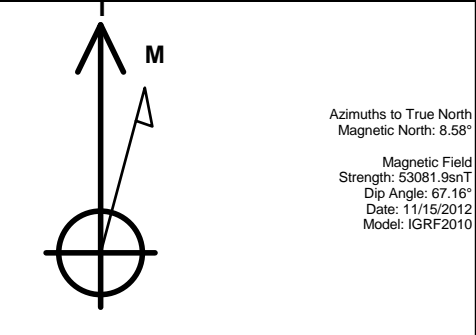


PETROLEUM DEVELOPMENT CORP Weld County CO

Well Name: **Dillard 20Y-401**
Surface Location: Dillard 20Y-HZ Pad Sec.20-T7N-R64W
North American Datum 1983 , US State Plane 1983 , Colorado Northern Zone
Ground Elevation: 4864.0
+N/-S +E/-W Northing Easting Latitude Longitude Slot
0.0 0.0 1445348.37 3259506.78 40.552130 -104.566120
RKB - 15' WELL @ 4879.0ft (RKB - 15')

WELLBORE TARGET DETAILS

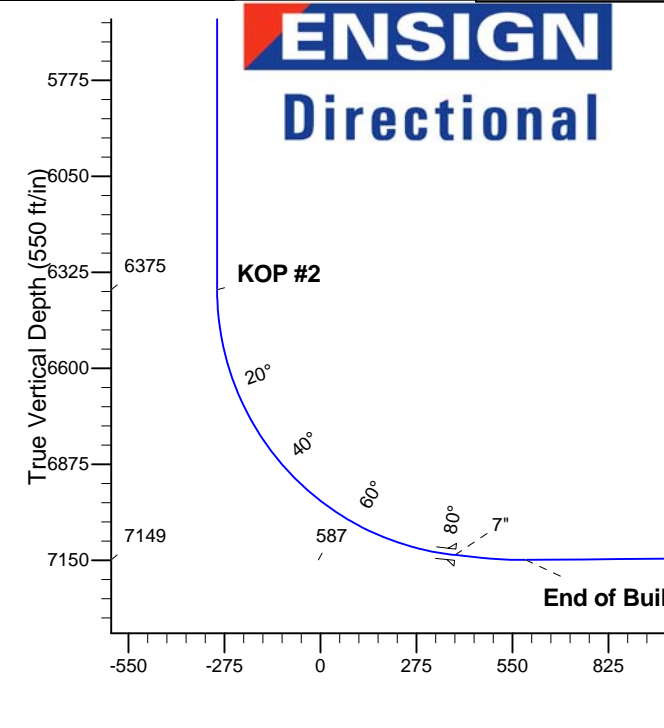
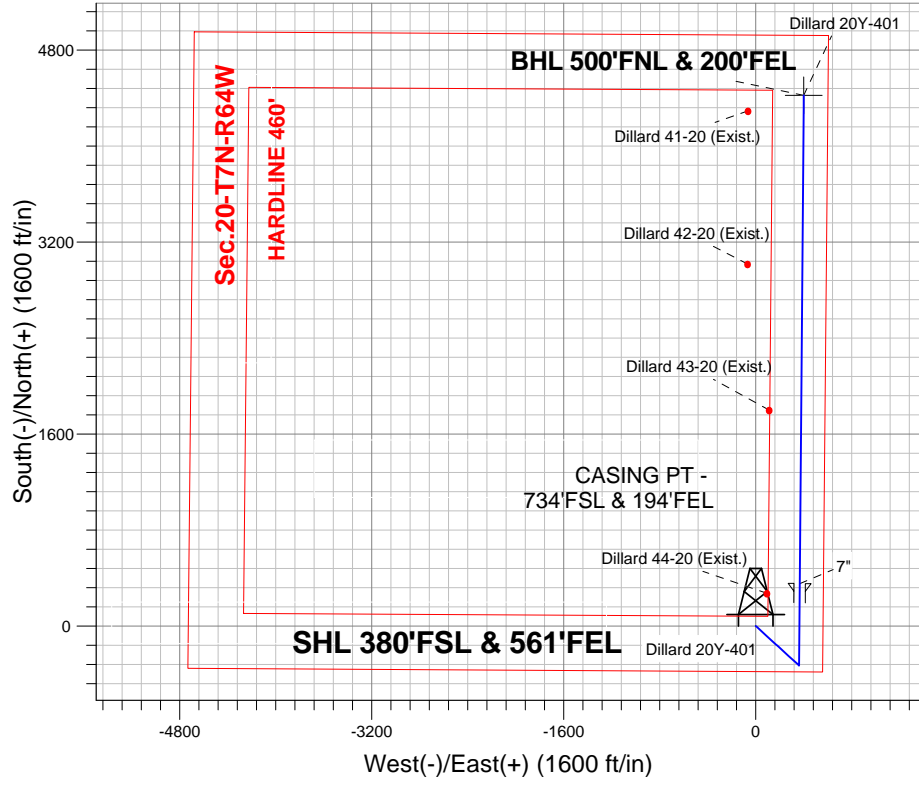
Name	TVD	+N/-S	+E/-W	Shape Point
BHL 500'FNL & 200'FEL	7119.0	4422.9	400.1	Point



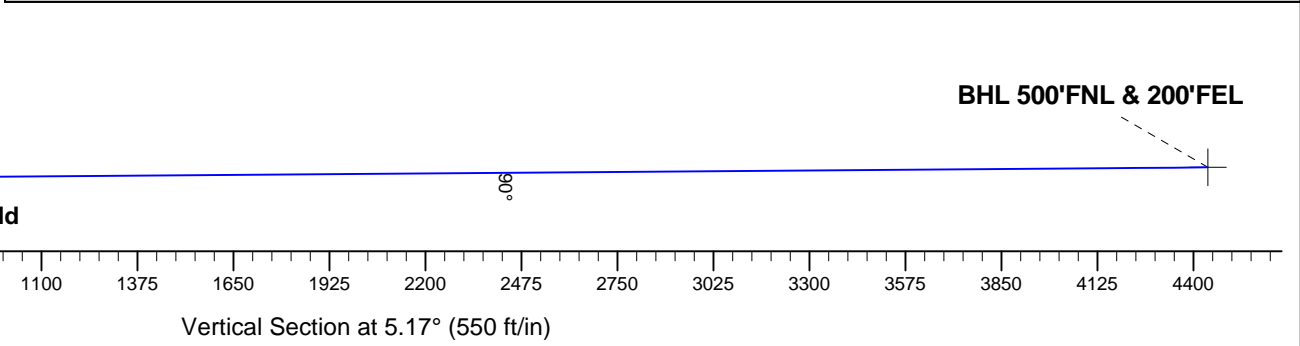
Dillard 20Y-HZ Pad Sec.20-T7N-R64W
Dillard 20Y-401
Plan #1 (11-15-12)
11:44, November 26 2012

ANNOTATIONS

TVD	MD	Annotation
1200.0	1200.0	KOP #1
6375.3	6409.0	KOP #2
7149.0	7731.9	End of Build



SECTION DETAILS										
Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	DLeg	TFace	VSec	Target
1	0.0	0.00	0.00	0.0	0.0	0.0	0.00	0.00	0.0	
2	1200.0	0.00	0.00	1200.0	0.0	0.0	0.00	0.00	0.0	
3	1610.7	8.21	132.43	1609.3	-19.8	21.7	2.00	132.43	-17.8	
4	4623.0	8.21	132.43	4590.7	-310.2	339.3	0.00	0.00	-278.3	
5	5033.7	0.00	0.00	5000.0	-330.0	361.0	2.00	180.00	-296.1	
6	6409.0	0.00	0.00	6375.3	-330.0	361.0	0.00	0.00	-296.1	
7	7529.0	84.00	0.47	7135.0	354.1	366.6	7.50	0.47	385.7	
8	7603.0	84.00	0.47	7142.8	427.7	367.2	0.00	0.00	459.0	
9	7731.9	90.44	0.47	7149.0	556.3	368.3	5.00	0.01	587.2	
10	11598.7	90.44	0.47	7119.0	4422.9	400.1	0.00	0.00	4440.9	BHL 500'FNL & 200'FEL





PETROLEUM DEVELOPMENT CORP Weld County CO

SEC.20-T7N-R64W

Dillard 20Y-HZ Pad Sec.20-T7N-R64W

Dillard 20Y-401

Wellbore #1

Plan: Plan #1 (11-15-12)

Standard Planning Report

26 November, 2012

Database:	Landmark	Local Co-ordinate Reference:	Well Dillard 20Y-401
Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	TVD Reference:	WELL @ 4879.0ft (RKB - 15')
Project:	SEC.20-T7N-R64W	MD Reference:	WELL @ 4879.0ft (RKB - 15')
Site:	Dillard 20Y-HZ Pad Sec.20-T7N-R64W	North Reference:	True
Well:	Dillard 20Y-401	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Plan #1 (11-15-12)		

Project	SEC.20-T7N-R64W, Weld County, CO		
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	Dillard 20Y-HZ Pad Sec.20-T7N-R64W		
Site Position:		Northing:	1,445,348.38 ft
From:	Lat/Long	Easting:	3,259,506.78 ft
Position Uncertainty:	0.0 ft	Slot Radius:	"
		Latitude:	40.552130
		Longitude:	-104.566120
		Grid Convergence:	0.60 °

Well	Dillard 20Y-401		
Well Position	+N/-S	0.0 ft	Northing:
	+E/-W	0.0 ft	Easting:
Position Uncertainty		0.0 ft	Wellhead Elevation:
			Latitude:
			Longitude:
			Ground Level:

Wellbore	Wellbore #1				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	11/15/2012	8.58	67.16	53,082

Design	Plan #1 (11-15-12)			
Audit Notes:				
Version:	Phase:	PROTOTYPE	Tie On Depth:	0.0
Vertical Section:	Depth From (TVD) (ft)	+N/-S (ft)	+E/-W (ft)	Direction (°)
	0.0	0.0	0.0	5.17

Plan Sections										
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)	TFO (°)	Target
0.0	0.00	0.00	0.0	0.0	0.0	0.00	0.00	0.00	0.00	
1,200.0	0.00	0.00	1,200.0	0.0	0.0	0.00	0.00	0.00	0.00	
1,610.7	8.21	132.43	1,609.3	-19.8	21.7	2.00	2.00	0.00	132.43	
4,623.0	8.21	132.43	4,590.7	-310.2	339.3	0.00	0.00	0.00	0.00	
5,033.7	0.00	0.00	5,000.0	-330.0	361.0	2.00	-2.00	0.00	180.00	
6,409.0	0.00	0.00	6,375.3	-330.0	361.0	0.00	0.00	0.00	0.00	
7,529.0	84.00	0.47	7,135.0	354.1	366.6	7.50	7.50	0.00	0.47	
7,603.0	84.00	0.47	7,142.8	427.7	367.2	0.00	0.00	0.00	0.00	
7,731.9	90.44	0.47	7,149.0	556.3	368.3	5.00	5.00	0.00	0.01	
11,598.7	90.44	0.47	7,119.0	4,422.9	400.1	0.00	0.00	0.00	0.00	BHL 500'FNL & 20C

Database:	Landmark	Local Co-ordinate Reference:	Well Dillard 20Y-401
Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	TVD Reference:	WELL @ 4879.0ft (RKB - 15')
Project:	SEC.20-T7N-R64W	MD Reference:	WELL @ 4879.0ft (RKB - 15')
Site:	Dillard 20Y-HZ Pad Sec.20-T7N-R64W	North Reference:	True
Well:	Dillard 20Y-401	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Plan #1 (11-15-12)		

Planned 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)
0.0	0.00	0.00	0.0	0.0	0.0	0.0	0.00	0.00	0.00
40.0	0.00	0.00	40.0	0.0	0.0	0.0	0.00	0.00	0.00
80.0	0.00	0.00	80.0	0.0	0.0	0.0	0.00	0.00	0.00
120.0	0.00	0.00	120.0	0.0	0.0	0.0	0.00	0.00	0.00
160.0	0.00	0.00	160.0	0.0	0.0	0.0	0.00	0.00	0.00
200.0	0.00	0.00	200.0	0.0	0.0	0.0	0.00	0.00	0.00
240.0	0.00	0.00	240.0	0.0	0.0	0.0	0.00	0.00	0.00
280.0	0.00	0.00	280.0	0.0	0.0	0.0	0.00	0.00	0.00
320.0	0.00	0.00	320.0	0.0	0.0	0.0	0.00	0.00	0.00
360.0	0.00	0.00	360.0	0.0	0.0	0.0	0.00	0.00	0.00
400.0	0.00	0.00	400.0	0.0	0.0	0.0	0.00	0.00	0.00
440.0	0.00	0.00	440.0	0.0	0.0	0.0	0.00	0.00	0.00
480.0	0.00	0.00	480.0	0.0	0.0	0.0	0.00	0.00	0.00
520.0	0.00	0.00	520.0	0.0	0.0	0.0	0.00	0.00	0.00
560.0	0.00	0.00	560.0	0.0	0.0	0.0	0.00	0.00	0.00
600.0	0.00	0.00	600.0	0.0	0.0	0.0	0.00	0.00	0.00
640.0	0.00	0.00	640.0	0.0	0.0	0.0	0.00	0.00	0.00
680.0	0.00	0.00	680.0	0.0	0.0	0.0	0.00	0.00	0.00
720.0	0.00	0.00	720.0	0.0	0.0	0.0	0.00	0.00	0.00
760.0	0.00	0.00	760.0	0.0	0.0	0.0	0.00	0.00	0.00
800.0	0.00	0.00	800.0	0.0	0.0	0.0	0.00	0.00	0.00
840.0	0.00	0.00	840.0	0.0	0.0	0.0	0.00	0.00	0.00
880.0	0.00	0.00	880.0	0.0	0.0	0.0	0.00	0.00	0.00
920.0	0.00	0.00	920.0	0.0	0.0	0.0	0.00	0.00	0.00
960.0	0.00	0.00	960.0	0.0	0.0	0.0	0.00	0.00	0.00
1,000.0	0.00	0.00	1,000.0	0.0	0.0	0.0	0.00	0.00	0.00
1,040.0	0.00	0.00	1,040.0	0.0	0.0	0.0	0.00	0.00	0.00
1,080.0	0.00	0.00	1,080.0	0.0	0.0	0.0	0.00	0.00	0.00
1,120.0	0.00	0.00	1,120.0	0.0	0.0	0.0	0.00	0.00	0.00
1,160.0	0.00	0.00	1,160.0	0.0	0.0	0.0	0.00	0.00	0.00
1,200.0	0.00	0.00	1,200.0	0.0	0.0	0.0	0.00	0.00	0.00
KOP #1									
1,240.0	0.80	132.43	1,240.0	-0.2	0.2	-0.2	2.00	2.00	0.00
1,280.0	1.60	132.43	1,280.0	-0.8	0.8	-0.7	2.00	2.00	0.00
1,320.0	2.40	132.43	1,320.0	-1.7	1.9	-1.5	2.00	2.00	0.00
1,360.0	3.20	132.43	1,359.9	-3.0	3.3	-2.7	2.00	2.00	0.00
1,400.0	4.00	132.43	1,399.8	-4.7	5.2	-4.2	2.00	2.00	0.00
1,440.0	4.80	132.43	1,439.7	-6.8	7.4	-6.1	2.00	2.00	0.00
1,480.0	5.60	132.43	1,479.6	-9.2	10.1	-8.3	2.00	2.00	0.00
1,520.0	6.40	132.43	1,519.3	-12.0	13.2	-10.8	2.00	2.00	0.00
1,560.0	7.20	132.43	1,559.1	-15.2	16.7	-13.7	2.00	2.00	0.00
1,600.0	8.00	132.43	1,598.7	-18.8	20.6	-16.9	2.00	2.00	0.00
1,610.7	8.21	132.43	1,609.3	-19.8	21.7	-17.8	2.00	2.00	0.00
1,640.0	8.21	132.43	1,638.3	-22.7	24.8	-20.3	0.00	0.00	0.00
1,680.0	8.21	132.43	1,677.9	-26.5	29.0	-23.8	0.00	0.00	0.00
1,720.0	8.21	132.43	1,717.5	-30.4	33.2	-27.2	0.00	0.00	0.00
1,760.0	8.21	132.43	1,757.1	-34.2	37.4	-30.7	0.00	0.00	0.00
1,800.0	8.21	132.43	1,796.7	-38.1	41.7	-34.2	0.00	0.00	0.00
1,840.0	8.21	132.43	1,836.2	-41.9	45.9	-37.6	0.00	0.00	0.00
1,880.0	8.21	132.43	1,875.8	-45.8	50.1	-41.1	0.00	0.00	0.00
1,920.0	8.21	132.43	1,915.4	-49.6	54.3	-44.5	0.00	0.00	0.00
1,960.0	8.21	132.43	1,955.0	-53.5	58.5	-48.0	0.00	0.00	0.00
2,000.0	8.21	132.43	1,994.6	-57.4	62.7	-51.5	0.00	0.00	0.00

