

PETROLEUM DEVELOPMENT CORP Weld County CO

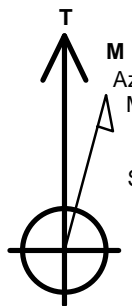
Well Name: **Rieder 18T-221**

Surface Location: Rieder 4N67W18Y Pad Sec.18-T4N-R67W
 North American Datum 1983 , US State Plane 1983 , Colorado Northern Zone
 Ground Elevation: 4806.0

+N/-S	+E/-W	Northing	Easting	Latitude	Longitude	Slot
0.0	0.0	1355509.64	3160201.05	40.307850	-104.925570	
RKB - 15' WELL @ 4821.0ft (RKB - 15')						

WELLBORE TARGET DETAILS

Name	TVD	+N/-S	+E/-W	Shape
SHL 677'FSL & 682'FEL	1.0	0.0	0.0	Point
BHL 500'FNL & 920'FEL	6944.0	4127.6	-412.7	Point

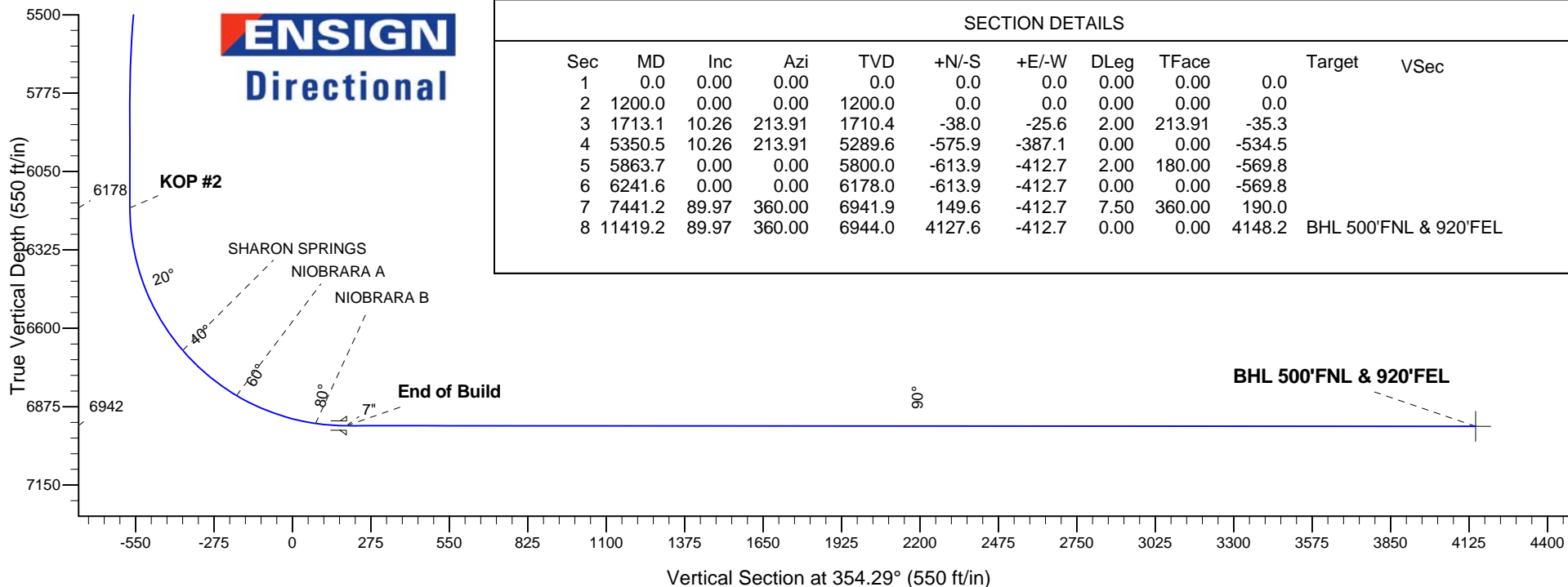
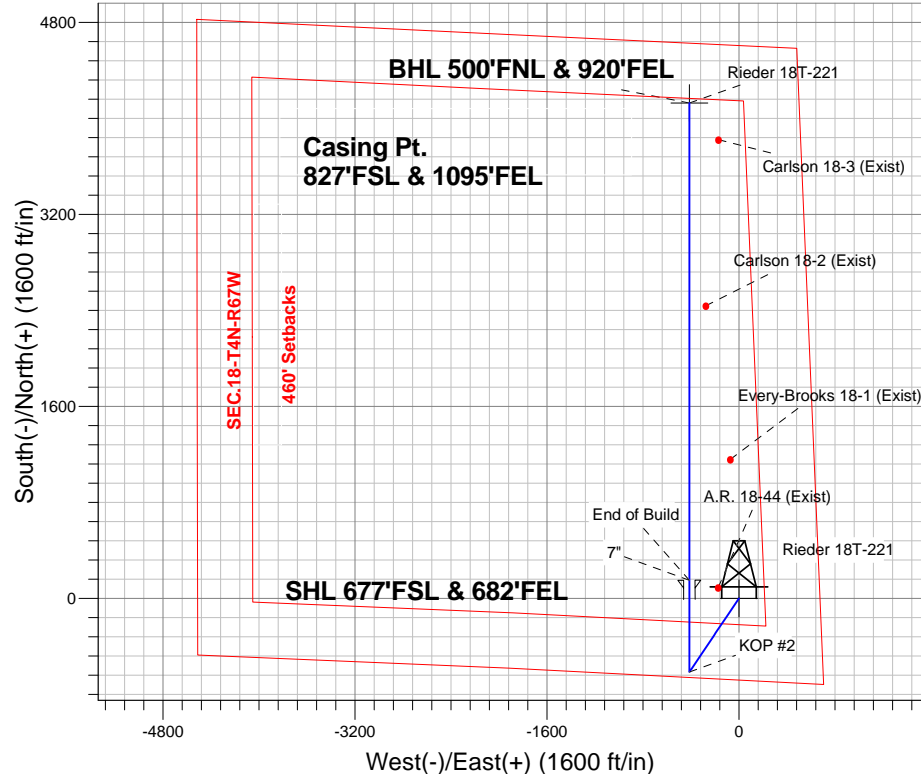


Azimuths to True North
 Magnetic North: 8.52°
 Magnetic Field
 Strength: 52736.9snT
 Dip Angle: 66.84°
 Date: 7/31/2014
 Model: IGRF2010

ANNOTATIONS

TVD	MD	Annotation
1200.0	1200.0	KOP #1
6177.9	6241.6	KOP #2
6941.9	7441.2	End of Build

Rieder 4N67W18Y Pad Sec.18-T4N-R67W
 Rieder 18T-221
 Plan #1 (7-31-14)
 9:44, August 05 2014



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	1200.0	0.00	0.00	1200.0	0.0	0.0	0.00	0.00	0.0	
3	1713.1	10.26	213.91	1710.4	-38.0	-25.6	2.00	213.91	-35.3	
4	5350.5	10.26	213.91	5289.6	-575.9	-387.1	0.00	0.00	-534.5	
5	5863.7	0.00	0.00	5800.0	-613.9	-412.7	2.00	180.00	-569.8	
6	6241.6	0.00	0.00	6178.0	-613.9	-412.7	0.00	0.00	-569.8	
7	7441.2	89.97	360.00	6941.9	149.6	-412.7	7.50	360.00	190.0	
8	11419.2	89.97	360.00	6944.0	4127.6	-412.7	0.00	0.00	4148.2	BHL 500'FNL & 920'FEL



PETROLEUM DEVELOPMENT CORP Weld County CO

SEC.18-T4N-R67W

Rieder 4N67W18Y Pad Sec.18-T4N-R67W

Rieder 18T-221

Wellbore #1

Plan: Plan #1 (7-31-14)

Standard Planning Report

05 August, 2014

Database:	Landmark	Local Co-ordinate Reference:	Well Rieder 18T-221
Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	TVD Reference:	WELL @ 4821.0ft (RKB - 15')
Project:	SEC.18-T4N-R67W	MD Reference:	WELL @ 4821.0ft (RKB - 15')
Site:	Rieder 4N67W18Y Pad Sec.18-T4N-R67W	North Reference:	True
Well:	Rieder 18T-221	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Plan #1 (7-31-14)		

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 4N67W18Y Pad Sec.18-T4N-R67W											
Site Position:						Northing:			1,355,509.65ft			Latitude:			40.307850		
From:			Lat/Long			Easting:			3,160,201.05ft			Longitude:			-104.925570		
Position Uncertainty:			0.0 ft			Slot Radius:			"			Grid Convergence:			0.37 °		

Well	Rieder 18T-221					
Well Position	+N-S	0.0 ft	Northing:	1,355,509.64 ft	Latitude:	40.307850
	+E-W	0.0 ft	Easting:	3,160,201.05 ft	Longitude:	-104.925570
Position Uncertainty		0.0 ft	Wellhead Elevation:	ft	Ground Level:	4,806.0 ft

Wellbore	Wellbore #1				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	7/31/2014	8.52	66.84	52,737

Design	Plan #1 (7-31-14)			
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	354.29

Plan Sections										
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)	TFO (°)	Target
0.0	0.00	0.00	0.0	0.0	0.0	0.00	0.00	0.00	0.00	
1,200.0	0.00	0.00	1,200.0	0.0	0.0	0.00	0.00	0.00	0.00	
1,713.1	10.26	213.91	1,710.4	-38.0	-25.6	2.00	2.00	0.00	213.91	
5,350.5	10.26	213.91	5,289.6	-575.9	-387.1	0.00	0.00	0.00	0.00	
5,863.7	0.00	0.00	5,800.0	-613.9	-412.7	2.00	-2.00	0.00	180.00	
6,241.6	0.00	0.00	6,178.0	-613.9	-412.7	0.00	0.00	0.00	0.00	
7,441.2	89.97	360.00	6,941.9	149.6	-412.7	7.50	7.50	0.00	360.00	
11,419.2	89.97	360.00	6,944.0	4,127.6	-412.7	0.00	0.00	0.00	0.00	BHL 500'FNL & 92C

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Site:	Rieder 4N67W18Y Pad Sec.18-T4N-R67W	North Reference:	True
Well:	Rieder 18T-221	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Plan #1 (7-31-14)		

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 677'FSL & 682'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
KOP #1									
1,300.0	2.00	213.91	1,300.0	-1.4	-1.0	-1.3	2.00	2.00	0.00
1,400.0	4.00	213.91	1,399.8	-5.8	-3.9	-5.4	2.00	2.00	0.00
1,500.0	6.00	213.91	1,499.5	-13.0	-8.8	-12.1	2.00	2.00	0.00
1,600.0	8.00	213.91	1,598.7	-23.1	-15.6	-21.5	2.00	2.00	0.00
1,700.0	10.00	213.91	1,697.5	-36.1	-24.3	-33.5	2.00	2.00	0.00
1,713.1	10.26	213.91	1,710.4	-38.0	-25.6	-35.3	2.00	2.00	0.00
1,800.0	10.26	213.91	1,795.9	-50.9	-34.2	-47.2	0.00	0.00	0.00
1,900.0	10.26	213.91	1,894.3	-65.7	-44.1	-60.9	0.00	0.00	0.00
2,000.0	10.26	213.91	1,992.7	-80.5	-54.1	-74.7	0.00	0.00	0.00
2,100.0	10.26	213.91	2,091.1	-95.2	-64.0	-88.4	0.00	0.00	0.00
2,200.0	10.26	213.91	2,189.5	-110.0	-74.0	-102.1	0.00	0.00	0.00
2,300.0	10.26	213.91	2,287.9	-124.8	-83.9	-115.8	0.00	0.00	0.00
2,400.0	10.26	213.91	2,386.3	-139.6	-93.8	-129.6	0.00	0.00	0.00
2,500.0	10.26	213.91	2,484.7	-154.4	-103.8	-143.3	0.00	0.00	0.00
2,600.0	10.26	213.91	2,583.1	-169.2	-113.7	-157.0	0.00	0.00	0.00
2,700.0	10.26	213.91	2,681.5	-184.0	-123.7	-170.7	0.00	0.00	0.00
2,800.0	10.26	213.91	2,779.9	-198.7	-133.6	-184.5	0.00	0.00	0.00
2,900.0	10.26	213.91	2,878.3	-213.5	-143.5	-198.2	0.00	0.00	0.00
3,000.0	10.26	213.91	2,976.7	-228.3	-153.5	-211.9	0.00	0.00	0.00
3,100.0	10.26	213.91	3,075.1	-243.1	-163.4	-225.6	0.00	0.00	0.00
3,200.0	10.26	213.91	3,173.5	-257.9	-173.4	-239.4	0.00	0.00	0.00
3,300.0	10.26	213.91	3,271.9	-272.7	-183.3	-253.1	0.00	0.00	0.00
3,400.0	10.26	213.91	3,370.3	-287.5	-193.2	-266.8	0.00	0.00	0.00
3,481.0	10.26	213.91	3,450.0	-299.4	-201.3	-277.9	0.00	0.00	0.00
PARKMAN									
3,500.0	10.26	213.91	3,468.7	-302.2	-203.2	-280.5	0.00	0.00	0.00
3,600.0	10.26	213.91	3,567.1	-317.0	-213.1	-294.3	0.00	0.00	0.00
3,700.0	10.26	213.91	3,665.5	-331.8	-223.1	-308.0	0.00	0.00	0.00
3,800.0	10.26	213.91	3,763.9	-346.6	-233.0	-321.7	0.00	0.00	0.00
3,900.0	10.26	213.91	3,862.3	-361.4	-242.9	-335.4	0.00	0.00	0.00
3,999.3	10.26	213.91	3,960.0	-376.1	-252.8	-349.1	0.00	0.00	0.00
SUSSEX									
4,000.0	10.26	213.91	3,960.7	-376.2	-252.9	-349.1	0.00	0.00	0.00
4,100.0	10.26	213.91	4,059.1	-391.0	-262.8	-362.9	0.00	0.00	0.00
4,200.0	10.26	213.91	4,157.5	-405.7	-272.8	-376.6	0.00	0.00	0.00
4,300.0	10.26	213.91	4,255.9	-420.5	-282.7	-390.3	0.00	0.00	0.00
4,400.0	10.26	213.91	4,354.3	-435.3	-292.6	-404.0	0.00	0.00	0.00

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Site:	Rieder 4N67W18Y Pad Sec.18-T4N-R67W	North Reference:	True
Well:	Rieder 18T-221	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Plan #1 (7-31-14)		

Planned Survey									
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
4,500.0	10.26	213.91	4,452.7	-450.1	-302.6	-417.8	0.00	0.00	0.00
4,568.4	10.26	213.91	4,520.0	-460.2	-309.4	-427.2	0.00	0.00	0.00
SHANNON									
4,600.0	10.26	213.91	4,551.1	-464.9	-312.5	-431.5	0.00	0.00	0.00
4,700.0	10.26	213.91	4,649.5	-479.7	-322.5	-445.2	0.00	0.00	0.00
4,800.0	10.26	213.91	4,747.9	-494.5	-332.4	-458.9	0.00	0.00	0.00
4,900.0	10.26	213.91	4,846.3	-509.2	-342.3	-472.7	0.00	0.00	0.00
5,000.0	10.26	213.91	4,944.7	-524.0	-352.3	-486.4	0.00	0.00	0.00
5,100.0	10.26	213.91	5,043.1	-538.8	-362.2	-500.1	0.00	0.00	0.00
5,200.0	10.26	213.91	5,141.5	-553.6	-372.2	-513.8	0.00	0.00	0.00
5,300.0	10.26	213.91	5,239.9	-568.4	-382.1	-527.6	0.00	0.00	0.00
5,350.5	10.26	213.91	5,289.6	-575.9	-387.1	-534.5	0.00	0.00	0.00
5,400.0	9.27	213.91	5,338.3	-582.8	-391.8	-541.0	2.00	-2.00	0.00
5,500.0	7.27	213.91	5,437.3	-594.8	-399.8	-552.0	2.00	-2.00	0.00
5,600.0	5.27	213.91	5,536.7	-603.8	-405.9	-560.5	2.00	-2.00	0.00
5,700.0	3.27	213.91	5,636.4	-610.0	-410.1	-566.2	2.00	-2.00	0.00
5,800.0	1.27	213.91	5,736.3	-613.3	-412.3	-569.2	2.00	-2.00	0.00
5,863.7	0.00	0.00	5,800.0	-613.9	-412.7	-569.8	2.00	-2.00	0.00
5,900.0	0.00	0.00	5,836.3	-613.9	-412.7	-569.8	0.00	0.00	0.00
6,000.0	0.00	0.00	5,936.3	-613.9	-412.7	-569.8	0.00	0.00	0.00
6,100.0	0.00	0.00	6,036.3	-613.9	-412.7	-569.8	0.00	0.00	0.00
6,200.0	0.00	0.00	6,136.3	-613.9	-412.7	-569.8	0.00	0.00	0.00
6,241.6	0.00	0.00	6,177.9	-613.9	-412.7	-569.8	0.00	0.00	0.00
KOP #2									
6,300.0	4.38	360.00	6,236.3	-611.7	-412.7	-567.6	7.49	7.49	0.00
6,400.0	11.88	360.00	6,335.2	-597.5	-412.7	-553.5	7.50	7.50	0.00
6,500.0	19.38	360.00	6,431.4	-570.6	-412.7	-526.7	7.50	7.50	0.00
6,600.0	26.88	360.00	6,523.3	-531.4	-412.7	-487.7	7.50	7.50	0.00
6,700.0	34.38	360.00	6,609.3	-480.5	-412.7	-437.0	7.50	7.50	0.00
6,786.8	40.88	360.00	6,678.0	-427.5	-412.7	-384.3	7.50	7.50	0.00
SHARON SPRINGS									
6,800.0	41.88	360.00	6,687.9	-418.8	-412.7	-375.6	7.50	7.50	0.00
6,900.0	49.38	360.00	6,757.8	-347.4	-412.7	-304.6	7.50	7.50	0.00
7,000.0	56.88	360.00	6,817.8	-267.4	-412.7	-225.0	7.50	7.50	0.00
7,034.6	59.47	360.00	6,836.0	-238.0	-412.7	-195.8	7.50	7.50	0.00
NIORARA A									
7,100.0	64.38	360.00	6,866.8	-180.3	-412.7	-138.4	7.50	7.50	0.00
7,200.0	71.88	360.00	6,904.0	-87.6	-412.7	-46.1	7.50	7.50	0.00
7,300.0	79.38	360.00	6,928.8	9.2	-412.7	50.2	7.50	7.50	0.00
7,331.6	81.74	360.00	6,934.0	40.3	-412.7	81.2	7.50	7.50	0.00
NIORARA B									
7,400.0	86.88	360.00	6,940.8	108.4	-412.7	148.9	7.50	7.50	0.00
7,441.2	89.97	360.00	6,941.9	149.6	-412.7	189.9	7.50	7.50	0.00
End of Build - 7"									
7,500.0	89.97	360.00	6,941.9	208.4	-412.7	248.4	0.01	0.01	0.00
7,600.0	89.97	360.00	6,942.0	308.4	-412.7	347.9	0.00	0.00	0.00
7,700.0	89.97	360.00	6,942.1	408.4	-412.7	447.4	0.00	0.00	0.00
7,800.0	89.97	360.00	6,942.1	508.4	-412.7	546.9	0.00	0.00	0.00
7,900.0	89.97	360.00	6,942.2	608.4	-412.7	646.4	0.00	0.00	0.00
8,000.0	89.97	360.00	6,942.2	708.4	-412.7	745.9	0.00	0.00	0.00
8,100.0	89.97	360.00	6,942.3	808.4	-412.7	845.4	0.00	0.00	0.00
8,200.0	89.97	360.00	6,942.3	908.4	-412.7	944.9	0.00	0.00	0.00

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Well:	Rieder 18T-221	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Plan #1 (7-31-14)		

