

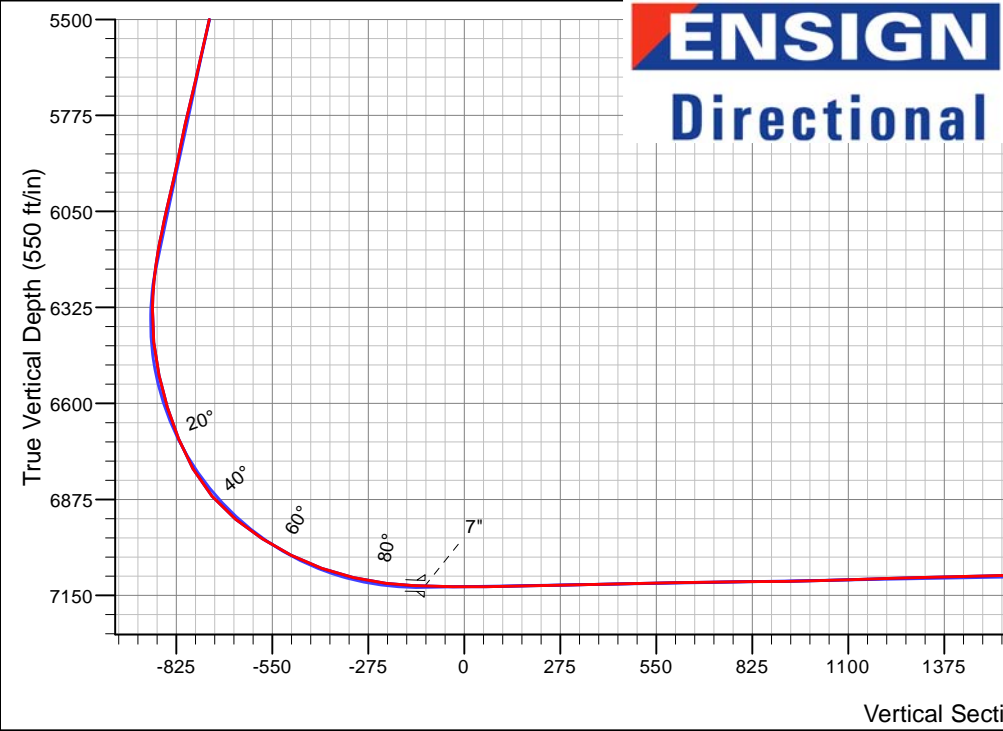
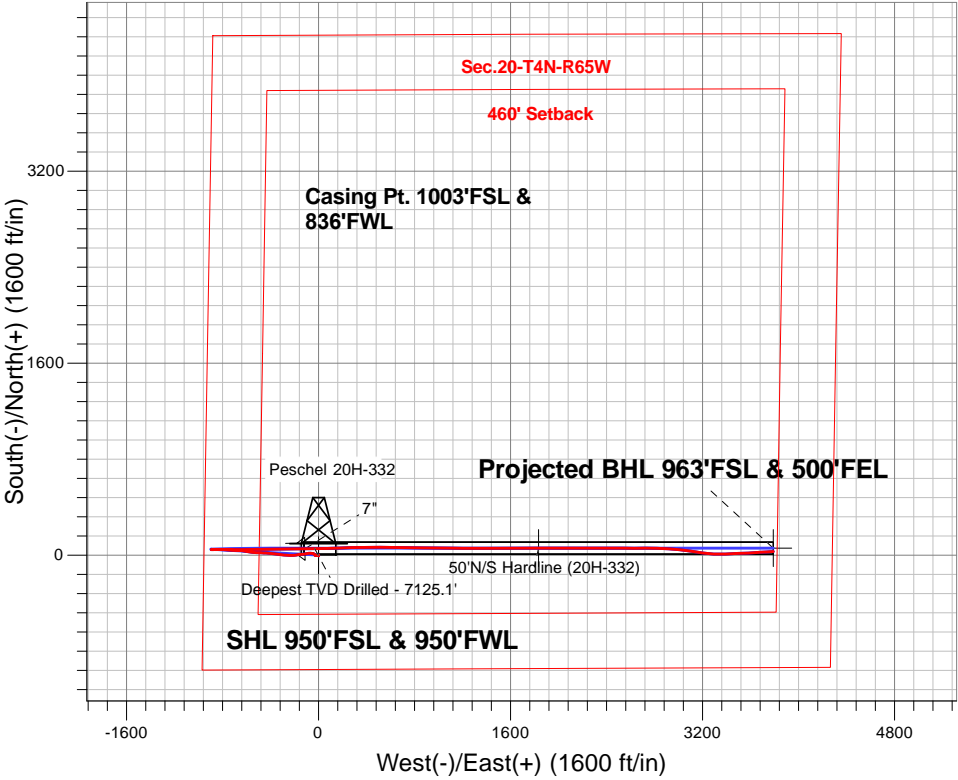
PETROLEUM DEVELOPMENT CORP Weld County CO

