

PETROLEUM DEVELOPMENT CORP DJ Basin

Well Name: **Popham 3B-301**

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

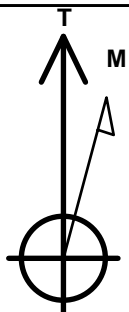
Ground Elevation: 4660.0

+N/-S	+E/-W	Northing	Easting	Latitude	Longitude	Slot
0.0	0.0	1366777.38	3268235.13	40.336210	-104.537780	

RKB - 23' WELL @ 4683.0ft (RKB - 23')

WELLBORE TARGET DETAILS

Name	TVD	+N/-S	+E/-W	Shape
SHL 761'FSL & 2288'FWL, Sec.3	1.0	0.0	0.0	Point
BHL 200'FSL & 1446'FWL, Sec.34	6698.0	4703.2	-602.1	Point
LPL 821'FSL & 1686'FWL, Sec.3	6738.5	59.6	-602.1	Point



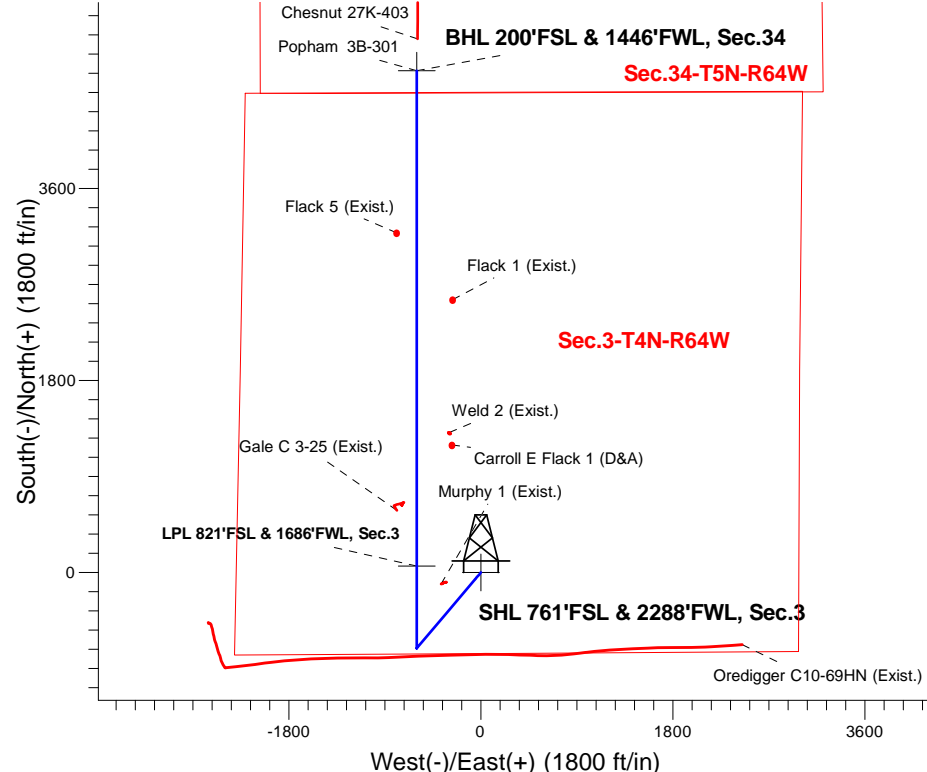
Azimuths to True North
Magnetic North: 8.04°

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

Popham 4N64W3Q Pad Sec.3-T4N-R64W
Popham 3B-301
Plan #1 (8-12-16)
13:11, August 16 2016

