

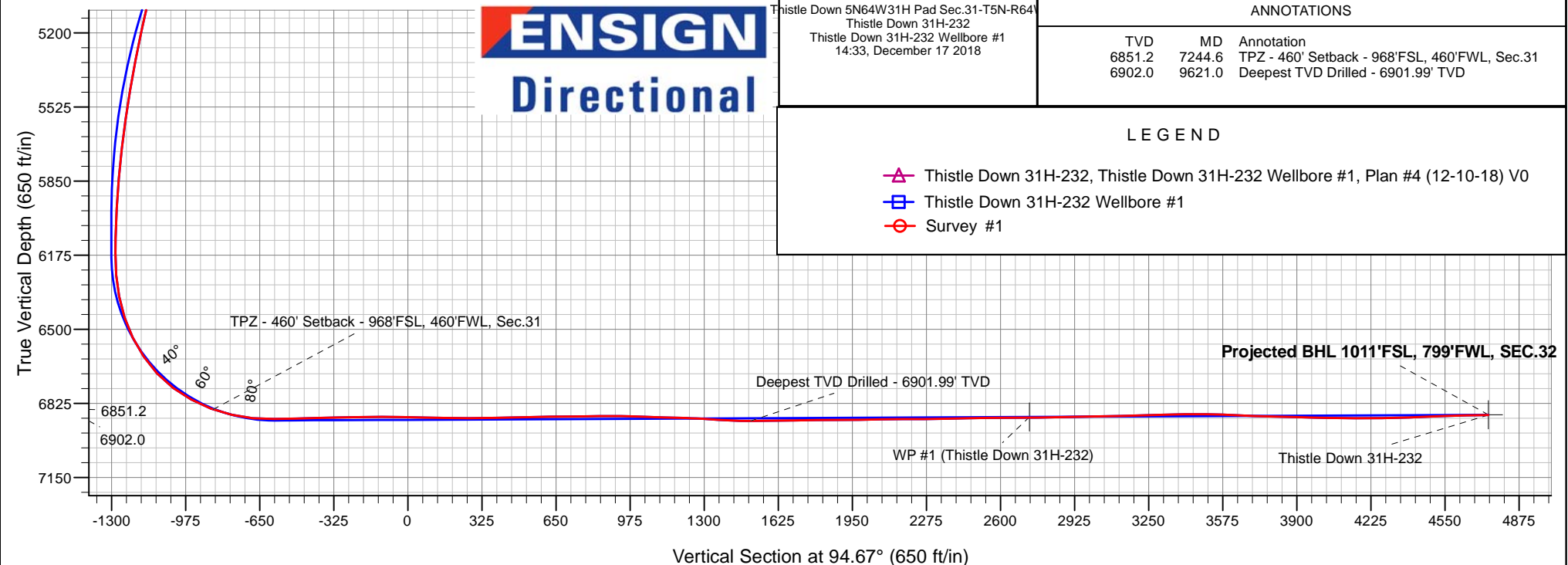
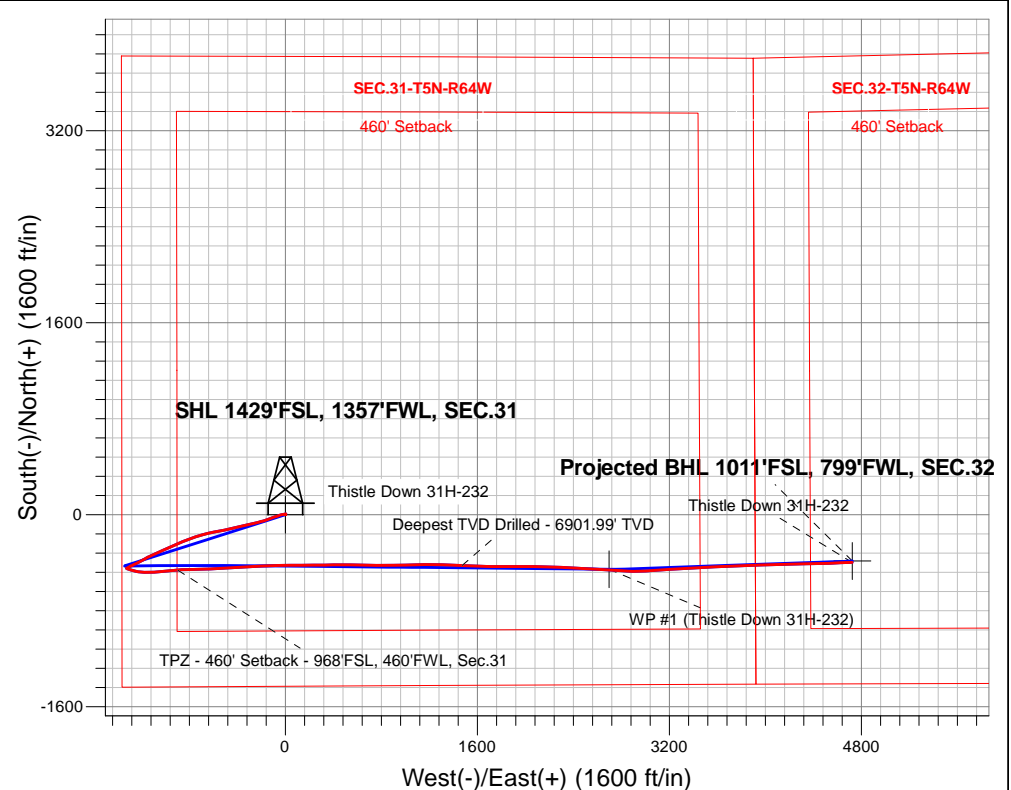
# PDC Energy Inc. DJ Basin

