

# PDC Energy Inc. DJ Basin

Well Name: **Erwin 1N (Nio C)**

Surface Location: Erwin 5N64W27 1-6 Pad Sec.27-T5N-R64W

North American Datum 1983 , US State Plane 1983, Colorado Northern Zone

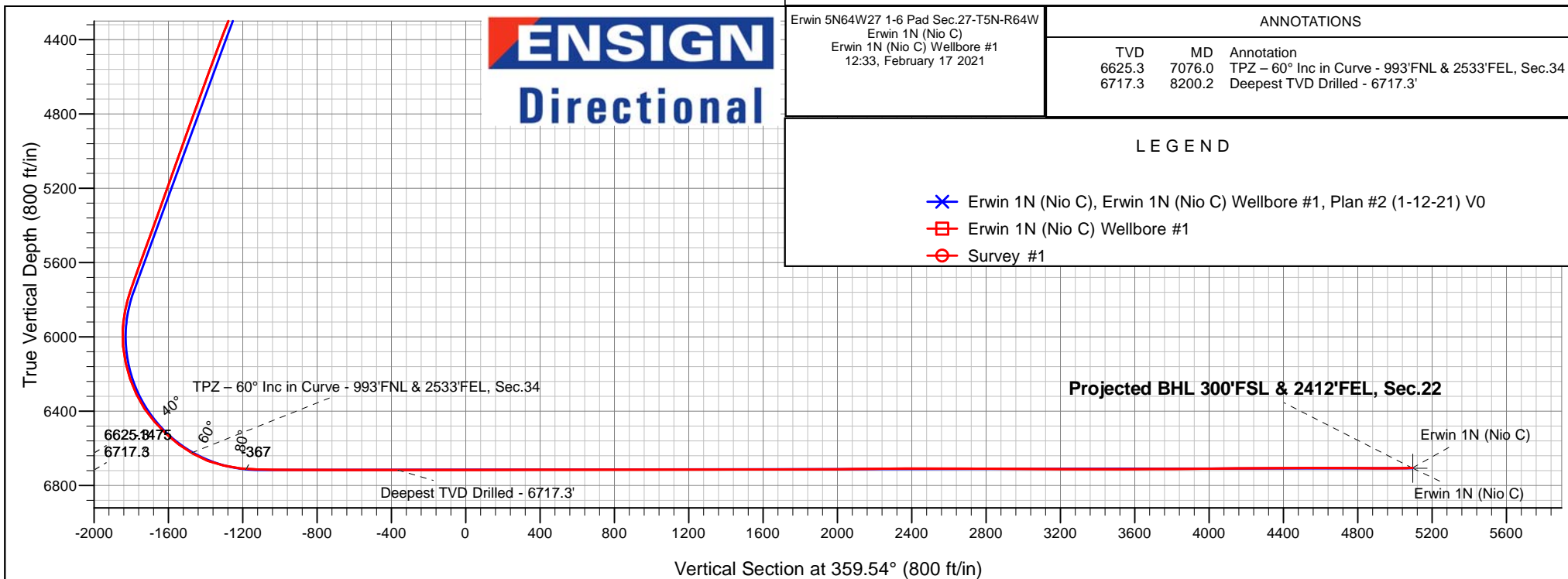
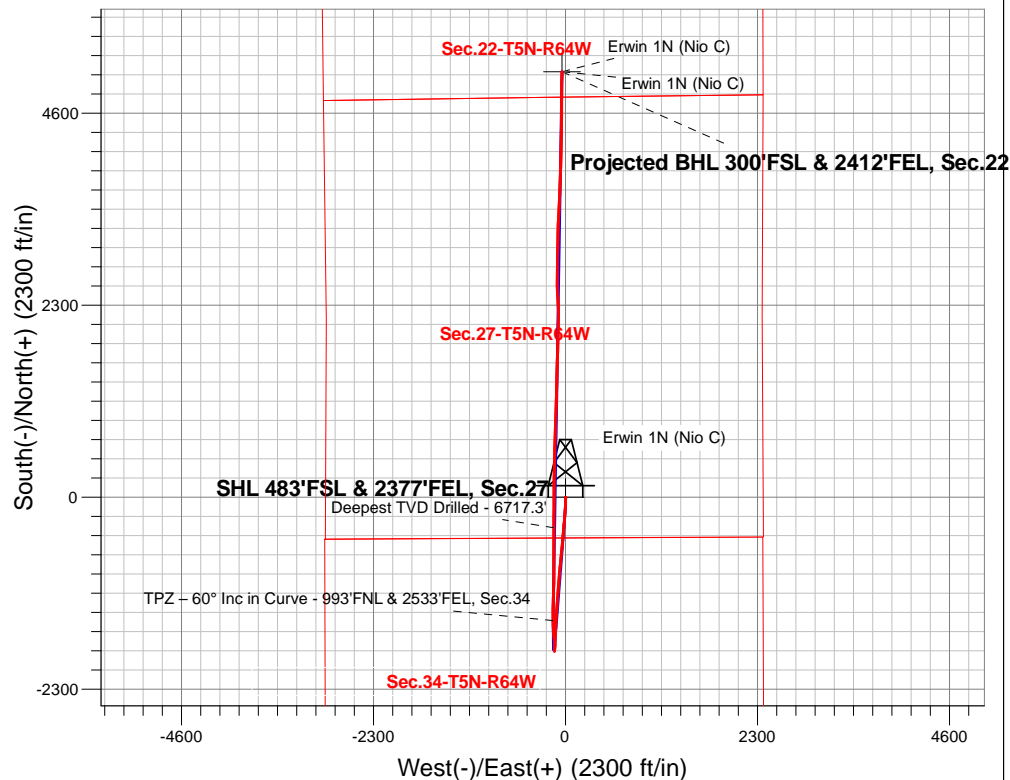
Ground Elevation: 4639.0

