

PETROLEUM DEVELOPMENT CORP Weld County CO

Well Name: **Hankins 20R-303**

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

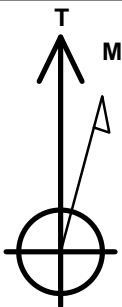
Ground Elevation: 4957.0

+N/-S	+E/-W	Northing	Easting	Latitude	Longitude	Slot
0.0	0.0	1386229.85	3162793.10	40.392130	-104.915550	

RKB - 15' WELL @ 4972.0ft (RKB - 15')

WELLBORE TARGET DETAILS

Name	TVD	+N/-S	+E/-W	Shape
SHL 90°FNL, 2272°FEL		0.0	0.0	Point
BHL 500°FSL, 1160°FEL	7040.0	-4703.2	1083.8	Point



Azimuths to True North
Magnetic North: 8.52°

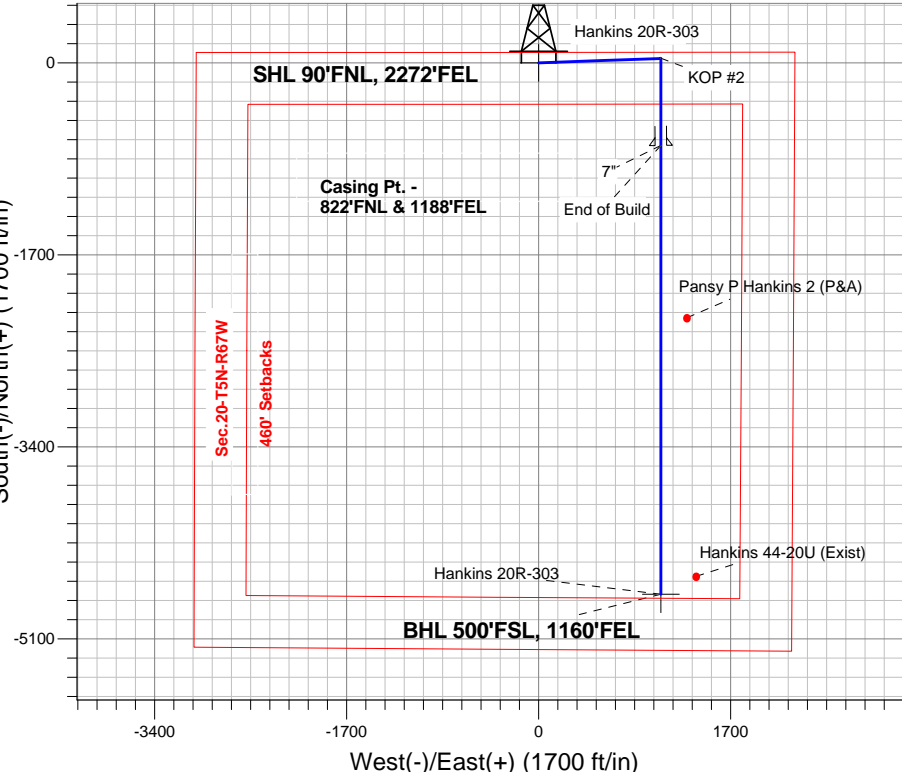
Magnetic Field
Strength: 52777.4snT
Dip Angle: 66.91°
Date: 8/12/2014
Model: IGRF2010

Hankins 5N67W20MR Pad Sec.20-T5N-R67W
Hankins 20R-303
Plan #1 (8-12-14)
9:25, August 13 2014

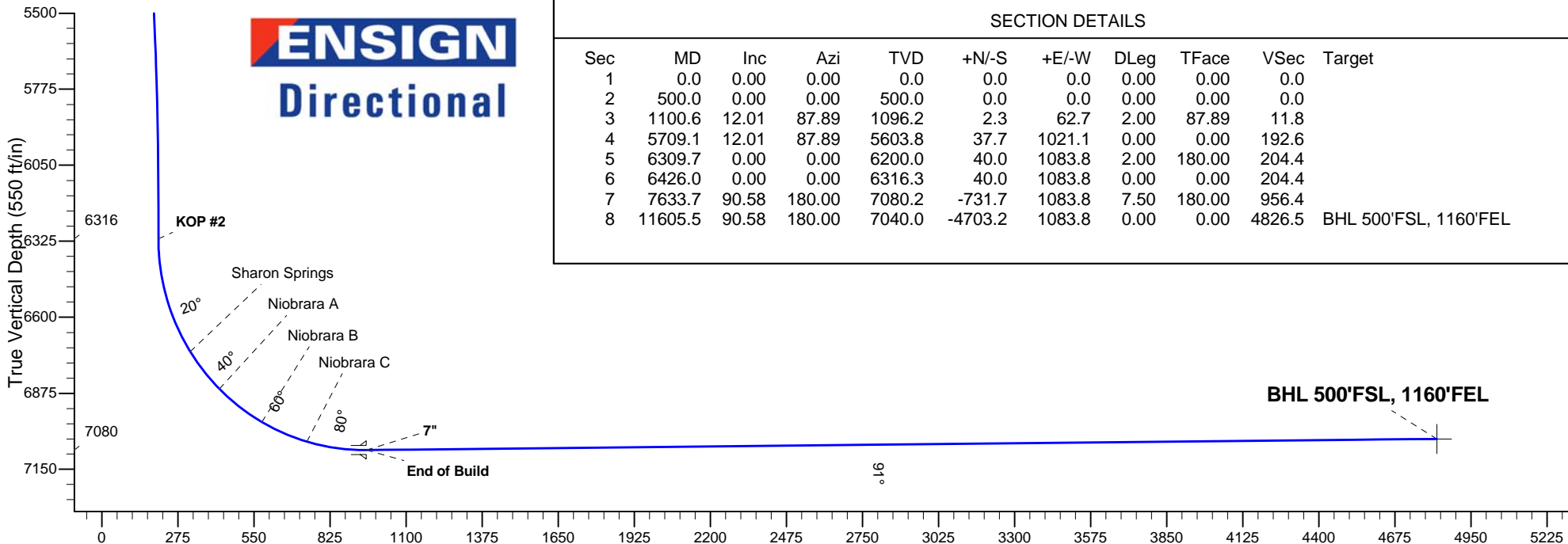
ANNOTATIONS

TVD	MD	Annotation
500.0	500.0	KOP #1
6316.3	6426.0	KOP #2
7080.2	7633.7	End of Build

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	500.0	0.00	0.00	500.0	0.0	0.0	0.00	0.00	0.0	
3	1100.6	12.01	87.89	1096.2	2.3	62.7	2.00	87.89	11.8	
4	5709.1	12.01	87.89	5603.8	37.7	1021.1	0.00	0.00	192.6	
5	6309.7	0.00	0.00	6200.0	40.0	1083.8	2.00	180.00	204.4	
6	6426.0	0.00	0.00	6316.3	40.0	1083.8	0.00	0.00	204.4	
7	7633.7	90.58	180.00	7080.2	-731.7	1083.8	7.50	180.00	956.4	
8	11605.5	90.58	180.00	7040.0	-4703.2	1083.8	0.00	0.00	4826.5	BHL 500°FSL, 1160°FEL

Vertical Section at 167.02° (550 ft/in)



PETROLEUM DEVELOPMENT CORP Weld County CO

SEC.20-T5N-R67W

Hankins 5N67W20MR Pad Sec.20-T5N-R67W

Hankins 20R-303

Wellbore #1

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

Standard Planning Report

13 August, 2014

Database:	Landmark	Local Co-ordinate Reference:	Well Hankins 20R-303
Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	TVD Reference:	WELL @ 4972.0ft (RKB - 15')
Project:	SEC.20-T5N-R67W	MD Reference:	WELL @ 4972.0ft (RKB - 15')
Site:	Hankins 5N67W20MR Pad Sec.20-T5N-R67W	North Reference:	True
Well:	Hankins 20R-303	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:			3,162,642.69ft			Longitude:			-104.916090		
Position Uncertainty:			0.0 ft			Slot Radius:			"			Grid Convergence:			0.38 °		

Well	Hankins 20R-303					
Well Position	+N/-S	0.0 ft	Northing:	1,386,229.85 ft	Latitude:	40.392130
	+E/-W	150.4 ft	Easting:	3,162,793.10 ft	Longitude:	-104.915550
Position Uncertainty		0.0 ft	Wellhead Elevation:	ft	Ground Level:	4,957.0 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	167.02

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	
500.0	0.00	0.00	500.0	0.0	0.0	0.00	0.00	0.00	0.00	
1,100.6	12.01	87.89	1,096.2	2.3	62.7	2.00	2.00	0.00	87.89	
5,709.1	12.01	87.89	5,603.8	37.7	1,021.1	0.00	0.00	0.00	0.00	
6,309.7	0.00	0.00	6,200.0	40.0	1,083.8	2.00	-2.00	0.00	180.00	
6,426.0	0.00	0.00	6,316.3	40.0	1,083.8	0.00	0.00	0.00	0.00	
7,633.7	90.58	180.00	7,080.2	-731.7	1,083.8	7.50	7.50	0.00	180.00	
11,605.5	90.58	180.00	7,040.0	-4,703.2	1,083.8	0.00	0.00	0.00	0.00	BHL 500'FSL, 1160

Database:	Landmark	Local Co-ordinate Reference:	Well Hankins 20R-303
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Project:	SEC.20-T5N-R67W	MD Reference:	WELL @ 4972.0ft (RKB - 15')
Site:	Hankins 5N67W20MR Pad Sec.20-T5N-R67W	North Reference:	True
Well:	Hankins 20R-303	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, 2272'FEL									
100.0	0.00	0.00	100.0	0.0	0.0	0.0	0.00	0.00	0.00
200.0	0.00	0.00	200.0	0.0	0.0	0.0	0.00	0.00	0.00
300.0	0.00	0.00	300.0	0.0	0.0	0.0	0.00	0.00	0.00
400.0	0.00	0.00	400.0	0.0	0.0	0.0	0.00	0.00	0.00
500.0	0.00	0.00	500.0	0.0	0.0	0.0	0.00	0.00	0.00
KOP#1									
600.0	2.00	87.89	600.0	0.1	1.7	0.3	2.00	2.00	0.00
700.0	4.00	87.89	699.8	0.3	7.0	1.3	2.00	2.00	0.00
800.0	6.00	87.89	799.5	0.6	15.7	3.0	2.00	2.00	0.00
900.0	8.00	87.89	898.7	1.0	27.9	5.3	2.00	2.00	0.00
1,000.0	10.00	87.89	997.5	1.6	43.5	8.2	2.00	2.00	0.00
1,100.0	12.00	87.89	1,095.6	2.3	62.6	11.8	2.00	2.00	0.00
1,100.6	12.01	87.89	1,096.2	2.3	62.7	11.8	2.00	2.00	0.00
1,200.0	12.01	87.89	1,193.4	3.1	83.4	15.7	0.00	0.00	0.00
1,300.0	12.01	87.89	1,291.2	3.8	104.2	19.6	0.00	0.00	0.00
1,400.0	12.01	87.89	1,389.1	4.6	124.9	23.6	0.00	0.00	0.00
1,500.0	12.01	87.89	1,486.9	5.4	145.7	27.5	0.00	0.00	0.00
1,600.0	12.01	87.89	1,584.7	6.1	166.5	31.4	0.00	0.00	0.00
1,700.0	12.01	87.89	1,682.5	6.9	187.3	35.3	0.00	0.00	0.00
1,800.0	12.01	87.89	1,780.3	7.7	208.1	39.3	0.00	0.00	0.00
1,900.0	12.01	87.89	1,878.1	8.4	228.9	43.2	0.00	0.00	0.00
2,000.0	12.01	87.89	1,975.9	9.2	249.7	47.1	0.00	0.00	0.00
2,100.0	12.01	87.89	2,073.7	10.0	270.5	51.0	0.00	0.00	0.00
2,200.0	12.01	87.89	2,171.5	10.8	291.3	54.9	0.00	0.00	0.00
2,300.0	12.01	87.89	2,269.3	11.5	312.1	58.9	0.00	0.00	0.00
2,400.0	12.01	87.89	2,367.2	12.3	332.9	62.8	0.00	0.00	0.00
2,500.0	12.01	87.89	2,465.0	13.1	353.7	66.7	0.00	0.00	0.00
2,600.0	12.01	87.89	2,562.8	13.8	374.5	70.6	0.00	0.00	0.00
2,700.0	12.01	87.89	2,660.6	14.6	395.3	74.5	0.00	0.00	0.00
2,800.0	12.01	87.89	2,758.4	15.4	416.1	78.5	0.00	0.00	0.00
2,900.0	12.01	87.89	2,856.2	16.1	436.9	82.4	0.00	0.00	0.00
3,000.0	12.01	87.89	2,954.0	16.9	457.7	86.3	0.00	0.00	0.00
3,100.0	12.01	87.89	3,051.8	17.7	478.5	90.2	0.00	0.00	0.00
3,200.0	12.01	87.89	3,149.6	18.4	499.3	94.2	0.00	0.00	0.00
3,300.0	12.01	87.89	3,247.5	19.2	520.1	98.1	0.00	0.00	0.00
3,400.0	12.01	87.89	3,345.3	20.0	540.9	102.0	0.00	0.00	0.00
3,500.0	12.01	87.89	3,443.1	20.7	561.7	105.9	0.00	0.00	0.00
3,552.1	12.01	87.89	3,494.0	21.1	572.5	108.0	0.00	0.00	0.00
Parkman									
3,600.0	12.01	87.89	3,540.9	21.5	582.5	109.8	0.00	0.00	0.00
3,700.0	12.01	87.89	3,638.7	22.3	603.3	113.8	0.00	0.00	0.00
3,800.0	12.01	87.89	3,736.5	23.0	624.1	117.7	0.00	0.00	0.00
3,900.0	12.01	87.89	3,834.3	23.8	644.9	121.6	0.00	0.00	0.00
4,000.0	12.01	87.89	3,932.1	24.6	665.7	125.5	0.00	0.00	0.00
4,100.0	12.01	87.89	4,029.9	25.3	686.5	129.5	0.00	0.00	0.00
4,163.4	12.01	87.89	4,092.0	25.8	699.7	131.9	0.00	0.00	0.00
Sussex									
4,200.0	12.01	87.89	4,127.8	26.1	707.3	133.4	0.00	0.00	0.00
4,300.0	12.01	87.89	4,225.6	26.9	728.1	137.3	0.00	0.00	0.00

