

PETROLEUM DEVELOPMENT CORP Weld County CO

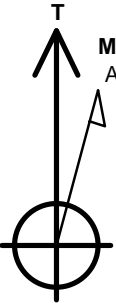
Well Name: Spaur 10Y-241

Surface Location: Spaur 4N67W10LQ Pad Sec.10-T4N-R67W
North American Datum 1983 , US State Plane 1983 , Colorado Northern Zone
Ground Elevation: 4831.0

+N/-S	+E/-W	Northing	Easting	Latitude	Longitude	Slot
0.0	0.0	1360127.25	3173449.67	40.320280	-104.877950	
RKB - 13' WELL @ 4844.0ft (RKB - 13')						

WELLBORE TARGET DETAILS

Name	TVD	+N/-S	+E/-W	Shape
50' E/W Hardline (10Y-241)	1.0	2499.5	2565.0	Rectangle (Sides: L3985.1 W100.0)
SHL 254'FSL & 2393'FWL	1.0	0.0	0.0	Point
BHL 500'FNL & 306'FEL	7005.0	4492.1	2565.0	Point



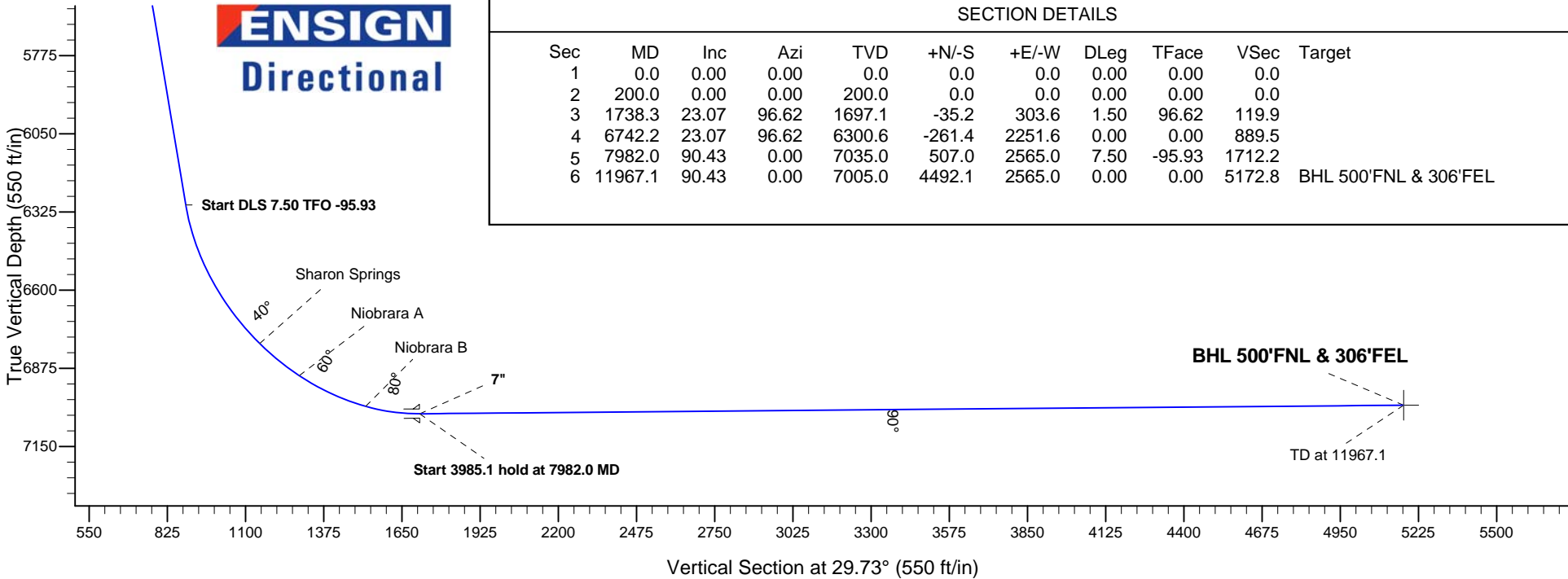
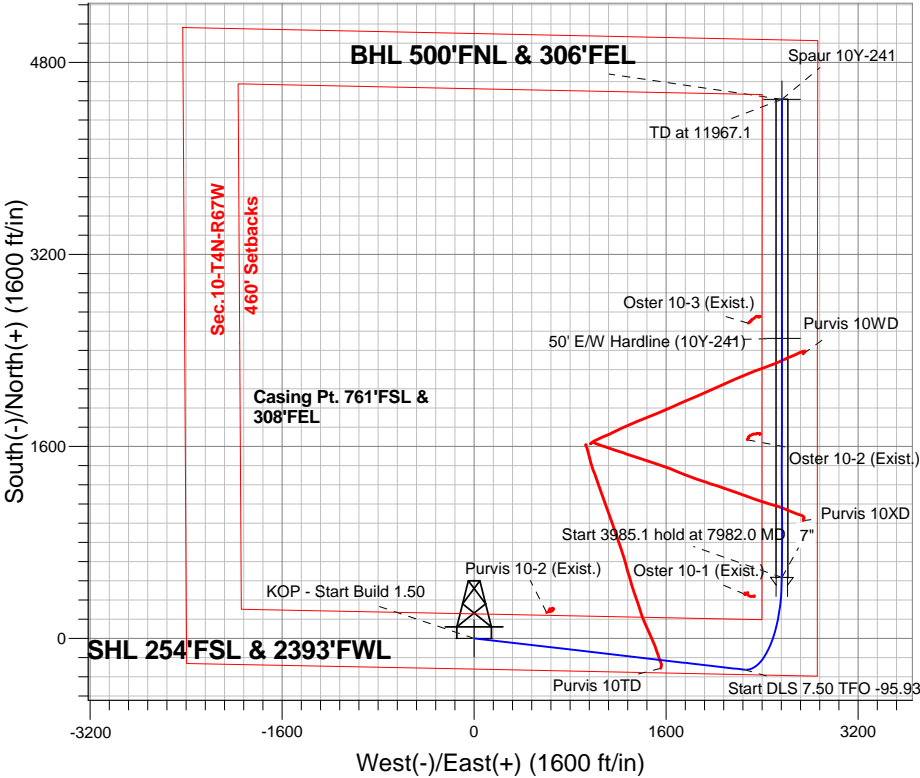
Azimuths to True North
Magnetic North: 8.38°

Magnetic Field
Strength: 52656.1snT
Dip Angle: 66.83°
Date: 6/16/2015
Model: IGRF2010

ANNOTATIONS

TVD	MD	Annotation
200.0	200.0	KOP - Start Build 1.50
6300.6	6742.2	Start DLS 7.50 TFO -95.93
7035.0	7982.0	Start 3985.1 hold at 7982.0 MD
7005.0	11967.1	TD at 11967.1

Spaur 4N67W10LQ Pad Sec.10-T4N-R67W
Spaur 10Y-241
Plan #1 (6-11-15)





PETROLEUM DEVELOPMENT CORP Weld County CO

SEC.10-T4N-R67W

Spaur 4N67W10LQ Pad Sec.10-T4N-R67W

Spaur 10Y-241

Wellbore #1

Plan: Plan #1 (6-11-15)

Standard Planning Report

16 June, 2015

Database:	EDM 2003.21 Single User Db	Local Co-ordinate Reference:	Well Spaur 10Y-241
Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	TVD Reference:	WELL @ 4844.0ft (RKB - 13')
Project:	SEC.10-T4N-R67W	MD Reference:	WELL @ 4844.0ft (RKB - 13')
Site:	Spaur 4N67W10LQ Pad Sec.10-T4N-R67W	North Reference:	True
Well:	Spaur 10Y-241	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Plan #1 (6-11-15)		

Project	SEC.10-T4N-R67W, Weld County, Colorado		
Map System:	US State Plane 1983	System Datum:	Mean Sea Level
Geo Datum:	North American Datum 1983		
Map Zone:	Colorado Northern Zone		Using geodetic scale factor

Site						Spaur 4N67W10LQ Pad Sec.10-T4N-R67W											
Site Position:						Northing:			1,360,247.47 ft			Latitude:			40.320610		
From:			Lat/Long			Easting:			3,173,448.83 ft			Longitude:			-104.877950		
Position Uncertainty:			0.0 ft			Slot Radius:			"			Grid Convergence:			0.40 °		

Well	Spaur 10Y-241					
Well Position	+N-S	-120.2 ft	Northing:	1,360,127.25 ft	Latitude:	40.320280
	+E-W	0.0 ft	Easting:	3,173,449.67 ft	Longitude:	-104.877950
Position Uncertainty		0.0 ft	Wellhead Elevation:	ft	Ground Level:	4,831.0 ft

Wellbore	Wellbore #1				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	6/16/2015	8.38	66.83	52,656

Design	Plan #1 (6-11-15)			
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	29.73

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	
200.0	0.00	0.00	200.0	0.0	0.0	0.00	0.00	0.00	0.00	
1,738.3	23.07	96.62	1,697.1	-35.2	303.6	1.50	1.50	0.00	96.62	
6,742.2	23.07	96.62	6,300.6	-261.4	2,251.6	0.00	0.00	0.00	0.00	
7,982.0	90.43	0.00	7,035.0	507.0	2,565.0	7.50	5.43	-7.79	-95.93	
11,967.1	90.43	0.00	7,005.0	4,492.1	2,565.0	0.00	0.00	0.00	0.00	BHL 500'FNL & 30€

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Project:	SEC.10-T4N-R67W	MD Reference:	WELL @ 4844.0ft (RKB - 13')
Site:	Spaur 4N67W10LQ Pad Sec.10-T4N-R67W	North Reference:	True
Well:	Spaur 10Y-241	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Plan #1 (6-11-15)		

Planned Survey									
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
0.0	0.00	0.00	0.0	0.0	0.0	0.0	0.00	0.00	0.00
100.0	0.00	0.00	100.0	0.0	0.0	0.0	0.00	0.00	0.00
200.0	0.00	0.00	200.0	0.0	0.0	0.0	0.00	0.00	0.00
KOP - Start Build 1.50									
300.0	1.50	96.62	300.0	-0.2	1.3	0.5	1.50	1.50	0.00
400.0	3.00	96.62	399.9	-0.6	5.2	2.1	1.50	1.50	0.00
500.0	4.50	96.62	499.7	-1.4	11.7	4.6	1.50	1.50	0.00
600.0	6.00	96.62	599.3	-2.4	20.8	8.2	1.50	1.50	0.00
700.0	7.50	96.62	698.6	-3.8	32.5	12.8	1.50	1.50	0.00
800.0	9.00	96.62	797.5	-5.4	46.7	18.5	1.50	1.50	0.00
900.0	10.50	96.62	896.1	-7.4	63.5	25.1	1.50	1.50	0.00
1,000.0	12.00	96.62	994.2	-9.6	82.9	32.8	1.50	1.50	0.00
1,100.0	13.50	96.62	1,091.7	-12.2	104.8	41.4	1.50	1.50	0.00
1,200.0	15.00	96.62	1,188.6	-15.0	129.3	51.1	1.50	1.50	0.00
1,300.0	16.50	96.62	1,284.9	-18.1	156.2	61.7	1.50	1.50	0.00
1,400.0	18.00	96.62	1,380.4	-21.6	185.7	73.4	1.50	1.50	0.00
1,500.0	19.50	96.62	1,475.0	-25.3	217.6	86.0	1.50	1.50	0.00
1,600.0	21.00	96.62	1,568.9	-29.3	252.0	99.6	1.50	1.50	0.00
1,700.0	22.50	96.62	1,661.7	-33.5	288.8	114.1	1.50	1.50	0.00
1,738.3	23.07	96.62	1,697.1	-35.2	303.6	119.9	1.50	1.50	0.00
1,800.0	23.07	96.62	1,753.8	-38.0	327.6	129.4	0.00	0.00	0.00
1,900.0	23.07	96.62	1,845.8	-42.6	366.5	144.8	0.00	0.00	0.00
2,000.0	23.07	96.62	1,937.8	-47.1	405.4	160.2	0.00	0.00	0.00
2,100.0	23.07	96.62	2,029.8	-51.6	444.4	175.5	0.00	0.00	0.00
2,200.0	23.07	96.62	2,121.8	-56.1	483.3	190.9	0.00	0.00	0.00
2,300.0	23.07	96.62	2,213.8	-60.6	522.2	206.3	0.00	0.00	0.00
2,400.0	23.07	96.62	2,305.8	-65.2	561.2	221.7	0.00	0.00	0.00
2,500.0	23.07	96.62	2,397.8	-69.7	600.1	237.1	0.00	0.00	0.00
2,600.0	23.07	96.62	2,489.8	-74.2	639.0	252.4	0.00	0.00	0.00
2,700.0	23.07	96.62	2,581.8	-78.7	678.0	267.8	0.00	0.00	0.00
2,800.0	23.07	96.62	2,673.8	-83.2	716.9	283.2	0.00	0.00	0.00
2,900.0	23.07	96.62	2,765.8	-87.8	755.8	298.6	0.00	0.00	0.00
3,000.0	23.07	96.62	2,857.8	-92.3	794.7	314.0	0.00	0.00	0.00
3,100.0	23.07	96.62	2,949.8	-96.8	833.7	329.3	0.00	0.00	0.00
3,200.0	23.07	96.62	3,041.8	-101.3	872.6	344.7	0.00	0.00	0.00
3,300.0	23.07	96.62	3,133.8	-105.8	911.5	360.1	0.00	0.00	0.00
3,400.0	23.07	96.62	3,225.8	-110.4	950.5	375.5	0.00	0.00	0.00
3,500.0	23.07	96.62	3,317.8	-114.9	989.4	390.8	0.00	0.00	0.00
3,600.0	23.07	96.62	3,409.8	-119.4	1,028.3	406.2	0.00	0.00	0.00
3,700.0	23.07	96.62	3,501.8	-123.9	1,067.3	421.6	0.00	0.00	0.00
3,763.2	23.07	96.62	3,560.0	-126.8	1,091.9	431.3	0.00	0.00	0.00
Parkman									
3,800.0	23.07	96.62	3,593.8	-128.4	1,106.2	437.0	0.00	0.00	0.00
3,900.0	23.07	96.62	3,685.8	-133.0	1,145.1	452.4	0.00	0.00	0.00
4,000.0	23.07	96.62	3,777.8	-137.5	1,184.1	467.7	0.00	0.00	0.00
4,100.0	23.07	96.62	3,869.8	-142.0	1,223.0	483.1	0.00	0.00	0.00
4,200.0	23.07	96.62	3,961.8	-146.5	1,261.9	498.5	0.00	0.00	0.00
4,300.0	23.07	96.62	4,053.8	-151.0	1,300.9	513.9	0.00	0.00	0.00
4,350.2	23.07	96.62	4,100.0	-153.3	1,320.4	521.6	0.00	0.00	0.00
Sussex									
4,400.0	23.07	96.62	4,145.8	-155.6	1,339.8	529.3	0.00	0.00	0.00
4,500.0	23.07	96.62	4,237.8	-160.1	1,378.7	544.6	0.00	0.00	0.00
4,600.0	23.07	96.62	4,329.8	-164.6	1,417.6	560.0	0.00	0.00	0.00

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Site:	Spaur 4N67W10LQ Pad Sec.10-T4N-R67W	North Reference:	True
Well:	Spaur 10Y-241	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Plan #1 (6-11-15)		

Planned Survey									
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
4,700.0	23.07	96.62	4,421.8	-169.1	1,456.6	575.4	0.00	0.00	0.00
4,800.0	23.07	96.62	4,513.8	-173.6	1,495.5	590.8	0.00	0.00	0.00
4,900.0	23.07	96.62	4,605.8	-178.2	1,534.4	606.2	0.00	0.00	0.00
4,911.1	23.07	96.62	4,616.0	-178.7	1,538.8	607.9	0.00	0.00	0.00
Shannon									
5,000.0	23.07	96.62	4,697.8	-182.7	1,573.4	621.5	0.00	0.00	0.00
5,100.0	23.07	96.62	4,789.8	-187.2	1,612.3	636.9	0.00	0.00	0.00
5,200.0	23.07	96.62	4,881.8	-191.7	1,651.2	652.3	0.00	0.00	0.00
5,300.0	23.07	96.62	4,973.8	-196.2	1,690.2	667.7	0.00	0.00	0.00
5,400.0	23.07	96.62	5,065.8	-200.8	1,729.1	683.1	0.00	0.00	0.00
5,500.0	23.07	96.62	5,157.8	-205.3	1,768.0	698.4	0.00	0.00	0.00
5,600.0	23.07	96.62	5,249.8	-209.8	1,807.0	713.8	0.00	0.00	0.00
5,700.0	23.07	96.62	5,341.8	-214.3	1,845.9	729.2	0.00	0.00	0.00
5,800.0	23.07	96.62	5,433.8	-218.8	1,884.8	744.6	0.00	0.00	0.00
5,900.0	23.07	96.62	5,525.8	-223.4	1,923.8	759.9	0.00	0.00	0.00
6,000.0	23.07	96.62	5,617.8	-227.9	1,962.7	775.3	0.00	0.00	0.00
6,100.0	23.07	96.62	5,709.8	-232.4	2,001.6	790.7	0.00	0.00	0.00
6,200.0	23.07	96.62	5,801.8	-236.9	2,040.5	806.1	0.00	0.00	0.00
6,300.0	23.07	96.62	5,893.8	-241.4	2,079.5	821.5	0.00	0.00	0.00
6,400.0	23.07	96.62	5,985.8	-246.0	2,118.4	836.8	0.00	0.00	0.00
6,500.0	23.07	96.62	6,077.8	-250.5	2,157.3	852.2	0.00	0.00	0.00
6,600.0	23.07	96.62	6,169.8	-255.0	2,196.3	867.6	0.00	0.00	0.00
6,700.0	23.07	96.62	6,261.8	-259.5	2,235.2	883.0	0.00	0.00	0.00
6,742.2	23.07	96.62	6,300.6	-261.4	2,251.6	889.5	0.00	0.00	0.00
Start DLS 7.50 TFO -95.93									
6,800.0	23.01	85.53	6,353.8	-261.8	2,274.2	900.3	7.50	-0.11	-19.20
6,900.0	24.67	67.36	6,445.4	-252.3	2,313.0	927.8	7.50	1.66	-18.17
7,000.0	28.18	52.39	6,535.1	-229.8	2,351.0	966.2	7.50	3.51	-14.96
7,100.0	32.95	40.97	6,621.2	-194.8	2,387.6	1,014.7	7.50	4.77	-11.43
7,200.0	38.51	32.32	6,702.4	-147.9	2,422.1	1,072.6	7.50	5.56	-8.64
7,300.0	44.57	25.64	6,777.3	-89.9	2,454.0	1,138.8	7.50	6.06	-6.69
7,315.2	45.52	24.75	6,788.0	-80.2	2,458.5	1,149.5	7.50	6.26	-5.84
Sharon Springs									
7,400.0	50.94	20.28	6,844.5	-21.7	2,482.6	1,212.2	7.50	6.39	-5.27
7,496.4	57.27	15.97	6,901.0	52.4	2,506.8	1,288.5	7.50	6.57	-4.47
Niobrara A									
7,500.0	57.51	15.82	6,903.0	55.4	2,507.6	1,291.5	7.50	6.65	-4.12
7,600.0	64.22	11.98	6,951.6	140.1	2,528.5	1,375.5	7.50	6.71	-3.84
7,700.0	71.02	8.55	6,989.7	231.0	2,544.9	1,462.5	7.50	6.80	-3.43
7,767.3	75.63	6.41	7,009.0	295.0	2,553.3	1,522.2	7.50	6.85	-3.19
Niobrara B									
7,800.0	77.88	5.40	7,016.5	326.6	2,556.5	1,551.3	7.50	6.87	-3.09
7,900.0	84.77	2.40	7,031.6	425.2	2,563.2	1,640.2	7.50	6.89	-3.00
7,982.0	90.43	0.00	7,035.0	507.0	2,565.0	1,712.2	7.50	6.91	-2.93
Start 3985.1 hold at 7982.0 MD - 7"									
8,000.0	90.43	0.00	7,034.9	525.0	2,565.0	1,727.8	0.00	0.00	0.00
8,100.0	90.43	0.00	7,034.1	625.0	2,565.0	1,814.6	0.00	0.00	0.00
8,200.0	90.43	0.00	7,033.4	725.0	2,565.0	1,901.5	0.00	0.00	0.00
8,300.0	90.43	0.00	7,032.6	825.0	2,565.0	1,988.3	0.00	0.00	0.00
8,400.0	90.43	0.00	7,031.9	925.0	2,565.0	2,075.1	0.00	0.00	0.00
8,500.0	90.43	0.00	7,031.1	1,025.0	2,565.0	2,162.0	0.00	0.00	0.00
8,600.0	90.43	0.00	7,030.3	1,125.0	2,565.0	2,248.8	0.00	0.00	0.00

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Site:	Spaur 4N67W10LQ Pad Sec.10-T4N-R67W	North Reference:	True
Well:	Spaur 10Y-241	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Plan #1 (6-11-15)		

