

PETROLEUM DEVELOPMENT CORP Weld County CO

Well Name: **Hankins 20M-203**

Surface Location: Hankins 5N67W20MR Pad Sec.20-T5N-R67W
North American Datum 1983 , US State Plane 1983 , Colorado Northern Zone

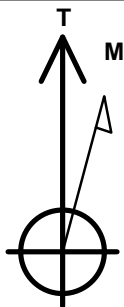
Ground Elevation: 4959.0

+N/-S	+E/-W	Northing	Easting	Latitude	Longitude	Slot
0.0	0.0	1386228.86	3162642.69	40.392130	-104.916090	

RKB - 15' WELL @ 4974.0ft (RKB - 15')

WELBORE TARGET DETAILS

Name	TVD	+N/-S	+E/-W	Shape
SHL 90'FNL, 2422'FEL		0.0	0.0	Point
BHL 500'FSL, 2590'FEL	6974.0	-4692.3	-197.8	Point



Azimuths to True North
Magnetic North: 8.52°

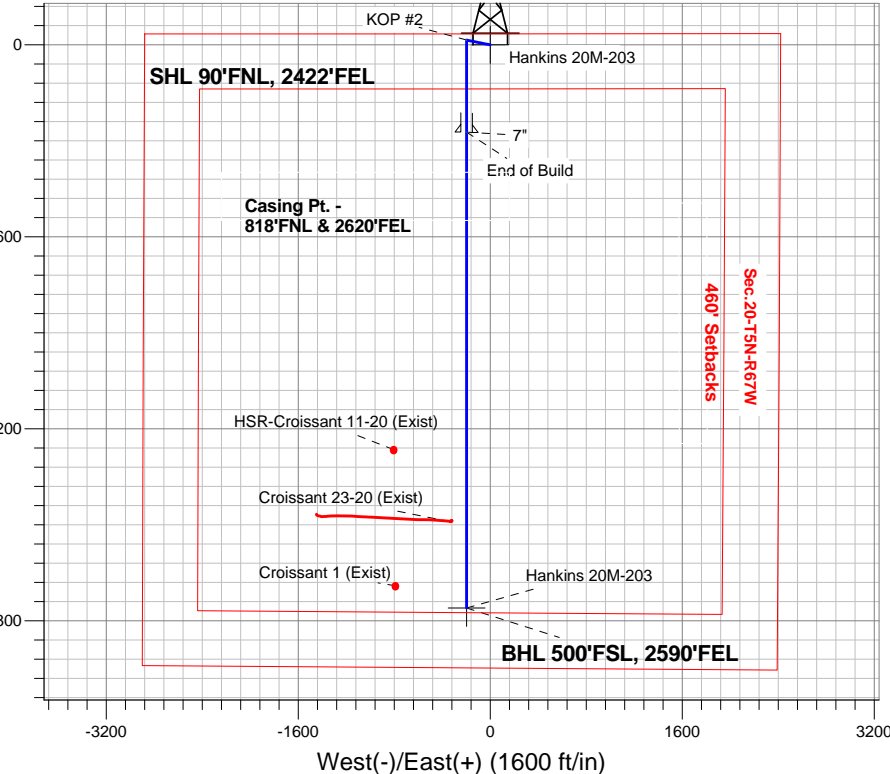
Magnetic Field
Strength: 52777.4snT
Dip Angle: 66.91°
Date: 8/12/2014
Model: IGRF2010

ANNOTATIONS

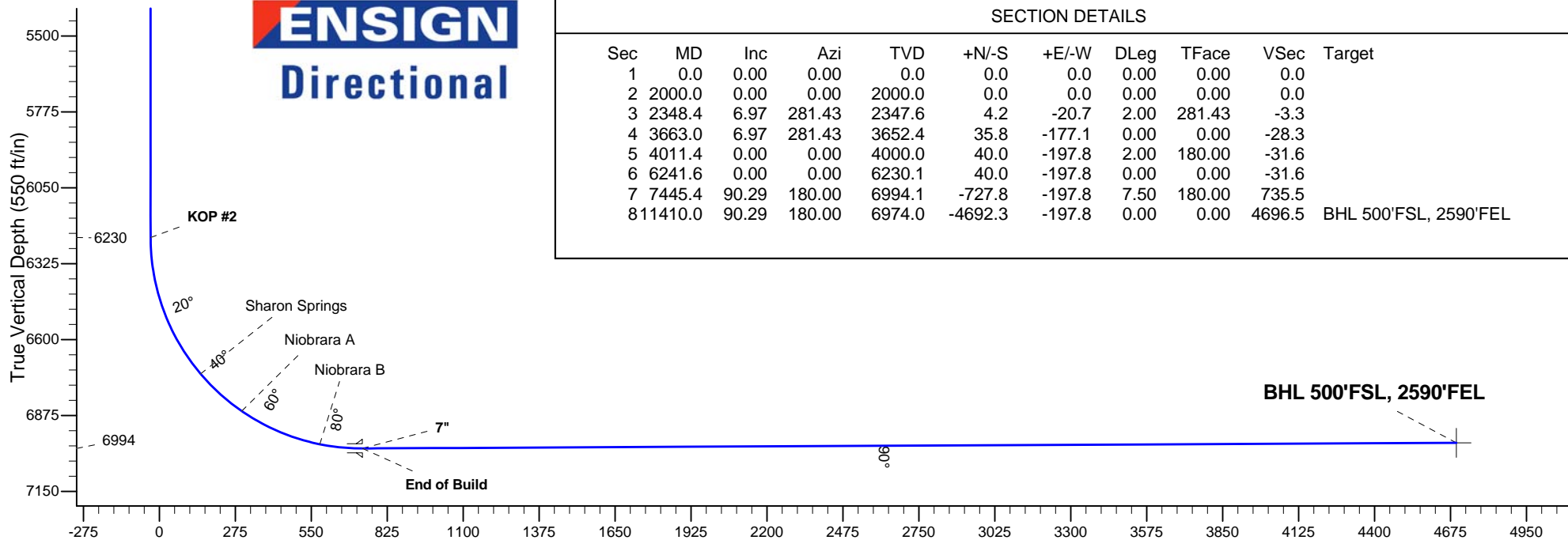
TVD	MD	Annotation
2000.0	2000.0	KOP #1
6230.2	6241.6	KOP #2
6994.1	7445.4	End of Build

Hankins 5N67W20MR Pad Sec.20-T5N-R67W
Hankins 20M-203
Plan #1 (8-12-14)
14:43, August 12 2014

South(-)/North(+) (1600 ft/in)



ENSIGN
Directional



SECTION DETAILS

Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	DLeg	TFace	VSec	Target
1	0.0	0.00	0.00	0.0	0.0	0.0	0.00	0.00	0.0	
2	2000.0	0.00	0.00	2000.0	0.0	0.0	0.00	0.00	0.0	
3	2348.4	6.97	281.43	2347.6	4.2	-20.7	2.00	281.43	-3.3	
4	3663.0	6.97	281.43	3652.4	35.8	-177.1	0.00	0.00	-28.3	
5	4011.4	0.00	0.00	4000.0	40.0	-197.8	2.00	180.00	-31.6	
6	6241.6	0.00	0.00	6230.1	40.0	-197.8	0.00	0.00	-31.6	
7	7445.4	90.29	180.00	6994.1	-727.8	-197.8	7.50	180.00	735.5	
	811410.0	90.29	180.00	6974.0	-4692.3	-197.8	0.00	0.00	4696.5	BHL 500'FSL, 2590'FEL

Vertical Section at 182.41° (550 ft/in)



PETROLEUM DEVELOPMENT CORP Weld County CO

SEC.20-T5N-R67W

Hankins 5N67W20MR Pad Sec.20-T5N-R67W

Hankins 20M-203

Wellbore #1

Plan: Plan #1 (8-12-14)

Standard Planning Report

12 August, 2014

Database:	Landmark	Local Co-ordinate Reference:	Well Hankins 20M-203
Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	TVD Reference:	WELL @ 4974.0ft (RKB - 15')
Project:	SEC.20-T5N-R67W	MD Reference:	WELL @ 4974.0ft (RKB - 15')
Site:	Hankins 5N67W20MR Pad Sec.20-T5N-R67W	North Reference:	True
Well:	Hankins 20M-203	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Plan #1 (8-12-14)		

Project	SEC.20-T5N-R67W, Weld County, Colorado		
Map System:	US State Plane 1983	System Datum:	Mean Sea Level
Geo Datum:	North American Datum 1983		Using Well Reference Point
Map Zone:	Colorado Northern Zone		Using geodetic scale factor

Site						Hankins 5N67W20MR Pad Sec.20-T5N-R67W											
Site Position:						Northing:			1,386,228.87 ft			Latitude:			40.392130		
From:			Lat/Long			Easting:			3,162,642.69 ft			Longitude:			-104.916090		
Position Uncertainty:			0.0 ft			Slot Radius:			"			Grid Convergence:			0.38 °		

Well	Hankins 20M-203					
Well Position	+N/-S	0.0 ft	Northing:	1,386,228.86 ft	Latitude:	40.392130
	+E/-W	0.0 ft	Easting:	3,162,642.69 ft	Longitude:	-104.916090
Position Uncertainty		0.0 ft	Wellhead Elevation:	ft	Ground Level:	4,959.0 ft

Wellbore	Wellbore #1				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	8/12/2014	8.52	66.91	52,777

Design	Plan #1 (8-12-14)			
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	182.41

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	
2,000.0	0.00	0.00	2,000.0	0.0	0.0	0.00	0.00	0.00	0.00	
2,348.4	6.97	281.43	2,347.6	4.2	-20.7	2.00	2.00	0.00	281.43	
3,663.0	6.97	281.43	3,652.4	35.8	-177.1	0.00	0.00	0.00	0.00	
4,011.4	0.00	0.00	4,000.0	40.0	-197.8	2.00	-2.00	0.00	180.00	
6,241.6	0.00	0.00	6,230.1	40.0	-197.8	0.00	0.00	0.00	0.00	
7,445.4	90.29	180.00	6,994.1	-727.8	-197.8	7.50	7.50	0.00	180.00	
11,410.0	90.29	180.00	6,974.0	-4,692.3	-197.8	0.00	0.00	0.00	0.00	BHL 500'FSL, 2590

Database:	Landmark	Local Co-ordinate Reference:	Well Hankins 20M-203
Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	TVD Reference:	WELL @ 4974.0ft (RKB - 15')
Project:	SEC.20-T5N-R67W	MD Reference:	WELL @ 4974.0ft (RKB - 15')
Site:	Hankins 5N67W20MR Pad	North Reference:	True
	Sec.20-T5N-R67W		
Well:	Hankins 20M-203	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Plan #1 (8-12-14)		

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 90'FNL, 2422'FEL									
100.0	0.00	0.00	100.0	0.0	0.0	0.0	0.00	0.00	0.00
200.0	0.00	0.00	200.0	0.0	0.0	0.0	0.00	0.00	0.00
300.0	0.00	0.00	300.0	0.0	0.0	0.0	0.00	0.00	0.00
400.0	0.00	0.00	400.0	0.0	0.0	0.0	0.00	0.00	0.00
500.0	0.00	0.00	500.0	0.0	0.0	0.0	0.00	0.00	0.00
600.0	0.00	0.00	600.0	0.0	0.0	0.0	0.00	0.00	0.00
700.0	0.00	0.00	700.0	0.0	0.0	0.0	0.00	0.00	0.00
800.0	0.00	0.00	800.0	0.0	0.0	0.0	0.00	0.00	0.00
900.0	0.00	0.00	900.0	0.0	0.0	0.0	0.00	0.00	0.00
1,000.0	0.00	0.00	1,000.0	0.0	0.0	0.0	0.00	0.00	0.00
1,100.0	0.00	0.00	1,100.0	0.0	0.0	0.0	0.00	0.00	0.00
1,200.0	0.00	0.00	1,200.0	0.0	0.0	0.0	0.00	0.00	0.00
1,300.0	0.00	0.00	1,300.0	0.0	0.0	0.0	0.00	0.00	0.00
1,400.0	0.00	0.00	1,400.0	0.0	0.0	0.0	0.00	0.00	0.00
1,500.0	0.00	0.00	1,500.0	0.0	0.0	0.0	0.00	0.00	0.00
1,600.0	0.00	0.00	1,600.0	0.0	0.0	0.0	0.00	0.00	0.00
1,700.0	0.00	0.00	1,700.0	0.0	0.0	0.0	0.00	0.00	0.00
1,800.0	0.00	0.00	1,800.0	0.0	0.0	0.0	0.00	0.00	0.00
1,900.0	0.00	0.00	1,900.0	0.0	0.0	0.0	0.00	0.00	0.00
2,000.0	0.00	0.00	2,000.0	0.0	0.0	0.0	0.00	0.00	0.00
KOP #1									
2,100.0	2.00	281.43	2,100.0	0.3	-1.7	-0.3	2.00	2.00	0.00
2,200.0	4.00	281.43	2,199.8	1.4	-6.8	-1.1	2.00	2.00	0.00
2,300.0	6.00	281.43	2,299.5	3.1	-15.4	-2.5	2.00	2.00	0.00
2,348.4	6.97	281.43	2,347.6	4.2	-20.7	-3.3	2.00	2.00	0.00
2,400.0	6.97	281.43	2,398.8	5.4	-26.9	-4.3	0.00	0.00	0.00
2,500.0	6.97	281.43	2,498.0	7.8	-38.8	-6.2	0.00	0.00	0.00
2,600.0	6.97	281.43	2,597.3	10.2	-50.7	-8.1	0.00	0.00	0.00
2,700.0	6.97	281.43	2,696.5	12.6	-62.6	-10.0	0.00	0.00	0.00
2,800.0	6.97	281.43	2,795.8	15.1	-74.4	-11.9	0.00	0.00	0.00
2,900.0	6.97	281.43	2,895.1	17.5	-86.3	-13.8	0.00	0.00	0.00
3,000.0	6.97	281.43	2,994.3	19.9	-98.2	-15.7	0.00	0.00	0.00
3,100.0	6.97	281.43	3,093.6	22.3	-110.1	-17.6	0.00	0.00	0.00
3,200.0	6.97	281.43	3,192.9	24.7	-122.0	-19.5	0.00	0.00	0.00
3,300.0	6.97	281.43	3,292.1	27.1	-133.9	-21.4	0.00	0.00	0.00
3,400.0	6.97	281.43	3,391.4	29.5	-145.8	-23.3	0.00	0.00	0.00
3,500.0	6.97	281.43	3,490.6	31.9	-157.7	-25.2	0.00	0.00	0.00
3,503.4	6.97	281.43	3,494.0	32.0	-158.1	-25.3	0.00	0.00	0.00
Parkman									
3,600.0	6.97	281.43	3,589.9	34.3	-169.6	-27.1	0.00	0.00	0.00
3,663.0	6.97	281.43	3,652.4	35.8	-177.1	-28.3	0.00	0.00	0.00
3,700.0	6.23	281.43	3,689.2	36.6	-181.2	-29.0	2.00	-2.00	0.00
3,800.0	4.23	281.43	3,788.8	38.5	-190.2	-30.4	2.00	-2.00	0.00
3,900.0	2.23	281.43	3,888.6	39.6	-195.7	-31.3	2.00	-2.00	0.00
4,000.0	0.23	281.43	3,988.6	40.0	-197.8	-31.6	2.00	-2.00	0.00
4,011.4	0.00	0.00	4,000.0	40.0	-197.8	-31.6	2.00	-2.00	0.00
4,100.0	0.00	0.00	4,088.6	40.0	-197.8	-31.6	0.00	0.00	0.00
4,103.4	0.00	0.00	4,092.0	40.0	-197.8	-31.6	0.00	0.00	0.00
Sussex									

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Project:	SEC.20-T5N-R67W	MD Reference:	WELL @ 4974.0ft (RKB - 15')
Site:	Hankins 5N67W20MR Pad	North Reference:	True
	Sec.20-T5N-R67W		
Well:	Hankins 20M-203	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Plan #1 (8-12-14)		

