

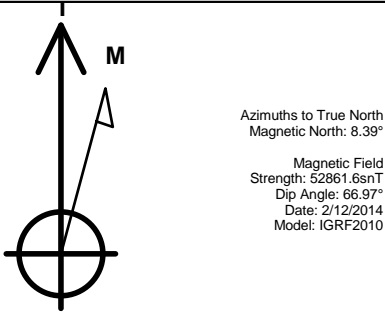
PETROLEUM DEVELOPMENT CORP Weld County CO

Well Name: Churchill 28J-423

Surface Location: Churchill 28J-HZ Pad Sec.28-T5N-R64W
North American Datum 1983 , US State Plane 1983 , Colorado Northern Zone
Ground Elevation: 4633.0
+N/-S +E/-W Northing Easting Latitude Longitude Slot
0.0 0.0 1381538.65 3262053.94 40.376910 -104.559390
RKB - 15' WELL @ 4648.0ft (RKB - 15')

WELLBORE TARGET DETAILS

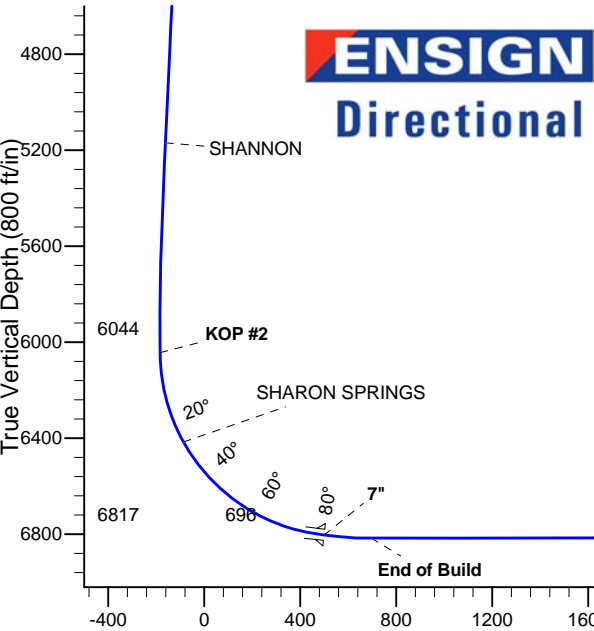
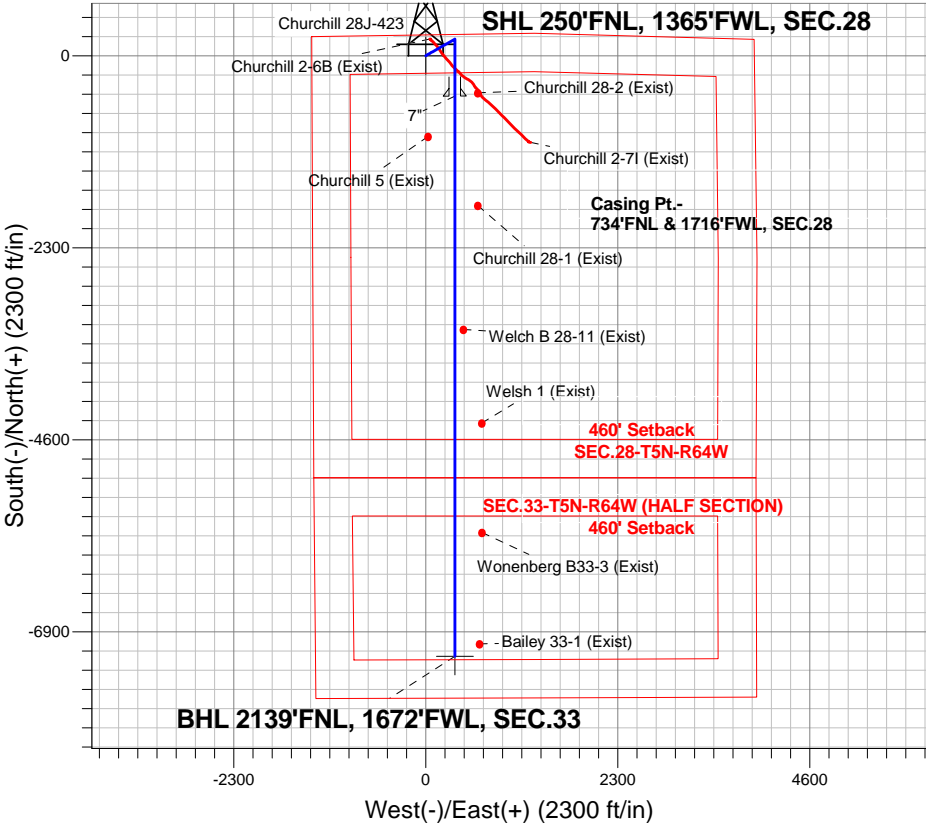
Name	TVD	+N/-S	+E/-W	Shape Point
SHL 250'FNL, 1365'FWL, SEC.28	1.0	0.0	0.0	Point
BHL 2139'FNL, 1672'FWL, SEC.33	6805.0	-7195.1	351.1	Point



ANNOTATIONS

TVD	MD	Annotation
1500.0	1500.0	KOP #1
6043.8	6063.6	KOP #2
6817.5	7379.8	End of Build

Churchill 28J-HZ Pad Sec.28-T5N-R64W
Churchill 28J-423
Plan #2 (2-11-14)
7:42, February 12 2014



SECTION DETAILS

Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	DLeg	TFace	VSec	Target
1	0.0	0.00	0.00	0.0	0.0	0.0	0.00	0.00	0.0	
2	1500.0	0.00	0.00	1500.0	0.0	0.0	0.00	0.00	0.0	
3	1787.5	5.75	60.33	1787.1	7.1	12.5	2.00	60.33	-6.5	
4	5532.3	5.75	60.33	5512.9	192.9	338.6	0.00	0.00	-176.1	
5	5819.8	0.00	0.00	5800.0	200.0	351.1	2.00	180.00	-182.7	
6	6063.6	0.00	0.00	6043.7	200.0	351.1	0.00	0.00	-182.7	
7	7183.6	84.00	180.00	6803.5	-484.1	351.1	7.50	180.00	500.6	
8	7257.6	84.00	180.00	6811.2	-557.7	351.1	0.00	0.00	574.1	
9	7379.8	90.11	180.00	6817.5	-679.7	351.1	5.00	0.00	696.0	
10	13895.2	90.11	180.00	6805.0	-7195.1	351.1	0.00	0.00	7203.7	BHL 2139'FNL, 1672'FWL, SEC.33

BHL 2139'FNL, 1672'FWL, SEC.33

Vertical Section at 177.21° (800 ft/in)



Directional

PETROLEUM DEVELOPMENT CORP Weld County CO

SEC.28-T5N-R64W

Churchill 28J-HZ Pad Sec.28-T5N-R64W

Churchill 28J-423

Wellbore #1

Plan: Plan #2 (2-11-14)

Standard Planning Report

12 February, 2014

Database:	Landmark	Local Co-ordinate Reference:	Well Churchill 28J-423
Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	TVD Reference:	WELL @ 4648.0ft (RKB - 15')
Project:	SEC.28-T5N-R64W	MD Reference:	WELL @ 4648.0ft (RKB - 15')
Site:	Churchill 28J-HZ Pad Sec.28-T5N-R64W	North Reference:	True
Well:	Churchill 28J-423	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Plan #2 (2-11-14)		

Project	SEC.28-T5N-R64W, Weld County, Colorado		
Map System:	US State Plane 1983	System Datum:	Mean Sea Level
Geo Datum:	North American Datum 1983		Using Well Reference Point
Map Zone:	Colorado Northern Zone		Using geodetic scale factor

Site Churchill 28J-HZ Pad Sec.28-T5N-R64W					
Site Position:		Northing:	1,381,533.43ft	Latitude:	40.376900
From:	Lat/Long	Easting:	3,261,903.54ft	Longitude:	-104.559930
Position Uncertainty:	0.0 ft	Slot Radius:	"	Grid Convergence:	0.61 °

Well	Churchill 28J-423					
Well Position	+N-S	3.6 ft	Northing:	1,381,538.65 ft	Latitude:	40.376910
	+E-W	150.5 ft	Easting:	3,262,053.94 ft	Longitude:	-104.559390
Position Uncertainty		0.0 ft	Wellhead Elevation:	ft	Ground Level:	4,633.0 ft

Wellbore	Wellbore #1				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	2/12/2014	8.39	66.97	52,862

Design	Plan #2 (2-11-14)			
Audit Notes:				
Version:	Phase:	PROTOTYPE	Tie On Depth:	0.0
Vertical Section:	Depth From (TVD) (ft)	+N/-S (ft)	+E/-W (ft)	Direction (°)
	0.0	0.0	0.0	177.21

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	
1,500.0	0.00	0.00	1,500.0	0.0	0.0	0.00	0.00	0.00	0.00	
1,787.5	5.75	60.33	1,787.1	7.1	12.5	2.00	2.00	0.00	60.33	
5,532.3	5.75	60.33	5,512.9	192.9	338.6	0.00	0.00	0.00	0.00	
5,819.8	0.00	0.00	5,800.0	200.0	351.1	2.00	-2.00	0.00	180.00	
6,063.6	0.00	0.00	6,043.7	200.0	351.1	0.00	0.00	0.00	0.00	
7,183.6	84.00	180.00	6,803.5	-484.1	351.1	7.50	7.50	0.00	180.00	
7,257.6	84.00	180.00	6,811.2	-557.7	351.1	0.00	0.00	0.00	0.00	
7,379.8	90.11	180.00	6,817.5	-679.7	351.1	5.00	5.00	0.00	0.00	
13,895.2	90.11	180.00	6,805.0	-7,195.1	351.1	0.00	0.00	0.00	0.00	BHL 2139'FNL, 167

Database:	Landmark	Local Co-ordinate Reference:	Well Churchill 28J-423
Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	TVD Reference:	WELL @ 4648.0ft (RKB - 15')
Project:	SEC.28-T5N-R64W	MD Reference:	WELL @ 4648.0ft (RKB - 15')
Site:	Churchill 28J-HZ Pad Sec.28-T5N-R64W	North Reference:	True
Well:	Churchill 28J-423	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Plan #2 (2-11-14)		

Planned Survey									
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N-S (ft)	+E-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
0.0	0.00	0.00	0.0	0.0	0.0	0.0	0.00	0.00	0.00
1.0	0.00	0.00	1.0	0.0	0.0	0.0	0.00	0.00	0.00
SHL 250'FNL, 1365'FWL, SEC.28									
100.0	0.00	0.00	100.0	0.0	0.0	0.0	0.00	0.00	0.00
200.0	0.00	0.00	200.0	0.0	0.0	0.0	0.00	0.00	0.00
300.0	0.00	0.00	300.0	0.0	0.0	0.0	0.00	0.00	0.00
400.0	0.00	0.00	400.0	0.0	0.0	0.0	0.00	0.00	0.00
500.0	0.00	0.00	500.0	0.0	0.0	0.0	0.00	0.00	0.00
600.0	0.00	0.00	600.0	0.0	0.0	0.0	0.00	0.00	0.00
700.0	0.00	0.00	700.0	0.0	0.0	0.0	0.00	0.00	0.00
800.0	0.00	0.00	800.0	0.0	0.0	0.0	0.00	0.00	0.00
900.0	0.00	0.00	900.0	0.0	0.0	0.0	0.00	0.00	0.00
1,000.0	0.00	0.00	1,000.0	0.0	0.0	0.0	0.00	0.00	0.00
1,100.0	0.00	0.00	1,100.0	0.0	0.0	0.0	0.00	0.00	0.00
1,200.0	0.00	0.00	1,200.0	0.0	0.0	0.0	0.00	0.00	0.00
1,300.0	0.00	0.00	1,300.0	0.0	0.0	0.0	0.00	0.00	0.00
1,400.0	0.00	0.00	1,400.0	0.0	0.0	0.0	0.00	0.00	0.00
1,500.0	0.00	0.00	1,500.0	0.0	0.0	0.0	0.00	0.00	0.00
KOP #1									
1,600.0	2.00	60.33	1,600.0	0.9	1.5	-0.8	2.00	2.00	0.00
1,700.0	4.00	60.33	1,699.8	3.5	6.1	-3.2	2.00	2.00	0.00
1,787.5	5.75	60.33	1,787.1	7.1	12.5	-6.5	2.00	2.00	0.00
1,800.0	5.75	60.33	1,799.5	7.8	13.6	-7.1	0.00	0.00	0.00
1,900.0	5.75	60.33	1,899.0	12.7	22.3	-11.6	0.00	0.00	0.00
2,000.0	5.75	60.33	1,998.4	17.7	31.0	-16.1	0.00	0.00	0.00
2,100.0	5.75	60.33	2,097.9	22.6	39.7	-20.7	0.00	0.00	0.00
2,200.0	5.75	60.33	2,197.4	27.6	48.4	-25.2	0.00	0.00	0.00
2,300.0	5.75	60.33	2,296.9	32.6	57.1	-29.7	0.00	0.00	0.00
2,400.0	5.75	60.33	2,396.4	37.5	65.9	-34.3	0.00	0.00	0.00
2,500.0	5.75	60.33	2,495.9	42.5	74.6	-38.8	0.00	0.00	0.00
2,600.0	5.75	60.33	2,595.4	47.4	83.3	-43.3	0.00	0.00	0.00
2,700.0	5.75	60.33	2,694.9	52.4	92.0	-47.8	0.00	0.00	0.00
2,800.0	5.75	60.33	2,794.4	57.4	100.7	-52.4	0.00	0.00	0.00
2,900.0	5.75	60.33	2,893.9	62.3	109.4	-56.9	0.00	0.00	0.00
3,000.0	5.75	60.33	2,993.4	67.3	118.1	-61.4	0.00	0.00	0.00
3,100.0	5.75	60.33	3,092.9	72.2	126.8	-66.0	0.00	0.00	0.00
3,200.0	5.75	60.33	3,192.4	77.2	135.5	-70.5	0.00	0.00	0.00
3,300.0	5.75	60.33	3,291.9	82.1	144.2	-75.0	0.00	0.00	0.00
3,400.0	5.75	60.33	3,391.4	87.1	152.9	-79.6	0.00	0.00	0.00
3,500.0	5.75	60.33	3,490.9	92.1	161.6	-84.1	0.00	0.00	0.00
3,559.4	5.75	60.33	3,550.0	95.0	166.8	-86.8	0.00	0.00	0.00
PARKMAN									
3,600.0	5.75	60.33	3,590.4	97.0	170.3	-88.6	0.00	0.00	0.00
3,700.0	5.75	60.33	3,689.9	102.0	179.0	-93.1	0.00	0.00	0.00
3,800.0	5.75	60.33	3,789.4	106.9	187.7	-97.7	0.00	0.00	0.00
3,900.0	5.75	60.33	3,888.9	111.9	196.5	-102.2	0.00	0.00	0.00
4,000.0	5.75	60.33	3,988.4	116.9	205.2	-106.7	0.00	0.00	0.00
4,100.0	5.75	60.33	4,087.9	121.8	213.9	-111.3	0.00	0.00	0.00
4,177.5	5.75	60.33	4,165.0	125.7	220.6	-114.8	0.00	0.00	0.00
SUSSEX									
4,200.0	5.75	60.33	4,187.4	126.8	222.6	-115.8	0.00	0.00	0.00
4,300.0	5.75	60.33	4,286.9	131.7	231.3	-120.3	0.00	0.00	0.00
4,400.0	5.75	60.33	4,386.4	136.7	240.0	-124.8	0.00	0.00	0.00

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Project:	SEC.28-T5N-R64W	MD Reference:	WELL @ 4648.0ft (RKB - 15')
Site:	Churchill 28J-HZ Pad Sec.28-T5N-R64W	North Reference:	True
Well:	Churchill 28J-423	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Plan #2 (2-11-14)		

Planned Survey									
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N-S (ft)	+E-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
4,500.0	5.75	60.33	4,485.9	141.7	248.7	-129.4	0.00	0.00	0.00
4,600.0	5.75	60.33	4,585.4	146.6	257.4	-133.9	0.00	0.00	0.00
4,700.0	5.75	60.33	4,684.9	151.6	266.1	-138.4	0.00	0.00	0.00
4,800.0	5.75	60.33	4,784.4	156.5	274.8	-143.0	0.00	0.00	0.00
4,900.0	5.75	60.33	4,883.9	161.5	283.5	-147.5	0.00	0.00	0.00
5,000.0	5.75	60.33	4,983.3	166.5	292.2	-152.0	0.00	0.00	0.00
5,100.0	5.75	60.33	5,082.8	171.4	300.9	-156.6	0.00	0.00	0.00
5,187.6	5.75	60.33	5,170.0	175.8	308.6	-160.5	0.00	0.00	0.00
SHANNON									
5,200.0	5.75	60.33	5,182.3	176.4	309.6	-161.1	0.00	0.00	0.00
5,300.0	5.75	60.33	5,281.8	181.3	318.3	-165.6	0.00	0.00	0.00
5,400.0	5.75	60.33	5,381.3	186.3	327.1	-170.1	0.00	0.00	0.00
5,500.0	5.75	60.33	5,480.8	191.3	335.8	-174.7	0.00	0.00	0.00
5,532.3	5.75	60.33	5,512.9	192.9	338.6	-176.1	0.00	0.00	0.00
5,600.0	4.40	60.33	5,580.4	195.8	343.8	-178.8	2.00	-2.00	0.00
5,700.0	2.40	60.33	5,680.2	198.8	348.9	-181.5	2.00	-2.00	0.00
5,800.0	0.40	60.33	5,780.2	200.0	351.0	-182.6	2.00	-2.00	0.00
5,819.8	0.00	0.00	5,800.0	200.0	351.1	-182.7	2.00	-2.00	0.00
5,900.0	0.00	0.00	5,880.2	200.0	351.1	-182.7	0.00	0.00	0.00
6,000.0	0.00	0.00	5,980.2	200.0	351.1	-182.7	0.00	0.00	0.00
6,063.6	0.00	0.00	6,043.8	200.0	351.1	-182.7	0.00	0.00	0.00
KOP #2									
6,100.0	2.73	180.00	6,080.2	199.1	351.1	-181.8	7.51	7.51	0.00
6,200.0	10.23	180.00	6,179.5	187.8	351.1	-170.5	7.50	7.50	0.00
6,300.0	17.73	180.00	6,276.4	163.7	351.1	-146.4	7.50	7.50	0.00
6,400.0	25.23	180.00	6,369.4	127.1	351.1	-109.8	7.50	7.50	0.00
6,452.4	29.16	180.00	6,416.0	103.2	351.1	-85.9	7.50	7.50	0.00
SHARON SPRINGS									
6,500.0	32.73	180.00	6,456.8	78.7	351.1	-61.5	7.50	7.50	0.00
6,600.0	40.23	180.00	6,537.2	19.3	351.1	-2.1	7.50	7.50	0.00
6,700.0	47.73	180.00	6,609.1	-50.1	351.1	67.2	7.50	7.50	0.00
6,800.0	55.23	180.00	6,671.3	-128.3	351.1	145.3	7.50	7.50	0.00
6,900.0	62.73	180.00	6,722.8	-214.0	351.1	230.8	7.50	7.50	0.00
7,000.0	70.23	180.00	6,762.7	-305.6	351.1	322.3	7.50	7.50	0.00
7,100.0	77.73	180.00	6,790.2	-401.6	351.1	418.3	7.50	7.50	0.00
7,183.6	84.00	180.00	6,803.5	-484.1	351.1	500.7	7.50	7.50	0.00
7"									
7,200.0	84.00	180.00	6,805.2	-500.4	351.1	517.0	0.00	0.00	0.00
7,257.6	84.00	180.00	6,811.2	-557.7	351.1	574.1	0.00	0.00	0.00
7,300.0	86.12	180.00	6,814.9	-600.0	351.1	616.4	5.00	5.00	0.00
7,379.8	90.11	180.00	6,817.5	-679.7	351.1	696.0	5.00	5.00	0.00
End of Build									
7,400.0	90.11	180.00	6,817.5	-699.9	351.1	716.2	0.00	0.00	0.00
7,500.0	90.11	180.00	6,817.3	-799.9	351.1	816.1	0.00	0.00	0.00
7,600.0	90.11	180.00	6,817.1	-899.9	351.1	916.0	0.00	0.00	0.00
7,700.0	90.11	180.00	6,816.9	-999.9	351.1	1,015.8	0.00	0.00	0.00
7,800.0	90.11	180.00	6,816.7	-1,099.9	351.1	1,115.7	0.00	0.00	0.00
7,900.0	90.11	180.00	6,816.5	-1,199.9	351.1	1,215.6	0.00	0.00	0.00
8,000.0	90.11	180.00	6,816.3	-1,299.9	351.1	1,315.5	0.00	0.00	0.00
8,100.0	90.11	180.00	6,816.1	-1,399.9	351.1	1,415.4	0.00	0.00	0.00
8,200.0	90.11	180.00	6,815.9	-1,499.9	351.1	1,515.2	0.00	0.00	0.00
8,300.0	90.11	180.00	6,815.7	-1,599.9	351.1	1,615.1	0.00	0.00	0.00

Database:	Landmark	Local Co-ordinate Reference:	Well Churchill 28J-423
Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	TVD Reference:	WELL @ 4648.0ft (RKB - 15')
Project:	SEC.28-T5N-R64W	MD Reference:	WELL @ 4648.0ft (RKB - 15')
Site:	Churchill 28J-HZ Pad Sec.28-T5N-R64W	North Reference:	True
Well:	Churchill 28J-423	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Plan #2 (2-11-14)		

Planned Survey									
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
8,400.0	90.11	180.00	6,815.6	-1,699.9	351.1	1,715.0	0.00	0.00	0.00
8,500.0	90.11	180.00	6,815.4	-1,799.9	351.1	1,814.9	0.00	0.00	0.00
8,600.0	90.11	180.00	6,815.2	-1,899.9	351.1	1,914.8	0.00	0.00	0.00
8,700.0	90.11	180.00	6,815.0	-1,999.9	351.1	2,014.6	0.00	0.00	0.00
8,800.0	90.11	180.00	6,814.8	-2,099.9	351.1	2,114.5	0.00	0.00	0.00
8,900.0	90.11	180.00	6,814.6	-2,199.9	351.1	2,214.4	0.00	0.00	0.00
9,000.0	90.11	180.00	6,814.4	-2,299.9	351.1	2,314.3	0.00	0.00	0.00
9,100.0	90.11	180.00	6,814.2	-2,399.9	351.1	2,414.2	0.00	0.00	0.00
9,200.0	90.11	180.00	6,814.0	-2,499.9	351.1	2,514.1	0.00	0.00	0.00
9,300.0	90.11	180.00	6,813.8	-2,599.9	351.1	2,613.9	0.00	0.00	0.00
9,400.0	90.11	180.00	6,813.6	-2,699.9	351.1	2,713.8	0.00	0.00	0.00
9,500.0	90.11	180.00	6,813.4	-2,799.9	351.1	2,813.7	0.00	0.00	0.00
9,600.0	90.11	180.00	6,813.2	-2,899.9	351.1	2,913.6	0.00	0.00	0.00
9,700.0	90.11	180.00	6,813.1	-2,999.9	351.1	3,013.5	0.00	0.00	0.00
9,800.0	90.11	180.00	6,812.9	-3,099.9	351.1	3,113.3	0.00	0.00	0.00
9,900.0	90.11	180.00	6,812.7	-3,199.9	351.1	3,213.2	0.00	0.00	0.00
10,000.0	90.11	180.00	6,812.5	-3,299.9	351.1	3,313.1	0.00	0.00	0.00
10,100.0	90.11	180.00	6,812.3	-3,399.9	351.1	3,413.0	0.00	0.00	0.00
10,200.0	90.11	180.00	6,812.1	-3,499.9	351.1	3,512.9	0.00	0.00	0.00
10,300.0	90.11	180.00	6,811.9	-3,599.9	351.1	3,612.7	0.00	0.00	0.00
10,400.0	90.11	180.00	6,811.7	-3,699.9	351.1	3,712.6	0.00	0.00	0.00
10,500.0	90.11	180.00	6,811.5	-3,799.9	351.1	3,812.5	0.00	0.00	0.00
10,600.0	90.11	180.00	6,811.3	-3,899.9	351.1	3,912.4	0.00	0.00	0.00
10,700.0	90.11	180.00	6,811.1	-3,999.9	351.1	4,012.3	0.00	0.00	0.00
10,800.0	90.11	180.00	6,810.9	-4,099.9	351.1	4,112.1	0.00	0.00	0.00
10,900.0	90.11	180.00	6,810.8	-4,199.9	351.1	4,212.0	0.00	0.00	0.00
11,000.0	90.11	180.00	6,810.6	-4,299.9	351.1	4,311.9	0.00	0.00	0.00
11,100.0	90.11	180.00	6,810.4	-4,399.9	351.1	4,411.8	0.00	0.00	0.00
11,200.0	90.11	180.00	6,810.2	-4,499.9	351.1	4,511.7	0.00	0.00	0.00
11,300.0	90.11	180.00	6,810.0	-4,599.9	351.1	4,611.6	0.00	0.00	0.00
11,400.0	90.11	180.00	6,809.8	-4,699.9	351.1	4,711.4	0.00	0.00	0.00
11,500.0	90.11	180.00	6,809.6	-4,799.9	351.1	4,811.3	0.00	0.00	0.00
11,600.0	90.11	180.00	6,809.4	-4,899.9	351.1	4,911.2	0.00	0.00	0.00
11,700.0	90.11	180.00	6,809.2	-4,999.9	351.1	5,011.1	0.00	0.00	0.00
11,800.0	90.11	180.00	6,809.0	-5,099.9	351.1	5,111.0	0.00	0.00	0.00
11,900.0	90.11	180.00	6,808.8	-5,199.9	351.1	5,210.8	0.00	0.00	0.00
12,000.0	90.11	180.00	6,808.6	-5,299.9	351.1	5,310.7	0.00	0.00	0.00
12,100.0	90.11	180.00	6,808.4	-5,399.9	351.1	5,410.6	0.00	0.00	0.00
12,200.0	90.11	180.00	6,808.3	-5,499.9	351.1	5,510.5	0.00	0.00	0.00
12,300.0	90.11	180.00	6,808.1	-5,599.9	351.1	5,610.4	0.00	0.00	0.00
12,400.0	90.11	180.00	6,807.9	-5,699.9	351.1	5,710.2	0.00	0.00	0.00
12,500.0	90.11	180.00	6,807.7	-5,799.9	351.1	5,810.1	0.00	0.00	0.00
12,600.0	90.11	180.00	6,807.5	-5,899.9	351.1	5,910.0	0.00	0.00	0.00
12,700.0	90.11	180.00	6,807.3	-5,999.9	351.1	6,009.9	0.00	0.00	0.00
12,800.0	90.11	180.00	6,807.1	-6,099.9	351.1	6,109.8	0.00	0.00	0.00
12,900.0	90.11	180.00	6,806.9	-6,199.9	351.1	6,209.6	0.00	0.00	0.00
13,000.0	90.11	180.00	6,806.7	-6,299.9	351.1	6,309.5	0.00	0.00	0.00
13,100.0	90.11	180.00	6,806.5	-6,399.9	351.1	6,409.4	0.00	0.00	0.00
13,200.0	90.11	180.00	6,806.3	-6,499.9	351.1	6,509.3	0.00	0.00	0.00
13,300.0	90.11	180.00	6,806.1	-6,599.9	351.1	6,609.2	0.00	0.00	0.00
13,400.0	90.11	180.00	6,806.0	-6,699.9	351.1	6,709.1	0.00	0.00	0.00
13,500.0	90.11	180.00	6,805.8	-6,799.9	351.1	6,808.9	0.00	0.00	0.00
13,600.0	90.11	180.00	6,805.6	-6,899.9	351.1	6,908.8	0.00	0.00	0.00

Database:	Landmark	Local Co-ordinate Reference:	Well Churchill 28J-423
Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	TVD Reference:	WELL @ 4648.0ft (RKB - 15')
Project:	SEC.28-T5N-R64W	MD Reference:	WELL @ 4648.0ft (RKB - 15')
Site:	Churchill 28J-HZ Pad Sec.28-T5N-R64W	North Reference:	True
Well:	Churchill 28J-423	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Plan #2 (2-11-14)		

Planned Survey									
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
13,700.0	90.11	180.00	6,805.4	-6,999.9	351.1	7,008.7	0.00	0.00	0.00
13,800.0	90.11	180.00	6,805.2	-7,099.9	351.1	7,108.6	0.00	0.00	0.00
13,895.2	90.11	180.00	6,805.0	-7,195.1	351.1	7,203.7	0.00	0.00	0.00
BHL 2139'FNL, 1672'FWL, SEC.33									

Targets									
Target Name	- hit/miss target	Dip Angle (°)	Dip Dir. (°)	TVD (ft)	+N/-S (ft)	+E/-W (ft)	Northing (ft)	Easting (ft)	
	- Shape								Latitude Longitude
BHL 2139'FNL, 1672'I	- plan hits target center	0.00	0.00	6,805.0	-7,195.1	351.1	1,374,347.99	3,262,481.32	40.357160 -104.558130
	- Point								
SHL 250'FNL, 1365'F	- plan hits target center	0.00	0.00	1.0	0.0	0.0	1,381,538.67	3,262,053.94	40.376910 -104.559390
	- Point								

Casing Points					
Measured Depth (ft)	Vertical Depth (ft)	Name	Casing Diameter (")	Hole Diameter (")	
7,183.6	6,803.5	7"	7	7-1/2	

Formations					
Measured Depth (ft)	Vertical Depth (ft)	Name	Lithology	Dip (°)	Dip Direction (°)
3,559.4	3,550.0	PARKMAN			
4,177.5	4,165.0	SUSSEX			
5,187.6	5,170.0	SHANNON			
6,452.4	6,416.0	SHARON SPRINGS			

Plan Annotations				
Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment
		+N/-S (ft)	+E/-W (ft)	
1,500.0	1,500.0	0.0	0.0	KOP #1
6,063.6	6,043.8	200.0	351.1	KOP #2
7,379.8	6,817.5	-679.7	351.1	End of Build



Directional

PETROLEUM DEVELOPMENT CORP Weld County CO

SEC.28-T5N-R64W

Churchill 28J-HZ Pad Sec.28-T5N-R64W

Churchill 28J-423

Wellbore #1

Plan #2 (2-11-14)

Anticollision Report

12 February, 2014



Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Churchill 28J-423
Project:	SEC.28-T5N-R64W	TVD Reference:	WELL @ 4648.0ft (RKB - 15')
Reference Site:	Churchill 28J-HZ Pad Sec.28-T5N-R64W	MD Reference:	WELL @ 4648.0ft (RKB - 15')
Site Error:	0.0ft	North Reference:	True
Reference Well:	Churchill 28J-423	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	Landmark
Reference Design:	Plan #2 (2-11-14)	Offset TVD Reference:	Offset Datum

Reference	Plan #2 (2-11-14)
Filter type:	NO GLOBAL FILTER: Using user defined selection & filtering criteria
Interpolation Method:	Stations
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	2/12/2014		
From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description	
0.0	13,895.2	Plan #2 (2-11-14) (Wellbore #1)	MWD	MWD - Standard	