Planned Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
8,700.0	90.43	0.00	7,029.6	1,225.0	2,565.0	2,335.7	0.00	0.00	0.00
8,800.0	90.43	0.00	7,028.8	1,325.0	2,565.0	2,422.5	0.00	0.00	0.00
8,900.0	90.43	0.00	7,028.1	1,425.0	2,565.0	2,509.3	0.00	0.00	0.00
9,000.0	90.43	0.00	7,027.3	1,525.0	2,565.0	2,596.2	0.00	0.00	0.00
9,100.0	90.43	0.00	7,026.6	1,625.0	2,565.0	2,683.0	0.00	0.00	0.00
9,200.0	90.43	0.00	7,025.8	1,725.0	2,565.0	2,769.9	0.00	0.00	0.00
9,300.0	90.43	0.00	7,025.1	1,825.0	2,565.0	2,856.7	0.00	0.00	0.00
9,400.0	90.43	0.00	7,024.3	1,925.0	2,565.0	2,943.5	0.00	0.00	0.00
9,500.0	90.43	0.00	7,023.6	2,025.0	2,565.0	3,030.4	0.00	0.00	0.00
9,600.0	90.43	0.00	7,022.8	2,125.0	2,565.0	3,117.2	0.00	0.00	0.00
9,700.0	90.43	0.00	7,022.1	2,225.0	2,565.0	3,204.0	0.00	0.00	0.00
9,800.0	90.43	0.00	7,021.3	2,325.0	2,565.0	3,290.9	0.00	0.00	0.00
9,900.0	90.43	0.00	7,020.6	2,425.0	2,565.0	3,377.7	0.00	0.00	0.00
10,000.0	90.43	0.00	7,019.8	2,525.0	2,565.0	3,464.6	0.00	0.00	0.00
10,100.0	90.43	0.00	7,019.1	2,625.0	2,565.0	3,551.4	0.00	0.00	0.00
10,200.0	90.43	0.00	7,018.3	2,725.0	2,565.0	3,638.2	0.00	0.00	0.00
10,300.0	90.43	0.00	7,017.6	2,825.0	2,565.0	3,725.1	0.00	0.00	0.00
10,400.0	90.43	0.00	7,016.8	2,925.0	2,565.0	3,811.9	0.00	0.00	0.00
10,500.0	90.43	0.00	7,016.0	3,025.0	2,565.0	3,898.7	0.00	0.00	0.00
10,600.0	90.43	0.00	7,015.3	3,125.0	2,565.0	3,985.6	0.00	0.00	0.00
10,700.0	90.43	0.00	7,014.5	3,225.0	2,565.0	4,072.4	0.00	0.00	0.00
10,800.0	90.43	0.00	7,013.8	3,325.0	2,565.0	4,159.3	0.00	0.00	0.00
10,900.0	90.43	0.00	7,013.0	3,425.0	2,565.0	4,246.1	0.00	0.00	0.00
11,000.0	90.43	0.00	7,012.3	3,524.9	2,565.0	4,332.9	0.00	0.00	0.00
11,100.0	90.43	0.00	7,011.5	3,624.9	2,565.0	4,419.8	0.00	0.00	0.00
11,200.0	90.43	0.00	7,010.8	3,724.9	2,565.0	4,506.6	0.00	0.00	0.00
11,300.0	90.43	0.00	7,010.0	3,824.9	2,565.0	4,593.4	0.00	0.00	0.00
11,400.0	90.43	0.00	7,009.3	3,924.9	2,565.0	4,680.3	0.00	0.00	0.00
11,500.0	90.43	0.00	7,008.5	4,024.9	2,565.0	4,767.1	0.00	0.00	0.00
11,600.0	90.43	0.00	7,007.8	4,124.9	2,565.0	4,854.0	0.00	0.00	0.00
11,700.0	90.43	0.00	7,007.0	4,224.9	2,565.0	4,940.8	0.00	0.00	0.00
11,800.0	90.43	0.00	7,006.3	4,324.9	2,565.0	5,027.6	0.00	0.00	0.00
11,900.0	90.43	0.00	7,005.5	4,424.9	2,565.0	5,114.5	0.00	0.00	0.00
11,967.1	90.43	0.00	7,005.0	4,492.0	2,565.0	5,172.7	0.00	0.00	0.00

TD at 11967.1

Targets

Target Name	Dip Angle (°)	Dip Dir. (°)	TVD (ft)	+N/-S (ft)	+E/-W (ft)	Northing (ft)	Easting (ft)	Latitude	Longitude
- hit/miss target									
- Shape									
BHL 500'FNL & 306'F	0.00	0.00	7,005.0	4,492.1	2,565.0	1,364,636.99	3,175,982.94	40.332610	-104.868750
- plan hits target center									
- Point									
SHL 254'FSL & 2393'I	0.00	0.00	1.0	0.0	0.0	1,360,127.26	3,173,449.67	40.320280	-104.877950
- plan hits target center									
- Point									
50' E/W Hardline (10Y	0.00	0.00	1.0	2,499.5	2,565.0	1,362,644.62	3,175,996.96	40.327141	-104.868751
- plan misses target center by 3581.5ft at 1.0ft MD (1.0 TVD, 0.0 N, 0.0 E)									
- Rectangle (sides W3,985.1 H100.0 D0.0)									

Database:	EDM 2003.21 Single User Db	Local Co-ordinate Reference:	Well Spaur 10Y-241
Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	TVD Reference:	WELL @ 4844.0ft (RKB - 13')
Project:	SEC.10-T4N-R67W	MD Reference:	WELL @ 4844.0ft (RKB - 13')
Site:	Spaur 4N67W10LQ Pad Sec.10-T4N-R67W	North Reference:	True
Well:	Spaur 10Y-241	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Plan #1 (6-11-15)		

Casing Points

Measured Depth (ft)	Vertical Depth (ft)	Name	Casing Diameter (")	Hole Diameter (")
7,982.0	7,035.0	7"	7	7-1/2

Formations

Measured Depth (ft)	Vertical Depth (ft)	Name	Lithology	Dip (°)	Dip Direction (°)
3,763.2	3,560.0	Parkman		0.00	
4,350.2	4,100.0	Sussex		0.00	
4,911.1	4,616.0	Shannon		0.00	
7,315.2	6,788.0	Sharon Springs		0.00	
7,496.4	6,901.0	Niobrara A		0.00	
7,767.3	7,009.0	Niobrara B		0.00	
	7,083.0	Niobrara C		0.00	
	7,204.0	Fort Hays		0.00	
	7,223.0	Codell		0.00	

Plan Annotations

Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment
		+N/-S (ft)	+E/-W (ft)	
200.0	200.0	0.0	0.0	KOP - Start Build 1.50
6,742.2	6,300.6	-261.4	2,251.6	Start DLS 7.50 TFO -95.93
7,982.0	7,035.0	507.0	2,565.0	Start 3985.1 hold at 7982.0 MD
11,967.1	7,005.0	4,492.0	2,565.0	TD at 11967.1



PETROLEUM DEVELOPMENT CORP Weld County CO

SEC.10-T4N-R67W

Spaur 4N67W10LQ Pad Sec.10-T4N-R67W

Spaur 10Y-241

Wellbore #1

Plan #1 (6-11-15)

Anticollision Report

16 June, 2015



Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Spaur 10Y-241
Project:	SEC.10-T4N-R67W	TVD Reference:	WELL @ 4844.0ft (RKB - 13')
Reference Site:	Spaur 4N67W10LQ Pad Sec.10-T4N-R67W	MD Reference:	WELL @ 4844.0ft (RKB - 13')
Site Error:	0.0ft	North Reference:	True
Reference Well:	Spaur 10Y-241	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	EDM 2003.21 Single User Db
Reference Design:	Plan #1 (6-11-15)	Offset TVD Reference:	Offset Datum

Reference	Plan #1 (6-11-15)
Filter type:	NO GLOBAL FILTER: Using user defined selection & filtering criteria
Interpolation Method:	MD Interval 100.0ft
Depth Range:	Unlimited
Results Limited by:	Maximum center-center distance of 1,000.0ft
Warning Levels Evaluated at:	2.00 Sigma
Error Model:	ISCWSA
Scan Method:	Closest Approach 3D
Error Surface:	Elliptical Conic

Survey Tool Program		Date	6/16/2015		
From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description	
0.0	11,967.1	Plan #1 (6-11-15) (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.10-T4N-R67W						
Oster 10-1 (Exist.) - Wellbore #1 - Wellbore #1	7,816.9	6,966.0	302.0	264.1	7.967	CC, ES, SF
Oster 10-2 (Exist.) - Wellbore #1 - Wellbore #1	9,133.0	6,958.4	288.4	232.1	5.122	CC, ES, SF
Oster 10-3 (Exist.) - Wellbore #1 - Wellbore #1	10,105.1	6,943.4	276.5	203.8	3.803	CC, ES, SF
Purvis 10-2 (Exist.) - Wellbore #1 - Wellbore #1	2,577.4	2,453.3	304.8	285.6	15.871	CC
Purvis 10-2 (Exist.) - Wellbore #1 - Wellbore #1	2,600.0	2,474.0	304.9	285.5	15.704	ES
Purvis 10-2 (Exist.) - Wellbore #1 - Wellbore #1	2,800.0	2,656.0	317.8	296.9	15.211	SF
Purvis 10TD Pad Sec. 10-T4N-R67W						
Purvis 10TD - Wellbore #1 - Wellbore #1	5,158.6	5,219.2	194.8	149.8	4.327	CC, ES, SF
Purvis 10WD - Wellbore #1 - Wellbore #1	9,855.8	7,406.4	184.4	110.0	2.477	CC, ES, SF
Purvis 10XD - Wellbore #1 - Wellbore #1	8,463.1	7,343.2	177.8	125.1	3.375	CC, ES, SF
Spaur 4N67W10LQ Pad Sec.10-T4N-R67W						
Spaur 10Q-321 - Wellbore #1 - Plan #3 (6-11-15)	200.0	198.0	91.1	90.4	142.165	CC
Spaur 10Q-321 - Wellbore #1 - Plan #3 (6-11-15)	300.0	298.0	91.2	90.2	84.619	ES
Spaur 10Q-321 - Wellbore #1 - Plan #3 (6-11-15)	1,000.0	992.2	130.4	126.0	29.166	SF
Spaur 10Q-401 - Wellbore #1 - Plan #2 (6-11-15)	200.0	198.0	105.7	105.0	164.984	CC
Spaur 10Q-401 - Wellbore #1 - Plan #2 (6-11-15)	300.0	298.0	105.8	104.7	98.145	ES
Spaur 10Q-401 - Wellbore #1 - Plan #2 (6-11-15)	1,100.0	1,089.7	155.9	150.8	31.038	SF
Spaur 10T-201 - Wellbore #1 - Plan #1 (6-11-15)	200.0	199.0	43.7	43.1	68.007	CC
Spaur 10T-201 - Wellbore #1 - Plan #1 (6-11-15)	300.0	299.0	43.9	42.8	40.622	ES
Spaur 10T-201 - Wellbore #1 - Plan #1 (6-11-15)	11,967.1	11,646.6	855.9	678.3	4.818	SF
Spaur 10T-241 - Wellbore #1 - Plan #2 (6-11-15)	200.0	199.0	72.9	72.2	113.338	CC
Spaur 10T-241 - Wellbore #1 - Plan #2 (6-11-15)	300.0	299.0	73.0	71.9	67.588	ES
Spaur 10T-241 - Wellbore #1 - Plan #2 (6-11-15)	900.0	895.1	102.3	98.4	25.975	SF
Spaur 10T-301 - Wellbore #1 - Plan #2 (6-11-15)	200.0	199.0	58.3	57.6	90.669	CC
Spaur 10T-301 - Wellbore #1 - Plan #2 (6-11-15)	300.0	299.0	58.5	57.4	54.102	ES
Spaur 10T-301 - Wellbore #1 - Plan #2 (6-11-15)	800.0	796.5	79.0	75.6	23.049	SF
Spaur 10T-321 - Wellbore #1 - Plan #1 (6-11-15)	200.0	200.0	14.6	13.9	22.590	CC
Spaur 10T-321 - Wellbore #1 - Plan #1 (6-11-15)	300.0	300.0	14.8	13.7	13.652	ES
Spaur 10T-321 - Wellbore #1 - Plan #1 (6-11-15)	11,967.1	11,804.8	364.1	186.8	2.054	SF
Spaur 10T-421 - Wellbore #1 - Plan #1 (6-11-15)	200.0	200.0	29.3	28.6	45.386	CC
Spaur 10T-421 - Wellbore #1 - Plan #1 (6-11-15)	300.0	300.0	29.3	28.3	27.096	ES
Spaur 10T-421 - Wellbore #1 - Plan #1 (6-11-15)	11,967.1	11,871.9	652.6	479.8	3.777	SF

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Spaur 10Y-241
Project:	SEC.10-T4N-R67W	TVD Reference:	WELL @ 4844.0ft (RKB - 13')
Reference Site:	Spaur 4N67W10LQ Pad Sec.10-T4N-R67W	MD Reference:	WELL @ 4844.0ft (RKB - 13')
Site Error:	0.0ft	North Reference:	True
Reference Well:	Spaur 10Y-241	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	EDM 2003.21 Single User Db
Reference Design:	Plan #1 (6-11-15)	Offset TVD Reference:	Offset Datum

Offset Design Existing Wells Sec.10-T4N-R67W - Oster 10-1 (Exist.) - Wellbore #1 - Wellbore #1												Offset Site Error:	0.0 ft
Survey Program: 100-NS-GYRO-MS												Offset Well Error:	0.0 ft
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
4,700.0	4,421.8	4,374.8	4,372.7	32.0	8.3	-42.86	370.7	2,264.8	972.0	939.6	32.37	30.026	
4,800.0	4,513.8	4,467.8	4,465.7	32.8	8.5	-44.49	370.9	2,263.7	941.6	907.9	33.72	27.923	
4,900.0	4,605.8	4,558.8	4,556.7	33.7	8.7	-46.19	371.1	2,262.5	912.0	876.9	35.11	25.975	
5,000.0	4,697.8	4,645.9	4,643.8	34.5	8.9	-47.92	371.6	2,261.4	883.5	846.9	36.51	24.199	
5,100.0	4,789.8	4,734.9	4,732.8	35.3	9.1	-49.80	372.5	2,260.6	856.5	818.5	37.97	22.559	
5,200.0	4,881.8	4,829.4	4,827.3	36.2	9.3	-51.89	373.2	2,259.6	830.2	790.7	39.51	21.012	
5,300.0	4,973.8	4,918.8	4,916.7	37.0	9.5	-53.97	373.7	2,259.1	805.2	764.2	41.05	19.615	
5,400.0	5,065.8	5,010.7	5,008.5	37.9	9.7	-56.23	374.3	2,258.4	781.6	738.9	42.65	18.326	
5,500.0	5,157.8	5,100.0	5,097.9	38.7	9.9	-58.54	375.0	2,257.9	759.4	715.2	44.24	17.166	
5,600.0	5,249.8	5,189.7	5,187.5	39.6	10.1	-60.95	375.7	2,257.8	739.0	693.2	45.82	16.127	
5,700.0	5,341.8	5,281.1	5,279.0	40.4	10.3	-63.52	376.6	2,257.9	720.3	672.9	47.42	15.192	
5,800.0	5,433.8	5,372.2	5,370.1	41.3	10.4	-66.17	377.3	2,258.2	703.4	654.5	48.98	14.361	
5,900.0	5,525.8	5,467.0	5,464.8	42.1	10.5	-69.02	377.9	2,258.7	688.3	637.8	50.52	13.623	
6,000.0	5,617.8	5,561.7	5,559.6	43.0	10.6	-71.97	378.1	2,259.1	674.6	622.6	52.01	12.972	
6,100.0	5,709.8	5,654.7	5,652.6	43.8	10.7	-74.96	378.1	2,259.4	662.6	609.2	53.41	12.406	
6,200.0	5,801.8	5,747.3	5,745.1	44.7	10.8	-78.03	378.0	2,259.6	652.7	598.0	54.75	11.921	
6,300.0	5,893.8	5,840.3	5,838.2	45.5	10.9	-81.19	377.8	2,259.8	644.9	588.9	56.02	11.513	
6,400.0	5,985.8	5,934.0	5,931.8	46.4	11.0	-84.43	377.4	2,259.9	639.3	582.1	57.21	11.174	
6,500.0	6,077.8	6,026.6	6,024.4	47.2	11.1	-87.69	376.9	2,259.8	635.7	577.4	58.32	10.900	
6,580.2	6,151.6	6,097.9	6,095.7	47.9	11.3	-90.24	376.7	2,259.3	634.7	575.6	59.14	10.732	
6,600.0	6,169.8	6,117.0	6,114.8	48.1	11.3	-90.93	376.7	2,259.2	634.8	575.4	59.34	10.698	
6,700.0	6,261.8	6,214.1	6,211.9	48.9	11.5	-94.38	375.9	2,258.9	635.9	575.7	60.21	10.563	
6,800.0	6,353.8	6,306.1	6,303.9	49.7	11.6	-87.40	374.9	2,258.9	637.0	576.2	60.73	10.489	
6,900.0	6,445.4	6,397.3	6,395.1	50.4	11.7	-74.07	373.9	2,258.9	628.5	568.3	60.26	10.430	
7,000.0	6,535.1	6,489.8	6,487.7	51.1	11.9	-64.46	372.6	2,258.6	609.6	550.8	58.74	10.378	
7,100.0	6,621.2	6,573.4	6,571.2	51.7	12.0	-58.82	371.3	2,258.2	580.8	524.5	56.23	10.328	
7,200.0	6,702.4	6,653.1	6,650.9	52.2	12.2	-56.96	370.3	2,257.7	543.7	490.9	52.80	10.297	
7,300.0	6,777.3	6,726.6	6,724.4	52.7	12.3	-58.32	369.6	2,257.9	499.6	450.9	48.69	10.262	
7,400.0	6,844.5	6,790.7	6,788.5	53.1	12.4	-62.41	369.1	2,257.6	451.0	406.6	44.35	10.168	
7,500.0	6,903.0	6,848.1	6,845.9	53.5	12.5	-69.00	368.8	2,257.2	401.2	360.6	40.56	9.891	
7,600.0	6,951.6	6,896.7	6,894.5	53.8	12.6	-76.90	368.6	2,257.0	354.8	316.6	38.23	9.282	
7,700.0	6,989.7	6,935.2	6,933.0	54.1	12.7	-84.39	368.6	2,257.0	319.1	281.5	37.57	8.493	
7,800.0	7,016.5	6,962.6	6,960.4	54.3	12.7	-89.62	368.6	2,257.1	302.4	264.6	37.83	7.993	
7,816.9	7,019.9	6,966.0	6,963.8	54.4	12.7	-90.19	368.6	2,257.1	302.0	264.1	37.91	7.967 CC, ES, SF	
7,900.0	7,031.6	6,978.1	6,975.9	54.5	12.8	-91.45	368.6	2,257.1	311.3	273.1	38.21	8.147	
8,000.0	7,034.9	6,981.6	6,979.4	54.7	12.8	-90.07	368.6	2,257.1	345.3	306.9	38.37	8.999	
8,100.0	7,034.1	6,981.0	6,978.8	54.9	12.8	-89.95	368.6	2,257.1	400.6	361.5	39.19	10.224	
8,200.0	7,033.4	6,980.3	6,978.1	55.2	12.8	-89.83	368.6	2,257.1	471.0	430.8	40.11	11.741	
8,300.0	7,032.6	6,979.7	6,977.5	55.4	12.8	-89.70	368.6	2,257.1	550.5	509.4	41.13	13.384	
8,400.0	7,031.9	6,979.0	6,976.8	55.8	12.8	-89.58	368.6	2,257.1	635.9	593.7	42.24	15.054	
8,500.0	7,031.1	6,978.3	6,976.1	56.2	12.8	-89.45	368.6	2,257.1	725.0	681.6	43.43	16.695	
8,600.0	7,030.3	6,977.6	6,975.4	56.6	12.8	-89.33	368.6	2,257.1	816.7	772.0	44.68	18.276	
8,700.0	7,029.6	6,977.0	6,974.8	57.1	12.8	-89.20	368.6	2,257.1	910.1	864.1	46.00	19.784	

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Spaur 10Y-241
Project:	SEC.10-T4N-R67W	TVD Reference:	WELL @ 4844.0ft (RKB - 13')
Reference Site:	Spaur 4N67W10LQ Pad Sec.10-T4N-R67W	MD Reference:	WELL @ 4844.0ft (RKB - 13')
Site Error:	0.0ft	North Reference:	True
Reference Well:	Spaur 10Y-241	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	EDM 2003.21 Single User Db
Reference Design:	Plan #1 (6-11-15)	Offset TVD Reference:	Offset Datum

Offset Design Existing Wells Sec.10-T4N-R67W - Oster 10-2 (Exist.) - Wellbore #1 - Wellbore #1												Offset Site Error: 0.0 ft		
Survey Program: 100-NS-GYRO-MS												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)			
8,200.0	7,033.4	6,976.9	6,975.3											
8,300.0	7,032.6	6,975.1	6,973.5	55.2	16.7	-93.36	1,657.8	2,276.5	976.4	931.8	44.54	21.919		
8,400.0	7,031.9	6,973.2	6,971.6	55.4	16.7	-93.00	1,657.8	2,276.5	881.4	835.8	45.54	19.353		
8,400.0	7,031.9	6,973.2	6,971.6	55.8	16.6	-92.64	1,657.8	2,276.5	787.6	740.9	46.62	16.894		
8,500.0	7,031.1	6,971.4	6,969.8	56.2	16.6	-92.27	1,657.8	2,276.5	695.5	647.7	47.77	14.559		
8,600.0	7,030.3	6,969.4	6,967.8	56.6	16.6	-91.88	1,657.9	2,276.5	605.9	556.9	48.99	12.369		
8,700.0	7,029.6	6,967.5	6,965.9	57.1	16.6	-91.49	1,657.9	2,276.6	520.2	469.9	50.26	10.349		
8,800.0	7,028.8	6,965.5	6,963.8	57.7	16.6	-91.09	1,657.9	2,276.6	440.5	388.9	51.59	8.538		
8,900.0	7,028.1	6,963.4	6,961.8	58.3	16.6	-90.68	1,657.9	2,276.6	370.7	317.8	52.96	7.000		
9,000.0	7,027.3	6,961.3	6,959.7	58.9	16.6	-90.26	1,658.0	2,276.6	317.6	263.2	54.37	5.841		
9,100.0	7,026.6	6,959.1	6,957.5	59.7	16.6	-89.83	1,658.0	2,276.6	290.2	234.4	55.81	5.200		
9,133.0	7,026.3	6,958.4	6,956.8	59.9	16.6	-89.69	1,658.0	2,276.6	288.4	232.1	56.30	5.122 CC, ES, SF		
9,200.0	7,025.8	6,956.9	6,955.3	60.4	16.6	-89.39	1,658.0	2,276.6	296.0	238.7	57.29	5.167		
9,300.0	7,025.1	6,954.6	6,953.0	61.3	16.6	-88.94	1,658.1	2,276.6	333.2	274.4	58.79	5.668		
9,400.0	7,024.3	6,952.3	6,950.6	62.2	16.6	-88.47	1,658.1	2,276.6	392.9	332.6	60.31	6.515		
9,500.0	7,023.6	6,949.9	6,948.3	63.1	16.6	-88.00	1,658.1	2,276.7	466.6	404.8	61.85	7.545		
9,600.0	7,022.8	6,947.4	6,945.8	64.1	16.6	-87.51	1,658.2	2,276.7	548.7	485.3	63.41	8.654		
9,700.0	7,022.1	6,944.9	6,943.3	65.2	16.6	-87.01	1,658.2	2,276.7	636.0	571.0	64.98	9.788		
9,800.0	7,021.3	6,942.3	6,940.7	66.3	16.6	-86.49	1,658.3	2,276.7	726.5	659.9	66.56	10.916		
9,900.0	7,020.6	6,939.6	6,938.0	67.4	16.6	-85.96	1,658.3	2,276.7	819.2	751.1	68.14	12.022		
10,000.0	7,019.8	6,936.9	6,935.3	68.6	16.6	-85.42	1,658.3	2,276.7	913.5	843.7	69.73	13.099		