+N/-S	+E/-W	Northing	Easting	Latitude	Longitude	Slot
0.0	0.0	1377056.40	3268929.60	40.364404	-104.534888	

Ensign 142 RKB - 28' WELL @ 4667.0ft (Ensign 142 RKB - 28')

## FINAL SURVEY

**Projected Bottom Hole Location**  
**13,665'MD 6706'TVD 5095'N & 39'W of SHL**  
**90.42 degree Inc @ 2.13 degree Azm**



**ENSIGN**  
**Directional**

Erwin 5N64W27 1-6 Pad Sec.27-T5N-R64W  
 Erwin 1N (Nio C)  
 Erwin 1N (Nio C) Wellbore #1  
 12:33, February 17 2021

### ANNOTATIONS

TVD	MD	Annotation
6625.3	7076.0	TPZ - 60° Inc in Curve - 993'FNL & 2533'FEL, Sec.34
6717.3	8200.2	Deepest TVD Drilled - 6717.3'

### LEGEND

- ✕ Erwin 1N (Nio C), Erwin 1N (Nio C) Wellbore #1, Plan #2 (1-12-21) V0
- Erwin 1N (Nio C) Wellbore #1
- Survey #1



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

**SEC.27-T5N-R64W**

**Erwin 5N64W27 1-6 Pad Sec.27-T5N-R64W**

**Erwin 1N (Nio C)**

**Erwin 1N (Nio C) Wellbore #1**

**Survey: Survey #1**

## **Standard Survey Report**

**17 February, 2021**

<b>Company:</b>	PDC Energy Inc. DJ Basin	<b>Local Co-ordinate Reference:</b>	Well Erwin 1N (Nio C)
<b>Project:</b>	SEC.27-T5N-R64W	<b>TVD Reference:</b>	WELL @ 4667.0ft (Ensign 142 RKB - 28')
<b>Site:</b>	Erwin 5N64W27 1-6 Pad Sec.27-T5N-R64W	<b>MD Reference:</b>	WELL @ 4667.0ft (Ensign 142 RKB - 28')
<b>Well:</b>	Erwin 1N (Nio C)	<b>North Reference:</b>	True
<b>Wellbore:</b>	Erwin 1N (Nio C) Wellbore #1	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	Erwin 1N (Nio C) Wellbore #1	<b>Database:</b>	US_EDM