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)
8,300.0	89.97	360.00	6,942.4	1,008.4	-412.7	1,044.5	0.00	0.00	0.00
8,400.0	89.97	360.00	6,942.4	1,108.4	-412.7	1,144.0	0.00	0.00	0.00
8,500.0	89.97	360.00	6,942.5	1,208.4	-412.7	1,243.5	0.00	0.00	0.00
8,600.0	89.97	360.00	6,942.5	1,308.4	-412.7	1,343.0	0.00	0.00	0.00
8,700.0	89.97	360.00	6,942.6	1,408.4	-412.7	1,442.5	0.00	0.00	0.00
8,800.0	89.97	360.00	6,942.6	1,508.4	-412.7	1,542.0	0.00	0.00	0.00
8,900.0	89.97	360.00	6,942.7	1,608.4	-412.7	1,641.5	0.00	0.00	0.00
9,000.0	89.97	360.00	6,942.7	1,708.4	-412.7	1,741.0	0.00	0.00	0.00
9,100.0	89.97	360.00	6,942.8	1,808.4	-412.7	1,840.5	0.00	0.00	0.00
9,200.0	89.97	360.00	6,942.8	1,908.4	-412.7	1,940.0	0.00	0.00	0.00
9,300.0	89.97	360.00	6,942.9	2,008.4	-412.7	2,039.5	0.00	0.00	0.00
9,400.0	89.97	360.00	6,942.9	2,108.4	-412.7	2,139.0	0.00	0.00	0.00
9,500.0	89.97	360.00	6,943.0	2,208.4	-412.7	2,238.5	0.00	0.00	0.00
9,600.0	89.97	360.00	6,943.0	2,308.4	-412.7	2,338.0	0.00	0.00	0.00
9,700.0	89.97	360.00	6,943.1	2,408.4	-412.7	2,437.5	0.00	0.00	0.00
9,800.0	89.97	360.00	6,943.2	2,508.4	-412.7	2,537.0	0.00	0.00	0.00
9,900.0	89.97	360.00	6,943.2	2,608.4	-412.7	2,636.5	0.00	0.00	0.00
10,000.0	89.97	360.00	6,943.3	2,708.4	-412.7	2,736.0	0.00	0.00	0.00
10,100.0	89.97	360.00	6,943.3	2,808.4	-412.7	2,835.5	0.00	0.00	0.00
10,200.0	89.97	360.00	6,943.4	2,908.4	-412.7	2,935.0	0.00	0.00	0.00
10,300.0	89.97	360.00	6,943.4	3,008.4	-412.7	3,034.5	0.00	0.00	0.00
10,400.0	89.97	360.00	6,943.5	3,108.4	-412.7	3,134.0	0.00	0.00	0.00
10,500.0	89.97	360.00	6,943.5	3,208.4	-412.7	3,233.5	0.00	0.00	0.00
10,600.0	89.97	360.00	6,943.6	3,308.4	-412.7	3,333.0	0.00	0.00	0.00
10,700.0	89.97	360.00	6,943.6	3,408.4	-412.7	3,432.5	0.00	0.00	0.00
10,800.0	89.97	360.00	6,943.7	3,508.4	-412.7	3,532.0	0.00	0.00	0.00
10,900.0	89.97	360.00	6,943.7	3,608.4	-412.7	3,631.6	0.00	0.00	0.00
11,000.0	89.97	360.00	6,943.8	3,708.4	-412.7	3,731.1	0.00	0.00	0.00
11,100.0	89.97	360.00	6,943.8	3,808.4	-412.7	3,830.6	0.00	0.00	0.00
11,200.0	89.97	360.00	6,943.9	3,908.4	-412.7	3,930.1	0.00	0.00	0.00
11,300.0	89.97	360.00	6,943.9	4,008.4	-412.7	4,029.6	0.00	0.00	0.00
11,400.0	89.97	360.00	6,944.0	4,108.4	-412.7	4,129.1	0.00	0.00	0.00
11,419.2	89.97	360.00	6,944.0	4,127.6	-412.7	4,148.2	0.00	0.00	0.00
BHL 500'FNL & 920'FEL									

Casing Points

Measured Depth (ft)	Vertical Depth (ft)	Name	Casing Diameter (")	Hole Diameter (")
7,441.2	6,941.9	7"	7	7-1/2

Database:	Landmark	Local Co-ordinate Reference:	Well Rieder 18T-221
Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	TVD Reference:	WELL @ 4821.0ft (RKB - 15')
Project:	SEC.18-T4N-R67W	MD Reference:	WELL @ 4821.0ft (RKB - 15')
Site:	Rieder 4N67W18Y Pad Sec.18-T4N-R67W	North Reference:	True
Well:	Rieder 18T-221	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Plan #1 (7-31-14)		

Formations						
Measured Depth (ft)	Vertical Depth (ft)	Name	Lithology	Dip (°)	Dip Direction (°)	
3,481.0	3,450.0	PARKMAN				
3,999.3	3,960.0	SUSSEX				
4,568.4	4,520.0	SHANNON				
6,786.8	6,678.0	SHARON SPRINGS				
7,034.6	6,836.0	NIOBRARA A				
7,331.6	6,934.0	NIOBRARA B				
	7,008.0	NIOBRARA C				
	7,132.0	FT HAYS				
	7,154.0	CODELL				

Plan Annotations				
Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment
		+N/-S (ft)	+E/-W (ft)	
1,200.0	1,200.0	0.0	0.0	KOP #1
6,241.6	6,177.9	-613.9	-412.7	KOP #2
7,441.2	6,941.9	149.6	-412.7	End of Build



PETROLEUM DEVELOPMENT CORP Weld County CO

SEC.18-T4N-R67W

Rieder 4N67W18Y Pad Sec.18-T4N-R67W

Rieder 18T-221

Wellbore #1

Plan #1 (7-31-14)

Anticollision Report

05 August, 2014



Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Rieder 18T-221
Project:	SEC.18-T4N-R67W	TVD Reference:	WELL @ 4821.0ft (RKB - 15')
Reference Site:	Rieder 4N67W18Y Pad Sec.18-T4N-R67W	MD Reference:	WELL @ 4821.0ft (RKB - 15')
Site Error:	0.0ft	North Reference:	True
Reference Well:	Rieder 18T-221	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 (7-31-14)	Offset TVD Reference:	Offset Datum

Reference	Plan #1 (7-31-14)
Filter type:	NO GLOBAL FILTER: Using user defined selection & filtering criteria
Interpolation Method:	MD Interval 100.0ft
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	8/5/2014		
From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description	
0.0	11,419.2	Plan #1 (7-31-14) (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						
A.R. 18-44 (Exist) - Wellbore #1 - Wellbore #1	1,546.2	1,529.3	194.3	160.5	5.742	CC
A.R. 18-44 (Exist) - Wellbore #1 - Wellbore #1	7,382.6	6,923.6	239.8	84.0	1.539	ES, SF
Carlson 18-2 (Exist) - Wellbore #1 - Wellbore #1	9,728.8	6,924.1	136.6	-54.3	0.716	Level 1, CC, ES, SF
Carlson 18-3 (Exist) - Wellbore #1 - Wellbore #1	11,113.2	6,934.8	242.6	25.8	1.119	Level 2, CC, ES, SF
Every-Brooks 18-1 (Exist) - Wellbore #1 - Wellbore #1	8,450.1	6,923.4	340.2	171.5	2.017	CC, ES, SF
Rieder 4N67W18Y Pad Sec.18-T4N-R67W						
Rieder 18T-321 - Wellbore #1 - Plan #1 (7-31-14)	1,000.0	1,000.0	30.7	26.4	7.184	CC
Rieder 18T-321 - Wellbore #1 - Plan #1 (7-31-14)	11,419.2	11,514.8	175.9	24.9	1.165	Level 2, ES, SF
Rieder 18T-401 - Wellbore #1 - Plan #1 (7-31-14)	800.0	799.0	61.4	58.0	18.211	CC, ES
Rieder 18T-401 - Wellbore #1 - Plan #1 (7-31-14)	11,419.2	11,616.9	376.9	234.3	2.644	SF
Rieder 18Y-241 - Wellbore #1 - Plan #1 (7-31-14)	1,200.0	1,200.0	27.9	22.7	5.395	CC, ES
Rieder 18Y-241 - Wellbore #1 - Plan #1 (7-31-14)	11,419.2	11,408.0	536.0	368.2	3.193	SF
Rieder 18Y-301 - Wellbore #1 - Plan #1 (7-31-14)	1,000.0	1,000.0	89.2	85.0	20.899	CC, ES
Rieder 18Y-301 - Wellbore #1 - Plan #1 (7-31-14)	11,419.2	11,513.9	852.5	685.5	5.104	SF
Rieder 18Y-441 - Wellbore #1 - Plan #1 (7-31-14)	1,200.0	1,200.0	58.6	53.4	11.330	CC, ES
Rieder 18Y-441 - Wellbore #1 - Plan #1 (7-31-14)	11,419.2	11,609.6	728.3	567.1	4.518	SF

Offset Design Existing Wells Sec.18-T4N-R67W - A.R. 18-44 (Exist) - Wellbore #1 - Wellbore #1													Offset Site Error:	0.0ft
Survey Program: 7290-UNKNOWN													Offset Well Error:	0.0ft
Reference	Vertical Depth (ft)	Measured Depth (ft)	Offset	Semi Major Axis Reference	Semi Major Axis Offset	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	-62.22	91.1	-172.9	196.1					
100.0	100.0	84.0	84.0	0.1	1.7	-62.22	91.1	-172.9	195.4	193.6	1.79	109.026		
200.0	200.0	184.0	184.0	0.3	3.7	-62.22	91.1	-172.9	195.4	191.4	4.02	48.648		
300.0	300.0	284.0	284.0	0.6	5.7	-62.22	91.1	-172.9	195.4	189.2	6.24	31.310		
400.0	400.0	384.0	384.0	0.8	7.7	-62.22	91.1	-172.9	195.4	187.0	8.47	23.083		
500.0	500.0	484.0	484.0	1.0	9.7	-62.22	91.1	-172.9	195.4	184.7	10.69	18.279		
600.0	600.0	584.0	584.0	1.2	11.7	-62.22	91.1	-172.9	195.4	182.5	12.92	15.131		
700.0	700.0	684.0	684.0	1.5	13.7	-62.22	91.1	-172.9	195.4	180.3	15.14	12.908		
800.0	800.0	784.0	784.0	1.7	15.7	-62.22	91.1	-172.9	195.4	178.1	17.37	11.254		
900.0	900.0	884.0	884.0	1.9	17.7	-62.22	91.1	-172.9	195.4	175.8	19.59	9.976		

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

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Rieder 18T-221
Project:	SEC.18-T4N-R67W	TVD Reference:	WELL @ 4821.0ft (RKB - 15')
Reference Site:	Rieder 4N67W18Y Pad Sec.18-T4N-R67W	MD Reference:	WELL @ 4821.0ft (RKB - 15')
Site Error:	0.0ft	North Reference:	True
Reference Well:	Rieder 18T-221	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 (7-31-14)	Offset TVD Reference:	Offset Datum

Offset Design Existing Wells Sec.18-T4N-R67W - A.R. 18-44 (Exist) - Wellbore #1 - Wellbore #1													Offset Site Error:	0.0 ft
Survey Program: 7290-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
1,000.0	1,000.0	984.0	984.0	2.1	19.7	-62.22		91.1	-172.9	195.4	173.6	21.82	8.959	
1,100.0	1,100.0	1,084.0	1,084.0	2.4	21.7	-62.22		91.1	-172.9	195.4	171.4	24.04	8.130	
1,200.0	1,200.0	1,184.0	1,184.0	2.6	23.7	-62.22		91.1	-172.9	195.4	169.2	26.26	7.441	
1,300.0	1,300.0	1,284.0	1,284.0	2.8	25.7	84.38		91.1	-172.9	195.3	166.8	28.46	6.860	
1,400.0	1,399.8	1,383.8	1,383.8	3.0	27.7	85.92		91.1	-172.9	194.8	164.2	30.64	6.359	
1,500.0	1,499.5	1,483.5	1,483.5	3.2	29.7	88.48		91.1	-172.9	194.4	161.6	32.82	5.922	
1,546.2	1,545.3	1,529.3	1,529.3	3.3	30.6	90.00		91.1	-172.9	194.3	160.5	33.84	5.742 CC	
1,600.0	1,598.7	1,582.7	1,582.7	3.4	31.7	92.04		91.1	-172.9	194.4	159.4	35.02	5.552	
1,700.0	1,697.5	1,681.5	1,681.5	3.6	33.6	96.54		91.1	-172.9	195.6	158.4	37.24	5.254	
1,800.0	1,795.9	1,779.9	1,779.9	3.9	35.6	101.57		91.1	-172.9	198.5	159.0	39.46	5.029	
1,900.0	1,894.3	1,878.3	1,878.3	4.2	37.6	106.43		91.1	-172.9	202.9	161.2	41.69	4.865	
2,000.0	1,992.7	1,976.7	1,976.7	4.5	39.5	111.06		91.1	-172.9	208.7	164.7	43.92	4.751	
2,100.0	2,091.1	2,075.1	2,075.1	4.8	41.5	115.42		91.1	-172.9	215.8	169.7	46.14	4.677	
2,200.0	2,189.5	2,173.5	2,173.5	5.2	43.5	119.49		91.1	-172.9	224.1	175.8	48.36	4.635	
2,300.0	2,287.9	2,271.9	2,271.9	5.5	45.4	123.26		91.1	-172.9	233.5	183.0	50.56	4.619	
2,400.0	2,386.3	2,370.3	2,370.3	5.9	47.4	126.72		91.1	-172.9	243.9	191.1	52.75	4.622	
2,500.0	2,484.7	2,468.7	2,468.7	6.3	49.4	129.90		91.1	-172.9	255.0	200.1	54.94	4.642	
2,600.0	2,583.1	2,567.1	2,567.1	6.6	51.3	132.81		91.1	-172.9	266.9	209.8	57.12	4.673	
2,700.0	2,681.5	2,665.5	2,665.5	7.0	53.3	135.47		91.1	-172.9	279.4	220.1	59.29	4.712	
2,800.0	2,779.9	2,763.9	2,763.9	7.4	55.3	137.90		91.1	-172.9	292.5	231.0	61.46	4.759	
2,900.0	2,878.3	2,862.3	2,862.3	7.8	57.2	140.13		91.1	-172.9	306.0	242.4	63.63	4.810	
3,000.0	2,976.7	2,960.7	2,960.7	8.2	59.2	142.16		91.1	-172.9	320.0	254.2	65.79	4.864	
3,100.0	3,075.1	3,059.1	3,059.1	8.6	61.2	144.02		91.1	-172.9	334.3	266.4	67.95	4.920	
3,200.0	3,173.5	3,157.5	3,157.5	8.9	63.1	145.73		91.1	-172.9	349.0	278.8	70.11	4.977	
3,300.0	3,271.9	3,255.9	3,255.9	9.3	65.1	147.31		91.1	-172.9	363.9	291.6	72.27	5.035	
3,400.0	3,370.3	3,354.3	3,354.3	9.7	67.1	148.75		91.1	-172.9	379.1	304.6	74.44	5.093	
3,500.0	3,468.7	3,452.7	3,452.7	10.1	69.1	150.09		91.1	-172.9	394.5	317.9	76.60	5.150	
3,600.0	3,567.1	3,551.1	3,551.1	10.5	71.0	151.33		91.1	-172.9	410.1	331.3	78.76	5.207	
3,700.0	3,665.5	3,649.5	3,649.5	10.9	73.0	152.47		91.1	-172.9	425.9	344.9	80.92	5.262	
3,800.0	3,763.9	3,747.9	3,747.9	11.3	75.0	153.54		91.1	-172.9	441.8	358.7	83.09	5.317	
3,900.0	3,862.3	3,846.3	3,846.3	11.7	76.9	154.53		91.1	-172.9	457.9	372.6	85.25	5.371	
4,000.0	3,960.7	3,944.7	3,944.7	12.1	78.9	155.45		91.1	-172.9	474.0	386.6	87.42	5.423	
4,100.0	4,059.1	4,043.1	4,043.1	12.5	80.9	156.32		91.1	-172.9	490.3	400.8	89.58	5.474	
4,200.0	4,157.5	4,141.5	4,141.5	12.9	82.8	157.12		91.1	-172.9	506.8	415.0	91.75	5.523	
4,300.0	4,255.9	4,239.9	4,239.9	13.3	84.8	157.88		91.1	-172.9	523.3	429.3	93.92	5.571	
4,400.0	4,354.3	4,338.3	4,338.3	13.7	86.8	158.59		91.1	-172.9	539.8	443.7	96.09	5.618	
4,500.0	4,452.7	4,436.7	4,436.7	14.1	88.7	159.26		91.1	-172.9	556.5	458.2	98.26	5.663	
4,600.0	4,551.1	4,535.1	4,535.1	14.5	90.7	159.89		91.1	-172.9	573.2	472.8	100.43	5.708	
4,700.0	4,649.5	4,633.5	4,633.5	15.0	92.7	160.48		91.1	-172.9	590.0	487.4	102.60	5.750	
4,800.0	4,747.9	4,731.9	4,731.9	15.4	94.6	161.04		91.1	-172.9	606.9	502.1	104.78	5.792	
4,900.0	4,846.3	4,830.3	4,830.3	15.8	96.6	161.57		91.1	-172.9	623.8	516.8	106.95	5.832	
5,000.0	4,944.7	4,928.7	4,928.7	16.2	98.6	162.08		91.1	-172.9	640.7	531.6	109.13	5.871	
5,100.0	5,043.1	5,027.1	5,027.1	16.6	100.5	162.55		91.1	-172.9	657.7	546.4	111.30	5.909	
5,200.0	5,141.5	5,125.5	5,125.5	17.0	102.5	163.01		91.1	-172.9	674.8	561.3	113.48	5.946	
5,300.0	5,239.9	5,223.9	5,223.9	17.4	104.5	163.44		91.1	-172.9	691.9	576.2	115.65	5.982	
5,400.0	5,338.3	5,322.3	5,322.3	17.8	106.4	163.88		91.1	-172.9	708.6	590.5	118.11	5.999	
5,500.0	5,437.3	5,421.3	5,421.3	18.0	108.4	164.28		91.1	-172.9	722.4	601.6	120.76	5.982	
5,600.0	5,536.7	5,520.7	5,520.7	18.3	110.4	164.56		91.1	-172.9	732.9	609.6	123.31	5.944	
5,700.0	5,636.4	5,620.4	5,620.4	18.5	112.4	164.76		91.1	-172.9	740.1	614.4	125.73	5.887	
5,800.0	5,736.3	5,720.3	5,720.3	18.6	114.4	164.86		91.1	-172.9	744.0	615.9	128.01	5.812	
5,900.0	5,836.3	5,820.3	5,820.3	18.8	116.4	18.78		91.1	-172.9	744.6	614.4	130.19	5.719	

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 18T-221
Project:	SEC.18-T4N-R67W	TVD Reference:	WELL @ 4821.0ft (RKB - 15')
Reference Site:	Rieder 4N67W18Y Pad Sec.18-T4N-R67W	MD Reference:	WELL @ 4821.0ft (RKB - 15')
Site Error:	0.0ft	North Reference:	True
Reference Well:	Rieder 18T-221	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 (7-31-14)	Offset TVD Reference:	Offset Datum