Database:	Landmark	Local Co-ordinate Reference:	Well Dillard 20Y-401
Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	TVD Reference:	WELL @ 4879.0ft (RKB - 15')
Project:	SEC.20-T7N-R64W	MD Reference:	WELL @ 4879.0ft (RKB - 15')
Site:	Dillard 20Y-HZ Pad Sec.20-T7N-R64W	North Reference:	True
Well:	Dillard 20Y-401	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Plan #1 (11-15-12)		

Planned 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)
2,040.0	8.21	132.43	2,034.2	-61.2	67.0	-54.9	0.00	0.00	0.00
2,080.0	8.21	132.43	2,073.8	-65.1	71.2	-58.4	0.00	0.00	0.00
2,120.0	8.21	132.43	2,113.4	-68.9	75.4	-61.8	0.00	0.00	0.00
2,160.0	8.21	132.43	2,153.0	-72.8	79.6	-65.3	0.00	0.00	0.00
2,200.0	8.21	132.43	2,192.6	-76.6	83.8	-68.8	0.00	0.00	0.00
2,240.0	8.21	132.43	2,232.1	-80.5	88.0	-72.2	0.00	0.00	0.00
2,280.0	8.21	132.43	2,271.7	-84.3	92.3	-75.7	0.00	0.00	0.00
2,320.0	8.21	132.43	2,311.3	-88.2	96.5	-79.1	0.00	0.00	0.00
2,360.0	8.21	132.43	2,350.9	-92.1	100.7	-82.6	0.00	0.00	0.00
2,400.0	8.21	132.43	2,390.5	-95.9	104.9	-86.1	0.00	0.00	0.00
2,440.0	8.21	132.43	2,430.1	-99.8	109.1	-89.5	0.00	0.00	0.00
2,480.0	8.21	132.43	2,469.7	-103.6	113.4	-93.0	0.00	0.00	0.00
2,520.0	8.21	132.43	2,509.3	-107.5	117.6	-96.4	0.00	0.00	0.00
2,560.0	8.21	132.43	2,548.9	-111.3	121.8	-99.9	0.00	0.00	0.00
2,600.0	8.21	132.43	2,588.4	-115.2	126.0	-103.4	0.00	0.00	0.00
2,640.0	8.21	132.43	2,628.0	-119.0	130.2	-106.8	0.00	0.00	0.00
2,680.0	8.21	132.43	2,667.6	-122.9	134.4	-110.3	0.00	0.00	0.00
2,720.0	8.21	132.43	2,707.2	-126.7	138.7	-113.7	0.00	0.00	0.00
2,760.0	8.21	132.43	2,746.8	-130.6	142.9	-117.2	0.00	0.00	0.00
2,800.0	8.21	132.43	2,786.4	-134.5	147.1	-120.7	0.00	0.00	0.00
2,840.0	8.21	132.43	2,826.0	-138.3	151.3	-124.1	0.00	0.00	0.00
2,880.0	8.21	132.43	2,865.6	-142.2	155.5	-127.6	0.00	0.00	0.00
2,920.0	8.21	132.43	2,905.2	-146.0	159.7	-131.0	0.00	0.00	0.00
2,960.0	8.21	132.43	2,944.8	-149.9	164.0	-134.5	0.00	0.00	0.00
3,000.0	8.21	132.43	2,984.3	-153.7	168.2	-138.0	0.00	0.00	0.00
3,040.0	8.21	132.43	3,023.9	-157.6	172.4	-141.4	0.00	0.00	0.00
3,080.0	8.21	132.43	3,063.5	-161.4	176.6	-144.9	0.00	0.00	0.00
3,120.0	8.21	132.43	3,103.1	-165.3	180.8	-148.3	0.00	0.00	0.00
3,160.0	8.21	132.43	3,142.7	-169.2	185.0	-151.8	0.00	0.00	0.00
3,200.0	8.21	132.43	3,182.3	-173.0	189.3	-155.3	0.00	0.00	0.00
3,240.0	8.21	132.43	3,221.9	-176.9	193.5	-158.7	0.00	0.00	0.00
3,280.0	8.21	132.43	3,261.5	-180.7	197.7	-162.2	0.00	0.00	0.00
3,320.0	8.21	132.43	3,301.1	-184.6	201.9	-165.6	0.00	0.00	0.00
3,360.0	8.21	132.43	3,340.7	-188.4	206.1	-169.1	0.00	0.00	0.00
3,400.0	8.21	132.43	3,380.2	-192.3	210.4	-172.6	0.00	0.00	0.00
3,440.0	8.21	132.43	3,419.8	-196.1	214.6	-176.0	0.00	0.00	0.00
3,480.0	8.21	132.43	3,459.4	-200.0	218.8	-179.5	0.00	0.00	0.00
3,520.0	8.21	132.43	3,499.0	-203.9	223.0	-182.9	0.00	0.00	0.00
3,560.0	8.21	132.43	3,538.6	-207.7	227.2	-186.4	0.00	0.00	0.00
3,600.0	8.21	132.43	3,578.2	-211.6	231.4	-189.9	0.00	0.00	0.00
3,640.0	8.21	132.43	3,617.8	-215.4	235.7	-193.3	0.00	0.00	0.00
3,680.0	8.21	132.43	3,657.4	-219.3	239.9	-196.8	0.00	0.00	0.00
3,720.0	8.21	132.43	3,697.0	-223.1	244.1	-200.2	0.00	0.00	0.00
3,760.0	8.21	132.43	3,736.6	-227.0	248.3	-203.7	0.00	0.00	0.00
3,800.0	8.21	132.43	3,776.1	-230.8	252.5	-207.2	0.00	0.00	0.00
3,840.0	8.21	132.43	3,815.7	-234.7	256.7	-210.6	0.00	0.00	0.00
3,880.0	8.21	132.43	3,855.3	-238.6	261.0	-214.1	0.00	0.00	0.00
3,920.0	8.21	132.43	3,894.9	-242.4	265.2	-217.5	0.00	0.00	0.00
3,960.0	8.21	132.43	3,934.5	-246.3	269.4	-221.0	0.00	0.00	0.00
4,000.0	8.21	132.43	3,974.1	-250.1	273.6	-224.5	0.00	0.00	0.00
4,040.0	8.21	132.43	4,013.7	-254.0	277.8	-227.9	0.00	0.00	0.00
4,080.0	8.21	132.43	4,053.3	-257.8	282.1	-231.4	0.00	0.00	0.00
4,120.0	8.21	132.43	4,092.9	-261.7	286.3	-234.8	0.00	0.00	0.00

Database:	Landmark	Local Co-ordinate Reference:	Well Dillard 20Y-401
Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	TVD Reference:	WELL @ 4879.0ft (RKB - 15')
Project:	SEC.20-T7N-R64W	MD Reference:	WELL @ 4879.0ft (RKB - 15')
Site:	Dillard 20Y-HZ Pad Sec.20-T7N-R64W	North Reference:	True
Well:	Dillard 20Y-401	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Plan #1 (11-15-12)		

Planned 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)
4,160.0	8.21	132.43	4,132.4	-265.5	290.5	-238.3	0.00	0.00	0.00
4,200.0	8.21	132.43	4,172.0	-269.4	294.7	-241.8	0.00	0.00	0.00
4,240.0	8.21	132.43	4,211.6	-273.3	298.9	-245.2	0.00	0.00	0.00
4,280.0	8.21	132.43	4,251.2	-277.1	303.1	-248.7	0.00	0.00	0.00
4,320.0	8.21	132.43	4,290.8	-281.0	307.4	-252.1	0.00	0.00	0.00
4,360.0	8.21	132.43	4,330.4	-284.8	311.6	-255.6	0.00	0.00	0.00
4,400.0	8.21	132.43	4,370.0	-288.7	315.8	-259.1	0.00	0.00	0.00
4,440.0	8.21	132.43	4,409.6	-292.5	320.0	-262.5	0.00	0.00	0.00
4,480.0	8.21	132.43	4,449.2	-296.4	324.2	-266.0	0.00	0.00	0.00
4,520.0	8.21	132.43	4,488.8	-300.2	328.4	-269.4	0.00	0.00	0.00
4,560.0	8.21	132.43	4,528.3	-304.1	332.7	-272.9	0.00	0.00	0.00
4,600.0	8.21	132.43	4,567.9	-308.0	336.9	-276.4	0.00	0.00	0.00
4,623.0	8.21	132.43	4,590.7	-310.2	339.3	-278.3	0.00	0.00	0.00
4,640.0	7.87	132.43	4,607.5	-311.8	341.1	-279.8	2.00	-2.00	0.00
4,680.0	7.07	132.43	4,647.2	-315.3	344.9	-282.9	2.00	-2.00	0.00
4,720.0	6.27	132.43	4,686.9	-318.4	348.3	-285.7	2.00	-2.00	0.00
4,760.0	5.47	132.43	4,726.7	-321.2	351.4	-288.2	2.00	-2.00	0.00
4,800.0	4.67	132.43	4,766.6	-323.6	354.0	-290.4	2.00	-2.00	0.00
4,840.0	3.87	132.43	4,806.4	-325.6	356.2	-292.2	2.00	-2.00	0.00
4,880.0	3.07	132.43	4,846.4	-327.2	358.0	-293.6	2.00	-2.00	0.00
4,920.0	2.27	132.43	4,886.3	-328.5	359.3	-294.8	2.00	-2.00	0.00
4,960.0	1.47	132.43	4,926.3	-329.4	360.3	-295.6	2.00	-2.00	0.00
5,000.0	0.67	132.43	4,966.3	-329.9	360.9	-296.0	2.00	-2.00	0.00
5,033.7	0.00	0.00	5,000.0	-330.0	361.0	-296.1	2.00	-2.00	0.00
5,040.0	0.00	0.00	5,006.3	-330.0	361.0	-296.1	0.00	0.00	0.00
5,080.0	0.00	0.00	5,046.3	-330.0	361.0	-296.1	0.00	0.00	0.00
5,120.0	0.00	0.00	5,086.3	-330.0	361.0	-296.1	0.00	0.00	0.00
5,160.0	0.00	0.00	5,126.3	-330.0	361.0	-296.1	0.00	0.00	0.00
5,200.0	0.00	0.00	5,166.3	-330.0	361.0	-296.1	0.00	0.00	0.00
5,240.0	0.00	0.00	5,206.3	-330.0	361.0	-296.1	0.00	0.00	0.00
5,280.0	0.00	0.00	5,246.3	-330.0	361.0	-296.1	0.00	0.00	0.00
5,320.0	0.00	0.00	5,286.3	-330.0	361.0	-296.1	0.00	0.00	0.00
5,360.0	0.00	0.00	5,326.3	-330.0	361.0	-296.1	0.00	0.00	0.00
5,400.0	0.00	0.00	5,366.3	-330.0	361.0	-296.1	0.00	0.00	0.00
5,440.0	0.00	0.00	5,406.3	-330.0	361.0	-296.1	0.00	0.00	0.00
5,480.0	0.00	0.00	5,446.3	-330.0	361.0	-296.1	0.00	0.00	0.00
5,520.0	0.00	0.00	5,486.3	-330.0	361.0	-296.1	0.00	0.00	0.00
5,560.0	0.00	0.00	5,526.3	-330.0	361.0	-296.1	0.00	0.00	0.00
5,600.0	0.00	0.00	5,566.3	-330.0	361.0	-296.1	0.00	0.00	0.00
5,640.0	0.00	0.00	5,606.3	-330.0	361.0	-296.1	0.00	0.00	0.00
5,680.0	0.00	0.00	5,646.3	-330.0	361.0	-296.1	0.00	0.00	0.00
5,720.0	0.00	0.00	5,686.3	-330.0	361.0	-296.1	0.00	0.00	0.00
5,760.0	0.00	0.00	5,726.3	-330.0	361.0	-296.1	0.00	0.00	0.00
5,800.0	0.00	0.00	5,766.3	-330.0	361.0	-296.1	0.00	0.00	0.00
5,840.0	0.00	0.00	5,806.3	-330.0	361.0	-296.1	0.00	0.00	0.00
5,880.0	0.00	0.00	5,846.3	-330.0	361.0	-296.1	0.00	0.00	0.00
5,920.0	0.00	0.00	5,886.3	-330.0	361.0	-296.1	0.00	0.00	0.00
5,960.0	0.00	0.00	5,926.3	-330.0	361.0	-296.1	0.00	0.00	0.00
6,000.0	0.00	0.00	5,966.3	-330.0	361.0	-296.1	0.00	0.00	0.00
6,040.0	0.00	0.00	6,006.3	-330.0	361.0	-296.1	0.00	0.00	0.00
6,080.0	0.00	0.00	6,046.3	-330.0	361.0	-296.1	0.00	0.00	0.00
6,120.0	0.00	0.00	6,086.3	-330.0	361.0	-296.1	0.00	0.00	0.00
6,160.0	0.00	0.00	6,126.3	-330.0	361.0	-296.1	0.00	0.00	0.00

Database:	Landmark	Local Co-ordinate Reference:	Well Dillard 20Y-401
Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	TVD Reference:	WELL @ 4879.0ft (RKB - 15')
Project:	SEC.20-T7N-R64W	MD Reference:	WELL @ 4879.0ft (RKB - 15')
Site:	Dillard 20Y-HZ Pad Sec.20-T7N-R64W	North Reference:	True
Well:	Dillard 20Y-401	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Plan #1 (11-15-12)		

Planned 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	0.00	0.00	6,166.3	-330.0	361.0	-296.1	0.00	0.00	0.00
6,240.0	0.00	0.00	6,206.3	-330.0	361.0	-296.1	0.00	0.00	0.00
6,280.0	0.00	0.00	6,246.3	-330.0	361.0	-296.1	0.00	0.00	0.00
6,320.0	0.00	0.00	6,286.3	-330.0	361.0	-296.1	0.00	0.00	0.00
6,360.0	0.00	0.00	6,326.3	-330.0	361.0	-296.1	0.00	0.00	0.00
6,400.0	0.00	0.00	6,366.3	-330.0	361.0	-296.1	0.00	0.00	0.00
6,409.0	0.00	0.00	6,375.3	-330.0	361.0	-296.1	0.00	0.00	0.00
KOP #2									
6,440.0	2.33	0.47	6,406.3	-329.4	361.0	-295.5	7.50	7.50	0.00
6,480.0	5.33	0.47	6,446.2	-326.7	361.0	-292.8	7.50	7.50	0.00
6,520.0	8.33	0.47	6,485.9	-321.9	361.1	-288.1	7.50	7.50	0.00
6,560.0	11.33	0.47	6,525.3	-315.1	361.1	-281.3	7.50	7.50	0.00
6,600.0	14.33	0.47	6,564.3	-306.2	361.2	-272.5	7.50	7.50	0.00
6,640.0	17.33	0.47	6,602.8	-295.3	361.3	-261.6	7.50	7.50	0.00
6,680.0	20.33	0.47	6,640.6	-282.4	361.4	-248.7	7.50	7.50	0.00
6,720.0	23.33	0.47	6,677.8	-267.6	361.5	-233.9	7.50	7.50	0.00
6,760.0	26.33	0.47	6,714.1	-250.8	361.6	-217.2	7.50	7.50	0.00
6,800.0	29.33	0.47	6,749.4	-232.1	361.8	-198.6	7.50	7.50	0.00
6,840.0	32.33	0.47	6,783.8	-211.6	362.0	-178.1	7.50	7.50	0.00
6,880.0	35.33	0.47	6,817.0	-189.3	362.2	-155.9	7.50	7.50	0.00
6,920.0	38.33	0.47	6,849.0	-165.4	362.4	-132.1	7.50	7.50	0.00
6,960.0	41.33	0.47	6,879.7	-139.8	362.6	-106.5	7.50	7.50	0.00
7,000.0	44.33	0.47	6,909.1	-112.6	362.8	-79.4	7.50	7.50	0.00
7,040.0	47.33	0.47	6,936.9	-83.9	363.0	-50.8	7.50	7.50	0.00
7,080.0	50.33	0.47	6,963.3	-53.8	363.3	-20.8	7.50	7.50	0.00
7,120.0	53.33	0.47	6,988.0	-22.3	363.5	10.5	7.50	7.50	0.00
7,160.0	56.33	0.47	7,011.0	10.4	363.8	43.1	7.50	7.50	0.00
7,200.0	59.33	0.47	7,032.3	44.2	364.1	76.8	7.50	7.50	0.00
7,240.0	62.33	0.47	7,051.8	79.1	364.4	111.6	7.50	7.50	0.00
7,280.0	65.33	0.47	7,069.5	115.0	364.7	147.4	7.50	7.50	0.00
7,320.0	68.33	0.47	7,085.2	151.8	365.0	184.1	7.50	7.50	0.00
7,360.0	71.33	0.47	7,099.0	189.3	365.3	221.5	7.50	7.50	0.00
7,400.0	74.33	0.47	7,110.8	227.5	365.6	259.5	7.50	7.50	0.00
7,440.0	77.33	0.47	7,120.6	266.3	365.9	298.2	7.50	7.50	0.00
7,480.0	80.33	0.47	7,128.4	305.6	366.2	337.3	7.50	7.50	0.00
7,520.0	83.33	0.47	7,134.0	345.1	366.5	376.8	7.50	7.50	0.00
7,529.0	84.00	0.47	7,135.0	354.1	366.6	385.7	7.49	7.49	0.00
7"									
7,560.0	84.00	0.47	7,138.3	384.9	366.9	416.4	0.00	0.00	0.00
7,600.0	84.00	0.47	7,142.5	424.7	367.2	456.0	0.00	0.00	0.00
7,603.0	84.00	0.47	7,142.8	427.7	367.2	459.0	0.00	0.00	0.00
7,640.0	85.85	0.47	7,146.0	464.5	367.5	495.8	5.00	5.00	0.00
7,680.0	87.85	0.47	7,148.2	504.5	367.8	535.6	5.00	5.00	0.00
7,720.0	89.85	0.47	7,149.0	544.5	368.2	575.4	5.00	5.00	0.00
7,731.9	90.44	0.47	7,149.0	556.4	368.3	587.3	4.99	4.99	0.00
End of Build									
7,760.0	90.44	0.47	7,148.8	584.5	368.5	615.3	0.00	0.00	0.00
7,800.0	90.44	0.47	7,148.5	624.4	368.8	655.1	0.00	0.00	0.00
7,840.0	90.44	0.47	7,148.2	664.4	369.2	695.0	0.00	0.00	0.00
7,880.0	90.44	0.47	7,147.9	704.4	369.5	734.9	0.00	0.00	0.00
7,920.0	90.44	0.47	7,147.6	744.4	369.8	774.7	0.00	0.00	0.00
7,960.0	90.44	0.47	7,147.2	784.4	370.1	814.6	0.00	0.00	0.00
8,000.0	90.44	0.47	7,146.9	824.4	370.5	854.5	0.00	0.00	0.00