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Site:	Hankins 5N67W20MR Pad Sec.20-T5N-R67W	North Reference:	True
Well:	Hankins 20R-303	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	12.01	87.89	4,323.4	27.6	748.9	141.2	0.00	0.00	0.00
4,500.0	12.01	87.89	4,421.2	28.4	769.6	145.1	0.00	0.00	0.00
4,600.0	12.01	87.89	4,519.0	29.2	790.4	149.1	0.00	0.00	0.00
4,631.7	12.01	87.89	4,550.0	29.4	797.0	150.3	0.00	0.00	0.00
Shannon									
4,700.0	12.01	87.89	4,616.8	29.9	811.2	153.0	0.00	0.00	0.00
4,800.0	12.01	87.89	4,714.6	30.7	832.0	156.9	0.00	0.00	0.00
4,900.0	12.01	87.89	4,812.4	31.5	852.8	160.8	0.00	0.00	0.00
5,000.0	12.01	87.89	4,910.2	32.2	873.6	164.8	0.00	0.00	0.00
5,100.0	12.01	87.89	5,008.0	33.0	894.4	168.7	0.00	0.00	0.00
5,200.0	12.01	87.89	5,105.9	33.8	915.2	172.6	0.00	0.00	0.00
5,300.0	12.01	87.89	5,203.7	34.5	936.0	176.5	0.00	0.00	0.00
5,400.0	12.01	87.89	5,301.5	35.3	956.8	180.4	0.00	0.00	0.00
5,500.0	12.01	87.89	5,399.3	36.1	977.6	184.4	0.00	0.00	0.00
5,600.0	12.01	87.89	5,497.1	36.8	998.4	188.3	0.00	0.00	0.00
5,700.0	12.01	87.89	5,594.9	37.6	1,019.2	192.2	0.00	0.00	0.00
5,709.1	12.01	87.89	5,603.8	37.7	1,021.1	192.6	0.00	0.00	0.00
5,800.0	10.19	87.89	5,693.0	38.3	1,038.6	195.9	2.00	-2.00	0.00
5,900.0	8.19	87.89	5,791.7	38.9	1,054.6	198.9	2.00	-2.00	0.00
6,000.0	6.19	87.89	5,890.9	39.4	1,067.1	201.2	2.00	-2.00	0.00
6,100.0	4.19	87.89	5,990.5	39.7	1,076.1	202.9	2.00	-2.00	0.00
6,200.0	2.19	87.89	6,090.3	39.9	1,081.7	204.0	2.00	-2.00	0.00
6,300.0	0.19	87.89	6,190.3	40.0	1,083.8	204.4	2.00	-2.00	0.00
6,309.7	0.00	0.00	6,200.0	40.0	1,083.8	204.4	2.00	-2.00	0.00
6,400.0	0.00	0.00	6,290.3	40.0	1,083.8	204.4	0.00	0.00	0.00
6,426.0	0.00	0.00	6,316.3	40.0	1,083.8	204.4	0.00	0.00	0.00
KOP #2									
6,500.0	5.55	180.00	6,390.2	36.4	1,083.8	207.9	7.50	7.50	0.00
6,600.0	13.05	180.00	6,488.8	20.3	1,083.8	223.6	7.50	7.50	0.00
6,700.0	20.55	180.00	6,584.5	-8.6	1,083.8	251.8	7.50	7.50	0.00
6,800.0	28.05	180.00	6,675.6	-49.7	1,083.8	291.8	7.50	7.50	0.00
6,856.0	32.25	180.00	6,724.0	-77.9	1,083.8	319.3	7.50	7.50	0.00
Sharon Springs									
6,900.0	35.55	180.00	6,760.5	-102.4	1,083.8	343.2	7.50	7.50	0.00
7,000.0	43.05	180.00	6,837.8	-165.7	1,083.8	404.8	7.50	7.50	0.00
7,029.5	45.27	180.00	6,859.0	-186.3	1,083.8	424.9	7.50	7.50	0.00
Niobrara A									
7,100.0	50.55	180.00	6,906.2	-238.5	1,083.8	475.8	7.50	7.50	0.00
7,200.0	58.05	180.00	6,964.5	-319.7	1,083.8	554.9	7.50	7.50	0.00
7,228.2	60.17	180.00	6,979.0	-343.9	1,083.8	578.5	7.50	7.50	0.00
Niobrara B									
7,300.0	65.55	180.00	7,011.7	-407.8	1,083.8	640.7	7.50	7.50	0.00
7,400.0	73.05	180.00	7,047.1	-501.2	1,083.8	731.8	7.50	7.50	0.00
7,410.3	73.82	180.00	7,050.0	-511.1	1,083.8	741.4	7.50	7.50	0.00
Niobrara C									
7,500.0	80.55	180.00	7,069.9	-598.5	1,083.8	826.6	7.50	7.50	0.00
7,600.0	88.05	180.00	7,079.8	-698.0	1,083.8	923.5	7.50	7.50	0.00
7,633.7	90.58	180.00	7,080.2	-731.7	1,083.8	956.3	7.50	7.50	0.00
End of Build - 7"									
7,700.0	90.58	180.00	7,079.5	-798.0	1,083.8	1,020.9	0.00	0.00	0.00
7,800.0	90.58	180.00	7,078.5	-898.0	1,083.8	1,118.4	0.00	0.00	0.00

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Site:	Hankins 5N67W20MR Pad Sec.20-T5N-R67W	North Reference:	True
Well:	Hankins 20R-303	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)
7,900.0	90.58	180.00	7,077.5	-998.0	1,083.8	1,215.8	0.00	0.00	0.00
8,000.0	90.58	180.00	7,076.5	-1,097.9	1,083.8	1,313.3	0.00	0.00	0.00
8,100.0	90.58	180.00	7,075.5	-1,197.9	1,083.8	1,410.7	0.00	0.00	0.00
8,200.0	90.58	180.00	7,074.5	-1,297.9	1,083.8	1,508.2	0.00	0.00	0.00
8,300.0	90.58	180.00	7,073.5	-1,397.9	1,083.8	1,605.6	0.00	0.00	0.00
8,400.0	90.58	180.00	7,072.4	-1,497.9	1,083.8	1,703.0	0.00	0.00	0.00
8,500.0	90.58	180.00	7,071.4	-1,597.9	1,083.8	1,800.5	0.00	0.00	0.00
8,600.0	90.58	180.00	7,070.4	-1,697.9	1,083.8	1,897.9	0.00	0.00	0.00
8,700.0	90.58	180.00	7,069.4	-1,797.9	1,083.8	1,995.4	0.00	0.00	0.00
8,800.0	90.58	180.00	7,068.4	-1,897.9	1,083.8	2,092.8	0.00	0.00	0.00
8,900.0	90.58	180.00	7,067.4	-1,997.9	1,083.8	2,190.2	0.00	0.00	0.00
9,000.0	90.58	180.00	7,066.4	-2,097.9	1,083.8	2,287.7	0.00	0.00	0.00
9,100.0	90.58	180.00	7,065.4	-2,197.9	1,083.8	2,385.1	0.00	0.00	0.00
9,200.0	90.58	180.00	7,064.3	-2,297.9	1,083.8	2,482.6	0.00	0.00	0.00
9,300.0	90.58	180.00	7,063.3	-2,397.9	1,083.8	2,580.0	0.00	0.00	0.00
9,400.0	90.58	180.00	7,062.3	-2,497.9	1,083.8	2,677.4	0.00	0.00	0.00
9,500.0	90.58	180.00	7,061.3	-2,597.9	1,083.8	2,774.9	0.00	0.00	0.00
9,600.0	90.58	180.00	7,060.3	-2,697.9	1,083.8	2,872.3	0.00	0.00	0.00
9,700.0	90.58	180.00	7,059.3	-2,797.9	1,083.8	2,969.8	0.00	0.00	0.00
9,800.0	90.58	180.00	7,058.3	-2,897.9	1,083.8	3,067.2	0.00	0.00	0.00
9,900.0	90.58	180.00	7,057.3	-2,997.8	1,083.8	3,164.7	0.00	0.00	0.00
10,000.0	90.58	180.00	7,056.3	-3,097.8	1,083.8	3,262.1	0.00	0.00	0.00
10,100.0	90.58	180.00	7,055.2	-3,197.8	1,083.8	3,359.5	0.00	0.00	0.00
10,200.0	90.58	180.00	7,054.2	-3,297.8	1,083.8	3,457.0	0.00	0.00	0.00
10,300.0	90.58	180.00	7,053.2	-3,397.8	1,083.8	3,554.4	0.00	0.00	0.00
10,400.0	90.58	180.00	7,052.2	-3,497.8	1,083.8	3,651.9	0.00	0.00	0.00
10,500.0	90.58	180.00	7,051.2	-3,597.8	1,083.8	3,749.3	0.00	0.00	0.00
10,600.0	90.58	180.00	7,050.2	-3,697.8	1,083.8	3,846.7	0.00	0.00	0.00
10,700.0	90.58	180.00	7,049.2	-3,797.8	1,083.8	3,944.2	0.00	0.00	0.00
10,800.0	90.58	180.00	7,048.2	-3,897.8	1,083.8	4,041.6	0.00	0.00	0.00
10,900.0	90.58	180.00	7,047.1	-3,997.8	1,083.8	4,139.1	0.00	0.00	0.00
11,000.0	90.58	180.00	7,046.1	-4,097.8	1,083.8	4,236.5	0.00	0.00	0.00
11,100.0	90.58	180.00	7,045.1	-4,197.8	1,083.8	4,333.9	0.00	0.00	0.00
11,200.0	90.58	180.00	7,044.1	-4,297.8	1,083.8	4,431.4	0.00	0.00	0.00
11,300.0	90.58	180.00	7,043.1	-4,397.8	1,083.8	4,528.8	0.00	0.00	0.00
11,400.0	90.58	180.00	7,042.1	-4,497.8	1,083.8	4,626.3	0.00	0.00	0.00
11,500.0	90.58	180.00	7,041.1	-4,597.8	1,083.8	4,723.7	0.00	0.00	0.00
11,600.0	90.58	180.00	7,040.1	-4,697.8	1,083.8	4,821.2	0.00	0.00	0.00
11,605.5	90.58	180.00	7,040.0	-4,703.2	1,083.8	4,826.5	0.00	0.00	0.00
BHL 500'FSL, 1160'FEL									

Database:	Landmark	Local Co-ordinate Reference:	Well Hankins 20R-303
Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	TVD Reference:	WELL @ 4972.0ft (RKB - 15')
Project:	SEC.20-T5N-R67W	MD Reference:	WELL @ 4972.0ft (RKB - 15')
Site:	Hankins 5N67W20MR Pad Sec.20-T5N-R67W	North Reference:	True
Well:	Hankins 20R-303	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	+N/-S	+E/-W	Northing	Easting		
- Shape	(°)	(°)	(ft)	(ft)	(ft)	(ft)	(ft)	Latitude	Longitude
BHL 500'FSL, 1160'FI - plan hits target center - Point	0.00	0.00	7,040.0	-4,703.2	1,083.8	1,381,534.07	3,163,907.81	40.379220	-104.911660
SHL 90'FNL, 2272'FE - plan hits target center - Point	0.00	0.00	1.0	0.0	0.0	1,386,229.85	3,162,793.10	40.392130	-104.915550

Casing Points					
Measured Depth (ft)	Vertical Depth (ft)	Name	Casing Diameter (")	Hole Diameter (")	
7,633.7	7,080.2	7"	7	7-1/2	

Formations						
Measured Depth (ft)	Vertical Depth (ft)	Name	Lithology	Dip (°)	Dip Direction (°)	
3,552.1	3,494.0	Parkman				
4,163.4	4,092.0	Sussex				
4,631.7	4,550.0	Shannon				
6,856.0	6,724.0	Sharon Springs				
7,029.5	6,859.0	Niobrara A				
7,228.2	6,979.0	Niobrara B				
7,410.3	7,050.0	Niobrara C				
	7,161.0	Ft. Hays				
	7,183.0	Codell				

Plan Annotations				
Measured Depth (ft)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Comment
500.0	500.0	0.0	0.0	KOP#1
6,426.0	6,316.3	40.0	1,083.8	KOP #2
7,633.7	7,080.2	-731.7	1,083.8	End of Build



PETROLEUM DEVELOPMENT CORP Weld County CO

SEC.20-T5N-R67W

Hankins 5N67W20MR Pad Sec.20-T5N-R67W

Hankins 20R-303

Wellbore #1

Plan #1 (8-12-14)

Anticollision Report

13 August, 2014



Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Hankins 20R-303
Project:	SEC.20-T5N-R67W	TVD Reference:	WELL @ 4972.0ft (RKB - 15')
Reference Site:	Hankins 5N67W20MR Pad Sec.20-T5N-R67W	MD Reference:	WELL @ 4972.0ft (RKB - 15')
Site Error:	0.0ft	North Reference:	True
Reference Well:	Hankins 20R-303	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 8/13/2014			
From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description
0.0	11,605.5	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						
Hankins 44-20U (Exist) - Wellbore #1 - Wellbore #1	11,448.8	6,980.6	312.0	83.4	1.365	Level 3, CC, ES, SF
Pansy P Hankins 2 (P&A) - Wellbore #1 - Wellbore #1	9,157.2	6,994.8	231.1	44.6	1.239	Level 2, CC, ES, SF
Hankins 5N67W20MR Pad Sec.20-T5N-R67W						
Hankins 20M-203 - Wellbore #1 - Plan #1 (8-12-14)	500.0	502.0	150.4	148.4	74.194	CC, ES
Hankins 20M-203 - Wellbore #1 - Plan #1 (8-12-14)	2,000.0	1,977.9	400.3	391.4	45.169	SF
Hankins 20M-323 - Wellbore #1 - Plan #1 (8-12-14)	500.0	502.0	89.1	87.1	43.967	CC, ES
Hankins 20M-323 - Wellbore #1 - Plan #1 (8-12-14)	11,605.5	11,500.2	972.4	789.2	5.308	SF
Hankins 20M-423 - Wellbore #1 - Plan #1 (8-12-14)	500.0	502.0	119.8	117.8	59.080	CC, ES
Hankins 20M-423 - Wellbore #1 - Plan #1 (8-12-14)	1,000.0	999.5	163.3	159.1	38.742	SF
Hankins 20R-243 - Wellbore #1 - Plan #1 (8-12-14)	500.0	501.0	61.3	59.3	30.261	CC, ES
Hankins 20R-243 - Wellbore #1 - Plan #1 (8-12-14)	11,605.5	11,445.4	536.3	354.7	2.953	SF
Hankins 20R-403 - Wellbore #1 - Plan #1 (8-12-14)	500.0	501.0	30.6	28.6	15.130	CC, ES
Hankins 20R-403 - Wellbore #1 - Plan #1 (8-12-14)	11,605.5	11,647.3	298.3	127.8	1.749	SF

