

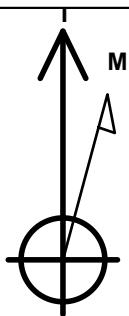
PETROLEUM DEVELOPMENT CORP Weld County CO

Well Name: Churchill 28M-343

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 1381538.98 3262084.58 40.376910 -104.559280
 Original Well Elev WELL @ 4648.0ft (Original Well Elev)

WELLBORE TARGET DETAILS

Name	TVD	+N/-S	+E/-W	Shape
SHL 250'FNL, 1395'FWL, SEC.28	1.0	0.0	0.0	Point
BHL 2138'FNL, 2097'FWL, SEC.33	6690.0	-7195.1	744.3	Point



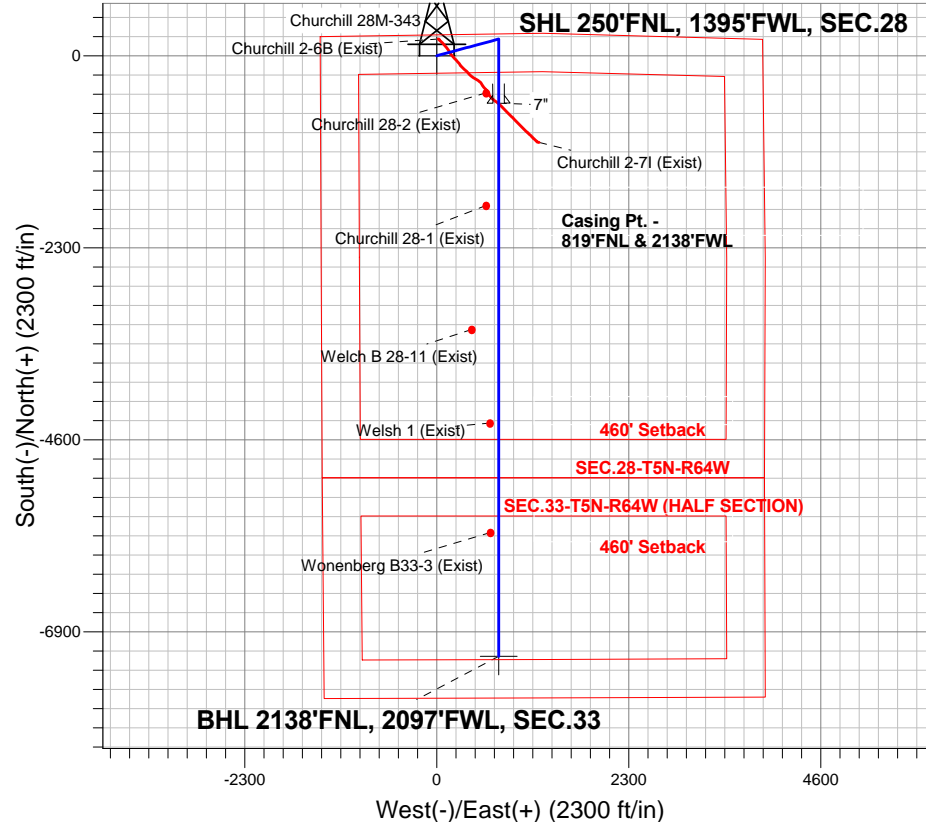
Azimuths to True North
 Magnetic North: 8.39°

Magnetic Field
 Strength: 52861.9nT
 Dip Angle: 66.97°
 Date: 2/11/2014
 Model: IGRF2010

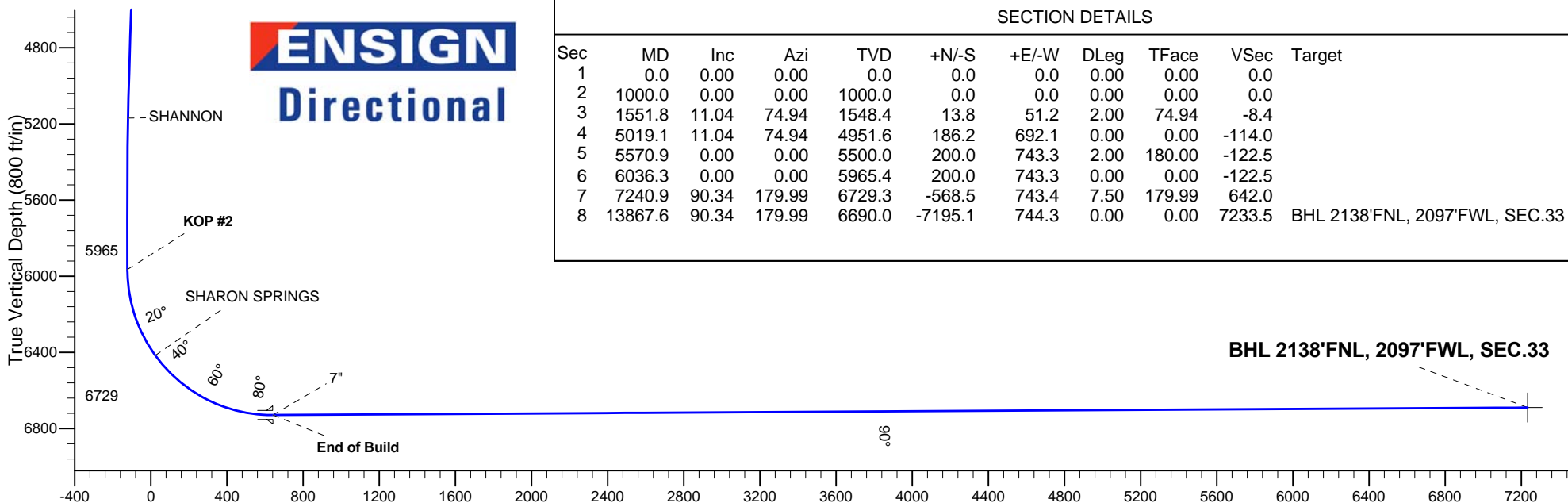
ANNOTATIONS

TVD	MD	Annotation
1000.0	1000.0	KOP #1
5965.4	6036.3	KOP #2
6729.3	7240.9	End of Build

Churchill 28J-HZ Pad Sec.28-T5N-R64W
 Churchill 28M-343
 Plan #2 (2-11-14)
 6:46, February 12 2014



ENSIGN
 Directional



SECTION DETAILS

Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	DLeg	TFace	VSec	Target
1	0.0	0.00	0.00	0.0	0.0	0.0	0.00	0.00	0.0	
2	1000.0	0.00	0.00	1000.0	0.0	0.0	0.00	0.00	0.0	
3	1551.8	11.04	74.94	1548.4	13.8	51.2	2.00	74.94	-8.4	
4	5019.1	11.04	74.94	4951.6	186.2	692.1	0.00	0.00	-114.0	
5	5570.9	0.00	0.00	5500.0	200.0	743.3	2.00	180.00	-122.5	
6	6036.3	0.00	0.00	5965.4	200.0	743.3	0.00	0.00	-122.5	
7	7240.9	90.34	179.99	6729.3	-568.5	743.4	7.50	179.99	642.0	
8	13867.6	90.34	179.99	6690.0	-7195.1	744.3	0.00	0.00	7233.5	BHL 2138'FNL, 2097'FWL, SEC.33

BHL 2138'FNL, 2097'FWL, SEC.33

Vertical Section at 174.09° (800 ft/in)



Directional

PETROLEUM DEVELOPMENT CORP Weld County CO

SEC.28-T5N-R64W

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

Churchill 28M-343

Wellbore #1

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

Standard Planning Report

12 February, 2014

Database:	Landmark	Local Co-ordinate Reference:	Well Churchill 28M-343
Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	TVD Reference:	WELL @ 4648.0ft (Original Well Elev)
Project:	SEC.28-T5N-R64W	MD Reference:	WELL @ 4648.0ft (Original Well Elev)
Site:	Churchill 28J-HZ Pad Sec.28-T5N-R64W	North Reference:	True
Well:	Churchill 28M-343	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 28M-343					
Well Position	+N/-S	3.6 ft	Northing:	1,381,538.98 ft	Latitude:	40.376910
	+E/-W	181.1 ft	Easting:	3,262,084.58 ft	Longitude:	-104.559280
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	2/11/2014	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	174.09

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	
1,000.0	0.00	0.00	1,000.0	0.0	0.0	0.00	0.00	0.00	0.00	
1,551.8	11.04	74.94	1,548.4	13.8	51.2	2.00	2.00	0.00	74.94	
5,019.1	11.04	74.94	4,951.6	186.2	692.1	0.00	0.00	0.00	0.00	
5,570.9	0.00	0.00	5,500.0	200.0	743.3	2.00	-2.00	0.00	180.00	
6,036.3	0.00	0.00	5,965.4	200.0	743.3	0.00	0.00	0.00	0.00	
7,240.9	90.34	179.99	6,729.3	-568.5	743.4	7.50	7.50	0.00	179.99	
13,867.6	90.34	179.99	6,690.0	-7,195.1	744.3	0.00	0.00	0.00	0.00	BHL 2138°FNL, 209

Database:	Landmark	Local Co-ordinate Reference:	Well Churchill 28M-343
Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	TVD Reference:	WELL @ 4648.0ft (Original Well Elev)
Project:	SEC.28-T5N-R64W	MD Reference:	WELL @ 4648.0ft (Original Well Elev)
Site:	Churchill 28J-HZ Pad Sec.28-T5N-R64W	North Reference:	True
Well:	Churchill 28M-343	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, 1395'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
KOP #1									
1,100.0	2.00	74.94	1,100.0	0.5	1.7	-0.3	2.00	2.00	0.00
1,200.0	4.00	74.94	1,199.8	1.8	6.7	-1.1	2.00	2.00	0.00
1,300.0	6.00	74.94	1,299.5	4.1	15.2	-2.5	2.00	2.00	0.00
1,400.0	8.00	74.94	1,398.7	7.2	26.9	-4.4	2.00	2.00	0.00
1,500.0	10.00	74.94	1,497.5	11.3	42.0	-6.9	2.00	2.00	0.00
1,551.8	11.04	74.94	1,548.4	13.8	51.2	-8.4	2.00	2.00	0.00
1,600.0	11.04	74.94	1,595.7	16.2	60.1	-9.9	0.00	0.00	0.00
1,700.0	11.04	74.94	1,693.9	21.1	78.6	-12.9	0.00	0.00	0.00
1,800.0	11.04	74.94	1,792.0	26.1	97.0	-16.0	0.00	0.00	0.00
1,900.0	11.04	74.94	1,890.2	31.1	115.5	-19.0	0.00	0.00	0.00
2,000.0	11.04	74.94	1,988.3	36.1	134.0	-22.1	0.00	0.00	0.00
2,100.0	11.04	74.94	2,086.5	41.0	152.5	-25.1	0.00	0.00	0.00
2,200.0	11.04	74.94	2,184.6	46.0	171.0	-28.2	0.00	0.00	0.00
2,300.0	11.04	74.94	2,282.8	51.0	189.5	-31.2	0.00	0.00	0.00
2,400.0	11.04	74.94	2,380.9	56.0	208.0	-34.3	0.00	0.00	0.00
2,500.0	11.04	74.94	2,479.1	60.9	226.4	-37.3	0.00	0.00	0.00
2,600.0	11.04	74.94	2,577.2	65.9	244.9	-40.4	0.00	0.00	0.00
2,700.0	11.04	74.94	2,675.4	70.9	263.4	-43.4	0.00	0.00	0.00
2,800.0	11.04	74.94	2,773.5	75.9	281.9	-46.4	0.00	0.00	0.00
2,900.0	11.04	74.94	2,871.7	80.8	300.4	-49.5	0.00	0.00	0.00
3,000.0	11.04	74.94	2,969.8	85.8	318.9	-52.5	0.00	0.00	0.00
3,100.0	11.04	74.94	3,068.0	90.8	337.4	-55.6	0.00	0.00	0.00
3,200.0	11.04	74.94	3,166.1	95.7	355.8	-58.6	0.00	0.00	0.00
3,300.0	11.04	74.94	3,264.3	100.7	374.3	-61.7	0.00	0.00	0.00
3,400.0	11.04	74.94	3,362.4	105.7	392.8	-64.7	0.00	0.00	0.00
3,500.0	11.04	74.94	3,460.6	110.7	411.3	-67.8	0.00	0.00	0.00
3,591.1	11.04	74.94	3,550.0	115.2	428.2	-70.5	0.00	0.00	0.00
PARKMAN									
3,600.0	11.04	74.94	3,558.7	115.6	429.8	-70.8	0.00	0.00	0.00
3,700.0	11.04	74.94	3,656.9	120.6	448.3	-73.9	0.00	0.00	0.00
3,800.0	11.04	74.94	3,755.0	125.6	466.8	-76.9	0.00	0.00	0.00
3,900.0	11.04	74.94	3,853.2	130.6	485.3	-79.9	0.00	0.00	0.00
4,000.0	11.04	74.94	3,951.3	135.5	503.7	-83.0	0.00	0.00	0.00
4,100.0	11.04	74.94	4,049.5	140.5	522.2	-86.0	0.00	0.00	0.00
4,200.0	11.04	74.94	4,147.6	145.5	540.7	-89.1	0.00	0.00	0.00
4,217.7	11.04	74.94	4,165.0	146.4	544.0	-89.6	0.00	0.00	0.00
SUSSEX									
4,300.0	11.04	74.94	4,245.8	150.5	559.2	-92.1	0.00	0.00	0.00
4,400.0	11.04	74.94	4,343.9	155.4	577.7	-95.2	0.00	0.00	0.00

Database:	Landmark	Local Co-ordinate Reference:	Well Churchill 28M-343
Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	TVD Reference:	WELL @ 4648.0ft (Original Well Elev)
Project:	SEC.28-T5N-R64W	MD Reference:	WELL @ 4648.0ft (Original Well Elev)
Site:	Churchill 28J-HZ Pad Sec.28-T5N-R64W	North Reference:	True
Well:	Churchill 28M-343	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	11.04	74.94	4,442.1	160.4	596.2	-98.2	0.00	0.00	0.00
4,600.0	11.04	74.94	4,540.2	165.4	614.7	-101.3	0.00	0.00	0.00
4,700.0	11.04	74.94	4,638.4	170.4	633.1	-104.3	0.00	0.00	0.00
4,800.0	11.04	74.94	4,736.5	175.3	651.6	-107.4	0.00	0.00	0.00
4,900.0	11.04	74.94	4,834.7	180.3	670.1	-110.4	0.00	0.00	0.00
5,000.0	11.04	74.94	4,932.8	185.3	688.6	-113.4	0.00	0.00	0.00
5,019.1	11.04	74.94	4,951.6	186.2	692.1	-114.0	0.00	0.00	0.00
5,100.0	9.42	74.94	5,031.2	190.0	706.0	-116.3	2.00	-2.00	0.00
5,200.0	7.42	74.94	5,130.1	193.8	720.1	-118.6	2.00	-2.00	0.00
5,240.2	6.61	74.94	5,170.0	195.0	724.9	-119.4	2.00	-2.00	0.00
SHANNON									
5,300.0	5.42	74.94	5,229.5	196.7	730.9	-120.4	2.00	-2.00	0.00
5,400.0	3.42	74.94	5,329.2	198.7	738.4	-121.6	2.00	-2.00	0.00
5,500.0	1.42	74.94	5,429.1	199.8	742.5	-122.3	2.00	-2.00	0.00
5,570.9	0.00	0.00	5,500.0	200.0	743.3	-122.5	2.00	-2.00	0.00
5,600.0	0.00	0.00	5,529.1	200.0	743.3	-122.5	0.00	0.00	0.00
5,700.0	0.00	0.00	5,629.1	200.0	743.3	-122.5	0.00	0.00	0.00
5,800.0	0.00	0.00	5,729.1	200.0	743.3	-122.5	0.00	0.00	0.00
5,900.0	0.00	0.00	5,829.1	200.0	743.3	-122.5	0.00	0.00	0.00
6,000.0	0.00	0.00	5,929.1	200.0	743.3	-122.5	0.00	0.00	0.00
6,036.3	0.00	0.00	5,965.4	200.0	743.3	-122.5	0.00	0.00	0.00
KOP #2									
6,100.0	4.78	179.99	6,029.0	197.3	743.3	-119.8	7.50	7.50	0.00
6,200.0	12.28	179.99	6,127.8	182.5	743.3	-105.1	7.50	7.50	0.00
6,300.0	19.78	179.99	6,223.9	154.9	743.3	-77.6	7.50	7.50	0.00
6,400.0	27.27	179.99	6,315.5	115.1	743.3	-38.0	7.50	7.50	0.00
6,500.0	34.77	179.99	6,401.1	63.6	743.3	13.3	7.50	7.50	0.00
6,518.3	36.15	179.99	6,416.0	53.0	743.3	23.8	7.50	7.50	0.00
SHARON SPRINGS									
6,600.0	42.27	179.99	6,479.3	1.3	743.3	75.2	7.50	7.50	0.00
6,700.0	49.77	179.99	6,548.7	-70.6	743.3	146.7	7.50	7.50	0.00
6,800.0	57.27	179.99	6,608.1	-151.0	743.3	226.6	7.50	7.50	0.00
6,900.0	64.77	179.99	6,656.5	-238.4	743.4	313.6	7.50	7.50	0.00
7,000.0	72.27	179.99	6,693.1	-331.4	743.4	406.1	7.50	7.50	0.00
7,100.0	79.77	179.99	6,717.2	-428.3	743.4	502.6	7.50	7.50	0.00
7,200.0	87.27	179.99	6,728.5	-527.6	743.4	601.3	7.50	7.50	0.00
7,240.9	90.34	179.99	6,729.3	-568.5	743.4	642.0	7.49	7.49	0.00
End of Build - 7"									
7,300.0	90.34	179.99	6,729.0	-627.6	743.4	700.8	0.00	0.00	0.00
7,400.0	90.34	179.99	6,728.4	-727.6	743.4	800.2	0.00	0.00	0.00
7,500.0	90.34	179.99	6,727.8	-827.6	743.4	899.7	0.00	0.00	0.00
7,600.0	90.34	179.99	6,727.2	-927.6	743.5	999.2	0.00	0.00	0.00
7,700.0	90.34	179.99	6,726.6	-1,027.6	743.5	1,098.6	0.00	0.00	0.00
7,800.0	90.34	179.99	6,726.0	-1,127.6	743.5	1,198.1	0.00	0.00	0.00
7,900.0	90.34	179.99	6,725.4	-1,227.6	743.5	1,297.6	0.00	0.00	0.00
8,000.0	90.34	179.99	6,724.8	-1,327.6	743.5	1,397.1	0.00	0.00	0.00
8,100.0	90.34	179.99	6,724.2	-1,427.6	743.5	1,496.5	0.00	0.00	0.00
8,200.0	90.34	179.99	6,723.6	-1,527.6	743.5	1,596.0	0.00	0.00	0.00
8,300.0	90.34	179.99	6,723.0	-1,627.6	743.5	1,695.5	0.00	0.00	0.00
8,400.0	90.34	179.99	6,722.4	-1,727.6	743.6	1,794.9	0.00	0.00	0.00
8,500.0	90.34	179.99	6,721.9	-1,827.6	743.6	1,894.4	0.00	0.00	0.00
8,600.0	90.34	179.99	6,721.3	-1,927.6	743.6	1,993.9	0.00	0.00	0.00

Database:	Landmark	Local Co-ordinate Reference:	Well Churchill 28M-343
Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	TVD Reference:	WELL @ 4648.0ft (Original Well Elev)
Project:	SEC.28-T5N-R64W	MD Reference:	WELL @ 4648.0ft (Original Well Elev)
Site:	Churchill 28J-HZ Pad Sec.28-T5N-R64W	North Reference:	True
Well:	Churchill 28M-343	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)
8,700.0	90.34	179.99	6,720.7	-2,027.6	743.6	2,093.3	0.00	0.00	0.00
8,800.0	90.34	179.99	6,720.1	-2,127.6	743.6	2,192.8	0.00	0.00	0.00
8,900.0	90.34	179.99	6,719.5	-2,227.6	743.6	2,292.3	0.00	0.00	0.00
9,000.0	90.34	179.99	6,718.9	-2,327.6	743.6	2,391.7	0.00	0.00	0.00
9,100.0	90.34	179.99	6,718.3	-2,427.6	743.7	2,491.2	0.00	0.00	0.00
9,200.0	90.34	179.99	6,717.7	-2,527.6	743.7	2,590.7	0.00	0.00	0.00
9,300.0	90.34	179.99	6,717.1	-2,627.6	743.7	2,690.1	0.00	0.00	0.00
9,400.0	90.34	179.99	6,716.5	-2,727.6	743.7	2,789.6	0.00	0.00	0.00
9,500.0	90.34	179.99	6,715.9	-2,827.6	743.7	2,889.1	0.00	0.00	0.00
9,600.0	90.34	179.99	6,715.3	-2,927.6	743.7	2,988.6	0.00	0.00	0.00
9,700.0	90.34	179.99	6,714.7	-3,027.6	743.7	3,088.0	0.00	0.00	0.00
9,800.0	90.34	179.99	6,714.1	-3,127.6	743.7	3,187.5	0.00	0.00	0.00
9,900.0	90.34	179.99	6,713.5	-3,227.6	743.8	3,287.0	0.00	0.00	0.00
10,000.0	90.34	179.99	6,713.0	-3,327.6	743.8	3,386.4	0.00	0.00	0.00
10,100.0	90.34	179.99	6,712.4	-3,427.6	743.8	3,485.9	0.00	0.00	0.00
10,200.0	90.34	179.99	6,711.8	-3,527.6	743.8	3,585.4	0.00	0.00	0.00
10,300.0	90.34	179.99	6,711.2	-3,627.6	743.8	3,684.8	0.00	0.00	0.00
10,400.0	90.34	179.99	6,710.6	-3,727.6	743.8	3,784.3	0.00	0.00	0.00
10,500.0	90.34	179.99	6,710.0	-3,827.6	743.8	3,883.8	0.00	0.00	0.00
10,600.0	90.34	179.99	6,709.4	-3,927.6	743.9	3,983.2	0.00	0.00	0.00
10,700.0	90.34	179.99	6,708.8	-4,027.5	743.9	4,082.7	0.00	0.00	0.00
10,800.0	90.34	179.99	6,708.2	-4,127.5	743.9	4,182.2	0.00	0.00	0.00
10,900.0	90.34	179.99	6,707.6	-4,227.5	743.9	4,281.7	0.00	0.00	0.00
11,000.0	90.34	179.99	6,707.0	-4,327.5	743.9	4,381.1	0.00	0.00	0.00
11,100.0	90.34	179.99	6,706.4	-4,427.5	743.9	4,480.6	0.00	0.00	0.00
11,200.0	90.34	179.99	6,705.8	-4,527.5	743.9	4,580.1	0.00	0.00	0.00
11,300.0	90.34	179.99	6,705.2	-4,627.5	744.0	4,679.5	0.00	0.00	0.00
11,400.0	90.34	179.99	6,704.6	-4,727.5	744.0	4,779.0	0.00	0.00	0.00
11,500.0	90.34	179.99	6,704.0	-4,827.5	744.0	4,878.5	0.00	0.00	0.00
11,600.0	90.34	179.99	6,703.5	-4,927.5	744.0	4,977.9	0.00	0.00	0.00
11,700.0	90.34	179.99	6,702.9	-5,027.5	744.0	5,077.4	0.00	0.00	0.00
11,800.0	90.34	179.99	6,702.3	-5,127.5	744.0	5,176.9	0.00	0.00	0.00
11,900.0	90.34	179.99	6,701.7	-5,227.5	744.0	5,276.3	0.00	0.00	0.00
12,000.0	90.34	179.99	6,701.1	-5,327.5	744.0	5,375.8	0.00	0.00	0.00
12,100.0	90.34	179.99	6,700.5	-5,427.5	744.1	5,475.3	0.00	0.00	0.00
12,200.0	90.34	179.99	6,699.9	-5,527.5	744.1	5,574.7	0.00	0.00	0.00
12,300.0	90.34	179.99	6,699.3	-5,627.5	744.1	5,674.2	0.00	0.00	0.00
12,400.0	90.34	179.99	6,698.7	-5,727.5	744.1	5,773.7	0.00	0.00	0.00
12,500.0	90.34	179.99	6,698.1	-5,827.5	744.1	5,873.2	0.00	0.00	0.00
12,600.0	90.34	179.99	6,697.5	-5,927.5	744.1	5,972.6	0.00	0.00	0.00
12,700.0	90.34	179.99	6,696.9	-6,027.5	744.1	6,072.1	0.00	0.00	0.00
12,800.0	90.34	179.99	6,696.3	-6,127.5	744.2	6,171.6	0.00	0.00	0.00
12,900.0	90.34	179.99	6,695.7	-6,227.5	744.2	6,271.0	0.00	0.00	0.00
13,000.0	90.34	179.99	6,695.1	-6,327.5	744.2	6,370.5	0.00	0.00	0.00
13,100.0	90.34	179.99	6,694.6	-6,427.5	744.2	6,470.0	0.00	0.00	0.00
13,200.0	90.34	179.99	6,694.0	-6,527.5	744.2	6,569.4	0.00	0.00	0.00
13,300.0	90.34	179.99	6,693.4	-6,627.5	744.2	6,668.9	0.00	0.00	0.00
13,400.0	90.34	179.99	6,692.8	-6,727.5	744.2	6,768.4	0.00	0.00	0.00
13,500.0	90.34	179.99	6,692.2	-6,827.5	744.3	6,867.8	0.00	0.00	0.00
13,600.0	90.34	179.99	6,691.6	-6,927.5	744.3	6,967.3	0.00	0.00	0.00
13,700.0	90.34	179.99	6,691.0	-7,027.5	744.3	7,066.8	0.00	0.00	0.00
13,800.0	90.34	179.99	6,690.4	-7,127.5	744.3	7,166.2	0.00	0.00	0.00
13,867.6	90.34	179.99	6,690.0	-7,195.1	744.3	7,233.5	0.00	0.00	0.00

