

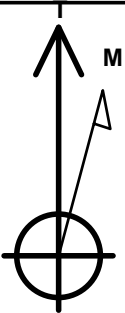
PETROLEUM DEVELOPMENT CORP Weld County CO

Well Name: **R&R Farms 29Q-441**

Surface Location: R&R Farms 5N63W29Q Pad Sec.29-T5N-R63W  
North American Datum 1983 , US State Plane 1983 , Colorado Northern Zone  
Ground Elevation: 4573.0  
+N/-S +E/-W Northing Easting Latitude Longitude Slot  
0.0 0.0 1377119.06 3289123.85 40.363950 -104.462420  
RKB - 15' WELL @ 4588.0ft (RKB - 15')

WELLBORE TARGET DETAILS

Name	TVD	+N/-S	+E/-W	Shape
SHL 245'FSL & 2003'FWL	1.0	0.0	0.0	Point
BHL 500'FNL & 2402'FWL	6572.0	4517.5	365.0	Point



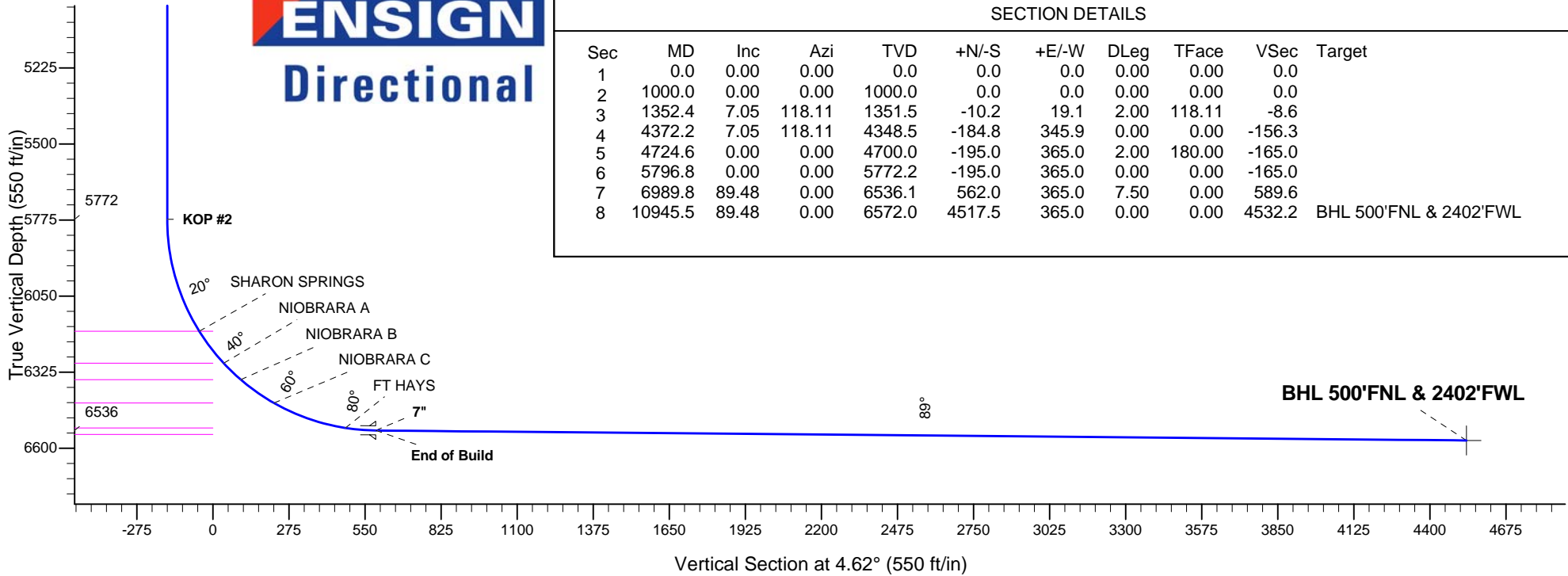
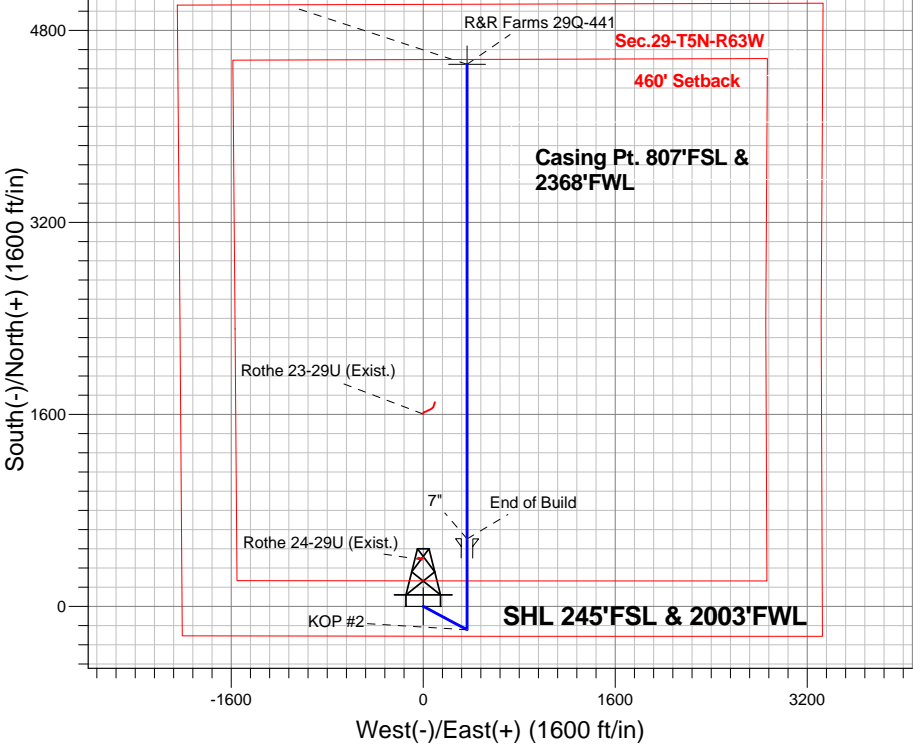
Azimuths to True North  
Magnetic North: 8.26°  
Magnetic Field  
Strength: 52802.0srT  
Dip Angle: 66.96°  
Date: 9/19/2014  
Model: IGRF2010

ANNOTATIONS

TVD	MD	Annotation
1000.0	1000.0	KOP #1
5772.2	5796.8	KOP #2
6536.1	6989.8	End of Build

R&R Farms 5N63W29Q Pad Sec.29-T5N-R63W  
R&R Farms 29Q-441  
Plan #1 (9-19-14)

BHL 500'FNL & 2402'FWL



SECTION DETAILS

Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	DLeg	TFace	VSec	Target
1	0.0	0.00	0.00	0.0	0.0	0.0	0.00	0.00	0.0	
2	1000.0	0.00	0.00	1000.0	0.0	0.0	0.00	0.00	0.0	
3	1352.4	7.05	118.11	1351.5	-10.2	19.1	2.00	118.11	-8.6	
4	4372.2	7.05	118.11	4348.5	-184.8	345.9	0.00	0.00	-156.3	
5	4724.6	0.00	0.00	4700.0	-195.0	365.0	2.00	180.00	-165.0	
6	5796.8	0.00	0.00	5772.2	-195.0	365.0	0.00	0.00	-165.0	
7	6989.8	89.48	0.00	6536.1	562.0	365.0	7.50	0.00	589.6	
8	10945.5	89.48	0.00	6572.0	4517.5	365.0	0.00	0.00	4532.2	BHL 500'FNL & 2402'FWL



# **PETROLEUM DEVELOPMENT CORP Weld County CO**

**SEC.29-T5N-R63W**

**R&R Farms 5N63W29Q Pad Sec.29-T5N-R63W**

**R&R Farms 29Q-441**

**Wellbore #1**

**Plan: Plan #1 (9-19-14)**

## **Standard Planning Report**

**24 September, 2014**

<b>Database:</b>	landmark	<b>Local Co-ordinate Reference:</b>	Well R&R Farms 29Q-441
<b>Company:</b>	PETROLEUM DEVELOPMENT CORP Weld County CO	<b>TVD Reference:</b>	WELL @ 4588.0ft (RKB - 15')
<b>Project:</b>	SEC.29-T5N-R63W	<b>MD Reference:</b>	WELL @ 4588.0ft (RKB - 15')
<b>Site:</b>	R&R Farms 5N63W29Q Pad Sec.29-T5N-R63W	<b>North Reference:</b>	True
<b>Well:</b>	R&R Farms 29Q-441	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Wellbore #1		
<b>Design:</b>	Plan #1 (9-19-14)		

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

Site						R&R Farms 5N63W29Q Pad Sec.29-T5N-R63W											
Site Position:						Northing:			1,377,210.14 ft			Latitude:			40.364200		
From:			Lat/Long			Easting:			3,289,122.78 ft			Longitude:			-104.462420		
Position Uncertainty:			0.0 ft			Slot Radius:			"			Grid Convergence:			0.67 °		

Well	R&R Farms 29Q-441					
Well Position	+N/-S	-91.1 ft	Northing:	1,377,119.06 ft	Latitude:	40.363950
	+E/-W	0.0 ft	Easting:	3,289,123.85 ft	Longitude:	-104.462420
Position Uncertainty		0.0 ft	Wellhead Elevation:	ft	Ground Level:	4,573.0 ft

<b>Wellbore</b>	Wellbore #1				
<b>Magnetics</b>	<b>Model Name</b>	<b>Sample Date</b>	<b>Declination (°)</b>	<b>Dip Angle (°)</b>	<b>Field Strength (nT)</b>
	IGRF2010	9/19/2014	8.26	66.96	52,802

<b>Design</b>	Plan #1 (9-19-14)				
<b>Audit Notes:</b>					
<b>Version:</b>	<b>Phase:</b>	PROTOTYPE	<b>Tie On Depth:</b>	0.0	
<b>Vertical Section:</b>	<b>Depth From (TVD) (ft)</b>	<b>+N/-S (ft)</b>	<b>+E/-W (ft)</b>	<b>Direction (°)</b>	
	0.0	0.0	0.0	4.62	

<b>Plan Sections</b>										
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)	TFO (°)	Target
0.0	0.00	0.00	0.0	0.0	0.0	0.00	0.00	0.00	0.00	
1,000.0	0.00	0.00	1,000.0	0.0	0.0	0.00	0.00	0.00	0.00	
1,352.4	7.05	118.11	1,351.5	-10.2	19.1	2.00	2.00	0.00	118.11	
4,372.2	7.05	118.11	4,348.5	-184.8	345.9	0.00	0.00	0.00	0.00	
4,724.6	0.00	0.00	4,700.0	-195.0	365.0	2.00	-2.00	0.00	180.00	
5,796.8	0.00	0.00	5,772.2	-195.0	365.0	0.00	0.00	0.00	0.00	
6,989.8	89.48	0.00	6,536.1	562.0	365.0	7.50	7.50	0.00	0.00	
10,945.5	89.48	0.00	6,572.0	4,517.5	365.0	0.00	0.00	0.00	0.00	BHL 500'FNL & 24C

<b>Database:</b>	landmark	<b>Local Co-ordinate Reference:</b>	Well R&R Farms 29Q-441
<b>Company:</b>	PETROLEUM DEVELOPMENT CORP Weld County CO	<b>TVD Reference:</b>	WELL @ 4588.0ft (RKB - 15')
<b>Project:</b>	SEC.29-T5N-R63W	<b>MD Reference:</b>	WELL @ 4588.0ft (RKB - 15')
<b>Site:</b>	R&R Farms 5N63W29Q Pad Sec.29-T5N-R63W	<b>North Reference:</b>	True
<b>Well:</b>	R&R Farms 29Q-441	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Wellbore #1		
<b>Design:</b>	Plan #1 (9-19-14)		

Planned Survey									
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
0.0	0.00	0.00	0.0	0.0	0.0	0.0	0.00	0.00	0.00
100.0	0.00	0.00	100.0	0.0	0.0	0.0	0.00	0.00	0.00
200.0	0.00	0.00	200.0	0.0	0.0	0.0	0.00	0.00	0.00
300.0	0.00	0.00	300.0	0.0	0.0	0.0	0.00	0.00	0.00
400.0	0.00	0.00	400.0	0.0	0.0	0.0	0.00	0.00	0.00
500.0	0.00	0.00	500.0	0.0	0.0	0.0	0.00	0.00	0.00
600.0	0.00	0.00	600.0	0.0	0.0	0.0	0.00	0.00	0.00
700.0	0.00	0.00	700.0	0.0	0.0	0.0	0.00	0.00	0.00
800.0	0.00	0.00	800.0	0.0	0.0	0.0	0.00	0.00	0.00
900.0	0.00	0.00	900.0	0.0	0.0	0.0	0.00	0.00	0.00
1,000.0	0.00	0.00	1,000.0	0.0	0.0	0.0	0.00	0.00	0.00
<b>KOP #1</b>									
1,100.0	2.00	118.11	1,100.0	-0.8	1.5	-0.7	2.00	2.00	0.00
1,200.0	4.00	118.11	1,199.8	-3.3	6.2	-2.8	2.00	2.00	0.00
1,300.0	6.00	118.11	1,299.5	-7.4	13.8	-6.3	2.00	2.00	0.00
1,352.4	7.05	118.11	1,351.5	-10.2	19.1	-8.6	2.00	2.00	0.00
1,400.0	7.05	118.11	1,398.8	-13.0	24.2	-11.0	0.00	0.00	0.00
1,500.0	7.05	118.11	1,498.0	-18.7	35.1	-15.8	0.00	0.00	0.00
1,600.0	7.05	118.11	1,597.2	-24.5	45.9	-20.7	0.00	0.00	0.00
1,700.0	7.05	118.11	1,696.5	-30.3	56.7	-25.6	0.00	0.00	0.00
1,800.0	7.05	118.11	1,795.7	-36.1	67.5	-30.5	0.00	0.00	0.00
1,900.0	7.05	118.11	1,895.0	-41.9	78.4	-35.4	0.00	0.00	0.00
2,000.0	7.05	118.11	1,994.2	-47.6	89.2	-40.3	0.00	0.00	0.00
2,100.0	7.05	118.11	2,093.5	-53.4	100.0	-45.2	0.00	0.00	0.00
2,200.0	7.05	118.11	2,192.7	-59.2	110.8	-50.1	0.00	0.00	0.00
2,300.0	7.05	118.11	2,292.0	-65.0	121.6	-55.0	0.00	0.00	0.00
2,400.0	7.05	118.11	2,391.2	-70.8	132.5	-59.9	0.00	0.00	0.00
2,500.0	7.05	118.11	2,490.4	-76.6	143.3	-64.8	0.00	0.00	0.00
2,600.0	7.05	118.11	2,589.7	-82.3	154.1	-69.7	0.00	0.00	0.00
2,700.0	7.05	118.11	2,688.9	-88.1	164.9	-74.5	0.00	0.00	0.00
2,800.0	7.05	118.11	2,788.2	-93.9	175.8	-79.4	0.00	0.00	0.00
2,900.0	7.05	118.11	2,887.4	-99.7	186.6	-84.3	0.00	0.00	0.00
3,000.0	7.05	118.11	2,986.7	-105.5	197.4	-89.2	0.00	0.00	0.00
3,100.0	7.05	118.11	3,085.9	-111.2	208.2	-94.1	0.00	0.00	0.00
3,200.0	7.05	118.11	3,185.2	-117.0	219.0	-99.0	0.00	0.00	0.00
3,300.0	7.05	118.11	3,284.4	-122.8	229.9	-103.9	0.00	0.00	0.00
3,317.7	7.05	118.11	3,302.0	-123.8	231.8	-104.8	0.00	0.00	0.00
<b>PARKMAN</b>									
3,400.0	7.05	118.11	3,383.6	-128.6	240.7	-108.8	0.00	0.00	0.00
3,500.0	7.05	118.11	3,482.9	-134.4	251.5	-113.7	0.00	0.00	0.00
3,600.0	7.05	118.11	3,582.1	-140.2	262.3	-118.6	0.00	0.00	0.00
3,700.0	7.05	118.11	3,681.4	-145.9	273.2	-123.5	0.00	0.00	0.00
3,800.0	7.05	118.11	3,780.6	-151.7	284.0	-128.4	0.00	0.00	0.00
3,869.9	7.05	118.11	3,850.0	-155.8	291.5	-131.8	0.00	0.00	0.00
<b>SUSSEX</b>									
3,900.0	7.05	118.11	3,879.9	-157.5	294.8	-133.2	0.00	0.00	0.00
4,000.0	7.05	118.11	3,979.1	-163.3	305.6	-138.1	0.00	0.00	0.00
4,100.0	7.05	118.11	4,078.4	-169.1	316.4	-143.0	0.00	0.00	0.00
4,200.0	7.05	118.11	4,177.6	-174.8	327.3	-147.9	0.00	0.00	0.00
4,300.0	7.05	118.11	4,276.8	-180.6	338.1	-152.8	0.00	0.00	0.00
4,372.2	7.05	118.11	4,348.5	-184.8	345.9	-156.3	0.00	0.00	0.00
4,400.0	6.49	118.11	4,376.1	-186.3	348.8	-157.6	2.00	-2.00	0.00

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<b>Project:</b>	SEC.29-T5N-R63W	<b>MD Reference:</b>	WELL @ 4588.0ft (RKB - 15')
<b>Site:</b>	R&R Farms 5N63W29Q Pad Sec.29-T5N-R63W	<b>North Reference:</b>	True
<b>Well:</b>	R&R Farms 29Q-441	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Wellbore #1		
<b>Design:</b>	Plan #1 (9-19-14)		

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)
4,500.0	4.49	118.11	4,475.6	-190.9	357.2	-161.5	2.00	-2.00	0.00
4,600.0	2.49	118.11	4,575.4	-193.7	362.6	-163.9	2.00	-2.00	0.00
4,700.0	0.49	118.11	4,675.4	-195.0	364.9	-164.9	2.00	-2.00	0.00
4,724.6	0.00	0.00	4,700.0	-195.0	365.0	-165.0	2.00	-2.00	0.00
4,800.0	0.00	0.00	4,775.4	-195.0	365.0	-165.0	0.00	0.00	0.00
4,884.6	0.00	0.00	4,860.0	-195.0	365.0	-165.0	0.00	0.00	0.00
SHANNON									
4,900.0	0.00	0.00	4,875.4	-195.0	365.0	-165.0	0.00	0.00	0.00
5,000.0	0.00	0.00	4,975.4	-195.0	365.0	-165.0	0.00	0.00	0.00
5,100.0	0.00	0.00	5,075.4	-195.0	365.0	-165.0	0.00	0.00	0.00
5,200.0	0.00	0.00	5,175.4	-195.0	365.0	-165.0	0.00	0.00	0.00
5,300.0	0.00	0.00	5,275.4	-195.0	365.0	-165.0	0.00	0.00	0.00
5,400.0	0.00	0.00	5,375.4	-195.0	365.0	-165.0	0.00	0.00	0.00
5,500.0	0.00	0.00	5,475.4	-195.0	365.0	-165.0	0.00	0.00	0.00
5,600.0	0.00	0.00	5,575.4	-195.0	365.0	-165.0	0.00	0.00	0.00
5,700.0	0.00	0.00	5,675.4	-195.0	365.0	-165.0	0.00	0.00	0.00
5,796.8	0.00	0.00	5,772.2	-195.0	365.0	-165.0	0.00	0.00	0.00
KOP #2									
5,800.0	0.24	0.00	5,775.4	-195.0	365.0	-165.0	7.55	7.55	0.00
5,900.0	7.74	0.00	5,875.1	-188.0	365.0	-158.0	7.50	7.50	0.00
6,000.0	15.24	0.00	5,973.0	-168.1	365.0	-138.2	7.50	7.50	0.00
6,100.0	22.74	0.00	6,067.5	-135.6	365.0	-105.8	7.50	7.50	0.00
6,200.0	30.24	0.00	6,156.9	-91.0	365.0	-61.3	7.50	7.50	0.00
6,223.4	32.00	0.00	6,177.0	-78.9	365.0	-49.3	7.50	7.50	0.00
SHARON SPRINGS									
6,300.0	37.74	0.00	6,239.8	-35.2	365.0	-5.7	7.50	7.50	0.00
6,369.8	42.98	0.00	6,293.0	10.0	365.0	39.4	7.50	7.50	0.00
NIOBRARA A									
6,400.0	45.24	0.00	6,314.6	31.0	365.0	60.3	7.50	7.50	0.00
6,455.1	49.37	0.00	6,352.0	71.5	365.0	100.7	7.50	7.50	0.00
NIOBRARA B									
6,500.0	52.74	0.00	6,380.2	106.4	365.0	135.5	7.50	7.50	0.00
6,600.0	60.24	0.00	6,435.4	189.8	365.0	218.5	7.50	7.50	0.00
6,603.3	60.49	0.00	6,437.0	192.6	365.0	221.4	7.50	7.50	0.00
NIOBRARA C									
6,700.0	67.74	0.00	6,479.2	279.6	365.0	308.1	7.50	7.50	0.00
6,800.0	75.24	0.00	6,510.9	374.3	365.0	402.5	7.50	7.50	0.00
6,878.5	81.13	0.00	6,527.0	451.2	365.0	479.1	7.50	7.50	0.00
FT HAYS									
6,900.0	82.74	0.00	6,530.0	472.4	365.0	500.3	7.50	7.50	0.00
6,989.8	89.48	0.00	6,536.1	562.0	365.0	589.5	7.50	7.50	0.00
End of Build - 7"									
7,000.0	89.48	0.00	6,536.2	572.2	365.0	599.7	0.04	0.04	0.00
7,100.0	89.48	0.00	6,537.1	672.2	365.0	699.4	0.00	0.00	0.00
7,200.0	89.48	0.00	6,538.0	772.2	365.0	799.0	0.00	0.00	0.00
7,300.0	89.48	0.00	6,538.9	872.2	365.0	898.7	0.00	0.00	0.00
7,400.0	89.48	0.00	6,539.8	972.1	365.0	998.4	0.00	0.00	0.00
7,500.0	89.48	0.00	6,540.7	1,072.1	365.0	1,098.1	0.00	0.00	0.00
7,600.0	89.48	0.00	6,541.6	1,172.1	365.0	1,197.7	0.00	0.00	0.00
7,700.0	89.48	0.00	6,542.5	1,272.1	365.0	1,297.4	0.00	0.00	0.00
7,800.0	89.48	0.00	6,543.5	1,372.1	365.0	1,397.1	0.00	0.00	0.00

