

PETROLEUM DEVELOPMENT CORP Weld County CO

Well Name: **Guttersen 31Q-401**

Surface Location: Guttersen 31Q-401 Pad Sec.31-T3N-R63W
North American Datum 1983 , US State Plane 1983 , Colorado Northern Zone

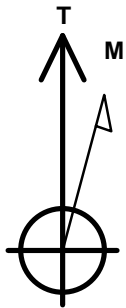
Ground Elevation: 4823.0

+N/-S	+E/-W	Northing	Easting	Latitude	Longitude	Slot
0.0	0.0	1308191.41	3285375.30	40.174870	-104.478720	

Original Well Elev WELL @ 4838.0ft (Original Well Elev)

WELLBORE TARGET DETAILS

Name	TVD	+N/-S	+E/-W	Shape
BHL 500'FNL, 2440'FEL	6848.0	4699.5	-315.7	Point



Azimuths to True North
Magnetic North: 8.43°

Magnetic Field
Strength: 52836.9snT
Dip Angle: 66.85°
Date: 5/31/2013
Model: IGRF2010

ANNOTATIONS

TVD	MD	Annotation
1000.0	1000.0	KOP #1
6054.2	6066.7	KOP #2
6828.0	7374.7	End of Build

Guttersen 31Q-401 Pad Sec.31-T3N-R63W
Guttersen 31Q-401
Plan #1 (5-31-13)
9:25, May 31 2013

South(-)/North(+) (1600 ft/in)

SEC.31-T3N-R63W
460' Setbacks

BHL 500'FNL & 2440'FEL

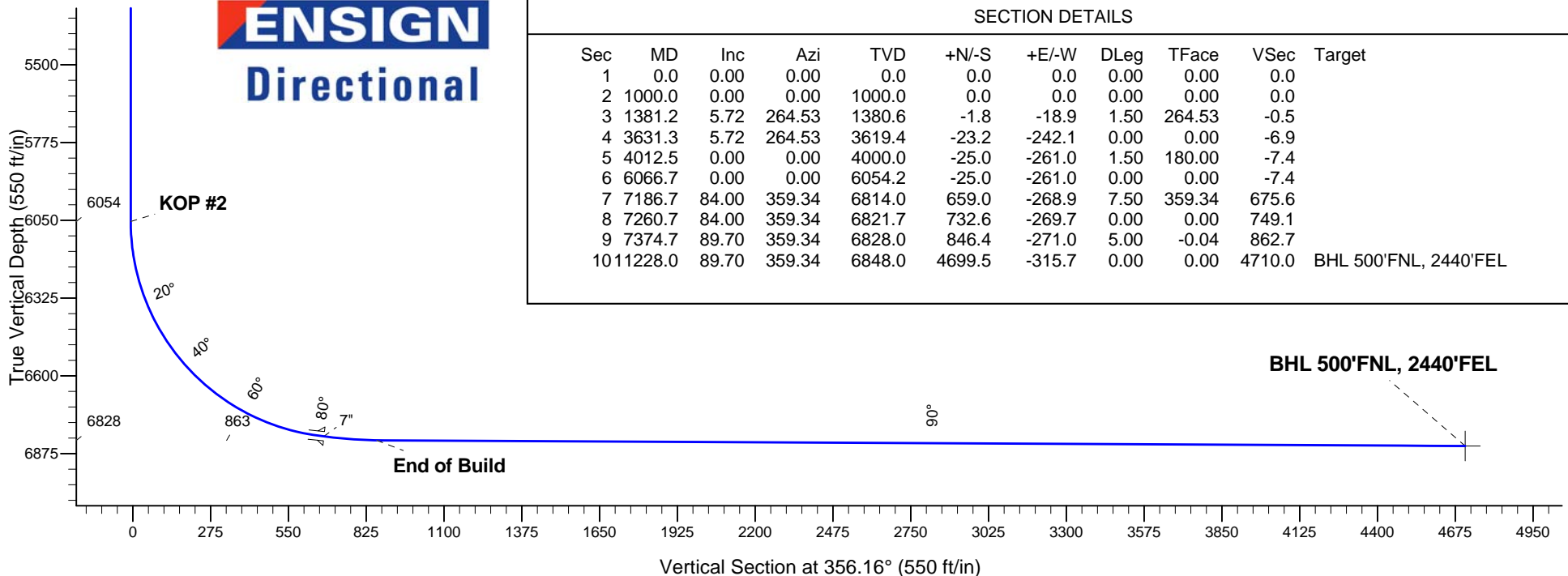
Casing Pt. - 734'FSL
& 2448'FEL

SHL 75'FSL & 2179'FEL

Guttersen 33-31 (Exist.)
Guttersen 33-31 (Exist.) 500' Target Circle

Guttersen 31Q-401

West(-)/East(+) (1600 ft/in)





Directional

PETROLEUM DEVELOPMENT CORP Weld County CO

SEC.31-T3N-R63W

Guttersen 31Q-401 Pad Sec.31-T3N-R63W

Guttersen 31Q-401

Wellbore #1

Plan: Plan #1 (5-31-13)

Standard Planning Report

31 May, 2013

Database:	Landmark	Local Co-ordinate Reference:	Well Guttersen 31Q-401
Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	TVD Reference:	WELL @ 4838.0ft (Original Well Elev)
Project:	SEC.31-T3N-R63W	MD Reference:	WELL @ 4838.0ft (Original Well Elev)
Site:	Guttersen 31Q-401 Pad Sec.31-T3N-R63W	North Reference:	True
Well:	Guttersen 31Q-401	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Plan #1 (5-31-13)		

Project	SEC.31-T3N-R63W, 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 Guttersen 31Q-401 Pad Sec.31-T3N-R63W					
Site Position:		Northing:		1,308,191.41 ft	
From:		Easting:		3,285,375.30 ft	
Position Uncertainty:		Slot Radius:		Grid Convergence:	
Lat/Long		0.0 ft		"	
				°	

Well	Guttersen 31Q-401					
Well Position	+N/-S	0.0 ft	Northing:	1,308,191.41 ft	Latitude:	40.174870
	+E/-W	0.0 ft	Easting:	3,285,375.30 ft	Longitude:	-104.478720
Position Uncertainty		0.0 ft	Wellhead Elevation:	ft	Ground Level:	4,823.0 ft

Wellbore	Wellbore #1				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	5/31/2013	8.43	66.85	52,837

Design	Plan #1 (5-31-13)			
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	356.16

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	
1,381.2	5.72	264.53	1,380.6	-1.8	-18.9	1.50	1.50	0.00	264.53	
3,631.3	5.72	264.53	3,619.4	-23.2	-242.1	0.00	0.00	0.00	0.00	
4,012.5	0.00	0.00	4,000.0	-25.0	-261.0	1.50	-1.50	0.00	180.00	
6,066.7	0.00	0.00	6,054.2	-25.0	-261.0	0.00	0.00	0.00	0.00	
7,186.7	84.00	359.34	6,814.0	659.0	-268.9	7.50	7.50	0.00	359.34	
7,260.7	84.00	359.34	6,821.7	732.6	-269.7	0.00	0.00	0.00	0.00	
7,374.7	89.70	359.34	6,828.0	846.4	-271.0	5.00	5.00	0.00	-0.04	
11,228.0	89.70	359.34	6,848.0	4,699.5	-315.7	0.00	0.00	0.00	0.00	BHL 500'FNL, 2440

Database:	Landmark	Local Co-ordinate Reference:	Well Guttersen 31Q-401
Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	TVD Reference:	WELL @ 4838.0ft (Original Well Elev)
Project:	SEC.31-T3N-R63W	MD Reference:	WELL @ 4838.0ft (Original Well Elev)
Site:	Guttersen 31Q-401 Pad Sec.31-T3N-R63W	North Reference:	True
Well:	Guttersen 31Q-401	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Plan #1 (5-31-13)		