Well Name: **Thistle Down 31H-232**

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 Latitude Longitude Slot  
0.0 0.037248263251619.89 40.352350 -104.597170  
Original Well Elev WELL @ 4827.0ft (Original Well Elev)

## FINAL SURVEY

**Projected Bottom Hole Location**  
**12,874'MD 6876'TVD 397'S & 4724'E of SHL**  
**90.87 degree Incl @ 87.5 degree AZM**





## **PDC Energy Inc. DJ Basin**

**SEC.31-T5N-R64W**

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

**Thistle Down 31H-232**

**Thistle Down 31H-232 Wellbore #1**

**Survey: Survey #1**

## **Standard Survey Report**

**17 December, 2018**

<b>Company:</b>	PDC Energy Inc. DJ Basin	<b>Local Co-ordinate Reference:</b>	Well Thistle Down 31H-232
<b>Project:</b>	SEC.31-T5N-R64W	<b>TVD Reference:</b>	WELL @ 4827.0ft (Original Well Elev)
<b>Site:</b>	Thistle Down 5N64W31H Pad Sec.31-T5N-R64W	<b>MD Reference:</b>	WELL @ 4827.0ft (Original Well Elev)
<b>Well:</b>	Thistle Down 31H-232	<b>North Reference:</b>	True
<b>Wellbore:</b>	Thistle Down 31H-232 Wellbore #1	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	Thistle Down 31H-232 Wellbore #1	<b>Database:</b>	US_EDM

<b>Project</b>	SEC.31-T5N-R64W, Weld County, CO		
<b>Map System:</b>	US State Plane 1983	<b>System Datum:</b>	Mean Sea Level
<b>Geo Datum:</b>	North American Datum 1983		Using Well Reference Point
<b>Map Zone:</b>	Colorado Northern Zone		Using geodetic scale factor

Site	Thistle Down 5N64W31H Pad Sec.31-T5N-R64W				
Site Position:		Northing:	1,372,559.16 usft	Latitude:	40.352560
From:	Lat/Long	Easting:	3,251,619.12 usft	Longitude:	-104.597170
Position Uncertainty:	0.0 ft	Slot Radius:	13-3/16 "	Grid Convergence:	0.58 °

