

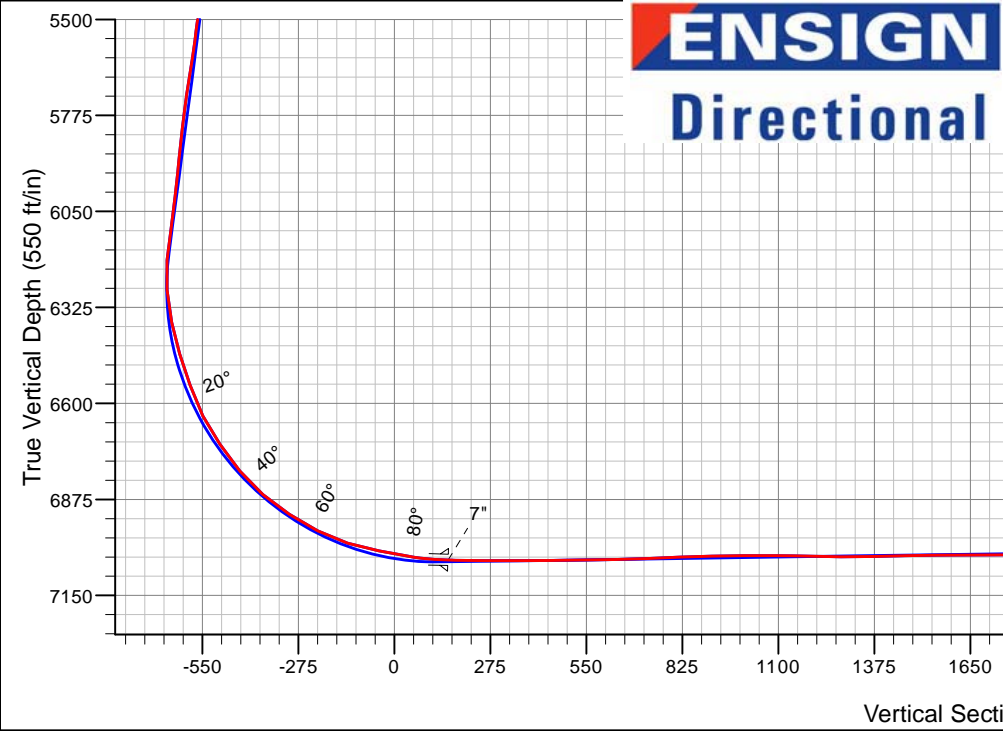
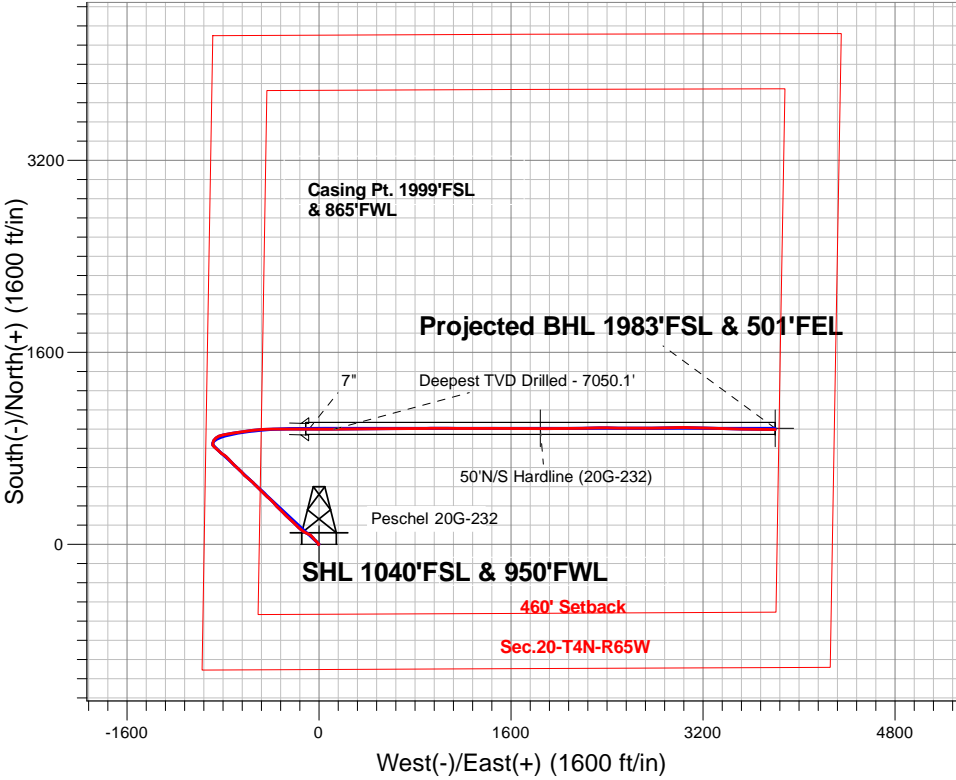
PETROLEUM DEVELOPMENT CORP Weld County CO

