

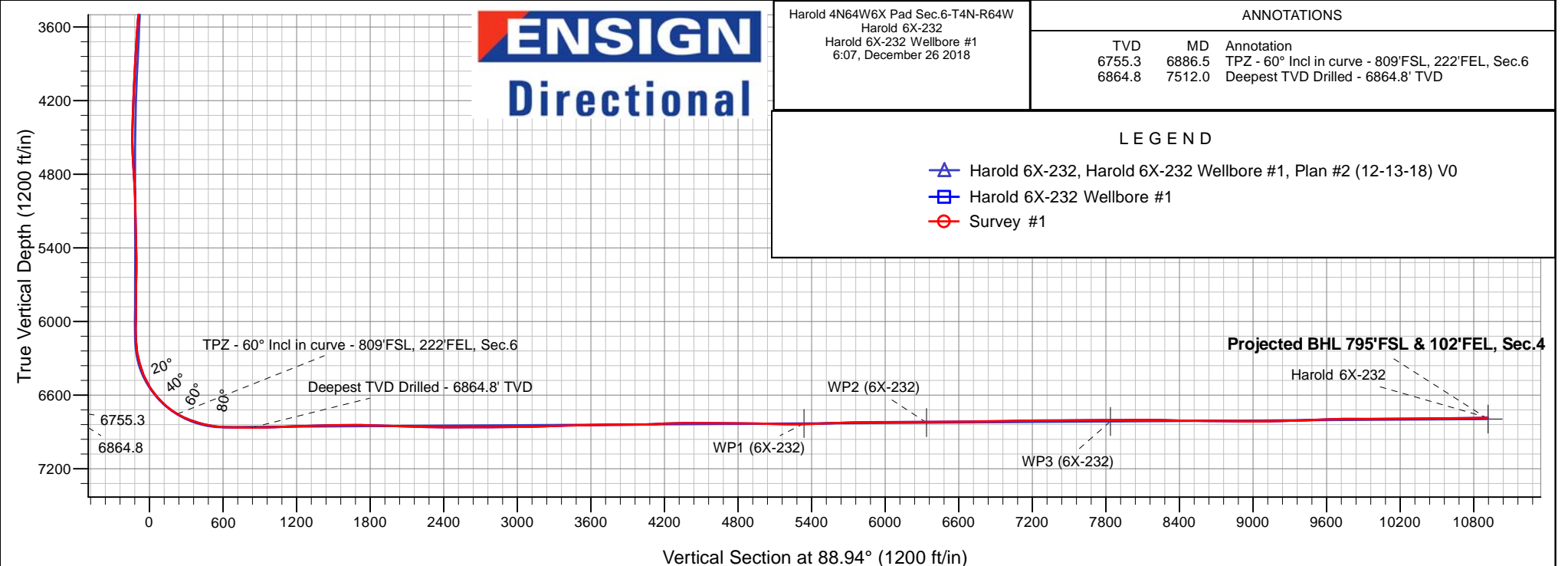
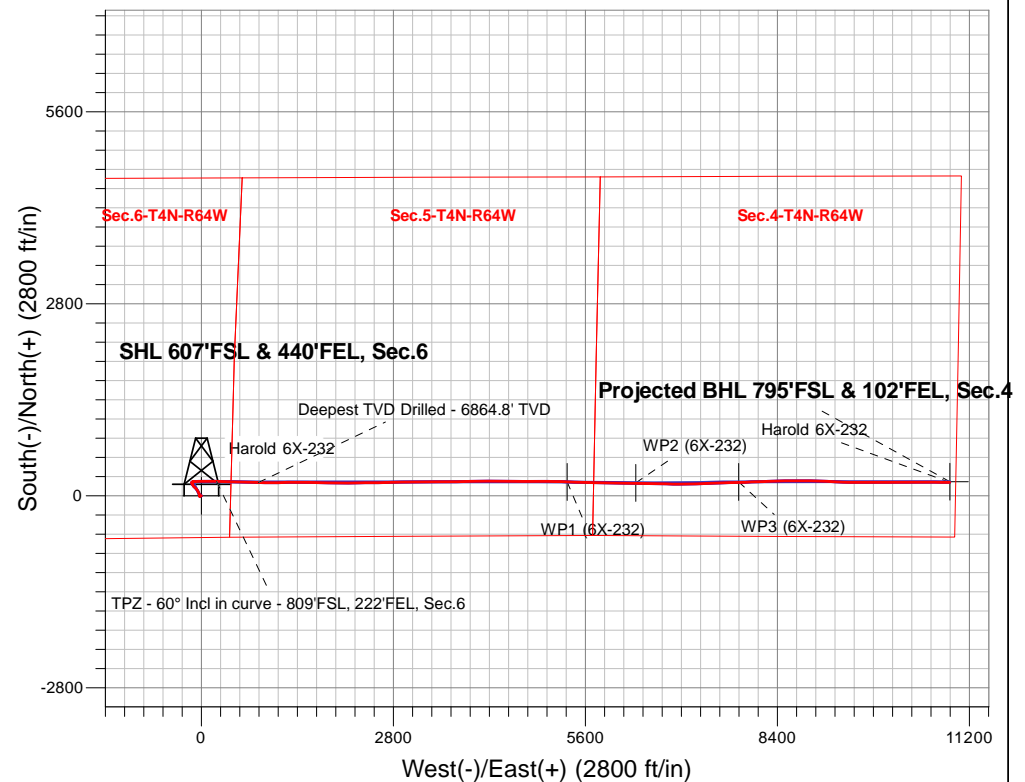
PDC Energy Inc. DJ Basin

