

W869

Att. 2

WYRALLAH-1

WCR

OIL and GAS DIVISION

ATTACHMENT 2

26 FEB 1985

RIG POSITIONING REPORT

WYRALLAH No. 1

W.C.R

VIC/P17

BY: ECL AUSTRALIA PTY LTD

SUPERVISION REPORT ON THE
POSITIONING OF THE RIG,
SOUTHERN CROSS, ONTO LOCATION WYRALLAH 1,
FOR
AUSTRALIAN AQUITAINE PETROLEUM PTY. LTD.
10TH - 16TH APRIL 1984

R.A. Roberts
ECL AUSTRALIA PTY. LTD.
16 Altona Street
West Perth 6005
Western Australia

ECL AUSTRALIA PTY. LTD.

C O N T E N T S
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- I PROJECT SUMMARY

- II PROJECT OBJECTIVES

- III RESULTS

- IV STATISTICAL ANALYSIS OF PROJECT TIME

- V DESCRIPTION OF OPERATIONS, CONCLUSIONS AND
RECOMMENDATIONS

- VI CLIENT REPRESENTATIVE - DAILY LOG

APPENDICES:

- A. CONTRACTOR'S EQUIPMENT

- B. SURVEY VESSEL SPECIFICATIONS

I PROJECT SUMMARY

CLIENT : Australian Aquitaine Petroleum Pty. Ltd.

PROJECT : Positioning the Rig "Southern Cross"

WELLSITE : Wyrallah 1

LOCATION : SP 480 on line GA 82B-212

Latitude 30^o 40' 36.8" S

Longitude 147^o 05' 04.9" E

Northing 5719059

Easting 507366

(Australian National Grid)

Zone 55

EQUIPMENT : 1) Aquafix Acoustic Positioning System.

a) J.M.R. - 1 Satellite Receiver

b) Perex Perifile 8042

c) 2109 M x Computer

d) HP 7210A Track Plotter

e) Silent 700 Keyboard Terminal

f) 5 Range Display Unit \$ Tow Fish

PERSONNEL : T. Crawford

C. Schaefer

SURVEY VESSEL : "Coral J"

PORT OF OPERATIONS .. : Welshpool Port

CLIENT REP : R.A. Roberts, ECL Australia Pty. Ltd.

COMMENCED : 10th April 1984

COMPLETED : 16th April 1984

MAP SHOWING WELL POSITION

148° 00'

←----- NORTH

147° 30'

Lat. 38° 40' 36.8" S

Long. 147° 05' 04.9" E

• WYRALLAH 1

147° 00'

38° 30'

39° 00'



II PROJECT OBJECTIVE

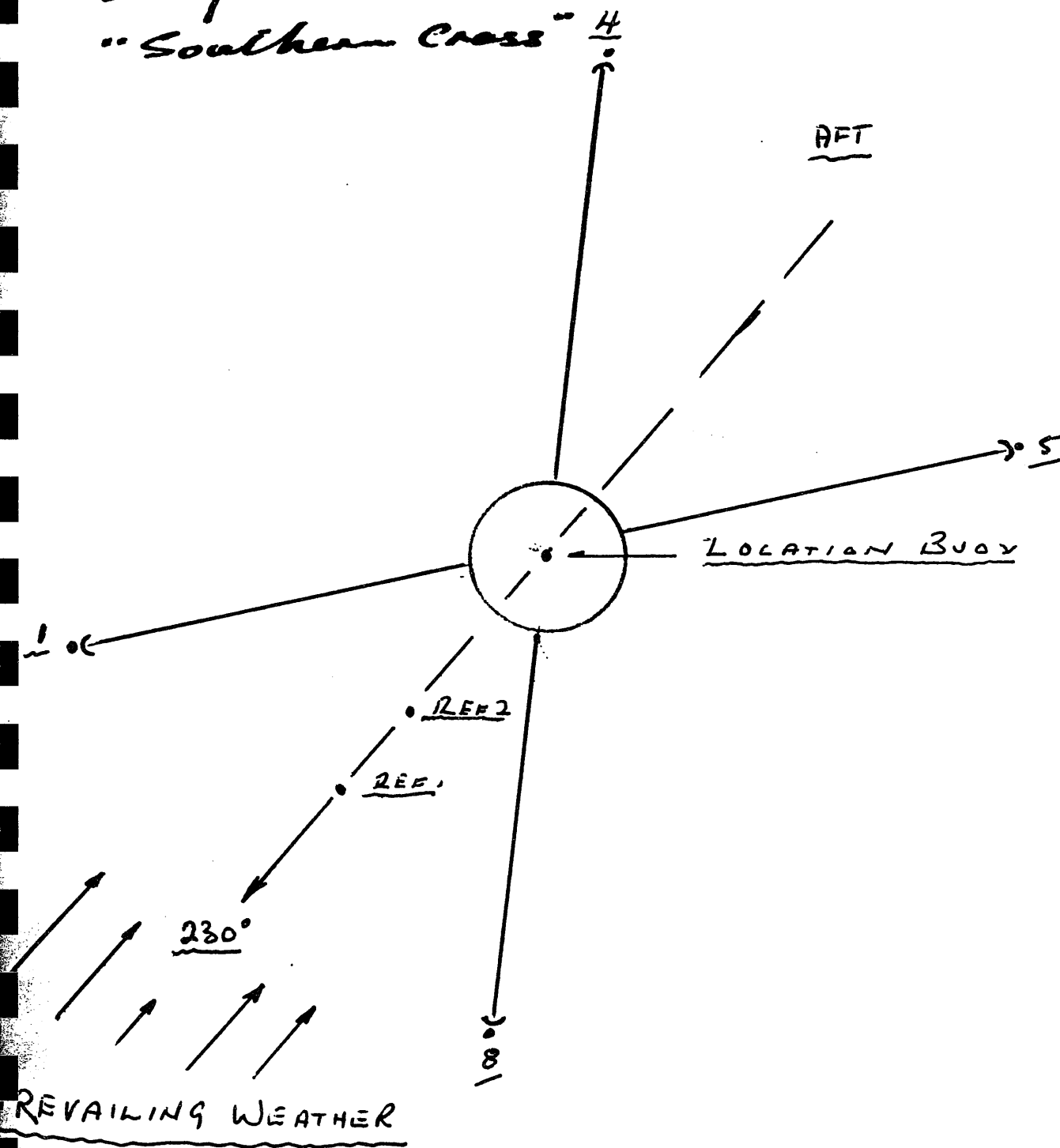
To locate the Rig "Southern Cross" on Well Site Wyrallah 1.

