Kyalla 117 N2-1H ST2

Well Completion Report
(Basic)

EP 117
Beetaloo Sub-basin
Northern Territory

Origin Energy Resources Ltd

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BHA	Bottom Hole Assembly
BOP	Blow Out Preventer
CVT	Constant Volume Trap
DDR	Daily Drilling Report
DF	Drill Floor
DFIT	Diagnostic Fracture Injection Test
DGR	Daily Geological Report
DST	Drill Stem Test
EMW	Estimated Mud Weight
EP	Exploration Permit
FIT	Formation Integrity Test
Fm	Formation
ft	feet
GVR	Geo-Vision Resistivity
HF	Hydraulic Fracturing
ID	Inner Diameter
JV	Joint Venture
KB	Kelly bushing
LOP	Leak Off Pressure
LOT	Leak Off Test
LWD	Logging While Drilling
m	metre
MD	Measured Depth
mMD	metres, measured depth
mRT	Metres, Rotary table
mMDRT	Metres, measured depth, rotary table
MW	Mud Weight
MWD	Measurement While Drilling
OD	Outer Diameter
PDC	Polycrystalline Diamond Compact
POOH	Pull Out Of Hole
ppg	Pounds per Gallon
psi	pounds per square inch
RCJB	Reverse Circulation Junk Basket
RIH	Run in Hole
RSS	Rotary Steerable System
RT	Rotary Table
ST	Side-track
TD	Total Depth
WBM	Water based mud
XLOT	Extended Leak Off Test

1 INTRODUCTION

Kyalla 117 N2-1H ST2 was drilled within Exploration Permit 117(R) in the Northern Territory, Australia by the Origin Energy Resources Ltd and Falcon Oil and Gas Joint Venture ("JV"). The well was planned as a horizontal appraisal well kicking off from the vertical exploration well Kyalla 117 N2-1. The primary aim of Kyalla 117 N2-1H ST2 was to evaluate the hydrocarbon potential of the lower Kyalla shale (primary target).

The well is located approximately 70 km south east of the town of Daly Waters (Figure 1). The Kyalla 117 N2-1H wellbore was spudded on 30 November 2019 at 23:30hrs when the kick-off plug was drilled out from the vertical exploration well Kyalla 117 N2-1 in the azimuth of 150° (Grid North). Termination of the wellbore was confirmed at a total depth of 1628.7mMDRT on December 06, 2019 after several unsuccessful fishing attempts. The Kyalla 117 N2-1H ST1 wellbore was subsequently side-tracked on December 07, 2019 from a kick-off depth of 1457mMDRT. The well was plugged and abandoned on January 06, 2020 due to the wellbore no longer being in specification for planned post drilling hydraulic fracture stimulation. Operations on a second side-track, Kyalla 117 N2-1H ST2, began on January 24, 2020. The wellbore was drilled approximately 180° from Kyalla 117 N2-1H and Kyalla 117 N2 1H ST1, with an azimuth of 329° (Grid North). A total depth of 3809.1mMDRT was reached on February 13, 2020. Casing and cementing operations on Kyalla 117 N2-1H ST2 were completed on February 20, 2020 and Ensign Rig 963 was rig released on February 21, 2020 at 14:00hrs.

EP 117 is one of three permits held by the JV, in which Origin Energy is the operator. The three permits are located within the Beetaloo Sub-Basin ("Beetaloo") of the greater McArthur Basin. Recent studies regarding the hydrocarbon potential of the Beetaloo have indicated that the organically enriched source rock intervals within the Mesoproterozoic Kyalla Formation have potential as regional shale plays. The location of Kyalla 117 N2-1 and its associated lateral Kyalla 117 N2-1H ST2 was selected with the intent to intersect the thickest and deepest preserved section of the Kyalla Formation within the JV permits, between known penetrations of prospective Kyalla Formation.

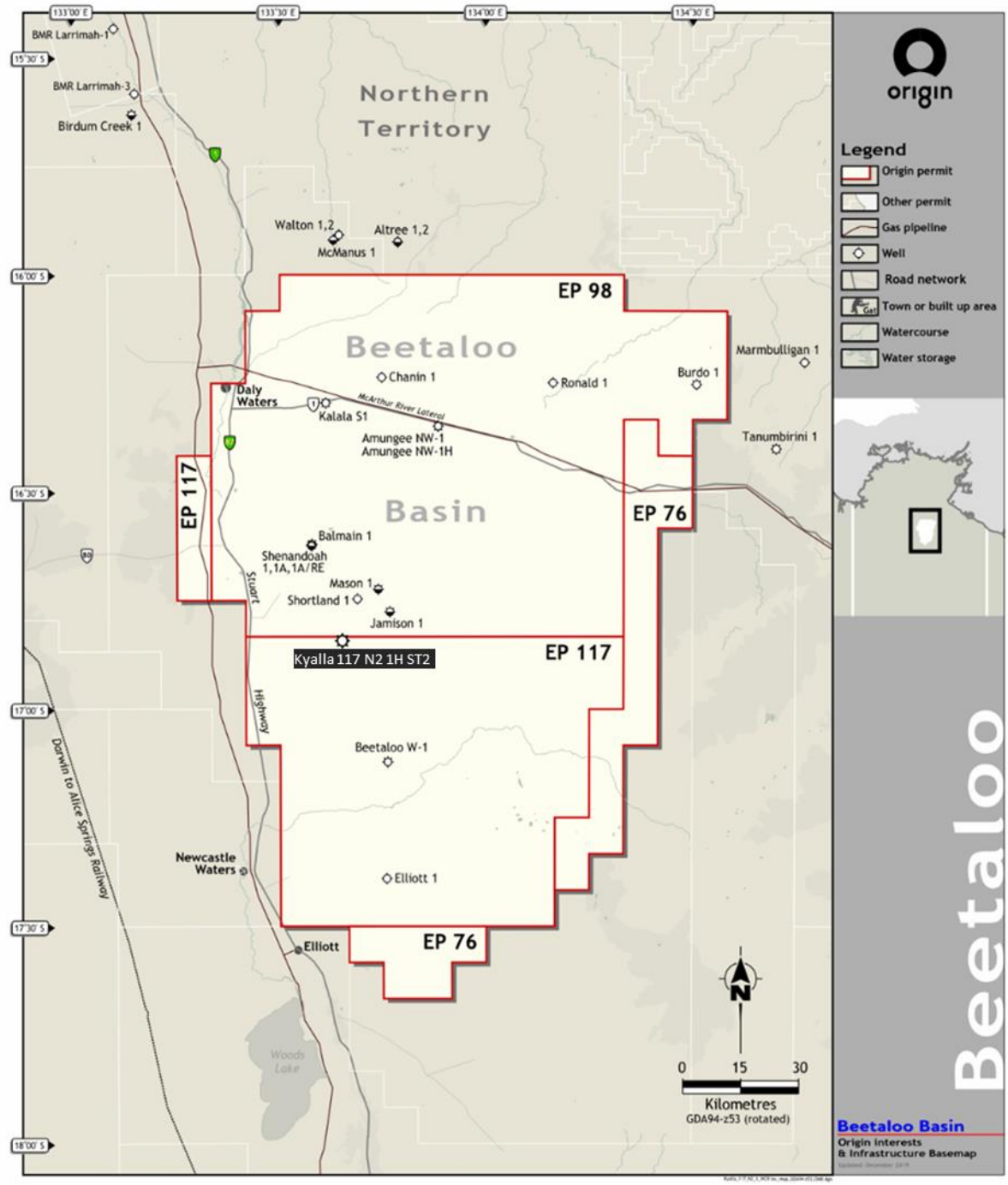

Figure 1. Kyalla 117 N2-1H ST2 Well Location and Permit Map

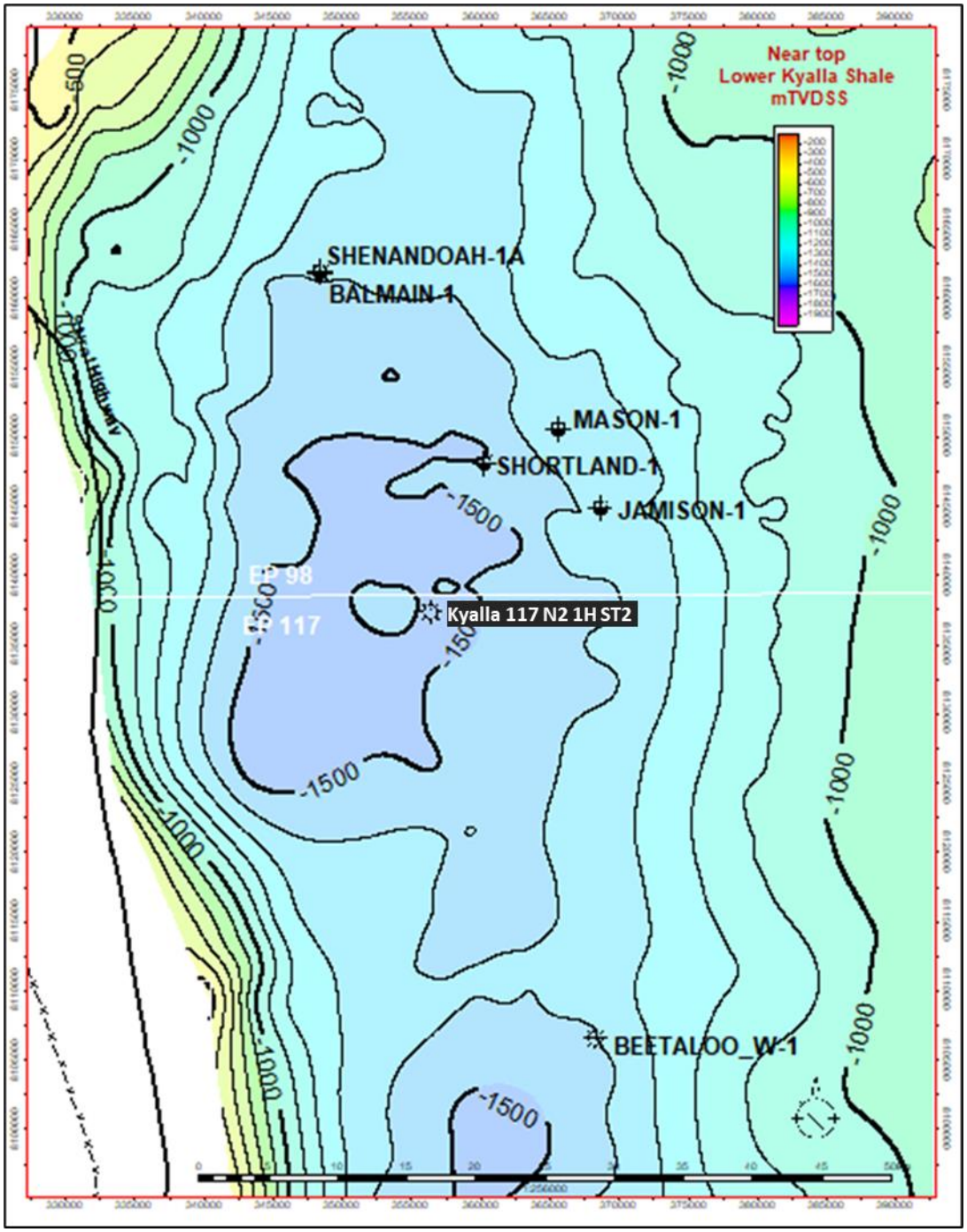

Figure 2. Location of Kyalla 117 N2 1H ST2 in EP 117 in the Beetaloo Sub-basin. Underlying grid shown is the near top of the Lower Kyalla Shale mTVDSS. Contour interval is 100m.

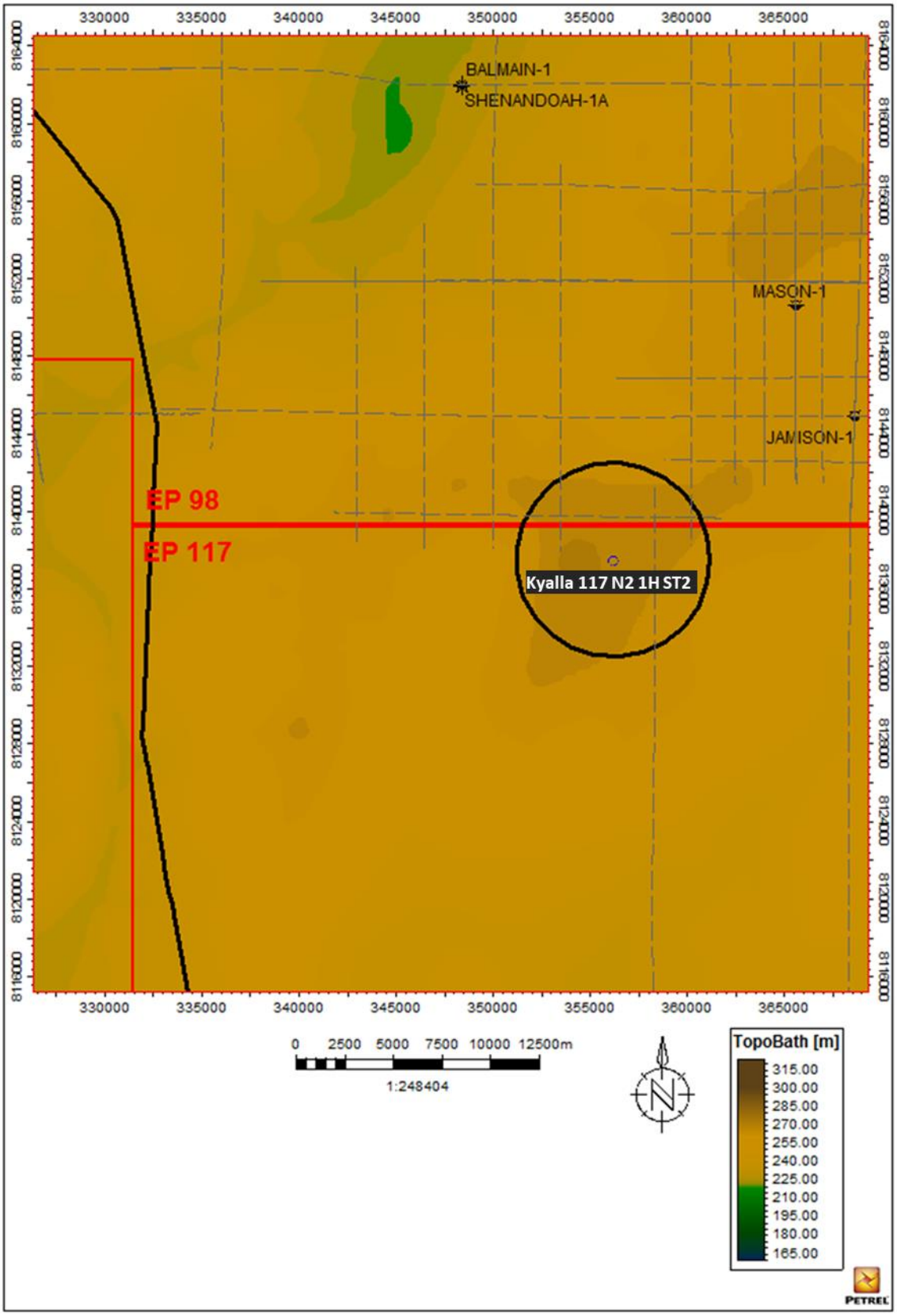

Figure 3. Kyalla 117 N2 1H ST2 surface location with underlying regional digital elevation model grid (mASL)

2 WELL SUMMARY SHEET

Well Name	Kyalla 117 N2-1H	Petroleum Title	EP117	Basin	McArthur Basin (Beetaloo Sub-basin)
Well Purpose	Appraisal	Status	Plugged and Abandoned	Parent Well Name, if any	Kyalla 117 N2-1
Spud Date	30/11/2019	TD Date	04/12/2019	End of Well Date	6/12/2019
Primary Objective	lower Kyalla Shale			Rig(s) Name	Ensign 963
Secondary Objective				100K Map Sheet	Warramban (5664)

Total Depth		mMDRT	mTVDSS	Side-Track Kick-off Depth, if applicable	1288.33mMDRT
	Driller	1628.79	-1323.45		
	Logger	1628.70	-1324.34	Drill Datum ☐ DF ☒ RT ☐ KB	GL Elevation: 269.92m Elevation Datum: Sea Level Drill Datum Elevation: 277.15m
Location *(GDA94 Datum with GRS80 Ellipsoid using MGA94 Grid)*	Coordinates	Surface	Bottom Hole	Seismic Station, if applicable	
	Latitude	16°50' 29.29" S	16°50'32.73"S		
Zone	Longitude	133°39' 06.752" E	133°39'8.633"E		
53	Easting	356 370.07	356 426.48		
	Northing	8 137 492.64	8 137 387.19		

Survey	Inline	Xline
Mc92 – 123. Shot Point		
Ma91 – 294. Shot Point 779		
Ma91 – 241. Shot Point 200		

Well Summary

Ensign Rig 963 was used to kick off the Kyalla 117 N2-1H wellbore from the vertical well Kyalla 117 N2-1.
A Reed NOV Tricone bit, Pathfinder mudmotor and MWD tool suite was run in hole (RIH) and the cement kick-off plug was drilled from 1262 to 1288mMDRT. New formation was confirmed and the 12 ¼" intermediate build section was drilled ahead from 1288mMDRT as per the directional drillers instructions. At 1626 mMD on December 04, 2019 the ROP started to drop off. When attempting to pick BHA off bottom it was observed to be hanging up. Successfully got back on bottom but while attempting to slide erratic tool face was observed; hence commenced rotating ahead. A low ROP of 0.4 m/hr was observed on drill ahead. Whilst drilling ahead 3 torque spikes were observed. This coincided with pump failure on surface which resulted in erratic stand pipe pressure. The decision was made to cease drilling and pull out of hole (POOH). At surface it was observed that all three cones from the tri-cone bit had been left down hole. A reverse circulation junk basket (RCJB) and magnet were RIH to retrieve the cones, but fishing was unsuccessful. Operations ceased and Kyalla 117 N2-1H was plugged back to 1448.3mMDRT.