<b>Project</b>	SEC.27-T5N-R64W, Weld County, Colorado		
<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	Erwin 5N64W27 1-6 Pad Sec.27-T5N-R64W				
Site Position:		Northing:	1,377,056.42 usft	Latitude:	40.364404
From:	Lat/Long	Easting:	3,268,929.60 usft	Longitude:	-104.534888
Position Uncertainty:	0.0 ft	Slot Radius:	13-3/16 "	Grid Convergence:	0.62 °

Well	Erwin 1N (Nio C)					
Well Position	+N/-S	0.0 ft	Northing:	1,377,056.41 usft	Latitude:	40.364404
	+E/-W	0.0 ft	Easting:	3,268,929.60 usft	Longitude:	-104.534888
Position Uncertainty		0.0 ft	Wellhead Elevation:	0.0 ft	Ground Level:	4,639.0 ft

<b>Wellbore</b>	Erwin 1N (Nio C) 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	01/12/2021	7.77	66.77	51,982

<b>Design</b>	Erwin 1N (Nio C) Wellbore #1				
<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	359.54	

<b>Survey Program</b>	<b>Date</b>	02/17/2021			
<b>From (ft)</b>	<b>To (ft)</b>	<b>Survey (Wellbore)</b>	<b>Tool Name</b>	<b>Description</b>	
71.0	13,665.0	Survey #1 (Erwin 1N (Nio C) Wellbore #1)	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	
71.0	0.60	134.00	71.0	-0.3	0.3	-0.3	0.85	0.85	0.00	
162.0	0.70	126.20	162.0	-0.9	1.1	-0.9	0.15	0.11	-8.57	
253.0	1.40	165.40	253.0	-2.3	1.8	-2.3	1.06	0.77	43.08	
343.0	2.50	174.60	342.9	-5.3	2.2	-5.4	1.27	1.22	10.22	
463.0	4.30	183.20	462.7	-12.4	2.2	-12.5	1.55	1.50	7.17	
553.0	5.70	184.80	552.4	-20.3	1.7	-20.3	1.56	1.56	1.78	
642.0	8.00	183.40	640.7	-30.8	0.9	-30.9	2.59	2.58	-1.57	
731.0	8.80	179.80	728.8	-43.8	0.6	-43.8	1.08	0.90	-4.04	
820.0	9.80	180.00	816.6	-58.2	0.6	-58.2	1.12	1.12	0.22	