Well	Thistle Down 31H-232					
Well Position	+N/-S	0.0 ft	Northing:	1,372,482.65 usft	Latitude:	40.352350
	+E/-W	0.0 ft	Easting:	3,251,619.90 usft	Longitude:	-104.597170
Position Uncertainty		0.0 ft	Wellhead Elevation:	0.0 ft	Ground Level:	4,804.0 ft

<b>Wellbore</b>	Thistle Down 31H-232 Wellbore #1				
<b>Magnetics</b>	<b>Model Name</b>	<b>Sample Date</b>	<b>Declination (°)</b>	<b>Dip Angle (°)</b>	<b>Field Strength (nT)</b>
	HDGM	12/10/2018	8.17	66.83	52,185

Design	Thistle Down 31H-232 Wellbore #1				
Audit Notes:					
Version:	1.0	Phase:	ACTUAL	Tie On Depth:	0.0
Vertical Section:	Depth From (TVD) (ft)	+N/-S (ft)	+E/-W (ft)	Direction (°)	
	0.0	0.0	0.0	94.67	

<b>Survey Program</b>	<b>Date</b>	12/17/2018			
<b>From (ft)</b>	<b>To (ft)</b>	<b>Survey (Wellbore)</b>	<b>Tool Name</b>	<b>Description</b>	
155.0	12,874.0	Survey #1 (Thistle Down 31H-232 Wellbor	MWD	MWD - Standard	

<b>Survey</b>										
<b>Measured Depth (ft)</b>	<b>Inclination (°)</b>	<b>Azimuth (°)</b>	<b>Vertical Depth (ft)</b>	<b>+N/-S (ft)</b>	<b>+E/-W (ft)</b>	<b>Vertical Section (ft)</b>	<b>Dogleg Rate (°/100usft)</b>	<b>Build Rate (°/100usft)</b>	<b>Turn Rate (°/100usft)</b>	
0.0	0.00	0.00	0.0	0.0	0.0	0.0	0.00	0.00	0.00	
1.0	0.00	18.00	1.0	0.0	0.0	0.0	0.45	0.45	0.00	
<b>SHL 1429'FSL, 1357'FWL, SEC.31</b>										
155.0	0.70	18.00	155.0	0.9	0.3	0.2	0.45	0.45	0.00	
250.0	0.70	29.50	250.0	2.0	0.8	0.6	0.15	0.00	12.11	
345.0	0.60	44.10	345.0	2.8	1.4	1.2	0.20	-0.11	15.37	
440.0	0.50	40.80	440.0	3.5	2.0	1.7	0.11	-0.11	-3.47	
536.0	0.70	44.00	536.0	4.2	2.7	2.3	0.21	0.21	3.33	
631.0	0.60	47.80	631.0	5.0	3.5	3.0	0.11	-0.11	4.00	
727.0	0.70	40.10	727.0	5.8	4.2	3.7	0.14	0.10	-8.02	

<b>Company:</b>	PDC Energy Inc. DJ Basin	<b>Local Co-ordinate Reference:</b>	Well Thistle Down 31H-232
<b>Project:</b>	SEC.31-T5N-R64W	<b>TVD Reference:</b>	WELL @ 4827.0ft (Original Well Elev)
<b>Site:</b>	Thistle Down 5N64W31H Pad Sec.31-T5N-R64W	<b>MD Reference:</b>	WELL @ 4827.0ft (Original Well Elev)
<b>Well:</b>	Thistle Down 31H-232	<b>North Reference:</b>	True
<b>Wellbore:</b>	Thistle Down 31H-232 Wellbore #1	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	Thistle Down 31H-232 Wellbore #1	<b>Database:</b>	US_EDM