<b>Database:</b>	landmark	<b>Local Co-ordinate Reference:</b>	Well R&R Farms 29Q-441
<b>Company:</b>	PETROLEUM DEVELOPMENT CORP Weld County CO	<b>TVD Reference:</b>	WELL @ 4588.0ft (RKB - 15')
<b>Project:</b>	SEC.29-T5N-R63W	<b>MD Reference:</b>	WELL @ 4588.0ft (RKB - 15')
<b>Site:</b>	R&R Farms 5N63W29Q Pad Sec.29-T5N-R63W	<b>North Reference:</b>	True
<b>Well:</b>	R&R Farms 29Q-441	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Wellbore #1		
<b>Design:</b>	Plan #1 (9-19-14)		

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)
7,900.0	89.48	0.00	6,544.4	1,472.1	365.0	1,496.7	0.00	0.00	0.00
8,000.0	89.48	0.00	6,545.3	1,572.1	365.0	1,596.4	0.00	0.00	0.00
8,100.0	89.48	0.00	6,546.2	1,672.1	365.0	1,696.1	0.00	0.00	0.00
8,200.0	89.48	0.00	6,547.1	1,772.1	365.0	1,795.8	0.00	0.00	0.00
8,300.0	89.48	0.00	6,548.0	1,872.1	365.0	1,895.4	0.00	0.00	0.00
8,400.0	89.48	0.00	6,548.9	1,972.1	365.0	1,995.1	0.00	0.00	0.00
8,500.0	89.48	0.00	6,549.8	2,072.1	365.0	2,094.8	0.00	0.00	0.00
8,521.4	89.48	0.00	6,550.0	2,093.5	365.0	2,116.1	0.00	0.00	0.00
CODELL									
8,600.0	89.48	0.00	6,550.7	2,172.1	365.0	2,194.4	0.00	0.00	0.00
8,700.0	89.48	0.00	6,551.6	2,272.1	365.0	2,294.1	0.00	0.00	0.00
8,800.0	89.48	0.00	6,552.5	2,372.1	365.0	2,393.8	0.00	0.00	0.00
8,900.0	89.48	0.00	6,553.4	2,472.1	365.0	2,493.4	0.00	0.00	0.00
9,000.0	89.48	0.00	6,554.3	2,572.1	365.0	2,593.1	0.00	0.00	0.00
9,100.0	89.48	0.00	6,555.3	2,672.1	365.0	2,692.8	0.00	0.00	0.00
9,200.0	89.48	0.00	6,556.2	2,772.1	365.0	2,792.5	0.00	0.00	0.00
9,300.0	89.48	0.00	6,557.1	2,872.1	365.0	2,892.1	0.00	0.00	0.00
9,400.0	89.48	0.00	6,558.0	2,972.1	365.0	2,991.8	0.00	0.00	0.00
9,500.0	89.48	0.00	6,558.9	3,072.1	365.0	3,091.5	0.00	0.00	0.00
9,600.0	89.48	0.00	6,559.8	3,172.1	365.0	3,191.1	0.00	0.00	0.00
9,700.0	89.48	0.00	6,560.7	3,272.1	365.0	3,290.8	0.00	0.00	0.00
9,800.0	89.48	0.00	6,561.6	3,372.0	365.0	3,390.5	0.00	0.00	0.00
9,900.0	89.48	0.00	6,562.5	3,472.0	365.0	3,490.2	0.00	0.00	0.00
10,000.0	89.48	0.00	6,563.4	3,572.0	365.0	3,589.8	0.00	0.00	0.00
10,100.0	89.48	0.00	6,564.3	3,672.0	365.0	3,689.5	0.00	0.00	0.00
10,200.0	89.48	0.00	6,565.2	3,772.0	365.0	3,789.2	0.00	0.00	0.00
10,300.0	89.48	0.00	6,566.1	3,872.0	365.0	3,888.8	0.00	0.00	0.00
10,400.0	89.48	0.00	6,567.0	3,972.0	365.0	3,988.5	0.00	0.00	0.00
10,500.0	89.48	0.00	6,568.0	4,072.0	365.0	4,088.2	0.00	0.00	0.00
10,600.0	89.48	0.00	6,568.9	4,172.0	365.0	4,187.9	0.00	0.00	0.00
10,700.0	89.48	0.00	6,569.8	4,272.0	365.0	4,287.5	0.00	0.00	0.00
10,800.0	89.48	0.00	6,570.7	4,372.0	365.0	4,387.2	0.00	0.00	0.00
10,900.0	89.48	0.00	6,571.6	4,472.0	365.0	4,486.9	0.00	0.00	0.00
10,945.5	89.48	0.00	6,572.0	4,517.5	365.0	4,532.2	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 245'FSL & 2003'I	0.00	0.00	1.0	0.0	0.0	1,377,119.07	3,289,123.85	40.363950	-104.462420
- plan hits target									
- Point									
BHL 500'FNL & 2402'	0.00	0.00	6,572.0	4,517.5	365.0	1,381,640.29	3,289,435.94	40.376350	-104.461110
- plan hits target									
- Point									

<b>Database:</b>	landmark	<b>Local Co-ordinate Reference:</b>	Well R&R Farms 29Q-441
<b>Company:</b>	PETROLEUM DEVELOPMENT CORP Weld County CO	<b>TVD Reference:</b>	WELL @ 4588.0ft (RKB - 15')
<b>Project:</b>	SEC.29-T5N-R63W	<b>MD Reference:</b>	WELL @ 4588.0ft (RKB - 15')
<b>Site:</b>	R&R Farms 5N63W29Q Pad Sec.29-T5N-R63W	<b>North Reference:</b>	True
<b>Well:</b>	R&R Farms 29Q-441	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Wellbore #1		
<b>Design:</b>	Plan #1 (9-19-14)		

Casing Points					
Measured Depth (ft)	Vertical Depth (ft)	Name	Casing Diameter (")	Hole Diameter (")	
6,989.8	6,536.1	7"	7	7-1/2	

Formations						
Measured Depth (ft)	Vertical Depth (ft)	Name	Lithology	Dip (°)	Dip Direction (°)	
3,317.7	3,302.0	PARKMAN		0.00		
3,869.9	3,850.0	SUSSEX		0.00		
4,884.6	4,860.0	SHANNON		0.00		
6,223.4	6,177.0	SHARON SPRINGS		0.00		
6,369.8	6,293.0	NIOBRARA A		0.00		
6,455.1	6,352.0	NIOBRARA B		0.00		
6,603.3	6,437.0	NIOBRARA C		0.00		
6,878.5	6,527.0	FT HAYS		0.00		
8,521.4	6,550.0	CODELL		0.00		

Plan Annotations					
Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates			
		+N/-S (ft)	+E/-W (ft)	Comment	
1,000.0	1,000.0	0.0	0.0	KOP #1	
5,796.8	5,772.2	-10.2	19.1	KOP #2	
6,989.8	6,536.1	-184.8	345.9	End of Build	



# **PETROLEUM DEVELOPMENT CORP Weld County CO**

**SEC.29-T5N-R63W**

**R&R Farms 5N63W29Q Pad Sec.29-T5N-R63W**

**R&R Farms 29Q-441**

**Wellbore #1**

**Plan #1 (9-19-14)**

## **Anticollision Report**

**25 September, 2014**





<b>Company:</b>	PETROLEUM DEVELOPMENT CORP Weld County CO	<b>Local Co-ordinate Reference:</b>	Well R&R Farms 29Q-441
<b>Project:</b>	SEC.29-T5N-R63W	<b>TVD Reference:</b>	WELL @ 4588.0ft (RKB - 15')
<b>Reference Site:</b>	R&R Farms 5N63W29Q Pad Sec.29-T5N-R63W	<b>MD Reference:</b>	WELL @ 4588.0ft (RKB - 15')
<b>Site Error:</b>	0.0ft	<b>North Reference:</b>	True
<b>Reference Well:</b>	R&R Farms 29Q-441	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.0ft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	Wellbore #1	<b>Database:</b>	landmark
<b>Reference Design:</b>	Plan #1 (9-19-14)	<b>Offset TVD Reference:</b>	Offset Datum

<b>Reference</b>	Plan #1 (9-19-14)		
<b>Filter type:</b>	NO GLOBAL FILTER: Using user defined selection & filtering criteria		
<b>Interpolation Method:</b>	MD Interval 100.0ft	<b>Error Model:</b>	ISCWSA
<b>Depth Range:</b>	Unlimited	<b>Scan Method:</b>	Closest Approach 3D
<b>Results Limited by:</b>	Maximum center-center distance of 1,000.0ft	<b>Error Surface:</b>	Elliptical Conic
<b>Warning Levels Evaluated at:</b>	2.00 Sigma		

<b>Survey Tool Program</b>	<b>Date</b> 9/24/2014			
<b>From (ft)</b>	<b>To (ft)</b>	<b>Survey (Wellbore)</b>	<b>Tool Name</b>	<b>Description</b>
0.0	10,944.7	Plan #1 (9-19-14) (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
<b>Offset Well - Wellbore - Design</b>						
Existing Wells Sec.29-T5N-R63W						
Rothe 23-29U (Exist.) - Wellbore #1 - Wellbore #1	8,031.7	6,527.5	368.4	320.7	7.720	CC, ES
Rothe 23-29U (Exist.) - Wellbore #1 - Wellbore #1	8,100.0	6,527.5	374.6	325.7	7.660	SF
Rothe 24-29U (Exist.) - Wellbore #1 - Wellbore #1	6,817.6	6,507.6	378.9	349.4	12.876	CC, ES
Rothe 24-29U (Exist.) - Wellbore #1 - Wellbore #1	6,900.0	6,521.6	387.5	357.2	12.788	SF
R&R Farms 5N63W29Q Pad Sec.29-T5N-R63W						
R&R Farms 29L-201 - Wellbore #1 - Plan #1 (9-19-14)	200.0	200.0	58.3	57.6	86.445	CC
R&R Farms 29L-201 - Wellbore #1 - Plan #1 (9-19-14)	400.0	399.7	58.7	57.1	37.603	ES
R&R Farms 29L-201 - Wellbore #1 - Plan #1 (9-19-14)	10,945.5	10,816.0	945.7	772.2	5.450	SF
R&R Farms 29L-321 - Wellbore #1 - Plan #1 (9-19-14)	1,000.0	1,000.0	120.3	116.0	28.160	CC, ES
R&R Farms 29L-321 - Wellbore #1 - Plan #1 (9-19-14)	10,945.5	10,872.4	497.1	325.8	2.902	SF
R&R Farms 29L-421 - Wellbore #1 - Plan #1 (9-19-14)	1,000.0	1,000.0	91.1	86.8	21.327	CC, ES
R&R Farms 29L-421 - Wellbore #1 - Plan #1 (9-19-14)	10,945.5	10,948.2	718.8	543.1	4.090	SF
R&R Farms 29Q-241 - Wellbore #1 - Plan #1 (9-19-14)	1,000.0	1,000.0	29.1	24.9	6.826	CC, ES
R&R Farms 29Q-241 - Wellbore #1 - Plan #1 (9-19-14)	10,945.5	10,792.5	303.7	157.9	2.082	SF
R&R Farms 29Q-301 - Wellbore #1 - Plan #1 (9-19-14)	166.3	167.3	29.1	28.6	55.486	CC
R&R Farms 29Q-301 - Wellbore #1 - Plan #1 (9-19-14)	200.0	201.0	29.1	28.5	43.081	ES
R&R Farms 29Q-301 - Wellbore #1 - Plan #1 (9-19-14)	10,945.5	10,888.8	234.2	73.5	1.458	Level 3, SF

<b>Offset Design</b>	Existing Wells Sec.29-T5N-R63W - Rothe 23-29U (Exist.) - Wellbore #1 - Wellbore #1											<b>Offset Site Error:</b>	0.0ft
<b>Survey Program:</b>	600-MWD											<b>Offset Well Error:</b>	0.0ft
Reference	Offset	Semi Major Axis		Distance		Minimum Separation		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	Warning
7,200.0	6,538.0	6,527.4	6,525.1	21.5	13.3	-90.23	1,603.8	-3.4	909.7	875.4	34.22	26.580	
7,300.0	6,538.9	6,527.4	6,525.1	22.9	13.3	-90.24	1,603.8	-3.4	819.2	783.6	35.67	22.964	
7,400.0	6,539.8	6,527.4	6,525.1	24.4	13.3	-90.24	1,603.8	-3.4	731.3	694.1	37.19	19.663	
7,500.0	6,540.7	6,527.4	6,525.1	26.0	13.3	-90.24	1,603.8	-3.4	646.9	608.1	38.76	16.689	
7,600.0	6,541.6	6,527.4	6,525.1	27.6	13.3	-90.24	1,603.8	-3.4	567.5	527.2	40.38	14.056	
7,700.0	6,542.5	6,527.5	6,525.1	29.2	13.3	-90.24	1,603.8	-3.4	495.7	453.7	42.03	11.795	
7,800.0	6,543.5	6,527.5	6,525.1	30.9	13.3	-90.25	1,603.8	-3.4	435.2	391.5	43.71	9.956	
7,900.0	6,544.4	6,527.5	6,525.2	32.6	13.3	-90.25	1,603.8	-3.4	391.2	345.8	45.43	8.612	

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

<b>Company:</b>	PETROLEUM DEVELOPMENT CORP Weld County CO	<b>Local Co-ordinate Reference:</b>	Well R&R Farms 29Q-441
<b>Project:</b>	SEC.29-T5N-R63W	<b>TVD Reference:</b>	WELL @ 4588.0ft (RKB - 15')
<b>Reference Site:</b>	R&R Farms 5N63W29Q Pad Sec.29-T5N-R63W	<b>MD Reference:</b>	WELL @ 4588.0ft (RKB - 15')
<b>Site Error:</b>	0.0ft	<b>North Reference:</b>	True
<b>Reference Well:</b>	R&R Farms 29Q-441	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.0ft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	Wellbore #1	<b>Database:</b>	landmark
<b>Reference Design:</b>	Plan #1 (9-19-14)	<b>Offset TVD Reference:</b>	Offset Datum

Offset Design Existing Wells Sec.29-T5N-R63W - Rothe 23-29U (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	Vertical	Measured	Vertical	Reference	Offset	Highside	Offset Wellbore Centre		Between	Between	Minimum	Separation		
Depth (ft)	Depth (ft)	Depth (ft)	Depth (ft)	(ft)	(ft)	Toolface (°)	+N/-S (ft)	+E/-W (ft)	Centres (ft)	Ellipses (ft)	Separation (ft)	Factor		
8,000.0	6,545.3	6,527.5	6,525.2	34.3	13.3	-90.25	1,603.8	-3.4	369.7	322.6	47.16	7.840	7.720 CC, ES 7.660 SF	
8,031.7	6,545.6	6,527.5	6,525.2	34.9	13.3	-90.25	1,603.8	-3.4	368.4	320.7	47.71			
8,100.0	6,546.2	6,527.5	6,525.2	36.0	13.3	-90.25	1,603.8	-3.4	374.6	325.7	48.91			
8,200.0	6,547.1	6,527.5	6,525.2	37.8	13.3	-90.26	1,603.8	-3.4	405.0	354.3	50.68	7.991		
8,300.0	6,548.0	6,527.5	6,525.2	39.6	13.3	-90.26	1,603.8	-3.4	455.7	403.2	52.46	8.686	7.991	
8,400.0	6,548.9	6,527.6	6,525.2	41.4	13.3	-90.26	1,603.8	-3.4	520.9	466.6	54.26	9.600		
8,500.0	6,549.8	6,527.6	6,525.3	43.2	13.3	-90.26	1,603.8	-3.4	595.8	539.7	56.06	10.627		
8,600.0	6,550.7	6,527.6	6,525.3	45.0	13.3	-90.27	1,603.8	-3.4	677.2	619.3	57.88	11.700		
8,700.0	6,551.6	6,527.6	6,525.3	46.8	13.3	-90.27	1,603.8	-3.4	763.1	703.4	59.70	12.781	12.781	
8,800.0	6,552.5	6,527.6	6,525.3	48.6	13.3	-90.27	1,603.8	-3.4	852.0	790.5	61.53	13.846		
8,900.0	6,553.4	6,527.6	6,525.3	50.4	13.3	-90.28	1,603.8	-3.4	943.2	879.8	63.37	14.883		

<b>Company:</b>	PETROLEUM DEVELOPMENT CORP Weld County CO	<b>Local Co-ordinate Reference:</b>	Well R&R Farms 29Q-441
<b>Project:</b>	SEC.29-T5N-R63W	<b>TVD Reference:</b>	WELL @ 4588.0ft (RKB - 15')
<b>Reference Site:</b>	R&R Farms 5N63W29Q Pad Sec.29-T5N-R63W	<b>MD Reference:</b>	WELL @ 4588.0ft (RKB - 15')
<b>Site Error:</b>	0.0ft	<b>North Reference:</b>	True
<b>Reference Well:</b>	R&R Farms 29Q-441	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.0ft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	Wellbore #1	<b>Database:</b>	landmark
<b>Reference Design:</b>	Plan #1 (9-19-14)	<b>Offset TVD Reference:</b>	Offset Datum

