

PETROLEUM DEVELOPMENT CORP Weld County CO

Well Name: **Rieder 18Q-421**

Surface Location: Rieder 4N67W18Q Pad Sec.18-T4N-R67W
North American Datum 1983 , US State Plane 1983 , Colorado Northern Zone

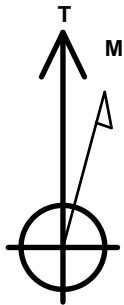
Ground Elevation: 4812.0

+N/-S	+E/-W	Northing	Easting	Latitude	Longitude	Slot
0.0	0.0	1355266.29	3158621.27	40.307210	-104.931240	

RKB - 15' WELL @ 4827.0ft (RKB - 15')

WELLBORE TARGET DETAILS

Name	TVD	+N/-S	+E/-W	Shape
SHL 364'FSL & 2272'FEL	1.0	0.0	0.0	Point
BHL 500'FNL & 2315'FEL	7161.0	4430.0	-231.4	Point



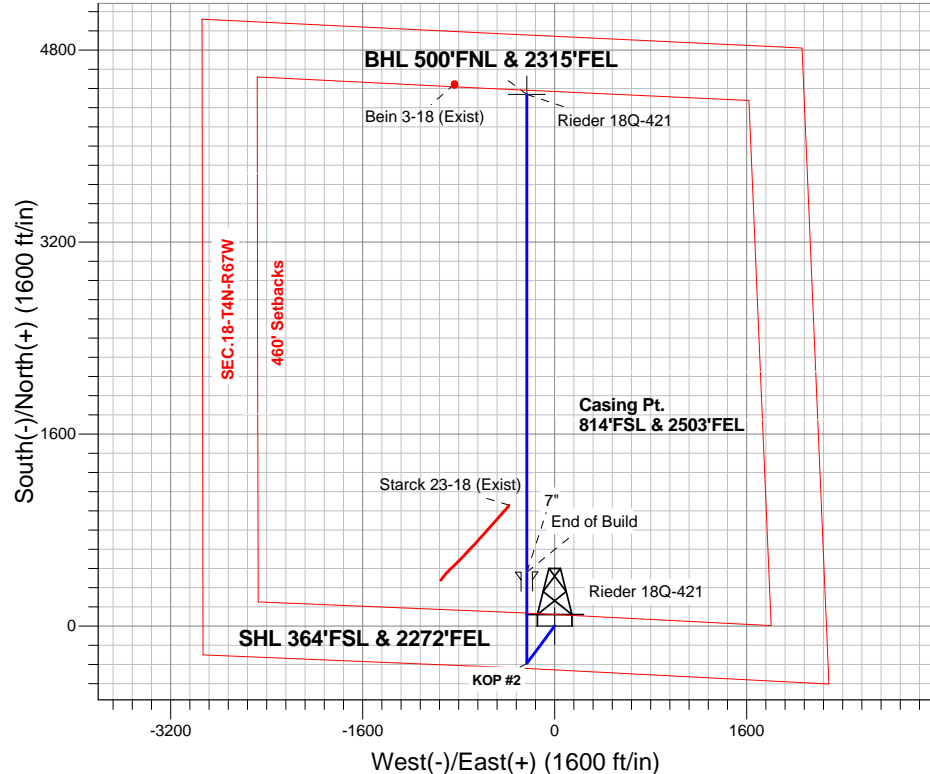
Azimuths to True North
Magnetic North: 8.52°

Magnetic Field
Strength: 52736.2snT
Dip Angle: 66.84°
Date: 7/30/2014
Model: IGRF2010

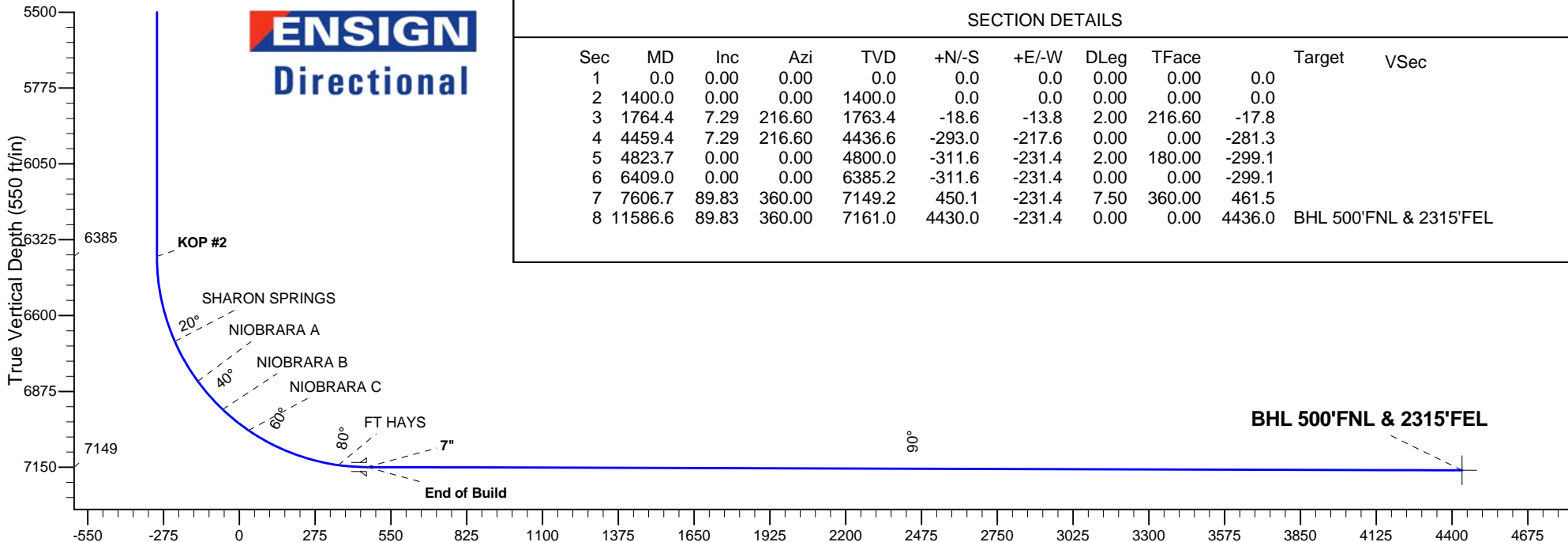
ANNOTATIONS

TVD	MD	Annotation
1400.0	1400.0	KOP #1
6385.3	6409.0	KOP #2
7149.2	7606.7	End of Build

Rieder 4N67W18Q Pad Sec.18-T4N-R67
Rieder 18Q-421
Plan #1 (7-30-14)
14:24, August 04 2014



ENSIGN
Directional



SECTION DETAILS

Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	DLeg	TFace	Target	VSec
1	0.0	0.00	0.00	0.0	0.0	0.0	0.00	0.00	0.0	
2	1400.0	0.00	0.00	1400.0	0.0	0.0	0.00	0.00	0.0	
3	1764.4	7.29	216.60	1763.4	-18.6	-13.8	2.00	216.60	-17.8	
4	4459.4	7.29	216.60	4436.6	-293.0	-217.6	0.00	0.00	-281.3	
5	4823.7	0.00	0.00	4800.0	-311.6	-231.4	2.00	180.00	-299.1	
6	6409.0	0.00	0.00	6385.2	-311.6	-231.4	0.00	0.00	-299.1	
7	7606.7	89.83	360.00	7149.2	450.1	-231.4	7.50	360.00	461.5	
8	11586.6	89.83	360.00	7161.0	4430.0	-231.4	0.00	0.00	4436.0	BHL 500'FNL & 2315'FEL

Vertical Section at 357.01° (550 ft/in)



PETROLEUM DEVELOPMENT CORP Weld County CO

SEC.18-T4N-R67W

Rieder 4N67W18Q Pad Sec.18-T4N-R67

Rieder 18Q-421

Wellbore #1

Plan: Plan #1 (7-30-14)

Standard Planning Report

04 August, 2014

Database:	Landmark	Local Co-ordinate Reference:	Well Rieder 18Q-421
Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	TVD Reference:	WELL @ 4827.0ft (RKB - 15')
Project:	SEC.18-T4N-R67W	MD Reference:	WELL @ 4827.0ft (RKB - 15')
Site:	Rieder 4N67W18Q Pad Sec.18-T4N-R67	North Reference:	True
Well:	Rieder 18Q-421	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Plan #1 (7-30-14)		

Project	SEC.18-T4N-R67W, Weld County, CO		
Map System:	US State Plane 1983	System Datum:	Mean Sea Level
Geo Datum:	North American Datum 1983		Using Well Reference Point
Map Zone:	Colorado Northern Zone		Using geodetic scale factor

Site						Rieder 4N67W18Q Pad Sec.18-T4N-R67											
Site Position:						Northing:			1,355,266.69 ft			Latitude:			40.307210		
From:			Lat/Long			Easting:			3,158,679.84 ft			Longitude:			-104.931030		
Position Uncertainty:			0.0 ft			Slot Radius:			"			Grid Convergence:			0.37 °		

Well	Rieder 18Q-421					
Well Position	+N/-S	0.0 ft	Northing:	1,355,266.29 ft	Latitude:	40.307210
	+E/-W	-58.6 ft	Easting:	3,158,621.27 ft	Longitude:	-104.931240
Position Uncertainty		0.0 ft	Wellhead Elevation:	ft	Ground Level:	4,812.0 ft

Wellbore	Wellbore #1				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	7/30/2014	8.53	66.84	52,736

Design	Plan #1 (7-30-14)			
Audit Notes:				
Version:	Phase:	PROTOTYPE	Tie On Depth:	0.0
Vertical Section:	Depth From (TVD) (ft)	+N/-S (ft)	+E/-W (ft)	Direction (°)
	0.0	0.0	0.0	357.01

Plan Sections										
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)	TFO (°)	Target
0.0	0.00	0.00	0.0	0.0	0.0	0.00	0.00	0.00	0.00	
1,400.0	0.00	0.00	1,400.0	0.0	0.0	0.00	0.00	0.00	0.00	
1,764.4	7.29	216.60	1,763.4	-18.6	-13.8	2.00	2.00	0.00	216.60	
4,459.4	7.29	216.60	4,436.6	-293.0	-217.6	0.00	0.00	0.00	0.00	
4,823.7	0.00	0.00	4,800.0	-311.6	-231.4	2.00	-2.00	0.00	180.00	
6,409.0	0.00	0.00	6,385.2	-311.6	-231.4	0.00	0.00	0.00	0.00	
7,606.7	89.83	360.00	7,149.2	450.1	-231.4	7.50	7.50	0.00	360.00	
11,586.6	89.83	360.00	7,161.0	4,430.0	-231.4	0.00	0.00	0.00	0.00	BHL 500'FNL & 231

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Project:	SEC.18-T4N-R67W	MD Reference:	WELL @ 4827.0ft (RKB - 15')
Site:	Rieder 4N67W18Q Pad Sec.18-T4N-R67	North Reference:	True
Well:	Rieder 18Q-421	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Plan #1 (7-30-14)		

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
1.0	0.00	0.00	1.0	0.0	0.0	0.0	0.00	0.00	0.00
SHL 364'FSL & 2272'FEL									
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
1,100.0	0.00	0.00	1,100.0	0.0	0.0	0.0	0.00	0.00	0.00
1,200.0	0.00	0.00	1,200.0	0.0	0.0	0.0	0.00	0.00	0.00
1,300.0	0.00	0.00	1,300.0	0.0	0.0	0.0	0.00	0.00	0.00
1,400.0	0.00	0.00	1,400.0	0.0	0.0	0.0	0.00	0.00	0.00
KOP #1									
1,500.0	2.00	216.60	1,500.0	-1.4	-1.0	-1.3	2.00	2.00	0.00
1,600.0	4.00	216.60	1,599.8	-5.6	-4.2	-5.4	2.00	2.00	0.00
1,700.0	6.00	216.60	1,699.5	-12.6	-9.4	-12.1	2.00	2.00	0.00
1,764.4	7.29	216.60	1,763.4	-18.6	-13.8	-17.8	2.00	2.00	0.00
1,800.0	7.29	216.60	1,798.7	-22.2	-16.5	-21.3	0.00	0.00	0.00
1,900.0	7.29	216.60	1,897.9	-32.4	-24.1	-31.1	0.00	0.00	0.00
2,000.0	7.29	216.60	1,997.1	-42.6	-31.6	-40.9	0.00	0.00	0.00
2,100.0	7.29	216.60	2,096.3	-52.8	-39.2	-50.6	0.00	0.00	0.00
2,200.0	7.29	216.60	2,195.5	-62.9	-46.7	-60.4	0.00	0.00	0.00
2,300.0	7.29	216.60	2,294.7	-73.1	-54.3	-70.2	0.00	0.00	0.00
2,400.0	7.29	216.60	2,393.9	-83.3	-61.9	-80.0	0.00	0.00	0.00
2,500.0	7.29	216.60	2,493.1	-93.5	-69.4	-89.7	0.00	0.00	0.00
2,600.0	7.29	216.60	2,592.3	-103.7	-77.0	-99.5	0.00	0.00	0.00
2,700.0	7.29	216.60	2,691.5	-113.9	-84.6	-109.3	0.00	0.00	0.00
2,800.0	7.29	216.60	2,790.7	-124.0	-92.1	-119.1	0.00	0.00	0.00
2,900.0	7.29	216.60	2,889.8	-134.2	-99.7	-128.8	0.00	0.00	0.00
3,000.0	7.29	216.60	2,989.0	-144.4	-107.2	-138.6	0.00	0.00	0.00
3,100.0	7.29	216.60	3,088.2	-154.6	-114.8	-148.4	0.00	0.00	0.00
3,200.0	7.29	216.60	3,187.4	-164.8	-122.4	-158.2	0.00	0.00	0.00
3,300.0	7.29	216.60	3,286.6	-175.0	-129.9	-167.9	0.00	0.00	0.00
3,400.0	7.29	216.60	3,385.8	-185.1	-137.5	-177.7	0.00	0.00	0.00
3,464.7	7.29	216.60	3,450.0	-191.7	-142.4	-184.0	0.00	0.00	0.00
PARKMAN									
3,500.0	7.29	216.60	3,485.0	-195.3	-145.1	-187.5	0.00	0.00	0.00
3,600.0	7.29	216.60	3,584.2	-205.5	-152.6	-197.3	0.00	0.00	0.00
3,700.0	7.29	216.60	3,683.4	-215.7	-160.2	-207.0	0.00	0.00	0.00
3,800.0	7.29	216.60	3,782.6	-225.9	-167.7	-216.8	0.00	0.00	0.00
3,900.0	7.29	216.60	3,881.8	-236.1	-175.3	-226.6	0.00	0.00	0.00
3,978.9	7.29	216.60	3,960.0	-244.1	-181.3	-234.3	0.00	0.00	0.00
SUSSEX									
4,000.0	7.29	216.60	3,981.0	-246.2	-182.9	-236.4	0.00	0.00	0.00
4,100.0	7.29	216.60	4,080.2	-256.4	-190.4	-246.1	0.00	0.00	0.00
4,200.0	7.29	216.60	4,179.3	-266.6	-198.0	-255.9	0.00	0.00	0.00
4,300.0	7.29	216.60	4,278.5	-276.8	-205.6	-265.7	0.00	0.00	0.00
4,400.0	7.29	216.60	4,377.7	-287.0	-213.1	-275.5	0.00	0.00	0.00

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Site:	Rieder 4N67W18Q Pad Sec.18-T4N-R67	North Reference:	True
Well:	Rieder 18Q-421	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Plan #1 (7-30-14)		

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)
4,459.4	7.29	216.60	4,436.6	-293.0	-217.6	-281.3	0.00	0.00	0.00
4,500.0	6.47	216.60	4,477.0	-296.9	-220.5	-285.0	2.00	-2.00	0.00
4,543.3	5.61	216.60	4,520.0	-300.6	-223.2	-288.5	2.00	-2.00	0.00
SHANNON									
4,600.0	4.47	216.60	4,576.5	-304.6	-226.2	-292.4	2.00	-2.00	0.00
4,700.0	2.47	216.60	4,676.3	-309.5	-229.8	-297.0	2.00	-2.00	0.00
4,800.0	0.47	216.60	4,776.3	-311.5	-231.3	-299.0	2.00	-2.00	0.00
4,823.7	0.00	0.00	4,800.0	-311.6	-231.4	-299.1	2.00	-2.00	0.00
4,900.0	0.00	0.00	4,876.3	-311.6	-231.4	-299.1	0.00	0.00	0.00
5,000.0	0.00	0.00	4,976.3	-311.6	-231.4	-299.1	0.00	0.00	0.00
5,100.0	0.00	0.00	5,076.3	-311.6	-231.4	-299.1	0.00	0.00	0.00
5,200.0	0.00	0.00	5,176.3	-311.6	-231.4	-299.1	0.00	0.00	0.00
5,300.0	0.00	0.00	5,276.3	-311.6	-231.4	-299.1	0.00	0.00	0.00
5,400.0	0.00	0.00	5,376.3	-311.6	-231.4	-299.1	0.00	0.00	0.00
5,500.0	0.00	0.00	5,476.3	-311.6	-231.4	-299.1	0.00	0.00	0.00
5,600.0	0.00	0.00	5,576.3	-311.6	-231.4	-299.1	0.00	0.00	0.00
5,700.0	0.00	0.00	5,676.3	-311.6	-231.4	-299.1	0.00	0.00	0.00
5,800.0	0.00	0.00	5,776.3	-311.6	-231.4	-299.1	0.00	0.00	0.00
5,900.0	0.00	0.00	5,876.3	-311.6	-231.4	-299.1	0.00	0.00	0.00
6,000.0	0.00	0.00	5,976.3	-311.6	-231.4	-299.1	0.00	0.00	0.00
6,100.0	0.00	0.00	6,076.3	-311.6	-231.4	-299.1	0.00	0.00	0.00
6,200.0	0.00	0.00	6,176.3	-311.6	-231.4	-299.1	0.00	0.00	0.00
6,300.0	0.00	0.00	6,276.3	-311.6	-231.4	-299.1	0.00	0.00	0.00
6,400.0	0.00	0.00	6,376.3	-311.6	-231.4	-299.1	0.00	0.00	0.00
6,409.0	0.00	0.00	6,385.3	-311.6	-231.4	-299.1	0.00	0.00	0.00
KOP #2									
6,500.0	6.83	360.00	6,476.1	-306.2	-231.4	-293.7	7.50	7.50	0.00
6,600.0	14.33	360.00	6,574.3	-287.8	-231.4	-275.4	7.50	7.50	0.00
6,700.0	21.83	360.00	6,669.3	-256.8	-231.4	-244.4	7.50	7.50	0.00
6,726.8	23.84	360.00	6,694.0	-246.4	-231.4	-234.0	7.50	7.50	0.00
SHARON SPRINGS									
6,800.0	29.33	360.00	6,759.4	-213.7	-231.4	-201.3	7.50	7.50	0.00
6,893.6	36.35	360.00	6,838.0	-163.0	-231.4	-150.7	7.50	7.50	0.00
NIORARA A									
6,900.0	36.83	360.00	6,843.2	-159.2	-231.4	-146.9	7.50	7.50	0.00
7,000.0	44.33	360.00	6,919.1	-94.2	-231.4	-82.0	7.50	7.50	0.00
7,029.9	46.57	360.00	6,940.0	-72.9	-231.4	-60.7	7.50	7.50	0.00
NIORARA B									
7,100.0	51.83	360.00	6,985.8	-19.8	-231.4	-7.7	7.50	7.50	0.00
7,151.0	55.65	360.00	7,016.0	21.3	-231.4	33.4	7.50	7.50	0.00
NIORARA C									
7,200.0	59.33	360.00	7,042.3	62.6	-231.4	74.6	7.50	7.50	0.00
7,300.0	66.83	360.00	7,087.6	151.7	-231.4	163.6	7.50	7.50	0.00
7,400.0	74.33	360.00	7,120.8	246.0	-231.4	257.7	7.50	7.50	0.00
7,500.0	81.83	360.00	7,141.4	343.7	-231.4	355.3	7.50	7.50	0.00
7,504.1	82.13	360.00	7,142.0	347.7	-231.4	359.3	7.50	7.50	0.00
FT HAYS									
7,600.0	89.33	360.00	7,149.1	443.4	-231.4	454.8	7.50	7.50	0.00
7,606.7	89.83	360.00	7,149.2	450.1	-231.4	461.5	7.50	7.50	0.00
End of Build - 7"									
7,700.0	89.83	360.00	7,149.5	543.4	-231.4	554.7	0.00	0.00	0.00
7,800.0	89.83	360.00	7,149.8	643.4	-231.4	654.6	0.00	0.00	0.00

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Project:	SEC.18-T4N-R67W	MD Reference:	WELL @ 4827.0ft (RKB - 15')
Site:	Rieder 4N67W18Q Pad Sec.18-T4N-R67	North Reference:	True
Well:	Rieder 18Q-421	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Plan #1 (7-30-14)		

