

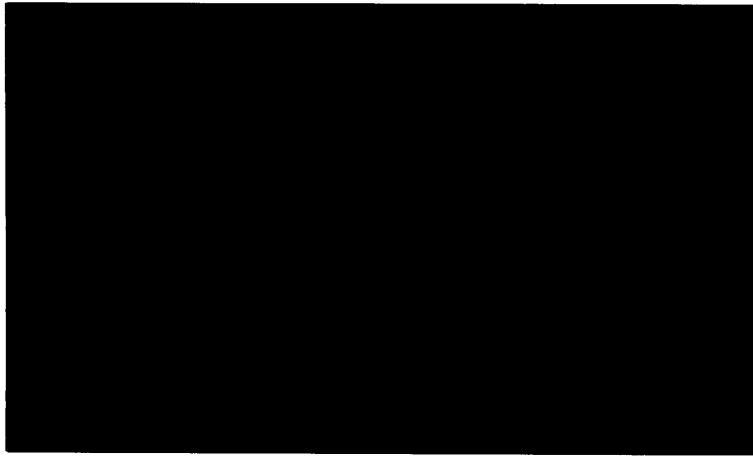
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PE915494



**OIL COMPANY  
OF AUSTRALIA**



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**BORAL ENERGY PETROLEUM PTY LTD**

**WELL COMPLETION PROGRAMME**

**PPL 1**

**NORTH PAARATTE 5**

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Distribution

Department of Natural Resources and Environment  
Boral Energy Petroleum Pty Ltd  
P A Elkington / J M Riley / R B Stork / Well file  
R A Naumann / P O'Neill  
Wellsite (3)

Oil Company of Australia Limited  
Level 2, South Court  
John Oxley Centre  
339 Coronation Drive  
MILTON QLD 4064  
A.C.N. 001 646 331

P O'Neill  
March 1999

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**PREFACE**

*The completion of this well is to be managed by Oil Company of Australia Limited (A.C.N. 001 646 331), a Boral Limited company, on behalf of the permit operator Boral Energy Petroleum Pty Ltd (BEPL).*

**1. SAFETY**

All operations conducted in the course of the North Paaratte 5 completion shall be in accordance with the safety requirements specified by the following documents, copies of which will be available at the well site.

- *Petroleum Regulations 1992 (Victoria)*
- *The "OCA" Drilling Manuals*
- *Century Drilling's Health Safety & Environmental Operations Manual.*

Oil Company of Australia Limited considers safety to be of paramount importance and stresses that safe completion operations are to be the primary objective of this program, in concert with efficient, trouble-free completion procedures to enable the operational and reservoir objectives of this project to be met.

The procedures listed in this program form a guide for the completion operations and may need to be modified, in consultation with the OCA Brisbane office, as the work progresses. If circumstances arise where there is a conflict between safety issues and this program, the OCA Rig Supervisor and the OCA Completions Engineer (if present) and the relevant third party Supervisor should apply judgment and common sense to ensure that safe operations are undertaken as a priority.

OCA requires all personnel involved in completion operations to be adequately trained and experienced in the relevant operations.

The OCA Rig Supervisor will hold minuted "Safety Meetings" at the well site with all the rig crew members and other third party personnel (e.g. Reeves Wireline) prior to and during the live completion process.

Job Safety Analysis (JSA) meetings must be conducted prior to any new or critical operation. Safety meeting minutes are to be transmitted to OCA Brisbane office together with Rig Morning Reports.

The joint onshore drilling 'Permit to Work' system will be used on this job. Details will be fully discussed at the first onsite safety meeting.

**2. ENVIRONMENT**

All operations conducted in the course of the North Paaratte 5 completion operation shall be in accordance with the OCA Drilling Compliance Manual.

The OCA rig supervisor should review this manual and ensure compliance.

**3. OBJECTIVE**

To complete North Paaratte 5 as a single string "Waarre Formation" gas producer.

**4. ACCOUNT CODE**

31 / 100 / 100 / 0004 / ----- / 12 / 2

**5. COST ESTIMATE**

\$382,000

**6. CONTACTS****6.1. Emergency**

Service	Port Campbell
Ambulance	000
Fire	000
CFA – Colac	(03) 5232 1923
Hospital (Warnambool Base Hospital)	(03) 5232 1923 (Ryot St)
Police	(03) 5598 6310 (Lord St)
State Emergency Service	(03) 5598 6363