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
1.0	0.00	0.00	1.0	0.0	0.0	0.0	0.00	0.00	0.00
Guttersen 33-31 (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
KOP #1									
1,040.0	0.60	264.53	1,040.0	0.0	-0.2	0.0	1.50	1.50	0.00
1,080.0	1.20	264.53	1,080.0	-0.1	-0.8	0.0	1.50	1.50	0.00
1,120.0	1.80	264.53	1,120.0	-0.2	-1.9	-0.1	1.50	1.50	0.00
1,160.0	2.40	264.53	1,160.0	-0.3	-3.3	-0.1	1.50	1.50	0.00
1,200.0	3.00	264.53	1,199.9	-0.5	-5.2	-0.1	1.50	1.50	0.00
1,240.0	3.60	264.53	1,239.8	-0.7	-7.5	-0.2	1.50	1.50	0.00
1,280.0	4.20	264.53	1,279.7	-1.0	-10.2	-0.3	1.50	1.50	0.00
1,320.0	4.80	264.53	1,319.6	-1.3	-13.3	-0.4	1.50	1.50	0.00
1,360.0	5.40	264.53	1,359.5	-1.6	-16.9	-0.5	1.50	1.50	0.00
1,381.2	5.72	264.53	1,380.6	-1.8	-18.9	-0.5	1.50	1.50	0.00
1,400.0	5.72	264.53	1,399.3	-2.0	-20.8	-0.6	0.00	0.00	0.00
1,440.0	5.72	264.53	1,439.1	-2.4	-24.8	-0.7	0.00	0.00	0.00
1,480.0	5.72	264.53	1,478.9	-2.8	-28.7	-0.8	0.00	0.00	0.00
1,520.0	5.72	264.53	1,518.7	-3.1	-32.7	-0.9	0.00	0.00	0.00
1,560.0	5.72	264.53	1,558.5	-3.5	-36.7	-1.0	0.00	0.00	0.00
1,600.0	5.72	264.53	1,598.3	-3.9	-40.6	-1.2	0.00	0.00	0.00
1,640.0	5.72	264.53	1,638.1	-4.3	-44.6	-1.3	0.00	0.00	0.00
1,680.0	5.72	264.53	1,677.9	-4.7	-48.6	-1.4	0.00	0.00	0.00
1,720.0	5.72	264.53	1,717.7	-5.0	-52.5	-1.5	0.00	0.00	0.00
1,760.0	5.72	264.53	1,757.5	-5.4	-56.5	-1.6	0.00	0.00	0.00
1,800.0	5.72	264.53	1,797.3	-5.8	-60.5	-1.7	0.00	0.00	0.00
1,840.0	5.72	264.53	1,837.1	-6.2	-64.4	-1.8	0.00	0.00	0.00
1,880.0	5.72	264.53	1,876.9	-6.6	-68.4	-2.0	0.00	0.00	0.00
1,920.0	5.72	264.53	1,916.7	-6.9	-72.4	-2.1	0.00	0.00	0.00

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Well:	Guttersen 31Q-401	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Plan #1 (5-31-13)		

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)
1,960.0	5.72	264.53	1,956.5	-7.3	-76.3	-2.2	0.00	0.00	0.00
2,000.0	5.72	264.53	1,996.3	-7.7	-80.3	-2.3	0.00	0.00	0.00
2,040.0	5.72	264.53	2,036.1	-8.1	-84.3	-2.4	0.00	0.00	0.00
2,080.0	5.72	264.53	2,075.9	-8.5	-88.2	-2.5	0.00	0.00	0.00
2,120.0	5.72	264.53	2,115.7	-8.8	-92.2	-2.6	0.00	0.00	0.00
2,160.0	5.72	264.53	2,155.5	-9.2	-96.2	-2.7	0.00	0.00	0.00
2,200.0	5.72	264.53	2,195.3	-9.6	-100.1	-2.9	0.00	0.00	0.00
2,240.0	5.72	264.53	2,235.1	-10.0	-104.1	-3.0	0.00	0.00	0.00
2,280.0	5.72	264.53	2,274.9	-10.4	-108.1	-3.1	0.00	0.00	0.00
2,320.0	5.72	264.53	2,314.7	-10.7	-112.0	-3.2	0.00	0.00	0.00
2,360.0	5.72	264.53	2,354.5	-11.1	-116.0	-3.3	0.00	0.00	0.00
2,400.0	5.72	264.53	2,394.3	-11.5	-120.0	-3.4	0.00	0.00	0.00
2,440.0	5.72	264.53	2,434.1	-11.9	-123.9	-3.5	0.00	0.00	0.00
2,480.0	5.72	264.53	2,473.9	-12.3	-127.9	-3.7	0.00	0.00	0.00
2,520.0	5.72	264.53	2,513.7	-12.6	-131.9	-3.8	0.00	0.00	0.00
2,560.0	5.72	264.53	2,553.5	-13.0	-135.8	-3.9	0.00	0.00	0.00
2,600.0	5.72	264.53	2,593.3	-13.4	-139.8	-4.0	0.00	0.00	0.00
2,640.0	5.72	264.53	2,633.1	-13.8	-143.8	-4.1	0.00	0.00	0.00
2,680.0	5.72	264.53	2,672.9	-14.2	-147.7	-4.2	0.00	0.00	0.00
2,720.0	5.72	264.53	2,712.7	-14.5	-151.7	-4.3	0.00	0.00	0.00
2,760.0	5.72	264.53	2,752.5	-14.9	-155.7	-4.4	0.00	0.00	0.00
2,800.0	5.72	264.53	2,792.3	-15.3	-159.6	-4.6	0.00	0.00	0.00
2,840.0	5.72	264.53	2,832.1	-15.7	-163.6	-4.7	0.00	0.00	0.00
2,880.0	5.72	264.53	2,871.9	-16.1	-167.6	-4.8	0.00	0.00	0.00
2,920.0	5.72	264.53	2,911.7	-16.4	-171.5	-4.9	0.00	0.00	0.00
2,960.0	5.72	264.53	2,951.5	-16.8	-175.5	-5.0	0.00	0.00	0.00
3,000.0	5.72	264.53	2,991.3	-17.2	-179.5	-5.1	0.00	0.00	0.00
3,040.0	5.72	264.53	3,031.1	-17.6	-183.4	-5.2	0.00	0.00	0.00
3,080.0	5.72	264.53	3,070.9	-18.0	-187.4	-5.3	0.00	0.00	0.00
3,120.0	5.72	264.53	3,110.7	-18.3	-191.4	-5.5	0.00	0.00	0.00
3,160.0	5.72	264.53	3,150.5	-18.7	-195.3	-5.6	0.00	0.00	0.00
3,200.0	5.72	264.53	3,190.3	-19.1	-199.3	-5.7	0.00	0.00	0.00
3,240.0	5.72	264.53	3,230.1	-19.5	-203.3	-5.8	0.00	0.00	0.00
3,280.0	5.72	264.53	3,269.9	-19.9	-207.2	-5.9	0.00	0.00	0.00
3,320.0	5.72	264.53	3,309.7	-20.2	-211.2	-6.0	0.00	0.00	0.00
3,360.0	5.72	264.53	3,349.5	-20.6	-215.2	-6.1	0.00	0.00	0.00
3,400.0	5.72	264.53	3,389.3	-21.0	-219.1	-6.3	0.00	0.00	0.00
3,440.0	5.72	264.53	3,429.1	-21.4	-223.1	-6.4	0.00	0.00	0.00
3,480.0	5.72	264.53	3,468.9	-21.8	-227.1	-6.5	0.00	0.00	0.00
3,520.0	5.72	264.53	3,508.7	-22.1	-231.0	-6.6	0.00	0.00	0.00
3,560.0	5.72	264.53	3,548.5	-22.5	-235.0	-6.7	0.00	0.00	0.00
3,600.0	5.72	264.53	3,588.3	-22.9	-239.0	-6.8	0.00	0.00	0.00
3,631.3	5.72	264.53	3,619.4	-23.2	-242.1	-6.9	0.00	0.00	0.00
3,640.0	5.59	264.53	3,628.1	-23.3	-242.9	-6.9	1.50	-1.50	0.00
3,680.0	4.99	264.53	3,668.0	-23.6	-246.6	-7.0	1.50	-1.50	0.00
3,720.0	4.39	264.53	3,707.8	-23.9	-249.9	-7.1	1.50	-1.50	0.00
3,760.0	3.79	264.53	3,747.7	-24.2	-252.7	-7.2	1.50	-1.50	0.00
3,800.0	3.19	264.53	3,787.6	-24.4	-255.1	-7.3	1.50	-1.50	0.00
3,840.0	2.59	264.53	3,827.6	-24.6	-257.1	-7.3	1.50	-1.50	0.00
3,880.0	1.99	264.53	3,867.6	-24.8	-258.7	-7.4	1.50	-1.50	0.00
3,920.0	1.39	264.53	3,907.5	-24.9	-259.9	-7.4	1.50	-1.50	0.00
3,960.0	0.79	264.53	3,947.5	-25.0	-260.6	-7.4	1.50	-1.50	0.00
4,000.0	0.19	264.53	3,987.5	-25.0	-261.0	-7.4	1.50	-1.50	0.00

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Site:	Guttersen 31Q-401 Pad Sec.31-T3N-R63W	North Reference:	True
Well:	Guttersen 31Q-401	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Plan #1 (5-31-13)		