Method used for positioning :-

- 1) Using the Oasis Offshore Acoustic/Satellite Integrated System with onboard equipment to relocate a previously deployed transponder net.
- 2) Lay buoy Pattern i.e. Anchor Buoys, Location & Reference Buoys a total of 7 the pattern of which outlined on the following page.
- 3) Move Rig onto the location and establish the position by a series of Transit Fixes around all Rig legs.

Buoy PATTERN Schematic

"Southern Cross" $\frac{4}{5}$



III POSITIONING RESULT

Included in this section there are diagrams showing the final position of the "Southern Cross". Bearing in mind that the transponder net gave a high RMS on their original positions when laid, it should be noted that although the final position shows +/- 5 metres off the location this is only relative to the net and that the absolute final position was acquired using the JMR 4 Satellite Navigation System onboard the "Southern Cross".

Prior to arrival on Wyrallah No. 1 site the equipment was tested and set up in the Navigation Mode. This was to assist in the locating of the site with the least amount of search. As the system can only operate in one mode at a time, it was not possible to request Satellite alerts in order to update our position whilst tracking the well site. This, however, was achieved by the utilization of the Sat Nav installed onboard the "Coral J".

On arrival at the well site, ranges from all transponders were established.

Using the co-ordinates supplied by the client, the positions of all the Anchor Buoys, Reference Buoy and Location Buoy were set up on the HP 7210 A Track Plotter. By traversing these positions the buoys were laid and their final locations checked (see diagram 1 for final positions).

The Rig arrived in exceptionally unfavourable conditions, zero visibility caused by fog, and were only able to locate the well site by radar using the "Coral J" as a reflector to guide the Tow Vessel. The method used was to standby Anchor Buoy No. 1 until the Rig had dropped her first anchor, then move onto location.