Database:	Landmark	Local Co-ordinate Reference:	Well Dillard 20Y-401
Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	TVD Reference:	WELL @ 4879.0ft (RKB - 15')
Project:	SEC.20-T7N-R64W	MD Reference:	WELL @ 4879.0ft (RKB - 15')
Site:	Dillard 20Y-HZ Pad Sec.20-T7N-R64W	North Reference:	True
Well:	Dillard 20Y-401	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Plan #1 (11-15-12)		

Planned 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)
8,040.0	90.44	0.47	7,146.6	864.4	370.8	894.3	0.00	0.00	0.00
8,080.0	90.44	0.47	7,146.3	904.4	371.1	934.2	0.00	0.00	0.00
8,120.0	90.44	0.47	7,146.0	944.4	371.5	974.1	0.00	0.00	0.00
8,160.0	90.44	0.47	7,145.7	984.4	371.8	1,013.9	0.00	0.00	0.00
8,200.0	90.44	0.47	7,145.4	1,024.4	372.1	1,053.8	0.00	0.00	0.00
8,240.0	90.44	0.47	7,145.1	1,064.4	372.5	1,093.6	0.00	0.00	0.00
8,280.0	90.44	0.47	7,144.8	1,104.4	372.8	1,133.5	0.00	0.00	0.00
8,320.0	90.44	0.47	7,144.4	1,144.4	373.1	1,173.4	0.00	0.00	0.00
8,360.0	90.44	0.47	7,144.1	1,184.4	373.4	1,213.2	0.00	0.00	0.00
8,400.0	90.44	0.47	7,143.8	1,224.4	373.8	1,253.1	0.00	0.00	0.00
8,440.0	90.44	0.47	7,143.5	1,264.4	374.1	1,293.0	0.00	0.00	0.00
8,480.0	90.44	0.47	7,143.2	1,304.4	374.4	1,332.8	0.00	0.00	0.00
8,520.0	90.44	0.47	7,142.9	1,344.4	374.8	1,372.7	0.00	0.00	0.00
8,560.0	90.44	0.47	7,142.6	1,384.4	375.1	1,412.6	0.00	0.00	0.00
8,600.0	90.44	0.47	7,142.3	1,424.4	375.4	1,452.4	0.00	0.00	0.00
8,640.0	90.44	0.47	7,142.0	1,464.4	375.7	1,492.3	0.00	0.00	0.00
8,680.0	90.44	0.47	7,141.7	1,504.4	376.1	1,532.2	0.00	0.00	0.00
8,720.0	90.44	0.47	7,141.3	1,544.4	376.4	1,572.0	0.00	0.00	0.00
8,760.0	90.44	0.47	7,141.0	1,584.4	376.7	1,611.9	0.00	0.00	0.00
8,800.0	90.44	0.47	7,140.7	1,624.4	377.1	1,651.7	0.00	0.00	0.00
8,840.0	90.44	0.47	7,140.4	1,664.4	377.4	1,691.6	0.00	0.00	0.00
8,880.0	90.44	0.47	7,140.1	1,704.4	377.7	1,731.5	0.00	0.00	0.00
8,920.0	90.44	0.47	7,139.8	1,744.4	378.1	1,771.3	0.00	0.00	0.00
8,960.0	90.44	0.47	7,139.5	1,784.4	378.4	1,811.2	0.00	0.00	0.00
9,000.0	90.44	0.47	7,139.2	1,824.4	378.7	1,851.1	0.00	0.00	0.00
9,040.0	90.44	0.47	7,138.9	1,864.4	379.0	1,890.9	0.00	0.00	0.00
9,080.0	90.44	0.47	7,138.5	1,904.4	379.4	1,930.8	0.00	0.00	0.00
9,120.0	90.44	0.47	7,138.2	1,944.4	379.7	1,970.7	0.00	0.00	0.00
9,160.0	90.44	0.47	7,137.9	1,984.4	380.0	2,010.5	0.00	0.00	0.00
9,200.0	90.44	0.47	7,137.6	2,024.4	380.4	2,050.4	0.00	0.00	0.00
9,240.0	90.44	0.47	7,137.3	2,064.4	380.7	2,090.3	0.00	0.00	0.00
9,280.0	90.44	0.47	7,137.0	2,104.4	381.0	2,130.1	0.00	0.00	0.00
9,320.0	90.44	0.47	7,136.7	2,144.4	381.3	2,170.0	0.00	0.00	0.00
9,360.0	90.44	0.47	7,136.4	2,184.3	381.7	2,209.9	0.00	0.00	0.00
9,400.0	90.44	0.47	7,136.1	2,224.3	382.0	2,249.7	0.00	0.00	0.00
9,440.0	90.44	0.47	7,135.8	2,264.3	382.3	2,289.6	0.00	0.00	0.00
9,480.0	90.44	0.47	7,135.4	2,304.3	382.7	2,329.4	0.00	0.00	0.00
9,520.0	90.44	0.47	7,135.1	2,344.3	383.0	2,369.3	0.00	0.00	0.00
9,560.0	90.44	0.47	7,134.8	2,384.3	383.3	2,409.2	0.00	0.00	0.00
9,600.0	90.44	0.47	7,134.5	2,424.3	383.6	2,449.0	0.00	0.00	0.00
9,640.0	90.44	0.47	7,134.2	2,464.3	384.0	2,488.9	0.00	0.00	0.00
9,680.0	90.44	0.47	7,133.9	2,504.3	384.3	2,528.8	0.00	0.00	0.00
9,720.0	90.44	0.47	7,133.6	2,544.3	384.6	2,568.6	0.00	0.00	0.00
9,760.0	90.44	0.47	7,133.3	2,584.3	385.0	2,608.5	0.00	0.00	0.00
9,800.0	90.44	0.47	7,133.0	2,624.3	385.3	2,648.4	0.00	0.00	0.00
9,840.0	90.44	0.47	7,132.7	2,664.3	385.6	2,688.2	0.00	0.00	0.00
9,880.0	90.44	0.47	7,132.3	2,704.3	386.0	2,728.1	0.00	0.00	0.00
9,920.0	90.44	0.47	7,132.0	2,744.3	386.3	2,768.0	0.00	0.00	0.00
9,960.0	90.44	0.47	7,131.7	2,784.3	386.6	2,807.8	0.00	0.00	0.00
10,000.0	90.44	0.47	7,131.4	2,824.3	386.9	2,847.7	0.00	0.00	0.00
10,040.0	90.44	0.47	7,131.1	2,864.3	387.3	2,887.5	0.00	0.00	0.00
10,080.0	90.44	0.47	7,130.8	2,904.3	387.6	2,927.4	0.00	0.00	0.00
10,120.0	90.44	0.47	7,130.5	2,944.3	387.9	2,967.3	0.00	0.00	0.00

Database:	Landmark	Local Co-ordinate Reference:	Well Dillard 20Y-401
Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	TVD Reference:	WELL @ 4879.0ft (RKB - 15')
Project:	SEC.20-T7N-R64W	MD Reference:	WELL @ 4879.0ft (RKB - 15')
Site:	Dillard 20Y-HZ Pad Sec.20-T7N-R64W	North Reference:	True
Well:	Dillard 20Y-401	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Plan #1 (11-15-12)		

Planned 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)
10,160.0	90.44	0.47	7,130.2	2,984.3	388.3	3,007.1	0.00	0.00	0.00
10,200.0	90.44	0.47	7,129.9	3,024.3	388.6	3,047.0	0.00	0.00	0.00
10,240.0	90.44	0.47	7,129.5	3,064.3	388.9	3,086.9	0.00	0.00	0.00
10,280.0	90.44	0.47	7,129.2	3,104.3	389.2	3,126.7	0.00	0.00	0.00
10,320.0	90.44	0.47	7,128.9	3,144.3	389.6	3,166.6	0.00	0.00	0.00
10,360.0	90.44	0.47	7,128.6	3,184.3	389.9	3,206.5	0.00	0.00	0.00
10,400.0	90.44	0.47	7,128.3	3,224.3	390.2	3,246.3	0.00	0.00	0.00
10,440.0	90.44	0.47	7,128.0	3,264.3	390.6	3,286.2	0.00	0.00	0.00
10,480.0	90.44	0.47	7,127.7	3,304.3	390.9	3,326.1	0.00	0.00	0.00
10,520.0	90.44	0.47	7,127.4	3,344.3	391.2	3,365.9	0.00	0.00	0.00
10,560.0	90.44	0.47	7,127.1	3,384.3	391.5	3,405.8	0.00	0.00	0.00
10,600.0	90.44	0.47	7,126.8	3,424.3	391.9	3,445.6	0.00	0.00	0.00
10,640.0	90.44	0.47	7,126.4	3,464.3	392.2	3,485.5	0.00	0.00	0.00
10,680.0	90.44	0.47	7,126.1	3,504.3	392.5	3,525.4	0.00	0.00	0.00
10,720.0	90.44	0.47	7,125.8	3,544.3	392.9	3,565.2	0.00	0.00	0.00
10,760.0	90.44	0.47	7,125.5	3,584.3	393.2	3,605.1	0.00	0.00	0.00
10,800.0	90.44	0.47	7,125.2	3,624.3	393.5	3,645.0	0.00	0.00	0.00
10,840.0	90.44	0.47	7,124.9	3,664.3	393.9	3,684.8	0.00	0.00	0.00
10,880.0	90.44	0.47	7,124.6	3,704.3	394.2	3,724.7	0.00	0.00	0.00
10,920.0	90.44	0.47	7,124.3	3,744.2	394.5	3,764.6	0.00	0.00	0.00
10,960.0	90.44	0.47	7,124.0	3,784.2	394.8	3,804.4	0.00	0.00	0.00
11,000.0	90.44	0.47	7,123.6	3,824.2	395.2	3,844.3	0.00	0.00	0.00
11,040.0	90.44	0.47	7,123.3	3,864.2	395.5	3,884.2	0.00	0.00	0.00
11,080.0	90.44	0.47	7,123.0	3,904.2	395.8	3,924.0	0.00	0.00	0.00
11,120.0	90.44	0.47	7,122.7	3,944.2	396.2	3,963.9	0.00	0.00	0.00
11,160.0	90.44	0.47	7,122.4	3,984.2	396.5	4,003.8	0.00	0.00	0.00
11,200.0	90.44	0.47	7,122.1	4,024.2	396.8	4,043.6	0.00	0.00	0.00
11,240.0	90.44	0.47	7,121.8	4,064.2	397.1	4,083.5	0.00	0.00	0.00
11,280.0	90.44	0.47	7,121.5	4,104.2	397.5	4,123.3	0.00	0.00	0.00
11,320.0	90.44	0.47	7,121.2	4,144.2	397.8	4,163.2	0.00	0.00	0.00
11,360.0	90.44	0.47	7,120.9	4,184.2	398.1	4,203.1	0.00	0.00	0.00
11,400.0	90.44	0.47	7,120.5	4,224.2	398.5	4,242.9	0.00	0.00	0.00
11,440.0	90.44	0.47	7,120.2	4,264.2	398.8	4,282.8	0.00	0.00	0.00
11,480.0	90.44	0.47	7,119.9	4,304.2	399.1	4,322.7	0.00	0.00	0.00
11,520.0	90.44	0.47	7,119.6	4,344.2	399.4	4,362.5	0.00	0.00	0.00
11,560.0	90.44	0.47	7,119.3	4,384.2	399.8	4,402.4	0.00	0.00	0.00
11,598.7	90.44	0.47	7,119.0	4,422.9	400.1	4,440.9	0.00	0.00	0.00
BHL 500'FNL & 200'FEL									

Targets

Target Name	Dip Angle (°)	Dip Dir. (°)	TVD (ft)	+N-S (ft)	+E-W (ft)	Northing (ft)	Easting (ft)	Latitude	Longitude
- hit/miss target									
- Shape									
BHL 500'FNL & 200'F	0.00	0.00	7,119.0	4,422.9	400.1	1,449,775.08	3,259,860.27	40.564270	-104.564680
- plan hits target center									
- Point									

Database:	Landmark	Local Co-ordinate Reference:	Well Dillard 20Y-401
Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	TVD Reference:	WELL @ 4879.0ft (RKB - 15')
Project:	SEC.20-T7N-R64W	MD Reference:	WELL @ 4879.0ft (RKB - 15')
Site:	Dillard 20Y-HZ Pad Sec.20-T7N-R64W	North Reference:	True
Well:	Dillard 20Y-401	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Plan #1 (11-15-12)		

Casing Points

Measured Depth (ft)	Vertical Depth (ft)	Name	Casing Diameter (")	Hole Diameter (")
7,529.0	7,135.0	7"	7	7-1/2

Plan Annotations

Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment
		+N/-S (ft)	+E/-W (ft)	
1,200.0	1,200.0	0.0	0.0	KOP #1
6,409.0	6,375.3	-330.0	361.0	KOP #2
7,731.9	7,149.0	556.4	368.3	End of Build



PETROLEUM DEVELOPMENT CORP Weld County CO

SEC.20-T7N-R64W

Dillard 20Y-HZ Pad Sec.20-T7N-R64W

Dillard 20Y-401

Wellbore #1

Plan #1 (11-15-12)

Anticollision Report

26 November, 2012



Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Dillard 20Y-401
Project:	SEC.20-T7N-R64W	TVD Reference:	WELL @ 4879.0ft (RKB - 15')
Reference Site:	Dillard 20Y-HZ Pad Sec.20-T7N-R64W	MD Reference:	WELL @ 4879.0ft (RKB - 15')
Site Error:	0.0ft	North Reference:	True
Reference Well:	Dillard 20Y-401	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	Landmark
Reference Design:	Plan #1 (11-15-12)	Offset TVD Reference:	Offset Datum

Reference	Plan #1 (11-15-12)		
Filter type:	NO GLOBAL FILTER: Using user defined selection & filtering criteria		
Interpolation Method:	Stations	Error Model:	ISCWSA
Depth Range:	Unlimited	Scan Method:	Closest Approach 3D
Results Limited by:	Maximum center-center distance of 1,000.0ft	Error Surface:	Elliptical Conic
Warning Levels Evaluated at:	2.00 Sigma		

Survey Tool Program	Date	11/26/2012		
From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description
0.0	11,598.7	Plan #1 (11-15-12) (Wellbore #1)	MWD	MWD - Standard

