

PETROLEUM DEVELOPMENT CORP Weld County CO

Well Name: **Hankins 20M-423**

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

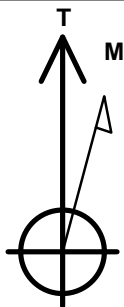
Ground Elevation: 4959.0

+N/-S	+E/-W	Northing	Easting	Latitude	Longitude	Slot
0.0	0.0	1386229.05	3162673.33	40.392130	-104.915980	

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

WELLBORE TARGET DETAILS

Name	TVD	+N/-S	+E/-W	Shape
SHL 90'FNL, 2392'FEL		0.0	0.0	Point
BHL 500'FSL, 2360'FEL	7173.0	-4692.3	2.8	Point



Azimuths to True North
Magnetic North: 8.52°

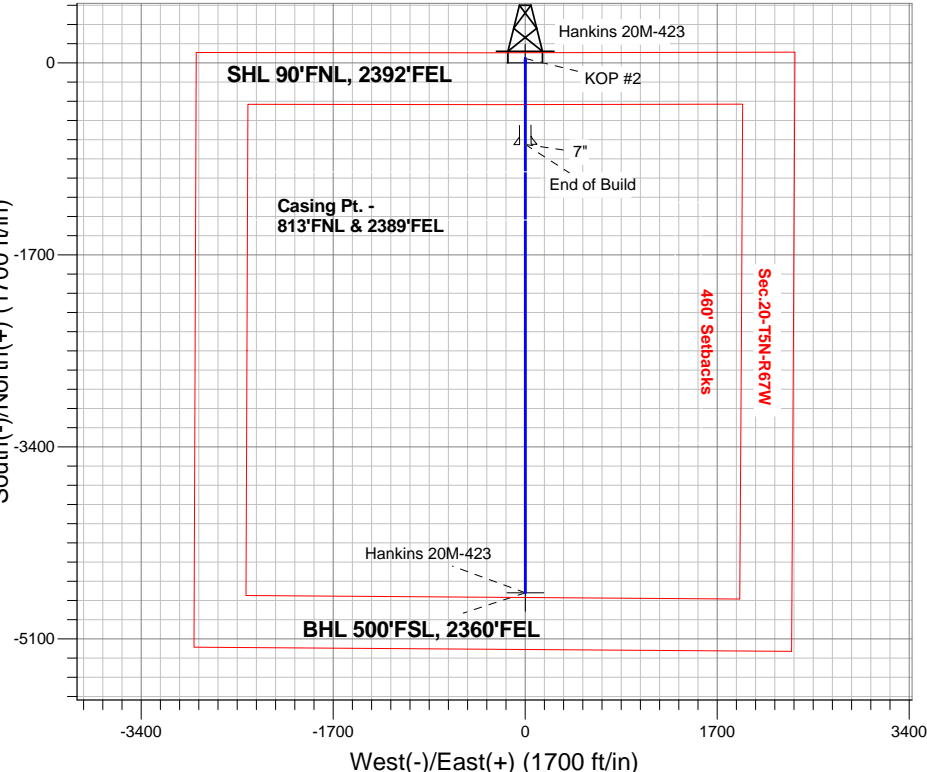
Magnetic Field
Strength: 52777.4snT
Dip Angle: 66.91°
Date: 8/12/2014
Model: IGRF2010

ANNOTATIONS

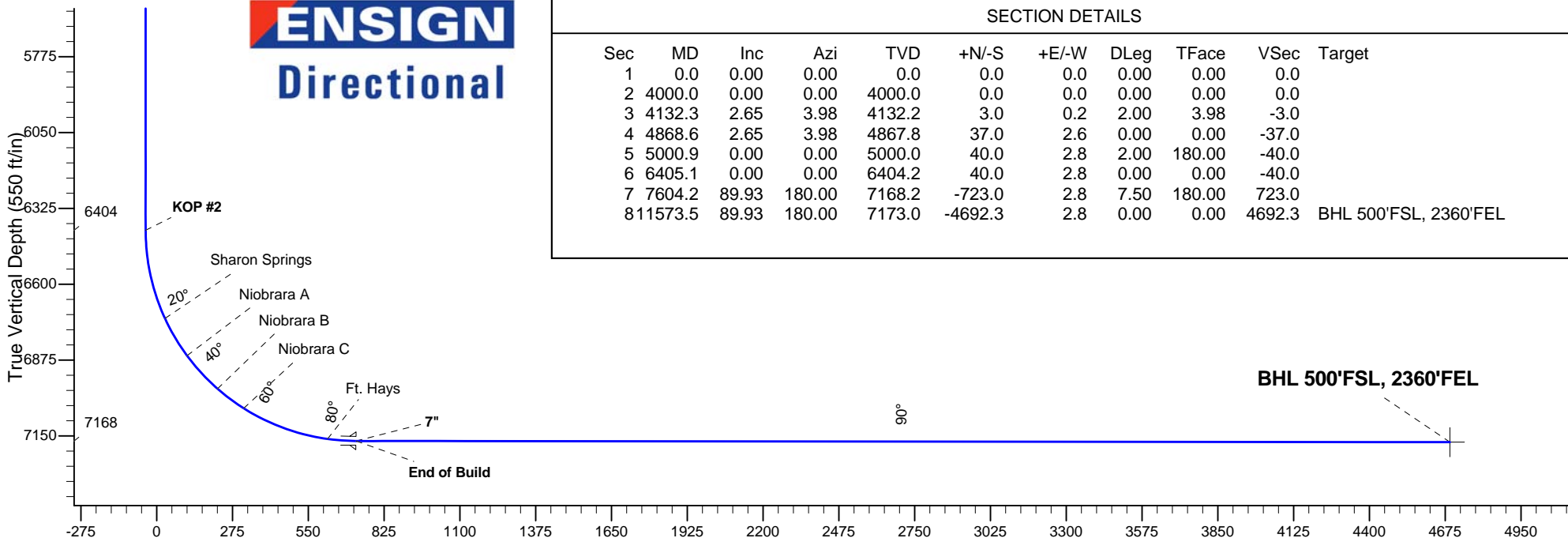
TVD	MD	Annotation
4000.0	4000.0	KOP #1
6404.2	6405.1	KOP #2
7168.2	7604.2	End of Build

Hankins 5N67W20MR Pad Sec.20-T5N-R67W
Hankins 20M-423
Plan #1 (8-12-14)
15:08, August 12 2014

South(-)/North(+) (1700 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	4000.0	0.00	0.00	4000.0	0.0	0.0	0.00	0.00	0.0	
3	4132.3	2.65	3.98	4132.2	3.0	0.2	2.00	3.98	-3.0	
4	4868.6	2.65	3.98	4867.8	37.0	2.6	0.00	0.00	-37.0	
5	5000.9	0.00	0.00	5000.0	40.0	2.8	2.00	180.00	-40.0	
6	6405.1	0.00	0.00	6404.2	40.0	2.8	0.00	0.00	-40.0	
7	7604.2	89.93	180.00	7168.2	-723.0	2.8	7.50	180.00	723.0	
8	811573.5	89.93	180.00	7173.0	-4692.3	2.8	0.00	0.00	4692.3	BHL 500'FSL, 2360'FEL

Vertical Section at 179.97° (550 ft/in)



PETROLEUM DEVELOPMENT CORP Weld County CO

SEC.20-T5N-R67W

Hankins 5N67W20MR Pad Sec.20-T5N-R67W

Hankins 20M-423

Wellbore #1

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

Standard Planning Report

12 August, 2014

Database:	Landmark	Local Co-ordinate Reference:	Well Hankins 20M-423
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-423	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-423					
Well Position	+N-S	0.0 ft	Northing:	1,386,229.05 ft	Latitude:	40.392130
	+E-W	30.6 ft	Easting:	3,162,673.33 ft	Longitude:	-104.915980
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	179.97

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	
4,000.0	0.00	0.00	4,000.0	0.0	0.0	0.00	0.00	0.00	0.00	
4,132.3	2.65	3.98	4,132.2	3.0	0.2	2.00	2.00	0.00	3.98	
4,868.6	2.65	3.98	4,867.8	37.0	2.6	0.00	0.00	0.00	0.00	
5,000.9	0.00	0.00	5,000.0	40.0	2.8	2.00	-2.00	0.00	180.00	
6,405.1	0.00	0.00	6,404.2	40.0	2.8	0.00	0.00	0.00	0.00	
7,604.2	89.93	180.00	7,168.2	-723.0	2.8	7.50	7.50	0.00	180.00	
11,573.5	89.93	180.00	7,173.0	-4,692.3	2.8	0.00	0.00	0.00	0.00	BHL 500'FSL, 2360

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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-423	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, 2392°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
2,100.0	0.00	0.00	2,100.0	0.0	0.0	0.0	0.00	0.00	0.00
2,200.0	0.00	0.00	2,200.0	0.0	0.0	0.0	0.00	0.00	0.00
2,300.0	0.00	0.00	2,300.0	0.0	0.0	0.0	0.00	0.00	0.00
2,400.0	0.00	0.00	2,400.0	0.0	0.0	0.0	0.00	0.00	0.00
2,500.0	0.00	0.00	2,500.0	0.0	0.0	0.0	0.00	0.00	0.00
2,600.0	0.00	0.00	2,600.0	0.0	0.0	0.0	0.00	0.00	0.00
2,700.0	0.00	0.00	2,700.0	0.0	0.0	0.0	0.00	0.00	0.00
2,800.0	0.00	0.00	2,800.0	0.0	0.0	0.0	0.00	0.00	0.00
2,900.0	0.00	0.00	2,900.0	0.0	0.0	0.0	0.00	0.00	0.00
3,000.0	0.00	0.00	3,000.0	0.0	0.0	0.0	0.00	0.00	0.00
3,100.0	0.00	0.00	3,100.0	0.0	0.0	0.0	0.00	0.00	0.00
3,200.0	0.00	0.00	3,200.0	0.0	0.0	0.0	0.00	0.00	0.00
3,300.0	0.00	0.00	3,300.0	0.0	0.0	0.0	0.00	0.00	0.00
3,400.0	0.00	0.00	3,400.0	0.0	0.0	0.0	0.00	0.00	0.00
3,494.0	0.00	0.00	3,494.0	0.0	0.0	0.0	0.00	0.00	0.00
Parkman									
3,500.0	0.00	0.00	3,500.0	0.0	0.0	0.0	0.00	0.00	0.00
3,600.0	0.00	0.00	3,600.0	0.0	0.0	0.0	0.00	0.00	0.00
3,700.0	0.00	0.00	3,700.0	0.0	0.0	0.0	0.00	0.00	0.00
3,800.0	0.00	0.00	3,800.0	0.0	0.0	0.0	0.00	0.00	0.00
3,900.0	0.00	0.00	3,900.0	0.0	0.0	0.0	0.00	0.00	0.00
4,000.0	0.00	0.00	4,000.0	0.0	0.0	0.0	0.00	0.00	0.00
KOP #1									
4,092.0	1.84	3.98	4,092.0	1.5	0.1	-1.5	2.00	2.00	0.00
Sussex									
4,100.0	2.00	3.98	4,100.0	1.7	0.1	-1.7	2.00	2.00	0.00
4,132.3	2.65	3.98	4,132.2	3.0	0.2	-3.0	2.00	2.00	0.00
4,200.0	2.65	3.98	4,199.9	6.2	0.4	-6.2	0.00	0.00	0.00
4,300.0	2.65	3.98	4,299.8	10.8	0.8	-10.8	0.00	0.00	0.00

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Site:	Hankins 5N67W20MR Pad	North Reference:	True
	Sec.20-T5N-R67W		
Well:	Hankins 20M-423	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)
4,400.0	2.65	3.98	4,399.7	15.4	1.1	-15.4	0.00	0.00	0.00
4,500.0	2.65	3.98	4,499.6	20.0	1.4	-20.0	0.00	0.00	0.00
4,550.5	2.65	3.98	4,550.0	22.3	1.6	-22.3	0.00	0.00	0.00
Shannon									
4,600.0	2.65	3.98	4,599.5	24.6	1.7	-24.6	0.00	0.00	0.00
4,700.0	2.65	3.98	4,699.3	29.2	2.0	-29.2	0.00	0.00	0.00
4,800.0	2.65	3.98	4,799.2	33.8	2.4	-33.8	0.00	0.00	0.00
4,868.6	2.65	3.98	4,867.8	37.0	2.6	-37.0	0.00	0.00	0.00
4,900.0	2.02	3.98	4,899.1	38.2	2.7	-38.2	2.00	-2.00	0.00
5,000.0	0.02	3.98	4,999.1	40.0	2.8	-40.0	2.00	-2.00	0.00
5,000.9	0.00	0.00	5,000.0	40.0	2.8	-40.0	2.00	-2.00	0.00
5,100.0	0.00	0.00	5,099.1	40.0	2.8	-40.0	0.00	0.00	0.00
5,200.0	0.00	0.00	5,199.1	40.0	2.8	-40.0	0.00	0.00	0.00
5,300.0	0.00	0.00	5,299.1	40.0	2.8	-40.0	0.00	0.00	0.00
5,400.0	0.00	0.00	5,399.1	40.0	2.8	-40.0	0.00	0.00	0.00
5,500.0	0.00	0.00	5,499.1	40.0	2.8	-40.0	0.00	0.00	0.00
5,600.0	0.00	0.00	5,599.1	40.0	2.8	-40.0	0.00	0.00	0.00
5,700.0	0.00	0.00	5,699.1	40.0	2.8	-40.0	0.00	0.00	0.00
5,800.0	0.00	0.00	5,799.1	40.0	2.8	-40.0	0.00	0.00	0.00
5,900.0	0.00	0.00	5,899.1	40.0	2.8	-40.0	0.00	0.00	0.00
6,000.0	0.00	0.00	5,999.1	40.0	2.8	-40.0	0.00	0.00	0.00
6,100.0	0.00	0.00	6,099.1	40.0	2.8	-40.0	0.00	0.00	0.00
6,200.0	0.00	0.00	6,199.1	40.0	2.8	-40.0	0.00	0.00	0.00
6,300.0	0.00	0.00	6,299.1	40.0	2.8	-40.0	0.00	0.00	0.00
6,400.0	0.00	0.00	6,399.1	40.0	2.8	-40.0	0.00	0.00	0.00
6,405.1	0.00	0.00	6,404.2	40.0	2.8	-40.0	0.00	0.00	0.00
KOP #2									
6,500.0	7.12	180.00	6,498.9	34.1	2.8	-34.1	7.50	7.50	0.00
6,600.0	14.62	180.00	6,597.0	15.3	2.8	-15.3	7.50	7.50	0.00
6,700.0	22.12	180.00	6,691.9	-16.2	2.8	16.2	7.50	7.50	0.00
6,735.0	24.75	180.00	6,724.0	-30.2	2.8	30.2	7.50	7.50	0.00
Sharon Springs									
6,800.0	29.62	180.00	6,781.8	-59.8	2.8	59.8	7.50	7.50	0.00
6,892.2	36.54	180.00	6,859.0	-110.1	2.8	110.1	7.50	7.50	0.00
Niobrara A									
6,900.0	37.12	180.00	6,865.2	-114.8	2.8	114.8	7.50	7.50	0.00
7,000.0	44.62	180.00	6,940.8	-180.2	2.8	180.2	7.50	7.50	0.00
7,055.7	48.80	180.00	6,979.0	-220.7	2.8	220.7	7.50	7.50	0.00
Niobrara B									
7,100.0	52.12	180.00	7,007.2	-254.9	2.8	254.9	7.50	7.50	0.00
7,174.5	57.71	180.00	7,050.0	-315.8	2.8	315.8	7.50	7.50	0.00
Niobrara C									
7,200.0	59.62	180.00	7,063.2	-337.6	2.8	337.6	7.50	7.50	0.00
7,300.0	67.12	180.00	7,108.0	-426.9	2.8	426.9	7.50	7.50	0.00
7,400.0	74.62	180.00	7,140.8	-521.3	2.8	521.3	7.50	7.50	0.00
7,500.0	82.12	180.00	7,160.9	-619.2	2.8	619.2	7.50	7.50	0.00
7,500.5	82.15	180.00	7,161.0	-619.7	2.8	619.7	7.50	7.50	0.00
Ft. Hays									
7,600.0	89.62	180.00	7,168.1	-718.9	2.8	718.9	7.50	7.50	0.00
7,604.2	89.93	180.00	7,168.2	-723.1	2.8	723.1	7.42	7.42	0.00
End of Build - 7"									

