

## SECTION 1 - ENGINEERING DATA

### 1.1 Engineering Summary

Walton-1 and 2 are located in Northern Territory Exploration Permit 24 (EP24) approximately 50km to the north east of Daly Waters (Figure 1). The hole was drilled as an exploration well to test a large, thrust anticlinal structure identified from the 1989 Nutwood Downs seismic survey. The well was drilled by Pacific Oil & Gas Pty. Ltd. as sole permit holder and operator, using Rockdril Contractors Pty Ltd's Rig 20, a Longyear 600.

Access to the location was via the boundary fenceline between Maryfield and Kalala stations and a two kilometre access along seismic line 109. Drill site preparation involved clearing a drilling pad over an area of approximately 150m x 150m. Drilling and potable water was trucked from a bore on the adjacent property.

Well site supervision was provided by Ian Ledlie, Tony Kress and Doug Morris.

Drilling operations commenced at Walton-1 at 1300 hrs on August 6, 1989 with Rockdril Rig 20 drilling a 12 1/4 inch top hole to 6.2 metres. A six metre conductor pipe was cemented prior to continuing in 8 1/2 inch hole. The hole to this point was air-drilled with a rotary bit. At 42m circulation was lost in what was interpreted to be a cavernous limestone. Drilling continued with air to 58.9m where the pipe became stuck at 1600 hrs on August 8. Several attempts were made to free the pipe over the next three days. It was obvious that, at this stage the pipe could not be freed, and Walton-1 was abandoned at 1500 hrs on August 11, and the rig was skidded 10m to the south.

Walton-2 was spudded at 1430 hrs on August 13, 1989 with a 12 1/4 inch top hole and drilled with air. A 9 5/8 inch conductor pipe was set and cemented at 7.47m. Drilling was continued in 8 1/2 inch with mud. Circulation was lost at 39.7m, at which point the hole was cemented. The hole was continued in 8 1/2 inch, with no returns to 50.0m, where the rate of penetration dropped and a trip was made to change the bit. No suitable rotary bit was available onsite, so an eight inch hammer was run. This resulted in a much improved ROP and the hole reached 96m at 2200 hrs on August 16. The string was tripped from the hole and seven inch casing run, but had to be reamed down, and again hard ground prevented reaming past 51m. A decision was made to run and cement the seven inch casing at this depth. After drilling the casing shoe with a 5 7/8 inch tricone bit, a six inch hammer was picked up and the hole was drilled ahead rapidly to a depth of 191.7m. (Note: a water flow of approx. 1500 gall./hr was intersected at about 120m). At 191.6 metres five inch casing was run and cemented and the BOP stack was nipped up and tested to 1000 psi prior to cement being drilled out with a 4 1/4 inch rotary bit.

