

# PDC Energy Inc. DJ Basin

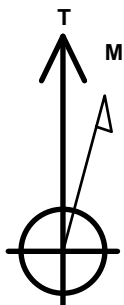
Well Name: **Thistle Down 31H-332**

Surface Location: Thistle Down 5N64W31H Pad Sec.31-T5N-R64W  
North American Datum 1983 , US State Plane 1983 Colorado Northern Zone  
Ground Elevation: 4803.0

+N/-S +E/-W Northing Easting Latitude Longitude Slot  
0.0 0.0 1372468.09 3251620.04 40.352310 -104.597170  
Original Well Elev WELL @ 4826.0ft (Original Well Elev)

## DESIGN TARGET DETAILS

Name	TVD	+N/-S	+E/-W	Shape
SHL 1414'FSL, 1357'FWL, SEC.31	1.0	0.0	0.0	Point
BHL 745'FSL, 800'FWL, SEC.32	6936.0	-648.0	4724.4	Point
LPL 745'FSL, 734'FWL, SEC.31	6966.0	-674.0	-622.0	Point



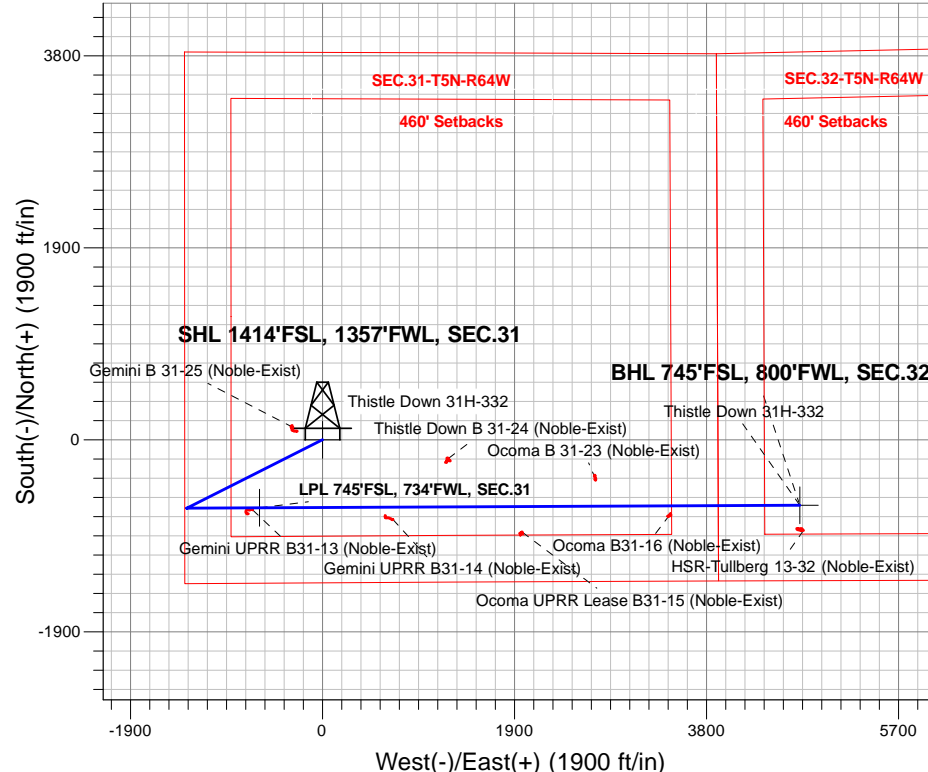
Azimuths to True North  
Magnetic North: 8.00°

Magnetic Field  
Strength: 52521.7snT  
Dip Angle: 66.84°  
Date: 3/3/2017  
Model: IGRF2010

Thistle Down 5N64W31H Pad Sec.31-T5N-R64W  
Thistle Down 31H-332  
Plan #1 (2-28-17)  
14:47, March 07 2017