Offset Design		Existing Wells Sec.29-T5N-R63W - Rothe 24-29U (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	0.39	404.4	2.8	404.7							
100.0	100.0	84.9	84.9	0.1	0.1	0.39	404.4	2.8	404.4	404.2	0.21	1,945.373				
200.0	200.0	184.7	184.7	0.3	0.2	0.39	404.5	2.7	404.5	403.9	0.54	742.455				
300.0	300.0	284.5	284.5	0.6	0.3	0.38	404.6	2.6	404.6	403.7	0.88	458.864				
400.0	400.0	384.4	384.4	0.8	0.4	0.36	404.7	2.5	404.7	403.5	1.22	332.113				
500.0	500.0	484.2	484.2	1.0	0.5	0.34	404.9	2.4	404.9	403.3	1.56	260.292				
600.0	600.0	584.1	584.1	1.2	0.7	0.31	405.1	2.2	405.1	403.2	1.89	214.065				
700.0	700.0	685.3	685.3	1.5	0.8	0.28	405.2	2.0	405.2	402.9	2.31	175.387				
800.0	800.0	785.6	785.6	1.7	1.0	0.25	405.0	1.8	405.1	402.3	2.73	148.447				
900.0	900.0	885.6	885.6	1.9	1.2	0.24	404.9	1.7	404.9	401.7	3.16	128.266				
1,000.0	1,000.0	985.4	985.4	2.1	1.5	0.19	404.8	1.3	404.8	401.2	3.60	112.491				
1,005.8	1,005.8	991.2	991.2	2.1	1.5	-117.93	404.8	1.3	404.8	401.1	3.62	111.710				
1,100.0	1,100.0	1,085.3	1,085.3	2.3	1.7	-118.23	404.7	0.7	405.5	401.5	4.03	100.726				
1,200.0	1,199.8	1,185.1	1,185.1	2.5	1.9	-118.94	404.6	-0.1	407.9	403.5	4.44	91.866				
1,300.0	1,299.5	1,284.6	1,284.6	2.7	2.1	-120.05	404.5	-1.0	412.2	407.3	4.87	84.686				
1,400.0	1,398.8	1,383.8	1,383.8	3.0	2.4	-121.52	404.5	-2.0	418.2	412.9	5.31	78.765				
1,500.0	1,498.0	1,482.8	1,482.8	3.2	2.6	-123.07	404.4	-3.1	424.8	419.1	5.77	73.693				
1,600.0	1,597.2	1,582.3	1,582.3	3.5	2.8	-124.59	404.3	-4.3	431.7	425.5	6.23	69.328				
1,700.0	1,696.5	1,681.9	1,681.8	3.8	3.0	-126.08	404.1	-5.7	438.8	432.1	6.69	65.547				
1,800.0	1,795.7	1,781.4	1,781.4	4.0	3.2	-127.55	403.7	-7.1	446.1	438.9	7.17	62.258				
1,900.0	1,895.0	1,881.0	1,880.9	4.3	3.5	-128.98	403.3	-8.7	453.6	445.9	7.64	59.384				
2,000.0	1,994.2	1,980.5	1,980.4	4.6	3.7	-130.39	402.7	-10.4	461.2	453.1	8.11	56.862				
2,100.0	2,093.5	2,079.3	2,079.2	4.9	3.9	-131.76	402.0	-12.3	469.1	460.5	8.59	54.635				
2,200.0	2,192.7	2,178.0	2,177.9	5.2	4.1	-133.11	401.3	-14.4	477.3	468.2	9.06	52.681				
2,300.0	2,292.0	2,276.6	2,276.4	5.5	4.3	-134.45	400.7	-16.9	485.8	476.3	9.53	50.966				
2,400.0	2,391.2	2,375.1	2,374.9	5.8	4.6	-135.78	400.0	-19.6	494.8	484.8	10.00	49.457				
2,500.0	2,490.4	2,473.5	2,473.2	6.1	4.8	-137.09	399.4	-22.5	504.0	493.6	10.47	48.126				
2,600.0	2,589.7	2,572.3	2,572.0	6.4	5.0	-138.36	398.8	-25.7	513.6	502.7	10.93	47.002				
2,700.0	2,688.9	2,671.2	2,670.9	6.8	5.2	-139.55	398.3	-28.5	523.5	512.1	11.38	46.011				
2,800.0	2,788.2	2,770.3	2,770.0	7.1	5.4	-140.67	397.9	-30.9	533.5	521.7	11.83	45.114				
2,900.0	2,887.4	2,869.5	2,869.1	7.4	5.6	-141.70	397.7	-33.1	543.7	531.4	12.27	44.298				
3,000.0	2,986.7	2,968.7	2,968.3	7.7	5.8	-142.66	397.5	-34.9	554.0	541.3	12.72	43.552				
3,100.0	3,085.9	3,067.2	3,066.8	8.0	6.0	-143.55	397.5	-36.4	564.5	551.4	13.16	42.897				
3,200.0	3,185.2	3,165.4	3,165.0	8.3	6.2	-144.38	397.8	-37.7	575.3	561.7	13.59	42.320				
3,300.0	3,284.4	3,263.6	3,263.1	8.6	6.4	-145.16	398.2	-39.0	586.3	572.3	14.03	41.798				
3,400.0	3,383.6	3,361.8	3,361.3	9.0	6.6	-145.90	398.9	-40.1	597.6	583.1	14.46	41.327				
3,500.0	3,482.9	3,459.9	3,459.5	9.3	6.8	-146.58	399.8	-41.2	609.1	594.2	14.89	40.899				
3,600.0	3,582.1	3,559.9	3,559.5	9.6	7.0	-147.24	400.8	-42.1	620.8	605.5	15.33	40.486				
3,700.0	3,681.4	3,661.3	3,660.8	9.9	7.2	-147.88	401.6	-42.9	632.2	616.4	15.78	40.070				
3,800.0	3,780.6	3,762.7	3,762.2	10.2	7.4	-148.49	402.1	-43.4	643.4	627.2	16.22	39.661				
3,900.0	3,879.9	3,864.2	3,863.7	10.6	7.6	-149.09	402.3	-43.8	654.2	637.6	16.67	39.258				
4,000.0	3,979.1	3,965.7	3,965.2	10.9	7.8	-149.67	402.1	-44.1	664.8	647.7	17.11	38.860				
4,100.0	4,078.4	4,065.4	4,064.9	11.2	8.0	-150.21	401.8	-44.1	675.2	657.7	17.55	38.477				
4,200.0	4,177.6	4,164.1	4,163.6	11.5	8.2	-150.72	401.7	-44.1	685.7	667.7	17.99	38.121				
4,300.0	4,276.8	4,262.8	4,262.3	11.9	8.4	-151.19	401.7	-43.8	696.4	677.9	18.43	37.789				
4,400.0	4,376.1	4,361.5	4,361.0	12.2	8.6	-151.65	401.9	-43.4	707.0	688.2	18.87	37.471				
4,500.0	4,475.6	4,460.5	4,460.0	12.4	8.8	-152.04	402.3	-42.9	715.5	696.2	19.28	37.112				
4,600.0	4,575.4	4,560.4	4,559.9	12.6	9.0	-152.25	402.9	-42.2	721.0	701.3	19.68	36.643				
4,700.0	4,675.4	4,661.0	4,660.5	12.7	9.2	-152.30	403.4	-41.6	723.3	703.3	20.05	36.068				
4,800.0	4,775.4	4,761.5	4,761.0	12.9	9.4	-34.13	403.8	-40.9	723.4	702.9	20.44	35.383				
4,900.0	4,875.4	4,862.1	4,861.6	13.1	9.6	-34.08	404.0	-40.3	723.3	702.4	20.84	34.704				

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

<b>Company:</b>	PETROLEUM DEVELOPMENT CORP Weld County CO	<b>Local Co-ordinate Reference:</b>	Well R&R Farms 29Q-441
<b>Project:</b>	SEC.29-T5N-R63W	<b>TVD Reference:</b>	WELL @ 4588.0ft (RKB - 15')
<b>Reference Site:</b>	R&R Farms 5N63W29Q Pad Sec.29-T5N-R63W	<b>MD Reference:</b>	WELL @ 4588.0ft (RKB - 15')
<b>Site Error:</b>	0.0ft	<b>North Reference:</b>	True
<b>Reference Well:</b>	R&R Farms 29Q-441	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.0ft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	Wellbore #1	<b>Database:</b>	landmark
<b>Reference Design:</b>	Plan #1 (9-19-14)	<b>Offset TVD Reference:</b>	Offset Datum

Offset Design Existing Wells Sec.29-T5N-R63W - Rothe 24-29U (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							
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	4,975.4	4,962.7	4,962.2	13.2	9.8	-34.03	404.2	-39.7	723.1	701.8	21.24	34.044		
5,100.0	5,075.4	5,065.0	5,064.5	13.4	10.0	-33.99	404.2	-39.0	722.7	701.1	21.64	33.394		
5,200.0	5,175.4	5,168.5	5,168.0	13.6	10.2	-33.94	403.9	-38.0	721.9	699.8	22.05	32.742		
5,300.0	5,275.4	5,271.9	5,271.3	13.7	10.5	-33.88	403.2	-36.6	720.6	698.1	22.46	32.090		
5,400.0	5,375.4	5,375.2	5,374.7	13.9	10.7	-33.81	402.2	-34.9	718.8	696.0	22.86	31.440		
5,500.0	5,475.4	5,478.6	5,478.0	14.1	10.9	-33.73	400.8	-32.8	716.6	693.3	23.27	30.790		
5,600.0	5,575.4	5,578.3	5,577.7	14.2	11.1	-33.65	399.3	-30.6	714.1	690.4	23.68	30.158		
5,700.0	5,675.4	5,677.0	5,676.4	14.4	11.3	-33.57	398.0	-28.5	711.8	687.7	24.08	29.555		
5,800.0	5,775.4	5,775.7	5,775.1	14.6	11.5	-33.49	396.7	-26.5	709.6	685.2	24.49	28.981		
5,900.0	5,875.1	5,874.1	5,873.4	14.8	11.7	-34.05	395.6	-24.7	701.9	677.2	24.68	28.437		
6,000.0	5,973.0	5,970.6	5,969.9	14.9	11.9	-35.70	394.6	-23.0	683.6	659.0	24.63	27.752		
6,100.0	6,067.5	6,064.4	6,063.7	14.9	12.1	-38.61	393.8	-21.4	655.5	631.1	24.42	26.844		
6,200.0	6,156.9	6,153.5	6,152.7	15.0	12.3	-43.00	393.0	-19.9	618.5	594.3	24.19	25.567		
6,300.0	6,239.8	6,235.9	6,235.1	15.0	12.4	-49.14	392.3	-18.5	574.3	550.2	24.19	23.745		
6,400.0	6,314.6	6,310.1	6,309.4	15.1	12.6	-57.13	391.6	-17.2	525.6	500.9	24.66	21.310		
6,500.0	6,380.2	6,375.1	6,374.3	15.2	12.7	-66.58	391.0	-16.1	475.7	450.1	25.68	18.526		
6,600.0	6,435.4	6,429.5	6,428.7	15.4	12.9	-76.34	390.6	-15.2	430.0	403.1	26.97	15.945		
6,700.0	6,479.2	6,472.6	6,471.8	15.9	12.9	-84.75	390.2	-14.4	395.3	367.1	28.17	14.030		
6,800.0	6,510.9	6,503.5	6,502.7	16.7	13.0	-90.39	389.9	-13.9	379.3	350.0	29.23	12.975		
6,817.6	6,515.2	6,507.6	6,506.8	16.9	13.0	-91.02	389.9	-13.8	378.9	349.4	29.42	12.876 CC, ES		
6,900.0	6,530.0	6,521.6	6,520.8	17.7	13.0	-92.45	389.8	-13.6	387.5	357.2	30.30	12.788 SF		
7,000.0	6,536.2	6,527.0	6,526.2	18.9	13.1	-91.00	389.7	-13.5	420.2	388.7	31.47	13.351		
7,100.0	6,537.1	6,527.1	6,526.3	20.1	13.1	-91.02	389.7	-13.5	472.3	439.5	32.74	14.424		
7,200.0	6,538.0	6,527.1	6,526.3	21.5	13.1	-91.03	389.7	-13.5	538.1	503.9	34.11	15.773		
7,300.0	6,538.9	6,527.2	6,526.4	22.9	13.1	-91.04	389.7	-13.5	613.2	577.6	35.56	17.242		
7,400.0	6,539.8	6,527.3	6,526.5	24.4	13.1	-91.05	389.7	-13.5	694.6	657.5	37.08	18.733		
7,500.0	6,540.7	6,527.4	6,526.6	26.0	13.1	-91.07	389.7	-13.5	780.3	741.7	38.65	20.190		
7,600.0	6,541.6	6,527.5	6,526.7	27.6	13.1	-91.08	389.7	-13.5	869.1	828.9	40.27	21.585		
7,700.0	6,542.5	6,527.6	6,526.7	29.2	13.1	-91.09	389.7	-13.5	960.2	918.2	41.92	22.905		

<b>Company:</b>	PETROLEUM DEVELOPMENT CORP Weld County CO	<b>Local Co-ordinate Reference:</b>	Well R&R Farms 29Q-441
<b>Project:</b>	SEC.29-T5N-R63W	<b>TVD Reference:</b>	WELL @ 4588.0ft (RKB - 15')
<b>Reference Site:</b>	R&R Farms 5N63W29Q Pad Sec.29-T5N-R63W	<b>MD Reference:</b>	WELL @ 4588.0ft (RKB - 15')
<b>Site Error:</b>	0.0ft	<b>North Reference:</b>	True
<b>Reference Well:</b>	R&R Farms 29Q-441	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.0ft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	Wellbore #1	<b>Database:</b>	landmark
<b>Reference Design:</b>	Plan #1 (9-19-14)	<b>Offset TVD Reference:</b>	Offset Datum

Offset Design		R&R Farms 5N63W29Q Pad Sec.29-T5N-R63W - R&R Farms 29L-201 - Wellbore #1 - Plan #1 (9-19-1)										Offset Site Error:		0.0 ft
Survey Program: 0-MWD												Offset Well Error:		0.0 ft
Reference		Offset		Semi Major Axis			Distance							Warning
Measured Depth (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	0.00	58.3	0.0	58.3					
100.0	100.0	100.0	100.0	0.1	0.1	0.00	58.3	0.0	58.3	58.1	0.22	259.334		
200.0	200.0	200.0	200.0	0.3	0.3	0.00	58.3	0.0	58.3	57.6	0.67	86.445	CC	
227.7	227.7	227.7	227.7	0.4	0.4	-0.13	58.3	-0.1	58.3	57.5	0.80	73.186		
300.0	300.0	300.0	299.9	0.6	0.6	-1.71	58.3	-1.7	58.3	57.2	1.11	52.328		
400.0	400.0	399.7	399.5	0.8	0.8	-6.81	58.3	-7.0	58.7	57.1	1.56	37.603	ES	
500.0	500.0	499.9	499.4	1.0	1.0	-14.95	57.9	-15.5	59.9	57.9	2.02	29.627		
600.0	600.0	600.8	599.7	1.2	1.3	-25.29	54.8	-25.9	60.6	58.1	2.49	24.325		
700.0	700.0	700.3	698.3	1.5	1.6	-37.00	49.5	-37.3	62.0	59.0	2.99	20.745		
800.0	800.0	799.4	796.7	1.7	1.9	-47.80	44.2	-48.8	65.9	62.4	3.52	18.740		
900.0	900.0	898.6	895.1	1.9	2.2	-57.14	38.9	-60.2	71.8	67.8	4.06	17.674		
1,000.0	1,000.0	997.8	993.5	2.1	2.5	-64.90	33.6	-71.6	79.4	74.8	4.62	17.172		
1,100.0	1,100.0	1,096.9	1,091.7	2.3	2.8	170.81	28.2	-83.1	89.8	84.9	4.91	18.283		
1,200.0	1,199.8	1,195.5	1,189.6	2.5	3.2	166.38	22.9	-94.4	104.5	99.1	5.33	19.590		
1,300.0	1,299.5	1,293.6	1,286.9	2.7	3.5	163.46	17.7	-105.8	122.8	117.1	5.76	21.343		
1,400.0	1,398.8	1,391.2	1,383.7	3.0	3.8	161.72	12.4	-117.0	144.3	138.1	6.19	23.305		
1,500.0	1,498.0	1,488.7	1,480.4	3.2	4.1	160.52	7.2	-128.3	166.3	159.7	6.65	25.018		
1,600.0	1,597.2	1,586.2	1,577.1	3.5	4.5	159.61	2.0	-139.5	188.4	181.2	7.11	26.486		
1,700.0	1,696.5	1,683.7	1,673.8	3.8	4.8	158.89	-3.3	-150.8	210.4	202.9	7.58	27.754		
1,800.0	1,795.7	1,781.2	1,770.5	4.0	5.1	158.31	-8.5	-162.0	232.6	224.5	8.06	28.856		
1,900.0	1,895.0	1,878.7	1,867.2	4.3	5.4	157.82	-13.7	-173.3	254.7	246.1	8.54	29.820		
2,000.0	1,994.2	1,976.2	1,963.9	4.6	5.8	157.42	-19.0	-184.5	276.8	267.8	9.03	30.669		
2,100.0	2,093.5	2,073.7	2,060.7	4.9	6.1	157.07	-24.2	-195.7	299.0	289.5	9.52	31.421		
2,200.0	2,192.7	2,171.2	2,157.4	5.2	6.4	156.77	-29.4	-207.0	321.2	311.1	10.01	32.091		
2,300.0	2,292.0	2,268.7	2,254.1	5.5	6.7	156.52	-34.7	-218.2	343.3	332.8	10.50	32.691		
2,400.0	2,391.2	2,366.2	2,350.8	5.8	7.1	156.29	-39.9	-229.5	365.5	354.5	11.00	33.231		
2,500.0	2,490.4	2,463.7	2,447.5	6.1	7.4	156.09	-45.1	-240.7	387.7	376.2	11.50	33.720		
2,600.0	2,589.7	2,561.2	2,544.2	6.4	7.7	155.91	-50.4	-252.0	409.9	397.9	12.00	34.163		
2,700.0	2,688.9	2,658.7	2,640.9	6.8	8.0	155.74	-55.6	-263.2	432.1	419.6	12.50	34.567		
2,800.0	2,788.2	2,756.2	2,737.6	7.1	8.4	155.60	-60.8	-274.5	454.3	441.3	13.00	34.937		
2,900.0	2,887.4	2,853.7	2,834.3	7.4	8.7	155.47	-66.1	-285.7	476.5	462.9	13.51	35.276		
3,000.0	2,986.7	2,951.2	2,931.0	7.7	9.0	155.35	-71.3	-297.0	498.7	484.6	14.01	35.588		
3,100.0	3,085.9	3,048.7	3,027.7	8.0	9.3	155.24	-76.5	-308.2	520.9	506.3	14.52	35.877		
3,200.0	3,185.2	3,146.2	3,124.4	8.3	9.7	155.13	-81.8	-319.5	543.1	528.0	15.02	36.144		
3,300.0	3,284.4	3,243.7	3,221.1	8.6	10.0	155.04	-87.0	-330.7	565.3	549.7	15.53	36.392		
3,400.0	3,383.6	3,341.2	3,317.9	9.0	10.3	154.95	-92.2	-341.9	587.5	571.4	16.04	36.623		
3,500.0	3,482.9	3,438.7	3,414.6	9.3	10.6	154.87	-97.5	-353.2	609.7	593.1	16.55	36.838		
3,600.0	3,582.1	3,536.2	3,511.3	9.6	11.0	154.80	-102.7	-364.4	631.9	614.8	17.06	37.040		
3,700.0	3,681.4	3,633.7	3,608.0	9.9	11.3	154.73	-107.9	-375.7	654.1	636.5	17.57	37.228		
3,800.0	3,780.6	3,731.2	3,704.7	10.2	11.6	154.67	-113.2	-386.9	676.3	658.2	18.08	37.405		
3,900.0	3,879.9	3,828.7	3,801.4	10.6	11.9	154.61	-118.4	-398.2	698.5	679.9	18.59	37.572		
4,000.0	3,979.1	3,926.2	3,898.1	10.9	12.3	154.55	-123.6	-409.4	720.7	701.6	19.10	37.729		
4,100.0	4,078.4	4,023.7	3,994.8	11.2	12.6	154.50	-128.9	-420.7	742.9	723.3	19.61	37.877		
4,200.0	4,177.6	4,121.2	4,091.5	11.5	12.9	154.45	-134.1	-431.9	765.1	745.0	20.13	38.017		
4,300.0	4,276.8	4,218.7	4,188.2	11.9	13.2	154.40	-139.3	-443.2	787.3	766.7	20.64	38.149		
4,400.0	4,376.1	4,316.3	4,285.0	12.2	13.6	154.40	-144.6	-454.4	809.4	788.3	21.16	38.247		
4,500.0	4,475.6	4,414.3	4,382.2	12.4	13.9	154.45	-149.8	-465.7	829.3	807.6	21.68	38.258		
4,600.0	4,575.4	4,512.8	4,479.9	12.6	14.2	154.37	-155.1	-477.1	846.0	823.8	22.16	38.177		
4,700.0	4,675.4	4,611.7	4,578.0	12.7	14.6	154.18	-160.4	-488.5	859.6	837.0	22.61	38.013		
4,800.0	4,775.4	4,710.9	4,676.4	12.9	14.9	-88.06	-165.8	-499.9	871.1	848.0	23.05	37.782		
4,900.0	4,875.4	4,810.1	4,774.8	13.1	15.2	-88.44	-171.1	-511.4	882.4	859.0	23.49	37.565		

