

PETROLEUM DEVELOPMENT CORP Weld County CO

Well Name: **Dillard 20R-303**

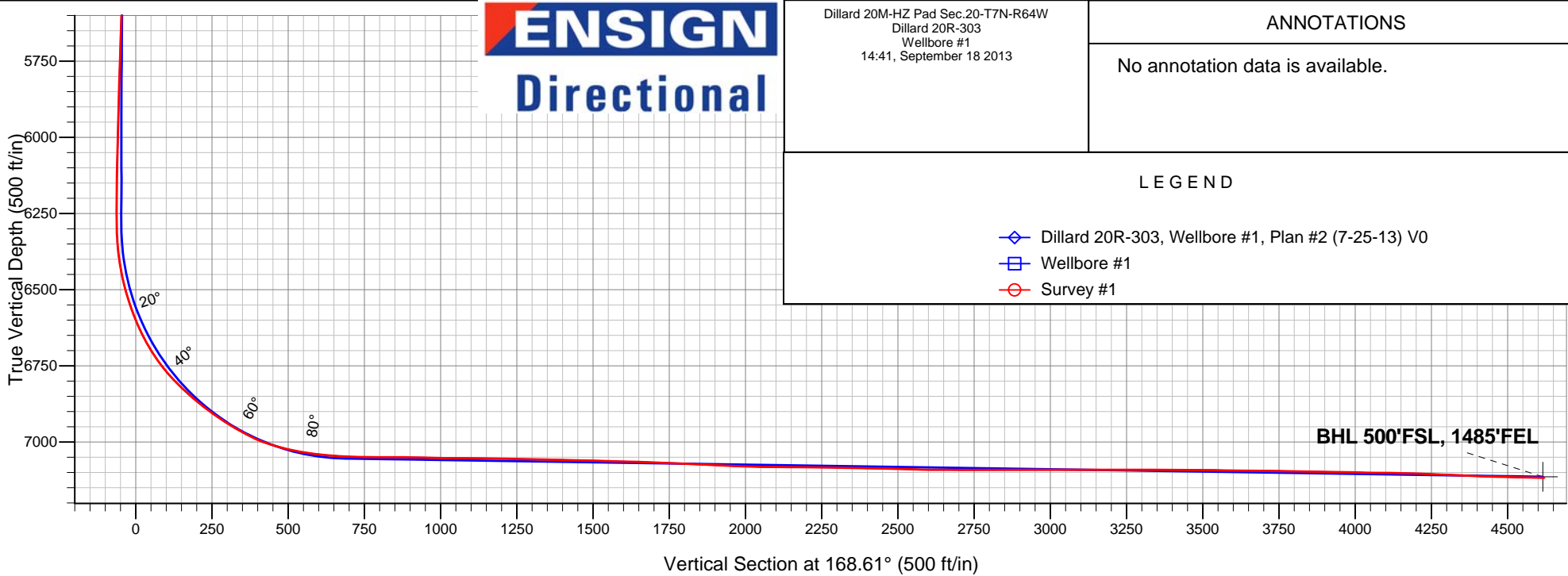
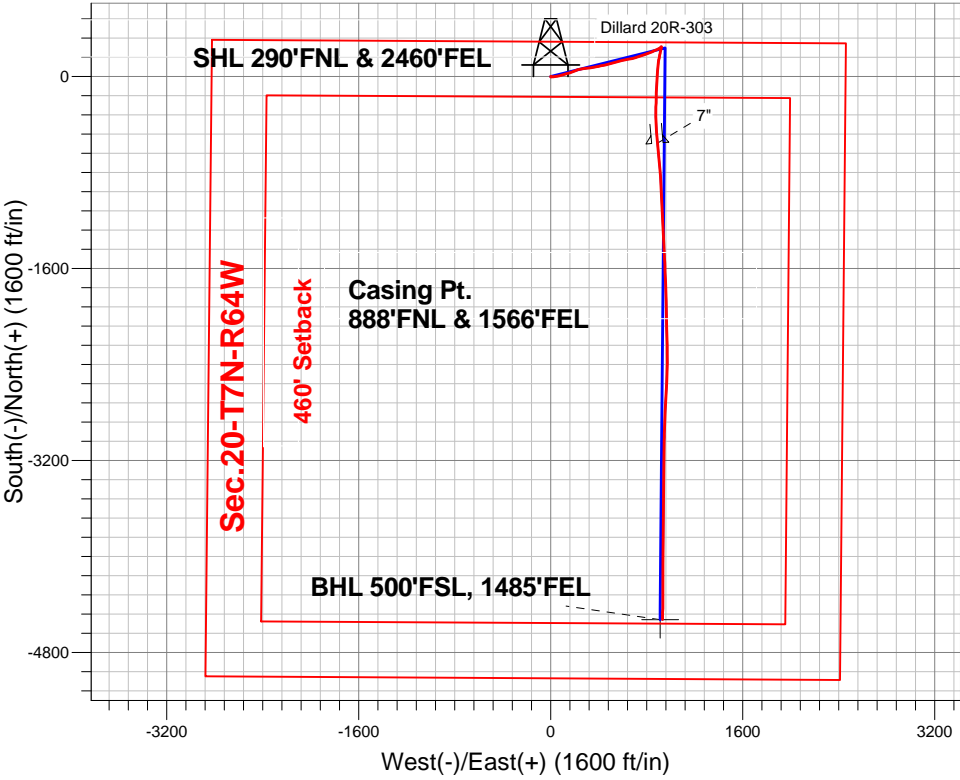
Surface Location: Dillard 20M-HZ Pad Sec.20-T7N-R64W  
North American Datum 1983 , US State Plane 1983 , Colorado Northern Zone

