

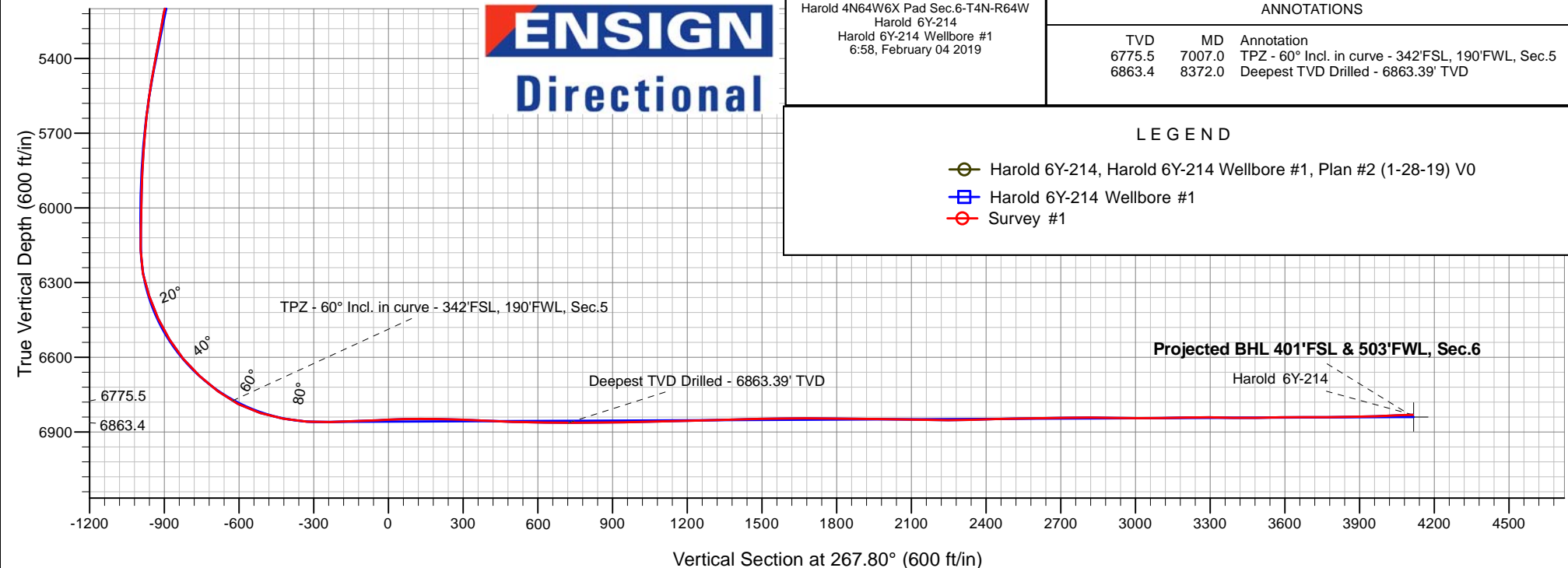
