



WEST TUNA W-38a

FINAL WELL REPORT

Prepared by

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SECTION 3 -- GEOSERVICES WELL LOGS

West Tuna W-38a	MASTERLOG --	1:500 scale from 740 to 1730 metres 1:200 scale from 1600 to 1730 metres
West Tuna W-38a	DRILLING LOG --	1:1000 scale from 740 to 1730 metres
West Tuna W-38a	GAS RATIO LOG --	1:200 scale from 1600 to 1730 metres

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1	24-05-2002	Geoservices Unit 95	Base Mudlogging Coordinator	

Section 1

General Well Summary

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WELL DATA

Operator : Esso Australia Ltd
Platform : West Tuna
Well name : West Tuna W-38a
Country : Australia
Location : Gippsland Basin
Structure : Tuna M-1
Field : West Tuna
Permit : Vic / L4

Location AMG co-ordinates 5 771 793.14 mN 621 529.76 mE

Location Local co-ordinates Lat: 38° 11' 36.515" S Long: 148° 23' 16.169" E

Target Local co-ordinates 59.8 mS 659.8 mE

Profile : Deviated
Reference depth : Rotary Table
RT to Seabed : 95.69 metres
RT above M.S.L. : 34.69 metres
Sea-water depth : 61.00 metres
Proposed total depth : 1722 metres
Actual total depth : 1730 metres
True vertical depth : 1472.5 metres
Spudded on : 18th May 2002
Total depth reached on : 21st May 2002

Drilling Contractor

Drilling Contractor : NABORS ISDL
Rig name : 453
Rig type : Platform

Drilling Phases

Diameter (inch)	From (m)	To (m)	Mud Type
8½"	740	1730	KCl / Glycol / PHPA

Cased Hole

Casing Diameter (inch)	Casing Type	Shoe Depth (m)
20"	Conductor Shoe	166.8 MDRT (Existing)
10 ³ / ₄ "	Surface	726.8 MDRT (Existing)
7"	Production Liner	1718 MDRT

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MUD LOGGING

Logging Unit Number: 95

Engineers: M. Boyd., G. Fawns, P. Rady, M. Smith

Sampling Interval

Sample Type	Number of sets	Quantity per set	Sampling interval	From (m)	To (m)
Washed and Dried	3	100 grams	10 metres	1440	1610
Washed and Dried	3	100 grams	5 metres	1610	1730

Cuttings Distribution

Company	Washed and Dried Sample Set
Esso Australia	1
Victorian Department of Energy and Minerals	1
Australian Bureau of Resources	1

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WELL SUMMARY

West Tuna W-38a is an infill well west of the West Tuna platform with the primary objective to enhance recovery of the M-1 oil reservoir. The well was drilled to a total depth of 1730m MDRT (1472.5 mTVDRT) in 8½" hole and completed with a single oil completion string of 3½" tubing in 7" production liner.

West Tuna W-38a was kicked off at 17:15 hours on 18th May 2002 after drilling out the cement plug to 740 m.

After the plug and abandonment of West Tuna W-38 was completed, a 8½" rock bit was made up with a motor and ran in the hole to the top of the cement plug at 681 m. The cement plug was drilled out to 740 m and the well kicked off drilling to 760 m drilling with seawater. The well was then displaced to a 8.8 ppg KCl/PHPA/Glycol system, a successful P.I.T. was conducted to 433 psi (12.5 ppg EMW with 8.8 ppg mud) and the bit pulled. A kick-off MWD/LWD steerable assembly with a Geodiamond PDC bit and motor set at 1.5° was then made up and ran in the hole to 760 m. The well kicked-off and was rotary and slide drilled ahead from 760 m to Total Depth at 1730 m. Baracarb-25 and Baracarb-100 were added to the mud system prior to entering the Latrobe Formation to bridge the pore throats and reduce the likelihood of differential sticking and seepage losses.

West Tuna W-38a reached a total depth of 1730 m (1472.5 mTVD) at 15:15 hours on 21st May 2002. The final survey at a depth of 1702.07 m had an inclination of 39.12° and an azimuth of 275.30°. 7" production casing was run to a depth of 1718 m and was completed as a single oil string with 3½" completion tubing.

