

# PETROLEUM DEVELOPMENT CORP Weld County CO

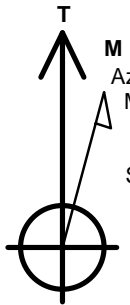
Well Name: **R&R Farms 29I-321**

Surface Location: R&R Farms 5N63W29L Pad Sec.29-T5N-R63W  
 North American Datum 1983 , US State Plane 1983 , Colorado Northern Zone  
 Ground Elevation: 4574.0

+N/-S	+E/-W	Northing	Easting	Latitude	Longitude	Slot
0.0	0.0	1377496.73	3287458.53	40.365040	-104.468380	
RKB - 13' WELL @ 4587.0ft (RKB - 13')						

## WELLBORE TARGET DETAILS

Name	TVD	+N/-S	+E/-W	Shape
SHL 641'FSL, 344'FWL	1.0	0.0	0.0	Point
BHL 500'FNL, 490'FWL	6454.0	4116.7	111.4	Point



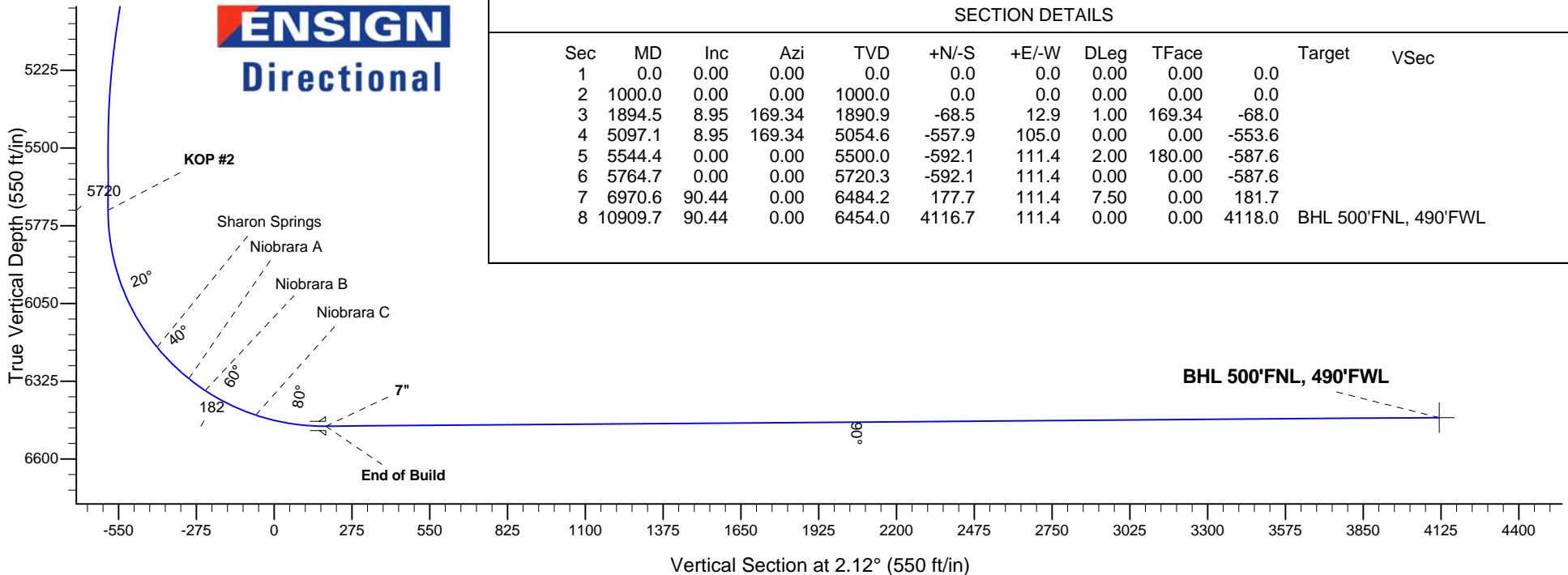
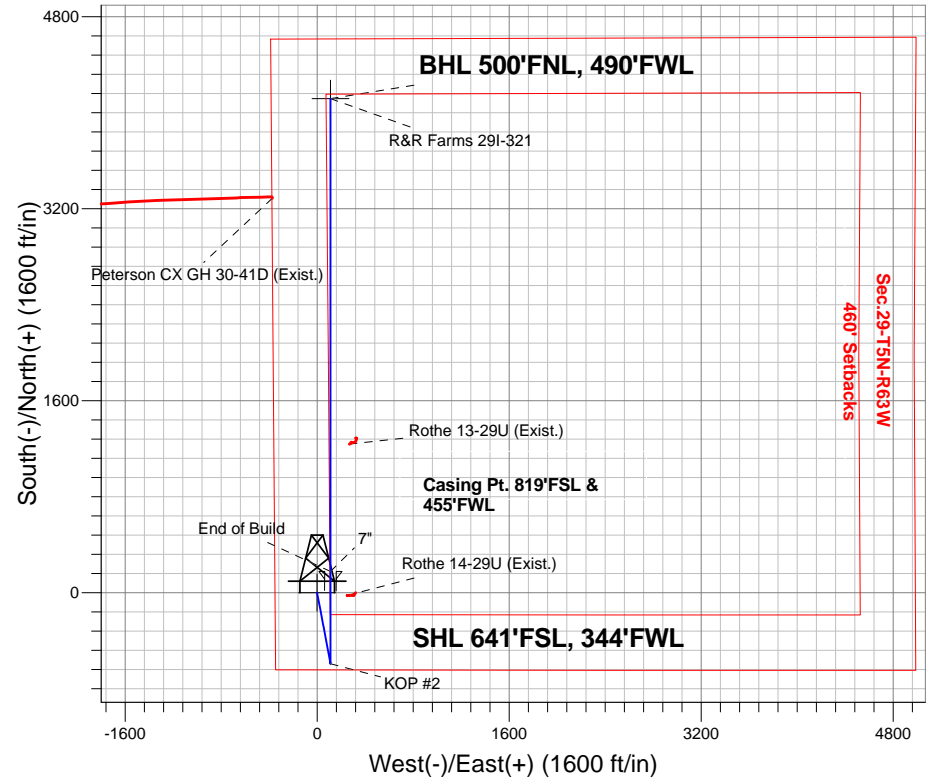
Azimuths to True North  
 Magnetic North: 8.19°

Magnetic Field  
 Strength: 52743.8snT  
 Dip Angle: 66.94°  
 Date: 4/8/2015  
 Model: IGRF2010

## ANNOTATIONS

TVD	MD	Annotation
1000.0	1000.0	KOP #1
5720.3	5764.7	KOP #2
6484.2	6970.6	End of Build

R&R Farms 5N63W29L Pad Sec.29-T5N-R63W  
 R&R Farms 29I-321  
 Plan #3 (4-10-15)





# **PETROLEUM DEVELOPMENT CORP Weld County CO**

**SEC.29-T5N-R63W**

**R&R Farms 5N63W29L Pad Sec.29-T5N-R63W**

**R&R Farms 29I-321**

**Wellbore #1**

**Plan: Plan #3 (4-10-15)**

## **Standard Planning Report**

**10 April, 2015**

<b>Database:</b>	Landmark	<b>Local Co-ordinate Reference:</b>	Well R&R Farms 29I-321
<b>Company:</b>	PETROLEUM DEVELOPMENT CORP Weld County CO	<b>TVD Reference:</b>	WELL @ 4587.0ft (RKB - 13')
<b>Project:</b>	SEC.29-T5N-R63W	<b>MD Reference:</b>	WELL @ 4587.0ft (RKB - 13')
<b>Site:</b>	R&R Farms 5N63W29L Pad Sec.29-T5N-R63W	<b>North Reference:</b>	True
<b>Well:</b>	R&R Farms 29I-321	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Wellbore #1		
<b>Design:</b>	Plan #3 (4-10-15)		

<b>Project</b>	SEC.29-T5N-R63W, Weld County, Colorado		
<b>Map System:</b>	US State Plane 1983	<b>System Datum:</b>	Mean Sea Level
<b>Geo Datum:</b>	North American Datum 1983		Using Well Reference Point
<b>Map Zone:</b>	Colorado Northern Zone		Using geodetic scale factor

Site						R&R Farms 5N63W29L Pad Sec.29-T5N-R63W											
Site Position:						Northing:			1,377,077.43ft			Latitude:			40.363870		
From:			Lat/Long			Easting:			3,288,054.21ft			Longitude:			-104.466260		
Position Uncertainty:			0.0 ft			Slot Radius:			"			Grid Convergence:			0.67 °		

Well	R&R Farms 29I-321					
Well Position	+N-S	426.2 ft	Northing:	1,377,496.73 ft	Latitude:	40.365040
	+E-W	-590.8 ft	Easting:	3,287,458.53 ft	Longitude:	-104.468380
Position Uncertainty		0.0 ft	Wellhead Elevation:	ft	Ground Level:	4,574.0 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	4/8/2015	8.19	66.94	52,744

<b>Design</b>	Plan #3 (4-10-15)			
<b>Audit Notes:</b>				
<b>Version:</b>	<b>Phase:</b>	PROTOTYPE	<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	2.12

<b>Plan Sections</b>										
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	
1,000.0	0.00	0.00	1,000.0	0.0	0.0	0.00	0.00	0.00	0.00	
1,894.5	8.95	169.34	1,890.9	-68.5	12.9	1.00	1.00	0.00	169.34	
5,097.1	8.95	169.34	5,054.6	-557.9	105.0	0.00	0.00	0.00	0.00	
5,544.4	0.00	0.00	5,500.0	-592.1	111.4	2.00	-2.00	0.00	180.00	
5,764.7	0.00	0.00	5,720.3	-592.1	111.4	0.00	0.00	0.00	0.00	
6,970.6	90.44	0.00	6,484.2	177.7	111.4	7.50	7.50	0.00	0.00	
10,909.7	90.44	0.00	6,454.0	4,116.7	111.4	0.00	0.00	0.00	0.00	BHL 500'FNL, 490'

<b>Database:</b>	Landmark	<b>Local Co-ordinate Reference:</b>	Well R&R Farms 29I-321
<b>Company:</b>	PETROLEUM DEVELOPMENT CORP Weld County CO	<b>TVD Reference:</b>	WELL @ 4587.0ft (RKB - 13')
<b>Project:</b>	SEC.29-T5N-R63W	<b>MD Reference:</b>	WELL @ 4587.0ft (RKB - 13')
<b>Site:</b>	R&R Farms 5N63W29L Pad Sec.29-T5N-R63W	<b>North Reference:</b>	True
<b>Well:</b>	R&R Farms 29I-321	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Wellbore #1		
<b>Design:</b>	Plan #3 (4-10-15)		

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
100.0	0.00	0.00	100.0	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
300.0	0.00	0.00	300.0	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
500.0	0.00	0.00	500.0	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
700.0	0.00	0.00	700.0	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
900.0	0.00	0.00	900.0	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
<b>KOP #1</b>									
1,100.0	1.00	169.34	1,100.0	-0.9	0.2	-0.9	1.00	1.00	0.00
1,200.0	2.00	169.34	1,200.0	-3.4	0.6	-3.4	1.00	1.00	0.00
1,300.0	3.00	169.34	1,299.9	-7.7	1.5	-7.7	1.00	1.00	0.00
1,400.0	4.00	169.34	1,399.7	-13.7	2.6	-13.6	1.00	1.00	0.00
1,500.0	5.00	169.34	1,499.4	-21.4	4.0	-21.3	1.00	1.00	0.00
1,600.0	6.00	169.34	1,598.9	-30.8	5.8	-30.6	1.00	1.00	0.00
1,700.0	7.00	169.34	1,698.3	-42.0	7.9	-41.6	1.00	1.00	0.00
1,800.0	8.00	169.34	1,797.4	-54.8	10.3	-54.4	1.00	1.00	0.00
1,894.5	8.95	169.34	1,890.9	-68.5	12.9	-68.0	1.00	1.00	0.00
1,900.0	8.95	169.34	1,896.3	-69.3	13.0	-68.8	0.00	0.00	0.00
2,000.0	8.95	169.34	1,995.1	-84.6	15.9	-84.0	0.00	0.00	0.00
2,100.0	8.95	169.34	2,093.9	-99.9	18.8	-99.1	0.00	0.00	0.00
2,200.0	8.95	169.34	2,192.7	-115.2	21.7	-114.3	0.00	0.00	0.00
2,300.0	8.95	169.34	2,291.4	-130.4	24.6	-129.4	0.00	0.00	0.00
2,400.0	8.95	169.34	2,390.2	-145.7	27.4	-144.6	0.00	0.00	0.00
2,500.0	8.95	169.34	2,489.0	-161.0	30.3	-159.8	0.00	0.00	0.00
2,600.0	8.95	169.34	2,587.8	-176.3	33.2	-174.9	0.00	0.00	0.00
2,700.0	8.95	169.34	2,686.6	-191.6	36.1	-190.1	0.00	0.00	0.00
2,800.0	8.95	169.34	2,785.4	-206.8	38.9	-205.3	0.00	0.00	0.00
2,900.0	8.95	169.34	2,884.1	-222.1	41.8	-220.4	0.00	0.00	0.00
3,000.0	8.95	169.34	2,982.9	-237.4	44.7	-235.6	0.00	0.00	0.00
3,100.0	8.95	169.34	3,081.7	-252.7	47.6	-250.7	0.00	0.00	0.00
3,200.0	8.95	169.34	3,180.5	-268.0	50.4	-265.9	0.00	0.00	0.00
3,300.0	8.95	169.34	3,279.3	-283.2	53.3	-281.1	0.00	0.00	0.00
3,309.8	8.95	169.34	3,289.0	-284.7	53.6	-282.6	0.00	0.00	0.00
<b>Parkman</b>									
3,400.0	8.95	169.34	3,378.1	-298.5	56.2	-296.2	0.00	0.00	0.00
3,500.0	8.95	169.34	3,476.8	-313.8	59.1	-311.4	0.00	0.00	0.00
3,600.0	8.95	169.34	3,575.6	-329.1	61.9	-326.6	0.00	0.00	0.00
3,700.0	8.95	169.34	3,674.4	-344.4	64.8	-341.7	0.00	0.00	0.00
3,800.0	8.95	169.34	3,773.2	-359.6	67.7	-356.9	0.00	0.00	0.00
3,900.0	8.95	169.34	3,872.0	-374.9	70.6	-372.1	0.00	0.00	0.00
4,000.0	8.95	169.34	3,970.8	-390.2	73.4	-387.2	0.00	0.00	0.00
4,019.5	8.95	169.34	3,990.0	-393.2	74.0	-390.2	0.00	0.00	0.00
<b>Sussex</b>									
4,100.0	8.95	169.34	4,069.5	-405.5	76.3	-402.4	0.00	0.00	0.00
4,200.0	8.95	169.34	4,168.3	-420.8	79.2	-417.5	0.00	0.00	0.00
4,300.0	8.95	169.34	4,267.1	-436.0	82.1	-432.7	0.00	0.00	0.00
4,400.0	8.95	169.34	4,365.9	-451.3	85.0	-447.9	0.00	0.00	0.00
4,495.3	8.95	169.34	4,460.0	-465.9	87.7	-462.3	0.00	0.00	0.00

<b>Database:</b>	Landmark	<b>Local Co-ordinate Reference:</b>	Well R&R Farms 29I-321
<b>Company:</b>	PETROLEUM DEVELOPMENT CORP Weld County CO	<b>TVD Reference:</b>	WELL @ 4587.0ft (RKB - 13')
<b>Project:</b>	SEC.29-T5N-R63W	<b>MD Reference:</b>	WELL @ 4587.0ft (RKB - 13')
<b>Site:</b>	R&R Farms 5N63W29L Pad	<b>North Reference:</b>	True
	Sec.29-T5N-R63W	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well:</b>	R&R Farms 29I-321		
<b>Wellbore:</b>	Wellbore #1		
<b>Design:</b>	Plan #3 (4-10-15)		

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)	
<b>Shannon</b>										
4,500.0	8.95	169.34	4,464.7	-466.6	87.8	-463.0	0.00	0.00	0.00	
4,600.0	8.95	169.34	4,563.5	-481.9	90.7	-478.2	0.00	0.00	0.00	
4,700.0	8.95	169.34	4,662.3	-497.2	93.6	-493.4	0.00	0.00	0.00	
4,800.0	8.95	169.34	4,761.0	-512.5	96.5	-508.5	0.00	0.00	0.00	
4,900.0	8.95	169.34	4,859.8	-527.7	99.3	-523.7	0.00	0.00	0.00	
5,000.0	8.95	169.34	4,958.6	-543.0	102.2	-538.9	0.00	0.00	0.00	
5,097.1	8.95	169.34	5,054.6	-557.9	105.0	-553.6	0.00	0.00	0.00	
5,100.0	8.89	169.34	5,057.4	-558.3	105.1	-554.0	2.00	-2.00	0.00	
5,200.0	6.89	169.34	5,156.4	-571.8	107.6	-567.4	2.00	-2.00	0.00	
5,300.0	4.89	169.34	5,255.9	-581.9	109.5	-577.4	2.00	-2.00	0.00	
5,400.0	2.89	169.34	5,355.7	-588.5	110.8	-584.0	2.00	-2.00	0.00	
5,500.0	0.89	169.34	5,455.6	-591.8	111.4	-587.2	2.00	-2.00	0.00	
5,544.4	0.00	0.00	5,500.0	-592.1	111.4	-587.6	2.00	-2.00	0.00	
5,600.0	0.00	0.00	5,555.6	-592.1	111.4	-587.6	0.00	0.00	0.00	
5,700.0	0.00	0.00	5,655.6	-592.1	111.4	-587.6	0.00	0.00	0.00	
5,764.7	0.00	0.00	5,720.3	-592.1	111.4	-587.6	0.00	0.00	0.00	
<b>KOP #2</b>										
5,800.0	2.65	0.00	5,755.6	-591.3	111.4	-586.7	7.50	7.50	0.00	
5,900.0	10.15	0.00	5,854.9	-580.1	111.4	-575.6	7.50	7.50	0.00	
6,000.0	17.65	0.00	5,951.9	-556.2	111.4	-551.6	7.50	7.50	0.00	
6,100.0	25.15	0.00	6,044.9	-519.7	111.4	-515.2	7.50	7.50	0.00	
6,200.0	32.65	0.00	6,132.4	-471.4	111.4	-467.0	7.50	7.50	0.00	
6,289.8	39.38	0.00	6,205.0	-418.7	111.4	-414.2	7.50	7.50	0.00	
<b>Sharon Springs</b>										
6,300.0	40.15	0.00	6,212.9	-412.1	111.4	-407.7	7.50	7.50	0.00	
6,400.0	47.65	0.00	6,284.9	-342.8	111.4	-338.5	7.50	7.50	0.00	
6,447.9	51.24	0.00	6,316.0	-306.5	111.4	-302.1	7.50	7.50	0.00	
<b>Niobrara A</b>										
6,500.0	55.15	0.00	6,347.2	-264.7	111.4	-260.4	7.50	7.50	0.00	
6,519.2	56.59	0.00	6,358.0	-248.8	111.4	-244.5	7.50	7.50	0.00	
<b>Niobrara B</b>										
6,600.0	62.65	0.00	6,398.9	-179.2	111.4	-174.9	7.50	7.50	0.00	
6,700.0	70.15	0.00	6,438.9	-87.6	111.4	-83.4	7.50	7.50	0.00	
6,718.7	71.55	0.00	6,445.0	-69.9	111.4	-65.8	7.50	7.50	0.00	
<b>Niobrara C</b>										
6,800.0	77.65	0.00	6,466.6	8.4	111.4	12.5	7.50	7.50	0.00	
6,900.0	85.15	0.00	6,481.5	107.2	111.4	111.3	7.50	7.50	0.00	
6,970.6	90.44	0.00	6,484.2	177.7	111.4	181.7	7.50	7.50	0.00	
<b>End of Build - 7"</b>										
7,000.0	90.44	0.00	6,484.0	207.1	111.4	211.1	0.00	0.00	0.00	
7,100.0	90.44	0.00	6,483.3	307.1	111.4	311.0	0.00	0.00	0.00	
7,200.0	90.44	0.00	6,482.5	407.1	111.4	411.0	0.00	0.00	0.00	
7,300.0	90.44	0.00	6,481.7	507.1	111.4	510.9	0.00	0.00	0.00	
7,400.0	90.44	0.00	6,481.0	607.1	111.4	610.8	0.00	0.00	0.00	
7,500.0	90.44	0.00	6,480.2	707.1	111.4	710.8	0.00	0.00	0.00	
7,600.0	90.44	0.00	6,479.4	807.1	111.4	810.7	0.00	0.00	0.00	
7,700.0	90.44	0.00	6,478.6	907.1	111.4	910.6	0.00	0.00	0.00	
7,800.0	90.44	0.00	6,477.9	1,007.1	111.4	1,010.5	0.00	0.00	0.00	
7,900.0	90.44	0.00	6,477.1	1,107.1	111.4	1,110.5	0.00	0.00	0.00	
8,000.0	90.44	0.00	6,476.3	1,207.1	111.4	1,210.4	0.00	0.00	0.00	