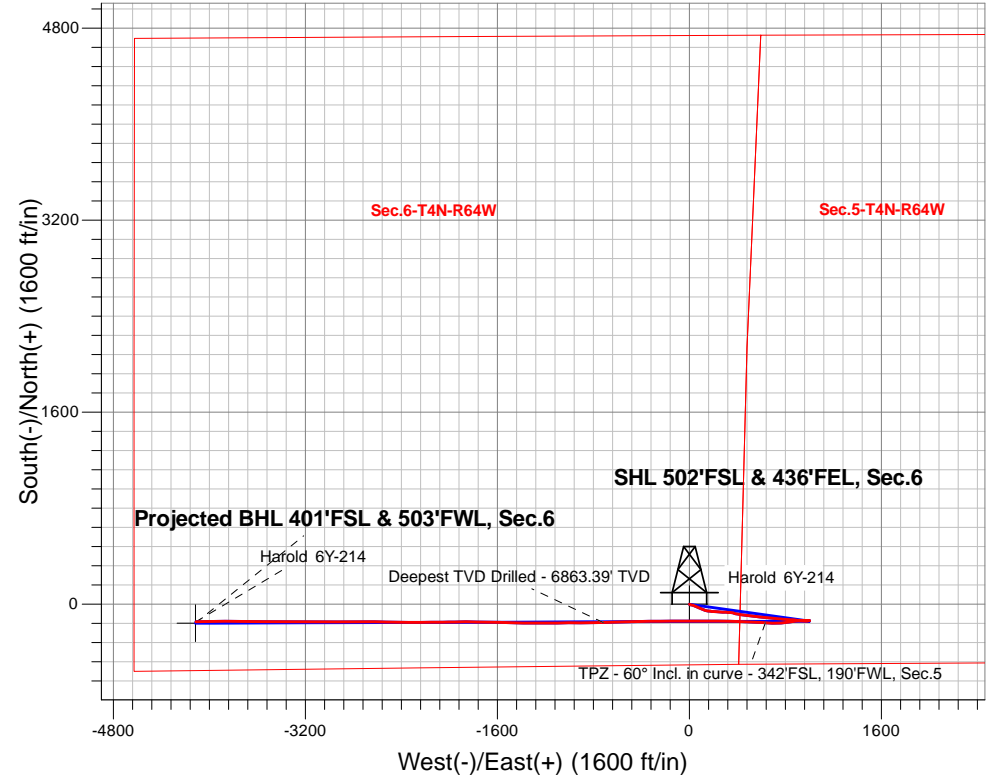
PDC Energy Inc. DJ Basin