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

<b>Company:</b>	PETROLEUM DEVELOPMENT CORP Weld County CO	<b>Local Co-ordinate Reference:</b>	Well R&R Farms 29Q-441
<b>Project:</b>	SEC.29-T5N-R63W	<b>TVD Reference:</b>	WELL @ 4588.0ft (RKB - 15')
<b>Reference Site:</b>	R&R Farms 5N63W29Q Pad Sec.29-T5N-R63W	<b>MD Reference:</b>	WELL @ 4588.0ft (RKB - 15')
<b>Site Error:</b>	0.0ft	<b>North Reference:</b>	True
<b>Reference Well:</b>	R&R Farms 29Q-441	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.0ft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	Wellbore #1	<b>Database:</b>	landmark
<b>Reference Design:</b>	Plan #1 (9-19-14)	<b>Offset TVD Reference:</b>	Offset Datum

Offset Design		R&R Farms 5N63W29Q Pad Sec.29-T5N-R63W - R&R Farms 29L-201 - Wellbore #1 - Plan #1 (9-19-1)									Offset Site Error:		0.0 ft
Survey Program: 0-MWD											Offset Well Error:		0.0 ft
Reference		Offset		Semi Major Axis			Distance						Warning
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	
5,000.0	4,975.4	4,909.3	4,873.2	13.2	15.6	-88.80	-176.4	-522.8	893.9	869.9	23.93	37.356	
5,100.0	5,075.4	5,008.5	4,971.6	13.4	15.9	-89.15	-181.7	-534.3	905.3	881.0	24.37	37.155	
5,200.0	5,175.4	5,121.8	5,084.0	13.6	16.2	-89.54	-187.6	-546.9	916.5	891.7	24.81	36.938	
5,300.0	5,275.4	5,262.3	5,223.9	13.7	16.5	-89.86	-192.7	-557.9	924.3	899.1	25.24	36.618	
5,400.0	5,375.4	5,403.6	5,365.2	13.9	16.7	-90.00	-194.9	-562.6	927.7	902.0	25.66	36.154	
5,500.0	5,475.4	5,513.9	5,475.4	14.1	16.9	-90.00	-195.0	-562.8	927.8	901.8	26.04	35.633	
5,600.0	5,575.4	5,613.9	5,575.4	14.2	17.0	-90.00	-195.0	-562.8	927.8	901.4	26.39	35.151	
5,657.3	5,632.7	5,671.2	5,632.7	14.3	17.1	-90.00	-195.0	-562.8	927.8	901.2	26.60	34.879	
5,700.0	5,675.4	5,713.8	5,675.3	14.4	17.1	-89.91	-193.6	-562.8	927.8	901.0	26.75	34.687	
5,800.0	5,775.4	5,812.1	5,772.8	14.6	17.2	-89.16	-181.4	-562.8	927.9	900.8	27.07	34.282	
5,900.0	5,875.1	5,907.6	5,865.2	14.8	17.3	-88.06	-157.6	-562.8	928.3	901.0	27.31	33.992	
6,000.0	5,973.0	6,000.0	5,951.2	14.9	17.3	-87.01	-123.8	-562.8	929.1	901.6	27.47	33.822	
6,100.0	6,067.5	6,092.8	6,032.7	14.9	17.3	-85.99	-79.7	-562.8	930.1	902.5	27.59	33.715	
6,200.0	6,156.9	6,182.9	6,106.3	15.0	17.2	-85.06	-27.7	-562.8	931.3	903.6	27.72	33.594	
6,300.0	6,239.8	6,271.7	6,172.3	15.0	17.2	-84.20	31.6	-562.8	932.6	904.7	27.94	33.378	
6,400.0	6,314.6	6,359.3	6,230.2	15.1	17.2	-83.44	97.3	-562.8	934.0	905.7	28.32	32.984	
6,500.0	6,380.2	6,446.0	6,279.7	15.2	17.3	-82.78	168.4	-562.8	935.3	906.4	28.92	32.345	
6,600.0	6,435.4	6,531.8	6,320.5	15.4	17.4	-82.23	243.8	-562.8	936.4	906.6	29.80	31.424	
6,700.0	6,479.2	6,617.0	6,352.4	15.9	17.6	-81.80	322.7	-562.8	937.4	906.4	30.99	30.248	
6,800.0	6,510.9	6,700.0	6,374.8	16.7	18.0	-81.49	402.6	-562.8	938.2	905.7	32.48	28.883	
6,900.0	6,530.0	6,786.1	6,388.8	17.7	18.7	-81.30	487.6	-562.8	938.6	904.3	34.31	27.359	
7,000.0	6,536.2	6,870.7	6,393.1	18.9	19.5	-81.23	572.0	-562.8	938.8	902.4	36.37	25.813	
7,100.0	6,537.1	6,970.7	6,393.0	20.1	20.6	-81.17	672.0	-562.8	938.9	900.1	38.83	24.181	
7,200.0	6,538.0	7,070.7	6,392.9	21.5	21.9	-81.11	772.0	-562.8	939.1	897.6	41.48	22.640	
7,300.0	6,538.9	7,170.7	6,392.8	22.9	23.2	-81.05	872.0	-562.8	939.2	894.9	44.30	21.203	
7,400.0	6,539.8	7,270.7	6,392.7	24.4	24.7	-80.99	972.0	-562.8	939.4	892.1	47.25	19.881	
7,500.0	6,540.7	7,370.7	6,392.6	26.0	26.2	-80.93	1,072.0	-562.8	939.5	889.2	50.32	18.673	
7,600.0	6,541.6	7,470.7	6,392.5	27.6	27.7	-80.87	1,172.0	-562.8	939.7	886.2	53.47	17.573	
7,700.0	6,542.5	7,570.7	6,392.4	29.2	29.3	-80.81	1,272.0	-562.8	939.9	883.2	56.71	16.573	
7,800.0	6,543.5	7,670.7	6,392.3	30.9	30.9	-80.75	1,372.0	-562.8	940.0	880.0	60.01	15.665	
7,900.0	6,544.4	7,770.7	6,392.2	32.6	32.6	-80.69	1,472.0	-562.8	940.2	876.8	63.36	14.838	
8,000.0	6,545.3	7,870.7	6,392.1	34.3	34.2	-80.63	1,572.0	-562.8	940.4	873.6	66.76	14.085	
8,100.0	6,546.2	7,970.7	6,392.0	36.0	35.9	-80.56	1,672.0	-562.8	940.5	870.3	70.20	13.398	
8,200.0	6,547.1	8,070.7	6,391.9	37.8	37.7	-80.50	1,771.9	-562.8	940.7	867.0	73.67	12.769	
8,300.0	6,548.0	8,170.6	6,391.8	39.6	39.4	-80.44	1,871.9	-562.8	940.9	863.7	77.17	12.192	
8,400.0	6,548.9	8,270.6	6,391.7	41.4	41.2	-80.38	1,971.9	-562.8	941.0	860.3	80.70	11.661	
8,500.0	6,549.8	8,370.6	6,391.6	43.2	42.9	-80.32	2,071.9	-562.8	941.2	857.0	84.24	11.173	
8,600.0	6,550.7	8,470.6	6,391.5	45.0	44.7	-80.26	2,171.9	-562.8	941.4	853.6	87.81	10.721	
8,700.0	6,551.6	8,570.6	6,391.4	46.8	46.5	-80.20	2,271.9	-562.8	941.5	850.2	91.39	10.303	
8,800.0	6,552.5	8,670.6	6,391.2	48.6	48.3	-80.14	2,371.9	-562.8	941.7	846.7	94.98	9.915	
8,900.0	6,553.4	8,770.6	6,391.1	50.4	50.1	-80.08	2,471.9	-562.8	941.9	843.3	98.59	9.554	
9,000.0	6,554.3	8,870.6	6,391.0	52.3	52.0	-80.02	2,571.9	-562.8	942.1	839.9	102.21	9.217	
9,100.0	6,555.3	8,970.6	6,390.9	54.1	53.8	-79.96	2,671.9	-562.8	942.2	836.4	105.84	8.903	
9,200.0	6,556.2	9,070.6	6,390.8	56.0	55.6	-79.90	2,771.9	-562.8	942.4	832.9	109.47	8.609	
9,300.0	6,557.1	9,170.6	6,390.7	57.8	57.5	-79.84	2,871.9	-562.8	942.6	829.5	113.12	8.333	
9,400.0	6,558.0	9,270.6	6,390.6	59.7	59.3	-79.78	2,971.9	-562.8	942.8	826.0	116.77	8.074	
9,500.0	6,558.9	9,370.6	6,390.5	61.5	61.1	-79.71	3,071.9	-562.8	943.0	822.5	120.43	7.830	
9,600.0	6,559.8	9,470.6	6,390.4	63.4	63.0	-79.65	3,171.9	-562.8	943.1	819.0	124.09	7.600	
9,700.0	6,560.7	9,570.6	6,390.3	65.3	64.9	-79.59	3,271.9	-562.8	943.3	815.6	127.76	7.384	
9,800.0	6,561.6	9,670.6	6,390.2	67.1	66.7	-79.53	3,371.9	-562.8	943.5	812.1	131.43	7.179	

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



<b>Company:</b>	PETROLEUM DEVELOPMENT CORP Weld County CO	<b>Local Co-ordinate Reference:</b>	Well R&R Farms 29Q-441
<b>Project:</b>	SEC.29-T5N-R63W	<b>TVD Reference:</b>	WELL @ 4588.0ft (RKB - 15')
<b>Reference Site:</b>	R&R Farms 5N63W29Q Pad Sec.29-T5N-R63W	<b>MD Reference:</b>	WELL @ 4588.0ft (RKB - 15')
<b>Site Error:</b>	0.0ft	<b>North Reference:</b>	True
<b>Reference Well:</b>	R&R Farms 29Q-441	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.0ft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	Wellbore #1	<b>Database:</b>	landmark
<b>Reference Design:</b>	Plan #1 (9-19-14)	<b>Offset TVD Reference:</b>	Offset Datum

<b>Offset Design</b>													Offset Site Error:	0.0 ft
Survey Program: 0-MWD													Offset Well Error:	0.0 ft
Reference														
Offset														
Semi Major Axis														
Distance														
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning	
9,900.0	6,562.5	9,770.6	6,390.1	69.0	68.6	-79.47	3,471.9	-562.8	943.7	808.6	135.11	6.985		
10,000.0	6,563.4	9,870.6	6,390.0	70.9	70.4	-79.41	3,571.9	-562.8	943.9	805.1	138.78	6.801		
10,100.0	6,564.3	9,970.6	6,389.9	72.8	72.3	-79.35	3,671.8	-562.8	944.1	801.6	142.47	6.627		
10,200.0	6,565.2	10,070.5	6,389.8	74.6	74.2	-79.29	3,771.8	-562.8	944.2	798.1	146.15	6.461		
10,300.0	6,566.1	10,170.5	6,389.7	76.5	76.1	-79.23	3,871.8	-562.8	944.4	794.6	149.84	6.303		
10,400.0	6,567.0	10,270.5	6,389.6	78.4	77.9	-79.17	3,971.8	-562.8	944.6	791.1	153.53	6.153		
10,500.0	6,568.0	10,370.5	6,389.5	80.3	79.8	-79.11	4,071.8	-562.8	944.8	787.6	157.22	6.010		
10,600.0	6,568.9	10,470.5	6,389.4	82.2	81.7	-79.05	4,171.8	-562.8	945.0	784.1	160.91	5.873		
10,700.0	6,569.8	10,570.5	6,389.3	84.1	83.6	-78.99	4,271.8	-562.8	945.2	780.6	164.61	5.742		
10,800.0	6,570.7	10,670.5	6,389.2	86.0	85.5	-78.93	4,371.8	-562.8	945.4	777.1	168.30	5.617		
10,900.0	6,571.6	10,770.5	6,389.0	87.8	87.3	-78.87	4,471.8	-562.8	945.6	773.6	172.00	5.498		
10,945.5	6,572.0	10,816.0	6,389.0	88.5	88.2	-78.84	4,517.3	-562.8	945.7	772.2	173.52	5.450 SF		

<b>Company:</b>	PETROLEUM DEVELOPMENT CORP Weld County CO	<b>Local Co-ordinate Reference:</b>	Well R&R Farms 29Q-441
<b>Project:</b>	SEC.29-T5N-R63W	<b>TVD Reference:</b>	WELL @ 4588.0ft (RKB - 15')
<b>Reference Site:</b>	R&R Farms 5N63W29Q Pad Sec.29-T5N-R63W	<b>MD Reference:</b>	WELL @ 4588.0ft (RKB - 15')
<b>Site Error:</b>	0.0ft	<b>North Reference:</b>	True
<b>Reference Well:</b>	R&R Farms 29Q-441	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.0ft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	Wellbore #1	<b>Database:</b>	landmark
<b>Reference Design:</b>	Plan #1 (9-19-14)	<b>Offset TVD Reference:</b>	Offset Datum

Offset Design		R&R Farms 5N63W29Q Pad Sec.29-T5N-R63W - R&R Farms 29L-321 - Wellbore #1 - Plan #1 (9-19-1										Offset Site Error:		0.0 ft
Survey Program: 0-MWD												Offset Well Error:		0.0 ft
Reference		Offset		Semi Major Axis			Distance							Warning
Measured Depth (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	1.33	120.2	2.8	120.3					
100.0	100.0	100.0	100.0	0.1	0.1	1.33	120.2	2.8	120.3	120.0	0.22	535.039		
200.0	200.0	200.0	200.0	0.3	0.3	1.33	120.2	2.8	120.3	119.6	0.67	178.346		
300.0	300.0	300.0	300.0	0.6	0.6	1.33	120.2	2.8	120.3	119.1	1.12	107.008		
400.0	400.0	400.0	400.0	0.8	0.8	1.33	120.2	2.8	120.3	118.7	1.57	76.434		
500.0	500.0	500.0	500.0	1.0	1.0	1.33	120.2	2.8	120.3	118.2	2.02	59.449		
600.0	600.0	600.0	600.0	1.2	1.2	1.33	120.2	2.8	120.3	117.8	2.47	48.640		
700.0	700.0	700.0	700.0	1.5	1.5	1.33	120.2	2.8	120.3	117.3	2.92	41.157		
800.0	800.0	800.0	800.0	1.7	1.7	1.33	120.2	2.8	120.3	116.9	3.37	35.669		
900.0	900.0	900.0	900.0	1.9	1.9	1.33	120.2	2.8	120.3	116.4	3.82	31.473		
1,000.0	1,000.0	1,000.0	1,000.0	2.1	2.1	1.33	120.2	2.8	120.3	116.0	4.27	28.160 CC, ES		
1,100.0	1,100.0	1,100.0	1,100.0	2.3	2.4	-117.51	120.2	2.8	121.1	116.4	4.70	25.755		
1,200.0	1,199.8	1,199.8	1,199.8	2.5	2.6	-119.62	120.2	2.8	123.6	118.4	5.12	24.149		
1,300.0	1,299.5	1,299.5	1,299.5	2.7	2.8	-122.92	120.2	2.8	128.1	122.6	5.54	23.109		
1,400.0	1,398.8	1,398.8	1,398.8	3.0	3.0	-127.06	120.2	2.8	134.9	128.9	5.98	22.547		
1,500.0	1,498.0	1,498.0	1,498.0	3.2	3.3	-130.98	120.2	2.8	142.7	136.2	6.43	22.182		
1,600.0	1,597.2	1,597.2	1,597.2	3.5	3.5	-134.48	120.2	2.8	151.0	144.1	6.88	21.940		
1,700.0	1,696.5	1,696.5	1,696.5	3.8	3.7	-137.61	120.2	2.8	159.9	152.6	7.34	21.793		
1,800.0	1,795.7	1,795.7	1,795.7	4.0	3.9	-140.40	120.2	2.8	169.2	161.4	7.79	21.717		
1,900.0	1,895.0	1,895.0	1,895.0	4.3	4.1	-142.90	120.2	2.8	178.8	170.6	8.24	21.693		
2,000.0	1,994.2	1,994.2	1,994.2	4.6	4.4	-145.14	120.2	2.8	188.8	180.1	8.70	21.707		
2,100.0	2,093.5	2,097.7	2,097.7	4.9	4.6	-147.61	118.7	2.2	198.0	188.9	9.13	21.692		
2,200.0	2,192.7	2,201.4	2,201.2	5.2	4.8	-150.69	113.6	0.2	205.4	195.8	9.52	21.564		
2,300.0	2,292.0	2,304.6	2,304.1	5.5	4.9	-154.36	105.1	-3.1	211.3	201.4	9.92	21.304		
2,400.0	2,391.2	2,405.1	2,403.9	5.8	5.1	-158.43	94.0	-7.4	216.5	206.2	10.31	20.994		
2,500.0	2,490.4	2,503.8	2,501.8	6.1	5.3	-162.31	82.8	-11.8	222.6	211.9	10.72	20.768		
2,600.0	2,589.7	2,602.5	2,599.7	6.4	5.6	-165.97	71.6	-16.1	229.7	218.6	11.14	20.620		
2,700.0	2,688.9	2,701.2	2,697.7	6.8	5.8	-169.40	60.4	-20.5	237.7	226.1	11.58	20.534		
2,800.0	2,788.2	2,799.9	2,795.6	7.1	6.0	-172.60	49.1	-24.9	246.5	234.5	12.03	20.495		
2,900.0	2,887.4	2,898.5	2,893.6	7.4	6.3	-175.58	37.9	-29.2	256.0	243.5	12.49	20.493		
3,000.0	2,986.7	2,997.2	2,991.5	7.7	6.5	-178.34	26.7	-33.6	266.2	253.2	12.97	20.519		
3,100.0	3,085.9	3,095.9	3,089.5	8.0	6.8	179.11	15.4	-38.0	276.9	263.4	13.46	20.568		
3,200.0	3,185.2	3,194.6	3,187.4	8.3	7.0	176.75	4.2	-42.3	288.1	274.2	13.96	20.633		
3,300.0	3,284.4	3,293.3	3,285.3	8.6	7.3	174.56	-7.0	-46.7	299.8	285.4	14.48	20.711		
3,400.0	3,383.6	3,391.9	3,383.3	9.0	7.6	172.54	-18.3	-51.1	311.9	296.9	15.00	20.798		
3,500.0	3,482.9	3,490.6	3,481.2	9.3	7.8	170.68	-29.5	-55.4	324.4	308.9	15.53	20.893		
3,600.0	3,582.1	3,589.3	3,579.2	9.6	8.1	168.95	-40.7	-59.8	337.2	321.1	16.06	20.992		
3,700.0	3,681.4	3,688.0	3,677.1	9.9	8.4	167.34	-51.9	-64.2	350.2	333.6	16.60	21.095		
3,800.0	3,780.6	3,786.7	3,775.0	10.2	8.7	165.86	-63.2	-68.5	363.5	346.4	17.15	21.199		
3,900.0	3,879.9	3,885.4	3,873.0	10.6	9.0	164.47	-74.4	-72.9	377.0	359.3	17.70	21.305		
4,000.0	3,979.1	3,984.0	3,970.9	10.9	9.2	163.19	-85.6	-77.3	390.8	372.5	18.25	21.411		
4,100.0	4,078.4	4,082.7	4,068.9	11.2	9.5	161.99	-96.9	-81.7	404.7	385.9	18.81	21.518		
4,200.0	4,177.6	4,181.4	4,166.8	11.5	9.8	160.87	-108.1	-86.0	418.8	399.4	19.37	21.623		
4,300.0	4,276.8	4,280.1	4,264.8	11.9	10.1	159.82	-119.3	-90.4	433.0	413.1	19.93	21.727		
4,400.0	4,376.1	4,378.8	4,362.7	12.2	10.4	158.86	-130.6	-94.8	447.2	426.7	20.50	21.820		
4,500.0	4,475.6	4,477.7	4,460.9	12.4	10.7	157.90	-141.8	-99.1	459.2	438.2	21.04	21.830		
4,600.0	4,575.4	4,576.9	4,559.3	12.6	11.0	156.81	-153.1	-103.5	468.2	446.6	21.55	21.721		
4,700.0	4,675.4	4,676.1	4,657.8	12.7	11.3	155.57	-164.4	-107.9	474.1	452.1	22.05	21.504		
4,800.0	4,775.4	4,775.7	4,756.7	12.9	11.6	-87.69	-175.7	-112.3	478.1	455.5	22.55	21.196		
4,900.0	4,875.4	4,881.1	4,861.6	13.1	11.9	-88.89	-185.7	-116.2	481.5	458.5	23.02	20.920		
5,000.0	4,975.4	4,987.2	4,967.4	13.2	12.1	-89.66	-192.1	-118.7	483.8	460.3	23.44	20.635		

