

PETROLEUM DEVELOPMENT CORP Weld County CO

Well Name: **Lofland 22T-402**

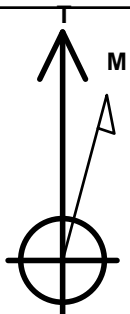
Surface Location: Lofland 22T-HZ Pad Sec.22-T5N-R65W
North American Datum 1983 , US State Plane 1983 , Colorado Northern Zone
Ground Elevation: 4648.0

+N/-S	+E/-W	Northing	Easting	Latitude	Longitude	Slot
0.0	0.0	1381862.83	3238304.19	40.378460	-104.644620	

RKB - 15' WELL @ 4663.0ft (RKB - 15')

WELLBORE TARGET DETAILS

Name	TVD	+N/-S	+E/-W	Shape
BHL 200'FSL, 500'FEL	6953.0	-166.8	6073.8	Point



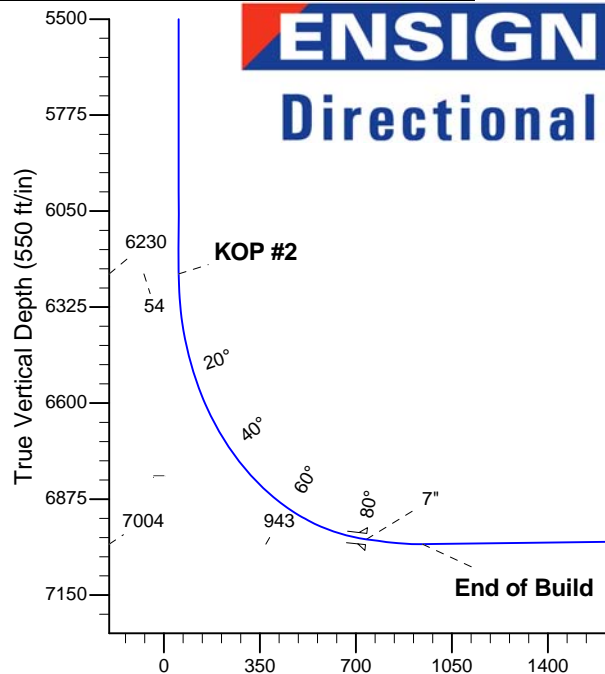
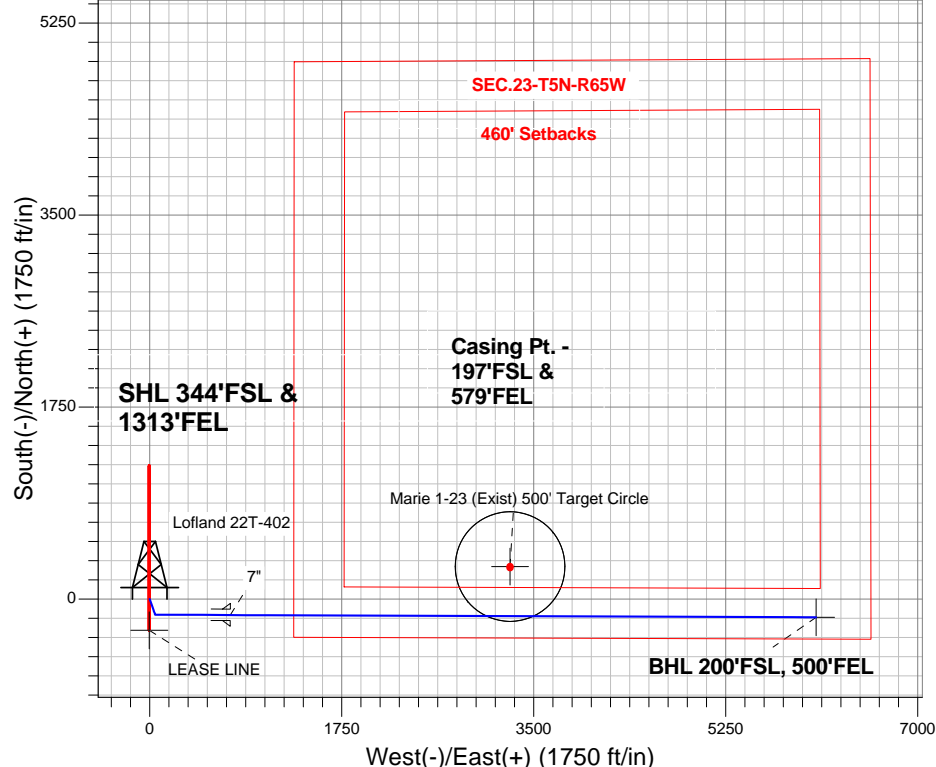
Azimuths to True North
Magnetic North: 8.54°

Magnetic Field
Strength: 52932.7nT
Dip Angle: 66.99°
Date: 5/14/2013
Model: IGRF2010

ANNOTATIONS

TVD	MD	Annotation
2500.0	2500.0	KOP #1
6230.3	6236.6	KOP #2
7004.0	7562.0	End of Build

Lofland 22T-HZ Pad Sec.22-T5N-R65W
Lofland 22T-402
Plan #1 (5-14-13)
14:11, May 16 2013



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	2500.0	0.00	0.00	2500.0	0.0	0.0	0.00	0.00	0.0	
3	2748.8	4.98	160.85	2748.4	-10.2	3.5	2.00	160.85	3.8	
4	4257.6	4.98	160.85	4251.6	-133.8	46.5	0.00	0.00	50.1	
5	4506.3	0.00	0.00	4500.0	-144.0	50.0	2.00	180.00	53.9	
6	6236.6	0.00	0.00	6230.3	-144.0	50.0	0.00	0.00	53.9	
7	7356.6	84.00	90.22	6990.0	-146.6	734.1	7.50	90.22	737.8	
8	7430.6	84.00	90.22	6997.8	-146.9	807.7	0.00	0.00	811.4	
9	7562.0	90.57	90.22	7004.0	-147.4	938.8	5.00	-0.03	942.5	
10	12697.2	90.57	90.22	6953.0	-166.8	6073.8	0.00	0.00	6076.0	BHL 200'FSL, 500'FEL

BHL 200'FSL, 500'FEL

Vertical Section at 91.57° (700 ft/in)



Directional

PETROLEUM DEVELOPMENT CORP Weld County CO

SEC.22-T5N-R65W

Lofland 22T-HZ Pad Sec.22-T5N-R65W

Lofland 22T-402

Wellbore #1

Plan: Plan #1 (5-14-13)

Standard Planning Report

15 May, 2013

Database:	Landmark	Local Co-ordinate Reference:	Well Lofland 22T-402
Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	TVD Reference:	WELL @ 4663.0ft (RKB - 15')
Project:	SEC.22-T5N-R65W	MD Reference:	WELL @ 4663.0ft (RKB - 15')
Site:	Lofland 22T-HZ Pad Sec.22-T5N-R65W	North Reference:	True
Well:	Lofland 22T-402	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Plan #1 (5-14-13)		

Project	SEC.22-T5N-R65W, 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						Lofland 22T-HZ Pad Sec.22-T5N-R65W											
Site Position:						Northing:			1,381,877.65 ft			Latitude:			40.378500		
From:			Lat/Long			Easting:			3,238,329.12 ft			Longitude:			-104.644530		
Position Uncertainty:			0.0 ft			Slot Radius:			"			Grid Convergence:			0.55 °		

Well	Lofland 22T-402					
Well Position	+N/-S	-14.6 ft	Northing:	1,381,862.83 ft	Latitude:	40.378460
	+E/-W	-25.1 ft	Easting:	3,238,304.19 ft	Longitude:	-104.644620
Position Uncertainty		0.0 ft	Wellhead Elevation:	ft	Ground Level:	4,648.0 ft

Wellbore	Wellbore #1				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	5/14/2013	8.54	66.99	52,933

Design	Plan #1 (5-14-13)			
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	91.57

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	
2,500.0	0.00	0.00	2,500.0	0.0	0.0	0.00	0.00	0.00	0.00	
2,748.8	4.98	160.85	2,748.4	-10.2	3.5	2.00	2.00	0.00	160.85	
4,257.6	4.98	160.85	4,251.6	-133.8	46.5	0.00	0.00	0.00	0.00	
4,506.3	0.00	0.00	4,500.0	-144.0	50.0	2.00	-2.00	0.00	180.00	
6,236.6	0.00	0.00	6,230.3	-144.0	50.0	0.00	0.00	0.00	0.00	
7,356.6	84.00	90.22	6,990.0	-146.6	734.1	7.50	7.50	0.00	90.22	
7,430.6	84.00	90.22	6,997.8	-146.9	807.7	0.00	0.00	0.00	0.00	
7,562.0	90.57	90.22	7,004.0	-147.4	938.8	5.00	5.00	0.00	-0.03	
12,697.2	90.57	90.22	6,953.0	-166.8	6,073.8	0.00	0.00	0.00	0.00	BHL 200'FSL, 500'F

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Site:	Lofland 22T-HZ Pad Sec.22-T5N-R65W	North Reference:	True
Well:	Lofland 22T-402	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Plan #1 (5-14-13)		

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
3.0	0.00	0.00	3.0	0.0	0.0	0.0	0.00	0.00	0.00
Marie 1-23 (Exist) 500' Target Circle									
40.0	0.00	0.00	40.0	0.0	0.0	0.0	0.00	0.00	0.00
80.0	0.00	0.00	80.0	0.0	0.0	0.0	0.00	0.00	0.00
120.0	0.00	0.00	120.0	0.0	0.0	0.0	0.00	0.00	0.00
160.0	0.00	0.00	160.0	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
240.0	0.00	0.00	240.0	0.0	0.0	0.0	0.00	0.00	0.00
280.0	0.00	0.00	280.0	0.0	0.0	0.0	0.00	0.00	0.00
320.0	0.00	0.00	320.0	0.0	0.0	0.0	0.00	0.00	0.00
360.0	0.00	0.00	360.0	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
440.0	0.00	0.00	440.0	0.0	0.0	0.0	0.00	0.00	0.00
480.0	0.00	0.00	480.0	0.0	0.0	0.0	0.00	0.00	0.00
520.0	0.00	0.00	520.0	0.0	0.0	0.0	0.00	0.00	0.00
560.0	0.00	0.00	560.0	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
640.0	0.00	0.00	640.0	0.0	0.0	0.0	0.00	0.00	0.00
680.0	0.00	0.00	680.0	0.0	0.0	0.0	0.00	0.00	0.00
720.0	0.00	0.00	720.0	0.0	0.0	0.0	0.00	0.00	0.00
760.0	0.00	0.00	760.0	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
840.0	0.00	0.00	840.0	0.0	0.0	0.0	0.00	0.00	0.00
880.0	0.00	0.00	880.0	0.0	0.0	0.0	0.00	0.00	0.00
920.0	0.00	0.00	920.0	0.0	0.0	0.0	0.00	0.00	0.00
960.0	0.00	0.00	960.0	0.0	0.0	0.0	0.00	0.00	0.00
1,000.0	0.00	0.00	1,000.0	0.0	0.0	0.0	0.00	0.00	0.00
1,040.0	0.00	0.00	1,040.0	0.0	0.0	0.0	0.00	0.00	0.00
1,080.0	0.00	0.00	1,080.0	0.0	0.0	0.0	0.00	0.00	0.00
1,120.0	0.00	0.00	1,120.0	0.0	0.0	0.0	0.00	0.00	0.00
1,160.0	0.00	0.00	1,160.0	0.0	0.0	0.0	0.00	0.00	0.00
1,200.0	0.00	0.00	1,200.0	0.0	0.0	0.0	0.00	0.00	0.00
1,240.0	0.00	0.00	1,240.0	0.0	0.0	0.0	0.00	0.00	0.00
1,280.0	0.00	0.00	1,280.0	0.0	0.0	0.0	0.00	0.00	0.00
1,320.0	0.00	0.00	1,320.0	0.0	0.0	0.0	0.00	0.00	0.00
1,360.0	0.00	0.00	1,360.0	0.0	0.0	0.0	0.00	0.00	0.00
1,400.0	0.00	0.00	1,400.0	0.0	0.0	0.0	0.00	0.00	0.00
1,440.0	0.00	0.00	1,440.0	0.0	0.0	0.0	0.00	0.00	0.00
1,480.0	0.00	0.00	1,480.0	0.0	0.0	0.0	0.00	0.00	0.00
1,520.0	0.00	0.00	1,520.0	0.0	0.0	0.0	0.00	0.00	0.00
1,560.0	0.00	0.00	1,560.0	0.0	0.0	0.0	0.00	0.00	0.00
1,600.0	0.00	0.00	1,600.0	0.0	0.0	0.0	0.00	0.00	0.00
1,640.0	0.00	0.00	1,640.0	0.0	0.0	0.0	0.00	0.00	0.00
1,680.0	0.00	0.00	1,680.0	0.0	0.0	0.0	0.00	0.00	0.00
1,720.0	0.00	0.00	1,720.0	0.0	0.0	0.0	0.00	0.00	0.00
1,760.0	0.00	0.00	1,760.0	0.0	0.0	0.0	0.00	0.00	0.00
1,800.0	0.00	0.00	1,800.0	0.0	0.0	0.0	0.00	0.00	0.00
1,840.0	0.00	0.00	1,840.0	0.0	0.0	0.0	0.00	0.00	0.00
1,880.0	0.00	0.00	1,880.0	0.0	0.0	0.0	0.00	0.00	0.00
1,920.0	0.00	0.00	1,920.0	0.0	0.0	0.0	0.00	0.00	0.00
1,960.0	0.00	0.00	1,960.0	0.0	0.0	0.0	0.00	0.00	0.00
2,000.0	0.00	0.00	2,000.0	0.0	0.0	0.0	0.00	0.00	0.00