## 6.2. OCA and Contractors

Company	Name	Number
OCA / BEPL	Peter O'Neill	(07) 3858 0603 (w) (07) 3262 2497 (h)
	Ross Naumann	(07) 3858 0622 (w) (07) 3848 8618 (h) 0413 584 661 (m)
	Joe Parver	(08) 8235 3744 (w) (08) 8332 1639 (h) 018 845 316 (m)
	Shane Robbie	(07) 3858 0635 (w) (07) 3285 6416 0417 73 1889 (m)
For Contractors – Refer to Section 14.5 Contractors Phone Numbers – Drilling Programme		

## 7. PERSONNEL RESPONSIBILITIES

<u>Name</u>	<u>Responsibility</u>
Peter O'Neill	On Call Engineer / Completion Engineer
Ross Naumann	Drilling Manager – alternative contact if no answer above
Joe Parver	Team Leader / Project Engineer
Shane Robbie	Drilling Superintendent (HSE Contact)
Barry Beetson	Rig Supervisor Equipment / rubbish removal from lease

## 8. DISCUSSION

North Paaratte 5 will be drilled in March – April 1999 as a development well in the North Paaratte Field, PPL 1, onshore Otway Basin. The primary objective is the Waarre Formation, and the reservoir will be used as a swing producer to meet peak gas demand.

Century Drilling Rig #1 will be used to complete the well immediately after the well is cased and cemented. The well is to be completed with a single string free flowing completion in the Waarre Formation. The zone will be underbalance perforated using 4-1/2" HSD TCP guns.

## 9. WELL HISTORY

Location : 38° 33' 09.78" S, 142° 57' 14.32" E  
 Elevation KB : 98.4 m MSL  
 Elevation GL : 92.9 m MSL  
 Well Spudded : TBA  
 Drilling Rig : Century Rig No.1, IDECO 7585  
 Reached TD : TBA  
 Total Depth : TBA mKB (Proposed TD – 1600 mKB)  
 PBSD : TBA mKB  
 Rig Released : TBA

## 10. RESERVOIR DATA

Formation	Interval (m KB)	Press (psig)	Temp (°F)	Source
Waarre Formation	1515 – 1525	2468	-	-

11. CASING AND HOLE DATA – *NOTE PROPOSED ONLY – TO BE CONFIRMED*

Hole Size	Depth	Casing Size/WT/Grade	Casing Shoe Depth
311 mm (12-1/4")	405 m KB	245mm / 53.57 kg/m / K55 (9-5/8" / 36 ppf)	TBA m KB
216 mm (8-1/2")	1600 m KB	178mm / 38.77 kg/m / K55 (7" / 26 ppf)	TBA m KB

## 12. DRILL STEM TEST RESULTS – NONE PLANNED

DST	Formation	Interval (m KB)	FSIP (psi)	Temp (°F)	Comments
Nil	-	-	-	-	-

## 13. PERFORATIONS – TO BE ADVISED ONCE DRILLED AND LOGGED

Formation	Interval (m KB)	Size	Type	Spf	Ø	Gm
Waarre Formation	TBA	4-1/2"	TCP	12	45	21

## 14. CASED HOLE LOGS – PROPOSED (INTERVAL TO BE CONFIRMED)

Log	Interval (m KB)	Company	Date
CBL-VDL-GR-CCL	PBTD to 250m rise 50m across TOC	Schlumberger	TBA



## 15. PROCEDURE

- Note:
- a) The following completion operations will be performed using the Century Rig 1 Drilling Rig immediately after the well is cased and suspended.
  - b) Fluids are only to be discharged into the drilling sump – they are not to be discharged elsewhere onto the well site.
  - b) Ensure drilling sump and flare pit are not restored prior to this workover – they will be required for this completion operation.
  - d) The well site is to be cleaned up and restored as soon as is practicable after this procedure.
  - e) The OCA supervisor will formally hand over the well to the production supervisor when the rig has moved off location and the lease is cleared of all equipment and rubbish using the “Handover / Handback – Gas Well” form.

1. Cement 7” longstring as per drilling programme (casing slips set etc).

Note: a) Top plug will have been displaced with clean 2% KCl brine.

2. Nipple down BOP stack.

3. Trim and bevel 7” casing stub. Install Kvaerner tubing spool 11” 3M x 7-1/16” 5M complete with secondary seals. Rig in to test port on bottom flange and pressure test seals to 3000 psi for 15 minutes. Bleed off pressure.

Note: a) Cut off casing 6” above face of casing head flange.

b) Bevel inside and outside of casing stub.