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



<b>Company:</b>	PETROLEUM DEVELOPMENT CORP Weld County CO	<b>Local Co-ordinate Reference:</b>	Well R&R Farms 29Q-441
<b>Project:</b>	SEC.29-T5N-R63W	<b>TVD Reference:</b>	WELL @ 4588.0ft (RKB - 15')
<b>Reference Site:</b>	R&R Farms 5N63W29Q Pad Sec.29-T5N-R63W	<b>MD Reference:</b>	WELL @ 4588.0ft (RKB - 15')
<b>Site Error:</b>	0.0ft	<b>North Reference:</b>	True
<b>Reference Well:</b>	R&R Farms 29Q-441	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.0ft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	Wellbore #1	<b>Database:</b>	landmark
<b>Reference Design:</b>	Plan #1 (9-19-14)	<b>Offset TVD Reference:</b>	Offset Datum

Offset Design		R&R Farms 5N63W29Q Pad Sec.29-T5N-R63W - R&R Farms 29L-321 - Wellbore #1 - Plan #1 (9-19-1)										Offset Site Error:		0.0 ft		
Survey Program: 0-MWD														Offset Well Error:		0.0 ft
Reference		Offset		Semi Major Axis			Distance							Warning		
Measured Depth	Vertical	Measured	Vertical	Reference	Offset	Highside	Offset Wellbore Centre		Between	Between	Minimum	Separation				
Depth (ft)	Depth (ft)	Depth (ft)	Depth (ft)	(ft)	(ft)	Toolface (°)	+N/-S (ft)	+E/-W (ft)	Centres (ft)	Ellipses (ft)	Separation (ft)	Factor				
5,100.0	5,075.4	5,093.6	5,073.8	13.4	12.3	-89.98	-194.9	-119.8	484.8	460.9	23.84	20.334				
5,200.0	5,175.4	5,195.3	5,175.4	13.6	12.5	-90.00	-195.0	-119.8	484.8	460.6	24.21	20.022				
5,300.0	5,275.4	5,295.3	5,275.4	13.7	12.7	-90.00	-195.0	-119.8	484.8	460.2	24.58	19.724				
5,400.0	5,375.4	5,395.3	5,375.4	13.9	12.9	-90.00	-195.0	-119.8	484.8	459.8	24.95	19.432				
5,500.0	5,475.4	5,495.3	5,475.4	14.1	13.0	-90.00	-195.0	-119.8	484.8	459.5	25.32	19.146				
5,600.0	5,575.4	5,595.3	5,575.4	14.2	13.2	-90.00	-195.0	-119.8	484.8	459.1	25.69	18.868				
5,700.0	5,675.4	5,695.3	5,675.4	14.4	13.4	-90.00	-195.0	-119.8	484.8	458.7	26.07	18.595				
5,741.1	5,716.5	5,736.3	5,716.5	14.5	13.5	-89.99	-194.9	-119.8	484.8	458.6	26.23	18.486				
5,800.0	5,775.4	5,795.0	5,775.1	14.6	13.6	-89.61	-191.7	-119.8	484.8	458.4	26.42	18.349				
5,900.0	5,875.1	5,893.7	5,872.4	14.8	13.7	-88.58	-176.2	-119.8	484.9	458.3	26.66	18.192				
6,000.0	5,973.0	5,991.2	5,966.0	14.9	13.7	-87.57	-148.8	-119.8	485.2	458.5	26.78	18.117				
6,100.0	6,067.5	6,087.8	6,054.3	14.9	13.7	-86.62	-110.0	-119.8	485.7	458.8	26.85	18.088				
6,200.0	6,156.9	6,183.4	6,136.4	15.0	13.7	-85.72	-61.0	-119.8	486.2	459.2	26.92	18.060				
6,300.0	6,239.8	6,278.2	6,211.0	15.0	13.7	-84.90	-2.7	-119.8	486.7	459.7	27.07	17.982				
6,400.0	6,314.6	6,372.2	6,277.4	15.1	13.7	-84.16	63.9	-119.8	487.3	460.0	27.37	17.803				
6,500.0	6,380.2	6,465.7	6,334.7	15.2	13.9	-83.52	137.6	-119.8	487.9	460.0	27.91	17.479				
6,600.0	6,435.4	6,558.6	6,382.4	15.4	14.2	-82.99	217.2	-119.8	488.5	459.7	28.75	16.993				
6,700.0	6,479.2	6,650.0	6,419.6	15.9	14.7	-82.57	300.7	-119.8	488.9	459.0	29.90	16.352				
6,800.0	6,510.9	6,743.2	6,446.9	16.7	15.5	-82.26	389.8	-119.8	489.3	457.8	31.41	15.578				
6,900.0	6,530.0	6,835.2	6,463.0	17.7	16.3	-82.08	480.3	-119.8	489.5	456.2	33.22	14.735				
7,000.0	6,536.2	6,927.2	6,468.2	18.9	17.3	-82.02	572.1	-119.8	489.5	454.2	35.29	13.870				
7,100.0	6,537.1	7,027.2	6,468.0	20.1	18.5	-81.89	672.0	-119.8	489.7	452.0	37.74	12.977				
7,200.0	6,538.0	7,127.2	6,467.9	21.5	19.8	-81.77	772.0	-119.8	489.8	449.5	40.37	12.133				
7,300.0	6,538.9	7,227.2	6,467.7	22.9	21.2	-81.65	872.0	-119.8	490.0	446.8	43.19	11.346				
7,400.0	6,539.8	7,327.2	6,467.6	24.4	22.7	-81.52	972.0	-119.8	490.2	444.0	46.14	10.624				
7,500.0	6,540.7	7,427.2	6,467.4	26.0	24.2	-81.40	1,072.0	-119.8	490.3	441.1	49.20	9.965				
7,600.0	6,541.6	7,527.2	6,467.3	27.6	25.8	-81.28	1,172.0	-119.8	490.5	438.1	52.36	9.367				
7,700.0	6,542.5	7,627.2	6,467.1	29.2	27.5	-81.15	1,272.0	-119.8	490.6	435.0	55.60	8.825				
7,800.0	6,543.5	7,727.1	6,466.9	30.9	29.1	-81.03	1,372.0	-119.8	490.8	431.9	58.90	8.333				
7,900.0	6,544.4	7,827.1	6,466.8	32.6	30.8	-80.91	1,472.0	-119.8	491.0	428.7	62.25	7.887				
8,000.0	6,545.3	7,927.1	6,466.6	34.3	32.5	-80.79	1,572.0	-119.8	491.1	425.5	65.65	7.482				
8,100.0	6,546.2	8,027.1	6,466.5	36.0	34.3	-80.66	1,672.0	-119.8	491.3	422.2	69.08	7.112				
8,200.0	6,547.1	8,127.1	6,466.3	37.8	36.0	-80.54	1,772.0	-119.8	491.5	418.9	72.55	6.775				
8,300.0	6,548.0	8,227.1	6,466.2	39.6	37.8	-80.42	1,872.0	-119.8	491.7	415.6	76.04	6.466				
8,400.0	6,548.9	8,327.1	6,466.0	41.4	39.6	-80.30	1,972.0	-119.8	491.8	412.3	79.56	6.182				
8,500.0	6,549.8	8,427.1	6,465.8	43.2	41.4	-80.17	2,072.0	-119.8	492.0	408.9	83.09	5.921				
8,600.0	6,550.7	8,527.1	6,465.7	45.0	43.2	-80.05	2,172.0	-119.8	492.2	405.5	86.65	5.680				
8,700.0	6,551.6	8,627.1	6,465.5	46.8	45.0	-79.93	2,272.0	-119.8	492.4	402.2	90.22	5.458				
8,800.0	6,552.5	8,727.1	6,465.4	48.6	46.9	-79.81	2,372.0	-119.8	492.6	398.8	93.80	5.251				
8,900.0	6,553.4	8,827.1	6,465.2	50.4	48.7	-79.69	2,471.9	-119.8	492.8	395.4	97.39	5.060				
9,000.0	6,554.3	8,927.1	6,465.1	52.3	50.5	-79.57	2,571.9	-119.8	493.0	392.0	100.99	4.881				
9,100.0	6,555.3	9,027.1	6,464.9	54.1	52.4	-79.44	2,671.9	-119.8	493.1	388.5	104.60	4.715				
9,200.0	6,556.2	9,127.1	6,464.7	56.0	54.2	-79.32	2,771.9	-119.8	493.3	385.1	108.21	4.559				
9,300.0	6,557.1	9,227.1	6,464.6	57.8	56.1	-79.20	2,871.9	-119.8	493.5	381.7	111.84	4.413				
9,400.0	6,558.0	9,327.1	6,464.4	59.7	58.0	-79.08	2,971.9	-119.8	493.7	378.3	115.46	4.276				
9,500.0	6,558.9	9,427.1	6,464.3	61.5	59.8	-78.96	3,071.9	-119.8	493.9	374.9	119.09	4.148				
9,600.0	6,559.8	9,527.0	6,464.1	63.4	61.7	-78.84	3,171.9	-119.8	494.1	371.4	122.73	4.026				
9,700.0	6,560.7	9,627.0	6,464.0	65.3	63.6	-78.72	3,271.9	-119.8	494.4	368.0	126.36	3.912				
9,800.0	6,561.6	9,727.0	6,463.8	67.1	65.4	-78.59	3,371.9	-119.8	494.6	364.6	130.00	3.804				
9,900.0	6,562.5	9,827.0	6,463.6	69.0	67.3	-78.47	3,471.9	-119.8	494.8	361.1	133.64	3.702				

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

<b>Company:</b>	PETROLEUM DEVELOPMENT CORP Weld County CO	<b>Local Co-ordinate Reference:</b>	Well R&R Farms 29Q-441
<b>Project:</b>	SEC.29-T5N-R63W	<b>TVD Reference:</b>	WELL @ 4588.0ft (RKB - 15')
<b>Reference Site:</b>	R&R Farms 5N63W29Q Pad Sec.29-T5N-R63W	<b>MD Reference:</b>	WELL @ 4588.0ft (RKB - 15')
<b>Site Error:</b>	0.0ft	<b>North Reference:</b>	True
<b>Reference Well:</b>	R&R Farms 29Q-441	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.0ft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	Wellbore #1	<b>Database:</b>	landmark
<b>Reference Design:</b>	Plan #1 (9-19-14)	<b>Offset TVD Reference:</b>	Offset Datum

<b>Offset Design</b>													Offset Site Error:	0.0 ft
Survey Program: 0-MWD													Offset Well Error:	0.0 ft
Reference														
Offset														
Semi Major Axis														
Distance														
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning	
10,000.0	6,563.4	9,927.0	6,463.5	70.9	69.2	-78.35	3,571.9	-119.8	495.0	357.7	137.29	3.606		
10,100.0	6,564.3	10,027.0	6,463.3	72.8	71.1	-78.23	3,671.9	-119.8	495.2	354.3	140.93	3.514		
10,200.0	6,565.2	10,127.0	6,463.2	74.6	73.0	-78.11	3,771.9	-119.8	495.4	350.8	144.58	3.427		
10,300.0	6,566.1	10,227.0	6,463.0	76.5	74.8	-77.99	3,871.9	-119.8	495.6	347.4	148.22	3.344		
10,400.0	6,567.0	10,327.0	6,462.9	78.4	76.7	-77.87	3,971.9	-119.8	495.9	344.0	151.87	3.265		
10,500.0	6,568.0	10,427.0	6,462.7	80.3	78.6	-77.75	4,071.9	-119.8	496.1	340.6	155.51	3.190		
10,600.0	6,568.9	10,527.0	6,462.5	82.2	80.5	-77.63	4,171.8	-119.8	496.3	337.2	159.15	3.118		
10,700.0	6,569.8	10,627.0	6,462.4	84.1	82.4	-77.51	4,271.8	-119.8	496.5	333.8	162.80	3.050		
10,800.0	6,570.7	10,727.0	6,462.2	86.0	84.3	-77.39	4,371.8	-119.8	496.8	330.3	166.44	2.985		
10,900.0	6,571.6	10,827.0	6,462.1	87.8	86.1	-77.27	4,471.8	-119.8	497.0	327.0	169.98	2.924		
10,945.5	6,572.0	10,872.4	6,462.0	88.5	86.8	-77.22	4,517.3	-119.8	497.1	325.8	171.31	2.902 SF		

<b>Company:</b>	PETROLEUM DEVELOPMENT CORP Weld County CO	<b>Local Co-ordinate Reference:</b>	Well R&R Farms 29Q-441
<b>Project:</b>	SEC.29-T5N-R63W	<b>TVD Reference:</b>	WELL @ 4588.0ft (RKB - 15')
<b>Reference Site:</b>	R&R Farms 5N63W29Q Pad Sec.29-T5N-R63W	<b>MD Reference:</b>	WELL @ 4588.0ft (RKB - 15')
<b>Site Error:</b>	0.0ft	<b>North Reference:</b>	True
<b>Reference Well:</b>	R&R Farms 29Q-441	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.0ft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	Wellbore #1	<b>Database:</b>	landmark
<b>Reference Design:</b>	Plan #1 (9-19-14)	<b>Offset TVD Reference:</b>	Offset Datum

Offset Design		R&R Farms 5N63W29Q Pad Sec.29-T5N-R63W - R&R Farms 29L-421 - Wellbore #1 - Plan #1 (9-19-1										Offset Site Error:		0.0 ft
Survey Program: 0-MWD												Offset Well Error:		0.0 ft
Reference		Offset		Semi Major Axis			Distance							Warning
Measured Depth (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	0.00	91.1	0.0	91.1					
100.0	100.0	100.0	100.0	0.1	0.1	0.00	91.1	0.0	91.1	90.9	0.22	405.210		
200.0	200.0	200.0	200.0	0.3	0.3	0.00	91.1	0.0	91.1	90.4	0.67	135.070		
300.0	300.0	300.0	300.0	0.6	0.6	0.00	91.1	0.0	91.1	90.0	1.12	81.042		
400.0	400.0	400.0	400.0	0.8	0.8	0.00	91.1	0.0	91.1	89.5	1.57	57.887		
500.0	500.0	500.0	500.0	1.0	1.0	0.00	91.1	0.0	91.1	89.1	2.02	45.023		
600.0	600.0	600.0	600.0	1.2	1.2	0.00	91.1	0.0	91.1	88.6	2.47	36.837		
700.0	700.0	700.0	700.0	1.5	1.5	0.00	91.1	0.0	91.1	88.2	2.92	31.170		
800.0	800.0	800.0	800.0	1.7	1.7	0.00	91.1	0.0	91.1	87.7	3.37	27.014		
900.0	900.0	900.0	900.0	1.9	1.9	0.00	91.1	0.0	91.1	87.3	3.82	23.836		
1,000.0	1,000.0	1,000.0	1,000.0	2.1	2.1	0.00	91.1	0.0	91.1	86.8	4.27	21.327 CC, ES		
1,100.0	1,100.0	1,100.0	1,100.0	2.3	2.4	-119.06	91.1	0.0	91.9	87.2	4.70	19.555		
1,200.0	1,199.8	1,199.8	1,199.8	2.5	2.6	-121.78	91.1	0.0	94.6	89.5	5.12	18.483		
1,300.0	1,299.5	1,299.5	1,299.5	2.7	2.8	-125.97	91.1	0.0	99.4	93.9	5.54	17.944		
1,400.0	1,398.8	1,398.8	1,398.8	3.0	3.0	-131.02	91.1	0.0	106.8	100.8	5.98	17.869		
1,500.0	1,498.0	1,498.0	1,498.0	3.2	3.3	-135.61	91.1	0.0	115.3	108.9	6.42	17.950		
1,600.0	1,597.2	1,597.2	1,597.2	3.5	3.5	-139.55	91.1	0.0	124.4	117.5	6.87	18.108		
1,700.0	1,696.5	1,697.5	1,697.5	3.8	3.7	-143.67	90.0	-1.3	133.6	126.3	7.29	18.319		
1,800.0	1,795.7	1,797.3	1,797.2	4.0	3.9	-148.61	86.8	-5.3	142.8	135.2	7.69	18.574		
1,900.0	1,895.0	1,896.3	1,895.7	4.3	4.1	-154.16	81.5	-11.9	152.8	144.7	8.09	18.889		
2,000.0	1,994.2	1,994.3	1,993.1	4.6	4.3	-160.05	74.2	-20.9	164.2	155.7	8.50	19.320		
2,100.0	2,093.5	2,092.2	2,090.2	4.9	4.5	-165.33	66.6	-30.3	177.2	168.3	8.92	19.858		
2,200.0	2,192.7	2,190.1	2,187.4	5.2	4.7	-169.88	59.0	-39.7	191.5	182.1	9.36	20.458		
2,300.0	2,292.0	2,288.0	2,284.5	5.5	5.0	-173.78	51.3	-49.2	206.8	197.0	9.81	21.083		
2,400.0	2,391.2	2,385.9	2,381.6	5.8	5.2	-177.15	43.7	-58.6	222.9	212.7	10.27	21.709		
2,500.0	2,490.4	2,483.7	2,478.8	6.1	5.5	179.94	36.1	-68.0	239.8	229.0	10.74	22.325		
2,600.0	2,589.7	2,581.6	2,575.9	6.4	5.7	177.42	28.5	-77.5	257.1	245.9	11.22	22.920		
2,700.0	2,688.9	2,679.5	2,673.0	6.8	6.0	175.21	20.8	-86.9	274.9	263.2	11.70	23.490		
2,800.0	2,788.2	2,777.4	2,770.2	7.1	6.3	173.27	13.2	-96.3	293.0	280.8	12.19	24.032		
2,900.0	2,887.4	2,875.3	2,867.3	7.4	6.6	171.56	5.6	-105.8	311.4	298.7	12.69	24.546		
3,000.0	2,986.7	2,973.2	2,964.4	7.7	6.9	170.04	-2.0	-115.2	330.0	316.8	13.18	25.032		
3,100.0	3,085.9	3,071.1	3,061.6	8.0	7.1	168.68	-9.7	-124.6	348.9	335.2	13.69	25.490		
3,200.0	3,185.2	3,169.0	3,158.7	8.3	7.4	167.46	-17.3	-134.1	367.9	353.7	14.19	25.923		
3,300.0	3,284.4	3,266.8	3,255.8	8.6	7.7	166.36	-24.9	-143.5	387.0	372.3	14.70	26.331		
3,400.0	3,383.6	3,364.7	3,353.0	9.0	8.0	165.36	-32.5	-152.9	406.3	391.1	15.21	26.715		
3,500.0	3,482.9	3,462.6	3,450.1	9.3	8.3	164.45	-40.2	-162.4	425.7	410.0	15.72	27.079		
3,600.0	3,582.1	3,560.5	3,547.2	9.6	8.6	163.63	-47.8	-171.8	445.2	429.0	16.24	27.421		
3,700.0	3,681.4	3,658.4	3,644.4	9.9	8.9	162.87	-55.4	-181.2	464.8	448.0	16.75	27.745		
3,800.0	3,780.6	3,756.3	3,741.5	10.2	9.2	162.17	-63.0	-190.7	484.4	467.2	17.27	28.052		
3,900.0	3,879.9	3,854.2	3,838.6	10.6	9.5	161.53	-70.7	-200.1	504.1	486.4	17.79	28.342		
4,000.0	3,979.1	3,952.0	3,935.8	10.9	9.8	160.93	-78.3	-209.5	523.9	505.6	18.31	28.616		
4,100.0	4,078.4	4,049.9	4,032.9	11.2	10.1	160.38	-85.9	-219.0	543.7	524.9	18.83	28.877		
4,200.0	4,177.6	4,147.8	4,130.0	11.5	10.4	159.87	-93.5	-228.4	563.6	544.2	19.35	29.124		
4,300.0	4,276.8	4,245.7	4,227.1	11.9	10.8	159.39	-101.1	-237.8	583.5	563.6	19.87	29.359		
4,400.0	4,376.1	4,343.6	4,324.3	12.2	11.1	158.98	-108.8	-247.3	603.3	582.9	20.40	29.567		
4,500.0	4,475.6	4,441.9	4,421.9	12.4	11.4	158.60	-116.4	-256.7	620.8	599.9	20.91	29.684		
4,600.0	4,575.4	4,540.7	4,519.8	12.6	11.7	158.10	-124.1	-266.3	635.1	613.7	21.40	29.682		
4,700.0	4,675.4	4,639.7	4,618.1	12.7	12.0	157.49	-131.8	-275.8	646.3	624.5	21.86	29.573		
4,800.0	4,775.4	4,739.0	4,716.6	12.9	12.3	-85.13	-139.6	-285.4	655.4	633.0	22.32	29.366		
4,900.0	4,875.4	4,838.2	4,815.1	13.1	12.6	-85.87	-147.3	-294.9	664.4	641.6	22.78	29.170		
5,000.0	4,975.4	4,937.4	4,913.5	13.2	13.0	-86.58	-155.0	-304.5	673.5	650.3	23.23	28.988		