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)
4,200.0	0.00	0.00	4,188.6	40.0	-197.8	-31.6	0.00	0.00	0.00
4,300.0	0.00	0.00	4,288.6	40.0	-197.8	-31.6	0.00	0.00	0.00
4,400.0	0.00	0.00	4,388.6	40.0	-197.8	-31.6	0.00	0.00	0.00
4,500.0	0.00	0.00	4,488.6	40.0	-197.8	-31.6	0.00	0.00	0.00
4,561.4	0.00	0.00	4,550.0	40.0	-197.8	-31.6	0.00	0.00	0.00
Shannon									
4,600.0	0.00	0.00	4,588.6	40.0	-197.8	-31.6	0.00	0.00	0.00
4,700.0	0.00	0.00	4,688.6	40.0	-197.8	-31.6	0.00	0.00	0.00
4,800.0	0.00	0.00	4,788.6	40.0	-197.8	-31.6	0.00	0.00	0.00
4,900.0	0.00	0.00	4,888.6	40.0	-197.8	-31.6	0.00	0.00	0.00
5,000.0	0.00	0.00	4,988.6	40.0	-197.8	-31.6	0.00	0.00	0.00
5,100.0	0.00	0.00	5,088.6	40.0	-197.8	-31.6	0.00	0.00	0.00
5,200.0	0.00	0.00	5,188.6	40.0	-197.8	-31.6	0.00	0.00	0.00
5,300.0	0.00	0.00	5,288.6	40.0	-197.8	-31.6	0.00	0.00	0.00
5,400.0	0.00	0.00	5,388.6	40.0	-197.8	-31.6	0.00	0.00	0.00
5,500.0	0.00	0.00	5,488.6	40.0	-197.8	-31.6	0.00	0.00	0.00
5,600.0	0.00	0.00	5,588.6	40.0	-197.8	-31.6	0.00	0.00	0.00
5,700.0	0.00	0.00	5,688.6	40.0	-197.8	-31.6	0.00	0.00	0.00
5,800.0	0.00	0.00	5,788.6	40.0	-197.8	-31.6	0.00	0.00	0.00
5,900.0	0.00	0.00	5,888.6	40.0	-197.8	-31.6	0.00	0.00	0.00
6,000.0	0.00	0.00	5,988.6	40.0	-197.8	-31.6	0.00	0.00	0.00
6,100.0	0.00	0.00	6,088.6	40.0	-197.8	-31.6	0.00	0.00	0.00
6,200.0	0.00	0.00	6,188.6	40.0	-197.8	-31.6	0.00	0.00	0.00
6,241.6	0.00	0.00	6,230.2	40.0	-197.8	-31.6	0.00	0.00	0.00
KOP #2									
6,300.0	4.38	180.00	6,288.5	37.8	-197.8	-29.4	7.51	7.51	0.00
6,400.0	11.88	180.00	6,387.4	23.6	-197.8	-15.3	7.50	7.50	0.00
6,500.0	19.38	180.00	6,483.7	-3.3	-197.8	11.6	7.50	7.50	0.00
6,600.0	26.88	180.00	6,575.6	-42.6	-197.8	50.9	7.50	7.50	0.00
6,700.0	34.38	180.00	6,661.5	-93.5	-197.8	101.7	7.50	7.50	0.00
6,778.6	40.28	180.00	6,724.0	-141.1	-197.8	149.3	7.50	7.50	0.00
Sharon Springs									
6,800.0	41.88	180.00	6,740.1	-155.2	-197.8	163.4	7.50	7.50	0.00
6,900.0	49.38	180.00	6,810.0	-226.6	-197.8	234.7	7.50	7.50	0.00
6,980.3	55.41	180.00	6,859.0	-290.2	-197.8	298.3	7.50	7.50	0.00
Niobrara A									
7,000.0	56.88	180.00	6,870.0	-306.6	-197.8	314.6	7.50	7.50	0.00
7,100.0	64.38	180.00	6,919.0	-393.7	-197.8	401.6	7.50	7.50	0.00
7,200.0	71.88	180.00	6,956.2	-486.4	-197.8	494.3	7.50	7.50	0.00
7,289.5	78.60	180.00	6,979.0	-572.9	-197.8	580.7	7.50	7.50	0.00
Niobrara B									
7,300.0	79.38	180.00	6,981.0	-583.2	-197.8	591.0	7.50	7.50	0.00
7,400.0	86.88	180.00	6,992.9	-682.4	-197.8	690.1	7.50	7.50	0.00
7,445.4	90.29	180.00	6,994.1	-727.8	-197.8	735.5	7.50	7.50	0.00
End of Build - 7"									
7,500.0	90.29	180.00	6,993.8	-782.4	-197.8	790.0	0.00	0.00	0.00
7,600.0	90.29	180.00	6,993.3	-882.4	-197.8	889.9	0.00	0.00	0.00
7,700.0	90.29	180.00	6,992.8	-982.4	-197.8	989.8	0.00	0.00	0.00
7,800.0	90.29	180.00	6,992.3	-1,082.4	-197.8	1,089.8	0.00	0.00	0.00
7,900.0	90.29	180.00	6,991.8	-1,182.4	-197.8	1,189.7	0.00	0.00	0.00
8,000.0	90.29	180.00	6,991.3	-1,282.4	-197.8	1,289.6	0.00	0.00	0.00

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Project:	SEC.20-T5N-R67W	MD Reference:	WELL @ 4974.0ft (RKB - 15')
Site:	Hankins 5N67W20MR Pad Sec.20-T5N-R67W	North Reference:	True
Well:	Hankins 20M-203	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Plan #1 (8-12-14)		

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)
8,100.0	90.29	180.00	6,990.8	-1,382.4	-197.8	1,389.5	0.00	0.00	0.00
8,200.0	90.29	180.00	6,990.2	-1,482.4	-197.8	1,489.4	0.00	0.00	0.00
8,300.0	90.29	180.00	6,989.7	-1,582.4	-197.8	1,589.3	0.00	0.00	0.00
8,400.0	90.29	180.00	6,989.2	-1,682.4	-197.8	1,689.2	0.00	0.00	0.00
8,500.0	90.29	180.00	6,988.7	-1,782.4	-197.8	1,789.1	0.00	0.00	0.00
8,600.0	90.29	180.00	6,988.2	-1,882.4	-197.8	1,889.0	0.00	0.00	0.00
8,700.0	90.29	180.00	6,987.7	-1,982.4	-197.8	1,988.9	0.00	0.00	0.00
8,800.0	90.29	180.00	6,987.2	-2,082.4	-197.8	2,088.9	0.00	0.00	0.00
8,900.0	90.29	180.00	6,986.7	-2,182.4	-197.8	2,188.8	0.00	0.00	0.00
9,000.0	90.29	180.00	6,986.2	-2,282.4	-197.8	2,288.7	0.00	0.00	0.00
9,100.0	90.29	180.00	6,985.7	-2,382.4	-197.8	2,388.6	0.00	0.00	0.00
9,200.0	90.29	180.00	6,985.2	-2,482.4	-197.8	2,488.5	0.00	0.00	0.00
9,300.0	90.29	180.00	6,984.7	-2,582.4	-197.8	2,588.4	0.00	0.00	0.00
9,400.0	90.29	180.00	6,984.2	-2,682.4	-197.8	2,688.3	0.00	0.00	0.00
9,500.0	90.29	180.00	6,983.7	-2,782.4	-197.8	2,788.2	0.00	0.00	0.00
9,600.0	90.29	180.00	6,983.2	-2,882.4	-197.8	2,888.1	0.00	0.00	0.00
9,700.0	90.29	180.00	6,982.7	-2,982.4	-197.8	2,988.0	0.00	0.00	0.00
9,800.0	90.29	180.00	6,982.1	-3,082.4	-197.8	3,088.0	0.00	0.00	0.00
9,900.0	90.29	180.00	6,981.6	-3,182.4	-197.8	3,187.9	0.00	0.00	0.00
10,000.0	90.29	180.00	6,981.1	-3,282.4	-197.8	3,287.8	0.00	0.00	0.00
10,100.0	90.29	180.00	6,980.6	-3,382.4	-197.8	3,387.7	0.00	0.00	0.00
10,200.0	90.29	180.00	6,980.1	-3,482.3	-197.8	3,487.6	0.00	0.00	0.00
10,300.0	90.29	180.00	6,979.6	-3,582.3	-197.8	3,587.5	0.00	0.00	0.00
10,400.0	90.29	180.00	6,979.1	-3,682.3	-197.8	3,687.4	0.00	0.00	0.00
10,500.0	90.29	180.00	6,978.6	-3,782.3	-197.8	3,787.3	0.00	0.00	0.00
10,600.0	90.29	180.00	6,978.1	-3,882.3	-197.8	3,887.2	0.00	0.00	0.00
10,700.0	90.29	180.00	6,977.6	-3,982.3	-197.8	3,987.1	0.00	0.00	0.00
10,800.0	90.29	180.00	6,977.1	-4,082.3	-197.8	4,087.1	0.00	0.00	0.00
10,900.0	90.29	180.00	6,976.6	-4,182.3	-197.8	4,187.0	0.00	0.00	0.00
11,000.0	90.29	180.00	6,976.1	-4,282.3	-197.8	4,286.9	0.00	0.00	0.00
11,100.0	90.29	180.00	6,975.6	-4,382.3	-197.8	4,386.8	0.00	0.00	0.00
11,200.0	90.29	180.00	6,975.1	-4,482.3	-197.8	4,486.7	0.00	0.00	0.00
11,300.0	90.29	180.00	6,974.6	-4,582.3	-197.8	4,586.6	0.00	0.00	0.00
11,400.0	90.29	180.00	6,974.1	-4,682.3	-197.8	4,686.5	0.00	0.00	0.00
11,410.0	90.29	180.00	6,974.0	-4,692.3	-197.8	4,696.5	0.00	0.00	0.00
BHL 500'FSL, 2590'FEL									

Targets									
Target Name	Dip Angle (°)	Dip Dir. (°)	TVD (ft)	+N/-S (ft)	+E/-W (ft)	Northing (ft)	Easting (ft)	Latitude	Longitude
- hit/miss target									
- Shape									
SHL 90'FNL, 2422'FE	0.00	0.00	1.0	0.0	0.0	1,386,228.87	3,162,642.69	40.392130	-104.916090
- plan hits target center									
- Point									
BHL 500'FSL, 2590'FI	0.00	0.00	6,974.0	-4,692.3	-197.8	1,381,535.54	3,162,475.78	40.379250	-104.916800
- plan hits target center									
- Point									

Database:	Landmark	Local Co-ordinate Reference:	Well Hankins 20M-203
Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	TVD Reference:	WELL @ 4974.0ft (RKB - 15')
Project:	SEC.20-T5N-R67W	MD Reference:	WELL @ 4974.0ft (RKB - 15')
Site:	Hankins 5N67W20MR Pad Sec.20-T5N-R67W	North Reference:	True
Well:	Hankins 20M-203	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Plan #1 (8-12-14)		

Casing Points					
Measured Depth (ft)	Vertical Depth (ft)	Name	Casing Diameter (")	Hole Diameter (")	
7,445.4	6,994.1	7"	7	7-1/2	

Formations						
Measured Depth (ft)	Vertical Depth (ft)	Name	Lithology	Dip (°)	Dip Direction (°)	
3,503.4	3,494.0	Parkman				
4,103.4	4,092.0	Sussex				
4,561.4	4,550.0	Shannon				
6,778.6	6,724.0	Sharon Springs				
6,980.3	6,859.0	Niobrara A				
7,289.5	6,979.0	Niobrara B				
	7,050.0	Niobrara C				
	7,161.0	Ft. Hays				
	7,183.0	Codell				

Plan Annotations					
Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates			
		+N/-S (ft)	+E/-W (ft)	Comment	
2,000.0	2,000.0	0.0	0.0	KOP #1	
6,241.6	6,230.2	40.0	-197.8	KOP #2	
7,445.4	6,994.1	-727.8	-197.8	End of Build	



PETROLEUM DEVELOPMENT CORP Weld County CO

SEC.20-T5N-R67W

Hankins 5N67W20MR Pad Sec.20-T5N-R67W

Hankins 20M-203

Wellbore #1

Plan #1 (8-12-14)

Anticollision Report

12 August, 2014



Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Hankins 20M-203
Project:	SEC.20-T5N-R67W	TVD Reference:	WELL @ 4974.0ft (RKB - 15')
Reference Site:	Hankins 5N67W20MR Pad Sec.20-T5N-R67W	MD Reference:	WELL @ 4974.0ft (RKB - 15')
Site Error:	0.0ft	North Reference:	True
Reference Well:	Hankins 20M-203	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 (8-12-14)	Offset TVD Reference:	Offset Datum

Reference	Plan #1 (8-12-14)		
Filter type:	NO GLOBAL FILTER: Using user defined selection & filtering criteria		
Interpolation Method:	Stations	Error Model:	ISCWSA
Depth Range:	Unlimited	Scan Method:	Closest Approach 3D
Results Limited by:	Maximum center-center distance of 1,000.0ft	Error Surface:	Elliptical Conic
Warning Levels Evaluated at:	2.00 Sigma		

Survey Tool Program	Date 8/12/2014			
From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description
0.0	11,410.0	Plan #1 (8-12-14) (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.20-T5N-R67W						
Croissant 1 (Exist) - Wellbore #1 - Wellbore #1	11,224.2	6,865.9	593.4	368.5	2.638	CC, ES, SF
Croissant 23-20 (Exist) - Wellbore #1 - Wellbore #1	10,687.6	7,046.0	133.6	41.0	1.442	Level 3, CC, ES, SF
HSR-Croissant 11-20 (Exist) - Wellbore #1 - Wellbore #1	10,091.2	6,902.7	607.3	403.0	2.972	CC
HSR-Croissant 11-20 (Exist) - Wellbore #1 - Wellbore #1	10,100.0	6,902.6	607.4	402.9	2.970	ES, SF
Hankins 5N67W20MR Pad Sec.20-T5N-R67W						
Hankins 20M-323 - Wellbore #1 - Plan #1 (8-12-14)	1,500.0	1,500.0	61.3	54.8	9.402	CC, ES
Hankins 20M-323 - Wellbore #1 - Plan #1 (8-12-14)	11,410.0	11,497.2	464.4	283.7	2.570	SF
Hankins 20M-423 - Wellbore #1 - Plan #1 (8-12-14)	2,000.0	2,000.0	30.6	21.9	3.495	CC, ES
Hankins 20M-423 - Wellbore #1 - Plan #1 (8-12-14)	11,410.0	11,573.2	305.1	159.8	2.099	SF
Hankins 20R-243 - Wellbore #1 - Plan #1 (8-12-14)	1,000.0	999.0	89.1	84.9	20.884	CC, ES
Hankins 20R-243 - Wellbore #1 - Plan #1 (8-12-14)	11,410.0	11,438.1	899.9	717.3	4.929	SF
Hankins 20R-303 - Wellbore #1 - Plan #1 (8-12-14)	500.0	498.0	150.4	148.4	74.524	CC, ES
Hankins 20R-303 - Wellbore #1 - Plan #1 (8-12-14)	2,000.0	1,938.3	396.1	385.6	37.769	SF
Hankins 20R-403 - Wellbore #1 - Plan #1 (8-12-14)	700.0	699.0	119.8	116.9	41.024	CC, ES
Hankins 20R-403 - Wellbore #1 - Plan #1 (8-12-14)	2,000.0	1,964.2	291.6	282.0	30.298	SF