Summary						
Site Name	Reference Measured Depth (ft)	Offset Measured Depth (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Separation Factor	Warning
Offset Well - Wellbore - Design						
Churchill 28J-HZ Pad Sec.28-T5N-R64W						
Churchill 28E-203 - Wellbore #1 - Plan #1 (1-22-14)	166.0	168.0	150.5	150.0	286.175	CC
Churchill 28E-203 - Wellbore #1 - Plan #1 (1-22-14)	200.0	200.0	150.5	149.8	223.210	ES
Churchill 28E-203 - Wellbore #1 - Plan #1 (1-22-14)	1,500.0	1,441.5	363.6	355.5	45.314	SF
Churchill 28E-423 - Wellbore #1 - Plan #1 (1-22-14)	366.0	368.0	119.9	118.4	84.115	CC
Churchill 28E-423 - Wellbore #1 - Plan #1 (1-22-14)	400.0	400.0	119.9	118.3	76.192	ES
Churchill 28E-423 - Wellbore #1 - Plan #1 (1-22-14)	1,500.0	1,471.2	255.6	248.4	35.518	SF
Churchill 28J-203 - Wellbore #1 - Plan #2 (2-11-14)	1,500.0	1,501.0	30.6	24.1	4.700	CC, ES
Churchill 28J-203 - Wellbore #1 - Plan #2 (2-11-14)	13,895.2	13,537.4	281.5	53.0	1.232	Level 2, SF
Churchill 28J-343 - Wellbore #1 - Plan #2 (2-11-14)	566.0	568.0	89.2	86.8	38.363	CC
Churchill 28J-343 - Wellbore #1 - Plan #2 (2-11-14)	600.0	601.9	89.2	86.7	35.999	ES
Churchill 28J-343 - Wellbore #1 - Plan #2 (2-11-14)	13,895.2	13,813.7	813.0	535.9	2.934	SF
Churchill 28J-443 - Wellbore #1 - Plan #1 (1-22-14)	766.3	767.3	58.5	55.3	18.157	CC
Churchill 28J-443 - Wellbore #1 - Plan #1 (1-22-14)	800.0	801.0	58.5	55.1	17.343	ES
Churchill 28J-443 - Wellbore #1 - Plan #1 (1-22-14)	13,895.2	13,884.0	607.5	328.4	2.177	SF
Churchill 28M-343 - Wellbore #1 - Plan #2 (2-11-14)	1,000.0	1,000.0	30.6	26.4	7.177	CC, ES
Churchill 28M-343 - Wellbore #1 - Plan #2 (2-11-14)	13,895.2	13,866.9	439.2	167.5	1.616	SF
Churchill 28M-443 - Wellbore #1 - Plan #1 (1-22-14)	400.0	399.0	61.3	59.7	39.014	CC, ES
Churchill 28M-443 - Wellbore #1 - Plan #1 (1-22-14)	13,895.2	13,973.0	713.5	434.4	2.556	SF
Existing Wells - Churchill 28J-HZ Sec.28-T5N-R64W						
Bailey 33-1 (Exist) - Wellbore #1 - Wellbore #1	13,745.8	6,844.3	292.7	19.1	1.070	Level 2, CC, ES, SF
Churchill 2-6B (Exist) - Wellbore #1 - Wellbore #1	4,568.3	4,612.0	123.6	101.8	5.681	CC, ES
Churchill 2-6B (Exist) - Wellbore #1 - Wellbore #1	4,600.0	4,643.3	123.7	101.9	5.655	SF
Churchill 2-7I (Exist) - Wellbore #1 - Wellbore #1	100.0	80.0	791.4	791.2	3,896.421	CC
Churchill 2-7I (Exist) - Wellbore #1 - Wellbore #1	200.0	178.7	791.6	791.1	1,466.945	ES
Churchill 2-7I (Exist) - Wellbore #1 - Wellbore #1	8,100.0	6,846.1	971.3	922.3	19.794	SF
Churchill 28-1 (Exist) - Wellbore #1 - Wellbore #1	8,492.4	6,817.4	273.0	98.7	1.566	CC
Churchill 28-1 (Exist) - Wellbore #1 - Wellbore #1	8,500.0	6,817.4	273.2	98.7	1.565	ES, SF
Churchill 28-2 (Exist) - Wellbore #1 - Wellbore #1	7,143.6	6,779.3	273.0	120.0	1.785	CC
Churchill 28-2 (Exist) - Wellbore #1 - Wellbore #1	7,150.0	6,780.3	273.1	120.0	1.784	ES, SF
Churchill 5 (Exist) - Wellbore #1 - Wellbore #1	7,665.5	6,808.0	323.2	162.9	2.016	CC, ES, SF
Welch B 28-11 (Exist) - Wellbore #1 - Wellbore #1	9,978.8	6,805.5	100.3	-101.0	0.498	Level 1, CC, ES, SF
Welsh 1 (Exist) - Wellbore #1 - Wellbore #1	11,100.9	6,810.4	320.5	97.9	1.440	Level 3, CC, ES, SF
Wonenberg B33-3 (Exist) - Wellbore #1 - Wellbore #1	12,412.5	6,823.8	323.3	75.6	1.305	Level 3, CC, ES, SF

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 Churchill 28J-423
Project:	SEC.28-T5N-R64W	TVD Reference:	WELL @ 4648.0ft (RKB - 15')
Reference Site:	Churchill 28J-HZ Pad Sec.28-T5N-R64W	MD Reference:	WELL @ 4648.0ft (RKB - 15')
Site Error:	0.0ft	North Reference:	True
Reference Well:	Churchill 28J-423	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	Landmark
Reference Design:	Plan #2 (2-11-14)	Offset TVD Reference:	Offset Datum

Offset Design Churchill 28J-HZ Pad Sec.28-T5N-R64W - Churchill 28E-203 - Wellbore #1 - Plan #1 (1-22-14)													Offset Site Error:	0.0 ft
Survey Program: 0-MWD													Offset Well Error:	0.0 ft
Measured Depth (ft)	Vertical Reference Depth (ft)	Offset Measured Depth (ft)	Offset Vertical Depth (ft)	Semi Major Axis Reference (ft)	Semi Major Axis Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning	
0.0	0.0	2.0	2.0	0.0	0.0	-91.38	-3.6	-150.5	150.5	150.5	0.00	N/A		
100.0	100.0	102.0	102.0	0.1	0.1	-91.38	-3.6	-150.5	150.5	150.3	0.23	656.443		
166.0	166.0	168.0	168.0	0.3	0.3	-91.38	-3.6	-150.5	150.5	150.0	0.53	286.175 CC		
200.0	200.0	200.0	200.0	0.3	0.3	-91.38	-3.6	-150.5	150.5	149.8	0.67	223.210 ES		
300.0	300.0	297.0	297.0	0.6	0.5	-91.26	-3.3	-152.1	152.2	151.1	1.11	137.190		
400.0	400.0	391.8	391.7	0.8	0.8	-90.91	-2.5	-156.8	157.1	155.6	1.55	101.572		
500.0	500.0	486.3	485.8	1.0	1.0	-90.37	-1.1	-164.5	165.3	163.3	2.01	82.446		
600.0	600.0	580.1	579.0	1.2	1.3	-89.71	0.9	-175.2	176.7	174.2	2.49	71.017		
700.0	700.0	673.1	670.9	1.5	1.6	-88.98	3.4	-188.8	191.4	188.4	3.00	63.688		
800.0	800.0	765.1	761.4	1.7	1.9	-88.23	6.3	-205.1	209.2	205.6	3.55	58.840		
900.0	900.0	856.7	851.0	1.9	2.3	-87.49	9.8	-224.2	230.1	226.0	4.14	55.593		
1,000.0	1,000.0	954.2	946.0	2.1	2.7	-86.80	13.7	-245.6	252.3	247.5	4.78	52.834		
1,100.0	1,100.0	1,051.6	1,041.0	2.4	3.2	-86.22	17.7	-267.1	274.5	269.1	5.42	50.667		
1,200.0	1,200.0	1,149.1	1,136.0	2.6	3.6	-85.72	21.6	-288.5	296.8	290.7	6.07	48.923		
1,300.0	1,300.0	1,246.6	1,231.0	2.8	4.1	-85.30	25.5	-310.0	319.0	312.3	6.72	47.497		
1,400.0	1,400.0	1,344.0	1,326.0	3.0	4.6	-84.93	29.4	-331.4	341.3	333.9	7.37	46.312		
1,500.0	1,500.0	1,441.5	1,421.0	3.3	5.0	-84.60	33.3	-352.9	363.6	355.5	8.02	45.314 SF		
1,600.0	1,600.0	1,538.7	1,515.6	3.5	5.5	-144.52	37.2	-374.2	387.3	380.1	7.12	54.377		
1,700.0	1,699.8	1,635.1	1,609.6	3.7	6.0	-144.38	41.1	-395.5	413.7	406.1	7.57	54.668		
1,787.5	1,787.1	1,718.8	1,691.2	3.9	6.4	-144.43	44.5	-413.9	439.1	431.1	7.95	55.222		
1,800.0	1,799.5	1,730.7	1,702.8	3.9	6.4	-144.49	44.9	-416.5	442.8	434.8	8.01	55.295		
1,900.0	1,899.0	1,825.9	1,795.7	4.1	6.9	-144.96	48.8	-437.5	473.1	464.6	8.47	55.825		
2,000.0	1,998.4	1,921.2	1,888.5	4.4	7.4	-145.37	52.6	-458.4	503.3	494.4	8.94	56.273		
2,100.0	2,097.9	2,016.5	1,981.3	4.6	7.8	-145.73	56.4	-479.4	533.6	524.1	9.42	56.653		
2,200.0	2,197.4	2,111.7	2,074.2	4.9	8.3	-146.06	60.3	-500.3	563.8	553.9	9.90	56.979		
2,300.0	2,296.9	2,207.0	2,167.0	5.1	8.8	-146.35	64.1	-521.3	594.1	583.8	10.38	57.259		
2,400.0	2,396.4	2,302.2	2,259.9	5.4	9.2	-146.62	67.9	-542.3	624.5	613.6	10.86	57.502		
2,500.0	2,495.9	2,397.5	2,352.7	5.7	9.7	-146.86	71.7	-563.2	654.8	643.4	11.35	57.714		
2,600.0	2,595.4	2,492.8	2,445.6	5.9	10.2	-147.08	75.6	-584.2	685.1	673.3	11.83	57.899		
2,700.0	2,694.9	2,588.0	2,538.4	6.2	10.6	-147.28	79.4	-605.2	715.4	703.1	12.32	58.063		
2,800.0	2,794.4	2,683.3	2,631.2	6.5	11.1	-147.46	83.2	-626.1	745.8	733.0	12.81	58.207		
2,900.0	2,893.9	2,778.5	2,724.1	6.7	11.6	-147.63	87.1	-647.1	776.1	762.8	13.30	58.336		
3,000.0	2,993.4	2,873.8	2,816.9	7.0	12.0	-147.79	90.9	-668.1	806.5	792.7	13.80	58.451		
3,100.0	3,092.9	2,969.0	2,909.8	7.3	12.5	-147.93	94.7	-689.0	836.9	822.6	14.29	58.553		
3,200.0	3,192.4	3,064.3	3,002.6	7.5	13.0	-148.07	98.5	-710.0	867.2	852.4	14.79	58.646		
3,300.0	3,291.9	3,159.6	3,095.5	7.8	13.4	-148.19	102.4	-730.9	897.6	882.3	15.28	58.729		
3,400.0	3,391.4	3,254.8	3,188.3	8.1	13.9	-148.31	106.2	-751.9	928.0	912.2	15.78	58.804		
3,500.0	3,490.9	3,350.1	3,281.2	8.4	14.4	-148.42	110.0	-772.9	958.4	942.1	16.28	58.872		
3,600.0	3,590.4	3,445.3	3,374.0	8.7	14.8	-148.52	113.9	-793.8	988.7	972.0	16.78	58.934		

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Churchill 28J-423
Project:	SEC.28-T5N-R64W	TVD Reference:	WELL @ 4648.0ft (RKB - 15')
Reference Site:	Churchill 28J-HZ Pad Sec.28-T5N-R64W	MD Reference:	WELL @ 4648.0ft (RKB - 15')
Site Error:	0.0ft	North Reference:	True
Reference Well:	Churchill 28J-423	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	Landmark
Reference Design:	Plan #2 (2-11-14)	Offset TVD Reference:	Offset Datum

Offset Design Churchill 28J-HZ Pad Sec.28-T5N-R64W - Churchill 28E-423 - Wellbore #1 - Plan #1 (1-22-14)													Offset Site Error:	0.0 ft
Survey Program: 0-MWD													Offset Well Error:	0.0 ft
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Semi Major Axis (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
0.0	0.0	2.0	2.0	0.0	0.0	-91.74	-91.74	-3.6	-119.8	119.9	119.9	0.00	N/A	
100.0	100.0	102.0	102.0	0.1	0.1	-91.74	-91.74	-3.6	-119.8	119.9	119.6	0.23	522.812	
200.0	200.0	202.0	202.0	0.3	0.3	-91.74	-91.74	-3.6	-119.8	119.9	119.2	0.68	176.579	
300.0	300.0	302.0	302.0	0.6	0.6	-91.74	-91.74	-3.6	-119.8	119.9	118.7	1.13	106.229	
366.0	366.0	368.0	368.0	0.7	0.7	-91.74	-91.74	-3.6	-119.8	119.9	118.4	1.42	84.115 CC	
400.0	400.0	400.0	400.0	0.8	0.8	-91.74	-91.74	-3.6	-119.8	119.9	118.3	1.57	76.192 ES	
500.0	500.0	498.0	498.0	1.0	1.0	-91.52	-91.52	-3.2	-121.4	121.5	119.5	2.01	60.468	
600.0	600.0	593.9	593.7	1.2	1.2	-90.92	-90.92	-2.0	-126.2	126.5	124.0	2.44	51.743	
700.0	700.0	689.3	688.8	1.5	1.4	-90.03	-90.03	-0.1	-134.0	134.6	131.7	2.89	46.503	
800.0	800.0	784.1	783.0	1.7	1.7	-88.95	-88.95	2.6	-144.7	146.0	142.6	3.37	43.344	
900.0	900.0	879.0	876.8	1.9	2.0	-87.79	-87.79	6.1	-158.5	160.6	156.7	3.87	41.478	
1,000.0	1,000.0	977.7	974.2	2.1	2.3	-86.72	-86.72	10.0	-173.9	176.4	171.9	4.41	39.984	
1,100.0	1,100.0	1,076.4	1,071.6	2.4	2.6	-85.82	-85.82	13.8	-189.2	192.1	187.2	4.96	38.752	
1,200.0	1,200.0	1,175.1	1,169.0	2.6	3.0	-85.05	-85.05	17.7	-204.6	208.0	202.5	5.51	37.726	
1,300.0	1,300.0	1,273.8	1,266.5	2.8	3.3	-84.40	-84.40	21.6	-219.9	223.8	217.8	6.07	36.866	
1,400.0	1,400.0	1,372.5	1,363.9	3.0	3.7	-83.83	-83.83	25.4	-235.3	239.7	233.1	6.63	36.139	
1,500.0	1,500.0	1,471.2	1,461.3	3.3	4.1	-83.33	-83.33	29.3	-250.7	255.6	248.4	7.20	35.518 SF	
1,600.0	1,600.0	1,569.7	1,558.5	3.5	4.4	-143.24	-143.24	33.2	-266.0	272.9	266.0	6.98	39.087	
1,700.0	1,699.8	1,667.6	1,655.2	3.7	4.8	-143.22	-143.22	37.0	-281.2	293.0	285.6	7.42	39.483	
1,787.5	1,787.1	1,752.9	1,739.3	3.9	5.1	-143.47	-143.47	40.4	-294.5	312.8	305.0	7.80	40.103	
1,800.0	1,799.5	1,765.0	1,751.3	3.9	5.2	-143.55	-143.55	40.8	-296.4	315.8	307.9	7.86	40.194	
1,900.0	1,899.0	1,862.0	1,847.0	4.1	5.5	-144.19	-144.19	44.6	-311.5	339.6	331.3	8.31	40.870	
2,000.0	1,998.4	1,959.1	1,942.8	4.4	5.9	-144.75	-144.75	48.4	-326.6	363.5	354.8	8.77	41.456	
2,100.0	2,097.9	2,056.1	2,038.6	4.6	6.2	-145.23	-145.23	52.2	-341.7	387.5	378.2	9.23	41.969	
2,200.0	2,197.4	2,153.1	2,134.4	4.9	6.6	-145.66	-145.66	56.0	-356.8	411.4	401.7	9.70	42.421	
2,300.0	2,296.9	2,250.2	2,230.2	5.1	7.0	-146.05	-146.05	59.8	-371.9	435.4	425.2	10.17	42.821	
2,400.0	2,396.4	2,347.2	2,326.0	5.4	7.3	-146.39	-146.39	63.6	-387.0	459.4	448.7	10.64	43.177	
2,500.0	2,495.9	2,444.3	2,421.8	5.7	7.7	-146.70	-146.70	67.5	-402.1	483.4	472.3	11.11	43.496	
2,600.0	2,595.4	2,541.3	2,517.6	5.9	8.1	-146.98	-146.98	71.3	-417.2	507.4	495.8	11.59	43.783	
2,700.0	2,694.9	2,638.4	2,613.4	6.2	8.4	-147.23	-147.23	75.1	-432.3	531.4	519.3	12.07	44.042	
2,800.0	2,794.4	2,735.4	2,709.1	6.5	8.8	-147.46	-147.46	78.9	-447.4	555.4	542.9	12.54	44.277	
2,900.0	2,893.9	2,832.5	2,804.9	6.7	9.2	-147.68	-147.68	82.7	-462.5	579.5	566.5	13.02	44.492	
3,000.0	2,993.4	2,929.5	2,900.7	7.0	9.5	-147.87	-147.87	86.5	-477.6	603.5	590.0	13.51	44.687	
3,100.0	3,092.9	3,026.6	2,996.5	7.3	9.9	-148.05	-148.05	90.3	-492.7	627.6	613.6	13.99	44.867	
3,200.0	3,192.4	3,123.6	3,092.3	7.5	10.3	-148.22	-148.22	94.1	-507.9	651.6	637.2	14.47	45.032	
3,300.0	3,291.9	3,220.7	3,188.1	7.8	10.6	-148.38	-148.38	97.9	-523.0	675.7	660.7	14.95	45.184	
3,400.0	3,391.4	3,317.7	3,283.9	8.1	11.0	-148.52	-148.52	101.7	-538.1	699.8	684.3	15.44	45.325	
3,500.0	3,490.9	3,414.7	3,379.7	8.4	11.4	-148.66	-148.66	105.5	-553.2	723.8	707.9	15.92	45.455	
3,600.0	3,590.4	3,511.8	3,475.4	8.7	11.7	-148.78	-148.78	109.3	-568.3	747.9	731.5	16.41	45.577	
3,700.0	3,689.9	3,608.8	3,571.2	8.9	12.1	-148.90	-148.90	113.1	-583.4	772.0	755.1	16.90	45.690	
3,800.0	3,789.4	3,705.9	3,667.0	9.2	12.5	-149.01	-149.01	116.9	-598.5	796.1	778.7	17.38	45.795	
3,900.0	3,888.9	3,802.9	3,762.8	9.5	12.8	-149.12	-149.12	120.7	-613.6	820.1	802.3	17.87	45.894	
4,000.0	3,988.4	3,900.0	3,858.6	9.8	13.2	-149.22	-149.22	124.5	-628.7	844.2	825.9	18.36	45.986	
4,100.0	4,087.9	3,997.0	3,954.4	10.1	13.6	-149.31	-149.31	128.3	-643.8	868.3	849.5	18.85	46.073	
4,200.0	4,187.4	4,094.1	4,050.2	10.3	14.0	-149.40	-149.40	132.1	-658.9	892.4	873.1	19.34	46.155	
4,300.0	4,286.9	4,191.1	4,146.0	10.6	14.3	-149.48	-149.48	135.9	-674.0	916.5	896.7	19.82	46.231	
4,400.0	4,386.4	4,288.2	4,241.7	10.9	14.7	-149.56	-149.56	139.7	-689.1	940.6	920.3	20.31	46.304	
4,500.0	4,485.9	4,385.2	4,337.5	11.2	15.1	-149.64	-149.64	143.5	-704.2	964.7	943.9	20.80	46.372	
4,600.0	4,585.4	4,482.3	4,433.3	11.5	15.4	-149.71	-149.71	147.3	-719.3	988.8	967.5	21.29	46.437	

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Churchill 28J-423
Project:	SEC.28-T5N-R64W	TVD Reference:	WELL @ 4648.0ft (RKB - 15')
Reference Site:	Churchill 28J-HZ Pad Sec.28-T5N-R64W	MD Reference:	WELL @ 4648.0ft (RKB - 15')
Site Error:	0.0ft	North Reference:	True
Reference Well:	Churchill 28J-423	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	Landmark
Reference Design:	Plan #2 (2-11-14)	Offset TVD Reference:	Offset Datum

Offset Design Churchill 28J-HZ Pad Sec.28-T5N-R64W - Churchill 28J-203 - Wellbore #1 - Plan #2 (2-11-14)													Offset Site Error:	0.0 ft
Survey Program: 0-MWD													Offset Well Error:	0.0 ft
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference	Offset	Semi Major Axis	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
0.0	0.0	1.0	1.0	0.0	0.0	-89.98	-89.98	0.0	-30.6	30.6	30.6	0.00	N/A	
100.0	100.0	101.0	101.0	0.1	0.1	-89.98	-89.98	0.0	-30.6	30.6	30.4	0.23	135.005	
200.0	200.0	201.0	201.0	0.3	0.3	-89.98	-89.98	0.0	-30.6	30.6	30.0	0.68	45.301	
300.0	300.0	301.0	301.0	0.6	0.6	-89.98	-89.98	0.0	-30.6	30.6	29.5	1.13	27.216	
400.0	400.0	401.0	401.0	0.8	0.8	-89.98	-89.98	0.0	-30.6	30.6	29.1	1.58	19.451	
500.0	500.0	501.0	501.0	1.0	1.0	-89.98	-89.98	0.0	-30.6	30.6	28.6	2.03	15.134	
600.0	600.0	601.0	601.0	1.2	1.2	-89.98	-89.98	0.0	-30.6	30.6	28.2	2.47	12.385	
700.0	700.0	701.0	701.0	1.5	1.5	-89.98	-89.98	0.0	-30.6	30.6	27.7	2.92	10.481	
800.0	800.0	801.0	801.0	1.7	1.7	-89.98	-89.98	0.0	-30.6	30.6	27.3	3.37	9.084	
900.0	900.0	901.0	901.0	1.9	1.9	-89.98	-89.98	0.0	-30.6	30.6	26.8	3.82	8.016	
1,000.0	1,000.0	1,001.0	1,001.0	2.1	2.1	-89.98	-89.98	0.0	-30.6	30.6	26.4	4.27	7.173	
1,100.0	1,100.0	1,101.0	1,101.0	2.4	2.4	-89.98	-89.98	0.0	-30.6	30.6	25.9	4.72	6.490	
1,200.0	1,200.0	1,201.0	1,201.0	2.6	2.6	-89.98	-89.98	0.0	-30.6	30.6	25.5	5.17	5.926	
1,300.0	1,300.0	1,301.0	1,301.0	2.8	2.8	-89.98	-89.98	0.0	-30.6	30.6	25.0	5.62	5.452	
1,400.0	1,400.0	1,401.0	1,401.0	3.0	3.0	-89.98	-89.98	0.0	-30.6	30.6	24.6	6.07	5.048	
1,500.0	1,500.0	1,501.0	1,501.0	3.3	3.3	-89.98	-89.98	0.0	-30.6	30.6	24.1	6.52	4.700 CC, ES	
1,600.0	1,600.0	1,601.0	1,601.0	3.5	3.5	-151.84	-151.84	0.0	-30.6	32.2	25.2	6.96	4.623	
1,700.0	1,699.8	1,700.8	1,700.8	3.7	3.7	-155.64	-155.64	0.0	-30.6	36.9	29.5	7.39	4.991	
1,787.5	1,787.1	1,788.1	1,788.1	3.9	3.9	-159.61	-159.61	0.0	-30.6	43.8	36.0	7.76	5.642	
1,800.0	1,799.5	1,800.5	1,800.5	3.9	3.9	-160.17	-160.17	0.0	-30.6	44.9	37.1	7.81	5.753	
1,900.0	1,899.0	1,900.0	1,900.0	4.1	4.2	-163.74	-163.74	0.0	-30.6	54.5	46.2	8.25	6.604	
2,000.0	1,998.4	1,999.4	1,999.4	4.4	4.4	-166.25	-166.25	0.0	-30.6	64.2	55.5	8.69	7.385	
2,100.0	2,097.9	2,098.9	2,098.9	4.6	4.6	-168.10	-168.10	0.0	-30.6	73.9	64.8	9.13	8.099	
2,200.0	2,197.4	2,198.4	2,198.4	4.9	4.8	-169.51	-169.51	0.0	-30.6	83.8	74.2	9.57	8.751	
2,300.0	2,296.9	2,297.9	2,297.9	5.1	5.1	-170.63	-170.63	0.0	-30.6	93.6	83.6	10.02	9.348	
2,400.0	2,396.4	2,397.4	2,397.4	5.4	5.3	-171.53	-171.53	0.0	-30.6	103.5	93.1	10.46	9.896	
2,500.0	2,495.9	2,496.9	2,496.9	5.7	5.5	-172.27	-172.27	0.0	-30.6	113.5	102.5	10.91	10.400	
2,600.0	2,595.4	2,596.4	2,596.4	5.9	5.7	-172.90	-172.90	0.0	-30.6	123.4	112.0	11.36	10.865	
2,700.0	2,694.9	2,695.9	2,695.9	6.2	5.9	-173.43	-173.43	0.0	-30.6	133.3	121.5	11.81	11.295	
2,800.0	2,794.4	2,795.4	2,795.4	6.5	6.2	-173.89	-173.89	0.0	-30.6	143.3	131.0	12.26	11.693	
2,900.0	2,893.9	2,894.9	2,894.9	6.7	6.4	-174.29	-174.29	0.0	-30.6	153.3	140.6	12.71	12.064	
3,000.0	2,993.4	2,994.4	2,994.4	7.0	6.6	-174.64	-174.64	0.0	-30.6	163.2	150.1	13.16	12.408	
3,100.0	3,092.9	3,099.6	3,099.5	7.3	6.8	-175.16	-175.16	0.2	-28.9	171.7	158.1	13.61	12.618	
3,200.0	3,192.4	3,205.5	3,205.3	7.5	7.1	-176.05	-176.05	0.7	-23.3	176.7	162.6	14.05	12.579	
3,300.0	3,291.9	3,308.7	3,308.1	7.8	7.3	-177.27	-177.27	1.5	-14.5	178.6	164.2	14.49	12.332	
3,400.0	3,391.4	3,408.6	3,407.6	8.1	7.5	-178.49	-178.49	2.4	-5.4	180.2	165.3	14.92	12.074	
3,500.0	3,490.9	3,508.5	3,507.1	8.4	7.7	-179.69	-179.69	3.3	3.7	181.8	166.4	15.36	11.833	
3,600.0	3,590.4	3,608.4	3,606.6	8.7	7.9	-179.13	-179.13	4.1	12.8	183.5	167.7	15.81	11.608	
3,700.0	3,689.9	3,708.3	3,706.1	8.9	8.2	-177.98	-177.98	5.0	21.9	185.3	169.0	16.26	11.397	
3,800.0	3,789.4	3,808.3	3,805.6	9.2	8.4	-176.85	-176.85	5.8	31.0	187.1	170.4	16.71	11.199	
3,900.0	3,888.9	3,908.2	3,905.1	9.5	8.6	-175.74	-175.74	6.7	40.1	189.1	171.9	17.17	11.014	
4,000.0	3,988.4	4,008.1	4,004.6	9.8	8.9	-174.65	-174.65	7.5	49.2	191.0	173.4	17.63	10.839	
4,100.0	4,087.9	4,108.0	4,104.1	10.1	9.1	-173.59	-173.59	8.4	58.3	193.1	175.0	18.09	10.675	
4,200.0	4,187.4	4,207.9	4,203.6	10.3	9.3	-172.55	-172.55	9.3	67.4	195.2	176.7	18.56	10.521	
4,300.0	4,286.9	4,307.8	4,303.1	10.6	9.6	-171.53	-171.53	10.1	76.5	197.4	178.4	19.03	10.375	
4,400.0	4,386.4	4,407.7	4,402.6	10.9	9.8	-170.53	-170.53	11.0	85.6	199.7	180.2	19.50	10.238	
4,500.0	4,485.9	4,507.7	4,502.1	11.2	10.1	-169.56	-169.56	11.8	94.7	202.0	182.0	19.98	10.108	
4,600.0	4,585.4	4,607.6	4,601.6	11.5	10.3	-168.61	-168.61	12.7	103.8	204.3	183.9	20.46	9.986	
4,700.0	4,684.9	4,707.5	4,701.1	11.8	10.6	-167.68	-167.68	13.6	112.9	206.8	185.8	20.95	9.870	
4,800.0	4,784.4	4,803.9	4,797.2	12.1	10.8	-166.90	-166.90	14.3	121.1	209.7	188.3	21.41	9.796	
4,900.0	4,883.9	4,900.0	4,893.1	12.3	11.0	-166.65	-166.65	14.8	126.3	215.2	193.4	21.84	9.853	

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 Churchill 28J-423
Project:	SEC.28-T5N-R64W	TVD Reference:	WELL @ 4648.0ft (RKB - 15')
Reference Site:	Churchill 28J-HZ Pad Sec.28-T5N-R64W	MD Reference:	WELL @ 4648.0ft (RKB - 15')
Site Error:	0.0ft	North Reference:	True
Reference Well:	Churchill 28J-423	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	Landmark
Reference Design:	Plan #2 (2-11-14)	Offset TVD Reference:	Offset Datum

Offset Design Churchill 28J-HZ Pad Sec.28-T5N-R64W - Churchill 28J-203 - Wellbore #1 - Plan #2 (2-11-14)												Offset Site Error: 0.0 ft	
Survey Program: 0-MWD												Offset Well Error: 0.0 ft	
Reference		Offset		Semi Major Axis		Highside Toolface (°)	Offset Wellbore Centre		Distance		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)			
5,000.0	4,983.3	4,992.2	4,985.3	12.6	11.2	166.89	15.0	128.2	223.3	201.0	22.24	10.037	
5,100.0	5,082.8	5,090.8	5,083.8	12.9	11.4	167.44	15.0	128.3	233.0	210.3	22.66	10.281	
5,200.0	5,182.3	5,190.3	5,183.3	13.2	11.6	167.95	15.0	128.3	242.8	219.7	23.10	10.509	
5,300.0	5,281.8	5,289.8	5,282.8	13.5	11.8	168.42	15.0	128.3	252.6	229.0	23.55	10.728	
5,400.0	5,381.3	5,389.3	5,382.3	13.8	12.0	168.86	15.0	128.3	262.4	238.4	23.99	10.939	
5,500.0	5,480.8	5,488.8	5,481.8	14.1	12.2	169.27	15.0	128.3	272.3	247.8	24.43	11.142	
5,532.3	5,512.9	5,520.9	5,513.9	14.1	12.3	169.40	15.0	128.3	275.4	250.9	24.58	11.207	
5,600.0	5,580.4	5,588.4	5,581.4	14.3	12.4	169.64	15.0	128.3	281.3	256.5	24.88	11.308	
5,700.0	5,680.2	5,688.2	5,681.2	14.5	12.6	169.87	15.0	128.3	287.2	261.9	25.28	11.360	
5,800.0	5,780.2	5,788.1	5,781.2	14.7	12.9	169.97	15.0	128.3	289.6	263.9	25.65	11.288	
5,819.8	5,800.0	5,807.9	5,801.0	14.7	12.9	-129.70	15.0	128.3	289.6	263.9	25.72	11.260	
5,900.0	5,880.2	5,888.1	5,881.2	14.8	13.1	-129.70	15.0	128.3	289.6	263.6	26.05	11.117	
6,000.0	5,980.2	5,969.1	5,962.0	15.0	13.2	-130.29	11.1	128.3	292.8	266.3	26.43	11.077	
6,063.6	6,043.7	6,019.3	6,011.7	15.2	13.3	-131.28	4.4	128.3	298.4	271.7	26.68	11.182	
6,100.0	6,080.2	6,050.0	6,041.9	15.2	13.4	47.79	-1.3	128.3	302.3	275.5	26.79	11.283	
6,150.0	6,130.0	6,086.6	6,077.6	15.3	13.4	46.76	-9.7	128.3	307.4	280.5	26.88	11.434	
6,200.0	6,179.5	6,125.3	6,114.7	15.3	13.5	45.81	-20.4	128.3	312.0	285.1	26.93	11.588	
6,250.0	6,228.3	6,163.8	6,151.1	15.4	13.6	44.98	-32.9	128.3	316.3	289.3	26.92	11.747	
6,300.0	6,276.4	6,200.0	6,184.7	15.4	13.7	44.30	-46.4	128.3	320.0	293.1	26.86	11.912	
6,350.0	6,323.5	6,240.3	6,221.4	15.5	13.7	43.69	-63.2	128.3	323.2	296.4	26.76	12.075	
6,400.0	6,369.4	6,278.4	6,255.1	15.5	13.8	43.21	-80.8	128.3	325.9	299.2	26.62	12.241	
6,450.0	6,413.9	6,316.4	6,287.9	15.5	13.9	42.84	-100.1	128.3	328.0	301.5	26.44	12.406	
6,500.0	6,456.8	6,350.0	6,316.0	15.5	14.0	42.58	-118.4	128.3	329.6	303.4	26.21	12.572	
6,550.0	6,498.0	6,392.2	6,350.2	15.6	14.1	42.40	-143.2	128.3	330.5	304.5	26.00	12.711	
6,600.0	6,537.2	6,430.1	6,379.7	15.6	14.3	42.33	-167.1	128.3	330.9	305.1	25.77	12.839	
6,650.0	6,574.3	6,468.0	6,407.9	15.6	14.4	42.37	-192.3	128.3	330.7	305.2	25.55	12.946	
6,700.0	6,609.1	6,500.0	6,430.8	15.7	14.5	42.48	-214.7	128.3	330.0	304.7	25.32	13.034	
6,750.0	6,641.5	6,543.8	6,460.5	15.8	14.8	42.73	-246.9	128.3	328.6	303.4	25.19	13.045	
6,800.0	6,671.3	6,581.8	6,484.7	15.9	15.0	43.07	-276.1	128.3	326.6	301.6	25.09	13.021	
6,850.0	6,698.5	6,619.9	6,507.5	16.0	15.2	43.51	-306.6	128.3	324.1	299.1	25.06	12.935	
6,900.0	6,722.8	6,658.0	6,528.8	16.3	15.5	44.07	-338.3	128.3	321.1	296.0	25.12	12.781	
6,950.0	6,744.2	6,700.0	6,550.4	16.5	15.8	44.78	-374.2	128.3	317.6	292.3	25.33	12.537	
7,000.0	6,762.7	6,734.8	6,566.8	16.9	16.1	45.51	-404.9	128.3	313.5	287.9	25.60	12.246	
7,050.0	6,778.0	6,773.4	6,583.3	17.2	16.4	46.42	-439.8	128.3	309.0	283.0	26.04	11.867	
7,100.0	6,790.2	6,812.1	6,598.1	17.7	16.8	47.46	-475.6	128.3	304.1	277.4	26.62	11.423	
7,150.0	6,799.3	6,850.0	6,610.7	18.1	17.2	48.61	-511.3	128.3	298.7	271.4	27.33	10.930	
7,183.6	6,803.5	6,877.5	6,618.8	18.5	17.5	49.51	-537.6	128.3	295.0	267.0	27.93	10.560	
7,200.0	6,805.2	6,890.4	6,622.3	18.7	17.6	49.83	-550.0	128.3	293.2	264.9	28.29	10.365	
7,257.6	6,811.2	6,936.3	6,632.9	19.3	18.2	50.73	-594.7	128.3	288.4	258.9	29.51	9.775	
7,300.0	6,814.9	6,970.4	6,639.0	19.8	18.6	51.33	-628.3	128.3	285.9	255.6	30.29	9.438	
7,379.8	6,817.5	7,035.1	6,646.5	20.8	19.4	52.35	-692.4	128.3	281.8	249.9	31.85	8.848	
7,400.0	6,817.5	7,050.0	6,647.5	21.0	19.6	52.51	-707.3	128.3	281.0	248.7	32.27	8.706	
7,477.4	6,817.3	7,119.6	6,648.6	22.1	20.5	52.70	-776.9	128.3	280.1	246.2	33.97	8.248	
7,500.0	6,817.3	7,142.2	6,648.5	22.4	20.8	52.70	-799.5	128.3	280.1	245.7	34.47	8.126	
7,600.0	6,817.1	7,242.2	6,648.3	23.8	22.3	52.69	-899.5	128.3	280.2	243.3	36.82	7.609	
7,700.0	6,816.9	7,342.2	6,648.1	25.2	23.8	52.69	-999.5	128.3	280.2	240.9	39.28	7.133	
7,800.0	6,816.7	7,442.2	6,647.8	26.8	25.3	52.68	-1,099.5	128.3	280.2	238.4	41.84	6.697	
7,900.0	6,816.5	7,542.2	6,647.6	28.4	26.9	52.68	-1,199.5	128.3	280.2	235.8	44.48	6.300	
8,000.0	6,816.3	7,642.2	6,647.4	30.0	28.6	52.67	-1,299.5	128.3	280.3	233.1	47.18	5.940	
8,100.0	6,816.1	7,742.2	6,647.1	31.6	30.2	52.67	-1,399.5	128.3	280.3	230.3	49.94	5.612	
8,200.0	6,815.9	7,842.2	6,646.9	33.3	31.9	52.66	-1,499.5	128.3	280.3	227.5	52.75	5.314	

