

PETROLEUM DEVELOPMENT CORP Weld County CO

Well Name: **Peschel 20H-232**

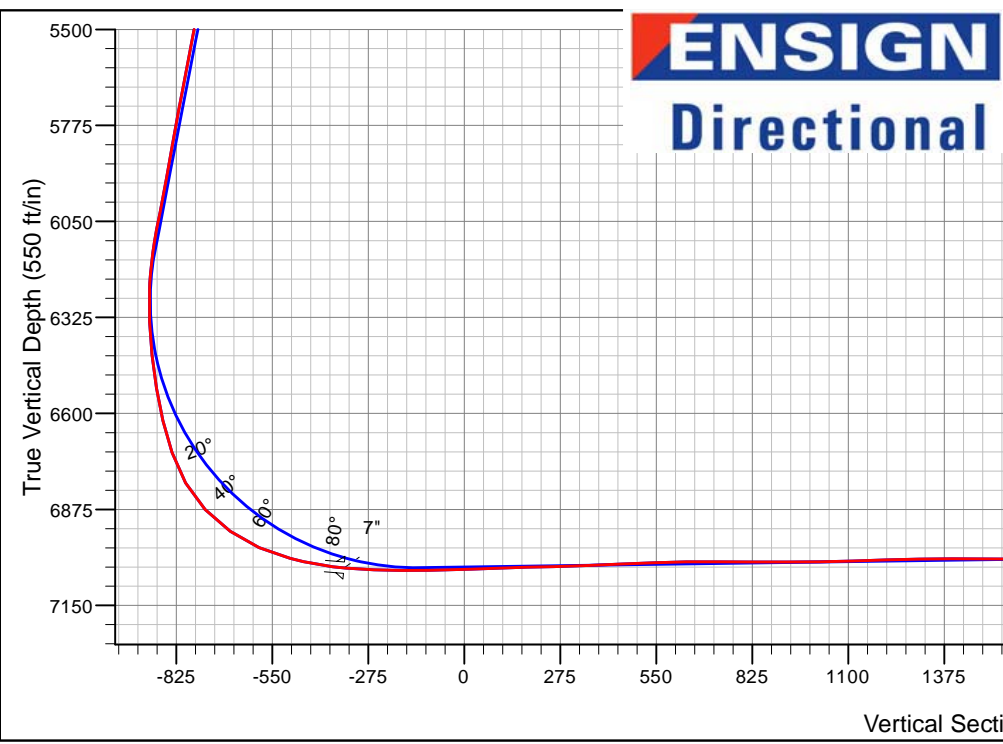
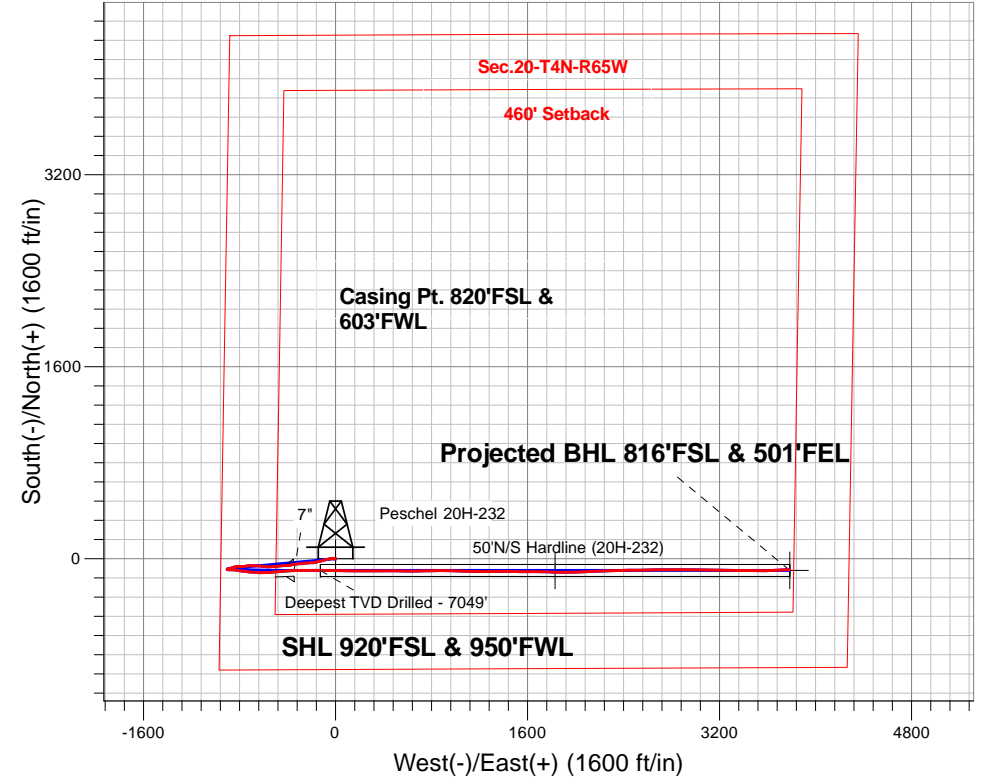
Surface Location: Peschel 4N65W20B Pad Sec.20-T4N-R65W
 North American Datum 1983 , US State Plane 1983, Colorado Northern Zone
 Ground Elevation: 4802.0

