DEPARTMENT OF BINES SOUTH AUSTRALIA

GEOLOGICAL SURVEY
IRON EXPLORATION SECTION

REPORT NO. 2

on

SAMPLING TECHNIQUES & DRILL LOGS

for the

NARRAMBOO AEROMAGNETIC ANOMALY

CENTRAL EYRE PENINSULA

May to November, 1961

by

G. R. Heath Geologist

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- A. Special Equipment
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PLAN BEFEBENCES

No.	Title
\$ 2999	Warramboo Aeromagnetic Anomaly. Locality Plan 1 in. = 50 m. 1 in. = 4 m.
S 3000	Warremboo Anomaly. Collar fitting for rotary drill holes. (After G. Whitten and M. Obst).
S 3000 Graph 1	Warramboo Anomaly. Frequency distribution of errors in estimated iron content. Cumulative curve of readings.
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S 3002 Graph 3	Warramboo Anomaly. Relation of acid soluble iron content to error in estimated iron content.
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5 3005 Graph 6	Warramboo Anomaly. Frequency distribution of samples with respect to iron content. Histograms at 1 and 3% groupings.
S 3006	warramboo Amomely. Generalised and somewhat idealised weathering profile.

DEPARTMENT OF MINES SOUTH AUSTRALIA

Report on

SAMPLING TECHNIQUES & DRILL LOGS

for the

WARRANBOO AERONAGNETIC ANONALY

ABSTRACT

The initial test programme at Marramboo has been completed after drilling 13.163°. Techniques have been developed for drilling, sampling and legging the materials encountered. The majority of holes intersected granitised metasediments containing an average of about 20% iron exides.

Further testing based on the techniques described should result in a rapid and relatively economical evaluation of the anomaly.

1. INTRODUCTION

The Warremboo Anomaly is an acromagnetic anomaly lying in central Eyro Peninsula (see Figure S 2999). It is clongete and asymmetrical being about 15 miles east-west by 2-3 miles north-south.

The initial test programme, as well as identifying the sub-surface material producing the anomaly, developed drilling and sampling techniques applicable in other areas.

This report describes techniques developed during the first phase of exploratory drilling from May to November, 1961. Drill logs and assay results are appended.

A brief history of the project and a review of the geophysical investigations which preceded the drilling programme are contained in Report No. 1 on "Drilling of the Warramboo Agromagnetic Anomaly Central Eyre Peninsula", by Graham Whitten, Semior Geologist.

In addition, Mhitten's report contains a general discussion of drilling results up to 19th August, 1961.

Geologically, the area consists of semewhat granitised Archaean metasediments overlain by unconsolidated sands and clays, which are capped by sheet kunkar.

The topography is gently undulating with a prominent system of superimposed sand dumes trending at about 120°. The dumes range up to 30 feet in height by several miles in length.

The only surface indications of bedrock are small patches of scattered ferruginous and manganiforous float.

The lack of pre-Caimosoic outcrops resulted in drill sites being selected on the basis of ground geophysical data.

However, the presence of relict martite in limonitic float mean 58000N. 67000E gave this area first priority in the drilling programme, while the subsequent discovery of mangamiferous modules near 56000N, 50000E made this area an obvious choice for early detailed testing.

2. DRILLING PROGRAMME

(a) Summery

Type of drill	Rotary	Di emond	Auger	Percussion
Nodel	Failing WW 1	Mindrill F25	Gemcodrill	Ruston Bucyrus W22 and self propolled rig constructed by Department of Kines (plant No. 10)
Brilling commenced	8/5/61	28/6/61	8/6/61	14/7/61
" concluded	4/9/61	1/11/61	5/9/61	31/8/61
ANo. Sites drilled	31	4	89	9
Footage drilled	5300°	1819*	5446*	598*
" per hole	156°	455*	61*	66*
" per week	311.	101*	418*	85*
Cost per foot	£1. 9. 7.	£3. 19. 3.	£0. 6. 3.	£2. 1. 6.
# Does not include drilled for tech		{ G:\$		

(b) Hetary Drill

The plant used for rotary drilling was a new Failing model Whil, combined rotary-percussion drill, which was also able to take short diamond drill cores. This plant was used to drill holes to fresh bedrock.

The fact that the rig was new and was operating at depths of less than 300 ft. resulted in a negligible amount of lost time idue to mechanical breakdown. During the closing stages of the programme however, the mud pump gave tremble due to internal abrasian (see discussion later) and the mater developed a leak between the water circuit and the sump. These faults developed too late to affect the first test programme, but will have to be rectified before drilling recommences.

Daily footages of up to 180 ft. were achieved under optimum conditions.

Tungstem carbide faced finger bits proved most successful for drilling unconsolidated material or meathered bedrock, while tricene roller bits were used to penetrate kunker and fresher bedrock.

As the WH I was the first plant of its type to be used by the Department for mineral exploration in this state, a certain amount of experimentation in drilling and sampling techniques was necessary to obtain optimum results.

The drillers' task was made more difficult by the lack of an operator's manual for the plant.

Two major problems were encountered during rotary drilling.

1. Interruption of mud circulation. The plant was fitted with a 2%" centrifugal pump to maintain the mud flow while drilling. Although the large capacity of this pump was an advantage in a number of cases, the ease with which the flow could be stopped by soft clay plugging the bit (without producing any significant increase in back pressure) more than discounted this factor.

A piston pump would evercome the problem, as well as climinating the priming difficulty experienced with the centrifugal pump.

2. Abrasive mud. The recirculated mud contained a large proportion of suspended quartz, and, as the hole entered less weathered hedrock, garnet and

iron exides as well. This highly abrasive mixture cut through bress fittings in a metter of days.

While it would probably be difficult or impossible to reduce the amount of abrasive material in suspension, the problem could be reduced by using specially hardened or subber lined fittings at points of maximum wear (e.g. gate valves, pump vanes etc.).

Forcussion drilling with the WW 1 was fairly straightforward at depths of less than 150°. At greater depths, however, the drilling action of the 2%" tools was effectively damped by the drilling mud which filled and supported the rotary drill holes.

This produced melfunctioning of the hydraulic lifting ram, as well as making it difficult for the driller to tell when the tools were at the bottom of the hole.

Apart from the slow turntable speed (which could possibly be improved by fitting later models with an overdrive), the NW I worked well as a dismond drill in fresh bedrock.

The cost per foot of diamond drilling at the bottom of a retary bele (about £9) was excessive, largely due to vibration damage and scouring of bits. It may be possible to reduce this cost by using smaller coring equipment and stabilising the core barrel and bit in the bottom of the hole.

An attempt was made to core semi-consolidated material using NHS equipment (split inner core barrel, bottom discharge bits), but the space between inner and outer barrels was repeatedly blocked by sand sized material carried down in the drilling mud.

This problem was reduced to some extent by drilling with water instead of mud.

However, once the and had been flushed out of the hole, the walls tended to college.

(c) Diamond Drill

In cases where rotary drill holes penetrated material warranting further study at depth, or where they did not penetrate far enough to obtain the information sought, a dismond drill was used to obtain the desired information.

The principal factors contributing to the success of the diamond drilling programme were:

- i. A new Mindrill F 25 plant was used, resulting in a minimum amount of lost time due to mechanical breakdowns.
- ii. The plant was under the control of an experienced and competent driller with the expert services of an overseer available throughout the period of intensive drilling.
- iii. Moles were drilled vertically in fresh rock from the bettem of retary holes, thus bypessing the difficulties normally encountered when dismond drilling through overburden or decomposed rock.

(d) Auger Drill

The Commodrill had the highest penetration rate of the plants used (over 200 ft. per day being achieved on several occasions).

However, the plant was unable to penetrate the shallow subsurface kwaker-limonite in many cases and only penetrated it with great difficulty in a number of others. This type of drilling was probably responsible for the frequent mechanical breakdowns suffered by the plant.

Further testing is required to determine whether the plant can be medified to handle tough drilling at shallow depth without suffering mechanical damage.

(e) Percussion Drill

Two plants were used during the percussion drilling programme.

In each case continuous open tube sampling was employed as far as possible.

Initially a small self-propelled rig (percussion drill Ne. 10), constructed by the Department, was used. At Coffin Boy, drilling dry lime sands, it had been very effective. At Marramboo, however, it could not handle the drilling conditions encountered.

It was stopped by flowing water-saturated quartz sand in the first three holes, at depths of 25° or less; its general rate of drilling was slow; and it was not powerful enough to pull casing when a hole had been completed. The plant was withdrawn after drilling seven heles.

The last two holes were drilled with a such heavier Ruston Bucyrus w 22 drill. This plant was quite successful. but being equipped for

undisturbed sampling was handicapped by a lack of correct equipment during the early stages.

3. COLLECTION & PREPARATION OF SAMPLES

(a) Failing WW 1

1. Rotary Cuttings

All mud returned during rotary drilling was directed, by means of a special collar fitting (Figure 5 3008), through a 12 mesh sieve and a settling tank. It then passed through two excavated sumps before being pumped back down the hole.

Settling tanks were made by cutting a 44 gallon drum into thirds (normal to drum axis) and welding 4" overflow pipes and handles on to the resulting tubs.

In this way, all the plus 12 mesh cuttings and a large proportion of the minus 12 mesh cuttings were retained for examination and assay.

At 10° intervels, drilling was stopped and the hole was flushed out for 5 minutes. The tank and sieve were then emptied on to rubber mats and washed out.

The sample was reduced to any desired size by cone and quartering and a 3 oz. jar full was retained for reference purposes. When a hole was in iron formation, an additional sample bag of cuttings was retained for possible assay.

Representative portions of the plus and minus 12 mesh fractions were washed free of mad and clay. The coarse fraction was cleaned by repeated agitation and washing in a 1" x 3" dismeter tobacco tin with 16 mesh covered openings at each ead, while the fine fraction was cleaned by repeated agitation followed by decantation of the clay suspension. In each case 1/4" ball bearings were added to the cuttings to help break up lumps of clay.

The clay free cuttings were dried on a small herosene pressure stove, and stored in 3° x 1° diameter plastic phials ready for microscope logging.

(11) Percussion Cores

The only precention necessary before taking a percussion open tube sample with the NW 1 was to flush the hole thoroughly with drilling mud to remove rotary cuttings, the settling of which could block the lower 2°-3° of the hole.

Open tube samples were taken at 20° intervals during normal rotary drilling (10° intervals where the mud return was zero). The fact that rotary drilling rods were 20°6" long caused some confusion to drillers unacquatomed to the rig.

(iii) Diamond Drill Cores

When the penetration rate of the rotary drill, using a tricone roller bit, fell below 4 ft. per hour, a dismond drill core was taken.

A 5° NK casing barrel fitted with 3% special coring bits was used on the rotary drill rods.

Precautions were similar to those employed for percussion coring: the hole was thoroughly flushed with drilling and to remove cuttings which would otherwise settle to the bottom of the hole. Diemond drilling was not successful first thing in the morning, as fine cuttings and debris from the sides of the hole filled the bottom 3°-5° of the hole evernight.

A nominal core recovery of 60% was specified before the driller could step a hole on his own initiative. However, this figure was varied by the geologist on the site according to the nature of the core and the information required.

(b) Gemcodrill

(i) Auger Cuttings

Sampling cuttings from the Gemcodrill was technically much simpler than sampling retary cuttings; the driller was able to collect all samples without assistance.

At the end of each 6° drilling run, the flights were spun in the hole to clear it as far as possible and a representative sample from the 6° interval was begged for microscope logging.

Cuttings were not washed in most cases due to pressure of other work. However, since auger cuttings, unlike retary cuttings, were not impregnated with drilling mud, the mineral content of unwashed cuttings could generally be determined without difficulty.

The standard of samples obtained throughout the area was quite variable.

In hard or compact layers (e.g. sheet kunkar or limenite-silica impregnated material) cuttings were reduced to a fine powder by the grinding action of the bit. This pewder was very difficult to interpret.

Under mearly dry, soft conditions, cuttings were brought to the surface as 1" diameter "marbles", which retained some structure (e.g. lamination) and could be legged rapidly. Unfortunately, such conditions were the exception rather than the rule.

When drilling below the water table (about R.L. 450°) samples were churned into a slurry in which all structure was destroyed and samples from individual runs were severely contaminated by material from higher in the sequence. Like the powder from the hard layers, this slurry was very difficult to interpret; such features as the overburden-bedrock contact being almost impossible to identify.

(11) Auger Cores

In addition to the normal flights, a number of devices were used with the Gemco to take samples from the bottom of the hole. They were:

(1) Core barrel in bettem auger flight. To obtain this type of sample, a special bit cut an annular hole, the contral cylinder of material being forced up into the barrel. This corer took a fairly good sample under optimum conditions (soft, damp material), but would not core moderately hard bands or sandy clays below the water table.

Furthermore, the flights had to be removed to extract the core, and this greatly slowed the rate of drilling (the chief advantage of the Gemco). Also, in met conditions, the hole usually collapsed before the flights could be replaced.

(2) Fost hole digger type sampler. This device was virtually a post hole digger which could be lowered to the bottom of the hole on NX dismond drill rods.

The sample consisted of cuttings compressed in the body of the sampler to form a solid core. Although this core provided material from a known depth, it yielded no more structural information than the suger cuttings. In addition, it suffered from the same disadvantages as (1).

(3) Hellow flights allowing cores to be taken with the flights down the hole.

The hollow auger flights did not arrive at Warramboo until the closing stages of the initial drilling programme. A trial hole (NA 89) was drilled at 60600N. 67150E during which several percussion open tube samples were taken through the hollow flights. Providing care was taken to avoid hard bands, the samples were quite satisfactory.

Other samplers which could be used with these hellow flights, to obtain samples from specific depths, are AX dismond drill equipment and small post hele diggers.

The hollow flights overcome most of the disadvantages of (1) above, but the equipment requires further testing to determine its effectiveness under variable conditions.

(c) Mindrill F25 - Dismond Drill Cores

The F25 diamond drill obtained very good samples, core recovery ranging from 73% in WD 1 to 93% in WD 3.

Standard drilling procedures were employed throughout the test programme, and no serious difficulties arose from a technical point of view.

(d) Percussion Drills - Core Samples

Open tube cores from both the percussion plants were of high standard, although some distortion of bedding occurred in wet clayey sequences.

The cores were split lengthwise normal to the bedding, while still damp, so as to expedite later structural studies.

4. SAMPLE LOGGING TECHNIOUK

(a) Cuttings

The plus and minus 12 mesh retary cutting fractions which had been washed free of clay and mud. and dried, were logged separately, with the aid of a binocular microscope.

Supplementary equipment consisted of an almico magnet (to test for magnetite and magnetic martite), a plastic container of 1:1 hydrachleric acid (to test for carbonate material), and a small mapping pen with a circular 1/25" flow hole (the point being used to test mineral hardness, and the hole to estimate mineral grain sixe).

The microscope was set up on the long-range tanks in the rear of a Lead Rever or Jeep. This gave a working area which was firm, well lit. and protected from the weather. A Holden utility was unsuitable for use as a field laboratory.

Working conditions and lack of time precluded the use of polarised light equipment, refractive index liquids etc.. to identify minerals more accurately.

The features recorded for cook sample were:

(1) Mineral species, associations and grain size characteristics. As well as identifying minerals wherever possible, an attempt was made to sub-classify minerals (e.g. felspars into orthoclase and plagiculase, garnet into pink and orange varieties and so on).

The mineral associations and grain size limits are tabulated in the section on DETAILED GEOLOGY.

(ii) Proportions of principal constituents. All mineral estimates were made visually (there being insufficient time for grain counts). The technique was largely a matter of getting a representative sample fraction, spreading it out evenly in the field of view, coupled with constant practice. The diagram from Shvetsev (in Terry and Chilingar, Journal of Sedimentary Petrology volume 25 No. 3, pages 230-233, Sept. 1955) was quite helpful.

The significance of mineral estimates is discussed in the next section (DISCUSSION OF LOG RESULTS). However, the many factors influencing visual mineral estimates (grain size, difficulty of obtaining a representative

sample and personal bias. to name a few) will probably make it difficult

to estimate iron oxides to better than plus or minus 5%, even after prolonged practice.

Unwashed cuttings from NR 24 and NR 25 were submitted to Australian Mineral spevelopment Laboratories for assay for acid soluble iron, manganese and insoluble matter. The assay results are appended to this report.

Auger cuttings were logged microscopically in the same way as rotary cuttings, but the logs are generally less complete due to the absence of core samples (which acted as controls in rotary holes).

(b) Cores

Percussion core samples were split, as described above, and logged macroscopically and microscopically in the same way as retary cuttings. In addition, structural characteristics (attitude of bedding to core axis etc.) were also recorded.

As well as providing structural information, the geological logs of core samples from rotary boles formed an accurate framework which could be filled in using the information obtained from rotary cuttings.

Selected core samples were split and assayed for acid soluble iron, manganese, and insoluble matter. The assay results are appended to this report.

A number of cores consisted of light yellow-brown clay sized material.

This was logged as clay, usually containing a very smell proportion of visible iron oxides.

In a number of cases, however, assay results suggested that much of the material was earthy limenite. Re-examination of the cores concerned suggests that iron-rich earthy limenite and iron-poor limenitic clay cannot be distinguished eptically using the equipment available. This fact should be kept in mind when evaluating iron oxide estimates in percussion core logs.

Diamond drill core was logged in detail, as it provides the only information on fresh bedrock. The following features have been or will be determined for diamond drill core:

- 1. Recovery and condition of core.
- ii. Attitude of bedding to core axis at 5° or 10° intervals.
- iii. Degree of magnetism.
- iv. Geology (macro is WD 1-4 micro as well is WD1-2)
 Degree of granitisation.
 Rimerals present and proportions of principal
 constituents.
 Unusual textural features.
- Y. Assay (AMDL).
- vi. Specific gravity (Geophysics Section).
- vii. Petrology of selected specimens (AMDL).
- viii. Magnetic susceptibility (Geophysics Section).

5. DISCUSSION OF LOG RESULTS

(a) MR1-31 Core Samples

Comparison of acid soluble iron content (determined by assay) and estimated iron content (dtermined microscopically).

General Notes

(1) Since the cores taken from rotary holes were all 1°-5° long and in general were taken at 10° or 20° intervals, they have been given equal weight in frequency distribution graphs.

On statistical grounds, samples should be the same size and randomly arranged. In practice, however, other factors (e.g. the uneven distribution of drill holes over the anomaly) make an accurate statistical appraisal impossible at present and unlikely at any exploratory stage.

(ii) During microscope logging, the iron exide content of each sample was estimated visually.

For purposes of comparison, these estimates have been multiplied by a factor of 0.7 to give the "estimated iron content". If all the iron had been present as haematite or martite, this factor would be accurate to within 0.1% (Fe₂O₂) containing 69.93% iron).

The most common iron oxide mineral in the hM1-31 cores is martite, with lesser magnetite (containing approximately 72.5% iron) and limonite (containing approximately 60-63% iron). Thus, as limonite and magnetite tend to cancel one another, the use of an alternate conversion factor does not

appear to be justified.

(iii) Just before this report was issued, six mistakes were discovered in the figures for ecid soluble iron contents of core samples. These errors have been corrected in APPENDIX C, but not in Graphs 1-6. Their presence results in slight modifications to graphs in the + 30% iron content and error range, but does not appreciably affect the major portion of graphs on which the results in this section are based.

Graph 1 (Figure S 3000) is a cumulative curve showing the frequency distribution of errors in the estimated from content. The median point of this curve occurs at an error value of -2% (i.e. for all samples compared, the mean estimated from content is 2% lower than the mean acid soluble from content).

This curve can also be used to obtain reliability figures for various propertiess of the total number of samples.

Thus if x = "ostimated iron content"

for x + 3.4%; 50% of estimates are within $\pm 3.4%$ of acid soluble iron content.

,	. +	3.7%	60%	*	•	99	*	± :	4.7%	*	44	*	*	**
3	(+	4.2%;	70%	*	*	*		土	6.7%	•	•	**	**	*
3	; +	4.5%;	BOX	39	***	**	M	± 4	9.6%	40	,#*	*		14
3	. +	5.5%:	90%	*	tr	14	**	±	13.3%	w	94	蛛	44	41

In Graph 2 (Figure S 3001), the data of graph 1 are plotted as histograms. These illustrate more clearly, the dominance of small errors over large ones, (e.g. 50 out of 131 estimates are within 2% of the corresponding assay value) as well as showing that underestimates are more common than overestimates.

Graphs 3 and 4 (Figures S3002-3) illustrate the distribution of errors in estimated iron content at various iron contents (acid soluble in 3, estimated in 4).

Both these graphs show the dominance of underestimates over overestimates regardless of the grade of the sample. In addition, the contours in graph 4 suggest that overestimates are more common when the estimated iron content is higher than 20%. However, this trend is not pronounced enough to justify the use of special correction factors when considering "estimated iron content" values.

(b) Comparison of retary care and sludge samples.

All available cores and cuttings from WR 24 and NR 25 were assayed for acid soluble iron by A.M.D.L. The following table summarises the results, and includes the estimated iron contents for comparison.

NE 24

Feetage	Type of Sample	Acid sol- uble iron	Estimated iron content	Difference
40'-41'	Core	25.3%	20%	- 5%
50*-60*	-12 mesh	19.1	45	+ 26
*	+12 mesh	17.5	60	+ 43
60'-61'	Core	18.1	15	- 3
60'-70'	-12 mesh	21.4	60	± 39
*	+12 mesh	18.6	30	+ 12
79'-80'	-12 mesh	17.6	60	+ 43
**	+12 mesh	16.3	30	+ 14
80'-81'	Core	16.7	- 10	₩ 7
8090.	- 12 mesk	17.9	50	+ 32
•	+12 mesh	16.7	30	+ 14
90'-100'	-12 mesh	18.4	50	+ 32
••	+12 mesh	20.4	30	+ 10
100101.	Core	14.1	7	- 7
100,-110,	-12 mesh	16.2	30	+ 14
110'-120'	-12 mesh	13.2	30	* 17
120*-121*	Core	14.8	14	- 1
120*-130*	-12 mesh	13.8	20	+ 6
. •	+12 mesh	14.3	15	+ 1
130*-140*	-12 mesh	12.5	10	- 21/2
*	+12 mesh	13.0	7	- 6
140*-141*	Core	33.7	20	- 14
140*-150*	-12 mesh	13.6	20	± 7
150*-160*	-12 mesh	15.3	7	- 8
160*-170*	-12 mesh	10.8	7	- 4
74*-179*	Diamond drill core	18.6	20	+ 1%
179*	END OF HOLE			
1	N.B. Coro = Perci	 spion open tube	ore sample	

⁻¹² mesh) = Unwashed fine and coarse rotary cuttings.

解 25

Footage	Type of Sample	Acid sol- uble iron	Estimated iron content	Difference
30*-40*	-12 mesh	33.8%	60%	+ 26%
40*-50*	-12 mesh	30.0	55	* 25
50'-60'	-12 mesh	20.5	45	+ 15
60°-61°	Core	23.6	15	- 8
70*-80*	-12 mesh	29.0	60	# 31
\$\$	+12 mesh	10.9	30	+ 19
80*-81*	Core	15.1	5	- 10
80*-90*	-12 mesk	24.6	50	+ 25
90*-100*	-12 mesh	16.0	50	+ 34
100*-101*	Core	12.0	0	- 12
100*-110*	-12 mesh	22.9	30	+7
110*-120*	-12 mesh	15.5	50	+ 35
120*-121*	Core	7.9	10	+ 2
130*-140*	-12 mesh	14.3	10	-4
140°-141°	.Gore	16.5	15	- 1%
140*-150*	-12 mesh	13.7	20	+7
150°-160°	-12 mesh	16.6	7	- 10
160°-161°	Core	20.0	20	0
160*-170*	-12 mesh	13.5	7	- 644
170*-178*	-12 mosh	28.3	40	+ 12
174*-178*	Diamond drill core	10.2	15	+ 5
178*	END OF HOLE			
		ion open tube co Unwashed fine an	•	cuttings.

The tabulated figures show that the acid soluble iron contents of cores and adjacent cuttings are very similar.

Thus in MR 24, from 60°-81°, the average acid soluble iron centent of cuttings is 18.5%, and of cores is 17.4%. From 80°-101°, cuttings contain 18.3% acid soluble iron while cores contain 15.4%.

Hence, despite the fact that unwashed cuttings contain a certain amount of drilling mud, their assay results seem to give a reasonably true picture of the grade of material intersected.

The difference between the acid soluble iron centents of equivalent plus and minus 12 mesh fractions is slight, the coarser fraction generally centaining less iron.

In contrast to the assay results, the estimated iron contents of adjacent cores and cuttings show very little agreement.

Since the estimated iron content of cuttings is determined from clay free samples, the errors must be introduced during washing.

The principal iron bearing minerals, magnetite and martite, usually occur as crystals less than 1/50" diameter. During washing of the samples these crystals will readily pass through a 16 mesh sieve with the clay fraction, unless present in composite fragments, thus tending to reduce the iron exide content of washed cuttings.

In general however, this trend is strongly outweighed by the fact that many samples contain up to 90% clay (as distinct from drilling mud). When this is removed, an imitial iron content of 5% becomes 50% in the washed sample.

Bearing is mind the rate at which samples must be logged, and the fact that sample preparation and logging are carried out by different people. there does not seem to be any way of increasing the quantitative accuracy of cutting estimates. In particular, it should be noted that unskilled labour was used for sample proparation.

The chief value of these samples is to provide qualitative information (e.g. appearance of different minerals) on the sequences between core samples.

The detailed logging of retary cuttings does not appear to be justified in sequences where core samples are close together. However, in the semi-consolidated material which is too hard for percussion tube sampling and too incoherent for diamond drilling, the judicious use of composite fragments from retary cuttings should result in a fairly reliable log, once the field goologist has become accustomed to the variety of metasediments likely to be encountered in the area.

Although the subdivision into plus and minus 12 mesh fractions does not appear to be significant from an analytical point of view, it does facilitate microscope logging. The coarse fraction contains composites and

debris from the sides of the hole, while the fine fraction contains fragments of all minerals present.

Micas are rare in cutting samples, as the flakes, with their large surface area per unit volume, are readily carried out of the settling tank by the circulating drilling mud.

(c) Grade Distribution of Samples Assered.

Graph 5 (Figure S 3004) is a cumulative curve showing the relation between the acid soluble iron content and the number of assays containing less than a certain percentage iron.

From this graph, the mean acid soluble from content for all samples assayed is 14.3%.

25% of the samples assayed contained 0 - 7.3% iron
" " " " 7.3 - 14.3% "
" " 14.3 - 21.1% "
" " 21.1 - 47.3% "

Only 8% of samples contained more than 30% iron.

The graph is virtually a straight line in the G-25% iron range, showing a uniform grade distribution for 85% of the samples. At higher grades, however the number of occurrences falls off very rapidly.

Graphs 6A and 6B (Figure S 3005) present the same data as Graph 5, but in the form of 1% and 3% grouping histograms. Graphs 6C and 6D are similar, but the groups are based on estimated iron content, instead of acid soluble iron.

Although the assays do not show a marked concentration at any particular grade, there are two quite well defined groupings. These are 0-9% and 12-25 (approx.) % iron. In addition, the 1% groupings show some concentration in the 0-9%, 10-16% and possibly 19 or 20-23% ranges.

Additional assays are necessary to show whether these are natural and significant groupings or whether the gaps have simply resulted from a statistically inadequate number of determinations (as the cumulative curve seems to indicate).

6. DETAILED GEGLOGY

(a) Geology Determined from Surface Exposures

The dominant topographical feature of the barramboo area is the sand dune system. The dunes may be as such as several miles long, 200-300 feet wide and 30 feet high. They are covered in fairly thick scrub and do not tend to migrate unless cleared of vegetation. The average trend of the system is about 120°. Dunes consist of virtually pure, rounded, well sorted, medium to fine grained quartz sand.

Nest of the 61000% line, the mein anomaly coincides with a series of low hills (less than 200 feet high). Drilling has shown there to be basement highs, but the only unusual surface features are scattered hard black manganiferous modules around 57000N 44000E and 56000N 58000E.

The interdunal areas are characterised by clayey soils grading to clay pans in the lowest areas. Orninage is internal, and the water table fluctuates about the clay pan level during the year.

Most of these clay pans consist of red-brown or black feetid clays. but in rare cases, they centain silicified areas (which form pseudo-outcreps of desert sandstone type material).

Limonitic quartz sandstone (fine grained quartz sand in limonite matrix) occurs at 10 localities adjacent to clay pans. Each of these localities overlies iron formation, or coincides with a "peak" in the aeromognetic anomaly. However, as Johns (Geological Survey Bulletin 37) reports laterites south-east of Warramboo, it would be unwise to use these occurrences as criteria for iron formation beyond the area covered by the anomaly without first examining their mode of occurrence.

Surface limenite float in the area around 58000N. 67000E, contains bands of relict martite crystals. This martite is the only surface material in the area which can definitely be related to the underlying bedrock.

(b) Geology Determined from Drill Hole Intersections

(i) Overburden

Kunkar is essentially a sub-surface feature (usually being covered by 1-4 ft. of sandy soil), but as a result of deflation it is exposed at the surface in many areas.

In well drained areas it generally forms a compact continuous sheet 1 ft. to 15 ft. thick, with a clearly defined upper surface and a diffuse lower surface (e.g. everlying the basement highs in Secs. 12 and 24. Hd. Warramboo). These areas are usually more than 20°-25° above the water table.

Friable and modular variants are most common over thick porous overburden sequences or near the water table.

The kunker is usually off-white to light brown in colour, but contains dark bands in some areas (due to manganiferous exides over parts of the anomaly, and organic material (?) elsewhere).

It is frequently underlain by limmite (usually associated with cherty silica). in the more elevated areas.

This limmite is usually dispersed or modular in form, but where it directly overlies from formation, it tends to occur as an extremely hard and compact layer.

East of 66000E, drill holes to the north and south of the anomaly intersected very impure gypsum (possibly averaging 30%) ranging from 2 ft. to 16 ft. and averaging about 9 ft. in thickness. The gypsum bearing material is usually covered by less than 4 feet of soil.

The gypsum grades from scattered crystals near the surface to thin bands (less than 6 inches thick) of impure rock gypsum, interbedded with sandy clay, near the base.

Apart from forming the sand dunes, pure quartz sand is a common sub-surface material. It is the dominant constituent of sequences up to 90° thick (e.g. NR 5) in the area south of the anomaly between 64000E and 67000E. This area may be an old valley filled with wind blown sands, or it may be an infilled take. The sand is usually unconsolidated, but occasional thin bands have been commented by precipitated silica to form very hard and resistant orthograntzites. The grain size is usually 1/50" - 1/100" (i.e. about 1/2 - 1/8 mm, or medium to fine grained sand on the Wentworth scale).

The only material commonly associated with the pure quartz sands is light grey to grey, homogeneous, structuroless clay.

In a number of drill holes, red-brown and yellow-brown, mottled.

laminated and banded clays were intersected. These clays form sequences less

than 25 feet thick, which closely resemble the Pleistocene clays along the coast south of Adelaide (e.g. Hallet's Cove).

(ii) Bedrock

The degree of metamorphism, absence of fossils and regional geological history all suggest that bedrock is of Archaean age.

In most samples, despite a certain amount of mobilization, bedding is obvious and well preserved. The identification of rounded zircons in a number of petrologically examined specimens confirms the sedimentary origin of this material.

The minerals identified in bedrock samples tend to occur in three fairly well defined groups. Those groups have characteristic grain size limits and tend to differ texturally. They are:

	Group 1	Group 2	бтопр 3
Mineral species	quartx grey folspar yellow-orange garnet magnetite-martite biotite tremplite Rare epidote sillimenite pyrite sphene	querts orthoclase calcite epidote hornblende Rare sillimanite tourmaline red-brown garnet tremolite Very rare suscovite Group 1 minorals	epidoto calcite cultivertheclase tourmaline tere hornbleade muscovite magnetite
Usual grain size	1/250" - 1/50"	1/20" - 1"	p to 2"
Texture	Hypidiomorphic, minerals concen- trated in original sedimentary bands.	Granoblastic to allotriomorphic, usually discordant masses, but concor- dant aggregates also common.	Allotriomerphic to pegmatitic or veined. Veins usually contain less than three minerals.
Possible source volume of parent material	Withia 1"	dithin 3°	may have migrated through distances of the order of 3° - 1 mile
Relative period of formation Group 1	3		***************************************
Group 2			?
Group 3 (particularly discordant quarts orthoclase)	Cryst	allination time	

Nost of the minerals present in the metasediments are characteristic of the sillimenite-almendine sub-facies of the almendine-amphibolite facies

liousever, the partial alteration of bietite to chlorite, and of bornblende to epidote and actimolite suggests that some retrograde metamorphism has taken place.

This sub-facies is characterised by the occurrence of perimagnatic processes. Thus, at Marramboo, the development of metasomatic quartz-orthoclase masses has produced effects ranging from slight deformation of bedding, through ptygmatic folding to complete destruction of bedding (giving igneous looking granites and pegmatites in a few cases).

Iron formation has been intersected in the majority of "on anomaly" holes.

The two dominant mineral associations are quartz-felsper-magnetitebiotite, and garnet-magnetite with lesser quartz-biotite-sillimanite-felsper. In the former association, the proportions of biotite and magnetite tend to vary inversely, resulting in all variants from granitic metasediment ("granite") to itabirite.

(c) <u>Menthering Profile</u>

Figure 5 3006 is a generalised and somewhat idealised prefile through the material above fresh bedrock. Seven distinct zenes have been recognised to date. They are:

- (1) Eunkar layer. Eentioned is section on "Overburden".
- (2, 3) Zones of limits and silica impregnation. These have been mentioned earlier ("Overburden"). They are generally desely associated.

Clay formed by the breakdown of bedrock minerals changes in appearance from the surface to fresh rock. Although the change is gradational, it is possible to recognise:

- (4) <u>Structuraless clay</u> near the surface. This is homogeneous in appearance, and the only clue to its origin is the presence of relict beds containing varying amounts of martite.
- (5) Flaky Clay at greater depths. Some of the clay in this zone is pseudomorphic after expanded micas, so that its origin is obvious. Most, however, has probably developed from folspars, whose crastal shape is not well

preserved by the naturally flaky clay minerals.

- (6) Fine grained <u>nyrite</u> was intersected below the water table in many boles

 The pyrite crystals were generally less than 1/1000" diameter but

 ranged up to 1/20" pyritohedrons in rare cases. The crystals were

 usually dispersed but nodules up to 3/4" diameter were obtained from

 several holes, and in one sample, the pyrite had comented a wind blown

 sand to form an irregularly lithified pyritic quarts sandstone.
- (7) <u>Calcercous randules</u> characterise the deepest recognisable zone. The nodules are compact and frequently occur to within a few feet of fresh bedrock. They are usually 1/50" 1/20" diameter, but range up to 3/4" in rare cases. The larger ones have produced considerable bedding distortion, as well as incorporating magnetite and martite from the pre-existing rock.

The order of appearance of the most common minerals is shown on the right hand side of the profile (Figure S 3006). The principal systematic exceptions are:

- (i) In cases where the pyrite zene is deeper than usual, garnet invariably appears before biotite, and in two cases, it appeared before any primary mineral except quartz. In addition, epidote is rare and sillimanite is invariably absent from the pyrite zone when it extends to their normal depth of occurrence.
- (ii) In cases where the zone of calcareous modules is slightly deeper than usual, sillimenite appears before epidete.

(d) Structural Geology

Although mobilisation has resulted in deformation and even destruction of hedding in some sequences, the majority of bedding planes intersected showed a dip of 30° - 60° .

There is no direct evidence available at present, to indicate the direction of dip. Paleomagnetic studies (in progress) may elucidate the problem.

Indirect evidence suggests a southerly dip. The main evidence being

- (i) The mangamiferous fleat around 56000N 58000E is on the morth edge of anomalous material (i.e. at the projected position of outcrop of a south dipping sequence).
- (ii) WD 1 (67000E) (on the north edge of an anomaly-producing iron rich sequence) passed out of continuous iron formation at 116°. whereas WD 2 (58000E) (on the south edge of the same sequence.

 9000° east) did not pass out of iron formation until 886°.

7. CONCLUSIONS

- (a) The initial drilling programme at Warramboo has shown that with suitable equipment and adequate supervision, drill hole samples of a high standard can be obtained at a relatively low cost.
- (b) For fast, detailed reconnaissance drilling, the Failing WW 1 has proved extending. This plant will be even better when the diamend drilling technique is perfected.
- (c) The Gemcodrill, used with hollow flights and bottom sampling devices, should be successful as a fill-in drill supplementing the www l. However, the factors causing mechanical breakdowns in hard material at shallow depth must be identified and climinated.
- (d) Sampling and logging techniques for the conditions and rock types encountered have achieved a high degree of efficiency. More detailed logging is not feasible unless the field staff is increased or more sophisticated equipment is used. Similarly, any marked increase in drilling efficiency will make the field geologist's task very difficult.

If the drilling schedule is erranged so that no more than two drills are operating at one time, the geologist will be able to prepare complete logs without causing a bottleneck in the exploration programme.

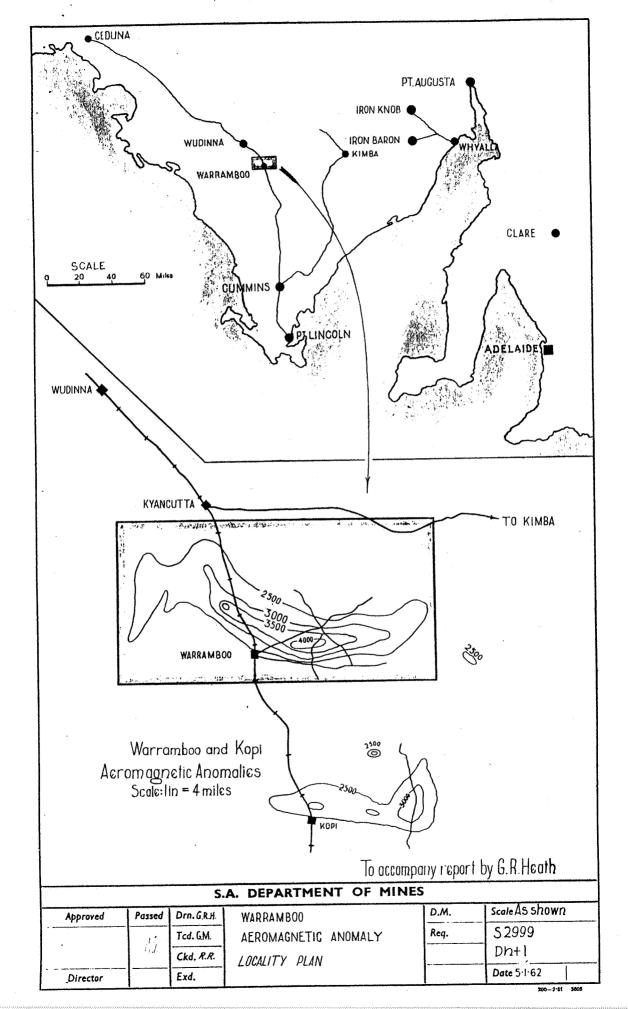
(e) Detailed logs of retary cuttings are unnecessary and to some extent misleading in sequences where adequate core samples are available.

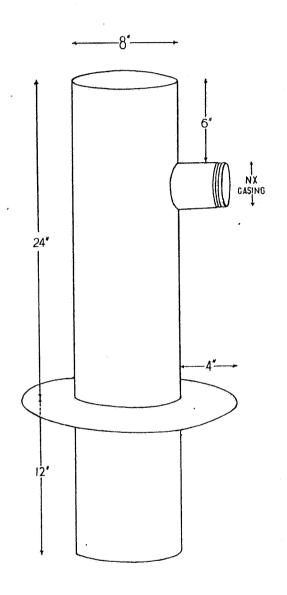
Where core samples cannot be obtained, detailed cutting logs provide the only geological information (over considerable sequences in some cases). If the limitations of these logs are kept in mind, they should be adequate for prefile construction, etc.

The accuracy of cutting logs is generally influenced more by the personal bias of the geologist than is the accuracy of core logs. Consequently, experience in microscope logging is important if meaningful cutting logs are to be obtained.

- (f) Comparison of assay results for core samples with field logs shows a close correlation. This justifies the reather quantitative logging techniques ased during the investigation.
- (g) Assays to date show an average iron content of 14.3% (Graph 5), this is equivalent to an iron exide centent of about 20%. Since the iron exide in fresh rock is mainly magnetite in the 1/250" 1/50" grain size range, the iron is particularly amonable to magnetic concentration.
- (h) The success of the progresse to date suggests that a future pattern of exploration based on the systematic application of techniques described in this report, has the greatest chance of discovering economically exploitable ore bedies.

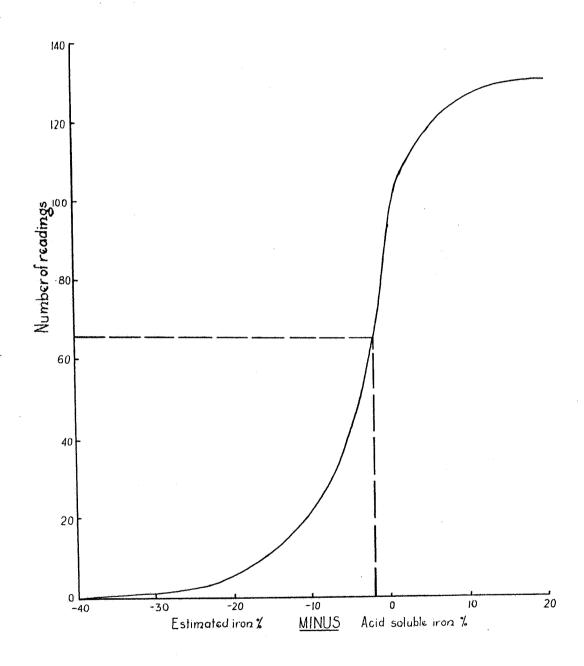
G. R. Heath Geologist IRON SECTION





To accompany report by GRHeath

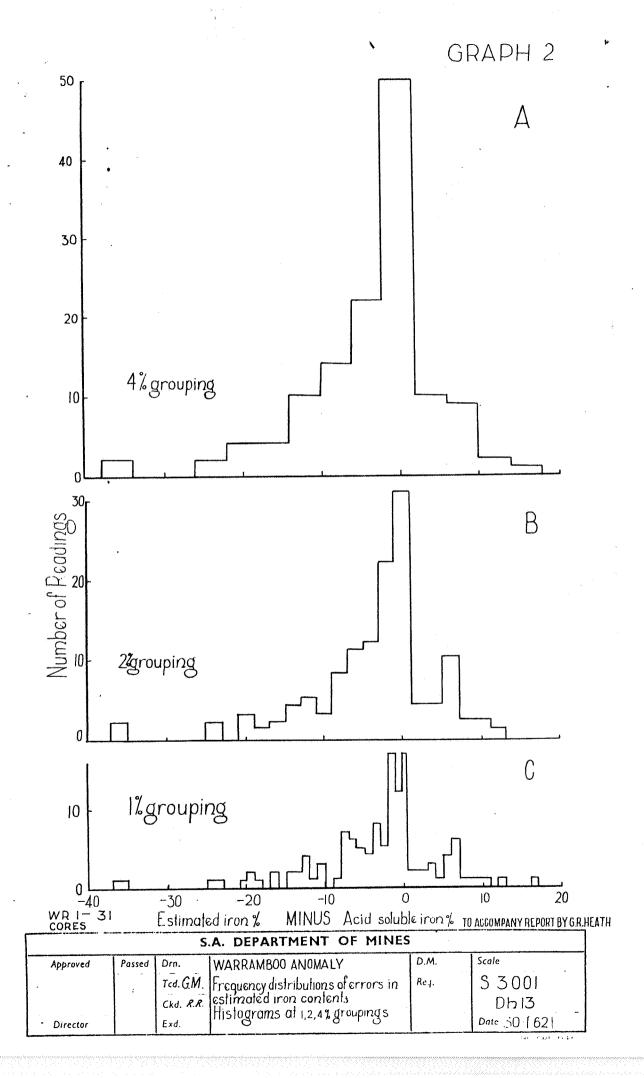
S.A. DEPARTMENT OF MINES						
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* .		Tcd. GM.	Collar fitting for rotary drill holes	Req.	S 3008	
·•		Ckd. R.R.			Dh13	
Director		Exd.	(After M.Obst & G.Whitten)		Date 2 · 2 · 62	

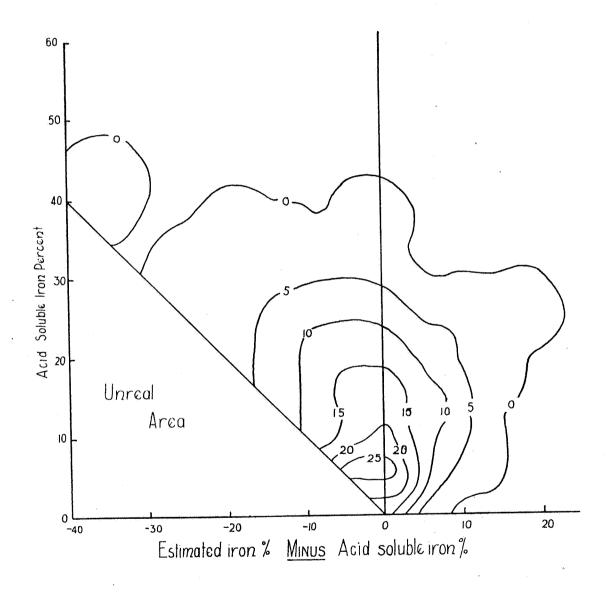


WR1-31c

To accompany report by G.R.Heath

S.A. DEPARTMENT OF MINES						
Approved	Passed	Drn.	WARRAMBOO ANOMALY	D.M.	Scale	
		Tcd. GM.	Frequency distribution of errors	Req.	S 3000	
_		Ckd. RR	in estimated iron content		Dh13	
Director		Exd.	Cumulative curve of readings		Date 30-1-62	



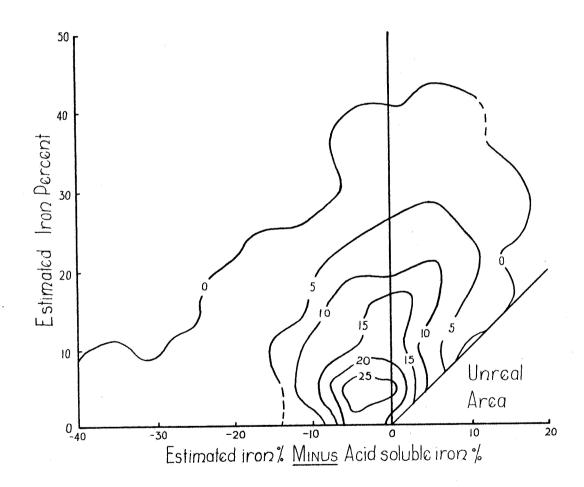


Contours at 0,5,10,15,20,25 percent of readings per square inch

W/	D.	 31	c	ores

To accompany report by GR Heath

0163								
S.A. DEPARTMENT OF MINES								
Passed	Drn.	WADDAMROO ANOMALY	D.M.	Scale				
	Ted. GM.	Relation of acid soluble iron	Req.	53002				
	c., a.	content to error in estimated iron		Dh13				
	Exd.	Based on 126 readings		Date '				
		Passed Drn. Tcd. G.M. Ckd. R.R.	Passed Drn. Tcd. G.M. Ckd. R.R. VARRAMBOO ANOMALY Relation of acid soluble iron content to error in estimated iron content	Passed Drn. Tcd. G.M. Ckd. R.R. S.A. DEPARTMENT OF MINES WARRAMBOO ANOMALY Relation of acid soluble iron content to error in estimated iron content				

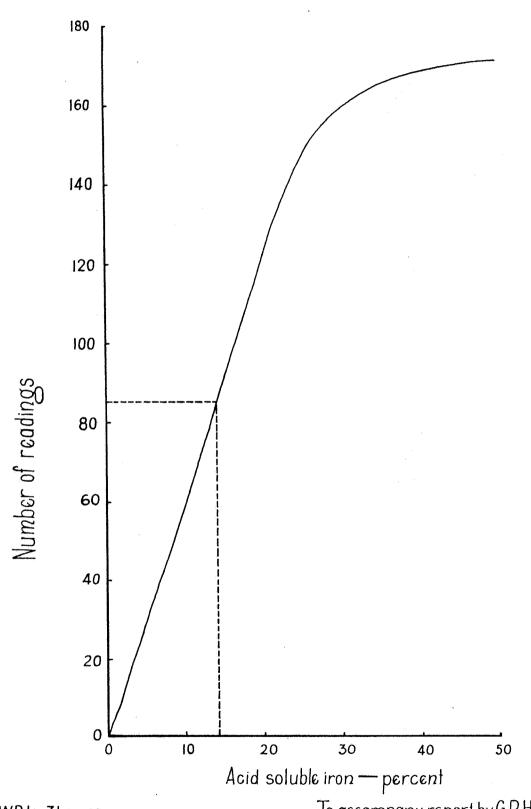


Contours at 0,5,10,15,20,25 percent of reading per square inch

WRI-31 cores

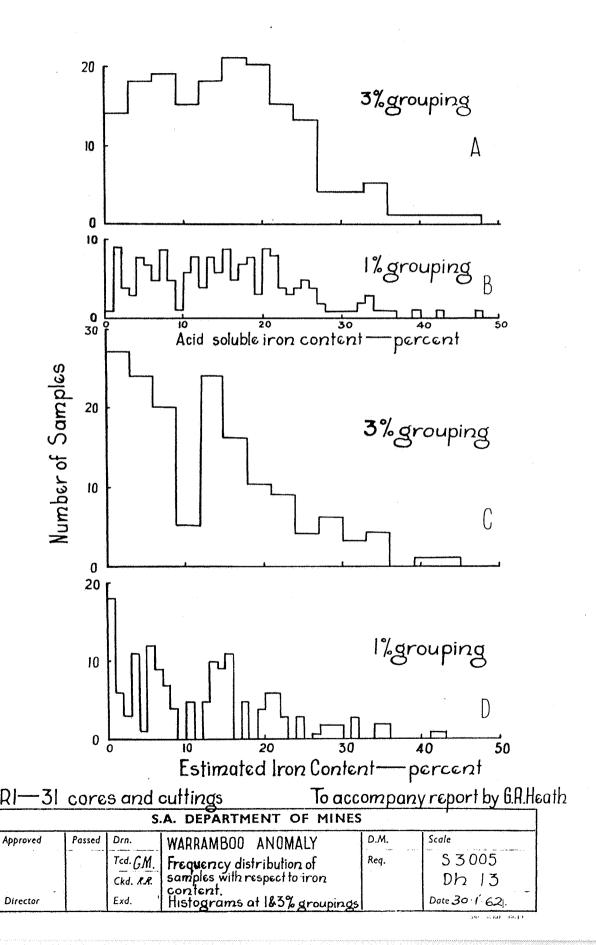
To accompany report by G.R.Heath

S.A. DEPARTMENT OF MINES						
Approved	Passed	Drn.	WARRAMBOO ANOMALY	D.M.	Scale	
• •		Ted.GM.	Relation of estimated iron content	Req.	\$3003	
		Ckd. R.R.	to error in estimated iron		Dh13	
Director		Exd.	content. BASED ON 126 READINGS		Date 30-1-62	

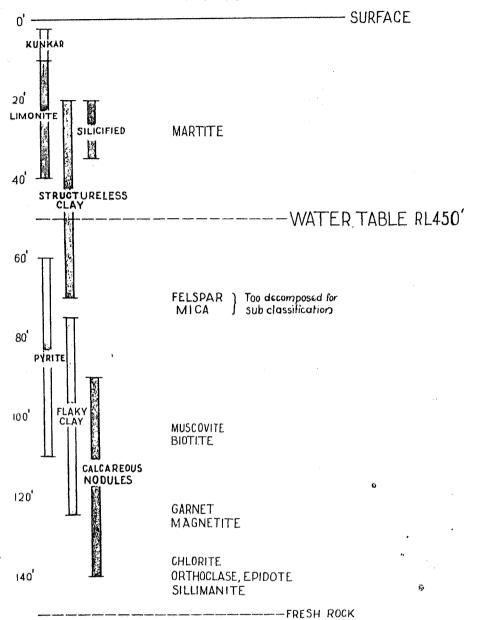


S.A. DEPARTMENT OF MINES							
Approved	Passed	Drn.	WARRAMBOO ANOMALY	D.M.	Scale		
		Tcd. G.M.	Frequency distribution of assays for acid soluble iron	Req.	5 3004		
		Ckd. R.A.	assays for acid soluble iron		Dh13		
Director		Exd.	Cumulative Curve		Date 30 · 1 ~ 62		

.500 6 60 6649



DEPTH AT WHICH MINERAL FIRST OCCURS



To accompany report by G.R. Heath.

S.A. DEPARTMENT OF MINES							
Approved	Passed	Drn.	WARRAMBOO ANOMALY	D.M.	Scale 20'vert. to 1"		
••			Generalised and somewhat	Req.	\$3006		
		Ckd. R.R	idealised weathering	Ì	Dh 13		
Director		Exd.	profile.		Date 30 62		

TO THE DEPUTY DIRECTOR:

Report No. 2 on

SAMPLING TECHNIQUES & DRILL LOGS

for the

WARRAMBOO AEROMAGNETIC ANOMALY

MAY TO NOVEMBER 1961

Herewith the above report.

Mr. Heath has given a very detailed and complete description of field operations during the first exploration phase.

1. DRILLING

Drilling both from the cost angle and from the geological point of view was the most efficient of any similar project carried out by the Iron Exploration Section. Of the plants, the failing two rotary plant (at £1/9/7 per foot) and a F25 (E1000) Mindrill Diamond Drill (at £3/19/3) were outstanding, due partly to new plants, partly to keen drillers and partly to the full time supervision of a competent drilling overseer and a resident geologist.

2. SAMPLE LOGGING TECHNIQUES

Sample logging techniques based on those used by the Iron Ore Company of Canada and tested previously by myself in the core shed on drill samples from Western Eyre Peninsula were used in the field by Mr. Heath. They were applied carefully and after modification where necessary gave very reliable results as checked against A.M.D.Les analytical results. The description of techniques used and the discussion of logging results is a very important part of the report.

3. DISCUSSION OF LOG RESULTS

Unfortunately in comparing grades Mr. heath compares "Volume percent as Estimated" against "Veight percent as Assayed". While his results are generally correct some modification in detail is necessary; moreover as iron minerals have an S.G. approaching twice the S.G. of country rock the modification correction is not linear.

Attached Graph 5 3169 shows the S.G.'s of mixtures from pure quartz (S.G. 2.65) to pure iron oxide 5.1 (haematite 5.1, magnetite 5.2) and demonstrates how the weight percent varies to approximately twice the volume percent.

Graph S 3170 shows how the curve (z) produced by plotting estimated iron percent (based on volumes alone) against estimated iron percent (corrected for S.G.) deviates from a 450 line, the curves on the X and Y axes being the correction factors not used

664

D.M.

by Mr. Heath. The average correction for 0-35% iron, i.e. 0-50% iron oxides, is 7-8% but the correction is not linear.

-2-

Graph S 3171 shows histograms at 1, 2 and 4½ groupings for rotary holes in the groupings WR 1-10, WR 11-20, WR 21-31. While the sample population is too small for exhaustive analysis the results for Holes WR 1-10 suggest a wide range of errors with over-estimates predominating the average over-estimate being + 4½. For Holes WR 11-20, there is a decided peak at "0" (that is, zero error in estimation) although the average error is still + 1½. For Holes 21-3¢ the range of error is less and the average error is + 0.66½. However, there are two peaks. While the reason for this has not yet been determined it may be related to two types of "ore".

As no assay results were available while field work was in progress the results quoted show an increase in accuracy with experience.

Graph S 3172, a histogram for all holes WR1-31 shows the peak as zero error. However, there is a pronounced positive skewness, the average being + 1.5%. An inspection of this curve shows that approximately three-quarters of the estimates lie in the range of -5% +10% error and that over 40% lie between -2% and +6% error.

Graph S 3173, contouring acid soluble iron percent against errors also indicates the positive skewness.

It is thought that when volume percent versus weight percent is taken into consideration in estimating grade the skewness will be reduced and may be removed if the field officer has assay results available with which to compare his estimates.

A range of error of 15% (that is, ± 7½%) for three-quarters of estimates and of ± 4% for 40% of estimates is thought to be very satisfactory for a field estimate, without analytical checks, and possibly all that can be achieved without unnecessarily elaborate equipment. Bearing in mind that the statistical analysis of an inadequate population can do no more than indicate trends, Mr. Heath has achieved a very high standard of logging.

4. COMPARISON RESULTS OF DIFFERENT SAMPLES

Some surprising results are achieved.

Adjacent core, +12 mesh unwashed cuttings and -12 mesh unwashed cuttings gave similar assay results while visual estimates for core and washed +12 and -12 mesh cuttings show little agreement.

Where core samples are frequent detailed logging of cuttings appears unnecessary except that it does give experience on sample logging techniques which may be needed for holes where core is not obtained.

61

664

-3-

5. DETAILED GEOLOGY

Dominant mineral associations, details of weathering profile and overburden are summarised and will provide a useful background for future work.

Structure is indefinite but may be elucidated by a re-assessment of later geophysical results.

6. GENERAL

- 6.1 A future drilling programme should utilise a Failing WWl and an F25 (E1000) diamond drill.
- 6.2 Sample logging should be carried on in the field but be confined mainly to core with only sufficient sludge logging to give experience for occasions when core is not available.
- 6.3 An office appraisal of geophysical results obtained since testing stopped will now be initiated.
- 6.4 Because this report lists the first results of an unusually detailed and, as it turns out, successful approach to drillhole logging it is suggested that this report be published in a Mining Review. If this principal be approved the report should be returned to the Senior Geologist, Iron Exploration Section for modification as outlined above.
- 6.5 The Appendices attached to this report are filed in DM 664B/6:

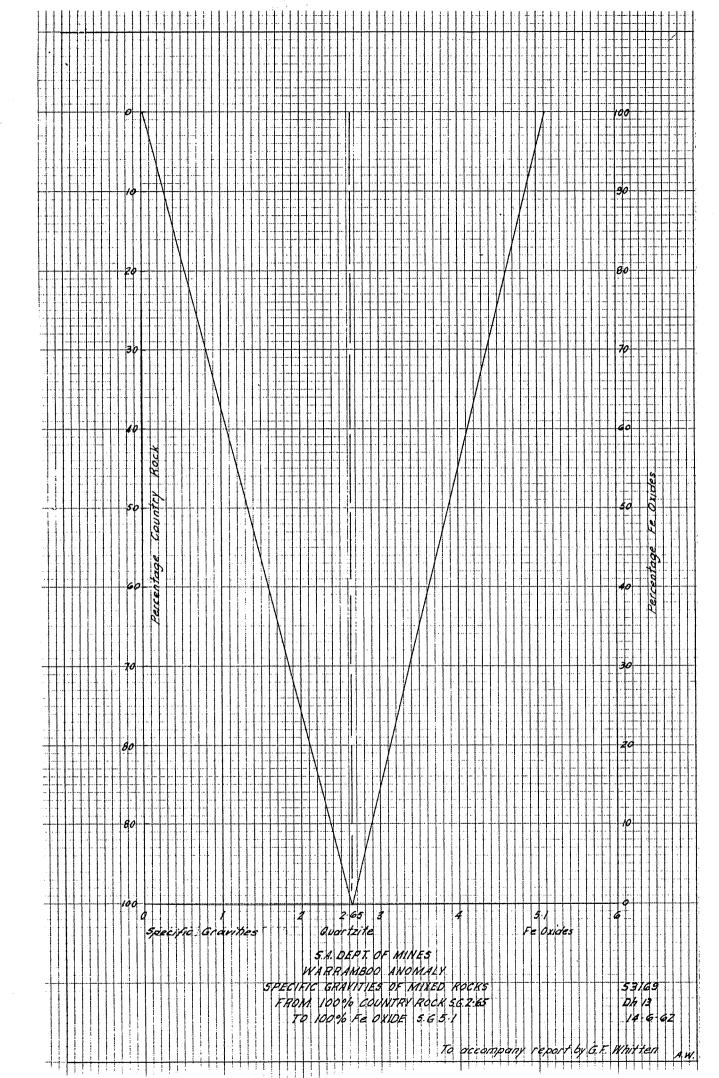
G. F. Whitten

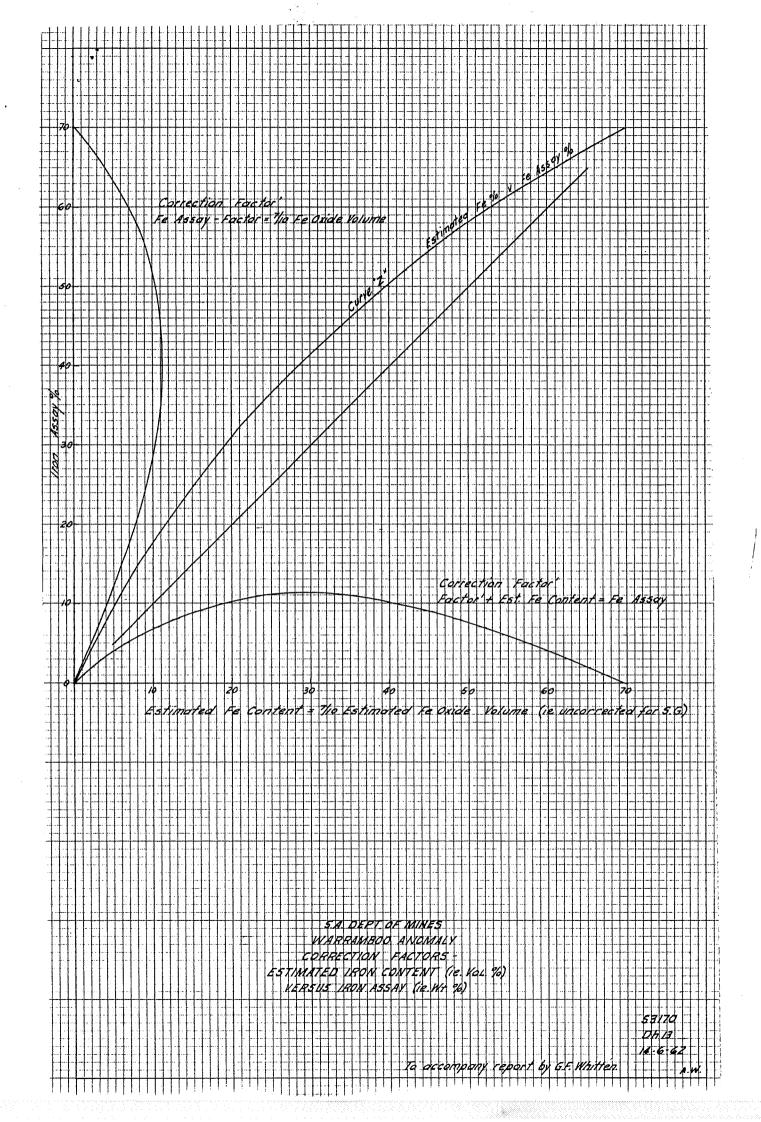
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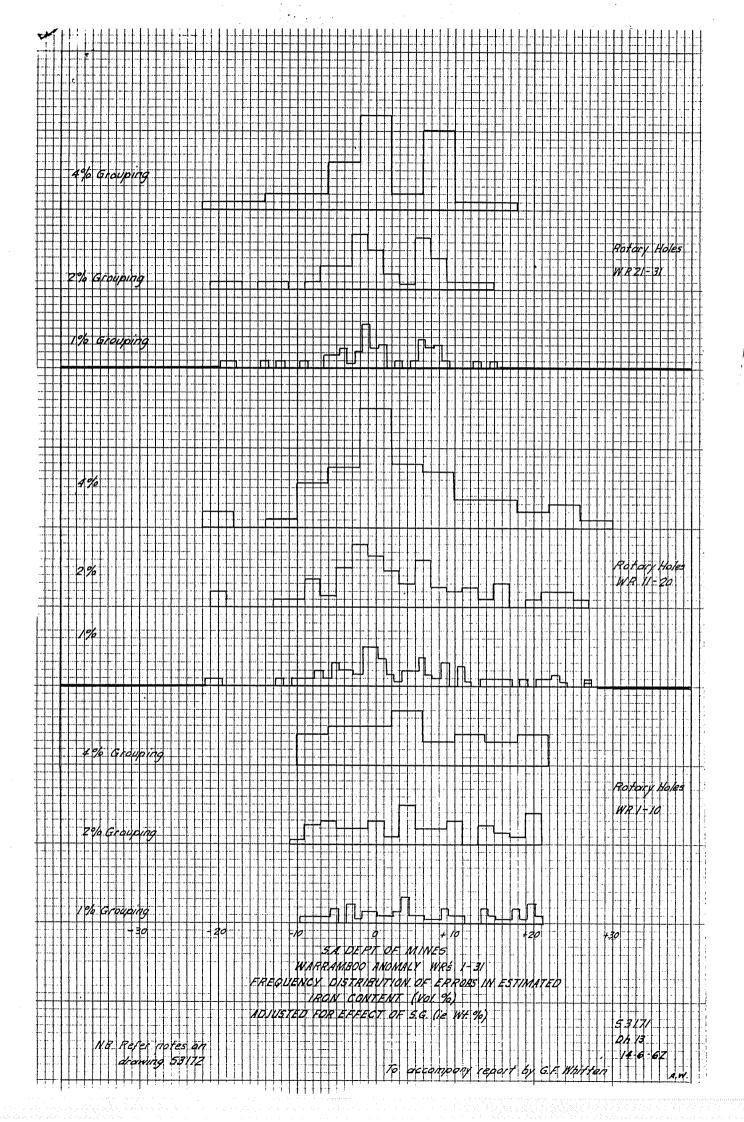
Senior Geologist

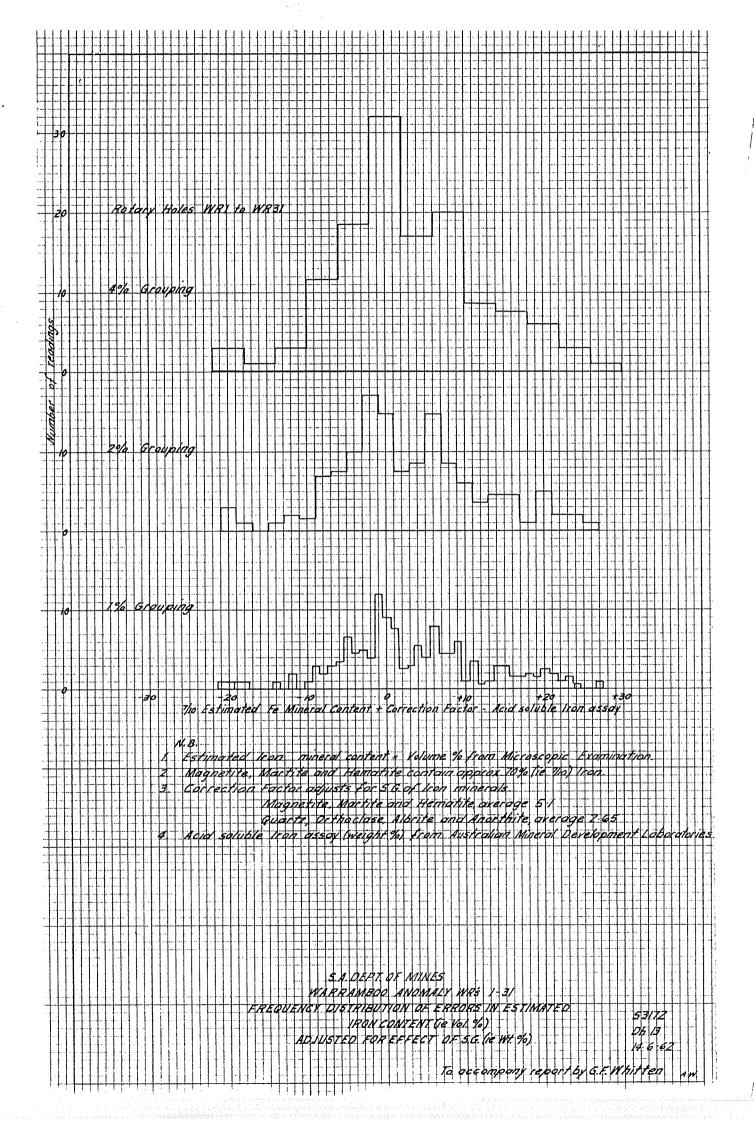
IRON EXPLORATION SECTION

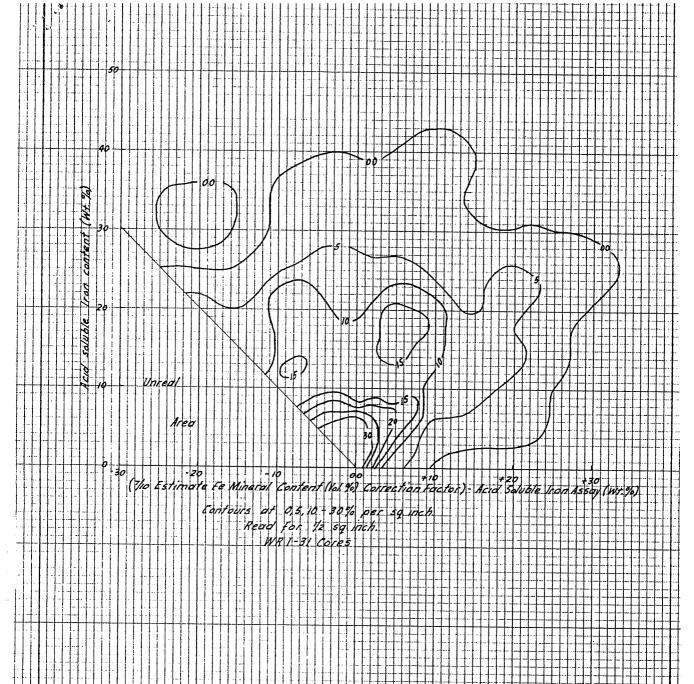
GFW:AGK 21/6/62











WARRAMBOO ANOMALY

RELATION OF ACID SOLVELE IRON CONTENT (W. %)

TO ERROR IM ESTIMATED FE CONTENT (VAL %) + CORRECTION FRETAR

SOUTH AUSTRALIA

GEOLOGICAL SURVEY IRON EXPLORATION SECTION

REPORT NO. 2

OA

SAPPLING TECHNIQUES & DAILL LOCS

for the

LABIANTO ALEGRACAETIC AROVALY

CHITTAL IYES STATISTIAL

May to November. 1961

by

G. R. Heath Geologist

Part II

APPENDIA A

SPECIAL FOUI PMENT

(a) Sampling cear

hydraulic core pusher for use with an 1

- 8" casing cellar fitting for retary drill holes (see figure S 3000)
- 4 Beavy 12 mesh sieves, 24" x 18" x 3".
- 4 Settling tanks, 1/3 of 44 gallon draws (cut across excs) fitted with 4" outlet spouts.
- 4 Smooth surfaced rubber mats. 4° \times 2°, (for come and quartering samples). Sample bags (up to 200 per week).

(b) Preparation and storage of samples

- 4 Round tobacce time with ends replaced by 16 mesh gamze (for washing + 12 mesh samples).
- 2 Smell drink shakers for disaggregating clays is 12 mesh samples.
- 1 Aladdis 2 hurser pressure kerosene stove, (for drying samples).
- 8" x 16" steel plate (16 gauge) to fit top of keresene store.
- 12 each of 4" x 4" and 7" x 7" tim dishes for drying washed cuttings.
- 3 or. gives jure for unmasked reference cutting samples (motel caps during transport, to be replaced with plactic caps for storage).
- M core bexes for storing glass jars.
- 3" x 1" plastic phials with caps, for storing wached satting samples.
- Al care boxes for storing plastic phisis.
- 1" masking tape for labelling phials and jars.
- Black ink pencils.
- l large kmife for splitting percussion core.

(e) langing seer

Reichert binocular microscope (no. 251,467) and accessories.

Mapping pen with 1/25" flow hole (for testing hardnesses and estimating grain size).

Lockproof container of 1:1 hydrochleric soid.

Small minico magnet with calibrated beard (to determine magnetic deflection Transperset pretractor.

2" point brush (for d amping diamend drill core),

Foolscap size duplicate books with spare carbon paper.

(d) Sundry coulpoent

- $2" \times 2" \times 42"$ yellow top pegs for merking drill holes.
- 2° x 2° galvanised tags and $3/4^{\circ}$ galvanised clouts to ottach tags to pags.
- 1 Set of metal punches for marking drill hole numbers on tags.

APPENDIX B

DRILL BOLE LOGS.

IRON EXPLORATION SECTION

LOG OF ATIGER PORE NO. WA. 1

Project: Warramboo Aeromognetic	Anosely	Delle 664/61
Sec. 25 Ed. serramboo	Se, Le Bante	here Ser. No. 651/61
Collar Coords 58600N, 67150K	Sale 457.3'	Grid Warrantoo
Yertical	Beath 81.	Plea Bef.
Date Bere Commenced 6.6.61	Completed 8.6.61	Briller S. Deane
Bore Legged by G. S. Heath	9.6.61	Mirer D. of M.

OBJECT: To test "less" adjacent to magnetic and gravity "highs".

RESULT: Metasediment containing up to 5% martite intersected 12'-81'

LOG Comprises

Geological Leg

frem	10	Rescription GEOLOGICAL LOG
0	6*	Berk brown very sandy leam, with abundant crystalline gypoum.
6*	12*	Light yellow-brown slightly clayey quartz sand, grain size about 1/100".
		Nater Table 7'-8'.
12*	18*	Four and white mottled fairly sandy coherent clay. 2-6% martite. Retasediment.
18*	42*	Lanianted searchet floky yellow-brown clay, containing up to 1/10" quarts frequents and very fine block fleck: (less than 1/500") of mortite (5%).
42*	78*	light grey very sticky floky puggy clay containing a few 1/100" quarte grains, and 5% fine grained martite.
78*	81,	Dark green decomposed quarts-opidate rock, with minor biotite, and S% fine grained martite.
ε)1 •	END OF HOLE (Auger stells)

General: An initial hale was drilled to 42°, but when the flights were withdrawn to try coring, the hale caved in and filled to the water table (7°%°).

IAON EXPLORATION SECTION

LOG OF ADGER BOKE NO. NA 2

<u>Project</u> : Garramboo Aeromagneti	ie Anomaly	Delle 664/61
Sec. 25 Hd. Warrantoo	Co. Le Hunte	Mare Ser. No. 651/61
Collar Coords 58700N. 67150F	Rala 456.4"	Grid warrantoo
<u>Yertical</u>	Repth 77.	Plan Ref.
Date Bare Commenced 9.6.61	Completed 9.6.61	Oriller S. Donne
Bore Logged By G.R. Heath	On 9.6.61, 13.6.61	Hirer D. of M.

QBJECT: To test "lows" adjacent to gravity and megnetic "highs".

RESULT: Metasediment with accessory martite intersected from 12'-77'.

LDG Comprises

Geological Log

.From	Te	Description GEOLOGICAL LOG
0	6*	# Yellow-brown fine grained slightly clayey quartz sand, containing abundant crystalline gypcum.
6*	12*	Yellew-brown sand similar to 0°-6°, but more clay and less gypsum. mimor limenite.
12*	18*	Light yellow-brown very sandy somewhat flaky clay. (querts mainly 1/50" but up to 1/10"). Hetasediment.
18*	60°	Off-white to very pale, very soft flaky and sticky clay containing 30-50% angular fine quarts send. Extremel rare martite.
60°	77*	Glay similar to 18'-60', but stiffer, more sandy and semuchat derker in colour. Golour darkens and sand increases with depth. At 77' light to medium grey. Barker colour due to some grey quarts, and a very small percentage of less than 1/500" pyrite. Contain a few garnet, epidote and felspar grains.
7	7*	END OF HOLE. (Brill set powerful enough to penetrate further - even with tangaten carbide

bit).

IRON EXPLORATION SECTION

LOG OF AUGER BORE NO. RA 3

Project: Warramboo Aeromagnetic	Anomaly	Qall. 664/61
Sec. 25 Hd. «erremboo	Çg. Le Hunte	Bore Ser. No. 651/61
Collar Coords 58600N, 67150E	R.L. 455.4°	<u>Grid</u> Warremboo
<u>Vertical</u>	Depth 71'	Plan Sel.
Date Bare Commenced 9.6.61	Completed 10.6,61	Oriller 5. Donne
Bers Logged by G.R. Heath	On 10.6.61, 13.6.61	Hirer D. of N.

QOJECT: To test flank of gravity and magnetic "highe".

RESULT: Motasediment containing less than 2% mertite intersected from 12°-71°.

LOG Comprises Geological Log

From	To	Rescription GFOLOGICAL LOG
0	6°	Yellow-brown to brown slightly clayey fine quarts sand. Gypcum rare.
6*	12*	Yellow-brown elayey sand, clay increasing with depth. Sand elmost all less than 1/50" quarts.
12*	18*	From very sandy somewhat flaky clay. Contains 1 or 2% mertite. Hotacodiment.
18*	36*	Light fown fluid sandy flaky clay. Send mostly loss them 1/50" quartz with few black flocks.
36*	66°	Very light grey sandy fluid clay. Sand meetly less than 1/50" greyish quarts with a few black flecks (mice or iron exides) and rare garnet grains.
66*	71*	Grey very sandy clay, coherent. Sand mainly less than 1/20", but some quartz fragments up to 1/10". Clay free sample, quartz less than 95%, garnet 1 or 2%, pyrite 1 or 2%, mimor epidote and felapar.
71		ENE OF HOLE (Too hard for drill to penetrate).

IRON EXPLORATION SECTION

LOG OF ADGER BORE NO. WA 4

Project:	Warramboo Aeromagnetic	Anomaly	D.H. 664/61
Sec. 25	M. Warramboo	Co. Le fiunte	Bore Ser. No. 651/61
Collar Coc	arda 58500N, 67150E	Bal. 453.3°	Grid Warrantoo
Vertical		Depth 74°	Plan Ref.
Date Bore	Commenced 10.6.61	Completed 10.6.61	Driller 5. Donne
Bere Logge	d by 6. B. Beath	On 12.6.61, 13.6.61	Birer D. of E.