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 Churchill 28J-423
Project:	SEC.28-T5N-R64W	TVD Reference:	WELL @ 4648.0ft (RKB - 15')
Reference Site:	Churchill 28J-HZ Pad Sec.28-T5N-R64W	MD Reference:	WELL @ 4648.0ft (RKB - 15')
Site Error:	0.0ft	North Reference:	True
Reference Well:	Churchill 28J-423	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	Landmark
Reference Design:	Plan #2 (2-11-14)	Offset TVD Reference:	Offset Datum

Offset Design		Churchill 28J-HZ Pad Sec.28-T5N-R64W - Churchill 28J-203 - Wellbore #1 - Plan #2 (2-11-14)											Offset Site Error:		0.0 ft
Survey Program: 0-MWD													Offset Well Error:		0.0 ft
Reference		Offset		Semi Major Axis			Distance							Warning	
Measured Depth	Vertical Depth	Measured Depth	Vertical Depth	Reference	Offset	Highside Toolface	Offset Wellbore Centre		Between Centres	Between Ellipses	Minimum Separation	Separation Factor			
(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(°)	+N/-S (ft)	+E/-W (ft)	(ft)	(ft)	(ft)				
8,300.0	6,815.7	7,942.2	6,646.7		35.0	33.7	52.65	-1,599.5	128.3	280.3	224.7	55.60	5.042		
8,400.0	6,815.6	8,042.2	6,646.5		36.8	35.4	52.65	-1,699.5	128.3	280.3	221.9	58.48	4.794		
8,500.0	6,815.4	8,142.2	6,646.2		38.5	37.2	52.64	-1,799.5	128.3	280.4	219.0	61.39	4.567		
8,600.0	6,815.2	8,242.2	6,646.0		40.3	39.0	52.64	-1,899.5	128.3	280.4	216.1	64.32	4.359		
8,700.0	6,815.0	8,342.2	6,645.8		42.0	40.7	52.63	-1,999.5	128.3	280.4	213.1	67.28	4.168		
8,800.0	6,814.8	8,442.2	6,645.6		43.8	42.5	52.63	-2,099.5	128.3	280.4	210.2	70.25	3.992		
8,900.0	6,814.6	8,542.2	6,645.3		45.6	44.4	52.62	-2,199.5	128.3	280.4	207.2	73.24	3.829		
9,000.0	6,814.4	8,642.2	6,645.1		47.4	46.2	52.61	-2,299.5	128.3	280.5	204.2	76.25	3.678		
9,100.0	6,814.2	8,742.2	6,644.9		49.2	48.0	52.61	-2,399.5	128.3	280.5	201.2	79.27	3.539		
9,200.0	6,814.0	8,842.2	6,644.7		51.1	49.8	52.60	-2,499.5	128.3	280.5	198.2	82.30	3.409		
9,300.0	6,813.8	8,942.2	6,644.4		52.9	51.7	52.60	-2,599.5	128.3	280.5	195.2	85.34	3.287		
9,400.0	6,813.6	9,042.2	6,644.2		54.7	53.5	52.59	-2,699.5	128.3	280.5	192.2	88.38	3.174		
9,500.0	6,813.4	9,142.2	6,644.0		56.6	55.4	52.59	-2,799.5	128.3	280.6	189.1	91.44	3.068		
9,600.0	6,813.2	9,242.2	6,643.7		58.4	57.2	52.58	-2,899.5	128.3	280.6	186.1	94.51	2.969		
9,700.0	6,813.1	9,342.2	6,643.5		60.3	59.1	52.57	-2,999.5	128.3	280.6	183.0	97.58	2.876		
9,800.0	6,812.9	9,442.2	6,643.3		62.1	61.0	52.57	-3,099.5	128.3	280.6	180.0	100.65	2.788		
9,900.0	6,812.7	9,542.2	6,643.1		64.0	62.8	52.56	-3,199.5	128.3	280.7	176.9	103.73	2.706		
10,000.0	6,812.5	9,642.2	6,642.8		65.9	64.7	52.56	-3,299.5	128.3	280.7	173.9	106.82	2.628		
10,100.0	6,812.3	9,742.2	6,642.6		67.7	66.6	52.55	-3,399.5	128.3	280.7	170.8	109.91	2.554		
10,200.0	6,812.1	9,842.2	6,642.4		69.6	68.5	52.55	-3,499.5	128.3	280.7	167.7	113.01	2.484		
10,300.0	6,811.9	9,942.2	6,642.2		71.5	70.3	52.54	-3,599.5	128.3	280.7	164.6	116.11	2.418		
10,400.0	6,811.7	10,042.2	6,641.9		73.3	72.2	52.54	-3,699.5	128.3	280.8	161.6	119.21	2.355		
10,500.0	6,811.5	10,142.2	6,641.7		75.2	74.1	52.53	-3,799.5	128.3	280.8	158.5	122.31	2.296		
10,600.0	6,811.3	10,242.2	6,641.5		77.1	76.0	52.52	-3,899.5	128.3	280.8	155.4	125.42	2.239		
10,700.0	6,811.1	10,342.2	6,641.3		79.0	77.9	52.52	-3,999.5	128.3	280.8	152.3	128.53	2.185		
10,800.0	6,810.9	10,442.2	6,641.0		80.9	79.8	52.51	-4,099.5	128.3	280.8	149.2	131.64	2.133		
10,900.0	6,810.8	10,542.2	6,640.8		82.7	81.7	52.51	-4,199.5	128.3	280.9	146.1	134.76	2.084		
11,000.0	6,810.6	10,642.2	6,640.6		84.6	83.5	52.50	-4,299.5	128.3	280.9	143.0	137.88	2.037		
11,100.0	6,810.4	10,742.2	6,640.3		86.5	85.4	52.50	-4,399.5	128.3	280.9	139.9	141.00	1.992		
11,200.0	6,810.2	10,842.2	6,640.1		88.4	87.3	52.49	-4,499.5	128.3	280.9	136.8	144.12	1.949		
11,300.0	6,810.0	10,942.2	6,639.9		90.3	89.2	52.48	-4,599.5	128.3	281.0	133.7	147.24	1.908		
11,400.0	6,809.8	11,042.2	6,639.7		92.2	91.1	52.48	-4,699.5	128.3	281.0	130.6	150.36	1.869		
11,500.0	6,809.6	11,142.2	6,639.4		94.1	93.0	52.47	-4,799.5	128.3	281.0	127.5	153.49	1.831		
11,600.0	6,809.4	11,242.2	6,639.2		96.0	94.9	52.47	-4,899.5	128.3	281.0	124.4	156.61	1.794		
11,700.0	6,809.2	11,342.2	6,639.0		97.9	96.8	52.46	-4,999.5	128.3	281.0	121.3	159.74	1.759		
11,800.0	6,809.0	11,442.2	6,638.8		99.8	98.7	52.46	-5,099.5	128.3	281.1	118.2	162.87	1.726		
11,900.0	6,808.8	11,542.2	6,638.5		101.7	100.6	52.45	-5,199.5	128.3	281.1	115.1	166.00	1.693		
12,000.0	6,808.6	11,642.2	6,638.3		103.6	102.5	52.44	-5,299.5	128.3	281.1	112.0	169.13	1.662		
12,100.0	6,808.4	11,742.2	6,638.1		105.5	104.4	52.44	-5,399.5	128.3	281.1	108.9	172.26	1.632		
12,200.0	6,808.3	11,842.2	6,637.8		107.4	106.3	52.43	-5,499.5	128.3	281.1	105.8	175.39	1.603		
12,300.0	6,808.1	11,942.2	6,637.6		109.3	108.2	52.43	-5,599.5	128.3	281.2	102.6	178.52	1.575		
12,400.0	6,807.9	12,042.2	6,637.4		111.2	110.1	52.42	-5,699.5	128.3	281.2	99.5	181.66	1.548		
12,500.0	6,807.7	12,142.2	6,637.2		113.1	112.0	52.42	-5,799.5	128.3	281.2	96.4	184.79	1.522		
12,600.0	6,807.5	12,242.2	6,636.9		115.0	113.9	52.41	-5,899.5	128.3	281.2	93.3	187.92	1.497 Level 3		
12,700.0	6,807.3	12,342.2	6,636.7		116.9	115.8	52.41	-5,999.5	128.3	281.3	90.2	191.06	1.472 Level 3		
12,800.0	6,807.1	12,442.2	6,636.5		118.8	117.8	52.40	-6,099.5	128.3	281.3	87.1	194.19	1.448 Level 3		
12,900.0	6,806.9	12,542.2	6,636.3		120.7	119.7	52.39	-6,199.5	128.3	281.3	84.0	197.33	1.425 Level 3		
13,000.0	6,806.7	12,642.2	6,636.0		122.6	121.6	52.39	-6,299.5	128.3	281.3	80.8	200.47	1.403 Level 3		
13,100.0	6,806.5	12,742.2	6,635.8		124.5	123.5	52.38	-6,399.5	128.3	281.3	77.7	203.60	1.382 Level 3		
13,200.0	6,806.3	12,842.2	6,635.6		126.4	125.4	52.38	-6,499.5	128.3	281.4	74.6	206.74	1.361 Level 3		
13,300.0	6,806.1	12,942.2	6,635.4		128.3	127.3	52.37	-6,599.5	128.3	281.4	71.5	209.87	1.341 Level 3		

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

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Churchill 28J-423
Project:	SEC.28-T5N-R64W	TVD Reference:	WELL @ 4648.0ft (RKB - 15')
Reference Site:	Churchill 28J-HZ Pad Sec.28-T5N-R64W	MD Reference:	WELL @ 4648.0ft (RKB - 15')
Site Error:	0.0ft	North Reference:	True
Reference Well:	Churchill 28J-423	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	Landmark
Reference Design:	Plan #2 (2-11-14)	Offset TVD Reference:	Offset Datum

Offset Design Churchill 28J-HZ Pad Sec.28-T5N-R64W - Churchill 28J-203 - Wellbore #1 - Plan #2 (2-11-14)												Offset Site Error:	0.0 ft
Survey Program: 0-MWD												Offset Well Error:	0.0 ft
Reference	Offset	Semi Major Axis		Distance									
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
13,400.0	6,806.0	13,042.2	6,635.1	130.2	129.2	52.37	-6,699.5	128.3	281.4	68.4	213.01	1.321	Level 3
13,500.0	6,805.8	13,142.2	6,634.9	132.1	131.1	52.36	-6,799.5	128.3	281.4	65.3	216.15	1.302	Level 3
13,600.0	6,805.6	13,242.2	6,634.7	134.0	133.0	52.35	-6,899.5	128.3	281.4	62.2	219.29	1.283	Level 3
13,700.0	6,805.4	13,342.2	6,634.4	135.9	134.9	52.35	-6,999.5	128.3	281.5	59.0	222.42	1.265	Level 3
13,800.0	6,805.2	13,442.2	6,634.2	137.8	136.8	52.34	-7,099.5	128.3	281.5	55.9	225.56	1.248	Level 2
13,895.2	6,805.0	13,537.4	6,634.0	139.7	138.7	52.34	-7,194.7	128.3	281.5	53.0	228.55	1.232	Level 2, SF

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Churchill 28J-423
Project:	SEC.28-T5N-R64W	TVD Reference:	WELL @ 4648.0ft (RKB - 15')
Reference Site:	Churchill 28J-HZ Pad Sec.28-T5N-R64W	MD Reference:	WELL @ 4648.0ft (RKB - 15')
Site Error:	0.0ft	North Reference:	True
Reference Well:	Churchill 28J-423	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	Landmark
Reference Design:	Plan #2 (2-11-14)	Offset TVD Reference:	Offset Datum

Offset Design Churchill 28J-HZ Pad Sec.28-T5N-R64W - Churchill 28J-343 - Wellbore #1 - Plan #2 (2-11-14)													Offset Site Error:	0.0 ft
Survey Program: 0-MWD													Offset Well Error:	0.0 ft
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference	Offset	Semi Major Axis	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
0.0	0.0	2.0	2.0	0.0	0.0	-89.99	-89.99	0.0	-89.2	89.2	89.2	0.00	N/A	
100.0	100.0	102.0	102.0	0.1	0.1	-89.99	-89.99	0.0	-89.2	89.2	88.9	0.23	388.890	
200.0	200.0	202.0	202.0	0.3	0.3	-89.99	-89.99	0.0	-89.2	89.2	88.5	0.68	131.347	
300.0	300.0	302.0	302.0	0.6	0.6	-89.99	-89.99	0.0	-89.2	89.2	88.0	1.13	79.018	
400.0	400.0	402.0	402.0	0.8	0.8	-89.99	-89.99	0.0	-89.2	89.2	87.6	1.58	56.505	
500.0	500.0	502.0	502.0	1.0	1.0	-89.99	-89.99	0.0	-89.2	89.2	87.1	2.03	43.976	
566.0	566.0	568.0	568.0	1.2	1.2	-89.99	-89.99	0.0	-89.2	89.2	86.8	2.32	38.363 CC	
600.0	600.0	601.9	601.9	1.2	1.2	-89.99	-89.99	0.0	-89.2	89.2	86.7	2.48	35.999 ES	
700.0	700.0	700.0	700.0	1.5	1.5	-89.47	-89.47	0.8	-90.7	90.7	87.8	2.92	31.111	
800.0	800.0	796.3	796.2	1.7	1.7	-88.05	-88.05	3.2	-95.1	95.3	91.9	3.35	28.431	
900.0	900.0	894.7	894.2	1.9	1.9	-86.06	-86.06	7.0	-102.0	102.5	98.7	3.80	26.951	
1,000.0	1,000.0	994.3	993.5	2.1	2.1	-84.24	-84.24	11.0	-109.3	110.2	105.9	4.27	25.810	
1,100.0	1,100.0	1,094.0	1,092.8	2.4	2.4	-82.66	-82.66	15.0	-116.7	118.0	113.2	4.74	24.883	
1,200.0	1,200.0	1,193.6	1,192.1	2.6	2.6	-81.27	-81.27	19.0	-124.0	125.8	120.6	5.22	24.119	
1,300.0	1,300.0	1,293.3	1,291.4	2.8	2.9	-80.05	-80.05	23.0	-131.3	133.7	128.0	5.70	23.483	
1,400.0	1,400.0	1,392.9	1,390.7	3.0	3.2	-78.96	-78.96	27.0	-138.6	141.7	135.5	6.18	22.947	
1,500.0	1,500.0	1,492.5	1,490.0	3.3	3.4	-77.99	-77.99	31.0	-146.0	149.7	143.1	6.66	22.490	
1,600.0	1,600.0	1,592.1	1,589.2	3.5	3.7	-137.75	-137.75	35.0	-153.3	159.1	152.1	6.93	22.961	
1,700.0	1,699.8	1,691.4	1,688.1	3.7	3.9	-138.00	-138.00	39.0	-160.6	171.0	163.6	7.36	23.231	
1,787.5	1,787.1	1,778.0	1,774.4	3.9	4.2	-138.73	-138.73	42.5	-167.0	183.5	175.8	7.74	23.722	
1,800.0	1,799.5	1,790.3	1,786.6	3.9	4.2	-138.89	-138.89	43.0	-167.9	185.5	177.7	7.79	23.802	
1,900.0	1,899.0	1,889.0	1,885.0	4.1	4.5	-140.05	-140.05	47.0	-175.1	201.0	192.8	8.24	24.401	
2,000.0	1,998.4	1,987.7	1,983.4	4.4	4.7	-141.04	-141.04	50.9	-182.4	216.7	208.0	8.69	24.933	
2,100.0	2,097.9	2,086.4	2,081.7	4.6	5.0	-141.90	-141.90	54.9	-189.7	232.4	223.2	9.15	25.408	
2,200.0	2,197.4	2,185.1	2,180.1	4.9	5.3	-142.65	-142.65	58.9	-196.9	248.1	238.5	9.60	25.833	
2,300.0	2,296.9	2,283.8	2,278.4	5.1	5.5	-143.31	-143.31	62.8	-204.2	263.9	253.8	10.06	26.217	
2,400.0	2,396.4	2,382.5	2,376.8	5.4	5.8	-143.90	-143.90	66.8	-211.4	279.7	269.1	10.53	26.565	
2,500.0	2,495.9	2,481.2	2,475.1	5.7	6.1	-144.42	-144.42	70.8	-218.7	295.5	284.5	10.99	26.881	
2,600.0	2,595.4	2,579.9	2,573.5	5.9	6.3	-144.89	-144.89	74.7	-226.0	311.4	299.9	11.46	27.169	
2,700.0	2,694.9	2,678.6	2,671.9	6.2	6.6	-145.32	-145.32	78.7	-233.2	327.2	315.3	11.93	27.434	
2,800.0	2,794.4	2,777.3	2,770.2	6.5	6.9	-145.70	-145.70	82.7	-240.5	343.1	330.7	12.40	27.676	
2,900.0	2,893.9	2,876.0	2,868.6	6.7	7.1	-146.06	-146.06	86.6	-247.7	359.0	346.1	12.87	27.900	
3,000.0	2,993.4	2,974.7	2,966.9	7.0	7.4	-146.38	-146.38	90.6	-255.0	374.9	361.6	13.34	28.107	
3,100.0	3,092.9	3,073.4	3,065.3	7.3	7.7	-146.67	-146.67	94.6	-262.3	390.8	377.0	13.81	28.299	
3,200.0	3,192.4	3,172.1	3,163.6	7.5	7.9	-146.94	-146.94	98.5	-269.5	406.8	392.5	14.28	28.477	
3,300.0	3,291.9	3,270.8	3,262.0	7.8	8.2	-147.20	-147.20	102.5	-276.8	422.7	407.9	14.76	28.643	
3,400.0	3,391.4	3,369.5	3,360.4	8.1	8.5	-147.43	-147.43	106.5	-284.0	438.6	423.4	15.23	28.798	
3,500.0	3,490.9	3,468.3	3,458.7	8.4	8.7	-147.65	-147.65	110.4	-291.3	454.6	438.9	15.71	28.943	
3,600.0	3,590.4	3,567.0	3,557.1	8.7	9.0	-147.85	-147.85	114.4	-298.6	470.5	454.4	16.18	29.079	
3,700.0	3,689.9	3,665.7	3,655.4	8.9	9.3	-148.04	-148.04	118.4	-305.8	486.5	469.9	16.66	29.207	
3,800.0	3,789.4	3,764.4	3,753.8	9.2	9.6	-148.22	-148.22	122.3	-313.1	502.5	485.3	17.13	29.327	
3,900.0	3,888.9	3,863.1	3,852.2	9.5	9.8	-148.38	-148.38	126.3	-320.3	518.5	500.8	17.61	29.440	
4,000.0	3,988.4	3,961.8	3,950.5	9.8	10.1	-148.54	-148.54	130.3	-327.6	534.4	516.3	18.09	29.547	
4,100.0	4,087.9	4,060.5	4,048.9	10.1	10.4	-148.69	-148.69	134.2	-334.9	550.4	531.8	18.56	29.649	
4,200.0	4,187.4	4,159.2	4,147.2	10.3	10.6	-148.82	-148.82	138.2	-342.1	566.4	547.3	19.04	29.744	
4,300.0	4,286.9	4,257.9	4,245.6	10.6	10.9	-148.96	-148.96	142.2	-349.4	582.4	562.9	19.52	29.835	
4,400.0	4,386.4	4,356.6	4,343.9	10.9	11.2	-149.08	-149.08	146.1	-356.7	598.4	578.4	20.00	29.921	
4,500.0	4,485.9	4,455.3	4,442.3	11.2	11.4	-149.20	-149.20	150.1	-363.9	614.4	593.9	20.48	30.003	
4,600.0	4,585.4	4,554.0	4,540.7	11.5	11.7	-149.31	-149.31	154.1	-371.2	630.4	609.4	20.95	30.081	
4,700.0	4,684.9	4,652.7	4,639.0	11.8	12.0	-149.42	-149.42	158.0	-378.4	646.3	624.9	21.43	30.156	
4,800.0	4,784.4	4,751.4	4,737.4	12.1	12.2	-149.52	-149.52	162.0	-385.7	662.3	640.4	21.91	30.227	

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 Churchill 28J-423
Project:	SEC.28-T5N-R64W	TVD Reference:	WELL @ 4648.0ft (RKB - 15')
Reference Site:	Churchill 28J-HZ Pad Sec.28-T5N-R64W	MD Reference:	WELL @ 4648.0ft (RKB - 15')
Site Error:	0.0ft	North Reference:	True
Reference Well:	Churchill 28J-423	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	Landmark
Reference Design:	Plan #2 (2-11-14)	Offset TVD Reference:	Offset Datum

Offset Design Churchill 28J-HZ Pad Sec.28-T5N-R64W - Churchill 28J-343 - Wellbore #1 - Plan #2 (2-11-14)													Offset Site Error:	0.0 ft
Survey Program: 0-MWD													Offset Well Error:	0.0 ft
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference	Offset	Semi Major Axis	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
4,900.0	4,883.9	4,850.1	4,835.7	12.3	12.5	-149.61		166.0	-393.0	678.3	656.0	22.39	30.294	
5,000.0	4,983.3	4,948.8	4,934.1	12.6	12.8	-149.70		169.9	-400.2	694.3	671.5	22.87	30.359	
5,100.0	5,082.8	5,047.5	5,032.5	12.9	13.1	-149.79		173.9	-407.5	710.4	687.0	23.35	30.421	
5,200.0	5,182.3	5,146.2	5,130.8	13.2	13.3	-149.88		177.9	-414.7	726.4	702.5	23.83	30.480	
5,300.0	5,281.8	5,245.0	5,229.2	13.5	13.6	-149.96		181.8	-422.0	742.4	718.1	24.31	30.537	
5,400.0	5,381.3	5,343.7	5,327.5	13.8	13.9	-150.03		185.8	-429.3	758.4	733.6	24.79	30.591	
5,500.0	5,480.8	5,442.4	5,425.9	14.1	14.1	-150.11		189.8	-436.5	774.4	749.1	25.27	30.644	
5,532.3	5,512.9	5,474.2	5,457.6	14.1	14.2	-150.13		191.1	-438.9	779.5	754.1	25.43	30.660	
5,600.0	5,580.4	5,541.2	5,524.4	14.3	14.4	-150.25		193.7	-443.8	789.7	763.9	25.77	30.647	
5,700.0	5,680.2	5,661.1	5,643.9	14.5	14.7	-150.31		198.0	-451.5	801.4	775.1	26.23	30.547	
5,800.0	5,780.2	5,793.6	5,776.3	14.7	14.9	-150.33		200.0	-455.2	806.2	779.6	26.66	30.245	
5,819.8	5,800.0	5,819.2	5,802.0	14.7	14.9	-90.00		200.0	-455.3	806.4	779.6	26.74	30.160	
5,900.0	5,880.2	5,899.4	5,882.2	14.8	15.1	-90.00		200.0	-455.3	806.4	779.3	27.04	29.823	
5,963.8	5,944.0	5,963.2	5,946.0	15.0	15.2	-90.00		200.0	-455.3	806.4	779.1	27.30	29.539	
6,000.0	5,980.2	5,999.4	5,982.2	15.0	15.3	-90.01		199.8	-455.3	806.4	778.9	27.44	29.384	
6,063.6	6,043.7	6,062.7	6,045.3	15.2	15.3	-90.30		195.8	-455.3	806.4	778.7	27.66	29.148	
6,100.0	6,080.2	6,098.6	6,081.0	15.2	15.4	89.44		191.3	-455.3	806.4	778.6	27.77	29.034	
6,150.0	6,130.0	6,147.7	6,129.2	15.3	15.4	89.07		182.3	-455.3	806.5	778.6	27.89	28.914	
6,200.0	6,179.5	6,196.4	6,176.4	15.3	15.5	88.71		170.4	-455.3	806.6	778.6	27.99	28.820	
6,250.0	6,228.3	6,244.9	6,222.5	15.4	15.5	88.36		155.5	-455.3	806.7	778.6	28.06	28.747	
6,300.0	6,276.4	6,293.0	6,267.4	15.4	15.5	88.02		137.9	-455.3	806.8	778.7	28.12	28.688	
6,350.0	6,323.5	6,340.9	6,310.7	15.5	15.6	87.68		117.7	-455.3	807.0	778.8	28.18	28.637	
6,400.0	6,369.4	6,388.5	6,352.5	15.5	15.6	87.36		94.8	-455.3	807.2	779.0	28.24	28.585	
6,450.0	6,413.9	6,435.8	6,392.5	15.5	15.6	87.04		69.6	-455.3	807.4	779.1	28.31	28.523	
6,500.0	6,456.8	6,483.0	6,430.8	15.5	15.6	86.74		42.1	-455.3	807.7	779.3	28.40	28.443	
6,550.0	6,498.0	6,529.8	6,467.1	15.6	15.7	86.45		12.5	-455.3	807.9	779.4	28.51	28.334	
6,600.0	6,537.2	6,576.5	6,501.3	15.6	15.7	86.18		-19.2	-455.3	808.2	779.5	28.67	28.188	
6,650.0	6,574.3	6,623.0	6,533.4	15.6	15.8	85.92		-52.8	-455.3	808.4	779.5	28.87	27.998	
6,700.0	6,609.1	6,669.3	6,563.4	15.7	15.8	85.68		-88.1	-455.3	808.7	779.5	29.13	27.757	
6,750.0	6,641.5	6,715.4	6,591.0	15.8	15.9	85.46		-125.1	-455.3	808.9	779.4	29.46	27.460	
6,800.0	6,671.3	6,761.4	6,616.2	15.9	16.1	85.26		-163.5	-455.3	809.1	779.3	29.85	27.104	
6,850.0	6,698.5	6,807.2	6,639.1	16.0	16.3	85.07		-203.2	-455.3	809.4	779.0	30.32	26.690	
6,900.0	6,722.8	6,852.9	6,659.4	16.3	16.5	84.91		-244.1	-455.3	809.6	778.7	30.87	26.221	
6,950.0	6,744.2	6,900.0	6,677.8	16.5	16.8	84.76		-287.4	-455.3	809.7	778.2	31.52	25.691	
7,000.0	6,762.7	6,944.0	6,692.6	16.9	17.1	84.63		-328.9	-455.3	809.9	777.7	32.23	25.132	
7,050.0	6,778.0	6,989.4	6,705.3	17.2	17.4	84.53		-372.5	-455.3	810.0	777.0	33.02	24.529	
7,100.0	6,790.2	7,034.8	6,715.3	17.7	17.8	84.45		-416.7	-455.3	810.2	776.3	33.90	23.900	
7,150.0	6,799.3	7,080.1	6,722.7	18.1	18.3	84.39		-461.4	-455.3	810.2	775.4	34.84	23.254	
7,183.6	6,803.5	7,110.5	6,726.2	18.5	18.6	84.36		-491.6	-455.3	810.3	774.8	35.51	22.816	
7,200.0	6,805.2	7,125.4	6,727.5	18.7	18.7	84.34		-506.5	-455.3	810.3	774.5	35.85	22.600	
7,257.6	6,811.2	7,177.3	6,729.6	19.3	19.3	84.11		-558.3	-455.3	810.7	773.6	37.08	21.865	
7,300.0	6,814.9	7,218.6	6,729.5	19.8	19.8	83.83		-599.6	-455.3	811.1	773.0	38.06	21.309	
7,379.8	6,817.5	7,298.3	6,729.2	20.8	20.8	83.61		-679.3	-455.3	811.4	771.4	40.04	20.265	
7,400.0	6,817.5	7,318.5	6,729.1	21.0	21.0	83.60		-699.6	-455.3	811.4	770.8	40.57	19.999	
7,500.0	6,817.3	7,418.5	6,728.7	22.4	22.4	83.59		-799.6	-455.3	811.4	768.1	43.28	18.748	
7,600.0	6,817.1	7,518.5	6,728.3	23.8	23.8	83.58		-899.5	-455.3	811.5	765.3	46.15	17.583	
7,700.0	6,816.9	7,618.5	6,727.9	25.2	25.3	83.56		-999.5	-455.3	811.5	762.3	49.15	16.511	
7,800.0	6,816.7	7,718.5	6,727.5	26.8	26.8	83.55		-1,099.5	-455.3	811.5	759.2	52.25	15.531	
7,900.0	6,816.5	7,818.5	6,727.1	28.4	28.4	83.53		-1,199.5	-455.3	811.5	756.1	55.44	14.637	
8,000.0	6,816.3	7,918.5	6,726.7	30.0	30.0	83.52		-1,299.5	-455.3	811.5	752.8	58.71	13.822	
8,100.0	6,816.1	8,018.5	6,726.3	31.6	31.7	83.50		-1,399.5	-455.3	811.6	749.5	62.04	13.080	

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 Churchill 28J-423
Project:	SEC.28-T5N-R64W	TVD Reference:	WELL @ 4648.0ft (RKB - 15')
Reference Site:	Churchill 28J-HZ Pad Sec.28-T5N-R64W	MD Reference:	WELL @ 4648.0ft (RKB - 15')
Site Error:	0.0ft	North Reference:	True
Reference Well:	Churchill 28J-423	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	Landmark
Reference Design:	Plan #2 (2-11-14)	Offset TVD Reference:	Offset Datum

