

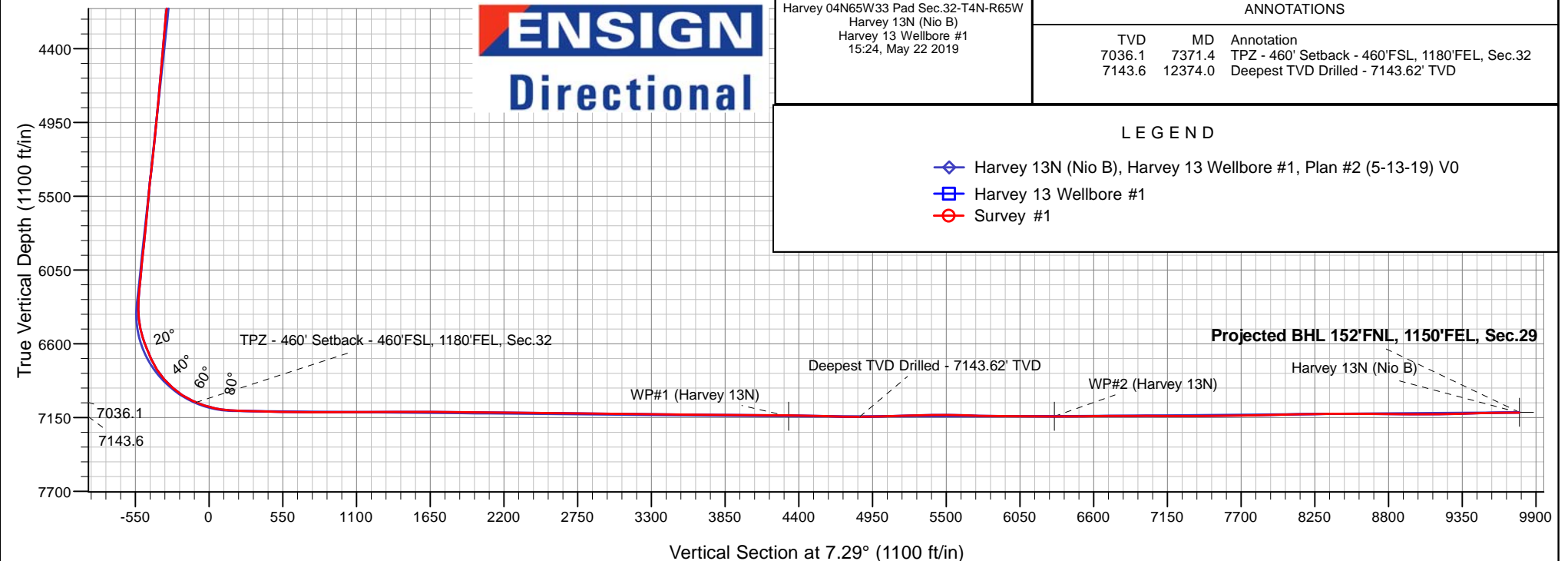
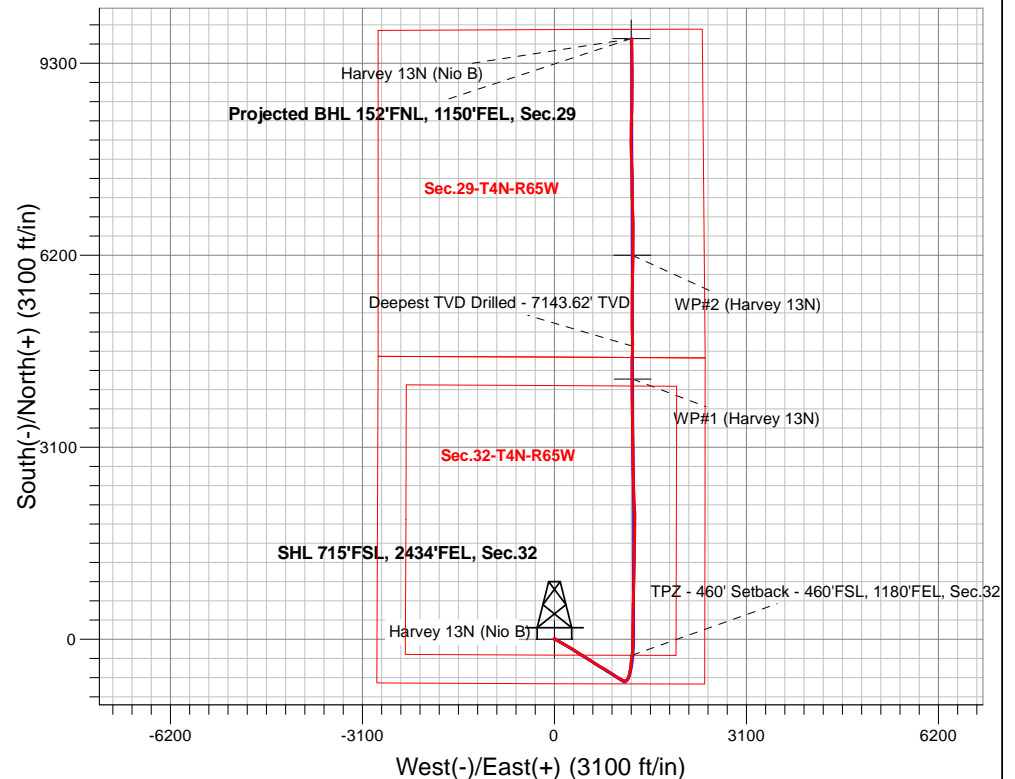
# PDC Energy Inc. DJ Basin