<b>Company:</b>	PDC Energy Inc. DJ Basin	<b>Local Co-ordinate Reference:</b>	Well Erwin 1N (Nio C)
<b>Project:</b>	SEC.27-T5N-R64W	<b>TVD Reference:</b>	WELL @ 4667.0ft (Ensign 142 RKB - 28')
<b>Site:</b>	Erwin 5N64W27 1-6 Pad Sec.27-T5N-R64W	<b>MD Reference:</b>	WELL @ 4667.0ft (Ensign 142 RKB - 28')
<b>Well:</b>	Erwin 1N (Nio C)	<b>North Reference:</b>	True
<b>Wellbore:</b>	Erwin 1N (Nio C) Wellbore #1	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	Erwin 1N (Nio C) 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)
909.0	10.40	177.90	904.2	-73.8	0.9	-73.8	0.79	0.67	-2.36
998.0	11.00	179.00	991.7	-90.3	1.4	-90.3	0.71	0.67	1.24
1,088.0	12.00	179.10	1,079.9	-108.3	1.7	-108.3	1.11	1.11	0.11
1,177.0	13.40	184.60	1,166.7	-127.8	1.0	-127.8	2.08	1.57	6.18
1,263.0	14.70	186.20	1,250.1	-148.6	-1.0	-148.6	1.58	1.51	1.86
1,352.0	16.90	185.30	1,335.7	-172.7	-3.4	-172.7	2.49	2.47	-1.01
1,442.0	18.90	185.30	1,421.4	-200.2	-6.0	-200.2	2.22	2.22	0.00
1,530.0	19.20	184.10	1,504.6	-228.9	-8.3	-228.8	0.56	0.34	-1.36
1,619.0	20.80	183.70	1,588.2	-259.2	-10.4	-259.1	1.80	1.80	-0.45
1,644.0	21.30	184.90	1,611.5	-268.2	-11.1	-268.1	2.64	2.00	4.80
1,743.0	20.21	183.60	1,704.1	-303.2	-13.7	-303.1	1.20	-1.10	-1.31
1,791.0	20.25	183.73	1,749.1	-319.7	-14.7	-319.6	0.13	0.08	0.27
1,881.0	20.24	184.98	1,833.6	-350.8	-17.1	-350.6	0.48	-0.01	1.39
1,970.0	20.20	185.62	1,917.1	-381.4	-19.9	-381.3	0.25	-0.04	0.72
2,060.0	20.32	186.06	2,001.5	-412.4	-23.1	-412.2	0.22	0.13	0.49
2,150.0	20.16	185.96	2,086.0	-443.4	-26.4	-443.2	0.18	-0.18	-0.11
2,240.0	20.22	185.70	2,170.4	-474.3	-29.5	-474.0	0.12	0.07	-0.29
2,330.0	18.60	184.86	2,255.3	-504.1	-32.3	-503.8	1.83	-1.80	-0.93