Well Name: **Peschel 20H-332**

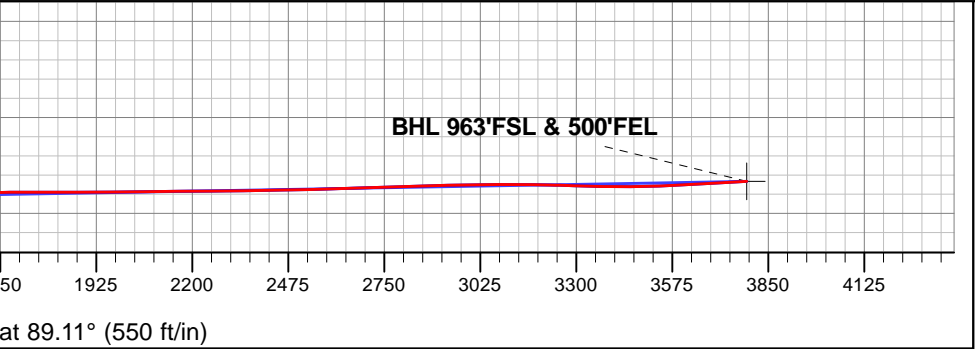
Surface Location: Peschel 4N65W20B Pad Sec.20-T4N-R65W  
North American Datum 1983 , US State Plane 1983, Colorado Northern Zone  
Ground Elevation: 4802.0  
+N/-S +E/-W Northing Easting Latitude Longitude Slot  
0.0 0.01350692.41 3225066.85 40.293240 -104.693150  
Ensign Rig #134 RKB - 13'WELL @ 4815.0ft (Ensign Rig #134 RKB - 13')

FINAL SURVEY

Projected Bottom Hole Location  
11578'MD 7058'TVD 29°N & 3788'E of SHL  
93.2 degree Incl @ 87.0 degree AZM



Peschel 4N65W20B Pad Sec.20-T4N-R65W Peschel 20H-332 Wellbore #1 7:54, September 08 2015	ANNOTATIONS		
	TVD	MD	Annotation
	7125.1	7752.0	Deepest TVD Drilled - 7125.1'
LEGEND			
— Peschel 20H-332, Wellbore #1, Plan #2 (8-24-15)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-332**

**Wellbore #1**

**Survey: Survey #1**

## **Standard Survey Report**

**08 September, 2015**

<b>Company:</b>	PETROLEUM DEVELOPMENT CORP Weld County CO	<b>Local Co-ordinate Reference:</b>	Well Peschel 20H-332
<b>Project:</b>	SEC.20-T4N-R65W	<b>TVD Reference:</b>	WELL @ 4815.0ft (Ensign Rig #134 RKB - 13')
<b>Site:</b>	Peschel 4N65W20B Pad Sec.20-T4N-R65W	<b>MD Reference:</b>	WELL @ 4815.0ft (Ensign Rig #134 RKB - 13')
<b>Well:</b>	Peschel 20H-332	<b>North Reference:</b>	True
<b>Wellbore:</b>	Wellbore #1	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	Wellbore #1	<b>Database:</b>	US_EDM