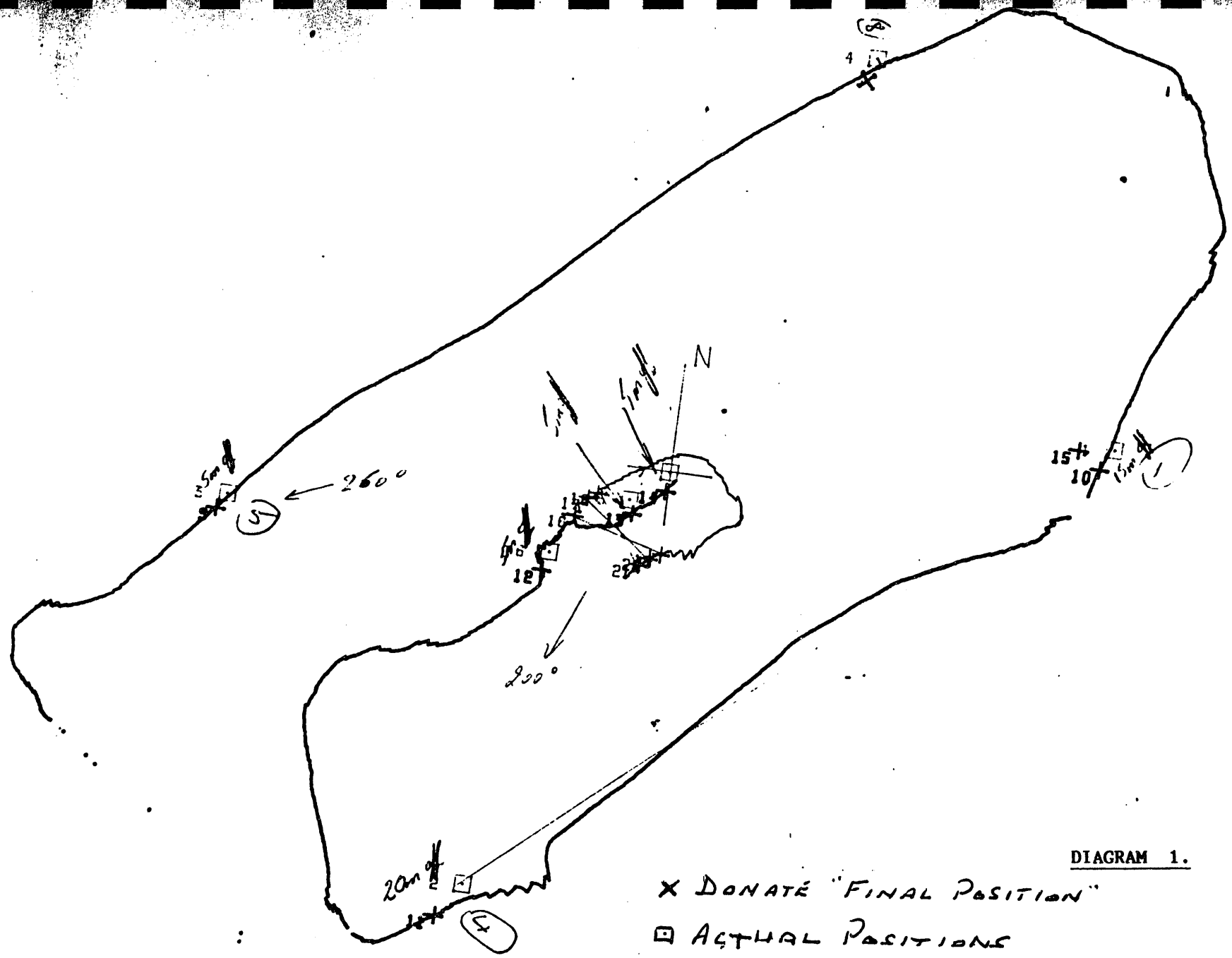


DIAGRAM 1.

X DONATÈ "FINAL POSITION"