<b>Database:</b>	Landmark	<b>Local Co-ordinate Reference:</b>	Well R&R Farms 29I-321
<b>Company:</b>	PETROLEUM DEVELOPMENT CORP Weld County CO	<b>TVD Reference:</b>	WELL @ 4587.0ft (RKB - 13')
<b>Project:</b>	SEC.29-T5N-R63W	<b>MD Reference:</b>	WELL @ 4587.0ft (RKB - 13')
<b>Site:</b>	R&R Farms 5N63W29L Pad	<b>North Reference:</b>	True
	Sec.29-T5N-R63W		
<b>Well:</b>	R&R Farms 29I-321	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Wellbore #1		
<b>Design:</b>	Plan #3 (4-10-15)		

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)	
8,100.0	90.44	0.00	6,475.6	1,307.1	111.4	1,310.3	0.00	0.00	0.00	
8,200.0	90.44	0.00	6,474.8	1,407.1	111.4	1,410.3	0.00	0.00	0.00	
8,300.0	90.44	0.00	6,474.0	1,507.1	111.4	1,510.2	0.00	0.00	0.00	
8,400.0	90.44	0.00	6,473.3	1,607.1	111.4	1,610.1	0.00	0.00	0.00	
8,500.0	90.44	0.00	6,472.5	1,707.1	111.4	1,710.0	0.00	0.00	0.00	
8,600.0	90.44	0.00	6,471.7	1,807.1	111.4	1,810.0	0.00	0.00	0.00	
8,700.0	90.44	0.00	6,471.0	1,907.1	111.4	1,909.9	0.00	0.00	0.00	
8,800.0	90.44	0.00	6,470.2	2,007.1	111.4	2,009.8	0.00	0.00	0.00	
8,900.0	90.44	0.00	6,469.4	2,107.1	111.4	2,109.8	0.00	0.00	0.00	
9,000.0	90.44	0.00	6,468.7	2,207.1	111.4	2,209.7	0.00	0.00	0.00	
9,100.0	90.44	0.00	6,467.9	2,307.1	111.4	2,309.6	0.00	0.00	0.00	
9,200.0	90.44	0.00	6,467.1	2,407.1	111.4	2,409.5	0.00	0.00	0.00	
9,300.0	90.44	0.00	6,466.4	2,507.1	111.4	2,509.5	0.00	0.00	0.00	
9,400.0	90.44	0.00	6,465.6	2,607.1	111.4	2,609.4	0.00	0.00	0.00	
9,500.0	90.44	0.00	6,464.8	2,707.1	111.4	2,709.3	0.00	0.00	0.00	
9,600.0	90.44	0.00	6,464.1	2,807.0	111.4	2,809.2	0.00	0.00	0.00	
9,700.0	90.44	0.00	6,463.3	2,907.0	111.4	2,909.2	0.00	0.00	0.00	
9,800.0	90.44	0.00	6,462.5	3,007.0	111.4	3,009.1	0.00	0.00	0.00	
9,900.0	90.44	0.00	6,461.8	3,107.0	111.4	3,109.0	0.00	0.00	0.00	
10,000.0	90.44	0.00	6,461.0	3,207.0	111.4	3,209.0	0.00	0.00	0.00	
10,100.0	90.44	0.00	6,460.2	3,307.0	111.4	3,308.9	0.00	0.00	0.00	
10,200.0	90.44	0.00	6,459.5	3,407.0	111.4	3,408.8	0.00	0.00	0.00	
10,300.0	90.44	0.00	6,458.7	3,507.0	111.4	3,508.7	0.00	0.00	0.00	
10,400.0	90.44	0.00	6,457.9	3,607.0	111.4	3,608.7	0.00	0.00	0.00	
10,500.0	90.44	0.00	6,457.1	3,707.0	111.4	3,708.6	0.00	0.00	0.00	
10,600.0	90.44	0.00	6,456.4	3,807.0	111.4	3,808.5	0.00	0.00	0.00	
10,700.0	90.44	0.00	6,455.6	3,907.0	111.4	3,908.5	0.00	0.00	0.00	
10,800.0	90.44	0.00	6,454.8	4,007.0	111.4	4,008.4	0.00	0.00	0.00	
10,900.0	90.44	0.00	6,454.1	4,107.0	111.4	4,108.3	0.00	0.00	0.00	
10,909.7	90.44	0.00	6,454.0	4,116.7	111.4	4,118.0	0.00	0.00	0.00	

Targets										
Target Name	- hit/miss target	Dip Angle (°)	Dip Dir. (°)	TVD (ft)	+N/-S (ft)	+E/-W (ft)	Northing (ft)	Easting (ft)	Latitude	Longitude
BHL 500'FNL, 490'FW	- plan hits target center	0.00	0.00	6,454.0	4,116.7	111.4	1,381,614.30	3,287,522.08	40.376340	-104.467980
SHL 641'FSL, 344'FW	- plan hits target center	0.00	0.00	1.0	0.0	0.0	1,377,496.75	3,287,458.53	40.365040	-104.468380
	- Point									

Casing Points						
Measured Depth (ft)	Vertical Depth (ft)	Name			Casing Diameter (")	Hole Diameter (")
6,970.6	6,484.2	7"			7	7-1/2

<b>Database:</b>	Landmark	<b>Local Co-ordinate Reference:</b>	Well R&R Farms 29I-321
<b>Company:</b>	PETROLEUM DEVELOPMENT CORP Weld County CO	<b>TVD Reference:</b>	WELL @ 4587.0ft (RKB - 13')
<b>Project:</b>	SEC.29-T5N-R63W	<b>MD Reference:</b>	WELL @ 4587.0ft (RKB - 13')
<b>Site:</b>	R&R Farms 5N63W29L Pad	<b>North Reference:</b>	True
	Sec.29-T5N-R63W		
<b>Well:</b>	R&R Farms 29I-321	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Wellbore #1		
<b>Design:</b>	Plan #3 (4-10-15)		

Formations						
Measured Depth (ft)	Vertical Depth (ft)	Name	Lithology	Dip (°)	Dip Direction (°)	
3,309.8	3,289.0	Parkman		0.00		
4,019.5	3,990.0	Sussex		0.00		
4,495.3	4,460.0	Shannon		0.00		
6,289.8	6,205.0	Sharon Springs		0.00		
6,447.9	6,316.0	Niobrara A		0.00		
6,519.2	6,358.0	Niobrara B		0.00		
6,718.7	6,445.0	Niobrara C		0.00		

Plan Annotations					
Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates			
		+N/-S (ft)	+E/-W (ft)	Comment	
1,000.0	1,000.0	0.0	0.0	KOP #1	
5,764.7	5,720.3	-68.5	12.9	KOP #2	
6,970.6	6,484.2	-557.9	105.0	End of Build	



# **PETROLEUM DEVELOPMENT CORP Weld County CO**

**SEC.29-T5N-R63W**

**R&R Farms 5N63W29L Pad Sec.29-T5N-R63W**

**R&R Farms 29I-321**

**Wellbore #1**

**Plan #3 (4-10-15)**

## **Anticollision Report**

**10 April, 2015**





<b>Company:</b>	PETROLEUM DEVELOPMENT CORP Weld County CO	<b>Local Co-ordinate Reference:</b>	Well R&R Farms 29I-321
<b>Project:</b>	SEC.29-T5N-R63W	<b>TVD Reference:</b>	WELL @ 4587.0ft (RKB - 13')
<b>Reference Site:</b>	R&R Farms 5N63W29L Pad Sec.29-T5N-R63W	<b>MD Reference:</b>	WELL @ 4587.0ft (RKB - 13')
<b>Site Error:</b>	0.0ft	<b>North Reference:</b>	True
<b>Reference Well:</b>	R&R Farms 29I-321	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.0ft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	Wellbore #1	<b>Database:</b>	Landmark
<b>Reference Design:</b>	Plan #3 (4-10-15)	<b>Offset TVD Reference:</b>	Offset Datum

<b>Reference</b>	Plan #3 (4-10-15)		
<b>Filter type:</b>	NO GLOBAL FILTER: Using user defined selection & filtering criteria		
<b>Interpolation Method:</b>	MD Interval 100.0ft	<b>Error Model:</b>	ISCWSA
<b>Depth Range:</b>	Unlimited	<b>Scan Method:</b>	Closest Approach 3D
<b>Results Limited by:</b>	Maximum center-center distance of 1,000.0ft	<b>Error Surface:</b>	Elliptical Conic
<b>Warning Levels Evaluated at:</b>	2.00 Sigma		

<b>Survey Tool Program</b>	<b>Date</b> 4/10/2015			
<b>From (ft)</b>	<b>To (ft)</b>	<b>Survey (Wellbore)</b>	<b>Tool Name</b>	<b>Description</b>
0.0	10,909.7	Plan #3 (4-10-15) (Wellbore #1)	MWD	MWD - Standard

<b>Summary</b>						
<b>Site Name</b>	<b>Reference Measured Depth (ft)</b>	<b>Offset Measured Depth (ft)</b>	<b>Distance Between Centres (ft)</b>	<b>Distance Between Ellipses (ft)</b>	<b>Separation Factor</b>	<b>Warning</b>
<b>Offset Well - Wellbore - Design</b>						
Existing Wells Sec.29-T5N-R63W						
Rothe 13-29U (Exist.) - Wellbore #1 - Wellbore #1	8,031.6	6,460.4	160.3	116.1	3.628	CC, ES, SF
Rothe 14-29U (Exist.) - Wellbore #1 - Wellbore #1	6,767.7	6,447.7	144.7	116.0	5.030	CC, ES, SF
Peterson CX GH 30-41D Pad Sec.30-T5N-R63W						
Peterson CX GH 30-41D - Wellbore #1 - Wellbore #1	10,082.3	7,052.6	485.5	398.1	5.554	CC
Peterson CX GH 30-41D - Wellbore #1 - Wellbore #1	10,100.0	7,052.2	485.8	398.1	5.537	ES, SF
R&R Farms 5N63W29L Pad Sec.29-T5N-R63W						
R&R Farms 29I-221 - Wellbore #1 - Plan #2 (4-10-15)	1,000.0	1,000.0	30.7	26.4	7.178	CC
R&R Farms 29I-221 - Wellbore #1 - Plan #2 (4-10-15)	1,100.0	1,100.0	30.8	26.1	6.571	ES
R&R Farms 29I-221 - Wellbore #1 - Plan #2 (4-10-15)	10,909.7	10,845.6	217.1	55.0	1.339	Level 3, SF
R&R Farms 29I-401 - Wellbore #1 - Plan #2 (4-10-15)	766.3	767.3	61.3	58.1	19.025	CC
R&R Farms 29I-401 - Wellbore #1 - Plan #2 (4-10-15)	900.0	900.6	61.6	57.8	16.242	ES
R&R Farms 29I-401 - Wellbore #1 - Plan #2 (4-10-15)	10,909.7	10,996.7	417.4	255.3	2.575	SF
R&R Farms 29L-241 - Wellbore #1 - Plan #2 (4-9-15)	800.0	800.0	30.7	27.3	9.092	CC, ES
R&R Farms 29L-241 - Wellbore #1 - Plan #2 (4-9-15)	10,909.7	10,853.6	254.9	90.8	1.554	SF
R&R Farms 29L-301 - Wellbore #1 - Plan #2 (4-9-15)	200.0	200.0	89.2	88.5	132.246	CC, ES
R&R Farms 29L-301 - Wellbore #1 - Plan #2 (4-9-15)	10,909.7	10,951.2	699.3	532.1	4.183	SF
R&R Farms 29L-441 - Wellbore #1 - Plan #2 (4-9-15)	400.0	400.0	58.5	56.9	37.194	CC, ES
R&R Farms 29L-441 - Wellbore #1 - Plan #2 (4-9-15)	10,909.7	11,014.1	502.8	339.2	3.074	SF

Offset Design		Existing Wells Sec.29-T5N-R63W - Rothe 13-29U (Exist.) - Wellbore #1 - Wellbore #1										Offset Site Error:		0.0 ft			
Survey Program: 600-MWD														Offset Well Error:		0.0 ft	
Reference		Offset		Semi Major Axis		Distance								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)	Offset Wellbore Centre +E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor					
7,100.0	6,483.3	6,469.6	6,468.6	18.1	13.0	94.10	1,238.7	271.6	945.2	914.2	31.02	30.475					
7,200.0	6,482.5	6,468.6	6,467.6	19.2	13.0	93.75	1,238.7	271.6	846.9	814.8	32.06	26.412					
7,300.0	6,481.7	6,467.6	6,466.6	20.3	13.0	93.40	1,238.7	271.6	748.9	715.7	33.24	22.532					
7,400.0	6,481.0	6,466.6	6,465.6	21.6	13.0	93.05	1,238.7	271.6	651.6	617.1	34.52	18.875					
7,500.0	6,480.2	6,465.6	6,464.7	23.0	13.0	92.70	1,238.7	271.6	555.2	519.3	35.89	15.468					
7,600.0	6,479.4	6,464.7	6,463.7	24.4	13.0	92.35	1,238.7	271.6	460.4	423.0	37.34	12.329					

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

<b>Company:</b>	PETROLEUM DEVELOPMENT CORP Weld County CO	<b>Local Co-ordinate Reference:</b>	Well R&R Farms 29I-32I
<b>Project:</b>	SEC.29-T5N-R63W	<b>TVD Reference:</b>	WELL @ 4587.0ft (RKB - 13')
<b>Reference Site:</b>	R&R Farms 5N63W29L Pad Sec.29-T5N-R63W	<b>MD Reference:</b>	WELL @ 4587.0ft (RKB - 13')
<b>Site Error:</b>	0.0ft	<b>North Reference:</b>	True
<b>Reference Well:</b>	R&R Farms 29I-32I	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.0ft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	Wellbore #1	<b>Database:</b>	Landmark
<b>Reference Design:</b>	Plan #3 (4-10-15)	<b>Offset TVD Reference:</b>	Offset Datum

Offset Design Existing Wells Sec.29-T5N-R63W - Rothe 13-29U (Exist.) - Wellbore #1 - Wellbore #1														Offset Site Error:	0.0 ft
Survey Program: 600-MWD														Offset Well Error:	0.0 ft
Reference		Offset		Semi Major Axis		Highside Toolface (°)	Distance		Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning		
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)		Offset Wellbore +N/-S (ft)	Centre +E/-W (ft)							
7,700.0	6,478.6	6,463.7	6,462.7	25.9	13.0	92.00	1,238.7	271.7	368.3	329.4	38.85	9.480			
7,800.0	6,477.9	6,462.7	6,461.7	27.5	13.0	91.65	1,238.7	271.7	281.6	241.2	40.41	6.970			
7,900.0	6,477.1	6,461.7	6,460.7	29.1	13.0	91.30	1,238.7	271.7	207.4	165.4	42.01	4.936			
8,000.0	6,476.3	6,460.7	6,459.7	30.7	13.0	90.94	1,238.7	271.7	163.4	119.7	43.65	3.742			
8,031.6	6,476.1	6,460.4	6,459.4	31.3	13.0	90.83	1,238.7	271.7	160.3	116.1	44.18	3.628	CC, ES, SF		
8,100.0	6,475.6	6,459.7	6,458.8	32.4	13.0	90.59	1,238.7	271.7	174.3	128.9	45.32	3.845			
8,200.0	6,474.8	6,458.7	6,457.8	34.1	13.0	90.24	1,238.7	271.7	232.5	185.5	47.01	4.945			
8,300.0	6,474.0	6,457.7	6,456.8	35.8	13.0	89.88	1,238.7	271.7	312.6	263.9	48.73	6.415			
8,400.0	6,473.3	6,456.7	6,455.8	37.5	13.0	89.52	1,238.7	271.8	401.7	351.3	50.47	7.961			
8,500.0	6,472.5	6,455.7	6,454.8	39.3	13.0	89.17	1,238.7	271.8	495.0	442.8	52.22	9.481			
8,600.0	6,471.7	6,454.7	6,453.8	41.1	13.0	88.81	1,238.7	271.8	590.5	536.6	53.98	10.940			
8,700.0	6,471.0	6,453.7	6,452.8	42.8	13.0	88.45	1,238.7	271.8	687.3	631.6	55.75	12.328			
8,800.0	6,470.2	6,452.7	6,451.8	44.6	13.0	88.10	1,238.7	271.8	784.9	727.4	57.54	13.642			
8,900.0	6,469.4	6,451.7	6,450.8	46.4	13.0	87.74	1,238.7	271.8	883.0	823.7	59.33	14.884			
9,000.0	6,468.7	6,450.7	6,449.8	48.2	13.0	87.38	1,238.7	271.8	981.5	920.4	61.13	16.058			

<b>Company:</b>	PETROLEUM DEVELOPMENT CORP Weld County CO	<b>Local Co-ordinate Reference:</b>	Well R&R Farms 291-321
<b>Project:</b>	SEC.29-T5N-R63W	<b>TVD Reference:</b>	WELL @ 4587.0ft (RKB - 13')
<b>Reference Site:</b>	R&R Farms 5N63W29L Pad Sec.29-T5N-R63W	<b>MD Reference:</b>	WELL @ 4587.0ft (RKB - 13')
<b>Site Error:</b>	0.0ft	<b>North Reference:</b>	True
<b>Reference Well:</b>	R&R Farms 291-321	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.0ft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	Wellbore #1	<b>Database:</b>	Landmark
<b>Reference Design:</b>	Plan #3 (4-10-15)	<b>Offset TVD Reference:</b>	Offset Datum