Well Name: **Harvey 13N (Nio B)**

Surface Location: Harvey 04N65W33 Pad Sec.32-T4N-R65W  
North American Datum 1983 , US State Plane 1983, Colorado Northern Zone  
Ground Elevation: 4900.0  
+N/-S +E/-W Northing Easting Latitude Longitude Slot  
0.0 0.0 1339923.463227043.06 40.263630 -104.686420  
Original Well Elev WELL @ 4923.0ft (Original Well Elev)

## FINAL SURVEY

**Projected Bottom Hole Location**  
**17,338'MD 7113'TVD 9696'N & 1247'E of SHL**  
**90.4 degree Incl @ 359.51 degree AZM**





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

**SEC.32-T4N-R65W**

**Harvey 04N65W33 Pad Sec.32-T4N-R65W**

**Harvey 13N (Nio B)**

**Harvey 13 Wellbore #1**

**Survey: Survey #1**

## **Standard Survey Report**

**22 May, 2019**

<b>Company:</b>	PDC Energy Inc. DJ Basin	<b>Local Co-ordinate Reference:</b>	Well Harvey 13N (Nio B)
<b>Project:</b>	SEC.32-T4N-R65W	<b>TVD Reference:</b>	WELL @ 4923.0ft (Original Well Elev)
<b>Site:</b>	Harvey 04N65W33 Pad Sec.32-T4N-R65W	<b>MD Reference:</b>	WELL @ 4923.0ft (Original Well Elev)
<b>Well:</b>	Harvey 13N (Nio B)	<b>North Reference:</b>	True
<b>Wellbore:</b>	Harvey 13 Wellbore #1	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	Harvey 13 Wellbore #1	<b>Database:</b>	US_EDM

<b>Project</b>	SEC.32-T4N-R65W, 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	Harvey 04N65W33 Pad Sec.32-T4N-R65W				
Site Position:		Northing:	1,339,821.45 usft	Latitude:	40.263350
From:	Lat/Long	Easting:	3,227,041.21 usft	Longitude:	-104.686430
Position Uncertainty:	0.0 ft	Slot Radius:	13-3/16 "	Grid Convergence:	0.53 °

Well	Harvey 13N (Nio B)					
Well Position	+N/-S	0.0 ft	Northing:	1,339,923.46 usft	Latitude:	40.263630
	+E/-W	0.0 ft	Easting:	3,227,043.07 usft	Longitude:	-104.686420
Position Uncertainty		0.0 ft	Wellhead Elevation:	0.0 ft	Ground Level:	4,900.0 ft

<b>Wellbore</b>	Harvey 13 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	5/13/2019	8.20	66.68	52,109

<b>Design</b>	Harvey 13 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	7.29	

<b>Survey Program</b>	<b>Date</b>	5/22/2019			
<b>From (ft)</b>	<b>To (ft)</b>	<b>Survey (Wellbore)</b>	<b>Tool Name</b>	<b>Description</b>	
235.0	17,338.0	Survey #1 (Harvey 13 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	
1.0	0.00	345.20	1.0	0.0	0.0	0.0	0.47	0.47	0.00	
<b>SHL 715'FSL, 2434'FEL, Sec.32</b>										
235.0	1.10	345.20	235.0	2.2	-0.6	2.1	0.47	0.47	0.00	
325.0	1.10	349.40	325.0	3.9	-1.0	3.7	0.09	0.00	4.67	
414.0	1.10	343.80	414.0	5.5	-1.4	5.3	0.12	0.00	-6.29	
504.0	0.60	7.90	503.9	6.8	-1.5	6.6	0.67	-0.56	26.78	
593.0	0.80	97.70	592.9	7.2	-0.8	7.0	1.12	0.22	100.90	
683.0	0.70	94.50	682.9	7.1	0.3	7.1	0.12	-0.11	-3.56	
773.0	1.70	139.70	772.9	6.0	1.7	6.2	1.45	1.11	50.22	
862.0	3.40	130.40	861.8	3.3	4.6	3.9	1.96	1.91	-10.45	

