

# PDC Energy Inc. DJ Basin



Broe 28NA  
 Broe Pad  
 North American Datum 1983 , US State Plane 1983, Colorado Northern Zone  
 Ground Elevation: 4741.0  
 +N/-S +E/-W Northing Easting Latitude Longitude Slot  
 0.0 0.0 1407658.60 3177031.76 40.450682 -104.863881  
 Ensign 769 - RKB 28' WELL @ 4769.0ft (Ensign 769 - RKB 28')

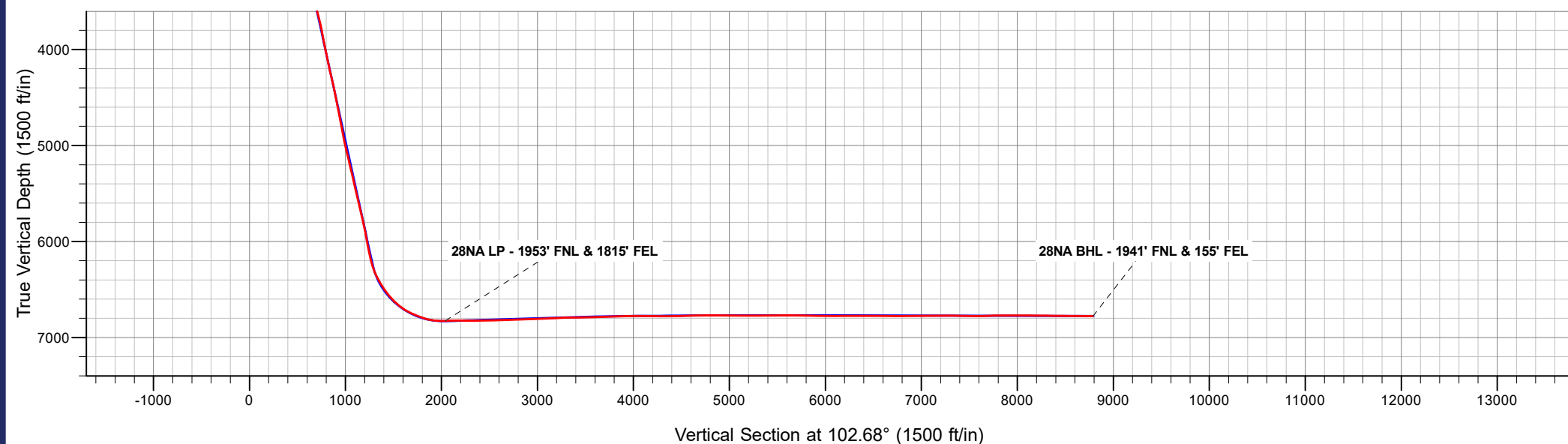
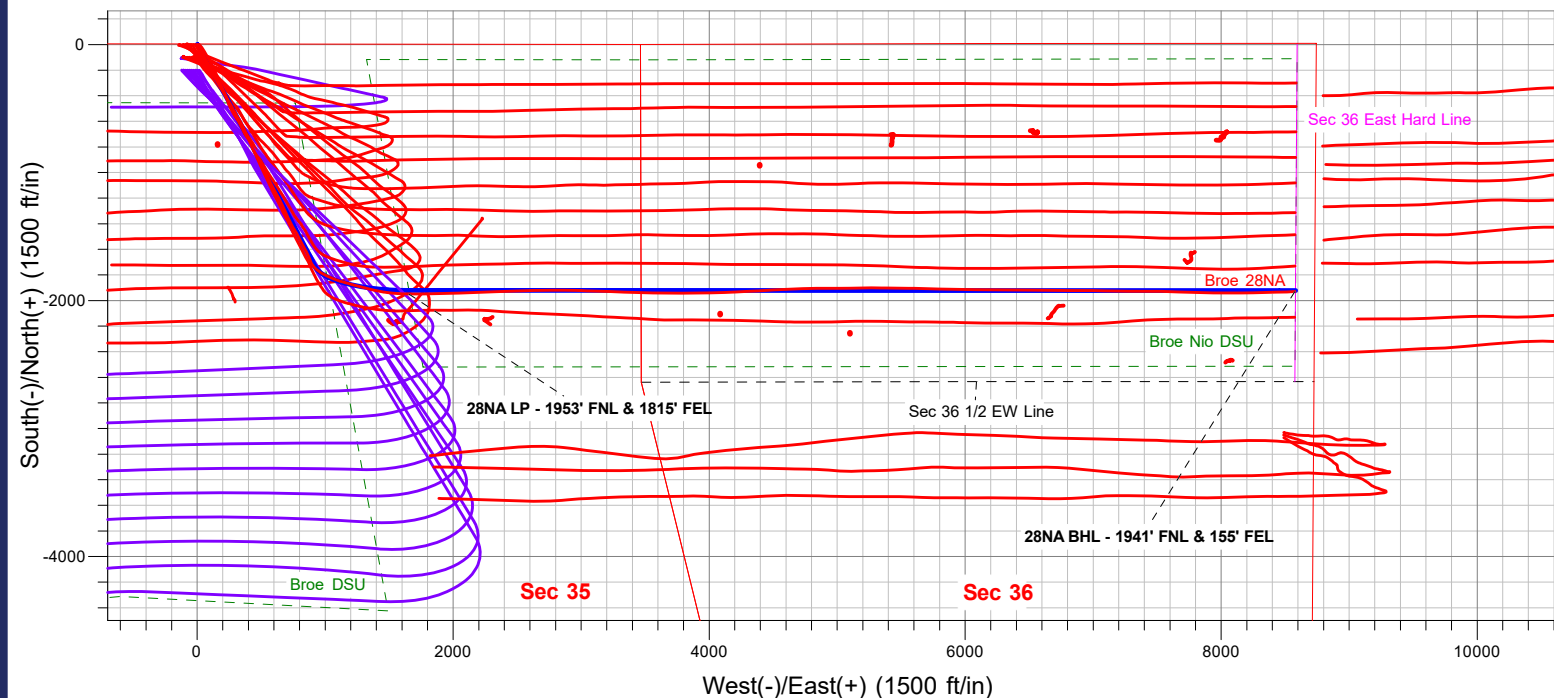
Broe Pad  
 Broe 28NA  
 Broe 28NA Final Surveys  
 14:28, May 24 2023

