

# PETROLEUM DEVELOPMENT CORP Weld County CO

Well Name: **Collins 18Q-301**

Surface Location: Collins 4N64W18T Pad Sec.18-T4N-R64W  
North American Datum 1983 , US State Plane 1983 , Colorado Northern Zone

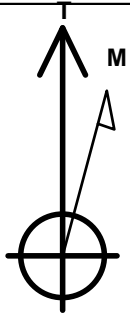
Ground Elevation: 4784.0

+N/-S	+E/-W	Northing	Easting	Latitude	Longitude	Slot
0.0	0.0	1355531.05	3254444.94	40.305740	-104.587660	

Original Well Elev WELL @ 4799.0ft (Original Well Elev)

## WELLBORE TARGET DETAILS

Name	TVD	+N/-S	+E/-W	Shape
SHL 234'FSL & 1000'FEL	1.0	0.0	0.0	Point
BHL 500'FNL & 2467'FEL	6909.0	4521.1	-1438.9	Point



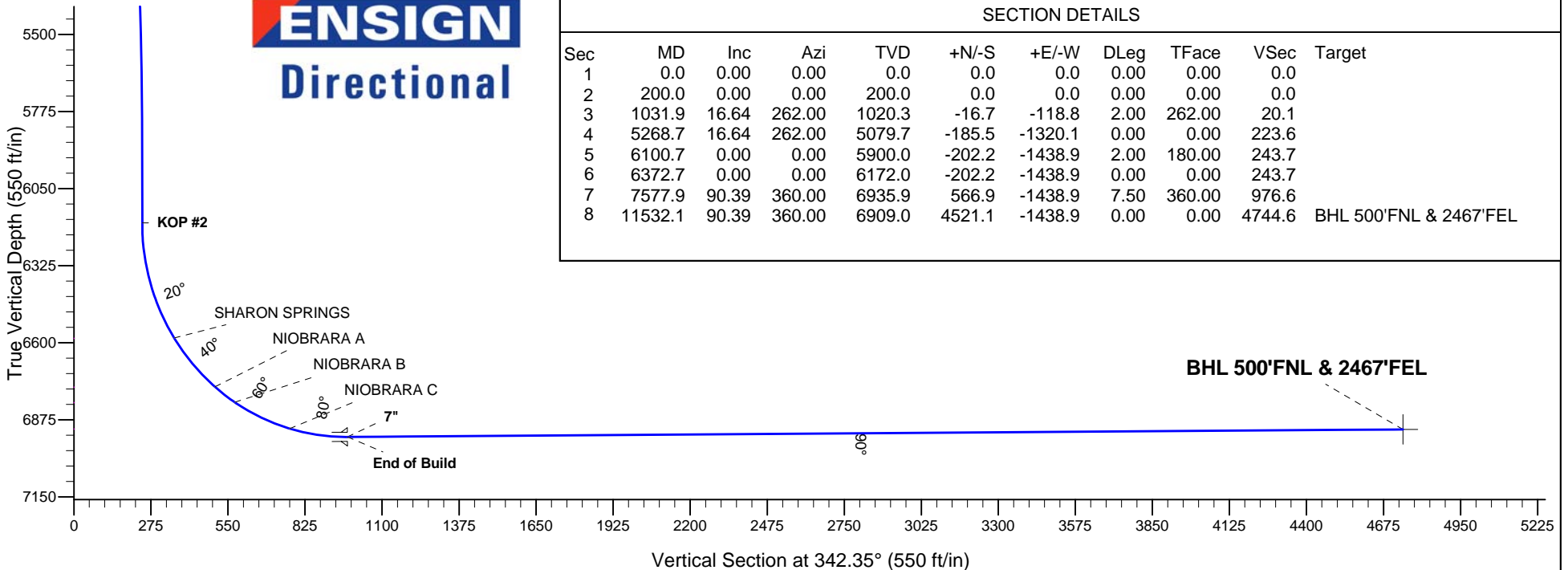
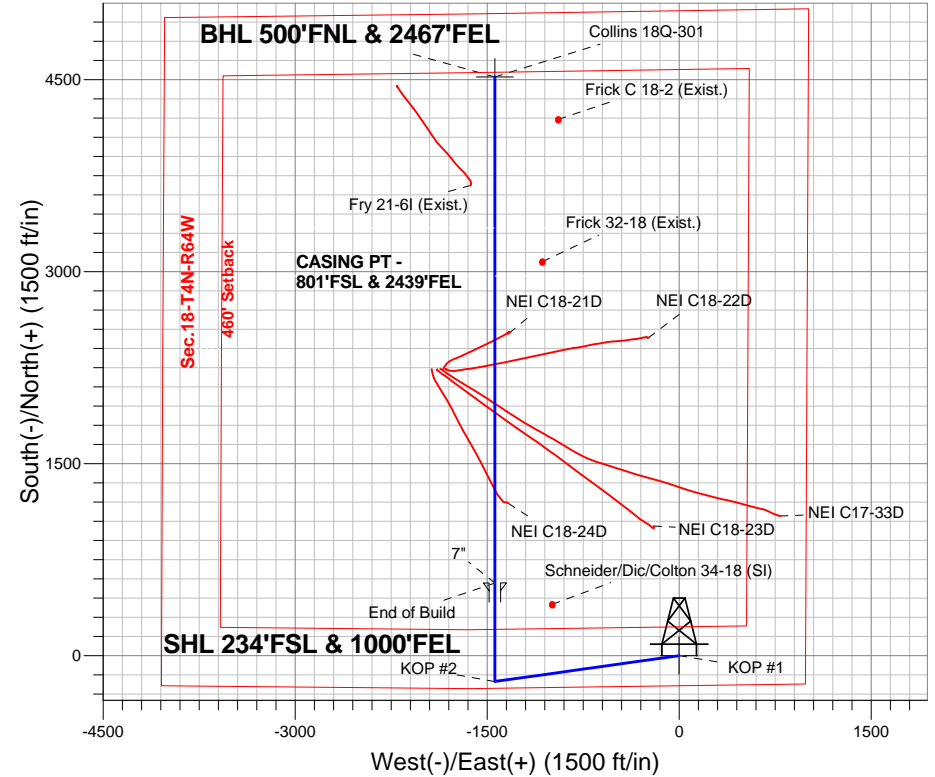
Azimuths to True North  
Magnetic North: 8.30°

Magnetic Field  
Strength: 52743.9nT  
Dip Angle: 66.89°  
Date: 11/3/2014  
Model: IGRF2010

Collins 4N64W18T Pad Sec.18-T4N-R64W  
Collins 18Q-301  
Plan #1 (11-3-14)

## ANNOTATIONS

TVD	MD	Annotation
200.0	200.0	KOP #1
6172.0	6372.7	KOP #2
6935.9	7577.9	End of Build





# **PETROLEUM DEVELOPMENT CORP Weld County CO**

**SEC.18-T4N-R64W**

**Collins 4N64W18T Pad Sec.18-T4N-R64W**

**Collins 18Q-301**

**Wellbore #1**

**Plan: Plan #1 (11-3-14)**

## **Standard Planning Report**

**06 November, 2014**

<b>Database:</b>	landmark	<b>Local Co-ordinate Reference:</b>	Well Collins 18Q-301
<b>Company:</b>	PETROLEUM DEVELOPMENT CORP Weld County CO	<b>TVD Reference:</b>	WELL @ 4799.0ft (Original Well Elev)
<b>Project:</b>	SEC.18-T4N-R64W	<b>MD Reference:</b>	WELL @ 4799.0ft (Original Well Elev)
<b>Site:</b>	Collins 4N64W18T Pad Sec.18-T4N-R64W	<b>North Reference:</b>	True
<b>Well:</b>	Collins 18Q-301	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Wellbore #1		
<b>Design:</b>	Plan #1 (11-3-14)		

<b>Project</b>	SEC.18-T4N-R64W		
<b>Map System:</b>	US State Plane 1983	<b>System Datum:</b>	Mean Sea Level
<b>Geo Datum:</b>	North American Datum 1983		Using Well Reference Point
<b>Map Zone:</b>	Colorado Northern Zone		Using geodetic scale factor

<b>Site</b>	Collins 4N64W18T Pad Sec.18-T4N-R64W		
<b>Site Position:</b>		<b>Northing:</b>	1,355,535.33 ft
<b>From:</b>	Lat/Long	<b>Easting:</b>	3,254,506.26 ft
<b>Position Uncertainty:</b>	0.0 ft	<b>Slot Radius:</b>	"
		<b>Latitude:</b>	40.305750
		<b>Longitude:</b>	-104.587440
		<b>Grid Convergence:</b>	0.59 °

<b>Well</b>	Collins 18Q-301		
<b>Well Position</b>	<b>+N/-S</b>	-3.7 ft	<b>Northing:</b>
	<b>+E/-W</b>	-61.4 ft	<b>Easting:</b>
<b>Position Uncertainty</b>		0.0 ft	<b>Wellhead Elevation:</b>
			<b>Latitude:</b>
			<b>Longitude:</b>
			<b>Ground Level:</b>

<b>Wellbore</b>	Wellbore #1				
<b>Magnetics</b>	<b>Model Name</b>	<b>Sample Date</b>	<b>Declination (°)</b>	<b>Dip Angle (°)</b>	<b>Field Strength (nT)</b>
	IGRF2010	11/3/2014	8.30	66.89	52,744

<b>Design</b>	Plan #1 (11-3-14)			
<b>Audit Notes:</b>				
<b>Version:</b>	<b>Phase:</b>	PROTOTYPE	<b>Tie On Depth:</b>	0.0
<b>Vertical Section:</b>	<b>Depth From (TVD) (ft)</b>	<b>+N/-S (ft)</b>	<b>+E/-W (ft)</b>	<b>Direction (°)</b>
	0.0	0.0	0.0	342.35

<b>Plan Sections</b>										
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)	TFO (°)	Target
0.0	0.00	0.00	0.0	0.0	0.0	0.00	0.00	0.00	0.00	
200.0	0.00	0.00	200.0	0.0	0.0	0.00	0.00	0.00	0.00	
1,031.9	16.64	262.00	1,020.3	-16.7	-118.8	2.00	2.00	0.00	262.00	
5,268.7	16.64	262.00	5,079.7	-185.5	-1,320.1	0.00	0.00	0.00	0.00	
6,100.7	0.00	0.00	5,900.0	-202.2	-1,438.9	2.00	-2.00	0.00	180.00	
6,372.7	0.00	0.00	6,172.0	-202.2	-1,438.9	0.00	0.00	0.00	0.00	
7,577.9	90.39	360.00	6,935.9	566.9	-1,438.9	7.50	7.50	0.00	360.00	
11,532.1	90.39	360.00	6,909.0	4,521.1	-1,438.9	0.00	0.00	0.00	0.00	BHL 500'FNL & 246

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<b>Project:</b>	SEC.18-T4N-R64W	<b>MD Reference:</b>	WELL @ 4799.0ft (Original Well Elev)
<b>Site:</b>	Collins 4N64W18T Pad Sec.18-T4N-R64W	<b>North Reference:</b>	True
<b>Well:</b>	Collins 18Q-301	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Wellbore #1		
<b>Design:</b>	Plan #1 (11-3-14)		

Planned Survey									
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
0.0	0.00	0.00	0.0	0.0	0.0	0.0	0.00	0.00	0.00
100.0	0.00	0.00	100.0	0.0	0.0	0.0	0.00	0.00	0.00
200.0	0.00	0.00	200.0	0.0	0.0	0.0	0.00	0.00	0.00
<b>KOP #1</b>									
300.0	2.00	262.00	300.0	-0.2	-1.7	0.3	2.00	2.00	0.00
400.0	4.00	262.00	399.8	-1.0	-6.9	1.2	2.00	2.00	0.00
500.0	6.00	262.00	499.5	-2.2	-15.5	2.6	2.00	2.00	0.00
600.0	8.00	262.00	598.7	-3.9	-27.6	4.7	2.00	2.00	0.00
700.0	10.00	262.00	697.5	-6.1	-43.1	7.3	2.00	2.00	0.00
800.0	12.00	262.00	795.6	-8.7	-62.0	10.5	2.00	2.00	0.00
900.0	14.00	262.00	893.1	-11.8	-84.3	14.3	2.00	2.00	0.00
1,000.0	16.00	262.00	989.6	-15.4	-109.9	18.6	2.00	2.00	0.00
1,031.9	16.64	262.00	1,020.3	-16.7	-118.8	20.1	2.00	2.00	0.00
1,100.0	16.64	262.00	1,085.5	-19.4	-138.1	23.4	0.00	0.00	0.00
1,200.0	16.64	262.00	1,181.3	-23.4	-166.4	28.2	0.00	0.00	0.00
1,300.0	16.64	262.00	1,277.1	-27.4	-194.8	33.0	0.00	0.00	0.00
1,400.0	16.64	262.00	1,372.9	-31.4	-223.1	37.8	0.00	0.00	0.00
1,500.0	16.64	262.00	1,468.8	-35.3	-251.5	42.6	0.00	0.00	0.00
1,600.0	16.64	262.00	1,564.6	-39.3	-279.9	47.4	0.00	0.00	0.00
1,700.0	16.64	262.00	1,660.4	-43.3	-308.2	52.2	0.00	0.00	0.00
1,800.0	16.64	262.00	1,756.2	-47.3	-336.6	57.0	0.00	0.00	0.00
1,900.0	16.64	262.00	1,852.0	-51.3	-364.9	61.8	0.00	0.00	0.00
2,000.0	16.64	262.00	1,947.8	-55.3	-393.3	66.6	0.00	0.00	0.00
2,100.0	16.64	262.00	2,043.6	-59.2	-421.6	71.4	0.00	0.00	0.00
2,200.0	16.64	262.00	2,139.4	-63.2	-450.0	76.2	0.00	0.00	0.00
2,300.0	16.64	262.00	2,235.3	-67.2	-478.3	81.0	0.00	0.00	0.00
2,400.0	16.64	262.00	2,331.1	-71.2	-506.7	85.8	0.00	0.00	0.00
2,500.0	16.64	262.00	2,426.9	-75.2	-535.1	90.6	0.00	0.00	0.00
2,600.0	16.64	262.00	2,522.7	-79.2	-563.4	95.4	0.00	0.00	0.00
2,700.0	16.64	262.00	2,618.5	-83.2	-591.8	100.2	0.00	0.00	0.00
2,800.0	16.64	262.00	2,714.3	-87.1	-620.1	105.0	0.00	0.00	0.00
2,900.0	16.64	262.00	2,810.1	-91.1	-648.5	109.8	0.00	0.00	0.00
3,000.0	16.64	262.00	2,906.0	-95.1	-676.8	114.6	0.00	0.00	0.00
3,100.0	16.64	262.00	3,001.8	-99.1	-705.2	119.4	0.00	0.00	0.00
3,200.0	16.64	262.00	3,097.6	-103.1	-733.5	124.2	0.00	0.00	0.00
3,300.0	16.64	262.00	3,193.4	-107.1	-761.9	129.0	0.00	0.00	0.00
3,400.0	16.64	262.00	3,289.2	-111.0	-790.2	133.8	0.00	0.00	0.00
3,500.0	16.64	262.00	3,385.0	-115.0	-818.6	138.6	0.00	0.00	0.00
3,600.0	16.64	262.00	3,480.8	-119.0	-847.0	143.5	0.00	0.00	0.00
3,700.0	16.64	262.00	3,576.6	-123.0	-875.3	148.3	0.00	0.00	0.00
3,800.0	16.64	262.00	3,672.5	-127.0	-903.7	153.1	0.00	0.00	0.00
3,900.0	16.64	262.00	3,768.3	-131.0	-932.0	157.9	0.00	0.00	0.00
3,960.3	16.64	262.00	3,826.0	-133.4	-949.1	160.8	0.00	0.00	0.00
<b>PARKMAN</b>									
4,000.0	16.64	262.00	3,864.1	-135.0	-960.4	162.7	0.00	0.00	0.00
4,100.0	16.64	262.00	3,959.9	-138.9	-988.7	167.5	0.00	0.00	0.00
4,200.0	16.64	262.00	4,055.7	-142.9	-1,017.1	172.3	0.00	0.00	0.00
4,300.0	16.64	262.00	4,151.5	-146.9	-1,045.4	177.1	0.00	0.00	0.00
4,400.0	16.64	262.00	4,247.3	-150.9	-1,073.8	181.9	0.00	0.00	0.00
4,455.0	16.64	262.00	4,300.0	-153.1	-1,089.4	184.5	0.00	0.00	0.00
<b>SUSSEX</b>									
4,500.0	16.64	262.00	4,343.1	-154.9	-1,102.2	186.7	0.00	0.00	0.00
4,600.0	16.64	262.00	4,439.0	-158.9	-1,130.5	191.5	0.00	0.00	0.00

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<b>Project:</b>	SEC.18-T4N-R64W	<b>MD Reference:</b>	WELL @ 4799.0ft (Original Well Elev)
<b>Site:</b>	Collins 4N64W18T Pad Sec.18-T4N-R64W	<b>North Reference:</b>	True
<b>Well:</b>	Collins 18Q-301	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Wellbore #1		
<b>Design:</b>	Plan #1 (11-3-14)		