Well Name: **Harold 6X-232**

Surface Location: Harold 4N64W6X Pad Sec.6-T4N-R64W
North American Datum 1983 , US State Plane 1983, Colorado Northern Zone
Ground Elevation: 4788.0
+N/-S+E/-W Northing Easting Latitude Longitude Slot
0.0 0.0 1366465.43254937.41 40.335740 -104.585490
RKB - 23' WELL @ 4811.0ft (RKB - 23')

FINAL SURVEY

Projected Bottom Hole Location
17,598'MD 6785'TVD 196'N & 10912'E of SHL
91.11 degree Incl @ 90.04 degree AZM



ENSIGN
Directional

Harold 4N64W6X Pad Sec.6-T4N-R64W
Harold 6X-232
Harold 6X-232 Wellbore #1
6:07, December 26 2018

ANNOTATIONS

TVD	MD	Annotation
6755.3	6886.5	TPZ - 60° Incl in curve - 809'FSL, 222'FEL, Sec. 6
6864.8	7512.0	Deepest TVD Drilled - 6864.8' TVD

LEGEND

- Harold 6X-232, Harold 6X-232 Wellbore #1, Plan #2 (12-13-18) V0
- Harold 6X-232 Wellbore #1
- Survey #1



PDC Energy Inc. DJ Basin

SEC.6-T4N-R64W

Harold 4N64W6X Pad Sec.6-T4N-R64W

Harold 6X-232

Harold 6X-232 Wellbore #1

Survey: Survey #1

Standard Survey Report

26 December, 2018

Company:	PDC Energy Inc. DJ Basin	Local Co-ordinate Reference:	Well Harold 6X-232
Project:	SEC.6-T4N-R64W	TVD Reference:	WELL @ 4811.0ft (RKB - 23')
Site:	Harold 4N64W6X Pad Sec.6-T4N-R64W	MD Reference:	WELL @ 4811.0ft (RKB - 23')
Well:	Harold 6X-232	North Reference:	True
Wellbore:	Harold 6X-232 Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Harold 6X-232 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-232					
Well Position	+N/-S	0.0 ft	Northing:	1,366,465.43 usft	Latitude:	40.335740
	+E/-W	0.0 ft	Easting:	3,254,937.41 usft	Longitude:	-104.585490
Position Uncertainty		0.0 ft	Wellhead Elevation:	0.0 ft	Ground Level:	4,788.0 ft

Wellbore	Harold 6X-232 Wellbore #1				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	HDGM	12/13/2018	8.18	66.83	52,190

Design	Harold 6X-232 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	88.94	

Survey Program	Date	12/26/2018			
From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description	
158.0	17,598.0	Survey #1 (Harold 6X-232 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	0.01	268.23	1.0	0.0	0.0	0.0	0.58	0.58	0.00	
SHL 607'FSL & 440'FEL, Sec.6										
158.0	0.92	268.23	158.0	0.0	-1.3	-1.3	0.58	0.58	0.00	
253.0	1.15	261.18	253.0	-0.2	-3.0	-3.0	0.28	0.24	-7.42	
348.0	1.11	258.65	348.0	-0.5	-4.8	-4.8	0.07	-0.04	-2.66	
444.0	1.11	256.16	443.9	-0.9	-6.6	-6.6	0.05	0.00	-2.59	
540.0	1.16	260.29	539.9	-1.3	-8.5	-8.5	0.10	0.05	4.30	
635.0	1.21	256.78	634.9	-1.7	-10.4	-10.4	0.09	0.05	-3.69	
731.0	1.26	273.53	730.9	-1.9	-12.5	-12.5	0.38	0.05	17.45	
826.0	1.44	268.63	825.9	-1.9	-14.7	-14.7	0.22	0.19	-5.16	