<b>Company:</b>	PDC Energy Inc. DJ Basin	<b>Local Co-ordinate Reference:</b>	Well Harvey 13N (Nio B)
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<b>Site:</b>	Harvey 04N65W33 Pad Sec.32-T4N-R65W	<b>MD Reference:</b>	WELL @ 4923.0ft (Original Well Elev)
<b>Well:</b>	Harvey 13N (Nio B)	<b>North Reference:</b>	True
<b>Wellbore:</b>	Harvey 13 Wellbore #1	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	Harvey 13 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)
952.0	5.20	121.60	951.6	-0.6	10.1	0.7	2.12	2.00	-9.78
1,041.0	7.00	121.80	1,040.1	-5.5	18.1	-3.2	2.02	2.02	0.22
1,131.0	7.10	120.50	1,129.4	-11.3	27.6	-7.7	0.21	0.11	-1.44
1,221.0	8.10	119.50	1,218.6	-17.2	37.9	-12.2	1.12	1.11	-1.11
1,310.0	10.20	119.00	1,306.4	-24.1	50.3	-17.5	2.36	2.36	-0.56
1,400.0	12.10	123.20	1,394.7	-33.1	65.1	-24.6	2.29	2.11	4.67
1,490.0	14.00	121.60	1,482.4	-44.0	82.3	-33.2	2.15	2.11	-1.78
1,579.0	16.10	120.20	1,568.4	-55.9	102.1	-42.4	2.39	2.36	-1.57
1,669.0	15.10	117.70	1,655.0	-67.6	123.3	-51.4	1.34	-1.11	-2.78
1,758.0	14.10	118.80	1,741.2	-78.2	143.1	-59.4	1.17	-1.12	1.24
1,845.0	13.00	117.00	1,825.7	-87.7	161.1	-66.6	1.35	-1.26	-2.07
1,938.0	11.44	117.12	1,916.6	-96.7	178.6	-73.2	1.68	-1.68	0.13
2,028.0	11.24	119.27	2,004.9	-105.1	194.2	-79.6	0.52	-0.22	2.39
2,117.0	11.41	118.13	2,092.1	-113.5	209.5	-85.9	0.32	0.19	-1.28
2,207.0	12.07	121.25	2,180.3	-122.5	225.4	-92.9	1.02	0.73	3.47
2,297.0	14.29	121.14	2,267.9	-133.2	243.0	-101.2	2.47	2.47	-0.12
2,387.0	16.20	121.25	2,354.7	-145.4	263.2	-110.8	2.12	2.12	0.12
2,477.0	16.58	121.62	2,441.1	-158.7	284.9	-121.2	0.44	0.42	0.41
2,566.0	16.75	123.16	2,526.3	-172.3	306.4	-132.0	0.53	0.19	1.73
2,657.0	15.14	121.90	2,613.8	-185.8	327.5	-142.7	1.81	-1.77	-1.38
2,747.0	15.70	122.06	2,700.6	-198.5	347.8	-152.7	0.62	0.62	0.18
2,837.0	18.17	122.37	2,786.7	-212.4	370.0	-163.7	2.75	2.74	0.34
2,927.0	17.79	123.19	2,872.3	-227.5	393.3	-175.7	0.51	-0.42	0.91
3,017.0	17.18	123.03	2,958.1	-242.2	416.0	-187.5	0.68	-0.68	-0.18
3,106.0	15.47	120.63	3,043.5	-255.5	437.2	-197.9	2.07	-1.92	-2.70
3,196.0	14.88	118.54	3,130.4	-267.1	457.7	-206.8	0.89	-0.66	-2.32
3,286.0	16.07	123.45	3,217.1	-279.5	478.2	-216.5	1.97	1.32	5.46
3,375.0	13.73	121.93	3,303.1	-291.9	497.5	-226.3	2.67	-2.63	-1.71
3,465.0	13.05	124.03	3,390.7	-303.2	515.0	-235.4	0.93	-0.76	2.33
3,555.0	14.24	120.65	3,478.1	-314.5	532.9	-244.3	1.59	1.32	-3.76
3,644.0	13.81	123.82	3,564.5	-326.0	551.2	-253.4	0.99	-0.48	3.56
3,734.0	14.23	121.48	3,651.8	-337.8	569.5	-262.7	0.78	0.47	-2.60
3,824.0	14.54	122.86	3,739.0	-349.7	588.4	-272.1	0.51	0.34	1.53
3,913.0	14.86	123.48	3,825.1	-362.0	607.3	-282.0	0.40	0.36	0.70
4,003.0	14.38	123.68	3,912.2	-374.6	626.3	-292.1	0.54	-0.53	0.22
4,092.0	16.07	124.98	3,998.0	-387.8	645.6	-302.7	1.94	1.90	1.46
4,182.0	15.74	124.89	4,084.6	-401.9	665.8	-314.1	0.37	-0.37	-0.10
4,272.0	13.94	121.15	4,171.6	-414.5	685.1	-324.2	2.26	-2.00	-4.16
4,361.0	11.57	114.21	4,258.4	-423.7	702.4	-331.1	3.17	-2.66	-7.80
4,452.0	13.84	118.85	4,347.2	-432.7	720.3	-337.8	2.73	2.49	5.10
4,542.0	12.87	122.72	4,434.7	-443.3	738.1	-346.0	1.47	-1.08	4.30
4,632.0	13.65	121.85	4,522.3	-454.4	755.6	-354.7	0.89	0.87	-0.97
4,721.0	12.07	118.48	4,609.1	-464.3	772.7	-362.5	1.96	-1.78	-3.79