Offset Design Existing Wells Sec.29-T5N-R63W - Rothe 14-29U (Exist.) - Wellbore #1 - Wellbore #1													Offset Site Error: 0.0 ft	
Survey Program: 600-MWD													Offset Well Error: 0.0 ft	
Reference		Offset		Semi Major Axis		Distance								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)	Minimum Separation (ft)	Separation Factor		
0.0	0.0	0.0	0.0	0.0	0.0	90.00	0.0	320.5	320.8					
100.0	100.0	85.7	85.7	0.1	0.1	90.02	-0.1	320.4	320.4	320.2	0.21	1,517.325		
200.0	200.0	186.5	186.5	0.3	0.2	90.10	-0.5	320.0	320.0	319.5	0.55	579.896		
300.0	300.0	287.3	287.3	0.6	0.3	90.23	-1.3	319.4	319.4	318.5	0.89	357.857		
400.0	400.0	388.2	388.1	0.8	0.4	90.43	-2.4	318.5	318.6	317.3	1.23	258.294		
500.0	500.0	489.0	488.9	1.0	0.6	90.68	-3.8	317.4	317.4	315.9	1.57	201.676		
600.0	600.0	589.7	589.7	1.2	0.7	91.00	-5.5	316.0	316.1	314.2	1.91	165.078		
700.0	700.0	689.6	689.6	1.5	0.9	91.35	-7.4	314.5	314.6	312.3	2.35	134.008		
800.0	800.0	789.6	789.5	1.7	1.1	91.74	-9.5	313.0	313.2	310.4	2.79	112.131		
900.0	900.0	888.8	888.7	1.9	1.3	92.13	-11.6	311.6	311.9	308.6	3.22	96.801		
1,000.0	1,000.0	988.7	988.6	2.1	1.5	92.49	-13.5	310.4	310.7	307.1	3.65	85.066		
1,100.0	1,100.0	1,088.0	1,087.8	2.3	1.7	-76.65	-15.4	309.3	309.5	305.4	4.05	76.393		
1,200.0	1,200.0	1,186.6	1,186.4	2.5	1.9	-76.82	-17.1	308.5	308.2	303.8	4.42	69.710		
1,300.0	1,299.9	1,286.4	1,286.1	2.7	2.1	-77.35	-18.5	308.0	306.8	302.0	4.80	63.860		
1,400.0	1,399.7	1,385.8	1,385.5	2.9	2.3	-78.22	-19.9	307.6	305.1	299.9	5.20	58.691		
1,500.0	1,499.4	1,484.7	1,484.4	3.1	2.5	-79.51	-20.7	307.5	303.4	297.8	5.61	54.113		
1,600.0	1,598.9	1,584.7	1,584.4	3.3	2.7	-81.22	-21.3	307.4	301.8	295.7	6.04	49.993		
1,700.0	1,698.3	1,684.8	1,684.5	3.6	2.9	-83.27	-21.8	307.2	299.9	293.4	6.48	46.265		
1,800.0	1,797.4	1,784.7	1,784.4	3.8	3.1	-85.67	-22.4	306.7	298.1	291.2	6.95	42.898		
1,900.0	1,896.3	1,884.3	1,884.1	4.1	3.4	-88.42	-23.0	305.9	296.5	289.1	7.44	39.871		
2,000.0	1,995.1	1,983.8	1,983.6	4.4	3.6	-91.33	-23.7	305.0	295.4	287.5	7.94	37.198		
2,100.0	2,093.9	2,082.9	2,082.6	4.7	3.8	-94.25	-24.3	303.9	294.9	286.5	8.46	34.874		
2,116.0	2,109.7	2,098.7	2,098.5	4.8	3.8	-94.73	-24.4	303.7	294.9	286.4	8.54	34.531		
2,200.0	2,192.7	2,181.8	2,181.5	5.0	4.0	-97.22	-24.7	302.6	295.2	286.2	8.98	32.879		
2,300.0	2,291.4	2,280.6	2,280.4	5.4	4.2	-100.21	-24.9	301.3	296.2	286.7	9.50	31.178		
2,400.0	2,390.2	2,379.4	2,379.1	5.7	4.4	-103.21	-24.9	299.9	298.1	288.1	10.02	29.737		
2,500.0	2,489.0	2,478.1	2,477.8	6.0	4.6	-106.21	-24.7	298.4	300.8	290.2	10.54	28.526		
2,600.0	2,587.8	2,576.8	2,576.5	6.4	4.8	-109.17	-24.4	296.9	304.3	293.3	11.06	27.519		
2,700.0	2,686.6	2,675.5	2,675.2	6.7	5.0	-112.04	-24.2	295.3	308.6	297.1	11.57	26.685		
2,800.0	2,785.4	2,774.3	2,774.0	7.1	5.2	-114.83	-24.0	293.8	313.7	301.7	12.07	25.997		
2,900.0	2,884.1	2,873.1	2,872.7	7.4	5.4	-117.50	-23.8	292.3	319.5	306.9	12.56	25.434		
3,000.0	2,982.9	2,971.9	2,971.5	7.8	5.6	-120.07	-23.8	290.9	325.9	312.9	13.05	24.978		
3,100.0	3,081.7	3,070.3	3,070.0	8.1	5.9	-122.52	-23.8	289.4	333.0	319.5	13.53	24.617		
3,200.0	3,180.5	3,168.6	3,168.3	8.5	6.1	-124.85	-23.7	288.1	340.8	326.8	14.00	24.345		
3,300.0	3,279.3	3,266.9	3,266.5	8.8	6.3	-127.08	-23.6	286.9	349.3	334.8	14.47	24.147		
3,400.0	3,378.1	3,365.2	3,364.8	9.2	6.5	-129.18	-23.3	285.8	358.4	343.5	14.93	24.012		
3,500.0	3,476.8	3,463.5	3,463.1	9.6	6.7	-131.18	-23.1	284.9	368.1	352.7	15.38	23.932		
3,600.0	3,575.6	3,562.2	3,561.8	9.9	6.9	-133.08	-22.8	283.9	378.3	362.5	15.83	23.891		
3,700.0	3,674.4	3,661.2	3,660.8	10.3	7.1	-134.89	-22.5	282.9	388.8	372.5	16.28	23.879		
3,800.0	3,773.2	3,760.2	3,759.8	10.7	7.3	-136.61	-22.2	281.9	399.7	382.9	16.73	23.889		
3,900.0	3,872.0	3,859.2	3,858.8	11.0	7.5	-138.25	-22.0	280.7	410.7	393.6	17.17	23.920		
4,000.0	3,970.8	3,958.2	3,957.8	11.4	7.7	-139.81	-21.8	279.4	422.1	404.5	17.61	23.968		
4,100.0	4,069.5	4,057.9	4,057.4	11.7	7.9	-141.32	-21.6	278.0	433.6	415.6	18.05	24.023		
4,200.0	4,168.3	4,158.0	4,157.5	12.1	8.1	-142.80	-21.6	276.1	445.1	426.7	18.49	24.077		
4,300.0	4,267.1	4,258.1	4,257.6	12.5	8.3	-144.26	-21.6	273.6	456.6	437.7	18.92	24.132		
4,400.0	4,365.9	4,358.2	4,357.6	12.9	8.6	-145.71	-21.7	270.7	468.1	448.7	19.35	24.190		
4,500.0	4,464.7	4,458.2	4,457.6	13.2	8.8	-147.14	-21.9	267.2	479.6	459.8	19.78	24.249		
4,600.0	4,563.5	4,556.7	4,556.1	13.6	9.0	-148.51	-22.2	263.4	491.1	470.9	20.20	24.317		
4,700.0	4,662.3	4,654.3	4,653.5	14.0	9.2	-149.76	-22.5	260.1	503.1	482.5	20.62	24.403		
4,800.0	4,761.0	4,751.9	4,751.1	14.3	9.4	-150.89	-22.7	257.5	515.6	494.5	21.04	24.504		
4,900.0	4,859.8	4,849.5	4,848.7	14.7	9.6	-151.90	-22.9	255.4	528.4	506.9	21.47	24.614		

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

<b>Company:</b>	PETROLEUM DEVELOPMENT CORP Weld County CO	<b>Local Co-ordinate Reference:</b>	Well R&R Farms 29I-321
<b>Project:</b>	SEC.29-T5N-R63W	<b>TVD Reference:</b>	WELL @ 4587.0ft (RKB - 13')
<b>Reference Site:</b>	R&R Farms 5N63W29L Pad Sec.29-T5N-R63W	<b>MD Reference:</b>	WELL @ 4587.0ft (RKB - 13')
<b>Site Error:</b>	0.0ft	<b>North Reference:</b>	True
<b>Reference Well:</b>	R&R Farms 29I-321	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.0ft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	Wellbore #1	<b>Database:</b>	Landmark
<b>Reference Design:</b>	Plan #3 (4-10-15)	<b>Offset TVD Reference:</b>	Offset Datum

Offset Design Existing Wells Sec.29-T5N-R63W - Rothe 14-29U (Exist.) - Wellbore #1 - Wellbore #1													Offset Site Error: 0.0 ft	
Survey Program: 600-MWD													Offset Well Error: 0.0 ft	
Reference		Offset		Semi Major Axis			Distance							Warning
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre		Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor		
							+N/-S (ft)	+E/-W (ft)						
5,000.0	4,958.6	4,947.2	4,946.4	15.1	9.8	-152.81	-23.1	253.9	541.6	519.7	21.90	24.732	5.030 CC, ES, SF	
5,100.0	5,057.4	5,045.1	5,044.2	15.4	10.0	-153.63	-23.3	253.0	555.1	532.8	22.33	24.858		
5,200.0	5,156.4	5,143.3	5,142.5	15.7	10.2	-154.38	-23.4	252.6	567.2	544.4	22.74	24.942		
5,300.0	5,255.9	5,241.9	5,241.1	15.9	10.4	-154.88	-23.6	252.7	576.4	553.2	23.14	24.910		
5,400.0	5,355.7	5,340.9	5,340.1	16.1	10.6	-155.15	-23.7	253.3	582.5	559.0	23.52	24.769		
5,500.0	5,455.6	5,440.0	5,439.2	16.3	10.8	-155.20	-23.8	254.4	585.7	561.8	23.88	24.525		
5,600.0	5,555.6	5,539.6	5,538.8	16.4	11.0	14.28	-23.9	256.1	586.3	562.1	24.26	24.164		
5,700.0	5,655.6	5,640.0	5,639.2	16.6	11.2	14.42	-24.0	257.5	586.6	561.9	24.65	23.797		
5,800.0	5,755.6	5,740.4	5,739.6	16.7	11.5	14.56	-24.1	258.7	586.0	561.0	24.97	23.472		
5,900.0	5,854.9	5,840.1	5,839.3	16.7	11.7	15.13	-24.1	259.5	575.4	550.4	24.94	23.068		
6,000.0	5,951.9	5,937.5	5,936.7	16.6	11.9	16.33	-24.2	260.0	552.3	527.7	24.62	22.432		
6,100.0	6,044.9	6,030.9	6,030.1	16.5	12.1	18.34	-24.2	260.1	517.3	493.2	24.06	21.496		
6,200.0	6,132.4	6,118.7	6,117.9	16.3	12.2	21.54	-24.2	260.0	471.2	447.8	23.40	20.136		
6,300.0	6,212.9	6,199.5	6,198.6	16.0	12.4	26.57	-24.2	259.5	415.2	392.3	22.88	18.149		
6,400.0	6,284.9	6,271.9	6,271.0	15.8	12.6	34.57	-24.1	258.8	351.2	328.2	22.97	15.288		
6,500.0	6,347.2	6,334.7	6,333.8	15.6	12.7	47.08	-24.0	258.0	281.9	257.6	24.29	11.603		
6,600.0	6,398.9	6,386.7	6,385.9	15.6	12.8	64.49	-23.9	257.2	213.0	186.3	26.69	7.981		
6,700.0	6,438.9	6,427.2	6,426.3	15.7	12.9	82.40	-23.8	256.5	158.5	130.1	28.39	5.584		
6,767.7	6,459.0	6,447.7	6,446.8	15.9	12.9	91.14	-23.7	256.2	144.7	116.0	28.78			
6,800.0	6,466.6	6,455.4	6,454.5	16.0	13.0	93.84	-23.7	256.0	148.1	119.3	28.84	5.136		
6,900.0	6,481.5	6,470.7	6,469.8	16.5	13.0	95.69	-23.6	255.7	194.8	165.5	29.33	6.641		
7,000.0	6,484.0	6,473.5	6,472.6	17.2	13.0	90.73	-23.6	255.7	272.1	242.0	30.19	9.015		
7,100.0	6,483.3	6,473.1	6,472.2	18.1	13.0	90.55	-23.6	255.7	360.9	329.8	31.08	11.612		
7,200.0	6,482.5	6,472.6	6,471.7	19.2	13.0	90.36	-23.6	255.7	454.3	422.2	32.12	14.145		
7,300.0	6,481.7	6,472.1	6,471.2	20.3	13.0	90.17	-23.6	255.7	550.0	516.7	33.28	16.526		
7,400.0	6,481.0	6,471.6	6,470.7	21.6	13.0	89.98	-23.6	255.7	647.1	612.5	34.56	18.723		
7,500.0	6,480.2	6,471.1	6,470.3	23.0	13.0	89.79	-23.6	255.7	744.9	709.0	35.92	20.735		
7,600.0	6,479.4	6,470.7	6,469.8	24.4	13.0	89.60	-23.7	255.7	843.2	805.8	37.36	22.568		
7,700.0	6,478.6	6,470.2	6,469.3	25.9	13.0	89.41	-23.7	255.7	941.9	903.0	38.86	24.235		

<b>Company:</b>	PETROLEUM DEVELOPMENT CORP Weld County CO	<b>Local Co-ordinate Reference:</b>	Well R&R Farms 29I-321
<b>Project:</b>	SEC.29-T5N-R63W	<b>TVD Reference:</b>	WELL @ 4587.0ft (RKB - 13')
<b>Reference Site:</b>	R&R Farms 5N63W29L Pad Sec.29-T5N-R63W	<b>MD Reference:</b>	WELL @ 4587.0ft (RKB - 13')
<b>Site Error:</b>	0.0ft	<b>North Reference:</b>	True
<b>Reference Well:</b>	R&R Farms 29I-321	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.0ft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	Wellbore #1	<b>Database:</b>	Landmark
<b>Reference Design:</b>	Plan #3 (4-10-15)	<b>Offset TVD Reference:</b>	Offset Datum

Offset Design Peterson CX GH 30-41D Pad Sec.30-T5N-R63W - Peterson CX GH 30-41D - Wellbore #1 - Wellbore #1														Offset Site Error:	0.0 ft
Survey Program: 181-Reference														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)	Distance	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
9,300.0	6,466.4	7,068.6	6,476.9	53.7	49.0	-91.83		3,289.1	-374.0	920.6	847.4	73.18	12.580		
9,400.0	6,465.6	7,066.6	6,474.9	55.6	49.0	-91.60		3,289.1	-374.0	837.3	762.3	74.99	11.166		
9,500.0	6,464.8	7,064.6	6,472.9	57.4	49.0	-91.36		3,289.2	-374.0	758.0	681.2	76.80	9.870		
9,600.0	6,464.1	7,062.5	6,470.9	59.3	49.0	-91.12		3,289.2	-374.0	684.3	605.6	78.62	8.704		
9,700.0	6,463.3	7,060.5	6,468.8	61.1	49.0	-90.88		3,289.2	-374.0	617.9	537.5	80.44	7.682		
9,800.0	6,462.5	7,058.5	6,466.8	63.0	49.0	-90.64		3,289.3	-374.0	561.6	479.3	82.26	6.827		
9,900.0	6,461.8	7,056.4	6,464.7	64.8	49.0	-90.40		3,289.3	-374.0	518.6	434.5	84.08	6.167		
10,000.0	6,461.0	7,054.3	6,462.6	66.7	49.0	-90.15		3,289.3	-374.0	492.4	406.5	85.91	5.732		
10,082.3	6,460.4	7,052.6	6,460.9	68.2	49.0	-89.95		3,289.3	-374.0	485.5	398.1	87.42	5.554 CC		
10,100.0	6,460.2	7,052.2	6,460.5	68.6	49.0	-89.90		3,289.3	-374.0	485.8	398.1	87.74	5.537 ES, SF		
10,200.0	6,459.5	7,050.1	6,458.4	70.4	49.0	-89.66		3,289.4	-374.0	499.5	410.0	89.57	5.577		
10,300.0	6,458.7	7,048.0	6,456.3	72.3	49.0	-89.40		3,289.4	-374.0	532.0	440.6	91.40	5.821		
10,400.0	6,457.9	7,045.8	6,454.2	74.2	49.0	-89.15		3,289.4	-374.0	580.2	486.9	93.23	6.223		
10,500.0	6,457.1	7,043.7	6,452.0	76.1	49.0	-88.90		3,289.5	-374.0	640.4	545.3	95.06	6.736		
10,600.0	6,456.4	7,041.5	6,449.8	77.9	49.0	-88.64		3,289.5	-374.0	709.6	612.7	96.89	7.324		
10,700.0	6,455.6	7,039.3	6,447.6	79.8	49.0	-88.38		3,289.5	-374.0	785.5	686.8	98.72	7.957		
10,800.0	6,454.8	7,037.1	6,445.4	81.7	49.0	-88.12		3,289.5	-374.0	866.3	765.8	100.55	8.616		
10,900.0	6,454.1	7,034.9	6,443.2	83.6	49.0	-87.86		3,289.6	-374.0	950.8	848.4	102.38	9.287		
10,909.7	6,454.0	7,034.7	6,443.0	83.8	49.0	-87.84		3,289.6	-374.0	959.2	856.6	102.56	9.352		

<b>Company:</b>	PETROLEUM DEVELOPMENT CORP Weld County CO	<b>Local Co-ordinate Reference:</b>	Well R&R Farms 291-321
<b>Project:</b>	SEC.29-T5N-R63W	<b>TVD Reference:</b>	WELL @ 4587.0ft (RKB - 13')
<b>Reference Site:</b>	R&R Farms 5N63W29L Pad Sec.29-T5N-R63W	<b>MD Reference:</b>	WELL @ 4587.0ft (RKB - 13')
<b>Site Error:</b>	0.0ft	<b>North Reference:</b>	True
<b>Reference Well:</b>	R&R Farms 291-321	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.0ft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	Wellbore #1	<b>Database:</b>	Landmark
<b>Reference Design:</b>	Plan #3 (4-10-15)	<b>Offset TVD Reference:</b>	Offset Datum

Offset Design R&R Farms 5N63W29L Pad Sec.29-T5N-R63W - R&R Farms 291-221 - Wellbore #1 - Plan #2 (4-10-15)												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 (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)	Minimum Separation (ft)		Separation Factor
0.0	0.0	0.0	0.0	0.0	0.0	-90.02	0.0	-30.7	30.7				
100.0	100.0	100.0	100.0	0.1	0.1	-90.02	0.0	-30.7	30.7	30.4	0.22	136.379	
200.0	200.0	200.0	200.0	0.3	0.3	-90.02	0.0	-30.7	30.7	30.0	0.67	45.460	
300.0	300.0	300.0	300.0	0.6	0.6	-90.02	0.0	-30.7	30.7	29.5	1.12	27.276	
400.0	400.0	400.0	400.0	0.8	0.8	-90.02	0.0	-30.7	30.7	29.1	1.57	19.483	
500.0	500.0	500.0	500.0	1.0	1.0	-90.02	0.0	-30.7	30.7	28.6	2.02	15.153	
600.0	600.0	600.0	600.0	1.2	1.2	-90.02	0.0	-30.7	30.7	28.2	2.47	12.398	
700.0	700.0	700.0	700.0	1.5	1.5	-90.02	0.0	-30.7	30.7	27.7	2.92	10.491	
800.0	800.0	800.0	800.0	1.7	1.7	-90.02	0.0	-30.7	30.7	27.3	3.37	9.092	
900.0	900.0	900.0	900.0	1.9	1.9	-90.02	0.0	-30.7	30.7	26.8	3.82	8.022	
1,000.0	1,000.0	1,000.0	1,000.0	2.1	2.1	-90.02	0.0	-30.7	30.7	26.4	4.27	7.178 CC	
1,100.0	1,100.0	1,100.0	1,100.0	2.3	2.4	102.24	0.0	-30.7	30.8	26.1	4.69	6.571 ES	
1,200.0	1,200.0	1,200.0	1,200.0	2.5	2.6	106.89	0.0	-30.7	31.5	26.4	5.09	6.185	
1,300.0	1,299.9	1,299.9	1,299.9	2.7	2.8	112.63	-0.9	-30.8	32.9	27.5	5.47	6.019	
1,400.0	1,399.7	1,399.9	1,399.9	2.9	3.0	117.56	-3.5	-31.0	35.2	29.3	5.83	6.025	
1,500.0	1,499.4	1,500.0	1,499.9	3.1	3.1	121.57	-7.8	-31.5	38.1	31.9	6.22	6.127	
1,600.0	1,598.9	1,600.1	1,599.8	3.3	3.3	124.66	-13.9	-32.2	41.6	35.0	6.62	6.293	
1,700.0	1,698.3	1,700.3	1,699.6	3.6	3.5	126.93	-21.7	-33.1	45.8	38.7	7.04	6.501	
1,800.0	1,797.4	1,800.4	1,799.3	3.8	3.7	128.52	-31.2	-34.2	50.4	42.9	7.48	6.731	
1,900.0	1,896.3	1,900.7	1,898.9	4.1	4.0	129.56	-42.5	-35.5	55.5	47.5	7.96	6.970	
2,000.0	1,995.1	2,000.9	1,998.3	4.4	4.2	129.49	-55.5	-36.9	60.4	51.9	8.47	7.130	
2,100.0	2,093.9	2,101.2	2,097.5	4.7	4.5	127.99	-70.3	-38.6	64.7	55.6	9.02	7.168	
2,200.0	2,192.7	2,201.3	2,196.2	5.0	4.8	125.55	-86.4	-40.4	68.5	58.9	9.62	7.124	
2,300.0	2,291.4	2,301.2	2,294.8	5.4	5.1	123.26	-102.7	-42.2	72.4	62.2	10.24	7.073	
2,400.0	2,390.2	2,401.0	2,393.3	5.7	5.4	121.21	-118.9	-44.1	76.4	65.6	10.88	7.024	
2,500.0	2,489.0	2,500.9	2,491.8	6.0	5.7	119.37	-135.2	-45.9	80.5	69.0	11.54	6.978	
2,600.0	2,587.8	2,600.8	2,590.4	6.4	6.1	117.71	-151.4	-47.7	84.7	72.5	12.22	6.935	
2,700.0	2,686.6	2,700.7	2,688.9	6.7	6.4	116.20	-167.6	-49.6	89.0	76.1	12.90	6.895	
2,800.0	2,785.4	2,800.6	2,787.5	7.1	6.7	114.84	-183.9	-51.4	93.2	79.7	13.60	6.858	
2,900.0	2,884.1	2,900.5	2,886.0	7.4	7.1	113.59	-200.1	-53.3	97.6	83.3	14.30	6.825	
3,000.0	2,982.9	3,000.3	2,984.5	7.8	7.4	112.45	-216.4	-55.1	102.0	87.0	15.01	6.794	
3,100.0	3,081.7	3,100.2	3,083.1	8.1	7.8	111.41	-232.6	-56.9	106.4	90.7	15.73	6.766	
3,200.0	3,180.5	3,200.1	3,181.6	8.5	8.2	110.44	-248.8	-58.8	110.9	94.4	16.45	6.740	
3,300.0	3,279.3	3,300.0	3,280.1	8.8	8.5	109.56	-265.1	-60.6	115.3	98.2	17.17	6.717	
3,400.0	3,378.1	3,399.9	3,378.7	9.2	8.9	108.74	-281.3	-62.4	119.9	102.0	17.90	6.696	
3,500.0	3,476.8	3,499.8	3,477.2	9.6	9.2	107.98	-297.6	-64.3	124.4	105.8	18.63	6.676	
3,600.0	3,575.6	3,599.7	3,575.8	9.9	9.6	107.27	-313.8	-66.1	128.9	109.6	19.37	6.658	
3,700.0	3,674.4	3,699.5	3,674.3	10.3	10.0	106.61	-330.1	-67.9	133.5	113.4	20.10	6.642	
3,800.0	3,773.2	3,799.4	3,772.8	10.7	10.3	105.99	-346.3	-69.8	138.1	117.3	20.84	6.627	
3,900.0	3,872.0	3,899.3	3,871.4	11.0	10.7	105.42	-362.5	-71.6	142.7	121.1	21.58	6.614	
4,000.0	3,970.8	3,999.2	3,969.9	11.4	11.1	104.88	-378.8	-73.4	147.3	125.0	22.32	6.601	
4,100.0	4,069.5	4,099.1	4,068.4	11.7	11.5	104.37	-395.0	-75.3	152.0	128.9	23.06	6.590	
4,200.0	4,168.3	4,199.0	4,167.0	12.1	11.8	103.90	-411.3	-77.1	156.6	132.8	23.80	6.579	
4,300.0	4,267.1	4,298.8	4,265.5	12.5	12.2	103.45	-427.5	-78.9	161.2	136.7	24.55	6.569	
4,400.0	4,365.9	4,398.7	4,364.1	12.9	12.6	103.02	-443.8	-80.8	165.9	140.6	25.29	6.560	
4,500.0	4,464.7	4,498.6	4,462.6	13.2	13.0	102.62	-460.0	-82.6	170.6	144.5	26.04	6.552	
4,600.0	4,563.5	4,598.5	4,561.1	13.6	13.3	102.24	-476.2	-84.4	175.2	148.5	26.78	6.544	
4,700.0	4,662.3	4,698.4	4,659.7	14.0	13.7	101.88	-492.5	-86.3	179.9	152.4	27.53	6.537	
4,800.0	4,761.0	4,798.3	4,758.2	14.3	14.1	101.54	-508.7	-88.1	184.6	156.3	28.27	6.530	
4,900.0	4,859.8	4,898.1	4,856.7	14.7	14.5	101.22	-525.0	-89.9	189.3	160.3	29.02	6.523	
5,000.0	4,958.6	4,998.0	4,955.3	15.1	14.9	100.91	-541.2	-91.8	194.0	164.3	29.77	6.518	