□ ACTUAL POSITIONS

~~~~~ TRACK OF VESSEL TRAVERSING POSITIONS.

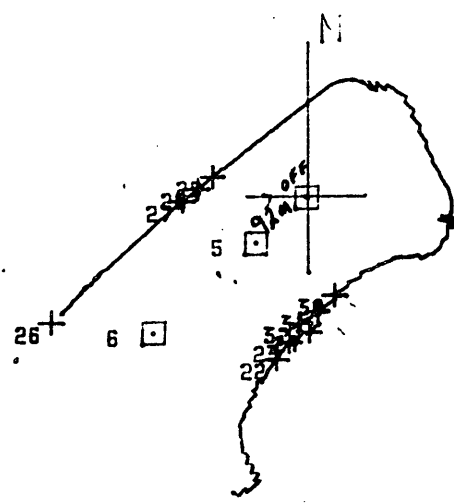


DIAGRAM 2.

*FIRST PRELIM.*  
 WELL POSITION  
 REF. BUOYS  
 X RIG LEG POSITIONS

5 □

26 + 6 □

5 □

1 □

2 □

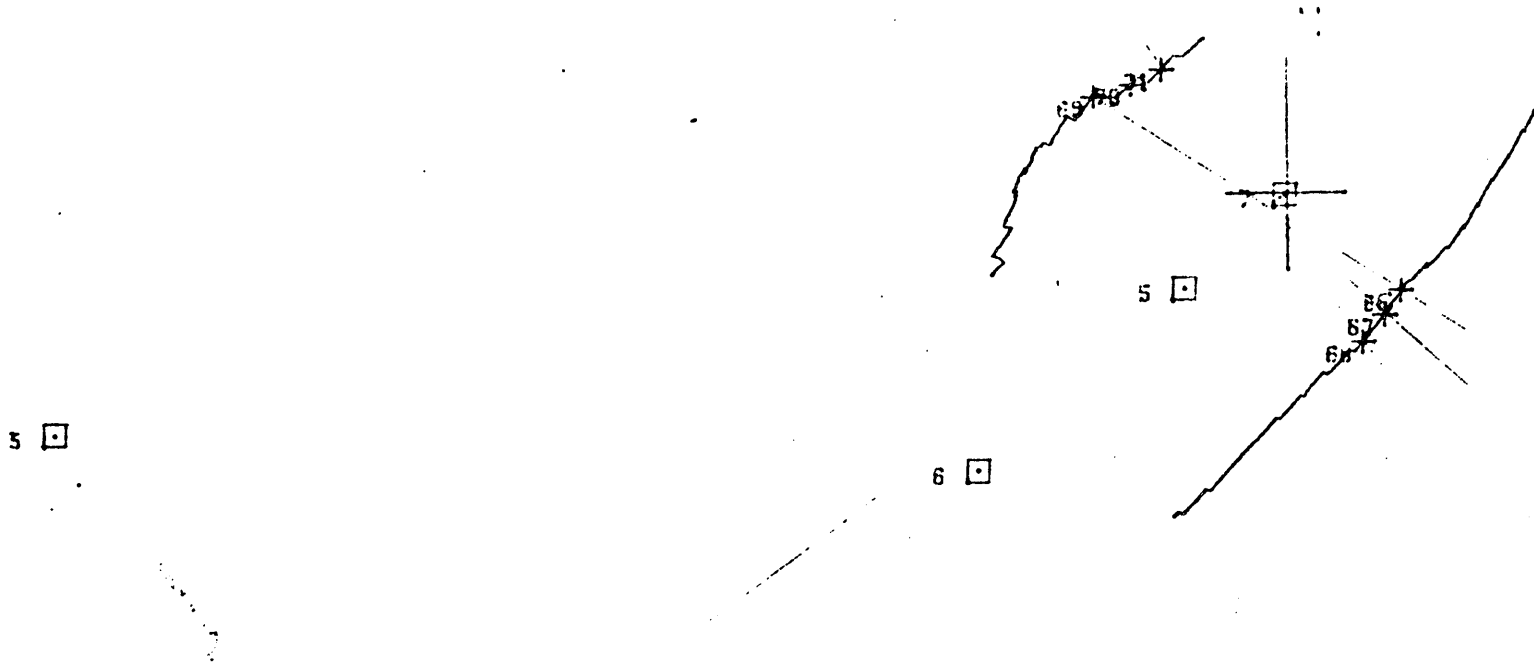






DIAGRAM 3.

SECOND PRELIM

-  N  
 WELL LOCATION
-  REF. BUOYS
-  RIG LEG POSITIONS

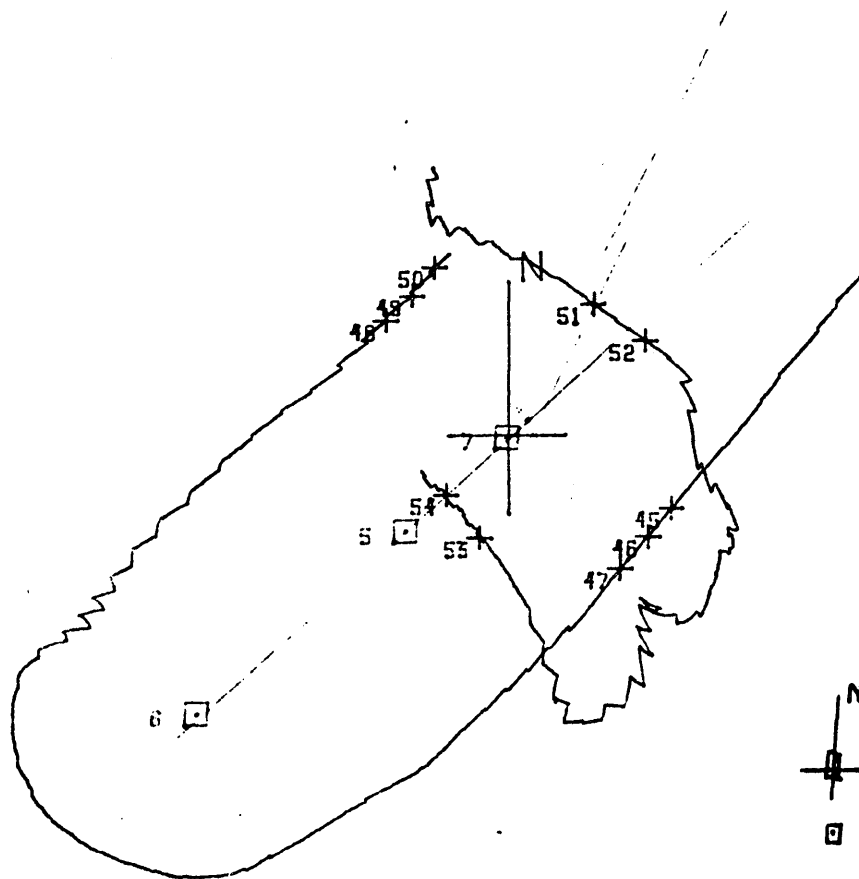
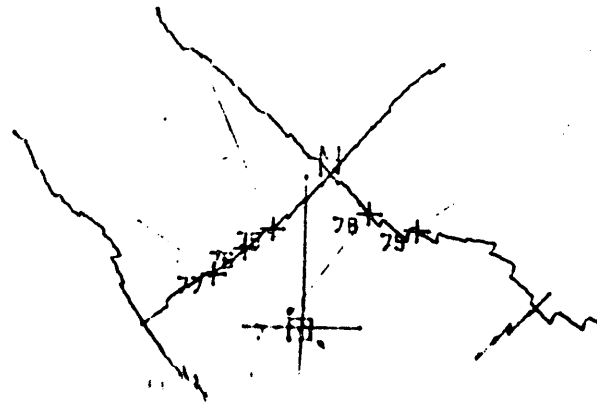


DIAGRAM 4.

THIRD PRELIM.

- N
- +— WELL POSITION
- REF. BOUYS
- x RIG LEG POSITIONS



6 □

DIAGRAM 5.

FINAL FIX

After running No. 1 anchor and holding on location # 8 was run, next # 4 and then # 5, # 3, # 7, # 2, and # 6 in that order.

However, # 2 anchor chain parted at the Pear Link and had to be repaired, delaying the final fixing and positioning by several hours.

Preliminary fixes were taken to establish in which direction and how far the rig would have to be moved in order to occupy the well site (see Diagrams 2 through 4 inc.).

Once # 2 anchor was rerun and tensioned, ballasting of the rig to its drill draft commenced, which took several more hours, the final fixes were then taken and accepted (see Diagram # 5) before leaving the site for Port Welshpool.

Throughout, the sea conditions were very good, with the minimum of swell and little or no wind.

On arrival in Port Welshpool C. Schaefer was transported by helicopter to the Rig where he set up the JMR 4 System.

The final position was established after 28 good passes had been received by the Sat Nav and the data reduced to a few metres.

Final position "Southern Cross" at the Derrick :

o  
38 40' 36.8" S  
o  
147 05' 06.03" E

Well coordinates :

38<sup>o</sup> 40' 36.8" S

147<sup>o</sup> 05' 04.9" E

Therefore the distance and bearing of location was 28.5 metres @

90<sup>o</sup> .



IV STATISTICAL ANALYSIS OF PROJECT TIME

| <u>Start Time</u> | <u>Activity</u>                                              | <u>End Time</u> | <u>Hours</u> |
|-------------------|--------------------------------------------------------------|-----------------|--------------|
| 10/4 02.30        | Installation of equipment on vessel                          | 11/4 10.30      | 13           |
| 11/4 10.30        | Testing of equipment before leaving Port                     | 14/4 09.25      | 70.55        |
| 14/4 09.25        | Travel Time                                                  | 14/4 14.00      | 4.35         |
| 14/4 14.00        | Deployed Transducer Tow Fish Assembly                        | 14/4 16.19      | 2.19         |
| 14/4 16.19        | Buoy Laying                                                  | 14/4 22.25      | 6.06         |
| 14/4 22.25        | Standby for Rig                                              | 15/4 06.05      | 7.40         |
| 15/4 06.05        | Deployment of Rig Anchors                                    | 15/4 19.00      | 12.55        |
| 15/4 19.00        | Standby to fix final position after Southern Cross ballasted | 16/4 02.24      | 7.24         |
| 16/4 02.24        | Travel Time                                                  | 16/4 07.37      | 5.13         |
| 16/4 07.37        | Demobilisation                                               | 16/4 13.30      | 5.53         |

These figures are based on times taken from the daily logs. They are an actual break-down of the primary activity at any one time throughout the operation. However the time from the "installation of the equipment" to the "test of equipment before leaving Port", has to be taken as a secondary activity and not operational, as the

vessel was unable to sail until the Navigation Equipment was in fact operational.