Database:	Landmark	Local Co-ordinate Reference:	Well Hankins 20M-423
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-423	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)
7,700.0	89.93	180.00	7,168.3	-818.9	2.8	818.9	0.00	0.00	0.00
7,800.0	89.93	180.00	7,168.4	-918.9	2.8	918.9	0.00	0.00	0.00
7,900.0	89.93	180.00	7,168.5	-1,018.9	2.8	1,018.9	0.00	0.00	0.00
8,000.0	89.93	180.00	7,168.6	-1,118.9	2.8	1,118.9	0.00	0.00	0.00
8,100.0	89.93	180.00	7,168.8	-1,218.9	2.8	1,218.9	0.00	0.00	0.00
8,200.0	89.93	180.00	7,168.9	-1,318.9	2.8	1,318.9	0.00	0.00	0.00
8,300.0	89.93	180.00	7,169.0	-1,418.9	2.8	1,418.9	0.00	0.00	0.00
8,400.0	89.93	180.00	7,169.1	-1,518.9	2.8	1,518.9	0.00	0.00	0.00
8,500.0	89.93	180.00	7,169.2	-1,618.9	2.8	1,618.9	0.00	0.00	0.00
8,600.0	89.93	180.00	7,169.4	-1,718.9	2.8	1,718.9	0.00	0.00	0.00
8,700.0	89.93	180.00	7,169.5	-1,818.9	2.8	1,818.9	0.00	0.00	0.00
8,800.0	89.93	180.00	7,169.6	-1,918.9	2.8	1,918.9	0.00	0.00	0.00
8,900.0	89.93	180.00	7,169.7	-2,018.9	2.8	2,018.9	0.00	0.00	0.00
9,000.0	89.93	180.00	7,169.9	-2,118.9	2.8	2,118.9	0.00	0.00	0.00
9,100.0	89.93	180.00	7,170.0	-2,218.9	2.8	2,218.9	0.00	0.00	0.00
9,200.0	89.93	180.00	7,170.1	-2,318.9	2.8	2,318.9	0.00	0.00	0.00
9,300.0	89.93	180.00	7,170.2	-2,418.9	2.8	2,418.9	0.00	0.00	0.00
9,400.0	89.93	180.00	7,170.3	-2,518.9	2.8	2,518.9	0.00	0.00	0.00
9,500.0	89.93	180.00	7,170.5	-2,618.9	2.8	2,618.9	0.00	0.00	0.00
9,600.0	89.93	180.00	7,170.6	-2,718.9	2.8	2,718.9	0.00	0.00	0.00
9,700.0	89.93	180.00	7,170.7	-2,818.9	2.8	2,818.9	0.00	0.00	0.00
9,800.0	89.93	180.00	7,170.8	-2,918.9	2.8	2,918.9	0.00	0.00	0.00
9,900.0	89.93	180.00	7,171.0	-3,018.9	2.8	3,018.9	0.00	0.00	0.00
10,000.0	89.93	180.00	7,171.1	-3,118.9	2.8	3,118.9	0.00	0.00	0.00
10,100.0	89.93	180.00	7,171.2	-3,218.9	2.8	3,218.9	0.00	0.00	0.00
10,200.0	89.93	180.00	7,171.3	-3,318.9	2.8	3,318.9	0.00	0.00	0.00
10,300.0	89.93	180.00	7,171.4	-3,418.9	2.8	3,418.9	0.00	0.00	0.00
10,400.0	89.93	180.00	7,171.6	-3,518.9	2.8	3,518.9	0.00	0.00	0.00
10,500.0	89.93	180.00	7,171.7	-3,618.9	2.8	3,618.9	0.00	0.00	0.00
10,600.0	89.93	180.00	7,171.8	-3,718.9	2.8	3,718.9	0.00	0.00	0.00
10,700.0	89.93	180.00	7,171.9	-3,818.9	2.8	3,818.9	0.00	0.00	0.00
10,800.0	89.93	180.00	7,172.1	-3,918.9	2.8	3,918.9	0.00	0.00	0.00
10,900.0	89.93	180.00	7,172.2	-4,018.9	2.8	4,018.9	0.00	0.00	0.00
11,000.0	89.93	180.00	7,172.3	-4,118.9	2.8	4,118.9	0.00	0.00	0.00
11,100.0	89.93	180.00	7,172.4	-4,218.9	2.8	4,218.9	0.00	0.00	0.00
11,200.0	89.93	180.00	7,172.5	-4,318.9	2.8	4,318.9	0.00	0.00	0.00
11,300.0	89.93	180.00	7,172.7	-4,418.9	2.8	4,418.9	0.00	0.00	0.00
11,400.0	89.93	180.00	7,172.8	-4,518.9	2.8	4,518.9	0.00	0.00	0.00
11,500.0	89.93	180.00	7,172.9	-4,618.9	2.8	4,618.9	0.00	0.00	0.00
11,573.5	89.93	180.00	7,173.0	-4,692.3	2.8	4,692.3	0.00	0.00	0.00
BHL 500'FSL, 2360'FEL									

Database:	Landmark	Local Co-ordinate Reference:	Well Hankins 20M-423
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-423	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Plan #1 (8-12-14)		

Targets										
Target Name	- hit/miss target	Dip Angle (°)	Dip Dir. (°)	TVD (ft)	+N/-S (ft)	+E/-W (ft)	Northing (ft)	Easting (ft)	Latitude	Longitude
BHL 500'FSL, 2360'FI	- plan hits target center	0.00	0.00	7,173.0	-4,692.3	2.8	1,381,537.06	3,162,707.01	40.379250	-104.915970
	- Point									
SHL 90'FNL, 2392'FE	- plan hits target center	0.00	0.00	1.0	0.0	0.0	1,386,229.07	3,162,673.33	40.392130	-104.915980
	- Point									

Casing Points					
Measured Depth (ft)	Vertical Depth (ft)	Name	Casing Diameter (")	Hole Diameter (")	
7,604.2	7,168.2	7"	7	7-1/2	

Formations						
Measured Depth (ft)	Vertical Depth (ft)	Name	Lithology	Dip (°)	Dip Direction (°)	
3,494.0	3,494.0	Parkman				
4,092.0	4,092.0	Sussex				
4,550.5	4,550.0	Shannon				
6,735.0	6,724.0	Sharon Springs				
6,892.2	6,859.0	Niobrara A				
7,055.7	6,979.0	Niobrara B				
7,174.5	7,050.0	Niobrara C				
7,500.5	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	
4,000.0	4,000.0	0.0	0.0	KOP #1	
6,405.1	6,404.2	40.0	2.8	KOP #2	
7,604.2	7,168.2	-723.1	2.8	End of Build	



PETROLEUM DEVELOPMENT CORP Weld County CO

SEC.20-T5N-R67W

Hankins 5N67W20MR Pad Sec.20-T5N-R67W

Hankins 20M-423

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-423
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-423	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	11,572.8	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						
Hankins 5N67W20MR Pad Sec.20-T5N-R67W						
Hankins 20M-203 - Wellbore #1 - Plan #1 (8-12-14)	2,000.0	2,000.0	30.6	21.9	3.495	CC, ES
Hankins 20M-203 - Wellbore #1 - Plan #1 (8-12-14)	11,573.5	11,409.0	305.1	159.8	2.099	SF
Hankins 20M-323 - Wellbore #1 - Plan #1 (8-12-14)	1,500.0	1,500.0	30.6	24.1	4.701	CC, ES
Hankins 20M-323 - Wellbore #1 - Plan #1 (8-12-14)	11,573.5	11,495.2	264.3	102.9	1.638	SF
Hankins 20R-243 - Wellbore #1 - Plan #1 (8-12-14)	1,000.0	999.0	58.5	54.2	13.705	CC, ES
Hankins 20R-243 - Wellbore #1 - Plan #1 (8-12-14)	11,573.5	11,437.1	697.3	520.9	3.952	SF
Hankins 20R-303 - Wellbore #1 - Plan #1 (8-12-14)	500.0	498.0	119.8	117.8	59.343	CC, ES
Hankins 20R-303 - Wellbore #1 - Plan #1 (8-12-14)	1,000.0	973.7	161.0	156.8	38.409	SF
Hankins 20R-403 - Wellbore #1 - Plan #1 (8-12-14)	700.0	699.0	89.1	86.2	30.530	CC, ES
Hankins 20R-403 - Wellbore #1 - Plan #1 (8-12-14)	11,573.5	11,640.1	933.3	750.8	5.113	SF

Offset Design											
Hankins 5N67W20MR Pad Sec.20-T5N-R67W - Hankins 20M-203 - Wellbore #1 - Plan #1 (8-12-14)											
Survey Program: 0-MWD											
Reference											
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)	+E/-W (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Minimum Separation (ft)
0.0	0.0	0.0	0.0	0.0	0.0	-89.97	0.0	-30.6	30.6		
100.0	100.0	100.0	100.0	0.1	0.1	-89.97	0.0	-30.6	30.6	30.4	0.22
200.0	200.0	200.0	200.0	0.3	0.3	-89.97	0.0	-30.6	30.6	30.0	0.67
300.0	300.0	300.0	300.0	0.6	0.6	-89.97	0.0	-30.6	30.6	29.5	1.12
400.0	400.0	400.0	400.0	0.8	0.8	-89.97	0.0	-30.6	30.6	29.1	1.57
500.0	500.0	500.0	500.0	1.0	1.0	-89.97	0.0	-30.6	30.6	28.6	2.02
600.0	600.0	600.0	600.0	1.2	1.2	-89.97	0.0	-30.6	30.6	28.2	2.47
700.0	700.0	700.0	700.0	1.5	1.5	-89.97	0.0	-30.6	30.6	27.7	2.92
800.0	800.0	800.0	800.0	1.7	1.7	-89.97	0.0	-30.6	30.6	27.3	3.37
900.0	900.0	900.0	900.0	1.9	1.9	-89.97	0.0	-30.6	30.6	26.8	3.82
1,000.0	1,000.0	1,000.0	1,000.0	2.1	2.1	-89.97	0.0	-30.6	30.6	26.4	4.27
1,100.0	1,100.0	1,100.0	1,100.0	2.4	2.4	-89.97	0.0	-30.6	30.6	25.9	4.72
1,200.0	1,200.0	1,200.0	1,200.0	2.6	2.6	-89.97	0.0	-30.6	30.6	25.5	5.17
1,300.0	1,300.0	1,300.0	1,300.0	2.8	2.8	-89.97	0.0	-30.6	30.6	25.0	5.62
1,400.0	1,400.0	1,400.0	1,400.0	3.0	3.0	-89.97	0.0	-30.6	30.6	24.6	6.07
1,500.0	1,500.0	1,500.0	1,500.0	3.3	3.3	-89.97	0.0	-30.6	30.6	24.1	6.52