Survey										
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	
822.0	0.40	289.60	822.0	6.3	4.3	3.7	0.97	-0.32	-116.32	
917.0	3.30	258.70	916.9	5.9	1.3	0.8	3.12	3.05	-32.53	
1,013.0	5.40	263.90	1,012.6	4.9	-5.9	-6.3	2.22	2.19	5.42	
1,108.0	8.20	260.50	1,106.9	3.3	-17.1	-17.3	2.98	2.95	-3.58	
1,204.0	9.90	255.10	1,201.7	0.0	-31.8	-31.7	1.98	1.77	-5.63	
1,299.0	10.70	251.00	1,295.2	-4.9	-48.0	-47.5	1.14	0.84	-4.32	
1,395.0	12.50	250.50	1,389.2	-11.3	-66.2	-65.1	1.88	1.88	-0.52	
1,490.0	13.50	252.60	1,481.8	-18.1	-86.5	-84.8	1.16	1.05	2.21	
1,628.0	12.60	248.60	1,616.3	-28.4	-115.9	-113.2	0.92	-0.65	-2.90	
1,777.0	11.22	249.12	1,762.0	-39.5	-144.6	-140.9	0.93	-0.93	0.35	
1,873.0	11.15	252.51	1,856.2	-45.6	-162.2	-157.9	0.69	-0.07	3.53	
1,968.0	12.26	254.59	1,949.2	-51.0	-180.6	-175.9	1.25	1.17	2.19	
2,063.0	13.21	255.29	2,041.9	-56.5	-200.9	-195.6	1.01	1.00	0.74	
2,158.0	15.83	253.17	2,133.9	-63.0	-223.8	-217.9	2.81	2.76	-2.23	
2,253.0	17.87	256.95	2,224.8	-70.0	-250.4	-243.8	2.44	2.15	3.98	
2,348.0	18.09	257.37	2,315.1	-76.5	-279.0	-271.8	0.27	0.23	0.44	
2,442.0	17.49	257.17	2,404.6	-82.9	-307.0	-299.2	0.64	-0.64	-0.21	
2,537.0	19.39	256.44	2,494.8	-89.7	-336.2	-327.8	2.01	2.00	-0.77	
2,631.0	20.65	257.56	2,583.1	-97.0	-367.6	-358.5	1.40	1.34	1.19	
2,726.0	19.38	257.53	2,672.3	-104.0	-399.3	-389.5	1.34	-1.34	-0.03	
2,822.0	19.38	257.56	2,762.9	-110.8	-430.4	-420.0	0.01	0.00	0.03	
2,917.0	19.51	255.56	2,852.5	-118.2	-461.2	-450.0	0.71	0.14	-2.11	
3,035.0	21.44	259.86	2,963.0	-126.9	-501.5	-489.5	2.07	1.64	3.64	
3,129.0	21.07	259.24	3,050.6	-133.1	-535.0	-522.4	0.46	-0.39	-0.66	
3,225.0	20.34	259.43	3,140.4	-139.4	-568.4	-555.1	0.76	-0.76	0.20	
3,321.0	19.60	258.78	3,230.7	-145.6	-600.6	-586.7	0.80	-0.77	-0.68	
3,416.0	20.37	255.59	3,319.9	-152.8	-632.2	-617.7	1.40	0.81	-3.36	
3,511.0	19.06	255.40	3,409.4	-160.8	-663.2	-647.9	1.38	-1.38	-0.20	
3,606.0	18.74	255.74	3,499.3	-168.5	-693.0	-677.0	0.36	-0.34	0.36	
3,702.0	19.43	253.63	3,590.0	-176.8	-723.3	-706.5	1.02	0.72	-2.20	
3,798.0	18.68	252.59	3,680.7	-185.9	-753.3	-735.7	0.86	-0.78	-1.08	
3,893.0	19.70	249.15	3,770.4	-196.1	-782.8	-764.2	1.60	1.07	-3.62	
3,988.0	20.18	248.27	3,859.7	-207.9	-813.0	-793.3	0.60	0.51	-0.93	
4,180.0	19.79	247.86	4,040.2	-232.4	-873.8	-852.0	0.22	-0.20	-0.21	
4,276.0	19.20	246.78	4,130.7	-244.7	-903.4	-880.5	0.72	-0.61	-1.13	
4,371.0	18.66	246.03	4,220.5	-257.1	-931.6	-907.6	0.62	-0.57	-0.79	
4,466.0	17.85	244.66	4,310.8	-269.5	-958.7	-933.6	0.96	-0.85	-1.44	
4,562.0	17.41	245.07	4,402.2	-281.8	-985.0	-958.8	0.48	-0.46	0.43	
4,657.0	19.16	247.51	4,492.5	-293.8	-1,012.3	-985.0	2.01	1.84	2.57	
4,752.0	18.32	246.93	4,582.4	-305.6	-1,040.4	-1,012.1	0.91	-0.88	-0.61	
4,848.0	18.44	245.10	4,673.5	-317.9	-1,068.1	-1,038.7	0.61	0.13	-1.91	
4,943.0	18.29	245.44	4,763.7	-330.4	-1,095.3	-1,064.7	0.19	-0.16	0.36	