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

<b>Company:</b>	PETROLEUM DEVELOPMENT CORP Weld County CO	<b>Local Co-ordinate Reference:</b>	Well R&R Farms 29Q-441
<b>Project:</b>	SEC.29-T5N-R63W	<b>TVD Reference:</b>	WELL @ 4588.0ft (RKB - 15')
<b>Reference Site:</b>	R&R Farms 5N63W29Q Pad Sec.29-T5N-R63W	<b>MD Reference:</b>	WELL @ 4588.0ft (RKB - 15')
<b>Site Error:</b>	0.0ft	<b>North Reference:</b>	True
<b>Reference Well:</b>	R&R Farms 29Q-441	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.0ft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	Wellbore #1	<b>Database:</b>	landmark
<b>Reference Design:</b>	Plan #1 (9-19-14)	<b>Offset TVD Reference:</b>	Offset Datum

Offset Design		R&R Farms 5N63W29Q Pad Sec.29-T5N-R63W - R&R Farms 29L-421 - Wellbore #1 - Plan #1 (9-19-1										Offset Site Error:		0.0 ft		
Survey Program: 0-MWD														Offset Well Error:		0.0 ft
Reference		Offset		Semi Major Axis			Distance							Warning		
Measured Depth	Vertical	Measured	Vertical	Reference	Offset	Highside	Offset Wellbore Centre		Between	Between	Minimum	Separation				
Depth (ft)	Depth (ft)	Depth (ft)	Depth (ft)	(ft)	(ft)	Toolface (°)	+N/-S (ft)	+E/-W (ft)	Centres (ft)	Ellipses (ft)	Separation (ft)	Factor				
5,100.0	5,075.4	5,036.6	5,012.0	13.4	13.3	-87.28	-162.8	-314.0	682.8	659.1	23.69	28.817				
5,200.0	5,175.4	5,135.9	5,110.5	13.6	13.6	-87.96	-170.5	-323.6	692.1	667.9	24.15	28.657				
5,300.0	5,275.4	5,235.1	5,208.9	13.7	13.9	-88.62	-178.2	-333.2	701.5	676.9	24.61	28.508				
5,400.0	5,375.4	5,349.2	5,322.3	13.9	14.2	-89.31	-186.4	-343.4	710.4	685.3	25.06	28.344				
5,500.0	5,475.4	5,472.7	5,445.4	14.1	14.5	-89.78	-192.3	-350.6	716.2	690.7	25.50	28.092				
5,600.0	5,575.4	5,596.8	5,569.4	14.2	14.7	-89.99	-194.8	-353.7	718.7	692.8	25.91	27.738				
5,700.0	5,675.4	5,702.8	5,675.4	14.4	14.9	-89.99	-194.9	-353.8	718.8	692.5	26.30	27.336				
5,800.0	5,775.4	5,802.8	5,775.4	14.6	15.0	-89.99	-194.9	-353.8	718.8	692.2	26.67	26.955				
5,900.0	5,875.1	5,902.8	5,875.1	14.8	15.2	-89.99	-188.0	-353.8	718.8	691.9	26.97	26.650				
6,000.0	5,973.0	6,002.8	5,973.0	14.9	15.2	-89.99	-168.1	-353.8	718.8	691.7	27.16	26.466				
6,100.0	6,067.5	6,102.8	6,067.5	14.9	15.3	-89.99	-135.5	-353.8	718.8	691.6	27.27	26.361				
6,200.0	6,156.9	6,202.7	6,156.9	15.0	15.3	-89.99	-91.0	-353.8	718.8	691.5	27.36	26.274				
6,300.0	6,239.8	6,302.7	6,239.8	15.0	15.2	-90.00	-35.1	-353.8	718.8	691.3	27.51	26.130				
6,400.0	6,314.6	6,402.7	6,314.6	15.1	15.2	-90.00	31.1	-353.8	718.8	691.0	27.81	25.847				
6,500.0	6,380.2	6,502.7	6,380.2	15.2	15.1	-90.00	106.5	-353.8	718.8	690.5	28.35	25.355				
6,600.0	6,435.4	6,602.7	6,435.4	15.4	15.1	-90.00	189.8	-353.8	718.8	689.6	29.20	24.614				
6,700.0	6,479.2	6,702.7	6,479.2	15.9	15.3	-90.00	279.6	-353.8	718.8	688.4	30.42	23.632				
6,800.0	6,510.9	6,802.7	6,510.9	16.7	16.0	-90.00	374.3	-353.8	718.8	686.8	32.00	22.463				
6,900.0	6,530.0	6,902.7	6,530.0	17.7	17.0	-90.00	472.4	-353.8	718.8	684.9	33.93	21.187				
6,905.3	6,530.7	6,908.0	6,530.6	17.8	17.0	-90.00	477.6	-353.8	718.8	684.8	34.04	21.115				
7,000.0	6,536.2	7,002.7	6,536.2	18.9	18.1	-90.00	572.2	-353.8	718.8	682.7	36.15	19.887				
7,100.0	6,537.1	7,102.7	6,537.1	20.1	19.3	-90.00	672.2	-353.8	718.8	680.2	38.61	18.618				
7,200.0	6,538.0	7,202.7	6,538.0	21.5	20.6	-90.00	772.2	-353.8	718.8	677.6	41.28	17.413				
7,300.0	6,538.9	7,302.7	6,538.9	22.9	22.0	-90.00	872.2	-353.8	718.8	674.7	44.13	16.290				
7,400.0	6,539.8	7,402.7	6,539.8	24.4	23.4	-90.00	972.1	-353.8	718.8	671.7	47.12	15.257				
7,500.0	6,540.7	7,502.7	6,540.7	26.0	25.0	-90.00	1,072.1	-353.8	718.8	668.6	50.22	14.314				
7,600.0	6,541.6	7,602.7	6,541.6	27.6	26.6	-90.00	1,172.1	-353.8	718.8	665.4	53.42	13.456				
7,700.0	6,542.5	7,702.7	6,542.5	29.2	28.2	-90.00	1,272.1	-353.8	718.8	662.1	56.70	12.678				
7,800.0	6,543.5	7,802.7	6,543.5	30.9	29.8	-90.00	1,372.1	-353.8	718.8	658.8	60.05	11.972				
7,900.0	6,544.4	7,902.7	6,544.4	32.6	31.5	-90.00	1,472.1	-353.8	718.8	655.4	63.45	11.330				
8,000.0	6,545.3	8,002.7	6,545.3	34.3	33.2	-90.00	1,572.1	-353.8	718.8	651.9	66.90	10.745				
8,100.0	6,546.2	8,102.7	6,546.2	36.0	34.9	-90.00	1,672.1	-353.8	718.8	648.5	70.39	10.213				
8,200.0	6,547.1	8,202.7	6,547.1	37.8	36.7	-90.00	1,772.1	-353.8	718.8	644.9	73.91	9.726				
8,300.0	6,548.0	8,302.7	6,548.0	39.6	38.4	-90.00	1,872.1	-353.8	718.8	641.4	77.47	9.279				
8,400.0	6,548.9	8,402.7	6,548.9	41.4	40.2	-90.00	1,972.1	-353.8	718.8	637.8	81.05	8.869				
8,500.0	6,549.8	8,502.7	6,549.8	43.2	42.0	-90.00	2,072.1	-353.8	718.8	634.2	84.65	8.492				
8,600.0	6,550.7	8,602.7	6,550.7	45.0	43.8	-90.00	2,172.1	-353.8	718.8	630.6	88.28	8.143				
8,700.0	6,551.6	8,702.7	6,551.6	46.8	45.6	-90.00	2,272.1	-353.8	718.8	626.9	91.92	7.820				
8,800.0	6,552.5	8,802.7	6,552.5	48.6	47.4	-90.00	2,372.1	-353.8	718.8	623.3	95.57	7.521				
8,900.0	6,553.4	8,902.7	6,553.4	50.4	49.3	-90.00	2,472.1	-353.8	718.8	619.6	99.25	7.243				
9,000.0	6,554.3	9,002.7	6,554.3	52.3	51.1	-90.00	2,572.1	-353.8	718.8	615.9	102.93	6.984				
9,100.0	6,555.3	9,102.7	6,555.3	54.1	52.9	-90.00	2,672.1	-353.8	718.8	612.2	106.62	6.742				
9,200.0	6,556.2	9,202.7	6,556.2	56.0	54.8	-90.00	2,772.1	-353.8	718.8	608.5	110.33	6.515				
9,300.0	6,557.1	9,302.7	6,557.1	57.8	56.6	-90.00	2,872.1	-353.8	718.8	604.8	114.04	6.303				
9,400.0	6,558.0	9,402.7	6,558.0	59.7	58.5	-90.00	2,972.1	-353.8	718.8	601.1	117.76	6.104				
9,500.0	6,558.9	9,502.7	6,558.9	61.5	60.3	-90.00	3,072.1	-353.8	718.8	597.3	121.49	5.917				
9,600.0	6,559.8	9,602.7	6,559.8	63.4	62.2	-90.00	3,172.1	-353.8	718.8	593.6	125.23	5.740				
9,700.0	6,560.7	9,702.7	6,560.7	65.3	64.1	-90.00	3,272.1	-353.8	718.8	589.9	128.97	5.574				
9,800.0	6,561.6	9,802.7	6,561.6	67.1	65.9	-90.00	3,372.0	-353.8	718.8	586.1	132.72	5.416				
9,900.0	6,562.5	9,902.7	6,562.5	69.0	67.8	-90.00	3,472.0	-353.8	718.8	582.4	136.47	5.267				

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

<b>Company:</b>	PETROLEUM DEVELOPMENT CORP Weld County CO	<b>Local Co-ordinate Reference:</b>	Well R&R Farms 29Q-441
<b>Project:</b>	SEC.29-T5N-R63W	<b>TVD Reference:</b>	WELL @ 4588.0ft (RKB - 15')
<b>Reference Site:</b>	R&R Farms 5N63W29Q Pad Sec.29-T5N-R63W	<b>MD Reference:</b>	WELL @ 4588.0ft (RKB - 15')
<b>Site Error:</b>	0.0ft	<b>North Reference:</b>	True
<b>Reference Well:</b>	R&R Farms 29Q-441	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.0ft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	Wellbore #1	<b>Database:</b>	landmark
<b>Reference Design:</b>	Plan #1 (9-19-14)	<b>Offset TVD Reference:</b>	Offset Datum

<b>Offset Design</b>													Offset Site Error:	0.0 ft
Survey Program: 0-MWD													Offset Well Error:	0.0 ft
Reference														
Offset														
Semi Major Axis														
Distance														
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning	
10,000.0	6,563.4	10,002.7	6,563.4	70.9	69.7	-90.00	3,572.0	-353.8	718.8	578.6	140.23	5.126		
10,100.0	6,564.3	10,102.7	6,564.3	72.8	71.6	-90.00	3,672.0	-353.8	718.8	574.8	143.99	4.992		
10,200.0	6,565.2	10,202.7	6,565.2	74.6	73.4	-90.00	3,772.0	-353.8	718.8	571.1	147.75	4.865		
10,300.0	6,566.1	10,302.7	6,566.1	76.5	75.3	-90.00	3,872.0	-353.8	718.8	567.3	151.52	4.744		
10,400.0	6,567.0	10,402.7	6,567.0	78.4	77.2	-90.00	3,972.0	-353.8	718.8	563.5	155.30	4.629		
10,500.0	6,568.0	10,502.7	6,568.0	80.3	79.1	-90.00	4,072.0	-353.8	718.8	559.8	159.07	4.519		
10,600.0	6,568.9	10,602.7	6,568.9	82.2	81.0	-90.00	4,172.0	-353.8	718.8	556.0	162.85	4.414		
10,700.0	6,569.8	10,702.7	6,569.8	84.1	82.9	-90.00	4,272.0	-353.8	718.8	552.2	166.63	4.314		
10,800.0	6,570.7	10,802.7	6,570.7	86.0	84.7	-90.00	4,372.0	-353.8	718.8	548.4	170.42	4.218		
10,900.0	6,571.6	10,902.7	6,571.6	87.8	86.6	-90.00	4,472.0	-353.8	718.8	544.6	174.21	4.126		
10,945.5	6,572.0	10,948.2	6,572.0	88.5	87.5	-90.00	4,517.5	-353.8	718.8	543.1	175.76	4.090 SF		

<b>Company:</b>	PETROLEUM DEVELOPMENT CORP Weld County CO	<b>Local Co-ordinate Reference:</b>	Well R&R Farms 29Q-441
<b>Project:</b>	SEC.29-T5N-R63W	<b>TVD Reference:</b>	WELL @ 4588.0ft (RKB - 15')
<b>Reference Site:</b>	R&R Farms 5N63W29Q Pad Sec.29-T5N-R63W	<b>MD Reference:</b>	WELL @ 4588.0ft (RKB - 15')
<b>Site Error:</b>	0.0ft	<b>North Reference:</b>	True
<b>Reference Well:</b>	R&R Farms 29Q-441	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.0ft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	Wellbore #1	<b>Database:</b>	landmark
<b>Reference Design:</b>	Plan #1 (9-19-14)	<b>Offset TVD Reference:</b>	Offset Datum

Offset Design		R&R Farms 5N63W29Q Pad Sec.29-T5N-R63W - R&R Farms 29Q-241 - Wellbore #1 - Plan #1 (9-19-1)										Offset Site Error:		0.0 ft
Survey Program: 0-MWD												Offset Well Error:		0.0 ft
Reference		Offset		Semi Major Axis			Distance							Warning
Measured Depth (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	0.00	29.1	0.0	29.1					
100.0	100.0	100.0	100.0	0.1	0.1	0.00	29.1	0.0	29.1	28.9	0.22	129.685		
200.0	200.0	200.0	200.0	0.3	0.3	0.00	29.1	0.0	29.1	28.5	0.67	43.228		
300.0	300.0	300.0	300.0	0.6	0.6	0.00	29.1	0.0	29.1	28.0	1.12	25.937		
400.0	400.0	400.0	400.0	0.8	0.8	0.00	29.1	0.0	29.1	27.6	1.57	18.526		
500.0	500.0	500.0	500.0	1.0	1.0	0.00	29.1	0.0	29.1	27.1	2.02	14.409		
600.0	600.0	600.0	600.0	1.2	1.2	0.00	29.1	0.0	29.1	26.7	2.47	11.790		
700.0	700.0	700.0	700.0	1.5	1.5	0.00	29.1	0.0	29.1	26.2	2.92	9.976		
800.0	800.0	800.0	800.0	1.7	1.7	0.00	29.1	0.0	29.1	25.8	3.37	8.646		
900.0	900.0	900.0	900.0	1.9	1.9	0.00	29.1	0.0	29.1	25.3	3.82	7.629		
1,000.0	1,000.0	1,000.0	1,000.0	2.1	2.1	0.00	29.1	0.0	29.1	24.9	4.27	6.826	CC, ES	
1,100.0	1,100.0	1,100.0	1,100.0	2.3	2.4	-121.04	29.1	0.0	30.0	25.3	4.70	6.385		
1,200.0	1,199.8	1,199.8	1,199.8	2.5	2.6	-128.79	29.1	0.0	33.0	27.9	5.12	6.455		
1,300.0	1,299.5	1,299.5	1,299.5	2.7	2.8	-138.70	29.1	0.0	39.1	33.5	5.53	7.061		
1,400.0	1,398.8	1,398.8	1,398.8	3.0	3.0	-147.85	29.1	0.0	48.6	42.6	5.96	8.156		
1,500.0	1,498.0	1,498.0	1,498.0	3.2	3.3	-154.16	29.1	0.0	59.4	53.0	6.39	9.294		
1,600.0	1,597.2	1,597.2	1,597.2	3.5	3.5	-158.50	29.1	0.0	70.6	63.8	6.82	10.356		
1,700.0	1,696.5	1,699.2	1,699.2	3.8	3.7	-162.03	27.6	0.8	80.5	73.3	7.23	11.141		
1,800.0	1,795.7	1,801.7	1,801.6	4.0	3.9	-165.51	22.9	3.4	87.3	79.7	7.62	11.464		
1,900.0	1,895.0	1,904.5	1,903.9	4.3	4.1	-169.33	15.0	7.8	91.1	83.1	8.02	11.361		
2,000.0	1,994.2	2,005.8	2,004.5	4.6	4.3	-173.64	4.4	13.6	92.3	83.9	8.42	10.965		
2,100.0	2,093.5	2,105.5	2,103.4	4.9	4.5	-177.89	-6.5	19.5	93.7	84.9	8.84	10.600		
2,200.0	2,192.7	2,205.3	2,202.4	5.2	4.7	178.01	-17.4	25.4	95.6	86.3	9.28	10.302		
2,300.0	2,292.0	2,305.0	2,301.4	5.5	5.0	174.08	-28.2	31.4	97.9	88.2	9.74	10.058		
2,400.0	2,391.2	2,404.8	2,400.4	5.8	5.2	170.35	-39.1	37.3	100.7	90.5	10.22	9.858		
2,500.0	2,490.4	2,504.5	2,499.4	6.1	5.5	166.83	-49.9	43.3	103.9	93.2	10.72	9.693		
2,600.0	2,589.7	2,604.3	2,598.3	6.4	5.7	163.54	-60.8	49.2	107.5	96.2	11.24	9.558		
2,700.0	2,688.9	2,704.0	2,697.3	6.8	6.0	160.46	-71.6	55.1	111.3	99.6	11.78	9.448		
2,800.0	2,788.2	2,803.8	2,796.3	7.1	6.3	157.60	-82.5	61.1	115.5	103.2	12.35	9.359		
2,900.0	2,887.4	2,903.5	2,895.3	7.4	6.6	154.95	-93.4	67.0	120.0	107.1	12.92	9.287		
3,000.0	2,986.7	3,003.3	2,994.3	7.7	6.9	152.48	-104.2	73.0	124.7	111.2	13.51	9.230		
3,100.0	3,085.9	3,103.0	3,093.2	8.0	7.2	150.21	-115.1	78.9	129.6	115.5	14.11	9.186		
3,200.0	3,185.2	3,202.8	3,192.2	8.3	7.5	148.10	-125.9	84.8	134.7	120.0	14.72	9.152		
3,300.0	3,284.4	3,302.5	3,291.2	8.6	7.8	146.14	-136.8	90.8	140.0	124.6	15.33	9.128		
3,400.0	3,383.6	3,402.3	3,390.2	9.0	8.1	144.33	-147.6	96.7	145.4	129.4	15.96	9.111		
3,500.0	3,482.9	3,502.0	3,489.2	9.3	8.4	142.65	-158.5	102.6	150.9	134.4	16.58	9.101		
3,600.0	3,582.1	3,601.8	3,588.2	9.6	8.7	141.09	-169.3	108.6	156.6	139.4	17.22	9.097		
3,700.0	3,681.4	3,700.8	3,686.5	9.9	9.0	139.76	-179.9	114.3	162.5	144.6	17.83	9.112		
3,800.0	3,780.6	3,799.0	3,784.2	10.2	9.2	139.45	-187.8	118.7	169.2	150.9	18.35	9.221		
3,900.0	3,879.9	3,897.0	3,882.0	10.6	9.4	140.21	-192.8	121.4	176.9	158.1	18.80	9.410		
4,000.0	3,979.1	3,994.5	3,979.5	10.9	9.6	141.89	-194.9	122.6	185.8	166.6	19.19	9.680		
4,100.0	4,078.4	4,093.3	4,078.4	11.2	9.8	144.07	-195.0	122.6	195.6	176.0	19.54	10.008		
4,200.0	4,177.6	4,192.6	4,177.6	11.5	9.9	146.07	-195.0	122.6	205.7	185.8	19.89	10.337		
4,300.0	4,276.8	4,291.8	4,276.8	11.9	10.1	147.89	-195.0	122.6	216.0	195.7	20.25	10.663		
4,400.0	4,376.1	4,391.1	4,376.1	12.2	10.3	149.55	-195.0	122.6	226.4	205.7	20.62	10.980		
4,500.0	4,475.6	4,490.6	4,475.6	12.4	10.5	150.81	-195.0	122.6	234.7	213.7	20.95	11.203		
4,600.0	4,575.4	4,590.4	4,575.4	12.6	10.7	151.57	-195.0	122.6	240.0	218.7	21.28	11.277		
4,700.0	4,675.4	4,690.4	4,675.4	12.7	10.9	151.89	-195.0	122.6	242.3	220.7	21.62	11.209		
4,800.0	4,775.4	4,790.4	4,775.4	12.9	11.1	-89.99	-195.0	122.6	242.4	220.4	21.99	11.025		
4,900.0	4,875.4	4,890.4	4,875.4	13.1	11.2	-89.99	-195.0	122.6	242.4	220.0	22.36	10.839		
5,000.0	4,975.4	4,990.4	4,975.4	13.2	11.4	-89.99	-195.0	122.6	242.4	219.7	22.74	10.658		