Company:	PDC Energy Inc. DJ Basin	Local Co-ordinate Reference:	Well Harold 6X-232
Project:	SEC.6-T4N-R64W	TVD Reference:	WELL @ 4811.0ft (RKB - 23')
Site:	Harold 4N64W6X Pad Sec.6-T4N-R64W	MD Reference:	WELL @ 4811.0ft (RKB - 23')
Well:	Harold 6X-232	North Reference:	True
Wellbore:	Harold 6X-232 Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Harold 6X-232 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)
922.0	1.51	258.28	921.8	-2.1	-17.1	-17.2	0.29	0.07	-10.78
1,017.0	1.38	261.47	1,016.8	-2.6	-19.5	-19.5	0.16	-0.14	3.36
1,113.0	1.30	271.37	1,112.8	-2.7	-21.7	-21.8	0.25	-0.08	10.31
1,208.0	1.41	267.39	1,207.7	-2.7	-24.0	-24.0	0.15	0.12	-4.19
1,303.0	0.67	260.96	1,302.7	-2.9	-25.7	-25.7	0.79	-0.78	-6.77
1,399.0	0.27	163.79	1,398.7	-3.2	-26.2	-26.2	0.78	-0.42	-101.22
1,495.0	0.26	128.70	1,494.7	-3.5	-25.9	-26.0	0.17	-0.01	-36.55
1,591.0	0.52	157.06	1,590.7	-4.1	-25.6	-25.7	0.33	0.27	29.54
1,682.0	0.58	141.06	1,681.7	-4.8	-25.2	-25.2	0.18	0.07	-17.58
1,778.0	0.69	145.80	1,777.7	-5.7	-24.5	-24.6	0.13	0.11	4.94
1,873.0	0.51	134.73	1,872.7	-6.4	-23.9	-24.0	0.22	-0.19	-11.65
1,969.0	0.55	142.19	1,968.7	-7.1	-23.3	-23.4	0.08	0.04	7.77
2,064.0	1.34	20.12	2,063.7	-6.4	-22.7	-22.8	1.79	0.83	-128.49
2,159.0	3.71	347.20	2,158.6	-2.4	-23.0	-23.0	2.83	2.49	-34.65
2,255.0	3.80	349.41	2,254.4	3.8	-24.2	-24.2	0.18	0.09	2.30
2,351.0	5.18	335.72	2,350.1	10.9	-26.6	-26.4	1.81	1.44	-14.26
2,446.0	4.41	342.26	2,444.8	18.2	-29.5	-29.1	0.99	-0.81	6.88
2,541.0	6.36	333.37	2,539.3	26.4	-32.9	-32.4	2.23	2.05	-9.36
2,637.0	6.04	337.85	2,634.8	35.9	-37.2	-36.6	0.60	-0.33	4.67
2,733.0	6.05	338.15	2,730.2	45.2	-41.0	-40.2	0.03	0.01	0.31
2,828.0	7.40	331.23	2,824.6	55.2	-45.8	-44.8	1.65	1.42	-7.28
2,924.0	7.24	328.97	2,919.8	65.8	-51.9	-50.7	0.34	-0.17	-2.35
3,019.0	7.11	327.71	3,014.1	75.9	-58.1	-56.7	0.21	-0.14	-1.33
3,115.0	6.72	326.97	3,109.4	85.7	-64.4	-62.8	0.42	-0.41	-0.77
3,210.0	6.63	321.44	3,203.7	94.6	-70.8	-69.1	0.68	-0.09	-5.82
3,306.0	6.34	316.49	3,299.1	102.8	-77.9	-76.0	0.66	-0.30	-5.16
3,401.0	5.72	311.85	3,393.6	109.8	-85.1	-83.0	0.83	-0.65	-4.88
3,496.0	6.33	312.18	3,488.1	116.4	-92.5	-90.3	0.64	0.64	0.35
3,592.0	6.35	318.73	3,583.5	124.0	-99.9	-97.6	0.75	0.02	6.82
3,688.0	5.68	319.05	3,678.9	131.6	-106.5	-104.1	0.70	-0.70	0.33
3,783.0	5.54	321.04	3,773.5	138.7	-112.5	-109.9	0.25	-0.15	2.09
3,878.0	5.37	322.90	3,868.1	145.8	-118.0	-115.3	0.26	-0.18	1.96
3,974.0	4.74	322.55	3,963.7	152.5	-123.2	-120.3	0.66	-0.66	-0.36
4,070.0	4.70	319.23	4,059.4	158.7	-128.1	-125.2	0.29	-0.04	-3.46
4,165.0	4.54	317.71	4,154.1	164.4	-133.2	-130.1	0.21	-0.17	-1.60
4,260.0	4.09	336.20	4,248.8	170.3	-137.1	-133.9	1.53	-0.47	19.46
4,452.0	4.20	337.23	4,440.3	183.0	-142.6	-139.2	0.07	0.06	0.54
4,547.0	3.88	5.39	4,535.1	189.4	-143.6	-140.1	2.09	-0.34	29.64
4,643.0	3.60	59.79	4,630.9	194.2	-140.7	-137.1	3.57	-0.29	56.67
4,738.0	3.61	64.49	4,725.7	197.0	-135.5	-131.8	0.31	0.01	4.95
4,833.0	4.01	60.91	4,820.5	199.9	-129.9	-126.1	0.49	0.42	-3.77
4,929.0	3.72	60.26	4,916.3	203.0	-124.2	-120.4	0.31	-0.30	-0.68
5,025.0	1.28	111.12	5,012.2	204.2	-120.5	-116.7	3.20	-2.54	52.98