2,420.0	19.72	184.88	2,340.3	-533.5	-34.8	-533.2	1.24	1.24	0.02
2,510.0	20.23	185.22	2,424.9	-564.1	-37.5	-563.8	0.58	0.57	0.38
2,599.0	20.37	185.10	2,508.4	-594.9	-40.3	-594.5	0.16	0.16	-0.13
2,689.0	21.21	185.62	2,592.5	-626.7	-43.3	-626.3	0.96	0.93	0.58
2,779.0	20.50	185.67	2,676.6	-658.6	-46.4	-658.2	0.79	-0.79	0.06
2,869.0	21.04	185.51	2,760.8	-690.3	-49.5	-689.9	0.60	0.60	-0.18
2,959.0	21.34	185.99	2,844.7	-722.7	-52.8	-722.3	0.39	0.33	0.53
3,048.0	21.18	185.90	2,927.6	-754.8	-56.1	-754.3	0.18	-0.18	-0.10
3,138.0	20.39	185.18	3,011.8	-786.6	-59.2	-786.1	0.92	-0.88	-0.80
3,227.0	21.05	185.89	3,095.0	-817.9	-62.3	-817.4	0.79	0.74	0.80
3,317.0	20.94	185.43	3,179.1	-850.0	-65.4	-849.5	0.22	-0.12	-0.51
3,407.0	20.87	184.20	3,263.1	-882.0	-68.1	-881.4	0.49	-0.08	-1.37
3,496.0	20.77	184.48	3,346.3	-913.6	-70.5	-913.0	0.16	-0.11	0.31
3,586.0	20.92	184.75	3,430.4	-945.5	-73.1	-944.9	0.20	0.17	0.30
3,675.0	20.97	185.24	3,513.5	-977.2	-75.9	-976.5	0.20	0.06	0.55
3,764.0	21.41	185.71	3,596.5	-1,009.2	-78.9	-1,008.5	0.53	0.49	0.53
3,853.0	21.16	185.08	3,679.5	-1,041.4	-82.0	-1,040.7	0.38	-0.28	-0.71
3,944.0	20.95	184.88	3,764.4	-1,073.9	-84.8	-1,073.2	0.24	-0.23	-0.22
4,033.0	21.01	184.68	3,847.5	-1,105.7	-87.5	-1,104.9	0.10	0.07	-0.22
4,123.0	20.92	183.32	3,931.5	-1,137.8	-89.7	-1,137.0	0.55	-0.10	-1.51
4,212.0	21.21	183.99	4,014.6	-1,169.7	-91.8	-1,169.0	0.42	0.33	0.75
4,302.0	20.94	183.98	4,098.6	-1,202.0	-94.0	-1,201.2	0.30	-0.30	-0.01
4,392.0	20.97	184.33	4,182.6	-1,234.1	-96.3	-1,233.3	0.14	0.03	0.39
4,482.0	20.82	185.19	4,266.7	-1,266.1	-99.0	-1,265.3	0.38	-0.17	0.96
4,571.0	21.12	183.67	4,349.8	-1,297.9	-101.5	-1,297.0	0.70	0.34	-1.71
4,661.0	20.80	182.92	4,433.8	-1,330.0	-103.3	-1,329.1	0.46	-0.36	-0.83