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Site:	Lofland 22T-HZ Pad Sec.22-T5N-R65W	North Reference:	True
Well:	Lofland 22T-402	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Plan #1 (5-14-13)		

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)
2,040.0	0.00	0.00	2,040.0	0.0	0.0	0.0	0.00	0.00	0.00
2,080.0	0.00	0.00	2,080.0	0.0	0.0	0.0	0.00	0.00	0.00
2,120.0	0.00	0.00	2,120.0	0.0	0.0	0.0	0.00	0.00	0.00
2,160.0	0.00	0.00	2,160.0	0.0	0.0	0.0	0.00	0.00	0.00
2,200.0	0.00	0.00	2,200.0	0.0	0.0	0.0	0.00	0.00	0.00
2,240.0	0.00	0.00	2,240.0	0.0	0.0	0.0	0.00	0.00	0.00
2,280.0	0.00	0.00	2,280.0	0.0	0.0	0.0	0.00	0.00	0.00
2,320.0	0.00	0.00	2,320.0	0.0	0.0	0.0	0.00	0.00	0.00
2,360.0	0.00	0.00	2,360.0	0.0	0.0	0.0	0.00	0.00	0.00
2,400.0	0.00	0.00	2,400.0	0.0	0.0	0.0	0.00	0.00	0.00
2,440.0	0.00	0.00	2,440.0	0.0	0.0	0.0	0.00	0.00	0.00
2,480.0	0.00	0.00	2,480.0	0.0	0.0	0.0	0.00	0.00	0.00
2,500.0	0.00	0.00	2,500.0	0.0	0.0	0.0	0.00	0.00	0.00
KOP #1									
2,520.0	0.40	160.85	2,520.0	-0.1	0.0	0.0	2.00	2.00	0.00
2,560.0	1.20	160.85	2,560.0	-0.6	0.2	0.2	2.00	2.00	0.00
2,600.0	2.00	160.85	2,600.0	-1.6	0.6	0.6	2.00	2.00	0.00
2,640.0	2.80	160.85	2,639.9	-3.2	1.1	1.2	2.00	2.00	0.00
2,680.0	3.60	160.85	2,679.9	-5.3	1.9	2.0	2.00	2.00	0.00
2,720.0	4.40	160.85	2,719.8	-8.0	2.8	3.0	2.00	2.00	0.00
2,748.8	4.98	160.85	2,748.4	-10.2	3.5	3.8	2.00	2.00	0.00
2,760.0	4.98	160.85	2,759.6	-11.1	3.9	4.2	0.00	0.00	0.00
2,800.0	4.98	160.85	2,799.5	-14.4	5.0	5.4	0.00	0.00	0.00
2,840.0	4.98	160.85	2,839.3	-17.7	6.1	6.6	0.00	0.00	0.00
2,880.0	4.98	160.85	2,879.2	-20.9	7.3	7.8	0.00	0.00	0.00
2,920.0	4.98	160.85	2,919.0	-24.2	8.4	9.1	0.00	0.00	0.00
2,960.0	4.98	160.85	2,958.9	-27.5	9.5	10.3	0.00	0.00	0.00
3,000.0	4.98	160.85	2,998.7	-30.8	10.7	11.5	0.00	0.00	0.00
3,040.0	4.98	160.85	3,038.6	-34.1	11.8	12.8	0.00	0.00	0.00
3,080.0	4.98	160.85	3,078.4	-37.3	13.0	14.0	0.00	0.00	0.00
3,120.0	4.98	160.85	3,118.3	-40.6	14.1	15.2	0.00	0.00	0.00
3,160.0	4.98	160.85	3,158.1	-43.9	15.2	16.4	0.00	0.00	0.00
3,200.0	4.98	160.85	3,198.0	-47.2	16.4	17.7	0.00	0.00	0.00
3,240.0	4.98	160.85	3,237.8	-50.4	17.5	18.9	0.00	0.00	0.00
3,280.0	4.98	160.85	3,277.7	-53.7	18.7	20.1	0.00	0.00	0.00
3,320.0	4.98	160.85	3,317.5	-57.0	19.8	21.3	0.00	0.00	0.00
3,360.0	4.98	160.85	3,357.4	-60.3	20.9	22.6	0.00	0.00	0.00
3,400.0	4.98	160.85	3,397.2	-63.5	22.1	23.8	0.00	0.00	0.00
3,440.0	4.98	160.85	3,437.1	-66.8	23.2	25.0	0.00	0.00	0.00
3,480.0	4.98	160.85	3,476.9	-70.1	24.3	26.3	0.00	0.00	0.00
3,520.0	4.98	160.85	3,516.8	-73.4	25.5	27.5	0.00	0.00	0.00
3,560.0	4.98	160.85	3,556.6	-76.7	26.6	28.7	0.00	0.00	0.00
3,600.0	4.98	160.85	3,596.5	-79.9	27.8	29.9	0.00	0.00	0.00
3,640.0	4.98	160.85	3,636.3	-83.2	28.9	31.2	0.00	0.00	0.00
3,680.0	4.98	160.85	3,676.2	-86.5	30.0	32.4	0.00	0.00	0.00
3,720.0	4.98	160.85	3,716.0	-89.8	31.2	33.6	0.00	0.00	0.00
3,760.0	4.98	160.85	3,755.9	-93.0	32.3	34.8	0.00	0.00	0.00
3,800.0	4.98	160.85	3,795.7	-96.3	33.4	36.1	0.00	0.00	0.00
3,840.0	4.98	160.85	3,835.6	-99.6	34.6	37.3	0.00	0.00	0.00
3,880.0	4.98	160.85	3,875.4	-102.9	35.7	38.5	0.00	0.00	0.00
3,920.0	4.98	160.85	3,915.3	-106.1	36.9	39.8	0.00	0.00	0.00
3,960.0	4.98	160.85	3,955.1	-109.4	38.0	41.0	0.00	0.00	0.00
4,000.0	4.98	160.85	3,995.0	-112.7	39.1	42.2	0.00	0.00	0.00

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Well:	Lofland 22T-402	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Plan #1 (5-14-13)		

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)
4,040.0	4.98	160.85	4,034.8	-116.0	40.3	43.4	0.00	0.00	0.00
4,080.0	4.98	160.85	4,074.7	-119.3	41.4	44.7	0.00	0.00	0.00
4,120.0	4.98	160.85	4,114.5	-122.5	42.5	45.9	0.00	0.00	0.00
4,160.0	4.98	160.85	4,154.4	-125.8	43.7	47.1	0.00	0.00	0.00
4,200.0	4.98	160.85	4,194.2	-129.1	44.8	48.3	0.00	0.00	0.00
4,240.0	4.98	160.85	4,234.1	-132.4	46.0	49.6	0.00	0.00	0.00
4,257.6	4.98	160.85	4,251.6	-133.8	46.5	50.1	0.00	0.00	0.00
4,280.0	4.53	160.85	4,273.9	-135.6	47.1	50.8	2.00	-2.00	0.00
4,320.0	3.73	160.85	4,313.8	-138.3	48.0	51.8	2.00	-2.00	0.00
4,360.0	2.93	160.85	4,353.8	-140.5	48.8	52.6	2.00	-2.00	0.00
4,400.0	2.13	160.85	4,393.7	-142.1	49.4	53.2	2.00	-2.00	0.00
4,440.0	1.33	160.85	4,433.7	-143.3	49.7	53.7	2.00	-2.00	0.00
4,480.0	0.53	160.85	4,473.7	-143.9	50.0	53.9	2.00	-2.00	0.00
4,506.3	0.00	0.00	4,500.0	-144.0	50.0	53.9	2.00	-2.00	0.00
4,520.0	0.00	0.00	4,513.7	-144.0	50.0	53.9	0.00	0.00	0.00
4,560.0	0.00	0.00	4,553.7	-144.0	50.0	53.9	0.00	0.00	0.00
4,600.0	0.00	0.00	4,593.7	-144.0	50.0	53.9	0.00	0.00	0.00
4,640.0	0.00	0.00	4,633.7	-144.0	50.0	53.9	0.00	0.00	0.00
4,680.0	0.00	0.00	4,673.7	-144.0	50.0	53.9	0.00	0.00	0.00
4,720.0	0.00	0.00	4,713.7	-144.0	50.0	53.9	0.00	0.00	0.00
4,760.0	0.00	0.00	4,753.7	-144.0	50.0	53.9	0.00	0.00	0.00
4,800.0	0.00	0.00	4,793.7	-144.0	50.0	53.9	0.00	0.00	0.00
4,840.0	0.00	0.00	4,833.7	-144.0	50.0	53.9	0.00	0.00	0.00
4,880.0	0.00	0.00	4,873.7	-144.0	50.0	53.9	0.00	0.00	0.00
4,920.0	0.00	0.00	4,913.7	-144.0	50.0	53.9	0.00	0.00	0.00
4,960.0	0.00	0.00	4,953.7	-144.0	50.0	53.9	0.00	0.00	0.00
5,000.0	0.00	0.00	4,993.7	-144.0	50.0	53.9	0.00	0.00	0.00
5,040.0	0.00	0.00	5,033.7	-144.0	50.0	53.9	0.00	0.00	0.00
5,080.0	0.00	0.00	5,073.7	-144.0	50.0	53.9	0.00	0.00	0.00
5,120.0	0.00	0.00	5,113.7	-144.0	50.0	53.9	0.00	0.00	0.00
5,160.0	0.00	0.00	5,153.7	-144.0	50.0	53.9	0.00	0.00	0.00
5,200.0	0.00	0.00	5,193.7	-144.0	50.0	53.9	0.00	0.00	0.00
5,240.0	0.00	0.00	5,233.7	-144.0	50.0	53.9	0.00	0.00	0.00
5,280.0	0.00	0.00	5,273.7	-144.0	50.0	53.9	0.00	0.00	0.00
5,320.0	0.00	0.00	5,313.7	-144.0	50.0	53.9	0.00	0.00	0.00
5,360.0	0.00	0.00	5,353.7	-144.0	50.0	53.9	0.00	0.00	0.00
5,400.0	0.00	0.00	5,393.7	-144.0	50.0	53.9	0.00	0.00	0.00
5,440.0	0.00	0.00	5,433.7	-144.0	50.0	53.9	0.00	0.00	0.00
5,480.0	0.00	0.00	5,473.7	-144.0	50.0	53.9	0.00	0.00	0.00
5,520.0	0.00	0.00	5,513.7	-144.0	50.0	53.9	0.00	0.00	0.00
5,560.0	0.00	0.00	5,553.7	-144.0	50.0	53.9	0.00	0.00	0.00
5,600.0	0.00	0.00	5,593.7	-144.0	50.0	53.9	0.00	0.00	0.00
5,640.0	0.00	0.00	5,633.7	-144.0	50.0	53.9	0.00	0.00	0.00
5,680.0	0.00	0.00	5,673.7	-144.0	50.0	53.9	0.00	0.00	0.00
5,720.0	0.00	0.00	5,713.7	-144.0	50.0	53.9	0.00	0.00	0.00
5,760.0	0.00	0.00	5,753.7	-144.0	50.0	53.9	0.00	0.00	0.00
5,800.0	0.00	0.00	5,793.7	-144.0	50.0	53.9	0.00	0.00	0.00
5,840.0	0.00	0.00	5,833.7	-144.0	50.0	53.9	0.00	0.00	0.00
5,880.0	0.00	0.00	5,873.7	-144.0	50.0	53.9	0.00	0.00	0.00
5,920.0	0.00	0.00	5,913.7	-144.0	50.0	53.9	0.00	0.00	0.00
5,960.0	0.00	0.00	5,953.7	-144.0	50.0	53.9	0.00	0.00	0.00
6,000.0	0.00	0.00	5,993.7	-144.0	50.0	53.9	0.00	0.00	0.00
6,040.0	0.00	0.00	6,033.7	-144.0	50.0	53.9	0.00	0.00	0.00

Database:	Landmark	Local Co-ordinate Reference:	Well Lofland 22T-402
Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	TVD Reference:	WELL @ 4663.0ft (RKB - 15')
Project:	SEC.22-T5N-R65W	MD Reference:	WELL @ 4663.0ft (RKB - 15')
Site:	Lofland 22T-HZ Pad Sec.22-T5N-R65W	North Reference:	True
Well:	Lofland 22T-402	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Plan #1 (5-14-13)		