Database:	Landmark	Local Co-ordinate Reference:	Well Churchill 28M-343
Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	TVD Reference:	WELL @ 4648.0ft (Original Well Elev)
Project:	SEC.28-T5N-R64W	MD Reference:	WELL @ 4648.0ft (Original Well Elev)
Site:	Churchill 28J-HZ Pad Sec.28-T5N-R64W	North Reference:	True
Well:	Churchill 28M-343	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)
BHL 2138'FNL, 2097'FWL, SEC.33									

Targets

Target Name - hit/miss target - Shape	Dip Angle (°)	Dip Dir. (°)	TVD (ft)	+N/-S (ft)	+E/-W (ft)	Northing (ft)	Easting (ft)	Latitude	Longitude
SHL 250'FNL, 1395'F - plan hits target center - Point	0.00	0.00	1.0	0.0	0.0	1,381,538.99	3,262,084.58	40.376910	-104.559280
BHL 2138'FNL, 2097'F - plan hits target center - Point	0.00	0.00	6,690.0	-7,195.1	744.3	1,374,352.49	3,262,905.13	40.357160	-104.556609

Casing Points

Measured Depth (ft)	Vertical Depth (ft)	Name	Casing Diameter (")	Hole Diameter (")
7,240.9	6,729.3	7"	7	7-1/2

Formations

Measured Depth (ft)	Vertical Depth (ft)	Name	Lithology	Dip (°)	Dip Direction (°)
3,591.1	3,550.0	PARKMAN			
4,217.7	4,165.0	SUSSEX			
5,240.2	5,170.0	SHANNON			
6,518.3	6,416.0	SHARON SPRINGS			

Plan Annotations

Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates +N/-S (ft)	+E/-W (ft)	Comment
1,000.0	1,000.0	0.0	0.0	KOP #1
6,036.3	5,965.4	200.0	743.3	KOP #2
7,240.9	6,729.3	-568.5	743.4	End of Build



Directional

PETROLEUM DEVELOPMENT CORP Weld County CO

SEC.28-T5N-R64W

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

Churchill 28M-343

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 28M-343
Project:	SEC.28-T5N-R64W	TVD Reference:	WELL @ 4648.0ft (Original Well Elev)
Reference Site:	Churchill 28J-HZ Pad Sec.28-T5N-R64W	MD Reference:	WELL @ 4648.0ft (Original Well Elev)
Site Error:	0.0ft	North Reference:	True
Reference Well:	Churchill 28M-343	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	13,867.6	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)	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	181.1	180.6	344.439	CC
Churchill 28E-203 - Wellbore #1 - Plan #1 (1-22-14)	200.0	200.0	181.1	180.5	268.648	ES
Churchill 28E-203 - Wellbore #1 - Plan #1 (1-22-14)	1,000.0	947.4	282.1	277.3	58.501	SF
Churchill 28E-423 - Wellbore #1 - Plan #1 (1-22-14)	366.0	368.0	150.5	149.1	105.615	CC
Churchill 28E-423 - Wellbore #1 - Plan #1 (1-22-14)	400.0	400.0	150.5	148.9	95.662	ES
Churchill 28E-423 - Wellbore #1 - Plan #1 (1-22-14)	1,000.0	972.9	206.6	202.2	46.731	SF
Churchill 28J-203 - Wellbore #1 - Plan #2 (2-11-14)	1,000.0	1,001.0	61.3	57.0	14.346	CC, ES
Churchill 28J-203 - Wellbore #1 - Plan #2 (2-11-14)	13,867.6	13,537.7	649.2	372.2	2.344	SF
Churchill 28J-343 - Wellbore #1 - Plan #2 (2-11-14)	566.0	568.0	119.8	117.5	51.551	CC
Churchill 28J-343 - Wellbore #1 - Plan #2 (2-11-14)	600.0	601.9	119.8	117.3	48.374	ES
Churchill 28J-343 - Wellbore #1 - Plan #2 (2-11-14)	1,200.0	1,190.8	162.6	157.5	31.855	SF
Churchill 28J-423 - Wellbore #1 - Plan #2 (2-11-14)	1,000.0	1,000.0	30.6	26.4	7.177	CC, ES
Churchill 28J-423 - Wellbore #1 - Plan #2 (2-11-14)	13,867.6	13,895.2	439.2	167.4	1.616	SF
Churchill 28J-443 - Wellbore #1 - Plan #1 (1-22-14)	766.3	767.3	89.2	85.9	27.668	CC
Churchill 28J-443 - Wellbore #1 - Plan #1 (1-22-14)	800.0	800.0	89.2	85.8	26.446	ES
Churchill 28J-443 - Wellbore #1 - Plan #1 (1-22-14)	1,100.0	1,096.6	100.4	95.7	21.396	SF
Churchill 28M-443 - Wellbore #1 - Plan #1 (1-22-14)	400.0	399.0	30.6	29.1	19.507	CC, ES
Churchill 28M-443 - Wellbore #1 - Plan #1 (1-22-14)	13,867.6	13,973.0	312.0	51.8	1.199	Level 2, SF
Existing Wells - Churchill 28J-HZ Sec.28-T5N-R64W						
Bailey 33-1 (Exist) - Wellbore #1 - Wellbore #1	13,718.2	6,729.9	131.1	-140.1	0.483	Level 1, CC, ES, SF
Churchill 2-6B (Exist) - Wellbore #1 - Wellbore #1	3,386.9	3,392.1	271.7	254.2	15.548	CC
Churchill 2-6B (Exist) - Wellbore #1 - Wellbore #1	3,400.0	3,404.2	271.7	254.2	15.496	ES
Churchill 2-6B (Exist) - Wellbore #1 - Wellbore #1	3,500.0	3,498.5	274.5	256.6	15.282	SF
Churchill 2-7I (Exist) - Wellbore #1 - Wellbore #1	7,710.7	6,765.4	476.6	433.3	11.015	CC, ES
Churchill 2-7I (Exist) - Wellbore #1 - Wellbore #1	7,800.0	6,765.6	484.9	440.2	10.858	SF
Churchill 28-1 (Exist) - Wellbore #1 - Wellbore #1	8,464.8	6,724.1	150.1	-22.5	0.870	Level 1, CC, ES, SF
Churchill 28-2 (Exist) - Wellbore #1 - Wellbore #1	7,116.3	6,700.9	149.9	-1.8	0.988	Level 1, CC, ES, SF
Welch B 28-11 (Exist) - Wellbore #1 - Wellbore #1	9,951.2	6,706.2	323.0	123.6	1.620	CC, ES, SF
Welsh 1 (Exist) - Wellbore #1 - Wellbore #1	11,073.3	6,706.6	103.0	-117.5	0.467	Level 1, CC, ES, SF
Wonenberg B33-3 (Exist) - Wellbore #1 - Wellbore #1	12,384.8	6,714.8	100.3	-145.2	0.409	Level 1, CC, ES, SF

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Churchill 28M-343
Project:	SEC.28-T5N-R64W	TVD Reference:	WELL @ 4648.0ft (Original Well Elev)
Reference Site:	Churchill 28J-HZ Pad Sec.28-T5N-R64W	MD Reference:	WELL @ 4648.0ft (Original Well Elev)
Site Error:	0.0ft	North Reference:	True
Reference Well:	Churchill 28M-343	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)	Vertical Offset Depth (ft)	Reference (ft)	Offset (ft)	Semi Major Axis Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
0.0	0.0	2.0	2.0	0.0	0.0	-91.15	-3.6	-181.1	181.1	181.1	0.00	N/A	
100.0	100.0	102.0	102.0	0.1	0.1	-91.15	-3.6	-181.1	181.1	180.9	0.23	790.093	
166.0	166.0	168.0	168.0	0.3	0.3	-91.15	-3.6	-181.1	181.1	180.6	0.53	344.439 CC	
200.0	200.0	200.0	200.0	0.3	0.3	-91.15	-3.6	-181.1	181.1	180.5	0.67	268.648 ES	
300.0	300.0	296.0	296.0	0.6	0.5	-91.05	-3.3	-182.7	182.8	181.7	1.11	165.106	
400.0	400.0	389.9	389.8	0.8	0.8	-90.77	-2.5	-187.3	187.7	186.2	1.54	121.642	
500.0	500.0	483.5	483.0	1.0	1.0	-90.33	-1.1	-194.9	195.8	193.8	2.00	97.868	
600.0	600.0	576.4	575.3	1.2	1.3	-89.78	0.8	-205.4	207.1	204.6	2.49	83.298	
700.0	700.0	668.5	666.4	1.5	1.6	-89.15	3.2	-218.7	221.6	218.6	3.01	73.685	
800.0	800.0	759.6	756.1	1.7	1.9	-88.50	6.1	-234.7	239.2	235.7	3.57	67.077	
900.0	900.0	850.0	844.4	1.9	2.3	-87.84	9.5	-253.3	260.0	255.8	4.16	62.485	
1,000.0	1,000.0	947.4	939.4	2.1	2.7	-87.19	13.5	-274.8	282.1	277.3	4.82	58.501 SF	
1,100.0	1,100.0	1,044.5	1,034.0	2.4	3.2	-161.53	17.4	-296.1	305.9	301.2	4.74	64.544	
1,200.0	1,199.8	1,140.8	1,127.9	2.6	3.6	-161.17	21.2	-317.3	333.0	327.8	5.19	64.194	
1,300.0	1,299.5	1,236.1	1,220.8	2.8	4.1	-161.00	25.1	-338.3	363.2	357.5	5.63	64.538	
1,400.0	1,398.7	1,330.4	1,312.7	3.0	4.5	-160.97	28.9	-359.0	396.5	390.4	6.06	65.391	
1,500.0	1,497.5	1,423.5	1,403.4	3.3	5.0	-161.04	32.6	-379.5	432.9	426.4	6.49	66.689	
1,551.8	1,548.4	1,471.3	1,450.0	3.5	5.2	-161.11	34.5	-390.0	453.0	446.3	6.71	67.496	
1,600.0	1,595.7	1,515.5	1,493.0	3.6	5.4	-161.31	36.3	-399.8	472.0	465.1	6.93	68.098	
1,700.0	1,693.9	1,607.3	1,582.5	4.0	5.8	-161.67	40.0	-420.0	511.6	504.2	7.40	69.175	
1,800.0	1,792.0	1,699.1	1,672.0	4.3	6.3	-161.98	43.7	-440.2	551.2	543.3	7.87	70.065	
1,900.0	1,890.2	1,790.9	1,761.4	4.7	6.7	-162.25	47.4	-460.4	590.8	582.4	8.34	70.808	
2,000.0	1,988.3	1,882.7	1,850.9	5.0	7.2	-162.49	51.0	-480.6	630.4	621.6	8.82	71.435	
2,100.0	2,086.5	1,974.4	1,940.4	5.4	7.6	-162.70	54.7	-500.8	670.0	660.7	9.31	71.968	
2,200.0	2,184.6	2,066.2	2,029.9	5.8	8.1	-162.88	58.4	-521.0	709.6	699.8	9.80	72.426	
2,300.0	2,282.8	2,158.0	2,119.3	6.2	8.5	-163.05	62.1	-541.2	749.2	738.9	10.29	72.821	
2,400.0	2,380.9	2,249.8	2,208.8	6.6	9.0	-163.19	65.8	-561.4	788.9	778.1	10.78	73.165	
2,500.0	2,479.1	2,341.6	2,298.3	7.0	9.4	-163.33	69.5	-581.6	828.5	817.2	11.28	73.465	
2,600.0	2,577.2	2,433.4	2,387.7	7.4	9.9	-163.45	73.2	-601.8	868.1	856.4	11.77	73.730	
2,700.0	2,675.4	2,525.2	2,477.2	7.8	10.3	-163.56	76.9	-622.0	907.8	895.5	12.27	73.964	
2,800.0	2,773.5	2,617.0	2,566.7	8.2	10.8	-163.66	80.6	-642.2	947.4	934.6	12.77	74.172	
2,900.0	2,871.7	2,708.8	2,656.1	8.6	11.2	-163.76	84.2	-662.4	987.1	973.8	13.27	74.357	

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Churchill 28M-343
Project:	SEC.28-T5N-R64W	TVD Reference:	WELL @ 4648.0ft (Original Well Elev)
Reference Site:	Churchill 28J-HZ Pad Sec.28-T5N-R64W	MD Reference:	WELL @ 4648.0ft (Original Well Elev)
Site Error:	0.0ft	North Reference:	True
Reference Well:	Churchill 28M-343	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 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	2.0	2.0	0.0	0.0	-91.39	-3.6	-150.5	150.5	150.5	0.00	N/A		
100.0	100.0	102.0	102.0	0.1	0.1	-91.39	-3.6	-150.5	150.5	150.3	0.23	656.445		
200.0	200.0	202.0	202.0	0.3	0.3	-91.39	-3.6	-150.5	150.5	149.8	0.68	221.713		
300.0	300.0	302.0	302.0	0.6	0.6	-91.39	-3.6	-150.5	150.5	149.4	1.13	133.381		
366.0	366.0	368.0	368.0	0.7	0.7	-91.39	-3.6	-150.5	150.5	149.1	1.42	105.615 CC		
400.0	400.0	400.0	400.0	0.8	0.8	-91.39	-3.6	-150.5	150.5	148.9	1.57	95.662 ES		
500.0	500.0	497.0	497.0	1.0	1.0	-91.22	-3.2	-152.0	152.2	150.2	2.01	75.778		
600.0	600.0	592.0	591.8	1.2	1.2	-90.76	-2.1	-156.7	157.0	154.6	2.44	64.349		
700.0	700.0	686.5	686.0	1.5	1.4	-90.05	-0.1	-164.3	165.1	162.2	2.89	57.128		
800.0	800.0	780.4	779.3	1.7	1.7	-89.18	2.5	-174.9	176.4	173.0	3.37	52.420		
900.0	900.0	874.2	872.1	1.9	2.0	-88.20	5.9	-188.4	190.9	187.0	3.87	49.311		
1,000.0	1,000.0	972.9	969.5	2.1	2.3	-87.25	9.8	-203.8	206.6	202.2	4.42	46.731 SF		
1,100.0	1,100.0	1,071.4	1,066.6	2.4	2.6	-161.41	13.6	-219.1	224.0	219.3	4.68	47.894		
1,200.0	1,199.8	1,169.2	1,163.2	2.6	3.0	-160.97	17.5	-234.3	244.6	239.5	5.11	47.846		
1,300.0	1,299.5	1,266.3	1,259.0	2.8	3.3	-160.81	21.3	-249.4	268.5	263.0	5.55	48.419		
1,400.0	1,398.7	1,362.5	1,354.1	3.0	3.7	-160.85	25.1	-264.4	295.6	289.6	5.97	49.485		
1,500.0	1,497.5	1,457.8	1,448.1	3.3	4.0	-161.04	28.8	-279.2	325.8	319.4	6.40	50.900		
1,551.8	1,548.4	1,506.8	1,496.5	3.5	4.2	-161.18	30.7	-286.9	342.7	336.1	6.62	51.779		
1,600.0	1,595.7	1,552.2	1,541.2	3.6	4.4	-161.42	32.5	-293.9	358.8	352.0	6.84	52.485		
1,700.0	1,693.9	1,646.4	1,634.2	4.0	4.7	-161.86	36.2	-308.6	392.3	385.0	7.29	53.784		
1,800.0	1,792.0	1,740.6	1,727.2	4.3	5.1	-162.22	39.9	-323.2	425.8	418.0	7.76	54.885		
1,900.0	1,890.2	1,834.8	1,820.2	4.7	5.4	-162.54	43.6	-337.9	459.3	451.1	8.23	55.827		
2,000.0	1,988.3	1,929.0	1,913.1	5.0	5.8	-162.81	47.2	-352.6	492.8	484.1	8.70	56.640		
2,100.0	2,086.5	2,023.2	2,006.1	5.4	6.1	-163.04	50.9	-367.2	526.3	517.1	9.18	57.348		
2,200.0	2,184.6	2,117.4	2,099.1	5.8	6.5	-163.25	54.6	-381.9	559.8	550.2	9.66	57.968		
2,300.0	2,282.8	2,211.6	2,192.1	6.2	6.8	-163.44	58.3	-396.5	593.4	583.2	10.14	58.515		
2,400.0	2,380.9	2,305.7	2,285.0	6.6	7.2	-163.60	62.0	-411.2	626.9	616.3	10.63	59.000		
2,500.0	2,479.1	2,399.9	2,378.0	7.0	7.5	-163.75	65.7	-425.9	660.4	649.3	11.11	59.432		
2,600.0	2,577.2	2,494.1	2,471.0	7.4	7.9	-163.88	69.4	-440.5	694.0	682.4	11.60	59.820		
2,700.0	2,675.4	2,588.3	2,564.0	7.8	8.2	-164.01	73.1	-455.2	727.5	715.4	12.09	60.170		
2,800.0	2,773.5	2,682.5	2,656.9	8.2	8.6	-164.12	76.8	-469.8	761.0	748.5	12.58	60.486		
2,900.0	2,871.7	2,776.7	2,749.9	8.6	9.0	-164.22	80.5	-484.5	794.6	781.5	13.07	60.773		
3,000.0	2,969.8	2,870.9	2,842.9	9.1	9.3	-164.31	84.2	-499.2	828.1	814.6	13.57	61.035		
3,100.0	3,068.0	2,965.1	2,935.9	9.5	9.7	-164.40	87.9	-513.8	861.7	847.6	14.06	61.274		
3,200.0	3,166.1	3,059.3	3,028.8	9.9	10.0	-164.48	91.5	-528.5	895.3	880.7	14.56	61.494		
3,300.0	3,264.3	3,153.5	3,121.8	10.3	10.4	-164.55	95.2	-543.2	928.8	913.8	15.05	61.696		
3,400.0	3,362.4	3,247.7	3,214.8	10.7	10.7	-164.62	98.9	-557.8	962.4	946.8	15.55	61.883		
3,500.0	3,460.6	3,341.9	3,307.8	11.1	11.1	-164.68	102.6	-572.5	995.9	979.9	16.05	62.055		

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Churchill 28M-343
Project:	SEC.28-T5N-R64W	TVD Reference:	WELL @ 4648.0ft (Original Well Elev)
Reference Site:	Churchill 28J-HZ Pad Sec.28-T5N-R64W	MD Reference:	WELL @ 4648.0ft (Original Well Elev)
Site Error:	0.0ft	North Reference:	True
Reference Well:	Churchill 28M-343	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 (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	-90.00	0.0	-61.3	61.3	61.3	0.00	N/A		
100.0	100.0	101.0	101.0	0.1	0.1	-90.00	0.0	-61.3	61.3	61.1	0.23	270.009		
200.0	200.0	201.0	201.0	0.3	0.3	-90.00	0.0	-61.3	61.3	60.6	0.68	90.601		
300.0	300.0	301.0	301.0	0.6	0.6	-90.00	0.0	-61.3	61.3	60.2	1.13	54.433		
400.0	400.0	401.0	401.0	0.8	0.8	-90.00	0.0	-61.3	61.3	59.7	1.58	38.903		
500.0	500.0	501.0	501.0	1.0	1.0	-90.00	0.0	-61.3	61.3	59.3	2.03	30.267		
600.0	600.0	601.0	601.0	1.2	1.2	-90.00	0.0	-61.3	61.3	58.8	2.47	24.769		
700.0	700.0	701.0	701.0	1.5	1.5	-90.00	0.0	-61.3	61.3	58.4	2.92	20.962		
800.0	800.0	801.0	801.0	1.7	1.7	-90.00	0.0	-61.3	61.3	57.9	3.37	18.169		
900.0	900.0	901.0	901.0	1.9	1.9	-90.00	0.0	-61.3	61.3	57.5	3.82	16.032		
1,000.0	1,000.0	1,001.0	1,001.0	2.1	2.1	-90.00	0.0	-61.3	61.3	57.0	4.27	14.346 CC, ES		
1,100.0	1,100.0	1,101.0	1,101.0	2.4	2.4	-165.34	0.0	-61.3	63.0	58.3	4.71	13.369		
1,200.0	1,199.8	1,200.8	1,200.8	2.6	2.6	-166.43	0.0	-61.3	68.1	62.9	5.14	13.245		
1,300.0	1,299.5	1,300.5	1,300.5	2.8	2.8	-167.93	0.0	-61.3	76.6	71.0	5.56	13.761		
1,400.0	1,398.7	1,399.7	1,399.7	3.0	3.0	-169.53	0.0	-61.3	88.5	82.5	5.99	14.788		
1,500.0	1,497.5	1,498.5	1,498.5	3.3	3.3	-171.05	0.0	-61.3	103.9	97.5	6.40	16.230		
1,551.8	1,548.4	1,549.4	1,549.4	3.5	3.4	-171.77	0.0	-61.3	113.3	106.7	6.62	17.116		
1,600.0	1,595.7	1,596.7	1,596.7	3.6	3.5	-172.39	0.0	-61.3	122.4	115.6	6.83	17.920		
1,700.0	1,693.9	1,694.9	1,694.9	4.0	3.7	-173.41	0.0	-61.3	141.4	134.2	7.28	19.433		
1,800.0	1,792.0	1,793.0	1,793.0	4.3	3.9	-174.20	0.0	-61.3	160.5	152.7	7.73	20.764		
1,900.0	1,890.2	1,891.2	1,891.2	4.7	4.1	-174.82	0.0	-61.3	179.5	171.4	8.18	21.942		
2,000.0	1,988.3	1,989.3	1,989.3	5.0	4.4	-175.31	0.0	-61.3	198.6	190.0	8.64	22.991		
2,100.0	2,086.5	2,087.5	2,087.5	5.4	4.6	-175.73	0.0	-61.3	217.7	208.6	9.10	23.928		
2,200.0	2,184.6	2,185.6	2,185.6	5.8	4.8	-176.07	0.0	-61.3	236.8	227.2	9.56	24.771		
2,300.0	2,282.8	2,283.8	2,283.8	6.2	5.0	-176.36	0.0	-61.3	255.9	245.9	10.02	25.533		
2,400.0	2,380.9	2,381.9	2,381.9	6.6	5.2	-176.62	0.0	-61.3	275.0	264.5	10.49	26.223		
2,500.0	2,479.1	2,480.1	2,480.1	7.0	5.5	-176.84	0.0	-61.3	294.1	283.2	10.95	26.852		
2,600.0	2,577.2	2,578.2	2,578.2	7.4	5.7	-177.03	0.0	-61.3	313.2	301.8	11.42	27.427		
2,700.0	2,675.4	2,676.4	2,676.4	7.8	5.9	-177.20	0.0	-61.3	332.4	320.5	11.89	27.955		
2,800.0	2,773.5	2,774.5	2,774.5	8.2	6.1	-177.35	0.0	-61.3	351.5	339.1	12.36	28.441		
2,900.0	2,871.7	2,872.7	2,872.7	8.6	6.3	-177.49	0.0	-61.3	370.6	357.8	12.83	28.889		
3,000.0	2,969.8	2,970.8	2,970.8	9.1	6.6	-177.61	0.0	-61.3	389.7	376.4	13.30	29.304		
3,100.0	3,068.0	3,069.0	3,069.0	9.5	6.8	-177.76	0.1	-60.2	407.9	394.1	13.78	29.591		
3,200.0	3,166.1	3,167.1	3,167.1	9.9	7.0	-177.98	0.6	-54.6	422.3	408.1	14.27	29.603		
3,300.0	3,264.3	3,265.3	3,265.3	10.3	7.3	-178.24	1.5	-45.5	433.1	418.4	14.74	29.389		
3,400.0	3,362.4	3,363.4	3,363.4	10.7	7.5	-178.48	2.4	-36.4	443.3	428.1	15.20	29.171		
3,500.0	3,460.6	3,461.6	3,461.6	11.1	7.7	-178.70	3.2	-27.3	453.5	437.8	15.66	28.963		
3,600.0	3,558.7	3,559.7	3,559.7	11.6	7.9	-178.92	4.1	-18.3	463.7	447.5	16.12	28.763		
3,700.0	3,656.9	3,657.9	3,657.9	12.0	8.1	-179.13	4.9	-9.2	473.8	457.3	16.59	28.570		
3,800.0	3,755.0	3,756.0	3,756.0	12.4	8.4	-179.33	5.8	-0.2	484.0	467.0	17.05	28.385		
3,900.0	3,853.2	3,854.2	3,854.2	12.8	8.6	-179.52	6.6	8.9	494.2	476.7	17.52	28.208		
4,000.0	3,951.3	3,952.3	3,952.3	13.3	8.8	-179.71	7.5	18.0	504.4	486.4	17.99	28.037		
4,100.0	4,049.5	4,050.5	4,050.5	13.7	9.1	-179.88	8.3	27.0	514.6	496.2	18.46	27.873		
4,200.0	4,147.6	4,148.6	4,148.6	14.1	9.3	-179.95	9.2	36.1	524.9	505.9	18.94	27.715		
4,300.0	4,245.8	4,246.8	4,246.8	14.5	9.6	-179.78	10.0	45.1	535.1	515.7	19.41	27.563		
4,400.0	4,343.9	4,344.9	4,344.9	14.9	9.8	-179.62	10.9	54.2	545.3	525.4	19.89	27.417		
4,500.0	4,442.1	4,443.1	4,443.1	15.4	10.1	-179.47	11.8	63.3	555.5	535.2	20.37	27.276		
4,600.0	4,540.2	4,541.2	4,541.2	15.8	10.3	-179.33	12.6	72.3	565.7	544.9	20.85	27.140		
4,700.0	4,638.4	4,639.4	4,639.4	16.2	10.6	-179.19	13.5	81.4	576.0	554.7	21.33	27.009		
4,800.0	4,736.5	4,737.5	4,737.5	16.6	10.8	-179.07	14.2	89.3	586.6	564.8	21.78	26.933		
4,900.0	4,834.7	4,835.7	4,835.7	17.1	10.9	-179.00	14.7	94.4	599.7	577.5	22.20	27.013		