MAzimuths to True North  
 Magnetic North: 7.84°  
 Magnetic Field  
 Strength: 51817.5nT  
 Dip Angle: 66.62°  
 Date: 04/06/2023  
 Model: HRGM

ANNOTATIONS

MD	TVD	Annotation
7606.0	6825.1	28NA LP - 1953' FNL & 1815' FEL
14531.0	6776.9	28NA BHL - 1941' FNL & 155' FEL

**FINAL SURVEY**  
**Projected Bottom Hole Location**  
**14531.0' MD / 6776.9' TVD**  
**89.32° INC / 87.86° AZM**  
**1941' FNL / 155' FEL**





# **PDC Energy Inc. DJ Basin**

**Sec.35-T6N-R67W**

**Broe Pad**

**Broe 28NA**

**Broe 28NA**

**Design: Broe 28NA Final Surveys**

## **Standard Survey Report**

**24 May, 2023**

<b>Company:</b>	PDC Energy Inc. DJ Basin	<b>Local Co-ordinate Reference:</b>	Well Broe 28NA
<b>Project:</b>	Sec.35-T6N-R67W	<b>TVD Reference:</b>	WELL @ 4769.0ft (Ensign 769 - RKB 28')
<b>Site:</b>	Broe Pad	<b>MD Reference:</b>	WELL @ 4769.0ft (Ensign 769 - RKB 28')
<b>Well:</b>	Broe 28NA	<b>North Reference:</b>	True
<b>Wellbore:</b>	Broe 28NA	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	Broe 28NA Final Surveys	<b>Database:</b>	US_EDM

<b>Project</b>	Sec.35-T6N-R67W		
<b>Map System:</b>	US State Plane 1983	<b>System Datum:</b>	Mean Sea Level
<b>Geo Datum:</b>	North American Datum 1983		
<b>Map Zone:</b>	Colorado Northern Zone		Using geodetic scale factor