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

<b>Company:</b>	PETROLEUM DEVELOPMENT CORP Weld County CO	<b>Local Co-ordinate Reference:</b>	Well R&R Farms 291-321
<b>Project:</b>	SEC.29-T5N-R63W	<b>TVD Reference:</b>	WELL @ 4587.0ft (RKB - 13')
<b>Reference Site:</b>	R&R Farms 5N63W29L Pad Sec.29-T5N-R63W	<b>MD Reference:</b>	WELL @ 4587.0ft (RKB - 13')
<b>Site Error:</b>	0.0ft	<b>North Reference:</b>	True
<b>Reference Well:</b>	R&R Farms 291-321	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.0ft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	Wellbore #1	<b>Database:</b>	Landmark
<b>Reference Design:</b>	Plan #3 (4-10-15)	<b>Offset TVD Reference:</b>	Offset Datum

Offset Design R&R Farms 5N63W29L Pad Sec.29-T5N-R63W - R&R Farms 291-221 - Wellbore #1 - Plan #2 (4-10-15)											Offset Site Error:		0.0 ft
Survey Program: 0-MWD											Offset Well Error:		0.0 ft
Reference		Offset		Semi Major Axis			Distance						
Measured Depth	Vertical Depth	Measured Depth	Vertical Depth	Reference	Offset	Highside Toolface	Offset Wellbore Centre		Between Centres	Between Ellipses	Minimum Separation	Separation Factor	Warning
Depth (ft)	Depth (ft)	Depth (ft)	Depth (ft)	(ft)	(ft)	(°)	+N/-S (ft)	+E/-W (ft)	(ft)	(ft)	(ft)		
5,100.0	5,057.4	5,098.1	5,054.0	15.4	15.2	100.64	-557.4	-93.6	198.7	168.2	30.50	6.515	
5,200.0	5,156.4	5,198.8	5,153.7	15.7	15.5	100.65	-571.2	-95.2	202.8	171.8	31.02	6.538	
5,300.0	5,255.9	5,299.5	5,253.9	15.9	15.7	100.65	-581.6	-96.3	205.9	174.4	31.47	6.541	
5,400.0	5,355.7	5,400.3	5,354.5	16.1	15.9	100.65	-588.4	-97.1	207.9	176.0	31.86	6.524	
5,500.0	5,455.6	5,501.1	5,455.2	16.3	16.1	100.66	-591.8	-97.5	208.9	176.7	32.19	6.488	
5,600.0	5,555.6	5,601.5	5,555.6	16.4	16.2	-90.00	-592.1	-97.5	209.0	176.5	32.49	6.431	
5,700.0	5,655.6	5,701.5	5,655.6	16.6	16.4	-90.00	-592.1	-97.5	209.0	176.2	32.76	6.378	
5,705.0	5,660.6	5,706.5	5,660.6	16.6	16.4	-90.00	-592.1	-97.5	209.0	176.2	32.78	6.376	
5,800.0	5,755.6	5,801.0	5,754.8	16.7	16.4	-88.43	-585.6	-97.5	209.0	176.1	32.95	6.344	
5,900.0	5,854.9	5,899.4	5,851.3	16.7	16.4	-86.15	-566.5	-97.5	209.4	176.5	32.90	6.366	
6,000.0	5,951.9	5,996.7	5,943.5	16.6	16.3	-83.95	-535.6	-97.5	210.1	177.5	32.63	6.440	
6,100.0	6,044.9	6,093.2	6,030.3	16.5	16.1	-81.88	-493.7	-97.5	211.1	178.9	32.18	6.560	
6,200.0	6,132.4	6,188.7	6,110.4	16.3	15.8	-79.97	-441.7	-97.5	212.2	180.6	31.61	6.715	
6,300.0	6,212.9	6,283.5	6,182.8	16.0	15.6	-78.25	-380.6	-97.5	213.5	182.5	31.00	6.886	
6,400.0	6,284.9	6,377.6	6,246.7	15.8	15.4	-76.73	-311.6	-97.5	214.7	184.3	30.44	7.053	
6,500.0	6,347.2	6,471.1	6,301.3	15.6	15.3	-75.44	-235.7	-97.5	215.9	185.9	30.04	7.188	
6,600.0	6,398.9	6,564.2	6,346.0	15.6	15.3	-74.39	-154.2	-97.5	217.0	187.1	29.89	7.260	
6,700.0	6,438.9	6,656.8	6,380.4	15.7	15.4	-73.58	-68.2	-97.5	217.9	187.8	30.07	7.246	
6,800.0	6,466.6	6,750.0	6,404.2	16.0	15.8	-73.02	21.8	-97.5	218.5	187.9	30.64	7.132	
6,900.0	6,481.5	6,841.4	6,416.8	16.5	16.3	-72.73	112.3	-97.5	218.8	187.2	31.61	6.924	
7,000.0	6,484.0	6,935.9	6,418.9	17.2	17.0	-72.69	206.7	-97.5	218.9	185.9	32.98	6.636	
7,100.0	6,483.3	7,035.9	6,418.3	18.1	17.9	-72.73	306.7	-97.5	218.8	184.1	34.71	6.304	
7,200.0	6,482.5	7,135.9	6,417.7	19.2	18.9	-72.77	406.7	-97.5	218.8	182.1	36.73	5.957	
7,300.0	6,481.7	7,235.9	6,417.1	20.3	20.1	-72.80	506.7	-97.5	218.7	179.8	39.00	5.610	
7,400.0	6,481.0	7,335.9	6,416.4	21.6	21.4	-72.84	606.7	-97.5	218.7	177.2	41.47	5.274	
7,500.0	6,480.2	7,435.9	6,415.8	23.0	22.8	-72.88	706.7	-97.5	218.7	174.5	44.11	4.957	
7,600.0	6,479.4	7,535.9	6,415.2	24.4	24.2	-72.92	806.7	-97.5	218.6	171.7	46.90	4.661	
7,700.0	6,478.6	7,635.9	6,414.6	25.9	25.7	-72.96	906.7	-97.5	218.6	168.8	49.81	4.388	
7,800.0	6,477.9	7,735.9	6,414.0	27.5	27.3	-73.00	1,006.7	-97.5	218.5	165.7	52.82	4.137	
7,900.0	6,477.1	7,835.9	6,413.4	29.1	28.9	-73.04	1,106.7	-97.5	218.5	162.6	55.92	3.907	
8,000.0	6,476.3	7,935.9	6,412.8	30.7	30.5	-73.08	1,206.7	-97.5	218.4	159.3	59.08	3.697	
8,100.0	6,475.6	8,035.9	6,412.2	32.4	32.2	-73.12	1,306.7	-97.5	218.4	156.1	62.31	3.505	
8,200.0	6,474.8	8,135.9	6,411.6	34.1	33.9	-73.16	1,406.7	-97.5	218.3	152.7	65.59	3.329	
8,300.0	6,474.0	8,235.9	6,410.9	35.8	35.6	-73.20	1,506.7	-97.5	218.3	149.4	68.91	3.168	
8,400.0	6,473.3	8,335.9	6,410.3	37.5	37.4	-73.24	1,606.7	-97.5	218.2	146.0	72.27	3.020	
8,500.0	6,472.5	8,435.9	6,409.7	39.3	39.1	-73.28	1,706.7	-97.5	218.2	142.5	75.67	2.884	
8,600.0	6,471.7	8,535.9	6,409.1	41.1	40.9	-73.32	1,806.7	-97.5	218.2	139.1	79.09	2.758	
8,700.0	6,471.0	8,635.9	6,408.5	42.8	42.7	-73.36	1,906.7	-97.5	218.1	135.6	82.55	2.642	
8,800.0	6,470.2	8,735.9	6,407.9	44.6	44.5	-73.40	2,006.7	-97.5	218.1	132.0	86.02	2.535	
8,900.0	6,469.4	8,835.9	6,407.3	46.4	46.3	-73.44	2,106.7	-97.5	218.0	128.5	89.52	2.436	
9,000.0	6,468.7	8,935.9	6,406.7	48.2	48.1	-73.48	2,206.7	-97.5	218.0	124.9	93.03	2.343	
9,100.0	6,467.9	9,035.9	6,406.1	50.1	49.9	-73.51	2,306.7	-97.5	217.9	121.4	96.56	2.257	
9,200.0	6,467.1	9,135.9	6,405.4	51.9	51.7	-73.55	2,406.7	-97.5	217.9	117.8	100.10	2.177	
9,300.0	6,466.4	9,235.9	6,404.8	53.7	53.6	-73.59	2,506.7	-97.5	217.8	114.2	103.66	2.101	
9,400.0	6,465.6	9,335.9	6,404.2	55.6	55.4	-73.63	2,606.7	-97.5	217.8	110.6	107.23	2.031	
9,500.0	6,464.8	9,435.9	6,403.6	57.4	57.3	-73.67	2,706.7	-97.5	217.8	106.9	110.82	1.965	
9,600.0	6,464.1	9,535.9	6,403.0	59.3	59.1	-73.71	2,806.7	-97.5	217.7	103.3	114.41	1.903	
9,700.0	6,463.3	9,635.9	6,402.4	61.1	61.0	-73.75	2,906.7	-97.5	217.7	99.7	118.01	1.844	
9,800.0	6,462.5	9,735.9	6,401.8	63.0	62.8	-73.79	3,006.7	-97.5	217.6	96.0	121.62	1.789	
9,900.0	6,461.8	9,835.9	6,401.2	64.8	64.7	-73.83	3,106.7	-97.5	217.6	92.3	125.24	1.737	

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



<b>Company:</b>	PETROLEUM DEVELOPMENT CORP Weld County CO	<b>Local Co-ordinate Reference:</b>	Well R&R Farms 29I-321
<b>Project:</b>	SEC.29-T5N-R63W	<b>TVD Reference:</b>	WELL @ 4587.0ft (RKB - 13')
<b>Reference Site:</b>	R&R Farms 5N63W29L Pad Sec.29-T5N-R63W	<b>MD Reference:</b>	WELL @ 4587.0ft (RKB - 13')
<b>Site Error:</b>	0.0ft	<b>North Reference:</b>	True
<b>Reference Well:</b>	R&R Farms 29I-321	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.0ft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	Wellbore #1	<b>Database:</b>	Landmark
<b>Reference Design:</b>	Plan #3 (4-10-15)	<b>Offset TVD Reference:</b>	Offset Datum

<b>Offset Design</b>													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	
10,000.0	6,461.0	9,935.9	6,400.6	66.7	66.6	-73.87	3,206.7	-97.5	217.5	88.7	128.87	1.688		
10,100.0	6,460.2	10,035.9	6,399.9	68.6	68.4	-73.91	3,306.7	-97.5	217.5	85.0	132.50	1.641		
10,200.0	6,459.5	10,135.9	6,399.3	70.4	70.3	-73.95	3,406.7	-97.5	217.4	81.3	136.14	1.597		
10,300.0	6,458.7	10,235.9	6,398.7	72.3	72.2	-73.99	3,506.7	-97.5	217.4	77.6	139.78	1.555		
10,400.0	6,457.9	10,335.9	6,398.1	74.2	74.1	-74.03	3,606.7	-97.5	217.4	73.9	143.44	1.515		
10,500.0	6,457.1	10,435.9	6,397.5	76.1	75.9	-74.07	3,706.7	-97.5	217.3	70.2	147.09	1.477	Level 3	
10,600.0	6,456.4	10,535.9	6,396.9	77.9	77.8	-74.11	3,806.7	-97.5	217.3	66.5	150.76	1.441	Level 3	
10,700.0	6,455.6	10,635.9	6,396.3	79.8	79.7	-74.15	3,906.7	-97.5	217.2	62.8	154.42	1.407	Level 3	
10,800.0	6,454.8	10,735.9	6,395.7	81.7	81.6	-74.19	4,006.7	-97.5	217.2	59.1	158.09	1.374	Level 3	
10,900.0	6,454.1	10,835.9	6,395.1	83.6	83.5	-74.23	4,106.6	-97.5	217.1	55.4	161.77	1.342	Level 3	
10,909.7	6,454.0	10,845.6	6,395.0	83.8	83.7	-74.23	4,116.4	-97.5	217.1	55.0	162.13	1.339	Level 3, SF	



<b>Company:</b>	PETROLEUM DEVELOPMENT CORP Weld County CO	<b>Local Co-ordinate Reference:</b>	Well R&R Farms 29I-321
<b>Project:</b>	SEC.29-T5N-R63W	<b>TVD Reference:</b>	WELL @ 4587.0ft (RKB - 13')
<b>Reference Site:</b>	R&R Farms 5N63W29L Pad Sec.29-T5N-R63W	<b>MD Reference:</b>	WELL @ 4587.0ft (RKB - 13')
<b>Site Error:</b>	0.0ft	<b>North Reference:</b>	True
<b>Reference Well:</b>	R&R Farms 29I-321	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.0ft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	Wellbore #1	<b>Database:</b>	Landmark
<b>Reference Design:</b>	Plan #3 (4-10-15)	<b>Offset TVD Reference:</b>	Offset Datum

Offset Design R&R Farms 5N63W29L Pad Sec.29-T5N-R63W - R&R Farms 29I-401 - Wellbore #1 - Plan #2 (4-10-15)												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)	+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	-90.01	0.0	-61.3	61.3	61.3	0.00	N/A	
100.0	100.0	101.0	101.0	0.1	0.1	-90.01	0.0	-61.3	61.3	61.1	0.23	270.057	
200.0	200.0	201.0	201.0	0.3	0.3	-90.01	0.0	-61.3	61.3	60.6	0.68	90.617	
300.0	300.0	301.0	301.0	0.6	0.6	-90.01	0.0	-61.3	61.3	60.2	1.13	54.443	
400.0	400.0	401.0	401.0	0.8	0.8	-90.01	0.0	-61.3	61.3	59.7	1.58	38.910	
500.0	500.0	501.0	501.0	1.0	1.0	-90.01	0.0	-61.3	61.3	59.3	2.03	30.273	
600.0	600.0	601.0	601.0	1.2	1.2	-90.01	0.0	-61.3	61.3	58.8	2.47	24.774	
700.0	700.0	701.0	701.0	1.5	1.5	-90.01	0.0	-61.3	61.3	58.4	2.92	20.965	
766.3	766.3	767.3	767.3	1.6	1.6	-90.01	0.0	-61.3	61.3	58.1	3.22	19.025 CC	
800.0	800.0	801.0	801.0	1.7	1.7	-90.01	0.0	-61.3	61.3	57.9	3.37	18.173	
900.0	900.0	900.6	900.6	1.9	1.9	-90.78	-0.8	-61.6	61.6	57.8	3.79	16.242 ES	
1,000.0	1,000.0	1,000.0	1,000.0	2.1	2.1	-92.99	-3.3	-62.6	62.7	58.5	4.20	14.931	
1,100.0	1,100.0	1,099.6	1,099.5	2.3	2.3	94.90	-7.3	-64.1	64.6	60.0	4.58	14.109	
1,200.0	1,200.0	1,199.0	1,198.7	2.5	2.5	92.48	-13.0	-66.3	67.7	62.7	4.95	13.659	
1,300.0	1,299.9	1,298.3	1,297.6	2.7	2.7	90.48	-20.2	-69.1	71.7	66.4	5.35	13.412	
1,400.0	1,399.7	1,397.4	1,396.3	2.9	2.9	88.90	-29.0	-72.5	76.8	71.0	5.76	13.317	
1,500.0	1,499.4	1,496.5	1,494.8	3.1	3.1	87.71	-39.5	-76.5	82.7	76.5	6.21	13.333	
1,600.0	1,598.9	1,595.4	1,592.8	3.3	3.4	86.88	-51.4	-81.1	89.6	83.0	6.68	13.426	
1,700.0	1,698.3	1,694.4	1,690.8	3.6	3.7	86.37	-65.0	-86.4	97.4	90.2	7.18	13.564	
1,800.0	1,797.4	1,794.1	1,789.3	3.8	4.0	86.64	-79.0	-91.8	105.3	97.6	7.72	13.646	
1,900.0	1,896.3	1,893.7	1,887.8	4.1	4.3	87.76	-93.1	-97.2	113.2	104.9	8.29	13.649	
2,000.0	1,995.1	1,993.4	1,986.3	4.4	4.6	89.16	-107.2	-102.7	121.1	112.2	8.90	13.610	
2,100.0	2,093.9	2,093.0	2,084.8	4.7	5.0	90.40	-121.2	-108.1	129.1	119.5	9.52	13.555	
2,200.0	2,192.7	2,192.7	2,183.3	5.0	5.3	91.49	-135.3	-113.5	137.1	126.9	10.16	13.492	
2,300.0	2,291.4	2,292.3	2,281.8	5.4	5.6	92.45	-149.4	-118.9	145.1	134.3	10.81	13.425	
2,400.0	2,390.2	2,392.0	2,380.3	5.7	6.0	93.32	-163.4	-124.4	153.2	141.7	11.47	13.357	
2,500.0	2,489.0	2,491.6	2,478.8	6.0	6.3	94.10	-177.5	-129.8	161.3	149.2	12.14	13.290	
2,600.0	2,587.8	2,591.3	2,577.3	6.4	6.7	94.80	-191.6	-135.2	169.5	156.7	12.82	13.224	
2,700.0	2,686.6	2,690.9	2,675.8	6.7	7.0	95.44	-205.6	-140.6	177.7	164.2	13.50	13.161	
2,800.0	2,785.4	2,790.6	2,774.3	7.1	7.4	96.03	-219.7	-146.1	185.8	171.7	14.19	13.101	
2,900.0	2,884.1	2,890.2	2,872.8	7.4	7.7	96.56	-233.8	-151.5	194.1	179.2	14.88	13.043	
3,000.0	2,982.9	2,989.9	2,971.3	7.8	8.1	97.05	-247.8	-156.9	202.3	186.7	15.57	12.989	
3,100.0	3,081.7	3,089.5	3,069.8	8.1	8.4	97.51	-261.9	-162.4	210.5	194.2	16.27	12.937	
3,200.0	3,180.5	3,189.2	3,168.3	8.5	8.8	97.92	-276.0	-167.8	218.8	201.8	16.97	12.888	
3,300.0	3,279.3	3,288.8	3,266.8	8.8	9.2	98.31	-290.0	-173.2	227.0	209.4	17.68	12.842	
3,400.0	3,378.1	3,388.4	3,365.3	9.2	9.5	98.67	-304.1	-178.6	235.3	216.9	18.38	12.799	
3,500.0	3,476.8	3,488.1	3,463.8	9.6	9.9	99.01	-318.2	-184.1	243.6	224.5	19.09	12.758	
3,600.0	3,575.6	3,587.7	3,562.3	9.9	10.2	99.32	-332.2	-189.5	251.9	232.1	19.80	12.719	
3,700.0	3,674.4	3,687.4	3,660.8	10.3	10.6	99.62	-346.3	-194.9	260.2	239.6	20.51	12.682	
3,800.0	3,773.2	3,787.0	3,759.3	10.7	11.0	99.89	-360.4	-200.4	268.5	247.2	21.23	12.648	
3,900.0	3,872.0	3,886.7	3,857.8	11.0	11.3	100.15	-374.4	-205.8	276.8	254.8	21.94	12.615	
4,000.0	3,970.8	3,986.3	3,956.3	11.4	11.7	100.40	-388.5	-211.2	285.1	262.4	22.66	12.584	
4,100.0	4,069.5	4,086.0	4,054.8	11.7	12.0	100.63	-402.6	-216.6	293.4	270.0	23.37	12.554	
4,200.0	4,168.3	4,185.6	4,153.3	12.1	12.4	100.84	-416.6	-222.1	301.7	277.6	24.09	12.526	
4,300.0	4,267.1	4,285.3	4,251.8	12.5	12.8	101.05	-430.7	-227.5	310.0	285.2	24.81	12.499	
4,400.0	4,365.9	4,384.9	4,350.3	12.9	13.1	101.25	-444.8	-232.9	318.4	292.9	25.52	12.474	
4,500.0	4,464.7	4,484.6	4,448.8	13.2	13.5	101.43	-458.8	-238.4	326.7	300.5	26.24	12.450	
4,600.0	4,563.5	4,584.2	4,547.3	13.6	13.9	101.61	-472.9	-243.8	335.0	308.1	26.96	12.427	
4,700.0	4,662.3	4,683.9	4,645.8	14.0	14.2	101.77	-487.0	-249.2	343.4	315.7	27.68	12.405	
4,800.0	4,761.0	4,783.5	4,744.3	14.3	14.6	101.93	-501.0	-254.6	351.7	323.3	28.40	12.384	
4,900.0	4,859.8	4,883.2	4,842.8	14.7	15.0	102.09	-515.1	-260.1	360.1	330.9	29.12	12.364	