+N/-S	+E/-W	Northing	Easting	Latitude	Longitude	Slot
0.0	0.01350663.27	3225067.12	40.293160	-104.693150		

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

FINAL SURVEY

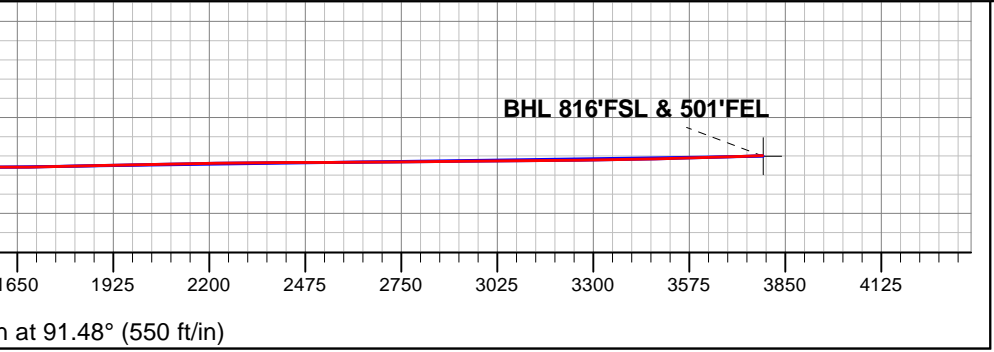
Projected Bottom Hole Location
 11568'MD 6984'TVD 91'S & 3784'E of SHL
 93.2 degree Incl @ 87.0 degree AZM



Peschel 4N65W20B Pad Sec.20-T4N-R65W
 Peschel 20H-232
 Wellbore #1
 7:23, September 10 2015

ANNOTATIONS		
TVD	MD	Annotation
7049.0	7656.0	Deepest TVD Drilled - 7049'

LEGEND	
	Peschel 20H-232, Wellbore #1, Plan #2 (8-29-15)R V0
	Wellbore #1
	Survey #1





PETROLEUM DEVELOPMENT CORP Weld County CO

SEC.20-T4N-R65W

Peschel 4N65W20B Pad Sec.20-T4N-R65W

Peschel 20H-232

Wellbore #1

Survey: Survey #1

Standard Survey Report

10 September, 2015



Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Peschel 20H-232
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-232	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-232					
Well Position	+N/-S	0.0 ft	Northing:	1,350,663.27 usft	Latitude:	40.293160
	+E/-W	0.0 ft	Easting:	3,225,067.12 usft	Longitude:	-104.693150
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	8/29/2015	8.25	66.83	52,640

