

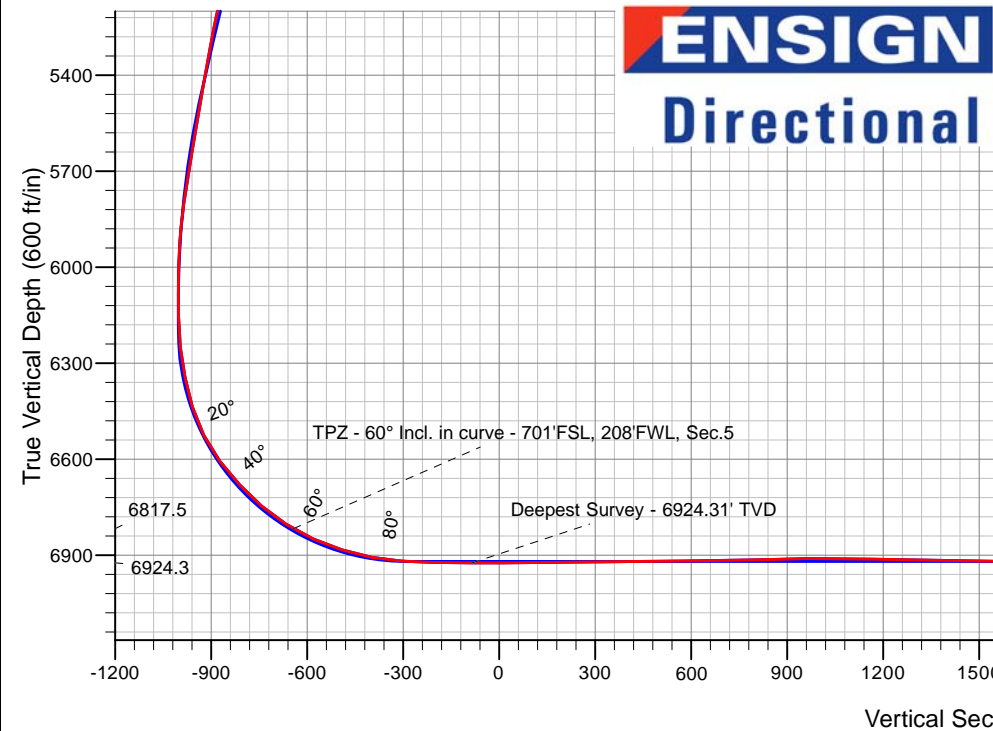
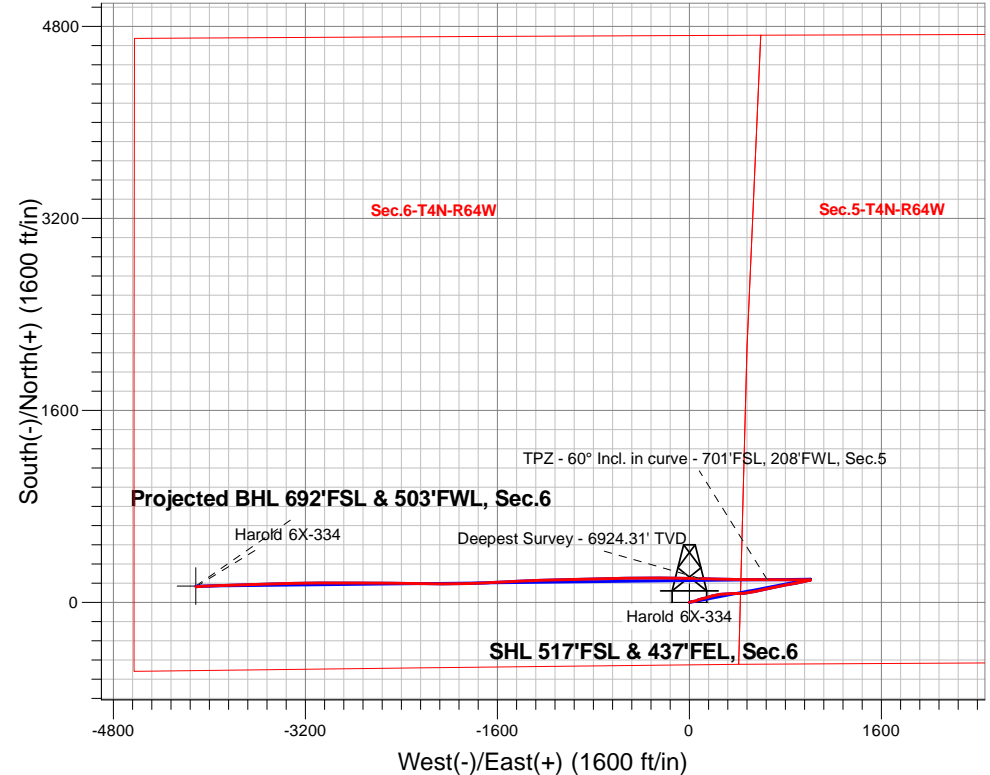
PDC Energy Inc. DJ Basin