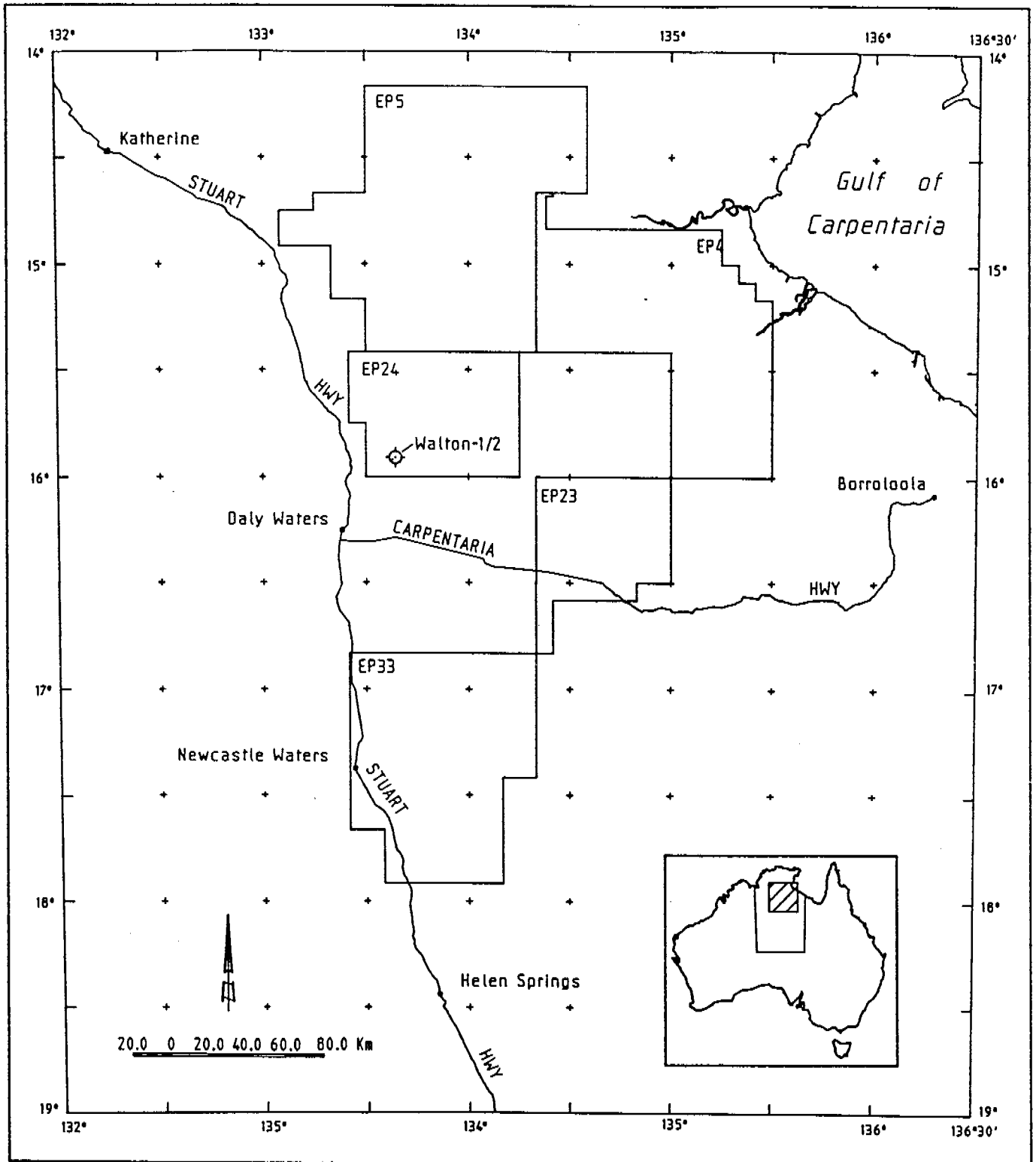


Figure 1. Location map for Walton-1 & 2.

A Formation Integrity Test was conducted and the formation held 800 psi (EMW 33.1 ppg). The CHD101 core assembly was then made up and the hole was fully cored to a depth of 778.5m, where a DST was run. The formation did not flow, and was presumed to be tight. Coring continued to a total depth of 1014.45m, where the hole was conditioned and wireline logs, including a velocity survey, were run.

Following evaluation of wireline logs and other drilling data it was decided to abandon the hole with the setting of cement plugs over the intervals, 242-142 metres and 45 metres to surface. The abandonment was completed and the rig released at 2000 hrs on September 24, 1989. A chronological log of drilling activities is included as Appendix 1.

1.2 General Data

Well Name: Walton-1,2  
Well Type: Exploration Well  
Operator: Pacific Oil & Gas Pty Limited  
Licence Holders: Pacific Oil & Gas Pty Limited 100%  
Petroleum Title: EP 24, Northern Territory  
Location: Walton-1,2  
Latitude: 15° 54'31.8" South  
Longitude: 133° 38'35.3" East  
Maryfield: 1:100,000 sheet  
AMG : 354746.2 E, 8240797.9 N  
Zone 53.  
Elevation: Walton-1,2  
Ground level: 192.0 m amsl  
Drilling Floor: 194.5 m amsl  
Total Depth: Walton-1: 58.9m below ground level  
Walton-2: 1014.45m below ground level  
Commencement  
Date: Walton-1: 6th August, 1989  
Walton-2: 13th August, 1989  
Total Depth  
Reached: Walton-2: 1715 Hrs 21st September, 1989  
Rig Released: 24th September, 1989  
Drilled by: Rockdril Contractors Pty. Ltd.  
Drilling Rig: Rig 20, Longyear 600

Hole Size: Walton-1  
12 1/4" to 6.2m  
8 1/2" to 58.9m

Walton-2  
12 1/4" to 7.47m  
8 1/2" to 50.4m  
8" to 96m  
6" to 191.7m  
110.5mm to 1010.2m  
103mm to 1014.45m  
All depths below ground level

Wireline Logs: Gamma, S.P., Temperature  
Gamma, Caliper, Density  
Dual Porosity  
Resistivity, Neutron  
Sonic  
Magnetic Susceptibility