Offset Design	Existing Wells Sec.20-T5N-R67W - Croissant 1 (Exist) - Wellbore #1 - Wellbore #1											Offset Site Error:	0.0 ft
Survey Program:	7295-UNKNOWN											Offset Well Error:	0.0 ft
Reference	Vertical Depth (ft)	Measured Depth (ft)	Offset Vertical Depth (ft)	Semi Major Axis Reference (ft)	Semi Major Axis Offset (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
10,500.0	6,978.6	6,869.6	6,869.6	74.0	137.4	90.35	-4,506.5	-791.2	936.3	724.9	211.32	4.431	
10,600.0	6,978.1	6,869.1	6,869.1	75.9	137.4	90.31	-4,506.5	-791.2	861.3	648.1	213.19	4.040	
10,700.0	6,977.6	6,868.6	6,868.6	77.8	137.4	90.26	-4,506.5	-791.2	791.8	576.7	215.07	3.682	
10,800.0	6,977.1	6,868.1	6,868.1	79.6	137.4	90.21	-4,506.5	-791.2	729.4	512.5	216.94	3.362	
10,900.0	6,976.6	6,867.6	6,867.6	81.5	137.4	90.16	-4,506.5	-791.2	676.2	457.4	218.82	3.090	
11,000.0	6,976.1	6,867.1	6,867.1	83.4	137.3	90.11	-4,506.5	-791.2	634.4	413.7	220.70	2.874	
11,100.0	6,975.6	6,866.6	6,866.6	85.3	137.3	90.06	-4,506.5	-791.2	606.3	383.7	222.58	2.724	
11,200.0	6,975.1	6,866.1	6,866.1	87.2	137.3	90.01	-4,506.5	-791.2	593.9	369.5	224.47	2.646	
11,224.2	6,974.9	6,865.9	6,865.9	87.7	137.3	90.00	-4,506.5	-791.2	593.4	368.5	224.92	2.638	CC, ES, SF
11,300.0	6,974.6	6,865.6	6,865.6	89.1	137.3	89.96	-4,506.5	-791.2	598.3	371.9	226.35	2.643	
11,410.0	6,974.0	6,865.0	6,865.0	91.2	137.3	89.91	-4,506.5	-791.2	621.8	393.4	228.42	2.722	

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 Hankins 20M-203
Project:	SEC.20-T5N-R67W	TVD Reference:	WELL @ 4974.0ft (RKB - 15')
Reference Site:	Hankins 5N67W20MR Pad Sec.20-T5N-R67W	MD Reference:	WELL @ 4974.0ft (RKB - 15')
Site Error:	0.0ft	North Reference:	True
Reference Well:	Hankins 20M-203	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 (8-12-14)	Offset TVD Reference:	Offset Datum

Offset Design													
Existing Wells Sec.20-T5N-R67W - Croissant 1 (Exist) - Wellbore #1 - Wellbore #1													
Survey Program: 7295-UNKNOWN												Offset Site Error:	0.0 ft
												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)		

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Hankins 20M-203
Project:	SEC.20-T5N-R67W	TVD Reference:	WELL @ 4974.0ft (RKB - 15')
Reference Site:	Hankins 5N67W20MR Pad Sec.20-T5N-R67W	MD Reference:	WELL @ 4974.0ft (RKB - 15')
Site Error:	0.0ft	North Reference:	True
Reference Well:	Hankins 20M-203	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 (8-12-14)	Offset TVD Reference:	Offset Datum

Offset Design Existing Wells Sec.20-T5N-R67W - Croissant 23-20 (Exist) - Wellbore #1 - Wellbore #1													Offset Site Error: 0.0 ft
Survey Program: 14-NS-GYRO-MS													Offset Well Error: 0.0 ft
Reference	Offset	Semi Major Axis		Distance									Warning
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	
9,700.0	6,982.7	7,032.7	6,864.8	59.0	17.8	84.07	-3,969.7	-331.3	996.5	922.9	73.53	13.553	
9,800.0	6,982.1	7,034.1	6,866.2	60.9	17.8	84.65	-3,969.7	-331.3	897.5	822.0	75.47	11.892	
9,900.0	6,981.6	7,035.4	6,867.5	62.8	17.8	85.23	-3,969.7	-331.3	798.7	721.3	77.41	10.318	
10,000.0	6,981.1	7,036.8	6,868.9	64.6	17.8	85.81	-3,969.7	-331.3	700.4	621.0	79.35	8.826	
10,100.0	6,980.6	7,038.2	6,870.2	66.5	17.8	86.39	-3,969.8	-331.3	602.5	521.2	81.29	7.411	
10,200.0	6,980.1	7,039.5	6,871.6	68.4	17.8	86.97	-3,969.8	-331.4	505.5	422.3	83.23	6.073	
10,300.0	6,979.6	7,040.8	6,872.9	70.2	17.8	87.54	-3,969.8	-331.4	409.9	324.7	85.17	4.813	
10,400.0	6,979.1	7,042.2	6,874.2	72.1	17.8	88.11	-3,969.8	-331.4	317.1	230.0	87.10	3.640	
10,500.0	6,978.6	7,043.5	6,875.6	74.0	17.8	88.68	-3,969.9	-331.4	230.3	141.2	89.02	2.586	
10,600.0	6,978.1	7,044.8	6,876.9	75.9	17.8	89.24	-3,969.9	-331.4	159.7	68.8	90.94	1.756	
10,687.6	6,977.7	7,046.0	6,878.0	77.5	17.8	89.73	-3,969.9	-331.4	133.6	41.0	92.62	1.442	Level 3, CC, ES, SF
10,700.0	6,977.6	7,046.1	6,878.2	77.8	17.8	89.80	-3,969.9	-331.4	134.2	41.3	92.86	1.445	Level 3
10,800.0	6,977.1	7,047.4	6,879.5	79.6	17.8	90.36	-3,969.9	-331.4	174.6	79.8	94.77	1.842	
10,900.0	6,976.6	7,048.7	6,880.8	81.5	17.8	90.92	-3,970.0	-331.4	250.9	154.2	96.67	2.596	
11,000.0	6,976.1	7,050.0	6,882.1	83.4	17.8	91.47	-3,970.0	-331.4	339.8	241.2	98.57	3.447	
11,100.0	6,975.6	7,051.3	6,883.4	85.3	17.8	92.02	-3,970.0	-331.4	433.5	333.0	100.46	4.315	
11,200.0	6,975.1	7,052.6	6,884.7	87.2	17.8	92.57	-3,970.0	-331.4	529.5	427.2	102.34	5.174	
11,300.0	6,974.6	7,053.8	6,885.9	89.1	17.8	93.11	-3,970.0	-331.4	626.8	522.6	104.21	6.014	
11,410.0	6,974.0	7,055.2	6,887.3	91.2	17.8	93.71	-3,970.1	-331.4	734.6	628.3	106.27	6.913	

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Hankins 20M-203
Project:	SEC.20-T5N-R67W	TVD Reference:	WELL @ 4974.0ft (RKB - 15')
Reference Site:	Hankins 5N67W20MR Pad Sec.20-T5N-R67W	MD Reference:	WELL @ 4974.0ft (RKB - 15')
Site Error:	0.0ft	North Reference:	True
Reference Well:	Hankins 20M-203	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 (8-12-14)	Offset TVD Reference:	Offset Datum

Offset Design Existing Wells Sec.20-T5N-R67W - HSR-Croissant 11-20 (Exist) - Wellbore #1 - Wellbore #1													Offset Site Error: 0.0 ft
Survey Program: 7264-UNKNOWN													Offset Well Error: 0.0 ft
Reference	Offset	Semi Major Axis		Distance									Warning
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	
9,300.0	6,984.7	6,906.7	6,906.7	51.7	138.1	90.38	-3,373.5	-805.1	997.4	807.7	189.69	5.258	
9,400.0	6,984.2	6,906.2	6,906.2	53.5	138.1	90.33	-3,373.5	-805.1	920.1	728.5	191.52	4.804	
9,500.0	6,983.7	6,905.7	6,905.7	55.3	138.1	90.28	-3,373.5	-805.1	847.5	654.2	193.36	4.383	
9,600.0	6,983.2	6,905.2	6,905.2	57.2	138.1	90.23	-3,373.5	-805.1	781.1	585.9	195.21	4.001	
9,700.0	6,982.7	6,904.7	6,904.7	59.0	138.1	90.19	-3,373.5	-805.1	722.4	525.3	197.05	3.666	
9,800.0	6,982.1	6,904.1	6,904.1	60.9	138.1	90.14	-3,373.5	-805.1	673.5	474.6	198.90	3.386	
9,900.0	6,981.6	6,903.6	6,903.6	62.8	138.1	90.09	-3,373.5	-805.1	636.7	435.9	200.76	3.171	
10,000.0	6,981.1	6,903.1	6,903.1	64.6	138.1	90.04	-3,373.5	-805.1	614.1	411.5	202.62	3.031	
10,091.2	6,980.7	6,902.7	6,902.7	66.3	138.1	90.00	-3,373.5	-805.1	607.3	403.0	204.31	2.972 CC	
10,100.0	6,980.6	6,902.6	6,902.6	66.5	138.1	90.00	-3,373.5	-805.1	607.4	402.9	204.48	2.970 ES, SF	
10,200.0	6,980.1	6,902.1	6,902.1	68.4	138.0	89.95	-3,373.5	-805.1	617.0	410.7	206.34	2.990	
10,300.0	6,979.6	6,901.6	6,901.6	70.2	138.0	89.90	-3,373.5	-805.1	642.2	434.0	208.21	3.085	
10,400.0	6,979.1	6,901.1	6,901.1	72.1	138.0	89.85	-3,373.5	-805.1	681.3	471.3	210.08	3.243	
10,500.0	6,978.6	6,900.6	6,900.6	74.0	138.0	89.80	-3,373.5	-805.1	732.1	520.2	211.95	3.454	
10,600.0	6,978.1	6,900.1	6,900.1	75.9	138.0	89.76	-3,373.5	-805.1	792.3	578.5	213.82	3.706	
10,700.0	6,977.6	6,899.6	6,899.6	77.8	138.0	89.71	-3,373.5	-805.1	859.9	644.3	215.69	3.987	
10,800.0	6,977.1	6,899.1	6,899.1	79.6	138.0	89.66	-3,373.5	-805.1	933.4	715.9	217.57	4.290	

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Hankins 20M-203
Project:	SEC.20-T5N-R67W	TVD Reference:	WELL @ 4974.0ft (RKB - 15')
Reference Site:	Hankins 5N67W20MR Pad Sec.20-T5N-R67W	MD Reference:	WELL @ 4974.0ft (RKB - 15')
Site Error:	0.0ft	North Reference:	True
Reference Well:	Hankins 20M-203	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 (8-12-14)	Offset TVD Reference:	Offset Datum

Offset Design Hankins 5N67W20MR Pad Sec.20-T5N-R67W - Hankins 20M-323 - Wellbore #1 - Plan #1 (8-12-14)													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 (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor		
0.0	0.0	0.0	0.0	0.0	0.0	90.01	0.0	61.3	61.3					
100.0	100.0	100.0	100.0	0.1	0.1	90.01	0.0	61.3	61.3	61.1	0.22	272.648		
200.0	200.0	200.0	200.0	0.3	0.3	90.01	0.0	61.3	61.3	60.6	0.67	90.883		
300.0	300.0	300.0	300.0	0.6	0.6	90.01	0.0	61.3	61.3	60.2	1.12	54.530		
400.0	400.0	400.0	400.0	0.8	0.8	90.01	0.0	61.3	61.3	59.7	1.57	38.950		
500.0	500.0	500.0	500.0	1.0	1.0	90.01	0.0	61.3	61.3	59.3	2.02	30.294		
600.0	600.0	600.0	600.0	1.2	1.2	90.01	0.0	61.3	61.3	58.8	2.47	24.786		
700.0	700.0	700.0	700.0	1.5	1.5	90.01	0.0	61.3	61.3	58.4	2.92	20.973		
800.0	800.0	800.0	800.0	1.7	1.7	90.01	0.0	61.3	61.3	57.9	3.37	18.177		
900.0	900.0	900.0	900.0	1.9	1.9	90.01	0.0	61.3	61.3	57.5	3.82	16.038		
1,000.0	1,000.0	1,000.0	1,000.0	2.1	2.1	90.01	0.0	61.3	61.3	57.0	4.27	14.350		
1,100.0	1,100.0	1,100.0	1,100.0	2.4	2.4	90.01	0.0	61.3	61.3	56.6	4.72	12.983		
1,200.0	1,200.0	1,200.0	1,200.0	2.6	2.6	90.01	0.0	61.3	61.3	56.1	5.17	11.854		
1,300.0	1,300.0	1,300.0	1,300.0	2.8	2.8	90.01	0.0	61.3	61.3	55.7	5.62	10.906		
1,400.0	1,400.0	1,400.0	1,400.0	3.0	3.0	90.01	0.0	61.3	61.3	55.2	6.07	10.098		
1,500.0	1,500.0	1,500.0	1,500.0	3.3	3.3	90.01	0.0	61.3	61.3	54.8	6.52	9.402 CC, ES		
1,600.0	1,600.0	1,597.9	1,597.9	3.5	3.5	89.71	0.3	62.9	63.0	56.0	6.95	9.055		
1,700.0	1,700.0	1,695.6	1,695.4	3.7	3.7	88.90	1.3	67.8	68.0	60.6	7.38	9.212		
1,800.0	1,800.0	1,792.8	1,792.3	3.9	3.9	87.80	2.9	75.9	76.4	68.6	7.82	9.772		
1,900.0	1,900.0	1,890.4	1,889.3	4.2	4.1	86.62	5.1	87.1	87.9	79.7	8.27	10.635		
2,000.0	2,000.0	1,989.7	1,987.7	4.4	4.4	85.65	7.5	99.1	100.2	91.4	8.73	11.468		
2,100.0	2,100.0	2,088.7	2,086.0	4.6	4.6	163.64	9.9	111.1	114.1	105.0	9.10	12.543		
2,200.0	2,199.8	2,187.2	2,183.7	4.8	4.9	163.58	12.3	123.0	131.3	121.8	9.50	13.825		
2,300.0	2,299.5	2,285.0	2,280.9	5.0	5.1	163.88	14.7	134.9	151.8	141.9	9.89	15.348		
2,348.4	2,347.6	2,332.2	2,327.6	5.1	5.3	164.11	15.8	140.6	162.9	152.9	10.08	16.166		
2,400.0	2,398.8	2,382.3	2,377.3	5.3	5.4	164.41	17.0	146.6	175.2	164.9	10.30	17.018		
2,500.0	2,498.0	2,479.4	2,473.7	5.5	5.7	164.90	19.4	158.4	199.0	188.3	10.72	18.566		
2,600.0	2,597.3	2,576.5	2,570.1	5.7	5.9	165.28	21.7	170.1	222.7	211.6	11.14	19.991		
2,700.0	2,696.5	2,673.6	2,666.5	6.0	6.2	165.59	24.0	181.9	246.5	235.0	11.57	21.304		
2,800.0	2,795.8	2,770.7	2,762.8	6.2	6.5	165.84	26.4	193.6	270.3	258.3	12.01	22.518		
2,900.0	2,895.1	2,867.9	2,859.2	6.5	6.8	166.05	28.7	205.4	294.1	281.7	12.44	23.641		
3,000.0	2,994.3	2,965.0	2,955.6	6.8	7.1	166.23	31.1	217.1	317.9	305.0	12.88	24.684		
3,100.0	3,093.6	3,062.1	3,052.0	7.1	7.4	166.39	33.4	228.9	341.7	328.4	13.32	25.653		
3,200.0	3,192.9	3,159.5	3,148.6	7.3	7.7	166.52	35.8	240.7	365.5	351.8	13.76	26.556		
3,300.0	3,292.1	3,271.6	3,260.1	7.6	7.9	166.72	38.0	252.0	387.4	373.2	14.21	27.266		
3,400.0	3,391.4	3,385.5	3,373.8	7.9	8.2	167.00	39.4	259.2	405.4	390.8	14.65	27.682		
3,500.0	3,490.6	3,500.8	3,489.1	8.2	8.4	167.37	40.0	261.9	419.6	404.5	15.09	27.815		
3,600.0	3,589.9	3,601.7	3,589.9	8.5	8.6	167.72	40.0	261.9	431.5	416.0	15.51	27.817		
3,663.0	3,652.4	3,664.2	3,652.4	8.7	8.7	167.94	40.0	261.9	439.0	423.2	15.79	27.801		
3,700.0	3,689.2	3,700.9	3,689.2	8.8	8.7	168.07	40.0	261.9	443.1	427.2	15.97	27.753		
3,800.0	3,788.8	3,800.5	3,788.8	9.0	8.9	168.34	40.0	261.9	452.0	435.6	16.42	27.530		
3,900.0	3,888.6	3,900.4	3,888.6	9.2	9.1	168.51	40.0	261.9	457.6	440.7	16.86	27.147		
4,000.0	3,988.6	4,000.3	3,988.6	9.4	9.4	168.57	40.0	261.9	459.7	442.4	17.27	26.614		
4,011.4	4,000.0	4,011.8	4,000.0	9.4	9.4	90.00	40.0	261.9	459.7	442.4	17.32	26.544		
4,100.0	4,088.6	4,100.3	4,088.6	9.5	9.6	90.00	40.0	261.9	459.7	442.0	17.69	25.992		
4,200.0	4,188.6	4,200.3	4,188.6	9.8	9.8	90.00	40.0	261.9	459.7	441.6	18.12	25.370		
4,300.0	4,288.6	4,300.3	4,288.6	10.0	10.0	90.00	40.0	261.9	459.7	441.1	18.55	24.776		
4,400.0	4,388.6	4,400.3	4,388.6	10.2	10.2	90.00	40.0	261.9	459.7	440.7	18.99	24.208		
4,500.0	4,488.6	4,500.3	4,488.6	10.4	10.4	90.00	40.0	261.9	459.7	440.3	19.42	23.665		
4,600.0	4,588.6	4,600.3	4,588.6	10.6	10.6	90.00	40.0	261.9	459.7	439.8	19.86	23.145		
4,700.0	4,688.6	4,700.3	4,688.6	10.8	10.8	90.00	40.0	261.9	459.7	439.4	20.30	22.647		