Considering the total time from the project and considering the categories listed, it can be seen that the major percentage of time taken was due to equipment failure.

| <u>Activity</u>                        | <u>Total Hours</u> | <u>Percentage</u> |
|----------------------------------------|--------------------|-------------------|
| Travel time                            | 9.48               | 7.21              |
| Buoy deployment                        | 8.25               | 6.19              |
| Standby for, and positioning<br>of Rig | 27.59              | 20.58             |
| Equipment downtime                     | 70.55              | 52.14             |
| Mobilisation and demobilisation        | 18.53              | 13.88             |
|                                        | -----              | -----             |
|                                        | 136.00             | 100 %             |
|                                        | -----              | -----             |

V DESCRIPTION OF OPERATIONS, CONCLUSIONS AND RECOMMENDATIONS

Although the operation began at 09.25 on Saturday 14th April, when the "Coral J" left the Port of Welshpool for the Wyrallah No. 1 Rig site, the operation in fact was due to begin Tuesday 10th April. The delay was caused by the Racal personnel who arrived on the 11th and then had to repair navigation equipment.

It should be mentioned that these extra days were added on at the beginning of the programme to be used to calibrate the JMR 1 Sat Nav equipment in view of the rather high RMS (128.16 metres) achieved during the previous site surveys. This was not to be, as the equipment was not fully operational until the Saturday, when this was not practical due to lack of time.

Once the operation began though, it went very smoothly and with no problems. The deployment of the Buoy pattern and subsequent fixes proved to be accurate, this took 8.265 hours left plenty of time to position the "Southern Cross" which arrived on location several hours later.

Although the fog was very thick and visibility was down to less than 100 metres all vessels were able to identify each other through radio and radar, which in fact assisted the running of the anchors and contributed to the speed and efficiency as all anchor buoys showed up very well on all ship's radars.

During the running of the anchors several fixes were taken, transiting the rigs legs, to establish the position and instructions were passed on to the rig as to which way they should move. The final fixes were taken once the rig had completed ballasting and the final positioning was within a few metres of the location

(The actual position was finalised onboard the rig using JMR 4 Sat Nav).

Throughout the entire project the weather was fine with very little swell and wind which led to the ease of operation and speed with which the project was carried out.

Monday 16th April, the positioning was completed and the "Coral J" returned to Port Welshpool arriving at 07.37.

From the "Statistical Analysis of Project Time" it is apparent that "downtime" through equipment failure constituted more than 50% of the time, although 24 hours was spent waiting for, and locating a spare 2109 MX Computer before any operational work could be carried out. There was also a problem with the "Programme Tape" and spares were requested from Racal Perth. Waiting for these to arrive in Welshpool constituted the balance of "downtime" for equipment.