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

Surface Location: Peschel 4N65W20B Pad Sec.20-T4N-R65W
North American Datum 1983 , US State Plane 1983, Colorado Northern Zone
Ground Elevation: 4801.0
+N/-S +E/-W Northing Easting Latitude Longitude Slot
0.0 0.0 1350783.50 3225068.81 40.293490 -104.693140
Ensign Rig #134 RKB - 13'WELL @ 4814.0ft (Ensign Rig #134 RKB - 13')

FINAL SURVEY

Projected Bottom Hole Location
11557'MD 7004'TVD 955'N & 3801'E of SHL
90.0 degree Incl @ 91.4 degree AZM



Peschel 4N65W20B Pad Sec.20-T4N-R65W Peschel 20G-232 Wellbore #1 8:49, August 10 2015	ANNOTATIONS		
	TVD	MD	Annotation
	7050.1	7877.0	Deepest TVD Drilled - 7050.1'

LEGEND

- Peschel 20G-232, Wellbore #1, Plan #2 (7-31-15)R V0
- Wellbore #1
- Survey #1

BHL 1983'FSL & 501'FEL



PETROLEUM DEVELOPMENT CORP Weld County CO

SEC.20-T4N-R65W

Peschel 4N65W20B Pad Sec.20-T4N-R65W

Peschel 20G-232

Wellbore #1

Survey: Survey #1

Standard Survey Report

10 August, 2015

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Peschel 20G-232
Project:	SEC.20-T4N-R65W	TVD Reference:	WELL @ 4814.0ft (Ensign Rig #134 RKB - 13')
Site:	Peschel 4N65W20B Pad Sec.20-T4N-R65W	MD Reference:	WELL @ 4814.0ft (Ensign Rig #134 RKB - 13')
Well:	Peschel 20G-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 20G-232					
Well Position	+N/-S	0.0 ft	Northing:	1,350,783.50 usft	Latitude:	40.293490
	+E/-W	0.0 ft	Easting:	3,225,068.82 usft	Longitude:	-104.693140
Position Uncertainty		0.0 ft	Wellhead Elevation:	ft	Ground Level:	4,801.0 ft

Wellbore	Wellbore #1				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	7/31/2015	8.26	66.83	52,649

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	75.75	

Survey Program	Date	8/10/2015			
From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description	
165.0	11,557.0	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	
165.0	0.60	215.50	165.0	-0.7	-0.5	-0.7	0.36	0.36	0.00	
257.0	0.90	209.50	257.0	-1.7	-1.1	-1.5	0.34	0.33	-6.52	
349.0	1.20	240.70	349.0	-2.8	-2.3	-3.0	0.69	0.33	33.91	
442.0	0.80	278.40	442.0	-3.2	-3.8	-4.5	0.81	-0.43	40.54	
534.0	1.50	338.40	533.9	-2.0	-4.9	-5.2	1.41	0.76	65.22	
627.0	1.90	341.20	626.9	0.6	-5.8	-5.5	0.44	0.43	3.01	
719.0	2.60	353.20	718.8	4.1	-6.6	-5.4	0.91	0.76	13.04	
811.0	2.80	333.80	810.7	8.2	-7.8	-5.6	1.01	0.22	-21.09	
883.0	3.80	320.80	882.6	11.6	-10.1	-6.9	1.73	1.39	-18.06	