OBJECT: To test flanks of gravity and magnetic "highs".

RESULT: Metasediment, 2.5'-74'. Martite 5%, 66'-74'.

LOG Comprises Geological Log

From	To	Description GEOLOGICAL LOG
0	2'	Brown very sandy loam.
2*	2.5*	Off-white to pale brown kunker, with fairly abundant fine quartz grains.
2,5'	12*	Off-white and pole form semewhat sandy mottled flaky clay (fine quartz sand), contains 1% fine martite, Motasediment,
12*	18*	Pale form sandy and somewhat micacoous mottled clay. Sand mainly less than 1/20" quarts, with minor pyrite.
18*	66*	Yellow-brown fairly sandy flaky elsy, colour becoming darker towards the base. Sand predominantly less than 1/20" quartz. Mertite 1 or 2%, rare garnet mear the base
66*	72*	Furple and dark grey-green sandy and microsoms clay (decomposed hedrock). Quartz and quartz-felspar about 80%, histite 15%, mertite about: 5% of clay-free fraction.
72*	74*	Dark purplish-brown clay (40%) containing abundant quartx- felsper and garnet, lesser biotite and about 5% martite.
74	•	END OF HOLE (Too hard for drill to penetrate).

THON CAPLORATION SECTION

LOG OF AUGEL HOME NO. 44 5

Project: Parramboo Aeromagnet	c Anomely	Dalis 664/61
Sec. 25 Hd. Warrenbee	Co. Le ilunte	Sore Ser. No. 651/61
Cellar Coords 58400N. 67150F	E.L. 451.2*	Grid Karramboo
<u>Vertical</u>	Denth 46.5°	Plan Ref.
Date Bore Commenced 10.6.61	Completed 12.6.61	Oriller S. Conne
Bore Logged by G. R. Hesth	On 13.6.61	Mirer D. of W.

OBJECT: To test magnetic "peak" coincident with gravity "high".

Result: Motosodiment containing up to 35% martite intersected from 6°-46.5°.

LOG Comprises Goological Log

arenings- where quantities are	- a restlement of 400; a digraditure in the	AND THE PROPERTY OF THE PROPER
fron	To	Description GEOLOGICAL LOG
•	6°	Yellow-brown and occasionally red-brown very sandy clay. Sand mainly less than 1/50" quartz, with some limenitementite in red-brown areas.
6*	12*	White and light reddish mottled slightly sandy flaky lime; clay with 2-5% flue grained limenite-martite. Metasedimums.
12*	18*	Slightly reddish-brown fairly sandy clay. Clay free fraction (60% of reck), 50% quartu, 50% limenite-martite (% martite),
16*	36*	Yellow-brown sandy rather fluid sticky clay, becoming darker in colour towards the bace. Clay free fraction (50% of rock), 60% quarts, 10% felsper, 30% mertite.
36*	42*	Dark yellow-brown very sandy coherent clay, with some purplish areas. Clay free fraction (75% of reck), 50% quarts, 50% martite, minor felsper.
42*	46,5*	Derk purplish-brown very sandy tough flaky clay. Very tough drilling (about 1 hour with tungsten carbide bit). Clay free fraction (60% of reak) 35% quarts, 5% felspar, 60% mertite.
46	.5*	END OF HOLE (Auger unable to penetrate fresher bedreck).

INON EXPLORATION SECTION

LOG OF AUGIN POSE NO. MA 6.

Project: ** ** ** ** ** ** ** ** ** ** ** ** **	Anomaly	Q.B. 664/61
Sec. 25 Mg. Marramboo	Co. Le fluste	flore Ser. No. 651/61
Coller Coords. 56300N, 67150A	B.L. 451.0°	Grid Marramboo
Vertical	Depth 61.	Plan sef.
Data Bore Communed 12.6.61	Campleted 13.6.61	Orillar S. Donne
Bore Lagged by G.R. Heath	Qm 13.6.61	Hirer 9. of 5.

OBJECT: To test flank of magnetic "peak" coincident with gravity "high".

RESULT: Metasediment intersected 9'-61' (5-15% mertite from 6'-54').

LOG Comprises Geological Log

From	Zo	Description
		GEOLOGICAL LOG
0	4*	Yellowish-brown very sandy clay with limenite modules and light grey elsy towards the bettem.
4*	7.5*	Abundant rubbly irenstone up to 1" dismeter.
7.5*	9*	Very hard (ever one hour's drilling) limomite impregnated name.
6*	12*	Roddish-brown and light groy fairly sandy coherent flaky clay, containing about 5% martite-limenite fragments. Motesediment,
12*	361	Reddish-brown fairly sandy fluid sticky fluky clay containing about 10-15% martite and 40% quarts.
36*	54*	Yellowish brown fairly seady fluid sticky clay. Contains about 55" quarts, 5-10% martite.
54'	60*	Semewhat greyick yellow-brown sandy to very sandy sticky clay. Contains 50% quarts, 10% felsper with mice and rare garnet.
66*	61*	Grey very micaceous clay (decempered schist). Hard drilling. Contains adjout SSX mica, 10% garnet, 5% felspur, 30% quartz with accessory iron exides.
6	1.	END OF HOLE (Auger unable to penetrate fresher rock).

RON EXPLORATION SECTION

LOG OF AUGEN BORE NO. A Z

<u>Project</u> : **arramboo Aeromagnetic	Anomaly	Q.E. 664/61
Sec. 25 Hd. warranhoe	Co. Le fante	Bore Ser. 19. 661/6
Collar Coords 58200N, 67150C	E.L. 450.6°	Grid karrashoo
<u>Vertical</u>	Genth 84.	Plan Ref.
Date Bore Communeed 13,6,61	Completed 14.6.61	Driller 5. Donne
Bore Legged by G.R. Heath	Qa 14.6.61, 15.6.61	Hirer O. of M.

OBJECT: To test trough in megnetic "high" associated with gravity "high".

RESULT: Betasediment intersected 0'-64' (10-25% martite from 12'-64').

Leg Com prises Macro and Microscopic geological logs.

From	To	Description GEQLAGICAL LOG
Ô	6.	Reddish-brown and white fairly sandy clay containing shundant limenite publics up to 1%" diameter. No obvious martite. Probably metasediment.
6*	12*	Yellow-brown, white and occasionally red-brown fairly sandy mottled flaky clay.
12*	· 18°	Yellow-brown and groyish-green fairly sandy clay. Contains 15-20% less than 1/50" martite.
18*	36*	Decomposed quarty-folsper-mertito-biotite rock. Beds loss than %", usually 1/10" thick. Grain size (except quarts-folsper) about 1/100". Martite context 10-20%.
361	78*	Yellow-brown sandy, very fluid sticky clay. Colour changes gradually to greyish yellow-brown towards the base. Contains 15-25% martite with quarts and rare felspar and garnet crystals.
78*	84*	Purplish brown very sandy clay. Clay free fractice contains 60% quarts, 15% garnet, 15% martite, 10% hietite.
84	•	END OF HOLE (Auger unable to penetrate fresher bedreck

Programment of Mines. South Australia

IKON LAPLORATION SECTION

LOG OF AUGIL BOUT NO. OF W.

Project: Warramboo Acromagnetic	Anomaly	D. 5. 664/61
Sec. 25 Hd. sarrasboo	Co. Le launte	Bore Ser. No. 651/61
Coller Coords 56100N, 67150E	fishe 450.5°	Grid herramboo
Yertical:	Depth 91'	Plan Bef.
Date Bere Commenced 14.6.61	Completed 15.6.61	Oriller 5. Donne
Bore Lagged by G.R. Beath	On 15.6.61, 21.6461	Hirer D. of R.

OBJECT: To test trough in magnetic "high" associated with gravity "high".

RESULT: Metasediment containing 5-30%, usually 10-20% martite, intersected 6'-90'.

LOG Comprises Heere and microscopic geological log

-		
From	Te	Description GEOLOGICAL LOG
0	6*	Off-white, dark brown and dark yellow-brown very sandy and somewhat limey clay.
6*	16*	Tabe sample obtained with "post hole digger" bit. Off- white, red-brown and yellow-brown motified and laminated fairly sandy clays. Limenite modules up to 2" diameter are abundant to about 10°. Send is mainly quarts with lesser (5%) limenite-mortite. Netasediment.
16*	18*	Thinly laminated clay as 6'-16', amrtite (5%) tends to eccur in less than 1/16" lamines.
18°	24'	Yellow-brown very sandy clay. Sand (60%) appears to be %, less than 1/50" quartz and % mertite.
24*	30*	Multicoloured laminated clay. Quartz and mertite (10%) fairly abundant.
30°	72*	Red-brown changing gradually to dirty-red-brown at about 60°, fluid very sticky, fairly sandy clay. Send mainly quarts and martite. Quarts (angular) 70%, decomposed felsper 5%, martite 25%, minor garnet. Grain size about 1/100°.
72*	84*	Dirty yellow brown fairly fluid clay. Sandy to very sandy Quartz (angular, 1/3 stained pink or yellow) 45%, decomposed felspar 15%, martite 40%, of clay free fraction (75% of rock).
84*	91°	Purplish brown sandy stiff micaccous clay. Quartz-felspar (decomposed) 65%, martite 15%, garnet 15%, biotite 5%, of clay free fraction (80% of rock).
91	•	END OF HOLE.

LEON LATION STOTION

LOG OF A THEFT HORE NO. MA 9

<u>Project</u> : **arramboe Aeromagnet	ic Anomaly	Q.N. 664/61
Sec. 25 Ed. *arramboo	Co. Le lante	Sore Serate. 651/6
Collar Coords 58000N. 67150F	R.L. 450.1°	Grid Warremboo
Vertical	Depth 93.7'	Plan Bef.
Pate Bore Commenced 15,6,61	Completed 16.6.61	Driller S. Conne
Rore Laured by G.R. Heath	Qn 21.6.61	Hirer D. of M.

ORJECT: To test gravity "peak" associated with trough in magnetic "high".

RESELT: Netseediment containing up to 30% martite intersected 12'-93.7'.

LOG Comprises Macro and microscopic geological log

		and the state of t
From	To	Description GEOLOGICAL LOG
0	6*	Light gray clay containing up to 2" limonite fragments.
6*	12*	Light yellow-brown clay containing fairly abundant limmaite grains and fragmants, and quartz grains.
12°	42°	Red-brown fluid and sticky fairly to very sandy clay 36'-42'. Clay free material: 60% angular quartz. (% iron stained). 30% martite (almost men-magnetic). 10% limemite, a few flakes of mica.
42*	84'	Greyisk yellow-brown fluid sticky very sendy clay. 42°-4 elsy free sample. Quartz (angular, 1/50° - 1/100°, 1/3 steined pink) 50%, martite (nem-magnetic) 45%, limmaite 5%, Rare mica flakes.
84*	91*	Red-brown laminated very sendy elay. Clay free sample. Querts (amgular, 1/20" - 1/100", % stained red and yellow) 70%, martite 30%, miner decomposed felsper (?), and limmite.
91.	92.5	Purplish-brown to yellow-brown sandy and somewhat micaccous clay.
92.5*	93.5'	Yellow-brown (khaki) sandy and very micaceous clay. Quarts (angular, rarely stained, 1/50" - 1/25") 75%, martite (slightly magnetic) 15%, decomposed felspar (?) 5%, biotite 5%. Clay free composition.
93.5*	93.7*	Purple-brown rather structureless sandy clay. Quartz (angular, 1/25"-1/50") 60%, slightly weathered felsper 20%, mertite (as 92.5"-93.5") 20%. A few mice flakes, Clay free sample.
93.	.7 *	END OF HOLE (Due to harder drilling and drag on flights),

INON LAPLONATION SECTION

LOG OF AUGUS BORE NO. IN 10

Project: %arranhoo Aeromagneti	e Anomaly	Dalla 664/61
Sec. 25 ld. Karramoo	Co. Le finte	Berg Ser. No. 651/61
Celler Coords 58000N, 67000F	Eal. 450.8°	Grid Rarremboo
<u>Vertical</u>	Benth 70°	Plan Ref.
Date Bore Commenced 24.6.61	Completed 29,6,61	Oriller S. Conse
Bere Legged by G.R. Heath	<u>0a</u> 30.6.61	Hirer D. of M.

OBJECT: To test gravity "peak" associated with trough in magnetic "high".

RESULT: Metasediment containing 15-30% martite intersected 0'-70'.

LOG Comprises Macro and microscopic geological log.

fres	To	GEOLOGICAL LOG Description
0	6*	Off-white and red brown clay containing abundant limenite (and minor mertite) fragments and minor querts.
6'	54'	Red-brown to yellow-brown sandy fluid clay, colour becomes duller at depth. Clay free fraction: 18°-24°. 50%, quarts (% iron stained), 36% limmate, 20% martite. 48°-54°: quarts (angular, 1/50°, 1/10 stained) 60%, martite 40%, minor limmate and decomposed felsper. Notacediment.
54*	66°	Fairly stiff sandy yellow-brown elay. Clay free fraction: 60% (angular, 1/25"-1/50", minor staining) quarts, 40% martite, minor decomposed mica and felaper.
66*	70*	Grey, yellow-brown and red-brown bedded (less than % beds) very sandy stiff cohesive clay. Clay free fraction: quertz (1/50", angular, eleca) 80%, martite (crystals, very slightly magnetic) 20%, minor felsper and mica (decomposed).
70)*	END OF HOLE (Auger stalls due to harder drilling).

IRON EXPLONATION SECTION

LOG OF ADGRE BOKE NO. JA LI

ROAGT: «arreshoo Aeromagnetic	Anomaly	Dalla 664/61
Sec. 25 jid. serranboo	Ço. Le iunte	Dare Ser. No. 651/61
Collar Coords 57900N. 67000E	£.L. 450.1°	Grid warreshoo
Yertical	Depth 10'	Plan Kef.:
Date Bore Communeed 16,6,61	Completed 16.6.61	Driller 5. Donne
Bore Locued by G.R. Heath	Qn 23.6.61	Hirer D. of M.

OBJECT: To test gravity and magnetic "highs".

RESULT: White clay containing abundant limenite (and mertite) intersected from 0°-10°.

LOG_ Comprises Macro and microscopic geological log

Fres	Te	Description GEOLOGICAL LOG	
0		Off-white to light grey clay, containing abundant limenite pebbles and grains, and very miner quarts. Some limenit pebbles contain bands of relict martite.	
10)*	END OF HOLE. Unable to posetrate hard bend of liminite impregnated material (bit red-bot).	

INON EXPLONATION SECTION

LOG OF ADGRE BOAR NO. W.A. 19

Project: carrendo Aeromagnetic	Azomoly	2. K. 604/61
Sec. 25 Md. sprrantoc	Co. Le Munte	Bore Ser. No. 051/
Celler Coords 57100M. 67000F	E.L. 453.2*	Grid warrandoo
<u>Vertical</u>	Depth 114'	Plan Ref.
Date Bore commenced 19.6.61	Campleted 20.6.61	Oriller S. Donne
Bore Legged by G.B. Heath	Qn 23.6.61. 26.6.61	illrer o. of n.

OBJECT: To test flanks of gravity and magnetic "highs".

RESULT: Light grey clay overlais by quartz sand intersected from 102-114'

LOG Comprises Macro and microscopic geological log.

Frem	To	Bescription BETAILED LOG
6	6*	Red-brown to yellow brown slightly clayer and. Abundant gypeum. miner quarts.
6'	12°	Sed-brown very fine grained somewhat clayer quartz-synaum
12*	18*	Light red-brown semewhat clayey fine gand.
18.	24*	Very light grey slightly sandy cohesive houngeneous clay.
24*	66*	Light yellowish brown, becoming grayish with depth, somewhat clayer sand. Fluid. Clay free fraction: virtually pure, peerly sorted, 1/300" - 1/10", assally 1/50" - 1/160", quarts sand, with extremely rare martite and pyrite grains.
66*	162*	Light grey fairly flaid, fairly clayey sand. Clay free fraction virtually pure angular quarts (mainly 1/50", but up to %" diameter) with less than 1% pyrite (becomes slightly more abundant near the base) and very rare martite grains.
102*	114*	Light grey, fairly stiff and cohesive, very sandy elsy. Clay free fraction 96% quarts (angular, up to %", usually 1/20-1/50", very poor sorting), 1 or 2% very fine stained pyrite (up to %" fragments).
1	14*	END OF HOLE - limit of flights.

IRON LAPLORATION SECTION

LOG OF AUGUE BORT NO. MA 20

Project:	sarramboo Aeromegaeti	c Anomaly	Della 664/61
Sec. 25	ud. warremboe	Co. Le imate	Bore Serano. 651/6
Collar Coor	ds 57000N, 67000E	E.L. 454.1°	Grid Kerramboo
<u>Vertical</u>		Depth 106'	Plan Ref.
Date Bere C	opposed 18.6.61	Completed 18.6.61	Driller S. Donne
here Legge	Lby G.R. Heath	ga 23.6.61, 26.6.61	Hirer D. of M.

COLECT: To test flanks of gravity and magnetic "highs".

EFSULT:, Light grey clay (decemposed metasediment ?) overlain by quartz sand intersected from 60' - 106'.

LOG Comprises Macro and microscopic geological log

From	To	Oescription DETAILED LOG
		the the figure form
0	6°	Yellow-brown to red-brown semsukat <u>alayev fand</u> . Abundant gypeum, minor quarts.
6*	12*	Red-brown very sandy clay, containing abundant gypsum and minor querts.
12*	60*	Light yellowish broom seamwhat clayey sand, becoming grey towards the base. Fluid. Clay free fraction: Quartz (mean grain size about 1/100", angular to sub-angular, fairly well serted, a few stained grains near the top) 90%, minor white decomposed felsper and less than 1/200 mertite grains, a few limmite grains near the top.
60*	96*	Light grey very sendy semewhat fluid clay. Clay increase with depth. Clay free fraction: quartz (angular, peerl serted, about 1/50") 99%, minor pyrite and decomposed felsper, very rare martite, epidete, biotite and garnet flakes.
96*	106*	Light grey, hemogeneous, stiff, cohecive, very sandy clay Clay free fraction; quarts (Nainly angular, 1/30" 1/100") 99%, small off-white decomposed felapar grains possibly 1%, a few pyrite grains.
10	98°	END OF HOLE - Auger stalls (due to drag on flights.)

IRON LAPLOLATION SIGILON

LOG OF LUGHE DOME NO. LA SIL

<u>Project</u> : Varramboo Aeromagneti	e Asomaly	D. H. 664/61	
Sec. 25 Md. warranboo	Co. Le Bunte	Bore Ser. No. (61/6)	
Celler Coords 56900%, 67000%	flake 453.7°	Grid *arrashoo	
Yertical	Genta 90°	Plea Ref.	
Date Bore commenced 17.6.61	Completed 17.6.61	Driller S. Donne	
Bore Louged by G.R. Heath	On 20.6.61	litter 0. of n.	

OBJECT: To test flanks of gravity and magnetic "highs".

REPOLT: Grey sandy clay overlain by quarts sand, intersected from 60°-90°.

106 Comprises Macro and Microscopic geological log.

F	rom	То	Description DETAILED LOG
	0	6.	Yellow-brown somewhat <u>clayer and</u> containing abundant selenite (up to %" crystals) and quartz.
	6*	12*	Red-brown clayer send (gypsum and quarts).
	12.	18*	Light red-brown very sandy fluid clsy (<u>elaver sand</u>). Reinly fine quarts sand.
	18*	24*	Light groy semembat sandy, very plastic glay.
M	24*	60°	Yellowish-grey slightly clayey fine grained quartz sand, (Quartz 1/100", angular) 96%, martite 1%, decomposed felsper or tremelite 1%, sinor limenite.
M	66°	90*	Grey very sandy clay. Proportion of elay increases fairly sharply at about 72° and remains constant to 90°. Clay free samples: quartz 90%, (angular, grain size about 1/5 - 1/25°, grains possibly greyer than 24°-60°), decompose felsper 1%, martite (very rare pyrite) 1% (non magnetic)
	90	,•	RND OF HOLE. Auger stells - no indication of hard drilling.

IRON FAPLORATION SECTION

LOG OF ADGER BOAF NO. 84 22.

Project: #arramboo Aeromagne	tic Anomaly	Baka 664/61
Sec. 25 M. serremboo	Co. Le Eunte	Dore Ser. No. 651/61
Collar Ceerus 56600N, 67000E	Raha 453.4°	Grid Warrankoo
<u>Yerticel</u>	<u>Depth</u> 114*	Plan Ref.
Date Here compensed 23,6,61	Completed 23,6,61	Briller S. Conne
Bore Leaged by G.R. Heath	Qn 24.6.61, 26.6.61	Hirer D. of M.

OBJECT: To test flanks of gravity and magnetic "highs".

RESULT: Grey clay everlain by quartz sand intersected from 90' - 114'.

LOG Comprises Recre & Microscopic geological log

From	To	Description DETAILED LOG
0	6'	Light yellow-brown and brown slightly clayey sand. Abundant gypoum, Mimor quartz.
6*	12.	Red-brown and yellow-brown very sandy clay. Abundant gypsum, minor quarts.
12*	16*	Very light brown semmuhat clayey fine quartz sand. Fluid.
18•	24*	Very light grey-brown semewhat clayey fluid fine quartz send.
241	30'	Light grey stiff sandy to very sandy elsy.
30*	90*	Brown slightly clayey sand, colour becomes lighter at deptificid. Clay free fraction (84°-90°); quartz (mainly angular, with a few sub-rounded grains, average size 1/50" - 1/100"), more than 99%, pyrite (up to 1/20") and rare martite (1/200") less than 1%.
90*	% *	Fluid grey-brown very sandy clay. Clay free fraction: Quartz (angular to sub-rounded, 1/100", poorly seried) more than 97%, martite (1/200") and occasional pyrite (less than 1/20") less than 1%,
96°	114*	Stiff "blue"-grey cohesive very sendy clay. Clay free fraction: quartz (mostly angular, 1/20" - 1/50", a few inclusions) 97%, white semewhat decomposed felapar 2%, pyrite 1%, einer martite.
1	14*	END OF HOLE. (Limit of flights).

LEON EXPLURATION SECTION

LOG OF AUGER DOKE NO. MA 23

Project: Marramboo Aeromogneti			c Anomaly Dalla 664/61	Della 664/61	
<u>See.</u> 25 <u>J</u>	id. serr	oodme	Co. i.e Hunte Bore Ser. No.	651/61	
Collar Coord	<u>ls</u> 56704	DN. 67000E	Rain 453.5' Grid warrante)6	
<u>Vertical</u>			heath 114' Plan hef.		
Date Bore Co	menced	23.6.61	Completed 23.6.61 Briller 5.	Jongo	
Bere Legged	br G.R.	licatk	On 23.6.61 Hirer D. of 1	A.	

OBJECT: To test "lows" adjacent to gravity and magnetic "highs".

RESULT: Light grey sandy clay everlain by quartz sand intersected from 84°-114°.

LOG Comprises Macro and microscopic geological log.

	المواجع المراجع	
From	To	Description DETAILED LOG
	6*	Red-brown to yellow-brown semewhat clayey sund. Abundant gyptum, minor quarts.
6*	12*	Red-brown and very light groyish-yellow clayey quartz gyps
12•	84*	Very slightly to slightly clayey send. Colour changes are gradual, but vary from 12'-18' light groyish-piak 24'-30' very light groy 36'-42' light yollowish-grey 42'-54' brown 76'-84' groyash yellow-brown Clay free sample: <u>Gazzis</u> (almost all angular, 1/100") more than 97%, a few less than 1/200" grains of martite and minor pyrite towards the base. A few felapar grains at about 80'.
84*	96*	Fluid light grey very sandy elsy. Clay free fines: Querta (a few grey grains, up to 4", usually 1/50" - 1/100") 96%, white semewhat decomposed felsper 1%, grains of very fine pyrite 1%, a few mortite grains.
961	114*	Stiff grey homegen cous very sandy clay. Clay free sample Operts (1/50" - 1/100", angular) 75%, white felsper 24%, a few very fine grained, up to %" pyrite frequents 1%.
1:	14*	END OF HOLE (Limit of flights).

Oppartment of Niges, South Australia

IRON FXPLORATION SECTION

LOG OF AUGER BORE NO. WA 24

<u>Project</u> : *Arromboo Aeromegnet	ic Anomely	<u>D.N.</u> 664/61
Sec. 25 Hd. Werremboo	Ce. Le launte	Bore Ser. No. 651/61
Cellar Ceerds. 56600N. 67000F	8_L. 453.5°	<u>Grid</u> warranbee
Yertical	Septh 102.	Plan Ref.
Date Sere commenced 22.6.61	Completed 22.6.61	Oriller 5. Songe
Bere Lagged by G.R. Heath	On 23.6.61	lirer D. of E.

OBJECT: To test "lows" adjacent to gravity and magnetic "highs".

EISTET: Light grey sandy clay overlain by quartz sand intersected from 90° - 102°.

199 Comprises Macro and micros copic geological log.

-		
From	Te	Description DETAILED LOG
0	6.	Reddish-brown semulat clayey sand, containing abundant gypoum and lesser quarts.
6*	12*	Very light yellow-brown 1/50" slightly clayey quartx- gypoum sand.
12*	18*	Light red-brown clayey fine quarts sand.
18*	66*	Light grey slightly clayer sand; colour gradually darkening and changing to grey-brown. Clay free fraction: Quartz (1/30" - 1/50", aminly angular) 99%, almor less than 1/200" martite, a few decomposed white felspar grains near the top, and extremely rare fine grained pyrite.
66*	901	No cuttings returned, prebably similar to 18' - 66'.
90'	102*	Light gray, stiff, very coherent, very sandy clay. Clay free fraction: Quartz (mainly 1/50" - 1/100", up to 4", a few very fine grained (less than 1/500") pyrite fragments up to 4" diameter.
10	2'	END OF HOLE. Auger stells, (due to drag on flights).

department of lines, pouts Augirelia

THUS LATIONATION SECTION

LOC OF MIGHT PURE NO. A 15

Project: Aprrachoo Acromegneti	c Anomaly	U.E. 564/61
Sec. 25 ld. serremboe	Co. Le liunte	Bare Seraya. 651/61
Coller Coords. S6500N. 67000F.	<u>H.</u> L. 453.5°	Grid serrestoe
Vertical	<u>Bepth</u> 114'	Plan kef.
Date Bore Commenced 21.6.61	Completed 21.6.61	Oriller 5. Josne
Bore Lagged by G.S. Heath	QN 22, 23,6,61	Hirer D. of B.

OBJECT: To test "lows" adjacent to gravity and magnetic "highs".

RESULT: Light grey clay, everlain by quartz sand, intersected from 102° - 114°.

LOG Comprises Macro and microscopic geological log.

California de Mariano	Martin Series (Series	
Free	To	Description DETAILED LOG
•	6*	Yellow-brown slightly clayey sand, consists of gypsus and lesser quarts.
6°	16*	Clay containing abundant crystalline gypens and minor veriable quarts. Small band of rock gypens at 9.5°. Colour: 6'-10° gray to yellow-brown 10°-11.5° red-brown and off-white 11.5°-14° light gray 14°-16° red-brown and gray.
16*	24*	Grey to greyish yellow-brown slightly clayey quartz sand. Grain size about 1/100".
24*	30°	tight groy slightly sandy clay.
30*	64*	Greyish yellow-brown very slightly clayey sand, 72° - 84°: clay free sample more than 99% clean angular to sub-rounded 1/50° - 1/160° querts, with less than 1% non-magmetic mertite (less than 1/200° grains).
84*	102	No cutting return, probably sand as 30° - 84°.
102'	114*	Light grey to grey, stiff, very sandy clay. Clay free sample: 1/30" - 1/50" gnarts (as 72' - 84') 80-85%, white, semewhat decomposed felenar 15%, one or 2% pyrite (up to 1/10" grains of less than 1/500" crystals) and less than 1% mortite (as 72' - 84').

114' END OF HOLE.

INON EXPLORATION SECTION

LOG OF AUGEN BORE NO. NA 26

Project: warramboo Aeromagnetic	Anomaly	D.H. 664/61
Sec. 25 Md. Warramboo	Co. Le liunte	Bore Ser. No. 651/61
Cellar Coords. 56400N. 67000E	B.L. 453.5°	Grid Warrantoo
<u>Yertical</u>	Denth 48'	Plan Ref.
Oute Bore Commenced 20,6,61	<u>Completed</u> 20,6,61	Driller S. Donne
Bore Louged by G.R. Heath	On 20.6.61	Hirer D. of M.

CRABCT: To test "lows" adjacent to gravity and magnetic "highs".

EFSULT: Light grey sandy clay everlain by quarts sand intersected from 24° - 42°.

LOG Comprises Macro and microscopic geological log

Free	To	Description QETAILED LOG
•	6*	Light yellow-brown to brown slightly clayey loam, containin shundant gypsum and quartz sand.
6'	12*	Light yellow-brown changing to brick-red clay, containing abundant crystalline gypoun and quarts sand.
N 12*	16*	Red-brown very sandy fluid clay (or clayey sand). Clay free frection: Quartz (1/5 iron stained, generally engular, 1/80") 78%, decomposed felaper or tire-lite 15-20%, limenite 5-7%, rare gypsum.
10.	24*	Dall red-brown fairly elayey medium to fine grained quartz send.
24*	30*	Light-grey very sandy clay. Coherent, but no visible structure.
N 30°	42*	Light grey, becoming darker and browner towards base, slightly elayey fluid send. Clay free fraction 100% quartz with very rare less than 1/200" iron exide grains. Quartz generally fairly segular, mean grain size 1/50" - 1/100" (commonly 1/10" - 1/250").
48	•	END OF HOLE. No return of outtings after caving at about 42' (several cubic feet of sand from this level).

IRON EXPLORATION SECTION

LOG OF AUGER BOBL NO. MA 27

Project: Warramboo Acromagneti	c Anomaly	D. H. 664/61
Sec. 24 iid. serramboo	Co. Le lunte	Bere Ser. No. 00502/
Coller Coords 55200N. 58000F	F.L. 523.4'	Grid warramboo
Yerliesi	Bepth 30'	Plea Ref.
Date fore Commenced 30,6,61	Completed 30.6.61	Oriller S. Donne
Bere Leaged by G.R. Heath	<u>On</u> 1.7.61	firer D. of H.

OBJECT: To test meterial on flank of gravity and magnetic anomalies.

RESULT: Limonite impregnated metasediment intersected from 2.5' - 36'.

LOG Comprises Macro and microscopic geological log.

From	To	Description DETAILED LOG
0	6.5 °	Light brown sandy clay leas.
0.5*	2.5*	Sheet kunker, containing mimor quarts and limenite.
2.5*	36*	Messive and medular limemite and limemite impregnated metasediment. Primary iron exides (martite) rare.
3	6*	END OF HOLE (Orilling too hard for anger to penetrate).
	0 0,5° 2,5°	0 0.5°

IRON FAPLOMATION SECTION

LOG OF ADGLE BORE NO. GA 28

Project: Narramboo Aeromagnetic	Anomaly	Dan. 664/61
Sec. 24 Hd. Werramboo	Ge. Le liunte	Bare Ser. No. DD 502/6:
Cellar Coords 55300N, 56000E	8.L. 528.4°	Grid Warrambee
<u>Vertical</u>	Depth 13.8°	Plan Ref.
Date Sere Commenced 6.7.61	Completed 6.7.61	Driller S. Donne
Bere Lagged by G.R. Heath	Qg 15.7.61	Hirer D. of M.

Office: To test "peak" in gravity associated with amugnetic essently.

Limonite impregnated metasediment intersected from 4° - 13.8'.

LOG Comprises Macro and microscopic geological log.

RESULT:

Fres	Te	Description DETAILED LOG
0	2*	Sandy and limey leas, with scattered kunker modules.
2*	4'	Light yellow-brown sheet kunkar, containing abundant limenite medules and scattered quartz grains.
4*	13.8*	Off-white and yellow-brown decomposed <u>naturalisms</u> , Grain size about 1/50°. <u>Quarts</u> , <u>limmite</u> and revely martite are recognisable minerals present. The rock contains abundant limmite, nodular near the top, becoming more dispersed towards : the base.
1	3.81	END OF HOLE. (Limenite impregnated enterial too hard and

LEON FAILORATION SECTION

LOG OF AUGER BONE NO. 64 29

Project: ** ** ** ** ** ** ** ** ** ** ** ** **	e Anomaly	D.N. 664/61
Sec. 24 Hd. warramboo	Co. Le liunte	Bore Ser. Ne. in 502/
Cellar Coords. 56400N, 58000F	Lal. 548.6°	Grid Garrantoo
<u>Vertical</u>	Depth 69'	Plan Ref.
Date Bere Commenced 6.7.61	Cospleted 7.7.61	Oriller 5. Come
Bore Logged by G.R. Heath	Qn 15.7.61	Hirer 6. of 6.

OBJECT: To test material adjacent to gravity and magnetic anomalies

RESULT: Decemposed metasediment (no iron exides) intersected from 6°-69°.

LOS Comprises Excre and microscopic geological leg.

From	To	Description DETAILED LOG
0	1.5*	Light brown sandy leam,
1.5*	6*	Off-white and light yellow-brown shoot and medular kunker. containing 5-10% scattered quarts grains.
6°	54*	Off-white and light red-brown mettled and laminated clays (dtcamesed hedrack). Laminae usually about 1/20" thick. Grain size 1/20" - 1/50". Onarts is the only recognizable mineral near the surface, but decomposed felsoer and mica occur near the base. Some limenite impregnation.
54*	69'	Light red-brown and yellow-brown laminated decemposed metasediment. Contains 50% quarts, 35% decemposed felsons 15% semawhat decemposed bigtite. Beds about 1/15" thick, grain size about 1/50".
4	•	ENO OF HOLE. Auger stalls (due to hard drilling and drag on flights).

TROY EXPLONATION SECTION

LOG OF AUGUL BORE NO. SA 30

Project:	Aerramboo Aeromagnet	ic Anomoly	D.A. 004/61
Sec. 24	iid. warrambee	Co. Le imnte	Bore Ser. No. 00 502/0
Collar Coor	ds 56,3004, 58000F	R.L. 552.2*	Grid warranboo
Vertical		Depth 47°	Plan kef.
Dete Bore	commenced 7.7.61	Completed 8.7.61	Oriller S. Sonne
Bore Logger	by G.R. Heath	0s 15.7.61	Hirer D. of M.

OBJECT: To test meterial adjacent to gravity and magnetic anomalies.

RESULT: Decemposed metasediment (no iron oxides) intersected from 12°-47°.

LOG Comprises Macro and microscopic geological log.

Frem	To	Description DETAILED LOG
0	2.	Sandy loam.
2*	12*	Nedular and sheet <u>knoker</u> , containing scattered quarts grains. Semewhat more frieble towards the base.
12*	18*	Off-white and light yellow-brown decomposed <u>motorediment</u> . Contains 60%, 1/30" quarts grains, with 40% decomposed felsper and mics. Bods about 1/10" thick.
18*	36*	Off-white and light red-brown mottled sandy clay (decomposetagediment). Contains 1/50" - 1/10" quarts (about 50 with decomposed felsper and mica.
36°	47*	Light yellow-brown and very light red-brown laminated decempesed <u>metacediment</u> . Contains 40% quarts. 30% decempesed biotite.
4	7*	END OF HOLE Auger stalls (due to hard drilling and

150N EXPLORATION SECTION

LOG OF AUGER BOKE NO. MA 31

Project: warreshoo Aerosequeti	c Anomaly	D.M. 664/61
Sec. 24 Ed. serramboo	Co. Le Hunte	Bers Ser. No. 20502/6
Cellar Coords 56200M, 50000E	Kal. 555.9°	Grid warrashoo
fertical	<u>Penth</u> 43.5°	Plan Bef.
Date Bore Commenced 8.7.61	Completed 8.7.61	Driller S. Sonne
Bere Logged by G. R. Heath	<u>0s</u> 15.7.61	Hirer 0. of M.

QBARCT: Ye test material adjacent to gravity and magnetic anomalies.

RESULT: Decemposed metasediment (so iron oxides) intersected from 12'-43.5'.

LOG Comprises Nacre and microscopic geological log.

From	To	Description DETAILED LOG
0.	1.5	Light brown gandy leas.
1.5	12.	Off-white to very light yellow-brown sheet, medalar and friable hunker, containing scattered quarts grains and rare, less than 4" diameter, limenite - dull block iron exide medales.
12*	16*	Very light red-brown (pink) clay rock, consisting of 90% decomposed felspar and mice, and 10% quarts. Probably <u>metasediment</u> . Grain size about 1/50°. Riner dispersed limenite.
18*	24*	Very light mauve clay rock. Similar in appearance to 12'-18', but containing 40-50% quarts.
24*	30*	Very light red-brown decomposed <u>metasediment</u> , similar to 12'-10', but contains 30-40% quartz. Heds 1/10" thick.
30*	36*	Light yellow-grey and red-brown laminated decomposed metasadiment. Commists of alternating 1/20" bods of quarts - decomposed felsper, and hietite rich rock. Grain size about 1/30".
36*	43.5°	Yellow-brown and red-brown, very sandy (40%) clay, Grain size 1/50°. Bedding elecure, Consists of 40% swarts, 60% decomposed and limenite stained felsper and mice.
43	.5*	END OF HOLE Auger stalls (due to hard drilling and drag on flights.)

IRON EXPLORATION SECTION

LOG OF AUGITE BOKE YO. 44 32

fre legt:	serramboo Aeromayneti	c Amomely	9.E. 664/61
Sec. 24	Hd. warramboo	Co. Le mate	Nore Ser. No. 502/62
Coller Coo	<u>rds</u> . 56100N, 56000E	Bal. 557.1*	Grid Warramboo
<u>Vertical</u>		Depth: 61.3*	Plan Ref.
Date Berg	Commenced 9/7/61	Completed 9/7/61	Driller S. Denne
Bere Legge	1 by 6. 8. Heath	Qa 15/7/61	Hirer D. of M.

OBJECT: To test material on flank of gravity and magnetic assemblies.

RESULT: Decomposed metasediment containing 20-30% manganiferous exides intersected from 6'-21'.

From	To	Description
Contractions of the contraction of	territaria de la compositoria de l	DETAILED LOG
0,	2*	Light brown sandy leas.
2*	6*	Off-white to light yellow-brown sheet and nodular kunkar, centaining about 8% black, less than %" iron exide modules, and scattered quarts.
6*	21*	Derk brown and red-brown clay containing about 60%, 1/20" - 1/50" quartz, and 25-30% dull black manganiferous exide grains.
21*	61.3*	Dull multiceleured decomposed metasadimunts. Principal constituents are quarts, white felsper and hietite, with iron exides up to 5% of some bods, quarts-orthoclase (probably metasomatic) common near 50°, and green amphibele present near the base. Grain size 1/20" - 1/50", Bodding mainly obscure, but occasionally 1/16" bods present.
6	1.3°	END OF HOLE Auger stells (due to hard drilling and drag on flights).

IRON FXPLORATION SECTION

LOG OF AUGER BORE NO. BA 33

Bere Legged by G. R. Heath On 15/7/61 Hirer D. of E.

OBJECT: To test material on flank of gravity and magnetic anomalies.

RESULT: Decomposed metasediment containing over 20% martite and manganese exides intersected from 12'-39'.

LOG Comprises Macro and microscopic geological log.

Fren	To	Description DETAILED LOG
6•	12*	Light yellow-brown and dark dirty grey rock. Upper part is sheet and modular <u>known</u> containing 30-50% dull black iron exides. Known is replaced by quartz towards the base, and some mortite is present. Grain size of iron exides is about 1/100°.
12*	30'	Various shades of light brown decomposed matagediment, occasisting of 20% amount exides (possibly % martite and % mangemiferous) 20% quarts, and the remainder decomposed felemer and mica. General fragments of vois quarts occur near the top. Grain size generally 1/50" - 1/200", although quarts crystals frequently up to 1/20" diameter.
30'	39*	Berk, fairly dull grey iron rich rock. Grain size shout 1/100", contains 50-90% acides (mainly mangan-iforous) averaging about 75-60%, Quarts and minor decomposed felsper and hietite are other constitutents. Redding mainly obscure, but 1/20"-1/5" in some fregments.
3	9.	END OF HOLE Auger stalls (due to hard drilling and

dree es flights).

IEON EXPLOBATION SECTION

LOG OF AUGER BORE NO. NA 34

<u>Project</u> : Warramboo Aeromagnet	D.R. 664/61	
Sec. 24 lid. sarramboo	Ca. Le Hunte	Bore Ser. No. 502/62
Collar Coords: 55900%, 58000%	8.L. 557.5°	<u>Grid</u> Warrantoo
<u>Verticel</u>	eeth 62°	Plen Ref.
Date Bore Commenced 10/7/61	Completed 10/7/61	Oriller S. Donne
Bore Langed by G. R. Heath	On 15/7/61	Hirer 0. of E.

To test material on flank of gravity and magnetic anomalies.

RESULT: Decomposed metaradiment containing 20% mortite and earthy manganese exides below 42°, intersected from 6°-62°.

LOG Comprises Macro and microscopic geological log.

OBJECT:

From	To	Description OFTATLED LOG
0.	2*	Light brown gandy lasm.
2*	.6•	Light yellow-brown and dirty grey sheet and modular <u>knuker</u> , containing 15% iron exides (mostly soft and dull) and a similar amount of querts.
6*	42*	Off-white, grey and various shades of brown mottled and laminated decomposed metasediment. Grain size 1/50" - 1/100". Consists of 5-30% (average 20%) iron exides (muinty martite), 35% quarts (up to 1/10" crystals), and the remainder decomposed mice and felspar (including some orthoclase in irregular lenses). Beds mainly 1/20" - 1/5" thick.
42*	62°	Off-white and grey decomposed <u>maintediment</u> , containing about <u>29% martite</u> , 30% quarts and 50% decomposed felspar, with abundant (probably 50-60% of cuttings) <u>dull black manganiforous exides</u> (partly earthy, partly compost crystalline) containing about 20 - 30% quarts. Bedding obscure in metasediment, and not detectable in iron exide. Grain size 1/20" (iron exide) to 1/100" (martite in metasediment). Iron exide content increases towards the base.

62° END OF HOLE. Auger stalls (due to hard drilling and drag on flights).

MEDERIMENT of Bines. South Australia

IRON EXPLOBATION SECTION

LOG OF AUGEN BONE NO. WA 35

Project: *arrashoo Aerosogneti	c Anomaly	Dalla 664/61
Sec. 24 Md. Marramboo	Co. Le liunte	Bore Ser. No. Col/62
Collar Coords. SCOON. SCOOR	Bala 556.6°	Grid warramboo
Vertical	Depth 54.7°	Plan kef.
Date Bore commenced 11.7.61	Cospleted 11.7.61	Driller S. Donne
Bere Legged by G.R. Heath	<u>Qn</u> 15.7.61	Mirer 0. of E.

OBJECT:

To test material on flank of gravity and magnetic anomalies

RESULT:

Decomposed metasediment containing 15-20% mertite intersected from 6° - 54.7°.

LOG Comprises

Macro and microscopic geological log

From	Te	Description DETAILED LOG
0	2*	Light brown sandy loss.
2•	6•	Light yellow-brown sheet and medular kunkar containing about 10% dull black from exides and 10% quarts.
6*	36*	Light multicoloured decomposed <u>metasediments</u> , consisting of less than 5% to 35% (averaging about <u>15%</u>) <u>martite</u> , 50% quarts and 35% decomposed mice and felspar. Grain size mainly 1/40" - 1/200". Redding not well defined in most cuttings, but a few show 1/16" beds. Secondary liminite occurs irregularly throughout the sequence.
36*	54.7'	Off-white and brown laminated decompared materialment, centaining 20% martite (some limemite) 30-40% quarts and decomposed felspar and biotite, interbedded with dirty grey friable material (1/100" grain size) centaining 60% (?) dull mangemiferous exides. Bedding about 1/16" - 16" in metacediments, and up to 2" in the iron exide.
54.	.7*	END OF HOLE. Anger stalls (due to hard drilling and

drag on flights).

ILON LAPLOBATION SECTION

LOG OF ADDIT BORE NO. A 36

Project: Aarramboo Aeromagneti	c Anomoly	Q. B. 064/61
Sec. 24 1d. xarramboo	Co. Le lunte	here Ser. No. 502/62
Celler Coords. 55700N. 56000E	551.9°	Grid Harremboo
<u>Yertical</u>	Depth 60'	Plan Bef.
Date Bore commenced 11.7.61	Completed 12.7.61	Driller 5. Donne
Bere Lagged by G.R. Heath	Qm_ 15.7.61	Hirer D. of M.

OBJECT: To test meterial on flank of gravity and magnetic anomalies.

RESULT: Decomposed metasediment containing 20-25% martite intersected from 6'-60'.

Free	To	Description DETAILED LOG
0	6*	Light yellow-brown mend grading into limey rand with fairly abundant yellow-brown kunkar modules. which contain scattered (5%) limenite modules.
6°	60*	off-white and light yellow - and red-breum decemposed metasediment, Consists of 5-50% mertite (average 20-25%) 30% quarts, and the remainder decemposed felsper and mice. Limmite is abundant near the top of the sequence (as modules, and imprognating metasediment). Grain size 1/50" - 1/100", Bodding 1/32" - %", naually about 1/10" 1/20" thick. Colour of powdered rock changes from pink to light from at 42".
•		END OF HOLE, Auger stalls (due to hard drilling and drag on flights).

Enertment of Pines. South Austrelia

LOUS EAPLOBATION SIETION

LOG OF AUGER HOLL NO. A 37

Project: Astramboo Acromagnet	ic Anemaly	ye.ha. 664/61	
Sec. 24 Md. Serramboo	Ços Le munte	Sere Ser. No. SUL/o	
Collar Coords 55600N, 56000F	E.L. 547.3*	Grid serremoo	
Yertical	2epth 40.5°	Planket.	
Date Bare Commenced 12.7.61	Completed 12.7.61	Briller S. Donne	
Bore Logged by 6.8. Booth	Qm 15.7.61	Mrer o. of a.	

OBJECT: To test peak on magnetic anomaly associated with gravity anomaly.

RESULT: Decomposed metasediment containing 10-15% martite intersected from 6' - 40.5'.

From	To	Bescription
		DETAILED LOG
	-	

- 0 6° Fine grained yellow-brown quartz sand.
- 6° 40.5° Off-white and yellow and red-brown mottled and laminated decomposed metasediment. Contains 2-40% martite (and lesser limenite) averaging 10-15%; 40% quartz and the remainder decomposed felspar and mica. Decomposed epidote is a rare accessory. Grain size 1/50" 1/200". Limenite (dispersed) is common near the surface, but decreases towards the base. Beds 1/32" %" thick, usually 1/10" 1/20". The powdered rock is coloured pink.
 - 40.5° END OF HOLE. Auger stalls (due to hard drilling and drag on flights).

IRON FAPLORATION SECTION

LOG OF ADGED BONE NO. SA 36

Project: Marramboe Aeromagnet	ic Anossely	D. 664/61
Sec. 24 Md. barramboo	Co. Le lunte	Sore Sero. No. 502/62
Collar Coords 55500N, 56000E	bal. 540.4°	Grid Warrandoo
<u>Yerlical</u>	Depth 114'	Plan hef.
Date Bore Commenced 12.7.61	Completed 13.7.61	Priller S. Donne
Bore Logged by G. R. Heath	On 15.7.61	iller D. of M.

OBJECT: To test "peaks" in gravity and magnetic anomalies.

RESULT: Decomposed metasediment containing 10-25% mertite intersected from 6' - 114'.

Frem	To	Description DETAILED LOG
ō	6*	Offwhite to light brown limey and sandy leam containing abundant light yellow-brown kunker modules. Nodules contain miner concretionary limenite -
6'	80*	Decomposed off-white, grey, red - and yellow-brown mottled and laminated decomposed <u>metasediment</u> . Grain size moisly about 1/100". Consists of murtite (and secondary limen ite) 2-30% averaging 10%, with quarts, decomposed felsper and mice. Limenite imprognation is common near the top of the sequence. Bods mainly 1/16" or less thick Powdered rock is pink to 48°, then light brown.
80*	114*	Brown to yellow-brown decomposed matasediment. Contains 10-25% iras axides (martite and dull soft material) increasing from the top to the bettom of the sequence, with quarts, decomposed felaper and less abundant decomposed mica. Grain size 1/20" - 1/200", usually about 1/120". Bedding usually obscure. Where present, it is about 1/16" thick.
114	4.	END OF HOLE. (Limit of flights).

IFON LAMIGRATION SECTION

LOG OF AUGER NORE YO. MA 39.

Project: Marramboo Aeromagneti	c Anomaly	0. E. 664/61
Sec. 24 Lid. werramboe	Ço. Le ilunte	Sere Ser. No. 301/62
Collar Coords. 55400N, 56000E	BaL. 533.4*	Grid serramboo
<u>Vertical</u>	Depth 60'	Plan Buf.
Date Bore Commeaced 13.7.61	Completed 13.7.61	Oriller 5. Donne
Bare Lagged by G.K. Heath	Qn 15.7.61	Hirer D. of M.

OBJECT: To test "peaks" in gravity and magnetic anomalies.

RESULT: Decomposed metasediment containing 5-20% primary iron exides intersected from 6'-60'.

Frem	Te	Description DETAILED LOG	
0	1*	Sandy leam (light brown).	
. 1*	6*	Sheet and modular yellow-brown knaker, with scattered modules of limenite centaining scattered 1/100" mortite crystals.	
6*	42*	Red-brown, eff-white and lesser yellow-brown mottled and laminated decomposed metasediment. Consists of iron exides (usually martite-limenite) 2-30%, usually 5-10%, quarta 50%, remainder decomposed felsper and mica. Grain size 1/20" - 1/100", Bedding usually obscure, eccasional 1/16" beds present.	
42*	60*	Yellow-brown and rarely red-brown decomposed, leached and liminite stained quartz - felspar - mics - martite matesediment. Unleached portions contain about 20% iron axides. Grain size about 1/50". No detectable bedded fragments.	
60*		END OF HOLE Auger stalls (hard drilling and drag on flights).	

Menertment of Sines. South Australia

IRON IXPLURATION SECTION

LOG OF AUGEN BURE NO. NA 40

Exoject: «Erremboo Aeromagneti	c Asomely	D.M. 664/61
Sec. 24 Lid. Karranboo	Lo. Le fante	Bore Ser. No. 502/62
Coller Coords. 57000N. (3000)	H.L. 510.6°	Srid warranhoo
-Vertical	Mepth 01'	Plan Ref.
-Date Bere Commenced 15.7.61	Completed 15.7.61	ariller S. Donne
Bore Logged by 6.K. Heath	_On 17.7.61	Hirer D. of M.

.OBJECT: To test meterial adjacent to gravity and magnetic "highs".

-RESULT: Decomposed metasediment (no iron exides) intersected from 21'-31'.

		And a series of the series of
From	To	Description DETAILED LOG
0	3•	Light brows sandy lass.
3*	12*	Very light yellow-brown and off-white kunker, containing abundant 1/100" quartz grains. Mainly modular and frieble.
12*	21*	Red-brown clsy. containing abundant 1/100" rounded quartz grains and scattered (1%) liminite fragments.
21.	81 *	Off-white light red-brown and light yellow-brown decomposed metasediment. Consists of 20-50%, 1/20" - 1/100" quartz with decomposed felsper and mice. Hedding generally not well defined, but 1/16" beds are eccasionally visible. Fewdered reck: pink 21'-30'. off-white 30'-48', pink 46'-54', pink to light yellow-brown 54'-60', light yellow-brown 60'-81'.
81	•	END OF HOLE. Auger stalls (due to hard drilling and drag on flights).

IAON EXPLUBATION SECTION

LOG OF AUGUL PORT NO. A 41

<u> Project:</u> **erramboo Aeromagnetic	Anomaly	Hall. 664/61
Sec. 24 id. serramboo	Co. Le liunte	Bare Ser. No. : 502/02
Celler Coords 56900N, 60000E	Kala 519.4°	Grid Astrophes
Yextical	MOL h 105'	Plan Ref.
Date Bore commenced 14.7.61	Completed 14.7.61	Oriller S. Conne
Hore Legged by G.R. Heath	On 17.7.61	Mirer D. of M.

OBJECT: To test material adjacent to gravity and magnetic "highs".

RESULT: Decomposed metasediment (no iron exides) intersected from 12'-105'.

from		. Description DETAILED LOG
0	2*	Light grey-brown sandy loam.
2*	6*	Light yellow-brown and off-white modular and friable slightly sandy kunkar.
6*	12*	Red-brown <u>clay</u> containing shundant 1/100" - 1/200" rounded Quarts grains.
12*	106*	Light red-brown, off-white and light yellow-brown mottled and laminated decomposed metagediment. Consists of 30-70%. 1/20" - 1/50" quarts with decomposed felsper and mice. Bedding usually obscure, but some cuttings show 1/32" - i(" bods and laminate. Powdered rock colour: pale pink 12'-36', off-white 36'-42', pink 42'-60', red 60'-72', red-brown to yellow-brown 72'-90', yellow-brown 90'-102', grownish-grey 102'-105'.
10)6°	END OF HOLE. Auger stalls (approaching limit of mechine, due to drag on flights).

INON PAPLORATION SECTION

LOG OF AUGES NOWE NO. MA 42

Project: xarramboo Aeromagaeti	c Anomely	Day. 664/61
Sec. 24 M. serromboo	Go. Le liunte	fore Ser. 30. 502/62
Coller Coords. 50000N, 60000F	8.L. 520.2*	Grid warrandoo
Vertical	Depth 90°	Plan Ref.
Date Bore Commenced 15.7.61	Completed 17.7.61	Driller 5. Conne
Rore Logged by G.G. Heath	on 16.7.61	nirer D. of M.

To test material adjacent to gravity and magnetic anomalies OBJECT: Decomposed metasediment (no iron exides) intersected from 12. -90. RESULT

From	Te	Description DETAILED LOG
0	2*	Grey-brown sandy.lean.
2*	6*	Light yellow-brown sheet and medular <u>kunker</u> containing 10% 1/100" reunded quartz graiss.
6'	12*	Red-brown <u>elmy</u> containing abundant 1/100" - 1/200" rounded quartz grains.
12°	90'	Red-brown, off-white and yellow-brown mottled and hedded decomposed mitacediment. Contains 30-76%, 1/20" - 1/80 quartz with decomposed felspur and mica. Bedding mainly obscure, butsa few cuttings show 1/32" - 4" beds. Fewdered rock colour: 12"-24" Pink 24"-30" Off-white 30"-72" Fink grading
		to derk-red and red-hrows
		72°-84° Yellow-brown and red- brown. 84°-90° Yellow-brown to
		greenish-grey ("kheki").
9	0,	END OF HOLE. Auger stalls (due to hard drilling sod drug on flights).

INON LAH UNETLON SECTION

LOG OF AUGUS BOOK NO. JE 43

Project: Aerradico Aerocagnet	ic Anomaly	Hali. 664/61
Sec. 24 id. Astronto	Co. Le dunte	Bore Ser. 302/60
Coller Coords. 56700N. 60000F	Kal. 523.0°	Grid werrentoo
<u>Vertical</u>	Depth 74.8*	Plan Ref.
Date Born Commenced 17.7.61	Completed 17.7.61	Oriller S. Bonne
Bere Legued by G.R. Mesth	<u>Qa</u> 18.7.61	Wirer D. of M.
		•

OBJECT: To test material adjacent to gravity and magnetic "highs".

RESULT: Intersected decomposed metasediment 12'-75' containing 2-5% martite from 12'-18' and 66'-72'.

From	To	Description OFTAILED LOG
0	2*	Light-brown to grey-brown sandy clay leas.
2*	12*	Red-brown <u>clay</u> containing shundant 1/100" - 1/200" rounded quartz grains.
12*	18,	Yellow-brown, off-white and red-brown decomposed metagedine containing 2-5% martite, with 25% quartz and decomposed felsper and mica. Grain size about 1/50".
18*	6 6 °	Yellow-brown, off-white (mainly) and red-brown mettled and laminated decomposed metasediment, Generally contains 56% or less, 1/20" - 1/100" quarts, with decomposed felspar and mica, Medding generally obscure, but occasionally 1/16" - %" beds visible. Foundered rock colour: 18'-60' Pink (almost off-white 36'-42'). 60'-66' Greenish yellow-brown ("kheki").
66*	72*	Yellow-brown decomposed <u>mitsediment</u> similar to 16'-66', but containing <u>2-5%, 1'50" martite</u> , 10% querts and 05-66% decomposed mics.
72*	74.8*	Greenish yellow-brown decomposed metagediment as 10°-66°. Contains rather fresher orthoclase and biotice.
7	4.8*	FNO OF HOLE. Auger stalls (due to fresher, more resistant metasediment).

TEON FAR OF ATTON STICTION

LOG OF AUGER BOAT NO. JA 44

Project: «arramboo Aeromegneti	c Anomaly	Qalla 664/61
Sec. 24 M. warremboo	Sa. Le ilunte	Bere Ser. No. 502/62
Collar Coords. 56600N, 60000F	<u>R.L.</u> 525.0*	Grid varrantoo
<u>Vertical</u>	Oepth 85°	tlan kef.
Date Bore Commenced 17.7.61	Completed 10.7.61	Griller 5. Donne
Bore Logged by G.R. Beath	On 10.7.61	liter D. of a.

OBJECT: To test flanks of gravity and magnetic anomalies

EESULT: Decomposed metasediment (5% martite 15'-30') intersected from 15'(?) - 65'.

Free	To	Description OFTATLED LOG
0	2*	Light-brown sandy loan.
2*	8•	Light yellow-brown and off-white modular and friable inskar containing 40%, 1/50" - 1/100" quartz grains (rounded) and rore limenite - martite grains.
8*	15°	Red-brown alay containing abundant 1/100" - 1/200" rounded quartz grains and rare martite - limenite.
15*	30'	Red-brown, off-white and lesser yellow-brown mottled and laminated decomposed metasediment, containing 2-20%, usually 5% mertite, limenite, with 20-80%, 1/20" - 1/100" quartz and decomposed felspar and mica. Leminae usually 1/16" thick.
30*	51*	Light red-brown, off-white and rarely yellow-brown decomposed quartz - felsper - mics metasediment, Similar to 15'-30', but so iron exides. Powdered rock coloured pick (almost off-white) 36'-42'.
51*	85*	Yellow-brown to grey-green decommend quartx-felspar (30-40%), biotite (60-70%) metanadiment, Grain size 1/50". Bedding obscure due to homogeneity of rock. Foudered rock colour: yellow brown 51°-72°, grey-green ("khaki") 72°-65°.
85	;•	END OF HOLE Auger stalls (due to hard drilling and drag on flights).

DEPARTMENT OF MINES. SOUTH AUSTRALIA

IRON EXPLORATION SECTION

LOG OF AUGER BORE NO. AA 45.

Project: «erramboo Aeromagnetic	Anosely	0.8. 664/61
Sec. 24 ld. serramboo	Co. Le liunte	Pere Ser. 19. 502/6.
Coller Coords. 56500N 60000F	R.L. 528.2*	Grid serremboo
Vertical	<u>Depth</u> 52.5*	Plan hef.
Date Sore commenced 18/7/61	Completed 18/7/61	Orillet S. Donne
Bore Lagged by: C. R. Heath	On 24/7/61	Hirer D. of M.

OBJECT: To test blanks of gravity and magnetic "highs".

RESULT: Decomposed metasediment containing about 15% martite intersected from 12*-52.5*.

106 Comprises: Macro and microscopic geological log.

rom ?	ò	Description BETAILED LOG	
0	1.5*	Light brown sandy and limey lean.	
1.5	8*	Light yellow-brown modular, friable and lesser sheet kunkar, containing 20-25%, 1/50" - 1/100" rounded quartz grains, and rare rounded limonite grains.	
8*	12*	Red-brown clay containing abundant 1/100" - 1/200" reunded quartz grains.	
12*	36*	Off-white, yellow-brown, red-brown and lesser greenish- grey bedded decomposed <u>metacedisent</u> . Centains 5-50% usually <u>10-20% mertite</u> with 40-50% quartz and 40% bietite and decomposed felsper. Grain size 1/20" - 1/100", usually 1/50"-1/100", Beds 4"-1/16" thick, frequently obscure.	
36*	42*	Dark grey decomposed <u>metasedismut</u> containing <u>10-15%</u> <u>martite</u> , 50-60% querts, 30-35% dull meagamiferous looking clsy. Grain size mainly 1/50" - 1/200".	
42'	52.5°	Off-white, yellow-brown and light grey decomposed metasediment. Similar to 12°-36°. Colour of powdered rack: 12°-18° Red-brown 18°-24° Off-white to very light yellow-brow 24°-30° Brown 30-52.5° Grey	

drag on flights).

Monthsent of Mines. South Australia

IKON LAPLOFATION SECTION

LOG OF AUGUS BOSE NO. NA 46

Project: Serremboo Aeromagnetic	Anomaly	2.M. 664/01
Sec. 24 dd. serreeboo	Co. Le dunte	Nore Ser. No. 523/62
Collar Coords. 56400N 60000F	£al. 530.6°	Grid warrazhoo
<u>Vertical</u>	Depth 60'	Plan Ref.
Date Bore commenced 23/7/61	<u>Completed</u> 23/7/61	Driller S. Conne
Bore Louned by: G. R. Heath	On 24/7/61	Hirer D. of M.

OBJECT: To test flanks of gravity and magnetic "highs".

RESULT: Decomposed metasediment containing about 20% mertite, intersected from 18'-60'+

From	To	Description DETAILED LOG
0.	1.5*	Light brown sendy lass.
1.5	9.	Light yellow-brown medular <u>kunkar</u> , containing 30-40%, 1/50"-1/200" rounded quartz grains.
9•	18*	Red-brown clay containing 85%. 1/200" rounded quarts grains and rure limenite grains.
18*	60*	Off-white yellow-brown and red-brown mottled and laminated decomposed matagodistrat. Contains 5-30% usually 20% martile (and limenite near the top, 30% quarts, with 50% decomposed felaper and losser mica. Grain size 1/20"-1/200", usually about 1/150". Bedding 1/32"-%", usually %"-1/16" thick, frequently obscure. Colour of powdered rock: 18'-24' Reddish-brown 24'-30' Dark brown 30"-54' Brown becoming semulat greyish towards the base, 54-60' Yellow-brown.
60	•	FNO OF BOLE. Auger stells (drag on flights and hard drilling.).

Monertment of bines, South Australia

IBON EXPLORATION SECTION

LOG OF AUGEL BOE! NO. MA 47.

Project: marramboo Aeromagnetic	Anomaly	D.H. 664/61
Sec. 24. Id. serrentee	Co. Le lante	Nore Ser. No. 523/6
Callar Coords. 56300N 60000E	R.L. 531.5*	Grid sarramboo
<u>Vertical</u>	<u>Depth</u> 63.5°	Plan Ref.
Date Bore commenced 23/7/61	<u>Completed</u> 24/7/61	Oriller S. Conne
Bore Lagued by G.R. Heath	<u>9n</u> 24/7/61	liter D. of E.

OBJECT: To test flanks of gravity and magnetic "highs".

RESULT: Decomposed metasediment containing 10°-20° martite intersected from 18°-63.5°.

Frem	To	Description DETAILED LOG	
0*	4*	Light brown to yellow-brown sendy loss.	
4'	9*	Light yellow-brown knaker (mainly modular) containing 40% 1/200" rounded quarts grains.	
9*	18*	Brown grading down to red-brown <u>clay</u> containing 70% rounded 1/100"-1/200" querts grains, and 10% similar limmaite grains. A few pebbles (#p to 1" diameter) of 1/50"-1/160" limmaite (and martite?) near base.	
16,	60*	Mainly off-white, with lesser red- and yellow-brown mottled and laminated decomposed maintained. Contains 5-25% usually 15-26% martite, with 30-50% quarts and variable decomposed felsper and mica. Grain size 1/20"-1/250", usually about 1/150". Bodding 1/32"-4", usually about 1/16" thick, frequently obscure. Foundered rock colour: 10'-24' Pink 24'-54' Light-brown changing gradually to dark-brown. 54'-60' Dark, somewhat groyish-brown.	
66°	63.5*	Dark-grey to dark yellow-brown decomposed metasediment similar to 10°-60°, but containing 10-15% martite, and 20% dull manuaniferang looking iron exide (frieble).	
63.5		END OF BOLE Auger stalls (herd drilling and drag on flights).	

IFON EXPLORATION SECTION

LOG OF AUGLE BORT NO. HA 48

Project: Barramboo Aeromagmetic	Anomely	D.H. 664/61
Sec. 24 Hd. *arramboo	Co. Le Bunte	Bore Ser. Vo. 523/62
Collar Coords. 56200N 60000F	Mal. 533.4°	Grid warramboo
<u>Vertical</u>	Depth 42°	Plan Ref.
Date Bore commenced 24/7/61	Completed 24/7/61	Oriller S. Oonne
Rore Loused by G. R. Heath	OR 24/7/61	Hirer D. of M.

OBJECT: To test gravity anomaly associated with flank of magnetic "high"

RESULT: Decomposed metasediment containing 10-20% martite intersected from 20*-42*.

from	To	Description OFTAILED LOG
, 0 *	6*	Light brown very sandy and somewhat limey leam, with minor modular and friable kunkar near the base.
6*	12*	Light yellow-brows slightly clayey and limey 1/100" -1/200" rounded guartz seed, with a few limenite grains.
12*	20*	Dark red-brown <u>clay</u> containing abundant 1/100"-1/200" rounded quarts sand, with 5-10% rounded limenite (and possibly martite) grains.
20*	30°	Yellow-brown, red-brown and off-white mettled and laminated decomposed maintediment, containing 5-25% usually 15-20% mertite, 40% quarts and 40-45% decomposed felapur and mica. Beds, frequently obscure, a few 1/16" beds visible. Grain size 1/100"-1/500", usually 1/150".
30*	36'	Dark grey decomposed metasediment, similar to 20°-30°, but containing about 20% grey, (possibly mangemiferous) clay.
36*	42*	Yellow-brown and red-brown decomposed metagediment as 20°-30°. Eartite content shout 10%
42	2*	EMD OF MOCK. Auger stells. (hard drilling and drag

IRON EAPLORATION SECTION

LOG OF AUGHT HORE NO. MA 49

Project: Rerremboo Aeropaymetic	Anomaly	Halla 064/61
Sec. 24 id. serremee	Co. Le liunte	Sore Ser. No. 523/62
Coller Coords. 56100N 6000Ut	H.L. 532.4°	Grid Warranboo
Vertical	Depth 114°	Plan Ref.
Onte Bore commenced 24/7/61	Completed 24/7/61	Driller S. Donne
Bore Logged by G. R. Heath	0a 24-25/7/61	Hirer D. of M.

OBJECT: To test "peak" in gravity anomaly associated with flank of magnetic "high".

Decomposed mortite (20-30%) metasediment intersected 25*-66*, manganiferous 66*-114*.

From	To	Poscription DETATILED LOG
0.	5.	Light brown sandy and limey leas.
5*	10*	Light yellow-brown and grey medular and friable kanker centaining 20-40%. 1/100"-1/200" rounded quartz.
10*	25*	Red-brown clay containing 80% 1/100"-1/200" rounded querts and less them 5% limenite (and martite?) grains.
25*	66*	Multicoloured mettled and laminated decomposed maintediment, containing 5-50%, namely 20-30% mertite, with variable querts, decomposed felapar and mice (clay). Grain size 1/100"-1/250" usually 1/150". Bedding generally obscure, but a few %"-1/32" beds visible.
66*	114*	Dark grey decomposed <u>metagodisant</u> (<u>itabirite</u>) consisting of 30% clay (decomposed felsper and mice). 70% and sixed fragments and larger. Clay free fraction consists of <u>30-66%</u> iron exides (increasing from top to bettom). <u>Martite</u> is dominant near the top of the sequence, but <u>menuniformus exides</u> (as up to '6" lumps) are dominant towards the base. Bedding obscure. The material is fluid below 90°.
114	6.*	END OF HOLE. (Limit of flights)

IRON EXPLORATION SECTION

LOG OF AUGER SORE NO. 64 50

Project: warramboo Aeromagnetic	Asomaly	Halle 664/61
Sec. 24 lid. warranhoe	Co. Le Hunte	Sore Ser. No. 523/62
Collar Coords. 56000N 60000F	B.L. 531.4°	Grid warramboe
<u>Vertical</u>	Depth 66°	Plan Ref.
Date Bore Commenced 24/7/61	Completed 25/7/61	Oriller S. Donne
Bore Logged by G. R. Heeth	On 26/7/61	Hirer D. of M.

OBJECT: To test "peaks" on gravity and magnetic anomalies

RESULT: Decomposed metasediment intersected from 24°-66'.
(15% mertite 24°-57°, 50-60% manganese exides 57°-66')

From	To	Description DETAILED LOG
0,	2.	Light brown sandy clay lear.
2*	6*	Light yellow-brown kunker. containing 30-40% 1/100" quarts, and minor limmite.
6*	12*	Light yellow-brown slightly clayey, 1/200", sub-reunded quarts gand,
12*	24*	Red-brown and dark grey mottled <u>clay</u> containing about 10% dull black <u>mangeriforous iron axide and 75%</u> 1/200° sub-rounded quarts.
24*	57 °	Mainly off-white and light red brown mottled and laminated decomposed metasediment. Contains 5-20%, usually about 15% mertite, with variable quarts, decomposed felsper and mice. A few liminate - mertite - mensatiferent exide modules occur through the sequence. Grain size mainly 1/150"-1/200". Bods usually %"-1/16" thick, frequently obscure.
57 *	66*	Dark grey, with miner eff-white and light brown decomposed metasediment. Contains 50:40% mendaniferous exide, with miner martite and limenite. 30% quarts. 10-20% decomposed felsper etc. Grain size 1/20"-1/100".
66	•	END OF HOLE. Auger stalls (bard drilling and drag on flights.)

IKON FAH OFATION SECTION

LOG OF AUGER BOLL NO. A 51

Project: #arremboo Aeromegnetic	Anemaly	0. H. 664/61	
Sec. 24. hd. warramboo	<u>Co</u> . le lante	Bore Ser. No. 523/6	
Cellar Geards. 55900N 60000E	Rak. 529.4°	Grid *arramboo	
<u>Vertical</u>	Denth 64'	Plan Ref.	
Date Bore commenced: 25/7/61	Completed 25/7/61	Oriller S. Donne	
Bere Lagged by G. R. Heath	<u>98</u> 26/7/61	Hirer D. of M.	

OBJECT:

To test gravity and asquetic peaks.

RESULT:

Decomposed metasediment (5-10% martite from 16*-54*, 30-60% manganiferous exides from 57*-64*).

LOG Comprises:

Macro and microscopic geological log.

From	Te	Description DETAILED LOG
0.	2*	Light brown sendy lear.
2*	8.	Mainly modular, light yellow-brown kunkar containing 20-40% 1/100"-1/200" rounded quartz and minor limonite.
8•	12*	Light yellow-brown slightly clayey 1/250" sub-rounded quartz sand with minor mangeniforous limenite.
12'	18*	Red-brown glar containing 80% sub-rounded 1/200" quarts and 1 or 2% limenite-martite.
18*	45°	Off-white, red- and yellow-brown mottled decomposed metacodimms. Contains 5-20%, usually <u>5-10% mortite</u> , with variable quarts, decomposed felspar and mica. Grain size 1/100"-1/200".
45*	57°	Off-white decomposed quertz-felsper rock, a few fragments containing up to 5% martite, Grain size about 1/50".
57*	64*	Dark grey, with lesser light yellow-brown and red-brown decomposed metasadiment, Contains 30-66% manuariforous axide, with minor martite and limenite, the remainder being 1/50"-1/160" decomposed felspar and quarts.
64°		END OF HOLE. Auger stells (hard drilling and drag on flights).

MEDERIMENT Of Mines, South Australia

IEON LAFLOKATION SECTION

LOG. OF AUGUS HORE NO. IA 52

Project: *arrashoo Aerosagaet	ic Anomely	2.4. 604/61
Sec. 24 Ed. serrantos	Ço. Le Hunte	Grid warramboo
Collar Coords. 55000N, 60000F	Bal. 527.4°	Bore Ser. No. 523/62
<u>Verticel</u>	enth 34'	Clan Sef.
Date Dore Commenced 25.7.61	Completed 26.7.61	Uriller S. Donne
hore Lagged by G.R. Heeth	0a 26.7.61	three v. of h.

OBJECT: Yo test gravity and magnetic peaks.

RESULT: Decomposed metasediment (?), (Limonite impregnated 12'-32'), intersected from 12'-34'.

Andreas spingings water and	entropy and a second	TO THE PROPERTY OF THE PROPERT	
fren	To	Description DETAILED LOG	
0	2.	Light brown sandy lase.	
2*	6*	Light yellow-brown knakar (mainly modular and sheet) contain ing about 30%, 1/200°, rounded quarts with rare mangamif- erous limmite.	
8.	12*	Red-brown and lesser light yellow-brown <u>play</u> containing 70-90% rounded 1/100" - 1/200" quartz grains, and a few grains and pea sized <u>andules</u> of manganiferous limonite	
12*	32'	Light yellow-brown and brick red limmite centaining 5-20%, 1/50" - 1/100", augular quarts and variable clay (up to 60% of some yellow-brown cuttings). A few fragments contain scattered 1/200" martite crystals. Probably impregnated metasediment.	
32*	34*	White hard clay (possibly decemposed felsper) containing 20-30%, 1/50" - 1/200" quarts and a few 1/500" iron exide grains. Augular quarts suggests metasediment, but no evidence of bedding.	
34	• · · · · · · · · · · · · · · · · · · ·	ENO OF HOLE. Auger stalls (hard drilling and drag on flights).	

IKON EAPLOGATION SECTION

LOG OF ATIGHT BOLL NO. 34 53.

Project: varramboo Aeromegnetic	Anomaly	164/61
Sec. 24 M. serrembos	io. Le funte	Bere ser. No. 223/6
Collar Coords. 55700N. 60000F	E.L. 528.0°	Grid warrandoc
<u>Yertical</u>	Depth 22*	Plan Ref.
Bate Bore Commenced 26.7.61	<u>Completed</u> 26.7.61	Oriller S. Bonne
Bore Lagged by G.E. Heath	Qu 26.7.61	liter 0. of N.

OBJECT: To test slight "low" is gravity and magnetic "highs".

RESULT: Sheet limenite containing rounded quartz and minor mertite intersected from 12°-22°.

From	To	Description UETAILED LOG
o	8•	Light yellow-brown well rounded and well serted, 1/200" quartz gagd, containing minor limmy clay.
8.	12*	Light yellow-brown sheet and modular kunker. containing 40-50%. rounded. 1/200" - 1/500" quartz grains.
12*	22 *	Brick red limesite containing 5-20% angular to rounded quarta grains (1/30" - 1/150") and scattered martite (?) fragmonts. Associated with light yellow-brown well rounded 1/200" quartz fairly strongly comented with clay, and containing scattered limenite and possibly martite grains.
22*		END OF HOLE. Too hard for drill to penetrate further.

INON LAPLOBATION SECTION

LOG OF ACULA BOKE NO. AA 54

<u> Erramboo Acromeçneti</u>	c Anomaly	Dall. 664/61
Sec. 14 jd. sarrambee	ig. Le inste	Bore Ser. R. Sad/Ga
Coller Coords. 55600N, 600001	bal. 526.6°	Grid Marresboo
Vertical	Depth 70°	Zlan bel.
Date Bore Commenced 26.7.61	Completed 26.7.61	Driller S. Jonne
Sore Logged by G.F. Beath	On 26.7.61	tirer 0. of a.

OBJECT: To test "peak" in magnetic anomaly associated with slight "low" in gravity anomaly.

RESULT: Decomposed metasediment (limenitic near the top) intersected from 18'-70'.

From	To	Description DETAILED LOG
0	10.	Light yellow-brown, 1/200", fairly well sorted, rounded quartz gand, with a few limenite grains,
10'	16*	Light yellow-brown sheet and modular <u>kunkar</u> , containing 20-50%, 1/200" quartz,
16*	48*	Brick red and lesser yellow-brown <u>liminite</u> , containing up to 20% quartz, and a few 1/200° martite grains. A few off-white to red-brown quartz (20-30%) - martite (20%) - decomposed felapar, reck fragments occur below 30°. Grain size 1/200°.
46*	58*	White <u>quarts</u> (60%) - decomposed <u>felguar</u> (40%) <u>rock</u> . Grain size 1/100" - 1/200", No visible bedding.
58*	70'	White and pale yellow-brown decomposed <u>metasediment</u> , containing 30% quartx, with semewhat decomposed mice and felsper. Grain size 1/100"-1/200", bedding 1/32". %" thick, Contains <u>accessory mertite</u> , and numerous limenite medules, and limenite impregnated areas.
76*		END OF HOLE. Auger stalls. Probably combination of compact material and drag on flights.

THON EXPLONATION SECTION

LOG OF AUGER POWE NO. NA 55

Project: Astramboo Aeromagnetic	Anomaly	U.B. 664/61
Sec. 24 jid. warranhoo	Co. Le imnte	Sore Ser. No. 523/62
Coller Coords. 55500N 60000F	Eal. 519.1°	Grid Warramboo
Vertical	Depth 21.	Plan Ref.
Date Sere commenced 26/7/61	Completed 26/7/61	Driller S. Donne
Bore Logged by G. R. Heath	<u>On</u> 28/7/61	tilrer 0. of M.

QOJECT: To test slight "lows" in gravity and magnetic "highs".

RASULT: Sheet limonite containing quartz and rare martite intersected from 15'-21'.

-		
Frem	Te	Description DETAILED LOG
0*	8*	Light yellow-brown, 1/100"-1/200", rounded, well sorted quarts gazd, with scattered limemite (and martite?) grains.
8•	12*	Pale yellow-brown kunker, containing 25% rounded, 1/200" quartz grains. Mainly sheet and modular.
12*	15*	Light yellow-brown very sandy (1/200" sub-rounded quarts)
15*	21*	Srick red to red-brown <u>limerite</u> (containing 20-30% quartz and rare martite grains) and stiff clay containing about 35% rounded quarts (1/200°) and 35% limenite and rare martite.
21*		END OF HOLE. Too hard for drill to penetrate further.