<b>Company:</b>	PDC Energy Inc. DJ Basin	<b>Local Co-ordinate Reference:</b>	Well Thistle Down 31H-232
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<b>Site:</b>	Thistle Down 5N64W31H Pad Sec.31-T5N-R64W	<b>MD Reference:</b>	WELL @ 4827.0ft (Original Well Elev)
<b>Well:</b>	Thistle Down 31H-232	<b>North Reference:</b>	True
<b>Wellbore:</b>	Thistle Down 31H-232 Wellbore #1	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	Thistle Down 31H-232 Wellbore #1	<b>Database:</b>	US_EDM

Survey									
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
5,039.0	17.13	244.61	4,855.1	-342.8	-1,121.8	-1,090.1	1.24	-1.21	-0.86
5,134.0	15.83	241.57	4,946.2	-354.9	-1,145.8	-1,113.1	1.64	-1.37	-3.20
5,229.0	15.22	240.90	5,037.8	-367.2	-1,168.1	-1,134.3	0.67	-0.64	-0.71
5,325.0	15.29	242.66	5,130.4	-379.1	-1,190.3	-1,155.5	0.49	0.07	1.83
5,420.0	13.85	241.29	5,222.3	-390.3	-1,211.4	-1,175.6	1.56	-1.52	-1.44
5,516.0	12.81	243.56	5,315.7	-400.6	-1,231.0	-1,194.3	1.21	-1.08	2.36
5,611.0	11.58	244.30	5,408.6	-409.4	-1,249.1	-1,211.6	1.31	-1.29	0.78
5,707.0	9.93	243.22	5,502.9	-417.3	-1,265.1	-1,227.0	1.73	-1.72	-1.13
5,801.0	9.13	247.62	5,595.6	-423.8	-1,279.3	-1,240.5	1.15	-0.85	4.68
5,897.0	7.68	244.32	5,690.6	-429.5	-1,292.1	-1,252.8	1.59	-1.51	-3.44
5,993.0	6.66	239.55	5,785.8	-435.1	-1,302.7	-1,262.9	1.23	-1.06	-4.97
6,088.0	5.80	237.22	5,880.3	-440.5	-1,311.5	-1,271.2	0.94	-0.91	-2.45
6,183.0	4.64	234.77	5,974.9	-445.3	-1,318.6	-1,278.0	1.24	-1.22	-2.58
6,279.0	0.88	274.66	6,070.7	-447.5	-1,322.5	-1,281.7	4.17	-3.92	41.55
6,374.0	0.85	258.31	6,165.7	-447.5	-1,324.0	-1,283.1	0.26	-0.03	-17.21
6,470.0	4.44	117.52	6,261.6	-449.4	-1,321.4	-1,280.4	5.34	3.74	-146.66
6,565.0	12.04	105.14	6,355.6	-453.7	-1,308.5	-1,267.2	8.17	8.00	-13.03
6,661.0	18.36	108.87	6,448.2	-461.2	-1,284.5	-1,242.7	6.66	6.58	3.89
6,756.0	26.17	103.13	6,536.1	-470.8	-1,249.9	-1,207.4	8.52	8.22	-6.04
