

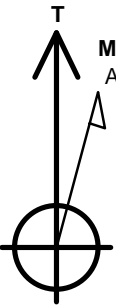
PETROLEUM DEVELOPMENT CORP Weld County CO

Well Name: R&R Farms 29L-241

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 377497.08 3287489.18 40.365040 -104.468270
RKB - 13' WELL @ 4587.0ft (RKB - 13')

WELLBORE TARGET DETAILS

Name	TVD	+N/-S	+E/-W	Shape
SHL 641'FSL, 374'FWL	1.0	0.0	0.0	Point
BHL 500'FNL, 738'FWL	6395.0	4116.7	328.8	Point



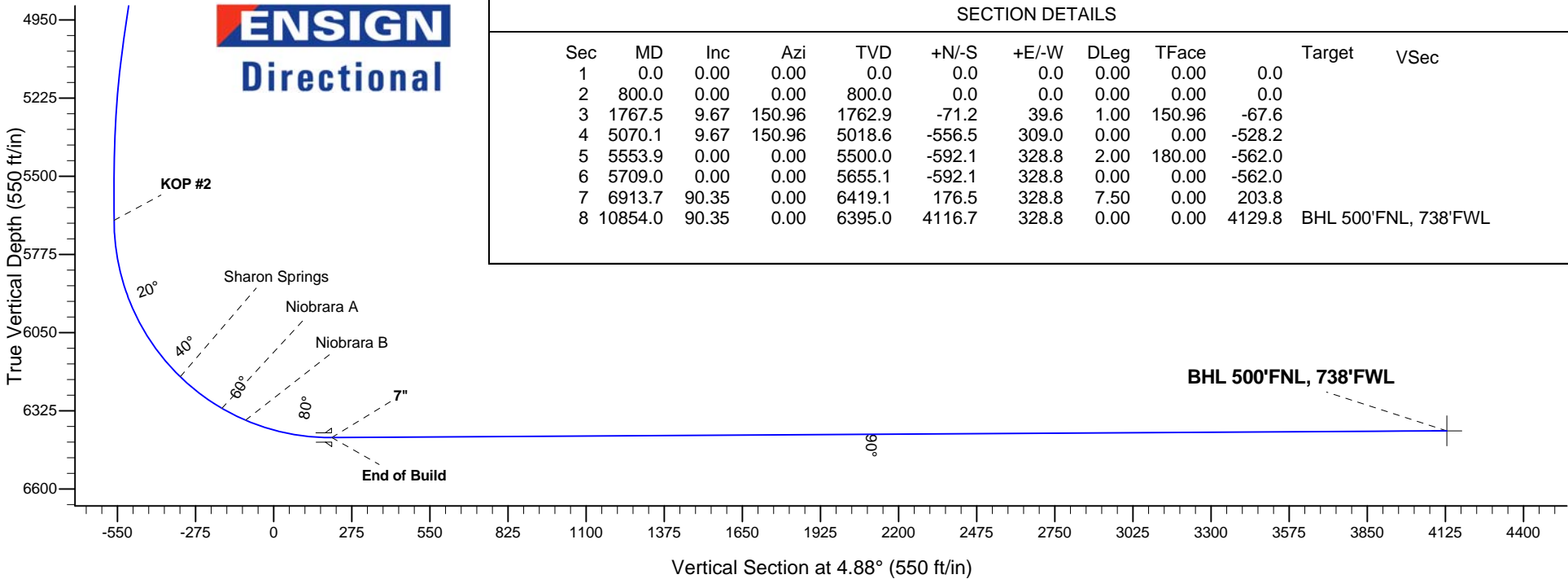
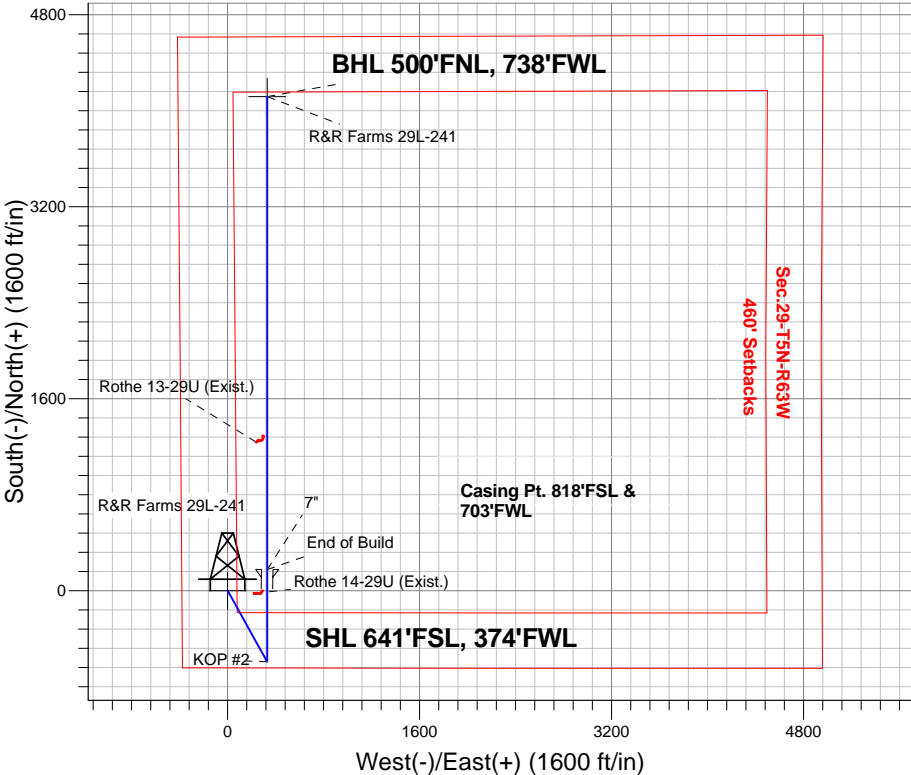
Azimuths to True North
Magnetic North: 8.19°

Magnetic Field
Strength: 52743.6snT
Dip Angle: 66.94°
Date: 4/9/2015
Model: IGRF2010

ANNOTATIONS

TVD	MD	Annotation
800.0	800.0	KOP #1
5655.1	5709.0	KOP #2
6419.1	6913.7	End of Build

R&R Farms 5N63W29L Pad Sec.29-T5N-R63W
R&R Farms 29L-241
Plan #3 (4-10-15)



SECTION DETAILS

Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	DLeg	TFace	Target	VSec
1	0.0	0.00	0.00	0.0	0.0	0.0	0.00	0.00	0.0	
2	800.0	0.00	0.00	800.0	0.0	0.0	0.00	0.00	0.0	
3	1767.5	9.67	150.96	1762.9	-71.2	39.6	1.00	150.96	-67.6	
4	5070.1	9.67	150.96	5018.6	-556.5	309.0	0.00	0.00	-528.2	
5	5553.9	0.00	0.00	5500.0	-592.1	328.8	2.00	180.00	-562.0	
6	5709.0	0.00	0.00	5655.1	-592.1	328.8	0.00	0.00	-562.0	
7	6913.7	90.35	0.00	6419.1	176.5	328.8	7.50	0.00	203.8	
8	10854.0	90.35	0.00	6395.0	4116.7	328.8	0.00	0.00	4129.8	BHL 500'FNL, 738'FWL



PETROLEUM DEVELOPMENT CORP Weld County CO

SEC.29-T5N-R63W

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

R&R Farms 29L-241

Wellbore #1

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

Standard Planning Report

10 April, 2015

Database:	Landmark	Local Co-ordinate Reference:	Well R&R Farms 29L-241
Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	TVD Reference:	WELL @ 4587.0ft (RKB - 13')
Project:	SEC.29-T5N-R63W	MD Reference:	WELL @ 4587.0ft (RKB - 13')
Site:	R&R Farms 5N63W29L Pad Sec.29-T5N-R63W	North Reference:	True
Well:	R&R Farms 29L-241	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Plan #3 (4-10-15)		

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

Site						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 29L-241					
Well Position	+N/-S	426.2 ft	Northing:	1,377,497.08 ft	Latitude:	40.365040
	+E/-W	-560.1 ft	Easting:	3,287,489.18 ft	Longitude:	-104.468270
Position Uncertainty		0.0 ft	Wellhead Elevation:	ft	Ground Level:	4,574.0 ft

Wellbore	Wellbore #1				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	4/9/2015	8.19	66.94	52,744

Design	Plan #3 (4-10-15)			
Audit Notes:				
Version:	Phase:	PROTOTYPE	Tie On Depth:	0.0
Vertical Section:	Depth From (TVD) (ft)	+N/-S (ft)	+E/-W (ft)	Direction (°)
	0.0	0.0	0.0	4.88

Plan Sections										
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)	TFO (°)	Target
0.0	0.00	0.00	0.0	0.0	0.0	0.00	0.00	0.00	0.00	
800.0	0.00	0.00	800.0	0.0	0.0	0.00	0.00	0.00	0.00	
1,767.5	9.67	150.96	1,762.9	-71.2	39.6	1.00	1.00	0.00	150.96	
5,070.1	9.67	150.96	5,018.6	-556.5	309.0	0.00	0.00	0.00	0.00	
5,553.9	0.00	0.00	5,500.0	-592.1	328.8	2.00	-2.00	0.00	180.00	
5,709.0	0.00	0.00	5,655.1	-592.1	328.8	0.00	0.00	0.00	0.00	
6,913.7	90.35	0.00	6,419.1	176.5	328.8	7.50	7.50	0.00	0.00	
10,854.0	90.35	0.00	6,395.0	4,116.7	328.8	0.00	0.00	0.00	0.00	BHL 500'FNL, 738'F

Database:	Landmark	Local Co-ordinate Reference:	Well R&R Farms 29L-241
Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	TVD Reference:	WELL @ 4587.0ft (RKB - 13')
Project:	SEC.29-T5N-R63W	MD Reference:	WELL @ 4587.0ft (RKB - 13')
Site:	R&R Farms 5N63W29L Pad Sec.29-T5N-R63W	North Reference:	True
Well:	R&R Farms 29L-241	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	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
KOP #1									
900.0	1.00	150.96	900.0	-0.8	0.4	-0.7	1.00	1.00	0.00
1,000.0	2.00	150.96	1,000.0	-3.1	1.7	-2.9	1.00	1.00	0.00
1,100.0	3.00	150.96	1,099.9	-6.9	3.8	-6.5	1.00	1.00	0.00
1,200.0	4.00	150.96	1,199.7	-12.2	6.8	-11.6	1.00	1.00	0.00
1,300.0	5.00	150.96	1,299.4	-19.1	10.6	-18.1	1.00	1.00	0.00
1,400.0	6.00	150.96	1,398.9	-27.4	15.2	-26.0	1.00	1.00	0.00
1,500.0	7.00	150.96	1,498.3	-37.3	20.7	-35.4	1.00	1.00	0.00
1,600.0	8.00	150.96	1,597.4	-48.7	27.1	-46.3	1.00	1.00	0.00
1,700.0	9.00	150.96	1,696.3	-61.7	34.2	-58.5	1.00	1.00	0.00
1,767.5	9.67	150.96	1,762.9	-71.2	39.6	-67.6	1.00	1.00	0.00
1,800.0	9.67	150.96	1,794.9	-76.0	42.2	-72.2	0.00	0.00	0.00
1,900.0	9.67	150.96	1,893.5	-90.7	50.4	-86.1	0.00	0.00	0.00
2,000.0	9.67	150.96	1,992.1	-105.4	58.5	-100.0	0.00	0.00	0.00
2,100.0	9.67	150.96	2,090.7	-120.1	66.7	-114.0	0.00	0.00	0.00
2,200.0	9.67	150.96	2,189.3	-134.8	74.8	-127.9	0.00	0.00	0.00
2,300.0	9.67	150.96	2,287.8	-149.5	83.0	-141.9	0.00	0.00	0.00
2,400.0	9.67	150.96	2,386.4	-164.2	91.2	-155.8	0.00	0.00	0.00
2,500.0	9.67	150.96	2,485.0	-178.9	99.3	-169.8	0.00	0.00	0.00
2,600.0	9.67	150.96	2,583.6	-193.6	107.5	-183.7	0.00	0.00	0.00
2,700.0	9.67	150.96	2,682.1	-208.3	115.6	-197.7	0.00	0.00	0.00
2,800.0	9.67	150.96	2,780.7	-222.9	123.8	-211.6	0.00	0.00	0.00
2,900.0	9.67	150.96	2,879.3	-237.6	132.0	-225.5	0.00	0.00	0.00
3,000.0	9.67	150.96	2,977.9	-252.3	140.1	-239.5	0.00	0.00	0.00
3,100.0	9.67	150.96	3,076.5	-267.0	148.3	-253.4	0.00	0.00	0.00
3,200.0	9.67	150.96	3,175.0	-281.7	156.4	-267.4	0.00	0.00	0.00
3,300.0	9.67	150.96	3,273.6	-296.4	164.6	-281.3	0.00	0.00	0.00
3,315.6	9.67	150.96	3,289.0	-298.7	165.9	-283.5	0.00	0.00	0.00
Parkman									
3,400.0	9.67	150.96	3,372.2	-311.1	172.7	-295.3	0.00	0.00	0.00
3,500.0	9.67	150.96	3,470.8	-325.8	180.9	-309.2	0.00	0.00	0.00
3,600.0	9.67	150.96	3,569.3	-340.5	189.1	-323.2	0.00	0.00	0.00
3,700.0	9.67	150.96	3,667.9	-355.2	197.2	-337.1	0.00	0.00	0.00
3,800.0	9.67	150.96	3,766.5	-369.9	205.4	-351.1	0.00	0.00	0.00
3,900.0	9.67	150.96	3,865.1	-384.6	213.5	-365.0	0.00	0.00	0.00
4,000.0	9.67	150.96	3,963.7	-399.3	221.7	-378.9	0.00	0.00	0.00
4,026.7	9.67	150.96	3,990.0	-403.2	223.9	-382.7	0.00	0.00	0.00
Sussex									
4,100.0	9.67	150.96	4,062.2	-413.9	229.8	-392.9	0.00	0.00	0.00
4,200.0	9.67	150.96	4,160.8	-428.6	238.0	-406.8	0.00	0.00	0.00
4,300.0	9.67	150.96	4,259.4	-443.3	246.2	-420.8	0.00	0.00	0.00
4,400.0	9.67	150.96	4,358.0	-458.0	254.3	-434.7	0.00	0.00	0.00
4,500.0	9.67	150.96	4,456.5	-472.7	262.5	-448.7	0.00	0.00	0.00

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Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	TVD Reference:	WELL @ 4587.0ft (RKB - 13')
Project:	SEC.29-T5N-R63W	MD Reference:	WELL @ 4587.0ft (RKB - 13')
Site:	R&R Farms 5N63W29L Pad Sec.29-T5N-R63W	North Reference:	True
Well:	R&R Farms 29L-241	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	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)
4,503.5	9.67	150.96	4,460.0	-473.2	262.8	-449.2	0.00	0.00	0.00
Shannon									
4,600.0	9.67	150.96	4,555.1	-487.4	270.6	-462.6	0.00	0.00	0.00
4,700.0	9.67	150.96	4,653.7	-502.1	278.8	-476.6	0.00	0.00	0.00
4,800.0	9.67	150.96	4,752.3	-516.8	287.0	-490.5	0.00	0.00	0.00
4,900.0	9.67	150.96	4,850.9	-531.5	295.1	-504.4	0.00	0.00	0.00
5,000.0	9.67	150.96	4,949.4	-546.2	303.3	-518.4	0.00	0.00	0.00
5,070.1	9.67	150.96	5,018.6	-556.5	309.0	-528.2	0.00	0.00	0.00
5,100.0	9.08	150.96	5,048.0	-560.7	311.4	-532.2	2.00	-2.00	0.00
5,200.0	7.08	150.96	5,147.0	-573.0	318.2	-543.9	2.00	-2.00	0.00
5,300.0	5.08	150.96	5,246.5	-582.3	323.3	-552.7	2.00	-2.00	0.00
5,400.0	3.08	150.96	5,346.2	-588.5	326.8	-558.6	2.00	-2.00	0.00
5,500.0	1.08	150.96	5,446.1	-591.7	328.5	-561.6	2.00	-2.00	0.00
5,553.9	0.00	0.00	5,500.0	-592.1	328.8	-562.0	2.00	-2.00	0.00
5,600.0	0.00	0.00	5,546.1	-592.1	328.8	-562.0	0.00	0.00	0.00
5,700.0	0.00	0.00	5,646.1	-592.1	328.8	-562.0	0.00	0.00	0.00
5,709.0	0.00	0.00	5,655.1	-592.1	328.8	-562.0	0.00	0.00	0.00
KOP #2									
5,800.0	6.83	0.00	5,745.9	-586.7	328.8	-556.6	7.50	7.50	0.00
5,900.0	14.33	0.00	5,844.2	-568.3	328.8	-538.3	7.50	7.50	0.00
6,000.0	21.83	0.00	5,939.2	-537.3	328.8	-507.4	7.50	7.50	0.00
6,100.0	29.33	0.00	6,029.3	-494.2	328.8	-464.4	7.50	7.50	0.00
6,200.0	36.83	0.00	6,113.0	-439.7	328.8	-410.1	7.50	7.50	0.00
6,300.0	44.33	0.00	6,188.9	-374.7	328.8	-345.3	7.50	7.50	0.00
6,322.8	46.04	0.00	6,205.0	-358.5	328.8	-329.2	7.50	7.50	0.00
Sharon Springs									
6,400.0	51.83	0.00	6,255.7	-300.3	328.8	-271.3	7.50	7.50	0.00
6,500.0	59.33	0.00	6,312.2	-217.9	328.8	-189.1	7.50	7.50	0.00
6,507.5	59.89	0.00	6,316.0	-211.4	328.8	-182.7	7.50	7.50	0.00
Niobrara A									
6,600.0	66.83	0.00	6,357.4	-128.8	328.8	-100.4	7.50	7.50	0.00
6,601.4	66.93	0.00	6,358.0	-127.5	328.8	-99.0	7.50	7.50	0.00
Niobrara B									
6,700.0	74.33	0.00	6,390.7	-34.6	328.8	-6.5	7.50	7.50	0.00
6,800.0	81.83	0.00	6,411.3	63.2	328.8	91.0	7.50	7.50	0.00
6,900.0	89.33	0.00	6,419.0	162.8	328.8	190.2	7.50	7.50	0.00
6,913.7	90.35	0.00	6,419.1	176.5	328.8	203.9	7.48	7.48	0.00
End of Build - 7"									
7,000.0	90.35	0.00	6,418.5	262.8	328.8	289.9	0.00	0.00	0.00
7,100.0	90.35	0.00	6,417.9	362.8	328.8	389.5	0.00	0.00	0.00
7,200.0	90.35	0.00	6,417.3	462.8	328.8	489.1	0.00	0.00	0.00
7,300.0	90.35	0.00	6,416.7	562.8	328.8	588.8	0.00	0.00	0.00
7,400.0	90.35	0.00	6,416.1	662.8	328.8	688.4	0.00	0.00	0.00
7,500.0	90.35	0.00	6,415.5	762.8	328.8	788.0	0.00	0.00	0.00
7,600.0	90.35	0.00	6,414.9	862.8	328.8	887.7	0.00	0.00	0.00
7,700.0	90.35	0.00	6,414.3	962.8	328.8	987.3	0.00	0.00	0.00
7,800.0	90.35	0.00	6,413.7	1,062.8	328.8	1,087.0	0.00	0.00	0.00
7,900.0	90.35	0.00	6,413.0	1,162.8	328.8	1,186.6	0.00	0.00	0.00
8,000.0	90.35	0.00	6,412.4	1,262.8	328.8	1,286.2	0.00	0.00	0.00
8,100.0	90.35	0.00	6,411.8	1,362.8	328.8	1,385.9	0.00	0.00	0.00
8,200.0	90.35	0.00	6,411.2	1,462.8	328.8	1,485.5	0.00	0.00	0.00