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-423
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-423	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-203 - 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		
1,600.0	1,600.0	1,600.0	1,600.0	3.5	3.5	-89.97	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	-89.97	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	-89.97	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	-89.97	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	-89.97	0.0	-30.6	30.6	21.9	8.77	3.495 CC, ES		
2,100.0	2,100.0	2,098.9	2,098.9	4.6	4.6	-89.37	0.4	-32.3	32.3	23.1	9.20	3.514		
2,200.0	2,200.0	2,197.6	2,197.5	4.8	4.8	-87.90	1.4	-37.3	37.4	27.8	9.63	3.887		
2,300.0	2,300.0	2,295.8	2,295.3	5.1	5.0	-86.18	3.0	-45.6	45.9	35.9	10.06	4.568		
2,400.0	2,400.0	2,394.3	2,393.1	5.3	5.2	-84.66	5.3	-56.8	57.5	47.0	10.49	5.482		
2,500.0	2,500.0	2,493.5	2,491.6	5.5	5.5	-83.60	7.7	-68.6	69.6	58.7	10.92	6.371		
2,600.0	2,600.0	2,592.8	2,590.1	5.7	5.7	-82.85	10.1	-80.4	81.7	70.3	11.35	7.193		
2,700.0	2,700.0	2,692.0	2,688.6	6.0	6.0	-82.30	12.5	-92.2	93.8	82.0	11.79	7.953		
2,800.0	2,800.0	2,791.3	2,787.2	6.2	6.2	-81.87	14.9	-104.0	105.9	93.7	12.23	8.658		
2,900.0	2,900.0	2,890.6	2,885.7	6.4	6.5	-81.53	17.2	-115.9	118.0	105.3	12.67	9.314		
3,000.0	3,000.0	2,989.8	2,984.2	6.6	6.8	-81.26	19.6	-127.7	130.1	117.0	13.11	9.925		
3,100.0	3,100.0	3,089.1	3,082.8	6.9	7.0	-81.03	22.0	-139.5	142.2	128.7	13.55	10.495		
3,200.0	3,200.0	3,188.3	3,181.3	7.1	7.3	-80.83	24.4	-151.3	154.4	140.4	14.00	11.028		
3,300.0	3,300.0	3,287.6	3,279.8	7.3	7.6	-80.67	26.8	-163.1	166.5	152.0	14.44	11.527		
3,400.0	3,400.0	3,386.9	3,378.3	7.5	7.9	-80.53	29.2	-174.9	178.6	163.7	14.89	11.996		
3,500.0	3,500.0	3,486.1	3,476.9	7.8	8.2	-80.40	31.6	-186.7	190.7	175.4	15.34	12.437		
3,600.0	3,600.0	3,585.4	3,575.4	8.0	8.4	-80.29	34.0	-198.5	202.9	187.1	15.78	12.852		
3,700.0	3,700.0	3,686.4	3,675.7	8.2	8.7	-80.19	36.4	-210.4	214.9	198.7	16.23	13.238		
3,800.0	3,800.0	3,794.2	3,783.0	8.4	9.0	-80.12	38.4	-220.4	224.3	207.7	16.67	13.460		
3,900.0	3,900.0	3,902.7	3,891.3	8.7	9.2	-80.08	39.6	-226.4	230.0	212.9	17.10	13.453		
4,000.0	4,000.0	4,011.4	4,000.0	8.9	9.4	-80.06	40.0	-228.5	231.9	214.4	17.53	13.232		
4,100.0	4,100.0	4,111.4	4,100.0	9.1	9.6	-84.48	40.0	-228.5	231.8	213.8	17.95	12.910		
4,132.3	4,132.2	4,143.7	4,132.2	9.2	9.6	-84.81	40.0	-228.5	231.6	213.5	18.09	12.802		
4,200.0	4,199.9	4,211.3	4,199.9	9.3	9.8	-85.58	40.0	-228.5	231.4	213.0	18.39	12.581		
4,300.0	4,299.8	4,311.2	4,299.8	9.6	10.0	-86.72	40.0	-228.5	231.1	212.2	18.83	12.270		
4,400.0	4,399.7	4,411.1	4,399.7	9.8	10.2	-87.86	40.0	-228.5	230.8	211.6	19.27	11.977		
4,500.0	4,499.6	4,511.0	4,499.6	10.0	10.4	-89.00	40.0	-228.5	230.7	211.0	19.72	11.701		
4,587.0	4,586.5	4,597.9	4,586.5	10.2	10.6	-90.00	40.0	-228.5	230.7	210.6	20.11	11.474		
4,600.0	4,599.5	4,610.9	4,599.5	10.2	10.6	-90.15	40.0	-228.5	230.7	210.5	20.16	11.441		
4,700.0	4,699.3	4,710.8	4,699.3	10.5	10.8	-91.29	40.0	-228.5	230.7	210.1	20.61	11.196		
4,800.0	4,799.2	4,810.7	4,799.2	10.7	11.0	-92.44	40.0	-228.5	230.9	209.8	21.06	10.965		
4,868.6	4,867.8	4,879.2	4,867.8	10.8	11.2	-93.22	40.0	-228.5	231.0	209.7	21.36	10.815		
4,900.0	4,899.1	4,910.6	4,899.1	10.9	11.2	-93.54	40.0	-228.5	231.1	209.6	21.50	10.751		
5,000.9	5,000.0	5,011.4	5,000.0	11.1	11.4	-90.00	40.0	-228.5	231.2	209.3	21.89	10.563		
5,100.0	5,099.1	5,110.5	5,099.1	11.3	11.6	-90.00	40.0	-228.5	231.2	208.9	22.30	10.367		
5,200.0	5,199.1	5,210.5	5,199.1	11.5	11.9	-90.00	40.0	-228.5	231.2	208.5	22.75	10.165		
5,300.0	5,299.1	5,310.5	5,299.1	11.7	12.1	-90.00	40.0	-228.5	231.2	208.0	23.19	9.970		
5,400.0	5,399.1	5,410.5	5,399.1	11.9	12.3	-90.00	40.0	-228.5	231.2	207.6	23.64	9.783		
5,500.0	5,499.1	5,510.5	5,499.1	12.2	12.5	-90.00	40.0	-228.5	231.2	207.2	24.08	9.602		
5,600.0	5,599.1	5,610.5	5,599.1	12.4	12.7	-90.00	40.0	-228.5	231.2	206.7	24.53	9.428		
5,700.0	5,699.1	5,710.5	5,699.1	12.6	12.9	-90.00	40.0	-228.5	231.2	206.3	24.97	9.260		
5,800.0	5,799.1	5,810.5	5,799.1	12.8	13.1	-90.00	40.0	-228.5	231.2	205.8	25.42	9.098		
5,900.0	5,899.1	5,910.5	5,899.1	13.1	13.3	-90.00	40.0	-228.5	231.2	205.4	25.86	8.941		
6,000.0	5,999.1	6,010.5	5,999.1	13.3	13.6	-90.00	40.0	-228.5	231.2	204.9	26.31	8.790		
6,100.0	6,099.1	6,110.5	6,099.1	13.5	13.8	-90.00	40.0	-228.5	231.2	204.5	26.75	8.644		
6,200.0	6,199.1	6,210.5	6,199.1	13.7	14.0	-90.00	40.0	-228.5	231.2	204.0	27.20	8.502		

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-423
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-423	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-203 - 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	
6,243.6	6,242.8	6,254.2	6,242.8	13.8	14.1	-90.02	39.9	-228.5	231.2	203.8	27.39	8.443	
6,300.0	6,299.1	6,310.4	6,298.8	14.0	14.2	-90.76	36.9	-228.5	231.3	203.6	27.61	8.375	
6,405.1	6,404.2	6,412.7	6,399.9	14.2	14.3	-94.72	20.9	-228.5	232.1	204.0	28.02	8.281	
6,450.0	6,449.1	6,455.2	6,441.0	14.3	14.4	82.91	10.3	-228.5	233.1	204.9	28.18	8.272	
6,500.0	6,498.9	6,501.8	6,485.4	14.4	14.5	80.33	-3.9	-228.5	234.7	206.4	28.34	8.283	
6,550.0	6,548.3	6,547.9	6,528.4	14.4	14.6	77.84	-20.6	-228.5	236.8	208.3	28.48	8.314	
6,600.0	6,597.0	6,593.5	6,569.8	14.5	14.7	75.45	-39.6	-228.5	239.2	210.6	28.61	8.361	
6,650.0	6,644.9	6,638.6	6,609.5	14.6	14.7	73.17	-60.8	-228.5	242.0	213.3	28.73	8.424	
6,700.0	6,691.9	6,683.2	6,647.6	14.7	14.8	71.01	-84.1	-228.5	245.0	216.2	28.83	8.501	
6,750.0	6,737.5	6,727.3	6,683.8	14.8	14.9	68.97	-109.3	-228.5	248.3	219.4	28.91	8.589	
6,800.0	6,781.8	6,771.1	6,718.3	14.9	15.0	67.06	-136.3	-228.5	251.7	222.7	28.97	8.687	
6,850.0	6,824.4	6,814.5	6,750.8	15.0	15.2	65.29	-164.9	-228.5	255.2	226.2	29.03	8.791	
6,900.0	6,865.2	6,857.5	6,781.5	15.1	15.3	63.64	-195.1	-228.5	258.7	229.6	29.08	8.898	
6,950.0	6,904.1	6,900.0	6,810.0	15.2	15.5	62.12	-226.6	-228.5	262.2	233.1	29.12	9.004	
7,000.0	6,940.8	6,942.6	6,836.8	15.4	15.7	60.73	-259.7	-228.5	265.7	236.5	29.19	9.103	
7,050.0	6,975.2	6,984.8	6,861.5	15.6	15.9	59.46	-293.9	-228.5	269.1	239.8	29.27	9.192	
7,100.0	7,007.2	7,026.7	6,884.2	15.9	16.2	58.32	-329.1	-228.5	272.3	242.9	29.39	9.264	
7,150.0	7,036.6	7,068.3	6,904.7	16.2	16.5	57.30	-365.4	-228.5	275.3	245.7	29.54	9.317	
7,200.0	7,063.2	7,109.8	6,923.2	16.5	16.9	56.39	-402.5	-228.5	278.0	248.3	29.76	9.344	
7,250.0	7,087.1	7,150.0	6,939.1	16.9	17.2	55.62	-439.4	-228.5	280.6	250.5	30.03	9.343	
7,300.0	7,108.0	7,192.3	6,953.8	17.3	17.6	54.92	-479.1	-228.5	282.8	252.4	30.40	9.305	
7,350.0	7,126.0	7,233.4	6,965.9	17.8	18.0	54.34	-518.3	-228.5	284.8	253.9	30.84	9.234	
7,400.0	7,140.8	7,274.3	6,975.8	18.2	18.4	53.88	-558.0	-228.5	286.4	255.0	31.38	9.128	
7,450.0	7,152.5	7,315.2	6,983.6	18.8	18.9	53.51	-598.1	-228.5	287.7	255.7	32.01	8.988	
7,500.0	7,160.9	7,356.0	6,989.3	19.3	19.4	53.25	-638.5	-228.5	288.6	255.9	32.74	8.816	
7,550.0	7,166.2	7,400.0	6,992.9	19.9	19.9	53.08	-682.4	-228.5	289.2	255.6	33.60	8.608	
7,551.3	7,166.3	7,400.0	6,992.9	20.0	19.9	53.08	-682.4	-228.5	289.2	255.6	33.61	8.605	
7,604.2	7,168.2	7,440.8	6,994.1	20.6	20.4	53.03	-723.2	-228.5	289.4	254.9	34.58	8.370	
7,700.0	7,168.3	7,535.6	6,993.6	21.9	21.7	52.94	-818.0	-228.5	289.8	253.2	36.62	7.912	
7,800.0	7,168.4	7,635.6	6,993.1	23.3	23.1	52.84	-918.0	-228.5	290.2	251.3	38.89	7.461	
7,900.0	7,168.5	7,735.6	6,992.6	24.7	24.6	52.74	-1,018.0	-228.5	290.5	249.3	41.27	7.040	
8,000.0	7,168.6	7,835.6	6,992.1	26.2	26.1	52.64	-1,118.0	-228.5	290.9	247.2	43.74	6.651	
8,100.0	7,168.8	7,935.6	6,991.6	27.8	27.7	52.54	-1,218.0	-228.5	291.3	245.0	46.29	6.293	
8,200.0	7,168.9	8,035.6	6,991.1	29.4	29.3	52.44	-1,318.0	-228.5	291.7	242.8	48.90	5.965	
8,300.0	7,169.0	8,135.6	6,990.6	31.1	31.0	52.35	-1,418.0	-228.5	292.1	240.5	51.57	5.664	
8,400.0	7,169.1	8,235.6	6,990.1	32.8	32.7	52.25	-1,518.0	-228.5	292.5	238.2	54.27	5.389	
8,500.0	7,169.2	8,335.6	6,989.6	34.5	34.4	52.15	-1,617.9	-228.5	292.8	235.8	57.02	5.136	
8,600.0	7,169.4	8,435.6	6,989.1	36.2	36.1	52.05	-1,717.9	-228.5	293.2	233.4	59.79	4.904	
8,700.0	7,169.5	8,535.6	6,988.5	37.9	37.9	51.96	-1,817.9	-228.5	293.6	231.0	62.59	4.691	
8,800.0	7,169.6	8,635.6	6,988.0	39.7	39.6	51.86	-1,917.9	-228.5	294.0	228.6	65.41	4.495	
8,900.0	7,169.7	8,735.6	6,987.5	41.5	41.4	51.76	-2,017.9	-228.5	294.4	226.1	68.25	4.313	
9,000.0	7,169.9	8,835.6	6,987.0	43.3	43.2	51.67	-2,117.9	-228.5	294.8	223.7	71.11	4.146	
9,100.0	7,170.0	8,935.6	6,986.5	45.1	45.0	51.57	-2,217.9	-228.5	295.2	221.2	73.97	3.990	
9,200.0	7,170.1	9,035.6	6,986.0	46.9	46.8	51.48	-2,317.9	-228.5	295.6	218.7	76.85	3.846	
9,300.0	7,170.2	9,135.6	6,985.5	48.7	48.7	51.38	-2,417.9	-228.5	296.0	216.2	79.73	3.712	
9,400.0	7,170.3	9,235.6	6,985.0	50.5	50.5	51.29	-2,517.9	-228.5	296.3	213.7	82.62	3.587	
9,500.0	7,170.5	9,335.6	6,984.5	52.3	52.3	51.19	-2,617.9	-228.5	296.7	211.2	85.52	3.470	
9,600.0	7,170.6	9,435.6	6,984.0	54.2	54.2	51.10	-2,717.9	-228.5	297.1	208.7	88.42	3.361	
9,700.0	7,170.7	9,535.6	6,983.5	56.0	56.0	51.00	-2,817.9	-228.5	297.5	206.2	91.32	3.258	
9,800.0	7,170.8	9,635.6	6,983.0	57.9	57.9	50.91	-2,917.9	-228.5	297.9	203.7	94.23	3.162	
9,900.0	7,171.0	9,735.6	6,982.5	59.7	59.7	50.82	-3,017.9	-228.5	298.3	201.2	97.13	3.071	