<b>Project</b>	SEC.20-T4N-R65W, Weld, Colorado		
<b>Map System:</b>	US State Plane 1983	<b>System Datum:</b>	Mean Sea Level
<b>Geo Datum:</b>	North American Datum 1983		Using Well Reference Point
<b>Map Zone:</b>	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-332					
Well Position	+N/-S	0.0 ft	Northing:	1,350,692.41 usft	Latitude:	40.293240
	+E/-W	0.0 ft	Easting:	3,225,066.85 usft	Longitude:	-104.693150
Position Uncertainty		0.0 ft	Wellhead Elevation:	ft	Ground Level:	4,802.0 ft

<b>Wellbore</b>	Wellbore #1				
<b>Magnetics</b>	<b>Model Name</b>	<b>Sample Date</b>	<b>Declination (°)</b>	<b>Dip Angle (°)</b>	<b>Field Strength (nT)</b>
	IGRF2010	8/24/2015	8.25	66.83	52,642

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	89.11	

<b>Survey Program</b>	<b>Date</b>	9/8/2015		
<b>From (ft)</b>	<b>To (ft)</b>	<b>Survey (Wellbore)</b>	<b>Tool Name</b>	<b>Description</b>
0.0	11,578.0	Survey #1 (Wellbore #1)	MWD	MWD - Standard

<b>Survey</b>										
<b>Measured Depth (ft)</b>	<b>Inclination (°)</b>	<b>Azimuth (°)</b>	<b>Vertical Depth (ft)</b>	<b>+N/-S (ft)</b>	<b>+E/-W (ft)</b>	<b>Vertical Section (ft)</b>	<b>Dogleg Rate (°/100usft)</b>	<b>Build Rate (°/100usft)</b>	<b>Turn Rate (°/100usft)</b>	
0.0	0.00	0.00	0.0	0.0	0.0	0.0	0.00	0.00	0.00	
1.0	0.01	155.80	1.0	0.0	0.0	0.0	1.46	1.46	0.00	
<b>SHL 950'FSL &amp; 950'FWL</b>										
10.2	0.15	155.80	10.2	0.0	0.0	0.0	1.46	1.46	0.00	
<b>50'N/S Hardline (20H-332)</b>										
103.0	1.50	155.80	103.0	-1.2	0.6	0.5	1.46	1.46	0.00	
165.0	1.60	154.70	165.0	-2.8	1.3	1.2	0.17	0.16	-1.77	
257.0	0.40	209.40	257.0	-4.2	1.6	1.6	1.53	-1.30	59.46	
349.0	0.40	278.10	348.9	-4.4	1.2	1.1	0.49	0.00	74.67	
442.0	0.50	257.70	441.9	-4.5	0.5	0.4	0.20	0.11	-21.94	

