

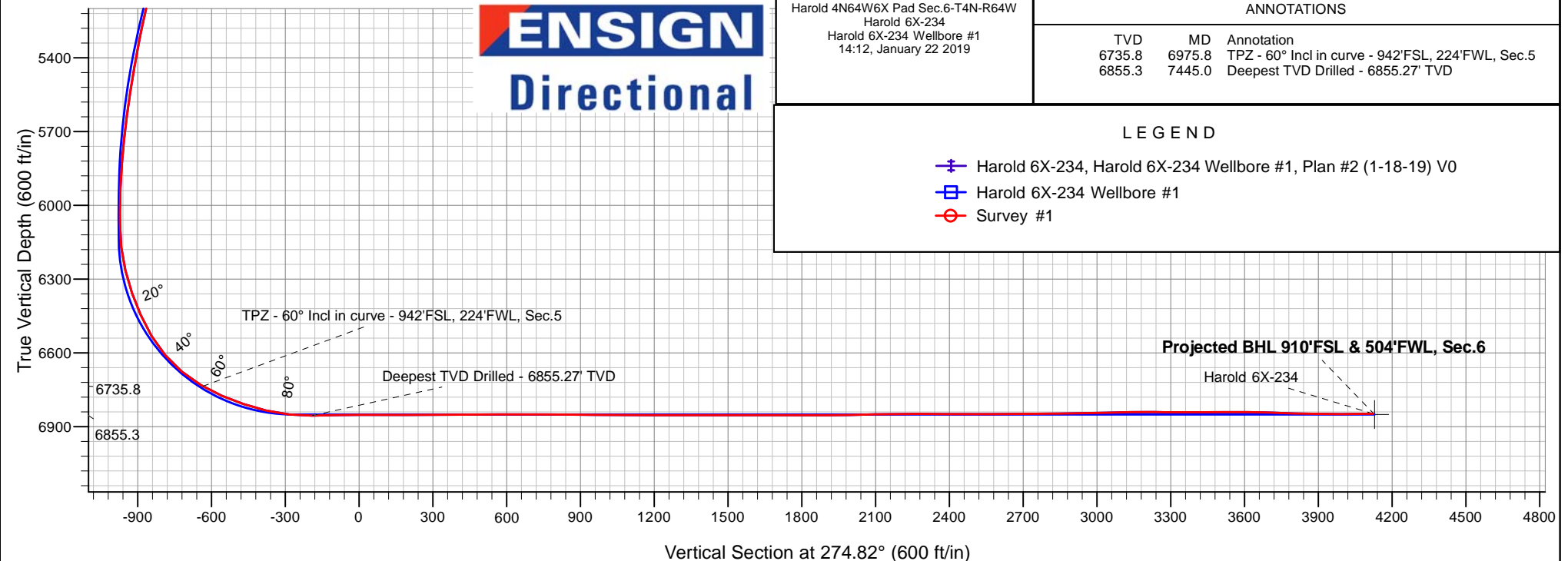