Offset Design Existing Wells Sec.20-T5N-R67W - Hankins 44-20U (Exist) - Wellbore #1 - Wellbore #1											
Survey Program: 7270-UNKNOWN											
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)
10,500.0	7,051.2	6,990.2	6,990.2	73.5	139.8	-91.76	-4,546.6	1,395.8	998.7	787.9	210.81
10,600.0	7,050.2	6,989.2	6,989.2	75.3	139.8	-91.58	-4,546.6	1,395.8	904.3	691.6	212.69
10,700.0	7,049.2	6,988.2	6,988.2	77.1	139.8	-91.39	-4,546.6	1,395.8	811.2	596.6	214.57
10,800.0	7,048.2	6,987.2	6,987.2	78.9	139.7	-91.21	-4,546.6	1,395.8	719.9	503.5	216.44
10,900.0	7,047.1	6,986.1	6,986.1	80.7	139.7	-91.02	-4,546.6	1,395.8	631.3	413.0	218.32
11,000.0	7,046.1	6,985.1	6,985.1	82.6	139.7	-90.83	-4,546.6	1,395.8	546.6	326.4	220.20
11,100.0	7,045.1	6,984.1	6,984.1	84.4	139.7	-90.65	-4,546.6	1,395.8	468.0	245.9	222.08
11,200.0	7,044.1	6,983.1	6,983.1	86.2	139.7	-90.46	-4,546.6	1,395.8	399.1	175.1	223.96
11,300.0	7,043.1	6,982.1	6,982.1	88.1	139.6	-90.28	-4,546.6	1,395.8	345.7	119.9	225.84
11,400.0	7,042.1	6,981.1	6,981.1	89.9	139.6	-90.09	-4,546.6	1,395.8	315.8	88.1	227.71
11,448.8	7,041.6	6,980.6	6,980.6	90.8	139.6	-90.00	-4,546.6	1,395.8	312.0	83.4	228.63
11,500.0	7,041.1	6,980.1	6,980.1	91.8	139.6	-89.90	-4,546.6	1,395.8	316.2	86.6	229.59
											1.377 Level 3

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 20R-303
Project:	SEC.20-T5N-R67W	TVD Reference:	WELL @ 4972.0ft (RKB - 15')
Reference Site:	Hankins 5N67W20MR Pad Sec.20-T5N-R67W	MD Reference:	WELL @ 4972.0ft (RKB - 15')
Site Error:	0.0ft	North Reference:	True
Reference Well:	Hankins 20R-303	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 - Hankins 44-20U (Exist) - Wellbore #1 - Wellbore #1													Offset Site Error:	0.0 ft
Survey Program: 7270-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 +N/-S (ft)	Wellbore Centre +E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor		
11,605.5	7,040.0	6,979.0	6,979.0	93.7	139.6	-89.71	-4,546.6	1,395.8	349.2	117.6	231.57	1.508		

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Hankins 20R-303
Project:	SEC.20-T5N-R67W	TVD Reference:	WELL @ 4972.0ft (RKB - 15')
Reference Site:	Hankins 5N67W20MR Pad Sec.20-T5N-R67W	MD Reference:	WELL @ 4972.0ft (RKB - 15')
Site Error:	0.0ft	North Reference:	True
Reference Well:	Hankins 20R-303	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 - Pansy P Hankins 2 (P&A) - Wellbore #1 - Wellbore #1											Offset Site Error:	0.0 ft
Survey Program: 7800-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		
8,200.0	7,074.5	7,004.5	7,004.5	35.3	140.1	-92.40	-2,255.1	1,314.9	984.6	814.6	169.99	5.792		
8,300.0	7,073.5	7,003.5	7,003.5	36.6	140.1	-92.15	-2,255.1	1,314.9	887.7	716.1	171.62	5.173		
8,400.0	7,072.4	7,002.4	7,002.4	38.1	140.0	-91.90	-2,255.1	1,314.9	791.6	618.3	173.28	4.568		
8,500.0	7,071.4	7,001.4	7,001.4	39.5	140.0	-91.65	-2,255.1	1,314.9	696.6	521.6	174.97	3.981		
8,600.0	7,070.4	7,000.4	7,000.4	41.0	140.0	-91.40	-2,255.1	1,314.9	603.2	426.5	176.68	3.414		
8,700.0	7,069.4	6,999.4	6,999.4	42.6	140.0	-91.15	-2,255.1	1,314.9	512.2	333.8	178.41	2.871		
8,800.0	7,068.4	6,998.4	6,998.4	44.1	140.0	-90.90	-2,255.1	1,314.9	425.4	245.3	180.15	2.361		
8,900.0	7,067.4	6,997.4	6,997.4	45.7	139.9	-90.65	-2,255.1	1,314.9	345.8	163.8	181.90	1.901		
9,000.0	7,066.4	6,996.4	6,996.4	47.3	139.9	-90.39	-2,255.1	1,314.9	279.5	95.8	183.67	1.522		
9,100.0	7,065.4	6,995.4	6,995.4	49.0	139.9	-90.14	-2,255.1	1,314.9	238.1	52.6	185.45	1.284	Level 3	
9,157.2	7,064.8	6,994.8	6,994.8	49.9	139.9	-90.00	-2,255.1	1,314.9	231.1	44.6	186.47	1.239	Level 2, CC, ES, SF	
9,200.0	7,064.3	6,994.3	6,994.3	50.7	139.9	-89.89	-2,255.1	1,314.9	235.0	47.8	187.23	1.255	Level 3	
9,300.0	7,063.3	6,993.3	6,993.3	52.3	139.9	-89.64	-2,255.1	1,314.9	271.7	82.7	189.02	1.437	Level 3	
9,400.0	7,062.3	6,992.3	6,992.3	54.0	139.8	-89.39	-2,255.1	1,314.9	335.2	144.4	190.82	1.757		
9,500.0	7,061.3	6,991.3	6,991.3	55.7	139.8	-89.14	-2,255.1	1,314.9	413.4	220.8	192.62	2.146		
9,600.0	7,060.3	6,990.3	6,990.3	57.5	139.8	-88.89	-2,255.1	1,314.9	499.5	305.1	194.42	2.569		
9,700.0	7,059.3	6,989.3	6,989.3	59.2	139.8	-88.64	-2,255.1	1,314.9	590.0	393.7	196.23	3.006		
9,800.0	7,058.3	6,988.3	6,988.3	61.0	139.8	-88.39	-2,255.1	1,314.9	683.1	485.0	198.04	3.449		
9,900.0	7,057.3	6,987.3	6,987.3	62.7	139.7	-88.14	-2,255.1	1,314.9	777.9	578.1	199.85	3.893		
10,000.0	7,056.3	6,986.3	6,986.3	64.5	139.7	-87.89	-2,255.1	1,314.9	873.9	672.2	201.66	4.334		
10,100.0	7,055.2	6,985.2	6,985.2	66.3	139.7	-87.64	-2,255.1	1,314.9	970.7	767.2	203.47	4.771		

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Hankins 20R-303
Project:	SEC.20-T5N-R67W	TVD Reference:	WELL @ 4972.0ft (RKB - 15')
Reference Site:	Hankins 5N67W20MR Pad Sec.20-T5N-R67W	MD Reference:	WELL @ 4972.0ft (RKB - 15')
Site Error:	0.0ft	North Reference:	True
Reference Well:	Hankins 20R-303	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	2.0	2.0	0.0	0.0	-90.00	0.0	-150.4	150.4	150.4	0.00	N/A		
100.0	100.0	102.0	102.0	0.1	0.1	-90.00	0.0	-150.4	150.4	150.2	0.23	656.104		
200.0	200.0	202.0	202.0	0.3	0.3	-90.00	0.0	-150.4	150.4	149.7	0.68	221.598		
300.0	300.0	302.0	302.0	0.6	0.6	-90.00	0.0	-150.4	150.4	149.3	1.13	133.312		
400.0	400.0	402.0	402.0	0.8	0.8	-90.00	0.0	-150.4	150.4	148.8	1.58	95.331		
500.0	500.0	502.0	502.0	1.0	1.0	-90.00	0.0	-150.4	150.4	148.4	2.03	74.194 CC, ES		
600.0	600.0	602.0	602.0	1.2	1.2	-177.91	0.0	-150.4	152.2	149.7	2.47	61.695		
700.0	699.8	701.8	701.8	1.4	1.5	-177.97	0.0	-150.4	157.4	154.5	2.90	54.285		
800.0	799.5	801.5	801.5	1.7	1.7	-178.07	0.0	-150.4	166.1	162.8	3.34	49.788		
900.0	898.7	900.7	900.7	1.9	1.9	-178.20	0.0	-150.4	178.3	174.5	3.77	47.229		
1,000.0	997.5	999.5	999.5	2.2	2.1	-178.33	0.0	-150.4	193.9	189.7	4.21	46.012		
1,100.6	1,096.2	1,098.2	1,098.2	2.6	2.4	-178.47	0.0	-150.4	213.1	208.5	4.66	45.758		
1,200.0	1,193.4	1,195.4	1,195.4	3.0	2.6	-178.61	0.0	-150.4	233.8	228.7	5.11	45.767		
1,300.0	1,291.2	1,293.2	1,293.2	3.4	2.8	-178.72	0.0	-150.4	254.6	249.0	5.57	45.729		
1,400.0	1,389.1	1,391.1	1,391.1	3.8	3.0	-178.82	0.0	-150.4	275.4	269.4	6.03	45.665		
1,500.0	1,486.9	1,488.9	1,488.9	4.2	3.2	-178.90	0.0	-150.4	296.2	289.7	6.50	45.588		
1,600.0	1,584.7	1,586.7	1,586.7	4.7	3.5	-178.97	0.0	-150.4	317.0	310.1	6.97	45.504		
1,700.0	1,682.5	1,684.5	1,684.5	5.1	3.7	-179.04	0.0	-150.4	337.8	330.4	7.44	45.418		
1,800.0	1,780.3	1,782.3	1,782.3	5.6	3.9	-179.09	0.0	-150.4	358.6	350.7	7.91	45.332		
1,900.0	1,878.1	1,880.1	1,880.1	6.0	4.1	-179.14	0.0	-150.4	379.4	371.1	8.39	45.249		
2,000.0	1,975.9	1,977.9	1,977.9	6.4	4.3	-179.19	0.0	-150.4	400.3	391.4	8.86	45.169 SF		
2,100.0	2,073.7	2,066.2	2,066.2	6.9	4.5	-179.20	0.2	-151.2	421.9	412.6	9.31	45.313		
2,200.0	2,171.5	2,150.7	2,150.6	7.4	4.7	-179.14	0.8	-154.3	446.3	436.6	9.75	45.777		
2,300.0	2,269.3	2,233.9	2,233.7	7.8	4.9	-179.02	1.9	-159.8	473.5	463.3	10.18	46.491		
2,400.0	2,367.2	2,315.7	2,315.1	8.3	5.1	-178.85	3.4	-167.5	503.4	492.7	10.62	47.406		
2,500.0	2,465.0	2,404.7	2,403.5	8.7	5.3	-178.63	5.6	-177.9	535.4	524.3	11.07	48.385		
2,600.0	2,562.8	2,499.4	2,497.4	9.2	5.5	-178.42	7.8	-189.1	567.7	556.1	11.52	49.284		
2,700.0	2,660.6	2,594.0	2,591.3	9.6	5.7	-178.24	10.1	-200.4	599.9	588.0	11.97	50.103		
2,800.0	2,758.4	2,688.6	2,685.3	10.1	6.0	-178.07	12.4	-211.6	632.2	619.8	12.43	50.851		
2,900.0	2,856.2	2,783.3	2,779.2	10.5	6.2	-177.92	14.7	-222.9	664.5	651.6	12.89	51.540		
3,000.0	2,954.0	2,877.9	2,873.1	11.0	6.5	-177.78	16.9	-234.1	696.8	683.4	13.35	52.174		
3,100.0	3,051.8	2,972.5	2,967.1	11.4	6.7	-177.65	19.2	-245.4	729.1	715.2	13.82	52.758		
3,200.0	3,149.6	3,067.2	3,061.0	11.9	7.0	-177.54	21.5	-256.6	761.3	747.1	14.28	53.299		
3,300.0	3,247.5	3,161.8	3,154.9	12.4	7.2	-177.43	23.8	-267.9	793.6	778.9	14.75	53.800		
3,400.0	3,345.3	3,256.4	3,248.9	12.8	7.5	-177.34	26.0	-279.1	825.9	810.7	15.22	54.266		
3,500.0	3,443.1	3,351.1	3,342.8	13.3	7.8	-177.25	28.3	-290.4	858.2	842.5	15.69	54.700		
3,600.0	3,540.9	3,445.7	3,436.7	13.7	8.0	-177.16	30.6	-301.6	890.5	874.4	16.16	55.105		
3,700.0	3,638.7	3,540.3	3,530.7	14.2	8.3	-177.09	32.9	-312.9	922.8	906.2	16.63	55.483		
3,800.0	3,736.5	3,635.0	3,624.6	14.7	8.6	-177.02	35.1	-324.2	955.1	938.0	17.11	55.837		
3,900.0	3,834.3	3,763.7	3,752.6	15.1	8.9	-176.94	37.9	-337.7	986.3	968.6	17.62	55.959		