Velocity Survey: Walton-2: 20 levels

Abandonment: Walton-1: Cement plug ten metres to surface.  
Walton-2: Cement plugs over the following intervals.  
242 to 142 metres  
45 metres to surface

### 1.3 Drilling Rig

#### ROCKDRIL RIG 20 - RIG AND EQUIPMENT DESCRIPTION

DRILLING RIG: Longyear 600

Depth Capacity: CHD 134 1,747 m (Rod Rating 1956m)  
CHD 101 2,180 m (Rod Rating 3050m)  
CHD 76 3,428 m (Rod Rating 2750m)

Power Unit: Caterpillar 3306-T 210 Hp @ 2,000 RPM  
620 lb. Ft. @ 1,400 RPM

Transmission: To Powerhead and Hoist Hydr/Mech (Funk) 4 speed  
Ratios: 6.27-1 (Blocked out on hoist)  
3.12-1  
1.75-1  
1.00-1

Bit Speeds: Based on 2000 Engine RPM @ 3,000 psi Pump  
Pressure: 1st - 130 RPM  
2nd - 260 RPM  
3rd - 466 RPM  
4th - 822 RPM

Powerhead: Pump & Drive Motor - Sunstrand 23 lb.  
Powerhead Ratio - 2.081:1  
Overall Ratio - 1st 13.09:1  
                  2nd 6.51:1  
                  3rd 3.65:1  
                  4th 2.087:1

Lubrication: Positive Lube Pump

Torque @ 4,500 psi - 1st 4,219 ft. IB  
                          2nd 2,099 Ft. IB  
                          3rd 1,179 Ft. Ib  
                          4th 673 Ft. Ib

Spindle I.D. 4-3/16" (106mm)  
Retraction 14" (355.6mm)

Max. casing size with head retracted - 12 "  
(304.8mm).

Feed System: Feed Length - 11 ft (3.35m)  
Cylinder Size - 5" Bore x 2-1/2" Piston Rod  
Lift Capacity - 73,625 lbs (33,396 kgs) @ 2500 PSI  
Thrust - 7,856 lbs (3,422 kgs) @ 200 PSI  
Hydraulic Pump -2 stage Compensator 2500 PSI  
                          and 200 PSI (Delavan)

Chuck: Hydraulic 3 - Jaw tungsten Inserts, Subs required  
to convert to top drive of Kelly from  
approximately 1200m 101 size hole.

Main Hoist: Type: Hydr/Gear  
Drum Diam: 9-1/2" (241.3mm) - Grooved  
Drum Length: 20-5/8" (523.87mm)  
Flange Diam: 18-1/4" (463.55mm)  
Drum Capacity: 730' x 5/8" Cable (223m x 16mm)  
Hydr. Pump: Sunstrand f23  
Hydr. Motor: Sunstrand f23 2-speed

	<u>Low</u>	<u>High</u>
1st	N/A	N/A
2nd	0-118ft/m (136m/m)	0-177ft/m (54m/m)
3rd	0-211ft/m (64.3m/m)	0-316ft/m (96m/m)
4th	0-370ft/m (113m/m)	0-555ft/m (169m/m)

Hoisting Capacity:

	<u>Single</u>	<u>4 Pt. Line</u>
1st	N/A	N/A
2nd	5,000 lbs (6804 kgs)	60,000 lbs (27,216 kgs)
3rd	9,750 lbs (4422 kgs)	39,000 lbs (17,690 kgs)
4th	5,500 lbs (2495 kgs)	22,000 lbs (9,979 kgs)

Brake:           Size - 18" x 14" (457 mm x 101 mm)  
                  Area - 226 sq. ins. (1458 cm<sup>2</sup>)  
                  Brakes used for holding loads only  
                  Power up and down through hydraulics

Wireline Hoist: Type:           Hydraulic-Chain drive from Main  
                                  Hoist Motor  
                  Drum Diam:       5-1/2" (140mm)  
                  Drum Length:     17-1/8" (435mm)  
                  Flange Diam:     30" (726mm)  
                  Drum Capacity:  6486 ft. x 5/16"   Cable (1996 m  
                                  x 8 mm) at 75% of  
                                  Spool Level Wind  
                  Bare Drum Speed: 0-1000 F.P.M. (305 m/m)  
                  Control:        Power up and down through  
                                  hydraulics with free wheel.