Ground Elevation: 4899.0

+N/-S	+E/-W	Northing	Easting	Latitude	Longitude	Slot
0.0	0.0	1449973.60	3257602.04	40.564880	-104.572800	
RKB - 15' WELL @ 4914.0ft (RKB - 15')						

FINAL SURVEY

Projected Bottom Hole Location  
11593'MD 7118'TVD 4525'S & 933'E of SHL  
88.8 degree Incl @ 180.7 degree AZM



Dillard 20M-HZ Pad Sec.20-T7N-R64W Dillard 20R-303 Wellbore #1 14:41, September 18 2013	ANNOTATIONS
	No annotation data is available.
LEGEND	
◆ Dillard 20R-303, Wellbore #1, Plan #2 (7-25-13) V0	
□ Wellbore #1	
○ Survey #1	



# **PETROLEUM DEVELOPMENT CORP Weld County CO**

**SEC.20-T7N-R64W**

**Dillard 20M-HZ Pad Sec.20-T7N-R64W**

**Dillard 20R-303**

**Wellbore #1**

**Survey: Survey #1**

## **Standard Survey Report**

**18 September, 2013**

<b>Company:</b>	PETROLEUM DEVELOPMENT CORP Weld County CO	<b>Local Co-ordinate Reference:</b>	Well Dillard 20R-303
<b>Project:</b>	SEC.20-T7N-R64W	<b>TVD Reference:</b>	WELL @ 4914.0ft (RKB - 15')
<b>Site:</b>	Dillard 20M-HZ Pad Sec.20-T7N-R64W	<b>MD Reference:</b>	WELL @ 4914.0ft (RKB - 15')
<b>Well:</b>	Dillard 20R-303	<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>	Landmark

<b>Project</b>	SEC.20-T7N-R64W, Weld County, CO		
<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	Dillard 20M-HZ Pad Sec.20-T7N-R64W				
Site Position:		Northing:	1,449,911.68ft	Latitude:	40.564710
From:	Lat/Long	Easting:	3,257,602.69ft	Longitude:	-104.572800
Position Uncertainty:	0.0 ft	Slot Radius:	"	Grid Convergence:	0.60 °

Well	Dillard 20R-303					
Well Position	+N-S	0.0 ft	Northing:	1,449,973.60 ft	Latitude:	40.564880
	+E-W	0.0 ft	Easting:	3,257,602.04 ft	Longitude:	-104.572800
Position Uncertainty		0.0 ft	Wellhead Elevation:	ft	Ground Level:	4,899.0 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	7/25/2013	8.49	67.14	53,015

<b>Design</b>	Wellbore #1				
<b>Audit Notes:</b>					
<b>Version:</b>	1.0	<b>Phase:</b>	ACTUAL	<b>Tie On Depth:</b>	0.0
<b>Vertical Section:</b>	<b>Depth From (TVD) (ft)</b>	<b>+N/-S (ft)</b>	<b>+E/-W (ft)</b>	<b>Direction (°)</b>	
	0.0	0.0	0.0	168.61	

<b>Survey Program</b>	<b>Date</b>	9/18/2013			
<b>From (ft)</b>	<b>To (ft)</b>	<b>Survey (Wellbore)</b>	<b>Tool Name</b>	<b>Description</b>	
147.0	11,593.0	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 (°/100ft)</b>	<b>Build Rate (°/100ft)</b>	<b>Turn Rate (°/100ft)</b>	
0.0	0.00	0.00	0.0	0.0	0.0	0.0	0.00	0.00	0.00	
147.0	0.50	198.50	147.0	-0.6	-0.2	0.6	0.34	0.34	0.00	
239.0	0.60	188.80	239.0	-1.5	-0.4	1.4	0.15	0.11	-10.54	
331.0	0.40	163.10	331.0	-2.2	-0.4	2.1	0.32	-0.22	-27.93	
423.0	0.40	97.80	423.0	-2.6	0.0	2.6	0.47	0.00	-70.98	
515.0	0.60	92.20	515.0	-2.7	0.8	2.8	0.22	0.22	-6.09	
607.0	0.70	76.40	607.0	-2.5	1.9	2.9	0.22	0.11	-17.17	
698.0	0.70	93.50	698.0	-2.5	2.9	3.0	0.23	0.00	18.79	
789.0	1.30	75.50	789.0	-2.2	4.5	3.1	0.74	0.66	-19.78	
880.0	2.00	82.10	879.9	-1.7	7.1	3.1	0.80	0.77	7.25	
975.0	1.80	78.90	974.9	-1.2	10.2	3.2	0.24	-0.21	-3.37	
1,067.0	3.80	87.90	1,066.8	-0.8	14.6	3.7	2.22	2.17	9.78	