Offset Design Existing Wells Sec.18-T4N-R67W - A.R. 18-44 (Exist) - Wellbore #1 - Wellbore #1													Offset Site Error:	0.0 ft
Survey Program: 7290-UNKNOWN													Offset Well Error:	0.0 ft
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference	Offset	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	
6,000.0	5,936.3	5,920.3	5,920.3	18.9	118.4	18.78	91.1	-172.9	744.6	612.3	132.37	5.625		
6,100.0	6,036.3	6,020.3	6,020.3	19.0	120.4	18.78	91.1	-172.9	744.6	610.1	134.55	5.534		
6,200.0	6,136.3	6,120.3	6,120.3	19.1	122.4	18.78	91.1	-172.9	744.6	607.9	136.72	5.446		
6,300.0	6,236.3	6,220.3	6,220.3	19.3	124.4	18.89	91.1	-172.9	742.5	604.1	138.44	5.364		
6,400.0	6,335.2	6,319.2	6,319.2	19.3	126.4	19.59	91.1	-172.9	729.2	591.1	138.09	5.281		
6,500.0	6,431.4	6,415.4	6,415.4	19.2	128.3	21.01	91.1	-172.9	703.8	568.2	135.63	5.189		
6,600.0	6,523.3	6,507.3	6,507.3	19.0	130.1	23.36	91.1	-172.9	667.0	535.6	131.42	5.076		
6,700.0	6,609.3	6,593.3	6,593.3	18.8	131.9	26.94	91.1	-172.9	619.8	493.5	126.30	4.907		
6,800.0	6,687.9	6,671.9	6,671.9	18.5	133.4	32.28	91.1	-172.9	563.4	441.4	122.05	4.616		
6,900.0	6,757.8	6,741.8	6,741.8	18.2	134.8	40.03	91.1	-172.9	499.7	378.0	121.71	4.106		
7,000.0	6,817.8	6,801.8	6,801.8	17.9	136.0	50.75	91.1	-172.9	431.3	303.0	128.29	3.362		
7,100.0	6,866.8	6,850.8	6,850.8	17.6	137.0	63.92	91.1	-172.9	362.2	221.9	140.29	2.581		
7,200.0	6,904.0	6,888.0	6,888.0	17.4	137.8	76.95	91.1	-172.9	299.0	148.5	150.48	1.987		
7,300.0	6,928.8	6,912.8	6,912.8	17.3	138.3	86.40	91.1	-172.9	253.4	98.6	154.80	1.637		
7,382.6	6,939.6	6,923.6	6,923.6	17.4	138.5	90.00	91.1	-172.9	239.8	84.0	155.79	1.539 ES, SF		
7,400.0	6,940.8	6,924.8	6,924.8	17.5	138.5	90.23	91.1	-172.9	240.4	84.5	155.90	1.542		
7,500.0	6,941.9	6,925.9	6,925.9	18.1	138.5	90.01	91.1	-172.9	266.9	110.4	156.57	1.705		
7,600.0	6,942.0	6,926.0	6,926.0	18.9	138.5	90.03	91.1	-172.9	323.6	166.2	157.39	2.056		
7,700.0	6,942.1	6,926.1	6,926.1	20.0	138.5	90.04	91.1	-172.9	397.7	239.4	158.37	2.511		
7,800.0	6,942.1	6,926.1	6,926.1	21.1	138.5	90.05	91.1	-172.9	481.3	321.8	159.47	3.018		
7,900.0	6,942.2	6,926.2	6,926.2	22.4	138.5	90.06	91.1	-172.9	570.2	409.5	160.69	3.548		
8,000.0	6,942.2	6,926.2	6,926.2	23.7	138.5	90.08	91.1	-172.9	662.3	500.2	162.01	4.088		
8,100.0	6,942.3	6,926.3	6,926.3	25.1	138.5	90.09	91.1	-172.9	756.3	592.9	163.40	4.629		
8,200.0	6,942.3	6,926.3	6,926.3	26.6	138.5	90.10	91.1	-172.9	851.8	686.9	164.86	5.167		
8,300.0	6,942.4	6,926.4	6,926.4	28.1	138.5	90.11	91.1	-172.9	948.1	781.8	166.37	5.699		

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Rieder 18T-221
Project:	SEC.18-T4N-R67W	TVD Reference:	WELL @ 4821.0ft (RKB - 15')
Reference Site:	Rieder 4N67W18Y Pad Sec.18-T4N-R67W	MD Reference:	WELL @ 4821.0ft (RKB - 15')
Site Error:	0.0ft	North Reference:	True
Reference Well:	Rieder 18T-221	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 (7-31-14)	Offset TVD Reference:	Offset Datum

Offset Design Existing Wells Sec.18-T4N-R67W - Carlson 18-2 (Exist) - Wellbore #1 - Wellbore #1												Offset Site Error:	0.0 ft
Survey Program: 7255-UNKNOWN												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
8,800.0	6,942.6	6,923.6	6,923.6	36.3	138.5	89.80	2,437.2	-276.1	938.8	764.4	174.46	5.381	
8,900.0	6,942.7	6,923.7	6,923.7	38.0	138.5	89.82	2,437.2	-276.1	840.0	663.8	176.17	4.768	
9,000.0	6,942.7	6,923.7	6,923.7	39.7	138.5	89.84	2,437.2	-276.1	741.5	563.6	177.90	4.168	
9,100.0	6,942.8	6,923.8	6,923.8	41.4	138.5	89.86	2,437.2	-276.1	643.5	463.8	179.65	3.582	
9,200.0	6,942.8	6,923.8	6,923.8	43.2	138.5	89.88	2,437.2	-276.1	546.2	364.8	181.42	3.011	
9,300.0	6,942.9	6,923.9	6,923.9	45.0	138.5	89.91	2,437.2	-276.1	450.1	266.9	183.20	2.457	
9,400.0	6,942.9	6,923.9	6,923.9	46.8	138.5	89.93	2,437.2	-276.1	356.1	171.1	184.99	1.925	
9,500.0	6,943.0	6,924.0	6,924.0	48.6	138.5	89.95	2,437.2	-276.1	266.5	79.7	186.78	1.427	Level 3
9,600.0	6,943.0	6,924.0	6,924.0	50.4	138.5	89.97	2,437.2	-276.1	187.8	-0.8	188.59	0.996	Level 1
9,700.0	6,943.1	6,924.1	6,924.1	52.2	138.5	89.99	2,437.2	-276.1	139.6	-50.8	190.41	0.733	Level 1
9,728.8	6,943.1	6,924.1	6,924.1	52.7	138.5	90.00	2,437.2	-276.1	136.6	-54.3	190.93	0.716	Level 1, CC, ES, SF
9,800.0	6,943.2	6,924.2	6,924.2	54.0	138.5	90.02	2,437.2	-276.1	154.1	-38.2	192.23	0.801	Level 1
9,900.0	6,943.2	6,924.2	6,924.2	55.8	138.5	90.04	2,437.2	-276.1	219.0	25.0	194.06	1.129	Level 2
10,000.0	6,943.3	6,924.3	6,924.3	57.6	138.5	90.06	2,437.2	-276.1	303.7	107.8	195.90	1.550	
10,100.0	6,943.3	6,924.3	6,924.3	59.5	138.5	90.08	2,437.2	-276.1	395.5	197.8	197.74	2.000	
10,200.0	6,943.4	6,924.4	6,924.4	61.3	138.5	90.10	2,437.2	-276.1	490.6	291.0	199.59	2.458	
10,300.0	6,943.4	6,924.4	6,924.4	63.2	138.5	90.13	2,437.2	-276.1	587.3	385.9	201.44	2.916	
10,400.0	6,943.5	6,924.5	6,924.5	65.0	138.5	90.15	2,437.2	-276.1	684.9	481.7	203.29	3.369	
10,500.0	6,943.5	6,924.5	6,924.5	66.9	138.5	90.17	2,437.2	-276.1	783.2	578.0	205.15	3.818	
10,600.0	6,943.6	6,924.6	6,924.6	68.7	138.5	90.19	2,437.2	-276.1	881.8	674.8	207.01	4.260	
10,700.0	6,943.6	6,924.6	6,924.6	70.6	138.5	90.21	2,437.2	-276.1	980.7	771.9	208.88	4.695	

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Rieder 18T-221
Project:	SEC.18-T4N-R67W	TVD Reference:	WELL @ 4821.0ft (RKB - 15')
Reference Site:	Rieder 4N67W18Y Pad Sec.18-T4N-R67W	MD Reference:	WELL @ 4821.0ft (RKB - 15')
Site Error:	0.0ft	North Reference:	True
Reference Well:	Rieder 18T-221	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 (7-31-14)	Offset TVD Reference:	Offset Datum

Offset Design Existing Wells Sec.18-T4N-R67W - Carlson 18-3 (Exist) - Wellbore #1 - Wellbore #1												Offset Site Error:	0.0 ft
Survey Program: 7288-UNKNOWN												Offset Well Error:	0.0 ft
Reference		Offset		Semi Major Axis		Distance							
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
10,200.0	6,943.4	6,934.4	6,934.4	61.3	138.7	89.89	3,821.6	-170.1	944.9	745.1	199.78	4.729	
10,300.0	6,943.4	6,934.4	6,934.4	63.2	138.7	89.90	3,821.6	-170.1	848.6	647.0	201.63	4.209	
10,400.0	6,943.5	6,934.5	6,934.5	65.0	138.7	89.91	3,821.6	-170.1	753.3	549.8	203.49	3.702	
10,500.0	6,943.5	6,934.5	6,934.5	66.9	138.7	89.92	3,821.6	-170.1	659.4	454.1	205.34	3.211	
10,600.0	6,943.6	6,934.6	6,934.6	68.7	138.7	89.94	3,821.6	-170.1	567.6	360.4	207.21	2.739	
10,700.0	6,943.6	6,934.6	6,934.6	70.6	138.7	89.95	3,821.6	-170.1	479.1	270.1	209.07	2.292	
10,800.0	6,943.7	6,934.7	6,934.7	72.4	138.7	89.96	3,821.6	-170.1	396.2	185.2	210.94	1.878	
10,900.0	6,943.7	6,934.7	6,934.7	74.3	138.7	89.97	3,821.6	-170.1	323.0	110.1	212.81	1.518	
11,000.0	6,943.8	6,934.8	6,934.8	76.2	138.7	89.99	3,821.6	-170.1	267.7	53.0	214.68	1.247 Level 2	
11,100.0	6,943.8	6,934.8	6,934.8	78.0	138.7	90.00	3,821.6	-170.1	243.0	26.4	216.56	1.122 Level 2	
11,113.2	6,943.8	6,934.8	6,934.8	78.3	138.7	90.00	3,821.6	-170.1	242.6	25.8	216.81	1.119 Level 2, CC, ES, SF	
11,200.0	6,943.9	6,934.9	6,934.9	79.9	138.7	90.01	3,821.6	-170.1	257.7	39.2	218.44	1.180 Level 2	
11,300.0	6,943.9	6,934.9	6,934.9	81.8	138.7	90.02	3,821.6	-170.1	306.2	85.9	220.32	1.390 Level 3	
11,400.0	6,944.0	6,935.0	6,935.0	83.7	138.7	90.04	3,821.6	-170.1	375.7	153.5	222.20	1.691	
11,419.2	6,944.0	6,935.0	6,935.0	84.0	138.7	90.04	3,821.6	-170.1	390.5	168.0	222.56	1.755	

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Rieder 18T-221
Project:	SEC.18-T4N-R67W	TVD Reference:	WELL @ 4821.0ft (RKB - 15')
Reference Site:	Rieder 4N67W18Y Pad Sec.18-T4N-R67W	MD Reference:	WELL @ 4821.0ft (RKB - 15')
Site Error:	0.0ft	North Reference:	True
Reference Well:	Rieder 18T-221	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 (7-31-14)	Offset TVD Reference:	Offset Datum

Offset Design Existing Wells Sec.18-T4N-R67W - Every-Brooks 18-1 (Exist) - Wellbore #1 - Wellbore #1													Offset Site Error:	0.0 ft
Survey Program: 7263-UNKNOWN													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		
Depth (ft)	Depth (ft)	Depth (ft)	Depth (ft)	(ft)	(ft)	(°)	+N/-S (ft)	+E/-W (ft)	(ft)	(ft)	(ft)			
7,600.0	6,942.0	6,923.0	6,923.0	18.9	138.5	89.93	1,158.5	-72.5	915.6	758.3	157.33	5.820		
7,700.0	6,942.1	6,923.1	6,923.1	20.0	138.5	89.93	1,158.5	-72.5	823.6	665.3	158.30	5.203		
7,800.0	6,942.1	6,923.1	6,923.1	21.1	138.5	89.94	1,158.5	-72.5	733.7	574.3	159.41	4.603		
7,900.0	6,942.2	6,923.2	6,923.2	22.4	138.5	89.95	1,158.5	-72.5	646.8	486.2	160.63	4.027		
8,000.0	6,942.2	6,923.2	6,923.2	23.7	138.5	89.96	1,158.5	-72.5	564.2	402.3	161.94	3.484		
8,100.0	6,942.3	6,923.3	6,923.3	25.1	138.5	89.97	1,158.5	-72.5	488.2	324.8	163.33	2.989		
8,200.0	6,942.3	6,923.3	6,923.3	26.6	138.5	89.98	1,158.5	-72.5	422.2	257.4	164.79	2.562		
8,300.0	6,942.4	6,923.4	6,923.4	28.1	138.5	89.99	1,158.5	-72.5	371.8	205.5	166.31	2.236		
8,400.0	6,942.4	6,923.4	6,923.4	29.7	138.5	90.00	1,158.5	-72.5	343.9	176.0	167.87	2.048		
8,450.1	6,942.4	6,923.4	6,923.4	30.5	138.5	90.00	1,158.5	-72.5	340.2	171.5	168.67	2.017	CC, ES, SF	
8,500.0	6,942.5	6,923.5	6,923.5	31.3	138.5	90.00	1,158.5	-72.5	343.8	174.4	169.47	2.029		
8,600.0	6,942.5	6,923.5	6,923.5	32.9	138.5	90.01	1,158.5	-72.5	371.8	200.6	171.11	2.173		
8,700.0	6,942.6	6,923.6	6,923.6	34.6	138.5	90.02	1,158.5	-72.5	422.1	249.3	172.77	2.443		
8,800.0	6,942.6	6,923.6	6,923.6	36.3	138.5	90.03	1,158.5	-72.5	488.0	313.6	174.46	2.797		
8,900.0	6,942.7	6,923.7	6,923.7	38.0	138.5	90.04	1,158.5	-72.5	564.0	387.9	176.18	3.202		
9,000.0	6,942.7	6,923.7	6,923.7	39.7	138.5	90.05	1,158.5	-72.5	646.6	468.7	177.91	3.635		
9,100.0	6,942.8	6,923.8	6,923.8	41.4	138.5	90.06	1,158.5	-72.5	733.6	553.9	179.66	4.083		
9,200.0	6,942.8	6,923.8	6,923.8	43.2	138.5	90.07	1,158.5	-72.5	823.5	642.0	181.42	4.539		
9,300.0	6,942.9	6,923.9	6,923.9	45.0	138.5	90.07	1,158.5	-72.5	915.5	732.3	183.20	4.997		

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Rieder 18T-221
Project:	SEC.18-T4N-R67W	TVD Reference:	WELL @ 4821.0ft (RKB - 15')
Reference Site:	Rieder 4N67W18Y Pad Sec.18-T4N-R67W	MD Reference:	WELL @ 4821.0ft (RKB - 15')
Site Error:	0.0ft	North Reference:	True
Reference Well:	Rieder 18T-221	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 (7-31-14)	Offset TVD Reference:	Offset Datum

Offset Design Rieder 4N67W18Y Pad Sec.18-T4N-R67W - Rieder 18T-321 - Wellbore #1 - Plan #1 (7-31-14)													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 (ft)	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	-90.01	-90.01	0.0	-30.7	30.7				
100.0	100.0	100.0	100.0	0.1	0.1	-90.01	-90.01	0.0	-30.7	30.7	30.5	0.22	136.494	
200.0	200.0	200.0	200.0	0.3	0.3	-90.01	-90.01	0.0	-30.7	30.7	30.0	0.67	45.498	
300.0	300.0	300.0	300.0	0.6	0.6	-90.01	-90.01	0.0	-30.7	30.7	29.6	1.12	27.299	
400.0	400.0	400.0	400.0	0.8	0.8	-90.01	-90.01	0.0	-30.7	30.7	29.1	1.57	19.499	
500.0	500.0	500.0	500.0	1.0	1.0	-90.01	-90.01	0.0	-30.7	30.7	28.7	2.02	15.166	
600.0	600.0	600.0	600.0	1.2	1.2	-90.01	-90.01	0.0	-30.7	30.7	28.2	2.47	12.409	
700.0	700.0	700.0	700.0	1.5	1.5	-90.01	-90.01	0.0	-30.7	30.7	27.8	2.92	10.500	
800.0	800.0	800.0	800.0	1.7	1.7	-90.01	-90.01	0.0	-30.7	30.7	27.3	3.37	9.100	
900.0	900.0	900.0	900.0	1.9	1.9	-90.01	-90.01	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	-90.01	-90.01	0.0	-30.7	30.7	26.4	4.27	7.184 CC	
1,100.0	1,100.0	1,099.3	1,099.2	2.4	2.3	-92.32	-92.32	-1.3	-31.8	31.9	27.2	4.69	6.786	
1,200.0	1,200.0	1,198.3	1,198.1	2.6	2.5	-98.29	-98.29	-5.1	-35.2	35.7	30.6	5.10	6.988	
1,300.0	1,300.0	1,297.0	1,296.4	2.8	2.7	-41.85	-41.85	-11.5	-40.9	41.3	35.8	5.49	7.531	
1,400.0	1,399.8	1,395.4	1,394.2	3.0	2.9	37.84	37.84	-20.4	-48.8	47.5	41.7	5.86	8.114	
1,500.0	1,499.5	1,493.7	1,491.2	3.2	3.2	35.21	35.21	-31.7	-58.8	54.1	47.9	6.24	8.665	
1,600.0	1,598.7	1,593.2	1,589.2	3.4	3.5	34.00	34.00	-44.9	-70.5	59.9	53.3	6.65	9.012	
1,700.0	1,697.5	1,693.1	1,687.5	3.6	3.8	34.73	34.73	-58.2	-82.3	62.9	55.8	7.08	8.884	
1,800.0	1,795.9	1,793.1	1,785.9	3.9	4.1	36.55	36.55	-71.5	-94.1	64.2	56.6	7.57	8.477	
1,900.0	1,894.3	1,893.1	1,884.3	4.2	4.5	38.32	38.32	-84.8	-105.9	65.5	57.4	8.09	8.089	
2,000.0	1,992.7	1,993.0	1,982.6	4.5	4.8	40.01	40.01	-98.1	-117.8	66.8	58.2	8.65	7.729	
2,100.0	2,091.1	2,093.0	2,081.0	4.8	5.2	41.64	41.64	-111.4	-129.6	68.2	59.0	9.23	7.397	
2,200.0	2,189.5	2,193.0	2,179.4	5.2	5.6	43.20	43.20	-124.7	-141.4	69.7	59.9	9.83	7.090	
2,300.0	2,287.9	2,292.9	2,277.8	5.5	5.9	44.69	44.69	-138.0	-153.2	71.2	60.8	10.46	6.809	
2,400.0	2,386.3	2,392.9	2,376.2	5.9	6.3	46.13	46.13	-151.3	-165.0	72.8	61.7	11.11	6.552	
2,500.0	2,484.7	2,492.9	2,474.5	6.3	6.7	47.50	47.50	-164.6	-176.8	74.4	62.6	11.78	6.316	
2,600.0	2,583.1	2,592.9	2,572.9	6.6	7.1	48.81	48.81	-178.0	-188.6	76.0	63.6	12.46	6.101	
2,700.0	2,681.5	2,692.8	2,671.3	7.0	7.5	50.06	50.06	-191.3	-200.4	77.7	64.5	13.16	5.903	
2,800.0	2,779.9	2,792.8	2,769.7	7.4	7.9	51.27	51.27	-204.6	-212.2	79.4	65.6	13.88	5.723	
2,900.0	2,878.3	2,892.8	2,868.0	7.8	8.3	52.42	52.42	-217.9	-224.0	81.2	66.6	14.61	5.557	
3,000.0	2,976.7	2,992.8	2,966.4	8.2	8.7	53.52	53.52	-231.2	-235.8	83.0	67.6	15.35	5.406	
3,100.0	3,075.1	3,092.7	3,064.8	8.6	9.1	54.57	54.57	-244.5	-247.6	84.8	68.7	16.10	5.266	
3,200.0	3,173.5	3,192.7	3,163.2	8.9	9.5	55.58	55.58	-257.8	-259.4	86.6	69.8	16.86	5.138	
3,300.0	3,271.9	3,292.7	3,261.5	9.3	9.9	56.55	56.55	-271.1	-271.2	88.5	70.9	17.63	5.020	
3,400.0	3,370.3	3,392.6	3,359.9	9.7	10.3	57.48	57.48	-284.4	-283.0	90.4	72.0	18.40	4.912	
3,500.0	3,468.7	3,492.6	3,458.3	10.1	10.7	58.37	58.37	-297.7	-294.8	92.3	73.1	19.18	4.811	
3,600.0	3,567.1	3,592.6	3,556.7	10.5	11.1	59.22	59.22	-311.0	-306.6	94.2	74.3	19.97	4.719	
3,700.0	3,665.5	3,692.6	3,655.1	10.9	11.5	60.04	60.04	-324.3	-318.4	96.2	75.4	20.76	4.633	
3,800.0	3,763.9	3,792.5	3,753.4	11.3	11.9	60.83	60.83	-337.6	-330.2	98.2	76.6	21.56	4.553	
3,900.0	3,862.3	3,892.5	3,851.8	11.7	12.3	61.58	61.58	-350.9	-342.0	100.1	77.8	22.36	4.479	
4,000.0	3,960.7	3,992.5	3,950.2	12.1	12.7	62.31	62.31	-364.2	-353.8	102.2	79.0	23.16	4.410	
4,100.0	4,059.1	4,092.4	4,048.6	12.5	13.1	63.00	63.00	-377.5	-365.6	104.2	80.2	23.97	4.346	
4,200.0	4,157.5	4,192.4	4,146.9	12.9	13.5	63.68	63.68	-390.8	-377.4	106.2	81.4	24.78	4.286	
4,300.0	4,255.9	4,292.4	4,245.3	13.3	13.9	64.32	64.32	-404.1	-389.2	108.3	82.7	25.60	4.230	
4,400.0	4,354.3	4,392.4	4,343.7	13.7	14.3	64.94	64.94	-417.4	-401.0	110.3	83.9	26.41	4.177	
4,500.0	4,452.7	4,492.3	4,442.1	14.1	14.7	65.54	65.54	-430.7	-412.8	112.4	85.2	27.23	4.128	
4,600.0	4,551.1	4,592.3	4,540.5	14.5	15.1	66.12	66.12	-444.0	-424.6	114.5	86.4	28.05	4.082	
4,700.0	4,649.5	4,692.3	4,638.8	15.0	15.5	66.67	66.67	-457.3	-436.4	116.6	87.7	28.87	4.038	
4,800.0	4,747.9	4,792.2	4,737.2	15.4	15.9	67.21	67.21	-470.6	-448.2	118.7	89.0	29.70	3.997	
4,900.0	4,846.3	4,892.2	4,835.6	15.8	16.4	67.73	67.73	-483.9	-460.0	120.8	90.3	30.52	3.959	
5,000.0	4,944.7	4,992.2	4,934.0	16.2	16.8	68.23	68.23	-497.2	-471.8	123.0	91.6	31.35	3.923	