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Spaur 10Y-241
Project:	SEC.10-T4N-R67W	TVD Reference:	WELL @ 4844.0ft (RKB - 13')
Reference Site:	Spaur 4N67W10LQ Pad Sec.10-T4N-R67W	MD Reference:	WELL @ 4844.0ft (RKB - 13')
Site Error:	0.0ft	North Reference:	True
Reference Well:	Spaur 10Y-241	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	EDM 2003.21 Single User Db
Reference Design:	Plan #1 (6-11-15)	Offset TVD Reference:	Offset Datum

Offset Design Existing Wells Sec.10-T4N-R67W - Oster 10-3 (Exist.) - Wellbore #1 - Wellbore #1												Offset Site Error: 0.0 ft	
Survey Program: 100-NS-GYRO-MS												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)		
9,200.0	7,025.8	6,958.4	6,957.1	60.4	17.0	-91.88	2,629.9	2,288.2	946.2	888.1	58.13	16.279	
9,300.0	7,025.1	6,956.7	6,955.4	61.3	17.0	-91.52	2,629.9	2,288.2	851.1	791.5	59.65	14.268	
9,400.0	7,024.3	6,955.0	6,953.7	62.2	17.0	-91.17	2,629.9	2,288.3	757.3	696.0	61.21	12.372	
9,500.0	7,023.6	6,953.3	6,952.0	63.1	17.0	-90.82	2,629.9	2,288.3	665.2	602.4	62.78	10.595	
9,600.0	7,022.8	6,951.6	6,950.3	64.1	17.0	-90.47	2,629.9	2,288.4	575.7	511.4	64.38	8.943	
9,700.0	7,022.1	6,949.9	6,948.6	65.2	17.0	-90.12	2,629.9	2,288.4	490.4	424.4	66.00	7.430	
9,800.0	7,021.3	6,948.3	6,947.0	66.3	17.0	-89.78	2,630.0	2,288.4	411.7	344.1	67.63	6.087	
9,900.0	7,020.6	6,946.6	6,945.3	67.4	17.0	-89.45	2,630.0	2,288.5	344.2	274.9	69.28	4.968	
10,000.0	7,019.8	6,945.0	6,943.7	68.6	17.0	-89.11	2,630.0	2,288.5	295.8	224.8	70.94	4.169	
10,100.0	7,019.1	6,943.4	6,942.1	69.8	17.0	-88.78	2,630.0	2,288.5	276.5	203.9	72.62	3.808	
10,105.1	7,019.0	6,943.4	6,942.1	69.9	17.0	-88.77	2,630.0	2,288.5	276.5	203.8	72.70	3.803 CC, ES, SF	
10,200.0	7,018.3	6,941.9	6,940.6	71.1	17.0	-88.46	2,630.0	2,288.6	292.3	218.0	74.30	3.934	
10,300.0	7,017.6	6,940.3	6,939.0	72.4	17.0	-88.13	2,630.0	2,288.6	338.3	262.3	76.00	4.451	
10,400.0	7,016.8	6,938.8	6,937.5	73.7	17.0	-87.82	2,630.0	2,288.6	404.2	326.5	77.70	5.203	
10,500.0	7,016.0	6,937.2	6,936.0	75.1	17.0	-87.50	2,630.0	2,288.7	482.1	402.7	79.41	6.071	
10,600.0	7,015.3	6,935.7	6,934.4	76.5	17.0	-87.19	2,630.1	2,288.7	566.9	485.7	81.13	6.988	
10,700.0	7,014.5	6,934.3	6,933.0	78.0	17.0	-86.88	2,630.1	2,288.7	656.0	573.1	82.85	7.918	
10,800.0	7,013.8	6,932.8	6,931.5	79.4	17.0	-86.57	2,630.1	2,288.8	747.8	663.3	84.58	8.842	
10,900.0	7,013.0	6,931.3	6,930.0	80.9	17.0	-86.27	2,630.1	2,288.8	841.6	755.2	86.31	9.750	
11,000.0	7,012.3	6,929.9	6,928.6	82.4	17.0	-85.97	2,630.1	2,288.8	936.6	848.5	88.05	10.637	

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Spaur 10Y-241
Project:	SEC.10-T4N-R67W	TVD Reference:	WELL @ 4844.0ft (RKB - 13')
Reference Site:	Spaur 4N67W10LQ Pad Sec.10-T4N-R67W	MD Reference:	WELL @ 4844.0ft (RKB - 13')
Site Error:	0.0ft	North Reference:	True
Reference Well:	Spaur 10Y-241	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	EDM 2003.21 Single User Db
Reference Design:	Plan #1 (6-11-15)	Offset TVD Reference:	Offset Datum

Offset Design Existing Wells Sec.10-T4N-R67W - Purvis 10-2 (Exist.) - Wellbore #1 - Wellbore #1													Offset Site Error:	0.0 ft
Survey Program: 100-NS-GYRO-MS													Offset Well Error:	0.0 ft
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference	Offset	Semi Major Axis	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
0.0	0.0	0.0	0.0	0.0	0.0	68.93	68.93	251.4	652.5	699.6				
100.0	100.0	73.9	73.9	0.1	0.1	68.93	68.93	251.5	652.7	699.5	699.3	0.20	3,568.947	
200.0	200.0	172.5	172.5	0.3	0.3	68.94	68.94	251.6	653.4	700.2	699.6	0.65	1,085.161	
300.0	300.0	273.9	273.9	0.5	0.6	-27.72	-27.72	251.7	654.2	699.8	698.7	1.13	621.925	
400.0	399.9	374.9	374.9	0.8	0.8	-27.85	-27.85	251.4	654.8	696.8	695.2	1.58	439.915	
500.0	499.7	476.5	476.5	1.0	1.1	-28.05	-28.05	250.5	655.6	691.4	689.3	2.03	340.527	
600.0	599.3	574.0	574.0	1.2	1.3	-28.37	-28.37	249.5	656.2	683.6	681.1	2.49	274.826	
700.0	698.6	672.8	672.8	1.5	1.5	-28.81	-28.81	248.7	657.2	673.8	670.8	2.98	226.132	
800.0	797.5	773.8	773.8	1.9	1.8	-29.47	-29.47	248.4	657.8	661.7	658.2	3.49	189.382	
900.0	896.1	872.0	871.9	2.2	2.0	-30.26	-30.26	248.0	658.2	647.2	643.2	4.02	161.182	
1,000.0	994.2	967.9	967.8	2.6	2.3	-31.22	-31.22	247.8	658.8	630.8	626.3	4.56	138.433	
1,100.0	1,091.7	1,069.4	1,069.4	3.1	2.5	-32.40	-32.40	247.2	659.6	612.5	607.3	5.12	119.598	
1,200.0	1,188.6	1,168.2	1,168.1	3.6	2.7	-33.77	-33.77	246.2	659.9	591.4	585.7	5.69	103.931	
1,300.0	1,284.9	1,263.6	1,263.6	4.1	3.0	-35.35	-35.35	245.1	660.2	568.6	562.3	6.30	90.282	
1,400.0	1,380.4	1,358.0	1,358.0	4.7	3.2	-37.29	-37.29	244.8	660.4	544.3	537.3	6.97	78.086	
1,500.0	1,475.0	1,455.3	1,455.2	5.3	3.4	-39.64	-39.64	244.2	660.7	518.6	510.9	7.71	67.242	
1,600.0	1,568.9	1,551.0	1,550.9	6.0	3.6	-42.39	-42.39	243.1	660.5	491.0	482.5	8.48	57.906	
1,700.0	1,661.7	1,646.2	1,646.1	6.8	3.7	-45.76	-45.76	242.5	659.9	462.5	453.2	9.30	49.707	
1,800.0	1,753.8	1,741.4	1,741.3	7.6	3.9	-49.51	-49.51	241.0	658.7	433.1	422.9	10.25	42.242	
1,900.0	1,845.8	1,831.9	1,831.8	8.4	4.0	-53.40	-53.40	239.4	657.5	405.3	394.0	11.29	35.895	
2,000.0	1,937.8	1,921.3	1,921.2	9.2	4.1	-57.75	-57.75	238.3	656.6	380.2	367.8	12.39	30.674	
2,100.0	2,029.8	2,013.3	2,013.1	10.1	4.3	-62.82	-62.82	237.6	655.3	358.0	344.4	13.56	26.403	
2,200.0	2,121.8	2,106.5	2,106.4	10.9	4.4	-68.51	-68.51	236.6	653.8	338.9	324.1	14.78	22.935	
2,300.0	2,213.8	2,197.8	2,197.6	11.7	4.6	-74.53	-74.53	235.4	652.7	323.5	307.5	16.02	20.195	
2,400.0	2,305.8	2,289.3	2,289.1	12.6	4.8	-80.88	-80.88	233.9	652.2	312.6	295.3	17.26	18.116	
2,500.0	2,397.8	2,382.1	2,381.9	13.4	5.0	-87.58	-87.58	232.2	651.9	306.3	287.9	18.41	16.638	
2,577.4	2,469.0	2,453.3	2,453.1	14.0	5.2	-92.90	-92.90	230.8	651.2	304.8	285.6	19.20	15.871 CC	
2,600.0	2,489.8	2,474.0	2,473.8	14.2	5.2	-94.46	-94.46	230.4	651.0	304.9	285.5	19.42	15.704 ES	
2,700.0	2,581.8	2,564.9	2,564.7	15.1	5.5	-101.19	-101.19	228.7	650.3	308.7	288.5	20.25	15.247	
2,800.0	2,673.8	2,656.0	2,655.7	15.9	5.7	-107.72	-107.72	227.3	649.5	317.8	296.9	20.90	15.211 SF	
2,900.0	2,765.8	2,744.8	2,744.6	16.7	5.8	-113.77	-113.77	226.2	648.3	331.8	310.5	21.36	15.539	
3,000.0	2,857.8	2,833.1	2,832.8	17.6	6.0	-119.31	-119.31	226.0	646.7	351.1	329.4	21.65	16.212	
3,100.0	2,949.8	2,924.8	2,924.5	18.4	6.1	-124.51	-124.51	226.0	644.9	374.0	352.1	21.83	17.135	
3,200.0	3,041.8	3,017.0	3,016.7	19.3	6.2	-129.15	-129.15	225.9	643.3	399.5	377.6	21.95	18.201	
3,300.0	3,133.8	3,107.6	3,107.2	20.1	6.4	-133.20	-133.20	225.7	641.6	427.5	405.5	22.07	19.373	
3,400.0	3,225.8	3,200.0	3,199.7	21.0	6.5	-136.87	-136.87	225.3	640.0	457.2	435.0	22.18	20.614	
3,500.0	3,317.8	3,288.5	3,288.1	21.8	6.7	-139.91	-139.91	225.4	638.8	488.6	466.3	22.30	21.908	
3,600.0	3,409.8	3,380.3	3,379.9	22.7	6.8	-142.65	-142.65	226.2	637.5	521.8	499.4	22.41	23.282	
3,700.0	3,501.8	3,472.7	3,472.3	23.5	6.9	-145.11	-145.11	226.7	636.2	555.7	533.1	22.55	24.645	
3,800.0	3,593.8	3,564.3	3,564.0	24.3	7.1	-147.31	-147.31	226.9	634.9	590.3	567.6	22.72	25.979	
3,900.0	3,685.8	3,655.9	3,655.5	25.2	7.2	-149.26	-149.26	227.3	633.6	625.7	602.8	22.92	27.305	
4,000.0	3,777.8	3,750.3	3,749.9	26.0	7.3	-150.97	-150.97	228.3	632.9	661.5	638.4	23.11	28.630	
4,100.0	3,869.8	3,843.7	3,843.3	26.9	7.4	-152.48	-152.48	229.1	632.7	697.2	673.9	23.30	29.922	
4,200.0	3,961.8	3,935.7	3,935.2	27.7	7.4	-153.78	-153.78	230.5	632.8	733.5	709.9	23.53	31.170	
4,300.0	4,053.8	4,030.6	4,030.2	28.6	7.5	-155.04	-155.04	231.3	632.8	769.7	745.9	23.76	32.390	
4,400.0	4,145.8	4,121.0	4,120.6	29.4	7.6	-156.14	-156.14	231.9	633.0	806.1	782.0	24.03	33.550	
4,500.0	4,237.8	4,205.7	4,205.3	30.3	7.7	-157.06	-157.06	233.0	632.7	843.3	818.9	24.33	34.663	
4,600.0	4,329.8	4,297.4	4,297.0	31.1	7.8	-157.95	-157.95	234.8	632.4	881.1	856.4	24.65	35.747	
4,700.0	4,421.8	4,392.6	4,392.2	32.0	7.9	-158.80	-158.80	236.4	632.1	918.8	893.9	24.97	36.791	
4,800.0	4,513.8	4,485.9	4,485.5	32.8	8.0	-159.58	-159.58	237.8	632.0	956.5	931.2	25.32	37.784	
4,900.0	4,605.8	4,579.4	4,578.9	33.7	8.2	-160.29	-160.29	239.3	632.1	994.2	968.6	25.67	38.729	

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 Spaur 10Y-241
Project:	SEC.10-T4N-R67W	TVD Reference:	WELL @ 4844.0ft (RKB - 13')
Reference Site:	Spaur 4N67W10LQ Pad Sec.10-T4N-R67W	MD Reference:	WELL @ 4844.0ft (RKB - 13')
Site Error:	0.0ft	North Reference:	True
Reference Well:	Spaur 10Y-241	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	EDM 2003.21 Single User Db
Reference Design:	Plan #1 (6-11-15)	Offset TVD Reference:	Offset Datum

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Spaur 10Y-241
Project:	SEC.10-T4N-R67W	TVD Reference:	WELL @ 4844.0ft (RKB - 13')
Reference Site:	Spaur 4N67W10LQ Pad Sec.10-T4N-R67W	MD Reference:	WELL @ 4844.0ft (RKB - 13')
Site Error:	0.0ft	North Reference:	True
Reference Well:	Spaur 10Y-241	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	EDM 2003.21 Single User Db
Reference Design:	Plan #1 (6-11-15)	Offset TVD Reference:	Offset Datum

Offset Design													Offset Site Error:	0.0 ft
Survey Program: 155-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		
2,800.0	2,673.8	3,122.4	2,935.2	15.9	18.5	-71.95	705.4	1,237.2	990.8	961.8	29.07	34.079		
2,900.0	2,765.8	3,195.7	3,001.2	16.7	19.1	-72.25	675.0	1,246.4	946.9	916.7	30.27	31.285		
3,000.0	2,857.8	3,281.0	3,078.8	17.6	19.7	-72.68	641.0	1,257.2	904.5	873.0	31.50	28.715		
3,100.0	2,949.8	3,370.4	3,160.3	18.4	20.4	-73.26	605.7	1,267.4	861.9	829.2	32.72	26.339		
3,200.0	3,041.8	3,453.5	3,236.4	19.3	21.0	-73.93	573.8	1,276.4	820.0	786.2	33.89	24.197		
3,300.0	3,133.8	3,537.5	3,313.8	20.1	21.6	-74.70	542.2	1,285.4	779.0	744.0	35.04	22.234		
3,400.0	3,225.8	3,621.6	3,391.5	21.0	22.1	-75.57	511.4	1,294.7	739.0	702.8	36.17	20.432		
3,500.0	3,317.8	3,708.9	3,472.5	21.8	22.7	-76.63	480.2	1,303.9	699.8	662.5	37.28	18.770		
3,600.0	3,409.8	3,802.4	3,559.4	22.7	23.4	-77.94	447.1	1,313.4	661.0	622.6	38.39	17.221		
3,700.0	3,501.8	3,902.9	3,652.0	23.5	24.1	-79.35	409.8	1,324.7	621.4	581.9	39.52	15.726		
3,800.0	3,593.8	3,990.7	3,732.7	24.3	24.8	-80.67	376.7	1,335.2	581.8	541.3	40.59	14.335		
3,900.0	3,685.8	4,080.7	3,815.2	25.2	25.4	-82.09	342.7	1,347.1	542.9	501.2	41.65	13.035		
4,000.0	3,777.8	4,166.0	3,893.3	26.0	26.1	-83.58	310.5	1,358.7	504.4	461.7	42.66	11.824		
4,100.0	3,869.8	4,252.6	3,973.2	26.9	26.7	-85.47	278.9	1,369.7	467.3	423.8	43.56	10.728		
4,200.0	3,961.8	4,341.9	4,056.4	27.7	27.3	-88.01	248.0	1,379.6	432.2	387.9	44.29	9.759		
4,300.0	4,053.8	4,436.4	4,144.6	28.6	27.9	-91.25	215.4	1,389.3	398.0	353.2	44.84	8.876		
4,400.0	4,145.8	4,524.8	4,226.8	29.4	28.5	-94.58	184.6	1,399.6	365.0	319.7	45.30	8.057		
4,500.0	4,237.8	4,615.7	4,311.3	30.3	29.2	-98.38	153.5	1,411.7	334.0	288.4	45.61	7.324		
4,600.0	4,329.8	4,715.6	4,403.6	31.1	29.9	-103.01	118.4	1,426.7	304.0	258.3	45.73	6.649		
4,700.0	4,421.8	4,806.5	4,487.0	32.0	30.6	-107.90	85.3	1,441.3	274.6	228.9	45.73	6.005		
4,800.0	4,513.8	4,898.3	4,571.4	32.8	31.2	-113.72	52.5	1,456.5	248.2	202.7	45.56	5.448		
4,900.0	4,605.8	4,991.0	4,656.7	33.7	31.9	-120.94	19.3	1,471.2	225.2	180.0	45.27	4.976		
5,000.0	4,697.8	5,080.9	4,739.6	34.5	32.6	-129.23	-12.6	1,485.1	207.2	162.1	45.06	4.597		
5,100.0	4,789.8	5,168.8	4,821.1	35.3	33.2	-138.39	-42.7	1,497.8	196.7	151.7	45.00	4.370		
5,158.6	4,843.7	5,219.2	4,868.4	35.8	33.5	-143.88	-59.1	1,504.5	194.8	149.8	45.03	4.327 CC, ES, SF		
5,200.0	4,881.8	5,254.3	4,901.4	36.2	33.7	-147.66	-69.9	1,508.9	195.8	150.7	45.08	4.343		
5,300.0	4,973.8	5,340.7	4,983.8	37.0	34.2	-156.47	-94.6	1,518.2	205.2	159.9	45.31	4.529		
5,400.0	5,065.8	5,428.9	5,068.5	37.9	34.7	-164.17	-117.4	1,526.5	222.7	176.8	45.83	4.858		
5,500.0	5,157.8	5,516.0	5,152.9	38.7	35.1	-170.31	-137.8	1,533.5	246.2	199.5	46.70	5.272		
5,600.0	5,249.8	5,602.7	5,237.8	39.6	35.5	-174.75	-154.5	1,538.8	274.9	227.1	47.75	5.756		
5,700.0	5,341.8	5,691.6	5,325.5	40.4	35.8	-177.92	-168.6	1,543.4	306.6	257.8	48.83	6.279		
5,800.0	5,433.8	5,781.3	5,414.4	41.3	36.0	-179.96	-179.8	1,547.1	340.4	290.6	49.81	6.833		
5,900.0	5,525.8	5,873.1	5,505.7	42.1	36.3	-178.53	-189.1	1,550.6	375.1	324.4	50.68	7.401		
6,000.0	5,617.8	5,963.7	5,595.9	43.0	36.5	-177.62	-196.4	1,553.7	410.4	359.0	51.43	7.981		
6,100.0	5,709.8	6,052.6	5,684.6	43.8	36.6	-177.06	-202.1	1,556.1	446.7	394.6	52.08	8.578		
6,200.0	5,801.8	6,142.6	5,774.5	44.7	36.8	-176.72	-206.7	1,557.9	483.7	431.1	52.66	9.186		
6,300.0	5,893.8	6,232.9	5,864.7	45.5	36.9	-176.57	-210.1	1,559.2	521.2	468.1	53.18	9.802		
6,400.0	5,985.8	6,325.2	5,956.9	46.4	37.0	-176.58	-212.2	1,560.5	559.0	505.4	53.63	10.422		
6,500.0	6,077.8	6,415.1	6,046.8	47.2	37.1	-176.65	-213.8	1,561.5	597.0	542.9	54.07	11.042		
6,600.0	6,169.8	6,505.0	6,136.7	48.1	37.2	-176.72	-215.1	1,562.1	635.4	580.9	54.50	11.660		
6,700.0	6,261.8	6,596.7	6,228.4	48.9	37.3	-176.78	-216.6	1,562.6	674.0	619.1	54.93	12.270		
6,800.0	6,353.8	6,687.0	6,318.6	49.7	37.4	-171.36	-218.3	1,562.8	712.7	657.7	55.02	12.954		
6,900.0	6,445.4	6,776.3	6,407.9	50.4	37.5	-152.74	-220.3	1,562.8	750.9	695.6	55.23	13.596		
7,000.0	6,535.1	6,865.7	6,497.3	51.1	37.6	-138.29	-222.5	1,562.6	788.4	732.6	55.74	14.144		
7,100.0	6,621.2	6,947.4	6,579.0	51.7	37.6	-127.92	-224.8	1,562.4	825.7	769.3	56.37	14.647		
7,200.0	6,702.4	7,023.8	6,655.4	52.2	37.7	-120.67	-227.1	1,561.8	863.9	806.9	57.06	15.141		
7,300.0	6,777.3	7,095.5	6,727.0	52.7	37.8	-115.51	-229.1	1,561.1	903.7	846.0	57.77	15.644		
7,400.0	6,844.5	7,160.9	6,792.4	53.1	37.9	-111.58	-231.0	1,560.5	945.7	887.2	58.50	16.166		
7,500.0	6,903.0	7,216.8	6,848.3	53.5	38.0	-108.13	-232.7	1,559.9	990.7	931.4	59.28	16.712		