<b>Site</b>	Broe Pad				
<b>Site Position:</b>		<b>Northing:</b>	1,407,657.81 usft	<b>Latitude:</b>	40.450682
<b>From:</b>	Lat/Long	<b>Easting:</b>	3,176,896.79 usft	<b>Longitude:</b>	-104.864366
<b>Position Uncertainty:</b>	0.0 ft	<b>Slot Radius:</b>	13-3/16 "	<b>Grid Convergence:</b>	0.41 °

<b>Well</b>	Broe 28NA					
<b>Well Position</b>	<b>+N/-S</b>	0.0 ft	<b>Northing:</b>	1,407,658.60 usft	<b>Latitude:</b>	40.450682
	<b>+E/-W</b>	0.0 ft	<b>Easting:</b>	3,177,031.76 usft	<b>Longitude:</b>	-104.863881
<b>Position Uncertainty</b>		0.0 ft	<b>Wellhead Elevation:</b>	ft	<b>Ground Level:</b>	4,741.0 ft

<b>Wellbore</b>	Broe 28NA				
<b>Magnetics</b>	<b>Model Name</b>	<b>Sample Date</b>	<b>Declination (°)</b>	<b>Dip Angle (°)</b>	<b>Field Strength (nT)</b>
	HRGM	04/06/2023	7.84	66.62	51,817.50341035

<b>Design</b>	Broe 28NA Final Surveys				
<b>Audit Notes:</b>					
<b>Version:</b>	1.0	<b>Phase:</b>	ACTUAL	<b>Tie On Depth:</b>	0.0
<b>Vertical Section:</b>	<b>Depth From (TVD) (ft)</b>	<b>+N/-S (ft)</b>	<b>+E/-W (ft)</b>	<b>Direction (°)</b>	
	0.0	0.0	0.0	102.68	

<b>Survey Program</b>	Date 05/24/2023			
<b>From (ft)</b>	<b>To (ft)</b>	<b>Survey (Wellbore)</b>	<b>Tool Name</b>	<b>Description</b>
69.0	14,531.0	Survey #1 (Broe 28NA)	MWD	MWD - Standard

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)
0.0	0.00	0.00	0.0	0.0	0.0	0.0	0.00	0.00	0.00
69.0	0.62	228.47	69.0	-0.2	-0.3	-0.2	0.90	0.90	0.00
160.0	1.58	113.50	160.0	-1.1	0.5	0.7	2.12	1.05	-126.34
251.0	4.04	122.82	250.9	-3.3	4.3	5.0	2.74	2.70	10.24
342.0	6.16	138.64	341.5	-8.7	10.3	11.9	2.77	2.33	17.38
458.0	9.58	151.82	456.4	-21.9	18.9	23.3	3.31	2.95	11.36
543.0	12.40	153.06	539.8	-36.3	26.4	33.7	3.33	3.32	1.46
628.0	15.21	153.06	622.4	-54.4	35.6	46.7	3.31	3.31	0.00
714.0	17.67	152.88	704.9	-76.0	46.7	62.2	2.86	2.86	-0.21
799.0	17.85	153.41	785.8	-99.2	58.4	78.7	0.28	0.21	0.62