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 18T-221
Project:	SEC.18-T4N-R67W	TVD Reference:	WELL @ 4821.0ft (RKB - 15')
Reference Site:	Rieder 4N67W18Y Pad Sec.18-T4N-R67W	MD Reference:	WELL @ 4821.0ft (RKB - 15')
Site Error:	0.0ft	North Reference:	True
Reference Well:	Rieder 18T-221	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 (7-31-14)	Offset TVD Reference:	Offset Datum

Offset Design Rieder 4N67W18Y Pad Sec.18-T4N-R67W - Rieder 18T-321 - Wellbore #1 - Plan #1 (7-31-14)													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
5,100.0	5,043.1	5,092.2	5,032.3	16.6	17.2	68.71	-510.5	-483.6	125.1	92.9	32.17	3.888		
5,200.0	5,141.5	5,192.1	5,130.7	17.0	17.6	69.17	-523.8	-495.4	127.3	94.2	33.00	3.856		
5,300.0	5,239.9	5,292.1	5,229.1	17.4	18.0	69.62	-537.1	-507.2	129.4	95.6	33.83	3.825		
5,400.0	5,338.3	5,392.1	5,327.5	17.8	18.4	69.91	-550.4	-519.0	131.7	97.1	34.61	3.806		
5,500.0	5,437.3	5,492.0	5,425.8	18.0	18.8	69.01	-563.7	-530.8	135.1	100.0	35.13	3.846		
5,600.0	5,536.7	5,592.6	5,524.8	18.3	19.2	66.91	-576.9	-542.5	139.7	104.3	35.42	3.945		
5,700.0	5,636.4	5,695.0	5,626.1	18.5	19.5	64.59	-588.3	-552.6	144.5	109.0	35.51	4.070		
5,800.0	5,736.3	5,797.7	5,728.1	18.6	19.7	62.35	-596.9	-560.3	149.1	113.6	35.53	4.197		
5,900.0	5,836.3	5,900.7	5,830.8	18.8	19.9	-85.87	-602.9	-565.6	153.4	117.9	35.50	4.320		
6,000.0	5,936.3	6,004.0	5,934.1	18.9	20.1	-87.11	-606.0	-568.4	155.9	120.3	35.58	4.381		
6,100.0	6,036.3	6,106.3	6,036.3	19.0	20.2	-87.33	-606.6	-568.9	156.3	120.5	35.83	4.364		
6,200.0	6,136.3	6,206.3	6,136.3	19.1	20.3	-87.33	-606.6	-568.9	156.3	120.2	36.10	4.331		
6,300.0	6,236.3	6,306.2	6,236.3	19.3	20.5	-88.15	-606.6	-568.9	156.3	120.0	36.22	4.315		
6,347.7	6,283.7	6,353.7	6,283.7	19.3	20.5	-90.00	-606.5	-568.9	156.2	120.2	35.96	4.343		
6,400.0	6,335.2	6,405.8	6,335.7	19.3	20.6	-92.40	-604.1	-568.9	156.3	120.7	35.58	4.394		
6,500.0	6,431.4	6,506.7	6,435.5	19.2	20.6	-96.95	-589.4	-568.9	157.4	122.7	34.65	4.541		
6,600.0	6,523.3	6,609.3	6,534.1	19.0	20.5	-101.34	-561.1	-568.9	159.3	125.8	33.58	4.746		
6,700.0	6,609.3	6,713.7	6,629.5	18.8	20.3	-105.45	-519.0	-568.9	162.1	129.7	32.43	5.000		
6,800.0	6,687.9	6,819.9	6,719.8	18.5	20.1	-109.19	-463.2	-568.9	165.5	134.2	31.28	5.290		
6,900.0	6,757.8	6,927.9	6,802.8	18.2	19.8	-112.49	-394.3	-568.9	169.2	138.9	30.23	5.596		
7,000.0	6,817.8	7,037.5	6,876.2	17.9	19.4	-115.31	-313.1	-568.9	172.9	143.5	29.35	5.890		
7,100.0	6,866.8	7,148.5	6,938.0	17.6	19.1	-117.63	-220.9	-568.9	176.4	147.6	28.76	6.132		
7,200.0	6,904.0	7,260.8	6,986.2	17.4	18.8	-119.42	-119.6	-568.9	179.4	150.8	28.56	6.281		
7,300.0	6,928.8	7,374.2	7,019.3	17.3	18.5	-120.70	-11.3	-568.9	181.7	152.9	28.81	6.305		
7,400.0	6,940.8	7,488.2	7,036.1	17.5	18.2	-121.47	101.4	-568.9	183.1	153.6	29.56	6.195		
7,500.0	6,941.9	7,595.6	7,038.0	18.1	18.4	-121.60	208.7	-568.9	183.4	152.7	30.71	5.972		
7,600.0	6,942.0	7,695.6	7,037.7	18.9	19.3	-121.50	308.7	-568.9	183.2	151.0	32.14	5.698		
7,700.0	6,942.1	7,795.6	7,037.4	20.0	20.4	-121.39	408.7	-568.9	183.0	149.1	33.86	5.403		
7,800.0	6,942.1	7,895.6	7,037.0	21.1	21.6	-121.29	508.7	-568.9	182.8	146.9	35.82	5.102		
7,900.0	6,942.2	7,995.6	7,036.7	22.4	22.8	-121.19	608.7	-568.9	182.6	144.6	37.98	4.807		
8,000.0	6,942.2	8,095.6	7,036.4	23.7	24.1	-121.08	708.7	-568.9	182.4	142.0	40.32	4.523		
8,100.0	6,942.3	8,195.6	7,036.0	25.1	25.5	-120.98	808.7	-568.9	182.2	139.4	42.80	4.256		
8,200.0	6,942.3	8,295.6	7,035.7	26.6	27.0	-120.88	908.7	-568.9	182.0	136.6	45.41	4.007		
8,300.0	6,942.4	8,395.6	7,035.4	28.1	28.5	-120.77	1,008.7	-568.9	181.8	133.6	48.12	3.777		
8,400.0	6,942.4	8,495.6	7,035.0	29.7	30.1	-120.67	1,108.7	-568.9	181.6	130.6	50.92	3.566		
8,500.0	6,942.5	8,595.6	7,034.7	31.3	31.6	-120.57	1,208.7	-568.9	181.4	127.6	53.80	3.371		
8,600.0	6,942.5	8,695.6	7,034.4	32.9	33.3	-120.46	1,308.7	-568.9	181.2	124.4	56.74	3.193		
8,700.0	6,942.6	8,795.6	7,034.0	34.6	34.9	-120.36	1,408.7	-568.9	181.0	121.2	59.75	3.029		
8,800.0	6,942.6	8,895.6	7,033.7	36.3	36.6	-120.25	1,508.7	-568.9	180.8	118.0	62.80	2.879		
8,900.0	6,942.7	8,995.6	7,033.4	38.0	38.3	-120.15	1,608.7	-568.9	180.6	114.7	65.89	2.741		
9,000.0	6,942.7	9,095.6	7,033.0	39.7	40.0	-120.04	1,708.7	-568.9	180.4	111.4	69.03	2.613		
9,100.0	6,942.8	9,195.6	7,032.7	41.4	41.7	-119.93	1,808.7	-568.9	180.2	108.0	72.20	2.496		
9,200.0	6,942.8	9,295.6	7,032.4	43.2	43.5	-119.83	1,908.7	-568.9	180.0	104.6	75.40	2.388		
9,300.0	6,942.9	9,395.6	7,032.1	45.0	45.2	-119.72	2,008.7	-568.9	179.8	101.2	78.63	2.287		
9,400.0	6,942.9	9,495.6	7,031.7	46.8	47.0	-119.62	2,108.7	-568.9	179.6	97.8	81.88	2.194		
9,500.0	6,943.0	9,595.6	7,031.4	48.6	48.8	-119.51	2,208.7	-568.9	179.5	94.3	85.16	2.107		
9,600.0	6,943.0	9,695.6	7,031.1	50.4	50.6	-119.40	2,308.7	-568.9	179.3	90.8	88.46	2.027		
9,700.0	6,943.1	9,795.6	7,030.7	52.2	52.4	-119.30	2,408.7	-568.9	179.1	87.3	91.78	1.951		
9,800.0	6,943.2	9,895.6	7,030.4	54.0	54.2	-119.19	2,508.7	-568.9	178.9	83.8	95.11	1.881		
9,900.0	6,943.2	9,995.6	7,030.1	55.8	56.0	-119.08	2,608.7	-568.9	178.7	80.2	98.47	1.815		
10,000.0	6,943.3	10,095.6	7,029.7	57.6	57.8	-118.97	2,708.7	-568.9	178.5	76.7	101.84	1.753		

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 18T-221
Project:	SEC.18-T4N-R67W	TVD Reference:	WELL @ 4821.0ft (RKB - 15')
Reference Site:	Rieder 4N67W18Y Pad Sec.18-T4N-R67W	MD Reference:	WELL @ 4821.0ft (RKB - 15')
Site Error:	0.0ft	North Reference:	True
Reference Well:	Rieder 18T-221	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 (7-31-14)	Offset TVD Reference:	Offset Datum

Offset Design Rieder 4N67W18Y Pad Sec.18-T4N-R67W - Rieder 18T-321 - Wellbore #1 - Plan #1 (7-31-14)													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 (ft)	Offset (ft)	Semi Major Axis (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
10,100.0	6,943.3	10,195.6	7,029.4	59.5	59.6	-118.87		2,808.7	-568.9	178.3	73.1	105.22	1.695	
10,200.0	6,943.4	10,295.6	7,029.1	61.3	61.5	-118.76		2,908.7	-568.9	178.1	69.5	108.62	1.640	
10,300.0	6,943.4	10,395.6	7,028.7	63.2	63.3	-118.65		3,008.7	-568.9	178.0	65.9	112.03	1.588	
10,400.0	6,943.5	10,495.6	7,028.4	65.0	65.1	-118.54		3,108.7	-568.9	177.8	62.3	115.46	1.540	
10,500.0	6,943.5	10,595.6	7,028.1	66.9	67.0	-118.43		3,208.7	-568.9	177.6	58.7	118.90	1.494 Level 3	
10,600.0	6,943.6	10,695.6	7,027.7	68.7	68.8	-118.32		3,308.7	-568.9	177.4	55.1	122.35	1.450 Level 3	
10,700.0	6,943.6	10,795.6	7,027.4	70.6	70.7	-118.21		3,408.7	-568.9	177.2	51.4	125.81	1.409 Level 3	
10,800.0	6,943.7	10,895.6	7,027.1	72.4	72.5	-118.10		3,508.7	-568.9	177.0	47.8	129.28	1.369 Level 3	
10,900.0	6,943.7	10,995.6	7,026.7	74.3	74.4	-117.99		3,608.7	-568.9	176.9	44.1	132.76	1.332 Level 3	
11,000.0	6,943.8	11,095.6	7,026.4	76.2	76.3	-117.88		3,708.7	-568.9	176.7	40.4	136.25	1.297 Level 3	
11,100.0	6,943.8	11,195.6	7,026.1	78.0	78.1	-117.77		3,808.7	-568.9	176.5	36.8	139.75	1.263 Level 3	
11,200.0	6,943.9	11,295.6	7,025.8	79.9	80.0	-117.66		3,908.7	-568.9	176.3	33.1	143.26	1.231 Level 2	
11,300.0	6,943.9	11,395.6	7,025.4	81.8	81.9	-117.55		4,008.7	-568.9	176.1	29.4	146.78	1.200 Level 2	
11,400.0	6,944.0	11,495.6	7,025.1	83.7	83.7	-117.44		4,108.7	-568.9	176.0	25.7	150.30	1.171 Level 2	
11,419.2	6,944.0	11,514.8	7,025.0	84.0	84.1	-117.42		4,127.9	-568.9	175.9	24.9	150.98	1.165 Level 2, ES, SF	

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Rieder 18T-221
Project:	SEC.18-T4N-R67W	TVD Reference:	WELL @ 4821.0ft (RKB - 15')
Reference Site:	Rieder 4N67W18Y Pad Sec.18-T4N-R67W	MD Reference:	WELL @ 4821.0ft (RKB - 15')
Site Error:	0.0ft	North Reference:	True
Reference Well:	Rieder 18T-221	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 (7-31-14)	Offset TVD Reference:	Offset Datum

Offset Design Rieder 4N67W18Y Pad Sec.18-T4N-R67W - Rieder 18T-401 - Wellbore #1 - Plan #1 (7-31-14)													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	-61.4	61.4				
100.0	100.0	99.0	99.0	0.1	0.1	-90.00	-90.00	0.0	-61.4	61.4	61.1	0.22	274.357	
200.0	200.0	199.0	199.0	0.3	0.3	-90.00	-90.00	0.0	-61.4	61.4	60.7	0.67	91.300	
300.0	300.0	299.0	299.0	0.6	0.6	-90.00	-90.00	0.0	-61.4	61.4	60.2	1.12	54.707	
400.0	400.0	399.0	399.0	0.8	0.8	-90.00	-90.00	0.0	-61.4	61.4	59.8	1.57	39.054	
500.0	500.0	499.0	499.0	1.0	1.0	-90.00	-90.00	0.0	-61.4	61.4	59.3	2.02	30.366	
600.0	600.0	599.0	599.0	1.2	1.2	-90.00	-90.00	0.0	-61.4	61.4	58.9	2.47	24.840	
700.0	700.0	699.0	699.0	1.5	1.5	-90.00	-90.00	0.0	-61.4	61.4	58.4	2.92	21.015	
800.0	800.0	799.0	799.0	1.7	1.7	-90.00	-90.00	0.0	-61.4	61.4	58.0	3.37	18.211 CC, ES	
900.0	900.0	897.4	897.4	1.9	1.9	-91.02	-91.02	-1.1	-62.6	62.6	58.8	3.79	16.509	
1,000.0	1,000.0	995.6	995.4	2.1	2.1	-93.86	-93.86	-4.5	-66.3	66.6	62.4	4.20	15.832	
1,100.0	1,100.0	1,093.3	1,092.8	2.4	2.3	-97.90	-97.90	-10.1	-72.5	73.4	68.8	4.62	15.885	
1,200.0	1,200.0	1,190.3	1,189.1	2.6	2.5	-102.38	-102.38	-17.8	-81.1	83.6	78.5	5.05	16.547	
1,300.0	1,300.0	1,286.7	1,284.4	2.8	2.8	-39.85	-39.85	-27.6	-92.0	95.8	90.3	5.46	17.543	
1,400.0	1,399.8	1,384.9	1,381.0	3.0	3.1	37.36	37.36	-39.4	-105.0	108.0	102.1	5.86	18.437	
1,500.0	1,499.5	1,484.4	1,478.8	3.2	3.4	36.32	36.32	-51.4	-118.3	117.7	111.4	6.27	18.779	
1,600.0	1,598.7	1,584.1	1,577.0	3.4	3.7	36.40	36.40	-63.5	-131.6	124.6	117.9	6.70	18.601	
1,700.0	1,697.5	1,684.0	1,675.2	3.6	4.1	37.41	37.41	-75.5	-145.0	128.7	121.6	7.16	17.980	
1,800.0	1,795.9	1,783.9	1,773.5	3.9	4.5	38.99	38.99	-87.6	-158.4	131.2	123.6	7.67	17.107	
1,900.0	1,894.3	1,883.8	1,871.7	4.2	4.8	40.53	40.53	-99.7	-171.7	133.8	125.6	8.21	16.288	
2,000.0	1,992.7	1,983.7	1,970.0	4.5	5.2	42.01	42.01	-111.7	-185.1	136.4	127.6	8.78	15.535	
2,100.0	2,091.1	2,083.6	2,068.3	4.8	5.6	43.43	43.43	-123.8	-198.5	139.2	129.8	9.37	14.844	
2,200.0	2,189.5	2,183.5	2,166.5	5.2	6.0	44.79	44.79	-135.9	-211.8	142.0	132.0	9.99	14.212	
2,300.0	2,287.9	2,283.4	2,264.8	5.5	6.4	46.10	46.10	-148.0	-225.2	144.9	134.2	10.62	13.634	
2,400.0	2,386.3	2,383.4	2,363.1	5.9	6.8	47.36	47.36	-160.0	-238.6	147.8	136.5	11.28	13.106	
2,500.0	2,484.7	2,483.3	2,461.3	6.3	7.2	48.57	48.57	-172.1	-251.9	150.9	138.9	11.95	12.624	
2,600.0	2,583.1	2,583.2	2,559.6	6.6	7.6	49.73	49.73	-184.2	-265.3	154.0	141.3	12.64	12.184	
2,700.0	2,681.5	2,683.1	2,657.9	7.0	8.0	50.85	50.85	-196.2	-278.7	157.1	143.8	13.34	11.780	
2,800.0	2,779.9	2,783.0	2,756.1	7.4	8.4	51.92	51.92	-208.3	-292.0	160.3	146.3	14.05	11.411	
2,900.0	2,878.3	2,882.9	2,854.4	7.8	8.8	52.94	52.94	-220.4	-305.4	163.6	148.8	14.78	11.073	
3,000.0	2,976.7	2,982.8	2,952.7	8.2	9.2	53.93	53.93	-232.5	-318.8	166.9	151.4	15.51	10.762	
3,100.0	3,075.1	3,082.7	3,050.9	8.6	9.6	54.88	54.88	-244.5	-332.1	170.3	154.0	16.25	10.476	
3,200.0	3,173.5	3,182.6	3,149.2	8.9	10.1	55.79	55.79	-256.6	-345.5	173.7	156.7	17.01	10.213	
3,300.0	3,271.9	3,282.5	3,247.5	9.3	10.5	56.67	56.67	-268.7	-358.9	177.2	159.4	17.77	9.970	
3,400.0	3,370.3	3,382.4	3,345.7	9.7	10.9	57.51	57.51	-280.8	-372.2	180.6	162.1	18.54	9.745	
3,500.0	3,468.7	3,482.3	3,444.0	10.1	11.3	58.32	58.32	-292.8	-385.6	184.2	164.9	19.31	9.537	
3,600.0	3,567.1	3,582.2	3,542.3	10.5	11.7	59.10	59.10	-304.9	-399.0	187.7	167.7	20.09	9.345	
3,700.0	3,665.5	3,682.1	3,640.6	10.9	12.1	59.85	59.85	-317.0	-412.3	191.3	170.5	20.88	9.166	
3,800.0	3,763.9	3,782.0	3,738.8	11.3	12.5	60.57	60.57	-329.0	-425.7	195.0	173.3	21.67	8.999	
3,900.0	3,862.3	3,881.9	3,837.1	11.7	12.9	61.27	61.27	-341.1	-439.1	198.6	176.2	22.46	8.844	
4,000.0	3,960.7	3,981.8	3,935.4	12.1	13.3	61.94	61.94	-353.2	-452.4	202.3	179.1	23.26	8.699	
4,100.0	4,059.1	4,081.7	4,033.6	12.5	13.8	62.59	62.59	-365.3	-465.8	206.0	182.0	24.06	8.564	
4,200.0	4,157.5	4,181.6	4,131.9	12.9	14.2	63.21	63.21	-377.3	-479.2	209.8	184.9	24.86	8.438	
4,300.0	4,255.9	4,281.5	4,230.2	13.3	14.6	63.81	63.81	-389.4	-492.5	213.6	187.9	25.67	8.319	
4,400.0	4,354.3	4,381.4	4,328.4	13.7	15.0	64.40	64.40	-401.5	-505.9	217.3	190.9	26.48	8.208	
4,500.0	4,452.7	4,481.3	4,426.7	14.1	15.4	64.96	64.96	-413.5	-519.3	221.2	193.9	27.29	8.103	
4,600.0	4,551.1	4,581.2	4,525.0	14.5	15.8	65.50	65.50	-425.6	-532.6	225.0	196.9	28.11	8.005	
4,700.0	4,649.5	4,681.1	4,623.2	15.0	16.2	66.02	66.02	-437.7	-546.0	228.8	199.9	28.92	7.912	
4,800.0	4,747.9	4,781.1	4,721.5	15.4	16.7	66.53	66.53	-449.8	-559.4	232.7	203.0	29.74	7.824	
4,900.0	4,846.3	4,881.0	4,819.8	15.8	17.1	67.02	67.02	-461.8	-572.7	236.6	206.0	30.56	7.742	
5,000.0	4,944.7	4,980.9	4,918.0	16.2	17.5	67.49	67.49	-473.9	-586.1	240.5	209.1	31.38	7.664	