Summary						
Site Name	Reference Measured Depth (ft)	Offset Measured Depth (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Separation Factor	Warning
Offset Well - Wellbore - Design						
Dillard 20Y-HZ Pad Sec.20-T7N-R64W						
Dillard 20T-221 - Wellbore #1 - Plan #1 (11-15-12)	966.3	967.3	30.6	26.4	7.417	CC
Dillard 20T-221 - Wellbore #1 - Plan #1 (11-15-12)	1,000.0	1,001.0	30.6	26.3	7.155	ES
Dillard 20T-221 - Wellbore #1 - Plan #1 (11-15-12)	11,598.7	11,569.1	696.1	525.7	4.085	SF
Dillard 20T-401 - Wellbore #1 - Plan #1 (11-15-12)	766.3	767.3	61.1	57.9	18.973	CC
Dillard 20T-401 - Wellbore #1 - Plan #1 (11-15-12)	800.0	801.0	61.1	57.8	18.123	ES
Dillard 20T-401 - Wellbore #1 - Plan #1 (11-15-12)	11,598.7	11,631.3	989.2	813.7	5.637	SF
Existing Wells Sec.20-T7N-R64W						
Dillard 41-20 (Exist.) - Wellbore #1 - Design #1	11,464.8	7,020.0	483.0	385.9	4.971	CC, ES
Dillard 41-20 (Exist.) - Wellbore #1 - Design #1	11,500.0	7,020.0	484.3	386.5	4.951	SF
Dillard 42-20 (Exist.) - Wellbore #1 - Design #1	10,189.6	7,020.0	478.3	404.2	6.459	CC
Dillard 42-20 (Exist.) - Wellbore #1 - Design #1	10,200.0	7,020.0	478.4	404.2	6.444	ES, SF
Dillard 43-20 (Exist.) - Wellbore #1 - Design #1	8,974.2	7,020.0	299.7	250.0	6.029	CC, ES
Dillard 43-20 (Exist.) - Wellbore #1 - Design #1	9,000.0	7,020.0	300.8	250.7	6.002	SF
Dillard 44-20 (Exist.) - Wellbore #1 - Design #1	1,200.0	1,201.0	288.2	283.0	55.728	CC
Dillard 44-20 (Exist.) - Wellbore #1 - Design #1	7,419.6	7,020.0	291.9	261.0	9.466	ES
Dillard 44-20 (Exist.) - Wellbore #1 - Design #1	7,450.0	7,020.0	293.2	262.2	9.460	SF

Offset Design											
Dillard 20Y-HZ Pad Sec.20-T7N-R64W - Dillard 20T-221 - Wellbore #1 - Plan #1 (11-15-12)											
Survey Program: 0-MWD											
Reference	Offset	Semi Major Axis		Distance		Minimum Separation		Separation Factor		Warning	
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Warning
0.0	0.0	1.0	1.0	0.0	0.0	-90.00	0.0	-30.6	30.6	30.6	N/A
100.0	100.0	101.0	101.0	0.1	0.1	-90.00	0.0	-30.6	30.6	30.3	134.654
200.0	200.0	201.0	201.0	0.3	0.3	-90.00	0.0	-30.6	30.6	29.9	0.68
300.0	300.0	301.0	301.0	0.6	0.6	-90.00	0.0	-30.6	30.6	29.4	1.13
400.0	400.0	401.0	401.0	0.8	0.8	-90.00	0.0	-30.6	30.6	29.0	1.58
500.0	500.0	501.0	501.0	1.0	1.0	-90.00	0.0	-30.6	30.6	28.5	2.03
600.0	600.0	601.0	601.0	1.2	1.2	-90.00	0.0	-30.6	30.6	28.1	2.47
700.0	700.0	701.0	701.0	1.5	1.5	-90.00	0.0	-30.6	30.6	27.6	2.92
800.0	800.0	801.0	801.0	1.7	1.7	-90.00	0.0	-30.6	30.6	27.2	3.37
900.0	900.0	901.0	901.0	1.9	1.9	-90.00	0.0	-30.6	30.6	26.7	3.82

CC - Min centre to center distance or convergent point, SF - min separation factor, ES - min ellipse separation

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Dillard 20Y-401
Project:	SEC.20-T7N-R64W	TVD Reference:	WELL @ 4879.0ft (RKB - 15')
Reference Site:	Dillard 20Y-HZ Pad Sec.20-T7N-R64W	MD Reference:	WELL @ 4879.0ft (RKB - 15')
Site Error:	0.0ft	North Reference:	True
Reference Well:	Dillard 20Y-401	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	Landmark
Reference Design:	Plan #1 (11-15-12)	Offset TVD Reference:	Offset Datum

Offset Design Dillard 20Y-HZ Pad Sec.20-T7N-R64W - Dillard 20T-221 - Wellbore #1 - Plan #1 (11-15-12)													Offset Site Error:	0.0 ft
Survey Program: 0-MWD													Offset Well Error:	0.0 ft
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference	Offset	Semi Major Axis	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
966.3	966.3	967.3	967.3	2.1	2.1	-90.00		0.0	-30.6	30.6	26.4	4.12	7.417 CC	
1,000.0	1,000.0	1,001.0	1,001.0	2.1	2.1	-90.00		0.0	-30.6	30.6	26.3	4.27	7.155 ES	
1,100.0	1,100.0	1,100.0	1,100.0	2.4	2.3	-92.40		-1.3	-31.7	31.7	27.1	4.70	6.762	
1,200.0	1,200.0	1,199.3	1,199.1	2.6	2.5	-98.54		-5.3	-35.1	35.5	30.4	5.10	6.961	
1,300.0	1,300.0	1,297.8	1,297.3	2.8	2.7	123.24		-11.8	-40.6	43.4	37.9	5.49	7.895	
1,400.0	1,399.8	1,396.5	1,395.3	3.0	2.9	120.73		-20.4	-48.0	55.7	49.8	5.88	9.470	
1,500.0	1,499.5	1,495.5	1,493.6	3.2	3.2	121.38		-29.3	-55.6	70.1	63.8	6.28	11.154	
1,600.0	1,598.7	1,594.1	1,591.5	3.4	3.4	123.68		-38.1	-63.2	86.3	79.6	6.71	12.875	
1,610.7	1,609.3	1,604.5	1,601.9	3.4	3.4	123.98		-39.1	-64.0	88.2	81.4	6.75	13.061	
1,700.0	1,697.7	1,692.4	1,689.1	3.6	3.7	126.36		-47.0	-70.7	103.9	96.8	7.16	14.520	
1,800.0	1,796.7	1,790.7	1,786.8	3.9	3.9	128.30		-55.8	-78.3	121.7	114.1	7.63	15.950	
1,900.0	1,895.6	1,889.1	1,884.4	4.2	4.2	129.74		-64.6	-85.8	139.6	131.5	8.12	17.190	
2,000.0	1,994.6	1,987.4	1,982.1	4.5	4.5	130.85		-73.5	-93.4	157.5	148.9	8.62	18.271	
2,100.0	2,093.6	2,085.7	2,079.7	4.8	4.8	131.74		-82.3	-100.9	175.5	166.4	9.13	19.215	
2,200.0	2,192.6	2,184.1	2,177.4	5.1	5.1	132.46		-91.1	-108.5	193.5	183.9	9.66	20.043	
2,300.0	2,291.5	2,282.4	2,275.0	5.4	5.4	133.06		-99.9	-116.0	211.6	201.4	10.18	20.774	
2,400.0	2,390.5	2,380.8	2,372.7	5.7	5.7	133.56		-108.8	-123.6	229.6	218.9	10.72	21.421	
2,500.0	2,489.5	2,479.1	2,470.3	6.0	6.0	133.99		-117.6	-131.1	247.7	236.4	11.26	21.998	
2,600.0	2,588.4	2,577.4	2,568.0	6.4	6.3	134.36		-126.4	-138.7	265.8	254.0	11.81	22.514	
2,700.0	2,687.4	2,675.8	2,665.6	6.7	6.6	134.69		-135.3	-146.2	283.9	271.5	12.35	22.977	
2,800.0	2,786.4	2,774.1	2,763.3	7.0	6.9	134.97		-144.1	-153.8	302.0	289.1	12.91	23.395	
2,900.0	2,885.4	2,872.4	2,860.9	7.4	7.2	135.23		-152.9	-161.3	320.1	306.6	13.46	23.774	
3,000.0	2,984.3	2,970.8	2,958.6	7.7	7.5	135.45		-161.8	-168.9	338.2	324.2	14.02	24.119	
3,100.0	3,083.3	3,069.1	3,056.2	8.0	7.8	135.66		-170.6	-176.4	356.3	341.7	14.58	24.433	
3,200.0	3,182.3	3,167.5	3,153.9	8.4	8.1	135.84		-179.4	-184.0	374.4	359.3	15.15	24.721	
3,300.0	3,281.3	3,265.8	3,251.5	8.7	8.4	136.01		-188.2	-191.5	392.6	376.9	15.71	24.986	
3,400.0	3,380.2	3,364.1	3,349.2	9.1	8.7	136.16		-197.1	-199.1	410.7	394.4	16.28	25.230	
3,500.0	3,479.2	3,462.5	3,446.8	9.4	9.0	136.30		-205.9	-206.6	428.8	412.0	16.85	25.455	
3,600.0	3,578.2	3,560.8	3,544.5	9.7	9.3	136.42		-214.7	-214.2	447.0	429.6	17.42	25.663	
3,700.0	3,677.2	3,659.1	3,642.1	10.1	9.6	136.54		-223.6	-221.7	465.1	447.1	17.99	25.857	
3,800.0	3,776.1	3,757.5	3,739.8	10.4	9.9	136.65		-232.4	-229.3	483.2	464.7	18.56	26.037	
3,900.0	3,875.1	3,855.8	3,837.4	10.8	10.2	136.75		-241.2	-236.8	501.4	482.3	19.13	26.205	
4,000.0	3,974.1	3,954.2	3,935.0	11.1	10.6	136.85		-250.1	-244.4	519.5	499.8	19.71	26.362	
4,100.0	4,073.1	4,052.5	4,032.7	11.5	10.9	136.93		-258.9	-251.9	537.7	517.4	20.28	26.509	
4,200.0	4,172.0	4,150.8	4,130.3	11.8	11.2	137.02		-267.7	-259.5	555.8	535.0	20.86	26.647	
4,300.0	4,271.0	4,249.2	4,228.0	12.2	11.5	137.09		-276.5	-267.0	574.0	552.5	21.43	26.777	
4,400.0	4,370.0	4,347.5	4,325.6	12.5	11.8	137.17		-285.4	-274.6	592.1	570.1	22.01	26.899	
4,500.0	4,469.0	4,445.8	4,423.3	12.9	12.1	137.23		-294.2	-282.1	610.2	587.7	22.59	27.014	
4,600.0	4,567.9	4,544.2	4,520.9	13.2	12.4	137.30		-303.0	-289.7	628.4	605.2	23.17	27.123	
4,623.0	4,590.7	4,566.8	4,543.4	13.3	12.5	137.31		-305.1	-291.4	632.6	609.3	23.30	27.147	
4,700.0	4,667.0	4,642.6	4,618.7	13.6	12.7	137.48		-311.9	-297.2	645.8	622.0	23.75	27.192	
4,800.0	4,766.6	4,751.3	4,726.7	13.8	13.0	137.50		-321.1	-305.1	660.3	636.1	24.26	27.224	
4,900.0	4,866.3	4,868.5	4,843.6	14.0	13.3	137.49		-327.8	-310.8	669.9	645.2	24.69	27.127	
5,000.0	4,966.3	4,986.4	4,961.4	14.1	13.5	137.48		-330.8	-313.4	674.3	649.2	25.08	26.886	
5,033.7	5,000.0	5,026.0	5,001.0	14.2	13.5	-90.08		-331.0	-313.6	674.6	649.4	25.21	26.759	
5,100.0	5,066.3	5,092.3	5,067.3	14.3	13.6	-90.08		-331.0	-313.6	674.6	649.1	25.44	26.519	
5,200.0	5,166.3	5,192.3	5,167.3	14.4	13.8	-90.08		-331.0	-313.6	674.6	648.8	25.77	26.179	
5,300.0	5,266.3	5,292.3	5,267.3	14.6	14.0	-90.08		-331.0	-313.6	674.6	648.5	26.10	25.845	
5,400.0	5,366.3	5,392.3	5,367.3	14.8	14.1	-90.08		-331.0	-313.6	674.6	648.1	26.44	25.517	
5,500.0	5,466.3	5,492.3	5,467.3	14.9	14.3	-90.08		-331.0	-313.6	674.6	647.8	26.78	25.193	
5,600.0	5,566.3	5,592.3	5,567.3	15.1	14.4	-90.08		-331.0	-313.6	674.6	647.5	27.12	24.875	

CC - Min centre to center distance or convergent point, SF - min separation factor, ES - min ellipse separation

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Dillard 20Y-401
Project:	SEC.20-T7N-R64W	TVD Reference:	WELL @ 4879.0ft (RKB - 15')
Reference Site:	Dillard 20Y-HZ Pad Sec.20-T7N-R64W	MD Reference:	WELL @ 4879.0ft (RKB - 15')
Site Error:	0.0ft	North Reference:	True
Reference Well:	Dillard 20Y-401	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	Landmark
Reference Design:	Plan #1 (11-15-12)	Offset TVD Reference:	Offset Datum