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



<b>Company:</b>	PETROLEUM DEVELOPMENT CORP Weld County CO	<b>Local Co-ordinate Reference:</b>	Well R&R Farms 29Q-441
<b>Project:</b>	SEC.29-T5N-R63W	<b>TVD Reference:</b>	WELL @ 4588.0ft (RKB - 15')
<b>Reference Site:</b>	R&R Farms 5N63W29Q Pad Sec.29-T5N-R63W	<b>MD Reference:</b>	WELL @ 4588.0ft (RKB - 15')
<b>Site Error:</b>	0.0ft	<b>North Reference:</b>	True
<b>Reference Well:</b>	R&R Farms 29Q-441	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.0ft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	Wellbore #1	<b>Database:</b>	landmark
<b>Reference Design:</b>	Plan #1 (9-19-14)	<b>Offset TVD Reference:</b>	Offset Datum

Offset Design		R&R Farms 5N63W29Q Pad Sec.29-T5N-R63W - R&R Farms 29Q-241 - Wellbore #1 - Plan #1 (9-19-1)										Offset Site Error:		0.0 ft		
Survey Program: 0-MWDD														Offset Well Error:		0.0 ft
Reference		Offset		Semi Major Axis			Distance							Warning		
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor				
5,100.0	5,075.4	5,090.4	5,075.4	13.4	11.6	-89.99	-195.0	122.6	242.4	219.3	23.13	10.482				
5,200.0	5,175.4	5,190.4	5,175.4	13.6	11.8	-89.99	-195.0	122.6	242.4	218.9	23.51	10.311				
5,300.0	5,275.4	5,290.4	5,275.4	13.7	12.0	-89.99	-195.0	122.6	242.4	218.5	23.90	10.144				
5,400.0	5,375.4	5,390.4	5,375.4	13.9	12.2	-89.99	-195.0	122.6	242.4	218.1	24.29	9.981				
5,500.0	5,475.4	5,490.4	5,475.4	14.1	12.4	-89.99	-195.0	122.6	242.4	217.7	24.68	9.823				
5,600.0	5,575.4	5,590.4	5,575.4	14.2	12.6	-89.99	-195.0	122.6	242.4	217.3	25.07	9.669				
5,651.2	5,626.6	5,641.6	5,626.6	14.3	12.7	-89.99	-195.0	122.6	242.4	217.1	25.27	9.592				
5,700.0	5,675.4	5,690.3	5,675.3	14.4	12.8	-89.66	-193.6	122.6	242.4	217.0	25.44	9.528				
5,800.0	5,775.4	5,788.6	5,772.8	14.6	13.0	-86.77	-181.3	122.6	242.8	217.1	25.65	9.465				
5,900.0	5,875.1	5,884.1	5,865.2	14.8	13.0	-82.59	-157.6	122.6	244.5	218.8	25.73	9.502				
6,000.0	5,973.0	5,977.6	5,952.1	14.9	13.1	-78.64	-123.3	122.6	247.4	221.6	25.77	9.600				
6,100.0	6,067.5	6,069.3	6,032.7	14.9	13.2	-74.98	-79.7	122.6	251.2	225.4	25.79	9.739				
6,200.0	6,156.9	6,159.4	6,106.3	15.0	13.2	-71.68	-27.7	122.6	255.6	229.8	25.83	9.897				
6,300.0	6,239.8	6,250.0	6,173.5	15.0	13.3	-68.71	32.9	122.6	260.4	234.5	25.91	10.050				
6,400.0	6,314.6	6,335.8	6,230.2	15.1	13.5	-66.24	97.3	122.6	265.1	239.1	26.07	10.170				
6,500.0	6,380.2	6,422.5	6,279.7	15.2	13.9	-64.13	168.4	122.6	269.6	243.3	26.35	10.232				
6,600.0	6,435.4	6,508.3	6,320.5	15.4	14.4	-62.42	243.8	122.6	273.6	246.8	26.81	10.205				
6,700.0	6,479.2	6,593.5	6,352.4	15.9	15.1	-61.11	322.8	122.6	277.0	249.5	27.51	10.069				
6,800.0	6,510.9	6,678.2	6,375.2	16.7	15.9	-60.18	404.3	122.6	279.4	251.0	28.48	9.813				
6,900.0	6,530.0	6,762.6	6,388.8	17.7	16.8	-59.64	487.6	122.6	280.9	251.2	29.74	9.446				
7,000.0	6,536.2	6,847.2	6,393.1	18.9	17.8	-59.45	572.0	122.6	281.5	250.1	31.34	8.981				
7,100.0	6,537.1	6,947.2	6,393.0	20.1	19.1	-59.28	672.0	122.6	282.0	248.5	33.53	8.411				
7,200.0	6,538.0	7,047.2	6,392.9	21.5	20.4	-59.10	772.0	122.6	282.5	246.6	35.88	7.874				
7,300.0	6,538.9	7,147.2	6,392.8	22.9	21.9	-58.92	872.0	122.6	283.0	244.7	38.37	7.377				
7,400.0	6,539.8	7,247.2	6,392.7	24.4	23.4	-58.75	972.0	122.6	283.5	242.6	40.97	6.921				
7,500.0	6,540.7	7,347.2	6,392.6	26.0	25.0	-58.57	1,072.0	122.6	284.1	240.4	43.66	6.507				
7,600.0	6,541.6	7,447.2	6,392.5	27.6	26.6	-58.40	1,172.0	122.6	284.6	238.2	46.42	6.131				
7,700.0	6,542.5	7,547.2	6,392.4	29.2	28.3	-58.23	1,272.0	122.6	285.1	235.9	49.24	5.790				
7,800.0	6,543.5	7,647.2	6,392.3	30.9	30.0	-58.05	1,372.0	122.6	285.7	233.6	52.11	5.482				
7,900.0	6,544.4	7,747.1	6,392.2	32.6	31.7	-57.88	1,472.0	122.6	286.2	231.2	55.01	5.203				
8,000.0	6,545.3	7,847.1	6,392.1	34.3	33.4	-57.71	1,572.0	122.6	286.7	228.8	57.95	4.948				
8,100.0	6,546.2	7,947.1	6,392.0	36.0	35.2	-57.54	1,672.0	122.6	287.3	226.4	60.90	4.717				
8,200.0	6,547.1	8,047.1	6,391.9	37.8	37.0	-57.37	1,772.0	122.6	287.8	224.0	63.88	4.506				
8,300.0	6,548.0	8,147.1	6,391.8	39.6	38.8	-57.20	1,871.9	122.6	288.4	221.5	66.87	4.312				
8,400.0	6,548.9	8,247.1	6,391.7	41.4	40.6	-57.03	1,971.9	122.6	288.9	219.1	69.88	4.135				
8,500.0	6,549.8	8,347.1	6,391.6	43.2	42.4	-56.86	2,071.9	122.6	289.5	216.6	72.89	3.972				
8,600.0	6,550.7	8,447.1	6,391.5	45.0	44.2	-56.70	2,171.9	122.6	290.0	214.1	75.91	3.821				
8,700.0	6,551.6	8,547.1	6,391.4	46.8	46.0	-56.53	2,271.9	122.6	290.6	211.7	78.93	3.682				
8,800.0	6,552.5	8,647.1	6,391.2	48.6	47.9	-56.36	2,371.9	122.6	291.2	209.2	81.96	3.553				
8,900.0	6,553.4	8,747.1	6,391.1	50.4	49.7	-56.20	2,471.9	122.6	291.7	206.7	84.98	3.433				
9,000.0	6,554.3	8,847.1	6,391.0	52.3	51.6	-56.03	2,571.9	122.6	292.3	204.3	88.01	3.321				
9,100.0	6,555.3	8,947.1	6,390.9	54.1	53.4	-55.87	2,671.9	122.6	292.8	201.8	91.04	3.217				
9,200.0	6,556.2	9,047.1	6,390.8	56.0	55.3	-55.70	2,771.9	122.6	293.4	199.4	94.06	3.119				
9,300.0	6,557.1	9,147.1	6,390.7	57.8	57.1	-55.54	2,871.9	122.6	294.0	196.9	97.08	3.028				
9,400.0	6,558.0	9,247.1	6,390.6	59.7	59.0	-55.38	2,971.9	122.6	294.6	194.5	100.10	2.943				
9,500.0	6,558.9	9,347.1	6,390.5	61.5	60.9	-55.22	3,071.9	122.6	295.1	192.0	103.12	2.862				
9,600.0	6,559.8	9,447.1	6,390.4	63.4	62.7	-55.06	3,171.9	122.6	295.7	189.6	106.13	2.786				
9,700.0	6,560.7	9,547.1	6,390.3	65.3	64.6	-54.90	3,271.9	122.6	296.3	187.2	109.13	2.715				
9,800.0	6,561.6	9,647.1	6,390.2	67.1	66.5	-54.74	3,371.9	122.6	296.9	184.7	112.13	2.648				
9,900.0	6,562.5	9,747.0	6,390.1	69.0	68.4	-54.58	3,471.9	122.6	297.5	182.3	115.13	2.584				

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

<b>Company:</b>	PETROLEUM DEVELOPMENT CORP Weld County CO	<b>Local Co-ordinate Reference:</b>	Well R&R Farms 29Q-441
<b>Project:</b>	SEC.29-T5N-R63W	<b>TVD Reference:</b>	WELL @ 4588.0ft (RKB - 15')
<b>Reference Site:</b>	R&R Farms 5N63W29Q Pad Sec.29-T5N-R63W	<b>MD Reference:</b>	WELL @ 4588.0ft (RKB - 15')
<b>Site Error:</b>	0.0ft	<b>North Reference:</b>	True
<b>Reference Well:</b>	R&R Farms 29Q-441	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.0ft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	Wellbore #1	<b>Database:</b>	landmark
<b>Reference Design:</b>	Plan #1 (9-19-14)	<b>Offset TVD Reference:</b>	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	6,563.4	9,847.0	6,390.0	70.9	70.2	-54.42	3,571.9	122.6	298.1	179.9	118.12	2.523		
10,100.0	6,564.3	9,947.0	6,389.9	72.8	72.1	-54.26	3,671.9	122.6	298.6	177.5	121.10	2.466		
10,200.0	6,565.2	10,047.0	6,389.8	74.6	74.0	-54.10	3,771.8	122.6	299.2	175.2	124.07	2.412		
10,300.0	6,566.1	10,147.0	6,389.7	76.5	75.9	-53.95	3,871.8	122.6	299.8	172.8	127.04	2.360		
10,400.0	6,567.0	10,247.0	6,389.6	78.4	77.8	-53.79	3,971.8	122.6	300.4	170.4	130.00	2.311		
10,500.0	6,568.0	10,347.0	6,389.5	80.3	79.7	-53.64	4,071.8	122.6	301.0	168.1	132.95	2.264		
10,600.0	6,568.9	10,447.0	6,389.4	82.2	81.6	-53.48	4,171.8	122.6	301.6	165.7	135.90	2.219		
10,700.0	6,569.8	10,547.0	6,389.3	84.1	83.5	-53.33	4,271.8	122.6	302.2	163.4	138.84	2.177		
10,800.0	6,570.7	10,647.0	6,389.2	86.0	85.4	-53.17	4,371.8	122.6	302.8	161.1	141.77	2.136		
10,900.0	6,571.6	10,747.0	6,389.0	87.8	87.3	-53.02	4,471.8	122.6	303.4	158.8	144.69	2.097		
10,945.5	6,572.0	10,792.5	6,389.0	88.5	88.1	-52.95	4,517.3	122.6	303.7	157.9	145.87	2.082 SF		



<b>Company:</b>	PETROLEUM DEVELOPMENT CORP Weld County CO	<b>Local Co-ordinate Reference:</b>	Well R&R Farms 29Q-441
<b>Project:</b>	SEC.29-T5N-R63W	<b>TVD Reference:</b>	WELL @ 4588.0ft (RKB - 15')
<b>Reference Site:</b>	R&R Farms 5N63W29Q Pad Sec.29-T5N-R63W	<b>MD Reference:</b>	WELL @ 4588.0ft (RKB - 15')
<b>Site Error:</b>	0.0ft	<b>North Reference:</b>	True
<b>Reference Well:</b>	R&R Farms 29Q-441	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.0ft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	Wellbore #1	<b>Database:</b>	landmark
<b>Reference Design:</b>	Plan #1 (9-19-14)	<b>Offset TVD Reference:</b>	Offset Datum

Offset Design		R&R Farms 5N63W29Q Pad Sec.29-T5N-R63W - R&R Farms 29Q-301 - Wellbore #1 - Plan #1 (9-19-1)										Offset Site Error:		0.0 ft		
Survey Program: 0-MWD														Offset Well Error:		0.0 ft
Reference		Offset		Semi Major Axis			Distance							Warning		
Measured Depth (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)								
0.0	0.0	1.0	1.0	0.0	0.0	-180.00	-29.1	0.0	29.1	29.1	0.00	N/A				
100.0	100.0	101.0	101.0	0.1	0.1	-180.00	-29.1	0.0	29.1	28.9	0.23	128.365				
166.3	166.3	167.3	167.3	0.3	0.3	-180.00	-29.1	0.0	29.1	28.6	0.53	55.486 CC				
200.0	200.0	201.0	201.0	0.3	0.3	180.00	-29.1	0.0	29.1	28.5	0.68	43.081 ES				
300.0	300.0	300.7	300.7	0.6	0.6	176.72	-29.6	1.7	29.7	28.6	1.11	26.689				
400.0	400.0	400.0	399.8	0.8	0.8	167.83	-31.1	6.7	31.8	30.3	1.56	20.461				
500.0	500.0	499.1	498.5	1.0	1.0	155.90	-33.5	15.0	36.8	34.7	2.03	18.151				
600.0	600.0	597.8	596.6	1.2	1.3	144.50	-36.7	26.2	45.4	42.8	2.53	17.906				
700.0	700.0	697.0	695.0	1.5	1.6	136.55	-40.2	38.1	55.7	52.6	3.06	18.196				
800.0	800.0	796.2	793.5	1.7	1.9	131.15	-43.6	49.9	66.7	63.1	3.59	18.578				
900.0	900.0	895.5	891.9	1.9	2.2	127.30	-47.1	61.8	78.2	74.1	4.12	18.959				
1,000.0	1,000.0	994.7	990.4	2.1	2.5	124.45	-50.5	73.6	89.9	85.3	4.66	19.309				
1,100.0	1,100.0	1,094.1	1,089.0	2.3	2.9	4.20	-54.0	85.5	100.1	95.4	4.74	21.108				
1,200.0	1,199.8	1,193.8	1,187.9	2.5	3.2	2.54	-57.4	97.4	106.9	101.8	5.16	20.717				
1,300.0	1,299.5	1,293.7	1,287.1	2.7	3.5	1.12	-60.9	109.4	110.3	104.7	5.58	19.758				
1,400.0	1,398.8	1,393.7	1,386.3	3.0	3.8	-0.21	-64.4	121.3	110.7	104.7	6.01	18.401				
1,500.0	1,498.0	1,493.7	1,485.5	3.2	4.2	-1.54	-67.8	133.3	110.6	104.2	6.46	17.131				
1,535.8	1,533.6	1,529.5	1,521.0	3.3	4.3	-2.02	-69.1	137.6	110.6	104.0	6.62	16.714				
1,600.0	1,597.2	1,593.6	1,584.6	3.5	4.5	-2.87	-71.3	145.2	110.6	103.7	6.91	16.022				
1,700.0	1,696.5	1,693.6	1,683.8	3.8	4.8	-4.21	-74.8	157.2	110.7	103.3	7.36	15.046				
1,800.0	1,795.7	1,793.6	1,783.0	4.0	5.1	-5.53	-78.2	169.1	110.8	103.0	7.81	14.183				
1,900.0	1,895.0	1,893.5	1,882.2	4.3	5.5	-6.86	-81.7	181.1	111.0	102.7	8.28	13.415				
2,000.0	1,994.2	1,993.5	1,981.4	4.6	5.8	-8.18	-85.2	193.0	111.3	102.5	8.74	12.728				
2,100.0	2,093.5	2,093.5	2,080.6	4.9	6.1	-9.49	-88.6	205.0	111.6	102.4	9.21	12.111				
2,200.0	2,192.7	2,193.4	2,179.8	5.2	6.4	-10.80	-92.1	216.9	111.9	102.2	9.69	11.553				
2,300.0	2,292.0	2,293.4	2,279.0	5.5	6.8	-12.10	-95.6	228.9	112.4	102.2	10.17	11.047				
2,400.0	2,391.2	2,393.4	2,378.2	5.8	7.1	-13.38	-99.0	240.8	112.8	102.2	10.66	10.587				
2,500.0	2,490.4	2,493.3	2,477.3	6.1	7.4	-14.66	-102.5	252.7	113.4	102.2	11.15	10.166				
2,600.0	2,589.7	2,593.3	2,576.5	6.4	7.7	-15.92	-106.0	264.7	114.0	102.3	11.65	9.780				
2,700.0	2,688.9	2,693.3	2,675.7	6.8	8.1	-17.17	-109.4	276.6	114.6	102.4	12.16	9.426				
2,800.0	2,788.2	2,793.2	2,774.9	7.1	8.4	-18.40	-112.9	288.6	115.3	102.6	12.67	9.099				
2,900.0	2,887.4	2,893.2	2,874.1	7.4	8.7	-19.62	-116.4	300.5	116.1	102.9	13.19	8.798				
3,000.0	2,986.7	2,993.2	2,973.3	7.7	9.0	-20.82	-119.8	312.5	116.9	103.1	13.72	8.518				
3,100.0	3,085.9	3,093.1	3,072.5	8.0	9.4	-22.01	-123.3	324.4	117.7	103.5	14.25	8.259				
3,200.0	3,185.2	3,193.1	3,171.7	8.3	9.7	-23.18	-126.8	336.4	118.6	103.8	14.79	8.018				
3,300.0	3,284.4	3,293.1	3,270.9	8.6	10.0	-24.33	-130.3	348.3	119.6	104.2	15.34	7.794				
3,400.0	3,383.6	3,393.0	3,370.1	9.0	10.4	-25.46	-133.7	360.3	120.6	104.7	15.90	7.585				
3,500.0	3,482.9	3,493.0	3,469.2	9.3	10.7	-26.57	-137.2	372.2	121.6	105.2	16.46	7.390				
3,600.0	3,582.1	3,593.0	3,568.4	9.6	11.0	-27.66	-140.7	384.2	122.7	105.7	17.03	7.208				
3,700.0	3,681.4	3,692.9	3,667.6	9.9	11.3	-28.73	-144.1	396.1	123.9	106.3	17.60	7.037				
3,800.0	3,780.6	3,792.9	3,766.8	10.2	11.7	-29.79	-147.6	408.1	125.0	106.8	18.18	6.877				
3,900.0	3,879.9	3,892.9	3,866.0	10.6	12.0	-30.82	-151.1	420.0	126.2	107.5	18.77	6.727				
4,000.0	3,979.1	3,992.8	3,965.2	10.9	12.3	-31.83	-154.5	432.0	127.5	108.1	19.36	6.586				
4,100.0	4,078.4	4,092.8	4,064.4	11.2	12.7	-32.83	-158.0	443.9	128.8	108.8	19.96	6.454				
4,200.0	4,177.6	4,192.8	4,163.6	11.5	13.0	-33.80	-161.5	455.8	130.1	109.6	20.56	6.329				
4,300.0	4,276.8	4,292.7	4,262.8	11.9	13.3	-34.75	-164.9	467.8	131.5	110.3	21.17	6.212				
4,400.0	4,376.1	4,392.7	4,362.0	12.2	13.6	-35.66	-168.4	479.7	133.0	111.3	21.77	6.110				
4,500.0	4,475.6	4,492.6	4,461.1	12.4	14.0	-35.93	-171.9	491.7	136.7	114.4	22.25	6.142				
4,600.0	4,575.4	4,592.4	4,560.1	12.6	14.3	-35.41	-175.3	503.6	143.1	120.5	22.62	6.326				
4,700.0	4,675.4	4,691.9	4,658.8	12.7	14.6	-34.21	-178.8	515.5	152.5	129.6	22.91	6.656				
4,800.0	4,775.4	4,791.1	4,757.3	12.9	14.9	85.50	-182.2	527.4	164.0	140.8	23.18	7.074				