Mast:            Crown Block Rating   121000 lbs. (54886 kgs) inc. 1.64  
                                  Factor of safety  
                  Hook Load Rating:  60000 lbs (27216 kgs) with 4 part  
                                  line  
                  Method of Raising:  Hyd. Cyl. (2)  
                  Rod Stacking Cap:  30 & 40 ft. stands  
                  Guy Lines Required:  4  
                  Mast Length:     58.4" (17.78 m)  
                  Weight Indicator:  Indicator gauge to 60000 lbs with  
                                  4 part line.

Mounting:       Trailer mounted with four levelling jacks

Mud Pump:       5 x 6 G.D. Pump rated 150 G.P.M. @ 310 PSI  
                  Powered by Sunstrand f21 Pump & Motor with Gear  
                  Reducer  
  
                  7-1/2 x 10 G.D. Pump Rated 487 G.P.M. @ 255 PSI (211  
                  G.P.M. @ 574 PSI - Powered by 4-71 G.M. Diesel.

Fluid Pumps: 2 x 535 Bean Pumps Powered by Sunstrand  
f21 Pump Driving 2 sunstrand f20 in series with bypass  
Max. Flow - 1 pump 35 G.P.M.  
Max. Flow - 2 pumps 70 G.P.M.

Specifications of Associated Equipment

Substructure: Rig raising sub-base - 7m long 2.5m width x 2.0m high

Derrick Floor: 3.5 m long width x 2.0 m high  
Swivel: Longyear Type LD max. safe static  
working load 28 tons. Max safe  
working load when rotating 15 tons at  
200/300 RPM.  
Weight  
Indicator: Martin-Decker Model WS8-11

Mud System:

- a. Mud system consisting of the following items:

Settling Tank

Overall dimensions 4.8m long 2.00m wide 0.90m high  
Mounted on oilfield type skid 6m long  
Capacity 8,600 litres (2,275 gals-54 BBLs)

Equipped with:

Geosource shale shaker capacity 300/500 GPM size 4' x 5' dual  
screen driven by an hydraulic motor 10HP

Pickup pump fe centrifugal 500 GPM hydraulic motor

Desilter 200 GPM model Economaster S2-E4

Mud agitator type axial flow impell 45 degree flat blade  
turbine, driven by a hydraulic low speed 60 RPM high torque  
motor.

Pump type Mission 3 x 4 x 13 centrifugal belt driven from  
engine.

Prime mover W/Power takeoff type Lister HR4 52 HP 1800 RPM

Hydraulic System: Gear pump tandem type suitable to operate  
pick-up, shale shaker, 2 mud agitators, centrifugal pump 2 x  
2-1/2 x 12 (No. 1 Agitator and 2 Centrifugal pumps are fitted  
on the other tank)

Mud gun

Degasser

- b. Mixing/storage tank-two compartments  
Overall Dimensions 4.8m long 2.00 wide 1.20 high mounted on  
oilfield type skid 6m long capacity 11,500 litres (3,042 gals  
- 72.4 BBLs)

Equipped with:

Centrifugal pump-Kelly-Lewis 2 x 2-1/2 x 13 driven by a  
hydraulic motor 18 HP

2 mud agitator W/impeller 26" hydraulic driven

2 mud gun

- c. Cementing/Killing unit mounted skid 6m long 22m wide w/two  
tanks around 1,000 gals. capacity each

Prime mover Lister diesel engine mel H46 103 Hp

Power take-off twin disc dry type

Gear box flexible coupling

Oilwell pump model D-323 type Triplex max. bore x stroke  
2-1/2" x 3" rated HP 60 rated press. 4,000 PSI rated RPM 500

Agitators 6 HP capacity 60RPM hydraulic driven one on each  
tank

Centrifugal pump type Kelly-Lewis K-70 2" x 2-1/2 x 9"  
Hydraulic driven

Hydraulic system including tandem gear pump driven from front  
of engine.