IRON EXPLORATION SECTION

LOG OF AUGER BORT NO. JA 56

Project: **erramboo Aeromagaetic	Anomely	D.B. 664/61
Sec. 24 Hd. Warrantoo	Co. Le mate	Bore Ser. No. 523/62
Collar Coords. 55400N 60000F	E.L. 509.7'	Grid. %arremboo
<u>Vertical</u>	Depth 15°	Plan Ref.
Date Bore commenced 27/7:/61	Completed 27/7/61	Briller S. Donne
Bore Logged by G. R. Heath	On 28/7/61	mirer D. of M.

QBJECT: To test gravity anomaly associated with low in amgmetic anomaly.

RESULT: Completely liminite impregnated metasediment (?) intersected from 8'-15'.

Frem	To	Description DETAILED LOG
0*	5*	Light brown very slightly clayey 1/200" reunded quartz sand.
51	8.	Light yellow-brown kunkar, containing 40% rounded 1/200" quarts.
8*	15*	Red-brown to brick red structureless <u>limesite</u> containing about 10% quartx (rounded) and minor mortite. Possibly some impregnated metacodiment (or clay) meer the base.
15	;*	END OF HOLE. Too hard and compact for drill to penetrate further.

INON EXPLORATION SECTION

LOG OF AUGEN BORE NO. NA 57

Project: Harrashoo Aerosegnet	ic Anomaly	0. N. 664/61	
Sec. 24 Hd. Nurramboo	Co. Le imnte	Bore Ser. No. 523/62	
Collar Coords 55300N 60000E	6.L. 506.2*	Grid warramboo	
Vortical	Depth 15*	Plan Ref.	
Date Bore commenced 27/7/61	Completed 27/7/61	Oriller S. Donne	
Nore Legged by G. R. Heath	On 28/7/61	Hirer D. of E.	

OBJECT. To test gravity anomaly associated with "low" in magnetic anomaly.

RESULT. Limenite impregnated metasediment (less than 10% martite) intersected from 12°-15°.

From	To	Description DETAILED LOG	
0.	2*	Pale brown sandy loam.	
2•	4*	Pale yellow-brown mainly modular kunkar, containing 40-50% rounded 1/200" quarts grains.	
4.	12*	Light yellow-brown <u>clar</u> containing 80% 1/100"-1/200" rounded quartz grains and rare limenite.	
12*	15*	Limmaite impregnated metasediment centaining less than 10% mertite.	
15	;•	END OF HOLE. Too hard for drill to penetrate further.	

LEON EXPLORATION SECTION

LOG OF AUGER BORE NO. SA 58

Project: Aarrasboo Aeremagaeti	c Anomaly	D.N. 664/61
Sec. 24 ld. *arramboo	Co. Le ilunte	Bore Ser. No. 523/62
Gollar Coords 55200N 60000E	502.6°	Grid warramboo
<u>Verticel</u>	Depth 21°	Plan Bef.
Sale Nore commenced 27/7/61	<u>Completed</u> 27/7/61	Oriller S. Conne
Bore Loaged by: G. R. Heath	Qm 28/7/61	Hirer D. of M.

OBJECT: To test gravity and magnetic "highs."

RESULT: Limonite impregnated metasediment containing 5-20% martite intersected from 12*-21*.

Frem	To	Description DETAILED LOG
0*	6•	Light yellow-brown clayey (up to 10%) 1/200" rounded quartz sand.
6*	12*	Light yellow-brown clay, containing 60% sub-angular to well rounded quarts sand (1/200") and scattered tunker andules near the top of the sequence.
12*	21*	Yellow-brown and red-brown severely weathered <u>materediment</u> , <u>impressated</u> and in places completely disrupted with <u>limmite</u> , Contains <u>5-20% mertite</u> and 50%, 1/50"-1/200" quertx. Bedding rerely preserved; where present, it is usually 1/8"-1/16" thick.

IKON EXPLORATION SECTION

LOG OF AUGUE BOOL NO. A 59

Project: *arramboo Aeromagnetic	Anomaly	D.K. 664/61
Sec. 24 ju. serremboo	Co. Le iunte	Bore Ser. No. 532/62
Coller Coords 55100% 60000F	Eal. 502.8°	Grid verrenbos
Vertical	<u>Depth</u> 25.5°	Plan Ref.
Date Bore commenced 27/7/61	Completed 27/7/61	Driller S. Donne
Bare Louned by G. R. Heath	<u>0n</u> 28/7/61	Hirer D. of M.

OBJECT: To test "peaks" on gravity and magnetic anomalies.

RESULT: Limonite impregnated metasediment?, overlain by everburden. intersected from 24'-25.5'.

Free	To Description DETAILED LOG-		
0.	6*	Light yellow-brown somewhat clayey, well rounded 1/200" QUELL Sand.	
6*	16*	Light yellow-brown <u>clay</u> containing variable (70-90%) quartz sand (as 0°-6°). A few yellow-brown kunkar nodules occur near the top of the sequence.	
18*	24*	Red-brown very sandy <u>elav</u> . similar to the overlying material.	
24*	25.5*	Dark red-brown decomposed <u>metacediment</u> (?) impregnated with and containing <u>medular</u> of limenite. 1/200" angular quartz, and rore martite crystals are the only recognizable primary constituents.	
25	5.5°	END OF HOLE. Sheet limenite too hard for drill to penetrate	

IRON FAMLURATION SECTION

LOG OF AUGER BORE NO. 164 60

Project Harramboo Aeromagneti	c Anomaly	U. H. 664/61
Sec. 24 ild. *srramboo	Co. Le duste	Bore Ser. No. 523/62
Coller Coerds 55000N 60000F	B.L. 503.0*	Grid Warrsaboo
Vertical	Depth 27 °	Plan Ref.
Date Bore commenced 27/7/61	Completed 27/7/61	Driller S. Donne
Bere Legged by G. F. Heeth	On 26/7/61	Hrer 9. of 1.

OBJECT: To test "peaks" on gravity and magnetic anomalies.

RESULT: Limonite impregnated overburden intersected from 16.-27.

Enn.	88.	
From	DTo	Description
-		DETAILED LOG
0	18*	Light yellow-brown very sandy clay or clayey sand (65-95%), well rounded, 1/100" - 1/200" quartz, and rere limmaite grains. Knaker nedules (semowhat friable), are rere sub-surface constituents.
18*	27 •	Sheet limemite, too hard for drill to penetrate further.
	27 *	END OF HOLE.

INON EXPLONATION SECTION

LOW OF AUSTA BOLL NO. 14 61

Project: Serramboo Acromagaetic	c Anosely	Hali. 664/61
Sec. 24 Mil. sarromboo	Ço. Le liunte	Bore Ser. No. 323/62
Coller Coords 54900N, 60000F	hala 499.1°	Grid verremboo
<u>Vertical</u>	<u>Genta</u> 28.5°	Plen kef.
Onte Bare Commenced 27.7.61	Completed 27.7.01	Driller S. Donne
Bore Louned by 6.K. Kesth	<u>9a</u> 28.7.61	liter D. of S.

OBJECT: To test floaks of gravity and magnetic anomalies

<u>RESULT:</u> Limmite impregnated material (metasediment?) intersected from 12° - 28.5°.

From	To	Description DETAILED LOG
0	12*	Light yellow-brown semewhat clayey. 1/100" - 1/200". well rounded quartz sand.
12*	26,5*	Red-brown silica and limenite impregnated <u>clay</u> containing 70 - 80% rounded quarts sand (as 0'-12'). Possible decomposed <u>materediment</u> (?) fragments occur sparsely near the base.
2	8.5	END OF HOLE. Rock too hard for drill to penetrate.

IRON EXPLORATION SECTION

LOG OF AUGER MORE NO. MA 62

Friest: Werranboo Aeromagnetic	Asomely	D.H. 664/61
Sec. 24 Hd. warrantee	Co. Le liante	Here Ser. No. 523/62
Collar Coords. 54000N, 60000E	Bel. 495.3*	Szid warrantoe
Yertical	Depth 32*	Plea_Ref.
Date Bare commenced 27.7.61	Completed 28.7.61	Briller S. Donne
Bore Legged by 6.2. Houth	<u>0n</u> 28.7.61	Birer D. of R.

To test flanks of gravity and magnetic "highs".

ESSELT: Limmitic decomposed setsediment (?) intersected from 24' - 32'.

Pros	70	Description DESKILED LOG
•	3°a	Light yellow-brown sandy loam.
.3*	£.	Medular yellow-brown knaker, containing 30% 1/200" well rounded quartz grains.
8'	24*	Light yellow-brown to yellow-brown elsy containing 80-90% 1/160" - 1/200" well rounded quarts grains.
24*	32*	Red brown cilies and limmite imprognated <u>alar</u> containing about 70%, 1/200° rounded to sub-ampular quarts, and 10% limmite (and possibly martito) grains. No evidence of hedding, but may be some decomposed motocodiment,
32	•	END OF MOLE, Rock too hard for drill to penetrate.

INON FXPLORATION SECTION

LOG OF AUGHT BURE NO. ME GO

Linical: astronomo feromequet	ic Amounty	Rab. 664/61
Sec. 24 lid. varramboo	Co. Le liunte	Bere Ser. No. 523/6
Coller Coords. 54700M. 600000	Fal. 496.1*	Grid narrashoo
<u>Verticul</u>	Depth 114°	Plea Kef.
Date Bore Commenced 28.7.61	Completed 28.7.61	Priller S. Donne
Nore Legged by G.H. Beeth	Qn 29.7.61	tirer D. of M.

GRIFCT: To test flamks of gravity and magnetic "highs".

RESULT: Decomposed metasediment (accessory iron exides) overlain by overburden intersected from 39° - 114°.

		The state of the s
Fres	To	Description DETAILED LOG
o	16*	Light yellow-brown clay, containing 80%, well reended. 1/100" - 1/200" quarts, and scattered light yellow-brow hunker medales mear the surface.
18.	30.	Yellow-brewn very sandy glar, similar to 0'-18'.
30*	39*	Red-brown to brick red very sandy limesite and silica impresented clay similar to 0'-18'.
39*	114*	Off-white, and very pale browns and greys decomposed marts (40-40%) - felemer (10-20%) - mice_metacodiment. Grein size 1/20" - 1/100". Redding generally obscure, but a few 1/16" hade visible. Iron emides are extremely rare, and do not form a significant proportion of the rock.
114	!•	END OF HOLE (Limit of flights).

IEON EXPLORATION SECTION

LOG OF AUGER BORE NO. DA 64

<u>Preject</u> : Warramboo Acromignetic	Anomaly	D.B. 664/61
Sec. 24 Hd. Warrantee	Çe, Le Heste	Bere Ser.No. 523/6
Geller Coords: 54600N, 60000E	R.L. 495.4"	Grid Warrantee
Yer: leel	Depth 54'	Plan Bel.
Date Nors communed 2.8,61	Camisted 2.8.61	Briller S. Benne
Bers legged by 6.2. Heath	<u>91.</u> 4.8.61	HERE D. of M.

MANGE: To test flanks of gravity and magnetic "kighs".

RESULT: Secomposed metasodiment (accessory mertite) everlain by everburden intersected from 45'-54'.

Prom	To	Description ONTAILED LOG
•	4*	Light yellow-brown sandy and semandet limsy last.
4*	6*	Pelo yellow-brown modular knaker containing 50%, 1/200" rounded quarts,
6*	30*	Yellow-brown to brown <u>also</u> containing 70-90% rounded 1/200" <u>smarts</u> and sentiered (1 or 2%) limenite grains.
30*	46'	Sed-brown, also containing SQK rounded 1/200" quarts grain with 5-105 limenite grains and sodules up to 2" dismeter
45 *	54'	Light grey, red-brown and yellow-brown <u>decomposed</u> meintedimms (floky elsy containing 50%, 1/100" - 1/200' engular quarta, and accessory martite. This meterial is below the water table, and structure has been destroyed during extraction.
54	•	NUM OF MOLE. Meterial too hard for drill to ponetrate.

IRON FXH OBATION SECTION

LOG OF AUGER BONE NO. WA 65

Project: Marramboo Aeromegmetic	Amounty	D.H. 664/61
Seg. 12 Hd. Warrentee	Çe. Le hunte	Sere Ser.No. 523/62
Coller Coords. 59200N, 49000N	Bak. 564.1"	Grid Warrenboo
<u>Tertical</u>	Depth 27.5*	Plan Ref.
Date Bore Commerced 3.8.61	Completed 3.8.61	Briller S. Denze
Berg Legged by G.R. Heath	On 4.8.61	Birth D. of R.

COLUMN TO

To test fleshs of gravity and magnetic "highs".

RESELT:

Limmite impregnated evertured intersected from 18'-27.5'.

LOS Comprises

Macro sad microscopie geological log

Free	To	Description DETAILED LOS
0	2.5	Light yellow-brown sandy lane.
2,5'	6° .	Light yellow-brown modular and shoot kanker, containing 30% 1/100" - 1/200" rounded quarts.
. 6*	18*	Yellow-brown very sandy (80-06%) gizy. Contains 1/200" rounded, well serted, querts greins, and seattered limmite frequents.
18°	27.5	Red-brown and locsor pollow-brown limmate and limmatic alar containing up to 20%, 1/100" - 1/200" rounded quarts grains.
2	7.5*	END OF MOLE. Meterial too hard and compact for drill

YEAR SEED

Department of Mines. South Australia

INON LAPLOBATION SICTION

LOG OF AUGER SORE NO. BA 66

<u>Erejegi</u> : Earramboe Aeremegmetic	Anomaly	D.M. 664/61
Sec. 12 Md. Marranbee	Ca. Le liante	Bors Ser. No. 523/62
Collar Coords. 59100N. 49000E	B.L. 566.1*	Grid Warrantes
Yerticel	Septh 102'	Plea Ref.
Date Nore Commenced 3,8,61	Completed 3.8.61	Oriller S. Donne
Bore Lauged by G.R. Heath	20 5.8,61	Hirer D. of M.

OR JACT:

To test flanks of gravity and magnetic "highs".

RESULT:

Decem pesed metasodismut (me iron exides) intersected from 25° - 102°.

LOG Comprises

Meere and microscopic geological log.

From	75	Description DETAILED LOG
0	2'	Light yellow-brown condy less.
2*	6*	Pele yellow-brown medalar and shoot <u>implay</u> containing 30%, 1/200" sounded quarta grains.
6*	10.	Yellow-brown also conteining OSK 1/200" rounded quarts.
10,	25*	Limmits, modular and imprognating and replacing earlier material (everburden?)
25'	78*	Off-white red-brown and yellow-brown untiled decomposed quarts-felaper (and possibly some size) unterediment. Sminly " <u>mranitia</u> " in appearance. Limmite staining and improposition occurs irregularly through the sequence. Grain size 1/20" - 1/100". He bedding detectable in cattings.
78'	163,	Yellowish groy-green ("khaki") decomposed quarta (20%) - histite (ing.) - felaper (10%) metacodisent, with minor (probably metacometic) quarta (50%) - felaper (50%). Grein size shout 1/80%. Bodding generally obscure, but a few grains show if - 1/16" reddick banding (bodding or steining).
10	5. (NOT) (SMD OL	Augur stalls (due to drug on flights and increasingly

IKON EXPLORATION SECTION

LOG OF ADGER BORE NO. HA 67

Praisct: Warrantee Aeromagmetic	Auemaly	D.N. 664/61
Sec. 12 Hd. Warrantee	Co. Le Beste	Mers Ser.No. 524/62
<u>Cellat Ceards</u> 59000N, 49000E	Ash 560.1°	Grid Warrantee
Yertical	Beath 78°	Plan Ref.
Date Bore Commenced 4.8.61	Completed 4.8.61	Briller S. Donne
Bere Legged by G.R. Heath	On 5.8.61	Hirer D. of M.

To test flanks of gravity and magnetic "highs".

RESELT: Decomposed notesediment (no iron exides) intersected from 22' - 78'

LAS Comprises Noore and microscopic geological log

tale of the second		
Free	To	Description DETAILED LOG
•	1.	Light brown sandy lass.
1.	4.	Pale yellow-brown knoker containing 1/200" rounded quartz.
4*	9*	Tellow-brown also containing 60%, rounded:4/50" - 1/200" quarts.
••	22.	Sandy-elay (everturden) containing abundant dispersed, imprognating and modular <u>limenta</u> .
22'	78*	Heisly off-white, with red-brown and yellow-brown decomposed gazety (36-70x) - foliant - mice anterestimant. Irregular limenite staining and impropuntion occur throughout the componer. Grain sine mainly 1/50" (renging from 1/20" - 1/200"). Bedding generally obscure, but where present, it is shout 1/0" thick.
7	·8•	FOR OF MOLE. Augus stalls (due to harder drilling and drop on flights).

IRON EXPLORATION SECTION

LOG OF AUGER BORE NO. WA GO

<u>Project</u> : Werrambee Aeremagnetic	Assesly	Pall. 664/61
Sec. 12 Ed. Warrantee	Co. Le liunte	Bere Ser No. 524/
Celler Coords 50900N, 49000E	Bai. 571.6*	Grid Warrantoe
<u>Vertical</u>	Bepth 72'	Plea Ref.
Bate Bare Commenced 4.8.61	Completed 5.8.61	Driller S. Donne
Fore Lagged by G.R. Heath	00 7.8.61	Hirer D. of M.

SERGE: To test flenks of growity and magnetic "highs".

RESELT: Decomposed metacodiment intersected from 18' - 72' (1-2% mertite from 18'-33').

105 Comprises Macro and microscopic geological log

*****	-	
Frem	To	Description DETAILED LOG
9	2.	Light brown sandy Jam.
2.	3.	Seattered modular kunkar.
3*	4*	Light yellow-harous glay containing 80%, rounded 1/200" quarty.
6*	18.	Limmite medulas and improgneted meterial. Some engular quarte suggests bedrock.
19.	33*	Processed grants-feleror-mice priceediment (of-white end lightly stained), containing 1 or 2% dispersed 1/250" mertite. Grain size mainly 1/30" - 1/100". Sodding (where detectsible), shout 1/16" think.
33*	60*	Off-white, with very alight limmatte statutus, descripted "grantita" metacadiansi, similar to 18'-33', but contains no martito.
60*	72*	Brown, yellow-brown and lesser off-white decomposed maissediment, similar to 35'-40', but severely stained and improgrammed with limmatte. Grain size 1/20" - 1/100
72	•	ENG OF HOLE. Auger stalls (due to harder drilling and

dreg on flights),

IRON EXPLOSATION SECTION

LOG OF AUGER NORE NO. NA. 69

is Assmaly	D.N. 664/61
Go. Le liente	Bere Ser. No. 524/62
Bake 575.1"	Grid Werrembee
Benth 84°	Fire Ref.
Completed 5.8.61	briller S. Dease
<u>9n</u> 7.8.61	Mere D. of M.
	Ga. Le Sunte Bain. 575.1° Benth 84° Completed 5.8.61

SHECT: To test flanks of gravity and magnetic "highs".

Preciped metasedisent intersected from 4'-84' (up to 2% martite from 18' - 54' and 69' - 75').

LOS Comprises Hours and microscopic geological log.

Free	To.	Description DETAILED LOS
•	1.5"	Light brown candy last.
1.5'	4*	fale yellow-brown modular and shoot hunker.
4*	18,	Notesediment (?) containing <u>limmite medules</u> , and imprograted with limmate and charty silica.
18*	54*	Pele greenish-gray decomposed <u>mineralisms</u> containing miner to accessory (less then 2%) muritie, and quarts - felsper-mice. Grain sine uninly about 1/50°. Sodding (where present) about 1/16° thick. Imprognating and modular liminite occur internittently throughout the coquence.
54'	69*	Off-white "granitie" denominated interestings, similar to 18'-64', but unrite-free.
69.	75*	Off-white and light brown murtite bearing meteredizant (as 18'-54').
75*	84*	Very light from decomposed martite-free metasediment similar to 54° - 60°.
	4*	NO OF HOLE. Auger stails (due to herder drilling and drag on flights).

IRON EXPLORATION SECTION

LOG OF AUGER PORE NO. NA 70

ic Anomaly	Dall 664/61
Ce. Le Hunte	fore Ser. No. 524/63
HaL. 580.1°	Grid Warrantee
Denth 60'	Plan Rof.
Campleted 6.8.61	Briller S. Donne
9. 7.8.61	Birer D. of E.
	Hal. 580.1° Depth 60° Campleted 6.8,61

COLUMN: To test flanks of gravity and magnetic "highs".

UESULT: Decomposed metasediment containing 10-20%7 mertite intersected from 25'-60'.

LOS Comprises | Heere and microscopic geological log

AND DESCRIPTION OF THE PERSON NAMED IN		
Free	To	Secori ption DETAILED LOG
0	1.	Light brown sandy last.
1.	•	Pale yellow-brown modular and shoot <u>imphar</u> , containing20%. 1/100" - 1/200" rounded quarts.
••	12.	Nodular and imprognating liminite.
12*	25*	Off-white and red-brown mettled decomposed <u>marin-felanor-mick retarediment</u> , containing accessory martite (less than 13). Grain size 1/150°.
25*	30'	Decomposed off-white, grey and brown decomposed <u>interedim</u> Contains <u>25/201 limedia-mertite</u> with quarts and decomposed felaper. Grain size 1/100" - 1/200". Structure observe.
30*	66 °	Off-white and yellow-brown decomposed and extensively limite imprometed missediment. Contains about 10% martite, with querts and decomposed felaper, and mica. Grain size about 1/200°, hedding %"-1/32" thick, assally obscure.
66)•	END OF HELE. Auger stalls (due to harder drilling and drag on flights.)

IKON EAPLORATION SECTION

LOG OF AUGER BORE NO. NA 71

Project: Warrantoe Aeremagnetic	Amountly	DE 664/61
Sec. 12 Md. Warramboo	Co. Le iluste	Nere Serano. 524/62
Collar Geords 58600N, 49000E	Eal. 585.1°	Grid Merranbos
<u>Yertisal</u>	Depth 84'	Plan Ref.
Date Bore Commenced 6,8,61	Campleted 6.8.61	Briller S. Coane
Bere Lessed by G.R. Heath	On 7.8.61	Mirrie D. of M.

WCD To test flanks of gravity and megastic "highe".

AMERICA: Secomposed unterediment containing up to EX martite intersected from 6' - 84'.

126 Comprises Mears and microscopic goological log

From	Во	Onegription SETAILED LOG
•	1.	Light breeze sendy Jaam.
1.	61	Pale yellow-brown, kunker containing 20% recoded 1/200" quarts.
6°	84*	off-white and red-brown mettied and laminated decomposed meatin - felanor - mice amissadiansi. Iron exides (metile) aminly accessery, but up to \$% of rock from \$4'-42'. Grain sine aminly 1/20" - 1/100", with some finer grained sequences. Limmite staining and imprognation occur throughout the sequence, and modules also ecour intermittently. Bodding 1/16" thick nounly obscure.
	м•	THE OF BOOK. Auger stalls (due to dray on flights and increasingly hard drilling).

IRON EXPLORATION SECTION

LOG OF AUGER NORE NO. MA 72

froject: Berra	mboo Aeromagneti	c Anomaly	Dalla 664/61
Sec. 12 Hd.	warrenboo	Co. Le liente	Bore Ser.No. 524/62
Collar Coords	58600N, 49000E	Eal. 566.3'	Grid Narramboo
<u>Vertical</u>		Depth 102*	Plan Ref.
Date Bere Comes	ced 7.8.61	Completed 7.8.61	Briller 5. Donne
Berg Lessed by	G.R. Heath	0a 7.8.61	Hirer D. of B.

GRIECT: To test flanks of gravity and magnetic "highs".

Decomposed metacodiment, containing 5-10% martite from 12'-20', and up to 5% martite from 20'402', intersected from 12'-102'.

LOG Comprises Meers and microscopic geological log

Free	79	Beseription BETATLED LOG
0	1.	Light brown sandy last.
,1.º	6°	Pale yellow-brown knoker containing 30%, 1/100" - 1/200" rounded querts.
4*	12.	Medular and imprognating liganite.
12*	162*	Off-white, red-brown and rerely yellow-brown method and laminated decomposed amortiz-foliance-mice anticondizant, Burtite equient 5-16% (run 12'-26', but does not exceed % height 20', Grein size sminly 1/26" - 1/160", Dedding 1/32" - 1/16" thick where visible, but usually cheenre.
10	12°	PRO OF MOLE. Auger stells (due to increasingly hard drilling and drop on flights.)

IRON EXPLORATION SECTION

LOG OF AUGER BORE NO. NA 73

Project: Marrambee Aeromagnetic	Amounty	Dall. 664/61	
Sec. 12 Hd. Warrenboo	Co. Le liunte	Bore Ser. No. 524/62	
Coller Coords 58400N. 49000E	Bala 591.6*	Grid Warramboo	
<u>Yertical</u>	Besth 90'	Plan Ref.	
Date Bere Commenced 7.8.61	Completed 7.8.61	Driller S. Donne	
Sere Lessed by G. R. Heath	98 8-10.8.61	Hirer O. of M.	

CRECT: To test gravity and magnetic "highs".

RESERT: Decomposed metasediment containing 10% mertite intersected from 6' - 90'.

LAS Comprises Macro and microscopic geological log.

From	To	Bosoription OFFAILED LOS
0	1*	Light brown condy last.
1.	4*	Pale yellow-brown kanker containing 40%, 1/100" rounded quarts.
6*	991	ted-brown, with lesser off-white and yellow-brown, decomposed metacodiment. Contains 5-20%, usually shout 16% metite-limmits, with marty and decomposed falses, and miss. Grain size animly shout 1/100%, but some ires-free quarte-folsper fragments up to 1/20%. Bedding shout 1/16" thick where visible.
•	10'	END OF HOLE. Auger stalls(due to herder drilling and drag on flights).

Beneriment of Mises. Senth Australia

IRON EXPLORATION SECTION

LOS OF AUGER BORE NO. WA 74

Project: Warrantoo Aeromagnetic	Anomaly	P. 664/61
Sec. 12 Hd. Warranton	Se. Le Sente	Here Ser. No. 524/62
Collar Coords 58300M, 49000E	Bab. 594.4"	<u>Grid</u> Nurrembee
<u>Vertical</u>	Beath 50°	Plan Ref.
Pate Sare Compased 7.8,61	Completed 8.8.61	Briller S. Donne
Berg Lessed by G.R. Heath	On 10,8,61	Mrer D. of H.

MANGED To test grewity and magnetic "highe".

#FEREZ: Secomposed motocodiment containing 20-30% martite intersected from 6'-50'.

LAG Comprises Macro and Microscopic goological log

Free	Te	Beseripties SENAILED LOG
•	1.	Light brown sandy lasts.
1.	6'	Pale brown <u>hunter</u> containing 30% 1/150" roundedquarts, and brown limmaite containing 10-20%, 1/200" martite, ands similar proportion of quarts.
6*	50°	Decomposed quarta - martité and gagria - felamor - martite - miss missodiment, containing - Mi overeging 26-36. martite, with a similar properties of quarta, Grain sine 1/80" - 1/200". Rodding usually observe, but where process, it is about 1/16" thick. Itahirite (?) frequents occur from 12'-18'.
\$) '	And of MOLE. Augor stalls (due to harder drilling.

IRON FAPLORATION SECTION

LOS OF AUGER BORE NO. MA 75

Project: Warrantee Aeromagnet	ic Amountly	D.B. 664/61
Sec. 12 Hd. Warrashee	Ca. Le itente	Here Ser.No. 524/62
Cellar Coords 58200N, 49000E	Ral. 597.2	Grid Marranbee
<u>Vertical</u>	Denth 46'	flan kef.
Sate Sere Commenced 8,8,61	Caminted 8.8.61	Briller S. Donne
Bers Leaved by C.R. Heeth	<u>0a</u> 10.8.61	Mirer B. of M.

MARCE: To test "peaks" on gravity and magnetic anomalies.

RESELT: Becomposed metasodiment containing 15-25% martite intersected from 12' - 48'.

LAG Comprises Heere and microscopic geological log.

Free	To	Besori ption BETAILED LOG
. 0	1.	Light brown sondy lane.
1.	6 *	Pale yellow-brown imples containing 30-40%, 1/100" - 1/200" rounded quarts.
6*	12*	Brown limmite containing 20-30% 1/100" mertite and a similar properties of querts.
12*	48*	Red-treum and yellow-brown decomposed <u>marts - felanor</u> - <u>martite</u> metacodimust. Martite context shout 25% mear the top grading to 15% mear the base of the sequence, Quarta 20-70%. Grain size about 1/100°. Bedding generally chacare, but where present, it is 1/16° - 4° thick.
40	•	THE OF HOLE. Anger stells, due to compact, more recistant anterial.

IRON EXPLORATION SECTION

LOG OF ADGER BORE NO. NA 76

Project: Warramboo Aeromagnetic	Anomaly	Dall. 664/61
Sec. 12 Md. Harramboo	Gg. Le Hente	Bere Ser. Ne. 524/62
Celler Coords 58100N, 49000E	Bal. 597.2*	Grid Warrantes
<u>Yertical</u>	Denth 114*	Plan Ref.
Sate Sers Commenced 10.8.61	Campleted 10,6,61	Briller 5. Donne
Bore Lessed by G.R. Heath	On 11.8.61	Wirer B. of H.

The test material adjacent to "peaks" on gravity and magnetic ensembles.

ARRENT: Decomposed metacodiment containing 18% mertite intersected from 108° - 114°

LOS Comprises Hours and microscopic geological log

Free	To.	Secoription SETAILED LOG
•	12.0	Light brown sandy lass.
1.	6°	Falo yellow-brown <u>imphor</u> containing 30% 1/200" rounded quarts and scattered limedite fragments.
6*	12.	Red-brown glar containing abundant (85%) reunded 1/200" quarts grains and limenite grains and medales.
15*	36*	Tellow-trees and red-trees decomposed guarts - felency - mice estandings, from exides should or assessory, grain size 1/160 - 1/200°, Bedding neually less than 1/16° thick, Some limmite steining.
36*	60*	Red-brown and off-white decomposed "granite". Grain sine up to 1/10" bodding observe. Felsper (up to 85%) is the deminent mineral.
60°	106°	Decomposed <u>interediment as 15° - 26°.</u> Mortito up to 5% is rere fragments. Limenite modules shandout below 100°.
100*	114*	Secomposed querts (50%) - <u>martite</u> (15%) - epidete metasodiment ecetaining abundant limmaite medales up to 2" diameter. Grain size 1/250° - 1/500°. (for martite) to 1/50° (for querts). Bodding fairly well defined, about 1/16" thick.
11	14'	EMP OF HOLE (Limit of flights).

IRON EXPLORATION SECTION

LOG OF AUGER BOOK NO. NA TI

<u>Project:</u> Werremboo Aeromagnetic	Anomaly	D.M. 664/61
Sec. 12 Hd. Herrenbee	Çe. Le liante	Bere Ser. No. 524/6
<u>Collar Coords</u> 58000M, 49000E	Bal. 597.2°	Grid Marrames
<u>Vertical</u>	<u>Bepth</u> 114'	Plan Ref.
Date Berg Commenced 10,8,61	Cambrid 10,8,61	Driller S. Denne
Bere lessed by G.R. Heath	92 11.8.61	Mirer D. of M.

MANCE: To test slight "lows" in growity and magnetic "highs".

PERMIT: Decomposed metacediment containing 10% mertite intersected from 102'-108'.

105 Comprises Meere and microscopic geological log.

From	20	Description Description
0	1,	Light brown condy Jaggs.
1*	6*	Fale yellow-brown <u>knaker</u> containing 30% 1/200° rounded querts.
6*	12.	Red-brown glay containing 80% 1/100" - 1/200" rounded quarts and scattered limmate grains and medales.
15*	165.	Ted-brown, yellow-brown and lesser gray-brown decomposed energy - falsons - size metacediness, interbedded with red-brown and off-white decomposed "granitg". Grain size 1/100" - 1/200" (metacediment) and 1/20" ("granite" Bodding generally about 1/10" thick where visible. Martite accessery in most cases, but rare fragments contain up to 2%. Limmite stained and improposed material is fairly ecomon throughout.
102*	196,	Pale greenish-grey decomposed <u>marts</u> (SQL) - <u>martite (19%</u> - epidate (45%) astasediment (af WA 76). Grain sine 1/50° - 1/500°. Bedding chacare. Limenite modules chandent.
106.	314"	Limmite stained and impregnated decopered "granite".
1	14"	END OF HOLE (Links of flights).

TEON EXPLORATION SECTION

LOG OF ADGER BOKE NO. SA 76

<u>Praissi</u> : Warramboo Aeromegnetic	Amenaly	D.N. 664/61
Seg. 12 Hd. Warranbee	Co. Le Heate	Bern Ser. No. 524/62
Callar Goords 57900N, 69000E	Bal. 597.9*	<u>Grid</u> Werrenboo
<u>Yertiesl</u>	Depth 66'	Dan Ref.
Date Bere Commenced 10,8,61	Campleted 11.8.61	Briller S. Donne
Bare Lessed by 6,8, Heath	9 12.8.61	Hirer D. of M.

MESTER: To test material adjacent to "peaks" on gravity and magnetic "highs".

PESILT: Decemposed metacediment containing about 10% martite intersected from 9° - 30°.

LOS Comprises Meere and microscopic geological log

From	20	Description DETAILED LOS
•	1,0	Pole brown sandy lamb.
1.	5°	Light yellow-brown and grey hunker containing 20%, 1/200" rounded quarts, and almor modular chert (fligt).
5 *	9*	Tellow-brown clay containing 60% 1/100" - 1/200" rounded quarts, and feirly chandrat medalar limenite.
9.	30°	Red-brown, yellow-brown and off-white descripted missessed missessed missessed missessed felipser, and 2-155 metits. Grain size mainly 1/200". Redding 1/16" thick.
30'	39*	Decomposed mineralisms, similar to 9' - 30', but making about or escentery.
39*	48*	Red-brows and off-white "grantto", containing quarts, decomposed folepar and lesser adea. Grain size 1/25" - 1/50".
48*	60°	Decomposed ministrations; os 30' - 39'.
60*	66*	Off-white decomposed "grantie", sommuket more limemite imprognated them 39' - 48'.
	66.	END OF HOLE. Auger stalls (don to harder drilling and drog on flights.)

IRON EXPLORATION SECTION

LOG OF AUGER DOES NO. NA 79

<u>freiest</u> : #arramboo Acromagnetic	Asomaly	Ball. 664/61
Sec. 12 Hd. Harrambee	Co. Le Heate	Sere Ser.No. 524/62
Cellar Coords 57000N, 49000E	Ral. 598.6*	Grid Warrenboo
Yertical	<u>Pepth</u> 114*	Man Ref.
Date Bore Commenced 11.8.61	<u>Completed</u> 12.8,61	Driller S. Donne
Rore Leagued by G.R. Heath	On 12.8.61	Birer D. of M.

BARGE: To test "peak" on megnetic enemely associated with gravity "high".

RESELT: Decomposed metasediment containing 16% martite intersected from 160° - 166°.

LANG Comprises Hours and microscopic geological leg.

Pres	76	Onceri ption SETAILED LOG
•	1.	Light bronn sandy lang.
1.	6°	Pale yellow-brown hunker containing 20%, 1/200" rounded querts.
6°	57*	Nod-brown and off-white untiled and luminated decomposed mistadiums. Contains quarts with decomposed felepar and miss. Primary iron exides accessory or absent. Grain sine about 1/100°. Bodding 1/16° - 1/8° thick where visible. Limmite staining and imprognation course intermittently through the sequence.
\$7 °	100*	Off-white decompaced <u>energy - fairner - mice "exemite".</u> Grain size 1/20" - 1/20". If you exides accessely to 1 or 2% (e.g. 70'-90'), Limenite imprognetion occurs from 70' - 50'. Bedding observe.
100*	105°	Pale yellow-brown decomposed querts (40%) - feleper (50%) - merite (10%) missediment. Grein size 1/200°.
105*	114*	Red-brown and off-white decomposed metasodiumst as 6' - 57'

IRON EXPLORATION SECTION

LOG OF AUGER BORE NO. HA GO

<u>Preissi</u> : Warrandoe Aeromognetic	Anomaly	D.B. 664/61
Sec. 12 Md. Herranboe	Co. Le Bente	Bars Sez.No. 00628/6
Collar Coords 57700M, 49000E	Bal. 598.6*	<u>Grid</u> Warrenbee
<u>Yertical</u>	Benth 106'	Plan Ref.
Pate Bers Commaced 12.8.61	Cambeted 12,8,61	Briller S. Soune
Bere Legged by 6,2, Seeth	On 15.8.61	Hirer D. of M.

GRANCE: To test "peaks" on gravity and augustic assumblies

ASSECT: Successed metasodiment, containing 5-10% martite, from 18' - 36' and less than 5% martite from 36' - 108', intersected from 6' - 108'.

106 Comprises Meers and microscopic geological log.

Free	70	Perceription STATUS LOG
•	1.	Light brown sandy leas.
3.	6*	Pelo yellow-brown inning containing 30%, 1/100" rounded querts.
6*	18*	Red-brown, yellow-brown and off-white decomposed quarta- felsper <u>metagodisms</u> , containing escencery markite, and dispersed limmits. Grain size chest 1/50°.
18*	36*	seconposed networdinant, vinilar to 6' - 18', but containing 1-10' primary iron saides.
36'	100'	Off-white with leaser red-brown descripted <u>interedizant</u> ("granite") containing quarts - descripted folioper and 1-26 metits. Grain sine about 1/20" - 1/40". Hedsler and impropositing limmite is frirly abundant, particular towards the base of the sequence.
100*	106,	Secondard quarts-folsper and leaser wice materialismet. similar to 6' - 18'. Marilla measurer to 55.
10	16 *	EMS OF MOLE. (Auger numble to penetrate more recistant material).

Reportment of lines. South Austrolia

INON CAPLCRATION SECTION

LOG OF AUGUE HOME NO. A. SI

Project: Astrashoo Aeromagnetic	Anomaly	2.1. 064/61
Sec. 12 3d. sarramboo	60. Le hunte	Bore Ser. 30. DO 520
Cellar Coords 57600N. 49000M	8.L. 596.6°	Grid varramboo
<u>Verticel</u>	<u>Septh</u> 72°	Plea Ref.
Bate Bore Commenced 12.8.61	Completed 13.6.61	Briller S. Donne
Bore Logged by G.R. Heath	<u>0a</u> 15.8.61	Mirer D. of M.
	and the second s	

<u>OBJECT</u>: To test "peaks" on grevity and magnetic anomalies

RESULT: Decomposed metasediment containing 15% martite intersected from 6' - 45'

LOG Comprises Macro and microscopic geological log

From	To	Seseription SETAILED LOG
9	2.	Light brown sandy leam.
2*	6.	Pale yellow-brown and grey kunker containing 30%, 1/200" rounded quarts.
6°	65*	Yellow-brown and red-brown, with lessor off-white decomposed quartz (35%) - martite (5-60%, averaging 15%) - felapor-wise netwodiment, containing fairly abundant dispersed and modeler limenite. Grain size usually 1/50" - 1/100". Redding obscure.
65°	72*	Decomposed motosediment, similar to 6° - 66°, but only contains accordary martite. Nodelar limento is shundant.
72	•	END OF HOLE. Auger stalls (due to harder drilling and drag on flights).

IRON EXPLORATION SECTION

LOG OF ADGER DORN NO. WA 82

Project: Warranboo Aeromagnetic	Anomaly	D. N. 664/61
Sec. 12 Hd. Harranboe	Co. Le Hante	Bare Ser.No. 00528/6.
Collar Coords 57500M, 49000E	Hale 597.6*	Grid Warrenbes
Yertical	Depth 14°	Plan Ref.
Java Sore Commenced 13.8.61	Completed 18.8.61	Briller S. Senne
Bere Lagged by G.R. Hoeth	92 19.8.62	Mirer D. of M.

MANGED: To test gravity "peak" coinciding with flank of magnetic "high".

BESULD Limmite imprognated overhurden intersected from 6' - 14'.

LOS Comprises Macro and microscopic geological log.

From	To	Reserve to the control of the contro
•	2*	Light brown ready lamb.
2*	6°	Pelo yellow-brown shoot and modeler hunter containing 10-30%, 1/200", remaded quarts.
6*	14*	Yellow-brown and red-brown elay, containing 60%, 1/50" - 1/100" rounded quarts, totally imprognated with secondary silica and limmatte.
1	4*	END OF HALE (The hard and extract for dvill to negativete).

IRON FAPLORATION SECTION

LOG OF AUGUE HORE NO. MA 13

<u>Fraisct</u> : Warramboe Aeremognetic	Aspecly	D.H. 664/61
Sec. 12 iid. Nerremboo	Co. Le liunte	Bers Ser.No. 00528/6.
Collar Coords 57400M, 49000E	Bala 596.6'	Grid Warrandoo
Tertical	<u>Benth</u> 114*	Plan Ref.
Date Bare Commenced 18.8.61	Completed 18,8,61	Briller 5. Donne
Bara Lasted by G.R. Heath	Qn 19.8,61	Hrer D. of K.

SAMEGE: To test flanks of gravity and magnetic assembles

Decempsed metasediment intersected from 10'-114' (1-2% Martite 66'-70', up to 5% mertite 78' - 114').

LOE Comprises Heere and microscopic geological leg

From	70	Description DESAILED LOG
• •	1.	Light brown sandy least.
1.	6*	Pale yellow-brown <u>lumber</u> grading to enlearesum. 1/200" rounded quarts sandstone.
6*	10°	Yellow-brown stiff alm containing 60%, 1/200" rounded querts.
10*	42*	Off-white, with irregular red-terms limmite staining, decomposed quarts (30:) - feliper - mice "granite". Grain size about 1/25", no visible structure.
42 °	66.	Off-white "granite" (so 10'-42') interhedded with yellow-brown quarta-felaper-mion indistinctly laminated notacediment (so primary into axides). Grein size 1/80" - 1/100", Limmite steining and improportion occur throughout.
66*	70'	Granitized setungeliment on 42' - 66', but containing
70'	78*	Off-shite "granita" on 10' - 42'
78*	114*	Fale yellow-brown to pale khaki decomposed biotite (naually 50-70%), - quarts (20-50%) - feloper mintediams. <u>Negtite negally short 1%</u> but up to 6% in rare frequents. A few off-white quarts-feloper frequents suggest slight grantitication. Grain size 1/50" - 1/100". Structure checure.
114	! •	FROM OF HOLE (limit of machine).

IRON EXPLORATION SECTION

LOG OF ADGER NORE NO. NA 84

is Anomaly	Balle 664/61
Co. Le Bente	Bere Ser. No. 00639/62
Lel. 596.7*	Stid Narramboo
Beath 114'	Plan Ref.
Completed 19.8.61	Briller S. Donne
<u>9a</u> 21.8.61	Mese D. of H.
	Co. Le Hente Rel. 596.7° Repth 114° Completed 19.8,61

To test slight "low" in gravity enemaly associated with flank of magnetic anomaly.

Personal Recomposed metasediment (no iron exides) intersected from 15° - 114°.

LAN Comprises Macro and microscopic geological log

Free	To .	Boseription SCIATLED LOG
•	2•	Light broom sandy land.
3*	6*	Pale yellow-house delearment querts gand containing scattered hunter modules.
6°	15*	Red-brown stiff <u>also</u> containing TEX 1/100" - 1/200" remaded quarts.
15*	34.	Light yellow-brown <u>decomposed metacodiment</u> containing 30% 1/25" quarts, 70% elsy (decomposed mice and felsper). Some limenite staining.
24.	<i>10</i> °	Management restance in colour, similar to 15' - 24' but red-brown and off-white in colour, and containing 40% quartz. Node 1/8" - 1/32" thick.
60*	79°	Yellow-hroum <u>sutgendiment</u> , similar to 15' - 24', but containing 10-20% recognisable blotite.
76*	114*	Light groy-green and off-white descripted granitized querts (45%) - Motite (25%) - felaper (20%) metacodizant. Grain size 1/10" - 1/100" senally 1/50". Redding cheenre (almost biotite rich "granite"). Primary iron exides accessory or absent.
114	! •	END OF MALE (limit of machine).

IRON EXPLORATION SECTION

LOS OF AUGER HORE NO. WA BE

<u>Project</u> : Warranboo Aeromegnetic	Amemaly	Pall. 664/61	
Sec. 12 Hd. Warranboe	Se. Le Bunte	Bere Ser. No. 00639/6	
Cellar Coords. 57200N, 49000E	Bale 594.6*	Grid Werremboo	
<u>Vertical</u>	Benth 67'	Plan Ref.	
Date Bare Commenced 19/8/61	<u>Completed</u> 19/8/61	Driller S. Deame	
Bere Lagged by 6 .R. Heath	9a 21/8/61	Hirer D. of M.	

MANGET: To test gravity and magnetic assumbles

Processed metasediments (negligible from exides) intersected from 12° - 67°.

LAG Comprises Meere and microscopic geological log.

Fren	To	Bestription BETAILED LOG
9.	1.	Light yellow-brown sandy lagu-
1.0	6*	Light yellow-brown calcardons quartz gami containing modular kunkar.
6*	12*	Red-brown alay containing 86% 1/156" rounded quarts.
12*	30*	<pre>tod-brown and off-white mettled decomposed quarts (40%) - flaky elsy (decomposed felaper and mice, 60%) anisondiams, Grain size 1/80°.</pre>
30*	35°	Off-white "granite". Similar to 12"-30", but mo: visible structure.
35*	42°	Secomposed material ment, as 12' - 20'.
42*	66*	Off-white "granite" (decomposed) as 30'-35'. Frimary iron exides seessery.
66°	72*	Red-brown decomposed <u>patacodiumni</u> , similar to 12° - 30°, but grein sine 1/20° and structure shours.
72.	77*	Off-white decomposed "granite", similar to 30'-35', grain size 1/25".
77*	87 *	Pale grey-green and leaser off-white granitized quarts (60%) - Metite (25%) - felsper (15%) meiacodismi, Grain sine 1/25" - 1/50", Redding 1/16" thick, indistinct,
81	, •	END OF HOLE. (Augor stalls due to hard drilling and drag on flights).

Tee hard for Auger to penetrate.

IRON EXPLORATION SECTION

LOG OF AUGER BORE NO. NA SG

<u>Project</u> : Werrembee Aeromagneti	c Amendy	Ball. 664/61
Sec. 12 Hd. Warrenboo	Ce. Lo imute	Bers Serale. D0639/
Callar Coords. 57100N, 49000E	Bake. 597.4*	Grid Warrandoo
<u>Vertical</u>	Depth 84*	Plan Ref.
Rate Bara Commenced 21.8,61	Completed 21.8.61	Driller S. Donne
here Lesses by G.R. Heath	21.8.61	Mrsr D. of M.

OBJECT: To test slight "low" in gravity enough excessisted with flank of magnetic "high".

BESULT: Becomposed metacodiment intersected from 6° - 84° (2-5% martite from 36° - 42°).

LAS Comprises Macro and microscopic geological log

-		
Free	7e	Description SKINILED LOG
•	2.	Light yellow-brown sandy learn.
2*	6.	Falo yellow-brown calcareous quart's gand containing scattered modules of rather frishle instant.
6*	33*	Red-brown, yellow-brown and off-white mettled and indistinctly luminated quarts (40%50%) - algg (decomposed felapar and miss, 50-60%) metacodiment, Grain sine 1/20" - 1/50".
23.	36*	Off-white decomposed "granite". Grain size 1/25", no visible structure.
36*	42*	Decomposed and calcite impregnated quarts (1/80" - 1/100", 30%) - martite (2-8%) - falsper - mica metacodiment. Forms hard resistant layer.
42*	75'	Red-brown and off-white decomposed <u>materediment</u> , similar to 6' - 33'. Bedding indistinct, 1/10" - 1/20" thick.
75°	90'	Off-white decompared "granita" on 35' - 36'.
80"	84"	Recommend unterediment on 42' - 75'.
8	6°	END OF HOLE. (Auger stalls due to increasingly resistant material and dres on flights).

IRON EXPLORATION SECTION

LOG OF AUGER BOKE NO. WA 87

Project: Warranhoo Aeromagaetic	Anomaly	D.B. 664/61
See. 12 Ed. Nerremboe	Sea Le liante	Sare Ser. No. 00539/6:
Coller Coords 57000M, 49000E	£4L. 600.0°	Grid Narrashoo
Tertical	Death 84'	Plan Ref.
Sale Sare Communed 21.8,61	Camplesed 24.8.61	Beiller S. Sonne
Bore Laured by G.R. Heath	On 26.8.61	Mirer D. of M.

28.ECT: To test slight "low" is gravity enough adjacent to magnetic "high"

EFFE.7: Granitised metasediment containing loss than 2% martite intersected from 12' - 84'.

LAS Comprises Neare and microscopic geological log

	يزيون يصبون بالماروق	
Free	70	Desertation OCINILID LOG
•	2*	Light yellow-brown games lass.
2*	6°	Pale yelloubroum shoot and medulor hunter, in a condy also matrix. Number contains 45% 1/200" recorded querts.
6°	12*	Yollow-brown and red-brown stiff also containing 75% 1/150" counted species.
12*	18.	Red-brown, off-white and yellow-brown decomposed silice and limenite stained and imprognated "granite". Contain 60% 1/25" quarts, with alay (decomposed felsion) and lose than 1% martite.
18*	24*	Brown decomposed quarta (SOS) - martite (25) - feloper - mice materialisms. Grain sino 1/26 - 1/80 . Structure chooses.
24*	60'	Red-brown and off-white landmated and mattled decomposed quarts 40-50% - follows - sice metapolimes. Contains less than 15 martile. Grain sine shout 1/25" - 1/50". Landman (where visible) about 1/20" thick.
60*	.64*	Off-white decomposed "granite". Contains short 50% quarts with feleper and lesser mice. Grain size 1/15". <u>Martile shount</u> or rare accessory. No visible structure.
6	4*	END OF HOLE (Auger stalls due to increasingly resistant material and drag on flights).

IRON EXPLORATION SECTION

LOG OF DIAMOND DETLL HOLE NO. HD 1

Project: Warramboo Aeromegnetic Anomaly D.H. 664/61

Sec. 24 Hd. Warrambee Co. Le Hunte Bere Ser.Ne. DO 3/62

Collar Coords. 58400N. 67150E R.L. 451.2° Grid Warrentoe

Vertical 400* Bentk Plea Ref.

Date Bere Commenced 28.6.61 Completed 12.7.61 Briller G.Speldewin

OBJECT: To test at depth itahirite intersected on magnetic "high" by MR 2

HELL: Iron formation intersected from 66° - 116.5°. 189.5° - 195°.

203' - 220' and 255.3' - 240'.

Comprises Moore and microscopic geological log

Magnetic Log Summery Log

Core Recovery and Condition

Description Free 70 STIMOUT LOG Continued from Mt. 2 standiment (itahirite is part) containing 10-75% everaging 30% magnetite-martite, with quarts, orthoglass, biotite and variable garmet and opidate. 68* 116.5 116.5' 109.5' Irregularly granitised metacodiment (veried from uneltered metacodiment to "granite"), "Pounds-district" (amphibole metacodiment) 139.7° - 140.7°. Notacediment (usually semsuhet granitised), Nagmetite rich 100.5° - 195° (196) 189.5' 260' (30K) 8' - 220' 6' - 196,5' Amphibolo rick 194'

Granitised metacodiment grading to "granite" Amphibole rick 365' - 366' " 359' - 350.3' 309.7"

389.7' 400' Homogeneous amphibele metacediment.

BIAMOND SRILL HOLE WD 1 (Contd.)

DETAILED LOG - CONTINUED FROM WE 2

	AND THE PROPERTY OF THE PROPER	
Fres	To	Description
68°	93 *	Martite-magnetite <u>itabirite</u> containing irregular blobe and lenses of metacomatically introduced (7) pink orthoclase (crystals up to %"). Composition about: 50-65% quarts-felsper, 0-20% average 5-10% biotite. 15-70% average 30-40% martite-magnetite, very rare garnet and epidete. Grain size 1/20"-1/50". Beds (due to mineral segregation) 1/10"-1" thick. Attitude 40° to core axis at 40° 60° " 72° 55° " " 78° 55° " " 96° 46° " " 99°
93.	97 •	Martito-anguetite <u>itabirite</u> , similar to 68'-93', but containing 10-20% hodded seamment decomposed epidete. Attitude 55° to core axis at 97'.
97*	101*	Martite-angustite <u>ilabirite</u> , finor grained than 68'-97' (1/50"-1/100"). Contains 30-78% averaging 40-56% martite-angustite, 5-10% pelo pink garnet, 40-55% quarts with minor orthoclase. Regular hedding 1" - 1/20" thick. Attitude 45°-50° to core axis at 96'.
101*	111.	Quartu-blotite-martite-magnetite garnet missediment, containing irrogular bods, lonces and masses of up to it erystals of messematic quartu-orthoclass and revely blotite, which may obliterate bodding (e.g. 107'-100'). Notacodiment, 1/50"-1/100" graims, quarta 70%, garnet 10%, blotite 10%, martite-magnetite 10%, Sodding similar to itabirite. Attitude 50" to core and at 104'. " 50"-65" " " " 110".
111*	116.5*	Heintediment as 161'-111', but containing loss motocomtic querts-orthoclase and rare %" epidate masses in dislocated areas (e.g. 114'). Attitude 55° to core axis at 112' 115'
116.5*	118.5*	Very hard quarts (SEK) - Metite (18K) <u>metacodiment</u> with rare epidete and pyrite. Seeding etc. as itabirite
118,5*	127.7*	Querts-biotite-germet metasodiment, similar to 111'-116.5' but containing less than 5% augmetite-carrite. Grein size 1/20"-1/50". Attitude 600-660 to core exis at 120'.
127.7°	139.7*	Greattic metassimms. 1/30°-k" bods of quarts, orthoclass and hiotite. Grain size uniformly 1/16°. Gernet and iron exides are rare accessories. Zig-Keg (possibly on ochelon) folding (1° amplitude and nevelength) is common throughout the sequence. Attitude 30° (grammated) to come arise at 130°

DETAILED LOG - CONTINUED FROM HE 2

AND THE PERSON NAMED IN COLUMN		
From	Te	Description
139.7'	140.7'	Dark grey 1/50" - 1/100" quartz-felspar (white) - biotite rock, containing amphibole (?) and minor magnetite. This rock is metasedimentary, but looks like a fine grained disrite. Attitude 459 to core axis at 140°.
140.7*	172.3*	Granitic melasediment as 127.7° - 139.7°, but angens of quarts-orthoclase are more common, and hedding in places (e.g. 164.5°) is obliterated, giving a classic quarts-orthoclase-hiotite granite. Brug folding is common (east limb anticlime, e.g. 158°). Gross bedding (?) is present at 157°, suggesting heds are everturned. Garnet and megaetite are only present in the least altered metacodiment. Attitude 66°(?) to core axis at 141°. 50° 146°. 50° 155°. 50° 155°. 50° 155°. 50° 160° 155°. 50° 160° 160° 160°. 50° 160° 160°. 50° 160° 160°. 50° 160° 170°.
172,8*	162.5*	Fine grained (1/50") minardimat containing numerous voin of pure white quarts up to 1" thick. These are most unmerous near 176". Grain sine is unimly less than 1/50 in unaltered areas. Book contains quarts, epidete, bietite and miner unquetite (less than 1%). At 173", a breediated none contains;" epidete crystels and masses of fibrous serpentime (possibly after amphibole). From 173.5" - 175", rock is very homogeneous dark grey. Gernet and metacomatic quarts-orthoclass are irregular constituents. Attitude 45°-50° to core axis at 177". " 70° " " 170° " " 170°
182.5	183,5°	Unaltered quarts-felsper-biotite missediment similar to 111 * - 116.5".
183.5*	109,5*	Strongly notacometiced quartu-felapor-biotic metacoliment. Solding severely conterted or childrented. Neck contains more than SOS orthoclass. Attitude 65-70° to core mis at 190°.
187.5*	196*	Extractional containing 25% germet, 15% magnetite, 20% chlorite, 10% Metite, 36% quarts. Metacomatic quarts, and to a lesser extent orthoclase, come as irregular masses through the sequence. Spidete is an irregular minor constituent. Attitude 650-760 to core axis at 190°.

DIABOND REILL ROLE 40 1 (Could.)

DETAILED LOG - CONTINUED FROM WR 2

CANADA CONTRACTOR OF THE PARTY	i kontroli della parte della menta parte della	
From	To.	Description
195°	196*	Quartz-feisper-bietite <u>metasediment</u> as 182.5° - 183.5°. Bedding 55° - 60° to core axis at 195°.
196*	196.5*	Quartz-epidete- <u>ambibele rack</u> containing miner magnetite. Grain size about 1/20°. Ambibele is dark green and irregularly oriented (bermblende or actinolite ?).
196.5°	203 °	Quarts-felsper-bietite <u>aminediment</u> containing minor magnetite and accessory epidete. Contains irregular quarts and quarts-orthoclase masses, similar to 111'-116.5'. Attitude 66°-70°(?) to core axis at 200'. 55°-66° " " 202'.
263*	229*	Querts (40%) - <u>magnetite</u> (losser martite) (30%) - garnet (15%) - hietite (15%) <u>mainediment</u> similar to 189,5° - 196°. Hegnetite content up to 50% for short (less than 6°) sequences. Grain size 1/50° - 1/200°. Metasomatic querts-orthoclase (up to %° crystals) is a minor constituent, but occurs throughout the sequence. Pyrit is occusionally shandout in joint planes. Attitude 50° to core axis at 205°. " 50°-65° " " 210°. " 66° to " " 215°. " 50° " " " " 220°.
220°	244*	Querts-bietite meiacediment, with fairly chandent (40%) antacomatic quarts-orthoclase present as irregular hode and dispersed musees. Grain size 1/20" - 1/50", heds somelly less them is thick. Attitude 45°-40° to core axis at 225°. 50° " 220°. 50° " 220°. 35°-40° " " 240°.
244*	250*	Pine grained (1/50" - 1/105") "granite" (quartz-biotite mittedings) coupletely impregnated with erthoclass, bedding virtually obliterated). Here grains of garnet cour in the least altered pertions.
250*	254,2*	Quarts-bietite <u>setacodismnt</u> with minor garnet and metacometic quarts-orthoglass similar to 220°-244°. Attitude 46° to core axis at 250°.
254.2"	265.3*	Fine grained "granite" as 244'-250'. Attitude 66° to sere unis at 225'.
256.3*	260*	Querts (25%) - <u>magnetite</u> (46%) - garnet (20%) - hietite (15%) <u>maintailment</u> . Grain sine unifermly 1/100°. Bedding net well defined. Quarts-ertheelase rare, Reds less than h" thick. Attitude 66° to core axis at 260°.

DIAMOND DETLL HOLE TO 1 (Centd.)

DETAILED LOG - CONTINUED FROM WH 2

from	To	Description
260°	305*	Quartz-pingicclase-biotite matanadiment, with abundant quartz-orthoclase in most places. Bedding generally obscure, giving classic looking "granites" and "granodicrites". Some plagioclase (e.g. 304°) shows prominent multiple twinning. Grain size 1/50" - 1/10". Attitude 55° to core exis at 265° 45° " " 270° 50° " " 275° 46° -60° " " 280° 45° -60° " " 296° 30° -66° " " 296° 50° -66° " " 306° 50° -66° " " 306°
305*	306*	Greenisk grey querts-bietite-ganhibele rock. Contains minor magnetite. Grain size 1/20".
306*	329*	"Granite" and "gramedierite" type materediments as 240- 305". Attitude 45°-50° to core axis at 310° 40° " " " 315° 40° " " " 320° 1 40° " " " 325°
329*	336,3*	Quartz-bietite (60%) - emphibele metasediment. Grain size 1/50". Bedding about 1/8" thick. Attitude 30° to core exis at 330".
330.3*	365'	"Grandierite" type <u>maiacadiment</u> similar to 260'-305'. Attitude 35° to core exis at 336' 40° " " 346' 55° " " 356' 40° " " 355°
355*	357 °	Biotite-sambibele extendedment, Grain size 1/20". Redding generally poorly defined.
367 *	389.7*	"Grenodierite" and leaser "greatte" type netasodiments similar to 260'-305'. Redding generally conterted and frequently eblicated. Grain size 1/20" - 1/50". Attitude 50° to core axis at 360' " 36°-40° " " 376' " 40° " " 375' " 40° " " 386'
389.7*	400°	Quertu-plagicelase-biotite-amphibelo <u>uniacadintal</u> , very uniform appearance throughout. Grain size unially about 1/30". Node semouhat irregular, everage 1/16" thick. Attitude 45° to core axis at 300° " 35° " " " 305° " 50° " " " 400°
4	60.	end of hole.

COME RECOVERY

From	To	Recovery	Condition		To	Recovery	Condition
68*	75.3	6.31	Feir - Good		335 •	2.2*	Fair - Broken
75.3*	65*	3.9	Broken	335	341 *	3.4*	Fair
85*	88•	1.8*	Fair	341.	351 •	9.0*	
88*	97 •	3.7*	Fair	351 *	369 *	5.5*	ent. Fair
97.	98.3	1.0*	Fair - Good	359 *		9.5	Excellent
98.3	161*	2.2*	Srekon		379.80		
101.	106*		Excellent				ont,
105*	110*	4.6*	Good - Excellent	379.8	307.8	8.6*	Good
116.	117.5	6.0*				4.2*	
117.5°	122.5*	4.5	Excellent - Fair	395.3	400"	5.6*	, **
122.5	132,8*	10.0	Excellent				
132.8"	136,3*	3.5	•	400	. es	-	•
136,3°	142.8*	6.4*	•	400		NO OF HOL	F
142.8*	152.8*	9.6	•				
152.8°	155.3*	2.4	#				
155.3'	162.5	7.7.	**				
		10.0*		Total		294.31	73.6%
		9.9*		-			
			Execulent - Fair				
		1.6°					
192,5'		8.8°					
		70	Maria - Soud				
	212*		Fair - Good				
	222*		Broken - Fels				
	227	- - -					
	232*		Pair - Good				
	242'	9,8*					
	251.7	9.4"	Excellent				
251.7		0.4°	Cool				
	262*	9.5	Broken & Feir				
	272.	9.9*	Execulent				
	279.3°	7.1					
279.3°		2.5	Excellent				
	292°	9.7*	*				
	361.8'	8.8*	*		•		
301.8'		2,3*					
	310.8.	6.3*	*				
	OCE 319.8°	70 8.3°	AX Excellent				

MAGNETIC LOG

CHARLES AND THE CONTRACTOR					
At	Deflection	At	Deflection	At	Deflection
69 '	90+*	180'	50	230	10°
70.5	90+°	190*	5*	232	5•
75*	90°	191	45°	235	5-*
76*	90+*	191.3	90-0	240	100
85°	90+°	191.6*	90°	250	5_0
90°	90+8	192*	100	255	90+ ⁶
95,51	36°	192.3	15*	256*	904e
98*	90+*	193	90-0	256*	90+0
99.5	90°	195*	900	259	90+°
101.	90°	196*	20°	260*	100
101.5	90+*	197.5	15-20 ⁶	265	00
106'	90°	198.5*	100	300°	0°
107 °s	960	200.5	19 ⁶	306*	5°
110.	99-	201.7	15°	310*	60
112*	150	262,5'	50	312*	150
113*	15*	203,5°	700	329.	15*
115.	10-°	204.5'	900	330'	19°
116*	90-0	205'	904 ⁰	362*	50
118°	10°	206,5"	90+8	353*	5*
120°	100	200*	90+8	250.	0.0
125°	50	209*	701°	380'	•
130°	go	210.	90.0	310'	•
135'	••	211.	90°	400'	00
140*	15°	212*	90-0		
162*	5°	213°	90- [©]		
171*	5.0	214°	900	400	END OF HOLE
172.6"	5*	215*	90°		
173.5	30°	216*	90-		ļ
174.3*	26 ⁶	218*	900	5]
175*	30°	220*	100	Š	1
175.5*	36 ⁶	223*	50		
177*	5°	225*	0.		
	, ·	- '		•	•

Descriment of Mines. South Australia IRON EXPLORATION SECTION

LOG OF DIAMOND DETLE HOLE NO. NO 2

Praisc: Warrambee Aeromagnetic Anomaly D.N. 664/61 Sec. 25 Hd. Warrenhoe Co. Le impte Bore Ser.Ne. 00 7/6 Celler Coords 55250N, 58000E Bala 525.9° Grid Warremboo Vertical Depth 928' Flan Ref. Date Sere Commerced 19.7.61 <u>Completed</u> 29.8.61 Priller 6. Spelden Bore Legged by 6.2. Heath € 24.7.61 to 7.9.61 Airer D. of H.

SELECT: To test meterial producing gravity and magnetic "highs" below MR 13.

AMERIC: Iron formation intersected from 247 '-686'.

105 Comprises Meere and microscopic geological log

Remnery Log Megnetic Log

Core Recovery and Condition. Inclination of Hole.

From	To	Deceription SUMMET LOS
		CONTINUED FROM HR 13
196*	194.8*	"Greatte" as 193' - 197' in th 13.
196.60	196*	Quartz-epidoto-biotito antocodiment.
196°	204,5"	"Granite" as 196" - 196.8".
204.5*	222.	Grazitised metasediment.
232*	243,9*	"Granito" similar to 196' - 196.8', but containing abandont garnet perphysoblacts
243.91	247*	Granitised metasediment, dislocated near the base.
241*	886*	Iron formation. Notacediment containing 10-20% namelly 15-20% negactite and loss commonly mertite. Other anjer constituents quartm, estheolose, plagicelase, histite, garnet, epidote and sillimentte. Encludes a thin amphibolite sequence (872.5° - 876.1°). Granitisation occurs throughout the sequence.
864*	928*	Severely grazitised granitic metasediment.

CONTINUED FROM HE 13 (197°)

From	To	Description DETAILED LOG
196°	196.8°	"Granite" as 193' - 197' in WR 13.
196.8*	196*	Grey quartz (30%) - epidete (46%) - bietite (25%) <u>melasediment</u> , Grein size about 1/30", very uniform appearance throughout. Felsper and amphibole are minor constituents. Bedding, frequently ebscure, less than §" thick. Attitude 45° ? to core axis at 197.5°.
198*	204.5*	Fink "granite" similar to 196° - 196.8°, with small remnant patches of relatively smaltered metasediment. Contains about 60% orthoclase, 35% quarts, 5% biotite, but presented variations occur throughout the sequence (regions of almost pure quarts or orthoclase). Grain size about 1/16°. Reliet metasediment is similar to 196.8° v 196°. Attitude 45° to core axis at 200°.
204.5*	207.5*	Grey and pick semember granitised, fairly uniform looking metacodiment. Consists of alternating bods (1/16" - K thick) of 1/50" quartz (50%) - hiotite (50%) and 1/15" quartz (50%) - orthoclase (50%). Pyrite and epidote are accessory constituents. Bodding well defined but semawhat contarted. Attitude 45° (?) to core axis at 205°.
299,5*	219,5*	Granitized metasadiment, Generally similar to 204" - 209.5", but more strongly altered, end hedding more distorted. A 3" band of almost pure quarts is present at 216", and perphyroblasts of garnet (up to %" diameter form about 5% of the rock from 217" - 218". Attitude 55°7 to core exis at 210". 40° " " " 211". 40° " " " 215".
219.6*	224.2*	Very homogenoous tough (sub-conchoidel fracture) granities melanatiment. About sems degree of granitisation as 204° - 207.8°, but quarts-orthoeless uniformly spread through the rock. Contains 70-75% quarts, 15-20% orthoeless, 10% blotite with accessory pyrite and magnetite. Redding generally obscure, but where present it is usually shout 1/8" thick. Attitude 66° to core axis at 220°.
224,2*	232.	Fairly severely granitised quarte-hietite <u>uniasediment</u> similar to 20%,5° - 21%,5°. Pyrite and magnetite occur as accessories throughout, while garnet (usually less then 1/10° erystals) is a miner constituent from 225,5° to 226,5°. Bedding uninly conterted or checure. Attitude 0° to core axis at 225°. 350° " " " 226°. 45° " " " 230°.
232*	243.9°	Pink "granite" containing reliet metasodiment, similar to 196° - 204.5° but containing garnet crystals from 232° - 241°. This garnet is most shundant from 239° - 240.5° where it is present as perphyrehlasts (perfect rheshie dedocahedrone) up to 1/4° diameter forming 10-20% of the rock. Grain size is variable, but generally 1/10° - 1/20°. Bedding obscure and conterted.

~2·

From	To	Oescription ONTAILED LOG
243.91	245°	Fairly severely granitised metasediment as 209.5° - 219.5 Attitude 55° - 66° to core axis at 245°.
2 45 °	247 *	Severely dislocated and discordantly granitised zone. Consists of clots and veins of hierite-magnetite irregularly distributed through a mass of up to 3/4" dismeter orthoclase crystals. Magnetite forms 15-20% of the rock. Quartz, epidote and pyrite are minor accessories.
247 •	884*	Low grade iron formation. With the exception of a thin amphibolite sequence, the unit consists of granitised

Low grade iron formation. With the exception of a thin amphibolite sequence, the unit consists of granitised quarts-orthoglase-magnetite-martite-blotite-garnet-opidate-sillimenite metasodiment.

Quartz is invariably present in the motasediment, as well as forming voins in some of the more severely granitised areas. Unless etherwise mentioned, white felsper (usually plagicelase) is estimated with quartz, as they are practically indistinguishable using the equipment available. In a few cases, plagicelase shows preminent multiple twinning, and the mineral is estimate separately in those cases.

Orthoclase

Plogicciese, like querts, occurs throughout the sequence. In the least affected metacediment, it is finely dispersed through the rock, but in the severely granitised areas it forms discordant messes of up to 1" dismoter crystals.

Primary iron emides occur in most units of the sequence. As far as can be determined, magnetite is the deminant species, but a few aggregates of non-magnetic octahedra (martite) occur.

Garnet and biotite are almost abiquitous, but revely become unjor seastituents. Cornet is usually present as 1/100" - 1/200" perfect risuble deducabedre.

Sillimenite is a fairly common constituent, usually occurring in fairly pure laminos up to 1/10" thick.

Epidoto is present as dispersed crystals in some metasediment hode, and also occurs as messes up to 3/4" disaster in some dislocated areas. The colour in these messes varies from dirty red-brown to greyish green.

Pyrite, calcite, tremplite, serpostine and green amphibele are rare accessories, or only occur ever short seasoness.

Grain size is very consistent throughout the sequence. Garnet and iron exides usually $1/100^{\circ}-1/250^{\circ}$ diameter, extended on arts-orthoclase $1/20^{\circ}-1^{\circ}$ diameter. Other minerals are usually intermediate in size between these extremes.

Bedding is fairly well defined in all but the most granitised areas. Beds are usually less than 1/8" thick, and ere usually lenticular in nature. Folding is much less common than in WD 1, but some drag folds (e.g. west limb anticline (?) at 210") to occur.

Fres	70	Description DETATLED LOG
247 *	886° (centd.)	The sequence consists of the following units:
247 *	247.4*	Very slightly concerdantly to discordantly granitised quarts (30%) - ertheclase (15%) - magnetite (50%) - biotite (5%) wastasediment.
247.4*	247.7*	Moderately severely, to severely discordantly granitised querts (25-30%) - orthoclase (40%) - magnetite martite (10-15%) - bietite (20%) - metasediment. Bedding obliterated. Orthoclase cryatals up to 1/2" diameter.
247.7*	2 49 *	Slightly to moderately, dominantly concerdently granitised quarts (30%) - orthoclase (35%) - magnetite, martite (25%) - hietite (10%) metasediment. Bedding slightly conterted.
249*	250*	Nederately to severely concordantly to discordantly granitised quarts (50%) - orthoclase (35%) - martite, magnetite (5%), biotite (10%) metasodiment, Attitude 40 - 50 to core axis at 250°.
250*	250.4*	Slightly to understely, dominantly consordantly granitised quarta (35%) - orthoclase (35%) - magnetite (10-15%) - biotite (10%) - garnet (5-16%) metasodiment.
250,4*	251.7*	Slightly to moderately discordantly and concordently granitised quarts (35-40%) - orthoclase (36%) - megaetite (15-20%) - hietite (16%) metasediment.
251.7*	252.2*	Hederately to severely concerdantly gramitised quarts (35%) - ertheclase (45%) - megaetite (5-16%) - hietite (5-16%) garnet (5%) metasediment.
262.2*	252.7*	Severely encoordantly to deminantly discordantly granitised quarts (30%) - orthoclase (56%) - megnetite (5%) - biotite (5%) - garnet (5%) metasediment.
252.7°	263.1*	Slightly to understely concerdently granitized quarts (30%) - orthoclase (30%) - magnetite (20-26%) - biotite (10%) - gernet (5-10%) metacodiment.
253.1*	255.5*	Slightly to moderately discordantly granitised quarts (60-65%) - orthoclase (30%) - magnetite (5-16%) metacodiment with accessory garnet and hietite. Very hard with sub-conchoidal fracture. Attitude 50° to core axis at 255°.
255.5	258.5°	Slightly concerdantly granitised quartz (45%) - erthoclase (25%) - megnetite (5%) - bietite (16%) - garnet (5%) - sillimmite (16%) metasediment.
258,5*	260,7*	Nederately, to dominantly strengly discordantly granitised quarts (40%) - orthoclase (30%) - megaetite (10%) - bietite (10%) - gernet (5%) antesediment. Attitude 60° to core unis at 260°.
260.7*	262*	Severely discordantly granitised quarts (60%) - orthoclase (20%) - plagicelase (15%) - magnetite (5%) metacediment. "Quartzitie" looking with sub-completed fracture.
262*	262,3*	Severely disconcerdently granitised quarts (35-40%) - erthoclase (45%) - biotite (10%) - germet (5-10%) metasediment.

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From	To	Description OFTAILLD LOG
262,3*	263,2*	Moderately concordently and lesser discordantly granitises quartz (20%) - orthoclase (40%) - magnetite (10%) - biotite (5%) - gernet (5%) - opidate (20%) metasediment.
263,2*	264.5*	Severely discordantly gramitised quartz (S5%) - orthoclass (30%) - plagieclase (20%) - biotite (10%) - epidote (5%) metasediment.
264.5*	264.8*	Slightly to moderately concordantly granitised quartz (40%) - orthoglase (30%) - magnetite (25%) - garnet (5%, metasediment.
264.8*	266,2	Mederately to severely discordantly and lesser concordant; granitized quartz (30-35%) - orthoclase (40%) - magnetite (10%) - biotite (10%) - garnet (5-10%) motescident. Attitude 150-200 to core axis at 265%.
266.2*	266.7*	Severely discordantly granitised quartz (25%) - orthoclass (45-50%) - magnetite (5-10%) - bistite (10%) - garnet (5%) metasediment.
266.7*	268.1*	Slightly concordantly granitised quartz (40%) - magnetite (5%) - orthoclase (30%) - biotite (5%) - garnet (15%) - epidote (5%) metasediment.
268,1*	268.6*	Very slightly concordently gramitised quarts (35%) - erthoclase (16%) - magnetite (25%) - hietite (30%) metasediment.
268,6*	269.2*	Moderately to strongly discordantly granitised quarts (20% - orthoclase (60%) - megnetite (5%) - bietite (5%) - garnet (5%) - opidate (5%) metasediment. Orthoclase crystals 1/4" diameter.
269.2*	269.4*	Slightly concerdently granitised quarts (30%) - orthoclass (10%) - magnetite (20%) - garnet (20%) \(\tau \) opidete (20%) metasediment, Garnet and magnetite concentrated is alternate 1/10° bods,
269.4*	269.8*	Severely discordantly granitised quarts (15%) - orthoclass (60%) - megaetite (16%) - garnet (15%) metasodiment.
269.8*	279.2*	Mederately to severely concerdently granitised quartz (15% - orthoclase (45%) - magnetite (15%) - biotite (10%) - garnet (10%) - opidete (5%) metasediment with accessory sillimenite. Attitude 45°-60° (conterted) to sere axis at 270°.
270.2*	270.3*	Slightly to moderately concordantly and lesser discordantly granitised querts (45%) - orthoclase (5%) - magnetite (50%) metasediment with accessory epidete and bietite. Vein quarts common.
270.3*	273.3*	Slightly to understely concordantly granitised quartz (30%) - orthoclase (30%) - magnetite (5%) - garnet (5%) - epidete (30%) metasediment showing minor ptygmetic folding.
273.3*	273.5*	Very slightly concordantly granitised quartz (35%) - orthoclase (5%) - magnetite (60%) metasediment.