Well Name: **Harold 6Y-214**

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 Latitude Longitude Slot
0.0 0.0 1366359.793254938.50 40.335450 -104.585490
RKB - 23' WELL @ 4810.0ft (RKB - 23')

FINAL SURVEY

Projected Bottom Hole Location
11,768'MD 6831'TVD 145'S & 4112'W of SHL
92.48 degree Incl @ 268.69 degree AZM



ENSIGN
Directional

Harold 4N64W6X Pad Sec.6-T4N-R64W
Harold 6Y-214
Harold 6Y-214 Wellbore #1
6:58, February 04 2019

ANNOTATIONS

TVD	MD	Annotation
6775.5	7007.0	TPZ - 60° Incl. in curve - 342'FSL, 190'FWL, Sec.5
6863.4	8372.0	Deepest TVD Drilled - 6863.39' TVD

LEGEND

- Harold 6Y-214, Harold 6Y-214 Wellbore #1, Plan #2 (1-28-19) V0
- Harold 6Y-214 Wellbore #1
- Survey #1



PDC Energy Inc. DJ Basin

SEC.6-T4N-R64W

Harold 4N64W6X Pad Sec.6-T4N-R64W

Harold 6Y-214

Harold 6Y-214 Wellbore #1

Survey: Survey #1

Standard Survey Report

04 February, 2019

Company:	PDC Energy Inc. DJ Basin	Local Co-ordinate Reference:	Well Harold 6Y-214
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 6Y-214	North Reference:	True
Wellbore:	Harold 6Y-214 Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Harold 6Y-214 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 6Y-214					
Well Position	+N/-S	0.0 ft	Northing:	1,366,359.79 usft	Latitude:	40.335450
	+E/-W	0.0 ft	Easting:	3,254,938.50 usft	Longitude:	-104.585490
Position Uncertainty		0.0 ft	Wellhead Elevation:	0.0 ft	Ground Level:	4,787.0 ft

Wellbore	Harold 6Y-214 Wellbore #1				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	HDGM	1/28/2019	8.17	66.83	52,175

Design	Harold 6Y-214 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	267.80	

Survey Program	Date	2/4/2019			
From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description	
252.0	11,768.0	Survey #1 (Harold 6Y-214 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	54.23	1.0	0.0	0.0	0.0	0.00	0.00	0.00	
SHL 502'FSL & 436'FEL, Sec.6										
252.0	0.23	54.23	252.0	0.3	0.4	-0.4	0.09	0.09	0.00	
348.0	0.48	179.40	348.0	0.0	0.6	-0.6	0.67	0.26	130.39	
444.0	1.48	130.63	444.0	-1.2	1.5	-1.5	1.27	1.04	-50.80	
539.0	2.74	102.89	538.9	-2.5	4.7	-4.6	1.67	1.33	-29.20	
635.0	4.12	103.55	634.7	-3.8	10.3	-10.1	1.44	1.44	0.69	
731.0	6.63	105.36	730.3	-6.1	18.9	-18.7	2.62	2.61	1.89	
826.0	7.36	108.26	824.6	-9.5	30.0	-29.6	0.85	0.77	3.05	
921.0	9.86	111.57	918.5	-14.4	43.4	-42.8	2.68	2.63	3.48	