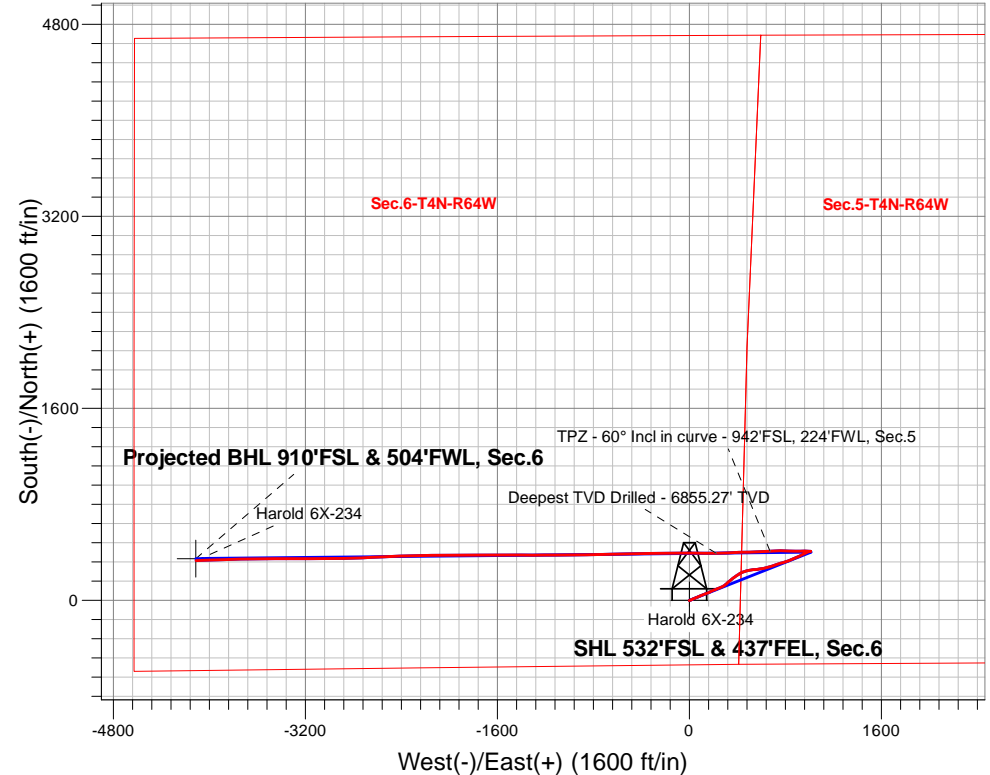
PDC Energy Inc. DJ Basin

