341150	67.10	14.10	0.970	7.38
53	14853	19	382950	5340450	64.50	13.60	0.380	10.50
54	14854	19	382800	5340250	76.10	14.70	0.300	2.90
55	14855	19	382450	5340650	80.10	9.74	0.250	2.05
56	14856	19	382050	5340800	75.00	15.20	0.350	3.39
57	14857	19	381600	5341150	72.40	16.80	0.390	3.47
58	14858	19	381400	5341050	44.00	23.20	0.890	14.50
59	14859	16	377550	5344600	58.50	14.20	0.620	5.38
60	14860	16	377600	5345000	66.60	16.20	0.680	5.26
61	14861	16	377300	5345500	65.70	14.90	0.690	6.79
62	14862	16	376450	5350100	64.70	17.00	0.630	6.28
63	14863	16	376780	5350940	66.30	15.10	0.670	5.88
64	14864	16	377060	5350500	73.00	14.90	0.380	3.73
65	14865	16	377200	5351460	61.70	16.70	1.040	10.30
66	14866	16	378050	5352400	71.30	15.00	0.390	4.43
67	14867	16	378460	5353000	68.20	14.80	0.640	5.91
68	14868	17	379120	5354500	69.80	15.70	0.500	4.75
69	14869	17	379640	5354940	60.10	13.60	0.440	7.95
70	14870	17	380160	5355260	59.40	14.30	0.460	7.71
71	14871	17	380570	5355700	59.50	14.50	0.540	7.23
72	14872	17	380640	5356000	57.10	15.50	0.550	7.61
73	14873	17	380860	5356920	61.20	15.80	0.810	6.16
74	14874	17	381100	5357850	62.30	15.30	0.780	5.81
75	14875	17	381040	5358500	68.40	12.70	0.490	5.31
76	14876	17	381180	5358940	72.80	12.30	0.410	3.40
77	14877	17	381180	5358960	71.10	11.10	0.270	3.45
78	14878	15	385440	5362760	67.70	12.20	0.530	7.43
79	14879	15	385560	5366840	72.20	10.30	0.160	2.44
80	14880	15	385800	5366700	65.20	12.10	0.470	11.10
81	14881	15	386220	5366380	68.60	13.10	0.520	6.15
82	14882	15	386680	5369520	59.30	14.30	0.780	7.12
83	14883	15	386680	5370220	56.70	15.10	0.900	8.83
84	14884	15	386480	5371320	63.10	13.90	0.780	7.44
85	14885	12	386160	5372940	71.60	12.30	0.440	2.87
86	14886	12	386320	5373740	74.70	11.80	0.370	1.75
87	14887	12	385980	5374260	67.30	14.80	0.180	3.82
88	14888	12	385600	5374340	78.30	10.60	0.130	0.98
89	14889	9	381840	5385200	73.70	12.20	0.150	2.27
90	14890	9	381460	5385460	75.60	11.50	0.250	1.50
91	14891	9	380920	5385460	69.30	14.20	0.290	2.68
92	14892	9	378800	5385260	75.50	11.20	0.220	0.59
93	14893	9	378800	5385260	71.40	11.90	0.400	3.43
94	14894	9	378360	5385060	73.70	11.30	0.320	2.85
95	14895	9	378320	5385450	77.80	11.30	0.290	1.36
96	14896	9	378520	5386250	71.60	12.90	0.550	3.38
97	14897	9	378660	5386700	70.60	14.20	0.350	2.63
98	14898	9	378840	5387040	81.80	8.93	0.110	1.42
99	14899	9	377720	5384320	76.70	11.50	0.220	1.70
100	14900	9	377200	5383800	77.60	11.10	0.310	1.17

	Sample	MgO	CaO	Na_2O	K_2O	MnO	P_2O_5	As
46	14846	0.880	0.0320	0.280	4.91	0.1300	0.0290	4.0
47	14847	0.780	0.0022	0.140	6.06	0.0200	0.0130	4.0
48	14848	0.610	0.0082	0.120	5.51	0.0540	0.0130	19.0
49	14849	0.480	0.0085	0.660	4.61	0.0580	0.0230	4.0