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)
4,012.5	0.00	0.00	4,000.0	-25.0	-261.0	-7.4	1.50	-1.50	0.00
4,040.0	0.00	0.00	4,027.5	-25.0	-261.0	-7.4	0.00	0.00	0.00
4,080.0	0.00	0.00	4,067.5	-25.0	-261.0	-7.4	0.00	0.00	0.00
4,120.0	0.00	0.00	4,107.5	-25.0	-261.0	-7.4	0.00	0.00	0.00
4,160.0	0.00	0.00	4,147.5	-25.0	-261.0	-7.4	0.00	0.00	0.00
4,200.0	0.00	0.00	4,187.5	-25.0	-261.0	-7.4	0.00	0.00	0.00
4,240.0	0.00	0.00	4,227.5	-25.0	-261.0	-7.4	0.00	0.00	0.00
4,280.0	0.00	0.00	4,267.5	-25.0	-261.0	-7.4	0.00	0.00	0.00
4,320.0	0.00	0.00	4,307.5	-25.0	-261.0	-7.4	0.00	0.00	0.00
4,360.0	0.00	0.00	4,347.5	-25.0	-261.0	-7.4	0.00	0.00	0.00
4,400.0	0.00	0.00	4,387.5	-25.0	-261.0	-7.4	0.00	0.00	0.00
4,440.0	0.00	0.00	4,427.5	-25.0	-261.0	-7.4	0.00	0.00	0.00
4,480.0	0.00	0.00	4,467.5	-25.0	-261.0	-7.4	0.00	0.00	0.00
4,520.0	0.00	0.00	4,507.5	-25.0	-261.0	-7.4	0.00	0.00	0.00
4,560.0	0.00	0.00	4,547.5	-25.0	-261.0	-7.4	0.00	0.00	0.00
4,600.0	0.00	0.00	4,587.5	-25.0	-261.0	-7.4	0.00	0.00	0.00
4,640.0	0.00	0.00	4,627.5	-25.0	-261.0	-7.4	0.00	0.00	0.00
4,680.0	0.00	0.00	4,667.5	-25.0	-261.0	-7.4	0.00	0.00	0.00
4,720.0	0.00	0.00	4,707.5	-25.0	-261.0	-7.4	0.00	0.00	0.00
4,760.0	0.00	0.00	4,747.5	-25.0	-261.0	-7.4	0.00	0.00	0.00
4,800.0	0.00	0.00	4,787.5	-25.0	-261.0	-7.4	0.00	0.00	0.00
4,840.0	0.00	0.00	4,827.5	-25.0	-261.0	-7.4	0.00	0.00	0.00
4,880.0	0.00	0.00	4,867.5	-25.0	-261.0	-7.4	0.00	0.00	0.00
4,920.0	0.00	0.00	4,907.5	-25.0	-261.0	-7.4	0.00	0.00	0.00
4,960.0	0.00	0.00	4,947.5	-25.0	-261.0	-7.4	0.00	0.00	0.00
5,000.0	0.00	0.00	4,987.5	-25.0	-261.0	-7.4	0.00	0.00	0.00
5,040.0	0.00	0.00	5,027.5	-25.0	-261.0	-7.4	0.00	0.00	0.00
5,080.0	0.00	0.00	5,067.5	-25.0	-261.0	-7.4	0.00	0.00	0.00
5,120.0	0.00	0.00	5,107.5	-25.0	-261.0	-7.4	0.00	0.00	0.00
5,160.0	0.00	0.00	5,147.5	-25.0	-261.0	-7.4	0.00	0.00	0.00
5,200.0	0.00	0.00	5,187.5	-25.0	-261.0	-7.4	0.00	0.00	0.00
5,240.0	0.00	0.00	5,227.5	-25.0	-261.0	-7.4	0.00	0.00	0.00
5,280.0	0.00	0.00	5,267.5	-25.0	-261.0	-7.4	0.00	0.00	0.00
5,320.0	0.00	0.00	5,307.5	-25.0	-261.0	-7.4	0.00	0.00	0.00
5,360.0	0.00	0.00	5,347.5	-25.0	-261.0	-7.4	0.00	0.00	0.00
5,400.0	0.00	0.00	5,387.5	-25.0	-261.0	-7.4	0.00	0.00	0.00
5,440.0	0.00	0.00	5,427.5	-25.0	-261.0	-7.4	0.00	0.00	0.00
5,480.0	0.00	0.00	5,467.5	-25.0	-261.0	-7.4	0.00	0.00	0.00
5,520.0	0.00	0.00	5,507.5	-25.0	-261.0	-7.4	0.00	0.00	0.00
5,560.0	0.00	0.00	5,547.5	-25.0	-261.0	-7.4	0.00	0.00	0.00
5,600.0	0.00	0.00	5,587.5	-25.0	-261.0	-7.4	0.00	0.00	0.00
5,640.0	0.00	0.00	5,627.5	-25.0	-261.0	-7.4	0.00	0.00	0.00
5,680.0	0.00	0.00	5,667.5	-25.0	-261.0	-7.4	0.00	0.00	0.00
5,720.0	0.00	0.00	5,707.5	-25.0	-261.0	-7.4	0.00	0.00	0.00
5,760.0	0.00	0.00	5,747.5	-25.0	-261.0	-7.4	0.00	0.00	0.00
5,800.0	0.00	0.00	5,787.5	-25.0	-261.0	-7.4	0.00	0.00	0.00
5,840.0	0.00	0.00	5,827.5	-25.0	-261.0	-7.4	0.00	0.00	0.00
5,880.0	0.00	0.00	5,867.5	-25.0	-261.0	-7.4	0.00	0.00	0.00
5,920.0	0.00	0.00	5,907.5	-25.0	-261.0	-7.4	0.00	0.00	0.00
5,960.0	0.00	0.00	5,947.5	-25.0	-261.0	-7.4	0.00	0.00	0.00
6,000.0	0.00	0.00	5,987.5	-25.0	-261.0	-7.4	0.00	0.00	0.00
6,040.0	0.00	0.00	6,027.5	-25.0	-261.0	-7.4	0.00	0.00	0.00
6,066.7	0.00	0.00	6,054.2	-25.0	-261.0	-7.4	0.00	0.00	0.00

Database:	Landmark	Local Co-ordinate Reference:	Well Gutteresen 31Q-401
Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	TVD Reference:	WELL @ 4838.0ft (Original Well Elev)
Project:	SEC.31-T3N-R63W	MD Reference:	WELL @ 4838.0ft (Original Well Elev)
Site:	Gutteresen 31Q-401 Pad Sec.31-T3N-R63W	North Reference:	True
Well:	Gutteresen 31Q-401	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Plan #1 (5-31-13)		