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	89.83	360.00	7,150.1	743.4	-231.4	754.4	0.00	0.00	0.00
8,000.0	89.83	360.00	7,150.4	843.4	-231.4	854.3	0.00	0.00	0.00
8,100.0	89.83	360.00	7,150.7	943.4	-231.4	954.1	0.00	0.00	0.00
8,200.0	89.83	360.00	7,151.0	1,043.4	-231.4	1,054.0	0.00	0.00	0.00
8,300.0	89.83	360.00	7,151.2	1,143.4	-231.4	1,153.9	0.00	0.00	0.00
8,400.0	89.83	360.00	7,151.5	1,243.4	-231.4	1,253.7	0.00	0.00	0.00
8,500.0	89.83	360.00	7,151.8	1,343.4	-231.4	1,353.6	0.00	0.00	0.00
8,600.0	89.83	360.00	7,152.1	1,443.4	-231.4	1,453.5	0.00	0.00	0.00
8,700.0	89.83	360.00	7,152.4	1,543.4	-231.4	1,553.3	0.00	0.00	0.00
8,800.0	89.83	360.00	7,152.7	1,643.4	-231.4	1,653.2	0.00	0.00	0.00
8,900.0	89.83	360.00	7,153.0	1,743.4	-231.4	1,753.1	0.00	0.00	0.00
9,000.0	89.83	360.00	7,153.3	1,843.4	-231.4	1,852.9	0.00	0.00	0.00
9,100.0	89.83	360.00	7,153.6	1,943.4	-231.4	1,952.8	0.00	0.00	0.00
9,200.0	89.83	360.00	7,153.9	2,043.4	-231.4	2,052.6	0.00	0.00	0.00
9,300.0	89.83	360.00	7,154.2	2,143.4	-231.4	2,152.5	0.00	0.00	0.00
9,400.0	89.83	360.00	7,154.5	2,243.4	-231.4	2,252.4	0.00	0.00	0.00
9,500.0	89.83	360.00	7,154.8	2,343.4	-231.4	2,352.2	0.00	0.00	0.00
9,600.0	89.83	360.00	7,155.1	2,443.4	-231.4	2,452.1	0.00	0.00	0.00
9,700.0	89.83	360.00	7,155.4	2,543.4	-231.4	2,552.0	0.00	0.00	0.00
9,800.0	89.83	360.00	7,155.7	2,643.4	-231.4	2,651.8	0.00	0.00	0.00
9,900.0	89.83	360.00	7,156.0	2,743.4	-231.4	2,751.7	0.00	0.00	0.00
10,000.0	89.83	360.00	7,156.3	2,843.4	-231.4	2,851.6	0.00	0.00	0.00
10,100.0	89.83	360.00	7,156.6	2,943.4	-231.4	2,951.4	0.00	0.00	0.00
10,200.0	89.83	360.00	7,156.9	3,043.4	-231.4	3,051.3	0.00	0.00	0.00
10,300.0	89.83	360.00	7,157.2	3,143.4	-231.4	3,151.1	0.00	0.00	0.00
10,400.0	89.83	360.00	7,157.5	3,243.3	-231.4	3,251.0	0.00	0.00	0.00
10,500.0	89.83	360.00	7,157.8	3,343.3	-231.4	3,350.9	0.00	0.00	0.00
10,600.0	89.83	360.00	7,158.1	3,443.3	-231.4	3,450.7	0.00	0.00	0.00
10,700.0	89.83	360.00	7,158.4	3,543.3	-231.4	3,550.6	0.00	0.00	0.00
10,800.0	89.83	360.00	7,158.7	3,643.3	-231.4	3,650.5	0.00	0.00	0.00
10,900.0	89.83	360.00	7,159.0	3,743.3	-231.4	3,750.3	0.00	0.00	0.00
11,000.0	89.83	360.00	7,159.3	3,843.3	-231.4	3,850.2	0.00	0.00	0.00
11,100.0	89.83	360.00	7,159.6	3,943.3	-231.4	3,950.1	0.00	0.00	0.00
11,200.0	89.83	360.00	7,159.9	4,043.3	-231.4	4,049.9	0.00	0.00	0.00
11,300.0	89.83	360.00	7,160.1	4,143.3	-231.4	4,149.8	0.00	0.00	0.00
11,400.0	89.83	360.00	7,160.4	4,243.3	-231.4	4,249.6	0.00	0.00	0.00
11,500.0	89.83	360.00	7,160.7	4,343.3	-231.4	4,349.5	0.00	0.00	0.00
11,586.6	89.83	360.00	7,161.0	4,430.0	-231.4	4,436.0	0.00	0.00	0.00
BHL 500'FNL & 2315'FEL									

Targets									
Target Name	Dip Angle (°)	Dip Dir. (°)	TVD (ft)	+N/-S (ft)	+E/-W (ft)	Northing (ft)	Easting (ft)	Latitude	Longitude
- hit/miss target									
- Shape									
SHL 364'FSL & 2272'	0.00	0.00	1.0	0.0	0.0	1,355,266.31	3,158,621.27	40.307210	-104.931240
- plan hits target center									
- Point									
BHL 500'FNL & 2315'	0.00	0.00	7,161.0	4,430.0	-231.4	1,359,694.51	3,158,361.43	40.319370	-104.932070
- plan hits target center									
- Point									

Database:	Landmark	Local Co-ordinate Reference:	Well Rieder 18Q-421
Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	TVD Reference:	WELL @ 4827.0ft (RKB - 15')
Project:	SEC.18-T4N-R67W	MD Reference:	WELL @ 4827.0ft (RKB - 15')
Site:	Rieder 4N67W18Q Pad Sec.18-T4N-R67	North Reference:	True
Well:	Rieder 18Q-421	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Plan #1 (7-30-14)		

Casing Points

Measured Depth (ft)	Vertical Depth (ft)	Name	Casing Diameter (")	Hole Diameter (")
7,606.7	7,149.2	7"	7	7-1/2

Formations

Measured Depth (ft)	Vertical Depth (ft)	Name	Lithology	Dip (°)	Dip Direction (°)
3,464.7	3,450.0	PARKMAN			
3,978.9	3,960.0	SUSSEX			
4,543.3	4,520.0	SHANNON			
6,726.8	6,694.0	SHARON SPRINGS			
6,893.6	6,838.0	NIOBRARA A			
7,029.9	6,940.0	NIOBRARA B			
7,151.0	7,016.0	NIOBRARA C			
7,504.1	7,142.0	FT HAYS			
	7,163.0	CODELL			

Plan Annotations

Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment
		+N/-S (ft)	+E/-W (ft)	
1,400.0	1,400.0	0.0	0.0	KOP #1
6,409.0	6,385.3	-311.6	-231.4	KOP #2
7,606.7	7,149.2	450.1	-231.4	End of Build



PETROLEUM DEVELOPMENT CORP Weld County CO

SEC.18-T4N-R67W

Rieder 4N67W18Q Pad Sec.18-T4N-R67

Rieder 18Q-421

Wellbore #1

Plan #1 (7-30-14)

Anticollision Report

04 August, 2014



Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Rieder 18Q-421
Project:	SEC.18-T4N-R67W	TVD Reference:	WELL @ 4827.0ft (RKB - 15')
Reference Site:	Rieder 4N67W18Q Pad Sec.18-T4N-R67	MD Reference:	WELL @ 4827.0ft (RKB - 15')
Site Error:	0.0ft	North Reference:	True
Reference Well:	Rieder 18Q-421	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	Landmark
Reference Design:	Plan #1 (7-30-14)	Offset TVD Reference:	Offset Datum

Reference	Plan #1 (7-30-14)
Filter type:	NO GLOBAL FILTER: Using user defined selection & filtering criteria
Interpolation Method:	Stations
Depth Range:	Unlimited
Results Limited by:	Maximum center-center distance of 1,000.0ft
Warning Levels Evaluated at:	2.00 Sigma
Error Model:	ISCWSA
Scan Method:	Closest Approach 3D
Error Surface:	Elliptical Conic

Survey Tool Program		Date	8/4/2014		
From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description	
0.0	11,586.6	Plan #1 (7-30-14) (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
Offset Well - Wellbore - Design						
Existing Wells Sec.18-T4N-R67W						
Bein 3-18 (Exist) - Wellbore #1 - Wellbore #1	11,586.6	7,177.0	608.6	377.4	2.632	CC, ES, SF
Starck 23-18 (Exist) - Wellbore #1 - Wellbore #1	8,153.2	7,211.1	154.8	-141.4	0.523	Level 1, CC, ES, SF
Rieder 4N67W18Q Pad Sec.18-T4N-R67						
Rieder 18Q-221 - Wellbore #1 - Plan #1 (7-30-14)	1,400.0	1,400.0	58.6	52.5	9.651	CC, ES
Rieder 18Q-221 - Wellbore #1 - Plan #1 (7-30-14)	11,586.6	11,376.4	381.3	232.5	2.563	SF
Rieder 18Q-321 - Wellbore #1 - Plan #1 (7-30-14)	1,400.0	1,400.0	30.7	24.6	5.055	CC, ES
Rieder 18T-241 - Wellbore #1 - Plan #1 (7-30-14)	11,586.6	11,478.3	207.2	67.9	1.487	Level 3, SF
Rieder 18T-201 - Wellbore #1 - Plan #1 (7-30-14)	800.0	799.0	178.5	175.1	52.979	CC, ES
Rieder 18T-201 - Wellbore #1 - Plan #1 (7-30-14)	11,586.6	11,412.1	957.5	786.3	5.592	SF
Rieder 18T-241 - Wellbore #1 - Plan #1 (7-30-14)	1,200.0	1,200.0	119.9	114.8	23.199	CC, ES
Rieder 18T-241 - Wellbore #1 - Plan #1 (7-30-14)	11,586.6	11,387.6	659.8	492.9	3.953	SF
Rieder 18T-301 - Wellbore #1 - Plan #1 (7-30-14)	1,000.0	999.0	150.6	146.3	35.285	CC, ES
Rieder 18T-301 - Wellbore #1 - Plan #1 (7-30-14)	11,586.6	11,497.6	790.6	617.7	4.572	SF
Rieder 18T-341 - Wellbore #1 - Plan #1 (7-30-14)	1,400.0	1,400.0	89.2	83.2	14.707	CC, ES
Rieder 18T-341 - Wellbore #1 - Plan #1 (7-30-14)	11,586.6	11,477.3	485.8	316.9	2.875	SF

Offset Design													
Existing Wells Sec.18-T4N-R67W - Bein 3-18 (Exist) - Wellbore #1 - Wellbore #1													
Survey Program: 7296-UNKNOWN													
Reference Offset Semi Major Axis													
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)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
10,900.0	7,159.0	7,175.0	7,175.0	74.8	143.5	-89.78	4,517.4	-833.8	980.8	762.5	218.29	4.493	
11,000.0	7,159.3	7,175.3	7,175.3	76.7	143.5	-89.81	4,517.4	-833.8	904.0	683.8	220.17	4.106	
11,100.0	7,159.6	7,175.6	7,175.6	78.6	143.5	-89.84	4,517.4	-833.8	832.1	610.0	222.06	3.747	
11,200.0	7,159.9	7,175.9	7,175.9	80.5	143.5	-89.87	4,517.4	-833.8	766.5	542.6	223.95	3.423	
11,300.0	7,160.1	7,176.1	7,176.1	82.4	143.5	-89.89	4,517.4	-833.8	709.0	483.2	225.84	3.140	
11,400.0	7,160.4	7,176.4	7,176.4	84.3	143.5	-89.92	4,517.4	-833.8	661.8	434.0	227.73	2.906	
11,500.0	7,160.7	7,176.7	7,176.7	86.1	143.5	-89.95	4,517.4	-833.8	627.0	397.3	229.63	2.730	
11,586.6	7,161.0	7,177.0	7,177.0	87.8	143.5	-89.98	4,517.4	-833.8	608.6	377.4	231.27	2.632	CC, ES, SF

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Rieder 18Q-421
Project:	SEC.18-T4N-R67W	TVD Reference:	WELL @ 4827.0ft (RKB - 15')
Reference Site:	Rieder 4N67W18Q Pad Sec.18-T4N-R67	MD Reference:	WELL @ 4827.0ft (RKB - 15')
Site Error:	0.0ft	North Reference:	True
Reference Well:	Rieder 18Q-421	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	Landmark
Reference Design:	Plan #1 (7-30-14)	Offset TVD Reference:	Offset Datum

Offset Design Existing Wells Sec.18-T4N-R67W - Starck 23-18 (Exist) - Wellbore #1 - Wellbore #1													Offset Site Error:	0.0 ft
Survey Program: 769-UNKNOWN													Offset Well Error:	0.0 ft
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference	Offset	Semi Major Axis	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
2,000.0	1,997.1	2,008.0	2,006.0	4.3	62.3	82.19		434.2	-907.7	997.6	931.1	66.56	14.988	
2,100.0	2,096.3	2,103.0	2,100.7	4.5	66.0	83.29		439.5	-902.3	993.8	923.3	70.55	14.087	
2,200.0	2,195.5	2,208.2	2,205.7	4.8	70.2	84.51		445.3	-896.3	990.3	915.3	74.94	13.214	
2,300.0	2,294.7	2,299.8	2,296.8	5.1	73.8	85.64		451.2	-890.5	987.1	908.3	78.85	12.519	
2,400.0	2,393.9	2,396.0	2,392.6	5.3	77.7	86.87		458.1	-884.4	984.8	901.8	83.03	11.861	
2,500.0	2,493.1	2,493.0	2,489.1	5.6	81.6	88.11		465.0	-878.4	983.1	895.9	87.24	11.269	
2,600.0	2,592.3	2,596.1	2,591.8	5.9	85.8	89.42		472.0	-872.0	981.6	890.0	91.67	10.708	
2,700.0	2,691.5	2,699.5	2,694.8	6.2	89.9	90.71		478.4	-865.2	980.1	884.0	96.10	10.198	
2,800.0	2,790.7	2,803.0	2,797.8	6.5	94.0	92.03		484.7	-857.8	978.4	877.9	100.49	9.737	
2,900.0	2,889.8	2,905.8	2,900.0	6.8	98.0	93.41		491.4	-849.2	976.6	871.8	104.85	9.314	
2,985.4	2,974.5	2,974.7	2,968.4	7.1	100.8	94.44		497.4	-842.4	975.8	867.9	107.90	9.043	
3,000.0	2,989.0	2,990.0	2,983.5	7.1	101.5	94.68		499.0	-840.9	975.9	867.3	108.57	8.988	
3,100.0	3,088.2	3,081.4	3,073.8	7.4	105.3	96.15		509.2	-831.7	977.0	864.3	112.69	8.670	
3,200.0	3,187.4	3,180.0	3,171.3	7.7	109.4	97.76		520.3	-821.1	978.6	861.5	117.10	8.356	
3,300.0	3,286.6	3,283.1	3,273.1	8.0	113.7	99.43		532.0	-810.3	981.2	859.5	121.71	8.062	
3,400.0	3,385.8	3,382.1	3,370.5	8.4	117.9	101.17		543.9	-797.0	983.1	856.9	126.14	7.794	
3,500.0	3,485.0	3,464.5	3,451.2	8.7	121.4	102.71		555.4	-785.1	986.7	856.8	129.93	7.594	
3,600.0	3,584.2	3,552.9	3,537.1	9.0	125.3	104.51		570.4	-770.8	992.6	858.5	134.04	7.405	
3,700.0	3,683.4	3,642.0	3,623.1	9.3	129.3	106.43		587.1	-754.6	1,000.0	861.7	138.22	7.235	
7,150.0	7,015.4	7,054.6	6,981.7	15.5	272.7	-15.37		993.3	-387.0	985.4	798.7	186.70	5.278	
7,200.0	7,042.3	7,079.0	7,006.0	15.5	273.4	-17.47		993.8	-387.0	944.4	768.0	176.42	5.353	
7,250.0	7,066.4	7,105.4	7,032.5	15.7	274.3	-20.33		994.5	-386.9	901.8	733.6	168.18	5.362	
7,300.0	7,087.6	7,129.1	7,056.1	15.9	275.1	-24.08		995.0	-386.9	857.6	694.1	163.57	5.243	
7,350.0	7,105.7	7,149.5	7,076.5	16.2	275.8	-29.07		995.4	-386.7	812.2	646.8	165.41	4.911	
7,400.0	7,120.8	7,166.5	7,093.5	16.6	276.3	-35.78		995.7	-386.6	765.8	588.8	177.04	4.326	
7,450.0	7,132.7	7,179.7	7,106.7	17.0	276.8	-44.71		996.0	-386.5	718.5	518.3	200.22	3.589	
7,500.0	7,141.4	7,189.3	7,116.3	17.4	277.1	-56.20		996.2	-386.4	670.7	438.4	232.33	2.887	
7,550.0	7,146.9	7,195.7	7,122.7	17.9	277.4	-69.90		996.3	-386.4	622.6	358.1	264.44	2.354	
7,600.0	7,149.1	7,198.8	7,125.9	18.4	277.5	-84.18		996.4	-386.3	574.4	289.6	284.78	2.017	
7,606.7	7,149.2	7,199.0	7,126.0	18.5	277.5	-86.02		996.4	-386.3	567.9	281.7	286.25	1.984	
7,700.0	7,149.5	7,201.1	7,128.1	19.5	277.6	-86.77		996.4	-386.3	478.9	191.0	287.85	1.664	
7,800.0	7,149.8	7,203.3	7,130.3	20.7	277.7	-87.59		996.4	-386.3	385.6	96.0	289.63	1.331 Level 3	
7,900.0	7,150.1	7,205.5	7,132.5	22.1	277.7	-88.40		996.5	-386.3	296.8	5.3	291.46	1.018 Level 2	
8,000.0	7,150.4	7,207.7	7,134.7	23.5	277.8	-89.22		996.5	-386.3	217.8	-75.5	293.31	0.743 Level 1	
8,100.0	7,150.7	7,209.9	7,136.9	24.9	277.9	-90.03		996.6	-386.2	163.7	-131.5	295.18	0.555 Level 1	
8,153.2	7,150.8	7,211.1	7,138.1	25.8	277.9	-90.47		996.6	-386.2	154.8	-141.4	296.18	0.523 Level 1, CC, ES, SF	
8,200.0	7,151.0	7,212.1	7,139.1	26.5	278.0	-90.85		996.6	-386.2	161.7	-135.3	297.05	0.544 Level 1	
8,300.0	7,151.2	7,214.3	7,141.3	28.0	278.1	-91.67		996.7	-386.2	213.3	-85.6	298.90	0.714 Level 1	
8,400.0	7,151.5	7,216.5	7,143.6	29.7	278.1	-92.50		996.7	-386.2	291.3	-9.5	300.74	0.968 Level 1	
8,500.0	7,151.8	7,218.8	7,145.8	31.3	278.2	-93.32		996.7	-386.2	379.7	77.1	302.55	1.255 Level 3	
8,600.0	7,152.1	7,221.0	7,148.0	33.0	278.3	-94.14		996.8	-386.2	472.7	168.4	304.32	1.553	
8,700.0	7,152.4	7,223.2	7,150.2	34.7	278.4	-94.96		996.8	-386.1	568.1	262.1	306.06	1.856	
8,800.0	7,152.7	7,225.5	7,152.5	36.4	278.5	-95.78		996.9	-386.1	664.9	357.1	307.75	2.160	
8,900.0	7,153.0	7,227.7	7,154.7	38.2	278.6	-96.60		996.9	-386.1	762.5	453.1	309.39	2.464	
9,000.0	7,153.3	7,229.9	7,157.0	39.9	278.6	-97.42		997.0	-386.1	860.6	549.6	310.99	2.767	
9,100.0	7,153.6	7,232.2	7,159.2	41.7	278.7	-98.23		997.0	-386.1	959.1	646.6	312.53	3.069	

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Rieder 18Q-421
Project:	SEC.18-T4N-R67W	TVD Reference:	WELL @ 4827.0ft (RKB - 15')
Reference Site:	Rieder 4N67W18Q Pad Sec.18-T4N-R67	MD Reference:	WELL @ 4827.0ft (RKB - 15')
Site Error:	0.0ft	North Reference:	True
Reference Well:	Rieder 18Q-421	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	Landmark
Reference Design:	Plan #1 (7-30-14)	Offset TVD Reference:	Offset Datum

Offset Design Rieder 4N67W18Q Pad Sec.18-T4N-R67 - Rieder 18Q-221 - Wellbore #1 - Plan #1 (7-30-14)													Offset Site Error:	0.0 ft
Survey Program: 0-MWD													Offset Well Error:	0.0 ft
Reference		Offset		Semi Major Axis			Distance							
Measured Depth	Vertical Depth	Measured Depth	Vertical Depth	Reference	Offset	Highside Toolface	Offset Wellbore Centre		Between Centres	Between Ellipses	Minimum Separation	Separation Factor	Warning	
(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(°)	+N/-S (ft)	+E/-W (ft)	(ft)	(ft)	(ft)			
0.0	0.0	0.0	0.0	0.0	0.0	90.00	0.0	58.6	58.6					
100.0	100.0	100.0	100.0	0.1	0.1	90.00	0.0	58.6	58.6	58.3	0.22	260.581		
200.0	200.0	200.0	200.0	0.3	0.3	90.00	0.0	58.6	58.6	57.9	0.67	86.860		
300.0	300.0	300.0	300.0	0.6	0.6	90.00	0.0	58.6	58.6	57.4	1.12	52.116		
400.0	400.0	400.0	400.0	0.8	0.8	90.00	0.0	58.6	58.6	57.0	1.57	37.226		
500.0	500.0	500.0	500.0	1.0	1.0	90.00	0.0	58.6	58.6	56.5	2.02	28.953		
600.0	600.0	600.0	600.0	1.2	1.2	90.00	0.0	58.6	58.6	56.1	2.47	23.689		
700.0	700.0	700.0	700.0	1.5	1.5	90.00	0.0	58.6	58.6	55.6	2.92	20.045		
800.0	800.0	800.0	800.0	1.7	1.7	90.00	0.0	58.6	58.6	55.2	3.37	17.372		
900.0	900.0	900.0	900.0	1.9	1.9	90.00	0.0	58.6	58.6	54.7	3.82	15.328		
1,000.0	1,000.0	1,000.0	1,000.0	2.1	2.1	90.00	0.0	58.6	58.6	54.3	4.27	13.715		
1,100.0	1,100.0	1,100.0	1,100.0	2.4	2.4	90.00	0.0	58.6	58.6	53.8	4.72	12.409		
1,200.0	1,200.0	1,200.0	1,200.0	2.6	2.6	90.00	0.0	58.6	58.6	53.4	5.17	11.330		
1,300.0	1,300.0	1,300.0	1,300.0	2.8	2.8	90.00	0.0	58.6	58.6	53.0	5.62	10.423		
1,400.0	1,400.0	1,400.0	1,400.0	3.0	3.0	90.00	0.0	58.6	58.6	52.5	6.07	9.651 CC, ES		
1,500.0	1,500.0	1,500.0	1,500.0	3.2	3.3	-127.93	0.0	58.6	59.6	53.1	6.49	9.186		
1,600.0	1,599.8	1,599.8	1,599.8	3.4	3.5	-131.63	0.0	58.6	63.0	56.1	6.89	9.143		
1,700.0	1,699.5	1,699.5	1,699.5	3.6	3.7	-136.95	0.0	58.6	69.1	61.8	7.29	9.479		
1,764.4	1,763.4	1,763.4	1,763.4	3.7	3.9	-140.77	0.0	58.6	74.7	67.2	7.55	9.902		
1,800.0	1,798.7	1,798.7	1,798.7	3.8	3.9	-142.86	0.0	58.6	78.3	70.6	7.69	10.175		
1,900.0	1,897.9	1,897.9	1,897.9	4.0	4.2	-147.80	0.0	58.6	88.7	80.6	8.11	10.940		
2,000.0	1,997.1	1,997.1	1,997.1	4.3	4.4	-151.67	0.0	58.6	99.7	91.2	8.54	11.684		
2,100.0	2,096.3	2,097.8	2,097.8	4.5	4.6	-154.03	-1.7	58.7	110.4	101.5	8.94	12.350		
2,200.0	2,195.5	2,199.0	2,198.9	4.8	4.7	-154.42	-6.9	59.0	119.8	110.4	9.33	12.840		
2,300.0	2,294.7	2,300.5	2,299.9	5.1	4.9	-153.29	-15.7	59.6	127.7	118.0	9.73	13.122		
2,400.0	2,393.9	2,401.0	2,399.7	5.3	5.1	-151.07	-27.5	60.5	134.6	124.4	10.16	13.243		
2,500.0	2,493.1	2,500.6	2,498.6	5.6	5.3	-148.90	-39.7	61.3	141.5	130.8	10.61	13.332		
2,600.0	2,592.3	2,600.2	2,597.5	5.9	5.5	-146.94	-51.9	62.1	148.5	137.4	11.08	13.408		
2,700.0	2,691.5	2,699.9	2,696.4	6.2	5.8	-145.16	-64.1	63.0	155.8	144.2	11.56	13.471		
2,800.0	2,790.7	2,799.5	2,795.2	6.5	6.0	-143.54	-76.2	63.8	163.1	151.1	12.06	13.523		
2,900.0	2,889.8	2,899.1	2,894.1	6.8	6.2	-142.06	-88.4	64.6	170.6	158.0	12.58	13.565		
3,000.0	2,989.0	2,998.7	2,993.0	7.1	6.5	-140.71	-100.6	65.5	178.2	165.1	13.10	13.599		
3,100.0	3,088.2	3,098.4	3,091.9	7.4	6.7	-139.46	-112.8	66.3	185.9	172.2	13.64	13.627		
3,200.0	3,187.4	3,198.0	3,190.7	7.7	7.0	-138.32	-125.0	67.1	193.6	179.5	14.19	13.649		
3,300.0	3,286.6	3,297.6	3,289.6	8.0	7.3	-137.26	-137.1	68.0	201.5	186.7	14.74	13.666		
3,400.0	3,385.8	3,397.2	3,388.5	8.4	7.5	-136.28	-149.3	68.8	209.4	194.1	15.31	13.679		
3,500.0	3,485.0	3,496.9	3,487.4	8.7	7.8	-135.38	-161.5	69.6	217.3	201.5	15.88	13.688		
3,600.0	3,584.2	3,596.5	3,586.2	9.0	8.1	-134.54	-173.7	70.5	225.3	208.9	16.45	13.695		
3,700.0	3,683.4	3,696.1	3,685.1	9.3	8.4	-133.75	-185.8	71.3	233.4	216.3	17.04	13.700		
3,800.0	3,782.6	3,795.7	3,784.0	9.6	8.7	-133.02	-198.0	72.1	241.5	223.9	17.62	13.703		
3,900.0	3,881.8	3,895.4	3,882.9	9.9	9.0	-132.34	-210.2	72.9	249.6	231.4	18.21	13.705		
4,000.0	3,981.0	3,995.0	3,981.7	10.3	9.3	-131.70	-222.4	73.8	257.8	238.9	18.81	13.705		
4,100.0	4,080.2	4,094.6	4,080.6	10.6	9.6	-131.09	-234.6	74.6	265.9	246.5	19.41	13.705		
4,200.0	4,179.3	4,194.3	4,179.5	10.9	9.8	-130.53	-246.7	75.4	274.2	254.2	20.01	13.703		
4,300.0	4,278.5	4,293.9	4,278.4	11.2	10.1	-130.00	-258.9	76.3	282.4	261.8	20.61	13.702		
4,400.0	4,377.7	4,393.5	4,377.2	11.6	10.4	-129.49	-271.1	77.1	290.7	269.4	21.22	13.699		
4,459.4	4,436.6	4,452.7	4,435.9	11.8	10.6	-129.21	-278.3	77.6	295.6	274.0	21.58	13.697		
4,500.0	4,477.0	4,493.1	4,476.1	11.9	10.7	-129.02	-283.3	77.9	298.8	276.9	21.82	13.692		
4,600.0	4,576.5	4,592.8	4,575.1	12.1	11.0	-128.21	-295.5	78.8	305.1	282.7	22.38	13.634		
4,700.0	4,676.3	4,692.6	4,674.1	12.3	11.3	-126.91	-307.5	79.6	309.4	286.5	22.92	13.499		
4,800.0	4,776.3	4,793.1	4,774.1	12.5	11.6	-125.55	-317.2	80.3	311.7	288.3	23.38	13.330		