4. Nipple up 13-3/8” BOP’s fitted with 4-1/2” pipe rams. (7-1/16” x 13-3/8” DSA required)

5. Make up 4-1/2” EUE landing joint to hanger with two way check valve installed in hanger. Land hanger in spool and screw in lock-down screws. Pressure test pipe rams to 200 / 3000 psi for 15 minutes against landing joint. Bleed off pressure. Remove landing joint. Pressure test blind rams to 200 / 3000 psi against two way check valve and hanger for 10 mins. Bleed off pressure. Back out lock-down screws, install landing joint and remove hanger etc.

Note: a) Note ensure tubing spool annulus outlet valve remains open throughout these tests.

b) High pressure pump trailer (rental unit) will be required for BOP pressure tests.

6. Rig up Schlumberger. Run CBL-VDL-GR-CCL log for 250 m over the Waarre Formation (from PBTD up), and for 50 metres across TOC. (TOC estimated to be @ 600 mKB) Correlate to open-hole Neutron – Density - Resistivity log (Schlumberger PEX). **Report results to Brisbane before proceeding to next step.**
7. Make up the following BHA and RIH to perforate the Waarre Formation (*Intervals to be advised and confirmed via facsimile by head office*):
- 4-1/2" TCP bull nose,
  - 4-1/2" TCP guns, 12 spf, 135/45 Ø, HMX, 34 JL, Ultrajet, 22.7 gm charges, and 4-1/2" gun spacer sections as appropriate,
  - Approx. 3m x 4-1/2" blank TCP gun (safety spacer),
  - 2-3/8" EUE TCP open firing head,
  - 1 jnt x 2-3/8" EUE J55 4.7 lb/ft tubing,
  - 2-3/8" x 3-1/2" EUE pin x pin crossover swage with 3-1/2" EUE collar
  - 10' x 3-1/2" EUE J55 9.3 lb/ft pup joint,
  - 3-1/2" EUE mechanical gun release sub (Note 1.791" ID),
  - 10' x 3-1/2" EUE J55 9.3 lb/ft pup joint,
  - 3-1/2" EUE 'XN' nipple (2.75" ID, 2.635" no-go)
  - 10' x 3-1/2" EUE J55 9.3 lb/ft perforated pup joint,
  - 3-1/2" EUE 'X' nipple (2.75" ID) – **with 2.75" PX plug installed,**
  - 10' x 3-1/2" EUE J55 9.3 lb/ft pup joint,
  - 3-1/2" x 4-1/2" EUE pin x pin crossover swage with 4-1/2" EUE collar,
  - 1 jnt 4-1/2" EUE J55 12.75 lb/ft R2 tubing,
  - Radioactive pip tag,
  - 1 jnt 4-1/2" EUE J55 12.75 lb/ft R2 tubing.
8. Rig up to pressure test plug. Pressure test to 2,000 psi against PX plug. Bleed off pressure.
9. Continue to RIH BHA as follows:
- Approx. 155 jnts 4-1/2" EUE J55 12.75 lb/ft R2 tubing,
  - 4-1/2" EUE J55 12.75 lb/ft pup joints as required
  - 1 jnt 4-1/2" EUE J55 12.75 lb/ft R2 tubing,

- Notes: a) Accurately strap all equipment prior to RIH.
- b) Confirm as accurately as possible top shot to radioactive pip tag distance.
- c) Drift all tubing components and measure and record OD and ID of all accessories.
- d) Optimum make up torque for 4-1/2" J55 12.75 lb/ft EUE tubing is 2860 ft-lb.
- e) Recommended make up torque for 3-1/2" EUE J55 9.3 lb/ft is 2280 ft-lb.