Offset Design		Churchill 28J-HZ Pad Sec.28-T5N-R64W - Churchill 28J-343 - Wellbore #1 - Plan #2 (2-11-14)											Offset Site Error:		0.0 ft	
Survey Program: 0-MWD														Offset Well Error:		0.0 ft
Reference		Offset		Semi Major Axis			Distance							Warning		
Measured Depth	Vertical Depth	Measured Depth	Vertical Depth	Reference	Offset	Highside Toolface	Offset Wellbore Centre		Between Centres	Between Ellipses	Minimum Separation	Separation Factor				
(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(°)	+N/-S (ft)	+E/-W (ft)	(ft)	(ft)	(ft)					
8,200.0	6,815.9	8,118.5	6,725.9	33.3	33.3	83.49	-1,499.5	-455.3	811.6	746.2	65.43	12.404				
8,300.0	6,815.7	8,218.5	6,725.5	35.0	35.0	83.47	-1,599.5	-455.3	811.6	742.8	68.86	11.787				
8,400.0	6,815.6	8,318.5	6,725.1	36.8	36.8	83.46	-1,699.5	-455.3	811.6	739.3	72.33	11.222				
8,500.0	6,815.4	8,418.5	6,724.7	38.5	38.5	83.44	-1,799.5	-455.3	811.7	735.8	75.83	10.704				
8,600.0	6,815.2	8,518.5	6,724.3	40.3	40.3	83.43	-1,899.5	-455.3	811.7	732.3	79.36	10.228				
8,700.0	6,815.0	8,618.5	6,723.9	42.0	42.0	83.41	-1,999.5	-455.3	811.7	728.8	82.92	9.789				
8,800.0	6,814.8	8,718.5	6,723.5	43.8	43.8	83.40	-2,099.5	-455.3	811.7	725.2	86.50	9.385				
8,900.0	6,814.6	8,818.5	6,723.1	45.6	45.6	83.38	-2,199.5	-455.3	811.8	721.7	90.09	9.010				
9,000.0	6,814.4	8,918.5	6,722.7	47.4	47.4	83.37	-2,299.5	-455.3	811.8	718.1	93.71	8.663				
9,100.0	6,814.2	9,018.5	6,722.3	49.2	49.3	83.35	-2,399.5	-455.3	811.8	714.5	97.34	8.340				
9,200.0	6,814.0	9,118.5	6,721.9	51.1	51.1	83.34	-2,499.5	-455.3	811.8	710.9	100.98	8.039				
9,300.0	6,813.8	9,218.5	6,721.5	52.9	52.9	83.33	-2,599.5	-455.3	811.9	707.2	104.64	7.759				
9,400.0	6,813.6	9,318.5	6,721.1	54.7	54.7	83.31	-2,699.5	-455.3	811.9	703.6	108.31	7.496				
9,500.0	6,813.4	9,418.5	6,720.7	56.6	56.6	83.30	-2,799.5	-455.3	811.9	699.9	111.98	7.250				
9,600.0	6,813.2	9,518.5	6,720.3	58.4	58.4	83.28	-2,899.5	-455.3	811.9	696.3	115.67	7.019				
9,700.0	6,813.1	9,618.5	6,719.9	60.3	60.3	83.27	-2,999.5	-455.3	812.0	692.6	119.36	6.802				
9,800.0	6,812.9	9,718.5	6,719.5	62.1	62.1	83.25	-3,099.5	-455.3	812.0	688.9	123.06	6.598				
9,900.0	6,812.7	9,818.5	6,719.1	64.0	64.0	83.24	-3,199.5	-455.3	812.0	685.2	126.77	6.405				
10,000.0	6,812.5	9,918.5	6,718.7	65.9	65.9	83.22	-3,299.5	-455.3	812.0	681.5	130.49	6.223				
10,100.0	6,812.3	10,018.5	6,718.3	67.7	67.7	83.21	-3,399.5	-455.3	812.1	677.9	134.20	6.051				
10,200.0	6,812.1	10,118.5	6,717.8	69.6	69.6	83.19	-3,499.5	-455.3	812.1	674.2	137.93	5.888				
10,300.0	6,811.9	10,218.5	6,717.4	71.5	71.5	83.18	-3,599.5	-455.3	812.1	670.4	141.66	5.733				
10,400.0	6,811.7	10,318.5	6,717.0	73.3	73.4	83.16	-3,699.5	-455.3	812.1	666.7	145.39	5.586				
10,500.0	6,811.5	10,418.5	6,716.6	75.2	75.2	83.15	-3,799.5	-455.3	812.2	663.0	149.13	5.446				
10,600.0	6,811.3	10,518.5	6,716.2	77.1	77.1	83.13	-3,899.5	-455.3	812.2	659.3	152.87	5.313				
10,700.0	6,811.1	10,618.5	6,715.8	79.0	79.0	83.12	-3,999.5	-455.3	812.2	655.6	156.61	5.186				
10,800.0	6,810.9	10,718.5	6,715.4	80.9	80.9	83.11	-4,099.5	-455.3	812.2	651.9	160.36	5.065				
10,900.0	6,810.8	10,818.5	6,715.0	82.7	82.8	83.09	-4,199.5	-455.3	812.3	648.1	164.11	4.949				
11,000.0	6,810.6	10,918.5	6,714.6	84.6	84.6	83.08	-4,299.5	-455.3	812.3	644.4	167.86	4.839				
11,100.0	6,810.4	11,018.5	6,714.2	86.5	86.5	83.06	-4,399.5	-455.3	812.3	640.7	171.62	4.733				
11,200.0	6,810.2	11,118.5	6,713.8	88.4	88.4	83.05	-4,499.5	-455.3	812.3	637.0	175.37	4.632				
11,300.0	6,810.0	11,218.5	6,713.4	90.3	90.3	83.03	-4,599.5	-455.3	812.4	633.2	179.13	4.535				
11,400.0	6,809.8	11,318.5	6,713.0	92.2	92.2	83.02	-4,699.5	-455.3	812.4	629.5	182.90	4.442				
11,500.0	6,809.6	11,418.5	6,712.6	94.1	94.1	83.00	-4,799.5	-455.3	812.4	625.7	186.66	4.352				
11,600.0	6,809.4	11,518.5	6,712.2	96.0	96.0	82.99	-4,899.5	-455.3	812.4	622.0	190.42	4.266				
11,700.0	6,809.2	11,618.5	6,711.8	97.9	97.9	82.97	-4,999.5	-455.3	812.5	618.3	194.19	4.184				
11,800.0	6,809.0	11,718.5	6,711.4	99.8	99.8	82.96	-5,099.5	-455.3	812.5	614.5	197.96	4.104				
11,900.0	6,808.8	11,818.5	6,711.0	101.7	101.7	82.94	-5,199.5	-455.3	812.5	610.8	201.73	4.028				
12,000.0	6,808.6	11,918.5	6,710.6	103.6	103.6	82.93	-5,299.5	-455.3	812.5	607.0	205.50	3.954				
12,100.0	6,808.4	12,018.5	6,710.2	105.5	105.5	82.91	-5,399.5	-455.3	812.6	603.3	209.27	3.883				
12,200.0	6,808.3	12,118.5	6,709.8	107.4	107.4	82.90	-5,499.5	-455.3	812.6	599.5	213.04	3.814				
12,300.0	6,808.1	12,218.5	6,709.4	109.3	109.3	82.89	-5,599.5	-455.3	812.6	595.8	216.82	3.748				
12,400.0	6,807.9	12,318.5	6,709.0	111.2	111.2	82.87	-5,699.5	-455.3	812.6	592.0	220.59	3.684				
12,500.0	6,807.7	12,418.5	6,708.6	113.1	113.1	82.86	-5,799.5	-455.3	812.7	588.3	224.37	3.622				
12,600.0	6,807.5	12,518.5	6,708.2	115.0	115.0	82.84	-5,899.5	-455.3	812.7	584.5	228.15	3.562				
12,700.0	6,807.3	12,618.5	6,707.8	116.9	116.9	82.83	-5,999.5	-455.3	812.7	580.8	231.93	3.504				
12,800.0	6,807.1	12,718.5	6,707.4	118.8	118.8	82.81	-6,099.5	-455.3	812.7	577.0	235.71	3.448				
12,900.0	6,806.9	12,818.5	6,707.0	120.7	120.7	82.80	-6,199.5	-455.3	812.8	573.3	239.49	3.394				
13,000.0	6,806.7	12,918.5	6,706.6	122.6	122.6	82.78	-6,299.5	-455.3	812.8	569.5	243.27	3.341				
13,100.0	6,806.5	13,018.5	6,706.2	124.5	124.5	82.77	-6,399.5	-455.3	812.8	565.8	247.05	3.290				
13,200.0	6,806.3	13,118.5	6,705.8	126.4	126.4	82.75	-6,499.5	-455.3	812.8	562.0	250.83	3.241				

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 Churchill 28J-423
Project:	SEC.28-T5N-R64W	TVD Reference:	WELL @ 4648.0ft (RKB - 15')
Reference Site:	Churchill 28J-HZ Pad Sec.28-T5N-R64W	MD Reference:	WELL @ 4648.0ft (RKB - 15')
Site Error:	0.0ft	North Reference:	True
Reference Well:	Churchill 28J-423	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	Landmark
Reference Design:	Plan #2 (2-11-14)	Offset TVD Reference:	Offset Datum

Offset Design Churchill 28J-HZ Pad Sec.28-T5N-R64W - Churchill 28J-343 - Wellbore #1 - Plan #2 (2-11-14)													Offset Site Error:	0.0 ft
Survey Program: 0-MWD													Offset Well Error:	0.0 ft
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Semi Major Axis Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning	
13,300.0	6,806.1	13,218.5	6,705.4	128.3	128.3	82.74	-6,599.5	-455.3	812.9	558.3	254.61	3.193		
13,400.0	6,806.0	13,318.5	6,705.0	130.2	130.2	82.72	-6,699.5	-455.3	812.9	554.5	258.39	3.146		
13,500.0	6,805.8	13,418.5	6,704.6	132.1	132.1	82.71	-6,799.5	-455.3	812.9	550.8	262.18	3.101		
13,600.0	6,805.6	13,518.5	6,704.2	134.0	134.0	82.70	-6,899.5	-455.3	813.0	547.0	265.96	3.057		
13,700.0	6,805.4	13,618.5	6,703.8	135.9	135.9	82.68	-6,999.5	-455.3	813.0	543.2	269.74	3.014		
13,800.0	6,805.2	13,718.5	6,703.4	137.8	137.8	82.67	-7,099.5	-455.3	813.0	539.5	273.53	2.972		
13,895.2	6,805.0	13,813.7	6,703.0	139.7	139.7	82.65	-7,194.7	-455.3	813.0	535.9	277.13	2.934 SF		

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Churchill 28J-423
Project:	SEC.28-T5N-R64W	TVD Reference:	WELL @ 4648.0ft (RKB - 15')
Reference Site:	Churchill 28J-HZ Pad Sec.28-T5N-R64W	MD Reference:	WELL @ 4648.0ft (RKB - 15')
Site Error:	0.0ft	North Reference:	True
Reference Well:	Churchill 28J-423	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	Landmark
Reference Design:	Plan #2 (2-11-14)	Offset TVD Reference:	Offset Datum

Offset Design Churchill 28J-HZ Pad Sec.28-T5N-R64W - Churchill 28J-443 - Wellbore #1 - Plan #1 (1-22-14)													Offset Site Error:	0.0 ft
Survey Program: 0-MWD													Offset Well Error:	0.0 ft
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning	
0.0	0.0	1.0	1.0	0.0	0.0	-89.99	0.0	-58.5	58.5	58.5	0.00	N/A		
100.0	100.0	101.0	101.0	0.1	0.1	-89.99	0.0	-58.5	58.5	58.3	0.23	257.736		
200.0	200.0	201.0	201.0	0.3	0.3	-89.99	0.0	-58.5	58.5	57.8	0.68	86.483		
300.0	300.0	301.0	301.0	0.6	0.6	-89.99	0.0	-58.5	58.5	57.4	1.13	51.959		
400.0	400.0	401.0	401.0	0.8	0.8	-89.99	0.0	-58.5	58.5	56.9	1.58	37.135		
500.0	500.0	501.0	501.0	1.0	1.0	-89.99	0.0	-58.5	58.5	56.5	2.03	28.892		
600.0	600.0	601.0	601.0	1.2	1.2	-89.99	0.0	-58.5	58.5	56.0	2.47	23.643		
700.0	700.0	701.0	701.0	1.5	1.5	-89.99	0.0	-58.5	58.5	55.6	2.92	20.009		
766.3	766.3	767.3	767.3	1.6	1.6	-89.99	0.0	-58.5	58.5	55.3	3.22	18.157 CC		
800.0	800.0	801.0	801.0	1.7	1.7	-89.99	0.0	-58.5	58.5	55.1	3.37	17.343 ES		
900.0	900.0	900.0	900.0	1.9	1.9	-88.80	1.2	-59.7	59.8	55.9	3.82	15.653		
1,000.0	1,000.0	998.2	998.0	2.1	2.1	-85.64	4.8	-63.3	63.5	59.3	4.26	14.912		
1,100.0	1,100.0	1,098.0	1,097.6	2.4	2.4	-82.23	9.2	-67.6	68.3	63.6	4.71	14.504		
1,200.0	1,200.0	1,197.8	1,197.2	2.6	2.6	-79.27	13.6	-72.0	73.4	68.2	5.17	14.197		
1,300.0	1,300.0	1,297.6	1,296.9	2.8	2.8	-76.70	18.0	-76.4	78.6	72.9	5.63	13.961		
1,400.0	1,400.0	1,397.4	1,396.5	3.0	3.1	-74.46	22.5	-80.7	83.9	77.8	6.09	13.779		
1,500.0	1,500.0	1,497.2	1,496.1	3.3	3.3	-72.48	26.9	-85.1	89.3	82.8	6.55	13.636		
1,600.0	1,600.0	1,597.0	1,595.7	3.5	3.5	-131.75	31.3	-89.4	96.0	89.1	6.94	13.843		
1,700.0	1,699.8	1,696.5	1,695.0	3.7	3.8	-132.22	35.7	-93.8	105.1	97.7	7.37	14.254		
1,787.5	1,787.1	1,783.5	1,781.8	3.9	4.0	-133.58	39.5	-97.6	114.9	107.2	7.75	14.829		
1,800.0	1,799.5	1,795.8	1,794.1	3.9	4.0	-133.85	40.0	-98.1	116.5	108.7	7.81	14.921		
1,900.0	1,899.0	1,895.0	1,893.1	4.1	4.3	-135.72	44.4	-102.4	128.9	120.7	8.25	15.620		
2,000.0	1,998.4	1,994.1	1,992.0	4.4	4.5	-137.26	48.8	-106.8	141.5	132.8	8.70	16.251		
2,100.0	2,097.9	2,093.3	2,091.0	4.6	4.8	-138.55	53.2	-111.1	154.1	144.9	9.16	16.822		
2,200.0	2,197.4	2,192.4	2,189.9	4.9	5.0	-139.64	57.5	-115.4	166.8	157.2	9.62	17.340		
2,300.0	2,296.9	2,291.5	2,288.9	5.1	5.2	-140.58	61.9	-119.8	179.6	169.5	10.08	17.812		
2,400.0	2,396.4	2,390.7	2,387.8	5.4	5.5	-141.40	66.3	-124.1	192.4	181.8	10.54	18.242		
2,500.0	2,495.9	2,489.8	2,486.8	5.7	5.7	-142.11	70.7	-128.4	205.2	194.2	11.01	18.636		
2,600.0	2,595.4	2,589.0	2,585.8	5.9	6.0	-142.74	75.1	-132.8	218.0	206.6	11.48	18.998		
2,700.0	2,694.9	2,688.1	2,684.7	6.2	6.2	-143.30	79.4	-137.1	230.9	219.0	11.95	19.331		
2,800.0	2,794.4	2,787.3	2,783.7	6.5	6.5	-143.79	83.8	-141.4	243.8	231.4	12.42	19.639		
2,900.0	2,893.9	2,886.4	2,882.6	6.7	6.7	-144.24	88.2	-145.7	256.7	243.9	12.89	19.924		
3,000.0	2,993.4	2,985.6	2,981.6	7.0	7.0	-144.65	92.6	-150.1	269.7	256.3	13.36	20.188		
3,100.0	3,092.9	3,084.7	3,080.5	7.3	7.2	-145.02	96.9	-154.4	282.6	268.8	13.83	20.434		
3,200.0	3,192.4	3,183.8	3,179.5	7.5	7.5	-145.36	101.3	-158.7	295.6	281.3	14.30	20.664		
3,300.0	3,291.9	3,283.0	3,278.4	7.8	7.7	-145.67	105.7	-163.1	308.5	293.7	14.78	20.878		
3,400.0	3,391.4	3,382.1	3,377.4	8.1	8.0	-145.95	110.1	-167.4	321.5	306.2	15.25	21.079		
3,500.0	3,490.9	3,481.3	3,476.3	8.4	8.2	-146.21	114.4	-171.7	334.5	318.7	15.73	21.268		
3,600.0	3,590.4	3,580.4	3,575.3	8.7	8.4	-146.45	118.8	-176.1	347.5	331.2	16.20	21.445		
3,700.0	3,689.9	3,679.6	3,674.2	8.9	8.7	-146.68	123.2	-180.4	360.4	343.8	16.68	21.612		
3,800.0	3,789.4	3,778.7	3,773.2	9.2	8.9	-146.89	127.6	-184.7	373.4	356.3	17.15	21.769		
3,900.0	3,888.9	3,877.8	3,872.1	9.5	9.2	-147.08	131.9	-189.0	386.4	368.8	17.63	21.918		
4,000.0	3,988.4	3,977.0	3,971.1	9.8	9.4	-147.26	136.3	-193.4	399.4	381.3	18.11	22.058		
4,100.0	4,087.9	4,076.1	4,070.0	10.1	9.7	-147.43	140.7	-197.7	412.4	393.9	18.59	22.192		
4,200.0	4,187.4	4,175.3	4,169.0	10.3	9.9	-147.59	145.1	-202.0	425.4	406.4	19.06	22.318		
4,300.0	4,286.9	4,274.4	4,267.9	10.6	10.2	-147.75	149.5	-206.4	438.5	418.9	19.54	22.438		
4,400.0	4,386.4	4,373.6	4,366.9	10.9	10.4	-147.89	153.8	-210.7	451.5	431.5	20.02	22.552		
4,500.0	4,485.9	4,472.7	4,465.8	11.2	10.7	-148.02	158.2	-215.0	464.5	444.0	20.50	22.661		
4,600.0	4,585.4	4,571.8	4,564.8	11.5	10.9	-148.15	162.6	-219.4	477.5	456.5	20.98	22.765		
4,700.0	4,684.9	4,671.0	4,663.7	11.8	11.2	-148.27	167.0	-223.7	490.5	469.1	21.46	22.863		
4,800.0	4,784.4	4,770.1	4,762.7	12.1	11.4	-148.38	171.3	-228.0	503.6	481.6	21.93	22.958		

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 Churchill 28J-423
Project:	SEC.28-T5N-R64W	TVD Reference:	WELL @ 4648.0ft (RKB - 15')
Reference Site:	Churchill 28J-HZ Pad Sec.28-T5N-R64W	MD Reference:	WELL @ 4648.0ft (RKB - 15')
Site Error:	0.0ft	North Reference:	True
Reference Well:	Churchill 28J-423	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	Landmark
Reference Design:	Plan #2 (2-11-14)	Offset TVD Reference:	Offset Datum

Offset Design Churchill 28J-HZ Pad Sec.28-T5N-R64W - Churchill 28J-443 - Wellbore #1 - Plan #1 (1-22-14)													Offset Site Error:	0.0 ft
Survey Program: 0-MWD													Offset Well Error:	0.0 ft
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference	Offset	Semi Major Axis	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
4,900.0	4,883.9	4,869.3	4,861.7	12.3	11.7	-148.49		175.7	-232.3	516.6	494.2	22.41	23.048	
5,000.0	4,983.3	4,968.4	4,960.6	12.6	11.9	-148.59		180.1	-236.7	529.6	506.7	22.89	23.135	
5,100.0	5,082.8	5,067.6	5,059.6	12.9	12.2	-148.69		184.5	-241.0	542.6	519.3	23.37	23.217	
5,200.0	5,182.3	5,166.7	5,158.5	13.2	12.4	-148.79		188.8	-245.3	555.7	531.8	23.85	23.297	
5,300.0	5,281.8	5,265.8	5,257.5	13.5	12.7	-148.87		193.2	-249.7	568.7	544.4	24.33	23.373	
5,400.0	5,381.3	5,370.9	5,362.3	13.8	12.9	-148.98		197.7	-254.1	581.6	556.8	24.81	23.438	
5,500.0	5,480.8	5,487.3	5,478.7	14.1	13.1	-149.35		200.0	-256.3	592.2	566.9	25.27	23.436	
5,532.3	5,512.9	5,522.6	5,513.9	14.1	13.2	-149.52		200.0	-256.4	595.0	569.6	25.41	23.418	
5,600.0	5,580.4	5,590.0	5,581.4	14.3	13.3	-149.86		200.0	-256.4	600.2	574.5	25.71	23.346	
5,700.0	5,680.2	5,689.9	5,681.2	14.5	13.5	-150.19		200.0	-256.4	605.3	579.2	26.12	23.172	
5,800.0	5,780.2	5,789.8	5,781.2	14.7	13.7	-150.33		200.0	-256.4	607.4	580.9	26.51	22.911	
5,819.8	5,800.0	5,809.6	5,801.0	14.7	13.8	-90.00		200.0	-256.4	607.5	580.9	26.59	22.850	
5,900.0	5,880.2	5,889.8	5,881.2	14.8	13.9	-90.00		200.0	-256.4	607.5	580.6	26.91	22.578	
6,000.0	5,980.2	5,989.8	5,981.2	15.0	14.1	-90.00		200.0	-256.4	607.5	580.2	27.32	22.236	
6,063.6	6,043.7	6,053.4	6,044.7	15.2	14.3	-90.00		200.0	-256.4	607.5	579.9	27.58	22.023	
6,069.4	6,049.6	6,059.2	6,050.6	15.2	14.3	90.00		200.0	-256.4	607.5	579.9	27.60	22.006	
6,100.0	6,080.2	6,089.8	6,081.2	15.2	14.3	90.00		199.1	-256.4	607.5	579.8	27.71	21.920	
6,150.0	6,130.0	6,139.8	6,131.0	15.3	14.4	89.99		195.0	-256.4	607.5	579.6	27.85	21.810	
6,200.0	6,179.5	6,189.8	6,180.4	15.3	14.4	89.98		187.7	-256.4	607.5	579.5	27.96	21.724	
6,250.0	6,228.3	6,239.8	6,229.3	15.4	14.5	89.98		177.1	-256.4	607.5	579.4	28.05	21.656	
6,300.0	6,276.4	6,289.8	6,277.3	15.4	14.5	89.97		163.4	-256.4	607.5	579.4	28.12	21.601	
6,350.0	6,323.5	6,339.8	6,324.4	15.5	14.6	89.97		146.6	-256.4	607.5	579.3	28.18	21.556	
6,400.0	6,369.4	6,389.7	6,370.2	15.5	14.6	89.96		126.7	-256.4	607.5	579.2	28.24	21.514	
6,450.0	6,413.9	6,439.7	6,414.7	15.5	14.6	89.96		103.9	-256.4	607.5	579.2	28.30	21.467	
6,500.0	6,456.8	6,489.7	6,457.5	15.5	14.7	89.95		78.2	-256.4	607.5	579.1	28.37	21.410	
6,550.0	6,498.0	6,539.6	6,498.6	15.6	14.7	89.94		49.8	-256.4	607.5	579.0	28.48	21.333	
6,600.0	6,537.2	6,589.6	6,537.8	15.6	14.7	89.94		18.8	-256.4	607.5	578.9	28.61	21.230	
6,650.0	6,574.3	6,639.5	6,574.8	15.6	14.8	89.94		-14.7	-256.4	607.5	578.7	28.80	21.094	
6,700.0	6,609.1	6,689.5	6,609.5	15.7	14.8	89.93		-50.6	-256.4	607.5	578.4	29.04	20.917	
6,750.0	6,641.5	6,739.4	6,641.9	15.8	14.9	89.93		-88.7	-256.4	607.5	578.1	29.35	20.696	
6,800.0	6,671.3	6,789.4	6,671.6	15.9	15.1	89.92		-128.8	-256.4	607.5	577.7	29.74	20.427	
6,850.0	6,698.5	6,839.3	6,698.7	16.0	15.3	89.92		-170.7	-256.4	607.5	577.3	30.21	20.110	
6,900.0	6,722.8	6,889.3	6,723.0	16.3	15.5	89.92		-214.4	-256.4	607.5	576.7	30.76	19.746	
6,950.0	6,744.2	6,939.2	6,744.4	16.5	15.9	89.91		-259.5	-256.4	607.5	576.1	31.41	19.340	
7,000.0	6,762.7	6,989.2	6,762.8	16.9	16.2	89.91		-305.9	-256.4	607.5	575.3	32.15	18.897	
7,050.0	6,778.0	7,039.1	6,778.1	17.2	16.7	89.91		-353.4	-256.4	607.5	574.5	32.97	18.424	
7,100.0	6,790.2	7,089.0	6,790.3	17.7	17.1	89.91		-401.8	-256.4	607.5	573.6	33.88	17.929	
7,150.0	6,799.3	7,139.0	6,799.3	18.1	17.6	89.91		-451.0	-256.4	607.5	572.6	34.87	17.420	
7,183.6	6,803.5	7,172.5	6,803.5	18.5	18.0	89.91		-484.2	-256.4	607.5	571.9	35.57	17.077	
7,200.0	6,805.2	7,188.9	6,805.2	18.7	18.1	89.91		-500.6	-256.4	607.5	571.6	35.93	16.906	
7,232.8	6,808.6	7,221.7	6,808.7	19.0	18.5	89.91		-533.1	-256.4	607.5	570.8	36.67	16.565	
7,257.6	6,811.2	7,246.5	6,811.3	19.3	18.8	89.91		-557.8	-256.4	607.5	570.2	37.24	16.313	
7,300.0	6,814.9	7,288.9	6,814.9	19.8	19.3	89.91		-600.0	-256.4	607.5	569.2	38.26	15.879	
7,379.8	6,817.5	7,368.6	6,817.5	20.8	20.3	89.91		-679.7	-256.4	607.5	567.2	40.26	15.088	
7,400.0	6,817.5	7,388.8	6,817.5	21.0	20.6	89.91		-699.9	-256.4	607.5	566.7	40.79	14.892	
7,500.0	6,817.3	7,488.8	6,817.3	22.4	21.9	89.91		-799.9	-256.4	607.5	564.0	43.52	13.958	
7,600.0	6,817.1	7,588.8	6,817.1	23.8	23.4	89.91		-899.9	-256.4	607.5	561.1	46.40	13.091	
7,700.0	6,816.9	7,688.8	6,816.9	25.2	24.9	89.91		-999.9	-256.4	607.5	558.1	49.42	12.293	
7,800.0	6,816.7	7,788.8	6,816.7	26.8	26.4	89.91		-1,099.9	-256.4	607.5	554.9	52.54	11.562	
7,900.0	6,816.5	7,888.8	6,816.5	28.4	28.0	89.91		-1,199.9	-256.4	607.5	551.7	55.75	10.896	
8,000.0	6,816.3	7,988.8	6,816.3	30.0	29.7	89.91		-1,299.9	-256.4	607.5	548.4	59.04	10.289	

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 Churchill 28J-423
Project:	SEC.28-T5N-R64W	TVD Reference:	WELL @ 4648.0ft (RKB - 15')
Reference Site:	Churchill 28J-HZ Pad Sec.28-T5N-R64W	MD Reference:	WELL @ 4648.0ft (RKB - 15')
Site Error:	0.0ft	North Reference:	True
Reference Well:	Churchill 28J-423	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	Landmark
Reference Design:	Plan #2 (2-11-14)	Offset TVD Reference:	Offset Datum

Offset Design		Churchill 28J-HZ Pad Sec.28-T5N-R64W - Churchill 28J-443 - Wellbore #1 - Plan #1 (1-22-14)										Offset Site Error:		0.0 ft
Survey Program: 0-MWD												Offset Well Error:		0.0 ft
Reference		Offset		Semi Major Axis				Distance						
Measured Depth	Vertical Depth	Measured Depth	Vertical Depth	Reference	Offset	Highside Toolface	Offset Wellbore Centre		Between Centres	Between Ellipses	Minimum Separation	Separation Factor	Warning	
(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(°)	+N/-S (ft)	+E/-W (ft)	(ft)	(ft)	(ft)			
8,100.0	6,816.1	8,088.8	6,816.1	31.6	31.3	89.91	-1,399.9	-256.4	607.5	545.1	62.39	9.737		
8,200.0	6,815.9	8,188.8	6,815.9	33.3	33.0	89.91	-1,499.9	-256.4	607.5	541.7	65.80	9.233		
8,300.0	6,815.7	8,288.8	6,815.7	35.0	34.7	89.91	-1,599.9	-256.4	607.5	538.2	69.25	8.773		
8,400.0	6,815.6	8,388.8	6,815.6	36.8	36.5	89.91	-1,699.9	-256.4	607.5	534.8	72.74	8.352		
8,500.0	6,815.4	8,488.8	6,815.4	38.5	38.2	89.91	-1,799.9	-256.4	607.5	531.2	76.26	7.966		
8,600.0	6,815.2	8,588.8	6,815.2	40.3	40.0	89.91	-1,899.9	-256.4	607.5	527.7	79.81	7.611		
8,700.0	6,815.0	8,688.8	6,815.0	42.0	41.8	89.91	-1,999.9	-256.4	607.5	524.1	83.39	7.285		
8,800.0	6,814.8	8,788.8	6,814.8	43.8	43.6	89.91	-2,099.9	-256.4	607.5	520.5	86.99	6.983		
8,900.0	6,814.6	8,888.8	6,814.6	45.6	45.4	89.91	-2,199.9	-256.4	607.5	516.9	90.61	6.704		
9,000.0	6,814.4	8,988.8	6,814.4	47.4	47.2	89.91	-2,299.9	-256.4	607.5	513.2	94.25	6.445		
9,100.0	6,814.2	9,088.8	6,814.2	49.2	49.0	89.91	-2,399.9	-256.4	607.5	509.6	97.90	6.205		
9,200.0	6,814.0	9,188.8	6,814.0	51.1	50.9	89.91	-2,499.9	-256.4	607.5	505.9	101.57	5.981		
9,300.0	6,813.8	9,288.8	6,813.8	52.9	52.7	89.91	-2,599.9	-256.4	607.5	502.2	105.25	5.772		
9,400.0	6,813.6	9,388.8	6,813.6	54.7	54.5	89.91	-2,699.9	-256.4	607.5	498.5	108.94	5.576		
9,500.0	6,813.4	9,488.8	6,813.4	56.6	56.4	89.91	-2,799.9	-256.4	607.5	494.8	112.65	5.393		
9,600.0	6,813.2	9,588.8	6,813.3	58.4	58.3	89.91	-2,899.9	-256.4	607.5	491.1	116.36	5.221		
9,700.0	6,813.1	9,688.8	6,813.1	60.3	60.1	89.91	-2,999.9	-256.4	607.5	487.4	120.07	5.059		
9,800.0	6,812.9	9,788.8	6,812.9	62.1	62.0	89.91	-3,099.9	-256.4	607.5	483.7	123.80	4.907		
9,900.0	6,812.7	9,888.8	6,812.7	64.0	63.8	89.91	-3,199.9	-256.4	607.5	480.0	127.53	4.763		
10,000.0	6,812.5	9,988.8	6,812.5	65.9	65.7	89.91	-3,299.9	-256.4	607.5	476.2	131.27	4.628		
10,100.0	6,812.3	10,088.8	6,812.3	67.7	67.6	89.91	-3,399.9	-256.4	607.5	472.5	135.02	4.499		
10,200.0	6,812.1	10,188.8	6,812.1	69.6	69.4	89.91	-3,499.9	-256.4	607.5	468.7	138.77	4.378		
10,300.0	6,811.9	10,288.8	6,811.9	71.5	71.3	89.91	-3,599.9	-256.4	607.5	465.0	142.52	4.262		
10,400.0	6,811.7	10,388.8	6,811.7	73.3	73.2	89.91	-3,699.9	-256.4	607.5	461.2	146.28	4.153		
10,500.0	6,811.5	10,488.8	6,811.5	75.2	75.1	89.91	-3,799.9	-256.4	607.5	457.4	150.05	4.049		
10,600.0	6,811.3	10,588.8	6,811.3	77.1	77.0	89.91	-3,899.9	-256.4	607.5	453.7	153.82	3.949		
10,700.0	6,811.1	10,688.8	6,811.1	79.0	78.8	89.91	-3,999.9	-256.4	607.5	449.9	157.59	3.855		
10,800.0	6,810.9	10,788.8	6,810.9	80.9	80.7	89.91	-4,099.9	-256.4	607.5	446.1	161.36	3.765		
10,900.0	6,810.8	10,888.8	6,810.8	82.7	82.6	89.91	-4,199.9	-256.4	607.5	442.3	165.14	3.679		
11,000.0	6,810.6	10,988.8	6,810.6	84.6	84.5	89.91	-4,299.9	-256.4	607.5	438.6	168.92	3.596		
11,100.0	6,810.4	11,088.8	6,810.4	86.5	86.4	89.91	-4,399.9	-256.4	607.5	434.8	172.70	3.517		
11,200.0	6,810.2	11,188.8	6,810.2	88.4	88.3	89.91	-4,499.9	-256.4	607.5	431.0	176.49	3.442		
11,300.0	6,810.0	11,288.8	6,810.0	90.3	90.2	89.91	-4,599.9	-256.4	607.5	427.2	180.28	3.370		
11,400.0	6,809.8	11,388.8	6,809.8	92.2	92.1	89.91	-4,699.9	-256.4	607.5	423.4	184.07	3.300		
11,500.0	6,809.6	11,488.8	6,809.6	94.1	94.0	89.91	-4,799.9	-256.4	607.5	419.6	187.86	3.234		
11,600.0	6,809.4	11,588.8	6,809.4	96.0	95.9	89.91	-4,899.9	-256.4	607.5	415.8	191.66	3.170		
11,700.0	6,809.2	11,688.8	6,809.2	97.9	97.8	89.91	-4,999.9	-256.4	607.5	412.0	195.45	3.108		
11,800.0	6,809.0	11,788.8	6,809.0	99.8	99.7	89.91	-5,099.9	-256.4	607.5	408.2	199.25	3.049		
11,900.0	6,808.8	11,888.8	6,808.8	101.7	101.6	89.91	-5,199.9	-256.4	607.5	404.4	203.05	2.992		
12,000.0	6,808.6	11,988.8	6,808.6	103.6	103.5	89.91	-5,299.9	-256.4	607.5	400.6	206.85	2.937		
12,100.0	6,808.4	12,088.8	6,808.5	105.5	105.4	89.91	-5,399.9	-256.4	607.5	396.8	210.66	2.884		
12,200.0	6,808.3	12,188.8	6,808.3	107.4	107.3	89.91	-5,499.9	-256.4	607.5	393.0	214.46	2.833		
12,300.0	6,808.1	12,288.8	6,808.1	109.3	109.2	89.91	-5,599.9	-256.4	607.5	389.2	218.27	2.783		
12,400.0	6,807.9	12,388.8	6,807.9	111.2	111.1	89.91	-5,699.9	-256.4	607.5	385.4	222.07	2.736		
12,500.0	6,807.7	12,488.8	6,807.7	113.1	113.0	89.91	-5,799.9	-256.4	607.5	381.6	225.88	2.689		
12,600.0	6,807.5	12,588.8	6,807.5	115.0	114.9	89.91	-5,899.9	-256.4	607.5	377.8	229.69	2.645		
12,700.0	6,807.3	12,688.8	6,807.3	116.9	116.8	89.91	-5,999.9	-256.4	607.5	374.0	233.50	2.602		
12,800.0	6,807.1	12,788.8	6,807.1	118.8	118.7	89.91	-6,099.9	-256.4	607.5	370.2	237.31	2.560		
12,900.0	6,806.9	12,888.8	6,806.9	120.7	120.6	89.91	-6,199.9	-256.4	607.5	366.4	241.12	2.519		
13,000.0	6,806.7	12,988.8	6,806.7	122.6	122.5	89.91	-6,299.9	-256.4	607.5	362.6	244.94	2.480		
13,100.0	6,806.5	13,088.8	6,806.5	124.5	124.4	89.91	-6,399.9	-256.4	607.5	358.7	248.75	2.442		