## ANNOTATIONS

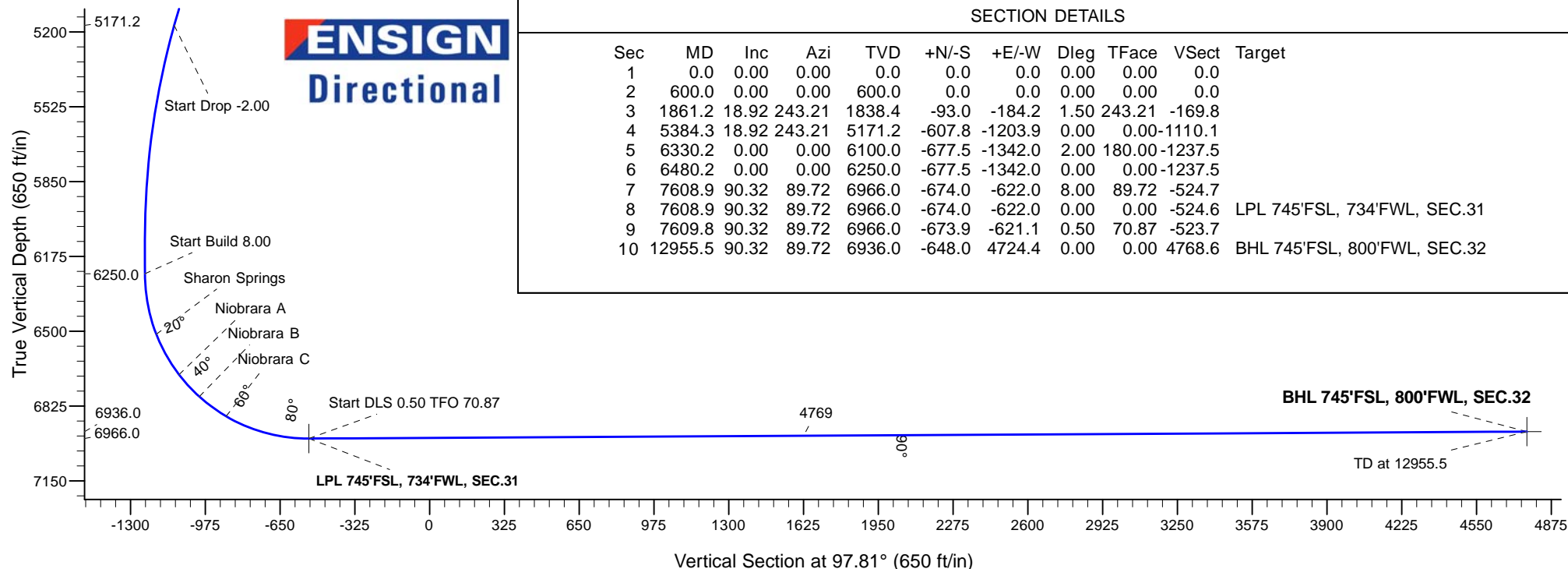
TVD	MD	Annotation
600.0	600.0	KOP - Start Build 1.50
5171.2	5384.3	Start Drop -2.00
6250.0	6480.2	Start Build 8.00
6966.0	7608.9	Start DLS 0.50 TFO 70.87
6966.0	7609.8	Start 5345.6 hold at 7609.8 MD
6936.0	12955.5	TD at 12955.5



**ENSIGN**  
Directional

## 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	1861.2	18.92	243.21	1838.4	-93.0	-184.2	1.50	243.21	-169.8	
4	5384.3	18.92	243.21	5171.2	-607.8	-1203.9	0.00	0.00	-1110.1	
5	6330.2	0.00	0.00	6100.0	-677.5	-1342.0	2.00	180.00	-1237.5	
6	6480.2	0.00	0.00	6250.0	-677.5	-1342.0	0.00	0.00	-1237.5	
7	7608.9	90.32	89.72	6966.0	-674.0	-622.0	8.00	89.72	-524.7	
8	7608.9	90.32	89.72	6966.0	-674.0	-622.0	0.00	0.00	-524.6	LPL 745'FSL, 734'FWL, SEC.31
9	7609.8	90.32	89.72	6966.0	-673.9	-621.1	0.50	70.87	-523.7	
10	12955.5	90.32	89.72	6936.0	-648.0	4724.4	0.00	0.00	4768.6	BHL 745'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-332**

**Wellbore #1**

**Plan #1 (2-28-17)**

## **Anticollision Report**

**07 March, 2017**

<b>Company:</b>	PDC Energy Inc. DJ Basin	<b>Local Co-ordinate Reference:</b>	Well Thistle Down 31H-332
<b>Project:</b>	SEC.31-T5N-R64W	<b>TVD Reference:</b>	WELL @ 4826.0ft (Original Well Elev)
<b>Reference Site:</b>	Thistle Down 5N64W31H Pad Sec.31-T5N-R64W	<b>MD Reference:</b>	WELL @ 4826.0ft (Original Well Elev)
<b>Site Error:</b>	0.0 ft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Thistle Down 31H-332	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.0 ft	<b>Output errors are at</b>	2.45 sigma
<b>Reference Wellbore</b>	Wellbore #1	<b>Database:</b>	US_EDM
<b>Reference Design:</b>	Plan #1 (2-28-17)	<b>Offset TVD Reference:</b>	Offset Datum