<b>Company:</b>	PETROLEUM DEVELOPMENT CORP Weld County CO	<b>Local Co-ordinate Reference:</b>	Well Peschel 20H-332
<b>Project:</b>	SEC.20-T4N-R65W	<b>TVD Reference:</b>	WELL @ 4815.0ft (Ensign Rig #134 RKB - 13')
<b>Site:</b>	Peschel 4N65W20B Pad Sec.20-T4N-R65W	<b>MD Reference:</b>	WELL @ 4815.0ft (Ensign Rig #134 RKB - 13')
<b>Well:</b>	Peschel 20H-332	<b>North Reference:</b>	True
<b>Wellbore:</b>	Wellbore #1	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	Wellbore #1	<b>Database:</b>	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	0.90	277.90	533.9	-4.5	-0.7	-0.7	0.50	0.43	21.96
627.0	1.10	282.50	626.9	-4.2	-2.2	-2.3	0.23	0.22	4.95
719.0	1.10	271.80	718.9	-3.9	-4.0	-4.1	0.22	0.00	-11.63
811.0	1.40	271.20	810.9	-3.9	-6.0	-6.1	0.33	0.33	-0.65
895.0	1.60	267.70	894.9	-3.9	-8.2	-8.3	0.26	0.24	-4.17
1,014.0	1.60	263.50	1,013.8	-4.2	-11.5	-11.6	0.10	0.00	-3.53
1,106.0	1.40	268.60	1,105.8	-4.3	-13.9	-14.0	0.26	-0.22	5.54
1,198.0	1.50	284.20	1,197.8	-4.1	-16.2	-16.3	0.44	0.11	16.96
1,291.0	1.80	276.20	1,290.7	-3.6	-18.8	-18.9	0.41	0.32	-8.60
1,383.0	1.40	265.40	1,382.7	-3.6	-21.4	-21.4	0.54	-0.43	-11.74
1,476.0	1.80	267.20	1,475.6	-3.7	-24.0	-24.0	0.43	0.43	1.94
1,568.0	1.40	269.30	1,567.6	-3.8	-26.5	-26.6	0.44	-0.43	2.28
1,661.0	1.10	241.90	1,660.6	-4.2	-28.5	-28.5	0.71	-0.32	-29.46
1,753.0	1.70	27.30	1,752.6	-3.4	-28.6	-28.7	2.91	0.65	158.04
1,846.0	4.00	330.80	1,845.5	0.6	-29.6	-29.6	3.63	2.47	-60.75
1,941.0	5.90	309.70	1,940.1	6.6	-34.9	-34.8	2.74	2.00	-22.21
2,036.0	6.90	293.20	2,034.5	12.0	-44.0	-43.8	2.19	1.05	-17.37
2,132.0	6.90	274.80	2,129.8	14.8	-55.0	-54.8	2.29	0.00	-19.17
2,227.0	7.60	271.20	2,224.1	15.4	-67.0	-66.7	0.88	0.74	-3.79
2,322.0	9.10	266.10	2,318.1	15.0	-80.7	-80.5	1.76	1.58	-5.37
2,417.0	9.20	257.40	2,411.9	12.8	-95.7	-95.4	1.46	0.11	-9.16
2,513.0	10.60	263.30	2,506.4	10.1	-111.9	-111.7	1.80	1.46	6.15
2,608.0	9.80	261.70	2,599.9	7.9	-128.6	-128.5	0.89	-0.84	-1.68
2,703.0	12.40	265.60	2,693.2	6.0	-146.8	-146.7	2.85	2.74	4.11
2,799.0	12.60	262.80	2,786.9	3.9	-167.4	-167.3	0.66	0.21	-2.92
2,894.0	12.80	261.40	2,879.6	1.0	-188.1	-188.1	0.39	0.21	-1.47
2,989.0	11.60	263.20	2,972.4	-1.7	-208.0	-208.0	1.32	-1.26	1.89
3,084.0	10.70	271.20	3,065.6	-2.7	-226.3	-226.3	1.88	-0.95	8.42
3,179.0	11.00	275.60	3,158.9	-1.6	-244.1	-244.1	0.93	0.32	4.63
3,275.0	9.80	271.40	3,253.3	-0.5	-261.4	-261.4	1.48	-1.25	-4.38
3,370.0	10.30	272.30	3,346.9	0.0	-278.0	-278.0	0.55	0.53	0.95
3,465.0	10.50	277.40	3,440.3	1.5	-295.1	-295.0	0.99	0.21	5.37
3,560.0	11.00	277.70	3,533.7	3.8	-312.6	-312.5	0.53	0.53	0.32
3,656.0	11.80	277.00	3,627.8	6.3	-331.5	-331.3	0.85	0.83	-0.73
3,751.0	12.10	277.00	3,720.7	8.7	-351.0	-350.8	0.32	0.32	0.00
3,846.0	14.10	277.70	3,813.2	11.4	-372.3	-372.1	2.11	2.11	0.74
3,941.0	14.10	276.50	3,905.4	14.3	-395.3	-395.0	0.31	0.00	-1.26
4,036.0	13.10	275.60	3,997.7	16.6	-417.5	-417.2	1.08	-1.05	-0.95
4,132.0	12.30	272.10	4,091.4	18.1	-438.6	-438.2	1.16	-0.83	-3.65
4,227.0	12.80	273.90	4,184.1	19.2	-459.2	-458.8	0.67	0.53	1.89
4,322.0	12.10	272.80	4,276.9	20.4	-479.6	-479.2	0.78	-0.74	-1.16
4,417.0	10.90	268.80	4,369.9	20.7	-498.5	-498.2	1.52	-1.26	-4.21