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Fres.		Description DETAILED LOG
273.6*	27 4. 6°	Nederately to severely concordantly and lesser discordant. granitised quarts (35%) - orthoclase (40%) - biotite (10 - garnet (5%) - epidete (10%) metasediment, showing mine ptygmetic folding.
274.6*	275.4*	Slightly concerdently granitised quarts (15%) - erthoclass (5%) - magnetite (66%) - garnet (10%) - epidete (10%) metasediment. Very homogeneous appearance. Attitude 60-65° to core axis at 275°.
275.4*	275.7*	Mederately to severely concerdantly granitised quartz (25) - orthoclase (30%) - megnetite (10-15%) - bietite (10-15%) epidete (20%) metasodiment
275.7°	276.7*	Slightly discordantly and concordantly granitized quarts (30%) - orthoclase (20%) - magnetite (5-10%) - biotite (10%) - garnet (5-10%) - epidete (25%) metasediment,
276.7*	277.1*	Slightly concerdantly and discordantly granitised quarts (30%) - orthoclase (15%) - megnetite (10-15%) - hietite (5-10%) - garnet (10%) - sillimente (10%) - opidete (15 metasediment.
277.1*	277.6*	Slightly to understely concerdently gresitized quarts (20% - orthoclase (35%) - magnetite (20%) - biotite (5-10%) - garnet (10%) - epidete (5-10%) unterediment.
277.6°	279.4*	Noderately concerdently granitised quartz (25%) - erthoclase (30-35%) - magnetite (25%) - bietite (5-10%) - garnet (10%) metocodiment.
279.4*	279.9*	Moderately concerdently and discordently granitized quarts (40%) - orthoclase (30%) - magnetite (10%) - Motite (10%) metasodiment, with accessory garnet.
219.9*	281.6*	Slightly to understely concerdently and lesser discordantly granitized quarts (40%) - orthoclase (36%) - magnetite (8%) - blotite (5%) - garnet (5%) - opidate (10%) metacodiment. Hard compact rock with sub-concludal fracture. Attitude 55° to core axis at 360°.
281.8*	243.5*	Hederately to severely discordently and concordently granttised querts (20%) - orthoclase (45%) - magnetite (5%) - bietite (10%) - garnet (5%) - epidete (10%) metacodiment. Contains one 1/2" bed or concordent voing of pure quarts.
263,5*	284,0*	Moderately concordantly granitised quartz (25%) - orthoclas (25%) - magnetite (16%) - garnet (16%) - hietite (16%) - epidote (26%) metacodimout.
284.0*	286,9*	Moderately consordently and discordently granitized quarts (20%) - orthoclase (35%) - magnetite (8%) - hietite (15%) - garnet (8%) - opidate (20%) astocodiment. Hemogeneous appearance, hedding observe.
286,9*	267.6*	Very slightly concordantly granitised quarts (19%) - extheologe (5%) - segmetite sertite (75%) - biotite (5%) metasediment, very homogeneous appearance.
267,6*	289.3'	Severely discordantly granitized quarts (30%) - orthoclass (30%) - magnetite (showing well developed sultiple twinning, 20%) - epidote (20%) metasediment.

Fron	To	Description DETAILED LOG
289,3*	290.7	Very severely discordantly granitised (completely dislocated) metusediment consisting of up to 1/2" clots of quartz (40%), orthoclase (20%), magnetite (10%), biotite (5%), garnet (5%) and epidete (20%). Attitude 30°-35° to core axis at 291°.
290.7°	291.8*	Moderately to severely concerdently and losser discordantly granitised querts (20%) - erthoclase (40%) - magnetite (15%) - garact (5%) - epidote (20%) metacodiment.
291.8*	293.3*	Slightly concordantly granitised quartz (80%) - orthoclass (5-10%) - magnetite (5-10%) - opidate (5%) metacodiment. "Quartzitic" texture, hadding chacure.
293.3*	294,2*	Severely discordantly granitised (simust completely dislocated) metasodiment consisting of up to 1/4" eletam of quartz (35%), erthoclase (35%), magnetite (5-10%) and epidote (20-25%) erystels.
294,2	296.0*	Noderately concerdently and discordently granitised quarts (40%) - orthoclase (35%) - megastite (10%) - biotite (10%) - garnet (10%) - epidete (5%) autacediment. Attitude 35°-40° to core axis at 295°.
296*	296,8*	Slightly to moderately discordently and concerdently granitised quarts (30%) - extheolese (40%) - magnetite (20%) - garnet (10%) metasediment. Redding somewhat contexted.
296.8*	297,5*	Slightly concerdently granitized quarts (40%) - orthoglass (25%) - magnetite (15%) - histite (10%) - garnet (10%) antesediment.
297.5*	297.7*	Very slightly consordently granitised quarts (45%) - erthoclase (26%) - magnetite (15-26%) - biotite (5%) - gernet (5-10%) - sillimenite (5%) metacodiment.
297.7*	299,2*	Slightly to understely conserdently and discordently granitised quarts (25%) - orthoclase (36%) - augmetite (15-20%) - hietite (5%) - gernet (15-20%) - epidate (5%) metacodiumnt. Bodding semmant distorted.
299,2*	299.5*	Severely conserdently granitized querts (30%) - orthoclase (45-50%) - magnetite (10%) - biotite (5-10%) - garnet (5%) autosodiumnt.
299.5*	300,7*	Mederately to severely conservently granitized metasodiment consisting of alternating hode of quarts (40%) - martite (60%) and quarts (20%) - extheologe (25%) - magnetite (25%) - hietite (5%) - garnet (15%) . Bedding somewhat contexted. Attitude 40^{9} - 45^{9} to core axis at 369° .
300.91	301.2*	Slightly concerdantly granitised quarts (35%) - orthoclass (15%) - magnetite (15%) - hietite (16%) - garnet (15%) - sillimenite (16%) metacodiment,
301,2*	302.1	Moderately concerdently and discordantly granitized quartz (30%) - ertheclase (30%) - magnetite (20%) - hietite (10%) - garnet (10%) metacediment.

Fren	To	Description DETAILED LOG
302,1*	302.5*	Severely discordantly granitised quartz (20%) - ertheclase (55%) - magnetite (5%) - garnet (5%) - epidete (15%) metasediment.
302,5*	304. 6°	Mederately concerdently granitised quarts (30%) - ertheclase (20%) - ungmetite (20%) - hietite (5%) - germet (20%) - sillimenite (5%) metasediment.
304.8*	305.9*	Severely discerdently granitised quarts (35%) - erthoclass (40%) - magnetite (15%) - bietite (5%) - epidote (5%) metasediment. Attitude 45°-50° to core axis at 306°.
305.9*	306.9*	Mederately concordantly and lesser discordantly granitised quarts (20%) - orthoclase (35%) - magnetite (20-25%) - biotite (10-15%) - garnet (10%) metasediment.
306.9*	307.1*	Severely discordently granitised quarts (25%) - ertheclass (45%) - magnetite (15-20%) - bietite (5-10%) - garnet (5%) metasediment.
367.1°	306.5*	Slightly concerdently gramitised quartm (25%) - orthoclase (20-25%) - magnetite (15%) - hietite (5%) - gurnet (15%) - sillimumite (5%) - epidete (10-15%) metasediment.
308.5'	307'	Slightly concordantly graniticed quarts (40%) - orthoclass (15%) - magnetite (5-10%) - Metite (20%) - garnet (5-10%) - tremplite (10%) metacediment.
309*	307.3*	Moderately consordently and discordently granitized quarts (36%) - orthoclase (36%) - magnetite (16%) - biotite (20%) - garnet (5%) - opidete (5%) metacodiment.
307.31	307.4*	Severely discordantly granitised quartz (45-50%) - erthoclase (20%) - magnetite (less than 5%) - epidete (20%) metacodiment.
301.4*	314*	Slightly to moderately concordently and revely, discordent granitised quarts (36%) - orthoclase (25-36%) - augustit (15%) - biotite (5-16%) - garnet (16%) - opidate (16%) motocodiment, with accessory silliments in scattered lamines. Attitude 55°-66° to core axis at 310°.
314*	315.2°	Mederately discordantly granitized quarts (20%) - orthoclase (40%) - augustite (20%) - Metite (10%) - garnet (5%) - opidate (5%) autosodiamat. Attitude 55° to core axis at 315°.
315.2*	316,7*	Slightly concordantly and discordantly granitized quarts (36%) - orthoclass (20%) - augmetite (10%) - biotite (10%) - garact (10%) - opidate (15%) metasodiment. Gentains one 1" sillimente rick bod.
316.7*	317.2*	Very slightly concerdently granitised quarts (26-30%) - extheciase (10%) - magnetite (20%) - hietite (15%) - garnet (5-10%) - epidete (20%) antecediment.
317.2*	319.7*	Slightly to understely discordantly to concerdently granitised querts (25%) - ertheclase (25%) - magnetite (10%) - biotite (5%) - garnet (15%) - sillimenite (20%)

metasediment,

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From	Te	Description OFTAILED LOG
319.7°	320*	Severely discordantly granitised quarts (20%) ertheclase (56%) megaetite (10%) bietite (5%) garnet (5%) epidete (5%) metasediment. Attitude 46°? to core axis at 320°.
320*	321*	Moderately discordustly and concordantly granitised quarts (25-30°) - orthoclase (30%) - magnetite (15%) - bietite (5-16%) - garnet (16%) - epidete (10%) metacodiment.
321	326.5*	Mederately to severely discordantly and lesser concerdantly granitised quarts (20-25%) - erthoclase (40%) - magnetite (10%) - biotite (15%) - garnet (5-10%) - epidete (5%) metasediment. Attitude 45° to core exis at 325°.
326.5*	329.1°	Moderately to severely discordantly granitised quarts (25%) - orthoclase (50%) - magnetite (5%) - gernet (5%) - opidate (15%) metasediment, with accessory bistite.
329.1*	331.4*	Slightly to moderately discordantly and lesser concerdantly grantized quarts (45%) - extheolate (20%) - magnetite (20-25%) - biotite (5%) - garnet (less than 5%) - epidete (5%) anterediment. Attitude 55° to core axis at 330°.
331.4*	332.4*	Severely discordently granitised quarts (20%) - orthoclass (50%) - augmetite (10%) - biotite (5%) - sillimenite (15%) autosediamet.
332.6'	333.6*	Nederately discordantly granitised quarts (35-40%) - orthoglass (25%) - augustite (35-40%) antesediment.
333,8°	334.8'	Very slightly concerdently granitised quarts (50%) - magnetite (40%) - biotite (10%) antecediamet. Very homogeneous appearance.
334.6*	336,3*	Moderately/to severaly discondently granitised quarts (36%) - orthoglase (46%) - augustite (5%) - garnet (5%) - sillimente (15%) metasediamet. Attitude 66° to sero unis at 336°.
336.3*	336°	Slightly discordantly and concerdently granitized quarts (40%) - orthoglase (15%) - magnetite (10-15%) - biotite (5-10%) - garget (5%) - sillimmite (20%) metacodiment.
336*	336,4°	Severgly discordantly graniticed quarts (18%) - orthoclass (46%) - magnetite (8%) - garnet (8%) - opidate (8%) - sillinemite (8%) notesediment.
338,4*	344'	Slightly to mederately commordantly and leaser discordantly granitiond quarts (30-36%) - estheologe (25%) - megaetite (10%) - hietite (5-16%) - gasmet (10%) - sillimenite (15%) getacodiment. Attitude 50°-56° to core sais at 340°.
344*	345,1*	Nederately to severely discerdantly granitised quarts (35%) - orthoclase (45%) - magnetite (5%) - garact (5%) - opidate (5%) - sillinamite (15%) untesediment. Attitude 60° to core axis at 345°.

From	To	Description DETAILED LOG
345.1*	346.7°	Slightly concordantly granitised quertz (40%) - orthoclase (10%) - magnetite (5%) - hiotite (15%) - garnet (10%) - sillimanite (20%) metasediment.
346.7°	347.1°	Mederately to severely discordantly gramitized quartz (15%) - orthoclase (35-40°) - magnetite (10%) - biotite (10-15%) - garnet (5%) - sillimenite (20%) metacodiment.
347.1*	349.6*	Slightly to moderately concordantly and lesser discordantly granitised quartz (30%) - orthoclase (20-25%) - magnetit (25%) - biotite (5%) - garnet (10-15%) - sillimenite (5% metasodiment.
349.6*	349.9*	Mederately to severely concordantly and discordantly granitised quarts (15%) - ertheologe (35%) - magnetite (15%) - garnet (16%) - biotite (16%) - sillimentte (15%) metasodiment.
349.9*	362.7*	Slightly concordantly and discordantly granitized quarts (25-30%) - orthoclase (25%) - magnetite (10-15%) - biotite (10%) - garnet (5%) - sillimanite (20%) metacodiment. Attitude 45°-50° to core axis at 350°.
352.7*	353*	Severely concerdently and discordently granitised quarts (20%) - orthoclase (60%) - magnetite (5%) - epidete (5%) - sillinguite (10%) metasodiment.
353*	365.5*	Slightly concerdantly and discordently granitised quarts (35%) - orthoglase (15%) - magnetite (16%) - garnet (16%) - bietite (15%) - sillimente (15%) metacodiment. Attitude 66°-66° to core amis at 355°.
365,5	355,6*	Severely discordantly granitised quarts (20%) - exthesisse (80%) - biotite - megmetite (both miner) metasodiment.
355.8*	358.7*	Slightly concerdantly granitised quarts (40%) - extinciose (15%) - amquetite (20%) - bietite ((10%) - garnet (5%) - sillimunite (10%) metacedimunt.
364,7*	369.7*	Slightly to understely consordantly granitized quarts (25%) - orthoglase (30%) - augustite (10%) - biotite (5%) - garnet (10%) - sillimonite (20%) actusediment.
357.7*	361.3*	Moderately concerdently and discordently granitized quarts (30%) - orthogram (30%) - magnetite (10%) - hietite (5%) - parmet (8%) - sillimenite (10%) metasodiment.
361.3*	362.7*	Attitude 40° to core axis at 360°. Slightly concerdently granitised quarts (40%) - erthoclase (20%) - magnetite (5%) - bietite (15%) - garnet (5-10%) - sillimente (10-15%) metacediment.
362.7*	363.1*	Severely discordently and concordently granitised quarts (20%) - orthoglass (55%) - magnetite (5-10%) - hietite (5%) - garnet (5-10%) - sillimente (5%) setasodiment.
363.1	366*	Slightly to moderately discordantly and lesser concerdently granitised quarts (25%) - orthoclase (36%) - augmetite (15%) - hiotite (5%) - gernet (16%) - sillimenite (15%) metasediment. Attitude 45° to core axis at 365°.

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from	To	Description DETAILED LOG
381.9*	382,2*	Severely discordently granitised quartz (20%) - erthoclase (50%) - megnetite (10%) - bietite (5%) - garnet (5%) - sillimenite (10%) metasediment.
362.2*	363,5°	Slightly to understely concordantly granitised quarts (40%) - orthoclase (25%) - unquetite (15%) - bietite (5%) - garnet (5%) - sillimenite (10%) metasediment.
363.5*	365.3*	Slightly concordantly granitised quarts (66%) - ertheclase (10%) - megmetite (10%) - bietite (5%) - garnet (5%) - gillimanite (5%) metasediment. Attitude 45° to core axis at 366°.
365.3*	366,2*	Slightly to moderately concordantly and rerely discordantly granitised querts (45%) - orthoclase (15%) - magnetite (10%) - biotite (10%) - garnet (15%) - sillimenite (5%) motocodiment.
388.2*	389.8*	Nederately concordantly and discordantly granitised quartz (35%) - orthoclase (25%) - magnetite (10%) - hietite (15% - garnet (5%) - epidote (10%) motocodiment containing accessory sillimenite.
309,6*	390.1*	Nederately concordently granitised quarts (40%) - erthoclase (30%) - magnetite (10%) - biotite (10%) - sillimenite (10%) metacodiment containing accessory garnet. Attitude 45°; to core axis at 390°.
390.1*	392.8*	Slightly concordently and varely discordently granitised quarts (40%) - orthoclass (20%) - magnetite (20%) - biotite (5%) - garnet (5%) setseedlment.
392,8*	393,2*	Nederately to severely esseerdantly and discordantly gran- itized quarta (20%) - estheelase (50%) - magnetite (15%) biotite (10%) - garnet (5%) metasedimmet.
393,2*	394,5*	Slightly concerdently granitised quarts (60%) - orthoclase (15%) - magnetite (15%) - hietite (5°) - garnet (5%) metacodiment.
394.5'	394,9*	Moderately to severely discordantly granitised quarts (SGK) - erthoclase (SGK) - anguetite (10%) - garnet (SS) metasediment.
394.9*	395.5*	Slightly concerdently granitized quartz (50%) - orthoclase (10%) - magnetite (20%) - biotite (10%) - gernet (10%) metacodiment. Attitude 45° to core sais at 395°,
375 ,5°	396.01	Severely discordantly granitised quarts (25%) - orthoclass (40%) - magnetite (5%) - biotite (5%) - garnet (5%) metasodiment.
396,0"	397.7*	Slightly concerdently granitised quarts (60%) - ertheelase (10%) magnetite (10-15%) - bietite (5-10%) - garnet (5%) - sillimente (5%) metasediment,
397.7*	400*	Moderately concerdantly gramitised quartz (35-40%) - ertheclase (40%) - magnetite (5-10%) - bistite (5%) - garnet (5%) - sillimenite (5%) metacodiment. Attitude 66° to core axis at 400°.

From	To	Description DETAILED LOG
400°	400.7°	Slightly concordantly granitized quarts (5%) - orthoclase (15%) - magnetite (10%) - biotite (10%) - garnet (5%) - sillimenite (10%) motesediment.
400.7*	402 °	Slightly concordantly granitised quartz (20%) - orthoclase (10%) - magnetite (25%) - green bietite-chlorite (10%) - garnet (5%) - epidete (30%) matesediment.
402 •	403.7*	Slightly concordantly granitised quartz (40%) - orthoclase (15%) - magnetite (15%) - garnet (10%) - sillimenite (20%) metasediment.
403.7*	404.1*	Mederately to severely discordantly granitised quarts (20%) - orthoclase (45%) - magnetite (10%) - biotite (5%) - sillimunite (15%) - epidete (5%) motosodiment.
404.1*	406.7*	Nederately concordantly granitised quarts (20%) - orthoclase (30%) - magnetite (20%) - hietite (5%) - garnet (10%) - silliminite (15%) metasodiment. Attitude 45°-50° to core axis at 465°.
405.7*	406.3*	Moderately to severely concordantly granitised quarts (20%) - orthoclase (40%) - magnetite (15%) - biotite (5%) - garnet (5%) - epidete (16%) metacodiment.
405.3*	467.11	Slightly to understely concordantly and rarely discordantly granitised quarts (35-40%) - orthoclase (20%) - augmetite (20-25%) - hietite (10%) - garnet (5%) - opidete (5%) metacodismut.
407.1*	409.1*	Moderately concerdently and leaser discordantly granitised quartz (35%) - orthoclase (35%) - magnetite (10%) - bietite (15%) - germet (5%) metasodiment.
409.1*	407.8*	Slightly concerdently granitised quarts (45%) - orthoclase (20%) - magnetite (10%) - biotite (5%) - garnet (15%) - epidete (5%) metasediment.
407.8*	411'	Moderately to severely discordantly granitised quarts (30%) orthoclase (50%) - magnetite (20%) metacodiment. Attitude 45° to core anie at 410°.
411*	411.4*	Slightly concordently and discordently gramitized quartz (38%) - orthoclase (18%) - magnetite (30%) - biotite (5%) - garnet (8%) - opidate (16%) metasodiment.
411.4*	412.2*	Nederately to severely concordantly and discordantly granitized quarts (25%) - orthoclase (40%) - magnetite (10%) - biotite (10%) - garnet (10%) - opidate (8%) materediment,
412.2*	413.1*	Slightly concordantly and lesser discordantly granitised quarts (5%) - orthoclase (20%) - augmetite (15%) - biotite (5%) - garnet (5%) metacodiment.
413.1*	413.4*	Noderately to severely concordantly and discordently granitised quarts (35%) - erthoclase (40%) - megnetite (15%) - hietite (5%) - garnet (5%) metacediment.
413.4*	413.7°	Very slightly granitised quarts (55%) - orthoclase fdispersed, 10%) - megnetite (15%) - bietite (5%) - garnet (15%) metasediment.

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From	TO	Description DETAILED LOG
413.7*	415.5*	Noderately to severely discordantly and concordantly granitised quarts (40%) - orthoclase (40%) - magnetite (10%) - biotite (5%) - garnet (5%) metasediment. Attitude 35°-40° to core axis at 416°.
415.5*	418.2*	Nederately concerdantly and lesser discordantly granitised quarts (30%) - orthoclase (40%) - magnetite (15%) - biotite (10%) - garnet (5%) metasediment.
416.2*	419*	Severely concordantly and discordantly granitised quartz (25%) - ertheclase (55%) - magnetite (10%) - bietite (5% - garnet (5%) metacodiment.
419*	419.5*	Slightly to moderately concordently greatised quarts (30% - erthoclase (25%) - magnetite (26%) - biotite (10%) - garnet (15%) motasediment.
419.5*	422.1*	Noderately to severely discordently and losser concerdently granitised quartz (25%) - orthoclase (40-45%) - magnetite (5-10%) - biotite (10%) - garnet (15%) metasediment. Attitude 50° to core axis at 420°.
422,1*	423.1*	Slightly to understely concerdently and miner discordently granitised quarts (40%) - erthoclase (30%) - unquetite (18%) - biotite (10%) - garnet (5%) untacediment.
423,1"	425*	Severely concordantly and discordantly greatised quarts (26-40%) - orthoclase (50%) - anguetite (10-15%) artesediment, Attitude 400-45° to core axis at 425°.
425°	427.2*	Moderately esacordantly and discordantly granitized quarts (20%) - orthoclase (40%) - amgnetite (20%) - biotite (10%) - garnet (5%) antecodiment.
427.2*	427.8*	Severely discordantly granitised quarts (40-45%) - magnetite (5-16%) - orthoclase (50%) metacodiment.
427.8*	429,5°	Nederately concordently and losser discordantly granitised querts (30%) - orthoclase (20%) - ampactite (15%) - biotite (5%) - plagicalsee (20%) metacodiment.
429,5*	430,2*	Severely discordantly grantised quarts (25%) - orthoclass (55-66%) - magnetite (10%) - Metite (5-10%) setasediment Attitude 55e to core axis at 430°.
430.2*	431,2*	Slightly to understely concerdently granitised quarts (50%) - orthoclase (30%) - augmetite (18%) - hietite (5%) untasediment,
41.2 *	436*	Severely discordently granitised (completely dislocated) peterediment containing irregular masses of quarts (30%) - magnetite (15%) - opidate (25%) arystals. Attitude 60°: to core unis at 436.5°.
436*	439.1*	Moderately concerdently and discordently granitised quarts (35/40%) - orthoclase (30%) - magnet to (15%) - hietite (5-10%) - garnet (10%) metacodiment.
439,1*	440.5°	Severely discordently granitised quartz (30%) - orthoclase (50%) - megmetite (5%) - garact (5%) - epidete (10%) metacediment. Attitude 40° to core axis at 440°.

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Fros	To	Description DETAILED LOG
440.5°	442.2*	Slightly concordently granitised quartz (45%) - orthoclass (20%) - magnetite (5%) - biotite (15%) - sillimenite (15%) metasediment.
442.2*	442.7*	Slightly concordantly and discordantly granitized quartz (30%) - orthoglase (20%) - magnetite (35-40%) - garnet (5-10%) - epidete (5%) metasediment.
442.7*	443,6*	Moderately to severely discordantly granitised quartz (30%) - orthoclass (45%) - magnetite (10%) - bietite (5%) - epidote (10%) metasediment.
443.4*	448,1*	Moderately discordantly granitised querts (35%) - orthoclase (45%) - augmetite (15%) - biotite (5%) metasediment. Attitude 40° to core axis at 444°.
448.1*	449,6*	Slightly to moderately concerdently and lesser discordant! granitised quarts (50%) - orthoclase (20%) - magnetite (15%) - biotite (16%) - garnet (5%) metasediment.
449.6*	450. 5°	Severely discordantly gramitised quartz (25%) - orthoclass (1/8" - 1/4" crystals, 65%) - magnetite (5%) - garnet (5%) notasediment. Attitude 45° to core axis at 451°.
450.5*	45 1.2*	Slightly concerdently granitised quarts (45%) - orthoclass (25%) - magnetite (10%) - hietite (15%) - garnet (5%) metacodismat,
451,2*	453.9*	Moderately to severely discordantly and lesser concerdent! granitised quarts (25%) - orthoclase (26%) - hietite (26%) - magnetite (16%) - garnet (16%) metacodiment.
463.1*	454.6°	Slightly to understely concerdently granitised quarts (45) - erthoclase (20%) - magnetite (20%) - hietite (15%) met sediment with georgeory gurnet. Attitude 45°-50° to core axis at 455°.
454.6*	456*	Moderately to severely discordantly gramitised quarts (36) - erthoclase (45%) - magnetite (15%) - biotite (5%) - epidete (5%) metasodiment.
456*	460,3	Slightly to moderately concerdently and leaser discordent! granitised quarts (48%) - orthoclase (18%) - magnetite (38%) - bietite (8%) - garnet (8%) metasodiment. Attitude 45°-50° to core axis at 460°.
460.3*	463,1*	Slightly to moderately concordantly and discordantly granitised quarts (50%) - orthoglass (20%) - magnetite (10%) - histite (10%) - garnet (5%) motocodiment.
463.1*	464.6*	Noderately to severely discordantly and concerdantly granitised quarts (40%) - orthoclase (35-40%) - ampactite (30-25%) motocodimum.
461.6*	465.6*	Moderately concerdently and discordently granitised quarts (45%) - orthoclase (36%) - magnetite (16%) - hiotite (15%) metasodiment. Attitude 25°(?) to core exis at 465°.
465.6*	466, 2'	Nederately concordently granitised quarts (35%) - orthoclase (30%) - magnetite (15%) - hietite (20%) metesediment.

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7702	To	General Ption DETAILED LOG
466,2*	467.1	Mederately to severely concordantly and leaser discordantly granitised quartz (30%) - orthoclase (45%) - magnetite (5-10%) - biotite (15-20%) metasediment.
467.1*	470.9*	Slightly to moderately concerdently and lesser discordantly granitised quarts (40-45%) - orthoclase (25-36%) - magnetite (15-20%) - biotite (10-15%) metasediment. Attitude 40° to core axis at 470°.
479.9*	475.2°	Nederately concordantly and discordantly granitized quartz (30%) - orthoclase (40%) - magnetite (15%) - biotite (5%) - garnet (10%) metasediment. Attitude 55° to core axis at 474°. 30° " " 475°.
475.2"	417.4*	Mederately to severely discordently granitised quarts (15% - orthoclase (mass of 1/4" crystals, 50%) - magnetite (20%) - hietite (8%) - opidate (10%) metasediment.
477.4*	480,2*	Noderately discordantly and lesser concerdantly granitised quarts (30-35%) - orthoclase (25-36%) - magnetite (25%) - biotite (15%) metacodiment with accessory garnet. Attitude 450-500 to core axis at 480°.
480,2*	461*	Severely discordantly granitised quarts (20%) - orthoclase (70%) - magnetite (8%) - blotite (8%) metasedismut.
481*	483,7*	Nederately concordantly and revoly discordantly granitised quarts (35-46%) - orthoclase (35%) - magnetite (20-25%) - biotite (5%) notocodiment.
463.7*	484.7°	Slightly to moderately concordently granitized quarts (40%) - orthoclase (30%) - magnetite (20-25%) - bietite (5-14%) metacodiment.
484.7*	491.	Mederately concordently and discordently granitized quarts (50%) - orthoclase (36%) - magnetite (18%) - biotite (5%) metacediment. Attitude 50° to core axis at 455°. 45° " " " 496°.
491*	493.5°	Slightly concordently granitised quarts (40%) - orthoclass (25%) - magnetite (10%) - blotite (10-15%) - opidate (10-15%) metasodismet.
493.5*	496*	Severely discordantly granitised quarta (30%) - orthoclase (60%) - magnetite (10%) metasodiment. Attitude 50° to core axis at 495'.
496*	502.5*	Moderately concordantly and discordantly granitised quarts (30%) - orthoclase (30%) - megmetite (20%) - biotite (15%) - garnet (5%) metasediment. Attitude 50 -55° to core axis at 500°.
502.5*	509.7*	Mederately concordently and losser discordently granitised quarts (30%) - orthoclase (30%) - magnetite (25-30%) - Medite (10-15%) metasediment containing accessory garnet. Attitude 55° to core axis at 506°.

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Fron	To.	Description DETAILED LOG
508.7*	509.5*	Slightly to moderately concerdantly and lesser discordant; granitised quartz (35-40%) - ertheclase (25-30%) - magnetite (15-20%) - bietite (10-15%) - garnet (5%) metasediment.
509.5*	210.	Slightly concordantly granitised quartz (45%) - orthoclass (5%) - magnetite (40%) - opidate (10%) matasediment. Attitude 55° to core axis at 510°.
510*	511.	Slightly to moderately concordantly and lesser discordantly granitised quarts (40%) - orthoclase (25%) - magnetite (15%) - biotite (15%) - opidate (5%) metasediment.
511*	511.4*	Moderately concordently and discordently granitised quarts (30%) - orthoclase (36%) - magnetite (20%) - biotite (10%) - sillimentte (5%) metasediment.
511.4*	514.8*	Nederately concerdently and revely discordently granitised quarts (30%) - orthoclase (25%) - magnetite (15%) - hietite (5%) - epidete (25%).
514.6*	515.3*	Slightly concordently granitised quarts (35%) - arthoclass (25%) - megnetite (15%) - biotite (16%) - sillimenite (15%) metasediment. Attitude 40° to core axis at 515°.
515,3°	515.8*	Moderately irregularly discordantly granitised quarts (30% - orthoclass (36%) - megastite (25%) - bistite (10%) untesediment.
515.6°	517.5*	Nederately to severely disconductly and losser concerdently grantitised quarts, (20%) - orthoglase (45%) - assertite (20%) - biotite (5%) - opidate (5%) asterodiment,
517.5*	218.	Moderately discordantly and concertantly granitised quartz (25%) - orthoclase (25%) - negretite (15%) - Metite (16 - garnet (5%) antecediment.
218.	519,3*	Severely discordantly graniticed quarts (20%) - erthoclase (45%) - asquetite (8%) - garnet (5%) - sillimumite (8%) meteodiumst.
519.3"	522°	Slightly to moderately concerdently granitieed quarts (25%) - erthoclase (25%) - magnetite (15%) - Metite (15%) - epidete (16%) - ejlimenite (16%) metacediment, Attitude 45%-45% to core anis at 520°.
522 *	522.6*	Slightly ecoesticatly granitized quarts (50%) - orthoclase (5%) - asymptite (30-26%) - garnet (10-15%) metacodiment. Yery beauguments appearance.
522.6*	523,6*	Severely discordantly granitised quarts (20%) - erthoclase (40%) - magnetite (10%) - epidete (5%) metasediment. Contains erthoclase crystals up to 1/2" diameter.
523,6°	526.7°	Mederately to severely concerdently and discordently granitised quarts (25%) - orthoclase (45%) - magnetite (18%) - histite (10%) - germet (8%) metacodiment.

From	To	Description ORTAILED LOG
526.7 •	529.2*	Slightly concerdently and discordently granitised quartz (30%) - orthoclase (20%) - magnetite (15%) - bietite (10%) - garnet (10%) - sillimenite (15%) metusediment.
529.2°	530,5*	Mederately concordantly and discordantly granitised quart: (35%) - orthoclase (25%) - megactite (20%) - biotite (5%) - garnet (10%) - sillimente (5%) metasediment. Attitude 55° (?) to core axis at 530°.
5 30. 5°	531.3*	Mederately to severely finely discordantly granitized quarts (30%) - ertheclase (45%) % megnetite (10%) - epidete (10%) - garnet (5%) metasediment.
531,3*	532.4*	Noderetely discordantly and concordantly granitized quarts (25%) - orthoclase (20%) - magnetite (20%) - bistite (5% - garnet (10%) - epidete (10%) - dillimente (10%) ustasediment. Sillimente occurs in relatively pure, less than 1/20° lenticles.
532,4"	533*	Moderately concordently and discordently granitised quarts (35%) - orthoclase (25%) - histite (15%) - megnetite (15 - opidate (16%) metamodiment.
533*	534,4*	Moderately to severely concerdantly gramitized quartz (20% - orthoclase (50%) - megnetite (5-10%) - biotite (10%) - germet (5%) - sillimonite (5-10°) metacodiment.
534.4*	536.2*	Moderately concerdently granitized quarts (25%) - orthoclase (25%) - magnetite (16%) - Metite (15%) - garact (16%) - sillimatite (15%) metacodiment. Attitude 55° to core axis at 535°.
536, 2*	534,6*	Slightly to understely concerdently gramitized quartz (45% - orthoclase (20%) - augustite (10%) - histite (8%) - garnet (8%) - silliaumite (15%) unterediment.
538,6'	540, 2*	Moderately concerdantly and locaer discordently granitised quarts (26%) - extheclase (26%) - magnetite (5%) - bietite (10%) - gurnet (10°) - sillimenite (5%) metacodiment. Attitude 60° to core amis at 540°.
540,2*	541,4*	Moderately to severely concerdently and losser discordantly granitised quarts (26%) - extinclese (46%) - magnetite (15%) - Metite (5%) - epidate (10%) materialment.
541.4°	543.9*	Moderately discordently and concordently granitized quartz (20%) - orthoclase (20%) - megastite (10%) - Metite (5%) - garnet (5%) - opidate (20%) - sillimenite (20%) metacodiment.
543.9*	544.9*	Slightly to moderately concerdently and lesser discordantly granitised quarts (38%) - orthoclase (20%) - augment to (30%) - histite (8%) - garnet (5%) - sillinemite (5%) metacodiment.
544.9*	545.3*	Severely discordantly granitised quarts (25%) - ertheclase (60%) - magnetite (8%) - sillimosite (16%) meteodiment. Attitude 60° to core axis at 545°.

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fres	To	Description DETAILED LOG
545.3°	546,1*	Slightly concordantly granitised quartz (55%) - orthoclase (10%) - magnetite (35%) metasediment containing accessory sillimenite.
546.1°	546,6°	Moderately to severely discerdantly and concerdantly granitised quarts (15%) - ertheclase (45%) - magnetite (20%) - biotite (10%) - garnet (10%) metasediment.
546.6*	547.3*	Slightly to moderately concordantly granitised quarts (30% - orthoclase (25%) - magnetite (10%) - biotite (15%) - garnet (5%) - sillimenite (15%) motacediment.
547.3*	547.9*	Mederately to severely concordantly and lesser discordantly granitised quarts (20%) - orthoclase (45%) - magnetite (15%) - hietite (5%) - garnet (15%) metasediment.
547.9°	550,3°	Moderately consordently and discordantly granitised quarts (25%) - erthoclase (40%) - magnetite (10-15%) - hietite (5-10%) - garnet (5%) - sillimenite (10%) metasediment. Attitude 45° to core axis at 550°.
560.31	551.1*	Slightly to understely concordantly and discordantly granitised quarts (25%) - orthoclase (15%) - magnetite (50%) - hietite (10%) metacodiment.
551.1*	\$52,1°	Moderately concerdently and discordantly granitised quarts (30%) — orthoclase (40%) — megastite (15%) — bietite (15% metasodiment.
562.1*	553,5*	Slightly to understely concerdantly and losser discordantly granitised quarts (30%) - orthoclass (20%) - histite (15%) - unquetite (15%) - gernet (5%) - opidate (10%) - sillimanite (5%) metacodiment.
563,5*	555.3*	Slightly consordatly and recely discordantly granitised quarts (36-40%) - orthoclase (20%) - magnetite (18%) - hietite (10%) - opidate (16*) - sillimenite (5-10%) metacodiment. Attitude 55° to core sais at 555°.
555.3'	554.3*	Severaly discordantly granitised quartz (20%) - ertheclass (60%) - magnetite (15%) - garnet (8%) metasediment,
556,3°	558,2*	Moderately to severely concerdently and losser discordantly granitised quarts (15-20%) - orthoclase (45%) - negmetite (15%) - hietite (5%) - garnet (10%) - sillimanite (5-10%) metacediment.
558,2*	557,2*	Severely concerdently and lesser discordantly granitised quartz (10°) - orthoclase (55%) - magnetite (20%) - biotite (5%) - garnet (10%) metasediment.
589, 2*	560,3*	Moderately to severely concerdently and discordently granitised quarts (20%) - erthoclase (40%) - megnetite (20-20%) - biotite (less than 8%) - sellimente (10%) metacodiment. Attitude 45° to core exis at 560°.
560.3*	560.6°	Severely concerdently and discordantly granitized quarts (46%) - orthoclase (15%) - megnetite (10%) - biotite (5%, - opidate (5%) motasediment)

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Frea	Te	Description DETAILED LOG
560.6*	562.6*	Mederately discordently granitised quarts (35%) - orthoclase (35%) - magnetite (20%) - sillimanite (10%) metasediment.
562.6*	564.5*	Slightly to moderately concordantly and discordantly granitised quartx (20%) - orthoclase (20%) - magnetite (15%) - garnet (5%) - opidate (30%) - sillimenite (10%) matasediment.
564.5°	567.9*	Moderately to severely discordantly and lesser concordantly granitised quarts (10%) - orthoclase (30%) - augmentite (35%) - bietite (5%) - garmet (10%) - epidete (10%) metasediment. Attitude 55° to core axis at 566°.
567.9*	569.5*	Slightly concordently granitised quarts (25%) - orthoclass (26%) - magnetite (25%) - hietite (5%) - garnet (15%) - epidete (16%) metasodiment.
569.5*	570.2*	Moderately discordantly and concordantly granitized quarts (30%) - orthoclase (30%) - magnetite (10%) - bietite (5% - opidate (10%) - sillimmaite (10%) notacediment, Attitude 45° to core axis at 870°.
570,2*	572*	Slightly concerdantly granitised quartz (26%) - orthoclass (26%) - amonotite (46%) - opidate (16%) antesediment.
672*	672.5*	Breccisted none. Crystals:of green amphibele and blobs of beautite - bistite up to 1" diameter in a groundmass of calcite (one clear vein).
572.5°	576.1 *	Yory slightly granitised dark green segment serpentialsed amphibelite. Consists of 70-86% serpentials - amphibele, 20-30% white felspar, with miner hietite-chlorite and quartz - orthoclase. Enther compact and "quartzitie" at each and of the sequence, but homogeneous (mass of 1/20" crystals) mear the centre. Sodding generally cheare. Attitude 45°(?) to core axis at \$75°.
576.1 °	579.3*	Slightly concerdantly granitised quarts (16%) - extheclase (8%) - biotite (16%) - garnet (8%) - epidate (46%) metacodismut containing accessory corportinised asphibals
579.3*	580*	Severely concerdantly and losser discordantly granitized quarts (19%) - orthoclass (66%) - magnetite (6%) - histite (6-19%) - germet (loss than 8%) - opidate (6%) - cillimatite (6%) actorodiment. Attitude 56° to core axis at 500°.
580*	563*	Slightly consordantly granitiesd querts (36%) - extheclase (28%) - magnetite (18%) - biotite (8%) - garnet (18%) - sillimenite (5%) metacodiment.
583*	563.7*	Moderately to severely concerdently and discordently granitised quarts (38%) - orthociase (56%) - anguetite (5%) - garnet (5%) - epidate (8%) metasediment.
563.7°	586.5*	Slightly discordently and concordently granitized quartz (50%) - erthoclase (20%) - anguetite (16%) - bietite (5%) - gernet (5%) - sillimenite (5%) antasediment. Attitude 35° to core axis at 565°.

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From	To	Description OFTAILED LOG
596.5*	591.2°	Nederately concordantly and discordantly granitised quartz (20%) - orthoclase (25%) - magnetite (25-30%) - biotite (5-10%) - garnet (5%) - opidate (10%) - sillimenite (5%) metasediment. Attitude 45° to core axis at 590°.
591.2*	59 2.5°	Noderately to severely discordently and lesser concordently granitised quarts (25%) - orthoclase (45%) - magnetite (10-15%) - bietite (10%) - gernet (less than 5%) - epidete (5%) metasediment.
592.5*	593,2*	Moderately discordantly and lesser concordantly granitised quarts (35%) - orthoclase (36%) - megnetite (20-25%) - bietite (less than 5%) - garnet (5%) - opidate (5%) motacediment.
593,2'	593.4*	Severely discordantly granitised quarts (15%) - orthoclase (55%) - magnetite-mertite (15%) - garnet (5%) - epidete (10%) metacediment.
593,4*	595.5*	Severely discordantly granitised (dislocated) quarts 50% - orthoclase (20%) magnetite (5%) - epidote (25%) rock. Consists of up to 1/4" epidote and garact-orthoclase blobs in a quarts matrix. Attitude 50° to core axis at 595.5°.
596.5*	594,5°	Slightly to moderately discordantly granitized quarts (30-35%) - orthoclase (25%) - megnetite (25-36%) - biotite (16%) - gernet (5%) antacodiment.
596,5*	596.7*	Mederately to severely discordantly granitised quarts (25%) - orthoclase (48%) - negmetite (19%) - biotite (5%) - garnet (5%) - epidete (10%) netecodiment.
596.7*	601.5*	Slightly concerdently and revely discordently granitised quarts (35-40%) - extheclase (18%) - augustite (10%) - bletite (10%) - garnet (8%) - sillimente (20-28%) metasediment. Attitude 85° to core axis at 600°.
601.5*	603.6*	Severely concerdently and discordantly granitized quarts (16%) - orthoglass (45-70%) - augmetite (10%) - hietite (5%) - garnet (5-10%) astecodiment.
663,6*	606.3*	Slightly to moderately concordantly and leaser discordantly granitized quarts (30%) - orthoclase (20%) - magnetite (10%) - bietite (5-10%) - opidate (10-15%) - sillimenite (20%) matecodiment. Attitude 55° to core axis at 665°.
606,3*	611.5°	Noderately concordently and discordently granitized quarts (25%) - erthoclase (30%) - magnetite (15%) - hietite (16%) - garnet (5-10%) - sillimenite (10-15%) metasodiment. Attitude 65° to core axis at 610°.
411.5*	612*	Moderately to severely concerdently and discordently granitized quarts (25-30%) - orthoclass (35-46%) - magnetite (18%, as relatively pure clots up to 1/2" diameter), biotite (8%) - opidate (18%) metacodiment.
612*	616.5*	Nederately concordantly and discordantly granitised quartz (30%) - orthoclase (36%) - magnetite (15-20%) - biotite (10-15%) - epidete (5%) metasediment, Attitude 45° to core axis at 615°.

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From	To	Description DETAILED LOG
616.5*	620.8*	Moderately to severely discordantly granitized quartz (20%) - orthoclase (45%) - magnetite (10%) - garnet (10%) - epidete (10%) - sillimanite (5%) metasediment. Attitude 55° to core axis at 620°.
620.8*	621.5*	Slightly concordantly and discordantly granitised quarts (30%) - orthoclase (15%) - magnetite (20-25%) - bistite (10-15%) - garnet (10%) - sillimenite (5%) - opidate (5%) metasediment.
621.5*	622,6*	Moderately to severely discordantly and concordantly granitised quarts (25%) - orthoglase (45%) - magnetite (15%) - biotite (5-10%) - garnet (5-10%) metasediment.
622.6*	623*	Slightly to moderately concerdently and finely discord- untly granitised quarts (30%) - orthoclase (30%) - magnetite (15%) - biotite (15%) - garnet (10%) metasediment.
623*	623.81	Mederately concordantly and losser discordantly granitised quarts (25%) - extheolose (40%) - magnetite (15-20%) - hietite (10%) - garnet (5-10%) antecediment. Bedding seasowhat contorted.
623.8*	624.6*	Slightly to understaly concerdently and finely discordant granitised querts (40%) - ertheclase (30%) - magnetite (10%) - histite (10%) - garnet (5%) semuchet quertuitie metacodiment.
624,8*	625.9*	Mederately to severely concerdently and discordently granitised quarts (20%) - ertheclase (50%) - magnetite (15%) - biotite (10%) - garnet (5%) metacodiment. Attitude 45° to core axis at 425°.
425.9*	626.8°	Moderately concerdently and losser discordently granitise quarts (20%) - erthoclase (20%) - magnetite (15-20%) - biotite (5-10%) - garnet (20%) - sillimenite (5%) meteodiment.
626.8*	627,3*	Moderately concerdently and discordently granitized quart (25%) - erthoclase (30%) - magnetite (10-10%) - bietite (10-15%) - epidete (5%) - cillimenite (10%) metacodimen
627.3*	628.3*	Slightly to moderately concentently and lesser discordent granitised quarts (34%) - exthecisee (36%) - magnetite (15%) - biotite (16%) - garnet (5%) - epidete (16%) metacodiment.
62 6.3°	632.5*	Moderately to severely concerdantly and discordantly granitised quarts (20%) - extheolase (40%) - magnetite (15-20%) - bietite (10%) - garnet (5-10%) - epidate (5%) metasediment. Attitude 45° to core axis at 400°.
632.5*	433,5*	Quartz (40%) - ertheclase (20%) - magnetite (20%) - hiotite (18%) - garmet (8%) metacodiment showing slight dispersed granitisation.
633.5°	634*	Nederately concerdently and discordently granitised quarts (30%) - orthoclase (30%) - magnetite (20%) - hietite (5%) - garnet (15%) metasodismet.
634*	634.4*	Severely discordantly granitised quartz (15%) - orthoclase (75%) - megnetite (5%) - garnet (5%) metasediment. Consists of a mass of $1/8^{\rm m}$ - $1/2^{\rm m}$ diameter orthoclase crystals.

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From	?e	Description DETAILED LOG
634.4*	636.4*	Fairly severely concordantly and discordantly granitised quarts (35%) - orthoclase (35%) - magnetite (15%) - biotite (less than 5%) - garnet (5%) - sillimenite (5-10%) metasediment. Somewhat quartzitic appearance. Attitude 60° to core axis at 635°.
636,4*	640,5*	Moderately concordantly and leaser discordantly granitised quarts (30-35%) - orthoclase (30%) - megmetite (10-15%) - biotite (15%) - sillimanite (10%) metasodiment. Attitude 65° to core axis at 640°.
640,5°	641.2°	Moderately to severely concordantly and discordantly granitised quartz (20%) - orthoclass (50%) - augmetite (50%) - biotite (15%) - sillimenite (16%) autocodiment.
641.2*	641.9*	Slightly concordantly granitised quarts (50%) - orthoclase (10%) - unquetite (10%) - bietite (10%) - garnet (5%) - sillimenite (15%) metacediment.
641.9*	660.4*	Mederately to severely concerdently and discordently granitised quartz (16%) - orthoclases (46%) - angustite (16%) - biotite (15%) - garnet (5%) - epidote (20%), metasediment.
650,4*	456. 2*	Mederately to severely disperdently and lesser concerdently granitized quartz (18%) - extheolose (80%) - magnetite (10%) - garnet (5%) - epidete (10%) - sillimenite (10%) metasediment containing secessory pyrite. Bedding almost obliterated Attitude 35° to core sais at 655°.
664, 2°	662.2*	Moderately to severely discordantly and losser concordantly granitized quarts (25%) - orthoclass (26%) - ampactite (25%) - histite (26%) - germet (5%) - silliments (10%) metacodiment. Includes dislocated area containing 40% martite. Attitude 40° to core axis at 440°.
662.2°	663*	Slightly concordently and finely discordently granitised quarts (50%) - orthoclase (20%) - augmetite (10-15%) - hietite (5-10%) - garnet (5%) autmodizent.
663*	666.2*	Noderately to severely concertantly and discordently granitised quarts (20%) - erthoclase (40%) - augustite (10%) - biotity (10%) - garnet (10%) antecediment. Attitude 50° to core axis at 665°.
666.2°	667.2°	Slightly discordantly and lesser concordantly granitized quarts (50%) - extheclase (10%) - augmetite (40%) metacodiumat. Fairly homogeneous (augmetite securs as 10° alots), dense rack.
667.2°	667.9*	Severely discordantly and lesser concerdantly granitised quarts (20%) - exthesiase (50%) - augmentite (10%) - biotite (10%) - garnet (10%) antacodiment.
667.9*	670,2*	Slightly to understely commordantly and discordantly granitised quarts (35%) - orthoclase (25%) - magnetite (20%) - bietite (10%) - garnet (10%) antasediment.

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		OETAILED LOG
670,2*	677.5*	Moderately to severely discordantly and concordantly granitised quartz (25%) - orthoclase (45%) - megnetite (5%) - biotite (5-10%) - garnet (5%) - sillimenite (5%) - epidote (5-10%) metasediment. Attitude 60° to core axis at 675°.
677.5*	618.7*	Very slightly concordently and finely discordently granitised quarts (60%) - orthoclase (5%) - negmetite (36%) metasediment. Fairly homogeneous mettled appearance.
678.7*	681.7*	Mederately to severely concordantly and losser discordantly granitized quarts (20-25%) - orthoclase (56%) - magnetite (10%) - biotite (5%) - garnet (10-15%) actsordiment. Attitude 50° to core axis at 600°.
661,7*	662,8*	Very fine grained hemogeneous quarts (30%) - megnetite (30%) - garnet (30%) - epidote (10%) metasediment.
662.6*	689.7*	Moderately severely concerdently and leaser discordantly granitised quarts (25%) - erthoclase (30-35%) - magnetit (10-15%) - hietite (10-15%) - garnet (10%) - sillinemite (5-10%) metasediment. Hegmetite occurs in 1/4" eress-cutting blobs. Attitude 60° to core sxis at 605°.
689,7°	69 1.3*	Moderately concordantly and locuer discordantly granitised quarts (40%) - orthoclase (30%) - megmetite (10%) - biotite (10%) - silliments (10%) astarodiment, containing accessory garnet. Attitude 45° to core axis at 670°.
691.3*	692,5°	Hodorately essectionally grantized quarts (30%) - erthoclase (30%) - magnetite (20%) - bietite (10%) - garnet (8%) metacodiment containing secosory sillimenit
692,5*	673,5°	Slightly concerdently granitized quartz (25%) - ertheclass (18%) - magnetite (18%) - garnet (5%) - epidete (20%) _ eillimentte (20%) mutesediment,
643.5°	646.3*	Severely discordantly gramitized quarts (20%) - orthoclass (40%) - biotite (10%) - opidate (20%) - sillimenite (10% metacodiment. Attitude 40° to core unis at 40%.3°.
696.31	697.3*	Rederately to severely concerdantly and discordantly granitized quarts (15%) - orthoclase (35%) - magnetite (20-25%) - biotite (5-14%) - garnet (10%) - sillimenite (10%) metacodiment.
697.3*	698,51	Slightly concordantly granitised quarts (25%) - orthoclass (15%) - biotite &(5-10%) - garnet (5%) - megnetite (5-10%) - opidate (26%) - sillimenite (20%) metacodiumn
696.5'	796.7*	Moderately to severely concerdantly and discordently granitized quarts (20%) - orthoclase (40%) - megnetite (5-10%) - garnet (5%) - epidete (15-20%) - sillimenite (10%) metacodiment. Contains blobs and crystals of quarts, orthoclase and epidete up to 1/4" diameter. Attitude 450 to core axis at 700". 60 " 706".

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Free	Te	Oescription DETAILED LOG
706.7°	707.1*	Slightly to moderately concerdantly and discordantly granitised quarts (15%) - orthoclase (25%) - magnetite (5%) - biotite (10%) - garact (5%) - epidete (20%) - sillimenite (20%) metasediment.
707.1*	707.6*	Severely concordently and discordently granitised quartz (15%) - orthoclase (50%) - magnetite (5-10%) - biotite (10%) - garnet (5-10%) - sillimenite (10%) metacodiment.
707.6*	799.5*	Nederately discordantly and lesser consordantly granitised quartz (10%) - erthoclase (36%) - magnetite (5-10%) - hiotite (5-10%) - garnet (15%) - epidate (15%) - sillimenite (15%) motocodiment.
707.5°	709.9*	Slightly concordantly and discordantly granitised quarts (25%) - erthoclase (10%) - magnetite (10%) - biotite (10-15%) - garnet (5-16%) - epidate (20%) - sillimenite (15%) metacodiment.
709.9*	710,3*	Severely concerdantly granitised quarts (30%) - orthoclase (40%) - megnetite (10%) - sillimenite (20%) metasediment Attitude 60° to core axis at 710°.
710.3*	712.7*	Nederately concordently and discordently granitised quartz (25%) - orthoclase (26%) - magnetite (15%) - hietite (5%) - epidete (16%) - sillimenite (25%) mutacodiment.
712.7*	713*	Noderately to severely concerdently and discordently granitized quarts (16%) - orthoclase (46%) - magnetite (10%) - biotite (10%) - gernet (10%) - sillimenite (10%) metacodiment.
713*	713.5'	Slightly to moderately-concerdently and discordantly granitized quarts (36%) - orthoclase (36%) - magnetite (18%) - biotite (18%) - germet (16%) metacodiment.
713.5°	713.7°	Severely discordently granitised quarts (2%) - orthoclase (4%) - megnetite (1%) - blottle (16%) - garnet (15%) metasediment,
713.7*	714.3*	Slightly to understely concerdently and discordently granitized quarts (30%) - ertheoluse (30%) - magnetite (16%) - biotite (5%)(- garnet (16%) -: silliumite (20%) metanediment.
714.3°	719.7*	Noderately to severely discordantly and lesser concordantly granitized quarta (18%) - orthoglass (40%) - magnetite (18%) - biotite (18%) - garnet (5%) - sillimenite (10%) unterediment.
719.7*	720.3°	Severely discordantly and leaser concerdantly granitised querts (15%) - orthoclase (55%) - magnetite (16%) - bietite (5-16%) - garnet (5-16%) - sillimanite (5%) astacodiment. Orthoclase crystals up to 1/4" dismeter. Attitude 55° to core unis at 720°.
720.3*	721.2*	Slightly concerdently and lesser discerdently granitised quarts (35%) - erthoclass (20%) - megmetite (5%) - biotite (10%) - garnet (10%) - sillimemite (20%) metosediment.

Free	Te	Description OFTAILED LOG
721.2*	724.1*	Moderately to severely concordently and discordently granitised quartz (15%) - orthoclase (40%) - magnetite (15%) - biotite (5-10%) - garnet (5-10%) - sillimenite (15%) metasediment. Contains one 1%" bed with 50% magnetite.
724.1*	726.5*	Mederately to severely discordantly and lesser concordant) granitised querts (15%) - orthoclase (30%) - megnetite (10%) - garnet (5%) - opidete (25%) - sillimanite (15%) metasediment. Attitude 50° to core axis at 725°.
726.5°	726*	Slightly concerdently and discordently granitised quartz (15%) - orthoclase (10%) - magnetite (10-15%) - hietite (5%) - garnet (5%) - opidate (30-36%) - sillimenite (20%) metasediment.
728*	729.5*	Mederately to severely discordantly granitised quartz (25% - orthoclase (25%) - magnetite (15%) - garnet (5%) - opidate (20%) - sillimenite (10%) metasediment.
729.5*	730.5*	Severely discordantly gramitized quartz (20%) - orthoclass (5%) - augmentite (5%) - garment (16%) - opidate (5%) - sillimunite (16%) autosodiment, Attitude 55° to core axis at 730,5°,
730.5*	731*	Slightly to moderately concordantly and discordantly granitised quarts (15%) - orthoclase (25%) - magnetite (16%) - biotite (15%) - garnet (25%) - sillimenite (16%) metacodiment.
731°	732,2*	Very slightly concerdently granitised quarts (20%) - orthoglace (2%) - megastite (20%) - Metite (10%) - garnet (20%) - epidete (20%) notacediment. Plue grained bemogeneous appearance as 661.7° - 602.8°.
782.2*	733,1*	Severely discordantly granitised (virtually dislocated) quarts (35-46%) - orthoclase (20-26%) - unquotite (5%) - garnet (5%) - cillimmite (5%) - epidote (25%) metacodiment. Consists of 1/6" epidote and orthoclase crystals in a quartx grandance.
788.1*	736.2*	Moderately to severally disconductly and losser consordantly granitised quarts (25%) - orthoclase (46%) - ampactite (16%) - biotite (5-16%) - garnet (5-16%) - sillimatite (16%) motacediment. Orthoclase darker in colour than usual (almost red). Attitude 55° to core axis at 735°.
736,2*	737	Slightly concerdently and discordantly granitised quarts (25%) - orthoclase (25%) - magnetite (16%) - hietite (16%) - sillingsite (36%) metasediment.
7 37 °	736,6*	Slightly to moderately concerdently and losser discordently granitised quarts (20%) - ertheclase (20%) - magnetite (20%) - garnet (15%) - sillimenite (5%) metacodiment,
736.6°	747.9*	Slightly to moderately concerdently and discordantly granitized quartz (15%) - orthoclase (40%) - magnetite (20%) - hietite (5%) - garnet (5%) - sillimenite (15%) metasediment. Attitude 35°-40° (conterted) to core axis at 740°.

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From	1 0	Description DETAILED LOG
747.9*	748.6*	Slightly concordantly and finely discordantly granitised quartz (25%) - orthoclase (25%) - megmetite (15%) - bistite (5%) - garnet (10%) - epidete (10%) - sillimnatite (10%) metasodiment.
748.8*	749.9*	Moderately to severely concerdantly and discordantly granitized quarts (25%) - orthoclase (40%) - amgnetite (10%) - garnet (5%) - epidote (5%) - sillimenite (15%) metasediment, containing rare accessory tourmaline and serpentine in joint planes.
749.9*	7 53 ,5°4	Mederately concordantly and lesser discordantly granitised quartz (25%) - orthoclase (30%) - megnetite (10%) - biotite (10%) - gernet (5%) - sillimmite (20%), metasediment. Attitude 50°-55° to sore axis at 750°.
753.5*	754.5*	Severely discordently granitised quartz (40%) - orthoclase (20%) - ungaetite (5-10%) - biotite (5%) - epidete (10-15%) - sillimenite (5%) metasediment.
754.5*	754.7*	Slightly, very finely discordently granitised quarts (45%) - magnetite (35-40%) - epidete (15-20%) metacodiment containing accessory orthoclass and sillimnite.
754.7*	756.2*	Slightly to moderately concordently and discordently granitised quarts (30%) - orthoclase (15-20%) - magnetit (10%) - biotite (10%) - garnet (5%) - opidate (15-20%) - sillimanite (10%) metacediment, Attitude 60° to core sais at 755°.
756,2°	756.9*	Severely discordantly and leaser concordantly granitized quarts (35%) - orthoglass (40%) n - magnetite (10%) - biotite (5%) - garnet (5%) - epidete (5%) metasodiumst.
756.9*	745.9*	Rederately irregularly concordantly and losser discordantly granitized quarts (26%) - orthoclase (36%) - ungastite (16%) - biotite (16%) - garnet (16%) - sillimmite (26%) untacediment. Granitization is largely restricted to 1" thick connordant masses (containing up to 1/4" crystels). Attitude 70° to core axis at 750°. " 60°-65° to core axis at 765°.
765.9*	767.8*	Moderately discardantly and concordantly granitised quarts (36%) - orthoclase (36%) - blotite (16%) - ungaetite (16%) - garnet (16%) metacediment (includes several 1/2" thick magnetite rick bods).
7 67.8 °	766*	Very slightly dominantly econordantly granitised quarts (30%) - magnetite (30%) - opidate (30%) metasodiment. Very homogeneous appearance.
766*	769.2*	Moderately concordently and very rarely discordently granitised quarts (30%) - orthoclase (40%) - unguetite (10-15%) - hietite (5%) - garact (10-15%) metasodiment.
769.2*	770*	Slightly concordently granitised quarts (45%) - orthoclase (25%) - magnetite (5%) - hietite (15%) - garnet (5%) - sillimente (5%) metasediment. Attitude 45° to core axis at 770°.

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From	To	Description DFTAILED LOG
770*	770.4°	Moderately to severely concordantly and lesser discordantly granitised quartz (30%) - erthoclase (45%) - magnetite (5-10%) - biotite (5-10%) - garnet (5%) - epidote (5%) metasediment.
770.4*	774*	Slightly to moderately concerdantly and lesser discordantly granitised quarts (30%) - ertheclase (20%) - augustite (5-10%) - biotite (10%) - garnet (10%) - epidete (15-20%) - sillimenite (5%) metasediment.
774*	774.6*	Severely discordantly granitized quarts (15%) - orthoclase (66%) - unguetite (5%) - epidote (10%) - sillimenite (10%) metasodiumnt.
774.6°	775,7°	Moderately concordantly granitised quarts (35%) - ortho- clase (30%) - magnetite (10-15%) - biotite (16%) - garnet (5%) - sillimenite (5-10%) metasodiment. Attitude 50° to core axis at 775°.
775.7*	776.2°	Slightly concerdently granitised querts (15-20%) - ertho- clase (15-20%) - magnetite (15-20%) - hietite (10-15%) - gernet (15-20%) - sillimenite (10-15%) - opidete (5%) metasodiment,
776.2*	777.8*	Mederately discordently and rarely commerdently granitised quartz (25%) - orthoclase (35%) - megaetite (15%) - bietite (16%) - apidote (15%) metacodiment. Shows min or drag folding (east limb anticline?).
777.8°	778,2*	Mederately: to severely discordantly and concordantly granitised quarts (20%) - orthoclase (40%) - magnetite (10%) - biotite (5%) - garnet (10%) - sillimmate (10%) metasodiment,
776.2*	761.9*	Moderately concordently and discordently granitised quarts (26%) - orthoclase (36%) - magnetite (15-26%) - hietite (8%) - garnet (5%) - opidate (15-26%) - sillimente (5%) motosodiment. Granitization is largely restricted to concordent masses up to 1" thick (mass of exystals up to 1/4" dismeter). Attitude 40° to core axis at 780°.
761.9*	762.4*	Severely discordantly granitized quarts (30%) - erthoclase (40%) - megnetite (5-10%) - garnet (5%) - epidete (10%) - eillimmite (loss than 5%) metasediment. Contains 1/8" quarts, erthoclase and rarely epidete erystels.
782,4*	785,4*	Mederately concerdantly and losser discordantly granitised querts (36%) - orthoclass (28%) - augustite (18%) - bietite (5%) - garnet (8%) - sillimenite (16%) metasodiment. Attitude 45° to core axis at 765°.
785.4*	786.5*	Noderately to severely concordently and lesser discordently granitised quartz (20%) - orthoclase (40%) - magnetite (5-10%) - hietite (5-10%) - opidate (15%) - sillimmite (10%) metasediment.
7 86. 5°	790.4°	Slightly to moderately concordently and lesser discordently granitised quartz (30%) - orthoclase (30%) - magnetite (15%) - biotite (5%) - garnet (5%) - sillimenite (15%) metasodiment, Attitude 55° to core axis at 790°.

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from	To	Description AFTATUED LOG
790.4°	791•	Severely concordantly and discordantly granitised quartz (20%) - orthoclase (60%) - magnetite (5%) - garnet (5%) - sillimenite (10%) metasediment.
791°	791.3*	Slightly concordantly granitised quartz (35%) - orthoclass (15%) - magnetite (15%) - biotite (5-10%) - garnet (5-10%) - opidate (10%) - sillimenite (10%) metasediment
791.3°	793.4°	Moderately concordently and lesser discordently granitised quarts (30%) - orthoclase (40%) - magnetite (15%) - biotite (5%) - garnet (10%) metasediment.
793,4*	795.1*	Moderately to severely discordantly and lesser concordantly granitized quarts (10%) - orthoclase (45%) - magnetite (10%) - biotite (5%) - garnet (5%) - opidate (20%) - sillimanite (5%) motasediment, Attitude 650-700 to core axis at 795°.
795.1*	797.3*	Maderately discordantly and leaser concordantly granitised quarts (25%) - orthoclase (36%) - magnetite (20-25%) - hietite (5-10%) - garnet (16%) - opidate (5%) metacodiment.
797.3*	798,6*	Bark, compact, fairly homogeneous slightly concordently granitised quarts (20%) - orthoclase (20%) - magnetite (25%) - epidote (35%) matacediment.
796.6*	860.7*	Nederately discordantly and concerdently granitized quarts (S%) - orthoclase (30%) - augmentite (15%) - opidate (40%) - sillinguite (16%) metasodiment. Attitude 55° to core axis at 600°.
899.7*	802.5*	Fine grained compan't slightly concerdantly granitised querts (30%) - orthoclase (30%) - magnetite (10-18%) - blotite (5-10%) - opidate (5%) - sillimunite (18%) materodiment.
802,5°	807.5*	Nederately to severely discordantly and concerdently granitized quarts (30%) - erthoclass (40%) - megnetite (5-10%) - histite (5%) - garnet (5-10%) - sillimenite (10%) metasodiment. Attitude 66° to core axis at 865°.
867.5°	812.8*	Severely discordantly and lesser concerdantly granitised quarts (25%) - orthoclase (56%) - magnetite (15%) - biotite (5%) - epidete (5%) metasodiment. Attitude 50° to core axis at 810°.
6 12. 6 °	814.4*	Nederately discordently and concordently granitised quarts (10%) - arthoclase (20%) - magnetite (20-25%) - Motite (10%) - garnet (10%) - sillimenite (15/20%) metacodiment.
814.4*	816,9*	Moderately to severely discordently graphtised quarts (25%) orthoclase (45%) - megnetite (15%) - biotite (16%) - sillimente (5%) metacodiment. Attitude 50° to core axis at 815°.
816.9*	817.9*	Slightly concordently and finely discordently granitized quarts (35%) - orthoclase (20%) - magnetite (15%) - biotite (16%) - garnet (10-15%) - sillimanite (5-10%) metacodiment.
817.9°	819.6*	Mederately to severely discordently and concordently

o-rig-o-state de cambigation (se se s	per animaleur de la companie de la c	
From	To	Description DETAILED LOG
817.9*	819.6° (Contd.)	granitised quarts (5%) - orthoclase (35%) - magnetite (20%) - biotite (10%) - garnet (5%) - epidote (15%) - sillimenite (10%) metasediment. Orthoclase darker in coleur them usual.
619.6*	819.7	Hemogeneous looking quartz (45%) - megnetite (30-35%) - bietite (10%) - epidete (10-15%) metasediment.
619.7*	822*	Slightly to understely concerdantly and discordantly granitised quarts (30%) - ertheclase (30%) - ungmetite (15-20%) - hietite (less then 5%) - garnet (15%) - sillimenite (5%) metasediment. Attitude 55° to core axis at 820°.
822 *	824.7*	Moderately to severely concordantly and lesser discordantly granitised quarts (35%) - orthoclase (30-35%) - magnetite (15-20%) - hietite (10%) - garnet (5%) metacodiment containing accessory sillimenite.
824,7*	825,5*	Pairly homogeneous slightly consordently granitised quarts (30%) - orthoclase (16%) - magnetite (30%) - hietite (8%) - epidete (25%) metasodiment containing occasiony garant. Attitude 55°-46° to core axis at 825°.
625.5*	633.2*	Nederately to severely discordantly and concordantly granitized quarts (15%) - orthoclase (40%) * magnetite (16%) - biotite (16%) - garnet (5%) * epidete (20%) metacediment. Attitude 55° to core axis at 830°.
633,2*	834,2*	Nederately concordantly granitized quarts (20-25%) - erthoclace (25-36%) - magnetite (18%) - biotite (18%) - garact (15%) - sillimentic (16%) metacodiment.
634.2 °	835.5?	Nodestately to severely disconductly and concerdently granitized quarts (20%) - orthoclase (50-55%) - augmetite (15%) - biotite (5-50%) - garnet (5%) setscodiamet. Nodding semankel conterted. Attitude 55° to core axis at 555°.
835.5*	887 *	Pork compact slightly concordantly granitized quarts (36%) - orthoclase (36%) - ungustite (26%) - hietite (18%) - garact (8%) - sillimanite (18%) metasediment.
837 *	636.7*	Moderately concordently and discordently granitized quarts (20%) - orthoclase (25-36%) - magnetite (15-20%) - biotite (15-20%) - garnet (5%) - sillimmate (10-15%) metacodiment,
838,7*	840.3*	Slightly to moderately discordantly and concerdantly granitized quartz (40%) - orthoclase (25%) - megnetite (10%) - biotite (10%) - garnet (5%) metacodiment. Attitude 50° to core axis at 640°.
849,3*	849.6*	Fairly homogeneous mottled elightly irregularly granitised quarts (35%) - orthoclase (5%) - magnetite (20%) - biotite (5-10%) - garnet (less than 5%) - epidete (30%) metacodiment.
849.6*	8 43. 5°	Moderately discordantly and lesser concordantly granitised quertz (25-30%) - arthoclase (30-36%) - megmetite (10%) - biotite (10%) - sillimentite (20%) metasediment, containing accessory garnet.

Fron	To	Gescription DETATLED LOG
843.5*	848.5°	Mederately to severely discordantly and concordantly granitised quartz (30%) - orthoclase (35%) - garnet (10% - magnetite (15%) - sillimenite (10%) metasediment containing accessory biotite. Attitude 60° to core axis at 845°.
848.5*	649.1*	Fairly homogeneous slightly granitised quartz (45%) - orthoclase (5%) - megnetite (25-30%) - garnet (10%) - epidete (10-15%) metasediment.
849.1*	849,81	Severely discordantly granitised querts (5-10%) - orthoclase (60%) - megnetite (5%) - hietite (5-10%) - garnet (10%) - epidete (10%) autosodiment.
849.6*	957.2°	Mederately to severely irregularly discordantly and concordantly granitised quarts (15%) - orthoclass (35%) - megastite (10-15%) - biotite (10%) - garnet (10-15%) - epidete (5%) - sillimente (10%) metasediment. Granitisation tends to occur in subsensordant 1" thick messes. Attitude 45° to core axis at 850°.
8 67.2 °	867.7*	Severely discordantly granitised quarts (10%) - orthoclase (70%) - magnetite (5%) - epidete (10%) - sillimunite (5%) metacodiment containing accessory biotite.
467.7°	857.5*	Slightly concerdently granitized quarts (45%) - erthoclase (5-10%) - magnetite (15%) - Metite (5-10%) - garnet (5%) - sillimente (20%) metasediment.
869.5*	861.5*	Mederately to severely ecasordently and discordently granitiond quarta (20%) - orthoclase (50%) - megnetite (10%) - garnet (5%) - opidate (10%) metasodiment. Attitude 50° to core axis at 860°.
861.5	862,1*	Slightly dominantly concordently granitized quarts (50%) - orthoclase (5-10%) - meguetite (30-30%) - opidate.(10%) metasodiment containing accessory biotite. Homogeneous appearance.
862,1°	864.8*	Moderately to severely concordently and discordently granitised querts (20%) - esthetiace (40%) - magnetite (10%) - hietite (10%) - garnet (10%) metacodiment. "Nottled" appearance, Attitude 50° to core exis at 665°.
046, 8*	869*	Slightly concordently granitised quarts (35%) - orthoclase (15%) - magnetite (10%) - hietite (5%) - garnet (5%) - sillimenite (30%) metasediment.
869*	673.5°	Moderately to severely discordantly and concerdantly granitised quarts (15%) - orthologo (45%) - magnetite (10%) - biotite (20%) - garnet (5%) - epidete (5%) metacodiment. Includes several 1" magnetite rich beds and rare epidete crystals up to 1/8" diameter. Attitude 60° to core exis at 670°.

From	10	Description DETAILED LOG
673.5	874.2*	Slightly to moderately discordantly and very rarely concerdantly granitised quartz (70%) - orthoclase (5-10%) - magnetite (10%) - epidote (10%) - biotite (1000 than 5%) metacodiment. "Quartzitic" texture.
874.5*	675 . 7*	Moderately to severely discordently gramitized quarts (15%) - orthoclase (45%) - magnetite (15%) - biotite (10%) - garact (10%) - epidote (5%) metasodiment. Attitude 50° to core exis at 875°.
875.7*	876.3*	Noderately concordantly and discordantly granitised quartz (50%) - magnetite (35%) - biotite (5%) - epidate (10%) metasediment, Fairly homogeneous "mattled" appearance.
876.3*	879.5°	Severely discordantly granitized ("marbled") quartz (15%) - orthoclase (50%) - plagicolase (showing preminent multiple twinning, 15%) - magnetite (5%) - bietite (5%) - garnet (5%) - opidate (5%) matacediment.
879.5*	879.7 °	Fairly homogeneous slightly discordently granitised quarts (40%) - orthoclase (10%) - magnetite (25-30%) - biotite (10-15%) - opidete (10%) materodiment.
879.7*	662'	Mederately to severely discordantly granitised ("marbled") quarta (15%) - orthoclase (50%) - megnetite (15-20%) - biotite (16%) - opidate (5-10%) metacodiment. Attitude 50° to core axis at 660°.
862*	662, 2*	Homogeneous mottled slightly concerdently and discordently granitised querts (45%) - erthoclase (10%) - magnetite (30-36%) - bictite (10-15%) motocodiment.
862.2*	866*	Nederstely to severely granitized quarts (25-36%) - ertheelase (36-46%) - megaetite (26%) - bietite (10%) - garnet (5%) metasediment, Attitude 55° to core axis at 866°,
	884*	End of iron fermation.
886*	810.4"	Severely, deminantly discordantly granitised quarts (about 25%) - orthoclase (40%) - plugiculase (10%) - biotite (5-20%, usually 10%) - epidote (5-30% usually 15%) antesediment containing accessory to revely 5%, usually 1 or 2% aeguotite. Grain size 1/100" (biotite and magnotite) to 1/10" (quarts and felaper). Bedding not well defined. Attitude 50° to core axis at 690°.
890.4*	928°	Severely, deminantly concerdently, granitised quarts (15%) orthoclase (pale pink to red, 60%) - plagicalese (10%) - bietite (5-25%, usually 10%) - epidete (accessory to 10%, usually 5%) metacediment containing accessory garner and accessory to rarely 1 or 2% magnetite. Grain size 1/100" (garnet) to 1/5" (orthoclase), Bedding 1/8"-1/4" thick, semachet contexted. Attitude 36° to core axis at 895". 55° " " " 900". 45° " " " 905". 568° " " " 915". 580° " " " 925". 55-60° " " " 925".

CORE RECOVERY

From	To	Recov- ery.	Condition	Free	To	Recov- ery.	Condition
196*	198.5*	2.8	Good	474*	478*	1.9*	Brokes.
RF	OUCE TO	BX		478*	400	8.7	Excellent - Fair
198.5	205°	5.4	Feir - Good	406	496	1.7*	Very Broken.
205	214.5*	8.7*	Excellent to Fair.	490	506*	5.8*	Excellent & Broken.
214.5	22 4 °	9.2	Fair - Good	508*	218.	9.1.	Good - Feir.
224*	227.8*	5.7	Excellent	518*	526	6.1*	Excellent - Fair
227.8*	233.8	4.3*	Fair	526	534.3*	5.9	Excellent.
233.8*	243.8	10.0*	Good - Excellent	534,31	536'	3.5	Excellent - Feir
243.8	252.5	7.8*	Excellent	536	542*	3.7	Excellent.
252.5°	253.5	2.2	" WESTYAND	542*	552*	10.2	**
253.5*	261.5	6.0		552*	542*	9.2	•
261.5"	269.5	9.7	Good - Excellest	562*	570.5*	7.1*	Excellent 6 Broken.
247.5*	275.5	5.6'	* 29 · · · · · · · · · · · · · · · · · ·	570.5	576*	5.2"	* * *
275.5	279.5	3.0'	Excellent	576*	500.5	4.7*	Good & Broken.
279.5	289,5"	9.3*	Excellent &	500.5	590.5"	8.3*	#
			Brekes,	590,5	597.5	7.0"	Execilent.
209.5*	299.5	9.9*	10 16 10	597.5	607.5*	8.0'	•
299.5*	307.5	9.8*		607.5	617.5	6.7	Exection 6
	hock to			450 #0	410 21		Broken.
309.5	319.5°	10.1	Exectiont	617.5	619.5	2.1	Excellent.
319.5*	329'	7.1°	Excellent & Eroken.	619.5°	627.5°	7.9° 9.8°	•
329 *	337.8"	8.4"	Good - Excellent	637.5	647.5*	7.8*	Excellent & Feir
337 .8*	347.8"	10.6*	Excellent.	647.5"	687.5	7.1*	Good
247.8*	347.8"	1.5*		667.5"	660,5"	2.6	Excellent
349.81	357.8*	8.2"	•	660,5*	667.5	7.2	**
367.8*	367.5	9.9*	Good	647.5	677.5	9.9*	
347.5	377.5	6.4	Excellent &	677.5	687.5*	10.2	•
			Broken,	607.5	697.5	9.1	Excellent & Fair
377.5	367.5	9.3*	Feir to Good	697.5	701.5	3.1.	Good to Broken
367.5	393.5	5.7*	Excellent.	701.5	706.6	2.0'	Broken
393,5*	397.5	4.6'	•	706.5	716.0	9.9*	Good to Excellen
397.5	407.5	10.4	Execlient.	716.0"	726.6*	7.0	Execilent to
407.5	417.5	10.1	.*	726,0"	736.0*	9.4*	Breken.
417.5	427.8	8.9*		736.0	746.0°	10.1°	Excellent.
427.8°	432.8	4.6*	*	746,0	756.5	9.6	**********
432.6*	437.6	4.9*	Good - Excellent	756.5	- · · · · · · · · · · · · · · · · · · ·	10.1	9
437.6*	448*	9.4"	Good - Broken	766.8	776,8	10.3	*
446*	456*	9.90	Excellent & Pair	776.8	766.6	9.1'	**
458 *	468*		Excellent.	786.8*	197	8,2	10
466*	474"	6.1*	Good - Excellent,	i maña	5 -0	~ ~ ~	

CORE RECOVERY

From	To	Seco ery	CAMET CLAM	From	To	Recev- ery	Condition
797*	602.7*	5.1*	Excellent & Brokes.				
802.7	812.7	5.9'	10 10 10				
612.7	822.7	9.8	Good to Broken.				
822 . 7 °	833.	4.3°	Excellent to Brokes.				
833 '	840*	6.9*	Excellent.				
840°	843*	3.0"	•				
843*	963 *	5.5*	Good to Broken.				
953.	863'	4,6*	Fair to Broken.				
963*	873.2	10.1*	Excellent & Broken,				
673.2°	893,5	9.70	Excellent & Fair				
863.5°	866,5*	0.3	Yory Broken.				
966,5°	892.7	6.1*	Excellent to Broken.				•
992.7	900'	3.4*					
100'	104.5	4.1*	Good 6 Broken.				
104.5"	914.51	3.5	Fair & Broken.				
914.5*	917.5	1.3'	Brokes				
17.5	919*	1.3*	Fair				
119 •	926*	7.6*	Fair & Excellent				
	JOHAL 458,	END OF 633, 8*	HOLE 86.5%				
PORAL I	for Iron	567.5*	82.4%				

MAGNETIC LOG

					in an in a sure of the sure of
At	Deflection	At	Deflection	At	Deflection
197.5*	10 ⁶	291°	25 °	375*	900
200*	150	291.5*	90-6	377.5	90-e
205	106	293*	40 ⁰	380	15
208.5	5°	295 •	900	382	159
210.	50	297	904	385*	150
215 °n	10 ⁰	298*	90-0	387 °	200
220*	100	300	90+6	390*	30°
225*	50	302	90- ⁶	392.5	159
230*	100-150	305	50°	395	250
232*	15°	307	90-0	397	15
235*	00	306	90-	400*	90-
240	00	310.	900	402	100
245*	00	313.	90-0	405	90-
246*	90+*	315*	90-0	406*	90-0
246.8*	00	317*	90-0	410'	5*
247.5	90+*	320*	20°	412*	150
249	900	325'	20°	415	100
251.	90+*	326*	90°	417	100
253 *	90-0	330	90°	420	15*
256*	90-0	332*	200	422*	30°
257.5	30°	355	90-0	425*	900
256.5	900	337	100	427	90-0
262*	90-*	340'	20°	430	90*
245*	96-9	363*	360	432*	15*
267 *	25 ⁶	345	300	433	50
270°	96 ⁶	347	200	434.	90*
273*	900	350	200	436.	100
275'	90+9	352°	20°	437	900
217	35	365	200	436*	900
279.5	90+	357.5	100	439	90-0
200*	45°	360	150	443*	90° to 904°
262.5	90-	362	90-	445	35°
205*	900	365	200	468*	90-
287 °	90+*	367	200	450*	200
		370"	900	451	90
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			1		
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DIAMOND DATEL HOLF NO 2

MAGNETIC LOG (Contd.)

na de la constanta de la const			indicatory open contents to the adjustment of the contents of		
At	Deflection	Αt	Deflection	At	Deflection
453.5*	900	530*	30°	600'	Q ^O
455°	90-0	532	91)-0	604	90-°
456.5°	90°	535	90-0	606	60
4581	90+0	538	0	607	00
459.5*	90#0	540	90-8	610.	100
460*	90° to 90-°	542	00		90°
462°	90-	545*	0.	611	90+6
463*	90° to 90-°	548*	0*	611.5	90+°
465*	90	550'	90°	613.	900
467 *	900			614.5*	I _
	1	552*	15	615'	0
470*	90° to 90° +	555	30°	619.	90
472°	90°	557	90	620	15
473.5°	900	560'	0*	621	90
475*	90°	563*	90+°	623	90-
478*	90	565	90-	625	90° to 90°-
480*	90°	5661	45 ⁰	627 °	20°
483*	96°	570°	g o	630*	90-°
485*	90*	571*	90-*	631.	90+0
486*	90	572*	5*	632.5	90+°
490*	90-0	573	•	635	90+9
495*	90-6	575*	0.	637 •	50
498*	90*	576*	00	640	900
500*	96-°	579*	900	•	9 0
502*	90° to 904°	500.5	900	642.5° 6 45 °	30°
506"	90-0	581	90		1
508*	90-0	202	•	647.5"	90° te 95+
510*	90° to 90-°	586	900	450*	
512.5*	99-9	567	•	652 °	90-0
515'	90	569.5	90°	468. 468.	90-0
218.	90-		0.0		90°
520°	90-0	590	90*	660*	900
	90+*	591*	960	662*	1
521.5° 524°	90-0	592	90-*	665	350
		595		647	900
525°	90° to 90-°	597	90-6	670.	900
528*	90-*	599 '	90-0	672.5	90-
;					
					1
1	7		•	#	ŧ

BIANOND DRILL HOLF WO 2

MCNETIC LOG (Contd.)