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	91.48	

Survey Program	Date	9/10/2015			
From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description	
136.0	11,568.0	Survey #1 (Wellbore #1)	MWD	MWD - Standard	

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
136.0	0.70	197.20	136.0	-0.8	-0.2	-0.2	0.51	0.51	0.00
229.0	0.80	182.60	229.0	-2.0	-0.4	-0.4	0.23	0.11	-15.70
321.0	1.10	183.90	321.0	-3.5	-0.5	-0.4	0.33	0.33	1.41
413.0	0.70	264.60	413.0	-4.4	-1.2	-1.0	1.31	-0.43	87.72
505.0	1.10	285.50	505.0	-4.3	-2.6	-2.5	0.56	0.43	22.72
598.0	1.10	295.30	597.9	-3.6	-4.2	-4.1	0.20	0.00	10.54
690.0	1.00	300.40	689.9	-2.9	-5.7	-5.6	0.15	-0.11	5.54
783.0	0.90	300.40	782.9	-2.1	-7.1	-7.0	0.11	-0.11	0.00
910.0	1.20	300.20	909.9	-0.9	-9.1	-9.0	0.24	0.24	-0.16

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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-232	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)
1,016.0	1.70	280.40	1,015.9	-0.1	-11.6	-11.6	0.66	0.47	-18.68
1,108.0	3.20	282.30	1,107.8	0.7	-15.4	-15.4	1.63	1.63	2.07
1,200.0	4.60	272.40	1,199.6	1.4	-21.6	-21.6	1.68	1.52	-10.76
1,293.0	4.10	271.70	1,292.3	1.7	-28.7	-28.7	0.54	-0.54	-0.75
1,385.0	5.00	272.60	1,384.0	2.0	-36.0	-36.0	0.98	0.98	0.98
1,478.0	6.20	253.10	1,476.6	0.7	-44.8	-44.8	2.40	1.29	-20.97
1,570.0	5.40	247.30	1,568.1	-2.4	-53.6	-53.5	1.08	-0.87	-6.30
1,662.0	6.10	256.80	1,659.6	-5.2	-62.3	-62.2	1.28	0.76	10.33
1,755.0	7.30	263.70	1,752.0	-7.0	-73.0	-72.8	1.55	1.29	7.42
1,848.0	9.00	259.40	1,844.0	-9.0	-86.0	-85.8	1.94	1.83	-4.62
1,943.0	8.60	249.20	1,937.9	-12.9	-100.0	-99.6	1.69	-0.42	-10.74
2,038.0	8.50	251.70	2,031.9	-17.6	-113.3	-112.8	0.41	-0.11	2.63
2,133.0	8.80	262.60	2,125.8	-20.7	-127.1	-126.6	1.75	0.32	11.47
2,229.0	8.50	255.00	2,220.7	-23.5	-141.3	-140.6	1.23	-0.31	-7.92
