SOUTH AUSTRALIA

DEPARTMENT OF MINES AND ENERGY

OPEN FILE ENVELOPE NO. 6816

EL 1353, IFOULD LAKE

PROGRESS AND FINAL REPORTS FOR THE PERIOD
19/11/86 TO 19/8/88

Submitted by

BHP Minerals Ltd

1988

ENVELOPE 6816

TENEMENT: EL 1353, Ifould Lake

TENEMENT HOLDER: BHP Minerals Ltd

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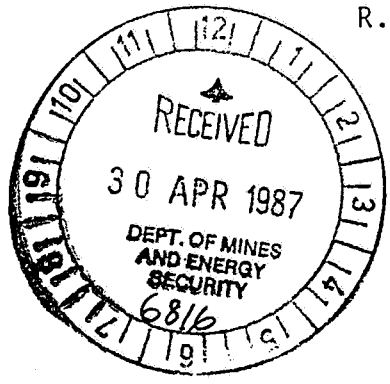
END OF CONTENTS

CR5359

EXPLORATION LICENCE 1353
IFOULD LAKE, SOUTH AUSTRALIA
REPORT FOR THE QUARTER
ENDED 19TH NOVEMBER 1986

R. J. TAYLOR,
ADELAIDE



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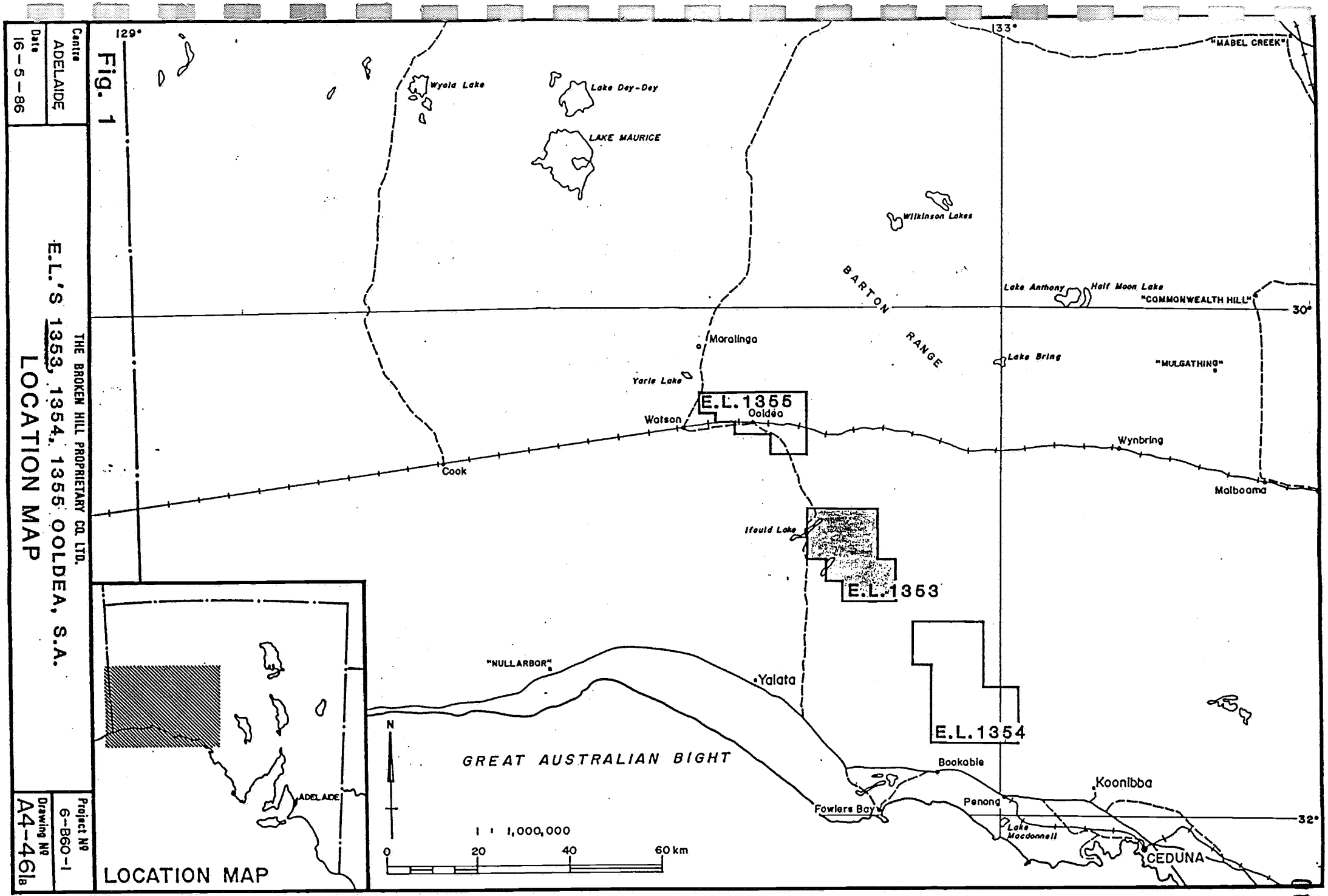


Fig. 1
Centre ADELAIDE
Date 16-5-86
THE BROKEN HILL PROPRIETARY CO. LTD.
E.L.'S 1353, 1354, 1355 OOLDEA, S.A.
LOCATION MAP
Project No 6-B60-1
Drawing No A4-461B
129°
133°
30°
32°
"MABEL CREEK"
Wyola Lake
Lake Dey-Dey
LAKE MAURICE
Wilkinson Lakes
BARTON RANGE
Lake Anthony
Half Moon Lake
"COMMONWEALTH HILL"
Maralinga
Yarle Lake
Lake Bring
"MULGATHING"
E.L. 1355
Ooldea
Watson
Cook
Wynbring
Malbooma
Ifould Lake
E.L. 1353
E.L. 1354
"NULLARBOR"
Yalata
GREAT AUSTRALIAN BIGHT
Bookabie
Koonibba
Penong
Fowlers Bay
Lake Macdonnell
CEDUNA
N
1 : 1,000,000
0 20 40 60 km
ADELAIDE
LOCATION MAP

005

132° 15'

132° 30'

30° 50'

31° 00'

31° 10'

TRAVERSE 2

TRAVERSE 7

TRAVERSE 3

Ruin

Pidinga Bore

Rockhole

Bore

Rockhole

Pidinga Tank

Ifould Bore

Rockhole

Ruin

Ifould Lake

Lake Tallacootra

Moondrah Tanks

RT2510

RT2509

RT2508

RT2507

RT2506

SEISMIC LINE

E.L.1353

64 63 62 61 60 59 58 57 56 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82

106 107 108 109 110 111 112 113 114

83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100 101 102 103 104 105

^{o109} R/C drillhole, prefixed OL

$^{\times}$RT2507 Stream sample site

Scale 1:100 000

0 2 4 6 8 10 km

LOCATION MAP

Loader Pedy

Lake Eyre

Lake Frome

Lake Torrens

Lake Gairdner

Port Augusta

Broken Hill

ADELAIDE

N

200 400 600 km

G81G-1 Fig. 2

THE BROKEN HILL PROPRIETARY CO. LTD.
EXPLORATION DEPARTMENT

E.L.1353 IFOULD LAKE, S.A.

DRILL TRAVERSES, DRILLHOLES AND STREAM SAMPLES

Revisions			
	Drawn:	Date:	Centre:
	Traced:	Project No:	Drawing No: A1-902
	Checked:		

EXPLORATION LICENCE 1353

IFOULD LAKE, SOUTH AUSTRALIA

QUARTERLY REPORT FOR THE PERIOD 20.8.86 TO 19.11.86

1. GENERAL STATEMENT

Exploration Licence 1353 was taken up to test the potential for heavy mineral sands in the Ooldea Ridge. It forms part of a regional exploration programme including nearby ELs 1354 and 1355. A literature search and geological assessment of the Tertiary sediments of the Ooldea Ridge showed that the environment for beach sands preservation may exist.

Reconnaissance geological field work and sampling has been carried out. Drill traverse lines have been delineated and cleared by bulldozer and drill testing commenced early in November 1986.

2. TITLE

Exploration Licence 1353 of 1,220 square kilometres was granted to BHP Minerals Limited on 20th August, 1986 for one year. Its location is shown in Figure 1.

3. FIELD INVESTIGATIONS

3.1 Reconnaissance Sampling

An initial field visit was made to ascertain track access, to collect geological field evidence and take a number of stream samples to be tested for heavy mineral content. Five samples, RT2506-2510, were collected from minor creeks draining the south western flank of the Ooldea Sand Ridge to test for the presence of economic heavy minerals such as rutile, ilmenite and zircon.

These stream samples comprised approximately 20 kg of minus 4 mm stream sediment collected at the most favourable trap site found. The locations of these sample sites are shown in Figure 2.

The samples were submitted to our Mineral Laboratory in Perth and the results can be summarised as follows:

Sample No.	Received Wt kg	Recovered HMs grms	Wt % H.M.s	Principal Heavy Minerals Observed
RT2506	15.5	19.0	0.12	Zircon > Rutile
RT2507	14.0	19.9	0.14	Zircon > Rutile
RT2508	17.5	38.7	0.22	Zircon > Rutile
RT2509	16.5	43.1	0.26	Zircon > Rutile
RT2510	18.0	58.4	0.32	Zircon > Rutile

These samples were only collected to see if any heavy minerals were present. They were not planned as quantitative assessments of the economic minerals. In all five samples the zircon weight was much greater than the rutile weight, but the presence of both minerals was encouraging.

3.2 Track Location for Drill Traverses

The exploration target is a heavy mineral strand-line in marine sands of Tertiary age on the south western flank of the Ooldea Ridge. This ridge is up to 15 km wide giving a distance of 7 or 8 kilometres from the summit ridge southwestwards to the change of slope on the edge of the Nullarbor Plain. Evidence from previous exploration in the area and from SADME personnel indicate the presence of marine sediments along the seaward margin of the ridge which are of Eocene to Miocene age.

Two traverses were selected to test this basic concept within this Exploration Licence. Track reconnaissance was carried out in early September. Mines Department approval for these tracks and the subsequent drilling programme was received on 12th September

1986. The tracks were prepared by a local contractor, Euria Pastoral Company Limited of Nundroo, between 25th September and 7th October, 1986.

Traverse 2. This traverse was sited in the north of the EL as shown in Figure 2 and was 9.7 kilometres long. The upper part of the line east of the SE/NW seismic line was new track, but west of this line, existing tracks were used and the traverse was terminated in a clay pan adjacent to the eastern end of Ifould Lake. The elevation ranged from 200 metres on the ridge to 80 metres adjacent to Ifould Lake.

Traverse 3 This traverse was sited in the east of the EL ranging from a height of 165 metres close to the ridge south-westwards for 7.5 kilometres and terminated at 80 metres which was considered to be the edge of the Nullarbor Plain. Most of the track was positioned across open grassland with very few trees.

Traverse 7 This was a shorter traverse which tested the lower flanks of the ridge between 150 m and 90 m along an existing track over a relatively short distance of 3 kilometres.

3.3 Drilling

The drilling programme was designed to test for the presence of economic heavy minerals and a reverse circulation rig was chosen. Wallis Drilling of Perth were contracted to carry out the work using a Gemco H12 Air Core Rig mounted on a Bedford Truck. The two adjacent ELs 1354 and 1355 were included in this drilling programme which started on 5th November and was completed on 27th November 1986.

Depth of Drill Holes

Drill holes were planned to a depth of 20 metres with occasional holes to go deeper to give extra stratigraphical information. Bedrock was encountered in some holes giving an average depth of 15.7 metres.

Drill Hole Spacing

The higher part of each drill traverse was drilled at a 400 metre hole spacing and the lower section at 200 metre spacing.

Sampling Procedure

The Reverse Circulation system gives an accurate sample from a known depth with minimal contamination. Each 2 metre interval was taken as a single sample. A Jones Splitter was used on site to reduce the size of the sample. A 25% split averaged between 3 and 5 kg and was bagged for detailed analysis. The remaining 75% split was used for geological logging and to give a composite sample for the complete hole. This was taken when the hole was finished and each 20 metre composite was derived from grab samples collected from each 2 metre interval left on the ground at the drillsite. A representative portion from each sample was also panned on site to give a visual estimation of the relative amount of heavy minerals present. A descriptive range from very light trace (v.l.t.), light trace (l.t.), trace, good trace (g.t.), very good trace (v.g.t.) and very very good trace (v.v.g.t.) was used. This served the purpose of highlighting specific samples and groups of samples for detailed analysis. Each individual sample was designated a sample number in the series RT1669 onwards.

Drilling Statistics

Traverse	No. of Holes	Hole Numbers	Total Metres	Average Hole Depth
2	28	OL56 - OL82	392.5	14.0
3	20	OL83 - OL102	350	17.5
7	7	OL106- OL112	121.3	17.3
	55		863.8	15.7

Sample Analysis

All the composite samples from each hole have been submitted to BHP Mineral Laboratory in Belmont, Perth for analysis together with selected individual 2 metre samples. These were selected on the basis of the field panning as described above. Each sample will be processed to give a heavy mineral concentrate which will then be analysed for the relative proportions of economic, titanium bearing heavy minerals.

Details of the laboratory analyses will be reported as soon as they become available. As the drilling was not completed during this quarter the geological interpretation and drill logs will be reported in the next quarterly report.

4. FUTURE PROGRAMME

The results of the recent drilling programme are now awaited and future work will depend upon these analyses. The geological data collected will be reported in the next quarterly report.

5. EXPENDITURE

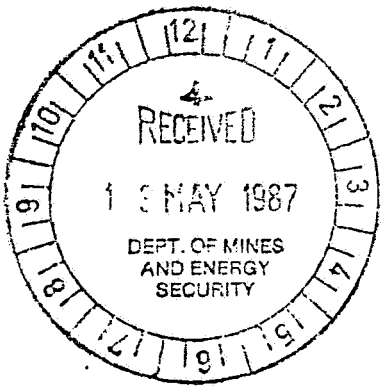
The expenditure in the first three months of this licence to the end of November 1986 is summarised as follows:

	$
Wages and salaries	14,575
Field Support	1,066
Drilling	8,696
Vehicles	1,887
Bulldozing	3,194
Geochemistry	1,214
Maps/Photos	225
Tenement Fees	2,261
Office Expenses	236
Drafting	339
Laboratory Charges	807
Administration	1,725
	$36,225

CR 5398

EXPLORATION LICENCE 1353
IFOULD LAKE, SOUTH AUSTRALIA

REPORT FOR THE QUARTER ENDED 19TH FEBRUARY 1987



R.J. TAYLOR
I. TEDDER

ADELAIDE

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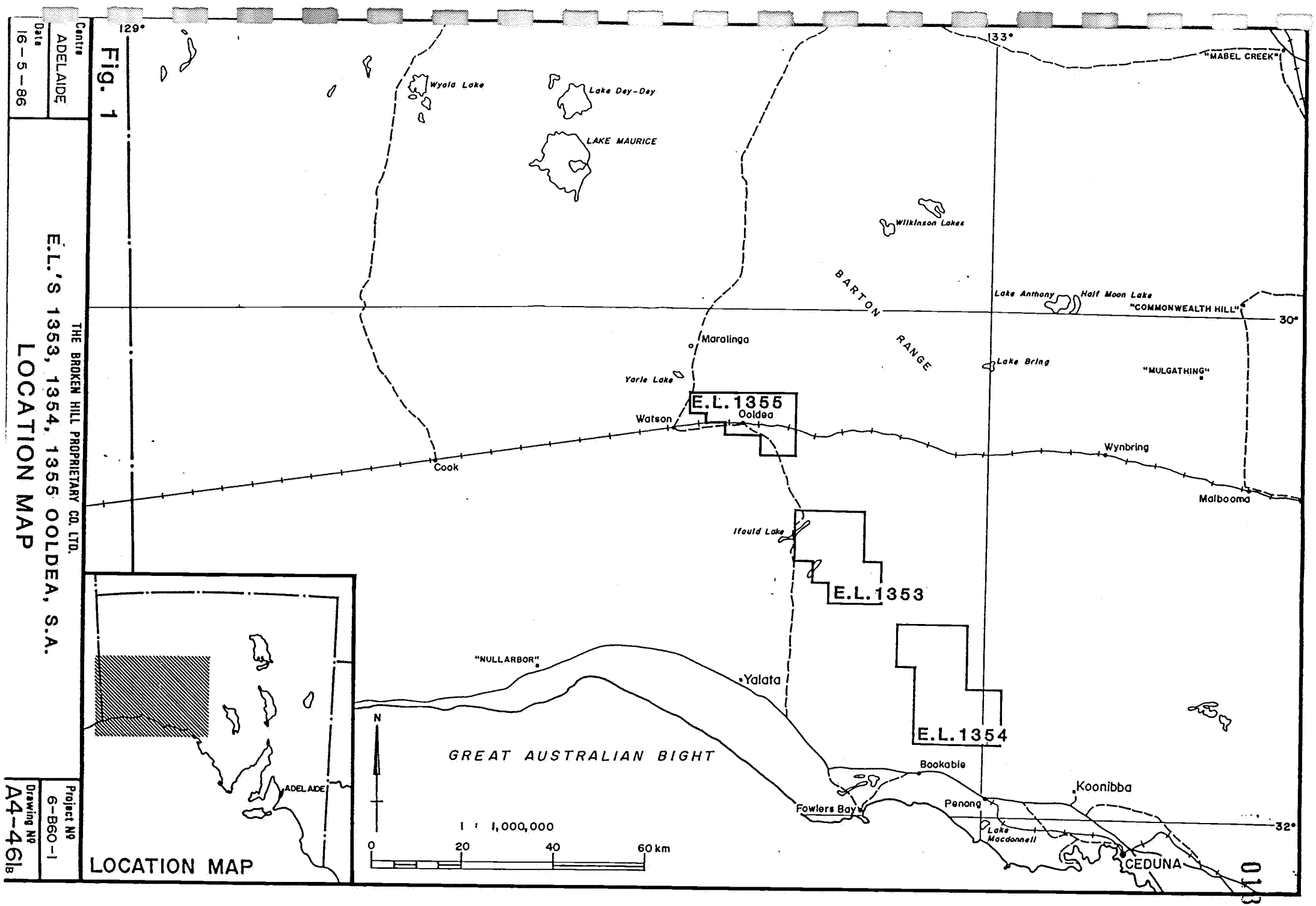
Fig. 1
Centre ADELAIDE
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E.L.'S 1353, 1354, 1355 OOLDEA, S.A.
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E.L. 1355
Ooldea
Watson
Cook
Wynbring
Malbooma
Ifould Lake
E.L. 1353
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LOCATION MAP

132° 15'

132° 30'

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TRAVERSE 2

TRAVERSE 7

TRAVERSE 3

Ruin

Pidinga Bore

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RT2510

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SEISMIC LINE

E.L.1353

64 63 62 61 60 59 58 57 56 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82

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$^{\times}$RT2507 Stream sample site

Scale 1:100 000

0 2 4 6 8 10 km

LOCATION MAP

Loader Pedy

Lake Eyre

Lake Frome

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Port Augusta

Broken Hill

ADELAIDE

N

200 400 600 km

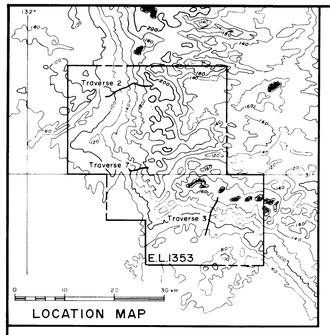
G81G-1 Fig. 2

THE BROKEN HILL PROPRIETARY CO. LTD.
EXPLORATION DEPARTMENT

E.L.1353 IFOULD LAKE, S.A.

DRILL TRAVERSES, DRILLHOLES AND STREAM SAMPLES

Revisions			
	Drawn:	Date:	Centre:
	Traced:	Project No:	Drawing No: A1-902
	Checked:		



LOCATION MAP

REFERENCE

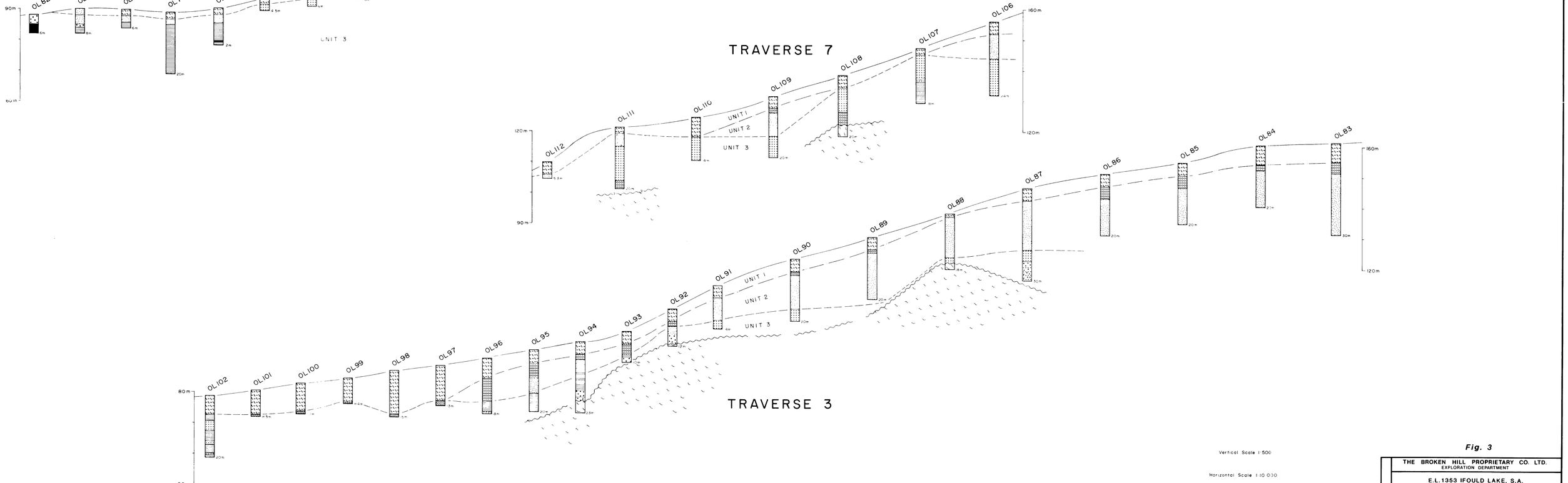
QUATERNARY SANDS — UNIT 1
- Buff to pale brown carbonate and clay rich loose sand.

MIOCENE (Oolidea Sands) — UNIT 2
- Rd-br fine to medium, clay-rich, sand.
- Rd-br fine to medium sand with minor clay. Cleaner to base, occasionally partially cemented.

EOCENE / MIOCENE (Plumridge Beds) — UNIT 3
- Cemented regolithic arenite breccia.
- Off-white to yellow fine to medium sandstones. Tubular structures frequent.
- Coarse to very coarse grained loose quartz sands.
- Grey/green/mauve malleable clays
- Lignite
- Massive grey limestone.

- Foliated Granitic Gneiss.

TRAVERSE 2



TRAVERSE 7

TRAVERSE 3

Vertical Scale 1:500

Horizontal Scale 1:10 000

0 200 400 600 800m

Fig. 3

THE BROKEN HILL PROPRIETARY CO. LTD.
EXPLORATION DEPARTMENT

E.L.1353 IFOULD LAKE, S.A.

GEOLOGICAL SECTIONS
TRAVERSES 2, 3, 7

Prepared: I.J.T./R.J.T.	Date: 7 5 87	Centre: ADELAIDE
Drawn: S.C. Skipworth	Project No:	Drawing No: A1-923
Checked:		

Revisions:

6816-2

EXPLORATION LICENCE 1353

IFOULD LAKE, SOUTH AUSTRALIA

QUARTERLY REPORT FOR THE PERIOD 20.11.86 TO 19.2.87

1. GENERAL STATEMENT

Exploration Licence 1353 was taken up to test the potential for heavy mineral sands in the Ooldea Ridge. It forms part of a regional exploration programme including nearby ELs 1354 and 1355. A literature search and geological assessment of the Tertiary sediments of the Ooldea Ridge showed that the environment for beach sands preservation may exist.

Reconnaissance geological field work and sampling has been carried out. Drill traverse lines have been delineated, cleared by bulldozer and were drill tested in November 1986. Geological interpretation has been completed but analytical results are still incomplete.

2. TITLE

Exploration Licence 1353 of 1,220 square kilometres was granted to BHP Minerals Limited on 20th August, 1986 for one year. Its location is shown in Figure 1.

3. FIELD INVESTIGATIONS AND RESULTS

No field work has been carried out during this quarter.

3.1 Drilling

The drilling programme was described in detail in the previous quarterly report and the statistical information can be summarised as follows:-

Traverse	No. of Holes	Hole Numbers	Total Metres	Average Hole Depth
2	28	OL 56 - OL 82	392.5	14.0
7	7	OL106 - OL112	121.3	17.3
3	20	OL 83 - OL102	350.0	17.5
3	55		863.8	15.7

Drilling was completed on the 27th November 1986.

3.2 Geological Interpretation

A reverse circulation rig was used and each 2 metre interval was separated and used as the basis of the geological logs. In most holes soft sediments and rock chips were produced, but occassional short lengths of core up to a few centimetres long were recovered from more lithified units.

The interpretation of this geological data was combined with similar information from the adjacent ELs 1354 and 1355. Pleistocene and Tertiary sediments intersected are broadly similar across all three ELs, with the main differences being within the lower marine sediments and the underlying basement. A common stratigraphical column has been used for each of the three licences. The Ooldea Stratigraphy is summarised in Table 1.

Traverses 2 and 3 were initially planned to test for the presence of heavy mineral bearing strand-lines on the south-western slope of the Ooldea Range and Traverse 7 was added during the drilling programme to give extra data utilising an existing track.

Table 1

OOLDEA STRATIGRAPHY

RECENT DUNES

- not drilled, 8-12 m
- all holes sited in interdunal corridors

PLEISTOCENE SANDS

- Unit 1

  Brown clay and carbonate rich fine medium grained sand. Calcrete nodules/layers common. Average 2-3 m thick up to 6 m maximum. Predominantly aeolian in origin.

MIOCENE, OOLDEA SANDS

- Unit 2

  Red-brown fine to medium clay sands. Partially cemented and lighter coloured to the base with decreasing clay content, possible weathering effect. Termite burrows in lithified layers. Probably Aeolian origin (some frosted grains).

MIOCENE/EOCENE - PLUMRIDGE BEDS - MARINE SANDS?

- Unit 3

  Predominantly a sandstone with varying Fe content. Fine to coarse grained often well sorted. Lithified and often mottled (? lateritic weathering).

  Minor sequences of brown/white/grey/purple laminated clays towards the base with interbedded lignites to 3 metres. Silicified sandstone very hard. Minor grey/green limestone in T3 ≡ Nullabor limestone? Interpreted as a shoreline facies of ? Miocene age.

PRE-TERTIARY BASEMENT

Bedrock varies from grey/green Palaeozoic Shales and Siltstones in T1 and T6 to Granitic Gneisses in T3 nad T5.

TRAVERSE 2 (T2)

Introduction

Traverse 2 commenced about 1 kilometre south west of the Ooldea Range crest at approximately latitude 30°50', longitude 132°16'. The top of the Ooldea Range in this locality is very wide and quite flat. The traverse progressed south west down the ridge towards the northeastern end of Ifould Lake and stopped just short of the lake. Hole spacing was at 500m for the first 10 holes (to OL65), then at 250m until the end of the traverse. These spacings were positioned on an ideal traverse normal to the ridge crest and projected onto the access track. Drill hole locations are shown in Figure 2.

Logistics

Length:	9.7 km
Holes drilled:	28
Hole numbers:	OL56 to OL82
Metres drilled:	392.5 m
No. of Samples:	226
Sample numbers:	RT 2969 to RT 3186

Geology

Three stratigraphic units were identified on Traverse 2. They will be described in some detail in this section for reference purposes, as the same units were noted on the other traverses, 3 and 7.

Unit 1. Pale brown to buff coloured, carbonate and clay rich fine to medium grained sand. The carbonate occurred as fine dust and/or calcrete fragments. The unit on Traverse 2 was up to 6 m thick. It is interpreted to be Quaternary in age and predominantly aeolian in origin.

Unit 2. Generally fine to medium grained, (minor coarse grains) poorly sorted clay rich sand. The coarser grains are subrounded and have a frosted appearance. There are three distinct zones in Unit 2.

Zone 1: Red brown, clay rich lumpy fine to medium grained sand. Thickness generally 2 to 3 metres.

Zone 2: Red brown, clay rich, loose, fine to medium grained sand. The sand becomes cleaner with an orangy-red colour towards the base. Thickness 10 to 15 m.

Zone 3: Curry yellow to pale yellow loose fine to medium grained sand.

These zones are basically differentiated on their clay content and show systematic relationship to the topography of the Ooldea Sand Ridge. It would appear the zones reflect the effects of weathering. Partially cemented layers sometimes occur within zones 2 and 3. Termite burrows were commonly observed where core of these lithified layers was returned.

Unit 2 is considered to be of aeolian origin. It is interpreted as the Ooldea Beds referred to by M. Benbow (BMR Record 1983/27) and given a Late Miocene to Pliocene age.

Unit 3. This is a complex stratigraphic unit compared to the others. It predominantly comprises fine to coarse grained sandstone with a wide range of iron stain colours. The recovery of some core indicated the sandstones retained a few primary bedding structures. Sorting can be quite good. Three other lithologies can be assigned to this unit.

1) A malleable clay of grey green to mauve colour associated occasionally with lignite.

2) A silica cemented, ferruginous sandstone breccia.

3) A pale grey green limestone, equated with the Nullabor Limestone.

These last three lithologies tend to occur on the lower slopes of the Ooldea Sand Range.

Two features were used in the field to distinguish the sandy type lithologies of this Unit from the other Units.

1) The sands are commonly very lithified, cemented by either iron oxides or silica cement.

2) The sandstone was often mottled indicating it has suffered a degree of lateritic weathering.

Unit 3 is correlated with the Plumridge Beds. This unit is considered to be the shore line facies of the Nullabor Limestone. Its age is Mid Miocene.

Discussion

Distribution of the 3 Units on Traverse 2 is fairly typical for the traverses along the Range. Unit 3 dominates the lower southwestern slopes of the Ooldea Sand Range. Clays and lignites were intersected in the last 5 holes of the traverse. The 8 preceeding holes met silicified, ferruginised sandstone breccias. Penetration rates of the drill rig in this lithology were extremely slow (e.g. 20 cm in half an hour). The breccias are interpreted to be silicified regolith, indicating a Miocene weathering period. Pisolites in sandstone breccia in hole OL70 supports this theory. Unit 3 was logged at the base of two other holes, OL61 and OL62. Here the mottled cemented nature of the sandstones differentiate it from Unit 2.

Unit 2 is confined to the upper two thirds of Traverse 2. The aeolian sands are generally 15-18m thick, thinning out completely over a distance of 750 m by OL71. The three weathering zones can be identified in most holes. Termite burrows preserved in cemented layers occur in at least three holes on the lower slopes of the ridge. There are more cemented horizons on the lower parts of the Ooldea ridge in Unit 2 than higher up, mimicking a pattern noted in Unit 2.

Unit 1 is fairly evenly distributed over the three units. It was not recognised on the last two holes OL81 and OL82, which were sited on a recent dune and a salt lake, respectively.

This geology is summarised in Figure 3 and the drill logs for Traverse 2 are included as Appendix A.

TRAVERSE 7 (T7)

Introduction

Traverse 7 was planned while the drilling programme was in progress. It was sited along a convenient track that allowed ready access to the lower slopes of the Ooldea Range, but not the upper part. The traverse was drilled parallel a deep (3m) gully which exposed several outcrops of fine grained white sandstone.

Unfortunately 2 of the 9 holes planned were not drilled due to rig break down and logistic constraints. (Figure 2)

Logistics

Traverse Length:	3 km
Holes drilled:	7
Hole numbers:	OL106 - OL112
Metres drilled:	121.3 m
Number of samples:	69
Sample numbers	RT 3397 - RT 3465

Geology

The geology on Traverse 7 is a little more difficult to interpret, possibly due to the short length of the traverse, its location on the lower slopes of the Ooldea Sand Range where the geology is more complex and the wide hole spacing (500 m).

The dominant unit drilled was Unit 3. As usual a variety of lithologies were encountered. Fine grained, moderately well sorted sands and sandstone with a wide range of colours from white and yellow through to orange, red-brown and purple occurred. There was no recognisable pattern of lithification down hole. For example, hole OL108 penetrated hard sandstone layers before entering loose flowing sands. The opposite happened in OL110 where the sands became increasingly impenetrable.

A moderately lithified mottled argillite and sandstone horizon occurred in OL107. The adjacent holes did not intersect it.

The last two holes, OL111 and OL112 drilled initially into siliceous, ferruginous, regolithic breccias with sandstone and argillite clasts. Pisolites, some quite well developed were observed in both holes in this siliceous zone. Only OL111 drilled through into underlying lithified fine grained sandstone.

Unit 2 is recognised in only two widely separated holes (OL106 and OL109). The weathering zones (described in Traverse 2 Report) were identified in both holes.

Unit 1, the carbonate rich clayey sand occurs as a blanket cover over the whole traverse as usual.

Discussion

This traverse clearly only tested a small part of the Ooldea Sand Range. The hole spacing is double that of the other traverses at the equivalent section of the ridge so making this traverse appear a little more complex. However, the basic features seen on the others were noted here. For example, Unit 3 is lithologically complex and has undergone weathering. This has resulted in the silicification and ferruginisation of the sands and erosion of an unknown amount of sand from the unit.

This geology is summarised in Figure 3 and the drill logs for Traverse 7 are included as Appendix B.

TRAVERSE 3 (T3)

Introduction

This traverse commenced within 2 km of the top of the Ooldea Sand Range at approximately 31 degrees 02 minutes south and 132 degrees 24 minutes east. Holes were drilled on a bulldozed line heading SSW. Initial hole spacing of 500 m was decreased to 250 m after OL91. (Figure 2)

Traverse 3 continued

Logistics

Traverse length:	7.5 km
Holes drilled:	20
Hole numbers:	OL83 - OL102
Metres drilled:	350 m
Number of samples:	202
Sample numbers:	RT 3195 - RT 3396

Holes OL103, OL104 and OL105 were not drilled. (Figure 2)

Geology

The lithologies on this traverse are much the same as on the other traverses. For detailed lithological description of the units refer to Traverse 2 (T2).

The three Units logged on this traverse were:

Unit 1: Quaternary, carbonate and clay rich fine to medium grained sand.

Unit 2: Late Miocene - Pliocene red-brown clay rich, fine to medium grained sand.

Unit 3: Miocene aged group of lithologies which include:
- malleable grey green clay (with or without lignite).
- pale grey green limestone (Nullabor Limestone
- mottled, silicified, fine to coarse grained sandstone.

Basement was intersected in 3 holes (OL88, OL92 and OL94). Two other holes, OL87 and OL93 were very close to basement judging from the coarse grained poorly sorted gritty sands that usually appear just before basement is hit. Basement lithologies varied from hole to hole. Very coarse grained granitic gneiss was observed in OL92, while foliated gneiss occurred in OL88.

Unit 3

The lower half of the traverse had a string of 5 holes (OL87 - OL101) that intersected limestone, yet holes on either side only penetrated malleable clays. Thin ferruginous sandstones are interbedded with the malleable clays in OL102 suggesting the sand acted as an aquifer for iron rich groundwaters. The iron could well have come from upslope where there are fractured ferruginous argillites (OL95) and mottled sandstones.

Unit 2

Unit 2, with its typical weathering zones (clay rich top grading down to relatively clean yellow sands) occurs over the upper two thirds of Traverse 3. The Unit generally thins down slope (south). Maximum thickness of over 23 m was intersected in the first hole.

Unit 1

Unit 1 lies as a blanket over the whole traverse. The only unusual feature is that it is particularly thick (about 10 to 14 m) on the lower slopes of the ridge.

Discussion

An irregular topographically high crystalline basement is apparent on the cross section of the traverse. This basement would have had ultimate control on the form and distribution of the prospective marine sediments during the Miocene (Unit 3).

Unit 2 is considered to be an aeolian product derived from the erosion and reworking of Unit 3 sands. This may have implications for heavy mineral deposits on the Range and may require a transfer of emphasis from marine sediments to aeolian sands.

Some lithologies intersected in Unit 3 on the lower slopes, clays and/or limestones, are not condusive to the accumulation of heavy mineral strand-lines and thus holes OL103, 104 and 105 were not drilled.

These geological interpretations are summarised in Figure 3 and the drill logs for Traverse 3 are included as Appendix C.

3.3 Sample Analysis

The sampling procedure was described in the previous quarterly report. For each hole a composite sample was collected from grab samples derived from every 2 metre interval for a 20 m depth of hole. Each 2 metre interval was sampled by taking a 25% split of the original drill material.

All the composite samples from each hole have been submitted to the BHP Mineral Laboratory in Belmont, Perth for analysis together with selected individual 2 metre samples. These were chosen on the basis of the field panning as described in the previous quarterly report, where concentrates were graded visually in a qualitative manner only. These samples are being processed to give a heavy mineral concentrate from which the relative proportions of economic heavy minerals will be ascertained.

The analytical work is only partially completed and therefore will be fully documented in the next report. To date the concentrations of economic heavy minerals, rutile, zircon and ilmenite, fall within the range 0.12% to 0.39% for these traverses.

4. FUTURE PROGRAMME

The results of this drilling are incomplete and future work will depend upon the assessment of these analyses when they are all received.

5. EXPENDITURE

The expenditure in the second quarter of this licence to the end of February 1987 is summarised as follows:-

	$
Wages and Salaries	3,617
Field Support	1,836
Drilling	12,665
Vehicles	1,255
Equipment	312
Surveys/Photos	85
Office Supplies	81
Freight	38
Laboratory Costs	1,077
Drafting	135
Administration & Overheads	1,055
	$22,156

The total expenditure to date for EL.1353 is $58,381.

This report is submitted to the
Department of Mines and Energy
as required by Clause 2 of EL.1353

APPENDIX A

DRILL LOGS - TRAVERSE 2

Drill Holes OL56 - OL82

Abbreviations used in geological logs:-

H.M.C.	Heavy mineral concentrate.
tr.	trace
v.l, l, g, v.g.tr.	very light, light, good, very good trace.
f.m.g.	fine to medium grained.
c.g.	coarse grained.