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)
6,080.0	0.00	0.00	6,073.7	-144.0	50.0	53.9	0.00	0.00	0.00
6,120.0	0.00	0.00	6,113.7	-144.0	50.0	53.9	0.00	0.00	0.00
6,160.0	0.00	0.00	6,153.7	-144.0	50.0	53.9	0.00	0.00	0.00
6,200.0	0.00	0.00	6,193.7	-144.0	50.0	53.9	0.00	0.00	0.00
6,236.6	0.00	0.00	6,230.3	-144.0	50.0	53.9	0.00	0.00	0.00
KOP #2									
6,240.0	0.26	90.22	6,233.7	-144.0	50.0	53.9	7.54	7.54	0.00
6,280.0	3.26	90.22	6,273.7	-144.0	51.2	55.2	7.50	7.50	0.00
6,320.0	6.26	90.22	6,313.5	-144.0	54.6	58.5	7.50	7.50	0.00
6,360.0	9.26	90.22	6,353.2	-144.0	59.9	63.9	7.50	7.50	0.00
6,400.0	12.26	90.22	6,392.4	-144.1	67.4	71.3	7.50	7.50	0.00
6,440.0	15.26	90.22	6,431.3	-144.1	76.9	80.9	7.50	7.50	0.00
6,480.0	18.26	90.22	6,469.6	-144.1	88.5	92.4	7.50	7.50	0.00
6,520.0	21.26	90.22	6,507.2	-144.2	102.0	105.9	7.50	7.50	0.00
6,560.0	24.26	90.22	6,544.1	-144.3	117.4	121.4	7.50	7.50	0.00
6,600.0	27.26	90.22	6,580.1	-144.3	134.8	138.7	7.50	7.50	0.00
6,640.0	30.26	90.22	6,615.2	-144.4	154.1	158.0	7.50	7.50	0.00
6,680.0	33.26	90.22	6,649.2	-144.5	175.1	179.0	7.50	7.50	0.00
6,710.1	35.51	90.22	6,674.0	-144.5	192.1	196.0	7.50	7.50	0.00
LEASE LINE									
6,720.0	36.26	90.22	6,682.1	-144.6	197.9	201.8	7.50	7.50	0.00
6,760.0	39.26	90.22	6,713.7	-144.7	222.4	226.3	7.50	7.50	0.00
6,800.0	42.26	90.22	6,744.0	-144.8	248.5	252.4	7.50	7.50	0.00
6,840.0	45.26	90.22	6,772.9	-144.9	276.2	280.0	7.50	7.50	0.00
6,880.0	48.26	90.22	6,800.3	-145.0	305.3	309.2	7.50	7.50	0.00
6,920.0	51.26	90.22	6,826.1	-145.1	335.8	339.7	7.50	7.50	0.00
6,960.0	54.26	90.22	6,850.3	-145.2	367.7	371.5	7.50	7.50	0.00
7,000.0	57.26	90.22	6,872.8	-145.3	400.7	404.6	7.50	7.50	0.00
7,040.0	60.26	90.22	6,893.6	-145.5	434.9	438.8	7.50	7.50	0.00
7,080.0	63.26	90.22	6,912.5	-145.6	470.2	474.0	7.50	7.50	0.00
7,120.0	66.26	90.22	6,929.6	-145.8	506.3	510.2	7.50	7.50	0.00
7,160.0	69.26	90.22	6,944.7	-145.9	543.4	547.2	7.50	7.50	0.00
7,200.0	72.26	90.22	6,957.9	-146.0	581.1	584.9	7.50	7.50	0.00
7,240.0	75.26	90.22	6,969.1	-146.2	619.5	623.3	7.50	7.50	0.00
7,280.0	78.26	90.22	6,978.2	-146.3	658.5	662.2	7.50	7.50	0.00
7,320.0	81.26	90.22	6,985.3	-146.5	697.8	701.6	7.50	7.50	0.00
7,356.6	84.00	90.22	6,990.0	-146.6	734.1	737.9	7.50	7.50	0.00
7"									
7,360.0	84.00	90.22	6,990.4	-146.6	737.5	741.2	0.00	0.00	0.00
7,400.0	84.00	90.22	6,994.6	-146.8	777.3	781.0	0.00	0.00	0.00
7,430.6	84.00	90.22	6,997.8	-146.9	807.7	811.4	0.00	0.00	0.00
7,440.0	84.47	90.22	6,998.7	-146.9	817.1	820.8	5.00	5.00	0.00
7,480.0	86.47	90.22	7,001.9	-147.1	856.9	860.6	5.00	5.00	0.00
7,520.0	88.47	90.22	7,003.6	-147.3	896.9	900.6	5.00	5.00	0.00
7,560.0	90.47	90.22	7,004.0	-147.4	936.9	940.6	5.00	5.00	0.00
7,562.0	90.57	90.22	7,004.0	-147.4	938.9	942.6	4.90	4.90	0.00
End of Build									
7,600.0	90.57	90.22	7,003.6	-147.6	976.9	980.6	0.00	0.00	0.00
7,640.0	90.57	90.22	7,003.2	-147.7	1,016.9	1,020.5	0.00	0.00	0.00
7,680.0	90.57	90.22	7,002.8	-147.9	1,056.9	1,060.5	0.00	0.00	0.00
7,720.0	90.57	90.22	7,002.4	-148.0	1,096.9	1,100.5	0.00	0.00	0.00
7,760.0	90.57	90.22	7,002.0	-148.2	1,136.9	1,140.5	0.00	0.00	0.00

Database:	Landmark	Local Co-ordinate Reference:	Well Lofland 22T-402
Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	TVD Reference:	WELL @ 4663.0ft (RKB - 15')
Project:	SEC.22-T5N-R65W	MD Reference:	WELL @ 4663.0ft (RKB - 15')
Site:	Lofland 22T-HZ Pad Sec.22-T5N-R65W	North Reference:	True
Well:	Lofland 22T-402	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Plan #1 (5-14-13)		

Planned Survey									
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
7,800.0	90.57	90.22	7,001.6	-148.3	1,176.9	1,180.5	0.00	0.00	0.00
7,840.0	90.57	90.22	7,001.2	-148.5	1,216.9	1,220.5	0.00	0.00	0.00
7,880.0	90.57	90.22	7,000.8	-148.6	1,256.9	1,260.5	0.00	0.00	0.00
7,920.0	90.57	90.22	7,000.4	-148.8	1,296.9	1,300.5	0.00	0.00	0.00
7,960.0	90.57	90.22	7,000.0	-148.9	1,336.9	1,340.4	0.00	0.00	0.00
8,000.0	90.57	90.22	6,999.6	-149.1	1,376.9	1,380.4	0.00	0.00	0.00
8,040.0	90.57	90.22	6,999.2	-149.2	1,416.9	1,420.4	0.00	0.00	0.00
8,080.0	90.57	90.22	6,998.8	-149.4	1,456.8	1,460.4	0.00	0.00	0.00
8,120.0	90.57	90.22	6,998.4	-149.5	1,496.8	1,500.4	0.00	0.00	0.00
8,160.0	90.57	90.22	6,998.0	-149.7	1,536.8	1,540.4	0.00	0.00	0.00
8,200.0	90.57	90.22	6,997.7	-149.8	1,576.8	1,580.4	0.00	0.00	0.00
8,240.0	90.57	90.22	6,997.3	-150.0	1,616.8	1,620.3	0.00	0.00	0.00
8,280.0	90.57	90.22	6,996.9	-150.1	1,656.8	1,660.3	0.00	0.00	0.00
8,320.0	90.57	90.22	6,996.5	-150.3	1,696.8	1,700.3	0.00	0.00	0.00
8,360.0	90.57	90.22	6,996.1	-150.4	1,736.8	1,740.3	0.00	0.00	0.00
8,400.0	90.57	90.22	6,995.7	-150.6	1,776.8	1,780.3	0.00	0.00	0.00
8,440.0	90.57	90.22	6,995.3	-150.7	1,816.8	1,820.3	0.00	0.00	0.00
8,480.0	90.57	90.22	6,994.9	-150.9	1,856.8	1,860.3	0.00	0.00	0.00
8,520.0	90.57	90.22	6,994.5	-151.0	1,896.8	1,900.3	0.00	0.00	0.00
8,560.0	90.57	90.22	6,994.1	-151.2	1,936.8	1,940.2	0.00	0.00	0.00
8,600.0	90.57	90.22	6,993.7	-151.3	1,976.8	1,980.2	0.00	0.00	0.00
8,640.0	90.57	90.22	6,993.3	-151.5	2,016.8	2,020.2	0.00	0.00	0.00
8,680.0	90.57	90.22	6,992.9	-151.6	2,056.8	2,060.2	0.00	0.00	0.00
8,720.0	90.57	90.22	6,992.5	-151.8	2,096.8	2,100.2	0.00	0.00	0.00
8,760.0	90.57	90.22	6,992.1	-151.9	2,136.8	2,140.2	0.00	0.00	0.00
8,800.0	90.57	90.22	6,991.7	-152.1	2,176.8	2,180.2	0.00	0.00	0.00
8,840.0	90.57	90.22	6,991.3	-152.2	2,216.8	2,220.2	0.00	0.00	0.00
8,880.0	90.57	90.22	6,990.9	-152.4	2,256.8	2,260.1	0.00	0.00	0.00
8,920.0	90.57	90.22	6,990.5	-152.5	2,296.8	2,300.1	0.00	0.00	0.00
8,960.0	90.57	90.22	6,990.1	-152.7	2,336.8	2,340.1	0.00	0.00	0.00
9,000.0	90.57	90.22	6,989.7	-152.8	2,376.8	2,380.1	0.00	0.00	0.00
9,040.0	90.57	90.22	6,989.3	-153.0	2,416.8	2,420.1	0.00	0.00	0.00
9,080.0	90.57	90.22	6,988.9	-153.1	2,456.8	2,460.1	0.00	0.00	0.00
9,120.0	90.57	90.22	6,988.5	-153.3	2,496.8	2,500.1	0.00	0.00	0.00
9,160.0	90.57	90.22	6,988.1	-153.5	2,536.8	2,540.0	0.00	0.00	0.00
9,200.0	90.57	90.22	6,987.7	-153.6	2,576.8	2,580.0	0.00	0.00	0.00
9,240.0	90.57	90.22	6,987.3	-153.8	2,616.8	2,620.0	0.00	0.00	0.00
9,280.0	90.57	90.22	6,986.9	-153.9	2,656.8	2,660.0	0.00	0.00	0.00
9,320.0	90.57	90.22	6,986.5	-154.1	2,696.8	2,700.0	0.00	0.00	0.00
9,360.0	90.57	90.22	6,986.1	-154.2	2,736.8	2,740.0	0.00	0.00	0.00
9,400.0	90.57	90.22	6,985.7	-154.4	2,776.8	2,780.0	0.00	0.00	0.00
9,440.0	90.57	90.22	6,985.3	-154.5	2,816.8	2,820.0	0.00	0.00	0.00
9,480.0	90.57	90.22	6,984.9	-154.7	2,856.8	2,859.9	0.00	0.00	0.00
9,520.0	90.57	90.22	6,984.5	-154.8	2,896.8	2,899.9	0.00	0.00	0.00
9,560.0	90.57	90.22	6,984.1	-155.0	2,936.8	2,939.9	0.00	0.00	0.00
9,600.0	90.57	90.22	6,983.8	-155.1	2,976.8	2,979.9	0.00	0.00	0.00
9,640.0	90.57	90.22	6,983.4	-155.3	3,016.8	3,019.9	0.00	0.00	0.00
9,680.0	90.57	90.22	6,983.0	-155.4	3,056.8	3,059.9	0.00	0.00	0.00
9,720.0	90.57	90.22	6,982.6	-155.6	3,096.8	3,099.9	0.00	0.00	0.00
9,760.0	90.57	90.22	6,982.2	-155.7	3,136.8	3,139.8	0.00	0.00	0.00
9,800.0	90.57	90.22	6,981.8	-155.9	3,176.8	3,179.8	0.00	0.00	0.00
9,840.0	90.57	90.22	6,981.4	-156.0	3,216.7	3,219.8	0.00	0.00	0.00
9,880.0	90.57	90.22	6,981.0	-156.2	3,256.7	3,259.8	0.00	0.00	0.00

Database:	Landmark	Local Co-ordinate Reference:	Well Lofland 22T-402
Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	TVD Reference:	WELL @ 4663.0ft (RKB - 15')
Project:	SEC.22-T5N-R65W	MD Reference:	WELL @ 4663.0ft (RKB - 15')
Site:	Lofland 22T-HZ Pad Sec.22-T5N-R65W	North Reference:	True
Well:	Lofland 22T-402	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Plan #1 (5-14-13)		