#### 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)
4,700.0	16.64	262.00	4,534.8	-162.8	-1,158.9	196.3	0.00	0.00	0.00
4,800.0	16.64	262.00	4,630.6	-166.8	-1,187.2	201.1	0.00	0.00	0.00
4,900.0	16.64	262.00	4,726.4	-170.8	-1,215.6	205.9	0.00	0.00	0.00
5,000.0	16.64	262.00	4,822.2	-174.8	-1,243.9	210.7	0.00	0.00	0.00
5,081.2	16.64	262.00	4,900.0	-178.0	-1,266.9	214.6	0.00	0.00	0.00
<b>SHANNON</b>									
5,100.0	16.64	262.00	4,918.0	-178.8	-1,272.3	215.5	0.00	0.00	0.00
5,200.0	16.64	262.00	5,013.8	-182.8	-1,300.6	220.3	0.00	0.00	0.00
5,268.7	16.64	262.00	5,079.7	-185.5	-1,320.1	223.6	0.00	0.00	0.00
5,300.0	16.01	262.00	5,109.7	-186.7	-1,328.8	225.1	2.00	-2.00	0.00
5,400.0	14.01	262.00	5,206.3	-190.3	-1,354.5	229.4	2.00	-2.00	0.00
5,500.0	12.01	262.00	5,303.7	-193.5	-1,376.8	233.2	2.00	-2.00	0.00
5,600.0	10.01	262.00	5,401.9	-196.1	-1,395.7	236.4	2.00	-2.00	0.00
5,700.0	8.01	262.00	5,500.6	-198.3	-1,411.2	239.0	2.00	-2.00	0.00
5,800.0	6.01	262.00	5,599.9	-200.0	-1,423.3	241.1	2.00	-2.00	0.00
5,900.0	4.01	262.00	5,699.5	-201.2	-1,432.0	242.5	2.00	-2.00	0.00
6,000.0	2.01	262.00	5,799.3	-202.0	-1,437.2	243.4	2.00	-2.00	0.00
6,100.0	0.01	262.00	5,899.3	-202.2	-1,438.9	243.7	2.00	-2.00	0.00
6,100.7	0.00	0.00	5,900.0	-202.2	-1,438.9	243.7	2.00	-2.00	0.00
6,200.0	0.00	0.00	5,999.3	-202.2	-1,438.9	243.7	0.00	0.00	0.00
6,300.0	0.00	0.00	6,099.3	-202.2	-1,438.9	243.7	0.00	0.00	0.00
6,372.7	0.00	0.00	6,172.0	-202.2	-1,438.9	243.7	0.00	0.00	0.00
<b>KOP #2</b>									
6,400.0	2.05	360.00	6,199.3	-201.7	-1,438.9	244.2	7.51	7.51	0.00
6,500.0	9.55	360.00	6,298.7	-191.6	-1,438.9	253.8	7.50	7.50	0.00
6,600.0	17.05	360.00	6,396.0	-168.6	-1,438.9	275.7	7.50	7.50	0.00
6,700.0	24.55	360.00	6,489.4	-133.1	-1,438.9	309.5	7.50	7.50	0.00
6,800.0	32.05	360.00	6,577.4	-85.8	-1,438.9	354.7	7.50	7.50	0.00
6,806.7	32.55	360.00	6,583.0	-82.2	-1,438.9	358.0	7.50	7.50	0.00
<b>SHARON SPRINGS</b>									
6,900.0	39.55	360.00	6,658.4	-27.3	-1,438.9	410.4	7.50	7.50	0.00
7,000.0	47.05	360.00	6,731.2	41.2	-1,438.9	475.7	7.50	7.50	0.00
7,039.0	49.98	360.00	6,757.0	70.4	-1,438.9	503.5	7.50	7.50	0.00
<b>NIORARA A</b>									
7,100.0	54.55	360.00	6,794.3	118.7	-1,438.9	549.5	7.50	7.50	0.00
7,131.4	56.91	360.00	6,812.0	144.6	-1,438.9	574.2	7.50	7.50	0.00
<b>NIORARA B</b>									
7,200.0	62.05	360.00	6,846.8	203.7	-1,438.9	630.5	7.50	7.50	0.00
7,300.0	69.55	360.00	6,887.8	294.8	-1,438.9	717.3	7.50	7.50	0.00
7,358.1	73.91	360.00	6,906.0	350.0	-1,438.9	769.9	7.50	7.50	0.00
<b>NIORARA C</b>									
7,400.0	77.05	360.00	6,916.5	390.5	-1,438.9	808.5	7.50	7.50	0.00
7,500.0	84.55	360.00	6,932.5	489.2	-1,438.9	902.5	7.50	7.50	0.00
7,577.9	90.39	360.00	6,935.9	567.0	-1,438.9	976.7	7.50	7.50	0.00
<b>End of Build - 7"</b>									
7,600.0	90.39	360.00	6,935.8	589.1	-1,438.9	997.7	0.00	0.00	0.00
7,700.0	90.39	360.00	6,935.1	689.1	-1,438.9	1,093.0	0.00	0.00	0.00
7,800.0	90.39	360.00	6,934.4	789.1	-1,438.9	1,188.3	0.00	0.00	0.00
7,900.0	90.39	360.00	6,933.7	889.1	-1,438.9	1,283.6	0.00	0.00	0.00
8,000.0	90.39	360.00	6,933.0	989.1	-1,438.9	1,378.9	0.00	0.00	0.00
8,100.0	90.39	360.00	6,932.4	1,089.1	-1,438.9	1,474.2	0.00	0.00	0.00
8,200.0	90.39	360.00	6,931.7	1,189.1	-1,438.9	1,569.4	0.00	0.00	0.00

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<b>Site:</b>	Collins 4N64W18T Pad Sec.18-T4N-R64W	<b>North Reference:</b>	True
<b>Well:</b>	Collins 18Q-301	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Wellbore #1		
<b>Design:</b>	Plan #1 (11-3-14)		

#### 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	90.39	360.00	6,931.0	1,289.1	-1,438.9	1,664.7	0.00	0.00	0.00
8,400.0	90.39	360.00	6,930.3	1,389.1	-1,438.9	1,760.0	0.00	0.00	0.00
8,500.0	90.39	360.00	6,929.6	1,489.0	-1,438.9	1,855.3	0.00	0.00	0.00
8,600.0	90.39	360.00	6,929.0	1,589.0	-1,438.9	1,950.6	0.00	0.00	0.00
8,700.0	90.39	360.00	6,928.3	1,689.0	-1,438.9	2,045.9	0.00	0.00	0.00
8,800.0	90.39	360.00	6,927.6	1,789.0	-1,438.9	2,141.2	0.00	0.00	0.00
8,900.0	90.39	360.00	6,926.9	1,889.0	-1,438.9	2,236.5	0.00	0.00	0.00
9,000.0	90.39	360.00	6,926.2	1,989.0	-1,438.9	2,331.7	0.00	0.00	0.00
9,100.0	90.39	360.00	6,925.6	2,089.0	-1,438.9	2,427.0	0.00	0.00	0.00
9,200.0	90.39	360.00	6,924.9	2,189.0	-1,438.9	2,522.3	0.00	0.00	0.00
9,300.0	90.39	360.00	6,924.2	2,289.0	-1,438.9	2,617.6	0.00	0.00	0.00
9,400.0	90.39	360.00	6,923.5	2,389.0	-1,438.9	2,712.9	0.00	0.00	0.00
9,500.0	90.39	360.00	6,922.8	2,489.0	-1,438.9	2,808.2	0.00	0.00	0.00
9,600.0	90.39	360.00	6,922.2	2,589.0	-1,438.9	2,903.5	0.00	0.00	0.00
9,700.0	90.39	360.00	6,921.5	2,689.0	-1,438.9	2,998.8	0.00	0.00	0.00
9,800.0	90.39	360.00	6,920.8	2,789.0	-1,438.9	3,094.1	0.00	0.00	0.00
9,900.0	90.39	360.00	6,920.1	2,889.0	-1,438.9	3,189.3	0.00	0.00	0.00
10,000.0	90.39	360.00	6,919.4	2,989.0	-1,438.9	3,284.6	0.00	0.00	0.00
10,100.0	90.39	360.00	6,918.7	3,089.0	-1,438.9	3,379.9	0.00	0.00	0.00
10,200.0	90.39	360.00	6,918.1	3,189.0	-1,438.9	3,475.2	0.00	0.00	0.00
10,300.0	90.39	360.00	6,917.4	3,289.0	-1,438.9	3,570.5	0.00	0.00	0.00
10,400.0	90.39	360.00	6,916.7	3,389.0	-1,438.9	3,665.8	0.00	0.00	0.00
10,500.0	90.39	360.00	6,916.0	3,489.0	-1,438.9	3,761.1	0.00	0.00	0.00
10,600.0	90.39	360.00	6,915.3	3,589.0	-1,438.9	3,856.4	0.00	0.00	0.00
10,700.0	90.39	360.00	6,914.7	3,689.0	-1,438.9	3,951.6	0.00	0.00	0.00
10,800.0	90.39	360.00	6,914.0	3,789.0	-1,438.9	4,046.9	0.00	0.00	0.00
10,900.0	90.39	360.00	6,913.3	3,889.0	-1,438.9	4,142.2	0.00	0.00	0.00
11,000.0	90.39	360.00	6,912.6	3,989.0	-1,438.9	4,237.5	0.00	0.00	0.00
11,100.0	90.39	360.00	6,911.9	4,089.0	-1,438.9	4,332.8	0.00	0.00	0.00
11,200.0	90.39	360.00	6,911.3	4,189.0	-1,438.9	4,428.1	0.00	0.00	0.00
11,300.0	90.39	360.00	6,910.6	4,289.0	-1,438.9	4,523.4	0.00	0.00	0.00
11,400.0	90.39	360.00	6,909.9	4,389.0	-1,438.9	4,618.7	0.00	0.00	0.00
11,500.0	90.39	360.00	6,909.2	4,489.0	-1,438.9	4,713.9	0.00	0.00	0.00
11,532.1	90.39	360.00	6,909.0	4,521.1	-1,438.9	4,744.6	0.00	0.00	0.00

#### Targets

Target Name	Dip Angle (°)	Dip Dir. (°)	TVD (ft)	+N-S (ft)	+E-W (ft)	Northing (ft)	Easting (ft)	Latitude	Longitude
- hit/miss target									
- Shape									
SHL 234'FSL & 1000'I - plan hits target - Point	0.00	0.00	1.0	0.0	0.0	1,355,531.06	3,254,444.94	40.305740	-104.587660
BHL 500'FNL & 2467' - plan hits target - Point	0.00	0.00	6,909.0	4,521.1	-1,438.9	1,360,036.90	3,252,959.66	40.318150	-104.592820

<b>Database:</b>	landmark	<b>Local Co-ordinate Reference:</b>	Well Collins 18Q-301
<b>Company:</b>	PETROLEUM DEVELOPMENT CORP Weld County CO	<b>TVD Reference:</b>	WELL @ 4799.0ft (Original Well Elev)
<b>Project:</b>	SEC.18-T4N-R64W	<b>MD Reference:</b>	WELL @ 4799.0ft (Original Well Elev)
<b>Site:</b>	Collins 4N64W18T Pad Sec.18-T4N-R64W	<b>North Reference:</b>	True
<b>Well:</b>	Collins 18Q-301	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Wellbore #1		
<b>Design:</b>	Plan #1 (11-3-14)		

#### Casing Points

Measured Depth (ft)	Vertical Depth (ft)	Name	Casing Diameter (")	Hole Diameter (")
7,577.9	6,935.9	7"	7	7-1/2

#### Formations

Measured Depth (ft)	Vertical Depth (ft)	Name	Lithology	Dip (°)	Dip Direction (°)
3,960.3	3,826.0	PARKMAN		0.00	
4,455.0	4,300.0	SUSSEX		0.00	
5,081.2	4,900.0	SHANNON		0.00	
6,806.7	6,583.0	SHARON SPRINGS		0.00	
7,039.0	6,757.0	NIOBRARA A		0.00	
7,131.4	6,812.0	NIOBRARA B		0.00	
7,358.1	6,906.0	NIOBRARA C		0.00	

#### Plan Annotations

Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment
		+N/-S (ft)	+E/-W (ft)	
200.0	200.0	0.0	0.0	KOP #1
6,372.7	6,172.0	-202.2	-1,438.9	KOP #2
7,577.9	6,935.9	567.0	-1,438.9	End of Build



# **PETROLEUM DEVELOPMENT CORP Weld County CO**

**SEC.18-T4N-R64W**

**Collins 4N64W18T Pad Sec.18-T4N-R64W**

**Collins 18Q-301**

**Wellbore #1**

**Plan #1 (11-3-14)**

## **Anticollision Report**

**06 November, 2014**





<b>Company:</b>	PETROLEUM DEVELOPMENT CORP Weld County CO	<b>Local Co-ordinate Reference:</b>	Well Collins 18Q-301
<b>Project:</b>	SEC.18-T4N-R64W	<b>TVD Reference:</b>	WELL @ 4799.0ft (Original Well Elev)
<b>Reference Site:</b>	Collins 4N64W18T Pad Sec.18-T4N-R64W	<b>MD Reference:</b>	WELL @ 4799.0ft (Original Well Elev)
<b>Site Error:</b>	0.0ft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Collins 18Q-301	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.0ft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	Wellbore #1	<b>Database:</b>	landmark
<b>Reference Design:</b>	Plan #1 (11-3-14)	<b>Offset TVD Reference:</b>	Offset Datum

<b>Reference</b>	Plan #1 (11-3-14)		
<b>Filter type:</b>	NO GLOBAL FILTER: Using user defined selection & filtering criteria		
<b>Interpolation Method:</b>	MD Interval 100.0ft	<b>Error Model:</b>	ISCWSA
<b>Depth Range:</b>	Unlimited	<b>Scan Method:</b>	Closest Approach 3D
<b>Results Limited by:</b>	Maximum center-center distance of 1,000.0ft	<b>Error Surface:</b>	Elliptical Conic
<b>Warning Levels Evaluated at:</b>	2.00 Sigma		

<b>Survey Tool Program</b>	<b>Date</b>	11/6/2014		
<b>From (ft)</b>	<b>To (ft)</b>	<b>Survey (Wellbore)</b>	<b>Tool Name</b>	<b>Description</b>
0.0	11,532.1	Plan #1 (11-3-14) (Wellbore #1)	MWD	MWD - Standard

Summary						
Site Name	Reference Measured Depth (ft)	Offset Measured Depth (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Separation Factor	Warning
<b>Offset Well - Wellbore - Design</b>						
Collins 4N64W18T Pad Sec.18-T4N-R64W						
Collins 18Q-221 - Wellbore #1 - Plan #1 (11-3-14)	200.0	199.0	30.7	30.0	45.651	CC, ES
Collins 18Q-221 - Wellbore #1 - Plan #1 (11-3-14)	11,532.1	11,398.4	256.8	86.1	1.504	SF
Collins 18T-201 - Wellbore #1 - Plan #1 (11-3-14)	200.0	198.0	89.3	88.7	133.361	CC, ES
Collins 18T-201 - Wellbore #1 - Plan #1 (11-3-14)	4,800.0	4,755.9	852.9	827.7	33.780	SF
Collins 18T-221 - Wellbore #1 - Plan #1 (11-3-14)	200.0	197.0	150.7	150.0	225.682	CC, ES
Collins 18T-221 - Wellbore #1 - Plan #1 (11-3-14)	2,600.0	2,518.5	718.8	706.5	58.463	SF
Collins 18T-321 - Wellbore #1 - Plan #1 (11-3-14)	200.0	198.0	120.0	119.3	179.137	CC, ES
Collins 18T-321 - Wellbore #1 - Plan #1 (11-3-14)	3,800.0	3,732.5	889.6	870.1	45.628	SF
Collins 18T-341 - Wellbore #1 - Plan #1 (10-27-14)	200.0	199.0	61.5	60.8	91.463	CC, ES
Collins 18T-341 - Wellbore #1 - Plan #1 (10-27-14)	11,532.1	11,375.1	833.9	656.3	4.697	SF
<b>Existing Wells Sec. 7-T4N-R64W</b>						
Frick 32-18 (Exist.) - Wellbore #1 - Wellbore #1	10,089.4	6,921.8	370.8	170.2	1.849	CC
Frick 32-18 (Exist.) - Wellbore #1 - Wellbore #1	10,100.0	6,921.7	371.0	170.2	1.848	ES, SF
Frick C 18-2 (Exist.) - Wellbore #1 - Wellbore #1	11,200.6	6,913.3	496.4	275.3	2.245	CC, ES, SF
Fry 21-6I (Exist.) - Wellbore #1 - Wellbore #1	10,688.9	7,048.4	189.0	-109.7	0.633	Level 1, CC, ES, SF
<b>NEI C18-32D Pad Sec.18-T4N-R64W</b>						
NEI C17-33D - Wellbore #1 - Wellbore #1						Out of range
NEI C18-21D - Wellbore #1 - Wellbore #1	9,532.7	7,039.3	109.1	41.4	1.612	CC, ES, SF
NEI C18-22D - Wellbore #1 - Wellbore #1						Out of range
NEI C18-23D - Wellbore #1 - Wellbore #1						Out of range
NEI C18-24D - Wellbore #1 - Wellbore #1	8,203.4	7,141.3	101.5	48.3	1.910	CC, ES, SF
Schneider/Dic/Colton 34-18 (SI) - Wellbore #1 - Design #	7,410.5	6,934.8	448.8	413.7	12.777	CC, ES
Schneider/Dic/Colton 34-18 (SI) - Wellbore #1 - Design #	7,500.0	6,948.5	457.4	421.4	12.706	SF

Offset Design												Collins 4N64W18T Pad Sec.18-T4N-R64W - Collins 18Q-221 - Wellbore #1 - Plan #1 (11-3-14)	Offset Site Error:	0.0 ft
Survey Program:												0-MWD	Offset Well Error:	0.0 ft
Reference		Offset		Semi Major Axis		Highside Toolface (°)	Offset Wellbore Centre		Distance		Separation Factor	Warning		
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)		+N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)			Minimum Separation (ft)	
0.0	0.0	0.0	0.0	0.0	0.0	90.00	0.0	30.7	30.7					
100.0	100.0	99.0	99.0	0.1	0.1	90.00	0.0	30.7	30.7	30.5	0.22	137.183		
200.0	200.0	199.0	199.0	0.3	0.3	90.00	0.0	30.7	30.7	30.0	0.67	45.651 CC, ES		