Hole and Casing Design (Drillers Depths)						Drilling Fluid	
Type	Hole Size	Depth (mMD)	Casing Size	Shoe mMD	Shoe mTVDSS	Hole Size	Type
Civil Conductor/ Stove pipe	NA	7.23-19	30"	NA	NA	NA	NA
Conductor	22"	19 -194	18 ⅝	193.7	83.45	22"	KCl polymer water-based drilling fluid

Surface	17 ½"	194-548	13 ⅜	544.65	-267.5	17 ½"	KCl polymer water-based drilling fluid
Intermediate	12 ¼"	1288.33 - 1628.79	-	-	-	12 ¼"	KCl polymer water-based drilling fluid

Stratigraphy – Formation Tops (Loggers Depths)					Formation Evaluation			
Formation	Depth				Suite/ Run	Measurement	Depth Interval	
	mMDRT	mTVDRT	mTVDGL	mTVDSS			From (mMD)	To (mMD)
Undifferentiated Cretaceous	7.23	7.23	0	269.92				
Anthony Lagoon Fm	70	70	-62.77	207.1				
Gum Ridge Fm	191.4	191.4	-184.17	85.7				
Antrim Plateau Volcanics	399.5	399.5	-392.27	-122.4				
Bukalara Sandstone	499	499	-491.77	-221.85				
Hayfield Fm	506.7	506.7	-499.47	-229.6				
Jamison Sandstone	891.3	891.3	-883.77	-614.2				
Kyalla Formation	988	988	-980.77	-710.85				

Mud Logging	Formation Testing (DST)	DFIT	☐ Yes ☒ No
Standard service including constant volume trap chromatograph mud gas analysis, drill cuttings collection, drill gas sampling with Isotubes™, headspace gas sampling with Isojars™	Nil	HF	☐ Yes ☒ No

Coring	Hydrocarbon Shows
NIL	Kyalla Formation

Completion
Plugged and Abandoned

Well Name	Kyalla 117 N2-1H ST1	Petroleum Title	EP117	Basin	McArthur Basin (Beetaloo Sub-basin)
Well Purpose	Appraisal	Status	Plugged and Abandoned	Parent Well Name, if any	Kyalla 117 N2-1H
Spud Date	07/12/2019	TD Date	26/12/2019	Rig Release Date	23/1/2019
Primary Objective	lower Kyalla shale			Rig(s) Name	Ensign 963
Secondary Objective				100K Map Sheet	Warramban (5664)

		mMD RT	mTVDSS
Total Depth	Driller	2809.00	-1504.15
	Logger	2809.11	-1504.78
Location *(GDA94 Datum with GRS80 Ellipsoid using MGA94 Grid)*	Coordinates	Surface	Bottom Hole
	Latitude	16°50' 29.29" S	16° 51' 04.97" S
	Longitude	133°39' 06.752" E	133°39' 26.13" E
	Easting	356 370.07	356 950.96
	Northing	8 137 492.64	8 136 399.69
Zone			
53			

Side-Track Kick-off Depth, if applicable: 1457mMDRT (ST1)

Drill Datum
☐ DF
☒ RT
☐ KB

GL Elevation: 269.92m
Elevation Datum: Sea Level
Drill Datum Elevation: 277.15m

Seismic Station, if applicable

Survey	Inline	Xline
Mc92 – 123. Shot		
Ma91 – 294. Shot		
Ma91 – 241. Shot		

Well Summary

Ensign Rig 963 was used to kick off Kyalla 117 N2-1H ST1 from Kyalla 117 N2-1H. A backup Reed NOV Tricone bit, Pathfinder mud motor and measurement while drilling (MWD) tool suite was RIH, tagging the top of the cement side-track plug at 1448.3mMDRT. The side-track plug was drilled out to the kick-off depth of 1457mMDRT where 50% new formation was confirmed. The 12 ¼" intermediate build section was drilled ahead from 1457mMDRT to 1506mMDRT where the decision was made to POOH and switch from Tricone / Mud Motor BHA to a Ulterra's CF713 Polycrystalline Diamond Compact (PDC) bit in combination with the Powerdrive rotary steerable system (RSS) directional drilling assembly. The modified bottom hole assembly (BHA) was RIH drilling proceeded to a depth of 1745mMDRT. At 1745mMDRT the decision was made to POOH to swap the RSS for a mud motor due to insufficient inclination building rates. Using the modified BHA with NOV's TKC76 (PDC) bit in combination with the 7-3/4" mud motor directional drilling assembly, drilling proceeded to the 12 ¼" hole section total depth of 1990mMDRT. 9 ⅝" intermediate casing was RIH and cemented; with the intermediate casing shoe set at 1984.88mMDRT. A USIT log was run and a good cement bond between the 9 ⅝" casing and surrounding formation was confirmed. The shoe track was drilled out from and 3 meters of new formation drilled to 1993mMDRT and an Extended Leak Off Test (XLOT) with and equivalent mud weight (EMW) of 21.5ppg (LOP – 3064psi, MW 11.5ppg) was conducted. The 8 ½" production section was drilled ahead using a PDC bit, Powerdrive RSS, GVR and MWD directional assembly. As per the directional drillers instructions inclination was gradually built to 90° which was achieved at approximately 2114mMDRT. The section drilled ahead to 2454mMDRT. AT this depth a high viscosity flocculated mud (3min/qt) was observed in the suction tank. The mud was circulated and conditioned until it reached 62 sec/qt. Drilling recommenced and continued ahead to 2710mMDRT. At 2710mMDRT a high viscosity mud (3min/qt) and reduced hole cleaning was identified out of hole. Shale cavings were observed at the shale shakers while at the same time the mud system was foaming at the mud tanks. A low viscosity sweep was pumped, the hole was circulated clean and a wiper trip was conducted back to the shoe where another low viscosity sweep was pumped. Five stands of drillpipe were pulled back inside the casing and the drag was recorded.

After observing no obstructions while passing through the avalanche zone the drill string was run back to bottom and the 8 ½" intermediate hole drilled ahead to 2786mMDRT. Drilling ceased to troubleshoot losses in stand pipe pressure (SPP) associated with aeration of the mud system. One stand of drill pipe was racked back and hydraulics testing of the short circulating system was conducted. After unsuccessfully attempting to recondition the mud and finding no issues with the mud pumps a decision was made to POOH to repair the mud system and change the BHA due to loss of signal to the Powerdrive RSS tool.
The BHA was RIH, washing and reaming through tights spots from 2472mMDRT to current total depth of 2786mMDRT. Drilling recommenced and the 8 ½" intermediate hole section was drilled ahead to 2809mMDRT. While drilling several drops in SPP were encountered and aerated mud continued to be an issue. At 2809mMDRT the decision was made to POOH and swap to a new mud system. While back reaming out of the hole tight spots were encountered at 2440 and 2375mMDRT. The string packed off at 2375mMDRT. As a response the drill string was worked with no rotation, 100klbs was slacked off and torque was increased to 30kft-lbs which resulted in successfully re-establishing rotation and circulation. A low viscosity sweep was pumped and attempted to back ream from 2375mMDRT. A pressure drop from 1550psi to 580psi at 400gpm, a torque reduction from 1-9 kft-lbs at 120 rpm and reduced drag indicated that while attempting to free the string the drill pipe had twisted / backed off. Upon pulling out of hole it was observed that the BHA and 14 joints (238m) of drill pipe had been left in the hole.

A cut pin screw-in sub fishing assembly was RIH on drill pipe and an attempt was made to engage the fish. After six unsuccessful attempts to retrieve the fish the assembly was POOH and switched to a 6 ¾" spiral grapple overshot assembly. After three attempts the pipe was successfully latched. While attempting to pass through the 9 ⅝" casing shoe the drill collars became stuck resulting in losing the fish again along with 1.3m of the spiral grapple. A 7" magnet, bump sub and junk basket were RIH in an attempt to retrieve the grapple and any metal debris left in the hole. The top of the fish was tagged at 1771mMDRT however no significant recovery was observed on the magnet or basket when brought back to surface.
An overshot and accelerator fishing assembly was RIH, tagging the top of the fish at 1771mMDRT. While attempting to latch on, the string was pushed down-hole to a depth of 2004.91mMDRT without a successfully latching. A skirt milling assembly was made up and RIH. The top of the fish was tagged at 2004.91mMDRT and was milled to 2007.14mMDRT. At this depth it was observed that the mill was no longer functioning and the assembly was POOH to surface.
A new concave mill assembly was run in the hole, tagging the top of fish at 2007.14mMDRT and milling of the drill pipe commenced to a depth of 2029.72mMDRT, and the junk and swarf circulated out of the hole. An overshot assembly with basket grapple was run in the hole, washing and rotating though numerous tight spots to the top of the fish at 2027.91mMDRT. The string was pumped out of the hole back to 1371.0mMDRT, then pulled to surface, recovering the entire drill pipe and BHA.

Once the entire fish was at surface the mud system was discarded and new 11.7ppg drilling mud was built up. A clean out assembly was RIH to a depth of 1964mMDRT (inside 9 ⅝" casing) and the fresh mud was displaced. While running in hole to current TD a number of tight spots and pack offs were encountered which were treated with sweeps and reaming. At 2137mMDRT a carbide lag test was performed and the open hole from 1990 to 2137mMDRT was calculated to be 10.23" (approximately 17% over gauge). During the subsequent trip out of hole significant cavings were observed at the shakers. Due to these indications of well bore instability, along with the over gauge borehole being out of specification for future hydraulic fracture stimulation the decision was made to plug and abandon Kyalla 117 N2-1H ST1. A bridge plug was RIH and set inside the 9 ⅝" casing at 1779.5mMDRT and subsequently pressure tested to 3,733psi / 10mins or 500psi above Leak off test pressure conducted on 9-5/8" casing shoe. This was followed by a cement plug set at a depth of 1779.5mMDRT and extending to 1585.5mMDRT. Cement plug correct placement was confirmed with a 2klbs tag weigh on bit (WOB). Operations on Kyalla 117 N2-1H ST1 ceased at 06:45 on January 24, 2020, switching to Kyalla 117N2-1H ST2.

Hole and Casing Design (Drillers Depths)						Drilling Fluid	
Type	Hole Size	Depth (mMD)	Casing Size (")	Shoe mMD	Shoe mTVDSS	Hole Size	Type
Civil Conductor/ Stove pipe	NA	7.23-19	30"	NA	NA	NA	NA
Conductor	22"	19 -194	18 ⅝"	193.7	83.45	22"	KCl polymer water-based drilling fluid

Surface	17 ½"	194-548	13 ⅜"	544.65	-267.5	17 ½"	KCl polymer water-based drilling fluid
Intermediate	12 ¼"	1457- 1990	9 5/8"	1984.88	-1513	12 ¼"	KCl polymer water-based drilling fluid
Production	8 ½"	1990- 2809	-	-	-	8 ½"	KCl polymer water-based drilling fluid

Stratigraphy – Formation Tops (Loggers Depths)					Formation Evaluation			
Formation	Depth				Suite/ Run	Measurement	Depth Interval	
	mMDRT	mTVDRT	mTVDGL	mTVDSS			From (mMD)	To (mMD)
Undifferentiated Cretaceous	7.23	7.23	0	269.92	S1/R1	USIT	5	1800
Anthony Lagoon Fm	70	70	-62.77	207.1				
Gum Ridge Fm	191.4	191.4	-184.17	85.7				
Antrim Plateau Volcanics	399.5	399.5	-392.27	-122.4				
Bukalara Sandstone	499	499	-491.77	-221.85				
Hayfield Fm	506.7	506.7	-499.47	-229.6				
Jamison Sandstone	891.3	891.3	-883.77	-614.2				
Kyalla Fm	988	988	-980.77	-710.85				
lower Kyalla shale	1832	1755.64	1748.41	-1478.49				

Mud Logging	Formation Testing (DST)		
Standard service including constant volume trap chromatograph mud gas analysis, drill cuttings collection, drill gas sampling with Isotubes™, headspace gas sampling with Isojars™	XLOT	DFIT	☐ Yes ☒ No
		HF	☐ Yes ☒ No

Coring	Hydrocarbon Shows
NIL	Kyalla Formation

Completion
Plugged and Abandoned

Well Name	Kyalla 117 N2-1H ST2	Petroleum Title	EP117	Basin	McArthur Basin (Beetaloo Sub-basin)
Well Purpose	Appraisal	Status	Cased and Suspended	Parent Well Name, if any	Kyalla 117 N2-1
Spud Date	24/01/2020	TD Date	13/02/2020	Rig Release Date	21/02/2020
Primary Objective	lower Kyalla shale			Rig(s) Name	Ensign 963
Secondary Objective				100K Map Sheet	Warramban (5664)

Total Depth		mMD RT	mTVDSS	Side-Track Kick-off Depth, if applicable	1196.42mMDRT (ST2)		
	Driller	3809.00	-1501.47				
	Logger	3809.00	-1501.30	Drill Datum ☐ DF ☒ RT ☐ KB	GL Elevation: 269.92m Elevation Datum: Sea Level Drill Datum Elevation: 277.15m		
Location *(GDA94 Datum with GRS80 Ellipsoid using MGA94 Grid)*	Coordinates	Surface	Bottom Hole	Seismic Station, if applicable	Survey	Inline	Xline
	Latitude	16°50' 29.29" S	16° 49' 25.12" S				
Zone	Longitude	133°39' 06.752" E	133°38' 28.84" E		Mc92 – 123. Shot		
53	Easting	356 370.07	355234.30		Ma91 – 294. Shot		
	Northing	8 137 492.64	8139457.32		Ma91 – 241. Shot		

Well Summary

Ensign Rig 963 was used to kick off Kyalla 117 N2-1H ST2 from the vertical well Kyalla 117 N2-1.
On January 24, 2020, a single trip whipstock and tri-mill assembly was prepared to be RIH. The UBHO in the whipstock BHA was scribed in the desired azimuth and the whipstock was RIH to 1202mMDRT. A Schlumberger wireline unit was rigged up to run a gyro to orientate the whipstock. The whipstock was orientated to 326.92°. After pulling the gyro tool out of hole the whipstock was pulled back from 1202m to the whipstock anchor set depth of 1199.6mMDRT.

Top of whipstock assembly: 1192mMDRT
Bottom of Anchor (set depth): 1199.6mMDRT
Anchor Slips: 1198.45mMDRT
Whipstock final orientation: 326.92°

The milling BHA was RIH to the top of the whipstock, which was tagged at 1192mMDRT. Milling of the casing commenced from 1192 to 1200mMDRT. 10bbl high viscosity sweeps were pumped at regular intervals to clean the hole from metal swarf. Kyalla 117 N2-1H ST2 was kicked off in the Upper Kyalla Formation at a depth of 1196.42mMDRT. Altogether 199kg of metal swarf was collected from the ditch magnets in the possum belly while milling the casing. Two high viscosity sweeps were pumped to clear the hole of any remaining swarf before pulling the milling BHA out of hole to surface and running in hole with a magnet for a clean out trip.

A 8 ½" NOV 616 PDC bit, mud motor and the pathfinder directional drilling and MWD assembly was RIH and a Formation Integrity Test (FIT) was conducted with 10.5ppg mud to 1021psi, giving an equivalent mud weight of 15.5ppg. The 8 ½" production section was

drilled ahead from 1200mMDRT to 1257mMDRT. The gyro tool was RIH on wireline to 1227.17mMDRT where it recorded a gyro survey at 1221.6mMDRT (357.1° azimuth, 6.28° inclination) confirming directional assembly tool face orientation.

The gyro tool was POOH to surface and the 8 ½" build section was drilled ahead to 1466mMDRT, taking surveys as per the directional drillers instructions. After pumping and circulating out High Viscosity (Hi-Vis) sweeps to clear the hole of any cuttings, spotted 20bbl of High Viscosity (Hi-Vis) pill at bottom prior to pull out the directional assembly to surface to change Bit and Stabilizer.

An Ulterra PDC bit with mudmotor and pathfinder directional assembly and MWD tools were RIH to 1454mMDRT, then washed down to bottom to clear cuttings. The 8 ½" build section was drilled ahead, rotating and sliding as per the directional drillers instructions to 1696mMDRT. At 1696mMDRT a reduction in the rate of penetration (ROP) during sliding indicated the tool was getting hung up and unable to transfer weight to the bit. A lubricant (BDF-933) was added to the mud system but no improvement in ROP was observed. Drilling continued ahead in the 8 ½" build section, intersecting the Lower Kyalla Formation at a depth of 1710.9mMDRT with no improvement in ROP. A decision was made to POOH to change the BHA. High viscosity sweeps were pumped and circulated out of hole prior to pulling the BHA to surface.

An Ulterra PDC bit with mudmotor and pathfinder directional assembly and MWD tools were RIH to 1685mMDRT, then washed down to bottom to clear cuttings. Commenced drill and slide ahead 8 ½" hole section to 1715mMDRT unable to get weight on Bit while sliding. At this stage decision made to POOH and replace directional motor to a PowerDrive RSS. After pumping and circulating out High Viscosity sweeps to clear the hole of any cuttings, spotted 20bbl of High Viscosity (Hi-Vis) pill at bottom prior to pull out the directional assembly to surface.

An Ulterra PDC bit with Powerdrive RSS and pathfinder directional assembly and MWD tools were RIH to 1685mMDRT, then washed down to bottom to clear cuttings. The 8 ½" build section was drilled ahead, rotating and sliding as per the directional drillers instructions from 1715MDRT to 2090mMDRT where an inclination of 83.81° and an azimuth of 329.15° was reached. The total depth for the build section was called at 2090mMDRT. High viscosity sweeps were pumped and circulated out of hole prior to pulling the BHA to surface to pick up the GVR tool.

A NOV 616 PDC bit with Powerdrive RSS and pathfinder directional assembly, GVR and MWD suite were RIH to 1930mMDRT and commenced logging the 8 ½" build section to 2090mMDRT. Drilled ahead in the 8 ½" production section to 2093mMDRT before losing communication with the downhole tools resulting in the BHA being POOH for inspection. A low viscosity sweep was pumped, the well was circulated clean, a 50bbl high viscosity pill was spotted and a flow check was conducted (static) before the BHA was POOH.

The Powerdrive RSS was successfully tested at surface before being RIH with a NOV 616 PDC bit, pathfinder directional assembly, GVR and MWD suite to 2070mMDRT. From this depth the bottom hole assembly washed down to bottom to clear cuttings. The 8 ½" horizontal production section was drilled ahead as per the directional drillers instructions to a total depth of 3809.1mMDRT with 90.45° inclination. After pumping and circulating out high viscosity sweeps to clear the borehole of any cuttings the BHA was POOH on elevators. A tight spot was encountered at 3363mMDRT but was cleared by running in hole by one stand and reaming the tight hole section. POOH with the BHA continued on elevators and the BHA was layed out sideways at surface. The well was subsequently cased with 5 ½" production casing, cemented and suspended. The well suspension operations were successfully conducted with Tubing Head (B-Section) installed and tested at Kyalla 117 N2-1H ST2 on February 21, 2020 and the rig was released.