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Project:	SEC.29-T5N-R63W	MD Reference:	WELL @ 4587.0ft (RKB - 13')
Site:	R&R Farms 5N63W29L Pad Sec.29-T5N-R63W	North Reference:	True
Well:	R&R Farms 29L-241	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	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)
8,300.0	90.35	0.00	6,410.6	1,562.8	328.8	1,585.1	0.00	0.00	0.00
8,400.0	90.35	0.00	6,410.0	1,662.8	328.8	1,684.8	0.00	0.00	0.00
8,500.0	90.35	0.00	6,409.4	1,762.8	328.8	1,784.4	0.00	0.00	0.00
8,600.0	90.35	0.00	6,408.8	1,862.8	328.8	1,884.0	0.00	0.00	0.00
8,700.0	90.35	0.00	6,408.2	1,962.8	328.8	1,983.7	0.00	0.00	0.00
8,800.0	90.35	0.00	6,407.5	2,062.8	328.8	2,083.3	0.00	0.00	0.00
8,900.0	90.35	0.00	6,406.9	2,162.8	328.8	2,182.9	0.00	0.00	0.00
9,000.0	90.35	0.00	6,406.3	2,262.8	328.8	2,282.6	0.00	0.00	0.00
9,100.0	90.35	0.00	6,405.7	2,362.8	328.8	2,382.2	0.00	0.00	0.00
9,200.0	90.35	0.00	6,405.1	2,462.8	328.8	2,481.8	0.00	0.00	0.00
9,300.0	90.35	0.00	6,404.5	2,562.8	328.8	2,581.5	0.00	0.00	0.00
9,400.0	90.35	0.00	6,403.9	2,662.8	328.8	2,681.1	0.00	0.00	0.00
9,500.0	90.35	0.00	6,403.3	2,762.8	328.8	2,780.8	0.00	0.00	0.00
9,600.0	90.35	0.00	6,402.7	2,862.8	328.8	2,880.4	0.00	0.00	0.00
9,700.0	90.35	0.00	6,402.0	2,962.8	328.8	2,980.0	0.00	0.00	0.00
9,800.0	90.35	0.00	6,401.4	3,062.8	328.8	3,079.7	0.00	0.00	0.00
9,900.0	90.35	0.00	6,400.8	3,162.8	328.8	3,179.3	0.00	0.00	0.00
10,000.0	90.35	0.00	6,400.2	3,262.8	328.8	3,278.9	0.00	0.00	0.00
10,100.0	90.35	0.00	6,399.6	3,362.8	328.8	3,378.6	0.00	0.00	0.00
10,200.0	90.35	0.00	6,399.0	3,462.8	328.8	3,478.2	0.00	0.00	0.00
10,300.0	90.35	0.00	6,398.4	3,562.8	328.8	3,577.8	0.00	0.00	0.00
10,400.0	90.35	0.00	6,397.8	3,662.8	328.8	3,677.5	0.00	0.00	0.00
10,500.0	90.35	0.00	6,397.2	3,762.8	328.8	3,777.1	0.00	0.00	0.00
10,600.0	90.35	0.00	6,396.6	3,862.8	328.8	3,876.7	0.00	0.00	0.00
10,700.0	90.35	0.00	6,395.9	3,962.8	328.8	3,976.4	0.00	0.00	0.00
10,800.0	90.35	0.00	6,395.3	4,062.8	328.8	4,076.0	0.00	0.00	0.00
10,854.0	90.35	0.00	6,395.0	4,116.7	328.8	4,129.8	0.00	0.00	0.00

Targets									
Target Name	Dip Angle (°)	Dip Dir. (°)	TVD (ft)	+N/-S (ft)	+E/-W (ft)	Northing (ft)	Easting (ft)	Latitude	Longitude
- hit/miss target									
- Shape									
SHL 641'FSL, 374'FW	0.00	0.00	1.0	0.0	0.0	1,377,497.10	3,287,489.18	40.365040	-104.468270
- plan hits target center									
- Point									
BHL 500'FNL, 738'FW	0.00	0.00	6,395.0	4,116.7	328.8	1,381,617.18	3,287,770.02	40.376340	-104.467090
- plan hits target center									
- Point									

Casing Points					
Measured Depth (ft)	Vertical Depth (ft)	Name	Casing Diameter (")	Hole Diameter (")	
6,913.7	6,419.1	7"	7	7-1/2	

Database:	Landmark	Local Co-ordinate Reference:	Well R&R Farms 29L-241
Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	TVD Reference:	WELL @ 4587.0ft (RKB - 13')
Project:	SEC.29-T5N-R63W	MD Reference:	WELL @ 4587.0ft (RKB - 13')
Site:	R&R Farms 5N63W29L Pad	North Reference:	True
	Sec.29-T5N-R63W		
Well:	R&R Farms 29L-241	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Plan #3 (4-10-15)		

Formations						
Measured Depth (ft)	Vertical Depth (ft)	Name	Lithology	Dip (°)	Dip Direction (°)	
3,315.6	3,289.0	Parkman		0.00		
4,026.7	3,990.0	Sussex		0.00		
4,503.5	4,460.0	Shannon		0.00		
6,322.8	6,205.0	Sharon Springs		0.00		
6,507.5	6,316.0	Niobrara A		0.00		
6,601.4	6,358.0	Niobrara B		0.00		
	6,445.0	Niobrara C		0.00		

Plan Annotations					
Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates			
		+N/-S (ft)	+E/-W (ft)	Comment	
800.0	800.0	0.0	0.0	KOP #1	
5,709.0	5,655.1	-592.1	328.8	KOP #2	
6,913.7	6,419.1	176.5	328.8	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 29L-241

Wellbore #1

Plan #3 (4-10-15)

Anticollision Report

10 April, 2015



Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well R&R Farms 29L-241
Project:	SEC.29-T5N-R63W	TVD Reference:	WELL @ 4587.0ft (RKB - 13')
Reference Site:	R&R Farms 5N63W29L Pad Sec.29-T5N-R63W	MD Reference:	WELL @ 4587.0ft (RKB - 13')
Site Error:	0.0ft	North Reference:	True
Reference Well:	R&R Farms 29L-241	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	Landmark
Reference Design:	Plan #3 (4-10-15)	Offset TVD Reference:	Offset Datum

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

Survey Tool Program	Date 4/10/2015			
From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description
0.0	10,854.0	Plan #3 (4-10-15) (Wellbore #1)	MWD	MWD - Standard

Summary						
Site Name	Reference Measured Depth (ft)	Offset Measured Depth (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Separation Factor	Warning
Offset Well - Wellbore - Design						
Existing Wells Sec.29-T5N-R63W						
Rothe 13-29U (Exist.) - Wellbore #1 - Wellbore #1	7,976.1	6,393.3	86.8	42.7	1.970	CC, ES, SF
Rothe 14-29U (Exist.) - Wellbore #1 - Wellbore #1	6,710.6	6,377.7	102.0	73.3	3.547	CC, ES, SF
R&R Farms 5N63W29L Pad Sec.29-T5N-R63W						
R&R Farms 29L-221 - Wellbore #1 - Plan #2 (4-10-15)	800.0	800.0	61.3	57.9	18.184	CC, ES
R&R Farms 29L-221 - Wellbore #1 - Plan #2 (4-10-15)	10,854.0	10,846.0	456.9	289.6	2.730	SF
R&R Farms 29L-321 - Wellbore #1 - Plan #3 (4-10-15)	800.0	800.0	30.7	27.3	9.092	CC, ES
R&R Farms 29L-321 - Wellbore #1 - Plan #3 (4-10-15)	10,854.0	10,909.7	254.9	90.8	1.554	SF
R&R Farms 29L-401 - Wellbore #1 - Plan #2 (4-10-15)	766.3	767.3	92.0	88.7	28.538	CC
R&R Farms 29L-401 - Wellbore #1 - Plan #2 (4-10-15)	800.0	801.0	92.0	88.6	27.260	ES
R&R Farms 29L-401 - Wellbore #1 - Plan #2 (4-10-15)	10,854.0	10,996.7	672.1	509.3	4.127	SF
R&R Farms 29L-301 - Wellbore #1 - Plan #2 (4-9-15)	200.0	200.0	58.5	57.8	86.786	CC, ES
R&R Farms 29L-301 - Wellbore #1 - Plan #2 (4-9-15)	10,854.0	10,951.6	455.2	289.7	2.750	SF
R&R Farms 29L-441 - Wellbore #1 - Plan #2 (4-9-15)	400.0	400.0	27.9	26.3	17.712	CC, ES
R&R Farms 29L-441 - Wellbore #1 - Plan #2 (4-9-15)	10,854.0	11,014.1	296.1	155.0	2.098	SF

Offset Design												
Existing Wells Sec.29-T5N-R63W - Rothe 13-29U (Exist.) - Wellbore #1 - Wellbore #1												
Survey Program: 600-MWD												
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
7,000.0	6,418.5	6,401.9	6,401.0	17.9	12.9	-94.87	1,238.9	241.9	979.9	949.2	30.70	31.921
7,100.0	6,417.9	6,401.1	6,400.1	18.8	12.9	-94.30	1,238.9	241.9	880.3	848.6	31.66	27.805
7,200.0	6,417.3	6,400.2	6,399.2	20.0	12.9	-93.72	1,238.9	241.9	780.9	748.1	32.76	23.837
7,300.0	6,416.7	6,399.3	6,398.4	21.2	12.8	-93.14	1,238.9	241.9	681.6	647.6	33.97	20.062
7,400.0	6,416.1	6,398.4	6,397.5	22.5	12.8	-92.57	1,238.9	241.9	582.5	547.2	35.28	16.510
7,500.0	6,415.5	6,397.6	6,396.6	24.0	12.8	-91.98	1,238.9	241.9	483.9	447.2	36.68	13.194
7,600.0	6,414.9	6,396.7	6,395.7	25.4	12.8	-91.40	1,238.9	242.0	385.9	347.8	38.13	10.120
7,700.0	6,414.3	6,395.8	6,394.8	27.0	12.8	-90.82	1,238.9	242.0	289.4	249.7	39.65	7.299
7,800.0	6,413.7	6,394.9	6,393.9	28.5	12.8	-90.23	1,238.9	242.0	196.3	155.1	41.21	4.763
7,900.0	6,413.0	6,394.0	6,393.0	30.2	12.8	-89.65	1,238.9	242.0	115.4	72.6	42.80	2.696
7,976.1	6,412.6	6,393.3	6,392.4	31.4	12.8	-89.20	1,238.9	242.0	86.8	42.7	44.04	1.970 CC, ES, SF

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

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well R&R Farms 29L-241
Project:	SEC.29-T5N-R63W	TVD Reference:	WELL @ 4587.0ft (RKB - 13')
Reference Site:	R&R Farms 5N63W29L Pad Sec.29-T5N-R63W	MD Reference:	WELL @ 4587.0ft (RKB - 13')
Site Error:	0.0ft	North Reference:	True
Reference Well:	R&R Farms 29L-241	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	Landmark
Reference Design:	Plan #3 (4-10-15)	Offset TVD Reference:	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			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	
8,000.0	6,412.4	6,393.1	6,392.2	31.8	12.8	-89.06	1,238.9	242.0	90.0	45.6	44.43	2.026	
8,100.0	6,411.8	6,392.2	6,391.3	33.5	12.8	-88.47	1,238.9	242.0	151.3	105.2	46.08	3.283	
8,200.0	6,411.2	6,391.3	6,390.4	35.2	12.8	-87.89	1,238.9	242.0	240.2	192.4	47.76	5.029	
8,300.0	6,410.6	6,390.5	6,389.5	36.9	12.8	-87.30	1,238.9	242.0	335.4	285.9	49.45	6.782	
8,400.0	6,410.0	6,389.6	6,388.6	38.6	12.8	-86.71	1,238.9	242.1	432.7	381.6	51.15	8.460	
8,500.0	6,409.4	6,388.7	6,387.7	40.4	12.8	-86.11	1,238.9	242.1	531.1	478.2	52.86	10.046	
8,600.0	6,408.8	6,387.8	6,386.8	42.2	12.8	-85.52	1,238.9	242.1	629.9	575.3	54.59	11.540	
8,700.0	6,408.2	6,386.9	6,385.9	43.9	12.8	-84.93	1,238.9	242.1	729.1	672.8	56.31	12.947	
8,800.0	6,407.5	6,386.0	6,385.0	45.7	12.8	-84.34	1,238.9	242.1	828.5	770.4	58.04	14.273	
8,900.0	6,406.9	6,385.1	6,384.1	47.5	12.8	-83.75	1,238.9	242.1	928.0	868.2	59.78	15.524	