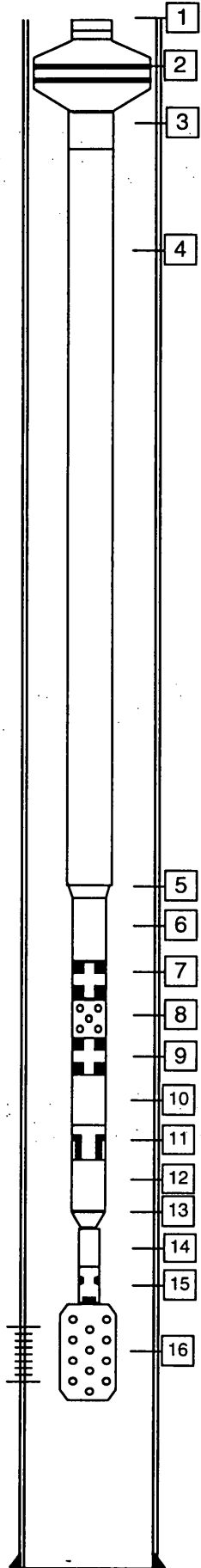
10. RIH, space out and land tubing with hanger in tubing spool to place top shot at correct depth.
11. Rig up Schlumberger for GR correlation. Correlate gun depth to CBL-VDL-GR-CCL. Rig down Schlumberger.
12. Adjust space out as necessary. Re-land hanger and run in tie down screws. (NB: If more than 2m adjustment to space out is required rerun GR correlation.)
13. Rig up wireline crew. Drift tubing to PX plug (2.75"). RIH and recover prong and plug. Rig aside wireline crew.
14. Install 4.0" back pressure valve in hanger. Nipple down BOP's, nipple up 4-1/16" Xmas tree. Remove back pressure valve.
15. Install 4.0" two way check valve in hanger. Pressure test Xmas tree to 3,000 psi for 15 minutes. Bleed off pressure.
16. Rig into adaptor flange test port. Pressure test hanger seals to 3,000 psi for 15 minutes. Bleed off pressure.
17. Rig in adjustable choke and tie into flare line. Ensure flare line is staked down at each connection.
18. Drop bar to perforate the Waarre Formation. Once fluids are unloaded, flow well to clean up for a minimum of a further 2 hours or as directed by Project Leader. Record choke size, FTHP and PCAP. Shut well in.
19. Rig up wireline crew. RIH and set 2.75" PX plug and prong in X nipple. Bleed pressure off tubing. Confirm plug is holding. Rig down wireline crew.
20. Install 4.0" back pressure valve in hanger.
21. Rig down and move out drilling rig.
22. Release rig.
23. Formally hand well over to testing crew. (Document with WHB(gas) form)



BEPL

Downhole Installation Diagram

Well: North Paaratte #5



PBTD: 1600 mKB

Item No.	Description	Length (m)	Depth (m KB)	Min ID (in)
1	KB to top of tubinghead spool			
2	Hanger, 6" x 4-1/2" EUE box x box			
3	4-1/2" pup joints as required			
4	approx 157 jts, 4-1/2" EUE, 12.75 ppf, J55, R2 tbg			
5	Crossover, 4-1/2" EUE x 3-1/2" EUE			
6	Pup joint, 10' x 3-1/2"			
7	X nipple, 3-1/2" EUE, (2.750 X)			2.750
8	Pup joint, 10' x 3-1/2" perforated			
9	XN nipple, 3-1/2" EUE, (2.75 X, 2.635 NoGo)			2.635
10	Pup joint, 10' x 3-1/2"			
11	3-1/2" EUE Gun Release sub			2.965
12	Pup joint, 10' x 3-1/2"			
13	Crossover, 3-1/2" EUE x 2-3/8" EUE			
14	One joint x 2-3/8" EUE, 4.7 ppf, J55, R2 tbg			
15	2-3/8" EUE open firing Head			
16	4-1/2" TCP Guns			

PERFORATIONS		Gun		Charges		
Formation	Interval (m KB)	Size	Type	SPF	Type	Ph gm
Waarre Formation		4.5"	TCP	12	HMX	45 21.0

<b>Surface Casing</b>	9-5/8", 36ppf, K55, BTC @ ___ mKB
<b>Production Casing</b>	7", 26 ppf K55 BTC @ ___ mKB
<b>Cementing Details</b>	
<b>Remarks</b>	
<b>String Weight Calculated</b>	<b>Actual</b>

Wellsite Supervisor		Not to Scale
Date of Installation		Proposed <input checked="" type="checkbox"/>
Drafted by	Date:	Re-Completion
Checked by	Date:	Completion