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

<b>Company:</b>	PETROLEUM DEVELOPMENT CORP Weld County CO	<b>Local Co-ordinate Reference:</b>	Well R&R Farms 29I-321
<b>Project:</b>	SEC.29-T5N-R63W	<b>TVD Reference:</b>	WELL @ 4587.0ft (RKB - 13')
<b>Reference Site:</b>	R&R Farms 5N63W29L Pad Sec.29-T5N-R63W	<b>MD Reference:</b>	WELL @ 4587.0ft (RKB - 13')
<b>Site Error:</b>	0.0ft	<b>North Reference:</b>	True
<b>Reference Well:</b>	R&R Farms 29I-321	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.0ft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	Wellbore #1	<b>Database:</b>	Landmark
<b>Reference Design:</b>	Plan #3 (4-10-15)	<b>Offset TVD Reference:</b>	Offset Datum

Offset Design R&R Farms 5N63W29L Pad Sec.29-T5N-R63W - R&R Farms 29I-401 - Wellbore #1 - Plan #2 (4-10-15)											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 (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)	Minimum Separation (ft)	Separation Factor	
5,000.0	4,958.6	4,982.8	4,941.3	15.1	15.3	102.23	-529.2	-265.5	368.4	338.6	29.84	12.344	
5,100.0	5,057.4	5,082.4	5,039.8	15.4	15.7	102.37	-543.2	-270.9	376.8	346.2	30.57	12.326	
5,200.0	5,156.4	5,182.1	5,138.3	15.7	16.0	102.39	-557.3	-276.3	384.7	353.5	31.18	12.339	
5,300.0	5,255.9	5,285.2	5,240.4	15.9	16.4	102.01	-571.0	-281.6	391.6	359.9	31.72	12.347	
5,400.0	5,355.7	5,389.9	5,344.5	16.1	16.6	101.58	-581.5	-285.7	396.7	364.5	32.14	12.342	
5,500.0	5,455.6	5,494.9	5,449.2	16.3	16.8	101.12	-588.4	-288.3	399.8	367.3	32.49	12.304	
5,600.0	5,555.6	5,600.1	5,554.3	16.4	17.0	-89.95	-591.8	-289.6	401.1	368.3	32.80	12.228	
5,700.0	5,655.6	5,702.4	5,656.6	16.6	17.1	-90.00	-592.1	-289.8	401.2	368.1	33.09	12.126	
5,753.8	5,709.4	5,756.2	5,710.4	16.6	17.2	-90.10	-592.1	-289.8	401.2	368.0	33.23	12.076	
5,800.0	5,755.6	5,802.4	5,756.6	16.7	17.3	-90.12	-592.1	-289.8	401.2	367.9	33.35	12.032	
5,900.0	5,854.9	5,902.4	5,856.6	16.7	17.4	-91.46	-590.4	-289.8	401.4	367.9	33.46	11.994	
6,000.0	5,951.9	6,003.9	5,957.1	16.6	17.4	-93.02	-577.0	-289.8	401.8	368.4	33.35	12.046	
6,100.0	6,044.9	6,106.9	6,056.4	16.5	17.3	-94.53	-549.9	-289.8	402.5	369.5	33.04	12.182	
6,200.0	6,132.4	6,211.5	6,152.6	16.3	17.1	-95.97	-509.0	-289.8	403.4	370.9	32.56	12.389	
6,300.0	6,212.9	6,317.6	6,243.5	16.0	16.9	-97.31	-454.5	-289.8	404.5	372.5	32.00	12.641	
6,400.0	6,284.9	6,425.1	6,327.0	15.8	16.6	-98.52	-386.9	-289.8	405.7	374.3	31.45	12.902	
6,500.0	6,347.2	6,533.9	6,401.1	15.6	16.3	-99.58	-307.3	-289.8	406.9	375.9	31.01	13.121	
6,600.0	6,398.9	6,644.0	6,463.7	15.6	16.1	-100.46	-216.9	-289.8	408.0	377.2	30.82	13.239	
6,700.0	6,438.9	6,755.0	6,513.1	15.7	16.1	-101.14	-117.6	-289.8	408.9	378.0	30.98	13.201	
6,800.0	6,466.6	6,866.8	6,547.7	16.0	16.3	-101.62	-11.4	-289.8	409.6	378.1	31.57	12.975	
6,900.0	6,481.5	6,979.1	6,566.5	16.5	16.7	-101.88	99.2	-289.8	410.0	377.4	32.62	12.570	
7,000.0	6,484.0	7,087.1	6,570.0	17.2	17.5	-101.96	207.1	-289.8	410.1	376.1	34.06	12.043	
7,100.0	6,483.3	7,187.1	6,570.0	18.1	18.3	-102.06	307.1	-289.8	410.3	374.5	35.78	11.468	
7,200.0	6,482.5	7,287.1	6,570.0	19.2	19.4	-102.17	407.1	-289.8	410.4	372.7	37.79	10.861	
7,300.0	6,481.7	7,387.1	6,570.0	20.3	20.5	-102.27	507.1	-289.8	410.6	370.6	40.05	10.251	
7,400.0	6,481.0	7,487.1	6,570.0	21.6	21.8	-102.38	607.1	-289.8	410.8	368.2	42.53	9.659	
7,500.0	6,480.2	7,587.1	6,570.0	23.0	23.2	-102.48	707.1	-289.8	410.9	365.8	45.18	9.096	
7,600.0	6,479.4	7,687.1	6,570.0	24.4	24.6	-102.59	807.1	-289.8	411.1	363.1	47.97	8.569	
7,700.0	6,478.6	7,787.1	6,570.0	25.9	26.1	-102.69	907.1	-289.8	411.3	360.4	50.89	8.081	
7,800.0	6,477.9	7,887.1	6,570.0	27.5	27.7	-102.79	1,007.1	-289.8	411.4	357.5	53.91	7.632	
7,900.0	6,477.1	7,987.1	6,570.0	29.1	29.2	-102.90	1,107.1	-289.8	411.6	354.6	57.01	7.220	
8,000.0	6,476.3	8,087.1	6,570.0	30.7	30.9	-103.00	1,207.1	-289.8	411.8	351.6	60.18	6.842	
8,100.0	6,475.6	8,187.1	6,570.0	32.4	32.5	-103.11	1,307.1	-289.8	412.0	348.5	63.41	6.496	
8,200.0	6,474.8	8,287.1	6,570.0	34.1	34.2	-103.21	1,407.1	-289.8	412.1	345.4	66.70	6.179	
8,300.0	6,474.0	8,387.1	6,570.0	35.8	35.9	-103.32	1,507.1	-289.8	412.3	342.3	70.02	5.888	
8,400.0	6,473.3	8,487.1	6,570.0	37.5	37.7	-103.42	1,607.1	-289.8	412.5	339.1	73.38	5.621	
8,500.0	6,472.5	8,587.1	6,570.0	39.3	39.4	-103.52	1,707.1	-289.8	412.7	335.9	76.78	5.375	
8,600.0	6,471.7	8,687.1	6,570.0	41.1	41.2	-103.63	1,807.1	-289.8	412.8	332.6	80.20	5.148	
8,700.0	6,471.0	8,787.1	6,570.0	42.8	42.9	-103.73	1,907.1	-289.8	413.0	329.4	83.64	4.938	
8,800.0	6,470.2	8,887.1	6,570.0	44.6	44.7	-103.83	2,007.1	-289.8	413.2	326.1	87.10	4.744	
8,900.0	6,469.4	8,987.1	6,570.0	46.4	46.5	-103.94	2,107.1	-289.8	413.4	322.8	90.58	4.564	
9,000.0	6,468.7	9,087.1	6,570.0	48.2	48.3	-104.04	2,207.1	-289.8	413.6	319.5	94.08	4.396	
9,100.0	6,467.9	9,187.1	6,570.0	50.1	50.1	-104.14	2,307.1	-289.8	413.8	316.2	97.59	4.240	
9,200.0	6,467.1	9,287.1	6,570.0	51.9	52.0	-104.25	2,407.1	-289.8	414.0	312.8	101.11	4.094	
9,300.0	6,466.4	9,387.1	6,570.0	53.7	53.8	-104.35	2,507.1	-289.8	414.1	309.5	104.64	3.958	
9,400.0	6,465.6	9,487.1	6,570.0	55.6	55.6	-104.45	2,607.1	-289.8	414.3	306.2	108.18	3.830	
9,500.0	6,464.8	9,587.1	6,570.0	57.4	57.5	-104.55	2,707.1	-289.8	414.5	302.8	111.72	3.710	
9,600.0	6,464.1	9,687.0	6,570.0	59.3	59.3	-104.66	2,807.0	-289.8	414.7	299.4	115.28	3.598	
9,700.0	6,463.3	9,787.0	6,570.0	61.1	61.2	-104.76	2,907.0	-289.8	414.9	296.1	118.83	3.492	
9,800.0	6,462.5	9,887.0	6,570.0	63.0	63.0	-104.86	3,007.0	-289.8	415.1	292.7	122.40	3.392	

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

<b>Company:</b>	PETROLEUM DEVELOPMENT CORP Weld County CO	<b>Local Co-ordinate Reference:</b>	Well R&R Farms 29I-321
<b>Project:</b>	SEC.29-T5N-R63W	<b>TVD Reference:</b>	WELL @ 4587.0ft (RKB - 13')
<b>Reference Site:</b>	R&R Farms 5N63W29L Pad Sec.29-T5N-R63W	<b>MD Reference:</b>	WELL @ 4587.0ft (RKB - 13')
<b>Site Error:</b>	0.0ft	<b>North Reference:</b>	True
<b>Reference Well:</b>	R&R Farms 29I-321	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.0ft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	Wellbore #1	<b>Database:</b>	Landmark
<b>Reference Design:</b>	Plan #3 (4-10-15)	<b>Offset TVD Reference:</b>	Offset Datum

<b>Offset Design</b>													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)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning	
9,900.0	6,461.8	9,987.0	6,570.0	64.8	64.9	-104.96	3,107.0	-289.8	415.3	289.3	125.96	3.297		
10,000.0	6,461.0	10,087.0	6,570.0	66.7	66.7	-105.07	3,207.0	-289.8	415.5	286.0	129.53	3.208		
10,100.0	6,460.2	10,187.0	6,570.0	68.6	68.6	-105.17	3,307.0	-289.8	415.7	282.6	133.10	3.123		
10,200.0	6,459.5	10,287.0	6,570.0	70.4	70.5	-105.27	3,407.0	-289.8	415.9	279.2	136.68	3.043		
10,300.0	6,458.7	10,387.0	6,570.0	72.3	72.3	-105.37	3,507.0	-289.8	416.1	275.9	140.26	2.967		
10,400.0	6,457.9	10,487.0	6,570.0	74.2	74.2	-105.48	3,607.0	-289.8	416.3	272.5	143.83	2.894		
10,500.0	6,457.1	10,587.0	6,570.0	76.1	76.1	-105.58	3,707.0	-289.8	416.5	269.1	147.41	2.826		
10,600.0	6,456.4	10,687.0	6,570.0	77.9	78.0	-105.68	3,807.0	-289.8	416.7	265.7	150.99	2.760		
10,700.0	6,455.6	10,787.0	6,570.0	79.8	79.9	-105.78	3,907.0	-289.8	416.9	262.4	154.57	2.697		
10,800.0	6,454.8	10,887.0	6,570.0	81.7	81.7	-105.88	4,007.0	-289.8	417.1	259.0	158.15	2.638		
10,900.0	6,454.1	10,987.0	6,570.0	83.6	83.6	-105.98	4,107.0	-289.8	417.4	255.6	161.73	2.581		
10,909.7	6,454.0	10,996.7	6,570.0	83.8	83.8	-105.99	4,116.7	-289.8	417.4	255.3	162.08	2.575 SF		

<b>Company:</b>	PETROLEUM DEVELOPMENT CORP Weld County CO	<b>Local Co-ordinate Reference:</b>	Well R&R Farms 29L-321
<b>Project:</b>	SEC.29-T5N-R63W	<b>TVD Reference:</b>	WELL @ 4587.0ft (RKB - 13')
<b>Reference Site:</b>	R&R Farms 5N63W29L Pad Sec.29-T5N-R63W	<b>MD Reference:</b>	WELL @ 4587.0ft (RKB - 13')
<b>Site Error:</b>	0.0ft	<b>North Reference:</b>	True
<b>Reference Well:</b>	R&R Farms 29L-321	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.0ft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	Wellbore #1	<b>Database:</b>	Landmark
<b>Reference Design:</b>	Plan #3 (4-10-15)	<b>Offset TVD Reference:</b>	Offset Datum

Offset Design R&R Farms 5N63W29L Pad Sec.29-T5N-R63W - R&R Farms 29L-241 - Wellbore #1 - Plan #2 (4-9-15)												Offset Site Error: 0.0 ft	
Survey Program: 0-MWDD												Offset Well Error: 0.0 ft	
Reference		Offset		Semi Major Axis			Distance						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)	Minimum Separation (ft)	Separation Factor	
0.0	0.0	0.0	0.0	0.0	0.0	90.02	0.0	30.7	30.7				
100.0	100.0	100.0	100.0	0.1	0.1	90.02	0.0	30.7	30.7	30.4	0.22	136.379	
200.0	200.0	200.0	200.0	0.3	0.3	90.02	0.0	30.7	30.7	30.0	0.67	45.460	
300.0	300.0	300.0	300.0	0.6	0.6	90.02	0.0	30.7	30.7	29.5	1.12	27.276	
400.0	400.0	400.0	400.0	0.8	0.8	90.02	0.0	30.7	30.7	29.1	1.57	19.483	
500.0	500.0	500.0	500.0	1.0	1.0	90.02	0.0	30.7	30.7	28.6	2.02	15.153	
600.0	600.0	600.0	600.0	1.2	1.2	90.02	0.0	30.7	30.7	28.2	2.47	12.398	
700.0	700.0	700.0	700.0	1.5	1.5	90.02	0.0	30.7	30.7	27.7	2.92	10.491	
800.0	800.0	800.0	800.0	1.7	1.7	90.02	0.0	30.7	30.7	27.3	3.37	9.092 CC, ES	
900.0	900.0	899.7	899.7	1.9	1.9	91.41	-0.8	31.1	31.1	27.3	3.79	8.193	
1,000.0	1,000.0	999.4	999.4	2.1	2.1	95.37	-3.0	32.3	32.5	28.3	4.20	7.738	
1,100.0	1,100.0	1,099.0	1,098.9	2.3	2.3	-69.43	-6.8	34.4	34.8	30.2	4.58	7.596	
1,200.0	1,200.0	1,198.5	1,198.2	2.5	2.5	-65.96	-12.1	37.4	37.8	32.8	4.96	7.625	
1,300.0	1,299.9	1,298.0	1,297.3	2.7	2.7	-63.45	-18.9	41.2	41.3	36.0	5.35	7.730	
1,400.0	1,399.7	1,397.3	1,396.2	2.9	2.9	-61.78	-27.2	45.8	45.4	39.6	5.75	7.882	
1,500.0	1,499.4	1,496.6	1,494.9	3.1	3.2	-60.78	-37.0	51.2	49.9	43.7	6.18	8.061	
1,600.0	1,598.9	1,595.8	1,593.3	3.3	3.4	-60.31	-48.3	57.4	54.8	48.1	6.64	8.251	
1,700.0	1,698.3	1,694.9	1,691.3	3.6	3.7	-60.25	-61.0	64.5	60.1	53.0	7.12	8.444	
1,800.0	1,797.4	1,794.2	1,789.2	3.8	4.0	-60.53	-75.2	72.4	65.8	58.2	7.64	8.623	
1,900.0	1,896.3	1,894.1	1,887.7	4.1	4.4	-61.75	-89.8	80.5	71.1	62.9	8.19	8.676	
2,000.0	1,995.1	1,993.9	1,986.1	4.4	4.7	-63.35	-104.5	88.7	76.0	67.2	8.78	8.649	
2,100.0	2,093.9	2,093.8	2,084.5	4.7	5.1	-64.77	-119.2	96.8	80.9	71.5	9.40	8.610	
2,200.0	2,192.7	2,193.6	2,183.0	5.0	5.4	-66.02	-133.9	105.0	85.9	75.9	10.03	8.565	
2,300.0	2,291.4	2,293.5	2,281.4	5.4	5.8	-67.13	-148.5	113.1	91.0	80.3	10.68	8.515	
2,400.0	2,390.2	2,393.3	2,379.9	5.7	6.1	-68.12	-163.2	121.3	96.0	84.7	11.34	8.465	
2,500.0	2,489.0	2,493.2	2,478.3	6.0	6.5	-69.02	-177.9	129.4	101.1	89.1	12.02	8.414	
2,600.0	2,587.8	2,593.1	2,576.7	6.4	6.9	-69.83	-192.5	137.6	106.2	93.5	12.70	8.364	
2,700.0	2,686.6	2,692.9	2,675.2	6.7	7.3	-70.56	-207.2	145.7	111.4	98.0	13.39	8.316	
2,800.0	2,785.4	2,792.8	2,773.6	7.1	7.6	-71.23	-221.9	153.9	116.5	102.4	14.09	8.270	
2,900.0	2,884.1	2,892.6	2,872.0	7.4	8.0	-71.84	-236.6	162.0	121.7	106.9	14.79	8.226	
3,000.0	2,982.9	2,992.5	2,970.5	7.8	8.4	-72.41	-251.2	170.2	126.8	111.3	15.50	8.184	
3,100.0	3,081.7	3,092.4	3,068.9	8.1	8.8	-72.92	-265.9	178.3	132.0	115.8	16.21	8.144	
3,200.0	3,180.5	3,192.2	3,167.4	8.5	9.2	-73.40	-280.6	186.4	137.2	120.3	16.93	8.106	
3,300.0	3,279.3	3,292.1	3,265.8	8.8	9.6	-73.85	-295.2	194.6	142.4	124.8	17.65	8.070	
3,400.0	3,378.1	3,391.9	3,364.2	9.2	9.9	-74.26	-309.9	202.7	147.6	129.3	18.37	8.036	
3,500.0	3,476.8	3,491.8	3,462.7	9.6	10.3	-74.65	-324.6	210.9	152.9	133.8	19.10	8.004	
3,600.0	3,575.6	3,591.6	3,561.1	9.9	10.7	-75.01	-339.3	219.0	158.1	138.3	19.83	7.973	
3,700.0	3,674.4	3,691.5	3,659.5	10.3	11.1	-75.34	-353.9	227.2	163.3	142.8	20.56	7.944	
3,800.0	3,773.2	3,791.4	3,758.0	10.7	11.5	-75.66	-368.6	235.3	168.6	147.3	21.29	7.917	
3,900.0	3,872.0	3,891.2	3,856.4	11.0	11.9	-75.96	-383.3	243.5	173.8	151.8	22.02	7.891	
4,000.0	3,970.8	3,991.1	3,954.9	11.4	12.3	-76.23	-398.0	251.6	179.0	156.3	22.76	7.867	
4,100.0	4,069.5	4,090.9	4,053.3	11.7	12.7	-76.50	-412.6	259.8	184.3	160.8	23.50	7.844	
4,200.0	4,168.3	4,190.8	4,151.7	12.1	13.1	-76.75	-427.3	267.9	189.5	165.3	24.23	7.821	
4,300.0	4,267.1	4,290.7	4,250.2	12.5	13.5	-76.98	-442.0	276.1	194.8	169.8	24.97	7.800	
4,400.0	4,365.9	4,390.5	4,348.6	12.9	13.8	-77.20	-456.6	284.2	200.1	174.4	25.71	7.780	
4,500.0	4,464.7	4,490.4	4,447.1	13.2	14.2	-77.42	-471.3	292.3	205.3	178.9	26.46	7.761	
4,600.0	4,563.5	4,590.2	4,545.5	13.6	14.6	-77.62	-486.0	300.5	210.6	183.4	27.20	7.743	
4,700.0	4,662.3	4,690.1	4,643.9	14.0	15.0	-77.81	-500.7	308.6	215.9	187.9	27.94	7.726	
4,800.0	4,761.0	4,789.9	4,742.4	14.3	15.4	-77.99	-515.3	316.8	221.1	192.5	28.68	7.709	
4,900.0	4,859.8	4,889.8	4,840.8	14.7	15.8	-78.16	-530.0	324.9	226.4	197.0	29.43	7.693	
5,000.0	4,958.6	4,989.7	4,939.2	15.1	16.2	-78.33	-544.7	333.1	231.7	201.5	30.17	7.678	