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)
9,920.0	90.57	90.22	6,980.6	-156.3	3,296.7	3,299.8	0.00	0.00	0.00
9,960.0	90.57	90.22	6,980.2	-156.5	3,336.7	3,339.8	0.00	0.00	0.00
10,000.0	90.57	90.22	6,979.8	-156.6	3,376.7	3,379.8	0.00	0.00	0.00
10,040.0	90.57	90.22	6,979.4	-156.8	3,416.7	3,419.8	0.00	0.00	0.00
10,080.0	90.57	90.22	6,979.0	-156.9	3,456.7	3,459.7	0.00	0.00	0.00
10,120.0	90.57	90.22	6,978.6	-157.1	3,496.7	3,499.7	0.00	0.00	0.00
10,160.0	90.57	90.22	6,978.2	-157.2	3,536.7	3,539.7	0.00	0.00	0.00
10,200.0	90.57	90.22	6,977.8	-157.4	3,576.7	3,579.7	0.00	0.00	0.00
10,240.0	90.57	90.22	6,977.4	-157.5	3,616.7	3,619.7	0.00	0.00	0.00
10,280.0	90.57	90.22	6,977.0	-157.7	3,656.7	3,659.7	0.00	0.00	0.00
10,320.0	90.57	90.22	6,976.6	-157.8	3,696.7	3,699.7	0.00	0.00	0.00
10,360.0	90.57	90.22	6,976.2	-158.0	3,736.7	3,739.6	0.00	0.00	0.00
10,400.0	90.57	90.22	6,975.8	-158.1	3,776.7	3,779.6	0.00	0.00	0.00
10,440.0	90.57	90.22	6,975.4	-158.3	3,816.7	3,819.6	0.00	0.00	0.00
10,480.0	90.57	90.22	6,975.0	-158.4	3,856.7	3,859.6	0.00	0.00	0.00
10,520.0	90.57	90.22	6,974.6	-158.6	3,896.7	3,899.6	0.00	0.00	0.00
10,560.0	90.57	90.22	6,974.2	-158.7	3,936.7	3,939.6	0.00	0.00	0.00
10,600.0	90.57	90.22	6,973.8	-158.9	3,976.7	3,979.6	0.00	0.00	0.00
10,640.0	90.57	90.22	6,973.4	-159.0	4,016.7	4,019.6	0.00	0.00	0.00
10,680.0	90.57	90.22	6,973.0	-159.2	4,056.7	4,059.5	0.00	0.00	0.00
10,720.0	90.57	90.22	6,972.6	-159.4	4,096.7	4,099.5	0.00	0.00	0.00
10,760.0	90.57	90.22	6,972.2	-159.5	4,136.7	4,139.5	0.00	0.00	0.00
10,800.0	90.57	90.22	6,971.8	-159.7	4,176.7	4,179.5	0.00	0.00	0.00
10,840.0	90.57	90.22	6,971.4	-159.8	4,216.7	4,219.5	0.00	0.00	0.00
10,880.0	90.57	90.22	6,971.0	-160.0	4,256.7	4,259.5	0.00	0.00	0.00
10,920.0	90.57	90.22	6,970.6	-160.1	4,296.7	4,299.5	0.00	0.00	0.00
10,960.0	90.57	90.22	6,970.2	-160.3	4,336.7	4,339.5	0.00	0.00	0.00
11,000.0	90.57	90.22	6,969.9	-160.4	4,376.7	4,379.4	0.00	0.00	0.00
11,040.0	90.57	90.22	6,969.5	-160.6	4,416.7	4,419.4	0.00	0.00	0.00
11,080.0	90.57	90.22	6,969.1	-160.7	4,456.7	4,459.4	0.00	0.00	0.00
11,120.0	90.57	90.22	6,968.7	-160.9	4,496.7	4,499.4	0.00	0.00	0.00
11,160.0	90.57	90.22	6,968.3	-161.0	4,536.7	4,539.4	0.00	0.00	0.00
11,200.0	90.57	90.22	6,967.9	-161.2	4,576.7	4,579.4	0.00	0.00	0.00
11,240.0	90.57	90.22	6,967.5	-161.3	4,616.7	4,619.4	0.00	0.00	0.00
11,280.0	90.57	90.22	6,967.1	-161.5	4,656.7	4,659.3	0.00	0.00	0.00
11,320.0	90.57	90.22	6,966.7	-161.6	4,696.7	4,699.3	0.00	0.00	0.00
11,360.0	90.57	90.22	6,966.3	-161.8	4,736.7	4,739.3	0.00	0.00	0.00
11,400.0	90.57	90.22	6,965.9	-161.9	4,776.7	4,779.3	0.00	0.00	0.00
11,440.0	90.57	90.22	6,965.5	-162.1	4,816.7	4,819.3	0.00	0.00	0.00
11,480.0	90.57	90.22	6,965.1	-162.2	4,856.7	4,859.3	0.00	0.00	0.00
11,520.0	90.57	90.22	6,964.7	-162.4	4,896.7	4,899.3	0.00	0.00	0.00
11,560.0	90.57	90.22	6,964.3	-162.5	4,936.7	4,939.3	0.00	0.00	0.00
11,600.0	90.57	90.22	6,963.9	-162.7	4,976.7	4,979.2	0.00	0.00	0.00
11,640.0	90.57	90.22	6,963.5	-162.8	5,016.6	5,019.2	0.00	0.00	0.00
11,680.0	90.57	90.22	6,963.1	-163.0	5,056.6	5,059.2	0.00	0.00	0.00
11,720.0	90.57	90.22	6,962.7	-163.1	5,096.6	5,099.2	0.00	0.00	0.00
11,760.0	90.57	90.22	6,962.3	-163.3	5,136.6	5,139.2	0.00	0.00	0.00
11,800.0	90.57	90.22	6,961.9	-163.4	5,176.6	5,179.2	0.00	0.00	0.00
11,840.0	90.57	90.22	6,961.5	-163.6	5,216.6	5,219.2	0.00	0.00	0.00
11,880.0	90.57	90.22	6,961.1	-163.7	5,256.6	5,259.1	0.00	0.00	0.00
11,920.0	90.57	90.22	6,960.7	-163.9	5,296.6	5,299.1	0.00	0.00	0.00
11,960.0	90.57	90.22	6,960.3	-164.0	5,336.6	5,339.1	0.00	0.00	0.00
12,000.0	90.57	90.22	6,959.9	-164.2	5,376.6	5,379.1	0.00	0.00	0.00

Database:	Landmark	Local Co-ordinate Reference:	Well Lofland 22T-402
Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	TVD Reference:	WELL @ 4663.0ft (RKB - 15')
Project:	SEC.22-T5N-R65W	MD Reference:	WELL @ 4663.0ft (RKB - 15')
Site:	Lofland 22T-HZ Pad Sec.22-T5N-R65W	North Reference:	True
Well:	Lofland 22T-402	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Plan #1 (5-14-13)		

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)
12,040.0	90.57	90.22	6,959.5	-164.3	5,416.6	5,419.1	0.00	0.00	0.00
12,080.0	90.57	90.22	6,959.1	-164.5	5,456.6	5,459.1	0.00	0.00	0.00
12,120.0	90.57	90.22	6,958.7	-164.6	5,496.6	5,499.1	0.00	0.00	0.00
12,160.0	90.57	90.22	6,958.3	-164.8	5,536.6	5,539.1	0.00	0.00	0.00
12,200.0	90.57	90.22	6,957.9	-164.9	5,576.6	5,579.0	0.00	0.00	0.00
12,240.0	90.57	90.22	6,957.5	-165.1	5,616.6	5,619.0	0.00	0.00	0.00
12,280.0	90.57	90.22	6,957.1	-165.3	5,656.6	5,659.0	0.00	0.00	0.00
12,320.0	90.57	90.22	6,956.7	-165.4	5,696.6	5,699.0	0.00	0.00	0.00
12,360.0	90.57	90.22	6,956.3	-165.6	5,736.6	5,739.0	0.00	0.00	0.00
12,400.0	90.57	90.22	6,956.0	-165.7	5,776.6	5,779.0	0.00	0.00	0.00
12,440.0	90.57	90.22	6,955.6	-165.9	5,816.6	5,819.0	0.00	0.00	0.00
12,480.0	90.57	90.22	6,955.2	-166.0	5,856.6	5,859.0	0.00	0.00	0.00
12,520.0	90.57	90.22	6,954.8	-166.2	5,896.6	5,898.9	0.00	0.00	0.00
12,560.0	90.57	90.22	6,954.4	-166.3	5,936.6	5,938.9	0.00	0.00	0.00
12,600.0	90.57	90.22	6,954.0	-166.5	5,976.6	5,978.9	0.00	0.00	0.00
12,640.0	90.57	90.22	6,953.6	-166.6	6,016.6	6,018.9	0.00	0.00	0.00
12,680.0	90.57	90.22	6,953.2	-166.8	6,056.6	6,058.9	0.00	0.00	0.00
12,697.2	90.57	90.22	6,953.0	-166.8	6,073.8	6,076.0	0.00	0.00	0.00
BHL 200'FSL, 500'FEL									

Targets

Target Name	Dip Angle (°)	Dip Dir. (°)	TVD (ft)	+N/-S (ft)	+E/-W (ft)	Northing (ft)	Easting (ft)	Latitude	Longitude
- hit/miss target									
- Shape									
Marie 1-23 (Exist) 50C	0.00	0.00	3.0	295.3	3,284.8	1,382,189.79	3,241,585.83	40.379270	-104.632830
- plan misses target center by 3298.0ft at 3.0ft MD (3.0 TVD, 0.0 N, 0.0 E)									
- Circle (radius 500.0)									
BHL 200'FSL, 500'FE	0.00	0.00	6,953.0	-166.8	6,073.8	1,381,754.60	3,244,379.01	40.378000	-104.622820
- plan hits target center									
- Point									
LEASE LINE	0.00	0.00	6,810.0	-285.4	-4.4	1,381,577.39	3,238,302.52	40.377677	-104.644636
- plan misses target center by 277.4ft at 6710.1ft MD (6674.0 TVD, -144.5 N, 192.1 E)									
- Polygon									
Point 1			6,810.0	0.0	0.0	1,381,577.39	3,238,302.52		
Point 2			6,810.0	1,500.0	0.0	1,383,077.25	3,238,288.05		

Casing Points

Measured Depth (ft)	Vertical Depth (ft)	Name	Casing Diameter (")	Hole Diameter (")
7,356.6	6,990.0	7"	7	7-1/2

Database:	Landmark	Local Co-ordinate Reference:	Well Lofland 22T-402
Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	TVD Reference:	WELL @ 4663.0ft (RKB - 15')
Project:	SEC.22-T5N-R65W	MD Reference:	WELL @ 4663.0ft (RKB - 15')
Site:	Lofland 22T-HZ Pad Sec.22-T5N-R65W	North Reference:	True
Well:	Lofland 22T-402	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Plan #1 (5-14-13)		

Plan Annotations

Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment
		+N/-S (ft)	+E/-W (ft)	
2,500.0	2,500.0	0.0	0.0	KOP #1
6,236.6	6,230.3	-144.0	50.0	KOP #2
7,562.0	7,004.0	-147.4	938.9	End of Build



Directional

PETROLEUM DEVELOPMENT CORP Weld County CO

SEC.22-T5N-R65W

Lofland 22T-HZ Pad Sec.22-T5N-R65W

Lofland 22T-402

Wellbore #1

Plan #1 (5-14-13)

Anticollision Report

15 May, 2013



Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Lofland 22T-402
Project:	SEC.22-T5N-R65W	TVD Reference:	WELL @ 4663.0ft (RKB - 15')
Reference Site:	Lofland 22T-HZ Pad Sec.22-T5N-R65W	MD Reference:	WELL @ 4663.0ft (RKB - 15')
Site Error:	0.0ft	North Reference:	True
Reference Well:	Lofland 22T-402	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	Landmark
Reference Design:	Plan #1 (5-14-13)	Offset TVD Reference:	Offset Datum

Reference	Plan #1 (5-14-13)		
Filter type:	NO GLOBAL FILTER: Using user defined selection & filtering criteria		
Interpolation Method:	Stations	Error Model:	ISCWSA
Depth Range:	Unlimited	Scan Method:	Closest Approach 3D
Results Limited by:	Maximum center-center distance of 10,000.0ft	Error Surface:	Elliptical Conic
Warning Levels Evaluated at:	2.00 Sigma		

Survey Tool Program	Date 5/15/2013			
From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description
0.0	12,697.2	Plan #1 (5-14-13) (Wellbore #1)	MWD	MWD - Standard

Summary						
Site Name	Reference Measured Depth (ft)	Offset Measured Depth (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Separation Factor	Warning
Offset Well - Wellbore - Design						
Lofland 22T-HZ Existing Wells						
Marie 1-23 (Exist) - Wellbore #1 - Wellbore #1	9,906.3	6,977.7	451.6	222.1	1.967	CC, ES, SF
Lofland 22T-HZ Pad Sec.22-T5N-R65W						
Lofland 22D-232 - Wellbore #1 - Plan #1 (5-14-13)	400.0	399.0	29.0	27.4	18.461	CC, ES
Lofland 22D-232 - Wellbore #1 - Plan #1 (5-14-13)	12,697.2	12,556.3	824.9	494.5	2.497	SF

Offset Design												Lofland 22T-HZ Existing Wells - Marie 1-23 (Exist) - Wellbore #1 - Wellbore #1		Offset Site Error:		0.0 ft	
Survey Program: 7300-UNKNOWN												Offset Well Error:		0.0 ft			
Reference		Offset		Semi Major Axis			Distance										
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning				
0.0	0.0	0.0	0.0	0.0	0.0	84.86	295.3	3,284.8	3,298.0								
100.0	100.0	97.0	97.0	0.1	1.9	84.86	295.3	3,284.8	3,298.0	3,296.0	2.05	1,606.772					
200.0	200.0	197.0	197.0	0.3	3.9	84.86	295.3	3,284.8	3,298.0	3,293.8	4.28	771.046					
300.0	300.0	297.0	297.0	0.6	5.9	84.86	295.3	3,284.8	3,298.0	3,291.5	6.50	507.225					
400.0	400.0	397.0	397.0	0.8	7.9	84.86	295.3	3,284.8	3,298.0	3,289.3	8.73	377.917					
500.0	500.0	497.0	497.0	1.0	9.9	84.86	295.3	3,284.8	3,298.0	3,287.1	10.95	301.145					
600.0	600.0	597.0	597.0	1.2	11.9	84.86	295.3	3,284.8	3,298.0	3,284.9	13.18	250.298					
700.0	700.0	697.0	697.0	1.5	13.9	84.86	295.3	3,284.8	3,298.0	3,282.6	15.40	214.142					
800.0	800.0	797.0	797.0	1.7	15.9	84.86	295.3	3,284.8	3,298.0	3,280.4	17.63	187.112					
900.0	900.0	897.0	897.0	1.9	17.9	84.86	295.3	3,284.8	3,298.0	3,278.2	19.85	166.142					
1,000.0	1,000.0	997.0	997.0	2.1	19.9	84.86	295.3	3,284.8	3,298.0	3,276.0	22.08	149.398					
1,100.0	1,100.0	1,097.0	1,097.0	2.4	21.9	84.86	295.3	3,284.8	3,298.0	3,273.7	24.30	135.720					
1,200.0	1,200.0	1,197.0	1,197.0	2.6	23.9	84.86	295.3	3,284.8	3,298.0	3,271.5	26.52	124.337					
1,300.0	1,300.0	1,297.0	1,297.0	2.8	25.9	84.86	295.3	3,284.8	3,298.0	3,269.3	28.75	114.715					
1,400.0	1,400.0	1,397.0	1,397.0	3.0	27.9	84.86	295.3	3,284.8	3,298.0	3,267.1	30.97	106.476					
1,500.0	1,500.0	1,497.0	1,497.0	3.3	29.9	84.86	295.3	3,284.8	3,298.0	3,264.8	33.20	99.340					
1,600.0	1,600.0	1,597.0	1,597.0	3.5	31.9	84.86	295.3	3,284.8	3,298.0	3,262.6	35.42	93.101					
1,700.0	1,700.0	1,697.0	1,697.0	3.7	33.9	84.86	295.3	3,284.8	3,298.0	3,260.4	37.65	87.600					
1,800.0	1,800.0	1,797.0	1,797.0	3.9	35.9	84.86	295.3	3,284.8	3,298.0	3,258.2	39.87	82.712					
1,900.0	1,900.0	1,897.0	1,897.0	4.2	37.9	84.86	295.3	3,284.8	3,298.0	3,255.9	42.10	78.341					
2,000.0	2,000.0	1,997.0	1,997.0	4.4	39.9	84.86	295.3	3,284.8	3,298.0	3,253.7	44.32	74.409					