50	14850	4.030	2.9000	4.780	1.63	0.1100	0.1100	4.0
51	14851	5.390	2.9100	4.110	2.06	0.1300	0.1100	4.0
52	14852	1.950	0.1200	2.910	4.08	0.0440	0.0820	4.0
53	14853	3.370	0.0130	0.010	2.90	0.1800	0.0340	4.0
54	14854	0.790	0.0032	0.130	4.45	0.0260	0.0067	4.0
55	14855	0.042	0.0000	0.180	2.05	0.0039	0.0064	12.0
56	14856	0.520	0.0000	0.110	4.56	0.0150	0.0400	4.0
57	14857	0.520	0.0000	0.320	3.89	0.0290	0.0280	4.0
58	14858	3.430	0.0026	0.031	3.08	0.1000	0.3000	4.0
59	14859	2.340	0.2400	1.650	4.10	0.0920	0.0840	4.0
60	14860	1.970	0.0850	2.030	4.44	0.0700	0.0690	4.0
61	14861	2.950	0.0510	1.730	4.42	0.1400	0.1000	4.0
62	14862	2.070	0.0380	2.840	3.12	0.0520	0.0820	4.0
63	14863	2.770	0.0850	2.150	4.57	0.0580	0.0990	4.0
64	14864	0.530	0.7900	1.120	4.02	0.0740	0.0660	4.0
65	14865	3.140	0.0620	2.310	1.11	0.0530	0.1400	4.0
66	14866	0.760	0.6400	3.900	3.82	0.0480	0.0730	4.0
67	14867	2.940	0.1600	3.060	2.29	0.0190	0.1100	4.0
68	14868	0.690	0.0500	1.530	4.52	0.0120	0.1000	4.0
69	14869	4.150	4.6500	1.860	2.64	0.1200	0.1800	4.0
70	14870	4.050	4.9800	3.220	2.11	0.1000	0.2100	4.0
71	14871	4.010	2.7700	5.340	2.64	0.1400	0.1900	4.0
72	14872	3.320	3.1200	3.640	4.22	0.0770	0.3000	4.0
73	14873	2.950	0.7700	6.360	2.10	0.1500	0.1100	4.0
74	14874	2.340	0.8100	7.580	1.38	0.1300	0.1300	4.0
75	14875	2.400	0.3100	6.050	0.08	0.1000	0.0640	4.0
76	14876	1.130	0.0710	3.020	3.42	0.0340	0.0240	4.0
77	14877	0.830	0.0470	4.300	2.28	0.0230	0.0062	4.0
78	14878	1.160	0.0130	0.360	6.00	0.0420	0.0360	4.0
79	14879	0.610	0.5100	2.820	2.45	0.0300	0.0054	4.0
80	14880	1.750	0.0190	0.084	5.72	0.0520	0.0740	4.0
81	14881	1.270	0.0500	0.077	6.04	0.1300	0.0740	4.0
82	14882	3.100	4.5200	2.380	4.31	0.2300	0.1400	4.0
83	14883	4.490	1.9200	1.030	5.22	0.4200	0.1800	4.0
84	14884	3.080	0.4400	2.110	4.28	0.2200	0.1200	4.0
85	14885	1.300	0.7400	2.150	4.64	0.0720	0.0680	4.0
86	14886	0.870	1.1300	3.340	2.39	0.0680	0.0410	4.0
87	14887	1.760	0.0430	0.360	4.41	0.1200	0.0000	4.0
88	14888	0.140	0.0470	1.150	4.81	0.0082	0.0000	4.0
89	14889	0.430	0.2000	2.500	4.30	0.0680	0.0000	4.0
90	14890	0.120	0.4300	3.290	4.33	0.0230	0.0190	4.0
91	14891	0.390	0.1100	4.090	4.14	0.0360	0.0190	4.0
92	14892	0.010	0.0770	3.330	3.98	0.0031	0.0100	4.0
93	14893	1.870	1.2900	3.170	2.91	0.0830	0.0420	4.0
94	14894	0.850	0.1600	2.850	5.14	0.0460	0.0340	4.0
95	14895	0.420	0.0450	2.590	3.10	0.0076	0.0065	4.0
96	14896	0.910	0.2600	1.970	2.77	0.0380	0.0900	4.0
97	14897	0.180	0.3200	2.310	3.29	0.0430	0.0520	24.0
98	14898	0.620	0.0550	1.420	2.19	0.0240	0.0000	113.0
99	14899	0.300	0.0650	3.470	3.13	0.0290	0.0057	4.0
100	14900	0.420	0.0044	0.110	4.25	0.0290	0.0000	4.0

		Ba	Ce	Co	Cr	Cu	Ga	La
46	14846	1050	180	14	20	58.0	17	47
47	14847	2050	170	25	20	1187.0	17	52