<b>Company:</b>	PETROLEUM DEVELOPMENT CORP Weld County CO	<b>Local Co-ordinate Reference:</b>	Well Peschel 20H-332
<b>Project:</b>	SEC.20-T4N-R65W	<b>TVD Reference:</b>	WELL @ 4815.0ft (Ensign Rig #134 RKB - 13')
<b>Site:</b>	Peschel 4N65W20B Pad Sec.20-T4N-R65W	<b>MD Reference:</b>	WELL @ 4815.0ft (Ensign Rig #134 RKB - 13')
<b>Well:</b>	Peschel 20H-332	<b>North Reference:</b>	True
<b>Wellbore:</b>	Wellbore #1	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	Wellbore #1	<b>Database:</b>	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)
4,512.0	11.80	273.90	4,463.1	21.1	-517.2	-516.8	1.42	0.95	5.37
4,607.0	10.90	270.70	4,556.2	21.9	-535.9	-535.5	1.16	-0.95	-3.37
4,703.0	11.50	276.30	4,650.4	23.1	-554.5	-554.0	1.29	0.63	5.83
4,798.0	12.10	279.90	4,743.4	25.8	-573.7	-573.2	1.00	0.63	3.79
4,893.0	12.40	280.70	4,836.2	29.4	-593.5	-593.0	0.36	0.32	0.84
4,989.0	10.60	281.60	4,930.3	33.1	-612.3	-611.7	1.88	-1.88	0.94
5,084.0	11.50	278.10	5,023.5	36.2	-630.2	-629.6	1.18	0.95	-3.68
5,179.0	13.40	269.50	5,116.3	37.4	-650.6	-650.0	2.79	2.00	-9.05
5,274.0	11.10	270.00	5,209.1	37.3	-670.8	-670.1	2.42	-2.42	0.53
5,369.0	11.70	273.50	5,302.3	37.9	-689.5	-688.9	0.96	0.63	3.68
5,465.0	11.80	274.10	5,396.3	39.2	-709.0	-708.4	0.16	0.10	0.63
5,560.0	12.00	274.20	5,489.2	40.7	-728.6	-727.9	0.21	0.21	0.11
5,655.0	13.10	277.60	5,581.9	42.8	-749.1	-748.4	1.39	1.16	3.58
5,751.0	13.20	273.00	5,675.4	44.8	-770.8	-770.0	1.09	0.10	-4.79
5,846.0	13.30	273.50	5,767.9	46.0	-792.6	-791.8	0.16	0.11	0.53
5,941.0	11.10	271.60	5,860.8	47.0	-812.6	-811.8	2.35	-2.32	-2.00
6,037.0	12.80	273.00	5,954.7	47.8	-832.5	-831.6	1.80	1.77	1.46
6,132.0	13.00	270.00	6,047.3	48.3	-853.7	-852.8	0.74	0.21	-3.16
6,227.0	10.90	266.10	6,140.2	47.7	-873.3	-872.5	2.37	-2.21	-4.11
6,323.0	6.50	262.30	6,235.1	46.4	-887.8	-886.9	4.62	-4.58	-3.96
6,418.0	0.80	271.20	6,329.9	45.7	-893.8	-893.0	6.01	-6.00	9.37
6,513.0	5.50	88.60	6,424.7	45.8	-889.9	-889.1	6.63	4.95	186.74
6,609.0	12.10	86.10	6,519.5	46.6	-875.2	-874.4	6.88	6.88	-2.60
6,704.0	17.80	89.70	6,611.3	47.3	-850.7	-849.9	6.08	6.00	3.79
6,799.0	21.40	91.10	6,700.8	47.1	-818.9	-818.1	3.82	3.79	1.47
6,895.0	29.50	93.00	6,787.4	45.5	-777.7	-776.9	8.48	8.44	1.98
6,990.0	40.40	90.00	6,865.1	44.3	-723.4	-722.6	11.61	11.47	-3.16
7,085.0	50.60	87.40	6,931.6	46.0	-655.8	-655.0	10.91	10.74	-2.74
7,180.0	57.40	89.30	6,987.5	48.1	-579.0	-578.2	7.34	7.16	2.00
7,275.0	63.20	88.80	7,034.5	49.5	-496.5	-495.7	6.12	6.11	-0.53
7,370.0	70.40	89.80	7,071.9	50.5	-409.3	-408.4	7.64	7.58	1.05
7,465.0	77.00	89.80	7,098.6	50.9	-318.1	-317.3	6.95	6.95	0.00
7,560.0	82.80	89.80	7,115.2	51.2	-224.6	-223.8	6.11	6.11	0.00
7,638.0	87.30	89.00	7,121.9	52.0	-147.0	-146.1	5.86	5.77	-1.03
7,671.2	87.94	89.03	7,123.3	52.6	-113.8	-113.0	1.93	1.93	0.09
7"									
7,752.0	89.50	89.10	7,125.1	53.9	-33.0	-32.2	1.93	1.93	0.09
Deepest TVD Drilled - 7125.1'									
7,847.0	90.80	88.60	7,124.9	55.8	62.0	62.8	1.47	1.37	-0.53
7,942.0	91.50	87.70	7,123.0	58.9	156.9	157.8	1.20	0.74	-0.95
8,038.0	90.80	87.70	7,121.0	62.7	252.8	253.7	0.73	-0.73	0.00
8,133.0	92.00	89.50	7,118.7	65.0	347.7	348.7	2.28	1.26	1.89
8,228.0	90.70	90.40	7,116.5	65.1	442.7	443.7	1.66	-1.37	0.95