<b>Company:</b>	PETROLEUM DEVELOPMENT CORP Weld County CO	<b>Local Co-ordinate Reference:</b>	Well Dillard 20R-303
<b>Project:</b>	SEC.20-T7N-R64W	<b>TVD Reference:</b>	WELL @ 4914.0ft (RKB - 15')
<b>Site:</b>	Dillard 20M-HZ Pad Sec.20-T7N-R64W	<b>MD Reference:</b>	WELL @ 4914.0ft (RKB - 15')
<b>Well:</b>	Dillard 20R-303	<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>	Landmark

Survey									
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
1,159.0	6.50	86.30	1,158.4	-0.4	22.9	4.9	2.94	2.93	-1.74
1,254.0	8.80	85.20	1,252.5	0.6	35.5	6.5	2.43	2.42	-1.16
1,350.0	10.90	79.30	1,347.1	2.9	51.7	7.4	2.42	2.19	-6.15
1,444.0	13.20	75.60	1,439.0	7.2	70.9	7.0	2.58	2.45	-3.94
1,539.0	13.40	74.80	1,531.5	12.8	92.0	5.7	0.29	0.21	-0.84
1,634.0	13.40	74.10	1,623.9	18.7	113.2	4.1	0.17	0.00	-0.74
1,730.0	13.50	73.50	1,717.3	24.9	134.7	2.2	0.18	0.10	-0.63
1,824.0	13.30	72.70	1,808.7	31.2	155.5	0.1	0.29	-0.21	-0.85
1,919.0	13.10	71.30	1,901.2	37.9	176.1	-2.4	0.40	-0.21	-1.47
2,014.0	12.50	67.80	1,993.8	45.3	195.8	-5.7	1.03	-0.63	-3.68
2,109.0	10.30	68.80	2,087.0	52.2	213.3	-9.1	2.33	-2.32	1.05
2,204.0	10.00	72.10	2,180.5	57.8	229.0	-11.5	0.69	-0.32	3.47
2,299.0	9.90	78.70	2,274.0	62.0	244.9	-12.4	1.20	-0.11	6.95
2,394.0	9.90	80.70	2,367.6	64.9	261.0	-12.1	0.36	0.00	2.11
2,490.0	9.90	84.50	2,462.2	67.0	277.3	-10.9	0.68	0.00	3.96
2,585.0	10.30	82.00	2,555.7	69.0	293.9	-9.6	0.62	0.42	-2.63
2,680.0	10.20	81.60	2,649.2	71.4	310.6	-8.6	0.13	-0.11	-0.42
2,775.0	10.00	84.60	2,742.7	73.4	327.1	-7.3	0.59	-0.21	3.16
2,870.0	10.80	81.40	2,836.2	75.5	344.1	-6.0	1.04	0.84	-3.37
2,965.0	11.50	80.10	2,929.4	78.5	362.3	-5.4	0.78	0.74	-1.37
3,060.0	10.80	77.20	3,022.6	82.1	380.3	-5.3	0.94	-0.74	-3.05
3,156.0	11.80	77.30	3,116.7	86.2	398.6	-5.8	1.04	1.04	0.10
3,251.0	12.40	79.20	3,209.6	90.3	418.1	-5.9	0.76	0.63	2.00
3,346.0	11.80	80.30	3,302.5	93.8	437.7	-5.5	0.68	-0.63	1.16
3,440.0	12.00	79.20	3,394.5	97.2	456.8	-5.1	0.32	0.21	-1.17
3,535.0	11.20	79.20	3,487.5	100.8	475.6	-4.9	0.84	-0.84	0.00
3,631.0	10.80	73.30	3,581.8	105.2	493.3	-5.7	1.24	-0.42	-6.15
3,726.0	10.60	71.20	3,675.1	110.5	510.1	-7.6	0.46	-0.21	-2.21
3,821.0	9.10	67.70	3,768.7	116.2	525.4	-10.2	1.70	-1.58	-3.68
3,916.0	9.10	72.90	3,862.5	121.3	539.5	-12.3	0.87	0.00	5.47
4,011.0	10.90	74.80	3,956.1	125.8	555.3	-13.7	1.93	1.89	2.00
4,107.0	13.20	79.70	4,050.0	130.2	574.9	-14.1	2.62	2.40	5.10
4,202.0	13.80	79.30	4,142.3	134.2	596.7	-13.7	0.64	0.63	-0.42
4,297.0	13.70	78.50	4,234.6	138.6	618.8	-13.6	0.23	-0.11	-0.84
4,393.0	13.10	79.20	4,328.0	142.9	640.7	-13.5	0.65	-0.63	0.73
4,488.0	12.10	78.50	4,420.7	146.9	661.0	-13.4	1.06	-1.05	-0.74
4,584.0	12.00	77.10	4,514.6	151.1	680.6	-13.7	0.32	-0.10	-1.46
4,679.0	11.70	73.80	4,607.6	156.0	699.5	-14.8	0.78	-0.32	-3.47
4,774.0	13.20	72.50	4,700.3	161.9	719.1	-16.8	1.61	1.58	-1.37
4,869.0	12.30	71.90	4,793.0	168.3	739.0	-19.1	0.96	-0.95	-0.63
4,964.0	12.00	70.10	4,885.9	174.8	757.9	-21.7	0.51	-0.32	-1.89
5,060.0	11.80	70.50	4,979.8	181.5	776.6	-24.6	0.23	-0.21	0.42
5,155.0	12.00	70.10	5,072.8	188.1	795.0	-27.4	0.23	0.21	-0.42
5,249.0	12.50	69.30	5,164.6	195.0	813.7	-30.5	0.56	0.53	-0.85
5,344.0	12.20	68.50	5,257.4	202.4	832.7	-33.9	0.36	-0.32	-0.84
5,439.0	10.50	66.40	5,350.6	209.5	849.9	-37.5	1.84	-1.79	-2.21
5,534.0	9.80	67.20	5,444.1	216.1	865.3	-41.0	0.75	-0.74	0.84
5,630.0	9.10	65.40	5,538.8	222.4	879.8	-44.3	0.79	-0.73	-1.88
5,725.0	7.60	62.80	5,632.8	228.4	892.2	-47.7	1.63	-1.58	-2.74
5,820.0	6.50	63.10	5,727.1	233.7	902.6	-50.9	1.16	-1.16	0.32
5,915.0	4.90	59.60	5,821.6	238.2	910.9	-53.7	1.72	-1.68	-3.68
6,010.0	4.20	56.80	5,916.3	242.2	917.3	-56.3	0.77	-0.74	-2.95
6,105.0	2.80	46.60	6,011.1	245.7	921.9	-58.8	1.61	-1.47	-10.74