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Spaur 10Y-241
Project:	SEC.10-T4N-R67W	TVD Reference:	WELL @ 4844.0ft (RKB - 13')
Reference Site:	Spaur 4N67W10LQ Pad Sec.10-T4N-R67W	MD Reference:	WELL @ 4844.0ft (RKB - 13')
Site Error:	0.0ft	North Reference:	True
Reference Well:	Spaur 10Y-241	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	EDM 2003.21 Single User Db
Reference Design:	Plan #1 (6-11-15)	Offset TVD Reference:	Offset Datum

Offset Design												Purvis 10TD Pad Sec. 10-T4N-R67W - Purvis 10WD - Wellbore #1 - Wellbore #1		Offset Site Error:	0.0 ft
Survey Program: 701-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)				
8,900.0	7,028.1	7,434.9	7,015.4	58.3	40.1	100.03	2,380.2	2,748.7	973.1	917.0	56.10	17.346			
9,000.0	7,027.3	7,431.8	7,012.2	58.9	40.1	99.07	2,380.3	2,748.8	875.1	817.2	57.95	15.101			
9,100.0	7,026.6	7,428.7	7,009.1	59.7	40.1	98.12	2,380.4	2,748.8	777.7	717.9	59.83	12.999			
9,200.0	7,025.8	7,425.6	7,006.0	60.4	40.1	97.17	2,380.4	2,748.9	681.0	619.3	61.73	11.032			
9,300.0	7,025.1	7,422.5	7,003.0	61.3	40.1	96.24	2,380.5	2,749.0	585.4	521.8	63.65	9.198			
9,400.0	7,024.3	7,419.5	7,000.0	62.2	40.1	95.31	2,380.6	2,749.0	491.6	426.0	65.58	7.496			
9,500.0	7,023.6	7,416.6	6,997.1	63.1	40.1	94.40	2,380.6	2,749.1	400.7	333.1	67.52	5.934			
9,600.0	7,022.8	7,413.7	6,994.1	64.1	40.1	93.49	2,380.7	2,749.2	315.3	245.8	69.46	4.539			
9,700.0	7,022.1	7,410.8	6,991.3	65.2	40.1	92.60	2,380.8	2,749.2	241.4	170.0	71.41	3.381			
9,800.0	7,021.3	7,407.9	6,988.4	66.3	40.1	91.71	2,380.8	2,749.3	192.7	119.3	73.35	2.627			
9,855.8	7,020.9	7,406.4	6,986.8	66.9	40.1	91.22	2,380.8	2,749.3	184.4	110.0	74.44	2.477 CC, ES, SF			
9,900.0	7,020.6	7,405.1	6,985.6	67.4	40.1	90.84	2,380.9	2,749.4	189.6	114.3	75.30	2.518			
10,000.0	7,019.8	7,402.3	6,982.8	68.6	40.1	89.97	2,380.9	2,749.4	234.0	156.8	77.24	3.030			
10,100.0	7,019.1	7,399.6	6,980.1	69.8	40.1	89.12	2,381.0	2,749.5	305.9	226.7	79.18	3.864			
10,200.0	7,018.3	7,396.9	6,977.4	71.1	40.1	88.28	2,381.0	2,749.5	390.3	309.2	81.10	4.813			
10,300.0	7,017.6	7,394.2	6,974.7	72.4	40.1	87.45	2,381.1	2,749.6	480.8	397.7	83.02	5.791			
10,400.0	7,016.8	7,391.5	6,972.0	73.7	40.1	86.63	2,381.1	2,749.6	574.4	489.4	84.94	6.762			
10,500.0	7,016.0	7,388.9	6,969.4	75.1	40.1	85.82	2,381.2	2,749.7	669.8	583.0	86.84	7.714			
10,600.0	7,015.3	7,386.3	6,966.8	76.5	40.1	85.03	2,381.2	2,749.7	766.4	677.7	88.72	8.638			
10,700.0	7,014.5	7,383.8	6,964.3	78.0	40.1	84.24	2,381.3	2,749.8	863.8	773.2	90.60	9.534			
10,800.0	7,013.8	7,381.2	6,961.7	79.4	40.1	83.47	2,381.3	2,749.9	961.7	869.2	92.46	10.401			

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Spaur 10Y-241
Project:	SEC.10-T4N-R67W	TVD Reference:	WELL @ 4844.0ft (RKB - 13')
Reference Site:	Spaur 4N67W10LQ Pad Sec.10-T4N-R67W	MD Reference:	WELL @ 4844.0ft (RKB - 13')
Site Error:	0.0ft	North Reference:	True
Reference Well:	Spaur 10Y-241	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	EDM 2003.21 Single User Db
Reference Design:	Plan #1 (6-11-15)	Offset TVD Reference:	Offset Datum

Offset Design Survey Program: 150-MWD													Offset Site Error: 0.0 ft	
Purvis 10TD Pad Sec. 10-T4N-R67W - Purvis 10XD - Wellbore #1 - Wellbore #1													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	
7,500.0	6,903.0	7,230.5	6,880.7	53.5	39.0	-3.23	990.2	2,743.0	964.1	911.2	52.95	18.207		
7,600.0	6,951.6	7,278.5	6,928.7	53.8	39.1	5.19	989.4	2,742.8	876.1	830.3	45.80	19.129		
7,700.0	6,989.7	7,316.4	6,966.6	54.1	39.1	19.12	988.7	2,742.7	783.2	741.2	42.00	18.648		
7,800.0	7,016.5	7,342.2	6,992.4	54.3	39.1	43.78	988.2	2,742.7	687.5	641.7	45.79	15.013		
7,900.0	7,031.6	7,355.1	7,005.3	54.5	39.1	75.50	988.0	2,742.7	590.8	541.5	49.30	11.985		
8,000.0	7,034.9	7,356.4	7,006.5	54.7	39.1	94.23	987.9	2,742.7	495.9	449.1	46.81	10.596		
8,100.0	7,034.1	7,353.6	7,003.7	54.9	39.1	93.33	988.0	2,742.7	404.2	356.3	47.89	8.440		
8,200.0	7,033.4	7,350.7	7,000.9	55.2	39.1	92.42	988.0	2,742.7	317.5	268.4	49.09	6.468		
8,300.0	7,032.6	7,347.9	6,998.1	55.4	39.1	91.51	988.1	2,742.7	241.3	190.9	50.38	4.789		
8,400.0	7,031.9	7,345.1	6,995.2	55.8	39.1	90.59	988.2	2,742.7	188.6	136.9	51.76	3.645		
8,463.1	7,031.4	7,343.2	6,993.4	56.0	39.1	90.01	988.2	2,742.7	177.8	125.1	52.67	3.375 CC, ES, SF		
8,500.0	7,031.1	7,342.2	6,992.4	56.2	39.1	89.68	988.2	2,742.7	181.5	128.3	53.20	3.412		
8,600.0	7,030.3	7,339.4	6,989.6	56.6	39.1	88.77	988.3	2,742.7	224.3	169.6	54.70	4.101		
8,700.0	7,029.6	7,336.6	6,986.8	57.1	39.1	87.88	988.3	2,742.7	296.0	239.8	56.24	5.264		
8,800.0	7,028.8	7,333.9	6,984.1	57.7	39.1	87.00	988.4	2,742.7	380.7	322.9	57.82	6.585		
8,900.0	7,028.1	7,331.2	6,981.4	58.3	39.1	86.13	988.4	2,742.7	471.4	412.0	59.43	7.932		
9,000.0	7,027.3	7,328.5	6,978.7	58.9	39.1	85.28	988.5	2,742.7	565.3	504.2	61.07	9.256		
9,100.0	7,026.6	7,325.9	6,976.1	59.7	39.1	84.43	988.6	2,742.7	660.9	598.2	62.73	10.536		
9,200.0	7,025.8	7,323.3	6,973.4	60.4	39.1	83.60	988.6	2,742.7	757.7	693.3	64.40	11.765		
9,300.0	7,025.1	7,320.7	6,970.9	61.3	39.1	82.78	988.7	2,742.7	855.2	789.1	66.08	12.941		
9,400.0	7,024.3	7,318.1	6,968.3	62.2	39.1	81.98	988.7	2,742.7	953.2	885.4	67.77	14.064		

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Spaur 10Y-241
Project:	SEC.10-T4N-R67W	TVD Reference:	WELL @ 4844.0ft (RKB - 13')
Reference Site:	Spaur 4N67W10LQ Pad Sec.10-T4N-R67W	MD Reference:	WELL @ 4844.0ft (RKB - 13')
Site Error:	0.0ft	North Reference:	True
Reference Well:	Spaur 10Y-241	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	EDM 2003.21 Single User Db
Reference Design:	Plan #1 (6-11-15)	Offset TVD Reference:	Offset Datum

Offset Design Spaur 4N67W10LQ Pad Sec.10-T4N-R67W - Spaur 10Q-321 - Wellbore #1 - Plan #3 (6-11-15)													Offset Site Error:	0.0 ft
Survey Program: 0-MWD													Offset Well Error:	0.0 ft
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Semi Major Axis (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
0.0	0.0	0.0	0.0	0.0	0.0	0.00	0.00	91.1	0.0	91.1				
100.0	100.0	98.0	98.0	0.1	0.1	0.00		91.1	0.0	91.1	90.9	0.19	470.417	
200.0	200.0	198.0	198.0	0.3	0.3	0.00		91.1	0.0	91.1	90.4	0.64	142.165 CC	
300.0	300.0	298.0	298.0	0.5	0.5	-97.44		91.1	0.0	91.2	90.2	1.08	84.619 ES	
400.0	399.9	397.9	397.9	0.8	0.8	-99.86		91.1	0.0	91.8	90.3	1.52	60.436	
500.0	499.7	497.7	497.7	1.0	1.0	-103.79		91.1	0.0	93.2	91.2	1.98	47.083	
600.0	599.3	597.3	597.3	1.2	1.2	-109.06		91.1	0.0	95.8	93.3	2.46	38.981	
700.0	698.6	696.6	696.6	1.5	1.4	-115.33		91.1	0.0	100.2	97.3	2.95	33.959	
800.0	797.5	795.5	795.5	1.9	1.7	-122.13		91.1	0.0	107.2	103.7	3.46	31.001	
900.0	896.1	894.1	894.1	2.2	1.9	-128.99		91.1	0.0	117.2	113.2	3.97	29.532	
1,000.0	994.2	992.2	992.2	2.6	2.1	-135.46		91.1	0.0	130.4	126.0	4.47	29.166 SF	
1,100.0	1,091.7	1,089.7	1,089.7	3.1	2.3	-141.28		91.1	0.0	147.1	142.2	4.97	29.613	
1,200.0	1,188.6	1,186.6	1,186.6	3.6	2.5	-146.34		91.1	0.0	167.2	161.8	5.46	30.652	
1,300.0	1,284.9	1,282.9	1,282.9	4.1	2.8	-150.65		91.1	0.0	190.6	184.7	5.94	32.115	
1,400.0	1,380.4	1,378.4	1,378.4	4.7	3.0	-154.28		91.1	0.0	217.2	210.8	6.41	33.878	
1,500.0	1,475.0	1,477.8	1,477.8	5.3	3.2	-157.41		90.9	0.8	246.1	239.2	6.88	35.789	
1,600.0	1,568.9	1,579.4	1,579.3	6.0	3.4	-159.95		90.3	4.1	275.5	268.2	7.33	37.597	
1,700.0	1,661.7	1,681.8	1,681.6	6.8	3.6	-162.03		89.3	10.2	305.2	297.4	7.79	39.202	
1,800.0	1,753.8	1,785.4	1,784.8	7.6	3.8	-163.83		87.7	19.1	334.7	326.4	8.28	40.440	
1,900.0	1,845.8	1,884.1	1,882.9	8.4	4.0	-165.24		85.9	29.7	362.6	353.8	8.79	41.271	
2,000.0	1,937.8	1,979.9	1,978.1	9.2	4.3	-166.40		84.1	40.0	390.5	381.2	9.30	41.973	
2,100.0	2,029.8	2,075.6	2,073.2	10.1	4.5	-167.41		82.3	50.4	418.6	408.8	9.83	42.594	
2,200.0	2,121.8	2,171.4	2,168.4	10.9	4.8	-168.29		80.5	60.7	446.7	436.4	10.35	43.148	
2,300.0	2,213.8	2,267.1	2,263.6	11.7	5.0	-169.07		78.7	71.1	475.0	464.1	10.88	43.647	
2,400.0	2,305.8	2,362.8	2,358.7	12.6	5.3	-169.76		76.9	81.4	503.3	491.9	11.42	44.087	
2,500.0	2,397.8	2,458.6	2,453.9	13.4	5.5	-170.38		75.1	91.8	531.7	519.7	11.95	44.482	
2,600.0	2,489.8	2,554.3	2,549.0	14.2	5.8	-170.94		73.3	102.2	560.1	547.6	12.49	44.837	
2,700.0	2,581.8	2,650.1	2,644.2	15.1	6.0	-171.44		71.5	112.5	588.6	575.5	13.03	45.157	
2,800.0	2,673.8	2,745.8	2,739.4	15.9	6.3	-171.89		69.7	122.9	617.1	603.5	13.58	45.447	
2,900.0	2,765.8	2,841.5	2,834.5	16.7	6.6	-172.31		67.9	133.2	645.6	631.5	14.12	45.709	
3,000.0	2,857.8	2,937.3	2,929.7	17.6	6.8	-172.69		66.1	143.6	674.2	659.5	14.67	45.947	
3,100.0	2,949.8	3,033.0	3,024.8	18.4	7.1	-173.04		64.3	153.9	702.8	687.6	15.22	46.165	
3,200.0	3,041.8	3,128.8	3,120.0	19.3	7.4	-173.36		62.5	164.3	731.4	715.6	15.78	46.363	
3,300.0	3,133.8	3,224.5	3,215.2	20.1	7.7	-173.66		60.7	174.7	760.0	743.7	16.33	46.544	
3,400.0	3,225.8	3,320.2	3,310.3	21.0	7.9	-173.94		58.9	185.0	788.7	771.8	16.88	46.711	
3,500.0	3,317.8	3,416.0	3,405.5	21.8	8.2	-174.19		57.1	195.4	817.4	799.9	17.44	46.864	
3,600.0	3,409.8	3,511.7	3,500.6	22.7	8.5	-174.43		55.3	205.7	846.0	828.1	18.00	47.005	
3,700.0	3,501.8	3,607.5	3,595.8	23.5	8.8	-174.66		53.5	216.1	874.7	856.2	18.56	47.135	
3,800.0	3,593.8	3,703.2	3,691.0	24.3	9.1	-174.87		51.7	226.4	903.5	884.3	19.12	47.255	
3,900.0	3,685.8	3,798.9	3,786.1	25.2	9.3	-175.06		49.9	236.8	932.2	912.5	19.68	47.367	
4,000.0	3,777.8	3,894.7	3,881.3	26.0	9.6	-175.25		48.1	247.2	960.9	940.7	20.24	47.470	
4,100.0	3,869.8	3,990.4	3,976.5	26.9	9.9	-175.42		46.3	257.5	989.6	968.8	20.81	47.567	

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Spaur 10Y-241
Project:	SEC.10-T4N-R67W	TVD Reference:	WELL @ 4844.0ft (RKB - 13')
Reference Site:	Spaur 4N67W10LQ Pad Sec.10-T4N-R67W	MD Reference:	WELL @ 4844.0ft (RKB - 13')
Site Error:	0.0ft	North Reference:	True
Reference Well:	Spaur 10Y-241	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	EDM 2003.21 Single User Db
Reference Design:	Plan #1 (6-11-15)	Offset TVD Reference:	Offset Datum

Offset Design Spaur 4N67W10LQ Pad Sec.10-T4N-R67W - Spaur 10Q-401 - Wellbore #1 - Plan #2 (6-11-15)													Offset Site Error:	0.0 ft
Survey Program: 0-MWD													Offset Well Error:	0.0 ft
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference	Offset	Semi Major Axis	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+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	1.51	105.6	2.8	105.7					
100.0	100.0	98.0	98.0	0.1	0.1	1.51	105.6	2.8	105.7	105.5	0.19	545.923		
200.0	200.0	198.0	198.0	0.3	0.3	1.51	105.6	2.8	105.7	105.0	0.64	164.984 CC		
300.0	300.0	298.0	298.0	0.5	0.5	-95.81	105.6	2.8	105.8	104.7	1.08	98.145 ES		
400.0	399.9	397.9	397.9	0.8	0.8	-97.91	105.6	2.8	106.3	104.8	1.52	69.953		
500.0	499.7	497.7	497.7	1.0	1.0	-101.35	105.6	2.8	107.4	105.4	1.98	54.258		
600.0	599.3	597.3	597.3	1.2	1.2	-105.99	105.6	2.8	109.6	107.1	2.46	44.563		
700.0	698.6	696.6	696.6	1.5	1.4	-111.63	105.6	2.8	113.4	110.4	2.96	38.341		
800.0	797.5	795.5	795.5	1.9	1.7	-117.90	105.6	2.8	119.4	116.0	3.47	34.417		
900.0	896.1	894.1	894.1	2.2	1.9	-124.43	105.6	2.8	128.3	124.3	3.99	32.150		
1,000.0	894.2	892.2	892.2	2.6	2.1	-130.80	105.6	2.8	140.4	135.9	4.51	31.125		
1,100.0	1,091.7	1,089.7	1,089.7	3.1	2.3	-136.72	105.6	2.8	155.9	150.8	5.02	31.038 SF		
1,200.0	1,188.6	1,186.6	1,186.6	3.6	2.5	-142.02	105.6	2.8	174.8	169.3	5.52	31.652		
1,300.0	1,284.9	1,282.9	1,282.9	4.1	2.8	-146.63	105.6	2.8	197.2	191.1	6.01	32.781		
1,400.0	1,380.4	1,378.4	1,378.4	4.7	3.0	-150.59	105.6	2.8	222.8	216.3	6.50	34.287		
1,500.0	1,475.0	1,473.0	1,473.0	5.3	3.2	-153.96	105.6	2.8	251.6	244.6	6.98	36.063		
1,600.0	1,568.9	1,566.9	1,566.9	6.0	3.4	-156.80	105.6	2.8	283.4	275.9	7.45	38.032		
1,700.0	1,661.7	1,659.7	1,659.7	6.8	3.6	-159.21	105.6	2.8	318.1	310.2	7.93	40.138		
1,800.0	1,753.8	1,751.8	1,751.8	7.6	3.8	-161.36	105.6	2.8	355.1	346.7	8.41	42.206		
1,900.0	1,845.8	1,843.8	1,843.8	8.4	4.0	-163.18	105.6	2.8	392.8	383.8	8.92	44.045		
2,000.0	1,937.8	1,935.8	1,935.8	9.2	4.2	-164.68	105.6	2.8	430.6	421.2	9.42	45.701		
2,100.0	2,029.8	2,031.3	2,031.3	10.1	4.4	-165.99	105.6	2.9	468.6	458.7	9.93	47.196		
2,200.0	2,121.8	2,136.2	2,136.2	10.9	4.6	-167.31	104.0	4.6	505.1	494.6	10.42	48.472		
2,300.0	2,213.8	2,242.8	2,242.6	11.7	4.8	-168.59	100.4	8.4	539.3	528.4	10.90	49.492		
2,400.0	2,305.8	2,351.1	2,350.6	12.6	5.0	-169.86	94.6	14.5	571.4	560.0	11.38	50.200		
2,500.0	2,397.8	2,455.2	2,454.2	13.4	5.3	-171.07	87.2	22.4	601.4	589.6	11.87	50.669		
2,600.0	2,489.8	2,550.1	2,548.5	14.2	5.5	-172.09	80.0	30.0	631.2	618.8	12.36	51.052		
2,700.0	2,581.8	2,645.0	2,642.8	15.1	5.7	-173.01	72.9	37.6	661.1	648.2	12.87	51.376		
2,800.0	2,673.8	2,739.9	2,737.1	15.9	5.9	-173.86	65.7	45.2	691.1	677.8	13.38	51.670		
2,900.0	2,765.8	2,834.8	2,831.5	16.7	6.1	-174.64	58.6	52.7	721.3	707.4	13.90	51.910		
3,000.0	2,857.8	2,929.7	2,925.8	17.6	6.3	-175.35	51.4	60.3	751.6	737.2	14.42	52.112		
3,100.0	2,949.8	3,024.6	3,020.1	18.4	6.6	-176.01	44.3	67.9	782.0	767.0	14.96	52.281		
3,200.0	3,041.8	3,119.5	3,114.4	19.3	6.8	-176.62	37.1	75.5	812.5	797.0	15.50	52.420		
3,300.0	3,133.8	3,214.4	3,208.7	20.1	7.1	-177.19	30.0	83.1	843.0	827.0	16.05	52.534		
3,400.0	3,225.8	3,309.3	3,303.1	21.0	7.3	-177.72	22.8	90.7	873.6	857.0	16.60	52.625		
3,500.0	3,317.8	3,404.2	3,397.4	21.8	7.6	-178.21	15.7	98.3	904.3	887.2	17.16	52.697		
3,600.0	3,409.8	3,499.1	3,491.7	22.7	7.8	-178.67	8.5	105.9	935.1	917.4	17.73	52.751		
3,700.0	3,501.8	3,594.0	3,586.0	23.5	8.1	-179.10	1.4	113.4	965.9	947.6	18.30	52.791		
3,800.0	3,593.8	3,688.9	3,680.4	24.3	8.3	-179.50	-5.8	121.0	996.7	977.8	18.87	52.818		

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Spaur 10Y-241
Project:	SEC.10-T4N-R67W	TVD Reference:	WELL @ 4844.0ft (RKB - 13')
Reference Site:	Spaur 4N67W10LQ Pad Sec.10-T4N-R67W	MD Reference:	WELL @ 4844.0ft (RKB - 13')
Site Error:	0.0ft	North Reference:	True
Reference Well:	Spaur 10Y-241	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	EDM 2003.21 Single User Db
Reference Design:	Plan #1 (6-11-15)	Offset TVD Reference:	Offset Datum