<b>Company:</b>	PETROLEUM DEVELOPMENT CORP Weld County CO	<b>Local Co-ordinate Reference:</b>	Well Peschel 20H-332
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<b>Site:</b>	Peschel 4N65W20B Pad Sec.20-T4N-R65W	<b>MD Reference:</b>	WELL @ 4815.0ft (Ensign Rig #134 RKB - 13')
<b>Well:</b>	Peschel 20H-332	<b>North Reference:</b>	True
<b>Wellbore:</b>	Wellbore #1	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	Wellbore #1	<b>Database:</b>	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)
8,323.0	91.50	90.40	7,114.7	64.4	537.7	538.6	0.84	0.84	0.00
8,418.0	90.70	91.20	7,112.8	63.1	632.7	633.6	1.19	-0.84	0.84
8,513.0	90.90	90.50	7,111.5	61.7	727.6	728.5	0.77	0.21	-0.74
8,608.0	90.70	90.50	7,110.2	60.9	822.6	823.5	0.21	-0.21	0.00
8,703.0	90.10	89.80	7,109.5	60.6	917.6	918.4	0.97	-0.63	-0.74
8,799.0	92.30	90.90	7,107.5	60.0	1,013.6	1,014.4	2.56	2.29	1.15
8,894.0	91.50	90.90	7,104.4	58.6	1,108.5	1,109.3	0.84	-0.84	0.00
8,989.0	91.90	90.00	7,101.5	57.8	1,203.5	1,204.2	1.04	0.42	-0.95
9,084.0	91.40	90.40	7,098.8	57.5	1,298.4	1,299.2	0.67	-0.53	0.42
9,179.0	91.60	89.10	7,096.3	57.9	1,393.4	1,394.1	1.38	0.21	-1.37
9,274.0	91.10	90.40	7,094.1	58.3	1,488.4	1,489.1	1.47	-0.53	1.37
9,370.0	91.90	89.50	7,091.6	58.4	1,584.3	1,585.0	1.25	0.83	-0.94
9,465.0	90.70	90.70	7,089.4	58.2	1,679.3	1,680.0	1.79	-1.26	1.26
9,560.0	89.70	89.00	7,089.1	58.5	1,774.3	1,775.0	2.08	-1.05	-1.79
9,655.0	90.00	90.20	7,089.3	59.1	1,869.3	1,870.0	1.30	0.32	1.26
9,750.0	91.10	90.00	7,088.4	59.0	1,964.3	1,965.0	1.18	1.16	-0.21
9,845.0	90.10	90.20	7,087.4	58.8	2,059.3	2,059.9	1.07	-1.05	0.21
9,940.0	90.90	89.50	7,086.6	59.1	2,154.3	2,154.9	1.12	0.84	-0.74
10,036.0	90.00	90.70	7,085.8	58.9	2,250.3	2,250.9	1.56	-0.94	1.25
10,131.0	91.00	89.80	7,085.0	58.5	2,345.3	2,345.9	1.42	1.05	-0.95
10,226.0	91.50	89.30	7,082.9	59.2	2,440.2	2,440.9	0.74	0.53	-0.53