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

<b>Company:</b>	PETROLEUM DEVELOPMENT CORP Weld County CO	<b>Local Co-ordinate Reference:</b>	Well R&R Farms 29L-321
<b>Project:</b>	SEC.29-T5N-R63W	<b>TVD Reference:</b>	WELL @ 4587.0ft (RKB - 13')
<b>Reference Site:</b>	R&R Farms 5N63W29L Pad Sec.29-T5N-R63W	<b>MD Reference:</b>	WELL @ 4587.0ft (RKB - 13')
<b>Site Error:</b>	0.0ft	<b>North Reference:</b>	True
<b>Reference Well:</b>	R&R Farms 29L-321	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.0ft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	Wellbore #1	<b>Database:</b>	Landmark
<b>Reference Design:</b>	Plan #3 (4-10-15)	<b>Offset TVD Reference:</b>	Offset Datum

Offset Design R&R Farms 5N63W29L Pad Sec.29-T5N-R63W - R&R Farms 29L-241 - Wellbore #1 - Plan #2 (4-9-15)											Offset Site Error:		0.0 ft
Survey Program: 0-MWDD											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)		
5,100.0	5,057.4	5,090.4	5,038.5	15.4	16.6	-78.51	-559.4	341.3	236.9	206.0	30.91	7.665	
5,200.0	5,156.4	5,194.5	5,141.6	15.7	16.9	-78.85	-572.4	348.5	241.3	209.9	31.45	7.674	
5,300.0	5,255.9	5,298.8	5,245.3	15.9	17.1	-79.09	-582.2	353.9	244.6	212.7	31.91	7.665	
5,400.0	5,355.7	5,403.1	5,349.4	16.1	17.3	-79.25	-588.6	357.5	246.8	214.5	32.31	7.639	
5,500.0	5,455.6	5,507.5	5,453.7	16.3	17.5	-79.33	-591.8	359.2	247.9	215.2	32.64	7.595	
5,600.0	5,555.6	5,609.5	5,555.6	16.4	17.6	90.00	-592.1	359.4	248.0	215.0	32.93	7.530	
5,700.0	5,655.6	5,709.5	5,655.6	16.6	17.7	90.00	-592.1	359.4	248.0	214.8	33.20	7.469	
5,705.0	5,660.6	5,714.4	5,660.6	16.6	17.7	90.00	-592.1	359.4	248.0	214.8	33.21	7.467	
5,800.0	5,755.6	5,809.0	5,754.8	16.7	17.8	88.67	-585.6	359.4	248.0	214.5	33.51	7.402	
5,900.0	5,854.9	5,907.4	5,851.3	16.7	17.8	86.75	-566.5	359.4	248.4	214.7	33.65	7.382	
6,000.0	5,951.9	6,004.7	5,943.5	16.6	17.6	84.90	-535.6	359.4	249.0	215.4	33.55	7.421	
6,100.0	6,044.9	6,101.1	6,030.3	16.5	17.4	83.15	-493.7	359.4	249.8	216.5	33.25	7.512	
6,200.0	6,132.4	6,196.7	6,110.4	16.3	17.2	81.52	-441.7	359.4	250.7	217.9	32.79	7.645	
6,300.0	6,212.9	6,291.5	6,182.8	16.0	16.9	80.06	-380.6	359.4	251.8	219.5	32.26	7.804	
6,400.0	6,284.9	6,385.6	6,246.7	15.8	16.7	78.76	-311.6	359.4	252.8	221.1	31.75	7.964	
6,500.0	6,347.2	6,479.1	6,301.3	15.6	16.5	77.65	-235.7	359.4	253.9	222.5	31.35	8.096	
6,600.0	6,398.9	6,572.1	6,346.0	15.6	16.3	76.75	-154.2	359.4	254.8	223.6	31.19	8.169	
6,700.0	6,438.9	6,664.8	6,380.4	15.7	16.3	76.05	-68.2	359.4	255.5	224.2	31.34	8.153	
6,800.0	6,466.6	6,757.2	6,404.0	16.0	16.4	75.57	21.0	359.4	256.1	224.2	31.88	8.032	
6,900.0	6,481.5	6,850.0	6,416.8	16.5	16.8	75.32	112.9	359.4	256.3	223.5	32.83	7.807	
6,908.3	6,482.2	6,857.0	6,417.3	16.6	16.8	75.30	119.9	359.4	256.4	223.4	32.94	7.784	
7,000.0	6,484.0	6,943.9	6,418.9	17.2	17.4	75.28	206.7	359.4	256.4	222.2	34.20	7.496	
7,100.0	6,483.3	7,043.9	6,418.3	18.1	18.3	75.32	306.7	359.4	256.3	220.4	35.94	7.133	
7,200.0	6,482.5	7,143.9	6,417.7	19.2	19.3	75.35	406.7	359.4	256.3	218.3	37.96	6.752	
7,300.0	6,481.7	7,243.9	6,417.1	20.3	20.5	75.38	506.7	359.4	256.3	216.0	40.23	6.371	
7,400.0	6,481.0	7,343.9	6,416.4	21.6	21.8	75.42	606.7	359.4	256.2	213.5	42.70	6.000	
7,500.0	6,480.2	7,443.9	6,415.8	23.0	23.2	75.45	706.7	359.4	256.2	210.8	45.35	5.649	
7,600.0	6,479.4	7,543.9	6,415.2	24.4	24.6	75.49	806.7	359.4	256.2	208.0	48.15	5.320	
7,700.0	6,478.6	7,643.9	6,414.6	25.9	26.1	75.52	906.7	359.4	256.1	205.0	51.06	5.016	
7,800.0	6,477.9	7,743.9	6,414.0	27.5	27.7	75.55	1,006.7	359.4	256.1	202.0	54.08	4.735	
7,900.0	6,477.1	7,843.9	6,413.4	29.1	29.3	75.59	1,106.7	359.4	256.0	198.8	57.19	4.477	
8,000.0	6,476.3	7,943.9	6,412.8	30.7	30.9	75.62	1,206.7	359.4	256.0	195.6	60.37	4.241	
8,100.0	6,475.6	8,043.9	6,412.2	32.4	32.5	75.66	1,306.7	359.4	256.0	192.3	63.61	4.024	
8,200.0	6,474.8	8,143.9	6,411.6	34.1	34.2	75.69	1,406.7	359.4	255.9	189.0	66.90	3.825	
8,300.0	6,474.0	8,243.9	6,410.9	35.8	35.9	75.72	1,506.7	359.4	255.9	185.6	70.24	3.643	
8,400.0	6,473.3	8,343.9	6,410.3	37.5	37.7	75.76	1,606.7	359.4	255.8	182.2	73.62	3.475	
8,500.0	6,472.5	8,443.9	6,409.7	39.3	39.4	75.79	1,706.7	359.4	255.8	178.8	77.04	3.321	
8,600.0	6,471.7	8,543.9	6,409.1	41.1	41.2	75.83	1,806.7	359.4	255.8	175.3	80.48	3.178	
8,700.0	6,471.0	8,643.9	6,408.5	42.8	42.9	75.86	1,906.7	359.4	255.7	171.8	83.95	3.046	
8,800.0	6,470.2	8,743.9	6,407.9	44.6	44.7	75.89	2,006.7	359.4	255.7	168.2	87.45	2.924	
8,900.0	6,469.4	8,843.9	6,407.3	46.4	46.5	75.93	2,106.7	359.4	255.6	164.7	90.97	2.810	
9,000.0	6,468.7	8,943.9	6,406.7	48.2	48.3	75.96	2,206.7	359.4	255.6	161.1	94.50	2.705	
9,100.0	6,467.9	9,043.9	6,406.1	50.1	50.1	76.00	2,306.7	359.4	255.6	157.5	98.06	2.606	
9,200.0	6,467.1	9,143.9	6,405.4	51.9	52.0	76.03	2,406.7	359.4	255.5	153.9	101.63	2.514	
9,300.0	6,466.4	9,243.9	6,404.8	53.7	53.8	76.07	2,506.7	359.4	255.5	150.3	105.21	2.428	
9,400.0	6,465.6	9,343.9	6,404.2	55.6	55.6	76.10	2,606.7	359.4	255.5	146.7	108.80	2.348	
9,500.0	6,464.8	9,443.9	6,403.6	57.4	57.5	76.13	2,706.7	359.4	255.4	143.0	112.41	2.272	
9,600.0	6,464.1	9,543.9	6,403.0	59.3	59.3	76.17	2,806.7	359.4	255.4	139.4	116.03	2.201	
9,700.0	6,463.3	9,643.9	6,402.4	61.1	61.2	76.20	2,906.7	359.4	255.3	135.7	119.65	2.134	
9,800.0	6,462.5	9,743.9	6,401.8	63.0	63.0	76.24	3,006.7	359.4	255.3	132.0	123.29	2.071	

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

<b>Company:</b>	PETROLEUM DEVELOPMENT CORP Weld County CO	<b>Local Co-ordinate Reference:</b>	Well R&R Farms 29I-321
<b>Project:</b>	SEC.29-T5N-R63W	<b>TVD Reference:</b>	WELL @ 4587.0ft (RKB - 13')
<b>Reference Site:</b>	R&R Farms 5N63W29L Pad Sec.29-T5N-R63W	<b>MD Reference:</b>	WELL @ 4587.0ft (RKB - 13')
<b>Site Error:</b>	0.0ft	<b>North Reference:</b>	True
<b>Reference Well:</b>	R&R Farms 29I-321	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.0ft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	Wellbore #1	<b>Database:</b>	Landmark
<b>Reference Design:</b>	Plan #3 (4-10-15)	<b>Offset TVD Reference:</b>	Offset Datum

<b>Offset Design</b>													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	
9,900.0	6,461.8	9,843.9	6,401.2	64.8	64.9	76.27	3,106.7	359.4	255.3	128.3	126.93	2.011		
10,000.0	6,461.0	9,943.9	6,400.6	66.7	66.7	76.30	3,206.7	359.4	255.2	124.7	130.58	1.955		
10,100.0	6,460.2	10,043.9	6,399.9	68.6	68.6	76.34	3,306.7	359.4	255.2	121.0	134.24	1.901		
10,200.0	6,459.5	10,143.9	6,399.3	70.4	70.5	76.37	3,406.7	359.4	255.2	117.3	137.90	1.850		
10,300.0	6,458.7	10,243.9	6,398.7	72.3	72.3	76.41	3,506.7	359.4	255.1	113.5	141.57	1.802		
10,400.0	6,457.9	10,343.9	6,398.1	74.2	74.2	76.44	3,606.7	359.4	255.1	109.8	145.25	1.756		
10,500.0	6,457.1	10,443.9	6,397.5	76.1	76.1	76.48	3,706.7	359.4	255.0	106.1	148.93	1.713		
10,600.0	6,456.4	10,543.9	6,396.9	77.9	78.0	76.51	3,806.7	359.4	255.0	102.4	152.62	1.671		
10,700.0	6,455.6	10,643.9	6,396.3	79.8	79.8	76.54	3,906.7	359.4	255.0	98.7	156.31	1.631		
10,800.0	6,454.8	10,743.9	6,395.7	81.7	81.7	76.58	4,006.7	359.4	254.9	94.9	160.00	1.593		
10,900.0	6,454.1	10,843.9	6,395.1	83.6	83.6	76.61	4,106.6	359.4	254.9	91.2	163.70	1.557		
10,909.7	6,454.0	10,853.6	6,395.0	83.8	83.8	76.62	4,116.4	359.4	254.9	90.8	164.06	1.554 SF		



<b>Company:</b>	PETROLEUM DEVELOPMENT CORP Weld County CO	<b>Local Co-ordinate Reference:</b>	Well R&R Farms 29L-321
<b>Project:</b>	SEC.29-T5N-R63W	<b>TVD Reference:</b>	WELL @ 4587.0ft (RKB - 13')
<b>Reference Site:</b>	R&R Farms 5N63W29L Pad Sec.29-T5N-R63W	<b>MD Reference:</b>	WELL @ 4587.0ft (RKB - 13')
<b>Site Error:</b>	0.0ft	<b>North Reference:</b>	True
<b>Reference Well:</b>	R&R Farms 29L-321	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.0ft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	Wellbore #1	<b>Database:</b>	Landmark
<b>Reference Design:</b>	Plan #3 (4-10-15)	<b>Offset TVD Reference:</b>	Offset Datum

Offset Design R&R Farms 5N63W29L Pad Sec.29-T5N-R63W - R&R Farms 29L-301 - Wellbore #1 - Plan #2 (4-9-15)											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 (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)	Minimum Separation (ft)	Separation Factor	
0.0	0.0	0.0	0.0	0.0	0.0	90.00	0.0	89.2	89.2				
100.0	100.0	100.0	100.0	0.1	0.1	90.00	0.0	89.2	89.2	88.9	0.22	396.738	
200.0	200.0	200.0	200.0	0.3	0.3	90.00	0.0	89.2	89.2	88.5	0.67	132.246	CC, ES
300.0	300.0	298.8	298.8	0.6	0.5	90.34	-0.5	89.8	89.8	88.7	1.10	81.511	
400.0	400.0	397.5	397.5	0.8	0.7	91.35	-2.2	91.8	91.9	90.3	1.53	60.061	
500.0	500.0	496.2	496.0	1.0	1.0	92.92	-4.9	95.1	95.3	93.3	1.97	48.403	
600.0	600.0	594.6	594.3	1.2	1.2	94.94	-8.6	99.7	100.2	97.8	2.41	41.496	
700.0	700.0	692.8	692.2	1.5	1.4	97.25	-13.4	105.5	106.7	103.8	2.87	37.232	
800.0	800.0	790.8	789.7	1.7	1.7	99.72	-19.3	112.7	114.8	111.5	3.32	34.591	
900.0	900.0	888.3	886.7	1.9	2.0	102.20	-26.2	121.1	124.6	120.8	3.77	33.019	
1,000.0	1,000.0	985.5	983.1	2.1	2.3	104.62	-34.1	130.7	136.2	131.9	4.23	32.189	
1,100.0	1,100.0	1,082.4	1,078.9	2.3	2.6	-62.62	-43.0	141.6	149.1	144.4	4.69	31.756	
1,200.0	1,200.0	1,178.9	1,174.1	2.5	3.0	-61.15	-52.9	153.7	162.9	157.8	5.11	31.845	
1,300.0	1,299.9	1,275.1	1,268.8	2.7	3.3	-60.19	-63.8	166.9	177.5	171.9	5.55	31.975	
1,400.0	1,399.7	1,371.0	1,362.9	2.9	3.7	-59.63	-75.6	181.4	192.7	186.7	6.00	32.118	
1,500.0	1,499.4	1,468.9	1,458.7	3.1	4.1	-59.41	-88.5	197.0	208.3	201.9	6.48	32.167	
1,600.0	1,598.9	1,567.8	1,555.4	3.3	4.6	-59.60	-101.5	212.9	223.1	216.1	6.97	32.000	
1,700.0	1,698.3	1,666.8	1,652.2	3.6	5.0	-60.13	-114.6	228.8	237.0	229.5	7.49	31.630	
1,800.0	1,797.4	1,765.9	1,749.1	3.8	5.5	-60.94	-127.6	244.7	250.1	242.1	8.04	31.096	
1,900.0	1,896.3	1,865.0	1,846.1	4.1	5.9	-62.01	-140.6	260.6	262.5	253.8	8.63	30.423	
2,000.0	1,995.1	1,964.1	1,943.0	4.4	6.3	-63.22	-153.7	276.5	274.6	265.3	9.24	29.712	
2,100.0	2,093.9	2,063.2	2,040.0	4.7	6.8	-64.33	-166.8	292.4	286.8	276.9	9.87	29.048	
2,200.0	2,192.7	2,162.3	2,136.9	5.0	7.3	-65.35	-179.8	308.3	299.1	288.6	10.52	28.432	
2,300.0	2,291.4	2,261.4	2,233.9	5.4	7.7	-66.28	-192.9	324.2	311.5	300.3	11.18	27.862	
2,400.0	2,390.2	2,360.5	2,330.8	5.7	8.2	-67.15	-205.9	340.1	323.9	312.1	11.85	27.335	
2,500.0	2,489.0	2,459.6	2,427.8	6.0	8.6	-67.95	-219.0	356.0	336.5	323.9	12.53	26.850	
2,600.0	2,587.8	2,558.7	2,524.7	6.4	9.1	-68.70	-232.0	371.9	349.1	335.8	13.22	26.402	
2,700.0	2,686.6	2,657.8	2,621.6	6.7	9.5	-69.39	-245.1	387.9	361.7	347.8	13.92	25.989	
2,800.0	2,785.4	2,756.9	2,718.6	7.1	10.0	-70.03	-258.1	403.8	374.4	359.8	14.62	25.607	
2,900.0	2,884.1	2,856.0	2,815.5	7.4	10.4	-70.64	-271.2	419.7	387.2	371.8	15.33	25.254	
3,000.0	2,982.9	2,955.1	2,912.5	7.8	10.9	-71.20	-284.2	435.6	399.9	383.9	16.04	24.927	
3,100.0	3,081.7	3,054.2	3,009.4	8.1	11.4	-71.73	-297.3	451.5	412.7	396.0	16.76	24.623	
3,200.0	3,180.5	3,153.3	3,106.4	8.5	11.8	-72.23	-310.3	467.4	425.6	408.1	17.48	24.341	
3,300.0	3,279.3	3,252.4	3,203.3	8.8	12.3	-72.70	-323.4	483.3	438.5	420.3	18.21	24.078	
3,400.0	3,378.1	3,351.5	3,300.3	9.2	12.7	-73.14	-336.4	499.2	451.4	432.4	18.94	23.833	
3,500.0	3,476.8	3,450.7	3,397.2	9.6	13.2	-73.55	-349.5	515.1	464.3	444.6	19.67	23.604	
3,600.0	3,575.6	3,549.8	3,494.2	9.9	13.6	-73.95	-362.5	531.0	477.3	456.9	20.41	23.389	
3,700.0	3,674.4	3,648.9	3,591.1	10.3	14.1	-74.32	-375.6	546.9	490.2	469.1	21.14	23.189	
3,800.0	3,773.2	3,748.0	3,688.1	10.7	14.6	-74.68	-388.6	562.8	503.2	481.4	21.88	23.000	
3,900.0	3,872.0	3,847.1	3,785.0	11.0	15.0	-75.01	-401.7	578.7	516.2	493.6	22.62	22.823	
4,000.0	3,970.8	3,946.2	3,881.9	11.4	15.5	-75.33	-414.7	594.6	529.3	505.9	23.36	22.656	
4,100.0	4,069.5	4,045.3	3,978.9	11.7	15.9	-75.64	-427.8	610.5	542.3	518.2	24.11	22.498	
4,200.0	4,168.3	4,144.4	4,075.8	12.1	16.4	-75.93	-440.8	626.5	555.4	530.5	24.85	22.349	
4,300.0	4,267.1	4,243.5	4,172.8	12.5	16.9	-76.21	-453.9	642.4	568.5	542.9	25.60	22.209	
4,400.0	4,365.9	4,342.6	4,269.7	12.9	17.3	-76.47	-466.9	658.3	581.5	555.2	26.34	22.076	
4,500.0	4,464.7	4,441.7	4,366.7	13.2	17.8	-76.72	-480.0	674.2	594.6	567.5	27.09	21.949	
4,600.0	4,563.5	4,540.8	4,463.6	13.6	18.3	-76.97	-493.0	690.1	607.7	579.9	27.84	21.829	
4,700.0	4,662.3	4,639.9	4,560.6	14.0	18.7	-77.20	-506.1	706.0	620.9	592.3	28.59	21.715	
4,800.0	4,761.0	4,739.0	4,657.5	14.3	19.2	-77.42	-519.2	721.9	634.0	604.6	29.34	21.607	
4,900.0	4,859.8	4,838.1	4,754.5	14.7	19.6	-77.63	-532.2	737.8	647.1	617.0	30.09	21.504	
5,000.0	4,958.6	4,937.2	4,851.4	15.1	20.1	-77.84	-545.3	753.7	660.3	629.4	30.85	21.405	