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-423
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-423	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							
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning	
10,000.0	7,171.1	9,835.6	6,982.0	61.6	61.6	50.72	-3,117.9	-228.5	298.7	198.7	100.04	2.986		
10,100.0	7,171.2	9,935.6	6,981.5	63.4	63.4	50.63	-3,217.9	-228.5	299.1	196.2	102.95	2.906		
10,200.0	7,171.3	10,035.6	6,981.0	65.3	65.3	50.54	-3,317.9	-228.5	299.5	193.7	105.85	2.830		
10,300.0	7,171.4	10,135.6	6,980.5	67.2	67.2	50.44	-3,417.9	-228.5	299.9	191.2	108.76	2.758		
10,400.0	7,171.6	10,235.6	6,979.9	69.0	69.0	50.35	-3,517.9	-228.5	300.3	188.7	111.67	2.689		
10,500.0	7,171.7	10,335.6	6,979.4	70.9	70.9	50.26	-3,617.9	-228.5	300.7	186.2	114.57	2.625		
10,600.0	7,171.8	10,435.5	6,978.9	72.8	72.8	50.17	-3,717.9	-228.5	301.1	183.7	117.47	2.563		
10,700.0	7,171.9	10,535.5	6,978.4	74.7	74.7	50.08	-3,817.9	-228.5	301.5	181.2	120.37	2.505		
10,800.0	7,172.1	10,635.5	6,977.9	76.6	76.5	49.99	-3,917.9	-228.5	301.9	178.7	123.26	2.449		
10,900.0	7,172.2	10,735.5	6,977.4	78.4	78.4	49.89	-4,017.9	-228.5	302.3	176.2	126.16	2.396		
11,000.0	7,172.3	10,835.5	6,976.9	80.3	80.3	49.80	-4,117.9	-228.5	302.7	173.7	129.05	2.346		
11,100.0	7,172.4	10,935.5	6,976.4	82.2	82.2	49.71	-4,217.9	-228.5	303.1	171.2	131.93	2.298		
11,200.0	7,172.5	11,035.5	6,975.9	84.1	84.1	49.62	-4,317.9	-228.5	303.6	168.7	134.82	2.252		
11,300.0	7,172.7	11,135.5	6,975.4	86.0	86.0	49.53	-4,417.9	-228.5	304.0	166.3	137.70	2.207		
11,400.0	7,172.8	11,235.5	6,974.9	87.9	87.9	49.44	-4,517.9	-228.5	304.4	163.8	140.57	2.165		
11,500.0	7,172.9	11,335.5	6,974.4	89.8	89.8	49.35	-4,617.9	-228.5	304.8	161.3	143.44	2.125		
11,573.5	7,173.0	11,409.0	6,974.0	90.9	91.2	49.29	-4,691.3	-228.5	305.1	159.8	145.31	2.099 SF		

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Hankins 20M-423
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-423	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	89.98	0.0	30.6	30.6					
100.0	100.0	100.0	100.0	0.1	0.1	89.98	0.0	30.6	30.6	30.4	0.22	136.324		
200.0	200.0	200.0	200.0	0.3	0.3	89.98	0.0	30.6	30.6	30.0	0.67	45.441		
300.0	300.0	300.0	300.0	0.6	0.6	89.98	0.0	30.6	30.6	29.5	1.12	27.265		
400.0	400.0	400.0	400.0	0.8	0.8	89.98	0.0	30.6	30.6	29.1	1.57	19.475		
500.0	500.0	500.0	500.0	1.0	1.0	89.98	0.0	30.6	30.6	28.6	2.02	15.147		
600.0	600.0	600.0	600.0	1.2	1.2	89.98	0.0	30.6	30.6	28.2	2.47	12.393		
700.0	700.0	700.0	700.0	1.5	1.5	89.98	0.0	30.6	30.6	27.7	2.92	10.486		
800.0	800.0	800.0	800.0	1.7	1.7	89.98	0.0	30.6	30.6	27.3	3.37	9.088		
900.0	900.0	900.0	900.0	1.9	1.9	89.98	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	89.98	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	89.98	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	89.98	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	89.98	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	89.98	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	89.98	0.0	30.6	30.6	24.1	6.52	4.701 CC, ES		
1,600.0	1,600.0	1,598.9	1,598.9	3.5	3.5	89.39	0.3	32.3	32.3	25.4	6.95	4.650		
1,700.0	1,700.0	1,697.6	1,697.5	3.7	3.7	87.94	1.3	37.3	37.4	30.1	7.38	5.071		
1,800.0	1,800.0	1,795.8	1,795.3	3.9	3.9	86.25	3.0	45.6	45.9	38.1	7.81	5.881		
1,900.0	1,900.0	1,894.1	1,892.9	4.2	4.1	84.73	5.2	56.9	57.6	49.3	8.25	6.984		
2,000.0	2,000.0	1,993.4	1,991.4	4.4	4.4	83.67	7.6	68.9	69.9	61.2	8.68	8.049		
2,100.0	2,100.0	2,092.6	2,089.9	4.6	4.6	82.93	10.0	80.9	82.2	73.1	9.12	9.012		
2,200.0	2,200.0	2,191.8	2,188.4	4.8	4.9	82.38	12.4	92.9	94.5	84.9	9.56	9.886		
2,300.0	2,300.0	2,291.1	2,286.8	5.1	5.1	81.96	14.8	104.9	106.8	96.8	10.00	10.681		
2,400.0	2,400.0	2,390.3	2,385.3	5.3	5.4	81.62	17.2	117.0	119.1	108.7	10.44	11.407		
2,500.0	2,500.0	2,489.6	2,483.8	5.5	5.7	81.35	19.6	129.0	131.4	120.6	10.89	12.072		
2,600.0	2,600.0	2,588.8	2,582.3	5.7	6.0	81.13	22.0	141.0	143.8	132.4	11.34	12.684		
2,700.0	2,700.0	2,688.0	2,680.8	6.0	6.3	80.94	24.4	153.0	156.1	144.3	11.78	13.248		
2,800.0	2,800.0	2,787.3	2,779.2	6.2	6.6	80.77	26.8	165.0	168.4	156.2	12.23	13.769		
2,900.0	2,900.0	2,886.5	2,877.7	6.4	6.8	80.63	29.2	177.0	180.8	168.1	12.68	14.252		
3,000.0	3,000.0	2,985.7	2,976.2	6.6	7.1	80.51	31.6	189.0	193.1	180.0	13.13	14.701		
3,100.0	3,100.0	3,085.0	3,074.7	6.9	7.4	80.40	34.0	201.0	205.4	191.8	13.59	15.120		
3,200.0	3,200.0	3,186.4	3,175.3	7.1	7.7	80.31	36.4	213.1	217.6	203.6	14.04	15.502		
3,300.0	3,300.0	3,294.3	3,282.8	7.3	8.0	80.24	38.4	223.2	227.1	212.6	14.47	15.692		
3,400.0	3,400.0	3,402.9	3,391.2	7.5	8.2	80.20	39.6	229.2	232.8	217.9	14.90	15.621		
3,500.0	3,500.0	3,511.8	3,500.0	7.8	8.4	80.18	40.0	231.2	234.7	219.3	15.33	15.310		
3,600.0	3,600.0	3,611.8	3,600.0	8.0	8.6	80.18	40.0	231.2	234.7	218.9	15.75	14.896		
3,700.0	3,700.0	3,711.8	3,700.0	8.2	8.8	80.18	40.0	231.2	234.7	218.5	16.19	14.491		
3,800.0	3,800.0	3,811.8	3,800.0	8.4	9.0	80.18	40.0	231.2	234.7	218.0	16.63	14.108		
3,900.0	3,900.0	3,911.8	3,900.0	8.7	9.2	80.18	40.0	231.2	234.7	217.6	17.08	13.743		
4,000.0	4,000.0	4,011.8	4,000.0	8.9	9.4	80.18	40.0	231.2	234.7	217.2	17.52	13.397		
4,100.0	4,100.0	4,111.7	4,100.0	9.1	9.6	76.62	40.0	231.2	234.3	216.3	17.95	13.048		
4,132.3	4,132.2	4,144.0	4,132.2	9.2	9.6	76.94	40.0	231.2	234.0	215.9	18.10	12.929		
4,200.0	4,199.9	4,211.6	4,199.9	9.3	9.8	77.69	40.0	231.2	233.3	214.9	18.39	12.683		
4,300.0	4,299.8	4,311.5	4,299.8	9.6	10.0	78.80	40.0	231.2	232.3	213.5	18.83	12.336		
4,400.0	4,399.7	4,411.4	4,399.7	9.8	10.2	79.92	40.0	231.2	231.5	212.2	19.28	12.009		
4,500.0	4,499.6	4,511.3	4,499.6	10.0	10.4	81.05	40.0	231.2	230.7	211.0	19.72	11.700		
4,600.0	4,599.5	4,611.2	4,599.5	10.2	10.6	82.18	40.0	231.2	230.0	209.9	20.16	11.409		
4,700.0	4,699.3	4,711.1	4,699.3	10.5	10.8	83.32	40.0	231.2	229.5	208.9	20.61	11.134		
4,800.0	4,799.2	4,811.0	4,799.2	10.7	11.0	84.47	40.0	231.2	229.0	207.9	21.06	10.874		
4,868.6	4,867.8	4,879.5	4,867.8	10.8	11.2	85.26	40.0	231.2	228.7	207.3	21.36	10.704		

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-423
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-423	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		
4,900.0	4,899.1	4,910.9	4,899.1	10.9	11.2	85.57	40.0	231.2	228.6	207.1	21.50	10.634		
5,000.9	5,000.0	5,011.8	5,000.0	11.1	11.4	90.00	40.0	231.2	228.5	206.6	21.89	10.437		
5,100.0	5,099.1	5,110.9	5,099.1	11.3	11.6	90.00	40.0	231.2	228.5	206.2	22.30	10.244		
5,200.0	5,199.1	5,210.9	5,199.1	11.5	11.9	90.00	40.0	231.2	228.5	205.7	22.75	10.044		
5,300.0	5,299.1	5,310.9	5,299.1	11.7	12.1	90.00	40.0	231.2	228.5	205.3	23.19	9.852		
5,400.0	5,399.1	5,410.9	5,399.1	11.9	12.3	90.00	40.0	231.2	228.5	204.8	23.63	9.667		
5,500.0	5,499.1	5,510.9	5,499.1	12.2	12.5	90.00	40.0	231.2	228.5	204.4	24.08	9.488		
5,600.0	5,599.1	5,610.9	5,599.1	12.4	12.7	90.00	40.0	231.2	228.5	203.9	24.52	9.316		
5,700.0	5,699.1	5,710.9	5,699.1	12.6	12.9	90.00	40.0	231.2	228.5	203.5	24.97	9.150		
5,800.0	5,799.1	5,810.9	5,799.1	12.8	13.1	90.00	40.0	231.2	228.5	203.0	25.41	8.990		
5,900.0	5,899.1	5,910.9	5,899.1	13.1	13.3	90.00	40.0	231.2	228.5	202.6	25.86	8.835		
6,000.0	5,999.1	6,010.9	5,999.1	13.3	13.6	90.00	40.0	231.2	228.5	202.1	26.30	8.686		
6,100.0	6,099.1	6,110.9	6,099.1	13.5	13.8	90.00	40.0	231.2	228.5	201.7	26.75	8.541		
6,200.0	6,199.1	6,210.9	6,199.1	13.7	14.0	90.00	40.0	231.2	228.5	201.3	27.19	8.401		
6,300.0	6,299.1	6,310.9	6,299.1	14.0	14.2	90.00	40.0	231.2	228.5	200.8	27.64	8.266		
6,339.2	6,338.3	6,350.1	6,338.3	14.0	14.3	90.08	39.7	231.2	228.5	200.6	27.81	8.215		
6,405.1	6,404.2	6,415.6	6,403.6	14.2	14.4	91.26	35.0	231.2	228.5	200.4	28.07	8.141		
6,450.0	6,449.1	6,459.8	6,447.4	14.3	14.5	-87.47	28.7	231.2	228.7	200.4	28.23	8.100		
6,500.0	6,498.9	6,508.6	6,495.2	14.4	14.6	-86.07	18.8	231.2	229.0	200.6	28.39	8.066		
6,550.0	6,548.3	6,557.1	6,541.9	14.4	14.6	-84.69	5.9	231.2	229.4	200.9	28.54	8.039		
6,600.0	6,597.0	6,605.3	6,587.5	14.5	14.7	-83.35	-9.8	231.2	230.0	201.3	28.69	8.018		
6,650.0	6,644.9	6,653.2	6,631.7	14.6	14.8	-82.04	-28.2	231.2	230.7	201.9	28.83	8.001		
6,700.0	6,691.9	6,700.0	6,673.7	14.7	14.9	-80.80	-48.8	231.2	231.5	202.5	28.98	7.988		
6,750.0	6,737.5	6,748.0	6,715.4	14.8	15.0	-79.57	-72.6	231.2	232.3	203.2	29.13	7.975		
6,800.0	6,781.8	6,795.1	6,754.7	14.9	15.1	-78.40	-98.4	231.2	233.3	204.0	29.30	7.961		
6,850.0	6,824.4	6,841.8	6,792.2	15.0	15.2	-77.30	-126.4	231.2	234.2	204.7	29.48	7.944		
6,900.0	6,865.2	6,888.3	6,827.7	15.1	15.3	-76.25	-156.5	231.2	235.2	205.5	29.69	7.923		
6,950.0	6,904.1	6,934.6	6,861.1	15.2	15.5	-75.27	-188.5	231.2	236.3	206.3	29.93	7.893		
7,000.0	6,940.8	6,980.7	6,892.4	15.4	15.7	-74.36	-222.3	231.2	237.3	207.1	30.21	7.853		
7,050.0	6,975.2	7,026.6	6,921.5	15.6	15.9	-73.51	-257.8	231.2	238.3	207.8	30.55	7.802		
7,100.0	7,007.2	7,072.4	6,948.3	15.9	16.2	-72.73	-294.8	231.2	239.3	208.4	30.93	7.736		
7,150.0	7,036.6	7,117.9	6,972.7	16.2	16.5	-72.02	-333.3	231.2	240.2	208.8	31.38	7.655		
7,200.0	7,063.2	7,163.3	6,994.8	16.5	16.8	-71.38	-373.0	231.2	241.1	209.2	31.90	7.558		
7,250.0	7,087.1	7,208.6	7,014.4	16.9	17.2	-70.82	-413.8	231.2	241.9	209.4	32.49	7.445		
7,300.0	7,108.0	7,253.8	7,031.5	17.3	17.6	-70.33	-455.6	231.2	242.6	209.5	33.16	7.316		
7,350.0	7,126.0	7,300.0	7,046.4	17.8	18.0	-69.90	-499.3	231.2	243.3	209.3	33.93	7.171		
7,400.0	7,140.8	7,343.9	7,058.1	18.2	18.5	-69.57	-541.6	231.2	243.8	209.0	34.76	7.015		
7,450.0	7,152.5	7,388.8	7,067.5	18.8	18.9	-69.30	-585.6	231.2	244.2	208.6	35.67	6.846		
7,500.0	7,160.9	7,433.7	7,074.4	19.3	19.5	-69.10	-629.9	231.2	244.5	207.9	36.67	6.669		
7,550.0	7,166.2	7,478.6	7,078.6	19.9	20.0	-68.98	-674.6	231.2	244.7	207.0	37.74	6.485		
7,604.2	7,168.2	7,527.2	7,080.2	20.6	20.6	-68.94	-723.1	231.2	244.8	205.8	38.97	6.282		
7,700.0	7,168.3	7,622.0	7,079.3	21.9	21.9	-68.71	-818.0	231.2	245.2	203.9	41.30	5.937		
7,800.0	7,168.4	7,722.0	7,078.2	23.3	23.3	-68.47	-917.9	231.2	245.6	201.7	43.87	5.598		
7,900.0	7,168.5	7,822.0	7,077.2	24.7	24.7	-68.22	-1,017.9	231.2	246.0	199.4	46.58	5.282		
8,000.0	7,168.6	7,922.0	7,076.2	26.2	26.3	-67.98	-1,117.9	231.2	246.4	197.1	49.38	4.991		
8,100.0	7,168.8	8,022.0	7,075.2	27.8	27.8	-67.73	-1,217.9	231.2	246.9	194.6	52.26	4.723		
8,200.0	7,168.9	8,122.0	7,074.2	29.4	29.4	-67.49	-1,317.9	231.2	247.3	192.1	55.22	4.479		
8,300.0	7,169.0	8,222.0	7,073.2	31.1	31.1	-67.25	-1,417.9	231.2	247.7	189.5	58.22	4.255		
8,400.0	7,169.1	8,322.0	7,072.2	32.8	32.8	-67.00	-1,517.9	231.2	248.2	186.9	61.27	4.050		
8,500.0	7,169.2	8,422.0	7,071.2	34.5	34.5	-66.76	-1,617.9	231.2	248.6	184.3	64.36	3.863		