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<b>Site:</b>	Erwin 5N64W27 1-6 Pad Sec.27-T5N-R64W	<b>MD Reference:</b>	WELL @ 4667.0ft (Ensign 142 RKB - 28')
<b>Well:</b>	Erwin 1N (Nio C)	<b>North Reference:</b>	True
<b>Wellbore:</b>	Erwin 1N (Nio C) Wellbore #1	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	Erwin 1N (Nio C) 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)
4,750.0	20.37	184.01	4,517.2	-1,361.2	-105.2	-1,360.3	0.65	-0.48	1.22
4,841.0	20.26	183.52	4,602.5	-1,392.8	-107.3	-1,391.9	0.22	-0.12	-0.54
4,931.0	19.60	182.41	4,687.1	-1,423.4	-108.9	-1,422.5	0.85	-0.73	-1.23
5,021.0	19.97	182.60	4,771.8	-1,453.8	-110.2	-1,452.9	0.42	0.41	0.21
5,110.0	19.74	184.94	4,855.5	-1,484.0	-112.2	-1,483.0	0.93	-0.26	2.63
5,200.0	20.35	184.78	4,940.0	-1,514.7	-114.8	-1,513.8	0.68	0.68	-0.18
5,289.0	18.69	182.57	5,023.9	-1,544.4	-116.7	-1,543.4	2.04	-1.87	-2.48
5,379.0	20.05	182.73	5,108.8	-1,574.2	-118.1	-1,573.2	1.51	1.51	0.18
5,469.0	19.47	182.44	5,193.5	-1,604.6	-119.5	-1,603.6	0.65	-0.64	-0.32
5,559.0	20.06	183.89	5,278.2	-1,635.0	-121.2	-1,634.0	0.85	0.66	1.61
5,648.0	19.68	181.82	5,361.9	-1,665.2	-122.7	-1,664.2	0.90	-0.43	-2.33
5,738.0	19.92	182.93	5,446.6	-1,695.7	-123.9	-1,694.6	0.50	0.27	1.23
5,828.0	19.99	181.88	5,531.2	-1,726.3	-125.2	-1,725.3	0.41	0.08	-1.17
5,917.0	19.76	181.01	5,614.9	-1,756.6	-126.0	-1,755.5	0.42	-0.26	-0.98
6,007.0	19.85	183.01	5,699.6	-1,787.1	-127.1	-1,786.0	0.76	0.10	2.22
6,097.0	16.83	183.30	5,785.0	-1,815.3	-128.6	-1,814.2	3.36	-3.36	0.32
6,186.0	9.86	183.33	5,871.6	-1,835.8	-129.8	-1,834.7	7.83	-7.83	0.03
6,276.0	3.49	183.01	5,960.9	-1,846.3	-130.4	-1,845.2	7.08	-7.08	-0.36
6,366.0	5.44	349.23	6,050.8	-1,844.8	-131.3	-1,843.7	9.85	2.17	184.69
6,456.0	11.86	358.66	6,139.7	-1,831.4	-132.4	-1,830.2	7.28	7.13	10.48
6,545.0	19.09	9.40	6,225.5	-1,807.8	-130.2	-1,806.7	8.71	8.12	12.07
6,635.0	25.63	1.11	6,308.7	-1,773.8	-127.4	-1,772.7	8.05	7.27	-9.21
6,725.0	33.71	354.71	6,386.8	-1,729.4	-129.3	-1,728.3	9.63	8.98	-7.11
6,814.0	41.02	354.19	6,457.5	-1,675.7	-134.6	-1,674.5	8.22	8.21	-0.58
6,904.0	47.11	353.49	6,522.1	-1,613.5	-141.3	-1,612.3	6.79	6.77	-0.78
6,994.0	52.87	356.24	6,580.0	-1,544.8	-147.4	-1,543.6	6.81	6.40	3.06
7,076.0	60.00	0.02	6,625.3	-1,476.6	-149.5	-1,475.4	9.50	8.69	4.61
TPZ – 60° Inc in Curve - 993'FNL & 2533'FEL, Sec.34									
7,083.0	60.61	0.32	6,628.8	-1,470.5	-149.5	-1,469.3	9.50	8.76	4.23
7,173.0	68.80	1.41	6,667.2	-1,389.2	-148.3	-1,388.0	9.17	9.10	1.21
7,262.0	76.96	1.16	6,693.4	-1,304.3	-146.4	-1,303.1	9.17	9.17	-0.28
7,352.0	83.98	1.31	6,708.3	-1,215.6	-144.5	-1,214.4	7.80	7.80	0.17
7,441.0	89.10	2.50	6,713.6	-1,126.8	-141.5	-1,125.7	5.91	5.75	1.34
7,531.0	88.87	0.32	6,715.2	-1,036.9	-139.3	-1,035.7	2.44	-0.26	-2.42
7,620.0	89.88	0.01	6,716.2	-947.9	-139.0	-946.7	1.19	1.13	-0.35
7,710.0	89.82	359.77	6,716.4	-857.9	-139.2	-856.7	0.27	-0.07	-0.27
7,799.0	90.00	359.73	6,716.6	-768.9	-139.6	-767.7	0.21	0.20	-0.04
7,889.0	89.80	359.76	6,716.7	-678.9	-140.0	-677.7	0.22	-0.22	0.03
7,978.0	90.03	359.75	6,716.9	-589.9	-140.4	-588.7	0.26	0.26	-0.01
8,068.0	89.88	0.26	6,716.9	-499.9	-140.4	-498.8	0.59	-0.17	0.57
8,158.0	89.76	359.63	6,717.2	-409.9	-140.4	-408.8	0.71	-0.13	-0.70
8,200.2	89.90	0.05	6,717.3	-367.7	-140.6	-366.6	1.05	0.33	1.00
Deepest TVD Drilled - 6717.3'									

