

PETROLEUM DEVELOPMENT CORP Weld County CO

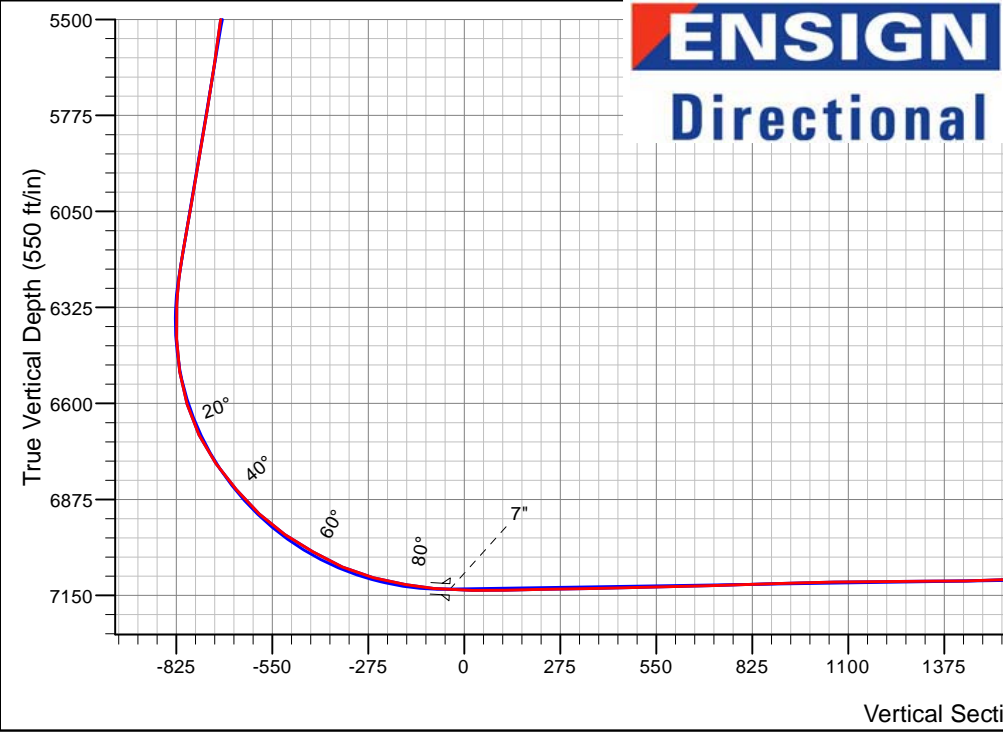
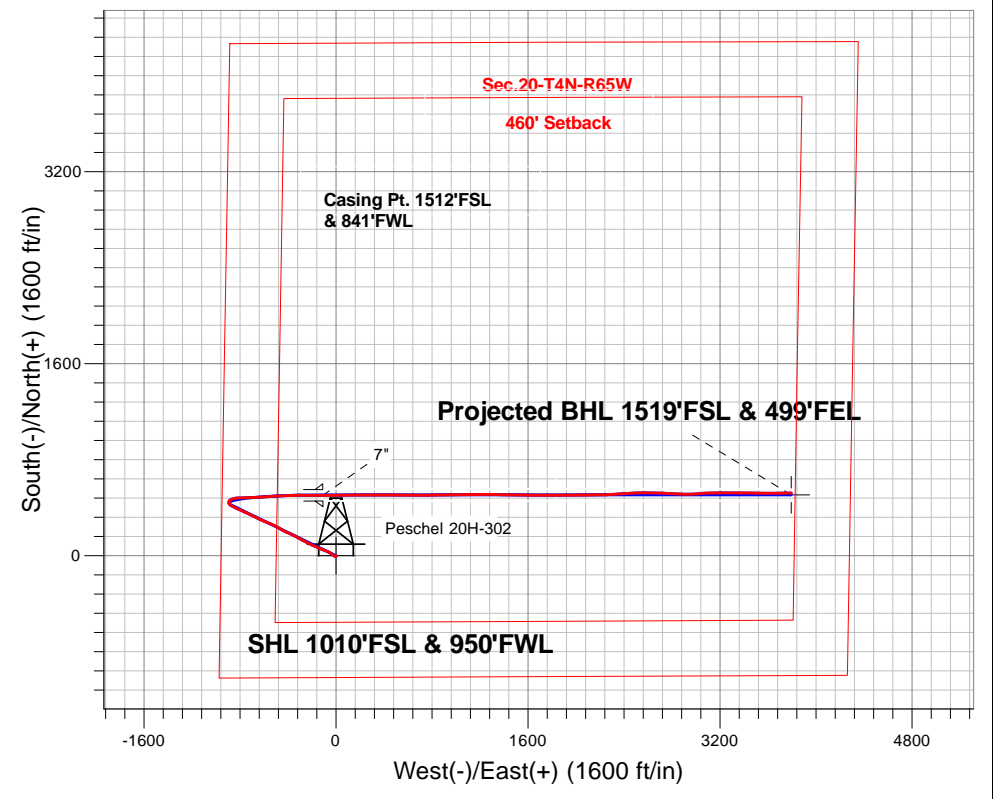
Well Name: **Peschel 20H-302**
 Surface Location: Peschel 4N65W20B Pad Sec.20-T4N-R65W
 North American Datum 1983 , US State Plane 1983, Colorado Northern Zone
 Ground Elevation: 4802.0