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-423
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-423	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			
8,600.0	7,169.4	8,522.0	7,070.1	36.2	36.2	-66.52	-1,717.9	231.2	249.1	181.6	67.48	3.691			
8,700.0	7,169.5	8,621.9	7,069.1	37.9	38.0	-66.29	-1,817.8	231.2	249.5	178.9	70.62	3.533			
8,800.0	7,169.6	8,721.9	7,068.1	39.7	39.7	-66.05	-1,917.8	231.2	250.0	176.2	73.78	3.388			
8,900.0	7,169.7	8,821.9	7,067.1	41.5	41.5	-65.81	-2,017.8	231.2	250.4	173.5	76.96	3.254			
9,000.0	7,169.9	8,921.9	7,066.1	43.3	43.3	-65.57	-2,117.8	231.2	250.9	170.8	80.15	3.130			
9,100.0	7,170.0	9,021.9	7,065.1	45.1	45.1	-65.34	-2,217.8	231.2	251.4	168.0	83.35	3.016			
9,200.0	7,170.1	9,121.9	7,064.1	46.9	46.9	-65.10	-2,317.8	231.2	251.9	165.3	86.55	2.910			
9,300.0	7,170.2	9,221.9	7,063.1	48.7	48.7	-64.87	-2,417.8	231.2	252.3	162.6	89.76	2.811			
9,400.0	7,170.3	9,321.9	7,062.1	50.5	50.5	-64.64	-2,517.8	231.2	252.8	159.8	92.98	2.719			
9,500.0	7,170.5	9,421.9	7,061.0	52.3	52.4	-64.41	-2,617.7	231.2	253.3	157.1	96.19	2.633			
9,600.0	7,170.6	9,521.9	7,060.0	54.2	54.2	-64.17	-2,717.7	231.2	253.8	154.4	99.40	2.553			
9,700.0	7,170.7	9,621.9	7,059.0	56.0	56.1	-63.94	-2,817.7	231.2	254.3	151.7	102.61	2.478			
9,800.0	7,170.8	9,721.9	7,058.0	57.9	57.9	-63.72	-2,917.7	231.2	254.8	149.0	105.82	2.408			
9,900.0	7,171.0	9,821.9	7,057.0	59.7	59.8	-63.49	-3,017.7	231.2	255.3	146.3	109.03	2.342			
10,000.0	7,171.1	9,921.9	7,056.0	61.6	61.6	-63.26	-3,117.7	231.2	255.8	143.6	112.23	2.279			
10,100.0	7,171.2	10,021.9	7,055.0	63.4	63.5	-63.03	-3,217.7	231.2	256.3	140.9	115.43	2.221			
10,200.0	7,171.3	10,121.9	7,054.0	65.3	65.3	-62.81	-3,317.7	231.2	256.8	138.2	118.62	2.165			
10,300.0	7,171.4	10,221.8	7,052.9	67.2	67.2	-62.58	-3,417.7	231.2	257.4	135.6	121.80	2.113			
10,400.0	7,171.6	10,321.8	7,051.9	69.0	69.1	-62.36	-3,517.6	231.2	257.9	132.9	124.98	2.063			
10,500.0	7,171.7	10,421.8	7,050.9	70.9	70.9	-62.14	-3,617.6	231.2	258.4	130.3	128.15	2.016			
10,600.0	7,171.8	10,521.8	7,049.9	72.8	72.8	-61.92	-3,717.6	231.2	258.9	127.6	131.32	1.972			
10,700.0	7,171.9	10,621.8	7,048.9	74.7	74.7	-61.69	-3,817.6	231.2	259.5	125.0	134.47	1.930			
10,800.0	7,172.1	10,721.8	7,047.9	76.6	76.6	-61.47	-3,917.6	231.2	260.0	122.4	137.62	1.889			
10,900.0	7,172.2	10,821.8	7,046.9	78.4	78.5	-61.25	-4,017.6	231.2	260.6	119.8	140.76	1.851			
11,000.0	7,172.3	10,921.8	7,045.9	80.3	80.4	-61.04	-4,117.6	231.2	261.1	117.2	143.89	1.815			
11,100.0	7,172.4	11,021.8	7,044.8	82.2	82.2	-60.82	-4,217.6	231.2	261.7	114.7	147.01	1.780			
11,200.0	7,172.5	11,121.8	7,043.8	84.1	84.1	-60.60	-4,317.6	231.2	262.2	112.1	150.12	1.747			
11,300.0	7,172.7	11,221.8	7,042.8	86.0	86.0	-60.39	-4,417.5	231.2	262.8	109.6	153.22	1.715			
11,400.0	7,172.8	11,321.8	7,041.8	87.9	87.9	-60.17	-4,517.5	231.2	263.3	107.0	156.32	1.685			
11,500.0	7,172.9	11,421.8	7,040.8	89.8	89.8	-59.96	-4,617.5	231.2	263.9	104.5	159.40	1.656			
11,573.5	7,173.0	11,495.2	7,040.1	90.9	91.2	-59.80	-4,691.0	231.2	264.3	102.9	161.41	1.638 SF			

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Hankins 20M-423
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-423	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	58.5	58.5					
100.0	100.0	99.0	99.0	0.1	0.1	90.01	0.0	58.5	58.5	58.3	0.22	261.560		
200.0	200.0	199.0	199.0	0.3	0.3	90.01	0.0	58.5	58.5	57.8	0.67	87.042		
300.0	300.0	299.0	299.0	0.6	0.6	90.01	0.0	58.5	58.5	57.4	1.12	52.155		
400.0	400.0	399.0	399.0	0.8	0.8	90.01	0.0	58.5	58.5	56.9	1.57	37.232		
500.0	500.0	499.0	499.0	1.0	1.0	90.01	0.0	58.5	58.5	56.5	2.02	28.949		
600.0	600.0	599.0	599.0	1.2	1.2	90.01	0.0	58.5	58.5	56.0	2.47	23.681		
700.0	700.0	699.0	699.0	1.5	1.5	90.01	0.0	58.5	58.5	55.6	2.92	20.035		
800.0	800.0	799.0	799.0	1.7	1.7	90.01	0.0	58.5	58.5	55.1	3.37	17.362		
900.0	900.0	899.0	899.0	1.9	1.9	90.01	0.0	58.5	58.5	54.7	3.82	15.318		
1,000.0	1,000.0	999.0	999.0	2.1	2.1	90.01	0.0	58.5	58.5	54.2	4.27	13.705 CC, ES		
1,100.0	1,100.0	1,097.0	1,097.0	2.4	2.3	89.91	0.1	60.1	60.2	55.5	4.70	12.799		
1,200.0	1,200.0	1,194.7	1,194.6	2.6	2.5	89.63	0.4	65.1	65.2	60.1	5.13	12.727		
1,300.0	1,300.0	1,292.0	1,291.5	2.8	2.8	89.25	1.0	73.3	73.7	68.2	5.56	13.268		
1,400.0	1,400.0	1,388.9	1,387.7	3.0	3.0	88.85	1.7	84.8	85.5	79.6	5.99	14.277		
1,500.0	1,500.0	1,488.1	1,486.0	3.3	3.2	88.50	2.6	97.8	98.7	92.3	6.43	15.353		
1,600.0	1,600.0	1,587.2	1,584.3	3.5	3.5	88.24	3.4	110.9	111.9	105.0	6.87	16.288		
1,700.0	1,700.0	1,686.3	1,682.5	3.7	3.8	88.03	4.3	123.9	125.0	117.7	7.31	17.103		
1,800.0	1,800.0	1,785.4	1,780.8	3.9	4.1	87.86	5.1	136.9	138.2	130.5	7.76	17.819		
1,900.0	1,900.0	1,884.6	1,879.1	4.2	4.4	87.72	6.0	150.0	151.4	143.2	8.20	18.453		
2,000.0	2,000.0	1,983.7	1,977.3	4.4	4.7	87.61	6.8	163.0	164.6	155.9	8.65	19.016		
2,100.0	2,100.0	2,082.8	2,075.6	4.6	5.0	87.51	7.7	176.0	177.7	168.6	9.11	19.521		
2,200.0	2,200.0	2,182.0	2,173.8	4.8	5.3	87.42	8.5	189.1	190.9	181.4	9.56	19.975		
2,300.0	2,300.0	2,281.1	2,272.1	5.1	5.6	87.35	9.4	202.1	204.1	194.1	10.01	20.385		
2,400.0	2,400.0	2,380.2	2,370.4	5.3	5.9	87.28	10.2	215.1	217.3	206.8	10.47	20.758		
2,500.0	2,500.0	2,479.3	2,468.6	5.5	6.2	87.22	11.1	228.2	230.4	219.5	10.92	21.098		
2,600.0	2,600.0	2,578.5	2,566.9	5.7	6.5	87.17	11.9	241.2	243.6	232.2	11.38	21.409		
2,700.0	2,700.0	2,677.6	2,665.2	6.0	6.9	87.13	12.8	254.2	256.8	245.0	11.84	21.695		
2,800.0	2,800.0	2,776.7	2,763.4	6.2	7.2	87.08	13.6	267.3	270.0	257.7	12.29	21.959		
2,900.0	2,900.0	2,875.9	2,861.7	6.4	7.5	87.05	14.5	280.3	283.1	270.4	12.75	22.202		
3,000.0	3,000.0	2,975.0	2,960.0	6.6	7.8	87.01	15.3	293.3	296.3	283.1	13.21	22.428		
3,100.0	3,100.0	3,074.1	3,058.2	6.9	8.1	86.98	16.2	306.4	309.5	295.8	13.67	22.638		
3,200.0	3,200.0	3,173.2	3,156.5	7.1	8.5	86.95	17.0	319.4	322.7	308.5	14.13	22.834		
3,300.0	3,300.0	3,272.4	3,254.7	7.3	8.8	86.92	17.9	332.4	335.8	321.2	14.59	23.016		
3,400.0	3,400.0	3,371.5	3,353.0	7.5	9.1	86.90	18.7	345.5	349.0	334.0	15.05	23.187		
3,500.0	3,500.0	3,470.6	3,451.3	7.8	9.4	86.88	19.6	358.5	362.2	346.7	15.51	23.348		
3,600.0	3,600.0	3,569.7	3,549.5	8.0	9.8	86.85	20.4	371.5	375.4	359.4	15.97	23.498		
3,700.0	3,700.0	3,668.9	3,647.8	8.2	10.1	86.83	21.3	384.6	388.5	372.1	16.44	23.640		
3,800.0	3,800.0	3,768.0	3,746.1	8.4	10.4	86.82	22.1	397.6	401.7	384.8	16.90	23.774		
3,900.0	3,900.0	3,867.1	3,844.3	8.7	10.7	86.80	23.0	410.6	414.9	397.5	17.36	23.900		
4,000.0	4,000.0	3,966.3	3,942.6	8.9	11.1	86.78	23.8	423.7	428.1	410.3	17.82	24.020		
4,100.0	4,100.0	4,065.4	4,040.9	9.1	11.4	82.75	24.7	436.7	441.0	422.8	18.26	24.150		
4,132.3	4,132.2	4,097.4	4,072.6	9.2	11.5	82.83	24.9	440.9	445.1	426.7	18.41	24.178		
4,200.0	4,199.9	4,164.5	4,139.1	9.3	11.7	83.21	25.5	449.7	453.7	435.0	18.72	24.235		
4,300.0	4,299.8	4,263.6	4,237.4	9.6	12.1	83.74	26.4	462.8	466.3	447.2	19.18	24.316		
4,400.0	4,399.7	4,362.7	4,335.6	9.8	12.4	84.24	27.2	475.8	479.0	459.4	19.64	24.394		
4,500.0	4,499.6	4,461.8	4,433.8	10.0	12.7	84.72	28.1	488.8	491.8	471.7	20.10	24.468		
4,600.0	4,599.5	4,560.9	4,532.1	10.2	13.0	85.17	28.9	501.9	504.6	484.0	20.56	24.540		
4,700.0	4,699.3	4,660.0	4,630.3	10.5	13.4	85.60	29.8	514.9	517.4	496.3	21.02	24.608		
4,800.0	4,799.2	4,759.1	4,728.6	10.7	13.7	86.02	30.6	527.9	530.2	508.7	21.49	24.674		
4,868.6	4,867.8	4,827.1	4,795.9	10.8	13.9	86.29	31.2	536.9	539.0	517.2	21.81	24.717		