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 28M-343
Project:	SEC.28-T5N-R64W	TVD Reference:	WELL @ 4648.0ft (Original Well Elev)
Reference Site:	Churchill 28J-HZ Pad Sec.28-T5N-R64W	MD Reference:	WELL @ 4648.0ft (Original Well Elev)
Site Error:	0.0ft	North Reference:	True
Reference Well:	Churchill 28M-343	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 (°)	Distance		Minimum Separation (ft)	Separation Factor	Warning		
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)		Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)				Between Centres (ft)	Between Ellipses (ft)
5,000.0	4,932.8	4,952.3	4,945.4	17.5	11.1	178.98	15.0	97.1	615.7	593.0	22.62	27.221	
5,019.1	4,951.6	4,967.8	4,960.9	17.6	11.1	178.98	15.0	97.3	619.0	596.3	22.70	27.275	
5,100.0	5,031.2	5,039.1	5,032.2	17.9	11.3	179.00	15.0	97.6	633.1	610.0	23.07	27.445	
5,200.0	5,130.1	5,138.0	5,131.1	18.1	11.5	179.03	15.0	97.6	647.7	624.2	23.51	27.554	
5,300.0	5,229.5	5,237.4	5,230.5	18.4	11.7	179.05	15.0	97.6	658.9	634.9	23.93	27.536	
5,400.0	5,329.2	5,337.1	5,330.2	18.6	11.9	179.06	15.0	97.6	666.6	642.3	24.32	27.412	
5,500.0	5,429.1	5,437.0	5,430.1	18.7	12.1	179.07	15.0	97.6	670.8	646.1	24.67	27.188	
5,570.9	5,500.0	5,507.9	5,501.0	18.8	12.3	-105.99	15.0	97.6	671.7	646.8	24.91	26.966	
5,600.0	5,529.1	5,537.0	5,530.1	18.9	12.3	-105.99	15.0	97.6	671.7	646.7	25.03	26.840	
5,700.0	5,629.1	5,637.0	5,630.1	19.0	12.5	-105.99	15.0	97.6	671.7	646.2	25.44	26.405	
5,800.0	5,729.1	5,737.0	5,730.1	19.1	12.8	-105.99	15.0	97.6	671.7	645.8	25.85	25.983	
5,900.0	5,829.1	5,837.0	5,830.1	19.3	13.0	-105.99	15.0	97.6	671.7	645.4	26.27	25.573	
5,939.1	5,868.1	5,876.1	5,869.1	19.3	13.1	-105.99	15.0	97.6	671.7	645.2	26.43	25.416	
6,000.0	5,929.1	5,928.1	5,921.2	19.4	13.2	-106.06	14.1	97.6	672.0	645.3	26.65	25.215	
6,036.3	5,965.4	5,957.2	5,950.2	19.5	13.2	-106.22	12.2	97.6	672.7	645.9	26.78	25.121	
6,050.0	5,979.1	5,968.2	5,961.1	19.5	13.2	73.69	11.2	97.6	673.0	646.2	26.81	25.098	
6,100.0	6,029.0	6,008.0	6,000.6	19.6	13.3	73.37	6.1	97.6	674.0	647.1	26.93	25.027	
6,150.0	6,078.6	6,050.0	6,041.9	19.6	13.4	73.09	-1.4	97.6	675.0	647.9	27.05	24.953	
6,200.0	6,127.8	6,087.4	6,078.4	19.6	13.4	72.89	-10.0	97.6	675.7	648.5	27.15	24.889	
6,250.0	6,176.3	6,127.0	6,116.4	19.7	13.5	72.74	-21.0	97.6	676.2	648.9	27.24	24.820	
6,300.0	6,223.9	6,166.6	6,153.8	19.7	13.6	72.65	-34.0	97.6	676.5	649.2	27.34	24.747	
6,350.0	6,270.3	6,206.1	6,190.4	19.7	13.7	72.62	-48.8	97.6	676.6	649.2	27.43	24.666	
6,400.0	6,315.5	6,250.0	6,230.1	19.7	13.8	72.64	-67.5	97.6	676.6	649.0	27.54	24.563	
6,450.0	6,359.1	6,285.2	6,261.1	19.7	13.8	72.72	-84.2	97.6	676.3	648.6	27.65	24.458	
6,500.0	6,401.1	6,324.8	6,295.0	19.8	13.9	72.86	-104.6	97.6	675.8	648.0	27.78	24.322	
6,550.0	6,441.2	6,364.5	6,327.9	19.8	14.1	73.06	-126.7	97.6	675.1	647.2	27.94	24.159	
6,600.0	6,479.3	6,400.0	6,356.4	19.8	14.2	73.30	-148.0	97.6	674.3	646.1	28.12	23.980	
6,650.0	6,515.2	6,444.1	6,390.2	19.9	14.3	73.63	-176.2	97.6	673.2	644.8	28.37	23.728	
6,700.0	6,548.7	6,484.0	6,419.5	19.9	14.5	74.00	-203.4	97.6	672.0	643.3	28.65	23.451	
6,750.0	6,579.7	6,524.1	6,447.4	20.0	14.7	74.43	-232.2	97.6	670.6	641.6	28.99	23.130	
6,800.0	6,608.1	6,564.4	6,473.8	20.1	14.9	74.91	-262.6	97.6	669.1	639.7	29.39	22.765	
6,850.0	6,633.7	6,604.9	6,498.8	20.2	15.1	75.45	-294.5	97.6	667.5	637.7	29.86	22.357	
6,900.0	6,656.5	6,645.6	6,522.1	20.4	15.4	76.04	-327.8	97.6	665.8	635.4	30.40	21.904	
6,950.0	6,676.3	6,686.5	6,543.7	20.5	15.7	76.68	-362.6	97.6	664.1	633.1	31.02	21.410	
7,000.0	6,693.1	6,727.8	6,563.6	20.8	16.0	77.37	-398.7	97.6	662.2	630.5	31.71	20.883	
7,050.0	6,706.7	6,769.3	6,581.6	21.0	16.4	78.10	-436.1	97.6	660.4	627.9	32.49	20.328	
7,100.0	6,717.2	6,811.1	6,597.7	21.4	16.8	78.89	-474.7	97.6	658.6	625.2	33.34	19.751	
7,150.0	6,724.5	6,850.0	6,610.7	21.7	17.2	79.66	-511.3	97.6	656.8	622.5	34.23	19.185	
7,200.0	6,728.5	6,895.9	6,623.7	22.1	17.7	80.59	-555.3	97.6	655.0	619.7	35.29	18.560	
7,240.9	6,729.3	6,931.0	6,631.8	22.5	18.1	81.34	-589.5	97.6	653.6	617.4	36.18	18.067	
7,300.0	6,729.0	6,982.7	6,640.9	23.0	18.7	82.15	-640.4	97.6	652.1	614.5	37.59	17.344	
7,400.0	6,728.4	7,072.3	6,648.4	24.1	19.9	82.85	-729.7	97.6	650.9	610.8	40.09	16.235	
7,451.8	6,728.1	7,121.9	6,648.6	24.7	20.6	82.89	-779.2	97.6	650.8	609.4	41.47	15.694	
7,500.0	6,727.8	7,170.1	6,648.4	25.3	21.2	82.91	-827.4	97.6	650.8	608.0	42.80	15.207	
7,600.0	6,727.2	7,270.1	6,648.2	26.5	22.7	82.94	-927.4	97.6	650.8	605.1	45.68	14.247	
7,700.0	6,726.6	7,370.1	6,648.0	27.9	24.2	82.97	-1,027.4	97.6	650.7	602.1	48.69	13.366	
7,800.0	6,726.0	7,470.1	6,647.8	29.3	25.8	83.01	-1,127.4	97.6	650.7	598.9	51.81	12.560	
7,900.0	6,725.4	7,570.1	6,647.5	30.8	27.4	83.04	-1,227.4	97.6	650.7	595.7	55.01	11.828	
8,000.0	6,724.8	7,670.1	6,647.3	32.3	29.0	83.07	-1,327.4	97.6	650.7	592.4	58.30	11.161	
8,100.0	6,724.2	7,770.1	6,647.1	33.9	30.7	83.10	-1,427.4	97.6	650.6	589.0	61.64	10.555	
8,200.0	6,723.6	7,870.1	6,646.9	35.5	32.4	83.13	-1,527.4	97.6	650.6	585.6	65.04	10.003	

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 28M-343
Project:	SEC.28-T5N-R64W	TVD Reference:	WELL @ 4648.0ft (Original Well Elev)
Reference Site:	Churchill 28J-HZ Pad Sec.28-T5N-R64W	MD Reference:	WELL @ 4648.0ft (Original Well Elev)
Site Error:	0.0ft	North Reference:	True
Reference Well:	Churchill 28M-343	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	6,723.0	7,970.1	6,646.6	37.1	34.1	83.17	-1,627.4	97.6	650.6	582.1	68.48	9.500		
8,400.0	6,722.4	8,070.1	6,646.4	38.8	35.9	83.20	-1,727.4	97.6	650.5	578.6	71.96	9.040		
8,500.0	6,721.9	8,170.1	6,646.2	40.4	37.7	83.23	-1,827.4	97.6	650.5	575.0	75.48	8.619		
8,600.0	6,721.3	8,270.1	6,646.0	42.1	39.4	83.26	-1,927.4	97.6	650.5	571.5	79.02	8.232		
8,700.0	6,720.7	8,370.1	6,645.7	43.9	41.2	83.30	-2,027.4	97.6	650.4	567.9	82.59	7.875		
8,800.0	6,720.1	8,470.1	6,645.5	45.6	43.0	83.33	-2,127.4	97.6	650.4	564.2	86.18	7.547		
8,900.0	6,719.5	8,570.1	6,645.3	47.3	44.9	83.36	-2,227.4	97.6	650.4	560.6	89.79	7.243		
9,000.0	6,718.9	8,670.1	6,645.0	49.1	46.7	83.39	-2,327.4	97.6	650.4	556.9	93.42	6.961		
9,100.0	6,718.3	8,770.1	6,644.8	50.9	48.5	83.42	-2,427.4	97.6	650.3	553.3	97.07	6.700		
9,200.0	6,717.7	8,870.1	6,644.6	52.7	50.4	83.46	-2,527.4	97.6	650.3	549.6	100.73	6.456		
9,300.0	6,717.1	8,970.1	6,644.4	54.5	52.2	83.49	-2,627.4	97.6	650.3	545.9	104.40	6.229		
9,400.0	6,716.5	9,070.1	6,644.1	56.3	54.0	83.52	-2,727.4	97.6	650.2	542.2	108.08	6.016		
9,500.0	6,715.9	9,170.1	6,643.9	58.1	55.9	83.55	-2,827.4	97.6	650.2	538.4	111.77	5.817		
9,600.0	6,715.3	9,270.1	6,643.7	59.9	57.8	83.59	-2,927.4	97.6	650.2	534.7	115.47	5.631		
9,700.0	6,714.7	9,370.1	6,643.5	61.7	59.6	83.62	-3,027.4	97.6	650.2	531.0	119.18	5.455		
9,800.0	6,714.1	9,470.1	6,643.2	63.5	61.5	83.65	-3,127.4	97.6	650.1	527.2	122.90	5.290		
9,900.0	6,713.5	9,570.1	6,643.0	65.4	63.4	83.68	-3,227.4	97.6	650.1	523.5	126.62	5.134		
10,000.0	6,713.0	9,670.1	6,642.8	67.2	65.2	83.71	-3,327.4	97.6	650.1	519.7	130.36	4.987		
10,100.0	6,712.4	9,770.1	6,642.5	69.1	67.1	83.75	-3,427.4	97.6	650.1	516.0	134.09	4.848		
10,200.0	6,711.8	9,870.1	6,642.3	70.9	69.0	83.78	-3,527.4	97.6	650.0	512.2	137.83	4.716		
10,300.0	6,711.2	9,970.1	6,642.1	72.8	70.9	83.81	-3,627.4	97.6	650.0	508.4	141.58	4.591		
10,400.0	6,710.6	10,070.1	6,641.9	74.6	72.7	83.84	-3,727.4	97.6	650.0	504.6	145.33	4.472		
10,500.0	6,710.0	10,170.1	6,641.6	76.5	74.6	83.88	-3,827.4	97.6	650.0	500.9	149.09	4.359		
10,600.0	6,709.4	10,270.1	6,641.4	78.3	76.5	83.91	-3,927.4	97.6	649.9	497.1	152.85	4.252		
10,700.0	6,708.8	10,370.1	6,641.2	80.2	78.4	83.94	-4,027.4	97.6	649.9	493.3	156.62	4.150		
10,800.0	6,708.2	10,470.1	6,641.0	82.1	80.3	83.97	-4,127.4	97.6	649.9	489.5	160.38	4.052		
10,900.0	6,707.6	10,570.1	6,640.7	83.9	82.2	84.00	-4,227.4	97.6	649.8	485.7	164.15	3.959		
11,000.0	6,707.0	10,670.1	6,640.5	85.8	84.1	84.04	-4,327.4	97.6	649.8	481.9	167.93	3.870		
11,100.0	6,706.4	10,770.1	6,640.3	87.7	86.0	84.07	-4,427.4	97.6	649.8	478.1	171.71	3.784		
11,200.0	6,705.8	10,870.1	6,640.1	89.6	87.9	84.10	-4,527.4	97.6	649.8	474.3	175.49	3.703		
11,300.0	6,705.2	10,970.1	6,639.8	91.4	89.8	84.13	-4,627.4	97.6	649.8	470.5	179.27	3.624		
11,400.0	6,704.6	11,070.1	6,639.6	93.3	91.6	84.17	-4,727.4	97.6	649.7	466.7	183.05	3.549		
11,500.0	6,704.0	11,170.1	6,639.4	95.2	93.5	84.20	-4,827.4	97.6	649.7	462.9	186.84	3.477		
11,600.0	6,703.5	11,270.1	6,639.1	97.1	95.4	84.23	-4,927.4	97.6	649.7	459.0	190.63	3.408		
11,700.0	6,702.9	11,370.1	6,638.9	99.0	97.3	84.26	-5,027.4	97.6	649.7	455.2	194.42	3.341		
11,800.0	6,702.3	11,470.1	6,638.7	100.8	99.2	84.29	-5,127.4	97.6	649.6	451.4	198.22	3.277		
11,900.0	6,701.7	11,570.1	6,638.5	102.7	101.1	84.33	-5,227.4	97.6	649.6	447.6	202.01	3.216		
12,000.0	6,701.1	11,670.1	6,638.2	104.6	103.0	84.36	-5,327.4	97.6	649.6	443.8	205.81	3.156		
12,100.0	6,700.5	11,770.1	6,638.0	106.5	104.9	84.39	-5,427.4	97.6	649.6	440.0	209.61	3.099		
12,200.0	6,699.9	11,870.1	6,637.8	108.4	106.9	84.42	-5,527.4	97.6	649.5	436.1	213.41	3.044		
12,300.0	6,699.3	11,970.1	6,637.6	110.3	108.8	84.46	-5,627.4	97.6	649.5	432.3	217.21	2.990		
12,400.0	6,698.7	12,070.1	6,637.3	112.2	110.7	84.49	-5,727.4	97.6	649.5	428.5	221.02	2.939		
12,500.0	6,698.1	12,170.1	6,637.1	114.1	112.6	84.52	-5,827.4	97.6	649.5	424.7	224.82	2.889		
12,600.0	6,697.5	12,270.1	6,636.9	116.0	114.5	84.55	-5,927.4	97.6	649.5	420.8	228.63	2.841		
12,700.0	6,696.9	12,370.1	6,636.6	117.9	116.4	84.59	-6,027.4	97.6	649.4	417.0	232.44	2.794		
12,800.0	6,696.3	12,470.1	6,636.4	119.8	118.3	84.62	-6,127.4	97.6	649.4	413.2	236.25	2.749		
12,900.0	6,695.7	12,570.1	6,636.2	121.6	120.2	84.65	-6,227.4	97.6	649.4	409.3	240.06	2.705		
13,000.0	6,695.1	12,670.1	6,636.0	123.5	122.1	84.68	-6,327.4	97.6	649.4	405.5	243.87	2.663		
13,100.0	6,694.6	12,770.1	6,635.7	125.4	124.0	84.71	-6,427.4	97.6	649.4	401.7	247.69	2.622		
13,200.0	6,694.0	12,870.1	6,635.5	127.3	125.9	84.75	-6,527.4	97.6	649.3	397.8	251.50	2.582		
13,300.0	6,693.4	12,970.1	6,635.3	129.2	127.8	84.78	-6,627.4	97.6	649.3	394.0	255.31	2.543		

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 28M-343
Project:	SEC.28-T5N-R64W	TVD Reference:	WELL @ 4648.0ft (Original Well Elev)
Reference Site:	Churchill 28J-HZ Pad Sec.28-T5N-R64W	MD Reference:	WELL @ 4648.0ft (Original Well Elev)
Site Error:	0.0ft	North Reference:	True
Reference Well:	Churchill 28M-343	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)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
13,400.0	6,692.8	13,070.1	6,635.1	131.1	129.7	84.81	-6,727.4	97.6	649.3	390.2	259.13	2.506	
13,500.0	6,692.2	13,170.1	6,634.8	133.0	131.6	84.84	-6,827.4	97.6	649.3	386.3	262.95	2.469	
13,600.0	6,691.6	13,270.1	6,634.6	134.9	133.5	84.88	-6,927.4	97.6	649.3	382.5	266.77	2.434	
13,700.0	6,691.0	13,370.1	6,634.4	136.8	135.5	84.91	-7,027.4	97.6	649.2	378.6	270.59	2.399	
13,800.0	6,690.4	13,470.1	6,634.2	138.7	137.4	84.94	-7,127.4	97.6	649.2	374.8	274.41	2.366	
13,867.6	6,690.0	13,537.7	6,634.0	140.0	138.7	84.96	-7,195.0	97.6	649.2	372.2	276.99	2.344 SF	

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Churchill 28M-343
Project:	SEC.28-T5N-R64W	TVD Reference:	WELL @ 4648.0ft (Original Well Elev)
Reference Site:	Churchill 28J-HZ Pad Sec.28-T5N-R64W	MD Reference:	WELL @ 4648.0ft (Original Well Elev)
Site Error:	0.0ft	North Reference:	True
Reference Well:	Churchill 28M-343	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 (ft)	Offset (ft)	Semi Major Axis Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning	
0.0	0.0	2.0	2.0	0.0	0.0	-90.00	0.0	-119.8	119.8	119.8	0.00	N/A		
100.0	100.0	102.0	102.0	0.1	0.1	-90.00	0.0	-119.8	119.8	119.6	0.23	522.571		
200.0	200.0	202.0	202.0	0.3	0.3	-90.00	0.0	-119.8	119.8	119.1	0.68	176.498		
300.0	300.0	302.0	302.0	0.6	0.6	-90.00	0.0	-119.8	119.8	118.7	1.13	106.180		
400.0	400.0	402.0	402.0	0.8	0.8	-90.00	0.0	-119.8	119.8	118.2	1.58	75.929		
500.0	500.0	502.0	502.0	1.0	1.0	-90.00	0.0	-119.8	119.8	117.8	2.03	59.093		
566.0	566.0	568.0	568.0	1.2	1.2	-90.00	0.0	-119.8	119.8	117.5	2.32	51.551 CC		
600.0	600.0	601.9	601.9	1.2	1.2	-90.00	0.0	-119.8	119.8	117.3	2.48	48.374 ES		
700.0	700.0	700.0	700.0	1.5	1.5	-89.60	0.8	-121.3	121.4	118.4	2.92	41.617		
800.0	800.0	794.5	794.4	1.7	1.7	-88.56	3.2	-125.6	125.9	122.5	3.35	37.587		
900.0	900.0	892.4	891.9	1.9	1.9	-87.01	6.9	-132.5	133.0	129.2	3.80	35.000		
1,000.0	1,000.0	992.1	991.2	2.1	2.1	-85.53	10.9	-139.8	140.6	136.4	4.27	32.955		
1,100.0	1,100.0	1,091.6	1,090.4	2.4	2.4	-159.32	14.9	-147.1	150.0	145.3	4.67	32.082		
1,200.0	1,199.8	1,190.8	1,189.3	2.6	2.6	-158.72	18.9	-154.4	162.6	157.5	5.10	31.855 SF		
1,300.0	1,299.5	1,289.5	1,287.6	2.8	2.9	-158.59	22.9	-161.7	178.4	172.8	5.53	32.254		
1,400.0	1,398.7	1,387.7	1,385.5	3.0	3.1	-158.82	26.8	-168.9	197.4	191.4	5.96	33.141		
1,500.0	1,497.5	1,485.1	1,482.6	3.3	3.4	-159.29	30.7	-176.1	219.6	213.2	6.38	34.419		
1,551.8	1,548.4	1,535.3	1,532.6	3.5	3.5	-159.60	32.8	-179.8	232.4	225.8	6.60	35.201		
1,600.0	1,595.7	1,581.9	1,579.0	3.6	3.7	-159.97	34.6	-183.2	244.7	237.9	6.82	35.885		
1,700.0	1,693.9	1,678.5	1,675.3	4.0	3.9	-160.63	38.5	-190.3	270.2	262.9	7.27	37.152		
1,800.0	1,792.0	1,775.2	1,771.6	4.3	4.2	-161.18	42.4	-197.4	295.8	288.0	7.73	38.241		
1,900.0	1,890.2	1,871.8	1,867.9	4.7	4.4	-161.64	46.3	-204.5	321.3	313.1	8.20	39.187		
2,000.0	1,988.3	1,968.5	1,964.2	5.0	4.7	-162.04	50.2	-211.6	346.9	338.2	8.67	40.015		
2,100.0	2,086.5	2,065.1	2,060.5	5.4	4.9	-162.38	54.0	-218.7	372.5	363.4	9.14	40.745		
2,200.0	2,184.6	2,161.8	2,156.8	5.8	5.2	-162.67	57.9	-225.9	398.1	388.5	9.62	41.393		
2,300.0	2,282.8	2,258.4	2,253.1	6.2	5.5	-162.93	61.8	-233.0	423.8	413.7	10.10	41.971		
2,400.0	2,380.9	2,355.1	2,349.4	6.6	5.7	-163.16	65.7	-240.1	449.4	438.8	10.58	42.489		
2,500.0	2,479.1	2,451.7	2,445.7	7.0	6.0	-163.37	69.6	-247.2	475.0	464.0	11.06	42.956		
2,600.0	2,577.2	2,548.3	2,542.1	7.4	6.2	-163.55	73.5	-254.3	500.7	489.1	11.54	43.379		
2,700.0	2,675.4	2,645.0	2,638.4	7.8	6.5	-163.72	77.4	-261.4	526.3	514.3	12.03	43.764		
2,800.0	2,773.5	2,741.6	2,734.7	8.2	6.8	-163.87	81.2	-268.5	551.9	539.4	12.51	44.115		
2,900.0	2,871.7	2,838.3	2,831.0	8.6	7.0	-164.01	85.1	-275.6	577.6	564.6	13.00	44.437		
3,000.0	2,969.8	2,934.9	2,927.3	9.1	7.3	-164.13	89.0	-282.7	603.3	589.8	13.49	44.732		
3,100.0	3,068.0	3,031.6	3,023.6	9.5	7.6	-164.25	92.9	-289.8	628.9	614.9	13.97	45.005		
3,200.0	3,166.1	3,128.2	3,119.9	9.9	7.8	-164.36	96.8	-296.9	654.6	640.1	14.46	45.257		
3,300.0	3,264.3	3,224.9	3,216.2	10.3	8.1	-164.45	100.7	-304.1	680.2	665.3	14.95	45.491		
3,400.0	3,362.4	3,321.5	3,312.5	10.7	8.3	-164.55	104.5	-311.2	705.9	690.5	15.44	45.708		
3,500.0	3,460.6	3,418.1	3,408.8	11.1	8.6	-164.63	108.4	-318.3	731.6	715.6	15.93	45.910		
3,600.0	3,558.7	3,514.8	3,505.1	11.6	8.9	-164.71	112.3	-325.4	757.2	740.8	16.43	46.099		
3,700.0	3,656.9	3,611.4	3,601.4	12.0	9.1	-164.78	116.2	-332.5	782.9	766.0	16.92	46.276		
3,800.0	3,755.0	3,708.1	3,697.7	12.4	9.4	-164.85	120.1	-339.6	808.6	791.1	17.41	46.441		
3,900.0	3,853.2	3,804.7	3,794.0	12.8	9.7	-164.92	124.0	-346.7	834.2	816.3	17.90	46.597		
4,000.0	3,951.3	3,901.4	3,890.3	13.3	9.9	-164.98	127.8	-353.8	859.9	841.5	18.40	46.743		
4,100.0	4,049.5	3,998.0	3,986.6	13.7	10.2	-165.04	131.7	-360.9	885.6	866.7	18.89	46.881		
4,200.0	4,147.6	4,094.7	4,082.9	14.1	10.5	-165.09	135.6	-368.0	911.2	891.9	19.38	47.011		
4,300.0	4,245.8	4,191.3	4,179.2	14.5	10.7	-165.14	139.5	-375.1	936.9	917.0	19.88	47.134		
4,400.0	4,343.9	4,288.0	4,275.5	14.9	11.0	-165.19	143.4	-382.3	962.6	942.2	20.37	47.250		
4,500.0	4,442.1	4,384.6	4,371.8	15.4	11.2	-165.24	147.3	-389.4	988.3	967.4	20.87	47.361		