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 Churchill 28J-423
Project:	SEC.28-T5N-R64W	TVD Reference:	WELL @ 4648.0ft (RKB - 15')
Reference Site:	Churchill 28J-HZ Pad Sec.28-T5N-R64W	MD Reference:	WELL @ 4648.0ft (RKB - 15')
Site Error:	0.0ft	North Reference:	True
Reference Well:	Churchill 28J-423	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	Landmark
Reference Design:	Plan #2 (2-11-14)	Offset TVD Reference:	Offset Datum

Offset Design Churchill 28J-HZ Pad Sec.28-T5N-R64W - Churchill 28J-443 - Wellbore #1 - Plan #1 (1-22-14)												Offset Site Error:	0.0 ft
Survey Program: 0-MWD												Offset Well Error:	0.0 ft
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Semi Major Axis Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Distance Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
13,200.0	6,806.3	13,188.8	6,806.3	126.4	126.3	89.91	-6,499.9	-256.4	607.5	354.9	252.56	2.405	
13,300.0	6,806.1	13,288.8	6,806.1	128.3	128.2	89.91	-6,599.9	-256.4	607.5	351.1	256.38	2.369	
13,400.0	6,806.0	13,388.8	6,806.0	130.2	130.1	89.91	-6,699.9	-256.4	607.5	347.3	260.20	2.335	
13,500.0	6,805.8	13,488.8	6,805.8	132.1	132.0	89.91	-6,799.9	-256.4	607.5	343.5	264.01	2.301	
13,600.0	6,805.6	13,588.8	6,805.6	134.0	134.0	89.91	-6,899.9	-256.4	607.5	339.7	267.83	2.268	
13,700.0	6,805.4	13,688.8	6,805.4	135.9	135.9	89.91	-6,999.9	-256.4	607.5	335.8	271.65	2.236	
13,800.0	6,805.2	13,788.8	6,805.2	137.8	137.8	89.91	-7,099.9	-256.4	607.5	332.0	275.47	2.205	
13,895.2	6,805.0	13,884.0	6,805.0	139.7	139.6	89.91	-7,195.1	-256.4	607.5	328.4	279.11	2.177 SF	

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Churchill 28J-423
Project:	SEC.28-T5N-R64W	TVD Reference:	WELL @ 4648.0ft (RKB - 15')
Reference Site:	Churchill 28J-HZ Pad Sec.28-T5N-R64W	MD Reference:	WELL @ 4648.0ft (RKB - 15')
Site Error:	0.0ft	North Reference:	True
Reference Well:	Churchill 28J-423	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	Landmark
Reference Design:	Plan #2 (2-11-14)	Offset TVD Reference:	Offset Datum

Offset Design Churchill 28J-HZ Pad Sec.28-T5N-R64W - Churchill 28M-343 - Wellbore #1 - Plan #2 (2-11-14)												Offset Site Error:	0.0 ft
Survey Program: 0-MWD												Offset Well Error:	0.0 ft
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
0.0	0.0	0.0	0.0	0.0	0.0	89.98	0.0	30.6	30.6				
100.0	100.0	100.0	100.0	0.1	0.1	89.98	0.0	30.6	30.6	30.4	0.22	136.355	
200.0	200.0	200.0	200.0	0.3	0.3	89.98	0.0	30.6	30.6	30.0	0.67	45.452	
300.0	300.0	300.0	300.0	0.6	0.6	89.98	0.0	30.6	30.6	29.5	1.12	27.271	
400.0	400.0	400.0	400.0	0.8	0.8	89.98	0.0	30.6	30.6	29.1	1.57	19.479	
500.0	500.0	500.0	500.0	1.0	1.0	89.98	0.0	30.6	30.6	28.6	2.02	15.151	
600.0	600.0	600.0	600.0	1.2	1.2	89.98	0.0	30.6	30.6	28.2	2.47	12.396	
700.0	700.0	700.0	700.0	1.5	1.5	89.98	0.0	30.6	30.6	27.7	2.92	10.489	
800.0	800.0	800.0	800.0	1.7	1.7	89.98	0.0	30.6	30.6	27.3	3.37	9.090	
900.0	900.0	900.0	900.0	1.9	1.9	89.98	0.0	30.6	30.6	26.8	3.82	8.021	
1,000.0	1,000.0	1,000.0	1,000.0	2.1	2.1	89.98	0.0	30.6	30.6	26.4	4.27	7.177 CC, ES	
1,100.0	1,100.0	1,098.9	1,098.9	2.4	2.3	89.20	0.5	32.3	32.3	27.6	4.71	6.864	
1,200.0	1,200.0	1,197.6	1,197.5	2.6	2.6	87.26	1.8	37.2	37.4	32.2	5.14	7.264	
1,300.0	1,300.0	1,295.9	1,295.4	2.8	2.8	85.00	4.0	45.4	45.8	40.2	5.59	8.199	
1,400.0	1,400.0	1,393.4	1,392.2	3.0	3.0	82.95	7.0	56.7	57.7	51.6	6.04	9.542	
1,500.0	1,500.0	1,490.1	1,487.7	3.3	3.3	81.30	10.9	71.0	72.9	66.4	6.52	11.183	
1,600.0	1,600.0	1,586.9	1,582.9	3.5	3.6	19.96	15.5	88.3	89.7	82.8	6.89	13.016	
1,700.0	1,699.8	1,685.9	1,680.0	3.7	3.9	19.86	20.4	106.6	103.9	96.6	7.31	14.204	
1,787.5	1,787.1	1,772.9	1,765.4	3.9	4.2	20.28	24.8	122.7	113.6	105.9	7.69	14.783	
1,800.0	1,799.5	1,785.3	1,777.6	3.9	4.3	20.38	25.4	125.0	114.8	107.1	7.74	14.834	
1,900.0	1,899.0	1,884.8	1,875.3	4.1	4.6	21.08	30.3	143.4	124.6	116.4	8.19	15.206	
2,000.0	1,998.4	1,984.3	1,972.9	4.4	5.0	21.68	35.3	161.8	134.4	125.7	8.65	15.529	
2,100.0	2,097.9	2,083.8	2,070.6	4.6	5.4	22.20	40.2	180.2	144.1	135.0	9.12	15.811	
2,200.0	2,197.4	2,183.4	2,168.3	4.9	5.7	22.66	45.2	198.6	153.9	144.3	9.59	16.059	
2,300.0	2,296.9	2,282.9	2,265.9	5.1	6.1	23.06	50.1	217.0	163.7	153.7	10.06	16.277	
2,400.0	2,396.4	2,382.4	2,363.6	5.4	6.5	23.41	55.1	235.4	173.5	163.0	10.54	16.470	
2,500.0	2,495.9	2,481.9	2,461.3	5.7	6.9	23.73	60.0	253.7	183.3	172.3	11.02	16.641	
2,600.0	2,595.4	2,581.4	2,559.0	5.9	7.3	24.02	65.0	272.1	193.2	181.7	11.50	16.795	
2,700.0	2,694.9	2,680.9	2,656.6	6.2	7.7	24.27	69.9	290.5	203.0	191.0	11.99	16.932	
2,800.0	2,794.4	2,780.4	2,754.3	6.5	8.2	24.51	74.9	308.9	212.8	200.3	12.48	17.055	
2,900.0	2,893.9	2,880.0	2,852.0	6.7	8.6	24.72	79.8	327.3	222.6	209.7	12.97	17.167	
3,000.0	2,993.4	2,979.5	2,949.7	7.0	9.0	24.91	84.8	345.7	232.5	219.0	13.46	17.268	
3,100.0	3,092.9	3,079.0	3,047.3	7.3	9.4	25.09	89.7	364.1	242.3	228.3	13.96	17.360	
3,200.0	3,192.4	3,178.5	3,145.0	7.5	9.8	25.26	94.7	382.5	252.1	237.7	14.45	17.444	
3,300.0	3,291.9	3,278.0	3,242.7	7.8	10.2	25.41	99.6	400.9	262.0	247.0	14.95	17.521	
3,400.0	3,391.4	3,377.5	3,340.3	8.1	10.6	25.55	104.6	419.3	271.8	256.4	15.45	17.591	
3,500.0	3,490.9	3,477.0	3,438.0	8.4	11.0	25.68	109.5	437.7	281.6	265.7	15.95	17.655	
3,600.0	3,590.4	3,576.5	3,535.7	8.7	11.5	25.81	114.5	456.1	291.5	275.0	16.45	17.715	
3,700.0	3,689.9	3,676.1	3,633.4	8.9	11.9	25.92	119.4	474.5	301.3	284.4	16.96	17.770	
3,800.0	3,789.4	3,775.6	3,731.0	9.2	12.3	26.03	124.4	492.9	311.2	293.7	17.46	17.821	
3,900.0	3,888.9	3,875.1	3,828.7	9.5	12.7	26.13	129.3	511.3	321.0	303.0	17.97	17.868	
4,000.0	3,988.4	3,974.6	3,926.4	9.8	13.1	26.23	134.3	529.7	330.9	312.4	18.47	17.912	
4,100.0	4,087.9	4,074.1	4,024.0	10.1	13.6	26.31	139.2	548.1	340.7	321.7	18.98	17.953	
4,200.0	4,187.4	4,173.6	4,121.7	10.3	14.0	26.40	144.2	566.5	350.6	331.1	19.48	17.992	
4,300.0	4,286.9	4,273.1	4,219.4	10.6	14.4	26.48	149.1	584.9	360.4	340.4	19.99	18.028	
4,400.0	4,386.4	4,372.6	4,317.1	10.9	14.8	26.55	154.1	603.3	370.2	349.7	20.50	18.061	
4,500.0	4,485.9	4,472.2	4,414.7	11.2	15.3	26.63	159.0	621.7	380.1	359.1	21.01	18.093	
4,600.0	4,585.4	4,571.7	4,512.4	11.5	15.7	26.69	164.0	640.1	389.9	368.4	21.52	18.122	
4,700.0	4,684.9	4,671.2	4,610.1	11.8	16.1	26.76	168.9	658.5	399.8	377.8	22.03	18.150	
4,800.0	4,784.4	4,770.7	4,707.8	12.1	16.5	26.82	173.9	676.9	409.6	387.1	22.54	18.176	
4,900.0	4,883.9	4,870.2	4,805.4	12.3	16.9	26.88	178.8	695.3	419.5	396.4	23.05	18.201	

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 Churchill 28J-423
Project:	SEC.28-T5N-R64W	TVD Reference:	WELL @ 4648.0ft (RKB - 15')
Reference Site:	Churchill 28J-HZ Pad Sec.28-T5N-R64W	MD Reference:	WELL @ 4648.0ft (RKB - 15')
Site Error:	0.0ft	North Reference:	True
Reference Well:	Churchill 28J-423	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	Landmark
Reference Design:	Plan #2 (2-11-14)	Offset TVD Reference:	Offset Datum

Offset Design Churchill 28J-HZ Pad Sec.28-T5N-R64W - Churchill 28M-343 - Wellbore #1 - Plan #2 (2-11-14)													Offset Site Error:	0.0 ft
Survey Program: 0-MWD													Offset Well Error:	0.0 ft
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference	Offset	Semi Major Axis	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
5,000.0	4,983.3	4,969.7	4,903.1	12.6	17.4	26.94	26.94	183.8	713.7	429.3	405.8	23.56	18.224	
5,100.0	5,082.8	5,078.0	5,009.5	12.9	17.8	27.01	27.01	189.0	733.1	438.7	414.6	24.08	18.218	
5,200.0	5,182.3	5,195.5	5,125.7	13.2	18.1	27.21	27.21	193.6	750.2	444.6	420.0	24.59	18.079	
5,300.0	5,281.8	5,313.4	5,242.8	13.5	18.4	27.53	27.53	197.0	762.8	446.4	421.3	25.09	17.793	
5,400.0	5,381.3	5,431.1	5,360.3	13.8	18.6	28.00	28.00	199.1	770.7	444.3	418.7	25.58	17.366	
5,500.0	5,480.8	5,548.4	5,477.5	14.1	18.8	28.63	28.63	200.0	773.9	438.2	412.1	26.08	16.805	
5,532.3	5,512.9	5,583.9	5,512.9	14.1	18.8	28.85	28.85	200.0	773.9	435.4	409.2	26.23	16.599	
5,600.0	5,580.4	5,651.3	5,580.4	14.3	18.9	29.18	29.18	200.0	773.9	430.2	403.7	26.52	16.223	
5,700.0	5,680.2	5,751.2	5,680.2	14.5	19.1	29.52	29.52	200.0	773.9	425.0	398.1	26.88	15.811	
5,800.0	5,780.2	5,851.1	5,780.2	14.7	19.2	29.66	29.66	200.0	773.9	422.9	395.7	27.20	15.546	
5,819.8	5,800.0	5,870.9	5,800.0	14.7	19.2	90.00	90.00	200.0	773.9	422.8	395.6	27.26	15.510	
5,900.0	5,880.2	5,951.1	5,880.2	14.8	19.4	90.00	90.00	200.0	773.9	422.8	395.3	27.57	15.340	
5,963.3	5,943.4	6,014.4	5,943.4	15.0	19.5	90.00	90.00	200.0	773.9	422.8	395.0	27.81	15.202	
6,000.0	5,980.2	6,051.1	5,980.2	15.0	19.5	90.02	90.02	199.9	773.9	422.8	394.9	27.96	15.124	
6,063.6	6,043.7	6,114.4	6,043.3	15.2	19.6	90.54	90.54	196.0	773.9	422.9	394.6	28.22	14.985	
6,100.0	6,080.2	6,150.4	6,079.0	15.2	19.6	-88.96	-88.96	191.5	773.9	422.9	394.6	28.37	14.908	
6,150.0	6,130.0	6,199.5	6,127.3	15.3	19.6	-88.28	-88.28	182.7	774.0	423.0	394.5	28.54	14.823	
6,200.0	6,179.5	6,248.2	6,174.6	15.3	19.7	-87.61	-87.61	170.8	774.0	423.2	394.5	28.68	14.754	
6,250.0	6,228.3	6,296.7	6,220.8	15.4	19.7	-86.95	-86.95	156.1	774.0	423.5	394.7	28.80	14.701	
6,300.0	6,276.4	6,344.9	6,265.6	15.4	19.7	-86.31	-86.31	138.5	774.0	423.7	394.8	28.90	14.661	
6,350.0	6,323.5	6,392.8	6,309.1	15.5	19.7	-85.69	-85.69	118.3	774.0	424.1	395.1	28.98	14.631	
6,400.0	6,369.4	6,440.5	6,351.0	15.5	19.7	-85.08	-85.08	95.6	774.0	424.4	395.4	29.05	14.608	
6,450.0	6,413.9	6,487.9	6,391.1	15.5	19.8	-84.50	-84.50	70.4	774.0	424.8	395.7	29.12	14.588	
6,500.0	6,456.8	6,535.1	6,429.4	15.5	19.8	-83.94	-83.94	42.9	774.0	425.3	396.1	29.19	14.566	
6,550.0	6,498.0	6,582.0	6,465.8	15.6	19.8	-83.41	-83.41	13.3	774.0	425.7	396.4	29.28	14.538	
6,600.0	6,537.2	6,628.7	6,500.2	15.6	19.8	-82.90	-82.90	-18.4	774.0	426.2	396.8	29.40	14.495	
6,650.0	6,574.3	6,675.3	6,532.4	15.6	19.9	-82.43	-82.43	-52.0	774.0	426.6	397.1	29.56	14.432	
6,700.0	6,609.1	6,721.7	6,562.4	15.7	19.9	-81.99	-81.99	-87.3	774.0	427.1	397.3	29.76	14.349	
6,750.0	6,641.5	6,767.9	6,590.1	15.8	20.0	-81.58	-81.58	-124.3	774.0	427.5	397.5	30.03	14.236	
6,800.0	6,671.3	6,813.9	6,615.5	15.9	20.1	-81.20	-81.20	-162.7	774.0	427.9	397.6	30.37	14.090	
6,850.0	6,698.5	6,859.8	6,638.4	16.0	20.2	-80.86	-80.86	-202.5	774.0	428.4	397.6	30.80	13.909	
6,900.0	6,722.8	6,905.6	6,658.9	16.3	20.4	-80.56	-80.56	-243.5	774.0	428.7	397.4	31.31	13.694	
6,950.0	6,744.2	6,950.0	6,676.3	16.5	20.5	-80.30	-80.30	-284.3	774.0	429.1	397.2	31.91	13.447	
7,000.0	6,762.7	6,996.9	6,692.1	16.9	20.8	-80.06	-80.06	-328.4	774.0	429.4	396.7	32.62	13.161	
7,050.0	6,778.0	7,042.4	6,704.9	17.2	21.0	-79.87	-79.87	-372.1	774.0	429.6	396.2	33.43	12.851	
7,100.0	6,790.2	7,087.9	6,715.0	17.7	21.3	-79.72	-79.72	-416.4	774.0	429.8	395.5	34.33	12.519	
7,150.0	6,799.3	7,133.3	6,722.4	18.1	21.6	-79.61	-79.61	-461.2	774.0	430.0	394.7	35.33	12.172	
7,183.6	6,803.5	7,163.7	6,725.9	18.5	21.8	-79.56	-79.56	-491.4	774.0	430.1	394.0	36.04	11.934	
7,200.0	6,805.2	7,178.6	6,727.2	18.7	21.9	-79.52	-79.52	-506.3	774.0	430.1	393.8	36.37	11.827	
7,257.6	6,811.2	7,230.6	6,729.3	19.3	22.4	-79.09	-79.09	-558.2	774.1	430.8	393.3	37.55	11.472	
7,300.0	6,814.9	7,271.8	6,729.1	19.8	22.8	-78.57	-78.57	-599.4	774.1	431.6	393.0	38.56	11.192	
7,379.8	6,817.5	7,351.5	6,728.7	20.8	23.6	-78.14	-78.14	-679.1	774.1	432.2	391.6	40.63	10.637	
7,400.0	6,817.5	7,371.7	6,728.5	21.0	23.8	-78.13	-78.13	-699.3	774.1	432.2	391.1	41.15	10.505	
7,500.0	6,817.3	7,471.7	6,728.0	22.4	24.9	-78.08	-78.08	-799.3	774.1	432.3	388.5	43.80	9.870	
7,600.0	6,817.1	7,571.7	6,727.4	23.8	26.2	-78.02	-78.02	-899.3	774.1	432.4	385.8	46.61	9.278	
7,700.0	6,816.9	7,671.7	6,726.8	25.2	27.5	-77.97	-77.97	-999.3	774.1	432.5	383.0	49.54	8.730	
7,800.0	6,816.7	7,771.7	6,726.2	26.8	28.9	-77.92	-77.92	-1,099.3	774.1	432.6	380.0	52.58	8.227	
7,900.0	6,816.5	7,871.7	6,725.6	28.4	30.4	-77.87	-77.87	-1,199.3	774.1	432.7	377.0	55.71	7.767	
8,000.0	6,816.3	7,971.7	6,725.0	30.0	31.9	-77.82	-77.82	-1,299.3	774.2	432.8	373.9	58.91	7.347	
8,100.0	6,816.1	8,071.7	6,724.4	31.6	33.4	-77.77	-77.77	-1,399.3	774.2	432.9	370.7	62.17	6.963	
8,200.0	6,815.9	8,171.7	6,723.8	33.3	35.0	-77.71	-77.71	-1,499.3	774.2	433.0	367.5	65.49	6.612	

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 Churchill 28J-423
Project:	SEC.28-T5N-R64W	TVD Reference:	WELL @ 4648.0ft (RKB - 15')
Reference Site:	Churchill 28J-HZ Pad Sec.28-T5N-R64W	MD Reference:	WELL @ 4648.0ft (RKB - 15')
Site Error:	0.0ft	North Reference:	True
Reference Well:	Churchill 28J-423	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	Landmark
Reference Design:	Plan #2 (2-11-14)	Offset TVD Reference:	Offset Datum

Offset Design		Churchill 28J-HZ Pad Sec.28-T5N-R64W - Churchill 28M-343 - Wellbore #1 - Plan #2 (2-11-14)											Offset Site Error:		0.0 ft
Survey Program: 0-MWD													Offset Well Error:		0.0 ft
Reference		Offset		Semi Major Axis			Distance								
Measured Depth	Vertical Depth	Measured Depth	Vertical Depth	Reference	Offset	Highside Toolface	Offset Wellbore Centre		Between Centres	Between Ellipses	Minimum Separation	Separation Factor	Warning		
(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(°)	+N/-S (ft)	+E/-W (ft)	(ft)	(ft)	(ft)				
8,300.0	6,815.7	8,271.7	6,723.2	35.0	36.6	-77.66	-1,599.3	774.2	433.1	364.2	68.85	6.291			
8,400.0	6,815.6	8,371.7	6,722.6	36.8	38.3	-77.61	-1,699.3	774.2	433.2	360.9	72.25	5.996			
8,500.0	6,815.4	8,471.7	6,722.0	38.5	40.0	-77.56	-1,799.3	774.2	433.3	357.6	75.68	5.726			
8,600.0	6,815.2	8,571.7	6,721.4	40.3	41.7	-77.51	-1,899.3	774.2	433.4	354.3	79.14	5.476			
8,700.0	6,815.0	8,671.7	6,720.8	42.0	43.4	-77.46	-1,999.3	774.2	433.5	350.9	82.62	5.247			
8,800.0	6,814.8	8,771.7	6,720.2	43.8	45.1	-77.41	-2,099.3	774.3	433.6	347.5	86.13	5.034			
8,900.0	6,814.6	8,871.7	6,719.6	45.6	46.9	-77.35	-2,199.3	774.3	433.7	344.0	89.65	4.837			
9,000.0	6,814.4	8,971.7	6,719.1	47.4	48.6	-77.30	-2,299.3	774.3	433.8	340.6	93.19	4.655			
9,100.0	6,814.2	9,071.7	6,718.5	49.2	50.4	-77.25	-2,399.3	774.3	433.9	337.1	96.75	4.485			
9,200.0	6,814.0	9,171.7	6,717.9	51.1	52.2	-77.20	-2,499.3	774.3	434.0	333.7	100.32	4.326			
9,300.0	6,813.8	9,271.7	6,717.3	52.9	54.0	-77.15	-2,599.3	774.3	434.1	330.2	103.90	4.178			
9,400.0	6,813.6	9,371.7	6,716.7	54.7	55.8	-77.10	-2,699.3	774.3	434.2	326.7	107.49	4.040			
9,500.0	6,813.4	9,471.7	6,716.1	56.6	57.6	-77.05	-2,799.3	774.4	434.3	323.2	111.09	3.910			
9,600.0	6,813.2	9,571.7	6,715.5	58.4	59.4	-77.00	-2,899.3	774.4	434.4	319.7	114.69	3.788			
9,700.0	6,813.1	9,671.7	6,714.9	60.3	61.2	-76.94	-2,999.3	774.4	434.5	316.2	118.31	3.673			
9,800.0	6,812.9	9,771.7	6,714.3	62.1	63.0	-76.89	-3,099.3	774.4	434.6	312.7	121.93	3.565			
9,900.0	6,812.7	9,871.7	6,713.7	64.0	64.9	-76.84	-3,199.3	774.4	434.7	309.2	125.55	3.462			
10,000.0	6,812.5	9,971.7	6,713.1	65.9	66.7	-76.79	-3,299.3	774.4	434.8	305.6	129.19	3.366			
10,100.0	6,812.3	10,071.7	6,712.5	67.7	68.5	-76.74	-3,399.3	774.4	434.9	302.1	132.82	3.275			
10,200.0	6,812.1	10,171.7	6,711.9	69.6	70.4	-76.69	-3,499.3	774.4	435.0	298.6	136.46	3.188			
10,300.0	6,811.9	10,271.7	6,711.3	71.5	72.2	-76.64	-3,599.3	774.5	435.1	295.0	140.10	3.106			
10,400.0	6,811.7	10,371.7	6,710.7	73.3	74.1	-76.59	-3,699.3	774.5	435.2	291.5	143.75	3.028			
10,500.0	6,811.5	10,471.7	6,710.2	75.2	75.9	-76.54	-3,799.2	774.5	435.4	288.0	147.40	2.954			
10,600.0	6,811.3	10,571.7	6,709.6	77.1	77.8	-76.48	-3,899.2	774.5	435.5	284.4	151.05	2.883			
10,700.0	6,811.1	10,671.7	6,709.0	79.0	79.7	-76.43	-3,999.2	774.5	435.6	280.9	154.71	2.815			
10,800.0	6,810.9	10,771.7	6,708.4	80.9	81.5	-76.38	-4,099.2	774.5	435.7	277.3	158.36	2.751			
10,900.0	6,810.8	10,871.7	6,707.8	82.7	83.4	-76.33	-4,199.2	774.5	435.8	273.8	162.02	2.690			
11,000.0	6,810.6	10,971.7	6,707.2	84.6	85.3	-76.28	-4,299.2	774.6	435.9	270.2	165.68	2.631			
11,100.0	6,810.4	11,071.7	6,706.6	86.5	87.1	-76.23	-4,399.2	774.6	436.0	266.7	169.34	2.575			
11,200.0	6,810.2	11,171.7	6,706.0	88.4	89.0	-76.18	-4,499.2	774.6	436.1	263.1	173.00	2.521			
11,300.0	6,810.0	11,271.7	6,705.4	90.3	90.9	-76.13	-4,599.2	774.6	436.2	259.6	176.66	2.469			
11,400.0	6,809.8	11,371.7	6,704.8	92.2	92.8	-76.08	-4,699.2	774.6	436.3	256.0	180.33	2.420			
11,500.0	6,809.6	11,471.7	6,704.2	94.1	94.7	-76.03	-4,799.2	774.6	436.4	252.4	183.99	2.372			
11,600.0	6,809.4	11,571.7	6,703.6	96.0	96.5	-75.98	-4,899.2	774.6	436.5	248.9	187.66	2.326			
11,700.0	6,809.2	11,671.7	6,703.0	97.9	98.4	-75.93	-4,999.2	774.7	436.7	245.3	191.32	2.282			
11,800.0	6,809.0	11,771.7	6,702.4	99.8	100.3	-75.88	-5,099.2	774.7	436.8	241.8	194.99	2.240			
11,900.0	6,808.8	11,871.7	6,701.8	101.7	102.2	-75.82	-5,199.2	774.7	436.9	238.2	198.65	2.199			
12,000.0	6,808.6	11,971.7	6,701.3	103.6	104.1	-75.77	-5,299.2	774.7	437.0	234.7	202.32	2.160			
12,100.0	6,808.4	12,071.7	6,700.7	105.5	106.0	-75.72	-5,399.2	774.7	437.1	231.1	205.98	2.122			
12,200.0	6,808.3	12,171.7	6,700.1	107.4	107.9	-75.67	-5,499.2	774.7	437.2	227.6	209.65	2.085			
12,300.0	6,808.1	12,271.7	6,699.5	109.3	109.7	-75.62	-5,599.2	774.7	437.3	224.0	213.32	2.050			
12,400.0	6,807.9	12,371.7	6,698.9	111.2	111.6	-75.57	-5,699.2	774.7	437.4	220.5	216.98	2.016			
12,500.0	6,807.7	12,471.7	6,698.3	113.1	113.5	-75.52	-5,799.2	774.8	437.6	216.9	220.65	1.983			
12,600.0	6,807.5	12,571.7	6,697.7	115.0	115.4	-75.47	-5,899.2	774.8	437.7	213.4	224.31	1.951			
12,700.0	6,807.3	12,671.7	6,697.1	116.9	117.3	-75.42	-5,999.2	774.8	437.8	209.8	227.97	1.920			
12,800.0	6,807.1	12,771.7	6,696.5	118.8	119.2	-75.37	-6,099.2	774.8	437.9	206.3	231.64	1.890			
12,900.0	6,806.9	12,871.7	6,695.9	120.7	121.1	-75.32	-6,199.2	774.8	438.0	202.7	235.30	1.861			
13,000.0	6,806.7	12,971.7	6,695.3	122.6	123.0	-75.27	-6,299.2	774.8	438.1	199.2	238.96	1.833			
13,100.0	6,806.5	13,071.7	6,694.7	124.5	124.9	-75.22	-6,399.2	774.8	438.2	195.6	242.63	1.806			
13,200.0	6,806.3	13,171.7	6,694.1	126.4	126.8	-75.17	-6,499.2	774.9	438.4	192.1	246.29	1.780			
13,300.0	6,806.1	13,271.7	6,693.5	128.3	128.7	-75.12	-6,599.2	774.9	438.5	188.5	249.95	1.754			

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 Churchill 28J-423
Project:	SEC.28-T5N-R64W	TVD Reference:	WELL @ 4648.0ft (RKB - 15')
Reference Site:	Churchill 28J-HZ Pad Sec.28-T5N-R64W	MD Reference:	WELL @ 4648.0ft (RKB - 15')
Site Error:	0.0ft	North Reference:	True
Reference Well:	Churchill 28J-423	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	Landmark
Reference Design:	Plan #2 (2-11-14)	Offset TVD Reference:	Offset Datum

Offset Design Churchill 28J-HZ Pad Sec.28-T5N-R64W - Churchill 28M-343 - Wellbore #1 - Plan #2 (2-11-14)												Offset Site Error:	0.0 ft
Survey Program: 0-MWD												Offset Well Error:	0.0 ft
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Semi Major Axis		Highside Toolface (°)	Offset Wellbore Centre		Distance		Minimum Separation (ft)	Separation Factor	Warning
Reference	Offset	Reference	Offset	Reference	Offset		+N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)			
13,400.0	6,806.0	13,371.7	6,692.9	130.2	130.6	-75.07	-6,699.2	774.9	438.6	185.0	253.61	1.729	
13,500.0	6,805.8	13,471.7	6,692.3	132.1	132.5	-75.02	-6,799.2	774.9	438.7	181.4	257.27	1.705	
13,600.0	6,805.6	13,571.7	6,691.8	134.0	134.4	-74.97	-6,899.2	774.9	438.8	177.9	260.92	1.682	
13,700.0	6,805.4	13,671.7	6,691.2	135.9	136.3	-74.92	-6,999.2	774.9	438.9	174.4	264.58	1.659	
13,800.0	6,805.2	13,771.7	6,690.6	137.8	138.2	-74.87	-7,099.2	774.9	439.1	170.8	268.24	1.637	
13,895.2	6,805.0	13,866.9	6,690.0	139.7	140.0	-74.82	-7,194.4	774.9	439.2	167.5	271.72	1.616 SF	

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Churchill 28J-423
Project:	SEC.28-T5N-R64W	TVD Reference:	WELL @ 4648.0ft (RKB - 15')
Reference Site:	Churchill 28J-HZ Pad Sec.28-T5N-R64W	MD Reference:	WELL @ 4648.0ft (RKB - 15')
Site Error:	0.0ft	North Reference:	True
Reference Well:	Churchill 28J-423	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	Landmark
Reference Design:	Plan #2 (2-11-14)	Offset TVD Reference:	Offset Datum