6,852.0	34.04	98.65	6,619.0	-479.7	-1,202.6	-1,159.6	8.52	8.20	-4.67
6,947.0	43.30	86.16	6,693.3	-481.5	-1,143.6	-1,100.6	12.71	9.75	-13.15
7,043.0	53.33	85.11	6,757.0	-476.0	-1,072.3	-1,029.9	10.48	10.45	-1.09
7,138.0	61.56	84.45	6,808.1	-468.7	-992.6	-951.1	8.68	8.66	-0.69
7,234.0	69.78	87.60	6,847.6	-462.7	-905.4	-864.7	9.07	8.56	3.28
7,244.6	70.57	87.55	6,851.2	-462.3	-895.4	-854.8	7.44	7.43	-0.50
TPZ - 460' Setback - 968'FSL, 460'FWL, Sec.31									
7,330.0	76.91	87.14	6,875.1	-458.5	-813.6	-773.5	7.44	7.43	-0.48
7,424.0	85.38	88.35	6,889.6	-454.9	-720.9	-681.4	9.10	9.01	1.29
7,520.0	90.50	87.24	6,893.0	-451.2	-625.0	-586.2	5.46	5.33	-1.16
7,526.0	90.54	87.22	6,893.0	-450.9	-619.1	-580.3	0.66	0.60	-0.27
LPL 1008'FSL, 735'FWL, SEC.31									
7,616.0	91.08	86.98	6,891.7	-446.3	-529.2	-491.1	0.66	0.60	-0.27
7,711.0	91.90	86.77	6,889.2	-441.2	-434.3	-397.0	0.89	0.86	-0.22
7,806.0	91.18	86.84	6,886.7	-435.9	-339.5	-302.9	0.76	-0.76	0.07
7,902.0	90.73	87.22	6,885.1	-430.9	-243.7	-207.8	0.61	-0.47	0.40
7,997.0	90.28	87.48	6,884.2	-426.5	-148.8	-113.5	0.55	-0.47	0.27
8,093.0	88.76	88.33	6,885.0	-423.0	-52.8	-18.2	1.81	-1.58	0.89
8,188.0	88.71	89.70	6,887.1	-421.4	42.1	76.3	1.44	-0.05	1.44
8,284.0	89.03	89.51	6,889.0	-420.7	138.1	171.9	0.39	0.33	-0.20
8,380.0	89.86	89.51	6,890.0	-419.9	234.1	267.5	0.86	0.86	0.00
8,475.0	91.25	89.53	6,889.0	-419.1	329.1	362.1	1.46	1.46	0.02
8,571.0	91.62	89.91	6,886.6	-418.6	425.1	457.7	0.55	0.39	0.40
8,666.0	90.66	90.45	6,884.7	-418.9	520.0	552.4	1.16	-1.01	0.57

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<b>Site:</b>	Thistle Down 5N64W31H Pad Sec.31-T5N-R64W	<b>MD Reference:</b>	WELL @ 4827.0ft (Original Well Elev)
<b>Well:</b>	Thistle Down 31H-232	<b>North Reference:</b>	True
<b>Wellbore:</b>	Thistle Down 31H-232 Wellbore #1	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	Thistle Down 31H-232 Wellbore #1	<b>Database:</b>	US_EDM