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well R&R Farms 29L-241
Project:	SEC.29-T5N-R63W	TVD Reference:	WELL @ 4587.0ft (RKB - 13')
Reference Site:	R&R Farms 5N63W29L Pad Sec.29-T5N-R63W	MD Reference:	WELL @ 4587.0ft (RKB - 13')
Site Error:	0.0ft	North Reference:	True
Reference Well:	R&R Farms 29L-241	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	Landmark
Reference Design:	Plan #3 (4-10-15)	Offset TVD Reference:	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	289.8	290.2							
100.0	100.0	85.6	85.6	0.1	0.1	90.02	-0.1	289.7	289.7	289.5	0.21	1,370.377				
200.0	200.0	186.4	186.4	0.3	0.2	90.11	-0.5	289.4	289.4	288.8	0.55	523.791				
300.0	300.0	287.1	287.1	0.6	0.3	90.26	-1.3	288.8	288.8	287.9	0.89	323.189				
400.0	400.0	387.8	387.8	0.8	0.4	90.47	-2.4	287.9	287.9	286.7	1.23	233.215				
500.0	500.0	488.6	488.5	1.0	0.6	90.75	-3.8	286.8	286.8	285.2	1.58	182.033				
600.0	600.0	589.3	589.2	1.2	0.7	91.10	-5.5	285.4	285.4	283.5	1.92	148.939				
700.0	700.0	689.2	689.1	1.5	0.9	91.49	-7.4	283.8	284.0	281.6	2.35	120.874				
800.0	800.0	789.1	789.0	1.7	1.1	91.92	-9.5	282.4	282.5	279.7	2.80	101.082				
900.0	900.0	888.4	888.3	1.9	1.3	-58.77	-11.6	281.0	280.8	277.6	3.19	87.999				
1,000.0	1,000.0	988.4	988.2	2.1	1.5	-58.84	-13.5	279.8	278.3	274.7	3.58	77.813				
1,100.0	1,099.9	1,087.6	1,087.4	2.3	1.7	-59.24	-15.4	278.6	275.0	271.0	3.97	69.219				
1,200.0	1,199.7	1,186.3	1,186.1	2.5	1.9	-60.01	-17.0	277.9	271.1	266.8	4.37	62.081				
1,300.0	1,299.4	1,285.9	1,285.6	2.7	2.1	-61.18	-18.5	277.4	266.8	262.0	4.78	55.837				
1,400.0	1,398.9	1,385.0	1,384.8	2.9	2.3	-62.77	-19.9	277.0	261.9	256.7	5.20	50.311				
1,500.0	1,498.3	1,483.7	1,483.4	3.2	2.5	-64.84	-20.7	276.8	256.6	251.0	5.65	45.415				
1,600.0	1,597.4	1,583.2	1,582.9	3.4	2.7	-67.46	-21.3	276.8	251.2	245.1	6.12	41.029				
1,700.0	1,696.3	1,682.7	1,682.5	3.7	2.9	-70.56	-21.8	276.5	245.5	238.9	6.62	37.081				
1,800.0	1,794.9	1,781.9	1,781.7	4.0	3.1	-74.16	-22.4	276.0	239.9	232.7	7.15	33.559				
1,900.0	1,893.5	1,881.1	1,880.8	4.4	3.3	-77.97	-23.0	275.3	234.9	227.2	7.69	30.530				
2,000.0	1,992.1	1,980.2	1,979.9	4.7	3.6	-81.93	-23.7	274.4	230.8	222.6	8.25	27.969				
2,100.0	2,090.7	2,078.9	2,078.6	5.1	3.8	-86.03	-24.3	273.2	227.7	218.9	8.82	25.824				
2,200.0	2,189.3	2,177.4	2,177.1	5.4	4.0	-90.26	-24.7	272.0	225.9	216.5	9.39	24.063				
2,289.9	2,277.9	2,265.9	2,265.6	5.8	4.2	-94.14	-24.9	270.9	225.3	215.4	9.89	22.774				
2,300.0	2,287.8	2,275.8	2,275.6	5.8	4.2	-94.58	-24.9	270.7	225.3	215.4	9.95	22.645				
2,400.0	2,386.4	2,374.2	2,373.9	6.2	4.4	-98.95	-24.9	269.3	226.2	215.7	10.51	21.527				
2,500.0	2,485.0	2,472.5	2,472.2	6.5	4.6	-103.31	-24.7	267.9	228.4	217.4	11.05	20.673				
2,600.0	2,583.6	2,570.9	2,570.6	6.9	4.8	-107.60	-24.4	266.3	232.0	220.5	11.57	20.049				
2,700.0	2,682.1	2,669.4	2,669.0	7.3	5.0	-111.74	-24.2	264.8	236.9	224.8	12.08	19.611				
2,800.0	2,780.7	2,767.9	2,767.5	7.7	5.2	-115.67	-24.0	263.3	243.0	230.4	12.57	19.327				
2,900.0	2,879.3	2,866.4	2,866.0	8.1	5.4	-119.40	-23.8	261.8	250.1	237.1	13.05	19.170				
3,000.0	2,977.9	2,965.0	2,964.6	8.4	5.6	-122.90	-23.8	260.3	258.2	244.7	13.51	19.115				
3,100.0	3,076.5	3,063.3	3,062.9	8.8	5.8	-126.16	-23.8	258.9	267.2	253.3	13.96	19.146				
3,200.0	3,175.0	3,161.4	3,161.1	9.2	6.0	-129.18	-23.7	257.6	277.1	262.7	14.39	19.253				
3,300.0	3,273.6	3,259.6	3,259.2	9.6	6.2	-131.97	-23.6	256.4	287.9	273.0	14.82	19.419				
3,400.0	3,372.2	3,357.8	3,357.4	10.0	6.4	-134.55	-23.4	255.3	299.3	284.1	15.25	19.631				
3,500.0	3,470.8	3,456.0	3,455.6	10.4	6.7	-136.92	-23.1	254.3	311.5	295.8	15.67	19.877				
3,600.0	3,569.3	3,554.4	3,554.0	10.8	6.9	-139.10	-22.8	253.4	324.1	308.0	16.09	20.147				
3,700.0	3,667.9	3,653.0	3,652.6	11.1	7.1	-141.14	-22.5	252.4	337.2	320.7	16.51	20.429				
3,800.0	3,766.5	3,751.6	3,751.2	11.5	7.3	-143.03	-22.2	251.3	350.6	333.7	16.92	20.720				
3,900.0	3,865.1	3,850.2	3,849.7	11.9	7.5	-144.80	-22.0	250.2	364.4	347.1	17.34	21.017				
4,000.0	3,963.7	3,948.7	3,948.3	12.3	7.7	-146.45	-21.8	248.9	378.4	360.7	17.75	21.316				
4,100.0	4,062.2	4,047.5	4,047.0	12.7	7.9	-148.01	-21.6	247.5	392.7	374.5	18.17	21.613				
4,200.0	4,160.8	4,146.3	4,145.8	13.1	8.1	-149.52	-21.6	245.7	407.2	388.6	18.59	21.906				
4,300.0	4,259.4	4,245.0	4,244.6	13.5	8.3	-151.00	-21.6	243.3	421.8	402.8	19.00	22.198				
4,400.0	4,358.0	4,343.7	4,343.2	13.9	8.5	-152.44	-21.7	240.5	436.6	417.2	19.41	22.490				
4,500.0	4,456.5	4,442.3	4,441.7	14.3	8.7	-153.86	-21.9	237.1	451.6	431.7	19.82	22.782				
4,600.0	4,555.1	4,540.7	4,540.1	14.7	9.0	-155.23	-22.1	233.3	466.8	446.5	20.23	23.075				
4,700.0	4,653.7	4,639.2	4,638.4	15.1	9.2	-156.47	-22.4	229.9	482.2	461.5	20.64	23.362				
4,800.0	4,752.3	4,737.7	4,736.9	15.5	9.4	-157.57	-22.7	227.2	497.7	476.7	21.06	23.638				
4,900.0	4,850.9	4,836.4	4,835.6	15.8	9.6	-158.53	-22.9	225.0	513.4	491.9	21.48	23.901				

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

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well R&R Farms 29L-241
Project:	SEC.29-T5N-R63W	TVD Reference:	WELL @ 4587.0ft (RKB - 13')
Reference Site:	R&R Farms 5N63W29L Pad Sec.29-T5N-R63W	MD Reference:	WELL @ 4587.0ft (RKB - 13')
Site Error:	0.0ft	North Reference:	True
Reference Well:	R&R Farms 29L-241	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	Landmark
Reference Design:	Plan #3 (4-10-15)	Offset TVD Reference:	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	4,949.4	4,935.2	4,934.4	16.2	9.8	-159.37	-23.1	223.4	529.2	507.3	21.91	24.151		
5,100.0	5,048.0	5,034.1	5,033.3	16.6	10.0	-160.13	-23.2	222.4	544.8	522.5	22.35	24.377		
5,200.0	5,147.0	5,133.5	5,132.7	16.9	10.2	-160.76	-23.4	221.9	558.0	535.2	22.77	24.509		
5,300.0	5,246.5	5,233.4	5,232.6	17.1	10.4	-161.17	-23.5	222.0	567.9	544.7	23.17	24.511		
5,400.0	5,346.2	5,333.6	5,332.8	17.3	10.6	-161.39	-23.7	222.6	574.4	550.8	23.55	24.390		
5,500.0	5,446.1	5,434.0	5,433.2	17.4	10.8	-161.41	-23.8	223.7	577.5	553.6	23.91	24.152		
5,600.0	5,546.1	5,534.2	5,533.4	17.6	11.0	-10.32	-23.9	225.3	577.6	553.3	24.28	23.783		
5,700.0	5,646.1	5,633.8	5,633.0	17.7	11.2	-10.18	-24.0	226.8	577.2	552.5	24.67	23.398		
5,800.0	5,745.9	5,733.2	5,732.4	17.8	11.4	-10.23	-24.1	227.9	571.6	546.9	24.74	23.101		
5,900.0	5,844.2	5,831.1	5,830.2	17.8	11.6	-10.74	-24.1	228.8	553.3	528.9	24.42	22.660		
6,000.0	5,939.2	5,925.7	5,924.8	17.6	11.8	-11.80	-24.2	229.3	522.7	499.0	23.73	22.027		
6,100.0	6,029.3	6,015.4	6,014.6	17.4	12.0	-13.62	-24.2	229.5	480.4	457.6	22.73	21.130		
6,200.0	6,113.0	6,098.5	6,097.6	17.2	12.2	-16.63	-24.2	229.4	427.2	405.6	21.55	19.819		
6,300.0	6,188.9	6,173.9	6,173.0	16.9	12.4	-21.64	-24.2	229.0	364.4	343.9	20.49	17.787		
6,400.0	6,255.7	6,240.2	6,239.4	16.7	12.5	-30.28	-24.1	228.5	293.8	273.6	20.28	14.491		
6,500.0	6,312.2	6,296.5	6,295.6	16.4	12.6	-45.19	-24.0	227.9	218.5	196.3	22.28	9.808		
6,600.0	6,357.4	6,341.6	6,340.8	16.3	12.7	-67.14	-24.0	227.3	145.9	119.6	26.32	5.544		
6,700.0	6,390.7	6,374.9	6,374.0	16.3	12.8	-87.50	-23.9	226.8	102.6	73.9	28.67	3.578		
6,710.6	6,393.5	6,377.7	6,376.8	16.3	12.8	-89.05	-23.9	226.7	102.0	73.3	28.77	3.547 CC, ES, SF		
6,800.0	6,411.3	6,395.7	6,394.8	16.5	12.8	-96.07	-23.8	226.4	134.4	105.1	29.22	4.598		
6,900.0	6,419.0	6,403.6	6,402.7	17.1	12.8	-90.50	-23.8	226.3	212.9	183.1	29.86	7.131		
7,000.0	6,418.5	6,403.4	6,402.5	17.9	12.8	-88.43	-23.8	226.3	304.4	273.8	30.61	9.946		
7,100.0	6,417.9	6,403.0	6,402.1	18.8	12.8	-88.23	-23.8	226.3	400.0	368.5	31.56	12.676		
7,200.0	6,417.3	6,402.6	6,401.8	20.0	12.8	-88.03	-23.8	226.3	497.3	464.7	32.64	15.235		
7,300.0	6,416.7	6,402.3	6,401.4	21.2	12.8	-87.82	-23.8	226.3	595.5	561.7	33.85	17.593		
7,400.0	6,416.1	6,401.9	6,401.0	22.5	12.8	-87.62	-23.8	226.3	694.3	659.1	35.15	19.749		
7,500.0	6,415.5	6,401.5	6,400.7	24.0	12.8	-87.41	-23.8	226.3	793.3	756.8	36.54	21.710		
7,600.0	6,414.9	6,401.2	6,400.3	25.4	12.8	-87.21	-23.8	226.4	892.6	854.6	37.99	23.492		
7,700.0	6,414.3	6,400.8	6,399.9	27.0	12.8	-87.00	-23.8	226.4	992.0	952.5	39.51	25.110		

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well R&R Farms 29L-241
Project:	SEC.29-T5N-R63W	TVD Reference:	WELL @ 4587.0ft (RKB - 13')
Reference Site:	R&R Farms 5N63W29L Pad Sec.29-T5N-R63W	MD Reference:	WELL @ 4587.0ft (RKB - 13')
Site Error:	0.0ft	North Reference:	True
Reference Well:	R&R Farms 29L-241	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	Landmark
Reference Design:	Plan #3 (4-10-15)	Offset TVD Reference:	Offset Datum

Offset Design R&R Farms 5N63W29L Pad Sec.29-T5N-R63W - R&R Farms 29I-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	-90.00	0.0	-61.3	61.3				
100.0	100.0	100.0	100.0	0.1	0.1	-90.00	0.0	-61.3	61.3	61.1	0.22	272.757	
200.0	200.0	200.0	200.0	0.3	0.3	-90.00	0.0	-61.3	61.3	60.6	0.67	90.919	
300.0	300.0	300.0	300.0	0.6	0.6	-90.00	0.0	-61.3	61.3	60.2	1.12	54.551	
400.0	400.0	400.0	400.0	0.8	0.8	-90.00	0.0	-61.3	61.3	59.7	1.57	38.965	
500.0	500.0	500.0	500.0	1.0	1.0	-90.00	0.0	-61.3	61.3	59.3	2.02	30.306	
600.0	600.0	600.0	600.0	1.2	1.2	-90.00	0.0	-61.3	61.3	58.8	2.47	24.796	
700.0	700.0	700.0	700.0	1.5	1.5	-90.00	0.0	-61.3	61.3	58.4	2.92	20.981	
800.0	800.0	800.0	800.0	1.7	1.7	-90.00	0.0	-61.3	61.3	57.9	3.37	18.184 CC, ES	
900.0	900.0	900.0	900.0	1.9	1.9	119.75	0.0	-61.3	61.7	57.9	3.79	16.270	
1,000.0	1,000.0	1,000.0	1,000.0	2.1	2.1	121.80	0.0	-61.3	63.1	58.9	4.20	15.022	
1,100.0	1,099.9	1,099.9	1,099.9	2.3	2.4	125.02	0.0	-61.3	65.5	60.9	4.61	14.196	
1,200.0	1,199.7	1,199.7	1,199.7	2.5	2.6	129.13	0.0	-61.3	69.2	64.1	5.03	13.738	
1,300.0	1,299.4	1,299.5	1,299.5	2.7	2.8	133.13	-0.9	-61.4	74.3	68.8	5.44	13.659	
1,400.0	1,398.9	1,399.5	1,399.4	2.9	3.0	136.23	-3.4	-61.7	80.6	74.8	5.82	13.840	
1,500.0	1,498.3	1,499.4	1,499.3	3.2	3.1	138.51	-7.8	-62.2	88.0	81.8	6.23	14.142	
1,600.0	1,597.4	1,599.4	1,599.1	3.4	3.3	140.08	-13.8	-62.9	96.5	89.8	6.65	14.520	
1,700.0	1,696.3	1,699.5	1,698.8	3.7	3.5	141.06	-21.6	-63.7	105.9	98.8	7.09	14.942	
1,800.0	1,794.9	1,799.5	1,798.4	4.0	3.7	141.57	-31.1	-64.8	116.1	108.6	7.56	15.368	
1,900.0	1,893.5	1,899.6	1,897.8	4.4	4.0	141.39	-42.4	-66.1	126.2	118.1	8.06	15.658	
2,000.0	1,992.1	1,999.7	1,997.1	4.7	4.2	140.51	-55.4	-67.6	135.7	127.2	8.59	15.798	
2,100.0	2,090.7	2,099.8	2,096.1	5.1	4.5	139.08	-70.1	-69.2	144.9	135.8	9.16	15.814	
2,200.0	2,189.3	2,199.6	2,194.6	5.4	4.8	137.30	-86.1	-71.0	153.9	144.1	9.77	15.744	
2,300.0	2,287.8	2,299.1	2,292.7	5.8	5.1	135.67	-102.3	-72.9	162.9	152.5	10.40	15.658	
2,400.0	2,386.4	2,398.6	2,390.9	6.2	5.4	134.21	-118.5	-74.7	172.1	161.0	11.05	15.567	
2,500.0	2,485.0	2,498.0	2,489.0	6.5	5.7	132.90	-134.7	-76.5	181.3	169.6	11.72	15.474	
2,600.0	2,583.6	2,597.5	2,587.1	6.9	6.1	131.71	-150.9	-78.3	190.7	178.3	12.40	15.383	
2,700.0	2,682.1	2,697.0	2,685.3	7.3	6.4	130.64	-167.0	-80.2	200.1	187.0	13.08	15.294	
2,800.0	2,780.7	2,796.5	2,783.4	7.7	6.7	129.66	-183.2	-82.0	209.6	195.8	13.78	15.209	
2,900.0	2,879.3	2,896.0	2,881.6	8.1	7.1	128.77	-199.4	-83.8	219.2	204.7	14.49	15.128	
3,000.0	2,977.9	2,995.5	2,979.7	8.4	7.4	127.95	-215.6	-85.7	228.7	213.5	15.20	15.051	
3,100.0	3,076.5	3,095.0	3,077.9	8.8	7.8	127.20	-231.7	-87.5	238.4	222.5	15.91	14.978	
3,200.0	3,175.0	3,194.5	3,176.0	9.2	8.1	126.51	-247.9	-89.3	248.0	231.4	16.64	14.910	
3,300.0	3,273.6	3,293.9	3,274.2	9.6	8.5	125.87	-264.1	-91.1	257.7	240.4	17.36	14.846	
3,400.0	3,372.2	3,393.4	3,372.3	10.0	8.9	125.27	-280.3	-93.0	267.5	249.4	18.09	14.785	
3,500.0	3,470.8	3,492.9	3,470.5	10.4	9.2	124.72	-296.5	-94.8	277.2	258.4	18.82	14.729	
3,600.0	3,569.3	3,592.4	3,568.6	10.8	9.6	124.21	-312.6	-96.6	287.0	267.5	19.56	14.675	
3,700.0	3,667.9	3,691.9	3,666.8	11.1	10.0	123.73	-328.8	-98.4	296.8	276.5	20.30	14.625	
3,800.0	3,766.5	3,791.4	3,764.9	11.5	10.3	123.28	-345.0	-100.3	306.7	285.6	21.04	14.578	
3,900.0	3,865.1	3,890.9	3,863.1	11.9	10.7	122.85	-361.2	-102.1	316.5	294.7	21.78	14.534	
4,000.0	3,963.7	3,990.4	3,961.2	12.3	11.1	122.46	-377.3	-103.9	326.4	303.8	22.52	14.492	
4,100.0	4,062.2	4,089.9	4,059.4	12.7	11.4	122.08	-393.5	-105.7	336.2	313.0	23.26	14.453	
4,200.0	4,160.8	4,189.3	4,157.5	13.1	11.8	121.73	-409.7	-107.6	346.1	322.1	24.01	14.416	
4,300.0	4,259.4	4,288.8	4,255.6	13.5	12.2	121.40	-425.9	-109.4	356.0	331.3	24.76	14.381	
4,400.0	4,358.0	4,388.3	4,353.8	13.9	12.5	121.08	-442.1	-111.2	365.9	340.4	25.50	14.347	
4,500.0	4,456.5	4,487.8	4,451.9	14.3	12.9	120.78	-458.2	-113.1	375.8	349.6	26.25	14.316	
4,600.0	4,555.1	4,587.3	4,550.1	14.7	13.3	120.50	-474.4	-114.9	385.8	358.8	27.00	14.286	
4,700.0	4,653.7	4,686.8	4,648.2	15.1	13.7	120.23	-490.6	-116.7	395.7	368.0	27.75	14.258	
4,800.0	4,752.3	4,786.3	4,746.4	15.5	14.1	119.98	-506.8	-118.5	405.7	377.2	28.51	14.231	
4,900.0	4,850.9	4,885.8	4,844.5	15.8	14.4	119.73	-523.0	-120.4	415.6	386.4	29.26	14.205	
5,000.0	4,949.4	4,985.2	4,942.7	16.2	14.8	119.50	-539.1	-122.2	425.6	395.6	30.01	14.181	