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WELL PROFILE

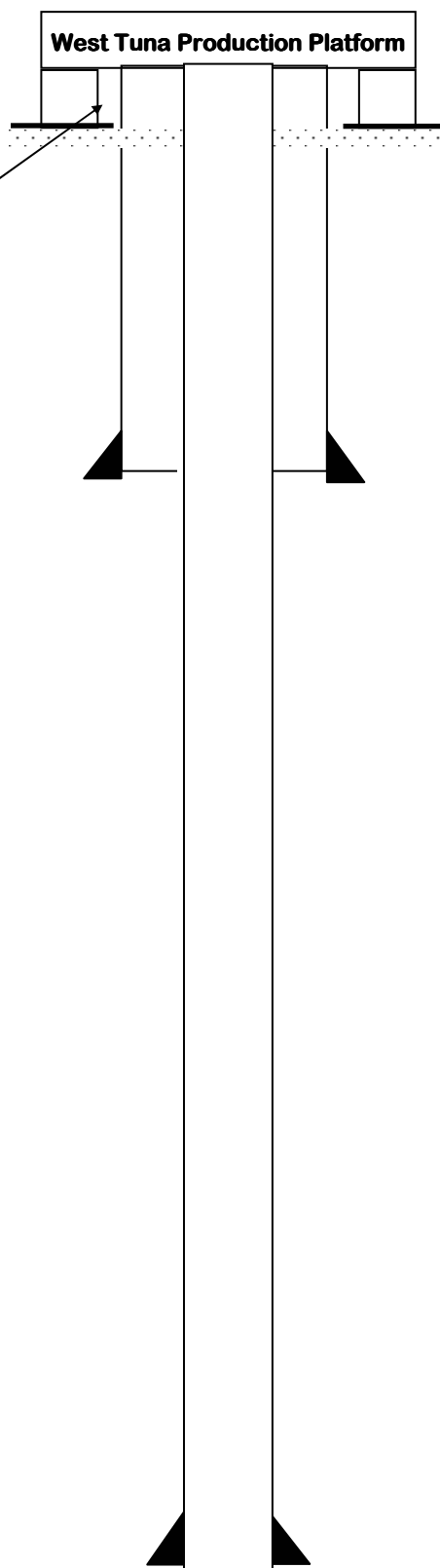
 Rotary Table to Mean Sea Level
 34.69 m