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 Lofland 22T-402
Project:	SEC.22-T5N-R65W	TVD Reference:	WELL @ 4663.0ft (RKB - 15')
Reference Site:	Lofland 22T-HZ Pad Sec.22-T5N-R65W	MD Reference:	WELL @ 4663.0ft (RKB - 15')
Site Error:	0.0ft	North Reference:	True
Reference Well:	Lofland 22T-402	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	Landmark
Reference Design:	Plan #1 (5-14-13)	Offset TVD Reference:	Offset Datum

Offset Design Lofland 22T-HZ Existing Wells - Marie 1-23 (Exist) - Wellbore #1 - Wellbore #1													Offset Site Error:	0.0 ft
Survey Program: 7300-UNKNOWN													Offset Well Error:	0.0 ft
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference	Offset	Semi Major Axis	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
2,100.0	2,100.0	2,097.0	2,097.0	4.6	41.9	84.86		295.3	3,284.8	3,298.0	3,251.5	46.55	70.852	
2,200.0	2,200.0	2,197.0	2,197.0	4.8	43.9	84.86		295.3	3,284.8	3,298.0	3,249.3	48.77	67.621	
2,300.0	2,300.0	2,297.0	2,297.0	5.1	45.9	84.86		295.3	3,284.8	3,298.0	3,247.0	51.00	64.671	
2,400.0	2,400.0	2,397.0	2,397.0	5.3	47.9	84.86		295.3	3,284.8	3,298.0	3,244.8	53.22	61.967	
2,500.0	2,500.0	2,497.0	2,497.0	5.5	49.9	84.86		295.3	3,284.8	3,298.0	3,242.6	55.45	59.481	
2,600.0	2,600.0	2,597.0	2,597.0	5.7	51.9	-76.03		295.3	3,284.8	3,297.6	3,240.0	57.64	57.210	
2,700.0	2,699.8	2,696.8	2,696.8	5.9	53.9	-76.14		295.3	3,284.8	3,296.3	3,236.5	59.80	55.122	
2,748.8	2,748.4	2,745.4	2,745.4	6.0	54.9	-76.22		295.3	3,284.8	3,295.4	3,234.6	60.85	54.154	
2,800.0	2,799.5	2,796.5	2,796.5	6.1	55.9	-76.30		295.3	3,284.8	3,294.4	3,232.4	61.96	53.165	
2,900.0	2,899.1	2,896.1	2,896.1	6.2	57.9	-76.44		295.3	3,284.8	3,292.3	3,228.2	64.14	51.330	
3,000.0	2,998.7	2,995.7	2,995.7	6.4	59.9	-76.59		295.3	3,284.8	3,290.3	3,224.0	66.32	49.610	
3,100.0	3,098.4	3,095.4	3,095.4	6.6	61.9	-76.73		295.3	3,284.8	3,288.3	3,219.8	68.51	47.996	
3,200.0	3,198.0	3,195.0	3,195.0	6.8	63.9	-76.88		295.3	3,284.8	3,286.3	3,215.6	70.71	46.478	
3,300.0	3,297.6	3,294.6	3,294.6	7.0	65.9	-77.03		295.3	3,284.8	3,284.3	3,211.4	72.91	45.048	
3,400.0	3,397.2	3,394.2	3,394.2	7.3	67.9	-77.18		295.3	3,284.8	3,282.4	3,207.3	75.11	43.699	
3,500.0	3,496.9	3,493.9	3,493.9	7.5	69.9	-77.32		295.3	3,284.8	3,280.5	3,203.1	77.32	42.426	
3,600.0	3,596.5	3,593.5	3,593.5	7.7	71.9	-77.47		295.3	3,284.8	3,278.6	3,199.0	79.54	41.221	
3,700.0	3,696.1	3,693.1	3,693.1	7.9	73.9	-77.62		295.3	3,284.8	3,276.7	3,194.9	81.76	40.079	
3,800.0	3,795.7	3,792.7	3,792.7	8.2	75.9	-77.77		295.3	3,284.8	3,274.8	3,190.9	83.98	38.997	
3,900.0	3,895.4	3,892.4	3,892.4	8.4	77.8	-77.91		295.3	3,284.8	3,273.0	3,186.8	86.20	37.969	
4,000.0	3,995.0	3,992.0	3,992.0	8.6	79.8	-78.06		295.3	3,284.8	3,271.2	3,182.8	88.43	36.992	
4,100.0	4,094.6	4,091.6	4,091.6	8.9	81.8	-78.21		295.3	3,284.8	3,269.4	3,178.7	90.66	36.062	
4,200.0	4,194.2	4,191.2	4,191.2	9.1	83.8	-78.36		295.3	3,284.8	3,267.6	3,174.7	92.89	35.176	
4,257.6	4,251.6	4,248.6	4,248.6	9.2	85.0	-78.44		295.3	3,284.8	3,266.6	3,172.4	94.18	34.685	
4,300.0	4,293.9	4,290.9	4,290.9	9.3	85.8	-78.49		295.3	3,284.8	3,266.0	3,170.8	95.13	34.331	
4,400.0	4,393.7	4,390.7	4,390.7	9.6	87.8	-78.56		295.3	3,284.8	3,264.9	3,167.5	97.36	33.534	
4,506.3	4,500.0	4,497.0	4,497.0	9.8	89.9	82.27		295.3	3,284.8	3,264.5	3,165.1	99.38	32.848	
4,600.0	4,593.7	4,590.7	4,590.7	10.0	91.8	82.27		295.3	3,284.8	3,264.5	3,163.0	101.45	32.179	
4,700.0	4,693.7	4,690.7	4,690.7	10.2	93.8	82.27		295.3	3,284.8	3,264.5	3,160.8	103.66	31.492	
4,800.0	4,793.7	4,790.7	4,790.7	10.4	95.8	82.27		295.3	3,284.8	3,264.5	3,158.6	105.88	30.833	
4,900.0	4,893.7	4,890.7	4,890.7	10.6	97.8	82.27		295.3	3,284.8	3,264.5	3,156.4	108.09	30.201	
5,000.0	4,993.7	4,990.7	4,990.7	10.8	99.8	82.27		295.3	3,284.8	3,264.5	3,154.2	110.31	29.595	
5,100.0	5,093.7	5,090.7	5,090.7	11.0	101.8	82.27		295.3	3,284.8	3,264.5	3,152.0	112.52	29.012	
5,200.0	5,193.7	5,190.7	5,190.7	11.2	103.8	82.27		295.3	3,284.8	3,264.5	3,149.7	114.74	28.452	
5,300.0	5,293.7	5,290.7	5,290.7	11.4	105.8	82.27		295.3	3,284.8	3,264.5	3,147.5	116.95	27.912	
5,400.0	5,393.7	5,390.7	5,390.7	11.6	107.8	82.27		295.3	3,284.8	3,264.5	3,145.3	119.17	27.393	
5,500.0	5,493.7	5,490.7	5,490.7	11.8	109.8	82.27		295.3	3,284.8	3,264.5	3,143.1	121.39	26.893	
5,600.0	5,593.7	5,590.7	5,590.7	12.1	111.8	82.27		295.3	3,284.8	3,264.5	3,140.9	123.61	26.410	
5,700.0	5,693.7	5,690.7	5,690.7	12.3	113.8	82.27		295.3	3,284.8	3,264.5	3,138.7	125.82	25.945	
5,800.0	5,793.7	5,790.7	5,790.7	12.5	115.8	82.27		295.3	3,284.8	3,264.5	3,136.4	128.04	25.496	
5,900.0	5,893.7	5,890.7	5,890.7	12.7	117.8	82.27		295.3	3,284.8	3,264.5	3,134.2	130.26	25.061	
6,000.0	5,993.7	5,990.7	5,990.7	12.9	119.8	82.27		295.3	3,284.8	3,264.5	3,132.0	132.48	24.642	
6,100.0	6,093.7	6,090.7	6,090.7	13.1	121.8	82.27		295.3	3,284.8	3,264.5	3,129.8	134.70	24.236	
6,200.0	6,193.7	6,190.7	6,190.7	13.3	123.8	82.27		295.3	3,284.8	3,264.5	3,127.6	136.91	23.843	
6,236.6	6,230.3	6,227.3	6,227.3	13.4	124.5	82.27		295.3	3,284.8	3,264.5	3,126.8	137.73	23.703	
6,250.0	6,243.7	6,240.7	6,240.7	13.4	124.8	-7.96		295.3	3,284.8	3,264.4	3,126.1	138.22	23.617	
6,300.0	6,293.6	6,290.6	6,290.6	13.5	125.8	-7.99		295.3	3,284.8	3,261.9	3,123.0	138.88	23.486	
6,350.0	6,343.3	6,340.3	6,340.3	13.7	126.8	-8.06		295.3	3,284.8	3,256.2	3,117.2	138.97	23.431	
6,400.0	6,392.4	6,389.4	6,389.4	13.8	127.8	-8.18		295.3	3,284.8	3,247.2	3,108.8	138.45	23.454	
6,450.0	6,440.9	6,437.9	6,437.9	13.9	128.8	-8.35		295.3	3,284.8	3,235.1	3,097.8	137.34	23.556	
6,500.0	6,488.5	6,485.5	6,485.5	14.0	129.7	-8.56		295.3	3,284.8	3,219.9	3,084.3	135.62	23.742	

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 Lofland 22T-402
Project:	SEC.22-T5N-R65W	TVD Reference:	WELL @ 4663.0ft (RKB - 15')
Reference Site:	Lofland 22T-HZ Pad Sec.22-T5N-R65W	MD Reference:	WELL @ 4663.0ft (RKB - 15')
Site Error:	0.0ft	North Reference:	True
Reference Well:	Lofland 22T-402	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	Landmark
Reference Design:	Plan #1 (5-14-13)	Offset TVD Reference:	Offset Datum