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

<b>Company:</b>	PETROLEUM DEVELOPMENT CORP Weld County CO	<b>Local Co-ordinate Reference:</b>	Well R&R Farms 29L-321
<b>Project:</b>	SEC.29-T5N-R63W	<b>TVD Reference:</b>	WELL @ 4587.0ft (RKB - 13')
<b>Reference Site:</b>	R&R Farms 5N63W29L Pad Sec.29-T5N-R63W	<b>MD Reference:</b>	WELL @ 4587.0ft (RKB - 13')
<b>Site Error:</b>	0.0ft	<b>North Reference:</b>	True
<b>Reference Well:</b>	R&R Farms 29L-321	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.0ft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	Wellbore #1	<b>Database:</b>	Landmark
<b>Reference Design:</b>	Plan #3 (4-10-15)	<b>Offset TVD Reference:</b>	Offset Datum

Offset Design R&R Farms 5N63W29L Pad Sec.29-T5N-R63W - R&R Farms 29L-301 - Wellbore #1 - Plan #2 (4-9-15)												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 (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)	Minimum Separation (ft)		Separation Factor
5,100.0	5,057.4	5,046.2	4,958.1	15.4	20.5	-78.09	-559.3	770.8	673.1	641.5	31.59	21.310	
5,200.0	5,156.4	5,168.1	5,078.3	15.7	20.9	-78.60	-572.3	786.7	683.5	651.3	32.19	21.234	
5,300.0	5,255.9	5,290.6	5,199.7	15.9	21.2	-78.97	-582.1	798.6	691.4	658.7	32.71	21.134	
5,400.0	5,355.7	5,413.5	5,322.2	16.1	21.4	-79.21	-588.6	806.5	696.6	663.4	33.15	21.014	
5,500.0	5,455.6	5,536.7	5,445.3	16.3	21.6	-79.33	-591.8	810.4	699.1	665.6	33.50	20.868	
5,600.0	5,555.6	5,647.0	5,555.6	16.4	21.7	90.00	-592.1	810.8	699.3	665.6	33.80	20.692	
5,700.0	5,655.6	5,747.0	5,655.6	16.6	21.8	90.00	-592.1	810.8	699.3	665.3	34.06	20.534	
5,746.2	5,701.8	5,793.2	5,701.8	16.6	21.9	90.04	-592.1	810.8	699.4	665.2	34.17	20.467	
5,800.0	5,755.6	5,847.0	5,755.6	16.7	21.9	89.98	-591.0	810.8	699.3	665.0	34.31	20.385	
5,900.0	5,854.9	5,946.9	5,854.7	16.7	21.9	89.92	-579.2	810.8	699.4	665.0	34.37	20.345	
6,000.0	5,951.9	6,046.7	5,951.4	16.6	21.9	89.86	-554.6	810.8	699.4	665.1	34.22	20.434	
6,100.0	6,044.9	6,146.5	6,043.9	16.5	21.7	89.81	-517.6	810.8	699.4	665.5	33.90	20.631	
6,200.0	6,132.4	6,246.1	6,130.8	16.3	21.5	89.76	-468.9	810.8	699.4	665.9	33.45	20.905	
6,300.0	6,212.9	6,345.7	6,210.6	16.0	21.3	89.71	-409.4	810.8	699.4	666.4	32.97	21.215	
6,400.0	6,284.9	6,445.2	6,281.9	15.8	21.0	89.67	-340.1	810.8	699.4	666.8	32.52	21.503	
6,500.0	6,347.2	6,544.6	6,343.5	15.6	20.7	89.63	-262.2	810.8	699.4	667.1	32.22	21.704	
6,600.0	6,398.9	6,644.0	6,394.5	15.6	20.4	89.60	-177.0	810.8	699.4	667.2	32.16	21.746	
6,700.0	6,438.9	6,743.4	6,434.0	15.7	20.1	89.58	-85.9	810.8	699.4	667.0	32.41	21.577	
6,800.0	6,466.6	6,842.7	6,461.4	16.0	19.8	89.56	9.5	810.8	699.4	666.3	33.03	21.173	
6,900.0	6,481.5	6,942.0	6,476.1	16.5	19.6	89.55	107.7	810.8	699.4	665.3	34.03	20.553	
7,000.0	6,484.0	7,041.5	6,478.6	17.2	19.5	89.55	207.1	810.8	699.4	664.0	35.39	19.760	
7,100.0	6,483.3	7,141.5	6,478.0	18.1	19.7	89.57	307.1	810.8	699.4	662.3	37.10	18.853	
7,200.0	6,482.5	7,241.5	6,477.3	19.2	20.6	89.58	407.1	810.8	699.4	660.3	39.10	17.888	
7,300.0	6,481.7	7,341.5	6,476.7	20.3	21.8	89.59	507.1	810.8	699.4	658.0	41.36	16.910	
7,400.0	6,481.0	7,441.5	6,476.1	21.6	23.0	89.60	607.1	810.8	699.4	655.5	43.84	15.953	
7,500.0	6,480.2	7,541.5	6,475.4	23.0	24.4	89.61	707.1	810.8	699.4	652.9	46.51	15.038	
7,600.0	6,479.4	7,641.5	6,474.8	24.4	25.8	89.62	807.1	810.8	699.4	650.0	49.33	14.178	
7,700.0	6,478.6	7,741.5	6,474.2	25.9	27.3	89.63	907.1	810.8	699.4	647.1	52.28	13.377	
7,800.0	6,477.9	7,841.5	6,473.6	27.5	28.8	89.65	1,007.1	810.8	699.4	644.0	55.34	12.637	
7,900.0	6,477.1	7,941.5	6,472.9	29.1	30.3	89.66	1,107.1	810.8	699.4	640.9	58.49	11.956	
8,000.0	6,476.3	8,041.5	6,472.3	30.7	31.9	89.67	1,207.1	810.8	699.4	637.6	61.72	11.331	
8,100.0	6,475.6	8,141.5	6,471.7	32.4	33.5	89.68	1,307.1	810.8	699.4	634.3	65.02	10.756	
8,200.0	6,474.8	8,241.5	6,471.0	34.1	35.2	89.69	1,407.1	810.8	699.4	631.0	68.37	10.228	
8,300.0	6,474.0	8,341.5	6,470.4	35.8	36.9	89.70	1,507.1	810.8	699.4	627.6	71.78	9.744	
8,400.0	6,473.3	8,441.5	6,469.8	37.5	38.6	89.71	1,607.1	810.8	699.4	624.1	75.22	9.297	
8,500.0	6,472.5	8,541.5	6,469.2	39.3	40.3	89.73	1,707.1	810.8	699.4	620.7	78.70	8.886	
8,600.0	6,471.7	8,641.5	6,468.5	41.1	42.0	89.74	1,807.1	810.8	699.4	617.1	82.21	8.506	
8,700.0	6,471.0	8,741.5	6,467.9	42.8	43.7	89.75	1,907.1	810.8	699.4	613.6	85.76	8.155	
8,800.0	6,470.2	8,841.5	6,467.3	44.6	45.5	89.76	2,007.1	810.8	699.4	610.0	89.32	7.830	
8,900.0	6,469.4	8,941.5	6,466.7	46.4	47.3	89.77	2,107.1	810.8	699.4	606.4	92.91	7.527	
9,000.0	6,468.7	9,041.5	6,466.0	48.2	49.0	89.78	2,207.0	810.8	699.4	602.8	96.52	7.246	
9,100.0	6,467.9	9,141.5	6,465.4	50.1	50.8	89.79	2,307.0	810.8	699.4	599.2	100.14	6.984	
9,200.0	6,467.1	9,241.5	6,464.8	51.9	52.6	89.81	2,407.0	810.8	699.4	595.6	103.78	6.739	
9,300.0	6,466.4	9,341.5	6,464.1	53.7	54.4	89.82	2,507.0	810.8	699.4	591.9	107.43	6.510	
9,400.0	6,465.6	9,441.5	6,463.5	55.6	56.2	89.83	2,607.0	810.8	699.4	588.3	111.10	6.295	
9,500.0	6,464.8	9,541.5	6,462.9	57.4	58.1	89.84	2,707.0	810.8	699.4	584.6	114.78	6.093	
9,600.0	6,464.1	9,641.5	6,462.3	59.3	59.9	89.85	2,807.0	810.8	699.4	580.9	118.47	5.903	
9,700.0	6,463.3	9,741.5	6,461.6	61.1	61.7	89.86	2,907.0	810.8	699.4	577.2	122.16	5.725	
9,800.0	6,462.5	9,841.5	6,461.0	63.0	63.5	89.87	3,007.0	810.8	699.4	573.5	125.87	5.556	
9,900.0	6,461.8	9,941.5	6,460.4	64.8	65.4	89.89	3,107.0	810.8	699.4	569.8	129.58	5.397	

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



<b>Company:</b>	PETROLEUM DEVELOPMENT CORP Weld County CO	<b>Local Co-ordinate Reference:</b>	Well R&R Farms 29L-321
<b>Project:</b>	SEC.29-T5N-R63W	<b>TVD Reference:</b>	WELL @ 4587.0ft (RKB - 13')
<b>Reference Site:</b>	R&R Farms 5N63W29L Pad Sec.29-T5N-R63W	<b>MD Reference:</b>	WELL @ 4587.0ft (RKB - 13')
<b>Site Error:</b>	0.0ft	<b>North Reference:</b>	True
<b>Reference Well:</b>	R&R Farms 29L-321	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.0ft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	Wellbore #1	<b>Database:</b>	Landmark
<b>Reference Design:</b>	Plan #3 (4-10-15)	<b>Offset TVD Reference:</b>	Offset Datum

<b>Offset Design</b>													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)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning	
10,000.0	6,461.0	10,041.5	6,459.7	66.7	67.2	89.90	3,207.0	810.8	699.4	566.0	133.30	5.246		
10,100.0	6,460.2	10,141.5	6,459.1	68.6	69.1	89.91	3,307.0	810.8	699.4	562.3	137.03	5.104		
10,200.0	6,459.5	10,241.5	6,458.5	70.4	70.9	89.92	3,407.0	810.8	699.4	558.6	140.76	4.968		
10,300.0	6,458.7	10,341.5	6,457.9	72.3	72.8	89.93	3,507.0	810.8	699.4	554.8	144.50	4.840		
10,400.0	6,457.9	10,441.5	6,457.2	74.2	74.6	89.94	3,607.0	810.8	699.4	551.1	148.25	4.717		
10,500.0	6,457.1	10,541.5	6,456.6	76.1	76.5	89.96	3,707.0	810.8	699.4	547.4	152.00	4.601		
10,600.0	6,456.4	10,641.5	6,456.0	77.9	78.4	89.97	3,807.0	810.8	699.4	543.6	155.75	4.490		
10,700.0	6,455.6	10,741.5	6,455.3	79.8	80.2	89.98	3,907.0	810.8	699.3	539.8	159.51	4.384		
10,800.0	6,454.8	10,841.5	6,454.7	81.7	82.1	89.99	4,007.0	810.8	699.3	536.1	163.27	4.283		
10,893.3	6,454.1	10,934.8	6,454.1	83.5	83.7	90.00	4,100.3	810.8	699.3	532.7	166.65	4.197		
10,900.0	6,454.1	10,941.5	6,454.1	83.6	83.8	90.00	4,107.0	810.8	699.3	532.5	166.88	4.191		
10,909.7	6,454.0	10,951.2	6,454.0	83.8	84.0	90.00	4,116.7	810.8	699.3	532.1	167.21	4.183 SF		

<b>Company:</b>	PETROLEUM DEVELOPMENT CORP Weld County CO	<b>Local Co-ordinate Reference:</b>	Well R&R Farms 29L-321
<b>Project:</b>	SEC.29-T5N-R63W	<b>TVD Reference:</b>	WELL @ 4587.0ft (RKB - 13')
<b>Reference Site:</b>	R&R Farms 5N63W29L Pad Sec.29-T5N-R63W	<b>MD Reference:</b>	WELL @ 4587.0ft (RKB - 13')
<b>Site Error:</b>	0.0ft	<b>North Reference:</b>	True
<b>Reference Well:</b>	R&R Farms 29L-321	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.0ft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	Wellbore #1	<b>Database:</b>	Landmark
<b>Reference Design:</b>	Plan #3 (4-10-15)	<b>Offset TVD Reference:</b>	Offset Datum

Offset Design R&R Farms 5N63W29L Pad Sec.29-T5N-R63W - R&R Farms 29L-441 - Wellbore #1 - Plan #2 (4-9-15)												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 (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)	Minimum Separation (ft)		Separation Factor
0.0	0.0	0.0	0.0	0.0	0.0	90.00	0.0	58.5	58.5				
100.0	100.0	100.0	100.0	0.1	0.1	90.00	0.0	58.5	58.5	58.3	0.22	260.359	
200.0	200.0	200.0	200.0	0.3	0.3	90.00	0.0	58.5	58.5	57.8	0.67	86.786	
300.0	300.0	300.0	300.0	0.6	0.6	90.00	0.0	58.5	58.5	57.4	1.12	52.072	
400.0	400.0	400.0	400.0	0.8	0.8	90.00	0.0	58.5	58.5	56.9	1.57	37.194	CC, ES
500.0	500.0	499.3	499.3	1.0	1.0	90.61	-0.6	59.1	59.1	57.1	2.00	29.577	
600.0	600.0	598.5	598.5	1.2	1.2	92.38	-2.5	60.8	60.9	58.5	2.41	25.234	
700.0	700.0	697.7	697.5	1.5	1.4	95.10	-5.7	63.7	64.0	61.2	2.84	22.539	
800.0	800.0	796.6	796.3	1.7	1.6	98.48	-10.1	67.8	68.6	65.4	3.28	20.942	
900.0	900.0	895.3	894.7	1.9	1.8	102.19	-15.8	73.0	74.9	71.1	3.72	20.122	
1,000.0	1,000.0	993.8	992.7	2.1	2.1	105.94	-22.6	79.3	82.8	78.6	4.17	19.873	
1,100.0	1,100.0	1,091.9	1,090.2	2.3	2.4	-60.21	-30.7	86.7	92.1	87.5	4.60	20.015	
1,200.0	1,200.0	1,189.8	1,187.3	2.5	2.7	-57.99	-40.0	95.3	102.2	97.2	5.01	20.406	
1,300.0	1,299.9	1,287.6	1,284.0	2.7	3.0	-56.53	-50.5	104.9	113.1	107.7	5.43	20.811	
1,400.0	1,399.7	1,385.0	1,380.2	2.9	3.3	-55.65	-62.2	115.6	124.5	118.7	5.87	21.205	
1,500.0	1,499.4	1,483.4	1,477.0	3.1	3.7	-55.26	-75.1	127.4	136.4	130.0	6.33	21.529	
1,600.0	1,598.9	1,582.8	1,574.8	3.3	4.0	-55.45	-88.1	139.4	147.3	140.5	6.82	21.620	
1,700.0	1,698.3	1,682.3	1,672.7	3.6	4.4	-56.14	-101.2	151.4	157.4	150.0	7.32	21.494	
1,800.0	1,797.4	1,781.8	1,770.6	3.8	4.8	-57.25	-114.3	163.4	166.5	158.6	7.86	21.186	
1,900.0	1,896.3	1,881.4	1,868.6	4.1	5.2	-58.73	-127.4	175.5	174.7	166.3	8.43	20.731	
2,000.0	1,995.1	1,980.9	1,966.5	4.4	5.6	-60.35	-140.5	187.5	182.7	173.7	9.03	20.231	
2,100.0	2,093.9	2,080.5	2,064.5	4.7	6.0	-61.83	-153.6	199.5	190.8	181.2	9.65	19.768	
2,200.0	2,192.7	2,180.1	2,162.4	5.0	6.4	-63.19	-166.8	211.5	199.0	188.8	10.29	19.340	
2,300.0	2,291.4	2,279.6	2,260.4	5.4	6.8	-64.44	-179.9	223.6	207.4	196.4	10.95	18.946	
2,400.0	2,390.2	2,379.2	2,358.4	5.7	7.2	-65.60	-193.0	235.6	215.8	204.2	11.61	18.585	
2,500.0	2,489.0	2,478.7	2,456.3	6.0	7.6	-66.66	-206.1	247.6	224.3	212.0	12.29	18.253	
2,600.0	2,587.8	2,578.3	2,554.3	6.4	8.0	-67.65	-219.2	259.6	232.9	219.9	12.98	17.949	
2,700.0	2,686.6	2,677.8	2,652.2	6.7	8.4	-68.57	-232.3	271.7	241.5	227.9	13.67	17.669	
2,800.0	2,785.4	2,777.4	2,750.2	7.1	8.8	-69.43	-245.4	283.7	250.2	235.9	14.37	17.412	
2,900.0	2,884.1	2,876.9	2,848.1	7.4	9.2	-70.23	-258.5	295.7	259.0	243.9	15.08	17.176	
3,000.0	2,982.9	2,976.5	2,946.1	7.8	9.6	-70.97	-271.6	307.7	267.8	252.0	15.79	16.958	
3,100.0	3,081.7	3,076.0	3,044.0	8.1	10.1	-71.67	-284.7	319.7	276.6	260.1	16.51	16.757	
3,200.0	3,180.5	3,175.6	3,142.0	8.5	10.5	-72.32	-297.8	331.8	285.5	268.3	17.23	16.570	
3,300.0	3,279.3	3,275.1	3,239.9	8.8	10.9	-72.94	-310.9	343.8	294.4	276.5	17.96	16.398	
3,400.0	3,378.1	3,374.7	3,337.9	9.2	11.3	-73.52	-324.0	355.8	303.4	284.7	18.68	16.238	
3,500.0	3,476.8	3,474.2	3,435.8	9.6	11.7	-74.07	-337.1	367.8	312.4	292.9	19.41	16.089	
3,600.0	3,575.6	3,573.8	3,533.8	9.9	12.1	-74.58	-350.2	379.9	321.4	301.2	20.15	15.950	
3,700.0	3,674.4	3,673.4	3,631.7	10.3	12.5	-75.07	-363.3	391.9	330.4	309.5	20.88	15.821	
3,800.0	3,773.2	3,772.9	3,729.7	10.7	12.9	-75.53	-376.4	403.9	339.4	317.8	21.62	15.700	
3,900.0	3,872.0	3,872.5	3,827.6	11.0	13.3	-75.97	-389.5	415.9	348.5	326.1	22.36	15.586	
4,000.0	3,970.8	3,972.0	3,925.6	11.4	13.7	-76.38	-402.6	428.0	357.6	334.5	23.10	15.480	
4,100.0	4,069.5	4,071.6	4,023.5	11.7	14.2	-76.78	-415.7	440.0	366.7	342.9	23.84	15.380	
4,200.0	4,168.3	4,171.1	4,121.5	12.1	14.6	-77.15	-428.8	452.0	375.8	351.2	24.59	15.286	
4,300.0	4,267.1	4,270.7	4,219.4	12.5	15.0	-77.51	-441.9	464.0	385.0	359.6	25.33	15.197	
4,400.0	4,365.9	4,370.2	4,317.4	12.9	15.4	-77.85	-455.0	476.1	394.1	368.0	26.08	15.114	
4,500.0	4,464.7	4,469.8	4,415.3	13.2	15.8	-78.18	-468.1	488.1	403.3	376.5	26.82	15.035	
4,600.0	4,563.5	4,569.3	4,513.3	13.6	16.2	-78.49	-481.2	500.1	412.5	384.9	27.57	14.960	
4,700.0	4,662.3	4,668.9	4,611.3	14.0	16.6	-78.79	-494.3	512.1	421.6	393.3	28.32	14.889	
4,800.0	4,761.0	4,768.4	4,709.2	14.3	17.0	-79.07	-507.4	524.1	430.8	401.8	29.07	14.822	
4,900.0	4,859.8	4,868.0	4,807.2	14.7	17.5	-79.34	-520.5	536.2	440.1	410.2	29.82	14.758	
5,000.0	4,958.6	4,967.5	4,905.1	15.1	17.9	-79.61	-533.6	548.2	449.3	418.7	30.57	14.698	