BHP MINERALS LIMITED

PROJECT: OOLDEA
LOCATION: PIDINGA IFOULD SHEET T2
MAP REFERENCE: BARTON SH53-9
COORDINATES: 237734.0mE 6585628mN
LOGGED BY: I. TEDDER

DRILLHOLE: OL 56
TOTAL DEPTH: 26 m
OPERATOR: WALLIS
RIG: GEMCO H12
DATE: 17/11/86

SAMPLE NO	METREAGE	H.M.C.	GEOLOGICAL DESCRIPTION	COMMENTS
RT2969	0 - 2	1 tr	Pale brown carbonate and clay rich f.m.g. sand	
RT2970	2 - 4	1 tr	Brown carbonate and clay with rich f.m.g. sand	
RT2971	4 - 6	1 tr	Reddish brown, clay rich f.m.g. sand.	
RT2972	6 - 8	1 tr	Reddish brown, minor clay, f.m.g. sand loose,	
			mod. sorting, some c. grains.	
RT2973	8 - 10	1 tr	" " " " " " "	
RT2974	10 - 12	1 tr	" " " " " 5% lumps "	
RT2975	12 - 14	1 tr	" " " " " 10% lumps "	
RT2976	14 - 16	1 tr	" " " " " 5% lumps "	
RT2977	16 - 18	1 tr	" " " " " " "	
RT2978	18 - 20	1 tr	Yellow brown f.m.g. mod. poorly sorted, loose	
			sand, cleaner.	
RT2979	20 - 22	1 tr	" " " " " " "	
RT2980	22 - 24	1 tr	Crmy. yellow f.m.g. mod. poorly sorted loose	
			Sand. V. clean.	
RT2981	24 - 26	1 tr	Crmy. yellow f.m.g. " " " " "	
			Just at 26 m hit harder cemented red brown sand -	
			better sorted grain size etc.	
			Sands above 26 probably mod. well sorted with	
			c.g. layers.	
			Composite RT2982 0 - 26 m	

REMARKS:

BHP MINERALS LIMITED

PROJECT: OOLDEA
LOCATION: PIDINGA IFOULD SHEET T2
MAP REFERENCE: BARTON SH53-9
COORDINATES: 237251.0mE 6585327.0mN
LOGGED BY: I. TEDDER

DRILLHOLE: OL 57
TOTAL DEPTH: 20 m
OPERATOR: WALLIS
RIG: GEMCO H12
DATE: 17/11/86

SAMPLE NO	METREAGE	H.M.C.	GEOLOGICAL DESCRIPTION	COMMENTS
RT2983	0 - 2	*1 tr	Pale brown cb and clay rich f.m.g. sand, minor	
			loose c.g.,mod poor sorted.	
RT2984	2 - 4	1 tr	" " " " " "	
RT2985	4 - 6	1 tr	Dark red brown clay lumpy f.m.g. sand. Minor c.g.	
			Moderately poor sorted.	
RT2986	6 - 8	1 tr	Red brown loose clayey f.m.g. sand, minor c.g.	
			Moderate poor sorted.	
RT2987	8 - 10	vl tr	" " " " " " " "	
RT2988	10 - 12	vl tr	" " " " " " " "	
RT2989	12 - 14	1 tr	" " " " " " " "	
RT2990	14 - 16	vl tr	Yellowish red. loose clayey f.m.g. sand, as	
			above 10% lumps.	
RT2991	16 - 18	vl tr	" " " " " " " " "	
RT2992	18 - 20	1 tr	" " " " " " " " "	
			Composite RT2993 0 to 20 m	
			* Very light trace to light trace! - Less than	
			in hole OL56.	

REMARKS:

BHP MINERALS LIMITED

PROJECT: OOLDEA
LOCATION: IFOULD T2
MAP REFERENCE: BARTON SH53-9
COORDINATES: 236784.0mE 6585266.0mN
LOGGED BY: I. TEDDER

DRILLHOLE: OL58
TOTAL DEPTH: 20 m
OPERATOR: WALLIS
RIG: GEMCO H12
DATE: 17/11/86

SAMPLE NO	METREAGE	H.M.C.	GEOLOGICAL DESCRIPTION	COMMENTS
RT2994	0 - 2	1 tr	Pale brn carbonate clay rich f.m.g.(minor cg)	
			loose sand	
RT2995	2 - 4	1 tr	" " " " " " "	
RT2996	4 - 6	v 1 tr	Red brown clay rich lumpy f.m.g. (minor cg) sand	
RT2997	6 - 8	v 1 tr	" " " " " " "	
RT2998	8 - 10	v 1 tr	Red brown clay rich loose f.m.g. (minor cg) sand	
RT2999	10 - 12	v 1 tr	" " " " " " "	
RT3000	12 - 14	1 tr	" " " " " " "	
RT3001	14 - 16	1 tr	" " " " " " "	
RT3002	16 - 18	1 tr	" " " " " " "	
RT3003	18 - 20		" " " " " " "	
			Composite RT3004 0 to 20 m	
			N.B. The heavy minerals (H,) are very fine	
			grained in OL56, 57 and 58.	

REMARKS:

BHP MINERALS LIMITED

PROJECT: OOLDEA
LOCATION: T2
MAP REFERENCE: BARTON SH53-9
COORDINATES: 236362.0mE 6585342.0mN
LOGGED BY: I. TEDDER

DRILLHOLE: OL59
TOTAL DEPTH: 20 m
OPERATOR: WALLIS
RIG: GEMCO H12
DATE: 17/11/86

SAMPLE NO	METREAGE	H.M.C.	GEOLOGICAL DESCRIPTION	COMMENTS
RT3005	0 - 2	1 tr	Pale brn carbonate and clay rich f.m.g. (minor	
			cg) loose sand	
RT3006	2 - 4	v l tr	Brn carbonate " " " " " "	
RT3007	4 - 6	v l tr	Brn clay rich lumpy f.m.g. (minor cg) sand	
RT3008	6 - 8	v l tr	" " " " " "	
RT3009	8 - 10	v l tr	Red brn clay rich loose f.m.g. (minor cg) sand	
RT3010	10 - 12	v l tr	" " " " " " "	
RT3011	12 - 14	v l tr	" " " " " " "	
RT3012	14 - 16	v l tr	" " " " " " "	
RT3013	16 - 18	v l tr	" " " " " " "	
RT3014	18 - 20	1 tr	" " " " " " "	
			Composite RT3015 0 - 20 m	

REMARKS:

BHP MINERALS LIMITED

PROJECT: OOLDEA
LOCATION: T2
MAP REFERENCE: BARTON SH53-9
COORDINATES: 235804.0mE 6585387.0mN
LOGGED BY: I. TEDDER

DRILLHOLE: OL60
TOTAL DEPTH: 20 m
OPERATOR: WALLIS
RIG: GEMCO H12
DATE: 18/11/86

SAMPLE NO	METREAGE	H.M.C.	GEOLOGICAL DESCRIPTION	COMMENTS
RT3016	0 - 2	1 tr	Pale brown/ish carbonate clay rich f.m.g. (minor	
			cg) ± 50% calcrete	
RT3017	2 - 4	1 tr	Red brown lumpy clay rich f.m.g. (minor cg) sand	
			Mod. poor sorted.	
RT3018	4 - 6	v 1 tr	Red brown loose clayey f.m.g. (minor c.g.) mod.	
			sorted sand.	
RT3019	6 - 8	v 1 tr	" " " " " " " "	
RT3020	8 - 10	v 1 tr	" " " " " " " "	
RT3021	10 - 12	v 1 tr	" " " " " " " "	
RT3022	12 - 14	v 1 tr	" " " " " " " "	
Rt3023	14 - 16	v 1 tr	" " " " " " " "	
RT3024	16 - 18	v 1 tr	Pale yellow, loose, f.m.g. (minor cg) mod.poor	
			sorted sand.	
RT3025	18 - 20	v 1 tr	Off white very clean 10-20% lumps, loose f.m.g.	
			(minor cg) mod. poor sorted sand.	
			Composite RT3026 0 to 20 m	

REMARKS:

BHP MINERALS LIMITED

PROJECT: OOLDEA
LOCATION: T2
MAP REFERENCE: BARTON SH53-9
COORDINATES: 235276.0mE 6585528.0mN
LOGGED BY: I. TEDDER

DRILLHOLE: OL61
TOTAL DEPTH: 20 m
OPERATOR: WALLIS
RIG: GEMCO H12
DATE: 18/11/86

SAMPLE NO	METREAGE	H.M.C.	GEOLOGICAL DESCRIPTION
RT3027	0 - 2	1 tr	Pale brown, carbonate & clay rich (10% calcrete) f.m.g.
			(minor cg) sand
RT3028	2 - 4	1 tr	Pale org/br, carbonate & clay " " " " " " " "
RT3029	4 - 6	v 1 tr	Brown clay rich, lumpy f.m.g. (minor cg) med.poor sorted
			sand. 5% calcrete lumps.
RT3030	6 - 8	1 tr	Red brown clay rich, loose f.m.g. (minor cg) mod. poor
			sorted sand
RT3031	8 - 10	1 tr	" " " " " " " " "
RT3032	10 - 12	1 tr	" " " " " " " " "
RT3033	12 - 14	1 tr	" " " " " " " " "
RT3034	14 - 16	1 tr	Red brown clay rich,loose with lumps " " " "
RT3035	16 - 18	tr	Buff white and red brown lumpy f.m.g.(minor cg) sand
RT3036	18 - 20	1 tr	As above but last 1 metre hit v.g. gneiss - Basement
			Composite RT3037 0 - 18 m
			H.Spec. of basement collected.

REMARKS:

BHP MINERALS LIMITED

PROJECT: OOLDEA
LOCATION: T2
MAP REFERENCE: BARTON SH53-9
COORDINATES: 234688.0mE 6585688.0mN
LOGGED BY: I. TEDDER

DRILLHOLE: OL62
TOTAL DEPTH: 20 m
OPERATOR: WALLIS
RIG: GEMCO H12
DATE: 18/11/86

SAMPLE NO	METREAGE	H.M.C.	GEOLOGICAL DESCRIPTION
RT3039	0 - 2	v l tr	Pale brn, carbonate & clay rich f.m.g. (minor cg) loose
			sand 20% lumps
RT3038	2 - 4	l tr	" " " " " " " " "
			sand 40% lumps
RT3040	4 - 6	l tr	Pale red brown clay rich lumpy f.m.g. (minor cg) sand
			minor calcrete still
RT3041	6 - 8	l tr	Red brown clay rich lumpy f.m.g. (minor cg) sand.No calcrete
RT3042	8 - 10	l tr	Red " " " loose " " " " " "
RT3043	10 - 12	l tr	" " " " " " " " " " "
RT3044	12 - 14	tr	" " " " " " " " " " "
RT3045	14 - 16	tr	" " " " " " " " " " "
RT3046	16 - 18	tr	" " " " " " " " " " "
RT3047	18 - 20	tr	White lumpy - Si cemented? and red brown (loose) f.m.g.
			(minor cg) sand
			Composite RT3048 0 - 20 m
			Heavy minerals still very fine grained.

REMARKS:

BHP MINERALS LIMITED

PROJECT: OOLDEA
LOCATION: T2
MAP REFERENCE: BARTON SH53-9
COORDINATES: 234131.0mE 6585794.0mN
LOGGED BY: I. TEDDER

DRILLHOLE: OL63
TOTAL DEPTH: 20 m
OPERATOR: WALLIS
RIG: GEMCO H12
DATE: 18/11/86

SAMPLE NO	METREAGE	H.M.C.	GEOLOGICAL DESCRIPTION
RT3049	0 - 2	1 tr	Pale buff/brn carbonate clay rich f.m.g.(minor cg) loose sand 10% carbonate cemented lumps
RT3050	2 - 4	1 tr	" " " " " " " "
RT3051	4 - 6	1 tr	Red brn clay rich lump f.m.g. (minor cg) sand, moderately poor sorted
RT3052	6 - 8	1 tr	Red brn clay rich loose f.m.g. (minor cg) sand, moderately poor sorted
RT3053	8 - 10	tr	" " " " " " " " " "
RT3054	10 - 12	tr	" " " " " " " " " "
RT3055	12 - 14	tr	" " " " " " " " " "
RT3056	14 - 16	tr	" " " " " " " " " "
RT3057	16 - 18	tr	" " " " " " " " " "
RT3058	18 - 20	tr	" " " " " " " " " "
			Composite RT3059 0 to 20 m

REMARKS:

BHP MINERALS LIMITED

PROJECT: OOLDEA
LOCATION: T2
MAP REFERENCE: BARTON SH53-9
COORDINATES: 233588.0mE 6585824.0mN
LOGGED BY: I. TEDDER

DRILLHOLE: OL64
TOTAL DEPTH: 20 m
OPERATOR: WALLIS
RIG: GEMCO H12
DATE: 18/11/86

SAMPLE NO	METREAGE	H.M.C.	GEOLOGICAL DESCRIPTION
RT3060	0 - 2	1 tr	Pale brn carbonate & clay rich f.m.g. (minor cg) loose
			and lumpy sand
RT3061	2 - 4	1 tr	Red brown clay rich f.m.g. (minor cg) loose sand 20%
			clayey lumps
RT3062	4 - 6	tr	Red brown clay rich f.m.g. (minor cg) loose sand 20% lumps
RT3063	6 - 8	tr	" " " " " " " " No lumps
RT3064	8 - 10	tr	" " " " " " " " " "
RT3065	10 - 12	tr	" " " " " " " " " "
RT3066	12 - 14	tr	" " " " " " " " " "
RT3067	14 - 16	tr	" " " " " " " " " "
RT3068	16 - 18	tr	" " " " " " " " " "
RT3069	18 - 20	tr	" " " " " " " " " "
			And some yellow sands in last metre (no clay)
			Composite RT3070 0 to 20 m
			Last 6 m or so - almost good trace of HM
			Creek/gully next to hole exposes >1 m of loose
			calcrete nodules with sandy matrix

REMARKS:

BHP MINERALS LIMITED

PROJECT: OOLDEA
LOCATION: T2
MAP REFERENCE: BARTON SH53-9
COORDINATES: 233211.0mE 6585312.0mN
LOGGED BY: I. TEDDER

DRILLHOLE: OL65
TOTAL DEPTH: 20 m
OPERATOR: WALLIS
RIG: GEMCO H12
DATE: 18/11/86

SAMPLE NO	METREAGE	H.M.C.	GEOLOGICAL DESCRIPTION
RT3071	0 - 2	1 tr	Pale brown loose carbonate & clay rich f.m.g. (minor cg)
			sand 5% carbonate cemented lumps
RT3072	2 - 4	1 tr	Pale reddish brown carbonate & clay rich f.m.g.(minor cg)
			sand 20% carbonate cemented lumps
RT3073	4 - 6	1 tr	Reddish brown clay rich f.m.g. (minor cg) loose sand
RT3074	6 - 8	1 tr	" " " " " " "
RT3075	8 - 10	1 tr	" " " " " " "
			occasional lumps
RT3076	10 - 12	1 tr	" " " " " " " " " "
RT3077	12 - 14	1 tr	" " " " " " " " " "
RT3078	14 - 16	1 tr	" " " " " " " " " "
RT3079	16 - 18	1 tr	Yellowish red brown clay rich f.m.g. (minor cg) loose sand
			occasional lumps
RT3080	18 - 20	1 tr	Yellow-orange f.m.g. (minor cg) loose sand - less clay
			occasional lumps
			Composite RT3081 0 - 20 m

REMARKS:

BHP MINERALS LIMITED

PROJECT: OOLDEA
LOCATION: T2
MAP REFERENCE: BARTON SH53-9
COORDINATES: 232864.0mE 6585101.0mN
LOGGED BY: I. TEDDER

DRILLHOLE: OL66
TOTAL DEPTH: 20 m
OPERATOR: WALLIS
RIG: GEMCO H12
DATE: 18/11/86

SAMPLE NO	METREAGE	H.M.C.	GEOLOGICAL DESCRIPTION
RT3082	0 - 2	1 tr	Pale yellow brown carbonate clay rich f.m.g.(minor cg)
			loose sand.
RT3083	2 - 4	1 tr	" " " " " " " " "
			loose and. 20% calcrete nodules
RT3084	4 - 6	tr	Pale brown carbonate & very rich f.m.g. (minor cg) loose
			sand
RT3085	6 - 8	1 tr	Red brown clay rich f.m.g. (minor cg) sand 30% lumps
RT3086	8 - 10	1 tr	" " " " " " "
RT3078	10 - 12	1 tr	" " " " " " "
			Worn like burrows (tubes) in some lumps.
RT3088	12 - 14	tr	" " " " " " " " *
			Few lumps Loose sand.
RT3089	14 - 16	tr	" " " " " " " "
			Even less lumps
RT3090	16 - 18	tr	Yellow f.m.g. (minor cg) clean loose sand
RT3091	18 - 20	tr	Yellow f.m.g. (minor cg) clean loose sand **
			Composite sample RT3092 0 to 20 m
			*Tested couple of coarser grained HM - magnetite
			**Tested f.m. HM for marnetite - very little

REMARKS:

BHP MINERALS LIMITED

PROJECT: OOLDEA
LOCATION: T2
MAP REFERENCE: BARTON SH53-9
COORDINATES: 232608.0mE 6585045.0mN
LOGGED BY:

DRILLHOLE: OL67
TOTAL DEPTH: 20 m
OPERATOR: WALLIS
RIG: GEMCO H12
DATE: 18/11/86

SAMPLE NO	METREAGE	H.M.C.	GEOLOGICAL DESCRIPTION
RT3093	0 - 2	1 tr	Buff pale brown calcrete nodule and sands (f.m.g.)
RT3094	2 - 4	1 tr	Brown lumpy - siliceous? f.m.g. (minor cg) moderate
			poor sorted sand
RT3095	4 - 6	1 tr	Yellowish brown hard lumpy f.m.g. (minor cg) poor sorted
			sand
RT3096	6 - 8	v 1 tr	Brown hard lumpy f.m.g. (minor cg) poor sorted sand
			Minor clay. Core pieces prove no sorting. Pale mottles on
			some. Tubes on others.
RT3097	8 - 10	neg	" " " " " " " " "
			Minor clay.
RT3098	10 - 12	neg	" " " " " " " " "
			Less lumpy
RT3099	12 - 14	1 tr	Red brown loose f.m.g. (minor cg) mod. poorly sorted sand
RT3100	14 - 16	1 tr	" " " " " " "
RT3101	16 - 18	1 tr	Pale yellow loose f.m.g. (minor cg) mod. poorly sorted sand
RT3102	18 - 20	tr	Yellow " " " " " "
			Composite RT3103 0 to 20 m

REMARKS:

BHP MINERALS LIMITED

PROJECT: OOLDEA
LOCATION: T2
MAP REFERENCE: BARTON SH53-9
COORDINATES: 232276.0mE 6584965.0mN
LOGGED BY: I. TEDDER

DRILLHOLE: OL68
TOTAL DEPTH: 20 METRES
OPERATOR: WALLIS
RIG: GEMCO H12
DATE: 18/11/86

SAMPLE NO	METREAGE	H.M.C.	GEOLOGICAL DESCRIPTION
RT3104	0 - 2	1 tr	Pale brn carbonate & clay rich f.m.g. (minor cg) loose sand
RT3105	2 - 4	1 tr	Light brown " " " " " " "
RT3106	4 - 6	1 tr	Brown " " " " " " "
RT3107	6 - 8	1 tr	Red brown clay rich f.m.g. (minor cg) mod. poor sorted
			loose sand. A few lumps of clayey sand.
RT3108	8 - 10	1 tr	" " " " " " "
RT3109	10 - 12	1 tr	" " " " " " "
RT3110	12 - 14	1 tr	" " " " " " "
			Some cemented pale brown mottled buff poor sorted sand st.
RT3111	14 - 16	1 tr	" " " " " " "
			Cemented sst = 30%
RT3112	16 - 18	1 tr	Yellowish red brown f.m.g. (cg) mod. poor sorted loose
			sand. Cemented sst = 40%
RT3113	18 - 20	1 tr	Purple brown/buff f.m.g. (minor cg) mod poor sorted
			arenite. Cemented sst = 60% - slow drilling
			Composite RT3114 0 - 20 m
			The last 4 m (possibly even higher) is of hard cemented
			sandstone. Core from the last 2 m (see spec) is mottled,
			has irregular tubular voids filled with sand
			- implying the hard sst is an old megolithic layer that
			has undergone erosion

REMARKS:

BHP MINERALS LIMITED

PROJECT: OOLDEA
LOCATION: T2
MAP REFERENCE: BARTON SH53-9
COORDINATES: 232035.0mE 6584925.0mN
LOGGED BY: I. TEDDER

DRILLHOLE: OL69
TOTAL DEPTH: 18.5 m
OPERATOR: WALLIS
RIG: GEMCO H12
DATE: 18/11/86

SAMPLE NO	METREAGE	H.M.C.	GEOLOGICAL DESCRIPTION
RT3115	0 - 2	L TR	Buff carbonate and clay rich f.m.g. (minor cg) sand and
			calcrete chips
RT3116	2 - 4	v l tr	" " " " " " " "
RT3117	4 - 6	l tr	Org.brn.cemented lumps of f.m.g. (cg) sand. Mod. poor
			sorted sand. Horizontal 3 mm diameter irregular tubular
			structure in one piece.
RT3118	6 - 8	v l tr	Org. brn. cemented lumps " " " " "
RT3119	8 - 10	v l tr	" " " " " " " "
RT3120	10 - 12	v l tr	" " " " " " " "
			Tubular structures at oblique angle to core noted again.
RT3121	12 - 14	v l tr	" " " " " " " "
RT3122	14 - 16	neg	Purple red brn. cemented f.m.g. (cg) poor sorted sst.
RT3123	16 - 18	v l tr	White cemented " " " " "
RT3124	18 -18.5	neg	Mottled white and purple red brn cemented sandstone.
			Hole stopping at approx. 18.5 m due to worn out bit
			Composite RT3125 0 to 18.5 m
			A lot of irregular tubular holes at all orientations -
			some with silica lining in chunks of siliceous sst.

REMARKS:

BHP MINERALS LIMITED

PROJECT: OOLDEA
LOCATION: T2
MAP REFERENCE: BARTON SH53-9
COORDINATES: 231749.0mE 6584769.0mN
LOGGED BY: I. TEDDER

DRILLHOLE: OL70
TOTAL DEPTH: 11 m
OPERATOR: WALLIS
RIG: GEMCO H12
DATE: 18/11/86

SAMPLE NO	METREAGE	H.M.C.	GEOLOGICAL DESCRIPTION
RT3126	0 - 2	1 tr	Pale buff brn carbonate & clay f.m.g. (cg) mod. poor
			sorted loose sand
RT3127	2 - 4	1 tr	Pale brn carbonate & clay rich f.m.g. (cg) mod. poor
			sorted loose sand
RT3128	4 - 6	v 1 tr	Red brown hard cemented f.m.g. (cg) mod. poor sorted
			sandstone.
RT3129	6 - 8	v 1 tr	Pale brown hard cemented f.m.g. (cg) mod poor sorted sst.
			Cores of massive poor sorted cemented sst.
RT3130	8 - 10	1 tr	Very pale brown hard cemented f.m.g. (cg) mod poor sorted
			sandstone. Core (see spec) of cemented breccia sst-
			megolithic?
RT3131	10 - 11*	NEG	Extremely hard siliceous regolithic? sst - mottled iron
			stained and grey coloured f.m.g. (cg) mod poor sorted.
			Refer specimens.
			Composite RT3123 0 to 11 m
			* Extremely hard sst after ½ hour changed to roller bit.
			Another ½ hour plus to drill 80 cm, so stopped the hole.

REMARKS:

BHP MINERALS LIMITED

PROJECT: OOLDEA
LOCATION: T2
MAP REFERENCE: BARTON SH53-9
COORDINATES: 231508.0E 6584503.0mN
LOGGED BY: I. TEDDER

DRILLHOLE: OL71
TOTAL DEPTH: 5 m
OPERATOR: WALLIS
RIG: GEMCO H12
DATE: 18/11/86

SAMPLE NO	METREAGE	H.M.C.	GEOLOGICAL DESCRIPTION
RT3133	0 - 2	1 tr	Pale brown/buff carbonate & clay rich f.m.g. (cg) loose sand
RT3134	2 - 4	1 tr	Pale brown carbonate & clay f.m.g. (cg) 20% calcrete chips
RT3135	4 - 5	1 tr	Purple brown very siliceous sst (regolith)
			Hit the extremely hard siliceous regolithic sandst. again,
			stopping the hole
			Composite RT3136 0 to 5 m

REMARKS:

BHP MINERALS LIMITED

PROJECT: OOLDEA
LOCATION: T2
MAP REFERENCE: BARTON SH53-9
COORDINATES: 231191.0mE 6584241.0mN
LOGGED BY: I. TEDDER

DRILLHOLE: OL72
TOTAL DEPTH: 8 m
OPERATOR: WALLIS
RIG: GEMCO H12
DATE: 18/11/86

SAMPLE NO	METREAGE	H.M.C.	GEOLOGICAL DESCRIPTION
RT3137	0 - 2	1 tr	Pale brown/buff loose carbonate/clay f.m.g. (cg) sand
RT3138	2 - 4	v 1 tr	Pale brown carbonate & clay but predom. hard cemented
			ferruginous regolithic sst. start. Recemented breccia common
RT3139	4 - 6	neg	Mottled brown and grey angular sst. recemented breccia
RT3140	6 - 8	v 1 tr	" " " " " " "
-			Composite RT3141 0 to 8 m

REMARKS:

BHP MINERALS LIMITED

PROJECT: OOLDEA
LOCATION: T2
MAP REFERENCE: BARTON SH53-9
COORDINATES: 230889.0mE 6584266.0mN
LOGGED BY: I. TEDDER

DRILLHOLE: OL73
TOTAL DEPTH: 8 m
OPERATOR: WALLIS
RIG: GEMCO H12
DATE: 19/11/86

SAMPLE NO	METREAGE	H.M.C.	GEOLOGICAL DESCRIPTION
RT3142	0 - 2	1 tr	Light brown/buff carbonate clay rich f.m.g. (cg) loose
			sand. Minor calcrete chips.
RT3143	2 - 4	neg	Brown lumpy f.m.g. (cg) sand. Partially cemented.
RT3144	4 - 6	v 1 tr	Darker brown lumpy f.m.g. (cg) sand >90% cemented
RT3145	6 - 8	v 1 tr	Brown lumpy f.m.g. (cg) sand >100% cemented sst.
			Very silicified ferruginous sst - very slow penetration
			rate.
			Composite RT3146 0 to 8 m

REMARKS:

BHP MINERALS LIMITED

PROJECT: OOLDEA
LOCATION: T2
MAP REFERENCE: BARTON AH53-9
COORDINATES: 230658.0mE 6584151.0mN
LOGGED BY: I. TEDDER

DRILLHOLE: OL74
TOTAL DEPTH: 7.5 m
OPERATOR: WALLIS
RIG: GEMCO H12
DATE: 19/11/86

SAMPLE NO	METREAGE	H.M.C.	GEOLOGICAL DESCRIPTION
RT3147	0 - 2	1 tr	Pale brown/buff carbonate & clay rich f.m.g. (cg) loose sand
			Minor calcrete nodules
RT3148	2 - 4	1 tr	" " " " " " "
			Cemented (Fe and Si?) and calcrete nodules
RT3149	4 - 6	v 1 tr	Brown cemented (Si?) f.m.g. (cg) poorly sorted sandst.
RT3150	6-7.5	neg	Purple brown silicifed arenite (silenite) poorly sorted.
			Hole stopped when virtually impenetrable.
			Composite RT3151 0 to 7.5 m
			Last couple of holes, it is noticeable that the hard
			siliceous sst. is patchy, the rig makes progress for
			5 to 10 cm then hits the hard stuff again - only in
			the upper 1 m of the last 2 m interval.

REMARKS:

BHP MINERALS LIMITED

PROJECT: OOLDEA
LOCATION: T2
MAP REFERENCE: BARTON SH53-9
COORDINATES: 230217.0mE 6583955.0mN
LOGGED BY: I. TEDDER

DRILLHOLE: OL75
TOTAL DEPTH: 6 m
OPERATOR: WALLIS
RIG: GEMCO H12
DATE: 19/11/86

SAMPLE NO	METREAGE	H.M.C.	GEOLOGICAL DESCRIPTION
RT3191	0 - 2	1 tr	Pale brown/buff loose f.m.g. (cg 1-2mm) sand, lb rich & clay
RT3192	2 - 4	1 tr	Pale brn loose f.m.g. (cg 1-2mm) sand. Large amount of
			calcrete chips.
RT3193	4 - 6	v 1 tr	Mauve, red brn very siliceous arenite breccia. Some silcrete
			chips (breccia) is resilcreted! specimen. Unprospective.
			Composite RT3194 0 to 6 m
			At 5 m hit very hard siliceous layer - jasper like silcrete
			cementing siliceous white arenite fragments. After 15 m
			broke through the ± 30 cm layer only to hit another very
			siliceous hard layer at 5.6 m.

REMARKS:

BHP MINERALS LIMITED

PROJECT: OOLDEA
LOCATION: T2
MAP REFERENCE: BARTON SH53-9
COORDINATES: 230121.0mE 6583623.0mN
LOGGED BY: I. TEDDER

DRILLHOLE: OL76
TOTAL DEPTH: 6 m
OPERATOR: WALLIS
RIG: GEMCO H12
DATE: 19/11/86

SAMPLE NO	METREAGE	H.M.C.	GEOLOGICAL DESCRIPTION
RT3152	0 - 2	v l tr	Pale brown/buff calcrete & clay f.m.g. (cg) sand. Calcrete
			dom. Poorly sorted.
RT3153	2 - 4	v l tr	Pale brown calcrete & silcrete sandy chip
RT3154	4 - 6	tr	Brown silcrete, yellow silcrete, poor sorted ferrug.arenite
			Heavy mineral is goethite? or haematite? as well as iron
			filing from the rig.
			Silcrete for last 2 metres of hole.
			Composite RT3155 0 to 6 m
			N.B. There is one carbonaceous limestone pebble lying
			around surface of the drill site. Nearby creek exposes
			some calcrete - sandy calcrete.
			Couldn't find any more - so may have been transported -
			decided it is black calcrete - see specimen OL76 packet.

REMARKS:

BHP MINERALS LIMITED

PROJECT: OOLDEA
LOCATION: T2
MAP REFERENCE: BARTON SH53-9
COORDINATES: 229834.0mE 6583382.0mN
LOGGED BY: I. TEDDER

DRILLHOLE: OL77
TOTAL DEPTH: 4.5 m
OPERATOR: WALLIS
RIG: GEMCO H12
DATE: 19/11/86

SAMPLE NO	METREAGE	H.M.C.	GEOLOGICAL DESCRIPTION
RT3187	0 - 2	1 tr	Pale brown/buff loose f.m.g. (cg) sand. Carbonate & clay rich
RT3188	2 - 4	1 tr	Greyish brn ferruginous m.g. arenite (f.c.g. 1-2mm) Fine to
			medium gr. well rounded and etched.
RT3189	4-4.5	1 tr*	Siliceous arenite - f.m.g. Extremely hard.
			Composite RT3190 0 to 4.5 m
			*Iron filings from drill rods etc. mask the true amount
			of HM

REMARKS:

BHP MINERALS LIMITED

PROJECT: OOLDEA
LOCATION: T2
MAP REFERENCE: BARTON SH53-9
COORDINATES: 229548.0mE 6583141.0mN
LOGGED BY: I. TEDDER

DRILLHOLE: OL78
TOTAL DEPTH: 12 m
OPERATOR: WALLIS
RIG: GEMCO H12
DATE: 19/11/86

SAMPLE NO	METREAGE	H.M.C.	GEOLOGICAL DESCRIPTION
RT3156	0 - 2	tr	Buff- pale brown Minor calcrete f.m.g. partially cemented
			sand dom. Some coarse grained (1 mm) sand
RT3157	2 - 4	tr	Yellow silicified (amyllite?) silcrete and brown f.m.g. (cg)
			arenite
RT3158	4 - 6	v l tr	Yellow silts/argillites, minor arenites as above.
RT3159	6 - 8		Yellow silt. or argillites
RT3160	8 - 10		Yellow silt or argillites
RT3161	10 - 12		Lignite, carbonaceous clay-silt. etc. 90% clays.
			Composite RT3162 to 6 m

REMARKS:

BHP MINERALS LIMITED

PROJECT: OOLDEA
LOCATION: T2
MAP REFERENCE: BARTON SH53-9
COORDINATES: 229322.0mE 6583020.0mN
LOGGED BY: I. TEDDER

DRILLHOLE: OL79
TOTAL DEPTH: 20 m
OPERATOR: WALLIS
RIG: GEMCO H12
DATE: 19/11/86

SAMPLE NO	METREAGE	H.M.C.	GEOLOGICAL DESCRIPTION
RT3163	0 - 2	tr	Pale brown/buff carbonate & clay rich f.m.g. (cg) sand
			Coarse grains are 1-2 mm
RT3164	2 - 4	1 tr	Brown/or. f.m.g. & cg (1-2mm) sub-angular qtz sand
RT3165	4 - 6		White, buff clays and argillite
RT3166	6 - 8		" " " " Talcose mica
RT3167	8 - 10		" " " " "
RT3168	10 - 12		" " " " Some grey clays. Very
			talcose micas.
RT3169	12 - 14		Pale grey clays, micaceous (talcose)
RT3170	14 - 16		" " " " "
RT3171	16 - 18		" " " " "
RT3172	18 - 20		" " " " " Some m.g. sands
			visual.
			Composite RT3173 0 to 4 m
			Hole drilled to ensure no other layers of prospective
			sands and to check for basement.
			Hole is next to a small salt lake.

REMARKS:

BHP MINERALS LIMITED

PROJECT: OOLDEA
LOCATION: T2
MAP REFERENCE: BARTON SH53-9
COORDINATES: 229000.0mE 6582889.0mN
LOGGED BY: I. TEDDER

DRILLHOLE: OL80
TOTAL DEPTH: 6 m
OPERATOR: WALLIS
RIG: GEMCO H12
DATE: 19/11/86

SAMPLE NO	METREAGE	H.M.C.	GEOLOGICAL DESCRIPTION
RT3174	0 - 2	1 tr	Pale brown buff f.m.g. (cg 1-2mm) carbonate & clay rich sand
RT3175	2 - 4	1 tr	Alternate red brown and off white f.m.g. (cg 1-2mm) sand
RT3176	4 - 6		Clays - yellow-white as in OL79
			Composite RT3177 0 to 4 m

REMARKS:

BHP MINERALS LIMITED

PROJECT: OOLDEA
LOCATION: T2
MAP REFERENCE: BARTON SH53-9
COORDINATES: 228734.0mE 6582839.0mN
LOGGED BY: I. TEDDER

DRILLHOLE: OL81
TOTAL DEPTH: 8 m
OPERATOR: WALLIS
RIG: GEMCO H12
DATE: 19/11/86

SAMPLE NO	METREAGE	H.M.C.	GEOLOGICAL DESCRIPTION
RT3178	0 - 2	1 tr	Brown (light) f.m.g. (cg 1-2mm) subangular loose sand
RT3179	2 - 4	1 tr	Orange brown " " " " "
RT3180	4 - 6	1 tr	" " and off white f.m.g. (cg 1-5mm some v.c.g.s.
			loose sand
RT3181	6 - 8		Clays - yellowish green and off white. Lignite hit right
			at end of hole.
			Composite RT3182 0 to 6 m
			Drilling started on a sand dune ridge.

REMARKS:

BHP MINERALS LIMITED

PROJECT: OOLDEA
LOCATION: T2
MAP REFERENCE: BARTON SH53-9
COORDINATES: 228523.0mE 6582854.0mN
LOGGED BY: I. TEDDER

DRILLHOLE: OL82
TOTAL DEPTH: 6 m
OPERATOR: WALLIS
RIG: GEMCO H12
DATE: 19/11/86

SAMPLE NO	METREAGE	H.M.C.	GEOLOGICAL DESCRIPTION
RT3183	0 - 2	1 tr	Dark greenish grey m.v.c.g. loose sand
RT3184	2 - 4	v 1 tr	1 m of sand as above then 1 m of lignite
RT3185	4 - 6		2 m of lignite
			Composite RT3186 0 to 4 m
			Started drilling on dried out lake.
			Surface scatterings of c. to v.c.g. qtz.

REMARKS:

APPENDIX B

DRILL LOGS - TRAVERSE 7

Drill Holes OL106 - OL112

Abbreviations used in geological logs:-

H.M.C.	Heavy mineral concentrate
tr.	trace
v.l, l, g, v.g.tr.	very light, light, good, very good trace.
f.m.g.	fine to medium grained.
c.g.	coarse grained.

BHP MINERALS LIMITED

PROJECT: OOLDEA
LOCATION: IFOULD T7
MAP REFERENCE: BARTON SH53-9
COORDINATES: 237663mE 6568765mN
LOGGED BY: I. TEDDER

DRILLHOLE: OL 106
TOTAL DEPTH: 24 m
OPERATOR: WALLIS
RIG: GEMCO H12
DATE: 22.11.86

SAMPLE NO	METREAGE	H.M.C.	GEOLOGICAL DESCRIPTION
RT3397	0 - 2	tr	Pale brn/buff cb and clay with f.m.g. (c.g.) loose sand
			±10% calcrete.
RT3398	2 - 4	l.tr	As above. ±10% calcrete.
RT3399	4 - 6	tr	Light brn clay rich f.m.g. (c.g.) loose sand.
RT3400	6 - 8	l.tr	Clean yellow f.m.g. (c.g.) loose sand.
RT3401	8 - 10	l.tr	Pale yellow very clean mod. sorted f.m.g. (c.g.) sand.
			Grains are sub-rounded to rounded and etched.
RT3402	10 - 12	l.tr	As above.
RT3403	12 - 14	-	Off white cemented f.m.g. (c.g.) sst. Mod poor sorting.
			Minor iron staining & mottling. Many tubular structures.
RT3404	14 - 16	v.l.tr	Yellow f. to (v.f.g.) (m.g. - very little) well sorted
			partially cemented sst.
RT3405	16 - 18	v.l.tr	Brn f. to (v.f.g.) (m.g. - very little) loose sand.
RT3406	18 - 20	v.l.tr	Pale mauve purple brn f.g. (v.f.g.) well sorted loose sand.
RT3407	20 - 22	v.l.tr	Mauve " " " " " " " "
RT3408	22 - 24	-	Mauve, well sorted f.g. loose sand - some dark ferruginous
			cemented lumps.
			Composite RT3409 to 24 m.