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 18T-221
Project:	SEC.18-T4N-R67W	TVD Reference:	WELL @ 4821.0ft (RKB - 15')
Reference Site:	Rieder 4N67W18Y Pad Sec.18-T4N-R67W	MD Reference:	WELL @ 4821.0ft (RKB - 15')
Site Error:	0.0ft	North Reference:	True
Reference Well:	Rieder 18T-221	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 (7-31-14)	Offset TVD Reference:	Offset Datum

Offset Design Rieder 4N67W18Y Pad Sec.18-T4N-R67W - Rieder 18T-401 - Wellbore #1 - Plan #1 (7-31-14)												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	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
5,100.0	5,043.1	5,080.8	5,016.3	16.6	17.9	67.95	-486.0	-599.5	244.4	212.2	32.20	7.590	
5,200.0	5,141.5	5,180.7	5,114.6	17.0	18.3	68.40	-498.0	-612.8	248.3	215.3	33.03	7.520	
5,300.0	5,239.9	5,280.6	5,212.8	17.4	18.7	68.83	-510.1	-626.2	252.3	218.4	33.85	7.453	
5,400.0	5,338.3	5,380.5	5,311.1	17.8	19.1	69.20	-522.2	-639.6	256.4	221.8	34.63	7.403	
5,500.0	5,437.3	5,480.3	5,409.3	18.0	19.6	68.98	-534.3	-652.9	261.6	226.4	35.22	7.427	
5,600.0	5,536.7	5,580.0	5,507.4	18.3	20.0	68.12	-546.3	-666.3	268.1	232.4	35.67	7.515	
5,700.0	5,636.4	5,679.4	5,605.1	18.5	20.4	66.65	-558.3	-679.6	276.0	240.1	35.99	7.671	
5,800.0	5,736.3	5,779.7	5,703.8	18.6	20.8	64.67	-570.4	-692.9	285.6	249.5	36.14	7.903	
5,900.0	5,836.3	5,885.6	5,808.4	18.8	21.1	-83.65	-581.4	-705.1	295.4	259.3	36.13	8.176	
6,000.0	5,936.3	5,992.5	5,914.5	18.9	21.3	-85.44	-589.8	-714.5	303.4	267.3	36.15	8.393	
6,100.0	6,036.3	6,100.1	6,021.8	19.0	21.5	-86.62	-595.7	-720.9	309.1	272.8	36.26	8.524	
6,200.0	6,136.3	6,208.3	6,129.9	19.1	21.7	-87.23	-598.8	-724.4	312.1	275.7	36.45	8.564	
6,300.0	6,236.3	6,313.7	6,235.3	19.3	21.8	-87.76	-599.4	-725.1	312.6	276.0	36.62	8.536	
6,390.7	6,326.1	6,403.5	6,325.1	19.3	22.0	-90.00	-599.4	-725.1	312.4	276.1	36.31	8.603	
6,400.0	6,335.2	6,412.6	6,334.2	19.3	22.0	-90.33	-599.4	-725.1	312.4	276.1	36.25	8.616	
6,500.0	6,431.4	6,510.9	6,432.4	19.2	22.1	-94.73	-597.3	-725.1	313.5	278.1	35.38	8.860	
6,600.0	6,523.3	6,612.7	6,533.2	19.0	22.1	-99.28	-583.1	-725.1	316.8	282.5	34.31	9.232	
6,700.0	6,609.3	6,718.5	6,634.9	18.8	22.0	-103.66	-554.3	-725.1	322.1	288.9	33.14	9.717	
6,800.0	6,687.9	6,828.5	6,735.4	18.5	21.8	-107.76	-509.7	-725.1	328.9	297.0	31.94	10.297	
6,900.0	6,757.8	6,943.1	6,832.0	18.2	21.6	-111.48	-448.5	-725.1	336.8	306.0	30.78	10.942	
7,000.0	6,817.8	7,062.2	6,921.7	17.9	21.2	-114.76	-370.3	-725.1	345.2	315.4	29.76	11.599	
7,100.0	6,866.8	7,185.8	7,000.7	17.6	20.9	-117.53	-275.4	-725.1	353.3	324.3	28.99	12.186	
7,200.0	6,904.0	7,313.6	7,065.3	17.4	20.5	-119.73	-165.2	-725.1	360.4	331.8	28.61	12.600	
7,300.0	6,928.8	7,444.9	7,111.5	17.3	20.1	-121.32	-42.5	-725.1	366.0	337.3	28.72	12.745	
7,400.0	6,940.8	7,578.8	7,136.4	17.5	19.8	-122.28	88.8	-725.1	369.6	340.2	29.41	12.566	
7,500.0	6,941.9	7,697.8	7,140.3	18.1	19.7	-122.54	207.7	-725.1	370.5	340.0	30.52	12.140	
7,600.0	6,942.0	7,797.8	7,140.6	18.9	20.2	-122.58	307.7	-725.1	370.7	338.8	31.87	11.630	
7,700.0	6,942.1	7,897.7	7,141.0	20.0	21.1	-122.62	407.7	-725.1	370.8	337.3	33.50	11.070	
7,800.0	6,942.1	7,997.7	7,141.3	21.1	22.2	-122.66	507.7	-725.1	371.0	335.6	35.36	10.491	
7,900.0	6,942.2	8,097.7	7,141.7	22.4	23.4	-122.70	607.7	-725.1	371.2	333.7	37.43	9.916	
8,000.0	6,942.2	8,197.7	7,142.0	23.7	24.7	-122.74	707.7	-725.1	371.3	331.7	39.66	9.362	
8,100.0	6,942.3	8,297.7	7,142.4	25.1	26.1	-122.77	807.7	-725.1	371.5	329.4	42.04	8.836	
8,200.0	6,942.3	8,397.7	7,142.7	26.6	27.5	-122.81	907.7	-725.1	371.6	327.1	44.54	8.345	
8,300.0	6,942.4	8,497.7	7,143.1	28.1	29.0	-122.85	1,007.7	-725.0	371.8	324.7	47.13	7.889	
8,400.0	6,942.4	8,597.7	7,143.4	29.7	30.5	-122.89	1,107.7	-725.0	372.0	322.2	49.81	7.468	
8,500.0	6,942.5	8,697.7	7,143.8	31.3	32.1	-122.93	1,207.7	-725.0	372.1	319.6	52.55	7.081	
8,600.0	6,942.5	8,797.7	7,144.1	32.9	33.7	-122.97	1,307.7	-725.0	372.3	316.9	55.36	6.725	
8,700.0	6,942.6	8,897.7	7,144.5	34.6	35.3	-123.01	1,407.7	-725.0	372.5	314.2	58.22	6.398	
8,800.0	6,942.6	8,997.7	7,144.8	36.3	37.0	-123.04	1,507.7	-725.0	372.6	311.5	61.12	6.097	
8,900.0	6,942.7	9,097.7	7,145.2	38.0	38.6	-123.08	1,607.7	-725.0	372.8	308.7	64.05	5.820	
9,000.0	6,942.7	9,197.7	7,145.5	39.7	40.3	-123.12	1,707.7	-725.0	372.9	305.9	67.02	5.564	
9,100.0	6,942.8	9,297.7	7,145.9	41.4	42.0	-123.16	1,807.7	-725.0	373.1	303.1	70.02	5.329	
9,200.0	6,942.8	9,397.7	7,146.2	43.2	43.8	-123.20	1,907.7	-725.0	373.3	300.2	73.04	5.111	
9,300.0	6,942.9	9,497.7	7,146.5	45.0	45.5	-123.23	2,007.7	-725.0	373.4	297.3	76.08	4.909	
9,400.0	6,942.9	9,597.7	7,146.9	46.8	47.3	-123.27	2,107.7	-725.0	373.6	294.5	79.13	4.721	
9,500.0	6,943.0	9,697.7	7,147.2	48.6	49.0	-123.31	2,207.7	-725.0	373.7	291.5	82.20	4.546	
9,600.0	6,943.0	9,797.7	7,147.6	50.4	50.8	-123.35	2,307.7	-725.0	373.9	288.6	85.29	4.384	
9,700.0	6,943.1	9,897.7	7,147.9	52.2	52.6	-123.39	2,407.7	-725.0	374.1	285.7	88.39	4.232	
9,800.0	6,943.2	9,997.7	7,148.3	54.0	54.4	-123.42	2,507.7	-725.0	374.2	282.7	91.50	4.090	
9,900.0	6,943.2	10,097.7	7,148.6	55.8	56.2	-123.46	2,607.7	-725.0	374.4	279.8	94.62	3.957	
10,000.0	6,943.3	10,197.7	7,149.0	57.6	58.0	-123.50	2,707.7	-725.0	374.6	276.8	97.74	3.832	

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 18T-221
Project:	SEC.18-T4N-R67W	TVD Reference:	WELL @ 4821.0ft (RKB - 15')
Reference Site:	Rieder 4N67W18Y Pad Sec.18-T4N-R67W	MD Reference:	WELL @ 4821.0ft (RKB - 15')
Site Error:	0.0ft	North Reference:	True
Reference Well:	Rieder 18T-221	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 (7-31-14)	Offset TVD Reference:	Offset Datum

Offset Design Rieder 4N67W18Y Pad Sec.18-T4N-R67W - Rieder 18T-401 - Wellbore #1 - Plan #1 (7-31-14)											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)		
10,100.0	6,943.3	10,297.7	7,149.3	59.5	59.8	-123.54	2,807.7	-725.0	374.7	273.8	100.87	3.715	
10,200.0	6,943.4	10,397.7	7,149.7	61.3	61.7	-123.58	2,907.7	-725.0	374.9	270.9	104.01	3.604	
10,300.0	6,943.4	10,497.7	7,150.0	63.2	63.5	-123.61	3,007.7	-725.0	375.0	267.9	107.16	3.500	
10,400.0	6,943.5	10,597.7	7,150.4	65.0	65.3	-123.65	3,107.7	-725.0	375.2	264.9	110.31	3.402	
10,500.0	6,943.5	10,697.7	7,150.7	66.9	67.2	-123.69	3,207.7	-725.0	375.4	261.9	113.46	3.308	
10,600.0	6,943.6	10,797.7	7,151.1	68.7	69.0	-123.73	3,307.7	-725.0	375.5	258.9	116.62	3.220	
10,700.0	6,943.6	10,897.7	7,151.4	70.6	70.8	-123.77	3,407.7	-725.0	375.7	255.9	119.78	3.137	
10,800.0	6,943.7	10,997.7	7,151.8	72.4	72.7	-123.80	3,507.7	-725.0	375.9	252.9	122.94	3.057	
10,900.0	6,943.7	11,097.7	7,152.1	74.3	74.5	-123.84	3,607.7	-725.0	376.0	249.9	126.11	2.982	
11,000.0	6,943.8	11,197.7	7,152.5	76.2	76.4	-123.88	3,707.7	-725.0	376.2	246.9	129.27	2.910	
11,100.0	6,943.8	11,297.7	7,152.8	78.0	78.3	-123.92	3,807.7	-725.0	376.4	243.9	132.44	2.842	
11,200.0	6,943.9	11,397.7	7,153.2	79.9	80.1	-123.95	3,907.7	-725.0	376.5	240.9	135.61	2.777	
11,300.0	6,943.9	11,497.7	7,153.5	81.8	82.0	-123.99	4,007.7	-725.0	376.7	237.9	138.78	2.714	
11,400.0	6,944.0	11,597.7	7,153.9	83.7	83.9	-124.03	4,107.7	-725.0	376.9	234.9	141.96	2.655	
11,419.2	6,944.0	11,616.9	7,153.9	84.0	84.2	-124.04	4,126.9	-725.0	376.9	234.3	142.57	2.644 SF	

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Rieder 18T-221
Project:	SEC.18-T4N-R67W	TVD Reference:	WELL @ 4821.0ft (RKB - 15')
Reference Site:	Rieder 4N67W18Y Pad Sec.18-T4N-R67W	MD Reference:	WELL @ 4821.0ft (RKB - 15')
Site Error:	0.0ft	North Reference:	True
Reference Well:	Rieder 18T-221	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 (7-31-14)	Offset TVD Reference:	Offset Datum