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

<b>Company:</b>	PETROLEUM DEVELOPMENT CORP Weld County CO	<b>Local Co-ordinate Reference:</b>	Well Collins 18Q-301
<b>Project:</b>	SEC.18-T4N-R64W	<b>TVD Reference:</b>	WELL @ 4799.0ft (Original Well Elev)
<b>Reference Site:</b>	Collins 4N64W18T Pad Sec.18-T4N-R64W	<b>MD Reference:</b>	WELL @ 4799.0ft (Original Well Elev)
<b>Site Error:</b>	0.0ft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Collins 18Q-301	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.0ft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	Wellbore #1	<b>Database:</b>	landmark
<b>Reference Design:</b>	Plan #1 (11-3-14)	<b>Offset TVD Reference:</b>	Offset Datum

Offset Design Collins 4N64W18T Pad Sec.18-T4N-R64W - Collins 18Q-221 - Wellbore #1 - Plan #1 (11-3-14)													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 Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning	
300.0	300.0	299.0	299.0	0.6	0.6	-172.43	0.0	30.7	32.4	31.3	1.12	29.043		
400.0	399.8	398.8	398.8	0.8	0.8	-173.47	0.0	30.7	37.6	36.0	1.56	24.068		
500.0	499.5	500.0	500.0	1.0	1.0	-174.44	-0.3	29.0	44.6	42.6	2.00	22.316		
600.0	598.7	601.5	601.3	1.3	1.2	-175.06	-1.1	23.7	51.5	49.1	2.43	21.234		
700.0	697.5	703.2	702.6	1.7	1.5	-175.46	-2.6	14.9	58.4	55.5	2.87	20.350		
800.0	795.6	805.1	803.8	2.0	1.7	-175.69	-4.6	2.5	65.2	61.9	3.33	19.595		
900.0	893.1	907.3	904.7	2.5	2.1	-175.82	-7.2	-13.5	72.0	68.2	3.81	18.920		
1,000.0	989.6	1,009.8	1,005.2	3.0	2.4	-175.86	-10.4	-33.1	78.7	74.4	4.30	18.296		
1,100.0	1,085.5	1,112.5	1,105.2	3.6	2.9	-175.81	-14.1	-56.3	84.5	79.7	4.83	17.498		
1,200.0	1,181.3	1,212.4	1,202.0	4.2	3.4	-175.67	-18.1	-80.5	88.8	83.4	5.38	16.498		
1,300.0	1,277.1	1,312.3	1,298.9	4.8	3.8	-175.54	-22.0	-104.7	93.0	87.1	5.94	15.658		
1,400.0	1,372.9	1,412.2	1,395.7	5.4	4.3	-175.42	-26.0	-129.0	97.3	90.8	6.51	14.954		
1,500.0	1,468.8	1,512.1	1,492.6	6.0	4.9	-175.31	-29.9	-153.2	101.6	94.5	7.08	14.346		
1,600.0	1,564.6	1,612.0	1,589.4	6.6	5.4	-175.22	-33.8	-177.4	105.8	98.2	7.66	13.821		
1,700.0	1,660.4	1,711.9	1,686.3	7.2	5.9	-175.13	-37.8	-201.6	110.1	101.9	8.24	13.364		
1,800.0	1,756.2	1,811.8	1,783.1	7.8	6.4	-175.04	-41.7	-225.8	114.4	105.5	8.82	12.963		
1,900.0	1,852.0	1,911.8	1,880.0	8.4	6.9	-174.96	-45.6	-250.0	118.6	109.2	9.41	12.609		
2,000.0	1,947.8	2,011.7	1,976.8	9.0	7.5	-174.89	-49.6	-274.2	122.9	112.9	10.00	12.294		
2,100.0	2,043.6	2,111.6	2,073.7	9.6	8.0	-174.82	-53.5	-298.4	127.2	116.6	10.59	12.012		
2,200.0	2,139.4	2,211.5	2,170.5	10.2	8.5	-174.76	-57.5	-322.7	131.4	120.3	11.18	11.758		
2,300.0	2,235.3	2,311.4	2,267.4	10.8	9.0	-174.70	-61.4	-346.9	135.7	123.9	11.77	11.529		
2,400.0	2,331.1	2,411.3	2,364.2	11.5	9.6	-174.64	-65.3	-371.1	140.0	127.6	12.37	11.320		
2,500.0	2,426.9	2,511.2	2,461.1	12.1	10.1	-174.59	-69.3	-395.3	144.2	131.3	12.96	11.130		
2,600.0	2,522.7	2,611.1	2,557.9	12.7	10.6	-174.54	-73.2	-419.5	148.5	135.0	13.56	10.956		
2,700.0	2,618.5	2,711.0	2,654.8	13.3	11.2	-174.50	-77.1	-443.7	152.8	138.6	14.15	10.795		
2,800.0	2,714.3	2,810.9	2,751.6	13.9	11.7	-174.45	-81.1	-467.9	157.1	142.3	14.75	10.648		
2,900.0	2,810.1	2,910.8	2,848.5	14.5	12.2	-174.41	-85.0	-492.1	161.3	146.0	15.35	10.511		
3,000.0	2,906.0	3,010.7	2,945.3	15.1	12.8	-174.37	-88.9	-516.4	165.6	149.6	15.95	10.385		
3,100.0	3,001.8	3,110.7	3,042.2	15.8	13.3	-174.33	-92.9	-540.6	169.9	153.3	16.54	10.267		
3,200.0	3,097.6	3,210.6	3,139.0	16.4	13.8	-174.30	-96.8	-564.8	174.1	157.0	17.14	10.157		
3,300.0	3,193.4	3,310.5	3,235.9	17.0	14.4	-174.26	-100.8	-589.0	178.4	160.7	17.74	10.054		
3,400.0	3,289.2	3,410.4	3,332.7	17.6	14.9	-174.23	-104.7	-613.2	182.7	164.3	18.34	9.958		
3,500.0	3,385.0	3,510.3	3,429.6	18.2	15.4	-174.20	-108.6	-637.4	186.9	168.0	18.94	9.868		
3,600.0	3,480.8	3,610.2	3,526.4	18.8	15.9	-174.17	-112.6	-661.6	191.2	171.7	19.54	9.783		
3,700.0	3,576.6	3,710.1	3,623.3	19.4	16.5	-174.14	-116.5	-685.8	195.5	175.3	20.15	9.703		
3,800.0	3,672.5	3,810.0	3,720.1	20.1	17.0	-174.11	-120.4	-710.1	199.7	179.0	20.75	9.628		
3,900.0	3,768.3	3,909.9	3,817.0	20.7	17.6	-174.09	-124.4	-734.3	204.0	182.7	21.35	9.556		
4,000.0	3,864.1	4,009.8	3,913.8	21.3	18.1	-174.06	-128.3	-758.5	208.3	186.3	21.95	9.489		
4,100.0	3,959.9	4,109.7	4,010.7	21.9	18.6	-174.04	-132.3	-782.7	212.6	190.0	22.55	9.425		
4,200.0	4,055.7	4,209.7	4,107.5	22.5	19.2	-174.02	-136.2	-806.9	216.8	193.7	23.15	9.364		
4,300.0	4,151.5	4,309.6	4,204.4	23.1	19.7	-173.99	-140.1	-831.1	221.1	197.3	23.76	9.307		
4,400.0	4,247.3	4,409.5	4,301.2	23.8	20.2	-173.97	-144.1	-855.3	225.4	201.0	24.36	9.252		
4,500.0	4,343.1	4,509.4	4,398.1	24.4	20.8	-173.95	-148.0	-879.5	229.6	204.7	24.96	9.199		
4,600.0	4,439.0	4,609.3	4,494.9	25.0	21.3	-173.93	-151.9	-903.7	233.9	208.3	25.56	9.150		
4,700.0	4,534.8	4,709.2	4,591.8	25.6	21.8	-173.91	-155.9	-928.0	238.2	212.0	26.17	9.102		
4,800.0	4,630.6	4,809.1	4,688.6	26.2	22.4	-173.90	-159.8	-952.2	242.4	215.7	26.77	9.056		
4,900.0	4,726.4	4,909.0	4,785.5	26.8	22.9	-173.88	-163.7	-976.4	246.7	219.3	27.37	9.013		
5,000.0	4,822.2	5,008.9	4,882.3	27.5	23.4	-173.86	-167.7	-1,000.6	251.0	223.0	27.98	8.971		
5,100.0	4,918.0	5,108.8	4,979.2	28.1	24.0	-173.84	-171.6	-1,024.8	255.3	226.7	28.58	8.931		
5,200.0	5,013.8	5,208.7	5,076.0	28.7	24.5	-173.83	-175.6	-1,049.0	259.5	230.3	29.18	8.893		
5,300.0	5,109.7	5,308.7	5,172.9	29.3	25.0	-173.81	-179.5	-1,073.2	263.6	233.8	29.79	8.849		

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

<b>Company:</b>	PETROLEUM DEVELOPMENT CORP Weld County CO	<b>Local Co-ordinate Reference:</b>	Well Collins 18Q-301
<b>Project:</b>	SEC.18-T4N-R64W	<b>TVD Reference:</b>	WELL @ 4799.0ft (Original Well Elev)
<b>Reference Site:</b>	Collins 4N64W18T Pad Sec.18-T4N-R64W	<b>MD Reference:</b>	WELL @ 4799.0ft (Original Well Elev)
<b>Site Error:</b>	0.0ft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Collins 18Q-301	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.0ft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	Wellbore #1	<b>Database:</b>	landmark
<b>Reference Design:</b>	Plan #1 (11-3-14)	<b>Offset TVD Reference:</b>	Offset Datum

Offset Design Collins 4N64W18T Pad Sec.18-T4N-R64W - Collins 18Q-221 - Wellbore #1 - Plan #1 (11-3-14)													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
5,400.0	5,206.3	5,408.6	5,269.8	29.7	25.6	-173.73		-183.4	-1,097.5	265.1	234.7	30.36	8.731	
5,500.0	5,303.7	5,500.0	5,358.5	30.1	26.0	-173.60		-186.9	-1,118.9	263.9	233.1	30.85	8.555	
5,600.0	5,401.9	5,594.2	5,450.7	30.4	26.3	-173.47		-190.1	-1,138.3	262.3	231.0	31.25	8.392	
5,700.0	5,500.6	5,685.9	5,541.0	30.7	26.6	-173.34		-192.7	-1,154.2	260.4	228.8	31.59	8.242	
5,800.0	5,599.9	5,777.7	5,631.7	30.9	26.8	-173.22		-194.8	-1,167.3	258.2	226.3	31.87	8.100	
5,900.0	5,699.5	5,869.5	5,723.0	31.1	27.0	-173.11		-196.4	-1,177.5	255.7	223.6	32.09	7.967	
6,000.0	5,799.3	5,961.4	5,814.5	31.2	27.2	-172.99		-197.6	-1,184.8	252.9	220.7	32.25	7.842	
6,100.0	5,899.3	6,053.3	5,906.4	31.3	27.3	-172.88		-198.4	-1,189.2	249.9	217.5	32.36	7.720	
6,200.0	5,999.3	6,146.9	6,000.0	31.4	27.4	89.17		-198.6	-1,190.7	248.2	215.6	32.67	7.598	
6,234.0	6,033.3	6,179.3	6,032.3	31.5	27.5	89.17		-198.6	-1,190.7	248.2	215.4	32.77	7.574	
6,300.0	6,099.3	6,245.2	6,098.3	31.5	27.5	89.17		-198.6	-1,190.7	248.2	215.2	32.97	7.528	
6,400.0	6,199.3	6,344.2	6,197.0	31.6	27.6	87.73		-191.9	-1,190.7	248.4	215.4	33.00	7.526	
6,500.0	6,298.7	6,441.9	6,292.7	31.7	27.7	85.54		-172.8	-1,190.7	248.9	216.1	32.89	7.568	
6,600.0	6,396.0	6,538.4	6,384.2	31.7	27.7	83.46		-142.2	-1,190.7	249.8	217.0	32.85	7.604	
6,700.0	6,489.4	6,634.0	6,470.2	31.8	27.8	81.50		-100.7	-1,190.7	251.0	218.1	32.91	7.625	
6,800.0	6,577.4	6,728.5	6,549.5	31.8	27.8	79.71		-49.4	-1,190.7	252.3	219.2	33.07	7.628	
6,900.0	6,658.4	6,822.3	6,621.4	31.8	27.8	78.10		10.7	-1,190.7	253.7	220.3	33.32	7.614	
7,000.0	6,731.2	6,915.3	6,684.9	31.8	27.8	76.70		78.7	-1,190.7	255.1	221.4	33.63	7.584	
7,100.0	6,794.3	7,007.7	6,739.3	31.9	27.9	75.52		153.3	-1,190.7	256.3	222.3	34.01	7.538	
7,200.0	6,846.8	7,100.0	6,784.3	32.0	28.0	74.57		233.8	-1,190.7	257.5	223.0	34.47	7.469	
7,300.0	6,887.8	7,191.1	6,818.8	32.1	28.2	73.87		318.1	-1,190.7	258.4	223.3	35.04	7.374	
7,400.0	6,916.5	7,282.4	6,843.1	32.4	28.5	73.40		406.0	-1,190.7	259.0	223.2	35.74	7.245	
7,500.0	6,932.5	7,373.5	6,856.8	32.7	28.9	73.19		496.0	-1,190.7	259.3	222.6	36.63	7.078	
7,600.0	6,935.8	7,466.3	6,859.9	33.1	29.3	73.21		588.7	-1,190.7	259.2	221.3	37.90	6.840	
7,700.0	6,935.1	7,556.3	6,859.4	33.7	30.0	73.25		688.7	-1,190.7	259.2	219.1	40.06	6.469	
7,800.0	6,934.4	7,646.3	6,859.0	34.3	30.7	73.30		788.7	-1,190.7	259.1	216.7	42.43	6.107	
7,900.0	6,933.7	7,736.3	6,858.5	35.1	31.6	73.35		888.7	-1,190.7	259.1	214.1	44.98	5.759	
8,000.0	6,933.0	7,826.3	6,858.0	35.9	32.6	73.40		988.7	-1,190.7	259.0	211.3	47.68	5.431	
8,100.0	6,932.4	7,916.3	6,857.6	36.9	33.7	73.45		1,088.7	-1,190.7	258.9	208.4	50.52	5.125	
8,200.0	6,931.7	8,006.3	6,857.1	37.9	34.9	73.49		1,188.7	-1,190.7	258.9	205.4	53.46	4.842	
8,300.0	6,931.0	8,096.3	6,856.7	39.0	36.1	73.54		1,288.7	-1,190.7	258.8	202.3	56.50	4.580	
8,400.0	6,930.3	8,186.3	6,856.2	40.2	37.4	73.59		1,388.7	-1,190.7	258.7	199.1	59.62	4.340	
8,500.0	6,929.6	8,276.3	6,855.8	41.4	38.8	73.64		1,488.7	-1,190.7	258.7	195.9	62.80	4.119	
8,600.0	6,929.0	8,366.3	6,855.3	42.8	40.3	73.69		1,588.7	-1,190.7	258.6	192.6	66.04	3.916	
8,700.0	6,928.3	8,456.3	6,854.9	44.1	41.7	73.74		1,688.7	-1,190.7	258.5	189.2	69.33	3.729	
8,800.0	6,927.6	8,546.3	6,854.4	45.5	43.2	73.78		1,788.7	-1,190.7	258.5	185.8	72.66	3.557	
8,900.0	6,926.9	8,636.3	6,854.0	47.0	44.8	73.83		1,888.7	-1,190.7	258.4	182.4	76.04	3.399	
9,000.0	6,926.2	8,726.3	6,853.5	48.5	46.4	73.88		1,988.7	-1,190.7	258.3	178.9	79.44	3.252	
9,100.0	6,925.6	8,816.3	6,853.1	50.0	48.0	73.93		2,088.7	-1,190.7	258.3	175.4	82.88	3.116	
9,200.0	6,924.9	8,906.3	6,852.6	51.5	49.6	73.98		2,188.7	-1,190.7	258.2	171.9	86.34	2.991	
9,300.0	6,924.2	8,996.3	6,852.1	53.1	51.2	74.03		2,288.7	-1,190.7	258.2	168.3	89.82	2.874	
9,400.0	6,923.5	9,086.3	6,851.7	54.7	52.9	74.07		2,388.7	-1,190.7	258.1	164.8	93.33	2.766	
9,500.0	6,922.8	9,176.3	6,851.2	56.4	54.6	74.12		2,488.7	-1,190.7	258.0	161.2	96.85	2.664	
9,600.0	6,922.2	9,266.3	6,850.8	58.0	56.3	74.17		2,588.7	-1,190.7	258.0	157.6	100.39	2.570	
9,700.0	6,921.5	9,356.3	6,850.3	59.7	58.0	74.22		2,688.7	-1,190.7	257.9	154.0	103.95	2.481	
9,800.0	6,920.8	9,446.3	6,849.9	61.3	59.7	74.27		2,788.7	-1,190.7	257.8	150.3	107.52	2.398	
9,900.0	6,920.1	9,536.3	6,849.4	63.0	61.5	74.32		2,888.7	-1,190.7	257.8	146.7	111.10	2.320	
10,000.0	6,919.4	9,626.3	6,849.0	64.7	63.2	74.37		2,988.7	-1,190.7	257.7	143.0	114.69	2.247	
10,100.0	6,918.7	9,716.3	6,848.5	66.4	65.0	74.41		3,088.7	-1,190.7	257.7	139.4	118.30	2.178	
10,200.0	6,918.1	9,806.3	6,848.1	68.2	66.8	74.46		3,188.7	-1,190.7	257.6	135.7	121.91	2.113	
10,300.0	6,917.4	9,896.3	6,847.6	69.9	68.5	74.51		3,288.7	-1,190.7	257.5	132.0	125.54	2.052	