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Churchill 28M-343
Project:	SEC.28-T5N-R64W	TVD Reference:	WELL @ 4648.0ft (Original Well Elev)
Reference Site:	Churchill 28J-HZ Pad Sec.28-T5N-R64W	MD Reference:	WELL @ 4648.0ft (Original Well Elev)
Site Error:	0.0ft	North Reference:	True
Reference Well:	Churchill 28M-343	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-423 - 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)	Semi Major Axis (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
0.0	0.0	0.0	0.0	0.0	0.0	-90.02	-90.02	0.0	-30.6	30.6				
100.0	100.0	100.0	100.0	0.1	0.1	-90.02	-90.02	0.0	-30.6	30.6	30.4	0.22	136.355	
200.0	200.0	200.0	200.0	0.3	0.3	-90.02	-90.02	0.0	-30.6	30.6	30.0	0.67	45.452	
300.0	300.0	300.0	300.0	0.6	0.6	-90.02	-90.02	0.0	-30.6	30.6	29.5	1.12	27.271	
400.0	400.0	400.0	400.0	0.8	0.8	-90.02	-90.02	0.0	-30.6	30.6	29.1	1.57	19.479	
500.0	500.0	500.0	500.0	1.0	1.0	-90.02	-90.02	0.0	-30.6	30.6	28.6	2.02	15.151	
600.0	600.0	600.0	600.0	1.2	1.2	-90.02	-90.02	0.0	-30.6	30.6	28.2	2.47	12.396	
700.0	700.0	700.0	700.0	1.5	1.5	-90.02	-90.02	0.0	-30.6	30.6	27.7	2.92	10.489	
800.0	800.0	800.0	800.0	1.7	1.7	-90.02	-90.02	0.0	-30.6	30.6	27.3	3.37	9.090	
900.0	900.0	900.0	900.0	1.9	1.9	-90.02	-90.02	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	-90.02	-90.02	0.0	-30.6	30.6	26.4	4.27	7.177 CC, ES	
1,100.0	1,100.0	1,100.0	1,100.0	2.4	2.4	-165.75	-165.75	0.0	-30.6	32.3	27.6	4.71	6.867	
1,200.0	1,199.8	1,199.8	1,199.8	2.6	2.6	-167.70	-167.70	0.0	-30.6	37.4	32.3	5.14	7.288	
1,300.0	1,299.5	1,299.5	1,299.5	2.8	2.8	-169.98	-169.98	0.0	-30.6	46.0	40.4	5.56	8.269	
1,400.0	1,398.7	1,398.7	1,398.7	3.0	3.0	-172.04	-172.04	0.0	-30.6	58.0	52.0	5.98	9.698	
1,500.0	1,497.5	1,497.5	1,497.5	3.3	3.3	-173.70	-173.70	0.0	-30.6	73.6	67.2	6.40	11.490	
1,551.8	1,548.4	1,549.8	1,549.8	3.5	3.4	-174.31	-174.31	0.2	-30.3	82.6	76.0	6.61	12.483	
1,600.0	1,595.7	1,598.7	1,598.6	3.6	3.5	-174.62	-174.62	0.8	-29.2	90.6	83.8	6.82	13.275	
1,700.0	1,693.9	1,700.9	1,700.8	4.0	3.7	-174.63	-174.63	3.5	-24.5	104.8	97.6	7.26	14.435	
1,800.0	1,792.0	1,803.4	1,802.9	4.3	3.9	-174.02	-174.02	7.9	-16.7	115.7	108.0	7.71	15.018	
1,900.0	1,890.2	1,902.9	1,901.9	4.7	4.2	-173.33	-173.33	12.9	-8.1	125.5	117.3	8.16	15.379	
2,000.0	1,988.3	2,002.5	2,000.9	5.0	4.4	-172.73	-172.73	17.8	0.6	135.3	126.6	8.62	15.692	
2,100.0	2,086.5	2,102.0	2,099.9	5.4	4.6	-172.22	-172.22	22.7	9.3	145.0	135.9	9.08	15.965	
2,200.0	2,184.6	2,201.5	2,198.9	5.8	4.9	-171.77	-171.77	27.7	17.9	154.8	145.3	9.55	16.204	
2,300.0	2,282.8	2,301.0	2,297.9	6.2	5.1	-171.38	-171.38	32.6	26.6	164.6	154.6	10.03	16.414	
2,400.0	2,380.9	2,400.5	2,396.9	6.6	5.4	-171.02	-171.02	37.5	35.2	174.4	163.9	10.51	16.600	
2,500.0	2,479.1	2,500.0	2,496.0	7.0	5.7	-170.71	-170.71	42.5	43.9	184.2	173.2	10.99	16.765	
2,600.0	2,577.2	2,599.5	2,595.0	7.4	5.9	-170.43	-170.43	47.4	52.6	194.1	182.6	11.47	16.912	
2,700.0	2,675.4	2,699.0	2,694.0	7.8	6.2	-170.17	-170.17	52.3	61.2	203.9	191.9	11.96	17.043	
2,800.0	2,773.5	2,798.6	2,793.0	8.2	6.5	-169.94	-169.94	57.3	69.9	213.7	201.2	12.45	17.162	
2,900.0	2,871.7	2,898.1	2,892.0	8.6	6.7	-169.73	-169.73	62.2	78.6	223.5	210.6	12.94	17.268	
3,000.0	2,969.8	2,997.6	2,991.0	9.1	7.0	-169.54	-169.54	67.1	87.2	233.4	219.9	13.44	17.365	
3,100.0	3,068.0	3,097.1	3,090.0	9.5	7.3	-169.36	-169.36	72.1	95.9	243.2	229.3	13.93	17.453	
3,200.0	3,166.1	3,196.6	3,189.0	9.9	7.5	-169.20	-169.20	77.0	104.6	253.0	238.6	14.43	17.533	
3,300.0	3,264.3	3,296.1	3,288.0	10.3	7.8	-169.04	-169.04	81.9	113.2	262.9	247.9	14.93	17.606	
3,400.0	3,362.4	3,395.6	3,387.1	10.7	8.1	-168.90	-168.90	86.9	121.9	272.7	257.3	15.43	17.672	
3,500.0	3,460.6	3,495.1	3,486.1	11.1	8.4	-168.77	-168.77	91.8	130.6	282.5	266.6	15.93	17.734	
3,600.0	3,558.7	3,594.7	3,585.1	11.6	8.6	-168.65	-168.65	96.8	139.2	292.4	275.9	16.43	17.790	
3,700.0	3,656.9	3,694.2	3,684.1	12.0	8.9	-168.54	-168.54	101.7	147.9	302.2	285.3	16.94	17.843	
3,800.0	3,755.0	3,793.7	3,783.1	12.4	9.2	-168.43	-168.43	106.6	156.5	312.1	294.6	17.44	17.891	
3,900.0	3,853.2	3,893.2	3,882.1	12.8	9.5	-168.33	-168.33	111.6	165.2	321.9	304.0	17.95	17.936	
4,000.0	3,951.3	3,992.7	3,981.1	13.3	9.8	-168.23	-168.23	116.5	173.9	331.8	313.3	18.45	17.977	
4,100.0	4,049.5	4,092.2	4,080.1	13.7	10.0	-168.15	-168.15	121.4	182.5	341.6	322.6	18.96	18.016	
4,200.0	4,147.6	4,191.7	4,179.2	14.1	10.3	-168.06	-168.06	126.4	191.2	351.4	332.0	19.47	18.052	
4,300.0	4,245.8	4,291.2	4,278.2	14.5	10.6	-167.98	-167.98	131.3	199.9	361.3	341.3	19.98	18.086	
4,400.0	4,343.9	4,390.8	4,377.2	14.9	10.9	-167.91	-167.91	136.2	208.5	371.1	350.7	20.48	18.118	
4,500.0	4,442.1	4,490.3	4,476.2	15.4	11.2	-167.84	-167.84	141.2	217.2	381.0	360.0	20.99	18.147	
4,600.0	4,540.2	4,589.8	4,575.2	15.8	11.5	-167.77	-167.77	146.1	225.9	390.8	369.3	21.50	18.175	
4,700.0	4,638.4	4,689.3	4,674.2	16.2	11.7	-167.70	-167.70	151.0	234.5	400.7	378.7	22.01	18.202	
4,800.0	4,736.5	4,788.8	4,773.2	16.6	12.0	-167.64	-167.64	156.0	243.2	410.5	388.0	22.52	18.226	
4,900.0	4,834.7	4,888.3	4,872.2	17.1	12.3	-167.58	-167.58	160.9	251.9	420.4	397.4	23.04	18.249	

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 28M-343
Project:	SEC.28-T5N-R64W	TVD Reference:	WELL @ 4648.0ft (Original Well Elev)
Reference Site:	Churchill 28J-HZ Pad Sec.28-T5N-R64W	MD Reference:	WELL @ 4648.0ft (Original Well Elev)
Site Error:	0.0ft	North Reference:	True
Reference Well:	Churchill 28M-343	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-423 - 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)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
5,000.0	4,932.8	4,987.8	4,971.2	17.5	12.6	-167.53		165.9	260.5	430.2	406.7	23.55	18.271	
5,019.1	4,951.6	5,006.8	4,990.2	17.6	12.6	-167.52		166.8	262.2	432.1	408.5	23.64	18.275	
5,100.0	5,031.2	5,087.4	5,070.4	17.9	12.9	-167.47		170.8	269.2	439.0	414.9	24.08	18.233	
5,200.0	5,130.1	5,187.3	5,169.7	18.1	13.2	-167.32		175.7	277.9	444.4	419.8	24.57	18.089	
5,300.0	5,229.5	5,287.2	5,269.1	18.4	13.4	-167.05		180.7	286.6	446.4	421.4	25.03	17.834	
5,400.0	5,329.2	5,387.2	5,368.6	18.6	13.7	-166.67		185.7	295.3	445.0	419.6	25.47	17.474	
5,500.0	5,429.1	5,487.0	5,467.9	18.7	14.0	-166.16		190.6	304.0	440.3	414.4	25.88	17.012	
5,570.9	5,500.0	5,554.7	5,535.2	18.8	14.2	-90.80		193.9	309.8	435.0	408.8	26.15	16.636	
5,600.0	5,529.1	5,580.2	5,560.7	18.9	14.3	-90.66		195.0	311.8	432.7	406.5	26.27	16.475	
5,700.0	5,629.1	5,668.4	5,648.7	19.0	14.4	-90.27		198.0	317.0	426.8	400.1	26.65	16.013	
5,800.0	5,729.1	5,756.9	5,737.1	19.1	14.6	-90.05		199.7	319.9	423.5	396.5	27.02	15.677	
5,900.0	5,829.1	5,848.9	5,829.1	19.3	14.8	-90.00		200.0	320.5	422.8	395.5	27.37	15.448	
6,000.0	5,929.1	5,948.9	5,929.1	19.4	14.9	-90.00		200.0	320.5	422.8	395.1	27.76	15.233	
6,036.3	5,965.4	5,985.2	5,965.4	19.5	15.0	-90.00		200.0	320.5	422.8	394.9	27.90	15.155	
6,036.7	5,965.7	5,985.6	5,965.7	19.5	15.0	90.01		200.0	320.5	422.8	394.9	27.90	15.154	
6,050.0	5,979.1	5,998.9	5,979.1	19.5	15.0	90.02		200.0	320.5	422.8	394.9	27.95	15.126	
6,100.0	6,029.0	6,048.8	6,029.0	19.6	15.1	90.36		200.0	320.5	422.9	394.7	28.16	15.017	
6,150.0	6,078.6	6,098.8	6,079.0	19.6	15.2	91.04		199.2	320.5	422.9	394.6	28.37	14.908	
6,200.0	6,127.8	6,149.2	6,129.2	19.6	15.3	91.72		195.2	320.5	423.0	394.5	28.54	14.821	
6,250.0	6,176.3	6,200.0	6,179.4	19.7	15.3	92.41		187.8	320.5	423.2	394.5	28.69	14.752	
6,300.0	6,223.9	6,251.1	6,229.4	19.7	15.4	93.08		177.1	320.5	423.5	394.7	28.81	14.698	
6,350.0	6,270.3	6,302.6	6,278.9	19.7	15.4	93.74		162.9	320.5	423.8	394.9	28.91	14.658	
6,400.0	6,315.5	6,354.4	6,327.6	19.7	15.5	94.39		145.3	320.5	424.1	395.1	28.99	14.629	
6,450.0	6,359.1	6,406.5	6,375.3	19.7	15.5	95.02		124.3	320.5	424.5	395.4	29.06	14.607	
6,500.0	6,401.1	6,459.0	6,421.8	19.8	15.5	95.63		99.9	320.5	424.9	395.8	29.13	14.587	
6,550.0	6,441.2	6,511.9	6,466.8	19.8	15.5	96.21		72.2	320.5	425.4	396.2	29.21	14.563	
6,600.0	6,479.3	6,565.1	6,510.0	19.8	15.6	96.77		41.2	320.5	425.9	396.5	29.31	14.528	
6,650.0	6,515.2	6,618.6	6,551.2	19.9	15.6	97.30		7.1	320.5	426.3	396.9	29.45	14.476	
6,700.0	6,548.7	6,672.4	6,590.2	19.9	15.7	97.79		-30.1	320.5	426.8	397.2	29.65	14.394	
6,750.0	6,579.7	6,726.5	6,626.6	20.0	15.7	98.25		-70.1	320.5	427.3	397.4	29.91	14.286	
6,800.0	6,608.1	6,780.9	6,660.2	20.1	15.8	98.68		-112.8	320.5	427.8	397.5	30.26	14.139	
6,850.0	6,633.7	6,835.6	6,690.9	20.2	16.0	99.06		-158.0	320.5	428.3	397.6	30.70	13.951	
6,900.0	6,656.5	6,890.4	6,718.4	20.4	16.2	99.40		-205.5	320.5	428.7	397.4	31.24	13.721	
6,950.0	6,676.3	6,945.5	6,742.4	20.5	16.5	99.70		-255.0	320.5	429.1	397.1	31.90	13.448	
7,000.0	6,693.1	7,000.8	6,762.9	20.8	16.9	99.95		-306.3	320.5	429.4	396.7	32.68	13.138	
7,050.0	6,706.7	7,056.2	6,779.7	21.0	17.3	100.15		-359.1	320.5	429.7	396.1	33.58	12.794	
7,100.0	6,717.2	7,111.7	6,792.6	21.4	17.8	100.31		-413.1	320.5	429.9	395.3	34.60	12.425	
7,150.0	6,724.5	7,167.4	6,801.6	21.7	18.3	100.42		-468.0	320.5	430.0	394.3	35.72	12.040	
7,200.0	6,728.5	7,219.0	6,807.2	22.1	18.9	100.58		-519.3	320.5	430.3	393.4	36.89	11.665	
7,240.9	6,729.3	7,259.9	6,811.5	22.5	19.3	100.99		-560.0	320.5	430.9	393.1	37.87	11.378	
7,300.0	6,729.0	7,323.6	6,816.2	23.0	20.1	101.65		-623.5	320.5	431.9	392.6	39.31	10.988	
7,400.0	6,728.4	7,427.9	6,817.4	24.1	21.4	101.89		-727.8	320.5	432.2	390.4	41.88	10.320	
7,500.0	6,727.8	7,527.9	6,817.2	25.3	22.7	101.94		-827.8	320.5	432.3	387.8	44.58	9.697	
7,600.0	6,727.2	7,627.9	6,817.0	26.5	24.2	101.99		-927.8	320.5	432.4	385.0	47.43	9.117	
7,700.0	6,726.6	7,727.9	6,816.8	27.9	25.7	102.04		-1,027.8	320.5	432.5	382.1	50.40	8.583	
7,800.0	6,726.0	7,827.9	6,816.6	29.3	27.2	102.09		-1,127.8	320.5	432.6	379.2	53.46	8.092	
7,900.0	6,725.4	7,927.9	6,816.5	30.8	28.8	102.15		-1,227.8	320.5	432.7	376.1	56.61	7.644	
8,000.0	6,724.8	8,027.9	6,816.3	32.3	30.4	102.20		-1,327.8	320.5	432.8	373.0	59.83	7.234	
8,100.0	6,724.2	8,127.9	6,816.1	33.9	32.1	102.25		-1,427.8	320.5	432.9	369.8	63.11	6.860	
8,200.0	6,723.6	8,227.8	6,815.9	35.5	33.8	102.30		-1,527.8	320.5	433.0	366.6	66.44	6.517	
8,300.0	6,723.0	8,327.8	6,815.7	37.1	35.5	102.35		-1,627.8	320.5	433.1	363.3	69.81	6.204	

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 28M-343
Project:	SEC.28-T5N-R64W	TVD Reference:	WELL @ 4648.0ft (Original Well Elev)
Reference Site:	Churchill 28J-HZ Pad Sec.28-T5N-R64W	MD Reference:	WELL @ 4648.0ft (Original Well Elev)
Site Error:	0.0ft	North Reference:	True
Reference Well:	Churchill 28M-343	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-423 - 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 (°)	Distance		Minimum Separation (ft)	Separation Factor	Warning		
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference	Offset		Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)				Between Centres (ft)	Between Ellipses (ft)
8,400.0	6,722.4	8,427.8	6,815.5	38.8	37.2	102.40	-1,727.8	320.5	433.2	360.0	73.22	5.917	
8,500.0	6,721.9	8,527.8	6,815.3	40.4	39.0	102.45	-1,827.8	320.5	433.3	356.7	76.66	5.652	
8,600.0	6,721.3	8,627.8	6,815.1	42.1	40.8	102.51	-1,927.8	320.5	433.4	353.3	80.13	5.409	
8,700.0	6,720.7	8,727.8	6,814.9	43.9	42.5	102.56	-2,027.8	320.5	433.5	349.9	83.62	5.184	
8,800.0	6,720.1	8,827.8	6,814.7	45.6	44.3	102.61	-2,127.8	320.5	433.6	346.5	87.13	4.977	
8,900.0	6,719.5	8,927.8	6,814.5	47.3	46.1	102.66	-2,227.8	320.5	433.7	343.1	90.66	4.784	
9,000.0	6,718.9	9,027.8	6,814.3	49.1	47.9	102.71	-2,327.8	320.5	433.8	339.6	94.21	4.605	
9,100.0	6,718.3	9,127.8	6,814.2	50.9	49.8	102.76	-2,427.8	320.5	433.9	336.2	97.77	4.438	
9,200.0	6,717.7	9,227.8	6,814.0	52.7	51.6	102.81	-2,527.8	320.5	434.0	332.7	101.34	4.283	
9,300.0	6,717.1	9,327.8	6,813.8	54.5	53.4	102.87	-2,627.8	320.5	434.1	329.2	104.92	4.138	
9,400.0	6,716.5	9,427.8	6,813.6	56.3	55.3	102.92	-2,727.8	320.5	434.2	325.7	108.51	4.002	
9,500.0	6,715.9	9,527.8	6,813.4	58.1	57.1	102.97	-2,827.8	320.5	434.3	322.2	112.11	3.874	
9,600.0	6,715.3	9,627.8	6,813.2	59.9	58.9	103.02	-2,927.8	320.5	434.4	318.7	115.72	3.754	
9,700.0	6,714.7	9,727.8	6,813.0	61.7	60.8	103.07	-3,027.8	320.5	434.5	315.2	119.34	3.641	
9,800.0	6,714.1	9,827.8	6,812.8	63.5	62.7	103.12	-3,127.8	320.5	434.6	311.7	122.96	3.535	
9,900.0	6,713.5	9,927.8	6,812.6	65.4	64.5	103.17	-3,227.8	320.5	434.8	308.2	126.59	3.434	
10,000.0	6,713.0	10,027.8	6,812.4	67.2	66.4	103.22	-3,327.8	320.5	434.9	304.6	130.22	3.339	
10,100.0	6,712.4	10,127.8	6,812.2	69.1	68.2	103.27	-3,427.8	320.5	435.0	301.1	133.86	3.249	
10,200.0	6,711.8	10,227.8	6,812.0	70.9	70.1	103.33	-3,527.8	320.5	435.1	297.6	137.50	3.164	
10,300.0	6,711.2	10,327.8	6,811.8	72.8	72.0	103.38	-3,627.7	320.5	435.2	294.0	141.14	3.083	
10,400.0	6,710.6	10,427.8	6,811.7	74.6	73.9	103.43	-3,727.7	320.5	435.3	290.5	144.79	3.006	
10,500.0	6,710.0	10,527.8	6,811.5	76.5	75.7	103.48	-3,827.7	320.5	435.4	286.9	148.44	2.933	
10,600.0	6,709.4	10,627.8	6,811.3	78.3	77.6	103.53	-3,927.7	320.5	435.5	283.4	152.09	2.863	
10,700.0	6,708.8	10,727.8	6,811.1	80.2	79.5	103.58	-4,027.7	320.5	435.6	279.8	155.75	2.797	
10,800.0	6,708.2	10,827.8	6,810.9	82.1	81.4	103.63	-4,127.7	320.5	435.7	276.3	159.41	2.733	
10,900.0	6,707.6	10,927.8	6,810.7	83.9	83.3	103.68	-4,227.7	320.5	435.8	272.8	163.06	2.673	
11,000.0	6,707.0	11,027.8	6,810.5	85.8	85.2	103.73	-4,327.7	320.5	435.9	269.2	166.72	2.615	
11,100.0	6,706.4	11,127.8	6,810.3	87.7	87.0	103.78	-4,427.7	320.5	436.0	265.6	170.39	2.559	
11,200.0	6,705.8	11,227.8	6,810.1	89.6	88.9	103.83	-4,527.7	320.5	436.1	262.1	174.05	2.506	
11,300.0	6,705.2	11,327.8	6,809.9	91.4	90.8	103.89	-4,627.7	320.5	436.2	258.5	177.71	2.455	
11,400.0	6,704.6	11,427.8	6,809.7	93.3	92.7	103.94	-4,727.7	320.5	436.4	255.0	181.37	2.406	
11,500.0	6,704.0	11,527.8	6,809.5	95.2	94.6	103.99	-4,827.7	320.5	436.5	251.4	185.04	2.359	
11,600.0	6,703.5	11,627.8	6,809.4	97.1	96.5	104.04	-4,927.7	320.5	436.6	247.9	188.70	2.314	
11,700.0	6,702.9	11,727.8	6,809.2	99.0	98.4	104.09	-5,027.7	320.5	436.7	244.3	192.37	2.270	
11,800.0	6,702.3	11,827.8	6,809.0	100.8	100.3	104.14	-5,127.7	320.5	436.8	240.8	196.03	2.228	
11,900.0	6,701.7	11,927.8	6,808.8	102.7	102.2	104.19	-5,227.7	320.5	436.9	237.2	199.70	2.188	
12,000.0	6,701.1	12,027.8	6,808.6	104.6	104.1	104.24	-5,327.7	320.5	437.0	233.7	203.37	2.149	
12,100.0	6,700.5	12,127.8	6,808.4	106.5	106.0	104.29	-5,427.7	320.5	437.1	230.1	207.03	2.111	
12,200.0	6,699.9	12,227.8	6,808.2	108.4	107.9	104.34	-5,527.7	320.5	437.2	226.6	210.70	2.075	
12,300.0	6,699.3	12,327.8	6,808.0	110.3	109.8	104.39	-5,627.7	320.5	437.4	223.0	214.36	2.040	
12,400.0	6,698.7	12,427.8	6,807.8	112.2	111.7	104.44	-5,727.7	320.5	437.5	219.4	218.03	2.006	
12,500.0	6,698.1	12,527.8	6,807.6	114.1	113.6	104.49	-5,827.7	320.5	437.6	215.9	221.69	1.974	
12,600.0	6,697.5	12,627.8	6,807.4	116.0	115.5	104.54	-5,927.7	320.5	437.7	212.3	225.36	1.942	
12,700.0	6,696.9	12,727.8	6,807.2	117.9	117.4	104.59	-6,027.7	320.5	437.8	208.8	229.02	1.912	
12,800.0	6,696.3	12,827.8	6,807.0	119.8	119.3	104.64	-6,127.7	320.5	437.9	205.2	232.69	1.882	
12,900.0	6,695.7	12,927.8	6,806.9	121.6	121.2	104.69	-6,227.7	320.5	438.0	201.7	236.35	1.853	
13,000.0	6,695.1	13,027.8	6,806.7	123.5	123.1	104.74	-6,327.7	320.5	438.2	198.1	240.01	1.826	
13,100.0	6,694.6	13,127.8	6,806.5	125.4	125.0	104.79	-6,427.7	320.5	438.3	194.6	243.67	1.799	
13,200.0	6,694.0	13,227.8	6,806.3	127.3	126.9	104.85	-6,527.7	320.5	438.4	191.1	247.33	1.772	
13,300.0	6,693.4	13,327.8	6,806.1	129.2	128.8	104.90	-6,627.7	320.5	438.5	187.5	250.99	1.747	
13,400.0	6,692.8	13,427.8	6,805.9	131.1	130.7	104.95	-6,727.7	320.5	438.6	184.0	254.65	1.722	

