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Report on Q24, 15

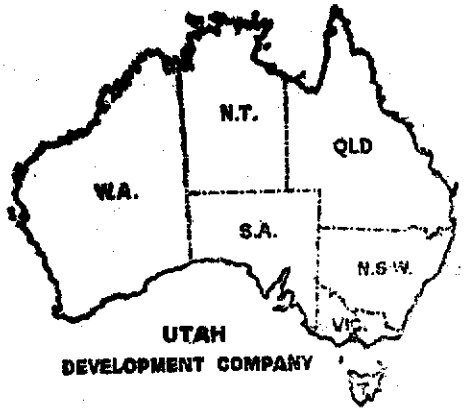
OFF-SHORE DRILLLING -TASMANIA

for

UDC - BHP

(3)

C. R. 583. May, 1968.



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AMG REFERENCE POINTS ADDED

Report No. CR. 583.

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INTRODUCTION

During the period February 27, 1968 - May 1, 1968, an off-shore drilling programme was carried out on behalf of UDC and BHP in their respective off-shore exploration licence areas in Deep Bay off Cape Barren Island and Ringarooma Bay, and Ansons Bay off N. E. Tasmania.

After investigations of various contractors, the drilling contract was awarded to Australian Dredging and General Works Pty. Ltd.

The vessel to carry the drilling rig was hired by the drilling contractor, from Gavin B. Youl, Symmons Plains, via Launceston.

A launch was hired to provide personnel transport and was used to mark out drill sites. The crew consisted of -

a) three men provided by the contractor,

b) field engineer and field assistant, sample washer for UDC-BHP.

The programme was largely carried out as planned, except at Ansons Bay, where the prevailing weather conditions prevented any of the planned holes being drilled.

RESULTS

From the point of tin values, the exercise was most disappointing. In none of the areas drilled were economic values encountered. From the drilling point of view, it has been proved that drilling on water using conventional equipment is possible and relatively economic.

COSTS

At this stage, not enough detailed information is to hand as to the total cost of the programme. However, it is anticipated that budget figures will not be exceeded apart from labour costs, which were calculated on a six day 60 hour week; in practice, seven days per week were worked and twelve hours per day, to take advantage of the suitable weather conditions.

CHRONOLOGICAL ORDER OF PROGRAMME

February 27, 1968 - May 1, 1968

Feb. 27 - March 1	Catamaran "Phoenix" fitted out	(4)
March 2 - March 5	Catamaran waited for suitable weather and arrived at anchorage off Cape Portland	(4)
March 6	Repairs to Catamaran	(1)
March 7 - March 27	Drilled 15 holes in Ringarooma Bay. During this period drilling took place on 13 days, 4 days were lost due to adverse weather, 4 days were lost due to crew leave(Plate 1).	(21)
March 28	Catamaran sailed to Flinders Island	(1)
March 29 - April 16	Drilled 20 holes in Deep Bay. During this period drilling took place on 14 days, 3 days were lost due to lack of casing and repairs to rig, 2 days were lost due to adverse weather (Plate 2).	(19)
April 17 - April 24	Prepared Catamaran to move across to Eddystone Point (1) Crew on leave (4) Unsuitable weather conditions (2) Sailed from Cape Barren to Eddystone Point (1)	(8)
April 25 - May 1	Off Ansons Bay, took Catamaran out to drilling site (3); on each occasion too rough to drill. Unsuitable weather (3)	(6)
		(64)

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SUMMARY:

Fitting out		4 days
Sailing Catamaran to drill areas, including delays		
Launceston - Cape Portland	4 days	
Cape Portland - Cape Barren Island	1 day	
Cape Barren Island - Eddystone Point	3 days	8 days
Leave crew (2x)		8 days
Drilling		
Ringarooma Bay	13 days	
Deep Bay	14 days	27 days
Delays due to unsuitable drilling conditions		
Ringarooma Bay	4 days	
Deep Bay	2 days	
Ansons Bay	6 days	12 days
Repairs to rig and lack of casing at Deep Bay		5 days
Total:		64 days

	Ringarooma Bay	Deep Bay	Ansons Bay	Total
Total number of days	17	19	6	42
Days drilled	13	14	-	27
Days delay	4	5	6	15
Number of holes drilled	15	20	-	35
Total footage drilled	421'	674'	5'	1,100'

REMARKS

Ringarooma Bay

From the commencement of actual drilling operations in this location until the completion of this stage, four days were lost due to unsuitable weather conditions. This resulted in a time efficiency of 76%.