At	Deflection	AŁ	Deflection	At	Deflection
675*	90-0	760°	10*	842*	900
678*	90°	762*	90°	845*	5.0
680*	90-0	765°	90°	846	90 ⁸
682*	90° to 90-	767.5*	900	860*	15 ⁶
685*	350	770*	90-0	852.5	90-0
687 *	90-6	772.5*	960	665	15°
690'	90-°	775*	90- ⁰	868°	90-
692*	90°	778*	90-8	860*	90-0
6951	90°	180 *	15 ⁰	662	90° to 90+°
697 *	90-	783*	10*	865	90 ⁸
700'	10	785	25 ⁰	867	90-6
703*	100	787	10°	870"	90-0
706*	10°	790*	25 ⁰	873*	90°
708*	90-	792*	90 ⁶	875	90 ⁰
710*	25°	795*	90-6	880	96 ⁶
712*	90-°	797 •	90°	882*	90°
715*	90-°	800*	36 ⁶	886	90
717*	90°	8082	900	886*	50
720*	90-°	805	10 ⁰	887	15.0
7231	90°	807 '	25°	890'	.00
725*	30*	809*	90-0	892*	10 ⁶
727	900	810.	90-0	895	50
730*	20°	811*	90-	097	50
732*	90-0	913'	90°	900*	5 ⁰
735'	90-0	815°	90-	902"	00
737.5	90-0	919.	90-0	905	20°
740*	900	8201	10°	910*	25°
743*	90-°	622*	90° to 90-°	915	00
745*	90-	825	90°	917	50
748*	90°	828	900	920	100
750*	10	830'	90°	923*	00
752*	₩*	833	15°	925*	0.
756*	90-°	836*	90-0	928*	00
758°	90-0	837 *	90-0	the of	1
,	,	840°	940	14 2-1-10 April 10 A	

Vepartment of Rines, South Australia

IRON EXPLONATION SECTION

LOG OF DIAMOND DRILLHOLE NO. 300

Fraict: Warramboo Aeromagnetic Anomaly D.B. 664/61 Sec. 24 Hd. Warramboo Co. Le liuste Hele Ser. No. 00 20/62 Cellar Coords 56800N, 64000E E.L. 456.0° Grid Warramboo Angle 900 Direction Bepth 600° Plan Rof. Date Hele Commenced 6.9.61 Completed 29.9.61 **Priller G. Speldewinde** On 28.9.61 Hele Legged by 6.R. Heath Hirer D. of M. 5.10.61

GBJECT: To test gravity "peak" associated with trough in magnetic "high".

RESULT: Iron fermation (10-35% iron exides) intersected from 100° - 144° and 348.5° - 660°.

LOG Comprises Goological Log Summary Log Magnetic Log

407.6"

600

From	Te	Description SUMMARY LOG
100*	134*	Quarts-felsper-epidete-bietite-martite (35%) metasediment
134*	144*	Quarts-erthoclase-garnet-epidete-magnetite (20%) metacediment.
144*	348,5*	Quartz-orthoclass-biotite-epidote motacediment with variable augmentite, garnet and herableads. Extensive granitisation and dislocation
		Magnetite 161.9° - 163.6° 15% 166.6° - 174° 25% 201.1° - 214.3° 10% 223.7° - 224.3° 10-15% 293° - 293.6° 5-10%
		Epidete 140° - 153° 157.8° - 161.9° 200.3° - 200.6° 285.0° - 267.5° 293.6° - 294.4°
		Epidete-ertheclase-amphibele 167.3° - 189.6° 280.6° - 283.1°
		Calcite amrble 315° - 321.5° 347.2° - 348.5°
348.5*	385*	Quarts-ertheclass-biotite-magnetite (15%) metasediment with lesser garnet and amphibele.
385*	407.6*	Quartz-ertheclase-biotite-magnetite (30%) metasediment.

Quartx-ertheclase-bietite-magnetite-martite (5-20% usually 10-15%) metasediment with lessor garnet,

sillimenite and epidete.

TO THE STREET STREET,		
From	To	Description DETAILED LOG
		CONTINUED FROM WR 6
100*	134*	Somewhat decomposed slightly to moderately concordantly granitised quartz-felsper-epidote-biotite-martite (30-50%, usually 35%) metasediment. Opaques possibly manganiferous near top. Attitude 40° to core axis at 110°? 60° " " " 120°? 50° " " " 130°?
134*	135°	Slightly decomposed quartx-epidete-felsper-magnetite- martite (10%) metasediment with minor garnet and bietite Moderately concordantly and discordantly granitised.
136°	144*	Moderately concordantly and lesser discordantly granitised magnetite (frequently as 1/10" blobs, 20-25%) - garnet (20-25%) - quartx - felaper (orthoclase 35%) metasodimen with minor biotite. Bodding well defined by mineral segregation. Attitude 70 to core axis at 137° 550 " " " 139° 25 " " " 144°
144*	148.2*	Mederately, deminantly discordantly granitised quartz- ertheclase-epidete-bietite metasodiment with miner magnetite and garnet. Fairly homogeneous appearance. Quartz rich bend from 146° - 146.2°.
148.2*	153.5*	Dislocated epidete rock with losser quarts-orthoclase and miner herablende and blotite, Attitude 50° to core axis at 151°.
153.5*	159.8*	Mederately to severely / discordently and concordently greatized quarts-orthoclass-biotite metasodiment, with accessory magnetite and opidate. Attitude 65° to core exis at 150°.
159.8*	161.9*	Sistemented epidote rock (semmaket leached), with hera- blende, ertheclase and quartz.
161.9°	163,6*	Slightly, dominantly concordently granitised quarts- orthoclase-magnetite (15%) - biotite - garnet metasedime:
163.6*	166.4*	Severity concerdantly and lesser discordently granitised orthoclase (60%) - quarts-opidate-biotite metasodiment, with rare garnet.
166.4*	166.6*	Mederately discordantly granitised epidote-orthoclase metasediment, with lesser hornblende and quarts.
166.6*	174°	Slightly concordently granitised augmetite (25%) - garnet-biotite-quartu-orthoclase metasediment. Attitude 50° to core axis at 169°.
174*	175.2*	Noderstely to severely concordantly granitised garnet- magnetite-bietite-quarts-orthoclase metacediment.
175.2*	187.3*	Moderately concordantly and lesser discordantly granitised biotite-quartz-orthoclase antesodiment, with minor garnet Attitude 45° to core exis at 180°.

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Fres	To	Description DETAILED LOG
167.3°	189.6°	Severely discordantly granitised (dislocated) epidete (decreasing top to bottom) - erthoclase (increasing top to bottom) - quartz metasediment, with rare bietite.
189.6*	195*	Severely discerdantly and concordantly granitized quartz- orthoclase-biotite-garnet metasediment. Attitude 60° to core axis at 190°.
195*	196*	Slightly, finely discordantly granitised biotite-quartz metasediment, with lesser garnet and felspars.
196*	201 *	Moderately to severely deminently concerdantly granitised quartz-ertheclase biotite metasediment. Attitude 55° to core axis at 200'.
201°	201.1	Epidote-biotite motosediment, containing minor quarts.
201.1*	212*	Nederately to severely discordantly and lesser concordantly greatised quertx-orthoclase-garnet-magnetite (10%) - biotite metasediment with lesser epidote, Attitude 70° to core exis at 210°.
212*	212.3*	Quarta-opidate-biotite motacediment, containing minor garnet.
212,3*	214.3*	Moderately concordently granitised anguetite (10%) - garnet-orthoglass-quarts-opidate astasediamet.
214.3*	219.2*	Moderately, dominantly concordantly granitised quarts- orthoglass-biotite-garnet metasodiment, with accessory magnetite.
219,2*	223.7*	Slightly irregularly granitised quarts-bietite notesediment with lesser orthoclass, and rare garnet perphyreblasts up to 1/10" diameter. Attitude 60° to core unis at 220°.
223,7*	224.3*	Slightly to moderately concerdently granitized garnet- magnetite (10-15%) - orthoglass-quartu-histite motosodium
224.3*	229.3*	Moderately to severely concerdantly and irregularly granitised quarta-bietite-erthoclase (pink to gray) motesediment, with lesser garnet.
229.3*	229,6*	Slightly irregularly granitised quarta-felsper-bletite- epidete metesediment.
229.6*	240,5°	Mederately to severely concerdently and discordently granitised quarts-orthoclass-hietite metacediment, with leaser gurnet (dispersed, and as perphyrehlasts up to 1/10" dismeter). Attitude 70° to core exis at 250°. 50° " " 240°.
240.5*	240.7*	Slightly granitised quartu-epidete-biotite metacodiment, with lesser orthoglass.
240.7*	257 *	Moderately to severely consordantly and lesser discordantly granitised quarta-orthoclase (pple foum) - biotite-opidete metasediment with lesser garnet. Attitude 55° to core axis at 250°.

	From	To	Description SETAILED LOG
***	257 •	257,5°	Slightly granitised quartz-felsper-epidete metasediment ("pseudo-porphyritic" appearance).
	267.5'	259.8*	Moderately to severely concordantly and lesser discordantly granitised quartz-orthoclass-biotite-garnet (perphyroblasts) metasodiment, Bodding contorted. Attitude 40° to core axis at 259°.
	259.8*	260°	Quartz-opidete-bietite (and possibly herablende) metasediment with lesser garnet and ertheclase.
	260*	272,6*	Medorately to severely concerdantly and discordantly granitised quarts-orthoclase-magnetite (5%) - biotite-garnet (up to 1/5" perphyreblasts) metasediment. Attitude 70° (conterted) to core axis at 270°.
	272.8°	273.4'	Slightly concordently and discordently granitised quarts- epidote-biotite metasodiment, with lesser orthoclase and gernet.
	273.4*	276.6*	Mederately to severely discordantly and concordantly granitised quarts-orthoclass-biotite autosediment, with lesser garnet and opidate.
	276.6*	277.3*	Slightly discordantly granitised quarts-opidete-bietite metasediment, with lesser orthoclase and gernet.
	217.8*	278.8*	Moderately discordantly and concordantly granitised quarts-orthoclass-hietite motosodiment, with lesser garnet and epidote.
	276,6'	260,3*	Severely discordently and concordently granitised quarts- ertheclase-biotite metasodiment with rare epidete and garnet. Attitude 50° to core exis at 200°.
	290,3	280.6*	Almost pure epidote, with less than 1/20" quarts veins, and less than 1/10" diameter erthoclase blobs.
	280.6*	282.7	Very homogeneous, fine grained (less than 1/50") erthe- alase-opidate-amphibale rock,
	262.7*	283.1*	Noderately discordently granitised epidote (vein) - orthoclase rock, with minor translite (?).
	265,1*	265.6	Noderately concordantly and discordantly granitised orthoclass-opidate-quarts metasodiment, with lesser biotite.
	256.6*	287.5	Very fine grained homogeneous epidete rock with very miner quartz and erthoclasse.
	267.5°	293*	Severely discordantly granitised quartz-orthoclass (off-white to 272', pink 272'-273') - hietite metasedim with lesser opidate and garnet. Bodding semsuhat conterted. Attitude 55° to core sais at 270'.
	293*	293,6*	Feirly homogeneous pyrite-garnet-magnetite (5-10%) -quarts-orthoclass-biotite metesediment.
	293.6	294.41	Dislocated quarts-opidate rock, with lesser orthoclase.

From	70	Description DETAILED LOG
294.4°	296.7°	Dislocated quartx (90%) rock, with minor orthoclase, epidote and hornblende.
296.7*	297.7*	Moderately concordantly and lesser discordantly granitise quartz-orthoclase-epidote-biotite metasediment. Shows well defined bedding.
297.7*	298.4*	Vein quartz with miner orthoclase hietite and epidete.
298,4*	299.7*	Mederately concordantly granitised quarts-orthoclase- epidote-biotite metasodiment.
299.7*	306,6*	Severely concordently and discordently granitized orthoclase (light and dark pink) quarta-epidete-bieti: metasodiment. Attitude 46°-45° (conterted) to core axis at 300°.
306,5	309*	Fine grained epidote-hietite rock with lesser erthoclase and rore quarts.
309*	313,3*	Severely discordantly and opposedently granitised quarts- orthoclase-biotite metasodiment, with lesser epidete. Attitude 55° to core axis at 310°.
313,3*	313.7*	Epidote-biotite rock with very minor quarta.
313.7*	315*	Moderately concerdently and discordently granitized quarts-orthoclass-kietite-reck, with lesser magnetite and garnet, and opidate-horablends from 314.6' - 315'.
315*	321.5*	Virtually pure calcite murble, with irregular epidete, herablende (?) and cale-cilicates (?) from 319.5° - 321.5°. Attitude 40° to core axis at 320°.
321.5*	323,5°	Very severely discordantly granitised querts (80%) rock with losser biotite, erthecisee, epidote and herablende,
323,5*	325°	Quarta-spidetethistite-amphibele meterediment, with lesser calcite. Contacts rather irregular.
325*	332,5°	Very slightly concerdently and discordantly granitized quarta-felsper-bietite antecediment, with losser epidete and rare scattered pyrite. Attitude 50°-55° to core axis at 325°. " " " " " " 330°.
332.5*	337 •	Very severely discordantly granitised (dislocated) querts-epidote-bietite autosodiment, with rure pyrite, herablende (?) and orthoclase,
337 *	341.9*	Severely concordently and discordently granitized quarts- orthoclass-biotite autosodiment, with rare garnet. Attitude 40° to core axis at 340'.
341.9*	343*	"Aplitic" looking quarts-orthoclase rock, with 10%, 1/10" germet perphyroblasts.
343'	345*	Mederately to severely discordantly and concordantly granitised quartz-orthoclass-biotite-garnet (up to 1/8" perphyroblests) astasediment.

	in differential and a second	
From	To	Description DETAILED LOG
345*	345.9*	Very severely discordantly granitised (dislocated) quartx-orthoclase-garmet-epidete rock.
345.9'	347.2	Moderately concordantly and lesser discordantly gramitised quarts-orthoclase-biotite metasediment, with rare garnet
347.2	346.5*	Virtually pure, very pale green calcite marble.
346.5*	365*	Mederately to severely concordantly and discordantly granitised magnetite (15%) - quarts-orthoclass-bietite metasediment, with lesser garnet and green amphibole, and rare epidete and tremplite. Attitude 66° to core axis at 350°. " 46° " " " 360°. " 55° " " " 370°. " 60° " " " " 380°.
365*	467.6*	Slightly to moderately discordantly granitized magnetite (30%) - orthoclase-quartu-biotite metasediment, with lesser epidote and rare garnet. Attitude 60° to core axis at 390°.
407.6*	414,2*	Noderately discordantly and losser concordantly granitised quarts-orthoclass-magnetite (10-15%) - hietite metasediment with rare green amphibole. Attitude 45° to core axis at 410°.
414.2'	415.5*	Severely discordantly granitised quarts-orthoclass-biotite- magnetite (5%) metasediment, with rere garnet.
415.5*	466.7*	Slightly to moderately concerdently and discordently greatized quarta-orthoclase-magnetite (15-20%) Medite metasediment, with rare translite and epidote. Attitude 500 to core axis at 420° " 46° " " 450° " 56° " " " 460° " 55° " " " 460°
466,7°	468.6*	Noderately to severely discordantly and lesser concerdantly graniticed quarts-orthoclase-martite (10%) - biotite metasodiment with minor epidote. Shows light iron staining. Attitude 60° to sere axis at 460.4°.
468,6*	473.9*	Severely discordantly granitised quarts-orthoclass (75-80%) rock, with lesser biotite and magnetite-martite (less than 5%) and rore garnet.
473,9*	475*	Moderately to severely concordently and revely discordently granitised quarts-orthoclass-martite (EX) -biotite matesediment.
475°	510.4*	Mederately to severely dominantly concerdantly and lesser discordantly granitised querts-ertheclase-hietite-garnet-magnetite (5-15%, usually 10%) metasediment, with rere silliments and epidote. Attitude 55° to core axis at 460°. """""""""""""""""""""""""""""""""""

From	To	Description DETAILED LOG
510.4*	533.1*	Rederately to severely discordantly and concordantly granitised metasediment, similar to 475° - 510.4°, but containing 10% sillimenite and 10% magnetite. Attitude 50° to core axis at 520°. 65° " " 530°.
533.1*	600°	Summently severely discordantly and lesser concordantly granitised querts-orthoclase (up to 1/2" crystals) magnetite (frequently cross cutting blobs up to 1/2" diameter, 5-20%, usually 10, possibly 15%) biotite-paraet metasediment, with lesser epidete and very rare horablende and sillimenite. Fure quarts bed or vein 575.5" 575.6". Preminent ptygmatic folding at 592.4".
		Attitude 559 to core exis at 540'.
	3.1 °	" 56 <u>" " " " 560</u> "
to 66		" 60 " " " 560°.
(Cont	id.)	" 40° " " " 570°.
		" 45° " " " 500°.
		* 60 * * 510
		60

CORE RECOVERY

		Recov-	general des des des des des des como como como como como como como com		managaness, social and the second	Recov	
From	To	ery	Condition	Free	To	ery	Condition
100	134*	5.0*	Broken	347.5*	357.5	10.2	Excellent
Rodu	¢e	to	NX	357.5	367.5°	10.0	Excellent & Fair.
134	137.5	3.3	Breken - Fair	367.5	377.5	6,2	Excellent & Brek
137.5	147°	9.1.	Fair - Excellent	377.5	367.5	10.1*	Excellent
147	150*	3.1	Fair - Excellent	367.5	397.5	10.00	Excellent & Fair,
REDUC	E	70	8X	397.5	407.5	7.8*	es 40
150°	160*	9.4"	Pair - Excellest	407.5	417.5	7.9°	
160'	170'	9.8		417.5	427.5	9.8*	Extellent
170*	180.	10.0	Good - Excellent	427.5	437.5	5,5°	Excellent & Broke
180*	190"	9.7"	* *	437.5	447.8"	7.0	Excellest
190°	290°	10.1*	Excellent	447.81	458*	10.5	•
200*	210.	10.0	•	458*	469*	10.2°	es .
210*	220*	9.4"	Excellent - Good	466.	478*	9.90	•
2201	230*	9.7*	Excellent	418.	486*	10.1"	. ** *
230	240*	10.1	Dem. Excellent	466	496"	10.2*	
240	250°	9.8.	Good - Excellent	496'	506*	10.2*	*
250*	2 60°	10.0	Excellent	206.	518.2	9.90	•
260*	270*	9.5'	•	518.2	529.5	9.8*	Excellent & Fair.
270	200*	10.2	•	526,5	538.8	10.0.	Execlient.
260°	290*	10.0	Excellent & Brokes	536.6*	549"	10.2*	*
290"	300'	6.20		549'	559, 2"	10.2	•
300'	366,5	5.2'	Good & Broken	559.2"	569.5*	7.1*	Excellent - Fair.
306.5	309.5	1.8	Brekes	540.5	579.6*	10.2	Excellent.
307.5	312*	3.0*	Broken & Expellen	577.8"	510.	9.3	Recellent & Breke
REP	KE	70	AX	800.	600*	6.5	
312.	317 *	3.6*	Recollent & Fair				
317 *	317.5'	0.4"	Fair	400.			
317.5	327.5	9.51,	Good - Excellent	Tetal	recever		- 600':
327.5*	337.5	9.10				[
337.5*	347.5	8.6*	Broken & Excellen			434.6*	= 93%,
		l .	}	S		·	i

MAGNETIC LOG

entrifficial and the state of t	AND THE RESIDENCE OF THE PARTY		sicolarditario managaria a contrarazza silvario della la		CONTRACTOR OF THE PROPERTY OF
At	Deflection	Ät	Deflection	AE	Deflection
100,	go	235°	-5°	380°	90+
	5	240*	100	383 •	900
134*	90-6	240.6"	90-0	385*	90+°
135'	90-0	245*	10*	307.5	90+6
137.5	90 ⁰	250	10*	390*	900
139.	900	255*	30°	392*	900 to 9010
141*	90°	260	90-0	395	90°
142.5"	90	262*	90-	397	90+°
144*	90-*	265	5*	400'	96+0
145*	10	270*	100	463*	900
147*	15°	273*	90-	405*	90+6
150*	go	275*	25°	407.5	90+*
156'	10	280	100	410*	90° to 90+°
160 *	.o*	265	150	413.	90°
166*	-6°	290°	150	415*	90-0
167	969	295*	•	47.5	90°
170*	908	300'	50	420*	100
171*	99+0	305	90	422*	90+
115.	90+ ⁰	310*	••	425*	900
173.9*	9040	315*	100	427	90+°
174.1	904°	320'	90	430.	90-*
175*	960	325	5	432.5	90°
160*	30*	330.	150	435*	96°
185*	150	336*	900	438	900
190*	200	340'	•	440*	904
195*	150	345*	200	442*	90+°
200*	150	346,2	1 -	445	90-*
292*	90-0	350	99°	448.	90°
205*	900	352.5	1	450.	100
2091	900	365	90*	452*	90-*
211.5*	90°	367	100	455	9010
212.5	900	340	900	461	904*
214°	900	363.	90.0	460.	900
215*	100	365	90-0	462*	900
220°	15	368*	900	446*	900
224*	90°- to 90°	370	90-	467	90-
225*	350	375•	900	470	00
230*	300	317.5	900	472*	1
	=				

(Contd.)

			and the state of t
At	Deflection	AE	Deflection
475*	90-0	538*	30-e
478*	90°	540*	90-*
480*	90-*	542*	90°
462*	900	545	90-6
485*	906	547	90°
487 *	900	550	90 [®]
490*	90-	55 2*	90°
492*	900	565	90*
4951	90-*	556	90-0
498*	90 ⁶	560	90-*
500*	90+0	542*	90 ⁶
503*	40°	545*	90°
505*	.20°	570*	90-*
506*	100	572*	90-*
210.	90-*	575*	90-
273.	900	\$77°	10 ⁶
515*	90-°	500'	90
527 *	90-0	543*	100
529'	90-°	505*	00
523	90-0	567*	90-0
525	90 ⁶	590'	90-*
526*	90°	592°	70°
530*	90*	516 *	90°
532*	90 [®]	597	960
536*	90	460*	60
		600*	RNO OF HOLK
•		7 9	•

Department of Mines. Senth Australia

IRON EXPLORATION SECTION

LOG OF DIABOND DETLLHOLE NO. NO 4

Preject: Werrembee Aeremagnetic Anomely

Sec. 24 Hd. Warrambee Co. Le Hunte Hele Ser. No. DD 43/62

Cellar Geords 58400N. 62000E R.L. 460.7° Grid Warrambee

Direction - Anole 90° Booth 460° Plan Ref.

Beta Hele Commenced 13.10.61 Gammleted 1.11.61 Briller G. Speldewinde

Hele Leased by C.R. Heeth On 31.10.61 Hirer D. of H. 8. 1.62

OBJECT: To test gravity high coincident with magnetic low,

RESULT: Granitic metasediments with minor epidote and garnet intersected from 114" - 406". Granitisation extensively developed.

LOG Comprises

Goological Log Core Recovery and Condition Hegnetic Log

From To Description

CHETTHER PARTY IN 11

114° 234.6° Quarts (ave. shout 30%) - off-white felaper (ave. shout 40%) - biotite (ave. shout 30%) semanhat concerdently and discordently granitised metacodiment. Grain size minly 1/20° - 1/10°, rarely 3/4° (felaper).

Other minerals present:

Epidete 1/4" Ferphyreblasts) 198'-199'

Quarts-folsper rich cross from 145'-146'.3' and 109'-111'. Quarts-folsper rich rock with poorly defined bodding and irregular blottle rich bonds from 281.6' - 284.6'.

Bodding generally about 1/10" thick, mederately well defined.

132' Minor fold 146' - 166' Conterted bodding 184.3' - 186.3' Good 1/10" bodding.

Attitude 25° to core exis at 115°.
35° -46° " 131.5°
40° " 139°
45° " 150°
45° " 170°
56° " 171.5°

etrores de la company		
from	To	Description GEOLOGICAL LOG
114°	99 1 1 B	
	234.6° mtd.)	Attitude 20° to core exis at 186°.
(Anda)	N 444 /	" 40° " " " 200,5°
		" 36° " " " 266 €
		" 55° " " " 219.5° " 50° " " " 230°
		50 " " " 239
234.6*	248.5*	Querts - pele pink ertheclase rock with miner bietite. Bedding obscure due to severe discordent granitisation. Grain size 1/10" - 1/5". Attitude 40°(?) to core axis at 239".
248,5*	406°	Gremitic metacodiment similar to 114° - 234.6°, but more severely gramitized (pale pink orthoclase occurs throughout). Dark pink orthoclase occurs at 237° and 340.5°, while a moraic of 1/8" querts-orthoclase erystals is present at 328°, 300° - 301°, 1/20° quarts-orthoclase bod.
		Garnet and histite form up to 1/2" diameter blobs at 259.5", while garnet (as less than 1/5" perphyreblasts) is a rare constituent below 292". Bedding is generally more distinct than from 114" - 234.6".
		258' - 269' Sovere concordent granitisation, some hodding distortion, lose biotite.
		275' - 278.5' As 258' - 269' above.
		299.7° - 301' Severely, mainly discordantly granities bodding obscure, minor histite.
		331.5' - 331.8' Metite 60%, querte-plagieciese 40%,
		344.5° - 351° Aplitic looking, minor blotito, dark pink orthoclase, bodding distorted or obscure.
		369° - 371° Gernet perphyroblects up to 1/4" dismotor (scattered).
		377.5' - 376' Grant Licot as 258' - 269',
		462° - 486° Soverely concordantly grantitised, dark pink orthoclass.
		Attitude 50° to sere exis at 250°.
		" 36° " " " 260° " " " " 270°
		50 270 200 200 200 200 200 200 200 200 20
		* 45° * * * 200°
		* 45° * * * * 200 K*
		450 " " 310" "55"-600 " " " 319,5" " 300 " " " 350" " 600 " " " 360" " 400 " " " 360" " 400 " " " 370"
		"55"-60" " " " 319,5"
		" 30" " " " 330" " 60" " " " 340"
		* 300 * * * * 350*
		* 45
		" 40" " " 370°
		" 35" " " " 389°

Frea	Te								eseri				
			W-101-100	GENTRAL				96.0	LOGIC	M. F		i in a second	مقدونه
248	406		A	lti i	ude	45	to	core	axis	at	390° 400°		
(Conte	i.)				50	'-5 <u>5</u> 0	#	행			400		
						40		49	88	**	406°		
406	,	Pan	AF	Dest.	E								

MANETIC LOS

Deflections zero except for $5^{\circ}-10^{\circ}$ deflections mean 390° (due to minor magnetite in hietite rich layers),

CORE RECOVERY

ND 4

-			_		Dich word and an order of the con-	4	4
From	To	Recovery	Condition	From	To R	covery	Condition
114°	120*	3.2*	Broken - Fair	31 0.5	320.5	10.0*	Excellent
3.5	DOCK TO	RX		320.5	330.5*	10.4	*
120°	139,3*	8.6*	Fair - Good	330.5	349.5*	9.9*	Good - Excelle
130.3	140.31	9.9*	Good - Excell-	340,5	346.5*	2,9*	Good - Fair.
			ent.	346.5"	356*	7.3	Excellent,
140.3	150.3'	9.3*	* * #	356"	366*	9.2*	Good - Excelle
150,3°	160.3	11.1*	Excellent	366.	376*	9.8*	Excellent.
160.3*	170.31	8.6*	*	276.	386°	9.6*	Good.
170.3°	180.3°	10.0*	*	386*	396'	7.9*	Pair - Good.
180.3°	190,4'	8.3*	Peir - Execli- out.	396"	406*	8.5*	Execilent - Fa
20	DOCE TO	AX					
190.4*	200'	4.0*	Brokon - Feir	496	* 81	e of hou	•
200"	210.	9.9*	Pair - Good				
510°	219.	3.6*	Excellent - Fair				
119.	229*	8.7*	Good - Excell- est,				
29'	237	6.1*	Exections	Tot	al recor	ery 117*	to 406':
1317 °	244.5	0.0	•		257.5		19%
M4.5°	254°	9.5*	•				
54'	264.	10.0	Good - Excell- out,				÷
164"	274"	6.2	Fair - Good	a			
74*	284*	10.0	Reclient				
194 °	293.51	10.1*	Good - Excell- ont.				
293.5*	300.	2.4'	Good - Breken		•		
100'	310.5"	10.1.	Excellent				
	1	į					

Department of Nines. South Australia

IRON EXPLORATION SECTION

LOG OF PERCUSSION BORE NO. NP 1

Project: Warramboe Aeromagnetic Amemaly

Sec. 25 Ed. Warramboo Co. Le Hunte

Bore Ser.No.PS 506/62

Collar Coords 57100N. 67000E R.L. 453.2° Grid Warramboo

Vertical

Depth 25° Plan Ref.

Date Bore Commenced 14.7.61 Completed 22.7.61 Driller E. Graham

Bore Legged by G.R. Heath On 25.7.61 Birer D. of M.

OBJECT: To test flank of gravity and magnetic enouglies.

RESIN.T: Quartz send intersected from 22' - 25'

LOG Comprises Macro and microscopic geological log

free	То	Description GETAILED LOG
		Continuous oven tube samples
0.	2.1*	Brown to red-brown very fine grained quarts send, containing minor clay and gypoum,
2.1*	10°epp.	Offubite and light yellow-brown, near the top, to red-brown near the base, crystalline gypoum (crystals less than & diameter). Semment elegay near the top, while the lowe centact is gradational, from about 7.5° to 12°.
10° app.	13*	Red-brown, yellow-brown and eff-white mattled slightly eleyey (less than 10%) quarts, sand, with minor gypsum,
13*	22*	Light grey and lesser red-brown mettled and irregularly bended elsy containing variable proportions (5% near the top to 80% near the base) of 1/20" - 1/250" sub-angular to sub-rounded quarts grains.
22*	25'	Very light grey to eff-white sub-engular to sub-rounded pure quartz sand, containing scattered 1/1600" black epaque grains. Grain size 1/50" - 1/1600", averaging about 1/200". He visible structure.
25*		END OF HOLE. Send flowed into coming as feet as it could be withdrawn.

Department of Mines. South Australia

IRON EXPLORATION SECTION

LOG OF PERCUSSION BORE NO. NP2

Project:	Warr	amboo Aeromagne	tic Amemaly	Dalla 664/61
Sec. 25	iid.	Warremboo	Co. Le imate	Bore Ser. No. PB 514/62
Cellar Co	erde	57200N, 67000	E Bal. 452.3°	Grid Warrenboo
Yertical			Depth 22°	Plan Ref.
Date Bore	Com	esced 22.7.61	Completed 24.7.61	Oxiller &. Graham
here Less	ed by	G.R. Heath	Qn 25.7.61	Hirer D. of M.
an tran.	•	A		

OBJECT: To test flank of gravity and magnetic anomalies

RESULT: Quartz send intersected from 18° - 22°.

LOG Comprises Noore and microscopic geological lag.

Free	70	Description DESAILED LOG
		Continuent over tube camples.
0.	2.3*	Brown to reddish-brown slightly clayey very fine quartz sendy leam, containing some gypsum.
2.3*	7*	Grystalline gypenm (up to 1/8" crystals) containing up to 20% red and yellow-brown clay, and up to 60% fine red-brown quarts send. Clay is most common near the top of the sequence, sand near the base.
7*	13*	Reddish-brown, yellow-brown and dirty grey mottled and irregularly banded, semouhat elayey, 1/200 quartz sand. Grains generally sub-rounded to rounded. Contains eccational limite modules, and pubbles formed by siliceous commutation of groups of quartz grains. Bending tends to be roughly parallel to core axis.
13.	16*	Light grey, and occasionally very light red and yellow-bres clsy, centaining variable propertions of 1/200" sub- rounded quarts grains, either dispersed, or as irregular "veiss". Randing again tends to be sub-vertical.
18*	22*	Off-white and shades of very light braum slightly elayey pure quarts sand. Gentains a few 1/1000" black epaque grains. Grain size 1:/50" - 1/1000", usually about 1/250 Grains angular to subremaded.
1	22*	END OF HOLE. Fluid sond.

Department of Mines. South Australia

IRON EXPLORATION SECTION

LOG OF PERCUSSION BORE NO. HP 3

freiest:	Warrembee	Acromegaet	tic Anomaly	D.N. 664/61
Sec. 26	lid. Warr	natios	Co. Le fiunte	Bore Ser. No. PB 515/62
Collar Co	erds 5730	DN, 670 60E	E.L. 451.2°	Grid Warrenboo
Vertical			ilenth 17°	Plan Ref.
Date Bore	Communed	24.7.61	Completed 24.7.61	Briller R. Graham
Bere Legge	ed by G.R.	. Heath	<u>9a</u> 25.7.61	Mirer D. of M.

OBJECT: To test flank of gravity and magnetic anomalies.

RESULT: Quartz sand intersected from 16° - 18°.

LOS Comprises Necro and microscopic geological log.

Pres	To	Gescripties DETAILED LOG
0.	3.	Continuous open tube samples Brown with lesser red and yellow-brown mottled very sandy (70%) slay leam,
3 *	11.5*	Mainly red-brown and yellowish gray-brown mottled and irregularly handed very sandy (66 - 75%) clay. Sand is unitly 1/200" rounded quarts, but gypens is a minor constituent near the top of the sequence, and limenite modules up to 1/4" diameter (enclosing quarts grains) occur spacedically throughout.
11.5*	16*	Light grey clay containing 15 - 75% quartz send (dispersed and veins). Send mainly 1/150° - 1/300°, sub-engular. Hiner liments staining.
16*	16*	Off-white and light brown (various shades) very slightly clayey quarts sand. Grains generally sub-angular to sub-rounded, 1/20" - 1/200", assaily 1/50" - 1/100". Limmite occurs as light staining on some grains. No visible structure.

18' EMD OF HOLE. Fluid send.

Department of Rises. South Australia

IRON EXPLORATION SECTION

LOG OF PERCUSSION DONE NO. WP4

Project: Warranhoe Aeromagneti	ic Anomaly	D.N. 664/61
Sec. 25 Hd. Werrentoo	Co. Le Bunte	Bere Serial No. PB 516/62
Collar Coords 57400%, 679008	R.L. 450.1°	Grid Warramboo
Yertical	Depth 69*	Plan Ref.
Date Bore Commenced 25.7.61	Completed 27.7.61	Driller &. Graham
Bore Logged by G.R. Heath	0s 29.7.61	Hirer D. of E.

OBJECT: To test gravity and magnetic anomalies

RESULT: Decemposed metasediment containing 10-20% martite intersected from 43° - 69°.

LOG Comprises | Nacro and microscopic geological log.

Frem	To	Description DETAILED LOG
	<u>, , , , , , , , , , , , , , , , , , , </u>	Centiamens esem tube samples
0.	1*	Brown sandy leam.
1*	5*	Red-brown and grey mottled and irregularly bended very <u>sandy elay</u> (contains 80%, 1/100" - 1/200", well rounded quarts and miner limmaite).
6.	7*	Grey and lesser red-brewn <u>elever sand</u> (semmuhat similar to 1° - 5°). Gentains 96%, rounded, 1/200° quartz graius.
7*	15*	Grey and miner red-brown, irregularly mottled and banded flar, containing 40-70% rounded 1/100° quarts grains.
15°	18•	Light grey-brown elightly <u>elever sand</u> . Contains 5-10% eley, with 1/100° - 1/200° subrounded quartz grains.
18*	36*	Off-white and gray, mottled, bended (?) and marbled <u>sandr_alar</u> . Probably everburden, but may be decomposed metasodiment. Contains about 20%, 1/50" - 1/150", sub-angular, irregularly distributed (in lemma and "voine") quarts. Clay is semuchat flaky, and contains bends of dispersed, very fine grained pyrite.
		Bedding or banding 30° to core axis 20.5° 25° " " 23.5° 36° " " 24.5° 30° " " 28.5° 25° " " 34.5°

38° 40° Red-brown and yellow-brown mottled and hedded (?) gandy alay. Clay is semanhat flaky, grading to decempsed mice (?) and contains 40% 1/20° - 1/50° angular quartz. and 5-10% modular and dispersed pyrite. Attitude 35° to core axis at 39.5°.

From	To	Oescription DETAILED LOG
40°	43*	Grey sandy clay as 18° - 30°
43*	69°	Red-brown, purple-brown, grey and yellow-brown mottled and irregularly bedded decomposed <u>metagodiment</u> . Contains 5-60% averaging 10-20% maxtite, 50% quartz and 30-40% decomposed felsper and mics (flaky clay). Grain size mainly about 1/200°. Bedding 1/16° - 6° usually 1/8° - 1/4° thick. Attitude 25° to core axis at 44.5°. 35° " " 52.5°
		369 " " " 52.5"
		15 9 " " " 54.5°
		50 " " " 60.50
		15° " " " 54.5° 5° " " " 60.5° 36-40° " " " 62.5°
		400 " " " 64,5"
64	•	END OF HMLE.

annihitari (annihitari annihitari	·	Micco-mercipal distribution	an a training		Or or the new or the later	-		-	MOUNTAINE	Magazina di Ma
From	on To	Description DETAILED LO								
O THE RESIDENCE OF THE PROPERTY OF THE PROPERT			-	ation (all three are a street a	Matter and the same			PE-AP-A	offic US	LUG
49°	U6*		A	ti tude	100	to	core	axis	at.	49.5*
(cont					300	40		10		52.5
					10° 30° 20°	60	89	48	49	56.5
					150	*	#	78		63.5
					150	şt	10	**	57	68.5
				20	≻25° 25°	197	49	10	27	70.5
				 .	250	ė.	,80	*	**	71.5
					250	60	99	•	60	76.5
					309	*	**	.49	84	81.5
					30° 30° 40°	49	**		-10	63.5
					400	49	•	188	*	84.5
86	5°		OF	HOLE.						

Department of Mines, South Australia

IRON EXPLORATION SECTION

		roe	OF PERCUSSION BORE NO.	LIPE
Praiset:	Warremboo	Aoremegne	tic Amonaly	D. N. 664/61
Sec. 25	lid. war	rambee	Co. Le liunte	Bore Ser. No. PB 520/62
Collar Co	ords 5770	DON. 67000E	Bal. 449.3*	Grid Warramboo
<u>Yerlical</u>			Depth 105'	Plan kef.
Date Bore	Commence	2.8.61	Campleted 10.8.61	Driller S. Graham
Bore Loug	ed by G.	R. Heath	On 10.8.61	Her D. of M.
OBJECT:	To test	gravity as	d anguetic anomalies	•
RESULT:	Decemper Centa	sed metased ins 10-20%	iment intersected free martite 28° - 98°, and	13° (?) - 195°. 15-10% mertite 98° - 105°.
LOS Comp	rises	Meere and	microscopie geologies	il leg.
From	Ъ		Description DETAILED LO	
	· · · · · · · · · · · · · · · · · · ·	Centimen	t open tube samples	_
0	1*	Brown sea	dy slav leas-	
1*	2.5°	mettled		m irregularly banded and stains 70% 1/100" rounded
2.5°	13*	very sl	ightly <u>sandy clay</u> . Co od limonite modules u	nd-breum mottled and banded enteins miner quarts and o to 1" diameter. Probably
13*	28*	white i Contain quarts.	rregularly bedded (?)	mis et 13.5°
26*	96*	Red-brown	and yellow-brown door	papered quarte-martite-fels

ed-brown and yellow-brown decomposed quarts-unrite-felsp mice mice mice from EX to 50 ever short sequences, but probably averages 10-20% for t unit. Grain size usually shout 1/100". Bodding general obscure, 1/32" - 2", usually 1/16" - 1/4" thick.

Attitude 50° to core exis at 29.5'

30° " " " 30.5'

30° " " " 37.5'

55° " " " 43.5'

70° " " " 46.5'

30° " " " 54.5'

50° " " " 67.5'

35° " " " 67.5'

From	tau parenta manamana parenta parenta per a seria de la compositiva de la compositiva de la compositiva de la c	Description DETAILED LOG
28*	98* Contd.)	Attitude 45° to core axis at 76.5° 45° " " 67.5° 35° " " " 90.5° 46°-45° " " 94.5°
96*	105*	Grey and grey-brown mottled and irregularly bedded decomposed quartx-felspar-martite-biotite metasediment. <u>Hartite 5-10%</u> of rock, usually 1/200° or less in dismet Bedding usually less than 1/8° thick. Attitude 30° to core axis at 104.5°.
		Below about 65°, most samples contain white calcareous modules up to 1/2" and rarely 1" diameter. These cut bedding planes, and are certainly concretionary (d.f. MR 3).
1	.06°	FND OF HOLE.

Separtment of Mines. South Amstralia

INON EXPLORATION SECTION

LOG OF PERCUSSION BORE NO. MP 7

Project: Warranboo Aeromagnetic Anomaly

Sec. 25 jid. Warranboo Co. Le Hunte Bore Ser.No. 98 527/62

Collar Georda 57800N. 67000E R.L. 449.5° Grid Warranboo

Vertical Depth 125° Plan Ref.

Pate Bore Commenced 10.8.61 Completed 15.8.61 Driller R. Graham

Bore Lessed by G.R. Heath On 17.8.61 Hirer D. of R.

OBJECT: To test gravity and magnetic anomalies.

RESULT: Decomposed itabirite intersected from 49.5° - 50.5° and 119° - 125°.

106 Comprises Notre and microscopic geological log Summary Log

Free	Te	Ueccription SUMMAY LOG
0	14.5*	Overharden. Mainly white semewhat sendy clay containing nedular limmaite.
14.5*	49,5*	Metasodiment containing 10-15% mortite.
49.5*	50.5*	Decomposed itabirite containing 45% martite,
50,5*	119*	Metasodiment containing 15-25% emrtite.
119*	125*	Martite (and minor magnetite) itabirite containing

From	70	Description OFTATLED LOG
		Centismens Open Tube Samples
0	1.	Brown sandy clay loss.
1*	3.5*	Red-brown, with lesser yellow-brown and off-white clay containing scattered <u>limenite medules</u> and 40%, 1/200" rounded querts.
3.5*	14.5*	Mainly off-white <u>clay</u> (overburden ?) containing scattered <u>limenite medules</u> up to 2" diameter and 5% (?) subangular quartz (1/50" - 1/100" diameter).
14.5*	21.	Red-brown decomposed <u>metacodiment</u> containing <u>15% mertite</u> , 35% quartz, 50% clay (after mice and felsper). Grain size 1/100" - 1/200". Moderately severe limenite staining. Attitude 60° to core axis at 16.5°. 35° " " 19.5°.
21*	24*	Off-white and light yellow-brown decomposed <u>metacadiment</u> containing 30%, 1/50° quarts, and <u>1 or 2% mertite</u> , with flaky clay.
24*	29°	Mainly red-brown decomposed <u>metacediment</u> similar to 14.5° - 21°. Contains <u>10% mertite</u> , 50% querts, 40% clay. Grain size shout 1/100°. Attitude 60° to core exis at 24.5° 45° " " 26.5° 40° " " 28.5°
29*	49.5*	Light unlticoloured laminated decomposed missediment, containing 10-20% usually 15% martite, 30% quartz, 56% clay. Grain size about 1/200". Bodding well defined, 1/32" - 1/2" usually 1/16" - 1/8" thick. Attitude 45° to core axis at 30.5° 50° " " 32.5° 50° " " 35.5° 46° " " " 46.5° 60° " " 46.5° 55° " " 47.5° 55° " " 47.5°
49.5*	50.5°	Dark purplish-grey decomposed <u>itabirite</u> , containing <u>46% mertite</u> , 56% quarts. Grain size 1/50" - 1/100".
50,6°	. 4°	Mainly red-broom, with lesser off-white and yellow-brown decomposed metasediment, similar to 14.5° - 21°. Gentains 5-20% nanally 10% mertite, 40% quarts, 50% flaky clay. Strain size 1/50° - 1/250°, usually less than 1/100°. Sodding well defined, similar to 29° - 49.5°. Attitude 10° to core exis at \$2.5° 40° " " \$4.5° 40° " " \$56.5° 25° " " \$7.5° 35° " " \$9.5° 45° " " \$9.5° 46° " " 60.5°

From	7o	Description OBTAILED LOG
67°	80.5*	Red-brown and eff-white mettled decomposed metasediment, similar to 50.5° - 67°, but bedding poorly defined. Contains 20-35% usually 25% martite-magnetite, 60% quartz, 80% flaky clay. Grain size 1/20° - 1/50°. Attitude 35° to core axis at 68.5° 20°? " " 71.5° 40°? " " 74.5° 20° " " 78.5°
60.5 *	115*	Grey-brown and off-white mottled and indistinctly hedded decomposed motacediment. Contains 25-35% magnetite-martite. 30% quarts with recognizable decomposed felspus and mice. Grain size about 1/20". Attitude 25°? to core axis at 81.5° 20° " " 83.5° 30° " " 90.5° 30° " " 94.5° 25°-30° " " 100.5° 46° " " 103.5° 20° " " 106.5° 35° " " 106.5° 35° " " 113.5°
115°	119•	Off-white and very pale multicoloured decomposed metagediment, Contains 10-15% magnetite-martite, 30% quarts, with folioper and mics. Greis size shout 1/150°. Bedding not well defined, shout 1/8° - 1/4° thick. Attitude 50° to core axis at 116.5° 25° " " 117.5°
119*	126*	Dark grey decomposed martite (and minor magnetite) itahirite. Contains 30-46% martite-magnetite usually 40-46%, with querts and minor folsper and mice. Grain size about 1/100". Bodding fairly well defined, less than 1/4" thick. Attitude 20 to core axis at 120,5" 200 " " " 122,5" 300 " " " 124,5"
129	5 •	END OF HOLE. Hackin to restrict water inflam.

Department of Minos. South Australia

IRON EXPLORATION SECTION

LOG OF PERCUSSION DORE NO. WP U

Project: Marramboo Aeromagnet	ic Anomaly	Dall 664/61
Sec. 24 Hd. Marramboe	Ce. Le iunte	Bore Ser. No. PE 534/62
Cellar Coords 56100N, 58000E	Rela 557.1*	Grid Warrantoo
<u>Vertical</u>	Depth 32°	Plan Ref.
Date Bore Commerced 16.8.61	<u>Completed</u> 19.8.61	Briller R. Graham
Sere Lagged by G.R. Heath	98 19.8.61	Hirer 0. of M.
OF HCT: To test morthern fl	ank of gravity and mag	metic amounties.
RESILT: Decomposed metasedi	ment centeining 10 - 2	5% martite and

mangamiferous exides intersected from 8° - 22°.

LOG Comprises Nacre and microscopic geological log.

Beseripties Frem To DETAILED LOG Centimous Open Tube Samples 1. Brown sandy lean. 20 Fale yellow-brown shoot kunkar becoming semouset more frishle towards the base, containing 40% rounded 1/100" - 1/200" quarts grains and 20%, 1/16" - 1/4" masganiferous 11mmite (?) medules (2" - 8" too hard for tube samples). 8. 18* querta-folsper-mice-martite (5-16%, dismersed) magnatiferous (1/16" - 1/8" bods and voims (?), 10-20%)
materialization, Slight irrogular granitisation, Grain
size 1/60" - 1/250", Bodding generally obscure, up to
1/4" thick, Mirty red-brown and yellow-brown severely decempesed Attitude 30° to core axis at 17.5°. Decomposed metatodiment containing 5-16% opeques (intermediate between martite and mangualforous material), 25% biotite and quartz-orthoclase (forund during grand itisation). Grain size 1/10" - 1/50". Bedding fairly well defined usually about 1/10" thick.

Attitude 45° to core axis at 19.5°.

55° " " 21.5°. 180 220 224 329 Decomposed gramitised metacodiment, similar to 18' - 22', but less than 1% energy exides, end 30 - 35% bietite.
Attitude 40° to core axis at 26.5°.
50° " " 29.5° 31.5* 32° END OF HOLE (Too hard for tube sampling).

Department of Bises. South Australia

IRON EXPLORATION SECTION

LOG OF PERCUSSION BORE NO. WP9

Project: Warrantee Aeromagne	tic Amemaly	P.B. 664/61
Sec. 24 Hd. Warranbee	<u>Co</u> . Le iluste	Bere Ser. No. PO 539/62
Cellar Ceerds 56000N, 58000E	R.L. 558.3°	Grid Warranhoe
<u>Verticel</u>	Depth 115'	Plan Ref.
Date Bere Commenced 19.8.61	Completed 31.8.61	Oriller R. Graham
Bore Lagged by G.R. Heath	On 2.9.61	Hirer D. of H.
CRAFCT: To test gravity	and magnetic assemblies.	
RESULT: Mangani forces (20 intersected fro 80'-112'.	0-50% usually 30% Mm On om 15'-96' (possibly to	ides) <u>metagadimenta</u>) 112°); 15% Hertite

LOG Comprises Macro and microscopic geological log.

Free	To	Description DETAILED LOG
•	1*	Green take sample. Light yellow-brown gand containing 75% 1/100" - 1/200" well rounded quarts, and 25% 1/6" - 1/4" medalos of dull block mangemiforous exides (hard and compact).
1.	10*	Sludge sample. Herd convoluted pole yellow-brown <u>knoker</u> containing <u>20-20% manage (erone exiden</u> (as 0°-1°) and about 30% rounded querts. Goodes as a recistant sheet, becoming seasuhet modular towards the base.
10*	15*	Sludge sample. Guttings similar to 1'-10', but <u>managese</u> axides (56%) and kunker (50%) eccur, as modules in a clayer matrix. Minor limenite present.
15*	20*	Sludge sample. Red-brown and dark groy mangamiforous decomposed metasodiment. Contains 166% mangamage axides (1/2 vitrouns, 1/2 certhy), 25% anguler 1/50" - 1/160" quarts and 25% decomposed felsper and mica.
20*	24*	Sladge sample. Bull reddish grey-brown material, similar to 15°-20°, but containing about <u>ANK measural foreus exides</u> and 40% querts.
24*	28*	Sindge sample. Light reddish-brown material, similar to 15°-20°, but containing <u>25% mangentforous exides</u> and 40% querts.
26*	30*	Once twhe samples, Off-white, light reddisk-brown and lesser grey decomposed seamwhat granitized netacediment. Contains 20-25% nearmose axides (so up to 1/8" subconsordant veins and dispersed 1/200" grains, may include some martite), 40-45% quarts, 5% decomposed mice and 30% decomposed felsper. Grain sine 1/200" (speques) to 1/10" (felsper). Hedding not well defined. Attitude 30" to core axis at 28,5",

From	To	Description DETAILED LOG
30*	51*	Open into samples. Grey and dull light brown decomposed matasadiment. Contains 25-50%. Dayally about 35% manusaniferous exides (as beds, dispersed 1/150" - 1/25 grains, discordant and concordant veins and irregular, roughly equidimensional masses up to 2" diameter. About half is dull and earthy, while the remainder is hard and semowhat vitrous, massibly grading into mart 30% quarts, with decomposed felspar and mics. Grain s mainly 1/100" - 1/150", but dispersed opaques as small as 1/250", and massive opaques up to 1/4". Bedding we well defined in the lower grade material (beds mainly 1/16" - 1/4" thick), but frequently obliterated in the higher grade material. Attitude 30" to core axis at 30.5" 35" " 33.5" 36" " 34.5" 40" " 42.5"
51.	54*	Open tube samples. Mangamiferous decomposed metagediment similar to 30°-51°, but containing about 20-28% mangamiferous exides. Hedding well defined throughout Grain size mainly 1/150° - 1/200°. Attitude 30° to core exis at 51.5°. 35° " 53.5°.
54*	67 *	Ones Tube samples. Mangamiferous decomposed <u>metasodim</u> as 30-61. Contains 25-60% <u>menelly 40% mangaments and</u> Attitude 40° (?) to core axis at 61.5° 40°, 65.5°
67 *	70*	Ones take samples. Mangamiferous decomposed metasedines as \$1°-54°, contains 25%, minly dispersed, management axides and secondary garmet. Attitude 45° to core axis at 47.5° 40° " " 68.5°.
70°	75°	Sindge sample (too hard to core). Hangamiferous decompositional containing 30-355 manusakes exides. Probably similar to 30° - 51°.
75°	80°	Sindpe comple. Decomposed <u>metanodianut</u> containing <u>15%</u> <u>menunate oxides</u> (possibly gradutional to mertito), 20-20% histite, 5% garnet with quarts and decomposed felapur.
86*	91.	Once inhe cambas. Decomposed metacodiment (similar to 75° - 80°) containing 25% comme exides (1/3" manuscriferens, 2/2 martite - possibly energemiferens), 10% garnet, 16% biotite, with quarts and orthoclass. Grains 1/100" - 1/200" (garnet) to 1/10" (orthoclass and energences exides). Bodding fairly well preserved, usually shout 1/8" thick. Attitude 30° to core exis at 82.5° 87.5°

-2-

From	To	Description DETAILED LOG
91 •	9 φ *	Open tube samples. Off-white and yellow-brown semewhat limenite stained and impregnated metasediment. Contains 15% mertite. 5% menganiferous exides (as less than 1/4" diameter segregations), 10% biotite. 5% garnet. with 35% quartz and 30% decomposed felspar (meinly orthoclase). Grain size about 1/100". Bedding fairly well defined usually 1/16" - 1/4" thick. Attitude 40° to core axis at 91.5" "35° 40° " " 94.5" "35° 55.5°
96°	103*	Open tube samples. Mainly yellow-brown, decorated materediment containing 15% martite (probably mangamiferous), 5% garnet, 10% biotite, with 36% quartz, and 40% orthoclase. Grain size 1/200" (garnet) to 1/4" (orthoclase). Bedding well defined, usually 1/16" - 1/8" thick. Attitude 40° to core axis at 98.5° " 40° " " " 100.5° " 30° " " " 102.5°
103*	109*	Open tube samples. Decomposed granitised metasadiment. similar is appearance to 96° - 163°, but mainly red-brown in colour. Contains about 15% mesasiforms leaking mertite, 15-20% hietite, less them 5% garnet with quarts and orthoclase. Bedding fairly well defined, but rather leaticular due to concerdant granitization, Grain size 1/200° - 1/4" (as 96°-103°). Attitude 30° to core exis at 104.5° 40° " " 167.5° 40° " " 108.5°
109*	112°	Gran inha samples, Off-white, grey and yellow-brown granitized and semantal limmate stained decomposed materials. Gentains 25% martia (leached and manganiferous leaking in part), 10% blotite, with quarts, orthoclase and accessory garnet. Grain size 1/200" - 1/10" (as 96° - 103°), Sodding not well defined, usually less than 1/4" thick. Sock is possibly granitized itabirite. Attitude 30° to core smis at 110.5°.
112*	115°	Green tube country. Light reddish-brown decomposed "granite", containing sheet Wi amageniferous martite, 5% amageniferous martite, 8% blotite, with coursely crystalline (up to 1/4" crystals) orthoclass and quarts. No visible structure.
115	3.	END OF HOLE. Hele shandened after severe caving at 80° - 85° level.

Department of Mines, South Australia

INON EXPLORATION SECTION

LOG OF RODARY ORILLHOUS NOS. ARI C MRIA

<u>Project</u> : Warramboo Aeromagmet	ic Anomaly	D.B. 664/61
Sec. 25 Md. Warrantee	Ço. Le imnte	Bere Ser.No. P8 644/61
Callar Coords 58000N, 67000E	R.L. 450.6*	Grid Warramboo
Vertical	Depth 149*	Plan Rof.
Onto Bore Communed 6.5.61	Completed 18,5,61	Oriller E. Manre H. Mischlewitz
Bore Logged by G.R. Heath	<u>Qa</u> 11-18.5.61	Hirer D. of M.
-		

GO.FCT: To test gravity and magnetic "peaks" adjacent to ironstone float containing reliet martite.

ADERLE: Metasediment containing 10-35%, usually 15-25%, iron exides intersected 0° - 149°.

LOG Comprises Detailed moore and microscopic geological leg Summary Log Negmetic Log

Pres	16	Seseription SUMMET LOG
0	80.8*	Seconjused, semuchet granitised metasediment centeining 5-40% probably averaging 15-26% iron exides (mainly mertite).
80,8*	166*	Semuchat granitised decompased <u>martite itabirite</u> containing 25-36% mertite. Micas are accessory.
165°	149°	Semouhat granitised motosodiment containing quarts, ortho- class, martite (and ampactite below 127°) with variable asservite, biotite, epidate and garnet, 127.5° - 129° quarts (10-70%) - magnetite (20-70%) band. Overall from exide content about 10-15%, Semorally similar to fresh becoment in Whi. Attitude generally 45° to 70° to core axis.

MAGNETIC LOS

Deflection 90° at 130°

" 90° at 145°.

ORTHUHOLES NOS. ART 5 MATA	(Contd.)	~2~
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From	To	Description OFTAILED LOG
0	10°	
10*	20•	Fines 30-40% of cuttings on sieve. Similar to 0° - 10°, but less than 5% quertz.
20*	22*	Percussion open tube sample. Bed-brown and lesser off-white decomposed metasediment. Grain size about 1/50". Martite and limmaite after martite (some modular limmaite) 30-40%, quartz 45%, clay 15-25%. Bedding obscure, possibly 45° to core axis.
20*	30*	Fines 85% of cuttings on sieve. Constituents as 0°-20°, but quartz 45-55%.
30*	44*	Fines 95% of cuttings on sieve. Quartz and limenitementite as 0° - 30°.
44*	45 °	Fercussion open tube sample. Light multicoleured mettled and laminated decomposed metasediment. Fertite-limenite 25-30%, quartz 45-50%, clay 25%. Bedding well defined, 50° to care axis.
45*	50*	Fines 90-95% of cuttings on sieve. Similar to 0° - 44°, angular quartz 50%, limenite 25-30%, martite 20-25%,
50*	60*	Fines 95% of cuttings on sieve. Quartz 50-60%, limenite-martite (as 45° - 50°) 40-50%.
60*	61 *	Percussion area tube sample. Off-white, yellow-brown and red-brown mettled, decomposed granitised, metacodiment. Grain size up to 1/4". Quarts 40%, orthoclase 45%, martite 15%. No well defined structure (bedding or granitised bands 70° or 15° to core axis).
60°	70°	Fines 90% of cuttings on sieve. Angular lightly stained quarts 60%, limmite with minor martite 30%, weathered and stained quartz-martite fragments (10-20% martite) 10%. Grain size mainly less than 3/16".
70*	80*	Fines 75% of cuttings on sieve. Augular quarts 50%, mertite (non-magnetic) and lesser limemite 35-40%, composites (quarts-martite and helow 75°, quarts-felspermartite with less than 20% martite) 10-15%.
60*	80.8*	Persussion even tube sample. Light yellow-brown and off-white decomposed "granite". grain size 1/20". Contains about 5% martite.
80.8*	61.5*	Percussion and tube sample. Off-white and dark purple decomposed martite itabirite. Centains 30-40% martite, 30% decomposed felsper, 30-40% quarts. Grain size about 1/50" - 1/150". Redding attitude about 45° to core axis.
81.5*	90*	Fines 65% of cuttings on sieve. Angular quartz and quartz- felspar fragments with accessory martite 70-80%, martite with minor limenite 20-30%, Compositos have grain size 1/100" - 1/10" and contain loss than 25% martite,

149* END OF HOLE.

Department of Mines. South Australia

IRON EXPLORATION SECTION

LOG OF ROTARY DETLL HOLE NO. WE2

Project: warramboo Aeremagmeti	c Anomaly	Qui. 664/61
Sec. 25 Md. Marramboo	Cg. Le liunte	Bore Ser. No. 644/61
Coller Coords 58400N, 67150E	Ral. 451.2*	Stid Warranhoo
<u>Yertical</u>	Denta 66'	Plan Ref.
Date Bere Commenced 19.5.61	Campleted 23.5.61	Driller H. Mischlewitz
Pers Legged by G.R. Heath	Qa 23-24.5.61	Hirer D. of M.

OBJECT: To test gravity and magnetic "peaks".

RESULT: Nortite-unguetite itabirite intersected from 0° - 66° (less weathered below 40°). Continued as WD 1.

LOG Comprises Macro and microscopic geological log

Free	ħ	Doseri ption SUMMAY LOG
•	11*	Leached secondary looking rock containing mainly liminate and reliet martite bands and minor quarts (i.e. weathered itabirite).
11.	40*	Off-white and yellow-brown sandy to very sandy clay. containing less than 1/8" quartz and limmite-martite grains. A few composites containing epidete, mice and garnet occur below 20 feet.
40°	54*	Leoched and altered martite-magnetite (tabirite, Grain size 1/50" - 1/20", Iron exides average 50% of rock.
54'	66*	Martite-anguetite itabirite, Magnetism variable (greatest at 66°). Grain size 1/100° - 1/10° averaging 1/50°. Iron exides probably average 40:50% of rock. Biotite is the only other unjor constituent, while garnet and felsper are accessories.

Continued as MD 1 to 400%.

from	Te	Description DETAILED LOG
		N.B. Cutting caught on 4 mesh sieve.
0	7*	Fines 50% of cuttings. <u>Limenite</u> with less than 1/4 mertit 65%, perous quartz sandstone 10% quartz (angular) 5%.
7*	11*	Biamend drill core. (11" recovery = 23%). Lesched. secondary looking guartz-limenite rock with a little relict martite in bands at 40° (?) to core exis. Non magnetic.
11*	20°	Fines 75% of cuttings. Components as 0° - 7°, but cuttings somewhat smaller (100% less than 1/4"). Limenite-mertite 85%, quartz (angular# 15%, sandstone less than 1%.
20*	22*	Quen tube neronasion sample. Off-white to yellow clay with less than 20% to 80% quarts and martite-limenite fragments (designatly less than 1/8" diameter). Hedding variable, 30-90" to core axis. A few (1%) very slightly magnetic grains.
22*	30°	Fines 70% of cuttings. Similar constituents to 0 - 7°, but rather smuller (average size about 1/8°) and containing 1 or 2% light grayish green epoque mineral. Angular quarts (with rare iron exide inclusions) 60-70%, Limonite-martite 30-40% (non-anguetic).
30*	40°	Fines 30% of cuttings. Similar components to 0 - 7°, but smaller (90% less then 1/8°) and containing a few felsper grains and groy-green mineral as 22° - 30°. Quarta 70-80%, limenite-martite 20-30%. The few composites contain a little mice and garnet, which is too small to be retained in sieve.
At 40°		Drilling becomes much harder.
40*	41.5*	Paramasian over tube sample, Leached and semewhat stained martite (and possibly angustite) itabirite. Grein size mainly 1/50" - 1/20" with a few quarta grains larger, Lighter hands contain mice and considerable clay. Bodding variable, shout 50" to core axis. Iron exides (containing loss than 3% angustic particles) 30-76%, everaging about 50%, quarts 30%, clay and mice 20%.
41.5*	50*	Fines 50-60% of cuttings. Constituents similar to 30° - 40°. Querts 60-70%, martite-liments 30-40%. Felspar, green mineral, mice accessory. Composites rare (usually querts-mice). IROM OKINES RESEMBLING THOSE IN 40° - 41.5° HAVE NOT BEEN RECOVERED. No anguetic particles.
50*	61.	CUTTINGS: Fines 40% of cuttings. Quarts and limemite- martite as 41.5°-50° but containing 2-5% magnetic particles. (Quarts-magnetite composites).

From	To	Description DETAILED LOG
,54°	66°	DIAMOND DRILL CORE. Recevery 54° - 58° 2°5" (59%) 58° - 61° 1°7" (54%) 61° - 66°2 2°11" (59%). This material is too herd to drill with relier bits, but does not core well. Martite-magnetite itabirite contain ing varying proportions of biotite mics and accessory garnet and felspar. Magnetism variable e.g. deflections 0° - 55° 10° - 56° 15° - 57° 15° - 59° 90-0 - 60° 25° - 61° 90° - 63° 30° - 64,5° 900° - 66°. In general, the less magnetic bands containing more biotite and vice versa. The total core probably contains 40-50% martite-magnetite of grain size 1/100" - 1/10", averaging 1/50". Attitude is variable; bedding is lenticular in some places and obscure in others.
		Bedding is 45° to core axis at 54.5°
		* * 700 * * * * * * * * *
		* * 440 * * * * * * * * * * * * * * * *
		" " 55° " " " 56°

Lineation 150 to log axis of bodding plane at 59°.

The itabirite fractures readily along irregular planes sub-parallel to the bedding.

61° 66° Sludge. The only cuttings retained in: a fly wire screen were 1/10° biotite flakes. This suggests that the reck lest during coring was more missesses than that recovered.

66' END OF HOLE.

Mirer D. of H.

Department of Minos, South Australia

IRON EXPLORATION SECTION

LOG OF ROTARY DEILLHOLE NO. WR 3

Project: Warrantoo Aeromagnetic Anomaly D. M. 664/61 Sec. 25 Hd. Warrenboo Co. Le Muste Bere Ser. No. 644/61 Collar Coords 57600N, 67000E R.L. 449.2° Grida Marramboo Vertical Depth 201.7° Plan Ref. Date Bere Commenced 24.5.61 Completed 27.5.61 Driller H. Mischlewitz Rore Logged by G.R. Heath

OBJECT: To identify and sample material producing gravity and magnetic "hi ghe".

RESULT: Quarts-opidate gaeiss and various coloured clays both with minor dispersed mertite-megaetite.

On 24-27.5.61

LOG Comprises Macro and microscopic coolegical legs.

-

		SUMMAY LOG
0	25°(app.)	Tellew brown clay with miner dispersed limenite-mertite and quarts.
25°(app.)	50°(app.)	Off-white and grey slightly sandy elsy with irregular lenses of send (quartz and minor martite). A little concretionary calcite occurs after 40°.

Description

50°(app.) 178° Interhedded purple martite-magnetite elsy and multicoloured, mettled, querts clay. Bods toss them 1/8" to 2" thick. Send generally loss them 1/50". Regnetite rare except 80° - 110°. Generationary calcute occurs as up to $1/2^{\alpha}$ nodules, containing dispersed quarts and iron exides.

178 201.7 Quartz-opidate-translite resk with minor mesowite and histite, and dispersed (less than 5%) martite-magnetite Sems pink folsper occurs below 200°. Germet is a comm secessory. Major minerals occur as less than 1° blobs separated by fibrous sillimmaite.

From	Te	descri ption Detailed log
		N.B. Cutting caught on 12 mesh sieve.
0	10*	Fines 86% of cuttings. Limonite (secondary, no mertite, non-magnetic) 90%, angular quartz 10%.
10*	20*	Fines 65% of cuttings. As for 0° - 10°, but quartz 20% and non-magnetic limenite with very minor mertite 86%.
20*	22*	Percussion open tube sample. Light yellow-brown very plestic clay, with minor dispersed quartz and limenite grains. Bedding obscure and distorted by flow, but possibly 25-30% to core axis at 20.5° and 90° (?) at 21.5°.
20*	30°	Fines 50% of cuttings. As for 0° - 10°, but quartz 65-70%, limenite with minor mortite 30-35%. A few magnetic grains, and a few quartz-mica composites.
30*	40*	Fines 75% of outtings. Very similar to 20° - 30°. Quartz 60-70%, limmite 25-35%, semmuhat megnetic mertite (frequently pseudomorphs after megnetite) 5%. Composites very rare.
40*	6.	Parenesian open tabe sample, Offwhite grey and light red-brown slightly sandy "marbled" clay, containing light grey irregular sand bands and "veins" (conterted and lenticular). Send mainly quarts with minor less than 1/50" non-magnetic iron exides. Redding 30° approx. to core axis at 40.5°. 60° (conterted) " " 41.5°.
40°	50°	Fines 50% of outtings. Angular quarts 60-70% (1/2 of this is steined light pink), limenite 15-25%, martite (brittle crushes to red pender, slightly magnetic) 5%, concretion any irregular shaped limestone grains ("micro-medules") containing dispersed quarts and martite 10%. Competites rare (generally contain very fine grained mics).
50°	60*	Fines 50-40% of cuttings. Constituents as 40° - 50°. Angular quarts (less than 10% stained pink) 40%, calcarcous "micro-modules" 40%, slightly magnetic martite 10%. Himmite 10%. Compasites very rare. One or two flakes of muccovite present.
60°	62°	Percentains over tube sample, 1/10" - 2" bods of dark purple clay containing shandest 1/50" martite and lessor quarts grains interbodded with off-white clay containing somewhat less quarts and very minor martite. Hen calcareoug. Bedding 35" to core exis at 60.5°.
60'	70°	Pines 65-75% of cuttings. Constituents as 40° - 50°. Gelearcous "micro-modules" 50%, quartz 30-35%, limonite 5-10%, slightly magnetic martite 5-10%. Composites very rare.
70°	80*	Fines 60-70% of cuttings. Constituents as 40° - 50°. Calcarooms "micro-modules" (containing semewhat more mertite) 45%, white angular quarts 45%, limenite 5%, martite (slightly magnetie) 5%,

from	ro	Description OH DATE 106
2A)*	52.4	rercussion open tube sample. 2" layers of off-white and multicoloured clay containing fairly abundant less than 1/50" quartz and minor mortite interhedded with 1" layers of almost pure broken quartz up to 1/3" dismeter. The clay is non-estcareous. Redding 50 (7) to core exis at 80.5° " 01.5°
60°	90*	Fines 20% of cuttings. Constituents as 40° - 50°, but quartz fragments larger (commonly 1/6" - 1/4") and magnetite present. Quartz 70%, calcareous "micro-nodules 15-20%, limonite 5%, martite-magnetite (2/3 magnetite) 5-10%. Magnetite usually contains quartz fragments.
90*	160*	Fines 30-40% of cuttings. Angular quartz fragments (1/8" ave. diam.) 35%, calcite-magnetite-martite composites (grain size 1/100") 40%, calcareous "micro-modules" 5%, martite (slightly magnetic) 10%, magnetite 10%. A few limonite fragments are also present.
100*	101.5*	Percussion open tube sample. Mainly off-white, yellow-brown and grey mottled clay, with minor martite and fairly abundant 1/100" quartz (particularly in the grey portions). One 1" band of purple clay containing abundant quartz and martite (non magnetic) fragments (c. 160° - 62°) 1/50" diameter. Non calcareous. Redding 15° to core axis at 100.5"
At 96"		Hard band, possibly martite limestone.
100*	110*	Fines 60-70% of cuttings. Components as 90-100°. Quertz 40%, "martite limestone" composites 50%, limenite 3%, calcarcous "micro-modules" 2%, martite- magnetite (1/5 magnetite) 5%.
110*	120*	Fines 30-40% of cuttings. Components as 90° - 100°. Quartz 40%. limestone with included minor quartz and mertite 40%, limenite 5%, mertite with minor amagnetite 5%
120*	122*	Percession open tube semple. Interhedded less than 1" layers of off-white, light brown and purple clay. The light clay contains moderately abundant quartz and minor murtite, while the purple material is martite rich (as 60" - 62"). Non calcaroous (no visible "limestone" fragments). Bedding 25" to core axis at 120.5" " 200" " " 121.5"
120*	130*	Fines 50-60% of cuttings. Components as 90° - 100°. Quartz 40%, limestone, martite-magnetite limestone and minor "micre-modules" 50%, mortite with minor limenite 10%, magnetite possibly 1%. Limestone fragments well rounded (as in all samples) but rather smaller than 110° - 120° (mainly less than 1/8" c.f. 1/8" - 1/4").
130*	140*	Fines 50-60% of cuttings. Components as 90° - 100°, but grain size averaging about 1/16°. Quartz 40%, limestone etc. as above 40%, martite with very rare magnetite 15%, limenite 5%. One or two grains of light greenish grey mineral (epidote?) and rare muscovite flakes.

From	То	DETAILED LOG
140*	142*	Percussion open tube sample: Grey and multicoloured mottled clay containing up to 1/2" rounded "limestone" nodules and fairly abundant clay. Iron oxides are restricted to less than 1/10" irregular laminae. Bedding 15 to core axis at 140.5' " 350 " " 141.5"
140*	151*	Fines 40-50% of cuttings. Quartz 30-35%, limestone (with dispersed quartz and martite) 50%, limonite 5%, martite with very minor magnetite 10-15%.
151*	162*	Fines 50-60% of cuttings. Constituents as $90^{\circ}-100^{\circ}$. Quartz 35%, limestone as above 45%, limenite 5% , martite with very minor magnetite 15% . Rare grains of grey-green mineral.
162*	164*	Percussion open tube sample. Interhedded less than 1" purple ferruginous sandy clay as 60° - 62°, dark brown sand with miner clay and light brown micaceous sandy clay with up to 1/2" limestone modules. Sand in each case is martite and quartz less than 1/50". Bedding at 162.5°, 30° to core axis " 163.5°, 20-50° " "
162*	170*	Fines 50-60% of cuttings. Constituents as 90° - 100°. Quartz 35%, limestone ("micro-nodules" etc.) 45-50%, limenite 5%, wartite with rare magnetite grains 10-15%.
178*) 3	Very hard drilling.
170*	180	Fines 50-60% of cuttings. 170° - 178° As 162° - 170°. 178° - 180° Angular, fresh rock fragments containing 1/20" - 1/100" crystals of quartz, epidote (?), martite, magnetite, garnet, hietite and muscovite micas, and minor felspar. A few fragments (1 or 2%) of sillimenite also present. Iron exides rarely exceed 20% of chips, usually 5-10%.
180°	185*	Diamend drill core, 9" (15%) recovery. Brilling hard (5ft. in 1% hrs.) but sounded very rough. Gneiss containing irregular segregations of epidote and quartz up to 1" diameter, separated in many cases by veialets of fibrous sillimanite. Garnet and mica are common accessories, forming up to 10 or 15% of some quartz blebs Martite and magnetite occurs as :dispersed crystals throughout the rock (5%),7less than 1/10" spherical blebs and as rare less than 1/10" lenticles and laminae. Andalusite may be present, but could not be definitely distinguished from quartz (some grains show evidence of 90° cleavage). Bedding very obscure, possibly 50° to core axis.
165*	190*	Fines 15-20% of cuttings. Quartz 25%, limenite with very minor martite and magnetite 5%, limestone etc. 1% approximately, composites as 180° - 185° 70% (including 5% which can be picked up; with a magnet.) Clay free fines contain 20% iron exides.
190*	195*	Fines 30-40% of cuttings. Constituents and proportions as 185° - 190°. 10-15% of cuttings picked up by magnet. Finos contain 40% iron exides.

From	To	Description DETAILED LOG
195*	200*	Fines 25-30% of cuttings. Constituents and proportions as 185° - 190°. 5-10% of cuttings picked up by magnet. Clay free fines contain 10-15% iron exides.
200*	201.7*	Blamend-drill core. 1°5" recovery (81%), very hard, used up diamend hit. Quartz-epidote gneiss as 180°-185°, similar appearance, but sillimenite is less abundant and pink orthoclase occurs in the quartz rich blebs. Iron oxide content less than 5% (magnetic deflections 10-25° throughout core). Bedding very obscure, possibly 35° to core axis.
		Sludge sample - fines 40-50% of cuttings. Quartz and minor potesh felsper 50%, limestone "micro-nedules" etc. 15%, limente with very rare martite-magnetite 5%, composites as above (containing minor pink felsper) 30%, Fines contain 20-25% iron exides.
201	. 7°	END OF HOLE.