Offset Design Rieder 4N67W18Y Pad Sec.18-T4N-R67W - Rieder 18Y-241 - Wellbore #1 - Plan #1 (7-31-14)													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 (ft)	Offset (ft)	Semi Major Axis (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
0.0	0.0	0.0	0.0	0.0	0.0	90.02		0.0	27.9	27.9				
100.0	100.0	100.0	100.0	0.1	0.1	90.02		0.0	27.9	27.9	27.7	0.22	124.085	
200.0	200.0	200.0	200.0	0.3	0.3	90.02		0.0	27.9	27.9	27.2	0.67	41.362	
300.0	300.0	300.0	300.0	0.6	0.6	90.02		0.0	27.9	27.9	26.8	1.12	24.817	
400.0	400.0	400.0	400.0	0.8	0.8	90.02		0.0	27.9	27.9	26.3	1.57	17.726	
500.0	500.0	500.0	500.0	1.0	1.0	90.02		0.0	27.9	27.9	25.9	2.02	13.787	
600.0	600.0	600.0	600.0	1.2	1.2	90.02		0.0	27.9	27.9	25.4	2.47	11.280	
700.0	700.0	700.0	700.0	1.5	1.5	90.02		0.0	27.9	27.9	25.0	2.92	9.545	
800.0	800.0	800.0	800.0	1.7	1.7	90.02		0.0	27.9	27.9	24.5	3.37	8.272	
900.0	900.0	900.0	900.0	1.9	1.9	90.02		0.0	27.9	27.9	24.1	3.82	7.299	
1,000.0	1,000.0	1,000.0	1,000.0	2.1	2.1	90.02		0.0	27.9	27.9	23.6	4.27	6.531	
1,100.0	1,100.0	1,100.0	1,100.0	2.4	2.4	90.02		0.0	27.9	27.9	23.2	4.72	5.909	
1,200.0	1,200.0	1,200.0	1,200.0	2.6	2.6	90.02		0.0	27.9	27.9	22.7	5.17	5.395 CC, ES	
1,300.0	1,300.0	1,300.0	1,300.0	2.8	2.8	-126.75		0.0	27.9	28.9	23.3	5.59	5.168	
1,400.0	1,399.8	1,399.8	1,399.8	3.0	3.0	-134.15		0.0	27.9	32.3	26.3	5.99	5.393	
1,500.0	1,499.5	1,499.7	1,499.7	3.2	3.2	-140.80		-1.7	28.1	38.6	32.2	6.36	6.065	
1,600.0	1,598.7	1,599.5	1,599.4	3.4	3.4	-143.80		-6.9	28.9	47.3	40.6	6.72	7.046	
1,700.0	1,697.5	1,699.3	1,698.8	3.6	3.6	-144.40		-15.5	30.2	58.3	51.2	7.10	8.210	
1,800.0	1,795.9	1,799.1	1,797.8	3.9	3.8	-143.13		-27.5	31.9	70.2	62.7	7.53	9.327	
1,900.0	1,894.3	1,898.5	1,896.1	4.2	4.0	-140.21		-42.3	34.1	81.7	73.7	8.01	10.200	
2,000.0	1,992.7	1,997.8	1,994.2	4.5	4.3	-137.80		-57.5	36.4	93.3	84.8	8.53	10.937	
2,100.0	2,091.1	2,097.0	2,092.2	4.8	4.5	-135.93		-72.7	38.6	105.1	96.0	9.09	11.564	
2,200.0	2,189.5	2,196.3	2,190.3	5.2	4.8	-134.43		-87.9	40.8	116.9	107.3	9.67	12.096	
2,300.0	2,287.9	2,295.5	2,288.3	5.5	5.1	-133.21		-103.0	43.1	128.8	118.6	10.27	12.548	
2,400.0	2,386.3	2,394.8	2,386.4	5.9	5.4	-132.19		-118.2	45.3	140.8	129.9	10.89	12.933	
2,500.0	2,484.7	2,494.1	2,484.5	6.3	5.7	-131.34		-133.4	47.6	152.8	141.3	11.52	13.263	
2,600.0	2,583.1	2,593.3	2,582.5	6.6	6.0	-130.61		-148.6	49.8	164.8	152.6	12.17	13.546	
2,700.0	2,681.5	2,692.6	2,680.6	7.0	6.3	-129.97		-163.8	52.0	176.9	164.0	12.82	13.791	
2,800.0	2,779.9	2,791.8	2,778.7	7.4	6.7	-129.42		-178.9	54.3	188.9	175.4	13.49	14.004	
2,900.0	2,878.3	2,891.1	2,876.7	7.8	7.0	-128.94		-194.1	56.5	201.0	186.8	14.16	14.190	
3,000.0	2,976.7	2,990.3	2,974.8	8.2	7.3	-128.51		-209.3	58.7	213.1	198.2	14.85	14.354	
3,100.0	3,075.1	3,089.6	3,072.8	8.6	7.7	-128.13		-224.5	61.0	225.2	209.7	15.53	14.498	
3,200.0	3,173.5	3,188.8	3,170.9	8.9	8.0	-127.78		-239.7	63.2	237.3	221.1	16.22	14.626	
3,300.0	3,271.9	3,288.1	3,269.0	9.3	8.4	-127.47		-254.8	65.5	249.4	232.5	16.92	14.740	
3,400.0	3,370.3	3,387.3	3,367.0	9.7	8.7	-127.19		-270.0	67.7	261.5	243.9	17.62	14.842	
3,500.0	3,468.7	3,486.6	3,465.1	10.1	9.1	-126.93		-285.2	69.9	273.7	255.3	18.33	14.934	
3,600.0	3,567.1	3,585.9	3,563.1	10.5	9.4	-126.70		-300.4	72.2	285.8	266.8	19.03	15.017	
3,700.0	3,665.5	3,685.1	3,661.2	10.9	9.8	-126.48		-315.6	74.4	297.9	278.2	19.74	15.092	
3,800.0	3,763.9	3,784.4	3,759.3	11.3	10.1	-126.28		-330.7	76.6	310.1	289.6	20.45	15.160	
3,900.0	3,862.3	3,883.6	3,857.3	11.7	10.5	-126.10		-345.9	78.9	322.2	301.1	21.17	15.222	
4,000.0	3,960.7	3,982.9	3,955.4	12.1	10.8	-125.92		-361.1	81.1	334.4	312.5	21.89	15.279	
4,100.0	4,059.1	4,082.1	4,053.4	12.5	11.2	-125.77		-376.3	83.4	346.5	323.9	22.60	15.331	
4,200.0	4,157.5	4,181.4	4,151.5	12.9	11.5	-125.62		-391.5	85.6	358.7	335.4	23.32	15.378	
4,300.0	4,255.9	4,280.6	4,249.6	13.3	11.9	-125.48		-406.6	87.8	370.9	346.8	24.05	15.422	
4,400.0	4,354.3	4,379.9	4,347.6	13.7	12.3	-125.35		-421.8	90.1	383.0	358.2	24.77	15.463	
4,500.0	4,452.7	4,479.1	4,445.7	14.1	12.6	-125.23		-437.0	92.3	395.2	369.7	25.49	15.501	
4,600.0	4,551.1	4,578.4	4,543.8	14.5	13.0	-125.11		-452.2	94.5	407.3	381.1	26.22	15.536	
4,700.0	4,649.5	4,677.7	4,641.8	15.0	13.3	-125.01		-467.3	96.8	419.5	392.6	26.95	15.569	
4,800.0	4,747.9	4,776.9	4,739.9	15.4	13.7	-124.90		-482.5	99.0	431.7	404.0	27.67	15.599	
4,900.0	4,846.3	4,876.2	4,837.9	15.8	14.1	-124.81		-497.7	101.3	443.8	415.4	28.40	15.627	
5,000.0	4,944.7	4,975.4	4,936.0	16.2	14.4	-124.72		-512.9	103.5	456.0	426.9	29.13	15.654	

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 18T-221
Project:	SEC.18-T4N-R67W	TVD Reference:	WELL @ 4821.0ft (RKB - 15')
Reference Site:	Rieder 4N67W18Y Pad Sec.18-T4N-R67W	MD Reference:	WELL @ 4821.0ft (RKB - 15')
Site Error:	0.0ft	North Reference:	True
Reference Well:	Rieder 18T-221	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 (7-31-14)	Offset TVD Reference:	Offset Datum

Offset Design Rieder 4N67W18Y Pad Sec.18-T4N-R67W - Rieder 18Y-241 - Wellbore #1 - Plan #1 (7-31-14)													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
5,100.0	5,043.1	5,074.7	5,034.1	16.6	14.8	-124.63		-528.1	105.7	468.2	438.3	29.86	15.679	
5,200.0	5,141.5	5,173.9	5,132.1	17.0	15.2	-124.55		-543.2	108.0	480.3	449.7	30.59	15.702	
5,300.0	5,239.9	5,273.2	5,230.2	17.4	15.5	-124.47		-558.4	110.2	492.5	461.2	31.32	15.724	
5,400.0	5,338.3	5,372.5	5,328.3	17.8	15.9	-124.45		-573.6	112.4	504.4	472.4	32.04	15.744	
5,500.0	5,437.3	5,471.9	5,426.5	18.0	16.3	-124.23		-588.8	114.7	514.7	482.0	32.69	15.744	
5,600.0	5,536.7	5,571.3	5,524.7	18.3	16.6	-123.68		-604.0	116.9	523.0	489.7	33.33	15.693	
5,700.0	5,636.4	5,672.8	5,625.1	18.5	16.9	-122.87		-618.7	119.1	529.4	495.5	33.90	15.614	
5,800.0	5,736.3	5,775.6	5,727.3	18.6	17.2	-122.07		-630.2	120.8	533.4	499.1	34.37	15.522	
5,900.0	5,836.3	5,878.9	5,830.3	18.8	17.4	-122.59		-638.1	122.0	535.2	500.5	34.76	15.397	
6,000.0	5,936.3	5,982.6	5,933.9	18.9	17.6	-122.04		-642.4	122.6	536.0	500.9	35.10	15.273	
6,100.0	6,036.3	6,085.1	6,036.3	19.0	17.7	-123.12		-643.1	122.7	536.2	500.8	35.40	15.148	
6,200.0	6,136.3	6,185.1	6,136.3	19.1	17.9	-123.12		-643.1	122.7	536.2	500.5	35.67	15.031	
6,300.0	6,236.3	6,287.4	6,238.6	19.3	18.0	-123.11		-640.7	122.7	536.2	500.3	35.91	14.933	
6,400.0	6,335.2	6,391.3	6,341.3	19.3	18.0	-123.05		-625.4	122.7	536.2	500.2	35.92	14.927	
6,500.0	6,431.4	6,495.1	6,440.9	19.2	17.9	-122.94		-596.4	122.7	536.1	500.4	35.70	15.016	
6,600.0	6,523.3	6,598.8	6,535.5	19.0	17.7	-122.77		-554.3	122.7	536.0	500.7	35.30	15.184	
6,700.0	6,609.3	6,702.1	6,623.3	18.8	17.4	-122.56		-499.9	122.7	535.9	501.1	34.78	15.409	
6,800.0	6,687.9	6,805.1	6,702.7	18.5	17.2	-122.30		-434.4	122.7	535.8	501.6	34.22	15.656	
6,900.0	6,757.8	6,907.8	6,772.3	18.2	16.9	-122.00		-359.1	122.7	535.7	502.0	33.73	15.884	
7,000.0	6,817.8	7,010.1	6,831.1	17.9	16.8	-121.66		-275.5	122.7	535.6	502.2	33.39	16.041	
7,100.0	6,866.8	7,111.8	6,877.9	17.6	16.8	-121.30		-185.2	122.7	535.5	502.2	33.31	16.079	
7,200.0	6,904.0	7,213.2	6,912.3	17.4	16.9	-120.92		-90.0	122.7	535.5	501.9	33.55	15.959	
7,300.0	6,928.8	7,314.0	6,933.6	17.3	17.2	-120.52		8.5	122.7	535.4	501.2	34.17	15.671	
7,400.0	6,940.8	7,414.3	6,941.8	17.5	17.8	-120.11		108.4	122.7	535.4	500.2	35.15	15.231	
7,442.1	6,942.6	7,456.3	6,941.9	17.7	18.0	-119.83		150.4	122.7	535.4	499.7	35.70	14.996	
7,500.0	6,941.9	7,514.3	6,942.0	18.1	18.5	-119.00		208.4	122.7	535.4	498.9	36.51	14.666	
7,600.0	6,942.0	7,614.3	6,942.0	18.9	19.3	-119.00		308.4	122.7	535.4	497.2	38.19	14.019	
7,700.0	6,942.1	7,714.3	6,942.1	20.0	20.3	-119.00		408.4	122.7	535.4	495.2	40.17	13.327	
7,800.0	6,942.1	7,814.3	6,942.1	21.1	21.5	-119.00		508.4	122.7	535.4	493.0	42.41	12.624	
7,900.0	6,942.2	7,914.3	6,942.2	22.4	22.7	-119.00		608.4	122.7	535.4	490.5	44.87	11.933	
8,000.0	6,942.2	8,014.3	6,942.2	23.7	24.0	-119.00		708.4	122.7	535.4	487.9	47.51	11.270	
8,100.0	6,942.3	8,114.3	6,942.3	25.1	25.4	-119.00		808.4	122.7	535.4	485.1	50.30	10.643	
8,200.0	6,942.3	8,214.3	6,942.3	26.6	26.9	-119.00		908.4	122.7	535.4	482.2	53.23	10.059	
8,300.0	6,942.4	8,314.3	6,942.4	28.1	28.4	-119.00		1,008.4	122.7	535.4	479.1	56.26	9.516	
8,400.0	6,942.4	8,414.3	6,942.4	29.7	30.0	-119.00		1,108.4	122.7	535.4	476.0	59.39	9.015	
8,500.0	6,942.5	8,514.3	6,942.5	31.3	31.6	-119.00		1,208.4	122.7	535.4	472.8	62.60	8.553	
8,600.0	6,942.5	8,614.3	6,942.5	32.9	33.3	-119.00		1,308.4	122.7	535.4	469.5	65.88	8.127	
8,700.0	6,942.6	8,714.3	6,942.6	34.6	34.9	-119.00		1,408.4	122.7	535.4	466.2	69.21	7.736	
8,800.0	6,942.6	8,814.3	6,942.6	36.3	36.6	-119.00		1,508.4	122.7	535.4	462.8	72.59	7.375	
8,900.0	6,942.7	8,914.3	6,942.7	38.0	38.3	-119.00		1,608.4	122.7	535.4	459.4	76.02	7.043	
9,000.0	6,942.7	9,014.3	6,942.7	39.7	40.1	-119.00		1,708.4	122.7	535.4	455.9	79.48	6.736	
9,100.0	6,942.8	9,114.3	6,942.8	41.4	41.8	-119.00		1,808.4	122.7	535.4	452.4	82.98	6.452	
9,200.0	6,942.8	9,214.3	6,942.9	43.2	43.6	-119.00		1,908.4	122.7	535.4	448.9	86.51	6.189	
9,300.0	6,942.9	9,314.3	6,942.9	45.0	45.3	-119.00		2,008.4	122.7	535.4	445.3	90.06	5.945	
9,400.0	6,942.9	9,414.3	6,943.0	46.8	47.1	-119.00		2,108.4	122.7	535.4	441.8	93.64	5.718	
9,500.0	6,943.0	9,514.3	6,943.0	48.6	48.9	-119.00		2,208.4	122.7	535.4	438.2	97.23	5.507	
9,600.0	6,943.0	9,614.3	6,943.1	50.4	50.7	-119.00		2,308.4	122.7	535.4	434.6	100.84	5.309	
9,700.0	6,943.1	9,714.3	6,943.1	52.2	52.6	-119.00		2,408.4	122.7	535.4	430.9	104.47	5.125	
9,800.0	6,943.2	9,814.3	6,943.2	54.0	54.4	-119.00		2,508.4	122.7	535.4	427.3	108.12	4.952	
9,900.0	6,943.2	9,914.3	6,943.2	55.8	56.2	-119.00		2,608.4	122.7	535.4	423.6	111.77	4.790	
10,000.0	6,943.3	10,014.3	6,943.3	57.6	58.0	-119.00		2,708.4	122.7	535.4	420.0	115.44	4.638	

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 18T-221
Project:	SEC.18-T4N-R67W	TVD Reference:	WELL @ 4821.0ft (RKB - 15')
Reference Site:	Rieder 4N67W18Y Pad Sec.18-T4N-R67W	MD Reference:	WELL @ 4821.0ft (RKB - 15')
Site Error:	0.0ft	North Reference:	True
Reference Well:	Rieder 18T-221	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 (7-31-14)	Offset TVD Reference:	Offset Datum

Offset Design Rieder 4N67W18Y Pad Sec.18-T4N-R67W - Rieder 18Y-241 - Wellbore #1 - Plan #1 (7-31-14)													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 (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning	
10,100.0	6,943.3	10,114.3	6,943.3	59.5	59.9	90.00	2,808.4	122.7	535.4	416.3	119.12	4.495		
10,200.0	6,943.4	10,214.3	6,943.4	61.3	61.7	90.00	2,908.4	122.7	535.4	412.6	122.81	4.360		
10,300.0	6,943.4	10,314.3	6,943.4	63.2	63.6	90.00	3,008.4	122.7	535.4	408.9	126.51	4.232		
10,400.0	6,943.5	10,414.3	6,943.5	65.0	65.4	90.00	3,108.4	122.7	535.4	405.2	130.22	4.112		
10,500.0	6,943.5	10,514.3	6,943.5	66.9	67.3	90.00	3,208.4	122.7	535.4	401.5	133.93	3.998		
10,600.0	6,943.6	10,614.3	6,943.6	68.7	69.1	90.00	3,308.4	122.7	535.4	397.8	137.65	3.890		
10,700.0	6,943.6	10,714.3	6,943.6	70.6	71.0	90.00	3,408.4	122.7	535.4	394.0	141.38	3.787		
10,800.0	6,943.7	10,814.3	6,943.7	72.4	72.9	90.00	3,508.4	122.7	535.4	390.3	145.11	3.690		
10,900.0	6,943.7	10,914.3	6,943.7	74.3	74.7	90.00	3,608.4	122.7	535.4	386.6	148.85	3.597		
11,000.0	6,943.8	11,014.3	6,943.8	76.2	76.6	90.00	3,708.4	122.7	535.4	382.8	152.59	3.509		
11,100.0	6,943.8	11,114.3	6,943.8	78.0	78.5	90.00	3,808.4	122.7	535.4	379.1	156.34	3.425		
11,200.0	6,943.9	11,214.3	6,943.9	79.9	80.4	90.00	3,908.4	122.7	535.4	375.3	160.09	3.344		
11,300.0	6,943.9	11,314.3	6,944.0	81.8	82.2	90.00	4,008.4	122.7	535.4	371.6	163.85	3.268		
11,358.9	6,944.0	11,373.2	6,944.0	82.9	83.3	90.00	4,067.3	122.7	535.4	369.3	166.06	3.224		
11,400.0	6,944.0	11,408.0	6,944.0	83.7	84.0	90.00	4,102.1	122.7	535.4	368.0	167.49	3.197		
11,419.2	6,944.0	11,408.0	6,944.0	84.0	84.0	90.00	4,102.1	122.7	536.0	368.2	167.85	3.193 SF		

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Rieder 18T-221
Project:	SEC.18-T4N-R67W	TVD Reference:	WELL @ 4821.0ft (RKB - 15')
Reference Site:	Rieder 4N67W18Y Pad Sec.18-T4N-R67W	MD Reference:	WELL @ 4821.0ft (RKB - 15')
Site Error:	0.0ft	North Reference:	True
Reference Well:	Rieder 18T-221	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 (7-31-14)	Offset TVD Reference:	Offset Datum