Offset Design Spaur 4N67W10LQ Pad Sec.10-T4N-R67W - Spaur 10T-201 - Wellbore #1 - Plan #1 (6-11-15)													Offset Site Error:	0.0 ft
Survey Program: 0-MWD													Offset Well Error:	0.0 ft
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference	Offset	Semi Major Axis	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+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	0.00	0.00	43.7	0.0	43.7				
100.0	100.0	99.0	99.0	0.1	0.1	0.00	0.00	43.7	0.0	43.7	43.5	0.19	224.686	
200.0	200.0	199.0	199.0	0.3	0.3	0.00	0.00	43.7	0.0	43.7	43.1	0.64	68.007 CC	
300.0	300.0	299.0	299.0	0.5	0.5	-98.32	0.00	43.7	0.0	43.9	42.8	1.08	40.622 ES	
400.0	399.9	398.9	398.9	0.8	0.8	-103.30	0.00	43.7	0.0	44.6	43.1	1.52	29.328	
500.0	499.7	498.7	498.7	1.0	1.0	-111.11	0.00	43.7	0.0	46.6	44.6	1.98	23.521	
600.0	599.3	598.3	598.3	1.2	1.2	-120.74	0.00	43.7	0.0	50.6	48.1	2.45	20.638	
700.0	698.6	697.6	697.6	1.5	1.4	-130.73	0.00	43.7	0.0	57.5	54.6	2.93	19.638	
800.0	797.5	796.5	796.5	1.9	1.7	-139.82	0.00	43.7	0.0	67.8	64.4	3.40	19.918	
900.0	896.1	896.9	896.9	2.2	1.9	-147.07	0.00	43.5	1.2	80.5	76.6	3.86	20.853	
1,000.0	894.2	897.7	897.6	2.6	2.1	-152.37	0.00	42.9	5.0	94.0	89.7	4.30	21.862	
1,100.0	1,091.7	1,098.9	1,098.6	3.1	2.3	-156.37	0.00	41.8	11.5	108.1	103.3	4.75	22.754	
1,200.0	1,188.6	1,200.6	1,199.8	3.6	2.5	-159.49	0.00	40.3	20.7	122.5	117.3	5.21	23.510	
1,300.0	1,284.9	1,302.7	1,301.2	4.1	2.8	-162.00	0.00	38.4	32.6	137.1	131.4	5.68	24.134	
1,400.0	1,380.4	1,405.2	1,402.7	4.7	3.1	-164.06	0.00	36.0	47.2	151.8	145.6	6.16	24.636	
1,500.0	1,475.0	1,508.2	1,504.1	5.3	3.4	-165.80	0.00	33.2	64.6	166.5	159.9	6.65	25.028	
1,600.0	1,568.9	1,611.6	1,605.5	6.0	3.8	-167.28	0.00	29.9	84.8	181.3	174.2	7.16	25.322	
1,700.0	1,661.7	1,715.5	1,706.8	6.8	4.2	-168.58	0.00	26.2	107.8	196.1	188.4	7.68	25.527	
1,800.0	1,753.8	1,819.9	1,807.8	7.6	4.6	-169.72	0.00	21.9	133.6	210.4	202.1	8.25	25.512	
1,900.0	1,845.8	1,925.1	1,908.9	8.4	5.2	-170.66	0.00	17.3	162.4	222.2	213.3	8.84	25.145	
2,000.0	1,937.8	2,024.9	2,004.3	9.2	5.7	-171.41	0.00	12.6	191.1	232.5	223.1	9.43	24.649	
2,100.0	2,029.8	2,124.3	2,099.4	10.1	6.3	-172.10	0.00	7.9	219.8	242.8	232.8	10.03	24.200	
2,200.0	2,121.8	2,223.7	2,194.5	10.9	6.8	-172.73	0.00	3.2	248.4	253.2	242.6	10.64	23.796	
2,300.0	2,213.8	2,323.1	2,289.6	11.7	7.4	-173.31	0.00	-1.4	277.1	263.6	252.4	11.25	23.428	
2,400.0	2,305.8	2,422.6	2,384.7	12.6	8.0	-173.85	0.00	-6.1	305.7	274.1	262.2	11.87	23.092	
2,500.0	2,397.8	2,522.0	2,479.8	13.4	8.6	-174.35	0.00	-10.8	334.4	284.5	272.0	12.49	22.785	
2,600.0	2,489.8	2,621.4	2,574.9	14.2	9.2	-174.81	0.00	-15.4	363.1	295.0	281.9	13.11	22.502	
2,700.0	2,581.8	2,720.8	2,670.0	15.1	9.8	-175.24	0.00	-20.1	391.7	305.5	291.7	13.73	22.241	
2,800.0	2,673.8	2,820.3	2,765.0	15.9	10.4	-175.65	0.00	-24.8	420.4	316.0	301.6	14.36	21.999	
2,900.0	2,765.8	2,919.7	2,860.1	16.7	11.0	-176.02	0.00	-29.5	449.0	326.5	311.5	14.99	21.775	
3,000.0	2,857.8	3,019.1	2,955.2	17.6	11.6	-176.37	0.00	-34.1	477.7	337.0	321.4	15.63	21.565	
3,100.0	2,949.8	3,118.5	3,050.3	18.4	12.2	-176.71	0.00	-38.8	506.3	347.6	331.3	16.27	21.370	
3,200.0	3,041.8	3,218.0	3,145.4	19.3	12.8	-177.02	0.00	-43.5	535.0	358.1	341.2	16.90	21.186	
3,300.0	3,133.8	3,317.4	3,240.5	20.1	13.4	-177.31	0.00	-48.1	563.7	368.7	351.2	17.55	21.014	
3,400.0	3,225.8	3,416.8	3,335.6	21.0	14.0	-177.59	0.00	-52.8	592.3	379.3	361.1	18.19	20.853	
3,500.0	3,317.8	3,516.2	3,430.7	21.8	14.6	-177.85	0.00	-57.5	621.0	389.9	371.0	18.83	20.700	
3,600.0	3,409.8	3,615.6	3,525.8	22.7	15.2	-178.10	0.00	-62.1	649.6	400.5	381.0	19.48	20.556	
3,700.0	3,501.8	3,715.1	3,620.8	23.5	15.8	-178.34	0.00	-66.8	678.3	411.1	390.9	20.13	20.420	
3,800.0	3,593.8	3,814.5	3,715.9	24.3	16.5	-178.56	0.00	-71.5	706.9	421.7	400.9	20.78	20.291	
3,900.0	3,685.8	3,913.9	3,811.0	25.2	17.1	-178.78	0.00	-76.2	735.6	432.3	410.9	21.43	20.168	
4,000.0	3,777.8	4,013.3	3,906.1	26.0	17.7	-178.98	0.00	-80.8	764.3	442.9	420.8	22.09	20.052	
4,100.0	3,869.8	4,112.8	4,001.2	26.9	18.3	-179.17	0.00	-85.5	792.9	453.5	430.8	22.74	19.941	
4,200.0	3,961.8	4,212.2	4,096.3	27.7	18.9	-179.36	0.00	-90.2	821.6	464.2	440.8	23.40	19.836	
4,300.0	4,053.8	4,311.6	4,191.4	28.6	19.5	-179.53	0.00	-94.8	850.2	474.8	450.7	24.06	19.735	
4,400.0	4,145.8	4,411.0	4,286.5	29.4	20.1	-179.70	0.00	-99.5	878.9	485.4	460.7	24.72	19.639	
4,500.0	4,237.8	4,510.4	4,381.6	30.3	20.8	-179.86	0.00	-104.2	907.5	496.1	470.7	25.38	19.547	
4,600.0	4,329.8	4,609.9	4,476.6	31.1	21.4	-179.98	0.00	-108.8	936.2	506.7	480.7	26.04	19.459	
4,700.0	4,421.8	4,709.3	4,571.7	32.0	22.0	-179.83	0.00	-113.5	964.9	517.4	490.7	26.70	19.375	
4,800.0	4,513.8	4,808.7	4,666.8	32.8	22.6	-179.69	0.00	-118.2	993.5	528.0	500.6	27.37	19.295	
4,900.0	4,605.8	4,908.1	4,761.9	33.7	23.2	-179.56	0.00	-122.9	1,022.2	538.7	510.6	28.03	19.217	
5,000.0	4,697.8	5,007.6	4,857.0	34.5	23.9	-179.42	0.00	-127.5	1,050.8	549.3	520.6	28.70	19.143	

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 Spaur 10Y-241
Project:	SEC.10-T4N-R67W	TVD Reference:	WELL @ 4844.0ft (RKB - 13')
Reference Site:	Spaur 4N67W10LQ Pad Sec.10-T4N-R67W	MD Reference:	WELL @ 4844.0ft (RKB - 13')
Site Error:	0.0ft	North Reference:	True
Reference Well:	Spaur 10Y-241	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	EDM 2003.21 Single User Db
Reference Design:	Plan #1 (6-11-15)	Offset TVD Reference:	Offset Datum

Offset Design Spaur 4N67W10LQ Pad Sec.10-T4N-R67W - Spaur 10T-201 - Wellbore #1 - Plan #1 (6-11-15)													Offset Site Error:	0.0 ft
Survey Program: 0-MWD													Offset Well Error:	0.0 ft
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference	Offset	Semi Major Axis	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
5,100.0	4,789.8	5,107.0	4,952.1	35.3	24.5	179.30		-132.2	1,079.5	560.0	530.6	29.36	19.071	
5,200.0	4,881.8	5,206.4	5,047.2	36.2	25.1	179.18		-136.9	1,108.1	570.6	540.6	30.03	19.003	
5,300.0	4,973.8	5,305.8	5,142.3	37.0	25.7	179.06		-141.5	1,136.8	581.3	550.6	30.70	18.937	
5,400.0	5,065.8	5,405.3	5,237.3	37.9	26.3	178.95		-146.2	1,165.4	592.0	560.6	31.37	18.873	
5,500.0	5,157.8	5,504.7	5,332.4	38.7	26.9	178.84		-150.9	1,194.1	602.7	570.6	32.04	18.812	
5,600.0	5,249.8	5,604.1	5,427.5	39.6	27.6	178.73		-155.5	1,222.8	613.3	580.6	32.71	18.752	
5,700.0	5,341.8	5,703.5	5,522.6	40.4	28.2	178.63		-160.2	1,251.4	624.0	590.6	33.38	18.695	
5,800.0	5,433.8	5,802.9	5,617.7	41.3	28.8	178.53		-164.9	1,280.1	634.7	600.6	34.05	18.640	
5,900.0	5,525.8	5,902.4	5,712.8	42.1	29.4	178.44		-169.6	1,308.7	645.4	610.6	34.72	18.587	
6,000.0	5,617.8	6,001.8	5,807.9	43.0	30.1	178.35		-174.2	1,337.4	656.0	620.6	35.39	18.535	
6,100.0	5,709.8	6,101.2	5,903.0	43.8	30.7	178.26		-178.9	1,366.0	666.7	630.6	36.07	18.485	
6,200.0	5,801.8	6,200.6	5,998.1	44.7	31.3	178.17		-183.6	1,394.7	677.4	640.7	36.74	18.437	
6,300.0	5,893.8	6,300.1	6,093.1	45.5	31.9	178.09		-188.2	1,423.4	688.1	650.7	37.42	18.390	
6,400.0	5,985.8	6,399.5	6,188.2	46.4	32.5	178.01		-192.9	1,452.0	698.8	660.7	38.09	18.345	
6,500.0	6,077.8	6,498.0	6,282.5	47.2	33.1	177.94		-197.4	1,480.4	709.5	670.7	38.76	18.304	
6,600.0	6,169.8	6,590.5	6,370.9	48.1	33.6	178.44		-194.5	1,507.1	720.7	681.5	39.29	18.343	
6,700.0	6,261.8	6,680.0	6,455.6	48.9	34.0	179.75		-181.2	1,532.7	733.3	693.5	39.74	18.451	
6,800.0	6,353.8	6,765.1	6,534.2	49.7	34.4	-167.62		-159.0	1,556.4	747.4	707.1	40.30	18.549	
6,900.0	6,445.4	6,850.0	6,609.8	50.4	34.8	-148.20		-127.8	1,579.2	762.3	721.1	41.24	18.487	
7,000.0	6,535.1	6,928.5	6,676.2	51.1	35.1	-132.33		-91.4	1,599.4	777.3	734.9	42.42	18.326	
7,100.0	6,621.2	7,007.8	6,739.4	51.7	35.3	-120.23		-47.6	1,618.5	792.0	748.3	43.67	18.135	
7,200.0	6,702.4	7,085.8	6,797.1	52.2	35.6	-111.24		2.0	1,636.0	805.9	761.1	44.81	17.984	
7,300.0	6,777.3	7,162.9	6,849.0	52.7	35.8	-104.54		56.8	1,651.8	818.7	773.0	45.70	17.914	
7,400.0	6,844.5	7,239.2	6,894.9	53.1	36.0	-99.54		116.1	1,665.8	830.0	783.7	46.28	17.933	
7,500.0	6,903.0	7,315.0	6,934.6	53.5	36.2	-95.83		179.4	1,677.9	839.6	793.1	46.54	18.040	
7,600.0	6,951.6	7,390.3	6,967.9	53.8	36.4	-93.14		246.2	1,688.1	847.2	800.6	46.61	18.176	
7,700.0	6,989.7	7,465.4	6,994.8	54.1	36.6	-91.31		315.8	1,696.3	852.8	806.2	46.60	18.302	
7,800.0	7,016.5	7,540.5	7,014.9	54.3	36.8	-90.24		387.7	1,702.6	856.2	809.5	46.64	18.357	
7,900.0	7,031.6	7,615.5	7,028.2	54.5	37.0	-89.84		461.5	1,706.7	857.3	810.4	46.89	18.284	
8,000.0	7,034.9	7,690.8	7,034.5	54.7	37.2	-90.05		536.4	1,708.8	856.2	808.6	47.60	17.990	
8,062.4	7,034.4	7,741.8	7,034.9	54.8	37.4	-90.10		587.5	1,709.0	855.9	807.3	48.62	17.605	
8,100.0	7,034.1	7,779.4	7,034.6	54.9	37.5	-90.10		625.0	1,709.0	855.9	806.6	49.30	17.361	
8,200.0	7,033.4	7,879.4	7,033.8	55.2	37.9	-90.10		725.0	1,709.0	855.9	804.6	51.28	16.690	
8,300.0	7,032.6	7,979.4	7,033.1	55.4	38.4	-90.10		825.0	1,709.0	855.9	802.5	53.46	16.011	
8,400.0	7,031.9	8,079.4	7,032.3	55.8	39.0	-90.10		925.0	1,709.0	855.9	800.1	55.81	15.336	
8,500.0	7,031.1	8,179.4	7,031.6	56.2	39.7	-90.10		1,025.0	1,709.0	855.9	797.6	58.32	14.675	
8,600.0	7,030.3	8,279.4	7,030.8	56.6	40.4	-90.10		1,125.0	1,709.0	855.9	794.9	60.97	14.037	
8,700.0	7,029.6	8,379.4	7,030.1	57.1	41.3	-90.10		1,225.0	1,709.0	855.9	792.2	63.75	13.427	
8,800.0	7,028.8	8,479.4	7,029.3	57.7	42.2	-90.10		1,325.0	1,709.0	855.9	789.3	66.62	12.847	
8,900.0	7,028.1	8,579.4	7,028.6	58.3	43.2	-90.10		1,425.0	1,709.0	855.9	786.3	69.59	12.299	
9,000.0	7,027.3	8,679.4	7,027.8	58.9	44.3	-90.10		1,525.0	1,709.0	855.9	783.3	72.64	11.782	
9,100.0	7,026.6	8,779.4	7,027.1	59.7	45.5	-90.10		1,625.0	1,709.0	855.9	780.1	75.77	11.297	
9,200.0	7,025.8	8,879.4	7,026.3	60.4	46.7	-90.10		1,725.0	1,709.0	855.9	777.0	78.95	10.841	
9,300.0	7,025.1	8,979.4	7,025.5	61.3	48.0	-90.10		1,825.0	1,709.0	855.9	773.7	82.19	10.413	
9,400.0	7,024.3	9,079.4	7,024.8	62.2	49.3	-90.10		1,925.0	1,709.0	855.9	770.4	85.49	10.012	
9,500.0	7,023.6	9,179.4	7,024.0	63.1	50.7	-90.10		2,025.0	1,709.0	855.9	767.1	88.82	9.637	
9,600.0	7,022.8	9,279.4	7,023.3	64.1	52.1	-90.10		2,125.0	1,709.0	855.9	763.7	92.19	9.284	
9,700.0	7,022.1	9,379.4	7,022.5	65.2	53.5	-90.10		2,225.0	1,709.0	855.9	760.3	95.60	8.953	
9,800.0	7,021.3	9,479.4	7,021.8	66.3	55.0	-90.10		2,325.0	1,709.0	855.9	756.9	99.04	8.642	
9,900.0	7,020.6	9,579.4	7,021.0	67.4	56.5	-90.10		2,425.0	1,709.0	855.9	753.4	102.51	8.350	
10,000.0	7,019.8	9,679.4	7,020.3	68.6	58.1	-90.10		2,525.0	1,709.0	855.9	749.9	106.00	8.074	

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 Spaur 10Y-241
Project:	SEC.10-T4N-R67W	TVD Reference:	WELL @ 4844.0ft (RKB - 13')
Reference Site:	Spaur 4N67W10LQ Pad Sec.10-T4N-R67W	MD Reference:	WELL @ 4844.0ft (RKB - 13')
Site Error:	0.0ft	North Reference:	True
Reference Well:	Spaur 10Y-241	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	EDM 2003.21 Single User Db
Reference Design:	Plan #1 (6-11-15)	Offset TVD Reference:	Offset Datum

Offset Design Spaur 4N67W10LQ Pad Sec.10-T4N-R67W - Spaur 10T-201 - Wellbore #1 - Plan #1 (6-11-15)												Offset Site Error:	0.0 ft
Survey Program: 0-MWD												Offset Well Error:	0.0 ft
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference	Offset	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
10,100.0	7,019.1	9,779.4	7,019.5	69.8	59.6	-90.10	2,625.0	1,709.0	855.9	746.4	109.52	7.815	
10,200.0	7,018.3	9,879.4	7,018.8	71.1	61.2	-90.10	2,725.0	1,709.0	855.9	742.9	113.06	7.571	
10,300.0	7,017.6	9,979.4	7,018.0	72.4	62.8	-90.10	2,825.0	1,709.0	855.9	739.3	116.62	7.340	
10,400.0	7,016.8	10,079.4	7,017.2	73.7	64.5	-90.10	2,925.0	1,709.0	855.9	735.7	120.19	7.121	
10,500.0	7,016.0	10,179.4	7,016.5	75.1	66.1	-90.10	3,025.0	1,709.0	855.9	732.1	123.78	6.915	
10,600.0	7,015.3	10,279.4	7,015.7	76.5	67.8	-90.10	3,125.0	1,709.0	855.9	728.5	127.38	6.719	
10,700.0	7,014.5	10,379.4	7,015.0	78.0	69.5	-90.10	3,225.0	1,709.0	855.9	724.9	131.00	6.534	
10,800.0	7,013.8	10,479.4	7,014.2	79.4	71.2	-90.10	3,325.0	1,709.0	855.9	721.3	134.63	6.357	
10,900.0	7,013.0	10,579.4	7,013.5	80.9	72.9	-90.10	3,425.0	1,709.0	855.9	717.6	138.27	6.190	
11,000.0	7,012.3	10,679.4	7,012.7	82.4	74.6	-90.10	3,525.0	1,709.0	855.9	714.0	141.93	6.031	
11,100.0	7,011.5	10,779.4	7,012.0	83.9	76.3	-90.10	3,625.0	1,709.0	855.9	710.3	145.59	5.879	
11,200.0	7,010.8	10,879.4	7,011.2	85.5	78.0	-90.10	3,725.0	1,709.0	855.9	706.7	149.26	5.735	
11,300.0	7,010.0	10,979.4	7,010.4	87.1	79.8	-90.10	3,825.0	1,709.0	855.9	703.0	152.94	5.597	
11,400.0	7,009.3	11,079.4	7,009.7	88.6	81.5	-90.10	3,924.9	1,709.0	855.9	699.3	156.62	5.465	
11,500.0	7,008.5	11,179.4	7,008.9	90.2	83.3	-90.10	4,024.9	1,709.0	855.9	695.6	160.31	5.339	
11,600.0	7,007.8	11,279.4	7,008.2	91.9	85.1	-90.10	4,124.9	1,709.0	855.9	691.9	164.01	5.219	
11,700.0	7,007.0	11,379.4	7,007.4	93.5	86.9	-90.10	4,224.9	1,709.0	855.9	688.2	167.72	5.103	
11,800.0	7,006.3	11,479.4	7,006.7	95.1	88.6	-90.09	4,324.9	1,709.0	855.9	684.5	171.43	4.993	
11,900.0	7,005.5	11,579.4	7,005.9	96.8	90.4	-90.09	4,424.9	1,709.0	855.9	680.8	175.15	4.887	
11,967.1	7,005.0	11,646.6	7,005.4	97.9	91.6	-90.09	4,492.1	1,709.0	855.9	678.3	177.65	4.818 SF	

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Spaur 10Y-241
Project:	SEC.10-T4N-R67W	TVD Reference:	WELL @ 4844.0ft (RKB - 13')
Reference Site:	Spaur 4N67W10LQ Pad Sec.10-T4N-R67W	MD Reference:	WELL @ 4844.0ft (RKB - 13')
Site Error:	0.0ft	North Reference:	True
Reference Well:	Spaur 10Y-241	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	EDM 2003.21 Single User Db
Reference Design:	Plan #1 (6-11-15)	Offset TVD Reference:	Offset Datum