2,324.0	9.00	250.80	2,314.6	-27.8	-155.1	-154.3	0.85	0.53	-4.42
2,419.0	9.50	258.70	2,408.4	-31.8	-169.8	-168.9	1.44	0.53	8.32
2,515.0	10.90	268.10	2,502.9	-33.6	-186.6	-185.7	2.26	1.46	9.79
2,610.0	10.90	267.50	2,596.2	-34.3	-204.6	-203.6	0.12	0.00	-0.63
2,705.0	10.70	266.50	2,689.5	-35.2	-222.4	-221.4	0.29	-0.21	-1.05
2,801.0	10.60	264.50	2,783.8	-36.6	-240.0	-239.0	0.40	-0.10	-2.08
2,896.0	10.50	264.70	2,877.2	-38.3	-257.4	-256.3	0.11	-0.11	0.21
2,991.0	8.40	259.40	2,970.9	-40.3	-272.8	-271.7	2.39	-2.21	-5.58
3,086.0	9.80	268.90	3,064.7	-41.8	-287.7	-286.5	2.16	1.47	10.00
3,181.0	11.50	267.50	3,158.1	-42.3	-305.2	-304.0	1.81	1.79	-1.47
3,276.0	9.80	261.70	3,251.4	-43.9	-322.7	-321.5	2.11	-1.79	-6.11
3,372.0	10.20	260.30	3,346.0	-46.5	-339.2	-337.9	0.49	0.42	-1.46
3,467.0	9.80	258.60	3,439.5	-49.5	-355.4	-354.0	0.52	-0.42	-1.79
3,562.0	10.10	260.00	3,533.1	-52.6	-371.5	-370.0	0.41	0.32	1.47
3,658.0	10.60	258.20	3,627.6	-55.8	-388.4	-386.9	0.62	0.52	-1.88
3,753.0	9.10	272.40	3,721.2	-57.3	-404.5	-402.9	2.99	-1.58	14.95
3,848.0	11.80	268.40	3,814.6	-57.3	-421.7	-420.1	2.94	2.84	-4.21
3,943.0	12.90	265.90	3,907.4	-58.3	-442.0	-440.4	1.29	1.16	-2.63
4,038.0	12.20	263.30	4,000.1	-60.2	-462.6	-460.9	0.95	-0.74	-2.74
4,133.0	13.10	263.80	4,092.8	-62.6	-483.2	-481.5	0.95	0.95	0.53
4,229.0	11.80	265.60	4,186.5	-64.5	-503.8	-502.0	1.41	-1.35	1.88
4,324.0	13.80	267.50	4,279.2	-65.7	-524.8	-523.0	2.15	2.11	2.00
4,419.0	11.20	264.00	4,371.9	-67.2	-545.3	-543.4	2.85	-2.74	-3.68
4,514.0	11.30	269.80	4,465.1	-68.2	-563.8	-561.9	1.20	0.11	6.11
4,609.0	12.10	277.40	4,558.1	-66.9	-583.0	-581.1	1.83	0.84	8.00
4,705.0	11.70	277.50	4,652.1	-64.4	-602.6	-600.8	0.42	-0.42	0.10
4,800.0	10.80	272.80	4,745.2	-62.7	-621.1	-619.3	1.35	-0.95	-4.95
4,895.0	11.10	277.20	4,838.5	-61.1	-639.0	-637.3	0.93	0.32	4.63