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

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Rieder 18Q-421
Project:	SEC.18-T4N-R67W	TVD Reference:	WELL @ 4827.0ft (RKB - 15')
Reference Site:	Rieder 4N67W18Q Pad Sec.18-T4N-R67	MD Reference:	WELL @ 4827.0ft (RKB - 15')
Site Error:	0.0ft	North Reference:	True
Reference Well:	Rieder 18Q-421	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	Landmark
Reference Design:	Plan #1 (7-30-14)	Offset TVD Reference:	Offset Datum

Offset Design Rieder 4N67W18Q Pad Sec.18-T4N-R67 - Rieder 18Q-221 - Wellbore #1 - Plan #1 (7-30-14)													Offset Site Error:	0.0 ft
Survey Program: 0-MWD													Offset Well Error:	0.0 ft
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference	Offset	Semi Major Axis	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
4,823.7	4,800.0	4,817.0	4,798.0	12.5	11.6	91.36	91.36	-319.0	80.4	311.9	288.4	23.48	13.281	
4,900.0	4,876.3	4,894.0	4,874.8	12.6	11.8	92.16	92.16	-323.4	80.7	312.3	288.5	23.81	13.120	
5,000.0	4,976.3	4,995.2	4,976.0	12.8	12.0	92.64	92.64	-326.0	80.9	312.6	288.4	24.18	12.927	
5,100.0	5,076.3	5,095.5	5,076.3	13.0	12.2	92.66	92.66	-326.1	80.9	312.6	288.1	24.54	12.741	
5,200.0	5,176.3	5,195.5	5,176.3	13.1	12.4	92.66	92.66	-326.1	80.9	312.6	287.7	24.89	12.562	
5,300.0	5,276.3	5,295.5	5,276.3	13.3	12.5	92.66	92.66	-326.1	80.9	312.6	287.4	25.24	12.386	
5,400.0	5,376.3	5,395.5	5,376.3	13.5	12.7	92.66	92.66	-326.1	80.9	312.6	287.0	25.59	12.214	
5,500.0	5,476.3	5,495.5	5,476.3	13.6	12.9	92.66	92.66	-326.1	80.9	312.6	286.7	25.95	12.045	
5,600.0	5,576.3	5,595.5	5,576.3	13.8	13.1	92.66	92.66	-326.1	80.9	312.6	286.3	26.31	11.880	
5,700.0	5,676.3	5,695.5	5,676.3	14.0	13.3	92.66	92.66	-326.1	80.9	312.6	285.9	26.68	11.718	
5,800.0	5,776.3	5,795.5	5,776.3	14.2	13.5	92.66	92.66	-326.1	80.9	312.6	285.6	27.04	11.559	
5,900.0	5,876.3	5,895.5	5,876.3	14.3	13.6	92.66	92.66	-326.1	80.9	312.6	285.2	27.41	11.403	
6,000.0	5,976.3	5,995.5	5,976.3	14.5	13.8	92.66	92.66	-326.1	80.9	312.6	284.8	27.79	11.251	
6,100.0	6,076.3	6,095.5	6,076.3	14.7	14.0	92.66	92.66	-326.1	80.9	312.6	284.5	28.16	11.102	
6,200.0	6,176.3	6,195.5	6,176.3	14.9	14.2	92.66	92.66	-326.1	80.9	312.6	284.1	28.54	10.955	
6,300.0	6,276.3	6,296.8	6,277.3	15.1	14.4	91.59	91.59	-320.3	80.9	312.4	283.5	28.85	10.827	
6,355.1	6,331.4	6,351.5	6,331.4	15.2	14.4	90.00	90.00	-311.6	80.9	312.3	283.3	28.97	10.778	
6,409.0	6,385.2	6,403.6	6,382.1	15.3	14.4	87.83	87.83	-299.8	80.9	312.5	283.5	29.05	10.757	
6,450.0	6,426.2	6,442.3	6,419.2	15.3	14.5	85.95	85.95	-288.7	80.9	313.1	284.0	29.08	10.766	
6,500.0	6,476.1	6,488.9	6,463.0	15.4	14.5	83.70	83.70	-273.0	80.9	314.3	285.2	29.09	10.803	
6,550.0	6,525.5	6,534.8	6,505.2	15.4	14.5	81.50	81.50	-254.9	80.9	316.0	286.9	29.08	10.866	
6,600.0	6,574.3	6,580.0	6,545.6	15.5	14.5	79.37	79.37	-234.7	80.9	318.1	289.0	29.04	10.954	
6,650.0	6,622.3	6,624.7	6,584.3	15.5	14.5	77.31	77.31	-212.3	80.9	320.5	291.6	28.98	11.062	
6,700.0	6,669.3	6,668.8	6,621.2	15.5	14.5	75.34	75.34	-188.1	80.9	323.4	294.5	28.90	11.189	
6,750.0	6,715.1	6,712.5	6,656.2	15.5	14.5	73.46	73.46	-162.1	80.9	326.4	297.6	28.81	11.331	
6,800.0	6,759.4	6,755.6	6,689.3	15.5	14.5	71.67	71.67	-134.4	80.9	329.7	301.0	28.71	11.484	
6,850.0	6,802.2	6,800.0	6,721.7	15.5	14.5	69.93	69.93	-104.1	80.9	333.2	304.6	28.61	11.647	
6,900.0	6,843.2	6,840.6	6,749.7	15.5	14.6	68.40	68.40	-74.7	80.9	336.7	308.2	28.51	11.811	
6,950.0	6,882.2	6,882.6	6,777.0	15.5	14.7	66.93	66.93	-42.8	80.9	340.3	311.9	28.42	11.975	
7,000.0	6,919.1	6,924.2	6,802.3	15.5	14.8	65.55	65.55	-9.8	80.9	343.9	315.6	28.34	12.133	
7,050.0	6,953.7	6,965.5	6,825.6	15.5	14.9	64.29	64.29	24.4	80.9	347.4	319.1	28.29	12.280	
7,100.0	6,985.8	7,006.5	6,846.9	15.5	15.0	63.13	63.13	59.4	80.9	350.9	322.6	28.27	12.411	
7,150.0	7,015.4	7,050.0	6,867.3	15.5	15.2	62.02	62.02	97.8	80.9	354.2	325.9	28.29	12.517	
7,200.0	7,042.3	7,087.8	6,883.3	15.5	15.4	61.13	61.13	132.1	80.9	357.3	328.9	28.37	12.594	
7,250.0	7,066.4	7,128.2	6,898.5	15.7	15.6	60.28	60.28	169.4	80.9	360.1	331.6	28.50	12.636	
7,300.0	7,087.6	7,168.3	6,911.6	15.9	15.9	59.53	59.53	207.4	80.9	362.8	334.1	28.70	12.639	
7,350.0	7,105.7	7,208.3	6,922.6	16.2	16.2	58.89	58.89	245.8	80.9	365.1	336.1	28.97	12.601	
7,400.0	7,120.8	7,250.0	6,932.0	16.6	16.5	58.32	58.32	286.4	80.9	367.1	337.8	29.34	12.515	
7,450.0	7,132.7	7,288.0	6,938.6	17.0	16.9	57.89	57.89	323.8	80.9	368.9	339.1	29.77	12.391	
7,500.0	7,141.4	7,327.6	6,943.5	17.4	17.2	57.53	57.53	363.2	80.9	370.2	339.9	30.30	12.221	
7,550.0	7,146.9	7,367.2	6,946.4	17.9	17.6	57.27	57.27	402.7	80.9	371.3	340.4	30.91	12.012	
7,600.0	7,149.1	7,407.7	6,947.2	18.4	18.0	57.11	57.11	443.2	80.9	371.9	340.3	31.61	11.765	
7,606.7	7,149.2	7,414.5	6,947.1	18.5	18.1	57.10	57.10	449.9	80.9	371.9	340.2	31.73	11.723	
7,700.0	7,149.5	7,507.7	6,947.1	19.5	19.2	57.05	57.05	543.1	80.9	372.2	338.6	33.51	11.107	
7,800.0	7,149.8	7,607.7	6,946.9	20.7	20.4	57.00	57.00	643.1	80.9	372.4	336.8	35.61	10.456	
7,900.0	7,150.1	7,707.7	6,946.8	22.1	21.8	56.95	56.95	743.1	80.9	372.6	334.7	37.89	9.834	
8,000.0	7,150.4	7,807.7	6,946.7	23.5	23.2	56.89	56.89	843.1	80.9	372.8	332.5	40.31	9.249	
8,100.0	7,150.7	7,907.7	6,946.6	24.9	24.7	56.84	56.84	943.1	80.9	373.0	330.2	42.84	8.708	
8,200.0	7,151.0	8,007.7	6,946.5	26.5	26.3	56.79	56.79	1,043.1	80.9	373.3	327.8	45.47	8.209	
8,300.0	7,151.2	8,107.7	6,946.4	28.0	27.9	56.74	56.74	1,143.1	80.9	373.5	325.3	48.18	7.752	
8,400.0	7,151.5	8,207.7	6,946.3	29.7	29.5	56.69	56.69	1,243.1	80.9	373.7	322.7	50.95	7.334	

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

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Rieder 18Q-421
Project:	SEC.18-T4N-R67W	TVD Reference:	WELL @ 4827.0ft (RKB - 15')
Reference Site:	Rieder 4N67W18Q Pad Sec.18-T4N-R67	MD Reference:	WELL @ 4827.0ft (RKB - 15')
Site Error:	0.0ft	North Reference:	True
Reference Well:	Rieder 18Q-421	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	Landmark
Reference Design:	Plan #1 (7-30-14)	Offset TVD Reference:	Offset Datum

Offset Design Rieder 4N67W18Q Pad Sec.18-T4N-R67 - Rieder 18Q-221 - Wellbore #1 - Plan #1 (7-30-14)													Offset Site Error:	0.0 ft
Survey Program: 0-MWD													Offset Well Error:	0.0 ft
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference	Offset	Semi Major Axis	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
8,500.0	7,151.8	8,307.7	6,946.2	31.3	31.2	56.64	56.64	1,343.1	80.9	373.9	320.1	53.78	6.952	
8,600.0	7,152.1	8,407.7	6,946.1	33.0	32.9	56.59	56.59	1,443.1	80.9	374.1	317.5	56.66	6.603	
8,700.0	7,152.4	8,507.7	6,946.0	34.7	34.6	56.54	56.54	1,543.1	80.9	374.4	314.8	59.58	6.284	
8,800.0	7,152.7	8,607.7	6,945.9	36.4	36.3	56.48	56.48	1,643.1	80.9	374.6	312.1	62.53	5.991	
8,900.0	7,153.0	8,707.7	6,945.8	38.2	38.1	56.43	56.43	1,743.1	80.9	374.8	309.3	65.50	5.722	
9,000.0	7,153.3	8,807.7	6,945.7	39.9	39.8	56.38	56.38	1,843.1	80.9	375.0	306.5	68.51	5.474	
9,100.0	7,153.6	8,907.7	6,945.6	41.7	41.6	56.33	56.33	1,943.1	80.9	375.2	303.7	71.53	5.246	
9,200.0	7,153.9	9,007.7	6,945.5	43.5	43.4	56.28	56.28	2,043.1	80.9	375.5	300.9	74.57	5.035	
9,300.0	7,154.2	9,107.7	6,945.4	45.3	45.2	56.23	56.23	2,143.1	80.9	375.7	298.1	77.63	4.840	
9,400.0	7,154.5	9,207.7	6,945.3	47.1	47.0	56.18	56.18	2,243.1	80.9	375.9	295.2	80.70	4.658	
9,500.0	7,154.8	9,307.7	6,945.2	48.9	48.9	56.13	56.13	2,343.1	80.9	376.1	292.4	83.78	4.490	
9,600.0	7,155.1	9,407.7	6,945.1	50.7	50.7	56.08	56.08	2,443.1	80.9	376.4	289.5	86.87	4.333	
9,700.0	7,155.4	9,507.7	6,945.0	52.5	52.5	56.03	56.03	2,543.1	80.9	376.6	286.6	89.97	4.186	
9,800.0	7,155.7	9,607.7	6,944.9	54.4	54.4	55.98	55.98	2,643.1	80.9	376.8	283.7	93.08	4.049	
9,900.0	7,156.0	9,707.7	6,944.7	56.2	56.2	55.93	55.93	2,743.1	80.9	377.0	280.9	96.19	3.920	
10,000.0	7,156.3	9,807.7	6,944.6	58.1	58.1	55.88	55.88	2,843.1	80.9	377.3	278.0	99.31	3.799	
10,100.0	7,156.6	9,907.7	6,944.5	59.9	59.9	55.82	55.82	2,943.1	80.9	377.5	275.1	102.43	3.685	
10,200.0	7,156.9	10,007.7	6,944.4	61.8	61.8	55.77	55.77	3,043.1	80.9	377.7	272.2	105.56	3.578	
10,300.0	7,157.2	10,107.7	6,944.3	63.6	63.7	55.72	55.72	3,143.1	80.9	378.0	269.3	108.69	3.477	
10,400.0	7,157.5	10,207.7	6,944.2	65.5	65.5	55.67	55.67	3,243.1	80.9	378.2	266.4	111.82	3.382	
10,500.0	7,157.8	10,307.7	6,944.1	67.4	67.4	55.62	55.62	3,343.1	80.9	378.4	263.5	114.96	3.292	
10,600.0	7,158.1	10,407.7	6,944.0	69.2	69.3	55.57	55.57	3,443.1	80.9	378.6	260.5	118.09	3.206	
10,700.0	7,158.4	10,507.7	6,943.9	71.1	71.1	55.52	55.52	3,543.1	80.9	378.9	257.6	121.23	3.125	
10,800.0	7,158.7	10,607.7	6,943.8	73.0	73.0	55.47	55.47	3,643.1	80.9	379.1	254.7	124.37	3.048	
10,900.0	7,159.0	10,707.7	6,943.7	74.8	74.9	55.42	55.42	3,743.1	80.9	379.3	251.8	127.51	2.975	
11,000.0	7,159.3	10,807.7	6,943.6	76.7	76.8	55.37	55.37	3,843.1	80.9	379.5	248.9	130.65	2.905	
11,100.0	7,159.6	10,907.7	6,943.5	78.6	78.7	55.32	55.32	3,943.1	80.9	379.8	246.0	133.79	2.839	
11,200.0	7,159.9	11,007.7	6,943.4	80.5	80.6	55.27	55.27	4,043.1	80.9	380.0	243.1	136.93	2.775	
11,300.0	7,160.1	11,107.7	6,943.3	82.4	82.4	55.23	55.23	4,143.1	80.9	380.2	240.2	140.07	2.715	
11,400.0	7,160.4	11,207.7	6,943.2	84.3	84.3	55.18	55.18	4,243.1	80.9	380.5	237.3	143.21	2.657	
11,500.0	7,160.7	11,307.7	6,943.1	86.1	86.2	55.13	55.13	4,343.1	80.9	380.7	234.3	146.35	2.601	
11,541.4	7,160.9	11,349.1	6,943.0	86.9	87.0	55.11	55.11	4,384.5	80.9	380.8	233.1	147.65	2.579	
11,586.6	7,161.0	11,376.4	6,943.0	87.8	87.5	55.09	55.09	4,411.8	80.9	381.3	232.5	148.80	2.563 SF	

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Rieder 18Q-421
Project:	SEC.18-T4N-R67W	TVD Reference:	WELL @ 4827.0ft (RKB - 15')
Reference Site:	Rieder 4N67W18Q Pad Sec.18-T4N-R67	MD Reference:	WELL @ 4827.0ft (RKB - 15')
Site Error:	0.0ft	North Reference:	True
Reference Well:	Rieder 18Q-421	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	Landmark
Reference Design:	Plan #1 (7-30-14)	Offset TVD Reference:	Offset Datum

Offset Design Rieder 4N67W18Q Pad Sec.18-T4N-R67 - Rieder 18Q-321 - Wellbore #1 - Plan #1 (7-30-14)													Offset Site Error:	0.0 ft
Survey Program: 0-MWD													Offset Well Error:	0.0 ft
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference	Offset	Semi Major Axis	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
0.0	0.0	0.0	0.0	0.0	0.0	89.99	89.99	0.0	30.7	30.7				
100.0	100.0	100.0	100.0	0.1	0.1	89.99	89.99	0.0	30.7	30.7	30.5	0.22	136.495	
200.0	200.0	200.0	200.0	0.3	0.3	89.99	89.99	0.0	30.7	30.7	30.0	0.67	45.498	
300.0	300.0	300.0	300.0	0.6	0.6	89.99	89.99	0.0	30.7	30.7	29.6	1.12	27.299	
400.0	400.0	400.0	400.0	0.8	0.8	89.99	89.99	0.0	30.7	30.7	29.1	1.57	19.499	
500.0	500.0	500.0	500.0	1.0	1.0	89.99	89.99	0.0	30.7	30.7	28.7	2.02	15.166	
600.0	600.0	600.0	600.0	1.2	1.2	89.99	89.99	0.0	30.7	30.7	28.2	2.47	12.409	
700.0	700.0	700.0	700.0	1.5	1.5	89.99	89.99	0.0	30.7	30.7	27.8	2.92	10.500	
800.0	800.0	800.0	800.0	1.7	1.7	89.99	89.99	0.0	30.7	30.7	27.3	3.37	9.100	
900.0	900.0	900.0	900.0	1.9	1.9	89.99	89.99	0.0	30.7	30.7	26.9	3.82	8.029	
1,000.0	1,000.0	1,000.0	1,000.0	2.1	2.1	89.99	89.99	0.0	30.7	30.7	26.4	4.27	7.184	
1,100.0	1,100.0	1,100.0	1,100.0	2.4	2.4	89.99	89.99	0.0	30.7	30.7	26.0	4.72	6.500	
1,200.0	1,200.0	1,200.0	1,200.0	2.6	2.6	89.99	89.99	0.0	30.7	30.7	25.5	5.17	5.935	
1,300.0	1,300.0	1,300.0	1,300.0	2.8	2.8	89.99	89.99	0.0	30.7	30.7	25.1	5.62	5.460	
1,400.0	1,400.0	1,400.0	1,400.0	3.0	3.0	89.99	89.99	0.0	30.7	30.7	24.6	6.07	5.055 CC, ES	
1,500.0	1,500.0	1,500.0	1,500.0	3.2	3.3	-129.12	-129.12	0.0	30.7	31.8	25.3	6.49	4.892	
1,600.0	1,599.8	1,599.8	1,599.8	3.4	3.5	-135.67	-135.67	0.0	30.7	35.3	28.4	6.89	5.123	
1,700.0	1,699.5	1,700.3	1,700.3	3.6	3.7	-142.00	-142.00	-1.7	30.1	41.0	33.7	7.26	5.646	
1,764.4	1,763.4	1,765.0	1,764.9	3.7	3.8	-144.65	-144.65	-4.5	29.2	45.2	37.8	7.48	6.049	
1,800.0	1,798.7	1,800.9	1,800.8	3.8	3.9	-145.61	-145.61	-6.7	28.5	47.6	40.0	7.61	6.254	
1,900.0	1,897.9	1,901.9	1,901.3	4.0	4.0	-145.85	-145.85	-15.1	25.7	52.8	44.8	7.99	6.600	
2,000.0	1,997.1	2,002.2	2,000.9	4.3	4.2	-143.85	-143.85	-26.0	22.0	56.3	47.9	8.40	6.699	
2,100.0	2,096.3	2,102.1	2,100.2	4.5	4.4	-141.95	-141.95	-37.0	18.4	59.8	51.0	8.83	6.767	
2,200.0	2,195.5	2,202.0	2,199.4	4.8	4.7	-140.27	-140.27	-48.1	14.7	63.3	54.1	9.29	6.820	
2,300.0	2,294.7	2,301.9	2,298.7	5.1	4.9	-138.76	-138.76	-59.1	11.0	66.9	57.2	9.76	6.860	
2,400.0	2,393.9	2,401.8	2,397.9	5.3	5.2	-137.41	-137.41	-70.2	7.4	70.6	60.3	10.25	6.889	
2,500.0	2,493.1	2,501.8	2,497.1	5.6	5.4	-136.19	-136.19	-81.2	3.7	74.3	63.5	10.75	6.909	
2,600.0	2,592.3	2,601.7	2,596.4	5.9	5.7	-135.09	-135.09	-92.2	0.0	78.0	66.7	11.26	6.922	
2,700.0	2,691.5	2,701.6	2,695.6	6.2	5.9	-134.08	-134.08	-103.3	-3.6	81.7	69.9	11.79	6.929	
2,800.0	2,790.7	2,801.5	2,794.9	6.5	6.2	-133.17	-133.17	-114.3	-7.3	85.5	73.1	12.33	6.931	
2,900.0	2,889.8	2,901.4	2,894.1	6.8	6.5	-132.33	-132.33	-125.4	-11.0	89.2	76.4	12.88	6.930	
3,000.0	2,989.0	3,001.4	2,993.4	7.1	6.8	-131.56	-131.56	-136.4	-14.7	93.0	79.6	13.43	6.926	
3,100.0	3,088.2	3,101.3	3,092.6	7.4	7.0	-130.85	-130.85	-147.4	-18.3	96.8	82.8	13.99	6.920	
3,200.0	3,187.4	3,201.2	3,191.8	7.7	7.3	-130.20	-130.20	-158.5	-22.0	100.7	86.1	14.56	6.913	
3,300.0	3,286.6	3,301.1	3,291.1	8.0	7.6	-129.59	-129.59	-169.5	-25.7	104.5	89.4	15.14	6.904	
3,400.0	3,385.8	3,401.1	3,390.3	8.4	7.9	-129.03	-129.03	-180.6	-29.3	108.3	92.6	15.72	6.894	
3,500.0	3,485.0	3,501.0	3,489.6	8.7	8.2	-128.50	-128.50	-191.6	-33.0	112.2	95.9	16.30	6.883	
3,600.0	3,584.2	3,600.9	3,588.8	9.0	8.5	-128.01	-128.01	-202.7	-36.7	116.1	99.2	16.89	6.872	
3,700.0	3,683.4	3,700.8	3,688.0	9.3	8.8	-127.55	-127.55	-213.7	-40.4	119.9	102.5	17.48	6.861	
3,800.0	3,782.6	3,800.7	3,787.3	9.6	9.1	-127.12	-127.12	-224.7	-44.0	123.8	105.7	18.08	6.850	
3,900.0	3,881.8	3,900.7	3,886.5	9.9	9.4	-126.72	-126.72	-235.8	-47.7	127.7	109.0	18.67	6.838	
4,000.0	3,981.0	4,000.6	3,985.8	10.3	9.7	-126.34	-126.34	-246.8	-51.4	131.6	112.3	19.28	6.827	
4,100.0	4,080.2	4,100.5	4,085.0	10.6	10.0	-125.98	-125.98	-257.9	-55.0	135.5	115.6	19.88	6.816	
4,200.0	4,179.3	4,200.4	4,184.2	10.9	10.3	-125.64	-125.64	-268.9	-58.7	139.4	118.9	20.49	6.805	
4,300.0	4,278.5	4,300.3	4,283.5	11.2	10.6	-125.32	-125.32	-279.9	-62.4	143.3	122.2	21.09	6.794	
4,400.0	4,377.7	4,400.3	4,382.7	11.6	10.9	-125.02	-125.02	-291.0	-66.0	147.2	125.5	21.70	6.783	
4,459.4	4,436.6	4,459.6	4,441.6	11.8	11.1	-124.85	-124.85	-297.5	-68.2	149.5	127.5	22.07	6.777	
4,500.0	4,477.0	4,500.0	4,481.8	11.9	11.2	-124.68	-124.68	-302.0	-69.7	151.0	128.7	22.30	6.770	
4,600.0	4,576.5	4,598.4	4,579.8	12.1	11.4	-124.30	-124.30	-310.8	-72.6	153.7	131.0	22.77	6.752	
4,700.0	4,676.3	4,696.9	4,678.1	12.3	11.6	-124.06	-124.06	-316.3	-74.5	155.5	132.3	23.18	6.707	
4,800.0	4,776.3	4,795.5	4,776.6	12.5	11.8	-123.96	-123.96	-318.7	-75.3	156.3	132.7	23.54	6.637	