Offset Design Churchill 28J-HZ Pad Sec.28-T5N-R64W - Churchill 28M-443 - Wellbore #1 - Plan #1 (1-22-14)													Offset Site Error:	0.0 ft
Survey Program: 0-MWD													Offset Well Error:	0.0 ft
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference	Offset	Semi Major Axis	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
0.0	0.0	0.0	0.0	0.0	0.0	90.01	90.01	0.0	61.3	61.3				
100.0	100.0	99.0	99.0	0.1	0.1	90.01	90.01	0.0	61.3	61.3	61.1	0.22	274.077	
200.0	200.0	199.0	199.0	0.3	0.3	90.01	90.01	0.0	61.3	61.3	60.6	0.67	91.207	
300.0	300.0	299.0	299.0	0.6	0.6	90.01	90.01	0.0	61.3	61.3	60.2	1.12	54.651	
400.0	400.0	399.0	399.0	0.8	0.8	90.01	90.01	0.0	61.3	61.3	59.7	1.57	39.014 CC, ES	
500.0	500.0	496.9	496.9	1.0	1.0	89.72	89.72	0.3	62.9	62.9	60.9	2.01	31.354	
600.0	600.0	594.6	594.5	1.2	1.2	88.91	88.91	1.3	67.8	67.9	65.5	2.45	27.782	
700.0	700.0	691.8	691.3	1.5	1.4	87.81	87.81	2.9	75.9	76.3	73.4	2.90	26.326	
800.0	800.0	788.4	787.2	1.7	1.7	86.63	86.63	5.1	87.1	88.0	84.6	3.37	26.104	
900.0	900.0	884.1	881.8	1.9	2.0	85.50	85.50	8.0	101.3	103.1	99.2	3.87	26.623	
1,000.0	1,000.0	978.7	974.8	2.1	2.3	84.51	84.51	11.4	118.4	121.4	117.0	4.40	27.584	
1,100.0	1,100.0	1,076.2	1,070.2	2.4	2.7	83.68	83.68	15.3	137.9	141.7	136.7	4.97	28.508	
1,200.0	1,200.0	1,174.1	1,166.0	2.6	3.1	83.06	83.06	19.2	157.5	162.0	156.5	5.55	29.175	
1,300.0	1,300.0	1,272.0	1,261.9	2.8	3.5	82.58	82.58	23.1	177.1	182.4	176.2	6.15	29.662	
1,400.0	1,400.0	1,369.9	1,357.7	3.0	3.9	82.19	82.19	27.0	196.7	202.8	196.0	6.75	30.031	
1,500.0	1,500.0	1,467.8	1,453.5	3.3	4.3	81.87	81.87	30.9	216.3	223.1	215.8	7.36	30.316	
1,600.0	1,600.0	1,566.0	1,549.7	3.5	4.8	21.29	21.29	34.8	235.9	241.9	234.9	7.03	34.411	
1,700.0	1,699.8	1,664.7	1,646.4	3.7	5.2	21.37	21.37	38.7	255.7	257.5	250.0	7.49	34.375	
1,787.5	1,787.1	1,751.6	1,731.4	3.9	5.6	21.66	21.66	42.2	273.0	268.5	260.6	7.90	34.006	
1,800.0	1,799.5	1,763.9	1,743.5	3.9	5.6	21.73	21.73	42.7	275.5	269.9	261.9	7.95	33.929	
1,900.0	1,899.0	1,863.3	1,840.8	4.1	6.1	22.23	22.23	46.7	295.4	281.0	272.6	8.43	33.344	
2,000.0	1,998.4	1,962.6	1,938.0	4.4	6.5	22.70	22.70	50.6	315.3	292.2	283.3	8.91	32.807	
2,100.0	2,097.9	2,062.0	2,035.3	4.6	7.0	23.13	23.13	54.6	335.1	303.5	294.1	9.39	32.314	
2,200.0	2,197.4	2,161.3	2,132.5	4.9	7.4	23.53	23.53	58.5	355.0	314.7	304.8	9.88	31.860	
2,300.0	2,296.9	2,260.7	2,229.8	5.1	7.8	23.91	23.91	62.5	374.9	325.9	315.6	10.37	31.441	
2,400.0	2,396.4	2,360.0	2,327.0	5.4	8.3	24.26	24.26	66.5	394.8	337.2	326.3	10.86	31.053	
2,500.0	2,495.9	2,459.4	2,424.3	5.7	8.7	24.58	24.58	70.4	414.6	348.5	337.1	11.35	30.692	
2,600.0	2,595.4	2,558.7	2,521.5	5.9	9.2	24.89	24.89	74.4	434.5	359.7	347.9	11.85	30.357	
2,700.0	2,694.9	2,658.0	2,618.8	6.2	9.6	25.18	25.18	78.4	454.4	371.0	358.7	12.35	30.044	
2,800.0	2,794.4	2,757.4	2,716.1	6.5	10.1	25.45	25.45	82.3	474.3	382.3	369.5	12.85	29.753	
2,900.0	2,893.9	2,856.7	2,813.3	6.7	10.5	25.70	25.70	86.3	494.1	393.6	380.3	13.35	29.479	
3,000.0	2,993.4	2,956.1	2,910.6	7.0	11.0	25.94	25.94	90.2	514.0	404.9	391.1	13.86	29.223	
3,100.0	3,092.9	3,055.4	3,007.8	7.3	11.4	26.17	26.17	94.2	533.9	416.3	401.9	14.36	28.982	
3,200.0	3,192.4	3,154.8	3,105.1	7.5	11.9	26.39	26.39	98.2	553.8	427.6	412.7	14.87	28.755	
3,300.0	3,291.9	3,254.1	3,202.3	7.8	12.3	26.59	26.59	102.1	573.6	438.9	423.5	15.38	28.542	
3,400.0	3,391.4	3,353.5	3,299.6	8.1	12.7	26.78	26.78	106.1	593.5	450.3	434.4	15.89	28.340	
3,500.0	3,490.9	3,452.8	3,396.8	8.4	13.2	26.97	26.97	110.0	613.4	461.6	445.2	16.40	28.149	
3,600.0	3,590.4	3,552.1	3,494.1	8.7	13.6	27.14	27.14	114.0	633.3	473.0	456.0	16.91	27.969	
3,700.0	3,689.9	3,651.5	3,591.3	8.9	14.1	27.31	27.31	118.0	653.1	484.3	466.9	17.42	27.797	
3,800.0	3,789.4	3,750.8	3,688.6	9.2	14.5	27.47	27.47	121.9	673.0	495.7	477.7	17.94	27.635	
3,900.0	3,888.9	3,850.2	3,785.9	9.5	15.0	27.62	27.62	125.9	692.9	507.0	488.6	18.45	27.480	
4,000.0	3,988.4	3,949.5	3,883.1	9.8	15.4	27.77	27.77	129.9	712.8	518.4	499.4	18.97	27.333	
4,100.0	4,087.9	4,048.9	3,980.4	10.1	15.9	27.91	27.91	133.8	732.7	529.7	510.3	19.48	27.193	
4,200.0	4,187.4	4,148.2	4,077.6	10.3	16.3	28.04	28.04	137.8	752.5	541.1	521.1	20.00	27.059	
4,300.0	4,286.9	4,247.5	4,174.9	10.6	16.8	28.17	28.17	141.7	772.4	552.5	532.0	20.51	26.931	
4,400.0	4,386.4	4,346.9	4,272.1	10.9	17.2	28.30	28.30	145.7	792.3	563.9	542.8	21.03	26.809	
4,500.0	4,485.9	4,446.2	4,369.4	11.2	17.7	28.41	28.41	149.7	812.2	575.2	553.7	21.55	26.692	
4,600.0	4,585.4	4,545.6	4,466.6	11.5	18.1	28.53	28.53	153.6	832.0	586.6	564.5	22.07	26.581	
4,700.0	4,684.9	4,644.9	4,563.9	11.8	18.6	28.64	28.64	157.6	851.9	598.0	575.4	22.59	26.473	
4,800.0	4,784.4	4,744.3	4,661.2	12.1	19.0	28.74	28.74	161.6	871.8	609.4	586.3	23.11	26.371	
4,900.0	4,883.9	4,843.6	4,758.4	12.3	19.5	28.84	28.84	165.5	891.7	620.8	597.1	23.63	26.272	

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 Churchill 28J-423
Project:	SEC.28-T5N-R64W	TVD Reference:	WELL @ 4648.0ft (RKB - 15')
Reference Site:	Churchill 28J-HZ Pad Sec.28-T5N-R64W	MD Reference:	WELL @ 4648.0ft (RKB - 15')
Site Error:	0.0ft	North Reference:	True
Reference Well:	Churchill 28J-423	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	Landmark
Reference Design:	Plan #2 (2-11-14)	Offset TVD Reference:	Offset Datum

Offset Design		Churchill 28J-HZ Pad Sec.28-T5N-R64W - Churchill 28M-443 - Wellbore #1 - Plan #1 (1-22-14)											Offset Site Error:		0.0 ft
Survey Program: 0-MWD													Offset Well Error:		0.0 ft
Reference		Offset		Semi Major Axis		Highside Toolface (°)	Offset Wellbore Centre		Distance		Minimum Separation (ft)	Separation Factor	Warning		
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference	Offset (ft)		+N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)					
5,000.0	4,983.3	4,943.0	4,855.7	12.6	19.9	28.94	169.5	911.5	632.1	608.0	24.15	26.177			
5,100.0	5,082.8	5,042.3	4,952.9	12.9	20.4	29.04	173.4	931.4	643.5	618.9	24.67	26.086			
5,200.0	5,182.3	5,141.6	5,050.2	13.2	20.8	29.13	177.4	951.3	654.9	629.7	25.19	25.998			
5,300.0	5,281.8	5,241.0	5,147.4	13.5	21.2	29.22	181.4	971.2	666.3	640.6	25.71	25.914			
5,400.0	5,381.3	5,340.3	5,244.7	13.8	21.7	29.30	185.3	991.0	677.7	651.5	26.23	25.832			
5,500.0	5,480.8	5,448.0	5,350.1	14.1	22.2	29.39	189.6	1,012.4	688.9	662.2	26.77	25.734			
5,532.3	5,512.9	5,490.1	5,391.5	14.1	22.3	29.44	191.1	1,020.0	692.0	665.0	26.96	25.670			
5,600.0	5,580.4	5,578.6	5,478.8	14.3	22.6	29.58	193.9	1,034.1	697.6	670.3	27.28	25.568			
5,700.0	5,680.2	5,709.9	5,609.1	14.5	22.9	29.71	197.1	1,050.1	704.7	677.0	27.69	25.446			
5,800.0	5,780.2	5,841.6	5,740.4	14.7	23.2	29.73	199.1	1,060.2	710.3	682.2	28.04	25.333			
5,819.8	5,800.0	5,867.8	5,766.5	14.7	23.2	90.05	199.4	1,061.6	711.2	683.1	28.10	25.311			
5,900.0	5,880.2	5,973.8	5,872.5	14.8	23.3	90.00	200.0	1,064.5	713.4	685.0	28.42	25.101			
6,000.0	5,980.2	6,080.5	5,979.2	15.0	23.5	90.00	200.0	1,064.6	713.5	684.7	28.81	24.770			
6,063.6	6,043.7	6,144.0	6,042.7	15.2	23.5	90.00	200.0	1,064.6	713.5	684.5	29.05	24.565			
6,100.0	6,080.2	6,180.5	6,079.2	15.2	23.6	-90.00	199.2	1,064.6	713.5	684.3	29.17	24.463			
6,150.0	6,130.0	6,230.5	6,129.0	15.3	23.6	-90.01	195.2	1,064.6	713.5	684.2	29.30	24.349			
6,200.0	6,179.5	6,280.5	6,178.5	15.3	23.6	-90.01	188.0	1,064.6	713.5	684.1	29.41	24.257			
6,250.0	6,228.3	6,330.5	6,227.4	15.4	23.7	-90.02	177.6	1,064.6	713.5	684.0	29.50	24.183			
6,300.0	6,276.4	6,380.5	6,275.5	15.4	23.7	-90.02	164.0	1,064.6	713.5	683.9	29.58	24.123			
6,350.0	6,323.5	6,430.6	6,322.7	15.5	23.7	-90.03	147.3	1,064.6	713.5	683.9	29.64	24.073			
6,400.0	6,369.4	6,480.6	6,368.6	15.5	23.7	-90.03	127.5	1,064.6	713.5	683.8	29.70	24.025			
6,450.0	6,413.9	6,530.6	6,413.1	15.5	23.7	-90.04	104.7	1,064.6	713.5	683.7	29.76	23.974			
6,500.0	6,456.8	6,580.6	6,456.1	15.5	23.8	-90.04	79.1	1,064.6	713.5	683.7	29.84	23.911			
6,550.0	6,498.0	6,630.7	6,497.3	15.6	23.8	-90.05	50.8	1,064.6	713.5	683.6	29.94	23.830			
6,600.0	6,537.2	6,680.7	6,536.6	15.6	23.8	-90.05	19.7	1,064.6	713.5	683.4	30.08	23.723			
6,650.0	6,574.3	6,730.8	6,573.7	15.6	23.8	-90.05	-13.8	1,064.6	713.5	683.3	30.26	23.581			
6,700.0	6,609.1	6,780.8	6,608.6	15.7	23.9	-90.06	-49.6	1,064.6	713.5	683.0	30.49	23.399			
6,750.0	6,641.5	6,830.9	6,641.1	15.8	23.9	-90.06	-87.7	1,064.6	713.5	682.7	30.79	23.171			
6,800.0	6,671.3	6,880.9	6,671.0	15.9	24.0	-90.07	-127.9	1,064.6	713.5	682.3	31.16	22.895			
6,850.0	6,698.5	6,931.0	6,698.2	16.0	24.1	-90.07	-169.9	1,064.6	713.5	681.9	31.61	22.569			
6,900.0	6,722.8	6,981.0	6,722.6	16.3	24.2	-90.07	-213.6	1,064.6	713.5	681.4	32.15	22.194			
6,950.0	6,744.2	7,031.1	6,744.1	16.5	24.3	-90.07	-258.8	1,064.6	713.5	680.7	32.77	21.774			
7,000.0	6,762.7	7,081.1	6,762.5	16.9	24.5	-90.07	-305.3	1,064.6	713.5	680.0	33.48	21.313			
7,050.0	6,778.0	7,131.2	6,777.9	17.2	24.7	-90.08	-352.9	1,064.6	713.5	679.2	34.27	20.819			
7,100.0	6,790.2	7,181.3	6,790.2	17.7	24.9	-90.08	-401.4	1,064.6	713.5	678.4	35.15	20.300			
7,150.0	6,799.3	7,231.3	6,799.2	18.1	25.2	-90.08	-450.7	1,064.6	713.5	677.4	36.10	19.763			
7,183.6	6,803.5	7,264.9	6,803.5	18.5	25.4	-90.08	-484.0	1,064.6	713.5	676.7	36.78	19.399			
7,200.0	6,805.2	7,281.4	6,805.2	18.7	25.5	-90.08	-500.3	1,064.6	713.5	676.4	37.13	19.217			
7,257.6	6,811.2	7,338.9	6,811.2	19.3	25.9	-90.08	-557.6	1,064.6	713.5	675.1	38.39	18.585			
7,300.0	6,814.9	7,381.4	6,814.9	19.8	26.2	-90.08	-599.9	1,064.6	713.5	674.1	39.38	18.118			
7,379.8	6,817.5	7,461.2	6,817.5	20.8	26.9	-90.08	-679.7	1,064.6	713.5	672.2	41.33	17.263			
7,400.0	6,817.5	7,481.5	6,817.5	21.0	27.1	-90.08	-699.9	1,064.6	713.5	671.7	41.85	17.050			
7,500.0	6,817.3	7,581.5	6,817.3	22.4	28.1	-90.08	-799.9	1,064.6	713.5	669.0	44.51	16.029			
7,600.0	6,817.1	7,681.5	6,817.1	23.8	29.1	-90.08	-899.9	1,064.6	713.5	666.2	47.33	15.074			
7,700.0	6,816.9	7,781.5	6,816.9	25.2	30.3	-90.08	-999.9	1,064.6	713.5	663.2	50.29	14.188			
7,800.0	6,816.7	7,881.5	6,816.7	26.8	31.6	-90.08	-1,099.9	1,064.6	713.5	660.2	53.36	13.372			
7,900.0	6,816.5	7,981.5	6,816.5	28.4	32.9	-90.08	-1,199.9	1,064.6	713.5	657.0	56.52	12.624			
8,000.0	6,816.3	8,081.5	6,816.3	30.0	34.3	-90.08	-1,299.9	1,064.6	713.5	653.7	59.77	11.939			
8,100.0	6,816.1	8,181.5	6,816.1	31.6	35.7	-90.08	-1,399.9	1,064.6	713.5	650.4	63.08	11.312			
8,200.0	6,815.9	8,281.5	6,815.9	33.3	37.2	-90.08	-1,499.9	1,064.6	713.5	647.1	66.44	10.739			
8,300.0	6,815.7	8,381.5	6,815.7	35.0	38.7	-90.08	-1,599.9	1,064.6	713.5	643.7	69.86	10.213			

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 Churchill 28J-423
Project:	SEC.28-T5N-R64W	TVD Reference:	WELL @ 4648.0ft (RKB - 15')
Reference Site:	Churchill 28J-HZ Pad Sec.28-T5N-R64W	MD Reference:	WELL @ 4648.0ft (RKB - 15')
Site Error:	0.0ft	North Reference:	True
Reference Well:	Churchill 28J-423	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	Landmark
Reference Design:	Plan #2 (2-11-14)	Offset TVD Reference:	Offset Datum

Offset Design		Churchill 28J-HZ Pad Sec.28-T5N-R64W - Churchill 28M-443 - Wellbore #1 - Plan #1 (1-22-14)											Offset Site Error:		0.0 ft
Survey Program: 0-MWD													Offset Well Error:		0.0 ft
Reference		Offset		Semi Major Axis			Distance							Warning	
Measured Depth	Vertical Depth	Measured Depth	Vertical Depth	Reference	Offset	Highside Toolface	Offset Wellbore Centre		Between Centres	Between Ellipses	Minimum Separation	Separation Factor			
(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(°)	+N/-S (ft)	+E/-W (ft)	(ft)	(ft)	(ft)				
8,400.0	6,815.6	8,481.5	6,815.5	36.8	40.3	-90.08	-1,699.9	1,064.6	713.5	640.2	73.32	9.732			
8,500.0	6,815.4	8,581.5	6,815.4	38.5	41.9	-90.08	-1,799.9	1,064.6	713.5	636.7	76.81	9.289			
8,600.0	6,815.2	8,681.5	6,815.2	40.3	43.5	-90.08	-1,899.9	1,064.6	713.5	633.2	80.34	8.881			
8,700.0	6,815.0	8,781.5	6,815.0	42.0	45.2	-90.08	-1,999.9	1,064.6	713.5	629.6	83.89	8.505			
8,800.0	6,814.8	8,881.5	6,814.8	43.8	46.8	-90.08	-2,099.9	1,064.6	713.5	626.0	87.47	8.157			
8,900.0	6,814.6	8,981.5	6,814.6	45.6	48.5	-90.08	-2,199.9	1,064.6	713.5	622.4	91.07	7.834			
9,000.0	6,814.4	9,081.5	6,814.4	47.4	50.2	-90.08	-2,299.9	1,064.6	713.5	618.8	94.69	7.535			
9,100.0	6,814.2	9,181.5	6,814.2	49.2	51.9	-90.08	-2,399.9	1,064.6	713.5	615.2	98.33	7.256			
9,200.0	6,814.0	9,281.5	6,814.0	51.1	53.7	-90.08	-2,499.9	1,064.6	713.5	611.5	101.98	6.997			
9,300.0	6,813.8	9,381.5	6,813.8	52.9	55.4	-90.08	-2,599.9	1,064.6	713.5	607.9	105.64	6.754			
9,400.0	6,813.6	9,481.5	6,813.6	54.7	57.2	-90.08	-2,699.9	1,064.6	713.5	604.2	109.32	6.527			
9,500.0	6,813.4	9,581.5	6,813.4	56.6	58.9	-90.08	-2,799.9	1,064.6	713.5	600.5	113.01	6.314			
9,600.0	6,813.2	9,681.5	6,813.2	58.4	60.7	-90.08	-2,899.9	1,064.6	713.5	596.8	116.71	6.114			
9,700.0	6,813.1	9,781.5	6,813.0	60.3	62.5	-90.08	-2,999.9	1,064.6	713.5	593.1	120.41	5.926			
9,800.0	6,812.9	9,881.5	6,812.9	62.1	64.3	-90.08	-3,099.9	1,064.6	713.5	589.4	124.13	5.748			
9,900.0	6,812.7	9,981.5	6,812.7	64.0	66.1	-90.08	-3,199.9	1,064.6	713.5	585.7	127.85	5.581			
10,000.0	6,812.5	10,081.5	6,812.5	65.9	67.9	-90.08	-3,299.9	1,064.6	713.5	581.9	131.58	5.423			
10,100.0	6,812.3	10,181.5	6,812.3	67.7	69.7	-90.08	-3,399.9	1,064.6	713.5	578.2	135.32	5.273			
10,200.0	6,812.1	10,281.5	6,812.1	69.6	71.5	-90.08	-3,499.9	1,064.6	713.5	574.5	139.06	5.131			
10,300.0	6,811.9	10,381.5	6,811.9	71.5	73.3	-90.08	-3,599.9	1,064.6	713.5	570.7	142.80	4.996			
10,400.0	6,811.7	10,481.5	6,811.7	73.3	75.2	-90.08	-3,699.9	1,064.6	713.5	567.0	146.55	4.869			
10,500.0	6,811.5	10,581.5	6,811.5	75.2	77.0	-90.08	-3,799.9	1,064.6	713.5	563.2	150.31	4.747			
10,600.0	6,811.3	10,681.5	6,811.3	77.1	78.8	-90.08	-3,899.9	1,064.6	713.5	559.4	154.07	4.631			
10,700.0	6,811.1	10,781.5	6,811.1	79.0	80.7	-90.08	-3,999.9	1,064.6	713.5	555.7	157.84	4.521			
10,800.0	6,810.9	10,881.5	6,810.9	80.9	82.5	-90.08	-4,099.9	1,064.6	713.5	551.9	161.60	4.415			
10,900.0	6,810.8	10,981.5	6,810.7	82.7	84.4	-90.08	-4,199.9	1,064.6	713.5	548.1	165.38	4.314			
11,000.0	6,810.6	11,081.5	6,810.6	84.6	86.2	-90.08	-4,299.9	1,064.6	713.5	544.4	169.15	4.218			
11,100.0	6,810.4	11,181.5	6,810.4	86.5	88.1	-90.08	-4,399.9	1,064.6	713.5	540.6	172.93	4.126			
11,200.0	6,810.2	11,281.5	6,810.2	88.4	89.9	-90.08	-4,499.9	1,064.6	713.5	536.8	176.71	4.038			
11,300.0	6,810.0	11,381.5	6,810.0	90.3	91.8	-90.08	-4,599.9	1,064.6	713.5	533.0	180.49	3.953			
11,400.0	6,809.8	11,481.5	6,809.8	92.2	93.6	-90.08	-4,699.9	1,064.6	713.5	529.2	184.28	3.872			
11,500.0	6,809.6	11,581.5	6,809.6	94.1	95.5	-90.08	-4,799.9	1,064.6	713.5	525.4	188.06	3.794			
11,600.0	6,809.4	11,681.5	6,809.4	96.0	97.4	-90.08	-4,899.9	1,064.6	713.5	521.7	191.85	3.719			
11,700.0	6,809.2	11,781.5	6,809.2	97.9	99.2	-90.08	-4,999.9	1,064.6	713.5	517.9	195.65	3.647			
11,800.0	6,809.0	11,881.5	6,809.0	99.8	101.1	-90.08	-5,099.9	1,064.6	713.5	514.1	199.44	3.578			
11,900.0	6,808.8	11,981.5	6,808.8	101.7	103.0	-90.08	-5,199.9	1,064.6	713.5	510.3	203.23	3.511			
12,000.0	6,808.6	12,081.5	6,808.6	103.6	104.9	-90.08	-5,299.9	1,064.6	713.5	506.5	207.03	3.446			
12,100.0	6,808.4	12,181.5	6,808.4	105.5	106.7	-90.08	-5,399.9	1,064.6	713.5	502.7	210.83	3.384			
12,200.0	6,808.3	12,281.5	6,808.2	107.4	108.6	-90.08	-5,499.9	1,064.6	713.5	498.9	214.63	3.324			
12,300.0	6,808.1	12,381.5	6,808.1	109.3	110.5	-90.08	-5,599.9	1,064.6	713.5	495.1	218.43	3.267			
12,400.0	6,807.9	12,481.5	6,807.9	111.2	112.4	-90.08	-5,699.9	1,064.6	713.5	491.3	222.24	3.211			
12,500.0	6,807.7	12,581.5	6,807.7	113.1	114.3	-90.08	-5,799.9	1,064.6	713.5	487.5	226.04	3.157			
12,600.0	6,807.5	12,681.5	6,807.5	115.0	116.1	-90.08	-5,899.9	1,064.6	713.5	483.7	229.85	3.104			
12,700.0	6,807.3	12,781.5	6,807.3	116.9	118.0	-90.08	-5,999.9	1,064.6	713.5	479.9	233.65	3.054			
12,800.0	6,807.1	12,881.5	6,807.1	118.8	119.9	-90.08	-6,099.9	1,064.6	713.5	476.0	237.46	3.005			
12,900.0	6,806.9	12,981.5	6,806.9	120.7	121.8	-90.08	-6,199.9	1,064.6	713.5	472.2	241.27	2.957			
13,000.0	6,806.7	13,081.5	6,806.7	122.6	123.7	-90.08	-6,299.9	1,064.6	713.5	468.4	245.08	2.911			
13,100.0	6,806.5	13,181.5	6,806.5	124.5	125.6	-90.08	-6,399.9	1,064.6	713.5	464.6	248.89	2.867			
13,200.0	6,806.3	13,281.5	6,806.3	126.4	127.5	-90.08	-6,499.9	1,064.6	713.5	460.8	252.70	2.824			
13,300.0	6,806.1	13,381.5	6,806.1	128.3	129.4	-90.08	-6,599.9	1,064.6	713.5	457.0	256.52	2.782			
13,400.0	6,806.0	13,481.5	6,805.9	130.2	131.2	-90.08	-6,699.9	1,064.6	713.5	453.2	260.33	2.741			

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 Churchill 28J-423
Project:	SEC.28-T5N-R64W	TVD Reference:	WELL @ 4648.0ft (RKB - 15')
Reference Site:	Churchill 28J-HZ Pad Sec.28-T5N-R64W	MD Reference:	WELL @ 4648.0ft (RKB - 15')
Site Error:	0.0ft	North Reference:	True
Reference Well:	Churchill 28J-423	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	Landmark
Reference Design:	Plan #2 (2-11-14)	Offset TVD Reference:	Offset Datum

Offset Design Churchill 28J-HZ Pad Sec.28-T5N-R64W - Churchill 28M-443 - Wellbore #1 - Plan #1 (1-22-14)												Offset Site Error:	0.0 ft
Survey Program: 0-MWD												Offset Well Error:	0.0 ft
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Semi Major Axis Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
13,500.0	6,805.8	13,581.5	6,805.8	132.1	133.1	-90.08	-6,799.9	1,064.6	713.5	449.4	264.14	2.701	
13,600.0	6,805.6	13,681.5	6,805.6	134.0	135.0	-90.08	-6,899.9	1,064.6	713.5	445.5	267.96	2.663	
13,700.0	6,805.4	13,781.5	6,805.4	135.9	136.9	-90.08	-6,999.9	1,064.6	713.5	441.7	271.78	2.625	
13,800.0	6,805.2	13,881.5	6,805.2	137.8	138.8	-90.08	-7,099.9	1,064.6	713.5	437.9	275.59	2.589	
13,856.6	6,805.1	13,938.1	6,805.1	138.9	139.9	-90.08	-7,156.6	1,064.6	713.5	435.8	277.76	2.569	
13,895.2	6,805.0	13,973.0	6,805.0	139.7	140.5	-90.08	-7,191.4	1,064.6	713.5	434.4	279.16	2.556 SF	

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Churchill 28J-423
Project:	SEC.28-T5N-R64W	TVD Reference:	WELL @ 4648.0ft (RKB - 15')
Reference Site:	Churchill 28J-HZ Pad Sec.28-T5N-R64W	MD Reference:	WELL @ 4648.0ft (RKB - 15')
Site Error:	0.0ft	North Reference:	True
Reference Well:	Churchill 28J-423	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	Landmark
Reference Design:	Plan #2 (2-11-14)	Offset TVD Reference:	Offset Datum

Offset Design									Existing Wells - Churchill 28J-HZ Sec.28-T5N-R64W - Bailey 33-1 (Exist) - Wellbore #1 - Wellbore #1				Offset Site Error:		0.0 ft	
Survey Program: 7600-UNKNOWN													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)					
12,800.0	6,807.1	6,846.1	6,846.1	118.8	136.9	-90.36	-7,045.7	643.8	990.1	734.5	255.57	3.874				
12,900.0	6,806.9	6,845.9	6,845.9	120.7	136.9	-90.32	-7,045.7	643.8	895.0	637.6	257.47	3.476				
13,000.0	6,806.7	6,845.7	6,845.7	122.6	136.9	-90.28	-7,045.7	643.8	801.2	541.8	259.38	3.089				
13,100.0	6,806.5	6,845.5	6,845.5	124.5	136.9	-90.24	-7,045.7	643.8	709.1	447.8	261.28	2.714				
13,200.0	6,806.3	6,845.3	6,845.3	126.4	136.9	-90.21	-7,045.7	643.8	619.4	356.2	263.18	2.353				
13,300.0	6,806.1	6,845.1	6,845.1	128.3	136.9	-90.17	-7,045.7	643.8	533.3	268.2	265.09	2.012				
13,400.0	6,806.0	6,845.0	6,845.0	130.2	136.9	-90.13	-7,045.7	643.8	453.1	186.1	267.00	1.697				
13,500.0	6,805.8	6,844.8	6,844.8	132.1	136.9	-90.09	-7,045.7	643.8	382.2	113.3	268.90	1.421	Level 3			
13,600.0	6,805.6	6,844.6	6,844.6	134.0	136.9	-90.05	-7,045.7	643.8	327.0	56.2	270.81	1.208	Level 2			
13,700.0	6,805.4	6,844.4	6,844.4	135.9	136.9	-90.02	-7,045.7	643.8	296.3	23.5	272.71	1.086	Level 2			
13,745.8	6,805.3	6,844.3	6,844.3	136.8	136.9	-90.00	-7,045.7	643.8	292.7	19.1	273.59	1.070	Level 2, CC, ES, SF			
13,800.0	6,805.2	6,844.2	6,844.2	137.8	136.9	-89.98	-7,045.7	643.8	297.7	23.0	274.62	1.084	Level 2			
13,895.2	6,805.0	6,844.0	6,844.0	139.7	136.9	-89.94	-7,045.7	643.8	328.6	52.2	276.43	1.189	Level 2			

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Churchill 28J-423
Project:	SEC.28-T5N-R64W	TVD Reference:	WELL @ 4648.0ft (RKB - 15')
Reference Site:	Churchill 28J-HZ Pad Sec.28-T5N-R64W	MD Reference:	WELL @ 4648.0ft (RKB - 15')
Site Error:	0.0ft	North Reference:	True
Reference Well:	Churchill 28J-423	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	Landmark
Reference Design:	Plan #2 (2-11-14)	Offset TVD Reference:	Offset Datum

Offset Design Existing Wells - Churchill 28J-HZ Sec.28-T5N-R64W - Churchill 2-6B (Exist) - Wellbore #1 - Wellbore #													Offset Site Error:	0.0 ft
Survey Program: 800-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	
0.0	0.0	0.0	0.0	0.0	0.0	123.64	-415.3	624.1	749.9					
100.0	100.0	80.4	80.4	0.1	0.1	123.64	-415.3	624.2	749.7	749.5	0.22	3,419.613		
200.0	200.0	179.6	179.6	0.3	0.2	123.63	-415.3	624.3	749.8	749.3	0.58	1,302.546		
300.0	300.0	278.8	278.8	0.6	0.4	123.62	-415.3	624.6	750.1	749.1	0.93	804.717		
400.0	400.0	378.0	378.0	0.8	0.5	123.60	-415.3	625.0	750.4	749.1	1.29	582.389		
500.0	500.0	477.2	477.2	1.0	0.6	123.57	-415.2	625.6	750.9	749.2	1.64	456.474		
600.0	600.0	576.4	576.4	1.2	0.8	123.54	-415.2	626.3	751.4	749.4	2.00	375.461		
700.0	700.0	675.6	675.6	1.5	0.9	123.51	-415.2	627.1	752.1	749.8	2.36	318.986		
800.0	800.0	774.8	774.8	1.7	1.0	123.47	-415.2	628.0	752.9	750.2	2.71	277.383		
900.0	900.0	886.8	886.7	1.9	1.2	123.42	-414.8	628.6	753.1	750.0	3.10	242.974		
1,000.0	1,000.0	1,000.3	1,000.3	2.1	1.3	123.38	-413.3	627.2	751.4	747.9	3.47	216.288		
1,100.0	1,100.0	1,109.7	1,109.6	2.4	1.5	123.25	-409.9	625.3	748.2	744.3	3.82	196.062		
1,200.0	1,200.0	1,216.8	1,216.6	2.6	1.6	123.10	-405.7	622.4	743.9	739.6	4.21	176.716		
1,300.0	1,300.0	1,331.3	1,330.9	2.8	1.8	123.02	-401.3	617.5	738.2	733.6	4.63	159.594		
1,400.0	1,400.0	1,438.9	1,438.2	3.0	2.0	122.91	-395.8	611.6	730.8	725.7	5.06	144.427		
1,500.0	1,500.0	1,535.1	1,534.1	3.3	2.2	122.76	-390.2	606.4	723.1	717.6	5.49	131.664		
1,600.0	1,600.0	1,624.8	1,623.6	3.5	2.4	62.54	-385.7	602.4	715.8	709.9	5.90	121.358		
1,700.0	1,699.8	1,733.7	1,732.2	3.7	2.7	62.93	-380.0	597.9	707.0	700.7	6.36	111.173		
1,787.5	1,787.1	1,835.9	1,834.1	3.9	2.9	63.58	-373.4	591.8	696.2	689.4	6.79	102.543		
1,800.0	1,799.5	1,850.0	1,848.1	3.9	3.0	63.64	-372.2	590.9	694.5	687.6	6.85	101.369		
1,900.0	1,899.0	1,976.2	1,973.3	4.1	3.3	64.10	-359.2	582.1	678.5	671.1	7.39	91.805		
2,000.0	1,998.4	2,103.7	2,098.6	4.4	3.7	64.24	-339.3	570.3	657.7	649.7	7.95	82.742		
2,100.0	2,097.9	2,213.5	2,206.2	4.6	4.0	64.48	-321.5	557.1	634.2	625.8	8.46	74.939		
2,200.0	2,197.4	2,320.6	2,310.8	4.9	4.3	65.05	-305.8	540.7	609.0	600.1	8.97	67.909		
2,300.0	2,296.9	2,417.9	2,405.7	5.1	4.5	65.97	-293.8	523.0	583.0	573.5	9.45	61.719		
2,400.0	2,396.4	2,510.0	2,495.6	5.4	4.8	67.06	-283.7	505.8	557.4	547.5	9.91	56.225		
2,500.0	2,495.9	2,614.0	2,597.2	5.7	5.1	68.42	-272.2	486.1	531.9	521.5	10.42	51.059		
2,600.0	2,595.4	2,712.7	2,693.2	5.9	5.4	69.79	-260.3	466.8	505.4	494.5	10.92	46.290		
2,700.0	2,694.9	2,806.6	2,784.6	6.2	5.7	71.01	-247.4	449.5	479.1	467.7	11.42	41.964		
2,800.0	2,794.4	2,907.5	2,882.7	6.5	6.0	72.24	-232.1	431.9	452.8	440.8	11.94	37.912		
2,900.0	2,893.9	3,004.9	2,977.3	6.7	6.3	73.27	-215.1	415.8	425.8	413.3	12.46	34.160		
3,000.0	2,993.4	3,091.0	3,061.0	7.0	6.5	74.18	-199.9	402.5	399.7	386.7	12.96	30.839		
3,100.0	3,092.9	3,185.0	3,152.8	7.3	6.8	75.55	-185.8	388.3	375.7	362.2	13.48	27.868		
3,200.0	3,192.4	3,278.5	3,244.4	7.5	7.1	77.24	-173.2	374.3	353.2	339.2	14.01	25.216		
3,300.0	3,291.9	3,373.0	3,337.0	7.8	7.4	79.10	-160.4	360.7	331.4	316.9	14.54	22.786		
3,400.0	3,391.4	3,468.0	3,430.3	8.1	7.7	81.29	-148.4	347.1	310.7	295.6	15.09	20.594		
3,500.0	3,490.9	3,566.5	3,527.0	8.4	8.0	83.80	-135.8	333.4	290.6	275.0	15.65	18.573		
3,600.0	3,590.4	3,671.3	3,629.7	8.7	8.3	86.59	-120.3	319.0	269.7	253.4	16.24	16.609		
3,700.0	3,689.9	3,779.5	3,734.5	8.9	8.7	89.59	-99.3	303.0	244.8	228.0	16.84	14.541		
3,800.0	3,789.4	3,876.1	3,827.7	9.2	9.0	92.89	-78.7	287.8	218.6	201.2	17.42	12.550		
3,900.0	3,888.9	3,968.9	3,917.2	9.5	9.3	97.43	-60.3	271.8	193.8	175.8	18.01	10.765		
4,000.0	3,988.4	4,061.2	4,006.6	9.8	9.6	103.36	-43.8	255.8	172.5	153.9	18.61	9.268		
4,100.0	4,087.9	4,155.1	4,097.9	10.1	9.9	110.38	-28.0	240.9	155.0	135.8	19.23	8.060		
4,200.0	4,187.4	4,249.8	4,190.6	10.3	10.2	118.21	-13.3	227.8	141.9	122.1	19.84	7.151		
4,300.0	4,286.9	4,346.4	4,285.3	10.6	10.5	127.16	1.0	215.2	132.9	112.5	20.43	6.505		
4,400.0	4,386.4	4,444.9	4,381.9	10.9	10.8	136.98	15.6	202.9	127.5	106.5	20.97	6.080		
4,500.0	4,485.9	4,544.7	4,479.8	11.2	11.1	147.00	31.7	192.3	124.3	102.8	21.46	5.791		
4,568.3	4,553.8	4,612.0	4,545.9	11.4	11.3	153.75	43.0	185.9	123.6	101.8	21.75	5.681 CC, ES		
4,600.0	4,585.4	4,643.3	4,576.5	11.5	11.4	157.00	48.5	182.7	123.7	101.9	21.88	5.655 SF		
4,700.0	4,684.9	4,738.7	4,669.6	11.8	11.7	167.58	66.4	171.7	127.2	104.9	22.26	5.714		
4,800.0	4,784.4	4,833.7	4,762.2	12.1	12.0	177.29	83.1	158.9	137.3	114.6	22.64	6.065		

