



**Anglian Oil Company Ltd.
Northern Lights
AA Pad
AA16**

**True North Directional Services Inc.
Torque and Drag Report**

**Job No. AB-CD-12345678
Revision: 1
Case #1**



True North
Directional Services Inc.

Torque and Drag Report for AA Pad, AA16, Design #1, Case #1

	Operating Parameters				
	Pick-up	Slack-off	Rotating Off Bottom	Rotary Drilling	Oriented Drilling
Bit Depth (m)	1,794.29	1,794.29	1,794.29	1,794.29	1,794.29
Mud Weight (kg/m ³)	800.00	800.00	800.00	800.00	800.00
Flow (m ³ /min)	0.86	0.86	0.86	0.86	0.86
Weight on Bit (N)				50,000	50,000
Torque at Bit (N-m)				1,000	
Pipe Speed (m/sec)				0.05	
Rotary Speed (RPM)				30	
BHA Torque (N-m)			500	500	
BHA Drag (N)	5,000	5,000		5,000	5,000
Block Weight(N)	50,000	50,000	50,000	50,000	50,000
Surface Tension (N)	303,851	59,319	188,191	132,827	-32,749
Surface Torque (N-m)			6,334	7,990	
Design Safety Factors:					
Tension	1.125	1.125	1.125	1.125	1.125
Torque	1.125	1.125	1.125	1.125	1.125
Stress	1.125	1.125	1.125	1.125	1.125