+N/-S	+E/-W	Northing	Easting	Latitude	Longitude	Slot
0.0	0.01350754.36	3225069.08	40.293410	-104.693140		

Ensign Rig #134 RKB - 13'WELL @ 4815.0ft (Ensign Rig #134 RKB - 13')

FINAL SURVEY

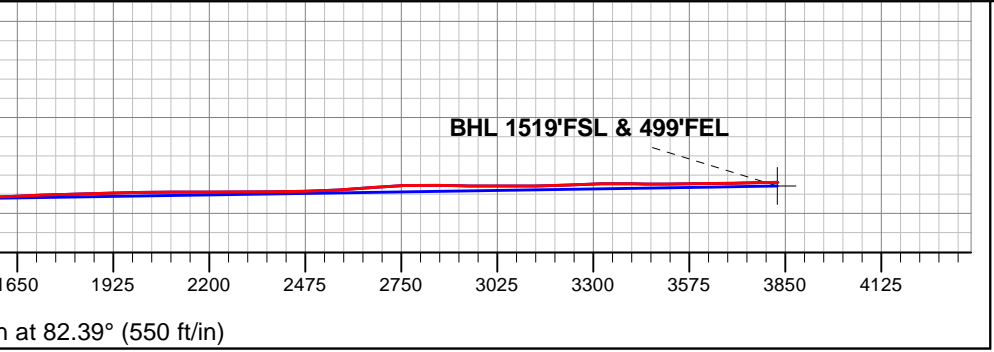
Projected Bottom Hole Location
 11591'MD 7061'TVD 522'N & 3793'E of SHL
 91.1 degree Incl @ 89.5 degree AZM



Peschel 4N65W20B Pad Sec.20-T4N-R65W
 Peschel 20H-302
 Wellbore #1
 8:50, August 17 2015

ANNOTATIONS		
TVD	MD	Annotation
7135.6	7751.0	Deepest TVD Drilled - 7135.6'

LEGEND	
	Peschel 20H-302, Wellbore #1, Plan #2 (8-7-15)R V0
	Wellbore #1
	Survey #1





PDC Energy Inc. DJ Basin

SEC.20-T4N-R65W

Peschel 4N65W20B Pad Sec.20-T4N-R65W

Peschel 20H-302

Wellbore #1

Survey: Survey #1

Standard Survey Report

15 October, 2018



Company:	PDC Energy Inc. DJ Basin	Local Co-ordinate Reference:	Well Peschel 20H-302
Project:	SEC.20-T4N-R65W	TVD Reference:	WELL @ 4815.0ft (Ensign Rig #134 RKB - 13')
Site:	Peschel 4N65W20B Pad Sec.20-T4N-R65W	MD Reference:	WELL @ 4815.0ft (Ensign Rig #134 RKB - 13')
Well:	Peschel 20H-302	North Reference:	True
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	US_EDM

Project	SEC.20-T4N-R65W, Weld, Colorado		
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	Peschel 4N65W20B Pad Sec.20-T4N-R65W				
Site Position:		Northing:	1,350,841.81 usft	Latitude:	40.293650
From:	Lat/Long	Easting:	3,225,068.28 usft	Longitude:	-104.693140
Position Uncertainty:	0.0 ft	Slot Radius:	13-3/16 "	Grid Convergence:	0.52 °