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 Churchill 28J-423
Project:	SEC.28-T5N-R64W	TVD Reference:	WELL @ 4648.0ft (RKB - 15')
Reference Site:	Churchill 28J-HZ Pad Sec.28-T5N-R64W	MD Reference:	WELL @ 4648.0ft (RKB - 15')
Site Error:	0.0ft	North Reference:	True
Reference Well:	Churchill 28J-423	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	Landmark
Reference Design:	Plan #2 (2-11-14)	Offset TVD Reference:	Offset Datum

Offset Design Existing Wells - Churchill 28J-HZ Sec.28-T5N-R64W - Churchill 2-6B (Exist) - Wellbore #1 - Wellbore #													Offset Site Error:	0.0 ft
Survey Program: 800-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	
4,900.0	4,883.9	4,931.9	4,857.9	12.3	12.3	-174.04	100.8	145.6	150.9	127.8	23.04	6.548		
5,000.0	4,983.3	5,028.9	4,952.7	12.6	12.6	-167.38	117.4	133.8	166.3	142.8	23.48	7.081		
5,100.0	5,082.8	5,126.7	5,049.0	12.9	12.9	-163.07	130.4	122.3	183.9	159.9	23.95	7.677		
5,200.0	5,182.3	5,228.2	5,149.5	13.2	13.2	-160.65	139.7	112.7	200.8	176.4	24.44	8.218		
5,300.0	5,281.8	5,330.6	5,251.4	13.5	13.5	-159.04	147.9	104.9	216.3	191.4	24.94	8.674		
5,400.0	5,381.3	5,429.2	5,349.5	13.8	13.8	-157.86	155.2	98.7	230.8	205.3	25.43	9.074		
5,500.0	5,480.8	5,523.8	5,443.5	14.1	14.0	-156.70	162.9	91.7	246.4	220.5	25.92	9.507		
5,532.3	5,512.9	5,555.0	5,474.5	14.1	14.1	-156.36	165.2	89.0	251.8	225.8	26.08	9.658		
5,600.0	5,580.4	5,626.3	5,545.4	14.3	14.3	-155.83	170.0	83.6	262.0	235.5	26.46	9.902		
5,700.0	5,680.2	5,725.0	5,643.8	14.5	14.6	-155.07	175.8	77.0	273.4	246.5	26.95	10.144		
5,800.0	5,780.2	5,831.1	5,749.5	14.7	14.8	-154.05	181.7	70.9	281.0	253.6	27.44	10.243		
5,819.8	5,800.0	5,850.8	5,769.1	14.7	14.9	-93.54	182.6	70.0	281.9	254.4	27.52	10.242		
5,900.0	5,880.2	5,930.7	5,848.8	14.8	15.1	-92.78	186.2	66.3	285.4	257.5	27.88	10.236		
6,000.0	5,980.2	6,035.3	5,953.3	15.0	15.4	-92.23	188.8	62.4	289.0	260.7	28.34	10.198		
6,063.6	6,043.7	6,104.1	6,022.2	15.2	15.5	-91.88	190.5	61.1	290.1	261.5	28.63	10.133		
6,100.0	6,080.2	6,141.3	6,059.3	15.2	15.6	88.52	191.7	60.8	290.4	261.6	28.79	10.087		
6,150.0	6,130.0	6,191.3	6,109.3	15.3	15.7	89.65	193.5	60.5	290.6	261.6	28.97	10.030		
6,200.0	6,179.5	6,240.7	6,158.6	15.3	15.8	91.36	195.2	60.2	291.0	261.8	29.14	9.985		
6,250.0	6,228.3	6,289.4	6,207.4	15.4	15.9	93.56	196.5	60.0	291.8	262.5	29.28	9.964		
6,300.0	6,276.4	6,337.4	6,255.3	15.4	16.1	96.18	197.5	59.7	293.4	264.0	29.40	9.979		
6,350.0	6,323.5	6,384.6	6,302.5	15.5	16.2	99.12	198.0	59.5	296.1	266.6	29.47	10.049		
6,400.0	6,369.4	6,427.4	6,345.4	15.5	16.3	102.04	198.4	59.1	300.7	271.2	29.48	10.200		
6,450.0	6,413.9	6,468.1	6,386.0	15.5	16.4	104.97	198.8	58.2	307.9	278.5	29.43	10.463		
6,500.0	6,456.8	6,509.5	6,427.4	15.5	16.5	108.04	199.3	56.9	318.1	288.8	29.30	10.857		
6,550.0	6,498.0	6,551.6	6,469.4	15.6	16.6	111.19	199.7	55.7	331.2	302.1	29.09	11.385		
6,600.0	6,537.2	6,591.9	6,509.8	15.6	16.7	114.11	200.1	54.7	347.3	318.5	28.80	12.058		
6,650.0	6,574.3	6,630.9	6,548.8	15.6	16.7	116.76	200.3	53.8	366.7	338.2	28.46	12.884		
6,700.0	6,609.1	6,667.8	6,585.6	15.7	16.8	119.01	200.4	53.2	389.3	361.2	28.09	13.856		
6,750.0	6,641.5	6,701.0	6,618.9	15.8	16.9	120.66	200.4	52.7	415.1	387.3	27.76	14.951		
6,800.0	6,671.3	6,731.3	6,649.2	15.9	16.9	121.74	200.3	52.3	444.1	416.6	27.52	16.139		
6,850.0	6,698.5	6,759.0	6,676.9	16.0	17.0	122.24	200.2	51.9	476.2	448.8	27.42	17.370		
6,900.0	6,722.8	6,784.0	6,701.8	16.3	17.0	122.10	200.0	51.6	511.0	483.5	27.50	18.580		
6,950.0	6,744.2	6,806.0	6,723.8	16.5	17.0	121.24	199.9	51.3	548.3	520.5	27.84	19.693		
7,000.0	6,762.7	6,824.9	6,742.8	16.9	17.1	119.55	199.8	51.0	587.8	559.3	28.49	20.635		
7,050.0	6,778.0	6,840.8	6,758.6	17.2	17.1	116.87	199.8	50.9	629.2	599.7	29.46	21.358		
7,100.0	6,790.2	6,853.4	6,771.2	17.7	17.1	113.04	199.7	50.8	672.2	641.4	30.75	21.862		
7,150.0	6,799.3	6,862.7	6,780.6	18.1	17.1	107.83	199.7	50.7	716.5	684.2	32.26	22.212		
7,183.6	6,803.5	6,867.2	6,785.0	18.5	17.1	103.47	199.6	50.6	746.8	713.5	33.30	22.428		
7,200.0	6,805.2	6,869.0	6,786.8	18.7	17.1	103.79	199.6	50.6	761.8	728.4	33.43	22.787		
7,257.6	6,811.2	6,875.3	6,793.1	19.3	17.1	104.92	199.6	50.6	814.7	780.8	33.92	24.023		
7,300.0	6,814.9	6,879.2	6,797.0	19.8	17.1	100.41	199.6	50.5	854.2	819.2	35.03	24.388		
7,379.8	6,817.5	6,882.2	6,800.0	20.8	17.1	89.96	199.6	50.5	929.2	892.6	36.64	25.361		
7,400.0	6,817.5	6,882.2	6,800.0	21.0	17.1	89.97	199.6	50.5	948.4	911.5	36.90	25.699		

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Churchill 28J-423
Project:	SEC.28-T5N-R64W	TVD Reference:	WELL @ 4648.0ft (RKB - 15')
Reference Site:	Churchill 28J-HZ Pad Sec.28-T5N-R64W	MD Reference:	WELL @ 4648.0ft (RKB - 15')
Site Error:	0.0ft	North Reference:	True
Reference Well:	Churchill 28J-423	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	Landmark
Reference Design:	Plan #2 (2-11-14)	Offset TVD Reference:	Offset Datum

Offset Design Existing Wells - Churchill 28J-HZ Sec.28-T5N-R64W - Churchill 2-7I (Exist) - Wellbore #1 - Wellbore #1													Offset Site Error:	0.0 ft
Survey Program: 514-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)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
0.0	0.0	0.0	0.0	0.0	0.0	124.17	124.17	-444.5	654.8	791.6				
100.0	100.0	80.0	80.0	0.1	0.1	124.17	124.17	-444.5	654.8	791.4	791.2	0.20	3,896.421 CC	
200.0	200.0	178.7	178.7	0.3	0.2	124.19	124.19	-444.8	654.8	791.6	791.1	0.54	1,466.945 ES	
300.0	300.0	277.4	277.4	0.6	0.3	124.22	124.22	-445.4	654.9	792.0	791.1	0.88	903.938	
400.0	400.0	376.1	376.1	0.8	0.4	124.26	124.26	-446.1	655.1	792.5	791.3	1.21	653.540	
500.0	500.0	474.8	474.7	1.0	0.5	124.31	124.31	-447.1	655.2	793.3	791.7	1.55	512.033	
600.0	600.0	570.7	570.7	1.2	0.7	124.38	124.38	-448.5	655.4	794.2	792.3	1.95	407.594	
700.0	700.0	664.9	664.8	1.5	0.9	124.54	124.54	-451.1	655.5	795.9	793.5	2.39	333.106	
800.0	800.0	757.7	757.5	1.7	1.1	124.75	124.75	-454.9	655.7	798.4	795.5	2.83	282.011	
900.0	900.0	849.6	849.4	1.9	1.4	124.98	124.98	-459.2	656.5	801.8	798.5	3.27	244.998	
1,000.0	1,000.0	939.2	938.8	2.1	1.6	125.21	125.21	-464.3	658.0	806.4	802.7	3.71	217.105	
1,100.0	1,100.0	1,028.9	1,028.3	2.4	1.8	125.44	125.44	-470.0	660.3	812.2	808.1	4.16	195.188	
1,200.0	1,200.0	1,118.7	1,117.8	2.6	2.0	125.67	125.67	-476.4	663.6	819.3	814.7	4.61	177.554	
1,300.0	1,300.0	1,214.2	1,213.0	2.8	2.3	125.87	125.87	-483.2	668.2	827.4	822.3	5.07	163.087	
1,400.0	1,400.0	1,311.2	1,309.6	3.0	2.5	125.99	125.99	-489.3	673.7	835.7	830.2	5.53	151.005	
1,500.0	1,500.0	1,405.0	1,403.0	3.3	2.7	126.11	126.11	-495.7	679.4	844.6	838.6	5.99	140.895	
1,600.0	1,600.0	1,497.6	1,495.1	3.5	3.0	65.89	65.89	-503.0	685.1	853.5	847.3	6.28	135.816	
1,700.0	1,699.8	1,585.8	1,582.8	3.7	3.2	66.14	66.14	-510.1	691.5	862.0	855.4	6.70	128.753	
1,787.5	1,787.1	1,659.3	1,655.8	3.9	3.4	66.44	66.44	-516.1	698.1	869.7	862.7	7.05	123.371	
1,800.0	1,799.5	1,670.1	1,666.5	3.9	3.5	66.51	66.51	-517.0	699.2	870.9	863.8	7.10	122.623	
1,900.0	1,899.0	1,759.9	1,755.4	4.1	3.7	67.05	67.05	-524.5	709.0	880.8	873.2	7.53	116.960	
2,000.0	1,998.4	1,861.7	1,856.2	4.4	4.0	67.69	67.69	-533.5	720.0	890.9	882.9	7.98	111.609	
2,100.0	2,097.9	1,959.0	1,952.6	4.6	4.3	68.26	68.26	-541.9	730.7	901.2	892.7	8.43	106.964	
2,200.0	2,197.4	2,059.3	2,051.8	4.9	4.6	68.82	68.82	-550.3	741.9	911.5	902.6	8.87	102.708	
2,300.0	2,296.9	2,161.4	2,153.0	5.1	4.9	69.36	69.36	-558.6	753.4	921.8	912.5	9.34	98.738	
2,400.0	2,396.4	2,257.7	2,248.4	5.4	5.2	69.92	69.92	-566.9	763.3	931.9	922.1	9.80	95.107	
2,500.0	2,495.9	2,346.0	2,335.8	5.7	5.5	70.40	70.40	-574.9	773.2	942.9	932.7	10.26	91.939	
2,600.0	2,595.4	2,433.5	2,422.2	5.9	5.8	70.93	70.93	-584.2	783.1	953.3	944.5	10.72	89.087	
2,700.0	2,694.9	2,519.4	2,506.9	6.2	6.1	71.47	71.47	-594.3	793.4	968.9	957.7	11.19	86.566	
2,800.0	2,794.4	2,602.5	2,588.6	6.5	6.4	71.95	71.95	-604.7	804.3	984.0	972.4	11.66	84.384	
7,379.8	6,817.5	6,844.5	6,775.1	20.8	20.3	-88.55	-88.55	-1,038.6	1,252.5	970.5	932.5	38.02	25.526	
7,400.0	6,817.5	6,844.6	6,775.1	21.0	20.3	-88.56	-88.56	-1,038.6	1,252.5	963.2	924.9	38.28	25.159	
7,500.0	6,817.3	6,844.8	6,775.3	22.4	20.3	-88.57	-88.57	-1,038.6	1,252.5	932.7	893.1	39.65	23.527	
7,600.0	6,817.1	6,845.0	6,775.5	23.8	20.3	-88.58	-88.58	-1,038.6	1,252.5	912.3	871.2	41.09	22.204	
7,700.0	6,816.9	6,845.3	6,775.8	25.2	20.3	-88.60	-88.60	-1,038.6	1,252.5	902.5	859.9	42.59	21.189	
7,738.7	6,816.8	6,845.4	6,775.9	25.8	20.3	-88.60	-88.60	-1,038.6	1,252.5	901.7	858.5	43.20	20.874	
7,800.0	6,816.7	6,845.5	6,776.0	26.8	20.3	-88.61	-88.61	-1,038.6	1,252.5	903.7	859.6	44.15	20.469	
7,900.0	6,816.5	6,845.7	6,776.2	28.4	20.3	-88.63	-88.63	-1,038.6	1,252.5	916.0	870.2	45.76	20.018	
8,000.0	6,816.3	6,845.9	6,776.4	30.0	20.3	-88.64	-88.64	-1,038.6	1,252.5	938.8	891.4	47.40	19.805	
8,100.0	6,816.1	6,846.1	6,776.6	31.6	20.3	-88.65	-88.65	-1,038.6	1,252.5	971.3	922.3	49.07	19.794 SF	

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Churchill 28J-423
Project:	SEC.28-T5N-R64W	TVD Reference:	WELL @ 4648.0ft (RKB - 15')
Reference Site:	Churchill 28J-HZ Pad Sec.28-T5N-R64W	MD Reference:	WELL @ 4648.0ft (RKB - 15')
Site Error:	0.0ft	North Reference:	True
Reference Well:	Churchill 28J-423	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	Landmark
Reference Design:	Plan #2 (2-11-14)	Offset TVD Reference:	Offset Datum

Offset Design Existing Wells - Churchill 28J-HZ Sec.28-T5N-R64W - Churchill 28-1 (Exist) - Wellbore #1 - Wellbore #													Offset Site Error:	0.0 ft
Survey Program: 6966-UNKNOWN													Offset Well Error:	0.0 ft
Reference		Offset		Semi Major Axis			Distance							
Measured Depth	Vertical Depth	Measured Depth	Vertical Depth	Reference	Offset	Highside Toolface	Offset Wellbore Centre		Between Centres	Between Ellipses	Minimum Separation	Separation Factor	Warning	
(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(°)	+N/-S (ft)	+E/-W (ft)	(ft)	(ft)	(ft)			
7,600.0	6,817.1	6,819.1	6,819.1	23.8	136.4	-90.36	-1,792.4	624.1	933.3	773.7	159.59	5.848		
7,700.0	6,816.9	6,818.9	6,818.9	25.2	136.4	-90.32	-1,792.4	624.1	838.2	677.1	161.09	5.203		
7,800.0	6,816.7	6,818.7	6,818.7	26.8	136.4	-90.28	-1,792.4	624.1	744.4	581.7	162.65	4.576		
7,900.0	6,816.5	6,818.5	6,818.5	28.4	136.4	-90.24	-1,792.4	624.1	652.4	488.1	164.25	3.972		
8,000.0	6,816.3	6,818.3	6,818.3	30.0	136.4	-90.20	-1,792.4	624.1	563.1	397.2	165.89	3.394		
8,100.0	6,816.1	6,818.1	6,818.1	31.6	136.4	-90.16	-1,792.4	624.1	478.1	310.5	167.57	2.853		
8,200.0	6,815.9	6,817.9	6,817.9	33.3	136.4	-90.12	-1,792.4	624.1	400.1	230.9	169.27	2.364		
8,300.0	6,815.7	6,817.7	6,817.7	35.0	136.4	-90.08	-1,792.4	624.1	334.1	163.1	170.99	1.954		
8,400.0	6,815.6	6,817.6	6,817.6	36.8	136.4	-90.04	-1,792.4	624.1	288.3	115.6	172.73	1.669		
8,492.4	6,815.4	6,817.4	6,817.4	38.4	136.3	-90.00	-1,792.4	624.1	273.0	98.7	174.35	1.566 CC		
8,500.0	6,815.4	6,817.4	6,817.4	38.5	136.3	-90.00	-1,792.4	624.1	273.2	98.7	174.49	1.565 ES, SF		
8,600.0	6,815.2	6,817.2	6,817.2	40.3	136.3	-89.96	-1,792.4	624.1	293.5	117.2	176.26	1.665		
8,700.0	6,815.0	6,817.0	6,817.0	42.0	136.3	-89.92	-1,792.4	624.1	343.0	164.9	178.05	1.926		
8,800.0	6,814.8	6,816.8	6,816.8	43.8	136.3	-89.88	-1,792.4	624.1	411.2	231.4	179.84	2.287		
8,900.0	6,814.6	6,816.6	6,816.6	45.6	136.3	-89.84	-1,792.4	624.1	490.5	308.9	181.65	2.700		
9,000.0	6,814.4	6,816.4	6,816.4	47.4	136.3	-89.80	-1,792.4	624.1	576.3	392.8	183.46	3.141		
9,100.0	6,814.2	6,816.2	6,816.2	49.2	136.3	-89.76	-1,792.4	624.1	666.1	480.8	185.29	3.595		
9,200.0	6,814.0	6,816.0	6,816.0	51.1	136.3	-89.71	-1,792.4	624.1	758.4	571.3	187.12	4.053		
9,300.0	6,813.8	6,815.8	6,815.8	52.9	136.3	-89.67	-1,792.4	624.1	852.4	663.5	188.95	4.511		
9,400.0	6,813.6	6,815.6	6,815.6	54.7	136.3	-89.63	-1,792.4	624.1	947.7	756.9	190.79	4.967		

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Churchill 28J-423
Project:	SEC.28-T5N-R64W	TVD Reference:	WELL @ 4648.0ft (RKB - 15')
Reference Site:	Churchill 28J-HZ Pad Sec.28-T5N-R64W	MD Reference:	WELL @ 4648.0ft (RKB - 15')
Site Error:	0.0ft	North Reference:	True
Reference Well:	Churchill 28J-423	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	Landmark
Reference Design:	Plan #2 (2-11-14)	Offset TVD Reference:	Offset Datum

Offset Design Existing Wells - Churchill 28J-HZ Sec.28-T5N-R64W - Churchill 28-2 (Exist) - Wellbore #1 - Wellbore #													Offset Site Error:	0.0 ft
Survey Program: 7600-UNKNOWN													Offset Well Error:	0.0 ft
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference	Offset	Semi Major Axis	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
0.0	0.0	0.0	0.0	0.0	0.0	125.46	125.46	-444.4	624.1	766.4				
100.0	100.0	81.0	81.0	0.1	1.6	125.46	125.46	-444.4	624.1	766.2	764.5	1.73	442.225	
200.0	200.0	181.0	181.0	0.3	3.6	125.46	125.46	-444.4	624.1	766.2	762.2	3.96	193.612	
300.0	300.0	281.0	281.0	0.6	5.6	125.46	125.46	-444.4	624.1	766.2	760.0	6.18	123.937	
400.0	400.0	381.0	381.0	0.8	7.6	125.46	125.46	-444.4	624.1	766.2	757.8	8.41	91.139	
500.0	500.0	481.0	481.0	1.0	9.6	125.46	125.46	-444.4	624.1	766.2	755.6	10.63	72.067	
600.0	600.0	581.0	581.0	1.2	11.6	125.46	125.46	-444.4	624.1	766.2	753.3	12.86	59.596	
700.0	700.0	681.0	681.0	1.5	13.6	125.46	125.46	-444.4	624.1	766.2	751.1	15.08	50.804	
800.0	800.0	781.0	781.0	1.7	15.6	125.46	125.46	-444.4	624.1	766.2	748.9	17.31	44.273	
900.0	900.0	881.0	881.0	1.9	17.6	125.46	125.46	-444.4	624.1	766.2	746.7	19.53	39.230	
1,000.0	1,000.0	981.0	981.0	2.1	19.6	125.46	125.46	-444.4	624.1	766.2	744.4	21.76	35.218	
1,100.0	1,100.0	1,081.0	1,081.0	2.4	21.6	125.46	125.46	-444.4	624.1	766.2	742.2	23.98	31.951	
1,200.0	1,200.0	1,181.0	1,181.0	2.6	23.6	125.46	125.46	-444.4	624.1	766.2	740.0	26.20	29.238	
1,300.0	1,300.0	1,281.0	1,281.0	2.8	25.6	125.46	125.46	-444.4	624.1	766.2	737.8	28.43	26.950	
1,400.0	1,400.0	1,381.0	1,381.0	3.0	27.6	125.46	125.46	-444.4	624.1	766.2	735.5	30.65	24.994	
1,500.0	1,500.0	1,481.0	1,481.0	3.3	29.6	125.46	125.46	-444.4	624.1	766.2	733.3	32.88	23.303	
1,600.0	1,600.0	1,581.0	1,581.0	3.5	31.6	65.25	65.25	-444.4	624.1	765.5	730.4	35.09	21.812	
1,700.0	1,699.8	1,680.8	1,680.8	3.7	33.6	65.65	65.65	-444.4	624.1	763.3	726.0	37.29	20.468	
1,787.5	1,787.1	1,768.1	1,768.1	3.9	35.4	66.22	66.22	-444.4	624.1	760.2	721.0	39.21	19.389	
1,800.0	1,799.5	1,780.5	1,780.5	3.9	35.6	66.30	66.30	-444.4	624.1	759.7	720.2	39.49	19.240	
1,900.0	1,899.0	1,880.0	1,880.0	4.1	37.6	66.99	66.99	-444.4	624.1	755.7	714.0	41.70	18.122	
2,000.0	1,998.4	1,979.4	1,979.4	4.4	39.6	67.69	67.69	-444.4	624.1	751.9	707.9	43.93	17.116	
2,100.0	2,097.9	2,078.9	2,078.9	4.6	41.6	68.40	68.40	-444.4	624.1	748.1	701.9	46.16	16.207	
2,200.0	2,197.4	2,178.4	2,178.4	4.9	43.6	69.11	69.11	-444.4	624.1	744.5	696.1	48.39	15.383	
2,300.0	2,296.9	2,277.9	2,277.9	5.1	45.6	69.84	69.84	-444.4	624.1	740.9	690.3	50.63	14.633	
2,400.0	2,396.4	2,377.4	2,377.4	5.4	47.5	70.56	70.56	-444.4	624.1	737.5	684.6	52.88	13.947	
2,500.0	2,495.9	2,476.9	2,476.9	5.7	49.5	71.30	71.30	-444.4	624.1	734.2	679.1	55.13	13.319	
2,600.0	2,595.4	2,576.4	2,576.4	5.9	51.5	72.04	72.04	-444.4	624.1	731.1	673.7	57.38	12.741	
2,700.0	2,694.9	2,675.9	2,675.9	6.2	53.5	72.78	72.78	-444.4	624.1	728.0	668.4	59.64	12.208	
2,800.0	2,794.4	2,775.4	2,775.4	6.5	55.5	73.54	73.54	-444.4	624.1	725.1	663.2	61.89	11.715	
2,900.0	2,893.9	2,874.9	2,874.9	6.7	57.5	74.30	74.30	-444.4	624.1	722.3	658.2	64.15	11.259	
3,000.0	2,993.4	2,974.4	2,974.4	7.0	59.5	75.06	75.06	-444.4	624.1	719.7	653.2	66.42	10.836	
3,100.0	3,092.9	3,073.9	3,073.9	7.3	61.5	75.83	75.83	-444.4	624.1	717.1	648.4	68.68	10.441	
3,200.0	3,192.4	3,173.4	3,173.4	7.5	63.5	76.61	76.61	-444.4	624.1	714.7	643.8	70.95	10.074	
3,300.0	3,291.9	3,272.9	3,272.9	7.8	65.5	77.39	77.39	-444.4	624.1	712.5	639.2	73.22	9.731	
3,400.0	3,391.4	3,372.4	3,372.4	8.1	67.4	78.17	78.17	-444.4	624.1	710.3	634.8	75.49	9.410	
3,500.0	3,490.9	3,471.9	3,471.9	8.4	69.4	78.96	78.96	-444.4	624.1	708.3	630.6	77.76	9.110	
3,600.0	3,590.4	3,571.4	3,571.4	8.7	71.4	79.75	79.75	-444.4	624.1	706.5	626.4	80.03	8.828	
3,700.0	3,689.9	3,670.9	3,670.9	8.9	73.4	80.55	80.55	-444.4	624.1	704.8	622.4	82.30	8.563	
3,800.0	3,789.4	3,770.4	3,770.4	9.2	75.4	81.35	81.35	-444.4	624.1	703.2	618.6	84.58	8.314	
3,900.0	3,888.9	3,869.9	3,869.9	9.5	77.4	82.16	82.16	-444.4	624.1	701.7	614.9	86.85	8.079	
4,000.0	3,988.4	3,969.4	3,969.4	9.8	79.4	82.97	82.97	-444.4	624.1	700.4	611.3	89.13	7.858	
4,100.0	4,087.9	4,068.9	4,068.9	10.1	81.4	83.78	83.78	-444.4	624.1	699.3	607.9	91.41	7.650	
4,200.0	4,187.4	4,168.4	4,168.4	10.3	83.4	84.59	84.59	-444.4	624.1	698.2	604.6	93.68	7.453	
4,300.0	4,286.9	4,267.9	4,267.9	10.6	85.4	85.41	85.41	-444.4	624.1	697.4	601.4	95.96	7.267	
4,400.0	4,386.4	4,367.4	4,367.4	10.9	87.3	86.22	86.22	-444.4	624.1	696.6	598.4	98.24	7.091	
4,500.0	4,485.9	4,466.9	4,466.9	11.2	89.3	87.04	87.04	-444.4	624.1	696.0	595.5	100.52	6.924	
4,600.0	4,585.4	4,566.4	4,566.4	11.5	91.3	87.86	87.86	-444.4	624.1	695.6	592.8	102.80	6.767	
4,700.0	4,684.9	4,665.9	4,665.9	11.8	93.3	88.68	88.68	-444.4	624.1	695.3	590.2	105.07	6.617	
4,800.0	4,784.4	4,765.4	4,765.4	12.1	95.3	89.50	89.50	-444.4	624.1	695.1	587.8	107.35	6.475	
4,860.3	4,844.3	4,825.3	4,825.3	12.2	96.5	90.00	90.00	-444.4	624.1	695.1	586.4	108.73	6.393	

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 Churchill 28J-423
Project:	SEC.28-T5N-R64W	TVD Reference:	WELL @ 4648.0ft (RKB - 15')
Reference Site:	Churchill 28J-HZ Pad Sec.28-T5N-R64W	MD Reference:	WELL @ 4648.0ft (RKB - 15')
Site Error:	0.0ft	North Reference:	True
Reference Well:	Churchill 28J-423	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	Landmark
Reference Design:	Plan #2 (2-11-14)	Offset TVD Reference:	Offset Datum