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

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well R&R Farms 29L-241
Project:	SEC.29-T5N-R63W	TVD Reference:	WELL @ 4587.0ft (RKB - 13')
Reference Site:	R&R Farms 5N63W29L Pad Sec.29-T5N-R63W	MD Reference:	WELL @ 4587.0ft (RKB - 13')
Site Error:	0.0ft	North Reference:	True
Reference Well:	R&R Farms 29L-241	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	Landmark
Reference Design:	Plan #3 (4-10-15)	Offset TVD Reference:	Offset Datum

Offset Design R&R Farms 5N63W29L Pad Sec.29-T5N-R63W - R&R Farms 29I-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
5,100.0	5,048.0	5,084.9	5,041.0	16.6	15.2	119.32	-555.3	-124.0	435.5	404.7	30.75	14.163	
5,200.0	5,147.0	5,186.1	5,141.2	16.9	15.4	119.20	-569.7	-125.6	443.9	412.6	31.28	14.188	
5,300.0	5,246.5	5,287.6	5,242.1	17.1	15.7	119.12	-580.5	-126.9	450.2	418.5	31.75	14.180	
5,400.0	5,346.2	5,389.3	5,343.5	17.3	15.9	119.07	-587.8	-127.7	454.5	422.3	32.15	14.136	
5,500.0	5,446.1	5,491.1	5,445.2	17.4	16.1	119.05	-591.6	-128.1	456.6	424.2	32.48	14.060	
5,600.0	5,546.1	5,592.0	5,546.1	17.6	16.2	-90.00	-592.1	-128.2	456.9	424.2	32.78	13.940	
5,700.0	5,646.1	5,692.0	5,646.1	17.7	16.3	-90.00	-592.1	-128.2	456.9	423.9	33.05	13.827	
5,800.0	5,745.9	5,792.0	5,745.9	17.8	16.4	-90.00	-586.7	-128.2	456.9	423.7	33.22	13.757	
5,900.0	5,844.2	5,892.0	5,844.2	17.8	16.4	-90.00	-568.3	-128.2	456.9	423.8	33.16	13.782	
6,000.0	5,939.2	5,992.0	5,939.2	17.6	16.3	-90.00	-537.3	-128.2	456.9	424.1	32.90	13.891	
6,100.0	6,029.3	6,092.0	6,029.3	17.4	16.1	-90.00	-494.2	-128.2	456.9	424.5	32.48	14.067	
6,200.0	6,113.0	6,192.0	6,113.0	17.2	15.8	-90.00	-439.7	-128.2	456.9	425.0	31.99	14.283	
6,300.0	6,188.9	6,292.0	6,188.9	16.9	15.6	-90.00	-374.7	-128.2	456.9	425.4	31.51	14.503	
6,400.0	6,255.7	6,392.0	6,255.7	16.7	15.4	-90.00	-300.3	-128.2	456.9	425.8	31.12	14.682	
6,500.0	6,312.2	6,492.0	6,312.2	16.4	15.3	-90.00	-217.9	-128.2	456.9	426.0	30.95	14.766	
6,600.0	6,357.4	6,592.0	6,357.4	16.3	15.3	-90.00	-128.8	-128.2	456.9	425.9	31.06	14.709	
6,700.0	6,390.7	6,692.0	6,390.7	16.3	15.6	-90.00	-34.6	-128.2	456.9	425.4	31.55	14.485	
6,800.0	6,411.3	6,792.0	6,411.3	16.5	16.0	-90.00	63.2	-128.2	456.9	424.5	32.42	14.093	
6,900.0	6,419.0	6,892.0	6,419.0	17.1	16.6	-90.00	162.8	-128.2	456.9	423.3	33.68	13.567	
7,000.0	6,418.5	6,992.0	6,418.5	17.9	17.4	-90.00	262.8	-128.2	456.9	421.6	35.30	12.946	
7,100.0	6,417.9	7,092.0	6,417.9	18.8	18.4	-90.00	362.8	-128.2	456.9	419.7	37.24	12.271	
7,200.0	6,417.3	7,192.0	6,417.3	20.0	19.6	-90.00	462.8	-128.2	456.9	417.5	39.46	11.581	
7,300.0	6,416.7	7,292.0	6,416.7	21.2	20.8	-90.00	562.8	-128.2	456.9	415.0	41.91	10.903	
7,400.0	6,416.1	7,392.0	6,416.1	22.5	22.1	-90.00	662.8	-128.2	456.9	412.4	44.56	10.254	
7,500.0	6,415.5	7,492.0	6,415.5	24.0	23.6	-90.00	762.8	-128.2	456.9	409.6	47.38	9.645	
7,600.0	6,414.9	7,592.0	6,414.9	25.4	25.0	-90.00	862.8	-128.2	456.9	406.6	50.33	9.080	
7,700.0	6,414.3	7,692.0	6,414.3	27.0	26.6	-90.00	962.8	-128.2	456.9	403.6	53.39	8.559	
7,800.0	6,413.7	7,792.0	6,413.7	28.5	28.2	-90.00	1,062.8	-128.2	456.9	400.4	56.55	8.081	
7,900.0	6,413.0	7,892.0	6,413.0	30.2	29.8	-90.00	1,162.8	-128.2	456.9	397.2	59.79	7.643	
8,000.0	6,412.4	7,992.0	6,412.4	31.8	31.5	-90.00	1,262.8	-128.2	456.9	393.9	63.09	7.243	
8,100.0	6,411.8	8,092.0	6,411.8	33.5	33.1	-90.00	1,362.8	-128.2	456.9	390.5	66.46	6.876	
8,200.0	6,411.2	8,192.0	6,411.2	35.2	34.9	-90.00	1,462.8	-128.2	456.9	387.1	69.87	6.540	
8,300.0	6,410.6	8,292.0	6,410.6	36.9	36.6	-90.00	1,562.8	-128.2	456.9	383.6	73.32	6.232	
8,400.0	6,410.0	8,392.0	6,410.0	38.6	38.3	-90.00	1,662.8	-128.2	456.9	380.1	76.81	5.949	
8,500.0	6,409.4	8,492.0	6,409.4	40.4	40.1	-90.00	1,762.8	-128.2	456.9	376.6	80.34	5.688	
8,600.0	6,408.8	8,592.0	6,408.8	42.2	41.9	-90.00	1,862.8	-128.2	456.9	373.1	83.89	5.447	
8,700.0	6,408.2	8,692.0	6,408.2	43.9	43.7	-90.00	1,962.8	-128.2	456.9	369.5	87.46	5.224	
8,800.0	6,407.5	8,792.0	6,407.5	45.7	45.5	-90.00	2,062.8	-128.2	456.9	365.9	91.06	5.018	
8,900.0	6,406.9	8,892.0	6,406.9	47.5	47.3	-90.00	2,162.8	-128.2	456.9	362.3	94.68	4.826	
9,000.0	6,406.3	8,992.0	6,406.3	49.4	49.1	-90.00	2,262.8	-128.2	456.9	358.6	98.31	4.648	
9,100.0	6,405.7	9,092.0	6,405.7	51.2	50.9	-90.00	2,362.8	-128.2	456.9	355.0	101.96	4.482	
9,200.0	6,405.1	9,192.0	6,405.1	53.0	52.8	-90.00	2,462.8	-128.2	456.9	351.3	105.62	4.326	
9,300.0	6,404.5	9,292.0	6,404.5	54.8	54.6	-90.00	2,562.8	-128.2	456.9	347.7	109.30	4.181	
9,400.0	6,403.9	9,392.0	6,403.9	56.7	56.5	-90.00	2,662.8	-128.2	456.9	344.0	112.98	4.044	
9,500.0	6,403.3	9,492.0	6,403.3	58.5	58.3	-90.00	2,762.8	-128.2	456.9	340.3	116.68	3.916	
9,600.0	6,402.7	9,592.0	6,402.7	60.4	60.2	-90.00	2,862.8	-128.2	456.9	336.6	120.38	3.796	
9,700.0	6,402.0	9,692.0	6,402.0	62.2	62.0	-90.00	2,962.8	-128.2	456.9	332.9	124.09	3.682	
9,800.0	6,401.4	9,792.0	6,401.4	64.1	63.9	-90.00	3,062.8	-128.2	456.9	329.1	127.81	3.575	
9,900.0	6,400.8	9,892.0	6,400.8	65.9	65.7	-90.00	3,162.8	-128.2	456.9	325.4	131.54	3.474	
10,000.0	6,400.2	9,992.0	6,400.2	67.8	67.6	-90.00	3,262.8	-128.2	456.9	321.7	135.27	3.378	

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

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well R&R Farms 29L-241
Project:	SEC.29-T5N-R63W	TVD Reference:	WELL @ 4587.0ft (RKB - 13')
Reference Site:	R&R Farms 5N63W29L Pad Sec.29-T5N-R63W	MD Reference:	WELL @ 4587.0ft (RKB - 13')
Site Error:	0.0ft	North Reference:	True
Reference Well:	R&R Farms 29L-241	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	Landmark
Reference Design:	Plan #3 (4-10-15)	Offset TVD Reference:	Offset Datum

Offset Design													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	
10,100.0	6,399.6	10,092.0	6,399.6	69.7	69.5	-90.00	3,362.8	-128.2	456.9	317.9	139.01	3.287		
10,200.0	6,399.0	10,192.0	6,399.0	71.5	71.4	-90.00	3,462.8	-128.2	456.9	314.2	142.76	3.201		
10,300.0	6,398.4	10,292.0	6,398.4	73.4	73.2	-90.00	3,562.8	-128.2	456.9	310.4	146.51	3.119		
10,400.0	6,397.8	10,392.0	6,397.8	75.3	75.1	-90.00	3,662.8	-128.2	456.9	306.7	150.26	3.041		
10,500.0	6,397.2	10,492.0	6,397.2	77.1	77.0	-90.00	3,762.8	-128.2	456.9	302.9	154.02	2.967		
10,600.0	6,396.6	10,592.0	6,396.6	79.0	78.9	-90.00	3,862.8	-128.2	456.9	299.2	157.78	2.896		
10,700.0	6,395.9	10,692.0	6,395.9	80.9	80.8	-90.00	3,962.8	-128.2	456.9	295.4	161.55	2.829		
10,800.0	6,395.3	10,792.0	6,395.3	82.8	82.6	-90.00	4,062.8	-128.2	456.9	291.6	165.32	2.764		
10,830.4	6,395.1	10,822.5	6,395.1	83.4	83.2	-90.00	4,093.2	-128.2	456.9	290.5	166.46	2.745		
10,854.0	6,395.0	10,846.0	6,395.0	83.8	83.7	-90.00	4,116.7	-128.2	456.9	289.6	167.35	2.730 SF		

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well R&R Farms 29L-241
Project:	SEC.29-T5N-R63W	TVD Reference:	WELL @ 4587.0ft (RKB - 13')
Reference Site:	R&R Farms 5N63W29L Pad Sec.29-T5N-R63W	MD Reference:	WELL @ 4587.0ft (RKB - 13')
Site Error:	0.0ft	North Reference:	True
Reference Well:	R&R Farms 29L-241	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	Landmark
Reference Design:	Plan #3 (4-10-15)	Offset TVD Reference:	Offset Datum

Offset Design R&R Farms 5N63W29L Pad Sec.29-T5N-R63W - R&R Farms 29L-321 - Wellbore #1 - Plan #3 (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	-89.98	0.0	-30.7	30.7					
100.0	100.0	100.0	100.0	0.1	0.1	-89.98	0.0	-30.7	30.7	30.4	0.22	136.379		
200.0	200.0	200.0	200.0	0.3	0.3	-89.98	0.0	-30.7	30.7	30.0	0.67	45.460		
300.0	300.0	300.0	300.0	0.6	0.6	-89.98	0.0	-30.7	30.7	29.5	1.12	27.276		
400.0	400.0	400.0	400.0	0.8	0.8	-89.98	0.0	-30.7	30.7	29.1	1.57	19.483		
500.0	500.0	500.0	500.0	1.0	1.0	-89.98	0.0	-30.7	30.7	28.6	2.02	15.153		
600.0	600.0	600.0	600.0	1.2	1.2	-89.98	0.0	-30.7	30.7	28.2	2.47	12.398		
700.0	700.0	700.0	700.0	1.5	1.5	-89.98	0.0	-30.7	30.7	27.7	2.92	10.491		
800.0	800.0	800.0	800.0	1.7	1.7	-89.98	0.0	-30.7	30.7	27.3	3.37	9.092 CC, ES		
900.0	900.0	900.0	900.0	1.9	1.9	120.46	0.0	-30.7	31.1	27.3	3.79	8.193		
1,000.0	1,000.0	1,000.0	1,000.0	2.1	2.1	124.43	0.0	-30.7	32.5	28.3	4.20	7.739		
1,100.0	1,099.9	1,100.1	1,100.1	2.3	2.3	128.96	-0.9	-30.5	34.8	30.2	4.58	7.598		
1,200.0	1,199.7	1,200.3	1,200.2	2.5	2.5	132.43	-3.4	-30.0	37.8	32.9	4.96	7.631		
1,300.0	1,299.4	1,300.5	1,300.3	2.7	2.7	134.91	-7.7	-29.2	41.4	36.0	5.35	7.740		
1,400.0	1,398.9	1,400.7	1,400.4	2.9	2.9	136.56	-13.8	-28.1	45.4	39.7	5.75	7.897		
1,500.0	1,498.3	1,501.0	1,500.4	3.2	3.1	137.52	-21.5	-26.6	50.0	43.8	6.18	8.081		
1,600.0	1,597.4	1,601.4	1,600.3	3.4	3.3	137.95	-31.0	-24.8	54.9	48.3	6.63	8.278		
1,700.0	1,696.3	1,701.7	1,700.0	3.7	3.6	137.96	-42.2	-22.7	60.3	53.2	7.12	8.476		
1,800.0	1,794.9	1,802.1	1,799.5	4.0	3.8	137.61	-55.1	-20.3	66.1	58.4	7.63	8.656		
1,900.0	1,893.5	1,902.5	1,898.8	4.4	4.1	136.33	-69.7	-17.5	71.3	63.1	8.19	8.698		
2,000.0	1,992.1	2,002.3	1,997.4	4.7	4.4	134.73	-84.9	-14.7	76.2	67.4	8.79	8.668		
2,100.0	2,090.7	2,102.2	2,096.0	5.1	4.7	133.32	-100.2	-11.8	81.1	71.7	9.41	8.626		
2,200.0	2,189.3	2,202.1	2,194.7	5.4	5.0	132.08	-115.5	-8.9	86.1	76.1	10.04	8.579		
2,300.0	2,287.8	2,301.9	2,293.3	5.8	5.4	130.97	-130.7	-6.0	91.2	80.5	10.69	8.528		
2,400.0	2,386.4	2,401.8	2,392.0	6.2	5.7	129.98	-146.0	-3.2	96.2	84.9	11.35	8.475		
2,500.0	2,485.0	2,501.6	2,490.6	6.5	6.0	129.09	-161.2	-0.3	101.3	89.3	12.03	8.424		
2,600.0	2,583.6	2,601.5	2,589.3	6.9	6.4	128.29	-176.5	2.6	106.4	93.7	12.71	8.373		
2,700.0	2,682.1	2,701.3	2,687.9	7.3	6.7	127.55	-191.8	5.4	111.6	98.2	13.40	8.324		
2,800.0	2,780.7	2,801.2	2,786.5	7.7	7.1	126.89	-207.0	8.3	116.7	102.6	14.10	8.277		
2,900.0	2,879.3	2,901.1	2,885.2	8.1	7.4	126.28	-222.3	11.2	121.9	107.1	14.81	8.232		
3,000.0	2,977.9	3,000.9	2,983.8	8.4	7.8	125.72	-237.5	14.1	127.1	111.5	15.52	8.189		
3,100.0	3,076.5	3,100.8	3,082.5	8.8	8.1	125.20	-252.8	16.9	132.2	116.0	16.23	8.148		
3,200.0	3,175.0	3,200.6	3,181.1	9.2	8.5	124.72	-268.1	19.8	137.4	120.5	16.95	8.110		
3,300.0	3,273.6	3,300.5	3,279.8	9.6	8.8	124.28	-283.3	22.7	142.6	125.0	17.67	8.074		
3,400.0	3,372.2	3,400.4	3,378.4	10.0	9.2	123.87	-298.6	25.5	147.9	129.5	18.39	8.040		
3,500.0	3,470.8	3,500.2	3,477.1	10.4	9.6	123.48	-313.8	28.4	153.1	134.0	19.12	8.007		
3,600.0	3,569.3	3,600.1	3,575.7	10.8	9.9	123.12	-329.1	31.3	158.3	138.5	19.85	7.976		
3,700.0	3,667.9	3,699.9	3,674.3	11.1	10.3	122.79	-344.3	34.2	163.5	143.0	20.58	7.947		
3,800.0	3,766.5	3,799.8	3,773.0	11.5	10.6	122.47	-359.6	37.0	168.8	147.5	21.31	7.920		
3,900.0	3,865.1	3,899.7	3,871.6	11.9	11.0	122.18	-374.9	39.9	174.0	152.0	22.04	7.894		
4,000.0	3,963.7	3,999.5	3,970.3	12.3	11.4	121.90	-390.1	42.8	179.3	156.5	22.78	7.869		
4,100.0	4,062.2	4,099.4	4,068.9	12.7	11.7	121.64	-405.4	45.7	184.5	161.0	23.52	7.846		
4,200.0	4,160.8	4,199.2	4,167.6	13.1	12.1	121.39	-420.6	48.5	189.8	165.5	24.26	7.824		
4,300.0	4,259.4	4,299.1	4,266.2	13.5	12.5	121.15	-435.9	51.4	195.0	170.0	25.00	7.803		
4,400.0	4,358.0	4,398.9	4,364.9	13.9	12.8	120.93	-451.2	54.3	200.3	174.6	25.74	7.782		
4,500.0	4,456.5	4,498.8	4,463.5	14.3	13.2	120.72	-466.4	57.1	205.6	179.1	26.48	7.763		
4,600.0	4,555.1	4,598.7	4,562.1	14.7	13.6	120.52	-481.7	60.0	210.8	183.6	27.22	7.745		
4,700.0	4,653.7	4,698.5	4,660.8	15.1	14.0	120.33	-496.9	62.9	216.1	188.1	27.96	7.728		
4,800.0	4,752.3	4,798.4	4,759.4	15.5	14.3	120.15	-512.2	65.8	221.4	192.7	28.71	7.711		
4,900.0	4,850.9	4,898.2	4,858.1	15.8	14.7	119.97	-527.5	68.6	226.6	197.2	29.45	7.695		
5,000.0	4,949.4	4,998.1	4,956.7	16.2	15.1	119.81	-542.7	71.5	231.9	201.7	30.20	7.680		