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-423
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-423	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		
4,900.0	4,899.1	4,858.2	4,826.8	10.9	14.0	86.47	31.5	541.0	543.0	521.1	21.94	24.747		
5,000.9	5,000.0	4,958.2	4,925.9	11.1	14.4	90.80	32.3	554.1	556.2	533.8	22.35	24.880		
5,100.0	5,099.1	5,056.5	5,023.3	11.3	14.7	90.69	33.2	567.0	569.2	546.4	22.78	24.982		
5,200.0	5,199.1	5,155.6	5,121.6	11.5	15.0	90.59	34.0	580.1	582.4	559.1	23.25	25.051		
5,300.0	5,299.1	5,254.8	5,219.9	11.7	15.4	90.50	34.9	593.1	595.5	571.8	23.71	25.117		
5,400.0	5,399.1	5,353.9	5,318.1	11.9	15.7	90.41	35.7	606.1	608.6	584.5	24.17	25.181		
5,500.0	5,499.1	5,453.0	5,416.4	12.2	16.0	90.32	36.6	619.2	621.8	597.2	24.63	25.242		
5,600.0	5,599.1	5,552.1	5,514.7	12.4	16.3	90.23	37.4	632.2	634.9	609.8	25.09	25.301		
5,700.0	5,699.1	5,651.3	5,612.9	12.6	16.7	90.15	38.3	645.2	648.1	622.5	25.56	25.358		
5,800.0	5,799.1	5,777.1	5,737.9	12.8	17.0	90.07	39.2	659.4	659.4	633.4	26.03	25.328		
5,900.0	5,899.1	5,906.8	5,867.3	13.1	17.2	90.02	39.8	668.4	666.3	639.8	26.50	25.147		
6,000.0	5,999.1	6,037.1	5,997.6	13.3	17.4	90.00	40.0	671.4	668.6	641.7	26.95	24.811		
6,100.0	6,099.1	6,137.7	6,098.1	13.5	17.6	90.00	40.0	671.4	668.6	641.3	27.37	24.433		
6,200.0	6,199.1	6,237.7	6,198.1	13.7	17.8	90.00	40.0	671.4	668.6	640.9	27.79	24.062		
6,243.8	6,243.0	6,281.5	6,242.0	13.8	17.8	90.01	39.9	671.4	668.6	640.7	27.97	23.904		
6,300.0	6,299.1	6,337.5	6,297.9	14.0	17.9	90.26	37.0	671.4	668.7	640.5	28.20	23.711		
6,405.1	6,404.2	6,439.9	6,398.9	14.2	18.1	91.62	21.1	671.4	668.9	640.3	28.62	23.376		
6,450.0	6,449.1	6,482.3	6,440.1	14.3	18.1	-87.56	10.6	671.4	669.3	640.5	28.78	23.255		
6,500.0	6,498.9	6,529.1	6,484.6	14.4	18.2	-86.66	-3.6	671.4	669.8	640.9	28.94	23.144		
6,550.0	6,548.3	6,575.2	6,527.6	14.4	18.3	-85.77	-20.3	671.4	670.6	641.5	29.10	23.042		
6,600.0	6,597.0	6,620.8	6,569.0	14.5	18.3	-84.91	-39.3	671.4	671.4	642.1	29.26	22.945		
6,650.0	6,644.9	6,665.9	6,608.8	14.6	18.4	-84.07	-60.5	671.4	672.4	643.0	29.42	22.852		
6,700.0	6,691.9	6,710.5	6,646.9	14.7	18.5	-83.26	-83.7	671.4	673.5	643.9	29.59	22.758		
6,750.0	6,737.5	6,754.7	6,683.2	14.8	18.6	-82.48	-108.9	671.4	674.7	644.9	29.77	22.659		
6,800.0	6,781.8	6,800.0	6,718.9	14.9	18.7	-81.70	-136.8	671.4	675.9	645.9	29.98	22.547		
6,850.0	6,824.4	6,841.9	6,750.4	15.0	18.8	-81.01	-164.5	671.4	677.2	647.0	30.20	22.421		
6,900.0	6,865.2	6,885.0	6,781.1	15.1	18.9	-80.33	-194.7	671.4	678.5	648.1	30.47	22.272		
6,950.0	6,904.1	6,927.7	6,809.8	15.2	19.1	-79.69	-226.3	671.4	679.9	649.1	30.77	22.096		
7,000.0	6,940.8	6,970.2	6,836.5	15.4	19.3	-79.09	-259.3	671.4	681.2	650.1	31.12	21.890		
7,050.0	6,975.2	7,012.4	6,861.3	15.6	19.5	-78.54	-293.5	671.4	682.5	651.0	31.52	21.650		
7,100.0	7,007.2	7,054.3	6,883.9	15.9	19.7	-78.02	-328.7	671.4	683.7	651.7	31.99	21.372		
7,150.0	7,036.6	7,100.0	6,906.4	16.2	19.9	-77.52	-368.5	671.4	684.9	652.4	32.55	21.041		
7,200.0	7,063.2	7,137.6	6,923.1	16.5	20.2	-77.13	-402.2	671.4	686.0	652.9	33.14	20.699		
7,250.0	7,087.1	7,179.0	6,939.5	16.9	20.4	-76.75	-440.2	671.4	687.0	653.2	33.83	20.306		
7,300.0	7,108.0	7,220.2	6,953.7	17.3	20.8	-76.43	-478.8	671.4	688.0	653.4	34.60	19.882		
7,350.0	7,126.0	7,261.3	6,965.9	17.8	21.1	-76.15	-518.1	671.4	688.8	653.3	35.45	19.430		
7,400.0	7,140.8	7,300.0	6,975.3	18.2	21.4	-75.92	-555.6	671.4	689.4	653.1	36.35	18.968		
7,450.0	7,152.5	7,343.2	6,983.7	18.8	21.8	-75.73	-598.0	671.4	690.0	652.6	37.37	18.462		
7,500.0	7,160.9	7,384.0	6,989.3	19.3	22.3	-75.60	-638.4	671.4	690.3	651.9	38.44	17.958		
7,550.0	7,166.2	7,424.8	6,992.8	19.9	22.7	-75.52	-679.1	671.4	690.6	651.0	39.58	17.450		
7,604.2	7,168.2	7,468.9	6,994.1	20.6	23.2	-75.49	-723.2	671.4	690.7	649.8	40.86	16.901		
7,700.0	7,168.3	7,563.7	6,993.6	21.9	24.3	-75.44	-818.0	671.4	690.8	647.5	43.31	15.950		
7,800.0	7,168.4	7,663.7	6,993.1	23.3	25.6	-75.39	-918.0	671.4	691.0	645.0	46.03	15.013		
7,900.0	7,168.5	7,763.7	6,992.6	24.7	26.9	-75.34	-1,018.0	671.4	691.1	642.3	48.87	14.142		
8,000.0	7,168.6	7,863.7	6,992.1	26.2	28.4	-75.29	-1,118.0	671.4	691.3	639.5	51.83	13.338		
8,100.0	7,168.8	7,963.7	6,991.6	27.8	29.8	-75.24	-1,218.0	671.4	691.5	636.6	54.88	12.599		
8,200.0	7,168.9	8,063.7	6,991.1	29.4	31.4	-75.19	-1,318.0	671.4	691.6	633.6	58.01	11.922		
8,300.0	7,169.0	8,163.7	6,990.6	31.1	32.9	-75.14	-1,418.0	671.4	691.8	630.6	61.20	11.303		
8,400.0	7,169.1	8,263.7	6,990.1	32.8	34.5	-75.09	-1,518.0	671.4	691.9	627.5	64.45	10.735		
8,500.0	7,169.2	8,363.7	6,989.6	34.5	36.2	-75.04	-1,618.0	671.4	692.1	624.3	67.75	10.215		

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-423
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-423	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		
8,600.0	7,169.4	8,463.7	6,989.1	36.2	37.8	-74.99	-1,717.9	671.4	692.3	621.2	71.09	9.738		
8,700.0	7,169.5	8,563.7	6,988.6	37.9	39.5	-74.94	-1,817.9	671.4	692.4	618.0	74.46	9.299		
8,800.0	7,169.6	8,663.7	6,988.1	39.7	41.2	-74.89	-1,917.9	671.4	692.6	614.7	77.87	8.895		
8,900.0	7,169.7	8,763.7	6,987.6	41.5	43.0	-74.84	-2,017.9	671.4	692.8	611.5	81.30	8.521		
9,000.0	7,169.9	8,863.7	6,987.1	43.3	44.7	-74.79	-2,117.9	671.4	692.9	608.2	84.75	8.176		
9,100.0	7,170.0	8,963.7	6,986.6	45.1	46.4	-74.74	-2,217.9	671.4	693.1	604.9	88.22	7.856		
9,200.0	7,170.1	9,063.7	6,986.1	46.9	48.2	-74.69	-2,317.9	671.4	693.2	601.5	91.71	7.559		
9,300.0	7,170.2	9,163.7	6,985.5	48.7	50.0	-74.64	-2,417.9	671.4	693.4	598.2	95.21	7.283		
9,400.0	7,170.3	9,263.7	6,985.0	50.5	51.8	-74.59	-2,517.9	671.4	693.6	594.9	98.73	7.025		
9,500.0	7,170.5	9,363.7	6,984.5	52.3	53.6	-74.54	-2,617.9	671.4	693.7	591.5	102.26	6.784		
9,600.0	7,170.6	9,463.7	6,984.0	54.2	55.4	-74.49	-2,717.9	671.4	693.9	588.1	105.80	6.559		
9,700.0	7,170.7	9,563.7	6,983.5	56.0	57.2	-74.44	-2,817.9	671.4	694.1	584.7	109.35	6.347		
9,800.0	7,170.8	9,663.7	6,983.0	57.9	59.0	-74.39	-2,917.9	671.4	694.3	581.3	112.91	6.149		
9,900.0	7,171.0	9,763.7	6,982.5	59.7	60.9	-74.34	-3,017.9	671.4	694.4	577.9	116.48	5.962		
10,000.0	7,171.1	9,863.7	6,982.0	61.6	62.7	-74.29	-3,117.9	671.4	694.6	574.5	120.05	5.786		
10,100.0	7,171.2	9,963.7	6,981.5	63.4	64.5	-74.24	-3,217.9	671.4	694.8	571.1	123.63	5.620		
10,200.0	7,171.3	10,063.7	6,981.0	65.3	66.4	-74.19	-3,317.9	671.4	694.9	567.7	127.21	5.463		
10,300.0	7,171.4	10,163.7	6,980.5	67.2	68.2	-74.14	-3,417.9	671.4	695.1	564.3	130.80	5.314		
10,400.0	7,171.6	10,263.7	6,980.0	69.0	70.1	-74.09	-3,517.9	671.4	695.3	560.9	134.39	5.174		
10,500.0	7,171.7	10,363.7	6,979.5	70.9	71.9	-74.04	-3,617.9	671.4	695.5	557.5	137.99	5.040		
10,600.0	7,171.8	10,463.7	6,979.0	72.8	73.8	-73.99	-3,717.9	671.4	695.6	554.0	141.59	4.913		
10,700.0	7,171.9	10,563.7	6,978.5	74.7	75.6	-73.94	-3,817.9	671.4	695.8	550.6	145.19	4.792		
10,800.0	7,172.1	10,663.7	6,978.0	76.6	77.5	-73.89	-3,917.9	671.4	696.0	547.2	148.79	4.677		
10,900.0	7,172.2	10,763.7	6,977.5	78.4	79.4	-73.84	-4,017.9	671.4	696.1	543.7	152.40	4.568		
11,000.0	7,172.3	10,863.7	6,976.9	80.3	81.2	-73.79	-4,117.9	671.4	696.3	540.3	156.01	4.463		
11,100.0	7,172.4	10,963.7	6,976.4	82.2	83.1	-73.74	-4,217.9	671.4	696.5	536.9	159.62	4.363		
11,200.0	7,172.5	11,063.7	6,975.9	84.1	85.0	-73.69	-4,317.9	671.4	696.7	533.4	163.23	4.268		
11,300.0	7,172.7	11,163.7	6,975.4	86.0	86.9	-73.64	-4,417.9	671.4	696.8	530.0	166.84	4.177		
11,400.0	7,172.8	11,263.7	6,974.9	87.9	88.7	-73.59	-4,517.9	671.4	697.0	526.6	170.46	4.089		
11,500.0	7,172.9	11,363.7	6,974.4	89.8	90.6	-73.54	-4,617.9	671.4	697.2	523.1	174.07	4.005		
11,573.5	7,173.0	11,437.1	6,974.0	90.9	92.0	-73.51	-4,691.3	671.4	697.3	520.9	176.47	3.952 SF		