Deep Bay

From the commencement of drilling until the completion, a time efficiency of 75% was attained.

Over the whole programme, 42% of time was spent drilling, 25.5% of time was lost due to unsuitable weather conditions. The remaining 32.5% of time was made up of fitting out, repairs, and the sailing of the rig to various areas.

PLANT

The plant used was a conventional percussion rig, a Goldfields G66, using 6" O.D. flush jointed casing.

The rig was mounted on the Catamaran "Phoenix", a twin hulled vessel. The dimensions of each hull are approximately 30' long x 7' wide at deck level x 4' 6" deep. The hulls are spaced 9' 6" apart. The whole gave an effective clear deck area of 27' long x 23' 6" wide. Average draught in loaded conditions was 3' 6". Propulsion is provided by two 60 H.P. Fordson Diesels, one mounted in each hull, each engine driving a propellor, mounted inside the space between the hulls.

A wheel house is situated aft of the deck area. The rudders are hydraulically controlled. The effectiveness of the rudders was greatly reduced because they were outside the wash of the propellors.

For mooring purposes, four hand-operated winches were welded on the deck, one in each corner, and swivelling fair leads welded on bow and stern of each pontoon. The anchors supplied weighed 5 cwt. each

and were connected to the winches through 400 ft. of $\frac{3}{4}$" dia. wire rope, and each anchor equipped with a buoy on a 40 ft. neuring. Due to the presence of an overhead gantry beam along the centre line of the deck, it was not possible to mount the rig along the centre line. The rig was placed slightly crosswise, so the mast could be raised alongside the gantry.

The rig, with the working end towards the bow, was placed on the deck in road condition and fastened to the deck by means of two pairs of cross chains and turn buckles welded to each axle and the deck. The mast was guyed to existing bollards. A hole was cut in the deck to allow drilling through the deck.

HOLE LOCATIONS

Hole locations were determined from the intersection of two shore based lines for each individual hole. Each line was marked by two beacons. Stations were established on shore and lines radiated from each station. The intersections of the appropriate radiating lines of two stations designated the hole location on the water surface. In practice, the beacons were placed on the appropriate lines and the launch travelled along one line until the other line was intersected and a buoy dropped. A tolerable accuracy of 100'-200' was achieved by this method.

The limitations of this method are light conditions and distance from the shore. It was found that accuracy diminished rapidly at distances offshore greater than one mile. This could be overcome by using illuminated beacons and placing the buoys at night.

MOORING PROCEDURE

In practice, three anchors were used, one stern anchor and two bow anchors. Location of the hole was denoted by a buoy, placed in position by launch. When steaming toward the site, the stern anchor was dropped first in such a position as to have the vessel lying with the stern towards the wind and sea and approximately 150 to 200 feet away from the hole. The vessel steamed passed the hole, with the stern line reeling off the winch.

The starboard bow or port bow anchor was dropped next, depending on current and wind conditions, by steaming approximately 100 to 150 feet past the hole to starboard or port as the case might be. The other bow anchor was then dropped by reversing the vessel back towards the stern

anchor, with the bow anchor rope reeling off. When enough slack was obtained this way, the vessel steamed forward to port or starboard, as the case might be, to 100 to 150 feet past the hole to drop the third anchor. Once the third anchor was in place, the vessel was winched over the hole by winding in the stern anchor line and the anchor line of the first bow anchor dropped. This procedure generally took about one half to one hour to complete, depending on conditions such as current, wind and depth of water. The same method was used to lift the anchors, two winches reeled off, while the wire of the third anchor was wound in, etc. Where possible, the engines assisted and the time occupied by this was roughly the same as when laying anchors. The whole operation would be less time consuming and more flexible if the winches had been mechanically operated.