Offset Design Rieder 4N67W18Y Pad Sec.18-T4N-R67W - Rieder 18Y-301 - Wellbore #1 - Plan #1 (7-31-14)													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 (ft)	Offset (ft)	Semi Major Axis (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
0.0	0.0	0.0	0.0	0.0	0.0	90.00	90.00	0.0	89.2	89.2				
100.0	100.0	100.0	100.0	0.1	0.1	90.00	90.00	0.0	89.2	89.2	89.0	0.22	397.073	
200.0	200.0	200.0	200.0	0.3	0.3	90.00	90.00	0.0	89.2	89.2	88.6	0.67	132.358	
300.0	300.0	300.0	300.0	0.6	0.6	90.00	90.00	0.0	89.2	89.2	88.1	1.12	79.415	
400.0	400.0	400.0	400.0	0.8	0.8	90.00	90.00	0.0	89.2	89.2	87.7	1.57	56.725	
500.0	500.0	500.0	500.0	1.0	1.0	90.00	90.00	0.0	89.2	89.2	87.2	2.02	44.119	
600.0	600.0	600.0	600.0	1.2	1.2	90.00	90.00	0.0	89.2	89.2	86.8	2.47	36.098	
700.0	700.0	700.0	700.0	1.5	1.5	90.00	90.00	0.0	89.2	89.2	86.3	2.92	30.544	
800.0	800.0	800.0	800.0	1.7	1.7	90.00	90.00	0.0	89.2	89.2	85.9	3.37	26.472	
900.0	900.0	900.0	900.0	1.9	1.9	90.00	90.00	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	90.00	90.00	0.0	89.2	89.2	85.0	4.27	20.899 CC, ES	
1,100.0	1,100.0	1,098.5	1,098.5	2.4	2.3	90.96	90.96	-1.5	90.0	90.1	85.4	4.69	19.202	
1,200.0	1,200.0	1,196.8	1,196.7	2.6	2.5	93.71	93.71	-6.0	92.4	92.6	87.6	5.09	18.195	
1,300.0	1,300.0	1,294.7	1,294.2	2.8	2.7	-116.78	-116.78	-13.4	96.3	98.2	92.7	5.48	17.920	
1,400.0	1,399.8	1,392.1	1,390.9	3.0	2.9	-113.92	-113.92	-23.7	101.7	107.5	101.6	5.86	18.339	
1,500.0	1,499.5	1,489.4	1,487.0	3.2	3.2	-111.76	-111.76	-36.8	108.6	120.4	114.1	6.28	19.181	
1,600.0	1,598.7	1,588.3	1,584.6	3.4	3.4	-110.99	-110.99	-51.0	116.1	135.3	128.5	6.73	20.103	
1,700.0	1,697.5	1,687.0	1,682.0	3.6	3.7	-111.55	-111.55	-65.1	123.5	151.4	144.2	7.22	20.968	
1,800.0	1,795.9	1,785.4	1,779.2	3.9	4.0	-112.90	-112.90	-79.2	130.9	168.3	160.6	7.76	21.706	
1,900.0	1,894.3	1,883.9	1,876.3	4.2	4.4	-114.04	-114.04	-93.3	138.3	185.4	177.1	8.32	22.275	
2,000.0	1,992.7	1,982.4	1,973.5	4.5	4.7	-114.99	-114.99	-107.4	145.7	202.5	193.6	8.91	22.717	
2,100.0	2,091.1	2,080.8	2,070.7	4.8	5.0	-115.79	-115.79	-121.5	153.1	219.7	210.2	9.53	23.060	
2,200.0	2,189.5	2,179.3	2,167.9	5.2	5.4	-116.47	-116.47	-135.6	160.5	236.9	226.7	10.15	23.329	
2,300.0	2,287.9	2,277.8	2,265.1	5.5	5.7	-117.07	-117.07	-149.7	168.0	254.1	243.3	10.79	23.541	
2,400.0	2,386.3	2,376.3	2,362.2	5.9	6.1	-117.58	-117.58	-163.8	175.4	271.4	259.9	11.45	23.709	
2,500.0	2,484.7	2,474.7	2,459.4	6.3	6.4	-118.04	-118.04	-177.9	182.8	288.6	276.5	12.11	23.842	
2,600.0	2,583.1	2,573.2	2,556.6	6.6	6.8	-118.44	-118.44	-192.0	190.2	305.9	293.1	12.77	23.949	
2,700.0	2,681.5	2,671.7	2,653.8	7.0	7.1	-118.80	-118.80	-206.1	197.6	323.2	309.8	13.45	24.035	
2,800.0	2,779.9	2,770.2	2,750.9	7.4	7.5	-119.13	-119.13	-220.2	205.0	340.5	326.4	14.13	24.104	
2,900.0	2,878.3	2,868.6	2,848.1	7.8	7.9	-119.42	-119.42	-234.2	212.4	357.8	343.0	14.81	24.160	
3,000.0	2,976.7	2,967.1	2,945.3	8.2	8.2	-119.69	-119.69	-248.3	219.8	375.2	359.7	15.50	24.206	
3,100.0	3,075.1	3,065.6	3,042.5	8.6	8.6	-119.93	-119.93	-262.4	227.3	392.5	376.3	16.19	24.242	
3,200.0	3,173.5	3,164.0	3,139.6	8.9	9.0	-120.15	-120.15	-276.5	234.7	409.9	393.0	16.89	24.272	
3,300.0	3,271.9	3,262.5	3,236.8	9.3	9.3	-120.36	-120.36	-290.6	242.1	427.2	409.6	17.58	24.296	
3,400.0	3,370.3	3,361.0	3,334.0	9.7	9.7	-120.54	-120.54	-304.7	249.5	444.6	426.3	18.28	24.315	
3,500.0	3,468.7	3,459.5	3,431.2	10.1	10.1	-120.72	-120.72	-318.8	256.9	461.9	442.9	18.98	24.330	
3,600.0	3,567.1	3,557.9	3,528.4	10.5	10.4	-120.88	-120.88	-332.9	264.3	479.3	459.6	19.69	24.343	
3,700.0	3,665.5	3,656.4	3,625.5	10.9	10.8	-121.03	-121.03	-347.0	271.7	496.6	476.2	20.39	24.352	
3,800.0	3,763.9	3,754.9	3,722.7	11.3	11.2	-121.17	-121.17	-361.1	279.1	514.0	492.9	21.10	24.359	
3,900.0	3,862.3	3,853.4	3,819.9	11.7	11.6	-121.30	-121.30	-375.2	286.5	531.4	509.6	21.81	24.365	
4,000.0	3,960.7	3,951.8	3,917.1	12.1	11.9	-121.42	-121.42	-389.3	294.0	548.7	526.2	22.52	24.368	
4,100.0	4,059.1	4,050.3	4,014.2	12.5	12.3	-121.54	-121.54	-403.4	301.4	566.1	542.9	23.23	24.371	
4,200.0	4,157.5	4,148.8	4,111.4	12.9	12.7	-121.64	-121.64	-417.5	308.8	583.5	559.5	23.94	24.372	
4,300.0	4,255.9	4,247.3	4,208.6	13.3	13.1	-121.75	-121.75	-431.6	316.2	600.9	576.2	24.65	24.373	
4,400.0	4,354.3	4,345.7	4,305.8	13.7	13.4	-121.84	-121.84	-445.7	323.6	618.2	592.9	25.37	24.373	
4,500.0	4,452.7	4,444.2	4,402.9	14.1	13.8	-121.93	-121.93	-459.8	331.0	635.6	609.5	26.08	24.372	
4,600.0	4,551.1	4,542.7	4,500.1	14.5	14.2	-122.02	-122.02	-473.9	338.4	653.0	626.2	26.80	24.370	
4,700.0	4,649.5	4,641.1	4,597.3	15.0	14.6	-122.10	-122.10	-488.0	345.8	670.4	642.9	27.51	24.368	
4,800.0	4,747.9	4,739.6	4,694.5	15.4	14.9	-122.18	-122.18	-502.1	353.3	687.8	659.6	28.23	24.366	
4,900.0	4,846.3	4,838.1	4,791.6	15.8	15.3	-122.25	-122.25	-516.2	360.7	705.2	676.2	28.94	24.363	
5,000.0	4,944.7	4,936.6	4,888.8	16.2	15.7	-122.32	-122.32	-530.3	368.1	722.6	692.9	29.66	24.360	

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 18T-221
Project:	SEC.18-T4N-R67W	TVD Reference:	WELL @ 4821.0ft (RKB - 15')
Reference Site:	Rieder 4N67W18Y Pad Sec.18-T4N-R67W	MD Reference:	WELL @ 4821.0ft (RKB - 15')
Site Error:	0.0ft	North Reference:	True
Reference Well:	Rieder 18T-221	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 (7-31-14)	Offset TVD Reference:	Offset Datum

Offset Design		Rieder 4N67W18Y Pad Sec.18-T4N-R67W - Rieder 18Y-301 - Wellbore #1 - Plan #1 (7-31-14)											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)				
5,100.0	5,043.1	5,035.0	4,986.0	16.6	16.1	-122.39	-544.3	375.5	739.9	709.6	30.38	24.357			
5,200.0	5,141.5	5,133.5	5,083.2	17.0	16.5	-122.45	-558.4	382.9	757.3	726.2	31.10	24.354			
5,300.0	5,239.9	5,232.0	5,180.4	17.4	16.8	-122.51	-572.5	390.3	774.7	742.9	31.82	24.350			
5,400.0	5,338.3	5,330.5	5,277.6	17.8	17.2	-122.69	-586.6	397.7	791.9	759.4	32.53	24.344			
5,500.0	5,437.3	5,429.3	5,375.0	18.0	17.6	-122.80	-600.8	405.2	807.4	774.3	33.17	24.345			
5,600.0	5,536.7	5,528.2	5,472.7	18.3	18.0	-122.68	-614.9	412.6	821.1	787.4	33.77	24.314			
5,700.0	5,636.4	5,632.8	5,576.0	18.5	18.3	-122.31	-629.7	420.4	832.9	798.6	34.32	24.268			
5,800.0	5,736.3	5,748.9	5,691.1	18.6	18.6	-121.83	-642.8	427.3	841.3	806.5	34.77	24.199			
5,900.0	5,836.3	5,865.9	5,807.6	18.8	18.9	92.57	-651.9	432.0	846.1	810.9	35.15	24.068			
6,000.0	5,936.3	5,983.4	5,925.0	18.9	19.1	92.89	-656.7	434.6	848.4	813.0	35.49	23.910			
6,100.0	6,036.3	6,094.7	6,036.3	19.0	19.2	92.95	-657.6	435.0	848.9	813.1	35.79	23.718			
6,200.0	6,136.3	6,194.7	6,136.3	19.1	19.3	92.95	-657.6	435.0	848.9	812.8	36.06	23.540			
6,217.0	6,153.3	6,211.7	6,153.3	19.2	19.4	92.96	-657.6	435.0	848.9	812.8	36.10	23.512			
6,300.0	6,236.3	6,294.7	6,236.3	19.3	19.5	93.09	-657.6	435.0	849.0	812.7	36.31	23.380			
6,400.0	6,335.2	6,398.7	6,340.1	19.3	19.6	93.85	-654.8	435.0	849.7	813.3	36.43	23.322			
6,500.0	6,431.4	6,507.0	6,447.0	19.2	19.6	94.62	-637.8	435.0	850.5	814.2	36.32	23.421			
6,600.0	6,523.3	6,617.1	6,552.2	19.0	19.4	95.32	-605.3	435.0	851.4	815.5	35.98	23.666			
6,700.0	6,609.3	6,729.0	6,653.1	18.8	19.2	95.92	-557.1	435.0	852.3	816.9	35.47	24.027			
6,800.0	6,687.9	6,842.4	6,747.0	18.5	18.9	96.41	-493.8	435.0	853.1	818.2	34.88	24.457			
6,900.0	6,757.8	6,957.0	6,831.4	18.2	18.6	96.78	-416.4	435.0	853.7	819.4	34.31	24.884			
7,000.0	6,817.8	7,072.5	6,903.7	17.9	18.3	97.01	-326.5	435.0	854.1	820.3	33.87	25.216			
7,100.0	6,866.8	7,188.4	6,961.9	17.6	18.0	97.11	-226.4	435.0	854.3	820.6	33.70	25.353			
7,200.0	6,904.0	7,304.5	7,004.4	17.4	17.9	97.06	-118.5	435.0	854.2	820.3	33.88	25.210			
7,300.0	6,928.8	7,420.1	7,029.9	17.3	17.9	96.87	-5.8	435.0	853.9	819.4	34.50	24.749			
7,400.0	6,940.8	7,535.1	7,038.2	17.5	18.3	96.54	108.7	435.0	853.3	817.8	35.54	24.008			
7,500.0	6,941.9	7,635.1	7,037.9	18.1	19.0	96.46	208.7	435.0	853.2	816.3	36.89	23.128			
7,600.0	6,942.0	7,735.1	7,037.5	18.9	19.8	96.43	308.7	435.0	853.1	814.6	38.54	22.134			
7,700.0	6,942.1	7,835.1	7,037.2	20.0	20.8	96.40	408.7	435.0	853.1	812.6	40.49	21.069			
7,800.0	6,942.1	7,935.1	7,036.9	21.1	22.0	96.38	508.7	435.0	853.0	810.3	42.69	19.981			
7,900.0	6,942.2	8,035.1	7,036.5	22.4	23.2	96.35	608.7	435.0	853.0	807.9	45.11	18.909			
8,000.0	6,942.2	8,135.1	7,036.2	23.7	24.5	96.33	708.7	435.0	852.9	805.2	47.71	17.877			
8,100.0	6,942.3	8,235.1	7,035.9	25.1	25.9	96.30	808.7	435.0	852.9	802.4	50.47	16.899			
8,200.0	6,942.3	8,335.1	7,035.5	26.6	27.4	96.28	908.7	435.0	852.9	799.5	53.36	15.983			
8,300.0	6,942.4	8,435.1	7,035.2	28.1	28.9	96.25	1,008.7	435.0	852.8	796.5	56.36	15.132			
8,400.0	6,942.4	8,535.0	7,034.9	29.7	30.5	96.22	1,108.7	435.0	852.8	793.3	59.45	14.343			
8,500.0	6,942.5	8,635.0	7,034.5	31.3	32.0	96.20	1,208.7	435.0	852.7	790.1	62.63	13.615			
8,600.0	6,942.5	8,735.0	7,034.2	32.9	33.7	96.17	1,308.7	435.0	852.7	786.8	65.88	12.944			
8,700.0	6,942.6	8,835.0	7,033.9	34.6	35.3	96.15	1,408.7	435.0	852.6	783.5	69.18	12.325			
8,800.0	6,942.6	8,935.0	7,033.6	36.3	37.0	96.12	1,508.7	435.0	852.6	780.1	72.53	11.754			
8,900.0	6,942.7	9,035.0	7,033.2	38.0	38.7	96.10	1,608.7	435.0	852.6	776.6	75.93	11.228			
9,000.0	6,942.7	9,135.0	7,032.9	39.7	40.4	96.07	1,708.7	435.0	852.5	773.1	79.37	10.741			
9,100.0	6,942.8	9,235.0	7,032.6	41.4	42.2	96.04	1,808.7	435.0	852.5	769.6	82.85	10.290			
9,200.0	6,942.8	9,335.0	7,032.2	43.2	43.9	96.02	1,908.7	435.0	852.4	766.1	86.35	9.872			
9,300.0	6,942.9	9,435.0	7,031.9	45.0	45.7	95.99	2,008.7	435.0	852.4	762.5	89.88	9.484			
9,400.0	6,942.9	9,535.0	7,031.6	46.8	47.5	95.97	2,108.7	435.0	852.4	758.9	93.43	9.123			
9,500.0	6,943.0	9,635.0	7,031.2	48.6	49.2	95.94	2,208.7	435.0	852.3	755.3	97.00	8.786			
9,600.0	6,943.0	9,735.0	7,030.9	50.4	51.0	95.92	2,308.7	435.0	852.3	751.7	100.60	8.472			
9,700.0	6,943.1	9,835.0	7,030.6	52.2	52.8	95.89	2,408.7	435.0	852.2	748.0	104.21	8.178			
9,800.0	6,943.2	9,935.0	7,030.2	54.0	54.7	95.87	2,508.7	435.0	852.2	744.4	107.83	7.903			
9,900.0	6,943.2	10,035.0	7,029.9	55.8	56.5	95.84	2,608.7	435.0	852.2	740.7	111.47	7.645			
10,000.0	6,943.3	10,135.0	7,029.6	57.6	58.3	95.81	2,708.7	435.0	852.1	737.0	115.12	7.402			

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 18T-221
Project:	SEC.18-T4N-R67W	TVD Reference:	WELL @ 4821.0ft (RKB - 15')
Reference Site:	Rieder 4N67W18Y Pad Sec.18-T4N-R67W	MD Reference:	WELL @ 4821.0ft (RKB - 15')
Site Error:	0.0ft	North Reference:	True
Reference Well:	Rieder 18T-221	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 (7-31-14)	Offset TVD Reference:	Offset Datum

Offset Design Rieder 4N67W18Y Pad Sec.18-T4N-R67W - Rieder 18Y-301 - Wellbore #1 - Plan #1 (7-31-14)													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 (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning	
10,100.0	6,943.3	10,235.0	7,029.2	59.5	60.1	95.79	2,808.7	435.0	852.1	733.3	118.78	7.174		
10,200.0	6,943.4	10,335.0	7,028.9	61.3	62.0	95.76	2,908.7	435.0	852.0	729.6	122.45	6.958		
10,300.0	6,943.4	10,435.0	7,028.6	63.2	63.8	95.74	3,008.7	435.0	852.0	725.9	126.13	6.755		
10,400.0	6,943.5	10,535.0	7,028.2	65.0	65.7	95.71	3,108.7	435.0	852.0	722.1	129.82	6.562		
10,500.0	6,943.5	10,635.0	7,027.9	66.9	67.5	95.69	3,208.7	435.0	851.9	718.4	133.52	6.380		
10,600.0	6,943.6	10,735.0	7,027.6	68.7	69.4	95.66	3,308.7	435.0	851.9	714.7	137.23	6.208		
10,700.0	6,943.6	10,835.0	7,027.3	70.6	71.2	95.63	3,408.7	435.0	851.9	710.9	140.94	6.044		
10,800.0	6,943.7	10,935.0	7,026.9	72.4	73.1	95.61	3,508.7	435.0	851.8	707.2	144.66	5.888		
10,900.0	6,943.7	11,035.0	7,026.6	74.3	75.0	95.58	3,608.7	435.0	851.8	703.4	148.39	5.740		
11,000.0	6,943.8	11,135.0	7,026.3	76.2	76.8	95.56	3,708.7	435.0	851.7	699.6	152.12	5.599		
11,100.0	6,943.8	11,235.0	7,025.9	78.0	78.7	95.53	3,808.7	435.0	851.7	695.9	155.85	5.465		
11,200.0	6,943.9	11,335.0	7,025.6	79.9	80.6	95.51	3,908.7	435.0	851.7	692.1	159.59	5.337		
11,300.0	6,943.9	11,435.0	7,025.3	81.8	82.4	95.48	4,008.7	435.0	851.6	688.3	163.33	5.214		
11,363.8	6,944.0	11,498.8	7,025.0	83.0	83.6	95.46	4,072.5	435.0	851.6	685.9	165.73	5.139		
11,400.0	6,944.0	11,513.9	7,025.0	83.7	83.9	95.46	4,087.5	435.0	851.9	685.2	166.69	5.111		
11,419.2	6,944.0	11,513.9	7,025.0	84.0	83.9	95.46	4,087.5	435.0	852.5	685.5	167.05	5.104 SF		

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Rieder 18T-221
Project:	SEC.18-T4N-R67W	TVD Reference:	WELL @ 4821.0ft (RKB - 15')
Reference Site:	Rieder 4N67W18Y Pad Sec.18-T4N-R67W	MD Reference:	WELL @ 4821.0ft (RKB - 15')
Site Error:	0.0ft	North Reference:	True
Reference Well:	Rieder 18T-221	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 (7-31-14)	Offset TVD Reference:	Offset Datum

Offset Design Rieder 4N67W18Y Pad Sec.18-T4N-R67W - Rieder 18Y-441 - Wellbore #1 - Plan #1 (7-31-14)													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	58.6	58.6				
100.0	100.0	100.0	100.0	0.1	0.1	90.00	90.00	0.0	58.6	58.6	58.3	0.22	260.579	
200.0	200.0	200.0	200.0	0.3	0.3	90.00	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	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	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	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	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	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	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	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	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	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	90.00	0.0	58.6	58.6	53.4	5.17	11.330 CC, ES	
1,300.0	1,300.0	1,299.3	1,299.3	2.8	2.8	-123.70	-123.70	-1.6	59.1	60.1	54.5	5.56	10.805	
1,400.0	1,399.8	1,398.5	1,398.4	3.0	3.0	-123.13	-123.13	-6.5	60.8	64.7	58.8	5.91	10.941	
1,500.0	1,499.5	1,497.4	1,496.9	3.2	3.1	-122.33	-122.33	-14.6	63.5	72.3	66.1	6.29	11.508	
1,600.0	1,598.7	1,595.9	1,594.6	3.4	3.3	-121.44	-121.44	-25.9	67.3	83.0	76.3	6.69	12.406	
1,700.0	1,697.5	1,694.4	1,692.0	3.6	3.6	-120.75	-120.75	-40.0	72.1	96.6	89.5	7.15	13.519	
1,800.0	1,795.9	1,793.3	1,789.7	3.9	3.8	-121.11	-121.11	-54.6	77.1	111.5	103.8	7.65	14.574	
1,900.0	1,894.3	1,892.2	1,887.4	4.2	4.1	-121.43	-121.43	-69.2	82.0	126.4	118.2	8.19	15.434	
2,000.0	1,992.7	1,991.1	1,985.0	4.5	4.4	-121.67	-121.67	-83.8	86.9	141.3	132.5	8.76	16.135	
2,100.0	2,091.1	2,089.9	2,082.7	4.8	4.7	-121.87	-121.87	-98.4	91.9	156.2	146.8	9.35	16.710	
2,200.0	2,189.5	2,188.8	2,180.4	5.2	5.0	-122.04	-122.04	-113.0	96.8	171.1	161.1	9.96	17.183	
2,300.0	2,287.9	2,287.7	2,278.1	5.5	5.3	-122.18	-122.18	-127.6	101.8	186.0	175.4	10.58	17.576	
2,400.0	2,386.3	2,386.6	2,375.7	5.9	5.7	-122.30	-122.30	-142.2	106.7	200.9	189.6	11.22	17.904	
2,500.0	2,484.7	2,485.5	2,473.4	6.3	6.0	-122.40	-122.40	-156.8	111.7	215.8	203.9	11.87	18.180	
2,600.0	2,583.1	2,584.4	2,571.1	6.6	6.3	-122.49	-122.49	-171.4	116.6	230.7	218.1	12.53	18.413	
2,700.0	2,681.5	2,683.2	2,668.8	7.0	6.7	-122.56	-122.56	-186.0	121.6	245.6	232.4	13.19	18.613	
2,800.0	2,779.9	2,782.1	2,766.4	7.4	7.0	-122.63	-122.63	-200.6	126.5	260.5	246.6	13.87	18.783	
2,900.0	2,878.3	2,881.0	2,864.1	7.8	7.4	-122.70	-122.70	-215.2	131.5	275.4	260.8	14.55	18.931	
3,000.0	2,976.7	2,979.9	2,961.8	8.2	7.7	-122.75	-122.75	-229.8	136.4	290.3	275.0	15.23	19.059	
3,100.0	3,075.1	3,078.8	3,059.4	8.6	8.1	-122.80	-122.80	-244.4	141.3	305.2	289.3	15.92	19.171	
3,200.0	3,173.5	3,177.6	3,157.1	8.9	8.4	-122.85	-122.85	-259.0	146.3	320.1	303.5	16.61	19.269	
3,300.0	3,271.9	3,276.5	3,254.8	9.3	8.8	-122.89	-122.89	-273.6	151.2	335.0	317.7	17.31	19.355	
3,400.0	3,370.3	3,375.4	3,352.5	9.7	9.1	-122.93	-122.93	-288.2	156.2	349.9	331.9	18.01	19.432	
3,500.0	3,468.7	3,474.3	3,450.1	10.1	9.5	-122.96	-122.96	-302.8	161.1	364.8	346.1	18.71	19.500	
3,600.0	3,567.1	3,573.2	3,547.8	10.5	9.8	-122.99	-122.99	-317.4	166.1	379.7	360.3	19.41	19.561	
3,700.0	3,665.5	3,672.1	3,645.5	10.9	10.2	-123.02	-123.02	-332.0	171.0	394.6	374.5	20.12	19.615	
3,800.0	3,763.9	3,770.9	3,743.2	11.3	10.6	-123.05	-123.05	-346.6	176.0	409.5	388.7	20.82	19.664	
3,900.0	3,862.3	3,869.8	3,840.8	11.7	10.9	-123.07	-123.07	-361.2	180.9	424.4	402.9	21.53	19.708	
4,000.0	3,960.7	3,968.7	3,938.5	12.1	11.3	-123.10	-123.10	-375.8	185.9	439.3	417.1	22.25	19.748	
4,100.0	4,059.1	4,067.6	4,036.2	12.5	11.7	-123.12	-123.12	-390.4	190.8	454.2	431.3	22.96	19.784	
4,200.0	4,157.5	4,166.5	4,133.9	12.9	12.0	-123.14	-123.14	-405.0	195.8	469.1	445.4	23.67	19.817	
4,300.0	4,255.9	4,265.4	4,231.5	13.3	12.4	-123.16	-123.16	-419.6	200.7	484.0	459.6	24.39	19.847	
4,400.0	4,354.3	4,364.2	4,329.2	13.7	12.7	-123.18	-123.18	-434.2	205.6	498.9	473.8	25.10	19.875	
4,500.0	4,452.7	4,463.1	4,426.9	14.1	13.1	-123.20	-123.20	-448.8	210.6	513.8	488.0	25.82	19.900	
4,600.0	4,551.1	4,562.0	4,524.6	14.5	13.5	-123.21	-123.21	-463.4	215.5	528.7	502.2	26.54	19.923	
4,700.0	4,649.5	4,660.9	4,622.2	15.0	13.8	-123.23	-123.23	-478.0	220.5	543.6	516.4	27.26	19.945	
4,800.0	4,747.9	4,759.8	4,719.9	15.4	14.2	-123.24	-123.24	-492.6	225.4	558.5	530.6	27.98	19.965	
4,900.0	4,846.3	4,858.7	4,817.6	15.8	14.6	-123.26	-123.26	-507.2	230.4	573.4	544.7	28.70	19.983	
5,000.0	4,944.7	4,957.5	4,915.2	16.2	14.9	-123.27	-123.27	-521.8	235.3	588.3	558.9	29.42	20.000	