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Hankins 20M-423
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-423	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							
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	
0.0	0.0	0.0	0.0	0.0	0.0	89.99	0.0	119.8	119.8					
100.0	100.0	98.0	98.0	0.1	0.1	89.99	0.0	119.8	119.8	119.6	0.22	538.276		
200.0	200.0	198.0	198.0	0.3	0.3	89.99	0.0	119.8	119.8	119.1	0.67	178.826		
300.0	300.0	298.0	298.0	0.6	0.6	89.99	0.0	119.8	119.8	118.7	1.12	107.009		
400.0	400.0	398.0	398.0	0.8	0.8	89.99	0.0	119.8	119.8	118.2	1.57	76.347		
500.0	500.0	498.0	498.0	1.0	1.0	89.99	0.0	119.8	119.8	117.8	2.02	59.343 CC, ES		
600.0	600.0	594.0	594.0	1.2	1.2	89.97	0.1	121.3	121.4	118.9	2.45	49.587		
700.0	700.0	689.8	689.6	1.5	1.4	89.89	0.2	126.1	126.3	123.5	2.88	43.940		
800.0	800.0	785.1	784.6	1.7	1.6	89.77	0.5	133.9	134.6	131.3	3.31	40.681		
900.0	900.0	879.8	878.7	1.9	1.9	89.63	0.9	144.9	146.2	142.4	3.75	39.001		
1,000.0	1,000.0	973.7	971.5	2.1	2.2	89.48	1.5	158.8	161.0	156.8	4.19	38.409 SF		
1,100.0	1,100.0	1,066.5	1,062.8	2.4	2.5	89.32	2.1	175.6	179.1	174.4	4.64	38.589		
1,200.0	1,200.0	1,162.2	1,156.5	2.6	2.8	89.18	2.8	195.3	199.7	194.6	5.10	39.174		
1,300.0	1,300.0	1,260.0	1,252.1	2.8	3.2	89.06	3.5	215.6	220.5	214.9	5.56	39.677		
1,400.0	1,400.0	1,357.8	1,347.8	3.0	3.6	88.96	4.3	236.0	241.3	235.3	6.02	40.094		
1,500.0	1,500.0	1,455.6	1,443.5	3.3	4.0	88.87	5.1	256.3	262.1	255.6	6.48	40.428		
1,600.0	1,600.0	1,553.4	1,539.1	3.5	4.5	88.80	5.8	276.6	282.9	275.9	6.95	40.701		
1,700.0	1,700.0	1,651.2	1,634.8	3.7	4.9	88.74	6.6	297.0	303.7	296.3	7.42	40.927		
1,800.0	1,800.0	1,749.1	1,730.5	3.9	5.3	88.68	7.3	317.3	324.5	316.6	7.89	41.117		
1,900.0	1,900.0	1,846.9	1,826.1	4.2	5.8	88.63	8.1	337.7	345.3	337.0	8.37	41.277		
2,000.0	2,000.0	1,944.7	1,921.8	4.4	6.2	88.59	8.8	358.0	366.1	357.3	8.84	41.414		
2,100.0	2,100.0	2,042.5	2,017.5	4.6	6.6	88.55	9.6	378.3	386.9	377.6	9.32	41.532		
2,200.0	2,200.0	2,140.3	2,113.1	4.8	7.1	88.52	10.3	398.7	407.7	398.0	9.79	41.635		
2,300.0	2,300.0	2,238.1	2,208.8	5.1	7.5	88.49	11.1	419.0	428.6	418.3	10.27	41.725		
2,400.0	2,400.0	2,335.9	2,304.5	5.3	8.0	88.46	11.8	439.4	449.4	438.6	10.75	41.805		
2,500.0	2,500.0	2,433.7	2,400.2	5.5	8.4	88.44	12.6	459.7	470.2	458.9	11.23	41.875		
2,600.0	2,600.0	2,531.5	2,495.8	5.7	8.9	88.41	13.3	480.1	491.0	479.3	11.71	41.938		
2,700.0	2,700.0	2,629.4	2,591.5	6.0	9.3	88.39	14.1	500.4	511.8	499.6	12.19	41.994		
2,800.0	2,800.0	2,727.2	2,687.2	6.2	9.7	88.37	14.8	520.7	532.6	519.9	12.67	42.044		
2,900.0	2,900.0	2,825.0	2,782.8	6.4	10.2	88.35	15.6	541.1	553.4	540.3	13.15	42.090		
3,000.0	3,000.0	2,922.8	2,878.5	6.6	10.6	88.34	16.3	561.4	574.2	560.6	13.63	42.131		
3,100.0	3,100.0	3,020.6	2,974.2	6.9	11.1	88.32	17.1	581.8	595.0	580.9	14.11	42.169		
3,200.0	3,200.0	3,118.4	3,069.8	7.1	11.5	88.31	17.8	602.1	615.8	601.3	14.59	42.203		
3,300.0	3,300.0	3,216.2	3,165.5	7.3	12.0	88.29	18.6	622.4	636.7	621.6	15.07	42.235		
3,400.0	3,400.0	3,314.0	3,261.2	7.5	12.4	88.28	19.3	642.8	657.5	641.9	15.56	42.263		
3,500.0	3,500.0	3,411.8	3,356.8	7.8	12.9	88.27	20.1	663.1	678.3	662.2	16.04	42.290		
3,600.0	3,600.0	3,509.7	3,452.5	8.0	13.3	88.26	20.8	683.5	699.1	682.6	16.52	42.314		
3,700.0	3,700.0	3,607.5	3,548.2	8.2	13.8	88.24	21.6	703.8	719.9	702.9	17.00	42.337		
3,800.0	3,800.0	3,705.3	3,643.9	8.4	14.2	88.23	22.3	724.1	740.7	723.2	17.49	42.358		
3,900.0	3,900.0	3,803.1	3,739.5	8.7	14.7	88.23	23.1	744.5	761.5	743.6	17.97	42.378		
4,000.0	4,000.0	3,900.9	3,835.2	8.9	15.1	88.22	23.8	764.8	782.3	763.9	18.45	42.396		
4,100.0	4,100.0	3,998.7	3,930.9	9.1	15.6	83.93	24.6	785.2	803.0	784.1	18.88	42.520		
4,132.3	4,132.2	4,030.3	3,961.8	9.2	15.7	83.89	24.8	791.7	809.6	790.5	19.04	42.516		
4,200.0	4,199.9	4,096.5	4,026.5	9.3	16.0	84.10	25.3	805.5	823.3	804.0	19.36	42.520		
4,300.0	4,299.8	4,194.3	4,122.2	9.6	16.5	84.40	26.1	825.9	843.7	823.9	19.84	42.523		
4,400.0	4,399.7	4,292.2	4,217.9	9.8	16.9	84.68	26.8	846.2	864.1	843.8	20.32	42.525		
4,500.0	4,499.6	4,390.0	4,313.6	10.0	17.4	84.96	27.6	866.5	884.5	863.7	20.80	42.526		
4,600.0	4,599.5	4,487.8	4,409.2	10.2	17.8	85.22	28.3	886.9	905.0	883.7	21.28	42.525		
4,700.0	4,699.3	4,585.6	4,504.9	10.5	18.3	85.47	29.1	907.2	925.4	903.7	21.76	42.523		
4,800.0	4,799.2	4,683.4	4,600.6	10.7	18.7	85.70	29.8	927.6	945.9	923.6	22.25	42.520		
4,868.6	4,867.8	4,750.5	4,666.2	10.8	19.0	85.86	30.3	941.5	959.9	937.4	22.58	42.517		

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-423
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-423	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										
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore +N/-S (ft)	Centre +E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning				
4,900.0	4,899.1	4,781.2	4,696.2	10.9	19.2	86.05	30.6	947.9	966.4	943.7	22.72	42.534					
5,000.9	5,000.0	4,879.9	4,792.7	11.1	19.6	90.51	31.3	968.4	987.3	964.1	23.15	42.646					

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Hankins 20M-423
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-423	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	90.00	0.0	89.1	89.1					
100.0	100.0	99.0	99.0	0.1	0.1	90.00	0.0	89.1	89.1	88.9	0.22	398.568		
200.0	200.0	199.0	199.0	0.3	0.3	90.00	0.0	89.1	89.1	88.5	0.67	132.635		
300.0	300.0	299.0	299.0	0.6	0.6	90.00	0.0	89.1	89.1	88.0	1.12	79.475		
400.0	400.0	399.0	399.0	0.8	0.8	90.00	0.0	89.1	89.1	87.6	1.57	56.735		
500.0	500.0	499.0	499.0	1.0	1.0	90.00	0.0	89.1	89.1	87.1	2.02	44.113		
600.0	600.0	599.0	599.0	1.2	1.2	90.00	0.0	89.1	89.1	86.7	2.47	36.085		
700.0	700.0	699.0	699.0	1.5	1.5	90.00	0.0	89.1	89.1	86.2	2.92	30.530 CC, ES		
800.0	800.0	796.0	796.0	1.7	1.7	89.95	0.1	90.7	90.8	87.4	3.35	27.098		
900.0	900.0	892.7	892.6	1.9	1.9	89.81	0.3	95.6	95.8	92.0	3.78	25.373		
1,000.0	1,000.0	989.0	988.5	2.1	2.1	89.62	0.7	103.7	104.2	100.0	4.21	24.765		
1,100.0	1,100.0	1,084.6	1,083.5	2.4	2.3	89.39	1.2	114.9	115.9	111.3	4.64	24.962		
1,200.0	1,200.0	1,179.9	1,177.7	2.6	2.6	89.16	1.9	129.2	130.9	125.9	5.09	25.735		
1,300.0	1,300.0	1,278.6	1,275.0	2.8	2.9	88.95	2.7	145.2	147.2	141.7	5.53	26.607		
1,400.0	1,400.0	1,377.2	1,372.3	3.0	3.2	88.79	3.4	161.3	163.5	157.6	5.98	27.341		
1,500.0	1,500.0	1,475.9	1,469.7	3.3	3.5	88.65	4.2	177.4	179.8	173.4	6.43	27.957		
1,600.0	1,600.0	1,574.5	1,567.0	3.5	3.9	88.54	4.9	193.5	196.2	189.3	6.89	28.480		
1,700.0	1,700.0	1,673.2	1,664.4	3.7	4.2	88.44	5.7	209.5	212.5	205.1	7.34	28.929		
1,800.0	1,800.0	1,771.9	1,761.7	3.9	4.6	88.36	6.4	225.6	228.8	221.0	7.80	29.318		
1,900.0	1,900.0	1,870.5	1,859.0	4.2	4.9	88.29	7.2	241.7	245.1	236.8	8.26	29.658		
2,000.0	2,000.0	1,969.2	1,956.4	4.4	5.3	88.23	8.0	257.8	261.4	252.6	8.72	29.958		
2,100.0	2,100.0	2,067.8	2,053.7	4.6	5.7	88.17	8.7	273.8	277.7	268.5	9.19	30.223		
2,200.0	2,200.0	2,166.5	2,151.1	4.8	6.0	88.13	9.5	289.9	294.0	284.3	9.65	30.460		
2,300.0	2,300.0	2,265.2	2,248.4	5.1	6.4	88.08	10.2	306.0	310.3	300.2	10.12	30.673		
2,400.0	2,400.0	2,363.8	2,345.7	5.3	6.8	88.04	11.0	322.0	326.6	316.0	10.58	30.864		
2,500.0	2,500.0	2,462.5	2,443.1	5.5	7.1	88.01	11.8	338.1	342.9	331.9	11.05	31.038		
2,600.0	2,600.0	2,561.2	2,540.4	5.7	7.5	87.98	12.5	354.2	359.2	347.7	11.51	31.196		
2,700.0	2,700.0	2,659.8	2,637.8	6.0	7.9	87.95	13.3	370.3	375.5	363.5	11.98	31.340		
2,800.0	2,800.0	2,758.5	2,735.1	6.2	8.2	87.92	14.0	386.3	391.8	379.4	12.45	31.473		
2,900.0	2,900.0	2,857.1	2,832.4	6.4	8.6	87.89	14.8	402.4	408.1	395.2	12.92	31.595		
3,000.0	3,000.0	2,955.8	2,929.8	6.6	9.0	87.87	15.6	418.5	424.4	411.1	13.39	31.707		
3,100.0	3,100.0	3,054.5	3,027.1	6.9	9.4	87.85	16.3	434.5	440.7	426.9	13.86	31.811		
3,200.0	3,200.0	3,153.1	3,124.5	7.1	9.7	87.83	17.1	450.6	457.1	442.7	14.32	31.908		
3,300.0	3,300.0	3,251.8	3,221.8	7.3	10.1	87.81	17.8	466.7	473.4	458.6	14.79	31.998		
3,400.0	3,400.0	3,350.4	3,319.1	7.5	10.5	87.79	18.6	482.8	489.7	474.4	15.26	32.082		
3,500.0	3,500.0	3,449.1	3,416.5	7.8	10.8	87.78	19.4	498.8	506.0	490.2	15.73	32.160		
3,600.0	3,600.0	3,547.8	3,513.8	8.0	11.2	87.76	20.1	514.9	522.3	506.1	16.20	32.234		
3,700.0	3,700.0	3,646.4	3,611.2	8.2	11.6	87.75	20.9	531.0	538.6	521.9	16.67	32.303		
3,800.0	3,800.0	3,745.1	3,708.5	8.4	12.0	87.74	21.6	547.0	554.9	537.8	17.14	32.368		
3,900.0	3,900.0	3,843.7	3,805.8	8.7	12.3	87.72	22.4	563.1	571.2	553.6	17.61	32.429		
4,000.0	4,000.0	3,942.4	3,903.2	8.9	12.7	87.71	23.1	579.2	587.5	569.4	18.09	32.487		
4,100.0	4,100.0	4,041.1	4,000.5	9.1	13.1	83.56	23.9	595.3	603.6	585.1	18.52	32.591		
4,132.3	4,132.2	4,072.9	4,032.0	9.2	13.2	83.57	24.2	600.5	608.8	590.1	18.67	32.600		
4,200.0	4,199.9	4,139.7	4,097.9	9.3	13.5	83.85	24.7	611.3	619.5	600.5	18.99	32.624		
4,300.0	4,299.8	4,238.4	4,195.2	9.6	13.9	84.25	25.4	627.4	635.3	615.9	19.45	32.657		
4,400.0	4,399.7	4,337.0	4,292.5	9.8	14.2	84.62	26.2	643.5	651.2	631.3	19.92	32.688		
4,500.0	4,499.6	4,435.7	4,389.8	10.0	14.6	84.98	26.9	659.5	667.1	646.7	20.39	32.717		
4,600.0	4,599.5	4,534.3	4,487.2	10.2	15.0	85.32	27.7	675.6	683.0	662.2	20.86	32.744		
4,700.0	4,699.3	4,633.0	4,584.5	10.5	15.4	85.64	28.5	691.7	699.0	677.7	21.33	32.770		
4,800.0	4,799.2	4,731.6	4,681.8	10.7	15.7	85.96	29.2	707.8	715.0	693.2	21.80	32.793		
4,868.6	4,867.8	4,799.3	4,748.6	10.8	16.0	86.16	29.7	718.8	725.9	703.8	22.13	32.809		