<b>Company:</b>	PDC Energy Inc. DJ Basin	<b>Local Co-ordinate Reference:</b>	Well Broe 28NA
<b>Project:</b>	Sec.35-T6N-R67W	<b>TVD Reference:</b>	WELL @ 4769.0ft (Ensign 769 - RKB 28')
<b>Site:</b>	Broe Pad	<b>MD Reference:</b>	WELL @ 4769.0ft (Ensign 769 - RKB 28')
<b>Well:</b>	Broe 28NA	<b>North Reference:</b>	True
<b>Wellbore:</b>	Broe 28NA	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	Broe 28NA Final Surveys	<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)	
884.0	19.43	151.12	866.3	-123.2	71.0	96.4	2.05	1.86	-2.69	
969.0	20.14	150.77	946.3	-148.3	85.0	115.5	0.85	0.84	-0.41	
1,054.0	20.14	148.66	1,026.1	-173.6	99.8	135.5	0.85	0.00	-2.48	
1,139.0	20.14	151.12	1,105.9	-198.9	114.5	155.3	1.00	0.00	2.89	
1,224.0	19.79	153.93	1,185.8	-224.7	127.8	174.1	1.20	-0.41	3.31	
1,309.0	17.94	154.29	1,266.3	-249.4	139.8	191.2	2.18	-2.18	0.42	
1,395.0	17.32	151.47	1,348.2	-272.6	151.7	207.9	1.23	-0.72	-3.28	
1,480.0	18.03	151.65	1,429.2	-295.3	164.0	224.8	0.84	0.84	0.21	
1,565.0	18.20	152.18	1,510.0	-318.6	176.4	242.1	0.28	0.20	0.62	
1,650.0	18.91	151.12	1,590.6	-342.4	189.3	259.8	0.92	0.84	-1.25	
1,703.0	18.55	150.42	1,640.8	-357.2	197.6	271.2	0.80	-0.68	-1.32	
1,790.0	18.06	149.53	1,723.4	-380.9	211.3	289.7	0.65	-0.56	-1.02	
1,880.0	18.56	151.89	1,808.8	-405.5	225.1	308.6	0.99	0.56	2.62	
1,970.0	19.13	151.58	1,894.0	-431.2	238.9	327.7	0.64	0.63	-0.34	
2,060.0	18.32	149.15	1,979.2	-456.3	253.1	347.1	1.25	-0.90	-2.70	
2,149.0	19.42	150.75	2,063.4	-481.2	267.5	366.7	1.37	1.24	1.80	
2,239.0	18.65	149.74	2,148.5	-506.7	282.1	386.5	0.93	-0.86	-1.12	
2,329.0	19.62	151.77	2,233.5	-532.4	296.5	406.2	1.31	1.08	2.26	
2,419.0	19.26	150.39	2,318.4	-558.6	311.0	426.0	0.65	-0.40	-1.53	
2,509.0	19.16	151.64	2,403.4	-584.5	325.3	445.7	0.47	-0.11	1.39	
2,599.0	19.20	150.33	2,488.4	-610.4	339.7	465.4	0.48	0.04	-1.46	
2,689.0	19.17	149.30	2,573.4	-636.0	354.5	485.5	0.38	-0.03	-1.14	
2,779.0	17.89	153.96	2,658.7	-661.1	368.1	504.3	2.17	-1.42	5.18	
2,868.0	20.06	158.43	2,742.9	-687.6	379.8	521.5	2.93	2.44	5.02	
2,958.0	20.33	157.11	2,827.4	-716.3	391.5	539.3	0.59	0.30	-1.47	
3,048.0	19.04	155.92	2,912.1	-744.1	403.6	557.1	1.50	-1.43	-1.32	
3,138.0	17.92	155.77	2,997.5	-770.2	415.3	574.2	1.25	-1.24	-0.17	
3,227.0	16.44	155.93	3,082.5	-794.1	426.0	590.0	1.66	-1.66	0.18	
3,317.0	15.73	154.12	3,169.0	-816.7	436.5	605.2	0.97	-0.79	-2.01	
3,407.0	18.08	149.83	3,255.1	-839.8	448.9	622.3	2.95	2.61	-4.77	
3,497.0	19.10	150.68	3,340.4	-864.7	463.1	641.7	1.17	1.13	0.94	
3,587.0	20.35	151.45	3,425.1	-891.3	477.8	661.9	1.42	1.39	0.86	
3,677.0	20.98	153.00	3,509.3	-919.4	492.6	682.5	0.93	0.70	1.72	
3,767.0	21.14	153.00	3,593.3	-948.2	507.3	703.1	0.18	0.18	0.00	
3,857.0	21.39	151.87	3,677.2	-977.2	522.4	724.2	0.53	0.28	-1.26	
3,947.0	19.12	153.42	3,761.6	-1,004.8	536.7	744.3	2.59	-2.52	1.72	
4,037.0	17.77	154.23	3,847.0	-1,030.4	549.3	762.1	1.53	-1.50	0.90	
4,126.0	16.55	155.57	3,932.0	-1,054.1	560.4	778.2	1.44	-1.37	1.51	
4,216.0	17.24	152.99	4,018.1	-1,077.7	571.8	794.5	1.13	0.77	-2.87	
4,306.0	18.18	152.22	4,103.9	-1,102.0	584.4	812.1	1.08	1.04	-0.86	
4,396.0	19.43	152.12	4,189.1	-1,127.6	597.9	831.0	1.39	1.39	-0.11	
4,486.0	19.48	152.80	4,273.9	-1,154.2	611.8	850.3	0.26	0.06	0.76	
4,576.0	18.73	150.54	4,359.0	-1,180.2	625.8	869.6	1.17	-0.83	-2.51	
4,666.0	17.19	147.98	4,444.6	-1,204.0	639.9	888.7	1.92	-1.71	-2.84	