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

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well R&R Farms 29L-241
Project:	SEC.29-T5N-R63W	TVD Reference:	WELL @ 4587.0ft (RKB - 13')
Reference Site:	R&R Farms 5N63W29L Pad Sec.29-T5N-R63W	MD Reference:	WELL @ 4587.0ft (RKB - 13')
Site Error:	0.0ft	North Reference:	True
Reference Well:	R&R Farms 29L-241	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	Landmark
Reference Design:	Plan #3 (4-10-15)	Offset TVD Reference:	Offset Datum

Offset Design R&R Farms 5N63W29L Pad Sec.29-T5N-R63W - R&R Farms 29I-321 - Wellbore #1 - Plan #3 (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	
5,100.0	5,048.0	5,097.9	5,055.4	16.6	15.4	119.64	-558.0	74.4	237.1	206.2	30.93	7.666	
5,200.0	5,147.0	5,196.2	5,152.7	16.9	15.7	119.40	-571.3	76.9	241.4	209.9	31.45	7.673	
5,300.0	5,246.5	5,294.6	5,250.5	17.1	15.9	119.23	-581.4	78.8	244.6	212.7	31.91	7.664	
5,400.0	5,346.2	5,393.0	5,348.6	17.3	16.1	119.11	-588.2	80.1	246.7	214.4	32.30	7.639	
5,500.0	5,446.1	5,491.4	5,447.0	17.4	16.3	119.05	-591.6	80.7	247.8	215.2	32.61	7.599	
5,600.0	5,546.1	5,590.5	5,546.1	17.6	16.4	-90.00	-592.1	80.8	248.0	215.1	32.91	7.536	
5,700.0	5,646.1	5,690.5	5,646.1	17.7	16.5	-90.00	-592.1	80.8	248.0	214.8	33.17	7.475	
5,714.6	5,660.7	5,705.1	5,660.7	17.7	16.6	-90.03	-592.1	80.8	248.0	214.8	33.21	7.467	
5,800.0	5,745.9	5,790.5	5,746.1	17.8	16.7	-91.14	-591.7	80.8	248.0	214.5	33.48	7.407	
5,900.0	5,844.2	5,891.4	5,846.4	17.8	16.7	-93.09	-581.6	80.8	248.3	214.7	33.64	7.382	
6,000.0	5,939.2	5,993.4	5,945.6	17.6	16.7	-95.00	-558.1	80.8	248.9	215.4	33.55	7.419	
6,100.0	6,029.3	6,096.5	6,041.8	17.4	16.5	-96.81	-521.2	80.8	249.8	216.5	33.24	7.514	
6,200.0	6,113.0	6,200.8	6,133.1	17.2	16.3	-98.51	-471.0	80.8	250.7	218.0	32.75	7.656	
6,300.0	6,188.9	6,306.2	6,217.6	16.9	16.0	-100.05	-408.1	80.8	251.9	219.7	32.18	7.826	
6,400.0	6,255.7	6,412.6	6,293.3	16.7	15.8	-101.40	-333.5	80.8	253.0	221.3	31.64	7.995	
6,500.0	6,312.2	6,519.9	6,358.4	16.4	15.6	-102.55	-248.3	80.8	254.1	222.8	31.26	8.127	
6,600.0	6,357.4	6,627.9	6,411.2	16.3	15.6	-103.47	-154.2	80.8	255.0	223.8	31.17	8.181	
6,700.0	6,390.7	6,736.5	6,450.4	16.3	15.8	-104.15	-53.0	80.8	255.7	224.3	31.48	8.123	
6,800.0	6,411.3	6,845.6	6,475.0	16.5	16.2	-104.57	53.2	80.8	256.2	224.0	32.26	7.941	
6,900.0	6,419.0	6,954.9	6,484.2	17.1	16.9	-104.73	162.0	80.8	256.4	222.9	33.52	7.649	
7,000.0	6,418.5	7,056.2	6,483.6	17.9	17.7	-104.70	263.3	80.8	256.4	221.2	35.14	7.295	
7,100.0	6,417.9	7,156.2	6,482.8	18.8	18.7	-104.67	363.3	80.8	256.3	219.3	37.04	6.920	
7,200.0	6,417.3	7,256.2	6,482.1	20.0	19.8	-104.63	463.3	80.8	256.3	217.1	39.21	6.537	
7,300.0	6,416.7	7,356.2	6,481.3	21.2	21.1	-104.60	563.3	80.8	256.2	214.7	41.59	6.161	
7,400.0	6,416.1	7,456.2	6,480.5	22.5	22.4	-104.56	663.3	80.8	256.2	212.0	44.17	5.801	
7,500.0	6,415.5	7,556.2	6,479.8	24.0	23.8	-104.53	763.3	80.8	256.2	209.3	46.90	5.462	
7,600.0	6,414.9	7,656.2	6,479.0	25.4	25.3	-104.50	863.3	80.8	256.1	206.4	49.77	5.146	
7,700.0	6,414.3	7,756.2	6,478.2	27.0	26.8	-104.46	963.3	80.8	256.1	203.3	52.75	4.855	
7,800.0	6,413.7	7,856.2	6,477.4	28.5	28.4	-104.43	1,063.3	80.8	256.1	200.2	55.81	4.588	
7,900.0	6,413.0	7,956.2	6,476.7	30.2	30.0	-104.39	1,163.3	80.8	256.0	197.0	58.96	4.342	
8,000.0	6,412.4	8,056.2	6,475.9	31.8	31.7	-104.36	1,263.3	80.8	256.0	193.8	62.18	4.117	
8,100.0	6,411.8	8,156.2	6,475.1	33.5	33.3	-104.33	1,363.3	80.8	255.9	190.5	65.45	3.910	
8,200.0	6,411.2	8,256.2	6,474.4	35.2	35.0	-104.29	1,463.3	80.8	255.9	187.1	68.77	3.721	
8,300.0	6,410.6	8,356.2	6,473.6	36.9	36.8	-104.26	1,563.3	80.8	255.9	183.7	72.13	3.547	
8,400.0	6,410.0	8,456.2	6,472.8	38.6	38.5	-104.22	1,663.3	80.8	255.8	180.3	75.53	3.387	
8,500.0	6,409.4	8,556.2	6,472.1	40.4	40.3	-104.19	1,763.3	80.8	255.8	176.8	78.97	3.239	
8,600.0	6,408.8	8,656.2	6,471.3	42.2	42.1	-104.15	1,863.3	80.8	255.7	173.3	82.43	3.103	
8,700.0	6,408.2	8,756.2	6,470.5	43.9	43.8	-104.12	1,963.3	80.8	255.7	169.8	85.91	2.976	
8,800.0	6,407.5	8,856.2	6,469.8	45.7	45.6	-104.09	2,063.3	80.8	255.7	166.2	89.42	2.859	
8,900.0	6,406.9	8,956.2	6,469.0	47.5	47.5	-104.05	2,163.3	80.8	255.6	162.7	92.95	2.750	
9,000.0	6,406.3	9,056.2	6,468.2	49.4	49.3	-104.02	2,263.3	80.8	255.6	159.1	96.50	2.649	
9,100.0	6,405.7	9,156.2	6,467.5	51.2	51.1	-103.98	2,363.3	80.8	255.6	155.5	100.06	2.554	
9,200.0	6,405.1	9,256.2	6,466.7	53.0	52.9	-103.95	2,463.3	80.8	255.5	151.9	103.63	2.466	
9,300.0	6,404.5	9,356.2	6,465.9	54.8	54.8	-103.92	2,563.3	80.8	255.5	148.3	107.22	2.383	
9,400.0	6,403.9	9,456.2	6,465.2	56.7	56.6	-103.88	2,663.3	80.8	255.4	144.6	110.82	2.305	
9,500.0	6,403.3	9,556.2	6,464.4	58.5	58.4	-103.85	2,763.3	80.8	255.4	141.0	114.44	2.232	
9,600.0	6,402.7	9,656.2	6,463.6	60.4	60.3	-103.81	2,863.3	80.8	255.4	137.3	118.06	2.163	
9,700.0	6,402.0	9,756.2	6,462.9	62.2	62.2	-103.78	2,963.3	80.8	255.3	133.6	121.69	2.098	
9,800.0	6,401.4	9,856.2	6,462.1	64.1	64.0	-103.74	3,063.3	80.8	255.3	130.0	125.33	2.037	
9,900.0	6,400.8	9,956.2	6,461.3	65.9	65.9	-103.71	3,163.3	80.8	255.2	126.3	128.98	1.979	

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

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well R&R Farms 29L-241
Project:	SEC.29-T5N-R63W	TVD Reference:	WELL @ 4587.0ft (RKB - 13')
Reference Site:	R&R Farms 5N63W29L Pad Sec.29-T5N-R63W	MD Reference:	WELL @ 4587.0ft (RKB - 13')
Site Error:	0.0ft	North Reference:	True
Reference Well:	R&R Farms 29L-241	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	Landmark
Reference Design:	Plan #3 (4-10-15)	Offset TVD Reference:	Offset Datum

Offset Design													Offset Site Error:		0.0 ft
Survey Program: 0-MWD													Offset Well Error:		0.0 ft
Reference		Offset		Semi Major Axis			Distance							Warning	
Measured Depth	Vertical Depth	Measured Depth	Vertical Depth	Reference	Offset	Highside Toolface	Offset Wellbore Centre		Between Centres	Between Ellipses	Minimum Separation	Separation Factor			
(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(°)	+N/-S (ft)	+E/-W (ft)	(ft)	(ft)	(ft)				
10,000.0	6,400.2	10,056.2	6,460.6	67.8	67.7	-103.68	3,263.3	80.8	255.2	122.6	132.63	1.924			
10,100.0	6,399.6	10,156.2	6,459.8	69.7	69.6	-103.64	3,363.2	80.8	255.2	118.9	136.29	1.872			
10,200.0	6,399.0	10,256.2	6,459.0	71.5	71.5	-103.61	3,463.2	80.8	255.1	115.2	139.96	1.823			
10,300.0	6,398.4	10,356.2	6,458.3	73.4	73.4	-103.57	3,563.2	80.8	255.1	111.5	143.63	1.776			
10,400.0	6,397.8	10,456.2	6,457.5	75.3	75.2	-103.54	3,663.2	80.8	255.1	107.8	147.31	1.731			
10,500.0	6,397.2	10,556.2	6,456.7	77.1	77.1	-103.50	3,763.2	80.8	255.0	104.0	151.00	1.689			
10,600.0	6,396.6	10,656.2	6,455.9	79.0	79.0	-103.47	3,863.2	80.8	255.0	100.3	154.69	1.648			
10,700.0	6,395.9	10,756.2	6,455.2	80.9	80.9	-103.44	3,963.2	80.8	255.0	96.6	158.38	1.610			
10,800.0	6,395.3	10,856.2	6,454.4	82.8	82.8	-103.40	4,063.2	80.8	254.9	92.8	162.08	1.573			
10,840.7	6,395.1	10,896.9	6,454.1	83.5	83.5	-103.39	4,103.9	80.8	254.9	91.3	163.58	1.558			
10,854.0	6,395.0	10,909.7	6,454.0	83.8	83.8	-103.38	4,116.7	80.8	254.9	90.8	164.07	1.554 SF			

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well R&R Farms 29L-241
Project:	SEC.29-T5N-R63W	TVD Reference:	WELL @ 4587.0ft (RKB - 13')
Reference Site:	R&R Farms 5N63W29L Pad Sec.29-T5N-R63W	MD Reference:	WELL @ 4587.0ft (RKB - 13')
Site Error:	0.0ft	North Reference:	True
Reference Well:	R&R Farms 29L-241	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	Landmark
Reference Design:	Plan #3 (4-10-15)	Offset TVD Reference:	Offset Datum