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 Hankins 20M-203
Project:	SEC.20-T5N-R67W	TVD Reference:	WELL @ 4974.0ft (RKB - 15')
Reference Site:	Hankins 5N67W20MR Pad Sec.20-T5N-R67W	MD Reference:	WELL @ 4974.0ft (RKB - 15')
Site Error:	0.0ft	North Reference:	True
Reference Well:	Hankins 20M-203	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 (8-12-14)	Offset TVD Reference:	Offset Datum

Offset Design										Hankins 5N67W20MR Pad Sec.20-T5N-R67W - Hankins 20M-323 - Wellbore #1 - Plan #1 (8-12-14)				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 (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				
4,800.0	4,788.6	4,800.3	4,788.6	11.0	11.0	90.00	40.0	261.9	459.7	439.0	20.74	22.169				
4,900.0	4,888.6	4,900.3	4,888.6	11.2	11.2	90.00	40.0	261.9	459.7	438.5	21.17	21.711				
5,000.0	4,988.6	5,000.3	4,988.6	11.4	11.4	90.00	40.0	261.9	459.7	438.1	21.61	21.270				
5,100.0	5,088.6	5,100.3	5,088.6	11.6	11.6	90.00	40.0	261.9	459.7	437.6	22.05	20.847				
5,200.0	5,188.6	5,200.3	5,188.6	11.8	11.8	90.00	40.0	261.9	459.7	437.2	22.49	20.440				
5,300.0	5,288.6	5,300.3	5,288.6	12.0	12.0	90.00	40.0	261.9	459.7	436.8	22.93	20.048				
5,400.0	5,388.6	5,400.3	5,388.6	12.3	12.3	90.00	40.0	261.9	459.7	436.3	23.37	19.670				
5,500.0	5,488.6	5,500.3	5,488.6	12.5	12.5	90.00	40.0	261.9	459.7	435.9	23.81	19.307				
5,600.0	5,588.6	5,600.3	5,588.6	12.7	12.7	90.00	40.0	261.9	459.7	435.4	24.25	18.956				
5,700.0	5,688.6	5,700.3	5,688.6	12.9	12.9	90.00	40.0	261.9	459.7	435.0	24.69	18.617				
5,800.0	5,788.6	5,800.3	5,788.6	13.1	13.1	90.00	40.0	261.9	459.7	434.6	25.13	18.290				
5,900.0	5,888.6	5,900.3	5,888.6	13.3	13.3	90.00	40.0	261.9	459.7	434.1	25.57	17.974				
6,000.0	5,988.6	6,000.3	5,988.6	13.5	13.5	90.00	40.0	261.9	459.7	433.7	26.02	17.669				
6,100.0	6,088.6	6,100.3	6,088.6	13.8	13.8	90.00	40.0	261.9	459.7	433.2	26.46	17.374				
6,200.0	6,188.6	6,200.3	6,188.6	14.0	14.0	90.00	40.0	261.9	459.7	432.8	26.90	17.088				
6,241.6	6,230.1	6,241.9	6,230.1	14.1	14.1	90.00	40.0	261.9	459.7	432.6	27.09	16.972				
6,245.1	6,233.7	6,245.4	6,233.7	14.1	14.1	-90.00	40.0	261.9	459.7	432.6	27.10	16.963				
6,250.0	6,238.6	6,250.3	6,238.6	14.1	14.1	-90.00	40.0	261.9	459.7	432.6	27.12	16.950				
6,254.4	6,242.9	6,254.7	6,242.9	14.1	14.1	-90.01	40.0	261.9	459.7	432.6	27.14	16.939				
6,300.0	6,288.5	6,300.3	6,288.5	14.2	14.2	-90.28	40.0	261.9	459.7	432.4	27.32	16.828				
6,350.0	6,338.2	6,350.2	6,338.4	14.2	14.3	-90.91	39.7	261.9	459.7	432.2	27.51	16.715				
6,400.0	6,387.4	6,400.5	6,388.7	14.3	14.4	-91.61	36.5	261.9	459.9	432.2	27.67	16.620				
6,450.0	6,436.0	6,451.3	6,439.0	14.4	14.5	-92.30	30.1	261.9	460.1	432.2	27.83	16.531				
6,500.0	6,483.7	6,502.4	6,489.1	14.5	14.5	-92.98	20.2	261.9	460.3	432.3	27.99	16.446				
6,550.0	6,530.3	6,553.9	6,538.9	14.6	14.6	-93.65	6.8	261.9	460.6	432.5	28.15	16.362				
6,600.0	6,575.6	6,605.8	6,588.0	14.7	14.7	-94.31	-10.0	261.9	461.0	432.7	28.33	16.275				
6,650.0	6,619.4	6,658.1	6,636.2	14.8	14.8	-94.95	-30.2	261.9	461.4	432.9	28.52	16.181				
6,700.0	6,661.5	6,710.8	6,683.2	14.9	14.9	-95.58	-53.9	261.9	461.9	433.2	28.74	16.074				
6,750.0	6,701.9	6,763.9	6,728.8	15.0	15.0	-96.17	-81.0	261.9	462.4	433.4	28.99	15.951				
6,800.0	6,740.1	6,817.3	6,772.8	15.1	15.1	-96.74	-111.4	261.9	462.9	433.6	29.29	15.806				
6,850.0	6,776.3	6,871.1	6,814.7	15.3	15.3	-97.28	-145.1	261.9	463.5	433.8	29.64	15.635				
6,900.0	6,810.0	6,925.3	6,854.5	15.5	15.5	-97.79	-181.8	261.9	464.0	433.9	30.06	15.435				
6,950.0	6,841.3	6,979.8	6,891.8	15.7	15.7	-98.26	-221.6	261.9	464.5	434.0	30.55	15.204				
7,000.0	6,870.0	7,034.6	6,926.3	16.0	16.0	-98.70	-264.1	261.9	465.1	433.9	31.13	14.941				
7,050.0	6,895.9	7,089.7	6,957.8	16.4	16.3	-99.10	-309.3	261.9	465.6	433.8	31.79	14.647				
7,100.0	6,919.0	7,145.0	6,986.2	16.8	16.7	-99.45	-356.8	261.9	466.0	433.5	32.54	14.323				
7,150.0	6,939.1	7,200.6	7,011.1	17.2	17.1	-99.76	-406.5	261.9	466.5	433.1	33.38	13.974				
7,200.0	6,956.2	7,256.5	7,032.4	17.7	17.6	-100.02	-458.1	261.9	466.8	432.5	34.32	13.601				
7,250.0	6,970.2	7,312.4	7,050.0	18.2	18.1	-100.24	-511.3	261.9	467.1	431.8	35.35	13.213				
7,300.0	6,981.0	7,368.6	7,063.6	18.7	18.7	-100.41	-565.7	261.9	467.4	430.9	36.47	12.815				
7,350.0	6,988.6	7,424.8	7,073.2	19.3	19.4	-100.52	-621.1	261.9	467.6	429.9	37.67	12.413				
7,400.0	6,992.9	7,481.1	7,078.7	19.9	20.0	-100.59	-677.1	261.9	467.7	428.7	38.93	12.012				
7,445.4	6,994.1	7,532.3	7,080.2	20.5	20.7	-100.61	-728.3	261.9	467.7	427.5	40.13	11.653				
7,500.0	6,993.8	7,587.3	7,079.6	21.2	21.4	-100.58	-783.3	261.9	467.6	426.1	41.57	11.250				
7,600.0	6,993.3	7,687.3	7,078.6	22.6	22.8	-100.51	-883.2	261.9	467.5	423.2	44.31	10.552				
7,700.0	6,992.8	7,787.3	7,077.6	24.1	24.2	-100.45	-983.2	261.9	467.4	420.3	47.20	9.904				
7,800.0	6,992.3	7,887.3	7,076.6	25.6	25.7	-100.39	-1,083.2	261.9	467.4	417.1	50.21	9.308				
7,900.0	6,991.8	7,987.3	7,075.6	27.1	27.3	-100.33	-1,183.2	261.9	467.3	413.9	53.32	8.764				
8,000.0	6,991.3	8,087.3	7,074.5	28.8	28.9	-100.27	-1,283.2	261.9	467.2	410.7	56.52	8.266				
8,100.0	6,990.8	8,187.3	7,073.5	30.4	30.5	-100.21	-1,383.2	261.9	467.1	407.3	59.78	7.813				

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 Hankins 20M-203
Project:	SEC.20-T5N-R67W	TVD Reference:	WELL @ 4974.0ft (RKB - 15')
Reference Site:	Hankins 5N67W20MR Pad Sec.20-T5N-R67W	MD Reference:	WELL @ 4974.0ft (RKB - 15')
Site Error:	0.0ft	North Reference:	True
Reference Well:	Hankins 20M-203	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 (8-12-14)	Offset TVD Reference:	Offset Datum

Offset Design Hankins 5N67W20MR Pad Sec.20-T5N-R67W - Hankins 20M-323 - Wellbore #1 - Plan #1 (8-12-14)													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 (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	
8,200.0	6,990.2	8,287.3	7,072.5	32.1	32.2	-100.15	-1,483.2	261.9	467.0	403.9	63.11	7.400	
8,300.0	6,989.7	8,387.3	7,071.5	33.8	33.9	-100.09	-1,583.2	261.9	466.9	400.4	66.49	7.022	
8,400.0	6,989.2	8,487.3	7,070.5	35.5	35.6	-100.03	-1,683.2	261.9	466.8	396.9	69.91	6.677	
8,500.0	6,988.7	8,587.3	7,069.5	37.3	37.4	-99.96	-1,783.2	261.9	466.7	393.4	73.37	6.361	
8,600.0	6,988.2	8,687.3	7,068.5	39.0	39.1	-99.90	-1,883.2	261.9	466.6	389.8	76.87	6.071	
8,700.0	6,987.7	8,787.3	7,067.5	40.8	40.9	-99.84	-1,983.2	261.9	466.6	386.2	80.39	5.803	
8,800.0	6,987.2	8,887.3	7,066.5	42.6	42.7	-99.78	-2,083.2	261.9	466.5	382.5	83.94	5.557	
8,900.0	6,986.7	8,987.3	7,065.4	44.4	44.5	-99.72	-2,183.2	261.9	466.4	378.9	87.52	5.329	
9,000.0	6,986.2	9,087.3	7,064.4	46.2	46.3	-99.66	-2,283.2	261.9	466.3	375.2	91.11	5.118	
9,100.0	6,985.7	9,187.3	7,063.4	48.0	48.1	-99.60	-2,383.1	261.9	466.2	371.5	94.72	4.922	
9,200.0	6,985.2	9,287.3	7,062.4	49.8	49.9	-99.54	-2,483.1	261.9	466.1	367.8	98.35	4.740	
9,300.0	6,984.7	9,387.3	7,061.4	51.7	51.7	-99.47	-2,583.1	261.9	466.0	364.1	101.99	4.570	
9,400.0	6,984.2	9,487.3	7,060.4	53.5	53.6	-99.41	-2,683.1	261.9	466.0	360.3	105.64	4.411	
9,500.0	6,983.7	9,587.3	7,059.4	55.3	55.4	-99.35	-2,783.1	261.9	465.9	356.6	109.31	4.262	
9,600.0	6,983.2	9,687.3	7,058.4	57.2	57.3	-99.29	-2,883.1	261.9	465.8	352.8	112.98	4.123	
9,700.0	6,982.7	9,787.3	7,057.3	59.0	59.1	-99.23	-2,983.1	261.9	465.7	349.1	116.67	3.992	
9,800.0	6,982.1	9,887.3	7,056.3	60.9	61.0	-99.17	-3,083.1	261.9	465.6	345.3	120.36	3.869	
9,900.0	6,981.6	9,987.3	7,055.3	62.8	62.8	-99.11	-3,183.1	261.9	465.6	341.5	124.07	3.752	
10,000.0	6,981.1	10,087.3	7,054.3	64.6	64.7	-99.04	-3,283.1	261.9	465.5	337.7	127.78	3.643	
10,100.0	6,980.6	10,187.3	7,053.3	66.5	66.6	-98.98	-3,383.1	261.9	465.4	333.9	131.50	3.539	
10,200.0	6,980.1	10,287.3	7,052.3	68.4	68.4	-98.92	-3,483.1	261.9	465.3	330.1	135.22	3.441	
10,300.0	6,979.6	10,387.3	7,051.3	70.2	70.3	-98.86	-3,583.1	261.9	465.2	326.3	138.95	3.348	
10,400.0	6,979.1	10,487.3	7,050.3	72.1	72.2	-98.80	-3,683.1	261.9	465.2	322.5	142.69	3.260	
10,500.0	6,978.6	10,587.3	7,049.2	74.0	74.1	-98.74	-3,783.1	261.9	465.1	318.7	146.43	3.176	
10,600.0	6,978.1	10,687.3	7,048.2	75.9	75.9	-98.67	-3,883.1	261.9	465.0	314.8	150.18	3.096	
10,700.0	6,977.6	10,787.3	7,047.2	77.8	77.8	-98.61	-3,983.0	261.9	464.9	311.0	153.93	3.020	
10,800.0	6,977.1	10,887.2	7,046.2	79.6	79.7	-98.55	-4,083.0	261.9	464.9	307.2	157.69	2.948	
10,900.0	6,976.6	10,987.2	7,045.2	81.5	81.6	-98.49	-4,183.0	261.9	464.8	303.3	161.45	2.879	
11,000.0	6,976.1	11,087.2	7,044.2	83.4	83.5	-98.43	-4,283.0	261.9	464.7	299.5	165.21	2.813	
11,100.0	6,975.6	11,187.2	7,043.2	85.3	85.4	-98.37	-4,383.0	261.9	464.6	295.7	168.98	2.750	
11,200.0	6,975.1	11,287.2	7,042.2	87.2	87.2	-98.30	-4,483.0	261.9	464.6	291.8	172.75	2.689	
11,300.0	6,974.6	11,387.2	7,041.1	89.1	89.1	-98.24	-4,583.0	261.9	464.5	288.0	176.53	2.631	
11,410.0	6,974.0	11,497.2	7,040.0	91.2	91.2	-98.17	-4,693.0	261.9	464.4	283.7	180.68	2.570 SF	

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Hankins 20M-203
Project:	SEC.20-T5N-R67W	TVD Reference:	WELL @ 4974.0ft (RKB - 15')
Reference Site:	Hankins 5N67W20MR Pad Sec.20-T5N-R67W	MD Reference:	WELL @ 4974.0ft (RKB - 15')
Site Error:	0.0ft	North Reference:	True
Reference Well:	Hankins 20M-203	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 (8-12-14)	Offset TVD Reference:	Offset Datum