Well Name: **Harold 6X-234**

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 1366392.583254938.16 40.335540 -104.585490
RKB - 23' WELL @ 4810.0ft (RKB - 23')

FINAL SURVEY

Projected Bottom Hole Location
11,780'MD 6849'TVD 331'N & 4110'W of SHL
90.80 degree Incl @ 267.61 degree AZM





PDC Energy Inc. DJ Basin

SEC.6-T4N-R64W

Harold 4N64W6X Pad Sec.6-T4N-R64W

Harold 6X-234

Harold 6X-234 Wellbore #1

Survey: Survey #1

Standard Survey Report

28 January, 2019

Company:	PDC Energy Inc. DJ Basin	Local Co-ordinate Reference:	Well Harold 6X-234
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-234	North Reference:	True
Wellbore:	Harold 6X-234 Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Harold 6X-234 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-234					
Well Position	+N/-S	0.0 ft	Northing:	1,366,392.58 usft	Latitude:	40.335540
	+E/-W	0.0 ft	Easting:	3,254,938.17 usft	Longitude:	-104.585490
Position Uncertainty		0.0 ft	Wellhead Elevation:	0.0 ft	Ground Level:	4,787.0 ft

Wellbore	Harold 6X-234 Wellbore #1				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	HDGM	1/18/2019	8.18	66.83	52,178

Design	Harold 6X-234 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	274.82	

Survey Program	Date	1/28/2019			
From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description	
252.0	11,780.0	Survey #1 (Harold 6X-234 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	121.38	1.0	0.0	0.0	0.0	0.00	0.00	0.00
SHL 532'FSL & 437'FEL, Sec.6									
252.0	0.14	121.38	252.0	-0.2	0.3	-0.3	0.06	0.06	0.00
348.0	0.38	143.31	348.0	-0.5	0.6	-0.6	0.27	0.25	22.84
444.0	0.25	146.43	444.0	-0.9	0.9	-0.9	0.14	-0.14	3.25
539.0	0.15	161.34	539.0	-1.2	1.0	-1.1	0.12	-0.11	15.69
635.0	0.44	85.65	635.0	-1.3	1.4	-1.5	0.45	0.30	-78.84
731.0	0.62	85.95	731.0	-1.2	2.3	-2.4	0.19	0.19	0.31
826.0	1.78	67.45	826.0	-0.6	4.2	-4.2	1.27	1.22	-19.47
921.0	3.18	66.44	920.9	1.0	8.0	-7.8	1.47	1.47	-1.06