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Peschel 20G-232
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Site:	Peschel 4N65W20B Pad Sec.20-T4N-R65W	MD Reference:	WELL @ 4814.0ft (Ensign Rig #134 RKB - 13')
Well:	Peschel 20G-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)
1,012.0	5.50	311.80	1,011.2	19.1	-17.4	-12.2	1.43	1.32	-6.98
1,104.0	5.50	313.60	1,102.8	25.0	-23.9	-17.0	0.19	0.00	1.96
1,197.0	5.40	313.30	1,195.3	31.1	-30.3	-21.7	0.11	-0.11	-0.32
1,289.0	7.20	317.50	1,286.8	38.3	-37.4	-26.8	2.02	1.96	4.57
1,382.0	10.80	320.10	1,378.6	49.3	-46.9	-33.3	3.89	3.87	2.80
1,474.0	11.20	320.50	1,468.9	62.8	-58.1	-40.8	0.44	0.43	0.43
1,566.0	11.00	309.60	1,559.2	75.3	-70.5	-49.8	2.29	-0.22	-11.85
1,659.0	8.60	290.40	1,650.9	83.4	-83.9	-60.8	4.33	-2.58	-20.65
1,751.0	10.20	295.50	1,741.6	89.3	-97.7	-72.7	1.96	1.74	5.54
1,844.0	11.20	297.60	1,833.0	97.0	-113.1	-85.8	1.15	1.08	2.26
1,939.0	11.80	303.80	1,926.1	106.7	-129.4	-99.1	1.45	0.63	6.53
2,034.0	11.10	306.60	2,019.2	117.6	-144.8	-111.4	0.94	-0.74	2.95
2,130.0	12.00	311.30	2,113.3	129.7	-159.7	-122.9	1.36	0.94	4.90
2,225.0	12.80	314.70	2,206.1	143.6	-174.6	-133.9	1.14	0.84	3.58
2,320.0	12.50	314.50	2,298.8	158.2	-189.4	-144.7	0.32	-0.32	-0.21
2,416.0	13.80	315.50	2,392.2	173.6	-204.9	-155.8	1.37	1.35	1.04
2,511.0	13.40	312.00	2,484.6	189.1	-221.0	-167.6	0.96	-0.42	-3.68
2,606.0	14.20	313.10	2,576.8	204.4	-237.7	-180.0	0.89	0.84	1.16
2,702.0	15.40	314.00	2,669.7	221.3	-255.5	-193.1	1.27	1.25	0.94