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Hankins 20R-303
Project:	SEC.20-T5N-R67W	TVD Reference:	WELL @ 4972.0ft (RKB - 15')
Reference Site:	Hankins 5N67W20MR Pad Sec.20-T5N-R67W	MD Reference:	WELL @ 4972.0ft (RKB - 15')
Site Error:	0.0ft	North Reference:	True
Reference Well:	Hankins 20R-303	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	2.0	2.0	0.0	0.0	-90.00	0.0	-89.1	89.1	89.1	0.00	N/A		
100.0	100.0	102.0	102.0	0.1	0.1	-90.00	0.0	-89.1	89.1	88.9	0.23	388.803		
200.0	200.0	202.0	202.0	0.3	0.3	-90.00	0.0	-89.1	89.1	88.5	0.68	131.317		
300.0	300.0	302.0	302.0	0.6	0.6	-90.00	0.0	-89.1	89.1	88.0	1.13	79.000		
400.0	400.0	402.0	402.0	0.8	0.8	-90.00	0.0	-89.1	89.1	87.6	1.58	56.493		
500.0	500.0	502.0	502.0	1.0	1.0	-90.00	0.0	-89.1	89.1	87.1	2.03	43.967 CC, ES		
600.0	600.0	602.0	602.0	1.2	1.2	-177.93	0.0	-89.1	90.9	88.4	2.47	36.848		
700.0	699.8	701.8	701.8	1.4	1.5	-178.04	0.0	-89.1	96.1	93.2	2.90	33.149		
800.0	799.5	801.5	801.5	1.7	1.7	-178.19	0.0	-89.1	104.8	101.5	3.34	31.420		
900.0	898.7	900.7	900.7	1.9	1.9	-178.38	0.0	-89.1	117.0	113.2	3.77	30.995		
1,000.0	997.5	999.5	999.5	2.2	2.1	-178.56	0.0	-89.1	132.6	128.4	4.21	31.472		
1,100.6	1,096.2	1,098.2	1,098.2	2.6	2.4	-178.73	0.0	-89.1	151.8	147.2	4.66	32.601		
1,200.0	1,193.4	1,195.4	1,195.4	3.0	2.6	-178.88	0.0	-89.1	172.5	167.4	5.11	33.771		
1,300.0	1,291.2	1,293.2	1,293.2	3.4	2.8	-179.01	0.0	-89.1	193.3	187.8	5.57	34.723		
1,400.0	1,389.1	1,391.1	1,391.1	3.8	3.0	-179.10	0.0	-89.1	214.1	208.1	6.03	35.505		
1,500.0	1,486.9	1,488.9	1,488.9	4.2	3.2	-179.18	0.0	-89.1	234.9	228.4	6.50	36.157		
1,600.0	1,584.7	1,595.0	1,595.0	4.7	3.5	-179.19	0.3	-87.6	254.3	247.4	6.97	36.487		
1,700.0	1,682.5	1,703.5	1,703.4	5.1	3.7	-179.05	1.4	-82.0	270.1	262.7	7.44	36.318		
1,800.0	1,780.3	1,813.2	1,812.6	5.6	3.9	-178.77	3.3	-72.4	282.2	274.3	7.91	35.654		
1,900.0	1,878.1	1,916.8	1,915.4	6.0	4.2	-178.42	5.8	-60.1	291.2	282.8	8.39	34.721		
2,000.0	1,975.9	2,016.4	2,014.3	6.4	4.4	-178.09	8.2	-48.1	300.0	291.1	8.86	33.859		
2,100.0	2,073.7	2,116.0	2,113.1	6.9	4.7	-177.78	10.6	-36.0	308.8	299.5	9.34	33.070		
2,200.0	2,171.5	2,215.6	2,211.9	7.4	4.9	-177.49	13.0	-24.0	317.6	307.8	9.82	32.348		
2,300.0	2,269.3	2,315.2	2,310.8	7.8	5.2	-177.21	15.4	-11.9	326.4	316.1	10.30	31.685		
2,400.0	2,367.2	2,414.8	2,409.6	8.3	5.5	-176.95	17.8	0.1	335.3	324.5	10.79	31.072		
2,500.0	2,465.0	2,514.4	2,508.4	8.7	5.8	-176.70	20.2	12.2	344.1	332.8	11.28	30.507		
2,600.0	2,562.8	2,614.0	2,607.3	9.2	6.0	-176.46	22.6	24.2	352.9	341.2	11.77	29.983		
2,700.0	2,660.6	2,713.6	2,706.1	9.6	6.3	-176.24	25.0	36.3	361.8	349.5	12.27	29.497		
2,800.0	2,758.4	2,813.2	2,805.0	10.1	6.6	-176.02	27.4	48.3	370.6	357.9	12.76	29.044		
2,900.0	2,856.2	2,912.8	2,903.8	10.5	6.9	-175.82	29.8	60.4	379.5	366.2	13.26	28.622		
3,000.0	2,954.0	3,012.4	3,002.6	11.0	7.2	-175.62	32.2	72.4	388.4	374.6	13.76	28.228		
3,100.0	3,051.8	3,112.0	3,101.5	11.4	7.5	-175.44	34.6	84.5	397.2	383.0	14.26	27.859		
3,200.0	3,149.6	3,200.0	3,188.9	11.9	7.8	-175.29	36.7	94.8	406.6	391.8	14.73	27.609		
3,300.0	3,247.5	3,292.1	3,280.6	12.4	8.0	-175.23	38.4	103.2	418.5	403.3	15.18	27.574		
3,400.0	3,345.3	3,378.5	3,366.8	12.8	8.1	-175.26	39.4	108.4	433.3	417.7	15.61	27.757		
3,500.0	3,443.1	3,464.1	3,452.4	13.3	8.3	-175.36	39.9	111.1	451.1	435.0	16.04	28.119		
3,600.0	3,540.9	3,554.6	3,542.9	13.7	8.5	-175.54	40.0	111.5	471.4	454.9	16.48	28.600		
3,700.0	3,638.7	3,652.5	3,640.7	14.2	8.7	-175.73	40.0	111.5	492.1	475.2	16.95	29.043		
3,800.0	3,736.5	3,750.3	3,738.5	14.7	8.8	-175.90	40.0	111.5	512.9	495.5	17.42	29.450		
3,900.0	3,834.3	3,848.1	3,836.3	15.1	9.0	-176.06	40.0	111.5	533.7	515.8	17.89	29.835		
4,000.0	3,932.1	3,945.9	3,934.1	15.6	9.2	-176.21	40.0	111.5	554.4	536.1	18.36	30.199		
4,100.0	4,029.9	4,043.7	4,031.9	16.0	9.4	-176.35	40.0	111.5	575.2	556.4	18.83	30.543		
4,200.0	4,127.8	4,141.5	4,129.8	16.5	9.6	-176.47	40.0	111.5	596.0	576.7	19.31	30.870		
4,300.0	4,225.6	4,239.3	4,227.6	16.9	9.8	-176.59	40.0	111.5	616.7	597.0	19.78	31.180		
4,400.0	4,323.4	4,337.1	4,325.4	17.4	10.0	-176.70	40.0	111.5	637.5	617.3	20.25	31.475		
4,500.0	4,421.2	4,434.9	4,423.2	17.9	10.2	-176.81	40.0	111.5	658.3	637.6	20.73	31.755		
4,600.0	4,519.0	4,532.8	4,521.0	18.3	10.4	-176.91	40.0	111.5	679.1	657.9	21.21	32.023		
4,700.0	4,616.8	4,630.6	4,618.8	18.8	10.6	-177.00	40.0	111.5	699.9	678.2	21.68	32.277		
4,800.0	4,714.6	4,728.4	4,716.6	19.2	10.8	-177.08	40.0	111.5	720.6	698.5	22.16	32.521		
4,900.0	4,812.4	4,826.2	4,814.4	19.7	11.1	-177.17	40.0	111.5	741.4	718.8	22.64	32.753		
5,000.0	4,910.2	4,924.0	4,912.2	20.2	11.3	-177.24	40.0	111.5	762.2	739.1	23.11	32.975		

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 20R-303
Project:	SEC.20-T5N-R67W	TVD Reference:	WELL @ 4972.0ft (RKB - 15')
Reference Site:	Hankins 5N67W20MR Pad Sec.20-T5N-R67W	MD Reference:	WELL @ 4972.0ft (RKB - 15')
Site Error:	0.0ft	North Reference:	True
Reference Well:	Hankins 20R-303	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)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning	
5,100.0	5,008.0	5,021.8	5,010.0	20.6	11.5	-177.32	40.0	111.5	783.0	759.4	23.59	33.188		
5,200.0	5,105.9	5,119.6	5,107.9	21.1	11.7	-177.39	40.0	111.5	803.8	779.7	24.07	33.392		
5,300.0	5,203.7	5,217.4	5,205.7	21.5	11.9	-177.45	40.0	111.5	824.6	800.0	24.55	33.588		
5,400.0	5,301.5	5,315.2	5,303.5	22.0	12.1	-177.51	40.0	111.5	845.4	820.3	25.03	33.775		
5,500.0	5,399.3	5,413.0	5,401.3	22.5	12.3	-177.57	40.0	111.5	866.2	840.7	25.51	33.956		
5,600.0	5,497.1	5,510.9	5,499.1	22.9	12.5	-177.63	40.0	111.5	887.0	861.0	25.99	34.129		
5,709.1	5,603.8	5,617.6	5,605.8	23.4	12.7	-177.69	40.0	111.5	909.6	883.1	26.51	34.310		
5,800.0	5,693.0	5,706.8	5,695.0	23.8	12.9	-177.75	40.0	111.5	927.1	900.2	26.98	34.370		
5,900.0	5,791.7	5,805.5	5,793.7	24.1	13.1	-177.80	40.0	111.5	943.1	915.7	27.43	34.384		
6,000.0	5,890.9	5,904.7	5,892.9	24.3	13.3	-177.84	40.0	111.5	955.6	927.8	27.85	34.319		
6,100.0	5,990.5	6,004.3	5,992.5	24.5	13.5	-177.86	40.0	111.5	964.7	936.4	28.22	34.178		
6,200.0	6,090.3	6,104.1	6,092.3	24.7	13.8	-177.88	40.0	111.5	970.2	941.7	28.57	33.966		
6,309.7	6,200.0	6,213.8	6,202.0	24.8	14.0	-90.00	40.0	111.5	972.3	943.4	28.90	33.641		
6,400.0	6,290.3	6,304.1	6,292.3	24.9	14.2	-90.00	40.0	111.5	972.3	943.1	29.26	33.233		
6,416.7	6,307.1	6,320.8	6,309.1	24.9	14.2	-90.00	40.0	111.5	972.3	943.0	29.32	33.157		
6,426.0	6,316.3	6,330.1	6,318.3	24.9	14.2	-90.00	40.0	111.5	972.3	943.0	29.36	33.117		
6,450.0	6,340.3	6,354.1	6,342.3	25.0	14.3	90.00	39.6	111.5	972.3	942.9	29.45	33.018		
6,500.0	6,390.2	6,404.1	6,392.2	25.0	14.4	89.99	36.2	111.5	972.3	942.7	29.62	32.831		
6,550.0	6,439.8	6,454.1	6,441.7	25.1	14.5	89.98	29.6	111.5	972.3	942.5	29.78	32.652		
6,600.0	6,488.8	6,504.0	6,490.7	25.1	14.5	89.97	19.8	111.5	972.3	942.4	29.94	32.478		
6,650.0	6,537.1	6,554.0	6,538.9	25.2	14.6	89.96	6.8	111.5	972.3	942.2	30.10	32.304		
6,700.0	6,584.5	6,603.9	6,586.2	25.2	14.7	89.96	-9.3	111.5	972.3	942.1	30.27	32.126		
6,750.0	6,630.7	6,653.9	6,632.3	25.3	14.8	89.95	-28.5	111.5	972.3	941.9	30.45	31.936		
6,800.0	6,675.6	6,703.8	6,677.1	25.3	14.9	89.94	-50.6	111.5	972.3	941.7	30.65	31.728		
6,850.0	6,718.9	6,753.8	6,720.3	25.4	15.0	89.94	-75.6	111.5	972.3	941.5	30.87	31.494		
6,900.0	6,760.5	6,803.7	6,761.8	25.5	15.1	89.93	-103.4	111.5	972.3	941.2	31.14	31.228		
6,950.0	6,800.2	6,853.6	6,801.3	25.6	15.2	89.92	-133.8	111.5	972.3	940.9	31.44	30.922		
7,000.0	6,837.8	6,903.5	6,838.8	25.7	15.4	89.92	-166.7	111.5	972.3	940.5	31.80	30.572		
7,050.0	6,873.2	6,953.4	6,874.1	25.8	15.6	89.91	-202.0	111.5	972.3	940.1	32.22	30.174		
7,100.0	6,906.2	7,003.3	6,907.0	25.9	15.8	89.91	-239.6	111.5	972.3	939.6	32.71	29.725		
7,150.0	6,936.7	7,053.2	6,937.3	26.0	16.1	89.90	-279.2	111.5	972.3	939.1	33.27	29.225		
7,200.0	6,964.5	7,103.1	6,965.0	26.2	16.4	89.90	-320.6	111.5	972.3	938.4	33.91	28.677		
7,250.0	6,989.6	7,153.0	6,990.0	26.4	16.7	89.89	-363.8	111.5	972.3	937.7	34.62	28.086		
7,300.0	7,011.7	7,202.9	7,012.0	26.6	17.1	89.89	-408.5	111.5	972.3	936.9	35.41	27.456		
7,350.0	7,030.9	7,252.7	7,031.1	26.9	17.5	89.89	-454.6	111.5	972.3	936.0	36.29	26.795		
7,400.0	7,047.1	7,302.6	7,047.2	27.2	18.0	89.88	-501.8	111.5	972.3	935.1	37.24	26.112		
7,450.0	7,060.1	7,352.5	7,060.1	27.5	18.5	89.88	-550.0	111.5	972.3	934.1	38.26	25.414		
7,500.0	7,069.9	7,402.3	7,069.9	27.8	19.1	89.88	-598.9	111.5	972.3	933.0	39.35	24.711		
7,550.0	7,076.5	7,452.2	7,076.4	28.2	19.7	89.88	-648.3	111.5	972.3	931.8	40.50	24.010		
7,600.0	7,079.8	7,502.1	7,079.7	28.6	20.3	89.88	-698.0	111.5	972.3	930.6	41.70	23.317		
7,633.7	7,080.2	7,535.7	7,080.1	28.9	20.7	89.88	-731.7	111.5	972.3	929.8	42.54	22.858		
7,655.8	7,080.0	7,557.8	7,079.9	29.1	21.0	89.88	-753.8	111.5	972.3	929.2	43.11	22.556		
7,700.0	7,079.5	7,602.0	7,079.5	29.5	21.6	89.88	-797.9	111.5	972.3	928.1	44.25	21.973		
7,800.0	7,078.5	7,702.0	7,078.4	30.5	23.0	89.88	-897.9	111.5	972.3	925.3	46.98	20.697		
7,900.0	7,077.5	7,802.0	7,077.4	31.6	24.4	89.88	-997.9	111.5	972.3	922.5	49.85	19.504		
8,000.0	7,076.5	7,902.0	7,076.4	32.7	25.9	89.88	-1,097.9	111.5	972.3	919.5	52.85	18.397		
8,100.0	7,075.5	8,002.0	7,075.4	34.0	27.5	89.88	-1,197.9	111.5	972.3	916.4	55.95	17.378		
8,200.0	7,074.5	8,102.0	7,074.4	35.3	29.1	89.88	-1,297.9	111.5	972.3	913.2	59.14	16.441		
8,300.0	7,073.5	8,202.0	7,073.4	36.6	30.8	89.88	-1,397.9	111.5	972.3	909.9	62.40	15.582		
8,400.0	7,072.4	8,302.0	7,072.4	38.1	32.4	89.88	-1,497.9	111.5	972.3	906.6	65.72	14.794		