SAMPLING NOTE. ?During diamond drilling, a sample of sludge was obtained by running the mud through a 4 gall., baffle fitted, dram. This sludge was washed free of mud. The resulting sample was treated as usual; 75% passed through the 1/20" - 1/25" screens in the washing tim.

Sludge from diamend drilling: + (1/20" - 1/25"). Similar constituents to 176" - 180". Quarts 40%, limente 5%, limestone ("micro-modules" etc.) 5%. Composites (roof frogments) 56% (opidate 50-66%, quarts 25-36%, martite-magnetite 5%, tromblite 5%, mice less than 5%, garnet less than 5%

- (1/20" - 1/25"). Composites rare. Querts 40%, magnetite-martite 40%, limenite 5%, limenite 5%, epidete, garnet, sice 10%.

Retary entlings - fines 40% of outlings. Genetituents os diamend sludge; quarts 40%, limestone 5%, limenite and minor mertite - negmetite 5%, reeğ fragments (so shove) 56%, Fines (slay free) contain 30-46% iron exides.

Department of Mines. South Australia IRON EXPLORATION SECTION

LOS OF ROTARY DETLLEGER NO. . . 4

Project: warrantee Aeromagne	tic Amemaly	D. M. 664/61
See. 25 Hd. Warrambee	Co. Le Huste	Bere Ser. No. 644/61
Collar Coords 58800W, 671508	B.L. 457.3*	Grid Werrenboo
<u>Vertical</u>	Depth 114*	Plan Ref.
Date Bere Commenced 27.5.61	Completed 29.5.61	Driller H. Mischlewitz
Bore Lagged by G.R. Heeth	On 27-29.5.61	Hirer D. of M.

OBJECT: To identify and sample material producing prenounced gravity and magnetic "lows" north of Amounty.

RESULT: Various coloured clays everlie bedded quartz-biotite rock with garnet purphyroblasts.

LOG Comprises Nacro and Microscopic goological legs.

free	To	Description SUMMANT LOG
•	8°(app.)	Clay containing graces and residual sandstone.
8*(app.)	30°(app.)	Yellow brown and off-white slightly sandy elsy.
30*(app.)	79*	Grey, mettled, slightly sandy clay with eccasional quarts bends.
70°	101 •	Semewhat decomposed quartu-blotite rock with variable germet and epidete.
101.	114*	Fine greined (less them 1/50" mainly) bedded quartx-bioti -epidete-garnet rock. Epidete varies from 50% to 1% of rock. Garnet ecoure as up to 1/4" perphyreblasts. Pyrite is eccessory.
		ATTITUME - Meinly 200-450 to core axis.

From	To	Description DETAILED LOG
		N.B. Cuttings caught on 12 mesh sieve.
0°	10°	Fines 25% of cuttings. Gypsum crystals (selenite) up to 1/4" diameter 40%, calcareous quartz gypsum sandstone (less than 1/50") 25%, siliceous, clayey and occasionally limonitic quartz gypsum sandstone (less than 1/50") 35%.
10*	20*	Fines 95% of cuttings. Gypsum (as above) 20%, angular quarts fragments 50%, calcareous sandstone (as above) 20% siliceous, clayey and gypsiferous sandstone (as above) 8%, limonite and limonitic quarts sandstone 2% (secondary
20*	22•	Percession over twhe sample, Off-white, pale yellow-brown and occasionally red-brown slightly sandy (less than 1/50 grains) clay, with irregular leases of yellow-brown very sandy clay and white clay containing less than 5% biotite and non-magnetic iron exide flocks (less than 1/500" dismeter). Bodding 35-40° to core axis at 20.5°. " 55° (lenticular) " " 21.5°.
20*	30°	Fines 70-75% of cuttings. Some constituents as 10°-20°. Quartz 75%, limenite and limenitic quartz sandstone 15%, gypsum etc. 10%.
30°	40*	Fines 70-75% of cuttings. Constituents as 10° - 20°. Quertz 85%, limmate etc. 10%, gypoum etc. 5%, rare grains of very fine grained (less than 1/1000") pyrite(?).
40°	42*	Paranasian anea tabe sample. Grey, light brownish grey and eff white mottled elay with minor angular less than 1/50" quarts grains and black flocks as 20° - 22°. One or two lesses of almost pure broken (less than 1/10") quarts. Redding 20 or 30° (checure) to core smis at 40.5°. " conterted " 41.5°.
40*	50*	Fince 90% of cuttings. Constituents as 10° - 20° with 5% pyritic (?) natorial as 30-40°. Quartz 90%, limento etc. 1%, gypsum, sandstone etc. 4%.
50*	60*	Constituents: . Quartz 90%, gypoum, sandstone etc. 5%, pyritic (?) material 4%, fragments of mice 1% (less than 1/50°), limonite etc. accessory. Fince 90% of cuttings.
60*	62'	forenesies once into sample. Grey mottled clay as 40° - 42°. Black flocks possibly 5%. Bedding 45° (veriable) to core sxis at 60.5°. 45° (conterted) " " 61.5°.
60'	70°	Fines 70% of cuttings. Quarts 70%, pyritic (?) material 7%, angular garact fragments 1%, other minerals (gypsum etc.) accessory.
76*	80°	Fines 90% of cuttings. Sludge darker in colour. Quertz 80%, composites (less than 1/25") quertx-hietite-epidete-garnet 10%, decomposed quartz-mice frequents 3%, pyritic (?) material 5%, limes ite etc. 1%, garnet 1%, gypoum etc. accessory.
80*	82*	Parametica erro tube sample. Decomposed quartz-biotite- garnet rock with minor opidate and very rare non-magnetic iron exides. Bedding (less than 5 mm.) due to variations in biotite content. Quartz 40%, biotite 35%, garnet 25%.
		Bedding 40° to core axis at 80.5°. " 40°-90° (variable) " 81.5°.

From	To	Description DETAILED LOG
80*	96*	Fines 86% of cuttings. Quartz 40%, garnet 1%, composites (as 70° - 80°) 60%. Limonite, gypsum etc. accessory.
90*	100 •	Fines 40% of cuttings. Quartz (including 1/3 large (up to 1/4") auguler fragments) 30%, gernet 5%, composites (as 70° - 80°) 65%.
160*	102*	Reconssion open tube sample. Off-white slightly sandy clay and yellow-brown clayer sand irregularly interhedded with epidete (50%) - quarts (20%) - bietite (20%) - garnet (10%) rock, less than 1/50" grain size, no well defined structure. Bedding (possibly flow) 300 to core axis at 100.5° 50 (?) " " 101.5°
	101 *	Drilling much harder (less than 4° per hr.)
	103*	Reller bit.
100*	105*	Fines 60-70% of cuttings. Quartz 25%, rock fragments (as 100° - 102°) 70%, gypsum, limonite etc. 5%.
105*	196*	Less than 1% of cuttings retained on 16 mesh sieve. Fines: - quartz 50%, biotite (some brense) 25%, garnet 15%, epidete 16%.
106*	114*	Diamed drill care, Recovery: 108° - 109.7°, 15° - 16° (75-80%); 169.7° - 114°, 37%° (75%). Fine grained (minly loss than 1/100°) biotite-quarts rock interhedded with 1/20° almost pure quarts layers, containing minor biotite and garnet, and accessory pyrite. Gernet perphyrebists up to 1/4° diameter occur thoughout the rock, although semumbat more abundant in some places (e.g. 113.5° - 114°). Pyrite occurs as thin coatings in some joint places. Epidote and iron exides are extremely rere accessories. Redding 40° to core axis at 109° 111° 113° 111° 113° 111° 113° 111° 114° Bedding generally loss than 1° and usually 1/8° - 1/4° thick.
106*	111*	Sludge: only about 1% retained on 16 much slove. Fines - Quarts 60%, biotite 20%, garnet 20%, epidete less than 1%. Miner gypsum, limenite etc.
111*	114*	No med return (bease no cuttings), Loss 800 galls, in 30, mins.
114	•	IND OF HOLE.

Department of Mines, South Australia

IRON EXPLORATION SECTION

LOG OF ROTAFY DRILLHOLE NO. MRS

<u>Project</u> : #arramboo Aeremagnet	ic Amomely	Dall. 664/61
Sec. 25 hd. sarramboo	Se. Le Hunte	Bore Ser. No. 649/61
Coller Goords 56400N, 67000E	<u>8.L.</u> 453.5	Grid Serresboo
<u>Yertical</u>	<u>Depth</u> 190.5°	Plan Ref.
Onte Pere Commenced 30.5.61	Campleted 1.6.61	Oriller H. Mischlewitz
Here Legged by G.R. Heath	<u>0a</u> 30.5-1.6.61	Wirer D. of M.

OBJECT: To identify and sample meterial producing magnetic and gravity "lows" south of Marramboo Anomaly.

Gypcum and angular quarts sand everlie quarts-hietite gueiss containing abundant felsper.

104 Comprises Meere and Microscopic geological legs.

Frem	Te	Description SUMMAY LOG
•	12*	Up to 3/4" gypsum (selemite) exystals.
12.	25*	Interhedded gypeum and grey clay (possibly flour gypeum) with miner angular quarts.
25'	45*	Mkito, poorly serted, angular, fine to very fine grained pure quarts send.
45°	119*	Grey slightly clayey quarts send (similar to 25'-45') containing 1 or 2% loss them 1/50" element non-engantic iron exides. Blobs of quarts grains around 80' commuted by fine grained pyrite.
110°	175*	Quarts-felaper semsuhat decomposed rock containing variable amounts of assocrite and histite, and minor pyrite.
175*	181.5*	Decomposed amphibolite or delerite, consisting of 50% serpentine-chlerite and 50% decomposed felapar.
181.5*	186.0*	Somewhat decomposed quarte-biotite rock with minor felsper and garnet and accessory iron exides.
186*	190.5*	Quarts-biotite banded gnoise with abundant augens and leases of off-white and pale pink felsper, and less than 1/4" garnet perphyrobinets. Attitude - Erregular 60° - 70° to core exis.

From	To	Description DETAILED LOG
		N.B. Cuttings caught on 12 mesh sieve.
O	10.	fines 15-20% of cuttings. Gypsum (selenite). up to 3/4", crystals, generally stained reddish. 95%, quartz 5%.
10*	20*	Fines 80-85% of cuttings. Gypsum (as 0° - 10°) 80%. slightly colcareous querts-gypsum sandstone 15% quartz S
26°	22*	Percussion area tube sample. Very irregularly interhedded light grey slightly sandy (gypeum) clay (flour gypeum (? and less than 1/2" crystalline selemite in clay matrix.
20*	30*	Fines 75% of sample. Gypsem as 0°-10°, 60-70%, quartz (angular, less than 1/10°) 30-40%.
30*	40*	Fines 50-60% of sample. Augular quartz (less than 1/10") more than 95%, gypsum and minor limemitic quartz sandstelless than 5%.
40*	42*	Percussion over tube sample. Homogeneous, structureless poorly sorted, angular, fine to very fine grained (mean grain size about 1/200") pure quarts sand (white).
40*	50*	Fines SQN of sample. Slightly groyich angular quartz (lest than 3/16") 99%, gypsum etc. 1%.
50*	60*	Fines 50% of sample. Quartz (as 40° - 50°) containing less than 1/160° iron exide inclusions 99% (some grains quite dark grey), gypsum etc. 1%.
60'	62*	Formasion once tube sample. Grey slightly clayer sand, somewhat coersor (1/50" - 1/100") but otherwise similar to 40° - 42° containing 1 or 2% almost meanagestic, less than 1/50" iron exide fragments (as inclusions is quartz grains and free particles). Bodding (?) 80-90" to core axis, visible as variation in grain sine of quartz.
69*	7 0°	Loss than 1% outlings retained on 16 much sieve. Fines:- groyish quarts (as 40° - 50°) 99%, martite (non magnetic, frequently establical) 1%, gypsum etc. accessory.
70*	80*	Fince 60% of outlings. Quarts (as 40°-50°) 99%, martite loss than 1%, quarts-pyrite composites (pyritehodra loss than 1/500°) loss than 1%, gypsum etc. accessory.
80*	62*	Forestaion open tabe sample. Grey-brown sandy elsy very irregularly interhedded with greyich clayey sand (as 60° - 62°). Send centains 1/8° - 1/2° blobs comented by finely crystalline pyrite. These blobs contain up to 20% pyrite and less than \$% martite. Bedding possibly 20° - 30° to core exis.
60*	90*	Fines 40-50% of cuttings. Grey quarts and pyrite as 70° - 80°. One or two tournaline grains (rounded) and limenitic quarts sandstone.
90°	100	Fines 50% of cuttings. Grey quarts and pyrite as 70' - 80'
100°	102 •	Percussion case tube sample. Grey brown clay and clayey quarts send as 80° - 82° (send semoutat courser in parts, up to 1/8"). Bedding obscure.

From	To	Description OFTAILED LOG
100*	110*	Fines 50% of cuttings. Quartz (grey) as 40° - 50° 95%. Quartz-pyrite-martite composites 2-5% (as 70° - 80°). gypsum, slightly limenitic quartz sandstone less than 5%. One or two felsper grains.
110*	120*	Fines 40-50% of cuttings. Grey quarts (30% 1/8" - 1/4") as 40'-50' 90%, quartz-pyrite-martite (as 70' - 60') 5-10%, gypsum etc. less than 5%, felsper accessory.
120*	122*	Porcussion open tube sample. Decomposed quartx-muscovite schist. Quartz groyish and semewhat rounded in places. Mica semetimes bloated and stained black (fine grained pyrite?), showing preferred orientation. Some decompose felaper. Bedding 70 (?) to core axis at 120.5 " 121.5"
120°	130°	Fines 40-50% of cuttings. Groyish and white quartz 90%. felsper (white, semewhat decomposed) 1 or 2%, pyrite etc. 5%, semewhat limenitie sendstone 1 or 2%, gypoum etc. 1 or 2%.
130*	140*	Fines 80% of cuttings. Quarts (less than 1/10 grey) 90%, white felsper 10%, pyrite, gypsum etc. accessory.
140°	142*	Ferenssies over tube sample. Grey mattled decomposed quartx-felsper-biotite-macowite rock (looks quite "sandy" in parts). Bedding very obscure, possibly 50°-65° to core exis. Appearance generally similar to 120°-122°.
140*	150*	Fines 70% of cuttings. Quartz (grey rare) 95% white folsper less than 5%, gypsum, limmaite etc. less than 5% Fines similar, Isasakkan pecs. 1% martite.
150°	160*	Fines 80-85% of outtings. Quartz (grey rare) 50-60%, white felsper 49-50%, gypsum, pyrite etc. occessory.
160*	162*	Persusaion ones inhe sample, light grey 1/50" semewhat decomposed quarts-felsper rock (75% quarts) with very rare mice. Some patches of quarts are quite dark grey, but there is no obvious reason for this. Hedding very obscure, but possibly 55-66° to core exis.
160*	170*	Fines 40-50% of outtings, quarts (1/10 grey) 85%, white felsper 10%, gypeum, pyrite, limenite etc. 5%. Very rare epidete grains, and chlorite-biotite flakes.
179	5•	Drilling harder, and dark outlings appear.
170*	190°	Fines 15% of cuttings. Quarts (as 160° - 170°) 35%, white felsper 5%, serpentine-chlorite-decomposed felsper composites 60%.
180°	162*	Persuasion onen tube sample. 180° - 181.5°. Becomposed Amphibolite. Greis size generally less than 1/20°. Semewhat fibrous serpentine and chlorite after green emphibole 50%, decomposed felspar 50% 181.5° - 182° Broken "buck" quarts. "Amphibolite" shows irregular foliation at about 45° to core axis.
186	5°	Drilling hard.
10	, •	Changed to relier bit.

From	To	Description DETAILED LOG
	167.5"	Changed to dismond bit,
180*	187.5*	Fines 20% of cuttings. Quartz 50%, serpentimized amphibolite or delerite (as 175-180°) 30%, angular fragments (fresh) of quartz containing biotite, chlorite epidete, garnet and very minor iron exides 15%, white felspar less than 5%, gypsum etc. less than 5%.
167.5*	190.5*	Diamond drill core. Recovery 3° (100%). Quartz-biotite gnoiss, with abundant lenses and less than 1° augent of off-white to spel, pink felspar, and scattered less than 1/4° perphyroblasts of pink garnet. Redding very irregular, but 60°-70° to core exis at 188°. Biotite tends to occur in bonds from less than 1/50° to 2° averaging 1/8° thick, and the purer bonds frequently contain some chlorite.
1	90.5*	END OF HOLE.

INON EXPLORATION SECTION

LOG OF KOTARY DEILLHOLE NO. WE 6

Project: Sarrambee Aeromagnet	ic Anomaly	D.B. 664/61
Sec. 24 Hd. Warramboo	Co. Le Hunte	Bore Ser. No. 649/61
Cellar Coords 56800N. 64000E	Bal. 456.0°	<u>Grid</u> Warrambos
Yertical	Depth 141.5*	Plea Ref.
Date Bare Commenced 5.6.61	Completed 6.6.61	Oziller H. Mischlewitz
Bare Leaged by G.R. Heath %	Qa 5-6.6.61	Hirer D. of H.

OBJECT: To identify and sample material producing gravity "high" in Warranhoo Anemaly.

RESULT: Bedrock consists of quarts-felsper-garact-m ice metasediment containing 15-25% mertite-magnetite.

LOS Comprises Hacro and microscopic geological legs. Hagnetic log.

Free	To	Description SUMMAY LOS
•	8.5*	Clay centaining quarts, limonite and minor mertite and calcoroous gypsum.
6.5*	20*	Herd limemite rich bend (minor quarts and mortito).
20' apprex.	apprex. 75°	White, red-brown and yellow-brown mottled and bedded clays containing fairly abundant quarts and limmite-partite (grain sine less than 1/50"). Martite increases from 5% to 76% of iron emides from top to bettem of sequence. Iron emides ecour in irregular less than 3/4" beds and lenses.
75°	121 *	Decempseed bedrock, less than $1/4^{\circ}$ - $1/8^{\circ}$ beds of quarta-felapar-martite-biotite-garnet rock and variable quarta-epidete-martite-augmetite rock. Dip generally 35° - 50° to our axis.
121*	125*	Quarts-felaper-martite-enquetite-bietite rock with variable epidete and minor garact. Gentains leases of courser grained quarts-orthoclass.
125*	136*	Mainly 1/100" grain size quarts-felsper-bietite "micro granite", with accessory martite-magnetite.
135*	136,6°	1/8" bods of quarta-felsper-garnet-martite-magnetite rock (1/200" grain size) centaining about 25% iron exides. Dip 55°-70° to core exis.
136.6°	141.5*	Similar to 136'-138.6', but only about 15% iron exides; bade conterted and leases of interstitial (up to 1") quarta-orthocisse present; badding due to composition variations much less obvious. A few less than 2" crosscutting toursmline masses present.

From	To	description DETAILED LOG
O	10'	N.B. Guttings caught on 12 mesh sieve. Angular quartz 5-10%, limenite with very minor mortite, and fine grained (less than 1/200") quartz-limenite sendstone 30%, calcite and calcareous very fine grained gypsum sandstone 50%, gypsum less than 5%. Fines: 50-60) of cuttings. Iron exides 20-30% of clay free fines.
		Herd bend (quartz-limenite) 8.5° - 20°: used reller bit.
10'	20*	Fines 50-60% of cuttings. Quarta (as 0°-10°) less than 5%, gypoum etc. less than 5%, limmite etc. (as 0°-10°) more than 90%. Iron exides 70% of clay free fines.
20°	22*	Percussion over tube sample. Very irregularly interhedded white clay, yellow-brown clay containing fairly abmadent less then 1/50" quarts, and red-brown clay containing fairly abundant limonite and relict martite fragments up to 1" in diameter. Sodding: 75°(?) to core exis at 20.5°
		49-450 " " " 21.50
20°	30*	Fines 50-60% of cuttings. Limouite and very minor martite (as 0"-10") 90-95%, angular quarts 5-10%, gypsum etc. accessery. Iron exides (meinly limonite) 50-60% of fines
30*	40*	Fines 60% of cuttings. Quartz 50-60%, limmite (as 0'-10') with 1/10-1/5 mertite 40-50%. Gypeum etc. eccessory. Iz exides (martite) 60-70% of clay free fines.
40*	42.	Percussion area tube summle. Yellow-brown and eff-white mottled very sandy clay (contains unimly 1/50" - 1/100" quarts). Irregular less than 3/4" dark lesses and hands contain abandant 1/50" - 1/100" martite, with occasional red-brown limenitic petches.
		Medding irregular and conterted, at 40.5°, bodding 40°-45° (variable) to core axis 41.5° "70°-90° "
40*	50°	Fines 70-75% of cuttings. Querts 60%, limemite-martite (1/2 martite) 40%, gypoum etc. occessory. Iron exides 60-70% of clay free fines (dominantly martite).
50'	60°	Fines 80% of cuttings. Quartz 75%, limmate-martite (2/3 mortite) 25%, gypsum, calcite etc., accessory. Iran exides 50-60% of clay free fines (deminantly martite).
60°	62*	Paraussies spen tube sample. Red and white mottled and irregularly hadded slightly samey elsy. Gentains scattered 1/20" quarts grains and minor 1/200" mortite. Bedding irregular, but about 450 to core axis at 61.5".
60*	80*	Megligible fines retained in settling trough.
66*	70°	Fines 80% of outlings. Quartz 30%, calcarcous "micro- modules" up to 3/8", 30%, mangamiferous (?) dull black iron exides 30%, martite-limenite 9%, orange translucent grains 1% (garnet?).
70°	80*	Fines 70% of cuttings. Quarts 10%, dull iron exides 60%, quarts-decomposed felsper (?) composites 30%, accessory orange mineral (garnet?).

From	To	Description DETAILED LOG
60°	62*	Percussion open tube sample. Less than 1/50" somewhat clayey martite interbedded with yellow-brown clayey quarts sand (1/200" - 1/20"). Beds generally less than 1/2" thick. A few gradational beds containing minor mica are also present. Bedding semetimes obscure, but 45° to core axis at 80.5° and 55°(?) " " 81.5°
80'	90*	Fines 75% of cuttings. Quarts 60%, limesite, mangamiforous exides etc. 10%, "micro-modules" etc. 5%, quartz-felspermartite-biotite-garnet composites, with occasionally abundant epidote 25%.
90*	100*	Fines 50-60% of cuttings. Quartz 30%, pink felsper and quartz-felsper composites 25%, iron exides 5%, composites as 80°-90° (but epidote rare) 40%.
100*	162*	Percussion Open Tabe Semple, Leminated (beds less than 1/4 in most cases) decomposed quarts-felaper-biotite-martite rock, with accessory garnet. Composition variable, but probably averages, quarts 60-70%, felaper 10% (variable), martite 10-15%, biotite 5-10%, garnet 5-10%. Percussion epen tube sample - very hard drilling. Grain size about 1/100°. Bedding 30°-35° to core axis at 100.5° 101.5°
100°	110°	Fines 60% of outtings. Quartz 30%, quartz-felsper-martite 25%, limenitic unterial 5%, fibrons sillimenite with interstitial martite 5%, compacitos as 80°-90° 30%, epidate 5%, "Micro-modules" etc., secossory.
110*	129*	Fines 50% of cuttings. Querts-martite-angustite and quarts-epidete-martite-angustite fragments picked up by magnet (averaging 30% iron exides) 10%, quarts 40%. limmite etc. 5%, quarts-epidete-martite and quarts-martite compacites with accessory mica, felsper and garn et 40%, sillimmite etc. 5%.
120'	121*	Faranasian ence into sample. Decomposed (elayey) quarts- opidate rock, with irregular loss than 1/2" blobs of martite-augmentite (1/10 magnetite) and stringers of sillimenite. Overall iron exides probably loss than 10% of rock. Scattered, up to 1", concretionary quartz- limenite publics.
121 •		Hard drilling - changed to reller bit.
120*	125*	Fines 15% of cuttings. Fragments still semewhat decompose Regnetic cuttings (as 110° - 120°) 16%, orthoclass and quarts-orthoclass fragments (accessory biotite) 25%, limenite etc. (much appears to be from measure the top of the hele) 15%, quarts-felsper-martite-biotite fragmen with variable epidote and accessory garnet 50% (iron exides 10-70%, average 20% of these cuttings.)
125°	130*	Fines 20-25% of enttings. Frequents fresh looking. Homogeneous 1/100° grain size quarts-felsper-biotite fragments (accessory epidote and magnetite-martite) - unstressed "micro-granite" 70%, quarts-orthoclase composites and grains 20%, epidote composites (as 120- 125') 10%, limmate etc. accessory.

From	To	Description DETAILED LOG
130*	135 '	Fines 15% of cuttings. "Micro-granite" as 125°-130°. 70%, quartz, felsper and composites 10%, quartz-epidete with variable felsper and mica 20%. Accessory limenite, garnet, and green amphibole. Cuttings frequently exceed 1/4" diameter.
134	5°	Changed to dismond bit.
136*	141.5*	Biamad drill cors. Recovery: 135° - 137.25°, 27" (100%), 137.25° - 141.5°, 50" (98%).
135*	138,6*	Sedded quartx-felsper-martite-magnetite-garmot-biotite rock. Beds 1/50" - 1/2" averaging 1/8" thick, consist of almost pure martite-magnetite, garmot, quartx-felsper and rarely orthoclase, Grain size of garmot and martite-magnetite about 1/200", quartx-felsper up to 1/10", biotite intermediate. Overall composition about quartx-felsper (1/5 (?) felsper) 50%, martite-magnetite 25%, garmot 20%, biotite 5%. Bedding fairly regular. Attitude 550-600 to core axis at 135° " 450-700" " " " 136° " 700" " " " 137° " 550" " " " 138.5°
138.6*	141.5*	Constituents similar to 135°-138.6°, but iron exide content iouer (15% approx. (?)) and differentiation into composition hands not a s sharp. Hadding is obscurring places and contented around 139°-140°. Feisper contents higher than above, and coarse grained (up to 1/4°) pink orthoclase occurs as irregular lenses, particularly in contents of martines (leases up to 1° thick). Coarselve.

in conterted portions (leases up to 1" thick). Coursely crystalline tearmaline containing less than 1/10" iron exide blobs occurs as irregular cross-cutting masses up to 2" leng.

Attitude 50° to core exis at 139'

50° (conterted) to core exis at 140'

30° " 141'

Some corporation developed in joints and partiage in the rock.

141.5' END OF HOLE.

		790	
Deflection	150	at	135.1*
	20		135.3*
	90-		135.80
	901		136.3"
	900		136.6
	90+		137.0
	2010		138.0
	90		130.60
	90-		139.00
	20		139.50
	90-		140.0
	40		141.00
	20		141.5

IRON EXPLORATION SECTION

LOG OF ROTARY DRILL HOLE NO. HR 7

Project: Warranhoo Acromagnetic Amounty D.M. 664/61 Sec. 24 Hd. Warramboo Co. Le Bunte Bere Ser. No. 649/61 56200N, 64000F B.L. 460.3* Collar Coords Grid Warranboo **Vertical** Benth 186' Plan Ref. Date Bore Commenced 7/6/61 Gempleted 9/6/61 Briller IL Mischlewitz Bore Louged by G.R. Beath Qn 7-9/6/61 Hirer D. of M.

GRANCE To identify and cample material producing gravity "high" in the Norremboo Amounty.

RESULT: Sedrock consists of quartz-felsper-garmet-martite-magnetitemics metasediment, containing 15-20% martite-magnetite.

LOG Comprises Macro and microscopic geological log.

Pron	79	Beseription SOMMAY LOG
0	7.5*	Slightly stained quarts sand.
7.5'	8.5 *	Yellow-brown limestone containing fairly chandest 1/300" querts grains (kusher).
8,5*	30*	Cream enlawred floky elsy (possibly gypecess), containing minor quarta and occasional limmite grains.
30'	45°	Yellow-brown and red-brown slay containing minor quarts.
45'	125°	Decempesed quarts-chierite rock, clayey in part, con- taining a few mertite grains.
125*	167 *	Decomposed querte-opidate-felsper-chlorite-biotite rocks, containing minor limmaite, martite and misaccous becamtite.
167*	186*	Quarts-felaper-biotite-garmet-epidete-martite-magnetite reak. Proportions of constituents quite variable, but from 101° - 186°, martite-magnetite about 15-20%. Grain size mainly 1/20° - 1/50°. Attitude (1/8° bods) generally about 70° to core axis.

From	Te	Description DETAILED LOG
		N.B. Cuttings caught on 12 mesh sieve.
0	10*	Fines 25% of cuttings. Yellow-brown limestone containing 1/300" well rounded quartz grains more than 95%, minor chloarcous limentic sandstone. From oxides 20% of fines, quartz 70% of fines.
7.5*	8.5°	Herd limestene band (changed to reller bit).
10*	20°	Fines 70% of cuttings. Limmetone as above 90%, limmaite containing 1/200" quarta grains 9%, augular quarta 1%. Fines contain 80% quarta (1/2 remaded) 20% limmaite etc.
20°	22*	Percussion open tube sample. Off-white (eroom) clay showing very light coloured mottling. Consists of 1/100 flakes (possibly gypsum) with a few 1" limemitic sandster layers. Bedding 800 to core axis at 20.5".
		" ° 21.5°.
29*	301	Fines 20-25% of cuttings. Limestone as 0° - 10° 40%, angular quarts 40%, limesite as 10° - 20° 20%, Fines similar, but limestone 20%, quarts 60%,
30'	49*	Fines 60-70% of cettings. Limetone as 0° - 10° 20%, quarts 70%, limemite as 10° - 20° 10%. Fines more than 95% quarts, minor iron exides and limetone.
40'	4 *	Persussion open inhosemule. Yellow-brown and red-brown mettled and irregularly hedded elsy (semewhat flaky - decomposed mice schiet?) containing a few less than 1/50" quarts grains. Bedding 20° to core axis at 40.5° 30°(?) " " " 41.5°
40'	50*	Fines 40% of outtings. Limestone as 0° - 10° 10%, limenite as 10° - 20° 25%, querts 65%, Fines similar, but contain one or two chlorite flakes.
50*	60*	Fince 60% of cuttings. Limetone at 0° - 10° 5%, quartz 60%, limenite as 10° - 20° 15%, a few chlorite finkes and chlorite containing compacitos. Fince similar but 5% chlorite.
60*	62*	Percentaion even tabe sample. Secondar decomposed chlorite- quartz rock, dark grey-green is colour. Chlorite flakes (1/50" - 1/100") more than 95%. d Bodding checure, 20-25, to core axis at 60.5".
60*	79*	Fines 60% of enttings. Limestone as 0° - 10° 5%, quarts 90%. limenite as 10° - 20° 5%. A few calcarous "micro-modules", 9(pass. 2%). Fines similar, but contain 5% chlorite flakes.
70°	80*	Fines 90% of cuttings. Limestone as 0' - 10' 5%, quartz 60%, limenite as 10' - 20' 5%, calcareous "micro modules" 30%. A few chlorite flakes. Fines similar, 5% chlorite, a few mortão grains.

from	To	Description DETAILED LOG
Ø © •	82.	Fergussian open tube sample. Clayey quartz-chlorite rock with irregular less than 1/10" limonite stained beds. Grain size about 1/100". Grey-green to yellowish-brown in colour. Bedding 5° to core axis at 80.5°. Bedding 60-85° (variable) to core axis at 81.5°.
60°	90*	Fines 60% of cuttings. Limestone as 0° - 16° less than 5% quartz 50%, limenite as 10° - 20° less than 5%, calcarcous "micro-nodules" 40%, chlorite less than 5%. Fines similar.
90*	100*	Fines 85% of cuttings. Limestone as 0° - 10° 1%, limenit as 10° - 20° 1%, chlorite 5%, calcareous "micro-modules 30%, quartz 63%. Fines similar, but containing a few mortite crystals.
100*	162*	Fergussion open tube sample. Nottled quartz-chlorite rock (quartz dominant) with a few less than 1/6" beds contain ing martite grains (purplish interstitial clay). Bedding 40-45° (?) to core axis at 100.5°. " 35-40° " " " 101.5°.
100*	110*	Fines 80-85% of cuttings. Limestone as 0° - 10° 5%, calcareous "micro-nodules" 35%, limenite less then 5%, chlorite 5-10%, quartz 50%, a few marths (possibly tournaline) grains. Fines similar with a few garnet grains.
110*	120*	Fines 95% of cuttings. Fibreus sillimmaite 36%, quartz 40%, calcareous "micro-medules" 25%, limente less than 5%, limentene less than 5%, no chlorite. Fimes less than 5% sillimenite.
120*	122*	First core contains lump of limestone disladged from 3° level. Mattled grey-green and off-white decomposed quarts-chlorite rack (about 50% of each). Contains irregular hods and lenses in which one or other is dominant. Grain size about 1/200" - 1/100". Bedding variable, about 45° to core axis. Himselimenite staining.
120°	130*	Fines 10% of cettings. Quartz 70%, felspar 20-25% (mostly white, a few pink orthoclase grains), chlorito-bietite 5%, tremplite less than 5%, a few auscovite, "micro-nodule" and limmite grains. Epidete very rare. Fines 85% quartz, 5-10% chlorite less than 10% felspar.
130*	140*	Fines 75-80% of cuttings. Quarts 75%, felaper (2/3 pink orthocluse) 20%, chlorite-biotite less than 5%. Minor limonite, tremplite etc. Fines similar.
140*	142*	Persussian ones tabe summle. Irregularly bedded quarts-felsper-epidote-chlorite-bietite semewhat decomposed rock. Misor limenite staining and few martite grains in some beds. Epidote is dispersed, and present as less than 1/2" irregular masses. Grain size about 1/100". Bedding 35-400 to core exis at 140.5"
140*	150*	Fines 60% of cuttings. Quartz (including 1/10 grey cherty looking fragments) 70%, epidete (massive looking) 10%, felspar (rerely orthoclase) 10%, chlorite-biotite 5%, limestone 5%, Fines similar, but contain 1 or 2% gernet.

From	To	Description DETAILED LOG
144.3*	144.8*	Hard band (quartz-epidete?).
150°	160*	Fines 80% of cuttings. Quarts (1/10 % 1/5 "cherty") 66%, felsper (rarely extheclase) 10%, felsper chlorite-biotite composites 10%, epidote (as 140° - 150°) 10%, chlorite-biotite 5%. Fines similar, but less felsper and a few grains of garnet and mortite.
160*	162*	Percussion open tube sample. Semewhat decomposed quartu- epidote-felspar rock with variable chlorite-biotite and about 2% missocous haematite. Grain size uninly 1/200" = 1/50", but a few less than 1/4" lenses of up to 1/10" quartu-epidote. Bedding 5° and 25° to core axis at 160.5°. 30° " " 161.5°.
160*	167 *	Fines 70% of cuttings. Quarts (rarely cherty) 70% app., quarts-felsper-epidote composites with minor variable mic and gernet 10%, epidote (two types, one fairly massive yellowish-green, the other more crystalline dark grey-green, about 1/2 of each) 10%, garnet 1%, limestone as 0° 10° 1%, "micro-modules" 2% chlorite-biotite 5%, a few grains of limmite and very slightly magnetic martite. Fines similar, but contain more garnet and a few massevite grains.
167*	172*	Hard drilling initially - ettempted dismond drilling, zero core recover.
167 *		Changed to relier Mt.
167*	172*	Dismond drill sludge, fines 70% of cettings. Quartz 80%, quartz-opidate-biotite compacitos with minor iron exides 16%, limestone etc. 5%, chierite-biotite less than 5%, folsper less than 5%, a few grains of quartz-pyritementite.
167 °	170*	Fines 80% of enttings. Quartz 80%, schistese quartz-epidet blotite composites (1/50° grain size) 5%, massive epidete frequents containing some quartz and mice 5%, limenite les than 6%, limestane etc. less than 5%, a few grains of felsper, garnet etc., chlorite blotite less than 5%. Fines similar, but 5% garnet and 1 or 2% martite.
170°	175*	Fines 60% of cuttings. Quartz 60%, epidote-quartz-mica composites 10%, composites, quartz with up to 20% biotite and garnet and a few martite-angustite crystals (picked up by magnet) 10% limenite 5-10% (probably from further up the hole), limentone 5%, chlorite-biotite 5%, epidote, felsper etc. less than 5%. Fines similar, but 5% garnet.
175°	181 •	Fines 20-25% of entitings. Quarts 40-50%, quarts-garnet-hield ite composites, with minor martite-magnetite (1/20 grains picked up by magnet) 40-50%, a few epidate, garnet, lime-stone and limenite grains, and one or two finely crystalline pyrite grains (less than 1/500°). Fines: 70% quarts, 10% garnet, 10% mics, 10% martite-magnetite (4/5 martite), a few pyrite grains.

From	To	Description DETAILED LOG
181*	186*	Diamond drill core, recovery 37" (60-65%). Quartz-felspar-garnet-martite-magnetite-biotite rock, with accessory epidete. Grain size mainly 1/20" - 1/50", although up to 1/4" in some quartz-felspar beds. Very prominent irregular jointing (explains broken core and low recovery). Quartz-felspar 60%, garnet 15%, biotite 5-10%, martite-magnetite 15-20%. Minerals are segregated into relatively pure beds and lenses. Medding less than 1", usually about 1/8" thick, quite irregular, but fairly constant in attitude. Redding 70° to core axis at 161.5° "65-76° "183". "75° "185.8°
186	•	END OF HOLE.

MOSTIC LOS

Deflection	et	161.5".	36
		103'	36
		143.5".	350_
		184" .	904
		184.5	90-
		105*	9049

TECH EXPLOSATION SECTION

LOG OF ROTARY DRILL HOLE NO. HR H

Exercer:	Werremboo Aeromegaet	ic Anomaly	D.N. 664/61
Sec. 24	M. Berrambee	Co. Le Huste	Bore Ser. No. 649/61
Cellar Cee	rde: 57600N, 64000E	Eal- 451.2*	Grid sarranbee
Yertical	,	Depth 126.2*	Plan Ref.
Date Bere	Commenced 10.6.61	Completed 12.6.61	Briller H. Mischlewitz
Bore Leave	d by G.R. Heath	<u>On</u> 10-12.6.61	Hirer 0. of M.
OBJECT:	To identify and sam	ple material producing	magnetic "high".
BESULT:	Quartz-ertheelase-e	pidote interbodded wit enteining minor biotit	h mortito-magnotite- e and gormet) occurs es

LOG Comprises

Nacro and microscopic geological legs. Magnetic legs.

From	To	Description SUMMAY LOG
0	15*	Off-white clay containing abundant limmaite (with some martite) and lesser quarts.
15*	110*	Red-brown, yellow-brown and grey sandy to very sandy clays. (hedded). Colour tends to become lighter with depth. Sand uninly 1/50" - 1/200" quarts and martite (with minor magnetite after 60") usually essentiated in less than 1" and assally 1/8" heds. Iron acide content up to 20%. usually 5-10%. Felapor and mice occur after 80".
110.	123*	Decomposed quarts-folsper rook, with SK garnet, SK martite, variable biotite and epidete (up to 20%, usually less the SK). Grain size 1/100°.
123.	128,2*	Martite-engantite-epidete and martite-engantite-quarts interhedded with quarts-epidete and irregular leation lar quarts-orthoclass. Bark hods contain minor garnet and biotite. Grain size mainly 1/160°, but erthoclass up to 1/2°. Here ecapecilies about; quarte-felsper 45%, angustite-martite 30-36% (up to 70% in some hode), epidete 15%, garnet 5%, accessory biotite. Abundant irregular leinting. Attitude about 45%-56° to come onic

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From	70	Description DETAILED LOG
0.	10°	N.B. Cuttings caught on 12 mesh sieve. Fairly hard drilling from surface. Fines 95% of cuttings. uQuartz (angular) 40-50%, limonite with minor quartz and martite 50-60%. Fines 30-40% iron oxides.
10°	20*	Fines 90-95% of cuttings. Quartz (as 0° - 10°) 10-15% limonite (as 0° - 10°) 85-90%. Fines: 40% iron exides (5% slightly magnetic).
20°	22*	Parenasias com tube sample. Irregularly bedded very sendy red-brown and yellow-brown clay. Red-brown clay costains maisly 1/50" limmite, with less than 1/4" bands of relict mertite and some quarts. Yellow-brown layers contain mainly quarts (less sandy than red-brown) with some limenite. Beds mainly about 1/4", same up to 1". Attitude 40° to core axis at 20.5°. 30° " 21.5°.
20°	30°	Fines 85% of cuttings. Quartz (more iron stained than shove) 20%, limenite (as 0° - 10°) 75-86%, martite (mon-amgmetic) less than 5%. Iron exides 56% of fines (1% slightly amgmetic).
30*	40°	Fines 90-95% of cuttings. Quarts (as 20° - 30°) \$0%. limenite (as 0° - 10°) 45%, martite (as 20° - 30°) 5%. Iron exides 50% of fines (4/5 slightly magnetic martite)
40*	42*	Percession eres tube sample. Off-white, reddish and brown irregularly bedded and muttled very sample clay. Martite occurs as dispersed 1/200" - 1/50" grains and as less than 1/20" angular grains in the lighter coloured beds. Iron exide cogtest probably 5-165. Bedding 55-70° to core exis at 40.5' (variable).
40*	. 56°	Pines 90% of enttings. Quarts (as 20° - 30°) 40%, limesite (as 0° - 10°) 55%, mertite (slightly to anderstely augmetic) 5%. Fines: 60% mertite (as 30° - 40°), 10% limesite, 30% quarts.
50'	60°	Fince 90% of outtings. Querts (as 20° - 30°) 70%, limmite (as 0° - 10°) 20%, martite (as 40 - 50°) 10%. Fince: 30-36% martite (possibly sems magnetite), 5% limmite, 60-66% querts.
40*	62°	Persussion and tube sample. Off-white and pole multi- coloured fairly sandy irregularly hodded clay. Sand mainly 1/50" segular querts, with martite securring spersely through the rock, and as secusional 1/8" bods. One 1" slightly clayer quarts-marrite hod (1/20" - 1/50" 50% of each. Bodding generally about 1/8" thick. Bodding 550-750 to core axis at 60.5" (veriable). " 600-760" " " 61.5" (").
60'	70°	Fince 85% of cuttings. Quartz 30%, martite with minor megactite and limenite 10%, colorrosus "micro-modules" 45%, composites (quartz-martite, minor mice) 15%. Fince similar (possibly 15% iron emides).
70*	80°	Fines 85% of cuttings. Quartz 40%, martite (as 60°-70°) 10%, "micro-modules" 40%, composites (as 60° - 70°) 10%. Fines: 15-20% iron exides.

From	To	Description DETAILED LOG
80°	82°	Percussion open tube sample. Irregularly bedded very sandy grey and light multicoleured clay. Quartz grains generally less than 1/50", but up to 1/20" occur throughout. The grey beds contain up to 80% martite while the light coleured beds contain semawhat decomposed felspar (pink in places). Mica is rather rare. Irea exide content 10-20%. Appears to be decomposed, low grade itabirite. Bedding up to %" thick, but generally about %". Attitude 45° to core axis at 80.5° "40-45° (irregular) to core axis at 81.5°.
80*	90*	Fines 90% of cuttings. Quartz 70%, martite (as 60°-70°) 10%, calcareous "micro-modules" 20%, a few grains of sillimanite and mica. Fines contain 25-30% iron exides.
90*	100*	Fines 85% of cuttings. Quarts 40%, martite-limenite with some magnetite 15-20%, calcareous "micro-modules" 30%, composites (quartu-martite mainly) 10-15%.
100*	102 *	Percussion open tube sample. Clay rock containing quarts, felspor, mertite, and biotite, similar to 80°-62°, but containing about helf as much mertite and twice as much mica, and rather more iron stained (yellow-brown in colour). Bedding 45°-50° to core axis at 160.5°. 60°-65° " " 101.5°
100*	110*	Fines 85% of cuttings. Quartz 40%, calcareous "wicro-mode: 40%, martite 10% (as 60-70°), compositos (quartx-martite: 10%.
110.	120*	Fines 90-95% of outlings. Minerals and proportions as 100'-110', with a few felsper grains and quartx-opidate-martite-garnet compositos.
120°	122*	Parametrica ones into cause. (very hard). Recentially a slightly decomposed quarts-felsper rock, with up to 5% garnet and martite, and variable (up to 20% usually loss than 5%) biotite and opidate. Grain size mainly about 1/100°, Redding generally very obscure, passibly 15°-20° or 30° to core axis at 120.5°, 46°(7) to core axis at 121.5°.
120°	126*	Fines 80% of enttings. Quarts and quarts-orthoclase fragments 40%, dark composites (quarts-opidate-martite-magnetite-garnet rock with miner wiee) 45%, liminite, "micro-modules" etc. 5%. Fines: 40-50% iron exides.
126°	128.2*	Quarts-opidate and irregular lenticular quarts-orthoclass rock interbadded with martite-angustite-opidate and martite-angustite-quarts rocks containing minor garnet and bietite. Orthoclass in quarts-felsper bads up to %" erystals, but grain size generally shout 1/100". Overall composition about; quarts-felsper 45%, augustite-martite 30-35% (up to 70% in some bods), epidate 15%, garnet 5%, bietite accessory. Abundant irregular jointis (epidate common is joints). Beds vary is thickness from %""2", but are generally less than %". Attitude 55-40° to core axis at 126.3° 127.7° 45° " 127.7° 127.7°
120,25*		35-40""""128,25° END OF HOLE

MAGNETIC LOG

Beflection 15° at 126°-126.5°

90° " 127°

90° " 127.7°

90° " 128.25°

TRON EXPLORATION SECTION

LOS OF ROTARY DRILL HOLE NO. WHO

Project: #erresboo. Aeromagnet	ic Anomaly	Dalla 664/61	
Sec. 24 Hd. Warrantoe	Co. Le Haste	Rere Ser. No. 649/61	
Collar Coords: 56600N, 64000E	Rain 462.1*	Grid: Warramboo	
<u>Yertical</u>	Repth: 159*	Plan Ref.	
Date Bers commenced: 13/6/61	<u>Completed</u> : 15/6/61	Briller: H. Mischlewitz	
Bore Lagged by: G. R. Heath	<u>9a</u> 13-15/6/61	Hirer: D. of M.	

OBJECT: To identify and sample material producing magnetic "high".

RESULT: Metasediment (low grade itabirite?) containing 15-30% mertitemegaetite intersected 70°-156°.

LOG Comprises Macro and microscopic geological logs Magnetic logs.

Fren	?e	Description SUMMARY LOG
.0*	15*	Off-white and red-brown slay containing abundant quartz and limonite-martite, some kunker.
15*	70*	Fele multicoloured, yellow-brown and dark purple-brown slightly to very sandy hadded clay. Sand is quarts and martite-limenite (usually less than 10%) tending to be segregated in alternate beds, with some felsper after 40' Groin size; quarts 1/20"-1/50%; iron exides 1/50"-1/100".
70*	100°	Becompared law grade martite-ungustite <u>itahirite</u> , containing minor biotite and white foleper. Average composition about 76% quarts, 30% martite-ungustite. Scain size 1/56"-1/200", usually lose than 1/100".
100*	136*	Broken, fitrly course grained quartu-orthoclase interhedded with loss than 1/25" quartu-felsper-hietite-magnetite-martite. Iron exide content probably everages about 15%.
136'	154*	Very regularly hedded (1/16" bods) quarta-felsper-martite- megactite-garact-bietite rock. Bedding due to miseral segregation. Grain sine sminly less than 1/50", but quarta-orthoclase up to 1/5". Composition about 50% quarta-felsper, 25% garact, 25% smrtite-magnetite, miser biotite.
156*	159*	Very tough quartritic rock, bodding parallel to core exis. Virtually all quartr-felaper with accessory garnet.

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	From	To	Description DETAILED LOG
			N.B. Cuttings caught on 12 mesh sieve.
e e	0*	10*	Fines 80% of cuttings. Limenite and less than 1/50" limenitic quartz sandstone 80%, calcarcous less than 1/50" quartz sandstone and kunkar fragments 20%, a few quartz-mertite fragments, and angular quartz fragments. Fines: 40% quartz, 50% mertite, 10% limenite, some felspar.
	10*	20*	Fines 60-70% of cuttings. Quartz (rather iron stained) 75%, limmite with minor mertite 25%. A few quartz-mertite composites. Fines similar, but 10-15% mertite.
	29°	22*	Parametics area tube sample. White and pale multicolourer clay containing fairly shandant less than 1/10" quartx, very irregularly interbedded with red-brown and yellow-brown mottled very sandy clay, containing less than 4" blobs of 1/50" broken martite. "" Bodding 45°(?) to core exis at 20.5°. "45°(?) " " " 21.5°.
	20*	30*	Fines 75-80% of cuttings. Quarts (as 10°-20°) 70%, limenite etc. (as 0°-10°) 20%, lmartite less than 1/10" fregments 10%. Fines: 50% quarts, 30% martite, 20% limenite.
	30*	40*	Fines 75-80% of cuttings. Quarts (rather less stained) 65%, limemite 20%, learning (as 20°-30°), 15%, Fines: 40% quarts, 50% mortite, 10% limemite, a few greins of decomposed mice.
•	6°	42*	Percussion even tube sample. Yellow-brown and purplish- groy very sandy hadded alay. Bods, about in thick, are due to segregation of querts (1/20"-1/50", rather iron stained) and martite (1/50"-1/100"). Send fraction about 60-70% querts, 30-40% martite. Bodding 50" to core axis at 40.5" 60-75" " " 41.5".
	40*	50*	Fince 85-90% of cuttings. Constituents and proportions as 30°-40°. A few limetone and weathered feleper grain present. Fince: 40-46% mertite (slightly magnetic) with less them 1/10 limemite, 35-40% querts.
	50*	60°	Fines 80% of cuttings. Constituents as 40°-50°, quartx 70%, martite (very slightly megnetic) 20%, limmaite 10%. Fines: 40% martite, 30% quartx, 10% limmaite, possibly 1% decomposed felaper.
	60°	62*	Parametica once tabe sample. Off-white and yellow-brown sandy clay, containing mainly 1/50" quarts with less than 1/200" scattered martite, interpedded with seasowhat clayer quarts-martite layers %"-1" thick. Iron exide content probably less than 10% for whole rock. Bodding 55" to core exis at 60.5". 55"(?) to core exis at 61.5".
	60°	70*	Fines 80% of outlings. Quarts 60%, limmate 25%, mortite 15%. A few quarts-martite composites and felsper grains. Fines: 50% quarts, 46% martite, 5% limmate, a few white felsper and slightly decomposed mice grains.

Free	To	Description DETAILED LOG
70°	80*	Fines 86% of cuttings. Quartz 50%, composites 20% (mainly quartz-felspar-martite and biotite-epidote-martite), biotite 10%, martite 10%, (and 1/10-1/20 magnetite), limenite 10%, a little clean felspar, limestone etc. Fines: 50% quartz, 25% martite and minor limenite, 10% biotite, 15% white felspar.
80°	82 •	Percussion over tube sample. Semewhat decomposed itabirite. Quarts-felsper (less than 1/50") interbedded with martite-magnetite (minly 1/100-t/200") containing some biotite. Martite-magnetite bedded and in less than & layers of blobe. Bedding mainly %"-1/16". Composition about 50-60% quarts-felsper, 30-40% martite-magnetite, 10% bjetite. Bedding 40,-45 to core axis at 80.5'. " " 61.5'.
80*	90°	Cuttings centain 70% fince. Quarts and quarts-felsper 50%, quarts-felsper-mertite-magnetite-bietite composites 25%, mertite and about 1/10 magnetite 25%. Fines: 60-65% mertite-magnetite (less than % magnetite), quarts and felsper 15-20%, minor bietite.
90°	100°	Fines 30% of cuttings, Querts 40%, querts-martite- magnetite composites 35%, felsper (white) 5%, querts- felsper-biotite-martite-magnetite 20%, Fines: 70% martite-magnetite (50+% magnetite) 30% querts-felsper, miner biotite.
100*	162*	Persussion over tube sample. Very hard drilling. Slightly decomposed quartu-martite-magnetite rock (itabirite), with minor felsper and biotite. Minorals dot as sharply segregated as proviously (house hadding more cheese). Gamposition: quarts-felsper 75-65%, martite-magnetite 15-25%. Grain size untily less than 1/100%. One %" vein of cross-cutting, almost pure epidote occurs in the core. Bods 1/16%-4%, usually about %". Attitude 20% (approx.) to core axis at 101.5%
100	•	Fairly hard - changed to roller bit.
100*	110*	Fince 35% of cuttings. Quartz and folsper 30%, composites (mainly quartx-mertite-magnetite, some quartx-folsper-mertite-magnetite) 65%, minor mics. limmate and lime-stone. Fince: 35% quartx, 55% mertite-magnetite, 5% white folsper, 5% bietite.
110.	120°	Fines 50% of enttings. Constituents and proportions similar to 100-110'. Fines contain a few yellow-erange garnet crystals.
120*	125°	Attempted diamend drill care. Only 1%" (2%) recovery. Fairly searce grained (up to %") querts-felsper (dirty plak) interhedded with about 1/25" querts-white felsper-hietite-magnetite-martite layers up to %" thick. Iron exides only 5-10%. Attitude about 10°-20° to core axis.
120'	139*	Fines 25% of enttings. Constituents and proportions similar to 100-110°. Fines similar, but bietite 10% and so garnet.

,Free	To	Description DETAILED LOG
130*	135*	Fines 40% of cuttings. Coarse dirty pink felspar (or andalusite) with minor quarts, biotite and epidote 40%. Quarts-martite-magnetite-felspar- biotite (less than 1/50") 30%. quarts 20%. mica 5%. minor white felspar (?), iron exides, limestane. Fines: 60% quarts-felspar, 30% martite-magnetite, 10% mica, minor epidote, etc.
135*	140*	Fines 60-70% of cuttings. Quartz 20% quartz-felspar- mertite-augmetite-garact-hiotite (grain size less then 1/50°) 60%, felspar (white, pink, dirty pink and grey) 10%, light yellowish-green epidete 10%, minor iron exides and mice. Fines: 10% iron exides.
140*	146*	Fines 30-40% of cuttings. Constituents and proportions similar to 136'-140', but garnet more preminent in compacitoe and fines, serpentine is feirly comman, and felspar is less abundant. Fines 20% iron exides.
145*	150°	Fixes 30% of outtings. Similar to 140'-145', but garnet a magnetite more prominent in compacites. Fixes: 50% quartz-folsper, 30% magnetite-martite; 20% garnet, minor mice.
153*	157 *	Attempted diamed drill care. Recovery 5" (10%) Very regularly hedded quarts-felsper-mertite-magnetite- garnet-hietite reak. Nedding due to mineral segregation Grein size sminly less than 1/50", but up to 1/5" in some quarts-orthoclase bende. Composition quarts-felsper 50%, garnet 25%, magnetite-martite 25%, minor hietite, and fairly abundant serpostine along joints and partings Dedding 1/25"-%" thick, everaging about 1/10". Attitude 35" and 45" to core smis on the two pieces of core recovered.
187 *	159 °	Diamed drill sore. Recovery short 15" (60%) very broken up. No point in preceeding, as drilling parallel to bedding planes. Buth extraoly tengh hemogeneous rock. Essentially a quartaite with some greenish slightly softer mineral (possibly epidote) and accessory garnet, pyrite and unguetite. Grain size about 1/50%, Redding short M", but very pourly defined. Attitude \$40-160 to core axis throughout. Blaich mineral present on fractus planes.
		Constant at 100 Andrill 100.

15020° et 81.5° 10 ° 00.5° 20° ° 101.5° 35° ° 120° - 125° 90er 90- ° 153° - 157° 10es then 10° 157° - 159°

IRON EXPLORATION SECTION

LOG OF ROTARY DETILLHOLE NO. WE. 10

Froignt: Werramboo Aeromagnetic Assembly

Sec. 24 Hd. Werramboo Co. Le Hunte

Gellar Coords. 55500N 64000E

Rel. 460.9°

Grid Werramboo

Yertical

Bate Bare Commenced: 19/6/61 Completed: 26/6/61 Briller: H. Mischlewitz

Bere Legged by: G. H. Hoeth On: 19-27/6/61 Hirer: D. of M.

CRAFECT: To test meterial adjacent to gravity and augmetic enemalies.

RESULT: Decempesed quarts-felsper rock 45'-231'+

LOG Comprises: Mecre and microscopic geological logs.

Free	To	Beseription SUMMET LOS
0,	11.	Surface sandy leam everlying clay and yellow-brown kunks
11*	45°	Very slightly eleyey pure quarts send. Peorly sorted, average grain size 1/75"-1/200", grains fairly well rounded. Righly indurated band. 42"-42.5" due to interpenetration — commutation by cilica.
6°	150*	Light grey slightly to very sandy sementat flaky elay. Bodied (decomposed bedrock). Contains angular 1/20"- 1/100" quarts and minor pyrite. Martite is a rere assessory.
150*	231*	Semuket decomposed quarts-white felsper-(chlorite- bietite rock. Quarte-orthoclase leases and august occur near the base, but bedding is fairly regular throughout. Grain size less than 1/10". Gernet and herableade are rare accessories. Attitude 30"-70" to core axis, mainly about 30°.

From	To	Description DETAILED LOG
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0*	10*	Fines 70% of cuttings. Kunkar fragments (yellow-brown limestone with up to 40%, 1/50" quartz grains) 90%. limenite containing abundant 1/50" quartz grains 5%, angular quartz grains 5%. Fines: 60% quartz (mainly rounded), 30% kunkar, 10% limenite-martite (1/10 martite).
19*	20*	Fines 75% of cuttings. Kunkar (as 0°-10°) 30%, liminite (as 0°-10°) 30%, slightly elayey quarts sendstone (rounded grains, grain eize about 1/200°,, elay coment very slightly calcareous) 40%, Fines as 0-10°, but iron exides 50% martite (derived from upper part of run).
20*	22*	Persussion onen tubo namelo. Structureless slightly clayer pure querts sand. Grain sine variable 1/50"-1/100", with grains commonly 1/200"-1/20". Coment very slightly colorrooms. Grains generally fairly well rounded, but angular grains are quite common.
20*	30°	Fines 80-86% of sumple. Kuntar (as 0°-10°) 20%, slightly eleyey quarts sendstone 36% (as 10°-20°), limmite (as 0°-10°) 30%, quarts grains (angular to rounded) 20%. Fines: 60% quarts, 15% kunkar, 15% eley containing fine send, 16% limenite and minor martite. A few garnet grains.
30*	40°	Pines 95% of cuttings. Quartz (mainly angular, a four grey grains) 90%, kunker 5%, clayey quartz sandstone (as 10'-20') 5%, minor limenite. Fines: 95% quartz (mainly angular, less than 1/5 rounded), minor limenite, kunker etc.
40'	42.	Attempted percussion open tube sample Zero recovery. Hard band at 42° designed tube.
4	2*	Herd head, relier hit 1" in 15 mins. Stamond drill, 42'-42.5', 50% (3") recovery. Herd head ends 42.5'.
42°	42,5 °	Highly indurated quarts sandstone. Here grain size about 1/200", but very peerly serted, and grains up to 1/10" diameter are quite common. Induration appears to be due to grain interpenetration, rather than deposition of introduced silies. The only observed minoral besides quarts is very minor(much less than 1%) pyrite. Grains are generally fairly angular. He structure visible in the core.
40*	50*	Fines 55% of cuttings. Quarts (angular to semachet rounde as 20°-30°) 36%, kunker frequents (as 0°-10°) 56%, quarts sandstone (as 10°-20°) 26%. Minor limesite. Fines more than 96% angular quarts. Minor limesite, kunker and sandstone.
50°	60°	Fines 40% of outtings. Quarts (as 20°-30°) and quartsite fragments 55%, kankar (as 0°-10°) 10%, quarts sendatone (as 10°-20°) 25%, limenite and limenitic quarts sendaton (as 0°-10°) 10% (martite very rare). Fines as 40°-50°.

From	?o	Description DETAILED LOG
60*	62°	Percussion open tube sample. Off-white to very light grey samewhat fleky clay containing scattered 1/20"-1/100" angular quartz grains and very rare martite and pyrite grains. Bedding very obscure, possibly 30 to core axis at 60.5" and 60(?) to " " 61.5".
60°	79*	Fines 70-75% of cuttings. Quartz (a few rounded and groy grains, 1 mainly as 20°-30°) 50%, kunker 15%, quartz sandstone 15%, limenite (as 0°-10°) 20%, Fines almost all quartz (99%) with miner limenite.
79°	80*	Fines 70% of cuttings. Guttings smaller than before, rerely larger than 1/10". Angular querts, (rare iron exide inclusions) 95%, quartu sandatone 3%, kunker 2%, rare limenite. Fines 100% querts, rare pyrite (?) grains.
80°	82°	Ferenzaina ones tube sample: Off-white to light grey sandy clay, similar to 60°-62°, but containing more quarts and pyrite, and possibly decomposed mice. Bedding very change. Attitude 55 (?) to core axis at 80.5° and 55 (?) " " 81.5°
80*	90*	Fines 60% of cuttings. Constituents and propertiens as 70°-80°. Very rare very fine grained (less than 1/1000°) pyrite (?). Fines as 70°-80°, very rare martite grains.
90'	100°	Fines 50-60% of enttings. Constituents as 70'-80', but quarts 99%. Fines as 70'-80'.
100,	102*	Percentaion ones tabe topolo, Light grey sendy elsy as 80'-82', but possibly gomewhat more flaky. Attitude possibly 55 (?) to core exis at 100.5' and 50°(?) " " 101.5'
190'	110*	Fince 40% of cuttings. Constituents as 70°-00°. Quartz 96%, pyrite 1%, miner conditions and kunkar. Fince as 70°-00° (possibly 1% pyrite).
110.	120*	Fince 60% of cuttings. Constituents as 70'-80', propertions similar to 90'-100'. Fines as 70'-80' (less pyrite than 100'-110').
120*	122*	Paramasian asem inha sample, light grey sandy clay as 60°-62', with a few loss them N" black pyritic (and passibly graphitic) beds. Bedding 45-50° to core axis at 120.5'. and 65-75 " " 121.5'.
120*	130*	Fines 60% of cuttings. Quartz more than 95%, minor kunkar quartz sundstone and limenite. Here pyrite grains. Fines as 70°-50°.
130'	140*	Fines 40% of outlings. Quartz more than 95%, pyrite, limmite, sandstone, hunker each sheet 1%. Fines 99%+ quartz, rare martite, pyrite etc.
140*	142*	Persussion open tube sample. 140°-141° light grey clay containing abundant quarts as 50°-62°. 141°-142° Same colour, but quarts fragments very rare. Bedding (due to slight staining) very conterted. Bedding 30(?)° to core axis at 140.5° and 40° (conterted) to core axis at 141.5°.

From	70	Description DETAILED LOG
140*	150*	Fines 40% of cuttings. Quartz more than 95%, minor pyrite, quartz sandstone and kunkar. Fines almost the same as course fraction.
150*	160*	Fines 50% of cuttings. Quartz (% containing biotite inclusions less than 1/100") 80%, white felsper 18%, pyrite 1 or 2%, Fines: 65% quartz, 30% felsper, 5% biotite-chlorite.
160°	162*	Persussian anea tube sample. Decomposed silvery grey- green and off-white method quartx-folsper-blotite- chlorite rock, Composition approximately 60% quarts and folsper and 40% biotite-chlorite, Attitude 75(7) ⁸ to core axis at 160,5° and 65-70 ⁹ " " 161,5°
160*	170*	Fines 30% of cuttings. Countituents and proportions as 150'-160', but grain sine rather larger. Fines: 80% quarts, 15-30% felspar, minor pyrite and biotite.
170*	180*	Fines 10% of cuttings. Quertz and querts-mice composites 65%, white felsper 35%, minor sandstone etc. Fines: 80% quarts, 10-15% felsper, 5-10% biotite-chlorite.
160*	182*	Personation acce two game, Bosomposed quarte-folsper- chlorite-histite rock similar to 160'-162', but bistite- chlorite rarer, and even should from some beds. Average composition about 20% bistite-chlorite. Attitude 55(7)' to core axis at 180.5' and 45' "181.5'
186*	190"	Pines 30% of cattings. Constituents and proportions as 170'-180'. Fines: 70% querts, 25% folsper, 5% shlorito-biotito.
140.	202*	Fince 36% of cuttings. Grain size coarse (commonly larger than %"). Quarts and quarts-mice compositos 55-46%, white felsper 40-46%. Fince: 76% quarts, 25% felsper, 5% chlorito-hietite.
202	•	MMS diamond drill core attempted. Complete failure due to sand in circuit jouring between inner and outer herrels.
200'	206*	Fines 86% of cuttings. Yery few cuttings retained on 12 mesh slove. Wanker, fine querts sandstone and querts fragments (from farther up the hele). Fines; more than 95% querts, miner felaper, mice, martite, pyrite.
206*	510.	Fince 95% of outlings. Small emount of outlings on 12 most slove is detrik from further up the hele (so 200'-205'). Fince on 200'-205'.
210*	215*	Regligible anterial retained on 12 mech slove. Fines: quarts 80%, quarta-mice composites 15%, white feleper 5%, minor bictite-chlorite, pyrite etc.
215*	220*	Negligible cuttings retained on 12 mesh sieve. Fines: Quarts 60%, quarts-mics 30-35%, felsper 5-10%, a few mics flakes and pyrite grains.

	on the second section of the second	
from	76	Description DETAILED LOG
		N.B. Cuttings cought on 12 mesh sieve.
0°	10°	Fines 25% of cuttings on sieve. Light yellow-brown kunker (calcareous quartz sandstone, grains mainly 1/200"). 75%, white clayey and semewhat silicoous quartz sandstone 5% (grain size as in kunker), limenitic quartz sandstone (grain size as kunker) 10%, angular quartz fragments 10%. Clay free fines; 60%, sub-rounded to rounded quartz (lightly iron stained), 40% kunker.
10*	201	Fince 90-95% of cuttings on slove. Kanker (as 0'-16') 30%, limenite (as 0'-10') 20%, querts (similar to 0'-10', but more rounded) 45%, white sandstone (as 0'-10') 5%. Fince: 60% querts, 15% kunker, 5% limenite.
20'	22*	formasion even tube sample. White and light yellow- brown mettled very slightly samey eley. For scattered quarts grains and rare limesite particles is coloured patches.
20°	30*	Fince 96% of cuttings on sieve. Constituents as 0'-10'. Quarts (as 10'-20') 40%, white sundstone 5%, kushar 25%, limenite 30%, Fines: 80% angular quarts, 10% limenite, 10% kunkar.
36'	40°	Fines 90% of cuttings on sieve. Quartz (mainly engaler, a few white well rounded as 10'-20') 70% kunker (as 0'-10') 20%. Jimenite (as 0'-10') 10%. Fines: more than 95% engular quartz (as 20'-30') miner kunker, limenite etc.
40*	42 *	Parametics even tabe sample. Light gray-brown sandy clay, showing irregular poorly defined bedding. Contains fairly measures 1/20"-1/50" quarts grains. Attitude 30 (?) to sore axis at 40.5" and 40" " " 41.5"
40*	50*	Fines 88% of cuttings on sieve. Quertz (% engular) 40%, hunker 40%, limeste 30%, Fines as 30'-40', but one or two felaper grains (white).
50'	60*	Fines 96% of enttings on slove. Quertz almost all angular, 96%, hunker 16%, a few limesite grains and some pyrite. Fines as 30'-40'.
60°	62*	Permesics ones tabe sample. Sandy clay similar to 40'-42', but semachet groyer and showing more distinct bodding. One off-white and red-brown sandy lens (1" dism.). Quarta and extremely rere pyrite (?), only sand perficies. Attitude 40 to core axis at 60.5' and 79'-90' " " " 61.5'
60°	70°	Fince 95% of cuttings on sieve. Quartz (angular) 65%, hunkar 5%, limenite 5%, pyrite (very finely crystalline) 5%. Fince same constituents, but more than 99% quartz,
70*	80°	Negligible unterial retained on 16 mesh sieve. Fines: more than 96% quarts, 1 or 2% pyrite, minor kunker and limmaite.

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i rom	To	Description OF TAILED LOG
80*	8]*	Percussion open tube sample. Grey sandy to very sandy clay. Similar to 40°-42°, but somewhat flaky, and pyritic (as 60°-61°, up to 2° nodules)
υ 0*	90°	Fines 90-95% of cuttings on sieve. Quartz (99% angular) 75-80%, pyrite 10-15% knoker 5%. limonite 5%. Fines: more than 95% quartz, minor knoker and limonite, a few grains of pyrite and decomposed mica (?).
90*	100*	Fines 90-95% of cuttings on sieve. Constituents and proportions as 80-90°. Fines: more than 95% quarts. minor pyrite. knaker and limonite.
100*	101*	Percussion open tube sample. Interhedded grey and dark grey sandy clay, similar to 40'42', contains quertz (mainly 1/50") and pyrite (as 60-61') from loss than 1/1000" to 4" (produces dark colour). Attitude 25-30" to core axis at 100.5'.
100*	110*	Fines 85% of cuttings on sieve. Constituents as 80-90'. pyrite 5%, quartz 90%. kunker 3%, limmate 2%, Fines as 90-100'.
110*	120*	Fines 75% of cuttings on sieve. Constituents as 80-90'. Pyrite 10%, querta 85%, kunkar and limonite less thus 5%. A few greins of decomposed felsper. Fines similar, but more than 95% quartz.
120*	121*	Percussion open tube sample. Bedded (1/16"-%" beds) quart: descapesed felsper-descapesed (chlerite-bietite) rock. Grein size about 1/20". White felsper up to %". Attitude 0-20 to sore exis at 120.5". "" 121.5".
120*	130*	Fines 85-90% of cuttings on slove, Quartz (angular) 85-90%, pyrite 5-10%, decomposed white felsper about 5%, a few limmate grains. Fines similar, but 1/5 of quartz grains contain biotite inclusions.
130*	141*	Fines 70% of cuttings on sieve, Quartz 40%, white felsper (fairly fresh, up to 4" crystals) 45%, pyrite 5%. Fines: 75% quartz, 20% felsper, 5% pyrite, a few mica flakes.
141*	142.6*	Bisment drill core. Recovery 1.6" (100%). Medium to course grained (1/20"-4") quarts-orthoclass-biotite rock showing poorly preserved bedding. Appears to be a metasediment containing metasematically introduced or developed orthoclass. Epidote is a constituent of the less altered portions, while garnet is a rare accessory. Fyrite occurs in fractures and joints. Minerals do not show appreciable preferred orientation. Attitude 30° to 40° to core exis.

142.6' END OF BOLE

IRON EXPLORATION SECTION

LOG OF ROTARY DRILLHOLE NO. NR. 12

freiest:	Verremboo Aeromegmet	ic Anomaly	P.H. 664/61
59g. 24	Hd. Kerrentee	Ce. le finate	Bere Ser. No. 512/62
Callar Ca	rds 55600M, 58000E	Bal. 547.3*	Grid Warrenboo
<u> Yerticel</u>	-	Depth 146.7°	Plan Ref.
Date Bere	<u>Communeed</u> 29,6,61	Campleted 1.7.61	Briller H. Mischlewitz
Bere_Lene	M hr 6.2. Heath	<u>0e</u> 1.7.61	Hirer D. of M.

GRECT: To test amountie and gravity enomalies

Querta-felsper-martite astasediment with minor hietite and garnet intersected from 8' - 146.7'. Iron exide content 29-25%.

LOG Comprises Macro and microscopic geological logs.

		والمتناف والمت والمتناف والمتناف والمتناف والمتناف والمتناف والمتناف والمتن
From	To	Beseription Summet LOS
•	4°	Sendy loom (surface seil).
4*	8.	Tellou-house very hard kunker containing scattered limeni frequents and 1/100" querts.
8.	135*	Decomposed quarts-Seisper-mertite such, heavily impropost with limmaite in places. Contains shout 20% from exide (1 or 2% magnetite moor the home).
135*	344.7*	Loss descapased quarta-felaper-martite-bietite-garnet rock. Contains short 25% iron emides. Beds mainly 1/10" thick. Grain size mainly 1/20" - 1/20". Very slightly (5" deflections.) magnetic. Attitude usually 45" to core emis.

From	10	Detailed LOG
		N.B. Cuttings caught in 16 mesh sieve.
9	10°	Fines 10% of cuttings on sieve, (0° - 4° sundy seil, 4° - 8° kunker, 8° - 10° rock), Yellow-brown slightly sandy (1/100° quarts) limestone (kunker) 40%, limenite (containing miner quarts and martite) 20%, rock fragment (1/20° - 1/50° quarts - decomposed felepar-martite) 40%, Fines; 20% rounded quarts, 30% rock fragments, 30% limenite and martite (1/3 martite), 20% kunker.
10*	20*	Fines 10% of outtings on sieve. Limenite-martite (as0° - 10°) 10%, rock fragments (as 0° - 10°) containing 5-20%, usually 10-15% from exides 90%, Fines: 45% quarts (as 0° - 10°), 35% martite with misor limenite, 20% rock fragments (as 0° - 10°).
20*	30°	Fines 15% of outlings on sieve. Nock fragments (as 0° - 10°) over 95%, riven exide content usually 10% winer quarts and liminite. Fines: 45% quarts (mainly sugular) 46% martite and minor liminite, 10% rock fragments.
30*	35*	Mogligible outtings retained on 16 mech sieve. Fines: 60% martite with minor limmaite and extremely rere magnetite, 35% quarts (se 20°-30°), 5% rock fragments.
36*	40*	Cattings, Megligible unterial retained on 16 meh sieve. Querts 70% (2/3 rounded) martite (ms 30°-35°) 25%, 5% rock frequents.
		Manual drill care: Recevery 2.3' (40%). Becompaced limite stained bedded (% beds) quarty-decompaced felaper-wartite reak, with minor decompaced mica (?) and cross-catting masses of secondary quarty-limite. Grain size about 1/80". No magnetic iron exides (0° deflection). Iron exides 15-20%. Attitude 50 to core exis at 36.5'. " 25° " " 30.5'
40*	50°	Fince 25% of outtings on sieve, Rock fregments (as 0'-10' ever 90% (iron exide content 5-10%). Minor querts and limed to, Fines: 70% mertite and winer limedite, 20% rock frequents, 10% angular querts,
50'	40*	Fines 25% of cuttings on slove. Becomposed rock fragments (as 0°-10°) more than 98% (True exide content 5-10%). Miner quarts and limenite. Fines 60% limenite-martite (with 2% magnetite), 30% angular quarts, 10% rock fragme
60°	65'	<u>Biampd drill more</u> Recovery 0.8' (16%). Becompared quarts-felaper-martite rock. Similar to 35'-40', but rether common grained (up to 16', usually 1/20'-1/50'), more decomposed and limmate imprograted. Tree exide content 20-25% (negligible magnetite). Attitude shout 45' to core axis.
60'	79*	Fines 70% of enttings on sieve, Questa (angular) 50%, limedite-martite (1/5 martite) 40%, compacites (limedite imprognated) 10%. Fines: 50% engalar stained questa, 50% limedite-martite (% of each), minor rock fragments.
70°	89*	Fines 30% of cuttings on slove. Similar to 60°-70°. Querts 50-60%, limmaite and querts-limmaite with minor martite 40-50%, minor rock frequents (as 0°-10°). Fines: 60% querts, lik martite, 25% limmaite (including imprognated rock frequents.

William Control of the Control of th	TO THE POST OF THE PARTY OF THE	
From	To	Description DETAILED LOG
80°	90 *	Fines 75% of cuttings on sieve. Angular stained quartz 40%, limenite-mertite 20%, rock fragments (limenite stained) 40%, similar to 60°-70°. Fines: 60% quartz, 30% martite with losser limenite, 10% oc@posites (as coarse fraction).
90*	95°	Fines 90% of enttings on sieve. Quartz (as 60°-70°) 45%. limenite-mertite (1/5 martite) 35%, rock fragments (2/3 limenite imprognated) 20%. Fines: 70% quartz, 30% mertite-limenite (% of each).
95°	100*	Attempted dismond drill core, more recovery.
95°	100°	Fines 96% of enttings on slove. Quartz 60%, limenite- mertite (2/3 mertite) 30%, composites (as 0°-10°) 10%. Fines: 66% mertite and minor limenite (with rare magneti 36% quarts, minor decomposed felaper.
100*	101*	Formusing even tube seamle. Recomposed bodded (1/16"-2" bods) quarts-mortite-also rook, with misor felsper. Grain size 1/100" - %" somally 1/20"-1/50". Mortite segregated in bode, content ranging from less than 5% to 40%, probably averaging 10-20%. Attitude 30" to core mais at 100.5".
100*	110*	Negligible enttings retained on 16 mish slove. Fines: 70% mertite (including 1 or 2% magnetite and miner limmite), 30% querts, miner decomposed felaper.
110.	120*	Fince 90% of cuttings on sieve. Querts (2/3 "cherty" and limenite stained) 80%, limenite and minor sertite 10%, reak fragments similar to 0"-10", 10% (5-10% iron exides). Fince: 60% querts, 35% sertite (minor limenite and magnetite), 8% quertsdessayes of felspor and mice-martite fragments.
130'	130*	Pines 90% of cuttings on clove. Constituents and proportions on 110'-120'. Pines: 60% querts, 30% mortit (as 110'-120') 10% composites (as 110'-120'),
130*	140*	Pines 70% of enttings on slove. Querts 50%, mortite- limenite 10%, querts-mortite (1/50°, semanhot stained) 25%, rock frequents (as 0°-10°) 15%, Pines; 50% querts (angular, a few leaves yellow grains), 36% mortite (miner magnetite and limenite), 5% garnet, 5% hietite, 5% semanhot decomposed white felsper,
149*	143*	Fines REW of cuttings on slove. Quests 40%, mortite- limmite 10%, quests-mortite and revely garnet 30%, rock freguents as 0-10°, 26%, Fines; 40% mortite (with rere magnetite), 25% quests, 10% bindite, 5% garnet.
143*	146.7*	<u>Diament drill core.</u> Recovery 1.6' (40%) quarts-folsper (56%) - mertite (25%) - blotte (10%) - germet (10%) rock, rather decomposed. Redded (about 1/10" bods) grain size 1/100" - %", usually 1/20" - 1/50". Very slightly megnetic in parts (5" deflection). Core is bodly broken up along joints and lpartings, Lincotion approximately parallel to long axis of bodding. Attitude 45°-50" to core axis throughout.
146.:	, •	Rise of Hose

46.7

END OF HOLE.