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

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Rieder 18Q-421
Project:	SEC.18-T4N-R67W	TVD Reference:	WELL @ 4827.0ft (RKB - 15')
Reference Site:	Rieder 4N67W18Q Pad Sec.18-T4N-R67	MD Reference:	WELL @ 4827.0ft (RKB - 15')
Site Error:	0.0ft	North Reference:	True
Reference Well:	Rieder 18Q-421	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	Landmark
Reference Design:	Plan #1 (7-30-14)	Offset TVD Reference:	Offset Datum

Offset Design Rieder 4N67W18Q Pad Sec.18-T4N-R67 - Rieder 18Q-321 - Wellbore #1 - Plan #1 (7-30-14)													Offset Site Error:	0.0 ft
Survey Program: 0-MWD													Offset Well Error:	0.0 ft
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference	Offset	Semi Major Axis	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
4,823.7	4,800.0	4,818.9	4,800.0	12.5	11.8	92.64	92.64	-318.8	-75.3	156.3	132.7	23.62	6.615	
4,900.0	4,876.3	4,895.1	4,876.3	12.6	12.0	92.64	92.64	-318.8	-75.3	156.3	132.4	23.89	6.541	
5,000.0	4,976.3	4,995.1	4,976.3	12.8	12.1	92.64	92.64	-318.8	-75.3	156.3	132.0	24.23	6.449	
5,100.0	5,076.3	5,095.1	5,076.3	13.0	12.3	92.64	92.64	-318.8	-75.3	156.3	131.7	24.58	6.359	
5,200.0	5,176.3	5,195.1	5,176.3	13.1	12.5	92.64	92.64	-318.8	-75.3	156.3	131.4	24.92	6.270	
5,300.0	5,276.3	5,295.1	5,276.3	13.3	12.7	92.64	92.64	-318.8	-75.3	156.3	131.0	25.28	6.183	
5,400.0	5,376.3	5,395.1	5,376.3	13.5	12.8	92.64	92.64	-318.8	-75.3	156.3	130.7	25.63	6.098	
5,500.0	5,476.3	5,495.1	5,476.3	13.6	13.0	92.64	92.64	-318.8	-75.3	156.3	130.3	25.99	6.014	
5,600.0	5,576.3	5,595.1	5,576.3	13.8	13.2	92.64	92.64	-318.8	-75.3	156.3	129.9	26.34	5.932	
5,700.0	5,676.3	5,695.1	5,676.3	14.0	13.4	92.64	92.64	-318.8	-75.3	156.3	129.6	26.71	5.852	
5,800.0	5,776.3	5,795.1	5,776.3	14.2	13.6	92.64	92.64	-318.8	-75.3	156.3	129.2	27.07	5.773	
5,900.0	5,876.3	5,895.1	5,876.3	14.3	13.7	92.64	92.64	-318.8	-75.3	156.3	128.8	27.44	5.696	
6,000.0	5,976.3	5,995.1	5,976.3	14.5	13.9	92.64	92.64	-318.8	-75.3	156.3	128.5	27.81	5.620	
6,100.0	6,076.3	6,095.1	6,076.3	14.7	14.1	92.64	92.64	-318.8	-75.3	156.3	128.1	28.18	5.546	
6,200.0	6,176.3	6,195.1	6,176.3	14.9	14.3	92.64	92.64	-318.8	-75.3	156.3	127.7	28.55	5.473	
6,300.0	6,276.3	6,295.1	6,276.3	15.1	14.5	92.64	92.64	-318.8	-75.3	156.3	127.3	28.93	5.402	
6,409.0	6,385.2	6,404.5	6,385.3	15.3	14.7	90.06	90.06	-311.8	-75.3	156.1	126.9	29.20	5.346	
6,410.2	6,386.5	6,405.7	6,386.5	15.3	14.7	90.00	90.00	-311.6	-75.3	156.1	126.9	29.20	5.346	
6,450.0	6,426.2	6,445.0	6,425.2	15.3	14.7	88.05	88.05	-305.2	-75.3	156.2	127.0	29.23	5.344	
6,500.0	6,476.1	6,494.0	6,473.0	15.4	14.7	85.62	85.62	-294.5	-75.3	156.6	127.4	29.23	5.357	
6,550.0	6,525.5	6,542.5	6,519.6	15.4	14.7	83.23	83.23	-280.8	-75.3	157.2	128.0	29.20	5.385	
6,600.0	6,574.3	6,590.7	6,564.9	15.5	14.8	80.90	80.90	-264.4	-75.3	158.1	129.0	29.14	5.427	
6,650.0	6,622.3	6,638.5	6,608.8	15.5	14.8	78.64	78.64	-245.3	-75.3	159.3	130.2	29.06	5.482	
6,700.0	6,669.3	6,686.0	6,651.0	15.5	14.8	76.47	76.47	-223.7	-75.3	160.6	131.7	28.96	5.548	
6,750.0	6,715.1	6,733.1	6,691.5	15.5	14.8	74.40	74.40	-199.7	-75.3	162.2	133.3	28.84	5.623	
6,800.0	6,759.4	6,779.9	6,730.2	15.5	14.8	72.43	72.43	-173.4	-75.3	163.9	135.1	28.72	5.705	
6,850.0	6,802.2	6,826.4	6,767.0	15.5	14.8	70.57	70.57	-145.0	-75.3	165.7	137.1	28.59	5.794	
6,900.0	6,843.2	6,872.6	6,801.8	15.5	14.8	68.83	68.83	-114.6	-75.3	167.5	139.1	28.47	5.885	
6,950.0	6,882.2	6,918.5	6,834.5	15.5	14.8	67.20	67.20	-82.4	-75.3	169.5	141.1	28.35	5.978	
7,000.0	6,919.1	6,964.1	6,865.0	15.5	14.9	65.69	65.69	-48.4	-75.3	171.4	143.2	28.25	6.068	
7,050.0	6,953.7	7,009.6	6,893.3	15.5	14.9	64.31	64.31	-12.9	-75.3	173.4	145.2	28.17	6.154	
7,100.0	6,985.8	7,054.8	6,919.3	15.5	15.0	63.04	63.04	24.1	-75.3	175.3	147.2	28.13	6.232	
7,150.0	7,015.4	7,100.0	6,943.1	15.5	15.2	61.88	61.88	62.5	-75.3	177.1	149.0	28.12	6.298	
7,200.0	7,042.3	7,144.7	6,964.3	15.5	15.4	60.85	60.85	101.8	-75.3	178.9	150.7	28.17	6.348	
7,250.0	7,066.4	7,189.4	6,983.2	15.7	15.6	59.93	59.93	142.3	-75.3	180.5	152.2	28.29	6.381	
7,300.0	7,087.6	7,233.9	6,999.7	15.9	15.9	59.12	59.12	183.7	-75.3	182.0	153.5	28.47	6.392	
7,350.0	7,105.7	7,278.3	7,013.7	16.2	16.2	58.42	58.42	225.9	-75.3	183.3	154.6	28.73	6.381	
7,400.0	7,120.8	7,322.6	7,025.2	16.6	16.5	57.83	57.83	268.7	-75.3	184.5	155.4	29.07	6.346	
7,450.0	7,132.7	7,366.9	7,034.1	17.0	16.9	57.34	57.34	312.0	-75.3	185.5	156.0	29.50	6.287	
7,500.0	7,141.4	7,411.0	7,040.6	17.4	17.3	56.96	56.96	355.6	-75.3	186.3	156.2	30.02	6.204	
7,550.0	7,146.9	7,455.1	7,044.5	17.9	17.7	56.68	56.68	399.5	-75.3	186.8	156.2	30.64	6.099	
7,600.0	7,149.1	7,499.2	7,045.8	18.4	18.2	56.50	56.50	443.6	-75.3	187.2	155.9	31.34	5.974	
7,606.7	7,149.2	7,505.1	7,045.8	18.5	18.2	56.49	56.49	449.5	-75.3	187.3	155.8	31.44	5.956	
7,700.0	7,149.5	7,598.4	7,045.3	19.5	19.3	56.29	56.29	542.8	-75.3	187.7	154.5	33.15	5.661	
7,800.0	7,149.8	7,698.4	7,044.8	20.7	20.5	56.08	56.08	642.8	-75.3	188.1	153.0	35.18	5.348	
7,900.0	7,150.1	7,798.4	7,044.3	22.1	21.9	55.88	55.88	742.8	-75.3	188.6	151.2	37.37	5.047	
8,000.0	7,150.4	7,898.4	7,043.7	23.5	23.3	55.67	55.67	842.8	-75.3	189.1	149.4	39.70	4.763	
8,100.0	7,150.7	7,998.4	7,043.2	24.9	24.8	55.47	55.47	942.8	-75.3	189.5	147.4	42.13	4.498	
8,200.0	7,151.0	8,098.4	7,042.7	26.5	26.3	55.26	55.26	1,042.8	-75.3	190.0	145.3	44.65	4.255	
8,300.0	7,151.2	8,198.4	7,042.2	28.0	27.9	55.06	55.06	1,142.8	-75.3	190.5	143.2	47.25	4.031	
8,400.0	7,151.5	8,298.4	7,041.7	29.7	29.5	54.86	54.86	1,242.8	-75.3	190.9	141.0	49.90	3.826	

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

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Rieder 18Q-421
Project:	SEC.18-T4N-R67W	TVD Reference:	WELL @ 4827.0ft (RKB - 15')
Reference Site:	Rieder 4N67W18Q Pad Sec.18-T4N-R67	MD Reference:	WELL @ 4827.0ft (RKB - 15')
Site Error:	0.0ft	North Reference:	True
Reference Well:	Rieder 18Q-421	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	Landmark
Reference Design:	Plan #1 (7-30-14)	Offset TVD Reference:	Offset Datum

Offset Design Rieder 4N67W18Q Pad Sec.18-T4N-R67 - Rieder 18Q-321 - Wellbore #1 - Plan #1 (7-30-14)												Offset Site Error: 0.0 ft	
Survey Program: 0-MWD												Offset Well Error: 0.0 ft	
Reference		Offset		Semi Major Axis			Distance						Warning
Measured Depth	Vertical Depth	Measured Depth	Vertical Depth	Reference	Offset	Highside Toolface	Offset Wellbore Centre	Between Centres	Between Ellipses	Minimum Separation	Separation Factor		
(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(°)	+N/-S (ft)	+E/-W (ft)	(ft)	(ft)	(ft)		
8,500.0	7,151.8	8,398.4	7,041.1	31.3	31.2	54.66	1,342.8	-75.3	191.4	138.8	52.60	3.639	
8,600.0	7,152.1	8,498.4	7,040.6	33.0	32.9	54.46	1,442.8	-75.3	191.9	136.5	55.34	3.467	
8,700.0	7,152.4	8,598.4	7,040.1	34.7	34.6	54.26	1,542.8	-75.3	192.4	134.3	58.11	3.310	
8,800.0	7,152.7	8,698.4	7,039.6	36.4	36.3	54.06	1,642.8	-75.3	192.8	131.9	60.90	3.166	
8,900.0	7,153.0	8,798.4	7,039.0	38.2	38.1	53.87	1,742.8	-75.3	193.3	129.6	63.71	3.034	
9,000.0	7,153.3	8,898.4	7,038.5	39.9	39.9	53.67	1,842.8	-75.3	193.8	127.3	66.54	2.913	
9,100.0	7,153.6	8,998.4	7,038.0	41.7	41.6	53.48	1,942.7	-75.3	194.3	124.9	69.38	2.800	
9,200.0	7,153.9	9,098.4	7,037.5	43.5	43.4	53.28	2,042.7	-75.3	194.8	122.6	72.23	2.697	
9,300.0	7,154.2	9,198.4	7,036.9	45.3	45.2	53.09	2,142.7	-75.3	195.3	120.2	75.08	2.601	
9,400.0	7,154.5	9,298.4	7,036.4	47.1	47.1	52.90	2,242.7	-75.3	195.8	117.8	77.94	2.512	
9,500.0	7,154.8	9,398.3	7,035.9	48.9	48.9	52.71	2,342.7	-75.3	196.3	115.5	80.80	2.429	
9,600.0	7,155.1	9,498.3	7,035.4	50.7	50.7	52.52	2,442.7	-75.3	196.8	113.1	83.66	2.352	
9,700.0	7,155.4	9,598.3	7,034.8	52.5	52.5	52.33	2,542.7	-75.3	197.3	110.8	86.52	2.280	
9,800.0	7,155.7	9,698.3	7,034.3	54.4	54.4	52.14	2,642.7	-75.3	197.8	108.4	89.38	2.213	
9,900.0	7,156.0	9,798.3	7,033.8	56.2	56.2	51.95	2,742.7	-75.3	198.3	106.0	92.23	2.150	
10,000.0	7,156.3	9,898.3	7,033.3	58.1	58.1	51.77	2,842.7	-75.3	198.8	103.7	95.09	2.091	
10,100.0	7,156.6	9,998.3	7,032.7	59.9	59.9	51.58	2,942.7	-75.3	199.3	101.4	97.93	2.035	
10,200.0	7,156.9	10,098.3	7,032.2	61.8	61.8	51.40	3,042.7	-75.3	199.8	99.0	100.78	1.983	
10,300.0	7,157.2	10,198.3	7,031.7	63.6	63.7	51.22	3,142.7	-75.3	200.3	96.7	103.61	1.933	
10,400.0	7,157.5	10,298.3	7,031.2	65.5	65.5	51.03	3,242.7	-75.3	200.8	94.4	106.44	1.887	
10,500.0	7,157.8	10,398.3	7,030.7	67.4	67.4	50.85	3,342.7	-75.3	201.4	92.1	109.27	1.843	
10,600.0	7,158.1	10,498.3	7,030.1	69.2	69.3	50.67	3,442.7	-75.3	201.9	89.8	112.08	1.801	
10,700.0	7,158.4	10,598.3	7,029.6	71.1	71.1	50.49	3,542.7	-75.3	202.4	87.5	114.89	1.762	
10,800.0	7,158.7	10,698.3	7,029.1	73.0	73.0	50.31	3,642.7	-75.3	202.9	85.2	117.69	1.724	
10,900.0	7,159.0	10,798.3	7,028.6	74.8	74.9	50.14	3,742.7	-75.3	203.4	83.0	120.49	1.689	
11,000.0	7,159.3	10,898.3	7,028.0	76.7	76.8	49.96	3,842.7	-75.3	204.0	80.7	123.27	1.655	
11,100.0	7,159.6	10,998.3	7,027.5	78.6	78.7	49.78	3,942.7	-75.3	204.5	78.5	126.05	1.622	
11,200.0	7,159.9	11,098.3	7,027.0	80.5	80.5	49.61	4,042.7	-75.3	205.0	76.2	128.82	1.592	
11,300.0	7,160.1	11,198.3	7,026.5	82.4	82.4	49.44	4,142.6	-75.3	205.6	74.0	131.57	1.562	
11,400.0	7,160.4	11,298.3	7,025.9	84.3	84.3	49.26	4,242.6	-75.3	206.1	71.8	134.32	1.534	
11,500.0	7,160.7	11,398.3	7,025.4	86.1	86.2	49.09	4,342.6	-75.3	206.6	69.6	137.07	1.508	
11,539.7	7,160.9	11,438.0	7,025.2	86.9	86.9	49.02	4,382.3	-75.3	206.9	68.7	138.15	1.497 Level 3	
11,586.6	7,161.0	11,478.3	7,025.0	87.8	87.7	48.95	4,422.7	-75.3	207.2	67.9	139.35	1.487 Level 3, SF	

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Rieder 18Q-421
Project:	SEC.18-T4N-R67W	TVD Reference:	WELL @ 4827.0ft (RKB - 15')
Reference Site:	Rieder 4N67W18Q Pad Sec.18-T4N-R67	MD Reference:	WELL @ 4827.0ft (RKB - 15')
Site Error:	0.0ft	North Reference:	True
Reference Well:	Rieder 18Q-421	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	Landmark
Reference Design:	Plan #1 (7-30-14)	Offset TVD Reference:	Offset Datum