DRILLING PROCEDURE

The drilling was carried out along the same lines as drilling on land of this type.

Casing was driven as far ahead as practicable and excavated by normal methods to within 6" to 12" of bottom of casing, to avoid contamination of sample. This only applied in the sand strata where run-ins could occur. In harder strata, it was necessary to dig in front of the casing to achieve progress. Some run-ins occurred especially in loose coarse sand, notwithstanding the fact that an attempt was made to keep casing full of water. On two occasions, difficulties were encountered in pulling casing. On the first hole when hammering the casing out, thread pulled out 13 feet below water and the remaining 62 feet was lost. On the second occasion, hammering the casing out produced no results after more than one hour, springing up of rough seas hampered this operation and finally vessel had to be slipped over casing; 65 feet was lost.

On another occasion, casing was bent due to peeuliar swell and current conditions.

EFFECTS OF SEA CONDITIONS ON DRILLING

It was found that the Catamaran was an extremely stable platform for its size and weight. Movement of the vessel along the casing during 10-15 knot winds, with wind wave conditions only, was very small, - 3" to 4" only. However, swell conditions, with moderate 2' to 3' swell, made vessel move along casing from 1' 6" to 2' and apart from the dangers of

entering the tools in the casing, cancelled out the spudding action. It also induced a horizontal movement in the vessel and made it surge against the casing; tightening up of the anchor ropes could not overcome this. This was more apparent where the water was deep - 30' - 50'.

From the experience gained in the three different locations, it can be stated that where swell conditions exist in water depths exceeding 10 feet, drilling with the above method is extremely difficult, if not impossible.

SUGGESTED IMPROVEMENTS TO PLANT AS USED

1. Drill rig placed so that vessel can be removed from casing if necessary and brought back to casing, thus not limiting the depth which can be drilled. This means -

   (a) casing situated in a slot in the deck instead of a hole. This aspect was considered before drilling commenced. However, it would have meant substantial alterations to the vessel and at the time this was not thought warranted.

   (b) mechanical winches and a tender capable of running out the anchors when vessel comes back to casing.

2. Drill rig which can rotate casing as well as hammer casing. This method would facilitate pulling of casing. The use of hydraulic jacks would be very limited due to the fact that the platform floats.

3. To combat moderate swell conditions, a vibratory-impact method and airlift excavation of casing would have to be employed as this rig is suspended and when in operation is virtually self-supporting.

SAMPLING

Samples were collected by emptying the pump directly into 12 gallon drums. Each 5' drive was collected separately. Contents of drum were measured and measurement recorded. Contents were reduced in volume by conventional panning methods, to volumes ranging from .5 lb to 1.5 lb in weight.

These samples were sent to the Mines Department Laboratories in Launceston for assay.

As a rule, no great variation existed between theoretical and actual volumes. In Deep Bay, however, most of the first 10 to 15 feet of sample was deficient, due to the extremely loose and soft nature of the ground in situ.

DRILLING RESULTS

Ringarooma Bay: Out of 15 holes, Nos. 1 and 5 were of nil depth into sea bottom, rock.

No. 7 - bottom was reached at 17' 9" below sea floor and in No. 9, bottom was reached at 27' 3" below sea floor.

None of the other holes were bottomed.

No tin values of any significance were encountered in any of the holes drilled.

Deep Bay: Out of 20 holes, 12 holes bottomed on rock; the remaining holes were not bottomed.

No tin values of any significance were encountered.

Drilling Results (Continued)

* HB = Hard Bottom
NB = Not Bottomed

Ringarooma Bay

No. of Hole	Water Depth	Depth Drilled	Bottom *	Value
1	37'	-	HB	Traces only, the highest value in any one section was in Hole 12b - 40'-45'; this section gave a value of .09 lb/ cu.yd.
2	38'	-	HB	
3	60'	30'	NB	
5	42'	-	HB	
7	39'	21'	HB	
8a	12'	26'	NB	
9	30'	30'	HB	
9a	12'	33'	NB	
11	31'	30'	NB	
11a	15'	33'	NB	
12a	16'	45'	NB	
12b	18'	50'	NB	
13	29'	30'	NB	
13a	18'	46'	NB	
14b	22'	47'	NB	
		421'		