2,797.0	15.70	313.40	2,761.2	238.9	-273.9	-206.6	0.36	0.32	-0.63
2,892.0	16.10	313.10	2,852.5	256.7	-292.8	-220.6	0.43	0.42	-0.32
2,987.0	15.90	316.60	2,943.9	275.2	-311.4	-234.0	1.04	-0.21	3.68
3,082.0	15.50	315.40	3,035.3	293.7	-329.2	-246.8	0.54	-0.42	-1.26
3,178.0	14.40	314.00	3,128.1	311.1	-346.8	-259.6	1.21	-1.15	-1.46
3,273.0	13.30	321.00	3,220.3	327.8	-362.2	-270.4	2.11	-1.16	7.37
3,368.0	11.60	319.40	3,313.1	343.6	-375.3	-279.2	1.83	-1.79	-1.68
3,463.0	11.00	314.00	3,406.2	357.1	-388.0	-288.2	1.28	-0.63	-5.68
3,559.0	11.40	311.30	3,500.4	369.7	-401.8	-298.4	0.69	0.42	-2.81
3,654.0	11.70	310.80	3,593.5	382.2	-416.1	-309.2	0.33	0.32	-0.53
3,749.0	12.70	311.80	3,686.3	395.5	-431.2	-320.5	1.08	1.05	1.05
3,844.0	13.60	314.50	3,778.8	410.3	-446.9	-332.2	1.15	0.95	2.84
3,939.0	17.10	315.70	3,870.4	428.1	-464.7	-345.0	3.70	3.68	1.26
4,035.0	17.40	315.20	3,962.1	448.4	-484.6	-359.3	0.35	0.31	-0.52
4,130.0	16.70	314.50	4,053.0	468.0	-504.4	-373.6	0.77	-0.74	-0.74
4,225.0	15.20	313.60	4,144.3	486.2	-523.1	-387.3	1.60	-1.58	-0.95
4,320.0	15.90	315.50	4,235.8	504.1	-541.3	-400.5	0.91	0.74	2.00
4,415.0	14.90	312.40	4,327.4	521.6	-559.4	-413.8	1.36	-1.05	-3.26
4,510.0	15.10	311.30	4,419.2	538.0	-577.7	-427.5	0.37	0.21	-1.16
4,606.0	13.50	309.00	4,512.2	553.3	-595.8	-441.3	1.77	-1.67	-2.40
4,701.0	14.30	309.70	4,604.4	567.8	-613.5	-454.8	0.86	0.84	0.74
4,796.0	15.20	320.30	4,696.3	584.8	-630.5	-467.1	2.99	0.95	11.16
4,892.0	12.20	317.30	4,789.6	602.0	-645.4	-477.3	3.21	-3.13	-3.13