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

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Churchill 28M-343
Project:	SEC.28-T5N-R64W	TVD Reference:	WELL @ 4648.0ft (Original Well Elev)
Reference Site:	Churchill 28J-HZ Pad Sec.28-T5N-R64W	MD Reference:	WELL @ 4648.0ft (Original Well Elev)
Site Error:	0.0ft	North Reference:	True
Reference Well:	Churchill 28M-343	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-423 - 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)		
13,500.0	6,692.2	13,527.8	6,805.7	133.0	132.6	105.00	-6,827.7	320.5	438.7	180.4	258.31	1.698	
13,600.0	6,691.6	13,627.8	6,805.5	134.9	134.6	105.05	-6,927.7	320.5	438.9	176.9	261.97	1.675	
13,700.0	6,691.0	13,727.8	6,805.3	136.8	136.5	105.10	-7,027.7	320.5	439.0	173.3	265.63	1.653	
13,800.0	6,690.4	13,827.8	6,805.1	138.7	138.4	105.15	-7,127.7	320.5	439.1	169.8	269.28	1.631	
13,867.6	6,690.0	13,895.2	6,805.0	140.0	139.7	105.18	-7,195.1	320.5	439.2	167.4	271.75	1.616 SF	

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Churchill 28M-343
Project:	SEC.28-T5N-R64W	TVD Reference:	WELL @ 4648.0ft (Original Well Elev)
Reference Site:	Churchill 28J-HZ Pad Sec.28-T5N-R64W	MD Reference:	WELL @ 4648.0ft (Original Well Elev)
Site Error:	0.0ft	North Reference:	True
Reference Well:	Churchill 28M-343	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)	Semi Major Axis Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning	
0.0	0.0	1.0	1.0	0.0	0.0	-90.00	0.0	-89.2	89.2	89.2	0.00	N/A		
100.0	100.0	101.0	101.0	0.1	0.1	-90.00	0.0	-89.2	89.2	88.9	0.23	392.741		
200.0	200.0	201.0	201.0	0.3	0.3	-90.00	0.0	-89.2	89.2	88.5	0.68	131.783		
300.0	300.0	301.0	301.0	0.6	0.6	-90.00	0.0	-89.2	89.2	88.0	1.13	79.175		
400.0	400.0	401.0	401.0	0.8	0.8	-90.00	0.0	-89.2	89.2	87.6	1.58	56.586		
500.0	500.0	501.0	501.0	1.0	1.0	-90.00	0.0	-89.2	89.2	87.1	2.03	44.025		
600.0	600.0	601.0	601.0	1.2	1.2	-90.00	0.0	-89.2	89.2	86.7	2.47	36.028		
700.0	700.0	701.0	701.0	1.5	1.5	-90.00	0.0	-89.2	89.2	86.2	2.92	30.489		
766.3	766.3	767.3	767.3	1.6	1.6	-90.00	0.0	-89.2	89.2	85.9	3.22	27.668 CC		
800.0	800.0	800.0	800.0	1.7	1.7	-90.00	0.0	-89.2	89.2	85.8	3.37	26.446 ES		
900.0	900.0	898.8	898.8	1.9	1.9	-89.23	1.2	-90.4	90.4	86.6	3.82	23.692		
1,000.0	1,000.0	996.8	996.7	2.1	2.1	-87.10	4.8	-93.9	94.1	89.8	4.26	22.093		
1,100.0	1,100.0	1,096.6	1,096.2	2.4	2.4	-159.91	9.2	-98.2	100.4	95.7	4.69	21.396 SF		
1,200.0	1,199.8	1,196.1	1,195.5	2.6	2.6	-158.69	13.6	-102.6	110.1	104.9	5.12	21.500		
1,300.0	1,299.5	1,295.2	1,294.5	2.8	2.8	-158.25	17.9	-106.9	123.0	117.4	5.55	22.174		
1,400.0	1,398.7	1,393.9	1,393.0	3.0	3.0	-158.39	22.3	-111.2	139.1	133.1	5.97	23.291		
1,500.0	1,497.5	1,492.0	1,490.9	3.3	3.3	-158.92	26.6	-115.5	158.4	152.0	6.40	24.761		
1,551.8	1,548.4	1,542.6	1,541.4	3.5	3.4	-159.30	28.9	-117.7	169.7	163.1	6.62	25.641		
1,600.0	1,595.7	1,589.5	1,588.2	3.6	3.5	-159.72	30.9	-119.8	180.6	173.8	6.84	26.419		
1,700.0	1,693.9	1,686.8	1,685.4	4.0	3.8	-160.46	35.2	-124.0	203.3	196.0	7.29	27.870		
1,800.0	1,792.0	1,784.2	1,782.6	4.3	4.0	-161.04	39.5	-128.3	225.9	218.2	7.76	29.133		
1,900.0	1,890.2	1,881.6	1,879.7	4.7	4.2	-161.52	43.8	-132.5	248.6	240.4	8.22	30.238		
2,000.0	1,988.3	1,979.0	1,976.9	5.0	4.5	-161.92	48.1	-136.8	271.3	262.6	8.69	31.211		
2,100.0	2,086.5	2,076.3	2,074.1	5.4	4.7	-162.26	52.4	-141.0	294.0	284.9	9.17	32.073		
2,200.0	2,184.6	2,173.7	2,171.3	5.8	4.9	-162.55	56.7	-145.3	316.8	307.1	9.64	32.843		
2,300.0	2,282.8	2,271.1	2,268.5	6.2	5.2	-162.80	61.0	-149.5	339.5	329.4	10.12	33.532		
2,400.0	2,380.9	2,368.5	2,365.7	6.6	5.4	-163.02	65.3	-153.8	362.2	351.6	10.61	34.153		
2,500.0	2,479.1	2,465.8	2,462.8	7.0	5.7	-163.21	69.6	-158.0	385.0	373.9	11.09	34.715		
2,600.0	2,577.2	2,563.2	2,560.0	7.4	5.9	-163.38	73.9	-162.3	407.7	396.1	11.57	35.226		
2,700.0	2,675.4	2,660.6	2,657.2	7.8	6.2	-163.54	78.2	-166.5	430.4	418.4	12.06	35.692		
2,800.0	2,773.5	2,758.0	2,754.4	8.2	6.4	-163.67	82.5	-170.8	453.2	440.6	12.55	36.118		
2,900.0	2,871.7	2,855.3	2,851.6	8.6	6.6	-163.80	86.8	-175.0	475.9	462.9	13.04	36.511		
3,000.0	2,969.8	2,952.7	2,948.8	9.1	6.9	-163.91	91.1	-179.3	498.7	485.2	13.52	36.872		
3,100.0	3,068.0	3,050.1	3,046.0	9.5	7.1	-164.02	95.4	-183.5	521.4	507.4	14.01	37.206		
3,200.0	3,166.1	3,147.4	3,143.1	9.9	7.4	-164.11	99.7	-187.8	544.2	529.7	14.51	37.515		
3,300.0	3,264.3	3,244.8	3,240.3	10.3	7.6	-164.20	104.0	-192.0	566.9	551.9	15.00	37.803		
3,400.0	3,362.4	3,342.2	3,337.5	10.7	7.9	-164.28	108.3	-196.3	589.7	574.2	15.49	38.071		
3,500.0	3,460.6	3,439.6	3,434.7	11.1	8.1	-164.35	112.6	-200.6	612.5	596.5	15.98	38.321		
3,600.0	3,558.7	3,536.9	3,531.9	11.6	8.3	-164.42	116.9	-204.8	635.2	618.7	16.48	38.555		
3,700.0	3,656.9	3,634.3	3,629.1	12.0	8.6	-164.49	121.2	-209.1	658.0	641.0	16.97	38.775		
3,800.0	3,755.0	3,731.7	3,726.3	12.4	8.8	-164.55	125.5	-213.3	680.7	663.3	17.46	38.981		
3,900.0	3,853.2	3,829.1	3,823.4	12.8	9.1	-164.60	129.8	-217.6	703.5	685.5	17.96	39.175		
4,000.0	3,951.3	3,926.4	3,920.6	13.3	9.3	-164.66	134.1	-221.8	726.3	707.8	18.45	39.357		
4,100.0	4,049.5	4,023.8	4,017.8	13.7	9.6	-164.71	138.4	-226.1	749.0	730.1	18.95	39.530		
4,200.0	4,147.6	4,121.2	4,115.0	14.1	9.8	-164.75	142.7	-230.3	771.8	752.3	19.44	39.693		
4,300.0	4,245.8	4,218.6	4,212.2	14.5	10.0	-164.80	147.0	-234.6	794.5	774.6	19.94	39.847		
4,400.0	4,343.9	4,315.9	4,309.4	14.9	10.3	-164.84	151.3	-238.8	817.3	796.9	20.44	39.993		
4,500.0	4,442.1	4,413.3	4,406.6	15.4	10.5	-164.88	155.6	-243.1	840.1	819.1	20.93	40.132		
4,600.0	4,540.2	4,510.7	4,503.7	15.8	10.8	-164.92	159.9	-247.3	862.8	841.4	21.43	40.264		
4,700.0	4,638.4	4,608.0	4,600.9	16.2	11.0	-164.95	164.2	-251.6	885.6	863.7	21.93	40.390		
4,800.0	4,736.5	4,705.4	4,698.1	16.6	11.3	-164.98	168.5	-255.8	908.4	885.9	22.42	40.509		

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 28M-343
Project:	SEC.28-T5N-R64W	TVD Reference:	WELL @ 4648.0ft (Original Well Elev)
Reference Site:	Churchill 28J-HZ Pad Sec.28-T5N-R64W	MD Reference:	WELL @ 4648.0ft (Original Well Elev)
Site Error:	0.0ft	North Reference:	True
Reference Well:	Churchill 28M-343	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 (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
4,900.0	4,834.7	4,802.8	4,795.3	17.1	11.5	-165.02	172.8	-260.1	931.1	908.2	22.92	40.623	
5,000.0	4,932.8	4,900.2	4,892.5	17.5	11.8	-165.05	177.1	-264.3	953.9	930.5	23.42	40.732	
5,019.1	4,951.6	4,918.8	4,911.0	17.6	11.8	-165.05	177.9	-265.2	958.2	934.7	23.51	40.752	
5,100.0	5,031.2	4,997.8	4,989.9	17.9	12.0	-165.15	181.4	-268.6	975.6	951.6	23.95	40.726	
5,200.0	5,130.1	5,096.1	5,088.0	18.1	12.2	-165.20	185.7	-272.9	994.0	969.6	24.45	40.649	

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Churchill 28M-343
Project:	SEC.28-T5N-R64W	TVD Reference:	WELL @ 4648.0ft (Original Well Elev)
Reference Site:	Churchill 28J-HZ Pad Sec.28-T5N-R64W	MD Reference:	WELL @ 4648.0ft (Original Well Elev)
Site Error:	0.0ft	North Reference:	True
Reference Well:	Churchill 28M-343	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 (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	0.0	0.0	0.0	0.0	90.03	90.03	0.0	30.6	30.7				
100.0	100.0	99.0	99.0	0.1	0.1	90.03	90.03	0.0	30.6	30.6	30.4	0.22	137.039	
200.0	200.0	199.0	199.0	0.3	0.3	90.03	90.03	0.0	30.6	30.6	30.0	0.67	45.604	
300.0	300.0	299.0	299.0	0.6	0.6	90.03	90.03	0.0	30.6	30.6	29.5	1.12	27.326	
400.0	400.0	399.0	399.0	0.8	0.8	90.03	90.03	0.0	30.6	30.6	29.1	1.57	19.507 CC, ES	
500.0	500.0	497.9	497.9	1.0	1.0	89.45	89.45	0.3	32.3	32.3	30.3	2.01	16.078	
600.0	600.0	596.6	596.5	1.2	1.2	88.00	88.00	1.3	37.3	37.4	34.9	2.45	15.257	
700.0	700.0	694.9	694.3	1.5	1.4	86.30	86.30	2.9	45.5	45.8	42.9	2.91	15.769	
800.0	800.0	792.4	791.2	1.7	1.7	84.76	84.76	5.2	57.0	57.7	54.3	3.39	17.024	
900.0	900.0	889.0	886.6	1.9	2.0	83.52	83.52	8.1	71.5	73.0	69.1	3.91	18.674	
1,000.0	1,000.0	984.5	980.5	2.1	2.3	82.57	82.57	11.6	88.9	91.6	87.1	4.46	20.514	
1,100.0	1,100.0	1,082.6	1,076.5	2.4	2.7	6.99	6.99	15.5	108.6	110.2	105.5	4.70	23.436	
1,200.0	1,199.8	1,181.5	1,173.3	2.6	3.1	6.72	6.72	19.5	128.3	125.5	120.4	5.14	24.415	
1,300.0	1,299.5	1,280.8	1,270.5	2.8	3.5	6.68	6.68	23.4	148.2	137.3	131.7	5.59	24.585	
1,400.0	1,398.7	1,380.4	1,368.0	3.0	4.0	6.81	6.81	27.4	168.1	145.7	139.7	6.04	24.128	
1,500.0	1,497.5	1,480.3	1,465.8	3.3	4.4	7.09	7.09	31.4	188.1	150.6	144.1	6.49	23.200	
1,551.8	1,548.4	1,532.1	1,516.5	3.5	4.6	7.30	7.30	33.4	198.5	151.8	145.1	6.73	22.549	
1,600.0	1,595.7	1,580.2	1,563.7	3.6	4.8	7.51	7.51	35.4	208.1	152.5	145.5	6.97	21.885	
1,700.0	1,693.9	1,680.2	1,661.5	4.0	5.3	7.95	7.95	39.3	228.1	153.9	146.4	7.46	20.628	
1,800.0	1,792.0	1,780.2	1,759.4	4.3	5.7	8.38	8.38	43.3	248.1	155.3	147.3	7.96	19.513	
1,900.0	1,890.2	1,880.2	1,857.3	4.7	6.2	8.80	8.80	47.3	268.1	156.7	148.3	8.46	18.518	
2,000.0	1,988.3	1,980.2	1,955.2	5.0	6.6	9.21	9.21	51.3	288.1	158.2	149.2	8.97	17.627	
2,100.0	2,086.5	2,080.2	2,053.1	5.4	7.0	9.62	9.62	55.3	308.1	159.6	150.1	9.49	16.824	
2,200.0	2,184.6	2,180.1	2,150.9	5.8	7.5	10.02	10.02	59.3	328.1	161.0	151.0	10.00	16.098	
2,300.0	2,282.8	2,280.1	2,248.8	6.2	7.9	10.41	10.41	63.3	348.1	162.5	152.0	10.53	15.439	
2,400.0	2,380.9	2,380.1	2,346.7	6.6	8.4	10.79	10.79	67.3	368.1	164.0	152.9	11.05	14.838	
2,500.0	2,479.1	2,480.1	2,444.6	7.0	8.8	11.17	11.17	71.2	388.1	165.4	153.9	11.58	14.288	
2,600.0	2,577.2	2,580.1	2,542.5	7.4	9.3	11.54	11.54	75.2	408.1	166.9	154.8	12.11	13.783	
2,700.0	2,675.4	2,680.1	2,640.4	7.8	9.7	11.91	11.91	79.2	428.1	168.4	155.8	12.65	13.317	
2,800.0	2,773.5	2,780.0	2,738.2	8.2	10.2	12.27	12.27	83.2	448.2	169.9	156.7	13.18	12.887	
2,900.0	2,871.7	2,880.0	2,836.1	8.6	10.6	12.62	12.62	87.2	468.2	171.4	157.7	13.72	12.489	
3,000.0	2,969.8	2,980.0	2,934.0	9.1	11.1	12.96	12.96	91.2	488.2	172.9	158.6	14.27	12.119	
3,100.0	3,068.0	3,080.0	3,031.9	9.5	11.5	13.30	13.30	95.2	508.2	174.4	159.6	14.81	11.774	
3,200.0	3,166.1	3,180.0	3,129.8	9.9	12.0	13.64	13.64	99.2	528.2	175.9	160.6	15.36	11.452	
3,300.0	3,264.3	3,280.0	3,227.6	10.3	12.4	13.97	13.97	103.1	548.2	177.5	161.5	15.92	11.150	
3,400.0	3,362.4	3,379.9	3,325.5	10.7	12.9	14.29	14.29	107.1	568.2	179.0	162.5	16.47	10.868	
3,500.0	3,460.6	3,479.9	3,423.4	11.1	13.3	14.61	14.61	111.1	588.2	180.5	163.5	17.03	10.603	
3,600.0	3,558.7	3,579.9	3,521.3	11.6	13.8	14.92	14.92	115.1	608.2	182.1	164.5	17.59	10.353	
3,700.0	3,656.9	3,679.9	3,619.2	12.0	14.2	15.23	15.23	119.1	628.2	183.6	165.5	18.15	10.118	
3,800.0	3,755.0	3,779.9	3,717.0	12.4	14.7	15.53	15.53	123.1	648.2	185.2	166.5	18.71	9.896	
3,900.0	3,853.2	3,879.9	3,814.9	12.8	15.1	15.82	15.82	127.1	668.2	186.7	167.4	19.28	9.685	
4,000.0	3,951.3	3,979.8	3,912.8	13.3	15.6	16.12	16.12	131.1	688.2	188.3	168.4	19.85	9.486	
4,100.0	4,049.5	4,079.8	4,010.7	13.7	16.0	16.40	16.40	135.0	708.2	189.9	169.4	20.42	9.298	
4,200.0	4,147.6	4,179.8	4,108.6	14.1	16.5	16.68	16.68	139.0	728.2	191.4	170.4	20.99	9.118	
4,300.0	4,245.8	4,279.8	4,206.4	14.5	16.9	16.96	16.96	143.0	748.2	193.0	171.4	21.57	8.948	
4,400.0	4,343.9	4,379.8	4,304.3	14.9	17.4	17.23	17.23	147.0	768.2	194.6	172.4	22.15	8.786	
4,500.0	4,442.1	4,479.8	4,402.2	15.4	17.8	17.50	17.50	151.0	788.2	196.2	173.4	22.73	8.631	
4,600.0	4,540.2	4,579.7	4,500.1	15.8	18.3	17.77	17.77	155.0	808.2	197.8	174.4	23.31	8.483	
4,700.0	4,638.4	4,679.7	4,598.0	16.2	18.7	18.03	18.03	159.0	828.2	199.3	175.4	23.90	8.342	
4,800.0	4,736.5	4,779.7	4,695.8	16.6	19.2	18.28	18.28	163.0	848.2	200.9	176.5	24.48	8.208	
4,900.0	4,834.7	4,879.7	4,793.7	17.1	19.6	18.54	18.54	166.9	868.2	202.5	177.5	25.07	8.079	

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

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Churchill 28M-343
Project:	SEC.28-T5N-R64W	TVD Reference:	WELL @ 4648.0ft (Original Well Elev)
Reference Site:	Churchill 28J-HZ Pad Sec.28-T5N-R64W	MD Reference:	WELL @ 4648.0ft (Original Well Elev)
Site Error:	0.0ft	North Reference:	True
Reference Well:	Churchill 28M-343	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)		
5,000.0	4,932.8	4,979.7	4,891.6	17.5	20.1	18.78	170.9	888.2	204.1	178.5	25.66	7.955	
5,019.1	4,951.6	4,998.8	4,910.3	17.6	20.2	18.83	171.7	892.1	204.5	178.7	25.77	7.932	
5,100.0	5,031.2	5,079.6	4,989.5	17.9	20.5	18.94	174.9	908.2	206.8	180.6	26.22	7.887	
5,200.0	5,130.1	5,179.4	5,087.2	18.1	21.0	18.81	178.9	928.2	212.8	186.1	26.69	7.973	
5,300.0	5,229.5	5,279.0	5,184.6	18.4	21.4	18.43	182.9	948.1	222.0	194.9	27.07	8.200	
5,400.0	5,329.2	5,378.2	5,281.7	18.6	21.9	17.83	186.8	968.0	234.5	207.1	27.39	8.563	
5,500.0	5,429.1	5,482.8	5,384.3	18.7	22.3	17.07	190.8	988.1	249.6	222.0	27.64	9.033	
5,570.9	5,500.0	5,559.5	5,460.0	18.8	22.5	91.48	193.3	1,000.6	260.4	232.6	27.77	9.374	
5,600.0	5,529.1	5,591.1	5,491.2	18.9	22.6	91.26	194.3	1,005.2	264.6	236.7	27.86	9.495	
5,700.0	5,629.1	5,700.4	5,599.7	19.0	22.9	90.65	196.9	1,018.5	276.7	248.5	28.18	9.816	
5,800.0	5,729.1	5,810.6	5,709.5	19.1	23.1	90.25	198.7	1,027.7	285.1	256.5	28.52	9.993	
5,900.0	5,829.1	5,921.4	5,820.1	19.3	23.3	90.05	199.8	1,032.9	289.7	260.8	28.87	10.032	
6,000.0	5,929.1	6,029.4	5,928.1	19.4	23.4	90.00	200.0	1,034.0	290.7	261.4	29.24	9.942	
6,036.3	5,965.4	6,065.7	5,964.4	19.5	23.4	90.00	200.0	1,034.0	290.7	261.3	29.37	9.898	
6,045.6	5,974.6	6,074.9	5,973.6	19.5	23.4	-90.00	200.0	1,034.0	290.7	261.3	29.40	9.888	
6,050.0	5,979.1	6,079.4	5,978.1	19.5	23.5	-90.01	200.0	1,034.0	290.7	261.3	29.41	9.883	
6,100.0	6,029.0	6,129.3	6,028.0	19.6	23.5	-90.51	200.0	1,034.0	290.7	261.2	29.51	9.850	
6,150.0	6,078.6	6,179.3	6,078.0	19.6	23.6	-91.49	199.2	1,034.0	290.8	261.2	29.54	9.843	
6,200.0	6,127.8	6,229.7	6,128.2	19.6	23.6	-92.51	195.3	1,034.0	290.9	261.4	29.55	9.846	
6,250.0	6,176.3	6,280.5	6,178.5	19.7	23.6	-93.51	188.0	1,034.0	291.2	261.7	29.55	9.853	
6,300.0	6,223.9	6,331.6	6,228.4	19.7	23.7	-94.51	177.3	1,034.0	291.6	262.0	29.56	9.864	
6,350.0	6,270.3	6,383.1	6,277.9	19.7	23.7	-95.48	163.2	1,034.0	292.0	262.4	29.57	9.875	
6,400.0	6,315.5	6,434.9	6,326.7	19.7	23.7	-96.43	145.7	1,034.0	292.5	262.9	29.60	9.883	
6,450.0	6,359.1	6,487.1	6,374.5	19.7	23.7	-97.35	124.7	1,034.0	293.1	263.4	29.64	9.887	
6,500.0	6,401.1	6,539.6	6,421.0	19.8	23.8	-98.24	100.3	1,034.0	293.7	264.0	29.71	9.885	
6,550.0	6,441.2	6,592.5	6,466.0	19.8	23.8	-99.09	72.6	1,034.0	294.4	264.6	29.81	9.875	
6,600.0	6,479.3	6,645.7	6,509.3	19.8	23.8	-99.90	41.7	1,034.0	295.1	265.1	29.94	9.854	
6,650.0	6,515.2	6,699.3	6,550.6	19.9	23.8	-100.67	7.6	1,034.0	295.8	265.7	30.12	9.821	
6,700.0	6,548.7	6,753.1	6,589.6	19.9	23.9	-101.38	-29.5	1,034.0	296.5	266.2	30.33	9.775	
6,750.0	6,579.7	6,807.3	6,626.1	20.0	23.9	-102.05	-69.5	1,034.0	297.2	266.6	30.60	9.714	
6,800.0	6,608.1	6,861.8	6,659.8	20.1	24.0	-102.66	-112.3	1,034.0	297.9	267.0	30.91	9.637	
6,850.0	6,633.7	6,916.5	6,690.6	20.2	24.1	-103.21	-157.5	1,034.0	298.5	267.3	31.28	9.544	
6,900.0	6,656.5	6,971.4	6,718.1	20.4	24.2	-103.70	-205.0	1,034.0	299.1	267.4	31.70	9.435	
6,950.0	6,676.3	7,026.6	6,742.2	20.5	24.3	-104.13	-254.6	1,034.0	299.7	267.5	32.19	9.310	
7,000.0	6,693.1	7,081.9	6,762.8	20.8	24.5	-104.49	-306.0	1,034.0	300.1	267.4	32.73	9.170	
7,050.0	6,706.7	7,137.4	6,779.6	21.0	24.7	-104.78	-358.9	1,034.0	300.5	267.2	33.34	9.015	
7,100.0	6,717.2	7,193.0	6,792.6	21.4	25.0	-105.01	-412.9	1,034.0	300.8	266.8	34.01	8.847	
7,150.0	6,724.5	7,248.7	6,801.6	21.7	25.3	-105.17	-467.9	1,034.0	301.1	266.3	34.74	8.667	
7,200.0	6,728.5	7,300.4	6,807.2	22.1	25.6	-105.40	-519.2	1,034.0	301.4	266.0	35.46	8.500	
7,240.9	6,729.3	7,341.3	6,811.5	22.5	25.9	-105.96	-559.9	1,034.0	302.3	266.4	35.97	8.404	
7,300.0	6,729.0	7,405.0	6,816.2	23.0	26.4	-106.89	-623.4	1,034.0	303.7	266.6	37.09	8.187	
7,400.0	6,728.4	7,509.3	6,817.4	24.1	27.3	-107.22	-727.8	1,034.0	304.2	264.7	39.44	7.712	
7,500.0	6,727.8	7,609.3	6,817.2	25.3	28.3	-107.29	-827.8	1,034.0	304.3	262.3	41.99	7.247	
7,600.0	6,727.2	7,709.3	6,817.0	26.5	29.5	-107.36	-927.8	1,034.0	304.4	259.7	44.69	6.811	
7,700.0	6,726.6	7,809.3	6,816.8	27.9	30.7	-107.44	-1,027.8	1,034.0	304.5	257.0	47.52	6.407	
7,800.0	6,726.0	7,909.3	6,816.6	29.3	31.9	-107.51	-1,127.8	1,034.0	304.6	254.1	50.46	6.036	
7,900.0	6,725.4	8,009.3	6,816.4	30.8	33.3	-107.58	-1,227.8	1,034.0	304.7	251.2	53.49	5.696	
8,000.0	6,724.8	8,109.3	6,816.3	32.3	34.7	-107.65	-1,327.8	1,034.0	304.8	248.2	56.59	5.386	
8,100.0	6,724.2	8,209.3	6,816.1	33.9	36.1	-107.73	-1,427.8	1,034.0	304.9	245.2	59.75	5.103	
8,200.0	6,723.6	8,309.3	6,815.9	35.5	37.6	-107.80	-1,527.8	1,034.0	305.0	242.1	62.97	4.844	
8,300.0	6,723.0	8,409.3	6,815.7	37.1	39.2	-107.87	-1,627.8	1,034.0	305.1	238.9	66.23	4.607	