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<b>Site:</b>	Dillard 20M-HZ Pad Sec.20-T7N-R64W	<b>MD Reference:</b>	WELL @ 4914.0ft (RKB - 15')
<b>Well:</b>	Dillard 20R-303	<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>	Landmark

Survey									
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
6,200.0	1.60	350.10	6,106.0	248.6	923.3	-61.4	2.46	-1.26	-59.47
6,295.0	1.00	246.50	6,201.0	249.6	922.3	-62.5	2.19	-0.63	-109.05
6,327.0	1.10	262.50	6,233.0	249.4	921.8	-62.5	0.96	0.31	50.00
6,359.0	0.90	257.80	6,265.0	249.3	921.2	-62.5	0.68	-0.63	-14.69
6,390.0	1.50	210.50	6,296.0	248.9	920.8	-62.2	3.58	1.94	-152.58
6,422.0	3.50	194.10	6,328.0	247.6	920.3	-61.0	6.58	6.25	-51.25
6,454.0	5.60	184.70	6,359.9	245.1	920.0	-58.6	6.94	6.56	-29.38
6,485.0	7.50	182.60	6,390.7	241.6	919.8	-55.2	6.18	6.13	-6.77
6,517.0	9.70	184.50	6,422.3	236.8	919.4	-50.6	6.93	6.88	5.94
6,549.0	12.30	187.20	6,453.7	230.7	918.8	-44.7	8.28	8.13	8.44
6,581.0	14.80	188.80	6,484.8	223.3	917.8	-37.7	7.90	7.81	5.00
6,612.0	17.40	190.10	6,514.6	214.8	916.3	-29.6	8.47	8.39	4.19
6,644.0	19.70	191.60	6,544.9	204.8	914.4	-20.2	7.34	7.19	4.69
6,676.0	22.20	191.30	6,574.8	193.6	912.1	-9.7	7.82	7.81	-0.94
6,707.0	24.40	191.80	6,603.3	181.6	909.7	1.6	7.13	7.10	1.61
6,739.0	27.00	192.60	6,632.1	168.0	906.7	14.3	8.20	8.13	2.50
6,771.0	29.70	191.70	6,660.3	153.2	903.6	28.3	8.54	8.44	-2.81
6,802.0	32.10	189.90	6,686.9	137.6	900.6	43.0	8.30	7.74	-5.81
6,834.0	34.90	187.40	6,713.6	120.1	897.9	59.6	9.75	8.75	-7.81
6,866.0	37.60	185.70	6,739.4	101.3	895.8	77.6	9.00	8.44	-5.31
6,898.0	40.50	185.40	6,764.2	81.2	893.8	96.9	9.08	9.06	-0.94
6,929.0	43.30	185.20	6,787.3	60.6	891.9	116.7	9.04	9.03	-0.65
6,961.0	46.20	184.90	6,810.0	38.2	890.0	138.3	9.09	9.06	-0.94
6,993.0	48.30	184.40	6,831.7	14.8	888.0	160.9	6.66	6.56	-1.56
7,024.0	50.20	183.80	6,852.0	-8.7	886.4	183.5	6.30	6.13	-1.94
7,056.0	51.90	183.10	6,872.1	-33.5	884.9	207.6	5.58	5.31	-2.19
7,088.0	53.70	182.90	6,891.4	-59.0	883.5	232.3	5.65	5.63	-0.63
7,119.0	55.30	182.30	6,909.4	-84.2	882.4	256.8	5.40	5.16	-1.94
7,151.0	57.20	181.60	6,927.2	-110.8	881.5	282.6	6.21	5.94	-2.19
7,183.0	59.10	180.90	6,944.1	-137.9	880.9	309.2	6.22	5.94	-2.19
7,215.0	60.50	182.00	6,960.2	-165.6	880.2	336.1	5.29	4.38	3.44
7,246.0	62.70	182.30	6,974.9	-192.8	879.2	362.6	7.15	7.10	0.97
7,278.0	65.90	181.90	6,988.8	-221.6	878.1	390.7	10.06	10.00	-1.25
7,310.0	69.90	181.90	7,000.8	-251.3	877.1	419.5	12.50	12.50	0.00
7,341.0	73.80	180.70	7,010.5	-280.7	876.5	448.3	13.11	12.58	-3.87
7,373.0	76.40	180.10	7,018.7	-311.6	876.3	478.5	8.32	8.13	-1.88
7,405.0	78.10	178.60	7,025.8	-342.8	876.6	509.2	7.01	5.31	-4.69
7,436.0	79.90	177.40	7,031.7	-373.2	877.7	539.2	6.94	5.81	-3.87
7,468.0	81.50	177.10	7,036.9	-404.8	879.2	570.4	5.08	5.00	-0.94
7,500.0	83.20	176.30	7,041.1	-436.4	881.0	601.8	5.86	5.31	-2.50
7,532.0	85.00	175.90	7,044.4	-468.2	883.2	633.4	5.76	5.63	-1.25
7,563.0	86.90	175.00	7,046.6	-499.0	885.6	664.1	6.78	6.13	-2.90
7,618.0	88.18	175.22	7,049.0	-553.8	890.3	718.7	2.36	2.32	0.40
7"									
7,662.0	89.20	175.40	7,050.0	-597.6	893.9	762.4	2.36	2.32	0.40
7,692.0	89.60	174.60	7,050.3	-627.5	896.5	792.2	2.98	1.33	-2.67
7,723.0	90.10	174.30	7,050.4	-658.3	899.5	823.0	1.88	1.61	-0.97
7,753.0	90.00	174.30	7,050.4	-688.2	902.5	852.9	0.33	-0.33	0.00
7,783.0	89.60	174.60	7,050.5	-718.1	905.4	882.7	1.67	-1.33	1.00
7,814.0	89.50	174.40	7,050.7	-748.9	908.4	913.6	0.72	-0.32	-0.65
7,844.0	89.20	174.90	7,051.0	-778.8	911.2	943.4	1.94	-1.00	1.67
7,875.0	87.90	175.30	7,051.8	-809.7	913.8	974.2	4.39	-4.19	1.29
7,905.0	88.30	176.50	7,052.8	-839.6	916.0	1,003.9	4.21	1.33	4.00

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<b>Site:</b>	Dillard 20M-HZ Pad Sec.20-T7N-R64W	<b>MD Reference:</b>	WELL @ 4914.0ft (RKB - 15')
<b>Well:</b>	Dillard 20R-303	<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>	Landmark