	Tubing string	NP 4 Qty	NP 5 Qty	Total Qty	Source	Action Req	Comments
1	Tubing, 4-1/2" EUE, 12.75 ppf, R2	165	165	330	Perth		
2	Pup joints - 4-1/2" EUE x 10'	2	2	4	Perth		
3	Pup joints - 4-1/2" EUE x 8'	1	1	2	Perth		
4	Pup joints - 4-1/2" EUE x 6'	1	1	2	Perth		
5	Pup joints - 4-1/2" EUE x 4'	1	1	2	Perth		
6	Pup joints - 4-1/2" EUE x 2'	1	1	2	Perth		
7	4-1/2" EUE collars	2	2	4			
8	Swage, 4-1/2" x 3-1/2" EUE, pin x pin crossover swage	2	2	4			
9	Pup joints - 3-1/2" EUE x 10' or 8'	3	3	6			
10	Collar, 3-1/2" EUE	2	2	4			
11	Tubing, 2-3/8" EUE, 4.7 ppf, R2	1	1	2			
12	Pup joints - 3-1/2" EUE x 10' perforated	1	1	2			
13	Swage, 3-1/2" x 2-3/8" EUE pin x pin	1	1	2			
14	Tubing, 2-7/8" EUE, 6.5 ppf, R2 (flareline quality)	5	5	10			
15	Crossover, 4-1/2" EUE pin x 4-1/2" IF box (stab v/v)	1	0	1			
	<b>Packers and flow control</b>	<b>NP4 Qty</b>	<b>NP5 Qty</b>	<b>Total Qty</b>	<b>Source</b>	<b>Action Req</b>	<b>Comments</b>
1	"X" nipple, 2.75" profile, 3-1/2" EUE (p x p)	1	1	2	Halliburton		
2	"XN" nipple, 2.75" profile, 2.635" NoGo, 3-1/2" EUE (p x p)	1	1	2	Halliburton		
	<b>Wellhead</b>	<b>NP4 Qty</b>	<b>NP5 Qty</b>	<b>Total Qty</b>	<b>Source</b>	<b>Action Req</b>	<b>Comments</b>
1	11" 3k x 7-1/16" 5k B section (incl studs, rings etc)	1	1	2	Kvaerner		
2	7-1/16" x 4-1/16" C section wellhead (incl studs, rings etc)	1	1	2	Kvaerner		
3	4-1/2" EUE Kvaerner hanger	1	1	2	Kvaerner		
4	2" NPT 3k variable choke (ensure redressed)	1	0	1			
5	Vaetrix plugs	2	2	4			
6	4-1/16" x 2" NPT 5M Companion Flange (incl studs, ring etc)	1	1	2	Kvaerner		
7	7-1/16" 5k x 13-5/8" 5k DSA (for BOP r/u on B section)	1	0	1	Century		
	<b>Completion fluids and filtration</b>	<b>NP4 Qty</b>	<b>NP5 Qty</b>	<b>Total Qty</b>	<b>Source</b>	<b>Action Req</b>	<b>Comments</b>
1							
2							
	<b>Perforating Equipment</b>	<b>NP4 Qty</b>	<b>NP5 Qty</b>	<b>Total Qty</b>	<b>Source</b>	<b>Action Req</b>	<b>Comments</b>
1	4-1/2" TCP guns, 12 spf, 34JL 22.7 gm HMX	TBA	TBA	TBA	Schlumb		
2	4-1/2" TCP spacer gun sections (incl safety spacer)	TBA	TBA	TBA	Schlumb		
3	2-3/8" EUE, open system, drop bar, firing head	1	1	2	Schlumb		
4	3-1/2" EUE mechanical gun release sub	1	1	2	Schlumb		

	Miscellaneous	NP4 Qty	NP5 Qty	Total Qty	Source	Action Req	Comments
1	6.1/8" tooth bit	1	0	1			
2	Casing scraper, 7" with 3.1/2" REG pin up	1	0	1			
3	Bit sub, crossover, 3-1/2" REG x 4-1/2" EUE	1	0	1	OCA Roma		
4	Enerpac pump, <u>test seals to 5k with gauge</u>	1	0	1	Kvaerner		
5	Kvaerner 4" BPV and 2waycheck, c/w running tool	1	0	1	Expertest		
6	Pipe dope, API modified	1	0	1			
7	2.75" PX plug	1	1	2			
8	2" Weco 602 hammer unions (complete)	3	3	6			
9	2" NPT nipples HEVIWALL	6	6	12			
10	Crossover swage, 2" NPT x 2-7/8" EUE p x p	1	1	2	Century		
11	2" Chicksen (complete)	4	0	4			
12	2" NPT Collars (Hevi-wall / Sch 80)	1	1	2			
13	1/2" NPT nipple (male x male) - (Sch 80)	1	1	2			
14	1/2" NPT plug	1	1	2			
15	1/2" NPT collar (f x f)	1	1	2			
16	1/2" NPT needle valve	1	1	2			
17	Paint pens	3	3	6			
18							
	<b>Handling / Other Equipment</b>	<b>NP4 Qty</b>	<b>NP5 Qty</b>	<b>Total Qty</b>	<b>Source</b>	<b>Action Req</b>	<b>Comments</b>
1	Tubing elevators, 4-1/2"	1	0	1			
2	Single joint pick up elevators c/w slings and swivel	1	0	1			
3	4-1/2" Tubing drift (42" long x 3.833" OD)	1	0	1			
4	Tong for tubing	1	0	1			
5	Stabbing board	1	0	1			
6	Pipe rams for 4-1/2" tubing	1 set	0	1 set			
7	Stabbing valve (4-1/2" IF? X 2.75" min bore ID)	1	0	1			