Offset Design Dillard 20Y-HZ Pad Sec.20-T7N-R64W - Dillard 20T-221 - Wellbore #1 - Plan #1 (11-15-12)													Offset Site Error:	0.0 ft
Survey Program: 0-MWD													Offset Well Error:	0.0 ft
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference	Offset	Semi Major Axis	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
5,700.0	5,666.3	5,692.3	5,667.3	15.2	14.6	-90.08	-331.0	-313.6	674.6	647.1	27.46	24.561		
5,800.0	5,766.3	5,792.3	5,767.3	15.4	14.8	-90.08	-331.0	-313.6	674.6	646.8	27.81	24.253		
5,900.0	5,866.3	5,892.3	5,867.3	15.6	14.9	-90.08	-331.0	-313.6	674.6	646.4	28.16	23.951		
6,000.0	5,966.3	5,992.3	5,967.3	15.7	15.1	-90.08	-331.0	-313.6	674.6	646.0	28.52	23.653		
6,100.0	6,066.3	6,092.3	6,067.3	15.9	15.3	-90.08	-331.0	-313.6	674.6	645.7	28.88	23.361		
6,200.0	6,166.3	6,192.3	6,167.3	16.1	15.4	-90.08	-331.0	-313.6	674.6	645.3	29.24	23.073		
6,300.0	6,266.3	6,292.3	6,267.3	16.2	15.6	-90.08	-331.0	-313.6	674.6	645.0	29.60	22.791		
6,409.0	6,375.3	6,401.3	6,376.3	16.4	15.8	-90.08	-331.0	-313.6	674.6	644.6	30.00	22.489		
6,450.0	6,416.3	6,442.3	6,417.3	16.5	15.9	-90.65	-331.0	-313.6	674.6	644.4	30.14	22.385		
6,500.0	6,466.1	6,492.1	6,467.1	16.5	16.0	-91.01	-331.0	-313.6	674.6	644.3	30.30	22.269		
6,550.0	6,515.5	6,542.6	6,517.5	16.6	16.0	-91.58	-330.2	-313.6	674.8	644.4	30.43	22.172		
6,600.0	6,564.3	6,594.4	6,569.1	16.6	16.1	-92.07	-324.9	-313.5	675.0	644.4	30.53	22.108		
6,650.0	6,612.3	6,647.0	6,620.5	16.6	16.1	-92.40	-314.2	-313.4	675.1	644.5	30.58	22.076		
6,700.0	6,659.3	6,700.0	6,671.1	16.6	16.1	-92.59	-298.3	-313.3	675.2	644.6	30.59	22.069		
6,750.0	6,705.1	6,753.2	6,719.9	16.6	16.1	-92.62	-277.2	-313.1	675.2	644.6	30.58	22.083		
6,800.0	6,749.4	6,806.2	6,766.2	16.6	16.1	-92.49	-251.3	-312.9	675.1	644.6	30.54	22.107		
6,850.0	6,792.2	6,859.0	6,809.4	16.6	16.1	-92.20	-221.1	-312.6	675.0	644.5	30.50	22.131		
6,900.0	6,833.2	6,911.1	6,848.8	16.6	16.0	-91.77	-187.1	-312.3	674.8	644.3	30.47	22.146		
6,950.0	6,872.2	6,962.4	6,884.1	16.6	16.0	-91.19	-149.9	-312.0	674.6	644.1	30.47	22.141		
7,000.0	6,909.1	7,012.7	6,915.1	16.5	15.9	-90.49	-110.2	-311.7	674.5	644.0	30.51	22.110		
7,037.5	6,935.2	7,049.7	6,935.3	16.5	15.9	-89.89	-79.3	-311.4	674.4	643.9	30.56	22.066		
7,050.0	6,943.7	7,061.9	6,941.4	16.5	15.9	-89.67	-68.8	-311.3	674.4	643.8	30.59	22.046		
7,100.0	6,975.8	7,109.7	6,963.3	16.5	15.8	-88.75	-26.2	-310.9	674.6	643.8	30.74	21.945		
7,150.0	7,005.4	7,156.3	6,980.7	16.4	15.8	-87.74	17.0	-310.5	674.9	644.0	30.95	21.810		
7,200.0	7,032.3	7,200.0	6,993.4	16.4	15.7	-86.70	58.8	-310.2	675.6	644.4	31.21	21.644		
7,250.0	7,056.4	7,245.3	7,002.9	16.4	15.8	-85.51	103.1	-309.8	676.6	645.0	31.56	21.440		
7,300.0	7,077.6	7,287.8	7,008.3	16.4	15.9	-84.31	145.2	-309.4	678.0	646.0	31.96	21.215		
7,350.0	7,095.7	7,329.0	7,010.2	16.5	16.2	-83.07	186.3	-309.1	679.8	647.4	32.41	20.977		
7,400.0	7,110.8	7,374.4	7,009.6	16.9	16.5	-81.72	231.7	-308.7	682.0	649.0	32.95	20.700		
7,450.0	7,122.7	7,422.7	7,008.8	17.3	16.9	-80.55	280.0	-308.3	684.0	650.4	33.59	20.365		
7,500.0	7,131.5	7,471.8	7,007.9	17.7	17.4	-79.66	329.1	-307.8	685.6	651.3	34.32	19.980		
7,529.0	7,135.0	7,500.5	7,007.5	18.0	17.6	-79.28	357.8	-307.6	686.4	651.6	34.77	19.741		
7,603.0	7,142.8	7,573.9	7,006.3	18.7	18.4	-78.55	431.2	-307.0	688.1	651.9	36.12	19.050		
7,700.0	7,148.8	7,670.6	7,004.7	19.8	19.4	-77.85	527.9	-306.1	689.6	651.5	38.10	18.097		
7,731.9	7,149.0	7,702.5	7,004.1	20.2	19.8	-77.79	559.8	-305.8	689.7	650.9	38.81	17.770		
7,800.0	7,148.5	7,770.6	7,003.0	21.0	20.7	-77.74	627.9	-305.2	689.8	649.4	40.45	17.054		
7,900.0	7,147.7	7,870.6	7,001.3	22.3	22.0	-77.67	727.8	-304.4	690.0	647.0	43.00	16.046		
8,000.0	7,146.9	7,970.6	6,999.7	23.7	23.4	-77.59	827.8	-303.5	690.1	644.4	45.71	15.096		
8,100.0	7,146.2	8,070.6	6,998.0	25.2	24.9	-77.52	927.8	-302.6	690.3	641.7	48.57	14.212		
8,200.0	7,145.4	8,170.6	6,996.4	26.7	26.4	-77.45	1,027.8	-301.8	690.4	638.9	51.54	13.396		
8,300.0	7,144.6	8,270.6	6,994.7	28.2	28.0	-77.38	1,127.8	-300.9	690.6	636.0	54.60	12.647		
8,400.0	7,143.8	8,370.6	6,993.0	29.8	29.6	-77.30	1,227.7	-300.0	690.7	633.0	57.74	11.961		
8,500.0	7,143.1	8,470.6	6,991.4	31.5	31.2	-77.23	1,327.7	-299.2	690.9	629.9	60.96	11.334		
8,600.0	7,142.3	8,570.6	6,989.7	33.1	32.9	-77.16	1,427.7	-298.3	691.0	626.8	64.22	10.760		
8,700.0	7,141.5	8,670.6	6,988.1	34.8	34.6	-77.09	1,527.7	-297.4	691.2	623.6	67.54	10.234		
8,800.0	7,140.7	8,770.6	6,986.4	36.5	36.4	-77.02	1,627.7	-296.6	691.3	620.4	70.90	9.751		
8,900.0	7,139.9	8,870.6	6,984.8	38.3	38.1	-76.94	1,727.6	-295.7	691.5	617.2	74.29	9.308		
9,000.0	7,139.2	8,970.6	6,983.1	40.0	39.9	-76.87	1,827.6	-294.8	691.6	613.9	77.71	8.900		
9,100.0	7,138.4	9,070.6	6,981.4	41.8	41.6	-76.80	1,927.6	-294.0	691.8	610.6	81.16	8.524		
9,200.0	7,137.6	9,170.6	6,979.8	43.6	43.4	-76.73	2,027.6	-293.1	691.9	607.3	84.63	8.176		
9,300.0	7,136.8	9,270.6	6,978.1	45.3	45.2	-76.66	2,127.5	-292.2	692.1	604.0	88.12	7.854		

CC - Min centre to center distance or convergent point, SF - min separation factor, ES - min ellipse separation

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Dillard 20Y-401
Project:	SEC.20-T7N-R64W	TVD Reference:	WELL @ 4879.0ft (RKB - 15')
Reference Site:	Dillard 20Y-HZ Pad Sec.20-T7N-R64W	MD Reference:	WELL @ 4879.0ft (RKB - 15')
Site Error:	0.0ft	North Reference:	True
Reference Well:	Dillard 20Y-401	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	Landmark
Reference Design:	Plan #1 (11-15-12)	Offset TVD Reference:	Offset Datum

Offset Design Dillard 20Y-HZ Pad Sec.20-T7N-R64W - Dillard 20T-221 - Wellbore #1 - Plan #1 (11-15-12)													Offset Site Error:	0.0 ft
Survey Program: 0-MWD													Offset Well Error:	0.0 ft
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning	
9,400.0	7,136.1	9,370.5	6,976.5	47.1	47.0	-76.58	2,227.5	-291.4	692.3	600.6	91.63	7.555		
9,500.0	7,135.3	9,470.5	6,974.8	49.0	48.8	-76.51	2,327.5	-290.5	692.4	597.3	95.16	7.277		
9,600.0	7,134.5	9,570.5	6,973.1	50.8	50.7	-76.44	2,427.5	-289.6	692.6	593.9	98.69	7.018		
9,700.0	7,133.7	9,670.5	6,971.5	52.6	52.5	-76.37	2,527.5	-288.8	692.8	590.5	102.24	6.776		
9,800.0	7,133.0	9,770.5	6,969.8	54.4	54.3	-76.30	2,627.4	-287.9	692.9	587.1	105.80	6.549		
9,900.0	7,132.2	9,870.5	6,968.2	56.3	56.2	-76.23	2,727.4	-287.0	693.1	583.7	109.37	6.337		
10,000.0	7,131.4	9,970.5	6,966.5	58.1	58.0	-76.15	2,827.4	-286.2	693.3	580.3	112.94	6.138		
10,100.0	7,130.6	10,070.5	6,964.9	59.9	59.9	-76.08	2,927.4	-285.3	693.4	576.9	116.53	5.951		
10,200.0	7,129.9	10,170.5	6,963.2	61.8	61.7	-76.01	3,027.4	-284.4	693.6	573.5	120.11	5.774		
10,300.0	7,129.1	10,270.5	6,961.5	63.6	63.6	-75.94	3,127.3	-283.6	693.8	570.1	123.71	5.608		
10,400.0	7,128.3	10,370.5	6,959.9	65.5	65.4	-75.87	3,227.3	-282.7	693.9	566.6	127.31	5.451		
10,500.0	7,127.5	10,470.5	6,958.2	67.4	67.3	-75.80	3,327.3	-281.8	694.1	563.2	130.91	5.302		
10,600.0	7,126.8	10,570.5	6,956.6	69.2	69.2	-75.72	3,427.3	-281.0	694.3	559.8	134.52	5.161		
10,700.0	7,126.0	10,670.5	6,954.9	71.1	71.1	-75.65	3,527.2	-280.1	694.5	556.3	138.13	5.028		
10,800.0	7,125.2	10,770.5	6,953.3	73.0	72.9	-75.58	3,627.2	-279.2	694.6	552.9	141.74	4.901		
10,900.0	7,124.4	10,870.5	6,951.6	74.8	74.8	-75.51	3,727.2	-278.4	694.8	549.5	145.36	4.780		
11,000.0	7,123.6	10,970.5	6,949.9	76.7	76.7	-75.44	3,827.2	-277.5	695.0	546.0	148.97	4.665		
11,100.0	7,122.9	11,070.5	6,948.3	78.6	78.6	-75.37	3,927.2	-276.6	695.2	542.6	152.59	4.556		
11,200.0	7,122.1	11,170.5	6,946.6	80.5	80.5	-75.30	4,027.1	-275.8	695.3	539.1	156.21	4.451		
11,300.0	7,121.3	11,270.5	6,945.0	82.4	82.3	-75.23	4,127.1	-274.9	695.5	535.7	159.83	4.352		
11,400.0	7,120.5	11,370.5	6,943.3	84.2	84.2	-75.15	4,227.1	-274.0	695.7	532.3	163.46	4.256		
11,500.0	7,119.8	11,470.5	6,941.6	86.1	86.1	-75.08	4,327.1	-273.2	695.9	528.8	167.08	4.165		
11,598.7	7,119.0	11,569.1	6,940.0	88.0	87.7	-75.01	4,425.7	-272.3	696.1	525.7	170.41	4.085 SF		

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Dillard 20Y-401
Project:	SEC.20-T7N-R64W	TVD Reference:	WELL @ 4879.0ft (RKB - 15')
Reference Site:	Dillard 20Y-HZ Pad Sec.20-T7N-R64W	MD Reference:	WELL @ 4879.0ft (RKB - 15')
Site Error:	0.0ft	North Reference:	True
Reference Well:	Dillard 20Y-401	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	Landmark
Reference Design:	Plan #1 (11-15-12)	Offset TVD Reference:	Offset Datum

Offset Design Dillard 20Y-HZ Pad Sec.20-T7N-R64W - Dillard 20T-401 - Wellbore #1 - Plan #1 (11-15-12)													Offset Site Error:	0.0 ft
Survey Program: 0-MWD													Offset Well Error:	0.0 ft
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference	Offset	Semi Major Axis	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
0.0	0.0	1.0	1.0	0.0	0.0	-90.00	-90.00	0.0	-61.1	61.1	61.1	0.00	N/A	
100.0	100.0	101.0	101.0	0.1	0.1	-90.00	-90.00	0.0	-61.1	61.1	60.9	0.23	269.308	
200.0	200.0	201.0	201.0	0.3	0.3	-90.00	-90.00	0.0	-61.1	61.1	60.5	0.68	90.366	
300.0	300.0	301.0	301.0	0.6	0.6	-90.00	-90.00	0.0	-61.1	61.1	60.0	1.13	54.292	
400.0	400.0	401.0	401.0	0.8	0.8	-90.00	-90.00	0.0	-61.1	61.1	59.6	1.58	38.802	
500.0	500.0	501.0	501.0	1.0	1.0	-90.00	-90.00	0.0	-61.1	61.1	59.1	2.03	30.189	
600.0	600.0	601.0	601.0	1.2	1.2	-90.00	-90.00	0.0	-61.1	61.1	58.7	2.47	24.705	
700.0	700.0	701.0	701.0	1.5	1.5	-90.00	-90.00	0.0	-61.1	61.1	58.2	2.92	20.907	
766.3	766.3	767.3	767.3	1.6	1.6	-90.00	-90.00	0.0	-61.1	61.1	57.9	3.22	18.973 CC	
800.0	800.0	801.0	801.0	1.7	1.7	-90.00	-90.00	0.0	-61.1	61.1	57.8	3.37	18.123 ES	
900.0	900.0	900.0	900.0	1.9	1.9	-90.80	-90.80	-0.9	-62.6	62.7	58.9	3.80	16.487	
1,000.0	1,000.0	997.0	996.9	2.1	2.1	-92.91	-92.91	-3.4	-67.0	67.2	63.0	4.21	15.952	
1,100.0	1,100.0	1,094.5	1,094.0	2.4	2.3	-95.85	-95.85	-7.6	-74.2	74.9	70.3	4.64	16.139	
1,200.0	1,200.0	1,191.3	1,190.1	2.6	2.5	-99.05	-99.05	-13.4	-84.2	86.0	80.9	5.09	16.876	
1,300.0	1,300.0	1,287.1	1,284.7	2.8	2.8	126.00	126.00	-20.8	-96.8	101.4	95.9	5.48	18.487	
1,400.0	1,399.8	1,384.5	1,380.6	3.0	3.1	125.03	125.03	-29.3	-111.6	121.0	115.1	5.89	20.542	
1,500.0	1,499.5	1,482.1	1,476.7	3.2	3.4	125.38	125.38	-37.9	-126.4	142.6	136.3	6.31	22.615	
1,600.0	1,598.7	1,579.2	1,572.3	3.4	3.7	126.50	126.50	-46.5	-141.1	166.3	159.6	6.74	24.667	
1,610.7	1,609.3	1,589.5	1,582.5	3.4	3.8	126.65	126.65	-47.4	-142.7	168.9	162.2	6.79	24.884	
1,700.0	1,697.7	1,675.9	1,667.5	3.6	4.1	128.11	128.11	-55.0	-155.8	191.3	184.1	7.21	26.549	
1,800.0	1,796.7	1,772.6	1,762.7	3.9	4.4	129.38	129.38	-63.6	-170.4	216.4	208.8	7.69	28.141	
1,900.0	1,895.6	1,869.3	1,857.9	4.2	4.8	130.39	130.39	-72.1	-185.1	241.7	233.5	8.19	29.502	
2,000.0	1,994.6	1,965.9	1,953.1	4.5	5.2	131.21	131.21	-80.6	-199.8	266.9	258.2	8.70	30.669	
2,100.0	2,093.6	2,062.6	2,048.3	4.8	5.5	131.88	131.88	-89.2	-214.4	292.2	283.0	9.23	31.674	
2,200.0	2,192.6	2,159.3	2,143.5	5.1	5.9	132.45	132.45	-97.7	-229.1	317.6	307.8	9.76	32.546	
2,300.0	2,291.5	2,256.0	2,238.6	5.4	6.3	132.94	132.94	-106.2	-243.7	343.0	332.7	10.30	33.307	
2,400.0	2,390.5	2,352.7	2,333.8	5.7	6.7	133.35	133.35	-114.8	-258.4	368.4	357.5	10.84	33.974	
2,500.0	2,489.5	2,449.4	2,429.0	6.0	7.1	133.72	133.72	-123.3	-273.1	393.8	382.4	11.39	34.563	
2,600.0	2,588.4	2,546.1	2,524.2	6.4	7.4	134.04	134.04	-131.8	-287.7	419.2	407.2	11.95	35.086	
2,700.0	2,687.4	2,642.8	2,619.4	6.7	7.8	134.32	134.32	-140.4	-302.4	444.6	432.1	12.51	35.552	
2,800.0	2,786.4	2,739.5	2,714.6	7.0	8.2	134.57	134.57	-148.9	-317.1	470.1	457.0	13.07	35.970	
2,900.0	2,885.4	2,836.2	2,809.8	7.4	8.6	134.80	134.80	-157.4	-331.7	495.5	481.9	13.63	36.346	
3,000.0	2,984.3	2,932.8	2,905.0	7.7	9.0	135.01	135.01	-165.9	-346.4	521.0	506.8	14.20	36.685	
3,100.0	3,083.3	3,029.5	3,000.2	8.0	9.4	135.19	135.19	-174.5	-361.1	546.4	531.7	14.77	36.994	
3,200.0	3,182.3	3,126.2	3,095.4	8.4	9.8	135.36	135.36	-183.0	-375.7	571.9	556.5	15.34	37.274	
3,300.0	3,281.3	3,222.9	3,190.5	8.7	10.1	135.52	135.52	-191.5	-390.4	597.4	581.4	15.92	37.531	
3,400.0	3,380.2	3,319.6	3,285.7	9.1	10.5	135.66	135.66	-200.1	-405.1	622.8	606.3	16.49	37.766	
3,500.0	3,479.2	3,416.3	3,380.9	9.4	10.9	135.79	135.79	-208.6	-419.7	648.3	631.2	17.07	37.982	
3,600.0	3,578.2	3,513.0	3,476.1	9.7	11.3	135.91	135.91	-217.1	-434.4	673.8	656.1	17.65	38.181	
3,700.0	3,677.2	3,609.7	3,571.3	10.1	11.7	136.02	136.02	-225.7	-449.1	699.3	681.0	18.23	38.365	
3,800.0	3,776.1	3,706.4	3,666.5	10.4	12.1	136.13	136.13	-234.2	-463.7	724.8	705.9	18.81	38.536	
3,900.0	3,875.1	3,803.1	3,761.7	10.8	12.5	136.22	136.22	-242.7	-478.4	750.2	730.9	19.39	38.694	
4,000.0	3,974.1	3,899.7	3,856.9	11.1	12.9	136.31	136.31	-251.3	-493.1	775.7	755.8	19.97	38.842	
4,100.0	4,073.1	3,996.4	3,952.1	11.5	13.3	136.40	136.40	-259.8	-507.7	801.2	780.7	20.55	38.980	
4,200.0	4,172.0	4,093.1	4,047.3	11.8	13.7	136.48	136.48	-268.3	-522.4	826.7	805.6	21.14	39.109	
4,300.0	4,271.0	4,189.8	4,142.4	12.2	14.1	136.55	136.55	-276.8	-537.0	852.2	830.5	21.72	39.229	
4,400.0	4,370.0	4,286.5	4,237.6	12.5	14.5	136.62	136.62	-285.4	-551.7	877.7	855.4	22.31	39.342	
4,500.0	4,469.0	4,383.2	4,332.8	12.9	14.9	136.69	136.69	-293.9	-566.4	903.2	880.3	22.90	39.449	
4,600.0	4,567.9	4,479.9	4,428.0	13.2	15.3	136.75	136.75	-302.4	-581.0	928.7	905.2	23.48	39.549	
4,623.0	4,590.7	4,502.2	4,450.0	13.3	15.3	136.77	136.77	-304.4	-584.4	934.6	911.0	23.62	39.571	
4,700.0	4,667.0	4,587.5	4,534.0	13.6	15.7	137.04	137.04	-311.8	-597.2	953.3	929.2	24.11	39.539	