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)
KOP #2									
6,080.0	1.00	359.34	6,067.5	-24.9	-261.0	-7.3	7.53	7.53	0.00
6,120.0	4.00	359.34	6,107.5	-23.1	-261.0	-5.6	7.50	7.50	0.00
6,160.0	7.00	359.34	6,147.3	-19.3	-261.1	-1.8	7.50	7.50	0.00
6,200.0	10.00	359.34	6,186.9	-13.4	-261.1	4.1	7.50	7.50	0.00
6,240.0	13.00	359.34	6,226.1	-5.4	-261.2	12.1	7.50	7.50	0.00
6,280.0	16.00	359.34	6,264.8	4.6	-261.3	22.1	7.50	7.50	0.00
6,320.0	19.00	359.34	6,302.9	16.6	-261.5	34.1	7.50	7.50	0.00
6,360.0	22.00	359.34	6,340.4	30.6	-261.6	48.1	7.50	7.50	0.00
6,400.0	25.00	359.34	6,377.1	46.6	-261.8	64.0	7.50	7.50	0.00
6,440.0	28.00	359.34	6,412.9	64.4	-262.0	81.8	7.50	7.50	0.00
6,480.0	31.00	359.34	6,447.7	84.1	-262.3	101.5	7.50	7.50	0.00
6,520.0	34.00	359.34	6,481.4	105.6	-262.5	123.0	7.50	7.50	0.00
6,560.0	37.00	359.34	6,514.0	128.8	-262.8	146.2	7.50	7.50	0.00
6,600.0	40.00	359.34	6,545.3	153.7	-263.1	171.0	7.50	7.50	0.00
6,640.0	43.00	359.34	6,575.2	180.2	-263.4	197.5	7.50	7.50	0.00
6,680.0	46.00	359.34	6,603.7	208.3	-263.7	225.5	7.50	7.50	0.00
6,720.0	49.00	359.34	6,630.8	237.7	-264.0	254.9	7.50	7.50	0.00
6,760.0	52.00	359.34	6,656.2	268.6	-264.4	285.7	7.50	7.50	0.00
6,800.0	55.00	359.34	6,680.0	300.8	-264.8	317.8	7.50	7.50	0.00
6,840.0	58.00	359.34	6,702.1	334.1	-265.1	351.1	7.50	7.50	0.00
6,880.0	61.00	359.34	6,722.4	368.6	-265.5	385.5	7.50	7.50	0.00
6,920.0	64.00	359.34	6,740.8	404.0	-265.9	421.0	7.50	7.50	0.00
6,960.0	67.00	359.34	6,757.4	440.4	-266.4	457.3	7.50	7.50	0.00
7,000.0	70.00	359.34	6,772.1	477.6	-266.8	494.4	7.50	7.50	0.00
7,040.0	73.00	359.34	6,784.8	515.6	-267.2	532.3	7.50	7.50	0.00
7,080.0	76.00	359.34	6,795.4	554.1	-267.7	570.8	7.50	7.50	0.00
7,120.0	79.00	359.34	6,804.1	593.1	-268.1	609.8	7.50	7.50	0.00
7,160.0	82.00	359.34	6,810.7	632.6	-268.6	649.2	7.50	7.50	0.00
7,186.7	84.00	359.34	6,814.0	659.1	-268.9	675.6	7.49	7.49	0.00
7"									
7,200.0	84.00	359.34	6,815.3	672.3	-269.0	688.8	0.00	0.00	0.00
7,240.0	84.00	359.34	6,819.5	712.1	-269.5	728.6	0.00	0.00	0.00
7,260.7	84.00	359.34	6,821.7	732.6	-269.7	749.1	0.00	0.00	0.00
7,280.0	84.97	359.34	6,823.5	751.9	-269.9	768.3	5.00	5.00	0.00
7,320.0	86.97	359.34	6,826.4	791.8	-270.4	808.1	5.00	5.00	0.00
7,360.0	88.97	359.34	6,827.8	831.8	-270.9	848.0	5.00	5.00	0.00
7,374.7	89.70	359.34	6,828.0	846.5	-271.0	862.7	5.00	5.00	0.00
End of Build									
7,400.0	89.70	359.34	6,828.1	871.7	-271.3	888.0	0.00	0.00	0.00
7,440.0	89.70	359.34	6,828.3	911.7	-271.8	927.9	0.00	0.00	0.00
7,480.0	89.70	359.34	6,828.5	951.7	-272.3	967.9	0.00	0.00	0.00
7,520.0	89.70	359.34	6,828.7	991.7	-272.7	1,007.8	0.00	0.00	0.00
7,560.0	89.70	359.34	6,828.9	1,031.7	-273.2	1,047.7	0.00	0.00	0.00
7,600.0	89.70	359.34	6,829.1	1,071.7	-273.7	1,087.7	0.00	0.00	0.00
7,640.0	89.70	359.34	6,829.3	1,111.7	-274.1	1,127.6	0.00	0.00	0.00
7,680.0	89.70	359.34	6,829.5	1,151.7	-274.6	1,167.5	0.00	0.00	0.00
7,720.0	89.70	359.34	6,829.7	1,191.7	-275.0	1,207.5	0.00	0.00	0.00
7,760.0	89.70	359.34	6,830.0	1,231.7	-275.5	1,247.4	0.00	0.00	0.00
7,800.0	89.70	359.34	6,830.2	1,271.7	-276.0	1,287.4	0.00	0.00	0.00
7,840.0	89.70	359.34	6,830.4	1,311.7	-276.4	1,327.3	0.00	0.00	0.00
7,880.0	89.70	359.34	6,830.6	1,351.7	-276.9	1,367.2	0.00	0.00	0.00
7,920.0	89.70	359.34	6,830.8	1,391.7	-277.4	1,407.2	0.00	0.00	0.00

Database:	Landmark	Local Co-ordinate Reference:	Well Guttersen 31Q-401
Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	TVD Reference:	WELL @ 4838.0ft (Original Well Elev)
Project:	SEC.31-T3N-R63W	MD Reference:	WELL @ 4838.0ft (Original Well Elev)
Site:	Guttersen 31Q-401 Pad Sec.31-T3N-R63W	North Reference:	True
Well:	Guttersen 31Q-401	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Plan #1 (5-31-13)		

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)
7,960.0	89.70	359.34	6,831.0	1,431.7	-277.8	1,447.1	0.00	0.00	0.00
8,000.0	89.70	359.34	6,831.2	1,471.7	-278.3	1,487.0	0.00	0.00	0.00
8,040.0	89.70	359.34	6,831.4	1,511.7	-278.8	1,527.0	0.00	0.00	0.00
8,080.0	89.70	359.34	6,831.6	1,551.7	-279.2	1,566.9	0.00	0.00	0.00
8,120.0	89.70	359.34	6,831.8	1,591.7	-279.7	1,606.9	0.00	0.00	0.00
8,160.0	89.70	359.34	6,832.0	1,631.7	-280.1	1,646.8	0.00	0.00	0.00
8,200.0	89.70	359.34	6,832.2	1,671.7	-280.6	1,686.7	0.00	0.00	0.00
8,240.0	89.70	359.34	6,832.5	1,711.7	-281.1	1,726.7	0.00	0.00	0.00
8,280.0	89.70	359.34	6,832.7	1,751.7	-281.5	1,766.6	0.00	0.00	0.00
8,320.0	89.70	359.34	6,832.9	1,791.7	-282.0	1,806.5	0.00	0.00	0.00
8,360.0	89.70	359.34	6,833.1	1,831.7	-282.5	1,846.5	0.00	0.00	0.00
8,400.0	89.70	359.34	6,833.3	1,871.7	-282.9	1,886.4	0.00	0.00	0.00
8,440.0	89.70	359.34	6,833.5	1,911.7	-283.4	1,926.4	0.00	0.00	0.00
8,480.0	89.70	359.34	6,833.7	1,951.7	-283.9	1,966.3	0.00	0.00	0.00
8,520.0	89.70	359.34	6,833.9	1,991.7	-284.3	2,006.2	0.00	0.00	0.00
8,560.0	89.70	359.34	6,834.1	2,031.7	-284.8	2,046.2	0.00	0.00	0.00
8,600.0	89.70	359.34	6,834.3	2,071.7	-285.2	2,086.1	0.00	0.00	0.00
8,640.0	89.70	359.34	6,834.5	2,111.6	-285.7	2,126.1	0.00	0.00	0.00
8,680.0	89.70	359.34	6,834.7	2,151.6	-286.2	2,166.0	0.00	0.00	0.00
8,720.0	89.70	359.34	6,835.0	2,191.6	-286.6	2,205.9	0.00	0.00	0.00
8,760.0	89.70	359.34	6,835.2	2,231.6	-287.1	2,245.9	0.00	0.00	0.00
8,800.0	89.70	359.34	6,835.4	2,271.6	-287.6	2,285.8	0.00	0.00	0.00
8,840.0	89.70	359.34	6,835.6	2,311.6	-288.0	2,325.7	0.00	0.00	0.00
8,880.0	89.70	359.34	6,835.8	2,351.6	-288.5	2,365.7	0.00	0.00	0.00
8,920.0	89.70	359.34	6,836.0	2,391.6	-289.0	2,405.6	0.00	0.00	0.00
8,960.0	89.70	359.34	6,836.2	2,431.6	-289.4	2,445.6	0.00	0.00	0.00
9,000.0	89.70	359.34	6,836.4	2,471.6	-289.9	2,485.5	0.00	0.00	0.00
9,040.0	89.70	359.34	6,836.6	2,511.6	-290.3	2,525.4	0.00	0.00	0.00
9,080.0	89.70	359.34	6,836.8	2,551.6	-290.8	2,565.4	0.00	0.00	0.00
9,120.0	89.70	359.34	6,837.0	2,591.6	-291.3	2,605.3	0.00	0.00	0.00
9,160.0	89.70	359.34	6,837.2	2,631.6	-291.7	2,645.2	0.00	0.00	0.00
9,200.0	89.70	359.34	6,837.4	2,671.6	-292.2	2,685.2	0.00	0.00	0.00
9,240.0	89.70	359.34	6,837.7	2,711.6	-292.7	2,725.1	0.00	0.00	0.00
9,280.0	89.70	359.34	6,837.9	2,751.6	-293.1	2,765.1	0.00	0.00	0.00
9,320.0	89.70	359.34	6,838.1	2,791.6	-293.6	2,805.0	0.00	0.00	0.00
9,360.0	89.70	359.34	6,838.3	2,831.6	-294.1	2,844.9	0.00	0.00	0.00
9,400.0	89.70	359.34	6,838.5	2,871.6	-294.5	2,884.9	0.00	0.00	0.00
9,440.0	89.70	359.34	6,838.7	2,911.6	-295.0	2,924.8	0.00	0.00	0.00
9,480.0	89.70	359.34	6,838.9	2,951.6	-295.5	2,964.7	0.00	0.00	0.00
9,520.0	89.70	359.34	6,839.1	2,991.6	-295.9	3,004.7	0.00	0.00	0.00
9,560.0	89.70	359.34	6,839.3	3,031.6	-296.4	3,044.6	0.00	0.00	0.00
9,600.0	89.70	359.34	6,839.5	3,071.6	-296.8	3,084.6	0.00	0.00	0.00
9,640.0	89.70	359.34	6,839.7	3,111.6	-297.3	3,124.5	0.00	0.00	0.00
9,680.0	89.70	359.34	6,839.9	3,151.6	-297.8	3,164.4	0.00	0.00	0.00
9,720.0	89.70	359.34	6,840.2	3,191.6	-298.2	3,204.4	0.00	0.00	0.00
9,760.0	89.70	359.34	6,840.4	3,231.6	-298.7	3,244.3	0.00	0.00	0.00
9,800.0	89.70	359.34	6,840.6	3,271.6	-299.2	3,284.3	0.00	0.00	0.00
9,840.0	89.70	359.34	6,840.8	3,311.6	-299.6	3,324.2	0.00	0.00	0.00
9,880.0	89.70	359.34	6,841.0	3,351.5	-300.1	3,364.1	0.00	0.00	0.00
9,920.0	89.70	359.34	6,841.2	3,391.5	-300.6	3,404.1	0.00	0.00	0.00
9,960.0	89.70	359.34	6,841.4	3,431.5	-301.0	3,444.0	0.00	0.00	0.00
10,000.0	89.70	359.34	6,841.6	3,471.5	-301.5	3,483.9	0.00	0.00	0.00
10,040.0	89.70	359.34	6,841.8	3,511.5	-301.9	3,523.9	0.00	0.00	0.00