Offset Design													Offset Site Error:	0.0 ft
Survey Program: 7300-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		
6,550.0	6,535.0	6,532.0	6,532.0	14.2	130.6	-8.83	295.3	3,284.8	3,201.7	3,068.4	133.30	24.018		
6,600.0	6,580.1	6,577.1	6,577.1	14.4	131.5	-9.17	295.3	3,284.8	3,180.5	3,050.1	130.40	24.390		
6,650.0	6,623.8	6,620.8	6,620.8	14.6	132.4	-9.58	295.3	3,284.8	3,156.4	3,029.5	126.93	24.867		
6,700.0	6,665.8	6,662.8	6,662.8	14.8	133.3	-10.07	295.3	3,284.8	3,129.5	3,006.6	122.93	25.458		
6,750.0	6,705.9	6,702.9	6,702.9	15.0	134.1	-10.66	295.3	3,284.8	3,100.0	2,981.6	118.44	26.175		
6,800.0	6,744.0	6,741.0	6,741.0	15.3	134.8	-11.37	295.3	3,284.8	3,068.0	2,954.5	113.52	27.027		
6,850.0	6,779.9	6,776.9	6,776.9	15.7	135.5	-12.23	295.3	3,284.8	3,033.6	2,925.3	108.26	28.020		
6,900.0	6,813.4	6,810.4	6,810.4	16.1	136.2	-13.28	295.3	3,284.8	2,996.9	2,894.1	102.82	29.148		
6,950.0	6,844.4	6,841.4	6,841.4	16.6	136.8	-14.56	295.3	3,284.8	2,958.2	2,860.8	97.38	30.378		
7,000.0	6,872.8	6,869.8	6,869.8	17.2	137.4	-16.16	295.3	3,284.8	2,917.5	2,825.3	92.26	31.622		
7,050.0	6,898.5	6,895.5	6,895.5	17.8	137.9	-18.17	295.3	3,284.8	2,875.1	2,787.2	87.96	32.688		
7,100.0	6,921.3	6,918.3	6,918.3	18.5	138.4	-20.76	295.3	3,284.8	2,831.2	2,746.0	85.21	33.224		
7,150.0	6,941.1	6,938.1	6,938.1	19.3	138.8	-24.16	295.3	3,284.8	2,785.9	2,700.8	85.15	32.719		
7,200.0	6,957.9	6,954.9	6,954.9	20.2	139.1	-28.75	295.3	3,284.8	2,739.4	2,650.2	89.21	30.707		
7,250.0	6,971.5	6,968.5	6,968.5	21.1	139.4	-35.14	295.3	3,284.8	2,692.0	2,593.0	99.01	27.189		
7,300.0	6,982.0	6,979.0	6,979.0	22.0	139.6	-44.28	295.3	3,284.8	2,643.9	2,528.2	115.62	22.866		
7,350.0	6,989.3	6,986.3	6,986.3	23.0	139.7	-57.39	295.3	3,284.8	2,595.1	2,457.3	137.87	18.823		
7,356.6	6,990.0	6,987.0	6,987.0	23.2	139.7	-59.47	295.3	3,284.8	2,588.7	2,447.8	140.93	18.369		
7,400.0	6,994.6	6,991.6	6,991.6	24.1	139.8	-59.89	295.3	3,284.8	2,546.2	2,403.8	142.40	17.881		
7,430.6	6,997.8	6,994.8	6,994.8	24.8	139.9	-60.20	295.3	3,284.8	2,516.3	2,372.8	143.45	17.541		
7,500.0	7,002.9	6,999.9	6,999.9	26.3	140.0	-76.77	295.3	3,284.8	2,448.2	2,286.3	161.87	15.124		
7,562.0	7,004.0	7,001.0	7,001.0	27.7	140.0	-92.95	295.3	3,284.8	2,387.4	2,219.9	167.47	14.256		
7,600.0	7,003.6	7,000.6	7,000.6	28.6	140.0	-92.90	295.3	3,284.8	2,350.0	2,181.7	168.35	13.959		
7,700.0	7,002.6	6,999.6	6,999.6	31.0	140.0	-92.78	295.3	3,284.8	2,252.0	2,081.2	170.73	13.190		
7,800.0	7,001.6	6,998.6	6,998.6	33.4	140.0	-92.65	295.3	3,284.8	2,154.1	1,980.9	173.17	12.439		
7,900.0	7,000.6	6,997.6	6,997.6	35.9	140.0	-92.53	295.3	3,284.8	2,056.4	1,880.8	175.67	11.706		
8,000.0	6,999.6	6,996.6	6,996.6	38.5	139.9	-92.40	295.3	3,284.8	1,959.0	1,780.8	178.20	10.993		
8,100.0	6,998.6	6,995.6	6,995.6	41.0	139.9	-92.27	295.3	3,284.8	1,861.8	1,681.1	180.78	10.299		
8,200.0	6,997.7	6,994.7	6,994.7	43.6	139.9	-92.15	295.3	3,284.8	1,765.0	1,581.6	183.37	9.625		
8,300.0	6,996.7	6,993.7	6,993.7	46.3	139.9	-92.02	295.3	3,284.8	1,668.5	1,482.5	186.00	8.971		
8,400.0	6,995.7	6,992.7	6,992.7	48.9	139.9	-91.90	295.3	3,284.8	1,572.5	1,383.9	188.64	8.336		
8,500.0	6,994.7	6,991.7	6,991.7	51.6	139.8	-91.77	295.3	3,284.8	1,477.0	1,285.7	191.30	7.721		
8,600.0	6,993.7	6,990.7	6,990.7	54.3	139.8	-91.65	295.3	3,284.8	1,382.1	1,188.1	193.97	7.125		
8,700.0	6,992.7	6,989.7	6,989.7	57.0	139.8	-91.52	295.3	3,284.8	1,288.0	1,091.4	196.65	6.550		
8,800.0	6,991.7	6,988.7	6,988.7	59.7	139.8	-91.39	295.3	3,284.8	1,194.9	995.5	199.35	5.994		
8,900.0	6,990.7	6,987.7	6,987.7	62.4	139.8	-91.27	295.3	3,284.8	1,103.0	900.9	202.05	5.459		
9,000.0	6,989.7	6,986.7	6,986.7	65.1	139.7	-91.14	295.3	3,284.8	1,012.6	807.8	204.76	4.945		
9,100.0	6,988.7	6,985.7	6,985.7	67.8	139.7	-91.02	295.3	3,284.8	924.1	716.7	207.48	4.454		
9,200.0	6,987.7	6,984.7	6,984.7	70.5	139.7	-90.89	295.3	3,284.8	838.3	628.1	210.20	3.988		
9,300.0	6,986.7	6,983.7	6,983.7	73.3	139.7	-90.76	295.3	3,284.8	756.0	543.1	212.93	3.551		
9,400.0	6,985.7	6,982.7	6,982.7	76.0	139.7	-90.64	295.3	3,284.8	678.4	462.8	215.66	3.146		
9,500.0	6,984.7	6,981.7	6,981.7	78.8	139.6	-90.51	295.3	3,284.8	607.5	389.1	218.39	2.782		
9,600.0	6,983.8	6,980.8	6,980.8	81.5	139.6	-90.39	295.3	3,284.8	545.7	324.5	221.13	2.468		
9,700.0	6,982.8	6,979.8	6,979.8	84.3	139.6	-90.26	295.3	3,284.8	496.5	272.6	223.87	2.218		
9,800.0	6,981.8	6,978.8	6,978.8	87.1	139.6	-90.13	295.3	3,284.8	463.9	237.3	226.61	2.047		
9,900.0	6,980.8	6,977.8	6,977.8	89.8	139.6	-90.01	295.3	3,284.8	451.6	222.3	229.35	1.969		
9,906.3	6,980.7	6,977.7	6,977.7	90.0	139.6	-90.00	295.3	3,284.8	451.6	222.1	229.53	1.967 CC, ES, SF		
10,000.0	6,979.8	6,976.8	6,976.8	92.6	139.5	-89.88	295.3	3,284.8	461.2	229.1	232.10	1.987		
10,100.0	6,978.8	6,975.8	6,975.8	95.3	139.5	-89.76	295.3	3,284.8	491.4	256.5	234.85	2.092		
10,200.0	6,977.8	6,974.8	6,974.8	98.1	139.5	-89.63	295.3	3,284.8	538.7	301.1	237.59	2.267		
10,300.0	6,976.8	6,973.8	6,973.8	100.9	139.5	-89.50	295.3	3,284.8	599.1	358.7	240.34	2.493		

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 Lofland 22T-402
Project:	SEC.22-T5N-R65W	TVD Reference:	WELL @ 4663.0ft (RKB - 15')
Reference Site:	Lofland 22T-HZ Pad Sec.22-T5N-R65W	MD Reference:	WELL @ 4663.0ft (RKB - 15')
Site Error:	0.0ft	North Reference:	True
Reference Well:	Lofland 22T-402	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	Landmark
Reference Design:	Plan #1 (5-14-13)	Offset TVD Reference:	Offset Datum

Offset Design Lofland 22T-HZ Existing Wells - Marie 1-23 (Exist) - Wellbore #1 - Wellbore #1												Offset Site Error: 0.0 ft	
Survey Program: 7300-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)		
10,400.0	6,975.8	6,972.8	6,972.8	103.7	139.5	-89.38	295.3	3,284.8	669.0	426.0	243.09	2.752	
10,500.0	6,974.8	6,971.8	6,971.8	106.4	139.4	-89.25	295.3	3,284.8	745.9	500.0	245.84	3.034	
10,600.0	6,973.8	6,970.8	6,970.8	109.2	139.4	-89.13	295.3	3,284.8	827.7	579.1	248.59	3.329	
10,700.0	6,972.8	6,969.8	6,969.8	112.0	139.4	-89.00	295.3	3,284.8	913.1	661.8	251.35	3.633	
10,800.0	6,971.8	6,968.8	6,968.8	114.8	139.4	-88.87	295.3	3,284.8	1,001.3	747.2	254.10	3.940	
10,900.0	6,970.8	6,967.8	6,967.8	117.6	139.4	-88.75	295.3	3,284.8	1,091.4	834.6	256.85	4.249	
11,000.0	6,969.9	6,966.9	6,966.9	120.3	139.3	-88.62	295.3	3,284.8	1,183.2	923.6	259.60	4.558	
11,100.0	6,968.9	6,965.9	6,965.9	123.1	139.3	-88.50	295.3	3,284.8	1,276.2	1,013.8	262.35	4.864	
11,200.0	6,967.9	6,964.9	6,964.9	125.9	139.3	-88.37	295.3	3,284.8	1,370.2	1,105.1	265.10	5.169	
11,300.0	6,966.9	6,963.9	6,963.9	128.7	139.3	-88.24	295.3	3,284.8	1,464.9	1,197.1	267.85	5.469	
11,400.0	6,965.9	6,962.9	6,962.9	131.5	139.3	-88.12	295.3	3,284.8	1,560.4	1,289.8	270.60	5.766	
11,500.0	6,964.9	6,961.9	6,961.9	134.3	139.2	-87.99	295.3	3,284.8	1,656.3	1,383.0	273.34	6.060	
11,600.0	6,963.9	6,960.9	6,960.9	137.1	139.2	-87.87	295.3	3,284.8	1,752.8	1,476.7	276.09	6.348	
11,700.0	6,962.9	6,959.9	6,959.9	139.9	139.2	-87.74	295.3	3,284.8	1,849.6	1,570.7	278.84	6.633	
11,800.0	6,961.9	6,958.9	6,958.9	142.7	139.2	-87.62	295.3	3,284.8	1,946.7	1,665.1	281.58	6.913	
11,900.0	6,960.9	6,957.9	6,957.9	145.4	139.2	-87.49	295.3	3,284.8	2,044.1	1,759.8	284.33	7.189	
12,000.0	6,959.9	6,956.9	6,956.9	148.2	139.1	-87.36	295.3	3,284.8	2,141.7	1,854.7	287.07	7.461	
12,100.0	6,958.9	6,955.9	6,955.9	151.0	139.1	-87.24	295.3	3,284.8	2,239.6	1,949.8	289.81	7.728	
12,200.0	6,957.9	6,954.9	6,954.9	153.8	139.1	-87.11	295.3	3,284.8	2,337.6	2,045.0	292.55	7.990	
12,300.0	6,956.9	6,953.9	6,953.9	156.6	139.1	-86.99	295.3	3,284.8	2,435.8	2,140.5	295.29	8.249	
12,400.0	6,956.0	6,953.0	6,953.0	159.4	139.1	-86.86	295.3	3,284.8	2,534.1	2,236.1	298.03	8.503	
12,500.0	6,955.0	6,952.0	6,952.0	162.2	139.0	-86.74	295.3	3,284.8	2,632.6	2,331.8	300.76	8.753	
12,600.0	6,954.0	6,951.0	6,951.0	165.0	139.0	-86.61	295.3	3,284.8	2,731.1	2,427.6	303.50	8.999	
12,697.2	6,953.0	6,950.0	6,950.0	167.7	139.0	-86.49	295.3	3,284.8	2,827.0	2,520.8	306.15	9.234	

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Lofland 22T-402
Project:	SEC.22-T5N-R65W	TVD Reference:	WELL @ 4663.0ft (RKB - 15')
Reference Site:	Lofland 22T-HZ Pad Sec.22-T5N-R65W	MD Reference:	WELL @ 4663.0ft (RKB - 15')
Site Error:	0.0ft	North Reference:	True
Reference Well:	Lofland 22T-402	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	Landmark
Reference Design:	Plan #1 (5-14-13)	Offset TVD Reference:	Offset Datum