Offset Design R&R Farms 5N63W29L Pad Sec.29-T5N-R63W - R&R Farms 29L-401 - Wellbore #1 - Plan #2 (4-10-15)													Offset Site Error:	0.0ft
Survey Program: 0-MWD													Offset Well Error:	0.0ft
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	1.0	1.0	0.0	0.0	-90.00	0.0	-92.0	92.0	92.0	0.00	N/A		
100.0	100.0	101.0	101.0	0.1	0.1	-90.00	0.0	-92.0	92.0	91.7	0.23	405.085		
200.0	200.0	201.0	201.0	0.3	0.3	-90.00	0.0	-92.0	92.0	91.3	0.68	135.925		
300.0	300.0	301.0	301.0	0.6	0.6	-90.00	0.0	-92.0	92.0	90.8	1.13	81.664		
400.0	400.0	401.0	401.0	0.8	0.8	-90.00	0.0	-92.0	92.0	90.4	1.58	58.365		
500.0	500.0	501.0	501.0	1.0	1.0	-90.00	0.0	-92.0	92.0	89.9	2.03	45.409		
600.0	600.0	601.0	601.0	1.2	1.2	-90.00	0.0	-92.0	92.0	89.5	2.47	37.160		
700.0	700.0	701.0	701.0	1.5	1.5	-90.00	0.0	-92.0	92.0	89.0	2.92	31.448		
766.3	766.3	767.3	767.3	1.6	1.6	-90.00	0.0	-92.0	92.0	88.7	3.22	28.538 CC		
800.0	800.0	801.0	801.0	1.7	1.7	-90.00	0.0	-92.0	92.0	88.6	3.37	27.260 ES		
900.0	900.0	900.4	900.4	1.9	1.9	118.99	-0.8	-92.3	92.7	88.9	3.77	24.604		
1,000.0	1,000.0	1,000.0	1,000.0	2.1	2.1	118.88	-3.3	-93.2	94.9	90.8	4.13	23.009		
1,100.0	1,099.9	1,099.1	1,099.0	2.3	2.3	118.71	-7.3	-94.8	98.6	94.1	4.50	21.898		
1,200.0	1,199.7	1,198.3	1,198.0	2.5	2.4	118.50	-12.9	-96.9	103.8	98.9	4.90	21.164		
1,300.0	1,299.4	1,297.4	1,296.8	2.7	2.7	118.25	-20.1	-99.7	110.4	105.0	5.33	20.723		
1,400.0	1,398.9	1,396.4	1,395.3	2.9	2.9	117.98	-28.9	-103.1	118.5	112.7	5.78	20.504		
1,500.0	1,498.3	1,495.1	1,493.4	3.2	3.1	117.70	-39.3	-107.1	128.0	121.7	6.26	20.450		
1,600.0	1,597.4	1,593.7	1,591.1	3.4	3.4	117.42	-51.2	-111.7	139.0	132.2	6.78	20.515		
1,700.0	1,696.3	1,692.1	1,688.6	3.7	3.7	117.16	-64.6	-116.9	151.4	144.1	7.33	20.661		
1,800.0	1,794.9	1,791.2	1,786.5	4.0	4.0	117.30	-78.6	-122.3	164.8	156.9	7.92	20.813		
1,900.0	1,893.5	1,890.3	1,884.4	4.4	4.3	117.60	-92.6	-127.7	178.4	169.8	8.53	20.909		
2,000.0	1,992.1	1,989.4	1,982.4	4.7	4.6	117.86	-106.6	-133.1	191.9	182.8	9.16	20.957		
2,100.0	2,090.7	2,088.5	2,080.3	5.1	5.0	118.09	-120.6	-138.5	205.5	195.7	9.80	20.971		
2,200.0	2,189.3	2,187.5	2,178.2	5.4	5.3	118.28	-134.6	-143.9	219.1	208.6	10.45	20.962		
2,300.0	2,287.8	2,286.6	2,276.2	5.8	5.6	118.46	-148.6	-149.3	232.6	221.5	11.11	20.939		
2,400.0	2,386.4	2,385.7	2,374.1	6.2	6.0	118.61	-162.5	-154.7	246.2	234.4	11.78	20.905		
2,500.0	2,485.0	2,484.8	2,472.0	6.5	6.3	118.75	-176.5	-160.1	259.8	247.3	12.45	20.865		
2,600.0	2,583.6	2,583.8	2,570.0	6.9	6.7	118.88	-190.5	-165.5	273.4	260.2	13.13	20.821		
2,700.0	2,682.1	2,682.9	2,667.9	7.3	7.0	118.99	-204.5	-170.9	286.9	273.1	13.81	20.775		
2,800.0	2,780.7	2,782.0	2,765.8	7.7	7.3	119.09	-218.5	-176.3	300.5	286.0	14.50	20.728		
2,900.0	2,879.3	2,881.0	2,863.8	8.1	7.7	119.19	-232.5	-181.7	314.1	298.9	15.19	20.682		
3,000.0	2,977.9	2,980.1	2,961.7	8.4	8.1	119.27	-246.5	-187.1	327.7	311.8	15.88	20.635		
3,100.0	3,076.5	3,079.2	3,059.6	8.8	8.4	119.35	-260.4	-192.5	341.2	324.7	16.57	20.590		
3,200.0	3,175.0	3,178.3	3,157.6	9.2	8.8	119.43	-274.4	-197.8	354.8	337.6	17.27	20.545		
3,300.0	3,273.6	3,277.3	3,255.5	9.6	9.1	119.49	-288.4	-203.2	368.4	350.4	17.97	20.502		
3,400.0	3,372.2	3,376.4	3,353.4	10.0	9.5	119.56	-302.4	-208.6	382.0	363.3	18.67	20.461		
3,500.0	3,470.8	3,475.5	3,451.3	10.4	9.8	119.62	-316.4	-214.0	395.6	376.2	19.37	20.420		
3,600.0	3,569.3	3,574.5	3,549.3	10.8	10.2	119.67	-330.4	-219.4	409.2	389.1	20.07	20.382		
3,700.0	3,667.9	3,673.6	3,647.2	11.1	10.5	119.72	-344.4	-224.8	422.7	402.0	20.78	20.344		
3,800.0	3,766.5	3,772.7	3,745.1	11.5	10.9	119.77	-358.3	-230.2	436.3	414.8	21.48	20.309		
3,900.0	3,865.1	3,871.8	3,843.1	11.9	11.3	119.81	-372.3	-235.6	449.9	427.7	22.19	20.274		
4,000.0	3,963.7	3,970.8	3,941.0	12.3	11.6	119.86	-386.3	-241.0	463.5	440.6	22.90	20.241		
4,100.0	4,062.2	4,069.9	4,038.9	12.7	12.0	119.90	-400.3	-246.4	477.1	453.5	23.61	20.209		
4,200.0	4,160.8	4,169.0	4,136.9	13.1	12.3	119.93	-414.3	-251.8	490.7	466.3	24.32	20.179		
4,300.0	4,259.4	4,268.1	4,234.8	13.5	12.7	119.97	-428.3	-257.2	504.3	479.2	25.03	20.149		
4,400.0	4,358.0	4,367.1	4,332.7	13.9	13.1	120.00	-442.3	-262.6	517.8	492.1	25.74	20.121		
4,500.0	4,456.5	4,466.2	4,430.7	14.3	13.4	120.04	-456.2	-268.0	531.4	505.0	26.45	20.094		
4,600.0	4,555.1	4,565.3	4,528.6	14.7	13.8	120.07	-470.2	-273.4	545.0	517.8	27.16	20.068		
4,700.0	4,653.7	4,664.3	4,626.5	15.1	14.2	120.10	-484.2	-278.8	558.6	530.7	27.87	20.043		
4,800.0	4,752.3	4,763.4	4,724.5	15.5	14.5	120.12	-498.2	-284.2	572.2	543.6	28.58	20.019		
4,900.0	4,850.9	4,862.5	4,822.4	15.8	14.9	120.15	-512.2	-289.6	585.8	556.5	29.30	19.995		

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

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well R&R Farms 29L-241
Project:	SEC.29-T5N-R63W	TVD Reference:	WELL @ 4587.0ft (RKB - 13')
Reference Site:	R&R Farms 5N63W29L Pad Sec.29-T5N-R63W	MD Reference:	WELL @ 4587.0ft (RKB - 13')
Site Error:	0.0ft	North Reference:	True
Reference Well:	R&R Farms 29L-241	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	Landmark
Reference Design:	Plan #3 (4-10-15)	Offset TVD Reference:	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
5,000.0	4,949.4	4,961.6	4,920.3	16.2	15.2	120.18	-526.2	-295.0	599.3	569.3	30.01	19.973	
5,100.0	5,048.0	5,060.6	5,018.3	16.6	15.6	120.26	-540.2	-300.4	612.9	582.1	30.71	19.954	
5,200.0	5,147.0	5,159.9	5,116.4	16.9	16.0	120.27	-554.2	-305.8	625.1	593.7	31.33	19.948	
5,300.0	5,246.5	5,263.2	5,218.5	17.1	16.3	120.00	-568.3	-311.2	635.4	603.5	31.91	19.913	
5,400.0	5,346.2	5,371.1	5,325.8	17.3	16.6	119.69	-579.8	-315.7	642.9	610.5	32.37	19.858	
5,500.0	5,446.1	5,479.5	5,433.8	17.4	16.8	119.38	-587.6	-318.7	647.4	614.6	32.75	19.766	
5,600.0	5,546.1	5,588.2	5,542.5	17.6	17.0	-89.95	-591.6	-320.2	649.0	615.9	33.08	19.619	
5,700.0	5,646.1	5,692.9	5,647.1	17.7	17.1	-90.00	-592.1	-320.4	649.2	615.8	33.37	19.454	
5,733.2	5,679.3	5,726.1	5,680.3	17.7	17.2	-90.06	-592.1	-320.4	649.2	615.8	33.44	19.411	
5,800.0	5,745.9	5,792.7	5,746.9	17.8	17.2	-90.47	-592.1	-320.4	649.2	615.6	33.60	19.324	
5,900.0	5,844.2	5,892.2	5,846.4	17.8	17.4	-91.97	-591.0	-320.4	649.6	615.9	33.71	19.272	
6,000.0	5,939.2	5,994.6	5,948.0	17.6	17.4	-93.65	-578.8	-320.4	650.6	617.0	33.61	19.356	
6,100.0	6,029.3	6,099.9	6,049.8	17.4	17.3	-95.29	-552.2	-320.4	652.1	618.8	33.30	19.580	
6,200.0	6,113.0	6,208.2	6,149.7	17.2	17.1	-96.85	-510.5	-320.4	654.0	621.2	32.82	19.924	
6,300.0	6,188.9	6,319.6	6,245.2	16.9	16.9	-98.31	-453.3	-320.4	656.3	624.0	32.26	20.346	
6,400.0	6,255.7	6,434.0	6,333.5	16.7	16.6	-99.63	-380.8	-320.4	658.7	627.0	31.70	20.778	
6,500.0	6,312.2	6,551.3	6,411.8	16.4	16.3	-100.77	-293.7	-320.4	661.0	629.7	31.29	21.128	
6,600.0	6,357.4	6,671.1	6,477.1	16.3	16.1	-101.70	-193.4	-320.4	663.1	631.9	31.17	21.275	
6,700.0	6,390.7	6,793.0	6,526.6	16.3	16.1	-102.40	-82.1	-320.4	664.8	633.3	31.46	21.128	
6,800.0	6,411.3	6,916.4	6,558.0	16.5	16.4	-102.84	37.1	-320.4	665.9	633.6	32.27	20.634	
6,900.0	6,419.0	7,040.6	6,569.9	17.1	17.1	-103.00	160.7	-320.4	666.3	632.7	33.59	19.834	
7,000.0	6,418.5	7,142.8	6,570.0	17.9	18.0	-103.05	262.8	-320.4	666.4	631.2	35.19	18.939	
7,100.0	6,417.9	7,242.8	6,570.0	18.8	18.9	-103.10	362.8	-320.4	666.5	629.5	37.06	17.984	
7,200.0	6,417.3	7,342.8	6,570.0	20.0	20.0	-103.15	462.8	-320.4	666.7	627.5	39.21	17.004	
7,300.0	6,416.7	7,442.8	6,570.0	21.2	21.3	-103.20	562.8	-320.4	666.8	625.2	41.58	16.037	
7,400.0	6,416.1	7,542.8	6,570.0	22.5	22.6	-103.25	662.8	-320.4	667.0	622.8	44.14	15.109	
7,500.0	6,415.5	7,642.8	6,570.0	24.0	24.0	-103.30	762.8	-320.4	667.1	620.2	46.87	14.234	
7,600.0	6,414.9	7,742.8	6,570.0	25.4	25.4	-103.35	862.8	-320.4	667.2	617.5	49.72	13.420	
7,700.0	6,414.3	7,842.8	6,570.0	27.0	27.0	-103.41	962.8	-320.4	667.4	614.7	52.69	12.667	
7,800.0	6,413.7	7,942.8	6,570.0	28.5	28.5	-103.46	1,062.8	-320.4	667.5	611.8	55.75	11.974	
7,900.0	6,413.0	8,042.8	6,570.0	30.2	30.2	-103.51	1,162.8	-320.4	667.7	608.8	58.88	11.339	
8,000.0	6,412.4	8,142.8	6,570.0	31.8	31.8	-103.56	1,262.8	-320.4	667.8	605.7	62.09	10.756	
8,100.0	6,411.8	8,242.8	6,570.0	33.5	33.5	-103.61	1,362.8	-320.4	668.0	602.6	65.35	10.222	
8,200.0	6,411.2	8,342.8	6,570.0	35.2	35.2	-103.66	1,462.8	-320.4	668.1	599.4	68.65	9.731	
8,300.0	6,410.6	8,442.8	6,570.0	36.9	36.9	-103.71	1,562.8	-320.4	668.2	596.2	72.00	9.281	
8,400.0	6,410.0	8,542.8	6,570.0	38.6	38.6	-103.76	1,662.8	-320.4	668.4	593.0	75.39	8.866	
8,500.0	6,409.4	8,642.8	6,570.0	40.4	40.4	-103.81	1,762.8	-320.4	668.5	589.7	78.80	8.484	
8,600.0	6,408.8	8,742.8	6,570.0	42.2	42.2	-103.86	1,862.8	-320.4	668.7	586.4	82.24	8.131	
8,700.0	6,408.2	8,842.8	6,570.0	43.9	43.9	-103.91	1,962.8	-320.4	668.8	583.1	85.71	7.804	
8,800.0	6,407.5	8,942.8	6,570.0	45.7	45.7	-103.97	2,062.8	-320.4	669.0	579.8	89.19	7.501	
8,900.0	6,406.9	9,042.8	6,570.0	47.5	47.5	-104.02	2,162.8	-320.4	669.1	576.4	92.69	7.219	
9,000.0	6,406.3	9,142.8	6,570.0	49.4	49.3	-104.07	2,262.8	-320.4	669.3	573.1	96.21	6.956	
9,100.0	6,405.7	9,242.8	6,570.0	51.2	51.2	-104.12	2,362.8	-320.4	669.4	569.7	99.74	6.712	
9,200.0	6,405.1	9,342.8	6,570.0	53.0	53.0	-104.17	2,462.8	-320.4	669.6	566.3	103.28	6.483	
9,300.0	6,404.5	9,442.8	6,570.0	54.8	54.8	-104.22	2,562.8	-320.4	669.7	562.9	106.84	6.268	
9,400.0	6,403.9	9,542.8	6,570.0	56.7	56.7	-104.27	2,662.8	-320.4	669.9	559.5	110.40	6.067	
9,500.0	6,403.3	9,642.8	6,570.0	58.5	58.5	-104.32	2,762.8	-320.4	670.0	556.0	113.98	5.879	
9,600.0	6,402.7	9,742.8	6,570.0	60.4	60.4	-104.37	2,862.8	-320.4	670.2	552.6	117.56	5.701	
9,700.0	6,402.0	9,842.8	6,570.0	62.2	62.2	-104.42	2,962.8	-320.4	670.3	549.2	121.15	5.533	
9,800.0	6,401.4	9,942.8	6,570.0	64.1	64.1	-104.47	3,062.8	-320.4	670.5	545.7	124.74	5.375	

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

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well R&R Farms 29L-241
Project:	SEC.29-T5N-R63W	TVD Reference:	WELL @ 4587.0ft (RKB - 13')
Reference Site:	R&R Farms 5N63W29L Pad Sec.29-T5N-R63W	MD Reference:	WELL @ 4587.0ft (RKB - 13')
Site Error:	0.0ft	North Reference:	True
Reference Well:	R&R Farms 29L-241	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	Landmark
Reference Design:	Plan #3 (4-10-15)	Offset TVD Reference:	Offset Datum

Offset Design													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	6,400.8	10,042.8	6,570.0	65.9	65.9	-104.52	3,162.8	-320.4	670.6	542.3	128.34	5.225		
10,000.0	6,400.2	10,142.8	6,570.0	67.8	67.8	-104.57	3,262.8	-320.4	670.8	538.8	131.94	5.084		
10,100.0	6,399.6	10,242.8	6,570.0	69.7	69.7	-104.62	3,362.8	-320.4	670.9	535.4	135.55	4.950		
10,200.0	6,399.0	10,342.8	6,570.0	71.5	71.5	-104.67	3,462.8	-320.4	671.1	531.9	139.16	4.822		
10,300.0	6,398.4	10,442.8	6,570.0	73.4	73.4	-104.72	3,562.8	-320.4	671.2	528.5	142.78	4.701		
10,400.0	6,397.8	10,542.8	6,570.0	75.3	75.3	-104.78	3,662.8	-320.4	671.4	525.0	146.40	4.586		
10,500.0	6,397.2	10,642.8	6,570.0	77.1	77.1	-104.83	3,762.8	-320.4	671.6	521.5	150.02	4.476		
10,600.0	6,396.6	10,742.8	6,570.0	79.0	79.0	-104.88	3,862.8	-320.4	671.7	518.1	153.64	4.372		
10,700.0	6,395.9	10,842.8	6,570.0	80.9	80.9	-104.93	3,962.8	-320.4	671.9	514.6	157.27	4.272		
10,800.0	6,395.3	10,942.8	6,570.0	82.8	82.8	-104.98	4,062.8	-320.4	672.0	511.1	160.90	4.177		
10,854.0	6,395.0	10,996.7	6,570.0	83.8	83.8	-105.00	4,116.7	-320.4	672.1	509.3	162.86	4.127 SF		