Company:	PDC Energy Inc. DJ Basin	Local Co-ordinate Reference:	Well Harold 6Y-214
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 6Y-214	North Reference:	True
Wellbore:	Harold 6Y-214 Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Harold 6Y-214 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	11.23	111.39	1,012.9	-20.8	59.7	-58.9	1.43	1.43	-0.19
1,112.0	12.66	114.81	1,105.8	-28.5	77.8	-76.6	1.68	1.51	3.60
1,208.0	12.86	113.33	1,199.5	-37.2	97.1	-95.6	0.40	0.21	-1.54
1,303.0	12.93	111.77	1,292.1	-45.3	116.7	-114.9	0.37	0.07	-1.64
1,399.0	12.78	106.08	1,385.7	-52.2	136.9	-134.8	1.33	-0.16	-5.93
1,495.0	12.43	98.62	1,479.4	-56.7	157.3	-155.0	1.73	-0.36	-7.77
1,590.0	12.37	95.61	1,572.2	-59.3	177.5	-175.1	0.68	-0.06	-3.17
1,686.0	10.32	89.22	1,666.3	-60.1	196.4	-193.9	2.50	-2.14	-6.66
1,781.0	10.74	93.47	1,759.7	-60.6	213.7	-211.2	0.93	0.44	4.47
1,876.0	11.53	99.11	1,852.9	-62.6	231.9	-229.4	1.42	0.83	5.94
1,972.0	11.77	95.95	1,946.9	-65.1	251.1	-248.5	0.71	0.25	-3.29
2,068.0	11.91	91.32	2,040.9	-66.4	270.8	-268.0	1.00	0.15	-4.82
2,163.0	11.46	90.32	2,133.9	-66.7	290.0	-287.3	0.52	-0.47	-1.05
2,259.0	11.44	92.51	2,228.0	-67.1	309.1	-306.3	0.45	-0.02	2.28
2,354.0	10.05	91.04	2,321.3	-67.7	326.8	-323.9	1.49	-1.46	-1.55
2,450.0	8.27	94.25	2,416.1	-68.4	342.0	-339.2	1.93	-1.85	3.34
2,519.0	8.37	97.89	2,484.4	-69.4	352.0	-349.0	0.78	0.14	5.28
2,637.0	9.06	110.64	2,601.0	-73.9	369.2	-366.1	1.73	0.58	10.81
2,733.0	11.46	104.51	2,695.5	-78.9	385.5	-382.2	2.74	2.50	-6.39
2,828.0	11.78	99.78	2,788.5	-82.9	404.2	-400.7	1.06	0.34	-4.98
2,924.0	11.92	97.38	2,882.5	-85.9	423.7	-420.0	0.53	0.15	-2.50
3,019.0	10.37	97.75	2,975.7	-88.3	441.9	-438.1	1.63	-1.63	0.39
3,115.0	11.43	100.59	3,070.0	-91.2	459.8	-455.9	1.24	1.10	2.96
3,210.0	11.80	96.97	3,163.0	-94.1	478.7	-474.7	0.86	0.39	-3.81
3,306.0	10.91	98.21	3,257.1	-96.6	497.4	-493.3	0.96	-0.93	1.29
3,401.0	11.35	95.21	3,350.4	-98.7	515.6	-511.4	0.77	0.46	-3.16
3,497.0	12.67	95.05	3,444.3	-100.5	535.5	-531.2	1.38	1.38	-0.17
3,592.0	13.10	95.08	3,536.9	-102.4	556.6	-552.3	0.45	0.45	0.03
3,688.0	11.76	93.40	3,630.6	-103.9	577.2	-572.8	1.45	-1.40	-1.75
3,783.0	12.21	96.25	3,723.5	-105.6	596.9	-592.4	0.78	0.47	3.00
3,879.0	12.78	96.84	3,817.3	-108.0	617.5	-612.9	0.61	0.59	0.61
3,975.0	12.58	97.79	3,910.9	-110.6	638.4	-633.7	0.30	-0.21	0.99
4,070.0	11.81	98.72	4,003.8	-113.5	658.3	-653.4	0.84	-0.81	0.98
4,165.0	12.06	94.02	4,096.7	-115.7	677.8	-672.8	1.06	0.26	-4.95
4,261.0	11.65	94.57	4,190.7	-117.2	697.4	-692.4	0.44	-0.43	0.57
4,356.0	12.57	94.39	4,283.6	-118.7	717.3	-712.2	0.97	0.97	-0.19
4,452.0	11.85	95.03	4,377.4	-120.4	737.5	-732.4	0.76	-0.75	0.67
4,548.0	12.19	95.25	4,471.3	-122.2	757.4	-752.2	0.36	0.35	0.23
4,643.0	12.60	96.27	4,564.1	-124.2	777.7	-772.4	0.49	0.43	1.07
4,738.0	11.94	95.36	4,656.9	-126.3	797.8	-792.4	0.72	-0.69	-0.96
4,833.0	10.88	93.64	4,750.0	-127.8	816.5	-811.0	1.17	-1.12	-1.81
4,929.0	11.78	94.09	4,844.2	-129.0	835.4	-829.8	0.94	0.94	0.47
5,025.0	10.62	89.01	4,938.3	-129.6	854.0	-848.4	1.59	-1.21	-5.29