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<b>Well:</b>	Harvey 13N (Nio B)	<b>North Reference:</b>	True
<b>Wellbore:</b>	Harvey 13 Wellbore #1	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	Harvey 13 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)
4,811.0	13.94	119.71	4,696.8	-474.2	790.4	-370.0	2.10	2.08	1.37
4,901.0	11.93	119.33	4,784.5	-484.1	807.9	-377.6	2.24	-2.23	-0.42
4,990.0	12.18	121.45	4,871.5	-493.5	823.9	-384.9	0.57	0.28	2.38
5,080.0	13.61	121.34	4,959.3	-504.0	841.1	-393.1	1.59	1.59	-0.12
5,169.0	14.51	123.57	5,045.6	-515.6	859.3	-402.3	1.18	1.01	2.51
5,259.0	13.43	121.95	5,132.9	-527.4	877.6	-411.7	1.28	-1.20	-1.80
5,349.0	13.92	123.10	5,220.4	-538.8	895.5	-420.7	0.62	0.54	1.28
5,438.0	14.12	122.83	5,306.7	-550.5	913.6	-430.1	0.24	0.22	-0.30
5,528.0	15.36	125.34	5,393.8	-563.4	932.5	-440.4	1.55	1.38	2.79
5,618.0	12.56	119.79	5,481.1	-575.1	950.8	-449.8	3.45	-3.11	-6.17
5,707.0	13.16	120.81	5,567.9	-585.1	967.9	-457.5	0.72	0.67	1.15
5,797.0	13.41	118.84	5,655.5	-595.4	985.8	-465.4	0.57	0.28	-2.19
5,887.0	14.07	120.23	5,742.9	-606.0	1,004.4	-473.5	0.82	0.73	1.54
5,977.0	13.37	124.88	5,830.3	-617.4	1,022.4	-482.6	1.45	-0.78	5.17
6,067.0	14.47	122.32	5,917.7	-629.4	1,040.4	-492.2	1.40	1.22	-2.84
6,156.0	14.34	119.49	6,003.9	-640.8	1,059.4	-501.1	0.80	-0.15	-3.18
6,246.0	13.89	120.10	6,091.2	-651.7	1,078.5	-509.5	0.53	-0.50	0.68
6,336.0	14.46	117.18	6,178.4	-662.2	1,097.8	-517.5	1.02	0.63	-3.24
6,425.0	13.98	117.52	6,264.7	-672.3	1,117.2	-525.0	0.55	-0.54	0.38
6,515.0	12.07	92.23	6,352.4	-677.7	1,136.3	-527.9	6.62	-2.12	-28.10
6,605.0	13.97	58.33	6,440.2	-672.3	1,155.0	-520.2	8.61	2.11	-37.67
6,694.0	18.68	37.10	6,525.7	-655.3	1,172.7	-501.1	8.46	5.29	-23.85
6,784.0	20.63	27.15	6,610.5	-629.7	1,188.7	-473.6	4.30	2.17	-11.06
6,807.0	21.43	24.68	6,632.0	-622.2	1,192.3	-465.8	5.19	3.48	-10.74
6,897.0	24.95	15.70	6,714.7	-589.0	1,204.3	-431.3	5.53	3.91	-9.98
6,986.0	32.45	12.93	6,792.7	-547.6	1,214.7	-388.9	8.56	8.43	-3.11
7,077.0	42.10	8.85	6,865.0	-493.5	1,224.9	-334.0	10.94	10.60	-4.48
7,166.0	48.57	6.41	6,927.6	-430.8	1,233.2	-270.7	7.53	7.27	-2.74
7,256.0	56.50	6.87	6,982.3	-359.9	1,241.5	-199.4	8.82	8.81	0.51
7,346.0	65.42	6.30	7,025.9	-281.8	1,250.5	-120.8	9.93	9.91	-0.63
7,371.4	67.41	5.68	7,036.1	-258.7	1,252.9	-97.5	8.13	7.82	-2.43
TPZ - 460' Setback - 460'FSL, 1180'FEL, Sec.32									
7,435.0	72.39	4.21	7,057.9	-199.2	1,258.0	-37.8	8.13	7.84	-2.32
7,525.0	77.82	1.57	7,081.1	-112.4	1,262.4	48.8	6.67	6.03	-2.93
7,614.0	85.46	0.71	7,094.0	-24.4	1,264.1	136.3	8.64	8.58	-0.97
7,657.2	86.93	1.28	7,096.9	18.7	1,264.9	179.2	3.66	3.41	1.32
LPL 737'FSL, 1155'FEL, Sec.32									
7,704.0	88.53	1.90	7,098.7	65.4	1,266.2	225.7	3.66	3.41	1.32
7,794.0	88.17	1.63	7,101.3	155.4	1,269.0	315.2	0.50	-0.40	-0.30
7,884.0	89.45	0.77	7,103.2	245.3	1,270.8	404.7	1.71	1.42	-0.96
7,974.0	88.85	0.38	7,104.5	335.3	1,271.7	494.1	0.80	-0.67	-0.43
8,063.0	88.41	0.21	7,106.6	424.3	1,272.2	582.4	0.53	-0.49	-0.19
8,153.0	88.05	0.14	7,109.4	514.2	1,272.5	671.6	0.41	-0.40	-0.08
8,243.0	90.44	1.05	7,110.6	604.2	1,273.4	761.0	2.84	2.66	1.01

