

PDC Energy Inc. DJ Basin

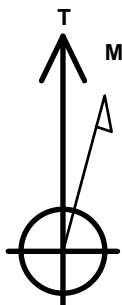
Well Name: **Thistle Down 31H-302**

Surface Location: Thistle Down 5N64W31H Pad Sec.31-T5N-R64W
North American Datum 1983 , US State Plane 1983, Colorado Northern Zone
Ground Elevation: 4804.0

+N/-S +E/-W Northing Easting Longitude Slot
0.0 0.0 1372500.87 3251619.71 40.352400 -104.597170
Original Well Elev WELL @ 4827.0ft (Original Well Elev)

DESIGN TARGET DETAILS

Name	TVD	+N/-S	+E/-W	Shape
SHL 1444'FSL, 1357'FWL, SEC.31	1.0	0.0	0.0	Point
BHL 1252'FSL, 800'FWL, SEC.32	6926.0	-174.4	4721.5	Point
LPL 1252'FSL, 733'FWL, SEC.31	6956.0	-196.7	-622.0	Point



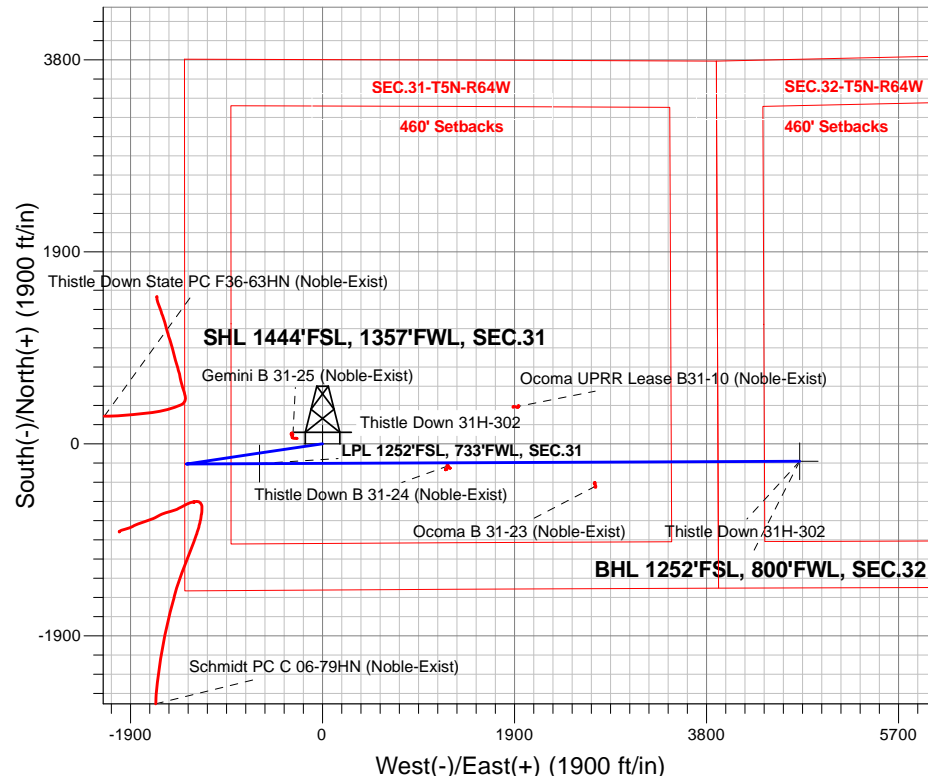
Azimuths to True North
Magnetic North: 8.00°

Magnetic Field
Strength: 52520.6snT
Dip Angle: 66.84°
Date: 3/7/2017
Model: IGRF2010

Thistle Down 5N64W31H Pad Sec.31-T5N-R64W
Thistle Down 31H-302
Plan #1 (2-28-17)
14:00, March 07 2017

