



Well Name: Erwin 3N  
 Surface Location: Erwin 5N64W27 PAD  
 North American Datum 1983  
 US State Plane 1983, Colorado Northern Zone  
 Ground Elevation: 4684.0  
 WELL @ 4707.0usft (Original Well Elev)

+N/-S    +E/-W    Northing    Easting    Latitude    Longitude    Slot  
 0.0    0.0    1377056.88    3268959.60    40° 21' 51.856 N    104° 32' 5.208 W

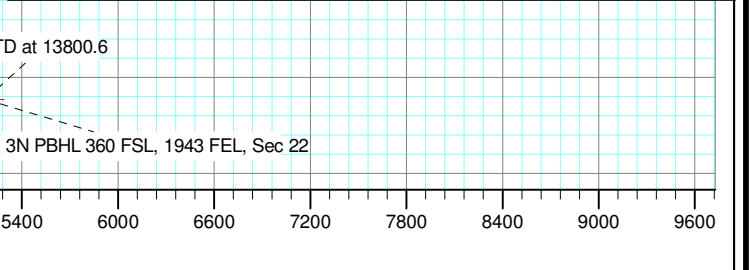
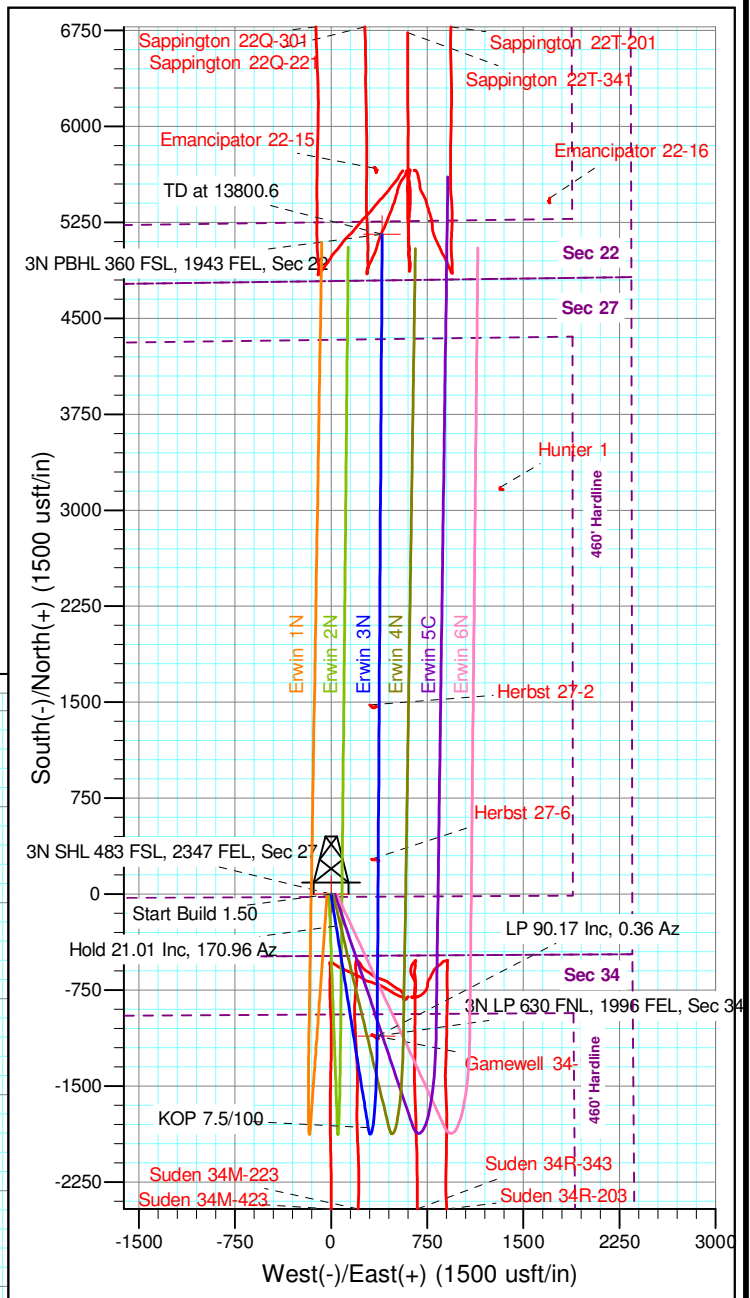
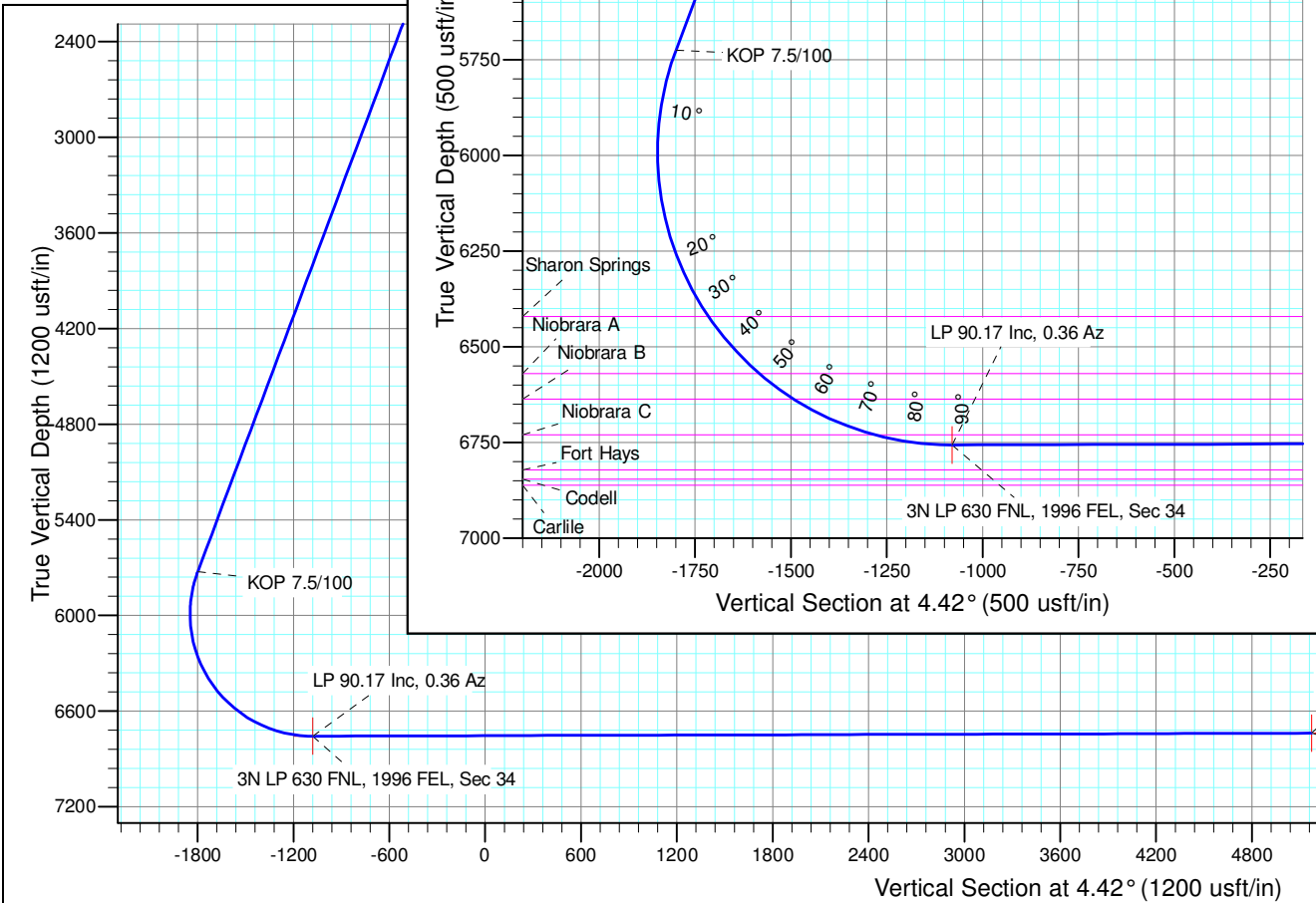
SECTION DETAILS

Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	VSec	Target
1	0.0	0.00	0.00	0.0	0.0	0.0	0.00	0.00	0.0	
2	200.0	0.00	0.00	200.0	0.0	0.0	0.00	0.00	0.0	
3	1600.9	21.01	170.96	1569.7	-250.9	39.9	1.50	170.96	-247.0	
4	6052.0	21.01	170.96	5724.8	-1827.2	290.6	0.00	0.00	-1799.3	
5	7530.6	90.17	0.36	6757.0	-1110.8	360.0	7.50	-169.94	-1079.7	
6	13800.6	90.17	0.36	6738.3	5159.1	399.0	0.00	0.00	5174.5	

Azimuths to True North  
 Magnetic North: 8.09°

Magnetic Field  
 Strength: 52398.6snT  
 Dip Angle: 66.86°  
 Date: 06/18/2017  
 Model: IGRF2015

Project: SEC. 27-T5N-R64W  
 Site: Erwin 5N64W27 PAD  
 Well: Erwin 3N  
 Wellbore: Wellbore #1  
 Design: Plan #2 19Jul17 kjs





# **PDC Energy Inc. DJ Basin**

**SEC. 27-T5N-R64W**

**Erwin 5N64W27 PAD**

**Erwin 3N**

**Wellbore #1**

**Plan #2 19Jul17 kjs**

## **Anticollision Report**

**19 July, 2017**

<b>Company:</b>	PDC Energy Inc. DJ Basin	<b>Local Co-ordinate Reference:</b>	Well Erwin 3N
<b>Project:</b>	SEC. 27-T5N-R64W	<b>TVD Reference:</b>	WELL @ 4707.0usft (Original Well Elev)
<b>Reference Site:</b>	Erwin 5N64W27 PAD	<b>MD Reference:</b>	WELL @ 4707.0usft (Original Well Elev)
<b>Site Error:</b>	0.0 usft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Erwin 3N	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.0 usft	<b>Output errors are at</b>	2.45 sigma
<b>Reference Wellbore</b>	Wellbore #1	<b>Database:</b>	EDM 5000.1 Single User Db
<b>Reference Design:</b>	Plan #2 19Jul17 kjs	<b>Offset TVD Reference:</b>	Offset Datum

<b>Reference</b>	Plan #2 19Jul17 kjs		
<b>Filter type:</b>	NO GLOBAL FILTER: Using user defined selection & filtering criteria		
<b>Interpolation Method:</b>	MD Interval 100.0usft	<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 1,682.5 usft	<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>	07/19/17		
<b>From (usft)</b>	<b>To (usft)</b>	<b>Survey (Wellbore)</b>	<b>Tool Name</b>	<b>Description</b>
0.0	13,800.6	Plan #2 19Jul17 kjs (Wellbore #1)	MWD	MWD - Standard