<b>Company:</b>	PDC Energy Inc. DJ Basin	<b>Local Co-ordinate Reference:</b>	Well Broe 28NA
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<b>Site:</b>	Broe Pad	<b>MD Reference:</b>	WELL @ 4769.0ft (Ensign 769 - RKB 28')
<b>Well:</b>	Broe 28NA	<b>North Reference:</b>	True
<b>Wellbore:</b>	Broe 28NA	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	Broe 28NA Final Surveys	<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)	
4,755.0	16.34	155.67	4,529.8	-1,226.6	652.1	905.5	2.67	-0.96	8.64	
4,845.0	18.83	156.24	4,615.6	-1,251.4	663.1	921.7	2.77	2.77	0.63	
4,935.0	18.75	155.21	4,700.8	-1,277.8	675.0	939.2	0.38	-0.09	-1.14	
5,025.0	17.86	154.83	4,786.2	-1,303.5	687.0	956.4	1.00	-0.99	-0.42	
5,115.0	17.19	156.34	4,872.1	-1,328.1	698.2	972.8	0.90	-0.74	1.68	
5,204.0	18.42	155.94	4,956.8	-1,353.0	709.2	989.0	1.39	1.38	-0.45	
5,294.0	19.25	152.10	5,042.0	-1,379.1	721.9	1,007.1	1.66	0.92	-4.27	
5,384.0	19.75	150.32	5,126.8	-1,405.4	736.4	1,027.0	0.86	0.56	-1.98	
5,474.0	19.92	150.91	5,211.5	-1,432.0	751.4	1,047.5	0.29	0.19	0.66	
5,564.0	19.63	148.55	5,296.2	-1,458.3	766.7	1,068.2	0.94	-0.32	-2.62	
5,653.0	19.01	153.53	5,380.2	-1,484.1	781.0	1,087.8	1.98	-0.70	5.60	
5,743.0	19.27	153.45	5,465.2	-1,510.5	794.2	1,106.5	0.29	0.29	-0.09	
5,855.0	19.84	150.80	5,570.7	-1,543.6	811.7	1,130.8	0.94	0.51	-2.37	
5,945.0	19.76	151.64	5,655.4	-1,570.3	826.4	1,151.0	0.33	-0.09	0.93	
6,035.0	19.67	151.18	5,740.1	-1,597.0	840.9	1,171.0	0.20	-0.10	-0.51	
6,124.0	18.40	151.85	5,824.3	-1,622.5	854.8	1,190.2	1.45	-1.43	0.75	
6,214.0	17.13	156.40	5,910.0	-1,647.2	866.8	1,207.3	2.09	-1.41	5.06	
6,304.0	18.96	160.32	5,995.6	-1,673.1	877.0	1,223.0	2.44	2.03	4.36	
6,394.0	18.49	153.62	6,080.8	-1,699.6	888.3	1,239.8	2.44	-0.52	-7.44	
6,484.0	18.16	145.63	6,166.3	-1,724.0	902.5	1,259.0	2.81	-0.37	-8.88	
6,573.0	18.51	137.88	6,250.7	-1,745.9	919.8	1,280.7	2.77	0.39	-8.71	
6,663.0	26.79	125.80	6,333.8	-1,768.4	945.9	1,311.1	10.51	9.20	-13.42	
6,753.0	29.79	119.69	6,413.0	-1,791.4	981.8	1,351.2	4.63	3.33	-6.79	
6,843.0	35.40	114.44	6,488.8	-1,813.3	1,025.0	1,398.1	6.98	6.23	-5.83	
6,933.0	39.63	111.22	6,560.2	-1,834.5	1,075.5	1,452.1	5.18	4.70	-3.58	
7,023.0	44.57	104.95	6,627.0	-1,853.0	1,132.9	1,512.1	7.20	5.49	-6.97	
7,112.0	54.44	106.59	6,684.7	-1,871.5	1,197.9	1,579.6	11.18	11.09	1.84	
7,202.0	62.39	104.52	6,731.8	-1,891.9	1,271.7	1,656.1	9.05	8.83	-2.30	
7,292.0	68.30	103.28	6,769.4	-1,911.6	1,351.1	1,737.8	6.68	6.57	-1.38	
7,382.0	71.23	100.84	6,800.5	-1,929.2	1,433.6	1,822.2	4.13	3.26	-2.71	
7,471.0	82.19	95.62	6,820.9	-1,941.5	1,519.2	1,908.4	13.57	12.31	-5.87	
7,561.0	91.22	92.45	6,826.1	-1,947.8	1,608.7	1,997.1	10.63	10.03	-3.52	
7,606.0	91.30	91.45	6,825.1	-1,949.3	1,653.7	2,041.4	2.24	0.18	-2.23	
<b>28NA LP - 1953' FNL &amp; 1815' FEL</b>										
7,651.0	91.38	90.44	6,824.1	-1,950.0	1,698.7	2,085.4	2.24	0.18	-2.23	
7,741.0	89.71	88.12	6,823.2	-1,948.9	1,788.7	2,172.9	3.18	-1.86	-2.58	
7,830.0	88.93	87.57	6,824.3	-1,945.6	1,877.6	2,259.0	1.07	-0.88	-0.62	
7,920.0	89.87	87.94	6,825.2	-1,942.0	1,967.5	2,345.9	1.12	1.04	0.41	
8,010.0	91.45	88.41	6,824.2	-1,939.2	2,057.5	2,433.0	1.83	1.76	0.52	
8,099.0	92.15	88.61	6,821.4	-1,936.9	2,146.4	2,519.3	0.82	0.79	0.22	
8,189.0	91.79	88.74	6,818.3	-1,934.8	2,236.3	2,606.6	0.43	-0.40	0.14	
8,279.0	91.74	88.34	6,815.5	-1,932.5	2,326.2	2,693.8	0.45	-0.06	-0.44	
8,369.0	92.13	87.65	6,812.5	-1,929.3	2,416.1	2,780.8	0.88	0.43	-0.77	