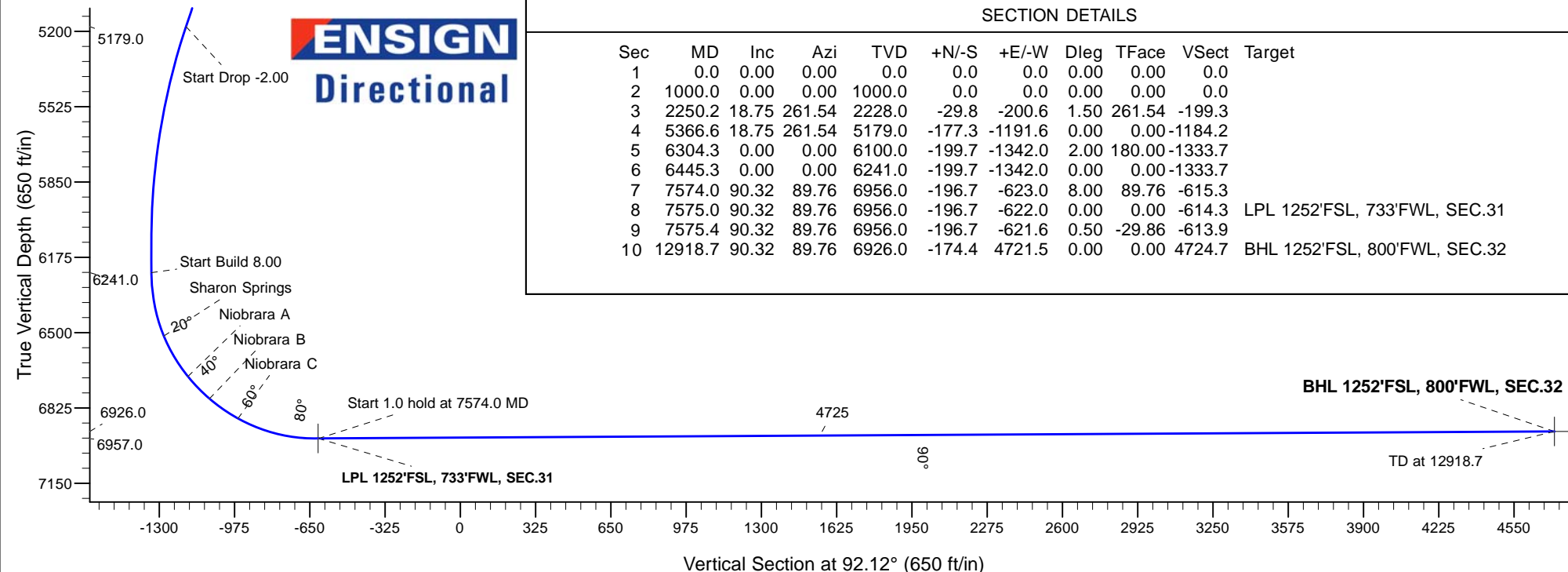
ANNOTATIONS

TVD	MD	Annotation
1000.0	1000.0	KOP - Start Build 1.50
5179.0	5366.6	Start Drop -2.00
6241.0	6445.3	Start Build 8.00
6957.0	7574.0	Start 1.0 hold at 7574.0 MD
6956.0	7575.4	Start 5343.3 hold at 7575.4 MD
6926.0	12918.7	TD at 12918.7



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	1000.0	0.00	0.00	1000.0	0.0	0.0	0.00	0.00	0.0	
3	2250.2	18.75	261.54	2228.0	-29.8	-200.6	1.50	261.54	-199.3	
4	5366.6	18.75	261.54	5179.0	-177.3	-1191.6	0.00	0.00	-1184.2	
5	6304.3	0.00	0.00	6100.0	-199.7	-1342.0	2.00	180.00	-1333.7	
6	6445.3	0.00	0.00	6241.0	-199.7	-1342.0	0.00	0.00	-1333.7	
7	7574.0	90.32	89.76	6956.0	-196.7	-623.0	8.00	89.76	-615.3	
8	7575.0	90.32	89.76	6956.0	-196.7	-622.0	0.00	0.00	-614.3	LPL 1252'FSL, 733'FWL, SEC.31
9	7575.4	90.32	89.76	6956.0	-196.7	-621.6	0.50	-29.86	-613.9	
10	12918.7	90.32	89.76	6926.0	-174.4	4721.5	0.00	0.00	4724.7	BHL 1252'FSL, 800'FWL, SEC.32





PDC Energy Inc. DJ Basin

SEC.31-T5N-R64W

Thistle Down 5N64W31H Pad Sec.31-T5N-R64W

Thistle Down 31H-302

Wellbore #1

Plan #1 (2-28-17)

Anticollision Report

07 March, 2017



Company:	PDC Energy Inc. DJ Basin	Local Co-ordinate Reference:	Well Thistle Down 31H-302
Project:	SEC.31-T5N-R64W	TVD Reference:	WELL @ 4827.0ft (Original Well Elev)
Reference Site:	Thistle Down 5N64W31H Pad Sec.31-T5N-R64W	MD Reference:	WELL @ 4827.0ft (Original Well Elev)
Site Error:	0.0 ft	North Reference:	True
Reference Well:	Thistle Down 31H-302	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 (2-28-17)	Offset TVD Reference:	Offset Datum

Reference	Plan #1 (2-28-17)		
Filter type:	NO GLOBAL FILTER: Using user defined selection & filtering criteria		
Interpolation Method:	Stations	Error Model:	ISCWSA
Depth Range:	Unlimited	Scan Method:	Closest Approach 3D
Results Limited by:	Maximum center-center distance of 800.0 ft	Error Surface:	Elliptical Conic
Warning Levels Evaluated at:	2.45 Sigma	Casing Method:	Not applied