Company:	PDC Energy Inc. DJ Basin	Local Co-ordinate Reference:	Well Harold 6X-232
Project:	SEC.6-T4N-R64W	TVD Reference:	WELL @ 4811.0ft (RKB - 23')
Site:	Harold 4N64W6X Pad Sec.6-T4N-R64W	MD Reference:	WELL @ 4811.0ft (RKB - 23')
Well:	Harold 6X-232	North Reference:	True
Wellbore:	Harold 6X-232 Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Harold 6X-232 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	1.11	111.65	5,107.2	203.5	-118.7	-114.9	0.18	-0.18	0.56
5,216.0	1.02	111.48	5,203.1	202.8	-117.0	-113.2	0.09	-0.09	-0.18
5,312.0	1.07	88.05	5,299.1	202.5	-115.3	-111.5	0.44	0.05	-24.41
5,407.0	1.41	77.83	5,394.1	202.8	-113.3	-109.5	0.43	0.36	-10.76
5,502.0	1.26	67.10	5,489.1	203.5	-111.2	-107.4	0.31	-0.16	-11.29
5,598.0	1.19	255.27	5,585.1	203.6	-111.2	-107.4	2.55	-0.07	-178.99
5,694.0	0.96	242.87	5,681.0	203.0	-112.9	-109.1	0.34	-0.24	-12.92
5,789.0	0.87	249.52	5,776.0	202.4	-114.2	-110.5	0.15	-0.09	7.00
5,885.0	0.26	246.52	5,872.0	202.0	-115.1	-111.3	0.64	-0.64	-3.13
5,981.0	0.38	235.91	5,968.0	201.8	-115.6	-111.8	0.14	0.13	-11.05
6,076.0	0.46	293.19	6,063.0	201.8	-116.2	-112.4	0.43	0.08	60.29
6,172.0	2.20	74.14	6,159.0	202.4	-114.8	-111.0	2.68	1.81	146.82
6,267.0	10.20	83.40	6,253.4	203.9	-104.7	-100.8	8.46	8.42	9.75
6,363.0	15.25	85.00	6,347.0	206.0	-83.6	-79.8	5.27	5.26	1.67
6,458.0	22.67	87.27	6,436.8	207.9	-52.8	-49.0	7.85	7.81	2.39
6,554.0	31.14	89.30	6,522.3	209.1	-9.5	-5.6	8.87	8.82	2.11
6,650.0	39.46	90.72	6,600.6	209.0	46.0	49.8	8.71	8.67	1.48
6,746.0	46.39	90.56	6,670.8	208.3	111.3	115.1	7.22	7.22	-0.17
6,842.0	55.15	89.80	6,731.5	208.1	185.6	189.4	9.15	9.13	-0.79
6,886.5	60.00	89.77	6,755.3	208.2	223.1	227.0	10.89	10.89	-0.07
TPZ - 60° Incl in curve - 809'FSL, 222'FEL, Sec.6									
6,937.0	65.50	89.74	6,778.5	208.4	268.0	271.8	10.89	10.89	-0.06
7,033.0	71.23	91.67	6,813.8	207.3	357.2	361.0	6.25	5.97	2.01
7,129.0	76.51	92.18	6,840.5	204.2	449.3	453.1	5.52	5.50	0.53
7,225.0	83.31	90.88	6,857.3	201.7	543.8	547.4	7.21	7.08	-1.35
7,280.8	86.91	91.43	6,862.1	200.6	599.3	602.9	6.53	6.46	0.99
LPL 801'FSL & 154'FWL Sec.5									
7,321.0	89.51	91.83	6,863.3	199.4	639.5	643.1	6.53	6.46	0.99
7,416.0	89.62	91.99	6,864.0	196.3	734.4	738.0	0.20	0.12	0.17
7,512.0	89.48	91.90	6,864.8	193.0	830.4	833.8	0.17	-0.15	-0.09
Deepest TVD Drilled - 6864.8' TVD									
7,607.0	91.19	90.80	6,864.2	190.8	925.4	928.7	2.14	1.80	-1.16
7,703.0	91.86	89.93	6,861.7	190.2	1,021.3	1,024.7	1.14	0.70	-0.91
7,798.0	92.70	89.48	6,857.9	190.6	1,116.2	1,119.6	1.00	0.88	-0.47
7,894.0	93.21	89.01	6,853.0	191.9	1,212.1	1,215.5	0.72	0.53	-0.49
7,990.0	91.02	88.56	6,849.4	193.9	1,308.0	1,311.4	2.33	-2.28	-0.47
8,115.0	91.13	89.57	6,847.1	196.0	1,433.0	1,436.4	0.81	0.09	0.81
8,210.0	90.27	91.09	6,845.9	195.4	1,528.0	1,531.3	1.84	-0.91	1.60
8,306.0	90.69	90.95	6,845.1	193.7	1,623.9	1,627.3	0.46	0.44	-0.15
8,401.0	89.01	91.51	6,845.4	191.7	1,718.9	1,722.2	1.86	-1.77	0.59
8,497.0	88.50	91.52	6,847.4	189.1	1,814.9	1,818.1	0.53	-0.53	0.01
8,593.0	88.47	91.18	6,850.0	186.9	1,910.8	1,913.9	0.36	-0.03	-0.35
8,688.0	88.08	90.78	6,852.8	185.3	2,005.7	2,008.8	0.59	-0.41	-0.42
8,784.0	88.73	89.55	6,855.5	185.0	2,101.7	2,104.8	1.45	0.68	-1.28