Database:	Landmark	Local Co-ordinate Reference:	Well Guttersen 31Q-401
Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	TVD Reference:	WELL @ 4838.0ft (Original Well Elev)
Project:	SEC.31-T3N-R63W	MD Reference:	WELL @ 4838.0ft (Original Well Elev)
Site:	Guttersen 31Q-401 Pad Sec.31-T3N-R63W	North Reference:	True
Well:	Guttersen 31Q-401	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Plan #1 (5-31-13)		

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)
10,080.0	89.70	359.34	6,842.0	3,551.5	-302.4	3,563.8	0.00	0.00	0.00
10,120.0	89.70	359.34	6,842.2	3,591.5	-302.9	3,603.8	0.00	0.00	0.00
10,160.0	89.70	359.34	6,842.4	3,631.5	-303.3	3,643.7	0.00	0.00	0.00
10,200.0	89.70	359.34	6,842.7	3,671.5	-303.8	3,683.6	0.00	0.00	0.00
10,240.0	89.70	359.34	6,842.9	3,711.5	-304.3	3,723.6	0.00	0.00	0.00
10,280.0	89.70	359.34	6,843.1	3,751.5	-304.7	3,763.5	0.00	0.00	0.00
10,320.0	89.70	359.34	6,843.3	3,791.5	-305.2	3,803.4	0.00	0.00	0.00
10,360.0	89.70	359.34	6,843.5	3,831.5	-305.7	3,843.4	0.00	0.00	0.00
10,400.0	89.70	359.34	6,843.7	3,871.5	-306.1	3,883.3	0.00	0.00	0.00
10,440.0	89.70	359.34	6,843.9	3,911.5	-306.6	3,923.3	0.00	0.00	0.00
10,480.0	89.70	359.34	6,844.1	3,951.5	-307.0	3,963.2	0.00	0.00	0.00
10,520.0	89.70	359.34	6,844.3	3,991.5	-307.5	4,003.1	0.00	0.00	0.00
10,560.0	89.70	359.34	6,844.5	4,031.5	-308.0	4,043.1	0.00	0.00	0.00
10,600.0	89.70	359.34	6,844.7	4,071.5	-308.4	4,083.0	0.00	0.00	0.00
10,640.0	89.70	359.34	6,844.9	4,111.5	-308.9	4,122.9	0.00	0.00	0.00
10,680.0	89.70	359.34	6,845.1	4,151.5	-309.4	4,162.9	0.00	0.00	0.00
10,720.0	89.70	359.34	6,845.4	4,191.5	-309.8	4,202.8	0.00	0.00	0.00
10,760.0	89.70	359.34	6,845.6	4,231.5	-310.3	4,242.8	0.00	0.00	0.00
10,800.0	89.70	359.34	6,845.8	4,271.5	-310.8	4,282.7	0.00	0.00	0.00
10,840.0	89.70	359.34	6,846.0	4,311.5	-311.2	4,322.6	0.00	0.00	0.00
10,880.0	89.70	359.34	6,846.2	4,351.5	-311.7	4,362.6	0.00	0.00	0.00
10,920.0	89.70	359.34	6,846.4	4,391.5	-312.1	4,402.5	0.00	0.00	0.00
10,960.0	89.70	359.34	6,846.6	4,431.5	-312.6	4,442.4	0.00	0.00	0.00
11,000.0	89.70	359.34	6,846.8	4,471.5	-313.1	4,482.4	0.00	0.00	0.00
11,040.0	89.70	359.34	6,847.0	4,511.5	-313.5	4,522.3	0.00	0.00	0.00
11,080.0	89.70	359.34	6,847.2	4,551.5	-314.0	4,562.3	0.00	0.00	0.00
11,120.0	89.70	359.34	6,847.4	4,591.4	-314.5	4,602.2	0.00	0.00	0.00
11,160.0	89.70	359.34	6,847.6	4,631.4	-314.9	4,642.1	0.00	0.00	0.00
11,200.0	89.70	359.34	6,847.9	4,671.4	-315.4	4,682.1	0.00	0.00	0.00
11,228.0	89.70	359.34	6,848.0	4,699.5	-315.7	4,710.0	0.00	0.00	0.00

BHL 500'FNL, 2440'FEL

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
Guttersen 33-31 (Exis - plan misses target center by 1901.3ft at 1.0ft MD (1.0 TVD, 0.0 N, 0.0 E) - Circle (radius 500.0)	0.00	0.00	1.0	1,894.3	162.1	1,310,087.41	3,285,515.53	40.180070	-104.478140
BHL 500'FNL, 2440'FI - plan hits target center - Point	0.00	0.00	6,848.0	4,699.5	-315.7	1,312,886.71	3,285,005.49	40.187770	-104.479850

Casing Points

Measured Depth (ft)	Vertical Depth (ft)	Name	Casing Diameter (")	Hole Diameter (")
7,186.7	6,814.0	7"	7	8-3/4

Database:	Landmark	Local Co-ordinate Reference:	Well Guttersen 31Q-401
Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	TVD Reference:	WELL @ 4838.0ft (Original Well Elev)
Project:	SEC.31-T3N-R63W	MD Reference:	WELL @ 4838.0ft (Original Well Elev)
Site:	Guttersen 31Q-401 Pad Sec.31-T3N-R63W	North Reference:	True
Well:	Guttersen 31Q-401	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Plan #1 (5-31-13)		

Plan Annotations				
Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment
		+N/-S (ft)	+E/-W (ft)	
1,000.0	1,000.0	0.0	0.0	KOP #1
6,066.7	6,054.2	-25.0	-261.0	KOP #2
7,374.7	6,828.0	846.5	-271.0	End of Build



Directional

PETROLEUM DEVELOPMENT CORP Weld County CO

SEC.31-T3N-R63W

Guttersen 31Q-401 Pad Sec.31-T3N-R63W

Guttersen 31Q-401

Wellbore #1

Plan #1 (5-31-13)

Anticollision Report

31 May, 2013



Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Guttersen 31Q-401
Project:	SEC.31-T3N-R63W	TVD Reference:	WELL @ 4838.0ft (Original Well Elev)
Reference Site:	Guttersen 31Q-401 Pad Sec.31-T3N-R63W	MD Reference:	WELL @ 4838.0ft (Original Well Elev)
Site Error:	0.0ft	North Reference:	True
Reference Well:	Guttersen 31Q-401	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 (5-31-13)	Offset TVD Reference:	Offset Datum