The performance of the contractors personnel showed a decided lack of technical knowledge concerning the Oasis System. However, there was no lack of keenness in attempting to repair and operate the equipment. It is the author's opinion that had the technical capabilities been of a higher standard and greater familiarisation with the system been apparent, the problems encountered and subsequent delays caused could have been minimised.

The choice of vessel, although small and cramped once all the "Oasis" equipment was installed, was indeed beneficial to the operation because of its manouverability and the invaluable experience of the Captain, whose help and knowledge of local conditions definitely assisted in the speed with which the operation was carried out.

The assistance given by all the personnel at the Aquitaine Base in Welshpool proved most helpful.

In conclusion, had the Oasis computer not been operational at the time when the Rig was due on location, the author had a programme set up on his personal calculator which would have enabled the rig to be positioned. This was also used to check the contractors values.

Tuesday, 10th April 1984

05.10 A.R.R. Melbourne.

07.00 Depart for Sydney.

08.05 A.R.R. Sydney. Taxi to Aquitaine office.

Contact in Welshpool : M. Christiaie Fouillant

Allister McCormick

(056) 881403. Base Welshpool Hotel for accomodation.

Information from A. McCormick:

Is possible Union Dispute on "Southern Cross".

Hopefully this will be resolved by Thursday.

12.00 Depart Sydney. -

13.15 A.R.R. Melbourne. Depart Welshpool.

17.00 A.R.R. Welshpool. Met Allister McCormick.

Went down to "Coral J".

Apparently Racal is sending down two technicians to install equipment which still has not been done.

21.30 One technician from Racal has arrived and has started installation of equipment on "Coral J".

End of Day

VI CLIENT REPRESENTATIVE - DAILY LOG

Monday, 9th April, 1984

14.00 Call from E. Howell, ECL Australia Pty. Ltd.

14.15 Called Claude Lambert at Aquitaine (02) 922 3499, address :-

99 Mount Street,

North Sydney, N.S.W.

(Cnr. Walker and Mount Streets)

to arrive 10th April at 8.10 a.m.

this office at 9.00 a.m.

16.30 Picked up ticket from ECL office Perth, 11.45 p.m.

17.00 Had call from Racal (24.45), John Duncan.

He explained the reason for the large RMS was not due to a big error "it was not calculated to the final 'mean'" which is +/- 25 metres. This, of course, is done using the following equation :

$$\text{Probable error in metres} = \sqrt{\frac{\text{RMS}^2}{\text{Passes used.}}}$$

$$\text{"According to Racal" i.e. } 24 = \sqrt{\frac{128^2}{29}}$$

22.00 Left for airport.

23.45 Depart Perth.

Wednesday, 11th April 1984

- 07.15      Went down to "Coral J".
- 08.00      Called in at A.A.P. office.  
Met with A. McCormick.
- 08.15      Buoys left on truck for "Coral J".
- 09.00      Trevor Crawford from Racal arrived at Aquitaine then proceeded down to fire-up gear on "Coral J". Tentative sailing time set for 10.00 hours.  
Still no word on the Union disputes (This is a dispute with Esso and not Aquitaine).
- 09.30      Returned car to Budget and joined "Coral J".
- 10.30      Racal equipment all installed and ready for test. However, "Programme Tape" for this project not to be found anywhere onboard. Trevor Crawford (Racal) has gone to phone Perth. Looks like sailing time delayed to 21.00 hours.
- 11.30      Program Tape found and set up for test all basic test commenced.
- 13.45      System fully operational. However, it was decided to wait for the spare Programme Tapes in order to have back-up in case of any problems.



18.00 JMR still accepting satellites but not printing out data on the silent 700. On deactivating the computer from Navigation Mode to Print these sat data format the computer would not fire-up - it was found on switching on, to have burned-out fuses which, when replaced, made no difference as there was by this time other damage in the Power Supply.