Company:	PDC Energy Inc. DJ Basin	Local Co-ordinate Reference:	Well Harold 6X-234
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-234	North Reference:	True
Wellbore:	Harold 6X-234 Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Harold 6X-234 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	4.92	63.76	1,016.6	3.9	14.1	-13.7	1.82	1.81	-2.79
1,112.0	6.26	67.20	1,111.2	7.7	22.5	-21.8	1.45	1.41	3.62
1,208.0	7.80	69.45	1,206.5	12.0	33.4	-32.3	1.63	1.60	2.34
1,303.0	8.74	65.36	1,300.5	17.3	46.0	-44.4	1.17	0.99	-4.31
1,399.0	10.58	67.03	1,395.1	23.8	60.8	-58.6	1.94	1.92	1.74
1,495.0	12.28	65.59	1,489.2	31.4	78.2	-75.3	1.80	1.77	-1.50
1,590.0	13.65	67.34	1,581.8	39.9	97.7	-94.0	1.50	1.44	1.84
1,686.0	13.08	68.15	1,675.2	48.3	118.3	-113.8	0.62	-0.59	0.84
1,781.0	12.86	71.72	1,767.7	55.6	138.3	-133.1	0.87	-0.23	3.76
1,876.0	13.47	65.99	1,860.3	63.5	158.4	-152.6	1.52	0.64	-6.03
1,972.0	13.71	61.95	1,953.6	73.4	178.7	-171.9	1.02	0.25	-4.21
2,068.0	12.71	67.14	2,047.0	82.8	198.5	-190.8	1.62	-1.04	5.41
2,163.0	11.72	69.41	2,139.9	90.3	217.1	-208.8	1.16	-1.04	2.39
2,258.0	12.57	69.93	2,232.8	97.2	235.9	-226.9	0.90	0.89	0.55
2,354.0	14.27	67.07	2,326.1	105.4	256.6	-246.8	1.90	1.77	-2.98
2,450.0	15.04	63.77	2,419.0	115.5	278.7	-268.0	1.18	0.80	-3.44
2,520.0	14.12	54.20	2,486.8	124.5	293.7	-282.2	3.68	-1.31	-13.67
2,637.0	14.23	44.25	2,600.2	143.2	315.3	-302.2	2.08	0.09	-8.50
2,733.0	15.76	50.76	2,693.0	159.9	333.7	-319.1	2.37	1.59	6.78
2,828.0	15.74	50.48	2,784.4	176.2	353.6	-337.6	0.08	-0.02	-0.29
2,924.0	15.73	54.76	2,876.8	192.0	374.3	-356.8	1.21	-0.01	4.46
3,019.0	14.90	56.28	2,968.4	206.2	395.0	-376.2	0.97	-0.87	1.60
3,115.0	14.22	55.85	3,061.3	219.7	415.0	-395.1	0.72	-0.71	-0.45
3,210.0	14.46	66.87	3,153.4	230.9	435.6	-414.6	2.88	0.25	11.60
3,306.0	13.01	74.26	3,246.7	238.6	457.0	-435.3	2.37	-1.51	7.70
3,401.0	11.79	73.73	3,339.4	244.2	476.6	-454.4	1.29	-1.28	-0.56
3,496.0	10.60	75.44	3,432.6	249.1	494.4	-471.7	1.30	-1.25	1.80
3,592.0	11.39	80.20	3,526.9	252.9	512.3	-489.2	1.25	0.82	4.96
3,688.0	11.33	86.93	3,621.0	255.1	531.0	-507.7	1.38	-0.06	7.01
3,783.0	13.11	84.62	3,713.8	256.6	551.1	-527.5	1.94	1.87	-2.43
3,878.0	13.09	84.37	3,806.4	258.6	572.5	-548.7	0.06	-0.02	-0.26
3,974.0	14.44	80.51	3,899.6	261.7	595.1	-571.0	1.70	1.41	-4.02
4,070.0	13.81	79.14	3,992.7	265.8	618.2	-593.6	0.74	-0.66	-1.43
4,165.0	14.39	74.56	4,084.8	271.1	640.7	-615.6	1.32	0.61	-4.82
4,260.0	13.11	73.11	4,177.1	277.4	662.4	-636.7	1.40	-1.35	-1.53
4,356.0	12.15	72.65	4,270.8	283.5	682.4	-656.2	1.01	-1.00	-0.48
4,452.0	11.76	72.36	4,364.7	289.5	701.4	-674.6	0.41	-0.41	-0.30
4,547.0	12.47	71.87	4,457.6	295.6	720.4	-693.0	0.76	0.75	-0.52
4,643.0	12.95	71.40	4,551.2	302.3	740.4	-712.4	0.51	0.50	-0.49
4,738.0	12.98	74.00	4,643.8	308.6	760.8	-732.1	0.61	0.03	2.74
4,833.0	14.63	73.93	4,736.1	314.9	782.6	-753.3	1.74	1.74	-0.07
4,929.0	13.54	71.40	4,829.2	321.8	804.9	-775.0	1.30	-1.14	-2.64
5,025.0	15.15	68.27	4,922.2	330.1	827.2	-796.5	1.86	1.68	-3.26