REMARKS:

BHP MINERALS LIMITED

PROJECT: OOLDEA
LOCATION: IFOULD T7
MAP REFERENCE: BARTON SH53-9
COORDINATES: 237256mE 6568661mN
LOGGED BY: I. TEDDER

DRILLHOLE: OL 107
TOTAL DEPTH: 18 m
OPERATOR: WALLIS
RIG: GEMCO H12
DATE: 22.11.86

SAMPLE NO	METREAGE	H.M.C.	GEOLOGICAL DESCRIPTION
RT3410	0 - 2	l.tr	Pale brn/buff cb and clay rich f.m.g. loose sand.
RT3411	2 - 4	tr	Pale mauve and buff f.m.g.partially cemented sand. Tubular
			structures in sst.
RT3412	4 - 6	l.tr	Curry yellow f.m.g. partially cemented sand. i.e. Dom. f.g.
			Fe cemented rock.
RT3413	6 - 8	tr	Curry yellow and off-white f.g. sands partially cemented. Fe cemented rock.
RT3414	8 - 10	tr	Dark brn slightly coarser f.g. well sorted loose sand.
			A few c grains.
RT3415	10 - 12	l.tr	Yellow and dark brn sands as above. Yellow is siliceous
			mottled clay. Must be clay band, clay only.
RT3416	12 -14	tr	Pale yellow clays and argillites - lithified and lightly
			Fe stained.
RT3417	14 - 16	-	Buff white clays and argillites - lithified and lightly
			Fe stained, and f.m.g. sands.
RT3418	16 - 18	-	Pale yellow clays as above and f.m.g. sands.
			Last 6 m very kaolinised clays, yellow and mauve Fe
			spotted. May be 60% clay, rest clayey sand.
			Composite RT3419 to 12 m
			Composite RT3420 from 14 - 20 m.

REMARKS:

BHP MINERALS LIMITED

PROJECT: OOLDEA
LOCATION: IFOULD T7
MAP REFERENCE: BARTON SH53-9
COORDINATES: 236729mE 6568722mN
LOGGED BY: I. TEDDER

DRILLHOLE: OL 108
TOTAL DEPTH: 20 m
OPERATOR: WALLIS
RIG: GEMCO H12
DATE: 22.11.86

SAMPLE NO	METREAGE	H.M.C.	GEOLOGICAL DESCRIPTION
RT3421	0 - 2	v.l.tr	Pale brn. cb and clay rich f.m.g. loose sand.
RT3422	2 - 4	l.tr	Light brn clay (cb) f.g. (m.g.) loose sand. Rare c.g.
RT3423	4 - 6	l.tr	Brown/buff lithified f.g. sands. One core with HM loam.
RT3424	6 - 8	good tr	Off white f.g. lithified sand, well sorted.
RT3425	8 - 10	good tr	Curry yellow f.g. loose sand, well sorted.
RT3426	10 - 12	tr	" " and grey - massive f.g. loose sand. Some Fe
			stained chips.
RT3427	12 - 14	good tr	Greyish-mauve-brn f.m.g. (c.g.) loose sand.
RT3428	14 - 16	tr	Buff-yellow-mauve clays with minor qtz veins - I think
			its highly weathered basement - see specimen from last sample
			interval for comparison.
RT3429	16 - 18	l.tr	Pale grey green clay, amphiboles and c.g. qtz.
RT3430	18 - 20	-	Greenish amphibolithic m.c.g. foliated weathered gneiss.
			The HM are very fine grained.
			Composite RT3431 to 16 m

REMARKS:

BHP MINERALS LIMITED

PROJECT: OOLDEA
LOCATION: IFOULD T7
MAP REFERENCE: BARTON SH53-9
COORDINATES: 236206mE 6568542mN
LOGGED BY: I. TEDDER

DRILLHOLE: OL 109
TOTAL DEPTH:
OPERATOR: WALLIS
RIG: GEMCO H12
DATE: 22.11.86

SAMPLE NO	METREAGE	H.M.C.	GEOLOGICAL DESCRIPTION
RT3432	0 - 2	l.tr	Pale brn/buff cb and clay rich f.g. (m.g.) loose sand.
RT3433	2 - 4	l.tr	Light brn " " " " " " " "
			10% calcrete.
RT3434	4 - 6	l.tr	Brn/red brn clay rich, lumpy f.m.g. sand - clayey.
RT3435	6 - 8	v.l.tr	Orange brn. f.g. loose well sorted sand - some cemented lump
RT3436	8 - 10	v.l.tr	Orange " " " " "
RT3437	10 - 12	l.tr	Yellow (curry) f.m.g. well sorted loose sand.
RT3438	12 - 14*	tr	Off white f.g. well sorted generally loose sand - mottled
			iron stained chips, some hard cemented chips.
RT3439	14 - 16	l.tr	Off white f.g. well sorted generally loose sand - some
			cemented Fe stained chips.
RT3440	16 - 18	v.l.tr	Brn and white m.g. mod. well sorted loose sand. - Some
			cemented core, mod poor sorted with clay.
RT3441	18 - 20	v.l.tr	Off white well sorted loose m.g. sand.
			* 13-14m - hard cemented white sst. which drill rig
			broke through.
			Composite RT3442 to 20 m

REMARKS:

BHP MINERALS LIMITED

PROJECT: OOLDEA
LOCATION: IFOULD T7
MAP REFERENCE: BARTON SH53-9
COORDINATES: 235808mE 6568377mN
LOGGED BY: I. TEDDER

DRILLHOLE: OL 110
TOTAL DEPTH: 14 m
OPERATOR: WALLIS
RIG: GEMCO H12
DATE: 22.11.86

SAMPLE NO	METREAGE	H.M.C.	GEOLOGICAL DESCRIPTION
RT3443	0 - 2	l.tr	Pale bn/buff cb and clay rich f.g. sand (loose)
RT3444	2 - 4	tr	As Above (m.g.) " " ±10% calcrete
RT3445	4 - 6	l.tr	Light brn. cb and clay with f.m.g. sand (loose).
RT3446	6 - 8	v.l.tr	Brn partially cemented f.g. mod. well sorted sand.
RT3447	8 - 10	v.l.tr	Brn loose f.g. well sorted sand.
RT3448	10 - 12	l.tr	Pale brn. off white partially cemented f.g. well sorted sand.
RT3449	12 - 14	tr	Off white siliceous cemented f.g. sst. and loose sand.
			Composite RT3450 to 14 m
			Did not spend too long trying to penetrate silica cemented
			layer as short of time on this traverse - better to have
			another hole down the track.
			Some core of the silica cemented arenite shows tubular
			structures filled with iron stained f.g. sands and
			opaline silicas cementing the white sst.

REMARKS:

BHP MINERALS LIMITED

PROJECT: OOLDEA
LOCATION: IFOULD T7
MAP REFERENCE: BARTON SH53-9
COORDINATES: 235341mE 6568182mN
LOGGED BY: I. TEDDER

DRILLHOLE: OL 111
TOTAL DEPTH: 20 m
OPERATOR: WALLIS
RIG: GEMCO H12
DATE: 22.11.86

SAMPLE NO	METREAGE	H.M.C.	GEOLOGICAL DESCRIPTION
RT3451	0 - 2	tr	Pale brn/buff cb and clay rich f.g. loose sand.
RT3452	2 - 4	tr	Buff coloured pile, but a large range of green to red
			siliceous and ferruginised regolith of f.g. sst (?)
			Silicified iron nodules in calcreted sst.
RT3453	4 - 6	l.tr	As for 2-4m - no calcrete - very siliceous in patches.
RT3454	6 - 8	v.l.tr	Minor cherty ferrug. sst. as above, then mod well sorted
			f.g. coarser f. grained lightly cemented sands.
RT3455	8 - 10	tr	Pale grn/grey and some iron stained f.g. well sorted sand.
			Cemented mostly light.
RT3456	10 - 12	tr	As above. Hard in patches.
RT3457	12 - 14	good tr	Pale brn. green grey well sorted f.g. sst.. Diss HM.
			Some disseminated HM in sst.
RT3458	14 - 16	good tr	Mauve, org. pale brn ferrug. f.g. sst.
RT3459	16 - 18	tr	Pale purple, clay with f.g. sst. Clay from basement.
RT3460	18 - 20	-	Greenish grey and white clays, m.g. qtz - weathered
			basement. Some chips look like gneiss - will be couple of
			metres yet to true basement.
			Composite RT3461 to 18 m

REMARKS:

BHP MINERALS LIMITED

PROJECT: OOLDEA
LOCATION: IFOULD T7
MAP REFERENCE: BARTON SH53-9
COORDINATES: 234828mE 6567987mN
LOGGED BY: I. TEDDER

DRILLHOLE: OL 112
TOTAL DEPTH: 5.3 m
OPERATOR: WALLIS
RIG: GEMCO H12
DATE: 22.11.86

SAMPLE NO	METREAGE	H.M.C.	GEOLOGICAL DESCRIPTION
RT3462	0 - 2	1.tr	Pale brn/buff cb and clay rich f.m.g. loose sand.
RT3463	2 - 4	1.tr	Light brn cb and clay with (m.g.) " "
RT3464	4 - 5.3	-	Hard cemented layer again 5-6 m in poorly sorted f.m.g. (c.g. sandstone. Core with incipient pisolites seen. Drilled for 25 minutes over last 1 m or less - progress very slow so stopping hole.
			Composite RT3465 to 5.3 m.

REMARKS:

APPENDIX C

DRILL LOGS - TRAVERSE 3

Drill Holes OL83 - OL102

Abbreviations used in geological logs:-

H.M.C.	Heavy mineral concentrate
tr.	trace
v.l, l, g, v.g.tr.	very light, light, good, very good trace.
f.m.g.	fine to medium grained.
c.g.	coarse grained.

BHP MINERALS LIMITED

PROJECT: OOLDEA
LOCATION: IFOULD T3
MAP REFERENCE: FOWLER SH53-13
COORDINATES: 252030mE 6563014mN
LOGGED BY: I. TEDDER

DRILLHOLE: OL83
TOTAL DEPTH: 30 m
OPERATOR: WALLIS
RIG: GEMCO H12
DATE: 20.11.86

SAMPLE NO	METREAGE	H.M.C.	GEOLOGICAL DESCRIPTION
RT3195	0 - 2	v.l.tr	v. pale br/buff cb & clay rich f.m.g. (c.g) loose sand
			30% calcrete nodules.
RT3196	2 - 4	v.l.tr	Pale brown/buff cb & clay rich f.m.g. (c.g. loose sand
			30% calcrete nudules.
RT3197	4 - 6	l.tr	light brown cb and clay rich f.m.g. (c.g.) loose sand
			10% nodules.
RT3198	6 - 8	v.l.tr	Red brown clay rich bumpy f.m.g. (c.g.) sand. Larger
			grained (<-1 mm) etched and well rounded.
RT3199	8 - 10	l.tr	Red brown minor clay f.m.g. (c.g.) loose sand some lumps
			(clay rich).
RT3200	10 - 12	v.l.tr.	Red brown clayey f.m.g. (c.g) loose sand.
RT3201	12 - 14	v.l.tr	" " " " " " "
RT3202	14 - 16	v.l.tr	" " " " " " "
RT3203	16 - 18	v.l.tr	Orange/red br f.m.g. (c.g. <2 mm) loose sand.
RT3204	18 - 20	vv.l.tr	" " " " " " loose sand.
RT3205	20 - 22	v.l.tr	Yellow org. " " " loose sand.
RT3206	22 - 24	v.l.tr	Yellow " " " loose sand.
RT3207	24 - 26	v.l.tr	Pale yellow clean f.m.g. (c.g.) loose sand. Some Fe
			stained mottled sst.
RT3208	26 - 28	v.l.tr	Pale yellow & off white partially cemented f.m.g. (c.g.)
			loose sand.
RT3209	28 - 30	v.l.tr	Off white partially cemented f.m.g. (c.g.) loose sand.
			Last 4 m easy to drill so cemented, rest is not too hard.
			There are some tubular voids in the sst. No regolithic

REMARKS: breccia though. HM are very fine-grained and just as in Traverse 2.
Composite RT3210 to 30 m.
Sands are mod. poorly sorted, the cemented pebbles show no sign of sorting.

BHP MINERALS LIMITED

PROJECT: OOLDEA
LOCATION: IFOULD T3
MAP REFERENCE: FOWLER SH53-13
COORDINATES: 251758mE 6562587mN
LOGGED BY: I. TEDDER

DRILLHOLE: OL84
TOTAL DEPTH: 20 m
OPERATOR: WALLIS
RIG: GEMCO H12
DATE: 20.11.86

SAMPLE NO	METREAGE	H.M.C.	GEOLOGICAL DESCRIPTION
RT3211	0 - 2	l.tr	Pale brown/buff cb and clay rich f.m.g. (c.g.) loose sand.
			10% calcrete nodules.
RT3212	2 - 4	l.tr	Pale brown cb and clay rich f.m.g. (c.g.) loose sand.
			30% calcrete nodules.
RT3213	4 - 6	v.l.tr	Pale brown cb clay rich f.m.g. (c.g.) loose sand.
			10% calcrete nodules.
RT3214	6 - 8	v.l.tr	Red brown clay rich bumpy f.m.g. (c.s.) sand.
RT3215	8 - 10	l.tr	Red brown clay rich loose f.m.g. (c.g.) sand.
			20% clay rich lumps.
RT3216	10 - 12	l.tr	Red brown clay rich loose f.m.g. (c.g) sand.
RT3217	12 - 14	v.l.tr	" " " " " " " "
RT3218	14 - 16	l.tr	" " " " " " " "
RT3219	16 - 18	v.l.tr	" " " " " " " "
RT3220	18 - 20	v.l.tr	" " " " " " " "
			E.O.H.
			~~Composite RT3221 to 20 m~~

REMARKS:

BHP MINERALS LIMITED

PROJECT: OOLDEA
LOCATION: IFOULD T3
MAP REFERENCE: FOWLER SH53-13
COORDINATES: 251577mE 6562085mN
LOGGED BY: I. TEDDER

DRILLHOLE: OL 85
TOTAL DEPTH: 20 m
OPERATOR: WALLIS
RIG: GEMCO H12
DATE: 20.11.86

SAMPLE NO	METREAGE	H.M.C.	GEOLOGICAL DESCRIPTION
RT3222	0 - 2	v.l.tr	Pale brn/buff cb and clay rich f.m.g. (c.g.) loose sand.
			10% calcrete nodules.
RT3223	2 - 4	l.tr	As above - 20% calcrte nodules.
RT3224	4 - 6	l.tr	Red brn lumpy clay rich f.m.g. (c.g.) poorly sorted sand.
RT3225	6 - 8	l.tr	" " " " " " " " " "
RT3226	8 - 10	l.tr	" " loose " " " " " " " "
RT3227	10 - 12	v.l.tr	" " " " " " " " " "
RT3228	12 - 14	l.tr	" " " " " " " " " "
			some coarse grains up to 2 mm.
RT3229	14 - 16	v.l.tr	Yellowish red, minor clay, f.m.g. (c.g.) poorly sorted
			sand. Some c.g. <2 mm.
RT3230	16 - 18	v.l.tr	Yellowish red minor clay, f.m.g. (c.g.) poorly sorted
			sand. Some c.g. <2 mm.
RT3231	18 - 20	l.tr	Yellow f.m.g. (c.g.) poorly sorted loose sand. <2 mm.
			H.M. continues to be very fine grained.
			Composite RT3232 to 20 m.

REMARKS:

BHP MINERALS LIMITED

PROJECT: OOLDEA
LOCATION: IFOULD T3
MAP REFERENCE: FOWLER SH53-13
COORDINATES: 251425mE 6561628mN
LOGGED BY: I. TEDDER

DRILLHOLE: OL 86
TOTAL DEPTH: 20 m
OPERATOR: WALLIS
RIG: GEMCO H12
DATE: 20.11.86

SAMPLE NO	METREAGE	H.M.C.	GEOLOGICAL DESCRIPTION
RT3223	0 - 2	v.l.tr	Pale brn/buff cb and clay rich f.m.g. (c.g.) loose sand.
			10% calcrete.
RT3234	2 - 4	l.tr	As above - 30% calcrete.
RT3235	4 - 6	tr	Red brn lumpy clay rich f.m.g. (c.g.) sand.
RT3236	6 - 8	tr	" " " " " " " "
RT3237	8 - 10	l.tr	" " loose " " " " "
RT3238	10 - 12	l.tr	" " " " " " " "
RT3239	12 - 14	l.tr	" " " " " " " "
RT3240	14 - 16	l.tr	" " " " " " " "
RT3241	16 - 18	v.l.tr	" " " " " " " "
RT3242	18 - 20	l.tr	" " " " " " " "
			Composite RT3243 to 20 m

REMARKS:

BHP MINERALS LIMITED

PROJECT: OOLDEA
LOCATION: IFOULD T3
MAP REFERENCE: FOWLER SH53-13
COORDINATES: 251184mE 6561186mN
LOGGED BY: I. TEDDER

DRILLHOLE: OL 87
TOTAL DEPTH: 30 m
OPERATOR: WALLIS
RIG: GEMCO H12
DATE: 20.11.86

SAMPLE NO	METREAGE	H.M.C.	GEOLOGICAL DESCRIPTION
RT3244	0 - 2	l.tr	Pale brn/buff cb and clay rich f.m.g. (c.g.) loose sand
			10% calcrete.
RT3245	2 - 4	l.tr	Brn clay rich (minor cb) f.m.g. (c.g.) sand.
RT3246	4 - 6	l.tr	Red brn clayey f.m.g. (c.g.) loose sand.
RT3247	6 - 8	l.tr	" " " " " " "
RT3248	8 - 10	l.tr	" " " " " " "
RT3249	10 - 12	v.l.tr	" " " " " " "
RT3250	12 - 14	l.tr	" " " " " " "
RT3251	14 - 16	l.tr	Yellowish red f.m.g. (c.g.) loose sand.
RT3252	16 - 18	l.tr	Yellow f.m.g. (c.g.) loose sand. (Mod. poor sorting).
RT3253	18 - 20	tr.	Light yellow f.m.g. (c.g.) loose sand with some cemented
			Fe mottled sst.
RT3254	20 - 22	tr.	White and Fe mottled, partially cemented f.m.g. (c.g.) sand.
RT3255	22 - 24	l.tr	" " " " " " " " "
RT3256	24 - 26	l.tr	Brownish yellow med. grained (c.g.) loose, very poorly
			sorted gritty sand. Seen in small core.
RT3257	26 - 28	tr.	Yellow m.c.g. loose sand. HM are v.f.g.
RT3258	28 - 30	v.l.tr	" " " " " " " generally slightly
			coarser than last sample.
			This hole is first over the top of the ridge.
			Composite RT3259 to 24 m
			" RT3260 24 to 30 m

REMARKS:

BHP MINERALS LIMITED

PROJECT: OOLDEA
LOCATION: IFOULD T3
MAP REFERENCE: FOWLER SH53-13
COORDINATES: 250942mE 6560809mN
LOGGED BY: I. TEDDER

DRILLHOLE: OL 88
TOTAL DEPTH: 18 m
OPERATOR: WALLIS
RIG: GEMCO H12
DATE: 20.11.86

SAMPLE NO	METREAGE	H.M.C.	GEOLOGICAL DESCRIPTION
RT3261	0 - 2	v.l.tr	Pale brn/buff cb and clay rich f.m.g. (c.g.) loose sand.
			10% calcrete.
RT3262	2 - 4	l.tr	Pale red brn clay rich f.m.g. (c.g.) loose sand.
			10% cemented sand.
RT3263	4 - 6	l.tr	Red brn partially cemented f.m.g. (c.g.) sand.
			Core with irregular tubes noted.
RT3264	6 - 8	l.tr	As above. (less lumpy)
RT3265	8 - 10	v.l.tr	Red brn partially cemented f.m.g. (c.g.) sand loose.
RT3266	10 - 12	tr.	Yellow f.m.g. (c.g.) loose sand. Mod. poor.
RT3267	12 - 14	tr.	Off white-yellow f.m.g. (c.g.) loose sand. Mod. poor.
RT3268	14 - 16	l.tr.	White and red porcellesite cemented f.m.g. (c.g.) sand.
			Slightly mottled m.g. poorly sorted core with tubular
			structures. Cherty/chalcidonic veins noted in core.
RT3269	16-18	-	Med grained slightly foliated gneiss. Basement
			in the last/m or so.
			It is possible that some translucent v. fine grained HM
			occurred in last sample, but I thought it was just f.g.
			quartz panning.
			Composite RT3270 to 16 m.

REMARKS:

BHP MINERALS LIMITED

069

PROJECT: OOLDEA
LOCATION: IFOULD T3
MAP REFERENCE: FOWLER SH53-13
COORDINATES: 250730mE 6560357mN
LOGGED BY: I. TEDDER

DRILLHOLE: OL 89
TOTAL DEPTH: 20 m
OPERATOR: WALLIS
RIG: GEMCO H12
DATE: 21.11.86

SAMPLE NO	METREAGE	H.M.C.	GEOLOGICAL DESCRIPTION
RT3271	0 - 2	l.tr	Pale brown/buff f.m.g. (c.g.) cb and clay rich loose sand.
			20% calcrete.
RT3272	2 - 4	l.tr	Pale brown f.m.g. (c.g.) and clay rich loose sand.
			10% calcrete.
RT3273	4 - 6	v.l.tr	Red brown clay rich f.m.g. (c.g.) loose sand. 20% lumps.
RT3274	6 - 8	l.tr	" " " " " " " " " "
RT3275	8 - 10	-	" " " " " " " " " "
RT3276	10 - 12	l.tr	Org/brown f.m.g. (c.g.) loose sand.
RT3277	12 - 14	l.tr	Yellow/brown f.m.g. (c.g.) loose sand.
RT3278	14 - 16	tr.	Yellow f.m.g. (c.g.) loose sand, couple of lumps.
RT3279	16 - 18	l.tr	Pale yellow f.m.g. (c.g.) loose sand, some lumps.
RT3280	18 - 20	l.tr	Off white " " " " " "
			Composite RT3281 to 20 m

REMARKS:

BHP MINERALS LIMITED

PROJECT: OOLDEA
LOCATION: IFOULD T3
MAP REFERENCE: FOWLER SH53-13
COORDINATES: 250549mE 6550357mN
LOGGED BY: I. TEDDER

DRILLHOLE: OL 90
TOTAL DEPTH: 20 m
OPERATOR: WALLIS
RIG: GEMCO H12
DATE: 21.11.86

SAMPLE NO	METREAGE	H.M.C.	GEOLOGICAL DESCRIPTION
RT3282	0 - 3	l.tr	Pale brown/buff cb and clay rich f.m.g.)c.g.) loose sand.
			10% calcrete nodules.
RT3283	3 - 4	l.tr	Pale brown cb and clay with f.m.g. (c.g.) loose sand.
			10% calcrete nodules.
RT3284	4 - 6	l.tr	Red brown clay rich f.m.g. (c.g.) loose sand. 1-2 mm
			minor clayey lumps.
RT3285	6 - 8	l.tr	As above (1-2 mm).
RT3286	8 - 10	v.l.tr	Orange/brn f.m.g. (c.g.) loose sand. (1-2 mm)
RT3287	10 - 12	l.tr	Yellow f.m.g. (c.g.) loose sand. (1-2 mm)
RT3288	12 - 14	l.tr	Off white f.m.g. (c.g.) loose sand, minor lumps.
RT3289	14 - 16	tr.	As above - m.g. dominates.
RT3290	16 - 18	l.tr	White, minor iron partially cemented, mottled f.m.g. sand.
			Bits of core with irregular voids.
RT3291	18 - 20	l.tr	White, cemented partially mottled f.m.g. sand.
			The white sandst. is sorted into beds I think, as core
			spec. show well sorted f.g. and mod. sorted med. grained
			ssts. Not sure if a different unit to the yellow sand -
			but I think it is a different unit as there is very little,
			to no coarse-grained sand in the white lithos.
			The c.g.'s of qtz are well rounded and flattened - ex
			foliated gneiss?
			Composite RT3292 to 20 m.

REMARKS:

BHP MINERALS LIMITED

PROJECT: OOLDEA
LOCATION: IFOULD T3
MAP REFERENCE: FOWLER SH53-13
COORDINATES: 250493mE 6559438mN
LOGGED BY: I. TEDDER

DRILLHOLE: OL 91
TOTAL DEPTH: 14 m
OPERATOR: WALLIS
RIG: GEMCO H12
DATE: 21.11.86

SAMPLE NO	METREAGE	H.M.C.	GEOLOGICAL DESCRIPTION
RT3293	0 - 2	l.tr	Pale brn buff cb and clay rich f.m.g. (c.g.) loose sand.
			1-2 m.
RT3294	2 - 4	v.l.tr	Pale brn cb and clay rich f.m.g. (c.g.) loose sand. Some
			clayey lumps, some slightly cemented. 1-2m.
RT3295	4 - 6	l.tr	Org. brn clay rich f.m.g. (c.g.) partially cemented sand.
			Poor sorted core.
RT3296	6 - 8	l.tr	As above.
RT3297	8 - 10	-	Org.brn clay rich f.m.g. (c.g.) partially cemented sst.
			Some tubular structures in core.
RT3298	10 - 12	l.tr	Drill returned core that appears to show unconformable
			relationship between overlying lightly cemented brn sands
			and indentifying mottled white/red sand. Tubular structures
			filled with brn sand. Indicates that they formed and
			lithified to show brn sand to flow in. Also fragment in
			overlying brn sand indicates environ of underlying white
			sand.
RT3299	12 - 14	v.l.tr	Hard cemented f.m.g. (c.g. to v.c.g. grit) sandstone.
			v.c.g. quartz grit - angular - occurs only near bottom of
			hole. Both indicate close to Basement. Core of cemented
			breccia regolith of white sand noted.
			Composite RT3300 to 14 m.

REMARKS:

BHP MINERALS LIMITED

PROJECT: OOLDEA
LOCATION: IFOULD T3
MAP REFERENCE: FOWLER SH53-13
COORDINATES: 250392mE 6559001mN
LOGGED BY: I. TEDDER

DRILLHOLE: OL 92
TOTAL DEPTH: 12 m
OPERATOR: WALLIS
RIG: GEMCO H12
DATE: 21.11.86

SAMPLE NO	METREAGE	H.M.C.	GEOLOGICAL DESCRIPTION
RT3301	0 - 2	1.tr	Pale brn/buff cb and clay rich f.m.g. (c.g.) loose sand.
			10% calcrete.
RT3302	2 - 4	1.tr	Pale brn cb and clay rich f.m.g. (c.g.) loose sand.
			±10% calcrete.
RT3303	4 - 6	1.tr	Light brn, clay rich (clayey lumps) f.m.g. (c.g.) sand.
			20% clayey lumps.
RT3304	6 - 8	1.tr	Mauve brn very c.g. gritty sand & f.m.g. sand.
RT3305	8 - 10	1.tr	Mauve brn very c.g. gritty sand, minor f.g. sand.
			Basement regolith.
RT3306	10 - 12	1.tr	Yellowish green weathered v.c.g. gritty Basement. Only
			slightly foliated.
			Composite RT3307 to 6 m.
			Composite RT3308 to 12 m.

REMARKS:

BHP MINERALS LIMITED

PROJECT: OOLDEA
LOCATION: IFOULD T3
MAP REFERENCE: FOWLER SH53-13
COORDINATES: 250321mE 6558714mN
LOGGED BY: I. TEDDER

DRILLHOLE: OL 93
TOTAL DEPTH: 10 m
OPERATOR: WALLIS
RIG: GEMCO H12
DATE: 21.11.86

SAMPLE NO	METREAGE	H.M.C.	GEOLOGICAL DESCRIPTION
RT3309	0 - 1	1.tr	Pale brn/buff cb clay rich f.m.g. (c.g.) loose sand.
RT3310	2 - 4	1.tr	As above - >10% calcrete.
RT3311	4 - 6	1.tr	Brn. clay rich f.m.g. (c.g.) loose sand. 10% clayey lumps.
RT3312	6 - 8	1.tr	80% clayey lumpy brn. f.m.g. sand.
RT3313	8 - 10	1.tr	As above, but also near 10 m c. to v.c.g. grit. Basement
			gneiss probably within one or two metres.
			Composite RT3314 to 10 m.

REMARKS:

BHP MINERALS LIMITED

PROJECT: OOLDEA
LOCATION: IFOULD T3
MAP REFERENCE: FOWLER SH53-13
COORDINATES: 250321mE 6558398mN
LOGGED BY: I. TEDDER

DRILLHOLE: OL 94
TOTAL DEPTH: 23 m
OPERATOR: WALLIS
RIG: GEMCO H12
DATE: 21.11.86

SAMPLE NO	METREAGE	H.M.C.	GEOLOGICAL DESCRIPTION
RT3315	0 - 2	1.tr	Pale brn/buff cb and clay rich loose sand f.m.g. (c.g.)
			± 10% calcrete.
RT3316	2 - 4	1.tr	Pale bn. cb and clay rich loose sand f.m.g. (c.g.)
			±10% calcrete.
RT3317	4 - 6	tr	Brn (light brn) clay rich loose sand. f.m.g. (c.g.)
RT3318	6 - 8	tr	Brn clay rich f.m.g. (c.g.) loose sand.
RT3319	8 - 10	1.tr	As above. 10% clayey lumps.
RT3320	10 - 12	tr	Red brn clayey lumps of f.m.g. (c.g.) sand. 30-40% lumps.
RT3321	12 - 14	1.tr	Possibly contaminated sample - calcrete colours it pale
			brn. 80% red-brn clayey lumps of f.m.g. (c.g.) sand.
RT3322	14 - 16	-	Mauve and grey clay/argillite soft and malleable.
RT3323	16 - 18	1.tr	As for 14-16 m, but also m.c.g. sands mixed with clay.
RT3324	18 - 20	1.tr	Pinkish mauve clay and sericite rich m.c.g. (fg) sand.
			Weathered basement?
RT3325	20 - 22	1.tr	As above. Weathered basement, I think.
RT3326	22 - 23	1.tr	Greenish grey m.c.g. gneissic sand, Basement.
			Possible foliated core at 22m suggests the more m.c.g.
			material is weathered basement.
			Composite RT3327 to 14 m
			Composite RT3328 to 22 m

REMARKS:

BHP MINERALS LIMITED

PROJECT: OOLDEA
LOCATION: IFOULD T3
MAP REFERENCE: FOWLER SH53-13
COORDINATES: 250290mE 6558127mN
LOGGED BY: I. TEDDER

DRILLHOLE: OL 95
TOTAL DEPTH: 20 m
OPERATOR: WALLIS
RIG: GEMCO H12
DATE: 21.11.86

SAMPLE NO	METREAGE	H.M.C.	GEOLOGICAL DESCRIPTION
RT3329	0 - 2	1.tr	Pale brn/buff cb and clay rich f.m.g. (c.g.) loose sand.
			10-15% calcrete nod.
RT3330	2 - 4	1.tr	As above. 15% ccalcrete nod.
RT3331	4 - 6	1.tr	Light brn clay rich (minor cb) f.m.g. (c.g.) loose sand.
			5% calcrete.
RT3332	6 - 8	tr.	Red brn clayey f.m.g. (c.g.) sands. Lumpy.
RT3333	8 - 10	1.tr	As above
RT3334	10 - 12	v.1.tr	As above
RT3335	12 - 14	1.tr	As above
RT3336	14 - 16	1.tr	Mauve/purple weathered fractured lithified argillite.
			Not foliated, so not basement?
RT3337	16 - 18	-	Pale mauve weathered fractured mottled argillite.
RT3338	18 - 20	-	Mauve, dark brown " " " "
			The lack of foliation in the weathered argillites
			suggest to me that this unit is equivalent to the
			weathered s.st higher up the hill.
			Composite RT3327 to 14 m
			Composite RT3328 to 22 m

REMARKS:

BHP MINERALS LIMITED

PROJECT: OOLDEA
LOCATION: IFOULD T3
MAP REFERENCE: FOWLER SH53-13
COORDINATES: 250154mE 6557750mN
LOGGED BY: I. TEDDER

DRILLHOLE: OL 96
TOTAL DEPTH: 18 m
OPERATOR: WALLIS
RIG: GEMCO H12
DATE: 21.11.86

SAMPLE NO	METREAGE	H.M.C.	GEOLOGICAL DESCRIPTION
RT3340	0 - 2	tr	Pale brn/buff f.m.g. (c.g.) cb. and clay rich loose sand.
			± 10% calcrete.
RT3341	2 - 4	tr	Light brn f.m.g. (c.g.) cb and clay rich loose sand.
			10% calcrete.
RT3342	4 - 6	tr	As above. 10% calcrete.
RT3343	6 - 8	tr	Brn f.m.g. (c.g.), minor cb. (calcrete nodules) loose sand.
RT3344	8 - 10	l.tr	As above. ± 1-3% calcrete still!!
RT3345	10 - 12	l.tr	Darker brn f.m.g. (c.g.) very rich sands. Some c.g.
			quartz grains with kaolin coating in the pile!?
RT3346	12 - 14	v.l.tr	Red brn very clayey, lumpy f.m.g. (c.g.) sand. Small
			HM recovery because of clay??
RT3347	14 - 16	X	Red brn sandy (f.m.g. (c.g.)) clay. Whole sample is
			balls of sandy clay.
RT3348	16 - 17	X	Mauve, purple clay.
RT3349	17 - 18	-	Highly ferruginous, almost gossan like hard rock.
			90% iron oxide -
			X Not panned
			Composite RT3350 to 16 m

REMARKS:

BHP MINERALS LIMITED

PROJECT: OOLDEA
LOCATION: IFOULD T3
MAP REFERENCE: 250114mE 6557509mN
COORDINATES:
LOGGED BY: I. TEDDER

DRILLHOLE: OL 97
TOTAL DEPTH: 13 m
OPERATOR: WALLIS
RIG: GEMCO H12
DATE: 21.11.86

SAMPLE NO	METREAGE	H.M.C.	GEOLOGICAL DESCRIPTION
RT3351	0 - 2	tr	Pale brn/buff cb and clay rich f.m.g. (c.g.) sand.
RT3352	2 - 4	tr	Pale brn cb and clay rich f.m.g. (c.g.) sand.
RT3353	4 - 6	tr	As above. Loose sand.
RT3354	6 - 8	tr	As above. c.g. up to 2 mm.
RT3355	8 - 10	1.tr	Brn cb and clay rich f.m.g. (c.g.) sand (loose) c.g. up to
			2 mm.
RT3356	10 - 12	1.tr	As above.
RT3357	12 - 13	-	Grey, dark grey arenitic and massive limestone.
			Very slow drilling.
			Composite RT3358 to 12m

REMARKS:

BHP MINERALS LIMITED

PROJECT: OOLDEA
LOCATION: IFOULD T3
MAP REFERENCE: FOWLER SH53-13
COORDINATES: 250038mE 6557237mN
LOGGED BY: I. TEDDER

DRILLHOLE: OL 98
TOTAL DEPTH: 15 m
OPERATOR: WALLIS
RIG: GEMCO H12
DATE: 21.11.86

SAMPLE NO	METREAGE	H.M.C.	GEOLOGICAL DESCRIPTION
RT3359	0 - 2	tr	Pale brn/buff f.m.g. (c.g.) cb and clay rich loose sand.
			10% calcrete.
RT3360	2 - 4	tr	Pale brn cb and clay rich f.m.g. (c.g.) loose sand.
			10% calcrete.
RT3361	4 - 6	tr	Brn cb and clay rich f.m.g. (c.g.) loose sand. 5% calcrete.
RT3362	6 - 8	tr	As above
RT3363	8 - 10	l.tr	As above
RT3364	10 - 12	l.tr	As above
RT3365	12 - 14	l.tr	As above
RT3366	14 - 15	-	Pale grey green hard massive limestone.
			Composite RT3367 to 14 m

REMARKS:

BHP MINERALS LIMITED

PROJECT: OOLDEA
LOCATION: IFOULD T3
MAP REFERENCE: FOWLER SH53-13
COORDINATES: 249957mE 65556891mN
LOGGED BY: I. TEDDER

DRILLHOLE: OL 99
TOTAL DEPTH: 8.4 m
OPERATOR: WALLIS
RIG: GEMCO H12
DATE: 21.11.86

SAMPLE NO	METREAGE	H.M.C.	GEOLOGICAL DESCRIPTION
RT3368	0 - 2	tr	Pale brn/buff cb and clay rich f.m.g. (c.g.) loose sand.
RT3369	2 - 4	tr	Brn (bright) " " " " " " " "
RT3370	4 - 6	tr	As above
RT3371	6 - 8	tr	As above - some black limestone chips.
RT3372	8 - 8.4	1.tr	Limestone - small sample.
			Composite RT3373 to 8 m

REMARKS:

BHP MINERALS LIMITED

080

PROJECT: OOLDEA
LOCATION: IFOULD T3
MAP REFERENCE: FOWLER SH53-13
COORDINATES: 249866mE 6556559mN
LOGGED BY: I. TEDDER

DRILLHOLE: OL 100
TOTAL DEPTH: 10 m
OPERATOR: WALLIS
RIG: GEMCO H12
DATE: 21.11.86

SAMPLE NO	METREAGE	H.M.C.	GEOLOGICAL DESCRIPTION
RT3374	0 - 2	l.tr	Pale brn/buff cb and clay rich f.m.g. (c.g.) loose sand.
			10% calcrete.
RT3375	2 - 4	tr	Brn cb and clay rich f.m.g. (c.g.) loose sand. 10% calcrete.
RT3376	4 - 6	l.tr	As above
RT3377	6 - 8	l.tr	As above
RT3378	8 - 10	v.l.tr	First metre as above, second metre - limestone.
			Composite RT3379 to 10 m

REMARKS:

BHP MINERALS LIMITED

081

PROJECT: OOLDEA
LOCATION: IFOULD T3
MAP REFERENCE: FOWLER SH53-13
COORDINATES: 249821mE 6556288mN
LOGGED BY: I. TEDDER

DRILLHOLE: OL 101
TOTAL DEPTH: 8.5 m
OPERATOR: WALLIS
RIG: GEMCO H12
DATE: 21.11.86

SAMPLE NO	METREAGE	H.M.C.	GEOLOGICAL DESCRIPTION
RT3380	0 - 2	tr	Pale brn/buff cb and clay rich f.m.g. (c.g.) loose sand.
			10% calcrete.
RT3381	2 - 4	1.tr	Brn cb and clay rich f.m.g. (c.g.) loose sand. 10% calcrete.
RT3382	4 - 6	1.tr	As above
RT3383	6 - 8	tr	As above
RT3384	8 - 8.5	1.tr	As above, plus grey green limestone.
			Composite RT3385 to 8.5 m

REMARKS:

BHP MINERALS LIMITED

PROJECT: OOLDEA
LOCATION: IFOULD T3
MAP REFERENCE: FOWLER SH53-13
COORDINATES: 249710mE 6555926mN
LOGGED BY: I. TEDDER

DRILLHOLE: OL 102
TOTAL DEPTH: 20 m
OPERATOR: WALLIS
RIG: GEMCO H12
DATE: 21.11.86

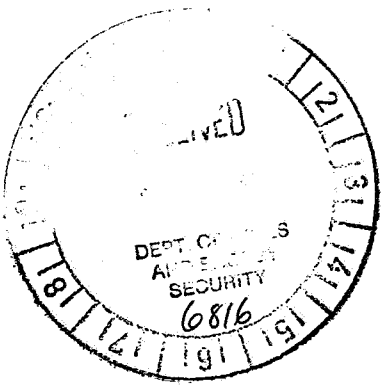
SAMPLE NO	METREAGE	H.M.C.	GEOLOGICAL DESCRIPTION
RT3386	0 - 2	l.tr	Pale brn/buff cb and clay with f.m.g. (c.g.) loose sand.
			10% calcrete.
RT3387	2 - 4	l.tr	Pale brn cb and clay with f.m.g. (c.g.) loose sand.
RT3388	4 - 6	l.tr	As above
RT3389	6 - 8	-	99% malleable clay - brown/grey. Some weathered ferruginous
			f.sst.
RT3390	8 - 10	tr	White f.g. well sorted sst. with disseminated HM.
RT3391	10 - 12	l.tr	f.g. sst. then pale grey, mauve mottled claystone.
RT3392	12 - 14	-	White to mauve claystone - partially lithified.
RT3393	14 - 16	v.l.tr	As for 14 but some f.m.g. (mg. dom) sand with clay.
RT3394	16 - 18	-	90% white semi-lithified (as seen in other holes) clay.
RT3395	18 - 20	-	>60% clay, minor m.g. sand as for 16 m.
			Composite RT3396 to 6 m.