Offset Design Lofland 22T-HZ Pad Sec.22-T5N-R65W - Lofland 22D-232 - Wellbore #1 - Plan #1 (5-14-13)													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 (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	59.83	59.83	14.6	25.1	29.0				
100.0	100.0	99.0	99.0	0.1	0.1	59.83	59.83	14.6	25.1	29.0	28.8	0.22	129.688	
200.0	200.0	199.0	199.0	0.3	0.3	59.83	59.83	14.6	25.1	29.0	28.3	0.67	43.157	
300.0	300.0	299.0	299.0	0.6	0.6	59.83	59.83	14.6	25.1	29.0	27.9	1.12	25.860	
400.0	400.0	399.0	399.0	0.8	0.8	59.83	59.83	14.6	25.1	29.0	27.4	1.57	18.461 CC, ES	
500.0	500.0	498.4	498.4	1.0	1.0	57.17	57.17	16.3	25.2	30.0	28.0	2.02	14.861	
600.0	600.0	597.5	597.4	1.2	1.2	50.15	50.15	21.4	25.6	33.4	30.9	2.47	13.515	
700.0	700.0	696.2	695.7	1.5	1.5	41.34	41.34	29.8	26.2	39.9	36.9	2.93	13.601	
800.0	800.0	794.4	793.2	1.7	1.7	33.13	33.13	41.6	27.2	50.0	46.6	3.41	14.687	
900.0	900.0	893.3	891.1	1.9	2.0	27.09	27.09	55.1	28.2	62.4	58.5	3.89	16.067	
1,000.0	1,000.0	992.3	989.2	2.1	2.3	23.06	23.06	68.7	29.2	75.3	70.9	4.36	17.263	
1,100.0	1,100.0	1,091.4	1,087.3	2.4	2.6	20.21	20.21	82.2	30.3	88.4	83.6	4.84	18.279	
1,200.0	1,200.0	1,190.4	1,185.4	2.6	2.9	18.11	18.11	95.8	31.3	101.7	96.4	5.31	19.144	
1,300.0	1,300.0	1,289.5	1,283.5	2.8	3.3	16.49	16.49	109.4	32.4	115.1	109.3	5.79	19.885	
1,400.0	1,400.0	1,388.5	1,381.7	3.0	3.6	15.21	15.21	122.9	33.4	128.5	122.3	6.26	20.525	
1,500.0	1,500.0	1,487.6	1,479.8	3.3	3.9	14.17	14.17	136.5	34.5	142.0	135.3	6.74	21.081	
1,600.0	1,600.0	1,586.6	1,577.9	3.5	4.2	13.31	13.31	150.0	35.5	155.6	148.4	7.21	21.570	
1,700.0	1,700.0	1,685.7	1,676.0	3.7	4.5	12.59	12.59	163.6	36.5	169.2	161.5	7.69	22.001	
1,800.0	1,800.0	1,784.7	1,774.1	3.9	4.9	11.98	11.98	177.1	37.6	182.8	174.6	8.17	22.384	
1,900.0	1,900.0	1,883.8	1,872.2	4.2	5.2	11.45	11.45	190.7	38.6	196.4	187.7	8.64	22.727	
2,000.0	2,000.0	1,982.9	1,970.4	4.4	5.5	10.99	10.99	204.2	39.7	210.0	200.9	9.12	23.035	
2,100.0	2,100.0	2,081.9	2,068.5	4.6	5.8	10.59	10.59	217.8	40.7	223.7	214.1	9.59	23.314	
2,200.0	2,200.0	2,181.0	2,166.6	4.8	6.2	10.23	10.23	231.3	41.7	237.3	227.2	10.07	23.567	
2,300.0	2,300.0	2,280.0	2,264.7	5.1	6.5	9.91	9.91	244.9	42.8	251.0	240.4	10.55	23.798	
2,400.0	2,400.0	2,379.1	2,362.8	5.3	6.8	9.63	9.63	258.5	43.8	264.6	253.6	11.02	24.010	
2,500.0	2,500.0	2,478.1	2,460.9	5.5	7.2	9.37	9.37	272.0	44.9	278.3	266.8	11.50	24.204	
2,600.0	2,600.0	2,576.9	2,558.8	5.7	7.5	-151.73	-151.73	285.5	45.9	293.5	281.8	11.66	25.177	
2,700.0	2,699.8	2,675.2	2,656.1	5.9	7.8	-152.22	-152.22	299.0	47.0	311.8	299.7	12.03	25.907	
2,748.8	2,748.4	2,722.9	2,703.4	6.0	8.0	-152.53	-152.53	305.5	47.5	321.8	309.6	12.21	26.347	
2,800.0	2,799.5	2,772.9	2,752.9	6.1	8.1	-152.96	-152.96	312.3	48.0	332.7	320.3	12.42	26.785	
2,900.0	2,899.1	2,870.5	2,849.6	6.2	8.5	-153.72	-153.72	325.7	49.0	354.1	341.2	12.83	27.594	
3,000.0	2,998.7	2,968.0	2,946.2	6.4	8.8	-154.40	-154.40	339.1	50.0	375.5	362.2	13.25	28.346	
3,100.0	3,098.4	3,065.6	3,042.9	6.6	9.1	-155.00	-155.00	352.4	51.1	396.9	383.3	13.67	29.047	
3,200.0	3,198.0	3,163.2	3,139.6	6.8	9.5	-155.54	-155.54	365.8	52.1	418.4	404.3	14.09	29.701	
3,300.0	3,297.6	3,260.8	3,236.2	7.0	9.8	-156.03	-156.03	379.1	53.1	440.0	425.4	14.51	30.312	
3,400.0	3,397.2	3,358.4	3,332.9	7.3	10.1	-156.47	-156.47	392.5	54.1	461.5	446.6	14.94	30.883	
3,500.0	3,496.9	3,456.0	3,429.6	7.5	10.4	-156.88	-156.88	405.8	55.2	483.1	467.7	15.38	31.419	
3,600.0	3,596.5	3,553.6	3,526.2	7.7	10.8	-157.25	-157.25	419.2	56.2	504.7	488.9	15.81	31.921	
3,700.0	3,696.1	3,651.2	3,622.9	7.9	11.1	-157.59	-157.59	432.5	57.2	526.3	510.1	16.25	32.393	
3,800.0	3,795.7	3,748.8	3,719.6	8.2	11.4	-157.90	-157.90	445.9	58.3	548.0	531.3	16.69	32.837	
3,900.0	3,895.4	3,846.3	3,816.2	8.4	11.7	-158.19	-158.19	459.2	59.3	569.6	552.5	17.13	33.256	
4,000.0	3,995.0	3,943.9	3,912.9	8.6	12.1	-158.45	-158.45	472.6	60.3	591.3	573.7	17.57	33.650	
4,100.0	4,094.6	4,041.5	4,009.6	8.9	12.4	-158.70	-158.70	486.0	61.3	613.0	594.9	18.02	34.023	
4,200.0	4,194.2	4,139.1	4,106.2	9.1	12.7	-158.93	-158.93	499.3	62.4	634.6	616.2	18.46	34.376	
4,257.6	4,251.6	4,195.3	4,161.9	9.2	12.9	-159.06	-159.06	507.0	63.0	647.1	628.4	18.72	34.570	
4,300.0	4,293.9	4,236.8	4,202.9	9.3	13.0	-159.20	-159.20	512.7	63.4	656.0	637.1	18.94	34.641	
4,400.0	4,393.7	4,335.0	4,300.2	9.6	13.4	-159.44	-159.44	526.1	64.4	674.8	655.3	19.45	34.699	
4,506.3	4,500.0	4,440.0	4,404.3	9.8	13.7	1.30	1.30	540.5	65.5	691.2	667.7	23.46	29.466	
4,600.0	4,593.7	4,532.8	4,496.2	10.0	14.0	1.36	1.36	553.2	66.5	704.0	680.1	23.96	29.388	
4,700.0	4,693.7	4,631.9	4,594.3	10.2	14.4	1.41	1.41	566.7	67.5	717.7	693.2	24.49	29.302	
4,800.0	4,793.7	4,730.9	4,692.4	10.4	14.7	1.47	1.47	580.3	68.6	731.4	706.4	25.03	29.219	

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 Lofland 22T-402
Project:	SEC.22-T5N-R65W	TVD Reference:	WELL @ 4663.0ft (RKB - 15')
Reference Site:	Lofland 22T-HZ Pad Sec.22-T5N-R65W	MD Reference:	WELL @ 4663.0ft (RKB - 15')
Site Error:	0.0ft	North Reference:	True
Reference Well:	Lofland 22T-402	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	Landmark
Reference Design:	Plan #1 (5-14-13)	Offset TVD Reference:	Offset Datum

Offset Design Lofland 22T-HZ Pad Sec.22-T5N-R65W - Lofland 22D-232 - Wellbore #1 - Plan #1 (5-14-13)													Offset Site Error:	0.0 ft
Survey Program: 0-MWD													Offset Well Error:	0.0 ft
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference	Offset	Semi Major Axis	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
4,900.0	4,893.7	4,830.0	4,790.5	10.6	15.0	1.52	593.9	69.6	745.1	719.6	25.57	29.138		
5,000.0	4,993.7	4,929.0	4,888.7	10.8	15.4	1.58	607.4	70.7	758.9	732.7	26.11	29.060		
5,100.0	5,093.7	5,028.1	4,986.8	11.0	15.7	1.63	621.0	71.7	772.6	745.9	26.65	28.984		
5,200.0	5,193.7	5,127.1	5,084.9	11.2	16.0	1.67	634.5	72.8	786.3	759.1	27.20	28.911		
5,300.0	5,293.7	5,255.9	5,212.7	11.4	16.4	1.73	650.2	74.0	798.6	770.8	27.76	28.768		
5,400.0	5,393.7	5,394.4	5,350.7	11.6	16.7	1.76	660.7	74.8	806.2	777.9	28.26	28.530		
5,500.0	5,493.7	5,533.5	5,489.8	11.8	16.9	1.78	664.6	75.1	809.0	780.3	28.69	28.200		
5,600.0	5,593.7	5,636.4	5,592.7	12.1	17.0	1.78	664.6	75.1	809.0	779.9	29.05	27.849		
5,700.0	5,693.7	5,736.4	5,692.7	12.3	17.2	1.78	664.6	75.1	809.0	779.5	29.42	27.500		
5,800.0	5,793.7	5,836.4	5,792.7	12.5	17.4	1.78	664.6	75.1	809.0	779.2	29.79	27.158		
5,900.0	5,893.7	5,936.4	5,892.7	12.7	17.5	1.78	664.6	75.1	809.0	778.8	30.16	26.822		
6,000.0	5,993.7	6,036.4	5,992.7	12.9	17.7	1.78	664.6	75.1	809.0	778.4	30.53	26.494		
6,060.0	6,054.6	6,097.3	6,053.6	13.0	17.8	1.78	664.6	75.1	809.0	778.2	30.76	26.297		
6,100.0	6,093.7	6,136.0	6,092.3	13.1	17.8	1.79	664.6	75.2	809.0	778.1	30.91	26.173		
6,200.0	6,193.7	6,232.3	6,188.2	13.3	18.0	2.34	664.6	83.1	809.2	778.0	31.28	25.875		
6,236.6	6,230.3	6,266.9	6,222.3	13.4	18.1	2.75	664.5	88.8	809.5	778.1	31.41	25.771		
6,250.0	6,243.7	6,279.4	6,234.6	13.4	18.1	-87.29	664.5	91.3	809.6	782.0	27.66	29.270		
6,300.0	6,293.6	6,325.9	6,279.7	13.5	18.2	-86.65	664.5	102.2	810.1	782.2	27.87	29.064		
6,350.0	6,343.3	6,371.8	6,323.7	13.7	18.2	-86.02	664.4	115.7	810.7	782.6	28.10	28.853		
6,400.0	6,392.4	6,417.4	6,366.3	13.8	18.3	-85.40	664.4	131.6	811.4	783.1	28.34	28.634		
6,450.0	6,440.9	6,462.5	6,407.6	13.9	18.4	-84.81	664.3	149.8	812.1	783.5	28.59	28.403		
6,500.0	6,488.5	6,507.2	6,447.3	14.0	18.5	-84.24	664.3	170.3	812.9	784.1	28.87	28.156		
6,550.0	6,535.0	6,550.0	6,484.2	14.2	18.6	-83.71	664.2	192.1	813.8	784.6	29.18	27.892		
6,600.0	6,580.1	6,595.5	6,522.0	14.4	18.8	-83.17	664.1	217.4	814.7	785.1	29.53	27.584		
6,650.0	6,623.8	6,639.2	6,556.8	14.6	18.9	-82.68	664.0	243.8	815.6	785.6	29.94	27.243		
6,700.0	6,665.8	6,682.6	6,589.8	14.8	19.1	-82.22	664.0	271.9	816.4	786.0	30.40	26.857		
6,750.0	6,705.9	6,725.7	6,621.0	15.0	19.3	-81.78	663.9	301.7	817.3	786.4	30.94	26.419		
6,800.0	6,744.0	6,768.6	6,650.3	15.3	19.5	-81.38	663.8	333.0	818.2	786.6	31.56	25.926		
6,850.0	6,779.9	6,811.3	6,677.6	15.7	19.7	-81.01	663.7	365.8	819.0	786.7	32.28	25.375		
6,900.0	6,813.4	6,853.7	6,703.0	16.1	20.0	-80.68	663.5	399.8	819.8	786.7	33.10	24.767		
6,950.0	6,844.4	6,896.0	6,726.4	16.6	20.3	-80.38	663.4	435.1	820.5	786.5	34.05	24.100		
7,000.0	6,872.8	6,938.2	6,747.6	17.2	20.7	-80.11	663.3	471.5	821.2	786.1	35.12	23.384		
7,050.0	6,898.5	6,980.2	6,766.8	17.8	21.1	-79.88	663.2	508.8	821.8	785.5	36.31	22.630		
7,100.0	6,921.3	7,022.1	6,783.9	18.5	21.6	-79.69	663.1	547.1	822.3	784.7	37.63	21.850		
7,150.0	6,941.1	7,063.9	6,798.8	19.3	22.1	-79.54	663.0	586.2	822.7	783.6	39.08	21.054		
7,200.0	6,957.9	7,105.7	6,811.5	20.2	22.7	-79.42	662.8	625.9	823.0	782.4	40.63	20.255		
7,250.0	6,971.5	7,150.0	6,822.7	21.1	23.4	-79.34	662.7	668.8	823.3	780.9	42.35	19.441		
7,300.0	6,982.0	7,189.0	6,830.4	22.0	24.1	-79.30	662.6	707.1	823.4	779.3	44.07	18.684		
7,350.0	6,989.3	7,230.7	6,836.5	23.0	24.8	-79.30	662.4	748.3	823.4	777.5	45.92	17.930		
7,356.6	6,990.0	7,236.2	6,837.1	23.2	24.9	-79.30	662.4	753.7	823.4	777.3	46.17	17.834		
7,359.9	6,990.4	7,238.9	6,837.4	23.3	25.0	-79.30	662.4	756.5	823.4	777.1	46.30	17.786		
7,400.0	6,994.6	7,272.3	6,840.3	24.1	25.6	-79.26	662.3	789.7	823.6	775.8	47.80	17.229		
7,430.6	6,997.8	7,300.0	6,841.6	24.8	26.1	-79.15	662.2	817.4	823.9	774.9	49.01	16.813		
7,500.0	7,002.9	7,361.1	6,841.6	26.3	27.4	-78.81	662.0	878.5	824.9	773.1	51.81	15.921		
7,562.0	7,004.0	7,423.0	6,841.3	27.7	28.7	-78.70	661.8	940.4	825.3	770.7	54.58	15.121		
7,600.0	7,003.6	7,461.0	6,841.0	28.6	29.5	-78.71	661.7	978.4	825.2	768.9	56.30	14.659		
7,700.0	7,002.6	7,561.0	6,840.4	31.0	31.7	-78.73	661.4	1,078.4	825.2	764.3	60.92	13.546		
7,800.0	7,001.6	7,661.0	6,839.8	33.4	34.0	-78.76	661.1	1,178.4	825.2	759.5	65.69	12.563		
7,900.0	7,000.6	7,761.0	6,839.1	35.9	36.4	-78.78	660.8	1,278.4	825.2	754.7	70.56	11.695		
8,000.0	6,999.6	7,861.0	6,838.5	38.5	38.9	-78.81	660.4	1,378.4	825.2	749.7	75.53	10.926		
8,100.0	6,998.6	7,961.0	6,837.9	41.0	41.4	-78.84	660.1	1,478.4	825.2	744.6	80.57	10.242		