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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)
4,991.0	12.70	272.80	4,932.5	-59.4	-658.8	-657.0	1.91	1.67	-4.58
5,086.0	10.80	270.20	5,025.5	-58.9	-678.1	-676.3	2.08	-2.00	-2.74
5,181.0	13.50	270.00	5,118.3	-58.9	-698.1	-696.3	2.84	2.84	-0.21
5,276.0	11.20	265.60	5,211.1	-59.6	-718.4	-716.6	2.61	-2.42	-4.63
5,371.0	11.60	264.70	5,304.2	-61.2	-737.1	-735.3	0.46	0.42	-0.95
5,467.0	12.00	258.40	5,398.2	-64.1	-756.5	-754.6	1.40	0.42	-6.56
5,562.0	10.30	269.10	5,491.4	-66.2	-774.6	-772.7	2.81	-1.79	11.26
5,657.0	10.60	274.00	5,584.9	-65.7	-791.8	-789.9	0.99	0.32	5.16
5,753.0	10.90	273.90	5,679.2	-64.5	-809.7	-807.8	0.31	0.31	-0.10
5,848.0	10.60	258.00	5,772.5	-65.7	-827.2	-825.2	3.13	-0.32	-16.74
5,943.0	10.30	253.10	5,866.0	-70.0	-843.9	-841.8	0.99	-0.32	-5.16
6,039.0	11.40	252.90	5,960.2	-75.2	-861.2	-858.9	1.15	1.15	-0.21
6,134.0	12.30	252.40	6,053.2	-81.1	-879.8	-877.4	0.95	0.95	-0.53
6,229.0	8.00	246.40	6,146.7	-86.8	-895.5	-893.0	4.66	-4.53	-6.32
6,325.0	3.00	250.10	6,242.2	-90.3	-904.0	-901.4	5.22	-5.21	3.85
6,420.0	3.10	101.90	6,337.2	-91.7	-903.8	-901.1	6.18	0.11	-156.00
6,515.0	5.40	88.10	6,431.9	-92.1	-896.8	-894.2	2.63	2.42	-14.53
6,611.0	9.50	90.90	6,527.1	-92.0	-884.4	-881.7	4.29	4.27	2.92
6,706.0	13.00	92.80	6,620.2	-92.7	-865.9	-863.2	3.70	3.68	2.00
6,801.0	19.20	96.50	6,711.5	-95.0	-839.7	-836.9	6.61	6.53	3.89
6,897.0	29.60	99.70	6,798.8	-100.8	-800.5	-797.6	10.92	10.83	3.33
6,992.0	42.60	95.60	6,875.4	-107.9	-745.1	-742.1	13.91	13.68	-4.32
7,087.0	55.70	95.10	6,937.4	-114.5	-673.7	-670.5	13.80	13.79	-0.53
7,182.0	65.30	87.40	6,984.2	-116.1	-591.3	-588.0	12.31	10.11	-8.11
7,277.0	76.60	85.40	7,015.1	-110.4	-501.8	-498.8	12.06	11.89	-2.11
7,317.0	77.30	84.70	7,024.2	-107.0	-463.0	-460.0	2.44	1.75	-1.75
7,402.0	82.70	87.00	7,038.9	-101.0	-379.5	-376.8	6.89	6.35	2.71
7,435.0	84.92	87.94	7,042.5	-99.6	-346.7	-344.0	7.31	6.73	2.86
7"									
7,451.0	86.00	88.40	7,043.7	-99.0	-330.8	-328.1	7.31	6.74	2.85
7,522.0	87.40	89.10	7,047.8	-97.5	-259.9	-257.3	2.20	1.97	0.99
7,561.0	89.30	90.50	7,049.0	-97.4	-221.0	-218.4	6.05	4.87	3.59
7,656.0	90.60	90.50	7,049.0	-98.2	-126.0	-123.4	1.37	1.37	0.00
Deepest TVD Drilled - 7049'									
7,751.0	91.80	91.00	7,047.1	-99.4	-31.0	-28.4	1.37	1.26	0.53
7,846.0	91.70	90.90	7,044.2	-101.0	64.0	66.5	0.15	-0.11	-0.11
7,942.0	91.60	90.70	7,041.4	-102.3	159.9	162.5	0.23	-0.10	-0.21
8,037.0	91.70	90.00	7,038.7	-102.9	254.9	257.4	0.74	0.11	-0.74
8,132.0	92.30	90.20	7,035.3	-103.1	349.8	352.4	0.67	0.63	0.21
8,227.0	92.40	89.10	7,031.4	-102.5	444.7	447.2	1.16	0.11	-1.16
8,322.0	92.20	91.40	7,027.6	-102.9	539.6	542.1	2.43	-0.21	2.42
8,417.0	91.00	89.30	7,025.0	-103.5	634.6	637.1	2.55	-1.26	-2.21
8,512.0	89.30	88.60	7,024.7	-101.8	729.6	732.0	1.94	-1.79	-0.74