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

<b>Survey Tool Program</b>	<b>Date</b> 3/7/2017			
<b>From (ft)</b>	<b>To (ft)</b>	<b>Survey (Wellbore)</b>	<b>Tool Name</b>	<b>Description</b>
0.0	12,955.5	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
<b>Offset Well - Wellbore - Design</b>						
Existing Wells Sec.31-T5N-R64W (GRID)						
Gemini B 31-25 (Noble-Exist) - Wellbore #1 - Wellbore #	1,850.0	1,797.6	199.7	187.3	16.132	CC
Gemini B 31-25 (Noble-Exist) - Wellbore #1 - Wellbore #	1,861.2	1,808.3	199.7	187.2	15.986	ES
Gemini B 31-25 (Noble-Exist) - Wellbore #1 - Wellbore #	8,000.0	6,937.3	799.7	741.2	13.671	SF
Gemini UPRR B31-13 (Noble-Exist) - Wellbore #1 - Well	7,537.2	6,928.6	17.6	-34.3	0.339	Level 1, CC, ES, SF
Gemini UPRR B31-14 (Noble-Exist) - Wellbore #1 - Well	8,927.9	6,941.2	123.3	40.0	1.480	Level 3, CC, ES, SF
Ocoma B 31-23 (Noble-Exist) - Wellbore #1 - Wellbore #	10,931.0	6,935.8	268.9	124.3	1.860	CC, ES, SF
Ocoma B31-16 (Noble-Exist) - Wellbore #1 - Wellbore #1	11,662.8	6,903.6	93.8	-75.5	0.554	Level 1, CC, ES, SF
Ocoma UPRR Lease B31-15 (Noble-Exist) - Wellbore #1	10,205.0	6,919.3	252.2	131.2	2.085	CC, ES, SF
Thistle Down B 31-24 (Noble-Exist) - Wellbore #1 - Wellb	9,476.8	6,942.8	480.8	383.1	4.921	CC
Thistle Down B 31-24 (Noble-Exist) - Wellbore #1 - Wellb	9,500.0	6,942.9	481.3	382.9	4.891	ES
Thistle Down B 31-24 (Noble-Exist) - Wellbore #1 - Wellb	9,600.0	6,943.2	496.3	394.8	4.888	SF
Existing Wells Sec.32-T5N-R64W (GRID)						
HSR-Tullberg 13-32 (Noble-Exist) - Wellbore #1 - Wellbo	12,955.5	6,863.7	245.5	33.1	1.156	Level 2, CC, ES, SF
Thistle Down 5N64W31H Pad Sec.31-T5N-R64W						
Thistle Down 31G-232 - Wellbore #1 - Plan #1 (2-28-17)	366.0	368.0	76.5	74.8	43.828	CC
Thistle Down 31G-232 - Wellbore #1 - Plan #1 (2-28-17)	400.0	402.0	76.5	74.6	39.585	ES
Thistle Down 31G-232 - Wellbore #1 - Plan #1 (2-28-17)	3,800.0	3,692.2	783.3	741.5	18.732	SF
Thistle Down 31G-332 - Wellbore #1 - Plan #1 (2-28-17)	166.0	168.0	91.1	90.4	141.358	CC
Thistle Down 31G-332 - Wellbore #1 - Plan #1 (2-28-17)	200.0	202.0	91.1	90.2	109.540	ES
Thistle Down 31G-332 - Wellbore #1 - Plan #1 (2-28-17)	3,300.0	3,165.5	797.3	762.8	23.128	SF
Thistle Down 31H-202 - Wellbore #1 - Plan #1 (2-28-17)	600.0	601.0	47.4	44.3	15.623	CC, ES
Thistle Down 31H-202 - Wellbore #1 - Plan #1 (2-28-17)	12,955.5	12,845.7	776.6	382.4	1.970	SF
Thistle Down 31H-232 - Wellbore #1 - Plan #1 (2-28-17)	600.0	601.0	14.6	11.5	4.807	CC
Thistle Down 31H-232 - Wellbore #1 - Plan #1 (2-28-17)	12,955.5	12,869.0	274.6	-104.6	0.724	Level 1, ES, SF
Thistle Down 31H-302 - Wellbore #1 - Plan #1 (2-28-17)	600.0	601.0	32.8	29.8	10.816	CC, ES
Thistle Down 31H-302 - Wellbore #1 - Plan #1 (2-28-17)	12,955.5	12,918.7	506.5	110.3	1.278	Level 3, SF
Thistle Down 31H-312 - Wellbore #1 - Plan #1 (2-28-17)	566.3	567.3	61.9	59.1	21.761	CC
Thistle Down 31H-312 - Wellbore #1 - Plan #1 (2-28-17)	600.0	601.0	61.9	58.9	20.431	ES
Thistle Down 31H-312 - Wellbore #1 - Plan #1 (2-28-17)	1,200.0	1,197.1	93.8	87.3	14.493	SF
Thistle Down 31I-212 - Wellbore #1 - Plan #1 (2-28-17)	400.0	400.0	14.6	12.6	7.563	CC
Thistle Down 31I-212 - Wellbore #1 - Plan #1 (2-28-17)	12,955.5	12,929.6	305.7	-77.6	0.798	Level 1, ES, SF
Thistle Down 31I-302 - Wellbore #1 - Plan #1 (2-28-17)	200.0	200.0	29.1	28.3	35.284	CC, ES
Thistle Down 31I-302 - Wellbore #1 - Plan #1 (2-28-17)	12,955.5	13,053.5	582.9	188.3	1.477	Level 3, SF

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