Cameron gate valve 2" 3,000 PSI

Cameron pressure gauge 3,000 PSI

Shear relief valve 3,000 PSI

Wellhead Equipment:

No.1 BOP Hydril 6"-3000 PSI W.P. Type GK bottom flanged  
6"-3000 PSI bore size 7-1/6"

No.1 BOP Shaffer 6" x 3,000 PSI W.P. Type B double unit top  
and bottom studded bore size 7-1/16"

No.1 Breda National Wellhead 5000 PSI to suit 7", 5", 4"  
casing plus all accessories

No.1 Drilling spacer spool 3000 PSI W.P. bottom and top  
flanged 6"-3000 PSI two outlets-1st flanged 2"-3000 PSI, 2nd  
3"-3000 PSI bore size 7-1/6"



No.2 National valve 2"-3000 PSI W.P. flanged for kill line  
No.1 National valve 3"-3000 PSI W.P. flanged for choke line  
No.1 National valve flo-tork model 3"-3000 PSI W.P.  
W./Hydraulic actuator  
No.1 Cameron check valve type R2"-3000 PSI W.P.  
No.1 National choke manifold assy. 3"x2-1/2" 3000 PSI W.P.  
No.1 Kill line 2"-3000 PSI W.P.  
No.1 Choke line 3"-3000 PSI W.P.  
No.1 Hydril automatic pump accumulator unit type HP-17-K80  
No.1 Shaffer hydraulic control panel pedestal type for BOP  
remote control  
No.1 Shaffer auxiliary control panel  
No.1 Bourne upper kelly cock 3000 PSI W.P.  
No.1 TIW Lower kelly cock 3000 PSI W.P.  
No.2 Gray Inside BOP (float valve) 3000 PSI W.P.  
No.1 Guiberson type G tubing preventor 1,500 PSI W.P.  
No.1 Guiberson Wireline oil savers type H W/hydraulic pump  
3000 PSI W.P.  
No.1 Guiberson Type C releasing attachment  
Set stabbing valves for different thread connections-flare  
line

Tubular Equipment and Fishing Tools:

CHD 101 Longyear rods O.D. 3.701" I.D. 3.268 (Midbody) I.D.  
3.091 joint depth rating 10,000 ft. (3,050m)  
Set of cross-over subs  
Core barrels for CHD 101mm  
Gotco overshot O.D. 5-7/8" w/spiral to catch from 2-3/8" to  
4-7/8  
Taper and bell taps for all tubing sizes

Surface and Casing Equipment:

Longyear automatic pre-torque and break-out tool rod size CHD  
76 through CHD 101  
Casing size E through N  
Max. torque (breakout) 2,8000 lb/ft  
Max. torque (make-up) 2,4000 lb/ft  
Rod clamp weight capacity 4,000 lb

Baash-Ross hinged casing spider w/different bushing

Baash-Ross casing slips 6-5/8"

Handling tools for 4", 5" and 7" casing

Set of circulating head for different sizes of casing

Set of lifting plugs for all tubing

Auxiliary Equipment:

Explosion proof lighting system

A.C. electric generator KVA60

A.C. electric generator KVA35

Water storage tank 2,000 gallons

Fuel storage tank 500 gallons

Workshop barrack

Motorpump type mono

Centrifugal pumps (2") - Petrol driven

Transportation and Lifting Means:

1 6 x 6 Mack truck fitted with hydraulic crane

2 Toyota Land-cruiser pick-up 4WD

Miscellaneous:

Radio-wireless set SSB radio fitted with appropriate flying  
doctor frequency

Set of mats for setting rig

Set of extinguishers

Drill collars and stabilizers to suit hole specifications.

1.4 Hole Sizes and Depths

- Walton-1: Drilling commenced with the air drilling of a 12 1/4" hole to 7.4m. The hole was then air drilled with an 8 1/2" bit to 58.9m.
- Walton-2: Walton-2 commenced with the drilling of a 12 1/4" hole to 7.47m; then with an 8 1/2" hole to 50.0m. An 8" hole was hammer drilled to 96m and a 6" hole to 192.5m. The remainder of the hole was fully cored with CHD 101, initially with a 110.5mm near bit reamer, but this was subsequently replaced with a 103mm reamer at 1010.2m.

1.5 Casing and Cementing

- Walton-1: 9 5/8" conductor set at 6.2m.  
Make: Kawasaki  
No of Joints: 1  
Cement Used: 6 sacks class A cement  
Accessories: Nil  
Remarks: Cemented to surface
- Walton-2: 9 5/8" conductor set at 7.47m.  
Make: Kawasaki  
No of Joints: 1  
Cement Used: 15 sacks class A cement  
Accessories: Nil  
Remarks: Cemented to surface
- 7" surface casing set at 50.4m  
Make: Kawasaki  
Weight: 26 lb/ft  
Grade: N80  
No of Joints: 4  
Cement Used: 47 sacks class A cement  
1 sack CFR2  
Accessories: Cement shoe  
Remarks: Cemented to Surface
- 5" intermediate casing set at 191.6m  
Make: Kawasaki  
Weight: 13 lb/ft  
Grade: K55  
No of Joints: 19  
Cement Used: 34 sacks class A cement  
1 sack CFR2  
Accessories: Cement shoe  
Remarks: No returns were observed at the surface.