Well	Peschel 20H-302					
Well Position	+N/-S	0.0 ft	Northing:	1,350,754.36 usft	Latitude:	40.293410
	+E/-W	0.0 ft	Easting:	3,225,069.08 usft	Longitude:	-104.693140
Position Uncertainty		0.0 ft	Wellhead Elevation:	ft	Ground Level:	4,802.0 ft

Wellbore	Wellbore #1				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	8/7/2015	8.26	66.83	52,647

Design	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	82.39	

Survey Program	Date	10/15/2018			
From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description	
73.0	11,591.0	Survey #1 (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	138.40	1.0	0.0	0.0	0.0	0.55	0.55	0.00	
SHL 1010°FSL & 950°FWL										
3.9	0.02	138.40	3.9	0.0	0.0	0.0	0.55	0.55	0.00	
50°N/S Hardline (20H-302)										
73.0	0.40	138.40	73.0	-0.2	0.2	0.1	0.55	0.55	0.00	
165.0	0.40	173.00	165.0	-0.7	0.4	0.3	0.26	0.00	37.61	
257.0	0.50	163.80	257.0	-1.5	0.6	0.4	0.13	0.11	-10.00	
349.0	0.30	227.50	349.0	-2.0	0.5	0.2	0.49	-0.22	69.24	
442.0	0.50	187.40	442.0	-2.6	0.3	-0.1	0.36	0.22	-43.12	

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Site:	Peschel 4N65W20B Pad Sec.20-T4N-R65W	MD Reference:	WELL @ 4815.0ft (Ensign Rig #134 RKB - 13')
Well:	Peschel 20H-302	North Reference:	True
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	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)	
534.0	0.30	167.40	534.0	-3.2	0.3	-0.2	0.26	-0.22	-21.74	
627.0	0.40	212.70	627.0	-3.7	0.2	-0.3	0.31	0.11	48.71	
719.0	0.70	208.50	719.0	-4.5	-0.3	-0.9	0.33	0.33	-4.57	
811.0	1.70	247.50	811.0	-5.5	-1.8	-2.5	1.34	1.09	42.39	
855.0	2.10	271.40	854.9	-5.7	-3.2	-4.0	2.00	0.91	54.32	
1,013.0	3.40	288.30	1,012.8	-4.2	-10.6	-11.0	0.96	0.82	10.70	
1,105.0	4.50	310.60	1,104.5	-1.0	-15.9	-15.9	2.03	1.20	24.24	
1,197.0	4.10	309.70	1,196.3	3.5	-21.2	-20.5	0.44	-0.43	-0.98	
1,289.0	4.10	308.80	1,288.0	7.6	-26.3	-25.0	0.07	0.00	-0.98	
1,382.0	5.60	312.00	1,380.7	12.8	-32.2	-30.3	1.64	1.61	3.44	
1,474.0	7.00	308.70	1,472.2	19.3	-39.9	-37.0	1.57	1.52	-3.59	
1,567.0	7.60	298.50	1,564.4	25.7	-49.8	-45.9	1.53	0.65	-10.97	