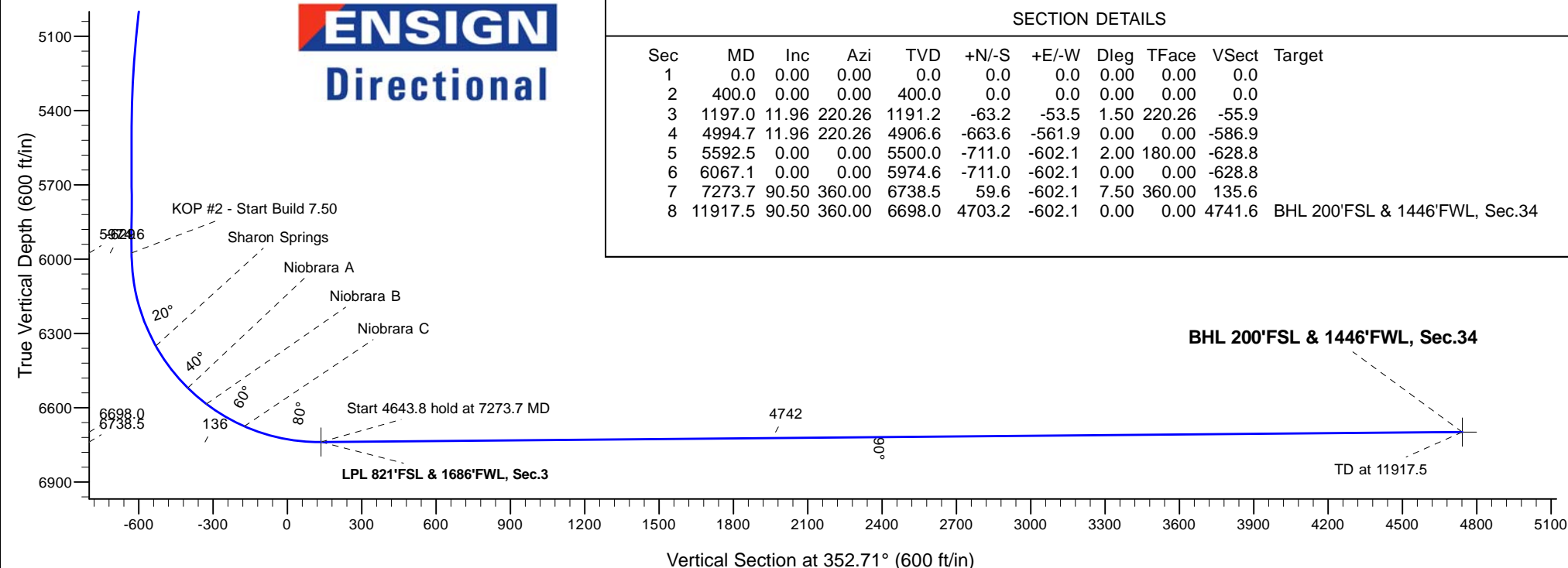
ANNOTATIONS

TVD	MD	Annotation
400.0	400.0	KOP - Start Build 1.50
4906.6	4994.7	Start Drop -2.00
5974.6	6067.1	KOP #2 - Start Build 7.50
6738.5	7273.7	Start 4643.8 hold at 7273.7 MD
6698.0	11917.5	TD at 11917.5



SECTION DETAILS

Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	VSec	Target
1	0.0	0.00	0.00	0.0	0.0	0.0	0.00	0.00	0.0	
2	400.0	0.00	0.00	400.0	0.0	0.0	0.00	0.00	0.0	
3	1197.0	11.96	220.26	1191.2	-63.2	-53.5	1.50	220.26	-55.9	
4	4994.7	11.96	220.26	4906.6	-663.6	-561.9	0.00	0.00	-586.9	
5	5592.5	0.00	0.00	5500.0	-711.0	-602.1	2.00	180.00	-628.8	
6	6067.1	0.00	0.00	5974.6	-711.0	-602.1	0.00	0.00	-628.8	
7	7273.7	90.50	360.00	6738.5	59.6	-602.1	7.50	360.00	135.6	
8	11917.5	90.50	360.00	6698.0	4703.2	-602.1	0.00	0.00	4741.6	BHL 200'FSL & 1446'FWL, Sec.34