REMARKS:

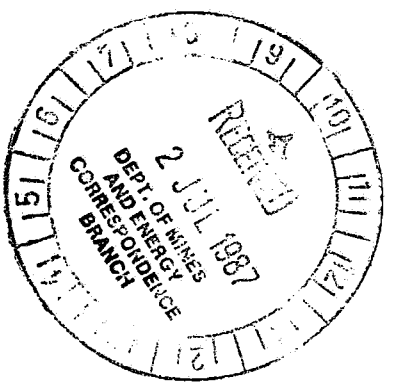
(CR 5468)

EXPLORATION LICENCE 1353
IFOULD LAKE, SOUTH AUSTRALIA

REPORT FOR THE QUARTER ENDED
19TH MAY 1987



R.J. TAYLOR
ADELAIDE



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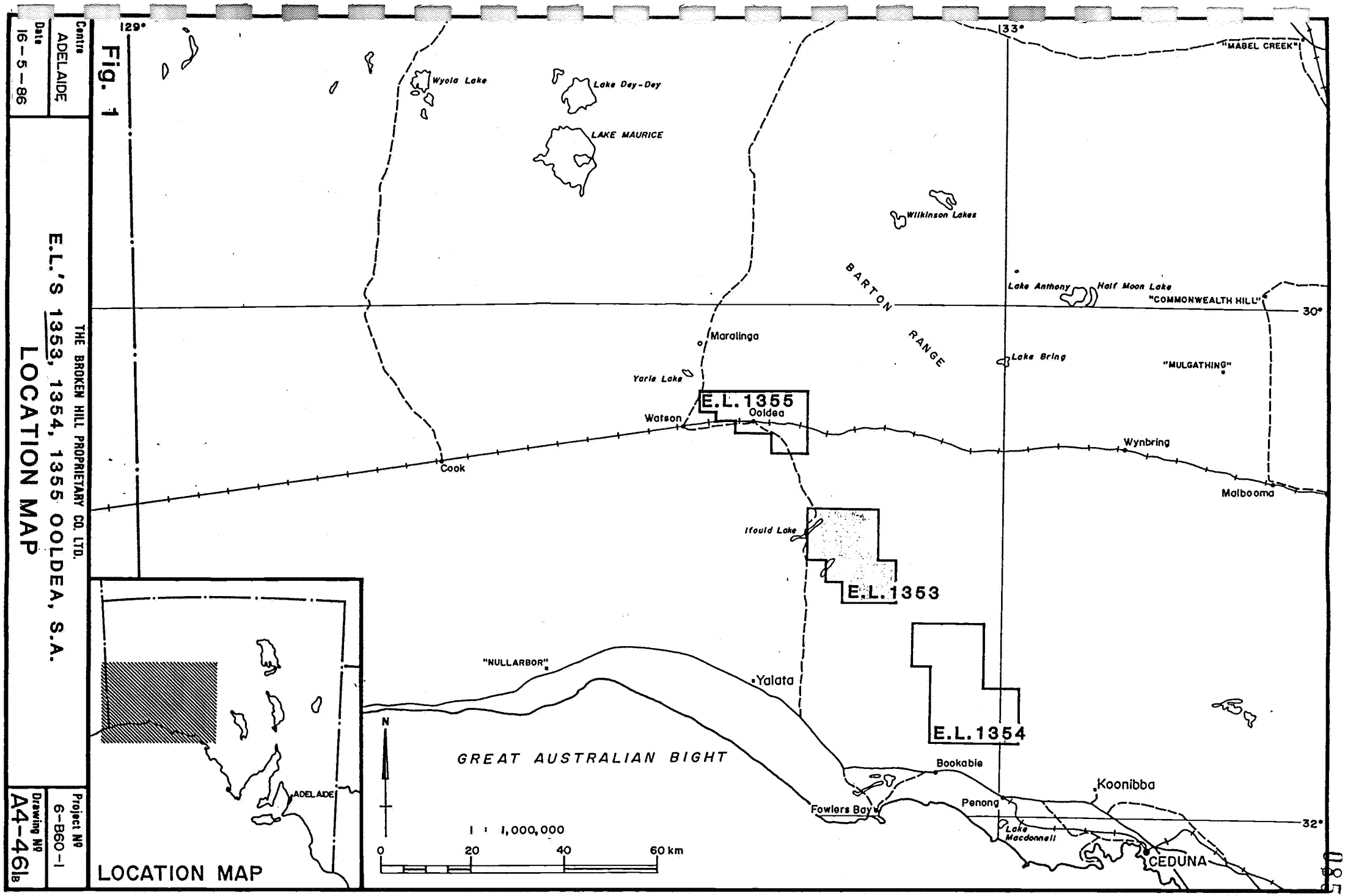
Fig. 1
Centre ADELAIDE
Date 16-5-86
THE BROKEN HILL PROPRIETARY CO. LTD.
E.L.'S 1353, 1354, 1355 OOLDEA, S.A.
LOCATION MAP
Project No 6-860-1
Drawing No A4-461B
129°
33°
30°
32°
"MABEL CREEK"
Wyola Lake
Lake Dey-Dey
LAKE MAURICE
Wilkinson Lakes
BARTON RANGE
Lake Anthony
Half Moon Lake
"COMMONWEALTH HILL"
Maralinga
Yarle Lake
Lake Bring
"MULGATHING"
E.L. 1355
Ooldea
Watson
Cook
Wynbring
Malbooma
Ifould Lake
E.L. 1353
E.L. 1354
"NULLARBOR"
Yalata
GREAT AUSTRALIAN BIGHT
Bookabie
Koonibba
Penong
Fowlers Bay
Lake Macdonnell
CEDUNA
N
1 : 1,000,000
0 20 40 60 km
ADELAIDE
LOCATION MAP

EXPLORATION LICENCE 1353

IFOULD LAKE, SOUTH AUSTRALIA

QUARTERLY REPORT FOR THE PERIOD 20.2.87 TO 19.5.87

1. GENERAL STATEMENT

Exploration Licence 1353 was taken up to test the potential for heavy mineral sands in the Ooldea Ridge. It forms part of a regional exploration programme including nearby ELs 1354 and 1355. A literature search and geological assessment of the Tertiary sediments of the Ooldea Ridge showed that the environment for beach sands preservation may exist.

Reconnaissance geological field work and sampling has been carried out. Drill traverse lines have been delineated, cleared by bulldozer and were drill tested in November 1986. Geological interpretation has been completed and analytical results have now been received.

2. TITLE

Exploration Licence 1353 of 1,220 square kilometres was granted to BHP Minerals Limited on 20th August, 1986 for one year. Its location is shown in Figure 1.

3. FIELD INVESTIGATIONS AND RESULTS

No field work has been carried out during this quarter.

3.1 Laboratory Results

Composite samples were prepared from each drill hole on Traverses 2, 7 and 3 as reported in previous quarterly reports. Four individual two metre intervals were also selected for laboratory analysis from observed higher heavy mineral concentrations noted in the field. These were:-

Traverse 2

OL 64	16 - 18 m

Traverse 7

OL 108	8 - 10 m
OL 111	14 - 16 m

Traverse 3

OL 89	14 - 16 m

All these samples were submitted to the BHP Mineral Laboratory in Belmont, Perth where a heavy mineral concentrate was prepared for each sample. These concentrates were then observed for economic heavy minerals, in particular rutile, zircon and ilmenite. Three size ranges were examined -0.4 mm +0.25 mm, -0.25 mm +0.18 mm and -0.18 mm = 0.075 mm, and the percentages of these minerals present were recorded. From this data weight percentages of the minerals present in the samples were determined. The calculations used the following formula:-

$$\text{Weight \% Heavy mineral(s)} = \frac{B}{A} \times 100$$

where B = Observed weight of mineral(s) in grms
A = Weight of dry original sample in grms

Traverse 2

The weight % of all heavy minerals in the composites of Traverse 2 range from a maximum of 1.21% in OL 76 to a minimum of 0.07% in OL 82. The variations of weight % of economic minerals can be summarized as follows:-

	Maximum Wgt. %	Hole No.	Minimum Wgt. %	Hole No.
Total H.M.'s	1.21	OL 76	0.07	OL 82
R/Z/Il.	0.39	OL 64	0.006	OL 76
Rutile	0.036	OL 64	0.0005	OL 60
Zircon	0.30	OL 64	0.002	OL 78
Ilmenite	0.11	OL 68	0.006	OL 76

The 16 - 18 m interval (RT 3068) in OL 64 had a combined Rutile/Zircon/Ilmenite weight of 0.26% indicating that approximately two thirds of the composite combined value of 0.39% was contained in the 16 - 18 m interval. This suggests that field observations of anomalous values are quite accurate as this interval was chosen on field panning evidence. The results are recorded in Table 1.

Traverse 7

Total heavy mineral values vary between 1.20% and 0.07% along this short traverse of 8 holes. The variations are summarised as follows:-

	Maximum Wgt. %	Hole No.	Minimum Wgt. %	Hole No.
Total H.M.'s	1.20	OL 111	0.07	OL 106
R/Z/Il.	0.15	OL 108	0.017	OL 106
Rutile	0.006	OL 108, 109	0.0009	OL 106
Zircon	0.074	OL 111	0.002	OL 107 (14-20m)
Ilmenite	0.093	OL 107	0.01	OL 112

Specific two-metre intervals were analysed from OL 108 (8-10m) and OL 111 (14-16m). In OL 108 the rutile value of 0.006% which is the highest on the traverse, occurs within the 8-10 m interval. No rutile was found in OL 111. The results are recorded in Table 2.

Traverse 3

The composite samples from the 20 holes along this traverse showed generally lower heavy mineral values than the other two traverses. Combined heavy mineral weight percentages varied from 0.52% in OL 92 to 0.06% in OL 83. The variations in mineral values are summarised as follows:-

	Maximum Wgt. %	Hole No.	Minimum Wgt. %	Hole No.
Total H.M.'s	0.52	OL 92	0.06	OL 83
R/Z/Il.	0.127	OL 101	0.003	OL 94
Rutile	0.005	OL 89	0.0003	OL 93
Zircon	0.049	OL 89	0.0003	OL 92
Ilmenite	0.113	OL 92	0.003	OL 94

The single two-metre interval analysed , OL 89 (14-16m), did not show any significantly anomalous values. Table 3 shows the result of this traverse.

All the results from these three traverses are summarised in Tables 1, 2 and 3. The individual Data Sheets from which these values have been calculated are to be found in Appendix A (Traverse 2), Appendix B (Traverse 7) and Appendix C (Traverse 3).

4. EXPENDITURE

The expenditure for the third quarter of this licence for the three months to the end of May 1987 is summarised as follows:-

	$
Wages & Salaries	4,721
Field Support	399
Vehicles	333
Office Expenses	178
Laboratory Costs	3,118
Drafting	473
Administration & Overheads	461
	$9,683

The total expenditure to date for EL.1353 is $68,064.

This report is submitted to the Department of Mines and Energy as required by Clause 2 of EL.1353.

TABLE 1

EL1353 IFOULD - SAMPLE RESULTS, TRAVERSE 2

Drill Hole Data			Sample No	Received Wt kg	Recovered HMs gm	Wt % Total HMs	Rutile gm	Rutile Wt %	Zircon gm	Zircon Wt %	Ilmenite gm	Ilmenite Wt %	Wt % Ru/Z/Il	Comments
Trav	Hole	Depth m												
2	OL56	0-26	RT2982	7.4	25.2	0.11	0.44	0.006	0.66	0.009	7.58	0.102	0.117	
2	OL57	0-20	RT2993	5.4	11.0	0.20	0.076	0.0014	1.14	0.021	2.58	0.047	0.076	
2	OL58	0-20	RT3004	5.5	13.2	0.24	0.077	0.0014	0.385	0.007	4.00	0.072	0.080	
2	OL59	0-20	RT3015	5.3	9.3	0.17	0.195	0.0036	1.285	0.024	2.44	0.046	0.074	
2	OL60	0-20	RT3026	5.6	6.5	0.12	0.027	0.0005	0.13	0.002	1.70	0.030	0.032	
2	OL61	0-20	RT3037	4.8	9.4	0.19	0.189	0.0039	2.20	0.046	1.55	0.032	0.036	
2	OL62	0-20	RT3048	5.3	26.5	0.5	0.44	0.0083	4.4	0.083	3.035	0.057	0.148	
2	OL63	0-20	RT3059	5.4	20.0	0.37	0.74	0.0137	2.96	0.055	4.65	0.086	0.155	
2	OL64	0-20	RT3070	4.5	29.5	0.65	1.65	0.036	13.63	0.30	2.66	0.059	0.39	
2	OL65	0-20	RT3081	5.5	21.5	0.39	0.28	0.0050	1.37	0.024	3.725	0.067	0.096	
2	OL66	0-20	RT3092	5.2	25.6	0.49	0.43	0.008	6.41	0.123	4.88	0.094	0.225	
2	OL67	0-20	RT3103	6.0	25.5	0.42	0.28	0.005	4.16	0.069	3.96	0.066	0.140	
2	OL68	0-20	RT3114	5.45	26.0	0.47	0.21	0.004	6.45	0.118	6.04	0.111	0.233	
2	OL69	0-18	RT3125	5.7	23.1	0.40	0.46	0.008	7.61	0.133	4.44	0.078	0.219	
2	OL70	0-11	RT3132	3.65	8.7	0.24	0.046	0.001	1.09	0.030	2.29	0.062	0.093	
2	OL71	0-5	RT3136	2.3	6.3	0.27	0.018	0.0008	0.09	0.0039	0.92	0.04	0.044	
2	OL72	0-8	RT3141	2.3	3.9	0.17	-	-	0.78	0.034	0.21	0.009	0.043	
2	OL73	0-8	RT3146	2.25	6.6	0.29	0.021	0.0009	0.063	0.003	0.641	0.028	0.032	
2	OL74	0-7	RT3151	2.3	7.3	0.32	0.03	0.0013	0.17	0.007	1.62	0.070	0.078	
2	OL76	0-6	RT3155	1.9	23.1	1.21	-	-	-	-	0.12	0.006	0.006	
2	OL78	0-6	RT3162	1.6	10.9	0.68	-	-	0.042	0.002	0.94	0.058	0.060	
2	OL79	0-4	RT3173	1.9	6.3	0.33	0.021	0.0011	0.133	0.007	2.08	0.109	0.117	
2	OL80	0-4	RT3177	1.6	4.1	0.26	-	-	0.28	0.017	0.53	0.033	0.050	
2	OL81	0-6	RT3182	1.5	4.7	0.31	0.037	0.002	0.05	0.003	1.13	0.075	0.080	
2	OL82	0-4	RT3186	1.85	1.4	0.07	-	-	-	-	1.11	0.060	0.060	
2	OL77	0-4	RT3190	1.3	7.6	0.58	-	-	-	-	1.07	0.082	0.082	
2	OL75	0-6	RT3194	1.8	2.2	0.12	0.015	0.008	0.075	0.004	0.64	0.035	0.039	
2	OL64	16-18	RT3068	5.0	24.7	0.49	1.08	0.02	9.67	0.19	2.33	0.047	0.26	

TABLE 2

EL1353, IFOULD - SAMPLE RESULTS, TRAVERSE 7

Drill Hole Data			Sample No	Received Wt kg	Recovered HMs gm	Wt % Total HMs	Rutile gm	Rutile Wt %	Zircon gm	Zircon Wt %	Ilmenite gm	Ilmenite Wt %	Wt % Ru/Z/Il	Comments
Trav	Hole	Depth m												
7	OL106	0-24	RT3409	6.6	4.6	0.07	0.062	0.0009	0.44	0.006	0.79	0.011	0.017	
7	OL107	0-12	RT3419	3.55	10.4	0.29	0.13	0.0036	1.34	0.038	2.25	0.063	0.105	
7	OL107	14-20	RT3420	1.55	4.6	0.30	-	-	0.03	0.002	0.28	0.018	0.020	
7	OL108	0-16	RT3431	4.0	20.7	0.52	0.25	0.006	2.04	0.051	3.72	0.093	0.15	
7	OL109	0-20	RT3442	5.85	11.8	0.20	0.356	0.006	1.78	0.030	2.34	0.040	0.076	
7	OL110	0-14	RT3450	4.15	13.7	0.33	0.08	0.002	0.82	0.019	0.92	0.022	0.043	
7	OL111	0-18	RT3461	5.0	59.9	1.20	-	-	3.70	0.074	2.33	0.046	0.12	
7	OL112	0-5	RT3465	1.7	3.9	0.23	0.058	0.003	0.76	0.044	0.17	0.01	0.057	
7	OL108	8-10	RT3425	4.0	10.8	0.27	0.24	0.006	0.40	0.01	1.6	0.04	0.05	
7	OL111	14-16	RT3458	3.0	35.4	1.18	-	-	0.67	0.022	4.92	0.16	0.18	

TABLE 3

EL1353, IFOULD - SAMPLE RESULTS, TRAVERSE 3

Drill Hole Data			Sample No	Received Wt kg	Recovered HMs gm	Wt % Total HMs	Rutile gm	Rutile Wt %	Zircon gm	Zircon Wt %	Ilmenite gm	Ilmenite Wt %	Wt % Ru/Z/Il	Comments
Trav	Hole	Depth m												
3	0L83	0-30	RT3210	7.7	4.5	0.06	0.045	0.0006	0.633	0.008	1.37	0.018	0.026	
3	0L84	0-20	RT3221	5.1	4.6	0.09	-	-	0.183	0.003	1.18	0.023	0.026	
3	0L85	0-20	RT3232	5.6	4.2	0.07	0.038	0.0007	0.38	0.006	1.18	0.021	0.027	
3	0L86	0-20	RT3243	5.35	8.4	0.16	0.043	0.0008	0.86	0.016	2.19	0.040	0.056	
3	0L87	0-24	RT3259	6.6	11.9	0.18	0.182	0.002	2.79	0.042	2.19	0.033	0.077	
3	0L87	24-30	RT3260	2.2	1.8	0.08	-	-	0.012	0.0005	0.29	0.013	0.013	
3	0L88	0-18	RT3270	4.8	9.6	0.20	0.068	0.0014	1.42	0.029	2.01	0.041	0.071	
3	0L89	0-20	RT3281	5.0	7.7	0.15	0.27	0.005	2.44	0.049	0.31	0.006	0.06	
3	0L90	0-20	RT3292	5.9	5.8	0.10	0.024	0.0004	0.28	0.004	1.03	0.017	0.021	
3	0L91	0-14	RT3300	4.2	5.5	0.13	0.062	0.0014	0.499	0.012	1.20	0.028	0.041	
3	0L92	0-6	RT3307	1.7	2.8	0.16	0.040	0.0023	0.132	0.008	0.72	0.042	0.052	
3	0L92	6-12	RT3308	1.9	9.9	0.52	-	-	0.006	0.0003	2.16	0.113	0.119	
3	0L93	0-10	RT3314	2.9	3.8	0.13	0.01	0.0003	0.106	0.004	0.264	0.009	0.013	
3	0L94	0-14	RT3327	3.8	7.0	0.18	0.048	0.001	0.72	0.018	2.39	0.062	0.081	
3	0L94	14-22	RT3328	2.05	2.9	0.14	-	-	-	-	0.073	0.003	0.003	
3	0L95	0-14	RT3339	4.25	8.5	0.20	0.029	0.0007	0.30	0.007	2.56	0.060	0.067	
3	0L96	0-16	RT3350	4.35	10.0	0.23	0.016	0.0003	0.11	0.0025	3.29	0.076	0.078	
3	0L97	0-12	RT3358	3.3	9.7	0.29	0.133	0.0040	0.79	0.024	2.36	0.071	0.089	
3	0L98	0-14	RT3367	3.65	8.3	0.23	0.024	0.0006	0.026	0.0071	1.70	0.046	0.053	
3	0L99	0-8	RT3373	2.1	4.5	0.21	0.028	0.001	0.28	0.013	0.47	0.022	0.036	
3	0L100	0-10	RT3379	2.6	4.4	0.17	0.030	0.001	0.13	0.005	0.67	0.026	0.032	
3	0L101	0-8	RT3385	2.1	5.9	0.28	0.040	0.002	0.46	0.022	2.17	0.103	0.127	
3	0L102	0-6	RT3396	1.7	3.1	0.18	0.012	0.0007	0.038	0.002	0.61	0.036	0.038	
3	0L89	14-16	RT3278	3.0	9.0	0.3	0.02	0.0006	0.50	0.02	-	-	0.02	

APPENDIX A

OBSERVERS DATA SHEETS - TRAVERSE 2

BHP MINERALS EXPLORATION

OBSERVER'S DATA SHEET --- TITANIUM SAMPLE No. RT2982.

OBSERVER: J. Davidson. SIZE RANGE OBSERVED: -0.4 +0.075 mm

SHEET No: 17 DATE STARTED: 10/4/87. DATE FINISHED: 10/4/87

ENTERED

MATERIAL: NON MAGS (HANDMAGNET) ☐ TICK OR SHOW OTHER: Mag Sep.

OBSERVED	-0.4 +0.25	-0.25 +0.18	-0.18 +0.075	OTHER: Mag 3&4.		GRAINS BOTTLED IN BAG	GRAINS FOR PROBING
WEIGHT	0.2.	1.2	21.6	1.9	24.9 gm		

MINERAL	Flag	VISUAL ESTIMATE OF MINERAL %				GRAIN COUNT CHECK	(SHOW SIZE FRACTION)
ILMENITE	E	40	25	25	97	.08, .3, 5.4, 18,	7.58 gm
MONAZITE	E						
RUTILE	E		1	2		.01, 0.43	0.46 gm
ZIRCON	E		2	3		.02 0.64	0.66 gm
LEUCOXENE	E/I						
ROCKS		25	25	25	3		
TOURMALINE		15	20	20			
WHITES		20	27	25			

COMMENTS:

BHP MINERALS EXPLORATION

OBSERVER'S DATA SHEET --- TITANIUM SAMPLE No. RT. 2993.

OBSERVER: P. Forknall SIZE RANGE OBSERVED: -0.4 +0.075mm

SHEET No: 63 DATE STARTED: 10-4-87 DATE FINISHED: 10-4-87

MATERIAL: NON MAGS (~~HANDMAGNET~~ MAG. SEP.) ☐ TICK OR SHOW OTHER:

ENTERED ☐

OBSERVED	-0.4 +0.25	-0.25 +0.18	-0.18 +0.075	OTHER: MAGS 3+4		
WEIGHT	0.1	0.4	7.6	1.1	9.2gm	

GRAINS ~~BOTTLED~~ IN BAG | GRAINS ~~FOR PROBING~~

MINERAL	Flag	VISUAL ESTIMATE OF MINERAL %				GRAIN COUNT CHECK	(SHOW SIZE FRACTION)
ILMENITE	E	35	35	20	80	.035, .14, 1.52, .88	2.58 gm
MONAZITE	E						
RUTILE	E	—	—	1	—		0.076 gm
ZIRCON	E	—	TR	15	—		1.14 gm
LEUCOXENE	E	—	TR	20	—		
ROCKS		15	15	4	20		
TOURMALINE		5	10	10	—		
WHITES		45	40	30	—		
		100%	100%	100%	100%		

COMMENTS: _____

OBSERVER'S DATA SHEET --- TITANIUM SAMPLE No : KI 3004 · 09

OBSERVER : P. Forknall. SIZE RANGE OBSERVED : - 0.4 + 0.075 mm

SHEET No : 64 DATE STARTED : 13-4-87 DATE FINISHED : 13-4-87

MATERIAL	NON MAGS (~~HANDMAGNET~~ MAG. SEP.) ☐ TICK OR SHOW OTHER:					ENTERED ☐
OBSERVED	-0.4 +0.25	-0.25 +0.18	-0.18 +0.075	OTHER: MAG 3+4	GRAIN COUNT -0.18 +0.075.	GRAINS BOTTLED IN BAG / GRAINS FOR PROBING
WEIGHT	0·2	1·4	7·7	1·4	10·7g	

MINERAL	Flag	VISUAL ESTIMATE OF MINERAL %				GRAIN COUNT CHECK	(~~SHOW~~ SIZE FRACTION)
ILMENITE	E	5	30	30	90	28.5% 0·01, ·42, 2·31	126 = 4·0g.
MONAZITE	E						
RUTILE	E			1		2·1%	·077 gm
ZIRCON	E			5		7·8%	·385 gm
LEUCOXENE	E						
ROCKS		20	20	30	10	31·5%	
TOURMALINE		45	20	14		12·2%	
WHITE		30	30	20		17·5%	
EPIDOTE		TR	TR	TR		—	
STAUROLITE		TR	TR	TR		—	
AMPHIBOLE							
		100%	100%	100%	100%		

COMMENTS :

JP 6·86

Sample RT300H. Grain Count. (size -0.18+0.075) 13.4.87.

Rocks	Zircon	Rutile	Whites	T/Mg	Tourmaline		
41	8	2	18	21	11	=	101
37	11	2	15	31	10	=	106
22	9	1	14	29	13	=	88
32	5	3	23	34	12	=	109
28	7	3	19	30	16	=	103
160	40	11	89	145	62		507
31.5%	7.8%	2.1%	17.5%	28.5%	12.2%		

BHP MINERALS EXPLORATION

OBSERVER'S DATA SHEET --- TITANIUM SAMPLE No. RT3015

OBSERVER: J. Davidson SIZE RANGE OBSERVED: -0.4 +0.075 mm

SHEET No: 18 DATE STARTED: 10/4/87 DATE FINISHED: 10/4/87

ENTERED

MATERIAL: NON MAGS (HANDMAGNET) ☐ TICK OR SHOW OTHER: Magsep.

OBSERVED	-0.4 +0.25	-0.25 +0.18	-0.18 +0.075	OTHER: Mag 3&4		GRAINS BOTTLED IN BAG	GRAINS FOR PROBING
WEIGHT	0.3	0.5	6.4	1.1	8.3 gr.		

MINERAL	Flag	VISUAL ESTIMATE OF MINERAL %				GRAIN COUNT CHECK	(SHOW SIZE FRACTION)
ILMENITE	E		20	20	96	0.1, 1.28, 1.06	2.44 gr
MONAZITE	E						
RUTILE	E	TR.	1	3		.19 .005	.195 gr
ZIRCON	E		1	20		.005 1.28	1.265 gr
LEUCOXENE	E	<1					
ROCKS		20	23	12	3		
WHITES		45	40	30	1		
TOURMALINE		35	15	16			
STAUROLITE		<1	TR.				
AMPHIBOLE			TR.				

COMMENTS:

OBSERVER'S DATA SHEET --- TITANIUM SAMPLE No : RT 3026

OBSERVER : EDNA SIZE RANGE OBSERVED : - 0.4 + 0.075mm

SHEET No : 28 DATE STARTED : 13.4.87 DATE FINISHED : 13.4.87

MATERIAL	NON MAGS (~~HANDMAGNET~~)	TICK OR SHOW OTHER:	ENTERED
OBSERVED	-0.4 +0.25 / -0.25 +0.18 / -0.18 +0.075 / OTHER: M3+4		GRAINS BOTTLED IN BAG / GRAINS FOR PROBING
WEIGHT	0.03 / 0.3 / 1.2. / 0.5	2.03 gm	

MINERAL	Flag	VISUAL ESTIMATE OF MINERAL %				GRAIN COUNT CHECK	(SHOW SIZE FRACTION)
ILMENITE	E	-	20	48	95	.06, .57, .47	1.70 gm
MONAZITE	E	-		-	-		
RUTILE	E	TR	<1	2	-	0.024, .003	0.027 gm
ZIRCON	E	1	5	10	-	.0003, .015, .12	0.13 gm
~~ELECTRIC~~	E	-	-	-	-		
ROCKS		8	15	15	5		
AMPHIBOLE		TR	TR	-	-		
TOURMALINE		60	30	10	-		
WHITES		31	30	15	-		
EPIDOTE		-	TR	TR	-		
		100%	100%	100%	100%		

COMMENTS :

BHP MINERALS EXPLORATION

OBSERVER'S DATA SHEET --- TITANIUM SAMPLE No. RT3037

OBSERVER : J. Davidson SIZE RANGE OBSERVED : - 0.4 + 0.075 mm

SHEET No : 19 DATE STARTED : 10/4/87 DATE FINISHED : 15/4/87

ENTERED ☐

MATERIAL	NON MAGS (HANDMAGNET) Mag Sep.	☐ TICK OR SHOW OTHER:				GRAINS BOTTLED IN BAG	GRAINS FOR PROBING
OBSERVED	-0.4 +0.25	-0.25 +0.18	-0.18 +0.075	OTHER: Mags3&4	6.91g		
WEIGHT	0.01	0.4	6.3	8.2			

MINERAL	Flag	VISUAL ESTIMATE OF MINERAL %				GRAIN COUNT CHECK	(SHOW SIZE FRACTION)	
ILMENITE	E	20	25	20	98	.002, 0.4, 1.26, 0.19	1.55	gm
MONAZITE	E							
RUTILE	E		TR.	3			0.189	gm
ZIRCON	E		TR.	35			2.20	gm
LEUCOXENE	E	<1	<1	1				
ROCKS		20	20	15	2			
WHITES		40	30	15	<1			
TOURMALINE		20	25	10				
AMPHIBOLE			1	<1				

COMMENTS : _____

JP 6·86

BHP MINERALS EXPLORATION

OBSERVER'S DATA SHEET --- TITANIUM SAMPLE No : RT. 3048.

OBSERVER : P. Forknall SIZE RANGE OBSERVED : - 0.4 + 0.075 mm

SHEET No : 66 DATE STARTED : 13-4-87 DATE FINISHED : 13-4-87

MATERIAL: NON MAGS (~~HANDMAGNET~~ MAGS. SEP.) ☐ TICK OR SHOW OTHER: ENTERED ☐

OBSERVED	-0.4 +0.25	-0.25 +0.18	-0.18 +0.075	OTHER: MAG. 3+4		GRAINS BOTTLED IN BAG	GRAINS FOR PROBING
WEIGHT	0·01	0·7	22·0	1·0	23.71 gm		

MINERAL	Flag	VISUAL ESTIMATE OF MINERAL %				GRAIN COUNT CHECK	(SHOW SIZE FRACTION)
ILMENITE	E	< 1	5	10	80	0.035, 9.2, . 8	3.035 gm
MONAZITE	E						
RUTILE	E			2			0.44 gm
ZIRCON	E	–	TR	20	+		4.4 gm
LEUCOXENE	E	–	TR		–		
ROCKS		60	40	18	20		
TOURMALINE		20	40	30	–		
WHITES		20	15	20	+		
AMPHIBOLE		–	TR	TR	–		
		100%	100%	100%	100%		

COMMENTS :

JP 6·86

OBSERVER'S DATA SHEET --- TITANIUM SAMPLE No. KT 3054 102

OBSERVER : P. Forknall SIZE RANGE OBSERVED : -0.4 +0.075 mm

SHEET No : 65 DATE STARTED : 13-4-87 DATE FINISHED : 13-4-87

MATERIAL	NON MAGS (~~HANDMAGNET~~ MAG. SEP.) ☐ TICK OR SHOW OTHER:					ENTERED ☐
OBSERVED	-0.4 +0.25	-0.25 +0.18	-0.18 +0.075	OTHER: MAGS 3+4		GRAINS ~~BOTTLED IN BAG~~ / GRAINS ~~FOR PROBING~~
WEIGHT	0.1	0.5	14.8	1.7	17.1 gm	

MINERAL	Flag	VISUAL ESTIMATE OF MINERAL %				GRAIN COUNT CHECK	(~~SHOW~~ SIZE FRACTION)
ILMENITE	E	30	25	20	90	0.03, 0.125, 2.96, 1.53	4.65 g.
MONAZITE	E						
RUTILE	E	TR	TR	5			0.74 g
ZIRCON	E	TR	< 1	20			2.96 g
LEUCOXENE	E	TR	TR	< 1			
ROCKS		30	45	25	10		
TOURMALINE		10	20	20			
WHITES		30	10	10			
GARNET		—	TR	TR	TR		
		100%	100%	100%	100%		

COMMENTS : _____

JP 6·86

BHP MINERALS EXPLORATION

OBSERVER'S DATA SHEET --- TITANIUM SAMPLE No. RT 3068.

OBSERVER: PAULINE. SIZE RANGE OBSERVED: -0.4 +0.075 mm

SHEET No: 24 DATE STARTED: 15.1.87. DATE FINISHED: 15.1.87

MATERIAL: NON MAGS (~~HANDMAGNET~~) ☐ TICK OR SHOW OTHER:
MAG SEPARATED.

ENTERED ☐

OBSERVED	-0.4 +0.25	-0.25 +0.18	-0.18 +0.075	OTHER: M3+4 -0.4-0.075.		
WEIGHT	01	1·1	21·5	0·8		

GRAINS BOTTLED IN BAG / GRAINS FOR PROBING

MINERAL	Flag	VISUAL ESTIMATE OF MINERAL %												GRAIN COUNT CHECK				(SHOW SIZE FRACTION)	
* ILMENITE	E	7			5	0·06	10	2·8	15					0·12	=	2·33 gm			
MONAZITE	E																		
RUTILE	E	<1			<1		5	1·08								1·08 g			
ZIRCON	E	1			5		45		<1							9·67 g			
LEUCOXENE	E	TR			<1		1												
TOURMALINE		50			50		10												
ROCKS		25			17		19		85										
KYANITE		10			15		10		<1										
EPIDOTE		TR			TR														
QUARTZ		5			5														
BARITE		2			3														
STAUROLITE		TR																	

COMMENTS:

* Ilmen Mag & Hem abd comb.

Mags 3&4 mostly 0.075.

BHP MINERALS EXPLORATION

OBSERVER'S DATA SHEET --- TITANIUM SAMPLE No. RT3070

OBSERVER: J. Davidson SIZE RANGE OBSERVED: -0.4 +0.075mm

SHEET No: 18 DATE STARTED: 15/1/87 DATE FINISHED: 15/1/87

ENTERED ☐

MATERIAL: NON MAGS (HANDMAGNET) ☐ TICK OR SHOW OTHER: Mag Sep.

OBSERVED	-0.4 +0.25	-0.25 +0.18	-0.18 +0.075	OTHER:	1.Cl	
WEIGHT	0.2	1.2	23.5		-0.4 m 3&4	

GRAINS BOTTLED IN BAG / GRAINS FOR PROBING

MINERAL	Flag	VISUAL ESTIMATE OF MINERAL %			GRAIN COUNT CHECK			(SHOW SIZE FRACTION)
ILMENITE	E	3	10	10	10	.19	= 2.66gm	
MONAZITE	E							
RUTILE	E	1	<1	7	Tr.		1.65gm	
ZIRCON	E	2	5	58	Tr		13.63gm	
LEUCOXENE	E		<1	<1				
ROCKS		50	40		90			
TOURMALINE		30	25	15				
BARITE		3	5					
KYANITE		10	10	10	Tr.			
ANDALUSITE		1						
STAUROLITE		<1	Tr	<1				
AMPHIBOLE		Tr						
QUARTZ			5					
GARNET					Tr			

COMMENTS:

* Ilmen Mag & Hem all comb.

Mag 3&4 mostly 0.075

BHP MINERALS EXPLORATION

OBSERVER'S DATA SHEET --- TITANIUM SAMPLE No. RT 3081.