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

<b>Company:</b>	PETROLEUM DEVELOPMENT CORP Weld County CO	<b>Local Co-ordinate Reference:</b>	Well Collins 18Q-301
<b>Project:</b>	SEC.18-T4N-R64W	<b>TVD Reference:</b>	WELL @ 4799.0ft (Original Well Elev)
<b>Reference Site:</b>	Collins 4N64W18T Pad Sec.18-T4N-R64W	<b>MD Reference:</b>	WELL @ 4799.0ft (Original Well Elev)
<b>Site Error:</b>	0.0ft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Collins 18Q-301	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.0ft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	Wellbore #1	<b>Database:</b>	landmark
<b>Reference Design:</b>	Plan #1 (11-3-14)	<b>Offset TVD Reference:</b>	Offset Datum

<b>Offset Design</b> Collins 4N64W18T Pad Sec.18-T4N-R64W - Collins 18Q-221 - Wellbore #1 - Plan #1 (11-3-14)												<b>Offset Site Error:</b>	0.0 ft
Survey Program: 0-MWD												<b>Offset Well Error:</b>	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
10,400.0	6,916.7	10,266.3	6,847.2	71.7	70.3	74.56	3,388.7	-1,190.7	257.5	128.3	129.17	1.993	
10,500.0	6,916.0	10,366.3	6,846.7	73.4	72.1	74.61	3,488.7	-1,190.7	257.4	124.6	132.81	1.938	
10,600.0	6,915.3	10,466.3	6,846.2	75.2	73.9	74.66	3,588.7	-1,190.7	257.4	120.9	136.46	1.886	
10,700.0	6,914.7	10,566.3	6,845.8	77.0	75.7	74.71	3,688.7	-1,190.7	257.3	117.2	140.11	1.836	
10,800.0	6,914.0	10,666.3	6,845.3	78.7	77.5	74.75	3,788.7	-1,190.7	257.2	113.5	143.78	1.789	
10,900.0	6,913.3	10,766.3	6,844.9	80.5	79.3	74.80	3,888.7	-1,190.7	257.2	109.7	147.44	1.744	
11,000.0	6,912.6	10,866.3	6,844.4	82.3	81.2	74.85	3,988.7	-1,190.7	257.1	106.0	151.12	1.701	
11,100.0	6,911.9	10,966.3	6,844.0	84.1	83.0	74.90	4,088.7	-1,190.7	257.1	102.3	154.80	1.661	
11,200.0	6,911.3	11,066.3	6,843.5	85.9	84.8	74.95	4,188.7	-1,190.7	257.0	98.5	158.48	1.622	
11,300.0	6,910.6	11,166.3	6,843.1	87.7	86.6	75.00	4,288.7	-1,190.7	256.9	94.8	162.17	1.584	
11,400.0	6,909.9	11,266.3	6,842.6	89.5	88.5	75.05	4,388.7	-1,190.7	256.9	91.0	165.86	1.549	
11,500.0	6,909.2	11,366.3	6,842.2	91.4	90.3	75.10	4,488.7	-1,190.7	256.8	87.3	169.56	1.515	
11,532.1	6,909.0	11,398.4	6,842.0	91.9	90.9	75.11	4,520.8	-1,190.7	256.8	86.1	170.75	1.504 SF	

<b>Company:</b>	PETROLEUM DEVELOPMENT CORP Weld County CO	<b>Local Co-ordinate Reference:</b>	Well Collins 18Q-301
<b>Project:</b>	SEC.18-T4N-R64W	<b>TVD Reference:</b>	WELL @ 4799.0ft (Original Well Elev)
<b>Reference Site:</b>	Collins 4N64W18T Pad Sec.18-T4N-R64W	<b>MD Reference:</b>	WELL @ 4799.0ft (Original Well Elev)
<b>Site Error:</b>	0.0ft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Collins 18Q-301	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.0ft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	Wellbore #1	<b>Database:</b>	landmark
<b>Reference Design:</b>	Plan #1 (11-3-14)	<b>Offset TVD Reference:</b>	Offset Datum

Offset Design Collins 4N64W18T Pad Sec.18-T4N-R64W - Collins 18T-201 - Wellbore #1 - Plan #1 (11-3-14)													Offset Site Error:	0.0 ft
Survey Program: 0-MWDD													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 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	87.66	3.6	89.3	89.3					
100.0	100.0	98.0	98.0	0.1	0.1	87.66	3.6	89.3	89.3	89.1	0.22	401.423		
200.0	200.0	198.0	198.0	0.3	0.3	87.66	3.6	89.3	89.3	88.7	0.67	133.361 CC, ES		
300.0	300.0	298.0	298.0	0.6	0.6	-174.44	3.6	89.3	91.1	89.9	1.11	81.763		
400.0	399.8	397.8	397.8	0.8	0.8	-174.74	3.6	89.3	96.3	94.7	1.56	61.707		
500.0	499.5	497.5	497.5	1.0	1.0	-175.16	3.6	89.3	105.0	102.9	2.01	52.119		
600.0	598.7	596.7	596.7	1.3	1.2	-175.64	3.6	89.3	117.1	114.6	2.47	47.387		
700.0	697.5	695.5	695.5	1.7	1.5	-176.13	3.6	89.3	132.7	129.8	2.93	45.268		
800.0	795.6	793.6	793.6	2.0	1.7	-176.60	3.6	89.3	151.7	148.4	3.39	44.705		
900.0	893.1	891.1	891.1	2.5	1.9	-177.01	3.6	89.3	174.2	170.3	3.86	45.134		
1,000.0	989.6	987.6	987.6	3.0	2.1	-177.37	3.6	89.3	200.1	195.7	4.33	46.226		
1,100.0	1,085.5	1,090.4	1,090.4	3.6	2.3	-177.60	3.1	87.9	227.2	222.4	4.79	47.394		
1,200.0	1,181.3	1,195.9	1,195.7	4.2	2.5	-177.53	1.0	83.1	251.3	246.0	5.25	47.817		
1,300.0	1,277.1	1,303.1	1,302.5	4.8	2.8	-177.22	-2.6	74.5	271.8	266.1	5.73	47.398		
1,400.0	1,372.9	1,408.2	1,406.8	5.4	3.0	-176.73	-7.6	62.7	289.1	282.8	6.23	46.401		
1,500.0	1,468.8	1,506.8	1,504.6	6.0	3.3	-176.28	-12.6	50.8	305.5	298.8	6.74	45.358		
1,600.0	1,564.6	1,605.4	1,602.4	6.6	3.5	-175.87	-17.6	39.0	322.0	314.8	7.25	44.407		
1,700.0	1,660.4	1,704.0	1,700.1	7.2	3.8	-175.50	-22.7	27.1	338.5	330.8	7.78	43.542		
1,800.0	1,756.2	1,802.6	1,797.9	7.8	4.1	-175.16	-27.7	15.3	355.1	346.8	8.30	42.755		
1,900.0	1,852.0	1,901.2	1,895.6	8.4	4.4	-174.85	-32.7	3.4	371.6	362.8	8.84	42.038		
2,000.0	1,947.8	1,999.8	1,993.4	9.0	4.7	-174.58	-37.7	-8.5	388.1	378.8	9.38	41.382		
2,100.0	2,043.6	2,098.4	2,091.2	9.6	5.0	-174.32	-42.8	-20.3	404.7	394.8	9.92	40.781		
2,200.0	2,139.4	2,197.0	2,188.9	10.2	5.3	-174.08	-47.8	-32.2	421.3	410.8	10.47	40.229		
2,300.0	2,235.3	2,295.6	2,286.7	10.8	5.6	-173.86	-52.8	-44.0	437.8	426.8	11.02	39.721		
2,400.0	2,331.1	2,394.2	2,384.4	11.5	5.9	-173.66	-57.8	-55.9	454.4	442.8	11.58	39.253		
2,500.0	2,426.9	2,492.8	2,482.2	12.1	6.2	-173.47	-62.8	-67.8	471.0	458.8	12.13	38.820		
2,600.0	2,522.7	2,591.5	2,580.0	12.7	6.5	-173.30	-67.9	-79.6	487.5	474.9	12.69	38.419		
2,700.0	2,618.5	2,690.1	2,677.7	13.3	6.9	-173.13	-72.9	-91.5	504.1	490.9	13.25	38.046		
2,800.0	2,714.3	2,788.7	2,775.5	13.9	7.2	-172.98	-77.9	-103.3	520.7	506.9	13.81	37.698		
2,900.0	2,810.1	2,887.3	2,873.2	14.5	7.5	-172.83	-82.9	-115.2	537.3	522.9	14.38	37.374		
3,000.0	2,906.0	2,985.9	2,971.0	15.1	7.8	-172.70	-87.9	-127.0	553.9	539.0	14.94	37.072		
3,100.0	3,001.8	3,084.5	3,068.8	15.8	8.1	-172.57	-93.0	-138.9	570.5	555.0	15.51	36.788		
3,200.0	3,097.6	3,183.1	3,166.5	16.4	8.5	-172.45	-98.0	-150.8	587.1	571.0	16.08	36.521		
3,300.0	3,193.4	3,281.7	3,264.3	17.0	8.8	-172.34	-103.0	-162.6	603.7	587.1	16.64	36.271		
3,400.0	3,289.2	3,380.3	3,362.1	17.6	9.1	-172.23	-108.0	-174.5	620.3	603.1	17.21	36.035		
3,500.0	3,385.0	3,478.9	3,459.8	18.2	9.4	-172.13	-113.1	-186.3	636.9	619.1	17.78	35.812		
3,600.0	3,480.8	3,577.5	3,557.6	18.8	9.8	-172.03	-118.1	-198.2	653.5	635.2	18.36	35.602		
3,700.0	3,576.6	3,676.1	3,655.3	19.4	10.1	-171.94	-123.1	-210.1	670.1	651.2	18.93	35.403		
3,800.0	3,672.5	3,774.7	3,753.1	20.1	10.4	-171.85	-128.1	-221.9	686.7	667.2	19.50	35.215		
3,900.0	3,768.3	3,873.3	3,850.9	20.7	10.8	-171.77	-133.1	-233.8	703.4	683.3	20.08	35.036		
4,000.0	3,864.1	3,971.9	3,948.6	21.3	11.1	-171.69	-138.2	-245.6	720.0	699.3	20.65	34.866		
4,100.0	3,959.9	4,070.5	4,046.4	21.9	11.4	-171.61	-143.2	-257.5	736.6	715.4	21.22	34.705		
4,200.0	4,055.7	4,169.1	4,144.1	22.5	11.7	-171.54	-148.2	-269.3	753.2	731.4	21.80	34.551		
4,300.0	4,151.5	4,267.7	4,241.9	23.1	12.1	-171.47	-153.2	-281.2	769.8	747.5	22.38	34.404		
4,400.0	4,247.3	4,366.3	4,339.7	23.8	12.4	-171.40	-158.3	-293.1	786.4	763.5	22.95	34.264		
4,500.0	4,343.1	4,465.0	4,437.4	24.4	12.7	-171.34	-163.3	-304.9	803.1	779.5	23.53	34.130		
4,600.0	4,439.0	4,563.6	4,535.2	25.0	13.1	-171.28	-168.3	-316.8	819.7	795.6	24.11	34.002		
4,700.0	4,534.8	4,662.2	4,632.9	25.6	13.4	-171.22	-173.3	-328.6	836.3	811.6	24.68	33.880		
4,800.0	4,630.6	4,755.9	4,725.9	26.2	13.7	-171.16	-178.1	-339.9	852.9	827.7	25.25	33.780 SF		
4,900.0	4,726.4	4,836.8	4,806.3	26.8	13.9	-171.15	-181.8	-348.6	870.9	845.2	25.74	33.834		
5,000.0	4,822.2	4,913.2	4,882.3	27.5	14.1	-171.19	-184.4	-354.9	891.3	865.1	26.20	34.022		

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

<b>Company:</b>	PETROLEUM DEVELOPMENT CORP Weld County CO	<b>Local Co-ordinate Reference:</b>	Well Collins 18Q-301
<b>Project:</b>	SEC.18-T4N-R64W	<b>TVD Reference:</b>	WELL @ 4799.0ft (Original Well Elev)
<b>Reference Site:</b>	Collins 4N64W18T Pad Sec.18-T4N-R64W	<b>MD Reference:</b>	WELL @ 4799.0ft (Original Well Elev)
<b>Site Error:</b>	0.0ft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Collins 18Q-301	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.0ft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	Wellbore #1	<b>Database:</b>	landmark
<b>Reference Design:</b>	Plan #1 (11-3-14)	<b>Offset TVD Reference:</b>	Offset Datum

<b>Offset Design</b> Collins 4N64W18T Pad Sec.18-T4N-R64W - Collins 18T-201 - Wellbore #1 - Plan #1 (11-3-14)													<b>Offset Site Error:</b>	0.0 ft
Survey Program: 0-MWD													<b>Offset Well Error:</b>	0.0 ft
Reference	Offset	Semi Major Axis		Distance									Warning	
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor		
5,100.0	4,918.0	5,000.0	4,968.9	28.1	14.2	-171.30	-186.5	-359.7	914.1	887.5	26.66	34.294		
5,200.0	5,013.8	5,063.3	5,032.2	28.7	14.4	-171.42	-187.3	-361.8	939.1	912.0	27.06	34.702		
5,300.0	5,109.7	5,138.8	5,107.7	29.3	14.5	-171.63	-187.7	-362.5	966.3	938.8	27.49	35.150		
5,400.0	5,206.3	5,235.4	5,204.3	29.7	14.6	-171.92	-187.7	-362.5	992.0	964.1	27.92	35.524		



<b>Company:</b>	PETROLEUM DEVELOPMENT CORP Weld County CO	<b>Local Co-ordinate Reference:</b>	Well Collins 18Q-301
<b>Project:</b>	SEC.18-T4N-R64W	<b>TVD Reference:</b>	WELL @ 4799.0ft (Original Well Elev)
<b>Reference Site:</b>	Collins 4N64W18T Pad Sec.18-T4N-R64W	<b>MD Reference:</b>	WELL @ 4799.0ft (Original Well Elev)
<b>Site Error:</b>	0.0ft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Collins 18Q-301	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.0ft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	Wellbore #1	<b>Database:</b>	landmark
<b>Reference Design:</b>	Plan #1 (11-3-14)	<b>Offset TVD Reference:</b>	Offset Datum

Offset Design Collins 4N64W18T Pad Sec.18-T4N-R64W - Collins 18T-221 - Wellbore #1 - Plan #1 (11-3-14)													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	88.61		3.6	150.6	150.7				
100.0	100.0	97.0	97.0	0.1	0.1	88.61		3.6	150.6	150.7	150.4	0.22	680.466	
200.0	200.0	197.0	197.0	0.3	0.3	88.61		3.6	150.6	150.7	150.0	0.67	225.682 CC, ES	
300.0	300.0	297.0	297.0	0.6	0.6	-173.46		3.6	150.6	152.4	151.3	1.11	137.104	
400.0	399.8	396.8	396.8	0.8	0.8	-173.66		3.6	150.6	157.6	156.0	1.56	101.151	
500.0	499.5	496.5	496.5	1.0	1.0	-173.98		3.6	150.6	166.3	164.2	2.01	82.643	
600.0	598.7	595.7	595.7	1.3	1.2	-174.36		3.6	150.6	178.4	175.9	2.47	72.231	
700.0	697.5	694.5	694.5	1.7	1.4	-174.79		3.6	150.6	194.0	191.0	2.93	66.185	
800.0	795.6	792.6	792.6	2.0	1.7	-175.22		3.6	150.6	213.0	209.6	3.39	62.744	
900.0	893.1	890.1	890.1	2.5	1.9	-175.64		3.6	150.6	235.4	231.5	3.86	60.973	
1,000.0	989.6	986.6	986.6	3.0	2.1	-176.04		3.6	150.6	261.2	256.9	4.33	60.331	
1,100.0	1,085.5	1,082.5	1,082.5	3.6	2.3	-176.42		3.6	150.6	289.6	284.8	4.81	60.252	
1,200.0	1,181.3	1,178.3	1,178.3	4.2	2.5	-176.74		3.6	150.6	318.2	312.9	5.29	60.130	
1,300.0	1,277.1	1,274.1	1,274.1	4.8	2.8	-177.01		3.6	150.6	346.8	341.0	5.78	59.984	
1,400.0	1,372.9	1,369.9	1,369.9	5.4	3.0	-177.24		3.6	150.6	375.4	369.1	6.27	59.829	
1,500.0	1,468.8	1,465.8	1,465.8	6.0	3.2	-177.43		3.6	150.6	404.0	397.2	6.77	59.675	
1,600.0	1,564.6	1,561.6	1,561.6	6.6	3.4	-177.60		3.6	150.6	432.6	425.3	7.27	59.525	
1,700.0	1,660.4	1,657.4	1,657.4	7.2	3.6	-177.75		3.6	150.6	461.2	453.5	7.77	59.382	
1,800.0	1,756.2	1,753.2	1,753.2	7.8	3.8	-177.88		3.6	150.6	489.8	481.6	8.27	59.247	
1,900.0	1,852.0	1,849.0	1,849.0	8.4	4.0	-178.00		3.6	150.6	518.5	509.7	8.77	59.120	
2,000.0	1,947.8	1,944.8	1,944.8	9.0	4.3	-178.10		3.6	150.6	547.1	537.8	9.27	59.000	
2,100.0	2,043.6	2,040.6	2,040.6	9.6	4.5	-178.20		3.6	150.6	575.7	565.9	9.78	58.889	
2,200.0	2,139.4	2,136.4	2,136.4	10.2	4.7	-178.28		3.6	150.6	604.3	594.0	10.28	58.784	
2,300.0	2,235.3	2,232.3	2,232.3	10.8	4.9	-178.36		3.6	150.6	632.9	622.1	10.79	58.686	
2,400.0	2,331.1	2,328.1	2,328.1	11.5	5.1	-178.43		3.6	150.6	661.6	650.3	11.29	58.593	
2,500.0	2,426.9	2,423.9	2,423.9	12.1	5.3	-178.50		3.6	150.6	690.2	678.4	11.80	58.507	
2,600.0	2,522.7	2,518.5	2,518.5	12.7	5.5	-178.55		3.6	150.6	718.8	706.5	12.30	58.463 SF	
2,700.0	2,618.5	2,608.2	2,608.2	13.3	5.7	-178.45		1.7	151.4	748.0	735.2	12.77	58.594	
2,800.0	2,714.3	2,700.0	2,699.8	13.9	5.9	-178.14		-2.8	153.2	778.0	764.7	13.22	58.830	
2,900.0	2,810.1	2,785.7	2,785.2	14.5	6.0	-177.67		-9.6	155.8	808.7	795.0	13.68	59.115	
3,000.0	2,906.0	2,873.6	2,872.5	15.1	6.2	-177.05		-19.0	159.5	840.4	826.2	14.15	59.375	
3,100.0	3,001.8	2,967.7	2,965.9	15.8	6.4	-176.34		-30.2	163.9	872.5	857.8	14.65	59.544	
3,200.0	3,097.6	3,061.9	3,059.3	16.4	6.6	-175.68		-41.4	168.4	904.7	889.5	15.16	59.668	
3,300.0	3,193.4	3,156.1	3,152.7	17.0	6.8	-175.07		-52.6	172.8	937.0	921.3	15.68	59.743	
3,400.0	3,289.2	3,250.2	3,246.1	17.6	7.0	-174.50		-63.9	177.2	969.4	953.2	16.21	59.791	