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<b>Well:</b>	Erwin 1N (Nio C)	<b>North Reference:</b>	True
<b>Wellbore:</b>	Erwin 1N (Nio C) Wellbore #1	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	Erwin 1N (Nio C) 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)
8,248.0	90.06	0.53	6,717.4	-319.9	-140.3	-318.8	1.05	0.33	1.00
8,338.0	90.17	0.87	6,717.2	-229.9	-139.2	-228.8	0.40	0.12	0.38
8,428.0	90.32	0.94	6,716.8	-139.9	-137.8	-138.8	0.18	0.17	0.08
8,518.0	90.02	0.62	6,716.5	-49.9	-136.6	-48.8	0.49	-0.33	-0.36
8,608.0	90.05	0.59	6,716.5	40.1	-135.6	41.2	0.05	0.03	-0.03
8,698.0	90.04	0.61	6,716.4	130.1	-134.7	131.1	0.02	-0.01	0.02
8,788.0	90.11	0.28	6,716.3	220.1	-134.0	221.1	0.37	0.08	-0.37
8,877.0	90.14	0.45	6,716.1	309.1	-133.4	310.1	0.19	0.03	0.19
8,966.0	90.18	1.42	6,715.8	398.0	-132.0	399.1	1.09	0.04	1.09
9,056.0	90.11	1.27	6,715.6	488.0	-129.9	489.0	0.18	-0.08	-0.17
9,145.0	90.04	1.72	6,715.5	577.0	-127.5	578.0	0.51	-0.08	0.51
9,235.0	90.04	1.22	6,715.4	667.0	-125.2	667.9	0.56	0.00	-0.56
9,325.0	90.09	1.85	6,715.3	756.9	-122.8	757.9	0.70	0.06	0.70
9,415.0	90.04	1.62	6,715.2	846.9	-120.1	847.8	0.26	-0.06	-0.26
9,504.0	90.14	1.83	6,715.1	935.8	-117.4	936.8	0.26	0.11	0.24
9,594.0	90.05	1.63	6,714.9	1,025.8	-114.7	1,026.7	0.24	-0.10	-0.22
9,684.0	90.22	2.68	6,714.7	1,115.7	-111.3	1,116.6	1.18	0.19	1.17
9,773.0	90.04	1.80	6,714.5	1,204.7	-107.8	1,205.5	1.01	-0.20	-0.99
9,862.0	90.02	1.77	6,714.5	1,293.6	-105.1	1,294.4	0.04	-0.02	-0.03
9,952.0	89.94	1.48	6,714.5	1,383.6	-102.5	1,384.4	0.33	-0.09	-0.32
10,042.0	90.35	1.95	6,714.3	1,473.6	-99.8	1,474.3	0.69	0.46	0.52
10,131.0	89.96	1.59	6,714.0	1,562.5	-97.1	1,563.2	0.60	-0.44	-0.40
10,221.0	90.01	1.09	6,714.1	1,652.5	-95.0	1,653.2	0.56	0.06	-0.56
10,311.0	89.89	1.62	6,714.2	1,742.5	-92.8	1,743.1	0.60	-0.13	0.59
10,401.0	90.22	1.61	6,714.1	1,832.4	-90.3	1,833.1	0.37	0.37	-0.01
10,491.0	90.11	1.23	6,713.8	1,922.4	-88.1	1,923.0	0.44	-0.12	-0.42
10,581.0	91.01	1.87	6,712.9	2,012.4	-85.6	2,013.0	1.23	1.00	0.71
10,670.0	90.55	1.19	6,711.7	2,101.3	-83.2	2,101.9	0.92	-0.52	-0.76
10,760.0	90.61	359.42	6,710.8	2,191.3	-82.8	2,191.9	1.97	0.07	-1.97
10,850.0	90.53	357.82	6,709.9	2,281.3	-84.9	2,281.9	1.78	-0.09	-1.78
10,939.0	90.17	356.51	6,709.4	2,370.2	-89.3	2,370.8	1.53	-0.40	-1.47
11,029.0	90.08	356.60	6,709.2	2,460.0	-94.7	2,460.7	0.14	-0.10	0.10
11,118.0	90.02	359.64	6,709.1	2,548.9	-97.7	2,549.6	3.42	-0.07	3.42
11,208.0	89.70	1.58	6,709.3	2,638.9	-96.7	2,639.6	2.18	-0.36	2.16
11,298.0	89.82	0.09	6,709.7	2,728.9	-95.4	2,729.6	1.66	0.13	-1.66
11,387.0	89.59	0.66	6,710.1	2,817.9	-94.8	2,818.6	0.69	-0.26	0.64
11,476.0	89.38	1.14	6,710.9	2,906.9	-93.4	2,907.6	0.59	-0.24	0.54
11,566.0	89.68	0.65	6,711.7	2,996.9	-92.0	2,997.5	0.64	0.33	-0.54
11,656.0	89.79	1.42	6,712.1	3,086.9	-90.4	3,087.5	0.86	0.12	0.86
11,745.0	89.39	0.50	6,712.7	3,175.9	-88.9	3,176.5	1.13	-0.45	-1.03
11,835.0	90.07	1.66	6,713.2	3,265.8	-87.2	3,266.4	1.49	0.76	1.29
11,925.0	90.30	3.50	6,712.9	3,355.7	-83.1	3,356.3	2.06	0.26	2.04
12,014.0	90.22	3.18	6,712.5	3,444.6	-78.0	3,445.1	0.37	-0.09	-0.36
12,104.0	90.28	4.09	6,712.1	3,534.4	-72.3	3,534.9	1.01	0.07	1.01