1,659.0	7.10	291.60	1,655.6	30.7	-60.4	-55.8	1.10	-0.54	-7.50	
1,752.0	8.80	290.40	1,747.8	35.3	-72.4	-67.1	1.84	1.83	-1.29	
1,844.0	9.90	291.60	1,838.5	40.7	-86.4	-80.2	1.21	1.20	1.30	
1,939.0	11.30	291.60	1,931.9	47.1	-102.6	-95.5	1.47	1.47	0.00	
2,035.0	11.50	292.50	2,026.0	54.3	-120.2	-112.0	0.28	0.21	0.94	
2,130.0	12.80	295.50	2,118.9	62.4	-138.4	-129.0	1.52	1.37	3.16	
2,225.0	12.40	291.40	2,211.6	70.7	-157.4	-146.7	1.03	-0.42	-4.32	
2,321.0	12.80	295.80	2,305.3	79.1	-176.6	-164.6	1.08	0.42	4.58	
2,416.0	12.20	291.30	2,398.0	87.3	-195.4	-182.2	1.20	-0.63	-4.74	
2,511.0	12.90	297.40	2,490.8	95.8	-214.2	-199.6	1.58	0.74	6.42	
2,607.0	12.30	294.30	2,584.5	104.9	-233.0	-217.1	0.94	-0.63	-3.23	
2,702.0	12.00	300.20	2,677.3	114.1	-250.8	-233.5	1.34	-0.32	6.21	
2,797.0	12.00	299.50	2,770.3	123.9	-267.9	-249.2	0.15	0.00	-0.74	
2,892.0	12.20	299.20	2,863.1	133.7	-285.3	-265.1	0.22	0.21	-0.32	
2,987.0	11.20	297.10	2,956.2	142.8	-302.3	-280.7	1.14	-1.05	-2.21	
3,083.0	10.90	295.00	3,050.4	150.9	-318.8	-296.0	0.52	-0.31	-2.19	
3,178.0	10.60	297.90	3,143.7	158.7	-334.7	-310.7	0.65	-0.32	3.05	
3,273.0	10.60	298.50	3,237.1	167.0	-350.1	-324.9	0.12	0.00	0.63	
3,368.0	10.60	295.10	3,330.5	174.9	-365.6	-339.3	0.66	0.00	-3.58	
3,464.0	11.00	294.80	3,424.8	182.5	-382.0	-354.4	0.42	0.42	-0.31	
3,559.0	11.40	292.10	3,518.0	189.8	-398.9	-370.2	0.69	0.42	-2.84	
3,654.0	11.90	295.00	3,611.0	197.5	-416.5	-386.7	0.81	0.53	3.05	
3,749.0	11.40	299.90	3,704.1	206.3	-433.5	-402.4	1.17	-0.53	5.16	
3,844.0	13.20	300.90	3,796.9	216.5	-450.9	-418.3	1.91	1.89	1.05	
3,940.0	13.30	299.50	3,890.3	227.6	-469.9	-435.7	0.35	0.10	-1.46	
4,035.0	12.80	299.40	3,982.9	238.1	-488.6	-452.8	0.53	-0.53	-0.11	
4,130.0	13.80	296.20	4,075.3	248.3	-508.0	-470.6	1.31	1.05	-3.37	
4,225.0	11.90	293.00	4,167.9	257.1	-527.1	-488.5	2.13	-2.00	-3.37	
4,320.0	14.20	295.00	4,260.5	265.9	-546.7	-506.7	2.47	2.42	2.11	
4,415.0	12.30	291.80	4,352.9	274.6	-566.7	-525.3	2.14	-2.00	-3.37	
4,511.0	11.70	290.00	4,446.9	281.7	-585.3	-542.9	0.74	-0.63	-1.88	