Offset Design													Offset Site Error:	0.0 ft
Survey Program: 0-MWD													Offset Well Error:	0.0 ft
Reference														
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Semi Major Axis Reference (ft)	Semi Major Axis Offset (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	90.03	0.0	30.6	30.6					
100.0	100.0	100.0	100.0	0.1	0.1	90.03	0.0	30.6	30.6	30.4	0.22	136.324		
200.0	200.0	200.0	200.0	0.3	0.3	90.03	0.0	30.6	30.6	30.0	0.67	45.441		
300.0	300.0	300.0	300.0	0.6	0.6	90.03	0.0	30.6	30.6	29.5	1.12	27.265		
400.0	400.0	400.0	400.0	0.8	0.8	90.03	0.0	30.6	30.6	29.1	1.57	19.475		
500.0	500.0	500.0	500.0	1.0	1.0	90.03	0.0	30.6	30.6	28.6	2.02	15.147		
600.0	600.0	600.0	600.0	1.2	1.2	90.03	0.0	30.6	30.6	28.2	2.47	12.393		
700.0	700.0	700.0	700.0	1.5	1.5	90.03	0.0	30.6	30.6	27.7	2.92	10.486		
800.0	800.0	800.0	800.0	1.7	1.7	90.03	0.0	30.6	30.6	27.3	3.37	9.088		
900.0	900.0	900.0	900.0	1.9	1.9	90.03	0.0	30.6	30.6	26.8	3.82	8.019		
1,000.0	1,000.0	1,000.0	1,000.0	2.1	2.1	90.03	0.0	30.6	30.6	26.4	4.27	7.175		
1,100.0	1,100.0	1,100.0	1,100.0	2.4	2.4	90.03	0.0	30.6	30.6	25.9	4.72	6.492		
1,200.0	1,200.0	1,200.0	1,200.0	2.6	2.6	90.03	0.0	30.6	30.6	25.5	5.17	5.927		
1,300.0	1,300.0	1,300.0	1,300.0	2.8	2.8	90.03	0.0	30.6	30.6	25.0	5.62	5.453		
1,400.0	1,400.0	1,400.0	1,400.0	3.0	3.0	90.03	0.0	30.6	30.6	24.6	6.07	5.049		
1,500.0	1,500.0	1,500.0	1,500.0	3.3	3.3	90.03	0.0	30.6	30.6	24.1	6.52	4.701		
1,600.0	1,600.0	1,600.0	1,600.0	3.5	3.5	90.03	0.0	30.6	30.6	23.7	6.97	4.398		
1,700.0	1,700.0	1,700.0	1,700.0	3.7	3.7	90.03	0.0	30.6	30.6	23.2	7.42	4.131		
1,800.0	1,800.0	1,800.0	1,800.0	3.9	3.9	90.03	0.0	30.6	30.6	22.8	7.87	3.895		
1,900.0	1,900.0	1,900.0	1,900.0	4.2	4.2	90.03	0.0	30.6	30.6	22.3	8.32	3.684		
2,000.0	2,000.0	2,000.0	2,000.0	4.4	4.4	90.03	0.0	30.6	30.6	21.9	8.77	3.495 CC, ES		
2,100.0	2,100.0	2,100.0	2,100.0	4.6	4.6	169.20	0.0	30.6	32.4	23.2	9.20	3.517		
2,200.0	2,199.8	2,199.8	2,199.8	4.8	4.8	170.68	0.0	30.6	37.5	27.9	9.61	3.901		
2,300.0	2,299.5	2,299.5	2,299.5	5.0	5.1	172.41	0.0	30.6	46.1	36.1	10.02	4.604		
2,348.4	2,347.6	2,347.6	2,347.6	5.1	5.2	173.20	0.0	30.6	51.6	41.3	10.21	5.049		
2,400.0	2,398.8	2,398.8	2,398.8	5.3	5.3	173.94	0.0	30.6	57.8	47.3	10.43	5.538		
2,500.0	2,498.0	2,498.0	2,498.0	5.5	5.5	174.99	0.0	30.6	69.9	59.0	10.86	6.430		
2,600.0	2,597.3	2,597.3	2,597.3	5.7	5.7	175.73	0.0	30.6	81.9	70.6	11.30	7.253		
2,700.0	2,696.5	2,696.5	2,696.5	6.0	5.9	176.28	0.0	30.6	94.0	82.3	11.73	8.015		
2,800.0	2,795.8	2,795.8	2,795.8	6.2	6.2	176.70	0.0	30.6	106.2	94.0	12.17	8.721		
2,900.0	2,895.1	2,895.1	2,895.1	6.5	6.4	177.04	0.0	30.6	118.3	105.7	12.61	9.377		
3,000.0	2,994.3	2,994.3	2,994.3	6.8	6.6	177.32	0.0	30.6	130.4	117.3	13.05	9.989		
3,100.0	3,093.6	3,093.6	3,093.6	7.1	6.8	177.55	0.0	30.6	142.5	129.0	13.50	10.559		
3,200.0	3,192.9	3,192.9	3,192.9	7.3	7.1	177.74	0.0	30.6	154.6	140.7	13.94	11.092		
3,300.0	3,292.1	3,292.1	3,292.1	7.6	7.3	177.90	0.0	30.6	166.8	152.4	14.39	11.591		
3,400.0	3,391.4	3,391.4	3,391.4	7.9	7.5	178.05	0.0	30.6	178.9	164.0	14.83	12.059		
3,500.0	3,490.6	3,490.6	3,490.6	8.2	7.7	178.17	0.0	30.6	191.0	175.7	15.28	12.499		
3,600.0	3,589.9	3,589.9	3,589.9	8.5	8.0	178.28	0.0	30.6	203.1	187.4	15.73	12.914		
3,663.0	3,652.4	3,652.4	3,652.4	8.7	8.1	178.34	0.0	30.6	210.8	194.8	16.01	13.163		
3,700.0	3,689.2	3,689.2	3,689.2	8.8	8.2	178.38	0.0	30.6	215.0	198.8	16.19	13.282		
3,800.0	3,788.8	3,788.8	3,788.8	9.0	8.4	178.45	0.0	30.6	224.1	207.5	16.64	13.471		
3,900.0	3,888.6	3,888.6	3,888.6	9.2	8.6	178.49	0.0	30.6	229.8	212.7	17.07	13.461		
4,000.0	3,988.6	3,988.6	3,988.6	9.4	8.9	178.50	0.0	30.6	231.9	214.4	17.48	13.267		
4,011.4	4,000.0	4,000.0	4,000.0	9.4	8.9	99.94	0.0	30.6	231.9	214.4	17.53	13.234		
4,100.0	4,088.6	4,089.3	4,089.3	9.5	9.1	99.59	1.4	30.7	231.8	213.9	17.90	12.948		
4,200.0	4,188.6	4,189.5	4,189.4	9.8	9.3	98.53	5.7	31.0	231.4	213.1	18.34	12.616		
4,300.0	4,288.6	4,289.4	4,289.2	10.0	9.5	97.39	10.3	31.4	231.1	212.3	18.78	12.303		
4,400.0	4,388.6	4,389.3	4,389.0	10.2	9.8	96.25	14.9	31.7	230.9	211.6	19.23	12.008		
4,500.0	4,488.6	4,489.2	4,488.8	10.4	10.0	95.11	19.5	32.0	230.7	211.1	19.67	11.730		
4,597.9	4,586.5	4,587.0	4,586.5	10.6	10.2	93.98	24.0	32.3	230.7	210.6	20.11	11.474		
4,600.0	4,588.6	4,589.1	4,588.6	10.6	10.2	93.96	24.1	32.3	230.7	210.6	20.11	11.469		

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 Hankins 20M-203
Project:	SEC.20-T5N-R67W	TVD Reference:	WELL @ 4974.0ft (RKB - 15')
Reference Site:	Hankins 5N67W20MR Pad Sec.20-T5N-R67W	MD Reference:	WELL @ 4974.0ft (RKB - 15')
Site Error:	0.0ft	North Reference:	True
Reference Well:	Hankins 20M-203	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 (8-12-14)	Offset TVD Reference:	Offset Datum

Offset Design Hankins 5N67W20MR Pad Sec.20-T5N-R67W - Hankins 20M-423 - Wellbore #1 - Plan #1 (8-12-14)											Offset Site Error:		0.0 ft
Survey Program: 0-MWWD											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
4,700.0	4,688.6	4,689.0	4,688.4	10.8	10.4	92.82	28.7	32.6	230.7	210.2	20.56	11.222	
4,800.0	4,788.6	4,788.9	4,788.1	11.0	10.7	91.67	33.3	33.0	230.9	209.9	21.01	10.989	
4,900.0	4,888.6	4,888.9	4,888.0	11.2	10.9	90.55	37.8	33.3	231.1	209.6	21.45	10.773	
5,000.0	4,988.6	4,989.4	4,988.5	11.4	11.0	90.01	40.0	33.4	231.2	209.4	21.85	10.584	
5,100.0	5,088.6	5,089.5	5,088.6	11.6	11.2	90.00	40.0	33.4	231.2	209.0	22.26	10.388	
5,200.0	5,188.6	5,189.5	5,188.6	11.8	11.5	90.00	40.0	33.4	231.2	208.5	22.70	10.186	
5,300.0	5,288.6	5,289.5	5,288.6	12.0	11.7	90.00	40.0	33.4	231.2	208.1	23.15	9.991	
5,400.0	5,388.6	5,389.5	5,388.6	12.3	11.9	90.00	40.0	33.4	231.2	207.6	23.59	9.802	
5,500.0	5,488.6	5,489.5	5,488.6	12.5	12.1	90.00	40.0	33.4	231.2	207.2	24.03	9.621	
5,600.0	5,588.6	5,589.5	5,588.6	12.7	12.4	90.00	40.0	33.4	231.2	206.8	24.48	9.446	
5,700.0	5,688.6	5,689.5	5,688.6	12.9	12.6	90.00	40.0	33.4	231.2	206.3	24.92	9.278	
5,800.0	5,788.6	5,789.5	5,788.6	13.1	12.8	90.00	40.0	33.4	231.2	205.9	25.37	9.115	
5,900.0	5,888.6	5,889.5	5,888.6	13.3	13.0	90.00	40.0	33.4	231.2	205.4	25.81	8.958	
6,000.0	5,988.6	5,989.5	5,988.6	13.5	13.3	90.00	40.0	33.4	231.2	205.0	26.26	8.806	
6,100.0	6,088.6	6,089.5	6,088.6	13.8	13.5	90.00	40.0	33.4	231.2	204.5	26.71	8.659	
6,200.0	6,188.6	6,189.5	6,188.6	14.0	13.7	90.00	40.0	33.4	231.2	204.1	27.15	8.517	
6,241.6	6,230.1	6,231.0	6,230.1	14.1	13.8	90.00	40.0	33.4	231.2	203.9	27.34	8.459	
6,246.6	6,235.1	6,236.0	6,235.1	14.1	13.8	-90.00	40.0	33.4	231.2	203.9	27.36	8.453	
6,250.0	6,238.6	6,239.5	6,238.6	14.1	13.8	-90.01	40.0	33.4	231.2	203.9	27.37	8.448	
6,254.6	6,243.2	6,244.1	6,243.2	14.1	13.8	-90.02	40.0	33.4	231.2	203.8	27.39	8.442	
6,300.0	6,288.5	6,289.4	6,288.5	14.2	13.9	-90.55	40.0	33.4	231.2	203.7	27.57	8.387	
6,350.0	6,338.2	6,339.1	6,338.2	14.2	14.0	-91.88	40.0	33.4	231.4	203.6	27.77	8.331	
6,400.0	6,387.4	6,388.3	6,387.4	14.3	14.1	-93.96	40.0	33.4	231.8	203.9	27.97	8.289	
6,450.0	6,436.0	6,438.1	6,437.2	14.4	14.3	-96.62	39.3	33.4	232.9	204.7	28.15	8.274	
6,500.0	6,483.7	6,489.0	6,487.9	14.5	14.3	-99.31	35.4	33.4	234.5	206.2	28.30	8.287	
6,550.0	6,530.3	6,540.7	6,539.1	14.6	14.4	-101.94	28.0	33.4	236.6	208.2	28.42	8.325	
6,600.0	6,575.6	6,593.3	6,590.5	14.7	14.5	-104.50	16.9	33.4	239.2	210.7	28.53	8.386	
6,650.0	6,619.4	6,646.8	6,641.9	14.8	14.6	-106.97	2.1	33.4	242.3	213.7	28.60	8.470	
6,700.0	6,661.5	6,701.1	6,692.9	14.9	14.7	-109.33	-16.7	33.4	245.7	217.0	28.66	8.573	
6,750.0	6,701.9	6,756.4	6,743.3	15.0	14.8	-111.56	-39.4	33.4	249.4	220.7	28.69	8.692	
6,800.0	6,740.1	6,812.7	6,792.7	15.1	14.9	-113.67	-66.2	33.4	253.3	224.6	28.71	8.822	
6,850.0	6,776.3	6,869.8	6,840.8	15.3	15.0	-115.63	-97.1	33.4	257.3	228.6	28.73	8.956	
6,900.0	6,810.0	6,927.9	6,887.2	15.5	15.2	-117.45	-132.1	33.4	261.5	232.7	28.77	9.088	
6,950.0	6,841.3	6,987.0	6,931.4	15.7	15.4	-119.12	-171.1	33.4	265.6	236.7	28.83	9.210	
7,000.0	6,870.0	7,046.9	6,973.1	16.0	15.6	-120.63	-214.1	33.4	269.5	240.6	28.95	9.312	
7,050.0	6,895.9	7,107.7	7,011.9	16.4	15.9	-121.98	-261.0	33.4	273.4	244.2	29.13	9.385	
7,100.0	6,919.0	7,169.3	7,047.2	16.8	16.3	-123.17	-311.4	33.4	276.9	247.5	29.40	9.419	
7,150.0	6,939.1	7,231.6	7,078.7	17.2	16.7	-124.20	-365.2	33.4	280.1	250.3	29.77	9.409	
7,200.0	6,956.2	7,294.6	7,105.9	17.7	17.3	-125.07	-422.0	33.4	282.9	252.6	30.26	9.349	
7,250.0	6,970.2	7,358.2	7,128.6	18.2	17.8	-125.78	-481.3	33.4	285.3	254.4	30.89	9.236	
7,300.0	6,981.0	7,422.2	7,146.4	18.7	18.5	-126.32	-542.8	33.4	287.1	255.5	31.66	9.071	
7,350.0	6,988.6	7,486.6	7,159.0	19.3	19.2	-126.70	-606.0	33.4	288.5	255.9	32.57	8.858	
7,400.0	6,992.9	7,551.3	7,166.3	19.9	20.0	-126.92	-670.2	33.4	289.2	255.6	33.62	8.604	
7,445.4	6,994.1	7,608.7	7,168.2	20.5	20.7	-126.97	-727.6	33.4	289.4	254.8	34.68	8.346	
7,500.0	6,993.8	7,663.3	7,168.2	21.2	21.4	-127.03	-782.2	33.4	289.7	253.8	35.84	8.082	
7,600.0	6,993.3	7,763.3	7,168.3	22.6	22.7	-127.13	-882.2	33.4	290.0	252.0	38.06	7.620	
7,700.0	6,992.8	7,863.3	7,168.5	24.1	24.2	-127.23	-982.2	33.4	290.4	250.0	40.40	7.188	
7,800.0	6,992.3	7,963.3	7,168.6	25.6	25.7	-127.32	-1,082.2	33.4	290.8	247.9	42.84	6.787	
7,900.0	6,991.8	8,063.3	7,168.7	27.1	27.2	-127.42	-1,182.2	33.4	291.2	245.8	45.37	6.418	
8,000.0	6,991.3	8,163.3	7,168.8	28.8	28.8	-127.52	-1,282.2	33.4	291.6	243.6	47.96	6.079	

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 Hankins 20M-203
Project:	SEC.20-T5N-R67W	TVD Reference:	WELL @ 4974.0ft (RKB - 15')
Reference Site:	Hankins 5N67W20MR Pad Sec.20-T5N-R67W	MD Reference:	WELL @ 4974.0ft (RKB - 15')
Site Error:	0.0ft	North Reference:	True
Reference Well:	Hankins 20M-203	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 (8-12-14)	Offset TVD Reference:	Offset Datum