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<b>Wellbore:</b>	Harvey 13 Wellbore #1	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	Harvey 13 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)
8,333.0	90.68	1.56	7,109.7	694.2	1,275.5	850.5	0.63	0.27	0.57
8,422.0	90.57	0.86	7,108.8	783.2	1,277.3	939.0	0.80	-0.12	-0.79
8,512.0	89.96	0.97	7,108.3	873.1	1,278.8	1,028.4	0.69	-0.68	0.12
8,601.0	90.22	1.06	7,108.2	962.1	1,280.4	1,116.9	0.31	0.29	0.10
8,691.0	89.78	1.12	7,108.2	1,052.1	1,282.1	1,206.4	0.49	-0.49	0.07
8,781.0	90.63	1.64	7,107.9	1,142.1	1,284.2	1,295.9	1.11	0.94	0.58
8,871.0	90.36	1.12	7,107.1	1,232.1	1,286.4	1,385.4	0.65	-0.30	-0.58
8,961.0	89.55	0.75	7,107.2	1,322.0	1,287.9	1,474.9	0.99	-0.90	-0.41
9,050.0	90.28	1.21	7,107.3	1,411.0	1,289.4	1,563.3	0.97	0.82	0.52
9,140.0	89.61	0.55	7,107.4	1,501.0	1,290.8	1,652.8	1.04	-0.74	-0.73
9,230.0	89.47	0.64	7,108.1	1,591.0	1,291.7	1,742.1	0.18	-0.16	0.10
9,319.0	89.74	1.66	7,108.7	1,680.0	1,293.5	1,830.6	1.19	0.30	1.15
9,408.0	89.61	2.56	7,109.2	1,768.9	1,296.8	1,919.3	1.02	-0.15	1.01
9,497.0	89.33	0.73	7,110.1	1,857.9	1,299.3	2,007.8	2.08	-0.31	-2.06
9,587.0	89.78	359.07	7,110.8	1,947.9	1,299.2	2,097.1	1.91	0.50	-1.84
9,677.0	89.54	357.34	7,111.3	2,037.8	1,296.4	2,185.9	1.94	-0.27	-1.92
9,767.0	89.60	355.52	7,112.0	2,127.6	1,290.8	2,274.3	2.02	0.07	-2.02
9,857.0	88.64	357.08	7,113.3	2,217.4	1,284.9	2,362.6	2.04	-1.07	1.73
9,947.0	88.78	357.56	7,115.4	2,307.3	1,280.7	2,451.3	0.56	0.16	0.53
10,037.0	89.76	359.61	7,116.5	2,397.3	1,278.5	2,540.2	2.52	1.09	2.28
10,127.0	89.41	358.02	7,117.2	2,487.3	1,276.7	2,629.2	1.81	-0.39	-1.77
10,218.0	89.25	358.04	7,118.2	2,578.2	1,273.5	2,719.0	0.18	-0.18	0.02
10,308.0	88.89	358.08	7,119.7	2,668.1	1,270.5	2,807.9	0.40	-0.40	0.04
10,398.0	89.00	359.27	7,121.4	2,758.1	1,268.4	2,896.8	1.33	0.12	1.32
10,487.0	89.22	359.17	7,122.7	2,847.1	1,267.2	2,984.9	0.27	0.25	-0.11
10,577.0	90.01	359.55	7,123.3	2,937.1	1,266.2	3,074.1	0.97	0.88	0.42
10,667.0	89.04	358.45	7,124.1	3,027.0	1,264.6	3,163.1	1.63	-1.08	-1.22
10,757.0	89.90	0.04	7,124.9	3,117.0	1,263.4	3,252.2	2.01	0.96	1.77
10,846.0	89.43	358.09	7,125.4	3,206.0	1,262.0	3,340.3	2.25	-0.53	-2.19
10,936.0	89.93	0.14	7,125.9	3,296.0	1,260.6	3,429.4	2.34	0.56	2.28
11,027.0	90.02	0.69	7,126.0	3,387.0	1,261.2	3,519.7	0.61	0.10	0.60
11,116.0	89.37	358.99	7,126.5	3,476.0	1,261.0	3,608.0	2.04	-0.73	-1.91
11,206.0	89.43	359.11	7,127.4	3,566.0	1,259.5	3,697.0	0.15	0.07	0.13
11,296.0	89.38	359.34	7,128.3	3,656.0	1,258.3	3,786.1	0.26	-0.06	0.26
11,385.0	89.43	359.10	7,129.3	3,744.9	1,257.1	3,874.2	0.28	0.06	-0.27
11,475.0	89.46	358.76	7,130.1	3,834.9	1,255.4	3,963.3	0.38	0.03	-0.38
11,564.0	89.83	359.00	7,130.7	3,923.9	1,253.7	4,051.3	0.50	0.42	0.27
11,654.0	88.98	358.49	7,131.6	4,013.9	1,251.7	4,140.3	1.10	-0.94	-0.57
11,745.0	89.55	0.50	7,132.8	4,104.9	1,250.9	4,230.5	2.30	0.63	2.21
11,835.0	89.38	0.34	7,133.6	4,194.9	1,251.5	4,319.8	0.26	-0.19	-0.18
11,838.6	89.36	0.36	7,133.7	4,198.4	1,251.6	4,323.4	0.65	-0.42	0.50
WP#1 (Harvey 13N)									
11,925.0	89.00	0.79	7,134.9	4,284.8	1,252.4	4,409.2	0.65	-0.42	0.50