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Site:	Harold 4N64W6X Pad Sec.6-T4N-R64W	MD Reference:	WELL @ 4810.0ft (RKB - 23')
Well:	Harold 6Y-214	North Reference:	True
Wellbore:	Harold 6Y-214 Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Harold 6Y-214 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	11.36	97.13	5,031.6	-130.6	872.0	-866.4	1.80	0.78	8.55
5,216.0	10.83	96.06	5,125.8	-132.7	890.4	-884.6	0.59	-0.55	-1.11
5,312.0	10.24	101.67	5,220.2	-135.4	907.7	-901.8	1.23	-0.61	5.84
5,407.0	11.03	97.39	5,313.5	-138.3	925.0	-919.0	1.18	0.83	-4.51
5,502.0	10.22	93.02	5,406.9	-139.9	942.4	-936.3	1.20	-0.85	-4.60
5,598.0	9.40	90.61	5,501.5	-140.4	958.8	-952.7	0.96	-0.85	-2.51
5,693.0	7.31	87.63	5,595.5	-140.3	972.6	-966.4	2.25	-2.20	-3.14
5,789.0	4.84	84.29	5,691.0	-139.6	982.7	-976.6	2.60	-2.57	-3.48
5,885.0	4.22	78.31	5,786.7	-138.5	990.2	-984.1	0.81	-0.65	-6.23
5,980.0	1.89	84.29	5,881.5	-137.6	995.2	-989.1	2.47	-2.45	6.29
6,076.0	1.29	94.91	5,977.5	-137.5	997.8	-991.8	0.69	-0.63	11.06
6,172.0	1.30	79.59	6,073.5	-137.4	1,000.0	-993.9	0.36	0.01	-15.96
6,267.0	0.50	221.62	6,168.4	-137.6	1,000.7	-994.7	1.81	-0.84	149.51
6,363.0	11.08	275.65	6,263.8	-137.0	991.3	-985.3	11.24	11.02	56.28
6,458.0	19.21	271.85	6,355.5	-135.6	966.5	-960.6	8.62	8.56	-4.00
6,554.0	24.77	265.27	6,444.5	-136.7	930.6	-924.7	6.33	5.79	-6.85
6,650.0	31.73	264.55	6,529.0	-140.8	885.4	-879.4	7.26	7.25	-0.75
6,746.0	39.98	261.28	6,606.7	-147.9	829.7	-823.4	8.82	8.59	-3.41
6,842.0	47.59	263.63	6,676.0	-156.5	763.9	-757.3	8.10	7.93	2.45
6,937.0	52.88	272.83	6,736.8	-158.5	691.1	-684.5	9.29	5.57	9.68
7,007.0	60.00	273.90	6,775.5	-155.1	632.9	-626.5	10.24	10.16	1.53
TPZ - 60° Incl. in curve - 342'FSL, 190'FWL, Sec.5									
7,033.0	62.64	274.26	6,787.9	-153.4	610.1	-603.8	10.24	10.17	1.38
7,129.0	73.61	271.73	6,823.7	-148.9	521.3	-515.2	11.68	11.43	-2.64
7,225.0	78.53	272.82	6,846.8	-145.2	428.2	-422.3	5.24	5.13	1.14
7,321.0	86.83	271.81	6,859.0	-141.3	333.2	-327.5	8.71	8.65	-1.05
7,372.6	89.48	271.07	6,860.7	-140.0	281.6	-276.1	5.34	5.14	-1.44
LPL 354'FSL & 152'FEL, Sec.6									
7,416.0	91.71	270.44	6,860.2	-139.5	238.2	-232.7	5.34	5.14	-1.44
7,512.0	91.99	269.56	6,857.1	-139.5	142.3	-136.8	0.96	0.29	-0.92
7,607.0	92.73	269.21	6,853.2	-140.5	47.4	-41.9	0.86	0.78	-0.37
7,702.0	91.46	270.52	6,849.7	-140.7	-47.6	52.9	1.92	-1.34	1.38
7,798.0	90.57	269.52	6,848.0	-140.7	-143.5	148.8	1.39	-0.93	-1.04
7,894.0	88.11	269.77	6,849.1	-141.3	-239.5	244.8	2.58	-2.56	0.26
7,990.0	87.48	269.29	6,852.8	-142.0	-335.5	340.7	0.82	-0.66	-0.50
8,085.0	86.96	268.93	6,857.4	-143.5	-430.3	435.5	0.67	-0.55	-0.38
8,180.0	89.17	267.67	6,860.6	-146.3	-525.2	530.5	2.68	2.33	-1.33
8,276.0	88.62	267.42	6,862.5	-150.4	-621.1	626.4	0.63	-0.57	-0.26
8,372.0	90.30	269.52	6,863.4	-153.0	-717.1	722.4	2.80	1.75	2.19
Deepest TVD Drilled - 6863.39' TVD									
8,468.0	90.59	269.96	6,862.6	-153.4	-813.1	818.4	0.55	0.30	0.46
8,563.0	90.78	269.81	6,861.5	-153.6	-908.1	913.3	0.25	0.20	-0.16
8,659.0	91.13	269.49	6,859.9	-154.2	-1,004.0	1,009.2	0.49	0.36	-0.33
8,754.0	91.61	268.93	6,857.6	-155.5	-1,099.0	1,104.2	0.78	0.51	-0.59