CC - Min centre to center distance or convergent point, SF - min separation factor, ES - min ellipse separation

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Dillard 20Y-401
Project:	SEC.20-T7N-R64W	TVD Reference:	WELL @ 4879.0ft (RKB - 15')
Reference Site:	Dillard 20Y-HZ Pad Sec.20-T7N-R64W	MD Reference:	WELL @ 4879.0ft (RKB - 15')
Site Error:	0.0ft	North Reference:	True
Reference Well:	Dillard 20Y-401	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	Landmark
Reference Design:	Plan #1 (11-15-12)	Offset TVD Reference:	Offset Datum

Offset Design Dillard 20Y-HZ Pad Sec.20-T7N-R64W - Dillard 20T-401 - Wellbore #1 - Plan #1 (11-15-12)													Offset Site Error:	0.0 ft
Survey Program: 0-MWD													Offset Well Error:	0.0 ft
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference	Offset	Semi Major Axis	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
4,800.0	4,766.6	4,725.8	4,671.0	13.8	16.0	137.28		-321.5	-613.7	972.5	947.9	24.67	39.417	
4,900.0	4,866.3	4,866.6	4,811.2	14.0	16.3	137.44		-327.9	-624.8	985.1	959.9	25.17	39.133	
5,000.0	4,966.3	5,008.9	4,953.3	14.1	16.5	137.51		-330.8	-629.8	990.8	965.2	25.61	38.688	
5,033.7	5,000.0	5,056.6	5,001.0	14.2	16.6	-90.06		-331.0	-630.1	991.1	965.4	25.74	38.513	
5,100.0	5,066.3	5,122.9	5,067.3	14.3	16.7	-90.06		-331.0	-630.1	991.1	965.2	25.96	38.184	
5,200.0	5,166.3	5,222.9	5,167.3	14.4	16.8	-90.06		-331.0	-630.1	991.1	964.9	26.28	37.710	
5,300.0	5,266.3	5,322.9	5,267.3	14.6	17.0	-90.06		-331.0	-630.1	991.1	964.5	26.61	37.243	
5,400.0	5,366.3	5,422.9	5,367.3	14.8	17.1	-90.06		-331.0	-630.1	991.1	964.2	26.95	36.782	
5,500.0	5,466.3	5,522.9	5,467.3	14.9	17.2	-90.06		-331.0	-630.1	991.1	963.9	27.28	36.328	
5,600.0	5,566.3	5,622.9	5,567.3	15.1	17.4	-90.06		-331.0	-630.1	991.1	963.5	27.62	35.881	
5,700.0	5,666.3	5,722.9	5,667.3	15.2	17.5	-90.06		-331.0	-630.1	991.1	963.2	27.97	35.442	
5,800.0	5,766.3	5,822.9	5,767.3	15.4	17.7	-90.06		-331.0	-630.1	991.1	962.8	28.31	35.009	
5,900.0	5,866.3	5,922.9	5,867.3	15.6	17.8	-90.06		-331.0	-630.1	991.1	962.5	28.66	34.583	
6,000.0	5,966.3	6,022.9	5,967.3	15.7	17.9	-90.06		-331.0	-630.1	991.1	962.1	29.01	34.164	
6,100.0	6,066.3	6,122.9	6,067.3	15.9	18.1	-90.06		-331.0	-630.1	991.1	961.8	29.37	33.751	
6,200.0	6,166.3	6,222.9	6,167.3	16.1	18.2	-90.06		-331.0	-630.1	991.1	961.4	29.72	33.346	
6,300.0	6,266.3	6,322.9	6,267.3	16.2	18.4	-90.06		-331.0	-630.1	991.1	961.1	30.08	32.948	
6,409.0	6,375.3	6,431.8	6,376.3	16.4	18.6	-90.06		-331.0	-630.1	991.1	960.7	30.48	32.522	
6,450.0	6,416.3	6,473.3	6,417.7	16.5	18.6	-90.54		-330.1	-630.1	991.1	960.5	30.62	32.367	
6,500.0	6,466.1	6,524.0	6,468.2	16.5	18.7	-90.56		-326.0	-630.1	991.1	960.4	30.75	32.229	
6,550.0	6,515.5	6,574.6	6,518.3	16.6	18.7	-90.57		-318.6	-630.0	991.1	960.3	30.85	32.132	
6,600.0	6,564.3	6,625.3	6,567.9	16.6	18.7	-90.58		-307.9	-629.9	991.1	960.2	30.90	32.072	
6,650.0	6,612.3	6,676.0	6,616.6	16.6	18.8	-90.59		-293.8	-629.8	991.1	960.2	30.93	32.043	
6,700.0	6,659.3	6,726.7	6,664.2	16.6	18.8	-90.60		-276.6	-629.7	991.1	960.2	30.93	32.040	
6,750.0	6,705.1	6,777.4	6,710.7	16.6	18.7	-90.60		-256.3	-629.5	991.1	960.2	30.92	32.054	
6,800.0	6,749.4	6,828.1	6,755.7	16.6	18.7	-90.60		-232.9	-629.3	991.1	960.2	30.90	32.077	
6,850.0	6,792.2	6,878.9	6,799.0	16.6	18.7	-90.60		-206.6	-629.1	991.1	960.2	30.88	32.099	
6,900.0	6,833.2	6,929.6	6,840.5	16.6	18.7	-90.59		-177.5	-628.8	991.1	960.2	30.87	32.109	
6,950.0	6,872.2	6,980.3	6,880.0	16.6	18.6	-90.59		-145.7	-628.6	991.1	960.2	30.88	32.097	
7,000.0	6,909.1	7,030.9	6,917.3	16.5	18.6	-90.58		-111.4	-628.3	991.1	960.1	30.92	32.049	
7,050.0	6,943.7	7,081.6	6,952.2	16.5	18.5	-90.57		-74.7	-627.9	991.1	960.0	31.01	31.956	
7,100.0	6,975.8	7,132.3	6,984.5	16.5	18.5	-90.55		-35.7	-627.6	991.0	959.9	31.16	31.805	
7,150.0	7,005.4	7,182.9	7,014.2	16.4	18.5	-90.53		5.3	-627.3	991.0	959.6	31.37	31.591	
7,200.0	7,032.3	7,233.5	7,041.2	16.4	18.5	-90.51		48.1	-626.9	991.0	959.3	31.66	31.305	
7,250.0	7,056.4	7,284.1	7,065.2	16.4	18.4	-90.49		92.6	-626.5	991.0	959.0	32.02	30.945	
7,300.0	7,077.6	7,334.7	7,086.2	16.4	18.5	-90.47		138.6	-626.1	991.0	958.5	32.48	30.511	
7,350.0	7,095.7	7,385.2	7,104.1	16.5	18.5	-90.44		185.8	-625.7	990.9	957.9	33.02	30.009	
7,400.0	7,110.8	7,435.7	7,118.8	16.9	18.6	-90.42		234.1	-625.3	990.9	957.3	33.66	29.443	
7,450.0	7,122.7	7,486.1	7,130.4	17.3	18.8	-90.39		283.2	-624.9	990.9	956.5	34.38	28.824	
7,500.0	7,131.5	7,536.6	7,138.6	17.7	19.1	-90.36		333.0	-624.5	990.9	955.7	35.18	28.163	
7,529.0	7,135.0	7,565.7	7,141.9	18.0	19.3	-90.34		361.9	-624.2	990.9	955.2	35.69	27.767	
7,603.0	7,142.8	7,639.8	7,149.6	18.7	19.8	-90.34		435.6	-623.6	990.8	953.8	37.09	26.716	
7,700.0	7,148.8	7,737.3	7,155.0	19.8	20.8	-90.30		532.9	-622.7	990.8	951.6	39.16	25.301	
7,731.9	7,149.0	7,769.3	7,155.0	20.2	21.1	-90.29		565.0	-622.5	990.8	950.9	39.88	24.842	
7,800.0	7,148.5	7,837.5	7,154.2	21.0	21.9	-90.27		633.1	-621.9	990.8	949.2	41.53	23.857	
7,900.0	7,147.7	7,937.5	7,153.0	22.3	23.1	-90.25		733.1	-621.0	990.7	946.6	44.10	22.467	
8,000.0	7,146.9	8,037.5	7,151.9	23.7	24.5	-90.23		833.1	-620.1	990.7	943.8	46.84	21.151	
8,100.0	7,146.2	8,137.5	7,150.7	25.2	25.9	-90.20		933.0	-619.3	990.6	940.9	49.73	19.921	
8,200.0	7,145.4	8,237.5	7,149.5	26.7	27.3	-90.18		1,033.0	-618.4	990.6	937.8	52.74	18.783	
8,300.0	7,144.6	8,337.5	7,148.4	28.2	28.8	-90.16		1,133.0	-617.5	990.5	934.7	55.85	17.735	
8,400.0	7,143.8	8,437.5	7,147.2	29.8	30.4	-90.14		1,233.0	-616.7	990.5	931.4	59.05	16.774	

CC - Min centre to center distance or convergent point, SF - min separation factor, ES - min ellipse separation

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Dillard 20Y-401
Project:	SEC.20-T7N-R64W	TVD Reference:	WELL @ 4879.0ft (RKB - 15')
Reference Site:	Dillard 20Y-HZ Pad Sec.20-T7N-R64W	MD Reference:	WELL @ 4879.0ft (RKB - 15')
Site Error:	0.0ft	North Reference:	True
Reference Well:	Dillard 20Y-401	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	Landmark
Reference Design:	Plan #1 (11-15-12)	Offset TVD Reference:	Offset Datum

Offset Design Dillard 20Y-HZ Pad Sec.20-T7N-R64W - Dillard 20T-401 - Wellbore #1 - Plan #1 (11-15-12)													Offset Site Error:	0.0 ft
Survey Program: 0-MWD													Offset Well Error:	0.0 ft
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference	Offset	Semi Major Axis	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
8,500.0	7,143.1	8,537.5	7,146.0	31.5	32.0	-90.11	-90.11	1,333.0	-615.8	990.5	928.1	62.32	15.892	
8,600.0	7,142.3	8,637.5	7,144.9	33.1	33.6	-90.09	-90.09	1,433.0	-615.0	990.4	924.8	65.66	15.085	
8,700.0	7,141.5	8,737.5	7,143.7	34.8	35.3	-90.07	-90.07	1,533.0	-614.1	990.4	921.3	69.04	14.344	
8,800.0	7,140.7	8,837.5	7,142.5	36.5	37.0	-90.05	-90.05	1,633.0	-613.2	990.3	917.8	72.48	13.664	
8,900.0	7,139.9	8,937.5	7,141.4	38.3	38.7	-90.02	-90.02	1,733.0	-612.4	990.3	914.3	75.95	13.039	
9,000.0	7,139.2	9,037.5	7,140.2	40.0	40.4	-90.00	-90.00	1,832.9	-611.5	990.2	910.8	79.45	12.463	
9,100.0	7,138.4	9,137.5	7,139.0	41.8	42.1	-89.98	-89.98	1,932.9	-610.6	990.2	907.2	82.99	11.931	
9,200.0	7,137.6	9,237.5	7,137.9	43.6	43.9	-89.96	-89.96	2,032.9	-609.8	990.2	903.6	86.55	11.440	
9,300.0	7,136.8	9,337.4	7,136.7	45.3	45.7	-89.93	-89.93	2,132.9	-608.9	990.1	900.0	90.14	10.984	
9,400.0	7,136.1	9,437.4	7,135.5	47.1	47.5	-89.91	-89.91	2,232.9	-608.0	990.1	896.3	93.74	10.561	
9,500.0	7,135.3	9,537.4	7,134.4	49.0	49.2	-89.89	-89.89	2,332.9	-607.2	990.0	892.7	97.37	10.168	
9,600.0	7,134.5	9,637.4	7,133.2	50.8	51.0	-89.87	-89.87	2,432.9	-606.3	990.0	889.0	101.01	9.801	
9,700.0	7,133.7	9,737.4	7,132.1	52.6	52.8	-89.84	-89.84	2,532.9	-605.4	989.9	885.3	104.66	9.459	
9,800.0	7,133.0	9,837.4	7,130.9	54.4	54.7	-89.82	-89.82	2,632.9	-604.6	989.9	881.6	108.33	9.138	
9,900.0	7,132.2	9,937.4	7,129.7	56.3	56.5	-89.80	-89.80	2,732.8	-603.7	989.9	877.9	112.01	8.837	
10,000.0	7,131.4	10,037.4	7,128.6	58.1	58.3	-89.78	-89.78	2,832.8	-602.8	989.8	874.1	115.70	8.555	
10,100.0	7,130.6	10,137.4	7,127.4	59.9	60.1	-89.76	-89.76	2,932.8	-602.0	989.8	870.4	119.40	8.290	
10,200.0	7,129.9	10,237.4	7,126.2	61.8	62.0	-89.73	-89.73	3,032.8	-601.1	989.7	866.6	123.11	8.040	
10,300.0	7,129.1	10,337.4	7,125.1	63.6	63.8	-89.71	-89.71	3,132.8	-600.2	989.7	862.9	126.82	7.804	
10,400.0	7,128.3	10,437.4	7,123.9	65.5	65.7	-89.69	-89.69	3,232.8	-599.4	989.7	859.1	130.55	7.581	
10,500.0	7,127.5	10,537.4	7,122.7	67.4	67.5	-89.67	-89.67	3,332.8	-598.5	989.6	855.3	134.28	7.370	
10,600.0	7,126.8	10,637.4	7,121.6	69.2	69.4	-89.64	-89.64	3,432.8	-597.6	989.6	851.6	138.01	7.170	
10,700.0	7,126.0	10,737.4	7,120.4	71.1	71.2	-89.62	-89.62	3,532.8	-596.8	989.5	847.8	141.75	6.981	
10,800.0	7,125.2	10,837.4	7,119.2	73.0	73.1	-89.60	-89.60	3,632.7	-595.9	989.5	844.0	145.50	6.801	
10,900.0	7,124.4	10,937.4	7,118.1	74.8	75.0	-89.57	-89.57	3,732.7	-595.0	989.5	840.2	149.25	6.629	
11,000.0	7,123.6	11,037.4	7,116.9	76.7	76.8	-89.55	-89.55	3,832.7	-594.2	989.4	836.4	153.01	6.466	
11,100.0	7,122.9	11,137.4	7,115.8	78.6	78.7	-89.53	-89.53	3,932.7	-593.3	989.4	832.6	156.77	6.311	
11,200.0	7,122.1	11,237.4	7,114.6	80.5	80.6	-89.51	-89.51	4,032.7	-592.4	989.3	828.8	160.53	6.163	
11,300.0	7,121.3	11,337.4	7,113.4	82.4	82.5	-89.48	-89.48	4,132.7	-591.6	989.3	825.0	164.30	6.021	
11,400.0	7,120.5	11,437.4	7,112.3	84.2	84.3	-89.46	-89.46	4,232.7	-590.7	989.3	821.2	168.07	5.886	
11,500.0	7,119.8	11,537.4	7,111.1	86.1	86.2	-89.44	-89.44	4,332.7	-589.9	989.2	817.4	171.85	5.756	
11,573.1	7,119.2	11,610.5	7,110.2	87.5	87.6	-89.42	-89.42	4,405.8	-589.2	989.2	814.6	174.61	5.665	
11,598.7	7,119.0	11,631.3	7,110.0	88.0	88.0	-89.42	-89.42	4,426.5	-589.0	989.2	813.7	175.48	5.637 SF	