Deep Bay

1	8'	38'	Rock	Assay results from 5 holes only are available; these indicate that traces of tin only are present.
2	9'	31'	Rock	
3	28'	11' 6"	Rock	
4	18'	11'	Rock	
5	6'	41'	Rock	
6	27'	31'	Rock	
7	6'	35'	Rock	
8	8'	23' 6"	Rock	
9	4'	18'	Rock	
10	15'	40'	NB	
11	5'	35'	NB	
12	15'	48'	NB	
13	6'	42'	NB	
14	7'	15'	Rock	
15	4'	11'	Rock	
16	3'	43'	Soft granite	
17	6'	45'	NB	
18	7'	45'	NB	
19	3'	65'	NB	
20	2'	45'	NB	
		674'		

RESULTS OF ANALYSES FROM

DEPARTMENT OF MINES, LAUNCESTON

Ringarooma Bay

Reg. No.		Footage etc.	Weight Grams	Percent Sn
680526	3RB	0 - 5'	60	0.20
680527		5' - 10'	125.6	0.04
680528		10' - 15'	153.5	0.05
680529		15' - 20'	236.0	0.04
680530		20' - 25'	167.8	0.12
680531		25' - 30'	130.9	0.08
680532		Sample of washstream		
680533	5RB	Bottom sample	56.2	0.05
680534	7RB	0 - 5'	68.6	0.06
680535		5' - 10'	91.8	0.04
680536		10' - 15'	81.1	0.06
680537		15' - 17'6	48.8	0.01
680538		17'9 - 21'	78.9	0.05
680539	9RB	0 - 5'	21.1	0.06
680540		5' - 10'	38.9	0.03
680541		10' - 15'	128.5	0.04
680542		15' - 20'	134.7	0.05
680543		20' - 25'	61.5	0.27
680544	11RB	0 - 5'	105.4	0.04
680545		5' - 10'	59.6	0.05
680546		10' - 15'	53.7	0.04
680547		15' - 20'	199.5	0.04
680548		20' - 25'	123.6	0.05
680549	11RB	25' - 30'	193.8	0.04
680550	13RB	0 - 5'	187.1	0.06
680551		5' - 10'	106.4	0.03
680552		10' - 15'	89.9	0.05
680553		15' - 20'	156.2	0.07
680554		20' - 25'	134.4	0.03
680555		25' - 30'	529.0	0.04
680556		Sample wash 27' below ground level		

Ringarooma Bay (continued)

Reg. No.		Footage etc.		Weight Grams	Percent Sn
680568	9ARB	0 - 5'		57.8	0.13
680569		5' - 10'		64.4	0.07
680570		10' - 15'		85.2	0.10
680571		15' - 20'		168.1	0.04
680572		20' - 25'		69.9	0.04
680573		25' - 30'		120.7	0.04
680574		30' - 33'		103.3	0.07
680575	11ARB	0 - 5'		168.4	0.04
680576		7' - 12'		149.6	0.04
680577		12' - 17'		86.8	0.04
680578		17' - 22'		221.5	0.03
680579		22' - 27'		312.2	0.03
680580		27' - 32'		215.7	0.14
680581		32' - 33'	Run in	98.6	0.54
680582		Wash			
680583	12ARB	0 - 5'		157.7	0.05
680584		5' - 10'		152.9	0.04
680585		10' - 15'		238.5	0.03
680586		15' - 20'		323.6	0.03
680587		20' - 25'		156.4	0.03
680588		25' - 30'		87.7	0.09
680589		30' - 35'		262.2	0.04
680590		35' - 40'		169.2	0.05
680591		40' - 45'		239.1	0.04
680592	12BRB	0 - 5'		90.6	0.04
680593		5' - 10'		118.0	0.04
680594		10' - 15'		147.3	0.03
680595		15' - 20'		135.0	0.03
680596		20' - 25'		193.2	0.03
680597		25' - 30'		120.1	0.04
680598		30' - 35'		475.9	0.04
680599		35' - 40'		227.6	0.11
680600		40' - 45'		223.3	0.16
680601		45' -		104.6	1.07
680602	13ARB	0 - 5'		89.2	0.07
680603		5' - 10'		115.3	0.05
680604		10' - 15'		162.2	0.04
680605		15' - 20'		215.4	0.03
680606		20' - 25'		276.3	0.04