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well R&R Farms 29L-241
Project:	SEC.29-T5N-R63W	TVD Reference:	WELL @ 4587.0ft (RKB - 13')
Reference Site:	R&R Farms 5N63W29L Pad Sec.29-T5N-R63W	MD Reference:	WELL @ 4587.0ft (RKB - 13')
Site Error:	0.0ft	North Reference:	True
Reference Well:	R&R Farms 29L-241	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	Landmark
Reference Design:	Plan #3 (4-10-15)	Offset TVD Reference:	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							
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	0.0	0.0	0.0	0.0	89.99	0.0	58.5	58.5				
100.0	100.0	100.0	100.0	0.1	0.1	89.99	0.0	58.5	58.5	58.3	0.22	260.359	
200.0	200.0	200.0	200.0	0.3	0.3	89.99	0.0	58.5	58.5	57.8	0.67	86.786 CC, ES	
300.0	300.0	299.2	299.2	0.6	0.5	90.52	-0.5	59.2	59.2	58.1	1.10	53.656	
400.0	400.0	398.4	398.3	0.8	0.7	92.03	-2.2	61.2	61.2	59.7	1.53	39.989	
500.0	500.0	497.4	497.2	1.0	1.0	94.33	-4.9	64.5	64.7	62.8	1.97	32.850	
600.0	600.0	596.2	595.9	1.2	1.2	97.15	-8.7	69.1	69.8	67.4	2.41	28.893	
700.0	700.0	694.8	694.2	1.5	1.4	100.23	-13.5	75.0	76.5	73.6	2.86	26.711	
800.0	800.0	793.2	792.1	1.7	1.7	103.30	-19.4	82.2	84.9	81.6	3.31	25.620	
900.0	900.0	891.2	889.6	1.9	2.0	-45.03	-26.4	90.7	94.4	90.7	3.76	25.091	
1,000.0	1,000.0	989.1	986.6	2.1	2.3	-43.19	-34.4	100.5	104.5	100.3	4.18	24.990	
1,100.0	1,099.9	1,086.8	1,083.3	2.3	2.6	-41.94	-43.4	111.5	114.9	110.3	4.61	24.914	
1,200.0	1,199.7	1,184.3	1,179.4	2.5	3.0	-41.15	-53.5	123.7	125.7	120.6	5.06	24.843	
1,300.0	1,299.4	1,281.6	1,275.2	2.7	3.3	-40.72	-64.5	137.2	136.7	131.2	5.52	24.766	
1,400.0	1,398.9	1,378.6	1,370.3	2.9	3.7	-40.56	-76.6	151.9	148.0	142.0	6.00	24.672	
1,500.0	1,498.3	1,477.5	1,467.1	3.2	4.2	-40.68	-89.6	167.8	159.1	152.6	6.50	24.466	
1,600.0	1,597.4	1,577.0	1,564.4	3.4	4.6	-41.18	-102.7	183.7	168.9	161.9	7.03	24.032	
1,700.0	1,696.3	1,676.6	1,661.9	3.7	5.1	-41.99	-115.8	199.7	177.5	169.9	7.58	23.401	
1,800.0	1,794.9	1,776.3	1,759.4	4.0	5.5	-43.10	-129.0	215.7	184.9	176.7	8.17	22.622	
1,900.0	1,893.5	1,876.0	1,856.9	4.4	5.9	-44.23	-142.1	231.7	192.0	183.2	8.78	21.857	
2,000.0	1,992.1	1,975.7	1,954.4	4.7	6.4	-45.29	-155.2	247.7	199.2	189.8	9.41	21.162	
2,100.0	2,090.7	2,075.3	2,051.9	5.1	6.9	-46.27	-168.3	263.7	206.5	196.5	10.06	20.530	
2,200.0	2,189.3	2,175.0	2,149.4	5.4	7.3	-47.18	-181.5	279.7	213.9	203.1	10.72	19.955	
2,300.0	2,287.8	2,274.7	2,246.9	5.8	7.8	-48.03	-194.6	295.7	221.3	209.9	11.39	19.432	
2,400.0	2,386.4	2,374.3	2,344.4	6.2	8.2	-48.83	-207.7	311.7	228.7	216.6	12.07	18.954	
2,500.0	2,485.0	2,474.0	2,441.9	6.5	8.7	-49.57	-220.9	327.7	236.2	223.4	12.75	18.518	
2,600.0	2,583.6	2,573.7	2,539.4	6.9	9.1	-50.28	-234.0	343.7	243.7	230.2	13.45	18.118	
2,700.0	2,682.1	2,673.4	2,636.9	7.3	9.6	-50.93	-247.1	359.7	251.2	237.1	14.15	17.751	
2,800.0	2,780.7	2,773.0	2,734.4	7.7	10.1	-51.55	-260.2	375.7	258.8	244.0	14.86	17.413	
2,900.0	2,879.3	2,872.7	2,831.9	8.1	10.5	-52.14	-273.4	391.7	266.4	250.9	15.58	17.101	
3,000.0	2,977.9	2,972.4	2,929.4	8.4	11.0	-52.69	-286.5	407.7	274.1	257.8	16.30	16.814	
3,100.0	3,076.5	3,072.1	3,026.9	8.8	11.4	-53.21	-299.6	423.7	281.7	264.7	17.03	16.547	
3,200.0	3,175.0	3,171.7	3,124.4	9.2	11.9	-53.71	-312.7	439.7	289.4	271.7	17.76	16.300	
3,300.0	3,273.6	3,271.4	3,221.9	9.6	12.4	-54.18	-325.9	455.7	297.1	278.6	18.49	16.070	
3,400.0	3,372.2	3,371.1	3,319.4	10.0	12.8	-54.62	-339.0	471.7	304.8	285.6	19.23	15.855	
3,500.0	3,470.8	3,470.8	3,416.9	10.4	13.3	-55.05	-352.1	487.7	312.6	292.6	19.97	15.655	
3,600.0	3,569.3	3,570.4	3,514.4	10.8	13.7	-55.45	-365.2	503.7	320.3	299.6	20.71	15.468	
3,700.0	3,667.9	3,670.1	3,611.9	11.1	14.2	-55.83	-378.4	519.7	328.1	306.7	21.46	15.293	
3,800.0	3,766.5	3,769.8	3,709.4	11.5	14.7	-56.20	-391.5	535.7	335.9	313.7	22.20	15.128	
3,900.0	3,865.1	3,869.5	3,806.9	11.9	15.1	-56.55	-404.6	551.7	343.7	320.7	22.95	14.973	
4,000.0	3,963.7	3,969.1	3,904.4	12.3	15.6	-56.88	-417.8	567.7	351.5	327.8	23.71	14.828	
4,100.0	4,062.2	4,068.8	4,001.9	12.7	16.1	-57.20	-430.9	583.7	359.3	334.9	24.46	14.690	
4,200.0	4,160.8	4,168.5	4,099.4	13.1	16.5	-57.51	-444.0	599.7	367.2	341.9	25.22	14.560	
4,300.0	4,259.4	4,268.2	4,196.9	13.5	17.0	-57.80	-457.1	615.7	375.0	349.0	25.97	14.438	
4,400.0	4,358.0	4,367.8	4,294.4	13.9	17.4	-58.08	-470.3	631.7	382.9	356.1	26.73	14.322	
4,500.0	4,456.5	4,467.5	4,391.9	14.3	17.9	-58.35	-483.4	647.7	390.7	363.2	27.49	14.211	
4,600.0	4,555.1	4,567.2	4,489.4	14.7	18.4	-58.61	-496.5	663.7	398.6	370.3	28.25	14.107	
4,700.0	4,653.7	4,666.9	4,586.9	15.1	18.8	-58.86	-509.6	679.7	406.5	377.4	29.02	14.008	
4,800.0	4,752.3	4,766.5	4,684.4	15.5	19.3	-59.10	-522.8	695.7	414.3	384.6	29.78	13.913	
4,900.0	4,850.9	4,866.2	4,781.9	15.8	19.8	-59.33	-535.9	711.7	422.2	391.7	30.55	13.823	
5,000.0	4,949.4	4,965.9	4,879.4	16.2	20.2	-59.55	-549.0	727.7	430.1	398.8	31.31	13.737	

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

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well R&R Farms 29L-241
Project:	SEC.29-T5N-R63W	TVD Reference:	WELL @ 4587.0ft (RKB - 13')
Reference Site:	R&R Farms 5N63W29L Pad Sec.29-T5N-R63W	MD Reference:	WELL @ 4587.0ft (RKB - 13')
Site Error:	0.0ft	North Reference:	True
Reference Well:	R&R Farms 29L-241	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	Landmark
Reference Design:	Plan #3 (4-10-15)	Offset TVD Reference:	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	5,048.0	5,075.5	4,986.9	16.6	20.6	-59.90	-562.7	744.3	437.3	405.2	32.03	13.652	
5,200.0	5,147.0	5,188.9	5,098.8	16.9	20.9	-60.32	-574.2	758.3	442.8	410.2	32.60	13.583	
5,300.0	5,246.5	5,302.5	5,211.6	17.1	21.2	-60.63	-582.9	768.9	446.9	413.9	33.08	13.509	
5,400.0	5,346.2	5,416.2	5,324.9	17.3	21.4	-60.84	-588.7	776.0	449.7	416.3	33.48	13.431	
5,500.0	5,446.1	5,530.1	5,438.7	17.4	21.6	-60.95	-591.7	779.6	451.2	417.4	33.80	13.347	
5,600.0	5,546.1	5,637.5	5,546.1	17.6	21.7	90.00	-592.1	780.1	451.4	417.3	34.09	13.242	
5,700.0	5,646.1	5,737.5	5,646.1	17.7	21.8	90.00	-592.1	780.1	451.4	417.0	34.34	13.143	
5,708.9	5,655.1	5,746.5	5,655.1	17.7	21.8	90.00	-592.1	780.1	451.4	417.0	34.36	13.136	
5,800.0	5,745.9	5,837.5	5,746.1	17.8	21.9	90.60	-591.4	780.1	451.4	417.0	34.42	13.114	
5,900.0	5,844.2	5,938.4	5,846.3	17.8	21.9	91.59	-580.7	780.1	451.5	417.3	34.23	13.193	
6,000.0	5,939.2	6,040.3	5,945.2	17.6	21.9	92.55	-556.5	780.1	451.8	418.0	33.84	13.352	
6,100.0	6,029.3	6,143.2	6,041.0	17.4	21.7	93.46	-519.0	780.1	452.2	418.9	33.32	13.573	
6,200.0	6,113.0	6,247.2	6,131.7	17.2	21.5	94.33	-468.3	780.1	452.7	419.9	32.73	13.829	
6,300.0	6,188.9	6,352.1	6,215.4	16.9	21.3	95.11	-405.2	780.1	453.2	421.0	32.17	14.087	
6,400.0	6,255.7	6,457.9	6,290.3	16.7	21.0	95.81	-330.6	780.1	453.7	422.0	31.73	14.300	
6,500.0	6,312.2	6,564.6	6,354.6	16.4	20.6	96.40	-245.6	780.1	454.2	422.7	31.50	14.417	
6,600.0	6,357.4	6,671.9	6,406.8	16.3	20.3	96.88	-151.9	780.1	454.7	423.1	31.58	14.395	
6,700.0	6,390.7	6,779.8	6,445.5	16.3	20.0	97.23	-51.3	780.1	455.0	423.0	32.03	14.205	
6,800.0	6,411.3	6,888.0	6,469.7	16.5	19.7	97.45	54.1	780.1	455.2	422.4	32.87	13.849	
6,900.0	6,419.0	6,996.5	6,478.7	17.1	19.5	97.54	162.1	780.1	455.3	421.2	34.09	13.357	
7,000.0	6,418.5	7,097.6	6,478.2	17.9	19.5	97.53	263.2	780.1	455.3	419.7	35.60	12.788	
7,100.0	6,417.9	7,197.6	6,477.6	18.8	20.2	97.53	363.2	780.1	455.3	417.9	37.44	12.161	
7,200.0	6,417.3	7,297.6	6,477.0	20.0	21.3	97.53	463.2	780.1	455.3	415.7	39.56	11.510	
7,300.0	6,416.7	7,397.6	6,476.4	21.2	22.5	97.53	563.2	780.1	455.3	413.4	41.91	10.863	
7,400.0	6,416.1	7,497.6	6,475.7	22.5	23.8	97.52	663.2	780.1	455.3	410.8	44.47	10.238	
7,500.0	6,415.5	7,597.6	6,475.1	24.0	25.2	97.52	763.2	780.1	455.3	408.1	47.20	9.646	
7,600.0	6,414.9	7,697.6	6,474.5	25.4	26.6	97.52	863.2	780.1	455.3	405.2	50.07	9.093	
7,700.0	6,414.3	7,797.6	6,473.8	27.0	28.1	97.52	963.2	780.1	455.3	402.2	53.06	8.580	
7,800.0	6,413.7	7,897.6	6,473.2	28.5	29.6	97.52	1,063.2	780.1	455.3	399.1	56.15	8.108	
7,900.0	6,413.0	7,997.6	6,472.6	30.2	31.2	97.51	1,163.2	780.1	455.3	396.0	59.32	7.674	
8,000.0	6,412.4	8,097.6	6,472.0	31.8	32.8	97.51	1,263.2	780.1	455.3	392.7	62.57	7.276	
8,100.0	6,411.8	8,197.6	6,471.3	33.5	34.5	97.51	1,363.2	780.1	455.3	389.4	65.87	6.911	
8,200.0	6,411.2	8,297.6	6,470.7	35.2	36.1	97.51	1,463.2	780.1	455.3	386.0	69.23	6.576	
8,300.0	6,410.6	8,397.6	6,470.1	36.9	37.8	97.51	1,563.2	780.1	455.3	382.6	72.64	6.268	
8,400.0	6,410.0	8,497.6	6,469.4	38.6	39.5	97.50	1,663.2	780.1	455.3	379.2	76.08	5.984	
8,500.0	6,409.4	8,597.6	6,468.8	40.4	41.2	97.50	1,763.2	780.1	455.3	375.7	79.55	5.723	
8,600.0	6,408.8	8,697.6	6,468.2	42.2	43.0	97.50	1,863.2	780.1	455.3	372.2	83.06	5.481	
8,700.0	6,408.2	8,797.6	6,467.6	43.9	44.7	97.50	1,963.2	780.1	455.3	368.7	86.59	5.258	
8,800.0	6,407.5	8,897.6	6,466.9	45.7	46.5	97.49	2,063.2	780.1	455.3	365.1	90.14	5.051	
8,900.0	6,406.9	8,997.6	6,466.3	47.5	48.3	97.49	2,163.2	780.1	455.3	361.5	93.72	4.858	
9,000.0	6,406.3	9,097.6	6,465.7	49.4	50.0	97.49	2,263.2	780.1	455.3	357.9	97.31	4.679	
9,100.0	6,405.7	9,197.6	6,465.0	51.2	51.8	97.49	2,363.2	780.1	455.3	354.3	100.92	4.511	
9,200.0	6,405.1	9,297.6	6,464.4	53.0	53.6	97.49	2,463.2	780.1	455.3	350.7	104.54	4.355	
9,300.0	6,404.5	9,397.6	6,463.8	54.8	55.4	97.48	2,563.2	780.1	455.3	347.1	108.18	4.208	
9,400.0	6,403.9	9,497.6	6,463.2	56.7	57.3	97.48	2,663.2	780.1	455.2	343.4	111.82	4.071	
9,500.0	6,403.3	9,597.6	6,462.5	58.5	59.1	97.48	2,763.2	780.1	455.2	339.8	115.48	3.942	
9,600.0	6,402.7	9,697.6	6,461.9	60.4	60.9	97.48	2,863.2	780.1	455.2	336.1	119.15	3.821	
9,700.0	6,402.0	9,797.6	6,461.3	62.2	62.7	97.47	2,963.2	780.1	455.2	332.4	122.83	3.706	
9,800.0	6,401.4	9,897.6	6,460.6	64.1	64.6	97.47	3,063.2	780.1	455.2	328.7	126.51	3.598	
9,900.0	6,400.8	9,997.6	6,460.0	65.9	66.4	97.47	3,163.2	780.1	455.2	325.0	130.20	3.496	

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

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well R&R Farms 29L-241
Project:	SEC.29-T5N-R63W	TVD Reference:	WELL @ 4587.0ft (RKB - 13')
Reference Site:	R&R Farms 5N63W29L Pad Sec.29-T5N-R63W	MD Reference:	WELL @ 4587.0ft (RKB - 13')
Site Error:	0.0ft	North Reference:	True
Reference Well:	R&R Farms 29L-241	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	Landmark
Reference Design:	Plan #3 (4-10-15)	Offset TVD Reference:	Offset Datum

Offset Design													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	6,400.2	10,097.6	6,459.4	67.8	68.3	97.47	3,263.2	780.1	455.2	321.3	133.90	3.400		
10,100.0	6,399.6	10,197.6	6,458.8	69.7	70.1	97.47	3,363.2	780.1	455.2	317.6	137.61	3.308		
10,200.0	6,399.0	10,297.6	6,458.1	71.5	72.0	97.46	3,463.2	780.1	455.2	313.9	141.32	3.221		
10,300.0	6,398.4	10,397.6	6,457.5	73.4	73.8	97.46	3,563.2	780.1	455.2	310.2	145.04	3.139		
10,400.0	6,397.8	10,497.6	6,456.9	75.3	75.7	97.46	3,663.2	780.1	455.2	306.5	148.76	3.060		
10,500.0	6,397.2	10,597.6	6,456.2	77.1	77.5	97.46	3,763.2	780.1	455.2	302.7	152.48	2.985		
10,600.0	6,396.6	10,697.6	6,455.6	79.0	79.4	97.46	3,863.1	780.1	455.2	299.0	156.22	2.914		
10,700.0	6,395.9	10,797.6	6,455.0	80.9	81.3	97.45	3,963.1	780.1	455.2	295.3	159.95	2.846		
10,800.0	6,395.3	10,897.6	6,454.4	82.8	83.1	97.45	4,063.1	780.1	455.2	291.5	163.69	2.781		
10,854.0	6,395.0	10,951.6	6,454.0	83.8	84.0	97.45	4,117.1	780.1	455.2	289.7	165.51	2.750 SF		