IRON EXPLORATION SECTION

LOG OF ROTARY DESILLHOLE NO. MR 13

Project: Warranboe Acromagnet	ic Assemly	D.N. 664/61
Sec. 24 Hd. Warranboo	Co. Le iluste	Bere Ser. No. 512/62
Coller Coorde: 55250N,58000E	R.L. 525.9'	Grid: Warranhoo
Vertical	Depth: 197 *(928*)	Plan Ref.
Bate Bore Commenced: 3/7/61	Completed: 6/7/61	Briller: T. Jervis & H. Rischlewitz.
Bore Logged by: 6, 2, South	00 4-6/7/61	Mrer: D. of M.

COJECT: To test gravity and magnetic "highe".

EXECUTE: Granitized querts-felsper-biotite-magnetite, martite (20%7) metasodiment intersected from 15'-197'.

Continued as NO 3 to 928'.

LOS Comprises Moore and microscopie geological logs.

From	26	Description Summer Los
0.	9.5°	Sendy loom,
0.5	3.5*	Yellow-brown shoot kunker with included querts and limmite.
3.5*	15.	Limmite-martite with minor descapesed antecediment.
15*	79*	Decomposed quarta-felaper-martite astacediment beavily imprognated with limmaite.
70*	180.	Light yellow-brown and multicoloured hedded eleys (decomposed metasodismut) containing 15-46% mertito, averaging 20-25%.
180°	197*	Severaly graniticed quarta-pingle-class-bistite-angustite- martite rock, 90% of rock is quarta-orthoclass-bistite "granite", Unaltered automodianat contains 10-15% iron exides.

Attitude 15° - 65° to core exis, sensity shout 36° .

From	To	Description
LION		DEBATLED LOG
		N.B. Cuttings caught on 12 moch sieve.
O*	10*	Fines 25% of cuttings on sieve (0°-0.5° sandy soil. 0.5°-3.5° kunkar, 3.5° on limenite). Light yellow-brown limestone (kunkar) containing 10-20% 1/50°-1/100° quarts 70%, limenite containing scattered (5%) 1/100° quarts and minor martite 30%. A few composites. Fines: 10% kunkar, 45% limenite, 40% martite, 5% angular iron stained quarts.
16*	20°	Fines 25% of cuttings on sieve. Ennker (as 0°-10°) 15%, 1/50° grains size quarts-mertite-decoupesed felsper 5%, limenite (similar to 0°-10°, but centains more mertite) 80%, Fines; 5-10% angular quarts, 46% mertite, 50% limenite (including completely imprognated clay and decomposed rock), a few quarts-mertite-decomposed felspe fragments.
20°	30*	Fince 20% of outtings on sieve. Ennker (as 0°-10°) 15%, rock fragments (as 10°-20°, containing 5-20% martite, and rather limenite stained) 25%, limenite (as 10°-20°) 64%. Fince: 20% quarts, 20% rock fragments, 60% martite with miner limenite.
30*	40°	Fince 20% of cuttings on sieve. Limmite (as 0'-10') 60%, decomposed querts-felsper fregments (off-white, miner iron exides). 40%, miner hunter. Fines: 75% limmitementite, 5% quartz, 20% rock fregments (mainly limmite stained).
•	it 40 *	Attempted percession open tube sample. Unsuccessful due to settling of abundant heavy outlings (up to 1" limenia and kunker fragments).
40°	50*	Fines 75% of cuttings on slove. Martite-limente 60%, kenker 5%, off-white rock fragments 5%, light yellow-brown limente stained and imprognated decomposed rock fragments (only querts identifiable) 30%. Pines similar to course fraction, but contain 10% angular querts.
50*	49*	Pince SEX of cuttings on sieve. Martite-limmate 70-80%, kanker SK, steined rock fragments (or 40°-50°) 15-25%. Pince similar, but contain SK white rock fragments, and 16% unstained angular quarts.
60*	42*	Parassian and into samle. Light yellow-brown clay (decomposed rock ?) containing letenthem 20% fine grains (less than 1/100") limmaite-martite and minor quarts. Centains irregular %" bads (value?) of broken limmaite with minor martite. Attitude (?) 30° to core axis at 61.5°.
60°	70°	Fines 75% of auttings on slove. Martite-limmite 85%, off-white rock frequents 5%, knoker 5%, yellow-brown rec frequents (as 40°-50°) 5%, Fluor: 30% angular quarts, 20% yellow-brown rock frequents, 5% white rock frequents 45% limmite-wartite,
70°	69*	Fines 65% of cuttings on sieve. Limmite with minor marti 95%, kunker 5%, where rock fragments and angular quartz. Fines: 60% angular quartz (% iron steined), 40% mortite-limente (% of each), where rock fragments etc.

Free	To	Description DETAILED LOG
80*	81*	Percussion open tube sample. Yellow-brown and multi- coloured clay containing abundant (50-60%) irregularly distributed 1/20"-1/50" sand. Sand is 60% quarts. 40% martite. Bedding very obscure, possibly 45° to core axis.
80*	90*	Fines 95-98% of cuttings on sieve. Limonite and minor martite 80%, rock fragments 5%, kunkar 5%, angular quartz 10%. Fines: 50-60% mortite, 40-50% quartz, minor limonite, one or two white decomposed rock fragments.
90*	100*	Fines 95-98% of cuttings on sieve. Quartz (angular lightly stained) 40%, martite 40%, quartz-martite composites with minor limemite 20%. Fines: 55% martite, 45% angular quartz.
100*	101*	Persussies once tube sample. Alternating %"-%" bods of off-white and red-brown mottled clay, and slightly claye; 1/20"-1/100" quarts-mertite sand. Sand 50% of rock. contains 60-70% quarts, 30-40% martite. Attitude 35° to core axis at 160.5°.
100*	110*	Fines 97% of cuttings on sieve. Quartz 30%, martite- limenite 50%, kunker 5%. Fines; quartz (angular, lightly stained) 40%, martite and very miner magnetite 60%.
110*	120'	Fines 98:99% of enttings on sleve. Querts 75%, martite with mimor limonite 25%. Fines: 56% quarts. 56% martite (1 or 2% augmetite).
120°	121*	Personagion ones tube sample. Bodded eley and quarta- mertite similar to 100'-110'. Sand 50-60% of rock. contains about 40% mertite (mainly 1/50"). Attitude 35° to core axis at 120.5'.
120*	130'	Fince more than 95% of cuttings on slove. Angular, feirly clean querts 66%, kunker 5%, limenite@martite 35%, rore querts-martite composites. Fince; 65% martite (including 5% magnetite and minor limenite).
130'	140*	Fines 95% of cuttings on sieve. Clean angular quartz 85% (one or two grains contain mice), martite (one or two magnetite grains) 5%, limonite 10%. Fines: 40-50% martite (1 or 2% magnetite, minor limonite), 50-60% quarts,
149*	141*	Personnies ones take namele. Bull multicoloured very sandy clay, similar in appearance to 80°-81°. Sand 60-70% of rock, consists of 65% martite, 35% quartu. Bedding 30-35° to core axis at 140.5°.
140*	150*	Fines 80% of sample on sieve. Querts (frequently containing up to 10% mortite) 80%, martite 20%. Fines: 60% querts. 40% mertite, minor limenite.
150°	160°	Fince 65% of cattings on sieve. Quarts (as 140°-150°) 90%, mertite 10%, Fince: 70% quarts, 30% mertite (with minor megnetite), a few flakes of fairly fresh looking biotite.

Lives	To	Description DETAILED LOG
160*	162*	Persussian enem tube sample. Clayey decomposed quartx-bietite-mertite rock interbedded with up to %" relatively pure quartx bods. Grains size 1/50"-1/100" in dark purple-brown bods, up to %" in quartx bods. Martite probably 20% of rock. Low grade decomposed itabirite. Attitude 20-250 to core axis at 160.5°, and 15-200 " " 161.5°.
160*	170*	Fines 80% of cuttings on sieve. Quartz (as 140°-150°) 85% mertite 15%, a few decomposed mica, epidete and felsper frequents. Fines: 60% quartz, 40% mertite and miser magnetite, a few bietite flakes.
170°	180*	Fince more than 95% of cuttings on slove. Quartz (inclusions rare) 90-95%, martite 5-10%, a few quartz- mice-martite composites. Fince: 70% quartz, 20% martite and minor magnetite, 5% decomposed felapar, 5% biolite, minor epidote.
180*	181*	Persussian even tube sample. Secomposed quarts-folsper- biotite metasodiment, containing loss them 5% martite. Bodding (up to 2" thick) due to varying amounts of biotite. Grain size about 1/20". Attitude 40" to core axis at 180,5°.
180*	190°	Fince 90% of outtings on slove. Quartz 55%, white, to grey felsper 30%, martite 5%, composites (mainly quartz- martite) 10%, Finos: 75%quartz, 26% martite (2% magnetit 5% white fotsper, minor blotite.
199'	193*	Fince S% of cuttings on sieve. Virtually all fresh rock fragments consisting of quarts, pink erthoclase and martite-augments (5-16%). Grain size 1/20"-1/50". Pince: 66% quarts, 36% orthoclase, 16% martite and minor augmentite.
193*	197*	Mammai Arill sers, recovery 2.5' (42%). Almost completely greatised metacodiment. The core is 9/10 "greate" (quarts-orthoclase rock with 1 or 2% biotite, grain size about 1/15", light gray epidete (?) possibly white felsper, occurs with quarts in irregular voims.) The remaining metacodiment is bedded quarts (10%) - white felsper (45-50%) - biotite (20%) - megactite-martite (10-15%) rock, grain size 1/50". Negactic deflection 25" at 196,5". Bodding 55"(?) to core axis at 196,5".

197

IRON EXPLOBATION SECTION

LOG OF ROTARY DETLE HOLE NO. WE 14

<u>Preject</u> : Warramboe Acromagnet			ic Assauly	D.B. 664/61	
Sec. 24	Hd.	Marranhoo	Co. Le impte	Rere Ser. No. Pt 520/62	
Collar Co	erde	55400M, 58000E	Bal. 533.4°	<u>Grid</u> Warranhoe	
Yertical .			Besth 171°	Plan. Ref.	
date Sere	Com	essed 6.7.61	Completed 5.7.61	Briller T. Jarvis & H. Mischlouitz	
lore Loss	ed_by	G.R. Heath	9 12.7.61	Mirer D. of H.	

BJECT: To test magnetic "high" on gravity plateen.

RESULT: Metacodiments containing 26-35% augmetite-unrelie were intersected from 2.5° to 171°.

LAG Comprises Macro and Microscopic geological logs Magnetic Log.

From	20	Roseription SURMAT LOG
•	0.5	Light brown sandy leas.
0.5	2.5*	Sheet, grading to modular innhar,
2,5°	166*	Whiticoloured decomposed metacodizant, containing <u>Frict</u> , usually about 20%, from exider. Decomposed feleper present from 250°, augustite from 70°, bietite from 120°, quenot from 130°. Grain sine 1/50° - 1/200°. Spidete is at minor countitoont from 150° en.
166*	171*	Fresh quarte-felaper-mertite, anguetite (20-60%, asually 30-36%) - garnet-hietite antesediment. "Grain size 1/50" T/100". Bods asually loss than 1/4" thick.

Attitude 20° - 30° to core exis throughout most of the core, but 55° at bottom,

montic los

Defication 90° at 170,5°.

free	To.	Description OFTATLED LOG
		N.B. Cattings caught on 12 mech sieve.
3	10°	Fines 15% of cuttings on sieve, (0°-0.5° sendy leam, 0.5° - 2.5° kunker, 2.5° + weathered rock). Yellow-brown limestone containing fairly abundant quarts and limenite (kunker) 30%, limenite and minor mertite 20%, rock fragments (decomposed from stained quarts-felsper-martite 1/50° grain size) 50%, Fines 85% mertite-magnetite (1/2 of each), 10% angular quarts, 5% decomposed felsper.
10*	20*	Fince 10% of cuttings on sieve. Constituents and propertions as 0-10°. Fince: similar to 0-10°, rather more martite than limmaite.
20*	21.	Parametica open tube sample.
		Redded decomposed metacediment. Clay containing 60% sand, which consists of 1/3 martite, 2/3 quarts. Grain size 1/50". Bods mainly 1/16" - 1/6" thick off-white and red-brown, containing verying amounts of iron exides. Bedding 50 - 100 to core exis at 20,5".
20'	30*	Fines 70% of cuttings on slove. Eacher 20%, limenite (minor mortite) 20%, rock frequents (similar to 0-10°, but loss from exides) 66%, minor quarts. Pines: 80% mortite (minor limenite), 5% angular querts, 15% rock frequents.
30"	40*	Fines 15% of cuttings on eleve. Martite 20%, limenite 20%, hunker 10%, rock frequents (as 20-30%) 86%. Fines as 20' - 30'.
40*	40.5	ferenceien ener tube comie.
		(Poor sample due to alternating hard and soft bands). Decomposed quarts-folsper metasediment containing minor iron exides.
60°	50°	Fines 70% of cuttings on slove, Limmite-mertite 35%, off-white decomposed quarta-felaper 20%, limmite imprognated meterial 35%, kanker 10%, Pines: 15% angular quarta, 15% off-white reak fragmants, 20% light yellow-brown limmite imprognated anterial, 50% limmite-mertite.
50*	40*	Fines 65% of cuttings on slove. Constituents as 40°-50°. limenite-mertite 35%, off-white rook fragments 5%, limenitie rock fragments 65%. Fines: 16% quarts, 16% white rock fragments, 35% imprognated (limenitie) rock fragments, 45% limenite-mertite.
et 6) •	Attempted percussion open tube sample: sere recevery.
40*	70°	Fines 50% of outtings on sieve. Lianaitie rock fragments 60%, limenite-martite 40%, minor quarts and white rock fragments. Fines: 20% clear angular quarts, 6% white rock fragments, 36% limenitie rock fragments, 40% limenite-martite (1/2 of each).

	North Carlotte Carlotte	
fres	To	Description BETAILED LOG
70°	80°	Fines 99% of cuttings on sieve. Limenite, martite. angular quarts and limenite impregnated rock fragments. Fines: 35% quarts, 60% magnetite-martite (1/5 magnetite) 5% rock fragments of limenite.
80'	91.	Persussies eres take sample
		Off-white and light brown decomposed metasediment. Send sized anterial (1/100" - 1/200") 40% of reck, consisting of 45% martite (with miner magnetite) 55% quarta. Bode 1/16" - 1/4" thick, 30° to core axis at 80,5".
80°	90*	Fines 98% of cuttings on slove. Quarts, kunker, linewite- mertite, reck frequents. Fines 60% querts, 20% limemiti rock frequents, 20% martite-magnetite (as 70° - 80°).
99*	100*	Fines 99% of cuttings on sieve. Quarts and limemite- mertite. Fines 60% querts, 30% megastite-mertite (1/20 megastite), 10% limemite and rock fragments.
100*	101.	formation even tabe comic.
		Brown and off-white decompased notasediment, similar to 80'-81' but darker in colour and decrear grained (1/50" grain size). Send sized unterial 75% of reck, consisting of 60% quarta, 40% mertite. Attitude 30" to core exis at 100,5'.
100*	110.	Fines 99% of cuttings on slove. Limmite-martite and querta. Fines: 70% querts, 20% martite (minor magnetite) 10% limmite and limmaitie rock frequents. A few decomposed feliper grains (7).
110*	120*	Fines 90% of enttings on sieve, Querts 50% (equidimension el. lightly stained) limenite-mertite 45%, some rock frequents (including decomposed mice). Fines 75% quartz (2/4 stained) 15% rock frequents (some freeher them chove, a little decomposed felsper), 16% limenite-mertite.
120'	121.	Personacion enem tube comple
	,	Park red decomposed quarte-martite-biotite metasediment. Grain size 1/50". Contains 50-40% quarte, 20-25% biot- ite, 20-25% martite. Attitude 20" to core axis at 120.5".
120°	130*	Fines 70% of cuttings on slove. Querts \$\ \text{is, white and off-white rook frequents \$\ \text{is.}\$ Bork brown querts-iron enide composites \$\ \text{is, dell black (unageniferous?)} iron exides \$\ \text{del} \text{is, Fines 30% querts, 36% unrite (niner dell exides and magnetite) \$\ \text{is white rook fragments, 36% querts-ion exide composites.}
130*	149*	Fines 90% of outtings on slove. Quarts 66%, "mangemiforou iron exides 10%, mertite 8%, limesite and rock fragments 20%. Fines: 30% mertite with winer magnetite, 15% garnet, 5% follower, 50% quarts, miner decomposed mice.

fres	To	Description DETAILED LOG
140*	141.	Percussion open tube sample.
		Decomposed quartx-martite-biotite-garnet metasediment. Grain size 1/100" - 1/200". Average composition 40% quarts. 30% martite, 15% biotite, 15% garnet. Reds 1/8' - 1" thick, 20° to core exis at 140.5°.
140*	150*	Fines 50% of cuttings on sieve. Rock fragments, about 55; quartz-orthoclase, 45% quartz-opidote-mertito-hiotito-garnet (1/200"). Slightly decomposed. Fines: 60% quartz-felsper (mostly orthoclase) 20% mortite-magnetite 20% rock fragments (as coerse fraction).
150°	160°	Fince 20% of cuttings on sieve. Slightly stained quortx- martite-biotite-garnet-epidete metasediment fragments 60%, quartz orthoclase 20%. Fines; similar to course fraction, a few serpentine fragments present.
160'	170°	Fines 10% of cuttings on sieve. Notasediment fragments. Similar to 150°-160°, but epidete more abundant, quarts-orthoclase rare, and a little sillimentte present. Fines similar to coarse fraction. Nagmetitementite content about 25-30%.
160°	165*	Manual Brill cars. Recovery 0.5° (10%). Very slightly decomposed quarts (10%) - orthoclese (30-35%) - hietite (30%) - martite (5-10%) - germet (15%) - epidete (5%) metasediment. Grain size 1/200°, hads less than 1/4° thick; not well defined; 55° to core axis at 164°.
17 9°	171*	Missand drill care, Recovery 0.75° (75%), Metacodiment similar to 160°-166°, Martite-asgmetite 20-50% (average 30-35%), garnet 15%, biotite 15%, quarts-felspar 30-35%, Grain size 1/50" - 1/100", Bods mainly less than 1/4" thick, Attitude 55° to sore exis: at 170°, Magnetic deflection 90° at 170°-171°,
171*		END OF HOLE.

IRON EXPLORATION SECTION

LOS OF BOTTARY DETLL HOLE NO. MR 15

Project: Werrantoe Aeromegaetic Anomaly

Dalla 664/61

Sec. 24 Hd. Warranbee

Ce. Le Bente Bore Ser. No. PS 520/62

Coller Coords 56400N. 58000E

Rain 548.6° Grid Warrenboo

Tertical

Benth 117° Plan Rof.

Date Bere Commenced 8.7.61

Campleted 11.7.61 Briller T. Jervis & M. Mischlewitz

Nore Legged by 6.R. Heath

Ou 13.7.61

Mirer B. of M.

MARKED: To test material adjacent to gravity and magnetic "highs".

ERREL: Granitised metasediment ("granitic gnoise") was intersected from 4" - 117". No significant iron minorals.

LOS Comprises

Notre and microscopic geological logs

Fren	70	Poostipties Summat Los
••	2.	Light brown sandy loom.
2*	4*	tight yellow-brown shoot and modelar hunkar.
4*	117*	Notecodiment. Secomposed 4'-160'. Contains quarts, plagicalms (?), and biotite, with leaves and august of quarts-orthoclass. Grain size 1/20' - 1/160', usually 1/80''. Minor (2%) martite present near the top of the sequence. Attitude 6'-65' to core axis.

	r y sir ya Milikali ka an yan yan ya	
From	7.0	Description OFTAILED LOG
		N.B. Cuttings caught on 12 mesh sieve.
0°	16*	Fines 50% of sample on sieve. Kunker (off-white to yellow- brown limestone containing scattered 1/200" quartz grains) 40%, sandy loam (break up readily) 10%, decempose rock fragments (off-white and dull red elay containing 1/200" quartz) 50%. Fines: 30% engular quartz, 30% rock fragments, 40% kunker.
10*	201	Fines 60% of sample on sieve. Auguler querts (some with adhering decomposed felsper) 50%, kunker 10%, reck fragments (as 0'-10') 40%, Fines: 66% querts, 30% rock fragments (as 0-10'), 5% kunker.
20*	21.	foression over tube same,
		Red and white mettled and irregularly bedded very sandy clay (decomposed metasediment). Gentains 60% sand sized meterial, up to 1/10" diameter, consisting of 98% quartu-decomposed felsper, 2% mertite. Beds 1/16" - 3/8" thick, 5"-10" to core axis at 20,5'.
20*	30'	Fines 50% of cuttings on sieve. Angular quarts 35%, rock fragments (as 0-10') 66%, knoker 5%. Fines 100% quarts grading to rock fragments.
30*	40*	Fines 70% of cuttings on sieve. Constituents and proportions as 20'-30'. Fines: quarta-rock fragments as 20'-30'.
40*	41.	Persussian agen take anomic.
		Off-white, with irregular iron stained patches, decomposed "granite". Georgists of 1/20" quarts grains (10%) scattered through white clay (decomposed folsoer). Bedding checure, possibly 40° to core exis at 40.5°.
49*	50*	Fines 60% of auttings on cieve. Angular quarta 50%, rock fragments (as 0'-10') 40%, kunkar 10%, Fines similar to 20'-30', with a few grains of decomposed mice.
80'	60'	Fines 85% of cuttings on slove. Augular quarta 75%, reck frequents (as 0'-10') 20%, knoker 5%, Fines 95% augular quarta (sees adhering decomposed reck), 5% rock fragments (as 0'-10'),
69*	41.	Permasian anny inha samin. Light yellow-brown decomposed metacodiment, consisting of 1/50" quarts and decomposed felsper, with decomposed biotite in some bods. Bodding 1/6" - 1/2" thick, 6" to core axis at 60.5".
60*	70°	Fines 65% of cuttings on slove. Augular quarts 75%, rock fragments (as 6'-10' & 60'-61') 25%. Pines similar to 50'-60', with some decomposed biotite.
70°	60°	Fines 50% of cuttings on slove. Pink and white, very slightly decomposed felaper 50%, engaler quarts 25%, rock fragments (as 60°-70°) 28%. Pines: 18% felaper, 30% rock fragments, 10% limenitic fragments, 46% angular quarts,

LOG OF ROTARY DETLI. HOLE NO. 18 15 (Coutd.)

From	T•	Beseription DETAILED LOG
70°	80°	Fines: 15% felsper, 30% rock fragments, 10% limenitic fragments, 45% angular quarts.
80°	61•	Forenzian open tabe sample. Red-brown and yellow-brown laminated, decomposed metasedim ont. Consists of 1/100" grains, 40% quartz-decomposed felsper, 60% decomposed mice, with accessory iron exides. Bods 1/32" - 1/8" thick; 25° to core axis at 80,5°.
80°	90°	Fines 30% of enttings on sieve. Pink and lightly stained felsper 80%, quarts and rock fragments 15%, limenite and limenitic fragments 5%. Fines: 60% felsper, 35% quarts, 5% fresh looking biotite.
90"	100*	Fines 20% of outtings on sieve. Constituents and propertions similar to 80°-90°, but limenite rare, and querts-felsper composites fairly common. Fines: " as 80°-90° with a few limenite fragments.
100°	110°	Fince 16% of cuttings on sieve. Felsper 45%, querte 25%, 1/160° grain size quarta-white felsper-bietite fragments 36%. Fines: 36% compacites (as course fraction) 16% bietite 35% felsper, 25% querts.
110*	112°	Fines 30% of enttings on sieve. Quartz and orthoclase 60% rock fragments (as 100°-110°) 40%. Fines similar to 100°-110°.
112•	117*	Mismad drill care. Recovery 2" (40%), Quartu (30%) - folsper (56%) - biotite (20%) metacediment, containing abundant quarts-orthoclass leases, irregular masses and auguss up to 1%" diameter. Looks like a typical granite gueics. Notacediment grain size 1/30" - 1/50", beds 1/20" - 1/8" thick, 45"-55" to core exis.
117*		END OF MOLE.

IRON EXPLOBATION SECTION

LOG OF ROTARY DRILL HOLE NO. IR 16

Preject: Warranhoo Aeromognetic Anomaly

Sec. 24 Hd. Warranhoo Go. Le Hunte Bare Ser.No.FR 520/62

Gellar Georde 55900N, 58000E R.L. 557.5' Grid Warranhoo

Fertical Bare Commenced 12.7.61 Completed 14.7.61 Spiller R. Nischlewitz 6. T. Jarvis

Rare Lagued by G.R. Hooth On 14.7.61 Hires S. of R.

To test material underlying surface managemiferous float adjacent to gravity and magnetic "highs".

Personal motorediment containing mangemiferous exides (similar to surface fleet) 3-50°, and mertite 50-158°.

LOS Comprises Mesro and microscopic geological logs.

then 1/6" thick.

Frem	To	Docari ption Summer Los
0	1.5*	Light brown sandy loam,
1.5*	3.0*	Light yellow-brown shoot and moduler knoker containing abundant mangamiforous iron exide frequents and modules.
3.0*	50*	Procupated quarty-felapur-wice metasodiumnt containing 15-ick bodded and cross criting masses of soft, dell, mangeniforous iron exides. Grain size shout 1/20".
50'	80*	Becampseed notesediment similar to 3'-50', containing 10-15% iros exides (maganiferous and martite).
80*	156*	Quarts-mertite (magnetite-rure) - epidate-garnet metacodiment, with minor variable hietite. Contains 25-36% mertite with minor magnetiterous material and magnetite. Notescentic quarte-orthoclass (as less than 1/2" lesses and irregular bods) forms about 25% of the rock. Grain size 1/100" - 1/200". Node usually less

Redding attitude increases from 50° to the core exis above 60°, to 65° to the core exis below 140°.

	natura entre Brokkinskovich	
Free	To	Description DETAILED LOG
		N.B. Cuttings caught on 12 mech sieve.
0	10*	Fines 10% of cuttings on sieve. Kunkar (56%) containing abundant (45%) dull black, fairly soft mangamiferous exides (brown streak). Fines: 70% quarts (1/2 well rounded) 20% kunkar, 10% dull from exides, a few decomposed rock fragments (as WR 15).
16*	20°	Fines 50% of outtings on sieve. Knuker 60%, dall mengan- iferous emides 40%, a few decomposed rock frequents, with secondary calcite and iron exides. Fines: 10% quartz, 10% rock fragments, 30% menganiferous exides, 50% knuker.
20'	21 •	Percussion Apen tube sample.
		Brown and dull multicoloured decomposed metasediment. Grain size 1/50", contains 60% quarts, 15% dull, soft, manganiferous emidee, 25% eley (after felaper and mice), Beds 1/32" - 1/8" thick, 50° to core emis at 20,5".
20*	30°	Fince 75% of enttings on slove. Rock fragments (as 20°-21' 30%, dull unaganiferous exides 30%, kunker 40%, a few angular quarts grains. Fince: 24% quarts, 10% kunker, 25% unaganiferous exides, 45% rock fragments (as 20°-21').
30*	46*	Fines 95% of cuttings on sieve. Manker 19%, angular quarts 40%, sungeniferous exides 30%, rock frequents 20%. Fines: 36% iron exides (1/2 santite, 1/2 sungeniferous), 15% kunker, 15% rock frequents, 36% quarts.:
40'	41.	Permasian anon take sample. Very light brown decouposed metacediment containing irregular masses and hade of dall black mangentferous exides. Grain size 1/20" - 1/4". Consists of 60% mangentferous exides 30% quarts, 10% elsy. Bods 1/8" - 1/2" thick, 50" to core exis.
40*	50°	Finse 90% of enttings on sieve. Manganiferous enides 55%, quertx 25%, decomposed rock fragments 20%. Fines: 45% iron enides (se 30°-40°), 30% quartx, 25% rock fragments.
50"	40*	Fines 90-95% of outlings on sieve. Mangamiferous exides 80%, querts 10%, rook fregments 10%. Fines as 40'-50'.
60*	61°	Parametica anna inho sample. Off-white and light reddish and yellowish brown decomposed methodisms. Gentains 1/100" - 1/200" quartz 75K, amaganiferous exides and some mertite 16K, decomposed felapar (elsy) 15K. Bode 1/16" - 1/4" thick, 40°-50° to core exis.
66*	70*	Fines ever 95% of enttings on sieve. Manganiferous emides 50%, quarts 35%, prock fragments (as 60°-61°) 15%. Fines as 40°-50°.
70'	80*	Fines ever 95% of cuttings on sieve. Genetituents and proportions as 60°-70°, a few grains of decomposed felapar. Fines: 36% dull mangamiferous emides, 50% angular quarta, 20% decomposed rock fragments (containing some angustite).

Fres		Description DETAILED LOG
O'er g		
80°	81*	Persussion open tube sample Grey and off-white decomposed metasediment, hard drilling. Consists of 1/50" - 1/100" quarts 65% (including some- what decomposed felapar), slightly decomposed hietite 20%, maganiferous exides and martite 15%. Beds meinly 1/8" thick, 50° to core axis at 80.5°.
80*	90°	Fince over 95% of cuttings on sieve. Manganifereus exides (with some martite) 40%, quarts 20%, orthoclase 30%, rock fragments (querts-felaper-me gmetite-martite) 10%, Finos: 45% iron exides (15% manganifereus, 20% martite, 10% magnetite), 15% querts, 25% felaper (mainly orthoclas 15% composites (fairly fresh),
90*	160*	Fince 90% of enttings on sieve. Mangagiferous exides 30%, quarts-orthoclase fragments 50%, quarts-anguetite-martite with miner garnet and buotite (1/200°) 20%, Fince: 35% iron exides (1/2 magnetite) 5% biotite, 5% garnet, 55% quarts-orthoclase,
100'	110'	Fince 90-95% of outtings on sieve. Iron exides 25% (1/2 in mortite-magnetite, 1/2 mangeniferous), rock fragments 75% (mainly fairly secree grained quartu-erthoclass, with leaser quartu-gernet-mortite-magnetite (miner blotite)). Fince: 20% iron exides (mainly magnetite - mortite), 60% quartu- erthoclass (with miner iron exides), 20% quartu-garnet-magnetite-martite.
110'	120*	Fines 85% of cuttings on slove. Eron emides 30% (2/3 mangamiforcus) rock fragments (as 100'-110') 70%, Fines as 100'-110'.
120°	130*	Fines 90-90% of outtings on sieve. Iron emides (unitaly mangeniforous) 35%, rook fregments (as 100°-110°, with a few fregments of almost pure mice) 66%, Fines: 36% iron emides (1/3 mageniforous, 1/3 martite, 1/3 magnetite), 66% rook fregments (virtuelly all quarts exthesiase),
130*	149*	Fines over 95% of entlings on sieve. Iron exides quarts- orthoclase- and quarts-unquetite-unrtite-garact-biotite on 100'-110'. Fines: 15% iron exides (as 120'-130'), 10% garact. S% biotite, 46% quarts, 26% orthoclase.
140*	144*	Manual drill care. Recovery 0.5° (12%). Slightly decomposed arterediment containing up to 1/2" thick leases of quarte-orthoclass (crystain ap to 1/10" in diameter). Notacediment 1/100" - 1/200" grain size. 30% quarte. 30% opidate. 25% augmetite-martite. 15% garnet. Rode 1/32" to 1/8" thick, 45" to core axis at 144°.
140*	150*	Fines 60% of exitings on slove. From emides 10%, rock fragments 90% (mainly quarta-orthoclass, quarta-garnet-augmentite-martite), Fines similar to operso fraction.
150°	154*	Fines 70% of outtings on sieve. Iron exides 5%, quarts- orthoclase 30%, artesediment 65%. Fines: 30% quarts, 20% orthoclase, 30% epidete, 20% iron exides, 5% garnet, 5% biotite.

From	To	Description DETAILED LOG
154*	158*	Dismond drill care. Recovery 2.1° (52%). Compact metasediment centeining about 25% lenticular and irregularly bedded (up to 1/2", usually less than 1/4" wide) quartz-orthoclase. Metasediment 1/100" - 1/200" grain size. 30-35% martite (magnetite rare). 15% garnet, 20% epidote. 30-35% quartz. Beds usually less than 1/10" thick, attitude 650 to core sxis.
156	3°	END OF HOLE.

TRON EXPLORATION SECTION

LOG OF ROTARY DRILL HOLE NO. WRIT & WRITA

Project:	Warramboo Aeremegnet	ic Anomaly	D.M. 664/61
Sec. 24	Hd. Warramboo	Co. Le liunte	Here Ser.No.FB 520/62
Collar Co		R.L. 479.2*	Grid Warramboo
Vertical		Bepth 182*, 187*	Plan Ref.
Date Bore	Commenced 15.7.61	Completed 16.7.61	Driller T. Jarvis
Bore Legg	ed by G.R. Heath	On 17-18,7,61	liter D. of M.
ODJECT:	To test gravity and	magnetic "highs".	
RESULT:		own into motasediment was intersected from	

LOG Comprises

Macro and Microscopic geological logs Engaetic logs

From	To	Description Summer Log
0,	3° %	Light brown sandy loam.
3*	6*	Light yellow-brown modular, grading to sheet kunkar. Contains minor limonite.
6*	41*	Overburden. White clayey fine quartz sandstone and light multicoloured mottled and irregularly bedded slightly sandy clays. Strongly impregnated with limmaite for the first 20° or so.
41*	65*	Decemposed metasediment containing irregular 1/4" lenses of quartx-martite. Overall iron oxide content 5-19%.
65*	125*	Decomposed purple-brown and grey-brown metasediment (possib- ly itabirite). Consists of alternating martite rich and poor beds. Martite content 20-40%, averaging 25-30%. Sand sixed porticles (mainly 1/50" - 1/150") 79-80% rock.
125*	165*	Martite-magnetite itabirite grading down into a quartx- felspar-martite-magnetite-epidote metasediment. Martite- anguetite content decreases from 40% near the topto 20-25% near the base. Grain size mainly about 1/200". Beds well defined. 1/2" - 1/32" thick (finer towards base).
185*	167 *	Coarse grained (up to 3/4" crystals) quartz-orthoclase- teurmaline-opidote-martite (10%) metasomatic pegmatite. Attitude variable, 15° to 55° to core exis.

From	To	Description DETAILED LOG
*		N.B. Cuttings caught on 12 mesh sieve.
0	10*	Fines 50% of cuttings on sieve. Kunkar (yellow-brown limestone fragments with 5% dispersed quartz grains) 98%, limenite medules (less than 1/4"), somewhat darker in colour than usual 2%. Fines: 60% quartz (rounded to well rounded), 30% kunkar, 10% limenite with a little martite.
10*	201	Fines 40% of cuttings on sieve. Kunkar 25%, limonite 30%, white non-calcareous clay containing 60% sub-angular to rounded, 1/250" quarts, 45%. Fines: 30% quarts, 30% kunkar, 20% limonite, 20% white sandstone (as coarse fraction).
20*	21.	Percusation open tube assole.
		Structureless clay or decomposed rock completely impregnated with siliceous limonite.
20*	30*	Fines 60% of cuttings on sieve. Munkar 15%, limonite 35%, white sandstone (as 10'-20') 50%. A few quartz-martite composites, 1/100" grain size. Fines: 40% limonite, 25% quartz, 5-10% kunker, 25-36% white sandstone.
30*	40*	Fines 55% of cuttings on sieve. Kunkar 10%, white sandstone 10%, quartz (mainly angular) 5%, limonite (generally containing 50%, 1/100" quartz) 75%. Fines: 5% kunkar, 15% quartz, 80% limonite with a few martite grains.
40*	u.	Percussion open tube sample. Grey and light yellow-brown mottled and irregularly bedded slightly sandy clay. Contains about 10%, 1/20" angular to subangular quarts grains. Possibly overburden. Bedding 45% to core exis at 40.5°.
40*	50*	Fines 85% of cuttings on sieve. Angular quarts 15%, kunker 25%, white sandstone 15%, limonite 45%. A few martite grains. Fines: 60% angular quarts, 35% limonite, 5% kunker and white sandstone. A few quarts-martite fragments.
50*	60°	Fines 95% of cuttings on sieve. Angular quartz 50%, limenite 30%, kunkar 15%, white sandstone 5%. 'A few martite-quartz grains. Fines: 85% angular quartz, 10% limenite (and 1/5 martite), 5% kunkar and white sandstone. A few grains of decomposed mica, and very fine grained (1/1000") pyrite.
60"	61*	Percussion area tube sample.
		Grey-brown and light grey irregularly bedded fairly sandy clay, with up to 1/4" irregular lenses of pure sand. Clay contains about 15%, 1/250" quartz-martite sand (1/2 of each), while the lenses contain 70% quartz. 30% martite, grain size 1/200" - 1/500". Overall iron exide content 5-10%. Probably decomposed bedrock. Bedding 30° to core axis at 60.5°.
60°	70*	Fines 90% of cuttings on sieve. 50% angular quarts, 15% calcareous "micro-modules" containing 10% fine grained martite, 15% kunker, 15% limonite, 5% white sandstone, a few grains of finely crystalline pyrite. Fines: 55% quarts, 20% "micro-modules", 10% limonite, 5% martite, 5% kunkar, 5% fine grained pyrite.

From	To	Description DETAILED LOG
70*	80*	Fines 85% of cuttings on sieve. Quarta 50%. "micro- modules" 30%, martite and quarta-martite 10%, kumkar 5%, limonite 5%. Fines: 50% quarta, 35% "micro-nodules", l5% martite, minor kunkar, limonite, decomposed mica etc.
80*	81*	Percussion open tube sample.
		Perplo-brown, grey and light yellow-brown mottled and irregularly bedded decomposed metasediment. Consists of about 30% clay. 70% 1/100" - 1/200" diameter sand. Sand is 30-80% averaging 70% quartz. 20-70% averaging 30% martite. Bedding 45° to core axis at 80.5°.
80°	90°	Fines over 95% of cuttings on slove. 45% angular quarts. "micro-nodules" 40%. martite 10%. limonite. kunkar, white sandstone 5%. Fines: 30% martite (slightly magnetic). 30% angular quarts. 40% "micro-nodules". minor limonite and kunkar.
90*	100*	Fines 85% of cuttings on sleve. Angular quartz 40%, "micro-modules" 40%, mortite 15%, minor limonite, kunkar acts. 5%. Fines 30% mertite, 30% "micro-modules, 40% angular quartz. Rere limonite and cherty looking material.
100*	101*	Parcussion once tube sample.
		Purple-brown and very light greyish yellow-brown decomposed metasediment (itabirite*) similar to 50°-81°. Rock 30% clay, 70%, 1/50" send. Clay includes several 1/8" - 1/4" cross-cutting veins of decomposed epidote. Sand 50-60% mertite, 40-50% quarts. Beds about 1/4" thick, 20° to core axis 100,5°.
100'	110*	Fines 85% of cuttings on sieve. Quartz 45%, "micro-modules" 45%, mertite 5%, limenite etc. 5%. Fines 40% quarts, 40% "micro-modules", 20% mertite, miner limenite decomposed felspar etc.
110*	120°	Fines 75% of cuttings on sieve. Angular quartz 45%. "micro-medules" 45%. martite 5%. decomposed quartz- felspar-martite composites, grain size 1/120", 5%. Fines: 50% quartz, 30% "micro-medules" 20% martite, a few composites (as coarse fraction).
120*	121*	Percussion open tube sample.
		Purple-brown and very light greyish yellow-brown decomposed metasediment similar to 60°-81°. Contains 20% clay and 80%, 1/10° - 1/50° sand. (Clay includes minor decomposed epidote.) Sand is 30% martite, 70% quartz. Bedding obscure, possibly 30-35° to core axis.
120'	130*	Fines 85% of cuttings on sieve. Quartz 45%, "micro-modules" 45%, martite 5%, rock fragments (1/50" - 1/100" grain size quartz-martite and quartz-ophoto) 5%. Fines: 40% quartz. 40% "micro-modules", 15% martite (and misor magnetite). 5% rock fragments, garnet. epidote etc.

From .	То	Description DETAILED LOG
130*	140*	Fines over 95% of cuttings on sieve. Quartz 50%. "micro-modules" 40%. martite 5%. quartz-epidete and quartz-martite-magnetite 5%. Fines: 40% "micro-modules". 35% angular quartz, 15% martite-magnetite, 10% rock fragments and slightly decomposed pink and white felsper.
140*	141*	Percussion open tube sample. Slightly decomposed martite- magnetite itabirite. Contains 40% martite-magnetite. 60% quartz with minor decomposed epidete, biotite and erthoclase. Grein size about 1/200". Eeds 1/8" - 1/2" thick. 150 to core exis.
140*	150*	Fines 90% of cuttings on sieve. Angular quartz 50%, grey felspar 10%, "micro-nedules" 30%, martite 2%, rock fragments (quartz-biotite and quartz-epidete-martite-magnetite mainly) 8%. Fines: 60% quartz, 26% "micro-nedules", 16% martite-magnetite, 16% rock fragments as coarse fraction.
150*	160*	Fines 90% of cuttings on sieve. Quartz 60%, grey to pink felspar 20%, rock fragments (mainly metasediment containing variable quartz; epidote, biotite, magnetite-martite, and quartz-orthoclase fragments. Minor tremplite, "micro-nodules" etc. fines similar to 140° + 150°.
160*	161*	Percussion open tube semple. Slightly decomposed quartremartite magnetite-felspar-epidote-biotite metasediment similar in appearance to 140°-141'. Grain size 1/100" - 1/200". Contains 30% martite-magnetite. 15% biotite. 15% epidoto. 40% quartz felspar. Beds 1/8" - 1/2" thick. 150 to core axis at 160.5°.
160*	170°	Fines 90% of cuttings on sieve. Quartz 45%, "Micro-modules" 15%, kunkar and limonite 10%, rock fragments (1/2 quartz-biotite, 1/2 magnetite-martite (36%) - quartz-biotite, minor epidote) 30%, Fines: 20% martite-magnetite, 5% biotite, 10% "micro-modules", 65% quartz and min or felspar.
170*	180*	Fines 70% of cuttings on sieve. Kankar 25%, angular quarts 25%, rock fragments (2/3 to 3/4 quartz-mertite-megnetite with miner biotite and epidote. 1/4 to 1/3 quartz-biotite-mertite, with miner orthoclase. Grain size in both cases 1/50" - 1/100") 50%, minor limonite and "micro-nodules". Fines: 25% magnetite-mertite, 10% "micro-nodules", 5% biotite, 60% quartz, quartz-martite and minor orthoclase.
M	UZA	
180*	194*	Fines 80% of cuttings on sieve. Quartz (and rare orthoclase) 40%, "micro-nodules" 10%, kunkar, limenite, etc. 5%, rock fragments (martite-magnetite 26-40%, with quartz, orthoclase, biotite and opidate. Grain size 1/100" - 1/200") 45%. Fines similar to coarse fraction.

ROTARY DRILLHOLE NO. WR 17A (Contd.) -5-

from	To	Description DETATLED LOG
184'	187*	Diamond drill core. Recovery 0.6° (20%) Quartz (30%)-white felsper (probably plagiculase, 10%) - epidete (35-40%) - martite, magnetite (20-25%) meta- sediment. Grain size 1/150" - 1/200". Bedding well defined, less than 1/10" thick, 400-55° to core exis. Metasediment contains miner lenticular quartz-orthoclase, and at about 185°, grades down into metasomatic pegmatite containing up to 3/4" crystals of quartz, orthoclase, tourmaline, epidete and martite (5-10%).
187	•	END OF HOLE

NAGNETIC LOG

AI	DEFLECTION
140.5	90-0
160.5*	90- ⁶
184*	900
185°	900

IRON EXPLORATION SECTION

LOG OF ROTARY DRILL HOLE NO. NR 18

Preject:	Karrashoo Aerom	gmetic Anomaly	D.H. 664/61
Sec. 12	lid. Werrantee	Ce. Le Hunte	Bere Ser. No. PB 521/62
Collar Co	ords 58200m, 490	000E R.L. 567.2*	Grid Warrachoo
<u>Verticel</u>		Depth 260.5°	Plan Ref.
Date Bore	Commenced 19.7	.61 <u>Completed</u> 25.7.6	blä Driller 7. Jarvis
Bore Lagg	ed by G.R. Heat!	on 20-26.7.61	Hirer D. of M.

OBJECT: To test gravity and magnetic "highs".

RESULT: Martite bearing metasediments were intersected from 6° to 240° containing 25 - 30% Martite from 6 - 150° and 5 - 30% martite and 5 - 30% manganese exides 150 - 240°.

LOG Comprises

Macre and microscopic geological log.

From	Тө	Description SUMMARY LOG
0'	1,	Light brown sandy loum.
1*	6*	Light yellow-brown kunkar containing 20-30% 1/100"1+ 1/200" rounded quartz and minor limonite.
6"	150*	Decomposed <u>quartz-felspar-martite metasediment</u> with variable mics and minor magnetite near the base. <u>Hartite content</u> varies from 5% to 50%, <u>averaging about 25-30%</u> throughout the sequence. Rock at 120° is comparable with a decomposed itabirite.
150*	240*	Decomposed metasediment similar to 6"-150", but containing 5-30% martite and 5-30% mangamiferous iron exide, Several sequences (e.g. 180"-190", 210"-230") contains 50-60% iron exides (possibly itabirites).
240*	260.5*	Interbedded hietite-quartz-epidete. bietite-felspar- sillimenite-garmet and quartz-epidete-biotite-garmet metasediments. Contain accessory martite and pyrite. Attitude 0° - 60°, usually 25° - 40° to core axis.

From	To	Description DETAILED LOG
		N.B. Cuttings caught on 12 Mesh Sieve.
0*	10*	Fines 50% of cuttings on slove. <u>Eunker</u> (light yellow-brown limestone containing 20-30%, 1/100" - 1/200" well rounded quarts grains, includes 5% black, ferraginous, charty, fragments) 60%, limonite (fine grained; contains about 10%, 1/150" rounded quarts) 30%, decomposed metapodiment fragments (1/150" - 1/200" quartz-martite-limonite-slay, containing about 15% martite) 10%. Fines 65% kumker, 10% limonite, 5% rock fragments, 10% quarts (1/2 rounded), 10% martite-magnetite.
10*	20*	Fines 40% of suttings on sieve. Eunker 5%, concretionary limenite 5%, rock fragments (1/2 as 0°-10°, 1/2 quartz-clay (decomposed folson) containing dispersed limenite and negligible martite) 90%. Fines 75% limenite-martite, 15% rock fragments (as coarse fraction), 5% quartz, 5% kunker.
20'	21*	Percussion open tube sample. Off-white and light red-brown mottled and bedded decomposed metasediment. Consists of 30% quartz, 5-10% martite, with decomposed felspar grading to clay. Grein size 1/20" - 1/50". Beds 1/16" - 1/4" thick, 20° to care axis at 20.5°.
20*	30*	Fines 80% of cuttings on sieve. Kunker 5%, limonite 5-10%, rock fragments (similar to 0° - 10°, centaining about 20% iros exides) 85-90%, a few grains of fresh looking quarts-biotite-martite (5-10%). Fines: 40% quartz (mainly angular), 30% limonite-martite, 30% rock fragments.
30*	40*	Fines 80% of cuttings on sieve. Limonite, kunker etc. 5%, rock fragments (decomposed) as 20°-30°, 95%. Fines 35% quartz, 25-30% martite and martite rich fragments, 35-40% rock fragments containing 20% or less martite.
40°	41*	Fercussion open tube sample. Off-white, red-brown, purple-brown and light yellow-brown mottled and irregularly bedded decomposed metasediment. Consists of about 25-30% martite, 20% quarts with clay and limenite. Limenite impregnation virtually complete in some places. Bedding 1/16" - 1/2" thick, strongly contorted, possibly 00 - 200 to core axis.
40*	50*	Fines 90% of cuttings on sieve. Limenite, kunker etc. 5%, rock fragments (virtually all strongly impregnated with limenite) 95%. Fines 25% limenite-martite, 25% quarts, 15% light coloured rock fragments, 35% limenite impregnate rock fragments.
50°	60*	Fines 90% of cuttings on sieve. Quartz 40%, limonite and totally limonite-impregnated rock fragments 40%, kunkar 5%, light coloured rock fragments 15%, a few martite fragments. Fines: quartz 70% (mostly iron stained), limonite and limonitic rock fragments 20%, martite 5-10%, light coloured rock fragments less than 5%.

From	To	Description BETAILED LOG
130'	133*	Fercussion open tube samples Yellow-brown, purple-brown and lesser off-white decomposed metasadiment (similar to, but contains less from than 119' - 120'). Contains 10 - 20% mertite (individual beds contain 5-80%), 50-60% quartm, 30% clay (decomposed felspor and lesser mica). Beds 1/16" - 3/4" thick, usually 1/8" - 1/4". Attitude 25° to core exis at 130.5' " 131.5' " 15-25° " " 132.5'
130*	140*	No cuttings returned.
140*	141*	Fercussion ones tabe sample Off-white, yellow-brown (and rarely purple-brown) decommoned metasediment (similar to 130° - 133°) Consists of 2-5% dispersed martite, 60% quarts, 35-38% decomposed felspar and mica. Grain size about 1/100°. Beds 1/32° - 1° usually 1/10° thick. Attitude 20° to core exis at 140.5°.
140*	147 *	Ne cuttings returned.
147*	148*	Fercussion open tube sample Yellow-brown and dark brown to black decomposed metasediment Contains 5-10% magnetite-martite (up to 100% of some irregular beds), 60% quartz, 30-35% decomposed felspar (orthoclase?) and minor mica. Grain size 1/100" mainly, but 1/20" in one metasematic (?) quartz- decomposed orthoclase (?) irregular 1/4" - 1/2" bed. Beds mainly 1/16" - 1/4" thick, attitude 250 to core axis at 147.5".
147'	260.5	No entlines returned.
160*	161*	Percussion open tube sample Off-white, yellow-brown and black mottled and thinly bedded decomposed metasediment. Contains 20-25% iron exides (mor- tite and manganiferous material), 30% quarts. 40-45% decomposed felspar and losser m ica. Grain size metaly about 1/60". Bedding mainly about 1/6" thick. Attitude 30-35° to core exis at 160.5°.
169*	170*	Percussion open tube sample Decomposed metasediment containing 25% martite and mangamiferous material (as 160° - 161°). Attitude 30-35° to core axis at 169.5°.
184*	165*	Percussion open tube sample Decomposed metasediment. similar to 160° - 161°, but containing 50% from exides (30% mangeniferous. 20% martite). Attitude 20° to core axis at 184.5°.
200*	201*	Percussion open tube sample. Yellow-brown and lesser off-white and black mottled and irregularly bedded decomposed metasediment similar to 147'-148'. Contains 5-10% iron exides (mainly manganiferes), 40% quartz, 50-55% decomposed felspar and minor mica. Grain size about 1/50". Bedding irregular and obscure, about 300 to core axis at 200.5°.

From	To	Description DETAILED LOG
214*	215*	Percussion open tube sample
		Yellow-brown and black <u>decomposed metasediment</u> (<u>decomposed</u> <u>itabirite?</u>) similar to 119°-120°. Contains 50-60% iron exides (mainly manganiferous). 30% quarts, 10-20% slightly decomposed felsper and lesser mice. Grain size 1/50° - 1/100°. Beds somewhat contexted 1/32° - 1/4° thick. 40° to core exis at 214.5°.
226*	227*	Percussion open tube sample Decomposed <u>itabirite</u> (?) similar to 119° - 120°. <u>Centains</u> 50% iron exides (2/3 martite 1/3 mangamiferous). 35% quarta, 15% decomposed felsper and bistite. A little decomposed orthoclase (metasomatic ?). Bedding checare, possibly 0° or 30° to core axis at 226.5°.
237*	238*	Percussion open tube sample Decem posed quartz (55%) - felspar (15%) - biotite (15-20%) -martite (19-15%) motosediment (grain size 1/200°), with patches and irregular beds of 1/20° quartz-decomposed erthoclase. Bedding somewhat irregular, about 40° to core sxis.
247*	246*	Percussion open tube sample Somewhat decomposed epidote (80%) quartz (20%) rock, with minor dispersed biotite and a few felsper crystals. Grain size about 1/20". Bedding very obscure, possibly sub-parallel to core exis.
258*	260.5°	Dismond drill core. Recovery 2.3° (90%). Somewhat decomposed quartz-felspar-epidete-biotite-garnet metasediment, with minor sillimenite, and accessory pyrite and martite. Three principal rock types irregularly interbedded.
		(1) Coarse grained $(1/10^{\circ} - 1/4^{\circ})$ quartz (40%) - epidote (30%) - biotite (20%) - garnet (10%) rock, all constituents well crystalline.
		(2) Finer grained (1/50") biotite (40%) - epidete (40%) - quartm, felsper (20%) rock with accessory pyrite and mertite. Biotite shows preferred orientation.
		(3) Biotite (40%) - felspar, sillimenite (30%) epidote (20%) - garnet (10%) rack. Biotite, sillimenite and felspar, show very pronounced preferred orientation, (crystals 1/20" long, 1/100" - 1/200" wide) while the garnet occurs as rhombic dedecakedral perphyroblasts up to 1/4" diameter,
		Attitude: sub-parallel, to 500 to core axis.

260.5

END OF HOLE.

IRON EXPLORATION SECTION

LOG OF ROTARY BRILL HOLE NO. WH 19

Preject: Warranboo Aeromagnet	ic Anomaly	D.B. 664/61
Sec. 10 Hd. Warramboo	Co. Le Eunte	Rore Ser.No. 521/62
Collar Coords 61300N. 45000E	R.L. 509.6*	Grid Warrantoo
<u>Vertical</u>	Benth 245°	Plan Ref.
Date Pore Commenced 26.7.61	Completed 28.7.61	Driller H. Mischlewitz
Bore Lauged by G.R. Heath	<u>on</u> 26-28.7.61	Hirer D. of M.
OBJECT: To test magnetic "h	igh" associated with (gravity enomaly
RESULT: Notesediment contain from 200°-245°.	ming 15-20% magnetite	martite was intersected

LOG Comprises

Macro and Microscopic geological logs. Magnetic Log.

From	To	Description SUMMARY LOG
0	1*	Brown sandy loam.
1.	6*	Off-white to light yellow-brown nodular and sheet kunkar, containing 1/200" rounded quartz and minor limenite.
6*	40*	Grey and red mottled and banded sandy (40%) clay. Contains rounded. 1/200". quartz grains. Some impregnation with limenite and silica (e.g. 36" - 39"). Overburden.
40*	75*	Overbanden (?). White end lightly stained clay containing 10% fairly angular quarts and 1% mertite. Irregular, minor silicification has occurred.
75*	95*	Decomposed metasediment (?). Dark grey and brown mottled and irregularly bedded (?) clay centaining 30% sub- angular quarts and 5% pyrite.
95*	200*	Decomposed metasediment. Grey and brown mottled and bedded clay near the tap to slightly decomposed rock at the base. Top similar to 75° - 95°, but whole sequence contains wery finely crystalline pyrite fragments with 5-30%, 1/100° - 1/200° 4 garnet crystals. The fresher samples centain 60% quartx-felspar, 20% garnet, 20% biotite. A included.
200*	245*	Somewhat decomposed quartz-folspar (50-55%) - epidote (15%) - magnetite-martite (15-20%) - garnet (10%) - biotite (5%) metasediment. Grain size mainly about 1/100". Attitude generally obscure, 65° to core axis at the base.

MAGNATIC LOG

Deflection 90-0 at 240*-245*.

	•	
		N.B. Cuttings caught on 12 mesh sieve.
0,	10'	Fines 85% of cuttings on sieve. (0'-1' sandy loom). Off-white to light yellow-brown kunkar. containing about 1/5 rounded. 1/200" quartz grains 99%. limite nodules 1% (less than 1/10" dismeter). Fines: 30% quartz (2/3 well rounded). 10% martite (remanie?). 5% liminite. 55% kunkar.
10*	20*	Fines 99% of cuttings on sieve. Kunker 70%, rounded quartz 30%. Fines: 85% wellrounded quartz, 10% kunker. 5% martite-limonite (4/5 martite).
20"	21*	Percussion open tube sample
		Light grey and brick-red mettled and irregularly bedded clay, centaining irregular patches of 90%, rounded 1/200" - 1/250" quartz grains. Average sand centent of core is about 40%. Colour banding is sub-horizontal, while bands of verying clay content are sub-vertical.
20*	3 0 *	Fines 60% of cuttings on sieve. Kunkar (calcareous quartz sandstone) 20%, white siliceous clayey quartz sandstone (1/200" rounded grains) 30%, brown and yellow-brown limenitic sandstone 50% (1/200" rounded grains). Fines: 30% kunkar, 36% clayey quartz sandstone, 40% limenitic quartz sandstone.
36*	39*	Hard band - changed to roller bit.
30"	40*	Fines 40% of cuttings on sieve. Kunkar 5%, clayey quartz sandstone 20%, limonitic quartz sandstone 16%, silicified decomposed reck fragments (?) (quartz and decomposed felspar ?), red and off-white. 65%. Fines similar to coarse fraction.
40*	50°	Fines 80% of cuttings on sieve. Kunkar 30%. limonitic quartz sandstone 10%, quartz (sub-angular) 10% white clay ocuteining sub-angular quartz 40%. silicified fragments (as 30°-40°) 10%. Fines: 60% mainly angular quartz, 10% kunkar, 10% limonitic sandstone, 10% clay with quartz, 10% siliceous clayer material.
50*	51*	Percussion open tube semple white, very lightly stained clay containing about 10%, 1/50" angular quartz grains and 1%, 1/200" scattored martite grains. Very indistinct bedding, due to variations in quartz content, at 20° to core exis.
50*	60*	Fines more than 95% of cuttings on sieve. Angular quartz 70%, kunkar 15%, limonitic quartz sandstone 10%, siliceous and clayey quartz sandstone 5%. Fines similar to coarse fraction, but contain 60% quartz.
60*	61*	Paraussian apan tube sample. White to off-white clay (as 50° - 51°). Faint banding at 40° to core axis at 60.5 °.

From	To	Description DETAILED LOG
130*	140*	Fines 99% of cuttings on sieve. Fragments of quarts. garactiforous pyrite and kunkar. Fines: 20% garact. 15% grey and white felspar, 5% pyrite, 60% quarts.
140*	141*	Ferenssias open tube sample Grey, grey-brown and reddish decomposed metasediment (similar to 120°-121°). Centains 20% clay, 5-10% pyrite, 30% garnet (up to 80% in patches), 40-45% quarts (and possibly felspar). Grain size mainly 1/40" - 1/100". Bedding indistinct and irregular, possibly 10-25° to core axis.
140*	150*	Fines 99% of cuttings on sieve. Quartz 40%, pyrite 40%, kunkur 10%. felsper 10%. Fines: 25% gernet, 5% pyrite, 20% grey and white felsper. 50% quartz,
150*	160*	Fines more than 95% of cuttings on sieve. Quartz 45%, garmetiferous pyrite 45%, grey felsper 10%. Fines: 25% garmet. 5% pyrite. 10% grey and white felsper, 60% quartz, a few biotite flakes.
160*	161*	Percussion open tube sample. Grey mettled decomposed metasediment, containing less clay (less than 5%) than the everlying material. Consists of 70% quarts-felspar, 15% garnet, 15% samewhat decomposed biotite, with winor dispersed pyrite. Grain size 1/50° - 1/150°. Bedding indistinct, possibly 40° to core axis.
160*	170*	Fines more than 95% of cuttings on sieve. Quartz 70%. garnetiferous pyrite 20%, grey felspar and seme pyrite impregnated quartz 10%. Fines: 30% garnet. 15% grey felspar and quertz containing very fine pyrite inclusions. 5% pyrite. 50% quartz.
170*	160*	Fines more than 95% of cuttings on sieve. Quartz (many fragments containing up to 40%, 1/150" garnet) 50%, garnetiferous pyrite 25%, grey felspar and pyritic quartz 25%, one or two hiotite flakes. Fines: 30% garnet, 10% grey felspar, 5% biotite, 5% pyrite, 50% quarts.
160*	181*	Percussion open tube sample Decomposed quarta, felsper 60% - garnet 20% - biotite 20% metasediment similar to, but less decomposed than 160'-161'. Grain size 1/150" for most of the garnet, up to 1/16" for some quarta fragments. Badding obscure, possibly 25° core axis.
160*	190*	Fines 95% of cuttings on sieve. Quartz 40%, garnetiferous pyrite 20%, quartz-felspar (grey) - garnet composites (with rare biotite) 40%, Fines: 20% garnet, 10% biotite, 5% pyrite, 15% felspar, 50% quartz.
190*	200*	Fines 65% of cuttings on sieve. Quartz (containing up to 20% garnet) 50%, quartz-felsper-biotite-garnet fairly fresh reck fragments (grain size 1/50" - 1/150") 50%. Fines: 20% garnet, 10% biotite. 25% grey felsper, 45% quartz, accessory magnetite. Some garnet grains are attracted by as sinico magnet.

From	To	Description DETAILED LOG
At	200*	No percussion sample, changed to roller bit.
200*	210*	Fines 85% of cuttings on sieve. Quartz and quartz garnet 60%, fresh rock fragments (quartz, felspar (60-65%) - garnet (15-20%) - biotite (10%) - magnetite (10%), grain size about 1/100") 40%, minor epidote and pyrite. Fines: 70% quartz-felspar, 15% garnet, 10% biotite, 5% magnetite.
210'	220*	Fines 85% of cuttings on sieve. Quartz and rock fragmonts. similar to 200'-210'. but containing about 5% epidote. Fines: 75% quartz-felspar. 10% gernet. 10% biotite. 5% magnetite, minor epidote.
220*	230*	Fines 90% of cuttings on sieve. Quartz and rock fragments generally similar to 200°-210°, but garnet and biotite more abundant, and some fragments contain up to 30% magnetite. Fines: 20% garnet, 10-15% magnetite, 10% biotite, 55-60% quartz-felspar.
230*	240*	Fines 80% of cuttings on sieve. Quartz and quartz-garnet 30%, rock fragments (similar to 200°-210°, but containing 30% epidote) 70%. Fines: 60% quartz, 10% garnet, 10% epidote, 10% biotite, 10% magnetite.
240*	245*	Diamond drill core, Recevery 2.0° (40%). Somewhat decemposed quartz, felspar (50-55%) - magnetite, martite (15-20%) - garnet (10%) - biotite (5%) - epidote (15%) metasediment. Grain size 1/10° (in some purer quartz bedé) to 1/150° (garnet and magnetite). Bedding well defined, mainly about 1/8° thick. Attitude variable (bedding somewhat contorted), but usually about 65° to core axis.
24	5*	END OF HOLE.

IRON EXPLORATION SECTION

LOG OF ROTARY DRILL HOLE NO. NR 20

Project: Warramboo Aeromagnet	ic Anomaly	Dall. 664/61
Sec. 10 Ud. Warramboo	Co. Le liunte	Bore Ser. No. 521/62
Collar Coords 63200N. 45000E	R.L. 550.2'	Grid Warramboo
<u>Yertical</u>	Benth 198.	Plan Ref.
Nate Bore Commenced 29.7.61	Completed 1.8.61	Driller T. Jarvis
Bore Logged by G.R. Heath	Qa 30.7.61-1.8.61	liter D. of M.
		e de la companya de

GRIECT: To test magnetic "highs" on gravity anomaly.

RESULT: Itabirite (30-60% martite) overlain and underlain by metasediments containing less than 10% iron oxides was intersected from 130°-175°.

LOG Comprises

Macro and Microscopic geological logs.

From	To	Description SUBMARY LOG
0	6°	Light yellow-brown fine quartz sand.
6•	10*	Light yellow-brown modular and sheet kunkar containing 30% 1/100" - 1/200" rounded quarts.
10*	30*	Overburden. Yellow-brown clay containing 80%. 1/200" rounded quertz, and scattered (5-10%), 1/4" dismeter limonite modules.
30*	130*	Decomposed red-brown, yellow-brown and grey quartz-felspar- mice-mertite metasediment. Contains 5-10% iron exides (95% martite. 5% magnetite). Grain size 1/150" - 1/250". Impregnating and modular limonite occur throughout, and minor secondary silicification has occurred.
130*	175°	Decomposed <u>itabirite</u> containing 30-60% martite. 30-60% quartz. and 10% decomposed biotite or felspor. Grain size 1/100" - 1/200". Bedding well defined. 1/10" - 1/20" thick.
175*	198*	Quartz - felspar-biotite-epidote metasediment containing 1-2% martite - magnetite (and haematite). and rare serpentine and garnet. Grain size 1/100" - 1/250". Bedding lenticular, less than 1/2" thick.

Attitude increases from 30^{9} to core axis at 100° , to $50\text{-}60^{9}$ at 195° .

MAGNETIC LOG

Deflection 5-100 (over small areas) at 193*-198*.

-2-

From	To	. Description DETAILED LOG
		N.B. Cuttings caught on 12 mesh sieve.
0*	10°	Fines 90% of cuttings on sieve. Light yellow-brown kunker containing 30%, 1/100" - 1/200" rounded quartz 92%, sub-rounded quartz 1%, limonite (less than 1/0" nodules) 1%. Fines: garnet etc. residue from WE 19.
10*	20*	Fines 95% of cuttings on sleve. Kunkar 95%, limonite 5% (as 0'-10'). Fines: 70% rounded quartz, 15% kunkar, 15% residue from WR 19 (garnet and magnetite).
20*	21*	Percussion open tube sample. Yellow-brown very sandy (60%) clay, containing 80%, 1/200" rounded quartz and 5-10% scattered, less than 1/4" diameter limenite nodules. No visible structure.
20*	30*	Fines 60% of cuttings on sieve. Red-brown and yellow-brown limemite containing 1/100" angular quartz and scattered martite grains 90%, kunkar 10%. Fines: 60% limemite. 20% rounded quartz, 20% kunkar.
30'	40*	Fines 40% of cuttings on sieve. Rock fragments (red-brown and white, 1/100" - 1/200" quartz-decomposed felspar-decomposed mica) 70%, limonite (as 20°-30°) 20%, kunkar 10%. Fines similar to coarse fraction.
40*	41*	Percussion open tube sample Red-brown with lesser off-white and yellow-brown, mottled and obscurely bedded decomposed metasediment. Centains 5% martite, 30%, 1/150" quartz, 65% decomposed felspar and lesser mica. Bedding obscure, but possibly 200 to core axis.
40*	50°	Fines 40% of cuttings on sieve. Limmite 15%, decomposed rock fragments (composition as 40°-41°) 65%. One or two grains of fresh quartz (70%) - garnet (10%) - biotite (15%) - magnetite (5%) rock. Grain size 1/100° - 1/200°. Fines similar to coarse fraction, but contain about 10% engular quartz.
50°	60*	Fines 80% of cuttings on sieve. Limonite and rock fragments as 40°-50°. Fines similar, but contain about 20% augular quartz, and a few magnetite grains.
60°	61*	Percussion open tube sample Red-brown decomposed quartz (40%) - m ica (30%) - martite (5-10%) - felsper (20-25%) metesediment, grain size about 1/150". Contains scattered small limenite medules. Bedding not well defined, but possibly 45° to core axis.
60°	70*	Fines 95% of cuttings on sieve. Limonite and completely limonite impregnated rock fragments 60%, quartz 10%, rock fragments (as 60°-61°, generally somewhat limonite impregnated) 30%. Fines: 80% rock fragments, 10% angular quartz, 30% limonite, 10% kunkar. 30% martite-magnetite (1/10 magnetite).
70*	80*	Fines 95% of cuttings on sieve. Limenite, quartz and rock fragments as 60°-70°. Fines 30% rock fragments, 10% quartz, 50% limenite and limenite-martite, 10% martite-magnetite.
80.	81.	Too hard for percussion sample.

From	To	Description DETAILED LOG
80*	90*	Fines 30% of cuttings on sieve. Rock fragments 5%, kunker 5%, limonite, with minor limonite-martite and rare magnetite 90%. Fines: 30% quarts, 10% kunker, 20% decomposed rock fragments (1/200" quarts, martite (10%), decomposed folsper), 20% limonite, 20% martite and rare magnetite.
90*	100*	Fines 85% of cuttings on sieve. Angular quartz 30%, rock fragments 25%, kunkar 5%, limonite with minor martite and rore magnetite 40%. Fines: 20% martite with minor magnetite, 46% angular quartz, 20% rock fragments, 20% limonite.
100*	101.	Parcussion poen tube sample
		Yellow-brown, grey and red-brown bedded decomposed meta- sediment. Consists of 75% clay (somewhat flaky), 15% angular quartz, 10% mertite (segregated in 1/10" beds). Grain size about 1/250". Bedding well defined, 1/16" - 2" thick, 300 to core axis.
100*	110•	Fines 90-95% of cuttings on sieve. Quartz 20%, kunker 5%, rock fragments 10%, limonite with minor martite 65%. Fines: 30% martite and minor magnetite, 30% angular quarts, 5% kunker, 15% rock fragments, 20% limonite.
110*	120*	Fines more than 95% of cuttings on sieve. Quartz 60%. martite and minor magnetite 20%. limonite 20%. Fines: 50% quartz. 40% mertite with minor magnetite and specular haematite, 10% limonite etc.
120*	121.	Percussion open tube semple
		Light brown laminated and somewhat mottled decomposed metasediment. Consists of 10% martite. 30% quartz. 60% clay (about 1/2 still recognizable as decomposed mica and felspar). Grain size about 1/200". Bedding fairly well defined, usually about 1/10" thick, 200 - 25 to core axis.
120*	130*	Fines over 95% of cuttings on sieve. Quartz 40%, mertite and minor magnetite 15%, limenite 45%. Fines: 45% martite and minor magnetite, 45% quartz, 10% limenite etc.
130*	140°	Fines over 95% of cuttings on sieve. Somewhat decomposed and silicified querts - haematite - martite (5-20%) - felspar fragments (1/50" grain size 30%, quartz 45%, limonite etc. 25%. Fines: 65% quartz, 10% rock fragments (as coarse fraction), 25% martite with minor limonite, magnetite and haematite.
140*	141*	Percussion open tube sample. Decomposed itabirite containing 60% martite, 30% quartz. 10% clay (decomposed felspar). Grain size 1/100" - 1/200". Bedding fairly well defined, mainly about 1/10" - 1/20" thick, 250 to core exis.
140*	150*	Fines over 95% of cuttings on sieve. Quarta 60%, rock fragments as 130°-140° 25%, limonite and minor martite 15%. Fines: 20% martite and minor limonite and magnetite, 20% rock fragments, 60% quartz. Hare grains of garnet and decomposed felsper.

Fron	То	Description DETAILED LOG
150*	160*	Fines 99% of cuttings on sieve. Quertz (minor included martite) 90%, limonite 10%, one or two grains of martite. Fines: 60% quartz, 15% martite, 5% limonite, a few rock fragments and decomposed felsper grains.
160*	161*	Percussion open tube sample Decomposed itabirite, similar to 140° - 141°, but containing 30-35% martite, 10% biotite and 55-60% quartz. Grain size mainly 1/100° - 1/200°, Bedding well defined, mainly about 1/16° thick, 30° to core axis.
160*	170*	Fines more than 95% of cuttings on slove. Quartz 80%. limonite and a few martite fragments 10%, rock fragments (mostly similar to 130°-140°, but a few quartz-martite) 10%, one or two grains of epidote. Fines: 75% quartz, 25% martite and minor magnetite, a few grains of decomposed felsper etc.
170*	189*	Fines more than 95% of cuttings on sieve. Quartz (mainly with minor included biotite and martite) 90%. limonite etc. 5%. rock fragments (fairly fresh looking 1/200" quartz-biotite-martite) 5%. Fines: 75% quartz, 20% martite and minor magnetite, 5% limonite, a few grains of biotite and decomposed felspar.
160*	161*	Percussion open Lube sample. Fresher than preceding samples (no clay). Somewhat decomposed quartz (25%) - felsper (45%) - biotite (30%) metasediment, containing accessory to minor (1 or 2%) martite and haematite. Grain size mainly less than 1/200", but some biotite and quartz crystals up to 1/50" diameter. Bedding sub-parallel to core exis, but very indistinct.
180*	190*	Fines 60% of cuttings on sieve. Quartz (with mimor bietite and felsper) 30%. Rock fragments (mainly fresh looking quartz-biotite-martite, with minor epidote, garnet and haematite) 65%, limonite etc. 5%. Fines similar to coarse fraction.
190*	193*	Fines 20% of cuttings on sieve. Rock fragments (4/5 quartz biotite with minor magnetite-martite, 1/10 quartz-epidote-haematite, 1/16 quartz-garnet-magnetite-martite with minor biotite, grain size about 1/50" - 1/150" in all cases) 80%, quartz and quartz-felspar 15-20%, minor limonite etc. Fines: 16% garnet, 15% martite and minor magnetite, 20% biotite, 15% epidote, 40% quartz-felspar. Minor haematite and limonite.
193*	198*	Diamond drill core. Becovery 4.5" (90%). Quartz (20%) - white felsper (30%) - biotite (30%) - epidote (20%) metasediment, with minor irregularly dispersed martite-magnetite (possibly 1 or 2%). Grain size mainly about 1/100". Serpentine is prominent in some joint planes. Bedding is generally 1/8" - 1/2" thick and somewhat lenticular in nature. Attitude is consistently 50° - 60° to the core axis. Jointing appears to be somewhat irregular.
	198*	end of hole.

IBON EXPLORATION SECTION

LOG OF BOTARY DRILLHOLE NO. WR 21

<u>Project</u> : Warramboo Aeromagnet	ic Anomaly	D.N. 664/61	
Sec. 10 Hd. Warrandon	Co. Le liunte	<u>Bore Ser.No</u> . 521/62	
Collar Coords 61600N, 43000E	B.L. 507.8*	Grid Karramboo	
<u>Yertical</u>	Depth 208*	Plan Ref.	
Date Bore Commenced 2.8.61	Completed 3.8.61	Driller T. Jarvis	
Bore Louged by G.R. Heath	<u>On</u> 2-3.8.61	lirer D. of M.	

OBJECT: To test "highs" in gravity and magnetic anomalies.

RESULT: Metasediment centeining 0-15% usually 5-10% iron exides intersected from 70°-208°.

106 Comprises Macro and Microscopic geological logs.

From	Te	Description SUMPARY LOG
0	5*	Light yellow-brown sandy loam.
5*	15*	Light yellow-brown kunkar containing 20-30% 1/200" rounded quarts.
15*	25*	Yellow-brown slightly clayey (10%) rounded 1/200" - 1/250" quartz send.
25*	70*	Red-brown, yellow-brown and offwhite clay containing rounded quarts and limonite grains. Silicoous and limonitic in part. Probably overburden.
70'	208*	Metasediment containing quartz, iron exides (martite and haematite above 140°, magnetite and martite below), biotite, epidote, garnet, felspar. Iron exide content: less than 1% to 15%, usually 5-10%. Grain size mainly about 1/100°. Attitude 10-45° to core exis.

From	То	Description DETAILED LOG
0	10*	N.B. Cuttings caught on 12 mesh sieve. Fines ever 95% of cuttings on sieve. Light yellow-brown kunkar containing 20-30%, 1/200" rounded quartz, 95%, residue from WR 20, 5%. Fines: 70% rounded quartz, 20% kunkar, 10% bietite etc. (from WR 20).
10*	20*	Fines 90% of cuttings on sleve. Kunker 100% (minor residue from MR 20). Fines as 0°-10°.
20*	21*	Percussion open tube sample Yellow-brown (orange), subangular to well rounded, well sorted, slightly clayey (10%) pure 1/200" - 1/250" quarts sand. No visible structure.
20*	30*	Fines 85% of cuttings on sieve. Kunkar 20%, yellow-brown and red-brown elayey, limonitic and rarely calcareous meterial containing 20-40%, 1/200" rounded quarts 80%, a few quarts grains. Fines: 40% rounded quarts, 40% sandy claystone (as course fraction), 15% kunkar, 5% residue from MR 20.
30*	40*	Fines 50% of cuttings on sieve. Claystone (as 20°-30°. but 1/2 fragments off-white. not iron stained) 90%. perous limonite 5%. kunkar 5%. Fines: 20% rounded quartz. 10% kunkar. 5% residue from WR 20. 65% sandy claystone (2/3 off-white).
40*	•	Too hard for percussion sample.
40"	50*	Fines 80% of cuttings on sieve. Quartz (mainly rounded) 5%, kunker 5%, sandy claystone to siliceous clayey sandstone (similar to 20°-30°, but more siliceous, and only 1/10° iron stained. Fines similar to coarse fraction, but 40% mainly angular quartz.
50*	60*	Fines 95% of cuttings on sieve. Quartz (angular) 30%, liminite 30%, siliceous clayey sandstone 35%, kunkar 5%. Fines: 90% angular quartz, 10% limonite, a few sandstone fragments.
60*	61*	Fercussion open tube sample. Red-brown and white mottled, and yellow-brown clay containing 30% semewhat rounded quarta (1/50") and 2-5% limonite (and some martite (?)). Banding (may be bedding) 80° - 90° to core axis.
60*	70*	Fines more than 95% of cuttings on sieve. Quartz 45%. siliceous clayey sandstone 50%, kunkar 5%, one grain of very finely crystallize pyrite. Fines: 80% quarts, 15% limenitic material, 5% finely crystalline pyrite.
70*	80*	Fines more than 95% of cuttings on sieve. Quartz (some grey) 85%, limonite 5%, sandstone 5%, kunker 5%, one or two grains finely crystalline pyrite. Fines: 85% quartz, 5% pyrite, 5% calcareous "micro-nodules", 5% haematite-limonite.
80*	81.	Percussion open tube sample Off-white and light purplish-brown mottled and irregularly bedded decomposed metasediment. Consists of 50% clay. 45% angular quartz (1/50" - 1/8") and 2-5% martite with limonite-basematite. Bedding 35° to core axis.