Well Name: **Harold 6X-334**

Surface Location: Harold 4N64W6X Pad Sec.6-T4N-R64W
 North American Datum 1983 , US State Plane 1983, Colorado Northern Zone
 Ground Elevation: 4787.0
 +N/-S+E/-W Northing Easting Longitude Slot
 0.0 0.0 1366374.368254938.35 40.335490 -104.585490
 RKB - 23' WELL @ 4810.0ft (RKB - 23')

FINAL SURVEY

Projected Bottom Hole Location
11,841'MD 6908'TVD 132'N & 4112'W of SHL
91.55 degree Incl @ 266.86 degree AZM



Harold 4N64W6X Pad Sec.6-T4N-R64W
 Harold 6X-334
 Harold 6X-334 Wellbore #1
 6:54, January 29 2019

ANNOTATIONS

TVD	MD	Annotation
6817.5	7059.6	TPZ - 60° Incl. in curve - 701'FSL, 208'FWL, Sec.5
6924.3	7636.0	Deepest Survey - 6924.31' TVD

LEGEND

- Harold 6X-334, Harold 6X-334 Wellbore #1, Plan #2 (1-22-19) V0
- Harold 6X-334 Wellbore #1
- Survey #1



PDC Energy Inc. DJ Basin

SEC.6-T4N-R64W

Harold 4N64W6X Pad Sec.6-T4N-R64W

Harold 6X-334

Harold 6X-334 Wellbore #1

Survey: Survey #1

Standard Survey Report

29 January, 2019

Company:	PDC Energy Inc. DJ Basin	Local Co-ordinate Reference:	Well Harold 6X-334
Project:	SEC.6-T4N-R64W	TVD Reference:	WELL @ 4810.0ft (RKB - 23')
Site:	Harold 4N64W6X Pad Sec.6-T4N-R64W	MD Reference:	WELL @ 4810.0ft (RKB - 23')
Well:	Harold 6X-334	North Reference:	True
Wellbore:	Harold 6X-334 Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Harold 6X-334 Wellbore #1	Database:	US_EDM

Project	SEC.6-T4N-R64W, Weld County, CO		
Map System:	US State Plane 1983	System Datum:	Mean Sea Level
Geo Datum:	North American Datum 1983		Using Well Reference Point
Map Zone:	Colorado Northern Zone		Using geodetic scale factor

Site	Harold 4N64W6X Pad Sec.6-T4N-R64W				
Site Position:		Northing:	1,366,494.58 usft	Latitude:	40.335820
From:	Lat/Long	Easting:	3,254,937.11 usft	Longitude:	-104.585490
Position Uncertainty:	0.0 ft	Slot Radius:	13-3/16 "	Grid Convergence:	0.59 °

Well	Harold 6X-334					
Well Position	+N/-S	0.0 ft	Northing:	1,366,374.36 usft	Latitude:	40.335490
	+E/-W	0.0 ft	Easting:	3,254,938.35 usft	Longitude:	-104.585490
Position Uncertainty		0.0 ft	Wellhead Elevation:	0.0 ft	Ground Level:	4,787.0 ft

Wellbore	Harold 6X-334 Wellbore #1				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	HDGM	1/22/2019	8.18	66.83	52,177

Design	Harold 6X-334 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	271.90	

Survey Program	Date	1/29/2019			
From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description	
252.0	11,841.0	Survey #1 (Harold 6X-334 Wellbore #1)	MWD	MWD - Standard	