18.45 Trevor Crawford called Racal Perth and was informed by them that arrangements were being made to get replacement from Queensland. This can only be done in the morning.  
Weather fantastic.

Equipment : Computer HP 21MX  
JMR 1 Sat Rec.  
Aquafix Acoustic P.S.  
Silent 700  
Gyro Compass

Thursday, 12th April 1984

09.00 Meeting with M. Fouillant. Advised about the latest developments on the "Coral J".

09.30 Worked on programme with TI] 59 confirming position from given co-ordinates by Racal of Transponders.

12.00 Lunch.

14.30 Departed with "Coral J" for test run.

17.30 Returned to Welshpool Port.

18.00 Meeting with Trevor Crawford concerning arrival of replacement computer. He informed me that Racal had just purchased one in Queensland. A decision was made and okayed by M. Fouillant (Base Manager) to release Trevor Crawford so that he could fly to Brisbane and hand carry the computer.

Friday, 13th April 1984

08.30 Still no information on Dispute onboard the "Southern Cross" (Hopefully 12.00).

09.00 Carried on with programme on transponder positions. Confirmed transponder positions from well location i.e., distance and bearings from site to transponder (see figure in this report).

14.00 Was informed that the rig could be on location Sunday 15th morning. Provided all partners accept the conditions, laid down by ESSO as the dispute is not completely resolved. ED for well location 02.30 - 03.00 Saturday a.m. when Trevor Crawford arrives back with spare computer.

17.00 Finally we have confirmation that the rig has been handed over to "Aquitaine" and should be on location Sunday morning - all going well.

Saturday, 14th April 1984

02.30 ETA of Trevor Crawford not arrived.

08.30 Checked with T.A.A. He was on flight and arrived Melbourne 23.00 (3rd).

09.00 Trevor Crawford arrived "Coral J".

09.25 "Coral J" sailed from Port Welshpool. Installation of replacement computer in progress. All onboard systems functioning OK.

14.00 On location.

14.05 Fish deployed.

15.00 Comm check with "Southern Cross" on channel 8 - 1 anchor coming up, 1 failed and 1 still down.  
Making circle around. Net all signals from "Pingers" good.

15.45 Chopper due on "Southern Cross".

16.19 Preparing to drop Buoy on location 5.

16.40 Dropped # 5 +/- 10 metres

17.28 Dropped # 8 +/- 20 metres

18.10 Dropped # 4 +/- 10 metres

18.30 Dropped # 1 +/- 20 metres

18.30 "Southern Cross" under tow. ETA 04.00 hours on location.

18.45 Dropped # 1, Location +/- 2 metres

18.50 Dropped # 2, Location +/- 5 metres

- 20.10 Dropped Location Buoy +/- 10 metres
- 20.15 Broke for supper.
- 21.30 Commenced final buoy check and positions. ETA of "Southern Cross" still 04.00 to 05.00 hours.
- Weather conditions throughout the day have been very good. Visibility to about 12 kilometres. No wind and calm seas. Swell 0.5 metres.
- 22.25 Standby for Rig.

Sunday, 15th April 1984

- 04.00 "Southern Cross" still 4 miles off Buoy Pattern. "Coral J" now standing by Anchor Buoy # 1. Fog very dense 100 to 200 metres visibility. Sea state calm. Wind conditions nil. Swell 0.5 metres.
- 06.05 Dropped # 1 Anchor.
- 06.30 Weather: Wind now picking up. Sea swell 0.5 to 1 metres. Visibility down to 100 metres.
- 06.45 Standing by on # 4.
- Waiting for completion of Anchor laying.
- 09.48 Anchors # 1, # 8, # 4 and # 5 down.
- 10.05 Transit fix taken on all left Rig needs to move +/- 150 metres at 020<sup>o</sup> to location.

12.05 All anchors down. Return to "Southern Cross" to make transit of Rig legs.

12.15 "Southern Cross" is +/- 90 metres off location at 050<sup>0</sup>.