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 28M-343
Project:	SEC.28-T5N-R64W	TVD Reference:	WELL @ 4648.0ft (Original Well Elev)
Reference Site:	Churchill 28J-HZ Pad Sec.28-T5N-R64W	MD Reference:	WELL @ 4648.0ft (Original Well Elev)
Site Error:	0.0ft	North Reference:	True
Reference Well:	Churchill 28M-343	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								
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)				
8,400.0	6,722.4	8,509.3	6,815.5	38.8	40.7	-107.94	-1,727.8	1,034.0	305.2	235.7	69.53	4.390			
8,500.0	6,721.9	8,609.3	6,815.3	40.4	42.3	-108.02	-1,827.8	1,034.0	305.4	232.5	72.85	4.191			
8,600.0	6,721.3	8,709.3	6,815.1	42.1	44.0	-108.09	-1,927.8	1,034.0	305.5	229.3	76.21	4.008			
8,700.0	6,720.7	8,809.3	6,814.9	43.9	45.6	-108.16	-2,027.8	1,034.0	305.6	226.0	79.59	3.839			
8,800.0	6,720.1	8,909.3	6,814.7	45.6	47.3	-108.23	-2,127.8	1,034.0	305.7	222.7	82.99	3.684			
8,900.0	6,719.5	9,009.3	6,814.5	47.3	49.0	-108.31	-2,227.8	1,034.0	305.8	219.4	86.41	3.539			
9,000.0	6,718.9	9,109.3	6,814.3	49.1	50.7	-108.38	-2,327.8	1,034.0	305.9	216.1	89.84	3.405			
9,100.0	6,718.3	9,209.3	6,814.1	50.9	52.4	-108.45	-2,427.8	1,034.0	306.0	212.8	93.28	3.281			
9,200.0	6,717.7	9,309.3	6,814.0	52.7	54.1	-108.52	-2,527.8	1,034.0	306.2	209.4	96.74	3.165			
9,300.0	6,717.1	9,409.3	6,813.8	54.5	55.9	-108.59	-2,627.8	1,034.0	306.3	206.1	100.21	3.056			
9,400.0	6,716.5	9,509.3	6,813.6	56.3	57.6	-108.67	-2,727.8	1,034.0	306.4	202.7	103.68	2.955			
9,500.0	6,715.9	9,609.3	6,813.4	58.1	59.4	-108.74	-2,827.8	1,034.0	306.5	199.3	107.17	2.860			
9,600.0	6,715.3	9,709.3	6,813.2	59.9	61.2	-108.81	-2,927.8	1,034.0	306.6	196.0	110.66	2.771			
9,700.0	6,714.7	9,809.3	6,813.0	61.7	63.0	-108.88	-3,027.8	1,034.0	306.7	192.6	114.15	2.687			
9,800.0	6,714.1	9,909.3	6,812.8	63.5	64.8	-108.95	-3,127.8	1,034.0	306.8	189.2	117.65	2.608			
9,900.0	6,713.5	10,009.3	6,812.6	65.4	66.6	-109.03	-3,227.8	1,034.0	307.0	185.8	121.16	2.534			
10,000.0	6,713.0	10,109.3	6,812.4	67.2	68.4	-109.10	-3,327.8	1,034.0	307.1	182.4	124.67	2.463			
10,100.0	6,712.4	10,209.3	6,812.2	69.1	70.2	-109.17	-3,427.8	1,034.0	307.2	179.0	128.18	2.397			
10,200.0	6,711.8	10,309.3	6,812.0	70.9	72.0	-109.24	-3,527.8	1,034.0	307.3	175.6	131.69	2.334			
10,300.0	6,711.2	10,409.3	6,811.8	72.8	73.8	-109.31	-3,627.8	1,034.0	307.4	172.2	135.21	2.274			
10,400.0	6,710.6	10,509.3	6,811.6	74.6	75.7	-109.38	-3,727.8	1,034.0	307.6	168.8	138.73	2.217			
10,500.0	6,710.0	10,609.3	6,811.5	76.5	77.5	-109.45	-3,827.7	1,034.0	307.7	165.4	142.25	2.163			
10,600.0	6,709.4	10,709.3	6,811.3	78.3	79.3	-109.53	-3,927.7	1,034.0	307.8	162.0	145.77	2.112			
10,700.0	6,708.8	10,809.3	6,811.1	80.2	81.2	-109.60	-4,027.7	1,034.0	307.9	158.6	149.29	2.063			
10,800.0	6,708.2	10,909.3	6,810.9	82.1	83.0	-109.67	-4,127.7	1,034.0	308.0	155.2	152.81	2.016			
10,900.0	6,707.6	11,009.3	6,810.7	83.9	84.9	-109.74	-4,227.7	1,034.0	308.2	151.8	156.33	1.971			
11,000.0	6,707.0	11,109.3	6,810.5	85.8	86.7	-109.81	-4,327.7	1,034.0	308.3	148.4	159.86	1.929			
11,100.0	6,706.4	11,209.3	6,810.3	87.7	88.6	-109.88	-4,427.7	1,034.0	308.4	145.0	163.38	1.888			
11,200.0	6,705.8	11,309.3	6,810.1	89.6	90.4	-109.95	-4,527.7	1,034.0	308.5	141.6	166.90	1.849			
11,300.0	6,705.2	11,409.3	6,809.9	91.4	92.3	-110.02	-4,627.7	1,034.0	308.7	138.2	170.42	1.811			
11,400.0	6,704.6	11,509.3	6,809.7	93.3	94.2	-110.09	-4,727.7	1,034.0	308.8	134.8	173.94	1.775			
11,500.0	6,704.0	11,609.3	6,809.5	95.2	96.0	-110.16	-4,827.7	1,034.0	308.9	131.5	177.46	1.741			
11,600.0	6,703.5	11,709.3	6,809.3	97.1	97.9	-110.24	-4,927.7	1,034.0	309.0	128.1	180.98	1.708			
11,700.0	6,702.9	11,809.3	6,809.2	99.0	99.8	-110.31	-5,027.7	1,034.0	309.2	124.7	184.50	1.676			
11,800.0	6,702.3	11,909.3	6,809.0	100.8	101.6	-110.38	-5,127.7	1,034.0	309.3	121.3	188.02	1.645			
11,900.0	6,701.7	12,009.3	6,808.8	102.7	103.5	-110.45	-5,227.7	1,034.0	309.4	117.9	191.53	1.616			
12,000.0	6,701.1	12,109.3	6,808.6	104.6	105.4	-110.52	-5,327.7	1,034.0	309.6	114.5	195.05	1.587			
12,100.0	6,700.5	12,209.3	6,808.4	106.5	107.3	-110.59	-5,427.7	1,034.0	309.7	111.1	198.56	1.560			
12,200.0	6,699.9	12,309.3	6,808.2	108.4	109.1	-110.66	-5,527.7	1,034.0	309.8	107.7	202.07	1.533			
12,300.0	6,699.3	12,409.3	6,808.0	110.3	111.0	-110.73	-5,627.7	1,034.0	309.9	104.4	205.58	1.508			
12,400.0	6,698.7	12,509.3	6,807.8	112.2	112.9	-110.80	-5,727.7	1,034.0	310.1	101.0	209.09	1.483	Level 3		
12,500.0	6,698.1	12,609.3	6,807.6	114.1	114.8	-110.87	-5,827.7	1,034.0	310.2	97.6	212.60	1.459	Level 3		
12,600.0	6,697.5	12,709.3	6,807.4	116.0	116.7	-110.94	-5,927.7	1,034.0	310.3	94.2	216.10	1.436	Level 3		
12,700.0	6,696.9	12,809.3	6,807.2	117.9	118.5	-111.01	-6,027.7	1,034.0	310.5	90.9	219.60	1.414	Level 3		
12,800.0	6,696.3	12,909.3	6,807.0	119.8	120.4	-111.08	-6,127.7	1,034.0	310.6	87.5	223.10	1.392	Level 3		
12,900.0	6,695.7	13,009.3	6,806.9	121.6	122.3	-111.15	-6,227.7	1,034.0	310.7	84.1	226.60	1.371	Level 3		
13,000.0	6,695.1	13,109.3	6,806.7	123.5	124.2	-111.22	-6,327.7	1,034.0	310.9	80.8	230.10	1.351	Level 3		
13,100.0	6,694.6	13,209.3	6,806.5	125.4	126.1	-111.29	-6,427.7	1,034.0	311.0	77.4	233.59	1.331	Level 3		
13,200.0	6,694.0	13,309.3	6,806.3	127.3	128.0	-111.36	-6,527.7	1,034.0	311.1	74.0	237.08	1.312	Level 3		
13,300.0	6,693.4	13,409.3	6,806.1	129.2	129.9	-111.43	-6,627.7	1,034.0	311.3	70.7	240.57	1.294	Level 3		
13,400.0	6,692.8	13,509.3	6,805.9	131.1	131.8	-111.50	-6,727.7	1,034.0	311.4	67.3	244.06	1.276	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 28M-343
Project:	SEC.28-T5N-R64W	TVD Reference:	WELL @ 4648.0ft (Original Well Elev)
Reference Site:	Churchill 28J-HZ Pad Sec.28-T5N-R64W	MD Reference:	WELL @ 4648.0ft (Original Well Elev)
Site Error:	0.0ft	North Reference:	True
Reference Well:	Churchill 28M-343	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									
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
13,500.0	6,692.2	13,609.3	6,805.7	133.0	133.7	-111.57	-6,827.7	1,034.0	311.5	64.0	247.54	1.258	Level 3
13,600.0	6,691.6	13,709.3	6,805.5	134.9	135.6	-111.64	-6,927.7	1,034.0	311.7	60.6	251.03	1.242	Level 2
13,700.0	6,691.0	13,809.3	6,805.3	136.8	137.4	-111.71	-7,027.7	1,034.0	311.8	57.3	254.51	1.225	Level 2
13,800.0	6,690.4	13,909.3	6,805.1	138.7	139.3	-111.78	-7,127.7	1,034.0	311.9	53.9	257.98	1.209	Level 2
13,833.6	6,690.2	13,942.9	6,805.1	139.4	140.0	-111.80	-7,161.3	1,034.0	312.0	52.8	259.15	1.204	Level 2
13,867.6	6,690.0	13,973.0	6,805.0	140.0	140.5	-111.82	-7,191.4	1,034.0	312.0	51.8	260.27	1.199	Level 2, SF

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Churchill 28M-343
Project:	SEC.28-T5N-R64W	TVD Reference:	WELL @ 4648.0ft (Original Well Elev)
Reference Site:	Churchill 28J-HZ Pad Sec.28-T5N-R64W	MD Reference:	WELL @ 4648.0ft (Original Well Elev)
Site Error:	0.0ft	North Reference:	True
Reference Well:	Churchill 28M-343	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	6,696.3	6,735.3	6,735.3	119.8	134.7	92.38	-7,045.7	613.1	927.5	673.8	253.76	3.655					
12,900.0	6,695.7	6,734.7	6,734.7	121.6	134.7	92.12	-7,045.7	613.1	828.7	573.0	255.69	3.241					
13,000.0	6,695.1	6,734.1	6,734.1	123.5	134.7	91.86	-7,045.7	613.1	730.1	472.5	257.61	2.834					
13,100.0	6,694.6	6,733.6	6,733.6	125.4	134.7	91.60	-7,045.7	613.1	632.0	372.5	259.52	2.435					
13,200.0	6,694.0	6,733.0	6,733.0	127.3	134.7	91.34	-7,045.7	613.1	534.6	273.1	261.43	2.045					
13,300.0	6,693.4	6,732.4	6,732.4	129.2	134.6	91.08	-7,045.7	613.1	438.3	175.0	263.34	1.664					
13,400.0	6,692.8	6,731.8	6,731.8	131.1	134.6	90.82	-7,045.7	613.1	344.2	78.9	265.25	1.298	Level 3				
13,500.0	6,692.2	6,731.2	6,731.2	133.0	134.6	90.57	-7,045.7	613.1	254.6	-12.5	267.14	0.953	Level 1				
13,600.0	6,691.6	6,730.6	6,730.6	134.9	134.6	90.31	-7,045.7	613.1	176.6	-92.5	269.04	0.656	Level 1				
13,700.0	6,691.0	6,730.0	6,730.0	136.8	134.6	90.05	-7,045.7	613.1	132.4	-138.5	270.93	0.489	Level 1				
13,718.2	6,690.9	6,729.9	6,729.9	137.2	134.6	90.00	-7,045.7	613.1	131.1	-140.1	271.27	0.483	Level 1, CC, ES, SF				
13,800.0	6,690.4	6,729.4	6,729.4	138.7	134.6	89.79	-7,045.7	613.1	154.5	-118.3	272.81	0.567	Level 1				
13,867.6	6,690.0	6,729.0	6,729.0	140.0	134.6	89.61	-7,045.7	613.1	198.8	-75.3	274.08	0.725	Level 1				

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Churchill 28M-343
Project:	SEC.28-T5N-R64W	TVD Reference:	WELL @ 4648.0ft (Original Well Elev)
Reference Site:	Churchill 28J-HZ Pad Sec.28-T5N-R64W	MD Reference:	WELL @ 4648.0ft (Original Well Elev)
Site Error:	0.0ft	North Reference:	True
Reference Well:	Churchill 28M-343	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: 800-NS-GYRO-MS													Offset Well Error:	0.0 ft
Reference		Offset		Semi Major Axis		Highside Toolface (°)	Distance		Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning	
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)		Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)						
0.0	0.0	0.0	0.0	0.0	0.0	124.98	-415.3	593.5	724.6					
100.0	100.0	80.4	80.4	0.1	0.1	124.98	-415.3	593.5	724.4	724.2	0.22	3,303.359		
200.0	200.0	179.6	179.6	0.3	0.2	124.97	-415.3	593.7	724.5	723.9	0.58	1,258.314		
300.0	300.0	278.9	278.9	0.6	0.4	124.96	-415.3	594.0	724.8	723.8	0.93	777.401		
400.0	400.0	378.1	378.1	0.8	0.5	124.94	-415.3	594.4	725.1	723.8	1.29	562.627		
500.0	500.0	477.4	477.4	1.0	0.6	124.91	-415.3	595.0	725.5	723.9	1.65	440.990		
600.0	600.0	576.6	576.6	1.2	0.8	124.88	-415.2	595.6	726.1	724.1	2.00	362.730		
700.0	700.0	675.9	675.9	1.5	0.9	124.84	-415.2	596.5	726.8	724.4	2.36	308.175		
800.0	800.0	775.1	775.1	1.7	1.0	124.80	-415.2	597.4	727.5	724.8	2.71	267.987		
900.0	900.0	886.6	886.6	1.9	1.2	124.75	-414.8	597.9	727.7	724.7	3.10	234.796		
1,000.0	1,000.0	999.8	999.7	2.1	1.3	124.71	-413.3	596.6	726.0	722.5	3.47	209.018		
1,100.0	1,100.0	1,109.0	1,108.9	2.4	1.5	49.82	-409.9	594.6	721.6	717.8	3.81	189.579		
1,200.0	1,199.8	1,215.4	1,215.1	2.6	1.6	50.14	-405.8	591.8	713.9	709.7	4.18	170.779		
1,300.0	1,299.5	1,328.1	1,327.7	2.8	1.8	50.87	-401.5	587.1	702.7	698.1	4.58	153.421		
1,400.0	1,398.7	1,434.8	1,434.1	3.0	2.0	51.87	-396.1	581.2	687.7	682.6	5.01	137.324		
1,500.0	1,497.5	1,530.2	1,529.2	3.3	2.2	53.05	-390.5	576.0	670.2	664.7	5.45	122.987		
1,551.8	1,548.4	1,574.7	1,573.6	3.5	2.3	53.72	-388.1	573.9	660.8	655.1	5.68	116.283		
1,600.0	1,595.7	1,617.4	1,616.2	3.6	2.4	54.26	-386.0	572.1	652.3	646.4	5.91	110.291		
1,700.0	1,693.9	1,721.4	1,719.9	4.0	2.7	55.61	-380.7	567.8	634.7	628.3	6.45	98.341		
1,800.0	1,792.0	1,835.3	1,833.5	4.3	2.9	57.20	-373.5	561.2	615.4	608.4	7.05	87.354		
1,900.0	1,890.2	1,953.3	1,950.6	4.7	3.2	58.73	-361.9	553.3	593.6	586.0	7.67	77.365		
2,000.0	1,988.3	2,080.8	2,076.2	5.0	3.6	60.28	-343.1	542.1	567.2	558.9	8.35	67.952		
2,100.0	2,086.5	2,183.4	2,176.7	5.4	3.9	61.73	-326.3	530.4	538.2	529.2	8.97	60.011		
2,200.0	2,184.6	2,283.1	2,274.2	5.8	4.2	63.63	-311.0	516.2	508.3	498.7	9.59	52.982		
2,300.0	2,282.8	2,376.7	2,365.5	6.2	4.4	66.06	-298.6	500.0	478.6	468.3	10.22	46.823		
2,400.0	2,380.9	2,466.6	2,453.3	6.6	4.7	68.95	-288.4	483.1	450.2	439.3	10.86	41.466		
2,500.0	2,479.1	2,559.8	2,544.3	7.0	4.9	72.30	-278.2	466.0	423.7	412.2	11.52	36.764		
2,600.0	2,577.2	2,658.0	2,640.0	7.4	5.2	76.38	-267.2	446.7	397.9	385.7	12.23	32.526		
2,700.0	2,675.4	2,754.0	2,733.4	7.8	5.5	80.70	-254.8	428.4	373.1	360.1	12.96	28.793		
2,800.0	2,773.5	2,850.0	2,826.9	8.2	5.8	85.30	-241.1	411.2	349.9	336.2	13.69	25.555		
2,900.0	2,871.7	2,949.2	2,923.2	8.6	6.1	90.47	-225.1	394.2	327.7	313.2	14.44	22.696		
3,000.0	2,969.8	3,042.8	3,014.1	9.1	6.4	95.71	-208.3	379.2	306.8	291.6	15.15	20.249		
3,100.0	3,068.0	3,129.3	3,098.3	9.5	6.7	100.97	-193.7	366.2	290.1	274.3	15.82	18.341		
3,200.0	3,166.1	3,217.1	3,184.2	9.9	6.9	106.83	-181.6	352.8	279.8	263.4	16.45	17.012		
3,300.0	3,264.3	3,312.3	3,277.5	10.3	7.2	113.40	-168.5	338.8	273.5	256.5	17.03	16.058		
3,386.9	3,349.5	3,392.1	3,355.7	10.7	7.5	119.00	-158.0	327.3	271.7	254.2	17.47	15.548 CC		
3,400.0	3,362.4	3,404.2	3,367.7	10.7	7.5	119.86	-156.4	325.5	271.7	254.2	17.53	15.496 ES		
3,500.0	3,460.6	3,498.5	3,460.2	11.1	7.8	126.38	-144.6	312.2	274.5	256.6	17.96	15.282 SF		
3,600.0	3,558.7	3,597.2	3,557.2	11.6	8.1	133.00	-131.6	298.5	280.5	262.1	18.32	15.307		
3,700.0	3,656.9	3,700.1	3,657.7	12.0	8.4	139.84	-115.3	284.2	288.0	269.4	18.61	15.474		
3,800.0	3,755.0	3,798.7	3,753.1	12.4	8.7	146.70	-95.3	269.4	296.7	277.8	18.84	15.750		
3,900.0	3,853.2	3,887.5	3,838.7	12.8	9.0	152.72	-76.4	255.3	309.4	290.3	19.05	16.243		
4,000.0	3,951.3	3,974.0	3,922.2	13.3	9.3	158.08	-59.3	240.3	327.8	308.6	19.27	17.010		
4,100.0	4,049.5	4,066.3	4,011.6	13.7	9.6	162.97	-42.9	224.3	350.4	330.9	19.54	17.931		
4,200.0	4,147.6	4,164.7	4,107.4	14.1	9.9	167.31	-26.5	208.8	374.4	354.5	19.86	18.849		
4,300.0	4,245.8	4,261.9	4,202.4	14.5	10.2	170.78	-11.5	195.6	398.8	378.6	20.24	19.707		
4,400.0	4,343.9	4,357.7	4,296.4	14.9	10.5	173.69	2.6	183.1	424.1	403.5	20.64	20.546		
4,500.0	4,442.1	4,460.0	4,396.8	15.4	10.8	176.44	17.9	170.6	449.6	428.5	21.09	21.318		
4,600.0	4,540.2	4,563.6	4,498.4	15.8	11.2	179.02	34.8	159.8	473.7	452.2	21.57	21.968		
4,700.0	4,638.4	4,666.0	4,589.0	16.2	11.4	-178.83	50.8	150.8	497.9	475.9	22.04	22.592		
4,800.0	4,736.5	4,740.5	4,671.3	16.6	11.7	-176.83	66.7	140.8	524.2	501.7	22.51	23.289		