OBSERVER: PAULINE SIZE RANGE OBSERVED: - 0.4 + 0.075 mm

SHEET No: 24 DATE STARTED: 13-4-87 DATE FINISHED: 13-4-87

ENTERED

MATERIAL: ~~NON MAGS (HANDMAGNET)~~ MAG SEPARATED. TICK OR SHOW OTHER:

OBSERVED	-0.4 +0.25	-0.25 +0.18	-0.18 +0.075	OTHER: M3+4.		
WEIGHT	0.01	0.9	9.0	1.1	11.01 gm	

GRAINS ~~BOTTLED IN BAG~~ GRAINS ~~FOR PROBING~~

MINERAL	Flag	VISUAL ESTIMATE OF MINERAL %				GRAIN COUNT CHECK	(~~SHOW SIZE FRACTION~~)
ILMENITE	E	5	15	28	97	0.005, 0.135, 2.52, 107	3.725 gm
MONAZITE	E						
RUTILE	E		<1	3		009, 0.27	.279 gm
ZIRCON	E		2	15	<1	0.018, 135,	1.37 gm
LEUCOXENE	E		1	<1			
ROCKS		60	29	7	2		
TOURMAUNE		5	25	2			
WHITES.		30	28	45	<1		
EPIDOTE		TR.	TR				
AMPHIBOLE			TR.	TR.			
GARNETS					<1		

COMMENTS:

BHP MINERALS EXPLORATION

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OBSERVER'S DATA SHEET --- TITANIUM SAMPLE No. RT3092

OBSERVER : EDNA SIZE RANGE OBSERVED : -0.4 +0.075mm

SHEET No : 29 DATE STARTED : 13-4-87 DATE FINISHED : 13-4-87

MATERIAL: ~~NON MAGS~~ (~~HANDMAGNET~~) MAG SEP TICK OR SHOW OTHER:

ENTERED

OBSERVED	-0.4 +0.25	-0.25 +0.18	-0.18 +0.075	OTHER: MAGS 3+4		GRAINS BOTTLED IN BAG / GRAINS FOR PROBING
WEIGHT	0.2.	1.0	21.2	1.6	24.0gm	

MINERAL	Flag	VISUAL ESTIMATE OF MINERAL %				GRAIN COUNT CHECK	(SHOW SIZE FRACTION)
ILMENITE	E	<1	20	15	9H	.092, .2, 3.18, 1.50	4.88 gm
MONAZITE	E	-	-	-	-		
RUTILE	E	-	<1	2	-	.01 .42	.43 gm
ZIRCON	E	1	5	30	-	.002, .05, 6.36	6.41 gm
LEUCOXENE	E	TR	-	2	-		
GARNET		-	TR	-	1		
ROCKS		H0	35	16	5		
TOURMALINE		35	25	10	-		
WHITES		2H	15	25	-		
AMPHIBOLE		TR	TR	-	-		
EPIDOTE		-	<1	-	-		
ANDALUSITE		-	TR	TR	-		
SPINEL		-	-	TR	-		
		100%	100%	100%	100%		

COMMENTS :

JP 6-86

BHP MINERALS EXPLORATION

OBSERVER'S DATA SHEET — TITANIUM SAMPLE No. RT 3103 107

OBSERVER: P. Forknall SIZE RANGE OBSERVED: -0.4 +0.075 mm

SHEET No: 67 DATE STARTED: 13-4-87 DATE FINISHED: 13-4-87

MATERIAL: NON MAGS (~~HANDMAGNET~~ MAG SEP) ☐ TICK OR SHOW OTHER:

ENTERED ☐

OBSERVED	-0.4 +0.25	-0.25 +0.18	-0.18 +0.075	OTHER: MAG 3+4	
WEIGHT	0.01	0.9	13.7	1.3	15.91 gm

GRAINS BOTTLED IN BAG / GRAINS FOR PROBING

MINERAL	Flag	VISUAL ESTIMATE OF MINERAL %				GRAIN COUNT CHECK	(SHOW SIZE FRACTION)
ILMENITE	E	20	20	20	80	.002, .18, 2.74, 1.04	3.96 gm
MONAZITE	E						
RUTILE	E	–	1	2		.009, .274	.28 gm
ZIRCON	E	–	5	30		.045, 4.11	4.155 gm
LEUCOXENE	E	–	TR	1			.137 gm
ROCKS		30	34	27	20		
TOURMALINE		20	30	10			
WHITE		30	10	10	TR		
		100%	100%	100%	100%		

COMMENTS:

JP 6·86

BHP MINERALS EXPLORATION

OBSERVER'S DATA SHEET --- TITANIUM SAMPLE No. RT.3114 108

OBSERVER: P. Forknall SIZE RANGE OBSERVED: -0.4 +0.075mm

SHEET No: 68 DATE STARTED: 13-4-87 DATE FINISHED: 13-4-87

MATERIAL: NON MAGS (~~HANDMAGNET~~ MAG. SEP.) ☐ TICK OR SHOW OTHER:

ENTERED ☐

OBSERVED	-0.4 +0.25	-0.25 +0.18	-0.18 +0.075	OTHER: MAGS 3+4.		GRAINS BOTTLED IN BAG / GRAINS FOR PROBING
WEIGHT	0.2	1.0	21.5	1.9	24.6g	

MINERAL	Flag	VISUAL ESTIMATE OF MINERAL %			GRAIN COUNT CHECK	(SHOW SIZE FRACTION)
ILMENITE	E	20	30	20 75	.04, .03, 4.3, 1.4	6.04 gm
MONAZITE	E					
RUTILE	E		1			0.21 gm
ZIRCON	E	—	TR	30		6.45 gm
LAUCOXENE	E					
ROCKS		20	40	24 20		
TOURMALINE		30	15	10		
WHITE		30	15	15		
GARNET		TR	TR	TR 5		
EPIDOTE		TR	TR	TR		
AMPHIBOLE		TR	TR	TR		
		100%	100%	100% 100%		

COMMENTS: _____

JP 6·86

BHP MINERALS EXPLORATION

OBSERVER'S DATA SHEET --- TITANIUM SAMPLE No. RT 3125.

OBSERVER: PAULINE. SIZE RANGE OBSERVED: -0.4 +0.075mm

SHEET No: 25. DATE STARTED: 13-4-87 DATE FINISHED: 13-4-87

MATERIAL: ~~NON MAGS (HANDMAGNET)~~ ☐ TICK OR SHOW OTHER: MAG SEPARATED.

ENTERED ☐

OBSERVED	-0.4 +0.25	-0.25 +0.18	-0.18 +0.075	OTHER: M3+4.	-0.18 +0.075	17.61g
WEIGHT	0.01	0.8	15.3	1.5		

GRAINS BOTTLED IN BAG / GRAINS FOR PROBING

MINERAL	Flag	VISUAL ESTIMATE OF MINERAL %				GRAIN COUNT CHECK			(SHOW SIZE FRACTION)
ILMENITE	E	3	15	20	84	16.3	.0003 .12	3.06 1.26	4.44 gm
MONAZITE	E								
RUTILE	E	TR	<1	3		2.2	.459 .008		.46 gm
ZIRCON	E		2	50	<1	55.4	.016 7.6		7.61 gm
LEUCOXENE		TR	<1	1		1.4			0.15 gm
ROCKS		55	29	11	15	13.4			
TOURMALINE		7	15	5		1.4			
WHITES.		35	38	10	<1	9 8			
AMPHIBOLE		TR	TR.						
SPINELS			TR						
GARNETS.			1		<1				

COMMENTS:

RT 3125 (−0.18 +0.075)

ZIRCON	ILM.	ROCKS	WHITES	TOURM	RUTILE	LEUC.		
38	10	6	6	1	1	1		63
60	13	7	5	1	2	1		152
50	13	12	8	1	3	1		240
45	16	16	12	1	1	2		333
38	16	15	10	2	2	1		417
231	68	56	41	6	9	6		
55·4	16·3	13·4	9·8	1·4	2·2	1·4		

BHP MINERALS EXPLORATION

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OBSERVER'S DATA SHEET --- TITANIUM SAMPLE No. RT 3132

OBSERVER : EDNA

SIZE RANGE OBSERVED : - 0.4 + 0.075 mm

SHEET No : 30 DATE STARTED : 13·4·87 DATE FINISHED : 13·4·87

MATERIAL: ~~NON MAGS~~ (~~HANDMAGNET~~) MAGS 3&4/5 TICK OR SHOW OTHER:

ENTERED

OBSERVED	-0.4 +0.25	-0.25 +0.18	-0.18 +0.075	OTHER: MAGS 3&4
WEIGHT	0·3	0·5	4·1	1·3

6.2gm

~~GRAINS BOTTLED IN BAG~~ ~~GRAINS FOR PROBING~~

MINERAL	Flag	VISUAL ESTIMATE OF MINERAL %				GRAIN COUNT CHECK	(~~SHOW SIZE FRACTION~~)
ILMENITE	E	10	24	30	70	·03, ·12, 1.23, 0.91	2.29gm
MONAZITE	E	-	-	-	-		
RUTILE	E	-	<1	1	-		0.046gm.
ZIRCON	E	10	5	24	1	103, 0.025, 1.02, 0.018	1.088gm
~~FLUOXENE~~	E	-	TR	<1	-		
GARNET		-	-	TR	TR		
ROCKS		50	35	30	15		
WHITES		20	30	10	14		
AMPHIBOLE		<1	3	<1	-		
TOURMALINE		10	3	5	-		
		100%	100%	100%	100%		

COMMENTS :

JP 6 86

BHP MINERALS EXPLORATION

OBSERVER'S DATA SHEET --- TITANIUM SAMPLE No. RT 31382

OBSERVER: P. Forknall SIZE RANGE OBSERVED: -0.4 +0.075 mm

SHEET No: 69 DATE STARTED: 13-4-87 DATE FINISHED: 13-4-87

MATERIAL: NON MAGS (~~HANDMAGNET~~ MAG. SEP.) ☐ TICK OR SHOW OTHER: ENTERED ☐

OBSERVED	-0.4 +0.25	-0.25 +0.18	-0.18 +0.075	OTHER: MAG. 3+4
WEIGHT	0.6	1.1	1.8	1.0

4.5g

GRAINS ~~BOTTLED~~ IN BAG GRAINS ~~FOR~~ PROBING

MINERAL	Flag	VISUAL ESTIMATE OF MINERAL %				GRAIN COUNT CHECK	(~~SHOW~~ SIZE ~~FRACTION~~)
ILMENITE	E	5	10	10	60	0.03 .18 .11 .6 .92	.92 gm.
MONAZITE	E						
RUTILE	E			1			0.018 gm.
ZIRCON	E	< 1		5			0.09 gm.
LEUCOXENE	E						
ROCKS		87	75	58	20		
EPIDOTE		TR	TR	TR			
BARITE		5	5	10			
KYANITE		1	5	5			
TOURMALINE		1	5	10			
GARNET		—	TR	1	20		
AMPHIBOLE		—	TR	TR			
ANDALUSITE		—	TR	TR			
		100%	100%	100%	100%		

COMMENTS:

JP 6-86

BHP MINERALS EXPLORATION

OBSERVER'S DATA SHEET --- TITANIUM SAMPLE No. RT3141. 113

OBSERVER: P. Forknall SIZE RANGE OBSERVED: -0.4 +0.075 mm

SHEET No: 70 DATE STARTED: 13-4-87 DATE FINISHED: 13-4-87

MATERIAL	NON MAGS (~~HANDMAGNET~~ HOT MAG. SEP.)			TICK OR SHOW OTHER:		ENTERED
OBSERVED	-0.4 +0.25	-0.25 +0.18	-0.18 +0.075	OTHER:		GRAINS BOTTLED IN BAG / GRAINS FOR PROBING
WEIGHT	0.4	0.6	2.6		3.6	

MINERAL	Flag	VISUAL ESTIMATE OF MINERAL %			GRAIN COUNT CHECK	(SHOW SIZE FRACTION)
ILMENITE	E	5	10	5	0.02, 06 0.13	0.21 gm
MONAZITE	E					
RUTILE	E					-
ZIRCON	E	-	TR	30		0.78 gm
LEUCOXENE	E	-	-	TR		
ROCKS		63	40	19		
TOURMALINE		10	15	15		
WHITE		20	30	25		
AMPHIBOLE		1	<1	1		
GARNETS		1	5	5		
		100%	100%	100%		

COMMENTS:

JP 6-86

BHP MINERALS EXPLORATION

OBSERVER'S DATA SHEET --- TITANIUM SAMPLE No. RT 3144

OBSERVER: Pauline SIZE RANGE OBSERVED: -0.4 +0.075 mm

SHEET No: 26 DATE STARTED: 13-4-87 DATE FINISHED: 14-4-87

MATERIAL: ~~NON MAGS (HANDMAGNET)~~ MAG SEPARATED. ☐ TICK OR SHOW OTHER:

ENTERED ☐

OBSERVED	-0.4 +0.25	-0.25 +0.18	-0.18 +0.075	OTHER: MTH	
WEIGHT	1.1	1.7	2.1	0.7	5.6gm

GRAINS BOTTLED IN BAG / GRAINS FOR PROBING

MINERAL	Flag	VISUAL ESTIMATE OF MINERAL %	GRAIN COUNT CHECK	(SHOW SIZE FRACTION)
ILMENITE	E	<1 <1 3 80	.001 .017 0.063	.641 gm
MONAZITE	E		.156	
RUTILE	E	TR. 1		.021 gm
ZIRCON	E	3		.063 gm
LEUCOXENE	E	1		.021 gm
ROCKS		96 95 83 15		
WHITES		3 4 7 3		
AMPHIBOLE		<1 <1 1 <1		
EPIDOTE		TR. 1 1 TR		
TOURMALINE		<1 <1		
GARNETS		2		

COMMENTS:

BHP MINERALS EXPLORATION

OBSERVER'S DATA SHEET --- TITANIUM SAMPLE No. RT3151

OBSERVER : EDNA SIZE RANGE OBSERVED : -0.0 +0.075mm

SHEET No : 31 DATE STARTED : 13·4·87 DATE FINISHED : 14·4·87

MATERIAL: ~~NON MAGS~~ (~~HANDMAGNET~~) TICK OR SHOW OTHER:

ENTERED

OBSERVED	-0.4 +0.25	-0.25 +0.18	-0.18 +0.075	OTHER: M3H4.		GRAINS ~~BOTTLED IN BAG~~	GRAINS ~~FOR PROBING~~
WEIGHT	0·8	0·9	3·0	1·7	6.4gm.		

MINERAL	Flag	VISUAL ESTIMATE OF MINERAL %				GRAIN COUNT CHECK	(SHOW SIZE FRACTION)
ILMENITE	E	10	15	13	60	·08, ·135, ·39, 1·02	1.62 gm
MONAZITE	E	–	–	–	–		
RUTILE	E	<1	TR	<1	–		0·03 gm
ZIRCON	E	TR	2	5	–	0·018, 0·15	0·17 gm
LEUCOXENE	E	–	TR	TR	–		
ROCKS		76	70	60	35		
GARNET		–	–	–	1		
WHITES		8	8	15	4		
AMPHIBOLE		1	2	2	–		
TOURMALINE		5	3	5	–		
		100%	100%	100%	100%		

COMMENTS :

JP 6·86

BHP MINERALS EXPLORATION

OBSERVER'S DATA SHEET --- TITANIUM SAMPLE No. RT3155

OBSERVER: J. Davidson SIZE RANGE OBSERVED: -0.4 +0.075 mm

SHEET No: 20 DATE STARTED: 13/4/87 DATE FINISHED: 13/4/87.

MATERIAL: NON MAGS (HANDMAGNET) ☐ TICK OR SHOW OTHER: Mag Sep.

ENTERED ☐

OBSERVED	-0.4 +0.25	-0.25 +0.18	-0.18 +0.075	OTHER: Mag 3&4		GRAINS BOTTLED IN BAG	GRAINS FOR PROBING
WEIGHT	2.8	4.3	4.9	6.9	18.9 gm		

MINERAL	Flag	VISUAL ESTIMATE OF MINERAL %				GRAIN COUNT CHECK		(SHOW SIZE FRACTION)	
ILMENITE	E	TR.	TR	<1	1	0.049	0.069	.118 gm	
MONAZITE	E								
RUTILE	E		TR.	TR.				—	
ZIRCON	E		TR.	<1				—	
LEUCOXENE									
ROCKS.		99	93	88	99				
WHITES		<1	TR.	<1					
EPIDOTE			5	10					
TOURMALINE			1	<1					

COMMENTS:

OBSERVER'S DATA SHEET --- TITANIUM SAMPLE No. RT3162

OBSERVER : J Davidson. SIZE RANGE OBSERVED : -0.4 +0.075mm

SHEET No : 21 DATE STARTED : 13/4/87 DATE FINISHED : 13/4/87

ENTERED

MATERIAL: NON MAGS (HANDMAGNET) ☐ TICK OR SHOW OTHER: Mag Sep.

OBSERVED	-0.4 +0.25	-0.25 +0.18	-0.18 +0.075	OTHER: Mag Sep		GRAINS BOTTLED IN BAG	GRAINS FOR PROBING
WEIGHT	3.6	2.0	4.2	1.0	10.8gm.		

MINERAL	Flag	VISUAL ESTIMATE OF MINERAL %				GRAIN COUNT CHECK	(SHOW SIZE FRACTION)
ILMENITE	E	1	2	5	65	0.036, .06, 0.21, .65	0.194 gm
MONAZITE	E						
RUTILE	E	TR	TR	TR			-
ZIRCON	E		<1	1			0.042 gm
LEUCOXENE	E						
ROCK		98	88	86	30		
WHITE		<1	5	3	5		
TOURMALINE		<1	2	3	<1		
AMPHIBOLE			2	2			

COMMENTS :

JP 6 86

BHP MINERALS EXPLORATION

OBSERVER'S DATA SHEET --- TITANIUM SAMPLE No. RT-3173

OBSERVER: D. Forknall SIZE RANGE OBSERVED: -0.4 +0.075 mm

SHEET No: 71 DATE STARTED: 14-4-87 DATE FINISHED: 14-4-87

MATERIAL: NON MAGS (~~HANDMAGNET~~ MAG SEP.) TICK OR SHOW OTHER: ENTERED

OBSERVED	-0.4 +0.25	-0.25 +0.18	-0.18 +0.075	OTHER: MAG 3+4	5.0gm	GRAINS BOTTLED IN BAG	GRAINS FOR PROBING
WEIGHT	0.2	0.8	2.1	1.9			

MINERAL	Flag	VISUAL ESTIMATE OF MINERAL %				GRAIN COUNT CHECK	(SHOW SIZE FRACTION)
ILMENITE	E	TR	5	25	80	0.04, 0.12, 1.52	2.08 gm
MONAZITE	E						
RUTILE	E	—	TR	<1		0.021	0.021 gm
ZIRCON	E	—	1	5		.008, .125	0.133 gm
LEUCOXENE	E	—	TR	TR			
ROCKS		89	50	20	10		
TOURMALINE		1	3	20			
WHITE		10	40	25			
EPIDOTE		TR	TR	TR			
AMPHIBOLE		TR	1	4			
GARNETS		—	—	TR	10		
		100%	100%	100%	100%		

COMMENTS:

BHP MINERALS EXPLORATION

OBSERVER'S DATA SHEET --- TITANIUM SAMPLE No. RT. 3177

OBSERVER: P. Forknall SIZE RANGE OBSERVED: -0.4 +0.075 mm

SHEET No: 72 DATE STARTED: 14-4-87 DATE FINISHED: 14-4-87

MATERIAL: NON MAGS (~~HANDMAGNET~~ NOT MAG. SEP.) ☐ TICK OR SHOW OTHER:

ENTERED ☐

OBSERVED	-0.4 +0.25	-0.25 +0.18	-0.18 +0.075	OTHER:		GRAINS ~~BOTTLED IN BAG~~	GRAINS ~~FOR PROBING~~
WEIGHT	0.5	0.5	2.8		3.8 gm.		

MINERAL	Flag	VISUAL ESTIMATE OF MINERAL %			GRAIN COUNT CHECK	(~~SHOW SIZE~~ FRACTION)
ILMENITE	E	TR	5	10	25 . 28	0.53 gm
MONAZITE	E					
RUTILE	E	—	TR			0
ZIRCON	E	—	TR	10		0.28 gm
LEUCOXENE	E					
ROCKS		65	45	35		
TOURMALINE		5	10	5		
WHITES		20	20	20		
GARNETS		10	10	10		
PYRITE		TR	TR	TR		
AMPHIBOLE		TR	10	10		
EPIDOTE		TR	TR	TR		
		100%	100%	100%		

COMMENTS:

BHP MINERALS EXPLORATION

OBSERVER'S DATA SHEET --- TITANIUM SAMPLE No. RT 3182

OBSERVER: Pauline. SIZE RANGE OBSERVED: -0.4 +0.075 mm

SHEET No: 27 DATE STARTED: 14-4-87 DATE FINISHED: 14-4-87.

MATERIAL: ~~NON MAGS (HANDMAGNET)~~ NOT MAG SEPARATED ☐ TICK OR SHOW OTHER:

ENTERED ☐

OBSERVED	-0.4 +0.25	-0.25 +0.18	-0.18 +0.075	OTHER:		GRAINS ~~BOTTLED~~ IN BAG	GRAINS ~~FOR PROBING~~
WEIGHT	0.4	1.1	1.3		2.8 gm.		

MINERAL	Flag	VISUAL ESTIMATE OF MINERAL %			GRAIN COUNT CHECK			~~SHOW SIZE~~ FRACTION
ILMENITE	E	10	40	50	'04	0.44	.65	1.13 gm.
MONAZITE	E							
RUTILE	E	TR	1	2	.011	.026		.037 gm.
ZIRCON	E		1	3	.011	.039		.050 gm.
LEUCOXENE	E		<1	1				
ROCKS		64	28	19				
TOURMALINE		3	2	1				
WHITES		20	25	20				
AMPHIBOLE		1	2	3				
EPIDOTE.		2	1	1				

COMMENTS:

JP 6-86

BHP MINERALS EXPLORATION

OBSERVER'S DATA SHEET --- TITANIUM SAMPLE No. RT. 3186

OBSERVER: P. Forknall SIZE RANGE OBSERVED: -0.4 +0.075 mm

SHEET No: 73 DATE STARTED: 14-4-87 DATE FINISHED: 14-4-87

MATERIAL	NON MAGS (~~HANDMAGNET~~ NOT MAG SEP.)	TICK OR SHOW OTHER:	ENTERED

OBSERVED	-0.4 +0.25	-0.25 +0.18	-0.18 +0.075	OTHER:		GRAINS BOTTLED IN BAG	GRAINS FOR PROBING
WEIGHT	0.2	0.6	1.0		1.8 gm		

MINERAL	Flag	VISUAL ESTIMATE OF MINERAL %			GRAIN COUNT CHECK			(SHOW SIZE FRACTION)
ILMENITE	E	35	40	40	0.07,	0.24,	.4	1.11 gm
MONAZITE	E							
RUTILE	E	–	–	TR				–
ZIRCON	E	TR	TR	TR				–
LEUCOXENE	E							
ROCKS		30	30	40				
WHITE		30	25	15				
TOURMALINE		5	5	5				
STAUROLITE		TR	<1	TR				
		100%	100%	100%				

COMMENTS: _____

BHP MINERALS EXPLORATION

OBSERVER'S DATA SHEET --- TITANIUM SAMPLE No

OBSERVER : P. Forknall SIZE RANGE OBSERVED

SHEET No : 74 DATE STARTED : 14-4-87 DATE

MATERIAL	NON MAGS (~~HANDMAGNET~~ MAG SEP.)				☐ TICK OR SHOW OTH
OBSERVED	-0.4 +0.25	-0.25 +0.18	-0.18 +0.075	OTHER: MAGS 3rH	
WEIGHT	1·1	1·0	4·2	0·9	6·2 gm

MINERAL	Flag	VISUAL ESTIMATE OF MINERAL %			GRAIN COUNT CHE
ILMENITE	E	1	1	10 70	01, .01 .02
MONAZITE	E				
RUTILE	E				
ZIRCON	E				
LEUCOXENE	E				
ROCKS		98	94	79	
WHITES		1	5	10 20	
EPIDOTE		TR	TR	TR	
AMPHIBOLE		—	TR	1	
GARNETS		—	TR	TR 10	
		100%	100%	100% 100%	

COMMENTS : _____

JP 6·86

BHP MINERALS EXPLORATION

123

OBSERVER'S DATA SHEET --- TITANIUM SAMPLE No. RT. 3194

OBSERVER : P. Forknall SIZE RANGE OBSERVED : - 0.4 + 0.075 mm

SHEET No : 75 DATE STARTED : 14-4-87 DATE FINISHED : 14-4-87

MATERIAL	NON MAGS (~~HAND MAGNET~~ NOT MAG. SEP.) ☐ TICK OR SHOW OTHER:					ENTERED ☐
OBSERVED	-0.4 +0.25	-0.25 +0.18	-0.18 +0.075	OTHER:	Grain COUNT -0.18 +0.075	2.6 gr
WEIGHT	0.3	0.8	1.5			

MINERAL	Flag	VISUAL ESTIMATE OF MINERAL %			GRAIN COUNT CHECK	(~~SHOW~~ SIZE FRACTION)
ILMENITE	E	20	35	20	18.1 % :06 :28 0.3	0.64 gm
MONAZITE	E					
RUTILE	E	—		1	1.5 %	0.015 gm
ZIRCON	E	—		5	3.8 %	0.075 gm
LEUCOXENE	E	—	TR	TR	0.7 %	
ROCKS		35	15	30	32.3 %	
WHITES		10	20	25	25.8 %	
GARNETS		35	30	8	6.9 %	
AMPHIBOLE		TR	<1	5	6.5 %	
TOURMALINE		—	TR	5	3.0 %	
EPIDOTE		—	TR	<1	1.1 %	
		100%	100%	100%		

COMMENTS :

Sample No RT3194 - Grain Count - (SIZE -0.18+0.075) 14.4.87.

ROCKS	ZIRCON	RUTILE	WHITES	AMPHIBOLE	IL/MG	LEUCOX	GARNET	TOURMAL	EPIDOTE		
32	2	2	25	8	18	1	6	2	–	=	96
29	3	3	28	6	14	–	9	4	2	=	98
38	3	–	32	3	21	2	5	4	1	=	109
33	5	–	24	11	14	–	9	2	–	=	98
37	7	3	26	6	28	1	6	4	3	=	121
169	20	8	135	34	95	4	35	16	6	=	522
32.3%	3.8%	1.5%	25.8%	6.5%	18.1%	0.7%	6.9%	3.0%	1.1%		

APPENDIX B

OBSERVERS DATA SHEETS - TRAVERSE 7

BHP MINERALS EXPLORATION

OBSERVER'S DATA SHEET --- TITANIUM SAMPLE No. RT 3409.

OBSERVER : Pauline. SIZE RANGE OBSERVED : -0.4 +0.075 mm

SHEET No : 31 DATE STARTED : 23-4-87 DATE FINISHED : 23-4-87.

MATERIAL ~~NON MAGS (HANDMAGNET)~~ NOT MAG SEPARATED. ☐ TICK OR SHOW OTHER:

ENTERED ☐

OBSERVED	-0.4 +0.25	-0.25 +0.18	-0.18 +0.075	OTHER:	3.5 gm	GRAINS BOTTLED IN BAG	GRAINS FOR PROBING
WEIGHT	0.2.	0.4	2.9				

MINERAL	Flag	VISUAL ESTIMATE OF MINERAL %	GRAIN COUNT CHECK	(SHOW SIZE FRACTION)
ILMENITE	E	3 / 15 / 25	.006 .06 .725	0.79 gm
MONAZITE	E			
RUTILE	E	<1 / 2	.004 .058	0.062 gm
ZIRCON	E	1 / 15	.004	0.435 gm
LEUCOXENE	E	1 / 1		
ROCKS		55 / 43 / 22		
TOURMALINE		17 / 15 / 10		
WHITES.		25 / 25 / 25		
EPIDOTE		TR / TR / TR		

COMMENTS :

BHP MINERALS EXPLORATION

OBSERVER'S DATA SHEET --- TITANIUM SAMPLE No. RT 3419.

OBSERVER: P. Forknall SIZE RANGE OBSERVED: -0.4 +0.075 mm

SHEET No: 95 DATE STARTED: 23-4-87 DATE FINISHED: 23-4-87

MATERIAL: NON MAGS (~~HANDMAGNET~~ MAG. SEP.) ☐ TICK OR SHOW OTHER: ENTERED ☐

OBSERVED	-0.4 +0.25	-0.25 +0.18	-0.18 +0.075	OTHER: MAGS 3+4	-0.18 +0.075	9.5 gm	GRAINS BOTTLED IN BAG	GRAINS FOR PROBING
WEIGHT	0.3	1.2	6.7	1.3				

MINERAL	Flag	VISUAL ESTIMATE OF MINERAL %	GRAIN COUNT CHECK	(SHOW SIZE FRACTION)
ILMENITE	E	5 / 10 / 20 / 60	15.5% (.015 .12 1.34 0.78)	2.25 gm
MONAZITE	E			
RUTILE	E	TR / TR / 2	3.4%	0.13 gm
ZIRCON	E	TR / 1 / 20	22.0%	1.34 gm
LEUCOXENE	E			
ROCKS		87 / 69 / 40 / 40	43.5%	
TOURMALINE		2 / 10 / 5	4.2%	
AMPHIBOLE		1 / TR / TR		
WHITES		5 / 10 / 13	11.3%	
SILLIMANITE		- / TR / TR		
		100% / 100% / 100% / 100%		

COMMENTS:

Example 101.5711. Grain Count. Size (−0·187+0·075) 23.4.87.

Rocks	Zircon	Rutile	Il/Mg	Tourmaline	Whites.		
54	35	4	28	5	11	=	137
56	23	4	21	4	13	=	121
52	24	6	14	3	16	=	115
53	27	3	14	9	15	=	121
215	109	17	77	21	55	=	494
43·5%	22·0%	3·4%	15·5%	4·2%	11·1%		

BHP MINERALS EXPLORATION

129

OBSERVER'S DATA SHEET --- TITANIUM SAMPLE No. RT 3420

OBSERVER: Pauline. SIZE RANGE OBSERVED: -0.4 +0.075 mm

SHEET No: 32. DATE STARTED: 23-4-87 DATE FINISHED: 23-4-87.

MATERIAL: ~~NON MAGS (HANDMAGNET)~~ NOT MAG SEPARATED. TICK OR SHOW OTHER: ENTERED

OBSERVED	-0.4 +0.25	-0.25 +0.18	-0.18 +0.075	OTHER:		
WEIGHT	0.4	1.5.	1.9		3.8 gm	

GRAINS BOTTLED IN BAG / GRAINS FOR PROBING

MINERAL	Flag	VISUAL ESTIMATE OF MINERAL %			GRAIN COUNT CHECK		(SHOW SIZE FRACTION)
ILMENITE	E	5	5	10	.02 .07	.19	0.28 gm
MONAZITE	E						
RUTILE	E						-
ZIRCON	E	<1	<1	<1			0.03 gm
LEUCOXENE	E						
ROCKS		90	92	87			
WHITES		5	3	3			
TOURMALINE		TR	<1	<1			

COMMENTS:

BHP MINERALS EXPLORATION

OBSERVER'S DATA SHEET --- TITANIUM SAMPLE No. RT3425

OBSERVER: J. Davidson SIZE RANGE OBSERVED: -0.4 +0.075 mm

SHEET No: 19 DATE STARTED: 15/1/87 DATE FINISHED: 16/1/87

ENTERED

MATERIAL	NON MAGS (HANDMAGNET) Mag Sep.	TICK OR SHOW OTHER:				GRAINS BOTTLED IN BAG	GRAINS FOR PROBING
OBSERVED	-0.4 +0.25	-0.25 +0.18	-0.18 +0.075	OTHER:	C4 -0.4 Mag 3&4		
WEIGHT	0.01	0.7	8.1				

MINERAL	Flag	VISUAL ESTIMATE OF MINERAL %			GRAIN COUNT CHECK	(SHOW SIZE FRACTION)
ILMENITE	E	7	20	1.6	20	1.6 gm
MONAZITE	E					
RUTILE	E	3	1	3	Tr.	0.24 gm
ZIRCON	E	3	2	5	TR	0.40 gm
LEUCOXENE	E	TR.	TR	1		
ROCKS		69	50	50	80	
TOURMALINE		10	25	15		
STAUROLITE		5	2	1	TR.	
KYANITE		7	10	3		
BARITE		3	2	2		
EPIDOTE			TR	<1		
QUARTZ			1			

COMMENTS:

BHP MINERALS EXPLORATION

OBSERVER'S DATA SHEET --- TITANIUM SAMPLE No. RT 3431

OBSERVER: EDW17 SIZE RANGE OBSERVED: -0.4 +0.075mm

SHEET No: 15 DATE STARTED: 16.1.87 DATE FINISHED: 16.1.87

ENTERED

MATERIAL	NON MAGS (HANDMAGNET)	MAGS (SEP) - TICK OR SHOW OTHER:					
OBSERVED	-0.4 +0.25	-0.25 +0.18	-0.18 +0.075	OTHER: -0.4 MAGS			GRAINS BOTTLED IN BAG / GRAINS FOR PROBING
WEIGHT	0.4	1.4	12.9	1.5			

MINERAL	Flag	VISUAL ESTIMATE OF MINERAL %				GRAIN COUNT CHECK		(SHOW SIZE FRACTION)
ILMENITE	E	10 .06	10 .10	17 2.19	90 1.35			3.72gm
MONAZITE	E	-	-	-	-			
RUTILE	E	<1	<1	2	-			0.25gm
ZIRCON	E	10 .064	5 .07	15 1.93	TR			2.06gm
LEUCOXENE	E	TR	TR	<1	-			
ROCKS		70	58	45	10			
TOURMALINE		4	20	15	<1			
KYANITE		5	5	5	<1			
BARITE		1	2	1	<1			
EPIDOTE		-	-	TR	-			
SPHENE		-	-	-	TR			
		100%	100%	100%				

COMMENTS:

BHP MINERALS EXPLORATION

OBSERVER'S DATA SHEET --- TITANIUM SAMPLE No. RT 3442

OBSERVER: P. Forkiall SIZE RANGE OBSERVED: -0.4 +0.075 mm

SHEET No: 99 DATE STARTED: 29-4-87 DATE FINISHED 29-4-87

MATERIAL	NON MAGS (~~HANDMAGNET~~ MAG. SEP.)			TICK OR SHOW OTHER:		ENTERED
OBSERVED	-0.4 +0.25	-0.25 +0.18	-0.18 +0.075	OTHER: MAGS 3+4		GRAINS ~~BOTTLED IN BAG~~	GRAINS ~~FOR PROBING~~
WEIGHT	0.3	0.9	8.9.	1.1	11.2 gm		

MINERAL	Flag	VISUAL ESTIMATE OF MINERAL %				GRAIN COUNT CHECK		(SHOW SIZE FRACTION)
ILMENITE	E	20	15	15	75	0.06 .13	1.33 .82	2.34 gm
MONAZITE	E							
RUTILE	E	-	<1	4				0.356 gm
ZIRCON	E	TR	1	20				1.78 gm
LEUCOXENE	E	-	<1	1				
Rocks		37	40	18	20			
GARNET		TR	TR	TR	5			
TOURMALINE		20	20	30				
KYANITE		20	20	10				
AMPHIBOLE		2	1	TR				
QUARTZ		1	1	2				
ANDALUSITE		TR	TR	TR				
EPIDOTE		-	TR	TR				
		100%	100%	100%	100%			

COMMENTS: _____

BHP MINERALS EXPLORATION

OBSERVER'S DATA SHEET --- TITANIUM SAMPLE No. RT 3450.

OBSERVER: T. Forknall SIZE RANGE OBSERVED: - 0.4 + 0.075 mm

SHEET No: 102 DATE STARTED: 29-4-87 DATE FINISHED: 30-4-87

MATERIAL: NON MAGS (~~HANDMAGNET~~ NOT MAG SEP) ☐ TICK OR SHOW OTHER: ENTERED ☑

OBSERVED	-0.4 +0.25	-0.25 +0.18	-0.18 +0.075	OTHER: MAGS 3+4		GRAINS BOTTLED IN BAG	GRAINS FOR PROBING
WEIGHT	0.1	1.5	8.1	1.2.	10.9 gm		

MINERAL	Flag	VISUAL ESTIMATE OF MINERAL %			GRAIN COUNT CHECK		(SHOW SIZE FRACTION)
ILMENITE	E	20	10	10	.02 .15	.51	0.98 gm
MONAZITE	E						
RUTILE	E	–	TR	1			0.08 gm
ZIRCON	E	1	1	10	.05	.81	0.825 gm
LEUCOXENE	E	–	TR	1			
ROCKS		14	10	10			
WHITES		60	69	62			
AMPHIBOLE		5	1	1			
TOURMALINE		TR	10	5			
		100%	100%	100%			

COMMENTS:

JP 6·86

BHP MINERALS EXPLORATION

OBSERVER'S DATA SHEET --- TITANIUM SAMPLE No. RT3458

OBSERVER: J. Davidson SIZE RANGE OBSERVED: -0.4 +0.075 mm

SHEET No: 20 DATE STARTED: 16/1/87 DATE FINISHED: 16/1/87

MATERIAL: NON MAGS (HANDMAGNET) ☐ TICK OR SHOW OTHER: Mag Sep.

ENTERED ☐

OBSERVED	-0.4 +0.25	-0.25 +0.18	-0.18 +0.075	OTHER:	0.5 -0.4 Mags 3&4
WEIGHT	0.02	0.5	31.8		

GRAINS BOTTLED IN BAG ☐ GRAINS FOR PROBING ☐

MINERAL	Flag	VISUAL ESTIMATE OF MINERAL %			GRAIN COUNT CHECK		
* ILMENITE	E	10	0.05	15 4.77	20	0.1	4.92g
MONAZITE	E						
RUTILE	E	41					
ZIRCON	E	2	1	2 0.67	TR.		0.67g
LEUCOXENE	E						
ROCKS		30	49	55	80		
TOURMALINE		7	20	15			
BARITE		30	2	3			
AMPHIBOLE		1					
QUARTZ		30	3				
KYANITE			10	3			
SILLIMANITE			5	7	TR.		
GAHNITE				TR.			

(SHOW SIZE FRACTION)

COMMENTS:

* Ilmen Mag Hem all comb.

Mags 3 & 4 mostly 0.075.

BHP MINERALS EXPLORATION

OBSERVER'S DATA SHEET --- TITANIUM SAMPLE No RT3461

OBSERVER : EDNI? SIZE RANGE OBSERVED : - 0.4 + 0.075mm

SHEET No : 16 DATE STARTED : 16·1·87 DATE FINISHED : 16-1-87

ENTERED

MATERIAL	NON MAGS (HANDMAGNET) HAG Cap TICK OR SHOW OTHER:						GRAINS BOTTLED IN BAG	GRAINS FOR PROBING
OBSERVED	-0.4 +0.25	-0.25 +0.18	-0.18 +0.075	OTHER: -0.4 HAGS				
WEIGHT	24	58	30·8	1·3				

MINERAL	Flag	VISUAL ESTIMATE OF MINERAL %				GRAIN COUNT CHECK		(SHOW SIZE FRACTION)	
ILMENITE	E	1	1	7 2 1 6	9 0 1 7		2-33 gr		
MONAZITE	E	-	-	-	-				
RUTILE	E	-	TR	< 1	-		-		
ZIRCON	E	TR	TR	1 2	< 1		3.70 gr		
~~MAGNETITE~~	E	-	-	-	-				
ROCKS		99	98	72	10				
~~ZIRCON~~		-	-	-	-				
EPIDOTE		TR	-	TR	TR				
TOURMALINE		TR	TR	5	< 1				
BARITE		TR	< 1	3	< 1				
QUARTZ		-	TR	TR	-				
KYANITE		-	-	1	-				
AMPHIBOLE		-	-	-	TR				
		100%	100%	100%	100%				

COMMENTS :

BHP MINERALS EXPLORATION

136

OBSERVER'S DATA SHEET --- TITANIUM SAMPLE No. RT. 3465.

OBSERVER: P. Tetzlaff SIZE RANGE OBSERVED: -0.4 +0.075 mm

SHEET No: 100. DATE STARTED: 29-4-87 DATE FINISHED 29-4-87

ENTERED ✓

MATERIAL: NON MAGS (~~HANDMAGNET~~ NOT MAG. SEP.) ☐ TICK OR SHOW OTHER:

OBSERVED	-0.4 +0.25	-0.25 +0.18	-0.18 +0.075	OTHER:	3.4gm
WEIGHT	0.2	0.3	2.9		

GRAINS ~~BOTTLED~~ IN BAG / GRAINS FOR PROBING

MINERAL	Flag	VISUAL ESTIMATE OF MINERAL %			GRAIN COUNT CHECK	(~~SHOW~~ SIZE FRACTION)
ILMENITE	E	2	10	5	.009 .03 / 0.14	0.17gm
MONAZITE	E					
RUTILE	E	—	<1	2		0.058gm
ZIRCON	E	1	10	25	.03 / .002 / 25	0.76gm
LEUCOXENE	E			1		
ROCKS		78	53	30		
AMPHIBOLE		6	6	1		
KYANITE		2	5	5		
QUARTZ		1	<1	1		
TOURMALINE		10	15	30		
		100%	100%	100%		

COMMENTS: _____

JP 6·86

APPENDIX C

OBSERVERS DATA SHEETS - TRAVERSE 3

BHP MINERALS EXPLORATION

OBSERVER'S DATA SHEET --- TITANIUM SAMPLE No. RT. 3210

OBSERVER: F. Forknall SIZE RANGE OBSERVED: -0.4 +0.075 mm

SHEET No: 76 DATE STARTED: 14-4-87 DATE FINISHED: 14-4-87

MATERIAL: NON MAGS (~~HANDMAGNET~~) NOT MAG. SEP. ☐ TICK OR SHOW OTHER:

ENTERED ☐

OBSERVED	-0.4 +0.25	-0.25 +0.18	-0.18 +0.075	OTHER:		GRAINS BOTTLED IN BAG	GRAINS FOR PROBING
WEIGHT	0.1	0.3	4.2		4.6 gm		

MINERAL	Flag	VISUAL ESTIMATE OF MINERAL %			GRAIN COUNT CHECK			(~~SHOW~~ SIZE FRACTION)
ILMENITE	E	25	30	30	.025	.09	1.26	1.37 gm
MONAZITE	E							
RUTILE	E	-	<1	1	.003	.042		.045 gm
ZIRCON	E	-	1	15	.003	.63		.633 gm
LEUCOXENE	E	-	-	TR				
ROCKS		49	30	28				
TOURMALINE		5	7	5				
EPIDOTE		TR	TR	TR				
WHITE		20	30	20				
GARNET		1	<1	<1				
		100%	100%	100%				

COMMENTS: _____

JP 6·86

BHP MINERALS EXPLORATION

139

OBSERVER'S DATA SHEET --- TITANIUM SAMPLE No. RT. 3221.