<b>Company:</b>	PETROLEUM DEVELOPMENT CORP Weld County CO	<b>Local Co-ordinate Reference:</b>	Well Collins 18Q-301
<b>Project:</b>	SEC.18-T4N-R64W	<b>TVD Reference:</b>	WELL @ 4799.0ft (Original Well Elev)
<b>Reference Site:</b>	Collins 4N64W18T Pad Sec.18-T4N-R64W	<b>MD Reference:</b>	WELL @ 4799.0ft (Original Well Elev)
<b>Site Error:</b>	0.0ft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Collins 18Q-301	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.0ft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	Wellbore #1	<b>Database:</b>	landmark
<b>Reference Design:</b>	Plan #1 (11-3-14)	<b>Offset TVD Reference:</b>	Offset Datum

Offset Design Collins 4N64W18T Pad Sec.18-T4N-R64W - Collins 18T-321 - Wellbore #1 - Plan #1 (11-3-14)													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 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	88.26	3.6	119.9	120.0					
100.0	100.0	98.0	98.0	0.1	0.1	88.26	3.6	119.9	120.0	119.8	0.22	539.212		
200.0	200.0	198.0	198.0	0.3	0.3	88.26	3.6	119.9	120.0	119.3	0.67	179.137 CC, ES		
300.0	300.0	298.0	298.0	0.6	0.6	-173.83	3.6	119.9	121.7	120.6	1.11	109.293		
400.0	399.8	397.8	397.8	0.8	0.8	-174.07	3.6	119.9	126.9	125.4	1.56	81.354		
500.0	499.5	497.5	497.5	1.0	1.0	-174.43	3.6	119.9	135.6	133.6	2.01	67.333		
600.0	598.7	596.7	596.7	1.3	1.2	-174.87	3.6	119.9	147.7	145.3	2.47	59.774		
700.0	697.5	695.5	695.5	1.7	1.5	-175.34	3.6	119.9	163.3	160.4	2.93	55.699		
800.0	795.6	793.6	793.6	2.0	1.7	-175.79	3.6	119.9	182.3	178.9	3.40	53.702		
900.0	893.1	891.1	891.1	2.5	1.9	-176.23	3.6	119.9	204.8	200.9	3.86	53.034		
1,000.0	989.6	987.6	987.6	3.0	2.1	-176.62	3.6	119.9	230.6	226.3	4.33	53.262		
1,100.0	1,085.5	1,083.5	1,083.5	3.6	2.3	-176.98	3.6	119.9	259.0	254.2	4.81	53.894		
1,200.0	1,181.3	1,179.3	1,179.3	4.2	2.5	-177.28	3.6	119.9	287.6	282.4	5.29	54.361		
1,300.0	1,277.1	1,275.1	1,275.1	4.8	2.8	-177.53	3.6	119.9	316.2	310.5	5.78	54.708		
1,400.0	1,372.9	1,370.9	1,370.9	5.4	3.0	-177.73	3.6	119.9	344.9	338.6	6.27	54.971		
1,500.0	1,468.8	1,466.8	1,466.8	6.0	3.2	-177.91	3.6	119.9	373.5	366.7	6.77	55.175		
1,600.0	1,564.6	1,562.6	1,562.6	6.6	3.4	-178.05	3.6	119.9	402.1	394.8	7.27	55.336		
1,700.0	1,660.4	1,658.2	1,658.2	7.2	3.6	-178.12	3.1	119.5	430.3	422.5	7.76	55.426		
1,800.0	1,756.2	1,753.3	1,753.3	7.8	3.8	-177.83	-0.5	116.7	456.1	447.9	8.24	55.324		
1,900.0	1,852.0	1,849.7	1,849.7	8.4	4.0	-177.20	-7.4	111.4	479.4	470.7	8.73	54.892		
2,000.0	1,947.8	1,945.2	1,945.2	9.0	4.2	-176.40	-16.3	104.5	500.8	491.5	9.23	54.239		
2,100.0	2,043.6	2,040.8	2,040.8	9.6	4.4	-175.67	-25.1	97.7	522.0	512.2	9.74	53.582		
2,200.0	2,139.4	2,136.3	2,136.3	10.2	4.7	-175.00	-33.9	90.9	543.2	533.0	10.26	52.936		
2,300.0	2,235.3	2,231.8	2,231.8	10.8	4.9	-174.39	-42.7	84.2	564.6	553.8	10.79	52.304		
2,400.0	2,331.1	2,327.3	2,327.3	11.5	5.1	-173.81	-51.4	77.4	586.0	574.6	11.33	51.703		
2,500.0	2,426.9	2,422.8	2,422.8	12.1	5.4	-173.28	-60.2	70.6	607.4	595.5	11.88	51.111		
2,600.0	2,522.7	2,518.0	2,518.0	12.7	5.6	-172.78	-69.0	63.8	628.9	616.5	12.44	50.547		
2,700.0	2,618.5	2,613.6	2,613.6	13.3	5.9	-172.32	-77.7	57.1	650.5	637.4	13.01	50.008		
2,800.0	2,714.3	2,708.9	2,708.9	13.9	6.1	-171.88	-86.5	50.3	672.0	658.5	13.58	49.493		
2,900.0	2,810.1	2,804.2	2,804.2	14.5	6.4	-171.47	-95.3	43.5	693.6	679.5	14.16	49.001		
3,000.0	2,906.0	2,900.5	2,900.5	15.1	6.7	-171.09	-104.1	36.7	715.3	700.6	14.74	48.533		
3,100.0	3,001.8	3,000.0	3,000.0	15.8	7.0	-170.73	-112.8	29.9	737.0	721.6	15.33	48.087		
3,200.0	3,097.6	3,095.5	3,095.5	16.4	7.2	-170.39	-121.6	23.2	758.7	742.8	15.92	47.663		
3,300.0	3,193.4	3,191.0	3,191.0	17.0	7.5	-170.07	-130.4	16.4	780.4	763.9	16.51	47.259		
3,400.0	3,289.2	3,286.5	3,286.5	17.6	7.8	-169.76	-139.1	9.6	802.1	785.0	17.11	46.875		
3,500.0	3,385.0	3,381.8	3,381.8	18.2	8.1	-169.48	-147.9	2.8	823.9	806.2	17.72	46.508		
3,600.0	3,480.8	3,477.2	3,477.2	18.8	8.4	-169.20	-156.7	-3.9	845.7	827.4	18.32	46.160		
3,700.0	3,576.6	3,572.5	3,572.5	19.4	8.6	-168.94	-165.5	-10.7	867.5	848.6	18.93	45.828		
3,800.0	3,672.5	3,667.9	3,667.9	20.1	8.9	-168.74	-173.2	-16.7	889.6	870.1	19.50	45.628 SF		
3,900.0	3,768.3	3,763.4	3,763.4	20.7	9.1	-168.67	-178.6	-20.9	913.1	893.1	20.01	45.639		
4,000.0	3,864.1	3,858.7	3,858.7	21.3	9.2	-168.73	-182.3	-23.7	938.2	917.7	20.50	45.769		
4,100.0	3,959.9	3,954.5	3,954.5	21.9	9.4	-168.90	-183.9	-24.9	964.9	943.9	20.95	46.057		
4,200.0	4,055.7	4,050.3	4,050.3	22.5	9.6	-169.18	-184.1	-25.1	992.9	971.5	21.40	46.388		



<b>Company:</b>	PETROLEUM DEVELOPMENT CORP Weld County CO	<b>Local Co-ordinate Reference:</b>	Well Collins 18Q-301
<b>Project:</b>	SEC.18-T4N-R64W	<b>TVD Reference:</b>	WELL @ 4799.0ft (Original Well Elev)
<b>Reference Site:</b>	Collins 4N64W18T Pad Sec.18-T4N-R64W	<b>MD Reference:</b>	WELL @ 4799.0ft (Original Well Elev)
<b>Site Error:</b>	0.0ft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Collins 18Q-301	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.0ft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	Wellbore #1	<b>Database:</b>	landmark
<b>Reference Design:</b>	Plan #1 (11-3-14)	<b>Offset TVD Reference:</b>	Offset Datum

Offset Design Collins 4N64W18T Pad Sec.18-T4N-R64W - Collins 18T-341 - Wellbore #1 - Plan #1 (10-27-14)													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	
0.0	0.0	0.0	0.0	0.0	0.0	86.61	3.6	61.4	61.5					
100.0	100.0	99.0	99.0	0.1	0.1	86.61	3.6	61.4	61.5	61.2	0.22	274.847		
200.0	200.0	199.0	199.0	0.3	0.3	86.61	3.6	61.4	61.5	60.8	0.67	91.463 CC, ES		
300.0	300.0	299.0	299.0	0.6	0.6	-175.52	3.6	61.4	63.2	62.1	1.12	56.639		
400.0	399.8	398.8	398.8	0.8	0.8	-175.85	3.6	61.4	68.4	66.9	1.56	43.797		
500.0	499.5	498.5	498.5	1.0	1.0	-176.31	3.6	61.4	77.1	75.1	2.02	38.259		
600.0	598.7	597.7	597.7	1.3	1.2	-176.80	3.6	61.4	89.3	86.8	2.47	36.105		
700.0	697.5	696.5	696.5	1.7	1.5	-177.26	3.6	61.4	104.9	102.0	2.93	35.769		
800.0	795.6	794.6	794.6	2.0	1.7	-177.67	3.6	61.4	124.0	120.6	3.40	36.512		
900.0	893.1	896.9	896.9	2.5	1.9	-177.91	3.2	59.8	144.9	141.1	3.85	37.687		
1,000.0	989.6	1,000.2	1,000.0	3.0	2.1	-177.90	1.7	54.6	165.8	161.5	4.28	38.729		
1,100.0	1,085.5	1,104.5	1,103.9	3.6	2.3	-177.72	-0.9	45.8	185.9	181.1	4.74	39.178		
1,200.0	1,181.3	1,210.1	1,208.7	4.2	2.6	-177.38	-4.6	33.2	202.6	197.3	5.23	38.698		
1,300.0	1,277.1	1,313.1	1,310.4	4.8	2.9	-176.92	-9.1	17.7	216.1	210.3	5.74	37.644		
1,400.0	1,372.9	1,412.2	1,408.3	5.4	3.2	-176.51	-13.6	2.3	229.1	222.8	6.26	36.607		
1,500.0	1,468.8	1,511.4	1,506.1	6.0	3.5	-176.14	-18.1	-13.1	242.1	235.3	6.79	35.684		
1,600.0	1,564.6	1,610.5	1,603.9	6.6	3.8	-175.82	-22.6	-28.5	255.2	247.8	7.32	34.853		
1,700.0	1,660.4	1,709.7	1,701.7	7.2	4.2	-175.52	-27.1	-43.9	268.2	260.4	7.86	34.128		
1,800.0	1,756.2	1,808.8	1,799.6	7.8	4.5	-175.25	-31.7	-59.3	281.3	272.9	8.40	33.466		
1,900.0	1,852.0	1,907.9	1,897.4	8.4	4.9	-175.00	-36.2	-74.7	294.3	285.4	8.95	32.870		
2,000.0	1,947.8	2,007.1	1,995.2	9.0	5.2	-174.78	-40.7	-90.1	307.4	297.9	9.51	32.331		
2,100.0	2,043.6	2,106.2	2,093.1	9.6	5.6	-174.57	-45.2	-105.5	320.5	310.4	10.06	31.842		
2,200.0	2,139.4	2,205.3	2,190.9	10.2	6.0	-174.38	-49.7	-120.9	333.5	322.9	10.62	31.397		
2,300.0	2,235.3	2,304.5	2,288.7	10.8	6.3	-174.21	-54.2	-136.3	346.6	335.4	11.19	30.990		
2,400.0	2,331.1	2,403.6	2,386.5	11.5	6.7	-174.04	-58.7	-151.7	359.7	348.0	11.75	30.616		
2,500.0	2,426.9	2,502.7	2,484.4	12.1	7.1	-173.89	-63.2	-167.1	372.8	360.5	12.31	30.272		
2,600.0	2,522.7	2,601.9	2,582.2	12.7	7.4	-173.75	-67.7	-182.5	385.9	373.0	12.88	29.955		
2,700.0	2,618.5	2,701.0	2,680.0	13.3	7.8	-173.62	-72.2	-197.9	399.0	385.5	13.45	29.661		
2,800.0	2,714.3	2,800.1	2,777.9	13.9	8.2	-173.49	-76.7	-213.3	412.0	398.0	14.02	29.389		
2,900.0	2,810.1	2,899.3	2,875.7	14.5	8.6	-173.38	-81.2	-228.7	425.1	410.5	14.59	29.136		
3,000.0	2,906.0	2,998.4	2,973.5	15.1	8.9	-173.27	-85.7	-244.1	438.2	423.1	15.16	28.899		
3,100.0	3,001.8	3,097.6	3,071.3	15.8	9.3	-173.17	-90.2	-259.5	451.3	435.6	15.74	28.678		
3,200.0	3,097.6	3,196.7	3,169.2	16.4	9.7	-173.07	-94.7	-274.9	464.4	448.1	16.31	28.472		
3,300.0	3,193.4	3,295.8	3,267.0	17.0	10.1	-172.98	-99.3	-290.3	477.5	460.6	16.89	28.278		
3,400.0	3,289.2	3,395.0	3,364.8	17.6	10.4	-172.89	-103.8	-305.7	490.6	473.2	17.46	28.095		
3,500.0	3,385.0	3,494.1	3,462.7	18.2	10.8	-172.81	-108.3	-321.1	503.7	485.7	18.04	27.924		
3,600.0	3,480.8	3,593.2	3,560.5	18.8	11.2	-172.73	-112.8	-336.5	516.8	498.2	18.62	27.761		
3,700.0	3,576.6	3,692.4	3,658.3	19.4	11.6	-172.65	-117.3	-351.9	529.9	510.7	19.19	27.608		
3,800.0	3,672.5	3,791.5	3,756.1	20.1	12.0	-172.58	-121.8	-367.3	543.0	523.3	19.77	27.464		
3,900.0	3,768.3	3,890.6	3,854.0	20.7	12.3	-172.52	-126.3	-382.7	556.1	535.8	20.35	27.326		
4,000.0	3,864.1	3,989.8	3,951.8	21.3	12.7	-172.45	-130.8	-398.1	569.2	548.3	20.93	27.196		
4,100.0	3,959.9	4,088.9	4,049.6	21.9	13.1	-172.39	-135.3	-413.5	582.3	560.8	21.51	27.072		
4,200.0	4,055.7	4,188.0	4,147.5	22.5	13.5	-172.33	-139.8	-428.9	595.4	573.4	22.09	26.955		
4,300.0	4,151.5	4,287.2	4,245.3	23.1	13.9	-172.28	-144.3	-444.3	608.6	585.9	22.67	26.842		
4,400.0	4,247.3	4,386.3	4,343.1	23.8	14.2	-172.22	-148.8	-459.7	621.7	598.4	23.25	26.735		
4,500.0	4,343.1	4,485.5	4,440.9	24.4	14.6	-172.17	-153.3	-475.1	634.8	610.9	23.83	26.633		
4,600.0	4,439.0	4,584.6	4,538.8	25.0	15.0	-172.12	-157.8	-490.5	647.9	623.5	24.41	26.536		
4,700.0	4,534.8	4,683.7	4,636.6	25.6	15.4	-172.07	-162.3	-505.9	661.0	636.0	25.00	26.443		
4,800.0	4,630.6	4,782.9	4,734.4	26.2	15.8	-172.03	-166.8	-521.3	674.1	648.5	25.58	26.353		
4,900.0	4,726.4	4,882.0	4,832.3	26.8	16.1	-171.98	-171.4	-536.7	687.2	661.0	26.16	26.268		
5,000.0	4,822.2	4,981.1	4,930.1	27.5	16.5	-171.94	-175.9	-552.1	700.3	673.6	26.74	26.186		