Offset Design Rieder 4N67W18Q Pad Sec.18-T4N-R67 - Rieder 18T-201 - Wellbore #1 - Plan #1 (7-30-14)													Offset Site Error:	0.0 ft
Survey Program: 0-MWD													Offset Well Error:	0.0 ft
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference	Offset	Semi Major Axis	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
0.0	0.0	0.0	0.0	0.0	0.0	90.00	90.00	0.0	178.5	178.5				
100.0	100.0	99.0	99.0	0.1	0.1	90.00	90.00	0.0	178.5	178.5	178.3	0.22	798.136	
200.0	200.0	199.0	199.0	0.3	0.3	90.00	90.00	0.0	178.5	178.5	177.8	0.67	265.603	
300.0	300.0	299.0	299.0	0.6	0.6	90.00	90.00	0.0	178.5	178.5	177.4	1.12	159.149	
400.0	400.0	399.0	399.0	0.8	0.8	90.00	90.00	0.0	178.5	178.5	176.9	1.57	113.613	
500.0	500.0	499.0	499.0	1.0	1.0	90.00	90.00	0.0	178.5	178.5	176.5	2.02	88.337	
600.0	600.0	599.0	599.0	1.2	1.2	90.00	90.00	0.0	178.5	178.5	176.0	2.47	72.261	
700.0	700.0	699.0	699.0	1.5	1.5	90.00	90.00	0.0	178.5	178.5	175.6	2.92	61.136	
800.0	800.0	799.0	799.0	1.7	1.7	90.00	90.00	0.0	178.5	178.5	175.1	3.37	52.979 CC, ES	
900.0	900.0	894.1	894.1	1.9	1.9	90.28	90.28	-0.9	179.8	179.8	176.1	3.79	47.481	
1,000.0	1,000.0	989.0	988.9	2.1	2.1	91.10	91.10	-3.5	183.6	183.9	179.8	4.20	43.846	
1,100.0	1,100.0	1,083.5	1,083.0	2.4	2.3	92.39	92.39	-7.9	190.0	190.9	186.3	4.62	41.357	
1,200.0	1,200.0	1,177.3	1,176.2	2.6	2.5	94.04	94.04	-14.1	198.9	200.7	195.7	5.06	39.704	
1,300.0	1,300.0	1,270.4	1,268.3	2.8	2.7	95.93	95.93	-21.8	210.2	213.6	208.1	5.52	38.708	
1,400.0	1,400.0	1,368.1	1,364.6	3.0	3.0	97.92	97.92	-31.1	223.7	228.5	222.5	6.02	37.973	
1,500.0	1,500.0	1,466.6	1,461.7	3.2	3.3	-116.99	-116.99	-40.5	237.4	244.4	238.1	6.35	38.475	
1,600.0	1,599.8	1,565.0	1,558.7	3.4	3.7	-116.14	-116.14	-49.9	251.0	262.0	255.3	6.77	38.732	
1,700.0	1,699.5	1,663.2	1,655.5	3.6	4.0	-115.98	-115.98	-59.2	264.6	281.2	274.0	7.19	39.096	
1,764.4	1,763.4	1,726.2	1,717.6	3.7	4.2	-116.17	-116.17	-65.2	273.3	294.3	286.8	7.48	39.358	
1,800.0	1,798.7	1,761.0	1,751.9	3.8	4.3	-116.47	-116.47	-68.5	278.1	301.7	294.1	7.64	39.483	
1,900.0	1,897.9	1,858.7	1,848.2	4.0	4.7	-117.22	-117.22	-77.8	291.6	322.6	314.5	8.12	39.751	
2,000.0	1,997.1	1,956.4	1,944.5	4.3	5.1	-117.88	-117.88	-87.1	305.1	343.6	335.0	8.61	39.915	
2,100.0	2,096.3	2,054.1	2,040.9	4.5	5.4	-118.47	-118.47	-96.4	318.7	364.6	355.5	9.11	40.003	
2,200.0	2,195.5	2,151.8	2,137.2	4.8	5.8	-118.99	-118.99	-105.8	332.2	385.6	376.0	9.63	40.034	
2,300.0	2,294.7	2,249.5	2,233.5	5.1	6.2	-119.46	-119.46	-115.1	345.7	406.7	396.5	10.16	40.025	
2,400.0	2,393.9	2,347.2	2,329.8	5.3	6.5	-119.88	-119.88	-124.4	359.2	427.8	417.1	10.70	39.987	
2,500.0	2,493.1	2,444.9	2,426.1	5.6	6.9	-120.27	-120.27	-133.7	372.7	448.9	437.6	11.24	39.929	
2,600.0	2,592.3	2,542.6	2,522.5	5.9	7.3	-120.61	-120.61	-143.0	386.3	470.0	458.2	11.79	39.855	
2,700.0	2,691.5	2,640.3	2,618.8	6.2	7.6	-120.93	-120.93	-152.3	399.8	491.1	478.8	12.35	39.772	
2,800.0	2,790.7	2,738.0	2,715.1	6.5	8.0	-121.22	-121.22	-161.6	413.3	512.3	499.3	12.91	39.682	
2,900.0	2,889.8	2,835.8	2,811.4	6.8	8.4	-121.49	-121.49	-170.9	426.8	533.4	519.9	13.47	39.589	
3,000.0	2,989.0	2,933.5	2,907.7	7.1	8.8	-121.74	-121.74	-180.2	440.3	554.6	540.5	14.04	39.493	
3,100.0	3,088.2	3,031.2	3,004.0	7.4	9.2	-121.97	-121.97	-189.5	453.9	575.8	561.2	14.61	39.397	
3,200.0	3,187.4	3,128.9	3,100.4	7.7	9.5	-122.19	-122.19	-198.8	467.4	597.0	581.8	15.19	39.302	
3,300.0	3,286.6	3,226.6	3,196.7	8.0	9.9	-122.38	-122.38	-208.1	480.9	618.1	602.4	15.77	39.207	
3,400.0	3,385.8	3,324.3	3,293.0	8.4	10.3	-122.57	-122.57	-217.4	494.4	639.4	623.0	16.35	39.114	
3,500.0	3,485.0	3,422.0	3,389.3	8.7	10.7	-122.74	-122.74	-226.7	507.9	660.6	643.6	16.93	39.024	
3,600.0	3,584.2	3,519.7	3,485.6	9.0	11.1	-122.91	-122.91	-236.0	521.4	681.8	664.3	17.51	38.935	
3,700.0	3,683.4	3,617.4	3,581.9	9.3	11.4	-123.06	-123.06	-245.3	535.0	703.0	684.9	18.10	38.849	
3,800.0	3,782.6	3,715.1	3,678.3	9.6	11.8	-123.21	-123.21	-254.6	548.5	724.2	705.5	18.68	38.766	
3,900.0	3,881.8	3,812.8	3,774.6	9.9	12.2	-123.34	-123.34	-263.9	562.0	745.4	726.2	19.27	38.685	
4,000.0	3,981.0	3,910.5	3,870.9	10.3	12.6	-123.47	-123.47	-273.2	575.5	766.7	746.8	19.86	38.607	
4,100.0	4,080.2	4,008.2	3,967.2	10.6	13.0	-123.59	-123.59	-282.5	589.0	787.9	767.5	20.45	38.531	
4,200.0	4,179.3	4,105.9	4,063.5	10.9	13.4	-123.71	-123.71	-291.8	602.6	809.1	788.1	21.04	38.458	
4,300.0	4,278.5	4,203.6	4,159.9	11.2	13.7	-123.82	-123.82	-301.1	616.1	830.4	808.7	21.63	38.387	
4,400.0	4,377.7	4,301.3	4,256.2	11.6	14.1	-123.92	-123.92	-310.4	629.6	851.6	829.4	22.22	38.318	
4,459.4	4,436.6	4,359.4	4,313.4	11.8	14.4	-123.98	-123.98	-316.0	637.6	864.2	841.7	22.58	38.279	
4,500.0	4,477.0	4,399.1	4,352.5	11.9	14.5	-124.15	-124.15	-319.8	643.1	872.7	849.9	22.83	38.233	
4,600.0	4,576.5	4,497.2	4,449.2	12.1	14.9	-124.40	-124.40	-329.1	656.7	892.2	868.8	23.38	38.156	
4,700.0	4,676.3	4,605.7	4,556.2	12.3	15.3	-124.41	-124.41	-339.3	671.5	909.6	885.7	23.92	38.032	
4,800.0	4,776.3	4,741.5	4,690.9	12.5	15.6	-124.20	-124.20	-349.4	686.2	922.2	897.8	24.39	37.812	

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

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Rieder 18Q-421
Project:	SEC.18-T4N-R67W	TVD Reference:	WELL @ 4827.0ft (RKB - 15')
Reference Site:	Rieder 4N67W18Q Pad Sec.18-T4N-R67	MD Reference:	WELL @ 4827.0ft (RKB - 15')
Site Error:	0.0ft	North Reference:	True
Reference Well:	Rieder 18Q-421	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	Landmark
Reference Design:	Plan #1 (7-30-14)	Offset TVD Reference:	Offset Datum

Offset Design Rieder 4N67W18Q Pad Sec.18-T4N-R67 - Rieder 18T-201 - Wellbore #1 - Plan #1 (7-30-14)													Offset Site Error:	0.0 ft
Survey Program: 0-MWD													Offset Well Error:	0.0 ft
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference	Offset	Semi Major Axis	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
4,823.7	4,800.0	4,774.0	4,723.2	12.5	15.7	92.47	92.47	-351.3	689.0	924.3	899.8	24.50	37.735	
4,900.0	4,876.3	4,878.9	4,827.7	12.6	15.9	92.74	92.74	-356.0	695.7	929.4	904.6	24.81	37.460	
5,000.0	4,976.3	5,017.0	4,965.8	12.8	16.2	92.90	92.90	-358.8	699.8	932.5	907.3	25.20	36.998	
5,100.0	5,076.3	5,126.5	5,075.3	13.0	16.3	92.91	92.91	-358.9	700.0	932.6	907.0	25.55	36.497	
5,200.0	5,176.3	5,226.5	5,175.3	13.1	16.4	92.91	92.91	-358.9	700.0	932.6	906.7	25.89	36.028	
5,300.0	5,276.3	5,326.5	5,275.3	13.3	16.6	92.91	92.91	-358.9	700.0	932.6	906.4	26.22	35.566	
5,400.0	5,376.3	5,426.5	5,375.3	13.5	16.7	92.91	92.91	-358.9	700.0	932.6	906.0	26.56	35.111	
5,500.0	5,476.3	5,526.5	5,475.3	13.6	16.8	92.91	92.91	-358.9	700.0	932.6	905.7	26.90	34.664	
5,600.0	5,576.3	5,626.5	5,575.3	13.8	17.0	92.91	92.91	-358.9	700.0	932.6	905.3	27.25	34.224	
5,700.0	5,676.3	5,726.5	5,675.3	14.0	17.1	92.91	92.91	-358.9	700.0	932.6	905.0	27.60	33.791	
5,800.0	5,776.3	5,826.5	5,775.3	14.2	17.3	92.91	92.91	-358.9	700.0	932.6	904.6	27.95	33.366	
5,900.0	5,876.3	5,926.5	5,875.3	14.3	17.4	92.91	92.91	-358.9	700.0	932.6	904.3	28.30	32.949	
6,000.0	5,976.3	6,026.5	5,975.3	14.5	17.6	92.91	92.91	-358.9	700.0	932.6	903.9	28.66	32.538	
6,100.0	6,076.3	6,126.5	6,075.3	14.7	17.7	92.91	92.91	-358.9	700.0	932.6	903.6	29.02	32.135	
6,200.0	6,176.3	6,226.5	6,175.3	14.9	17.9	92.91	92.91	-358.9	700.0	932.6	903.2	29.38	31.739	
6,300.0	6,276.3	6,332.1	6,280.5	15.1	18.0	92.52	92.52	-352.7	700.0	932.3	902.6	29.73	31.358	
6,409.0	6,385.2	6,443.4	6,389.6	15.3	18.1	91.16	91.16	-330.5	700.0	931.6	901.6	30.05	30.997	
6,450.0	6,426.2	6,483.6	6,428.0	15.3	18.1	90.51	90.51	-318.6	700.0	931.4	901.3	30.15	30.891	
6,481.9	6,458.1	6,514.6	6,457.1	15.4	18.1	90.00	90.00	-308.1	700.0	931.4	901.2	30.21	30.830	
6,500.0	6,476.1	6,531.9	6,473.2	15.4	18.1	89.71	89.71	-301.7	700.0	931.4	901.2	30.24	30.798	
6,550.0	6,525.5	6,579.4	6,516.6	15.4	18.0	88.93	88.93	-282.3	700.0	931.6	901.3	30.30	30.740	
6,600.0	6,574.3	6,626.2	6,558.0	15.5	18.0	88.15	88.15	-260.7	700.0	931.9	901.6	30.34	30.712	
6,650.0	6,622.3	6,672.2	6,597.4	15.5	18.0	87.38	87.38	-236.9	700.0	932.4	902.1	30.37	30.707	
6,700.0	6,669.3	6,717.6	6,634.8	15.5	17.9	86.63	86.63	-211.1	700.0	933.1	902.7	30.37	30.720	
6,750.0	6,715.1	6,762.4	6,670.1	15.5	17.9	85.89	85.89	-183.6	700.0	933.9	903.6	30.38	30.743	
6,800.0	6,759.4	6,806.6	6,703.4	15.5	17.8	85.18	85.18	-154.5	700.0	934.9	904.5	30.39	30.768	
6,850.0	6,802.2	6,850.0	6,734.3	15.5	17.8	84.49	84.49	-124.0	700.0	936.0	905.6	30.40	30.789	
6,900.0	6,843.2	6,893.5	6,763.5	15.5	17.8	83.81	83.81	-91.8	700.0	937.1	906.7	30.44	30.791	
6,950.0	6,882.2	6,936.3	6,790.4	15.5	17.7	83.16	83.16	-58.6	700.0	938.4	907.9	30.50	30.770	
7,000.0	6,919.1	6,978.6	6,815.1	15.5	17.7	82.54	82.54	-24.2	700.0	939.7	909.1	30.59	30.716	
7,050.0	6,953.7	7,020.6	6,837.7	15.5	17.6	81.95	81.95	11.1	700.0	941.0	910.3	30.73	30.623	
7,100.0	6,985.8	7,062.1	6,858.2	15.5	17.6	81.39	81.39	47.3	700.0	942.4	911.4	30.92	30.482	
7,150.0	7,015.4	7,100.0	6,875.1	15.5	17.6	80.90	80.90	81.2	700.0	943.7	912.6	31.14	30.301	
7,200.0	7,042.3	7,144.4	6,892.8	15.5	17.6	80.37	80.37	121.9	700.0	945.0	913.6	31.47	30.034	
7,250.0	7,066.4	7,185.1	6,906.8	15.7	17.6	79.91	79.91	160.1	700.0	946.3	914.5	31.85	29.713	
7,300.0	7,087.6	7,225.6	6,918.8	15.9	17.6	79.49	79.49	198.8	700.0	947.6	915.3	32.29	29.341	
7,350.0	7,105.7	7,265.9	6,928.6	16.2	17.7	79.11	79.11	237.8	700.0	948.7	915.9	32.81	28.911	
7,400.0	7,120.8	7,305.9	6,936.4	16.6	17.9	78.77	78.77	277.1	700.0	949.8	916.4	33.41	28.430	
7,450.0	7,132.7	7,350.0	6,942.5	17.0	18.2	78.44	78.44	320.8	700.0	950.8	916.7	34.11	27.875	
7,500.0	7,141.4	7,385.6	6,945.6	17.4	18.5	78.20	78.20	356.2	700.0	951.6	916.8	34.82	27.330	
7,550.0	7,146.9	7,425.2	6,947.1	17.9	18.9	77.97	77.97	395.8	700.0	952.4	916.8	35.63	26.732	
7,600.0	7,149.1	7,472.6	6,947.1	18.4	19.4	77.82	77.82	443.2	700.0	952.8	916.3	36.58	26.045	
7,606.7	7,149.2	7,479.3	6,947.1	18.5	19.4	77.82	77.82	449.9	700.0	952.9	916.1	36.72	25.948	
7,700.0	7,149.5	7,572.6	6,947.0	19.5	20.5	77.80	77.80	543.2	700.0	952.9	914.2	38.74	24.596	
7,800.0	7,149.8	7,672.6	6,946.9	20.7	21.7	77.77	77.77	643.2	700.0	953.0	911.9	41.13	23.173	
7,900.0	7,150.1	7,772.6	6,946.8	22.1	23.0	77.75	77.75	743.2	700.0	953.1	909.4	43.70	21.808	
8,000.0	7,150.4	7,872.6	6,946.7	23.5	24.4	77.73	77.73	843.2	700.0	953.2	906.7	46.44	20.523	
8,100.0	7,150.7	7,972.6	6,946.6	24.9	25.8	77.70	77.70	943.2	700.0	953.3	904.0	49.32	19.329	
8,200.0	7,151.0	8,072.6	6,946.5	26.5	27.4	77.68	77.68	1,043.2	700.0	953.4	901.1	52.31	18.226	
8,300.0	7,151.2	8,172.6	6,946.4	28.0	28.9	77.65	77.65	1,143.2	700.0	953.4	898.1	55.39	17.214	
8,400.0	7,151.5	8,272.6	6,946.3	29.7	30.5	77.63	77.63	1,243.2	700.0	953.5	895.0	58.55	16.286	

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

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Rieder 18Q-421
Project:	SEC.18-T4N-R67W	TVD Reference:	WELL @ 4827.0ft (RKB - 15')
Reference Site:	Rieder 4N67W18Q Pad Sec.18-T4N-R67	MD Reference:	WELL @ 4827.0ft (RKB - 15')
Site Error:	0.0ft	North Reference:	True
Reference Well:	Rieder 18Q-421	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	Landmark
Reference Design:	Plan #1 (7-30-14)	Offset TVD Reference:	Offset Datum

Offset Design Rieder 4N67W18Q Pad Sec.18-T4N-R67 - Rieder 18T-201 - Wellbore #1 - Plan #1 (7-30-14)													Offset Site Error:	0.0 ft
Survey Program: 0-MWD													Offset Well Error:	0.0 ft
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference	Offset	Semi Major Axis	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
8,500.0	7,151.8	8,372.6	6,946.2	31.3	32.1	77.61	77.61	1,343.2	700.0	953.6	891.8	61.78	15.437	
8,600.0	7,152.1	8,472.6	6,946.1	33.0	33.8	77.58	77.58	1,443.2	700.0	953.7	888.6	65.06	14.659	
8,700.0	7,152.4	8,572.6	6,946.0	34.7	35.5	77.56	77.56	1,543.2	700.0	953.8	885.4	68.39	13.946	
8,800.0	7,152.7	8,672.6	6,945.9	36.4	37.2	77.54	77.54	1,643.1	700.0	953.9	882.1	71.77	13.291	
8,900.0	7,153.0	8,772.6	6,945.8	38.2	38.9	77.51	77.51	1,743.1	700.0	954.0	878.8	75.18	12.690	
9,000.0	7,153.3	8,872.6	6,945.7	39.9	40.6	77.49	77.49	1,843.1	700.0	954.1	875.4	78.62	12.135	
9,100.0	7,153.6	8,972.6	6,945.6	41.7	42.4	77.47	77.47	1,943.1	700.0	954.1	872.1	82.09	11.623	
9,200.0	7,153.9	9,072.6	6,945.4	43.5	44.2	77.44	77.44	2,043.1	700.0	954.2	868.6	85.58	11.150	
9,300.0	7,154.2	9,172.6	6,945.3	45.3	45.9	77.42	77.42	2,143.1	700.0	954.3	865.2	89.09	10.711	
9,400.0	7,154.5	9,272.6	6,945.2	47.1	47.7	77.40	77.40	2,243.1	700.0	954.4	861.8	92.63	10.304	
9,500.0	7,154.8	9,372.6	6,945.1	48.9	49.5	77.37	77.37	2,343.1	700.0	954.5	858.3	96.17	9.925	
9,600.0	7,155.1	9,472.6	6,945.0	50.7	51.4	77.35	77.35	2,443.1	700.0	954.6	854.8	99.74	9.571	
9,700.0	7,155.4	9,572.6	6,944.9	52.5	53.2	77.32	77.32	2,543.1	700.0	954.7	851.4	103.31	9.241	
9,800.0	7,155.7	9,672.6	6,944.8	54.4	55.0	77.30	77.30	2,643.1	700.0	954.8	847.9	106.90	8.931	
9,900.0	7,156.0	9,772.6	6,944.7	56.2	56.8	77.28	77.28	2,743.1	700.0	954.8	844.3	110.50	8.641	
10,000.0	7,156.3	9,872.6	6,944.6	58.1	58.7	77.25	77.25	2,843.1	700.0	954.9	840.8	114.10	8.369	
10,100.0	7,156.6	9,972.6	6,944.5	59.9	60.5	77.23	77.23	2,943.1	700.0	955.0	837.3	117.72	8.113	
10,200.0	7,156.9	10,072.6	6,944.4	61.8	62.3	77.21	77.21	3,043.1	700.0	955.1	833.8	121.34	7.871	
10,300.0	7,157.2	10,172.6	6,944.3	63.6	64.2	77.18	77.18	3,143.1	700.0	955.2	830.2	124.97	7.643	
10,400.0	7,157.5	10,272.6	6,944.2	65.5	66.0	77.16	77.16	3,243.1	700.0	955.3	826.7	128.61	7.428	
10,500.0	7,157.8	10,372.6	6,944.1	67.4	67.9	77.14	77.14	3,343.1	700.0	955.4	823.1	132.25	7.224	
10,600.0	7,158.1	10,472.6	6,944.0	69.2	69.8	77.11	77.11	3,443.1	700.0	955.5	819.6	135.90	7.031	
10,700.0	7,158.4	10,572.6	6,943.9	71.1	71.6	77.09	77.09	3,543.1	700.0	955.6	816.0	139.55	6.847	
10,800.0	7,158.7	10,672.6	6,943.8	73.0	73.5	77.07	77.07	3,643.1	700.0	955.6	812.4	143.21	6.673	
10,900.0	7,159.0	10,772.6	6,943.7	74.8	75.4	77.04	77.04	3,743.1	700.0	955.7	808.9	146.87	6.507	
11,000.0	7,159.3	10,872.6	6,943.6	76.7	77.2	77.02	77.02	3,843.1	700.0	955.8	805.3	150.53	6.350	
11,100.0	7,159.6	10,972.6	6,943.5	78.6	79.1	77.00	77.00	3,943.1	700.0	955.9	801.7	154.20	6.199	
11,200.0	7,159.9	11,072.6	6,943.4	80.5	81.0	76.97	76.97	4,043.1	700.0	956.0	798.1	157.87	6.056	
11,300.0	7,160.1	11,172.6	6,943.3	82.4	82.9	76.95	76.95	4,143.1	700.0	956.1	794.6	161.54	5.919	
11,400.0	7,160.4	11,272.6	6,943.1	84.3	84.7	76.93	76.93	4,243.1	700.0	956.2	791.0	165.22	5.787	
11,500.0	7,160.7	11,372.6	6,943.0	86.1	86.6	76.90	76.90	4,343.1	700.0	956.3	787.4	168.90	5.662	
11,511.9	7,160.8	11,384.5	6,943.0	86.4	86.8	76.90	76.90	4,355.1	700.0	956.3	787.0	169.33	5.647	
11,586.6	7,161.0	11,412.1	6,943.0	87.8	87.4	76.89	76.89	4,382.6	700.0	957.5	786.3	171.22	5.592 SF	

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Rieder 18Q-421
Project:	SEC.18-T4N-R67W	TVD Reference:	WELL @ 4827.0ft (RKB - 15')
Reference Site:	Rieder 4N67W18Q Pad Sec.18-T4N-R67	MD Reference:	WELL @ 4827.0ft (RKB - 15')
Site Error:	0.0ft	North Reference:	True
Reference Well:	Rieder 18Q-421	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	Landmark
Reference Design:	Plan #1 (7-30-14)	Offset TVD Reference:	Offset Datum