Reference	Plan #1 (5-31-13)		
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 1,000.0ft	Error Surface:	Elliptical Conic
Warning Levels Evaluated at:	2.00 Sigma		

Survey Tool Program	Date 5/31/2013			
From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description
0.0	11,228.0	Plan #1 (5-31-13) (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						
Guttersen 31Q-401 Pad Sec.31-T3N-R63W						
Guttersen 31Q-221 - Wellbore #1 - Plan #1 (1-09-13)	1,000.0	1,000.0	30.7	26.5	7.198	CC, ES
Guttersen 31Q-221 - Wellbore #1 - Plan #1 (1-09-13)	11,228.4	11,055.2	370.6	222.0	2.495	SF
Guttersen 31T-201 - Wellbore #1 - Plan #1 (1-09-13)	200.0	200.0	92.2	91.5	136.761	CC, ES
Guttersen 31T-201 - Wellbore #1 - Plan #1 (1-09-13)	11,228.4	11,093.9	972.0	793.8	5.456	SF
Guttersen 31T-441 - Wellbore #1 - Plan #1 (1-09-13)	1,000.0	1,000.0	61.5	57.2	14.396	CC, ES
Guttersen 31T-441 - Wellbore #1 - Plan #1 (1-09-13)	11,228.4	11,229.4	589.5	407.1	3.232	SF
Guttersen 33-31 (Exist.) - Wellbore #1 - Wellbore #1	8,417.5	6,833.4	445.2	269.6	2.535	CC, ES, SF

Offset Design		Guttersen 31Q-401 Pad Sec.31-T3N-R63W - Guttersen 31Q-221 - Wellbore #1 - Plan #1 (1-09-13)										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)				
0.0	0.0	0.0	0.0	0.0	0.0	90.02	0.0	30.7	30.7						
100.0	100.0	100.0	100.0	0.1	0.1	90.02	0.0	30.7	30.7	30.5	0.22	136.761			
200.0	200.0	200.0	200.0	0.3	0.3	90.02	0.0	30.7	30.7	30.1	0.67	45.587			
300.0	300.0	300.0	300.0	0.6	0.6	90.02	0.0	30.7	30.7	29.6	1.12	27.352			
400.0	400.0	400.0	400.0	0.8	0.8	90.02	0.0	30.7	30.7	29.2	1.57	19.537			
500.0	500.0	500.0	500.0	1.0	1.0	90.02	0.0	30.7	30.7	28.7	2.02	15.196			
600.0	600.0	600.0	600.0	1.2	1.2	90.02	0.0	30.7	30.7	28.3	2.47	12.433			
700.0	700.0	700.0	700.0	1.5	1.5	90.02	0.0	30.7	30.7	27.8	2.92	10.520			
800.0	800.0	800.0	800.0	1.7	1.7	90.02	0.0	30.7	30.7	27.4	3.37	9.117			
900.0	900.0	900.0	900.0	1.9	1.9	90.02	0.0	30.7	30.7	26.9	3.82	8.045			
1,000.0	1,000.0	1,000.0	1,000.0	2.1	2.1	90.02	0.0	30.7	30.7	26.5	4.27	7.198	CC, ES		
1,100.0	1,100.0	1,100.0	1,100.0	2.3	2.4	-174.74	0.0	30.7	32.0	27.3	4.70	6.811			
1,200.0	1,199.9	1,199.9	1,199.9	2.5	2.6	-175.30	0.0	30.7	36.0	30.8	5.12	7.016			
1,300.0	1,299.7	1,299.7	1,299.7	2.8	2.8	-176.02	0.0	30.7	42.5	36.9	5.55	7.659			
1,381.2	1,380.6	1,380.6	1,380.6	2.9	3.0	-176.59	0.0	30.7	49.7	43.8	5.89	8.438			
1,400.0	1,399.3	1,399.3	1,399.3	3.0	3.0	-176.72	0.0	30.7	51.6	45.6	5.97	8.637			
1,500.0	1,498.8	1,498.8	1,498.8	3.2	3.3	-177.25	0.0	30.7	61.5	55.1	6.40	9.607			
1,600.0	1,598.3	1,598.3	1,598.3	3.5	3.5	-177.63	0.0	30.7	71.5	64.6	6.84	10.449			
1,700.0	1,697.8	1,697.8	1,697.8	3.7	3.7	-177.92	0.0	30.7	81.4	74.1	7.28	11.187			
1,800.0	1,797.3	1,797.3	1,797.3	4.0	3.9	-178.15	0.0	30.7	91.4	83.7	7.72	11.837			

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 Guttersen 31Q-401
Project:	SEC.31-T3N-R63W	TVD Reference:	WELL @ 4838.0ft (Original Well Elev)
Reference Site:	Guttersen 31Q-401 Pad Sec.31-T3N-R63W	MD Reference:	WELL @ 4838.0ft (Original Well Elev)
Site Error:	0.0ft	North Reference:	True
Reference Well:	Guttersen 31Q-401	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 (5-31-13)	Offset TVD Reference:	Offset Datum