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Design:	Harold 6X-232 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	88.47	88.95	6,857.8	186.2	2,196.7	2,199.7	0.69	-0.27	-0.63
8,975.0	88.19	89.45	6,860.6	187.6	2,292.6	2,295.7	0.60	-0.29	0.52
9,071.0	89.31	89.63	6,862.7	188.3	2,388.6	2,391.7	1.18	1.17	0.19
9,166.0	90.27	89.13	6,863.1	189.4	2,483.6	2,486.7	1.14	1.01	-0.53
9,262.0	90.55	89.40	6,862.4	190.6	2,579.6	2,582.7	0.41	0.29	0.28
9,357.0	90.24	89.18	6,861.7	191.8	2,674.6	2,677.7	0.40	-0.33	-0.23
9,452.0	89.90	89.05	6,861.6	193.2	2,769.5	2,772.7	0.38	-0.36	-0.14
9,548.0	91.22	88.98	6,860.7	194.9	2,865.5	2,868.6	1.38	1.38	-0.07
9,643.0	90.55	88.58	6,859.2	196.9	2,960.5	2,963.6	0.82	-0.71	-0.42
9,738.0	90.24	88.38	6,858.6	199.4	3,055.5	3,058.6	0.39	-0.33	-0.21
9,834.0	92.17	90.12	6,856.5	200.7	3,151.4	3,154.6	2.71	2.01	1.81
9,928.0	91.89	89.64	6,853.2	200.9	3,245.4	3,248.5	0.59	-0.30	-0.51
10,024.0	91.58	89.43	6,850.3	201.7	3,341.3	3,344.5	0.39	-0.32	-0.22
10,119.0	91.53	89.28	6,847.7	202.7	3,436.3	3,439.4	0.17	-0.05	-0.16
10,213.0	90.74	91.68	6,845.9	201.9	3,530.2	3,533.4	2.69	-0.84	2.55
10,309.0	91.02	88.89	6,844.4	201.5	3,626.2	3,629.3	2.92	0.29	-2.91
10,404.0	90.57	88.90	6,843.1	203.3	3,721.2	3,724.3	0.47	-0.47	0.01
10,500.0	90.49	88.60	6,842.2	205.4	3,817.2	3,820.3	0.32	-0.08	-0.31
10,596.0	90.49	88.41	6,841.4	207.9	3,913.1	3,916.3	0.20	0.00	-0.20
10,691.0	90.88	88.27	6,840.2	210.7	4,008.1	4,011.3	0.44	0.41	-0.15
10,787.0	92.59	90.04	6,837.3	212.1	4,104.0	4,107.2	2.56	1.78	1.84
10,882.0	92.48	89.93	6,833.1	212.1	4,198.9	4,202.1	0.16	-0.12	-0.12
10,978.0	92.03	90.13	6,829.3	212.0	4,294.8	4,298.0	0.51	-0.47	0.21
11,073.0	89.99	90.94	6,827.7	211.2	4,389.8	4,393.0	2.31	-2.15	0.85
11,169.0	89.54	90.95	6,828.1	209.6	4,485.8	4,488.9	0.47	-0.47	0.01
11,265.0	89.37	90.10	6,829.0	208.7	4,581.8	4,584.9	0.90	-0.18	-0.89
11,361.0	89.68	90.01	6,829.8	208.6	4,677.8	4,680.9	0.34	0.32	-0.09
11,457.0	89.29	89.82	6,830.6	208.7	4,773.8	4,776.8	0.45	-0.41	-0.20
11,553.0	89.23	89.50	6,831.9	209.3	4,869.8	4,872.8	0.34	-0.06	-0.33
11,648.0	89.03	89.06	6,833.3	210.5	4,964.8	4,967.8	0.51	-0.21	-0.46
11,744.0	89.23	91.90	6,834.8	209.7	5,060.7	5,063.8	2.97	0.21	2.96
11,839.0	89.06	91.26	6,836.2	207.1	5,155.7	5,158.6	0.70	-0.18	-0.67
11,935.0	89.03	91.13	6,837.8	205.1	5,251.7	5,254.6	0.14	-0.03	-0.14
12,018.3	91.70	92.70	6,837.3	202.3	5,334.9	5,337.7	3.72	3.21	1.89
WP1 (6X-232)									
12,031.0	92.11	92.94	6,836.8	201.7	5,347.6	5,350.4	3.72	3.21	1.89
12,126.0	91.92	92.35	6,833.5	197.3	5,442.4	5,445.1	0.65	-0.20	-0.62
12,222.0	91.94	91.70	6,830.3	193.9	5,538.3	5,540.9	0.68	0.02	-0.68
12,317.0	91.92	90.84	6,827.1	191.8	5,633.2	5,635.8	0.90	-0.02	-0.91
12,413.0	92.09	90.61	6,823.7	190.6	5,729.2	5,731.7	0.30	0.18	-0.24
12,509.0	90.27	91.41	6,821.7	188.9	5,825.1	5,827.6	2.07	-1.90	0.83
12,604.0	89.96	90.91	6,821.5	187.0	5,920.1	5,922.5	0.62	-0.33	-0.53
12,700.0	90.01	90.57	6,821.6	185.7	6,016.1	6,018.5	0.36	0.05	-0.35