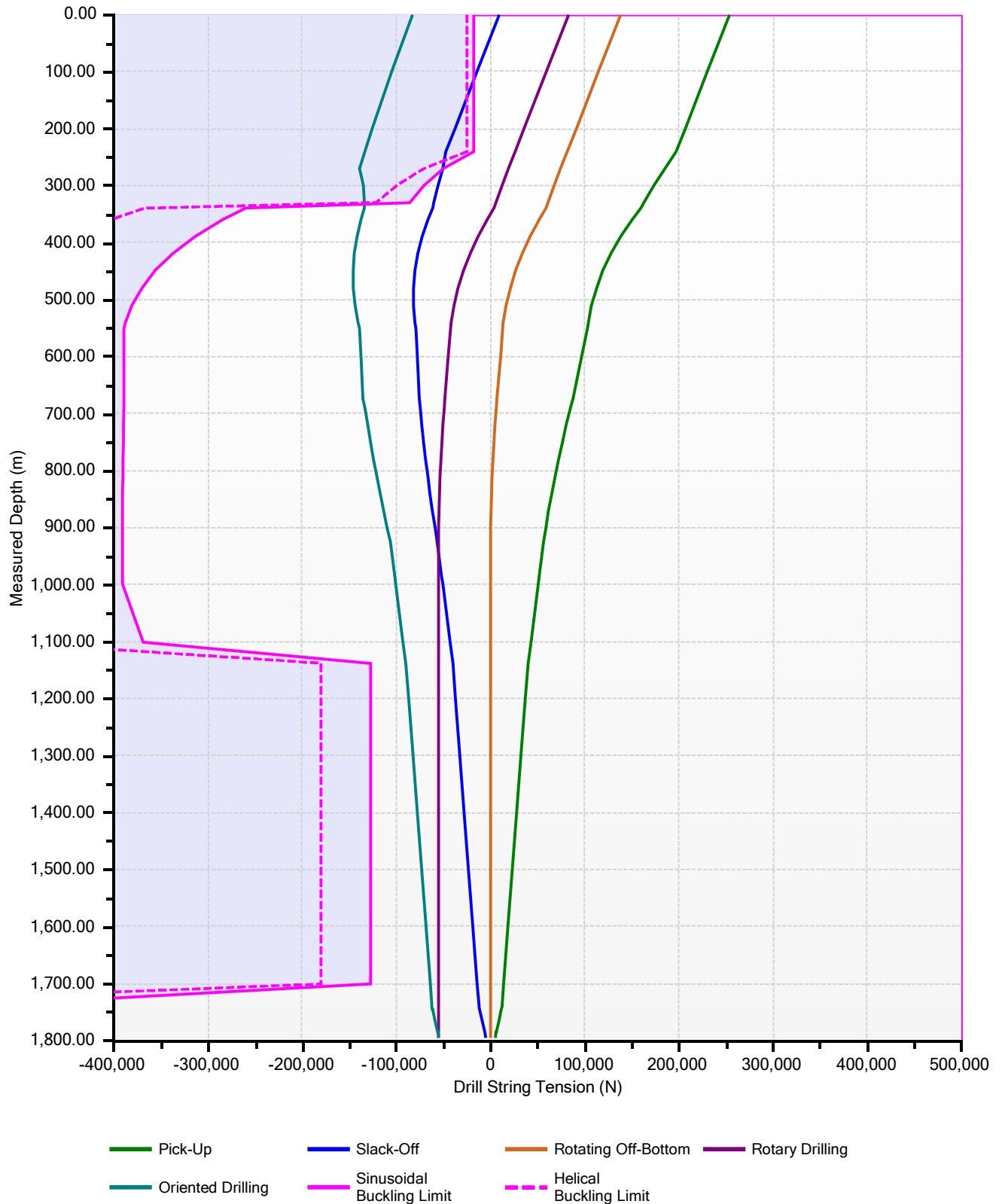
Casing/Hole Details

Comp. #	Description	Outside Diameter (mm)	Inside Diameter (mm)	Friction Factor	From		To	
					Measured Depth (m)	Vertical Depth (m)	Measured Depth (m)	Vertical Depth (m)
1	13 3/8in Casing	340	323	0.20	<Surface>	<Surface>	250.00	250.00
2	9 5/8in Casing	244	229	0.20	<Surface>	<Surface>	500.00	441.03
3	7in Casing	178	166	0.20	<Surface>	<Surface>	1,000.00	486.60
3	171mm Open Hole		171	0.20	1,000.00	486.60	1,794.29	486.60

Drillstring Details

Comp. #	Component Type	Description	Outside Diameter (mm)	Inside Diameter (mm)	Weight (N/m)	Length (m)	Cumulative Length (m)
12	DP (S) - Used - Premium	4" DP (S) NC46(IF) - 15.70 lb/ft	102	82	263.13	338.47	1,794.29
11	HWDP	4" HWDP NC40(FH) - 29.70 lb/ft	102	65	433.44	800.00	1,455.82
10	DP (X) - Used - Premium	4" DP (X) H90 - 15.70 lb/ft	102	82	256.15	600.00	655.82
9	Sub	5.118" Cross Over	130	58	592.32	0.82	55.82
8	Jar	4 3/4" Mechanical Jar	121	57	666.85	4.99	55.00
7	Sub	5.236" Cross Over	133	63	592.32	0.58	50.01
6	4 3/4" Drill Collar	4 3/4" DC - 44.00 lb/ft	121	64	642.13	18.86	49.43
5	MWD	4 3/4" MWD	121	72	842.10	20.29	30.57
4	Sub	4.843" Float Sub	123	50	1,023.91	1.17	10.28
3	Sub	4.843" Float Sub	123	50	633.80	1.16	9.11
2	Motor	4 3/4" Motor Lobe 4:5 - 6.3 stg	121	57	603.50	7.73	7.95
1	Bit	6" Bit	152	57	2,043.00	0.22	0.22

Torque and Drag Report for AA Pad, AA16, Design #1, Case #1



Torque and Drag Report for AA Pad, AA16, Design #1, Case #1

Disclaimer Notice

True North Directional Services Inc. makes no warranty of any kind with respect to the subject matter included herein or the completeness or accuracy of this document.

True North Directional Services Inc. are not responsible for any actions (or lack thereof) taken as a result of relying on or in any way using information contained in this document and in no event shall be liable for any damages resulting from reliance on or use of this information.