Summary						
Site Name	Reference	Offset	Distance		Separation Factor	Warning
	Measured Depth (usft)	Measured Depth (usft)	Between Centres (usft)	Between Ellipses (usft)		
<b>Offset Well - Wellbore - Design</b>						
Erwin 5N64W27 PAD						
Erwin 1N - Wellbore #1 - Plan #2 19Jul17 kjs	200.0	200.0	30.0	29.2	39.350	CC
Erwin 1N - Wellbore #1 - Plan #2 19Jul17 kjs	300.0	299.9	30.3	29.1	24.151	ES
Erwin 1N - Wellbore #1 - Plan #2 19Jul17 kjs	13,726.4	13,729.0	470.9	195.7	1.711	SF
Erwin 2N - Wellbore #1 - Plan #2 19Jul17 kjs	200.0	200.0	15.1	14.3	19.766	CC
Erwin 2N - Wellbore #1 - Plan #2 19Jul17 kjs	13,700.0	13,615.4	273.1	6.6	1.025	Level 2, ES, SF
Erwin 4N - Wellbore #1 - Design #1 18Jun17 jps	200.0	200.0	14.9	14.1	19.547	CC
Erwin 4N - Wellbore #1 - Design #1 18Jun17 jps	13,700.0	13,621.9	269.6	1.8	1.007	Level 2, ES, SF
Erwin 5C - Wellbore #1 - Design #1 18Jun17 jps	387.3	387.3	29.6	27.8	16.968	CC
Erwin 5C - Wellbore #1 - Design #1 18Jun17 jps	400.0	399.9	29.6	27.8	16.348	ES
Erwin 5C - Wellbore #1 - Design #1 18Jun17 jps	13,800.6	13,986.4	518.0	245.1	1.898	SF
Erwin 6N - Wellbore #1 - Design #1 18Jun17 jps	200.0	200.0	44.9	44.1	58.860	CC
Erwin 6N - Wellbore #1 - Design #1 18Jun17 jps	300.0	299.5	45.2	44.0	36.028	ES
Erwin 6N - Wellbore #1 - Design #1 18Jun17 jps	13,700.0	13,685.6	751.7	477.6	2.742	SF
<b>Existing Wells Sec 34 T5N R64W</b>						
Gamewell 34-1 - Wellbore #1 - Wellbore #1	4,085.8	3,867.2	160.8	121.8	4.127	CC
Gamewell 34-1 - Wellbore #1 - Wellbore #1	4,100.0	3,880.3	160.9	121.8	4.114	ES, SF
Suden 34M-223 - Wellbore #1 - Wellbore #1	7,200.0	7,264.2	147.5	83.0	2.285	ES, SF
Suden 34M-223 - Wellbore #1 - Wellbore #1	7,202.2	7,262.4	147.5	83.0	2.286	CC
Suden 34M-423 - Wellbore #1 - Wellbore #1	2,904.7	2,785.8	145.9	118.4	5.313	CC, ES, SF
Suden 34R-203 - Wellbore #1 - Wellbore #1	7,100.0	7,324.2	547.5	481.6	8.306	SF
Suden 34R-203 - Wellbore #1 - Wellbore #1	7,264.0	7,207.2	537.6	474.3	8.486	CC, ES
Suden 34R-343 - Wellbore #1 - Wellbore #1	7,300.0	7,221.7	299.7	238.5	4.895	SF
Suden 34R-343 - Wellbore #1 - Wellbore #1	7,500.0	7,012.1	295.4	237.2	5.071	ES
Suden 34R-343 - Wellbore #1 - Wellbore #1	7,555.0	6,961.5	294.6	237.2	5.138	CC
<b>Existing Wells Sec. 22-T5N-R64W</b>						
Emancipator 22-15 - Wellbore #1 - Wellbore #1	13,800.6	6,636.0	516.7	360.3	3.305	CC, ES, SF
Emancipator 22-16 - Wellbore #1 - Wellbore #1	13,800.6	6,610.2	1,337.7	1,181.3	8.552	CC, ES, SF
Sappington 22Q-221 - Wellbore #1 - Wellbore #1	13,800.6	6,717.8	183.1	61.1	1.501	CC, ES, SF
Sappington 22Q-301 - Wellbore #1 - Wellbore #1	13,800.6	6,789.3	517.5	358.6	3.257	CC, ES, SF
Sappington 22T-201 - Wellbore #1 - Wellbore #1	13,800.6	6,692.8	567.7	412.1	3.649	CC, ES, SF
Sappington 22T-341 - Wellbore #1 - Wellbore #1	13,800.6	6,737.1	233.6	84.4	1.566	CC, ES, SF