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)	
0.0	0.00	0.00	0.0	0.0	0.0	0.0	0.00	0.00	0.00	
1.0	0.00	5.91	1.0	0.0	0.0	0.0	0.00	0.00	0.00	
SHL 517'FSL & 437'FEL, Sec.6										
252.0	0.17	5.91	252.0	0.4	0.0	0.0	0.07	0.07	0.00	
348.0	0.15	333.94	348.0	0.6	0.0	0.0	0.09	-0.02	-33.30	
444.0	0.04	171.00	444.0	0.7	-0.1	0.1	0.20	-0.11	-169.73	
539.0	0.28	348.77	539.0	0.9	-0.1	0.1	0.34	0.25	187.13	
635.0	0.09	113.46	635.0	1.1	-0.1	0.1	0.35	-0.20	129.89	
731.0	0.32	129.34	731.0	0.9	0.2	-0.2	0.24	0.24	16.54	
826.0	0.21	164.30	826.0	0.6	0.5	-0.4	0.20	-0.12	36.80	
921.0	0.12	111.36	921.0	0.4	0.6	-0.6	0.18	-0.09	-55.73	

Company:	PDC Energy Inc. DJ Basin	Local Co-ordinate Reference:	Well Harold 6X-334
Project:	SEC.6-T4N-R64W	TVD Reference:	WELL @ 4810.0ft (RKB - 23')
Site:	Harold 4N64W6X Pad Sec.6-T4N-R64W	MD Reference:	WELL @ 4810.0ft (RKB - 23')
Well:	Harold 6X-334	North Reference:	True
Wellbore:	Harold 6X-334 Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Harold 6X-334 Wellbore #1	Database:	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)
1,017.0	1.04	64.79	1,017.0	0.7	1.5	-1.5	1.00	0.96	-48.51
1,112.0	3.23	61.56	1,111.9	2.3	4.6	-4.5	2.31	2.31	-3.40
1,208.0	4.35	69.50	1,207.7	4.9	10.4	-10.2	1.29	1.17	8.27
1,303.0	5.48	78.31	1,302.4	7.1	18.2	-18.0	1.43	1.19	9.27
1,399.0	6.72	81.20	1,397.8	8.9	28.3	-28.0	1.33	1.29	3.01
1,495.0	7.91	80.25	1,493.0	10.8	40.3	-39.9	1.25	1.24	-0.99
1,590.0	8.64	74.54	1,587.0	13.9	53.6	-53.2	1.16	0.77	-6.01
1,686.0	8.73	66.50	1,681.9	18.7	67.3	-66.6	1.27	0.09	-8.38
1,781.0	9.27	71.57	1,775.8	24.0	81.1	-80.3	1.01	0.57	5.34
1,876.0	10.35	72.75	1,869.4	28.9	96.6	-95.5	1.16	1.14	1.24
1,972.0	11.07	77.11	1,963.7	33.5	113.8	-112.6	1.13	0.75	4.54
2,068.0	13.64	77.60	2,057.5	38.0	133.8	-132.5	2.68	2.68	0.51
2,163.0	13.25	71.17	2,149.9	43.9	155.1	-153.5	1.63	-0.41	-6.77
2,258.0	13.33	76.90	2,242.3	49.9	176.0	-174.3	1.39	0.08	6.03
2,354.0	13.13	76.71	2,335.8	55.0	197.4	-195.5	0.21	-0.21	-0.20
2,450.0	12.66	73.94	2,429.4	60.4	218.1	-216.0	0.81	-0.49	-2.89
2,521.0	11.66	75.22	2,498.8	64.4	232.6	-230.3	1.46	-1.41	1.80
2,637.0	13.21	85.72	2,612.1	68.3	257.1	-254.7	2.36	1.34	9.05
2,733.0	13.13	85.51	2,705.5	70.0	278.9	-276.5	0.10	-0.08	-0.22
2,828.0	13.04	85.83	2,798.1	71.6	300.4	-297.8	0.12	-0.09	0.34
2,923.0	12.76	85.75	2,890.7	73.2	321.5	-318.9	0.30	-0.29	-0.08
3,019.0	14.01	89.62	2,984.1	74.1	343.7	-341.1	1.60	1.30	4.03
3,114.0	13.35	88.72	3,076.4	74.4	366.2	-363.5	0.73	-0.69	-0.95
3,210.0	12.20	88.70	3,170.0	74.9	387.4	-384.7	1.20	-1.20	-0.02
3,306.0	11.74	88.84	3,263.9	75.3	407.3	-404.6	0.48	-0.48	0.15
3,401.0	12.46	88.98	3,356.8	75.7	427.2	-424.5	0.76	0.76	0.15
3,496.0	13.97	86.55	3,449.3	76.5	448.9	-446.1	1.69	1.59	-2.56
3,592.0	15.37	81.46	3,542.2	79.1	473.1	-470.2	1.98	1.46	-5.30
3,688.0	14.67	80.28	3,634.9	83.1	497.6	-494.6	0.80	-0.73	-1.23
3,783.0	14.32	79.69	3,726.9	87.2	521.0	-517.9	0.40	-0.37	-0.62
3,878.0	14.24	79.26	3,818.9	91.5	544.1	-540.8	0.14	-0.08	-0.45
3,974.0	14.15	78.73	3,912.0	96.0	567.2	-563.7	0.16	-0.09	-0.55
4,070.0	13.04	77.37	4,005.3	100.6	589.3	-585.6	1.20	-1.16	-1.42
4,165.0	14.17	78.24	4,097.6	105.3	611.1	-607.3	1.21	1.19	0.92
4,260.0	16.85	79.59	4,189.2	110.2	636.0	-632.0	2.85	2.82	1.42
4,356.0	16.08	77.80	4,281.2	115.5	662.7	-658.5	0.96	-0.80	-1.86
4,452.0	15.17	77.07	4,373.7	121.1	688.0	-683.6	0.97	-0.95	-0.76
4,547.0	14.13	75.35	4,465.6	126.9	711.3	-706.7	1.19	-1.09	-1.81
4,642.0	13.30	75.27	4,557.9	132.6	733.1	-728.3	0.87	-0.87	-0.08
4,738.0	14.37	80.18	4,651.1	137.4	755.5	-750.5	1.65	1.11	5.11
4,833.0	13.41	79.57	4,743.3	141.4	778.0	-772.8	1.02	-1.01	-0.64
4,929.0	12.95	78.21	4,836.8	145.6	799.4	-794.2	0.58	-0.48	-1.42
5,025.0	14.37	82.15	4,930.1	149.5	821.8	-816.4	1.77	1.48	4.10