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 28M-343
Project:	SEC.28-T5N-R64W	TVD Reference:	WELL @ 4648.0ft (Original Well Elev)
Reference Site:	Churchill 28J-HZ Pad Sec.28-T5N-R64W	MD Reference:	WELL @ 4648.0ft (Original Well Elev)
Site Error:	0.0ft	North Reference:	True
Reference Well:	Churchill 28M-343	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: 800-NS-GYRO-MS													Offset Well Error:	0.0 ft
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference	Offset	Semi Major Axis	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
4,900.0	4,834.7	4,828.1	4,756.8	17.1	12.0	-175.04		82.1	129.0	553.1	530.1	23.01	24.042	
5,000.0	4,932.8	4,927.5	4,853.6	17.5	12.3	-173.15		100.0	115.5	582.5	559.0	23.55	24.740	
5,019.1	4,951.6	4,947.7	4,873.3	17.6	12.4	-172.79		103.6	112.9	588.1	564.4	23.66	24.860	
5,100.0	5,031.2	5,026.2	4,950.0	17.9	12.6	-171.59		117.0	103.5	610.1	585.9	24.17	25.247	
5,200.0	5,130.1	5,127.7	5,050.0	18.1	12.9	-170.50		130.5	91.6	634.7	609.9	24.76	25.638	
5,300.0	5,229.5	5,239.5	5,160.8	18.4	13.2	-169.75		140.7	81.1	654.2	628.8	25.33	25.826	
5,400.0	5,329.2	5,352.6	5,273.3	18.6	13.6	-169.11		149.5	72.9	668.3	642.4	25.87	25.834	
5,500.0	5,429.1	5,446.7	5,366.8	18.7	13.8	-168.57		156.6	66.9	678.3	652.0	26.32	25.769	
5,570.9	5,500.0	5,508.9	5,428.7	18.8	14.0	-93.22		161.7	62.3	684.1	657.5	26.61	25.705	
5,600.0	5,529.1	5,534.3	5,453.9	18.9	14.1	-93.05		163.7	60.2	686.4	659.7	26.74	25.672	
5,700.0	5,629.1	5,648.4	5,567.4	19.0	14.4	-92.38		171.2	51.5	693.7	666.5	27.24	25.467	
5,800.0	5,729.1	5,745.5	5,664.2	19.1	14.6	-91.88		177.1	45.0	700.2	672.5	27.69	25.284	
5,900.0	5,829.1	5,860.7	5,779.0	19.3	14.9	-91.38		183.0	38.9	705.3	677.1	28.19	25.017	
6,000.0	5,929.1	5,963.6	5,881.7	19.4	15.2	-91.02		187.3	34.3	709.7	681.1	28.65	24.770	
6,036.3	5,965.4	6,004.0	5,922.1	19.5	15.3	-90.94		188.3	32.8	711.1	682.2	28.82	24.671	
6,050.0	5,979.1	6,019.4	5,937.5	19.5	15.3	89.06		188.5	32.2	711.5	682.6	28.88	24.634	
6,100.0	6,029.0	6,080.7	5,998.8	19.6	15.5	89.33		189.8	30.8	712.7	683.5	29.11	24.482	
6,150.0	6,078.6	6,136.4	6,054.4	19.6	15.6	89.95		191.6	30.2	713.1	683.8	29.32	24.323	
6,200.0	6,127.8	6,186.0	6,104.0	19.6	15.7	90.77		193.3	29.9	713.5	684.0	29.50	24.183	
6,250.0	6,176.3	6,234.6	6,152.5	19.7	15.8	91.81		195.0	29.6	714.1	684.5	29.68	24.061	
6,300.0	6,223.9	6,282.2	6,200.1	19.7	15.9	93.00		196.3	29.3	715.2	685.3	29.84	23.966	
6,350.0	6,270.3	6,328.6	6,246.5	19.7	16.0	94.32		197.3	29.1	716.8	686.8	29.99	23.903	
6,400.0	6,315.5	6,373.8	6,291.7	19.7	16.1	95.72		197.9	28.9	719.3	689.1	30.12	23.883	
6,450.0	6,359.1	6,413.4	6,331.3	19.7	16.2	96.99		198.3	28.6	722.8	692.6	30.21	23.927	
6,500.0	6,401.1	6,447.8	6,365.7	19.8	16.3	98.09		198.6	28.0	728.1	697.8	30.28	24.048	
6,550.0	6,441.2	6,488.0	6,405.9	19.8	16.4	99.45		199.0	27.0	735.4	705.0	30.34	24.235	
6,600.0	6,479.3	6,518.6	6,436.5	19.8	16.5	100.32		199.4	26.0	744.5	714.2	30.39	24.500	
6,650.0	6,515.2	6,556.8	6,474.6	19.9	16.6	101.53		199.8	24.9	755.6	725.2	30.44	24.821	
6,700.0	6,548.7	6,592.9	6,510.7	19.9	16.7	102.57		200.1	24.0	768.8	738.3	30.51	25.201	
6,750.0	6,579.7	6,627.5	6,545.4	20.0	16.7	103.44		200.3	23.3	784.2	753.6	30.59	25.633	
6,800.0	6,608.1	6,659.5	6,577.3	20.1	16.8	104.03		200.4	22.7	801.8	771.1	30.73	26.093	
6,850.0	6,633.7	6,687.3	6,605.2	20.2	16.9	104.22		200.4	22.3	821.9	790.9	30.94	26.560	
6,900.0	6,656.5	6,710.5	6,628.3	20.4	16.9	103.92		200.3	22.0	844.4	813.1	31.26	27.011	
6,950.0	6,676.3	6,730.8	6,648.6	20.5	16.9	103.21		200.3	21.7	869.3	837.6	31.69	27.432	
7,000.0	6,693.1	6,748.0	6,665.8	20.8	17.0	102.05		200.2	21.4	896.6	864.3	32.23	27.816	
7,050.0	6,706.7	6,762.2	6,680.0	21.0	17.0	100.40		200.1	21.2	926.0	893.1	32.87	28.170	
7,100.0	6,717.2	6,773.2	6,691.0	21.4	17.0	98.23		200.1	21.1	957.5	923.9	33.58	28.515	
7,150.0	6,724.5	6,781.0	6,698.9	21.7	17.0	95.53		200.0	20.9	990.7	956.4	34.29	28.889	

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Churchill 28M-343
Project:	SEC.28-T5N-R64W	TVD Reference:	WELL @ 4648.0ft (Original Well Elev)
Reference Site:	Churchill 28J-HZ Pad Sec.28-T5N-R64W	MD Reference:	WELL @ 4648.0ft (Original Well Elev)
Site Error:	0.0ft	North Reference:	True
Reference Well:	Churchill 28M-343	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 (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	125.46	-444.5	624.1	766.4					
100.0	100.0	80.0	80.0	0.1	0.1	125.46	-444.5	624.1	766.3	766.1	0.20	3,774.820		
200.0	200.0	178.7	178.7	0.3	0.2	125.48	-444.8	624.2	766.5	765.9	0.54	1,421.050		
300.0	300.0	277.4	277.4	0.6	0.3	125.50	-445.4	624.3	766.9	766.0	0.88	875.661		
400.0	400.0	376.1	376.1	0.8	0.4	125.54	-446.1	624.4	767.4	766.2	1.21	633.114		
500.0	500.0	474.8	474.8	1.0	0.5	125.60	-447.1	624.6	768.1	766.6	1.55	496.052		
600.0	600.0	570.8	570.8	1.2	0.7	125.67	-448.5	624.8	769.1	767.2	1.95	394.951		
700.0	700.0	664.9	664.8	1.5	0.9	125.83	-451.2	624.8	770.8	768.5	2.39	322.880		
800.0	800.0	757.8	757.7	1.7	1.1	126.04	-454.9	625.1	773.4	770.6	2.83	273.509		
900.0	900.0	849.9	849.7	1.9	1.4	126.27	-459.3	625.8	776.9	773.6	3.27	237.752		
1,000.0	1,000.0	939.8	939.4	2.1	1.6	126.51	-464.3	627.3	781.6	777.9	3.71	210.829		
1,100.0	1,100.0	1,029.8	1,029.2	2.4	1.8	51.82	-470.1	629.7	786.4	782.3	4.12	190.777		
1,200.0	1,199.8	1,119.9	1,119.0	2.6	2.0	52.25	-476.5	633.0	790.4	785.9	4.54	174.206		
1,300.0	1,299.5	1,215.8	1,214.5	2.8	2.3	52.87	-483.3	637.6	793.3	788.4	4.96	159.979		
1,400.0	1,398.7	1,312.9	1,311.2	3.0	2.5	53.64	-489.4	643.2	794.5	789.1	5.39	147.389		
1,500.0	1,497.5	1,405.9	1,403.9	3.3	2.7	54.59	-495.8	648.8	794.3	788.5	5.84	136.114		
1,551.8	1,548.4	1,457.0	1,454.8	3.5	2.9	55.22	-499.7	651.9	793.8	787.7	6.08	130.514		
1,600.0	1,595.7	1,497.9	1,495.5	3.6	3.0	55.75	-503.1	654.5	793.4	787.1	6.31	125.681		
1,644.5	1,639.3	1,538.7	1,536.0	3.8	3.1	56.27	-506.3	657.3	793.3	786.8	6.54	121.343		
1,700.0	1,693.9	1,586.7	1,583.7	4.0	3.2	56.85	-510.2	660.9	793.5	786.7	6.81	116.460		
1,800.0	1,792.0	1,672.4	1,668.7	4.3	3.5	57.84	-517.2	668.8	795.6	788.3	7.32	108.625		
1,900.0	1,890.2	1,763.7	1,759.2	4.7	3.7	58.82	-524.9	678.8	799.3	791.5	7.86	101.672		
2,000.0	1,988.3	1,864.1	1,858.6	5.0	4.0	59.91	-533.7	689.6	803.5	795.1	8.43	95.352		
2,100.0	2,086.5	1,962.2	1,955.7	5.4	4.3	60.94	-542.2	700.4	808.0	799.0	8.99	89.849		
2,200.0	2,184.6	2,062.3	2,054.8	5.8	4.6	61.97	-550.5	711.6	812.7	803.1	9.57	84.911		
2,300.0	2,282.8	2,163.4	2,155.0	6.2	4.9	62.98	-558.8	722.9	817.4	807.3	10.16	80.425		
2,400.0	2,380.9	2,259.1	2,249.8	6.6	5.2	63.99	-567.0	732.8	822.3	811.5	10.76	76.400		
2,500.0	2,479.1	2,348.0	2,337.8	7.0	5.5	64.90	-575.1	742.8	828.3	816.9	11.36	72.908		
2,600.0	2,577.2	2,435.4	2,424.1	7.4	5.8	65.83	-584.4	752.7	835.9	823.9	11.97	69.835		
2,700.0	2,675.4	2,522.7	2,510.1	7.8	6.1	66.76	-594.8	763.1	845.1	832.5	12.59	67.132		
2,800.0	2,773.5	2,607.4	2,593.4	8.2	6.4	67.61	-605.4	774.3	855.9	842.6	13.21	64.797		
2,900.0	2,871.7	2,685.5	2,670.0	8.6	6.7	68.38	-616.6	785.5	869.0	855.1	13.82	62.884		
3,000.0	2,969.8	2,790.0	2,772.1	9.1	7.1	69.35	-632.0	801.3	883.1	868.6	14.50	60.909		
3,100.0	3,068.0	2,894.6	2,874.6	9.5	7.5	70.29	-646.3	816.6	896.3	881.1	15.17	59.077		
3,200.0	3,166.1	2,981.4	2,959.5	9.9	7.9	71.09	-659.1	829.0	910.4	894.6	15.81	57.580		
3,300.0	3,264.3	3,081.4	3,057.3	10.3	8.3	72.06	-674.9	842.5	925.3	908.8	16.50	56.084		
3,400.0	3,362.4	3,189.3	3,163.0	10.7	8.7	72.98	-690.5	857.9	939.5	922.3	17.20	54.611		
3,500.0	3,460.6	3,301.0	3,272.6	11.1	9.1	73.92	-705.8	873.2	953.1	935.2	17.92	53.184		
3,600.0	3,558.7	3,409.4	3,379.3	11.6	9.5	74.80	-719.0	887.0	965.1	946.5	18.63	51.801		
3,700.0	3,656.9	3,501.2	3,469.7	12.0	9.8	75.52	-730.1	898.9	977.3	958.0	19.31	50.622		
3,800.0	3,755.0	3,581.3	3,548.3	12.4	10.2	76.10	-740.3	910.2	990.8	970.9	19.96	49.648		
6,850.0	6,633.7	6,661.7	6,592.3	20.2	20.0	-47.90	-1,037.2	1,217.3	967.6	939.3	28.33	34.157		
6,900.0	6,656.5	6,686.4	6,617.0	20.4	20.1	-52.88	-1,037.4	1,218.0	929.6	900.3	29.30	31.727		
6,950.0	6,676.3	6,707.9	6,638.4	20.5	20.1	-58.30	-1,037.7	1,218.5	890.9	860.3	30.59	29.126		
7,000.0	6,693.1	6,725.6	6,656.1	20.8	20.1	-63.97	-1,037.8	1,218.9	851.8	819.8	32.03	26.593		
7,050.0	6,706.7	6,740.1	6,670.6	21.0	20.2	-69.74	-1,037.9	1,219.3	812.7	779.2	33.46	24.287		
7,100.0	6,717.2	6,751.2	6,681.8	21.4	20.2	-75.35	-1,038.0	1,219.6	773.8	739.1	34.72	22.289		
7,150.0	6,724.5	6,759.0	6,689.6	21.7	20.2	-80.59	-1,038.1	1,219.7	735.6	699.9	35.71	20.602		
7,200.0	6,728.5	6,763.5	6,694.1	22.1	20.2	-85.24	-1,038.1	1,219.9	698.5	662.1	36.42	19.181		
7,240.9	6,729.3	6,764.7	6,695.2	22.5	20.2	-88.52	-1,038.1	1,219.9	669.2	632.4	36.82	18.176		
7,300.0	6,729.0	6,764.8	6,695.3	23.0	20.2	-88.53	-1,038.1	1,219.9	629.1	591.6	37.52	16.768		

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 28M-343
Project:	SEC.28-T5N-R64W	TVD Reference:	WELL @ 4648.0ft (Original Well Elev)
Reference Site:	Churchill 28J-HZ Pad Sec.28-T5N-R64W	MD Reference:	WELL @ 4648.0ft (Original Well Elev)
Site Error:	0.0ft	North Reference:	True
Reference Well:	Churchill 28M-343	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	
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)				
7,400.0	6,728.4	6,765.0	6,695.5	24.1	20.2	-88.55	-1,038.1	1,219.9	568.9	530.1	38.79	14.666	11.015 CC, ES 10.858 SF		
7,500.0	6,727.8	6,765.1	6,695.6	25.3	20.2	-88.57	-1,038.1	1,219.9	521.1	480.9	40.15	12.977			
7,600.0	6,727.2	6,765.3	6,695.8	26.5	20.2	-88.59	-1,038.1	1,219.9	489.3	447.7	41.60	11.762			
7,700.0	6,726.6	6,765.4	6,695.9	27.9	20.2	-88.61	-1,038.2	1,219.9	476.7	433.6	43.10	11.060			
7,710.7	6,726.5	6,765.4	6,696.0	28.0	20.2	-88.61	-1,038.2	1,219.9	476.6	433.3	43.27				
7,800.0	6,726.0	6,765.6	6,696.1	29.3	20.2	-88.62	-1,038.2	1,219.9	484.9	440.2	44.66				
7,900.0	6,725.4	6,765.7	6,696.2	30.8	20.2	-88.64	-1,038.2	1,219.9	512.8	466.5	46.26	11.086			
8,000.0	6,724.8	6,765.8	6,696.4	32.3	20.2	-88.66	-1,038.2	1,219.9	557.5	509.6	47.90	11.640			
8,100.0	6,724.2	6,766.0	6,696.5	33.9	20.2	-88.68	-1,038.2	1,219.9	615.4	565.8	49.57	12.415			
8,200.0	6,723.6	6,766.1	6,696.7	35.5	20.2	-88.69	-1,038.2	1,219.9	683.1	631.8	51.26	13.325			
8,300.0	6,723.0	6,766.3	6,696.8	37.1	20.2	-88.71	-1,038.2	1,219.9	757.9	704.9	52.98	14.305			
8,400.0	6,722.4	6,766.4	6,696.9	38.8	20.2	-88.73	-1,038.2	1,219.9	838.0	783.3	54.72	15.314			
8,500.0	6,721.9	6,766.6	6,697.1	40.4	20.2	-88.74	-1,038.2	1,219.9	922.0	865.6	56.48	16.326			

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Churchill 28M-343
Project:	SEC.28-T5N-R64W	TVD Reference:	WELL @ 4648.0ft (Original Well Elev)
Reference Site:	Churchill 28J-HZ Pad Sec.28-T5N-R64W	MD Reference:	WELL @ 4648.0ft (Original Well Elev)
Site Error:	0.0ft	North Reference:	True
Reference Well:	Churchill 28M-343	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: 6966-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		
7,500.0	6,727.8	6,729.8	6,729.8	25.3	134.6	92.18	-1,792.4	593.5	976.4	819.4	156.97	6.220		
7,600.0	6,727.2	6,729.2	6,729.2	26.5	134.6	91.96	-1,792.4	593.5	877.7	719.3	158.41	5.541		
7,700.0	6,726.6	6,728.6	6,728.6	27.9	134.6	91.73	-1,792.4	593.5	779.4	619.5	159.91	4.874		
7,800.0	6,726.0	6,728.0	6,728.0	29.3	134.6	91.51	-1,792.4	593.5	681.5	520.0	161.46	4.221		
7,900.0	6,725.4	6,727.4	6,727.4	30.8	134.5	91.28	-1,792.4	593.5	584.4	421.3	163.06	3.584		
8,000.0	6,724.8	6,726.8	6,726.8	32.3	134.5	91.05	-1,792.4	593.5	488.4	323.7	164.69	2.966		
8,100.0	6,724.2	6,726.2	6,726.2	33.9	134.5	90.83	-1,792.4	593.5	394.4	228.1	166.35	2.371		
8,200.0	6,723.6	6,725.6	6,725.6	35.5	134.5	90.60	-1,792.4	593.5	304.4	136.3	168.03	1.811		
8,300.0	6,723.0	6,725.0	6,725.0	37.1	134.5	90.37	-1,792.4	593.5	222.9	53.2	169.73	1.313 Level 3		
8,400.0	6,722.4	6,724.4	6,724.4	38.8	134.5	90.15	-1,792.4	593.5	163.5	-8.0	171.45	0.953 Level 1		
8,464.8	6,722.1	6,724.1	6,724.1	39.8	134.5	90.00	-1,792.4	593.5	150.1	-22.5	172.58	0.870 Level 1, CC, ES, SF		
8,500.0	6,721.9	6,723.9	6,723.9	40.4	134.5	89.92	-1,792.4	593.5	154.1	-19.0	173.19	0.890 Level 1		
8,600.0	6,721.3	6,723.3	6,723.3	42.1	134.5	89.69	-1,792.4	593.5	202.0	27.1	174.94	1.155 Level 2		
8,700.0	6,720.7	6,722.7	6,722.7	43.9	134.5	89.47	-1,792.4	593.5	279.0	102.3	176.70	1.579		
8,800.0	6,720.1	6,722.1	6,722.1	45.6	134.4	89.24	-1,792.4	593.5	367.3	188.8	178.46	2.058		
8,900.0	6,719.5	6,721.5	6,721.5	47.3	134.4	89.01	-1,792.4	593.5	460.3	280.1	180.24	2.554		
9,000.0	6,718.9	6,720.9	6,720.9	49.1	134.4	88.79	-1,792.4	593.5	555.8	373.8	182.02	3.054		
9,100.0	6,718.3	6,720.3	6,720.3	50.9	134.4	88.56	-1,792.4	593.5	652.7	468.9	183.80	3.551		
9,200.0	6,717.7	6,719.7	6,719.7	52.7	134.4	88.33	-1,792.4	593.5	750.4	564.8	185.59	4.043		
9,300.0	6,717.1	6,719.1	6,719.1	54.5	134.4	88.11	-1,792.4	593.5	848.6	661.2	187.39	4.528		
9,400.0	6,716.5	6,718.5	6,718.5	56.3	134.4	87.88	-1,792.4	593.5	947.2	758.0	189.18	5.007		

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Churchill 28M-343
Project:	SEC.28-T5N-R64W	TVD Reference:	WELL @ 4648.0ft (Original Well Elev)
Reference Site:	Churchill 28J-HZ Pad Sec.28-T5N-R64W	MD Reference:	WELL @ 4648.0ft (Original Well Elev)
Site Error:	0.0ft	North Reference:	True
Reference Well:	Churchill 28M-343	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 (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	126.83	-444.5	593.5	741.7					
100.0	100.0	81.0	81.0	0.1	1.6	126.83	-444.5	593.5	741.4	739.7	1.73	427.942		
200.0	200.0	181.0	181.0	0.3	3.6	126.83	-444.5	593.5	741.4	737.5	3.96	187.359		
300.0	300.0	281.0	281.0	0.6	5.6	126.83	-444.5	593.5	741.4	735.3	6.18	119.934		
400.0	400.0	381.0	381.0	0.8	7.6	126.83	-444.5	593.5	741.4	733.0	8.41	88.195		
500.0	500.0	481.0	481.0	1.0	9.6	126.83	-444.5	593.5	741.4	730.8	10.63	69.739		
600.0	600.0	581.0	581.0	1.2	11.6	126.83	-444.5	593.5	741.4	728.6	12.86	57.671		
700.0	700.0	681.0	681.0	1.5	13.6	126.83	-444.5	593.5	741.4	726.4	15.08	49.164		
800.0	800.0	781.0	781.0	1.7	15.6	126.83	-444.5	593.5	741.4	724.1	17.31	42.843		
900.0	900.0	881.0	881.0	1.9	17.6	126.83	-444.5	593.5	741.4	721.9	19.53	37.963		
1,000.0	1,000.0	981.0	981.0	2.1	19.6	126.83	-444.5	593.5	741.4	719.7	21.76	34.081		
1,100.0	1,100.0	1,081.0	1,081.0	2.4	21.6	52.01	-444.5	593.5	740.4	716.4	23.96	30.894		
1,200.0	1,199.8	1,180.8	1,180.8	2.6	23.6	52.38	-444.5	593.5	737.2	711.0	26.15	28.187		
1,300.0	1,299.5	1,280.5	1,280.5	2.8	25.6	53.01	-444.5	593.5	731.9	703.5	28.33	25.833		
1,400.0	1,398.7	1,379.7	1,379.7	3.0	27.6	53.89	-444.5	593.5	724.6	694.1	30.50	23.755		
1,500.0	1,497.5	1,478.5	1,478.5	3.3	29.6	55.05	-444.5	593.5	715.4	682.7	32.67	21.896		
1,551.8	1,548.4	1,529.4	1,529.4	3.5	30.6	55.76	-444.5	593.5	710.0	676.2	33.80	21.004		
1,600.0	1,595.7	1,576.7	1,576.7	3.6	31.5	56.37	-444.5	593.5	704.8	669.9	34.89	20.200		
1,700.0	1,693.9	1,674.9	1,674.9	4.0	33.5	57.67	-444.5	593.5	694.2	657.0	37.16	18.681		
1,800.0	1,792.0	1,773.0	1,773.0	4.3	35.5	59.00	-444.5	593.5	684.0	644.6	39.45	17.338		
1,900.0	1,890.2	1,871.2	1,871.2	4.7	37.4	60.38	-444.5	593.5	674.2	632.4	41.76	16.144		
2,000.0	1,988.3	1,969.3	1,969.3	5.0	39.4	61.79	-444.5	593.5	664.8	620.7	44.09	15.080		
2,100.0	2,086.5	2,067.5	2,067.5	5.4	41.3	63.24	-444.5	593.5	655.9	609.4	46.43	14.127		
2,200.0	2,184.6	2,165.6	2,165.6	5.8	43.3	64.73	-444.5	593.5	647.3	598.6	48.78	13.271		
2,300.0	2,282.8	2,263.8	2,263.8	6.2	45.3	66.26	-444.5	593.5	639.3	588.1	51.14	12.500		
2,400.0	2,380.9	2,361.9	2,361.9	6.6	47.2	67.83	-444.5	593.5	631.7	578.2	53.52	11.804		
2,500.0	2,479.1	2,460.1	2,460.1	7.0	49.2	69.43	-444.5	593.5	624.6	568.7	55.90	11.173		
2,600.0	2,577.2	2,558.2	2,558.2	7.4	51.2	71.06	-444.5	593.5	618.0	559.7	58.29	10.602		
2,700.0	2,675.4	2,656.4	2,656.4	7.8	53.1	72.73	-444.5	593.5	612.0	551.3	60.69	10.084		
2,800.0	2,773.5	2,754.5	2,754.5	8.2	55.1	74.43	-444.5	593.5	606.5	543.4	63.09	9.612		
2,900.0	2,871.7	2,852.7	2,852.7	8.6	57.1	76.15	-444.5	593.5	601.5	536.0	65.50	9.183		
3,000.0	2,969.8	2,950.8	2,950.8	9.1	59.0	77.90	-444.5	593.5	597.1	529.2	67.91	8.793		
3,100.0	3,068.0	3,049.0	3,049.0	9.5	61.0	79.68	-444.5	593.5	593.3	523.0	70.32	8.438		
3,200.0	3,166.1	3,147.1	3,147.1	9.9	62.9	81.48	-444.5	593.5	590.2	517.4	72.73	8.114		
3,300.0	3,264.3	3,245.3	3,245.3	10.3	64.9	83.29	-444.5	593.5	587.6	512.4	75.14	7.819		
3,400.0	3,362.4	3,343.4	3,343.4	10.7	66.9	85.11	-444.5	593.5	585.6	508.0	77.55	7.551		
3,500.0	3,460.6	3,441.6	3,441.6	11.1	68.8	86.95	-444.5	593.5	584.2	504.3	79.95	7.307		
3,600.0	3,558.7	3,539.7	3,539.7	11.6	70.8	88.79	-444.5	593.5	583.5	501.2	82.35	7.086		
3,665.4	3,622.9	3,603.9	3,603.9	11.8	72.1	90.00	-444.5	593.5	583.4	499.5	83.92	6.952		
3,700.0	3,656.9	3,637.9	3,637.9	12.0	72.8	90.64	-444.5	593.5	583.4	498.7	84.74	6.885		
3,800.0	3,755.0	3,736.0	3,736.0	12.4	74.7	92.48	-444.5	593.5	584.0	496.8	87.13	6.702		
3,900.0	3,853.2	3,834.2	3,834.2	12.8	76.7	94.32	-444.5	593.5	585.1	495.6	89.50	6.538		
4,000.0	3,951.3	3,932.3	3,932.3	13.3	78.6	96.15	-444.5	593.5	586.9	495.0	91.86	6.389		
4,100.0	4,049.5	4,030.5	4,030.5	13.7	80.6	97.97	-444.5	593.5	589.3	495.1	94.22	6.255		
4,200.0	4,147.6	4,128.6	4,128.6	14.1	82.6	99.77	-444.5	593.5	592.3	495.7	96.56	6.134		
4,300.0	4,245.8	4,226.8	4,226.8	14.5	84.5	101.55	-444.5	593.5	595.9	497.0	98.89	6.026		
4,400.0	4,343.9	4,324.9	4,324.9	14.9	86.5	103.31	-444.5	593.5	600.1	498.9	101.21	5.929		
4,500.0	4,442.1	4,423.1	4,423.1	15.4	88.5	105.05	-444.5	593.5	604.9	501.4	103.51	5.843		
4,600.0	4,540.2	4,521.2	4,521.2	15.8	90.4	106.75	-444.5	593.5	610.2	504.4	105.81	5.767		
4,700.0	4,638.4	4,619.4	4,619.4	16.2	92.4	108.43	-444.5	593.5	616.1	508.0	108.09	5.700		
4,800.0	4,736.5	4,717.5	4,717.5	16.6	94.4	110.07	-444.5	593.5	622.5	512.2	110.36	5.641		