<b>Company:</b>	PDC Energy Inc. DJ Basin	<b>Local Co-ordinate Reference:</b>	Well Harvey 13N (Nio B)
<b>Project:</b>	SEC.32-T4N-R65W	<b>TVD Reference:</b>	WELL @ 4923.0ft (Original Well Elev)
<b>Site:</b>	Harvey 04N65W33 Pad Sec.32-T4N-R65W	<b>MD Reference:</b>	WELL @ 4923.0ft (Original Well Elev)
<b>Well:</b>	Harvey 13N (Nio B)	<b>North Reference:</b>	True
<b>Wellbore:</b>	Harvey 13 Wellbore #1	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	Harvey 13 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)
12,015.0	88.52	0.36	7,136.8	4,374.8	1,253.3	4,498.5	0.72	-0.53	-0.48
12,104.0	88.75	0.57	7,139.0	4,463.8	1,254.1	4,586.9	0.35	0.26	0.24
12,194.0	89.22	1.02	7,140.6	4,553.8	1,255.3	4,676.3	0.72	0.52	0.50
12,284.0	89.08	1.65	7,141.9	4,643.7	1,257.4	4,765.8	0.72	-0.16	0.70
12,374.0	88.73	1.88	7,143.6	4,733.7	1,260.2	4,855.4	0.47	-0.39	0.26
<b>Deepest TVD Drilled - 7143.62' TVD</b>									
12,464.0	91.39	359.33	7,143.5	4,823.6	1,261.1	4,944.7	4.09	2.96	-2.83
12,554.0	92.02	358.98	7,140.8	4,913.6	1,259.8	5,033.8	0.80	0.70	-0.39
12,644.0	92.11	358.63	7,137.6	5,003.5	1,257.9	5,122.7	0.40	0.10	-0.39
12,734.0	92.05	358.40	7,134.3	5,093.4	1,255.6	5,211.6	0.26	-0.07	-0.26
12,824.0	90.87	359.68	7,132.0	5,183.4	1,254.1	5,300.7	1.93	-1.31	1.42
12,913.0	90.60	359.27	7,130.9	5,272.4	1,253.3	5,388.8	0.55	-0.30	-0.46
13,003.0	90.59	0.27	7,130.0	5,362.4	1,252.9	5,478.0	1.11	-0.01	1.11
13,093.0	88.22	1.04	7,130.9	5,452.3	1,253.9	5,567.4	2.77	-2.63	0.86
13,182.0	88.24	1.12	7,133.6	5,541.3	1,255.6	5,655.9	0.09	0.02	0.09
13,271.0	87.65	0.84	7,136.8	5,630.2	1,257.1	5,744.3	0.73	-0.66	-0.31
13,360.0	89.83	1.47	7,138.8	5,719.2	1,258.9	5,832.7	2.55	2.45	0.71
13,450.0	90.06	1.09	7,138.9	5,809.1	1,260.9	5,922.2	0.49	0.26	-0.42
13,540.0	89.59	0.83	7,139.2	5,899.1	1,262.4	6,011.7	0.60	-0.52	-0.29
13,630.0	89.53	1.04	7,139.8	5,989.1	1,263.9	6,101.1	0.24	-0.07	0.23
13,720.0	89.74	1.03	7,140.4	6,079.1	1,265.5	6,190.6	0.23	0.23	-0.01
13,810.0	90.05	0.89	7,140.6	6,169.1	1,267.0	6,280.0	0.38	0.34	-0.16
13,838.9	90.06	0.87	7,140.6	6,197.9	1,267.5	6,308.7	0.07	0.02	-0.07
<b>WP#2 (Harvey 13N)</b>									
13,900.0	90.07	0.83	7,140.5	6,259.1	1,268.4	6,369.5	0.07	0.02	-0.07
13,990.0	90.34	0.38	7,140.2	6,349.1	1,269.3	6,458.9	0.58	0.30	-0.50
14,080.0	90.55	359.76	7,139.5	6,439.1	1,269.5	6,548.1	0.73	0.23	-0.69
14,169.0	90.57	359.72	7,138.6	6,528.1	1,269.1	6,636.4	0.05	0.02	-0.04
14,259.0	90.27	359.00	7,137.9	6,618.1	1,268.0	6,725.5	0.87	-0.33	-0.80
14,349.0	90.27	358.95	7,137.5	6,708.0	1,266.4	6,814.6	0.06	0.00	-0.06
14,439.0	90.21	358.72	7,137.1	6,798.0	1,264.6	6,903.6	0.26	-0.07	-0.26
14,528.0	89.92	358.72	7,137.0	6,887.0	1,262.6	6,991.6	0.33	-0.33	0.00
14,618.0	89.89	358.23	7,137.2	6,977.0	1,260.2	7,080.5	0.55	-0.03	-0.54
14,709.0	89.17	358.39	7,137.9	7,067.9	1,257.5	7,170.4	0.81	-0.79	0.18
14,798.0	90.45	0.50	7,138.2	7,156.9	1,256.7	7,258.6	2.77	1.44	2.37
14,887.0	89.41	0.09	7,138.3	7,245.9	1,257.1	7,346.9	1.26	-1.17	-0.46
14,977.0	91.05	358.68	7,138.0	7,335.9	1,256.2	7,436.0	2.40	1.82	-1.57
15,067.0	91.10	358.59	7,136.3	7,425.9	1,254.0	7,525.0	0.11	0.06	-0.10
15,157.0	90.69	357.94	7,134.9	7,515.8	1,251.3	7,613.9	0.85	-0.46	-0.72
15,247.0	90.57	357.15	7,133.9	7,605.7	1,247.4	7,702.5	0.89	-0.13	-0.88
15,336.0	91.32	359.15	7,132.4	7,694.7	1,244.6	7,790.4	2.40	0.84	2.25
15,425.0	91.08	358.54	7,130.6	7,783.6	1,242.8	7,878.4	0.74	-0.27	-0.69
15,515.0	90.85	357.09	7,129.0	7,873.5	1,239.3	7,967.2	1.63	-0.26	-1.61
15,604.0	91.90	0.47	7,126.9	7,962.5	1,237.5	8,055.2	3.98	1.18	3.80