12.45 Transit of legs for final fixes before tensioning up anchors.

13.30 Transit fix completed position off location according to co-ordinates supplied by Racal is 15 metres at 230<sup>0</sup>. On this basis the OK is given to tension and take or ballast for final fix. This information passed by radio to C.7.C.(???) "Southern Cross".

13.45 It was also decided to transfer C.S. (Racal) to the base on its arrival, to be taken off by basket on to the rig.

13.55 Tensioning on Rig commenced.

14.40 # 2 Anchor chain defective. Preparation made to pull up anchor.

14.45 Commenced Buoy recoverage. # 1 and # 8 wiped out. Recovered # 4, # 5 and # 2. Reference Buoys location under Rig. Will be recovered by "Southern Cross".

16.00 Completed Recovery of 4 Buoys and standing by for completion of the running of # 2 Anchor and ballasting of Rig legs before final fix can be completed.

19.00 # 2 Anchor laid laid and ballasting commenced.

22.30 Called "Southern Cross" for update on ballasting. Was informed +/- 1 hour.

23.30 Called again. Was told still half an hour.

Monday, 16th April 1984

00.01 Called by "Southern Cross". Ballasting completed.

00.05 Commenced approach for first final fix.

00.20 Caught transducer fish on Anchor line which, when retrieved was fairly badly damaged. Connector from reel to fish shad parted. Rascal personnel prepared another transducer.

01.18 Fish deployed with Replacement Transducers System in operation with all 5 ranges.

01.30 Commenced final approach to Rig for Fix.

01.55 Fix at Port and starboard side. Completed going 050 on both approaches.

02.05 Commenced approach for lateral fixes.

02.24 Completed fixes.  
Final computation of Rig position 5 metres off at 230°.

02.30 Departed for Welshpool Port.

07.37 Arrived in Port Welshpool.

08.00 Report of positioning made to M. Fouillout and T. McCormick at Aquitaine Base at Welshpool.

10.00 Unable to pick up a flight to Perth from Melbourne (Booked on tomorrow's flight at 09.30 hours).

14.00 Departed Welshpool for Melbourne by car.

17.30 Arrived Melbourne Skyways International Motel.

Tuesday, 17th April 1984

09.00 Departed Melbourne for Perth.

13.30 Arrived Perth.

A P P E N D I X    A

CONTRACTOR'S EQUIPMENT

|                             |               |                                                                                  |
|-----------------------------|---------------|----------------------------------------------------------------------------------|
| Acoustic Positioning System | Aquafix       |                                                                                  |
| consisting of               | C.D.U.        | Serial No. 001                                                                   |
|                             | C.D.U.        | Serial No. 010                                                                   |
|                             | Transponders  | Serial Nos. 303, 158,<br>322, 326, 331, 324,<br>341, 335, 358, 369,<br>302, 370. |
| Satellite Receiver          | JMR-1         | Serial No. 76159, 76097                                                          |
| Computer                    | -HP 21 MX     | Serial No. 1723F0013                                                             |
| Terminal                    | TI Silent 700 | Serial No. 17062, 17063                                                          |
| Plotter                     | HP 9862A      | Serial No. 1841A12545                                                            |
| Gyrocompass                 | Arma Brown    | Serial No. 177                                                                   |