Offset Design Spaur 4N67W10LQ Pad Sec.10-T4N-R67W - Spaur 10T-241 - Wellbore #1 - Plan #2 (6-11-15)													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	
0.0	0.0	0.0	0.0	0.0	0.0	0.00	72.9	0.0	72.9					
100.0	100.0	99.0	99.0	0.1	0.1	0.00	72.9	0.0	72.9	72.7	0.19	374.455		
200.0	200.0	199.0	199.0	0.3	0.3	0.00	72.9	0.0	72.9	72.2	0.64	113.338 CC		
300.0	300.0	299.0	299.0	0.5	0.5	-97.64	72.9	0.0	73.0	71.9	1.08	67.588 ES		
400.0	399.9	398.9	398.9	0.8	0.8	-100.66	72.9	0.0	73.6	72.1	1.52	48.402		
500.0	499.7	498.7	498.7	1.0	1.0	-105.53	72.9	0.0	75.1	73.2	1.98	37.932		
600.0	599.3	598.3	598.3	1.2	1.2	-111.95	72.9	0.0	78.1	75.6	2.46	31.778		
700.0	698.6	697.6	697.6	1.5	1.4	-119.37	72.9	0.0	83.2	80.3	2.95	28.229		
800.0	797.5	796.5	796.5	1.9	1.7	-127.11	72.9	0.0	91.2	87.7	3.44	26.462		
900.0	896.1	895.1	895.1	2.2	1.9	-134.51	72.9	0.0	102.3	98.4	3.94	25.975 SF		
1,000.0	894.2	893.2	893.2	2.6	2.1	-141.15	72.9	0.0	117.0	112.5	4.43	26.412		
1,100.0	1,091.7	1,090.7	1,090.7	3.1	2.3	-146.85	72.9	0.0	135.0	130.1	4.91	27.503		
1,200.0	1,188.6	1,187.6	1,187.6	3.6	2.5	-151.60	72.9	0.0	156.3	150.9	5.38	29.048		
1,300.0	1,284.9	1,287.9	1,287.9	4.1	2.8	-155.59	72.6	1.0	179.9	174.0	5.84	30.807		
1,400.0	1,380.4	1,389.4	1,389.3	4.7	3.0	-158.82	71.4	4.5	203.9	197.7	6.28	32.480		
1,500.0	1,475.0	1,491.6	1,491.3	5.3	3.2	-161.50	69.5	10.6	228.3	221.6	6.73	33.952		
1,600.0	1,568.9	1,594.6	1,593.9	6.0	3.4	-163.77	66.7	19.4	253.0	245.8	7.18	35.228		
1,700.0	1,661.7	1,698.2	1,696.8	6.8	3.6	-165.76	63.0	30.9	277.7	270.1	7.65	36.328		
1,800.0	1,753.8	1,802.8	1,800.3	7.6	3.9	-167.55	58.5	45.2	302.1	294.0	8.14	37.101		
1,900.0	1,845.8	1,908.7	1,904.6	8.4	4.2	-169.12	53.0	62.5	324.3	315.6	8.67	37.395		
2,000.0	1,937.8	2,015.3	2,009.1	9.2	4.6	-170.49	46.6	82.6	343.8	334.6	9.21	37.321		
2,100.0	2,029.8	2,113.3	2,104.9	10.1	4.9	-171.61	40.4	102.3	362.4	352.6	9.75	37.150		
2,200.0	2,121.8	2,211.3	2,200.8	10.9	5.3	-172.63	34.2	121.9	381.0	370.7	10.30	36.979		
2,300.0	2,213.8	2,309.4	2,296.6	11.7	5.7	-173.55	27.9	141.5	399.7	388.9	10.86	36.804		
2,400.0	2,305.8	2,407.4	2,392.5	12.6	6.1	-174.39	21.7	161.2	418.6	407.1	11.43	36.631		
2,500.0	2,397.8	2,505.4	2,488.3	13.4	6.5	-175.16	15.5	180.8	437.5	425.5	12.00	36.460		
2,600.0	2,489.8	2,603.5	2,584.1	14.2	6.9	-175.87	9.2	200.5	456.5	443.9	12.58	36.291		
2,700.0	2,581.8	2,701.5	2,680.0	15.1	7.3	-176.52	3.0	220.1	475.5	462.3	13.16	36.124		
2,800.0	2,673.8	2,799.5	2,775.8	15.9	7.7	-177.11	-3.2	239.8	494.6	480.9	13.75	35.960		
2,900.0	2,765.8	2,897.6	2,871.7	16.7	8.1	-177.67	-9.5	259.4	513.8	499.4	14.35	35.798		
3,000.0	2,857.8	2,995.6	2,967.5	17.6	8.5	-178.18	-15.7	279.1	533.0	518.0	14.95	35.640		
3,100.0	2,949.8	3,093.6	3,063.3	18.4	9.0	-178.66	-21.9	298.7	552.2	536.6	15.56	35.485		
3,200.0	3,041.8	3,191.7	3,159.2	19.3	9.4	-179.11	-28.2	318.4	571.4	555.3	16.17	35.333		
3,300.0	3,133.8	3,289.7	3,255.0	20.1	9.8	-179.52	-34.4	338.0	590.7	574.0	16.79	35.186		
3,400.0	3,225.8	3,387.7	3,350.9	21.0	10.3	-179.92	-40.6	357.7	610.1	592.7	17.41	35.042		
3,500.0	3,317.8	3,485.8	3,446.7	21.8	10.7	-179.72	-46.9	377.3	629.4	611.4	18.03	34.903		
3,600.0	3,409.8	3,583.8	3,542.5	22.7	11.2	-179.37	-53.1	397.0	648.8	630.1	18.66	34.767		
3,700.0	3,501.8	3,681.8	3,638.4	23.5	11.6	-179.05	-59.3	416.6	668.2	648.9	19.29	34.636		
3,800.0	3,593.8	3,779.9	3,734.2	24.3	12.1	-178.74	-65.6	436.2	687.6	667.7	19.93	34.508		
3,900.0	3,685.8	3,877.9	3,830.1	25.2	12.5	-178.45	-71.8	455.9	707.0	686.5	20.56	34.385		
4,000.0	3,777.8	3,975.9	3,925.9	26.0	12.9	-178.18	-78.0	475.5	726.5	705.3	21.20	34.265		
4,100.0	3,869.8	4,073.9	4,021.8	26.9	13.4	-177.92	-84.3	495.2	745.9	724.1	21.84	34.149		
4,200.0	3,961.8	4,172.0	4,117.6	27.7	13.8	-177.67	-90.5	514.8	765.4	742.9	22.49	34.036		
4,300.0	4,053.8	4,270.0	4,213.4	28.6	14.3	-177.43	-96.7	534.5	784.9	761.8	23.14	33.927		
4,400.0	4,145.8	4,368.0	4,309.3	29.4	14.7	-177.21	-103.0	554.1	804.4	780.6	23.78	33.822		
4,500.0	4,237.8	4,466.1	4,405.1	30.3	15.2	-177.00	-109.2	573.8	823.9	799.5	24.43	33.719		
4,600.0	4,329.8	4,564.1	4,501.0	31.1	15.6	-176.80	-115.4	593.4	843.5	818.4	25.09	33.620		
4,700.0	4,421.8	4,662.1	4,596.8	32.0	16.1	-176.60	-121.7	613.1	863.0	837.2	25.74	33.525		
4,800.0	4,513.8	4,760.2	4,692.6	32.8	16.5	-176.42	-127.9	632.7	882.5	856.1	26.40	33.432		
4,900.0	4,605.8	4,858.2	4,788.5	33.7	17.0	-176.24	-134.1	652.4	902.1	875.0	27.06	33.342		
5,000.0	4,697.8	4,956.2	4,884.3	34.5	17.4	-176.07	-140.4	672.0	921.6	893.9	27.71	33.255		

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 Spaur 10Y-241
Project:	SEC.10-T4N-R67W	TVD Reference:	WELL @ 4844.0ft (RKB - 13')
Reference Site:	Spaur 4N67W10LQ Pad Sec.10-T4N-R67W	MD Reference:	WELL @ 4844.0ft (RKB - 13')
Site Error:	0.0ft	North Reference:	True
Reference Well:	Spaur 10Y-241	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	EDM 2003.21 Single User Db
Reference Design:	Plan #1 (6-11-15)	Offset TVD Reference:	Offset Datum

Offset Design Spaur 4N67W10LQ Pad Sec.10-T4N-R67W - Spaur 10T-241 - Wellbore #1 - Plan #2 (6-11-15)												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
5,100.0	4,789.8	5,054.3	4,980.2	35.3	17.9	175.91	-146.6	691.6	941.2	912.8	28.38	33.170	
5,200.0	4,881.8	5,152.3	5,076.0	36.2	18.3	175.75	-152.8	711.3	960.8	931.7	29.04	33.088	
5,300.0	4,973.8	5,250.3	5,171.9	37.0	18.8	175.60	-159.1	730.9	980.4	950.7	29.70	33.009	
5,400.0	5,065.8	5,348.4	5,267.7	37.9	19.2	175.46	-165.3	750.6	1,000.0	969.6	30.36	32.932	

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Spaur 10Y-241
Project:	SEC.10-T4N-R67W	TVD Reference:	WELL @ 4844.0ft (RKB - 13')
Reference Site:	Spaur 4N67W10LQ Pad Sec.10-T4N-R67W	MD Reference:	WELL @ 4844.0ft (RKB - 13')
Site Error:	0.0ft	North Reference:	True
Reference Well:	Spaur 10Y-241	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	EDM 2003.21 Single User Db
Reference Design:	Plan #1 (6-11-15)	Offset TVD Reference:	Offset Datum

Offset Design Spaur 4N67W10LQ Pad Sec.10-T4N-R67W - Spaur 10T-301 - Wellbore #1 - Plan #2 (6-11-15)													Offset Site Error:	0.0 ft
Survey Program: 0-MWD													Offset Well Error:	0.0 ft
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference	Offset	Semi Major Axis	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+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	0.00	0.00	58.3	0.0	58.3				
100.0	100.0	99.0	99.0	0.1	0.1	0.00		58.3	0.0	58.3	58.1	0.19	299.560	
200.0	200.0	199.0	199.0	0.3	0.3	0.00		58.3	0.0	58.3	57.6	0.64	90.669 CC	
300.0	300.0	299.0	299.0	0.5	0.5	-97.89		58.3	0.0	58.5	57.4	1.08	54.102 ES	
400.0	399.9	398.9	398.9	0.8	0.8	-101.65		58.3	0.0	59.1	57.6	1.52	38.854	
500.0	499.7	498.7	498.7	1.0	1.0	-107.67		58.3	0.0	60.8	58.8	1.98	30.690	
600.0	599.3	598.3	598.3	1.2	1.2	-115.40		58.3	0.0	64.2	61.7	2.46	26.132	
700.0	698.6	697.6	697.6	1.5	1.4	-124.01		58.3	0.0	70.0	67.1	2.94	23.816	
800.0	797.5	796.5	796.5	1.9	1.7	-132.52		58.3	0.0	79.0	75.6	3.43	23.049 SF	
900.0	896.1	895.1	895.1	2.2	1.9	-140.20		58.3	0.0	91.4	87.5	3.91	23.371	
1,000.0	994.2	993.2	993.2	2.6	2.1	-146.72		58.3	0.0	107.2	102.8	4.38	24.444	
1,100.0	1,091.7	1,093.6	1,093.6	3.1	2.3	-152.02		58.0	1.1	125.3	120.4	4.84	25.880	
1,200.0	1,188.6	1,194.7	1,194.7	3.6	2.5	-156.10		57.1	4.8	144.0	138.7	5.28	27.274	
1,300.0	1,284.9	1,296.5	1,296.2	4.1	2.7	-159.34		55.6	11.2	163.2	157.5	5.73	28.490	
1,400.0	1,380.4	1,398.8	1,398.1	4.7	3.0	-161.99		53.4	20.2	182.6	176.4	6.18	29.529	
1,500.0	1,475.0	1,501.7	1,500.2	5.3	3.2	-164.23		50.6	32.0	202.2	195.6	6.65	30.405	
1,600.0	1,568.9	1,605.2	1,602.6	6.0	3.5	-166.15		47.0	46.5	222.0	214.8	7.13	31.135	
1,700.0	1,661.7	1,709.3	1,705.2	6.8	3.8	-167.84		42.9	63.8	241.7	234.1	7.62	31.732	
1,800.0	1,753.8	1,814.1	1,807.9	7.6	4.2	-169.36		38.0	84.0	261.0	252.9	8.14	32.053	
1,900.0	1,845.8	1,919.9	1,911.1	8.4	4.6	-170.67		32.4	107.2	278.0	269.3	8.70	31.948	
2,000.0	1,937.8	2,020.7	2,008.8	9.2	5.0	-171.76		26.6	131.1	293.0	283.7	9.26	31.645	
2,100.0	2,029.8	2,119.5	2,104.5	10.1	5.4	-172.72		20.9	154.7	308.0	298.2	9.83	31.332	
2,200.0	2,121.8	2,218.2	2,200.2	10.9	5.9	-173.59		15.2	178.3	323.1	312.7	10.41	31.049	
2,300.0	2,213.8	2,317.0	2,295.9	11.7	6.4	-174.39		9.5	201.9	338.3	327.3	10.99	30.783	
2,400.0	2,305.8	2,415.7	2,391.7	12.6	6.8	-175.12		3.8	225.5	353.5	341.9	11.58	30.532	
2,500.0	2,397.8	2,514.4	2,487.4	13.4	7.3	-175.78		-1.9	249.1	368.8	356.6	12.17	30.294	
2,600.0	2,489.8	2,613.2	2,583.1	14.2	7.8	-176.40		-7.6	272.7	384.1	371.3	12.77	30.068	
2,700.0	2,581.8	2,711.9	2,678.8	15.1	8.3	-176.96		-13.3	296.3	399.4	386.1	13.38	29.854	
2,800.0	2,673.8	2,810.7	2,774.5	15.9	8.8	-177.49		-19.1	319.9	414.8	400.8	13.99	29.650	
2,900.0	2,765.8	2,909.4	2,870.2	16.7	9.3	-177.98		-24.8	343.5	430.3	415.6	14.61	29.456	
3,000.0	2,857.8	3,008.1	2,965.9	17.6	9.8	-178.43		-30.5	367.0	445.7	430.5	15.23	29.270	
3,100.0	2,949.8	3,106.9	3,061.6	18.4	10.3	-178.85		-36.2	390.6	461.2	445.3	15.85	29.093	
3,200.0	3,041.8	3,205.6	3,157.3	19.3	10.8	-179.25		-41.9	414.2	476.7	460.2	16.48	28.924	
3,300.0	3,133.8	3,304.4	3,253.0	20.1	11.3	-179.62		-47.6	437.8	492.2	475.1	17.11	28.762	
3,400.0	3,225.8	3,403.1	3,348.8	21.0	11.8	-179.97		-53.3	461.4	507.7	490.0	17.75	28.607	
3,500.0	3,317.8	3,501.8	3,444.5	21.8	12.3	-179.71		-59.0	485.0	523.3	504.9	18.39	28.459	
3,600.0	3,409.8	3,600.6	3,540.2	22.7	12.9	-179.40		-64.7	508.6	538.9	519.8	19.03	28.317	
3,700.0	3,501.8	3,699.3	3,635.9	23.5	13.4	-179.11		-70.4	532.2	554.5	534.8	19.68	28.181	
3,800.0	3,593.8	3,798.1	3,731.6	24.3	13.9	-178.83		-76.1	555.8	570.1	549.7	20.32	28.051	
3,900.0	3,685.8	3,896.8	3,827.3	25.2	14.4	-178.57		-81.8	579.4	585.7	564.7	20.97	27.926	
4,000.0	3,777.8	3,995.5	3,923.0	26.0	14.9	-178.32		-87.5	602.9	601.3	579.7	21.63	27.805	
4,100.0	3,869.8	4,094.3	4,018.7	26.9	15.4	-178.09		-93.2	626.5	616.9	594.7	22.28	27.690	
4,200.0	3,961.8	4,193.0	4,114.4	27.7	16.0	-177.87		-98.9	650.1	632.6	609.6	22.94	27.579	
4,300.0	4,053.8	4,291.8	4,210.1	28.6	16.5	-177.65		-104.6	673.7	648.2	624.6	23.60	27.473	
4,400.0	4,145.8	4,390.5	4,305.9	29.4	17.0	-177.45		-110.3	697.3	663.9	639.6	24.26	27.370	
4,500.0	4,237.8	4,489.2	4,401.6	30.3	17.5	-177.26		-116.0	720.9	679.6	654.6	24.92	27.271	
4,600.0	4,329.8	4,588.0	4,497.3	31.1	18.0	-177.07		-121.7	744.5	695.2	669.7	25.58	27.176	
4,700.0	4,421.8	4,686.7	4,593.0	32.0	18.6	-176.90		-127.4	768.1	710.9	684.7	26.25	27.085	
4,800.0	4,513.8	4,785.5	4,688.7	32.8	19.1	-176.73		-133.1	791.7	726.6	699.7	26.92	26.996	
4,900.0	4,605.8	4,884.2	4,784.4	33.7	19.6	-176.57		-138.8	815.3	742.3	714.7	27.58	26.911	
5,000.0	4,697.8	4,982.9	4,880.1	34.5	20.1	-176.41		-144.5	838.8	758.0	729.8	28.25	26.829	

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 Spaur 10Y-241
Project:	SEC.10-T4N-R67W	TVD Reference:	WELL @ 4844.0ft (RKB - 13')
Reference Site:	Spaur 4N67W10LQ Pad Sec.10-T4N-R67W	MD Reference:	WELL @ 4844.0ft (RKB - 13')
Site Error:	0.0ft	North Reference:	True
Reference Well:	Spaur 10Y-241	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	EDM 2003.21 Single User Db
Reference Design:	Plan #1 (6-11-15)	Offset TVD Reference:	Offset Datum

Offset Design Spaur 4N67W10LQ Pad Sec.10-T4N-R67W - Spaur 10T-301 - Wellbore #1 - Plan #2 (6-11-15)												Offset Site Error:	0.0 ft
Survey Program: 0-MWD												Offset Well Error:	0.0 ft
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
5,100.0	4,789.8	5,081.7	4,975.8	35.3	20.7	176.27	-150.2	862.4	773.7	744.8	28.92	26.750	
5,200.0	4,881.8	5,180.4	5,071.5	36.2	21.2	176.12	-155.9	886.0	789.4	759.8	29.60	26.673	
5,300.0	4,973.8	5,279.2	5,167.3	37.0	21.7	175.99	-161.6	909.6	805.1	774.9	30.27	26.599	
5,400.0	5,065.8	5,377.9	5,263.0	37.9	22.2	175.85	-167.3	933.2	820.9	789.9	30.94	26.527	
5,500.0	5,157.8	5,476.6	5,358.7	38.7	22.7	175.73	-173.1	956.8	836.6	805.0	31.62	26.458	
5,600.0	5,249.8	5,575.4	5,454.4	39.6	23.3	175.61	-178.8	980.4	852.3	820.0	32.30	26.391	
5,700.0	5,341.8	5,674.1	5,550.1	40.4	23.8	175.49	-184.5	1,004.0	868.0	835.1	32.97	26.326	
5,800.0	5,433.8	5,772.8	5,645.8	41.3	24.3	175.37	-190.2	1,027.6	883.8	850.1	33.65	26.263	
5,900.0	5,525.8	5,871.6	5,741.5	42.1	24.8	175.26	-195.9	1,051.2	899.5	865.2	34.33	26.202	
6,000.0	5,617.8	5,970.3	5,837.2	43.0	25.4	175.16	-201.6	1,074.8	915.3	880.3	35.01	26.143	
6,100.0	5,709.8	6,069.1	5,932.9	43.8	25.9	175.06	-207.3	1,098.3	931.0	895.3	35.69	26.086	
6,200.0	5,801.8	6,167.8	6,028.6	44.7	26.4	174.96	-213.0	1,121.9	946.8	910.4	36.37	26.030	
6,300.0	5,893.8	6,266.5	6,124.4	45.5	26.9	174.86	-218.7	1,145.5	962.5	925.4	37.05	25.976	
6,400.0	5,985.8	6,365.3	6,220.1	46.4	27.5	174.77	-224.4	1,169.1	978.3	940.5	37.74	25.924	
6,500.0	6,077.8	6,464.0	6,315.8	47.2	28.0	174.68	-230.1	1,192.7	994.0	955.6	38.42	25.873	

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Spaur 10Y-241
Project:	SEC.10-T4N-R67W	TVD Reference:	WELL @ 4844.0ft (RKB - 13')
Reference Site:	Spaur 4N67W10LQ Pad Sec.10-T4N-R67W	MD Reference:	WELL @ 4844.0ft (RKB - 13')
Site Error:	0.0ft	North Reference:	True
Reference Well:	Spaur 10Y-241	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	EDM 2003.21 Single User Db
Reference Design:	Plan #1 (6-11-15)	Offset TVD Reference:	Offset Datum