<b>Company:</b>	PDC Energy Inc. DJ Basin	<b>Local Co-ordinate Reference:</b>	Well Harvey 13N (Nio B)
<b>Project:</b>	SEC.32-T4N-R65W	<b>TVD Reference:</b>	WELL @ 4923.0ft (Original Well Elev)
<b>Site:</b>	Harvey 04N65W33 Pad Sec.32-T4N-R65W	<b>MD Reference:</b>	WELL @ 4923.0ft (Original Well Elev)
<b>Well:</b>	Harvey 13N (Nio B)	<b>North Reference:</b>	True
<b>Wellbore:</b>	Harvey 13 Wellbore #1	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	Harvey 13 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)	
15,694.0	91.13	0.22	7,124.5	8,052.4	1,238.0	8,144.5	0.90	-0.86	-0.28	
15,784.0	90.52	0.82	7,123.2	8,142.4	1,238.8	8,233.8	0.95	-0.68	0.67	
15,874.0	90.63	0.36	7,122.3	8,232.4	1,239.7	8,323.2	0.53	0.12	-0.51	
15,963.0	90.35	1.29	7,121.6	8,321.4	1,241.0	8,411.6	1.09	-0.31	1.04	
16,054.0	89.80	1.23	7,121.5	8,412.4	1,243.0	8,502.1	0.61	-0.60	-0.07	
16,143.0	89.86	1.27	7,121.7	8,501.4	1,245.0	8,590.6	0.08	0.07	0.04	
16,234.0	89.19	1.31	7,122.5	8,592.3	1,247.0	8,681.1	0.74	-0.74	0.04	
16,324.0	89.22	1.60	7,123.7	8,682.3	1,249.3	8,770.6	0.32	0.03	0.32	
16,414.0	90.57	0.99	7,123.9	8,772.3	1,251.3	8,860.2	1.65	1.50	-0.68	
16,504.0	89.64	359.96	7,123.7	8,862.3	1,252.1	8,949.5	1.54	-1.03	-1.14	
16,593.0	89.13	359.83	7,124.7	8,951.3	1,251.9	9,037.8	0.59	-0.57	-0.15	
16,683.0	90.79	0.04	7,124.7	9,041.3	1,251.8	9,127.0	1.86	1.84	0.23	
16,773.0	90.37	0.05	7,123.8	9,131.2	1,251.9	9,216.3	0.47	-0.47	0.01	
16,862.0	92.15	359.36	7,121.9	9,220.2	1,251.4	9,304.5	2.14	2.00	-0.78	
16,952.0	91.80	359.64	7,118.8	9,310.2	1,250.6	9,393.6	0.50	-0.39	0.31	
17,041.0	91.44	359.28	7,116.3	9,399.1	1,249.8	9,481.7	0.57	-0.40	-0.40	
17,131.0	90.83	359.20	7,114.5	9,489.1	1,248.6	9,570.8	0.68	-0.68	-0.09	
17,220.0	90.40	359.51	7,113.5	9,578.1	1,247.6	9,659.0	0.60	-0.48	0.35	
17,338.0	90.40	359.51	7,112.7	9,696.1	1,246.6	9,775.9	0.00	0.00	0.00	
Projected BHL 152'FNL, 1150'FEL, Sec.29										