Company:	PDC Energy Inc. DJ Basin	Local Co-ordinate Reference:	Well Harold 6X-234
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Site:	Harold 4N64W6X Pad Sec.6-T4N-R64W	MD Reference:	WELL @ 4810.0ft (RKB - 23')
Well:	Harold 6X-234	North Reference:	True
Wellbore:	Harold 6X-234 Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Harold 6X-234 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	16.98	68.38	5,013.5	339.8	851.6	-820.0	1.93	1.93	0.12
5,216.0	15.74	66.87	5,105.6	350.0	876.6	-844.1	1.37	-1.29	-1.57
5,312.0	13.82	66.28	5,198.4	359.8	899.1	-865.7	2.01	-2.00	-0.61
5,407.0	13.59	64.55	5,290.7	369.1	919.5	-885.3	0.49	-0.24	-1.82
5,502.0	11.97	62.14	5,383.3	378.5	938.3	-903.2	1.79	-1.71	-2.54
5,627.0	11.61	63.67	5,505.7	390.2	961.1	-924.9	0.38	-0.29	1.22
5,723.0	8.32	62.10	5,600.2	397.7	975.9	-939.0	3.44	-3.43	-1.64
5,818.0	7.37	71.73	5,694.4	402.8	987.7	-950.4	1.70	-1.00	10.14
5,914.0	5.81	75.57	5,789.7	406.0	998.3	-960.6	1.69	-1.63	4.00
6,010.0	3.21	83.67	5,885.4	407.5	1,005.7	-967.9	2.78	-2.71	8.44
6,105.0	0.92	106.37	5,980.4	407.6	1,009.0	-971.2	2.51	-2.41	23.89
6,201.0	0.27	197.94	6,076.3	407.1	1,009.7	-971.9	1.01	-0.68	95.39
6,296.0	6.12	276.46	6,171.2	407.5	1,004.6	-966.8	6.39	6.16	82.65
6,392.0	14.14	280.36	6,265.6	410.2	987.9	-950.0	8.38	8.35	4.06
6,488.0	18.93	266.56	6,357.6	411.3	960.8	-922.9	6.42	4.99	-14.38
6,583.0	24.69	268.41	6,445.8	409.9	925.6	-887.9	6.11	6.06	1.95
6,679.0	30.37	271.60	6,530.9	410.0	881.3	-843.7	6.11	5.92	3.32
6,775.0	39.94	271.76	6,609.3	411.6	826.1	-788.6	9.97	9.97	0.17
6,871.0	50.98	270.83	6,676.5	413.1	757.8	-720.4	11.52	11.50	-0.97
6,967.0	59.29	264.94	6,731.4	410.0	679.2	-642.3	10.01	8.66	-6.14
6,975.8	60.00	265.20	6,735.8	409.4	671.6	-634.8	8.47	8.08	2.95
TPZ - 60° Incl in curve - 942'FSL, 224'FWL, Sec.5									
7,062.0	66.99	267.57	6,774.3	404.5	594.7	-558.6	8.47	8.11	2.75
7,158.0	71.26	268.79	6,808.5	401.7	505.1	-469.5	4.60	4.45	1.27
7,254.0	76.87	268.45	6,834.8	399.5	412.8	-377.8	5.85	5.84	-0.35
7,350.0	84.03	266.09	6,850.8	395.0	318.3	-284.0	7.84	7.46	-2.46
7,370.1	85.40	266.92	6,852.6	393.7	298.4	-264.2	7.98	6.83	4.16
LPL 926'FSL & 149'FEL, Sec.6									
7,445.0	90.52	270.02	6,855.3	391.7	223.5	-189.8	7.98	6.83	4.13
Deepest TVD Drilled - 6855.27' TVD									
7,541.0	91.64	270.79	6,853.5	392.4	127.6	-94.1	1.42	1.17	0.80
7,636.0	89.96	270.28	6,852.1	393.3	32.6	0.6	1.85	-1.77	-0.54
7,732.0	88.91	269.92	6,853.1	393.5	-63.4	96.3	1.16	-1.09	-0.38
7,827.0	90.97	269.45	6,853.2	393.0	-158.4	190.9	2.22	2.17	-0.49
7,923.0	90.78	269.07	6,851.7	391.7	-254.4	286.4	0.44	-0.20	-0.40
8,019.0	90.01	268.81	6,851.0	389.9	-350.4	381.9	0.85	-0.80	-0.27
8,115.0	89.44	268.60	6,851.5	387.8	-446.3	477.3	0.63	-0.59	-0.22
8,210.0	90.53	268.81	6,851.5	385.6	-541.3	571.8	1.17	1.15	0.22
8,305.0	90.27	269.20	6,850.9	384.0	-636.3	666.3	0.49	-0.27	0.41
8,401.0	89.85	269.17	6,850.8	382.6	-732.3	761.8	0.44	-0.44	-0.03
8,497.0	89.33	268.38	6,851.5	380.6	-828.3	857.3	0.99	-0.54	-0.82
8,593.0	89.98	269.56	6,852.0	378.8	-924.2	952.8	1.40	0.68	1.23
8,688.0	89.52	269.67	6,852.5	378.2	-1,019.2	1,047.4	0.50	-0.48	0.12
8,784.0	89.73	269.63	6,853.1	377.6	-1,115.2	1,143.0	0.22	0.22	-0.04