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<b>Reference Site:</b>	Erwin 5N64W27 PAD	<b>MD Reference:</b>	WELL @ 4707.0usft (Original Well Elev)
<b>Site Error:</b>	0.0 usft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Erwin 3N	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.0 usft	<b>Output errors are at</b>	2.45 sigma
<b>Reference Wellbore</b>	Wellbore #1	<b>Database:</b>	EDM 5000.1 Single User Db
<b>Reference Design:</b>	Plan #2 19Jul17 kjs	<b>Offset TVD Reference:</b>	Offset Datum

Summary						
Site Name	Reference Measured Depth (usft)	Offset Measured Depth (usft)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Separation Factor	Warning
Existing Wells Sec. 27 T5N R64W						
Hunter 1 - Wellbore #1 - Wellbore #1						Out of range
Herbst 27-2 - Wellbore #1 - Wellbore #1	10,118.3	6,651.8	71.6	-5.6	0.927	Level 1, CC, ES, SF
Herbst 27-6 - Wellbore #1 - Wellbore #1	8,913.2	6,679.6	50.9	-7.6	0.870	Level 1, CC, ES, SF

Offset Design													Offset Site Error:	0.0 usft	
Survey Program: 0-MWD													Offset Well Error:		0.0 usft
Reference													Distance		Warning
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor			
0.0	0.0	0.0	0.0	0.0	0.0	-90.27	-0.1	-30.0	30.0						
100.0	100.0	100.0	100.0	0.1	0.1	-90.27	-0.1	-30.0	30.0	29.8	0.21	141.557			
200.0	200.0	200.0	200.0	0.4	0.4	-90.27	-0.1	-30.0	30.0	29.2	0.76	39.350	CC		
300.0	300.0	299.9	299.9	0.6	0.6	98.74	-1.4	-30.1	30.3	29.1	1.26	24.151	ES		
400.0	399.9	399.9	399.8	0.9	0.9	98.67	-5.4	-30.4	31.2	29.5	1.75	17.786			
500.0	499.7	499.8	499.5	1.2	1.2	98.56	-11.9	-30.9	32.7	30.4	2.32	14.093			
600.0	599.3	599.7	599.0	1.5	1.5	98.42	-21.0	-31.5	34.8	31.8	2.95	11.782			
700.0	698.6	699.6	698.2	1.8	1.8	98.26	-32.7	-32.4	37.5	33.8	3.66	10.239			
800.0	797.5	799.4	797.0	2.2	2.2	98.09	-47.0	-33.4	40.8	36.3	4.45	9.156			
900.0	896.1	899.3	895.4	2.7	2.7	97.92	-63.8	-34.6	44.6	39.3	5.34	8.367			
1,000.0	994.2	999.1	993.3	3.2	3.2	97.74	-83.2	-36.0	49.1	42.8	6.32	7.774			
1,100.0	1,091.7	1,098.8	1,090.5	3.7	3.7	97.58	-105.1	-37.6	54.2	46.8	7.40	7.320			
1,200.0	1,188.6	1,198.5	1,187.2	4.3	4.3	97.42	-129.6	-39.3	59.8	51.2	8.59	6.963			
1,300.0	1,284.9	1,298.2	1,283.1	5.0	4.9	97.26	-156.5	-41.3	66.0	56.1	9.88	6.680			
1,400.0	1,380.4	1,397.8	1,378.2	5.7	5.6	97.12	-185.9	-43.4	72.8	61.5	11.28	6.450			