10,321.0	90.80	91.10	7,081.0	58.9	2,535.2	2,535.8	2.03	-0.74	1.89
10,416.0	91.80	90.20	7,078.9	57.8	2,630.2	2,630.8	1.42	1.05	-0.95
10,511.0	91.40	89.50	7,076.2	58.1	2,725.1	2,725.7	0.85	-0.42	-0.74
10,607.0	92.70	91.90	7,072.8	56.9	2,821.1	2,821.6	2.84	1.35	2.50
10,702.0	91.50	94.20	7,069.3	51.8	2,915.9	2,916.3	2.73	-1.26	2.42
10,797.0	90.30	94.90	7,067.8	44.3	3,010.5	3,010.9	1.46	-1.26	0.74
10,892.0	90.10	98.10	7,067.5	33.5	3,104.9	3,105.1	3.37	-0.21	3.37
10,987.0	89.30	99.00	7,068.0	19.4	3,198.9	3,198.8	1.27	-0.84	0.95
11,082.0	87.70	92.50	7,070.5	9.9	3,293.3	3,293.1	7.04	-1.68	-6.84
11,178.0	89.20	87.90	7,073.1	9.6	3,389.2	3,389.0	5.04	1.56	-4.79
11,273.0	91.50	87.70	7,072.5	13.2	3,484.2	3,483.9	2.43	2.42	-0.21
11,368.0	92.50	86.80	7,069.2	17.8	3,579.0	3,578.8	1.42	1.05	-0.95
11,463.0	93.20	86.70	7,064.4	23.2	3,673.7	3,673.6	0.74	0.74	-0.11
11,521.0	93.20	87.00	7,061.2	26.3	3,731.5	3,731.5	0.52	0.00	0.52
11,578.0	93.20	87.00	7,058.0	29.3	3,788.4	3,788.4	0.00	0.00	0.00
BHL 992'FSL & 500'FEL									

<b>Company:</b>	PETROLEUM DEVELOPMENT CORP Weld County CO	<b>Local Co-ordinate Reference:</b>	Well Peschel 20H-332
<b>Project:</b>	SEC.20-T4N-R65W	<b>TVD Reference:</b>	WELL @ 4815.0ft (Ensign Rig #134 RKB - 13')
<b>Site:</b>	Peschel 4N65W20B Pad Sec.20-T4N-R65W	<b>MD Reference:</b>	WELL @ 4815.0ft (Ensign Rig #134 RKB - 13')
<b>Well:</b>	Peschel 20H-332	<b>North Reference:</b>	True
<b>Wellbore:</b>	Wellbore #1	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	Wellbore #1	<b>Database:</b>	US_EDM

Casing Points					
Measured Depth (ft)	Vertical Depth (ft)	Name		Casing Diameter (")	Hole Diameter (")
7,671.2	7,123.3	7"		7	7-1/2

Survey Annotations					
Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment	
		+N/-S (ft)	+E/-W (ft)		
7,752.0	7,125.1	53.9	-33.0	Deepest TVD Drilled - 7125.1'	

Checked By: \_\_\_\_\_ Approved By: \_\_\_\_\_ Date: \_\_\_\_\_