From	To	Description DETAILED LOG
80*	90*	Fines 90-95% of cuttings on sieve. Quartz 85%, sandstone 5%, limenite 5%, pyrite 5%, one or two biotite flakes. Fines: 70% quartz, 16% "micro-nodules" 5% limenite-haematite. 5% pyrite, 5% sandstone.
90*	100*	Fines 90-95% of cuttings on sieve. Culcareous "micro- modules" (usually contain 10% haematite or martite, and minor quartz and pyrite) 50%, quartz 45%, limonite and sandstone 5%. Fines: 40% quartz, 40% "micro-modules", 10% haematite-martite, 10% pyrite.
100*	191*	Perenssian open tube sazalo. Pale famish-grey and light purple-brown decemposed meta- sediment (similar to 60°-61°) contains about 5% iron exides and scattered "micro-nedules". Bedding obscure, possibly 15° to core axis.
100*	110*	Fines 60% of cuttings on sieve. "Micro-nodules" (haematitic) 60%, quartx 35%, limonite etc. 5%. Fines: 45% "micro-nodules". 40% quartz, 10% haematite (and martite?). 5% limonite sandstone etc., pyrite rare.
110*	126*	Fines 60% of cuttings on sleve. Reconstitic "micro-modules" 65%, quartz 35%. Fines: 60% quartz, 30% "micro-modules", 10% hecmatite (and mertite?).
120°	131.	Percussion open tube sample Grey-green and purple-brown, laminated decomposed quarts (20%) - epidete (30%) - biotite (20%) - felspar (15%) - martite beematite (15%) metasediment. Grain size about 1/100". Bedding well defined 1/32" - 1/8", usually 1/16" thick, 10° to core axis.
120*	130*	Fines 80% of cuttings on slove. Angular quartz 30%, hacmatite "micro-nodules" 65%, limonite etc. 5%. Fines: 50% angular quartz, 50% "micro-nodules", minor biotite and epidete.
130*	140*	Fines 80% of cuttings on sieve. Quartz 30%, "micro- modules" 55%, limenite etc. 5%, quartz-felspar 5%, reck fragments (1/100" quartz-garnet-biotite) 5%, minor pyrite. Fines: 30% "micro-modules", 40% quartz and quartz-felspar, 10% garnet, 10% biotite, 5% epidete, 5% magnetite.
140*	141*	Percussion open tube sample Somewhat decomposed grey-green metasediment. Contains 25% epidote, 15% biotite, 15% garnet, 45% quartz and minor felsper, iron oxides are accessory. Grain size about 1/75". Bedding not well defined, possibly 40° - 45° to core axis.
140*	150*	Fines 90-95% of cuttings on sieve. Quartz and quartz-felsper 45%, "micro-nodules" 25%, limonite etc. 10%, rock fragments (as 130"-140") 20%, Fines: 5% magnetite (some martite-haematite), 50% quartz and quartz felsper, 15% garnet, 10% biotite, 20% "micro-nodules", minor epidete.
150*	160*	Fines 80% of cuttings on sieve. Quartz-felspar 50%. "micro-nodules" 20% rock fragments (similar to 130°-140°) 20%, biotite 5%, limenite etc. 5%. Fines: 40% magnetite, 20% garnet, 30% quartz-felspar (minor biotite), 10% "micro-nodules".

LOG OF ROTARY DRILLHOLK NO. ME 21 (Contd.) -4-

From	To	Description DETAILED LOG
	160'	Too bard for percussion sample.
160.	170*	Fines 95% of the negligible cuttings retained on sieve. Generally similar to 150°160°. Fines: 45% quarta-felspar, 20% garnet, 25% magnetite, 10% biotite.
170*	180*	Fines 99% of cuttings on sieve. Similar to 150°-160°. Fines: 15% magnetite (minor mertite), 15% garnet, 15% biotite, 55% querts and minor felspar.
180*	190*	Fines 85-90% of cuttings on slove. Quartz-felspar 50%, rock fragments (shout 1/5 containing garnet and magnetite, the remainder quartz-felspar-bietite) 40%, biotite 5%, limenite etc. 5%. Fines: 25% bietite,m 10% magnetite. 10% garnet. 50% quartz-felspar, 5% limenite. "micromodules" etc.
190*	200*	Fines 90-95% of cuttings on sieve. Quartz-felspar 50%, biotite 5%, "micro-modules" 10%, limonite etc. 5%, rock fragments (similar to 180'-190') 30%. Fines: 20% garnet, 15% biotite. 5% magnetite-martite, 60% quartz-felspar.
200*	204*	Fines 75% of cuttings on sieve. Bock fragments (virtually all quartz-felsper-biotite with accessory megnetite and garnet) 55%, quartz-felsper 35%, biotite 5%, limonite etc. 5%. Fines: 15% garnet. 20% biotite, 5% magnetitemartite, 60% quartz-felsper.
204*	208*	Diamond drill core. Recovery 0.4* (10%). Quartz-felsper (60%) - garnet (0-20%) - biotite (10-25%) - magnetite-martite (5-10%) metasediment. Grain size 1/100" - 1/200". Bedding well defined, semewhat lenticular. Attitude 10° to 45° to core axis.
208*		end of hole.

IRON EXPLORATION SECTION

LOG OF ROTARY DRILL HOLE NO. WR 22

Project: Warramboo Acromagnetic Anomaly		D.H. 664/61
Sec. 10 Hd. Warrenboo	Co. Le liunte	Bore Sarial No. DD 522/62
Collar coords 64400N, 43000E	Rel. 526.0"	Grid Warramboo
<u>Vertical</u>	Benth 162°	Plan Ref.
Date Pore Commenced 4.8.61	Completed 7.8.61	Driller T. Jarvis & H. Mischlewits
Bore Legged by G.R. Heath	9n 4-7.8.61	Hirer D. of M.

UBJECT: To test magnetic "peak" on gravity anomaly.

BESULT: Decomposed itabirite (7) (20-30% martite) intersected from 70° - 115°.

Metasediments, generally low is iron exides, everlie and underlie this sequence.

LOG Comprises Macro and Microscopic geological logs

From	To	Description SURMARY LOG
0*	5*	Light brown fine grained rounded quartz sand.
5*	9*	Light yellow-brown kunker containing 20-30% 1/200" rounded quertz.
9*	12*	Nodular and impregnating limenite.
12*	50*	Decomposed quartz-felspar-epidote-martite metasediment. containing 10-25% iron oxides. Grain size about 1/150".
50*	70°	Decomposed quartz-felspar-mica ("granite") metasediment containing accessory (less than 1%) from exides. Grain size about 1/50". Structure obscure.
70°	115*	Decomposed quartz-felspar-martite metasediment (itabirite?). Contains 20-30% martite, 30-50% quartz. Grain size about 1/200°. Bedding about 1/8° thick.
115*	162*	Decomposed, grading to fresh, quartz-felsper-bietite, with lesser garnet and magnetite-martite metasediment. Grain size 1/8" - 1/200". Average iron exide content throughout the sequence, about 5%. Epidote is an irregularly distributed component. Attitude 250-86° to core exis (most commonly near 80°).

From	To	Description DETAILED LOG
		N.W. Cuttings caught on 12 mesh sieve.
0	10*	Fines ever 95% of cuttings on sieve. Angular quartz 10%, limenite 16%, pale yellow-brown kunker containing 20-30% 1/200" rounded quartz 80%. Fines: 10% kunker, 5% limenite. 30% rounded quartz, 55% residue from MR 21 (garaet, biotite etc.).
10*	20*	Fines 85% of cuttings on sieve. Angular quartz 20%, kunker 30%, limonite 40%, decomposed rock fragments (quartz-martite (10-30% averaging 20%) - clay, 1/20" - 1/50" grain size) 10%. Fines: 30% limonite, 15% martite, 15% kunkar, 10% rock fragments, 30% meinly angular quartz.
20*	21*	Percussion open tube sample. Purple, off-white and yellow-brown decomposed metasediment. Contains 20-25% martite. 50% quarts, 25-30% decomposed felspar and mica. Grain size about 1/200". Bedding well defined, 300-350 to core exis.
20*	30*	Fines 75% of cuttings on sieve. Angular quartz 55%, rock fragments (similar to 20°-21°) 45%. Fines: 15-20% limonite-martite, 50% quartz, 30-35% rock fragments.
30*	40*	Fines 75% of cuttings on sleve. Quartz 60%, limenite etc. 10%, rock fragments 30% (as 20°-21°). Fines: 70% quartz, 30% limenite-martite.
40*	41*	Percussion open tube sample. Off-white and brown decomposed motasediment. Contains 10% martite (and limonite), 10% decomposed epidote, 40% quartz and 40% decomposed felspar and mics. Grain size 1/50" - 1/150". Bedding well defined. up to 1/2" thick, 25° to core exis.
40'	50*	Fines 85% of cuttings on sieve. limenite-martite 5-10%. rock fragments 10%, quartz 80-85%. Fines: 10-15% martite-limenite, 85-90% quartz.
50'	60*	Fines 70% of cuttings on sieve. Limonite and minor martite 15%, rock fragments 15%, quartz 70%. Fines: 15% limonite-martite, 20% rock fragments, 65% quartz.
60*	61*	Percussion open tube sample. Off-white homogeneous looking decomposed metasediment. Contains 50%. 1/50" quartz. 50% clay (decomposed felspar and mica) and possibly 1% 1/500" - 1/1000" scattered from exides. Redding obscure.
60*	76*	Fines 70% of cuttings on sieve. Quartz 70%, limemite and minor martite 10%, rock fragments 20%. Fines: 20% limenite-martite, 10% rock fragments, 70% quartz.
70*	80 *	Fines 50% of cuttings on sieve. Quartz 80%, limenite and minor martite 10%, rock fragments 10%. Fines: 10-15% martite and minor limenite, 85-90% quartz.
80*	61*	Percussion over tube sample. Yellow-brown decomposed metasediment. Contains 20-25% martite, 30% quarts, 45-50% clay (decomposed felspar and mica). Grain size mainly 1/150" - 1/200". Bedding fairly well defined, 50-85° to core exis.

162°

END OF HOLE.

From	70	Description DETAILED LOG
86*	90*	Fines 50% of cuttings on sieve. Quartz 70%, limemite and impregnated material 20%, rock fragments 10%. Fines: 80% quartz, 10% martite-limenite, 5% decomposed felspar, 5% rock fragments.
90*	100*	Fines 40% of cuttings on sieve. Quartz 60%, limenite etc. 30%, rock fragments 10%. Fines: 30% martite and mimor limenite, 10% rock fragments, 60% quartz, mimor decomposed felspar.
100*	101*	Ferenssion open tube sample. Yellow-brown decomposed metasediment similar to 80°-81°. Contains 25-36% martite. 20% clay (decomposed felspar and mica), 50-55% quartz (almost an itabirite). Grain size mainly less than 1/200°. Bedding fairly well defined, about 1/8° thick, 250-30° to core exis.
100*	110*	Fines 90-95% of cuttings on sieve. Quartz 65%, limonite etc. 25%, rock fragments 10%. Fines: 25% martite. 5% limon ite and rock fragments. 70% quartz.
110*	120*	Fines 70% of cuttings on sleve. Quartz 45%, limonite etc. 45%, rock fragments 10%. Fines: 50% quartz, 50% martite, minor rock fragments etc.
120*	121*	Percussion open tube sample. Yellow-brown flaky clay centaining 10-20%, 1/250" quartx. Bedding obscure, possibly 700-800 to core axis.
120°	130*	Negligible cuttings retained on sieve. Fines: 10% martite. 10% decemposed felsper and mica. 80% quartz (usually with minor included martite and biotite).
130*	140*	Negligible cuttings retained on sieve. Fines: 20% martite, 5% biotite, 5% decomposed felspar. 70% quartz (as 120° - 130°).
At	140*	Too hard for percussion sample.
140*	150*	Fines 80% of cuttings on sieve. Quartz 60%, limemite etc. 40%, one or two fresh looking quartz-biolite-epidote fragments. Fines: 30% martite and minor magnetite, 15% white felspar, 15% garnet, 5-10% biolite, 30-35% quartz.
150*	160*	Fines 70% of cuttings on sieve. Book fragments (mainly quartx-felspar-bietite, with lesser epidote, martite and garnet) 30%, felspar 5%, limonite etc. 15%, quartz 50%. Fines: 10% bietite, 10% garnet, 10% white felspar, 20% magnetite-martite, 50% quartz.
160*	162*	Diamond drill core. Recovery 1.0° (50%). Interbedded quartz (40%) - white felspar (50%) - bictite (10%) and quartz (50%) - magnetite. mertite (20%) - gernet (20%) - bictite (10%) metasediment. Overall iron oxide content about 5%. Epidote is a rowe accessory. Grain size 1/6" (quarts. felspar) to 1/200" (gurnet. magnetite). Bedding semewhat irregular, fairly well defiaed, 1/8" to 2" thick. Attitude 70°-75° to core axis.

IRON EXPLORATION SECTION

LOG OF ROTARY DETLL HOLE NO. WR 23 5 23A

Project: Warramboo Aeromagneti		ic Asomely	Dall. 664/61
<u>Sec</u> . 10	lid. Warrambos	Co. Le liunte	Bore Ser.No. DD 565/62
Collar Coc	ords 53100M, 40000E	R.L. 476.3°	Grid Warramboo
Yertical	.•	Depth 147'	Plan Ref.
Date Sere	Compensed 8.8.61	Completed 12.8.61	<u>Priller</u> H. Bischlewitz
Bore Logge	ed by G.H. Heath	9n 9-12.8.61	Birer D. of M.

OBJECT: To test gravity and magnetic "highs".

RESULT: Metasediments containing less than 10% magnetite-martite intersected from 55° - 147°. This meterial may not be sufficient to explain the anomalies.

LOG Comprises Macre and Microscopic geological legs.

. From	To	Description SUMMARY LOG
0	1.	Light brown sandy losm.
1.	15*	Very tough pale yellow-brown modular and sheet kunkar containing 10-30% 1/100" - 1/200" rounded quarts.
15*	55*	Offwhite and various shades of brown interbedded 1/100" slightly rounded quartz sand and slightly to very sandy quartz clay. Sedding sub-horizontal. Limonite nodules occur near the top of the sequence.
55*	136*	Decomposed quartz-mica metasediment. Light grey sandy. slightly pyritic, bedded, flaky clay. Contains about 50% angular quarts (1/100" grain size). and 1 or 2% pyrite near the base.
136*	140*	Decomposed quartz (35-40%) - felspar (15%) - biotite (30%) - garnet (10%) - martite (5-10%) metasediment. Grain size 1/100" - 1/10".
140*	147*	"Grandiorite". Homogeneous looking quartz-plagieclase- biotite metasediment with 5% scattered garnet and accessory iron exides. Attitude about 40° to core axis.

From	To	Description DETAILED LOG
		N.B. Cuttings caught on 12 mesh sieve.
0	16*	Fines 80% of cuttings on sieve. Pale yellow-brown kunker containing 10-30%, 1/100" - 1/200" rounded quartz, 100%. Fines: 80% kunker, 15% rounded quartz, 5% residue from WR 22,
10*	20'	Fines more than 95% of cuttings on sieve. Kunker 30%. limente 20%, pale yellow-brown clay containing 80% rounded 1/100" - 1/200" quartz 20%, eff-white siliceous, 1/100" - 1/200" rounded quartz sandstone 30%, a few well rounded quartz grains. Fines: 30% kunker, 70% dominantly well rounded quartz.
20*	21*	Percussion open tube sample. Off-white and brown (limenite stained) clay containing 70%, 1/100" - 1/200" rounded quartz. Limenite modules (up to 1" diameter) occur throughout the clay.
20°	30*	Fines 80% of cuttings on sieve. Sub-angular to rounded quarta 20%, white siliceous sandstone 30%, kunkarlo%, limonite and limonitic quartz sandstone 40%. Fines: 70% quartz (1/2 angular) 10% limonite, 10% kunkar, 10% siliceous sandstone.
30*	40*	Fines 75% of cuttings on sieve. Quartz (1/2 angular) 30%, limpaite 30%, siliceous sandstone (2/3 off-white, 1/3 yellow-brown) 30%, kunker 10%, Fines: 20% residues (garnet, megnetite etc.), 50% angular quartz, 15% sandstone and kunker, 15% limonite.
40*	41*	Percussion open tube sample. Pale yellow-brown interbedded slightly rounded 1/100" quartz sand, and sandy clay containing 10% quartz as above, and 70% 1/500" quartz. Bedding sub-normal to core axis.
40*	50*	Fines 60 - 85% of cuttings on sieve. Quartz (75% angular) 70%, limenite etc. 15%, silicous sandstone 15%. Fines: 90% quartz (mainly angular), 5% limenite, 5% sandstone and kunkar.
50°	60*	Fines 90-95% of cuttings on sieve. Quartz (9/10 angular) 70%, limonite etc. 10%, siliceous sandstone 10%, kunker 10%. Fines: Nore than 95% angular quartz, sinor limonite sandstone etc., a few martite grains, and one or two fragments of very finely crystalline (1/1000°) pyrite.
60*	61*	Percussion open tube sample. Light grey sandy flaky clay (decomposed quartz-mics metasediment). Contains 50% angular quartz, and rare pyrite. Grain size 1/100". Bedding obscure possibly 65 to core axis. This material closely resembles MR 19.

From	To	Description DETAILED LOG		
60* 70*		Fines 90-95% of cuttings on sieve. Limonite 5%, kunkar 10%, siliceous sandstone 5%, pyrite 5%, angular quartz 75%. Fines: 5% pyrite, 5% limonite, 5% kunkar, 85% angular quartz.		
70*	80*	Fines 90-95% of cuttings on sieve. Quartz 90%, pyrite 5%, kunkar etc. 5%. Fines: 99% quartz. 1% pyrite.		
80'	81*	Percussion open tube sample Light grey decomposed metasediment as 60° - 61°.		
80*	90*	Negligible cuttings retained on sleve. Fines: Nore than 95% quarts. 1 or 2% pyrite, 1 or 2% kunkar etc.		
90*	100*	Negligible cuttings retained on sieve. Fines: Nore than 95% quarts, 1 or 2% pyrite, 1 or 2% somewhat decomposed mica.		
100*	101*	Percussion open tube sample Light grey pyritic decomposed metasediment as 60°-61°.		
100*	120*	No water return.		
120°	121*	Percussion oven tube sample Light grey-brown decomposed metasediment, similar to 60° - 61°, but more pyritic and containing 1 or 2% martite. Bedding (?) sub-parallel to core axis.		
120*	130*	No sater return.		
130*	136*	Negligible fines retained on sieve. Fines: 50% quartz and minor felspar, 25% martite. 10% garnet, 10% pyrite. 5% biotite. Became harder at 136°.		
138*	139*	Percussion open tube sample. Decomposed quartz (35-40%) felspar (15%) - martite (5-10%) - biotite (30%) - garnet 10% metasediment. Grain size 1/100" (martite, garnet) to 1/10" (quartz). Bedding obscure. possibly 400 to core axis.		
138*	142*	Negligible cuttings retained on sieve. Fines: Quartz 45%, garnet 10%, bietite 20%, pyrite 5%, felsper 20%, minor martite.		
142*	147"	Diamond drill core. Becovery 2.8° (56%). Quartz (35%) - white felspar (plagicclase - 50%) - histite (10%) - garnet (5%) metasediment ("granediorite"). Grain size 1/50" - 1/10". Bedding 1/0" - 1/4" thick. Iron exides (accessory magnetite - martite) very rare. Pyrite occurs on some joint faces. Attitude 35° - 40° to core exis.		

147 END OF HOLE.

IRON EXPLORATION SECTION

LOG OF BOTARY DRILL HOLE NO. OR 24

Project: Wa	rranboo Aeromagaet	ic Asemaly	0. M. 664/61
Sec. 29 Hd	. Warramboo	Co. Le liunte	Bore Ser. No. DD 529/62
Collar Coord	57900N, 69000E	R.L.	Grid Werramboo
<u>Verticel</u>		<u>Depth</u> 179*	Plan Bof.
Date Bore Co	menced 14.8.61	Completed 14.8.61	Driller T. Jarvis
Bore Legged	by G.R. Heath	on 14.0.61	Hirer D. of M.
			•

OBJECT: To test "high" in magnetic anomaly

RESULT: Netasediment (Itabirite ?) containing about 25% magnetite - martite was intersected from 25° - 179°.

LOG Comprises Nacro and Microscopic geological logs Magnetic Log Summery Log

From	To	Description SUMMARY LOG
0.	16*	Light brown, well rounded. 1/50" quartz (80%) - gypsum (20%) sand.
10.	20*	Light yellow-brown nedular and friable kunker.
20°	25*	Multicoloured mottled <u>clay</u> containing abundant limenite modules. Overburden.
25*	179*	Somewhat granitised quartz-martite-magnetite-felspar- biotite, metasediment with minor epidote (approaching an itabirite). Nartite (and magnetite below 140°) content 10-30% usually about 25%. Grain size mainly about 1/100°.
		Attitude 20° - 65° to core exis. higher values more common.

MAGNETIC LOG

Deflection 90- from 174' - 179'.

		N.B. Cuttings caught on 12 mesh Sieve.
From	To	Description DETAILED LOG
0	10°	Negligible cuttings retained on sieve. Well rounded, 1/50" quartz sand 80%. 1/50" gypsum fragments 20%, one or two limonite grains.
10*	20*	Fines more than 95% of cuttings on sieve. Rounded quartz 10%, limonite and limonitic sandstone 50%, pale yellow-brown kunker (containing 30-60% 1/100" rounded quartz) 40%. Hard drilling from 18 feet. Fines: 60% rounded quarts, 30% gypsum, 10% limonite, minor kunkar.
26*	21*	Percussion open tube sample. Light grey, yellow-brown and red-brown clay containing abundant limonite modules up to 2" diameter.
21.	30*	Fines 80% of cuttings on sieve. Kunker 5%, quartz (mainly angular) 15%, limonite etc. 80%. Fines: 60% angular quartz, 20% limonite and limonite impregnated rock fragments. 20% martite.
30*	40*	Fines 90-95% of cuttings on sieve. Limonite etc. 90%, sugalar quartz 10%. Fines: 70% limonite, 30% quartz, a few grains of martite and decomposed felspar.
40*	41° i	Percussion open tube sample. Yellow-brown decomposed quartz (30%) - martite (30%) - felspar (40%) metasediment (decomposed granitised itabirite?). Grain size 1/50" - 1/200". Bedding feirly well defined, 20° to core existimanite modules (up to 3/4" diameter) occur throughout the rock.
40"	50*	Fines 90% of cuttings on sieve. Quartz 50%, limonite etc. 30%, martite 20%. Fines: 25-30% martite, 10% limonite etc., 60-65% quartz.
50*	60*	Fines 90% of cuttings on sieve. Quertz 60%, martite 15%, limonite etc. 10% colcareous "micro-nedules" with included quertz and martite 15%. Fines: 30% martite, 10% "micro-nedules" and fragments, 5% limonite etc., 55% quartz.
60°	61*	Percussion open tube sample. Off-white and purple-brown decomposed quarta (40%) - martite (20-25%) - felspar (35-40%) metasediment (similar to, but less limonite staimed than 40°-41°). Martite content of individual beds up to 50%. Grain size 1/100" (in martite rich beds) to 1/10" in purer quarta areas). Bedding irregular (due to granitisation?), possibly 65° to core axis.
60*	70*	Fines 85% of cuttings on sieve. Quartz 70%, "micro-nodules" 10%, limonite etc. 10%, mertite 10%. Fines: 16% "micro-nodules", 30% mertite, 60% quartz, mimorilimonite etc.
70*	80*	Fines 90-95% of cuttings on sieve. Quartz 70%. "micro-nodules" 20%. martite 5%. limonite 5%. Fines: 30% martite. 10% "micro-nodules". 60% quartz.

From	To	Description DETAILED LOG
80*	81.	Percussion open tube sample. Decomposed metasediment consisting of interbedded quartz (20%) - clay (decomposed felsper - 80%) and quartz (45%) - martite (25%) - clay (30%). Probably granitised itabirite. Similar to 60°-61°, but more regularly bedded. Overall martite content probably 15%. Grain size about 1/150°. Bedding shout 25° to core axis, well defined.
80*	90*	Fines 90-95% of cuttings on sieve. Quartz 60%. "micro- nodules" 30%, martite 5-10%, limonite etc. less than 5%. Fines: 25% martite, 10% "micro-nodules", 65% quartz.
90*	100*	Fines more than 95% of cuttings on sieve. Quartz 50%, "micro-nodules" 40%, mertite 5%, limonite etc. 5%. Fines: 30% martite, 25% "micro-nodules", 45% quartx.
100*	101*	Percussion open tabe sample. Yellow-brown and purple- brown decomposed metasediment, intermediate in appear- ance between 40°-41° and 60°-81°. Consists of about 10% mertite, 5% decomposed biotite, 15% decomposed felsper and 70% quartz. Mertite occurs in less than 1/4" beds. Grain size mainly about 1/100". Bedding well defined, somewhat contorted changing from 5° to 50° to core axis.
100*	110*	Fines more than 95% of cuttings on sieve. Quartz 50%, martite 5%, limenite etc. 5%, "micro-nodules" 40%. Fines: 20% martite, 30% "micro-nodules", 50% quartz. minor limenite and decomposed felspar.
110*	120*	Fines more than 95% of cuttings on sieve. Quartz 70%, "micro-nodules" 20%, limonite 5%, martite 5%. Fines: 15% martite, 5% decomposed felsper, 10% "micro-nedules", 70% quartz, a few decomposed mica flakes.
120*	121*	Percussion open tube sample. Yellow-brown and purple-brown decomposed quarts (50%) - martite (20%) - biotite (10%) - felsper (20%) metasediment. similar to 100°-101°, but bedding less well defined. Grain size about 1/100°. Attitude 35°-40° to core exis.
120*	130*	Fines more than 95% of cuttings on sleve. Quartz 55%, martite 10%, limonite etc. 5%, "micro-nodules" 30%, Fines: 20% martite, 10% "micro-nodules", 5% decomposed felspar, 65% quartz, a few biotite flakes.
130*	140*	Fines 90-95% of cuttings on sieve. Quartz 55%, felspar (mostly pink and grey) 30%, biotite 5%, martite 10%, Fines: 55% quartz, 20% martite, 5% biotite, 20% felspar, miner "micro-modules" etc.
140*	141*	Percussion open tube sample. Decomposed yellow-brown and black quartz (45%) - felsper (15%) - martite (30%) - hiotite (10%) metasediment as 120°-121°. Grain size about 1/50°. Bedding obscure, possibly 65° to core exis. Minor garnet.

LOG OF ROTARY DATILIFOLE NO. NE 24 (Contd.) -4-

From	7o	Description DETAILED LOG
140'	150°	Fines 90% of cuttings on sieve. Quartz 55%, grey and pink felspar 20%, martite 10%, "micro-nodules" 10%, limonite etc. 5%. Fines: 20% martite-magnetite (1/2 magnetite), 15% felspar, 5% "micro-nodules", 5% biotite.
150*	160*	Fines more than 95% of cuttings on sieve. Quartz 40%, felsper 40%, martite 5%, "micro-modules" 5%, biotite 5%, limonite etc.5%. Fines: 10% martite-magnetite, 10% biotite, 10% "micro-modules", 15% felsper, 55% quartz.
160°	170*	Fines 90% of cuttings on sieve. Quartz 40%, felspar 20%, limonite and martite 5%, quartz-felspar-magnetite-martite rock fragments, with variable biotite and epidet (grain size about 1/100") 35%, minor biotite. Fines: 26% magnetite-martite (2/3 magnetite), 20% felspar, 5% biotite, 10% rock fragments, 45% quartz.
174*	179*	Diamond drill care. Recovery 0.5° ((10%). Slightly decomposed quartx (40%) - orthoclase (10%) - magnetite, martite (30%) - epidete (10%) - biotite (10%) metasediment. Orthoclase is restricted to irregular lenses and augens less than 1° diameter. Grain size 1/100° (magnetite-martite) to 1/10° ((orthoclase). Bedding well defined, fairly regular, generally less than 1/4° thick. Attitude 55°-60° to core exis.
170'	179*	Sludge. Quartz 35%, felspar 15%, magnetite-martite 15%, biotite 5%, epidote 5%, "micro-modules" 5%, composites (as 174'-179') 20%.
;	179*	END OF HOLE.

IRON EXPLORATION SECTION

LOG OF ROTARY DRILL HOLE NO. NR 25

Project: Narramboo Aeremagnetic Anomaly D.M. 664/61 Sec. 24 Hd. Karrasbee Co. Le Bunto Bere Ser. No. BD 530/62 Cellar Coords 57900%, 68000E R.L. Grid Warramboo **Vertical** Depth 176° Plan Ref. Driller T. Jarvis Date Bore Commenced 15.8.61 Completed 17.8.61 Rore Louned by G.R. Heath On 16-17.8.61 Hirer D. of M.

OBJECT: To test "high " in magnetic anomaly.

Metasediment containing 10-30% (averaging 20%) martite-magnetite was intersected from 50°-85° and 110°-178°. RESULT:

LOG Comprises Macro and microscopic geological log Magnetic Log Summary Log

Fres	To	Description SUMMARY LOG
0.	31	Light yellow-brown well rounded quartz sand.
3*	25*	Very finely (amorphous) ? to coersely (1/4") crystalline yellow-brown and red-brown stained gypsum, containing variable (10%) ? quartz sand.
25*	50*	Yellow-brown and red-brown <u>limonitic</u> decomposed <u>metasediment</u> containing accessory martite.
50*	85*	Decomposed, granitised quartz-felspar-martite metasediment. Nartite content 10-25% averaging about 15%. Grain size 1/150" - 1/200".
85*	110*	Decomposed <u>mica schist</u> (quartz 5%, felspar, 20%, mica 75%). Very homogeneous. Negligible martite.
110*	130	Decomposed quartz (50%) martite (10-15%) felspar (35-40%) metasediment similar to 50°-85°.
130*	155*	Decomposed quartz-felspar-magnetite. <u>martite</u> (20%) - garnet <u>metasediment</u> . Grain size about 1/200".
155*	165*	Decomposed martite-magnetite (25-30%) itabirite. Grain size 1/50" - 1/250".
165*	178*	Granitised quartx-felspor-magnetite, martite (20-25%) - garnet - biotite epidote metasediment, similar to 130° - 156°. Grain size 1/10" - 1/250".
		Attitude mainly 45°-65° to core exis, but contorted

in part.

MAGNETIC LOG

90-9 st 140° 90-9 " 160° Deflection

160

90-0 " 175

From	To	Description DETAILED LOG
		N.B. Cuttings caught on 12 mosh sieve.
0	10*	Fines 90-95% of cuttings on sieve. Quarta (mainly angular) 30%, white gypsum (not visibly crystalline) 60%, residue from NR 24 10%. Finos: 20% gypsum, 30% quarta. 50% residue from NR 24.
10.	20*	Fines 70% of cuttings on sleve. 1/4" fragments of crystalline gypsum 95%, quartz etc. 5%. Fines: 40% gypsum, 40% mainly angular quartz, 20% residue (magnetite etc.).
20*	21.	Percussion open tube sample Red-brown and yellow-brown 1/200" - 1/50" crystalline gypsum containing scuttered (5%?) quartx grains.
20°	30*	Fines 90% of outtings on sieve. Quartz 5%, gypsum (as 10°-20°) 10%, limonite and limonite impregnated meta-sediment 65%. Fines: 15% quartz, 5% gypsum, 30% mertite (and very rare magnetite), 50% limonite.
30*	49*	Fines 70% of cuttings on sieve. Limonite etc. (as 20°-30°) 95%, quartz, gypeum etc. 5%. Fines: 15% quartz. 15% martite, 70% limonite.
40*	41*%	Percussion open tube sample Yellow-brown and dark red-brown decomposed and limonite stained and impregnated quartz-felspar metasediment. Some granular limonite possibly after martite. However, less stained rock contains less than 1% martite. Bedding fairly well defined, 1/8"-1/4" thick, 45° to core axis.
40*	50*	Fines 95% of cuttings on sieve. Quartz 15%, gypsum 5%, limonite etc. 80%. Fines: 20% quartz, 10% martite, 70% limonite etc.
50*	60*	Fines 75% of cuttings on sieve. Quartz 15%, limonite and minor martite 65%, Fines: 35%, quartz, 15% martite, 50% limonite etc.
60*	61 •	Forcussion open tube sample Red-brown and dirty yellow-brown quartz (25%) - martite and limenite after martite (20-25%) - decomposed mica and lesser felsper metazediment. Limenite staining is common. Grain size about 1/150°. Bedding fairly well defined; about 1/8° thick, 50°-55° to core axis.
60*	70°	Fines 90-95% of cuttings on sieve. Quartz 50%, limonite etc. 40%, gypsum 5%, martite 5%, a few quartz-martite rock fragments. Fines: 15% quartz, 10% limonite etc., 75% martite.
70'	80*	Fines 95% of cuttings on sieve. Quartz 30%. martite 30%, calcareous "micro-modules" 20%. limonite 15%, gypsum 5%. Fines: 10% quartz, 5% "micro-modules", 5% limonite etc. 80% martite.
80°	81*	Forcussion open tube sample Multicoloured mottled and bedded, growitised and conterted, somewhat decomposed quartz-felspar-martite (5-10%) meta- sediment. Minor limonite staining. Grain size 1/200" (unsltered metasediment) to 1/5" (quartz-felspar). Bedding 1/16" - 1/8" thick, shows ptygmatic felding.

From	To	Description DETAILED LOG		
80*	90*	Fines 85% of cuttings on sieve. Quartz 35%, martite 25%, limonite etc. 15%, "micro-nedules" 20%, gypsum 5%, Fines: 15% quartz, 10" "micro-nedules", 5% limonite etc., 70% martite.		
90*	100*	Fines 90-95% of cuttings on sieve. Quartz 30%. "micro- modules" 30%. martite 30%. limonite etc. 10%. Fines: 15% quartz. 15% "micro-modules". 5% limonite. 65% martite.		
100*	101*	Percussion open tube sample Yellow-brown faintly mottled decomposed quartz (5%) - felspar (20%) - mica (75%) metasediment. Rock contains about 5% scattered 1/20" "micro-nedules". Grain size about 1/100". No visible structure.		
100*	110*	Fines 90% of cuttings on sieve. Quartz 40%, "micro-nodules" 30%, 20% martite, 10% limenite, minor gypeum etc. Fines: 25% "micro-nodules", 30% quartz. 10% limenite etc., 35% martite.		
110*	120*	Fines 80% of cuttings on sieve. "Micro-nadules" 20%, quarts-martite-felspur composites 20%, limonite etc. 10%, martite 5%, quartz 40%. Fines: 30% martite, 10% limonite etc., 40% quartz, 10% "micro-nodules", 10% rock fragments (including some mice and epidote).		
120*	121*.	Percussion open tube sample. Off-white luminated decomposed quartz (50%) - martite (10-15t) - felsper (35-40%) metasediment. Grain size 1/100" - 1/200". Bedding fairly well defined, about 1/16" thick, 60° to core axis.		
120*	130*	Fines 90-95% of cuttings on sieve. Quarta 30% "micro- nodules" 30%, limonite and minor martite 20, rock fragments 20% (mainly quartz-martite). Fines: 20% martite (minor magnetite) 10% limonite etc., 10% "micro- nodules", 20% rock fragments, 40% quartz.		
130'	140*	Fines 90-95% of cuttings on sleve. Quartz 45%, limonite with miner martite 10%, 5% gypsum, 10% "micro-nodules", 30% rock fragments (3/4 as before, 1/4 martite-magnetite-epidote). Fines: 15% martite-magnetite, 5% "micro-nodules", 20% composites, 60% quartz.		
140*	141*	Percussion open tube sample Yellow-brown. off-white and black bedded decomposed quarts (45%) - felspar (20%) - mertite-magnetite (20%) - garnet (10%) - epidote (5%) metasediment. Grain size about 1/200". Bedding well defined, 1/16" - 1/4" thick, somewhat conterted sub-parallel to core axis.		
140*	150*	Fines 85-90% of cuttings on sieve. Quartz 50%, limenite and minor martite 10%, rock fragments (as 140°-141°) 20%, "micro-nodules" 20%. Fines: 15-20% martite-magnetite, 5% garnet. 1% limenite etc., 10% "micro-nodules", 55-60% quartz-felspar.		
150*	160*	Fines 95% of cuttings on sieve. Quartz 55%, limonite etc. 5; magnetite and lesser martite 15%, "micro-nodules" 25%, minor epidote and felspar. Fines: 30% "micro-nodules", 10% magnetite-martite, 15% rock fragments, 45% quartz. Minor epidote and garact.		

LOG OF ROTARY DRILL HOLE NO. NR 25 (Contd.) -4-

From	To	Description DETAILED LOG
160*	161,	Percussion open tube sample Decomposed magnetite-martite itabirite. Contains 25-30% magnetite-martite. 15% felspar, 55-60% quartz. Grain size 1/50" - 1/250". Bedding fairly well defined, about 1/2" - 2" thick, 400 to core axis.
160*	179*	Fines 70% of cuttings on sieve. Quartz 45%, limenite and minor mertite-magnetite 5%, quartz-epidote-garnet-magnetite fragments, 50%. Fines: 50% quartz, 30% rock fragments (as course fraction), 10% limenite etc., 10% "micro-modules".
174*	178*	Diamond Brill core. Recovery 2.5° (60%). Fairly severely granitised metasediment. Contains 20-25% magnetite-martite, 5% garmet, 5% blotite, 5% epidoto, 60-65% quartx-orthoclase (metasomatic?) with minor serpostime in joint planes. Grain size 1/250" (garmet and iron exides) to 1/10" (orthoclase). Dedding well defined and fairly regular (although distorted by lenses and blobs of quartz-orthoclase). Beds generally loss than 1/2" thick. Attitude about 65° to core axis.
170*	176•	Sludge. Fines 70% of cuttings on sieve. Rock fragments 95% (1/2 quarts and quarts-orthoclase, 1/2 motasediment as 174°-176°), limonite 5%. Fines: 20% quarts, 20% "micro-madules", 5% limonite, 5% rock fragments (as 174°-178°), 50% magnetite-martite.
178*	ı	END OF HOLE.

IRON EXPLORATION SECTION

LOG OF ROTARY DRILL HOLE NO. WR 26

Project: Wa	rranboo Aeromagnet	ic Anomely	D.H. 664/61
Sec. 25 Hd	. Marramboo	Co. Le Bunte	Bore Ser.No. DD 531/62
Collar Coord	57000N, 62000E	H.L. 489.7'	Grid Warranboo
<u>Vertical</u>		Bepth 100'	Plan Rof.
Date Bore Co	meaced 17.8.61	Completed 19.8.61	Driller T. Jarvis
Bore Logged	by G.R. Heath	On 18-19.8.61	Hirer D. of M.

COJECT: To test magnetic "peak" essociated with gravity "high".

RESULT: Metasediment containing 10-20% primary iron exides intersected from 50'-100'. Manganese exides are also present.

LOG Comprises Macro and Microscopic geological log.
Summary Log
Hagnetic Log.

From	To	Description SUMMARY LOG
9*	1.	Light yellow-brown sandy loam.
1*	30*	Pale yellow-brown and grey cherty somewhat mangamiferous sheet and moduler <u>kunkar</u> , in a matrix of calcareous clayey quarts sand.
30*	50*	No sample.
50*	60*	Decomposed limenite impregnated metasediment containing about 15-20% martite, and 10% manganiferous exides.
60*	100*	Quartz (40%) - felspar (25%) - magnetite, martite (10-20%) - garnet (10%) - biotite (10%) somewhat granitized metasediment. Grain size about 1/100". Beds well defined, about 1/6" - 1/4" thick. Attitude 25 -55° to core axis.

RAGRETIC LOG Deflection 90-0 to 900 from 96'-100'.

From	To	Description BETAILED LOG
		N.B. Cuttings caught on 12 mesh sieve.
G	10*	Fines 65-90% of cuttings on sieve. Augular quartz fragments 5%, residue from %E 25 (mainly quartz-magnetite) 5%, kunkar (very compact sheet material, contains 40-50% 1/200° rounded quartz. Colour grey and pale yellow-brown banded, giving a cherty appearance. Grey bands are acid insoluble, and appear to be manganiferous) 90%. Fines: 30% well rounded quartz, 10% kunkar, 60% residue from WE 25 (magnetite, garnet, biotite, angular felsics).
10*	20*	Fines 86% of cuttings on sieve. Angular quartz 5%, limonitic autorial 5%, <u>kunkar 90%</u> . Fines: 80% well rounded quartz, 5% kunkar, 5% limonite, 10% residue from we 25.
20*	21.	Fercussion open tube sample. Kunkar nedules and fragments in a matrix of well rounded 1/200° quarts sand containing 20% clay. Difficult to determine whether this core is representative, or a compressed mass of cuttings.
20*	30*	Fines 75% of cuttings on sieve. Quartz 5%, kunkar 65%, limenite (containing 10%, 1/200" rounded quartz and rare martite grains) 30%. Fines: 20% quartz (1/2 angular). 40% kunkar, 40% limenite, miner residual material from WR 25.
30*	50*	Ne samples. No sludge return, and too hard for percussion sample.
50*	60*	Fines more than 95% of cuttings on sieve. Iron stained angular <u>quartz 50%</u> , small modules of <u>manganiferous</u> looking material 20%, limonite and <u>limonite</u> impregnated decomposed metasediment. <u>30%</u> . Fines: 45% quartz, 20% decomposed felspar and quartz-felspar, 35% opaque oxides (about 2/3 mortite, 1/3 manganiferous).
60*	61*	Percussion open tube sample. Mainly yellow-brown decomposed quartz (40%) - felspar (25-30%) - martite (10-15%) - biotite (15%) - garnet (5%) metasediment. Grain size about 1/100". Bedding fairly well defined, up to 1/4" thick, about 25° to core axis. Some limonite imprognation.
60*	70*	Fines 95% of cuttings on sieve. Quartz with minor felspar and mics 55%, kankar 5%, manganiferous exides 15%, limenite etc. 25%. Fines: 20-25% magnetite-mertite. 5% manganiferous exides. 70-75% quartz-felspar with minor mics and garact.
70°	80*	Fines 90-95% of cuttings on sieve. Quartz-felspar and minor biotite 80%, manganese exides 5%, limenite etc. 15%. Fines: 30%.martite-magnetite, 5% garnet, 5% limenite, 60% quartx-felspar with minor biotite.

From	To	Description DETAILED LOG
60*	61.	Percussion open tube sample. Limonite stained decomposed metasediment similar to 60'-61'. but centaining 10% martite (and minor magnetite) and 5-10% epidote as well. Attitude 25'? to core sxis.
80*	90*	Fines 99% of cuttings on sieve. Martite-magnetite 5%, limenite 20%, quartz (80%) - martite (20%) fragments 10%, quartz-felspar-mica fragments 10%, kunkar 5%, quartz 50%. Fines: 20% magnetite-martite, 10% quartz-5% biotite, 10% rock fragments (1/200" quartz-biotite-magnetite-martite-garnet), 55% quartz.
90*	96*	Fines 85% of cuttings on sieve. Rock fragments (as 96'-100') 40%, magnetite-martite 10%, limonite 10%, quarts 40%. Fines: 25% magnetite-martite, 10% garnet. 5% biotite. 60% quartzfelspar.
96*	100*	Diamond drill core. Recovery 2.8° (70%). Semowhat granitised quartz (40%) - felspar (1/2 pink, 1/2 white. 20%) - gernet (10%) magnetite (10-30%, usually 20%) - bietite (10%) matasediment. Grain size 1/200" (garnet, magnetite) to 1/10" (felspar). Bedding well defined, usually about 55° to core axis, but shows drag felding (west limb anticline) near the centre of the sample. Beds 1/16" - 1/2" thick, due to mineral segregation.
100	,•	end of hole.

IRON EXPLORATION SECTION

LOG OF BOTARY DRILL HOLE NO. NR 27

Project: Warramboo Aeromagnetic Amomaly D.N. 664/61 Sec. Adj. 7 Hd. Marramboe Co. Le liunte Hore Ser.No. DD 534/62 Collar Coords 65800N. 37000E E.L. 454.4° Grid Warrambos Vertical Depth 66° Plan Ref. Date Bore Commenced 21.8.61 Completed 22.8.61 Driller H. Mischlewitz Bere Legged by G.R. Heath On 22.8.61 D. of M. Hirer

OBJECT: To test megnetic "peak" associated with gravity "high".

RESULT: .Quartz and quartz-felsper-bietite metasediment intersected from 30° - 66°. Hele possibly tee shallow to reach anomalous material.

LOG Comprises Macro and microscopic geological log

From	Te	Description SUBMARY LOG
0	2•	Light brown sandy clay lenn.
31	5*	Pele yellow-brown modular rather dispersed kunkar. in a sandy matrix.
5*	20*	Light yellow-brown sand. Consists of virtually pure, well rounded 1/100" - 1/200" quarts sand. but some limmaite and silica imprognation has occurred near the surface.
20*	30*	No sample.
30*	66*	Quartz-felsper-biotite <u>metasediment</u> interbedded with resistant metaquartzite. <u>Iron Oxides absent or rare accessories</u> . Grain size about 1/100". Bedding (where distinguishable) 1/8" - 1/10" thick. Attitude 10° - 35° to core axis.

66 t

END OF HOLE.

From	То	Description DETAILED LOG
		N.B. Cuttings caught on 12 mesh sieve.
0	10°	Fines 70% of cuttings on sieve. Limonite and limonitic quartz sandstone (grain size 1/100" - 1/260") 80%; siliceous quartz sandstone (rounded 1/100" - 1/200") 20%, rare kunkar. Fines: 20% rounded quartz, 10% siliceous sandstone, 5-10% kunkar, 60-65% limonite etc.
10°	20'	Fines 95% of cuttings on sieve. Kunkar 5%, siliceous quartz sandstone 50%, quartz 5%, limonite etc. 40%. Fines: 5% kunkar, 25% quartz, 25% limonite etc., 45% siliceous quartz sandstone.
20*	21*	Percussion open tube sample Light yellow-brown well rounded 1/150" pure guartz sand, with very rare martite grains.
20*	30*	No mud return.
30*	46*	Fines 95% of cuttings on sieve. Angular quartz 30%, white somewhat decomposed felspar 25%, quartz-martite fragments (1/250" grain size) 5%, pyrite 5%, limonite 15%, siliceous sandstone 20%. Fines similar to coarse fraction.
401	41*	Percussion open tube sample Light grey pyritic clay containing 5% pyrite, 30% 1/50" - 1/100" angular quartz, with decomposed felspar and mica 70%. No visible structure. Limonite and siliceous nodules fairly common.
40*	50*	Fines 99% of cuttings on sieve. Quartz 50%, felspar 20%, siliceous fragments 20%, limonite 10%, minor martite and pyrite. Fines: 75% quartz, 10% felspar, 10% siliceous fragments, limonite, pyrite, martite all less than 5%.
50 *	60*	Fines more than 95% of cuttings on sieve. Quartz 25%, felspar 25%, siliceous fragments 25%, limonite 25%, Fines: 80% quartz, 10% felspar, 5% pyrite, 5% siliceous fragments etc.
61*	66*	Diamend drill core Recovery 3.9° (78%). Light grey slightly weathered metaquartzite grading down (boundary about 62°) into quartz-felspar-bietite metasediment. Upper material consists of over 99%, 1/150° quartz, with rare bietite, martite and felspar. Lower rock type contains 30% bietite, 20% felspar, 50% quartz with accessory martite. Grain size about 1/100°. Bedding 1/8° - 1/16° thick, somewhat contorted, 10°-35° to core axis.

IRON EXPLORATION SECTION

LOG OF ROTARY DRILL HOLE NO. MR 28

Project: Warramboo Aeromag	netic Anomaly	D.N. 664/61
Sec. 12 fid. Warramboo	Co. Le Hunte	Boro Ser.No. 535/62
Collar Coords 56000M. 450	000 Bal. 588.9*	Grid Warrenhoe
<u>Vertical</u>	<u>Berth</u> 76.4°	Plan Ref.
Date Bore Commenced 23.8.	61 Completed 24.0.61	Driller H. Mischlewitz
Bore Louged by G.R. Heath	<u>0a</u> 23-24.8.61	Hirer D. of M.

OBJECT: To test gravity "high" associated with magnetic "law".

RESULT: Partially and totally granitised metasediment (no iron oxides) intersected from 12° - 76.4°.

Goarse grained - Hele possibly too shallow to intersect anomalous material.

LOG Comprises

Detailed Macro and microscopic geological log

From To		Description Summary Log	
0*	2•	Pale yellow-brown sondy loom.	
2*	12*	Pale yellow-brown nodular and rather friable kunker. somewhat limonitic near the base.	
12*	76.4*	Quartz-folspar-biotite "granite" (grain size about 1/4"). containing a few areas of less altered metasediment (quartz-folspar-biotite-garnet). Bedding still present is strongly contorted.	

From	To	Description DETAILED LOG
à		N.B. Cuttings caught on 12 mesh sieve.
•	10*	Fines 80% of cuttings on sieve. Pale yellow-brown <u>kunkar</u> containing 20%. 1/200" rounded quarts, and one or two limmate grains. Fines: 60% well rounded quarts. 35% kunkar, 5% limenite.
10*	20*	Fines 70% of cuttings on sieve. Lightly stained decomposed <u>quartz-hiotite-felspar</u> fragments 1/50" - 1/100" grain size. red-brown 40%, yellow-brown 50%, kunkar 10%, Fines similar to coarse fraction, but 1 or 2% martite, and 10% well rounded quartz.
	20*	Too hard for percussion tube sample.
20*	30*	Fines 70% of cuttings on sieve. "Granite" fragments, as 10°-20°. 75%, yellow-brown and dark grey kunkar 20%, limonite 5%. Fines: 90% "granite", 10% kunkar.
30*	40*	Fines 70% of cuttings on sieve. Fine and course fractions 99% "granite" (cs 10°-26°, but fresher mica and ware accessory martite). Rare kunker.
40*	41.	Fercusion open tube tample. Decomposed apparently structureless "granite", containing 30% quartz, 15% shiotite, 55% felspar. Grain size about 1/15".
40°	50*	Negligible cuttings retained on sieve. Fines: 50% quarts, 30% felspar, 20% biotite.
50*	60*	Negligible cuttings retained on sieve. Fines: 40% quarts, 30% composites (quartz-felsper-biotite), 20% felsper. 10% biotite.
60*	70*	Fines 75% of cuttings on sieve. Angular quartz 30%. biotite flakes 5%. " <u>Granite</u> " 65%. Fines: 10-15% biotite. 40% quartz. 45-50% "granite" fragments.
75*	76.4*	Biamond drill core. Recovery 1.35° (95%). Very coorse grained "granite" (1/20" - 1%" averaging 1/4" - 1/2" crystals) containing a small area of partially made over metasediment. "Granite" consists of 20% quarts. 5-10% biotite, 65-70% coarsely perthitic felspar, with a few 1/10" garnet crystals. Less altered metasediment (grain about 1/20") consists of 5% garnet. 15-20% biotite. 66% rather opalescent quarts and 15-20% greywhite felspar. Remaining bedding about %" thick, strongly contorted.

76.4° END OF HOLE

Department of Bines. South Australia IKON EXPLORATION SECTION

LOG OF ROTARY DRILLHOLE NO. WE 29

Project:	Warrandos Aeromaçaet	ic Anomaly	D.S. 664/61		
50Ga 12	Ud. Warramboo	Bore Ser. No. 530/62			
Collar Coo	rda: 57000N 45000E	R.L. 577.1°	Grid Warramboo		
<u>Vertical</u>		<u>Depth</u> 196*	Plan Ref.		
Date Bore	commenced 24/8/61	<u>Completed</u> 29/8/61	Priller T. Jarvis		
Bere Legge	d by G. R. Heath	On 25-29/8/61	Hirer D. of M.		

COLECT: To test "peaks" in gravity and magnetic anomalies.

RESULT: Metasediment containing about 10% martite - magnetite intersected from 25°-196°.

LOG Comprises: Mecro and microscopic geological logs.

From	То	Description SUMMARY LOG	
0.	25*	Light yellow-brown well rounded 1/150" quartz sand containing nodular kunkar near the surface and up to 16% limenite - martite grains throughout.	
25'	160*	Decomposed quartz - felspar - mica metasediment containing about 10% martite. Grain size about 1/100".	
160*	196*	Granitised quartx - orthoclase - epidete - garnet magnetite, martite (5-10%) metasediment. Grain size 1/250" - %".	
		Bedding obscure or contorted in all semples taken.	

From	To	Description DETAILED LOG	
		N.B. Cuttings caught on 12 mesh sieve.	
0	10.	Fines 90% of cuttings on sieve. Pele yellow-brown <u>kunkar</u> 90%, a few grains of quarts and limonite. Fines: 45% well rounded quarts, 45% kunkar, 10% limonite modules.	
10*	20*	Fines 99% of cuttings on sieve. <u>Kunker 50%</u> , clusters of 1/200" well rounded <u>quarts grains</u> lightly cemented with <u>clay</u> 50%. Fines: 10% kunker, 5-10% limonite - martite (1/2 of each), 86-85% well rounded quarts.	
20*	21*	Percussion open tube sample. Red-brown to yellow-brown mattled and irregularly banded well rounded 1/150" quartz sand containing 5% martite and 10-15% clay. Banding mainly sub-borizontal.	
20'	30*	Fines 95% of cuttings on sieve. Augular quartz 20%, limonite nodules 5%, kunkar 50%, limonitic rock fragments 25%. Fines: 20% quarts (1/2 rounded), 10% kunkar, 10% martite, 60% limonitic fragments.	
30*	40*	Fines 80% of cuttings on sieve. Hock fragments (as 40° - 50°), limouitic 75%, off-white 25%. Fines: 5-10%/martite, 25% angular quarta, 20% off-white fragments, 45-50% limouitic fragments.	
40*	41*	Percussion open tube sample. Red-brown with lesser off- white and yellow-brown mottled and irregularly laminated decomposed quarts (35%) - martite (10%) - clay (decomposed felsoar and mica. 55%) metasediment. Grein size about 1/200°. Bedding indistinct. about 65° to core axis.	
40*	50*	Fines 50% of cuttings on sleve. <u>Limonite</u> , and limonite stained and <u>impregnated decomposed metasediment</u> (clay + 30% angular quartz + 5% martite) 65%, off-white decomposed metasediment (quartz and flaky clay) 35%. Fines: 15% off-white fragments, 5-10% martite, 10% quartz, 65-70% limonite etc.	
50*	60*	Fines 85-90% of cuttings on slove. Off-white to pale yellow-brown fragments 55%, limonitic fragments 45%. Fines: 2% mortite, 5-10% quarta, 56% limonitic fragments, 40% off-white to yellow-brown fragments.	
At	60*	Too hard for percussion tube sample.	
60*	70*	No water return,	
70*	60*	Negligible cuttings retained on sieve. Fines: 5% martite, 40% quarts, 20% limenitic metasediment, 35% off-white and yellow-bree a decomposed metasediment.	
89*	90*	Negligible cuttings retained on sieve. Fines 85% well rounded lightly stained quartz sand, 5-10% martite. 5-10% rock fragments as above.	
90*	100*	Negligible cuttings retained on sieve. Fines: 95% well rounded quarts. 5% martite. minor decomposed metasediment.	
100*	110*	Negligible cuttings retained on sieve. Fines as 90'-100'.	
110*	120*	Fines 99% of cuttings on sieve. Kunkar 20%, limenite etc. 10%, quartz - martite (as 90° - 100°) lightly cemented with clay. 70%, Fines as 90°-100°.	

From	To	Description DETAILED LOS	
120'	130*	Negligible cuttings retained on sieve. Fines as 90°-100°.	
		N.B. Severe slumping from the 25° level occurred when the drill had reached 85°. The inflowing sand held down subsequent cuttings.	
120*	130*	Sample collected during flushing of the hole with thick mad. Fines 85% of cuttings on sieve. Quartz 20%, limenite etc. 20%, somewhat weathered quartz (35%) - martite (15-20%) felspar - mica metasediment (grain size 1/200") 60%. Fines similar to coarse fraction.	
130*	135*	Diamond drill core. Recovery 2' (40%). Light yellow-brown homogeneous looking decomposed <u>quartz-felspar-mics</u> metasediment containing <u>5% martile</u> . Grain size 1/200" - 1/400". No visible structure.	
130*	140*	Fines 95% of cuttings on sieve. Kunkar 5%, limenite 30%, quarts 15%, rock fragments (as 130° - 135° and 120° - 130°) 50%. Fines: 50% quartz, 20% limenite (1/10 magnetic), 20% rock fragments, 10% martite.	
140	150*	Fines 95% of enttings on sieve. Course fraction as 130°-140°. Fines: 15% martite. 10% limonite, 30% quartz. 45% rock fragments as 130°-140°.	
150*	160*	Fines 90-95% of cuttings on sieve. Quartz (containing up to 5% martite) 90%, kunkar 5%. limonite 5%. Fines: 10% martite, 5% limonite, 85% quartz - martite (as coarse fraction).	
160'	170*	Fines 90-95% of cuttings on sieve. Limonite 5%, quartz - decomposed orthoclase 25%, quartz-martite (as 150°-160°) 70%. Fines: 10% martite, 30% quartz - orthoclase, 60% quartx - martite.	
170*	169*	Fines 95% of cuttings on sieve. Coarse fraction as 160° - 170°. Fines: 20% martite, 30% quartz, 50% composites as 160° - 170°.	
180*	190*	Fines more than 95% of cuttings on sieve. Decomposed rock fragments (as 160° - 170°) 40%. Epidote and quarta - epidote fragments (some manganiferous locking) 60%. Fines: 40% quarta - epidote, 60% quarta - martite - felspar.	
194*	196*	biamond drill care. Recovery 1.8* (90%). Rederately to severely discordantly and concordantly granitised quartz (25-30%) - erthoclase (35%) - megnetite mertite (5-10%) - epidote (25-30%) - garnet (5%) metasediment. Grain size 1/250" (garnet and magnetite) to 1/4" (erthoclase). Bedding indistinct and strongly conterted.	
19	6*	end of hole.	

IRON EXPLORATION SECTION

LOG OF ROTARY DELLL HOLE NO. WE 30

Project: Werramboo Aeromagn	D.M. 664/61	
Sec. 14 Hd. Warrenboo	Co. Le Hunto	Bore Ser. No. DO 544/62
Collar Coords 54200M, 4900	E B.L. 610.2°	Grid Warramboo
<u>Yertical</u>	Depth 69°	Plan Ref.
Date Bore Commenced 29.8.6	Completed 31.8.61	Briller T. Jarvis
Bore Loqued by 6. R. Heath	On 30-31.8.61	Hirer D. of M.
OBJECT: To test gravity &	ad magnetic "peaks".	
RESULT: Retesediment cont 15° - 25°; unde	aining up to 10% martit	e intersected from y "granite".

106 Comprises Macro and microscopic geological log

From	Te	Description SUMMARY LOG
0	3'	Pale yellow-brown quartz sand.
3*	15*	Pale yellow-brown kunker modules in a matrix of somewhat limey and clayey quartz sand.
15°	25*	Decomposed quartz - felspar- mica metasediment containing 5-10% martite. Grain size 1/100".
25*	69*	Quarts - felspar (plagiociase and orthoclase) - biotite "gramediorite" or "granite", with up to 5% leached garnet porphyroblasts and accessory martite. Grain size usually about 1/8". No visible structure.

From	Te	Description DETAILED LOG
0	10*	N.B. Cuttings caught on 12 mesh sieve. Fines 85% of cuttings on sieve. Pale yellow-brown kunkar containing 40%. 1/150" - 1/200" rounded quarts 95%. remanie from WE 29. 5%. Fines: 30% rounded quarts. 15% remanie from WE 29, 55% kunkar.
10*	20*	Fines 85% of cuttings on sleve. <u>Kunker</u> 35%, red-brown and off-white limenite stained and impregnated decomposed <u>metasediment framents</u> 60%, quartx etc. 5%. Fines: 20% martite, 30% quartx, 15% limenitic metasediment, 35% kunker.
At	20*	Too hard for percussion tube sample.
20*	30*	Fines 35% of cuttings on sieve. Decemposed <u>quartz</u> — <u>felspar - mica</u> frequents (containing less than 5% martite) 90%, quartz 5%, kunkar 5%. Fines similar to coarse fraction, with a few martite grains.
30*	68*	No mid return.
40"	41.	Parcussion open tube sample. Decomposed "granite" consisting of 30% quarts, 20-25% histite. 45-50% felspar (orthocluse) with accessory martite. Grain size 1/100" - 1/6". No visible structure.
60*	61*	1-1/2" rock fragments picked up while attempting porcussion open tube sampling. Somewhat decomposed and stained "granite" consisting of 5% biotite, 35% quartz and 60% orthoclase. Grain size about 1/20". No visible structure.
68°	69°	Diamond drill core. Recovery 0.5° (50%). Very slightly decomposed "granite" or "granodicrite". Consists of quarts (30%), garnet (1/8" - 1/4" porphyroblasts, somewhat leached looking, reddish-brown, 5%), pink orthoclase (30%), yellowish-brown plagicaluse (multiple twianed, 35%). Grain size 1/10" - 1/5" no visible structure.
69	•	end of hole.

IRON EXPLORATION SECTION

LOG OF ROTARY DRILL HOLE NO. NR 31

Project:	Warremboo Aeromagneti	ic Anomaly	Dan. 664/61
Sec. 25	Hd. Warramboo	Co. Le liunte	Bore Ser.No. 545/62
Collar Co	ords 58400N. 62000E	R.L. 480.7*	Grid Warramboo
<u>Yertical</u>		<u>Bepth</u> 117*	Plan Ref.
Date Bore	Commenced 1.9.61	Completed 4.9.61	Driller T. Jarvis
Bere Leuc	ed by G.R. Heath	Qn 2-5.9.61	Hirer D. of M.

CRIFCT: To test gravity "peak" associated with "low" in magnetic anomaly

RESULT: Metascdiment containing quartz, grey felspar, epidete and bietite with rare garnet and tourmaline intersected from 25° - 117°.

LOG Comprises Macro and microscopic geological log. Summary Log.

From	To.	Description SUMMARY LOG		
0	3°	Light yellow-brown quartz sand.		
3*	12*	Kainly nodular kunkar. associated with minor silicoous limonite near the base.		
12*	25*	Tellow-brows very sandy clay (contains 60-70% 1/150" - 1/200" rounded quartz sand).		
25*	92*	Decomposed metasediment (bedded quartz-clay rock). Some- what pyritic from 60°-90°. Contains minor very fine grained (1/500") martite.		
92*	117*	Slightly decomposed, grading to fresh quartz - felspar - biotite metasediment with variable epidote and minor tourmeline and garnet. Grain size 1/150" (garnet) to 1" (tourmaline). Granitisation slight to severe (increasing from top to base of sequence.)		
		Attitude $30^6 - 45^9$ to core exis.		

-		
From	To	Description DETAILED LOG
0"	10*	Fines 90% of cuttings on sieve. Pale yellow-brown kunkar 80%, subangular quartz 10%, remanie from MR 30, 10%. Fines: 40% kunkar, 10% remanie, 50% quartz (1/2 well rounded), minor limonite.
10*	20*	Fines 85% of cuttings on sieve. Kunkar 95%, quartz (rounded) 5%, one or two limenite fragments. Fines: 66% limenite, 40% quartz (3/4 angular).
20*	21*	Percussion open tube sample. Yellow-brewn, faintly mettled clay, containing 60-70% well ranaded 1/150" - 1/200" quartz sand.
20°	30*	Fines 90-95% of cuttings on sieve. Angular quartz 25%, off-white clay containing 5% angular quartz (decomposed metasediment?) 25%, limonite, and limonite impregnated clay (as above) 50%. Fines: 50% angular quartz, 30% white clay, 20% limonitic clay.
36*	40*	Fines more than 95% of cuttings on sieve. Kunkar 5%. limonitic clay 25%, white clay 30%, quartz 40%. Fines: 80% angular quarts, 20% white clay. 20% limonitic clay.
40*	41*	Percussion open tube sample. Pale purple, yellow-brown and off-white mettled and irregularly banded clay containing 25% angular 1/50" quartz. Probably decomposed metasediment. One banding trend (bedding ?), 30° to core axis at 40.5°.
40'	50*	Fines 90-95% of cuttings on sieve. Angular quartz 80%. limonitic clay 15%, white clay 5%. Fines: 90% angular quartz. 5-10% limonitic clay. 1 or 2% white clay.
50*	60*	Fines 80% of cuttings on sieve. Angular quartz 99%, minor limonitic and white clay, and kunkar. Fines: similar to coarse fraction.
60*	61*	Percussion open tube sample. Light grey very faintly mettled clay centeining 30% angular 1/50" - 1/100" quarts. and 5%. 1/250" - 1/500" dispersed mertite (and possibly pyrite).
60°	70*	Fines 85% of cuttings on sieve. Angular quartz (up to 1/4" diameter) 99%, a few grains of pyrite, kunkar and limenitic and white clay. Fines similar to coarse fraction.
70*	80*	Fines 45% of cuttings on sieve. Angular quartz 95%, very finely crystalline pyrite (1/1000") 5%, minor clay etc. Fines similar to coarse fraction, and including a few garnet and felspar fragments.
80°	81*	Percussion open tube sample. Decomposed, heavily pyrite impregnated metasediment. Contains 20% biotite, 5% garnet. 30% pyrite and 45% quartz - felspar. Grain size about 1/100". Bedding fairly well defined, less than 1/8" thick, about 45° to core axis.

From	n To Description DETAILED LOG				
80.	90°	Fines 95% of cuttings on sieve. Quartz 70%, grey felspar 25%, pyrite 5%, a few garmet fragments. Fines: 10-15% felspar, 5-10% pink garmet, 5% pyrite, 75% quartz.			
90*	100*	Fines 80% of cuttings on sieve. Felsper and quarts - felsper - biotite composites 50%, quarts 25%, limenite 5%, a few grains of pyrite and garnet, and one or two epidete fragments. Fines: 5% garnet, 40% felsper, 55% quarts, minor pyrite, biotite, limenite.			
92*	97 °	Diamond drill core. Recevery 1.1° (20%). Grey semewhat decomposed quartz (35%) - grey felsper (60%) - hietite (5%) metasediment, with accessory garnet. Grain size 1/150" (garnet) to 3/8" (felspar). Bedding rather indistinct, somewhat contexted, 40° to core axis.			
100*	110*	Fines 90-95% of cuttings on 12 mesh sieve. Quarts 69%, bietite 5%, limonite 5%, epidote 10% (contains some biotite), grey felspar 20%, minor garnet. Fines: 65% quarts, 10% epidote, 5% biotite, 5% garnet, 5% pyrite, 10% grey felspar.			
110*	112*	Fines 75% of cuttings on 12 mesh sieve. Quartz 65%, fresh looking quertz - felsper - epidete - biotite 30%, garnet (5%) with miner limenite and pyrite. Fines (110°-117°): similar to coarse fraction, but containing rare tourmaline fragments.			
112°	117*	Diamond drill core. Recovery 4.4° (90%). Light grey to grey-green moderately severely concordantly and discordantly granitised quarts - grey white felsper (70%) - epidete (20%) - biotite (10%) metasediment, containing tourneline crystels up to 3/4" diameter in the most dislocated portions. Grain size 1/50" (least altered) to 1/4" (granitised areas). Bedding fairly well defined over most of the core, about 35° to core axis.			

117* END OF HOLE.

APPENDIX C
AUSTRALIAN MINERAL DEVELOPMENT LABORATORY
ASSAY RESULTS

Locality: Md. Warramboo. Secs. 10, 12, 24, 25.

from	To	Sample No.	Acid sol. Fe	Ma	Insoluble Matter
MI					
21.	22.	A2755/61	29.7%	0.125%	49.1%
44*	45.5°	A2756/61	21.8	0.13	55.3
60'	61.	A2757/61	22.6	0.12	54.1
80"	80.8*	A2758/61	13.9	0.175	68.5
80.8	81.5*	A2759/61	17.9	1.13	60.5
101*	102*	A2760/61	23.0	1.58	53.7
128*	133.2*	A2761/61	8.85	3.12	59.1
144.31	149*	A2762/61	8.45	1.90	82.9
MB2					
7.	11.	A2763/61	47.3	0.06	20.8
20*	22*	A2764/61	21.7	0.05	60.1
40*	41.5°	A2765/61	36.8	0.115	38.1
54*	58*	A2766/61	21.6	0.30	61.5
58*	61 •	A2767/61	26.2	0.15	57.7
61.	66*	A2768/61	21.0	0.60	61.1
ME3					•
60*	62*	A2769/61	15.5	0.10	65.4
80*	82*	A2770/61	10.8	1.03	68.8
100'	101.5*	A2771/61	16.2	3.25	51.5
120*	122	A2772/61	20.2	1.80	54.6
140*	142*	A2773/61	12.7	5.50	53.0
162*	164*	A2T74/61	20.8	4.90	46.9
180*	185.	A2775/61	7.0	1.25	62.9
200*	201.8*	A2776/61	6.1	0.75	82.3
M4					
60*	62*	A2777/61	1.15	0.015	70.0
109.8	114*	A2778/61	3.2	0.055	83.3

APPENDIX G (Contd.)

ASSAY RESULTS

From	To	Sample No.	Acid sol. Fe	Ma	Insoluble Matter
Me					
20*	22*	A2779/61	22.6	0.07	54.9
40"	42"	A2780/61	19.4	0.13	60.9
60*	62*	A2781/61	5.75	9.06	77.5
80*	62*	A2782/61	18.7	1.51	57.9
100*	102*	A2783/61	17.8	1.21	60.1
120.	121.	A2784/61	27.8	0.66	46.6
135°	136.5	A2785/61	12.0	1.25	77.3
138.5*	141.5*	A2786/61	7.25	0.19	61.3
MAZ					
80*	82*	A2767/61	7.55	0.12	67.2
100*	102*	A2788/61	2.85	0.03	77.8
140	142*	A2789/61	5.30	0.03	74.6
160*	162'	A2790/61	2.35	1.33	79.6
161.	186,	A2791/61	9.60	0.04	79.0
WRG.					
20*	22*	A2792/61	15.8	0.075	63.6
40*	42*	A2793/61	6.45	0.65	78.3
60*	62.	A2794/61	4.55	1.75	79.6
80*	82.	A2795/61	7.15	1.94	73.2
160*	102*	A2796/61	6.25	0,615	74.0
120*	122*	A2797/61	4.90	1.12	82.0
126*	128.3*	A2798/61	13.9	1.10	71.5
HE9					
20.	22*	A2799/61	11.0	0.069	68.2
40	42*	A2800/61	22.6	0.175	54.1
60'	62*	A2801/61	20.3	0,175	55.6
60*	82*	A2802/61	32.4	0.545	41.4
100'	102*	A2803/61	16.6	0.41	58.6
120*	125*	A2804/61	4.4	0.17	84.4
153*	157*	A2805/61	7.5	1.48	79.5
157	159*	A2806/61	4.0	0.245	85.5

APPENDIX C (Coatd.)

ASSAY RESULTS

		Comple No.	Acid sol. Fe		Insoluble Matter
from	To	Sample No.	werd shi' to	<i>7</i> ×31	Intelliging Marries
WALL.					
120*	122*	A2807/61	1.35	0.01	83.3
M815					
35*	40*	A2808/61	13.9	0.06	69.1
60*	65°	A2809/61	25.0	0.13	52.3
143*	146.7*	A2810/61	11.8	1.06	75.8
MI13					
60*	62*	A2811/61	21.8	0.04	52.1
80*	81*	A2812/61	23.4	0.09	53.0
100*	101*	A2813/61	15.9	0.095	66.5
120*	121*	A2814/61	15.6	0.13	66.4
140*	141*	A2815/61	19.0	0.075	61.4
169*	162*	A2016/61	27.0	0.218	54.3
180*	181.	A2817/61	5.45	0.081	70.2
193*	197 °	A2818/61	1.15	0.094	93.2
FR14	.		•		
20*	21.	A2819/61	26. 2	0.14	49.0
80°		A2820/61	13.2	0.075	69.2
100*	101*	A2821/61	17.5	0.10	60.5
120	121	A2822/61	18.8	0.175	59.3
140*	141*	A2023/61	15.3	1.15	67.5
160°	165*	A2824/61	5.8	1.24	82.0
170*	171*	A2825/61	14.2	1.49	70.6
WRIE	-				
29,	21.	A2826/61	2.75	0.015	74.0
80*	81*	A2827/61	8.90	0.61	71.3
\$12°	117*	A2828/61	1.15	0.01	95.9
¥R16	i.				•
20*	21*	A2829/61	15.0	0.115	67.4
40*	41'	A2830/61	11.5	3.52	62.7
60*	61*	A2831/61	11.2	1.12	71.8
80*	81*	A2832/61	8,65	1.67	73.9
140'	144*	A2833/61	0.35	0.86	80.5
154*	158*	A2834/61	11.2	1.02	74.4

APPENDIX C (Contd.)

ASSAY RESULTS

From	To	Sample No.	Acid sol. Fe	Na	Insoluble Matter
MI7	gengene genetry og profesionelle florite en med			-	
60*	61*	A2835/61	10.3	0.035	70.3
80*	81*	A2836/61	18.4	0.175	57.1
100*	101'	A2887/61	17.6	0.22	58.3
120*	121*	A2838/61	24.5	0.34	45.9
140	141'	A2839/61	15.9	0.185	64.7
160°	161*	A2346/61	14.8	0.155	60.8
184*	167*	A2841/61	13.1	0.155	72.0
WR18					
20°	21 °	A2642/61	4.1	0.01	63,2
10"	41*	A2843/61	34.1	0.105	42.6
80"	91.	A2845/61	28.2	0.125	51.7
100*	101.	A2846/61	22.0	0.075	57.2
119*	120*	A2847/61	24.8	0.125	56.7
130*	133*	A2848/61	22.1	0.135	60.2
140'	141'	A2849/61	13.3	0.055	72.3
147 *	148*	A2850/61	9.5	0.53	76.7
160*	161*	A2851/61	18.1	0.405	65.4
169'	170'	A2852/61	21.7	0.93	60.1
184*	185*	A2853/61	20.3	0.11	58,2
200	201*	A2854/61	17.7	0.06	60.2
214*	215*	A2855/61	26 . G	0.315	52.2
226*	227	A2656/61	20.5	0.165	58.5
237	238*	A2857/61	5.65	6.04	70.6
258*	260.5*	A2059/61	7.5	1.43	66,0
MB 19	•				
80*	81.	A2859/61	1.5	0.03	79.2
120	121.	A2860/61	1.5	1.00	81.5
140*	141*	A2861/61	1.5	1.66	82.2
240*	245*	A2862/61	15.2	0.69	64.0
P820) ,				
40*	41*	A2863/61	18.1	0.02	56.1
60*	61*	A2664/61	30.4	0.06	43.0
100*	101.	A2865/61	13.4	0.435	61.8
120	121'	A2866/61	11.1	0.10	70.8 56.7
140*	141*	A2867/61	25.0 % 5	0.20 0.20	52.0
160*	161*	A2868/61 A2869/61	25.5 4.6	0.20	77.1
180'	181*	-		0.000	77.8
193.	196•	A2870/61	4.7	A.Al	31.44

ASSAY RESULTS

From	To	Sample No.	Acid sol. Fe	Ma	Insoluble Matter
11121					
60*	61.	A2871/61	5.8	0.02	70.6
80*	81.	A2872/61	11.0	0.06	66.9
100*	101*	A2879/61	20.1	0.38	46.9
120*	121.	A2874/61	21.2	0.18	48.4
140*	141*	A2075/61	20.6	0.82	50.7
204*	208*	A2876/61	6,9	1.05	80.9
WR22		e e			
20*	21*	A2877/61	17.5	0.025	59.1
40*	41*	A2878/61	13.1	0.015	69.5
80*	61*	A2879/61	16.3	0.16	56.4
100*	101*	A2880/61	21.6	0.05	55.9
120'	121.	A2881/61	17.7	0.055	48.4
160*	162*	A2882/61	5.9	0.255	82.8
5B23		•			
120*	121 *	A2883/61	7.1	0.105	50.6
138*	139*	A2884/61	4.6	0.015	77.5
142*	147	A2685/61	1.3	0.02	94.0
WR24					*.
40*	41'	A2886/61	25.3	0.16	51.0
60*	61.	A2887/61	16.1	0.065	60.4
80*	81*	A2888/61	16.7	0.05	61.8
100*	101*	A28 89 /61	14.1	0.055	66.6
120	121*	A2890/61	14.8	0.105	61.6
140*	141*	A2891/61	33.7	0.19	34.7
174°	179*	A2892/61	18.6	0.185	62.1
WR25					
60.	61*	A2893/61	23.6	0.135	46.9
60*	81.	A2894/61	15.1	0.055	64.6
100°	101*	A2895/61	12.0	0.04	59.6
120*	121	A2896/61	7.9	0.065	73.6
140	141*	A2097/61	16.5	0.635	64.3
160*	161*	A2698/61	20.0	0.675	58.0
174*	178*	A2899/61	10.2	1.91	66.7

ASSAY RESULTS

From	To	Sample Mo.	Acid sol. Fe	Ma	Insoluble Matter
WR26					
60*	61.	A2900/61	16.3	0.89	62.2
80*	81.	A2901/61	12.9	0.50	68.0
96*	100*	A2902/61	14.1	1.58	73.6
MEZI					:•
64*	66*	A2903/61	2.60	0.05	84.7
HR29					
40*	41*	A2904/61	21.2	0.08	55.9
130*	135*	A2905/61	7.65	9.075	73.6
194*	196*	A2906/61	13.1	1.20	70.9
¥830					
68*	69*	A2907/61	1.20	0.035	96.5
¥831	•				
60*	61.	A2908/61	0.82	0.005	67.1
112*	117*	A2909/61	3.90	0.075	81.1

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