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

<b>Company:</b>	PETROLEUM DEVELOPMENT CORP Weld County CO	<b>Local Co-ordinate Reference:</b>	Well R&R Farms 29Q-441
<b>Project:</b>	SEC.29-T5N-R63W	<b>TVD Reference:</b>	WELL @ 4588.0ft (RKB - 15')
<b>Reference Site:</b>	R&R Farms 5N63W29Q Pad Sec.29-T5N-R63W	<b>MD Reference:</b>	WELL @ 4588.0ft (RKB - 15')
<b>Site Error:</b>	0.0ft	<b>North Reference:</b>	True
<b>Reference Well:</b>	R&R Farms 29Q-441	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.0ft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	Wellbore #1	<b>Database:</b>	landmark
<b>Reference Design:</b>	Plan #1 (9-19-14)	<b>Offset TVD Reference:</b>	Offset Datum

Offset Design		R&R Farms 5N63W29Q Pad Sec.29-T5N-R63W - R&R Farms 29Q-301 - Wellbore #1 - Plan #1 (9-19-1)									Offset Site Error:		0.0 ft		
Survey Program: 0-MWD													Offset Well Error:		0.0 ft
Reference		Offset		Semi Major Axis			Distance							Warning	
Measured Depth (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)							
4,900.0	4,875.4	4,890.4	4,855.7	13.1	15.3	86.93	-185.7	539.2	175.7	152.2	23.49	7.481			
5,000.0	4,975.4	4,990.3	4,954.9	13.2	15.6	88.19	-189.1	551.1	187.5	163.7	23.81	7.875			
5,100.0	5,075.4	5,096.6	5,060.6	13.4	15.8	89.17	-192.1	561.6	197.2	173.1	24.10	8.182			
5,200.0	5,175.4	5,203.5	5,167.4	13.6	16.0	89.74	-194.1	568.2	203.4	179.0	24.43	8.328			
5,300.0	5,275.4	5,310.9	5,274.7	13.7	16.2	89.97	-194.9	571.1	206.1	181.3	24.77	8.319			
5,400.0	5,375.4	5,412.6	5,376.4	13.9	16.3	89.98	-194.9	571.2	206.2	181.0	25.14	8.201			
5,500.0	5,475.4	5,512.6	5,476.4	14.1	16.5	89.98	-194.9	571.2	206.2	180.7	25.51	8.083			
5,600.0	5,575.4	5,612.6	5,576.4	14.2	16.6	89.98	-194.9	571.2	206.2	180.3	25.88	7.968			
5,700.0	5,675.4	5,712.6	5,676.4	14.4	16.8	89.98	-194.9	571.2	206.2	179.9	26.25	7.855			
5,740.3	5,715.7	5,752.9	5,716.7	14.5	16.8	89.96	-194.8	571.2	206.2	179.8	26.40	7.810			
5,800.0	5,775.4	5,812.4	5,776.1	14.6	16.9	89.04	-191.6	571.2	206.2	179.5	26.68	7.729			
5,900.0	5,875.1	5,911.0	5,873.4	14.8	17.0	86.58	-176.0	571.2	206.5	179.4	27.16	7.604			
6,000.0	5,973.0	6,008.5	5,966.8	14.9	17.1	84.21	-148.4	571.2	207.2	179.7	27.55	7.524			
6,100.0	6,067.5	6,105.0	6,055.1	14.9	17.1	81.95	-109.6	571.2	208.2	180.4	27.83	7.483			
6,200.0	6,156.9	6,200.0	6,136.6	15.0	17.2	79.87	-60.9	571.2	209.5	181.4	28.05	7.469			
6,300.0	6,239.8	6,295.2	6,211.5	15.0	17.3	77.96	-2.2	571.2	210.8	182.6	28.26	7.460			
6,400.0	6,314.6	6,389.2	6,277.8	15.1	17.3	76.28	64.3	571.2	212.3	183.7	28.57	7.429			
6,500.0	6,380.2	6,482.6	6,335.0	15.2	17.5	74.84	138.0	571.2	213.6	184.6	29.06	7.353			
6,600.0	6,435.4	6,575.4	6,382.6	15.4	17.7	73.64	217.6	571.2	214.9	185.1	29.83	7.203			
6,700.0	6,479.2	6,667.7	6,420.0	15.9	18.1	72.71	302.0	571.2	215.9	185.0	30.98	6.970			
6,800.0	6,510.9	6,759.8	6,446.9	16.7	18.7	72.04	390.0	571.2	216.7	184.2	32.55	6.660			
6,900.0	6,530.0	6,850.0	6,462.9	17.7	19.5	71.65	478.7	571.2	217.2	182.7	34.50	6.296			
7,000.0	6,536.2	6,943.5	6,468.2	18.9	20.5	71.50	572.1	571.2	217.4	180.6	36.84	5.902			
7,100.0	6,537.1	7,043.5	6,468.0	20.1	21.6	71.23	672.0	571.2	217.8	178.5	39.26	5.547			
7,200.0	6,538.0	7,143.5	6,467.9	21.5	22.9	70.97	772.0	571.2	218.1	176.3	41.84	5.213			
7,300.0	6,538.9	7,243.5	6,467.7	22.9	24.3	70.71	872.0	571.2	218.4	173.9	44.56	4.902			
7,400.0	6,539.8	7,343.5	6,467.6	24.4	25.8	70.44	972.0	571.2	218.8	171.4	47.40	4.617			
7,500.0	6,540.7	7,443.5	6,467.4	26.0	27.3	70.18	1,072.0	571.2	219.2	168.8	50.32	4.355			
7,600.0	6,541.6	7,543.5	6,467.3	27.6	28.9	69.92	1,172.0	571.2	219.5	166.2	53.32	4.117			
7,700.0	6,542.5	7,643.5	6,467.1	29.2	30.5	69.66	1,272.0	571.2	219.9	163.5	56.39	3.900			
7,800.0	6,543.5	7,743.5	6,466.9	30.9	32.1	69.40	1,372.0	571.2	220.3	160.8	59.50	3.702			
7,900.0	6,544.4	7,843.5	6,466.8	32.6	33.8	69.14	1,472.0	571.2	220.6	158.0	62.65	3.522			
8,000.0	6,545.3	7,943.5	6,466.6	34.3	35.4	68.88	1,572.0	571.2	221.0	155.2	65.83	3.358			
8,100.0	6,546.2	8,043.5	6,466.5	36.0	37.2	68.63	1,672.0	571.2	221.4	152.4	69.04	3.207			
8,200.0	6,547.1	8,143.5	6,466.3	37.8	38.9	68.37	1,772.0	571.2	221.8	149.5	72.27	3.069			
8,300.0	6,548.0	8,243.5	6,466.2	39.6	40.6	68.11	1,872.0	571.2	222.2	146.7	75.51	2.943			
8,400.0	6,548.9	8,343.5	6,466.0	41.4	42.4	67.86	1,972.0	571.2	222.6	143.8	78.77	2.826			
8,500.0	6,549.8	8,443.5	6,465.8	43.2	44.2	67.61	2,072.0	571.2	223.0	141.0	82.04	2.718			
8,600.0	6,550.7	8,543.4	6,465.7	45.0	46.0	67.35	2,172.0	571.2	223.4	138.1	85.31	2.619			
8,700.0	6,551.6	8,643.4	6,465.5	46.8	47.8	67.10	2,272.0	571.2	223.8	135.2	88.59	2.526			
8,800.0	6,552.5	8,743.4	6,465.4	48.6	49.6	66.85	2,371.9	571.2	224.2	132.4	91.87	2.441			
8,900.0	6,553.4	8,843.4	6,465.2	50.4	51.4	66.60	2,471.9	571.2	224.7	129.5	95.16	2.361			
9,000.0	6,554.3	8,943.4	6,465.1	52.3	53.2	66.35	2,571.9	571.2	225.1	126.6	98.44	2.286			
9,100.0	6,555.3	9,043.4	6,464.9	54.1	55.0	66.11	2,671.9	571.2	225.5	123.8	101.72	2.217			
9,200.0	6,556.2	9,143.4	6,464.7	56.0	56.9	65.86	2,771.9	571.2	225.9	120.9	105.00	2.152			
9,300.0	6,557.1	9,243.4	6,464.6	57.8	58.7	65.61	2,871.9	571.2	226.4	118.1	108.28	2.091			
9,400.0	6,558.0	9,343.4	6,464.4	59.7	60.5	65.37	2,971.9	571.2	226.8	115.3	111.55	2.033			
9,500.0	6,558.9	9,443.4	6,464.3	61.5	62.4	65.12	3,071.9	571.2	227.3	112.5	114.81	1.979			
9,600.0	6,559.8	9,543.4	6,464.1	63.4	64.2	64.88	3,171.9	571.2	227.7	109.6	118.07	1.929			
9,700.0	6,560.7	9,643.4	6,464.0	65.3	66.1	64.64	3,271.9	571.2	228.2	106.8	121.33	1.881			

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

<b>Company:</b>	PETROLEUM DEVELOPMENT CORP Weld County CO	<b>Local Co-ordinate Reference:</b>	Well R&R Farms 29Q-441
<b>Project:</b>	SEC.29-T5N-R63W	<b>TVD Reference:</b>	WELL @ 4588.0ft (RKB - 15')
<b>Reference Site:</b>	R&R Farms 5N63W29Q Pad Sec.29-T5N-R63W	<b>MD Reference:</b>	WELL @ 4588.0ft (RKB - 15')
<b>Site Error:</b>	0.0ft	<b>North Reference:</b>	True
<b>Reference Well:</b>	R&R Farms 29Q-441	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.0ft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	Wellbore #1	<b>Database:</b>	landmark
<b>Reference Design:</b>	Plan #1 (9-19-14)	<b>Offset TVD Reference:</b>	Offset Datum

<b>Offset Design</b>													<b>Offset Site Error:</b>	0.0 ft
Survey Program: 0-MWD													<b>Offset Well Error:</b>	0.0 ft
<b>Reference</b>		<b>Offset</b>		<b>Semi Major Axis</b>			<b>Distance</b>							<b>Warning</b>
<b>Measured Depth (ft)</b>	<b>Vertical Depth (ft)</b>	<b>Measured Depth (ft)</b>	<b>Vertical Depth (ft)</b>	<b>Reference (ft)</b>	<b>Offset (ft)</b>	<b>Highside Toolface (°)</b>	<b>Offset Wellbore Centre +N/-S (ft)</b>	<b>+E/-W (ft)</b>	<b>Between Centres (ft)</b>	<b>Between Ellipses (ft)</b>	<b>Minimum Separation (ft)</b>	<b>Separation Factor</b>		
9,800.0	6,561.6	9,743.4	6,463.8	67.1	68.0	64.40	3,371.9	571.2	228.6	104.1	124.57	1.835		
9,900.0	6,562.5	9,843.4	6,463.6	69.0	69.8	64.16	3,471.9	571.2	229.1	101.3	127.81	1.792		
10,000.0	6,563.4	9,943.4	6,463.5	70.9	71.7	63.92	3,571.9	571.2	229.6	98.5	131.04	1.752		
10,100.0	6,564.3	10,043.4	6,463.3	72.8	73.6	63.68	3,671.9	571.2	230.0	95.8	134.26	1.713		
10,200.0	6,565.2	10,143.4	6,463.2	74.6	75.4	63.44	3,771.9	571.2	230.5	93.0	137.48	1.677		
10,300.0	6,566.1	10,243.3	6,463.0	76.5	77.3	63.21	3,871.9	571.2	231.0	90.3	140.68	1.642		
10,400.0	6,567.0	10,343.3	6,462.9	78.4	79.2	62.97	3,971.9	571.2	231.5	87.6	143.87	1.609		
10,500.0	6,568.0	10,443.3	6,462.7	80.3	81.1	62.74	4,071.9	571.2	231.9	84.9	147.06	1.577		
10,600.0	6,568.9	10,543.3	6,462.5	82.2	82.9	62.50	4,171.8	571.2	232.4	82.2	150.23	1.547		
10,700.0	6,569.8	10,643.3	6,462.4	84.1	84.8	62.27	4,271.8	571.2	232.9	79.5	153.40	1.518		
10,800.0	6,570.7	10,743.3	6,462.2	86.0	86.7	62.04	4,371.8	571.2	233.4	76.9	156.55	1.491 Level 3		
10,900.0	6,571.6	10,843.3	6,462.1	87.8	88.4	61.81	4,471.8	571.2	233.9	74.4	159.54	1.466 Level 3		
10,945.5	6,572.0	10,888.8	6,462.0	88.5	89.2	61.71	4,517.3	571.2	234.2	73.5	160.65	1.458 Level 3, SF		

<b>Company:</b>	PETROLEUM DEVELOPMENT CORP Weld County CO	<b>Local Co-ordinate Reference:</b>	Well R&R Farms 29Q-441
<b>Project:</b>	SEC.29-T5N-R63W	<b>TVD Reference:</b>	WELL @ 4588.0ft (RKB - 15')
<b>Reference Site:</b>	R&R Farms 5N63W29Q Pad Sec.29-T5N-R63W	<b>MD Reference:</b>	WELL @ 4588.0ft (RKB - 15')
<b>Site Error:</b>	0.0ft	<b>North Reference:</b>	True
<b>Reference Well:</b>	R&R Farms 29Q-441	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.0ft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	Wellbore #1	<b>Database:</b>	landmark
<b>Reference Design:</b>	Plan #1 (9-19-14)	<b>Offset TVD Reference:</b>	Offset Datum

Reference Depths are relative to WELL @ 4588.0ft (RKB - 15')

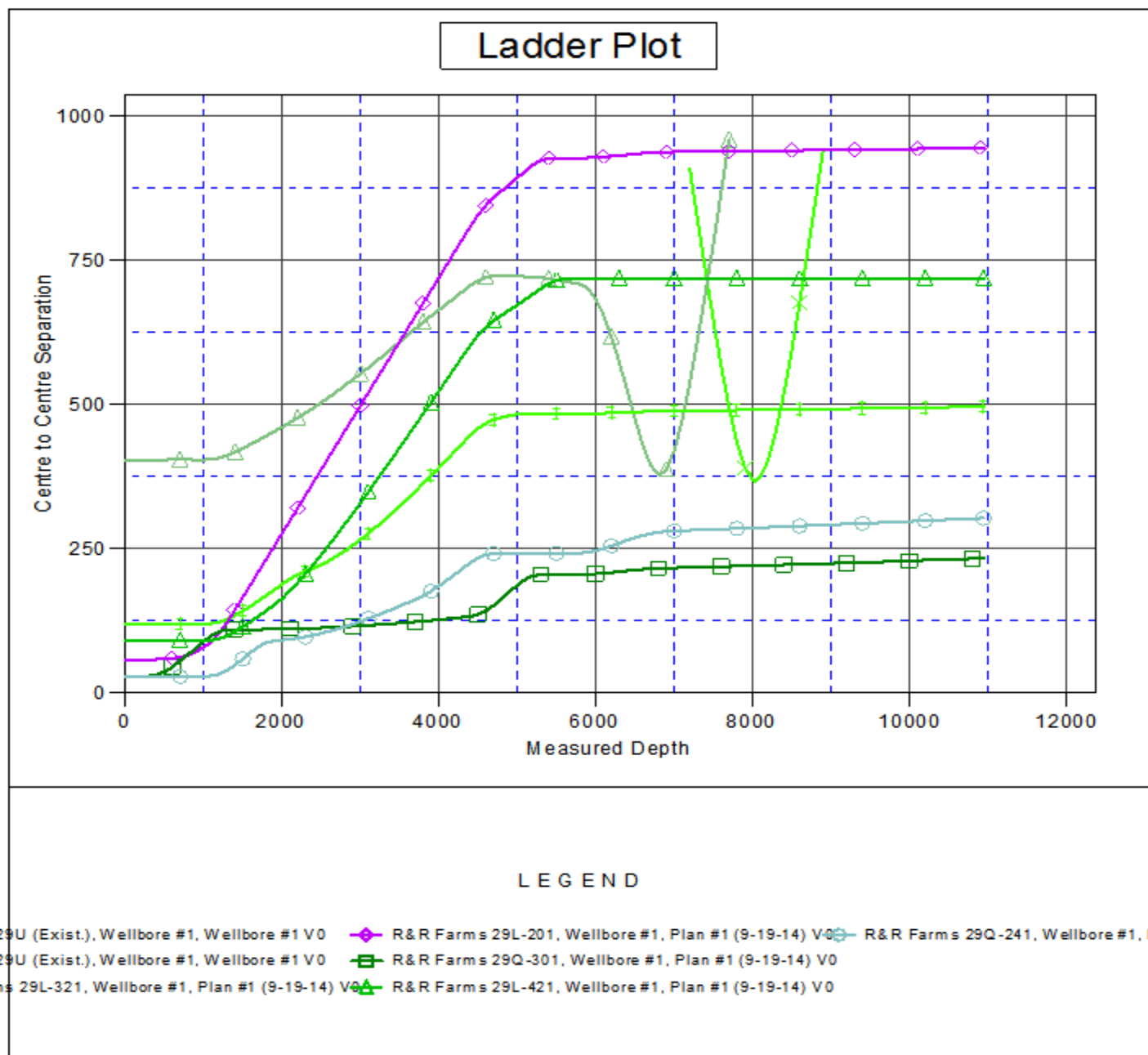
Offset Depths are relative to Offset Datum

Central Meridian is -105.500000 °

Coordinates are relative to: R&amp;R Farms 29Q-441

Coordinate System is US State Plane 1983, Colorado Northern Zone

Grid Convergence at Surface is: 0.67°



<b>Company:</b>	PETROLEUM DEVELOPMENT CORP Weld County CO	<b>Local Co-ordinate Reference:</b>	Well R&R Farms 29Q-441
<b>Project:</b>	SEC.29-T5N-R63W	<b>TVD Reference:</b>	WELL @ 4588.0ft (RKB - 15')
<b>Reference Site:</b>	R&R Farms 5N63W29Q Pad Sec.29-T5N-R63W	<b>MD Reference:</b>	WELL @ 4588.0ft (RKB - 15')
<b>Site Error:</b>	0.0ft	<b>North Reference:</b>	True
<b>Reference Well:</b>	R&R Farms 29Q-441	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.0ft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	Wellbore #1	<b>Database:</b>	landmark
<b>Reference Design:</b>	Plan #1 (9-19-14)	<b>Offset TVD Reference:</b>	Offset Datum

Reference Depths are relative to WELL @ 4588.0ft (RKB - 15')  
 Offset Depths are relative to Offset Datum  
 Central Meridian is -105.500000 °

Coordinates are relative to: R&R Farms 29Q-441  
 Coordinate System is US State Plane 1983, Colorado Northern Zone  
 Grid Convergence at Surface is: 0.67°