Offset Design		Spaur 4N67W10LQ Pad Sec.10-T4N-R67W - Spaur 10T-321 - Wellbore #1 - Plan #1 (6-11-15)										Offset Site Error:		0.0 ft
Survey Program: 0-MWD												Offset Well Error:		0.0 ft
Reference		Offset		Semi Major Axis		Highside Toolface (°)	Offset Wellbore Centre		Distance		Minimum Separation (ft)	Separation Factor	Warning	
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)		+N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)				
0.0	0.0	0.0	0.0	0.0	0.0	0.00	14.6	0.0	14.6					
100.0	100.0	100.0	100.0	0.1	0.1	0.00	14.6	0.0	14.6	14.4	0.20	74.521		
200.0	200.0	200.0	200.0	0.3	0.3	0.00	14.6	0.0	14.6	13.9	0.65	22.590	CC	
300.0	300.0	300.0	300.0	0.5	0.5	-101.67	14.6	0.0	14.8	13.7	1.08	13.652	ES	
400.0	399.9	399.9	399.9	0.8	0.8	-115.51	14.6	0.0	16.0	14.5	1.52	10.526		
500.0	499.7	500.0	500.0	1.0	1.0	-129.87	14.5	1.3	18.9	17.0	1.96	9.642		
600.0	599.3	600.2	600.1	1.2	1.2	-139.76	14.2	5.2	22.8	20.4	2.40	9.469		
700.0	698.6	700.6	700.3	1.5	1.4	-146.46	13.7	11.8	27.1	24.3	2.86	9.495		
800.0	797.5	801.1	800.4	1.9	1.7	-151.09	13.0	21.0	31.8	28.5	3.32	9.573		
900.0	896.1	901.8	900.3	2.2	1.9	-154.35	12.1	32.8	36.6	32.8	3.80	9.647		
1,000.0	994.2	1,002.6	1,000.1	2.6	2.3	-156.69	11.1	47.3	41.6	37.3	4.29	9.698		
1,100.0	1,091.7	1,103.5	1,099.5	3.1	2.6	-158.39	9.8	64.4	46.7	41.9	4.80	9.719		
1,200.0	1,188.6	1,204.5	1,198.6	3.6	3.0	-159.64	8.3	84.2	51.8	46.4	5.33	9.708		
1,300.0	1,284.9	1,305.7	1,297.3	4.1	3.4	-160.55	6.7	106.6	56.9	51.0	5.88	9.667		
1,400.0	1,380.4	1,407.1	1,395.4	4.7	3.9	-161.20	4.8	131.6	62.0	55.6	6.46	9.597		
1,500.0	1,475.0	1,508.5	1,493.0	5.3	4.4	-161.66	2.8	159.3	67.2	60.1	7.07	9.500		
1,600.0	1,568.9	1,610.1	1,590.0	6.0	5.0	-161.96	0.5	189.6	72.3	64.6	7.71	9.383		
1,700.0	1,661.7	1,711.9	1,686.2	6.8	5.7	-162.13	-1.9	222.5	77.5	69.1	8.38	9.243		
1,800.0	1,753.8	1,812.3	1,780.6	7.6	6.4	-162.27	-4.5	256.8	82.8	73.7	9.10	9.094		
1,900.0	1,845.8	1,912.2	1,874.3	8.4	7.0	-162.41	-7.0	291.1	88.1	78.3	9.84	8.953		
2,000.0	1,937.8	2,012.0	1,968.1	9.2	7.7	-162.53	-9.6	325.3	93.5	82.9	10.59	8.826		
2,100.0	2,029.8	2,111.9	2,061.9	10.1	8.5	-162.64	-12.1	359.6	98.9	87.5	11.35	8.711		
2,200.0	2,121.8	2,211.7	2,155.6	10.9	9.2	-162.74	-14.6	393.9	104.2	92.1	12.11	8.608		
2,300.0	2,213.8	2,311.6	2,249.4	11.7	9.9	-162.83	-17.2	428.1	109.6	96.7	12.87	8.514		
2,400.0	2,305.8	2,411.4	2,343.1	12.6	10.6	-162.91	-19.7	462.4	115.0	101.3	13.64	8.428		
2,500.0	2,397.8	2,511.3	2,436.9	13.4	11.3	-162.99	-22.3	496.6	120.3	105.9	14.41	8.351		
2,600.0	2,489.8	2,611.2	2,530.7	14.2	12.0	-163.05	-24.8	530.9	125.7	110.5	15.18	8.280		
2,700.0	2,581.8	2,711.0	2,624.4	15.1	12.8	-163.11	-27.3	565.2	131.1	115.1	15.95	8.215		
2,800.0	2,673.8	2,810.9	2,718.2	15.9	13.5	-163.17	-29.9	599.4	136.4	119.7	16.73	8.155		
2,900.0	2,765.8	2,910.7	2,811.9	16.7	14.2	-163.22	-32.4	633.7	141.8	124.3	17.51	8.100		
3,000.0	2,857.8	3,010.6	2,905.7	17.6	14.9	-163.27	-35.0	667.9	147.2	128.9	18.28	8.049		
3,100.0	2,949.8	3,110.4	2,999.5	18.4	15.7	-163.32	-37.5	702.2	152.5	133.5	19.06	8.002		
3,200.0	3,041.8	3,210.3	3,093.2	19.3	16.4	-163.36	-40.1	736.5	157.9	138.1	19.84	7.959		
3,300.0	3,133.8	3,310.1	3,187.0	20.1	17.1	-163.40	-42.6	770.7	163.3	142.7	20.62	7.918		
3,400.0	3,225.8	3,410.0	3,280.7	21.0	17.9	-163.44	-45.1	805.0	168.6	147.2	21.40	7.880		
3,500.0	3,317.8	3,509.9	3,374.5	21.8	18.6	-163.47	-47.7	839.2	174.0	151.8	22.18	7.845		
3,600.0	3,409.8	3,609.7	3,468.3	22.7	19.3	-163.51	-50.2	873.5	179.4	156.4	22.96	7.811		
3,700.0	3,501.8	3,709.6	3,562.0	23.5	20.1	-163.54	-52.8	907.8	184.7	161.0	23.75	7.780		
3,800.0	3,593.8	3,809.4	3,655.8	24.3	20.8	-163.57	-55.3	942.0	190.1	165.6	24.53	7.751		
3,900.0	3,685.8	3,909.3	3,749.5	25.2	21.5	-163.59	-57.8	976.3	195.5	170.2	25.31	7.723		
4,000.0	3,777.8	4,009.1	3,843.3	26.0	22.2	-163.62	-60.4	1,010.5	200.9	174.8	26.10	7.697		
4,100.0	3,869.8	4,109.0	3,937.1	26.9	23.0	-163.64	-62.9	1,044.8	206.2	179.3	26.88	7.672		
4,200.0	3,961.8	4,208.9	4,030.8	27.7	23.7	-163.67	-65.5	1,079.1	211.6	183.9	27.66	7.649		
4,300.0	4,053.8	4,308.7	4,124.6	28.6	24.4	-163.69	-68.0	1,113.3	217.0	188.5	28.45	7.627		
4,400.0	4,145.8	4,408.6	4,218.3	29.4	25.2	-163.71	-70.5	1,147.6	222.3	193.1	29.23	7.606		
4,500.0	4,237.8	4,508.4	4,312.1	30.3	25.9	-163.73	-73.1	1,181.8	227.7	197.7	30.02	7.586		
4,600.0	4,329.8	4,608.3	4,405.9	31.1	26.6	-163.75	-75.6	1,216.1	233.1	202.3	30.80	7.567		
4,700.0	4,421.8	4,708.1	4,499.6	32.0	27.4	-163.77	-78.2	1,250.4	238.4	206.9	31.59	7.549		
4,800.0	4,513.8	4,808.0	4,593.4	32.8	28.1	-163.79	-80.7	1,284.6	243.8	211.4	32.37	7.532		
4,900.0	4,605.8	4,907.8	4,687.1	33.7	28.9	-163.80	-83.3	1,318.9	249.2	216.0	33.16	7.515		
5,000.0	4,697.8	5,007.7	4,780.9	34.5	29.6	-163.82	-85.8	1,353.1	254.5	220.6	33.94	7.500		

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 Spaur 10Y-241
Project:	SEC.10-T4N-R67W	TVD Reference:	WELL @ 4844.0ft (RKB - 13')
Reference Site:	Spaur 4N67W10LQ Pad Sec.10-T4N-R67W	MD Reference:	WELL @ 4844.0ft (RKB - 13')
Site Error:	0.0ft	North Reference:	True
Reference Well:	Spaur 10Y-241	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	EDM 2003.21 Single User Db
Reference Design:	Plan #1 (6-11-15)	Offset TVD Reference:	Offset Datum

Offset Design Spaur 4N67W10LQ Pad Sec.10-T4N-R67W - Spaur 10T-321 - Wellbore #1 - Plan #1 (6-11-15)													Offset Site Error:	0.0 ft
Survey Program: 0-MWD													Offset Well Error:	0.0 ft
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference	Offset	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning	
5,100.0	4,789.8	5,107.6	4,874.7	35.3	30.3	-163.83	-88.3	1,387.4	259.9	225.2	34.73	7.485		
5,200.0	4,881.8	5,207.4	4,968.4	36.2	31.1	-163.85	-90.9	1,421.7	265.3	229.8	35.51	7.470		
5,300.0	4,973.8	5,307.3	5,062.2	37.0	31.8	-163.86	-93.4	1,455.9	270.7	234.4	36.30	7.456		
5,400.0	5,065.8	5,407.1	5,155.9	37.9	32.5	-163.88	-96.0	1,490.2	276.0	238.9	37.08	7.443		
5,500.0	5,157.8	5,507.0	5,249.7	38.7	33.3	-163.89	-98.5	1,524.4	281.4	243.5	37.87	7.430		
5,600.0	5,249.8	5,606.8	5,343.5	39.6	34.0	-163.90	-101.0	1,558.7	286.8	248.1	38.66	7.418		
5,700.0	5,341.8	5,706.7	5,437.2	40.4	34.7	-163.92	-103.6	1,593.0	292.1	252.7	39.44	7.406		
5,800.0	5,433.8	5,806.5	5,531.0	41.3	35.5	-163.93	-106.1	1,627.2	297.5	257.3	40.23	7.395		
5,900.0	5,525.8	5,906.4	5,624.7	42.1	36.2	-163.94	-108.7	1,661.5	302.9	261.9	41.02	7.384		
6,000.0	5,617.8	6,006.3	5,718.5	43.0	36.9	-163.95	-111.2	1,695.7	308.2	266.4	41.80	7.374		
6,100.0	5,709.8	6,106.1	5,812.3	43.8	37.7	-163.96	-113.7	1,730.0	313.6	271.0	42.59	7.364		
6,200.0	5,801.8	6,206.0	5,906.0	44.7	38.4	-163.97	-116.3	1,764.3	319.0	275.6	43.38	7.354		
6,300.0	5,893.8	6,305.8	5,999.8	45.5	39.1	-163.98	-118.8	1,798.5	324.4	280.2	44.16	7.345		
6,400.0	5,985.8	6,405.7	6,093.5	46.4	39.9	-163.99	-121.4	1,832.8	329.7	284.8	44.95	7.335		
6,500.0	6,077.8	6,505.5	6,187.3	47.2	40.6	-164.00	-123.9	1,867.0	335.1	289.4	45.74	7.327		
6,600.0	6,169.8	6,605.4	6,281.1	48.1	41.3	-164.01	-126.5	1,901.3	340.5	293.9	46.52	7.318		
6,700.0	6,261.8	6,705.2	6,374.8	48.9	42.1	-164.02	-129.0	1,935.6	345.8	298.5	47.31	7.310		
6,800.0	6,353.8	6,793.5	6,457.7	49.7	42.7	-163.41	-128.3	1,965.9	351.7	303.3	48.33	7.276		
6,900.0	6,445.4	6,878.5	6,536.9	50.4	43.2	-136.37	-118.3	1,994.8	357.1	307.9	49.20	7.257		
7,000.0	6,535.1	6,963.3	6,614.5	51.1	43.7	-122.86	-99.1	2,023.2	361.7	312.0	49.67	7.282		
7,100.0	6,621.2	7,050.0	6,691.1	51.7	44.2	-113.22	-70.1	2,051.3	365.4	315.6	49.77	7.342		
7,200.0	6,702.4	7,133.4	6,761.5	52.2	44.6	-106.67	-33.7	2,077.1	368.1	318.6	49.58	7.425		
7,300.0	6,777.3	7,218.9	6,829.4	52.7	45.0	-102.43	11.9	2,102.1	370.0	320.8	49.23	7.515		
7,400.0	6,844.5	7,305.0	6,892.4	53.1	45.4	-99.86	65.7	2,125.2	371.0	322.1	48.89	7.589		
7,500.0	6,903.0	7,391.8	6,949.8	53.5	45.8	-98.56	127.3	2,146.4	371.3	322.6	48.65	7.632		
7,600.0	6,951.6	7,479.5	7,000.7	53.8	46.1	-98.25	196.1	2,165.2	370.8	322.1	48.71	7.614		
7,700.0	6,989.7	7,568.3	7,044.4	54.1	46.4	-98.75	271.6	2,181.4	369.9	320.7	49.11	7.531		
7,800.0	7,016.5	7,658.3	7,080.0	54.3	46.7	-99.95	353.1	2,194.6	368.4	318.5	49.90	7.384		
7,900.0	7,031.6	7,750.0	7,106.7	54.5	47.0	-101.77	440.2	2,204.6	366.7	315.7	51.05	7.183		
8,000.0	7,034.9	7,842.8	7,123.6	54.7	47.3	-104.08	531.2	2,211.0	364.9	312.3	52.60	6.937		
8,100.0	7,034.1	7,938.2	7,130.0	54.9	47.6	-105.27	626.3	2,213.6	364.2	309.7	54.50	6.682		
8,138.9	7,033.8	7,976.5	7,129.8	55.0	47.7	-105.28	664.6	2,213.7	364.2	308.9	55.25	6.591		
8,200.0	7,033.4	8,037.7	7,129.3	55.2	47.9	-105.28	725.8	2,213.7	364.2	307.7	56.46	6.450		
8,300.0	7,032.6	8,137.7	7,128.6	55.4	48.3	-105.28	825.8	2,213.7	364.2	305.6	58.56	6.219		
8,400.0	7,031.9	8,237.7	7,127.8	55.8	48.7	-105.28	925.7	2,213.7	364.2	303.4	60.81	5.988		
8,500.0	7,031.1	8,337.7	7,127.1	56.2	49.2	-105.28	1,025.7	2,213.7	364.2	301.0	63.20	5.762		
8,600.0	7,030.3	8,437.7	7,126.3	56.6	49.8	-105.28	1,125.7	2,213.7	364.2	298.4	65.72	5.541		
8,700.0	7,029.6	8,537.7	7,125.6	57.1	50.4	-105.28	1,225.7	2,213.7	364.2	295.8	68.35	5.328		
8,800.0	7,028.8	8,637.7	7,124.8	57.7	51.1	-105.28	1,325.7	2,213.7	364.2	293.1	71.08	5.124		
8,900.0	7,028.1	8,737.7	7,124.1	58.3	51.8	-105.28	1,425.7	2,213.7	364.2	290.3	73.89	4.928		
9,000.0	7,027.3	8,837.7	7,123.3	58.9	52.6	-105.28	1,525.7	2,213.7	364.2	287.4	76.78	4.743		
9,100.0	7,026.6	8,937.7	7,122.6	59.7	53.5	-105.28	1,625.7	2,213.7	364.2	284.4	79.74	4.567		
9,200.0	7,025.8	9,037.7	7,121.8	60.4	54.4	-105.28	1,725.7	2,213.7	364.2	281.4	82.76	4.400		
9,300.0	7,025.1	9,137.7	7,121.0	61.3	55.4	-105.28	1,825.7	2,213.7	364.2	278.3	85.84	4.242		
9,400.0	7,024.3	9,237.7	7,120.3	62.2	56.5	-105.28	1,925.7	2,213.7	364.2	275.2	88.97	4.093		
9,500.0	7,023.6	9,337.7	7,119.5	63.1	57.6	-105.28	2,025.7	2,213.7	364.2	272.0	92.14	3.952		
9,600.0	7,022.8	9,437.7	7,118.8	64.1	58.8	-105.28	2,125.7	2,213.7	364.2	268.8	95.35	3.819		
9,700.0	7,022.1	9,537.7	7,118.0	65.2	60.0	-105.28	2,225.7	2,213.7	364.2	265.6	98.60	3.693		
9,800.0	7,021.3	9,637.7	7,117.3	66.3	61.2	-105.28	2,325.7	2,213.7	364.2	262.3	101.88	3.575		
9,900.0	7,020.6	9,737.7	7,116.5	67.4	62.5	-105.28	2,425.7	2,213.7	364.2	259.0	105.19	3.462		
10,000.0	7,019.8	9,837.7	7,115.8	68.6	63.8	-105.28	2,525.7	2,213.7	364.2	255.6	108.52	3.356		

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 Spaur 10Y-241
Project:	SEC.10-T4N-R67W	TVD Reference:	WELL @ 4844.0ft (RKB - 13')
Reference Site:	Spaur 4N67W10LQ Pad Sec.10-T4N-R67W	MD Reference:	WELL @ 4844.0ft (RKB - 13')
Site Error:	0.0ft	North Reference:	True
Reference Well:	Spaur 10Y-241	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	EDM 2003.21 Single User Db
Reference Design:	Plan #1 (6-11-15)	Offset TVD Reference:	Offset Datum

Offset Design Spaur 4N67W10LQ Pad Sec.10-T4N-R67W - Spaur 10T-321 - Wellbore #1 - Plan #1 (6-11-15)												Offset Site Error:	0.0 ft
Survey Program: 0-MWD												Offset Well Error:	0.0 ft
Reference		Offset		Semi Major Axis		Highside Toolface (°)	Distance		Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)		Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)					
10,100.0	7,019.1	9,937.7	7,115.0	69.8	65.2	-105.28	2,625.7	2,213.7	364.2	252.3	111.88	3.255	
10,200.0	7,018.3	10,037.7	7,114.3	71.1	66.6	-105.28	2,725.7	2,213.7	364.2	248.9	115.27	3.159	
10,300.0	7,017.6	10,137.7	7,113.5	72.4	68.0	-105.28	2,825.7	2,213.7	364.2	245.5	118.67	3.069	
10,400.0	7,016.8	10,237.7	7,112.7	73.7	69.5	-105.28	2,925.7	2,213.7	364.2	242.1	122.09	2.983	
10,500.0	7,016.0	10,337.7	7,112.0	75.1	71.0	-105.28	3,025.7	2,213.7	364.2	238.6	125.53	2.901	
10,600.0	7,015.3	10,437.7	7,111.2	76.5	72.5	-105.28	3,125.7	2,213.7	364.2	235.2	128.99	2.823	
10,700.0	7,014.5	10,537.7	7,110.5	78.0	74.0	-105.28	3,225.7	2,213.7	364.2	231.7	132.45	2.749	
10,800.0	7,013.8	10,637.7	7,109.7	79.4	75.6	-105.28	3,325.7	2,213.7	364.2	228.2	135.94	2.679	
10,900.0	7,013.0	10,737.7	7,109.0	80.9	77.2	-105.28	3,425.7	2,213.7	364.2	224.7	139.43	2.612	
11,000.0	7,012.3	10,837.7	7,108.2	82.4	78.8	-105.28	3,525.7	2,213.7	364.2	221.2	142.94	2.548	
11,100.0	7,011.5	10,937.7	7,107.5	83.9	80.4	-105.28	3,625.7	2,213.7	364.2	217.7	146.46	2.486	
11,200.0	7,010.8	11,037.7	7,106.7	85.5	82.0	-105.28	3,725.7	2,213.7	364.2	214.2	149.99	2.428	
11,300.0	7,010.0	11,137.7	7,106.0	87.1	83.6	-105.28	3,825.7	2,213.7	364.2	210.6	153.52	2.372	
11,400.0	7,009.3	11,237.7	7,105.2	88.6	85.3	-105.27	3,925.7	2,213.7	364.2	207.1	157.07	2.318	
11,500.0	7,008.5	11,337.7	7,104.4	90.2	87.0	-105.27	4,025.7	2,213.7	364.2	203.5	160.62	2.267	
11,600.0	7,007.8	11,437.7	7,103.7	91.9	88.6	-105.27	4,125.7	2,213.7	364.2	200.0	164.19	2.218	
11,700.0	7,007.0	11,537.7	7,102.9	93.5	90.3	-105.27	4,225.7	2,213.7	364.2	196.4	167.75	2.171	
11,800.0	7,006.3	11,637.7	7,102.2	95.1	92.0	-105.27	4,325.7	2,213.7	364.2	192.8	171.33	2.125	
11,900.0	7,005.5	11,737.7	7,101.4	96.8	93.7	-105.27	4,425.6	2,213.7	364.1	189.2	174.91	2.082	
11,967.1	7,005.0	11,804.8	7,100.9	97.9	94.9	-105.27	4,492.8	2,213.7	364.1	186.8	177.32	2.054 SF	

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Spaur 10Y-241
Project:	SEC.10-T4N-R67W	TVD Reference:	WELL @ 4844.0ft (RKB - 13')
Reference Site:	Spaur 4N67W10LQ Pad Sec.10-T4N-R67W	MD Reference:	WELL @ 4844.0ft (RKB - 13')
Site Error:	0.0ft	North Reference:	True
Reference Well:	Spaur 10Y-241	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	EDM 2003.21 Single User Db
Reference Design:	Plan #1 (6-11-15)	Offset TVD Reference:	Offset Datum