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Dillard 20Y-401
Project:	SEC.20-T7N-R64W	TVD Reference:	WELL @ 4879.0ft (RKB - 15')
Reference Site:	Dillard 20Y-HZ Pad Sec.20-T7N-R64W	MD Reference:	WELL @ 4879.0ft (RKB - 15')
Site Error:	0.0ft	North Reference:	True
Reference Well:	Dillard 20Y-401	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	Landmark
Reference Design:	Plan #1 (11-15-12)	Offset TVD Reference:	Offset Datum

Offset Design Existing Wells Sec.20-T7N-R64W - Dillard 41-20 (Exist.) - Wellbore #1 - Design #1												Offset Site Error:	0.0 ft
Survey Program: 0-MWD												Offset Well Error:	0.0 ft
Reference	Offset	Semi Major Axis		Distance									
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
10,600.0	7,126.8	7,020.0	7,020.0	69.2	15.7	-73.39	4,291.7	-63.9	990.5	909.0	81.49	12.155	
10,700.0	7,126.0	7,020.0	7,020.0	71.1	15.7	-73.39	4,291.7	-63.9	904.5	821.2	83.29	10.860	
10,800.0	7,125.2	7,020.0	7,020.0	73.0	15.7	-73.39	4,291.7	-63.9	821.7	736.6	85.10	9.656	
10,900.0	7,124.4	7,020.0	7,020.0	74.8	15.7	-73.39	4,291.7	-63.9	743.2	656.2	86.91	8.551	
11,000.0	7,123.6	7,020.0	7,020.0	76.7	15.7	-73.39	4,291.7	-63.9	670.3	581.6	88.73	7.555	
11,100.0	7,122.9	7,020.0	7,020.0	78.6	15.7	-73.39	4,291.7	-63.9	605.3	514.8	90.54	6.685	
11,200.0	7,122.1	7,020.0	7,020.0	80.5	15.7	-73.39	4,291.7	-63.9	550.8	458.5	92.36	5.964	
11,300.0	7,121.3	7,020.0	7,020.0	82.4	15.7	-73.39	4,291.7	-63.9	510.4	416.2	94.18	5.419	
11,400.0	7,120.5	7,020.0	7,020.0	84.2	15.7	-73.39	4,291.7	-63.9	487.4	391.4	95.99	5.077	
11,464.8	7,120.0	7,020.0	7,020.0	85.5	15.7	-73.39	4,291.7	-63.9	483.0	385.9	97.17	4.971 CC, ES	
11,500.0	7,119.8	7,020.0	7,020.0	86.1	15.7	-73.39	4,291.7	-63.9	484.3	386.5	97.82	4.951 SF	
11,598.7	7,119.0	7,020.0	7,020.0	88.0	15.7	-73.39	4,291.7	-63.9	501.3	401.7	99.61	5.032	

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Dillard 20Y-401
Project:	SEC.20-T7N-R64W	TVD Reference:	WELL @ 4879.0ft (RKB - 15')
Reference Site:	Dillard 20Y-HZ Pad Sec.20-T7N-R64W	MD Reference:	WELL @ 4879.0ft (RKB - 15')
Site Error:	0.0ft	North Reference:	True
Reference Well:	Dillard 20Y-401	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	Landmark
Reference Design:	Plan #1 (11-15-12)	Offset TVD Reference:	Offset Datum

Offset Design Existing Wells Sec.20-T7N-R64W - Dillard 42-20 (Exist.) - Wellbore #1 - Design #1												Offset Site Error:	0.0 ft
Survey Program: 0-MWD												Offset Well Error:	0.0 ft
Reference		Offset		Semi Major Axis			Distance						Warning
Measured Depth	Vertical Depth	Measured Depth	Vertical Depth	Reference	Offset	Highside Toolface	Offset Wellbore Centre	Between Centres	Between Ellipses	Minimum Separation	Separation Factor		
(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(°)	+N/-S (ft)	+E/-W (ft)	(ft)	(ft)	(ft)		
9,400.0	7,136.1	7,020.0	7,020.0	47.1	15.7	-73.24	3,016.6	-69.5	923.2	863.1	60.07	15.367	
9,500.0	7,135.3	7,020.0	7,020.0	49.0	15.7	-73.24	3,016.6	-69.5	839.2	777.4	61.82	13.575	
9,600.0	7,134.5	7,020.0	7,020.0	50.8	15.7	-73.24	3,016.6	-69.5	759.2	695.6	63.58	11.941	
9,700.0	7,133.7	7,020.0	7,020.0	52.6	15.7	-73.24	3,016.6	-69.5	684.4	619.1	65.34	10.475	
9,800.0	7,133.0	7,020.0	7,020.0	54.4	15.7	-73.24	3,016.6	-69.5	616.9	549.8	67.11	9.192	
9,900.0	7,132.2	7,020.0	7,020.0	56.3	15.7	-73.24	3,016.6	-69.5	559.1	490.2	68.89	8.117	
10,000.0	7,131.4	7,020.0	7,020.0	58.1	15.7	-73.24	3,016.6	-69.5	514.5	443.8	70.67	7.281	
10,100.0	7,130.6	7,020.0	7,020.0	59.9	15.7	-73.24	3,016.6	-69.5	486.6	414.2	72.45	6.716	
10,189.6	7,129.9	7,020.0	7,020.0	61.6	15.7	-73.24	3,016.6	-69.5	478.3	404.2	74.05	6.459 CC	
10,200.0	7,129.9	7,020.0	7,020.0	61.8	15.7	-73.24	3,016.6	-69.5	478.4	404.2	74.24	6.444 ES, SF	
10,300.0	7,129.1	7,020.0	7,020.0	63.6	15.7	-73.24	3,016.6	-69.5	490.9	414.8	76.03	6.456	
10,400.0	7,128.3	7,020.0	7,020.0	65.5	15.7	-73.24	3,016.6	-69.5	522.5	444.7	77.83	6.714	
10,500.0	7,127.5	7,020.0	7,020.0	67.4	15.7	-73.24	3,016.6	-69.5	570.2	490.6	79.63	7.161	
10,600.0	7,126.8	7,020.0	7,020.0	69.2	15.7	-73.24	3,016.6	-69.5	630.2	548.8	81.43	7.740	
10,700.0	7,126.0	7,020.0	7,020.0	71.1	15.7	-73.24	3,016.6	-69.5	699.5	616.3	83.24	8.404	
10,800.0	7,125.2	7,020.0	7,020.0	73.0	15.7	-73.24	3,016.6	-69.5	775.5	690.4	85.04	9.119	
10,900.0	7,124.4	7,020.0	7,020.0	74.8	15.7	-73.24	3,016.6	-69.5	856.4	769.6	86.85	9.861	
11,000.0	7,123.6	7,020.0	7,020.0	76.7	15.7	-73.24	3,016.6	-69.5	941.0	852.4	88.66	10.614	

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Dillard 20Y-401
Project:	SEC.20-T7N-R64W	TVD Reference:	WELL @ 4879.0ft (RKB - 15')
Reference Site:	Dillard 20Y-HZ Pad Sec.20-T7N-R64W	MD Reference:	WELL @ 4879.0ft (RKB - 15')
Site Error:	0.0ft	North Reference:	True
Reference Well:	Dillard 20Y-401	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	Landmark
Reference Design:	Plan #1 (11-15-12)	Offset TVD Reference:	Offset Datum

Offset Design Existing Wells Sec.20-T7N-R64W - Dillard 43-20 (Exist.) - Wellbore #1 - Design #1													Offset Site Error:	0.0 ft
Survey Program: 0-MWD													Offset Well Error:	0.0 ft
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference	Offset	Semi Major Axis	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
8,100.0	7,146.2	7,020.0	7,020.0	25.2	15.7	-63.14		1,799.7	111.1	924.2	887.6	36.58	25.267	
8,200.0	7,145.4	7,020.0	7,020.0	26.7	15.7	-63.14		1,799.7	111.1	830.2	792.2	37.95	21.878	
8,300.0	7,144.6	7,020.0	7,020.0	28.2	15.7	-63.14		1,799.7	111.1	737.8	698.5	39.37	18.743	
8,400.0	7,143.8	7,020.0	7,020.0	29.8	15.7	-63.14		1,799.7	111.1	647.7	606.9	40.82	15.867	
8,500.0	7,143.1	7,020.0	7,020.0	31.5	15.7	-63.14		1,799.7	111.1	561.0	518.7	42.31	13.258	
8,600.0	7,142.3	7,020.0	7,020.0	33.1	15.7	-63.14		1,799.7	111.1	479.4	435.6	43.83	10.938	
8,700.0	7,141.5	7,020.0	7,020.0	34.8	15.7	-63.14		1,799.7	111.1	406.2	360.8	45.37	8.952	
8,800.0	7,140.7	7,020.0	7,020.0	36.5	15.7	-63.14		1,799.7	111.1	346.6	299.7	46.94	7.385	
8,900.0	7,139.9	7,020.0	7,020.0	38.3	15.7	-63.14		1,799.7	111.1	308.7	260.2	48.52	6.363	
8,974.2	7,139.4	7,020.0	7,020.0	39.6	15.7	-63.14		1,799.7	111.1	299.7	250.0	49.70	6.029 CC, ES	
9,000.0	7,139.2	7,020.0	7,020.0	40.0	15.7	-63.14		1,799.7	111.1	300.8	250.7	50.11	6.002 SF	
9,100.0	7,138.4	7,020.0	7,020.0	41.8	15.7	-63.14		1,799.7	111.1	325.0	273.3	51.72	6.283	
9,200.0	7,137.6	7,020.0	7,020.0	43.6	15.7	-63.14		1,799.7	111.1	375.2	321.9	53.34	7.034	
9,300.0	7,136.8	7,020.0	7,020.0	45.3	15.7	-63.14		1,799.7	111.1	442.6	387.7	54.97	8.052	
9,400.0	7,136.1	7,020.0	7,020.0	47.1	15.7	-63.14		1,799.7	111.1	520.7	464.0	56.62	9.197	
9,500.0	7,135.3	7,020.0	7,020.0	49.0	15.7	-63.14		1,799.7	111.1	605.2	546.9	58.26	10.387	
9,600.0	7,134.5	7,020.0	7,020.0	50.8	15.7	-63.14		1,799.7	111.1	693.8	633.9	59.92	11.579	
9,700.0	7,133.7	7,020.0	7,020.0	52.6	15.7	-63.14		1,799.7	111.1	785.2	723.6	61.58	12.751	
9,800.0	7,133.0	7,020.0	7,020.0	54.4	15.7	-63.14		1,799.7	111.1	878.5	815.2	63.25	13.889	
9,900.0	7,132.2	7,020.0	7,020.0	56.3	15.7	-63.14		1,799.7	111.1	973.1	908.1	64.92	14.988	

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Dillard 20Y-401
Project:	SEC.20-T7N-R64W	TVD Reference:	WELL @ 4879.0ft (RKB - 15')
Reference Site:	Dillard 20Y-HZ Pad Sec.20-T7N-R64W	MD Reference:	WELL @ 4879.0ft (RKB - 15')
Site Error:	0.0ft	North Reference:	True
Reference Well:	Dillard 20Y-401	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	Landmark
Reference Design:	Plan #1 (11-15-12)	Offset TVD Reference:	Offset Datum

Offset Design Existing Wells Sec.20-T7N-R64W - Dillard 44-20 (Exist.) - Wellbore #1 - Design #1												Offset Site Error: 0.0 ft	
Survey Program: 0-MWD												Offset Well Error: 0.0 ft	
Reference		Offset		Semi Major Axis		Highside Toolface (°)	Offset Wellbore Centre		Distance		Minimum Separation (ft)	Separation Factor	Warning
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference	Offset		+N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)			
0.0	0.0	1.0	1.0	0.0	0.0	18.55	273.2	91.7	288.2				
100.0	100.0	101.0	101.0	0.1	0.1	18.55	273.2	91.7	288.2	288.0	0.23	1,269.613	
200.0	200.0	201.0	201.0	0.3	0.3	18.55	273.2	91.7	288.2	287.5	0.68	426.016	
300.0	300.0	301.0	301.0	0.6	0.6	18.55	273.2	91.7	288.2	287.1	1.13	255.950	
400.0	400.0	401.0	401.0	0.8	0.8	18.55	273.2	91.7	288.2	286.6	1.58	182.926	
500.0	500.0	501.0	501.0	1.0	1.0	18.55	273.2	91.7	288.2	286.2	2.03	142.321	
600.0	600.0	601.0	601.0	1.2	1.2	18.55	273.2	91.7	288.2	285.7	2.47	116.468	
700.0	700.0	701.0	701.0	1.5	1.5	18.55	273.2	91.7	288.2	285.3	2.92	98.563	
800.0	800.0	801.0	801.0	1.7	1.7	18.55	273.2	91.7	288.2	284.8	3.37	85.430	
900.0	900.0	901.0	901.0	1.9	1.9	18.55	273.2	91.7	288.2	284.4	3.82	75.386	
1,000.0	1,000.0	1,001.0	1,001.0	2.1	2.1	18.55	273.2	91.7	288.2	283.9	4.27	67.454	
1,100.0	1,100.0	1,101.0	1,101.0	2.4	2.4	18.55	273.2	91.7	288.2	283.5	4.72	61.033	
1,200.0	1,200.0	1,201.0	1,201.0	2.6	2.6	18.55	273.2	91.7	288.2	283.0	5.17	55.728 CC	
1,300.0	1,300.0	1,301.0	1,301.0	2.8	2.8	-114.18	273.2	91.7	288.9	283.3	5.60	51.613	
1,400.0	1,399.8	1,400.8	1,400.8	3.0	3.0	-115.08	273.2	91.7	291.1	285.1	6.01	48.461	
1,500.0	1,499.5	1,500.5	1,500.5	3.2	3.3	-116.54	273.2	91.7	294.9	288.5	6.43	45.885	
1,600.0	1,598.7	1,599.7	1,599.7	3.4	3.5	-118.51	273.2	91.7	300.6	293.7	6.86	43.804	
1,610.7	1,609.3	1,610.3	1,610.3	3.4	3.5	-118.74	273.2	91.7	301.3	294.4	6.91	43.609	
1,700.0	1,697.7	1,698.7	1,698.7	3.6	3.7	-120.81	273.2	91.7	307.7	300.4	7.32	42.055	
1,800.0	1,796.7	1,797.7	1,797.7	3.9	3.9	-123.03	273.2	91.7	315.3	307.5	7.78	40.519	
1,900.0	1,895.6	1,896.6	1,896.6	4.2	4.2	-125.14	273.2	91.7	323.4	315.1	8.25	39.179	
2,000.0	1,994.6	1,995.6	1,995.6	4.5	4.4	-127.14	273.2	91.7	331.9	323.1	8.73	38.014	
2,100.0	2,093.6	2,094.6	2,094.6	4.8	4.6	-129.04	273.2	91.7	340.7	331.5	9.21	37.003	
2,200.0	2,192.6	2,193.6	2,193.6	5.1	4.8	-130.85	273.2	91.7	350.0	340.3	9.69	36.126	
2,300.0	2,291.5	2,292.5	2,292.5	5.4	5.0	-132.56	273.2	91.7	359.5	349.4	10.17	35.364	
2,400.0	2,390.5	2,391.5	2,391.5	5.7	5.3	-134.19	273.2	91.7	369.4	358.7	10.64	34.702	
2,500.0	2,489.5	2,490.5	2,490.5	6.0	5.5	-135.72	273.2	91.7	379.5	368.4	11.12	34.125	
2,600.0	2,588.4	2,589.4	2,589.4	6.4	5.7	-137.18	273.2	91.7	389.9	378.3	11.60	33.621	
2,700.0	2,687.4	2,688.4	2,688.4	6.7	5.9	-138.57	273.2	91.7	400.6	388.5	12.07	33.182	
2,800.0	2,786.4	2,787.4	2,787.4	7.0	6.2	-139.88	273.2	91.7	411.4	398.9	12.55	32.796	
2,900.0	2,885.4	2,886.4	2,886.4	7.4	6.4	-141.12	273.2	91.7	422.5	409.5	13.02	32.458	
3,000.0	2,984.3	2,985.3	2,985.3	7.7	6.6	-142.30	273.2	91.7	433.8	420.3	13.49	32.161	
3,100.0	3,083.3	3,084.3	3,084.3	8.0	6.8	-143.42	273.2	91.7	445.2	431.2	13.96	31.900	
3,200.0	3,182.3	3,183.3	3,183.3	8.4	7.0	-144.48	273.2	91.7	456.8	442.4	14.42	31.669	
3,300.0	3,281.3	3,282.3	3,282.3	8.7	7.3	-145.50	273.2	91.7	468.5	453.6	14.89	31.466	
3,400.0	3,380.2	3,381.2	3,381.2	9.1	7.5	-146.46	273.2	91.7	480.4	465.1	15.36	31.285	
3,500.0	3,479.2	3,480.2	3,480.2	9.4	7.7	-147.37	273.2	91.7	492.4	476.6	15.82	31.125	
3,600.0	3,578.2	3,579.2	3,579.2	9.7	7.9	-148.25	273.2	91.7	504.5	488.3	16.28	30.984	
3,700.0	3,677.2	3,678.2	3,678.2	10.1	8.2	-149.08	273.2	91.7	516.8	500.0	16.75	30.858	
3,800.0	3,776.1	3,777.1	3,777.1	10.4	8.4	-149.87	273.2	91.7	529.1	511.9	17.21	30.745	
3,900.0	3,875.1	3,876.1	3,876.1	10.8	8.6	-150.63	273.2	91.7	541.6	523.9	17.67	30.646	
4,000.0	3,974.1	3,975.1	3,975.1	11.1	8.8	-151.35	273.2	91.7	554.1	535.9	18.13	30.557	
4,100.0	4,073.1	4,074.1	4,074.1	11.5	9.0	-152.04	273.2	91.7	566.7	548.1	18.59	30.477	
4,200.0	4,172.0	4,173.0	4,173.0	11.8	9.3	-152.70	273.2	91.7	579.4	560.3	19.05	30.406	
4,300.0	4,271.0	4,272.0	4,272.0	12.2	9.5	-153.33	273.2	91.7	592.1	572.6	19.51	30.343	
4,400.0	4,370.0	4,371.0	4,371.0	12.5	9.7	-153.94	273.2	91.7	605.0	585.0	19.97	30.287	
4,500.0	4,469.0	4,470.0	4,470.0	12.9	9.9	-154.52	273.2	91.7	617.8	597.4	20.43	30.236	
4,600.0	4,567.9	4,568.9	4,568.9	13.2	10.2	-155.08	273.2	91.7	630.8	609.9	20.89	30.191	
4,623.0	4,590.7	4,591.7	4,591.7	13.3	10.2	-155.20	273.2	91.7	633.8	612.8	21.00	30.181	
4,700.0	4,667.0	4,668.0	4,668.0	13.6	10.4	-155.65	273.2	91.7	642.9	621.5	21.36	30.092	
4,800.0	4,766.6	4,767.6	4,767.6	13.8	10.6	-156.08	273.2	91.7	651.9	630.1	21.80	29.904	