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<b>Site:</b>	Broe Pad	<b>MD Reference:</b>	WELL @ 4769.0ft (Ensign 769 - RKB 28')
<b>Well:</b>	Broe 28NA	<b>North Reference:</b>	True
<b>Wellbore:</b>	Broe 28NA	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	Broe 28NA Final Surveys	<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)	
8,459.0	91.20	86.86	6,809.9	-1,925.0	2,506.0	2,867.5	1.36	-1.03	-0.88	
8,549.0	91.54	88.30	6,807.7	-1,921.2	2,595.9	2,954.4	1.64	0.38	1.60	
8,639.0	91.96	89.62	6,805.0	-1,919.6	2,685.8	3,041.8	1.54	0.47	1.47	
8,728.0	92.92	90.31	6,801.2	-1,919.5	2,774.7	3,128.5	1.33	1.08	0.78	
8,818.0	93.84	90.15	6,795.9	-1,919.9	2,864.6	3,216.2	1.04	1.02	-0.18	
8,908.0	91.18	90.90	6,791.9	-1,920.7	2,954.5	3,304.1	3.07	-2.96	0.83	
8,997.0	90.64	92.69	6,790.5	-1,923.5	3,043.4	3,391.5	2.10	-0.61	2.01	
9,087.0	90.04	92.10	6,790.0	-1,927.3	3,133.3	3,480.0	0.93	-0.67	-0.66	
9,177.0	91.79	91.22	6,788.5	-1,929.9	3,223.3	3,568.4	2.18	1.94	-0.98	
9,267.0	92.29	91.02	6,785.3	-1,931.6	3,313.2	3,656.5	0.60	0.56	-0.22	
9,357.0	91.73	92.91	6,782.2	-1,934.7	3,403.1	3,744.9	2.19	-0.62	2.10	
9,447.0	92.15	93.00	6,779.1	-1,939.4	3,492.9	3,833.5	0.48	0.47	0.10	
9,537.0	91.38	90.06	6,776.4	-1,941.8	3,582.8	3,921.8	3.38	-0.86	-3.27	
9,627.0	90.41	89.36	6,775.0	-1,941.3	3,672.8	4,009.4	1.33	-1.08	-0.78	
9,716.0	89.36	89.54	6,775.1	-1,940.5	3,761.8	4,096.1	1.20	-1.18	0.20	
9,806.0	89.20	89.91	6,776.3	-1,940.0	3,851.8	4,183.8	0.45	-0.18	0.41	
9,896.0	88.40	90.26	6,778.1	-1,940.2	3,941.8	4,271.6	0.97	-0.89	0.39	
9,986.0	90.52	89.56	6,779.0	-1,940.0	4,031.8	4,359.4	2.48	2.36	-0.78	
10,076.0	91.98	87.30	6,777.0	-1,937.5	4,121.7	4,446.6	2.99	1.62	-2.51	
10,165.0	91.76	86.58	6,774.1	-1,932.8	4,210.5	4,532.2	0.85	-0.25	-0.81	
10,255.0	91.57	86.87	6,771.5	-1,927.7	4,300.4	4,618.7	0.39	-0.21	0.32	
10,345.0	90.49	87.36	6,769.9	-1,923.1	4,390.2	4,705.4	1.32	-1.20	0.54	
10,435.0	89.90	86.48	6,769.6	-1,918.3	4,480.1	4,792.0	1.18	-0.66	-0.98	
10,525.0	90.07	88.02	6,769.6	-1,914.0	4,570.0	4,878.7	1.72	0.19	1.71	
10,615.0	89.17	87.43	6,770.2	-1,910.4	4,659.9	4,965.7	1.20	-1.00	-0.66	
10,705.0	89.30	87.36	6,771.4	-1,906.3	4,749.8	5,052.5	0.16	0.14	-0.08	
10,794.0	89.80	89.66	6,772.1	-1,904.0	4,838.8	5,138.8	2.64	0.56	2.58	
10,884.0	90.08	90.21	6,772.2	-1,903.9	4,928.8	5,226.5	0.69	0.31	0.61	
10,974.0	90.36	89.47	6,771.9	-1,903.6	5,018.8	5,314.3	0.88	0.31	-0.82	
11,064.0	90.38	89.25	6,771.3	-1,902.6	5,108.8	5,401.9	0.25	0.02	-0.24	
11,153.0	90.10	89.60	6,770.9	-1,901.7	5,197.8	5,488.5	0.50	-0.31	0.39	
11,243.0	90.63	89.12	6,770.3	-1,900.7	5,287.7	5,576.1	0.79	0.59	-0.53	
11,333.0	89.96	91.51	6,769.9	-1,901.2	5,377.7	5,664.0	2.76	-0.74	2.66	
11,423.0	89.80	90.91	6,770.1	-1,903.1	5,467.7	5,752.2	0.69	-0.18	-0.67	
11,513.0	88.31	90.34	6,771.5	-1,904.1	5,557.7	5,840.2	1.77	-1.66	-0.63	
11,602.0	88.97	91.52	6,773.7	-1,905.6	5,646.7	5,927.3	1.52	0.74	1.33	
11,692.0	89.85	91.99	6,774.6	-1,908.3	5,736.6	6,015.6	1.11	0.98	0.52	
11,782.0	90.20	91.20	6,774.5	-1,910.8	5,826.6	6,103.9	0.96	0.39	-0.88	
11,872.0	90.37	90.87	6,774.1	-1,912.5	5,916.6	6,192.1	0.41	0.19	-0.37	
11,962.0	90.12	91.03	6,773.7	-1,913.9	6,006.5	6,280.2	0.33	-0.28	0.18	
12,052.0	90.14	90.81	6,773.5	-1,915.4	6,096.5	6,368.3	0.25	0.02	-0.24	
12,141.0	89.78	90.72	6,773.6	-1,916.6	6,185.5	6,455.4	0.42	-0.40	-0.10	
12,231.0	89.56	90.37	6,774.1	-1,917.4	6,275.5	6,543.4	0.46	-0.24	-0.39	
12,321.0	89.56	89.99	6,774.8	-1,917.7	6,365.5	6,631.2	0.42	0.00	-0.42	