OBSERVER: P. Forknall SIZE RANGE OBSERVED: -0.4 +0.075 mm

SHEET No: 77 DATE STARTED: 14-4-87 DATE FINISHED: 14-4-87

MATERIAL	NON MAGS (~~HANDMAGNET~~ NOT MAG.) ☐ TICK OR SHOW OTHER:				ENTERED ☐
OBSERVED	-0.4 +0.25	-0.25 +0.18	-0.18 +0.075	OTHER:	GRAINS BOTTLED IN BAG / GRAINS FOR PROBING
WEIGHT	0.04	0.3	3.6	3.94 g	

MINERAL	Flag	VISUAL ESTIMATE OF MINERAL %			GRAIN COUNT CHECK			(~~SHOW~~ SIZE FRACTION)
ILMENITE	E	25	30	30	.01	.04,	1.08	1.18 gm
MONAZITE	E							
RUTILE	E							-
ZIRCON	E	TR	<1	5	.003	0.18		.183 gm
LEUCOXENE	E							
ROCK		55	39	35				
TOURMALINE		<1	1					
WHITE		20	30	30				
GARNET		TR	TR	TR				
		100%	100%	100%				

COMMENTS: _____

JP 6-86

BHP MINERALS EXPLORATION

OBSERVER'S DATA SHEET --- TITANIUM SAMPLE No. RT. 3232.

OBSERVER: P. Forknall SIZE RANGE OBSERVED: -0.4 +0.075 mm

SHEET No: 78 DATE STARTED: 15-4-87 DATE FINISHED: 15-4-87

MATERIAL	NON MAGS (~~HANDMAGNET~~ NOT MAG. SEP.)			TICK OR SHOW OTHER:	ENTERED
OBSERVED	-0.4 +0.25	-0.25 +0.18	-0.18 +0.075	OTHER:	GRAINS BOTTLED IN BAG / GRAINS FOR PROBING
WEIGHT	0.2.	0.3	3.8	4.3 gm	

MINERAL	Flag	VISUAL ESTIMATE OF MINERAL %			GRAIN COUNT CHECK		(SHOW SIZE FRACTION)
ILMENITE	E	<1	15	30	.045	1.14	1.185 gm
MONAZITE	E						
RUTILE	E	-	-	<1			.038 gm
ZIRCON	E	TR	<1	10			.38 gm
LEUCOXENE	E						
ROCKS		93	70	24			
TOURMALINE		<1	5	5			
WHITE		5	10	29			
AMPHIBOLE		-	TR	1			
		100%	100%	100%			

COMMENTS: _____

JP 6·86

BHP MINERALS EXPLORATION

OBSERVER'S DATA SHEET --- TITANIUM SAMPLE No. RT. 3243.

OBSERVER: P. Forknall SIZE RANGE OBSERVED: -0.4 +0.075 mm

SHEET No: 79 DATE STARTED: 15-4-87 DATE FINISHED: 15-4-87

MATERIAL: NON MAGS (~~HANDMAGNET~~ MAG SEP.) ☐ TICK OR SHOW OTHER:

ENTERED ☐

OBSERVED	-0.4 +0.25	-0.25 +0.18	-0.18 +0.075	OTHER: MAG 3+4		
WEIGHT	0.1.	0.5	4.3	1.2	6.1 gm	

GRAINS ~~BOTTLED~~ IN BAG | GRAINS ~~FOR~~ PROBING

MINERAL	Flag	VISUAL ESTIMATE OF MINERAL %				GRAIN COUNT CHECK	(SHOW SIZE FRACTION)
ILMENITE	E	10	30	25	80	.01, .15, 1.075, .196	2.19 gm
MONAZITE	E						
RUTILE	E	—	—	< 1			0.043 gm
ZIRCON	E	—	—	20			0.86 gm
LEUCOXENE	E	—	TR	TR			
ROCKS		78	53	25	20		
TOURMALINE		2	2	5			
WHITE		10	15	25			
		100%	100%	100%	100%		

COMMENTS: _____

JP 6·86

BHP MINERALS EXPLORATION

OBSERVER'S DATA SHEET --- TITANIUM SAMPLE No. RT.3259.

OBSERVER: P. Forknall SIZE RANGE OBSERVED: -0.4 +0.075mm

SHEET No: 80 DATE STARTED: 15-4-87 DATE FINISHED: 15-4-87

MATERIAL: NON MAGS (~~HANDMAGNET~~ MAG. SEP.) ☐ TICK OR SHOW OTHER: ENTERED ☐

OBSERVED	-0.4 +0.25	-0.25 +0.18	-0.18 +0.075	OTHER: MAG 3+4		GRAINS BOTTLED IN BAG	GRAINS FOR PROBING
WEIGHT	0.2.	0.6	8.8	0.5	10.1gm.		

MINERAL	Flag	VISUAL ESTIMATE OF MINERAL %				GRAIN COUNT CHECK				(SHOW SIZE FRACTION)	
ILMENITE	E	10	10	20	70	.02	.06	1.78	35	2.19	gm
MONAZITE	E										
RUTILE	E		<1	2			.006	0.176		0.162	gm
ZIRCON	E	TR	25	30			.15	2.64		2.79	gm
LEUCOXENE		—	TR	2							
ROCKS		75	30	10	30						
TOURMALINE		5	5	5							
WHITES		10	30	31							
		100%	100%	100%	100%						

COMMENTS: _____

BHP MINERALS EXPLORATION

OBSERVER'S DATA SHEET --- TITANIUM SAMPLE No. RT. 3260.

OBSERVER: P. Farknall SIZE RANGE OBSERVED: -0.4 +0.075 mm

SHEET No: 81 DATE STARTED: 15-4-87 DATE FINISHED: 15-4-87

MATERIAL: NON MAGS (~~HANDMAGNET~~) ☐ TICK OR SHOW OTHER:

NOT MAG SEPARATED.

ENTERED ☐

OBSERVED	-0.4 +0.25	-0.25 +0.18	-0.18 +0.075	OTHER:		GRAINS ~~BOTTLED IN BAG~~	GRAINS ~~FOR PROBING~~
WEIGHT	0.1	0.5	0.6		1.2 gr.		

MINERAL	Flag	VISUAL ESTIMATE OF MINERAL %			GRAIN COUNT CHECK	(~~SHOW~~ SIZE FRACTION)
ILMENITE	E	10	20	30	.01, .1, .18	.29 gm
MONAZITE	E					
RUTILE	E	—	—	TR		—
ZIRCON	E	—	TR	2		0.012 gm
LEUCOXENE	E					
ROCKS		78	73	38		
TOURMALINE		2	2	5		
WHITE		10	5	25		
		100%	100%	100%		

COMMENTS: _____

JP 6·86

BHP MINERALS EXPLORATION

OBSERVER'S DATA SHEET --- TITANIUM SAMPLE No. RT.3270.

OBSERVER : P. Forkuall SIZE RANGE OBSERVED : -0.4 +0.075 mm

SHEET No : 82 DATE STARTED : 15-4-87 DATE FINISHED : 15-4-87

MATERIAL: NON MAGS (~~HANDMAGNET~~ MAG SEP.) ☐ TICK OR SHOW OTHER:

ENTERED ☐

OBSERVED	-0.4 +0.25	-0.25 +0.18	-0.18 +0.075	OTHER: MAGS 3+4		GRAINS ~~BOTTLED~~ IN BAG	GRAINS ~~FOR~~ PROBING
WEIGHT	0·2	0·6	6·8	0·6	8.2 gm		

MINERAL	Flag	VISUAL ESTIMATE OF MINERAL %				GRAIN COUNT CHECK	(~~SHOW~~ SIZE FRACTION)
ILMENITE	E	25	20	20	80	·05, ·12, 1.36, ·48	2.01 gm
MONAZITE	E						
RUTILE	E	–	<1	1			0.068 gm
ZIRCON	E	–	10	20		·06 1.36	1.42 gm
LEUCOXENE	E						
Rocks		45	34	30	20		
TOURMALINE		5	5				
WHITES		25	30	29			
		100%	100%	100%	100%		

COMMENTS : _____

JP 6·86

BHP MINERALS EXPLORATION

OBSERVER'S DATA SHEET --- TITANIUM SAMPLE No. RT 3278.

OBSERVER: P. Forknall SIZE RANGE OBSERVED: -0.4 +0.075 mm

SHEET No: 23 DATE STARTED: 15-1-87 DATE FINISHED: 16-1-87.

MATERIAL: NON MAGS (~~HANDMAGNET~~ MAG. SEP.) ☐ TICK OR SHOW OTHER:

ENTERED ☐

OBSERVED	-0.4 +0.25	-0.25 +0.18	-0.18 +0.075	OTHER:	002 -.4. Mags 3+4.
WEIGHT	0.01	0.1	2.5		

GRAINS BOTTLED IN BAG | GRAINS FOR PROBING

MINERAL	Flag	VISUAL ESTIMATE OF MINERAL %			GRAIN COUNT CHECK	(SHOW SIZE FRACTION)
ILMENITE	E					
MONAZITE	E					
RUTILE	E	-	TR	2 0.02	TR 0.02	
ZIRCON	E	<1	TR	20 .50	TR .50	
LEUCOXENE	E		TR	2	-	
ROCKS		80	40	30	25	
KYANITE		20	35	20	TR	
EPIDOTE		TR	TR	1	-	
MAG/HEM		TR	5	10	75	
TOURMALINE		TR	20	10	-	
QUARTZ		TR	TR	5	TR	
GARNET		-	TR	TR	TR	
ANDALUSITE		-	TR	TR	TR	
		100%	100%	100%	100%	

COMMENTS: Mags 3+4 - size 0.075mm to dust.

BHP MINERALS EXPLORATION

OBSERVER'S DATA SHEET --- TITANIUM SAMPLE No. RT3281

OBSERVER: PAULINE · SIZE RANGE OBSERVED: -0.4 +0.075 mm

SHEET No: 25 DATE STARTED: 15·1·87 · DATE FINISHED: 16·1·87 ·

ENTERED

MATERIAL OBSERVED	NON MAGS (~~HANDMAGNET~~ MAG SEPARATED)			TICK OR SHOW OTHER: OTHER: M3+4 -4-0.075	-0.18 +0.075 NM.		GRAINS BOTTLED IN BAG	GRAINS FOR PROBING
	-0.4 +0.25	-0.25 +0.18	-0.18 +0.075					
WEIGHT	0·04	0·3	3·9	0·4				

MINERAL	Flag	VISUAL ESTIMATE OF MINERAL %						GRAIN COUNT CHECK		(SHOW SIZE FRACTION)	
ILMENITE	E	2	5	5		30		8·5			
MONAZITE	E			·195		·12				·31g	
RUTILE	E	TR	1	7				6·2		·27g	
ZIRCON	E	10	30	·1	60	2·34	<1	49·6		2·44g	
LEUCOXENE	E	TR	1	2				3·5			
ROCKS		75	38	13		6·9		19·7			
TOURMALINE		10	15	10		<1		7·7			
BARITE		2	5	2		<1		2·0			
ANDALUSITE		TR	1	<1		<1					
AMPHIBOLE		TR	1	<1							
KYANITE		1	2	1				2·5			
QUARTZ			1			<1					

COMMENTS:

BHP MINERALS EXPLORATION

OBSERVER'S DATA SHEET --- TITANIUM SAMPLE No. RT. 3292.

OBSERVER: P. Forknall SIZE RANGE OBSERVED: -0.4 +0.075mm

SHEET No: 83 DATE STARTED: 15-4-87 DATE FINISHED: 15-4-87

MATERIAL: ~~NON MAGS (HANDMAGNET)~~ MAG SEPARATED. ☐ TICK OR SHOW OTHER: ENTERED ☐

OBSERVED	-0.4 +0.25	-0.25 +0.18	-0.18 +0.075	OTHER: M3+4		
WEIGHT	0.03.	0.2	2.2	0.6	3.03gm	GRAINS BOTTLED IN BAG / GRAINS FOR PROBING

MINERAL	Flag	VISUAL ESTIMATE OF MINERAL %				GRAIN COUNT CHECK	(SHOW SIZE FRACTION)
ILMENITE	E	40	25	25	70	0.012, 0.05, .55, .42	1.03 gm
MONAZITE	E						
RUTILE	E	TR	1	1		.007, .022	0.024 gm
ZIRCON	E	10	20	20		.013, .04, .24	0.28 gm
LEUCOXENE	E	—	TR	TR			
ROCKS		40	41	32	30		
TOURMALINE		5	5	10			
QUARTZ		2	2	5			
KYANITE		2	5	2			
AMPHIBOLE		1	1	5			
EPIDOTE		—	TR	TR			
		100%	100%	100%	100%		

COMMENTS:

JP 6·86

BHP MINERALS EXPLORATION

OBSERVER'S DATA SHEET --- TITANIUM SAMPLE No. RT 3300

OBSERVER : PAULINE. SIZE RANGE OBSERVED : - 0.4 + 0.075 mm

SHEET No : 29 DATE STARTED : 15-4-87 DATE FINISHED : 15-4-87.

MATERIAL: ~~NON MAGS (HANDMAGNET)~~ ☐ TICK OR SHOW OTHER: MAG SEPARATED.

ENTERED ☐

OBSERVED	-0.4 +0.25	-0.25 +0.18	-0.18 +0.075	OTHER: MJ+4.	4.5 gm
WEIGHT	0.2.	0.2	3.3	0.8	

~~GRAINS BOTTLED IN BAG~~ ~~GRAINS FOR PROBING~~ (~~SHOW SIZE FRACTION~~)

MINERAL	Flag	VISUAL ESTIMATE OF MINERAL %	GRAIN COUNT CHECK	
ILMENITE	E	2 15 . 15 98	.004, .03, .49, .78	1.20 gm
MONAZITE	E			
RUTILE	E	< 1 2	.002, .06	0.062 gm
ZIRCON	E	< 1 2 15 < 1	.004 .495	0.499 gm
LEUCOXENE	E	< 1 < 1 2		0.066 gm
ROCKS		20 15 5 1		
WHITES		65 60 58 < 1		
TOURMALINE		10 3 2		
AMPHIBOLE		3 5 1		
EPIDOTE		TR. TR		
GARNETS		< 1 .		

COMMENTS :

JP 6-86

BHP MINERALS EXPLORATION

OBSERVER'S DATA SHEET --- TITANIUM SAMPLE No. RT3307

OBSERVER: J. Davidson SIZE RANGE OBSERVED: -0.4 +0.075 mm

SHEET No: 24 DATE STARTED: 15/4/87 DATE FINISHED: 16/4/87

MATERIAL: NON MAGS (HANDMAGNET) ☐ TICK OR SHOW OTHER: NOT MAG SEP.

ENTERED ☐

OBSERVED	-0.4 +0.25	-0.25 +0.18	-0.18 +0.075	OTHER:	-0.18 +0.075		GRAINS BOTTLED IN BAG	GRAINS FOR PROBING
WEIGHT	0.04	0.4	1.2	✱		1.64 gm		

MINERAL	Flag	VISUAL ESTIMATE OF MINERAL %			GRAIN COUNT CHECK		(SHOW SIZE FRACTION)	
ILMENITE	E	15	45	45	43.6	.006 .54 .118	0.72	gm
MONAZITE	E							
RUTILE	E	TR.	<1	3	2.0	.004 .036 .04	0.040	gm
ZIRCON	E		3	10	12.3	0.01 .12	0.132	gm
LEUCOXENE	E	TR.	TR.	TR.				
ROCKS		70	27	10	10.7			
WHITES		10	10	25	24.2			
AMPHIBOLE		2	10	5	2.9			
TOURMALINE		2	5	2	4.1			
GARNET.		TR.						

COMMENTS: TOTAL No FOR GRAIN 438

J. Davidson RT3307 −0.18 +0.075 15/4/87

ILMEN	RUTILE	ZIRCON	ROCK	WHITES	TOURM	AMPH.					
36	2	8	8	19	3	4		80			
72	5	20	15	40	8	9		169			
112	6	30	33	67	10	12		270			
151	8	46	39	89	13	15		361			
191	9	54	47	106	13	18		438	TOTAL		
43.6	2.0	12.3	10.7	24.2	2.9	4.1					

BHP MINERALS EXPLORATION

OBSERVER'S DATA SHEET --- TITANIUM SAMPLE No. RT. 3308.

OBSERVER: P. Forknall SIZE RANGE OBSERVED: -0.4 +0.075 mm

SHEET No: 84 DATE STARTED: 16-4-87 DATE FINISHED: 16-4-87

MATERIAL: NON MAGS (~~HANDMAGNET~~ MAG. SEP.) ☐ TICK OR SHOW OTHER:

ENTERED ☐

OBSERVED	-0.4 +0.25	-0.25 +0.18	-0.18 +0.075	OTHER: MAGS 3+4	6.3gm.	
WEIGHT	0.2	0.1	0.6	5.4		

GRAINS ~~BOTTLED~~ IN BAG / GRAINS ~~FOR~~ PROBING

MINERAL	Flag	VISUAL ESTIMATE OF MINERAL %				GRAIN COUNT CHECK	(~~SHOW~~ SIZE ~~FRACTION~~)
ILMENITE	E				40		2.16gm
MONAZITE	E						
RUTILE	E	—	—	TR			—
ZIRCON	E	—	—	1			.006gm
LEUCOXENE	E						
ROCKS		59	69	44	60		
WHITES		1	1	25			
AMPHIBOLE		40	30	30			
		100%	100%	100%	100%		

COMMENTS: _____

JP 6·86

BHP MINERALS EXPLORATION

OBSERVER'S DATA SHEET --- TITANIUM SAMPLE No. RT. 3314

OBSERVER: P. Forknall SIZE RANGE OBSERVED: -0.4 +0.075 mm

SHEET No: 85 DATE STARTED: 16-4-87 DATE FINISHED: 16-4-87

MATERIAL: NON MAGS (~~HANDMAGNET~~ NOT MAG SEP.) ☐ TICK OR SHOW OTHER:

ENTERED ☐

OBSERVED	-0.4 +0.25	-0.25 +0.18	-0.18 +0.075	OTHER:		GRAINS BOTTLED IN BAG	GRAINS FOR PROBING
WEIGHT	0.2.	0.6	1.0		1.8 gm.		

MINERAL	Flag	VISUAL ESTIMATE OF MINERAL %			GRAIN COUNT CHECK	(SHOW SIZE FRACTION)
ILMENITE	E	2	10	20	.004 .060 .2	0.264 gm
MONAZITE	E					
RUTILE	E		TR	1		0.01 gm
ZIRCON	E		1	10	.006 .1	0.106 gm
LEUCOXENE	E					
ROCKS		91	73	27		
WHITE		5	10	20		
AMPHIBOLE		2	5	20		
GARNET		TR	<1	1		
TOURMALINE		—	TR	<1		
		100%	100%	100%		

COMMENTS: _____

BHP MINERALS EXPLORATION

OBSERVER'S DATA SHEET --- TITANIUM SAMPLE No. RT3327

OBSERVER : J. Davidson SIZE RANGE OBSERVED : - 0.4 + 0.075 mm

SHEET No : 25 DATE STARTED : 16/4/87 DATE FINISHED : 16/4/87

MATERIAL: NON MAGS (HANDMAGNET) ☐ TICK OR SHOW OTHER: MAG SEP

ENTERED ☐

OBSERVED	-0.4 +0.25	-0.25 +0.18	-0.18 +0.075	OTHER: Mag 304	5.0 gm	GRAINS BOTTLED IN BAG	GRAINS FOR PROBING
WEIGHT	0.1	0.2	2.4	2.3			

MINERAL	Flag	VISUAL ESTIMATE OF MINERAL %				GRAIN COUNT CHECK	(SHOW SIZE FRACTION)	
ILMENITE	E	24	1	17	85	.024, .003, .408, 1.955	2.39 gm	
MONAZITE	E							
RUTILE	E	TR	<1	2			.048 gm	
ZIRCON	E	TR.	<1	30			0.72 gm	
LEUCOXENE	E		TR	1			.024 gm	
ROCK		30	7	15	7			
STAUROLITE		<1						
TOURMALINE		1	1	<1	TR			
AMPHIBOLE		20	45	20	3			
WHITES		25	45	15	TR			
GARNET					5			

COMMENTS :

JP 6-86

BHP MINERALS EXPLORATION

OBSERVER'S DATA SHEET --- TITANIUM SAMPLE No. RT 3328

OBSERVER: P. Forknall SIZE RANGE OBSERVED: -0.4 +0.075 mm

SHEET No: 87 DATE STARTED: 16-4-87 DATE FINISHED: 16-4-87

MATERIAL: ~~NON MAGG~~ (~~HANDMAGNET~~) NOT MAG. SEP. ☐ TICK OR SHOW OTHER: ENTERED ☐

OBSERVED	-0.4 +0.25	-0.25 +0.18	-0.18 +0.075	OTHER:
WEIGHT	0.3.	1.0	1.0	2.3gm

~~GRAINS BOTTLED IN BAG~~ ~~GRAINS FOR PROBING~~

MINERAL	Flag	VISUAL ESTIMATE OF MINERAL %			GRAIN COUNT CHECK	(~~SHOW~~ SIZE FRACTION)
ILMENITE	E	1	2	5	.503 .02 .05	.073 gm
MONAZITE	E					
RUTILE	E					–
ZIRCON	E			TR		–
LEUCOXENE	E					
ROCKS		98	97	94		
WHITE GARNET		1	1	1		
		TR	TR	TR		
		100%	100%	100%		

COMMENTS: _____

BHP MINERALS EXPLORATION

155

OBSERVER'S DATA SHEET --- TITANIUM SAMPLE No. RT 3339

OBSERVER: P. Forknall SIZE RANGE OBSERVED: -0.4 +0.075 mm

SHEET No: 88 DATE STARTED: 16-4-87 DATE FINISHED: 16-4-87

MATERIAL: NON MAGS (~~HANDMAGNET~~ MAG. SEP.) ☐ TICK OR SHOW OTHER: ENTERED ☐

OBSERVED	-0.4 +0.25	-0.25 +0.18	-0.18 +0.075	OTHER: MAG. 3+4	-0.18 +0.075.	6.6 gm	GRAINS ~~BOTTLED IN BAG~~	GRAINS ~~FOR PROBING~~
WEIGHT	0.2	0.3	2.9	3.2				

MINERAL	Flag	VISUAL ESTIMATE OF MINERAL %				GRAIN COUNT CHECK		(~~SHOW SIZE FRACTION~~)	
ILMENITE	E	1	10	10	70	10.2%	.03 .29	2.56 gm	
MONAZITE	E						2.24 2.56		
RUTILE	E	—	—	<1		1.3%		0.029 gm	
ZIRCON	E	TR	5	10		8.2%	.015 .29	0.30 gm	
ROCKS		39	34	40	30	44.7%			
WHITES		30	25	25		22%			
GARNET		TR	TR	—	TR	—			
AMPHIBOLE		30	25	10		7.2%			
TOURMALINE		TR	1	5		6.1%			
		100%	100%	100%	100%				

COMMENTS:

JP 6-86

Sample N°RT3339. Grain Count (-0.18+0.075) 16.4.87.

	Zircon	Rutile	Tourm	Amphibole	White	Il/Mg.		
66	6	1	6	7	21	4	=	111
45	9	2	10	10	29	19	=	124
42	16	1	4	5	20	9	=	97
52	7	2	8	11	31	15	=	126
205	38	6	28	33	101	47	=	458
44·7%	8·2%	1·3%	6·1%	7·2%	22	10·2%		

BHP MINERALS EXPLORATION

OBSERVER'S DATA SHEET --- TITANIUM SAMPLE No. RT 3350

OBSERVER : EDNA . SIZE RANGE OBSERVED : - 0.4 + 0.075 mm

SHEET No : 33 DATE STARTED : 16.4.87 DATE FINISHED : 16.4.87

MATERIAL: ~~NON MAGS~~ (~~HANDMAGNET~~) [MAGS 3+4] TICK OR SHOW OTHER:

ENTERED

OBSERVED	-0.4 +0.25	-0.25 +0.18	-0.18 +0.075	OTHER: MAGS 3+4
WEIGHT	0.1	0.5	1.6	3.0

5.2 gm

GRAINS ~~BOTTLED IN BAG~~ | GRAINS ~~FOR PROBING~~

MINERAL	Flag	VISUAL ESTIMATE OF MINERAL %				GRAIN COUNT CHECK	(SHOW SIZE ~~FRACTION~~)
ILMENITE	E	3	15	25	94	.007 .075 0.4 2.82	3.29 gm
MONAZITE	E	+	-	+	-		
RUTILE	E	-	TR	<1	-		.016 gm
ZIRCON	E	5	15	-	<1	.005, .075, .030	.110 gm
LEUCOXENE	E	-	TR	<1	+		
GARNET		TR	TR	-	<1		
ROCKS		40	25	10	5		
AMPHIBOLE		35	30	5	1		
WHITES		15	14	55	-		
TOURMALINE		2	1	5	-		
		100%	100%	100%	100%		

COMMENTS :

BHP MINERALS EXPLORATION

OBSERVER'S DATA SHEET --- TITANIUM SAMPLE No. RT3358

OBSERVER : J. Davidson SIZE RANGE OBSERVED : -0.4 +0.075 mm

SHEET No : 26 DATE STARTED : 16/4/87. DATE FINISHED : 16/4/87

MATERIAL OBSERVED: NON MAGS (HANDMAGNET) ☐ TICK OR SHOW OTHER: MAG SEP.

ENTERED ☐

MATERIAL OBSERVED	-0.4 +0.25	-0.25 +0.18	-0.18 +0.075	OTHER: Mag 304		GRAINS BOTTLED IN BAG	GRAINS FOR PROBING
WEIGHT	0.3	0.3.	2.6	2.6	5.8gm		

MINERAL	Flag	VISUAL ESTIMATE OF MINERAL %				GRAIN COUNT CHECK	(SHOW SIZE FRACTION)
ILMENITE	E	3	5	10	80	.004 .015 .26 2.08	2.36 gm
MONAZITE	E						
RUTILE	E	<1	1	5		.003 .13	0.133 gm
ZIRCON	E	TR	3	30		.009 .28	0.789 gm
LEUCOXENE	E	<1	<1	1			.026 gm
AMPHIBOLE		50	50	27	7		
ROCK		20	18	10	10		
GARNET					3		
TOURMALINE		2	3	2			
WHITES		25	20	15			
EPIDOTE		TR.	<1	<1			

COMMENTS :

BHP MINERALS EXPLORATION

OBSERVER'S DATA SHEET --- TITANIUM SAMPLE No. RT.3367.

OBSERVER: P. Torknell SIZE RANGE OBSERVED: -0.4 +0.075 mm

SHEET No: 93 DATE STARTED: 23-4-87 DATE FINISHED: 23-4-87

MATERIAL: NON MAGS (~~HANDMAGNET~~ MAG. SEP.) ☐ TICK OR SHOW OTHER:

ENTERED ☐

OBSERVED	-0.4 +0.25	-0.25 +0.18	-0.18 +0.075	OTHER: MAGS 3+4	4.2 gm	GRAINS BOTTLED IN BAG	GRAINS FOR PROBING
WEIGHT	0.1	0.4	1.2	2.5.			

MINERAL	Flag	VISUAL ESTIMATE OF MINERAL %	GRAIN COUNT CHECK	(SHOW SIZE FRACTION)
ILMENITE	E	5 5 15 60	.005 .02 .18 1.5	1.70 gm
MONAZITE	E			
RUTILE	E	– TR 2 –		0.024 gm
ZIRCON	E	TR 5 20 –	.02, .24	0.26 gm
LEUCOXENE	E	TR TR 1 –		0.012 gm
ROCKS		10 20 15 10		
TOURMALINE		10 10 10 –		
AMPHIBOLE		45 40 22 15		
GARNET		TR TR TR 15		
WHITES		30 20 15 –		
		100% 100% 100% 100%		

COMMENTS:

BHP MINERALS EXPLORATION

OBSERVER'S DATA SHEET --- TITANIUM SAMPLE No. RT. 3373.

OBSERVER: P. Forknall. SIZE RANGE OBSERVED: -0.4 +0.075 mm

SHEET No: 94 DATE STARTED: 23-4-87 DATE FINISHED: 23-4-87

MATERIAL: NON MAGS (~~HANDMAGNET~~ NOT MAG. SEP.) ☐ TICK OR SHOW OTHER:

ENTERED ☐

OBSERVED	-0.4 +0.25	-0.25 +0.18	-0.18 +0.075	OTHER:		
WEIGHT	0.5	0.6	2.8		3.9 gm	

GRAINS BOTTLED IN BAG / GRAINS FOR PROBING

MINERAL	Flag	VISUAL ESTIMATE OF MINERAL %			GRAIN COUNT CHECK			(SHOW SIZE FRACTION)
ILMENITE	E	5	5	15	.025	.03	.42	.47 gm
MONAZITE	E							
RUTILE	E	–	TR	1				.028 gm
ZIRCON	E	TR	1	10	.006	.28		.286 gm
LEUCOXENE	E	TR	TR	TR				
ROCKS		10	34	25				
TOURMALINE		10	5	5				
GARNET		10	5	1				
AMPHIBOLE		64	30	28				
WHITES.		1	20	15				
		100%	100%	100%				

COMMENTS: _____

BHP MINERALS EXPLORATION

OBSERVER'S DATA SHEET --- TITANIUM SAMPLE No. RT 3379

OBSERVER: EDNA SIZE RANGE OBSERVED: -0.4 +0.075mm

SHEET No: 34 DATE STARTED: 16.4.87 DATE FINISHED: 16.4.87

MATERIAL	~~NON MAGS~~ (~~HANDMAGNET~~) WHOLE SAMP	TICK OR SHOW OTHER:	ENTERED

OBSERVED	-0.4 +0.25	-0.25 +0.18	-0.18 +0.075	OTHER:		GRAINS ~~BOTTLED IN BAG~~	GRAINS FOR PROBING
WEIGHT	0.3	0.9	0.5		1.7gm		

MINERAL	Flag	VISUAL ESTIMATE OF MINERAL %			GRAIN COUNT CHECK			(SHOW SIZE ~~FRACTION~~)
ILMENITE	E	45	38	40	1135	34	0.2	0.67gm
MONAZITE	E	-	-	TR				tr
RUTILE	E	2	<1	3	.006	.009	.015	0.030gm
ZIRCON	E	2	3	20	.006	.027	.1	0.133gm
LEUCOXENE		T	<1	<1				
ROCKS		7	8	8				
AMPHIBOLE		31	40	17				
NAITES		3	3	7				
GARNET		10	7	2				
TOURMALINE		<1	1	3				
		100%	100%	100%				

COMMENTS:

JP 6-86

BHP MINERALS EXPLORATION

OBSERVER'S DATA SHEET --- TITANIUM SAMPLE No. RT3385

OBSERVER: J. Davidson SIZE RANGE OBSERVED: -0.4 +0.075 mm

SHEET No: 30 DATE STARTED: 23/4/87 DATE FINISHED: 23/4/87

MATERIAL	NON MAGS (HANDMAGNET) ☐ TICK OR SHOW OTHER: Mag Sep					ENTERED ☐
OBSERVED	-0.4 +0.25	-0.25 +0.18	-0.18 +0.075	OTHER: Mag Sep		GRAINS BOTTLED IN BAG / GRAINS FOR PROBING
WEIGHT	0.3.	0.4	1.8	2.3	4.8 gm	

MINERAL	Flag	VISUAL ESTIMATE OF MINERAL %				GRAIN COUNT CHECK		(SHOW SIZE FRACTION)
ILMENITE	E		3	92		.054	2.116	2.17 gm
MONAZITE	E							
RUTILE	E	TR	1	2		.004	.036	0.040 gm
ZIRCON	E	1	2	25		.003, .008, 0.45		0.46 gm.
LEUCOXENE	E	TR	TR	2			.036	~~0~~
GARNET		2	2		5			
ROCKS		3	5	15	3			
AMPHIBOLE		83	75	25				
WHITES		10	12	20				
TOURMALINE		1	3	7				
EPIDOTE		TR	TR	1				

COMMENTS:

BHP MINERALS EXPLORATION

OBSERVER'S DATA SHEET --- TITANIUM SAMPLE No. PT 3396

OBSERVER : J. Davidson SIZE RANGE OBSERVED : -0.4 +0.075 mm

SHEET No : 31 DATE STARTED : 23/4/87 DATE FINISHED : 23/4/87.

ENTERED

MATERIAL	NON MAGS (HANDMAGNET) ☐ TICK OR SHOW OTHER: NOT MAG SEP.					
OBSERVED	-0.4 +0.25	-0.25 +0.18	-0.18 +0.075	OTHER:		
WEIGHT	0.3.	0.8	0.6		1.7 gm	

GRAINS BOTTLED IN BAG / GRAINS FOR PROBING

MINERAL	Flag	VISUAL ESTIMATE OF MINERAL %			GRAIN COUNT CHECK			(SHOW SIZE FRACTION)	
ILMENITE	E	30	35	40	.09	.28	.24	0.61 gm	
MONAZITE	E								
RUTILE	E		Te	2				0.012 gm	
ZIRCON	E		<1	5	.008		.03	0.038 gm	
LEUCOXENE	E		TR						
ROCKS		20	10	15					
AMPHIBOLE		35	35	13					
WHITES		2	7	20					
EPIDOTE		TR.	TR						
GARNET		10	5						
TOURMALINE		3	7	5					

COMMENTS :

JP 6·86

(CR 5554)

EXPLORATION LICENCE 1353
IFOULD LAKE, SOUTH AUSTRALIA

REPORT FOR THE QUARTER ENDED
19TH AUGUST 1987

R.J. TAYLOR
ADELAIDE

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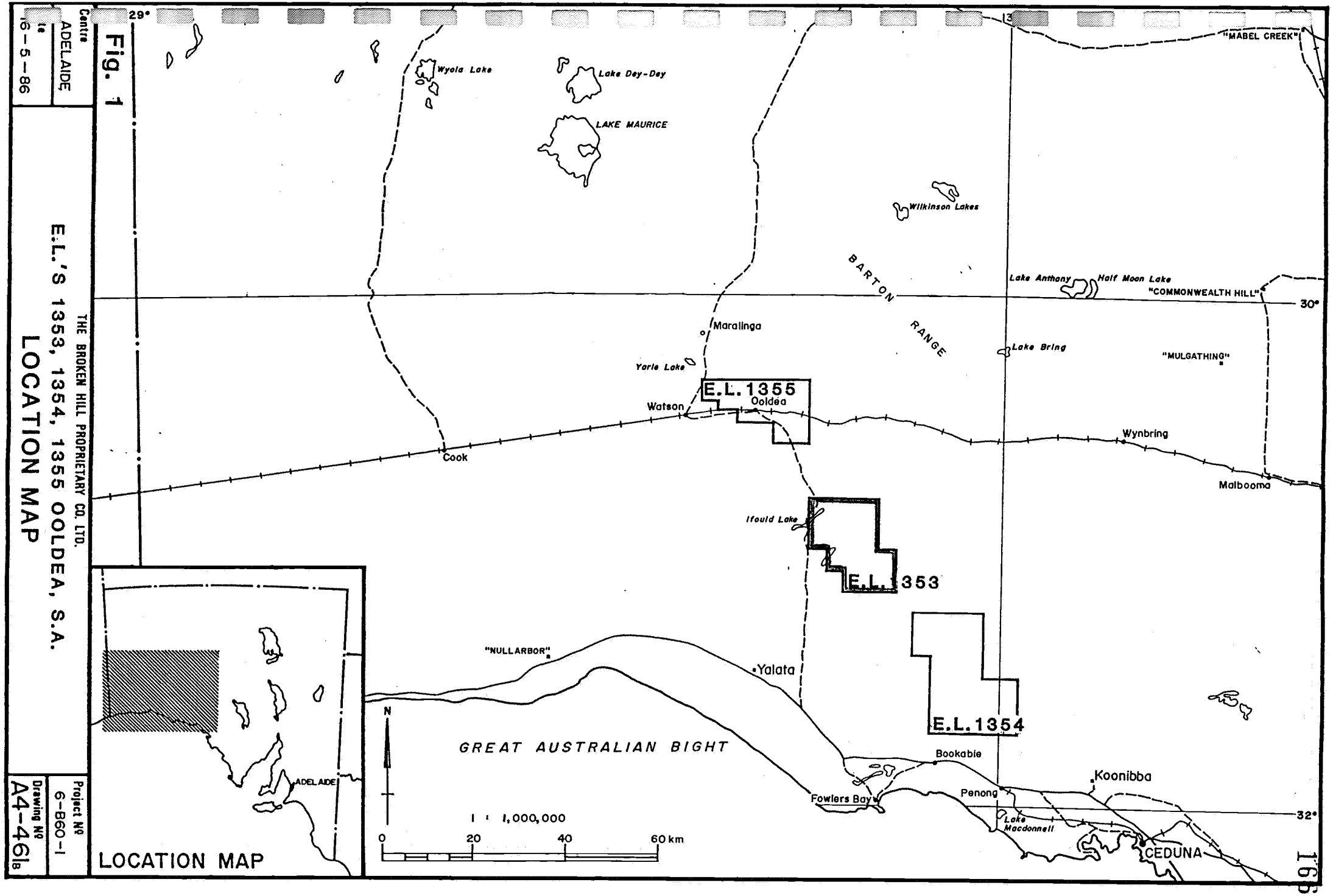


Fig. 1
Centre
ADELAIDE
16-5-86
THE BROKEN HILL PROPRIETARY CO. LTD.
E.L.'S 1353, 1354, 1355 OOLDEA, S.A.
LOCATION MAP
Project Nº
6-B60-1
Drawing Nº
A4-461B
29°
30°
32°
"MABEL CREEK"
Wyola Lake
Lake Dey-Dey
LAKE MAURICE
Wilkinson Lakes
BARTON RANGE
Lake Anthony
Half Moon Lake
"COMMONWEALTH HILL"
Maralinga
Yarle Lake
Lake Bring
"MULGATHING"
E.L. 1355
Ooldea
Watson
Cook
Wynbring
Malbooma
Ifould Lake
E.L. 1353
"NULLARBOR"
Yalata
E.L. 1354
GREAT AUSTRALIAN BIGHT
Bookabie
Koonibba
Penong
Fowlers Bay
Lake Macdonnell
CEDUNA
N
1 : 1,000,000
0 20 40 60 km
ADELAIDE
LOCATION MAP

EXPLORATION LICENCE 1353

IFOULD LAKE, SOUTH AUSTRALIA

QUARTERLY REPORT FOR THE PERIOD 20.5.87 TO 19.8.87

1. GENERAL STATEMENT

Exploration Licence 1353 was taken up to test the potential for heavy mineral sands in the Ooldea Ridge. It forms part of a regional exploration programme including nearby ELs 1354 and 1355. A literature search and geological assessment of the Tertiary sediments of the Ooldea Ridge showed that the environment for beach sands preservation may exist.