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

<b>Company:</b>	PETROLEUM DEVELOPMENT CORP Weld County CO	<b>Local Co-ordinate Reference:</b>	Well Collins 18Q-301
<b>Project:</b>	SEC.18-T4N-R64W	<b>TVD Reference:</b>	WELL @ 4799.0ft (Original Well Elev)
<b>Reference Site:</b>	Collins 4N64W18T Pad Sec.18-T4N-R64W	<b>MD Reference:</b>	WELL @ 4799.0ft (Original Well Elev)
<b>Site Error:</b>	0.0ft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Collins 18Q-301	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.0ft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	Wellbore #1	<b>Database:</b>	landmark
<b>Reference Design:</b>	Plan #1 (11-3-14)	<b>Offset TVD Reference:</b>	Offset Datum

Offset Design Collins 4N64W18T Pad Sec.18-T4N-R64W - Collins 18T-341 - Wellbore #1 - Plan #1 (10-27-14)													Offset Site Error:	0.0 ft
Survey Program: 0-MWDD													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	
5,100.0	4,918.0	5,080.3	5,027.9	28.1	16.9	-171.90	-180.4	-567.5	713.4	686.1	27.33	26.107		
5,200.0	5,013.8	5,161.6	5,108.3	28.7	17.1	-171.89	-183.8	-579.3	727.6	699.8	27.82	26.158		
5,300.0	5,109.7	5,240.7	5,186.8	29.3	17.3	-171.94	-186.5	-588.6	744.3	716.0	28.29	26.310		
5,400.0	5,206.3	5,319.5	5,265.2	29.7	17.5	-172.05	-188.7	-595.9	761.0	732.3	28.72	26.499		
5,500.0	5,303.7	5,400.0	5,345.6	30.1	17.6	-172.16	-190.2	-601.1	776.9	747.8	29.10	26.699		
5,600.0	5,401.9	5,476.2	5,421.7	30.4	17.8	-172.29	-191.1	-604.1	791.9	762.5	29.41	26.922		
5,700.0	5,500.6	5,554.5	5,500.0	30.7	17.9	-172.42	-191.4	-605.1	806.1	776.4	29.69	27.151		
5,800.0	5,599.9	5,653.4	5,598.9	30.9	18.0	-172.57	-191.4	-605.1	818.2	788.3	29.96	27.311		
5,900.0	5,699.5	5,753.0	5,698.5	31.1	18.1	-172.67	-191.4	-605.1	826.9	796.7	30.19	27.388		
6,000.0	5,799.3	5,852.9	5,798.3	31.2	18.3	-172.73	-191.4	-605.1	832.1	801.7	30.39	27.382		
6,100.0	5,899.3	5,952.8	5,898.3	31.3	18.4	-172.75	-191.4	-605.1	833.9	803.3	30.56	27.288		
6,200.0	5,999.3	6,052.8	5,998.3	31.4	18.6	89.26	-191.4	-605.1	833.9	803.0	30.89	26.995		
6,300.0	6,099.3	6,152.8	6,098.3	31.5	18.7	89.26	-191.4	-605.1	833.9	802.6	31.22	26.707		
6,400.0	6,199.3	6,252.5	6,197.9	31.6	18.9	89.26	-190.9	-605.1	833.9	802.3	31.55	26.428		
6,500.0	6,298.7	6,351.1	6,296.0	31.7	19.0	89.28	-181.2	-605.1	833.9	802.1	31.81	26.211		
6,600.0	6,396.0	6,450.0	6,392.3	31.7	19.1	89.31	-158.9	-605.1	833.9	801.9	32.00	26.058		
6,700.0	6,489.4	6,548.5	6,484.5	31.8	19.1	89.35	-124.5	-605.1	833.9	801.7	32.14	25.942		
6,800.0	6,577.4	6,647.3	6,571.8	31.8	19.2	89.40	-78.4	-605.1	833.8	801.6	32.29	25.820		
6,900.0	6,658.4	6,746.2	6,652.6	31.8	19.2	89.47	-21.3	-605.1	833.8	801.3	32.52	25.643		
7,000.0	6,731.2	6,845.3	6,725.3	31.8	19.3	89.54	45.8	-605.1	833.8	800.9	32.88	25.357		
7,100.0	6,794.3	6,944.5	6,788.9	31.9	19.4	89.62	121.9	-605.1	833.8	800.4	33.47	24.915		
7,200.0	6,846.8	7,043.9	6,842.1	32.0	19.5	89.71	205.7	-605.1	833.8	799.5	34.33	24.290		
7,300.0	6,887.8	7,143.4	6,884.1	32.1	19.8	89.80	295.9	-605.1	833.8	798.3	35.51	23.483		
7,400.0	6,916.5	7,243.1	6,914.1	32.4	20.3	89.90	390.9	-605.1	833.8	796.8	37.02	22.525		
7,500.0	6,932.5	7,343.0	6,931.4	32.7	20.9	90.00	489.2	-605.1	833.8	795.0	38.84	21.467		
7,505.3	6,933.0	7,348.3	6,932.0	32.7	21.0	90.00	494.5	-605.1	833.8	794.9	38.95	21.408		
7,600.0	6,935.8	7,443.0	6,935.9	33.1	21.8	90.07	589.1	-605.1	833.8	792.9	40.94	20.367		
7,700.0	6,935.1	7,543.0	6,934.9	33.7	22.9	90.06	689.1	-605.1	833.8	790.5	43.27	19.271		
7,800.0	6,934.4	7,643.0	6,933.9	34.3	24.0	90.04	789.1	-605.1	833.8	788.0	45.79	18.211		
7,900.0	6,933.7	7,743.0	6,933.0	35.1	25.3	90.02	889.1	-605.1	833.8	785.3	48.48	17.199		
7,988.8	6,933.1	7,831.8	6,932.1	35.8	26.5	90.00	977.8	-605.1	833.8	782.8	51.00	16.350		
8,000.0	6,933.0	7,843.0	6,932.0	35.9	26.7	90.00	989.1	-605.1	833.8	782.5	51.32	16.248		
8,100.0	6,932.4	7,943.0	6,931.1	36.9	28.1	89.98	1,089.1	-605.1	833.8	779.5	54.28	15.361		
8,200.0	6,931.7	8,043.0	6,930.1	37.9	29.6	89.96	1,189.0	-605.1	833.8	776.5	57.34	14.540		
8,300.0	6,931.0	8,143.0	6,929.1	39.0	31.1	89.94	1,289.0	-605.1	833.8	773.3	60.50	13.782		
8,400.0	6,930.3	8,243.0	6,928.2	40.2	32.7	89.92	1,389.0	-605.1	833.8	770.1	63.73	13.084		
8,500.0	6,929.6	8,343.0	6,927.2	41.4	34.3	89.90	1,489.0	-605.1	833.8	766.8	67.02	12.442		
8,600.0	6,929.0	8,443.0	6,926.3	42.8	36.0	89.88	1,589.0	-605.1	833.8	763.4	70.36	11.850		
8,700.0	6,928.3	8,543.0	6,925.3	44.1	37.6	89.86	1,689.0	-605.1	833.8	760.0	73.76	11.304		
8,800.0	6,927.6	8,643.0	6,924.3	45.5	39.3	89.84	1,789.0	-605.1	833.8	756.6	77.20	10.801		
8,900.0	6,926.9	8,743.0	6,923.4	47.0	41.0	89.83	1,889.0	-605.1	833.8	753.1	80.67	10.336		
9,000.0	6,926.2	8,843.0	6,922.4	48.5	42.8	89.81	1,989.0	-605.1	833.8	749.6	84.17	9.906		
9,100.0	6,925.6	8,943.0	6,921.5	50.0	44.5	89.79	2,089.0	-605.1	833.8	746.1	87.70	9.507		
9,200.0	6,924.9	9,043.0	6,920.5	51.5	46.3	89.77	2,189.0	-605.1	833.8	742.5	91.26	9.137		
9,300.0	6,924.2	9,143.0	6,919.5	53.1	48.0	89.75	2,289.0	-605.1	833.8	739.0	94.84	8.792		
9,400.0	6,923.5	9,243.0	6,918.6	54.7	49.8	89.73	2,389.0	-605.1	833.8	735.4	98.44	8.471		
9,500.0	6,922.8	9,343.0	6,917.6	56.4	51.6	89.71	2,489.0	-605.1	833.8	731.8	102.05	8.171		
9,600.0	6,922.2	9,443.0	6,916.7	58.0	53.4	89.69	2,589.0	-605.1	833.8	728.1	105.68	7.890		
9,700.0	6,921.5	9,543.0	6,915.7	59.7	55.2	89.67	2,689.0	-605.1	833.8	724.5	109.33	7.627		
9,800.0	6,920.8	9,643.0	6,914.7	61.3	57.0	89.65	2,789.0	-605.1	833.8	720.8	112.98	7.380		
9,900.0	6,920.1	9,743.0	6,913.8	63.0	58.9	89.63	2,889.0	-605.1	833.8	717.2	116.65	7.148		

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

<b>Company:</b>	PETROLEUM DEVELOPMENT CORP Weld County CO	<b>Local Co-ordinate Reference:</b>	Well Collins 18Q-301
<b>Project:</b>	SEC.18-T4N-R64W	<b>TVD Reference:</b>	WELL @ 4799.0ft (Original Well Elev)
<b>Reference Site:</b>	Collins 4N64W18T Pad Sec.18-T4N-R64W	<b>MD Reference:</b>	WELL @ 4799.0ft (Original Well Elev)
<b>Site Error:</b>	0.0ft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Collins 18Q-301	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.0ft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	Wellbore #1	<b>Database:</b>	landmark
<b>Reference Design:</b>	Plan #1 (11-3-14)	<b>Offset TVD Reference:</b>	Offset Datum

Offset Design Collins 4N64W18T Pad Sec.18-T4N-R64W - Collins 18T-341 - Wellbore #1 - Plan #1 (10-27-14)													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)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning	
10,000.0	6,919.4	9,843.0	6,912.8	64.7	60.7	89.61	2,989.0	-605.1	833.8	713.5	120.33	6.929		
10,100.0	6,918.7	9,943.0	6,911.9	66.4	62.5	89.59	3,089.0	-605.1	833.8	709.8	124.02	6.723		
10,200.0	6,918.1	10,043.0	6,910.9	68.2	64.3	89.58	3,188.9	-605.1	833.8	706.1	127.72	6.529		
10,300.0	6,917.4	10,143.0	6,909.9	69.9	66.2	89.56	3,288.9	-605.1	833.8	702.4	131.42	6.345		
10,400.0	6,916.7	10,243.0	6,909.0	71.7	68.0	89.54	3,388.9	-605.1	833.8	698.7	135.14	6.170		
10,500.0	6,916.0	10,343.0	6,908.0	73.4	69.9	89.52	3,488.9	-605.1	833.8	695.0	138.86	6.005		
10,600.0	6,915.3	10,443.0	6,907.1	75.2	71.7	89.50	3,588.9	-605.1	833.8	691.3	142.58	5.848		
10,700.0	6,914.7	10,543.0	6,906.1	77.0	73.6	89.48	3,688.9	-605.1	833.8	687.5	146.31	5.699		
10,800.0	6,914.0	10,643.0	6,905.1	78.7	75.5	89.46	3,788.9	-605.1	833.8	683.8	150.05	5.557		
10,900.0	6,913.3	10,743.0	6,904.2	80.5	77.3	89.44	3,888.9	-605.1	833.8	680.0	153.79	5.422		
11,000.0	6,912.6	10,843.0	6,903.2	82.3	79.2	89.42	3,988.9	-605.1	833.8	676.3	157.54	5.293		
11,100.0	6,911.9	10,943.0	6,902.3	84.1	81.1	89.40	4,088.9	-605.1	833.8	672.6	161.29	5.170		
11,200.0	6,911.3	11,043.0	6,901.3	85.9	82.9	89.38	4,188.9	-605.1	833.8	668.8	165.04	5.052		
11,300.0	6,910.6	11,143.0	6,900.3	87.7	84.8	89.36	4,288.9	-605.1	833.9	665.1	168.80	4.940		
11,400.0	6,909.9	11,243.0	6,899.4	89.5	86.7	89.35	4,388.9	-605.1	833.9	661.3	172.56	4.832		
11,500.0	6,909.2	11,343.0	6,898.4	91.4	88.6	89.33	4,488.9	-605.1	833.9	657.5	176.32	4.729		
11,532.1	6,909.0	11,375.1	6,898.1	91.9	89.2	89.32	4,521.0	-605.1	833.9	656.3	177.53	4.697 SF		

<b>Company:</b>	PETROLEUM DEVELOPMENT CORP Weld County CO	<b>Local Co-ordinate Reference:</b>	Well Collins 18Q-301
<b>Project:</b>	SEC.18-T4N-R64W	<b>TVD Reference:</b>	WELL @ 4799.0ft (Original Well Elev)
<b>Reference Site:</b>	Collins 4N64W18T Pad Sec.18-T4N-R64W	<b>MD Reference:</b>	WELL @ 4799.0ft (Original Well Elev)
<b>Site Error:</b>	0.0ft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Collins 18Q-301	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.0ft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	Wellbore #1	<b>Database:</b>	landmark
<b>Reference Design:</b>	Plan #1 (11-3-14)	<b>Offset TVD Reference:</b>	Offset Datum

<b>Offset Design</b> Existing Wells Sec. 7-T4N-R64W - Frick 32-18 (Exist.) - Wellbore #1 - Wellbore #1												<b>Offset Site Error:</b>	0.0 ft
Survey Program: 7160-UNKNOWN												<b>Offset Well Error:</b>	0.0 ft
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Semi Major Axis Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
9,200.0	6,924.9	6,927.9	6,927.9	51.5	138.6	90.94	3,078.4	-1,068.1	963.6	778.9	184.68	5.218	
9,300.0	6,924.2	6,927.2	6,927.2	53.1	138.5	90.83	3,078.4	-1,068.1	872.1	685.7	186.43	4.678	
9,400.0	6,923.5	6,926.5	6,926.5	54.7	138.5	90.72	3,078.4	-1,068.1	782.8	594.6	188.20	4.159	
9,500.0	6,922.8	6,925.8	6,925.8	56.4	138.5	90.62	3,078.4	-1,068.1	696.3	506.4	189.97	3.665	
9,600.0	6,922.2	6,925.2	6,925.2	58.0	138.5	90.51	3,078.4	-1,068.1	614.0	422.3	191.75	3.202	
9,700.0	6,921.5	6,924.5	6,924.5	59.7	138.5	90.41	3,078.4	-1,068.1	537.7	344.2	193.55	2.778	
9,800.0	6,920.8	6,923.8	6,923.8	61.3	138.5	90.30	3,078.4	-1,068.1	470.4	275.0	195.34	2.408	
9,900.0	6,920.1	6,923.1	6,923.1	63.0	138.5	90.20	3,078.4	-1,068.1	416.4	219.2	197.15	2.112	
10,000.0	6,919.4	6,922.4	6,922.4	64.7	138.4	90.09	3,078.4	-1,068.1	381.4	182.5	198.96	1.917	
10,089.4	6,918.8	6,921.8	6,921.8	66.3	138.4	90.00	3,078.4	-1,068.1	370.8	170.2	200.58	1.849 CC	
10,100.0	6,918.7	6,921.7	6,921.7	66.4	138.4	89.99	3,078.4	-1,068.1	371.0	170.2	200.77	1.848 ES, SF	
10,200.0	6,918.1	6,921.1	6,921.1	68.2	138.4	89.88	3,078.4	-1,068.1	387.0	184.4	202.59	1.910	
10,300.0	6,917.4	6,920.4	6,920.4	69.9	138.4	89.78	3,078.4	-1,068.1	426.4	222.0	204.41	2.086	
10,400.0	6,916.7	6,919.7	6,919.7	71.7	138.4	89.67	3,078.4	-1,068.1	483.7	277.5	206.23	2.345	
10,500.0	6,916.0	6,919.0	6,919.0	73.4	138.4	89.57	3,078.4	-1,068.1	553.3	345.2	208.06	2.659	
10,600.0	6,915.3	6,918.3	6,918.3	75.2	138.4	89.46	3,078.4	-1,068.1	631.0	421.1	209.89	3.006	
10,700.0	6,914.7	6,917.7	6,917.7	77.0	138.4	89.36	3,078.4	-1,068.1	714.4	502.6	211.73	3.374	
10,800.0	6,914.0	6,917.0	6,917.0	78.7	138.3	89.25	3,078.4	-1,068.1	801.5	588.0	213.56	3.753	
10,900.0	6,913.3	6,916.3	6,916.3	80.5	138.3	89.15	3,078.4	-1,068.1	891.4	676.0	215.40	4.138	
11,000.0	6,912.6	6,915.6	6,915.6	82.3	138.3	89.04	3,078.4	-1,068.1	983.2	765.9	217.24	4.526	

<b>Company:</b>	PETROLEUM DEVELOPMENT CORP Weld County CO	<b>Local Co-ordinate Reference:</b>	Well Collins 18Q-301
<b>Project:</b>	SEC.18-T4N-R64W	<b>TVD Reference:</b>	WELL @ 4799.0ft (Original Well Elev)
<b>Reference Site:</b>	Collins 4N64W18T Pad Sec.18-T4N-R64W	<b>MD Reference:</b>	WELL @ 4799.0ft (Original Well Elev)
<b>Site Error:</b>	0.0ft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Collins 18Q-301	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.0ft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	Wellbore #1	<b>Database:</b>	landmark
<b>Reference Design:</b>	Plan #1 (11-3-14)	<b>Offset TVD Reference:</b>	Offset Datum