<b>Company:</b>	PDC Energy Inc. DJ Basin	<b>Local Co-ordinate Reference:</b>	Well Erwin 1N (Nio C)
<b>Project:</b>	SEC.27-T5N-R64W	<b>TVD Reference:</b>	WELL @ 4667.0ft (Ensign 142 RKB - 28')
<b>Site:</b>	Erwin 5N64W27 1-6 Pad Sec.27-T5N-R64W	<b>MD Reference:</b>	WELL @ 4667.0ft (Ensign 142 RKB - 28')
<b>Well:</b>	Erwin 1N (Nio C)	<b>North Reference:</b>	True
<b>Wellbore:</b>	Erwin 1N (Nio C) Wellbore #1	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	Erwin 1N (Nio C) 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)	
12,194.0	89.86	1.37	6,712.0	3,624.3	-68.0	3,624.7	3.06	-0.47	-3.02	
12,283.0	90.23	2.12	6,711.9	3,713.2	-65.3	3,713.7	0.94	0.42	0.84	
12,374.0	90.38	1.86	6,711.4	3,804.2	-62.1	3,804.6	0.33	0.16	-0.29	
12,464.0	90.44	1.46	6,710.8	3,894.2	-59.5	3,894.5	0.45	0.07	-0.44	
12,554.0	90.47	2.41	6,710.1	3,984.1	-56.5	3,984.4	1.06	0.03	1.06	
12,643.0	90.44	1.81	6,709.3	4,073.0	-53.2	4,073.3	0.67	-0.03	-0.67	
12,733.0	90.57	0.35	6,708.6	4,163.0	-51.5	4,163.3	1.63	0.14	-1.62	
12,823.0	90.34	1.90	6,707.8	4,253.0	-49.7	4,253.3	1.74	-0.26	1.72	
12,913.0	90.46	0.19	6,707.2	4,343.0	-48.1	4,343.2	1.90	0.13	-1.90	
13,003.0	90.70	2.44	6,706.3	4,432.9	-46.0	4,433.2	2.51	0.27	2.50	
13,093.0	89.36	357.97	6,706.2	4,522.9	-45.7	4,523.1	5.18	-1.49	-4.97	
13,182.0	90.14	0.17	6,706.6	4,611.9	-47.1	4,612.1	2.62	0.88	2.47	
13,272.0	89.91	358.70	6,706.6	4,701.9	-48.0	4,702.1	1.65	-0.26	-1.63	
13,362.0	90.26	2.50	6,706.5	4,791.9	-47.1	4,792.1	4.24	0.39	4.22	
13,452.0	88.68	358.71	6,707.3	4,881.8	-46.1	4,882.0	4.56	-1.76	-4.21	
13,542.0	90.90	3.51	6,707.6	4,971.8	-44.4	4,972.0	5.88	2.47	5.33	
13,632.0	90.42	2.13	6,706.6	5,061.7	-40.0	5,061.8	1.62	-0.53	-1.53	
13,665.0	90.42	2.13	6,706.3	5,094.6	-38.7	5,094.8	0.00	0.00	0.00	

Design Targets										
Target Name	Dip Angle (°)	Dip Dir. (°)	TVD (ft)	+N/-S (ft)	+E/-W (ft)	Northing (usft)	Easting (usft)	Latitude		Longitude
SHL 483'FSL & 2377'FE - hit/miss target - Shape - Point	0.00	0.00	1.0	0.0	0.0	1,377,056.42	3,268,929.60	40.364404		-104.534888
BHL 302'FSL & 2414'FE - survey misses target center by 2.9ft at 13665.0ft MD (6706.3 TVD, 5094.6 N, -38.7 E) - Point	0.00	0.00	6,707.7	5,096.1	-40.8	1,382,151.50	3,268,833.33	40.378392		-104.535034

Survey Annotations					
Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment	
7,076.0	6,625.3	+N/-S (ft)	+E/-W (ft)	TPZ - 60° Inc in Curve - 993'FNL & 2533'FEL, Sec.34 Deepest TVD Drilled - 6717.3'	
8,200.2	6,717.3	-1,476.6	-149.5		
		-367.7	-140.6		

Checked By: _____	Approved By: _____	Date: _____
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