Ringarooma Bay (continued)

Reg. No.		Footage etc.		Weight Grams	Percent Sn
680607		25' - 30'		235.5	0.03
680608		30' - 35'		172.8	0.06
680609		30' - 35'	Wash		
680610		35' - 40'		109.8	0.05
680611		40' - 45'		90.3	0.08
680612		Sample of wash at 45'			
680613		45' - 46'		87.7	0.17
680626	8ARB	0 - 5'		87.5	0.26
680627		5' - 10'		162.7	0.07
680628		10' - 15'		123.8	0.04
680629		15' - 20'		159.4	0.03
680630		20' - 25'		168.7	0.03
680631		25' - 26'		26.0	0.05
680632	14BRB	0 - 5'		46.9	0.05
680633		5' - 10'		104.3	0.04
680634		10' - 15'		161.3	0.04
680635		15' - 20'		213.2	0.04
680636		20' - 25'		105.7	0.04
680637		25' - 30'		120.1	0.05
680638		30' - 35'		129.3	0.05
680639		35' - 40'		128.3	0.06
680640		40' - 45'		60.3	0.20
680641		45' - 47'		53.7	0.21

Deep Bay, Cape Barren Island

680684	12DB	0 - 5'		136.7	0.04
680685		5' - 10'		145.4	0.04
680686		10' - 15'		155.6	0.03
680687		15' - 20'		61.9	0.04
680688		20' - 25'		108.4	0.04
680689		25' - 30'		172.0	0.04
680690		30' - 35'		245.2	0.03
680691		35' - 40'		101.7	0.04
680692		40' - 45'		116.2	0.04

Deep Bay, Cape Barren Island (continued)

Reg. No.		Footage etc.			Weight Grams	Percent Sn
680693	13DB	0	- 10'		187.9	0.03
680694		15'	- 20'	Sample U/S	19.1	0.05
680695		20'	- 25'	Sample U/S	74.1	0.03
680696		25'	- 30'		45.3	0.01
680697		30'	- 35'		102.6	0.03
680698		35'	- 42'		191.1	0.03
680699	15DB	0	- 5'		38.5	0.04
680700		5'	- 10'		71.6	0.25
680701		10'	- 11'6		84.4	0.06
680702	18DB	0	- 15'		41.3	0.03
680703		15'	- 20'		83.0	0.04
680704		20'	- 25'		92.4	0.05
680705		25'	- 30'		75.2	0.05
680706		30'	- 35'		92.2	0.03
680707		35'	- 40'		107.3	0.03
680708		40'	- 45'		89.5	0.03
680709	19DB	0	- 5'		112.3	0.04
680710		5'	- 15'		132.2	0.03
680711		15'	- 20'		99.2	0.04
680712		20'	- 25'		193.5	0.03
680713		25'	- 30'		156.7	0.04
680714		30'	- 35'		235.0	0.06
680715		35'	- 45'		41.3	0.13
680716		45'	- 50'		78.9	0.13
680717		50'	- 55'		135.9	0.08
680718		55'	- 60'		191.5	0.04
680719		60'	- 65'		128.1	0.03
680720	20DB	0	- 10'		81.5	0.02
680721		10'	- 15'		61.4	0.04
680722		15'	- 20'		141.5	0.01
680723		20'	- 25'		119.5	0.03
680724		25'	- 30'		184.1	0.03
680725		30'	- 35'		95.8	0.03
680726		40'	- 45'		203.4	0.03
680736		35'	- 40'		72.4	0.03

Deep Bay, Cape Barren Island (continued)