Rotary Table to Sea Bed 95.69 m

20" conductor shoe at 166.8 m

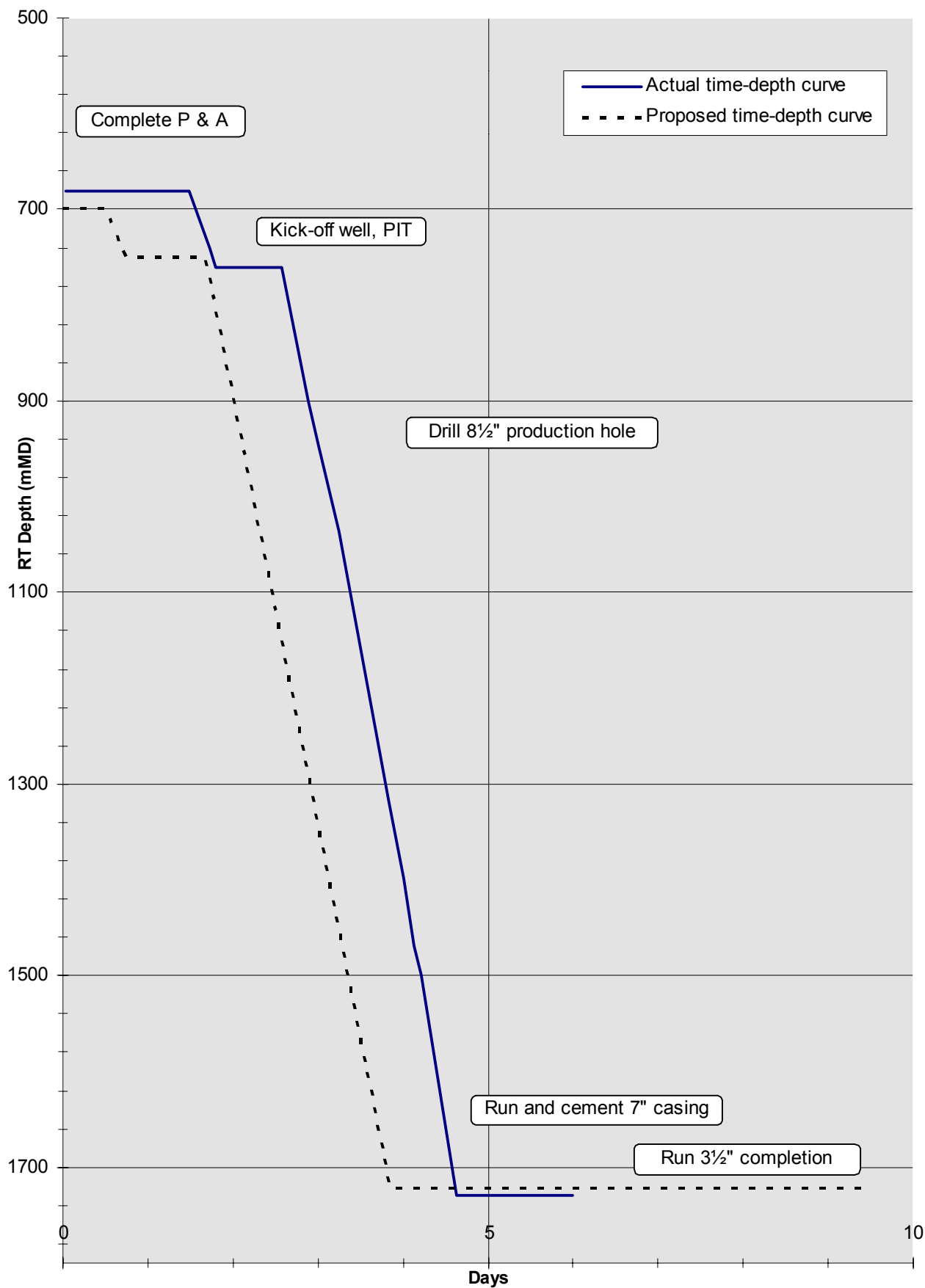
10¾" Surface casing at 726.8 m

7" Production liner set at 1718 m


Nabors Rig 453
Spudded W-38a
18th May 2002
From 740 m
760 m - 1730 m
Mud Weight 8.9 - 10.5 ppg
8½" Hole drilled to 1730 m

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WTN W-38a TIME-DEPTH CURVE (measured depth)



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BIT RUN SUMMARY

BIT	Size (")	Type	Jets	In (m)	Out (m)	Hours	Condition
1RR	8½	Hughes MX20D	3 x 20	740	760	1.8	1-2-WT-A-E/E/E-IN-BT-BHA
2	8½	SII Geodiamond S75HPX	7 x 14	760	1730	30.57	1-1-WT-A-X-IN-CT/BT-TD

CASING DATA

Type	Size (Inches)	Weight (lb/ft)	Grade	Thread	Depth (mMDRT)
Conductor	20"	84	K-55	BTC	166.8
Surface	10¾"	54.5	K-55	BTC	726.8
Production	7"	26	L-80	LT&C	1718

CEMENTING DATA

Casing details	Cement Type	Dry Cement Volume (sx)	Cement Additives	Mix Water (bbls)	Slurry Volume (bbls)	Slurry Density (ppg)	Cement to/from (mMDRT)	Casing Pressure Test (psi)
7"	ABC Class G	360	Halad 413L 32 gal/10 bbl SCR-100L 1 gal/10 bbl	45	78	15.8	1718	Not Available

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WELL DIRECTIONAL PROFILE
(From Geoservices ALS Software)

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WELL DIARY

17th May 2002	End of WTN W-38 plug and abandonment, start WTN-W38a at 01:00 hours. Change out upper BOP rams. Function test BOP's and pressure test cement plug. Change out lower pipe rams to 5". Pull wear bushing. Make up test assembly and test BOP's. Run wear bushing. Wait on weather whilst mix drilling mud and doing rig maintenance.
18th May 2002	Continue to wait on weather whilst mix drilling mud and doing rig maintenance. Prepare BHA, pick up motor and set bend, make up Bit and BHA and run in hole to top of cement at 681 m. Drill cement from 681 m to 740 m. Kick off from 740 m and drill / slide 740 m to 760 m. Displace well to 8.8 ppg mud, circulate and condition mud. Pull out of hole to 721 m. Rig up Howco and conduct PIT. Rig up Schlumberger and run Gyro survey.
19th May 2002	Rig up Schlumberger and run Gyro survey, obstruction at 551 m. Pull out of hole and rig down Schlumberger. Pull out of hole with drill pipe from 759 m to 22 m. Run in hole to 759 m. Rig up Schlumberger and run Gyro survey. Pull out of hole and rig down Schlumberger. Pull out of hole with drill pipe. Make up new BHA and run in hole. Drill, slide and survey from 760 m to 946 m.
20th May 2002	Drill, slide and survey from 946 m to 1398 m.
21st May 2002	Drill, slide and survey from 1398 m to 1730 m. Work pipe and circulate hole clean. Pull out of hole to 710 m and circulate hole clean. Slip and cut and service rig. Run in hole to 1730 m.
22nd May 2002	Run in hole to 1730 m. Circulate hole clean. Pull out of hole to 711 m soft breaking each connection. Circulate hole clean and run in hole to 1730 m. Circulate hole clean and pull out of hole. Pull wear bushing and jet well head. Change out upper pipe rams and pressure test.
23rd May 2002	Complete pressure testing. Dress rig floor to run 7" casing. Run 7" casing as per program. Land out and cement as per program. Geoservices released at 21:30 hours