1,500.0	1,475.0	1,497.3	1,472.5	6.4	6.4	96.98	-217.8	-45.7	80.1	67.3	12.79	6.263			
1,600.0	1,568.9	1,596.8	1,565.9	7.3	7.2	96.85	-252.0	-48.1	88.0	73.6	14.41	6.108			
1,700.0	1,662.2	1,696.5	1,659.0	8.1	8.0	96.98	-287.4	-50.7	96.2	80.1	16.10	5.978			
1,800.0	1,755.6	1,796.1	1,752.2	9.0	8.9	97.09	-322.7	-53.2	104.4	86.6	17.79	5.867			
1,900.0	1,848.9	1,895.8	1,845.4	9.9	9.7	97.18	-358.1	-55.7	112.6	93.1	19.50	5.773			
2,000.0	1,942.3	1,995.5	1,938.5	10.7	10.6	97.26	-393.4	-58.3	120.7	99.5	21.21	5.693			
2,100.0	2,035.6	2,095.1	2,031.7	11.6	11.5	97.33	-428.8	-60.8	128.9	106.0	22.93	5.623			
2,200.0	2,129.0	2,194.8	2,124.8	12.5	12.3	97.39	-464.1	-63.4	137.1	112.4	24.65	5.561			
2,300.0	2,222.3	2,294.5	2,218.0	13.3	13.2	97.45	-499.5	-65.9	145.3	118.9	26.38	5.507			
2,400.0	2,315.7	2,394.1	2,311.1	14.2	14.0	97.50	-534.8	-68.5	153.4	125.3	28.11	5.459			
2,500.0	2,409.0	2,493.8	2,404.3	15.1	14.9	97.54	-570.2	-71.0	161.6	131.8	29.84	5.416			
2,600.0	2,502.4	2,593.5	2,497.4	16.0	15.8	97.58	-605.5	-73.5	169.8	138.2	31.57	5.377			
2,700.0	2,595.7	2,693.1	2,590.6	16.9	16.6	97.62	-640.9	-76.1	178.0	144.7	33.31	5.343			
2,800.0	2,689.1	2,792.8	2,683.7	17.8	17.5	97.65	-676.2	-78.6	186.1	151.1	35.05	5.311			
2,900.0	2,782.4	2,892.5	2,776.9	18.6	18.4	97.68	-711.6	-81.2	194.3	157.5	36.79	5.282			
3,000.0	2,875.8	2,992.1	2,870.0	19.5	19.2	97.71	-746.9	-83.7	202.5	164.0	38.53	5.256			
3,100.0	2,969.1	3,091.8	2,963.2	20.4	20.1	97.73	-782.3	-86.2	210.7	170.4	40.27	5.232			
3,200.0	3,062.5	3,191.5	3,056.3	21.3	21.0	97.76	-817.6	-88.8	218.8	176.8	42.01	5.209			
3,300.0	3,155.8	3,291.1	3,149.5	22.2	21.8	97.78	-853.0	-91.3	227.0	183.3	43.75	5.189			
3,400.0	3,249.2	3,390.8	3,242.6	23.1	22.7	97.80	-888.3	-93.9	235.2	189.7	45.50	5.170			
3,500.0	3,342.5	3,490.5	3,335.8	24.0	23.6	97.82	-923.7	-96.4	243.4	196.1	47.24	5.152			
3,600.0	3,435.9	3,590.1	3,428.9	24.8	24.4	97.84	-959.0	-98.9	251.6	202.6	48.98	5.135			
3,700.0	3,529.2	3,689.8	3,522.1	25.7	25.3	97.86	-994.4	-101.5	259.7	209.0	50.73	5.120			
3,800.0	3,622.6	3,789.5	3,615.2	26.6	26.2	97.87	-1,029.7	-104.0	267.9	215.4	52.47	5.105			
3,900.0	3,715.9	3,889.1	3,708.4	27.5	27.0	97.89	-1,065.1	-106.6	276.1	221.9	54.22	5.092			

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