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Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	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)
4,606.0	13.00	294.40	4,539.7	289.4	-604.1	-560.5	1.69	1.37	4.63
4,701.0	11.70	293.90	4,632.5	297.7	-622.6	-577.7	1.37	-1.37	-0.53
4,796.0	11.30	296.50	4,725.5	305.8	-639.8	-593.7	0.69	-0.42	2.74
4,892.0	9.10	295.80	4,820.0	313.3	-655.0	-607.8	2.30	-2.29	-0.73
4,987.0	9.10	295.80	4,913.8	319.8	-668.6	-620.3	0.00	0.00	0.00
5,082.0	8.10	293.70	5,007.8	325.8	-681.4	-632.3	1.10	-1.05	-2.21
5,178.0	9.80	296.40	5,102.6	332.1	-695.0	-644.9	1.82	1.77	2.81
5,273.0	8.30	296.50	5,196.4	338.8	-708.3	-657.3	1.58	-1.58	0.11
5,368.0	10.40	297.10	5,290.1	345.8	-722.1	-670.0	2.21	2.21	0.63
5,463.0	8.40	295.70	5,383.9	352.7	-736.0	-682.8	2.12	-2.11	-1.47
5,559.0	9.10	295.00	5,478.7	358.9	-749.2	-695.1	0.74	0.73	-0.73
5,654.0	9.10	296.20	5,572.5	365.4	-762.7	-707.7	0.20	0.00	1.26
5,749.0	10.30	296.50	5,666.2	372.5	-777.1	-720.9	1.26	1.26	0.32
5,845.0	11.30	292.70	5,760.5	380.0	-793.4	-736.2	1.28	1.04	-3.96
5,940.0	10.90	292.00	5,853.7	386.9	-810.4	-752.0	0.44	-0.42	-0.74
6,035.0	11.30	294.40	5,946.9	394.2	-827.2	-767.7	0.64	0.42	2.53
6,131.0	12.00	299.70	6,040.9	403.0	-844.4	-783.6	1.33	0.73	5.52
6,226.0	12.60	297.80	6,133.8	412.7	-862.1	-799.9	0.76	0.63	-2.00
6,321.0	9.80	298.50	6,226.9	421.4	-878.4	-814.9	2.95	-2.95	0.74
6,416.0	10.90	341.20	6,320.5	433.8	-888.4	-823.2	7.97	1.16	44.95
6,512.0	8.30	4.70	6,415.2	449.3	-890.8	-823.5	4.85	-2.71	24.48
6,607.0	10.20	48.90	6,509.1	461.7	-883.9	-815.0	7.53	2.00	46.53
6,702.0	17.40	68.90	6,601.3	472.3	-864.3	-794.1	8.99	7.58	21.05
6,798.0	25.80	85.10	6,690.6	479.3	-830.0	-759.2	10.66	8.75	16.88
6,893.0	35.60	89.50	6,772.2	481.3	-781.6	-711.0	10.58	10.32	4.63
6,988.0	40.90	86.80	6,846.8	483.3	-722.8	-652.5	5.85	5.58	-2.84
7,084.0	45.40	87.00	6,916.8	486.8	-657.3	-587.1	4.69	4.69	0.21
7,178.0	57.00	86.00	6,975.6	491.4	-584.3	-514.1	12.37	12.34	-1.06
7,273.0	60.40	85.80	7,024.9	497.2	-503.3	-433.1	3.58	3.58	-0.21
7,368.0	65.50	88.20	7,068.1	501.5	-418.9	-348.8	5.82	5.37	2.53
7,463.0	76.20	90.00	7,099.3	502.9	-329.3	-259.8	11.40	11.26	1.89
7,558.0	80.20	90.30	7,118.7	502.7	-236.3	-167.7	4.22	4.21	0.32
7,640.0	84.30	90.30	7,129.7	502.2	-155.1	-87.2	5.00	5.00	0.00
7,686.0	86.50	89.68	7,133.4	502.2	-109.2	-41.8	4.96	4.77	-1.36
7"									
7,751.0	89.60	88.80	7,135.6	503.1	-44.3	22.7	4.96	4.78	-1.35
Deepest TVD Drilled - 7135.6'									
7,846.0	91.50	89.60	7,134.7	504.4	50.7	117.0	2.17	2.00	0.84
7,941.0	90.70	89.30	7,132.9	505.3	145.7	211.3	0.90	-0.84	-0.32
8,036.0	91.50	90.30	7,131.1	505.7	240.6	305.5	1.35	0.84	1.05
8,132.0	90.50	89.60	7,129.4	505.8	336.6	400.6	1.27	-1.04	-0.73
8,226.0	92.00	90.00	7,127.4	506.1	430.6	493.8	1.65	1.60	0.43
8,321.0	90.70	89.60	7,125.1	506.4	525.6	588.0	1.43	-1.37	-0.42
8,417.0	92.20	91.10	7,122.7	505.8	621.5	683.0	2.21	1.56	1.56