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 18T-221
Project:	SEC.18-T4N-R67W	TVD Reference:	WELL @ 4821.0ft (RKB - 15')
Reference Site:	Rieder 4N67W18Y Pad Sec.18-T4N-R67W	MD Reference:	WELL @ 4821.0ft (RKB - 15')
Site Error:	0.0ft	North Reference:	True
Reference Well:	Rieder 18T-221	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 (7-31-14)	Offset TVD Reference:	Offset Datum

Offset Design Rieder 4N67W18Y Pad Sec.18-T4N-R67W - Rieder 18Y-441 - Wellbore #1 - Plan #1 (7-31-14)												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	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
5,100.0	5,043.1	5,056.4	5,012.9	16.6	15.3	-123.28	-536.4	240.3	603.2	573.1	30.14	20.015	
5,200.0	5,141.5	5,155.3	5,110.6	17.0	15.7	-123.29	-551.0	245.2	618.2	587.3	30.86	20.030	
5,300.0	5,239.9	5,254.2	5,208.3	17.4	16.0	-123.30	-565.6	250.2	633.1	601.5	31.58	20.043	
5,400.0	5,338.3	5,353.1	5,306.0	17.8	16.4	-123.40	-580.2	255.1	647.7	615.4	32.30	20.055	
5,500.0	5,437.3	5,452.2	5,403.9	18.0	16.8	-123.38	-594.9	260.1	660.7	627.8	32.93	20.062	
5,600.0	5,536.7	5,551.4	5,501.9	18.3	17.2	-123.08	-609.5	265.0	671.9	638.3	33.55	20.028	
5,700.0	5,636.4	5,654.8	5,604.1	18.5	17.5	-122.53	-624.4	270.0	681.1	646.9	34.11	19.965	
5,800.0	5,736.3	5,763.4	5,711.8	18.6	17.8	-121.92	-636.6	274.2	687.3	652.8	34.58	19.880	
5,900.0	5,836.3	5,872.5	5,820.6	18.8	18.0	92.59	-645.1	277.1	690.6	655.7	34.96	19.755	
6,000.0	5,936.3	5,982.1	5,930.1	18.9	18.2	92.96	-649.6	278.6	692.2	657.0	35.29	19.616	
6,100.0	6,036.3	6,088.3	6,036.3	19.0	18.4	93.02	-650.4	278.9	692.5	656.9	35.59	19.459	
6,200.0	6,136.3	6,188.3	6,136.3	19.1	18.5	93.02	-650.4	278.9	692.5	656.7	35.86	19.311	
6,217.5	6,153.8	6,205.8	6,153.8	19.2	18.5	93.03	-650.4	278.9	692.5	656.6	35.91	19.287	
6,300.0	6,236.3	6,288.3	6,236.3	19.3	18.6	93.20	-650.4	278.9	692.7	656.5	36.12	19.176	
6,400.0	6,335.2	6,387.2	6,335.2	19.3	18.8	94.28	-650.4	278.9	693.6	657.3	36.29	19.114	
6,500.0	6,431.4	6,489.8	6,437.7	19.2	18.9	96.19	-647.9	278.9	695.9	659.6	36.31	19.164	
6,600.0	6,523.3	6,599.6	6,546.1	19.0	18.9	98.18	-631.3	278.9	699.1	663.0	36.10	19.366	
6,700.0	6,609.3	6,713.9	6,655.3	18.8	18.7	100.05	-597.6	278.9	702.9	667.3	35.64	19.722	
6,800.0	6,687.9	6,832.9	6,762.2	18.5	18.5	101.77	-545.7	278.9	707.0	672.0	35.00	20.199	
6,900.0	6,757.8	6,956.5	6,863.4	18.2	18.2	103.27	-474.9	278.9	711.1	676.8	34.28	20.742	
7,000.0	6,817.8	7,084.4	6,954.6	17.9	17.9	104.52	-385.5	278.9	714.8	681.2	33.62	21.258	
7,100.0	6,866.8	7,215.9	7,031.5	17.6	17.6	105.46	-279.0	278.9	717.7	684.5	33.20	21.619	
7,200.0	6,904.0	7,350.1	7,090.0	17.4	17.5	106.04	-158.5	278.9	719.6	686.5	33.18	21.690	
7,300.0	6,928.8	7,485.6	7,126.8	17.3	17.7	106.25	-28.2	278.9	720.3	686.6	33.71	21.371	
7,400.0	6,940.8	7,621.2	7,140.1	17.5	18.3	106.06	106.6	278.9	719.7	684.9	34.81	20.676	
7,449.1	6,942.8	7,670.6	7,140.4	17.7	18.6	105.95	156.0	278.9	719.3	683.8	35.46	20.286	
7,500.0	6,941.9	7,721.5	7,140.8	18.1	19.0	106.04	206.9	278.9	719.6	683.5	36.14	19.913	
7,600.0	6,942.0	7,821.5	7,141.6	18.9	19.8	106.10	306.9	278.9	719.8	682.0	37.75	19.065	
7,700.0	6,942.1	7,921.5	7,142.3	20.0	20.8	106.15	406.9	278.9	720.0	680.3	39.65	18.158	
7,800.0	6,942.1	8,021.5	7,143.1	21.1	21.9	106.20	506.9	278.9	720.2	678.4	41.79	17.233	
7,900.0	6,942.2	8,121.5	7,143.8	22.4	23.1	106.26	606.9	278.9	720.4	676.2	44.14	16.321	
8,000.0	6,942.2	8,221.5	7,144.6	23.7	24.5	106.31	706.9	278.9	720.6	673.9	46.66	15.443	
8,100.0	6,942.3	8,321.5	7,145.3	25.1	25.8	106.36	806.9	278.9	720.8	671.4	49.33	14.611	
8,200.0	6,942.3	8,421.5	7,146.1	26.6	27.3	106.42	906.9	278.9	721.0	668.8	52.13	13.831	
8,300.0	6,942.4	8,521.5	7,146.8	28.1	28.8	106.47	1,006.9	278.9	721.2	666.1	55.03	13.106	
8,400.0	6,942.4	8,621.5	7,147.6	29.7	30.4	106.52	1,106.9	278.9	721.4	663.3	58.02	12.434	
8,500.0	6,942.5	8,721.5	7,148.3	31.3	31.9	106.58	1,206.9	278.9	721.6	660.5	61.08	11.813	
8,600.0	6,942.5	8,821.5	7,149.1	32.9	33.6	106.63	1,306.8	278.9	721.8	657.5	64.21	11.240	
8,700.0	6,942.6	8,921.5	7,149.8	34.6	35.2	106.68	1,406.8	278.9	722.0	654.6	67.40	10.712	
8,800.0	6,942.6	9,021.5	7,150.6	36.3	36.9	106.74	1,506.8	278.9	722.2	651.5	70.63	10.225	
8,900.0	6,942.7	9,121.5	7,151.3	38.0	38.6	106.79	1,606.8	278.9	722.4	648.5	73.90	9.774	
9,000.0	6,942.7	9,221.5	7,152.1	39.7	40.3	106.84	1,706.8	278.9	722.6	645.3	77.21	9.358	
9,100.0	6,942.8	9,321.5	7,152.8	41.4	42.1	106.89	1,806.8	278.9	722.8	642.2	80.55	8.972	
9,200.0	6,942.8	9,421.5	7,153.6	43.2	43.8	106.95	1,906.8	278.9	723.0	639.0	83.92	8.615	
9,300.0	6,942.9	9,521.5	7,154.3	45.0	45.6	107.00	2,006.8	278.9	723.2	635.9	87.31	8.283	
9,400.0	6,942.9	9,621.5	7,155.1	46.8	47.4	107.05	2,106.8	278.9	723.4	632.7	90.72	7.973	
9,500.0	6,943.0	9,721.5	7,155.8	48.6	49.2	107.11	2,206.8	278.9	723.6	629.4	94.16	7.685	
9,600.0	6,943.0	9,821.5	7,156.6	50.4	51.0	107.16	2,306.8	278.9	723.8	626.2	97.60	7.416	
9,700.0	6,943.1	9,921.5	7,157.3	52.2	52.8	107.21	2,406.8	278.9	724.0	622.9	101.06	7.164	
9,800.0	6,943.2	10,021.5	7,158.1	54.0	54.6	107.26	2,506.8	278.9	724.2	619.7	104.54	6.928	
9,900.0	6,943.2	10,121.5	7,158.8	55.8	56.4	107.32	2,606.8	278.9	724.4	616.4	108.02	6.706	

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 18T-221
Project:	SEC.18-T4N-R67W	TVD Reference:	WELL @ 4821.0ft (RKB - 15')
Reference Site:	Rieder 4N67W18Y Pad Sec.18-T4N-R67W	MD Reference:	WELL @ 4821.0ft (RKB - 15')
Site Error:	0.0ft	North Reference:	True
Reference Well:	Rieder 18T-221	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 (7-31-14)	Offset TVD Reference:	Offset Datum

Offset Design Rieder 4N67W18Y Pad Sec.18-T4N-R67W - Rieder 18Y-441 - Wellbore #1 - Plan #1 (7-31-14)													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 (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning	
10,000.0	6,943.3	10,221.5	7,159.6	57.6	58.2	107.37	2,706.8	278.9	724.6	613.1	111.52	6.498		
10,100.0	6,943.3	10,321.5	7,160.3	59.5	60.1	107.42	2,806.8	278.9	724.8	609.8	115.02	6.302		
10,200.0	6,943.4	10,421.5	7,161.1	61.3	61.9	107.48	2,906.8	278.9	725.0	606.5	118.53	6.117		
10,300.0	6,943.4	10,521.5	7,161.8	63.2	63.7	107.53	3,006.8	278.9	725.2	603.2	122.05	5.942		
10,400.0	6,943.5	10,621.5	7,162.6	65.0	65.6	107.58	3,106.8	278.9	725.5	599.9	125.57	5.777		
10,500.0	6,943.5	10,721.5	7,163.3	66.9	67.4	107.63	3,206.7	278.9	725.7	596.6	129.11	5.621		
10,600.0	6,943.6	10,821.5	7,164.1	68.7	69.3	107.69	3,306.7	278.9	725.9	593.2	132.64	5.472		
10,700.0	6,943.6	10,921.5	7,164.8	70.6	71.2	107.74	3,406.7	278.9	726.1	589.9	136.18	5.332		
10,800.0	6,943.7	11,021.5	7,165.6	72.4	73.0	107.79	3,506.7	278.9	726.3	586.6	139.73	5.198		
10,900.0	6,943.7	11,121.5	7,166.3	74.3	74.9	107.84	3,606.7	278.9	726.5	583.2	143.27	5.071		
11,000.0	6,943.8	11,221.5	7,167.1	76.2	76.8	107.90	3,706.7	278.9	726.7	579.9	146.82	4.950		
11,100.0	6,943.8	11,321.5	7,167.8	78.0	78.6	107.95	3,806.7	278.9	726.9	576.6	150.38	4.834		
11,200.0	6,943.9	11,421.5	7,168.6	79.9	80.5	108.00	3,906.7	278.9	727.2	573.2	153.93	4.724		
11,300.0	6,943.9	11,521.5	7,169.3	81.8	82.4	108.05	4,006.7	278.9	727.4	569.9	157.49	4.618		
11,347.1	6,944.0	11,568.5	7,169.7	82.7	83.3	108.08	4,053.8	278.9	727.5	568.3	159.17	4.570		
11,400.0	6,944.0	11,609.6	7,170.0	83.7	84.0	108.10	4,094.8	278.9	727.7	566.8	160.84	4.524		
11,419.2	6,944.0	11,609.6	7,170.0	84.0	84.0	108.10	4,094.8	278.9	728.3	567.1	161.19	4.518 SF		

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Rieder 18T-221
Project:	SEC.18-T4N-R67W	TVD Reference:	WELL @ 4821.0ft (RKB - 15')
Reference Site:	Rieder 4N67W18Y Pad Sec.18-T4N-R67W	MD Reference:	WELL @ 4821.0ft (RKB - 15')
Site Error:	0.0ft	North Reference:	True
Reference Well:	Rieder 18T-221	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 (7-31-14)	Offset TVD Reference:	Offset Datum

Reference Depths are relative to WELL @ 4821.0ft (RKB - 15')

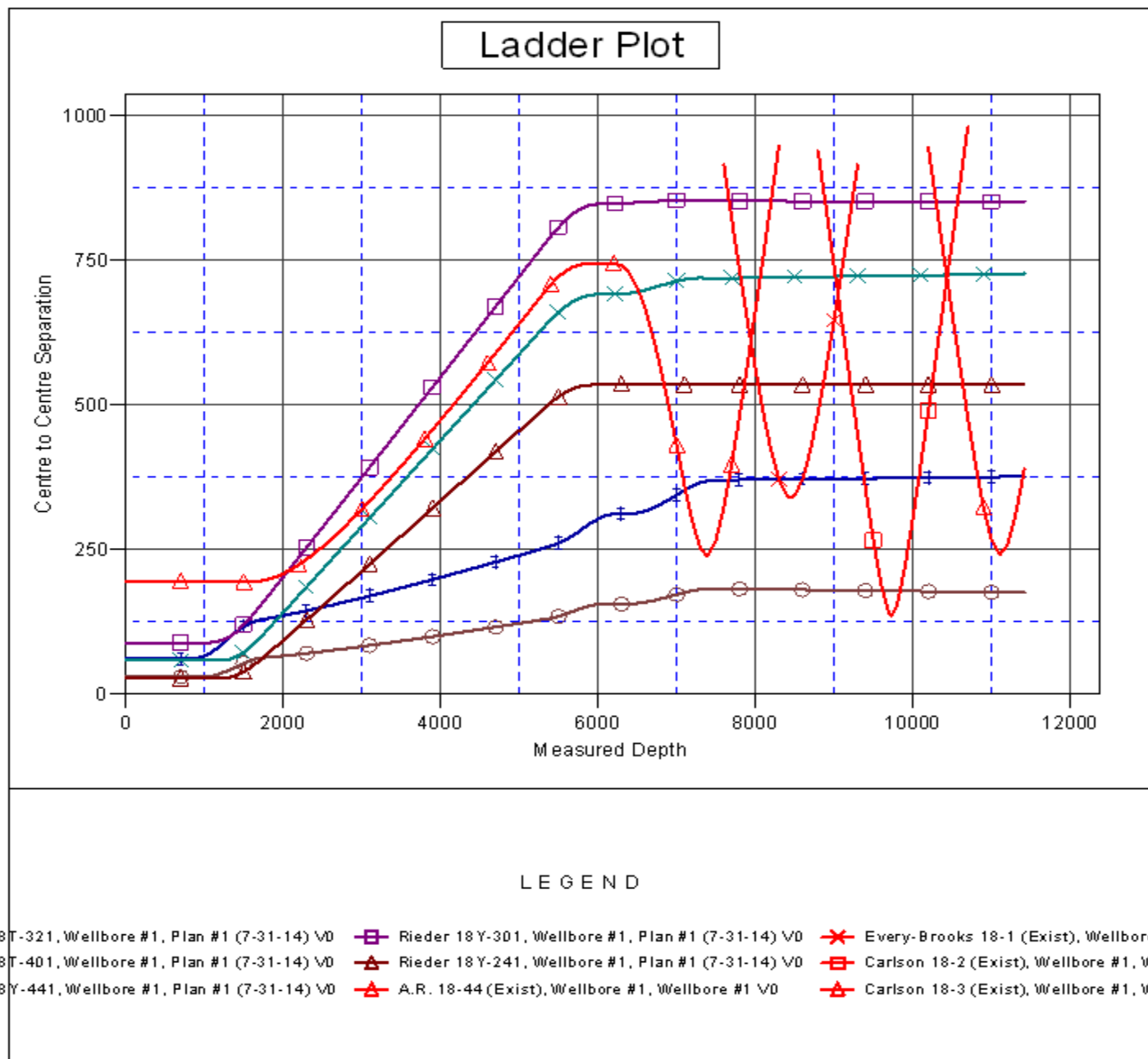
Offset Depths are relative to Offset Datum

Central Meridian is -105.500000 °

Coordinates are relative to: Rieder 18T-221

Coordinate System is US State Plane 1983, Colorado Northern Zone

Grid Convergence at Surface is: 0.37°



Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Rieder 18T-221
Project:	SEC.18-T4N-R67W	TVD Reference:	WELL @ 4821.0ft (RKB - 15')
Reference Site:	Rieder 4N67W18Y Pad Sec.18-T4N-R67W	MD Reference:	WELL @ 4821.0ft (RKB - 15')
Site Error:	0.0ft	North Reference:	True
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Central Meridian is -105.500000 °

Coordinates are relative to: Rieder 18T-221

Coordinate System is US State Plane 1983, Colorado Northern Zone

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