Survey									
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
8,762.0	90.74	91.08	6,883.6	-420.2	616.0	648.2	0.66	0.08	0.66
8,858.0	90.58	90.43	6,882.5	-421.5	712.0	744.0	0.70	-0.17	-0.68
8,953.0	91.19	89.87	6,881.0	-421.7	807.0	838.6	0.87	0.64	-0.59
9,049.0	88.97	89.28	6,880.9	-421.0	903.0	934.3	2.39	-2.31	-0.61
9,144.0	87.89	89.17	6,883.5	-419.7	997.9	1,028.8	1.14	-1.14	-0.12
9,239.0	88.26	89.04	6,886.7	-418.2	1,092.9	1,123.3	0.41	0.39	-0.14
9,335.0	88.49	88.82	6,889.4	-416.4	1,188.8	1,218.8	0.33	0.24	-0.23
9,430.0	86.10	91.24	6,893.9	-416.5	1,283.7	1,313.3	3.58	-2.52	2.55
9,526.0	86.90	92.06	6,899.7	-419.2	1,379.5	1,409.0	1.19	0.83	0.85
9,621.0	90.37	92.66	6,902.0	-423.2	1,474.3	1,503.9	3.71	3.65	0.63
Deepest TVD Drilled - 6901.99' TVD									
9,717.0	90.95	92.34	6,900.9	-427.3	1,570.2	1,599.8	0.69	0.60	-0.33
9,813.0	90.79	91.81	6,899.4	-430.8	1,666.2	1,695.7	0.58	-0.17	-0.55
9,908.0	90.59	90.29	6,898.3	-432.6	1,761.1	1,790.5	1.61	-0.21	-1.60
10,003.0	90.09	89.35	6,897.7	-432.3	1,856.1	1,885.2	1.12	-0.53	-0.99
10,098.0	91.05	91.01	6,896.8	-432.6	1,951.1	1,979.9	2.02	1.01	1.75
10,193.0	90.94	91.09	6,895.1	-434.3	2,046.1	2,074.7	0.14	-0.12	0.08
10,290.0	90.49	90.69	6,893.9	-435.8	2,143.1	2,171.5	0.62	-0.46	-0.41
10,385.0	90.14	90.37	6,893.4	-436.7	2,238.1	2,266.2	0.50	-0.37	-0.34
10,481.0	91.32	92.74	6,892.2	-439.3	2,334.0	2,362.0	2.76	1.23	2.47
10,577.0	91.21	94.17	6,890.0	-445.1	2,429.8	2,458.0	1.49	-0.11	1.49
10,672.0	90.58	93.28	6,888.6	-451.2	2,524.6	2,553.0	1.15	-0.66	-0.94
10,767.0	90.22	92.85	6,887.9	-456.3	2,619.5	2,647.9	0.59	-0.38	-0.45
10,845.6	90.47	93.56	6,887.4	-460.7	2,698.0	2,726.5	0.96	0.31	0.91
WP #1 (Thistle Down 31H-232)									
10,863.0	90.52	93.72	6,887.3	-461.8	2,715.3	2,743.9	0.96	0.31	0.91
10,958.0	91.28	94.25	6,885.8	-468.4	2,810.1	2,838.9	0.98	0.80	0.56
11,054.0	91.15	89.94	6,883.8	-471.9	2,906.0	2,934.7	4.49	-0.14	-4.49
11,150.0	91.05	86.69	6,881.9	-469.1	3,001.9	3,030.1	3.39	-0.10	-3.39
11,245.0	91.30	86.35	6,880.0	-463.3	3,096.7	3,124.1	0.44	0.26	-0.36
11,341.0	91.56	86.62	6,877.6	-457.5	3,192.5	3,219.1	0.39	0.27	0.28
11,437.0	91.53	86.29	6,875.0	-451.5	3,288.3	3,314.1	0.35	-0.03	-0.34
11,532.0	91.21	85.87	6,872.7	-445.0	3,383.0	3,408.0	0.56	-0.34	-0.44
11,628.0	88.81	87.07	6,872.7	-439.1	3,478.8	3,503.0	2.80	-2.50	1.25
11,723.0	88.05	87.51	6,875.3	-434.6	3,573.7	3,597.2	0.92	-0.80	0.46
11,819.0	87.19	86.76	6,879.3	-429.8	3,669.5	3,692.3	1.19	-0.90	-0.78
11,914.0	88.85	88.38	6,882.6	-425.8	3,764.3	3,786.5	2.44	1.75	1.71
12,010.0	88.46	88.02	6,884.8	-422.8	3,860.3	3,881.9	0.55	-0.41	-0.38
12,106.0	88.76	87.62	6,887.1	-419.2	3,956.2	3,977.2	0.52	0.31	-0.42
12,202.0	89.24	88.60	6,888.8	-416.0	4,052.1	4,072.5	1.14	0.50	1.02
12,298.0	89.44	88.21	6,889.9	-413.3	4,148.0	4,167.9	0.46	0.21	-0.41
12,393.0	90.95	89.30	6,889.6	-411.3	4,243.0	4,262.4	1.96	1.59	1.15
12,489.0	91.75	88.82	6,887.3	-409.7	4,339.0	4,357.9	0.97	0.83	-0.50