Offset Design Spaur 4N67W10LQ Pad Sec.10-T4N-R67W - Spaur 10T-421 - Wellbore #1 - Plan #1 (6-11-15)													Offset Site Error:	0.0 ft
Survey Program: 0-MWD													Offset Well Error:	0.0 ft
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference	Offset	Semi Major Axis	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+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	5.47		29.1	2.8	29.3				
100.0	100.0	100.0	100.0	0.1	0.1	5.47		29.1	2.8	29.3	29.1	0.20	149.722	
200.0	200.0	200.0	200.0	0.3	0.3	5.47		29.1	2.8	29.3	28.6	0.65	45.386 CC	
200.0	200.0	200.0	200.0	0.3	0.3	5.47		29.1	2.8	29.3	28.6	0.65	45.385	
300.0	300.0	300.0	300.0	0.5	0.5	-93.71		29.1	2.8	29.3	28.3	1.08	27.096 ES	
400.0	399.9	399.9	399.9	0.8	0.8	-101.24		29.1	2.8	29.8	28.3	1.52	19.587	
500.0	499.7	499.7	499.7	1.0	1.0	-112.84		29.1	2.8	31.8	29.8	1.98	16.034	
600.0	599.3	599.3	599.3	1.2	1.2	-126.17		29.1	2.8	36.3	33.9	2.45	14.828	
700.0	698.6	699.4	699.4	1.5	1.4	-137.39		29.0	4.1	43.4	40.4	2.90	14.927	
800.0	797.5	799.9	799.8	1.9	1.6	-145.29		28.5	8.0	51.5	48.2	3.35	15.400	
900.0	896.1	900.6	900.3	2.2	1.9	-150.97		27.7	14.5	60.4	56.6	3.80	15.908	
1,000.0	994.2	1,001.6	1,000.8	2.6	2.1	-155.17		26.6	23.7	69.7	65.4	4.26	16.367	
1,100.0	1,091.7	1,102.8	1,101.4	3.1	2.4	-158.38		25.1	35.6	79.2	74.5	4.73	16.752	
1,200.0	1,188.6	1,204.4	1,201.9	3.6	2.7	-160.89		23.3	50.2	88.9	83.7	5.21	17.058	
1,300.0	1,284.9	1,306.3	1,302.2	4.1	3.0	-162.91		21.2	67.4	98.7	93.0	5.71	17.288	
1,400.0	1,380.4	1,408.4	1,402.4	4.7	3.4	-164.57		18.8	87.4	108.5	102.3	6.22	17.450	
1,500.0	1,475.0	1,510.8	1,502.2	5.3	3.8	-165.95		16.0	110.1	118.4	111.6	6.75	17.549	
1,600.0	1,568.9	1,613.5	1,601.7	6.0	4.3	-167.12		12.9	135.5	128.2	120.9	7.29	17.587	
1,700.0	1,661.7	1,716.5	1,700.7	6.8	4.8	-168.13		9.4	163.6	138.0	130.1	7.84	17.597	
1,800.0	1,753.8	1,819.6	1,799.0	7.6	5.4	-168.98		5.7	194.4	147.3	138.8	8.44	17.442	
1,900.0	1,845.8	1,919.3	1,893.7	8.4	6.0	-169.65		1.9	225.3	155.6	146.5	9.06	17.163	
2,000.0	1,937.8	2,018.9	1,988.3	9.2	6.6	-170.25		-1.9	256.2	163.9	154.2	9.69	16.912	
2,100.0	2,029.8	2,118.6	2,083.0	10.1	7.2	-170.79		-5.7	287.1	172.2	161.9	10.32	16.687	
2,200.0	2,121.8	2,218.2	2,177.6	10.9	7.8	-171.28		-9.5	318.0	180.6	169.6	10.95	16.485	
2,300.0	2,213.8	2,317.8	2,272.3	11.7	8.5	-171.73		-13.3	348.9	189.0	177.4	11.59	16.302	
2,400.0	2,305.8	2,417.5	2,366.9	12.6	9.1	-172.14		-17.0	379.8	197.3	185.1	12.23	16.135	
2,500.0	2,397.8	2,517.1	2,461.6	13.4	9.8	-172.52		-20.8	410.7	205.7	192.9	12.87	15.984	
2,600.0	2,489.8	2,616.8	2,556.2	14.2	10.4	-172.87		-24.6	441.6	214.1	200.6	13.51	15.844	
2,700.0	2,581.8	2,716.4	2,650.9	15.1	11.1	-173.19		-28.4	472.5	222.5	208.4	14.16	15.717	
2,800.0	2,673.8	2,816.0	2,745.5	15.9	11.7	-173.49		-32.2	503.4	230.9	216.1	14.81	15.599	
2,900.0	2,765.8	2,915.7	2,840.2	16.7	12.4	-173.77		-36.0	534.3	239.4	223.9	15.45	15.489	
3,000.0	2,857.8	3,015.3	2,934.8	17.6	13.0	-174.03		-39.7	565.2	247.8	231.7	16.10	15.388	
3,100.0	2,949.8	3,115.0	3,029.5	18.4	13.7	-174.27		-43.5	596.1	256.2	239.5	16.75	15.294	
3,200.0	3,041.8	3,214.6	3,124.2	19.3	14.3	-174.49		-47.3	627.0	264.6	247.2	17.40	15.206	
3,300.0	3,133.8	3,314.2	3,218.8	20.1	15.0	-174.71		-51.1	657.9	273.1	255.0	18.06	15.123	
3,400.0	3,225.8	3,413.9	3,313.5	21.0	15.6	-174.91		-54.9	688.8	281.5	262.8	18.71	15.046	
3,500.0	3,317.8	3,513.5	3,408.1	21.8	16.3	-175.09		-58.7	719.7	289.9	270.6	19.36	14.974	
3,600.0	3,409.8	3,613.1	3,502.8	22.7	17.0	-175.27		-62.5	750.6	298.4	278.4	20.02	14.905	
3,700.0	3,501.8	3,712.8	3,597.4	23.5	17.6	-175.44		-66.2	781.5	306.8	286.2	20.68	14.841	
3,800.0	3,593.8	3,812.4	3,692.1	24.3	18.3	-175.60		-70.0	812.4	315.3	294.0	21.33	14.780	
3,900.0	3,685.8	3,912.1	3,786.7	25.2	18.9	-175.75		-73.8	843.3	323.7	301.8	21.99	14.722	
4,000.0	3,777.8	4,011.7	3,881.4	26.0	19.6	-175.89		-77.6	874.1	332.2	309.5	22.65	14.668	
4,100.0	3,869.8	4,111.3	3,976.0	26.9	20.3	-176.02		-81.4	905.0	340.7	317.3	23.31	14.616	
4,200.0	3,961.8	4,211.0	4,070.7	27.7	20.9	-176.15		-85.2	935.9	349.1	325.1	23.97	14.567	
4,300.0	4,053.8	4,310.6	4,165.3	28.6	21.6	-176.28		-89.0	966.8	357.6	332.9	24.63	14.520	
4,400.0	4,145.8	4,410.3	4,260.0	29.4	22.3	-176.39		-92.7	997.7	366.0	340.7	25.29	14.475	
4,500.0	4,237.8	4,509.9	4,354.6	30.3	22.9	-176.50		-96.5	1,028.6	374.5	348.5	25.95	14.433	
4,600.0	4,329.8	4,609.5	4,449.3	31.1	23.6	-176.61		-100.3	1,059.5	383.0	356.3	26.61	14.392	
4,700.0	4,421.8	4,709.2	4,543.9	32.0	24.2	-176.71		-104.1	1,090.4	391.4	364.1	27.27	14.353	
4,800.0	4,513.8	4,808.8	4,638.6	32.8	24.9	-176.81		-107.9	1,121.3	399.9	372.0	27.93	14.316	
4,900.0	4,605.8	4,908.4	4,733.2	33.7	25.6	-176.91		-111.7	1,152.2	408.4	379.8	28.60	14.280	

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 Spaur 10Y-241
Project:	SEC.10-T4N-R67W	TVD Reference:	WELL @ 4844.0ft (RKB - 13')
Reference Site:	Spaur 4N67W10LQ Pad Sec.10-T4N-R67W	MD Reference:	WELL @ 4844.0ft (RKB - 13')
Site Error:	0.0ft	North Reference:	True
Reference Well:	Spaur 10Y-241	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	EDM 2003.21 Single User Db
Reference Design:	Plan #1 (6-11-15)	Offset TVD Reference:	Offset Datum

Offset Design Spaur 4N67W10LQ Pad Sec.10-T4N-R67W - Spaur 10T-421 - Wellbore #1 - Plan #1 (6-11-15)													Offset Site Error:	0.0 ft
Survey Program: 0-MWD													Offset Well Error:	0.0 ft
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference	Offset	Semi Major Axis	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
5,000.0	4,697.8	5,008.1	4,827.9	34.5	26.2	-177.00	-177.00	-115.4	1,183.1	416.8	387.6	29.26	14.246	
5,100.0	4,789.8	5,107.7	4,922.5	35.3	26.9	-177.08	-177.08	-119.2	1,214.0	425.3	395.4	29.92	14.213	
5,200.0	4,881.8	5,207.4	5,017.2	36.2	27.6	-177.17	-177.17	-123.0	1,244.9	433.8	403.2	30.59	14.181	
5,300.0	4,973.8	5,307.0	5,111.8	37.0	28.2	-177.25	-177.25	-126.8	1,275.8	442.2	411.0	31.25	14.151	
5,400.0	5,065.8	5,406.6	5,206.5	37.9	28.9	-177.32	-177.32	-130.6	1,306.7	450.7	418.8	31.92	14.122	
5,500.0	5,157.8	5,506.3	5,301.1	38.7	29.5	-177.40	-177.40	-134.4	1,337.6	459.2	426.6	32.58	14.094	
5,600.0	5,249.8	5,605.9	5,395.8	39.6	30.2	-177.47	-177.47	-138.2	1,368.5	467.6	434.4	33.25	14.067	
5,700.0	5,341.8	5,705.6	5,490.4	40.4	30.9	-177.54	-177.54	-141.9	1,399.4	476.1	442.2	33.91	14.041	
5,800.0	5,433.8	5,805.2	5,585.1	41.3	31.5	-177.60	-177.60	-145.7	1,430.3	484.6	450.0	34.58	14.015	
5,900.0	5,525.8	5,904.8	5,679.7	42.1	32.2	-177.67	-177.67	-149.5	1,461.2	493.1	457.8	35.24	13.991	
6,000.0	5,617.8	6,004.5	5,774.4	43.0	32.9	-177.73	-177.73	-153.3	1,492.1	501.5	465.6	35.91	13.968	
6,100.0	5,709.8	6,104.1	5,869.1	43.8	33.5	-177.79	-177.79	-157.1	1,523.0	510.0	473.4	36.57	13.945	
6,200.0	5,801.8	6,203.8	5,963.7	44.7	34.2	-177.85	-177.85	-160.9	1,553.9	518.5	481.3	37.24	13.923	
6,300.0	5,893.8	6,303.4	6,058.4	45.5	34.9	-177.90	-177.90	-164.7	1,584.8	527.0	489.1	37.91	13.902	
6,400.0	5,985.8	6,403.0	6,153.0	46.4	35.5	-177.96	-177.96	-168.4	1,615.7	535.5	496.9	38.57	13.881	
6,500.0	6,077.8	6,502.7	6,247.7	47.2	36.2	-178.01	-178.01	-172.2	1,646.6	543.9	504.7	39.24	13.861	
6,600.0	6,169.8	6,602.3	6,342.3	48.1	36.9	-178.06	-178.06	-176.0	1,677.5	552.4	512.5	39.91	13.842	
6,700.0	6,261.8	6,701.9	6,437.0	48.9	37.5	-178.11	-178.11	-179.8	1,708.4	560.9	520.3	40.58	13.823	
6,800.0	6,353.8	6,795.1	6,525.5	49.7	38.1	-167.53	-167.53	-181.0	1,737.3	569.4	528.2	41.25	13.805	
6,900.0	6,445.8	6,885.0	6,610.5	50.4	38.6	-150.34	-150.34	-172.1	1,765.0	577.9	536.0	41.93	13.782	
7,000.0	6,535.1	6,975.0	6,694.0	51.1	39.0	-136.51	-136.51	-152.7	1,792.2	586.1	543.5	42.62	13.752	
7,100.0	6,621.2	7,065.1	6,774.9	51.7	39.5	-126.38	-126.38	-123.1	1,818.5	593.8	550.5	43.30	13.715	
7,200.0	6,702.4	7,155.6	6,852.2	52.2	39.9	-119.23	-119.23	-83.5	1,843.6	601.0	557.1	43.97	13.669	
7,300.0	6,777.3	7,246.5	6,924.9	52.7	40.2	-114.22	-114.22	-34.4	1,867.2	607.6	563.0	44.65	13.609	
7,400.0	6,844.5	7,337.9	6,991.9	53.1	40.5	-110.76	-110.76	23.9	1,888.9	613.5	568.1	45.36	13.525	
7,500.0	6,903.0	7,430.1	7,052.3	53.5	40.8	-108.44	-108.44	90.7	1,908.4	618.6	572.4	46.13	13.409	
7,600.0	6,951.6	7,523.2	7,105.0	53.8	41.1	-106.98	-106.98	165.4	1,925.4	622.8	575.8	46.97	13.260	
7,700.0	6,989.7	7,617.2	7,149.1	54.1	41.4	-106.22	-106.22	247.1	1,939.5	626.2	578.2	47.95	13.060	
7,800.0	7,016.5	7,712.2	7,183.7	54.3	41.7	-106.04	-106.04	334.9	1,950.6	628.7	579.6	49.07	12.810	
7,900.0	7,031.6	7,808.5	7,207.9	54.5	41.9	-106.37	-106.37	427.7	1,958.2	630.2	579.8	50.38	12.509	
8,000.0	7,034.9	7,906.0	7,220.9	54.7	42.2	-107.15	-107.15	524.1	1,962.2	630.8	578.9	51.92	12.151	
8,100.0	7,034.1	8,005.3	7,223.4	54.9	42.5	-107.45	-107.45	623.4	1,962.7	631.3	577.5	53.73	11.748	
8,200.0	7,033.4	8,105.3	7,224.3	55.2	42.8	-107.59	-107.59	723.4	1,962.7	631.7	576.1	55.69	11.344	
8,300.0	7,032.6	8,205.3	7,225.1	55.4	43.2	-107.73	-107.73	823.4	1,962.7	632.2	574.4	57.82	10.935	
8,400.0	7,031.9	8,305.3	7,226.0	55.8	43.7	-107.86	-107.86	923.4	1,962.7	632.7	572.6	60.09	10.529	
8,500.0	7,031.1	8,405.3	7,226.8	56.2	44.3	-108.00	-108.00	1,023.4	1,962.7	633.2	570.7	62.50	10.132	
8,600.0	7,030.3	8,505.3	7,227.7	56.6	44.9	-108.14	-108.14	1,123.3	1,962.7	633.7	568.7	65.02	9.746	
8,700.0	7,029.6	8,605.2	7,228.5	57.1	45.7	-108.28	-108.28	1,223.3	1,962.7	634.2	566.6	67.65	9.375	
8,800.0	7,028.8	8,705.2	7,229.4	57.7	46.4	-108.42	-108.42	1,323.3	1,962.7	634.7	564.4	70.37	9.020	
8,900.0	7,028.1	8,805.2	7,230.2	58.3	47.3	-108.55	-108.55	1,423.3	1,962.7	635.2	562.1	73.17	8.682	
9,000.0	7,027.3	8,905.2	7,231.1	58.9	48.3	-108.69	-108.69	1,523.3	1,962.7	635.7	559.7	76.03	8.361	
9,100.0	7,026.6	9,005.2	7,231.9	59.7	49.3	-108.83	-108.83	1,623.3	1,962.7	636.3	557.3	78.96	8.058	
9,200.0	7,025.8	9,105.2	7,232.8	60.4	50.3	-108.96	-108.96	1,723.2	1,962.7	636.8	554.8	81.95	7.771	
9,300.0	7,025.1	9,205.2	7,233.6	61.3	51.5	-109.10	-109.10	1,823.2	1,962.7	637.3	552.3	84.98	7.500	
9,400.0	7,024.3	9,305.1	7,234.5	62.2	52.7	-109.24	-109.24	1,923.2	1,962.7	637.8	549.8	88.05	7.244	
9,500.0	7,023.6	9,405.1	7,235.3	63.1	53.9	-109.37	-109.37	2,023.2	1,962.7	638.4	547.2	91.16	7.002	
9,600.0	7,022.8	9,505.1	7,236.2	64.1	55.2	-109.51	-109.51	2,123.2	1,962.7	638.9	544.6	94.31	6.775	
9,700.0	7,022.1	9,605.1	7,237.0	65.2	56.5	-109.64	-109.64	2,223.2	1,962.7	639.4	542.0	97.48	6.560	
9,800.0	7,021.3	9,705.1	7,237.9	66.3	57.9	-109.78	-109.78	2,323.1	1,962.7	640.0	539.3	100.68	6.357	
9,900.0	7,020.6	9,805.1	7,238.7	67.4	59.3	-109.91	-109.91	2,423.1	1,962.7	640.5	536.6	103.90	6.165	
10,000.0	7,019.8	9,905.1	7,239.6	68.6	60.8	-110.05	-110.05	2,523.1	1,962.7	641.1	533.9	107.14	5.983	

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 Spaur 10Y-241
Project:	SEC.10-T4N-R67W	TVD Reference:	WELL @ 4844.0ft (RKB - 13')
Reference Site:	Spaur 4N67W10LQ Pad Sec.10-T4N-R67W	MD Reference:	WELL @ 4844.0ft (RKB - 13')
Site Error:	0.0ft	North Reference:	True
Reference Well:	Spaur 10Y-241	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	EDM 2003.21 Single User Db
Reference Design:	Plan #1 (6-11-15)	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	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)			
10,100.0	7,019.1	10,005.1	7,240.5	69.8	62.2	-110.18	2,623.1	1,962.7	641.6	531.2	110.40	5.812		
10,200.0	7,018.3	10,105.0	7,241.3	71.1	63.7	-110.32	2,723.1	1,962.7	642.2	528.5	113.68	5.649		
10,300.0	7,017.6	10,205.0	7,242.2	72.4	65.3	-110.45	2,823.1	1,962.7	642.7	525.8	116.96	5.495		
10,400.0	7,016.8	10,305.0	7,243.0	73.7	66.8	-110.59	2,923.0	1,962.7	643.3	523.0	120.27	5.349		
10,500.0	7,016.0	10,405.0	7,243.9	75.1	68.4	-110.72	3,023.0	1,962.7	643.9	520.3	123.58	5.210		
10,600.0	7,015.3	10,505.0	7,244.7	76.5	70.0	-110.85	3,123.0	1,962.7	644.4	517.5	126.90	5.078		
10,700.0	7,014.5	10,605.0	7,245.6	78.0	71.6	-110.99	3,223.0	1,962.7	645.0	514.8	130.23	4.953		
10,800.0	7,013.8	10,705.0	7,246.4	79.4	73.2	-111.12	3,323.0	1,962.7	645.6	512.0	133.57	4.833		
10,900.0	7,013.0	10,805.0	7,247.3	80.9	74.9	-111.25	3,423.0	1,962.7	646.2	509.3	136.91	4.720		
11,000.0	7,012.3	10,904.9	7,248.1	82.4	76.5	-111.39	3,522.9	1,962.7	646.7	506.5	140.26	4.611		
11,100.0	7,011.5	11,004.9	7,249.0	83.9	78.2	-111.52	3,622.9	1,962.7	647.3	503.7	143.61	4.508		
11,200.0	7,010.8	11,104.9	7,249.8	85.5	79.9	-111.65	3,722.9	1,962.7	647.9	501.0	146.96	4.409		
11,300.0	7,010.0	11,204.9	7,250.7	87.1	81.6	-111.78	3,822.9	1,962.7	648.5	498.2	150.32	4.314		
11,400.0	7,009.3	11,304.9	7,251.5	88.6	83.3	-111.91	3,922.9	1,962.7	649.1	495.4	153.68	4.224		
11,500.0	7,008.5	11,404.9	7,252.4	90.2	85.0	-112.04	4,022.9	1,962.7	649.7	492.7	157.04	4.137		
11,600.0	7,007.8	11,504.9	7,253.2	91.9	86.8	-112.18	4,122.8	1,962.7	650.3	489.9	160.41	4.054		
11,700.0	7,007.0	11,604.9	7,254.1	93.5	88.5	-112.31	4,222.8	1,962.7	650.9	487.2	163.77	3.975		
11,800.0	7,006.3	11,704.8	7,254.9	95.1	90.3	-112.44	4,322.8	1,962.7	651.5	484.4	167.14	3.898		
11,900.0	7,005.5	11,804.8	7,255.8	96.8	92.0	-112.57	4,422.8	1,962.7	652.2	481.7	170.50	3.825		
11,967.1	7,005.0	11,871.9	7,256.4	97.9	93.2	-112.65	4,489.9	1,962.7	652.6	479.8	172.76	3.777 SF		

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Spaur 10Y-241
Project:	SEC.10-T4N-R67W	TVD Reference:	WELL @ 4844.0ft (RKB - 13')
Reference Site:	Spaur 4N67W10LQ Pad Sec.10-T4N-R67W	MD Reference:	WELL @ 4844.0ft (RKB - 13')
Site Error:	0.0ft	North Reference:	True
Reference Well:	Spaur 10Y-241	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	EDM 2003.21 Single User Db
Reference Design:	Plan #1 (6-11-15)	Offset TVD Reference:	Offset Datum

Reference Depths are relative to WELL @ 4844.0ft (RKB - 13')

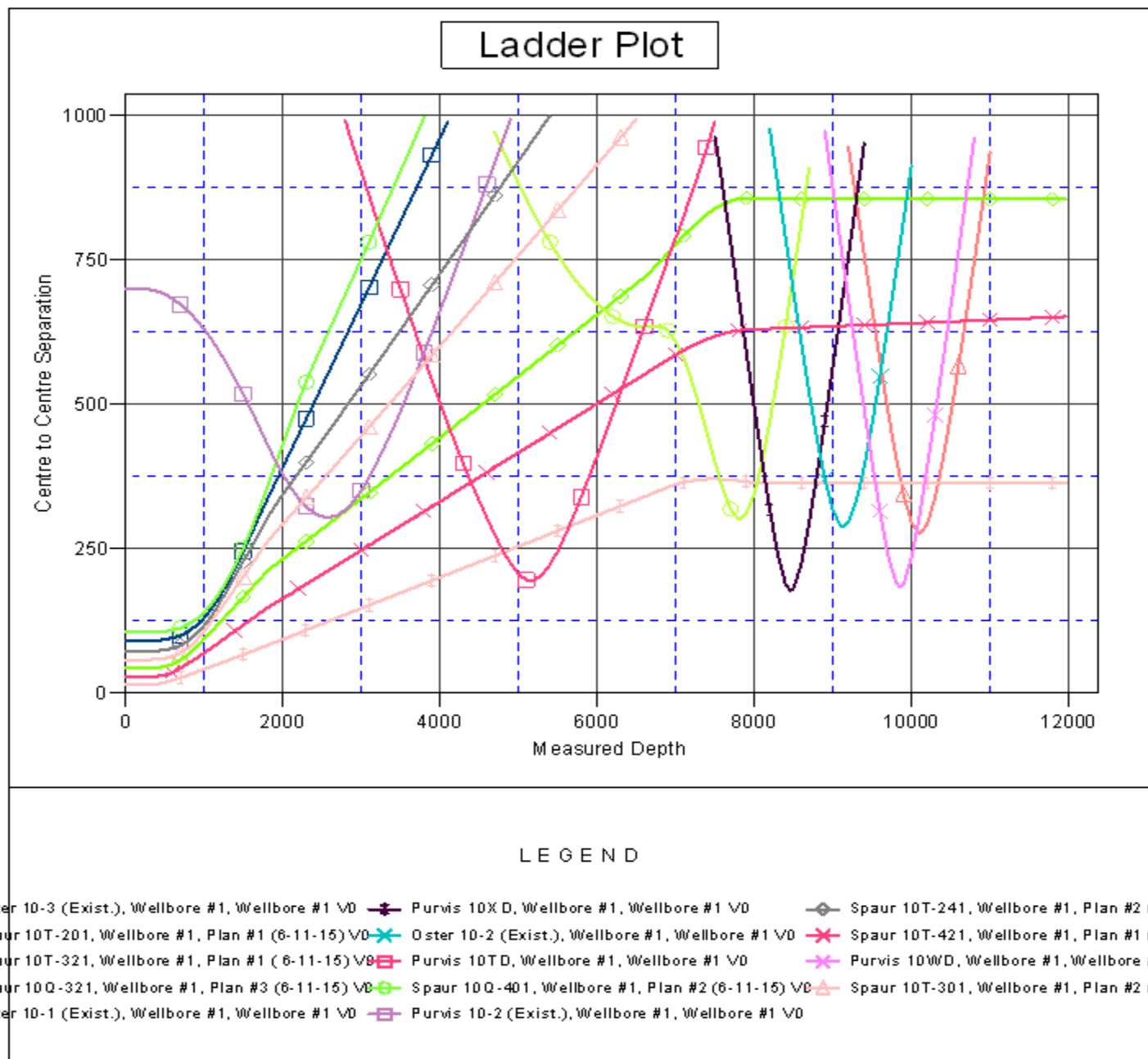
Offset Depths are relative to Offset Datum

Central Meridian is -105.500000 °

Coordinates are relative to: Spaur 10Y-241

Coordinate System is US State Plane 1983, Colorado Northern Zone

Grid Convergence at Surface is: 0.40°



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