Reg. No.		Footage etc.	Weight Grams	Percent Sn
680737	1DB	0 - 10'	202.6	0.04
680738		10' - 15'	132.0	0.05
680739		15' - 20'	116.3	0.04
680740		20' - 25'	251.4	0.04
680741		25' - 30'	159.1	0.03
680742		30' - 35'	219.5	0.04
680743	5DB	0 - 10'	135.8	0.03
680744		10' - 15'	164.2	0.03
680745		15' - 20'	153.9	0.04
680746		20' - 25'	257.8	0.03
680747		25' - 30'	269.4	0.04
680748		30' - 35'	177.5	0.04
680749		35' - 40'	215.3	0.03
680750		40' - 41'	71.0	0.04
680751		Sample rock at 41'.	Not assayed	
680752	7DB	0 - 10'	240.6	0.03
680753		10' - 15'	181.3	0.04
680754		15' - 20'	269.1	0.04
680755		20' - 25'	214.9	0.04
680756		25' - 30'	154.8	0.04
680757		30' - 35'	96.6	0.05
680758	8DB	0 - 10'	318.1	0.03
680759		10' - 15'	317.2	0.03
680760		15' - 20'	146.9	0.04
680761		20' - 23' 6	73.9	0.03
680762	9DB	0 - 10'	107.6	0.05
680763		10' - 15'	19.9	0.09
680764	10DB	0 - 10'	247.9	0.03
680765		10' - 15'	263.3	0.03
680766		15' - 20'	277.8	0.03
680767		20' - 25'	193.3	0.03
680768		25' - 30'	358.9	0.03
680769		30' - 35'	181.8	0.04
680770		35' - 40'	213.6	0.04
680771	11DB	0 - 10'	125.8	0.04
680772		10' - 15'	153.7	0.03
680773		15' - 20'	177.3	0.04
680774		20' - 25'	282.0	0.04

Deep Bay, Cape Barren Island (continued)

Reg. No.		Footage etc.			Weight Grams	Percent Sn
680775		25'	- 30'		334.7	0.03
680776		30'	- 35'		264.3	0.03
680777	14DB	0	- 10'		101.9	0.05
680778		10'	- 15'3	Sample U/S	35.6	0.03
680780	16DB	0	- 10'		76.1	0.04
680781		10'	- 15'		320.9	0.04
680782		15'	- 20'		268.7	0.04
680783		20'	- 25'		164.4	0.04
680784		25'	- 30'		186.2	0.04
680785		30'	- 35'		121.8	0.05
680786		35'	- 40'		122.0	0.04
680787		40'	- 43'		130.3	0.06
680788	17DB	0	- 10'		25.2	0.04
680789		10'	- 15'		68.8	0.03
680790		15'	- 20'		65.6	0.05
680791		20'	- 25'		66.0	0.04
680792		25'	- 30'		153.7	0.05
680793		30'	- 35'		173.3	0.05
680794		35'	- 40'		224.1	0.04
680795		40'	- 45'		157.7	0.05
680829	1DB	35'	- 38'		278.7	0.03
680830	2DB	0	- 10'		244.6	0.03
680831		10'	- 15'		284.5	0.03
680832		15'	- 20'		227.7	0.02
680833		20'	- 25'		253.0	0.03
680834		25'	- 30'		151.8	0.03
680835	3DB	0	- 5'		186.8	0.08
680836		5'	- 10'		186.2	0.03
680837	4DB	0	- 10'		251.0	0.03
680838	6DB	0	- 10'		265.3	0.04
680839		10'	- 15'		178.2	0.04
680840		15'	- 20'		267.5	0.04
680841		25'	- 30'	(A)	551.1	0.03
680842		25'	- 30'	(B)	255.5	0.04
680843	5 Ansons Bay	0	- 5'		107.9	0.05