<b>Company:</b>	PDC Energy Inc. DJ Basin	<b>Local Co-ordinate Reference:</b>	Well Thistle Down 31H-232
<b>Project:</b>	SEC.31-T5N-R64W	<b>TVD Reference:</b>	WELL @ 4827.0ft (Original Well Elev)
<b>Site:</b>	Thistle Down 5N64W31H Pad Sec.31-T5N-R64W	<b>MD Reference:</b>	WELL @ 4827.0ft (Original Well Elev)
<b>Well:</b>	Thistle Down 31H-232	<b>North Reference:</b>	True
<b>Wellbore:</b>	Thistle Down 31H-232 Wellbore #1	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	Thistle Down 31H-232 Wellbore #1	<b>Database:</b>	US_EDM

Survey									
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
12,584.0	92.70	88.98	6,883.6	-407.9	4,433.9	4,452.4	1.01	1.00	0.17
12,680.0	91.71	87.89	6,880.0	-405.2	4,529.8	4,547.7	1.53	-1.03	-1.14
12,776.0	91.10	87.31	6,877.6	-401.2	4,625.7	4,643.0	0.88	-0.64	-0.60
12,817.0	90.87	87.50	6,876.9	-399.4	4,666.6	4,683.6	0.73	-0.56	0.46
12,874.0	90.87	87.50	6,876.0	-396.9	4,723.6	4,740.2	0.00	0.00	0.00
Projected BHL 1011'FSL, 799'FWL, SEC.32									

Design Targets									
Target Name	Dip Angle (°)	Dip Dir. (°)	TVD (ft)	+N/-S (ft)	+E/-W (ft)	Northing (usft)	Easting (usft)	Latitude	Longitude
- hit/miss target									
- Shape									
SHL 1429'FSL, 1357'FW	0.00	0.00	1.0	0.0	0.0	1,372,482.66	3,251,619.90	40.352350	-104.597170
- survey hits target center									
- Point									
Projected BHL 1011'FSL	0.00	0.00	6,875.0	-386.0	4,724.4	1,372,144.79	3,256,347.73	40.351289	-104.580220
- survey misses target center by 11.0ft at 12874.0ft MD (6876.0 TVD, -396.9 N, 4723.6 E)									
- Point									
WP #1 (Thistle Down 31	0.00	0.00	6,884.5	-454.9	2,698.3	1,372,055.27	3,254,322.57	40.351101	-104.587489
- survey misses target center by 6.5ft at 10845.6ft MD (6887.4 TVD, -460.7 N, 2698.0 E)									
- Point									

Survey Annotations				
Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment
		+N/-S (ft)	+E/-W (ft)	
7,244.6	6,851.2	-462.3	-895.4	TPZ - 460' Setback - 968'FSL, 460'FWL, Sec.31
9,621.0	6,902.0	-423.2	1,474.3	Deepest TVD Drilled - 6901.99' TVD

Checked By: _____	Approved By: _____	Date: _____
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