<b>Offset Design</b> Existing Wells Sec. 7-T4N-R64W - Frick C 18-2 (Exist.) - Wellbore #1 - Wellbore #1													<b>Offset Site Error:</b>	0.0 ft
Survey Program: 7186-UNKNOWN													<b>Offset Well Error:</b>	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
10,400.0	6,916.7	6,918.7	6,918.7	71.7	138.4	90.63	90.63	4,189.5	-942.6	941.9	735.6	206.29	4.566	
10,500.0	6,916.0	6,918.0	6,918.0	73.4	138.4	90.55	90.55	4,189.5	-942.6	858.6	650.4	208.12	4.125	
10,600.0	6,915.3	6,917.3	6,917.3	75.2	138.3	90.47	90.47	4,189.5	-942.6	779.1	569.2	209.96	3.711	
10,700.0	6,914.7	6,916.7	6,916.7	77.0	138.3	90.39	90.39	4,189.5	-942.6	704.9	493.1	211.80	3.328	
10,800.0	6,914.0	6,916.0	6,916.0	78.7	138.3	90.31	90.31	4,189.5	-942.6	637.8	424.2	213.65	2.985	
10,900.0	6,913.3	6,915.3	6,915.3	80.5	138.3	90.24	90.24	4,189.5	-942.6	580.3	364.8	215.49	2.693	
11,000.0	6,912.6	6,914.6	6,914.6	82.3	138.3	90.16	90.16	4,189.5	-942.6	535.3	318.0	217.34	2.463	
11,100.0	6,911.9	6,913.9	6,913.9	84.1	138.3	90.08	90.08	4,189.5	-942.6	506.4	287.2	219.19	2.310	
11,200.0	6,911.3	6,913.3	6,913.3	85.9	138.3	90.00	90.00	4,189.5	-942.6	496.4	275.3	221.05	2.245	
11,200.6	6,911.3	6,913.3	6,913.3	85.9	138.3	90.00	90.00	4,189.5	-942.6	496.4	275.3	221.06	2.245	CC, ES, SF
11,300.0	6,910.6	6,912.6	6,912.6	87.7	138.3	89.92	89.92	4,189.5	-942.6	506.2	283.3	222.90	2.271	
11,400.0	6,909.9	6,911.9	6,911.9	89.5	138.2	89.84	89.84	4,189.5	-942.6	534.9	310.2	224.76	2.380	
11,500.0	6,909.2	6,911.2	6,911.2	91.4	138.2	89.76	89.76	4,189.5	-942.6	579.7	353.1	226.62	2.558	
11,532.1	6,909.0	6,911.0	6,911.0	91.9	138.2	89.74	89.74	4,189.5	-942.6	596.9	369.7	227.21	2.627	

<b>Company:</b>	PETROLEUM DEVELOPMENT CORP Weld County CO	<b>Local Co-ordinate Reference:</b>	Well Collins 18Q-301
<b>Project:</b>	SEC.18-T4N-R64W	<b>TVD Reference:</b>	WELL @ 4799.0ft (Original Well Elev)
<b>Reference Site:</b>	Collins 4N64W18T Pad Sec.18-T4N-R64W	<b>MD Reference:</b>	WELL @ 4799.0ft (Original Well Elev)
<b>Site Error:</b>	0.0ft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Collins 18Q-301	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.0ft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	Wellbore #1	<b>Database:</b>	landmark
<b>Reference Design:</b>	Plan #1 (11-3-14)	<b>Offset TVD Reference:</b>	Offset Datum

Offset Design Existing Wells Sec. 7-T4N-R64W - Fry 21-6I (Exist.) - Wellbore #1 - Wellbore #1													Offset Site Error:	0.0 ft
Survey Program: 644-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)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
9,800.0	6,920.8	7,072.6	6,977.9	61.3	235.2	-96.99		3,677.4	-1,628.0	908.5	625.6	282.83	3.212	
9,900.0	6,920.1	7,070.0	6,975.3	63.0	235.1	-96.21		3,677.5	-1,628.0	811.0	526.2	284.79	2.848	
10,000.0	6,919.4	7,067.4	6,972.7	64.7	235.0	-95.43		3,677.5	-1,628.0	714.1	427.4	286.71	2.491	
10,100.0	6,918.7	7,064.7	6,970.1	66.4	235.0	-94.63		3,677.6	-1,628.0	618.3	329.7	288.58	2.143	
10,200.0	6,918.1	7,062.0	6,967.3	68.2	234.9	-93.81		3,677.6	-1,628.0	524.0	233.6	290.41	1.804	
10,300.0	6,917.4	7,059.3	6,964.6	69.9	234.8	-92.99		3,677.7	-1,628.0	432.3	140.1	292.21	1.479	Level 3
10,400.0	6,916.7	7,056.5	6,961.9	71.7	234.8	-92.15		3,677.7	-1,628.0	345.2	51.2	293.96	1.174	Level 2
10,500.0	6,916.0	7,053.7	6,959.1	73.4	234.7	-91.31		3,677.8	-1,628.0	267.2	-28.5	295.65	0.904	Level 1
10,600.0	6,915.3	7,050.9	6,956.2	75.2	234.7	-90.46		3,677.9	-1,627.9	208.9	-88.4	297.28	0.703	Level 1
10,688.9	6,914.7	7,048.4	6,953.7	76.8	234.6	-89.69		3,677.9	-1,627.9	189.0	-109.7	298.68	0.633	Level 1, CC, ES, SF
10,700.0	6,914.7	7,048.1	6,953.4	77.0	234.6	-89.60		3,677.9	-1,627.9	189.3	-109.5	298.85	0.634	Level 1
10,800.0	6,914.0	7,045.2	6,950.5	78.7	234.5	-88.73		3,678.0	-1,627.9	219.2	-81.1	300.36	0.730	Level 1
10,900.0	6,913.3	7,042.3	6,947.7	80.5	234.5	-87.86		3,678.0	-1,627.9	283.3	-18.5	301.80	0.939	Level 1
11,000.0	6,912.6	7,039.4	6,944.8	82.3	234.4	-86.98		3,678.1	-1,627.9	363.9	60.7	303.17	1.200	Level 2
11,100.0	6,911.9	7,036.5	6,941.8	84.1	234.4	-86.10		3,678.2	-1,627.9	452.3	147.8	304.47	1.486	Level 3
11,200.0	6,911.3	7,033.5	6,938.9	85.9	234.3	-85.21		3,678.2	-1,627.8	544.7	239.0	305.70	1.782	
11,300.0	6,910.6	7,030.6	6,935.9	87.7	234.2	-84.31		3,678.3	-1,627.8	639.4	332.6	306.85	2.084	
11,400.0	6,909.9	7,027.6	6,932.9	89.5	234.2	-83.42		3,678.4	-1,627.8	735.5	427.6	307.92	2.389	
11,500.0	6,909.2	7,024.6	6,929.9	91.4	234.1	-82.51		3,678.4	-1,627.8	832.5	523.6	308.91	2.695	
11,532.1	6,909.0	7,023.6	6,928.9	91.9	234.1	-82.22		3,678.4	-1,627.8	863.8	554.6	309.21	2.793	

<b>Company:</b>	PETROLEUM DEVELOPMENT CORP Weld County CO	<b>Local Co-ordinate Reference:</b>	Well Collins 18Q-301
<b>Project:</b>	SEC.18-T4N-R64W	<b>TVD Reference:</b>	WELL @ 4799.0ft (Original Well Elev)
<b>Reference Site:</b>	Collins 4N64W18T Pad Sec.18-T4N-R64W	<b>MD Reference:</b>	WELL @ 4799.0ft (Original Well Elev)
<b>Site Error:</b>	0.0ft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Collins 18Q-301	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.0ft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	Wellbore #1	<b>Database:</b>	landmark
<b>Reference Design:</b>	Plan #1 (11-3-14)	<b>Offset TVD Reference:</b>	Offset Datum

Offset Design													Offset Site Error:	0.0 ft
Survey Program: 128-Reference													Offset Well Error:	0.0 ft
NEI C18-32D Pad Sec.18-T4N-R64W - NEI C18-21D - Wellbore #1 - Wellbore #1														
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Semi Major Axis 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	
8,600.0	6,929.0	7,051.7	6,983.1	42.8	18.0	96.01	2,521.6	-1,329.7	939.0	887.3	51.68	18.169		
8,700.0	6,928.3	7,050.3	6,981.7	44.1	18.0	95.27	2,521.6	-1,329.7	839.7	786.4	53.34	15.744		
8,800.0	6,927.6	7,048.9	6,980.3	45.5	18.0	94.54	2,521.7	-1,329.7	740.7	685.7	55.01	13.464		
8,900.0	6,926.9	7,047.6	6,978.9	47.0	18.0	93.82	2,521.7	-1,329.7	642.0	585.3	56.71	11.321		
9,000.0	6,926.2	7,046.2	6,977.6	48.5	18.0	93.12	2,521.7	-1,329.8	543.7	485.3	58.42	9.307		
9,100.0	6,925.6	7,044.9	6,976.2	50.0	18.0	92.42	2,521.7	-1,329.8	446.2	386.1	60.14	7.420		
9,200.0	6,924.9	7,043.5	6,974.9	51.5	18.0	91.73	2,521.7	-1,329.8	350.1	288.2	61.87	5.659		
9,300.0	6,924.2	7,042.3	6,973.6	53.1	18.0	91.05	2,521.7	-1,329.8	257.0	193.4	63.60	4.041		
9,400.0	6,923.5	7,041.0	6,972.3	54.7	18.0	90.38	2,521.7	-1,329.8	171.8	106.4	65.34	2.629		
9,500.0	6,922.8	7,039.7	6,971.1	56.4	18.0	89.73	2,521.7	-1,329.8	113.9	46.8	67.09	1.698		
9,532.7	6,922.6	7,039.3	6,970.7	56.9	18.0	89.51	2,521.7	-1,329.8	109.1	41.4	67.66	1.612 CC, ES, SF		
9,600.0	6,922.2	7,038.5	6,969.9	58.0	18.0	89.08	2,521.7	-1,329.8	128.2	59.4	68.84	1.862		
9,700.0	6,921.5	7,037.3	6,968.6	59.7	18.0	88.44	2,521.7	-1,329.8	199.7	129.1	70.59	2.829		
9,800.0	6,920.8	7,036.1	6,967.4	61.3	18.0	87.81	2,521.7	-1,329.8	288.7	216.4	72.34	3.991		
9,900.0	6,920.1	7,034.9	6,966.3	63.0	18.0	87.19	2,521.7	-1,329.8	383.1	309.0	74.10	5.171		
10,000.0	6,919.4	7,033.7	6,965.1	64.7	18.0	86.58	2,521.7	-1,329.9	479.8	404.0	75.85	6.326		
10,100.0	6,918.7	7,032.6	6,963.9	66.4	18.0	85.98	2,521.7	-1,329.9	577.7	500.1	77.60	7.444		
10,200.0	6,918.1	7,031.5	6,962.8	68.2	18.0	85.39	2,521.8	-1,329.9	676.1	596.8	79.34	8.521		
10,300.0	6,917.4	7,030.3	6,961.7	69.9	18.0	84.81	2,521.8	-1,329.9	775.0	693.9	81.09	9.557		
10,400.0	6,916.7	7,029.2	6,960.6	71.7	17.9	84.23	2,521.8	-1,329.9	874.1	791.3	82.83	10.553		
10,500.0	6,916.0	7,028.2	6,959.5	73.4	17.9	83.67	2,521.8	-1,329.9	973.4	888.8	84.56	11.510		

<b>Company:</b>	PETROLEUM DEVELOPMENT CORP Weld County CO	<b>Local Co-ordinate Reference:</b>	Well Collins 18Q-301
<b>Project:</b>	SEC.18-T4N-R64W	<b>TVD Reference:</b>	WELL @ 4799.0ft (Original Well Elev)
<b>Reference Site:</b>	Collins 4N64W18T Pad Sec.18-T4N-R64W	<b>MD Reference:</b>	WELL @ 4799.0ft (Original Well Elev)
<b>Site Error:</b>	0.0ft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Collins 18Q-301	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.0ft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	Wellbore #1	<b>Database:</b>	landmark
<b>Reference Design:</b>	Plan #1 (11-3-14)	<b>Offset TVD Reference:</b>	Offset Datum

<b>Offset Design</b> NEI C18-32D Pad Sec.18-T4N-R64W - NEI C18-24D - Wellbore #1 - Wellbore #1												<b>Offset Site Error:</b>	0.0 ft
Survey Program: 731-Reference												<b>Offset Well Error:</b>	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
7,200.0	6,846.8	7,064.4	6,901.4	32.0	25.6	12.36	1,193.2	-1,338.5	994.7	965.4	29.29	33.955	
7,300.0	6,887.8	7,106.9	6,943.8	32.1	25.7	18.25	1,192.8	-1,337.9	903.7	876.6	27.06	33.393	
7,400.0	6,916.5	7,135.9	6,972.9	32.4	25.7	30.58	1,192.5	-1,337.5	808.4	780.3	28.11	28.763	
7,500.0	6,932.5	7,151.0	6,988.0	32.7	25.8	59.70	1,192.3	-1,337.3	710.5	672.5	37.97	18.709	
7,600.0	6,935.8	7,153.2	6,990.2	33.1	25.8	95.92	1,192.3	-1,337.3	611.7	566.3	45.46	13.456	
7,700.0	6,935.1	7,151.0	6,988.0	33.7	25.8	94.67	1,192.3	-1,337.3	513.4	466.9	46.55	11.029	
7,800.0	6,934.4	7,149.3	6,986.2	34.3	25.8	93.70	1,192.3	-1,337.4	415.9	368.1	47.73	8.712	
7,900.0	6,933.7	7,147.3	6,984.2	35.1	25.8	92.56	1,192.4	-1,337.4	319.9	270.9	48.98	6.530	
8,000.0	6,933.0	7,145.3	6,982.2	35.9	25.8	91.44	1,192.4	-1,337.4	227.3	177.0	50.30	4.518	
8,100.0	6,932.4	7,143.3	6,980.3	36.9	25.7	90.33	1,192.4	-1,337.4	144.8	93.2	51.66	2.804	
8,200.0	6,931.7	7,141.4	6,978.3	37.9	25.7	89.24	1,192.4	-1,337.5	101.5	48.5	53.06	1.913	
8,203.4	6,931.7	7,141.3	6,978.2	37.9	25.7	89.20	1,192.4	-1,337.5	101.5	48.3	53.11	1.910	CC, ES, SF
8,300.0	6,931.0	7,139.4	6,976.4	39.0	25.7	88.15	1,192.5	-1,337.5	140.1	85.6	54.49	2.571	
8,400.0	6,930.3	7,137.5	6,974.5	40.2	25.7	87.08	1,192.5	-1,337.5	221.2	165.3	55.95	3.954	
8,500.0	6,929.6	7,135.7	6,972.6	41.4	25.7	86.03	1,192.5	-1,337.5	313.4	256.0	57.43	5.458	
8,600.0	6,929.0	7,133.8	6,970.8	42.8	25.7	84.98	1,192.5	-1,337.6	409.3	350.4	58.92	6.947	
8,700.0	6,928.3	7,132.0	6,968.9	44.1	25.7	83.96	1,192.6	-1,337.6	506.8	446.4	60.42	8.387	
8,800.0	6,927.6	7,130.2	6,967.1	45.5	25.7	82.94	1,192.6	-1,337.6	605.1	543.1	61.93	9.770	
8,900.0	6,926.9	7,128.4	6,965.3	47.0	25.7	81.95	1,192.6	-1,337.7	703.8	640.4	63.44	11.095	
9,000.0	6,926.2	7,126.6	6,963.6	48.5	25.7	80.96	1,192.6	-1,337.7	802.9	738.0	64.95	12.363	
9,100.0	6,925.6	7,124.8	6,961.8	50.0	25.7	80.00	1,192.6	-1,337.7	902.2	835.7	66.45	13.577	



<b>Company:</b>	PETROLEUM DEVELOPMENT CORP Weld County CO	<b>Local Co-ordinate Reference:</b>	Well Collins 18Q-301
<b>Project:</b>	SEC.18-T4N-R64W	<b>TVD Reference:</b>	WELL @ 4799.0ft (Original Well Elev)
<b>Reference Site:</b>	Collins 4N64W18T Pad Sec.18-T4N-R64W	<b>MD Reference:</b>	WELL @ 4799.0ft (Original Well Elev)
<b>Site Error:</b>	0.0ft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Collins 18Q-301	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.0ft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	Wellbore #1	<b>Database:</b>	landmark
<b>Reference Design:</b>	Plan #1 (11-3-14)	<b>Offset TVD Reference:</b>	Offset Datum