Offset Design Rieder 4N67W18Q Pad Sec.18-T4N-R67 - Rieder 18T-241 - Wellbore #1 - Plan #1 (7-30-14)													Offset Site Error:	0.0 ft
Survey Program: 0-MWD													Offset Well Error:	0.0 ft
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference	Offset	Semi Major Axis	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
0.0	0.0	0.0	0.0	0.0	0.0	89.99	89.99	0.0	119.9	119.9				
100.0	100.0	100.0	100.0	0.1	0.1	89.99	89.99	0.0	119.9	119.9	119.7	0.22	533.571	
200.0	200.0	200.0	200.0	0.3	0.3	89.99	89.99	0.0	119.9	119.9	119.3	0.67	177.857	
300.0	300.0	300.0	300.0	0.6	0.6	89.99	89.99	0.0	119.9	119.9	118.8	1.12	106.714	
400.0	400.0	400.0	400.0	0.8	0.8	89.99	89.99	0.0	119.9	119.9	118.4	1.57	76.224	
500.0	500.0	500.0	500.0	1.0	1.0	89.99	89.99	0.0	119.9	119.9	117.9	2.02	59.286	
600.0	600.0	600.0	600.0	1.2	1.2	89.99	89.99	0.0	119.9	119.9	117.5	2.47	48.506	
700.0	700.0	700.0	700.0	1.5	1.5	89.99	89.99	0.0	119.9	119.9	117.0	2.92	41.044	
800.0	800.0	800.0	800.0	1.7	1.7	89.99	89.99	0.0	119.9	119.9	116.6	3.37	35.571	
900.0	900.0	900.0	900.0	1.9	1.9	89.99	89.99	0.0	119.9	119.9	116.1	3.82	31.387	
1,000.0	1,000.0	1,000.0	1,000.0	2.1	2.1	89.99	89.99	0.0	119.9	119.9	115.7	4.27	28.083	
1,100.0	1,100.0	1,100.0	1,100.0	2.4	2.4	89.99	89.99	0.0	119.9	119.9	115.2	4.72	25.408	
1,200.0	1,200.0	1,200.0	1,200.0	2.6	2.6	89.99	89.99	0.0	119.9	119.9	114.8	5.17	23.199 CC, ES	
1,300.0	1,300.0	1,297.4	1,297.4	2.8	2.8	90.61	90.61	-1.3	121.0	121.0	115.4	5.59	21.649	
1,400.0	1,400.0	1,394.7	1,394.5	3.0	3.0	92.39	92.39	-5.2	124.0	124.2	118.3	5.99	20.742	
1,500.0	1,500.0	1,491.5	1,491.0	3.2	3.1	-121.97	-121.97	-11.6	129.1	130.8	124.5	6.37	20.532	
1,600.0	1,599.8	1,588.5	1,587.3	3.4	3.4	-120.14	-120.14	-20.6	136.1	141.6	134.9	6.75	20.990	
1,700.0	1,699.5	1,687.6	1,685.6	3.6	3.6	-119.35	-119.35	-30.4	143.8	154.9	147.7	7.14	21.679	
1,764.4	1,763.4	1,751.2	1,748.8	3.7	3.7	-119.45	-119.45	-36.8	148.8	164.3	156.9	7.41	22.170	
1,800.0	1,798.7	1,786.5	1,783.7	3.8	3.8	-119.70	-119.70	-40.3	151.6	169.7	162.1	7.56	22.438	
1,900.0	1,897.9	1,885.3	1,881.7	4.0	4.1	-120.33	-120.33	-50.1	159.3	184.9	176.9	8.01	23.087	
2,000.0	1,997.1	1,984.1	1,979.7	4.3	4.4	-120.86	-120.86	-59.9	167.0	200.1	191.6	8.47	23.614	
2,100.0	2,096.3	2,082.9	2,077.8	4.5	4.6	-121.32	-121.32	-69.7	174.7	215.4	206.4	8.96	24.042	
2,200.0	2,195.5	2,181.7	2,175.8	4.8	4.9	-121.71	-121.71	-79.5	182.4	230.6	221.2	9.45	24.392	
2,300.0	2,294.7	2,280.5	2,273.8	5.1	5.2	-122.06	-122.06	-89.4	190.1	245.9	235.9	9.96	24.677	
2,400.0	2,393.9	2,379.4	2,371.8	5.3	5.5	-122.37	-122.37	-99.2	197.9	261.1	250.7	10.48	24.910	
2,500.0	2,493.1	2,478.2	2,469.9	5.6	5.8	-122.64	-122.64	-109.0	205.6	276.4	265.4	11.01	25.102	
2,600.0	2,592.3	2,577.0	2,567.9	5.9	6.1	-122.88	-122.88	-118.8	213.3	291.7	280.2	11.55	25.260	
2,700.0	2,691.5	2,675.8	2,665.9	6.2	6.4	-123.10	-123.10	-128.6	221.0	307.0	294.9	12.09	25.391	
2,800.0	2,790.7	2,774.6	2,764.0	6.5	6.7	-123.30	-123.30	-138.5	228.7	322.3	309.6	12.64	25.499	
2,900.0	2,889.8	2,873.5	2,862.0	6.8	7.0	-123.48	-123.48	-148.3	236.4	337.6	324.4	13.19	25.589	
3,000.0	2,989.0	2,972.3	2,960.0	7.1	7.3	-123.65	-123.65	-158.1	244.2	352.9	339.1	13.75	25.664	
3,100.0	3,088.2	3,071.1	3,058.0	7.4	7.6	-123.80	-123.80	-167.9	251.9	368.2	353.9	14.31	25.726	
3,200.0	3,187.4	3,169.9	3,156.1	7.7	7.9	-123.94	-123.94	-177.8	259.6	383.5	368.6	14.88	25.777	
3,300.0	3,286.6	3,268.7	3,254.1	8.0	8.3	-124.07	-124.07	-187.6	267.3	398.8	383.3	15.44	25.820	
3,400.0	3,385.8	3,367.6	3,352.1	8.4	8.6	-124.19	-124.19	-197.4	275.0	414.1	398.1	16.01	25.855	
3,500.0	3,485.0	3,466.4	3,450.1	8.7	8.9	-124.30	-124.30	-207.2	282.7	429.4	412.8	16.59	25.885	
3,600.0	3,584.2	3,565.2	3,548.2	9.0	9.2	-124.40	-124.40	-217.0	290.5	444.7	427.5	17.16	25.909	
3,700.0	3,683.4	3,664.0	3,646.2	9.3	9.5	-124.50	-124.50	-226.9	298.2	460.0	442.3	17.74	25.928	
3,800.0	3,782.6	3,762.8	3,744.2	9.6	9.8	-124.59	-124.59	-236.7	305.9	475.3	457.0	18.32	25.944	
3,900.0	3,881.8	3,861.6	3,842.2	9.9	10.2	-124.67	-124.67	-246.5	313.6	490.6	471.7	18.90	25.957	
4,000.0	3,981.0	3,960.5	3,940.3	10.3	10.5	-124.75	-124.75	-256.3	321.3	505.9	486.4	19.48	25.967	
4,100.0	4,080.2	4,059.3	4,038.3	10.6	10.8	-124.82	-124.82	-266.1	329.0	521.2	501.2	20.07	25.975	
4,200.0	4,179.3	4,158.1	4,136.3	10.9	11.1	-124.90	-124.90	-276.0	336.8	536.6	515.9	20.65	25.980	
4,300.0	4,278.5	4,256.9	4,234.3	11.2	11.4	-124.96	-124.96	-285.8	344.5	551.9	530.6	21.24	25.984	
4,400.0	4,377.7	4,355.7	4,332.4	11.6	11.8	-125.02	-125.02	-295.6	352.2	567.2	545.4	21.83	25.987	
4,459.4	4,436.6	4,414.4	4,390.6	11.8	12.0	-125.06	-125.06	-301.4	356.8	576.3	554.1	22.17	25.988	
4,500.0	4,477.0	4,454.6	4,430.4	11.9	12.1	-125.16	-125.16	-305.4	359.9	582.3	559.9	22.41	25.984	
4,600.0	4,576.5	4,553.6	4,528.7	12.1	12.4	-125.19	-125.19	-315.3	367.6	595.8	572.9	22.94	25.969	
4,700.0	4,676.3	4,652.8	4,627.1	12.3	12.7	-124.92	-124.92	-325.1	375.4	607.4	583.9	23.45	25.902	
4,800.0	4,776.3	4,766.4	4,740.0	12.5	13.0	-124.39	-124.39	-335.0	383.1	616.0	592.1	23.90	25.778	

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

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Rieder 18Q-421
Project:	SEC.18-T4N-R67W	TVD Reference:	WELL @ 4827.0ft (RKB - 15')
Reference Site:	Rieder 4N67W18Q Pad Sec.18-T4N-R67	MD Reference:	WELL @ 4827.0ft (RKB - 15')
Site Error:	0.0ft	North Reference:	True
Reference Well:	Rieder 18Q-421	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	Landmark
Reference Design:	Plan #1 (7-30-14)	Offset TVD Reference:	Offset Datum

Offset Design Rieder 4N67W18Q Pad Sec.18-T4N-R67 - Rieder 18T-241 - Wellbore #1 - Plan #1 (7-30-14)													Offset Site Error:	0.0 ft
Survey Program: 0-MWD													Offset Well Error:	0.0 ft
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference	Offset	Semi Major Axis	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
4,823.7	4,800.0	4,793.9	4,767.4	12.5	13.1	92.35	92.35	-336.8	384.6	617.4	593.4	23.99	25.729	
4,900.0	4,876.3	4,882.5	4,855.8	12.6	13.3	92.76	92.76	-341.4	388.2	620.6	596.3	24.30	25.546	
5,000.0	4,976.3	4,999.1	4,972.3	12.8	13.5	93.00	93.00	-344.2	390.3	622.6	597.9	24.67	25.241	
5,100.0	5,076.3	5,103.1	5,076.3	13.0	13.6	93.01	93.01	-344.3	390.4	622.7	597.7	25.02	24.890	
5,200.0	5,176.3	5,203.1	5,176.3	13.1	13.8	93.01	93.01	-344.3	390.4	622.7	597.3	25.36	24.558	
5,300.0	5,276.3	5,303.1	5,276.3	13.3	13.9	93.01	93.01	-344.3	390.4	622.7	597.0	25.70	24.231	
5,400.0	5,376.3	5,403.1	5,376.3	13.5	14.1	93.01	93.01	-344.3	390.4	622.7	596.6	26.04	23.910	
5,500.0	5,476.3	5,503.1	5,476.3	13.6	14.3	93.01	93.01	-344.3	390.4	622.7	596.3	26.39	23.595	
5,600.0	5,576.3	5,603.1	5,576.3	13.8	14.4	93.01	93.01	-344.3	390.4	622.7	595.9	26.74	23.285	
5,700.0	5,676.3	5,703.1	5,676.3	14.0	14.6	93.01	93.01	-344.3	390.4	622.7	595.6	27.10	22.980	
5,800.0	5,776.3	5,803.1	5,776.3	14.2	14.8	93.01	93.01	-344.3	390.4	622.7	595.2	27.45	22.682	
5,900.0	5,876.3	5,903.1	5,876.3	14.3	14.9	93.01	93.01	-344.3	390.4	622.7	594.9	27.81	22.388	
6,000.0	5,976.3	6,003.1	5,976.3	14.5	15.1	93.01	93.01	-344.3	390.4	622.7	594.5	28.18	22.101	
6,100.0	6,076.3	6,103.1	6,076.3	14.7	15.3	93.01	93.01	-344.3	390.4	622.7	594.1	28.54	21.818	
6,200.0	6,176.3	6,203.1	6,176.3	14.9	15.4	93.01	93.01	-344.3	390.4	622.7	593.8	28.91	21.541	
6,300.0	6,276.3	6,306.7	6,279.7	15.1	15.6	92.45	92.45	-338.2	390.4	622.4	593.2	29.25	21.279	
6,409.0	6,385.2	6,416.0	6,386.7	15.3	15.7	90.47	90.47	-316.7	390.4	621.9	592.3	29.54	21.050	
6,428.9	6,405.2	6,435.2	6,405.2	15.3	15.7	90.00	90.00	-311.3	390.4	621.8	592.2	29.58	21.019	
6,450.0	6,426.2	6,455.5	6,424.5	15.3	15.7	89.50	89.50	-305.2	390.4	621.9	592.2	29.63	20.990	
6,500.0	6,476.1	6,503.0	6,469.0	15.4	15.7	88.33	88.33	-288.8	390.4	622.1	592.4	29.70	20.946	
6,550.0	6,525.5	6,550.0	6,512.1	15.4	15.7	87.17	87.17	-269.9	390.4	622.6	592.9	29.75	20.932	
6,600.0	6,574.3	6,595.8	6,552.8	15.5	15.6	86.04	86.04	-248.9	390.4	623.4	593.6	29.77	20.942	
6,650.0	6,622.3	6,641.2	6,591.9	15.5	15.6	84.93	84.93	-225.8	390.4	624.4	594.7	29.77	20.972	
6,700.0	6,669.3	6,686.0	6,629.0	15.5	15.6	83.85	83.85	-200.8	390.4	625.7	595.9	29.77	21.018	
6,750.0	6,715.1	6,730.2	6,664.1	15.5	15.6	82.79	82.79	-173.9	390.4	627.1	597.3	29.76	21.073	
6,800.0	6,759.4	6,774.0	6,697.3	15.5	15.5	81.77	81.77	-145.4	390.4	628.6	598.9	29.75	21.134	
6,850.0	6,802.2	6,817.2	6,728.5	15.5	15.5	80.79	80.79	-115.4	390.4	630.4	600.6	29.74	21.193	
6,900.0	6,843.2	6,860.0	6,757.6	15.5	15.5	79.84	79.84	-84.1	390.4	632.2	602.4	29.76	21.245	
6,950.0	6,882.2	6,900.0	6,783.1	15.5	15.5	78.98	78.98	-53.3	390.4	634.1	604.3	29.79	21.286	
7,000.0	6,919.1	6,944.4	6,809.6	15.5	15.5	78.09	78.09	-17.7	390.4	636.0	606.1	29.86	21.300	
7,050.0	6,953.7	6,986.0	6,832.5	15.5	15.5	77.28	77.28	17.1	390.4	638.0	608.0	29.97	21.288	
7,100.0	6,985.8	7,027.3	6,853.3	15.5	15.5	76.52	76.52	52.8	390.4	639.9	609.8	30.12	21.243	
7,150.0	7,015.4	7,068.4	6,872.0	15.5	15.6	75.82	75.82	89.3	390.4	641.8	611.5	30.33	21.162	
7,200.0	7,042.3	7,109.1	6,888.7	15.5	15.7	75.16	75.16	126.5	390.4	643.7	613.1	30.59	21.041	
7,250.0	7,066.4	7,150.0	6,903.3	15.7	16.0	74.56	74.56	164.6	390.4	645.5	614.6	30.93	20.869	
7,300.0	7,087.6	7,190.0	6,915.7	15.9	16.2	74.02	74.02	202.6	390.4	647.2	615.8	31.34	20.651	
7,350.0	7,105.7	7,230.1	6,926.1	16.2	16.5	73.54	73.54	241.4	390.4	648.7	616.9	31.82	20.389	
7,400.0	7,120.8	7,270.1	6,934.4	16.6	16.9	73.11	73.11	280.5	390.4	650.1	617.7	32.37	20.085	
7,450.0	7,132.7	7,309.9	6,940.6	17.0	17.2	72.74	72.74	319.8	390.4	651.3	618.3	32.99	19.743	
7,500.0	7,141.4	7,350.0	6,944.8	17.4	17.6	72.43	72.43	359.7	390.4	652.4	618.7	33.69	19.365	
7,550.0	7,146.9	7,389.2	6,946.9	17.9	18.0	72.18	72.18	398.9	390.4	653.2	618.8	34.46	18.959	
7,600.0	7,149.1	7,433.5	6,947.1	18.4	18.5	72.01	72.01	443.2	390.4	653.8	618.5	35.35	18.497	
7,606.7	7,149.2	7,440.2	6,947.1	18.5	18.5	72.00	72.00	449.9	390.4	653.8	618.4	35.48	18.427	
7,700.0	7,149.5	7,533.5	6,947.0	19.5	19.6	71.97	71.97	543.2	390.4	654.0	616.5	37.47	17.453	
7,800.0	7,149.8	7,633.5	6,946.9	20.7	20.9	71.93	71.93	643.2	390.4	654.1	614.3	39.82	16.428	
7,900.0	7,150.1	7,733.5	6,946.8	22.1	22.2	71.90	71.90	743.1	390.4	654.2	611.9	42.35	15.448	
8,000.0	7,150.4	7,833.5	6,946.7	23.5	23.6	71.87	71.87	843.1	390.4	654.3	609.3	45.04	14.528	
8,100.0	7,150.7	7,933.5	6,946.6	24.9	25.1	71.83	71.83	943.1	390.4	654.5	606.6	47.86	13.674	
8,200.0	7,151.0	8,033.5	6,946.5	26.5	26.6	71.80	71.80	1,043.1	390.4	654.6	603.8	50.79	12.888	
8,300.0	7,151.2	8,133.5	6,946.4	28.0	28.2	71.77	71.77	1,143.1	390.4	654.7	600.9	53.81	12.167	
8,400.0	7,151.5	8,233.5	6,946.3	29.7	29.9	71.73	71.73	1,243.1	390.4	654.8	597.9	56.91	11.507	

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

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Rieder 18Q-421
Project:	SEC.18-T4N-R67W	TVD Reference:	WELL @ 4827.0ft (RKB - 15')
Reference Site:	Rieder 4N67W18Q Pad Sec.18-T4N-R67	MD Reference:	WELL @ 4827.0ft (RKB - 15')
Site Error:	0.0ft	North Reference:	True
Reference Well:	Rieder 18Q-421	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	Landmark
Reference Design:	Plan #1 (7-30-14)	Offset TVD Reference:	Offset Datum

Offset Design Rieder 4N67W18Q Pad Sec.18-T4N-R67 - Rieder 18T-241 - Wellbore #1 - Plan #1 (7-30-14)													Offset Site Error:	0.0 ft
Survey Program: 0-MWD													Offset Well Error:	0.0 ft
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference	Offset	Semi Major Axis	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
8,500.0	7,151.8	8,333.5	6,946.2	31.3	31.5	71.70	71.70	1,343.1	390.4	655.0	594.9	60.06	10.904	
8,600.0	7,152.1	8,433.5	6,946.1	33.0	33.2	71.67	71.67	1,443.1	390.4	655.1	591.8	63.28	10.353	
8,700.0	7,152.4	8,533.5	6,946.0	34.7	34.9	71.63	71.63	1,543.1	390.4	655.2	588.7	66.54	9.848	
8,800.0	7,152.7	8,633.5	6,945.9	36.4	36.6	71.60	71.60	1,643.1	390.4	655.3	585.5	69.83	9.384	
8,900.0	7,153.0	8,733.5	6,945.8	38.2	38.4	71.57	71.57	1,743.1	390.4	655.5	582.3	73.16	8.959	
9,000.0	7,153.3	8,833.5	6,945.7	39.9	40.1	71.53	71.53	1,843.1	390.4	655.6	579.1	76.53	8.567	
9,100.0	7,153.6	8,933.5	6,945.6	41.7	41.9	71.50	71.50	1,943.1	390.4	655.7	575.8	79.91	8.206	
9,200.0	7,153.9	9,033.5	6,945.5	43.5	43.7	71.47	71.47	2,043.1	390.4	655.9	572.5	83.32	7.872	
9,300.0	7,154.2	9,133.5	6,945.4	45.3	45.5	71.43	71.43	2,143.1	390.4	656.0	569.2	86.75	7.562	
9,400.0	7,154.5	9,233.5	6,945.3	47.1	47.3	71.40	71.40	2,243.1	390.4	656.1	565.9	90.19	7.275	
9,500.0	7,154.8	9,333.5	6,945.2	48.9	49.1	71.37	71.37	2,343.1	390.4	656.2	562.6	93.65	7.007	
9,600.0	7,155.1	9,433.5	6,945.0	50.7	51.0	71.34	71.34	2,443.1	390.4	656.4	559.2	97.12	6.758	
9,700.0	7,155.4	9,533.5	6,944.9	52.5	52.8	71.30	71.30	2,543.1	390.4	656.5	555.9	100.61	6.525	
9,800.0	7,155.7	9,633.5	6,944.8	54.4	54.6	71.27	71.27	2,643.1	390.4	656.6	552.5	104.10	6.307	
9,900.0	7,156.0	9,733.5	6,944.7	56.2	56.5	71.24	71.24	2,743.1	390.4	656.8	549.2	107.61	6.103	
10,000.0	7,156.3	9,833.5	6,944.6	58.1	58.3	71.20	71.20	2,843.1	390.4	656.9	545.8	111.12	5.912	
10,100.0	7,156.6	9,933.5	6,944.5	59.9	60.2	71.17	71.17	2,943.1	390.4	657.0	542.4	114.64	5.731	
10,200.0	7,156.9	10,033.5	6,944.4	61.8	62.0	71.14	71.14	3,043.1	390.4	657.2	539.0	118.17	5.561	
10,300.0	7,157.2	10,133.5	6,944.3	63.6	63.9	71.10	71.10	3,143.1	390.4	657.3	535.6	121.70	5.401	
10,400.0	7,157.5	10,233.5	6,944.2	65.5	65.7	71.07	71.07	3,243.1	390.4	657.4	532.2	125.23	5.249	
10,500.0	7,157.8	10,333.5	6,944.1	67.4	67.6	71.04	71.04	3,343.1	390.4	657.5	528.8	128.78	5.106	
10,600.0	7,158.1	10,433.5	6,944.0	69.2	69.5	71.00	71.00	3,443.1	390.4	657.7	525.4	132.32	4.970	
10,700.0	7,158.4	10,533.5	6,943.9	71.1	71.3	70.97	70.97	3,543.1	390.4	657.8	521.9	135.87	4.841	
10,800.0	7,158.7	10,633.5	6,943.8	73.0	73.2	70.94	70.94	3,643.1	390.4	657.9	518.5	139.43	4.719	
10,900.0	7,159.0	10,733.5	6,943.7	74.8	75.1	70.91	70.91	3,743.1	390.4	658.1	515.1	142.98	4.602	
11,000.0	7,159.3	10,833.5	6,943.6	76.7	77.0	70.87	70.87	3,843.1	390.4	658.2	511.7	146.54	4.491	
11,100.0	7,159.6	10,933.5	6,943.5	78.6	78.9	70.84	70.84	3,943.1	390.4	658.3	508.2	150.11	4.386	
11,200.0	7,159.9	11,033.5	6,943.4	80.5	80.7	70.81	70.81	4,043.1	390.4	658.5	504.8	153.67	4.285	
11,300.0	7,160.1	11,133.5	6,943.3	82.4	82.6	70.77	70.77	4,143.1	390.4	658.6	501.4	157.24	4.189	
11,400.0	7,160.4	11,233.5	6,943.2	84.3	84.5	70.74	70.74	4,243.1	390.4	658.7	497.9	160.81	4.096	
11,500.0	7,160.7	11,333.5	6,943.1	86.1	86.4	70.71	70.71	4,343.1	390.4	658.9	494.5	164.37	4.008	
11,531.9	7,160.8	11,365.4	6,943.0	86.7	87.0	70.70	70.70	4,375.0	390.4	658.9	493.4	165.52	3.981	
11,586.6	7,161.0	11,387.6	6,943.0	87.8	87.4	70.69	70.69	4,397.2	390.4	659.8	492.9	166.89	3.953 SF	

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Rieder 18Q-421
Project:	SEC.18-T4N-R67W	TVD Reference:	WELL @ 4827.0ft (RKB - 15')
Reference Site:	Rieder 4N67W18Q Pad Sec.18-T4N-R67	MD Reference:	WELL @ 4827.0ft (RKB - 15')
Site Error:	0.0ft	North Reference:	True
Reference Well:	Rieder 18Q-421	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	Landmark
Reference Design:	Plan #1 (7-30-14)	Offset TVD Reference:	Offset Datum