Offset Design Hankins 5N67W20MR Pad Sec.20-T5N-R67W - Hankins 20M-423 - Wellbore #1 - Plan #1 (8-12-14)											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 (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	
8,100.0	6,990.8	8,263.3	7,169.0	30.4	30.5	-127.62	-1,382.2	33.4	291.9	241.3	50.60	5.769	
8,200.0	6,990.2	8,363.3	7,169.1	32.1	32.1	-127.72	-1,482.2	33.4	292.3	239.0	53.30	5.485	
8,300.0	6,989.7	8,463.3	7,169.2	33.8	33.8	-127.81	-1,582.2	33.4	292.7	236.7	56.03	5.224	
8,400.0	6,989.2	8,563.3	7,169.3	35.5	35.6	-127.91	-1,682.2	33.4	293.1	234.3	58.79	4.985	
8,500.0	6,988.7	8,663.3	7,169.4	37.3	37.3	-128.01	-1,782.1	33.4	293.5	231.9	61.59	4.765	
8,600.0	6,988.2	8,763.3	7,169.6	39.0	39.1	-128.10	-1,882.1	33.4	293.9	229.5	64.40	4.563	
8,700.0	6,987.7	8,863.3	7,169.7	40.8	40.8	-128.20	-1,982.1	33.4	294.3	227.0	67.23	4.377	
8,800.0	6,987.2	8,963.3	7,169.8	42.6	42.6	-128.30	-2,082.1	33.4	294.6	224.6	70.08	4.204	
8,900.0	6,986.7	9,063.3	7,169.9	44.4	44.4	-128.39	-2,182.1	33.4	295.0	222.1	72.94	4.045	
9,000.0	6,986.2	9,163.3	7,170.1	46.2	46.2	-128.49	-2,282.1	33.4	295.4	219.6	75.81	3.897	
9,100.0	6,985.7	9,263.3	7,170.2	48.0	48.0	-128.58	-2,382.1	33.4	295.8	217.1	78.69	3.759	
9,200.0	6,985.2	9,363.3	7,170.3	49.8	49.8	-128.68	-2,482.1	33.4	296.2	214.6	81.58	3.631	
9,300.0	6,984.7	9,463.3	7,170.4	51.7	51.7	-128.77	-2,582.1	33.4	296.6	212.1	84.48	3.511	
9,400.0	6,984.2	9,563.3	7,170.5	53.5	53.5	-128.87	-2,682.1	33.4	297.0	209.6	87.38	3.399	
9,500.0	6,983.7	9,663.3	7,170.7	55.3	55.3	-128.96	-2,782.1	33.4	297.4	207.1	90.28	3.294	
9,600.0	6,983.2	9,763.3	7,170.8	57.2	57.2	-129.06	-2,882.1	33.4	297.8	204.6	93.18	3.196	
9,700.0	6,982.7	9,863.3	7,170.9	59.0	59.0	-129.15	-2,982.1	33.4	298.2	202.1	96.09	3.103	
9,800.0	6,982.1	9,963.3	7,171.0	60.9	60.9	-129.24	-3,082.1	33.4	298.6	199.6	99.00	3.016	
9,900.0	6,981.6	10,063.2	7,171.2	62.8	62.8	-129.34	-3,182.1	33.4	299.0	197.1	101.90	2.934	
10,000.0	6,981.1	10,163.2	7,171.3	64.6	64.6	-129.43	-3,282.1	33.4	299.4	194.6	104.81	2.856	
10,100.0	6,980.6	10,263.2	7,171.4	66.5	66.5	-129.52	-3,382.1	33.4	299.8	192.1	107.72	2.783	
10,200.0	6,980.1	10,363.2	7,171.5	68.4	68.4	-129.61	-3,482.1	33.4	300.2	189.6	110.62	2.713	
10,300.0	6,979.6	10,463.2	7,171.6	70.2	70.2	-129.71	-3,582.1	33.4	300.6	187.0	113.53	2.648	
10,400.0	6,979.1	10,563.2	7,171.8	72.1	72.1	-129.80	-3,682.1	33.4	301.0	184.5	116.43	2.585	
10,500.0	6,978.6	10,663.2	7,171.9	74.0	74.0	-129.89	-3,782.1	33.4	301.4	182.1	119.33	2.526	
10,600.0	6,978.1	10,763.2	7,172.0	75.9	75.9	-129.98	-3,882.1	33.4	301.8	179.6	122.22	2.469	
10,700.0	6,977.6	10,863.2	7,172.1	77.8	77.7	-130.07	-3,982.1	33.4	302.2	177.1	125.12	2.415	
10,800.0	6,977.1	10,963.2	7,172.3	79.6	79.6	-130.16	-4,082.1	33.4	302.6	174.6	128.01	2.364	
10,900.0	6,976.6	11,063.2	7,172.4	81.5	81.5	-130.25	-4,182.1	33.4	303.0	172.1	130.90	2.315	
11,000.0	6,976.1	11,163.2	7,172.5	83.4	83.4	-130.35	-4,282.1	33.4	303.4	169.6	133.78	2.268	
11,100.0	6,975.6	11,263.2	7,172.6	85.3	85.3	-130.44	-4,382.1	33.4	303.8	167.1	136.66	2.223	
11,200.0	6,975.1	11,363.2	7,172.7	87.2	87.2	-130.53	-4,482.1	33.4	304.2	164.7	139.54	2.180	
11,300.0	6,974.6	11,463.2	7,172.9	89.1	89.1	-130.62	-4,582.1	33.4	304.6	162.2	142.41	2.139	
11,410.0	6,974.0	11,573.2	7,173.0	91.2	90.9	-130.71	-4,692.1	33.4	305.1	159.8	145.33	2.099 SF	

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Hankins 20M-203
Project:	SEC.20-T5N-R67W	TVD Reference:	WELL @ 4974.0ft (RKB - 15')
Reference Site:	Hankins 5N67W20MR Pad Sec.20-T5N-R67W	MD Reference:	WELL @ 4974.0ft (RKB - 15')
Site Error:	0.0ft	North Reference:	True
Reference Well:	Hankins 20M-203	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 (8-12-14)	Offset TVD Reference:	Offset Datum

Offset Design Hankins 5N67W20MR Pad Sec.20-T5N-R67W - Hankins 20R-243 - Wellbore #1 - Plan #1 (8-12-14)												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 (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor		
0.0	0.0	0.0	0.0	0.0	0.0	90.02	0.0	89.1	89.1					
100.0	100.0	99.0	99.0	0.1	0.1	90.02	0.0	89.1	89.1	88.9	0.22	398.568		
200.0	200.0	199.0	199.0	0.3	0.3	90.02	0.0	89.1	89.1	88.5	0.67	132.635		
300.0	300.0	299.0	299.0	0.6	0.6	90.02	0.0	89.1	89.1	88.0	1.12	79.475		
400.0	400.0	399.0	399.0	0.8	0.8	90.02	0.0	89.1	89.1	87.6	1.57	56.735		
500.0	500.0	499.0	499.0	1.0	1.0	90.02	0.0	89.1	89.1	87.1	2.02	44.113		
600.0	600.0	599.0	599.0	1.2	1.2	90.02	0.0	89.1	89.1	86.7	2.47	36.085		
700.0	700.0	699.0	699.0	1.5	1.5	90.02	0.0	89.1	89.1	86.2	2.92	30.530		
800.0	800.0	799.0	799.0	1.7	1.7	90.02	0.0	89.1	89.1	85.8	3.37	26.456		
900.0	900.0	899.0	899.0	1.9	1.9	90.02	0.0	89.1	89.1	85.3	3.82	23.342		
1,000.0	1,000.0	999.0	999.0	2.1	2.1	90.02	0.0	89.1	89.1	84.9	4.27	20.884 CC, ES		
1,100.0	1,100.0	1,096.0	1,096.0	2.4	2.3	89.95	0.1	90.7	90.8	86.1	4.70	19.319		
1,200.0	1,200.0	1,192.7	1,192.6	2.6	2.5	89.76	0.4	95.6	95.8	90.7	5.12	18.697		
1,300.0	1,300.0	1,289.0	1,288.5	2.8	2.8	89.49	0.9	103.7	104.2	98.6	5.56	18.738		
1,400.0	1,400.0	1,384.9	1,383.7	3.0	3.0	89.17	1.7	114.9	115.9	109.9	6.01	19.276		
1,500.0	1,500.0	1,484.0	1,482.0	3.3	3.2	88.88	2.5	127.9	129.1	122.6	6.49	19.878		
1,600.0	1,600.0	1,583.2	1,580.3	3.5	3.5	88.64	3.4	141.0	142.2	135.3	6.98	20.365		
1,700.0	1,700.0	1,682.3	1,678.5	3.7	3.8	88.43	4.2	154.0	155.4	147.9	7.49	20.760		
1,800.0	1,800.0	1,781.4	1,776.8	3.9	4.1	88.27	5.1	167.0	168.6	160.6	7.99	21.085		
1,900.0	1,900.0	1,880.5	1,875.1	4.2	4.4	88.12	5.9	180.1	181.7	173.2	8.51	21.356		
2,000.0	2,000.0	1,979.7	1,973.3	4.4	4.7	87.99	6.8	193.1	194.9	185.9	9.03	21.584		
2,100.0	2,100.0	2,078.6	2,071.4	4.6	5.0	166.50	7.6	206.1	209.8	200.7	9.07	23.123		
2,200.0	2,199.8	2,176.9	2,168.8	4.8	5.3	166.62	8.5	219.0	228.0	218.5	9.48	24.043		
2,300.0	2,299.5	2,274.5	2,265.6	5.0	5.6	166.89	9.3	231.9	249.5	239.6	9.88	25.251		
2,348.4	2,347.6	2,321.5	2,312.2	5.1	5.7	167.05	9.7	238.0	261.1	251.1	10.07	25.931		
2,400.0	2,398.8	2,371.5	2,361.7	5.3	5.9	167.28	10.1	244.6	273.9	263.6	10.29	26.620		
2,500.0	2,498.0	2,468.3	2,457.7	5.5	6.2	167.68	11.0	257.4	298.7	288.0	10.72	27.868		
2,600.0	2,597.3	2,565.2	2,553.7	5.7	6.5	168.02	11.8	270.1	323.6	312.4	11.15	29.012		
2,700.0	2,696.5	2,662.0	2,649.7	6.0	6.8	168.30	12.6	282.8	348.4	336.8	11.59	30.064		
2,800.0	2,795.8	2,758.9	2,745.7	6.2	7.1	168.55	13.4	295.6	373.2	361.2	12.03	31.032		
2,900.0	2,895.1	2,855.7	2,841.7	6.5	7.4	168.77	14.3	308.3	398.1	385.6	12.47	31.927		
3,000.0	2,994.3	2,952.6	2,937.8	6.8	7.7	168.96	15.1	321.0	422.9	410.0	12.91	32.755		
3,100.0	3,093.6	3,049.4	3,033.8	7.1	8.1	169.13	15.9	333.8	447.8	434.4	13.36	33.523		
3,200.0	3,192.9	3,146.3	3,129.8	7.3	8.4	169.29	16.8	346.5	472.7	458.9	13.81	34.238		
3,300.0	3,292.1	3,243.1	3,225.8	7.6	8.7	169.42	17.6	359.2	497.5	483.3	14.25	34.904		
3,400.0	3,391.4	3,340.0	3,321.8	7.9	9.0	169.55	18.4	372.0	522.4	507.7	14.70	35.526		
3,500.0	3,490.6	3,436.8	3,417.8	8.2	9.3	169.66	19.3	384.7	547.3	532.1	15.16	36.108		
3,600.0	3,589.9	3,533.7	3,513.8	8.5	9.6	169.76	20.1	397.4	572.1	556.5	15.61	36.653		
3,663.0	3,652.4	3,594.7	3,574.3	8.7	9.8	169.83	20.6	405.5	587.8	571.9	15.90	36.980		
3,700.0	3,689.2	3,630.6	3,609.9	8.8	10.0	169.89	20.9	410.2	596.8	580.7	16.08	37.111		
3,800.0	3,788.8	3,728.2	3,706.6	9.0	10.3	170.00	21.8	423.0	618.8	602.2	16.56	37.370		
3,900.0	3,888.6	3,826.4	3,804.0	9.2	10.6	170.05	22.6	435.9	637.4	620.3	17.02	37.449		
4,000.0	3,988.6	3,925.2	3,901.9	9.4	10.9	170.03	23.5	448.9	652.6	635.1	17.46	37.365		
4,011.4	4,000.0	3,936.6	3,913.2	9.4	11.0	91.45	23.6	450.4	654.1	636.6	17.51	37.347		
4,100.0	4,088.6	4,024.4	4,000.2	9.5	11.3	91.36	24.3	462.0	665.7	647.8	17.90	37.190		
4,200.0	4,188.6	4,123.5	4,098.5	9.8	11.6	91.26	25.2	475.0	678.8	660.5	18.35	36.986		
4,300.0	4,288.6	4,222.6	4,196.7	10.0	11.9	91.17	26.0	488.0	692.0	673.2	18.81	36.791		
4,400.0	4,388.6	4,321.7	4,295.0	10.2	12.3	91.08	26.9	501.1	705.1	685.8	19.26	36.604		
4,500.0	4,488.6	4,420.9	4,393.2	10.4	12.6	90.99	27.7	514.1	718.2	698.5	19.72	36.425		
4,600.0	4,588.6	4,520.0	4,491.5	10.6	12.9	90.90	28.6	527.1	731.4	711.2	20.17	36.253		
4,700.0	4,688.6	4,619.1	4,589.8	10.8	13.2	90.82	29.4	540.2	744.5	723.9	20.63	36.089		

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 Hankins 20M-203
Project:	SEC.20-T5N-R67W	TVD Reference:	WELL @ 4974.0ft (RKB - 15')
Reference Site:	Hankins 5N67W20MR Pad Sec.20-T5N-R67W	MD Reference:	WELL @ 4974.0ft (RKB - 15')
Site Error:	0.0ft	North Reference:	True
Reference Well:	Hankins 20M-203	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 (8-12-14)	Offset TVD Reference:	Offset Datum