Offset Design NEI C18-32D Pad Sec.18-T4N-R64W - Schneider/Dic/Colton 34-18 (SI) - Wellbore #1 - Design #1												Offset Site Error:	0.0 ft
Survey Program: 0-Reference												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
900.0	893.1	909.1	909.1	2.5	1.9	33.27	400.8	-990.1	995.4	991.3	4.09	243.647	
1,000.0	989.6	1,005.6	1,005.6	3.0	2.1	34.35	400.8	-990.1	973.7	969.0	4.67	208.698	
1,100.0	1,085.5	1,101.5	1,101.5	3.6	2.4	35.40	400.8	-990.1	950.0	944.7	5.28	179.797	
1,200.0	1,181.3	1,197.3	1,197.3	4.2	2.6	36.41	400.8	-990.1	926.5	920.5	5.93	156.351	
1,300.0	1,277.1	1,293.1	1,293.1	4.8	2.8	37.47	400.8	-990.1	903.2	896.6	6.59	137.114	
1,400.0	1,372.9	1,388.9	1,388.9	5.4	3.0	38.58	400.8	-990.1	880.3	873.0	7.27	121.117	
1,500.0	1,468.8	1,484.8	1,484.8	6.0	3.2	39.76	400.8	-990.1	857.7	849.8	7.97	107.652	
1,600.0	1,564.6	1,580.6	1,580.6	6.6	3.4	40.99	400.8	-990.1	835.5	826.9	8.69	96.197	
1,700.0	1,660.4	1,676.4	1,676.4	7.2	3.7	42.29	400.8	-990.1	813.7	804.3	9.42	86.361	
1,800.0	1,756.2	1,772.2	1,772.2	7.8	3.9	43.65	400.8	-990.1	792.4	782.2	10.18	77.848	
1,900.0	1,852.0	1,868.0	1,868.0	8.4	4.1	45.09	400.8	-990.1	771.5	760.5	10.95	70.428	
2,000.0	1,947.8	1,963.8	1,963.8	9.0	4.3	46.61	400.8	-990.1	751.1	739.4	11.75	63.924	
2,100.0	2,043.6	2,059.6	2,059.6	9.6	4.5	48.20	400.8	-990.1	731.3	718.7	12.57	58.193	
2,200.0	2,139.4	2,155.4	2,155.4	10.2	4.7	49.87	400.8	-990.1	712.1	698.7	13.40	53.125	
2,300.0	2,235.3	2,251.3	2,251.3	10.8	4.9	51.64	400.8	-990.1	693.5	679.2	14.26	48.627	
2,400.0	2,331.1	2,347.1	2,347.1	11.5	5.2	53.49	400.8	-990.1	675.6	660.5	15.14	44.625	
2,500.0	2,426.9	2,442.9	2,442.9	12.1	5.4	55.44	400.8	-990.1	658.5	642.4	16.04	41.059	
2,600.0	2,522.7	2,538.7	2,538.7	12.7	5.6	57.48	400.8	-990.1	642.2	625.2	16.95	37.878	
2,700.0	2,618.5	2,634.5	2,634.5	13.3	5.8	59.62	400.8	-990.1	626.8	608.9	17.89	35.038	
2,800.0	2,714.3	2,730.3	2,730.3	13.9	6.0	61.86	400.8	-990.1	612.3	593.5	18.84	32.505	
2,900.0	2,810.1	2,826.1	2,826.1	14.5	6.2	64.19	400.8	-990.1	598.9	579.1	19.80	30.248	
3,000.0	2,906.0	2,922.0	2,922.0	15.1	6.5	66.62	400.8	-990.1	586.5	565.8	20.77	28.240	
3,100.0	3,001.8	3,017.8	3,017.8	15.8	6.7	69.14	400.8	-990.1	575.4	553.6	21.74	26.460	
3,200.0	3,097.6	3,113.6	3,113.6	16.4	6.9	71.75	400.8	-990.1	565.4	542.7	22.72	24.886	
3,300.0	3,193.4	3,209.4	3,209.4	17.0	7.1	74.44	400.8	-990.1	556.7	533.1	23.69	23.503	
3,400.0	3,289.2	3,305.2	3,305.2	17.6	7.3	77.21	400.8	-990.1	549.4	524.8	24.65	22.293	
3,500.0	3,385.0	3,401.0	3,401.0	18.2	7.5	80.03	400.8	-990.1	543.6	518.0	25.59	21.243	
3,600.0	3,480.8	3,496.8	3,496.8	18.8	7.7	82.91	400.8	-990.1	539.1	512.6	26.50	20.341	
3,700.0	3,576.6	3,592.6	3,592.6	19.4	8.0	85.82	400.8	-990.1	536.2	508.8	27.39	19.575	
3,800.0	3,672.5	3,688.5	3,688.5	20.1	8.2	88.75	400.8	-990.1	534.8	506.5	28.24	18.934	
3,842.5	3,713.2	3,729.2	3,729.2	20.3	8.3	90.00	400.8	-990.1	534.6	506.0	28.59	18.697	
3,900.0	3,768.3	3,784.3	3,784.3	20.7	8.4	91.69	400.8	-990.1	534.9	505.8	29.06	18.408	
4,000.0	3,864.1	3,880.1	3,880.1	21.3	8.6	94.62	400.8	-990.1	536.5	506.7	29.83	17.988	
4,100.0	3,959.9	3,975.9	3,975.9	21.9	8.8	97.53	400.8	-990.1	539.7	509.1	30.55	17.664	
4,200.0	4,055.7	4,071.7	4,071.7	22.5	9.0	100.40	400.8	-990.1	544.3	513.1	31.23	17.430	
4,300.0	4,151.5	4,167.5	4,167.5	23.1	9.3	103.21	400.8	-990.1	550.4	518.6	31.86	17.276	
4,400.0	4,247.3	4,263.3	4,263.3	23.8	9.5	105.96	400.8	-990.1	558.0	525.5	32.45	17.195	
4,500.0	4,343.1	4,359.1	4,359.1	24.4	9.7	108.64	400.8	-990.1	566.8	533.8	32.99	17.180	
4,600.0	4,439.0	4,455.0	4,455.0	25.0	9.9	111.24	400.8	-990.1	577.0	543.5	33.49	17.226	
4,700.0	4,534.8	4,550.8	4,550.8	25.6	10.1	113.75	400.8	-990.1	588.3	554.4	33.96	17.325	
4,800.0	4,630.6	4,646.6	4,646.6	26.2	10.3	116.17	400.8	-990.1	600.8	566.4	34.39	17.471	
4,900.0	4,726.4	4,742.4	4,742.4	26.8	10.5	118.49	400.8	-990.1	614.4	579.6	34.79	17.660	
5,000.0	4,822.2	4,838.2	4,838.2	27.5	10.8	120.71	400.8	-990.1	629.0	593.9	35.17	17.886	
5,100.0	4,918.0	4,934.0	4,934.0	28.1	11.0	122.83	400.8	-990.1	644.6	609.1	35.52	18.145	
5,200.0	5,013.8	5,029.8	5,029.8	28.7	11.2	124.86	400.8	-990.1	661.0	625.1	35.86	18.432	
5,300.0	5,109.7	5,125.7	5,125.7	29.3	11.4	126.87	400.8	-990.1	678.1	642.0	36.16	18.754	
5,400.0	5,206.3	5,222.3	5,222.3	29.7	11.6	128.80	400.8	-990.1	694.4	658.0	36.35	19.103	
5,500.0	5,303.7	5,319.7	5,319.7	30.1	11.8	130.42	400.8	-990.1	708.9	672.4	36.55	19.397	
5,600.0	5,401.9	5,417.9	5,417.9	30.4	12.1	131.76	400.8	-990.1	721.6	684.9	36.76	19.630	
5,700.0	5,500.6	5,516.6	5,516.6	30.7	12.3	132.82	400.8	-990.1	732.3	695.3	36.99	19.798	
5,800.0	5,599.9	5,615.9	5,615.9	30.9	12.5	133.64	400.8	-990.1	740.6	703.4	37.22	19.898	

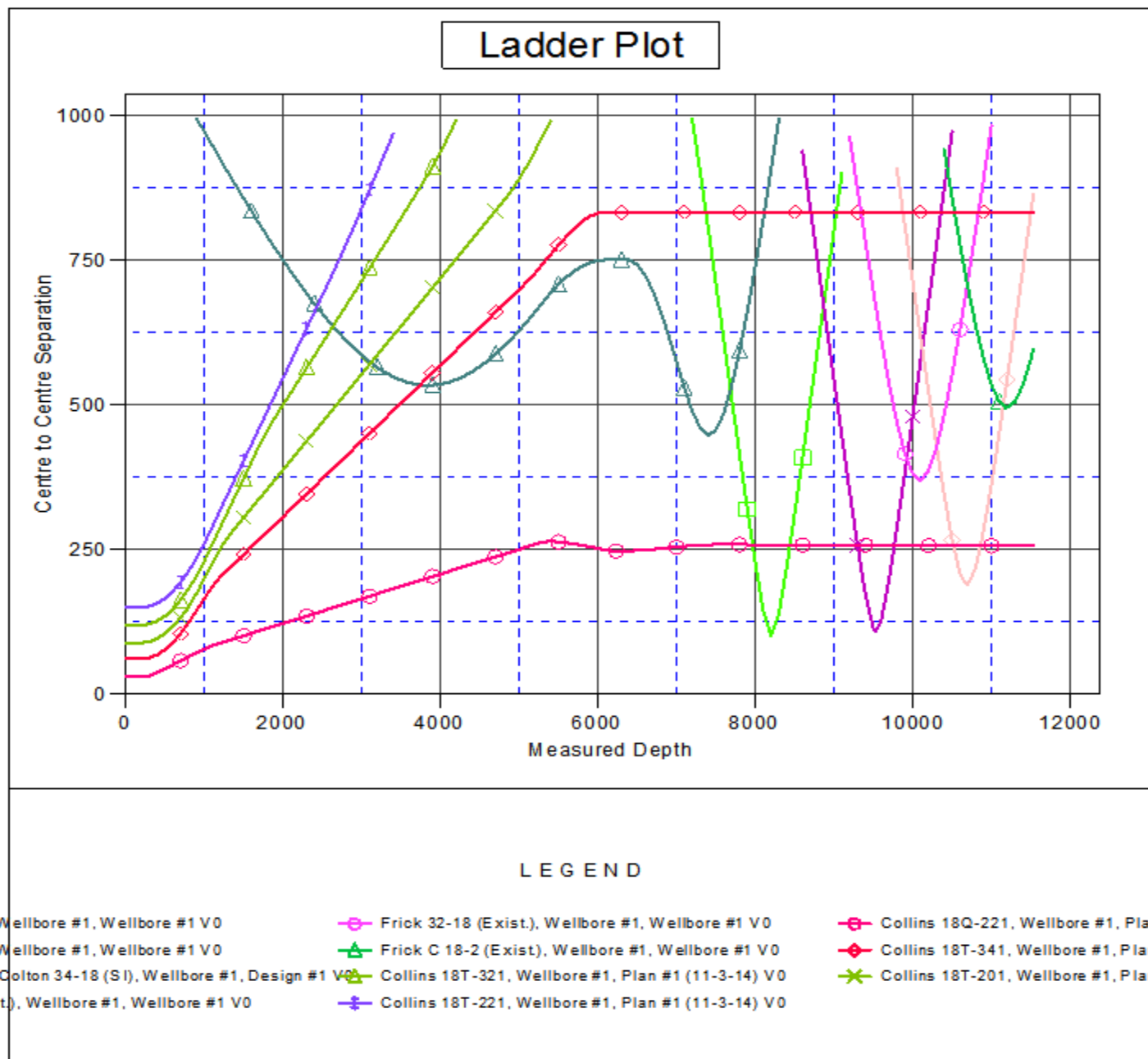
CC - Min centre to center distance or convergent point, SF - min separation factor, ES - min ellipse separation

<b>Company:</b>	PETROLEUM DEVELOPMENT CORP Weld County CO	<b>Local Co-ordinate Reference:</b>	Well Collins 18Q-301
<b>Project:</b>	SEC.18-T4N-R64W	<b>TVD Reference:</b>	WELL @ 4799.0ft (Original Well Elev)
<b>Reference Site:</b>	Collins 4N64W18T Pad Sec.18-T4N-R64W	<b>MD Reference:</b>	WELL @ 4799.0ft (Original Well Elev)
<b>Site Error:</b>	0.0ft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Collins 18Q-301	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.0ft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	Wellbore #1	<b>Database:</b>	landmark
<b>Reference Design:</b>	Plan #1 (11-3-14)	<b>Offset TVD Reference:</b>	Offset Datum

Offset Design													Offset Site Error:	0.0 ft
Survey Program: 0-Reference													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	
5,900.0	5,699.5	5,715.5	5,715.5	31.1	12.7	134.21	400.8	-990.1	746.7	709.3	37.47	19.928		
6,000.0	5,799.3	5,815.3	5,815.3	31.2	13.0	134.55	400.8	-990.1	750.4	712.7	37.73	19.889		
6,100.0	5,899.3	5,915.3	5,915.3	31.3	13.2	134.66	400.8	-990.1	751.6	713.6	38.00	19.778		
6,200.0	5,999.3	6,015.3	6,015.3	31.4	13.4	36.66	400.8	-990.1	751.6	713.3	38.33	19.609		
6,300.0	6,099.3	6,115.3	6,115.3	31.5	13.6	36.66	400.8	-990.1	751.6	713.0	38.66	19.441		
6,400.0	6,199.3	6,215.3	6,215.3	31.6	13.9	36.70	400.8	-990.1	751.3	712.3	38.93	19.300		
6,500.0	6,298.7	6,314.7	6,314.7	31.7	14.1	37.53	400.8	-990.1	743.2	704.6	38.56	19.274		
6,600.0	6,396.0	6,412.0	6,412.0	31.7	14.3	39.50	400.8	-990.1	725.0	687.4	37.55	19.308		
6,700.0	6,489.4	6,505.4	6,505.4	31.8	14.5	42.74	400.8	-990.1	697.5	661.5	36.02	19.366		
6,800.0	6,577.4	6,593.4	6,593.4	31.8	14.7	47.42	400.8	-990.1	661.9	627.7	34.22	19.343		
6,900.0	6,658.4	6,674.4	6,674.4	31.8	14.9	53.67	400.8	-990.1	620.2	587.6	32.60	19.026		
7,000.0	6,731.2	6,747.2	6,747.2	31.8	15.1	61.37	400.8	-990.1	575.1	543.3	31.71	18.135		
7,100.0	6,794.3	6,810.3	6,810.3	31.9	15.2	69.97	400.8	-990.1	530.1	498.2	31.88	16.628		
7,200.0	6,846.8	6,862.8	6,862.8	32.0	15.3	78.37	400.8	-990.1	490.2	457.3	32.82	14.934		
7,300.0	6,887.8	6,903.8	6,903.8	32.1	15.4	85.29	400.8	-990.1	461.1	427.2	33.96	13.579		
7,400.0	6,916.5	6,932.5	6,932.5	32.4	15.5	89.71	400.8	-990.1	448.9	413.9	35.01	12.822		
7,410.5	6,918.8	6,934.8	6,934.8	32.4	15.5	90.00	400.8	-990.1	448.8	413.7	35.12	12.777 CC, ES		
7,500.0	6,932.5	6,948.5	6,948.5	32.7	15.5	91.07	400.8	-990.1	457.4	421.4	36.00	12.706 SF		
7,600.0	6,935.8	6,951.8	6,951.8	33.1	15.5	89.84	400.8	-990.1	486.7	449.8	36.91	13.188		
7,700.0	6,935.1	6,951.1	6,951.1	33.7	15.5	89.75	400.8	-990.1	533.4	495.4	38.00	14.036		
7,800.0	6,934.4	6,950.4	6,950.4	34.3	15.5	89.66	400.8	-990.1	593.5	554.3	39.20	15.138		
7,900.0	6,933.7	6,949.7	6,949.7	35.1	15.5	89.58	400.8	-990.1	663.2	622.7	40.49	16.378		
8,000.0	6,933.0	6,949.0	6,949.0	35.9	15.5	89.49	400.8	-990.1	739.9	698.1	41.86	17.677		
8,100.0	6,932.4	6,948.4	6,948.4	36.9	15.5	89.40	400.8	-990.1	821.7	778.4	43.29	18.981		
8,200.0	6,931.7	6,947.7	6,947.7	37.9	15.5	89.32	400.8	-990.1	907.1	862.3	44.78	20.259		
8,300.0	6,931.0	6,947.0	6,947.0	39.0	15.5	89.23	400.8	-990.1	995.2	948.9	46.31	21.492		

<b>Company:</b>	PETROLEUM DEVELOPMENT CORP Weld County CO	<b>Local Co-ordinate Reference:</b>	Well Collins 18Q-301
<b>Project:</b>	SEC.18-T4N-R64W	<b>TVD Reference:</b>	WELL @ 4799.0ft (Original Well Elev)
<b>Reference Site:</b>	Collins 4N64W18T Pad Sec.18-T4N-R64W	<b>MD Reference:</b>	WELL @ 4799.0ft (Original Well Elev)
<b>Site Error:</b>	0.0ft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Collins 18Q-301	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.0ft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	Wellbore #1	<b>Database:</b>	landmark
<b>Reference Design:</b>	Plan #1 (11-3-14)	<b>Offset TVD Reference:</b>	Offset Datum

Reference Depths are relative to WELL @ 4799.0ft (Original Well Elev) Coordinates are relative to: Collins 18Q-301  
 Offset Depths are relative to Offset Datum  
 Central Meridian is -105.500000 °  
 Coordinate System is US State Plane 1983, Colorado Northern Zone  
 Grid Convergence at Surface is: 0.59°



<b>Company:</b>	PETROLEUM DEVELOPMENT CORP Weld County CO	<b>Local Co-ordinate Reference:</b>	Well Collins 18Q-301
<b>Project:</b>	SEC.18-T4N-R64W	<b>TVD Reference:</b>	WELL @ 4799.0ft (Original Well Elev)
<b>Reference Site:</b>	Collins 4N64W18T Pad Sec.18-T4N-R64W	<b>MD Reference:</b>	WELL @ 4799.0ft (Original Well Elev)
<b>Site Error:</b>	0.0ft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Collins 18Q-301	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.0ft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	Wellbore #1	<b>Database:</b>	landmark
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