Company:	PDC Energy Inc. DJ Basin	Local Co-ordinate Reference:	Well Harold 6X-232
Project:	SEC.6-T4N-R64W	TVD Reference:	WELL @ 4811.0ft (RKB - 23')
Site:	Harold 4N64W6X Pad Sec.6-T4N-R64W	MD Reference:	WELL @ 4811.0ft (RKB - 23')
Well:	Harold 6X-232	North Reference:	True
Wellbore:	Harold 6X-232 Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Harold 6X-232 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)
12,796.0	90.85	91.29	6,820.8	184.2	6,112.1	6,114.4	1.15	0.88	0.75
12,892.0	90.38	91.38	6,819.8	181.9	6,208.0	6,210.3	0.50	-0.49	0.09
12,988.0	90.32	91.10	6,819.2	179.9	6,304.0	6,306.3	0.30	-0.06	-0.29
13,018.6	90.41	91.08	6,819.0	179.3	6,334.6	6,336.9	0.30	0.29	-0.06
WP2 (6X-232)									
13,083.0	90.60	91.04	6,818.5	178.1	6,399.0	6,401.2	0.30	0.29	-0.06
13,178.0	90.29	91.05	6,817.7	176.3	6,494.0	6,496.1	0.33	-0.33	0.01
13,275.0	90.52	90.64	6,817.0	174.9	6,591.0	6,593.1	0.48	0.24	-0.42
13,371.0	90.60	91.13	6,816.1	173.4	6,686.9	6,689.0	0.52	0.08	0.51
13,467.0	90.69	90.95	6,815.0	171.7	6,782.9	6,784.9	0.21	0.09	-0.19
13,563.0	90.85	90.55	6,813.7	170.4	6,878.9	6,880.9	0.45	0.17	-0.42
13,658.0	91.22	90.42	6,812.0	169.6	6,973.9	6,975.8	0.41	0.39	-0.14
13,753.0	91.02	88.82	6,810.2	170.3	7,068.9	7,070.8	1.70	-0.21	-1.68
13,848.0	90.49	88.53	6,808.9	172.5	7,163.8	7,165.8	0.64	-0.56	-0.31
13,944.0	90.55	87.74	6,808.0	175.6	7,259.8	7,261.8	0.83	0.06	-0.82
14,040.0	90.32	88.49	6,807.3	178.7	7,355.7	7,357.8	0.82	-0.24	0.78
14,135.0	90.32	88.07	6,806.8	181.6	7,450.7	7,452.8	0.44	0.00	-0.44
14,232.0	90.38	87.65	6,806.2	185.2	7,547.6	7,549.7	0.44	0.06	-0.43
14,327.0	90.66	87.42	6,805.3	189.3	7,642.5	7,644.7	0.38	0.29	-0.24
14,423.0	90.01	89.33	6,804.8	192.0	7,738.5	7,740.7	2.10	-0.68	1.99
14,519.0	89.99	88.60	6,804.8	193.8	7,834.5	7,836.7	0.76	-0.02	-0.76
14,519.5	89.99	88.60	6,804.8	193.8	7,835.0	7,837.2	0.71	0.55	-0.45
WP3 (6X-232)									
14,615.0	90.52	88.17	6,804.3	196.5	7,930.4	7,932.7	0.71	0.55	-0.45
14,710.0	90.38	88.13	6,803.6	199.5	8,025.4	8,027.7	0.15	-0.15	-0.04
14,806.0	89.85	87.61	6,803.4	203.1	8,121.3	8,123.7	0.77	-0.55	-0.54
14,902.0	89.85	87.42	6,803.6	207.3	8,217.2	8,219.6	0.20	0.00	-0.20
14,998.0	87.49	88.84	6,805.9	210.4	8,313.1	8,315.6	2.87	-2.46	1.48
15,093.0	89.29	88.96	6,808.5	212.2	8,408.1	8,410.5	1.90	1.89	0.13
15,188.0	89.76	88.85	6,809.3	214.0	8,503.0	8,505.5	0.51	0.49	-0.12
15,283.0	89.62	88.24	6,809.8	216.4	8,598.0	8,600.5	0.66	-0.15	-0.64
15,378.0	88.84	90.39	6,811.1	217.6	8,693.0	8,695.5	2.41	-0.82	2.26
15,474.0	88.92	89.58	6,813.0	217.6	8,789.0	8,791.5	0.85	0.08	-0.84
15,569.0	89.23	91.73	6,814.5	216.5	8,883.9	8,886.4	2.29	0.33	2.26
15,665.0	89.23	91.85	6,815.8	213.5	8,979.9	8,982.3	0.12	0.00	0.13
15,760.0	91.44	93.13	6,815.3	209.4	9,074.8	9,077.1	2.69	2.33	1.35
15,855.0	91.69	92.75	6,812.7	204.5	9,169.6	9,171.8	0.48	0.26	-0.40
15,951.0	91.58	92.18	6,809.9	200.4	9,265.5	9,267.6	0.60	-0.11	-0.59
16,046.0	91.58	91.38	6,807.3	197.4	9,360.4	9,362.5	0.84	0.00	-0.84
16,142.0	91.89	90.85	6,804.4	195.6	9,456.3	9,458.4	0.64	0.32	-0.55
16,237.0	92.23	90.28	6,801.0	194.6	9,551.3	9,553.3	0.70	0.36	-0.60
16,332.0	92.31	89.76	6,797.2	194.6	9,646.2	9,648.2	0.55	0.08	-0.55
16,428.0	90.21	89.75	6,795.1	195.0	9,742.2	9,744.1	2.19	-2.19	-0.01
16,524.0	90.69	89.28	6,794.4	195.8	9,838.2	9,840.1	0.70	0.50	-0.49