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Peschel 20G-232
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Site:	Peschel 4N65W20B Pad Sec.20-T4N-R65W	MD Reference:	WELL @ 4814.0ft (Ensign Rig #134 RKB - 13')
Well:	Peschel 20G-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)
4,987.0	12.50	314.10	4,882.4	616.5	-659.6	-487.5	0.79	0.32	-3.37
5,082.0	14.30	313.30	4,974.8	631.7	-675.5	-499.2	1.90	1.89	-0.84
5,177.0	12.50	311.30	5,067.2	646.6	-691.8	-511.3	1.96	-1.89	-2.11
5,272.0	13.70	313.40	5,159.7	661.1	-707.7	-523.1	1.36	1.26	2.21
5,368.0	13.70	317.50	5,253.0	677.3	-723.6	-534.6	1.01	0.00	4.27
5,463.0	12.60	316.80	5,345.5	693.1	-738.3	-544.9	1.17	-1.16	-0.74
5,558.0	15.40	317.10	5,437.7	709.9	-754.0	-556.0	2.95	2.95	0.32
5,654.0	12.60	313.10	5,530.8	726.4	-770.3	-567.8	3.08	-2.92	-4.17
5,749.0	14.10	306.60	5,623.2	740.4	-787.2	-580.7	2.23	1.58	-6.84
5,844.0	11.90	300.90	5,715.8	752.3	-804.8	-594.9	2.68	-2.32	-6.00
5,940.0	10.60	308.50	5,809.9	762.9	-820.3	-607.2	2.05	-1.35	7.92
6,035.0	11.30	315.90	5,903.2	775.0	-833.6	-617.1	1.65	0.74	7.79
6,130.0	12.80	315.20	5,996.1	789.2	-847.5	-627.1	1.59	1.58	-0.74
6,226.0	12.80	311.10	6,089.7	803.7	-863.0	-638.6	0.95	0.00	-4.27
6,257.0	13.70	312.40	6,119.9	808.4	-868.3	-642.5	3.06	2.90	4.19
6,321.0	12.30	314.50	6,182.3	818.3	-878.7	-650.2	2.31	-2.19	3.28
6,416.0	15.70	5.10	6,274.8	838.3	-884.8	-651.2	12.91	3.58	53.26
6,512.0	16.80	26.70	6,367.0	863.7	-877.4	-637.8	6.36	1.15	22.50
6,607.0	18.60	52.40	6,457.7	885.2	-859.2	-614.9	8.37	1.89	27.05
6,702.0	19.40	65.00	6,547.5	901.1	-832.9	-585.4	4.39	0.84	13.26
6,798.0	26.50	78.60	6,635.9	912.1	-797.4	-548.3	9.19	7.40	14.17
6,893.0	35.80	81.40	6,717.1	920.5	-749.0	-499.4	9.91	9.79	2.95
6,988.0	38.00	80.90	6,793.1	929.3	-692.7	-442.6	2.34	2.32	-0.53
7,083.0	50.70	82.10	6,860.9	939.0	-627.1	-376.7	13.40	13.37	1.26
7,178.0	56.70	82.80	6,917.1	949.0	-551.3	-300.7	6.34	6.32	0.74
7,273.0	62.60	86.50	6,965.1	956.6	-469.7	-219.7	7.06	6.21	3.89
7,368.0	74.00	90.00	7,000.2	959.2	-381.6	-133.8	12.48	12.00	3.68
7,463.0	79.30	89.80	7,022.1	959.3	-289.2	-44.2	5.58	5.58	-0.21
7,558.0	80.40	89.70	7,038.9	959.7	-195.7	46.6	1.16	1.16	-0.11
7,605.0	85.40	90.50	7,044.7	959.6	-149.1	91.7	10.77	10.64	1.70
7,669.4	87.99	90.66	7,048.4	959.0	-84.8	153.9	4.03	4.02	0.24
7"									
7,687.0	88.70	90.70	7,048.9	958.8	-67.2	170.9	4.03	4.02	0.24
7,782.0	89.90	89.80	7,050.0	958.4	27.8	262.9	1.58	1.26	-0.95
7,877.0	90.00	89.70	7,050.1	958.8	122.8	355.0	0.15	0.11	-0.11
Deepest TVD Drilled - 7050.1'									
7,973.0	90.70	88.60	7,049.5	960.2	218.8	448.4	1.36	0.73	-1.15
8,068.0	90.70	89.30	7,048.4	962.0	313.7	540.9	0.74	0.00	0.74
8,163.0	91.10	89.80	7,046.9	962.7	408.7	633.1	0.67	0.42	0.53
8,258.0	92.40	90.40	7,044.0	962.5	503.7	725.1	1.51	1.37	0.63
8,353.0	91.80	90.20	7,040.5	962.0	598.6	817.0	0.67	-0.63	-0.21
8,448.0	91.80	89.80	7,037.5	962.0	693.6	909.1	0.42	0.00	-0.42
8,544.0	90.20	89.50	7,035.8	962.6	789.5	1,002.2	1.70	-1.67	-0.31