48	14848	1850	120	110	20	684.0	18	10
49	14849	1050	140	16	20	1.0	15	39
50	14850	1150	94	39	20	11.0	22	10
51	14851	2050	130	38	20	6.0	16	10
52	14852	1050	130	46	20	6.0	20	37
53	14853	1250	130	45	20	93.0	18	27
54	14854	1350	150	14	20	1.0	18	35
55	14855	1950	130	27	20	15.0	18	10
56	14856	1650	200	19	20	6.0	19	52
57	14857	950	110	12	20	41.0	21	51
58	14858	950	160	64	160	389.0	24	79
59	14859	1250	120	24	140	39.0	20	42
60	14860	1450	150	25	180	12.0	21	38
61	14861	1150	140	41	130	1.0	21	46
62	14862	850	120	19	70	1.0	23	37
63	14863	1150	150	30	140	4.0	18	49
64	14864	120	110	26	20	1.0	18	40
65	14865	30	120	42	99	1.0	21	49
66	14866	950	120	37	20	1.0	16	29
67	14867	240	130	34	110	1.0	20	38
68	14868	1450	160	25	20	1.0	19	39
69	14869	1050	170	42	120	60.0	16	62
70	14870	810	180	55	100	37.0	15	70
71	14871	1350	160	50	20	7.0	18	47
72	14872	2950	280	46	86	22.0	19	99
73	14873	1050	79	29	20	1.0	22	10
74	14874	670	100	49	20	1.0	21	23
75	14875	430	83	37	20	1.0	22	10
76	14876	1250	160	31	20	1.0	20	50
77	14877	950	60	27	20	1.0	17	10
78	14878	2650	170	43	20	10.0	16	34
79	14879	760	120	59	20	1.0	16	30
80	14880	1930	160	65	20	1.0	18	47
81	14881	1350	160	26	20	6.0	20	36
82	14882	1250	140	64	20	9.0	19	33
83	14883	1450	150	54	120	23.0	21	40
84	14884	850	88	87	20	1.0	17	10
85	14885	1350	180	24	20	1.0	18	45
86	14886	370	120	39	20	1.0	19	26
87	14887	1650	210	15	20	1.0	19	10
88	14888	2150	170	33	20	1.0	15	46
89	14889	1850	190	29	20	1.0	15	65
90	14890	1950	160	58	20	1.0	19	37
91	14891	2250	230	8	20	1.0	19	72
92	14892	2050	110	35	20	1.0	10	10
93	14893	410	150	26	40	1.0	23	59
94	14894	2150	220	74	20	1.0	14	59
95	14895	720	130	14	20	30.0	15	37
96	14896	1050	140	18	20	1.0	17	32
97	14897	1350	200	27	20	1.0	21	79
98	14898	760	190	54	20	1.0	14	31
99	14899	1250	100	21	20	1.0	15	26
100	14900	850	61	14	20	1.0	16	10

		Nb	Ni	Pb	Rb	Sc	Sr	Th
46	14846	11.0	4.0	3.0	186.0	8	11	20
47	14847	17.0	1.0	9.0	183.0	9	30	16
48	14848	18.0	2.0	3.0	137.0	7	37	14
49	14849	16.0	2.0	17.0	185.0	7	28	23
50	14850	9.0	7.0	10.0	34.0	38	467	3
51	14851	15.0	4.0	3.0	46.0	37	417	3
52	14852	15.0	9.0	19.0	137.0	18	128	14
53	14853	9.0	23.0	238.0	98.0	23	5	7
54	14854	14.0	4.0	50.0	190.0	11	6	18
55	14855	11.0	3.0	29.0	77.0	8	71	13
56	14856	14.0	6.0	174.0	179.0	13	5	11
57	14857	12.0	4.0	47.0	155.0	11	16	19
58	14858	6.0	55.0	11.0	84.0	44	14	25
59	14859	14.0	36.0	237.0	153.0	19	108	17
60	14860	15.0	27.0	23.0	191.0	19	83	21
61	14861	13.0	35.0	3.0	153.0	22	63	23
62	14862	13.0	27.0	3.0	98.0	16	71	21
63	14863	14.0	37.0	3.0	166.0	21	88	20
64	14864	3.0	5.0	3.0	154.0	11	17	27
65	14865	8.0	33.0	3.0	50.0	25	64	17
66	14866	9.0	1.0	3.0	119.0	12	141	20
67	14867	8.0	33.0	3.0	90.0	19	58	21
68	14868	13.0	4.0	3.0	127.0	15	57	14