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 20R-303
Project:	SEC.20-T5N-R67W	TVD Reference:	WELL @ 4972.0ft (RKB - 15')
Reference Site:	Hankins 5N67W20MR Pad Sec.20-T5N-R67W	MD Reference:	WELL @ 4972.0ft (RKB - 15')
Site Error:	0.0ft	North Reference:	True
Reference Well:	Hankins 20R-303	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		
8,500.0	7,071.4	8,402.0	7,071.4	39.5	34.1	89.88	-1,597.9	111.5	972.3	903.2	69.10	14.071		
8,600.0	7,070.4	8,502.0	7,070.4	41.0	35.9	89.88	-1,697.9	111.5	972.3	899.8	72.53	13.407		
8,700.0	7,069.4	8,602.0	7,069.3	42.6	37.6	89.88	-1,797.9	111.5	972.3	896.3	75.99	12.796		
8,800.0	7,068.4	8,702.0	7,068.3	44.1	39.4	89.88	-1,897.9	111.5	972.3	892.8	79.49	12.232		
8,900.0	7,067.4	8,802.0	7,067.3	45.7	41.1	89.88	-1,997.9	111.5	972.3	889.3	83.02	11.712		
9,000.0	7,066.4	8,902.0	7,066.3	47.3	42.9	89.88	-2,097.9	111.5	972.3	885.8	86.57	11.231		
9,100.0	7,065.4	9,002.0	7,065.3	49.0	44.7	89.88	-2,197.9	111.5	972.3	882.2	90.15	10.786		
9,200.0	7,064.3	9,102.0	7,064.3	50.7	46.5	89.88	-2,297.9	111.5	972.3	878.6	93.75	10.371		
9,300.0	7,063.3	9,202.0	7,063.3	52.3	48.3	89.88	-2,397.9	111.5	972.3	875.0	97.37	9.986		
9,400.0	7,062.3	9,302.0	7,062.3	54.0	50.2	89.88	-2,497.9	111.5	972.3	871.3	101.00	9.627		
9,500.0	7,061.3	9,402.0	7,061.2	55.7	52.0	89.88	-2,597.8	111.5	972.3	867.7	104.65	9.291		
9,600.0	7,060.3	9,502.0	7,060.2	57.5	53.8	89.88	-2,697.8	111.5	972.3	864.0	108.31	8.977		
9,700.0	7,059.3	9,602.0	7,059.2	59.2	55.7	89.88	-2,797.8	111.5	972.3	860.3	111.99	8.682		
9,800.0	7,058.3	9,702.0	7,058.2	61.0	57.5	89.88	-2,897.8	111.5	972.3	856.7	115.67	8.406		
9,900.0	7,057.3	9,802.0	7,057.2	62.7	59.4	89.88	-2,997.8	111.5	972.3	853.0	119.37	8.145		
10,000.0	7,056.3	9,902.0	7,056.2	64.5	61.2	89.88	-3,097.8	111.5	972.3	849.3	123.07	7.900		
10,100.0	7,055.2	10,002.0	7,055.2	66.3	63.1	89.88	-3,197.8	111.5	972.3	845.5	126.79	7.669		
10,200.0	7,054.2	10,102.0	7,054.2	68.1	65.0	89.88	-3,297.8	111.5	972.3	841.8	130.51	7.450		
10,300.0	7,053.2	10,202.0	7,053.1	69.8	66.8	89.88	-3,397.8	111.5	972.3	838.1	134.23	7.244		
10,400.0	7,052.2	10,302.0	7,052.1	71.6	68.7	89.88	-3,497.8	111.5	972.3	834.4	137.97	7.048		
10,500.0	7,051.2	10,402.0	7,051.1	73.5	70.6	89.88	-3,597.8	111.5	972.3	830.6	141.71	6.862		
10,600.0	7,050.2	10,502.0	7,050.1	75.3	72.5	89.88	-3,697.8	111.5	972.3	826.9	145.45	6.685		
10,700.0	7,049.2	10,602.0	7,049.1	77.1	74.3	89.88	-3,797.8	111.5	972.3	823.1	149.20	6.517		
10,800.0	7,048.2	10,702.0	7,048.1	78.9	76.2	89.88	-3,897.8	111.5	972.3	819.4	152.95	6.357		
10,900.0	7,047.1	10,802.0	7,047.1	80.7	78.1	89.88	-3,997.8	111.5	972.3	815.6	156.71	6.205		
11,000.0	7,046.1	10,902.0	7,046.1	82.6	80.0	89.88	-4,097.8	111.5	972.3	811.9	160.47	6.059		
11,100.0	7,045.1	11,002.0	7,045.0	84.4	81.9	89.88	-4,197.8	111.5	972.3	808.1	164.24	5.920		
11,200.0	7,044.1	11,102.0	7,044.0	86.2	83.7	89.88	-4,297.8	111.5	972.3	804.3	168.01	5.787		
11,300.0	7,043.1	11,202.0	7,043.0	88.1	85.6	89.88	-4,397.8	111.5	972.3	800.5	171.78	5.660		
11,400.0	7,042.1	11,302.0	7,042.0	89.9	87.5	89.88	-4,497.8	111.5	972.3	796.8	175.56	5.539		
11,500.0	7,041.1	11,402.0	7,041.0	91.8	89.4	89.88	-4,597.7	111.5	972.3	793.0	179.33	5.422		
11,572.7	7,040.3	11,474.7	7,040.3	93.1	90.8	89.88	-4,670.5	111.5	972.3	790.2	182.08	5.340		
11,605.5	7,040.0	11,500.2	7,040.0	93.7	91.3	89.88	-4,696.0	111.5	972.4	789.2	183.18	5.308 SF		

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Hankins 20R-303
Project:	SEC.20-T5N-R67W	TVD Reference:	WELL @ 4972.0ft (RKB - 15')
Reference Site:	Hankins 5N67W20MR Pad Sec.20-T5N-R67W	MD Reference:	WELL @ 4972.0ft (RKB - 15')
Site Error:	0.0ft	North Reference:	True
Reference Well:	Hankins 20R-303	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	2.0	2.0	0.0	0.0	-90.01	0.0	-119.8	119.8	119.8	0.00	N/A		
100.0	100.0	102.0	102.0	0.1	0.1	-90.01	0.0	-119.8	119.8	119.5	0.23	522.454		
200.0	200.0	202.0	202.0	0.3	0.3	-90.01	0.0	-119.8	119.8	119.1	0.68	176.458		
300.0	300.0	302.0	302.0	0.6	0.6	-90.01	0.0	-119.8	119.8	118.7	1.13	106.156		
400.0	400.0	402.0	402.0	0.8	0.8	-90.01	0.0	-119.8	119.8	118.2	1.58	75.912		
500.0	500.0	502.0	502.0	1.0	1.0	-90.01	0.0	-119.8	119.8	117.8	2.03	59.080 CC, ES		
600.0	600.0	602.0	602.0	1.2	1.2	-177.92	0.0	-119.8	121.5	119.1	2.47	49.272		
700.0	699.8	701.8	701.8	1.4	1.5	-178.00	0.0	-119.8	126.8	123.9	2.90	43.717		
800.0	799.5	801.5	801.5	1.7	1.7	-178.13	0.0	-119.8	135.5	132.1	3.34	40.604		
900.0	898.7	900.7	900.7	1.9	1.9	-178.27	0.0	-119.8	147.6	143.9	3.77	39.112		
1,000.0	997.5	999.5	999.5	2.2	2.1	-178.43	0.0	-119.8	163.3	159.1	4.21	38.742 SF		
1,100.6	1,096.2	1,098.2	1,098.2	2.6	2.4	-178.59	0.0	-119.8	182.5	177.8	4.66	39.179		
1,200.0	1,193.4	1,195.4	1,195.4	3.0	2.6	-178.73	0.0	-119.8	203.2	198.0	5.11	39.769		
1,300.0	1,291.2	1,293.2	1,293.2	3.4	2.8	-178.85	0.0	-119.8	224.0	218.4	5.57	40.226		
1,400.0	1,389.1	1,391.1	1,391.1	3.8	3.0	-178.95	0.0	-119.8	244.8	238.7	6.03	40.585		
1,500.0	1,486.9	1,488.9	1,488.9	4.2	3.2	-179.03	0.0	-119.8	265.6	259.1	6.50	40.872		
1,600.0	1,584.7	1,586.7	1,586.7	4.7	3.5	-179.10	0.0	-119.8	286.4	279.4	6.97	41.106		
1,700.0	1,682.5	1,684.5	1,684.5	5.1	3.7	-179.16	0.0	-119.8	307.2	299.8	7.44	41.299		
1,800.0	1,780.3	1,782.3	1,782.3	5.6	3.9	-179.21	0.0	-119.8	328.0	320.1	7.91	41.460		
1,900.0	1,878.1	1,880.1	1,880.1	6.0	4.1	-179.26	0.0	-119.8	348.8	340.4	8.39	41.595		
2,000.0	1,975.9	1,977.9	1,977.9	6.4	4.3	-179.30	0.0	-119.8	369.6	360.8	8.86	41.711		
2,100.0	2,073.7	2,075.7	2,075.7	6.9	4.6	-179.34	0.0	-119.8	390.4	381.1	9.34	41.811		
2,200.0	2,171.5	2,173.5	2,173.5	7.4	4.8	-179.37	0.0	-119.8	411.2	401.4	9.82	41.897		
2,300.0	2,269.3	2,271.3	2,271.3	7.8	5.0	-179.40	0.0	-119.8	432.1	421.8	10.29	41.973		
2,400.0	2,367.2	2,369.2	2,369.2	8.3	5.2	-179.43	0.0	-119.8	452.9	442.1	10.77	42.039		
2,500.0	2,465.0	2,467.0	2,467.0	8.7	5.4	-179.46	0.0	-119.8	473.7	462.4	11.25	42.098		
2,600.0	2,562.8	2,564.8	2,564.8	9.2	5.7	-179.48	0.0	-119.8	494.5	482.8	11.73	42.150		
2,700.0	2,660.6	2,662.6	2,662.6	9.6	5.9	-179.50	0.0	-119.8	515.3	503.1	12.21	42.196		
2,800.0	2,758.4	2,760.4	2,760.4	10.1	6.1	-179.52	0.0	-119.8	536.1	523.4	12.69	42.238		
2,900.0	2,856.2	2,858.2	2,858.2	10.5	6.3	-179.54	0.0	-119.8	556.9	543.7	13.17	42.275		
3,000.0	2,954.0	2,956.0	2,956.0	11.0	6.5	-179.55	0.0	-119.8	577.7	564.1	13.65	42.309		
3,100.0	3,051.8	3,053.8	3,053.8	11.4	6.8	-179.57	0.0	-119.8	598.5	584.4	14.14	42.340		
3,200.0	3,149.6	3,151.6	3,151.6	11.9	7.0	-179.58	0.0	-119.8	619.3	604.7	14.62	42.368		
3,300.0	3,247.5	3,249.5	3,249.5	12.4	7.2	-179.60	0.0	-119.8	640.2	625.1	15.10	42.394		
3,400.0	3,345.3	3,347.3	3,347.3	12.8	7.4	-179.61	0.0	-119.8	661.0	645.4	15.58	42.417		
3,500.0	3,443.1	3,445.1	3,445.1	13.3	7.6	-179.62	0.0	-119.8	681.8	665.7	16.06	42.439		
3,600.0	3,540.9	3,542.9	3,542.9	13.7	7.9	-179.63	0.0	-119.8	702.6	686.0	16.55	42.459		
3,700.0	3,638.7	3,640.7	3,640.7	14.2	8.1	-179.64	0.0	-119.8	723.4	706.4	17.03	42.477		
3,800.0	3,736.5	3,738.5	3,738.5	14.7	8.3	-179.65	0.0	-119.8	744.2	726.7	17.51	42.494		
3,900.0	3,834.3	3,836.3	3,836.3	15.1	8.5	-179.66	0.0	-119.8	765.0	747.0	18.00	42.509		
4,000.0	3,932.1	3,934.1	3,934.1	15.6	8.7	-179.67	0.0	-119.8	785.8	767.3	18.48	42.523		
4,100.0	4,029.9	4,032.9	4,032.9	16.0	9.0	-179.67	0.2	-119.8	806.6	787.7	18.96	42.532		
4,200.0	4,127.8	4,133.5	4,133.5	16.5	9.2	-179.47	3.1	-119.6	827.1	807.7	19.45	42.524		
4,300.0	4,225.6	4,231.3	4,231.2	16.9	9.4	-179.17	7.6	-119.2	847.5	827.6	19.93	42.522		
4,400.0	4,323.4	4,329.1	4,328.9	17.4	9.6	-178.89	12.1	-118.9	867.9	847.5	20.41	42.519		
4,500.0	4,421.2	4,426.9	4,426.6	17.9	9.8	-178.62	16.6	-118.6	888.4	867.5	20.90	42.515		
4,600.0	4,519.0	4,524.7	4,524.3	18.3	10.1	-178.36	21.1	-118.3	908.8	887.4	21.38	42.509		
4,700.0	4,616.8	4,622.6	4,622.0	18.8	10.3	-178.11	25.6	-118.0	929.3	907.4	21.86	42.503		
4,800.0	4,714.6	4,720.4	4,719.7	19.2	10.5	-177.88	30.1	-117.7	949.7	927.4	22.35	42.496		
4,900.0	4,812.4	4,818.2	4,817.4	19.7	10.7	-177.65	34.6	-117.4	970.2	947.4	22.84	42.488		
5,000.0	4,910.2	4,915.0	4,914.1	20.2	10.9	-177.46	38.7	-117.1	990.7	967.4	23.30	42.515		

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 20R-303
Project:	SEC.20-T5N-R67W	TVD Reference:	WELL @ 4972.0ft (RKB - 15')
Reference Site:	Hankins 5N67W20MR Pad Sec.20-T5N-R67W	MD Reference:	WELL @ 4972.0ft (RKB - 15')
Site Error:	0.0ft	North Reference:	True
Reference Well:	Hankins 20R-303	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	Vertical Depth	Measured Depth	Vertical Depth	Reference	Offset	Highside Toolface	Offset Wellbore Centre		Between Centres	Between Ellipses	Minimum Separation	Separation Factor					
(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(°)	+N/-S (ft)	+E/-W (ft)	(ft)	(ft)	(ft)						