Hole and Casing Design (Drillers Depths)						Drilling Fluid	
Type	Hole Size	Depth (mMD)	Casing Size	Shoe mMD	Shoe mTVDSS	Hole Size	Type
Civil Conductor/ Stove pipe	NA	7.23-19	30"	NA	NA	NA	NA
Conductor	22"	19 -194	18 ⅝	193.7	83.45	22"	KCl polymer water-based drilling fluid
Surface	17 ½"	194-548	13 ⅜	544.65	-267.5	17 ½"	KCl polymer water-based drilling fluid
Intermediate (ST1)	12 ¼"	548-1196	9 5/8"	1984.88	-1513	12 ¼"	KCl polymer water-based drilling fluid

Production	8 ½"	1196-3809	5 ½ "	3802.45	-1508	8 ½	KCl polymer water-based drilling fluid

Stratigraphy – Formation Tops (Loggers Depths)					Formation Evaluation			
Formation	Depth				Suite/ Run	Measurement	Depth Interval	
	mMDRT	mTVDRT	mTVDGL	mTVDSS			From (mMD)	To (mMD)
Undifferentiated Cretaceous	7.23	7.23	0	269.92	S2/R2	CBL_VDL_MAP	7.47	1977.54
Anthony Lagoon Fm	70	70	-62.77	207.1				
Gum Ridge Fm	191.4	191.4	-184.17	85.7				
Antrim Plateau Volcanics	399.5	399.5	-392.27	-122.4				
Bukalara Sandstone	499	499	-491.77	-221.85				
Hayfield Fm	506.7	506.7	-499.47	-229.6				
Jamison Sandstone	891.3	891.3	-883.77	-614.2				
Kyalla Fm	988	988	-980.77	-710.85				
Lower Kyalla shale	1945	1754	1746.77	-1477				

Mud Logging	Formation Testing (DST)	DFIT	☐ Yes ☒ No
Standard service including constant volume trap chromatograph mud gas analysis, drill cuttings collection, drill gas sampling with Isotubes™, headspace gas sampling with Isojars™	FIT	HF	☐ Yes ☒ No

Coring	Hydrocarbon Shows
NIL	Kyalla Formation

Completion
Cased and Suspended for Multistage Hydraulic Fracture Stimulation

3 DRILLING

3.1 RIG SPECIFICATIONS

Ensign Energy Services Australia Rig 963 was used to drill Kyalla 117 N2-1H, Kyalla 117 N2-1H ST1 and Kyalla 117 N2-1H ST2. This rig is a 1500 hp fully automated ADR drilling rig capable of 750,000 lbs pull capacity with 500 000 lbs setback. The rig is equipped with a Tesco EXI 800 Top Drive capable of providing 37.5 kft-lbs continuous torque at 112 RPM. The circulating system consisted of two Gardner Denver PZ11 AC electric triplex pumps and one TSM 750 mechanically driven triplex pump, one skidable transfer tank and three skid mounted active tanks with a total useable volume of 1550 barrels. Three PrimaG 4PDD shale shakers and two Derrick DE-1000 FHD centrifuges provided mud cleaning and conditioning capabilities. The circulating system was also complimented by a Swaco CD-1400 centrifugal vacuum degasser. The Blow Out Prevention (BOP) system comprised a 5M T3 7082 Annular Preventer, 5M T3 Double Gate Ram Preventer (VBR and Blind/Shear), 5M Drilling Spool with 3-1/8" Choke Line (outer HCR) and 2-1/16" Kill Line (Outer HCR), 5M T3 Single Gate Lower Ram Preventer, 5M Choke Manifold with 2x Pason remote operated chokes and a Control Technologies BOP control unit (accumulator) with nitrogen back up.

3.2 SUMMARY OF DAILY DRILLING REPORTS AND RELATED OPERATIONS

Table 1 lists a summary of the daily drilling activities for Kyalla 117 N2-1H, Kyalla 117 N2-1H ST1, and Kyalla 117 N2-1H ST2. For detailed daily drilling reports see Appendix 1, and daily geological reports see Appendix 2. Time versus depth is shown in Figure 4. Well schematics are shown in Figure 5 to Figure 12 in Section 3.7.

DDR #	Start Date	End Date	Last 24hr Summary
1	29/11/2019	30/11/2019	• Waited on cement kick off plug to reach 500 psi compression strength. • Tagged the top of the cement kick off plug prior to pulling out of the hole with the 5" drill pipe cement string. • Pressure tested the choke manifold & BOPE.
2	30/11/2019	01/12/2019	• Completed pressure testing the BOPE. • Laid out excess 8" drill collars from the mast. • Made up Kick Off & Build BHA & RIH on 5" drill pipe. • Commenced drilling kick off plug as per directional drillers instructions
3	01/12/2019	02/12/2019	• Continued drilling kick-off plug as per directional drillers instructions. • Confirmed side track achieved and commenced drilling the 12.25" build section.
4	02/12/2019	03/12/2019	• Continued drilling the 12.25" build section to 1491mRT
5	03/12/2019	04/12/2019	• Continued drilling the 12.25" build section to 1615mRT
6	04/12/2019	05/12/2019	• Continued drilling the 12.25" build section to 1628.79mRT. • Pulled out of the hole with the 12.25" build BHA due to Mud Pump failure. • Tri Cone Drill Bit found to have failed. • Commenced running in the hole with a Fishing Magnet to fish the Drill Bit Cones.
7	05/12/2019	06/12/2019	• Ran in the hole with the Fishing Magnet to top of the fish. • Pulled out of the hole with the Fishing Magnet.

			• Ran in the hole with the Reverse circulating junk mill & engaged the fish. • Commenced pulling out of the hole with the Reverse circulating junk mill.
8	06/12/2019	07/12/2019	• Pulled out of the hole with the Reverse circulating junk mill. • RIH with 5" DP cement string and pumped kick off cement plug. • Waited on the cement kick off plug to reach 500 psi compression strength before tagging. • Pulled out of the hole with the 5" DP cementing string.
9	07/12/2019	08/12/2019	• Made up the new 12.25" BHA & RIH on 5" DP and performed a side track from 1448mRT to 1457mRT. • Continued drilling 12.25" build section from 1457mRT to 1506mRT. • Circulated the mud column until the shakers were clean.
10	08/12/2019	09/12/2019	• Pulled out of the hole with the 12.25" side track & build BHA. • Made up the 12.25" RSS BHA & RIH on 5" DP. • Continued drilling the 12.25" build section
11	09/12/2019	10/12/2019	• Continued drilling the 12.25" build section to 1722mRT.
12	10/12/2019	11/12/2019	• Drilled 12.25" build section to 1745mRT - unable to achieve desired build rates. • Circulated well clean. • POOH 12.25" build assembly from 1745mRT to 153mRT. • Laid down PowerDrive assembly and downloaded telescope data. • Made up 12.25" mud motor assembly and RIH to 1507mRT
13	11/12/2019	12/12/2019	• RIH build assembly from 1507mRT to 1745mRT. • Drilled 12.25" build section from 1745mRT to 1869mRT. • Replaced mud pump 2 piston. • Replaced mud pump 2 pop-off hammer union. • Conducted rig service. • Drilled 12.25" build section from 1869mRT to 1936mRT.
14	12/12/2019	13/12/2019	• Drilled 12.25" build section from 1936mRT to 1990mRT. • Circulated well clean. • POOH 12.25" build assembly from 1990mRT to 176mRT. • POOH 12.25" bulid BHA from 176mRT to surface. • Laid down directional tools. • Picked up and made up GVR assembly. • RIH GVR BHA from surface to 140mRT. • RIH GVR assembly on drill pipe from 140mRT to 244mRT
15	13/12/2019	14/12/2019	• RIH GVR assembly on drill pipe from 244mRT to 1736mRT. • Wash and reamed from 1736mRT to 1990mRT. • Circulated well clean and recorded SCR's. • GVR logged out of hole from 1990mRT to 1733mRT. • Conducted rig service. • Conducted mud pump fluid end inspection. • GVR logged out of hole from 1733mRT to 1592mRT
16	14/12/2019	15/12/2019	• GVR logged out of hole from 1592mRT to 1260mRT. • Circulated well clean. • POOH GVR assembly from 1260mRT to 140mRT. • POOH GVR BHA from 140mRT to surface. • Laid down GVR BHA and downloaded data. After review, proceed with RIH w/ 9-5/8" casing • Conducted rig service • R/U 9-5/8" casing handling equipment and Overdrive
17	15/12/2019	16/12/2019	• Made up 9.625" intermediate shoe track and tested floats - floats held. • Troubleshoot and repaired WFT overdrive and JAM. • RIH 9.625" intermediate casing from 34mRT to 1521mRT
18	16/12/2019	17/12/2019	• RIH 9.625" intermediate casing from 1521mRT to 1974mRT. • Made up and RIH 9.625" casing hanger and landed out at 1984.88mRT. • Circulated well clean. • Cemented 9.625" intermediate casing as per program.

			• Rigged down cementing equipment and WFT overdrive system. • Picked up jetting tool and jetted BOP, well head and side outlet valves. • Picked up and engaged casing hanger packoff assembly. • Pressure tested packoff upper and lower seals. • Retrieved and laid out packoff assembly running tool.
19	17/12/2019	18/12/2019	• RIH and lay out 6x 8" DC. • Picked up, RIH and rack back additional drill pipe. • Laid out HWDP for inspection and picked up replacement HWDP. • Conducted rig service. • Replaced washpipe. • Commenced pressure testing BOP and associated equipment
20	18/12/2019	19/12/2019	• Pressure tested BOP and associated equipment. • Rigged up SLB and run USIT log. • Made up and RIH 8.5" directional BHA from surface to 5mRT.
21	19/12/2019	20/12/2019	• RIH 8.5" directional BHA from 5mRT to 104mRT. • RIH 8.5" directional assembly from 104mRT to 1920mRt. • Washed 8.5" directional assembly from 1920mRT to 1933mRT. • Drilled out shoe track from 1933mRT to 1981mRt. • Circulated well clean. • Conducted grey cement pressure test. • Drilled out shoe track and 3m of new formation from 1981mRT to 1993mRT. • Circulated well clean. • Conducted XLOT - 2 cycles. • Circulated bottoms up.
22	20/12/2019	21/12/2019	• Drilled 8.5" lateral hole section from 1993mRT to 2377mRT
23	21/12/2019	22/12/2019	• Drilled 8.5" lateral hole section from 2377mRT to 2454mRt. • Circulated and conditioned mud system. • Drilled 8.5" lateral hole section from 2454mRT to 2623mRT. • Conducted rig service. • Drilled 8.5" lateral hole section from 2623mRT to 2710mRT. • Circulated and conditioned mud. • Circulated well clean prior to POOH
24	22/12/2019	23/12/2019	• Circulated well clean. • Back reamed from 2710mRT to 2420mRT. • Circulated well clean due to obstruction. • Back reamed from 2420mRT to 1984mRT. • Circulated well clean. • POOH from 1984mRT to 1725mRT to confirm build section clear of cuttings. • RIH from 1725mRT to 1957mRT. • Circulated and conditioned mud. • Conducted rig service and slip and cut drill line whilst circulating and conditioning mud
25	23/12/2019	24/12/2019	• Circulated and conditioned mud. • RIH from 1957mRT to 2189mRT. • Circulated and conditioned mud. • RIH from 2189mRT to 2449mRT. • Circulated and conditioned mud. • RIH from 2449mRT to 2664mRT. • Washed and reamed from 2664mRT to 2710mRT. • Circulated and conditioned mud. • Drilled 8.5" lateral hole section from 2710mRT to 2786mRT. • Commenced troubleshooting circulating pressure reduction due to drilling fluid aeration
26	24/12/2019	25/12/2019	• Troubleshooting circulating pressure reduction due to drilling fluid aeration. • POOH from 2709mRT to 2654mRT. • Troubleshoot drawworks PLC.

			• POOH from 2654mRT to 1060mRT
27	25/12/2019	26/12/2019	• POOH from 1060mRT to 140mRT. • POOH 8.5" directional BHA from 140mRT to surface. • Make up and RIH 8.5" directional BHA from surface to 104mRT. • RIH from 104mRT to 250mRT. • Conducted man down muster drill. • RIH from 250mRT to 1957mRT. • Circulated and conditioned mud at 1957mRT. • RIH from 1957mRT to 2245mRT. • Circulated and conditioned mud at 2245mRT. • RIH from 2245mRT to 2472mRT. • Circulated and conditioned mud at 2472mRT
28	26/12/2019	27/12/2019	• Washed and reamed from 2472mRT to 2786mRT. • Circulated and conditioned mud. • Drilled 8.5" lateral hole section from 2786mRT to 2809mRT. • Troubleshoot aerated mud system. • POOH from 2786mRT to 2440mRT. • Work tight hole from 2440mRT to 2375mRT. • Back reamed from 2375mRT to 2160mRT
29	27/12/2019	28/12/2019	• Back reamed from 2160mRT to 1975mRT. • Circulated well clean. • POOH from 1975mRT to surface. • Identified backed off tool joint (238m of DP and BHA left in hole). • Prepared fishing tools. • RIH with cut pin screw in sub from surface to 2136mRt. • Attempted to engage fish - unsuccessful. • Back reamed from 2124mRT to 1969mRT. • POOH from 1969mRT to 1824mRT
30	28/12/2019	29/12/2019	• POOH from 1824mRT to surface. • Prepared 8-3/8" overshot fishing assembly. • RIH with 8-3/8" overshot fishing assembly from surface to 1984mRT. • Washed in with 8-3/8" overshot assembly from 1984mRT to 2140.09mRT. • Washed TOF. • RIH to 2142.48mRT and engaged fish. • Pumped out of hole from 2142.48mRT to 1984mRT. • Worked TOF into 9-5/8" casing shoe
31	29/12/2019	30/12/2019	• Pumped out of hole from 1984mRT to 1745mRT • Re-engage dislodged fish • Circulated well clean • POOH from 1745mRT (1888mRT bit depth) to surface – No fish at surface • Laid down overshot fishing assembly and picked up &” magnet fishing assembly • RIH 7” magnet fishing assembly from surface to 1739mRT • Circulated well clean
32	30/12/2019	31/01/2019	• RIH from 1739mRT to 1748.93mRT and tagged TOF. • Cycle pumps and reciprocated string to engage junk in fishing assembly. • POOH 7" magnet fishing assembly from 1748.75mRT to surface. • RIH 7" magnet fishing assembly from surface to 1748.93mRT and tagged TOF. • Cycle pumps and reciprocated string to engage junk in fishing assembly. • POOH 7" magnet fishing assembly from 1748.93mRT to surface. • RIH drill pipe screw in fishing assembly from surface to 1749.32mRT and tagged TOF. • Attempted to engage fish - unsuccessful. • Circulated well clean through fish
33	31/01/2019	01/01/2020	• Pulled out of the hole with the fishing assembly. • RIH with the magnet & junk basket assembly and tagged TOF.

			• POOH with the magnet & junk basket assembly. Swarf observed on the magnet with no junk in the basket. • Made up the 8 3/8" overshot fishing assembly and RIH on 5" DP as per the fishing hands instructions.
34	01/01/2020	02/01/2020	• RIH with the 8 3/8" overshot BHA on 5" DP & attempted to recover the fish without success. • POOH with the 8 3/8" overshot BHA on 5" DP. • Made up the skirt milling BHA & RIH to the top of the fish. • Commenced milling the tool joint of the fish.
35	02/01/2020	03/01/2020	• Continue milling the top of the fish with the skirt mill. • Pulled out of the hole with the skirt mill on 5" DP. • Made up the concave bladed mill BHA & RIH on 5" DP. • Continued to mill the top of the fish
36	03/01/2020	04/01/2020	• Completed milling the top of the fish. Milled approximately 1.2 - 2 meters. • POOH with the concave blade milling BHA on 5" DP. • Made up the 8 1/8" over shot dressed with a 5" basket grapple & mill control and RIH on 5" DP to 47mRT.
37	04/01/2020	05/01/2020	• RIH with the 8 1/8" over shot dressed with a 5" basket grapple & mill control on 5" DP to 2008mRT. • Washed & reamed down from 2008mRT to 2027.91mRT TOF. • Pumped out the hole back to 1371mRT. Pumped a Hi - Vis sweep & circulated bottoms up. • POOH with the 8 1/8" over shot dressed with a 5" basket grapple & mill control on 5" DP to 327mRT
38	05/01/2020	06/01/2020	• POOH with the 8 1/8" over shot dressed with a 5" basket grapple & mill control on 5" DP from 327mRT to surface. • Laid out the fishing BHA & recovered drill string. • RIH with a 8.5" milling clean out BHA to 110mRT. • Commenced cleaning the mud tanks and mud circulating system in preparation for mixing the new mud
39	06/01/2020	07/01/2020	• Continued cleaning the mud tanks and mud circulating system in preparation for mixing the new mud. • RIH with the 8.5" clean out BHA on 5" DP to the 9 5/8" casing shoe. • Pumped a Hi Vis sweep and circulated casing volume while mixing the new mud
40	07/01/2020	08/01/2020	• Completed mixing the new mud volume • Washed and reamed with the 8.5” clean out BHA on 5” DP from 1964mmRT to 2030mRT
41	08/01/2020	09/01/2020	• Washed & reamed with the 8.5" clean out BHA on 5" DP to 2263mRT. • Decision made to pull out of the hole due to hole instability. • Washed and reamed back to 2137mRT
42	09/01/2020	10/01/2020	• Washed & reamed back into the casing shoe. • Pumped sweeps and circulated the casing volume clean. • POOH with the 8.5" clean out BHA. • Commenced inspection and Function/Pressure testing of the BOP
43	10/01/2020	11/01/2020	• Completed function/pressure testing the BOP, Choke Manifold & associated equipment. • Made up the 8.5" BHA and RIH to the casing shoe and circulated the mud column
44	11/01/2020	12/01/2020	• Continue circulating the mud column in the casing while waiting on forward plan to be approved and equipment to be mobilized. • Performed offline maintenance & crack testing of loose handling drilling equipment. • Commenced mixing mud in order to reduce the mud weight from 11.7 ppg to 11.0 ppg
45	12/01/2020	13/01/2020	• Continued circulating the mud column in the casing while waiting on forward plan to be approved and equipment to arrive onsite.