Offset Design Existing Wells - Churchill 28J-HZ Sec.28-T5N-R64W - Churchill 28-2 (Exist) - Wellbore #1 - Wellbore #													Offset Site Error:	0.0 ft
Survey Program: 7600-UNKNOWN													Offset Well Error:	0.0 ft
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference	Offset	Semi Major Axis	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
4,900.0	4,883.9	4,864.9	4,864.9	12.3	97.3	90.33		-444.4	624.1	695.1	585.5	109.63	6.340	
5,000.0	4,983.3	4,964.3	4,964.3	12.6	99.3	91.15		-444.4	624.1	695.2	583.3	111.91	6.213	
5,100.0	5,082.8	5,063.8	5,063.8	12.9	101.3	91.97		-444.4	624.1	695.5	581.3	114.18	6.091	
5,200.0	5,182.3	5,163.3	5,163.3	13.2	103.3	92.79		-444.4	624.1	695.9	579.5	116.46	5.976	
5,300.0	5,281.8	5,262.8	5,262.8	13.5	105.3	93.61		-444.4	624.1	696.5	577.8	118.74	5.866	
5,400.0	5,381.3	5,362.3	5,362.3	13.8	107.2	94.43		-444.4	624.1	697.2	576.2	121.01	5.761	
5,500.0	5,480.8	5,461.8	5,461.8	14.1	109.2	95.24		-444.4	624.1	698.0	574.8	123.29	5.662	
5,532.3	5,512.9	5,493.9	5,493.9	14.1	109.9	95.51		-444.4	624.1	698.4	574.3	124.02	5.631	
5,600.0	5,580.4	5,561.4	5,561.4	14.3	111.2	96.00		-444.4	624.1	699.0	573.4	125.54	5.568	
5,700.0	5,680.2	5,661.2	5,661.2	14.5	113.2	96.50		-444.4	624.1	699.6	571.9	127.73	5.477	
5,800.0	5,780.2	5,761.2	5,761.2	14.7	115.2	96.70		-444.4	624.1	699.9	570.0	129.90	5.388	
5,819.8	5,800.0	5,781.0	5,781.0	14.7	115.6	157.04		-444.4	624.1	699.9	569.6	130.33	5.370	
5,900.0	5,880.2	5,861.2	5,861.2	14.8	117.2	157.04		-444.4	624.1	699.9	567.8	132.07	5.299	
6,000.0	5,980.2	5,961.2	5,961.2	15.0	119.2	157.04		-444.4	624.1	699.9	565.6	134.26	5.213	
6,063.6	6,043.7	6,024.7	6,024.7	15.2	120.5	157.04		-444.4	624.1	699.9	564.2	135.65	5.160	
6,100.0	6,080.2	6,061.2	6,061.2	15.2	121.2	-23.01		-444.4	624.1	699.1	562.8	136.30	5.129	
6,150.0	6,130.0	6,111.0	6,111.0	15.3	122.2	-23.25		-444.4	624.1	695.4	558.6	136.76	5.085	
6,200.0	6,179.5	6,160.5	6,160.5	15.3	123.2	-23.69		-444.4	624.1	688.7	552.0	136.72	5.038	
6,250.0	6,228.3	6,209.3	6,209.3	15.4	124.2	-24.35		-444.4	624.1	679.1	542.9	136.19	4.987	
6,300.0	6,276.4	6,257.4	6,257.4	15.4	125.1	-25.24		-444.4	624.1	666.6	531.4	135.20	4.931	
6,350.0	6,323.5	6,304.5	6,304.5	15.5	126.1	-26.39		-444.4	624.1	651.3	517.5	133.82	4.867	
6,400.0	6,369.4	6,350.4	6,350.4	15.5	127.0	-27.84		-444.4	624.1	633.4	501.3	132.12	4.794	
6,450.0	6,413.9	6,394.9	6,394.9	15.5	127.9	-29.63		-444.4	624.1	612.9	482.7	130.23	4.706	
6,500.0	6,456.8	6,437.8	6,437.8	15.5	128.8	-31.82		-444.4	624.1	590.1	461.7	128.34	4.598	
6,550.0	6,498.0	6,479.0	6,479.0	15.6	129.6	-34.46		-444.4	624.1	565.1	438.4	126.68	4.461	
6,600.0	6,537.2	6,518.2	6,518.2	15.6	130.4	-37.64		-444.4	624.1	538.1	412.5	125.57	4.285	
6,650.0	6,574.3	6,555.3	6,555.3	15.6	131.1	-41.41		-444.4	624.1	509.5	384.2	125.35	4.065	
6,700.0	6,609.1	6,590.1	6,590.1	15.7	131.8	-45.83		-444.4	624.1	479.6	353.2	126.36	3.796	
6,750.0	6,641.5	6,622.5	6,622.5	15.8	132.4	-50.90		-444.4	624.1	448.8	320.0	128.78	3.485	
6,800.0	6,671.3	6,652.3	6,652.3	15.9	133.0	-56.56		-444.4	624.1	417.7	285.2	132.53	3.152	
6,850.0	6,698.5	6,679.5	6,679.5	16.0	133.6	-62.64		-444.4	624.1	386.9	249.8	137.14	2.821	
6,900.0	6,722.8	6,703.8	6,703.8	16.3	134.1	-68.86		-444.4	624.1	357.3	215.4	141.89	2.518	
6,950.0	6,744.2	6,725.2	6,725.2	16.5	134.5	-74.85		-444.4	624.1	330.0	183.9	146.04	2.259	
7,000.0	6,762.7	6,743.7	6,743.7	16.9	134.9	-80.24		-444.4	624.1	306.3	157.1	149.15	2.054	
7,050.0	6,778.0	6,759.0	6,759.0	17.2	135.2	-84.73		-444.4	624.1	287.9	136.7	151.15	1.904	
7,100.0	6,790.2	6,771.2	6,771.2	17.7	135.4	-88.09		-444.4	624.1	276.3	124.0	152.33	1.814	
7,143.6	6,798.3	6,779.3	6,779.3	18.1	135.6	-90.00		-444.4	624.1	273.0	120.0	152.98	1.785 CC	
7,150.0	6,799.3	6,780.3	6,780.3	18.1	135.6	-90.20		-444.4	624.1	273.1	120.0	153.06	1.784 ES, SF	
7,183.6	6,803.5	6,784.5	6,784.5	18.5	135.7	-90.87		-444.4	624.1	275.9	122.4	153.47	1.798	
7,200.0	6,805.2	6,786.2	6,786.2	18.7	135.7	-91.23		-444.4	624.1	278.7	125.0	153.66	1.814	
7,257.6	6,811.2	6,792.2	6,792.2	19.3	135.8	-92.48		-444.4	624.1	295.6	141.3	154.31	1.915	
7,300.0	6,814.9	6,795.9	6,795.9	19.8	135.9	-92.21		-444.4	624.1	314.2	159.3	154.92	2.028	
7,379.8	6,817.5	6,798.5	6,798.5	20.8	136.0	-89.91		-444.4	624.1	360.4	204.2	156.12	2.308	
7,400.0	6,817.5	6,798.5	6,798.5	21.0	136.0	-89.90		-444.4	624.1	373.9	217.5	156.39	2.391	
7,500.0	6,817.3	6,798.3	6,798.3	22.4	136.0	-89.86		-444.4	624.1	448.2	290.5	157.75	2.841	
7,600.0	6,817.1	6,798.1	6,798.1	23.8	136.0	-89.82		-444.4	624.1	531.0	371.8	159.18	3.336	
7,700.0	6,816.9	6,797.9	6,797.9	25.2	136.0	-89.78		-444.4	624.1	618.9	458.3	160.69	3.852	
7,800.0	6,816.7	6,797.7	6,797.7	26.8	136.0	-89.74		-444.4	624.1	710.1	547.8	162.24	4.376	
7,900.0	6,816.5	6,797.5	6,797.5	28.4	136.0	-89.70		-444.4	624.1	803.3	639.4	163.84	4.903	
8,000.0	6,816.3	6,797.3	6,797.3	30.0	135.9	-89.66		-444.4	624.1	898.0	732.5	165.48	5.426	
8,100.0	6,816.1	6,797.1	6,797.1	31.6	135.9	-89.62		-444.4	624.1	993.7	826.6	167.15	5.945	

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 Churchill 28J-423
Project:	SEC.28-T5N-R64W	TVD Reference:	WELL @ 4648.0ft (RKB - 15')
Reference Site:	Churchill 28J-HZ Pad Sec.28-T5N-R64W	MD Reference:	WELL @ 4648.0ft (RKB - 15')
Site Error:	0.0ft	North Reference:	True
Reference Well:	Churchill 28J-423	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	Landmark
Reference Design:	Plan #2 (2-11-14)	Offset TVD Reference:	Offset Datum

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Churchill 28J-423
Project:	SEC.28-T5N-R64W	TVD Reference:	WELL @ 4648.0ft (RKB - 15')
Reference Site:	Churchill 28J-HZ Pad Sec.28-T5N-R64W	MD Reference:	WELL @ 4648.0ft (RKB - 15')
Site Error:	0.0ft	North Reference:	True
Reference Well:	Churchill 28J-423	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	Landmark
Reference Design:	Plan #2 (2-11-14)	Offset TVD Reference:	Offset Datum

Offset Design Existing Wells - Churchill 28J-HZ Sec.28-T5N-R64W - Churchill 5 (Exist) - Wellbore #1 - Wellbore #1													Offset Site Error:	0.0 ft
Survey Program: 6992-UNKNOWN													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)	+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	178.35	-965.4	27.9	965.9					
100.0	100.0	91.0	91.0	0.1	1.8	178.35	-965.4	27.9	965.8	963.9	1.93	499.755		
200.0	200.0	191.0	191.0	0.3	3.8	178.35	-965.4	27.9	965.8	961.7	4.16	232.316		
300.0	300.0	291.0	291.0	0.6	5.8	178.35	-965.4	27.9	965.8	959.4	6.38	151.332		
400.0	400.0	391.0	391.0	0.8	7.8	178.35	-965.4	27.9	965.8	957.2	8.61	112.215		
500.0	500.0	491.0	491.0	1.0	9.8	178.35	-965.4	27.9	965.8	955.0	10.83	89.166		
600.0	600.0	591.0	591.0	1.2	11.8	178.35	-965.4	27.9	965.8	952.8	13.06	73.973		
700.0	700.0	691.0	691.0	1.5	13.8	178.35	-965.4	27.9	965.8	950.5	15.28	63.203		
800.0	800.0	791.0	791.0	1.7	15.8	178.35	-965.4	27.9	965.8	948.3	17.51	55.171		
900.0	900.0	891.0	891.0	1.9	17.8	178.35	-965.4	27.9	965.8	946.1	19.73	48.950		
1,000.0	1,000.0	991.0	991.0	2.1	19.8	178.35	-965.4	27.9	965.8	943.9	21.96	43.990		
1,100.0	1,100.0	1,091.0	1,091.0	2.4	21.8	178.35	-965.4	27.9	965.8	941.6	24.18	39.942		
1,200.0	1,200.0	1,191.0	1,191.0	2.6	23.8	178.35	-965.4	27.9	965.8	939.4	26.40	36.577		
1,300.0	1,300.0	1,291.0	1,291.0	2.8	25.8	178.35	-965.4	27.9	965.8	937.2	28.63	33.735		
1,400.0	1,400.0	1,391.0	1,391.0	3.0	27.8	178.35	-965.4	27.9	965.8	935.0	30.85	31.302		
1,500.0	1,500.0	1,491.0	1,491.0	3.3	29.8	178.35	-965.4	27.9	965.8	932.7	33.08	29.197		
1,600.0	1,600.0	1,591.0	1,591.0	3.5	31.8	118.09	-965.4	27.9	966.6	931.3	35.29	27.389		
1,700.0	1,699.8	1,690.8	1,690.8	3.7	33.8	118.32	-965.4	27.9	969.1	931.6	37.49	25.850		
1,787.5	1,787.1	1,778.1	1,778.1	3.9	35.6	118.64	-965.4	27.9	972.7	933.3	39.40	24.684		
1,800.0	1,799.5	1,790.5	1,790.5	3.9	35.8	118.71	-965.4	27.9	973.3	933.6	39.68	24.528		
1,900.0	1,899.0	1,890.0	1,890.0	4.1	37.8	119.22	-965.4	27.9	978.1	936.2	41.90	23.347		
2,000.0	1,998.4	1,989.4	1,989.4	4.4	39.8	119.73	-965.4	27.9	983.1	939.0	44.12	22.283		
2,100.0	2,097.9	2,088.9	2,088.9	4.6	41.8	120.23	-965.4	27.9	988.1	941.8	46.35	21.321		
2,200.0	2,197.4	2,188.4	2,188.4	4.9	43.8	120.73	-965.4	27.9	993.2	944.6	48.58	20.447		
2,300.0	2,296.9	2,287.9	2,287.9	5.1	45.8	121.22	-965.4	27.9	998.4	947.6	50.81	19.650		
6,700.0	6,609.1	6,600.1	6,600.1	15.7	132.0	27.70	-965.4	27.9	970.7	858.9	111.74	8.687		
6,750.0	6,641.5	6,632.5	6,632.5	15.8	132.6	30.61	-965.4	27.9	934.9	824.9	109.96	8.502		
6,800.0	6,671.3	6,662.3	6,662.3	15.9	133.2	34.10	-965.4	27.9	897.3	787.8	109.58	8.189		
6,850.0	6,698.5	6,689.5	6,689.5	16.0	133.8	38.27	-965.4	27.9	858.3	747.2	111.07	7.728		
6,900.0	6,722.8	6,713.8	6,713.8	16.3	134.3	43.20	-965.4	27.9	818.0	703.3	114.76	7.128		
6,950.0	6,744.2	6,735.2	6,735.2	16.5	134.7	48.92	-965.4	27.9	776.7	656.1	120.63	6.439		
7,000.0	6,762.7	6,753.7	6,753.7	16.9	135.1	55.38	-965.4	27.9	734.7	606.6	128.12	5.735		
7,050.0	6,778.0	6,769.0	6,769.0	17.2	135.4	62.41	-965.4	27.9	692.3	556.2	136.17	5.084		
7,100.0	6,790.2	6,781.2	6,781.2	17.7	135.6	69.67	-965.4	27.9	649.9	506.3	143.53	4.528		
7,150.0	6,799.3	6,790.3	6,790.3	18.1	135.8	76.73	-965.4	27.9	607.7	458.5	149.19	4.073		
7,183.6	6,803.5	6,794.5	6,794.5	18.5	135.9	81.15	-965.4	27.9	579.8	428.0	151.80	3.819		
7,200.0	6,805.2	6,796.2	6,796.2	18.7	135.9	81.45	-965.4	27.9	566.3	414.1	152.14	3.722		
7,257.6	6,811.2	6,802.2	6,802.2	19.3	136.0	82.49	-965.4	27.9	520.3	367.0	153.29	3.394		
7,300.0	6,814.9	6,805.9	6,805.9	19.8	136.1	85.63	-965.4	27.9	487.9	333.1	154.75	3.153		
7,379.8	6,817.5	6,808.5	6,808.5	20.8	136.2	90.10	-965.4	27.9	431.4	275.1	156.32	2.760		
7,400.0	6,817.5	6,808.5	6,808.5	21.0	136.2	90.09	-965.4	27.9	418.3	261.7	156.59	2.671		
7,500.0	6,817.3	6,808.3	6,808.3	22.4	136.2	90.06	-965.4	27.9	363.1	205.2	157.94	2.299		
7,600.0	6,817.1	6,808.1	6,808.1	23.8	136.2	90.02	-965.4	27.9	329.8	170.4	159.38	2.069		
7,665.5	6,817.0	6,808.0	6,808.0	24.7	136.2	90.00	-965.4	27.9	323.2	162.9	160.36	2.016 CC, ES, SF		
7,700.0	6,816.9	6,807.9	6,807.9	25.2	136.2	89.99	-965.4	27.9	325.1	164.2	160.88	2.021		
7,800.0	6,816.7	6,807.7	6,807.7	26.8	136.2	89.95	-965.4	27.9	350.1	187.7	162.44	2.155		
7,900.0	6,816.5	6,807.5	6,807.5	28.4	136.2	89.92	-965.4	27.9	399.3	235.3	164.04	2.434		
8,000.0	6,816.3	6,807.3	6,807.3	30.0	136.1	89.89	-965.4	27.9	465.2	299.5	165.68	2.808		
8,100.0	6,816.1	6,807.1	6,807.1	31.6	136.1	89.85	-965.4	27.9	541.5	374.2	167.35	3.236		
8,200.0	6,815.9	6,806.9	6,806.9	33.3	136.1	89.82	-965.4	27.9	624.6	455.6	169.04	3.695		
8,300.0	6,815.7	6,806.7	6,806.7	35.0	136.1	89.78	-965.4	27.9	712.1	541.3	170.76	4.170		

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 Churchill 28J-423
Project:	SEC.28-T5N-R64W	TVD Reference:	WELL @ 4648.0ft (RKB - 15')
Reference Site:	Churchill 28J-HZ Pad Sec.28-T5N-R64W	MD Reference:	WELL @ 4648.0ft (RKB - 15')
Site Error:	0.0ft	North Reference:	True
Reference Well:	Churchill 28J-423	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	Landmark
Reference Design:	Plan #2 (2-11-14)	Offset TVD Reference:	Offset Datum

Offset Design Existing Wells - Churchill 28J-HZ Sec.28-T5N-R64W - Churchill 5 (Exist) - Wellbore #1 - Wellbore #1													Offset Site Error:	0.0 ft
Survey Program: 6992-UNKNOWN													Offset Well Error:	0.0 ft
Reference	Offset	Semi Major Axis		Distance										Warning
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor		
8,400.0	6,815.6	6,806.6	6,806.6	36.8	136.1	89.75	-965.4	27.9	802.5	630.0	172.50	4.652		
8,500.0	6,815.4	6,806.4	6,806.4	38.5	136.1	89.72	-965.4	27.9	894.9	720.7	174.26	5.136		
8,600.0	6,815.2	6,806.2	6,806.2	40.3	136.1	89.68	-965.4	27.9	988.8	812.8	176.03	5.617		

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Churchill 28J-423
Project:	SEC.28-T5N-R64W	TVD Reference:	WELL @ 4648.0ft (RKB - 15')
Reference Site:	Churchill 28J-HZ Pad Sec.28-T5N-R64W	MD Reference:	WELL @ 4648.0ft (RKB - 15')
Site Error:	0.0ft	North Reference:	True
Reference Well:	Churchill 28J-423	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	Landmark
Reference Design:	Plan #2 (2-11-14)	Offset TVD Reference:	Offset Datum

Offset Design Existing Wells - Churchill 28J-HZ Sec.28-T5N-R64W - Welch B 28-11 (Exist) - Wellbore #1 - Wellbore													Offset Site Error:	0.0 ft
Survey Program: 7010-UNKNOWN													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	
9,000.0	6,814.4	6,807.4	6,807.4	47.4	136.1	-91.07	-3,278.8	451.4	984.0	800.8	183.23	5.370		
9,100.0	6,814.2	6,807.2	6,807.2	49.2	136.1	-90.96	-3,278.8	451.4	884.6	699.5	185.06	4.780		
9,200.0	6,814.0	6,807.0	6,807.0	51.1	136.1	-90.85	-3,278.8	451.4	785.3	598.4	186.90	4.202		
9,300.0	6,813.8	6,806.8	6,806.8	52.9	136.1	-90.74	-3,278.8	451.4	686.2	497.5	188.74	3.636		
9,400.0	6,813.6	6,806.6	6,806.6	54.7	136.1	-90.63	-3,278.8	451.4	587.5	396.9	190.59	3.083		
9,500.0	6,813.4	6,806.4	6,806.4	56.6	136.1	-90.53	-3,278.8	451.4	489.3	296.8	192.44	2.542		
9,600.0	6,813.2	6,806.2	6,806.2	58.4	136.1	-90.42	-3,278.8	451.4	391.9	197.6	194.30	2.017		
9,700.0	6,813.1	6,806.1	6,806.1	60.3	136.1	-90.31	-3,278.8	451.4	296.4	100.2	196.16	1.511		
9,800.0	6,812.9	6,805.9	6,805.9	62.1	136.1	-90.20	-3,278.8	451.4	205.1	7.1	198.02	1.036 Level 2		
9,900.0	6,812.7	6,805.7	6,805.7	64.0	136.1	-90.09	-3,278.8	451.4	127.6	-72.3	199.88	0.638 Level 1		
9,978.8	6,812.5	6,805.5	6,805.5	65.5	136.1	-90.00	-3,278.8	451.4	100.3	-101.0	201.36	0.498 Level 1, CC, ES, SF		
10,000.0	6,812.5	6,805.5	6,805.5	65.9	136.1	-89.98	-3,278.8	451.4	102.5	-99.2	201.75	0.508 Level 1		
10,100.0	6,812.3	6,805.3	6,805.3	67.7	136.1	-89.87	-3,278.8	451.4	157.3	-46.3	203.62	0.772 Level 1		
10,200.0	6,812.1	6,805.1	6,805.1	69.6	136.1	-89.76	-3,278.8	451.4	242.8	37.3	205.49	1.182 Level 2		
10,300.0	6,811.9	6,804.9	6,804.9	71.5	136.1	-89.65	-3,278.8	451.4	336.4	129.1	207.37	1.622		
10,400.0	6,811.7	6,804.7	6,804.7	73.3	136.1	-89.54	-3,278.8	451.4	432.9	223.7	209.24	2.069		
10,500.0	6,811.5	6,804.5	6,804.5	75.2	136.1	-89.43	-3,278.8	451.4	530.7	319.6	211.12	2.514		
10,600.0	6,811.3	6,804.3	6,804.3	77.1	136.1	-89.32	-3,278.8	451.4	629.2	416.2	213.00	2.954		
10,700.0	6,811.1	6,804.1	6,804.1	79.0	136.1	-89.21	-3,278.8	451.4	728.1	513.2	214.88	3.388		
10,800.0	6,810.9	6,803.9	6,803.9	80.9	136.1	-89.10	-3,278.8	451.4	827.2	610.5	216.76	3.816		
10,900.0	6,810.8	6,803.8	6,803.8	82.7	136.1	-88.99	-3,278.8	451.4	926.6	707.9	218.64	4.238		

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Churchill 28J-423
Project:	SEC.28-T5N-R64W	TVD Reference:	WELL @ 4648.0ft (RKB - 15')
Reference Site:	Churchill 28J-HZ Pad Sec.28-T5N-R64W	MD Reference:	WELL @ 4648.0ft (RKB - 15')
Site Error:	0.0ft	North Reference:	True
Reference Well:	Churchill 28J-423	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	Landmark
Reference Design:	Plan #2 (2-11-14)	Offset TVD Reference:	Offset Datum

Offset Design		Existing Wells - Churchill 28J-HZ Sec.28-T5N-R64W - Welsh 1 (Exist) - Wellbore #1 - Wellbore #1										Offset Site Error:		0.0 ft			
Survey Program: 6930-UNKNOWN														Offset Well Error:		0.0 ft	
Reference		Offset		Semi Major Axis			Distance										
Measured Depth	Vertical Depth	Measured Depth	Vertical Depth	Reference	Offset	Highside Toolface	Offset Wellbore Centre		Between Centres	Between Ellipses	Minimum Separation	Separation Factor	Warning				
(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(°)	+N/-S (ft)	+E/-W (ft)	(ft)	(ft)	(ft)						
10,200.0	6,812.1	6,812.1	6,812.1	69.6	136.2	-90.31	-4,400.8	671.6	956.2	750.6	205.62	4.651					
10,300.0	6,811.9	6,811.9	6,811.9	71.5	136.2	-90.27	-4,400.8	671.6	862.7	655.2	207.50	4.158					
10,400.0	6,811.7	6,811.7	6,811.7	73.3	136.2	-90.24	-4,400.8	671.6	770.7	561.4	209.37	3.681					
10,500.0	6,811.5	6,811.5	6,811.5	75.2	136.2	-90.21	-4,400.8	671.6	681.1	469.8	211.25	3.224					
10,600.0	6,811.3	6,811.3	6,811.3	77.1	136.2	-90.17	-4,400.8	671.6	594.7	381.6	213.13	2.790					
10,700.0	6,811.1	6,811.1	6,811.1	79.0	136.2	-90.14	-4,400.8	671.6	513.3	298.3	215.02	2.387					
10,800.0	6,810.9	6,810.9	6,810.9	80.9	136.2	-90.10	-4,400.8	671.6	439.6	222.7	216.90	2.027					
10,900.0	6,810.8	6,810.8	6,810.8	82.7	136.2	-90.07	-4,400.8	671.6	378.3	159.5	218.79	1.729					
11,000.0	6,810.6	6,810.6	6,810.6	84.6	136.2	-90.03	-4,400.8	671.6	336.0	115.3	220.67	1.523					
11,100.0	6,810.4	6,810.4	6,810.4	86.5	136.2	-90.00	-4,400.8	671.6	320.5	97.9	222.56	1.440 Level 3					
11,100.9	6,810.4	6,810.4	6,810.4	86.5	136.2	-90.00	-4,400.8	671.6	320.5	97.9	222.58	1.440 Level 3, CC, ES, SF					
11,200.0	6,810.2	6,810.2	6,810.2	88.4	136.2	-89.97	-4,400.8	671.6	335.4	111.0	224.45	1.495 Level 3					
11,300.0	6,810.0	6,810.0	6,810.0	90.3	136.2	-89.93	-4,400.8	671.6	377.3	150.9	226.34	1.667					
11,400.0	6,809.8	6,809.8	6,809.8	92.2	136.2	-89.90	-4,400.8	671.6	438.3	210.1	228.24	1.921					
11,500.0	6,809.6	6,809.6	6,809.6	94.1	136.2	-89.86	-4,400.8	671.6	511.8	281.7	230.13	2.224					
11,600.0	6,809.4	6,809.4	6,809.4	96.0	136.2	-89.83	-4,400.8	671.6	593.1	361.1	232.02	2.556					
11,700.0	6,809.2	6,809.2	6,809.2	97.9	136.2	-89.79	-4,400.8	671.6	679.4	445.5	233.92	2.904					
11,800.0	6,809.0	6,809.0	6,809.0	99.8	136.2	-89.76	-4,400.8	671.6	769.0	533.2	235.81	3.261					
11,900.0	6,808.8	6,808.8	6,808.8	101.7	136.2	-89.73	-4,400.8	671.6	860.9	623.2	237.71	3.622					
12,000.0	6,808.6	6,808.6	6,808.6	103.6	136.2	-89.69	-4,400.8	671.6	954.5	714.9	239.60	3.984					

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Churchill 28J-423
Project:	SEC.28-T5N-R64W	TVD Reference:	WELL @ 4648.0ft (RKB - 15')
Reference Site:	Churchill 28J-HZ Pad Sec.28-T5N-R64W	MD Reference:	WELL @ 4648.0ft (RKB - 15')
Site Error:	0.0ft	North Reference:	True
Reference Well:	Churchill 28J-423	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	Landmark
Reference Design:	Plan #2 (2-11-14)	Offset TVD Reference:	Offset Datum

Offset Design												Offset Site Error:	0.0 ft
Survey Program: 7600-UNKNOWN												Offset Well Error:	0.0 ft
Existing Wells - Churchill 28J-HZ Sec.28-T5N-R64W - Wonenberg B33-3 (Exist) - Wellbore #1 - Wellbo													
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
11,500.0	6,809.6	6,825.6	6,825.6	94.1	136.5	-90.31	-5,712.4	674.4	968.0	737.6	230.44	4.201	
11,600.0	6,809.4	6,825.4	6,825.4	96.0	136.5	-90.28	-5,712.4	674.4	874.4	642.1	232.33	3.764	
11,700.0	6,809.2	6,825.2	6,825.2	97.9	136.5	-90.24	-5,712.4	674.4	782.4	548.2	234.23	3.340	
11,800.0	6,809.0	6,825.0	6,825.0	99.8	136.5	-90.21	-5,712.4	674.4	692.6	456.4	236.12	2.933	
11,900.0	6,808.8	6,824.8	6,824.8	101.7	136.5	-90.17	-5,712.4	674.4	605.9	367.9	238.02	2.546	
12,000.0	6,808.6	6,824.6	6,824.6	103.6	136.5	-90.14	-5,712.4	674.4	524.1	284.2	239.92	2.184	
12,100.0	6,808.4	6,824.4	6,824.4	105.5	136.5	-90.11	-5,712.4	674.4	449.6	207.8	241.82	1.859	
12,200.0	6,808.3	6,824.3	6,824.3	107.4	136.5	-90.07	-5,712.4	674.4	386.9	143.2	243.72	1.587	
12,300.0	6,808.1	6,824.1	6,824.1	109.3	136.5	-90.04	-5,712.4	674.4	342.3	96.7	245.61	1.394	Level 3
12,400.0	6,807.9	6,823.9	6,823.9	111.2	136.5	-90.00	-5,712.4	674.4	323.5	76.0	247.52	1.307	Level 3
12,412.5	6,807.8	6,823.8	6,823.8	111.4	136.5	-90.00	-5,712.4	674.4	323.3	75.6	247.75	1.305	Level 3, CC, ES, SF
12,500.0	6,807.7	6,823.7	6,823.7	113.1	136.5	-89.97	-5,712.4	674.4	335.0	85.5	249.42	1.343	Level 3
12,600.0	6,807.5	6,823.5	6,823.5	115.0	136.5	-89.94	-5,712.4	674.4	373.8	122.4	251.32	1.487	Level 3
12,700.0	6,807.3	6,823.3	6,823.3	116.9	136.5	-89.90	-5,712.4	674.4	432.7	179.5	253.22	1.709	
12,800.0	6,807.1	6,823.1	6,823.1	118.8	136.5	-89.87	-5,712.4	674.4	504.7	249.6	255.12	1.978	
12,900.0	6,806.9	6,822.9	6,822.9	120.7	136.5	-89.83	-5,712.4	674.4	585.0	328.0	257.02	2.276	
13,000.0	6,806.7	6,822.7	6,822.7	122.6	136.5	-89.80	-5,712.4	674.4	670.6	411.7	258.93	2.590	
13,100.0	6,806.5	6,822.5	6,822.5	124.5	136.5	-89.77	-5,712.4	674.4	759.8	498.9	260.83	2.913	
13,200.0	6,806.3	6,822.3	6,822.3	126.4	136.4	-89.73	-5,712.4	674.4	851.3	588.6	262.73	3.240	
13,300.0	6,806.1	6,822.1	6,822.1	128.3	136.4	-89.70	-5,712.4	674.4	944.6	680.0	264.64	3.569	

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Churchill 28J-423
Project:	SEC.28-T5N-R64W	TVD Reference:	WELL @ 4648.0ft (RKB - 15')
Reference Site:	Churchill 28J-HZ Pad Sec.28-T5N-R64W	MD Reference:	WELL @ 4648.0ft (RKB - 15')
Site Error:	0.0ft	North Reference:	True
Reference Well:	Churchill 28J-423	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	Landmark
Reference Design:	Plan #2 (2-11-14)	Offset TVD Reference:	Offset Datum

Reference Depths are relative to WELL @ 4648.0ft (RKB - 15')

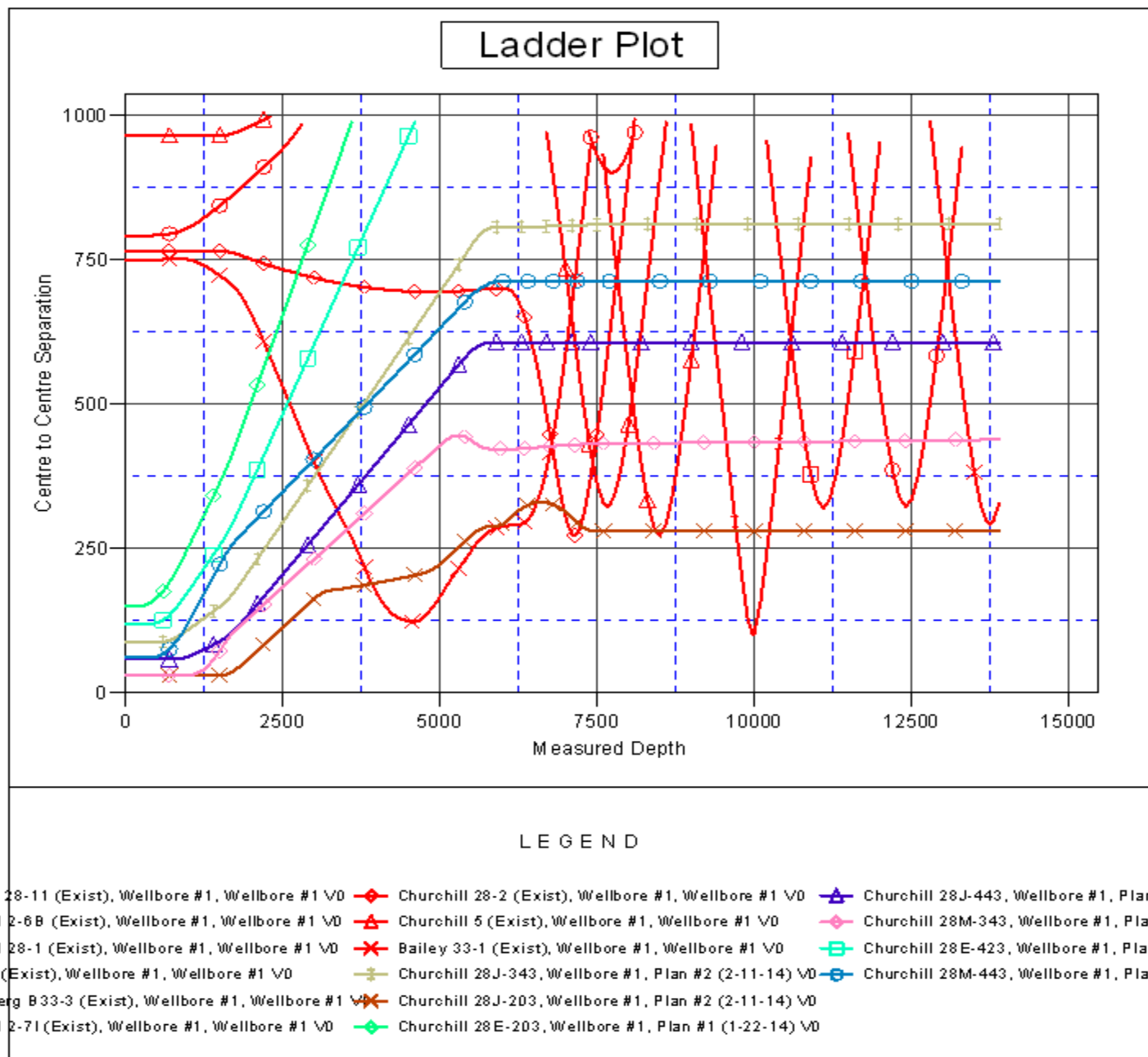
Offset Depths are relative to Offset Datum

Central Meridian is -105.500000 °

Coordinates are relative to: Churchill 28J-423

Coordinate System is US State Plane 1983, Colorado Northern Zone

Grid Convergence at Surface is: 0.61°



Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Churchill 28J-423
Project:	SEC.28-T5N-R64W	TVD Reference:	WELL @ 4648.0ft (RKB - 15')
Reference Site:	Churchill 28J-HZ Pad Sec.28-T5N-R64W	MD Reference:	WELL @ 4648.0ft (RKB - 15')
Site Error:	0.0ft	North Reference:	True
Reference Well:	Churchill 28J-423	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	Landmark
Reference Design:	Plan #2 (2-11-14)	Offset TVD Reference:	Offset Datum

Reference Depths are relative to WELL @ 4648.0ft (RKB - 15')

Offset Depths are relative to Offset Datum

Central Meridian is -105.500000 °

Coordinates are relative to: Churchill 28J-423

Coordinate System is US State Plane 1983, Colorado Northern Zone

Grid Convergence at Surface is: 0.61°