Company:	PDC Energy Inc. DJ Basin	Local Co-ordinate Reference:	Well Harold 6X-232
Project:	SEC.6-T4N-R64W	TVD Reference:	WELL @ 4811.0ft (RKB - 23')
Site:	Harold 4N64W6X Pad Sec.6-T4N-R64W	MD Reference:	WELL @ 4811.0ft (RKB - 23')
Well:	Harold 6X-232	North Reference:	True
Wellbore:	Harold 6X-232 Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Harold 6X-232 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)	
16,619.0	89.59	90.39	6,794.1	196.1	9,933.2	9,935.1	1.64	-1.16	1.17	
16,714.0	89.73	89.86	6,794.7	195.9	10,028.2	10,030.1	0.58	0.15	-0.56	
16,809.0	90.35	89.33	6,794.6	196.6	10,123.2	10,125.1	0.86	0.65	-0.56	
16,905.0	91.27	89.13	6,793.3	197.9	10,219.1	10,221.1	0.98	0.96	-0.21	
17,000.0	90.55	90.23	6,791.8	198.4	10,314.1	10,316.0	1.38	-0.76	1.16	
17,096.0	89.73	90.24	6,791.5	198.0	10,410.1	10,412.0	0.85	-0.85	0.01	
17,191.0	90.41	90.04	6,791.4	197.8	10,505.1	10,507.0	0.75	0.72	-0.21	
17,286.0	91.41	89.92	6,789.9	197.8	10,600.1	10,602.0	1.06	1.05	-0.13	
17,382.0	90.66	90.69	6,788.2	197.3	10,696.1	10,697.9	1.12	-0.78	0.80	
17,476.0	90.99	90.13	6,786.8	196.6	10,790.1	10,791.9	0.69	0.35	-0.60	
17,538.0	91.11	90.04	6,785.7	196.5	10,852.1	10,853.8	0.24	0.19	-0.15	
17,598.0	91.11	90.04	6,784.5	196.5	10,912.1	10,913.8	0.00	0.00	0.00	
Projected BHL 795'FSL & 102'FEL, Sec.4										