Survey									
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
7,935.0	89.80	177.10	7,053.3	-869.5	917.6	1,033.6	5.39	5.00	2.00
7,966.0	90.20	177.10	7,053.3	-900.5	919.2	1,064.3	1.29	1.29	0.00
7,996.0	89.90	177.20	7,053.3	-930.4	920.7	1,093.9	1.05	-1.00	0.33
8,027.0	88.70	177.00	7,053.7	-961.4	922.3	1,124.6	3.92	-3.87	-0.65
8,057.0	89.00	177.30	7,054.3	-991.4	923.8	1,154.2	1.41	1.00	1.00
8,087.0	89.50	177.20	7,054.7	-1,021.3	925.2	1,183.9	1.70	1.67	-0.33
8,118.0	89.20	176.90	7,055.0	-1,052.3	926.8	1,214.6	1.37	-0.97	-0.97
8,148.0	88.40	177.40	7,055.6	-1,082.2	928.3	1,244.2	3.14	-2.67	1.67
8,179.0	88.60	177.20	7,056.5	-1,113.2	929.7	1,274.9	0.91	0.65	-0.65
8,209.0	88.80	177.90	7,057.1	-1,143.1	931.0	1,304.5	2.43	0.67	2.33
8,239.0	88.80	177.70	7,057.8	-1,173.1	932.2	1,334.1	0.67	0.00	-0.67
8,270.0	89.00	177.60	7,058.4	-1,204.1	933.5	1,364.7	0.72	0.65	-0.32
8,300.0	89.10	177.20	7,058.9	-1,234.1	934.8	1,394.4	1.37	0.33	-1.33
8,331.0	88.80	176.90	7,059.4	-1,265.0	936.4	1,425.0	1.37	-0.97	-0.97
8,361.0	88.50	177.30	7,060.1	-1,295.0	937.9	1,454.7	1.67	-1.00	1.33
8,393.0	88.30	177.10	7,061.0	-1,326.9	939.5	1,486.3	0.88	-0.63	-0.63
8,424.0	88.10	177.40	7,062.0	-1,357.9	941.0	1,516.9	1.16	-0.65	0.97
8,456.0	88.50	177.40	7,063.0	-1,389.8	942.4	1,548.5	1.25	1.25	0.00
8,488.0	88.60	177.20	7,063.8	-1,421.8	943.9	1,580.2	0.70	0.31	-0.63
8,520.0	88.70	176.60	7,064.5	-1,453.7	945.7	1,611.8	1.90	0.31	-1.88
8,551.0	88.00	177.20	7,065.4	-1,484.6	947.3	1,642.5	2.97	-2.26	1.94
8,583.0	88.10	177.60	7,066.5	-1,516.6	948.8	1,674.1	1.29	0.31	1.25
8,615.0	88.30	177.00	7,067.5	-1,548.5	950.3	1,705.7	1.98	0.63	-1.88
8,646.0	87.80	177.80	7,068.6	-1,579.5	951.7	1,736.3	3.04	-1.61	2.58
8,678.0	87.90	177.60	7,069.8	-1,611.4	953.0	1,767.9	0.70	0.31	-0.63
8,710.0	87.40	176.90	7,071.1	-1,643.4	954.5	1,799.5	2.69	-1.56	-2.19
8,741.0	87.10	176.60	7,072.6	-1,674.3	956.3	1,830.2	1.37	-0.97	-0.97
8,773.0	86.90	177.40	7,074.2	-1,706.2	957.9	1,861.8	2.57	-0.63	2.50
8,805.0	87.10	178.20	7,075.9	-1,738.1	959.2	1,893.3	2.57	0.63	2.50
8,838.0	87.60	179.40	7,077.4	-1,771.1	959.9	1,925.8	3.94	1.52	3.64
8,869.0	87.70	178.70	7,078.7	-1,802.1	960.4	1,956.2	2.28	0.32	-2.26
8,901.0	88.40	178.60	7,079.8	-1,834.0	961.1	1,987.7	2.21	2.19	-0.31
8,933.0	88.80	179.00	7,080.6	-1,866.0	961.8	2,019.2	1.77	1.25	1.25
8,965.0	88.90	179.20	7,081.2	-1,898.0	962.3	2,050.7	0.70	0.31	0.63
8,997.0	89.10	178.60	7,081.8	-1,930.0	962.9	2,082.1	1.98	0.63	-1.88
9,028.0	89.30	178.40	7,082.2	-1,961.0	963.7	2,112.7	0.91	0.65	-0.65
9,060.0	89.40	178.30	7,082.6	-1,993.0	964.7	2,144.2	0.44	0.31	-0.31
9,092.0	89.60	178.60	7,082.8	-2,025.0	965.5	2,175.8	1.13	0.63	0.94
9,123.0	89.60	178.30	7,083.1	-2,055.9	966.4	2,206.3	0.97	0.00	-0.97
9,155.0	89.50	177.90	7,083.3	-2,087.9	967.4	2,237.9	1.29	-0.31	-1.25
9,187.0	89.30	178.60	7,083.7	-2,119.9	968.4	2,269.4	2.27	-0.63	2.19
9,218.0	89.20	179.20	7,084.1	-2,150.9	969.0	2,299.9	1.96	-0.32	1.94
9,250.0	89.10	178.70	7,084.5	-2,182.9	969.6	2,331.4	1.59	-0.31	-1.56
9,282.0	89.00	178.50	7,085.1	-2,214.9	970.4	2,362.9	0.70	-0.31	-0.63
9,313.0	88.80	178.90	7,085.7	-2,245.9	971.1	2,393.4	1.44	-0.65	1.29
9,345.0	88.30	179.50	7,086.5	-2,277.9	971.5	2,424.8	2.44	-1.56	1.88
9,376.0	88.20	178.90	7,087.4	-2,308.8	971.9	2,455.3	1.96	-0.32	-1.94
9,409.0	88.70	179.40	7,088.3	-2,341.8	972.4	2,487.7	2.14	1.52	1.52
9,440.0	88.40	180.20	7,089.1	-2,372.8	972.5	2,518.1	2.76	-0.97	2.58
9,472.0	88.50	180.40	7,090.0	-2,404.8	972.4	2,549.5	0.70	0.31	0.63
9,503.0	88.90	181.70	7,090.7	-2,435.8	971.8	2,579.7	4.39	1.29	4.19
9,535.0	89.30	182.10	7,091.2	-2,467.8	970.7	2,610.9	1.77	1.25	1.25
9,567.0	89.70	183.00	7,091.4	-2,499.7	969.3	2,641.9	3.08	1.25	2.81