Reconnaissance geological field work and sampling has been carried out. Drill traverse lines have been delineated, cleared by bulldozer and were drill tested in November 1986. Geological interpretation has been completed and analytical results have now been received. No field work has been undertaken during this quarter.

2. TITLE

Exploration Licence 1353 of 1,220 square kilometres was granted to BHP Minerals Limited on 20th August, 1986 for one year and has now been renewed for a second year. Its location is shown on Figure 1.

3. FIELD INVESTIGATIONS

No field work has been carried out during this quarter.

The results of follow-up drilling in the nearly EL.1355 Ooldea are awaited in order to assess the full potential of this licence. When these results are available the next phase of exploration will be planned.

4. EXPENDITURE

The expenditure for the fourth quarter of EL.1353 for the three months to the end of August 1987 is summarised as follows:

Wages and salaries	3575
Field support	48
Vehicles	259
Tenement renewal fees	2446
Laboratory costs	550
Administration and overheads	344
	$7222

The total expenditure to date for EL.1353 is $75,286.

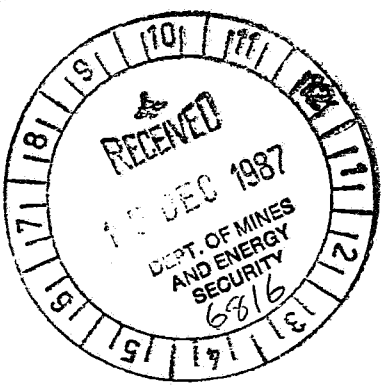
This report is submitted to the Department of Mines and Energy as required by Clause 2 of EL.1353.

(CR 5708)

EXPLORATION LICENCE 1353
IFOULD LAKE, SOUTH AUSTRALIA

REPORT FOR THE QUARTER ENDED
19TH NOVEMBER 1987

R.J. TAYLOR
Adelaide



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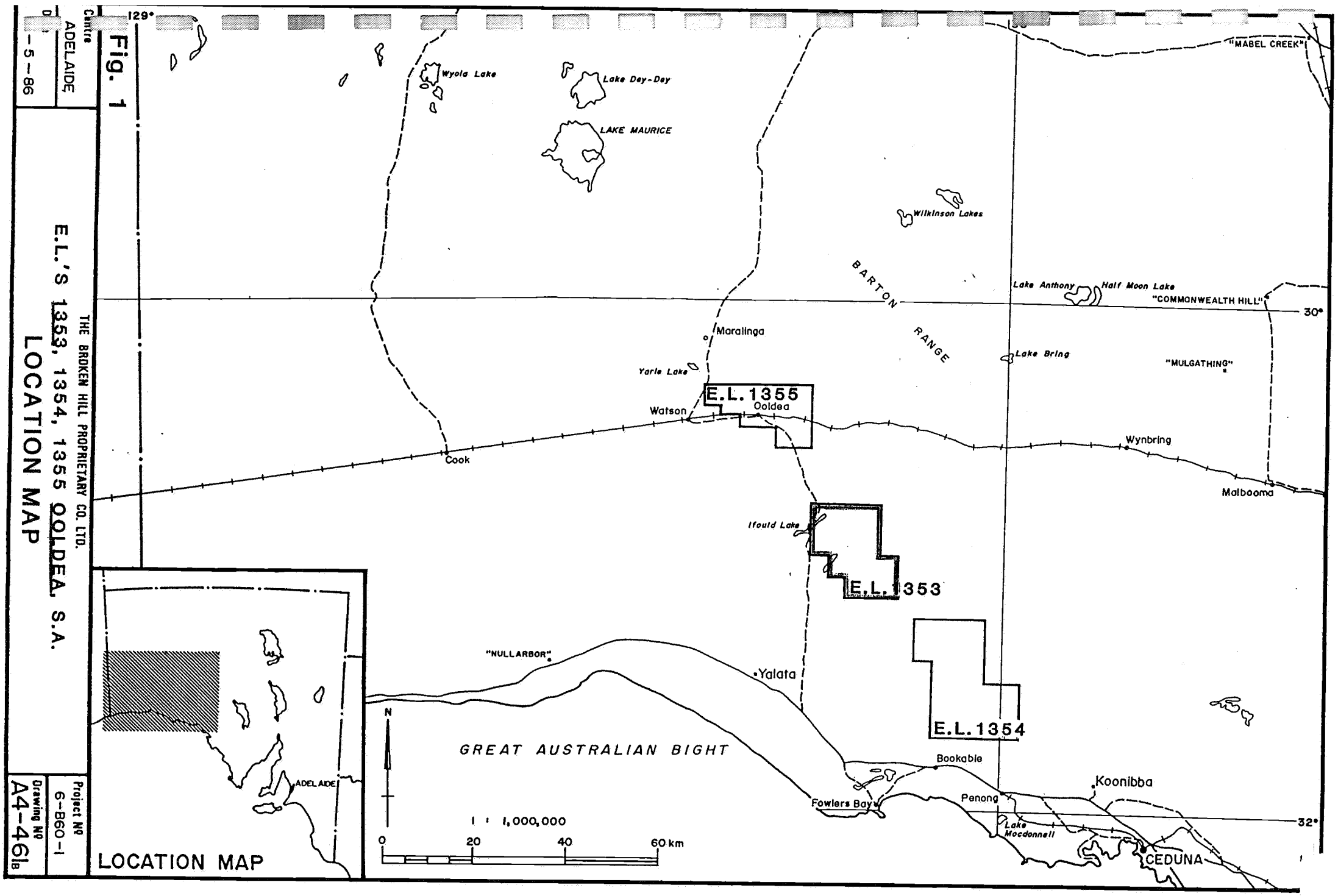


Fig. 1
129°
"MABEL CREEK"
Wyola Lake
Lake Dey-Dey
LAKE MAURICE
Wilkinson Lakes
BARTON RANGE
Lake Anthony
Half Moon Lake
"COMMONWEALTH HILL"
30°
Maralinga
Yarle Lake
Lake Bring
"MULGATHING"
E.L. 1355
Ooldea
Watson
Cook
Wynbring
Malbooma
Ifould Lake
E.L. 1353
"NULLARBOR"
Yalata
E.L. 1354
GREAT AUSTRALIAN BIGHT
Bookabie
Koonibba
Penong
Fowlers Bay
Lake Macdonnell
32°
CEDUNA
N
1 : 1,000,000
0 20 40 60 km
ADELAIDE
LOCATION MAP
THE BROKEN HILL PROPRIETARY CO. LTD.
E.L.'S 1353, 1354, 1355 OOLDEA, S.A.
LOCATION MAP
Centre ADELAIDE
D - 5 - 86
Project No 6-860-1
Drawing No A4-461B

EXPLORATION LICENCE 1353

IFOULD LAKE, SOUTH AUSTRALIA

QUARTERLY REPORT FOR THE PERIOD 20.8.87 TO 19.11.87

1. GENERAL STATEMENT

Exploration Licence 1353 was taken up to test the potential for heavy mineral sands in the Ooldea Ridge. It forms part of a regional exploration programme including nearby ELs 1354 and 1355. A literature search and geological assessment of the Tertiary sediments of the Ooldea Ridge showed that the environment for beach sands preservation may exist.

Reconnaissance geological field work and sampling has been carried out. Drill traverse lines have been delineated, cleared by bulldozer and were drill tested in November 1986. Geological interpretation has been completed and analytical results have now been received. No field work has been undertaken during this quarter.

2. TITLE

Exploration Licence 1353 of 1,220 square kilometres was granted to BHP Minerals Limited on 20th August, 1986 for one year and has now been renewed for a second year. Its location is shown on Figure 1.

3. FIELD INVESTIGATIONS

No field work has been carried out during this quarter. The results of follow-up drilling in the nearby EL.1355 Ooldea have been received. These results are now being studied and the next phase of exploration in this licence is being considered.

4. EXPENDITURE

The expenditure for the fifth quarter of EL.1353 for the 3 months to the end of November 1987 is summarised as follows:-

Wages and salaries	400
Equipment costs	90
Administration and overheads	24
	$ 514

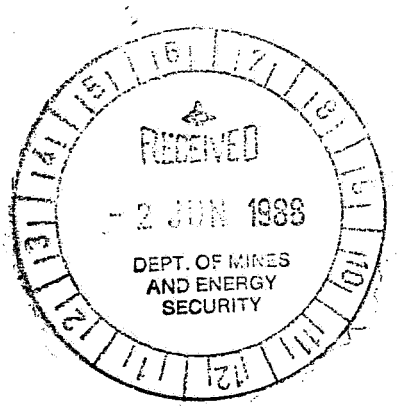
The total expenditure to date for EL.1353 is $75,800.

This report is submitted to the Department of Mines and Energy as required by Clause 2 of EL.1353.

CR 5884

EXPLORATION LICENCE 1353
IFOULD LAKE, SOUTH AUSTRALIA

QUARTERLY REPORT FOR THE PERIOD
ENDING 19TH FEBRUARY 1988.



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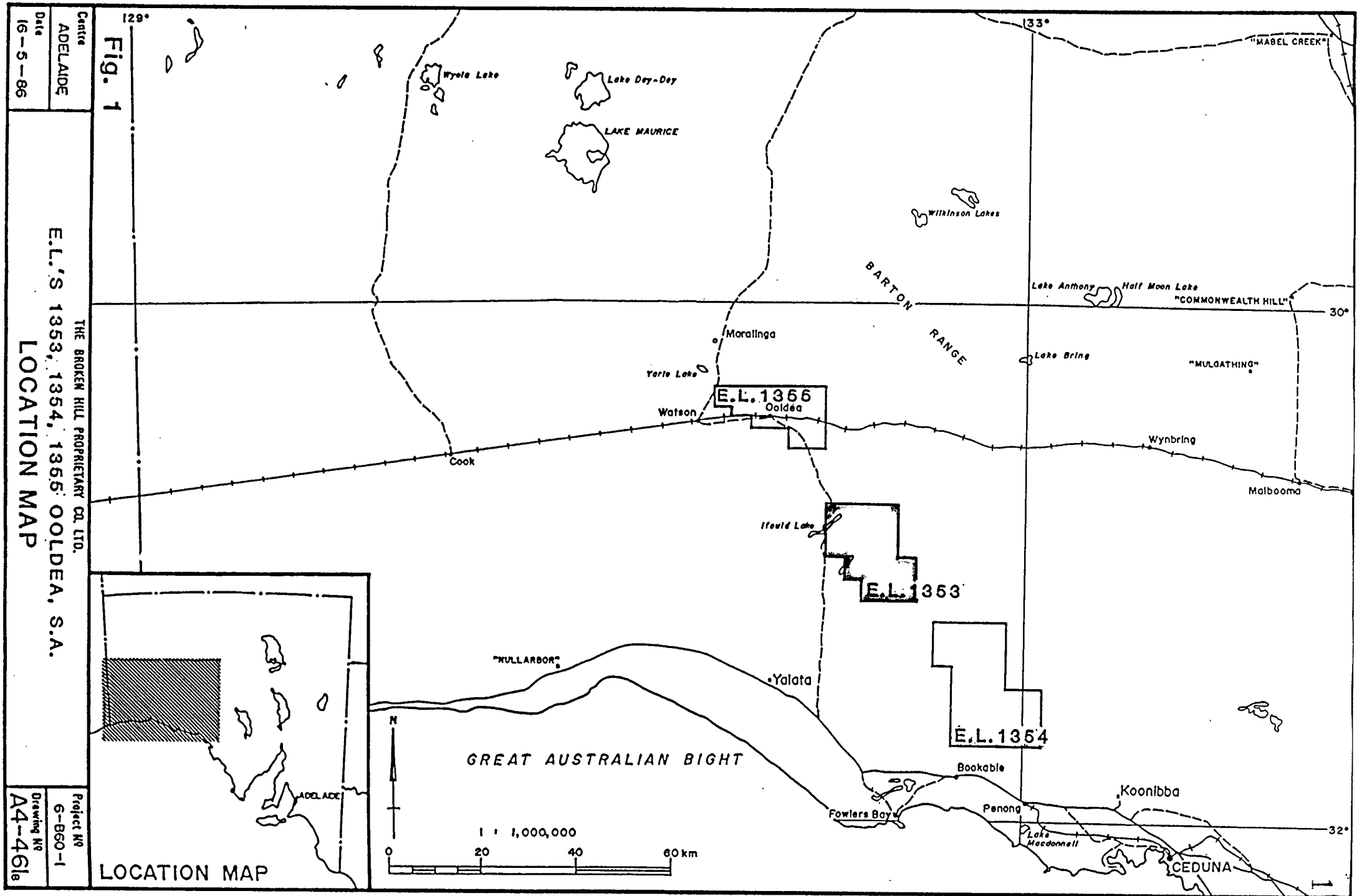


Fig. 1
129°
133°
"MABEL CREEK"
Wyola Lake
Lake Dey-Dey
LAKE MAURICE
Wilkinson Lakes
BARTON RANGE
Lake Anthony
Half Moon Lake
"COMMONWEALTH HILL"
30°
Moralinga
Lake Bring
"MULGATHING"
Yarle Lake
E.L.1356
Ooldea
Watson
Cook
Wynbring
Malbooma
Ifould Lake
E.L.1353
"NULLARBOR"
Yalata
E.L.1354
GREAT AUSTRALIAN BIGHT
Bookable
Koonibba
Penong
Fowlers Bay
Lake Macdonnell
32°
CEDUNA
N
1 : 1,000,000
0 20 40 60 km
ADELAIDE
LOCATION MAP
THE BROKEN HILL PROPRIETARY CO. LTD.
E.L.'S 1353, 1354, 1355 OOLDEA, S.A.
LOCATION MAP
Centre ADELAIDE
Date 16-5-86
Project No 6-860-1
Drawing No A4-461e

EXPLORATION LICENCE 1353

IFOULD LAKE, SOUTH AUSTRALIA

QUARTERLY REPORT FOR THE PERIOD ENDING

19TH FEBRUARY, 1988.

1. GENERAL STATEMENT

Exploration Licence 1353 was taken up to test the potential for heavy mineral sands in the Ooldea Ridge. It forms part of a regional exploration programme including nearby EL's 1354 and 1355. A literature search and geological assessment of the Tertiary sediments of the Ooldea Ridge showed that the environment for beach sand preservation may exist.

2. TITLE

Exploration Licence 1353 of 1,220 square kilometres was granted to BHP Minerals Limited on 20th August, 1986 for one year and has now been renewed for a second year. Its location is shown on Figure 1.

3. FIELD INVESTIGATIONS

No field work has been carried out during this quarter. Laboratory analyses of heavy mineral concentrates especially in relation to their zircon content are currently in progress at the BHP Belmont Laboratory in Perth. Depending on the outcome of this work a decision will be made as to whether further work can be justified.

4. EXPENDITURE

The expenditure for the sixth quarter of EL.1353 for the three months to the end of February is summarized as follows:-

Wages and Salaries	$ 2209
Field Support	22
Geochemistry	112
Freight costs	263
Administration & Overheads	130
	$ 2736

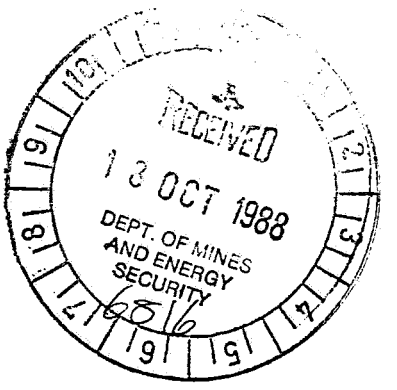
The total expenditure to date for EL.1353 is $78,536.

CR 6260

EXPLORATION LICENCE 1353
IFOULD LAKE, SOUTH AUSTRALIA

QUARTERLY REPORT FOR THE PERIOD
ENDING 19TH MAY 1988.

K. GREY
ADELAIDE.



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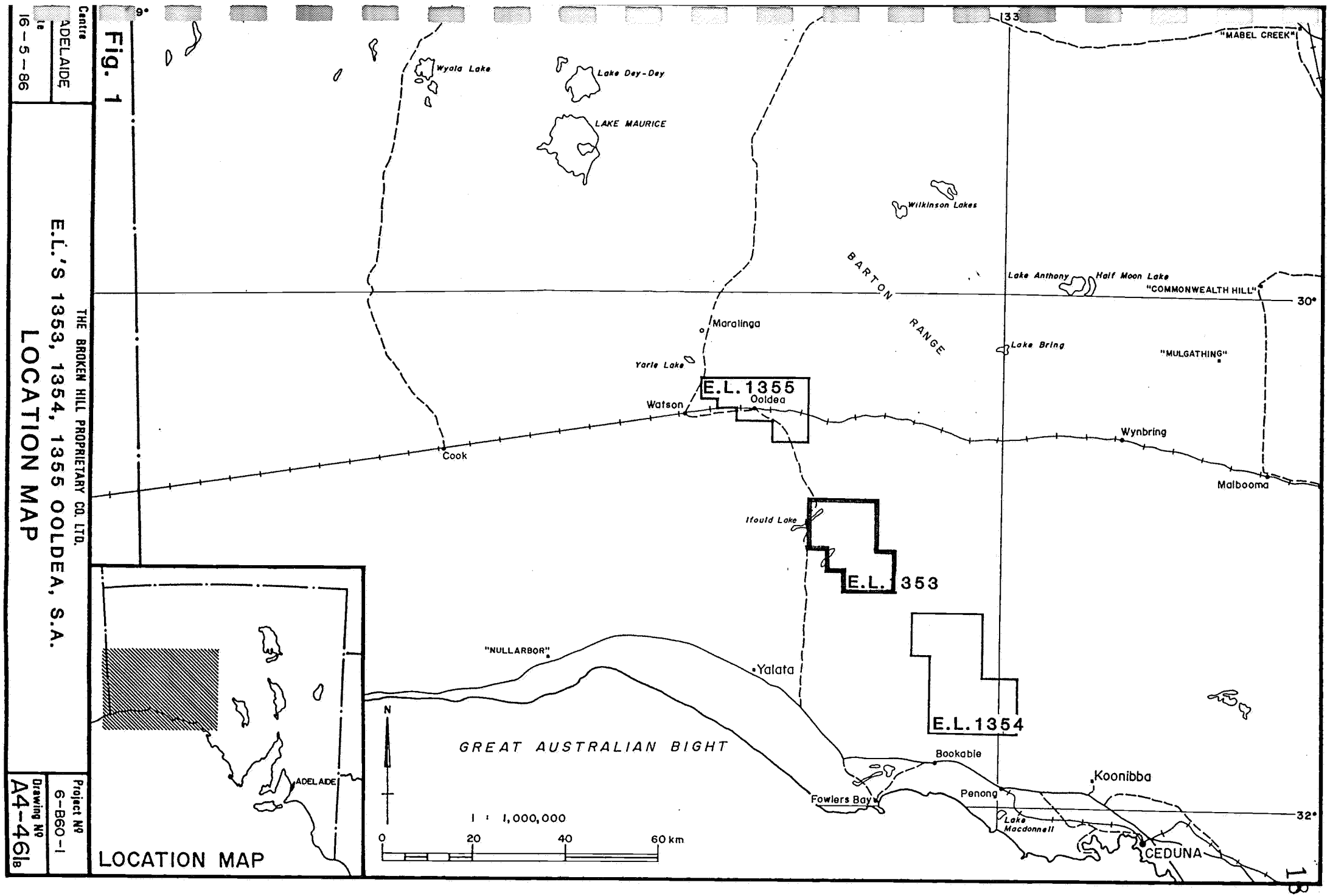


Fig. 1
Centre
ADELAIDE
16-5-86
THE BROKEN HILL PROPRIETARY CO. LTD.
E.L.'S 1353, 1354, 1355 OOLDEA, S.A.
LOCATION MAP
Project No
6-860-1
Drawing No
A4-461
9°
133
"MABEL CREEK"
Wyola Lake
Lake Dey-Dey
LAKE MAURICE
Wilkinson Lakes
BARTON RANGE
Lake Anthony
Half Moon Lake
"COMMONWEALTH HILL"
30°
Maralinga
Yarle Lake
Lake Bring
"MULGATHING"
E.L. 1355
Ooldea
Watson
Cook
Wynbring
Malbooma
Ifould Lake
E.L. 353
E.L. 1354
"NULLARBOR"
Yalata
GREAT AUSTRALIAN BIGHT
Bookable
Koonibba
Penong
Fowlers Bay
Lake Macdonnell
32°
CEDUNA
N
1 : 1,000,000
0
20
40
60 km
ADELAIDE
LOCATION MAP

EXPLORATION LICENCE 1353

IFOULD LAKE, SOUTH AUSTRALIA

QUARTERLY REPORT FOR THE PERIOD ENDING

19TH MAY, 1988.

1. GENERAL STATEMENT

Exploration Licence 1353 was taken up to test the potential for heavy mineral sands in the Ooldea Ridge. It forms part of a regional exploration programme including nearby EL's 1354 and 1355. A literature search and geological assessment of the Tertiary sediments of the Ooldea Ridge showed that the environment for beach sand preservation may exist.

2. TITLE

Exploration Licence 1353 of 1,220 square kilometres was granted to BHP Minerals Limited on 20th August, 1986 for one year and has been renewed for a second year. Its location is shown on Figure 1.

3. FIELD INVESTIGATIONS

No field work has been carried out during this quarter.

Laboratory analyses of heavy mineral concentrates, especially in relation to their zircon content are still in progress at the BHP Belmont Laboratory in Perth. Depending on the outcome of this work a decision will be made as to whether further work can be justified.

4. EXPENDITURE

The Expenditure for the seventh quarter of EL.1353 for the three months to the end of May 1988 is summarized as follows:-

Wages and Salaries	$ 1959
Drafting	80
Equipment	40
Surveys and Maps	17
Vehicles	27
Administration and Overheads	318
Total	$ 2441

The total expenditure to date for EL.1353 is $80,977.

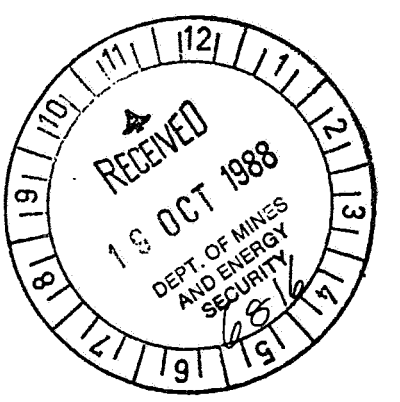
The report is submitted to the Department of Mines and Energy as required by Clause 2 of EL.1353.

CR 6261

EXPLORATION LICENCE 1353
IFOULD LAKE, SOUTH AUSTRALIA

RELINQUISHMENT AND QUARTERLY
REPORT FOR THE PERIOD ENDING
19TH AUGUST 1988.

K. GREY
ADELAIDE.



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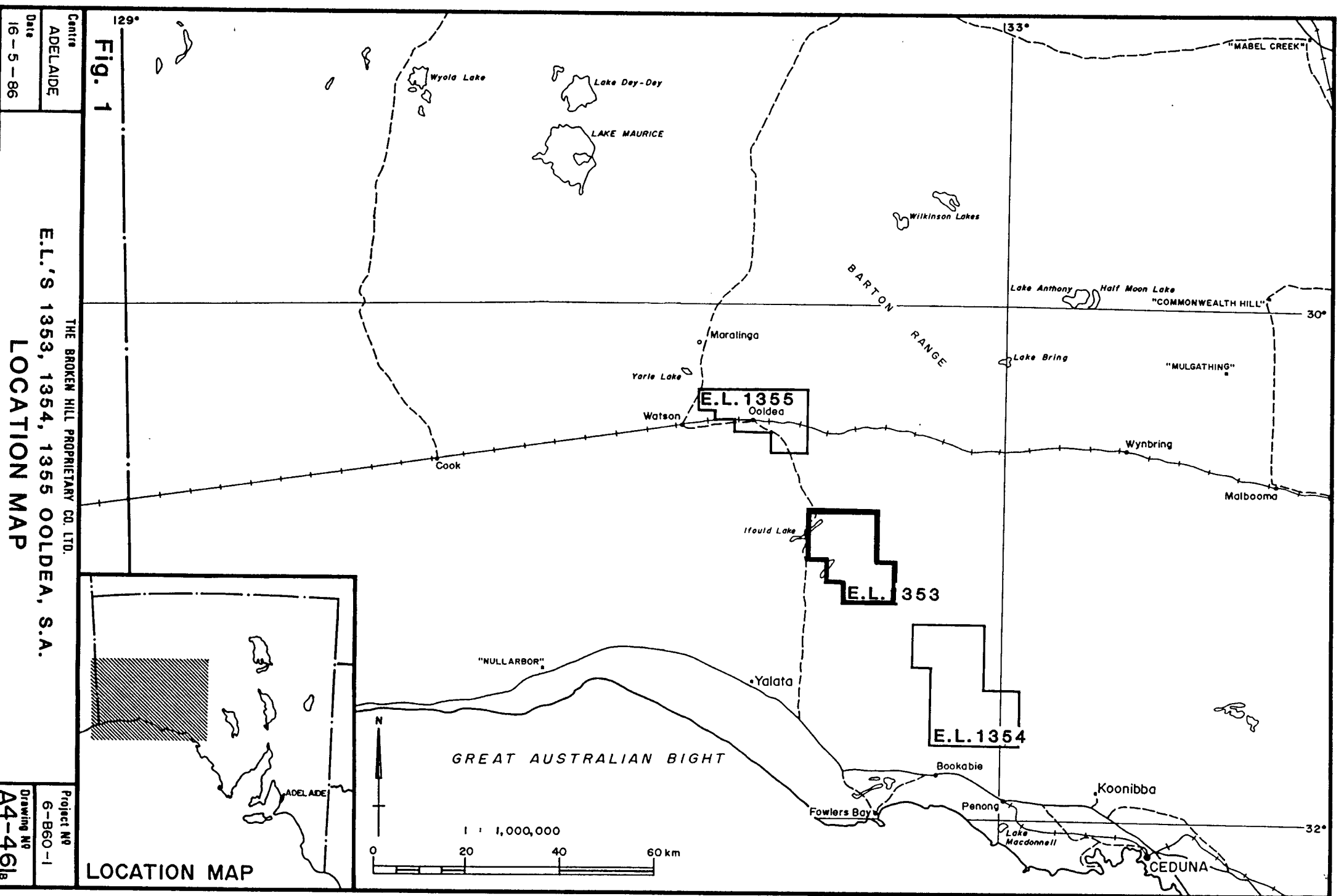
Fig. 1
129°
33°
"MABEL CREEK"
Wyola Lake
Lake Dey-Dey
LAKE MAURICE
Wilkinson Lakes
BARTON RANGE
Lake Anthony
Half Moon Lake
"COMMONWEALTH HILL"
30°
Maralinga
Yarle Lake
Lake Bring
"MULGATHING"
E.L. 1355
Ooldea
Watson
Cook
Wynbring
Malbooma
Ifould Lake
E.L. 1353
E.L. 1354
"NULLARBOR"
Yalata
GREAT AUSTRALIAN BIGHT
Bookabie
Koonibba
Penong
Fowlers Bay
Lake Macdonnell
32°
CEDUNA
N
1 : 1,000,000
0
20
40
60 km
ADELAIDE
LOCATION MAP
Centre ADELAIDE
Date 16-5-86
THE BROKEN HILL PROPRIETARY CO. LTD.
E.L.'S 1353, 1354, 1355 OOLDEA, S.A.
LOCATION MAP
Project No 6-B60-1
Drawing No A4-461B

EXPLORATION LICENCE 1353

IFOULD LAKE, SOUTH AUSTRALIA

RELINQUISHMENT AND QUARTERLY REPORT FOR THE

PERIOD ENDING 19TH AUGUST, 1988.

1. GENERAL STATEMENT

Exploration Licence 1353 was taken up to test the potential for heavy mineral sands in the Ooldea Ridge. It forms part of a regional exploration programme including nearby EL's 1354 and 1355. A literature search and geological assessment of the Tertiary sediments of the Ooldea Ridge showed that the environment for beach sand preservation may exist.

2. TITLE

Exploration Licence 1353 of 1,220 square kilometres was granted to BHP Minerals Limited on 20th August, 1986 for one year and has been renewed for a second year.

The Department of Mines and Energy were advised in a letter dated 5th August 1988 that this licence would not be renewed at the end of its current term.

Its location is shown on Figure 1.

3. FIELD INVESTIGATIONS AND RESULTS

No field work was carried out during this quarter.

Anomalous zircon values were reported in composites for holes OL64 and OL68 on traverse two. Further samples were submitted to Belmont Laboratory to ascertain the extent of this anomaly.

Results for % Heavy Minerals and Observer sheets for these samples are shown in Figure 2 and Appendix A respectively. The total % HM have been plotted onto a portion of the traverse cross-section in Figure 3.

3.1 Conclusions

While a minor zircon and ilmenite anomaly exists along the base of unit 2 (see Figure 3) between OL66 and OL69 no further work is considered worthwhile. The almost total lack of rutile, sub-economic quantities of zircon and ilmenite (see Table 1) depth to mineralisation and fine grain size of heavy minerals (mainly in the 0.18 to 0.075 mm size fraction) are the main reasons for this judgement.

TABLE 1. EL.1353 IFOULD LAKE
SELECTED SIGNIFICANT SAMPLE ANALYSES : TRAVERSE TWO

HOLE	DEPTH	SAMPLE NO.	% RUTILE	% ILMENITE	% ZIRCON	% R+I+Z	TOTAL % HM *
OL68	16-18m	RT3068	0.02	0.05	0.19	0.26	0.99
OL69	14-16m	RT3123	0.01	0.06	0.11	0.18	1.01

* NOTE: Total HM% includes all >2.96 SG minerals and includes Barite, Tourmaline, Kyanite, Quartz and rocks.

- All results $\geq 0.90\%$ total HM chosen.

4. EXPENDITURE

The expenditure for the final quarter of this licence for the three months to the end of August 1988 is summarised as follows:-

Wages and Salaries	$ 693
Other: includes field support	267
Laboratory costs	1980
Administration & Overheads	441
Total	$3381

Total expenditure for EL.1353 over the two year term is: $84,358.

This report is submitted to the Department of Mines and Energy as required by Clause 2 of EL.1353.

APPENDIX A

OBSERVERS DATA SHEETS : TRAVERSE TWO

Itould Lake 12
OL 66 0-2m to 18-20

BHP MINERALS EXPLORATION

OBSERVER'S DATA SHEET --- TITANIUM SAMPLE No. RT 3082191

OBSERVER : EDNA SIZE RANGE OBSERVED : -0.4 +0.025mm

SHEET No : 13 DATE STARTED : 6·7·88 DATE FINISHED : 6·7·88

MATERIAL: NON MAGS (~~HANDMAGNET~~) ☐ TICK OR SHOW OTHER: MAG SEPARATED.

ENTERED ☐

OBSERVED	-0.4 +0.25	-0.25 +0.18	-0.18 +0.075	OTHER: M.3+4		
WEIGHT	0.2	1.4	4.8	2.2		

GRAINS BOTTLED IN BAG | GRAINS FOR PROBING

MINERAL	Flag	VISUAL ESTIMATE OF MINERAL %				GRAIN COUNT CHECK	(SHOW SIZE FRACTION)
ILMENITE	E	<1	3	5	50		
MONAZITE	E	TR	<1	<1			
RUTILE	E	TR	<1	2			
ZIRCON	E	TR	1	5			
LEUCOXENE	E	TR	TR	2			
OTHERS.		100	96	86	50		

COMMENTS : OTHERS : TOURMALINE · ROCKS · QUARTZ · KYANITE · AMPHIBOLE.

2-4m

192

BHP MINERALS EXPLORATION

OBSERVER'S DATA SHEET --- TITANIUM SAMPLE No. RT 3083

OBSERVER: Pauline SIZE RANGE OBSERVED: - 0.4 + 0.075 mm

SHEET No: 16 DATE STARTED: 6-7-88 DATE FINISHED: 6-7-88.

MATERIAL: NON MAGS (~~HANDMAGNET~~) ☐ TICK OR SHOW OTHER: MAG SEPARATED.

ENTERED ☐

OBSERVED	-0.4 +0.25	-0.25 +0.18	-0.18 +0.075	OTHER: mag.		
WEIGHT	0.05	0.6	4.1	1.5		

GRAINS BOTTLED IN BAG | GRAINS FOR PROBING

MINERAL	Flag	VISUAL ESTIMATE OF MINERAL %												GRAIN COUNT CHECK						(SHOW SIZE FRACTION)	
ILMENITE	E			<1			2			7		60									
MONAZITE	E																				
RUTILE	E			TR			<1			2											
ZIRCON	E									4											
LEUCOXENE	E						1			3											
OTHERS			100			97			84			40									

COMMENTS: Others kyanite, rocks, tourmaline + quartz.

P 6-86

4-6m

BHP MINERALS EXPLORATION

OBSERVER'S DATA SHEET --- TITANIUM SAMPLE No. RT 3084 193

OBSERVER : EDNA SIZE RANGE OBSERVED : -0.4 +0.075mm

SHEET No : 17 DATE STARTED : 6·7·88 DATE FINISHED : 6·7·88

MATERIAL	NON MAGS (~~HANDMAGNET~~) MAG SEP	TICK OR SHOW OTHER:	ENTERED

OBSERVED	-0.4 +0.25	-0.25 +0.18	-0.18 +0.075	OTHER: M·3+4			GRAINS BOTTLED IN BAG	GRAINS FOR PROBING
WEIGHT	0·05	0·8	6·5	2·1				

MINERAL	Flag	VISUAL ESTIMATE OF MINERAL %				GRAIN COUNT CHECK	(SHOW SIZE FRACTION)	
ILMENITE	E	<1	3	10	80			
MONAZITE	E		TR					
RUTILE	E		<1	2				
ZIRCON	E	TR	2	7				
LEUCOXENE	E		2	2				
OTHERS		100	93	79	20			

COMMENTS : OTHERS: TOURMALINE · QUARTZ · KYANITE · ROCKS

JP 6·86

6-8a

BHP MINERALS EXPLORATION

OBSERVER'S DATA SHEET --- TITANIUM SAMPLE No. RT 3085 19

OBSERVER: PAULING SIZE RANGE OBSERVED: -0.4 +0.075 mm

SHEET No: 18 DATE STARTED: 6-7-88 DATE FINISHED: 6-7-88

MATERIAL: NON MAGS (~~HANDMAGNET~~) ☐ TICK OR SHOW OTHER: MAG SEPARATED.

ENTERED ☐

OBSERVED	-0.4 +0.25	-0.25 +0.18	-0.18 +0.075	OTHER: MIX+.		
WEIGHT	0.03	0.7	10.0	1.5		

MINERAL	Flag	VISUAL ESTIMATE OF MINERAL %												GRAIN COUNT CHECK						(SHOW SIZE FRACTION)	
ILMENITE	E			2			4			7		6	0								
MONAZITE	E									<1											
RUTILE	E		TR	.			1	.		2											
ZIRCON	E						1			2	6		TR	.							
LEUCOXENE	E		<1				3			4											
OTHERS			9	8		9	1			6	1		40								

GRAINS BOTTLED IN BAG | GRAINS FOR PROBING

COMMENTS: Others tourmaline, rocks, quartz + kyanite.

8-10

BHP MINERALS EXPLORATION

OBSERVER'S DATA SHEET --- TITANIUM SAMPLE No. RT 3086 195

OBSERVER : EDNA SIZE RANGE OBSERVED : -0.4 +0.025mm

SHEET No : 18 DATE STARTED : 7.7.88 DATE FINISHED : 7.7.88

MATERIAL: ~~NON MAGS (HANDMAGNET)~~ ☐ TICK OR SHOW OTHER: MAG SEP.

ENTERED ☐

OBSERVED	-0.4 +0.25	-0.25 +0.18	-0.18 +0.075	OTHER: M.3+4		
WEIGHT	0.2	0.8	9.8	0.5		

GRAINS BOTTLED IN BAG | GRAINS FOR PROBING

MINERAL	Flag	VISUAL ESTIMATE OF MINERAL %				GRAIN COUNT CHECK	(SHOW SIZE FRACTION)
ILMENITE	E	<1	2	4	60		
MONAZITE	E	TR	TR	TR			
RUTILE	E	TR	TR	1			
ZIRCON	E	TR	2	18			
LEUCOXENE	E		<1	3			
OTHERS		99	96	74	40		

COMMENTS : OTHERS : TOURMALINE-QUARTZ. KYANITE. ROCKS.

P 6-86

10-12

BHP MINERALS EXPLORATION

OBSERVER'S DATA SHEET --- TITANIUM SAMPLE No. RT 3087 196

OBSERVER : EDNA SIZE RANGE OBSERVED : -0.4 +0.075mm

SHEET No : 19 DATE STARTED : 7-7-88 DATE FINISHED : 7-7-88

MATERIAL: NON MAGS (~~HANDMAGNET~~) ☐ TICK OR SHOW OTHER: MAG-SEP

ENTERED ☐

OBSERVED	-0.4 +0.25	-0.25 +0.18	-0.18 +0.075	OTHER: M.3+4			GRAINS BOTTLED IN BAG	GRAINS FOR PROBING
WEIGHT	0.03	0.8	8.6	0.6				

MINERAL	Flag	VISUAL ESTIMATE OF MINERAL %				GRAIN COUNT CHECK	(SHOW SIZE FRACTION)	
ILMENITE	E	TR	1	10	70			
MONAZITE	E		TR	<1				
RUTILE	E		1	2				
ZIRCON	E		2	20				
LEUCOXENE	E	TR	2	3				
OTHERS		100	94	65	30			

COMMENTS : OTHERS: QUARTZ · ROCKS · TOURMALINE

12-14

BHP MINERALS EXPLORATION

OBSERVER'S DATA SHEET --- TITANIUM SAMPLE No. RT 3088 197

OBSERVER: PAULINE SIZE RANGE OBSERVED: -0.4 +0.075 mm

SHEET No: 19 DATE STARTED: 7-7-88 DATE FINISHED: 7-7-88.