CC - Min centre to center distance or convergent point, SF - min separation factor, ES - min ellipse separation

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Dillard 20Y-401
Project:	SEC.20-T7N-R64W	TVD Reference:	WELL @ 4879.0ft (RKB - 15')
Reference Site:	Dillard 20Y-HZ Pad Sec.20-T7N-R64W	MD Reference:	WELL @ 4879.0ft (RKB - 15')
Site Error:	0.0ft	North Reference:	True
Reference Well:	Dillard 20Y-401	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	Landmark
Reference Design:	Plan #1 (11-15-12)	Offset TVD Reference:	Offset Datum

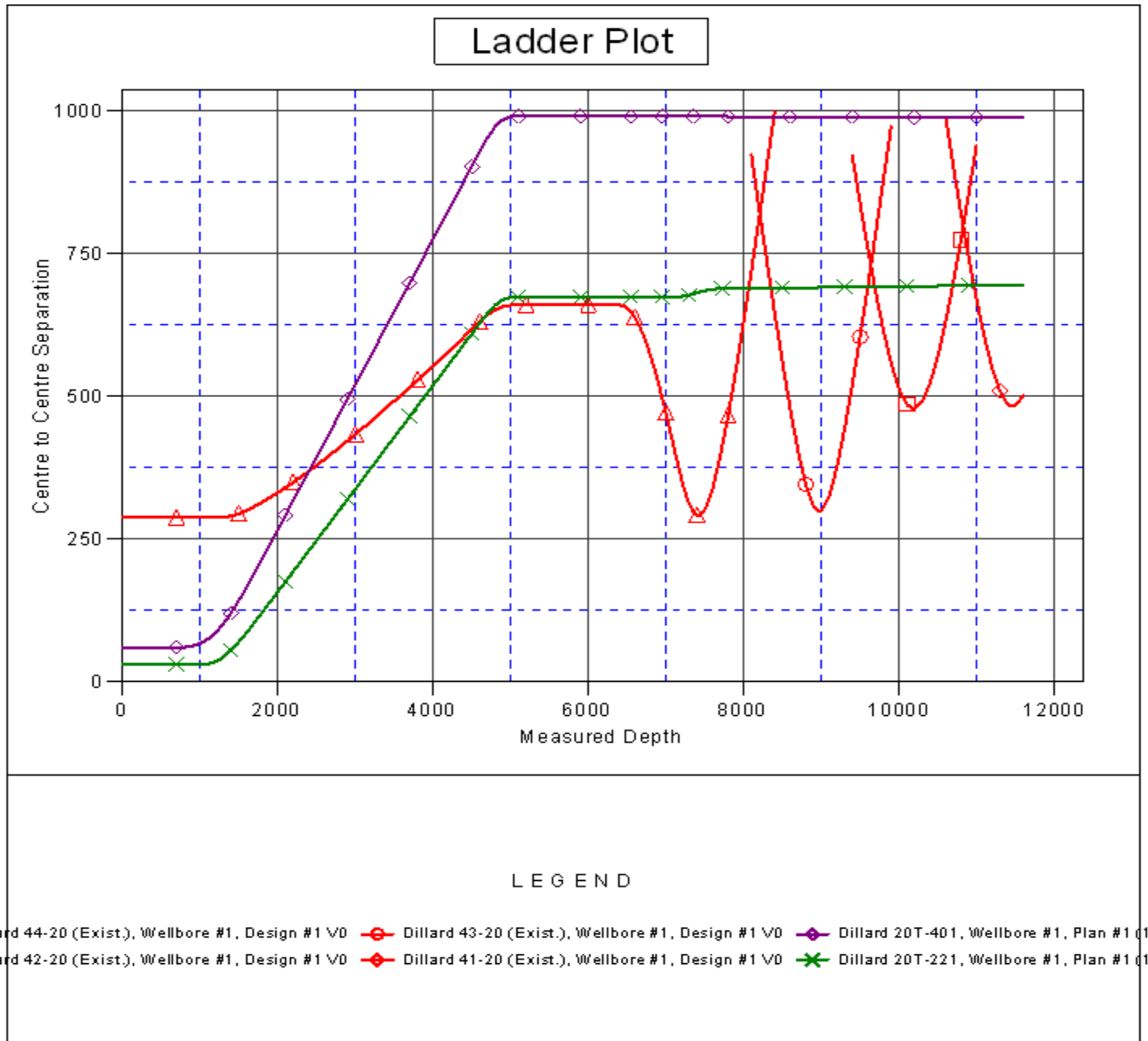
Offset Design Existing Wells Sec.20-T7N-R64W - Dillard 44-20 (Exist.) - Wellbore #1 - Design #1													Offset Site Error:	0.0 ft
Survey Program: 0-MWD													Offset Well Error:	0.0 ft
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference	Offset	Semi Major Axis	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
4,900.0	4,866.3	4,867.3	4,867.3	14.0	10.8	-156.36		273.2	91.7	657.8	635.5	22.21	29.609	
5,000.0	4,966.3	4,967.3	4,967.3	14.1	11.1	-156.48		273.2	91.7	660.4	637.8	22.61	29.213	
5,033.7	5,000.0	5,001.0	5,001.0	14.2	11.1	-24.06		273.2	91.7	660.6	637.9	22.72	29.080	
5,100.0	5,066.3	5,067.3	5,067.3	14.3	11.3	-24.06		273.2	91.7	660.6	637.6	22.99	28.736	
5,200.0	5,166.3	5,167.3	5,167.3	14.4	11.5	-24.06		273.2	91.7	660.6	637.2	23.40	28.232	
5,300.0	5,266.3	5,267.3	5,267.3	14.6	11.7	-24.06		273.2	91.7	660.6	636.8	23.81	27.745	
5,400.0	5,366.3	5,367.3	5,367.3	14.8	12.0	-24.06		273.2	91.7	660.6	636.4	24.22	27.272	
5,500.0	5,466.3	5,467.3	5,467.3	14.9	12.2	-24.06		273.2	91.7	660.6	636.0	24.64	26.814	
5,600.0	5,566.3	5,567.3	5,567.3	15.1	12.4	-24.06		273.2	91.7	660.6	635.6	25.05	26.370	
5,700.0	5,666.3	5,667.3	5,667.3	15.2	12.6	-24.06		273.2	91.7	660.6	635.2	25.47	25.940	
5,800.0	5,766.3	5,767.3	5,767.3	15.4	12.9	-24.06		273.2	91.7	660.6	634.7	25.88	25.522	
5,900.0	5,866.3	5,867.3	5,867.3	15.6	13.1	-24.06		273.2	91.7	660.6	634.3	26.30	25.116	
6,000.0	5,966.3	5,967.3	5,967.3	15.7	13.3	-24.06		273.2	91.7	660.6	633.9	26.72	24.722	
6,100.0	6,066.3	6,067.3	6,067.3	15.9	13.5	-24.06		273.2	91.7	660.6	633.5	27.14	24.340	
6,200.0	6,166.3	6,167.3	6,167.3	16.1	13.7	-24.06		273.2	91.7	660.6	633.1	27.56	23.968	
6,300.0	6,266.3	6,267.3	6,267.3	16.2	14.0	-24.06		273.2	91.7	660.6	632.6	27.98	23.607	
6,409.0	6,375.3	6,376.3	6,376.3	16.4	14.2	-24.06		273.2	91.7	660.6	632.2	28.45	23.224	
6,450.0	6,416.3	6,417.3	6,417.3	16.5	14.3	-24.60		273.2	91.7	659.6	631.1	28.57	23.091	
6,500.0	6,466.1	6,467.1	6,467.1	16.5	14.4	-24.88		273.2	91.7	655.7	627.1	28.61	22.918	
6,550.0	6,515.5	6,516.5	6,516.5	16.6	14.5	-25.38		273.2	91.7	648.8	620.3	28.57	22.712	
6,600.0	6,564.3	6,565.3	6,565.3	16.6	14.6	-26.12		273.2	91.7	639.1	610.6	28.44	22.470	
6,650.0	6,612.3	6,613.3	6,613.3	16.6	14.8	-27.12		273.2	91.7	626.5	598.3	28.24	22.184	
6,700.0	6,659.3	6,660.3	6,660.3	16.6	14.9	-28.40		273.2	91.7	611.2	583.2	27.98	21.843	
6,750.0	6,705.1	6,706.1	6,706.1	16.6	15.0	-30.02		273.2	91.7	593.3	565.6	27.68	21.433	
6,800.0	6,749.4	6,750.4	6,750.4	16.6	15.1	-32.01		273.2	91.7	573.0	545.6	27.37	20.933	
6,850.0	6,792.2	6,793.2	6,793.2	16.6	15.2	-34.44		273.2	91.7	550.4	523.3	27.09	20.319	
6,900.0	6,833.2	6,834.2	6,834.2	16.6	15.2	-37.37		273.2	91.7	525.8	498.9	26.88	19.561	
6,950.0	6,872.2	6,873.2	6,873.2	16.6	15.3	-40.87		273.2	91.7	499.4	472.6	26.80	18.633	
7,000.0	6,909.1	6,910.1	6,910.1	16.5	15.4	-44.98		273.2	91.7	471.5	444.6	26.91	17.519	
7,050.0	6,943.7	6,944.7	6,944.7	16.5	15.5	-49.75		273.2	91.7	442.7	415.4	27.27	16.234	
7,100.0	6,975.8	6,976.8	6,976.8	16.5	15.6	-55.13		273.2	91.7	413.3	385.4	27.87	14.827	
7,150.0	7,005.4	7,006.4	7,006.4	16.4	15.6	-61.00		273.2	91.7	384.1	355.4	28.69	13.387	
7,200.0	7,032.3	7,020.0	7,020.0	16.4	15.7	-65.12		273.2	91.7	356.1	326.8	29.32	12.145	
7,250.0	7,056.4	7,020.0	7,020.0	16.4	15.7	-67.03		273.2	91.7	331.8	302.1	29.68	11.178	
7,300.0	7,077.6	7,020.0	7,020.0	16.4	15.7	-68.50		273.2	91.7	312.4	282.4	30.04	10.399	
7,350.0	7,095.7	7,020.0	7,020.0	16.5	15.7	-69.47		273.2	91.7	299.0	268.6	30.39	9.839	
7,400.0	7,110.8	7,020.0	7,020.0	16.9	15.7	-69.94		273.2	91.7	292.4	261.7	30.71	9.523	
7,419.6	7,115.9	7,020.0	7,020.0	17.0	15.7	-69.98		273.2	91.7	291.9	261.0	30.83	9.466 ES	
7,450.0	7,122.7	7,020.0	7,020.0	17.3	15.7	-69.88		273.2	91.7	293.2	262.2	31.00	9.460 SF	
7,500.0	7,131.5	7,020.0	7,020.0	17.7	15.7	-69.31		273.2	91.7	301.3	270.1	31.25	9.644	
7,529.0	7,135.0	7,020.0	7,020.0	18.0	15.7	-68.74		273.2	91.7	309.1	277.8	31.36	9.857	
7,603.0	7,142.8	7,020.0	7,020.0	18.7	15.7	-68.74		273.2	91.7	339.2	307.2	32.03	10.590	
7,700.0	7,148.8	7,020.0	7,020.0	19.8	15.7	-65.55		273.2	91.7	395.4	363.0	32.32	12.233	
7,731.9	7,149.0	7,020.0	7,020.0	20.2	15.7	-64.26		273.2	91.7	416.6	384.2	32.35	12.875	
7,800.0	7,148.5	7,020.0	7,020.0	21.0	15.7	-64.26		273.2	91.7	465.7	432.6	33.10	14.070	
7,900.0	7,147.7	7,020.0	7,020.0	22.3	15.7	-64.26		273.2	91.7	545.3	511.1	34.28	15.910	
8,000.0	7,146.9	7,020.0	7,020.0	23.7	15.7	-64.26		273.2	91.7	630.8	595.3	35.54	17.751	
8,100.0	7,146.2	7,020.0	7,020.0	25.2	15.7	-64.26		273.2	91.7	720.0	683.1	36.86	19.532	
8,200.0	7,145.4	7,020.0	7,020.0	26.7	15.7	-64.26		273.2	91.7	811.7	773.5	38.24	21.224	
8,300.0	7,144.6	7,020.0	7,020.0	28.2	15.7	-64.26		273.2	91.7	905.2	865.5	39.67	22.816	
8,400.0	7,143.8	7,020.0	7,020.0	29.8	15.7	-64.26		273.2	91.7	999.9	958.8	41.14	24.304	

CC - Min centre to center distance or convergent point, SF - min separation factor, ES - min ellipse separation

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Dillard 20Y-401
Project:	SEC.20-T7N-R64W	TVD Reference:	WELL @ 4879.0ft (RKB - 15')
Reference Site:	Dillard 20Y-HZ Pad Sec.20-T7N-R64W	MD Reference:	WELL @ 4879.0ft (RKB - 15')
Site Error:	0.0ft	North Reference:	True
Reference Well:	Dillard 20Y-401	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	Landmark
Reference Design:	Plan #1 (11-15-12)	Offset TVD Reference:	Offset Datum

Reference Depths are relative to WELL @ 4879.0ft (RKB - 15')
Offset Depths are relative to Offset Datum
Central Meridian is -105.500000 °

Coordinates are relative to: Dillard 20Y-401
Coordinate System is US State Plane 1983, Colorado Northern Zone
Grid Convergence at Surface is: 0.60°



Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Dillard 20Y-401
Project:	SEC.20-T7N-R64W	TVD Reference:	WELL @ 4879.0ft (RKB - 15')
Reference Site:	Dillard 20Y-HZ Pad Sec.20-T7N-R64W	MD Reference:	WELL @ 4879.0ft (RKB - 15')
Site Error:	0.0ft	North Reference:	True
Reference Well:	Dillard 20Y-401	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	Landmark
Reference Design:	Plan #1 (11-15-12)	Offset TVD Reference:	Offset Datum

Reference Depths are relative to WELL @ 4879.0ft (RKB - 15')
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Central Meridian is -105.500000 °

Coordinates are relative to: Dillard 20Y-401
Coordinate System is US State Plane 1983, Colorado Northern Zone
Grid Convergence at Surface is: 0.60°