			• Continued with offline maintenance & crack testing of loose handling drilling equipment. • Reduced the mud weight from 11.7 ppg to 11.0 ppg in the cased hole and mud circulating system
46	13/01/2020	14/01/2020	• Continued circulating the mud column in the casing while waiting on forward plan to be approved and equipment to arrive onsite. • Continued with offline maintenance & crack testing of loose handling drilling equipment. • Inspected 2 x bridge plugs and 1 x setting tool that arrived onsite
47	14/01/2020	15/01/2020	• Continued circulating the mud column in the casing while waiting on forward plan to be approved and equipment to arrive onsite. • Continued with offline maintenance & house keeping. • Reassemble the loose drilling handling equipment that has passed crack testing inspection
48	15/01/2020	16/01/2020	• Continued circulating the mud column in the casing while waiting on forward plan to be approved and equipment to arrive onsite. • Continued with offline maintenance & house keeping
49	16/01/2020	17/01/2020	• Continued circulating the mud column in the casing while waiting on forward plan to be approved and equipment to arrive onsite. • Continued with offline maintenance & house keeping. • Whipstocks and Milling equipment arrived onsite
50	17/01/2020	18/01/2020	• Continued circulating the mud column in the casing while waiting on forward plan to be approved. • Pulled out of the hole with the 8.5" circulating BHA. • Ran in the hole to 1779.5mRT with the casing scraper assembly and cleaned area where the bridge plug will be set. • Commenced pulling out of the hole with the casing scraper assembly
51	18/01/2020	19/01/2020	• Pulled out of the hole with the casing scraper assembly. • Made up the bridge plug on 5" DP & RIH and set at 1779.5mRT. • Confirmed bridge plug in place with tag and pressure test. • Pulled out with the bridge plug running tool on 5" DP. • RIH with cement stinger on 5" DP to1192mRT. • Suspended operations due to high frequency of lightning strikes around the lease
52	19/01/2020	20/01/2020	• RIH with cement stinger on 5" DP to1779.5mRT. • Pumped the abandonment cement plug as per program. • Waited on the abandonment cement plug to reach 500psi compression strength. • Tagged with 5 klb down and confirmed top of the abandonment cement plug at 1585mRT. • POOH with cement stinger on 5" DP to surface. • Made up the 9.625" casing scraper assembly and RIH to 118mRT
53	20/01/2020	21/01/2020	• RIH with the 9.625" casing scraper assembly to 1200mRT and worked across the proposed Whipstock setting point from 1190mRT to 1200mRT. • RIH with the 9.625" casing scraper assembly to 1288mRT and circulated bottoms up. • POOH w with the 9.625" casing scraper assembly to surface. • Performed a drift run with the Mud Motor set at 1.5° through the Well Head & first joint of casing and confirmed not hanging up. • Picked up an additional 280 meters of HWDP & 260 meters of 5" DP and racked back. • Performed rig maintenance & housekeeping while waiting on final approval of the forward plan
54	21/01/2020	22/01/2020	• Performed rig maintenance and housekeeping whilst waiting on final approval of forward plan. • Reduced mud weight of the surface system to 10.5ppg. • Made up and RIH clean out assembly from surface to 1200mRT. • Displaced 11ppg mud from well and replaced with 10.5ppg mud.

			• Commenced centrifuging surface mud system to reduce mud weight from 11ppg to 10.5ppg
55	22/01/2020	23/01/2020	• Centrifuged surface mud system and reduced mud weight from 11ppg to 10.5ppg. • Circulated well bore and conditioned mud rheology as per drilling fluids program. • Performed rig maintenance & housekeeping while waiting on final approval of the forward plan
56	23/01/2020	24/01/2020	• Performed rig maintenance & housekeeping while waiting on final approval of the forward plan. • Broke circulation and circulated 2x bottoms up
57	24/01/2020	25/01/2020	• Performed rig maintenance & housekeeping while waiting on final approval of the forward plan. • Retrieved wear bushing. • Rigged up to run WIS whipstock assembly. • Spotted SLB wireline unit. • Made up whipstock and tri-mill assembly. • Scribed and orientated UBHO. • RIH whipstock BHA from 42mRT to 162mRT
58	25/01/2020	26/01/2020	• RIH whipstock assembly from 162mRT to 1202mRT. • Rigged up SLB wireline surface equipment for gyro run. • Run gyro on wireline and orientated whipstock. • Rigged down SLB wireline surface equipment. • Pulled back whipstock assembly from 1202mRT to 1199mRT. • Set whip stock anchor and sheared whipstock break bolt. • Broke circulation and confirmed flow through milling assembly. • POOH with milling assembly from 1192mRT to surface. • Retrieved wear bushing. • Conducted rig service. • Performed rig maintenance while waiting for iron roughneck parts to arrive from Moomba to the rig site
59	26/01/2020	27/01/2020	• Performed rig maintenance while waiting for iron roughneck parts to arrive from Moomba to the rig site. • Held weekly safety meeting with both crews, maintenance personnel and all third party personnel on location. • Prepared the iron roughneck for reassembly with replacement parts. • Commenced pressure testing BOP and associated equipment
60	27/01/2020	28/01/2020	• Continued to pressure test BOP and associated equipment. • Reassembled the iron roughneck with replacement parts that arrived from Moomba. • Made up and RIH milling BHA from surface to 237mRT. • Continued to run milling assembly on drill pipe from 237mRT to 1183mRT. • Washed down milling assembly from 1183mRT to 1192mRT. • Milled window from 1192mRT to 1194mRT
61	28/01/2020	29/01/2020	• Continued to mill window from 1194mRT to 1200mRT. • Reamed milled window from 1200mRT to 1191mRT. • Conducted slide tests through milled window. • Circulated well bore clean. • POOH with milling assembly from 1200mRT to surface. • Conducted rig service. • Made up jetting tool and cleaned BOP to flush swarf from cavities. • Made up and RIH 8.5" directional BHA from surface to 90mRT. • Continued to RIH 8.5" directional assembly on drill pipe from 90mRT to 1187mRT. • Circulated well bore to even mud weight. • Rigged up Halliburton for FIT.
62	29/01/2020	30/01/2020	• Conducted troubleshooting on Halliburton surface lines - unable to achieve successful pressure test.

			• Conducted FIT and rigged down Halliburton. • Rigged up SLB wireline and run gyro survey. • Orientated 8.5" directional assembly tool face. • Rigged down SLB wireline. • Run 8.5" directional assembly through whipstock and milled window. • Drilled 8.5" build section from 1200mRT to 1257mRT. • Rig up SLB wireline and run gyro survey
63	30/01/2020	31/01/2020	• Run SLB wireline and run gyro survey. • Rigged down SLB wireline. • Drilled 8.5" build section from 1257mRT to 1427mRT
64	31/01/2020	01/02/2020	• Drilled 8.5" build section from 1427mRT to 1466mRT. • Pumped a high viscosity sweep and circulated well bore clean. • POOH 8.5" directional assembly on drill pipe from 1466mRT to 120mRT. • Conducted well control muster drill. • Continued to POOH with 8.5" directional assembly from 120mRT to surface. • Changed bit and string Stabiliser. • RIH 8.5" directional BHA from surface to 90mRT. • RIH 8.5" directional assembly from 90mRT to 1169mRT. • Conducted rig service. • RIH 8.5" directional assembly from 1169mRT to 1193mRT.
65	01/02/2020	02/02/2020	• RIH 8.5" directional assembly from 1193mRT to 1466mRT. • Circulated bottoms up and recorded SCR's. • Drilled 8.5" build section from 1466mRT to 1671mRT.
66	02/02/2020	03/02/2020	• Drilled 8.5" build section from 1671mRT to 1696mRT. • Circulated and conditioned mud - added 1% BDF lubricant. • Drilled 8.5" build section from 1796mRT to 1713mRT. • Pumped a high viscosity sweep and circulated well bore clean. • POOH 8.5" directional assembly on drill pipe from 1713mRT to 90mRT. • POOH 8.5" BHA from 90mRT to surface. • Laid down string Stabiliser and graded bit. • RIH 8.5" directional BHA from surface to 40mRT. • Conducted rig service. • RIH 8.5" directional assembly on drill pipe from 40mRT to 874mRT
67	03/02/2020	04/02/2020	• RIH directional assembly on drill pipe from 874mRT to 1713mRT. • Drilled 8.5" build section from 1713mRT to 1715mRT. • Pumped a high viscosity sweep and circulated well bore clean. • POOH 8.5" directional assembly on drill pipe from 1715mRT to 42mRT. • POOH 8.5" directional BHA from 42mRT to surface. • Made up and RIH RSS directional assembly from surface to 1189mRT. • Conducted rig service. • RIH RSS directional assembly from 1189mRT to 1458mRT. • Wash and reamed RSS directional assembly from 145mRT to 1715mRT. • Drilled 8.5" build section from 1715mRT to 1723mRT.
68	04/02/2020	05/02/2020	• Drilled 8.5" build section from 1723mRT to 1884mRT
69	05/02/2020	06/02/2020	• Drilled 8.5" build section from 1884mRT to 2090mRT - Section TD
70	06/02/2020	07/02/2020	• Pumped low viscosity sweep and circulated well bore clean. • Conducted flow check. • Spot 50 bbl high viscosity pill on bottom. • POOH 8.5" directional assembly on elevators from 2090mRT to 24mRT. • POOH 8.5" directional BHA from 24mRT to surface. • Made up and RIH 8.5" directional BHA from surface to 102mRT. • Conducted rig service. • RIH 8.5" directional assembly on drill pipe from 102mRT to 1173mRT. • Slipped and cut drill line. • Performed ERP drill - Fire/Man down. • Temporarily ceased operations due to lightening.

			• RIH 8.5" directional assembly on drill pipe from 1173mRT to 1930mRT. • Logged build section with Spectral GR from 1930mRT to 1947mRT
71	07/02/2020	08/02/2020	• Logged build section with Spectral GR from 1947mRT to 2090mRT. • Circulated well bore clean. • Commenced troubleshooting PowerDrive. • Drilled 8.5" production section from 2090mRT to 2093mRT. • Pumped a low viscosity sweep and circulated well bore clean. • Spotted 50 bbl high viscosity pill on bottom. • POOH 8.5" directional assembly on elevators from 2093mRT to 102mRT. • POOH 8.5" directional BHA from 102mRT to surface. • Conducted rig service. • Made up and RIH 8.5" directional BHA from surface to 102mRT. • RIH 8.5" directional assembly from 102mRT to 445mRT.
72	08/02/2020	09/02/2020	• RIH 8.5" directional assembly from 445mRT to 2044mRT. • Washed 8.5" directional assembly from 2044mRT to 2093mRT. • Circulated well bore clean and recorded SCR's. • Drilled 8.5" production section from 2093mRT to 2303mRT
73	09/02/2020	10/02/2020	• Drilled 8.5" production section from 2303mRT to 2622mRT. • Conducted rig service. • Reset Peco HMI to clear drawworks fault. • Drilled 8.5" production section from 2622mRT to 2651mRT
74	10/02/2020	11/02/2020	• Drilled 8.5" production section from 2651mRT to 2911mRT. • Conducted rig service. • Drilled 8.5" production section from 2911mRT to 2978mRT
75	11/02/2020	12/02/2020	• Drilled 8.5" production section from 2978mRT to 3286mRT. • Conducted rig service. • Drilled 8.5" production section from 3286mRT to 3290mRT
76	12/02/2020	13/02/2020	• Drilled 8.5" production section from 3290mRT to 3616mRT
77	13/02/2020	14/02/2020	• Drilled 8.5" production section from 3616mRT to TD at 3809mRT. • Circulated and conditioned the hole clean. • POOH with the 8.5" BHA on 5" DP from 3809mRT to 3363mRT
78	14/02/2020	15/02/2020	• POOH with the 8.5" BHA on 5" DP into the casing window • Commenced laying out 5" DP sideways from 1174mRT to 701mRT
79	15/02/2020	16/02/2020	• Continued laying out 5" DP and 8.5" BHA. • Continued laying out the 5" DP sideways.
80	16/02/2020	17/02/2020	• Completed laying out all of the tubular's from the mast. • Rigged up and commenced running the 5.5" production casing. • Trouble shoot Weatherford Torkdrive system
81	17/02/2020	18/02/2020	• Rectified the packer issue on the Weatherford Torkdrive. • Continued running the 5.5" production casing as per the tally to 1188mRT
82	18/02/2020	19/02/2020	• Continued running the 5.5" production casing from 1188mRT to 3089mRT
83	19/02/2020	20/02/2020	• Continued running the 5.5" production casing as per the tally from 3089mRT to casing shoe setting depth at 3802.23mRT. • Circulated and conditioned the hole prior to the cement job. • Rigged up and prepared to cement the 5.5" production casing as per program
84	20/02/2020	21/02/2020	• Cemented the 5.5" production casing as per program. • Installed and pressure tested the pack off seal assembly as per procedure. • Rigged down the casing handling and cementing equipment. • Prepared to Nipple down the BOP and install the "C " Wellhead Section
85	21/02/2020	22/02/2020	• Nippled down the BOP. • Continued to dump and clean the mud tanks. • Opened up the BOP bonnets and inspected the components. • Installed the 7-1/16" 10M tubing head and master valve assembly. • Note: Rig released from Kyalla 117 N2 H1-ST2 at 14:00hrs.

Table 1. Summary of Daily Drilling Reports and related activities

3.3 PLANNED AND ACTUAL TIME VERSUS DEPTH CURVE

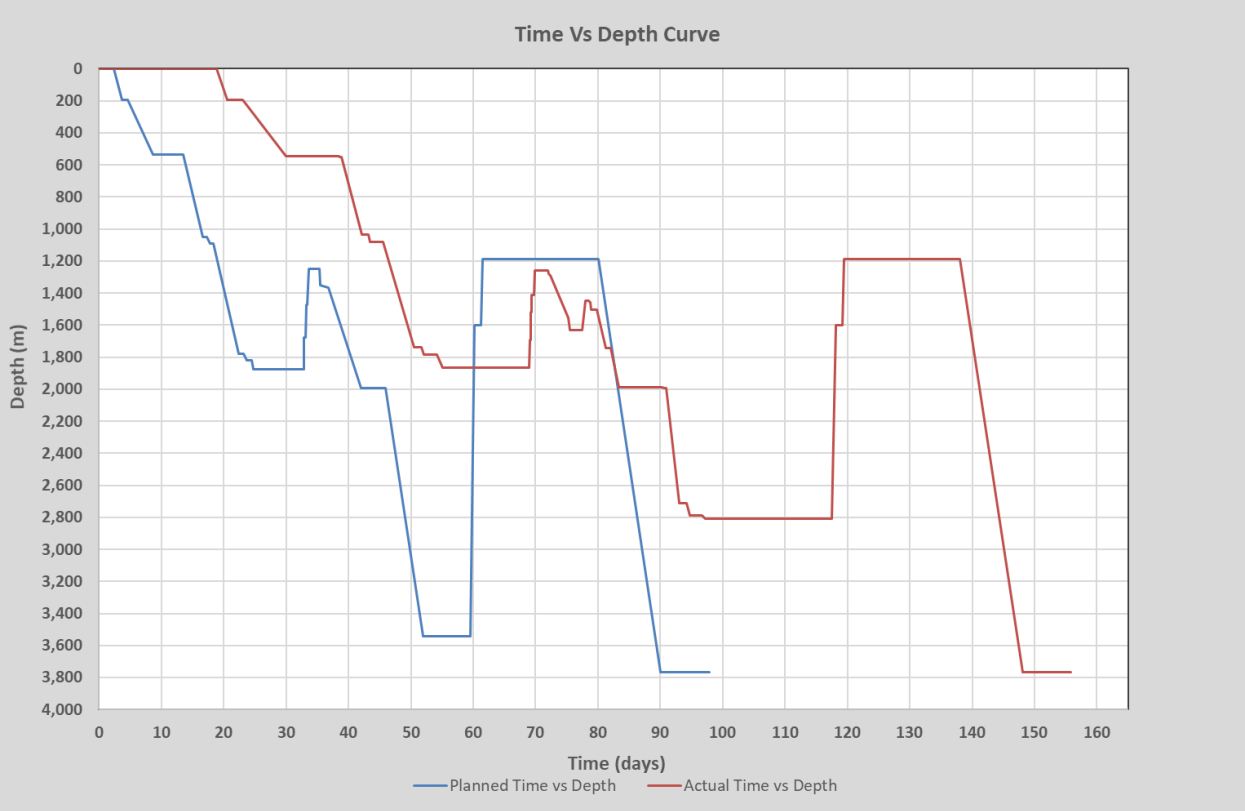

Figure 4. Combined Kyalla 117 N2-1H, Kyalla 117 N2-1H ST1, and Kyalla 117 N2-1H ST2 Time vs Depth Chart, including Kyalla 117 N2-1 vertical

3.4 HOLE SIZES AND DEPTHS

Details of hole sizes and depths are provided in Table 2. Kyalla 117 N2-1H, Kyalla 117 N2-1H ST1, Kyalla 117 N2-1H ST2 as drilled schematics showing hole size and depths are provided in Figure 3 to Figure 12.

Wellbore	Type	Hole Size (")	Depth From (mMDRT)	Depth To (mMDRT)	Rig
Kyalla 117 N2-1H	Intermediate	12 ¼"	1288.33	1628.79	Ensign 963
Kyalla 117 N2-1H ST1	Intermediate	12 ¼"	1457	1990	Ensign 963
Kyalla 117 N2-1H ST1	Production	8 ½"	1990	2809	Ensign 963
Kyalla 117 N2-1H ST2	Production	8 ½"	1196.42	3809	Ensign 963

Table 2. Kyalla 117 N2-1H, Kyalla 117 N2-1H ST1, Kyalla 117 N2-1H ST2 size and depth details

3.5 CASING AND EQUIPMENT INSTALLED IN OR ON THE WELL

Table 3 to Table 5 summarize the casing and equipment installed in or on Kyalla 117 N2-1H, Kyalla 117 N2-1H ST1 and Kyalla 117 N2-1H ST2 respectively. The as drilled schematics showing the casing and equipment dimension is provided in Figure 3. to Figure 12. Detailed casing information is attached in casing reports (Appendix 3).