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well R&R Farms 29L-241
Project:	SEC.29-T5N-R63W	TVD Reference:	WELL @ 4587.0ft (RKB - 13')
Reference Site:	R&R Farms 5N63W29L Pad Sec.29-T5N-R63W	MD Reference:	WELL @ 4587.0ft (RKB - 13')
Site Error:	0.0ft	North Reference:	True
Reference Well:	R&R Farms 29L-241	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	Landmark
Reference Design:	Plan #3 (4-10-15)	Offset TVD Reference:	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	89.97	0.0	27.9	27.9				
100.0	100.0	100.0	100.0	0.1	0.1	89.97	0.0	27.9	27.9	27.6	0.22	123.980	
200.0	200.0	200.0	200.0	0.3	0.3	89.97	0.0	27.9	27.9	27.2	0.67	41.327	
300.0	300.0	300.0	300.0	0.6	0.6	89.97	0.0	27.9	27.9	26.7	1.12	24.796	
400.0	400.0	400.0	400.0	0.8	0.8	89.97	0.0	27.9	27.9	26.3	1.57	17.712 CC, ES	
500.0	500.0	499.7	499.7	1.0	1.0	91.26	-0.6	28.5	28.5	26.5	2.00	14.236	
600.0	600.0	599.3	599.2	1.2	1.2	94.81	-2.5	30.2	30.3	27.9	2.42	12.553	
700.0	700.0	698.7	698.6	1.5	1.4	99.80	-5.7	33.1	33.7	30.8	2.84	11.834	
800.0	800.0	798.0	797.7	1.7	1.6	105.29	-10.2	37.2	38.6	35.4	3.28	11.788	
900.0	900.0	897.2	896.6	1.9	1.8	-41.13	-15.9	42.4	44.8	41.1	3.70	12.114	
1,000.0	1,000.0	996.2	995.1	2.1	2.1	-38.10	-22.8	48.8	51.3	47.2	4.10	12.525	
1,100.0	1,099.9	1,095.1	1,093.4	2.3	2.4	-36.11	-31.0	56.3	58.2	53.7	4.51	12.887	
1,200.0	1,199.7	1,193.8	1,191.3	2.5	2.7	-34.85	-40.4	65.0	65.2	60.3	4.94	13.198	
1,300.0	1,299.4	1,292.4	1,288.8	2.7	3.0	-34.12	-51.1	74.8	72.5	67.1	5.39	13.458	
1,400.0	1,398.9	1,390.9	1,386.0	2.9	3.3	-33.79	-63.0	85.7	79.9	74.1	5.85	13.671	
1,500.0	1,498.3	1,490.2	1,483.7	3.2	3.7	-33.82	-75.9	97.6	87.2	80.9	6.32	13.789	
1,600.0	1,597.4	1,590.0	1,581.9	3.4	4.1	-34.42	-89.1	109.6	93.2	86.3	6.82	13.655	
1,700.0	1,696.3	1,689.9	1,680.1	3.7	4.5	-35.53	-102.2	121.7	97.7	90.4	7.35	13.299	
1,800.0	1,794.9	1,789.8	1,778.4	4.0	4.8	-37.12	-115.4	133.7	101.0	93.1	7.91	12.771	
1,900.0	1,893.5	1,889.7	1,876.8	4.4	5.2	-38.76	-128.5	145.8	104.0	95.5	8.50	12.242	
2,000.0	1,992.1	1,989.6	1,975.1	4.7	5.6	-40.30	-141.7	157.9	107.1	98.0	9.11	11.764	
2,100.0	2,090.7	2,089.5	2,073.4	5.1	6.0	-41.75	-154.8	169.9	110.3	100.6	9.73	11.333	
2,200.0	2,189.3	2,189.4	2,171.7	5.4	6.4	-43.12	-168.0	182.0	113.6	103.2	10.38	10.943	
2,300.0	2,287.8	2,289.3	2,270.0	5.8	6.8	-44.42	-181.1	194.1	116.9	105.8	11.04	10.589	
2,400.0	2,386.4	2,389.2	2,368.3	6.2	7.2	-45.64	-194.3	206.1	120.2	108.5	11.71	10.269	
2,500.0	2,485.0	2,489.2	2,466.6	6.5	7.7	-46.80	-207.4	218.2	123.7	111.3	12.39	9.977	
2,600.0	2,583.6	2,589.1	2,564.9	6.9	8.1	-47.89	-220.6	230.3	127.1	114.0	13.09	9.712	
2,700.0	2,682.1	2,689.0	2,663.2	7.3	8.5	-48.92	-233.7	242.3	130.6	116.8	13.79	9.470	
2,800.0	2,780.7	2,788.9	2,761.5	7.7	8.9	-49.90	-246.9	254.4	134.2	119.7	14.51	9.249	
2,900.0	2,879.3	2,888.8	2,859.8	8.1	9.3	-50.83	-260.0	266.5	137.8	122.5	15.23	9.046	
3,000.0	2,977.9	2,988.7	2,958.1	8.4	9.7	-51.72	-273.2	278.5	141.4	125.4	15.96	8.860	
3,100.0	3,076.5	3,088.6	3,056.4	8.8	10.1	-52.55	-286.3	290.6	145.0	128.3	16.69	8.689	
3,200.0	3,175.0	3,188.5	3,154.7	9.2	10.5	-53.35	-299.5	302.7	148.7	131.3	17.43	8.531	
3,300.0	3,273.6	3,288.4	3,253.0	9.6	10.9	-54.11	-312.6	314.7	152.4	134.3	18.18	8.385	
3,400.0	3,372.2	3,388.4	3,351.3	10.0	11.3	-54.83	-325.8	326.8	156.2	137.2	18.93	8.250	
3,500.0	3,470.8	3,488.3	3,449.6	10.4	11.7	-55.52	-338.9	338.9	159.9	140.2	19.68	8.125	
3,600.0	3,569.3	3,588.2	3,547.9	10.8	12.2	-56.17	-352.1	350.9	163.7	143.3	20.44	8.009	
3,700.0	3,667.9	3,688.1	3,646.2	11.1	12.6	-56.80	-365.2	363.0	167.5	146.3	21.20	7.901	
3,800.0	3,766.5	3,788.0	3,744.5	11.5	13.0	-57.40	-378.4	375.1	171.3	149.4	21.97	7.800	
3,900.0	3,865.1	3,887.9	3,842.8	11.9	13.4	-57.97	-391.5	387.1	175.2	152.4	22.73	7.705	
4,000.0	3,963.7	3,987.8	3,941.1	12.3	13.8	-58.52	-404.7	399.2	179.0	155.5	23.50	7.617	
4,100.0	4,062.2	4,087.7	4,039.4	12.7	14.2	-59.05	-417.8	411.3	182.9	158.6	24.28	7.534	
4,200.0	4,160.8	4,187.6	4,137.7	13.1	14.6	-59.55	-431.0	423.3	186.8	161.7	25.05	7.457	
4,300.0	4,259.4	4,287.6	4,236.1	13.5	15.0	-60.03	-444.1	435.4	190.7	164.9	25.83	7.384	
4,400.0	4,358.0	4,387.5	4,334.4	13.9	15.5	-60.49	-457.3	447.5	194.6	168.0	26.60	7.315	
4,500.0	4,456.5	4,487.4	4,432.7	14.3	15.9	-60.94	-470.4	459.5	198.5	171.1	27.38	7.250	
4,600.0	4,555.1	4,587.3	4,531.0	14.7	16.3	-61.37	-483.6	471.6	202.5	174.3	28.16	7.189	
4,700.0	4,653.7	4,687.2	4,629.3	15.1	16.7	-61.78	-496.7	483.7	206.4	177.5	28.94	7.131	
4,800.0	4,752.3	4,787.1	4,727.6	15.5	17.1	-62.17	-509.9	495.7	210.4	180.6	29.73	7.077	
4,900.0	4,850.9	4,887.0	4,825.9	15.8	17.5	-62.56	-523.0	507.8	214.3	183.8	30.51	7.025	
5,000.0	4,949.4	4,986.9	4,924.2	16.2	17.9	-62.92	-536.2	519.9	218.3	187.0	31.29	6.976	

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

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well R&R Farms 29L-241
Project:	SEC.29-T5N-R63W	TVD Reference:	WELL @ 4587.0ft (RKB - 13')
Reference Site:	R&R Farms 5N63W29L Pad Sec.29-T5N-R63W	MD Reference:	WELL @ 4587.0ft (RKB - 13')
Site Error:	0.0ft	North Reference:	True
Reference Well:	R&R Farms 29L-241	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	Landmark
Reference Design:	Plan #3 (4-10-15)	Offset TVD Reference:	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						
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
5,100.0	5,048.0	5,086.8	5,022.5	16.6	18.4	-63.26	-549.3	531.9	222.4	190.3	32.06	6.936	
5,200.0	5,147.0	5,188.5	5,122.5	16.9	18.8	-63.10	-562.6	544.1	227.5	194.9	32.61	6.975	
5,300.0	5,246.5	5,293.8	5,226.7	17.1	19.0	-62.69	-574.1	554.7	232.3	199.3	33.00	7.040	
5,400.0	5,346.2	5,399.4	5,331.6	17.3	19.3	-62.20	-582.8	562.7	236.4	203.1	33.31	7.097	
5,500.0	5,446.1	5,505.2	5,437.0	17.4	19.5	-61.64	-588.7	568.0	239.7	206.2	33.54	7.147	
5,600.0	5,546.1	5,611.1	5,542.9	17.6	19.6	89.90	-591.7	570.8	242.0	208.3	33.74	7.174	
5,700.0	5,646.1	5,714.3	5,646.1	17.7	19.8	90.00	-592.1	571.2	242.4	208.4	34.00	7.130	
5,733.3	5,679.5	5,747.7	5,679.5	17.7	19.8	90.15	-592.1	571.2	242.4	208.4	34.04	7.121	
5,800.0	5,745.9	5,814.1	5,745.9	17.8	19.9	91.27	-592.1	571.2	242.5	208.5	33.99	7.133	
5,900.0	5,844.2	5,913.7	5,845.5	17.8	20.0	95.20	-590.8	571.2	243.4	210.1	33.38	7.294	
6,000.0	5,939.2	6,016.2	5,947.1	17.6	20.0	99.53	-578.0	571.2	245.9	213.4	32.49	7.569	
6,100.0	6,029.3	6,121.5	6,048.7	17.4	19.9	103.65	-550.8	571.2	249.7	218.2	31.46	7.936	
6,200.0	6,113.0	6,229.6	6,148.2	17.2	19.8	107.47	-508.6	571.2	254.5	224.1	30.38	8.377	
6,300.0	6,188.9	6,340.8	6,243.2	16.9	19.5	110.91	-451.1	571.2	259.9	230.6	29.31	8.867	
6,400.0	6,255.7	6,454.8	6,330.9	16.7	19.2	113.90	-378.5	571.2	265.6	237.2	28.37	9.361	
6,500.0	6,312.2	6,571.6	6,408.5	16.4	18.8	116.40	-291.4	571.2	271.0	243.3	27.67	9.796	
6,600.0	6,357.4	6,690.8	6,473.2	16.3	18.5	118.38	-191.3	571.2	275.8	248.5	27.32	10.096	
6,700.0	6,390.7	6,812.0	6,522.1	16.3	18.2	119.82	-80.6	571.2	279.5	252.1	27.44	10.189	
6,800.0	6,411.3	6,934.7	6,553.2	16.5	17.9	120.71	38.0	571.2	282.0	253.9	28.09	10.040	
6,900.0	6,419.0	7,058.1	6,564.9	17.1	17.8	121.04	160.7	571.2	282.9	253.7	29.27	9.667	
7,000.0	6,418.5	7,160.2	6,565.0	17.9	18.5	121.14	262.8	571.2	283.2	252.6	30.64	9.244	
7,100.0	6,417.9	7,260.2	6,565.0	18.8	19.5	121.25	362.8	571.2	283.5	251.3	32.25	8.791	
7,200.0	6,417.3	7,360.2	6,565.0	20.0	20.7	121.35	462.8	571.2	283.8	249.7	34.11	8.321	
7,300.0	6,416.7	7,460.2	6,565.0	21.2	21.9	121.46	562.8	571.2	284.2	248.0	36.19	7.852	
7,400.0	6,416.1	7,560.2	6,565.0	22.5	23.2	121.56	662.8	571.2	284.5	246.0	38.44	7.401	
7,500.0	6,415.5	7,660.2	6,565.0	24.0	24.6	121.67	762.8	571.2	284.8	244.0	40.83	6.975	
7,600.0	6,414.9	7,760.2	6,565.0	25.4	26.1	121.77	862.8	571.2	285.1	241.8	43.35	6.578	
7,700.0	6,414.3	7,860.2	6,565.0	27.0	27.6	121.87	962.8	571.2	285.4	239.5	45.96	6.211	
7,800.0	6,413.7	7,960.2	6,565.0	28.5	29.2	121.98	1,062.8	571.2	285.8	237.1	48.65	5.874	
7,900.0	6,413.0	8,060.2	6,565.0	30.2	30.8	122.08	1,162.8	571.2	286.1	234.7	51.42	5.564	
8,000.0	6,412.4	8,160.2	6,565.0	31.8	32.4	122.19	1,262.8	571.2	286.4	232.2	54.23	5.281	
8,100.0	6,411.8	8,260.2	6,565.0	33.5	34.0	122.29	1,362.8	571.2	286.7	229.6	57.10	5.022	
8,200.0	6,411.2	8,360.2	6,565.0	35.2	35.7	122.39	1,462.8	571.2	287.1	227.1	60.00	4.784	
8,300.0	6,410.6	8,460.2	6,565.0	36.9	37.4	122.49	1,562.8	571.2	287.4	224.5	62.94	4.567	
8,400.0	6,410.0	8,560.2	6,565.0	38.6	39.1	122.60	1,662.8	571.2	287.7	221.8	65.90	4.366	
8,500.0	6,409.4	8,660.2	6,565.0	40.4	40.9	122.70	1,762.8	571.2	288.1	219.2	68.88	4.182	
8,600.0	6,408.8	8,760.2	6,565.0	42.2	42.6	122.80	1,862.8	571.2	288.4	216.5	71.89	4.012	
8,700.0	6,408.2	8,860.2	6,565.0	43.9	44.4	122.90	1,962.8	571.2	288.7	213.8	74.91	3.854	
8,800.0	6,407.5	8,960.2	6,565.0	45.7	46.1	123.01	2,062.8	571.2	289.1	211.1	77.95	3.708	
8,900.0	6,406.9	9,060.2	6,565.0	47.5	47.9	123.11	2,162.8	571.2	289.4	208.4	80.99	3.573	
9,000.0	6,406.3	9,160.2	6,565.0	49.4	49.7	123.21	2,262.8	571.2	289.7	205.7	84.05	3.447	
9,100.0	6,405.7	9,260.2	6,565.0	51.2	51.5	123.31	2,362.8	571.2	290.1	202.9	87.11	3.330	
9,200.0	6,405.1	9,360.2	6,565.0	53.0	53.3	123.41	2,462.8	571.2	290.4	200.2	90.18	3.220	
9,300.0	6,404.5	9,460.2	6,565.0	54.8	55.2	123.51	2,562.8	571.2	290.7	197.5	93.25	3.118	
9,400.0	6,403.9	9,560.2	6,565.0	56.7	57.0	123.61	2,662.8	571.2	291.1	194.7	96.33	3.022	
9,500.0	6,403.3	9,660.2	6,565.0	58.5	58.8	123.71	2,762.8	571.2	291.4	192.0	99.41	2.931	
9,600.0	6,402.7	9,760.2	6,565.0	60.4	60.7	123.81	2,862.8	571.2	291.7	189.3	102.49	2.846	
9,700.0	6,402.0	9,860.2	6,565.0	62.2	62.5	123.91	2,962.8	571.2	292.1	186.5	105.58	2.767	
9,800.0	6,401.4	9,960.2	6,565.0	64.1	64.3	124.01	3,062.8	571.2	292.4	183.8	108.66	2.691	
9,900.0	6,400.8	10,060.2	6,565.0	65.9	66.2	124.11	3,162.8	571.2	292.8	181.0	111.75	2.620	

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

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well R&R Farms 29L-241
Project:	SEC.29-T5N-R63W	TVD Reference:	WELL @ 4587.0ft (RKB - 13')
Reference Site:	R&R Farms 5N63W29L Pad Sec.29-T5N-R63W	MD Reference:	WELL @ 4587.0ft (RKB - 13')
Site Error:	0.0ft	North Reference:	True
Reference Well:	R&R Farms 29L-241	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	Landmark
Reference Design:	Plan #3 (4-10-15)	Offset TVD Reference:	Offset Datum

Offset Design													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	6,400.2	10,160.2	6,565.0	67.8	68.0	124.21	3,262.8	571.2	293.1	178.3	114.83	2.553		
10,100.0	6,399.6	10,260.2	6,565.0	69.7	69.9	124.31	3,362.8	571.2	293.5	175.5	117.91	2.489		
10,200.0	6,399.0	10,360.2	6,565.0	71.5	71.8	124.40	3,462.8	571.2	293.8	172.8	120.99	2.428		
10,300.0	6,398.4	10,460.2	6,565.0	73.4	73.6	124.50	3,562.8	571.2	294.1	170.1	124.07	2.371		
10,400.0	6,397.8	10,560.2	6,565.0	75.3	75.5	124.60	3,662.8	571.2	294.5	167.3	127.15	2.316		
10,500.0	6,397.2	10,660.2	6,565.0	77.1	77.4	124.70	3,762.8	571.2	294.8	164.6	130.23	2.264		
10,600.0	6,396.6	10,760.2	6,565.0	79.0	79.2	124.80	3,862.8	571.2	295.2	161.9	133.30	2.214		
10,700.0	6,395.9	10,860.2	6,565.0	80.9	81.1	124.89	3,962.8	571.2	295.5	159.2	136.37	2.167		
10,800.0	6,395.3	10,960.2	6,565.0	82.8	83.0	124.99	4,062.8	571.2	295.9	156.4	139.44	2.122		
10,854.0	6,395.0	11,014.1	6,565.0	83.8	84.0	125.04	4,116.7	571.2	296.1	155.0	141.09	2.098 SF		

Reference Depths are relative to WELL @ 4587.0ft (RKB - 13')	Coordinates are relative to: R&R Farms 29L-241
Offset Depths are relative to Offset Datum	Coordinate System is US State Plane 1983, Colorado Northern Zone
Central Meridian is -105.500000 °	Grid Convergence at Surface is: 0.67°



Reference Depths are relative to WELL @ 4587.0ft (RKB - 13')	Coordinates are relative to: R&R Farms 29L-241
Offset Depths are relative to Offset Datum	Coordinate System is US State Plane 1983, Colorado Northern Zone
Central Meridian is -105.500000 °	Grid Convergence at Surface is: 0.67°