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Hankins 20R-303
Project:	SEC.20-T5N-R67W	TVD Reference:	WELL @ 4972.0ft (RKB - 15')
Reference Site:	Hankins 5N67W20MR Pad Sec.20-T5N-R67W	MD Reference:	WELL @ 4972.0ft (RKB - 15')
Site Error:	0.0ft	North Reference:	True
Reference Well:	Hankins 20R-303	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	1.0	1.0	0.0	0.0	-90.02	0.0	-61.3	61.3	61.3	0.00	N/A		
100.0	100.0	101.0	101.0	0.1	0.1	-90.02	0.0	-61.3	61.3	61.1	0.23	269.948		
200.0	200.0	201.0	201.0	0.3	0.3	-90.02	0.0	-61.3	61.3	60.6	0.68	90.581		
300.0	300.0	301.0	301.0	0.6	0.6	-90.02	0.0	-61.3	61.3	60.2	1.13	54.421		
400.0	400.0	401.0	401.0	0.8	0.8	-90.02	0.0	-61.3	61.3	59.7	1.58	38.894		
500.0	500.0	501.0	501.0	1.0	1.0	-90.02	0.0	-61.3	61.3	59.3	2.03	30.261 CC, ES		
600.0	600.0	601.0	601.0	1.2	1.2	-177.96	0.0	-61.3	63.0	60.6	2.46	25.577		
700.0	699.8	700.8	700.8	1.4	1.5	-178.11	0.0	-61.3	68.3	65.4	2.90	23.560		
800.0	799.5	800.5	800.5	1.7	1.7	-178.32	0.0	-61.3	77.0	73.6	3.33	23.086		
900.0	898.7	899.7	899.7	1.9	1.9	-178.55	0.0	-61.3	89.1	85.4	3.77	23.630		
1,000.0	997.5	998.5	998.5	2.2	2.1	-178.76	0.0	-61.3	104.8	100.6	4.21	24.876		
1,100.6	1,096.2	1,101.5	1,101.5	2.6	2.4	-178.91	0.1	-59.5	122.3	117.6	4.64	26.322		
1,200.0	1,193.4	1,204.4	1,204.2	3.0	2.6	-178.97	0.5	-54.0	137.7	132.7	5.08	27.132		
1,300.0	1,291.2	1,308.9	1,308.3	3.4	2.8	-178.96	1.1	-44.7	149.7	144.2	5.53	27.084		
1,400.0	1,389.1	1,412.3	1,410.9	3.8	3.1	-178.88	1.9	-31.9	158.3	152.3	5.99	26.425		
1,500.0	1,486.9	1,512.0	1,509.7	4.2	3.3	-178.81	2.8	-18.8	166.0	159.6	6.46	25.710		
1,600.0	1,584.7	1,611.7	1,608.5	4.7	3.6	-178.74	3.6	-5.7	173.8	166.8	6.93	25.069		
1,700.0	1,682.5	1,711.4	1,707.4	5.1	3.9	-178.67	4.5	7.4	181.5	174.1	7.41	24.494		
1,800.0	1,780.3	1,811.1	1,806.2	5.6	4.2	-178.62	5.3	20.5	189.3	181.4	7.89	23.977		
1,900.0	1,878.1	1,910.8	1,905.0	6.0	4.5	-178.56	6.2	33.6	197.0	188.7	8.38	23.512		
2,000.0	1,975.9	2,010.5	2,003.9	6.4	4.8	-178.51	7.0	46.7	204.8	195.9	8.87	23.090		
2,100.0	2,073.7	2,110.2	2,102.7	6.9	5.1	-178.47	7.9	59.8	212.5	203.2	9.36	22.706		
2,200.0	2,171.5	2,209.9	2,201.5	7.4	5.4	-178.42	8.7	72.9	220.3	210.4	9.85	22.356		
2,300.0	2,269.3	2,309.6	2,300.4	7.8	5.7	-178.38	9.6	86.1	228.1	217.7	10.35	22.035		
2,400.0	2,367.2	2,409.3	2,399.2	8.3	6.0	-178.35	10.5	99.2	235.8	225.0	10.85	21.741		
2,500.0	2,465.0	2,509.0	2,498.0	8.7	6.3	-178.31	11.3	112.3	243.6	232.2	11.34	21.471		
2,600.0	2,562.8	2,608.7	2,596.8	9.2	6.6	-178.28	12.2	125.4	251.3	239.5	11.84	21.221		
2,700.0	2,660.6	2,708.4	2,695.7	9.6	7.0	-178.25	13.0	138.5	259.1	246.7	12.34	20.989		
2,800.0	2,758.4	2,808.1	2,794.5	10.1	7.3	-178.22	13.9	151.6	266.8	254.0	12.84	20.774		
2,900.0	2,856.2	2,907.8	2,893.3	10.5	7.6	-178.19	14.7	164.7	274.6	261.2	13.35	20.575		
3,000.0	2,954.0	3,007.5	2,992.2	11.0	7.9	-178.16	15.6	177.8	282.3	268.5	13.85	20.388		
3,100.0	3,051.8	3,107.2	3,091.0	11.4	8.3	-178.14	16.4	190.9	290.1	275.7	14.35	20.214		
3,200.0	3,149.6	3,206.9	3,189.8	11.9	8.6	-178.12	17.3	204.0	297.8	283.0	14.85	20.051		
3,300.0	3,247.5	3,306.6	3,288.6	12.4	8.9	-178.09	18.2	217.2	305.6	290.2	15.36	19.897		
3,400.0	3,345.3	3,406.3	3,387.5	12.8	9.2	-178.07	19.0	230.3	313.3	297.5	15.86	19.753		
3,500.0	3,443.1	3,506.0	3,486.3	13.3	9.6	-178.05	19.9	243.4	321.1	304.7	16.37	19.618		
3,600.0	3,540.9	3,605.7	3,585.1	13.7	9.9	-178.03	20.7	256.5	328.9	312.0	16.87	19.490		
3,700.0	3,638.7	3,705.4	3,684.0	14.2	10.2	-178.02	21.6	269.6	336.6	319.2	17.38	19.369		
3,800.0	3,736.5	3,805.1	3,782.8	14.7	10.5	-178.00	22.4	282.7	344.4	326.5	17.88	19.255		
3,900.0	3,834.3	3,904.8	3,881.6	15.1	10.9	-177.98	23.3	295.8	352.1	333.7	18.39	19.146		
4,000.0	3,932.1	4,004.5	3,980.5	15.6	11.2	-177.97	24.1	308.9	359.9	341.0	18.90	19.043		
4,100.0	4,029.9	4,104.2	4,079.3	16.0	11.5	-177.95	25.0	322.0	367.6	348.2	19.40	18.945		
4,200.0	4,127.8	4,203.8	4,178.1	16.5	11.9	-177.94	25.8	335.1	375.4	355.5	19.91	18.852		
4,300.0	4,225.6	4,303.5	4,276.9	16.9	12.2	-177.92	26.7	348.2	383.1	362.7	20.42	18.764		
4,400.0	4,323.4	4,403.2	4,375.8	17.4	12.5	-177.91	27.6	361.4	390.9	370.0	20.93	18.679		
4,500.0	4,421.2	4,502.9	4,474.6	17.9	12.9	-177.90	28.4	374.5	398.6	377.2	21.43	18.599		
4,600.0	4,519.0	4,602.6	4,573.4	18.3	13.2	-177.88	29.3	387.6	406.4	384.5	21.94	18.522		
4,700.0	4,616.8	4,702.3	4,672.3	18.8	13.5	-177.87	30.1	400.7	414.2	391.7	22.45	18.448		
4,800.0	4,714.6	4,802.0	4,771.1	19.2	13.8	-177.86	31.0	413.8	421.9	399.0	22.96	18.377		
4,900.0	4,812.4	4,901.7	4,869.9	19.7	14.2	-177.85	31.8	426.9	429.7	406.2	23.47	18.310		
5,000.0	4,910.2	5,001.4	4,968.7	20.2	14.5	-177.84	32.7	440.0	437.4	413.4	23.97	18.245		

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 20R-303
Project:	SEC.20-T5N-R67W	TVD Reference:	WELL @ 4972.0ft (RKB - 15')
Reference Site:	Hankins 5N67W20MR Pad Sec.20-T5N-R67W	MD Reference:	WELL @ 4972.0ft (RKB - 15')
Site Error:	0.0ft	North Reference:	True
Reference Well:	Hankins 20R-303	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:	0.0ft
Survey Program: 0-MWD													Offset Well Error:	0.0ft
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		
5,100.0	5,008.0	5,101.1	5,067.6	20.6	14.8	-177.83	33.5	453.1	445.2	420.7	24.48	18.183		
5,200.0	5,105.9	5,200.8	5,166.4	21.1	15.2	-177.82	34.4	466.2	452.9	427.9	24.99	18.123		
5,300.0	5,203.7	5,300.5	5,265.2	21.5	15.5	-177.81	35.3	479.3	460.7	435.2	25.50	18.065		
5,400.0	5,301.5	5,400.2	5,364.1	22.0	15.8	-177.80	36.1	492.4	468.4	442.4	26.01	18.010		
5,500.0	5,399.3	5,499.9	5,462.9	22.5	16.2	-177.79	37.0	505.6	476.2	449.7	26.52	17.957		
5,600.0	5,497.1	5,599.6	5,561.7	22.9	16.5	-177.78	37.8	518.7	484.0	456.9	27.03	17.905		
5,709.1	5,603.8	5,700.0	5,661.3	23.4	16.8	-177.78	38.7	531.6	492.7	465.2	27.55	17.883		
5,800.0	5,693.0	5,778.6	5,739.5	23.8	17.0	-177.79	39.2	539.8	500.9	472.9	27.95	17.917		
5,900.0	5,791.7	5,863.4	5,823.9	24.1	17.2	-177.80	39.6	546.3	509.3	480.9	28.33	17.978		
6,000.0	5,890.9	5,947.9	5,908.4	24.3	17.3	-177.83	39.9	550.2	517.1	488.5	28.65	18.048		
6,100.0	5,990.5	6,032.4	5,992.8	24.5	17.4	-177.85	40.0	551.6	524.5	495.5	28.94	18.125		
6,200.0	6,090.3	6,130.9	6,091.3	24.7	17.6	-177.88	40.0	551.7	530.0	500.8	29.22	18.141		
6,309.7	6,200.0	6,240.5	6,201.0	24.8	17.8	-90.00	40.0	551.7	532.1	502.6	29.50	18.040		
6,348.7	6,239.0	6,279.6	6,240.0	24.8	17.8	-90.01	39.9	551.7	532.1	502.5	29.64	17.953		
6,400.0	6,290.3	6,330.7	6,291.1	24.9	17.9	-90.26	37.5	551.7	532.1	502.3	29.82	17.846		
6,426.0	6,316.3	6,356.5	6,316.7	24.9	17.9	-90.53	35.1	551.7	532.2	502.2	29.91	17.793		
6,450.0	6,340.3	6,380.1	6,340.2	25.0	18.0	89.18	32.0	551.7	532.2	502.2	29.99	17.746		
6,500.0	6,390.2	6,429.1	6,388.4	25.0	18.0	88.58	23.4	551.7	532.3	502.1	30.15	17.652		
6,550.0	6,439.8	6,477.8	6,435.7	25.1	18.1	87.98	11.8	551.7	532.5	502.1	30.32	17.562		
6,600.0	6,488.8	6,526.2	6,481.8	25.1	18.2	87.40	-2.7	551.7	532.7	502.2	30.50	17.468		
6,650.0	6,537.1	6,574.2	6,526.6	25.2	18.3	86.83	-19.9	551.7	533.0	502.3	30.68	17.370		
6,700.0	6,584.5	6,621.9	6,570.0	25.2	18.3	86.28	-39.8	551.7	533.3	502.4	30.89	17.265		
6,750.0	6,630.7	6,669.3	6,611.8	25.3	18.4	85.74	-62.2	551.7	533.6	502.5	31.11	17.151		
6,800.0	6,675.6	6,716.5	6,651.9	25.3	18.5	85.22	-87.0	551.7	534.0	502.6	31.37	17.025		
6,850.0	6,718.9	6,763.4	6,690.2	25.4	18.6	84.73	-114.1	551.7	534.4	502.8	31.65	16.885		
6,900.0	6,760.5	6,810.0	6,726.6	25.5	18.7	84.25	-143.3	551.7	534.8	502.9	31.97	16.730		
6,950.0	6,800.2	6,856.5	6,760.9	25.6	18.9	83.80	-174.5	551.7	535.3	503.0	32.32	16.559		
7,000.0	6,837.8	6,902.7	6,793.2	25.7	19.0	83.38	-207.6	551.7	535.7	503.0	32.72	16.372		
7,050.0	6,873.2	6,950.0	6,824.0	25.8	19.2	82.97	-243.4	551.7	536.2	503.0	33.17	16.164		
7,100.0	6,906.2	6,994.5	6,851.0	25.9	19.4	82.61	-278.8	551.7	536.6	503.0	33.65	15.946		
7,150.0	6,936.7	7,040.2	6,876.5	26.0	19.6	82.27	-316.7	551.7	537.0	502.8	34.18	15.709		
7,200.0	6,964.5	7,085.7	6,899.6	26.2	19.8	81.97	-355.9	551.7	537.4	502.7	34.76	15.459		
7,250.0	6,989.6	7,131.1	6,920.3	26.4	20.1	81.69	-396.3	551.7	537.8	502.4	35.39	15.195		
7,300.0	7,011.7	7,176.4	6,938.5	26.6	20.4	81.45	-437.8	551.7	538.1	502.1	36.07	14.921		
7,350.0	7,030.9	7,221.5	6,954.2	26.9	20.8	81.24	-480.1	551.7	538.4	501.6	36.78	14.637		
7,400.0	7,047.1	7,266.6	6,967.3	27.2	21.1	81.06	-523.2	551.7	538.7	501.1	37.55	14.346		
7,450.0	7,060.1	7,311.6	6,977.8	27.5	21.5	80.92	-567.0	551.7	538.9	500.5	38.36	14.049		
7,500.0	7,069.9	7,356.6	6,985.7	27.8	22.0	80.81	-611.2	551.7	539.0	499.8	39.21	13.748		
7,550.0	7,076.5	7,400.0	6,990.9	28.2	22.4	80.74	-654.4	551.7	539.2	499.1	40.09	13.450		
7,600.0	7,079.8	7,446.4	6,993.8	28.6	22.9	80.71	-700.6	551.7	539.2	498.2	41.04	13.139		
7,633.7	7,080.2	7,477.0	6,994.1	28.9	23.3	80.70	-731.2	551.7	539.2	497.5	41.69	12.933		
7,700.0	7,079.5	7,543.3	6,993.8	29.5	24.1	80.74	-797.5	551.7	539.2	495.8	43.38	12.427		
7,800.0	7,078.5	7,643.3	6,993.2	30.5	25.3	80.79	-897.5	551.7	539.1	493.0	46.07	11.702		
7,900.0	7,077.5	7,743.3	6,992.7	31.6	26.7	80.84	-997.5	551.7	539.0	490.1	48.90	11.023		
8,000.0	7,076.5	7,843.3	6,992.2	32.7	28.1	80.90	-1,097.5	551.7	538.9	487.1	51.85	10.393		
8,100.0	7,075.5	7,943.3	6,991.7	34.0	29.5	80.95	-1,197.5	551.7	538.8	483.9	54.92	9.812		
8,200.0	7,074.5	8,043.3	6,991.2	35.3	31.0	81.00	-1,297.5	551.7	538.8	480.7	58.07	9.278		
8,300.0	7,073.5	8,143.3	6,990.7	36.6	32.6	81.06	-1,397.5	551.7	538.7	477.4	61.30	8.788		
8,400.0	7,072.4	8,243.3	6,990.2	38.1	34.2	81.11	-1,497.5	551.7	538.6	474.0	64.59	8.339		
8,500.0	7,071.4	8,343.3	6,989.7	39.5	35.8	81.16	-1,597.5	551.7	538.5	470.6	67.94	7.927		