Offset Design Guttersen 31Q-401 Pad Sec.31-T3N-R63W - Guttersen 31Q-221 - Wellbore #1 - Plan #1 (1-09-13)													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
1,900.0	1,896.8	1,896.8	1,896.8	4.3	4.2	-178.33		0.0	30.7	101.3	93.2	8.16	12.414	
2,000.0	1,996.3	1,996.3	1,996.3	4.5	4.4	-178.48		0.0	30.7	111.3	102.7	8.61	12.930	
2,100.0	2,095.8	2,095.8	2,095.8	4.8	4.6	-178.60		0.0	30.7	121.3	112.2	9.05	13.392	
2,200.0	2,195.3	2,195.3	2,195.3	5.1	4.8	-178.71		0.0	30.7	131.2	121.7	9.50	13.810	
2,300.0	2,294.8	2,294.8	2,294.8	5.3	5.0	-178.80		0.0	30.7	141.2	131.2	9.95	14.188	
2,400.0	2,394.3	2,394.3	2,394.3	5.6	5.3	-178.88		0.0	30.7	151.1	140.7	10.40	14.533	
2,500.0	2,493.8	2,493.8	2,493.8	5.9	5.5	-178.95		0.0	30.7	161.1	150.3	10.85	14.848	
2,600.0	2,593.3	2,593.3	2,593.3	6.2	5.7	-179.01		0.0	30.7	171.1	159.8	11.30	15.137	
2,700.0	2,692.8	2,692.8	2,692.8	6.5	5.9	-179.07		0.0	30.7	181.0	169.3	11.75	15.404	
2,800.0	2,792.3	2,792.3	2,792.3	6.7	6.2	-179.11		0.0	30.7	191.0	178.8	12.20	15.649	
2,900.0	2,891.8	2,891.8	2,891.8	7.0	6.4	-179.16		0.0	30.7	201.0	188.3	12.66	15.877	
3,000.0	2,991.3	2,991.3	2,991.3	7.3	6.6	-179.20		0.0	30.7	210.9	197.8	13.11	16.088	
3,100.0	3,090.8	3,090.6	3,090.6	7.6	6.8	-179.13		-0.5	29.6	219.8	206.2	13.55	16.216	
3,200.0	3,190.3	3,201.6	3,201.5	7.9	7.0	-178.82		-2.2	25.9	226.1	212.1	13.98	16.173	
3,300.0	3,289.8	3,307.5	3,307.2	8.2	7.2	-178.28		-5.1	19.4	229.8	215.4	14.41	15.947	
3,400.0	3,389.3	3,411.0	3,410.2	8.5	7.4	-177.54		-8.9	10.8	231.2	216.3	14.84	15.576	
3,500.0	3,488.8	3,510.9	3,509.7	8.8	7.6	-176.78		-12.9	1.9	232.1	216.8	15.27	15.200	
3,600.0	3,588.3	3,610.9	3,609.2	9.0	7.9	-176.04		-16.8	-6.9	233.1	217.4	15.70	14.844	
3,631.3	3,619.4	3,641.6	3,639.7	9.1	7.9	-175.81		-18.1	-9.6	233.4	217.6	15.84	14.738	
3,700.0	3,687.9	3,706.6	3,704.5	9.3	8.1	-175.39		-20.3	-14.7	234.2	218.1	16.13	14.518	
3,800.0	3,787.6	3,800.0	3,797.7	9.5	8.3	-174.93		-22.8	-20.2	235.1	218.6	16.53	14.223	
3,900.0	3,887.6	3,895.9	3,893.6	9.7	8.5	-174.64		-24.4	-23.8	235.6	218.7	16.92	13.929	
4,000.0	3,987.5	3,990.6	3,988.2	9.9	8.6	-174.53		-25.0	-25.1	235.9	218.6	17.28	13.652	
4,012.5	4,000.0	4,002.4	4,000.0	9.9	8.7	90.00		-25.0	-25.1	235.9	218.5	17.33	13.614	
4,100.0	4,087.5	4,089.9	4,087.5	10.0	8.8	90.00		-25.0	-25.1	235.9	218.2	17.67	13.344	
4,200.0	4,187.5	4,189.9	4,187.5	10.2	9.1	90.00		-25.0	-25.1	235.9	217.8	18.10	13.031	
4,300.0	4,287.5	4,289.9	4,287.5	10.4	9.3	90.00		-25.0	-25.1	235.9	217.3	18.53	12.729	
4,400.0	4,387.5	4,389.9	4,387.5	10.6	9.5	90.00		-25.0	-25.1	235.9	216.9	18.96	12.441	
4,500.0	4,487.5	4,489.9	4,487.5	10.8	9.7	90.00		-25.0	-25.1	235.9	216.5	19.39	12.165	
4,600.0	4,587.5	4,589.9	4,587.5	11.0	10.0	90.00		-25.0	-25.1	235.9	216.0	19.82	11.900	
4,700.0	4,687.5	4,689.9	4,687.5	11.2	10.2	90.00		-25.0	-25.1	235.9	215.6	20.25	11.646	
4,800.0	4,787.5	4,789.9	4,787.5	11.4	10.4	90.00		-25.0	-25.1	235.9	215.2	20.68	11.403	
4,900.0	4,887.5	4,889.9	4,887.5	11.6	10.6	90.00		-25.0	-25.1	235.9	214.7	21.12	11.169	
5,000.0	4,987.5	4,989.9	4,987.5	11.8	10.8	90.00		-25.0	-25.1	235.9	214.3	21.55	10.944	
5,100.0	5,087.5	5,089.9	5,087.5	12.0	11.1	90.00		-25.0	-25.1	235.9	213.9	21.99	10.727	
5,200.0	5,187.5	5,189.9	5,187.5	12.2	11.3	90.00		-25.0	-25.1	235.9	213.4	22.42	10.519	
5,300.0	5,287.5	5,289.9	5,287.5	12.4	11.5	90.00		-25.0	-25.1	235.9	213.0	22.86	10.318	
5,400.0	5,387.5	5,389.9	5,387.5	12.6	11.7	90.00		-25.0	-25.1	235.9	212.6	23.29	10.125	
5,500.0	5,487.5	5,489.9	5,487.5	12.8	12.0	90.00		-25.0	-25.1	235.9	212.1	23.73	9.939	
5,600.0	5,587.5	5,589.9	5,587.5	13.0	12.2	90.00		-25.0	-25.1	235.9	211.7	24.17	9.759	
5,700.0	5,687.5	5,689.9	5,687.5	13.2	12.4	90.00		-25.0	-25.1	235.9	211.3	24.61	9.585	
5,800.0	5,787.5	5,789.9	5,787.5	13.4	12.6	90.00		-25.0	-25.1	235.9	210.8	25.04	9.418	
5,900.0	5,887.5	5,889.9	5,887.5	13.6	12.9	90.00		-25.0	-25.1	235.9	210.4	25.48	9.255	
5,931.8	5,919.3	5,921.7	5,919.3	13.6	12.9	89.90		-24.6	-25.1	235.9	210.2	25.62	9.206	
6,000.0	5,987.5	5,989.5	5,986.8	13.8	13.1	88.63		-19.4	-25.1	235.9	210.0	25.91	9.106	
6,066.7	6,054.2	6,054.3	6,050.8	13.9	13.2	86.06		-8.8	-25.1	236.4	210.3	26.18	9.031	
6,100.0	6,087.5	6,086.1	6,081.8	14.0	13.3	85.11		-1.6	-25.1	237.0	210.7	26.31	9.008	
6,150.0	6,137.4	6,133.3	6,127.2	14.1	13.4	82.74		11.4	-25.1	238.3	211.8	26.51	8.987	
6,200.0	6,186.9	6,180.0	6,171.1	14.2	13.5	80.44		27.0	-25.1	239.9	213.2	26.71	8.982	
6,250.0	6,235.8	6,226.1	6,213.6	14.3	13.6	78.22		45.0	-25.1	242.0	215.1	26.91	8.991	
6,300.0	6,283.9	6,271.8	6,254.5	14.4	13.7	76.08		65.3	-25.1	244.4	217.2	27.11	9.013	

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 Guttersen 31Q-401
Project:	SEC.31-T3N-R63W	TVD Reference:	WELL @ 4838.0ft (Original Well Elev)
Reference Site:	Guttersen 31Q-401 Pad Sec.31-T3N-R63W	MD Reference:	WELL @ 4838.0ft (Original Well Elev)
Site Error:	0.0ft	North Reference:	True
Reference Well:	Guttersen 31Q-401	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 (5-31-13)	Offset TVD Reference:	Offset Datum