MATERIAL	NON MAGS (~~HANDMAGNET~~) MAG SEPARATED -	☐ TICK OR SHOW OTHER:				ENTERED ☐
OBSERVED	-0.4 +0.25	-0.25 +0.18	-0.18 +0.075	OTHER: MAG.		GRAINS BOTTLED IN BAG / GRAINS FOR PROBING
WEIGHT	0.1	1.0	15.0	1.0		

MINERAL	Flag	VISUAL ESTIMATE OF MINERAL %				GRAIN COUNT CHECK	(SHOW SIZE FRACTION)
ILMENITE	E	2	4	12	75		
MONAZITE	E			<1			
RUTILE	E	TR	2	4			
ZIRCON	E		1	30	TR		
LEUCOXENE	E	<1	3	5			
OTHERS		98	90	49	25		

COMMENTS: Others rocks, quartz, kyanite + tourmaline.

JP 6-86

14-16

BHP MINERALS EXPLORATION

OBSERVER'S DATA SHEET --- TITANIUM SAMPLE No. RT 3089 19

OBSERVER: Pauline SIZE RANGE OBSERVED: -0.4 +0.075 mm

SHEET No: 20 DATE STARTED: 7-7-88 DATE FINISHED: 7-7-88.

MATERIAL	NON MAGS (~~HANDMAGNET~~) MAG SEPARATED.			TICK OR SHOW OTHER:			ENTERED
OBSERVED	-0.4 +0.25	-0.25 +0.18	-0.18 +0.075	OTHER: NJ+4.			GRAINS BOTTLED IN BAG / GRAINS FOR PROBING
WEIGHT	0.05	0.9	20.1	0.8			

MINERAL	Flag	VISUAL ESTIMATE OF MINERAL %				GRAIN COUNT CHECK	(SHOW SIZE FRACTION)
ILMENITE	E	41	3	10	80		
MONAZITE	E						
RUTILE	E	TR.	1	4			
ZIRCON	E		1	20	TR.		
LEUCOXENE	E	41	4	7			
OTHERS		100	91	59	20		

COMMENTS: Others tourmaline, kyanite, rocks + quartz.

JP 6-86

16-18

BHP MINERALS EXPLORATION

OBSERVER'S DATA SHEET --- TITANIUM SAMPLE No. RT 3090 199

OBSERVER: EDNH SIZE RANGE OBSERVED: -0.4 +0.025mm

SHEET No: 21 DATE STARTED: 7·7·88 DATE FINISHED: 8·7·88

MATERIAL	~~NON MAGS (HANDMAGNET)~~ MAG SEP	TICK OR SHOW OTHER:	ENTERED

OBSERVED	-0.4 +0.25	-0.25 +0.18	-0.18 +0.075	OTHER: NJH			GRAINS BOTTLED IN BAG	GRAINS FOR PROBING
WEIGHT	0·02	1·0	22·4	0·8				

MINERAL	Flag	VISUAL ESTIMATE OF MINERAL %				GRAIN COUNT CHECK	(SHOW SIZE FRACTION)	
ILMENITE	E	TR	3	10	80			
MONAZITE	E		TR	2				
RUTILE	E	TR	1	4				
ZIRCON	E		1	50				
LEUCOXENE	E	TR	3	5				
OTHERS		100	92	29	20			

COMMENTS: OTHERS: TOURMALINE · ROCKS · KYANITE

18-20

200

BHP MINERALS EXPLORATION

OBSERVER'S DATA SHEET --- TITANIUM SAMPLE No. RT 3091

OBSERVER: Pauline SIZE RANGE OBSERVED: -0.4 +0.075 mm

SHEET No: 21 DATE STARTED: 8-7-88 DATE FINISHED: 8-7-88

MATERIAL	NON MAGS (~~HANDMAGNET~~) MAG SEPARATED. ☐ TICK OR SHOW OTHER:						ENTERED ☐
OBSERVED	-0.4 +0.25	-0.25 +0.18	-0.18 +0.075	OTHER: M3+4.			GRAINS BOTTLED IN BAG / GRAINS FOR PROBING
WEIGHT	0.07	0.7	23.9	0.7			

MINERAL	Flag	VISUAL ESTIMATE OF MINERAL %								GRAIN COUNT CHECK	(SHOW SIZE FRACTION)	
ILMENITE	E	2		7		10		80				
MONAZITE	E					<1						
RUTILE	E			1		4						
ZIRCON	E			3		30		<1				
LEUCOXENE	E	<1		5		5						
OTHERS		98		84		51		20				

COMMENTS: Others tourmaline, rocks + kyanite.

Hould Lake 12 20/7/88
OL67 0-2m

BHP MINERALS EXPLORATION

201

OBSERVER'S DATA SHEET --- TITANIUM SAMPLE No. RT3093

OBSERVER: PAULINE SIZE RANGE OBSERVED: -0.4 +0.075mm

SHEET No: 22 DATE STARTED: 8-7-88 DATE FINISHED: 8-7-88

MATERIAL	~~NON MAGS (HANDMAGNET)~~ NOT MAG SEPARATED	TICK OR SHOW OTHER:	ENTERED

OBSERVED	-0.4 +0.25	-0.25 +0.18	-0.18 +0.075	OTHER:			GRAINS BOTTLED IN BAG	GRAINS FOR PROBING
WEIGHT	0.1	0.5	3.0					

MINERAL	Flag	VISUAL ESTIMATE OF MINERAL %	GRAIN COUNT CHECK	(SHOW SIZE FRACTION)
ILMENITE	E	3 7 15		
MONAZITE	E	TR 1		
RUTILE	E	TR <1 3		
ZIRCON	E	1 15		
LEUCOXENE	E	TR 2 5		
OTHERS		97 90 61		

COMMENTS:

Others tourmaline, rocks rhyolite.

JP 6·86

BHP MINERALS EXPLORATION

OBSERVER'S DATA SHEET --- TITANIUM SAMPLE No. RT309

OBSERVER : EDNA SIZE RANGE OBSERVED : -0.4 +0.075mm

SHEET No : 22 DATE STARTED : 8·7·87 DATE FINISHED : 8·7·87

MATERIAL	~~NON MAGS (HANDMAGNET)~~ NOT MAG SEP. ☐ TICK OR SHOW OTHER:						ENTERED ☐
OBSERVED	-0.4 +0.25	-0.25 +0.18	-0.18 +0.075	OTHER:			GRAINS BOTTLED IN BAG / GRAINS FOR PROBING
WEIGHT	0·02	0·4	0·8				

MINERAL	Flag	VISUAL ESTIMATE OF MINERAL %			GRAIN COUNT CHECK	(SHOW SIZE FRACTION)
ILMENITE	E	3	7	16		
MONAZITE	E	TR	TR	1		
RUTILE	E	TR	TR	2		
ZIRCON	E	<1	2	14		
LEUCOXENE	E	TR	<1	3		
OTHERS		97	9	64		

COMMENTS : OTHERS: TOURMALINE, ROCKS. QUARTZ + KYANITE.

4-6

203

BHP MINERALS EXPLORATION

OBSERVER'S DATA SHEET --- TITANIUM SAMPLE No. RT 3095

OBSERVER: Pauline SIZE RANGE OBSERVED: -0.4 +0.075mm

SHEET No: 23 DATE STARTED: 8-7-88 DATE FINISHED: 8-7-88

MATERIAL: NON MAGS (~~HANDMAGNET~~) ☐ TICK OR SHOW OTHER: MAG SEPARATED.

ENTERED ☐

OBSERVED	-0.4 +0.25	-0.25 +0.18	-0.18 +0.075	OTHER: MJH.			GRAINS BOTTLED IN BAG	GRAINS FOR PROBING
WEIGHT	.0·03	0·4	3·8	0·4				

MINERAL	Flag	VISUAL ESTIMATE OF MINERAL %												GRAIN COUNT CHECK						(SHOW SIZE FRACTION)	
ILMENITE	E			TR			5			10			8	5							
MONAZITE	E																				
RUTILE	E						<1			3											
ZIRCON	E						2			40			TR	.							
LEUCOXENE	E			TR			2			3											
OTHERS			100			91			44			15									

COMMENTS: Others rocks, tourmaline + hyanite + quartz.

P 6·86

6-8m

BHP MINERALS EXPLORATION

OBSERVER'S DATA SHEET --- TITANIUM SAMPLE No. RT 3096 204

OBSERVER: EDNA SIZE RANGE OBSERVED: -0.4 +0.025mm

SHEET No: 23 DATE STARTED: 8·7·68 DATE FINISHED 11-7-68.

MATERIAL ~~NON MAGS (HANDMAGNET)~~ ☐ TICK OR SHOW OTHER: NOT MAGSEP

ENTERED ☐

OBSERVED	-0.4 +0.25	-0.25 +0.18	-0.18 +0.075	OTHER:			GRAINS BOTTLED IN BAG	GRAINS FOR PROBING
WEIGHT	0·05.	0.3	4·0					

MINERAL	Flag	VISUAL ESTIMATE OF MINERAL %			GRAIN COUNT CHECK	(SHOW SIZE FRACTION)	
ILMENITE	E	1	12	15			
MONAZITE	E		TR	<1			
RUTILE	E		<1	2			
ZIRCON	E	TR	8	25			
LEUCOXENE	E	·	2	2			
OTHERS		99	78	56			

COMMENTS: OTHERS: TOURMALINE · ROCKS · KYANITE.

8-10

BHP MINERALS EXPLORATION

OBSERVER'S DATA SHEET --- TITANIUM SAMPLE No. RT 3097 205

OBSERVER : PAULINE SIZE RANGE OBSERVED : -0.4 +0.075 mm

SHEET No : 24 DATE STARTED : 8-7-88 DATE FINISHED : 8-7-88.

MATERIAL: NON MAGS (~~HANDMAGNET~~) ☐ TICK OR SHOW OTHER: MAG SEPARATED.

ENTERED ☐

OBSERVED	-0.4 +0.25	-0.25 +0.18	-0.18 +0.075	OTHER: MTH.			GRAINS BOTTLED IN BAG	GRAINS FOR PROBING
WEIGHT	0.08	0.7	7.1	1.0				

MINERAL	Flag	VISUAL ESTIMATE OF MINERAL %	GRAIN COUNT CHECK	(SHOW SIZE FRACTION)
ILMENITE	E	1 . 7. 10 7S		
MONAZITE	E			
RUTILE	E	TR. 1 3		
ZIRCON	E	TR 4. 30 TR.		
LEUCOXENE	E	TR 3 4		
OTHERS	-	99 86. 53 2S		

COMMENTS : Others tourmaline, rocks, kyanite, quartz.

10-12m

BHP MINERALS EXPLORATION

OBSERVER'S DATA SHEET --- TITANIUM SAMPLE No. RT 3098 206

OBSERVER : IENA SIZE RANGE OBSERVED : -0.4 +0.025mm

SHEET No : 24 DATE STARTED : 11-7-88 DATE FINISHED : 11-7-88

MATERIAL	NON MAGS (~~HANDMAGNET~~) MAG SEP	TICK OR SHOW OTHER:	ENTERED

OBSERVED	-0.4 +0.25	-0.25 +0.18	-0.18 +0.075	OTHER: M.3+4.			GRAINS BOTTLED IN BAG	GRAINS FOR PROBING
WEIGHT	0.03	1.0	15.1	1.2.				

MINERAL	Flag	VISUAL ESTIMATE OF MINERAL %				GRAIN COUNT CHECK	(SHOW SIZE FRACTION)	
ILMENITE	E	<1	15	15.	90			
MONAZITE	E	TR	TR	<1				
RUTILE	E		TR	3				
ZIRCON	E	TR	4	35				
LEUCOXENE	E		1	3				
OTHERS		100	80	44	10			

COMMENTS : OTHERS: TOURMALINE · KYANITE · ROCKS.

12-14c

BHP MINERALS EXPLORATION

207

OBSERVER'S DATA SHEET --- TITANIUM SAMPLE No. RT 3099

OBSERVER: Pauline SIZE RANGE OBSERVED: -0.4 +0.075 mm

SHEET No: 25 DATE STARTED: 11-7-88 DATE FINISHED: 11-7-88

MATERIAL	NON MAGS (~~HANDMAGNET~~) MAG SEPARATED	TICK OR SHOW OTHER:	ENTERED

OBSERVED	-0.4 +0.25	-0.25 +0.18	-0.18 +0.075	OTHER: M3+4 -			GRAINS BOTTLED IN BAG	GRAINS FOR PROBING
WEIGHT	0.03.	1.0	18.8	1.0				

MINERAL	Flag	VISUAL ESTIMATE OF MINERAL %				GRAIN COUNT CHECK						(SHOW SIZE FRACTION)	
ILMENITE	E	3	10	12	80								
MONAZITE	E												
RUTILE	E	TR	1	3									
ZIRCON	E	<1	3	2S	TR.								
LEUCOXENE	E	TR	3	3									
OTHERS		97	83	57	20								

COMMENTS: Others tourmaline, rocks, kyanite + quartz.

JP 6·86

14-16

208

BHP MINERALS EXPLORATION

OBSERVER'S DATA SHEET --- TITANIUM SAMPLE No. RT 3100

OBSERVER : Pauline SIZE RANGE OBSERVED : -0.4 +0.075 mm

SHEET No : 26 DATE STARTED : 11-7-88 DATE FINISHED : 11-7-88.

MATERIAL OBSERVED: NON MAGS (~~HANDMAGNET~~) ☐ TICK OR SHOW OTHER: MAG SEPARATED.

ENTERED ☐

WEIGHT	-0.4 +0.25	-0.25 +0.18	-0.18 +0.075	OTHER: mag.			GRAINS BOTTLED IN BAG	GRAINS FOR PROBING
	0.02	1.3	21.7	1.1				

MINERAL	Flag	VISUAL ESTIMATE OF MINERAL %				GRAIN COUNT CHECK	(SHOW SIZE FRACTION)	
ILMENITE	E	1	10	15	8S			
MONAZITE	E							
RUTILE	E	TR	2	4				
ZIRCON	E		3	3S	TR			
LEUCOXENE	E	TR	3	4				
OTHERS.		99	82	42	1S			

COMMENTS : Others tourmaline, rocks + kyanite.

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16-18m

209

BHP MINERALS EXPLORATION

OBSERVER'S DATA SHEET --- TITANIUM SAMPLE No. RT 3101

OBSERVER : EDNA SIZE RANGE OBSERVED : -0.4 +0.075mm

SHEET No : 25 DATE STARTED : 11.7.88 DATE FINISHED : 11.7.88

MATERIAL	NON MAGS (~~HANDMAGNET~~) ☐ TICK OR SHOW OTHER: MAG S&P						ENTERED ☐
OBSERVED	-0.4 +0.25	-0.25 +0.18	-0.18 +0.075	OTHER: M.3+4			GRAINS BOTTLED IN BAG / GRAINS FOR PROBING
WEIGHT	0.04	1.1	26.3.	1.0			

MINERAL	Flag	VISUAL ESTIMATE OF MINERAL %				GRAIN COUNT CHECK	(SHOW SIZE FRACTION)
ILMENITE	E	2	15	18	85		
MONAZITE	E						
RUTILE	E		<1	3			
ZIRCON	E	TR	7	27			
LEUCOXENE	E	<1	2	4			
OTHERS		98	76	48	15		

COMMENTS : OTHERS: TOURMALINE · KYANITE ROCKS

JP 6-86

18-20m

210

BHP MINERALS EXPLORATION

OBSERVER'S DATA SHEET --- TITANIUM SAMPLE No. RT 3102.

OBSERVER : Pauline SIZE RANGE OBSERVED : -0.4 +0.075 mm

SHEET No : 28 DATE STARTED : 11-7-88 DATE FINISHED : 11-7-88

MATERIAL	NON MAGS (~~HANDMAGNET~~) MAG SEPARATED.	TICK OR SHOW OTHER:	ENTERED

OBSERVED	-0.4 +0.25	-0.25 +0.18	-0.18 +0.075	OTHER: MJ+4.	-0.18 +0.075	GRAINS BOTTLED IN BAG	GRAINS FOR PROBING
WEIGHT	0.1	1.0	23.0	0.9.			

MINERAL	Flag	VISUAL ESTIMATE OF MINERAL %	GRAIN COUNT CHECK	(SHOW SIZE FRACTION)
ILMENITE	E	5 10 15 85	14.5	
MONAZITE	E			
RUTILE	E	1 5	4.8	
ZIRCON	E	3 5 35 41	37.4	
LEUCOXENE	E	1 3 4	5.9	
OTHERS		91 81 41 15	37.4.	

COMMENTS : Others tourmaline, rocks + kyanite.

RT 3102

RT 3102 (-0·18+0·075)

18-20u

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	Ilmenite	Monazite	Rutile	Zircon	Leuc.	Others.	
1	5		1	16	2	16	40
2	5		1	14	2	17	39
3	6		4	13	2	13	38
4	3		1	15	2	15	36
5	5		3	15	2	13	38
6	7		3	15	2	13	40
7	6		1	12	3	15	37
8	6			13	1	15	35
9	5		2	12	3	12	34
10	6		2	14	3	10	35
Total	54		18	139	22	139	372
%	14·5		4·8	37·4	5·9	37·4	

BHP MINERALS EXPLORATION

212

Hould Lake T2
OL 69
0-2m
20/7/88

OBSERVER'S DATA SHEET --- TITANIUM SAMPLE No. RT 3115

OBSERVER : EDNA

SIZE RANGE OBSERVED : -0.4 +0.075mm

SHEET No : 27 DATE STARTED : 11.7.88 DATE FINISHED : 11.7.88

ENTERED

MATERIAL	NON MAGS (~~HANDMAGNET~~) MAG SEP		TICK OR SHOW OTHER:				GRAINS BOTTLED IN BAG	GRAINS FOR PROBING
OBSERVED	-0.4 +0.25	-0.25 +0.18	-0.18 +0.075	OTHER: M.3 +4				
WEIGHT	0.2	0.9	2.9.	1.3				

MINERAL	Flag	VISUAL ESTIMATE OF MINERAL %				GRAIN COUNT CHECK	(SHOW SIZE FRACTION)	
ILMENITE	E	3	12	15	60			
MONAZITE	E	TR	TR	1				
RUTILE	E		<1	4				
ZIRCON	E	2	7	17				
LEUCOXENE	E		<1	3				
OTHERS		95	81	60	40			

COMMENTS : OTHERS : TOURMALINE KYANITE ROCKS

2-4m

213

BHP MINERALS EXPLORATION

OBSERVER'S DATA SHEET --- TITANIUM SAMPLE No. RT 3116

OBSERVER : EDNA SIZE RANGE OBSERVED : -0.4 +0.025mm

SHEET No : 3A DATE STARTED : 13.7.88 DATE FINISHED : 13.7.88.

MATERIAL	~~NON MAGS (HANDMAGNET)~~ NET MAG SEP ☐ TICK OR SHOW OTHER:						ENTERED ☐
OBSERVED	-0.4 +0.25	-0.25 +0.18	-0.18 +0.075	OTHER:			GRAINS BOTTLED IN BAG / GRAINS FOR PROBING
WEIGHT	0.1	0.6	2.2				

MINERAL	Flag	VISUAL ESTIMATE OF MINERAL %			GRAIN COUNT CHECK	(SHOW SIZE FRACTION)
ILMENITE	E	10	20	20		
MONAZITE	E					
RUTILE	E		<1	3		
ZIRCON	E	TR	3	25		
LEUCOXENE	E		TR	<1		
OTHERS		90	77	52		

COMMENTS : OTHERS : TOURMALINE . BARITE : ROCKS .

JP 6-86

BHP MINERALS EXPLORATION

214

OBSERVER'S DATA SHEET --- TITANIUM SAMPLE No. RT 3117.

OBSERVER : PAULINE SIZE RANGE OBSERVED : - 0.4 + 0.075 mm

SHEET No : 34 DATE STARTED : 13-7-88 DATE FINISHED : 13-7-88

MATERIAL	~~NON MAGS (HANDMAGNET)~~ NOT MAG SEPARATED. ☐ TICK OR SHOW OTHER:						ENTERED ☐
OBSERVED	-0.4 +0.25	-0.25 +0.18	-0.18 +0.075	OTHER:			GRAINS BOTTLED IN BAG / GRAINS FOR PROBING
WEIGHT	0.1	0.5	3.4				

MINERAL	Flag	VISUAL ESTIMATE OF MINERAL %	GRAIN COUNT CHECK	(SHOW SIZE FRACTION)
ILMENITE	E	3.10.20.		
MONAZITE	E			
RUTILE	E	<1 . 4		
ZIRCON	E	<1 . 30		
LEUCOXENE	E	<1 . 2		
OTHERS		97 . 90 . 44		

COMMENTS : Others rocks, quartz, hyanite + tourmaline.

6-Oct

BHP MINERALS EXPLORATION

215

OBSERVER'S DATA SHEET --- TITANIUM SAMPLE No. RT 3118

OBSERVER: PAULINE SIZE RANGE OBSERVED: -0.4 +0.075 mm

SHEET No: 35 DATE STARTED: 13-7-88 DATE FINISHED: 13-7-88

MATERIAL: NON MAGS (~~HANDMAGNET~~) ☐ TICK OR SHOW OTHER: MAG SEPARATED.

ENTERED ☐

OBSERVED	-0.4 +0.25	-0.25 +0.18	-0.18 +0.075	OTHER: MAG.			GRAINS BOTTLED IN BAG	GRAINS FOR PROBING
WEIGHT	0.04	0.4	5.3	0.6				

MINERAL	Flag	VISUAL ESTIMATE OF MINERAL %			GRAIN COUNT CHECK						(SHOW SIZE FRACTION)	
ILMENITE	E	3	10	15	80							
MONAZITE	E											
RUTILE	E	TR	1	3								
ZIRCON	E		2	40	TR							
LEUCOXENE	E		2	2								
OTHERS.		97	85	40	20							

COMMENTS: Others quartz, kyanite, tourmaline + rocks.

8-10 µm

BHP MINERALS EXPLORATION

216

OBSERVER'S DATA SHEET --- TITANIUM SAMPLE No. RT 3119.

OBSERVER: Pauline SIZE RANGE OBSERVED: -0.4 +0.075 mm

SHEET No: 37 DATE STARTED: 13-7-88 DATE FINISHED: 13-7-88

MATERIAL: NON MAGS (~~HANDMAGNET~~) ☐ TICK OR SHOW OTHER: MAG SEPARATED.

ENTERED ☐

OBSERVED	-0.4 +0.25	-0.25 +0.18	-0.18 +0.075	OTHER: mj+4			GRAINS BOTTLED IN BAG	GRAINS FOR PROBING
WEIGHT	0.02	0.8	9.4	1.0				

MINERAL	Flag	VISUAL ESTIMATE OF MINERAL %	GRAIN COUNT CHECK	(SHOW SIZE FRACTION)
ILMENITE	E	3 12 15 90		
MONAZITE	E			
RUTILE	E	1 3		
ZIRCON	E	1 5 5 5 TR		
LEUCOXENE	E	1 2		
OTHERS		97 71 25 10		

COMMENTS: Others quartz, kyanite, rocks + tourmaline.

10-12m

BHP MINERALS EXPLORATION

21

OBSERVER'S DATA SHEET --- TITANIUM SAMPLE No. RT 3120

OBSERVER : EDNA SIZE RANGE OBSERVED : -0.4 +0.075mm

SHEET No : 36 DATE STARTED : 13·7·88 DATE FINISHED : 13·7·88

MATERIAL	NON MAGS (~~HANDMAGNET~~) ☐ TICK OR SHOW OTHER: MAG SEP						ENTERED ☐
OBSERVED	-0.4 +0.25	-0.25 +0.18	-0.18 +0.075	OTHER: M-3+4			GRAINS BOTTLED IN BAG / GRAINS FOR PROBING
WEIGHT	0.01	0.7	13.7	1.0			

MINERAL	Flag	VISUAL ESTIMATE OF MINERAL %				GRAIN COUNT CHECK	(SHOW SIZE FRACTION)
ILMENITE	E	20	20	20	90		
MONAZITE	E						
RUTILE	E		TR	3			
ZIRCON	E	TR	12	60			
LEUCOXENE	E	TR	2	1			
OTHERS		80	66	16	10		

COMMENTS : OTHERS: TOURMALINE · ROCKS · KYANITE

P 6·88

12-14m

BHP MINERALS EXPLORATION

218

OBSERVER'S DATA SHEET --- TITANIUM SAMPLE No. RT 3121

OBSERVER : PAULINE SIZE RANGE OBSERVED : - 0.4 + 0.075 mm

SHEET No : 38 DATE STARTED : 14-7-88 DATE FINISHED : 14-7-88

MATERIAL	NON MAGS (~~HANDMAGNET~~ MAG SEPARATED)	TICK OR SHOW OTHER:	ENTERED

OBSERVED	-0.4 +0.25	-0.25 +0.18	-0.18 +0.075	OTHER: MJ+4 -			GRAINS BOTTLED IN BAG	GRAINS FOR PROBING
WEIGHT	0.03	0.5	12.3	0.6				

MINERAL	Flag	VISUAL ESTIMATE OF MINERAL %				GRAIN COUNT CHECK	(SHOW SIZE FRACTION)
ILMENITE	E	1	15	20	85		
MONAZITE	E						
RUTILE	E	TR	1	3			
ZIRCON	E	TR	2	25	TR		
LEUCOXENE	E	TR	3	4			
OTHERS		99	79	48	15		

COMMENTS : Others quartz, kyanite tourmaline + rocks.

14-16m

BHP MINERALS EXPLORATION

OBSERVER'S DATA SHEET --- TITANIUM SAMPLE No. RT 3122 21

OBSERVER : PAULINE SIZE RANGE OBSERVED : -0.4 +0.075mm

SHEET No : 39 DATE STARTED : 14-7-88 DATE FINISHED : 14-7-88

MATERIAL	NON MAGS (~~HANDMAGNET~~) MAG SEPARATED. ☐ TICK OR SHOW OTHER:						ENTERED ☐
OBSERVED	-0.4 +0.25	-0.25 +0.18	-0.18 +0.075	OTHER: M3+4.			GRAINS BOTTLED IN BAG / GRAINS FOR PROBING
WEIGHT	0.01	0.9	29.9	1.1			

MINERAL	Flag	VISUAL ESTIMATE OF MINERAL %	GRAIN COUNT CHECK	(SHOW SIZE FRACTION)
ILMENITE	E	3 20 20 50		
MONAZITE	E			
RUTILE	E	1 3		
ZIRCON	E	TR 20 50		
LEUCOXENE	E	1 1		
OTHERS		97 58 26 50		

COMMENTS : Others rocks, ~~hypersthene~~ + tourmaline.

BHP MINERALS EXPLORATION

OBSERVER'S DATA SHEET --- TITANIUM SAMPLE No. KT 3123 220

OBSERVER: PAULINE SIZE RANGE OBSERVED: -0.4 +0.075 mm

SHEET No: 41 DATE STARTED: 14-7-88 DATE FINISHED: 14-7-88.

MATERIAL: NON MAGS (~~HANDMAGNET~~) ☐ TICK OR SHOW OTHER: MAG SEPARATED.

ENTERED ☐

OBSERVED	-0.4 +0.25	-0.25 +0.18	-0.18 +0.075	OTHER: MOUNT.		
WEIGHT	0.06	0.5	12.9	0.4		

GRAINS BOTTLED IN BAG | GRAINS FOR PROBING

MINERAL	Flag	VISUAL ESTIMATE OF MINERAL %	GRAIN COUNT CHECK	(SHOW SIZE FRACTION)
ILMENITE	E	1 12 15 50		at 2.20g
MONAZITE	E			
RUTILE	E	4 1 2		
ZIRCON	E	2 30 TR		
LEUCOXENE	E	TR 3 2		
OTHERS		99 83 51 50		

COMMENTS: Others barite, rocks, tourmaline + kyanite.

BHP MINERALS EXPLORATION

EOH.

OBSERVER'S DATA SHEET --- TITANIUM SAMPLE No. RT 3124. 221

OBSERVER: PAULINE SIZE RANGE OBSERVED: -0.4 +0.075 mm

SHEET No: 43 DATE STARTED: 14-7-88 DATE FINISHED: 15-7-88

MATERIAL	NON MAGS (~~HANDMAGNET~~) ☐ TICK OR SHOW OTHER: MAG SEPARATED.						ENTERED ☐
OBSERVED	-0.4 +0.25	-0.25 +0.18	-0.18 +0.075	OTHER: MIXT.			GRAINS BOTTLED IN BAG / GRAINS FOR PROBING
WEIGHT	0.06	0-2	4-6	0-4			

MINERAL	Flag	VISUAL ESTIMATE OF MINERAL %	GRAIN COUNT CHECK	(SHOW SIZE FRACTION)
ILMENITE	E	3 / 15 / 15 / 60		
MONAZITE	E			
RUTILE	E	<1 / 2		
ZIRCON	E	10 / 50 / TR		
LEUCOXENE	E	<1 / 1 / 2		
OTHERS		97 / 74 / 31 / 40		

COMMENTS: Others barite, rocks, tourmaline + kyanite.

JP 6-86

Weight Percent Heavy Mineral - 006

Lab Number	Field No.	Received Weight	Weight H.M.	Weight Percent Heavy Min.
RT 3082	RT 3082	3.100	10.30	0.33
RT 3083	RT 3083	3.400	7.80	0.23
RT 3084	RT 3084	3.200	12.40	0.39
RT 3085	RT 3085	3.500	14.60	0.42
RT 3086	RT 3086	3.600	12.90	0.36
RT 3087	RT 3087	3.300	11.10	0.34
RT 3088	RT 3088	3.200	19.60	0.61
RT 3089	RT 3089	3.900	24.80	0.64
RT 3090	RT 3090	3.600	26.10	0.73
RT 3091	RT 3091	3.700	27.90	0.75
RT 3093	RT 3093	3.200	4.50	0.14
RT 3094	RT 3094	2.800	4.00	0.14
RT 3095	RT 3095	3.100	5.40	0.17
RT 3096	RT 3096	2.200	4.90	0.22
RT 3097	RT 3097	3.200	9.60	0.30
RT 3098	RT 3098	3.500	19.00	0.54
RT 3099	RT 3099	3.500	22.90	0.65
RT 3100	RT 3100	3.500	26.00	0.74
RT 3101	RT 3101	3.700	31.50	0.85
RT 3102	RT 3102	3.300	25.10	0.76
RT 3104	RT 3104	2.300	4.90	0.21
RT 3105	RT 3105	2.200	4.80	0.22
RT 3106	RT 3106	2.200	7.50	0.34
RT 3107	RT 3107	2.300	8.60	0.37
RT 3108	RT 3108	2.200	10.70	0.49
RT 3109	RT 3109	2.200	14.40	0.65
RT 3110	RT 3110	2.300	15.00	0.65
RT 3111	RT 3111	2.400	14.00	0.58
RT 3112	RT 3112	2.400	23.80	0.99
RT 3113	RT 3113	2.200	4.90	0.22
RT 3115	RT 3115	2.900	6.80	0.23
RT 3116	RT 3116	3.100	3.60	0.12
RT 3117	RT 3117	2.700	4.60	0.17
RT 3118	RT 3118	3.000	7.40	0.25
RT 3119	RT 3119	2.900	12.50	0.43
RT 3120	RT 3120	3.100	17.70	0.57
RT 3121	RT 3121	2.900	15.20	0.52
RT 3122	RT 3122	3.400	34.50	1.01
RT 3123	RT 3123	3.700	15.50	0.42
RT 3124	RT 3124	1.000	5.80	0.58

40 records selected.

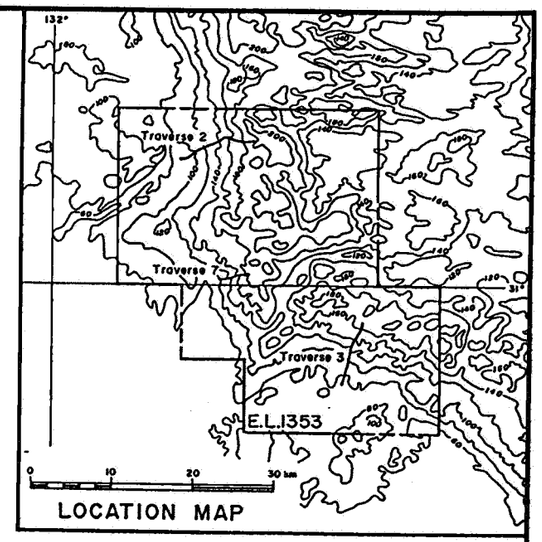
Figure 2. Weight percent total heavy minerals for samples submitted on traverse two (holes OL66-OL69).

LEGEND

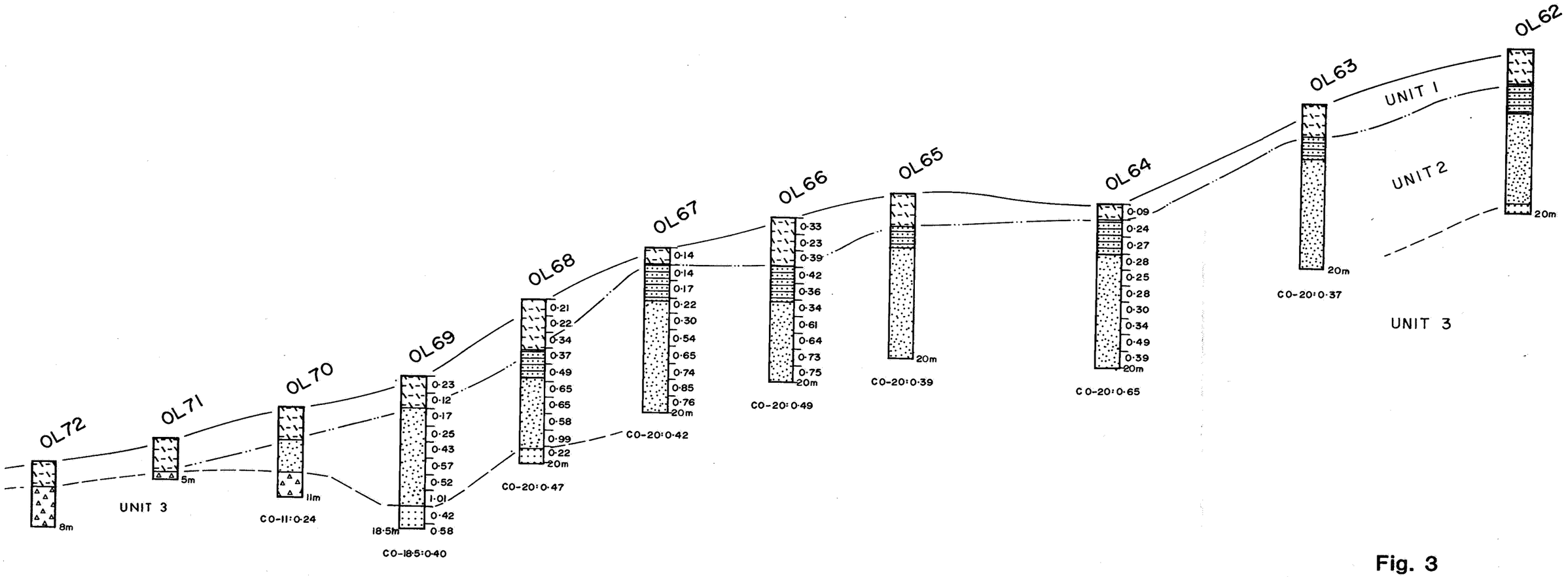
0·42 / 0·61 — *Percentage heavy mineral fraction (2·96 S.G.)*

CO-20:0·65 — *Composite sample, depth from/to and % H.M.*

TRAVERSE 2
(central portion)



LOCATION MAP



Vertical Scale 1:500

Horizontal Scale 1:10 000

0 200 400 600 800m

Fig. 3

BHP-Utah Minerals International
Asia Pacific Division - Exploration Department

E.L. 1353 IFOULD LAKE, S.A.

GEOLOGICAL SECTION : TRAVERSE 2
ANALYSES % HEAVY MINERALS

Prepared: K. Grey	Date: Oct. 1988	Centre: Adelaide
Drawn: A.E.Young	Project №:	Drawing №: A3 – 345
Checked:		

Revisions:

000224

SAMPLES HELD AT SADME, GLENSIDE, CORE LIBRARY.

EL1353 IFOULD LAKE

Traverse	Hole No	Depth m	Sample Numbers	Sample Bottles	Samples not Submitted
2	OL61	20	RT3027-3036	10	
2	OL69	18.5	RT3115-3124	10	
7	OL106	24	RT3397-3408	10	
7	OL108	20	RT3421-3430	9	RT3425
3	OL83	30	RT3195-3209	14	RT3207
3	OL96	18	RT3340-3349	10	
3	OL97	13	RT3351-3357	7	
3	OL98	15	RT3359-3366	8	
3	OL99	8.5	RT3368-3372	5	
3	OL100	10	RT3374-3378	5	
3	OL101	8.5	RT3380-3384	5	
3	OL102	20	RT3386-3395	10	

EL1354 CHUNDIE

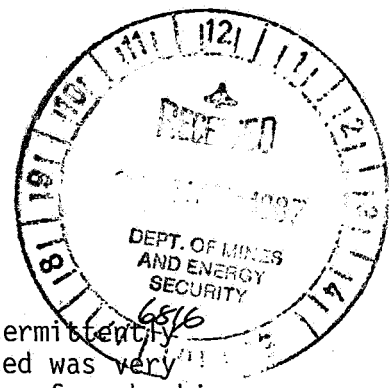
Traverse	Hole No	Depth m	Sample Numbers	Sample Bottles	Samples not Submitted
4	OL113	30	RT3466-3480	15	
5	OL138	30	RT3736-3750	15	
5	OL141	30	RT3767-3781	15	
5	OL147	40	RT3830-3849	19	RT3845
5	OL155	40	RT3923-3924	20	

EL1355 OOLDEA

Traverse	Hole No	Depth m	Sample Numbers	Sample Bottles	Samples not Submitted
1	OL6	20	RT2491-2500	10	
1	OL18	33	RT2779-2795	17	
1	OL33	24	RT2753-2764	10	RT2764, RT2758
6	OL39	24	RT2798-2809	11	RT2803
6	OL41	26	RT2822-2834	13	

Small sections of core have been included for the following hole intervals:

OL33	12-14 m	RT2759
OL33	14-16 m	RT2760
OL41	22-24 m	RT2833
OL69	18-20 m	RT3124
OL108	18-20 m	RT3430
OL138	26-28 m	RT3749
OL147	18-20 m	RT3839
OL147	16-18 m	RT3838
OL155	22-24 m	RT3934
OL155	30-32 m	RT3938



The reverse circulation rig used only produced a core intermittently when the sands were lithified. Therefore the core produced was very sporadic and most of the material returned was in the form of rock chips and sedimentary particles.

ADELAIDE
19.5.87