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 20R-303
Project:	SEC.20-T5N-R67W	TVD Reference:	WELL @ 4972.0ft (RKB - 15')
Reference Site:	Hankins 5N67W20MR Pad Sec.20-T5N-R67W	MD Reference:	WELL @ 4972.0ft (RKB - 15')
Site Error:	0.0ft	North Reference:	True
Reference Well:	Hankins 20R-303	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							
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning	
8,600.0	7,070.4	8,443.3	6,989.2	41.0	37.5	81.22	-1,697.5	551.7	538.4	467.1	71.33	7.548		
8,700.0	7,069.4	8,543.3	6,988.7	42.6	39.2	81.27	-1,797.5	551.7	538.4	463.6	74.77	7.200		
8,800.0	7,068.4	8,643.3	6,988.2	44.1	40.9	81.32	-1,897.5	551.7	538.3	460.0	78.24	6.880		
8,900.0	7,067.4	8,743.3	6,987.7	45.7	42.6	81.38	-1,997.5	551.7	538.2	456.5	81.75	6.584		
9,000.0	7,066.4	8,843.3	6,987.2	47.3	44.3	81.43	-2,097.5	551.7	538.1	452.9	85.28	6.310		
9,100.0	7,065.4	8,943.3	6,986.7	49.0	46.1	81.48	-2,197.5	551.7	538.1	449.2	88.84	6.057		
9,200.0	7,064.3	9,043.2	6,986.2	50.7	47.9	81.54	-2,297.5	551.7	538.0	445.6	92.42	5.821		
9,300.0	7,063.3	9,143.2	6,985.7	52.3	49.6	81.59	-2,397.5	551.7	537.9	441.9	96.01	5.603		
9,400.0	7,062.3	9,243.2	6,985.1	54.0	51.4	81.64	-2,497.5	551.7	537.8	438.2	99.63	5.398		
9,500.0	7,061.3	9,343.2	6,984.6	55.7	53.2	81.70	-2,597.5	551.7	537.8	434.5	103.26	5.208		
9,600.0	7,060.3	9,443.2	6,984.1	57.5	55.0	81.75	-2,697.5	551.7	537.7	430.8	106.90	5.030		
9,700.0	7,059.3	9,543.2	6,983.6	59.2	56.8	81.80	-2,797.5	551.7	537.6	427.1	110.56	4.863		
9,800.0	7,058.3	9,643.2	6,983.1	61.0	58.7	81.86	-2,897.5	551.7	537.6	423.3	114.23	4.706		
9,900.0	7,057.3	9,743.2	6,982.6	62.7	60.5	81.91	-2,997.5	551.7	537.5	419.6	117.91	4.558		
10,000.0	7,056.3	9,843.2	6,982.1	64.5	62.3	81.96	-3,097.5	551.7	537.4	415.8	121.60	4.419		
10,100.0	7,055.2	9,943.2	6,981.6	66.3	64.1	82.02	-3,197.5	551.7	537.3	412.0	125.30	4.288		
10,200.0	7,054.2	10,043.2	6,981.1	68.1	66.0	82.07	-3,297.5	551.7	537.3	408.3	129.01	4.165		
10,300.0	7,053.2	10,143.2	6,980.6	69.8	67.8	82.12	-3,397.5	551.7	537.2	404.5	132.72	4.048		
10,400.0	7,052.2	10,243.2	6,980.1	71.6	69.7	82.18	-3,497.5	551.7	537.1	400.7	136.44	3.937		
10,500.0	7,051.2	10,343.2	6,979.6	73.5	71.5	82.23	-3,597.4	551.7	537.1	396.9	140.17	3.831		
10,600.0	7,050.2	10,443.2	6,979.1	75.3	73.4	82.28	-3,697.4	551.7	537.0	393.1	143.91	3.732		
10,700.0	7,049.2	10,543.2	6,978.6	77.1	75.3	82.34	-3,797.4	551.7	536.9	389.3	147.65	3.637		
10,800.0	7,048.2	10,643.2	6,978.1	78.9	77.1	82.39	-3,897.4	551.7	536.9	385.5	151.39	3.546		
10,900.0	7,047.1	10,743.2	6,977.6	80.7	79.0	82.44	-3,997.4	551.7	536.8	381.6	155.14	3.460		
11,000.0	7,046.1	10,843.2	6,977.0	82.6	80.9	82.50	-4,097.4	551.7	536.7	377.8	158.90	3.378		
11,100.0	7,045.1	10,943.2	6,976.5	84.4	82.7	82.55	-4,197.4	551.7	536.7	374.0	162.66	3.299		
11,200.0	7,044.1	11,043.2	6,976.0	86.2	84.6	82.60	-4,297.4	551.7	536.6	370.2	166.42	3.224		
11,300.0	7,043.1	11,143.2	6,975.5	88.1	86.5	82.66	-4,397.4	551.7	536.5	366.3	170.19	3.153		
11,400.0	7,042.1	11,243.2	6,975.0	89.9	88.3	82.71	-4,497.4	551.7	536.5	362.5	173.96	3.084		
11,500.0	7,041.1	11,343.2	6,974.5	91.8	90.2	82.77	-4,597.4	551.7	536.4	358.7	177.73	3.018		
11,574.5	7,040.3	11,417.7	6,974.1	93.1	91.6	82.81	-4,671.9	551.7	536.4	355.8	180.55	2.971		
11,605.5	7,040.0	11,445.4	6,974.0	93.7	92.2	82.82	-4,699.6	551.7	536.3	354.7	181.65	2.953 SF		

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Hankins 20R-303
Project:	SEC.20-T5N-R67W	TVD Reference:	WELL @ 4972.0ft (RKB - 15')
Reference Site:	Hankins 5N67W20MR Pad Sec.20-T5N-R67W	MD Reference:	WELL @ 4972.0ft (RKB - 15')
Site Error:	0.0ft	North Reference:	True
Reference Well:	Hankins 20R-303	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		
0.0	0.0	1.0	1.0	0.0	0.0	-90.02	0.0	-30.6	30.6	30.6	0.00	N/A		
100.0	100.0	101.0	101.0	0.1	0.1	-90.02	0.0	-30.6	30.6	30.4	0.23	134.974		
200.0	200.0	201.0	201.0	0.3	0.3	-90.02	0.0	-30.6	30.6	30.0	0.68	45.290		
300.0	300.0	301.0	301.0	0.6	0.6	-90.02	0.0	-30.6	30.6	29.5	1.13	27.210		
400.0	400.0	401.0	401.0	0.8	0.8	-90.02	0.0	-30.6	30.6	29.1	1.58	19.447		
500.0	500.0	501.0	501.0	1.0	1.0	-90.02	0.0	-30.6	30.6	28.6	2.03	15.130 CC, ES		
600.0	600.0	601.0	601.0	1.2	1.2	-178.01	0.0	-30.6	32.4	29.9	2.46	13.143		
700.0	699.8	700.8	700.8	1.4	1.5	-178.29	0.0	-30.6	37.6	34.7	2.90	12.984		
800.0	799.5	802.1	802.0	1.7	1.7	-178.53	0.1	-28.8	44.5	41.2	3.32	13.417		
900.0	898.7	903.5	903.3	1.9	1.9	-178.66	0.3	-23.4	51.4	47.7	3.73	13.772		
1,000.0	997.5	1,005.2	1,004.7	2.2	2.1	-178.73	0.8	-14.4	58.2	54.1	4.16	14.012		
1,100.6	1,096.2	1,107.8	1,106.4	2.6	2.4	-178.75	1.4	-1.7	65.0	60.5	4.59	14.163		
1,200.0	1,193.4	1,208.5	1,205.9	3.0	2.7	-178.71	2.1	14.1	70.2	65.2	5.05	13.905		
1,300.0	1,291.2	1,308.4	1,304.4	3.4	3.0	-178.66	2.9	30.3	74.8	69.3	5.53	13.542		
1,400.0	1,389.1	1,408.3	1,403.0	3.8	3.3	-178.61	3.6	46.6	79.4	73.4	6.01	13.219		
1,500.0	1,486.9	1,508.2	1,501.6	4.2	3.7	-178.58	4.4	62.9	84.0	77.5	6.50	12.931		
1,600.0	1,584.7	1,608.1	1,600.1	4.7	4.0	-178.54	5.2	79.1	88.6	81.6	6.99	12.677		
1,700.0	1,682.5	1,708.0	1,698.7	5.1	4.4	-178.51	5.9	95.4	93.2	85.7	7.48	12.448		
1,800.0	1,780.3	1,807.9	1,797.2	5.6	4.7	-178.48	6.7	111.7	97.8	89.8	7.98	12.243		
1,900.0	1,878.1	1,907.8	1,895.8	6.0	5.1	-178.45	7.5	128.0	102.3	93.9	8.49	12.058		
2,000.0	1,975.9	2,007.7	1,994.3	6.4	5.4	-178.43	8.3	144.2	106.9	97.9	8.99	11.892		
2,100.0	2,073.7	2,107.6	2,092.9	6.9	5.8	-178.41	9.0	160.5	111.5	102.0	9.50	11.741		
2,200.0	2,171.5	2,207.5	2,191.5	7.4	6.2	-178.39	9.8	176.8	116.1	106.1	10.01	11.603		
2,300.0	2,269.3	2,307.3	2,290.0	7.8	6.5	-178.37	10.6	193.1	120.7	110.2	10.51	11.477		
2,400.0	2,367.2	2,407.2	2,388.6	8.3	6.9	-178.35	11.3	209.3	125.3	114.2	11.03	11.362		
2,500.0	2,465.0	2,507.1	2,487.1	8.7	7.3	-178.34	12.1	225.6	129.8	118.3	11.54	11.255		
2,600.0	2,562.8	2,607.0	2,585.7	9.2	7.7	-178.32	12.9	241.9	134.4	122.4	12.05	11.158		
2,700.0	2,660.6	2,706.9	2,684.2	9.6	8.0	-178.31	13.6	258.2	139.0	126.5	12.56	11.067		
2,800.0	2,758.4	2,806.8	2,782.8	10.1	8.4	-178.30	14.4	274.4	143.6	130.5	13.08	10.983		
2,900.0	2,856.2	2,906.7	2,881.4	10.5	8.8	-178.28	15.2	290.7	148.2	134.6	13.59	10.905		
3,000.0	2,954.0	3,006.6	2,979.9	11.0	9.2	-178.27	15.9	307.0	152.8	138.7	14.10	10.832		
3,100.0	3,051.8	3,106.5	3,078.5	11.4	9.6	-178.26	16.7	323.2	157.4	142.7	14.62	10.764		
3,200.0	3,149.6	3,206.4	3,177.0	11.9	9.9	-178.25	17.5	339.5	161.9	146.8	15.13	10.700		
3,300.0	3,247.5	3,306.3	3,275.6	12.4	10.3	-178.24	18.2	355.8	166.5	150.9	15.65	10.640		
3,400.0	3,345.3	3,406.2	3,374.1	12.8	10.7	-178.23	19.0	372.1	171.1	154.9	16.17	10.584		
3,500.0	3,443.1	3,506.1	3,472.7	13.3	11.1	-178.22	19.8	388.3	175.7	159.0	16.68	10.531		
3,600.0	3,540.9	3,606.0	3,571.3	13.7	11.4	-178.21	20.5	404.6	180.3	163.1	17.20	10.481		
3,700.0	3,638.7	3,705.9	3,669.8	14.2	11.8	-178.21	21.3	420.9	184.9	167.1	17.72	10.434		
3,800.0	3,736.5	3,805.8	3,768.4	14.7	12.2	-178.20	22.1	437.2	189.5	171.2	18.24	10.389		
3,900.0	3,834.3	3,905.7	3,866.9	15.1	12.6	-178.19	22.9	453.4	194.0	175.3	18.75	10.347		
4,000.0	3,932.1	4,005.6	3,965.5	15.6	13.0	-178.19	23.6	469.7	198.6	179.4	19.27	10.307		
4,100.0	4,029.9	4,105.5	4,064.1	16.0	13.3	-178.18	24.4	486.0	203.2	183.4	19.79	10.269		
4,200.0	4,127.8	4,205.3	4,162.6	16.5	13.7	-178.17	25.2	502.2	207.8	187.5	20.31	10.232		
4,300.0	4,225.6	4,305.2	4,261.2	16.9	14.1	-178.17	25.9	518.5	212.4	191.6	20.83	10.198		
4,400.0	4,323.4	4,405.1	4,359.7	17.4	14.5	-178.16	26.7	534.8	217.0	195.6	21.34	10.165		
4,500.0	4,421.2	4,505.0	4,458.3	17.9	14.9	-178.16	27.5	551.1	221.5	199.7	21.86	10.133		
4,600.0	4,519.0	4,604.9	4,556.8	18.3	15.3	-178.15	28.2	567.3	226.1	203.7	22.38	10.103		
4,700.0	4,616.8	4,704.8	4,655.4	18.8	15.6	-178.15	29.0	583.6	230.7	207.8	22.90	10.075		
4,800.0	4,714.6	4,804.7	4,754.0	19.2	16.0	-178.14	29.8	599.9	235.3	211.9	23.42	10.047		
4,900.0	4,812.4	4,904.6	4,852.5	19.7	16.4	-178.14	30.5	616.2	239.9	215.9	23.94	10.021		
5,000.0	4,910.2	5,004.5	4,951.1	20.2	16.8	-178.13	31.3	632.4	244.5	220.0	24.46	9.996		