68-514

U.D.C. — B.H.P. Joint Venture

SAMPLE HOLE LOCATIONS

RINGAROOMA BAY

N.E. Tasmania

Plate I

125018

Scale of miles

0

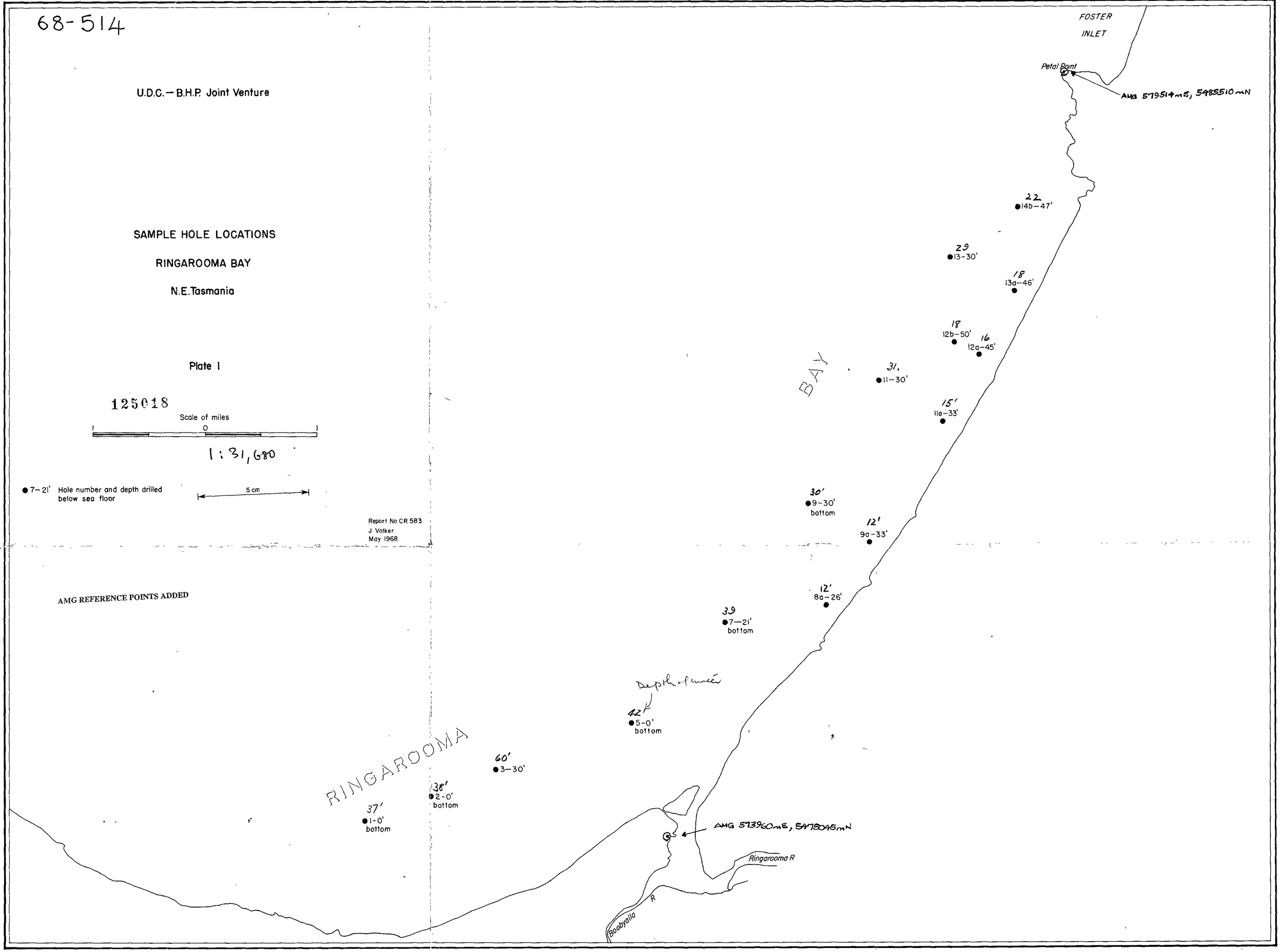
1 : 31,680

● 7–21' Hole number and depth drilled below sea floor

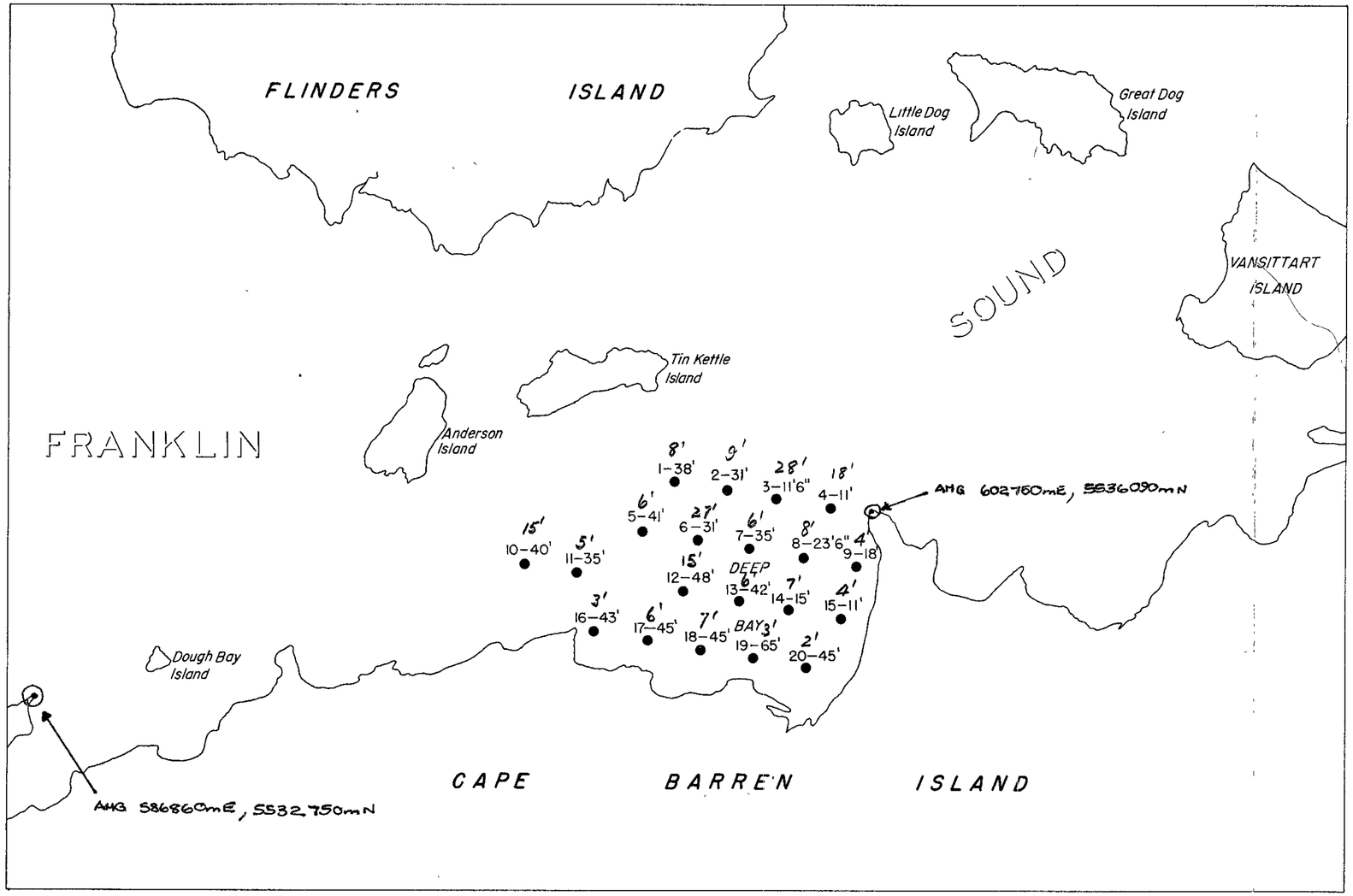
5 cm

Report No CR 583
J Volker
May 1968

AMG REFERENCE POINTS ADDED



68-514



U.D.C.— B.H.P. Joint Venture

SAMPLE HOLE LOCATIONS

DEEP BAY

Cape Barren Island

Plate 2

125019

Scale of miles

1 0 1 2 3 4

5 cm

● 10-40' Hole number and depth drilled below sea floor

AMG REFERENCE POINTS ADDED

Report No CR 583
J Volker
May, 1968