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Design:	Harold 6Y-214 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)	
8,850.0	90.88	270.36	6,855.6	-156.1	-1,195.0	1,200.1	1.67	-0.76	1.49	
8,946.0	91.49	270.44	6,853.6	-155.5	-1,291.0	1,296.0	0.64	0.64	0.08	
9,041.0	92.15	269.71	6,850.5	-155.3	-1,385.9	1,390.9	1.04	0.69	-0.77	
9,137.0	90.72	271.57	6,848.1	-154.3	-1,481.9	1,486.7	2.44	-1.49	1.94	
9,233.0	91.64	271.26	6,846.2	-151.9	-1,577.8	1,582.5	1.01	0.96	-0.32	
9,327.0	89.41	271.78	6,845.3	-149.4	-1,671.8	1,676.3	2.44	-2.37	0.55	
9,423.0	89.39	270.51	6,846.3	-147.5	-1,767.7	1,772.1	1.32	-0.02	-1.32	
9,518.0	89.24	269.68	6,847.4	-147.3	-1,862.7	1,867.0	0.89	-0.16	-0.87	
9,614.0	89.33	269.04	6,848.6	-148.4	-1,958.7	1,963.0	0.67	0.09	-0.67	
9,709.0	89.10	270.31	6,849.9	-148.9	-2,053.7	2,057.9	1.36	-0.24	1.34	
9,805.0	89.13	269.48	6,851.4	-149.1	-2,149.7	2,153.8	0.87	0.03	-0.86	
9,899.0	89.50	268.69	6,852.6	-150.6	-2,243.7	2,247.8	0.93	0.39	-0.84	
9,995.0	91.55	270.90	6,851.7	-150.9	-2,339.7	2,343.7	3.14	2.14	2.30	
10,090.0	92.35	271.02	6,848.4	-149.4	-2,434.6	2,438.5	0.85	0.84	0.13	
10,184.0	90.46	271.21	6,846.1	-147.5	-2,528.5	2,532.3	2.02	-2.01	0.20	
10,280.0	90.91	270.26	6,845.0	-146.3	-2,624.5	2,628.2	1.09	0.47	-0.99	
10,375.0	91.34	269.70	6,843.1	-146.3	-2,719.5	2,723.1	0.74	0.45	-0.59	
10,471.0	89.29	270.69	6,842.6	-146.0	-2,815.5	2,819.0	2.37	-2.14	1.03	
10,566.0	89.09	269.82	6,843.9	-145.6	-2,910.5	2,913.9	0.94	-0.21	-0.92	
10,662.0	89.87	269.48	6,844.8	-146.2	-3,006.5	3,009.9	0.89	0.81	-0.35	
10,757.0	90.62	269.10	6,844.4	-147.3	-3,101.5	3,104.8	0.89	0.79	-0.40	
10,853.0	91.76	269.48	6,842.4	-148.5	-3,197.4	3,200.8	1.25	1.19	0.40	
10,949.0	89.21	270.87	6,841.6	-148.2	-3,293.4	3,296.7	3.03	-2.66	1.45	
11,044.0	89.29	270.86	6,842.8	-146.8	-3,388.4	3,391.5	0.08	0.08	-0.01	
11,140.0	90.55	270.87	6,843.0	-145.4	-3,484.4	3,487.4	1.31	1.31	0.01	
11,235.0	91.43	270.83	6,841.3	-143.9	-3,579.4	3,582.3	0.93	0.93	-0.04	
11,331.0	89.55	270.51	6,840.5	-142.8	-3,675.4	3,678.1	1.99	-1.96	-0.33	
11,427.0	90.24	270.23	6,840.7	-142.2	-3,771.4	3,774.0	0.78	0.72	-0.29	
11,523.0	91.11	269.87	6,839.6	-142.1	-3,867.3	3,870.0	0.98	0.91	-0.38	
11,619.0	91.86	269.22	6,837.1	-142.9	-3,963.3	3,965.9	1.03	0.78	-0.68	
11,708.0	92.48	268.69	6,833.7	-144.5	-4,052.2	4,054.8	0.92	0.70	-0.60	
11,768.0	92.48	268.69	6,831.1	-145.9	-4,112.2	4,114.7	0.00	0.00	0.00	
Projected BHL 401'FSL & 503'FWL, Sec.6										

Company:	PDC Energy Inc. DJ Basin	Local Co-ordinate Reference:	Well Harold 6Y-214
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 6Y-214	North Reference:	True
Wellbore:	Harold 6Y-214 Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Harold 6Y-214 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 502'FSL & 436'FEL - survey hits target center - Point	0.00	0.00	1.0	0.0	0.0	1,366,359.80	3,254,938.50	40.335450	-104.585490
Projected BHL 401'FSL i - survey misses target center by 15.3ft at 11768.0ft MD (6831.1 TVD, -145.9 N, -4112.2 E) - Point	0.00	0.00	6,840.0	-158.2	-4,114.5	1,366,159.22	3,250,826.07	40.335015	-104.600249

Survey Annotations				
Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment
		+N/-S (ft)	+E/-W (ft)	
7,007.0	6,775.5	-155.1	632.9	TPZ - 60° Incl. in curve - 342'FSL, 190'FWL, Sec.5
8,372.0	6,863.4	-153.0	-717.1	Deepest TVD Drilled - 6863.39' TVD

Checked By: _____	Approved By: _____	Date: _____
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