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 20R-303
Project:	SEC.20-T5N-R67W	TVD Reference:	WELL @ 4972.0ft (RKB - 15')
Reference Site:	Hankins 5N67W20MR Pad Sec.20-T5N-R67W	MD Reference:	WELL @ 4972.0ft (RKB - 15')
Site Error:	0.0ft	North Reference:	True
Reference Well:	Hankins 20R-303	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		
5,100.0	5,008.0	5,104.4	5,049.6	20.6	17.2	-178.13	32.1	648.7	249.1	224.1	24.98	9.971		
5,200.0	5,105.9	5,204.3	5,148.2	21.1	17.5	-178.12	32.8	665.0	253.6	228.1	25.50	9.948		
5,300.0	5,203.7	5,304.2	5,246.7	21.5	17.9	-178.12	33.6	681.2	258.2	232.2	26.02	9.926		
5,400.0	5,301.5	5,404.1	5,345.3	22.0	18.3	-178.12	34.4	697.5	262.8	236.3	26.54	9.904		
5,500.0	5,399.3	5,504.0	5,443.9	22.5	18.7	-178.11	35.1	713.8	267.4	240.3	27.06	9.883		
5,600.0	5,497.1	5,603.9	5,542.4	22.9	19.1	-178.11	35.9	730.1	272.0	244.4	27.58	9.863		
5,709.1	5,603.8	5,712.9	5,649.9	23.4	19.5	-178.10	36.8	747.8	277.0	248.8	28.14	9.842		
5,800.0	5,693.0	5,803.7	5,739.6	23.8	19.8	-178.09	37.5	762.6	279.7	251.1	28.61	9.776		
5,900.0	5,791.7	5,900.0	5,834.6	24.1	20.2	-178.06	38.2	778.3	279.4	250.3	29.06	9.616		
6,000.0	5,890.9	5,994.4	5,927.9	24.3	20.5	-178.01	38.8	792.1	277.3	247.9	29.41	9.431		
6,100.0	5,990.5	6,085.5	6,018.5	24.5	20.7	-177.97	39.3	802.5	275.0	245.3	29.70	9.257		
6,200.0	6,090.3	6,176.8	6,109.4	24.7	20.9	-177.94	39.7	810.0	272.3	242.4	29.95	9.092		
6,309.7	6,200.0	6,277.0	6,209.5	24.8	21.0	-90.02	39.9	814.9	269.0	238.9	30.17	8.917		
6,400.0	6,290.3	6,359.6	6,292.1	24.9	21.1	-90.00	40.0	816.3	267.5	237.0	30.47	8.779		
6,413.0	6,303.3	6,371.8	6,304.3	24.9	21.2	-90.00	40.0	816.3	267.5	236.9	30.51	8.766		
6,426.0	6,316.3	6,384.8	6,317.3	24.9	21.2	-90.00	40.0	816.3	267.5	236.9	30.56	8.753		
6,429.5	6,319.8	6,388.3	6,320.8	24.9	21.2	90.00	40.0	816.3	267.5	236.9	30.57	8.749		
6,450.0	6,340.3	6,408.8	6,341.3	25.0	21.2	90.08	40.0	816.3	267.5	236.8	30.64	8.728		
6,500.0	6,390.2	6,458.7	6,391.2	25.0	21.3	90.76	40.0	816.3	267.5	236.6	30.84	8.675		
6,550.0	6,439.8	6,508.7	6,441.2	25.1	21.3	91.95	39.1	816.3	267.6	236.6	31.05	8.619		
6,600.0	6,488.8	6,559.2	6,491.5	25.1	21.4	93.15	35.0	816.3	267.9	236.6	31.27	8.565		
6,650.0	6,537.1	6,610.1	6,541.8	25.2	21.5	94.34	27.5	816.3	268.2	236.7	31.50	8.516		
6,700.0	6,584.5	6,661.3	6,591.9	25.2	21.5	95.52	16.6	816.3	268.7	237.0	31.73	8.470		
6,750.0	6,630.7	6,713.0	6,641.5	25.3	21.6	96.67	2.2	816.3	269.3	237.4	31.94	8.431		
6,800.0	6,675.6	6,765.0	6,690.3	25.3	21.7	97.79	-15.6	816.3	270.0	237.8	32.15	8.398		
6,850.0	6,718.9	6,817.4	6,738.2	25.4	21.7	98.88	-36.9	816.3	270.7	238.4	32.35	8.369		
6,900.0	6,760.5	6,870.3	6,784.9	25.5	21.8	99.92	-61.6	816.3	271.6	239.0	32.54	8.344		
6,950.0	6,800.2	6,923.5	6,830.1	25.6	21.9	100.92	-89.7	816.3	272.4	239.7	32.75	8.319		
7,000.0	6,837.8	6,977.1	6,873.5	25.7	22.0	101.87	-121.1	816.3	273.4	240.4	32.97	8.291		
7,050.0	6,873.2	7,031.0	6,914.9	25.8	22.1	102.77	-155.8	816.3	274.3	241.1	33.22	8.256		
7,100.0	6,906.2	7,085.3	6,953.9	25.9	22.3	103.60	-193.5	816.3	275.2	241.7	33.53	8.208		
7,150.0	6,936.7	7,139.9	6,990.4	26.0	22.4	104.37	-234.1	816.3	276.1	242.2	33.91	8.144		
7,200.0	6,964.5	7,194.9	7,024.1	26.2	22.6	105.08	-277.5	816.3	277.0	242.7	34.38	8.058		
7,250.0	6,989.6	7,250.1	7,054.7	26.4	22.8	105.71	-323.5	816.3	277.9	242.9	34.96	7.949		
7,300.0	7,011.7	7,305.6	7,082.1	26.6	23.1	106.27	-371.7	816.3	278.6	243.0	35.67	7.813		
7,350.0	7,030.9	7,361.4	7,106.0	26.9	23.4	106.75	-422.1	816.3	279.3	242.8	36.51	7.651		
7,400.0	7,047.1	7,417.3	7,126.2	27.2	23.7	107.16	-474.2	816.3	279.9	242.4	37.50	7.464		
7,450.0	7,060.1	7,473.4	7,142.6	27.5	24.1	107.49	-527.9	816.3	280.4	241.8	38.64	7.257		
7,500.0	7,069.9	7,529.6	7,155.0	27.8	24.6	107.74	-582.7	816.3	280.8	240.9	39.92	7.034		
7,550.0	7,076.5	7,586.0	7,163.3	28.2	25.0	107.90	-638.4	816.3	281.1	239.7	41.33	6.800		
7,600.0	7,079.8	7,642.4	7,167.6	28.6	25.6	107.99	-694.6	816.3	281.2	238.3	42.86	6.560		
7,633.7	7,080.2	7,679.3	7,168.2	28.9	25.9	108.01	-731.6	816.3	281.2	237.3	43.94	6.400		
7,700.0	7,079.5	7,745.6	7,168.2	29.5	26.6	108.15	-797.9	816.3	281.5	235.9	45.57	6.177		
7,800.0	7,078.5	7,845.6	7,168.4	30.5	27.7	108.37	-897.8	816.3	281.8	233.7	48.14	5.855		
7,900.0	7,077.5	7,945.6	7,168.5	31.6	29.0	108.59	-997.8	816.3	282.2	231.4	50.83	5.551		
8,000.0	7,076.5	8,045.6	7,168.6	32.7	30.3	108.81	-1,097.8	816.3	282.5	228.9	53.64	5.268		
8,100.0	7,075.5	8,145.6	7,168.7	34.0	31.6	109.03	-1,197.8	816.3	282.9	226.4	56.53	5.005		
8,200.0	7,074.5	8,245.6	7,168.8	35.3	33.0	109.24	-1,297.8	816.3	283.3	223.8	59.50	4.761		
8,300.0	7,073.5	8,345.6	7,169.0	36.6	34.5	109.46	-1,397.8	816.3	283.7	221.1	62.53	4.537		
8,400.0	7,072.4	8,445.6	7,169.1	38.1	36.0	109.68	-1,497.8	816.3	284.0	218.4	65.61	4.329		

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 20R-303
Project:	SEC.20-T5N-R67W	TVD Reference:	WELL @ 4972.0ft (RKB - 15')
Reference Site:	Hankins 5N67W20MR Pad Sec.20-T5N-R67W	MD Reference:	WELL @ 4972.0ft (RKB - 15')
Site Error:	0.0ft	North Reference:	True
Reference Well:	Hankins 20R-303	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
8,500.0	7,071.4	8,545.5	7,169.2	39.5	37.6	109.89	-1,597.8	816.3	284.4	215.7	68.74	4.138	
8,600.0	7,070.4	8,645.5	7,169.3	41.0	39.1	110.11	-1,697.8	816.3	284.8	212.9	71.90	3.961	
8,700.0	7,069.4	8,745.5	7,169.5	42.6	40.8	110.32	-1,797.8	816.3	285.2	210.1	75.10	3.798	
8,800.0	7,068.4	8,845.5	7,169.6	44.1	42.4	110.53	-1,897.8	816.3	285.6	207.3	78.32	3.647	
8,900.0	7,067.4	8,945.5	7,169.7	45.7	44.1	110.75	-1,997.8	816.3	286.0	204.4	81.56	3.507	
9,000.0	7,066.4	9,045.5	7,169.8	47.3	45.7	110.96	-2,097.8	816.3	286.4	201.6	84.82	3.377	
9,100.0	7,065.4	9,145.5	7,169.9	49.0	47.4	111.17	-2,197.8	816.3	286.8	198.7	88.09	3.256	
9,200.0	7,064.3	9,245.5	7,170.1	50.7	49.2	111.38	-2,297.8	816.3	287.2	195.8	91.38	3.143	
9,300.0	7,063.3	9,345.5	7,170.2	52.3	50.9	111.59	-2,397.7	816.3	287.6	193.0	94.68	3.038	
9,400.0	7,062.3	9,445.5	7,170.3	54.0	52.6	111.80	-2,497.7	816.3	288.1	190.1	97.98	2.940	
9,500.0	7,061.3	9,545.5	7,170.4	55.7	54.4	112.01	-2,597.7	816.3	288.5	187.2	101.29	2.848	
9,600.0	7,060.3	9,645.5	7,170.6	57.5	56.2	112.22	-2,697.7	816.3	288.9	184.3	104.60	2.762	
9,700.0	7,059.3	9,745.5	7,170.7	59.2	57.9	112.43	-2,797.7	816.3	289.3	181.4	107.92	2.681	
9,800.0	7,058.3	9,845.5	7,170.8	61.0	59.7	112.63	-2,897.7	816.3	289.8	178.5	111.24	2.605	
9,900.0	7,057.3	9,945.5	7,170.9	62.7	61.5	112.84	-2,997.7	816.3	290.2	175.7	114.55	2.533	
10,000.0	7,056.3	10,045.5	7,171.0	64.5	63.3	113.05	-3,097.7	816.3	290.7	172.8	117.87	2.466	
10,100.0	7,055.2	10,145.4	7,171.2	66.3	65.1	113.25	-3,197.7	816.3	291.1	169.9	121.19	2.402	
10,200.0	7,054.2	10,245.4	7,171.3	68.1	66.9	113.46	-3,297.7	816.3	291.6	167.1	124.50	2.342	
10,300.0	7,053.2	10,345.4	7,171.4	69.8	68.8	113.66	-3,397.7	816.3	292.0	164.2	127.81	2.285	
10,400.0	7,052.2	10,445.4	7,171.5	71.6	70.6	113.86	-3,497.7	816.3	292.5	161.3	131.12	2.230	
10,500.0	7,051.2	10,545.4	7,171.7	73.5	72.4	114.07	-3,597.7	816.3	292.9	158.5	134.42	2.179	
10,600.0	7,050.2	10,645.4	7,171.8	75.3	74.3	114.27	-3,697.7	816.3	293.4	155.7	137.72	2.130	
10,700.0	7,049.2	10,745.4	7,171.9	77.1	76.1	114.47	-3,797.7	816.3	293.9	152.8	141.02	2.084	
10,800.0	7,048.2	10,845.4	7,172.0	78.9	77.9	114.67	-3,897.7	816.3	294.3	150.0	144.31	2.040	
10,900.0	7,047.1	10,945.4	7,172.1	80.7	79.8	114.87	-3,997.6	816.3	294.8	147.2	147.59	1.997	
11,000.0	7,046.1	11,045.4	7,172.3	82.6	81.6	115.07	-4,097.6	816.3	295.3	144.4	150.87	1.957	
11,100.0	7,045.1	11,145.4	7,172.4	84.4	83.5	115.27	-4,197.6	816.3	295.8	141.6	154.14	1.919	
11,200.0	7,044.1	11,245.4	7,172.5	86.2	85.4	115.47	-4,297.6	816.3	296.3	138.9	157.40	1.882	
11,300.0	7,043.1	11,345.4	7,172.6	88.1	87.2	115.67	-4,397.6	816.3	296.7	136.1	160.66	1.847	
11,400.0	7,042.1	11,445.4	7,172.8	89.9	89.1	115.86	-4,497.6	816.3	297.2	133.3	163.91	1.813	
11,500.0	7,041.1	11,545.4	7,172.9	91.8	90.9	116.06	-4,597.6	816.3	297.7	130.6	167.15	1.781	
11,605.5	7,040.0	11,647.3	7,173.0	93.7	92.8	116.26	-4,699.6	816.3	298.3	127.8	170.51	1.749 SF	

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Hankins 20R-303
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Reference Site:	Hankins 5N67W20MR Pad Sec.20-T5N-R67W	MD Reference:	WELL @ 4972.0ft (RKB - 15')
Site Error:	0.0ft	North Reference:	True
Reference Well:	Hankins 20R-303	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 @ 4972.0ft (RKB - 15')
Offset Depths are relative to Offset Datum
Central Meridian is -105.500000 °

Coordinates are relative to: Hankins 20R-303
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 20R-303
Project:	SEC.20-T5N-R67W	TVD Reference:	WELL @ 4972.0ft (RKB - 15')
Reference Site:	Hankins 5N67W20MR Pad Sec.20-T5N-R67W	MD Reference:	WELL @ 4972.0ft (RKB - 15')
Site Error:	0.0ft	North Reference:	True
Reference Well:	Hankins 20R-303	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	Landmark
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