Offset Design Rieder 4N67W18Q Pad Sec.18-T4N-R67 - Rieder 18T-301 - Wellbore #1 - Plan #1 (7-30-14)													Offset Site Error:	0.0 ft
Survey Program: 0-MWD													Offset Well Error:	0.0 ft
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference	Offset	Semi Major Axis	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
0.0	0.0	0.0	0.0	0.0	0.0	90.00	90.00	0.0	150.6	150.6				
100.0	100.0	99.0	99.0	0.1	0.1	90.00	90.00	0.0	150.6	150.6	150.4	0.22	673.428	
200.0	200.0	199.0	199.0	0.3	0.3	90.00	90.00	0.0	150.6	150.6	149.9	0.67	224.102	
300.0	300.0	299.0	299.0	0.6	0.6	90.00	90.00	0.0	150.6	150.6	149.5	1.12	134.282	
400.0	400.0	399.0	399.0	0.8	0.8	90.00	90.00	0.0	150.6	150.6	149.0	1.57	95.861	
500.0	500.0	499.0	499.0	1.0	1.0	90.00	90.00	0.0	150.6	150.6	148.6	2.02	74.535	
600.0	600.0	599.0	599.0	1.2	1.2	90.00	90.00	0.0	150.6	150.6	148.1	2.47	60.971	
700.0	700.0	699.0	699.0	1.5	1.5	90.00	90.00	0.0	150.6	150.6	147.7	2.92	51.583	
800.0	800.0	799.0	799.0	1.7	1.7	90.00	90.00	0.0	150.6	150.6	147.2	3.37	44.701	
900.0	900.0	899.0	899.0	1.9	1.9	90.00	90.00	0.0	150.6	150.6	146.8	3.82	39.439	
1,000.0	1,000.0	999.0	999.0	2.1	2.1	90.00	90.00	0.0	150.6	150.6	146.3	4.27	35.285 CC, ES	
1,100.0	1,100.0	1,095.2	1,095.2	2.4	2.3	90.39	90.39	-1.0	151.8	151.8	147.2	4.69	32.395	
1,200.0	1,200.0	1,191.2	1,191.0	2.6	2.5	91.56	91.56	-4.2	155.4	155.6	150.5	5.09	30.566	
1,300.0	1,300.0	1,286.7	1,286.3	2.8	2.7	93.38	93.38	-9.5	161.3	162.1	156.6	5.51	29.431	
1,400.0	1,400.0	1,381.6	1,380.5	3.0	2.9	95.67	95.67	-16.8	169.6	171.4	165.5	5.94	28.843	
1,500.0	1,500.0	1,478.7	1,476.5	3.2	3.2	-118.60	-118.60	-26.1	180.0	184.1	177.8	6.34	29.046	
1,600.0	1,599.8	1,577.5	1,574.3	3.4	3.4	-117.32	-117.32	-35.7	190.8	198.8	192.1	6.74	29.515	
1,700.0	1,699.5	1,676.2	1,671.9	3.6	3.7	-116.99	-116.99	-45.3	201.6	215.2	208.0	7.15	30.092	
1,764.4	1,763.4	1,739.5	1,734.5	3.7	3.9	-117.19	-117.19	-51.5	208.6	226.5	219.1	7.43	30.496	
1,800.0	1,798.7	1,774.5	1,769.2	3.8	4.0	-117.49	-117.49	-54.9	212.4	233.0	225.4	7.59	30.707	
1,900.0	1,897.9	1,872.8	1,866.4	4.0	4.3	-118.24	-118.24	-64.4	223.2	251.1	243.1	8.05	31.200	
2,000.0	1,997.1	1,971.1	1,963.6	4.3	4.6	-118.88	-118.88	-74.0	233.9	269.3	260.8	8.53	31.579	
2,100.0	2,096.3	2,069.4	2,060.9	4.5	4.9	-119.45	-119.45	-83.5	244.7	287.6	278.6	9.03	31.865	
2,200.0	2,195.5	2,167.7	2,158.1	4.8	5.3	-119.94	-119.94	-93.1	255.4	305.9	296.3	9.53	32.080	
2,300.0	2,294.7	2,265.9	2,255.3	5.1	5.6	-120.38	-120.38	-102.6	266.2	324.1	314.1	10.05	32.240	
2,400.0	2,393.9	2,364.2	2,352.6	5.3	5.9	-120.78	-120.78	-112.2	277.0	342.4	331.9	10.58	32.358	
2,500.0	2,493.1	2,462.5	2,449.8	5.6	6.3	-121.13	-121.13	-121.7	287.7	360.7	349.6	11.12	32.442	
2,600.0	2,592.3	2,560.8	2,547.0	5.9	6.6	-121.45	-121.45	-131.3	298.5	379.1	367.4	11.66	32.500	
2,700.0	2,691.5	2,659.1	2,644.2	6.2	6.9	-121.74	-121.74	-140.8	309.2	397.4	385.2	12.21	32.539	
2,800.0	2,790.7	2,757.4	2,741.5	6.5	7.3	-122.01	-122.01	-150.4	320.0	415.8	403.0	12.77	32.561	
2,900.0	2,889.8	2,855.7	2,838.7	6.8	7.6	-122.25	-122.25	-159.9	330.8	434.1	420.8	13.33	32.571	
3,000.0	2,989.0	2,953.9	2,935.9	7.1	8.0	-122.47	-122.47	-169.5	341.5	452.5	438.6	13.89	32.572	
3,100.0	3,088.2	3,052.2	3,033.1	7.4	8.3	-122.68	-122.68	-179.1	352.3	470.8	456.4	14.46	32.565	
3,200.0	3,187.4	3,150.5	3,130.4	7.7	8.6	-122.87	-122.87	-188.6	363.0	489.2	474.2	15.03	32.553	
3,300.0	3,286.6	3,248.8	3,227.6	8.0	9.0	-123.04	-123.04	-198.2	373.8	507.6	492.0	15.60	32.536	
3,400.0	3,385.8	3,347.1	3,324.8	8.4	9.3	-123.21	-123.21	-207.7	384.6	526.0	509.8	16.18	32.515	
3,500.0	3,485.0	3,445.4	3,422.0	8.7	9.7	-123.36	-123.36	-217.3	395.3	544.3	527.6	16.75	32.492	
3,600.0	3,584.2	3,543.7	3,519.3	9.0	10.0	-123.50	-123.50	-226.8	406.1	562.7	545.4	17.33	32.467	
3,700.0	3,683.4	3,641.9	3,616.5	9.3	10.4	-123.64	-123.64	-236.4	416.8	581.1	563.2	17.91	32.440	
3,800.0	3,782.6	3,740.2	3,713.7	9.6	10.7	-123.76	-123.76	-245.9	427.6	599.5	581.0	18.50	32.413	
3,900.0	3,881.8	3,838.5	3,810.9	9.9	11.1	-123.88	-123.88	-255.5	438.4	617.9	598.8	19.08	32.384	
4,000.0	3,981.0	3,936.8	3,908.2	10.3	11.4	-123.99	-123.99	-265.0	449.1	636.3	616.7	19.67	32.356	
4,100.0	4,080.2	4,035.1	4,005.4	10.6	11.8	-124.10	-124.10	-274.6	459.9	654.7	634.5	20.25	32.327	
4,200.0	4,179.3	4,133.4	4,102.6	10.9	12.1	-124.20	-124.20	-284.1	470.6	673.1	652.3	20.84	32.298	
4,300.0	4,278.5	4,231.7	4,199.9	11.2	12.5	-124.29	-124.29	-293.7	481.4	691.5	670.1	21.43	32.270	
4,400.0	4,377.7	4,329.9	4,297.1	11.6	12.8	-124.38	-124.38	-303.2	492.2	709.9	687.9	22.02	32.241	
4,459.4	4,436.6	4,388.3	4,354.8	11.8	13.0	-124.43	-124.43	-308.9	498.5	720.9	698.5	22.37	32.224	
4,500.0	4,477.0	4,428.3	4,394.3	11.9	13.2	-124.57	-124.57	-312.8	502.9	728.2	705.6	22.61	32.203	
4,600.0	4,576.5	4,526.8	4,491.9	12.1	13.5	-124.72	-124.72	-322.4	513.7	744.8	721.7	23.16	32.166	
4,700.0	4,676.3	4,628.0	4,591.9	12.3	13.9	-124.82	-124.82	-332.2	524.8	759.5	735.8	23.67	32.089	
4,800.0	4,776.3	4,753.1	4,716.1	12.5	14.2	-124.88	-124.88	-342.2	536.1	770.3	746.2	24.14	31.909	

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

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Rieder 18Q-421
Project:	SEC.18-T4N-R67W	TVD Reference:	WELL @ 4827.0ft (RKB - 15')
Reference Site:	Rieder 4N67W18Q Pad Sec.18-T4N-R67	MD Reference:	WELL @ 4827.0ft (RKB - 15')
Site Error:	0.0ft	North Reference:	True
Reference Well:	Rieder 18Q-421	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	Landmark
Reference Design:	Plan #1 (7-30-14)	Offset TVD Reference:	Offset Datum

Offset Design Rieder 4N67W18Q Pad Sec.18-T4N-R67 - Rieder 18T-301 - Wellbore #1 - Plan #1 (7-30-14)													Offset Site Error:	0.0 ft
Survey Program: 0-MWD													Offset Well Error:	0.0 ft
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference	Offset	Semi Major Axis	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
4,823.7	4,800.0	4,782.9	4,745.8	12.5	14.3	92.42		-344.1	538.2	772.1	747.8	24.24	31.850	
4,900.0	4,876.3	4,879.3	4,841.9	12.6	14.5	92.74		-348.7	543.3	776.3	751.8	24.55	31.627	
5,000.0	4,976.3	5,006.1	4,968.6	12.8	14.7	92.93		-351.5	546.5	778.9	754.0	24.93	31.249	
5,100.0	5,076.3	5,112.7	5,075.3	13.0	14.9	92.94		-351.6	546.6	779.0	753.8	25.28	30.820	
5,200.0	5,176.3	5,212.7	5,175.3	13.1	15.0	92.94		-351.6	546.6	779.0	753.4	25.61	30.416	
5,300.0	5,276.3	5,312.7	5,275.3	13.3	15.1	92.94		-351.6	546.6	779.0	753.1	25.95	30.019	
5,400.0	5,376.3	5,412.7	5,375.3	13.5	15.3	92.94		-351.6	546.6	779.0	752.7	26.29	29.628	
5,500.0	5,476.3	5,512.7	5,475.3	13.6	15.4	92.94		-351.6	546.6	779.0	752.4	26.64	29.244	
5,600.0	5,576.3	5,612.7	5,575.3	13.8	15.6	92.94		-351.6	546.6	779.0	752.0	26.99	28.866	
5,700.0	5,676.3	5,712.7	5,675.3	14.0	15.8	92.94		-351.6	546.6	779.0	751.7	27.34	28.495	
5,800.0	5,776.3	5,812.7	5,775.3	14.2	15.9	92.94		-351.6	546.6	779.0	751.3	27.69	28.130	
5,900.0	5,876.3	5,912.7	5,875.3	14.3	16.1	92.94		-351.6	546.6	779.0	751.0	28.05	27.772	
6,000.0	5,976.3	6,012.7	5,975.3	14.5	16.2	92.94		-351.6	546.6	779.0	750.6	28.41	27.420	
6,100.0	6,076.3	6,112.7	6,075.3	14.7	16.4	92.94		-351.6	546.6	779.0	750.3	28.77	27.075	
6,200.0	6,176.3	6,212.7	6,175.3	14.9	16.6	92.94		-351.6	546.6	779.0	749.9	29.14	26.736	
6,300.0	6,276.3	6,312.7	6,275.3	15.1	16.7	92.94		-351.6	546.6	779.0	749.5	29.50	26.404	
6,409.0	6,385.2	6,426.7	6,388.8	15.3	16.9	92.39		-344.1	546.6	778.7	748.8	29.88	26.060	
6,450.0	6,426.2	6,468.9	6,430.5	15.3	16.9	91.97		-337.0	546.6	778.5	748.5	30.00	25.953	
6,500.0	6,476.1	6,520.0	6,480.2	15.4	16.9	91.45		-325.4	546.6	778.3	748.2	30.10	25.855	
6,550.0	6,525.5	6,570.5	6,528.6	15.4	16.9	90.93		-310.7	546.6	778.1	747.9	30.17	25.788	
6,600.0	6,574.3	6,620.6	6,575.4	15.5	16.9	90.40		-292.9	546.6	778.0	747.8	30.22	25.749	
6,638.5	6,611.3	6,658.8	6,610.3	15.5	16.9	90.00		-277.4	546.6	778.0	747.8	30.23	25.734	
6,650.0	6,622.3	6,670.2	6,620.6	15.5	16.9	89.88		-272.4	546.6	778.0	747.8	30.24	25.731	
6,700.0	6,669.3	6,719.4	6,663.9	15.5	16.9	89.36		-249.2	546.6	778.1	747.8	30.24	25.728	
6,750.0	6,715.1	6,768.1	6,705.3	15.5	16.8	88.84		-223.5	546.6	778.2	747.9	30.24	25.734	
6,800.0	6,759.4	6,816.4	6,744.6	15.5	16.8	88.34		-195.5	546.6	778.3	748.1	30.24	25.742	
6,850.0	6,802.2	6,864.3	6,781.8	15.5	16.8	87.84		-165.3	546.6	778.6	748.3	30.24	25.744	
6,900.0	6,843.2	6,911.8	6,816.7	15.5	16.7	87.35		-133.2	546.6	778.9	748.6	30.27	25.730	
6,950.0	6,882.2	6,958.9	6,849.3	15.5	16.7	86.87		-99.2	546.6	779.2	748.9	30.33	25.694	
7,000.0	6,919.1	7,005.7	6,879.5	15.5	16.7	86.41		-63.5	546.6	779.6	749.1	30.42	25.626	
7,050.0	6,953.7	7,052.1	6,907.3	15.5	16.6	85.96		-26.3	546.6	780.0	749.4	30.56	25.521	
7,100.0	6,985.8	7,100.0	6,933.6	15.5	16.6	85.52		13.8	546.6	780.4	749.7	30.77	25.367	
7,150.0	7,015.4	7,144.1	6,955.5	15.5	16.5	85.12		52.0	546.6	780.9	749.8	31.03	25.168	
7,200.0	7,042.3	7,189.6	6,975.8	15.5	16.5	84.73		92.8	546.6	781.3	750.0	31.36	24.915	
7,250.0	7,066.4	7,235.0	6,993.5	15.7	16.5	84.36		134.5	546.6	781.8	750.1	31.77	24.609	
7,300.0	7,087.6	7,280.0	7,008.6	15.9	16.5	84.02		177.0	546.6	782.3	750.0	32.26	24.249	
7,350.0	7,105.7	7,324.9	7,021.2	16.2	16.8	83.69		220.0	546.6	782.8	750.0	32.82	23.847	
7,400.0	7,120.8	7,369.6	7,031.2	16.6	17.2	83.40		263.6	546.6	783.2	749.8	33.47	23.402	
7,450.0	7,132.7	7,414.1	7,038.6	17.0	17.6	83.13		307.4	546.6	783.7	749.5	34.19	22.921	
7,500.0	7,141.4	7,458.4	7,043.4	17.4	18.0	82.88		351.5	546.6	784.1	749.1	34.98	22.412	
7,550.0	7,146.9	7,502.6	7,045.6	17.9	18.4	82.66		395.6	546.6	784.5	748.6	35.84	21.885	
7,600.0	7,149.1	7,549.8	7,045.7	18.4	18.9	82.50		442.8	546.6	784.7	747.9	36.81	21.317	
7,606.7	7,149.2	7,556.5	7,045.6	18.5	19.0	82.49		449.5	546.6	784.7	747.8	36.95	21.237	
7,700.0	7,149.5	7,649.8	7,045.1	19.5	20.1	82.44		542.8	546.6	784.8	745.8	39.00	20.126	
7,800.0	7,149.8	7,749.8	7,044.6	20.7	21.3	82.38		642.8	546.6	785.0	743.5	41.41	18.956	
7,900.0	7,150.1	7,849.8	7,044.1	22.1	22.6	82.32		742.8	546.6	785.1	741.0	44.02	17.835	
8,000.0	7,150.4	7,949.8	7,043.6	23.5	24.1	82.26		842.8	546.6	785.2	738.4	46.79	16.780	
8,100.0	7,150.7	8,049.8	7,043.0	24.9	25.5	82.20		942.8	546.6	785.3	735.6	49.70	15.800	
8,200.0	7,151.0	8,149.8	7,042.5	26.5	27.0	82.14		1,042.8	546.6	785.4	732.7	52.73	14.896	
8,300.0	7,151.2	8,249.8	7,042.0	28.0	28.6	82.08		1,142.8	546.6	785.5	729.7	55.84	14.066	
8,400.0	7,151.5	8,349.8	7,041.5	29.7	30.2	82.02		1,242.8	546.6	785.6	726.6	59.04	13.306	

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

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Rieder 18Q-421
Project:	SEC.18-T4N-R67W	TVD Reference:	WELL @ 4827.0ft (RKB - 15')
Reference Site:	Rieder 4N67W18Q Pad Sec.18-T4N-R67	MD Reference:	WELL @ 4827.0ft (RKB - 15')
Site Error:	0.0ft	North Reference:	True
Reference Well:	Rieder 18Q-421	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	Landmark
Reference Design:	Plan #1 (7-30-14)	Offset TVD Reference:	Offset Datum

Offset Design Rieder 4N67W18Q Pad Sec.18-T4N-R67 - Rieder 18T-301 - Wellbore #1 - Plan #1 (7-30-14)												Offset Site Error: 0.0 ft	
Survey Program: 0-MWD												Offset Well Error: 0.0 ft	
Reference		Offset		Semi Major Axis			Distance					Warning	
Measured Depth	Vertical Depth	Measured Depth	Vertical Depth	Reference	Offset	Highside Toolface	Offset Wellbore Centre		Between Centres	Between Ellipses	Minimum Separation		
(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(°)	+N/-S (ft)	+E/-W (ft)	(ft)	(ft)	(ft)		
8,500.0	7,151.8	8,449.8	7,041.0	31.3	31.9	81.96	1,342.8	546.6	785.7	723.4	62.31	12.611	
8,600.0	7,152.1	8,549.8	7,040.4	33.0	33.5	81.90	1,442.8	546.6	785.9	720.2	65.63	11.974	
8,700.0	7,152.4	8,649.8	7,039.9	34.7	35.2	81.84	1,542.8	546.6	786.0	717.0	69.00	11.391	
8,800.0	7,152.7	8,749.8	7,039.4	36.4	36.9	81.78	1,642.8	546.6	786.1	713.7	72.41	10.856	
8,900.0	7,153.0	8,849.8	7,038.9	38.2	38.7	81.72	1,742.8	546.6	786.2	710.3	75.86	10.364	
9,000.0	7,153.3	8,949.8	7,038.3	39.9	40.4	81.66	1,842.8	546.6	786.3	707.0	79.34	9.911	
9,100.0	7,153.6	9,049.8	7,037.8	41.7	42.2	81.61	1,942.8	546.6	786.4	703.6	82.85	9.493	
9,200.0	7,153.9	9,149.8	7,037.3	43.5	44.0	81.55	2,042.8	546.6	786.6	700.2	86.38	9.106	
9,300.0	7,154.2	9,249.8	7,036.8	45.3	45.7	81.49	2,142.7	546.6	786.7	696.8	89.93	8.748	
9,400.0	7,154.5	9,349.7	7,036.2	47.1	47.5	81.43	2,242.7	546.6	786.8	693.3	93.50	8.415	
9,500.0	7,154.8	9,449.7	7,035.7	48.9	49.3	81.37	2,342.7	546.6	786.9	689.9	97.08	8.106	
9,600.0	7,155.1	9,549.7	7,035.2	50.7	51.2	81.31	2,442.7	546.6	787.1	686.4	100.68	7.817	
9,700.0	7,155.4	9,649.7	7,034.7	52.5	53.0	81.25	2,542.7	546.6	787.2	682.9	104.29	7.548	
9,800.0	7,155.7	9,749.7	7,034.1	54.4	54.8	81.19	2,642.7	546.6	787.3	679.4	107.91	7.296	
9,900.0	7,156.0	9,849.7	7,033.6	56.2	56.6	81.13	2,742.7	546.6	787.4	675.9	111.55	7.059	
10,000.0	7,156.3	9,949.7	7,033.1	58.1	58.5	81.07	2,842.7	546.6	787.6	672.4	115.19	6.837	
10,100.0	7,156.6	10,049.7	7,032.6	59.9	60.3	81.02	2,942.7	546.6	787.7	668.9	118.84	6.628	
10,200.0	7,156.9	10,149.7	7,032.1	61.8	62.2	80.96	3,042.7	546.6	787.8	665.3	122.49	6.432	
10,300.0	7,157.2	10,249.7	7,031.5	63.6	64.0	80.90	3,142.7	546.6	787.9	661.8	126.16	6.246	
10,400.0	7,157.5	10,349.7	7,031.0	65.5	65.9	80.84	3,242.7	546.6	788.1	658.3	129.82	6.070	
10,500.0	7,157.8	10,449.7	7,030.5	67.4	67.8	80.78	3,342.7	546.6	788.2	654.7	133.50	5.904	
10,600.0	7,158.1	10,549.7	7,030.0	69.2	69.6	80.72	3,442.7	546.6	788.3	651.2	137.18	5.747	
10,700.0	7,158.4	10,649.7	7,029.4	71.1	71.5	80.66	3,542.7	546.6	788.5	647.6	140.86	5.598	
10,800.0	7,158.7	10,749.7	7,028.9	73.0	73.4	80.60	3,642.7	546.6	788.6	644.1	144.55	5.456	
10,900.0	7,159.0	10,849.7	7,028.4	74.8	75.2	80.54	3,742.7	546.6	788.7	640.5	148.24	5.321	
11,000.0	7,159.3	10,949.7	7,027.9	76.7	77.1	80.49	3,842.7	546.6	788.9	637.0	151.93	5.192	
11,100.0	7,159.6	11,049.7	7,027.3	78.6	79.0	80.43	3,942.7	546.6	789.0	633.4	155.62	5.070	
11,200.0	7,159.9	11,149.7	7,026.8	80.5	80.9	80.37	4,042.7	546.6	789.2	629.8	159.32	4.953	
11,300.0	7,160.1	11,249.7	7,026.3	82.4	82.7	80.31	4,142.7	546.6	789.3	626.3	163.02	4.842	
11,400.0	7,160.4	11,349.7	7,025.8	84.3	84.6	80.25	4,242.6	546.6	789.4	622.7	166.72	4.735	
11,500.0	7,160.7	11,449.7	7,025.2	86.1	86.5	80.19	4,342.6	546.6	789.6	619.1	170.43	4.633	
11,524.6	7,160.8	11,474.3	7,025.1	86.6	87.0	80.18	4,367.3	546.6	789.6	618.3	171.34	4.608	
11,586.6	7,161.0	11,497.6	7,025.0	87.8	87.4	80.16	4,390.6	546.6	790.6	617.7	172.92	4.572 SF	

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Rieder 18Q-421
Project:	SEC.18-T4N-R67W	TVD Reference:	WELL @ 4827.0ft (RKB - 15')
Reference Site:	Rieder 4N67W18Q Pad Sec.18-T4N-R67	MD Reference:	WELL @ 4827.0ft (RKB - 15')
Site Error:	0.0ft	North Reference:	True
Reference Well:	Rieder 18Q-421	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	Landmark
Reference Design:	Plan #1 (7-30-14)	Offset TVD Reference:	Offset Datum