Kyalla 117 N2-1H

Type	Hole Size (“)	Hole Depth (mMDRT)	Casing Size OD (”)	Casing Size ID (“)	Weight (lb/ft)	Grade	Thread	Shoe Depth (mMDRT)
Conductor	22	19 -194	18 5/8	17.831	87.5	K-55	BTC	193.7
Surface	17 ½	194 -548	13 3/8	12.415	68	L-80	BTC	544.65
Intermediate	12 ¼	1288.33-1628.79	NA Plugged and Abandoned					

Table 3. Kyalla 117 N2-1H casing details

Kyalla 117 N2-1H ST1

Type	Hole Size (“)	Hole Depth (mMDRT)	Casing Size OD (”)	Casing Size ID (“)	Weight (lb/ft)	Grade	Thread	Shoe Depth (mMDRT)
Conductor	22	19 -194	18 5/8	17.831	87.5	K-55	BTC	193.7
Surface	17 ½	194-548	13 3/8	12.415	68	L-80	BTC	544.65
Intermediate	12 ¼	548-1990	9 ⅝	8.681	47	P-110	JFE BEAR	1984.88
Production	8 ½	1990-2809	NA Plugged and Abandoned					

Table 4. Kyalla 117 N2-1H ST1 casing details

Kyalla 117 N2-1H ST2

Type	Hole Size (“)	Hole Depth (mMDRT)	Casing Size OD (”)	Casing Size ID (“)	Weight (lb/ft)	Grade	Thread	Shoe Depth (mMDRT)
Conductor	22	19 - 194	18 5/8	17.831	87.5	K-55	BTC	193.7
Surface	17 ½	194 - 548	13 3/8	12.415	68	L-80	BTC	544.65
Intermediate (ST1)	12 ¼	548 - 1196	9 ⅝	8.681	47	P-110	JFE BEAR	1196.42
Production	8 ½	1196 - 3809	5 ½	4.670	23	P-110	JFE BEAR	3802.45

Table 5. Kyalla 117 N2-1H ST2 casing details

3.6 CEMENTING OPERATIONS CARRIED OUT

Table 6 summarizes the cementing operations carried out on Kyalla 117 N2-1H ST2. Detailed cementing operations can be found in the Daily Drilling Reports (Appendix 1) and the cementing reports (Appendix 4).

String (") / Plug	Cement Type	Cement Additives	Slurry Vol (bbls)	Slurry Density (ppg)	Cement to / from (mMDRT)	Test Criteria (Tag / Pressure Test) (psi)	Comments
Conductor	950 sacks of Class G	Well Life 734 Calcium Chloride	199	15.8	90.5 (top) to 193.7 (bottom)	1162	No returns to Surface
Conductor (Top Up Job)	287 sacks of Class G	Well Life 734 Calcium Chloride	52	15.8	8.12 (top) to 90.5 (bottom)	NA	Returns to surface
Surface Casing Lead (Stage 1)	232 sacks of Class G	Econolite Liquid HR-5 D-Air 3500L	73	13.5	211.44 (top) to 394.64 (bottom)	NA	
Surface Casing Tail (Stage 1)	352 Sacks of Class G	Econolite Liquid D-Air 3500L	72.9	15.8	394.64 (top) to 548.00 (bottom)	-	Plug not bumped
Surface Casing Lead (Stage 2)	407 sacks of Class G	Econolite Liquid D-Air 3500L Well Life 734	126	13.5	8.13 (top) to 170 (bottom)	NA	Returns to surface
Surface Casing Tail (Stage 2)	82 sacks of Class G	Econolite Liquid D-Air 3500L	18.1	15.8	170 (top) to 207.53 (bottom)	2000	Plug did not bump
13 3/8 surface casing shoe isolation plug 1	238 sacks Class G	Econolite Liquid D-Air 3500L	49.1	15.8	420.21 (top) to 520.21 (bottom)	3050	Isolate float collar.
13 3/8 surface casing shoe isolation plug 2	238 sacks of Class G	Econolite Liquid D-Air 3500L	49.1	15.8	448 (top) to 548 (bottom)	NA	Hesitation to squeeze 13 3/8 casing shoe
12 ¼ Abandonment Plug 1	431 sacks of Class G	D-Air 3500L Halad 344 Halad413 CFR-3 HR-5	87.6	15.8	1690 (top) to 1865 (bottom)	NA	Isolate lower Kyalla Formation
12 ¼ Abandonment Plug 2	394 sacks of Class G	D-Air 3500L Halad 344 Halad413 CFR-3 HR-5	87.6	15.8	1520 (top) to 1680 (bottom)	NA	Isolate middle Kyalla Formation
12 ¼ Abandonment Plug 3	246 sacks of Class G	D-Air 3500L Halad 344 Halad413 CFR-3 HR-5	87.6	15.8	1410 (top) to 1510 (bottom)	NA	Isolate middle Kyalla Formation
12 ¼ Open Hole kick off plug (Plug #4)	418 sacks of Class G	D-Air 3500 Halad 413 CFR3 HR5	79.1	16.5	1260 (top) to 1410 (bottom)	NA	