PETROLEUM DEVELOPMENT CORP DJ Basin

SEC.3-T4N-R64W

Popham 4N64W3Q Pad Sec.3-T4N-R64W

Popham 3B-301

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-301
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-301	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	11,917.5	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-403 - Wellbore #1 - Wellbore #1	11,917.5	14,160.0	321.6	202.4	2.698	CC, ES, SF
Existing Wells for Sec.3-T4N-R64W GRID						
Gale C 3-25 (Exist.) - Wellbore #1 - Wellbore #1	7,804.1	6,730.7	192.0	150.0	4.573	CC, ES, SF
Murphy 1 (Exist.) - Wellbore #1 - Wellbore #1	2,241.4	2,199.5	201.3	185.9	13.071	CC, ES
Murphy 1 (Exist.) - Wellbore #1 - Wellbore #1	7,107.1	6,711.3	232.4	195.3	6.272	SF
Oredigger C10-69HN (Exist.) - Wellbore #1 - Wellbore #1	6,500.0	8,204.6	325.0	253.3	4.532	SF
Oredigger C10-69HN (Exist.) - Wellbore #1 - Wellbore #1	6,582.7	8,205.9	309.9	243.3	4.655	CC, ES
Weld 2 (Exist.) - Wellbore #1 - Wellbore #1	8,525.6	6,711.8	304.3	248.8	5.484	CC, ES, SF
Existing Wells Sec.3-T4N-R64W						
Carroll E Flack 1 (D&A) - Wellbore #1 - Wellbore #1	8,409.1	6,711.6	328.9	126.0	1.621	CC, ES, SF
Flack 1 (Exist.) - Wellbore #1 - Wellbore #1	9,771.7	6,707.7	337.2	105.4	1.454	Level 3, CC, ES, SF
Flack 5 (Exist.) - Wellbore #1 - Wellbore #1	10,398.3	6,707.3	189.6	-56.4	0.771	Level 1, CC
Flack 5 (Exist.) - Wellbore #1 - Wellbore #1	10,400.0	6,707.2	189.6	-56.4	0.771	Level 1, ES, SF
Popham 4N64W3Q Pad Sec.3-T4N-R64W						
Popham 3B-201 - Wellbore #1 - Plan #1 (8-12-16)	200.0	200.0	14.6	13.8	17.647	CC, ES
Popham 3B-201 - Wellbore #1 - Plan #1 (8-12-16)	11,917.5	11,864.6	250.8	22.6	1.099	Level 2, SF
Popham 3B-221 - Wellbore #1 - Plan #1 (8-12-16)	400.0	400.0	14.8	12.9	7.698	CC, ES
Popham 3B-221 - Wellbore #1 - Plan #1 (8-12-16)	11,917.5	11,810.7	261.5	37.3	1.166	Level 2, SF
Popham 3P-241 - Wellbore #1 - Plan #1 (8-12-16)	400.0	400.0	32.9	31.0	17.071	CC, ES
Popham 3P-241 - Wellbore #1 - Plan #1 (8-12-16)	11,917.5	11,808.7	870.0	637.7	3.745	SF
Popham 3P-341 - Wellbore #1 - Plan #1 (8-12-16)	400.0	400.0	47.4	45.5	24.613	CC, ES
Popham 3P-341 - Wellbore #1 - Plan #1 (8-12-16)	11,917.5	11,879.9	557.5	324.6	2.394	SF

Offset Design	Chesnut 27K-HZ Pad Sec.27-T5N-R64W - Chesnut 27K-403 - Wellbore #1 - Wellbore #1										Offset Site Error:	0.0 ft
Survey Program:	165-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
11,300.0	6,703.4	14,160.0	6,765.5	102.7	156.8	176.07	5,001.9	-593.7	923.2	809.6	113.62	8.126
11,400.0	6,702.5	14,160.0	6,765.5	105.0	156.8	176.07	5,001.9	-593.7	824.2	709.7	114.52	7.197
11,500.0	6,701.6	14,160.0	6,765.5	107.3	156.8	176.07	5,001.9	-593.7	725.5	610.0	115.43	6.285

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