

PETROLEUM DEVELOPMENT CORP DJ Basin

Well Name: **Popham 3B-221**

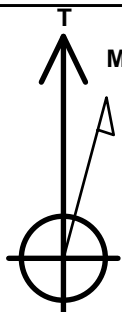
Surface Location: Popham 4N64W3Q Pad Sec.3-T4N-R64W
North American Datum 1983 , US State Plane 1983, Colorado Northern Zone

Ground Elevation: 4660.0

+N/-S	+E/-W	Northing	Easting	Latitude	Longitude	Slot
0.0	0.0	1366791.99	3268237.76	40.336250	-104.537770	
RKB - 23' WELL @ 4683.0ft (RKB - 23')						

WELLBORE TARGET DETAILS

Name	TVD	+N/-S	+E/-W	Shape
SHL 776'FSL & 2288'FWL, Sec.3	1.0	0.0	0.0	Point
BHL 200'FSL & 1696'FWL, Sec.34	6624.0	4688.7	-354.0	Point
LPL 819'FSL & 1934'FWL, Sec.3	6654.0	42.9	-354.0	Point



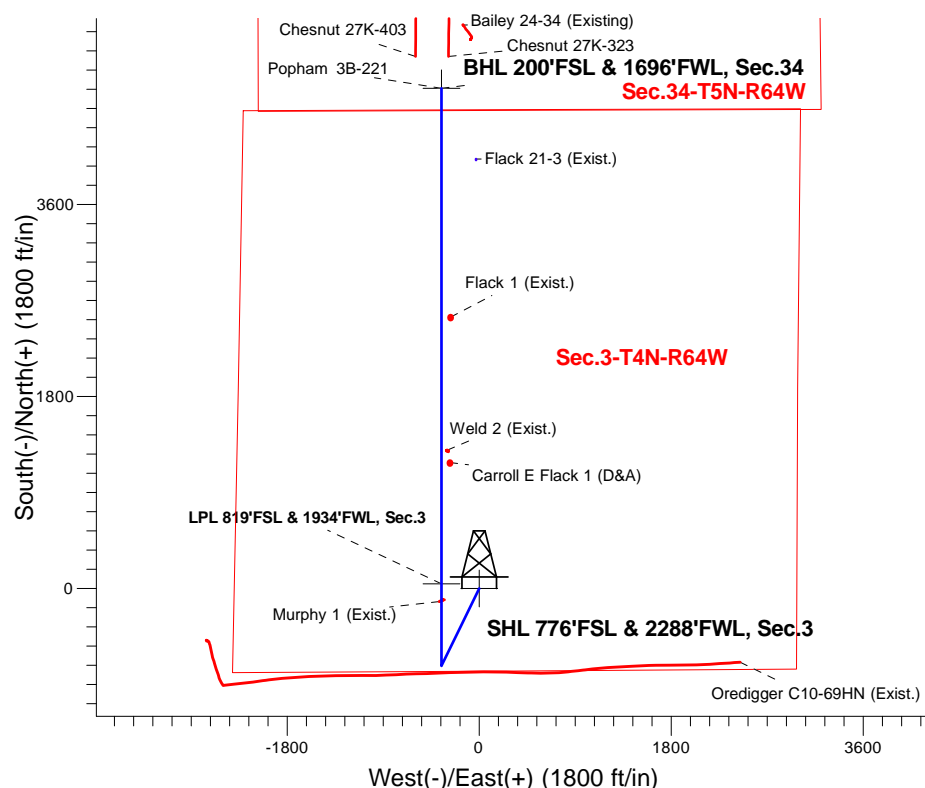
Azimuths to True North
Magnetic North: 8.04°

Magnetic Field
Strength: 52578.9snT
Dip Angle: 66.85°
Date: 8/12/2016
Model: IGRF2010

Popham 4N64W3Q Pad Sec.3-T4N-R64W
Popham 3B-221
Plan #1 (8-12-16)
14:43, August 16 2016