Survey Tool Program	Date 3/7/2017			
From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description
0.0	12,918.7	Plan #1 (2-28-17) (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						
Existing Wells Sec.31-T5N-R64W (GRID)						
Gemini B 31-25 (Noble-Exist) - Wellbore #1 - Wellbore #	2,449.0	2,384.4	94.7	78.2	5.731	CC, ES
Gemini B 31-25 (Noble-Exist) - Wellbore #1 - Wellbore #	7,900.0	6,925.3	287.3	229.4	4.958	SF
Ocoma B 31-23 (Noble-Exist) - Wellbore #1 - Wellbore #	10,894.7	6,926.1	238.9	93.4	1.642	CC
Ocoma B 31-23 (Noble-Exist) - Wellbore #1 - Wellbore #	10,900.0	6,926.1	239.0	93.3	1.640	ES, SF
Ocoma UPRR Lease B31-10 (Noble-Exist) - Wellbore #1	10,086.3	6,932.5	548.4	429.0	4.590	CC
Ocoma UPRR Lease B31-10 (Noble-Exist) - Wellbore #1	10,100.0	6,932.6	548.6	428.7	4.575	ES
Ocoma UPRR Lease B31-10 (Noble-Exist) - Wellbore #1	10,200.0	6,933.0	560.1	436.9	4.547	SF
Thistle Down B 31-24 (Noble-Exist) - Wellbore #1 - Wellb	9,440.3	6,931.6	28.0	-70.6	0.284	Level 1, CC, ES, SF
Existing Wells Sec.36-T5N-R65W						
Schmidt PC C 06-79HN (Noble-Exist) - Wellbore #1 - We	6,726.6	6,525.8	374.6	320.1	6.881	CC, ES, SF
Thistle Down 5N64W31H Pad Sec.31-T5N-R64W						
Thistle Down 31G-232 - Wellbore #1 - Plan #1 (2-28-17)	366.3	367.3	43.7	42.0	25.057	CC
Thistle Down 31G-232 - Wellbore #1 - Plan #1 (2-28-17)	500.0	500.5	44.3	41.8	17.914	ES
Thistle Down 31G-232 - Wellbore #1 - Plan #1 (2-28-17)	5,400.0	5,311.8	746.6	680.9	11.360	SF
Thistle Down 31G-332 - Wellbore #1 - Plan #1 (2-28-17)	166.3	167.3	58.3	57.6	90.583	CC
Thistle Down 31G-332 - Wellbore #1 - Plan #1 (2-28-17)	200.0	201.0	58.3	57.4	70.324	ES
Thistle Down 31G-332 - Wellbore #1 - Plan #1 (2-28-17)	4,500.0	4,382.0	799.6	748.6	15.668	SF
Thistle Down 31H-202 - Wellbore #1 - Plan #1 (2-28-17)	800.0	800.0	14.6	10.4	3.528	CC
Thistle Down 31H-202 - Wellbore #1 - Plan #1 (2-28-17)	12,918.7	12,845.4	275.0	-110.3	0.714	Level 1, ES, SF
Thistle Down 31H-232 - Wellbore #1 - Plan #1 (2-28-17)	800.0	800.0	18.2	14.1	4.410	CC
Thistle Down 31H-232 - Wellbore #1 - Plan #1 (2-28-17)	12,918.7	12,868.3	253.9	-129.1	0.663	Level 1, ES, SF
Thistle Down 31H-312 - Wellbore #1 - Plan #1 (2-28-17)	600.0	600.0	29.1	26.1	9.623	CC
Thistle Down 31H-312 - Wellbore #1 - Plan #1 (2-28-17)	700.0	699.8	29.5	25.9	8.262	ES
Thistle Down 31H-312 - Wellbore #1 - Plan #1 (2-28-17)	12,918.7	12,911.4	539.3	142.4	1.359	Level 3, SF
Thistle Down 31H-332 - Wellbore #1 - Plan #1 (2-28-17)	600.0	599.0	32.8	29.8	10.835	CC, ES
Thistle Down 31H-332 - Wellbore #1 - Plan #1 (2-28-17)	12,918.7	12,955.1	506.5	110.3	1.278	Level 3, SF
Thistle Down 31I-212 - Wellbore #1 - Plan #1 (2-28-17)	400.0	399.0	47.4	45.4	24.610	CC, ES
Thistle Down 31I-212 - Wellbore #1 - Plan #1 (2-28-17)	5,900.0	5,908.3	798.7	727.9	11.277	SF
Thistle Down 31I-302 - Wellbore #1 - Plan #1 (2-28-17)	200.0	199.0	61.9	61.1	75.228	CC, ES
Thistle Down 31I-302 - Wellbore #1 - Plan #1 (2-28-17)	4,400.0	4,269.8	790.5	742.1	16.317	SF
Thistle Down PC F36-63HN Pad Sec.36-T5N-R65W						
Thistle Down State PC F36-63HN (Noble-Exist) - Wellbo	6,631.6	6,557.2	580.1	525.1	10.549	CC, ES, SF

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