Company:	PDC Energy Inc. DJ Basin	Local Co-ordinate Reference:	Well Harold 6X-334
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Site:	Harold 4N64W6X Pad Sec.6-T4N-R64W	MD Reference:	WELL @ 4810.0ft (RKB - 23')
Well:	Harold 6X-334	North Reference:	True
Wellbore:	Harold 6X-334 Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Harold 6X-334 Wellbore #1	Database:	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)
5,120.0	14.01	80.94	5,022.2	152.9	844.8	-839.3	0.49	-0.38	-1.27
5,216.0	13.30	80.46	5,115.5	156.5	867.2	-861.5	0.75	-0.74	-0.50
5,312.0	12.35	79.38	5,209.1	160.3	888.1	-882.4	1.02	-0.99	-1.13
5,407.0	11.21	76.39	5,302.1	164.3	907.1	-901.2	1.36	-1.20	-3.15
5,502.0	9.91	75.04	5,395.5	168.6	924.0	-917.9	1.39	-1.37	-1.42
5,598.0	10.07	79.74	5,490.0	172.2	940.2	-934.0	0.87	0.17	4.90
5,693.0	10.18	79.68	5,583.5	175.2	956.6	-950.3	0.12	0.12	-0.06
5,789.0	9.47	77.01	5,678.1	178.5	972.7	-966.3	0.88	-0.74	-2.78
5,885.0	8.85	74.32	5,772.9	182.3	987.5	-980.9	0.78	-0.65	-2.80
5,980.0	6.31	75.79	5,867.0	185.5	999.6	-992.9	2.68	-2.67	1.55
6,076.0	2.63	72.92	5,962.7	187.5	1,006.8	-1,000.1	3.84	-3.83	-2.99
6,172.0	0.10	347.22	6,058.7	188.2	1,008.9	-1,002.1	2.73	-2.64	-89.27
6,267.0	0.52	286.76	6,153.7	188.4	1,008.5	-1,001.7	0.50	0.44	-63.64
6,363.0	6.03	269.31	6,249.5	188.5	1,003.0	-996.2	5.77	5.74	-18.18
6,458.0	11.68	273.90	6,343.3	189.1	988.4	-981.6	5.99	5.95	4.83
6,554.0	16.58	268.59	6,436.4	189.4	965.0	-958.2	5.27	5.10	-5.53
6,650.0	26.88	268.01	6,525.5	188.3	929.5	-922.8	10.73	10.73	-0.60
6,746.0	36.62	271.19	6,607.0	188.1	879.1	-872.4	10.29	10.15	3.31
6,842.0	42.86	272.39	6,680.8	190.1	817.8	-811.0	6.55	6.50	1.25
6,937.0	49.25	270.01	6,746.7	191.4	749.4	-742.7	6.96	6.73	-2.51
7,033.0	57.76	268.27	6,803.7	190.2	672.4	-665.7	8.98	8.86	-1.81
7,059.6	60.00	268.77	6,817.5	189.6	649.6	-643.0	8.57	8.42	1.89
TPZ - 60° Incl. in curve - 701°FSL, 208°FWL, Sec.5									
7,129.0	65.85	269.99	6,849.1	189.0	587.8	-581.3	8.57	8.43	1.75
7,225.0	72.50	270.73	6,883.2	189.6	498.2	-491.6	6.96	6.93	0.77
7,321.0	79.16	271.23	6,906.7	191.2	405.1	-398.6	6.96	6.94	0.52
7,416.0	86.32	271.51	6,918.7	193.4	311.0	-304.4	7.54	7.54	0.29
7,434.1	86.76	271.53	6,919.7	193.9	292.9	-286.4	2.44	2.44	0.09
LPL 697°FSL & 149°FEL, Sec.6									
7,512.0	88.66	271.60	6,922.9	196.0	215.1	-208.5	2.44	2.44	0.09
7,636.0	90.00	271.03	6,924.3	198.9	91.2	-84.5	1.17	1.08	-0.46
Deepest Survey - 6924.31' TVD									
7,732.0	90.47	270.84	6,923.9	200.4	-4.8	11.4	0.53	0.49	-0.20
7,827.0	90.43	270.46	6,923.2	201.5	-99.8	106.4	0.40	-0.04	-0.40
7,923.0	90.51	270.53	6,922.4	202.3	-195.8	202.4	0.11	0.08	0.07
8,019.0	90.41	270.68	6,921.6	203.3	-291.8	298.4	0.19	-0.10	0.16
8,114.0	90.83	269.61	6,920.6	203.6	-386.8	393.3	1.21	0.44	-1.13
8,210.0	90.69	269.56	6,919.3	202.9	-482.8	489.2	0.15	-0.15	-0.05
8,305.0	90.75	269.15	6,918.1	201.8	-577.8	584.1	0.44	0.06	-0.43
8,401.0	90.89	269.00	6,916.7	200.3	-673.7	680.0	0.21	0.15	-0.16
8,497.0	91.16	268.23	6,915.0	198.0	-769.7	775.8	0.85	0.28	-0.80
8,592.0	91.27	268.06	6,913.0	194.9	-864.6	870.6	0.21	0.12	-0.18
8,688.0	91.20	267.33	6,910.9	191.0	-960.5	966.3	0.76	-0.07	-0.76
8,784.0	89.01	270.20	6,910.8	189.0	-1,056.5	1,062.2	3.76	-2.28	2.99