Offset Design Hankins 5N67W20MR Pad Sec.20-T5N-R67W - Hankins 20R-243 - Wellbore #1 - Plan #1 (8-12-14)											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 (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	
4,800.0	4,788.6	4,718.3	4,688.0	11.0	13.6	90.74	30.3	553.2	757.6	736.5	21.09	35.931	
4,900.0	4,888.6	4,817.4	4,786.3	11.2	13.9	90.67	31.1	566.2	770.8	749.2	21.54	35.779	
5,000.0	4,988.6	4,916.5	4,884.6	11.4	14.2	90.59	32.0	579.3	783.9	761.9	22.00	35.633	
5,100.0	5,088.6	5,015.6	4,982.8	11.6	14.6	90.52	32.8	592.3	797.1	774.6	22.46	35.493	
5,200.0	5,188.6	5,114.8	5,081.1	11.8	14.9	90.45	33.7	605.3	810.2	787.3	22.91	35.357	
5,300.0	5,288.6	5,213.9	5,179.4	12.0	15.2	90.39	34.5	618.4	823.3	800.0	23.37	35.227	
5,400.0	5,388.6	5,313.0	5,277.6	12.3	15.5	90.32	35.4	631.4	836.5	812.7	23.83	35.101	
5,500.0	5,488.6	5,412.2	5,375.9	12.5	15.9	90.26	36.2	644.4	849.6	825.3	24.29	34.980	
5,600.0	5,588.6	5,511.3	5,474.1	12.7	16.2	90.20	37.1	657.5	862.8	838.0	24.75	34.863	
5,700.0	5,688.6	5,610.4	5,572.4	12.9	16.5	90.14	37.9	670.5	875.9	850.7	25.21	34.750	
5,800.0	5,788.6	5,731.3	5,692.4	13.1	16.9	90.07	38.9	685.5	888.5	862.8	25.69	34.581	
5,900.0	5,888.6	5,876.0	5,836.5	13.3	17.2	90.02	39.7	697.4	896.7	870.5	26.18	34.249	
6,000.0	5,988.6	6,021.4	5,981.9	13.5	17.4	90.00	40.0	702.0	899.8	873.2	26.66	33.753	
6,100.0	6,088.6	6,127.1	6,087.6	13.8	17.6	90.00	40.0	702.1	899.9	872.8	27.08	33.230	
6,200.0	6,188.6	6,227.1	6,187.6	14.0	17.7	90.00	40.0	702.1	899.9	872.4	27.50	32.725	
6,241.6	6,230.1	6,268.7	6,229.1	14.1	17.8	90.00	40.0	702.1	899.9	872.2	27.67	32.519	
6,250.0	6,238.6	6,277.1	6,237.6	14.1	17.8	-90.00	39.9	702.1	899.9	872.2	27.71	32.481	
6,260.0	6,248.6	6,287.1	6,247.6	14.1	17.8	-90.00	39.8	702.1	899.9	872.1	27.74	32.438	
6,300.0	6,288.5	6,327.1	6,287.5	14.2	17.9	-90.00	37.8	702.1	899.9	872.0	27.88	32.274	
6,350.0	6,338.2	6,377.1	6,337.2	14.2	18.0	-90.01	32.4	702.1	899.9	871.8	28.05	32.079	
6,400.0	6,387.4	6,427.1	6,386.5	14.3	18.0	-90.01	23.8	702.1	899.9	871.7	28.22	31.890	
6,450.0	6,436.0	6,477.1	6,435.1	14.4	18.1	-90.02	12.0	702.1	899.9	871.5	28.38	31.705	
6,500.0	6,483.7	6,527.2	6,482.8	14.5	18.2	-90.02	-3.0	702.1	899.9	871.3	28.55	31.516	
6,550.0	6,530.3	6,577.2	6,529.4	14.6	18.3	-90.02	-21.1	702.1	899.9	871.2	28.73	31.318	
6,600.0	6,575.6	6,627.2	6,574.8	14.7	18.3	-90.03	-42.2	702.1	899.9	871.0	28.93	31.104	
6,650.0	6,619.4	6,677.2	6,618.6	14.8	18.4	-90.03	-66.2	702.1	899.9	870.7	29.16	30.864	
6,700.0	6,661.5	6,727.3	6,660.9	14.9	18.5	-90.04	-93.0	702.1	899.9	870.5	29.42	30.592	
6,750.0	6,701.9	6,777.3	6,701.2	15.0	18.6	-90.04	-122.6	702.1	899.9	870.2	29.72	30.281	
6,800.0	6,740.1	6,827.4	6,739.6	15.1	18.8	-90.04	-154.7	702.1	899.9	869.8	30.07	29.924	
6,850.0	6,776.3	6,877.4	6,775.8	15.3	18.9	-90.05	-189.2	702.1	899.9	869.4	30.49	29.516	
6,900.0	6,810.0	6,927.5	6,809.6	15.5	19.1	-90.05	-226.1	702.1	899.9	868.9	30.97	29.056	
6,950.0	6,841.3	6,977.5	6,841.0	15.7	19.3	-90.05	-265.1	702.1	899.9	868.4	31.53	28.543	
7,000.0	6,870.0	7,027.6	6,869.7	16.0	19.5	-90.05	-306.1	702.1	899.9	867.7	32.16	27.980	
7,050.0	6,895.9	7,077.6	6,895.7	16.4	19.8	-90.06	-348.9	702.1	899.9	867.0	32.88	27.371	
7,100.0	6,919.0	7,127.7	6,918.8	16.8	20.1	-90.06	-393.3	702.1	899.9	866.2	33.68	26.721	
7,150.0	6,939.1	7,177.7	6,939.0	17.2	20.4	-90.06	-439.1	702.1	899.9	865.3	34.56	26.040	
7,200.0	6,956.2	7,227.8	6,956.1	17.7	20.8	-90.06	-486.1	702.1	899.9	864.4	35.52	25.336	
7,250.0	6,970.2	7,277.9	6,970.2	18.2	21.2	-90.06	-534.1	702.1	899.9	863.3	36.55	24.618	
7,300.0	6,981.0	7,327.9	6,981.0	18.7	21.7	-90.06	-583.0	702.1	899.9	862.2	37.66	23.895	
7,350.0	6,988.6	7,378.0	6,988.6	19.3	22.2	-90.07	-632.5	702.1	899.9	861.1	38.83	23.176	
7,400.0	6,992.9	7,428.1	6,993.0	19.9	22.7	-90.07	-682.3	702.1	899.9	859.8	40.05	22.467	
7,445.4	6,994.1	7,473.6	6,994.1	20.5	23.2	-90.07	-727.8	702.1	899.9	858.7	41.21	21.838	
7,500.0	6,993.8	7,528.1	6,993.8	21.2	23.9	-90.07	-782.4	702.1	899.9	857.2	42.65	21.098	
7,600.0	6,993.3	7,628.1	6,993.3	22.6	25.1	-90.07	-882.4	702.1	899.9	854.5	45.42	19.813	
7,700.0	6,992.8	7,728.1	6,992.8	24.1	26.4	-90.07	-982.4	702.1	899.9	851.6	48.33	18.619	
7,800.0	6,992.3	7,828.1	6,992.3	25.6	27.8	-90.07	-1,082.4	702.1	899.9	848.5	51.37	17.519	
7,900.0	6,991.8	7,928.1	6,991.8	27.1	29.3	-90.07	-1,182.4	702.1	899.9	845.4	54.51	16.510	
8,000.0	6,991.3	8,028.1	6,991.3	28.8	30.8	-90.07	-1,282.4	702.1	899.9	842.2	57.73	15.588	
8,100.0	6,990.8	8,128.1	6,990.8	30.4	32.4	-90.07	-1,382.4	702.1	899.9	838.9	61.02	14.747	
8,200.0	6,990.2	8,228.1	6,990.3	32.1	34.0	-90.07	-1,482.4	702.1	899.9	835.5	64.38	13.978	

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 Hankins 20M-203
Project:	SEC.20-T5N-R67W	TVD Reference:	WELL @ 4974.0ft (RKB - 15')
Reference Site:	Hankins 5N67W20MR Pad Sec.20-T5N-R67W	MD Reference:	WELL @ 4974.0ft (RKB - 15')
Site Error:	0.0ft	North Reference:	True
Reference Well:	Hankins 20M-203	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 (8-12-14)	Offset TVD Reference:	Offset Datum

Offset Design										Hankins 5N67W20MR Pad Sec.20-T5N-R67W - Hankins 20R-243 - Wellbore #1 - Plan #1 (8-12-14)				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 (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor			
8,300.0	6,989.7	8,328.1	6,989.8	33.8	35.6	-90.07	-1,582.4	702.1	899.9	832.1	67.79	13.276			
8,400.0	6,989.2	8,428.1	6,989.3	35.5	37.2	-90.07	-1,682.4	702.1	899.9	828.6	71.24	12.632			
8,500.0	6,988.7	8,528.1	6,988.8	37.3	38.9	-90.07	-1,782.4	702.1	899.9	825.2	74.73	12.042			
8,600.0	6,988.2	8,628.1	6,988.3	39.0	40.6	-90.07	-1,882.4	702.1	899.9	821.6	78.25	11.500			
8,700.0	6,987.7	8,728.1	6,987.8	40.8	42.3	-90.07	-1,982.4	702.1	899.9	818.1	81.80	11.001			
8,800.0	6,987.2	8,828.1	6,987.2	42.6	44.1	-90.07	-2,082.4	702.1	899.9	814.5	85.38	10.540			
8,900.0	6,986.7	8,928.1	6,986.7	44.4	45.8	-90.07	-2,182.4	702.1	899.9	810.9	88.98	10.114			
9,000.0	6,986.2	9,028.1	6,986.2	46.2	47.6	-90.07	-2,282.4	702.1	899.9	807.3	92.59	9.719			
9,100.0	6,985.7	9,128.1	6,985.7	48.0	49.4	-90.07	-2,382.4	702.1	899.9	803.7	96.23	9.351			
9,200.0	6,985.2	9,228.1	6,985.2	49.8	51.1	-90.07	-2,482.4	702.1	899.9	800.0	99.88	9.010			
9,300.0	6,984.7	9,328.1	6,984.7	51.7	52.9	-90.07	-2,582.4	702.1	899.9	796.3	103.55	8.691			
9,400.0	6,984.2	9,428.1	6,984.2	53.5	54.7	-90.07	-2,682.4	702.1	899.9	792.7	107.22	8.393			
9,500.0	6,983.7	9,528.1	6,983.7	55.3	56.6	-90.07	-2,782.4	702.1	899.9	789.0	110.91	8.114			
9,600.0	6,983.2	9,628.1	6,983.2	57.2	58.4	-90.07	-2,882.4	702.1	899.9	785.3	114.61	7.852			
9,700.0	6,982.7	9,728.1	6,982.7	59.0	60.2	-90.07	-2,982.4	702.1	899.9	781.6	118.32	7.606			
9,800.0	6,982.1	9,828.1	6,982.2	60.9	62.0	-90.07	-3,082.4	702.1	899.9	777.9	122.03	7.374			
9,900.0	6,981.6	9,928.1	6,981.7	62.8	63.9	-90.07	-3,182.4	702.1	899.9	774.1	125.76	7.156			
10,000.0	6,981.1	10,028.1	6,981.2	64.6	65.7	-90.07	-3,282.4	702.1	899.9	770.4	129.49	6.950			
10,100.0	6,980.6	10,128.1	6,980.7	66.5	67.6	-90.07	-3,382.4	702.1	899.9	766.7	133.22	6.755			
10,200.0	6,980.1	10,228.1	6,980.2	68.4	69.4	-90.07	-3,482.4	702.1	899.9	762.9	136.97	6.570			
10,300.0	6,979.6	10,328.1	6,979.7	70.2	71.3	-90.07	-3,582.4	702.1	899.9	759.2	140.71	6.395			
10,400.0	6,979.1	10,428.1	6,979.1	72.1	73.1	-90.07	-3,682.4	702.1	899.9	755.4	144.47	6.229			
10,500.0	6,978.6	10,528.1	6,978.6	74.0	75.0	-90.07	-3,782.4	702.1	899.9	751.7	148.22	6.071			
10,600.0	6,978.1	10,628.1	6,978.1	75.9	76.8	-90.07	-3,882.3	702.1	899.9	747.9	151.99	5.921			
10,700.0	6,977.6	10,728.1	6,977.6	77.8	78.7	-90.07	-3,982.3	702.1	899.9	744.1	155.75	5.778			
10,800.0	6,977.1	10,828.1	6,977.1	79.6	80.6	-90.07	-4,082.3	702.1	899.9	740.4	159.52	5.641			
10,900.0	6,976.6	10,928.1	6,976.6	81.5	82.4	-90.07	-4,182.3	702.1	899.9	736.6	163.29	5.511			
11,000.0	6,976.1	11,028.1	6,976.1	83.4	84.3	-90.07	-4,282.3	702.1	899.9	732.8	167.07	5.386			
11,100.0	6,975.6	11,128.1	6,975.6	85.3	86.2	-90.07	-4,382.3	702.1	899.9	729.0	170.85	5.267			
11,200.0	6,975.1	11,228.1	6,975.1	87.2	88.1	-90.07	-4,482.3	702.1	899.9	725.3	174.63	5.153			
11,300.0	6,974.6	11,328.1	6,974.6	89.1	89.9	-90.07	-4,582.3	702.1	899.9	721.5	178.41	5.044			
11,410.0	6,974.0	11,438.1	6,974.0	91.2	92.0	-90.07	-4,692.3	702.1	899.9	717.3	182.58	4.929 SF			

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Hankins 20M-203
Project:	SEC.20-T5N-R67W	TVD Reference:	WELL @ 4974.0ft (RKB - 15')
Reference Site:	Hankins 5N67W20MR Pad Sec.20-T5N-R67W	MD Reference:	WELL @ 4974.0ft (RKB - 15')
Site Error:	0.0ft	North Reference:	True
Reference Well:	Hankins 20M-203	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 (8-12-14)	Offset TVD Reference:	Offset Datum

Offset Design Hankins 5N67W20MR Pad Sec.20-T5N-R67W - Hankins 20R-303 - Wellbore #1 - Plan #1 (8-12-14)													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 (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor		
0.0	0.0	0.0	0.0	0.0	0.0	90.00	0.0	150.4	150.4					
100.0	100.0	98.0	98.0	0.1	0.1	90.00	0.0	150.4	150.4	150.2	0.22	675.974		
200.0	200.0	198.0	198.0	0.3	0.3	90.00	0.0	150.4	150.4	149.7	0.67	224.573		
300.0	300.0	298.0	298.0	0.6	0.6	90.00	0.0	150.4	150.4	149.3	1.12	134.383		
400.0	400.0	398.0	398.0	0.8	0.8	90.00	0.0	150.4	150.4	148.9	1.57	95.878		
500.0	500.0	498.0	498.0	1.0	1.0	90.00	0.0	150.4	150.4	148.4	2.02	74.524 CC, ES		
600.0	600.0	593.1	593.1	1.2	1.2	89.98	0.1	151.9	152.0	149.6	2.45	62.145		
700.0	700.0	687.9	687.7	1.5	1.4	89.92	0.2	156.6	156.9	154.0	2.87	54.637		
800.0	800.0	782.2	781.8	1.7	1.6	89.82	0.5	164.3	165.1	161.8	3.31	49.833		
900.0	900.0	876.0	874.9	1.9	1.9	89.70	0.9	175.0	176.6	172.8	3.78	46.742		
1,000.0	1,000.0	968.9	966.8	2.1	2.1	89.57	1.4	188.7	191.2	187.0	4.27	44.776		
1,100.0	1,100.0	1,060.9	1,057.3	2.4	2.5	89.44	2.0	205.1	209.1	204.3	4.80	43.559		
1,200.0	1,200.0	1,155.8	1,150.2	2.6	2.8	89.30	2.7	224.6	229.6	224.3	5.38	42.710		
1,300.0	1,300.0	1,253.6	1,245.9	2.8	3.2	89.18	3.5	244.9	250.4	244.4	5.99	41.827		
1,400.0	1,400.0	1,351.4	1,341.6	3.0	3.6	89.09	4.2	265.3	271.2	264.6	6.61	41.025		
1,500.0	1,500.0	1,449.3	1,437.2	3.3	4.0	89.00	5.0	285.6	292.0	284.8	7.25	40.309		
1,600.0	1,600.0	1,547.1	1,532.9	3.5	4.4	88.93	5.7	306.0	312.9	305.0	7.89	39.674		
1,700.0	1,700.0	1,644.9	1,628.6	3.7	4.9	88.86	6.5	326.3	333.7	325.1	8.53	39.111		
1,800.0	1,800.0	1,742.7	1,724.2	3.9	5.3	88.80	7.2	346.6	354.5	345.3	9.18	38.612		
1,900.0	1,900.0	1,840.5	1,819.9	4.2	5.7	88.75	8.0	367.0	375.3	365.4	9.83	38.167		
2,000.0	2,000.0	1,938.3	1,915.6	4.4	6.2	88.71	8.7	387.3	396.1	385.6	10.49	37.769 SF		
2,100.0	2,100.0	2,035.7	2,010.9	4.6	6.6	167.19	9.5	407.6	418.6	409.3	9.25	45.236		
2,200.0	2,199.8	2,132.4	2,105.4	4.8	7.0	167.18	10.2	427.7	444.3	434.7	9.67	45.940		
2,300.0	2,299.5	2,228.0	2,199.0	5.0	7.5	167.25	11.0	447.6	473.4	463.3	10.08	46.975		
2,348.4	2,347.6	2,274.0	2,243.9	5.1	7.7	167.30	11.3	457.1	488.6	478.4	10.27	47.586		
2,400.0	2,398.8	2,322.8	2,291.6	5.3	7.9	167.43	11.7	467.3	505.3	494.8	10.50	48.135		
2,500.0	2,498.0	2,417.4	2,384.2	5.5	8.3	167.66	12.4	487.0	537.5	526.6	10.94	49.124		
2,600.0	2,597.3	2,512.1	2,476.8	5.7	8.8	167.87	13.1	506.6	569.8	558.4	11.39	50.021		
2,700.0	2,696.5	2,606.7	2,569.3	6.0	9.2	168.06	13.9	526.3	602.0	590.2	11.84	50.837		
2,800.0	2,795.8	2,701.3	2,661.9	6.2	9.6	168.22	14.6	546.0	634.3	622.0	12.30	51.584		
2,900.0	2,895.1	2,796.0	2,754.5	6.5	10.1	168.37	15.3	565.7	666.6	653.8	12.75	52.268		
3,000.0	2,994.3	2,890.6	2,847.0	6.8	10.5	168.51	16.0	585.4	698.9	685.7	13.21	52.896		
3,100.0	3,093.6	2,985.2	2,939.6	7.1	10.9	168.64	16.8	605.0	731.2	717.5	13.67	53.475		
3,200.0	3,192.9	3,079.9	3,032.1	7.3	11.4	168.75	17.5	624.7	763.4	749.3	14.14	54.010		
3,300.0	3,292.1	3,174.5	3,124.7	7.6	11.8	168.85	18.2	644.4	795.7	781.1	14.60	54.506		
3,400.0	3,391.4	3,269.1	3,217.3	7.9	12.2	168.95	19.0	664.1	828.0	813.0	15.06	54.966		
3,500.0	3,490.6	3,363.8	3,309.8	8.2	12.7	169.04	19.7	683.8	860.3	844.8	15.53	55.394		
3,600.0	3,589.9	3,458.4	3,402.4	8.5	13.1	169.12	20.4	703.4	892.6	876.6	16.00	55.793		
3,663.0	3,652.4	3,518.0	3,460.7	8.7	13.4	169.17	20.9	715.8	913.0	896.7	16.29	56.031		
3,700.0	3,689.2	3,553.1	3,495.0	8.8	13.5	169.24	21.1	723.1	924.7	908.2	16.49	56.062		
3,800.0	3,788.8	3,648.7	3,588.5	9.0	14.0	169.39	21.9	743.0	954.2	937.2	17.01	56.088		
3,900.0	3,888.6	3,745.2	3,682.9	9.2	14.4	169.49	22.6	763.1	980.3	962.8	17.52	55.967		