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Section 2

Geological Summary

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FORMATION TOPS

DESCRIPTION	MD (m) - RT	TVD (m) - RT
Top of Gippsland Limestone	Not Applicable	
Top of Lakes Entrance	1268.5	1113.6
Top of Latrobe Group	1615.5	1383.6
Top of Coarse Clastics	1625.5	1391.8
TOTAL DEPTH	1730	1472.5

GEOLOGICAL SUMMARY**GIPPSLAND FORMATION:**760 m - 1220 m **LIMESTONE**

CALCILUTITE Very light olive grey to light grey, medium grey in part, fossils and fossil fragments, minor to trace disseminated and nodular pyrite, trace calcite grains, trace carbonaceous specks, trace micromicaceous, predominantly soft to dispersive, occasionally firm, amorphous to sub-blocky.

1220 m - 1268.5m **MARL**

MARL Pale olive grey to medium dark grey, common disseminated and trace nodular pyrite, trace glauconite grains, minor micromicaceous, minor microfossils, soft to firm, sub-blocky.

LAKES ENTRANCE FORMATION:1268.5 m - 1615.5 m **CLAYSTONE**

CLAYSTONE Light olive grey to olive grey, very calcareous, 5% disseminated fine carbonaceous material, occasional Foraminifer, trace micromica, trace micropyrrite, firm to occasionally moderately hard, sub-blocky.

LATROBE FORMATION:1615.5 m - 1625.5 m **Interbedded SANDSTONE and CLAYSTONE**

CLAYSTONE Predominantly light olive grey to light brownish grey, occasionally medium dark grey, very calcareous, 5% fine carbonaceous material, trace micropyrrite, occasional Foraminifer, soft to predominantly firm, occasionally moderately hard, sub-blocky.

SANDSTONE Medium dark grey, greyish brown, dark reddish brown, common mottled, fine grained, moderately sorted, strong calcareous and dolomitic cement, common argillaceous/limonitic matrix, common glauconite, hard aggregates, tight to very poor visual porosity, no fluorescence.

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COARSE CLASTICS:

1625.5 m - 1730 m

SANDSTONE with CLAYSTONE**SANDSTONE**

Quartzose, clear to translucent, medium to very coarse, moderately sorted, sub-angular to sub-rounded, common angular fractured clasts, trace siliceous cement, trace pyrite cement in part, trace argillaceous matrix, predominantly loose and clean, good inferred porosity, trace fluorescence.

Fluorescence: 1645 m - 1665 m: trace dull even greenish yellow fluorescence, instant diffuse yellowish whit crush cut, thin film to ring residue.

CLAYSTONE

Pale yellowish brown to pale brown, slightly calcareous, slightly silty, minor fine carbonaceous material, soft to dispersive, amorphous.

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GAS REPORT

Gas was recorded from the kick-off point in the 8½" hole with initial background levels of 3 units and increasing to 10 units at the Latrobe Formation at 1615.5 m. Composition of this gas was C₁ with traces of C₂ at the Lakes Entrance.

On penetrating the Latrobe formation at 1615.5 m, there was a marked increase in gas levels, from 10 units to an initial peak of 46 units at 1627 m. The composition of the gases also changed with an increase in heavier gases (C₂ to C₅), indicating a hydrocarbon bearing lithology. Higher peaks were detected on penetration of the Coarse Clastics with a maximum peak of 863 units being recorded. Beneath the oil water contact gas levels gradually dropped from 50 units to around 20 units at TD.

Localised increases in background gas are attributable to both lithology variations and the penetration rate which was dependant upon the drilling method, being either rotary or slide, carried out at the time. No CO₂ or H₂S was detected while drilling West Tuna W-38a.

Gas peaks through the Latrobe Group

Depth metres	Total Gas units	C ₁ %	C ₂ %	C ₃ %	iC ₄ %	nC ₄ %	iC ₅ %	nC ₅ %
1627	46	0.64	0.02	0.01	-	-	-	-
1633	114	1.25	0.10	0.04	0.01	-	-	-
1646	863	9.68	0.62	0.26	0.05	0.07	0.03	0.01
1659	156	1.28	0.13	0.07	0.01	0.02	0.01	-

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