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Design:	Harold 6X-334 Wellbore #1	Database:	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)
8,879.0	88.82	268.46	6,912.6	187.8	-1,151.5	1,157.0	1.84	-0.20	-1.83
8,975.0	88.93	267.84	6,914.5	184.7	-1,247.4	1,252.8	0.66	0.11	-0.65
9,071.0	89.13	267.71	6,916.1	181.0	-1,343.3	1,348.6	0.25	0.21	-0.14
9,166.0	89.21	267.39	6,917.5	177.0	-1,438.2	1,443.3	0.35	0.08	-0.34
9,262.0	89.03	267.13	6,918.9	172.4	-1,534.1	1,538.9	0.33	-0.19	-0.27
9,357.0	88.64	266.90	6,920.9	167.4	-1,628.9	1,633.6	0.48	-0.41	-0.24
9,452.0	88.46	266.69	6,923.3	162.1	-1,723.8	1,728.2	0.29	-0.19	-0.22
9,548.0	90.35	268.75	6,924.3	158.3	-1,819.7	1,823.9	2.91	1.97	2.15
9,643.0	89.71	268.68	6,924.2	156.2	-1,914.6	1,918.8	0.68	-0.67	-0.07
9,738.0	90.57	270.34	6,924.0	155.3	-2,009.6	2,013.7	1.97	0.91	1.75
9,834.0	90.46	270.64	6,923.1	156.2	-2,105.6	2,109.6	0.33	-0.11	0.31
9,928.0	90.11	270.51	6,922.6	157.1	-2,199.6	2,203.6	0.40	-0.37	-0.14
10,024.0	89.83	270.58	6,922.7	158.0	-2,295.6	2,299.6	0.30	-0.29	0.07
10,119.0	89.70	270.63	6,923.1	159.0	-2,390.6	2,394.6	0.15	-0.14	0.05
10,213.0	89.22	270.73	6,924.0	160.1	-2,484.6	2,488.5	0.52	-0.51	0.11
10,309.0	92.11	270.51	6,922.9	161.2	-2,580.6	2,584.5	3.02	3.01	-0.23
10,404.0	92.18	270.15	6,919.3	161.7	-2,675.5	2,679.4	0.39	0.07	-0.38
10,500.0	92.45	269.88	6,915.4	161.8	-2,771.4	2,775.3	0.40	0.28	-0.28
10,596.0	90.76	270.11	6,912.7	161.7	-2,867.4	2,871.2	1.78	-1.76	0.24
10,691.0	90.97	269.44	6,911.3	161.4	-2,962.4	2,966.1	0.74	0.22	-0.71
10,787.0	89.17	271.04	6,911.2	161.8	-3,058.4	3,062.0	2.51	-1.88	1.67
10,882.0	89.34	269.25	6,912.4	162.0	-3,153.4	3,157.0	1.89	0.18	-1.88
10,978.0	89.53	268.95	6,913.4	160.5	-3,249.3	3,252.9	0.37	0.20	-0.31
11,073.0	89.22	268.22	6,914.4	158.2	-3,344.3	3,347.7	0.83	-0.33	-0.77
11,169.0	89.95	268.42	6,915.1	155.3	-3,440.3	3,443.5	0.79	0.76	0.21
11,265.0	89.92	267.81	6,915.2	152.2	-3,536.2	3,539.3	0.64	-0.03	-0.64
11,361.0	90.22	269.16	6,915.1	149.7	-3,632.2	3,635.1	1.44	0.31	1.41
11,457.0	90.22	268.55	6,914.7	147.7	-3,728.1	3,731.0	0.64	0.00	-0.64
11,553.0	90.69	268.18	6,914.0	145.0	-3,824.1	3,826.8	0.62	0.49	-0.39
11,648.0	90.95	267.46	6,912.6	141.4	-3,919.0	3,921.6	0.81	0.27	-0.76
11,744.0	91.56	267.02	6,910.5	136.8	-4,014.9	4,017.2	0.78	0.64	-0.46
11,781.0	91.55	266.86	6,909.5	134.8	-4,051.8	4,054.1	0.43	-0.03	-0.43
11,841.0	91.55	266.86	6,907.9	131.5	-4,111.7	4,113.8	0.00	0.00	0.00
Projected BHL 692'FSL & 503'FWL, Sec.6									