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

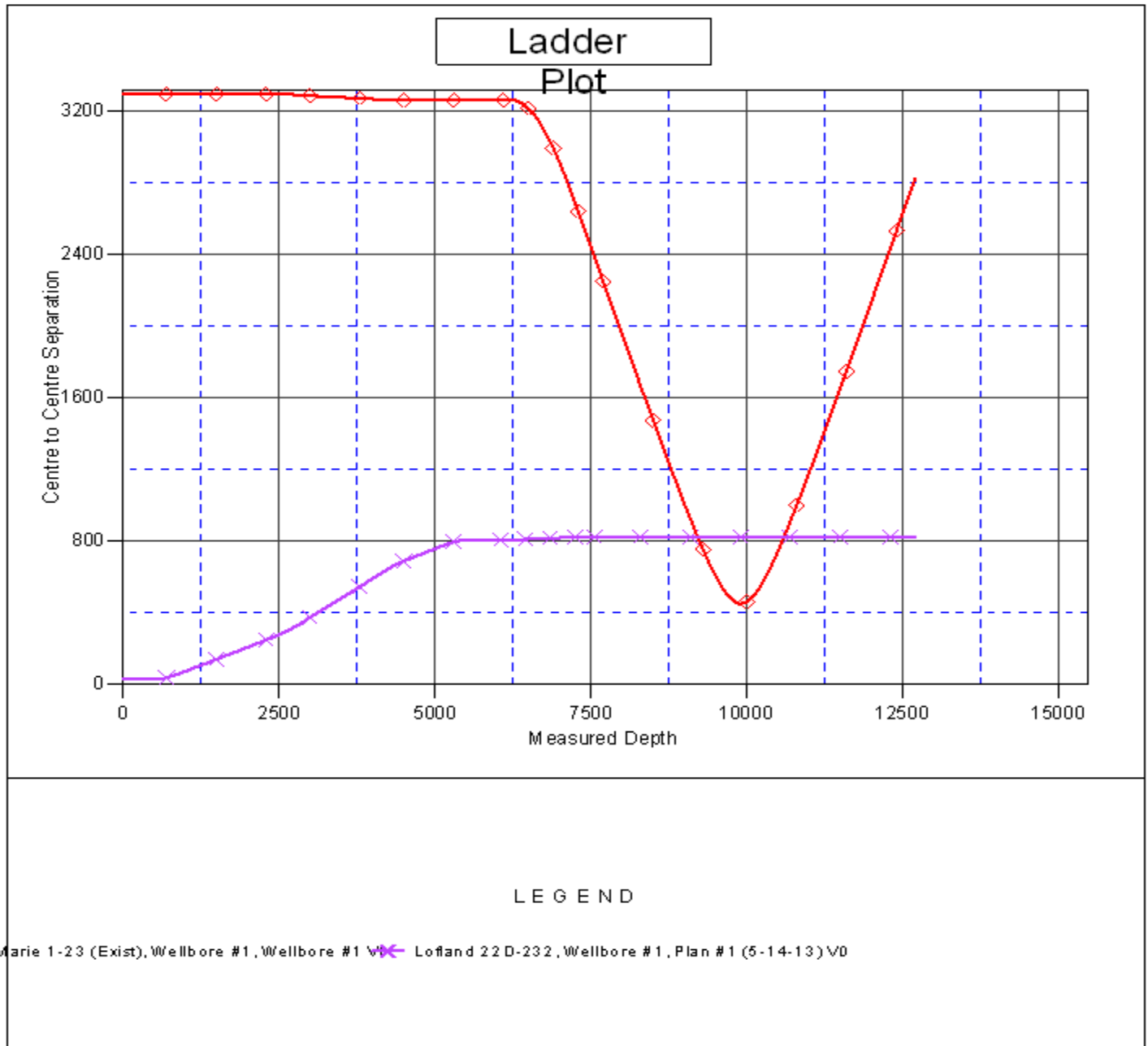
Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Lofland 22T-402
Project:	SEC.22-T5N-R65W	TVD Reference:	WELL @ 4663.0ft (RKB - 15')
Reference Site:	Lofland 22T-HZ Pad Sec.22-T5N-R65W	MD Reference:	WELL @ 4663.0ft (RKB - 15')
Site Error:	0.0ft	North Reference:	True
Reference Well:	Lofland 22T-402	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	Landmark
Reference Design:	Plan #1 (5-14-13)	Offset TVD Reference:	Offset Datum

Offset Design Lofland 22T-HZ Pad Sec.22-T5N-R65W - Lofland 22D-232 - Wellbore #1 - Plan #1 (5-14-13)												Offset Site Error: 0.0 ft	
Survey Program: 0-MWD												Offset Well Error: 0.0 ft	
Reference		Offset		Semi Major Axis		Highside Toolface (°)	Offset Wellbore Centre		Distance		Minimum Separation (ft)	Separation Factor	Warning
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference	Offset		+N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)			
8,200.0	6,997.7	8,061.0	6,837.2	43.6	43.9	-78.86	659.8	1,578.4	825.2	739.5	85.67	9.632	
8,300.0	6,996.7	8,161.0	6,836.6	46.3	46.5	-78.89	659.5	1,678.4	825.2	734.4	90.82	9.086	
8,400.0	6,995.7	8,261.0	6,836.0	48.9	49.1	-78.91	659.2	1,778.4	825.2	729.1	96.01	8.594	
8,500.0	6,994.7	8,361.0	6,835.4	51.6	51.7	-78.94	658.9	1,878.4	825.2	723.9	101.24	8.150	
8,600.0	6,993.7	8,461.0	6,834.7	54.3	54.3	-78.96	658.5	1,978.4	825.1	718.6	106.50	7.747	
8,700.0	6,992.7	8,561.0	6,834.1	57.0	57.0	-78.99	658.2	2,078.4	825.1	713.3	111.79	7.381	
8,800.0	6,991.7	8,661.0	6,833.5	59.7	59.7	-79.02	657.9	2,178.4	825.1	708.0	117.10	7.046	
8,900.0	6,990.7	8,761.0	6,832.8	62.4	62.3	-79.04	657.6	2,278.4	825.1	702.7	122.44	6.739	
9,000.0	6,989.7	8,861.0	6,832.2	65.1	65.0	-79.07	657.3	2,378.4	825.1	697.3	127.79	6.457	
9,100.0	6,988.7	8,961.0	6,831.6	67.8	67.7	-79.09	657.0	2,478.4	825.1	691.9	133.15	6.197	
9,200.0	6,987.7	9,061.0	6,831.0	70.5	70.4	-79.12	656.6	2,578.4	825.1	686.6	138.53	5.956	
9,300.0	6,986.7	9,161.0	6,830.3	73.3	73.2	-79.14	656.3	2,678.4	825.1	681.2	143.92	5.733	
9,400.0	6,985.7	9,261.0	6,829.7	76.0	75.9	-79.17	656.0	2,778.4	825.1	675.7	149.33	5.525	
9,500.0	6,984.7	9,361.0	6,829.1	78.8	78.6	-79.19	655.7	2,878.4	825.1	670.3	154.74	5.332	
9,600.0	6,983.8	9,461.0	6,828.4	81.5	81.4	-79.22	655.4	2,978.4	825.1	664.9	160.16	5.151	
9,700.0	6,982.8	9,561.0	6,827.8	84.3	84.1	-79.25	655.1	3,078.4	825.0	659.5	165.59	4.982	
9,800.0	6,981.8	9,661.0	6,827.2	87.1	86.8	-79.27	654.7	3,178.4	825.0	654.0	171.03	4.824	
9,900.0	6,980.8	9,761.0	6,826.6	89.8	89.6	-79.30	654.4	3,278.4	825.0	648.6	176.48	4.675	
10,000.0	6,979.8	9,861.0	6,825.9	92.6	92.3	-79.32	654.1	3,378.3	825.0	643.1	181.93	4.535	
10,100.0	6,978.8	9,961.0	6,825.3	95.3	95.1	-79.35	653.8	3,478.3	825.0	637.6	187.39	4.403	
10,200.0	6,977.8	10,061.0	6,824.7	98.1	97.9	-79.37	653.5	3,578.3	825.0	632.2	192.85	4.278	
10,300.0	6,976.8	10,161.0	6,824.0	100.9	100.6	-79.40	653.2	3,678.3	825.0	626.7	198.32	4.160	
10,400.0	6,975.8	10,261.0	6,823.4	103.7	103.4	-79.43	652.8	3,778.3	825.0	621.2	203.80	4.048	
10,500.0	6,974.8	10,361.0	6,822.8	106.4	106.1	-79.45	652.5	3,878.3	825.0	615.7	209.28	3.942	
10,600.0	6,973.8	10,461.0	6,822.2	109.2	108.9	-79.48	652.2	3,978.3	825.0	610.2	214.76	3.841	
10,700.0	6,972.8	10,561.0	6,821.5	112.0	111.7	-79.50	651.9	4,078.3	825.0	604.7	220.25	3.746	
10,800.0	6,971.8	10,661.0	6,820.9	114.8	114.5	-79.53	651.6	4,178.3	825.0	599.2	225.74	3.655	
10,900.0	6,970.8	10,761.0	6,820.3	117.6	117.2	-79.55	651.3	4,278.3	825.0	593.7	231.23	3.568	
11,000.0	6,969.9	10,861.0	6,819.7	120.3	120.0	-79.58	650.9	4,378.3	825.0	588.2	236.73	3.485	
11,100.0	6,968.9	10,961.0	6,819.0	123.1	122.8	-79.61	650.6	4,478.3	825.0	582.7	242.23	3.406	
11,200.0	6,967.9	11,061.0	6,818.4	125.9	125.6	-79.63	650.3	4,578.3	825.0	577.2	247.73	3.330	
11,300.0	6,966.9	11,161.0	6,817.8	128.7	128.3	-79.66	650.0	4,678.3	824.9	571.7	253.24	3.258	
11,400.0	6,965.9	11,261.0	6,817.1	131.5	131.1	-79.68	649.7	4,778.3	824.9	566.2	258.75	3.188	
11,500.0	6,964.9	11,361.0	6,816.5	134.3	133.9	-79.71	649.4	4,878.3	824.9	560.7	264.26	3.122	
11,600.0	6,963.9	11,461.0	6,815.9	137.1	136.7	-79.73	649.0	4,978.3	824.9	555.2	269.78	3.058	
11,700.0	6,962.9	11,561.0	6,815.3	139.9	139.5	-79.76	648.7	5,078.3	824.9	549.6	275.29	2.997	
11,800.0	6,961.9	11,661.0	6,814.6	142.7	142.3	-79.79	648.4	5,178.3	824.9	544.1	280.81	2.938	
11,900.0	6,960.9	11,761.0	6,814.0	145.4	145.0	-79.81	648.1	5,278.3	824.9	538.6	286.33	2.881	
12,000.0	6,959.9	11,861.0	6,813.4	148.2	147.8	-79.84	647.8	5,378.3	824.9	533.1	291.86	2.826	
12,100.0	6,958.9	11,961.0	6,812.7	151.0	150.6	-79.86	647.5	5,478.3	824.9	527.5	297.38	2.774	
12,200.0	6,957.9	12,061.0	6,812.1	153.8	153.4	-79.89	647.1	5,578.3	824.9	522.0	302.91	2.723	
12,300.0	6,956.9	12,161.0	6,811.5	156.6	156.2	-79.91	646.8	5,678.3	824.9	516.5	308.44	2.674	
12,400.0	6,956.0	12,261.0	6,810.9	159.4	159.0	-79.94	646.5	5,778.3	824.9	510.9	313.97	2.627	
12,500.0	6,955.0	12,361.0	6,810.2	162.2	161.8	-79.97	646.2	5,878.3	824.9	505.4	319.50	2.582	
12,600.0	6,954.0	12,461.0	6,809.6	165.0	164.6	-79.99	645.9	5,978.3	824.9	499.9	325.04	2.538	
12,669.7	6,953.3	12,530.7	6,809.2	166.9	166.5	-80.01	645.7	6,048.0	824.9	496.0	328.90	2.508	
12,697.2	6,953.0	12,556.3	6,809.0	167.7	167.2	-80.02	645.6	6,073.6	824.9	494.5	330.36	2.497 SF	

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Lofland 22T-402
Project:	SEC.22-T5N-R65W	TVD Reference:	WELL @ 4663.0ft (RKB - 15')
Reference Site:	Lofland 22T-HZ Pad Sec.22-T5N-R65W	MD Reference:	WELL @ 4663.0ft (RKB - 15')
Site Error:	0.0ft	North Reference:	True
Reference Well:	Lofland 22T-402	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	Landmark
Reference Design:	Plan #1 (5-14-13)	Offset TVD Reference:	Offset Datum

Reference Depths are relative to WELL @ 4663.0ft (RKB - 15')
Offset Depths are relative to Offset Datum
Central Meridian is -105.500000 °

Coordinates are relative to: Lofland 22T-402
Coordinate System is US State Plane 1983, Colorado Northern Zone
Grid Convergence at Surface is: 0.55°



Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Lofland 22T-402
Project:	SEC.22-T5N-R65W	TVD Reference:	WELL @ 4663.0ft (RKB - 15')
Reference Site:	Lofland 22T-HZ Pad Sec.22-T5N-R65W	MD Reference:	WELL @ 4663.0ft (RKB - 15')
Site Error:	0.0ft	North Reference:	True
Reference Well:	Lofland 22T-402	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	Landmark
Reference Design:	Plan #1 (5-14-13)	Offset TVD Reference:	Offset Datum

Reference Depths are relative to WELL @ 4663.0ft (RKB - 15')
Offset Depths are relative to Offset Datum
Central Meridian is -105.500000 °

Coordinates are relative to: Lofland 22T-402
Coordinate System is US State Plane 1983, Colorado Northern Zone
Grid Convergence at Surface is: 0.55°