Table 6. Kyalla 117 N2-1H ST2 cementing operations

3.7 WELL SCHEMATICS

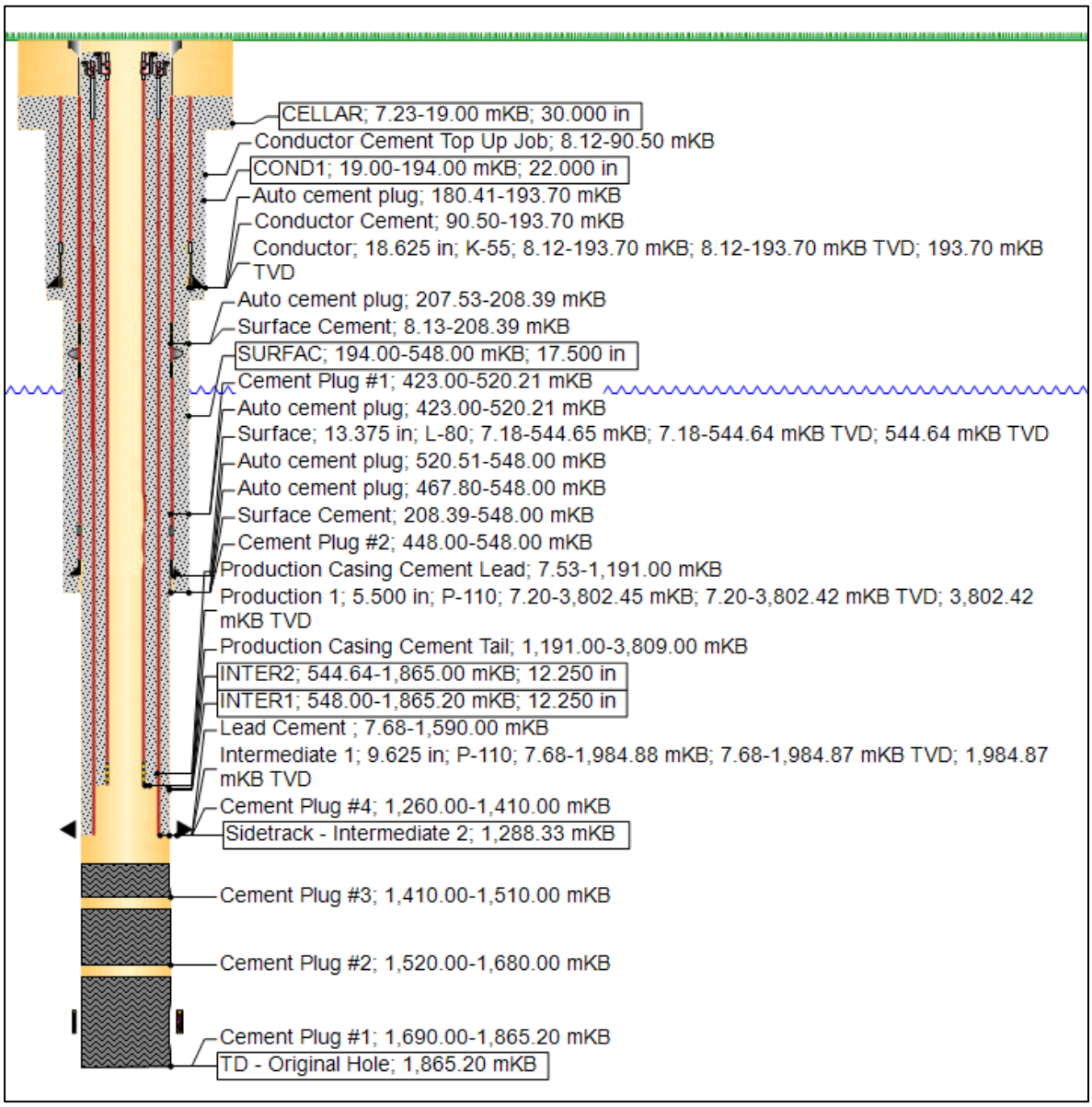

Figure 5. Kyalla 117 N2-1 as drilled well schematic

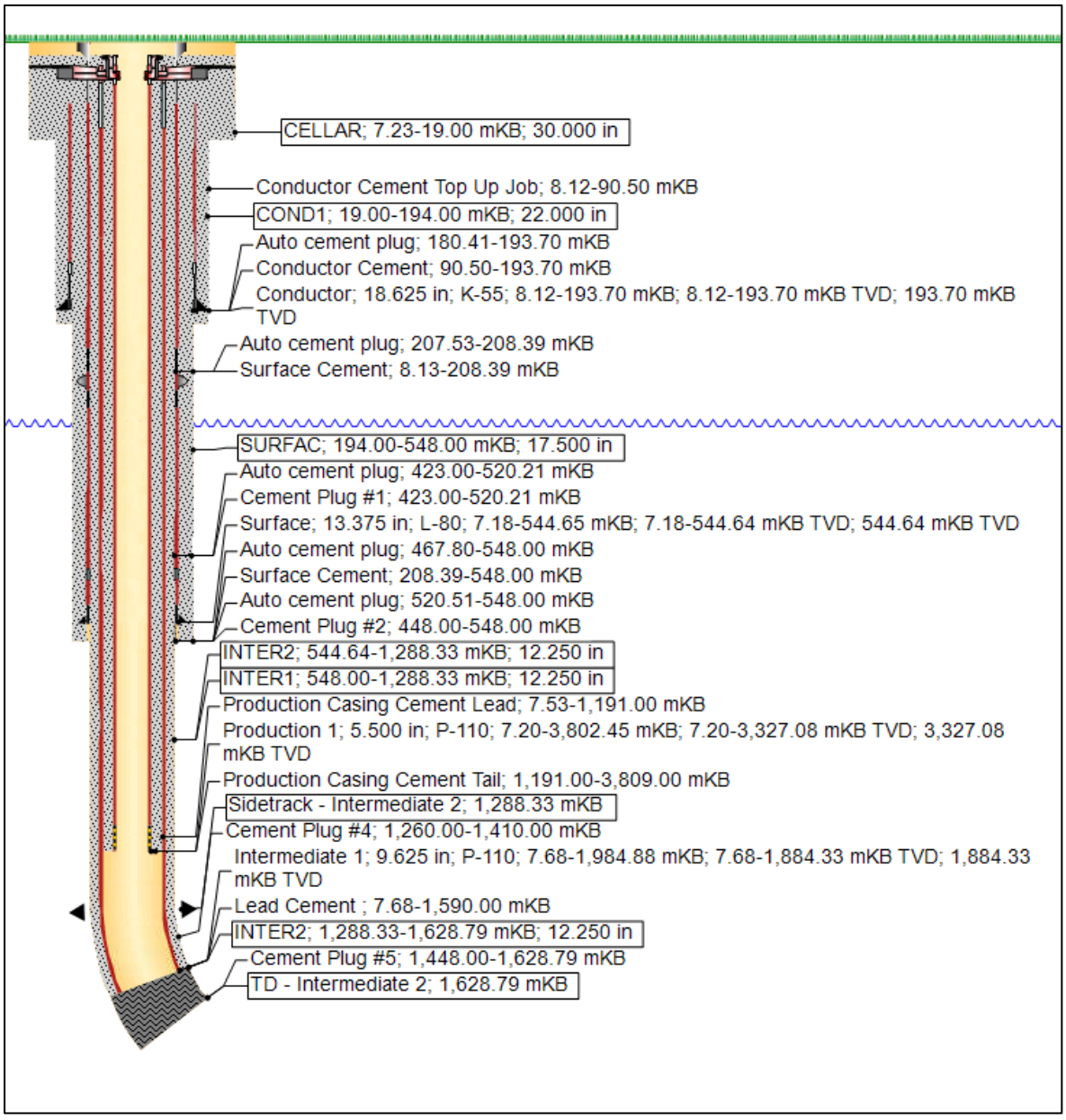

Figure 6. Kyalla 117 N2-1H as drilled well schematic

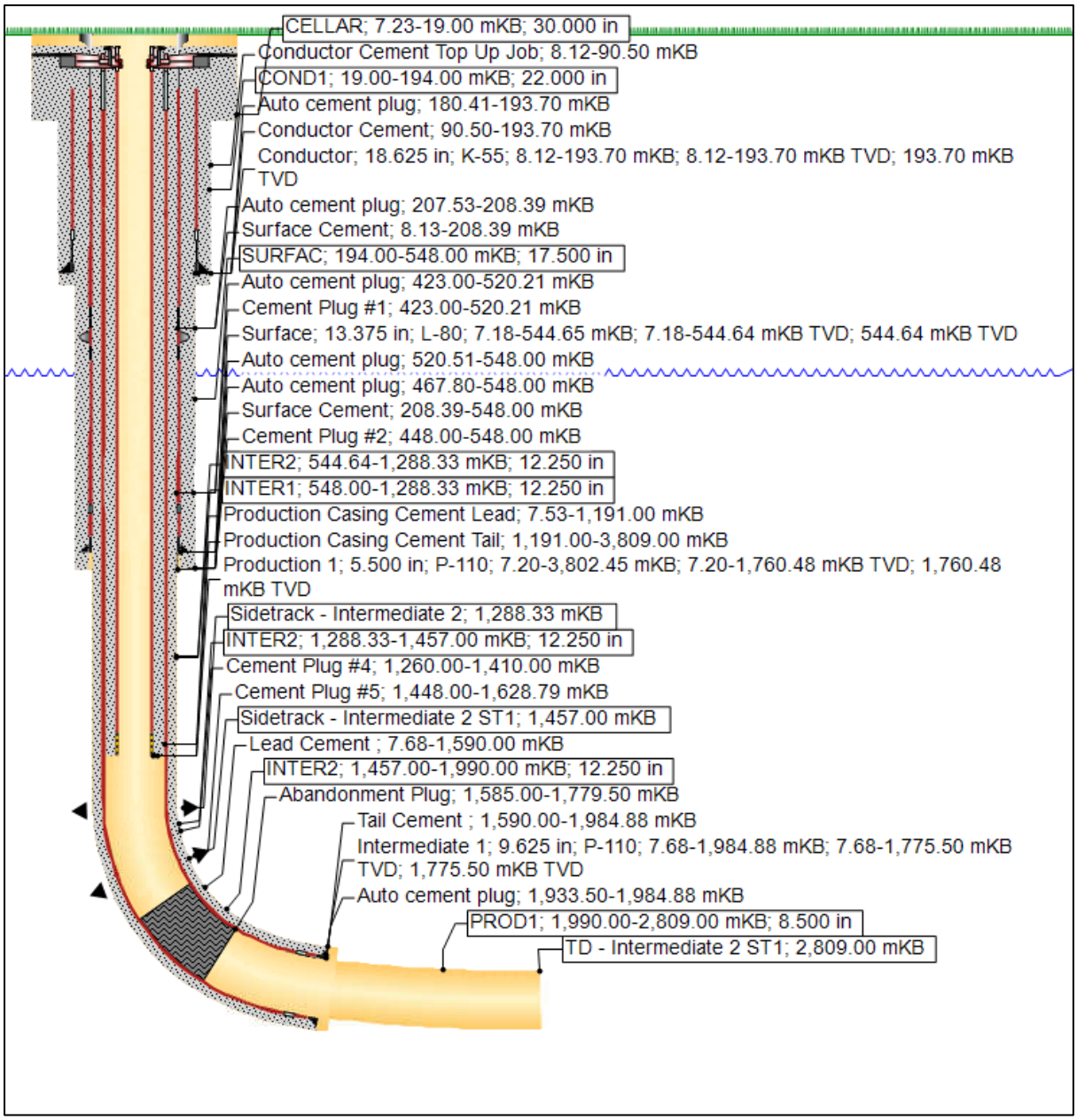

Figure 7. Kyalla 117 N2-1H ST1 as drilled well schematic

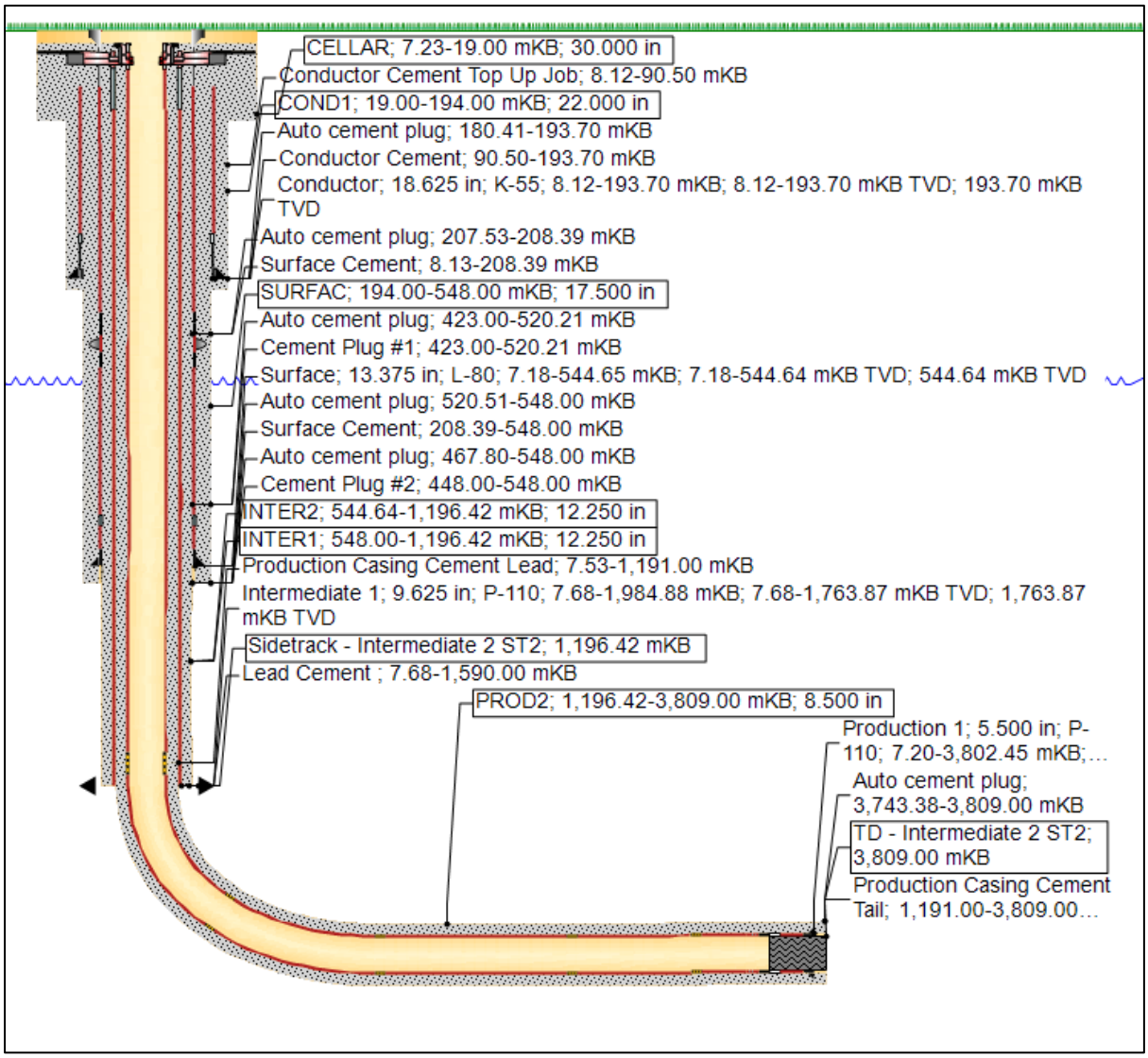

Figure 8. Kyalla 117 N2-1H ST2 as drilled well schematic

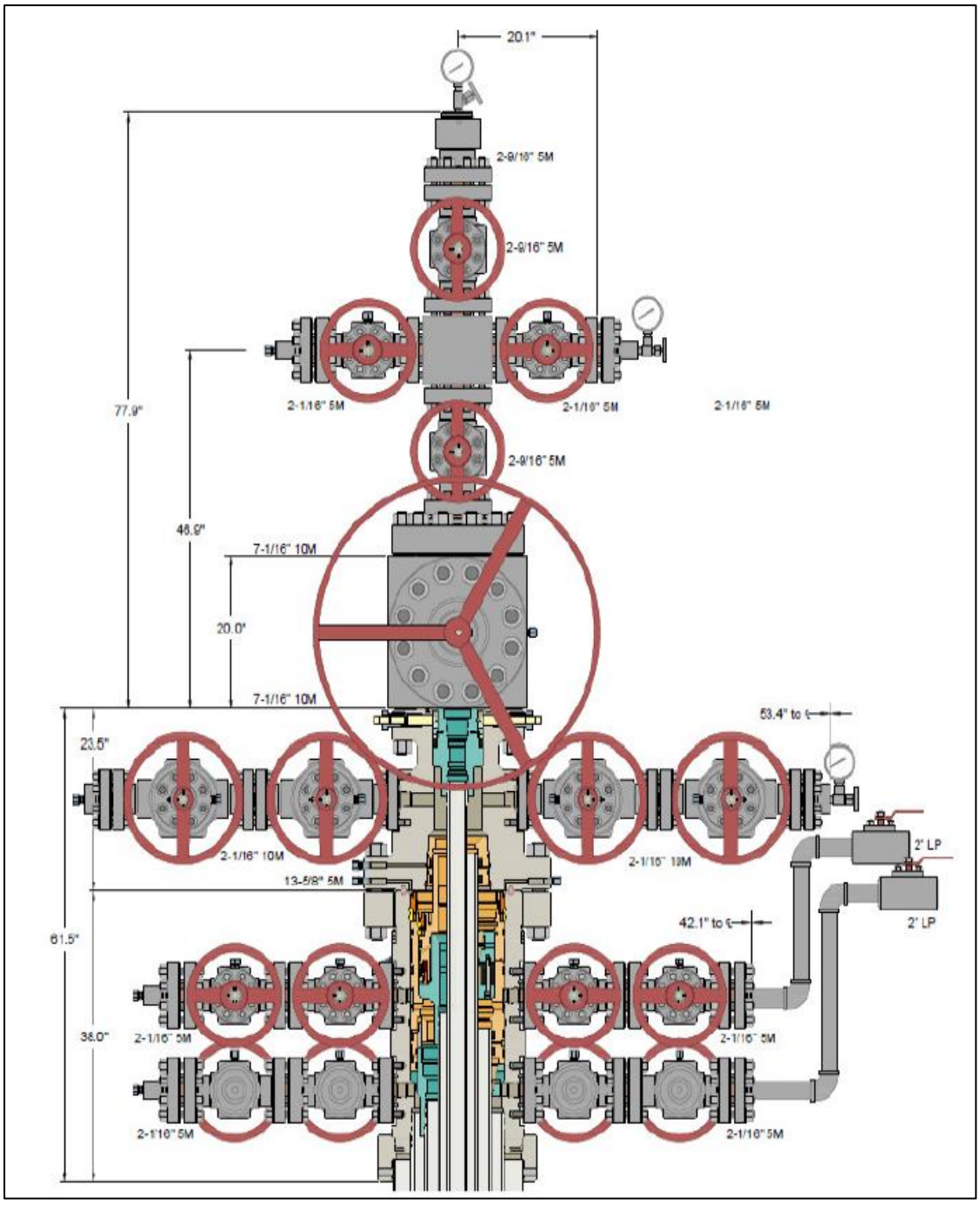

Figure 9. Kyalla 117 N2-1H, Kyalla 117 N2-1H ST1, and Kyalla 117 N2-1H ST2 installed wellhead equipment schematic

Figure 10. Kyalla 117 N2-1H, Kyalla 117 N2-1H ST1, and Kyalla 117 N2-1H ST2 installed wellhead equipment photo

D SECTION				
Des	Model	SN	WP (psi)	Make
Companion Flange	7-1/16" 10M x 2-9/16" 5M			GE OIL & GAS
Gate Valve	2-9/16" 5M			GE OIL & GAS
Gate Valve	2-1/16" 5M			GE OIL & GAS
Flow Cross	2-9/16" 5M, w/ 2-1/16" 5M flange outlets	JN5390369-01		GE OIL & GAS
Companion Flange	2-9/16" 5M x 3" Bowen			GE OIL & GAS
Tree Cap	3" Bowen w/ 1/2" NPT	JN5404106-01		GE OIL & GAS
Companion Flange	2-1/16" 5M flanged x 2" NPT			GE OIL & GAS
Bull Plug	2" NPT male x 1/2" NPT female			GE OIL & GAS
Needle Valve	1/2" NPT 5M			GE OIL & GAS
C SECTION				
Des	Model	SN	WP (psi)	Make
Tubing Head	13-5/8" 5M x 7-1/16" 10M, w/ 2-1/16" 10M flange outlets	JN5351805-02		GE OIL & GAS
Master Valve	7-1/16" 10M	SJA1110-A-001		GE OIL & GAS
Gate Valve	2-1/16" 10M			GE OIL & GAS
Companion Flange	2-1/16" 10M flanged x 2" NPT		3,000.0	GE OIL & GAS
Bull Plug	2" NPT male x 1/2" NPT female		3,000.0	GE OIL & GAS
Needle Valve	1/2" NPT 10K			GE OIL & GAS
B SECTION				
Des	Model	SN	WP (psi)	Make
9.625" Mandrel Hanger	R221931-1 (RSH-2)	610004960/1/3	5,000.0	GENERAL ELECTRIC
9.625" Pack-Off	H371578-1 (RSH-2)	JN5356445-02	5,000.0	GENERAL ELECTRIC
A SECTION				
Des	Model	SN	WP (psi)	Make
		JN3356152-1	5,000.0	GENERAL ELECTRIC

Figure 11. Kyalla 117 N2-1H, Kyalla 117 N2-1H ST1, and Kyalla 117 N2-1H ST2 installed wellhead equipment specifications

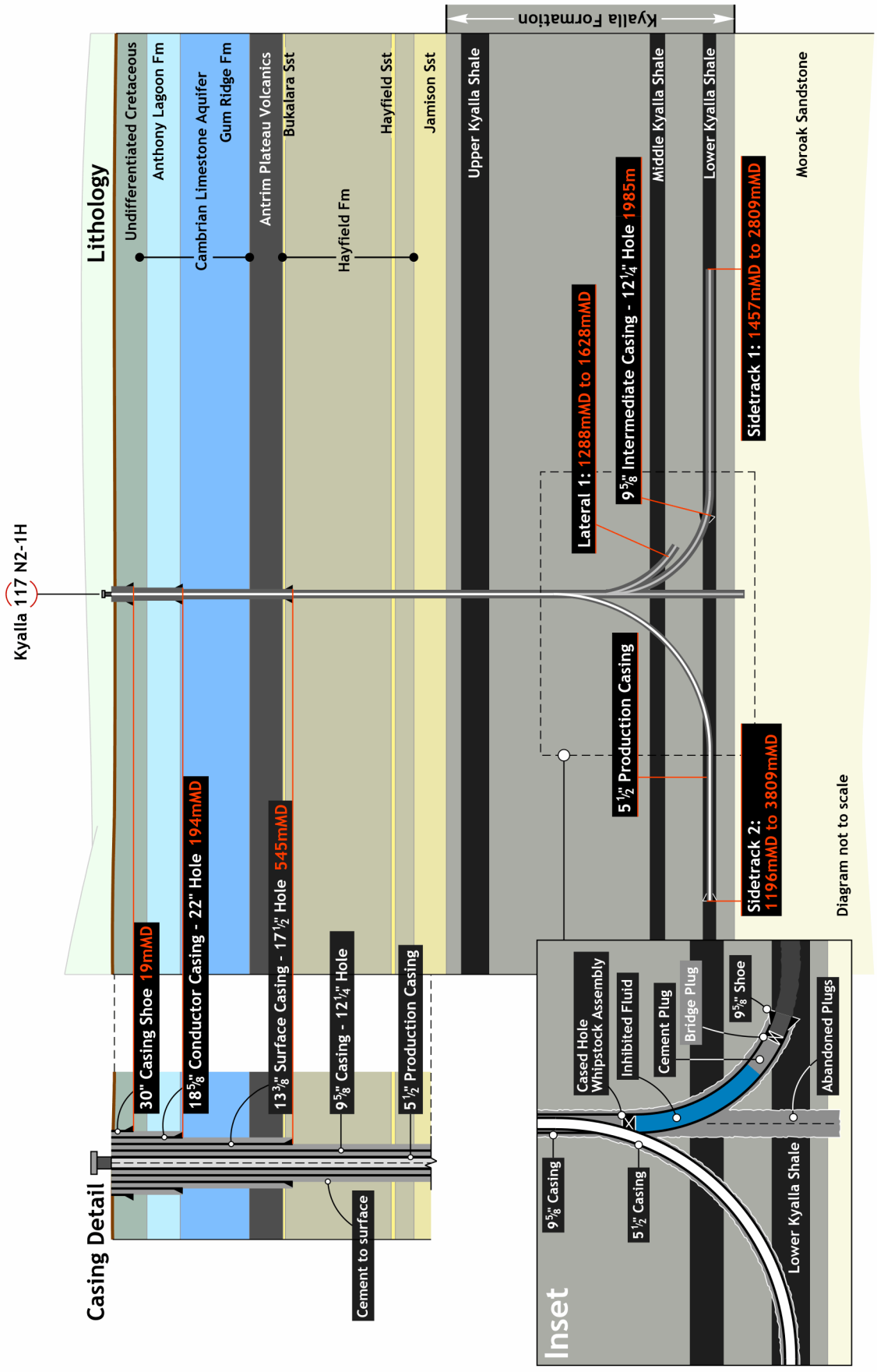

Figure 12. Kyalla 117 N2-1H, Kyalla 117 N2-1H ST1 and Kyalla 117 N2-1H ST2 as drilled schematic

3.8 BIT RECORDS

Table 7 summarizes the bit records for Kyalla 117 N2-1H, Kyalla 117 N2-1H ST1, and Kyalla 117 N2-1H ST2. Full descriptions are listed in the daily drilling reports (Appendix 1) and the Bit Records Summary in Appendix 5.

Well Bore Name	Well Bore Section	Bit Run	Size (in)	Model	SN	Type	Make	Depth drilled (m)	Drill hours (hr)
Kyalla 117 N2-1H	Intermediate	1	12 ¼	H30JCPDH	D241900	Tri cone	NOV	366.79	53.5
Kyalla 117 N2-1H ST1	Intermediate	New	12 ¼	H30JCPDH	D241898	Tri cone	NOV	58	12.5
Kyalla 117 N2-1H ST1	Intermediate	RR1	12 ¼	CF713 U03241	49034	PDC	Ulterra	239	34.95
Kyalla 117 N2-1H ST1	Intermediate	New	12 ¼	TKC76	E264507	PDC	Reed Hycalog	245	20.5
Kyalla 117 N2-1H ST1	Production	New	8 ½	TKC66	E264057	PDC	NOV	819	36.15
Kyalla 117 N2-1H ST1	Production	RR1	8 ½	TKC66	E264057	PDC	NOV	819	36.15
Kyalla 117 N2-1H ST2	Intermediate	New	8 ½	TKC66	E264058	PDC	NOV	274	36.69
Kyalla 117 N2-1H ST2	Intermediate	New	8 ½	CF713	48938	PDC	Ulterra	582	62.64
Kyalla 117 N2-1H ST2	Intermediate	RR1	8 ½	CF713	48938	PDC	Ulterra	582	62.64
Kyalla 117 N2-1H ST2	Intermediate	RR2	8 ½	CF713	48938	PDC	Ulterra	582	62.64
Kyalla 117 N2-1H ST2	Production	New	8 ½	TKC66	E264056	PDC	NOV	1719	99.65
Kyalla 117 N2-1H ST2	Production	RR1	8 ½	TKC66	E264056	PDC	NOV	1719	99.65

Table 7 Kyalla 117 N2-1H, Kyalla 117 N2-1H ST1, and Kyalla 117 N2-1H ST2 Bit Records

3.9 BHA RECORDS

Figure 13 and Figure 14 summarise the BHA information from Kyalla 117 N2-1H, Kyalla 117 N2-1H ST1, and Kyalla 117 N2-1H ST2.

BHA Summary

WellView

Well Name: KYALLA 117 N2-1H **Job Type: DRILLING ORIGINAL**

Area & ATP Code	Surface Legal Location	License #	Well Configuration Type	Ground Elevation (m)	Casing Flange Elevation (m)	KB-Ground Distance (m)	KB-Casing Flange Distance (m)
BLO-W			HORIZONTAL FRAC	269.92		7.23	

Bit Run	BHA #	String Name	BHA	Drill Bit	Bit Dull	Depth In (mKB)	Depth Out (mKB)	Drilled (m)	Drill Time (hr)	BHA ROP (m/hr)
1	20	Rotary Build	NOV H30JCPDH, Mud Motor, Stabiliser, Float Sub, Non Mag X/O, Non Mag X/O, Telescope APWD & GR, Non Mag X/O, GVR - 8 2 X StabiliserS, Non Mag X/O, 8" Drill Collar, Hydra-Jar, 8" Drill Collar, Bottle Neck Crossover, Heavy Weight Drill Pipe, Drill Pipe	12 1/4in, NOV, H30JCPDH, D241900	8-8-LC-A-N-4-LC-RIG	1,262.00	1,628.79	366.79	53.50	6.9
	21	Fishing assembly	11.5" Junk Magnet, Bit Sub, 8" Drill Collar, Hydra-Jar, Crossover, Heavy Weight Drill Pipe, Drill Pipe		-------	1,628.79	1,628.79			
	22	Fishing assembly	Junk Sub, 8" Drill Collar, Hydra-Jar, Crossover, Heavy Weight Drill Pipe, Drill Pipe		-------	1,627.93	1,627.93			
New	23	Rotary Build	NOV H30JCPDH, Mud Motor 1.5deg bend, Stabiliser, Float Sub, Non Mag X/O, Non Mag X/O Pin x Pin, Telescope 825 HF with APWD, Non Mag X/O, Non Mag X/O, 8" Drill Collar, Hydra-Jar, 8" Drill Collar, Bottle Neck Crossover, Heavy Weight Drill Pipe, Drill Pipe	12 1/4in, NOV, H30JCPDH, D241898	1-1-WT-C-0-0-NO-BHA	1,448.00	1,506.00	58.00	12.50	4.6
RR 1	24	Packed Hole	Ulterra CF713 U03241, PD900 X6 RA 12-1/4" Stabilised CC with Ported Float, Receiver Sub (slick), PD900FC-AA Flex Collar, Non Mag X/O, Telescope 825 HF with APWD, Non Mag X/O, Non Mag X/O, Tomax AST, 8" Drill Collar, Hydra-Jar, 8" Drill Collar, Bottle Neck Crossover, Heavy Weight Drill Pipe, Drill Pipe	12 1/4in, Ulterra, CF713 U03241, 49034	1-1-WT-A-X-0-NO-BHA	1,506.00	1,745.00	239.00	34.95	6.8
New	25	Rotary Build	Reed Hycalog TKC76, Mud Motor 1.5deg bend, Stabiliser, Float Sub, NM Pony Collar, Non Mag X/O, Non Mag X/O Pin x Pin, Telescope 825 HF with APWD, Non Mag X/O, Non Mag X/O, 8" Drill Collar, Hydra-Jar, 8" Drill Collar, Bottle Neck Crossover, Heavy Weight Drill Pipe, Drill Pipe	12 1/4in, Reed Hycalog, TKC76, E264507	1-2-CT-S-X-0-WT-TD	1,745.00	1,990.00	245.00	20.50	12.0
RR 1	26	Rotary Build	Reed Hycalog TKC76, Bit Sub XO with ported float., NM Pony Collar, Non Mag X/O, Non Mag X/O Pin x Pin, Telescope 825 HF with APWD, Non Mag X/O, GVR-8, Non Mag XO, 8" Drill Collar, Hydra-Jar, 8" Drill Collar, Bottle Neck Crossover, Heavy Weight Drill Pipe, Drill Pipe	12 1/4in, Reed Hycalog, TKC76, E264507	1-2-CT-S-X-0-WT-TD	1,990.00	1,990.00			
New	27	Steerable	NOV TKC66, PD 675 X6 AB 8-1/2" Stabilised CC - Type 3 Pad - with ported float, HHOP, 6.75" Split Collar, DPM 6.75in, Extension Sub, TelePacer Azi Gr-SGR, Saver Sub, AWR 6.75in, ABS 6.75in, Crossover, Float Sub, GVR-6 2 x 8-3/8" Stabs, Crossover, Filter Sub, Heavy Weight Drill Pipe, Hydra-Jar, Heavy Weight Drill Pipe, Drill Pipe	8 1/2in, NOV, TKC66, E264057	0-1-CT-S-X-0-ER-DTF	1,990.00	2,786.00	796.00	34.40	23.1
RR 1	28	Steerable	NOV TKC66, PD 675 X6 AB 8-1/2" Stabilised CC - Type 3 Pad - with ported float, HHOP, 6.75" Split Collar, DPM 6.75in, Extension Sub, TelePacer Azi Gr-SGR, Saver Sub, AWR 6.75in, ABS 6.75in, Crossover, Float Sub, GVR-6 2 x 8-3/8" Stabs, Crossover, Filter Sub, Heavy Weight Drill Pipe, Hydra-Jar, Heavy Weight Drill Pipe, Drill Pipe	8 1/2in, NOV, TKC66, E264057	0-1-CT-S-X-0-PN-BHA	2,786.00	2,809.00	23.00	1.75	13.1
	29	Fishing assembly	Screw in Sub, Drill Pipe		-------	0.00	2,136.00			
	30	Fishing assembly	Overshot 8-3/8", Bumper Sub, Drill Pipe		-------	0.00	2,142.48			
	31	Fishing assembly	7" Fishing Magnet, Boot Basket (Junk Sub), Bit Sub, Drill Pipe		-------	0.00	1,748.93			
	32	Fishing assembly	Overshot, Bumper Sub, Accelerator, Drill Pipe		-------	0.00	2,005.00			
	33	Milling Assembly	Mill, Bit Sub, Bumper Sub, Drilling Jars - Hydraulic, Drill Collar, Accelerator, Drill Pipe		-------	0.00	2,006.50			
	34	Milling Assembly	Mill, Bit Sub, Bumper Sub, Drilling Jars - Hydraulic, Drill Collar, Accelerator, Drill Pipe		-------	0.00	2,008.71			