Company:	PDC Energy Inc. DJ Basin	Local Co-ordinate Reference:	Well Harold 6X-334
Project:	SEC.6-T4N-R64W	TVD Reference:	WELL @ 4810.0ft (RKB - 23')
Site:	Harold 4N64W6X Pad Sec.6-T4N-R64W	MD Reference:	WELL @ 4810.0ft (RKB - 23')
Well:	Harold 6X-334	North Reference:	True
Wellbore:	Harold 6X-334 Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Harold 6X-334 Wellbore #1	Database:	US_EDM

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 517'FSL & 437'FEL - survey hits target center - Point	0.00	0.00	1.0	0.0	0.0	1,366,374.37	3,254,938.35	40.335490	-104.585490
Projected BHL 692'FSL - survey misses target center by 13.3ft at 11841.0ft MD (6907.9 TVD, 131.5 N, -4111.7 E) - Point	0.00	0.00	6,920.0	136.2	-4,114.3	1,366,468.16	3,250,823.08	40.335863	-104.600248

Survey Annotations				
Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment
		+N/-S (ft)	+E/-W (ft)	
7,059.6	6,817.5	189.6	649.6	TPZ - 60° Incl. in curve - 701'FSL, 208'FWL, Sec.5
7,636.0	6,924.3	198.9	91.2	Deepest Survey - 6924.31' TVD

Checked By: _____	Approved By: _____	Date: _____
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