<b>Company:</b>	PDC Energy Inc. DJ Basin	<b>Local Co-ordinate Reference:</b>	Well Broe 28NA
<b>Project:</b>	Sec.35-T6N-R67W	<b>TVD Reference:</b>	WELL @ 4769.0ft (Ensign 769 - RKB 28')
<b>Site:</b>	Broe Pad	<b>MD Reference:</b>	WELL @ 4769.0ft (Ensign 769 - RKB 28')
<b>Well:</b>	Broe 28NA	<b>North Reference:</b>	True
<b>Wellbore:</b>	Broe 28NA	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	Broe 28NA Final Surveys	<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)
12,411.0	89.79	90.29	6,775.3	-1,917.9	6,455.5	6,719.1	0.42	0.26	0.33
12,501.0	90.05	90.17	6,775.4	-1,918.3	6,545.5	6,807.0	0.32	0.29	-0.13
12,591.0	90.11	91.06	6,775.3	-1,919.3	6,635.5	6,895.0	0.99	0.07	0.99
12,680.0	90.74	91.20	6,774.6	-1,921.0	6,724.5	6,982.2	0.73	0.71	0.16
12,770.0	90.89	89.96	6,773.3	-1,921.9	6,814.5	7,070.2	1.39	0.17	-1.38
12,860.0	90.85	89.95	6,772.0	-1,921.9	6,904.5	7,158.0	0.05	-0.04	-0.01
12,950.0	89.55	90.60	6,771.7	-1,922.3	6,994.5	7,245.8	1.61	-1.44	0.72
13,040.0	89.18	91.44	6,772.7	-1,923.9	7,084.4	7,334.0	1.02	-0.41	0.93
13,130.0	88.93	91.06	6,774.1	-1,925.9	7,174.4	7,422.2	0.51	-0.28	-0.42
13,219.0	88.94	90.59	6,775.8	-1,927.1	7,263.4	7,509.3	0.53	0.01	-0.53
13,309.0	90.64	90.29	6,776.1	-1,927.8	7,353.4	7,597.2	1.92	1.89	-0.33
13,399.0	91.85	89.63	6,774.2	-1,927.8	7,443.3	7,685.0	1.53	1.34	-0.73
13,489.0	91.78	91.87	6,771.3	-1,928.9	7,533.3	7,773.0	2.49	-0.08	2.49
13,579.0	89.76	91.63	6,770.1	-1,931.7	7,623.2	7,861.3	2.26	-2.24	-0.27
13,669.0	90.03	91.85	6,770.3	-1,934.4	7,713.2	7,949.7	0.39	0.30	0.24
13,759.0	89.64	91.00	6,770.5	-1,936.7	7,803.2	8,038.0	1.04	-0.43	-0.94
13,848.0	89.69	91.18	6,771.1	-1,938.4	7,892.1	8,125.2	0.21	0.06	0.20
13,938.0	89.32	90.49	6,771.8	-1,939.7	7,982.1	8,213.2	0.87	-0.41	-0.77
14,028.0	89.49	90.26	6,772.8	-1,940.3	8,072.1	8,301.2	0.32	0.19	-0.26
14,117.0	89.58	89.34	6,773.5	-1,939.9	8,161.1	8,387.9	1.04	0.10	-1.03
14,207.0	89.52	89.32	6,774.2	-1,938.9	8,251.1	8,475.5	0.07	-0.07	-0.02
14,297.0	89.81	88.64	6,774.7	-1,937.3	8,341.1	8,562.9	0.82	0.32	-0.76
14,387.0	89.48	88.38	6,775.3	-1,935.0	8,431.1	8,650.2	0.47	-0.37	-0.29
14,469.0	89.32	87.86	6,776.1	-1,932.3	8,513.0	8,729.5	0.66	-0.20	-0.63
14,531.0	89.32	87.86	6,776.9	-1,929.9	8,575.0	8,789.5	0.00	0.00	0.00
<b>28NA BHL - 1941' FNL &amp; 155' FEL</b>									

Design Annotations				
Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment
		+N/-S (ft)	+E/-W (ft)	
7,606.0	6,825.1	-1,949.3	1,653.7	28NA LP - 1953' FNL & 1815' FEL
14,531.0	6,776.9	-1,929.9	8,575.0	28NA BHL - 1941' FNL & 155' FEL

Checked By: \_\_\_\_\_ Approved By: \_\_\_\_\_ Date: \_\_\_\_\_