Figure 13 Kyalla 117 N2-1H, Kyalla 117 N2-1H ST1, and Kyalla 117 N2-1H ST2 BHA summary (pg 1 / 2 - see Figure 14 for 2 / 2)

BHA Summary

WellView

Well Name: KYALLA 117 N2-1H **Job Type: DRILLING ORIGINAL**

Area & ATP Code	Surface Legal Location	License #	Well Configuration Type	Ground Elevation (m)	Casing Flange Elevation (m)	KB-Ground Distance (m)	KB-Casing Flange Distance (m)
BLO-W			HORIZONTAL FRAC	269.92		7.23	

Bit Run	BHA #	String Name	BHA	Drill Bit	Bit Dull	Depth In (mKB)	Depth Out (mKB)	Drilled (m)	Drill Time (hr)	BHA ROP (m/hr)
	35	Fishing assembly	Overshot, XO Sub, Bumper Sub, Accelerator, Drill Pipe		-------	0.00	2,027.91			
New	36	Cleanout Assembly	Smith RH8281, Bit Sub, Float Sub, NM Pony Collar, TelePacer, Crossover, Filter Sub, Heavy Weight Drill Pipe, Hydra-Jar, Heavy Weight Drill Pipe, Drill Pipe	8 1/2in, Smith, RH8281, FHK30DODPS	1-1-WT-S-E-1-WT-BHA	0.00	2,263.00			
RR 1	37	Cleanout Assembly	Smith RH8281, Bit Sub, Drill Collar, Heavy Weight Drill Pipe, Fishing Jar, Heavy Weight Drill Pipe, Drill Pipe	8 1/2in, Smith, RH8281, FHK30DODPS	1-1-WT-S-E-1-WT-BHA	2,809.00	2,809.00			
RR 2	38	Cleanout Assembly	Smith RH8281, Casing Scraper, Bit Sub, Fishing Jar, Drill Collar, Heavy Weight Drill Pipe, Drill Pipe	8 1/2in, Smith, RH8281, FHK30DODPS	1-1-WT-S-E-1-WT-BHA	2,809.00	2,809.00			
	39	Slick	Tubing, XO Sub, XO Sub, Drill Pipe		-------	2,809.00	2,809.00			
RR 3	40	Cleanout Assembly	Smith RH8281, Casing Scraper, Bit Sub, Fishing Jar, Drill Collar, Heavy Weight Drill Pipe, Drill Pipe	8 1/2in, Smith, RH8281, FHK30DODPS	1-1-WT-S-E-1-WT-BHA	2,809.00	2,809.00			
RR 4	41	Cleanout Assembly	Smith RH8281, Bit Sub, Drill Collar, Drill Pipe	8 1/2in, Smith, RH8281, FHK30DODPS	1-1-WT-S-E-1-WT-BHA					
	42	Kick Off	9-5/8" Expandable Anchor, 9-5/8" TM+ Whipstock, 8-1/2" Tri-Mill, 6-1/2" Running Tool, Heavy Weight Drill Pipe, Float Sub, Wireline Gyro Sub, Drill Collar, Heavy Weight Drill Pipe, Drill Pipe		-------					
	43	Milling Assembly	8-1/2" Tri-Mill, 6-1/2" Running Tool, Heavy Weight Drill Pipe, Float Sub, Drill Collar, Heavy Weight Drill Pipe, Drill Pipe		-------	1,192.00	1,200.00	8.00	13.75	0.6
New	44	Rotary Build	NOV TKC66, 6-3/4" G2 Motor ABH Sleve 7/8 5.0, 6-3/4" IB Stabiliser, Float Sub, 6-3/4" Non-Mag Pony DC, 6-3/4" Non-Mag DC, Crossover, 6-3/4" Filter Sub, UBHO Sub, Heavy Weight Drill Pipe, Powerstroke Drilling Jar, Heavy Weight Drill Pipe, Drill Pipe, Heavy Weight Drill Pipe, Drill Pipe	8 1/2in, NOV, TKC66, E264058	1-2-BT-G-X-0-CT-BHA	1,192.00	1,466.00	274.00	36.69	7.5
New	45	Rotary Build	Ulterra CF713, 6-3/4" G2 Motor ABH Sleve 7/8 5.0, 8" IB Stabiliser, Float Sub, 6-3/4" Non-Mag Pony DC, 6-3/4" Non-Mag DC, Crossover, 6-3/4" Filter Sub, Heavy Weight Drill Pipe, Powerstroke Drilling Jar, Heavy Weight Drill Pipe, Drill Pipe, Heavy Weight Drill Pipe, Drill Pipe	8 1/2in, Ulterra, CF713, 48938	0-1-CT-G-X-0-NO-BHA	1,466.00	1,713.00	247.00	17.77	13.9
RR 1	46	Rotary Build	Ulterra CF713, 6-3/4" G2 Motor ABH Sleve 7/8 5.0, Float Sub, 6-3/4" Non-Mag Pony DC, 6-3/4" Non-Mag DC, Crossover, 6-3/4" Filter Sub, Heavy Weight Drill Pipe, Drill Pipe, Heavy Weight Drill Pipe, Powerstroke Drilling Jar, Heavy Weight Drill Pipe, Drill Pipe	8 1/2in, Ulterra, CF713, 48938	0-1-CT-G-X-0-NO-BHA	1,713.00	1,715.00	2.00	0.75	2.7
RR 2	47	Steerable	Ulterra CF713, 6.75 PD Orbit-AA 8.5" Stabilsed CU Collar, HHOP, 6.75" Split Collar, DPM 6.75in, TelePacer Azi Gr-SGR, 6.5" Crossover, Float Sub, Crossover, Filter Sub, Heavy Weight Drill Pipe, NOV Powerstroke Jar, Heavy Weight Drill Pipe, Drill Pipe	8 1/2in, Ulterra, CF713, 48938	1-2-CT-G-X-0-BT-BHA	1,715.00	2,090.00	375.00	44.12	8.5
New	48	Steerable	NOV TKC66, 6.75 PD Orbit-AA 8.5" Stabilsed CU Collar, HHOP, 6.75" Split Collar, DPM 6.75in, TelePacer Azi Gr-SGR, 6.75" AWR w/ Saver Sub, 6.75" ABS, 6.5" Crossover, Float Sub, GVR-6, Crossover, Filter Sub, Heavy Weight Drill Pipe, NOV Powerstroke Jar, Heavy Weight Drill Pipe, Drill Pipe	8 1/2in, NOV, TKC66, E264056	0-0-NO-A-X-0-NO-BHA	2,090.00	2,093.00	3.00	0.25	12.0
RR 1	49	Steerable	NOV TKC66, 6.75 PD Orbit-AA 8.5" Stabilsed CU Collar, HHOP, 6.75" Split Collar, DPM 6.75in, TelePacer Azi Gr-SGR, 6.75" AWR w/ Saver Sub, 6.75" ABS, 6.5" Crossover, Float Sub, GVR-6, Crossover, Filter Sub, Heavy Weight Drill Pipe, NOV Powerstroke Jar, Heavy Weight Drill Pipe, Drill Pipe	8 1/2in, NOV, TKC66, E264056	2-2-CT-N-X-0-BT-TD	2,093.00	3,809.00	1,716.00	99.40	17.3

Figure 14 Kyalla 117 N2-1H, Kyalla 117 N2-1H ST1, and Kyalla 117 N2-1H ST2 BHA summary (pg 2 / 2 - see Figure 13 for 1 / 2)

3.10 DRILLING FLUIDS

Halliburton was contracted to supply and maintain drilling fluids in Kyalla 117 N2-1H, Kyalla 117 N2-1H ST1, and Kyalla 117 N2-1H ST2. A daily summary of drilling fluids operations and End of Well Report can be found in Appendix 6.

4 GEOLOGY

4.1 BEETALOO SUB-BASIN STRATIGRAPHY

The Mesoproterozoic Roper Group (Figure 15) comprises progradational cycles of mudstone and sandstone units reaching thickness' greater than 3000 m with averages of 1500 m away from major depocenters (Abbott and Sweet, 2000). Even though the succession has yet to be fully penetrated in the deepest depocenters, individual formations can be traced across the basin showing remarkable thickness consistency and lateral continuity in seismic profiles (Munson, 2014). The first detailed stratigraphic study of the Roper Group was presented by Jackson et al. (1988) and furthered by detailed investigations from Jackson and Raiswell (1991) and Warren et al. (1998) who supplemented the pre-existing framework with additional regional and local stratigraphic, sedimentological and geochemical information. The Roper Group succession was deposited in a variety of settings within shallow-marine, and nearshore to shelf environments (Powell et al., 1987; Jackson et al., 1988; Abbott and Sweet, 2000) with organic enrichment confined to the Velkerri and Kyalla formations. The sequence has been recognised as having excellent exploration potential.

The Kyalla Formation within the upper Roper Group, is dominated by grey and black siltstone and mudstone, with regionally variable sandstone content. The Kyalla Formation sits conformably on top of the Moroak Sandstone, and exhibits a sharp, erosional and disconformable contact with the overlying Neoproterozoic Jamison sandstone, a trough cross-stratified, fine to medium grained, arenaceous to arkosic sandstone (Figure 15).

Although dispersed organic matter exists throughout the Kyalla Formation, three intervals of thicker organic rich mudstone and siltstones have been identified and informally defined as the lower, middle and upper Kyalla shales (Figure 15). Historic exploration in the Beetaloo Sub-basin has observed oil bleeds and gas shows, good shale reservoir properties, and minor gas to surface from the Kyalla Formation which support the model for a shale resource play.

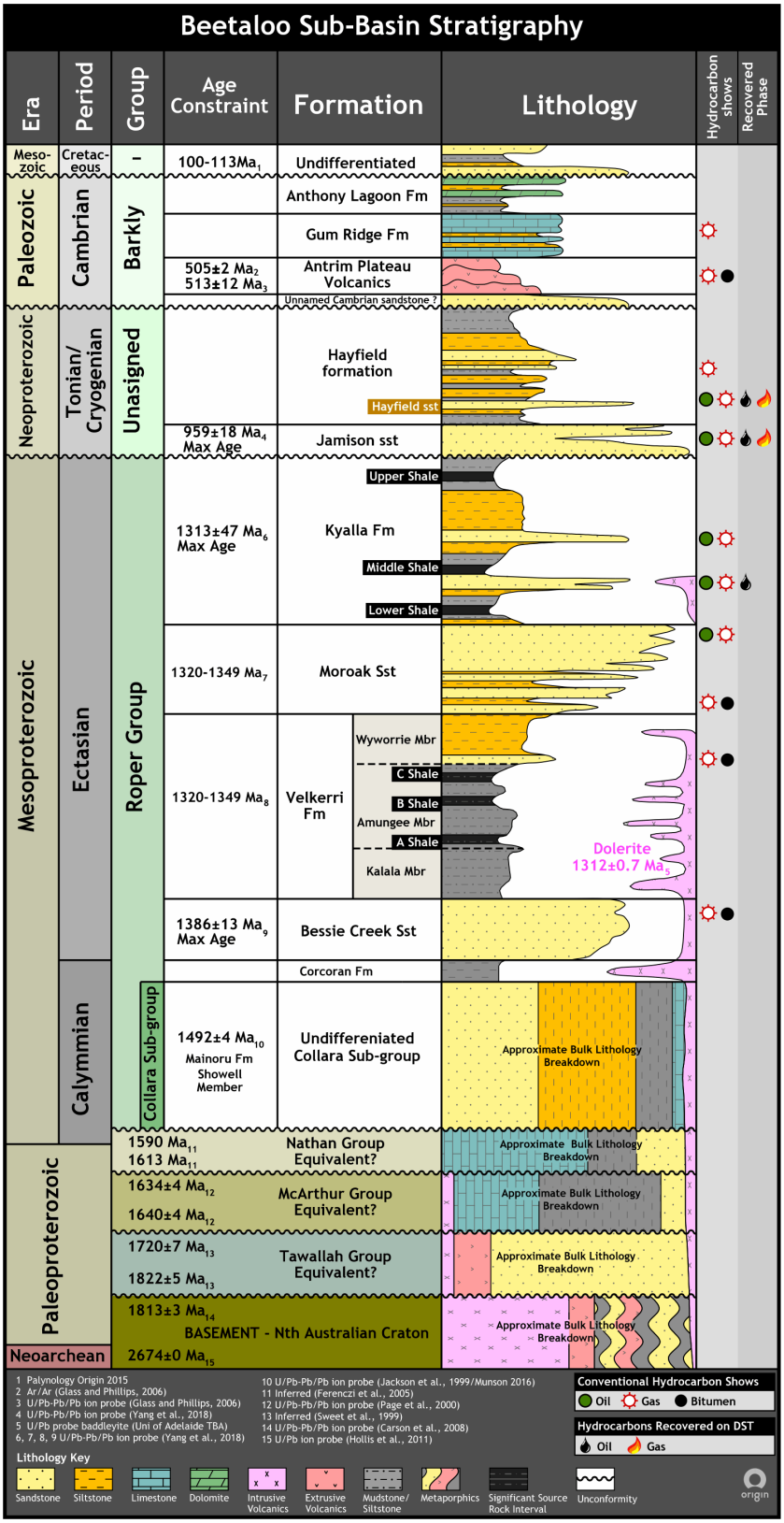

Figure 15. Beetaloo Sub-Basin Stratigraphy

4.2 FORMATION TOPS

Refer to Well Summary Sheet for as drilled Formation Top depths for Kyalla 117 N2-1H, Kyalla 117 N2-1H ST1, and Kyalla 117 N2-1H ST2. Detailed daily geological reports are provided in Appendix 2. Lithological cuttings descriptions in Appendix 7.

4.3 RESERVOIR AND PROSPECTIVE HORIZONS

The Kyalla Formation is a silty mudstone with thin planar interbeds of siltstone and sandstone. Significant intervals of fine to medium grained sandstone, up to 70 m thick have also been recorded in the lower half of the formation (Lanigan et al, 1994) with southern and eastern well penetrations (Beetaloo W-1, Elliott-1, Tanumbirini-1) to date indicating better developed intra-formational sands. This variation has been hypothesised to be associated to differences in well proximity to the paleo-sediment source at the time of Kyalla deposition. Prospective horizons within the Kyalla Formation consist of organically enriched shale intervals, with three identified prospective intervals informally referred to by Origin as the lower, middle and upper Kyalla shales.

The Kyalla Formation is extensive across the Beetaloo Sub-Basin but has been regionally variably eroded by the base Jamison Sandstone (Base Neoproterozoic) unconformity towards the edges of the preserved Beetaloo Basin. The formation is shown from 2D seismic lines and well penetrations to be best preserved within current day Beetaloo Sub-basin deeps where the least erosion has taken place. Thickest penetrations to date within these Basin deeps have been intersected at Tanumbirini-1 (835 m) and Beetaloo W-1 (796.6 m). The Kyalla Formation unconformably underlies the Jamison Sandstone and conformably overlies the Moroak Sandstone (Fulton and Knapton, 2015).

The Kyalla Formation was 808 m thick at Kyalla 117 N2-1, with the formation intersected from 988 to 1796 mMDRT. The Kyalla 117 N2-1H ST2 well was side tracked into the Kyalla Formation at 1196mMD intersecting the lower Kyalla Shale at 1945mMD.

Complete lithological descriptions of the intersected stratigraphy within Kyalla 117 N2-1H, Kyalla 117 N2-1H ST1 and Kyalla 117 N2-1H ST2 are summarized in Appendix 2 and Appendix 7.