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-423
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-423	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							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				
4,900.0	4,899.1	4,830.2	4,779.1	10.9	16.1	86.34	30.0	723.8	731.0	708.7	22.27	32.830				
5,000.9	5,000.0	4,929.8	4,877.3	11.1	16.5	90.72	30.7	740.0	747.3	724.6	22.68	32.944				
5,100.0	5,099.1	5,027.6	4,973.8	11.3	16.9	90.65	31.5	756.0	763.4	740.3	23.12	33.018				
5,200.0	5,199.1	5,126.2	5,071.2	11.5	17.2	90.58	32.3	772.0	779.7	756.1	23.59	33.051				
5,300.0	5,299.1	5,224.9	5,168.5	11.7	17.6	90.51	33.0	788.1	796.0	771.9	24.06	33.082				
5,400.0	5,399.1	5,323.6	5,265.8	11.9	18.0	90.45	33.8	804.2	812.3	787.7	24.53	33.112				
5,500.0	5,499.1	5,422.2	5,363.2	12.2	18.4	90.38	34.5	820.3	828.5	803.5	25.00	33.141				
5,600.0	5,599.1	5,520.9	5,460.5	12.4	18.8	90.32	35.3	836.3	844.8	819.4	25.47	33.169				
5,700.0	5,699.1	5,619.5	5,557.9	12.6	19.1	90.27	36.1	852.4	861.1	835.2	25.94	33.196				
5,800.0	5,799.1	5,718.2	5,655.2	12.8	19.5	90.21	36.8	868.5	877.4	851.0	26.41	33.222				
5,900.0	5,899.1	5,816.9	5,752.6	13.1	19.9	90.16	37.6	884.5	893.7	866.8	26.88	33.246				
6,000.0	5,999.1	5,923.6	5,857.9	13.3	20.3	90.10	38.4	901.8	909.9	882.5	27.36	33.258				
6,100.0	6,099.1	6,069.3	6,002.4	13.5	20.6	90.05	39.3	920.6	922.8	894.9	27.87	33.114				
6,200.0	6,199.1	6,216.6	6,149.2	13.7	20.9	90.01	39.8	932.1	930.6	902.3	28.36	32.814				
6,300.0	6,299.1	6,364.7	6,297.2	14.0	21.1	90.00	40.0	936.1	933.3	904.5	28.84	32.360				
6,405.1	6,404.2	6,470.7	6,403.2	14.2	21.3	90.00	40.0	936.1	933.3	904.0	29.27	31.883				
6,450.0	6,449.1	6,515.6	6,448.1	14.3	21.3	-90.00	38.7	936.1	933.3	903.9	29.44	31.702				
6,500.0	6,498.9	6,565.6	6,497.9	14.4	21.4	-90.01	34.2	936.1	933.3	903.7	29.60	31.526				
6,550.0	6,548.3	6,615.6	6,547.3	14.4	21.5	-90.01	26.5	936.1	933.3	903.6	29.76	31.357				
6,600.0	6,597.0	6,665.7	6,596.1	14.5	21.5	-90.02	15.5	936.1	933.3	903.4	29.92	31.192				
6,650.0	6,644.9	6,715.7	6,644.0	14.6	21.6	-90.02	1.4	936.1	933.3	903.2	30.08	31.025				
6,700.0	6,691.9	6,765.7	6,691.0	14.7	21.7	-90.02	-15.9	936.1	933.3	903.1	30.25	30.851				
6,750.0	6,737.5	6,815.7	6,736.7	14.8	21.7	-90.03	-36.2	936.1	933.3	902.9	30.44	30.664				
6,800.0	6,781.8	6,865.8	6,781.0	14.9	21.8	-90.03	-59.4	936.1	933.3	902.7	30.64	30.457				
6,850.0	6,824.4	6,915.8	6,823.7	15.0	21.9	-90.03	-85.5	936.1	933.3	902.4	30.88	30.222				
6,900.0	6,865.2	6,965.8	6,864.6	15.1	22.0	-90.04	-114.3	936.1	933.3	902.2	31.16	29.954				
6,950.0	6,904.1	7,015.9	6,903.5	15.2	22.1	-90.04	-145.7	936.1	933.3	901.8	31.48	29.645				
7,000.0	6,940.8	7,065.9	6,940.3	15.4	22.2	-90.04	-179.7	936.1	933.3	901.5	31.86	29.291				
7,050.0	6,975.2	7,116.0	6,974.8	15.6	22.3	-90.05	-215.9	936.1	933.3	901.0	32.31	28.889				
7,100.0	7,007.2	7,166.0	7,006.8	15.9	22.5	-90.05	-254.4	936.1	933.3	900.5	32.82	28.438				
7,150.0	7,036.6	7,216.1	7,036.2	16.2	22.7	-90.05	-294.8	936.1	933.3	899.9	33.41	27.938				
7,200.0	7,063.2	7,266.1	7,063.0	16.5	22.9	-90.05	-337.1	936.1	933.3	899.2	34.07	27.393				
7,250.0	7,087.1	7,316.2	7,086.9	16.9	23.1	-90.05	-381.1	936.1	933.3	898.5	34.82	26.806				
7,300.0	7,108.0	7,366.2	7,107.9	17.3	23.4	-90.06	-426.5	936.1	933.3	897.7	35.64	26.185				
7,350.0	7,126.0	7,416.3	7,125.8	17.8	23.7	-90.06	-473.3	936.1	933.3	896.8	36.55	25.537				
7,400.0	7,140.8	7,466.4	7,140.7	18.2	24.1	-90.06	-521.1	936.1	933.3	895.8	37.53	24.870				
7,450.0	7,152.5	7,516.4	7,152.4	18.8	24.5	-90.06	-569.7	936.1	933.3	894.7	38.58	24.192				
7,500.0	7,160.9	7,566.5	7,160.9	19.3	24.9	-90.06	-619.1	936.1	933.3	893.6	39.70	23.512				
7,550.0	7,166.2	7,616.5	7,166.2	19.9	25.3	-90.06	-668.8	936.1	933.3	892.4	40.87	22.836				
7,604.2	7,168.2	7,670.8	7,168.1	20.6	25.9	-90.06	-723.0	936.1	933.3	891.1	42.20	22.118				
7,700.0	7,168.3	7,766.6	7,168.3	21.9	26.9	-90.06	-818.9	936.1	933.3	888.6	44.69	20.884				
7,800.0	7,168.4	7,866.6	7,168.4	23.3	28.0	-90.06	-918.9	936.1	933.3	885.9	47.45	19.670				
7,900.0	7,168.5	7,966.6	7,168.5	24.7	29.2	-90.06	-1,018.9	936.1	933.3	883.0	50.35	18.537				
8,000.0	7,168.6	8,066.6	7,168.6	26.2	30.5	-90.06	-1,118.9	936.1	933.3	879.9	53.37	17.488				
8,100.0	7,168.8	8,166.6	7,168.7	27.8	31.9	-90.06	-1,218.9	936.1	933.3	876.8	56.49	16.522				
8,200.0	7,168.9	8,266.6	7,168.9	29.4	33.3	-90.06	-1,318.9	936.1	933.3	873.6	59.69	15.636				
8,300.0	7,169.0	8,366.6	7,169.0	31.1	34.8	-90.06	-1,418.9	936.1	933.3	870.4	62.97	14.822				
8,400.0	7,169.1	8,466.6	7,169.1	32.8	36.3	-90.06	-1,518.9	936.1	933.3	867.0	66.30	14.077				
8,500.0	7,169.2	8,566.6	7,169.2	34.5	37.9	-90.06	-1,618.9	936.1	933.3	863.6	69.69	13.392				
8,600.0	7,169.4	8,666.6	7,169.4	36.2	39.5	-90.06	-1,718.9	936.1	933.3	860.2	73.12	12.763				

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

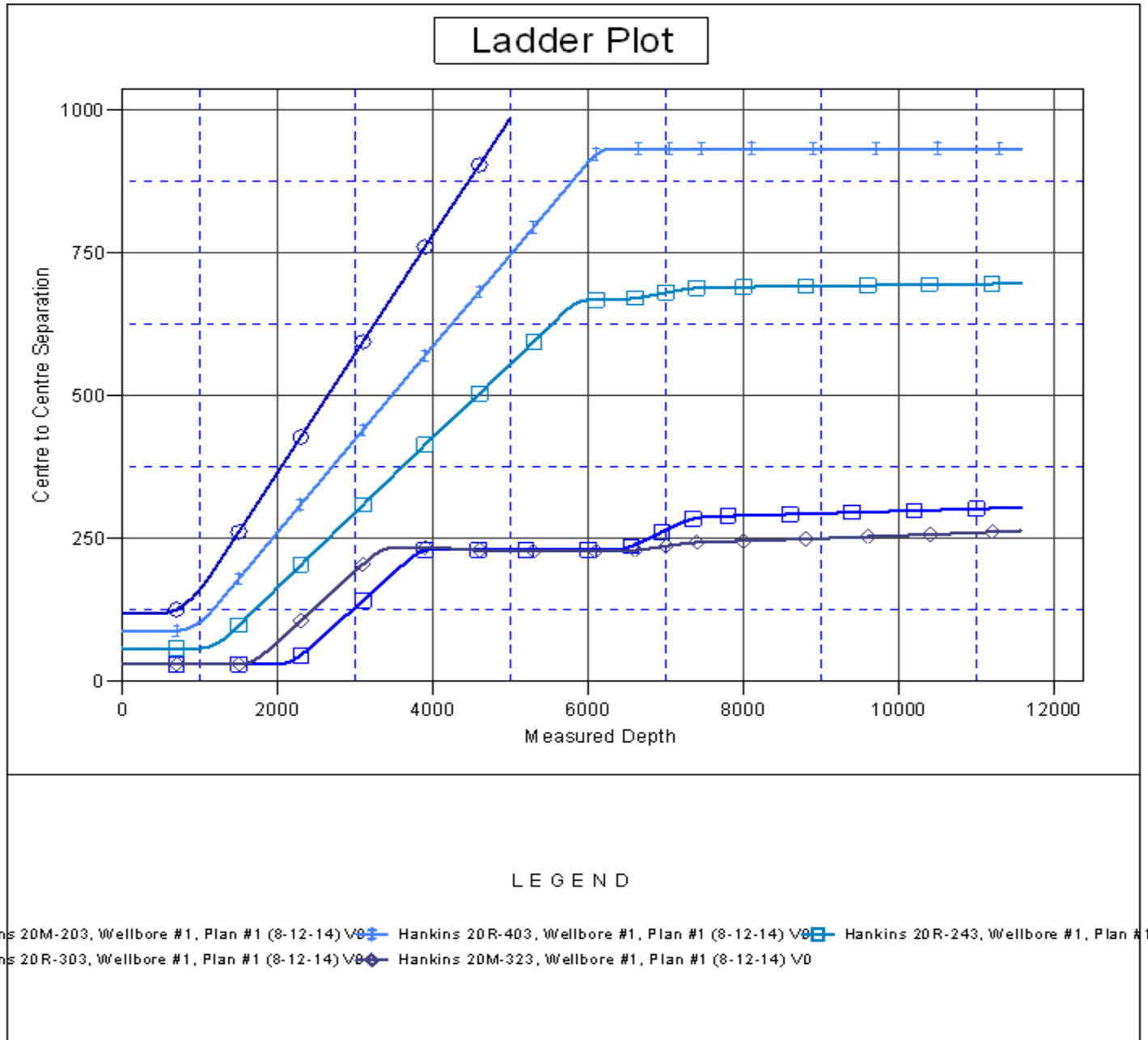
Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Hankins 20M-423
Project:	SEC.20-T5N-R67W	TVD Reference:	WELL @ 4974.0ft (RKB - 15')
Reference Site:	Hankins 5N67W20MR Pad Sec.20-T5N-R67W	MD Reference:	WELL @ 4974.0ft (RKB - 15')
Site Error:	0.0ft	North Reference:	True
Reference Well:	Hankins 20M-423	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
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
8,700.0	7,169.5	8,766.6	7,169.5	37.9	41.1	-90.06	-1,818.9	936.1	933.3	856.7	76.60	12.185	
8,800.0	7,169.6	8,866.6	7,169.6	39.7	42.7	-90.06	-1,918.9	936.1	933.3	853.2	80.10	11.652	
8,900.0	7,169.7	8,966.6	7,169.7	41.5	44.4	-90.06	-2,018.9	936.1	933.3	849.7	83.64	11.159	
9,000.0	7,169.9	9,066.6	7,169.8	43.3	46.1	-90.06	-2,118.9	936.1	933.3	846.1	87.20	10.703	
9,100.0	7,170.0	9,166.6	7,170.0	45.1	47.8	-90.06	-2,218.9	936.1	933.3	842.5	90.78	10.281	
9,200.0	7,170.1	9,266.6	7,170.1	46.9	49.5	-90.06	-2,318.9	936.1	933.3	838.9	94.39	9.888	
9,300.0	7,170.2	9,366.6	7,170.2	48.7	51.3	-90.06	-2,418.9	936.1	933.3	835.3	98.01	9.523	
9,400.0	7,170.3	9,466.6	7,170.3	50.5	53.0	-90.06	-2,518.9	936.1	933.3	831.7	101.65	9.182	
9,500.0	7,170.5	9,566.6	7,170.5	52.3	54.8	-90.06	-2,618.9	936.1	933.3	828.0	105.30	8.863	
9,600.0	7,170.6	9,666.6	7,170.6	54.2	56.5	-90.06	-2,718.9	936.1	933.3	824.3	108.97	8.565	
9,700.0	7,170.7	9,766.6	7,170.7	56.0	58.3	-90.06	-2,818.9	936.1	933.3	820.7	112.65	8.285	
9,800.0	7,170.8	9,866.6	7,170.8	57.9	60.1	-90.06	-2,918.9	936.1	933.3	817.0	116.33	8.023	
9,900.0	7,171.0	9,966.6	7,170.9	59.7	61.9	-90.06	-3,018.9	936.1	933.3	813.3	120.03	7.776	
10,000.0	7,171.1	10,066.6	7,171.1	61.6	63.7	-90.06	-3,118.9	936.1	933.3	809.6	123.74	7.543	
10,100.0	7,171.2	10,166.6	7,171.2	63.4	65.5	-90.06	-3,218.9	936.1	933.3	805.9	127.45	7.323	
10,200.0	7,171.3	10,266.6	7,171.3	65.3	67.3	-90.06	-3,318.9	936.1	933.3	802.1	131.18	7.115	
10,300.0	7,171.4	10,366.6	7,171.4	67.2	69.2	-90.06	-3,418.9	936.1	933.3	798.4	134.91	6.918	
10,400.0	7,171.6	10,466.6	7,171.6	69.0	71.0	-90.06	-3,518.9	936.1	933.3	794.7	138.64	6.732	
10,500.0	7,171.7	10,566.6	7,171.7	70.9	72.8	-90.06	-3,618.9	936.1	933.3	790.9	142.38	6.555	
10,600.0	7,171.8	10,666.6	7,171.8	72.8	74.7	-90.06	-3,718.9	936.1	933.3	787.2	146.13	6.387	
10,700.0	7,171.9	10,766.6	7,171.9	74.7	76.5	-90.06	-3,818.9	936.1	933.3	783.4	149.88	6.227	
10,800.0	7,172.1	10,866.6	7,172.0	76.6	78.3	-90.06	-3,918.9	936.1	933.3	779.7	153.63	6.075	
10,900.0	7,172.2	10,966.6	7,172.2	78.4	80.2	-90.06	-4,018.9	936.1	933.3	775.9	157.39	5.930	
11,000.0	7,172.3	11,066.6	7,172.3	80.3	82.0	-90.06	-4,118.9	936.1	933.3	772.2	161.16	5.791	
11,100.0	7,172.4	11,166.6	7,172.4	82.2	83.9	-90.06	-4,218.9	936.1	933.3	768.4	164.93	5.659	
11,200.0	7,172.5	11,266.6	7,172.5	84.1	85.8	-90.06	-4,318.9	936.1	933.3	764.6	168.70	5.533	
11,300.0	7,172.7	11,366.6	7,172.7	86.0	87.6	-90.06	-4,418.9	936.1	933.3	760.8	172.47	5.412	
11,400.0	7,172.8	11,466.6	7,172.8	87.9	89.5	-90.06	-4,518.9	936.1	933.3	757.1	176.25	5.296	
11,500.0	7,172.9	11,566.6	7,172.9	89.8	91.3	-90.06	-4,618.9	936.1	933.3	753.3	180.03	5.184	
11,573.5	7,173.0	11,640.1	7,173.0	90.9	92.7	-90.06	-4,692.3	936.1	933.3	750.8	182.54	5.113 SF	

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Hankins 20M-423
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-423	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-423
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-423
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-423	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-423
Coordinate System is US State Plane 1983, Colorado Northern Zone
Grid Convergence at Surface is: 0.38°