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8,512.0	91.40	90.30	7,119.7	504.7	716.5	777.0	1.19	-0.84	-0.84	
8,607.0	91.90	88.60	7,117.0	505.6	811.4	871.2	1.86	0.53	-1.79	
8,702.0	91.50	90.00	7,114.2	506.8	906.4	965.5	1.53	-0.42	1.47	
8,797.0	91.10	89.30	7,112.0	507.3	1,001.4	1,059.7	0.85	-0.42	-0.74	
8,892.0	90.40	88.40	7,110.8	509.2	1,096.3	1,154.1	1.20	-0.74	-0.95	
8,987.0	90.80	90.30	7,109.8	510.3	1,191.3	1,248.4	2.04	0.42	2.00	
9,083.0	89.80	90.50	7,109.3	509.6	1,287.3	1,343.4	1.06	-1.04	0.21	
9,178.0	91.30	90.20	7,108.3	509.1	1,382.3	1,437.5	1.61	1.58	-0.32	
9,273.0	92.50	91.10	7,105.2	508.0	1,477.2	1,531.5	1.58	1.26	0.95	
9,368.0	92.40	91.10	7,101.1	506.2	1,572.1	1,625.3	0.11	-0.11	0.00	
9,463.0	91.90	90.70	7,097.6	504.7	1,667.1	1,719.2	0.67	-0.53	-0.42	
9,558.0	91.60	89.80	7,094.7	504.3	1,762.0	1,813.3	1.00	-0.32	-0.95	
9,654.0	91.90	89.80	7,091.7	504.6	1,858.0	1,908.4	0.31	0.31	0.00	
9,749.0	90.70	89.80	7,089.6	504.9	1,952.9	2,002.6	1.26	-1.26	0.00	
9,844.0	90.10	89.80	7,088.9	505.3	2,047.9	2,096.8	0.63	-0.63	0.00	
9,939.0	90.00	88.40	7,088.8	506.8	2,142.9	2,191.1	1.48	-0.11	-1.47	
10,034.0	90.80	89.30	7,088.2	508.7	2,237.9	2,285.5	1.27	0.84	0.95	
10,129.0	90.00	86.00	7,087.5	512.6	2,332.8	2,380.1	3.57	-0.84	-3.47	
10,224.0	91.20	86.10	7,086.5	519.1	2,427.6	2,474.9	1.27	1.26	0.11	
10,320.0	93.60	88.60	7,082.5	523.5	2,523.4	2,570.5	3.61	2.50	2.60	
10,415.0	94.40	91.10	7,075.9	523.8	2,618.1	2,664.4	2.76	0.84	2.63	
10,510.0	92.80	92.30	7,069.9	521.0	2,712.9	2,758.0	2.10	-1.68	1.26	
10,605.0	88.00	93.50	7,069.2	516.2	2,807.7	2,851.4	5.21	-5.05	1.26	
10,700.0	90.00	91.40	7,070.9	512.1	2,902.6	2,944.9	3.05	2.11	-2.21	
10,795.0	89.60	85.10	7,071.2	515.0	2,997.5	3,039.3	6.64	-0.42	-6.63	
10,891.0	90.70	87.70	7,071.0	521.0	3,093.3	3,135.1	2.94	1.15	2.71	
10,986.0	92.70	89.10	7,068.2	523.7	3,188.2	3,229.5	2.57	2.11	1.47	
11,081.0	91.00	89.80	7,065.1	524.6	3,283.2	3,323.7	1.94	-1.79	0.74	
11,176.0	88.90	92.10	7,065.2	523.0	3,378.2	3,417.7	3.28	-2.21	2.42	
11,271.0	90.50	90.50	7,065.7	520.9	3,473.1	3,511.5	2.38	1.68	-1.68	
11,366.0	90.70	90.50	7,064.7	520.0	3,568.1	3,605.6	0.21	0.21	0.00	
11,461.0	91.20	89.10	7,063.1	520.4	3,663.1	3,699.8	1.56	0.53	-1.47	
11,533.0	91.10	89.50	7,061.7	521.2	3,735.1	3,771.2	0.57	-0.14	0.56	
11,591.0	91.10	89.50	7,060.5	521.8	3,793.1	3,828.8	0.00	0.00	0.00	
BHL 1504'FSL & 500'FEL										

Casing Points				
Measured Depth (ft)	Vertical Depth (ft)	Name	Casing Diameter (")	Hole Diameter (")
7,686.0	7,133.4	7"	7	8-3/4

Company:	PDC Energy Inc. DJ Basin	Local Co-ordinate Reference:	Well Peschel 20H-302
Project:	SEC.20-T4N-R65W	TVD Reference:	WELL @ 4815.0ft (Ensign Rig #134 RKB - 13')
Site:	Peschel 4N65W20B Pad Sec.20-T4N-R65W	MD Reference:	WELL @ 4815.0ft (Ensign Rig #134 RKB - 13')
Well:	Peschel 20H-302	North Reference:	True
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	US_EDM

Survey Annotations				
Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment
		+N/-S (ft)	+E/-W (ft)	
7,751.0	7,135.6	503.1	-44.3	Deepest TVD Drilled - 7135.6'

Checked By: _____ Approved By: _____ Date: _____