5 FORMATION SAMPLING

5.1 DRILL CUTTINGS

Drill cuttings samples were collected for Kyalla 117 N2-1H, Kyalla 117 N2-1H ST1, and Kyalla 117 N2-1H ST2.. Sampling intervals are summarised in Table 8 below:

Well Name	Cuttings Interval		Sample Rate (m)	Comments
	From (mMDRT)	To (mMDRT)		
Kyalla 117 N2-1H	1288	1628.79	3	12 ¼“ Section
Kyalla 117 N2-1H ST1	1457	1990	3	12 ¼“ Section
Kyalla 117 N2-1H ST1	1990	2101	3	8 ½“ Section
Kyalla 117 N2-1H ST1	2101	2809	6	8 ½ “ Section
Kyalla 117 N2-1H ST2	1200	1263	3	8 ½ “ Section
Kyalla 117 N2-1H ST2	1263	1284	6	8 ½ “ Section
Kyalla 117 N2-1H ST2	1284	1290	3	8 ½ “ Section
Kyalla 117 N2-1H ST2	1290	3809	6	8 ½ “ Section

Table 8. Kyalla 117 N2-1H, Kyalla 117 N2-1H ST1, and Kyalla 117 N2-1H ST2 Drill Cuttings Interval and Sampling Rate Summary

Detailed drill cuttings lithological descriptions are enclosed in Appendix 7.

5.2 MUD GAS

A total of 106 drill cutting headspace gas samples (Isojars™) and 110 drill gas samples (Isotubes™) were collected between Kyalla 117 N2-1H, Kyalla 117 N2-1H ST1 and Kyalla 117 N2-1H ST2 (Table 9). A detailed summary of mudgas sample collection depths is enclosed in the Geoservices End of Well Report in Appendix 8.

Well	Isojars	Isotubes
Kyalla 117 N2-1H	7	7
Kyalla 117 N2-1H ST1	42	46
Kyalla 117 N2-1H ST2	57	57

Table 9. Kyalla 117 N2-1H, Kyalla 117 N2-1H ST1, and Kyalla 117 N2-1H ST2 Well site gas sample collection

6 FORMATION EVALUATION

6.1 MUDLOGGING

Geoservices (Schlumberger) provided mudlogging services for the drilling of Kyalla 117 N2-1H, Kyalla 117 N2-1H ST1, and Kyalla 117 N2-1H ST2. This included standard mud logging service, constant volume trap (CVT) mud gas chromatographic analysis (C_1-C_5, CO_2, H_2S) and monitoring, real time and lagged data acquisition and live streaming from wellsite, data storage and high-resolution digital imaging of cuttings over the interval from 17 to 1865.2 mMDRT. Mudlogging data, log displays and the Geoservices End of Well Report are enclosed in in Appendix 8.

6.2 WIRELINE LOGGING

Table 10 summarizes the wireline logs that were acquired at Kyalla 117 N2-1H, Kyalla 117 N2-1H ST1, and Kyalla 117 N2-1H ST2:

WIRELINE LOGGING					
SUITE /RUN #	Depth (mMDRT)		Description	Logging Company	Remarks
	From	To			
S1/R1	5.00	1800	CBL-VDL-USIT	Schlumberger	Kyalla 117 N2-1H ST1
S2/R2	7.47	1977	CBL-VDL-MAP	Schlumberger	Kyalla 117 N2-1H ST2

Table 10. Summary of Wireline Logs

Field data, processed data and log displays for all wireline logs are provided in Appendix 9.

6.3 LOGGING WHILE DRILLING (LWD) / MEASUREMENTS WHILE DRILLING (MWD)

Table 11 summarizes LWD logs that were acquired at Kyalla 117 N2-1H, Kyalla 117 N2-1H ST1, and Kyalla 117 N2-1H ST2:

Depth (mMDRT)		Description	Logging Company	Remarks
From	To			
1260	1628	HDS1L-SGS-AGR-DPM-HHOP-PDX-AWR-GVR	Pathfinder	Kyalla 117 N2-1H
1255	2809	HDS1L-SGS-AGR-DPM-HHOP-PDX-AWR-GVR	Pathfinder	Kyalla 117 N2-1H ST1
1180	3809	HDS1L-SGS-AGR-DPM-HHOP-PDX-AWR-GVR	Pathfinder	Kyalla 117 N2-1H ST2

Table 11. Summary of LWD / MWD logs.

Field data, processed data and log displays for all LWD and MWD logs are provided in Appendix 10.

6.4 HYDROCARBON INDICATIONS

6.4.1 GAS DETECTION WHILST DRILLING

Continuous Mud Gas monitoring and chromatographic breakdown of hydrocarbon gases ($C_1 – C_5$, CO_2 H_2S) were performed by Geoservices during the drilling of Kyalla 117 N2-1H, Kyalla 117 N2-1H ST1, and Kyalla 117 N2-1H ST2. A summary of gas data collected whilst drilling is enclosed in Appendix 8.

6.4.2 FLUORESCENCE

Kyalla 117 N2-1H

1623mRT – 1626mRT

10% Shale: light medium grey to medium dark grey, homogenous, micro mica, common silty laminations, tr carbonaceous flecks, moderately hard to hard, sub-blocky to sub-fissile.

40% Siltstone: medium dark grey to dark grey, argillaceous, micro-mica, thin SHALE laminations, moderately hard to hard, sub-blocky to blocky.

50% Sandstone: light grey to medium light grey, translucent quartz grains, very fine to fine, well-sorted, sub-rounded to rounded, occasionally spherical quartz, strong siliceous cement, quartz overgrowths, moderate hard to hard, tight visual porosity. FLUORESCENCE: trace moderately bright yellow even fluorescence, very slow direct cut with very thin dull yellow ring residual.

1626mRT – 1629mRT

10% Shale: light medium grey to medium dark grey, homogenous, micro mica, common silty laminations, tr carbonaceous flecks, moderately hard to hard, sub-blocky to sub-fissile.

10% Siltstone: medium dark grey to dark grey, argillaceous, micro mica, thin SHALE laminations, moderately hard to hard, sub-blocky to blocky.

80% Sandstone: off white to light grey, clear to translucent quartz, very fine to fine, well sorted, sub-rounded, strong siliceous cement, common quartz overgrowths, minor silt sized quartz matrix, poor visual porosity. FLUORESCENCE: trace moderately bright yellow even fluorescence, very slow direct cut with very thin dull yellow ring residual.

Kyalla 117 N2-1H ST1

1620mRT – 1632mRT

10% Shale: light medium dark grey, homogenous, micro mica, common silty laminations, common carbonaceous flecks, moderately hard to hard, sub-blocky to sub-fissile

30% Siltstone: dark grey, very finely arenaceous, micro-mica, moderately hard to hard, sub-blocky to blocky.

60% Sandstone: off white, clear to translucent quartz, very fine, sub-angular to sub-rounded, very well sorted, strong siliceous cement, quartz overgrowths, hard, tight visual porosity. FLUORESCENCE: 1620-1632m trace-5% moderately bright yellow even fluorescence, very slow crush cut with very thin dull greenish yellow ring residual.

2008mRT – 2011mRT

95% Shale: medium dark grey to dark grey, silty carbonaceous, common micro mica flecks, moderately hard, sub-blocky to blocky

5% Sandstone: off white to white, very fine grain, well sorted, sub-rounded, strong calcareous cement, trace off white argillaceous and siliceous matrix, tight inferred visual porosity. FLUORESCENCE: Pale Yellow Fluorescence, moderate crush cut, moderate ring residue

2011mRT – 2014mRT

100% Shale: medium dark grey to dark grey, silty carbonaceous, common micro mica flecks, moderately hard, sub-blocky to blocky. Trace disseminated pyrite

tr Sandstone: off white to white, very fine grain, well sorted, sub-rounded, strong calcareous cement, trace off white argillaceous and siliceous matrix, tight inferred visual porosity. FLUORESCENCE: Pale Yellow Fluorescence, slow crush cut, moderate ring residue

2014mRT – 2017mRT

95% Shale: medium dark grey to dark grey, silty carbonaceous, common micro mica flecks, moderately hard, sub-blocky to blocky. Trace disseminated pyrite

tr Sandstone: off white to white, very fine grain, well sorted, sub-rounded, strong calcareous cement, trace off white argillaceous and siliceous matrix, tight inferred visual porosity. FLUORESCENCE: Pale Yellow Fluorescence, slow crush cut, moderate ring residue

5% Siltstone: medium grey to dark grey, argillaceous, common very finely arenaceous, micro mica, common lithic and carbonaceous specks, moderately hard, sub-blocky to blocky

2017mRT – 2020mRT

85% Shale: medium dark grey to dark grey, silty carbonaceous, common micro mica flecks, moderately hard, sub-blocky to blocky. Trace disseminated pyrite

5% Sandstone: White to off white, clear to translucent quartz, strong siliceous cement, tight inferred visual porosity. FLUORESCENCE Trace Pale Yellow

10% Siltstone: medium grey to dark grey, argillaceous, common very finely arenaceous, micro mica, common lithic and carbonaceous specks, moderately hard, sub-blocky to blocky

2041mRT – 2044mRT

95% Shale: Medium dark grey to dark grey, silty, carbonaceous, common micro mica flecks, moderately hard, sub blocky to blocky.

5% Sandstone: off white to white, very fine, well sorted, sub rounded, strong siliceous cement, trace of white argillaceous and siliceous matrix, tight inferred visual porosity FLUORESCENCE: Rare to trace Pale Yellow

2119mRT – 2125mRT

95% Shale: Medium dark grey to dark grey, silty, carbonaceous, common micro mica flecks, trace pyrite, moderately hard, sub blocky to blocky.

5% Sandstone: Off white to white, very fine, well sorted, sub rounded, strong siliceous cement, trace of white argillaceous and siliceous matrix, tight inferred visual porosity. FLUORESCENCE: Rare to trace Pale Yellow

2197mRT – 2203mRT

100% Shale: Medium dark grey to dark grey, silty, carbonaceous, common micro mica flecks, trace pyrite, moderately hard, sub blocky to blocky.

tr% Sandstone: off white to white, very fine, well sorted, sub rounded, strong siliceous cement, trace of white argillaceous and siliceous matrix, tight inferred visual porosity. FLUORESCENCE: Rare to trace Pale Yellow

Kyalla 117 N2-1H ST2

1626mRT – 1632mRT

50% Shale: medium dark grey, moderately hard to hard, sub-blocky to sub-fissile, carbonaceous flecks.

5% Siltstone: medium grey, hard, argillaceous, sucrosic, angular.

45% Sandstone: yellowish grey, very fine grain to medium grain, dominantly fine grain, clear to frosted, sub-rounded, subspherical, minor carbonaceous flecks, cemented aggregates and loose grains. FLUORESCENCE: mod bright pale yellow, diffuse fluorescence in grain aggregates, nil to very faint diffuse cut. Very faint, very pale-yellow ring residue.

6.5 FORMATION TESTING

6.5.1 Formation Integrity Test (FIT)

Well bore: Kyalla 117 N2-1H ST2

Test Date	Test Type	Test Depth (mRT)	Tested Formation	Fluid Density (ppg)	Fluid Type
29/01/2020	FIT	1200	Kyalla Fm	10.6	WBM

LO Eq Fluid Density (ppg)	Surface Pressure (psi)
15.6	1016

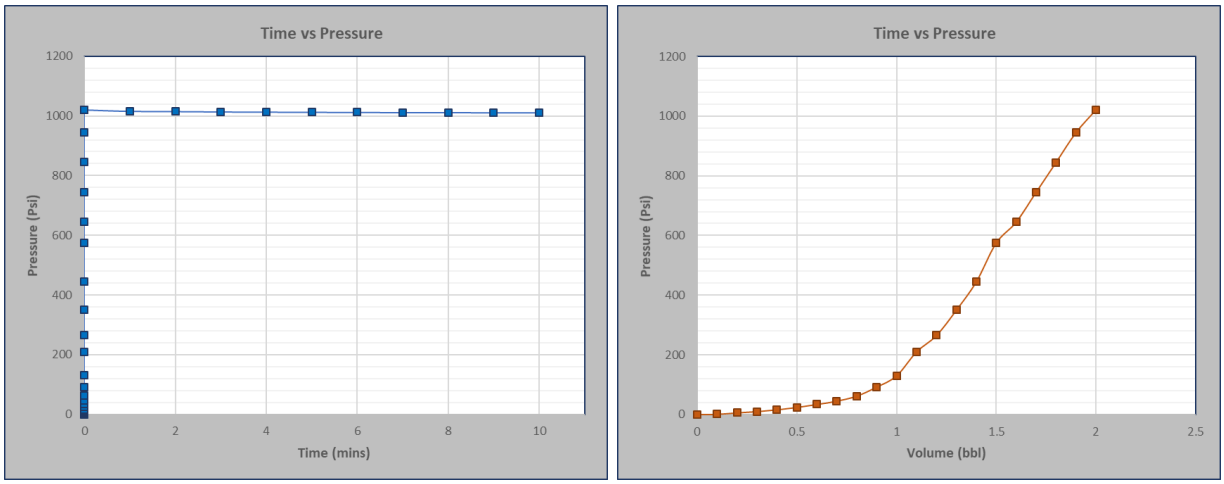

Figure 16. Graphical summary of FIT Results

6.5.2 Extended Leak Off Test (XLOT)

Well bore: Kyalla 117 N2-1H ST2

The shoe track of Kyalla 117 N2-1H ST1 was drilled out from 1990mMDRT to 1993mMDRT and an Extended Leak Off Test (XLOT) with and equivalent mud weight (EMW) of 21.5ppg (LOP – 3064psi, MW 11.5ppg) was conducted

Test Date	Test Type	Test Depth (mRT)	Tested Formation	Fluid Density (ppg)	Fluid Type
19/12/2019	XLOT	1993	Kyalla Fm	11.5	brine

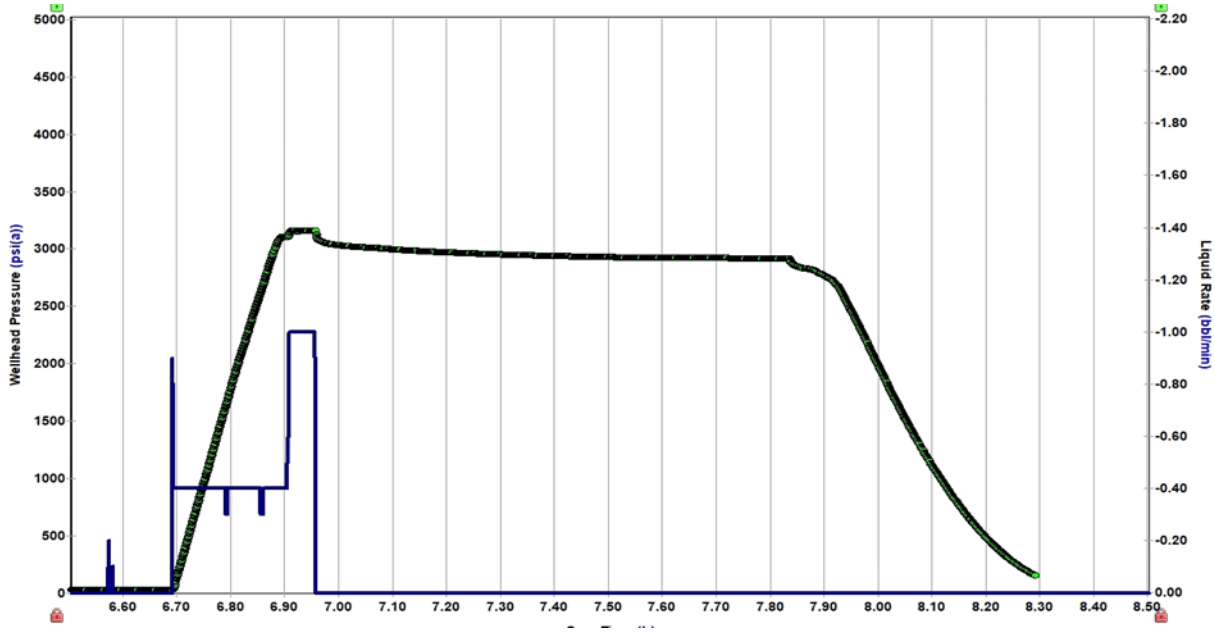

Figure 17: Graphical summary of XLOT #1

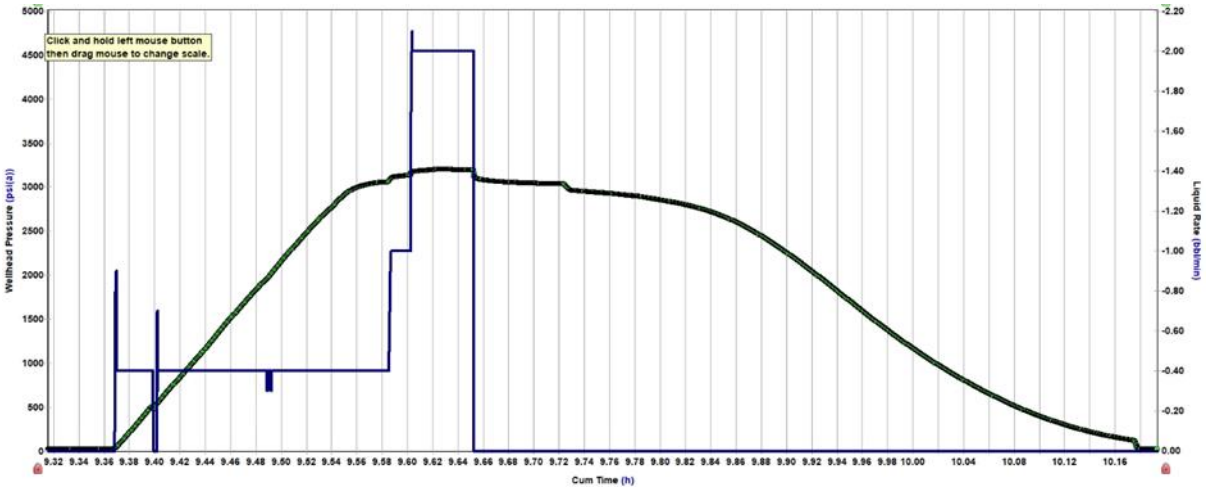

Figure 18: Graphical summary of XLOT #2

APPENDICES

Appendix 1: Daily Drilling Reports (DDR)
Appendix 2: Daily Geological Reports (DGR)
Appendix 3: Casing Reports
Appendix 4: Cementing Reports
Appendix 5: Bit Records
Appendix 6: Halliburton Drilling Fluids Report
Appendix 7: Lithological Cuttings Descriptions
Appendix 8: Geoservices End of Well Report
Appendix 9: Wireline Log Displays
Appendix 10: Logging While Drilling (LWD) / Measurements While Drilling (MWD) Data