Design Targets										
Target Name - hit/miss target - Shape	Dip Angle (°)	Dip Dir. (°)	TVD (ft)	+N/-S (ft)	+E/-W (ft)	Northing (usft)	Easting (usft)	Latitude	Longitude	
SHL 715'FSL, 2434'FEL - survey hits target center - Point	0.00	0.00	1.0	0.0	0.0	1,339,923.47	3,227,043.07	40.263630	-104.686420	
Projected BHL 152'FNL, - survey misses target center by 6.1ft at 17338.0ft MD (7112.7 TVD, 9696.1 N, 1246.6 E) - Point	0.00	0.00	7,110.0	9,697.8	1,241.4	1,349,631.83	3,228,195.42	40.290250	-104.681970	
WP#2 (Harvey 13N) - survey misses target center by 12.8ft at 13838.9ft MD (7140.6 TVD, 6197.9 N, 1267.5 E) - Point	0.00	0.00	7,140.0	6,198.1	1,254.7	1,346,132.57	3,228,240.82	40.280644	-104.681923	
WP#1 (Harvey 13N) - survey misses target center by 12.5ft at 11838.5ft MD (7133.7 TVD, 4198.4 N, 1251.6 E) - Point	0.00	0.00	7,140.0	4,198.2	1,262.3	1,344,132.91	3,228,266.76	40.275154	-104.681896	

Survey Annotations					
Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates			
		+N/-S (ft)	+E/-W (ft)	Comment	
7,371.4	7,036.1	-258.7	1,252.9	TPZ - 460' Setback - 460'FSL, 1180'FEL, Sec.32	
12,374.0	7,143.6	4,733.7	1,260.2	Deepest TVD Drilled - 7143.62' TVD	



<b>Company:</b>	PDC Energy Inc. DJ Basin	<b>Local Co-ordinate Reference:</b>	Well Harvey 13N (Nio B)
<b>Project:</b>	SEC.32-T4N-R65W	<b>TVD Reference:</b>	WELL @ 4923.0ft (Original Well Elev)
<b>Site:</b>	Harvey 04N65W33 Pad Sec.32-T4N-R65W	<b>MD Reference:</b>	WELL @ 4923.0ft (Original Well Elev)
<b>Well:</b>	Harvey 13N (Nio B)	<b>North Reference:</b>	True
<b>Wellbore:</b>	Harvey 13 Wellbore #1	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	Harvey 13 Wellbore #1	<b>Database:</b>	US_EDM

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