TABLE 1

BIT SUMMARY

WALTON-1 & 2

Bit No	Make/Type	Serial No	Depth in (m)	Depth out (m)	W.O.B. (kg)	R.P.M.	Pump Pressure (psi)
	<u>WALTON-1</u>						
1	Reed, tricone 12 1/4 inch	-	0.0m	6.2	3000	70	-
2	Reed, tricone 8 1/2 inch	874701	6.2	58.91	3-9000	20-50	-
	<u>WALTON-2</u>						
1	Reed, tricone 12 1/4"		0.0	7.47	9000	60	-
2	Reed, H7615, tricone 8 1/2"	BR4922	7.47	42.39	7000	70	200
3	Security, S44F, tricone 8 1/2"	447249	42.39	50.0	6000	70	-
RR2	Reed, tricone, H7615 8 1/2"	BR4922	50.0	50.19	6000	70	-
4	Flat-face, hammer 8"		50.00	96.00	3000	50	300
5	Varel, tricone, VM2	135791	DOC	96			
6	Flat-face, hammer, 6"	L69347	96.0	192.0	2000	40	
7	Walker McDonald, 4 1/4"	2N8947	DOC				
8	Longyear, 8-step 101mm	L27934	191.7	196.3	6000	250	200
9	Longyear-Impregnated S6	L10458	196.3	453.9	5000	200	300
10	Longyear-Impregnated S6	L31345	453.9	570.9	4000	250	200
11	Longyear-Impregnated S6	L29029	570.9	580.5	6000	250	300
12	Longyear, 4-step 25/35101mm	L31704	580.5	663.5	6000	250	450
RR11	Longyear-Impregnated S6	L20627	663.5	672.7	7000	250	600
13	Longyear, 4-step 101mm	L13739	672.7	778.5	5000	250	400
RR11	Longyear-Impregnated S6	L29029	778.5	829.0	6000	250	350
14	Longyear-Impregnated S6	L29028	829.0	939.5	4000	250	300
RR10	Longyear-Impregnated S6	L31345	939.5	987.85	6000	250	300
15	Longyear-Impregnated S8	L31348	987.85	1014.45	12000	300	350

1.6 Drilling Mud

Walton-1 was spudded using an air drilling system, using stiff foam where lost circulation was encountered. Walton-2 was spudded with water to which Ausgel was added in sweeps between connections. The section from 50.0m to 96.0m was air-drilled with stiff foam injection. The section from 96m to 192.5m was hammer-drilled with water being lifted from the hole. The remainder of the hole was drilled with a DrillFloc system, a polyacrilamide mud, with up to 3% KCl added towards the lower part of the hole.

Details of the drilling fluid properties and mud consumed for the hole is given in Appendix 2.

1.7 Water Supply

Both drill and potable water were trucked from a water bore ten kilometres from the well site on Kalala station.

1.8 Bit & Deviation Record

1.8.1 Drilling Bits

Two drilling bits were used in the drilling of Walton-1. Fifteen bits were used in the drilling of Walton-2; details of bit usage are given in Table 1.

1.8.2 Deviation

Deviation Survey details are given in Table 2, no deviation surveys were conducted in Walton-1.

TABLE 2

Deviation Survey Record

WALTON-2

Depth (m)	Deviation (°)
115.7	1
321.7	1/4
420.0	1/4
519.7	3/4
580.0	3/4
636.0	1
730.0	1 1/4
830.0	2 1/2
940.0	2 3/4

### 1.9 Fishing and Related Operations

The following fishing operations were conducted at Walton-1 when pipe became stuck in the hole at a depth of 58.9 metres:

- (i) The 101mm pin thread was bakerlocked into the 3 1/2" IF X/O Sub at the bottom of the Kelly rod. Using a combination of drawworks, feedrams and casing jacks, 175 000lbs of pull was exerted on the stuck pipe, with no success.
- (ii) A stinger string was run into the hole and air and water injected in an attempt to clear cuttings from the annulus. The stinger string could not be worked past the string stabilizer. After removal of the string 200 000 lbs pull was exerted on the stuck pipe, also without success.
- (iii) The string was backed out above the collars and an overshot made up and run in the hole in an attempt to back off collars further down the hole, this was unsuccessful.