<b>Company:</b>	PETROLEUM DEVELOPMENT CORP Weld County CO	<b>Local Co-ordinate Reference:</b>	Well Dillard 20R-303
<b>Project:</b>	SEC.20-T7N-R64W	<b>TVD Reference:</b>	WELL @ 4914.0ft (RKB - 15')
<b>Site:</b>	Dillard 20M-HZ Pad Sec.20-T7N-R64W	<b>MD Reference:</b>	WELL @ 4914.0ft (RKB - 15')
<b>Well:</b>	Dillard 20R-303	<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>	Landmark

Survey									
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
9,599.0	90.10	183.50	7,091.5	-2,531.7	967.5	2,672.9	2.00	1.25	1.56
9,631.0	89.60	183.00	7,091.6	-2,563.6	965.7	2,703.8	2.21	-1.56	-1.56
9,662.0	89.40	183.00	7,091.9	-2,594.6	964.1	2,733.9	0.65	-0.65	0.00
9,694.0	90.00	182.60	7,092.0	-2,626.5	962.5	2,764.9	2.25	1.88	-1.25
9,726.0	90.40	182.90	7,091.9	-2,658.5	961.0	2,795.9	1.56	1.25	0.94
9,758.0	90.20	182.80	7,091.7	-2,690.5	959.4	2,826.9	0.70	-0.63	-0.31
9,790.0	90.40	182.70	7,091.6	-2,722.4	957.8	2,858.0	0.70	0.63	-0.31
9,821.0	90.50	182.70	7,091.3	-2,753.4	956.4	2,888.0	0.32	0.32	0.00
9,853.0	90.20	182.90	7,091.1	-2,785.4	954.8	2,919.1	1.13	-0.94	0.63
9,885.0	90.00	182.60	7,091.1	-2,817.3	953.3	2,950.1	1.13	-0.63	-0.94
9,916.0	90.40	182.90	7,091.0	-2,848.3	951.8	2,980.1	1.61	1.29	0.97
9,948.0	89.90	182.30	7,090.9	-2,880.2	950.3	3,011.2	2.44	-1.56	-1.88
9,979.0	89.80	181.50	7,091.0	-2,911.2	949.3	3,041.4	2.60	-0.32	-2.58
10,011.0	89.90	181.30	7,091.1	-2,943.2	948.5	3,072.6	0.70	0.31	-0.63
10,043.0	89.90	181.70	7,091.1	-2,975.2	947.7	3,103.8	1.25	0.00	1.25
10,074.0	90.10	181.50	7,091.1	-3,006.2	946.8	3,134.0	0.91	0.65	-0.65
10,106.0	89.80	181.10	7,091.1	-3,038.2	946.1	3,165.2	1.56	-0.94	-1.25
10,137.0	90.00	181.50	7,091.2	-3,069.2	945.4	3,195.4	1.44	0.65	1.29
10,169.0	89.90	180.80	7,091.2	-3,101.2	944.8	3,226.7	2.21	-0.31	-2.19
10,201.0	90.20	180.80	7,091.2	-3,133.2	944.3	3,258.0	0.94	0.94	0.00
10,232.0	89.50	181.20	7,091.3	-3,164.2	943.8	3,288.2	2.60	-2.26	1.29
10,264.0	89.40	180.80	7,091.6	-3,196.2	943.2	3,319.5	1.29	-0.31	-1.25
10,296.0	89.70	181.10	7,091.8	-3,228.2	942.7	3,350.7	1.33	0.94	0.94
10,327.0	89.80	180.50	7,092.0	-3,259.2	942.2	3,381.0	1.96	0.32	-1.94