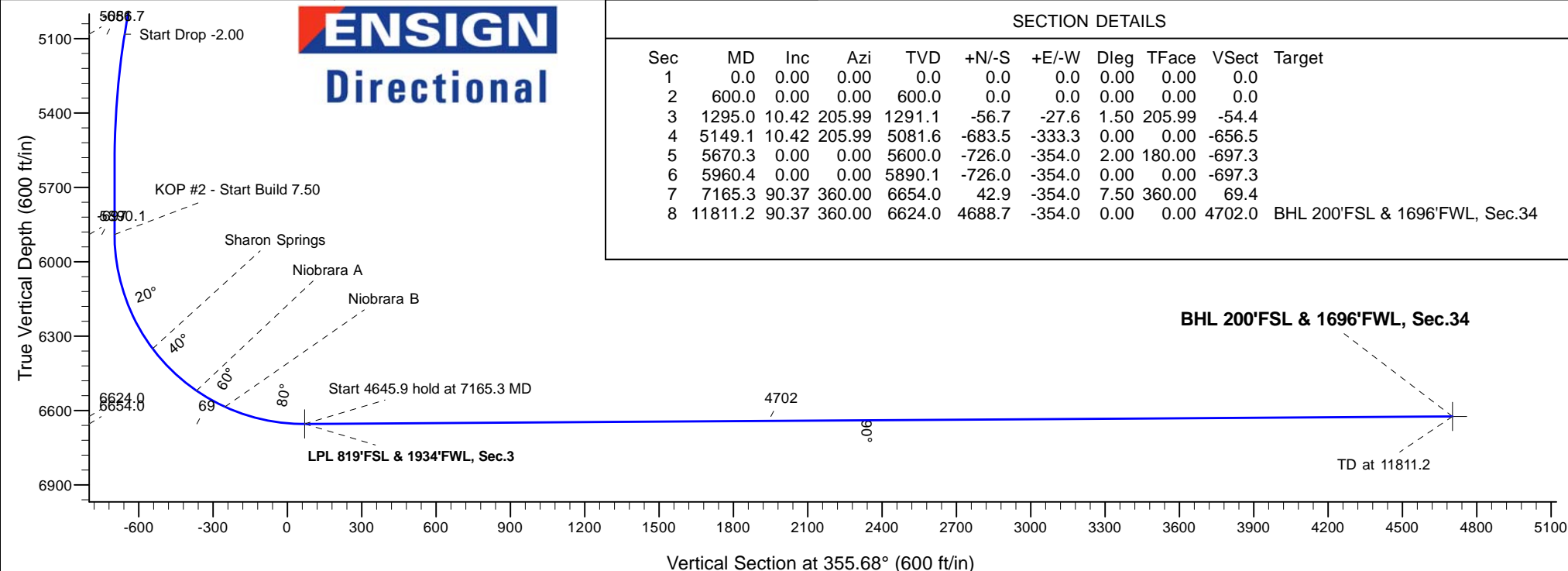
ANNOTATIONS

TVD	MD	Annotation
600.0	600.0	KOP - Start Build 1.50
5081.7	5149.1	Start Drop -2.00
5890.1	5960.4	KOP #2 - Start Build 7.50
6654.0	7165.3	Start 4645.9 hold at 7165.3 MD
6624.0	11811.2	TD at 11811.2



SECTION DETAILS

Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	Vsect	Target
1	0.0	0.00	0.00	0.0	0.0	0.0	0.00	0.00	0.0	
2	600.0	0.00	0.00	600.0	0.0	0.0	0.00	0.00	0.0	
3	1295.0	10.42	205.99	1291.1	-56.7	-27.6	1.50	205.99	-54.4	
4	5149.1	10.42	205.99	5081.6	-683.5	-333.3	0.00	0.00	-656.5	
5	5670.3	0.00	0.00	5600.0	-726.0	-354.0	2.00	180.00	-697.3	
6	5960.4	0.00	0.00	5890.1	-726.0	-354.0	0.00	0.00	-697.3	
7	7165.3	90.37	360.00	6654.0	42.9	-354.0	7.50	360.00	69.4	
8	11811.2	90.37	360.00	6624.0	4688.7	-354.0	0.00	0.00	4702.0	BHL 200'FSL & 1696'FWL, Sec.34





PETROLEUM DEVELOPMENT CORP DJ Basin

SEC.3-T4N-R64W

Popham 4N64W3Q Pad Sec.3-T4N-R64W

Popham 3B-221

Wellbore #1

Plan #1 (8-12-16)

Anticollision Report

16 August, 2016



Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	Local Co-ordinate Reference:	Well Popham 3B-221
Project:	SEC.3-T4N-R64W	TVD Reference:	WELL @ 4683.0ft (RKB - 23')
Reference Site:	Popham 4N64W3Q Pad Sec.3-T4N-R64W	MD Reference:	WELL @ 4683.0ft (RKB - 23')
Site Error:	0.0 ft	North Reference:	True
Reference Well:	Popham 3B-221	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 ft	Output errors are at	2.45 sigma
Reference Wellbore	Wellbore #1	Database:	US_EDM
Reference Design:	Plan #1 (8-12-16)	Offset TVD Reference:	Offset Datum