Design Targets										
Target Name	Dip Angle (°)	Dip Dir. (°)	TVD (ft)	+N/-S (ft)	+E/-W (ft)	Northing (usft)	Easting (usft)	Latitude	Longitude	
SHL 607'FSL & 440'FEL - hit/miss target - Shape - Point	0.00	0.00	1.0	0.0	0.0	1,366,465.44	3,254,937.41	40.335740	-104.585490	
Projected BHL 795'FSL & 102'FEL, Sec.4 - survey misses target center by 13.3ft at 17598.0ft MD (6784.5 TVD, 196.5 N, 10912.1 E) - Point	0.00	0.00	6,796.0	202.8	10,914.4	1,366,780.75	3,265,848.67	40.336290	-104.546340	
WP3 (6X-232) - survey misses target center by 13.5ft at 14519.5ft MD (6804.8 TVD, 193.8 N, 7835.0 E) - Point	0.00	0.00	6,815.4	202.1	7,834.8	1,366,748.31	3,262,769.37	40.336291	-104.557387	
WP2 (6X-232) - survey misses target center by 8.7ft at 13018.6ft MD (6819.0 TVD, 179.3 N, 6334.6 E) - Point	0.00	0.00	6,824.9	185.7	6,334.8	1,366,716.44	3,261,269.68	40.336248	-104.562767	
WP1 (6X-232) - survey misses target center by 6.1ft at 12018.4ft MD (6837.2 TVD, 202.3 N, 5335.0 E) - Point	0.00	0.00	6,831.2	201.5	5,334.8	1,366,721.93	3,260,269.62	40.336292	-104.566354	
WP #1 (Judy 6X-314) - survey misses target center by 1855.8ft at 6440.6ft MD (6420.7 TVD, 207.6 N, -59.3 E) - Point	0.00	0.00	6,918.0	1,162.1	-1,571.2	1,367,611.18	3,253,354.39	40.338930	-104.591126	

Survey Annotations					
Measured Depth (ft)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Comment	
6,886.5	6,755.3	208.2	223.1	TPZ - 60° Incl in curve - 809'FSL, 222'FEL, Sec.6	
7,512.0	6,864.8	193.0	830.4	Deepest TVD Drilled - 6864.8' TVD	

Checked By: _____	Approved By: _____	Date: _____
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