69	14869	6.0	38.0	3.0	71.0	30	531	20
70	14870	3.0	37.0	3.0	73.0	31	517	23
71	14871	7.0	16.0	3.0	65.0	28	329	21
72	14872	18.0	30.0	3.0	75.0	34	617	25
73	14873	8.0	3.0	3.0	35.0	29	159	8
74	14874	8.0	2.0	42.0	30.0	26	270	17
75	14875	6.0	1.0	44.0	21.0	17	216	13
76	14876	17.0	3.0	3.0	113.0	12	101	20
77	14877	14.0	1.0	3.0	84.0	10	116	19
78	14878	13.0	4.0	3.0	253.0	20	65	9
79	14879	10.0	5.0	10.0	132.0	4	167	24
80	14880	12.0	8.0	14.0	249.0	16	45	11
81	14881	14.0	3.0	22.0	261.0	14	23	16
82	14882	12.0	8.0	40.0	221.0	23	402	13
83	14883	13.0	23.0	214.0	246.0	30	209	10
84	14884	10.0	5.0	49.0	261.0	27	116	10
85	14885	12.0	12.0	110.0	179.0	12	117	21
86	14886	9.0	11.0	48.0	169.0	10	136	19
87	14887	7.0	18.0	10.0	182.0	3	125	17
88	14888	17.0	6.0	11.0	129.0	3	83	16
89	14889	8.0	4.0	3.0	143.0	3	60	23
90	14890	12.0	2.0	7.0	112.0	6	116	20
91	14891	13.0	4.0	18.0	74.0	7	186	21
92	14892	7.0	1.0	25.0	83.0	5	59	25
93	14893	17.0	5.0	240.0	193.0	11	55	32
94	14894	16.0	3.0	10.0	109.0	9	58	27
95	14895	16.0	2.0	9.0	140.0	7	179	30
96	14896	13.0	1.0	6.0	107.0	12	184	16
97	14897	16.0	1.0	246.0	83.0	5	152	18
98	14898	12.0	1.0	256.0	77.0	2	81	9
99	14899	8.0	1.0	38.0	97.0	8	84	17
100	14900	8.0	1.0	9.0	188.0	5	5	15

		U	V	Y	Zn	Zr
46	14846	1	10	35.0	74	264
47	14847	1	10	30.0	69	266
48	14848	1	10	29.0	109	187
49	14849	1	10	29.0	98	201
50	14850	1	290	22.0	66	145
51	14851	1	260	14.0	60	132
52	14852	1	200	26.0	127	256
53	14853	1	120	30.0	738	178
54	14854	1	10	38.0	89	281
55	14855	1	32	25.0	8	157
56	14856	1	53	32.0	84	243
57	14857	1	10	31.0	78	304
58	14858	1	360	26.0	205	165
59	14859	1	120	30.0	415	260
60	14860	1	140	27.0	231	253
61	14861	1	140	29.0	169	261
62	14862	1	93	36.0	87	279
63	14863	1	140	24.0	79	253
64	14864	1	24	41.0	13	248
65	14865	1	190	29.0	99	304
66	14866	1	10	33.0	76	244
67	14867	1	130	26.0	74	239
68	14868	1	60	26.0	50	225
69	14869	1	260	16.0	66	125
70	14870	1	230	16.0	66	140
71	14871	1	210	20.0	133	164
72	14872	1	250	20.0	70	155
73	14873	1	210	16.0	77	136
74	14874	3	120	26.0	86	237
75	14875	1	62	27.0	93	246
76	14876	1	30	36.0	52	229
77	14877	1	22	34.0	64	206
78	14878	1	110	22.0	221	191
79	14879	1	10	16.0	66	133
80	14880	1	180	18.0	156	168
81	14881	1	61	41.0	202	287
82	14882	1	180	23.0	291	162
83	14883	1	230	20.0	594	157
84	14884	1	170	22.0	475	223
85	14885	1	54	30.0	234	242
86	14886	1	43	41.0	87	280
87	14887	1	10	30.0	103	224
88	14888	1	10	30.0	85	243
89	14889	1	10	26.0	20	205
90	14890	1	10	22.0	54	252
91	14891	5	10	27.0	75	243
92	14892	1	10	13.0	43	121
93	14893	1	62	20.0	143	194
94	14894	3	23	32.0	20	140
95	14895	1	22	25.0	108	173
96	14896	1	53	18.0	29	176
97	14897	1	10	28.0	140	208
98	14898	1	10	21.0	17	174
99	14899	1	10	23.0	69	158
100	14900	1	10	20.0	33	209