10,359.0	90.20	180.20	7,092.0	-3,291.2	942.1	3,412.4	1.56	1.25	-0.94
10,391.0	90.30	180.00	7,091.8	-3,323.2	942.0	3,443.7	0.70	0.31	-0.63
10,423.0	89.60	179.80	7,091.9	-3,355.2	942.1	3,475.1	2.28	-2.19	-0.63
10,454.0	89.00	180.70	7,092.2	-3,386.1	941.9	3,505.5	3.49	-1.94	2.90
10,486.0	89.10	180.60	7,092.8	-3,418.1	941.6	3,536.8	0.44	0.31	-0.31
10,518.0	89.10	180.30	7,093.3	-3,450.1	941.3	3,568.1	0.94	0.00	-0.94
10,549.0	89.10	180.50	7,093.8	-3,481.1	941.1	3,598.4	0.65	0.00	0.65
10,581.0	89.30	180.10	7,094.2	-3,513.1	940.9	3,629.8	1.40	0.63	-1.25
10,613.0	89.60	180.50	7,094.5	-3,545.1	940.8	3,661.1	1.56	0.94	1.25
10,644.0	89.50	180.60	7,094.7	-3,576.1	940.5	3,691.4	0.46	-0.32	0.32
10,676.0	89.50	180.40	7,095.0	-3,608.1	940.2	3,722.7	0.62	0.00	-0.63
10,708.0	89.10	181.40	7,095.4	-3,640.1	939.7	3,754.0	3.37	-1.25	3.13
10,740.0	88.70	180.80	7,096.0	-3,672.1	939.1	3,785.2	2.25	-1.25	-1.88
10,772.0	88.80	180.80	7,096.7	-3,704.1	938.6	3,816.5	0.31	0.31	0.00
10,803.0	89.10	181.50	7,097.3	-3,735.1	938.0	3,846.8	2.46	0.97	2.26
10,835.0	89.00	180.40	7,097.8	-3,767.1	937.5	3,878.0	3.45	-0.31	-3.44
10,867.0	88.90	180.50	7,098.4	-3,799.1	937.2	3,909.3	0.44	-0.31	0.31
10,899.0	89.10	180.20	7,099.0	-3,831.1	937.0	3,940.7	1.13	0.63	-0.94
10,930.0	89.10	180.10	7,099.5	-3,862.1	936.9	3,971.0	0.32	0.00	-0.32
10,962.0	89.00	180.90	7,100.0	-3,894.0	936.7	4,002.3	2.52	-0.31	2.50
10,994.0	89.10	180.00	7,100.5	-3,926.0	936.4	4,033.6	2.83	0.31	-2.81
11,025.0	88.90	180.50	7,101.1	-3,957.0	936.3	4,064.0	1.74	-0.65	1.61
11,057.0	88.90	180.80	7,101.7	-3,989.0	935.9	4,095.3	0.94	0.00	0.94
11,089.0	88.90	180.10	7,102.3	-4,021.0	935.7	4,126.6	2.19	0.00	-2.19
11,120.0	89.10	180.00	7,102.8	-4,052.0	935.6	4,157.0	0.72	0.65	-0.32
11,152.0	88.70	179.50	7,103.4	-4,084.0	935.8	4,188.4	2.00	-1.25	-1.56
11,184.0	88.20	180.60	7,104.3	-4,116.0	935.7	4,219.7	3.77	-1.56	3.44
11,216.0	87.70	180.90	7,105.5	-4,148.0	935.3	4,251.0	1.82	-1.56	0.94
11,247.0	87.50	180.00	7,106.8	-4,178.9	935.1	4,281.3	2.97	-0.65	-2.90
11,279.0	87.20	179.70	7,108.2	-4,210.9	935.2	4,312.7	1.33	-0.94	-0.94