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8,879.0	89.28	269.38	6,853.9	376.8	-1,210.2	1,237.6	0.54	-0.47	-0.26
8,975.0	90.56	270.40	6,854.0	376.6	-1,306.2	1,333.2	1.70	1.33	1.06
9,071.0	90.18	270.00	6,853.4	376.9	-1,402.2	1,428.9	0.57	-0.40	-0.42
9,166.0	90.11	269.96	6,853.2	376.9	-1,497.2	1,523.6	0.08	-0.07	-0.04
9,262.0	89.80	270.10	6,853.2	377.0	-1,593.2	1,619.3	0.35	-0.32	0.15
9,357.0	89.08	269.61	6,854.2	376.7	-1,688.2	1,713.9	0.92	-0.76	-0.52
9,452.0	90.69	270.02	6,854.4	376.4	-1,783.2	1,808.5	1.75	1.69	0.43
9,548.0	90.03	269.88	6,853.8	376.3	-1,879.2	1,904.2	0.70	-0.69	-0.15
9,643.0	91.31	269.93	6,852.7	376.2	-1,974.2	1,998.8	1.35	1.35	0.05
9,738.0	91.22	269.62	6,850.6	375.8	-2,069.2	2,093.4	0.34	-0.09	-0.33
9,834.0	90.73	269.09	6,848.9	374.7	-2,165.1	2,189.0	0.75	-0.51	-0.55
9,928.0	90.11	268.66	6,848.2	372.9	-2,259.1	2,282.5	0.80	-0.66	-0.46
10,024.0	89.78	268.00	6,848.3	370.1	-2,355.1	2,377.9	0.77	-0.34	-0.69
10,119.0	89.03	267.35	6,849.3	366.2	-2,450.0	2,472.1	1.04	-0.79	-0.68
10,213.0	90.29	268.21	6,849.9	362.6	-2,543.9	2,565.4	1.62	1.34	0.91
10,309.0	90.55	267.46	6,849.2	358.9	-2,639.9	2,660.7	0.83	0.27	-0.78
10,404.0	91.10	266.82	6,847.8	354.2	-2,734.7	2,754.8	0.89	0.58	-0.67
10,500.0	90.28	268.72	6,846.6	350.5	-2,830.6	2,850.1	2.16	-0.85	1.98
10,596.0	91.28	268.22	6,845.3	347.9	-2,926.6	2,945.5	1.16	1.04	-0.52
10,691.0	90.92	269.85	6,843.5	346.3	-3,021.6	3,040.0	1.76	-0.38	1.72
10,787.0	91.68	270.39	6,841.3	346.5	-3,117.5	3,135.6	0.97	0.79	0.56
10,882.0	88.82	270.78	6,840.9	347.5	-3,212.5	3,230.4	3.04	-3.01	0.41
10,978.0	89.90	269.81	6,842.0	348.0	-3,308.5	3,326.1	1.51	1.13	-1.01
11,073.0	90.38	269.75	6,841.8	347.6	-3,403.5	3,420.7	0.51	0.51	-0.06
11,169.0	89.09	269.92	6,842.2	347.3	-3,499.5	3,516.3	1.36	-1.34	0.18
11,265.0	90.10	268.56	6,842.9	346.1	-3,595.5	3,611.9	1.76	1.05	-1.42
11,361.0	87.76	269.22	6,844.7	344.2	-3,691.4	3,707.3	2.53	-2.44	0.69
11,457.0	88.34	268.43	6,847.9	342.2	-3,787.4	3,802.7	1.02	0.60	-0.82
11,553.0	89.23	268.42	6,850.0	339.6	-3,883.3	3,898.1	0.93	0.93	-0.01
11,648.0	90.08	267.51	6,850.5	336.2	-3,978.2	3,992.4	1.31	0.89	-0.96
11,720.0	90.80	267.61	6,850.0	333.2	-4,050.2	4,063.9	1.01	1.00	0.14
11,780.0	90.80	267.61	6,849.2	330.7	-4,110.1	4,123.4	0.00	0.00	0.00
Projected BHL 910'FSL & 504'FWL, Sec.6									

Company:	PDC Energy Inc. DJ Basin	Local Co-ordinate Reference:	Well Harold 6X-234
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-234	North Reference:	True
Wellbore:	Harold 6X-234 Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Harold 6X-234 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 532'FSL & 437'FEL - survey hits target center - Point	0.00	0.00	1.0	0.0	0.0	1,366,392.58	3,254,938.17	40.335540	-104.585490
Projected BHL 910'FSL - survey misses target center by 16.9ft at 11780.0ft MD (6849.2 TVD, 330.7 N, -4110.1 E) - Point	0.00	0.00	6,851.0	347.0	-4,114.1	1,366,697.11	3,250,820.89	40.336492	-104.600248

Survey Annotations				
Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment
		+N/-S (ft)	+E/-W (ft)	
6,975.8	6,735.8	409.4	671.6	TPZ - 60° Incl in curve - 942'FSL, 224'FWL, Sec.5
7,445.0	6,855.3	391.7	223.5	Deepest TVD Drilled - 6855.27' TVD

Checked By: _____	Approved By: _____	Date: _____
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