Reference	Plan #1 (8-12-16)		
Filter type:	NO GLOBAL FILTER: Using user defined selection & filtering criteria		
Interpolation Method:	MD Interval 100.0ft	Error Model:	ISCWSA
Depth Range:	Unlimited	Scan Method:	Closest Approach 3D
Results Limited by:	Maximum center-center distance of 1,000.0 ft	Error Surface:	Elliptical Conic
Warning Levels Evaluated at:	2.45 Sigma	Casing Method:	Not applied

Survey Tool Program	Date 8/16/2016			
From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description
0.0	11,811.2	Plan #1 (8-12-16) (Wellbore #1)	MWD	MWD - Standard

Summary						
Site Name	Reference Measured Depth (ft)	Offset Measured Depth (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Separation Factor	Warning
Offset Well - Wellbore - Design						
Chesnut 27K-HZ Pad Sec.27-T5N-R64W						
Chesnut 27K-323 - Wellbore #1 - Wellbore #1	11,811.2	14,120.0	315.0	118.7	1.604	CC, ES, SF
Chesnut 27K-403 - Wellbore #1 - Wellbore #1	11,811.2	14,160.0	430.4	205.2	1.911	CC, ES, SF
Chesnut Existing Pad Sec.27-T5N-R64W						
Bailey 24-34 (Existing) - Wellbore #1 - Wellbore #1	11,811.2	6,604.0	627.9	495.8	4.754	CC, ES, SF
Existing Wells for Sec.3-T4N-R64W GRID						
Murphy 1 (Exist.) - Wellbore #1 - Wellbore #1	7,000.0	6,622.7	17.1	-19.4	0.468	Level 1, ES
Murphy 1 (Exist.) - Wellbore #1 - Wellbore #1	7,000.3	6,622.8	17.1	-19.4	0.468	Level 1, CC, SF
Oredigger C10-69HN (Exist.) - Wellbore #1 - Wellbore #1	6,400.0	8,453.7	390.9	315.6	5.190	SF
Oredigger C10-69HN (Exist.) - Wellbore #1 - Wellbore #1	6,500.0	8,456.7	361.4	292.9	5.270	ES
Oredigger C10-69HN (Exist.) - Wellbore #1 - Wellbore #1	6,525.5	8,457.5	360.1	293.4	5.398	CC
Weld 2 (Exist.) - Wellbore #1 - Wellbore #1	8,419.2	6,632.0	52.8	-2.6	0.954	Level 1, CC, ES, SF
Existing Wells Sec.3-T4N-R64W						
Carroll E Flack 1 (D&A) - Wellbore #1 - Wellbore #1	8,302.8	6,629.7	78.0	-122.9	0.388	Level 1, CC, ES, SF
Flack 1 (Exist.) - Wellbore #1 - Wellbore #1	9,665.4	6,628.9	86.4	-143.7	0.375	Level 1, CC, ES, SF
Flack 21-3 (Exist.) - Wellbore #1 - Wellbore #1	11,148.1	6,609.3	323.3	60.0	1.228	Level 2, CC, ES, SF
Popham 4N64W3Q Pad Sec.3-T4N-R64W						
Popham 3B-201 - Wellbore #1 - Plan #1 (8-12-16)	200.0	200.0	29.3	28.5	35.449	CC, ES
Popham 3B-201 - Wellbore #1 - Plan #1 (8-12-16)	11,811.2	11,864.6	493.5	260.4	2.118	SF
Popham 3B-301 - Wellbore #1 - Plan #1 (8-12-16)	400.0	400.0	14.8	12.9	7.698	CC, ES
Popham 3B-301 - Wellbore #1 - Plan #1 (8-12-16)	11,811.2	11,917.5	261.5	37.3	1.166	Level 2, SF
Popham 3P-241 - Wellbore #1 - Plan #1 (8-12-16)	600.0	600.0	18.2	15.2	6.013	CC, ES
Popham 3P-241 - Wellbore #1 - Plan #1 (8-12-16)	11,811.2	11,809.2	616.0	382.7	2.640	SF
Popham 3P-341 - Wellbore #1 - Plan #1 (8-12-16)	600.0	600.0	32.8	29.8	10.824	CC, ES
Popham 3P-341 - Wellbore #1 - Plan #1 (8-12-16)	11,811.2	11,879.9	314.3	85.6	1.374	Level 3, SF

Offset Design	Chesnut 27K-HZ Pad Sec.27-T5N-R64W - Chesnut 27K-323 - Wellbore #1 - Wellbore #1										Offset Site Error:	0.0 ft
Survey Program:	164-MWD										Offset Well Error:	0.0 ft
Reference		Offset		Semi Major Axis		Distance						
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor
												Warning

CC - Min centre to center distance or convergent point, SF - min separation factor, ES - min ellipse separation