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

<b>Company:</b>	PETROLEUM DEVELOPMENT CORP Weld County CO	<b>Local Co-ordinate Reference:</b>	Well R&R Farms 29L-321
<b>Project:</b>	SEC.29-T5N-R63W	<b>TVD Reference:</b>	WELL @ 4587.0ft (RKB - 13')
<b>Reference Site:</b>	R&R Farms 5N63W29L Pad Sec.29-T5N-R63W	<b>MD Reference:</b>	WELL @ 4587.0ft (RKB - 13')
<b>Site Error:</b>	0.0ft	<b>North Reference:</b>	True
<b>Reference Well:</b>	R&R Farms 29L-321	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.0ft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	Wellbore #1	<b>Database:</b>	Landmark
<b>Reference Design:</b>	Plan #3 (4-10-15)	<b>Offset TVD Reference:</b>	Offset Datum

Offset Design R&R Farms 5N63W29L Pad Sec.29-T5N-R63W - R&R Farms 29L-441 - Wellbore #1 - Plan #2 (4-9-15)											Offset Site Error:		0.0 ft
Survey Program: 0-MWDD											Offset Well Error:		0.0 ft
Reference		Offset		Semi Major Axis			Distance						Warning
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre		Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	
							+N/-S (ft)	+E/-W (ft)					
5,100.0	5,057.4	5,067.1	5,003.1	15.4	18.3	-79.86	-546.7	560.2	458.5	427.2	31.32	14.641	
5,200.0	5,156.4	5,168.2	5,102.6	15.7	18.7	-80.07	-560.0	572.4	468.0	436.1	31.94	14.655	
5,300.0	5,255.9	5,280.1	5,213.1	15.9	19.0	-80.04	-572.8	584.1	476.6	444.1	32.43	14.696	
5,400.0	5,355.7	5,392.4	5,324.6	16.1	19.3	-79.91	-582.3	592.9	483.1	450.3	32.83	14.716	
5,500.0	5,455.6	5,505.1	5,437.0	16.3	19.5	-79.67	-588.7	598.7	487.7	454.5	33.16	14.709	
5,600.0	5,555.6	5,618.0	5,549.8	16.4	19.6	89.96	-591.8	601.5	490.1	456.7	33.44	14.659	
5,700.0	5,655.6	5,723.8	5,655.6	16.6	19.8	90.00	-592.1	601.8	490.4	456.7	33.71	14.545	
5,754.0	5,709.6	5,777.8	5,709.6	16.6	19.8	90.08	-592.1	601.8	490.4	456.5	33.84	14.490	
5,800.0	5,755.6	5,823.8	5,755.6	16.7	19.9	90.10	-592.1	601.8	490.4	456.4	33.96	14.440	
5,900.0	5,854.9	5,923.9	5,855.6	16.7	20.0	91.16	-590.1	601.8	490.5	456.5	33.97	14.440	
6,000.0	5,951.9	6,025.3	5,956.1	16.6	20.0	92.38	-576.2	601.8	490.8	457.1	33.75	14.543	
6,100.0	6,044.9	6,128.3	6,055.1	16.5	19.9	93.56	-548.6	601.8	491.3	458.0	33.35	14.734	
6,200.0	6,132.4	6,232.7	6,150.9	16.3	19.7	94.68	-507.3	601.8	492.0	459.2	32.82	14.991	
6,300.0	6,212.9	6,338.5	6,241.3	16.0	19.5	95.73	-452.5	601.8	492.9	460.6	32.25	15.284	
6,400.0	6,284.9	6,445.7	6,324.3	15.8	19.2	96.67	-384.8	601.8	493.7	462.0	31.71	15.569	
6,500.0	6,347.2	6,554.1	6,397.8	15.6	18.9	97.50	-305.2	601.8	494.6	463.3	31.33	15.788	
6,600.0	6,398.9	6,663.6	6,459.8	15.6	18.6	98.19	-215.0	601.8	495.5	464.3	31.20	15.879	
6,700.0	6,438.9	6,774.1	6,508.7	15.7	18.3	98.73	-116.0	601.8	496.1	464.7	31.42	15.792	
6,800.0	6,466.6	6,885.3	6,543.0	16.0	18.0	99.11	-10.4	601.8	496.6	464.6	32.04	15.503	
6,900.0	6,481.5	6,996.9	6,561.6	16.5	17.8	99.31	99.6	601.8	496.9	463.9	33.07	15.026	
7,000.0	6,484.0	7,104.5	6,565.0	17.2	18.0	99.38	207.1	601.8	497.0	462.6	34.47	14.419	
7,100.0	6,483.3	7,204.5	6,565.0	18.1	18.9	99.46	307.1	601.8	497.1	461.0	36.15	13.754	
7,200.0	6,482.5	7,304.5	6,565.0	19.2	20.0	99.55	407.1	601.8	497.3	459.2	38.12	13.044	
7,300.0	6,481.7	7,404.5	6,565.0	20.3	21.2	99.64	507.1	601.8	497.4	457.0	40.36	12.324	
7,400.0	6,481.0	7,504.5	6,565.0	21.6	22.5	99.73	607.1	601.8	497.5	454.7	42.81	11.621	
7,500.0	6,480.2	7,604.5	6,565.0	23.0	23.8	99.81	707.1	601.8	497.7	452.2	45.45	10.950	
7,600.0	6,479.4	7,704.5	6,565.0	24.4	25.3	99.90	807.1	601.8	497.8	449.6	48.24	10.320	
7,700.0	6,478.6	7,804.5	6,565.0	25.9	26.8	99.99	907.1	601.8	497.9	446.8	51.15	9.734	
7,800.0	6,477.9	7,904.5	6,565.0	27.5	28.3	100.07	1,007.1	601.8	498.1	443.9	54.17	9.194	
7,900.0	6,477.1	8,004.5	6,565.0	29.1	29.9	100.16	1,107.1	601.8	498.2	440.9	57.28	8.698	
8,000.0	6,476.3	8,104.5	6,565.0	30.7	31.5	100.25	1,207.1	601.8	498.3	437.9	60.46	8.242	
8,100.0	6,475.6	8,204.5	6,565.0	32.4	33.1	100.33	1,307.1	601.8	498.5	434.8	63.71	7.824	
8,200.0	6,474.8	8,304.5	6,565.0	34.1	34.8	100.42	1,407.1	601.8	498.6	431.6	67.01	7.441	
8,300.0	6,474.0	8,404.5	6,565.0	35.8	36.5	100.51	1,507.1	601.8	498.7	428.4	70.35	7.089	
8,400.0	6,473.3	8,504.5	6,565.0	37.5	38.2	100.59	1,607.1	601.8	498.9	425.2	73.74	6.766	
8,500.0	6,472.5	8,604.5	6,565.0	39.3	39.9	100.68	1,707.1	601.8	499.0	421.9	77.15	6.468	
8,600.0	6,471.7	8,704.5	6,565.0	41.1	41.6	100.77	1,807.1	601.8	499.2	418.6	80.60	6.193	
8,700.0	6,471.0	8,804.5	6,565.0	42.8	43.4	100.85	1,907.1	601.8	499.3	415.2	84.07	5.939	
8,800.0	6,470.2	8,904.5	6,565.0	44.6	45.2	100.94	2,007.1	601.8	499.5	411.9	87.57	5.704	
8,900.0	6,469.4	9,004.5	6,565.0	46.4	46.9	101.03	2,107.1	601.8	499.6	408.5	91.08	5.485	
9,000.0	6,468.7	9,104.5	6,565.0	48.2	48.7	101.11	2,207.1	601.8	499.8	405.1	94.61	5.282	
9,100.0	6,467.9	9,204.5	6,565.0	50.1	50.5	101.20	2,307.1	601.8	499.9	401.7	98.16	5.093	
9,200.0	6,467.1	9,304.5	6,565.0	51.9	52.3	101.29	2,407.1	601.8	500.1	398.3	101.71	4.916	
9,300.0	6,466.4	9,404.5	6,565.0	53.7	54.2	101.37	2,507.1	601.8	500.2	394.9	105.28	4.751	
9,400.0	6,465.6	9,504.5	6,565.0	55.6	56.0	101.46	2,607.1	601.8	500.4	391.5	108.86	4.596	
9,500.0	6,464.8	9,604.5	6,565.0	57.4	57.8	101.55	2,707.1	601.8	500.5	388.1	112.45	4.451	
9,600.0	6,464.1	9,704.5	6,565.0	59.3	59.6	101.63	2,807.0	601.8	500.7	384.6	116.05	4.314	
9,700.0	6,463.3	9,804.4	6,565.0	61.1	61.5	101.72	2,907.0	601.8	500.8	381.2	119.65	4.186	
9,800.0	6,462.5	9,904.4	6,565.0	63.0	63.3	101.80	3,007.0	601.8	501.0	377.7	123.26	4.064	
9,900.0	6,461.8	10,004.4	6,565.0	64.8	65.2	101.89	3,107.0	601.8	501.1	374.3	126.87	3.950	

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

<b>Company:</b>	PETROLEUM DEVELOPMENT CORP Weld County CO	<b>Local Co-ordinate Reference:</b>	Well R&R Farms 29I-321
<b>Project:</b>	SEC.29-T5N-R63W	<b>TVD Reference:</b>	WELL @ 4587.0ft (RKB - 13')
<b>Reference Site:</b>	R&R Farms 5N63W29L Pad Sec.29-T5N-R63W	<b>MD Reference:</b>	WELL @ 4587.0ft (RKB - 13')
<b>Site Error:</b>	0.0ft	<b>North Reference:</b>	True
<b>Reference Well:</b>	R&R Farms 29I-321	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.0ft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	Wellbore #1	<b>Database:</b>	Landmark
<b>Reference Design:</b>	Plan #3 (4-10-15)	<b>Offset TVD Reference:</b>	Offset Datum

<b>Offset Design</b>													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	
10,000.0	6,461.0	10,104.4	6,565.0	66.7	67.0	101.98	3,207.0	601.8	501.3	370.8	130.49	3.842		
10,100.0	6,460.2	10,204.4	6,565.0	68.6	68.9	102.06	3,307.0	601.8	501.4	367.3	134.11	3.739		
10,200.0	6,459.5	10,304.4	6,565.0	70.4	70.7	102.15	3,407.0	601.8	501.6	363.9	137.74	3.642		
10,300.0	6,458.7	10,404.4	6,565.0	72.3	72.6	102.23	3,507.0	601.8	501.8	360.4	141.37	3.549		
10,400.0	6,457.9	10,504.4	6,565.0	74.2	74.5	102.32	3,607.0	601.8	501.9	356.9	145.00	3.462		
10,500.0	6,457.1	10,604.4	6,565.0	76.1	76.3	102.40	3,707.0	601.8	502.1	353.5	148.64	3.378		
10,600.0	6,456.4	10,704.4	6,565.0	77.9	78.2	102.49	3,807.0	601.8	502.3	350.0	152.27	3.298		
10,700.0	6,455.6	10,804.4	6,565.0	79.8	80.1	102.57	3,907.0	601.8	502.4	346.5	155.91	3.223		
10,800.0	6,454.8	10,904.4	6,565.0	81.7	81.9	102.66	4,007.0	601.8	502.6	343.0	159.55	3.150		
10,900.0	6,454.1	11,004.4	6,565.0	83.6	83.8	102.75	4,107.0	601.8	502.8	339.6	163.19	3.081		
10,909.7	6,454.0	11,014.1	6,565.0	83.8	84.0	102.75	4,116.7	601.8	502.8	339.2	163.55	3.074 SF		

<b>Company:</b>	PETROLEUM DEVELOPMENT CORP Weld County CO	<b>Local Co-ordinate Reference:</b>	Well R&R Farms 29I-321
<b>Project:</b>	SEC.29-T5N-R63W	<b>TVD Reference:</b>	WELL @ 4587.0ft (RKB - 13')
<b>Reference Site:</b>	R&R Farms 5N63W29L Pad Sec.29-T5N-R63W	<b>MD Reference:</b>	WELL @ 4587.0ft (RKB - 13')
<b>Site Error:</b>	0.0ft	<b>North Reference:</b>	True
<b>Reference Well:</b>	R&R Farms 29I-321	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.0ft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	Wellbore #1	<b>Database:</b>	Landmark
<b>Reference Design:</b>	Plan #3 (4-10-15)	<b>Offset TVD Reference:</b>	Offset Datum

Reference Depths are relative to WELL @ 4587.0ft (RKB - 13')

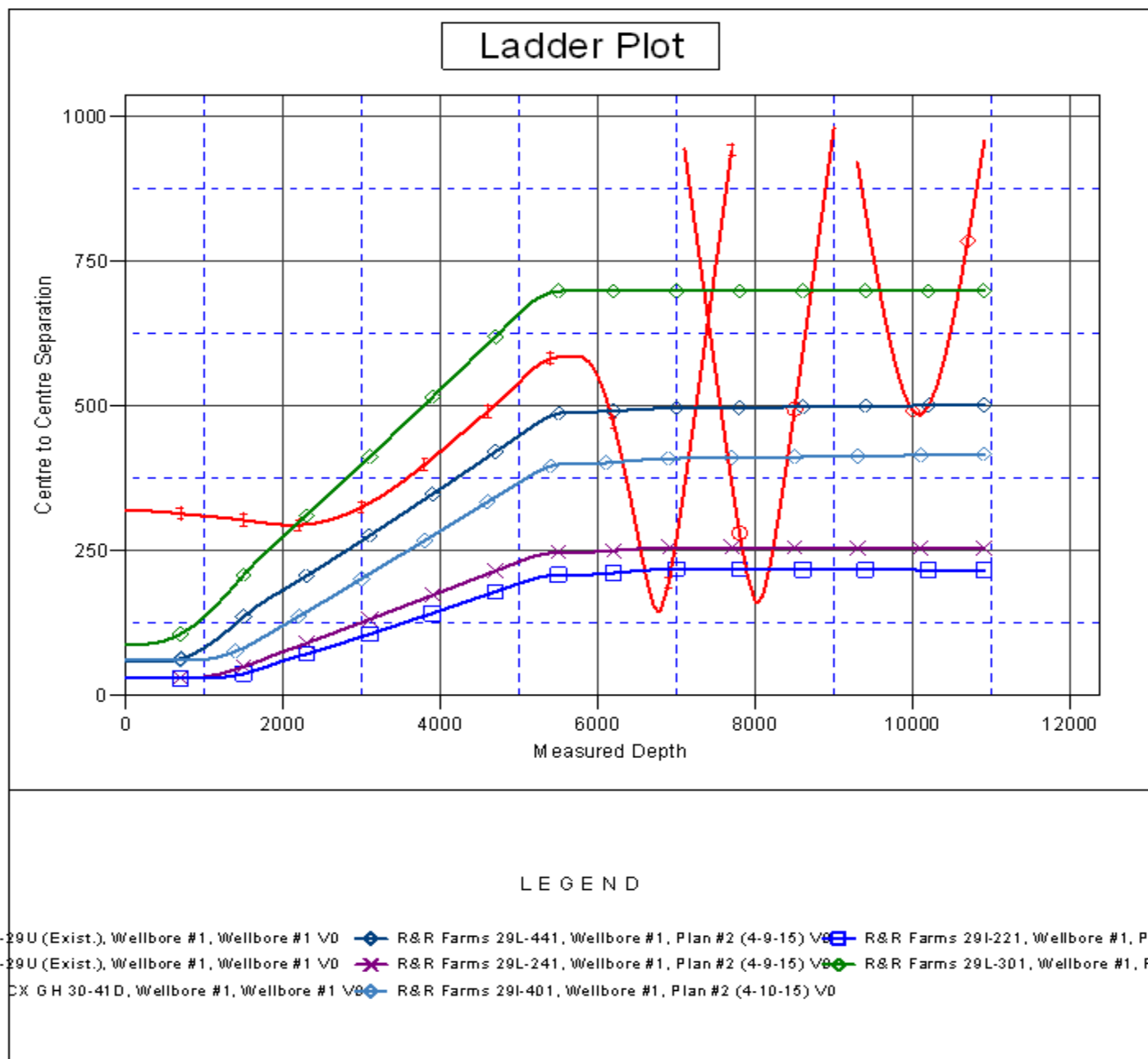
Offset Depths are relative to Offset Datum

Central Meridian is -105.500000 °

Coordinates are relative to: R&R Farms 29I-321

Coordinate System is US State Plane 1983, Colorado Northern Zone

Grid Convergence at Surface is: 0.67°



<b>Company:</b>	PETROLEUM DEVELOPMENT CORP Weld County CO	<b>Local Co-ordinate Reference:</b>	Well R&R Farms 29I-321
<b>Project:</b>	SEC.29-T5N-R63W	<b>TVD Reference:</b>	WELL @ 4587.0ft (RKB - 13')
<b>Reference Site:</b>	R&R Farms 5N63W29L Pad Sec.29-T5N-R63W	<b>MD Reference:</b>	WELL @ 4587.0ft (RKB - 13')
<b>Site Error:</b>	0.0ft	<b>North Reference:</b>	True
<b>Reference Well:</b>	R&R Farms 29I-321	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.0ft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	Wellbore #1	<b>Database:</b>	Landmark
<b>Reference Design:</b>	Plan #3 (4-10-15)	<b>Offset TVD Reference:</b>	Offset Datum

Reference Depths are relative to WELL @ 4587.0ft (RKB - 13')  
 Offset Depths are relative to Offset Datum  
 Central Meridian is -105.500000 °

Coordinates are relative to: R&R Farms 29I-321  
 Coordinate System is US State Plane 1983, Colorado Northern Zone  
 Grid Convergence at Surface is: 0.67°