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 28M-343
Project:	SEC.28-T5N-R64W	TVD Reference:	WELL @ 4648.0ft (Original Well Elev)
Reference Site:	Churchill 28J-HZ Pad Sec.28-T5N-R64W	MD Reference:	WELL @ 4648.0ft (Original Well Elev)
Site Error:	0.0ft	North Reference:	True
Reference Well:	Churchill 28M-343	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
Reference		Offset		Semi Major Axis		Highside Toolface (°)	Distance		Minimum Separation (ft)	Separation Factor	Warning			
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)		Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)						
4,900.0	4,834.7	4,815.7	4,815.7	17.1	96.3	111.68	-444.5	593.5	629.4	516.8	112.61	5.589		
5,000.0	4,932.8	4,913.8	4,913.8	17.5	98.3	113.26	-444.5	593.5	636.9	522.0	114.86	5.545		
5,019.1	4,951.6	4,932.6	4,932.6	17.6	98.7	113.56	-444.5	593.5	638.4	523.1	115.29	5.537		
5,100.0	5,031.2	5,012.2	5,012.2	17.9	100.2	114.82	-444.5	593.5	644.3	527.2	117.13	5.501		
5,200.0	5,130.1	5,111.1	5,111.1	18.1	102.2	116.10	-444.5	593.5	650.7	531.3	119.36	5.452		
5,300.0	5,229.5	5,210.5	5,210.5	18.4	104.2	117.06	-444.5	593.5	655.7	534.1	121.57	5.394		
5,400.0	5,329.2	5,310.2	5,310.2	18.6	106.2	117.72	-444.5	593.5	659.3	535.5	123.76	5.327		
5,500.0	5,429.1	5,410.1	5,410.1	18.7	108.2	118.07	-444.5	593.5	661.2	535.3	125.91	5.251		
5,570.9	5,500.0	5,481.0	5,481.0	18.8	109.6	-166.91	-444.5	593.5	661.6	534.2	127.42	5.193		
5,600.0	5,529.1	5,510.1	5,510.1	18.9	110.2	-166.91	-444.5	593.5	661.6	533.6	128.04	5.167		
5,700.0	5,629.1	5,610.1	5,610.1	19.0	112.2	-166.91	-444.5	593.5	661.6	531.5	130.19	5.082		
5,800.0	5,729.1	5,710.1	5,710.1	19.1	114.2	-166.91	-444.5	593.5	661.6	529.3	132.34	5.000		
5,900.0	5,829.1	5,810.1	5,810.1	19.3	116.2	-166.91	-444.5	593.5	661.6	527.2	134.49	4.920		
6,000.0	5,929.1	5,910.1	5,910.1	19.4	118.2	-166.91	-444.5	593.5	661.6	525.0	136.64	4.842		
6,036.3	5,965.4	5,946.4	5,946.4	19.5	118.9	-166.91	-444.5	593.5	661.6	524.2	137.42	4.815		
6,050.0	5,979.1	5,960.1	5,960.1	19.5	119.2	13.10	-444.5	593.5	661.5	523.8	137.68	4.805		
6,100.0	6,029.0	6,010.0	6,010.0	19.6	120.2	13.19	-444.5	593.5	659.1	520.8	138.27	4.767		
6,150.0	6,078.6	6,059.6	6,059.6	19.6	121.2	13.41	-444.5	593.5	653.4	515.1	138.28	4.725		
6,200.0	6,127.8	6,108.8	6,108.8	19.6	122.2	13.75	-444.5	593.5	644.6	506.9	137.71	4.681		
6,250.0	6,176.3	6,157.3	6,157.3	19.7	123.1	14.24	-444.5	593.5	632.8	496.2	136.57	4.633		
6,300.0	6,223.9	6,204.9	6,204.9	19.7	124.1	14.89	-444.5	593.5	617.8	483.0	134.87	4.581		
6,350.0	6,270.3	6,251.3	6,251.3	19.7	125.0	15.72	-444.5	593.5	600.0	467.3	132.64	4.523		
6,400.0	6,315.5	6,296.5	6,296.5	19.7	125.9	16.78	-444.5	593.5	579.2	449.3	129.92	4.458		
6,450.0	6,359.1	6,340.1	6,340.1	19.7	126.8	18.10	-444.5	593.5	555.7	428.9	126.81	4.383		
6,500.0	6,401.1	6,382.1	6,382.1	19.8	127.6	19.76	-444.5	593.5	529.7	406.2	123.43	4.291		
6,550.0	6,441.2	6,422.2	6,422.2	19.8	128.4	21.84	-444.5	593.5	501.1	381.1	119.97	4.177		
6,600.0	6,479.3	6,460.3	6,460.3	19.8	129.2	24.44	-444.5	593.5	470.3	353.5	116.75	4.028		
6,650.0	6,515.2	6,496.2	6,496.2	19.9	129.9	27.72	-444.5	593.5	437.4	323.2	114.24	3.829		
6,700.0	6,548.7	6,529.7	6,529.7	19.9	130.6	31.84	-444.5	593.5	402.8	289.7	113.06	3.563		
6,750.0	6,579.7	6,560.7	6,560.7	20.0	131.2	37.00	-444.5	593.5	366.7	252.7	114.00	3.217		
6,800.0	6,608.1	6,589.1	6,589.1	20.1	131.8	43.38	-444.5	593.5	329.6	211.9	117.71	2.800		
6,850.0	6,633.7	6,614.7	6,614.7	20.2	132.3	51.01	-444.5	593.5	292.0	167.8	124.23	2.350		
6,900.0	6,656.5	6,637.5	6,637.5	20.4	132.7	59.64	-444.5	593.5	254.8	122.3	132.52	1.923		
6,950.0	6,676.3	6,657.3	6,657.3	20.5	133.1	68.64	-444.5	593.5	219.4	78.8	140.58	1.561		
7,000.0	6,693.1	6,674.1	6,674.1	20.8	133.5	77.07	-444.5	593.5	187.8	41.2	146.57	1.281 Level 3		
7,050.0	6,706.7	6,687.7	6,687.7	21.0	133.8	84.02	-444.5	593.5	163.4	13.4	149.96	1.090 Level 2		
7,100.0	6,717.2	6,698.2	6,698.2	21.4	134.0	88.91	-444.5	593.5	150.8	-0.7	151.46	0.996 Level 1		
7,116.3	6,719.9	6,700.9	6,700.9	21.5	134.0	90.00	-444.5	593.5	149.9	-1.8	151.73	0.988 Level 1, CC, ES, SF		
7,150.0	6,724.5	6,705.5	6,705.5	21.7	134.1	91.44	-444.5	593.5	153.6	1.4	152.16	1.009 Level 2		
7,200.0	6,728.5	6,709.5	6,709.5	22.1	134.2	91.51	-444.5	593.5	171.5	18.7	152.78	1.122 Level 2		
7,240.9	6,729.3	6,710.3	6,710.3	22.5	134.2	89.72	-444.5	593.5	194.6	41.3	153.24	1.270 Level 3		
7,300.0	6,729.0	6,710.0	6,710.0	23.0	134.2	89.58	-444.5	593.5	236.7	82.8	153.92	1.538		
7,400.0	6,728.4	6,709.4	6,709.4	24.1	134.2	89.36	-444.5	593.5	320.4	165.2	155.17	2.065		
7,500.0	6,727.8	6,708.8	6,708.8	25.3	134.2	89.13	-444.5	593.5	411.5	255.0	156.50	2.629		
7,600.0	6,727.2	6,708.2	6,708.2	26.5	134.2	88.90	-444.5	593.5	505.9	348.0	157.91	3.204		
7,700.0	6,726.6	6,707.6	6,707.6	27.9	134.2	88.68	-444.5	593.5	602.1	442.8	159.38	3.778		
7,800.0	6,726.0	6,707.0	6,707.0	29.3	134.1	88.45	-444.5	593.5	699.4	538.5	160.90	4.347		
7,900.0	6,725.4	6,706.4	6,706.4	30.8	134.1	88.22	-444.5	593.5	797.4	634.9	162.46	4.908		
8,000.0	6,724.8	6,705.8	6,705.8	32.3	134.1	88.00	-444.5	593.5	895.8	731.7	164.06	5.460		
8,100.0	6,724.2	6,705.2	6,705.2	33.9	134.1	87.77	-444.5	593.5	994.5	828.8	165.68	6.003		

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Churchill 28M-343
Project:	SEC.28-T5N-R64W	TVD Reference:	WELL @ 4648.0ft (Original Well Elev)
Reference Site:	Churchill 28J-HZ Pad Sec.28-T5N-R64W	MD Reference:	WELL @ 4648.0ft (Original Well Elev)
Site Error:	0.0ft	North Reference:	True
Reference Well:	Churchill 28M-343	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	
Reference		Offset		Semi Major Axis			Distance							Warning			
Measured Depth	Vertical Depth	Measured Depth	Vertical Depth	Reference	Offset	Highside Toolface	Offset Wellbore Centre		Between Centres	Between Ellipses	Minimum Separation	Separation Factor					
(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(°)	+N/-S (ft)	+E/-W (ft)	(ft)	(ft)	(ft)						
9,100.0	6,718.3	6,711.3	6,711.3	50.9	134.2	90.90	-3,278.8	420.8	910.4	726.6	183.76	4.954					
9,200.0	6,717.7	6,710.7	6,710.7	52.7	134.2	90.79	-3,278.8	420.8	817.7	632.1	185.58	4.406					
9,300.0	6,717.1	6,710.1	6,710.1	54.5	134.2	90.69	-3,278.8	420.8	726.9	539.5	187.41	3.879					
9,400.0	6,716.5	6,709.5	6,709.5	56.3	134.2	90.58	-3,278.8	420.8	638.8	449.6	189.23	3.376					
9,500.0	6,715.9	6,708.9	6,708.9	58.1	134.2	90.47	-3,278.8	420.8	554.9	363.8	191.07	2.904					
9,600.0	6,715.3	6,708.3	6,708.3	59.9	134.2	90.37	-3,278.8	420.8	477.1	284.2	192.91	2.473					
9,700.0	6,714.7	6,707.7	6,707.7	61.7	134.2	90.26	-3,278.8	420.8	409.2	214.4	194.75	2.101					
9,800.0	6,714.1	6,707.1	6,707.1	63.5	134.1	90.16	-3,278.8	420.8	356.6	160.0	196.60	1.814					
9,900.0	6,713.5	6,706.5	6,706.5	65.4	134.1	90.05	-3,278.8	420.8	327.0	128.6	198.44	1.648					
9,951.2	6,713.2	6,706.2	6,706.2	66.3	134.1	90.00	-3,278.8	420.8	323.0	123.6	199.39	1.620 CC, ES, SF					
10,000.0	6,713.0	6,706.0	6,706.0	67.2	134.1	89.95	-3,278.8	420.8	326.7	126.4	200.30	1.631					
10,100.0	6,712.4	6,705.4	6,705.4	69.1	134.1	89.84	-3,278.8	420.8	355.6	153.5	202.15	1.759					
10,200.0	6,711.8	6,704.8	6,704.8	70.9	134.1	89.74	-3,278.8	420.8	407.7	203.7	204.00	1.999					
10,300.0	6,711.2	6,704.2	6,704.2	72.8	134.1	89.63	-3,278.8	420.8	475.4	269.5	205.86	2.309					
10,400.0	6,710.6	6,703.6	6,703.6	74.6	134.1	89.53	-3,278.8	420.8	553.0	345.2	207.72	2.662					
10,500.0	6,710.0	6,703.0	6,703.0	76.5	134.1	89.42	-3,278.8	420.8	636.8	427.2	209.58	3.038					
10,600.0	6,709.4	6,702.4	6,702.4	78.3	134.0	89.32	-3,278.8	420.8	724.8	513.3	211.44	3.428					
10,700.0	6,708.8	6,701.8	6,701.8	80.2	134.0	89.21	-3,278.8	420.8	815.5	602.2	213.31	3.823					
10,800.0	6,708.2	6,701.2	6,701.2	82.1	134.0	89.11	-3,278.8	420.8	908.2	693.0	215.17	4.221					

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Churchill 28M-343
Project:	SEC.28-T5N-R64W	TVD Reference:	WELL @ 4648.0ft (Original Well Elev)
Reference Site:	Churchill 28J-HZ Pad Sec.28-T5N-R64W	MD Reference:	WELL @ 4648.0ft (Original Well Elev)
Site Error:	0.0ft	North Reference:	True
Reference Well:	Churchill 28M-343	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

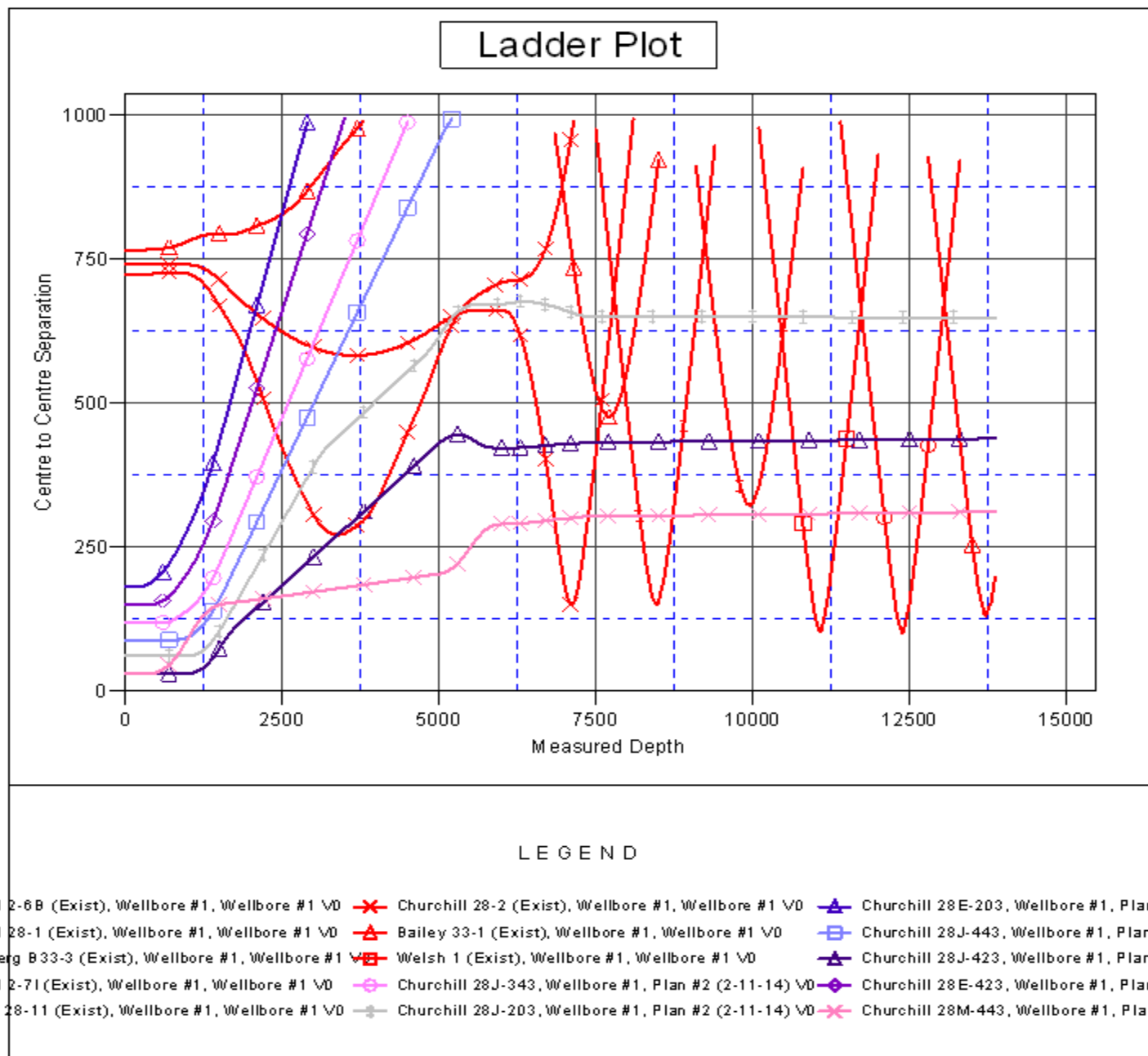
Offset Design												Offset Site Error:	0.0 ft
Survey Program: 6930-UNKNOWN												Offset Well Error:	0.0 ft
Existing Wells - Churchill 28J-HZ Sec.28-T5N-R64W - Welsh 1 (Exist) - Wellbore #1 - Wellbore #1													
Reference		Offset		Semi Major Axis		Distance							
Measured Depth (ft)	Vertical 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
10,100.0	6,712.4	6,712.4	6,712.4	69.1	134.2	93.21	-4,400.9	640.9	978.7	776.6	202.13	4.842	
10,200.0	6,711.8	6,711.8	6,711.8	70.9	134.2	92.88	-4,400.9	640.9	879.3	675.3	204.04	4.310	
10,300.0	6,711.2	6,711.2	6,711.2	72.8	134.2	92.55	-4,400.9	640.9	780.1	574.2	205.94	3.788	
10,400.0	6,710.6	6,710.6	6,710.6	74.6	134.2	92.22	-4,400.9	640.9	681.1	473.3	207.84	3.277	
10,500.0	6,710.0	6,710.0	6,710.0	76.5	134.2	91.89	-4,400.9	640.9	582.5	372.7	209.73	2.777	
10,600.0	6,709.4	6,709.4	6,709.4	78.3	134.2	91.56	-4,400.9	640.9	484.4	272.7	211.62	2.289	
10,700.0	6,708.8	6,708.8	6,708.8	80.2	134.2	91.23	-4,400.9	640.9	387.2	173.7	213.51	1.814	
10,800.0	6,708.2	6,708.2	6,708.2	82.1	134.2	90.90	-4,400.9	640.9	292.1	76.7	215.39	1.356 Level 3	
10,900.0	6,707.6	6,707.6	6,707.6	83.9	134.2	90.57	-4,400.9	640.9	201.6	-15.7	217.26	0.928 Level 1	
11,000.0	6,707.0	6,707.0	6,707.0	85.8	134.1	90.24	-4,400.9	640.9	126.4	-92.7	219.13	0.577 Level 1	
11,073.3	6,706.6	6,706.6	6,706.6	87.2	134.1	90.00	-4,400.9	640.9	103.0	-117.5	220.50	0.467 Level 1, CC, ES, SF	
11,100.0	6,706.4	6,706.4	6,706.4	87.7	134.1	89.91	-4,400.9	640.9	106.4	-114.6	221.00	0.481 Level 1	
11,200.0	6,705.8	6,705.8	6,705.8	89.6	134.1	89.58	-4,400.9	640.9	163.3	-59.6	222.86	0.733 Level 1	
11,300.0	6,705.2	6,705.2	6,705.2	91.4	134.1	89.25	-4,400.9	640.9	249.0	24.3	224.72	1.108 Level 2	
11,400.0	6,704.6	6,704.6	6,704.6	93.3	134.1	88.92	-4,400.9	640.9	342.5	116.0	226.56	1.512	
11,500.0	6,704.0	6,704.0	6,704.0	95.2	134.1	88.59	-4,400.9	640.9	438.9	210.5	228.41	1.922	
11,600.0	6,703.5	6,703.5	6,703.5	97.1	134.1	88.26	-4,400.9	640.9	536.7	306.4	230.24	2.331	
11,700.0	6,702.9	6,702.9	6,702.9	99.0	134.1	87.93	-4,400.9	640.9	635.1	403.0	232.07	2.737	
11,800.0	6,702.3	6,702.3	6,702.3	100.8	134.0	87.60	-4,400.9	640.9	733.9	500.1	233.90	3.138	
11,900.0	6,701.7	6,701.7	6,701.7	102.7	134.0	87.27	-4,400.9	640.9	833.1	597.4	235.71	3.534	
12,000.0	6,701.1	6,701.1	6,701.1	104.6	134.0	86.94	-4,400.9	640.9	932.4	694.9	237.52	3.926	

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Churchill 28M-343
Project:	SEC.28-T5N-R64W	TVD Reference:	WELL @ 4648.0ft (Original Well Elev)
Reference Site:	Churchill 28J-HZ Pad Sec.28-T5N-R64W	MD Reference:	WELL @ 4648.0ft (Original Well Elev)
Site Error:	0.0ft	North Reference:	True
Reference Well:	Churchill 28M-343	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
11,400.0	6,704.6	6,720.6	6,720.6	93.3	134.4	93.33	-5,712.4	643.8	989.9	763.2	226.75	4.366	
11,500.0	6,704.0	6,720.0	6,720.0	95.2	134.4	93.00	-5,712.4	643.8	890.5	661.8	228.68	3.894	
11,600.0	6,703.5	6,719.5	6,719.5	97.1	134.4	92.66	-5,712.4	643.8	791.2	560.6	230.61	3.431	
11,700.0	6,702.9	6,718.9	6,718.9	99.0	134.4	92.32	-5,712.4	643.8	692.1	459.6	232.54	2.976	
11,800.0	6,702.3	6,718.3	6,718.3	100.8	134.4	91.98	-5,712.4	643.8	593.4	358.9	234.46	2.531	
11,900.0	6,701.7	6,717.7	6,717.7	102.7	134.4	91.64	-5,712.4	643.8	495.1	258.7	236.37	2.095	
12,000.0	6,701.1	6,717.1	6,717.1	104.6	134.3	91.30	-5,712.4	643.8	397.7	159.4	238.28	1.669	
12,100.0	6,700.5	6,716.5	6,716.5	106.5	134.3	90.97	-5,712.4	643.8	302.0	61.8	240.18	1.257	Level 3
12,200.0	6,699.9	6,715.9	6,715.9	108.4	134.3	90.63	-5,712.4	643.8	210.3	-31.8	242.07	0.869	Level 1
12,300.0	6,699.3	6,715.3	6,715.3	110.3	134.3	90.29	-5,712.4	643.8	131.4	-112.6	243.96	0.539	Level 1
12,384.8	6,698.8	6,714.8	6,714.8	111.9	134.3	90.00	-5,712.4	643.8	100.3	-145.2	245.55	0.409	Level 1, CC, ES, SF
12,400.0	6,698.7	6,714.7	6,714.7	112.2	134.3	89.95	-5,712.4	643.8	101.5	-144.4	245.84	0.413	Level 1
12,500.0	6,698.1	6,714.1	6,714.1	114.1	134.3	89.61	-5,712.4	643.8	152.7	-95.0	247.71	0.617	Level 1
12,600.0	6,697.5	6,713.5	6,713.5	116.0	134.3	89.27	-5,712.4	643.8	237.4	-12.2	249.57	0.951	Level 1
12,700.0	6,696.9	6,712.9	6,712.9	117.9	134.3	88.93	-5,712.4	643.8	330.7	79.3	251.43	1.315	Level 3
12,800.0	6,696.3	6,712.3	6,712.3	119.8	134.2	88.59	-5,712.4	643.8	427.1	173.8	253.28	1.686	
12,900.0	6,695.7	6,711.7	6,711.7	121.6	134.2	88.26	-5,712.4	643.8	524.8	269.7	255.12	2.057	
13,000.0	6,695.1	6,711.1	6,711.1	123.5	134.2	87.92	-5,712.4	643.8	623.3	366.3	256.95	2.426	
13,100.0	6,694.6	6,710.6	6,710.6	125.4	134.2	87.58	-5,712.4	643.8	722.2	463.4	258.78	2.791	
13,200.0	6,694.0	6,710.0	6,710.0	127.3	134.2	87.24	-5,712.4	643.8	821.3	560.7	260.59	3.152	
13,300.0	6,693.4	6,709.4	6,709.4	129.2	134.2	86.90	-5,712.4	643.8	920.6	658.2	262.40	3.509	

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Churchill 28M-343
Project:	SEC.28-T5N-R64W	TVD Reference:	WELL @ 4648.0ft (Original Well Elev)
Reference Site:	Churchill 28J-HZ Pad Sec.28-T5N-R64W	MD Reference:	WELL @ 4648.0ft (Original Well Elev)
Site Error:	0.0ft	North Reference:	True
Reference Well:	Churchill 28M-343	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 (Original Well Elev) Coordinates are relative to: Churchill 28M-343
Offset Depths are relative to Offset Datum
Central Meridian is -105.500000 °
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 28M-343
Project:	SEC.28-T5N-R64W	TVD Reference:	WELL @ 4648.0ft (Original Well Elev)
Reference Site:	Churchill 28J-HZ Pad Sec.28-T5N-R64W	MD Reference:	WELL @ 4648.0ft (Original Well Elev)
Site Error:	0.0ft	North Reference:	True
Reference Well:	Churchill 28M-343	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 (Original Well Elev) Coordinates are relative to: Churchill 28M-343
 Offset Depths are relative to Offset Datum
 Central Meridian is -105.500000 °
 Coordinate System is US State Plane 1983, Colorado Northern Zone
 Grid Convergence at Surface is: 0.61°