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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)	
8,607.0	89.70	89.30	7,025.6	-100.0	824.6	826.9	0.85	0.42	0.74	
8,703.0	90.20	91.00	7,025.6	-100.3	920.5	922.8	1.85	0.52	1.77	
8,798.0	90.80	91.90	7,024.8	-102.7	1,015.5	1,017.8	1.14	0.63	0.95	
8,893.0	92.10	91.20	7,022.4	-105.2	1,110.4	1,112.8	1.55	1.37	-0.74	
8,988.0	91.40	90.30	7,019.5	-106.5	1,205.4	1,207.7	1.20	-0.74	-0.95	
9,083.0	91.20	90.00	7,017.3	-106.7	1,300.4	1,302.7	0.38	-0.21	-0.32	
9,178.0	90.20	89.10	7,016.2	-106.0	1,395.4	1,397.6	1.42	-1.05	-0.95	
9,274.0	89.60	91.80	7,016.4	-106.7	1,491.3	1,493.6	2.88	-0.63	2.81	
9,369.0	89.60	90.70	7,017.0	-108.8	1,586.3	1,588.6	1.16	0.00	-1.16	
9,464.0	90.30	89.80	7,017.1	-109.2	1,681.3	1,683.6	1.20	0.74	-0.95	
9,559.0	91.40	92.30	7,015.7	-111.0	1,776.3	1,778.6	2.87	1.16	2.63	
9,654.0	91.90	89.90	7,013.0	-112.8	1,871.2	1,873.5	2.58	0.53	-2.53	
9,749.0	90.80	90.00	7,010.7	-112.7	1,966.2	1,968.4	1.16	-1.16	0.11	
9,844.0	91.00	87.90	7,009.2	-111.0	2,061.2	2,063.3	2.22	0.21	-2.21	
9,940.0	91.50	86.30	7,007.1	-106.1	2,157.0	2,159.0	1.75	0.52	-1.67	
10,035.0	90.60	88.80	7,005.4	-102.1	2,251.9	2,253.8	2.80	-0.95	2.63	
10,130.0	90.70	87.70	7,004.3	-99.2	2,346.8	2,348.6	1.16	0.11	-1.16	
10,225.0	89.70	88.80	7,004.0	-96.3	2,441.8	2,443.5	1.56	-1.05	1.16	
10,320.0	90.50	90.20	7,003.8	-95.4	2,536.8	2,538.4	1.70	0.84	1.47	
10,415.0	90.70	89.10	7,002.8	-94.8	2,631.8	2,633.3	1.18	0.21	-1.16	
10,511.0	90.00	90.20	7,002.2	-94.3	2,727.8	2,729.3	1.36	-0.73	1.15	
10,606.0	90.60	88.60	7,001.7	-93.3	2,822.8	2,824.2	1.80	0.63	-1.68	
10,701.0	90.50	90.50	7,000.8	-92.5	2,917.7	2,919.2	2.00	-0.11	2.00	
10,796.0	90.90	89.60	6,999.7	-92.6	3,012.7	3,014.1	1.04	0.42	-0.95	
10,891.0	90.60	91.70	6,998.4	-93.7	3,107.7	3,109.1	2.23	-0.32	2.21	
10,986.0	90.20	91.70	6,997.8	-96.5	3,202.7	3,204.1	0.42	-0.42	0.00	
11,082.0	90.30	90.30	6,997.3	-98.2	3,298.7	3,300.1	1.46	0.10	-1.46	
11,177.0	92.20	91.00	6,995.3	-99.3	3,393.6	3,395.1	2.13	2.00	0.74	
11,272.0	90.80	90.70	6,992.8	-100.7	3,488.6	3,490.0	1.51	-1.47	-0.32	
11,367.0	91.50	88.60	6,990.9	-100.1	3,583.6	3,584.9	2.33	0.74	-2.21	
11,462.0	92.10	87.20	6,987.9	-96.6	3,678.4	3,679.7	1.60	0.63	-1.47	
11,510.0	92.00	87.20	6,986.2	-94.3	3,726.3	3,727.5	0.21	-0.21	0.00	
11,568.0	92.00	87.20	6,984.1	-91.4	3,784.2	3,785.3	0.00	0.00	0.00	

Casing Points					
Measured Depth (ft)	Vertical Depth (ft)	Name	Casing Diameter (")	Hole Diameter (")	
7,435.0	7,042.5	7"	7	8-3/4	

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Peschel 20H-232
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-232	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)	
7,656.0	7,049.0	-98.2	-126.0	Deepest TVD Drilled - 7049'

Checked By: _____ Approved By: _____ Date: _____