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Hankins 20M-203
Project:	SEC.20-T5N-R67W	TVD Reference:	WELL @ 4974.0ft (RKB - 15')
Reference Site:	Hankins 5N67W20MR Pad Sec.20-T5N-R67W	MD Reference:	WELL @ 4974.0ft (RKB - 15')
Site Error:	0.0ft	North Reference:	True
Reference Well:	Hankins 20M-203	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 (8-12-14)	Offset TVD Reference:	Offset Datum

Offset Design													Offset Site Error:	0.0 ft
Survey Program: 0-MWD													Offset Well Error:	0.0 ft
Reference		Offset		Semi Major Axis			Distance							Warning
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor		
0.0	0.0	0.0	0.0	0.0	0.0	90.01	0.0	119.8	119.8					
100.0	100.0	99.0	99.0	0.1	0.1	90.01	0.0	119.8	119.8	119.6	0.22	535.576		
200.0	200.0	199.0	199.0	0.3	0.3	90.01	0.0	119.8	119.8	119.1	0.67	178.228		
300.0	300.0	299.0	299.0	0.6	0.6	90.01	0.0	119.8	119.8	118.7	1.12	106.794		
400.0	400.0	399.0	399.0	0.8	0.8	90.01	0.0	119.8	119.8	118.2	1.57	76.238		
500.0	500.0	499.0	499.0	1.0	1.0	90.01	0.0	119.8	119.8	117.8	2.02	59.277		
600.0	600.0	599.0	599.0	1.2	1.2	90.01	0.0	119.8	119.8	117.3	2.47	48.490		
700.0	700.0	699.0	699.0	1.5	1.5	90.01	0.0	119.8	119.8	116.9	2.92	41.024 CC, ES		
800.0	800.0	795.0	795.0	1.7	1.7	89.97	0.1	121.4	121.4	118.1	3.35	36.256		
900.0	900.0	890.7	890.6	1.9	1.9	89.87	0.3	126.1	126.4	122.6	3.77	33.490		
1,000.0	1,000.0	986.1	985.6	2.1	2.1	89.72	0.7	134.0	134.7	130.5	4.21	31.975		
1,100.0	1,100.0	1,080.7	1,079.6	2.4	2.3	89.53	1.2	145.0	146.3	141.6	4.67	31.318		
1,200.0	1,200.0	1,174.9	1,172.7	2.6	2.6	89.34	1.8	159.0	161.2	156.0	5.16	31.264		
1,300.0	1,300.0	1,273.6	1,270.1	2.8	2.9	89.15	2.6	175.1	177.5	171.8	5.68	31.237		
1,400.0	1,400.0	1,372.2	1,367.4	3.0	3.2	88.99	3.4	191.1	193.8	187.5	6.22	31.147		
1,500.0	1,500.0	1,470.9	1,464.8	3.3	3.5	88.86	4.1	207.2	210.1	203.3	6.77	31.018		
1,600.0	1,600.0	1,569.5	1,562.1	3.5	3.9	88.75	4.9	223.3	226.4	219.0	7.33	30.874		
1,700.0	1,700.0	1,668.2	1,659.4	3.7	4.2	88.65	5.6	239.4	242.7	234.8	7.90	30.724		
1,800.0	1,800.0	1,766.9	1,756.8	3.9	4.6	88.57	6.4	255.4	259.0	250.5	8.47	30.576		
1,900.0	1,900.0	1,865.5	1,854.1	4.2	4.9	88.49	7.2	271.5	275.3	266.2	9.05	30.433		
2,000.0	2,000.0	1,964.2	1,951.5	4.4	5.3	88.42	7.9	287.6	291.6	282.0	9.62	30.298 SF		
2,100.0	2,100.0	2,062.6	2,048.5	4.6	5.6	166.92	8.7	303.6	309.6	300.4	9.14	33.864		
2,200.0	2,199.8	2,160.3	2,144.9	4.8	6.0	166.98	9.4	319.5	330.9	321.3	9.56	34.625		
2,300.0	2,299.5	2,257.2	2,240.5	5.0	6.4	167.13	10.2	335.3	355.5	345.6	9.96	35.699		
2,348.4	2,347.6	2,303.8	2,286.5	5.1	6.5	167.23	10.5	342.9	368.6	358.5	10.15	36.323		
2,400.0	2,398.8	2,353.3	2,335.3	5.3	6.7	167.40	10.9	351.0	383.0	372.6	10.37	36.924		
2,500.0	2,498.0	2,449.3	2,430.1	5.5	7.1	167.70	11.6	366.6	410.9	400.1	10.81	38.010		
2,600.0	2,597.3	2,545.3	2,524.8	5.7	7.4	167.96	12.4	382.2	438.8	427.5	11.25	39.001		
2,700.0	2,696.5	2,641.3	2,619.5	6.0	7.8	168.19	13.1	397.9	466.7	455.0	11.69	39.909		
2,800.0	2,795.8	2,737.3	2,714.2	6.2	8.2	168.39	13.9	413.5	494.6	482.4	12.14	40.741		
2,900.0	2,895.1	2,833.3	2,809.0	6.5	8.5	168.58	14.6	429.2	522.5	509.9	12.59	41.508		
3,000.0	2,994.3	2,929.4	2,903.7	6.8	8.9	168.74	15.3	444.8	550.4	537.4	13.04	42.215		
3,100.0	3,093.6	3,025.4	2,998.4	7.1	9.2	168.89	16.1	460.4	578.3	564.8	13.49	42.870		
3,200.0	3,192.9	3,121.4	3,093.2	7.3	9.6	169.02	16.8	476.1	606.2	592.3	13.94	43.476		
3,300.0	3,292.1	3,217.4	3,187.9	7.6	10.0	169.15	17.6	491.7	634.2	619.8	14.40	44.041		
3,400.0	3,391.4	3,313.4	3,282.6	7.9	10.3	169.26	18.3	507.4	662.1	647.2	14.86	44.566		
3,500.0	3,490.6	3,409.4	3,377.3	8.2	10.7	169.36	19.0	523.0	690.0	674.7	15.31	45.057		
3,600.0	3,589.9	3,505.4	3,472.1	8.5	11.1	169.46	19.8	538.7	717.9	702.2	15.77	45.515		
3,663.0	3,652.4	3,565.9	3,531.8	8.7	11.3	169.51	20.2	548.5	735.5	719.5	16.06	45.789		
3,700.0	3,689.2	3,601.5	3,566.9	8.8	11.4	169.58	20.5	554.3	745.7	729.4	16.26	45.872		
3,800.0	3,788.8	3,698.3	3,662.4	9.0	11.8	169.71	21.3	570.1	770.7	754.0	16.75	46.015		
3,900.0	3,888.6	3,795.9	3,758.7	9.2	12.2	169.78	22.0	586.0	792.4	775.2	17.23	45.995		
4,000.0	3,988.6	3,894.2	3,855.7	9.4	12.5	169.80	22.8	602.0	810.8	793.1	17.69	45.827		
4,011.4	4,000.0	3,905.5	3,866.8	9.4	12.6	91.23	22.8	603.8	812.6	794.9	17.74	45.800		
4,100.0	4,088.6	3,992.9	3,953.0	9.5	12.9	91.16	23.5	618.1	827.1	808.9	18.14	45.601		
4,200.0	4,188.6	4,091.6	4,050.3	9.8	13.3	91.08	24.3	634.1	843.3	824.7	18.60	45.344		
4,300.0	4,288.6	4,190.2	4,147.7	10.0	13.7	91.01	25.0	650.2	859.6	840.5	19.06	45.098		
4,400.0	4,388.6	4,288.9	4,245.0	10.2	14.0	90.94	25.8	666.3	875.9	856.4	19.52	44.863		
4,500.0	4,488.6	4,387.5	4,342.4	10.4	14.4	90.88	26.6	682.3	892.2	872.2	19.99	44.638		
4,600.0	4,588.6	4,486.2	4,439.7	10.6	14.8	90.81	27.3	698.4	908.4	888.0	20.45	44.423		
4,700.0	4,688.6	4,584.9	4,537.0	10.8	15.2	90.75	28.1	714.5	924.7	903.8	20.91	44.216		

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

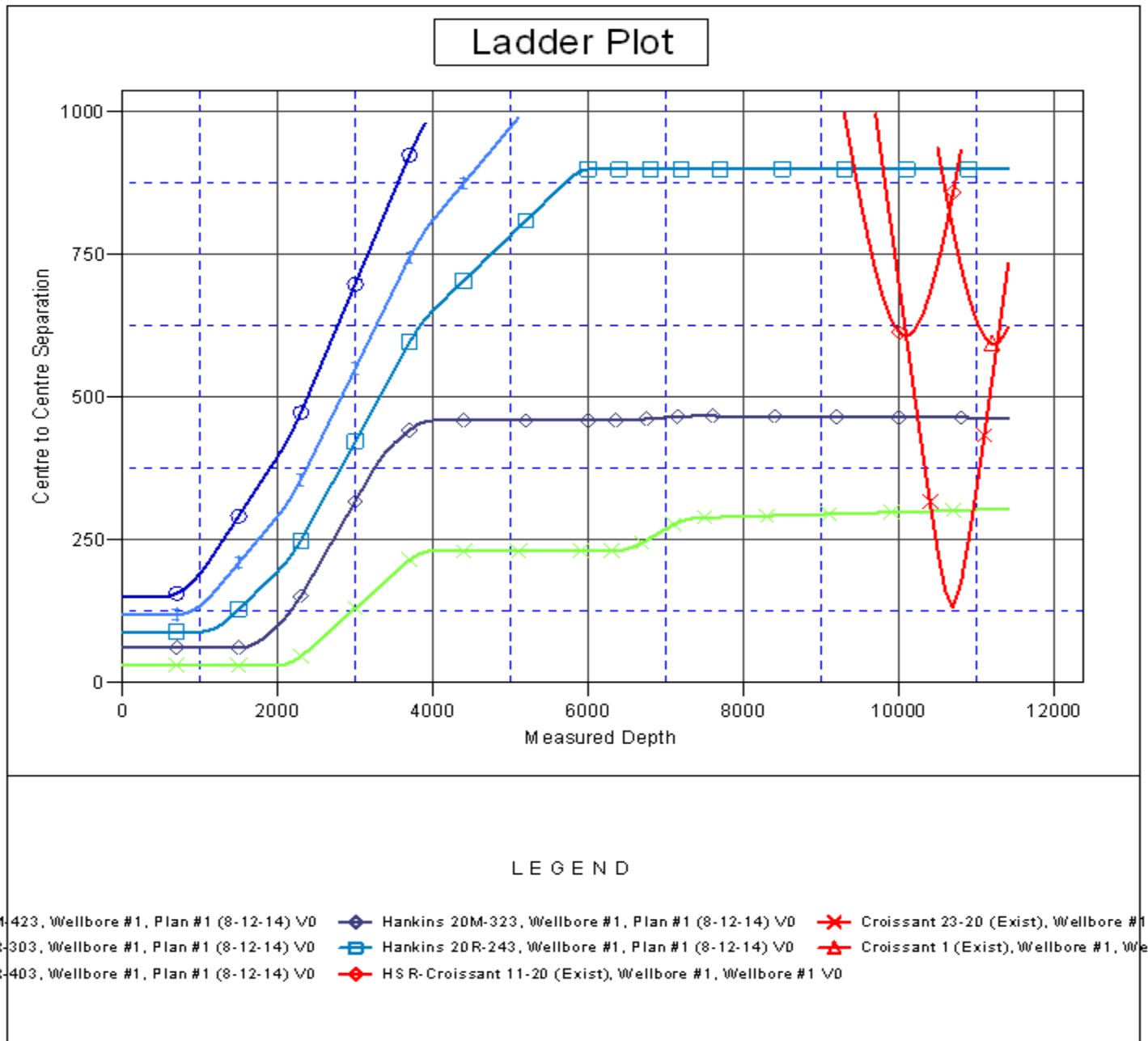
Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Hankins 20M-203
Project:	SEC.20-T5N-R67W	TVD Reference:	WELL @ 4974.0ft (RKB - 15')
Reference Site:	Hankins 5N67W20MR Pad Sec.20-T5N-R67W	MD Reference:	WELL @ 4974.0ft (RKB - 15')
Site Error:	0.0ft	North Reference:	True
Reference Well:	Hankins 20M-203	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 (8-12-14)	Offset TVD Reference:	Offset Datum

Offset Design										Hankins 5N67W20MR Pad Sec.20-T5N-R67W - Hankins 20R-403 - Wellbore #1 - Plan #1 (8-12-14)				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)					
4,800.0	4,788.6	4,683.5	4,634.4	11.0	15.6	90.69	28.8	730.6	941.0	919.6	21.38	44.018				
4,900.0	4,888.6	4,782.2	4,731.7	11.2	15.9	90.63	29.6	746.6	957.3	935.4	21.84	43.827				
5,000.0	4,988.6	4,880.8	4,829.1	11.4	16.3	90.58	30.4	762.7	973.6	951.2	22.31	43.644				
5,100.0	5,088.6	4,979.5	4,926.4	11.6	16.7	90.52	31.1	778.8	989.8	967.1	22.77	43.468				

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Hankins 20M-203
Project:	SEC.20-T5N-R67W	TVD Reference:	WELL @ 4974.0ft (RKB - 15')
Reference Site:	Hankins 5N67W20MR Pad Sec.20-T5N-R67W	MD Reference:	WELL @ 4974.0ft (RKB - 15')
Site Error:	0.0ft	North Reference:	True
Reference Well:	Hankins 20M-203	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 (8-12-14)	Offset TVD Reference:	Offset Datum

Reference Depths are relative to WELL @ 4974.0ft (RKB - 15')
 Offset Depths are relative to Offset Datum
 Central Meridian is -105.500000 °

Coordinates are relative to: Hankins 20M-203
 Coordinate System is US State Plane 1983, Colorado Northern Zone
 Grid Convergence at Surface is: 0.38°



Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Hankins 20M-203
Project:	SEC.20-T5N-R67W	TVD Reference:	WELL @ 4974.0ft (RKB - 15')
Reference Site:	Hankins 5N67W20MR Pad Sec.20-T5N-R67W	MD Reference:	WELL @ 4974.0ft (RKB - 15')
Site Error:	0.0ft	North Reference:	True
Reference Well:	Hankins 20M-203	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 (8-12-14)	Offset TVD Reference:	Offset Datum

Reference Depths are relative to WELL @ 4974.0ft (RKB - 15')
Offset Depths are relative to Offset Datum
Central Meridian is -105.500000 °

Coordinates are relative to: Hankins 20M-203
Coordinate System is US State Plane 1983, Colorado Northern Zone
Grid Convergence at Surface is: 0.38°