Offset Design Rieder 4N67W18Q Pad Sec.18-T4N-R67 - Rieder 18T-341 - Wellbore #1 - Plan #1 (7-30-14)													Offset Site Error:	0.0 ft
Survey Program: 0-MWD													Offset Well Error:	0.0 ft
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference	Offset	Semi Major Axis	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
0.0	0.0	0.0	0.0	0.0	0.0	89.99	89.99	0.0	89.2	89.2				
100.0	100.0	100.0	100.0	0.1	0.1	89.99	89.99	0.0	89.2	89.2	89.0	0.22	397.076	
200.0	200.0	200.0	200.0	0.3	0.3	89.99	89.99	0.0	89.2	89.2	88.6	0.67	132.359	
300.0	300.0	300.0	300.0	0.6	0.6	89.99	89.99	0.0	89.2	89.2	88.1	1.12	79.415	
400.0	400.0	400.0	400.0	0.8	0.8	89.99	89.99	0.0	89.2	89.2	87.7	1.57	56.725	
500.0	500.0	500.0	500.0	1.0	1.0	89.99	89.99	0.0	89.2	89.2	87.2	2.02	44.120	
600.0	600.0	600.0	600.0	1.2	1.2	89.99	89.99	0.0	89.2	89.2	86.8	2.47	36.098	
700.0	700.0	700.0	700.0	1.5	1.5	89.99	89.99	0.0	89.2	89.2	86.3	2.92	30.544	
800.0	800.0	800.0	800.0	1.7	1.7	89.99	89.99	0.0	89.2	89.2	85.9	3.37	26.472	
900.0	900.0	900.0	900.0	1.9	1.9	89.99	89.99	0.0	89.2	89.2	85.4	3.82	23.357	
1,000.0	1,000.0	1,000.0	1,000.0	2.1	2.1	89.99	89.99	0.0	89.2	89.2	85.0	4.27	20.899	
1,100.0	1,100.0	1,100.0	1,100.0	2.4	2.4	89.99	89.99	0.0	89.2	89.2	84.5	4.72	18.908	
1,200.0	1,200.0	1,200.0	1,200.0	2.6	2.6	89.99	89.99	0.0	89.2	89.2	84.1	5.17	17.264	
1,300.0	1,300.0	1,300.0	1,300.0	2.8	2.8	89.99	89.99	0.0	89.2	89.2	83.6	5.62	15.883	
1,400.0	1,400.0	1,400.0	1,400.0	3.0	3.0	89.99	89.99	0.0	89.2	89.2	83.2	6.07	14.707 CC, ES	
1,500.0	1,500.0	1,500.0	1,500.0	3.2	3.3	-127.48	89.99	0.0	89.2	90.3	83.8	6.49	13.912	
1,600.0	1,599.8	1,599.8	1,599.8	3.4	3.5	-129.97	89.99	0.0	89.2	93.6	86.7	6.89	13.584	
1,700.0	1,699.5	1,698.5	1,698.4	3.6	3.7	-132.75	89.99	-1.5	89.9	99.9	92.6	7.26	13.758	
1,764.4	1,763.4	1,761.8	1,761.8	3.7	3.8	-134.10	89.99	-4.2	91.1	105.9	98.4	7.49	14.134	
1,800.0	1,798.7	1,796.9	1,796.8	3.8	3.9	-134.67	89.99	-6.2	91.9	109.6	102.0	7.62	14.383	
1,900.0	1,897.9	1,895.3	1,894.7	4.0	4.0	-135.02	89.99	-13.9	95.3	120.8	112.8	8.01	15.082	
2,000.0	1,997.1	1,993.9	1,992.7	4.3	4.2	-134.02	89.99	-24.5	99.9	132.8	124.4	8.43	15.761	
2,100.0	2,096.3	2,093.1	2,091.2	4.5	4.4	-132.96	89.99	-35.6	104.8	145.0	136.2	8.87	16.352	
2,200.0	2,195.5	2,192.3	2,189.6	4.8	4.7	-132.07	89.99	-46.8	109.6	157.3	147.9	9.33	16.854	
2,300.0	2,294.7	2,291.6	2,288.1	5.1	4.9	-131.31	89.99	-57.9	114.4	169.6	159.7	9.81	17.281	
2,400.0	2,393.9	2,390.8	2,386.6	5.3	5.2	-130.65	89.99	-69.0	119.3	181.9	171.5	10.31	17.645	
2,500.0	2,493.1	2,490.0	2,485.1	5.6	5.4	-130.07	89.99	-80.2	124.1	194.2	183.4	10.81	17.956	
2,600.0	2,592.3	2,589.2	2,583.5	5.9	5.7	-129.56	89.99	-91.3	129.0	206.5	195.2	11.33	18.222	
2,700.0	2,691.5	2,688.4	2,682.0	6.2	5.9	-129.11	89.99	-102.5	133.8	218.9	207.0	11.86	18.450	
2,800.0	2,790.7	2,787.7	2,780.5	6.5	6.2	-128.71	89.99	-113.6	138.7	231.2	218.8	12.40	18.647	
2,900.0	2,889.8	2,886.9	2,879.0	6.8	6.5	-128.35	89.99	-124.7	143.5	243.6	230.7	12.95	18.817	
3,000.0	2,989.0	2,986.1	2,977.4	7.1	6.8	-128.03	89.99	-135.9	148.3	256.0	242.5	13.50	18.965	
3,100.0	3,088.2	3,085.3	3,075.9	7.4	7.1	-127.73	89.99	-147.0	153.2	268.4	254.3	14.06	19.094	
3,200.0	3,187.4	3,184.5	3,174.4	7.7	7.4	-127.46	89.99	-158.1	158.0	280.8	266.2	14.62	19.206	
3,300.0	3,286.6	3,283.8	3,272.9	8.0	7.7	-127.21	89.99	-169.3	162.9	293.2	278.0	15.19	19.305	
3,400.0	3,385.8	3,383.0	3,371.3	8.4	8.0	-126.99	89.99	-180.4	167.7	305.6	289.8	15.76	19.392	
3,500.0	3,485.0	3,482.2	3,469.8	8.7	8.2	-126.78	89.99	-191.5	172.6	318.0	301.7	16.33	19.469	
3,600.0	3,584.2	3,581.4	3,568.3	9.0	8.5	-126.58	89.99	-202.7	177.4	330.4	313.5	16.91	19.537	
3,700.0	3,683.4	3,680.6	3,666.8	9.3	8.9	-126.40	89.99	-213.8	182.2	342.8	325.3	17.49	19.598	
3,800.0	3,782.6	3,779.9	3,765.2	9.6	9.2	-126.24	89.99	-225.0	187.1	355.3	337.2	18.08	19.651	
3,900.0	3,881.8	3,879.1	3,863.7	9.9	9.5	-126.08	89.99	-236.1	191.9	367.7	349.0	18.66	19.699	
4,000.0	3,981.0	3,978.3	3,962.2	10.3	9.8	-125.94	89.99	-247.2	196.8	380.1	360.9	19.25	19.742	
4,100.0	4,080.2	4,077.5	4,060.6	10.6	10.1	-125.80	89.99	-258.4	201.6	392.5	372.7	19.84	19.781	
4,200.0	4,179.3	4,176.7	4,159.1	10.9	10.4	-125.67	89.99	-269.5	206.5	405.0	384.5	20.44	19.815	
4,300.0	4,278.5	4,276.0	4,257.6	11.2	10.7	-125.55	89.99	-280.6	211.3	417.4	396.4	21.03	19.847	
4,400.0	4,377.7	4,375.2	4,356.1	11.6	11.0	-125.44	89.99	-291.8	216.2	429.8	408.2	21.63	19.875	
4,459.4	4,436.6	4,434.1	4,414.5	11.8	11.2	-125.37	89.99	-298.4	219.0	437.2	415.2	21.98	19.890	
4,500.0	4,477.0	4,474.4	4,454.6	11.9	11.3	-125.38	89.99	-302.9	221.0	442.1	419.9	22.22	19.898	
4,600.0	4,576.5	4,574.1	4,553.5	12.1	11.6	-125.12	89.99	-314.1	225.9	452.7	430.0	22.76	19.895	
4,700.0	4,676.3	4,680.9	4,659.7	12.3	11.9	-124.67	89.99	-324.1	230.2	460.6	437.3	23.22	19.833	
4,800.0	4,776.3	4,788.2	4,766.8	12.5	12.1	-124.24	89.99	-330.6	233.0	464.8	441.2	23.63	19.671	

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

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Rieder 18Q-421
Project:	SEC.18-T4N-R67W	TVD Reference:	WELL @ 4827.0ft (RKB - 15')
Reference Site:	Rieder 4N67W18Q Pad Sec.18-T4N-R67	MD Reference:	WELL @ 4827.0ft (RKB - 15')
Site Error:	0.0ft	North Reference:	True
Reference Well:	Rieder 18Q-421	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	Landmark
Reference Design:	Plan #1 (7-30-14)	Offset TVD Reference:	Offset Datum

Offset Design Rieder 4N67W18Q Pad Sec.18-T4N-R67 - Rieder 18T-341 - Wellbore #1 - Plan #1 (7-30-14)													Offset Site Error:	0.0 ft
Survey Program: 0-MWD													Offset Well Error:	0.0 ft
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference	Offset	Semi Major Axis	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
4,823.7	4,800.0	4,813.8	4,792.3	12.5	12.2	92.46	92.46	-331.5	233.4	465.3	441.6	23.72	19.616	
4,900.0	4,876.3	4,895.9	4,874.4	12.6	12.3	92.67	92.67	-333.3	234.2	466.1	442.1	24.01	19.415	
5,000.0	4,976.3	4,997.7	4,976.3	12.8	12.5	92.68	92.68	-333.4	234.2	466.2	441.8	24.36	19.138	
5,100.0	5,076.3	5,097.7	5,076.3	13.0	12.7	92.68	92.68	-333.4	234.2	466.2	441.5	24.70	18.873	
5,200.0	5,176.3	5,197.7	5,176.3	13.1	12.8	92.68	92.68	-333.4	234.2	466.2	441.1	25.05	18.613	
5,300.0	5,276.3	5,297.7	5,276.3	13.3	13.0	92.68	92.68	-333.4	234.2	466.2	440.8	25.39	18.357	
5,400.0	5,376.3	5,397.7	5,376.3	13.5	13.2	92.68	92.68	-333.4	234.2	466.2	440.4	25.75	18.106	
5,500.0	5,476.3	5,497.7	5,476.3	13.6	13.3	92.68	92.68	-333.4	234.2	466.2	440.1	26.10	17.860	
5,600.0	5,576.3	5,597.7	5,576.3	13.8	13.5	92.68	92.68	-333.4	234.2	466.2	439.7	26.46	17.619	
5,700.0	5,676.3	5,697.7	5,676.3	14.0	13.7	92.68	92.68	-333.4	234.2	466.2	439.3	26.82	17.382	
5,800.0	5,776.3	5,797.7	5,776.3	14.2	13.9	92.68	92.68	-333.4	234.2	466.2	439.0	27.18	17.150	
5,900.0	5,876.3	5,897.7	5,876.3	14.3	14.1	92.68	92.68	-333.4	234.2	466.2	438.6	27.55	16.923	
6,000.0	5,976.3	5,997.7	5,976.3	14.5	14.2	92.68	92.68	-333.4	234.2	466.2	438.2	27.91	16.700	
6,100.0	6,076.3	6,097.7	6,076.3	14.7	14.4	92.68	92.68	-333.4	234.2	466.2	437.9	28.28	16.481	
6,200.0	6,176.3	6,197.7	6,176.3	14.9	14.6	92.68	92.68	-333.4	234.2	466.2	437.5	28.66	16.267	
6,300.0	6,276.3	6,297.7	6,276.3	15.1	14.8	92.68	92.68	-333.4	234.2	466.2	437.1	29.03	16.057	
6,409.0	6,385.2	6,409.1	6,387.3	15.3	14.9	91.78	91.78	-326.1	234.2	465.9	436.5	29.40	15.849	
6,450.0	6,426.2	6,450.3	6,428.0	15.3	15.0	91.09	91.09	-319.3	234.2	465.7	436.2	29.50	15.788	
6,500.0	6,476.1	6,500.2	6,476.6	15.4	15.0	90.25	90.25	-308.2	234.2	465.7	436.1	29.59	15.736	
6,514.8	6,490.7	6,514.8	6,490.7	15.4	15.0	90.00	90.00	-304.3	234.2	465.6	436.0	29.61	15.726	
6,550.0	6,525.5	6,549.6	6,523.9	15.4	15.0	89.41	89.41	-294.0	234.2	465.7	436.0	29.65	15.705	
6,600.0	6,574.3	6,598.6	6,569.9	15.5	15.0	88.58	88.58	-277.0	234.2	465.8	436.1	29.68	15.693	
6,650.0	6,622.3	6,647.2	6,614.3	15.5	15.0	87.75	87.75	-257.3	234.2	466.0	436.3	29.69	15.695	
6,700.0	6,669.3	6,695.4	6,657.0	15.5	15.0	86.94	86.94	-235.0	234.2	466.3	436.6	29.69	15.709	
6,750.0	6,715.1	6,743.2	6,697.8	15.5	15.0	86.15	86.15	-210.2	234.2	466.7	437.1	29.67	15.729	
6,800.0	6,759.4	6,790.6	6,736.8	15.5	15.0	85.37	85.37	-183.2	234.2	467.2	437.5	29.66	15.751	
6,850.0	6,802.2	6,837.7	6,773.7	15.5	15.0	84.62	84.62	-154.0	234.2	467.7	438.1	29.66	15.770	
6,900.0	6,843.2	6,884.4	6,808.5	15.5	15.0	83.89	83.89	-122.8	234.2	468.3	438.7	29.68	15.781	
6,950.0	6,882.2	6,930.9	6,841.2	15.5	15.0	83.19	83.19	-89.8	234.2	469.0	439.3	29.72	15.778	
7,000.0	6,919.1	6,977.0	6,871.6	15.5	15.1	82.52	82.52	-55.1	234.2	469.7	439.9	29.81	15.758	
7,050.0	6,953.7	7,022.9	6,899.7	15.5	15.1	81.88	81.88	-18.8	234.2	470.4	440.5	29.94	15.714	
7,100.0	6,985.8	7,068.5	6,925.4	15.5	15.2	81.28	81.28	18.9	234.2	471.1	441.0	30.12	15.643	
7,150.0	7,015.4	7,113.9	6,948.7	15.5	15.4	80.71	80.71	57.8	234.2	471.9	441.5	30.36	15.542	
7,200.0	7,042.3	7,159.0	6,969.5	15.5	15.5	80.19	80.19	97.8	234.2	472.6	441.9	30.67	15.408	
7,250.0	7,066.4	7,204.0	6,987.9	15.7	15.8	79.70	79.70	138.9	234.2	473.3	442.3	31.06	15.240	
7,300.0	7,087.6	7,250.0	7,004.2	15.9	16.0	79.24	79.24	181.9	234.2	474.0	442.5	31.53	15.036	
7,350.0	7,105.7	7,293.4	7,017.1	16.2	16.3	78.84	78.84	223.3	234.2	474.7	442.6	32.06	14.805	
7,400.0	7,120.8	7,337.8	7,027.9	16.6	16.7	78.48	78.48	266.4	234.2	475.3	442.6	32.68	14.542	
7,450.0	7,132.7	7,382.2	7,036.2	17.0	17.0	78.16	78.16	309.9	234.2	475.8	442.4	33.38	14.255	
7,500.0	7,141.4	7,426.4	7,041.9	17.4	17.4	77.89	77.89	353.8	234.2	476.3	442.1	34.15	13.948	
7,550.0	7,146.9	7,470.5	7,045.1	17.9	17.9	77.66	77.66	397.8	234.2	476.7	441.7	34.98	13.625	
7,600.0	7,149.1	7,515.6	7,045.7	18.4	18.3	77.48	77.48	442.8	234.2	477.0	441.1	35.90	13.288	
7,606.7	7,149.2	7,522.3	7,045.7	18.5	18.4	77.47	77.47	449.5	234.2	477.0	441.0	36.04	13.237	
7,700.0	7,149.5	7,615.6	7,045.2	19.5	19.5	77.38	77.38	542.8	234.3	477.2	439.1	38.06	12.538	
7,800.0	7,149.8	7,715.6	7,044.7	20.7	20.7	77.29	77.29	642.8	234.3	477.4	436.9	40.45	11.801	
7,900.0	7,150.1	7,815.6	7,044.2	22.1	22.0	77.19	77.19	742.8	234.3	477.5	434.5	43.03	11.097	
8,000.0	7,150.4	7,915.6	7,043.6	23.5	23.5	77.09	77.09	842.8	234.3	477.7	432.0	45.78	10.436	
8,100.0	7,150.7	8,015.6	7,043.1	24.9	25.0	77.00	77.00	942.8	234.3	477.9	429.3	48.65	9.823	
8,200.0	7,151.0	8,115.6	7,042.6	26.5	26.5	76.90	76.90	1,042.8	234.3	478.1	426.5	51.64	9.258	
8,300.0	7,151.2	8,215.5	7,042.1	28.0	28.1	76.81	76.81	1,142.8	234.3	478.3	423.6	54.72	8.741	
8,400.0	7,151.5	8,315.5	7,041.6	29.7	29.7	76.71	76.71	1,242.8	234.3	478.5	420.6	57.87	8.268	

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

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Rieder 18Q-421
Project:	SEC.18-T4N-R67W	TVD Reference:	WELL @ 4827.0ft (RKB - 15')
Reference Site:	Rieder 4N67W18Q Pad Sec.18-T4N-R67	MD Reference:	WELL @ 4827.0ft (RKB - 15')
Site Error:	0.0ft	North Reference:	True
Reference Well:	Rieder 18Q-421	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	Landmark
Reference Design:	Plan #1 (7-30-14)	Offset TVD Reference:	Offset Datum

Offset Design Rieder 4N67W18Q Pad Sec.18-T4N-R67 - Rieder 18T-341 - Wellbore #1 - Plan #1 (7-30-14)												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
8,500.0	7,151.8	8,415.5	7,041.0	31.3	31.4	76.62	1,342.8	234.3	478.7	417.6	61.09	7.836	
8,600.0	7,152.1	8,515.5	7,040.5	33.0	33.1	76.52	1,442.8	234.3	478.9	414.5	64.36	7.441	
8,700.0	7,152.4	8,615.5	7,040.0	34.7	34.8	76.42	1,542.8	234.3	479.1	411.4	67.67	7.079	
8,800.0	7,152.7	8,715.5	7,039.5	36.4	36.5	76.33	1,642.8	234.3	479.2	408.2	71.03	6.748	
8,900.0	7,153.0	8,815.5	7,038.9	38.2	38.2	76.23	1,742.8	234.3	479.4	405.0	74.41	6.443	
9,000.0	7,153.3	8,915.5	7,038.4	39.9	40.0	76.14	1,842.8	234.3	479.6	401.8	77.83	6.163	
9,100.0	7,153.6	9,015.5	7,037.9	41.7	41.8	76.04	1,942.7	234.3	479.8	398.6	81.27	5.904	
9,200.0	7,153.9	9,115.5	7,037.4	43.5	43.6	75.95	2,042.7	234.3	480.0	395.3	84.73	5.666	
9,300.0	7,154.2	9,215.5	7,036.8	45.3	45.4	75.85	2,142.7	234.3	480.2	392.0	88.21	5.444	
9,400.0	7,154.5	9,315.5	7,036.3	47.1	47.2	75.76	2,242.7	234.3	480.4	388.7	91.70	5.239	
9,500.0	7,154.8	9,415.5	7,035.8	48.9	49.0	75.66	2,342.7	234.3	480.6	385.4	95.21	5.048	
9,600.0	7,155.1	9,515.5	7,035.3	50.7	50.8	75.57	2,442.7	234.3	480.9	382.1	98.73	4.870	
9,700.0	7,155.4	9,615.5	7,034.7	52.5	52.7	75.47	2,542.7	234.3	481.1	378.8	102.26	4.704	
9,800.0	7,155.7	9,715.5	7,034.2	54.4	54.5	75.38	2,642.7	234.3	481.3	375.5	105.80	4.549	
9,900.0	7,156.0	9,815.5	7,033.7	56.2	56.4	75.29	2,742.7	234.3	481.5	372.1	109.35	4.403	
10,000.0	7,156.3	9,915.5	7,033.2	58.1	58.2	75.19	2,842.7	234.3	481.7	368.8	112.90	4.266	
10,100.0	7,156.6	10,015.5	7,032.7	59.9	60.1	75.10	2,942.7	234.3	481.9	365.4	116.46	4.138	
10,200.0	7,156.9	10,115.5	7,032.1	61.8	61.9	75.00	3,042.7	234.3	482.1	362.1	120.03	4.017	
10,300.0	7,157.2	10,215.5	7,031.6	63.6	63.8	74.91	3,142.7	234.3	482.3	358.7	123.60	3.902	
10,400.0	7,157.5	10,315.5	7,031.1	65.5	65.6	74.82	3,242.7	234.3	482.5	355.4	127.17	3.794	
10,500.0	7,157.8	10,415.5	7,030.6	67.4	67.5	74.72	3,342.7	234.3	482.8	352.0	130.74	3.692	
10,600.0	7,158.1	10,515.5	7,030.0	69.2	69.4	74.63	3,442.7	234.3	483.0	348.6	134.32	3.596	
10,700.0	7,158.4	10,615.5	7,029.5	71.1	71.3	74.53	3,542.7	234.3	483.2	345.3	137.90	3.504	
10,800.0	7,158.7	10,715.5	7,029.0	73.0	73.1	74.44	3,642.7	234.3	483.4	341.9	141.48	3.417	
10,900.0	7,159.0	10,815.5	7,028.5	74.8	75.0	74.35	3,742.7	234.3	483.6	338.6	145.07	3.334	
11,000.0	7,159.3	10,915.5	7,027.9	76.7	76.9	74.25	3,842.7	234.3	483.9	335.2	148.65	3.255	
11,100.0	7,159.6	11,015.5	7,027.4	78.6	78.8	74.16	3,942.7	234.3	484.1	331.8	152.24	3.180	
11,200.0	7,159.9	11,115.5	7,026.9	80.5	80.6	74.07	4,042.6	234.3	484.3	328.5	155.82	3.108	
11,300.0	7,160.1	11,215.4	7,026.4	82.4	82.5	73.97	4,142.6	234.3	484.5	325.1	159.41	3.040	
11,400.0	7,160.4	11,315.4	7,025.8	84.3	84.4	73.88	4,242.6	234.3	484.8	321.8	162.99	2.974	
11,500.0	7,160.7	11,415.4	7,025.3	86.1	86.3	73.79	4,342.6	234.3	485.0	318.5	166.52	2.912	
11,536.9	7,160.9	11,452.3	7,025.1	86.8	86.8	73.75	4,379.5	234.3	485.1	317.4	167.71	2.892	
11,586.6	7,161.0	11,477.3	7,025.0	87.8	87.2	73.73	4,404.5	234.3	485.8	316.9	168.97	2.875 SF	

Reference Depths are relative to WELL @ 4827.0ft (RKB - 15')	Coordinates are relative to: Rieder 18Q-421
Offset Depths are relative to Offset Datum	Coordinate System is US State Plane 1983, Colorado Northern Zone
Central Meridian is -105.500000 °	Grid Convergence at Surface is: 0.37°



Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Rieder 18Q-421
Project:	SEC.18-T4N-R67W	TVD Reference:	WELL @ 4827.0ft (RKB - 15')
Reference Site:	Rieder 4N67W18Q Pad Sec.18-T4N-R67	MD Reference:	WELL @ 4827.0ft (RKB - 15')
Site Error:	0.0ft	North Reference:	True
Reference Well:	Rieder 18Q-421	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	Landmark
Reference Design:	Plan #1 (7-30-14)	Offset TVD Reference:	Offset Datum

Reference Depths are relative to WELL @ 4827.0ft (RKB - 15')

Offset Depths are relative to Offset Datum

Central Meridian is -105.500000 °

Coordinates are relative to: Rieder 18Q-421

Coordinate System is US State Plane 1983, Colorado Northern Zone

Grid Convergence at Surface is: 0.37°