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Well:	Peschel 20G-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)
8,639.0	89.60	88.30	7,036.0	964.4	884.5	1,094.7	1.41	-0.63	-1.26
8,734.0	88.60	89.50	7,037.5	966.3	979.5	1,187.2	1.64	-1.05	1.26
8,829.0	89.30	90.90	7,039.2	965.9	1,074.5	1,279.2	1.65	0.74	1.47
8,924.0	91.80	91.10	7,038.3	964.3	1,169.4	1,370.8	2.64	2.63	0.21
9,019.0	90.90	90.50	7,036.1	963.0	1,264.4	1,462.6	1.14	-0.95	-0.63
9,114.0	90.70	89.70	7,034.8	962.8	1,359.4	1,554.6	0.87	-0.21	-0.84
9,210.0	90.20	88.60	7,034.0	964.2	1,455.4	1,648.0	1.26	-0.52	-1.15
9,305.0	90.50	89.10	7,033.4	966.1	1,550.4	1,740.5	0.61	0.32	0.53
9,400.0	91.10	91.40	7,032.1	965.7	1,645.3	1,832.4	2.50	0.63	2.42
9,495.0	91.40	89.80	7,030.0	964.7	1,740.3	1,924.2	1.71	0.32	-1.68
9,590.0	91.50	91.10	7,027.6	964.0	1,835.3	2,016.1	1.37	0.11	1.37
9,685.0	91.00	90.00	7,025.6	963.1	1,930.2	2,107.9	1.27	-0.53	-1.16
9,781.0	90.00	90.00	7,024.7	963.1	2,026.2	2,201.0	1.04	-1.04	0.00
9,876.0	90.30	89.10	7,024.5	963.8	2,121.2	2,293.2	1.00	0.32	-0.95
9,971.0	89.30	88.30	7,024.8	966.0	2,216.2	2,385.8	1.35	-1.05	-0.84
10,066.0	90.10	88.10	7,025.3	968.9	2,311.2	2,478.6	0.87	0.84	-0.21
10,161.0	91.40	90.90	7,024.1	969.8	2,406.1	2,570.8	3.25	1.37	2.95
10,251.0	91.00	90.90	7,022.2	968.4	2,496.1	2,657.7	0.44	-0.44	0.00
10,343.0	91.50	90.40	7,020.2	967.3	2,588.1	2,746.6	0.77	0.54	-0.54
10,436.0	91.90	89.70	7,017.4	967.2	2,681.0	2,836.6	0.87	0.43	-0.75
10,528.0	92.30	89.00	7,014.0	968.3	2,773.0	2,926.0	0.88	0.43	-0.76
10,620.0	91.40	89.80	7,011.1	969.2	2,864.9	3,015.3	1.31	-0.98	0.87
10,712.0	91.50	88.10	7,008.7	970.9	2,956.9	3,104.9	1.85	0.11	-1.85
10,804.0	91.80	89.70	7,006.1	972.7	3,048.8	3,194.4	1.77	0.33	1.74
10,897.0	92.20	92.30	7,002.8	971.1	3,141.7	3,284.1	2.83	0.43	2.80
10,992.0	91.50	92.10	6,999.8	967.4	3,236.6	3,375.2	0.77	-0.74	-0.21
11,087.0	89.00	91.80	6,999.4	964.2	3,331.5	3,466.4	2.65	-2.63	-0.32
11,182.0	89.10	91.60	7,000.9	961.4	3,426.5	3,557.7	0.24	0.11	-0.21
11,278.0	89.30	91.10	7,002.3	959.1	3,522.5	3,650.2	0.56	0.21	-0.52
11,373.0	89.40	90.40	7,003.4	957.9	3,617.4	3,741.9	0.74	0.11	-0.74
11,468.0	89.50	90.40	7,004.3	957.2	3,712.4	3,833.8	0.11	0.11	0.00
11,499.0	90.00	91.40	7,004.4	956.7	3,743.4	3,863.7	3.61	1.61	3.23
11,557.0	90.00	91.40	7,004.4	955.3	3,801.4	3,919.6	0.00	0.00	0.00

Casing Points					
Measured Depth (ft)	Vertical Depth (ft)	Name	Casing Diameter (")	Hole Diameter (")	
7,669.4	7,048.4	7"	7	8-3/4	

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Peschel 20G-232
Project:	SEC.20-T4N-R65W	TVD Reference:	WELL @ 4814.0ft (Ensign Rig #134 RKB - 13')
Site:	Peschel 4N65W20B Pad Sec.20-T4N-R65W	MD Reference:	WELL @ 4814.0ft (Ensign Rig #134 RKB - 13')
Well:	Peschel 20G-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			
		+N/-S (ft)	+E/-W (ft)	Comment	
7,877.0	7,050.1	958.8	122.8	Deepest TVD Drilled - 7050.1'	

Checked By: _____	Approved By: _____	Date: _____
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