<b>Company:</b>	PETROLEUM DEVELOPMENT CORP Weld County CO	<b>Local Co-ordinate Reference:</b>	Well Dillard 20R-303
<b>Project:</b>	SEC.20-T7N-R64W	<b>TVD Reference:</b>	WELL @ 4914.0ft (RKB - 15')
<b>Site:</b>	Dillard 20M-HZ Pad Sec.20-T7N-R64W	<b>MD Reference:</b>	WELL @ 4914.0ft (RKB - 15')
<b>Well:</b>	Dillard 20R-303	<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>	Landmark

Survey									
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
11,311.0	87.20	180.10	7,109.8	-4,242.9	935.2	4,344.0	1.25	0.00	1.25
11,342.0	87.50	180.30	7,111.2	-4,273.8	935.1	4,374.3	1.16	0.97	0.65
11,374.0	88.10	180.20	7,112.5	-4,305.8	935.0	4,405.7	1.90	1.88	-0.31
11,406.0	88.60	180.10	7,113.4	-4,337.8	934.9	4,437.0	1.59	1.56	-0.31
11,437.0	88.60	180.70	7,114.1	-4,368.8	934.7	4,467.3	1.93	0.00	1.94
11,469.0	88.70	180.60	7,114.9	-4,400.8	934.3	4,498.6	0.44	0.31	-0.31
11,501.0	88.80	180.40	7,115.6	-4,432.8	934.0	4,529.9	0.70	0.31	-0.63
11,533.0	88.80	180.90	7,116.3	-4,464.8	933.7	4,561.2	1.56	0.00	1.56
11,593.0	88.80	180.70	7,117.5	-4,524.7	932.8	4,619.9	0.33	0.00	-0.33

Casing Points				
Measured Depth (ft)	Vertical Depth (ft)	Name	Casing Diameter (")	Hole Diameter (")
7,618.0	7,049.0	7"	7	7-1/2

Checked By: _____	Approved By: _____	Date: _____
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