### 1.10 Formation Testing

No formation tests were conducted in Walton-1. A drill stem test was conducted in Walton-2 over the interval 755.86 to 778.5m on the 7th September. The conventional bottom-hole test commenced at 0552hrs on the 7th and was pulled at 0548hrs on the 8th. Approximately 15 metres of slightly oil-cut mud was recovered from the drill collars above the tool. The tool itself contained mud without any oil cut. Full details of the test and the subsequent attempt to swab the hole (DST 2), which also failed to produce a flow, can be found in Appendix 3.

### 1.11 Time Distribution

Time spent on the various phases of the drilling operation are given in Appendix 4, and a time-depth curve for Walton-1,2 is included as Figure 2.

### 1.12 Well Costs

A detailed cost break-down for Walton-1,2 is given in Table 3.

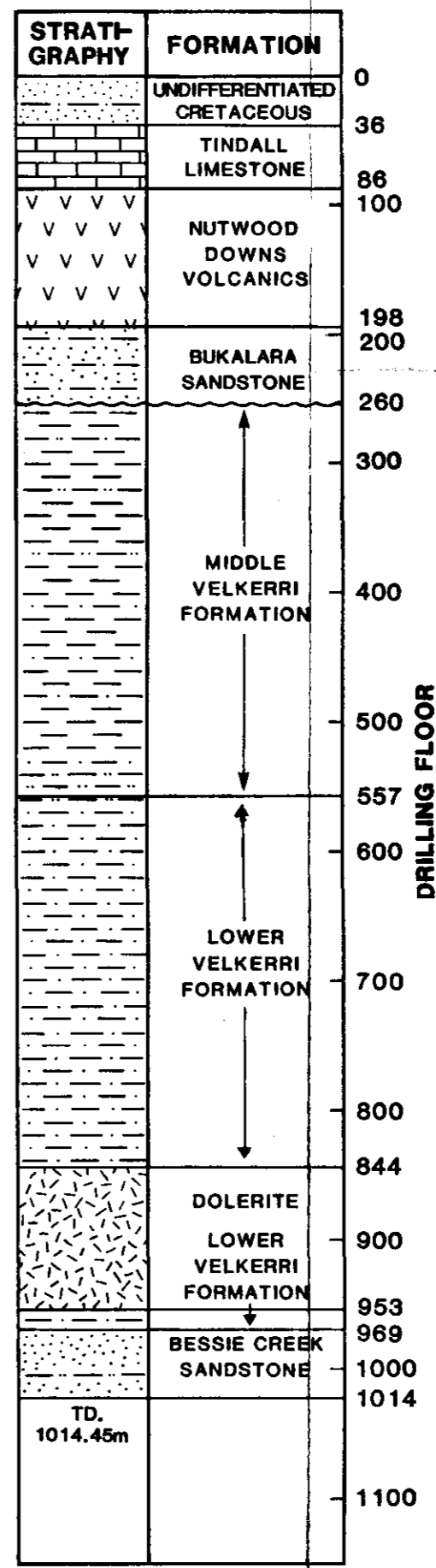
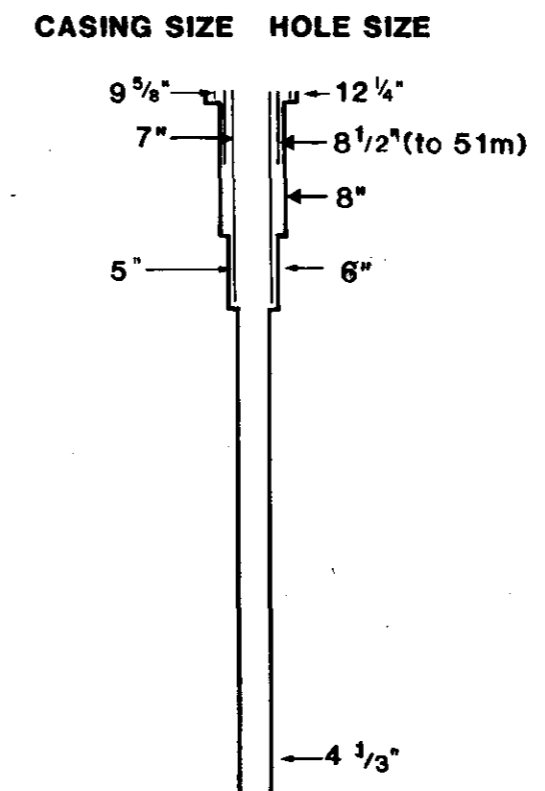
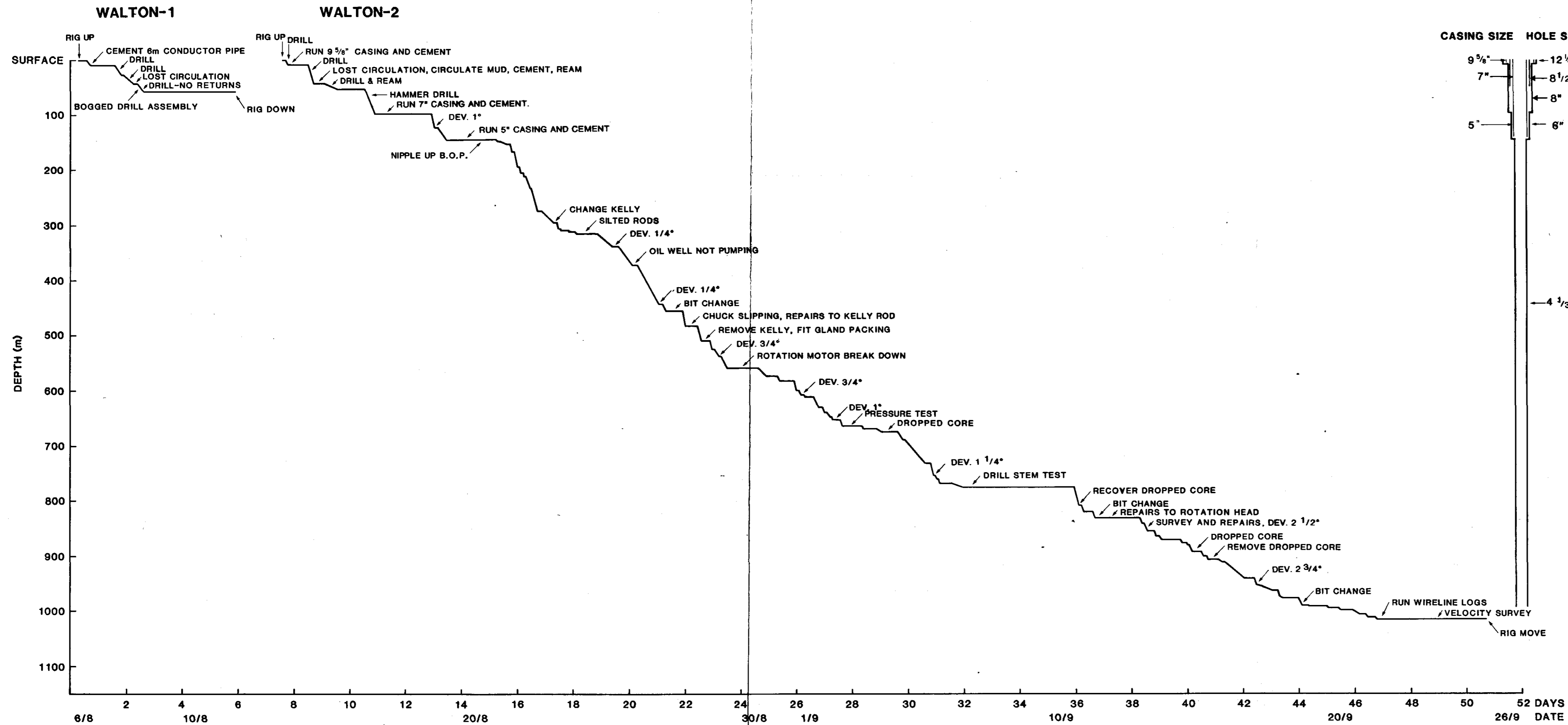


Figure 2

Pacific Oil & Gas Pty Limited

## WALTON-1 & 2

### TIME DEPTH CURVE

REF.		DRAFTING	Kemp Cartographica
SCALE	1:5000	REPORT	303794
AUTHOR	K. Malm, K.P.L.	PLAN No	PetNTcw4204
DATE	January, 1990		

TABLE 3

WELL COSTS

WALTON-1, & -2

as at 30/6/90

ITEM	TOTALS
Drilling	571,979
Supplies & Communications	18,116
Vehicle Operation	3,076
Travel & Accommodation	84,942
Contractors & Professionals	3,150
Laboratory Analysis	11,660
Salaries, Office Costs, & other Costs	57,038
TOTAL	750,006