Offset Design Guttersen 31Q-401 Pad Sec.31-T3N-R63W - Guttersen 31Q-221 - Wellbore #1 - Plan #1 (1-09-13)													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)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
6,350.0	6,331.1	6,317.0	6,293.7	14.5	13.8	74.05		87.8	-25.1	247.0	219.7	27.31	9.044	
6,400.0	6,377.1	6,361.8	6,331.2	14.6	13.9	72.13		112.4	-25.1	249.9	222.4	27.51	9.085	
6,450.0	6,421.7	6,406.2	6,366.8	14.7	14.1	70.32		138.8	-25.1	253.0	225.3	27.70	9.132	
6,500.0	6,464.7	6,450.0	6,400.4	14.8	14.2	68.63		166.9	-25.1	256.2	228.3	27.89	9.184	
6,550.0	6,505.9	6,493.9	6,432.4	14.9	14.4	67.05		196.9	-25.1	259.5	231.4	28.09	9.237	
6,600.0	6,545.3	6,537.2	6,462.3	15.1	14.7	65.59		228.3	-25.1	262.8	234.5	28.29	9.289	
6,650.0	6,582.5	6,580.3	6,490.2	15.2	14.9	64.26		261.1	-25.1	266.1	237.6	28.50	9.337	
6,700.0	6,617.4	6,623.0	6,516.0	15.4	15.2	63.04		295.2	-25.1	269.3	240.6	28.72	9.378	
6,750.0	6,650.0	6,665.6	6,539.7	15.7	15.5	61.93		330.5	-25.1	272.4	243.5	28.95	9.409	
6,800.0	6,680.0	6,707.9	6,561.3	16.0	15.8	60.94		366.9	-25.1	275.4	246.2	29.22	9.426	
6,850.0	6,707.3	6,750.0	6,580.8	16.3	16.1	60.07		404.2	-25.1	278.3	248.8	29.52	9.426	
6,900.0	6,731.8	6,792.0	6,598.2	16.6	16.5	59.30		442.5	-25.1	280.9	251.1	29.87	9.405	
6,950.0	6,753.4	6,833.8	6,613.3	17.1	16.9	58.63		481.4	-25.1	283.3	253.1	30.27	9.361	
7,000.0	6,772.1	6,875.5	6,626.3	17.5	17.3	58.08		521.0	-25.1	285.5	254.8	30.73	9.293	
7,050.0	6,787.6	6,917.1	6,637.1	18.0	17.8	57.62		561.2	-25.1	287.4	256.2	31.25	9.199	
7,100.0	6,800.0	6,958.6	6,645.6	18.6	18.3	57.27		601.8	-25.1	289.1	257.2	31.84	9.080	
7,150.0	6,809.2	7,000.0	6,652.0	19.1	18.8	57.01		642.7	-25.1	290.4	257.9	32.50	8.936	
7,186.7	6,814.0	7,030.3	6,655.2	19.6	19.2	56.89		672.8	-25.1	291.2	258.2	33.04	8.814	
7,200.0	6,815.3	7,041.3	6,656.1	19.8	19.3	56.86		683.8	-25.1	291.5	258.2	33.29	8.757	
7,260.7	6,821.7	7,091.3	6,658.0	20.5	19.9	56.39		733.7	-25.1	294.3	259.9	34.37	8.563	
7,300.0	6,825.1	7,127.7	6,657.8	21.0	20.4	55.78		770.1	-25.1	296.7	261.8	34.94	8.493	
7,374.7	6,828.0	7,202.3	6,657.0	22.1	21.4	55.20		844.7	-25.1	299.5	263.2	36.30	8.251	
7,400.0	6,828.1	7,227.6	6,656.8	22.4	21.8	55.17		870.0	-25.1	299.9	263.0	36.90	8.129	
7,500.0	6,828.6	7,327.6	6,655.8	23.9	23.3	55.05		970.0	-25.1	301.8	262.5	39.31	7.676	
7,600.0	6,829.1	7,427.5	6,654.7	25.4	24.8	54.94		1,070.0	-25.1	303.6	261.8	41.84	7.257	
7,700.0	6,829.6	7,527.5	6,653.7	27.0	26.4	54.83		1,169.9	-25.1	305.4	261.0	44.44	6.872	
7,800.0	6,830.2	7,627.5	6,652.7	28.6	28.0	54.72		1,269.9	-25.1	307.3	260.1	47.12	6.521	
7,900.0	6,830.7	7,727.5	6,651.7	30.2	29.7	54.62		1,369.9	-25.1	309.1	259.2	49.85	6.200	
8,000.0	6,831.2	7,827.5	6,650.7	31.9	31.3	54.51		1,469.9	-25.1	310.9	258.3	52.64	5.907	
8,100.0	6,831.7	7,927.5	6,649.7	33.6	33.1	54.40		1,569.9	-25.1	312.8	257.3	55.45	5.640	
8,200.0	6,832.2	8,027.4	6,648.7	35.3	34.8	54.30		1,669.8	-25.1	314.6	256.3	58.31	5.395	
8,300.0	6,832.8	8,127.4	6,647.7	37.1	36.5	54.20		1,769.8	-25.1	316.4	255.2	61.19	5.172	
8,400.0	6,833.3	8,227.4	6,646.6	38.8	38.3	54.10		1,869.8	-25.1	318.3	254.2	64.09	4.966	
8,500.0	6,833.8	8,327.4	6,645.6	40.6	40.1	53.99		1,969.8	-25.1	320.1	253.1	67.01	4.777	
8,600.0	6,834.3	8,427.4	6,644.6	42.4	41.9	53.90		2,069.7	-25.1	321.9	252.0	69.94	4.603	
8,700.0	6,834.8	8,527.3	6,643.6	44.2	43.7	53.80		2,169.7	-25.1	323.8	250.9	72.89	4.442	
8,800.0	6,835.4	8,627.3	6,642.6	46.0	45.5	53.70		2,269.7	-25.1	325.6	249.8	75.85	4.293	
8,900.0	6,835.9	8,727.3	6,641.6	47.8	47.3	53.60		2,369.7	-25.1	327.5	248.6	78.82	4.155	
9,000.0	6,836.4	8,827.3	6,640.6	49.6	49.2	53.51		2,469.6	-25.1	329.3	247.5	81.80	4.026	
9,100.0	6,836.9	8,927.3	6,639.6	51.5	51.0	53.42		2,569.6	-25.1	331.2	246.4	84.78	3.906	
9,200.0	6,837.4	9,027.3	6,638.5	53.3	52.8	53.32		2,669.6	-25.1	333.0	245.2	87.77	3.794	
9,300.0	6,838.0	9,127.2	6,637.5	55.2	54.7	53.23		2,769.6	-25.1	334.8	244.1	90.76	3.689	
9,400.0	6,838.5	9,227.2	6,636.5	57.0	56.5	53.14		2,869.5	-25.1	336.7	242.9	93.75	3.591	
9,500.0	6,839.0	9,327.2	6,635.5	58.9	58.4	53.05		2,969.5	-25.1	338.5	241.8	96.75	3.499	
9,600.0	6,839.5	9,427.2	6,634.5	60.7	60.2	52.96		3,069.5	-25.1	340.4	240.6	99.75	3.412	
9,700.0	6,840.0	9,527.2	6,633.5	62.6	62.1	52.87		3,169.5	-25.1	342.2	239.5	102.75	3.331	
9,800.0	6,840.6	9,627.1	6,632.5	64.5	64.0	52.79		3,269.4	-25.1	344.1	238.3	105.75	3.254	
9,900.0	6,841.1	9,727.1	6,631.5	66.3	65.8	52.70		3,369.4	-25.1	345.9	237.2	108.76	3.181	
10,000.0	6,841.6	9,827.1	6,630.5	68.2	67.7	52.62		3,469.4	-25.1	347.8	236.0	111.76	3.112	
10,100.0	6,842.1	9,927.1	6,629.4	70.1	69.6	52.53		3,569.4	-25.1	349.6	234.9	114.76	3.047	
10,200.0	6,842.7	10,027.1	6,628.4	72.0	71.5	52.45		3,669.4	-25.1	351.5	233.7	117.76	2.985	

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 Guttersen 31Q-401
Project:	SEC.31-T3N-R63W	TVD Reference:	WELL @ 4838.0ft (Original Well Elev)
Reference Site:	Guttersen 31Q-401 Pad Sec.31-T3N-R63W	MD Reference:	WELL @ 4838.0ft (Original Well Elev)
Site Error:	0.0ft	North Reference:	True
Reference Well:	Guttersen 31Q-401	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 (5-31-13)	Offset TVD Reference:	Offset Datum

Offset Design Guttersen 31Q-401 Pad Sec.31-T3N-R63W - Guttersen 31Q-221 - Wellbore #1 - Plan #1 (1-09-13)												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)	Semi Major Axis		Highside Toolface (°)	Offset Wellbore Centre		Distance		Minimum Separation (ft)	Separation Factor	Warning
Reference	Offset	Reference	Offset	(ft)	(ft)		+N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)			
10,300.0	6,843.2	10,127.0	6,627.4	73.8	73.3	52.37	3,769.3	-25.1	353.3	232.6	120.76	2.926	
10,400.0	6,843.7	10,227.0	6,626.4	75.7	75.2	52.28	3,869.3	-25.1	355.2	231.4	123.76	2.870	
10,500.0	6,844.2	10,327.0	6,625.4	77.6	77.1	52.20	3,969.3	-25.1	357.1	230.3	126.76	2.817	
10,600.0	6,844.7	10,427.0	6,624.4	79.5	79.0	52.12	4,069.3	-25.1	358.9	229.2	129.75	2.766	
10,700.0	6,845.3	10,527.0	6,623.4	81.4	80.9	52.04	4,169.2	-25.1	360.8	228.0	132.75	2.718	
10,800.0	6,845.8	10,627.0	6,622.4	83.3	82.8	51.97	4,269.2	-25.1	362.6	226.9	135.74	2.671	
10,900.0	6,846.3	10,726.9	6,621.3	85.2	84.7	51.89	4,369.2	-25.1	364.5	225.7	138.73	2.627	
11,000.0	6,846.8	10,826.9	6,620.3	87.0	86.5	51.81	4,469.2	-25.1	366.3	224.6	141.72	2.585	
11,100.0	6,847.3	10,926.9	6,619.3	88.9	88.4	51.74	4,569.1	-25.1	368.2	223.5	144.71	2.544	
11,200.0	6,847.9	11,026.9	6,618.3	90.8	90.3	51.66	4,669.1	-25.1	370.1	222.4	147.69	2.506	
11,228.0	6,848.0	11,054.9	6,618.0	91.4	90.9	51.64	4,697.1	-25.1	370.6	222.0	148.53	2.495	
11,228.4	6,848.0	11,055.2	6,618.0	91.4	90.9	51.64	4,697.5	-25.1	370.6	222.0	148.54	2.495 SF	

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Guttersen 31Q-401
Project:	SEC.31-T3N-R63W	TVD Reference:	WELL @ 4838.0ft (Original Well Elev)
Reference Site:	Guttersen 31Q-401 Pad Sec.31-T3N-R63W	MD Reference:	WELL @ 4838.0ft (Original Well Elev)
Site Error:	0.0ft	North Reference:	True
Reference Well:	Guttersen 31Q-401	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 (5-31-13)	Offset TVD Reference:	Offset Datum

Offset Design Guttersen 31Q-401 Pad Sec.31-T3N-R63W - Guttersen 31T-201 - Wellbore #1 - Plan #1 (1-09-13)													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 (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	90.01	90.01	0.0	92.2	92.2				
100.0	100.0	100.0	100.0	0.1	0.1	90.01	90.01	0.0	92.2	92.2	92.0	0.22	410.283	
200.0	200.0	200.0	200.0	0.3	0.3	90.01	90.01	0.0	92.2	92.2	91.5	0.67	136.761 CC, ES	
300.0	300.0	296.8	296.8	0.6	0.5	90.05	90.05	-0.1	93.9	93.9	92.8	1.11	84.868	
400.0	400.0	393.5	393.3	0.8	0.8	90.17	90.17	-0.3	98.7	99.0	97.4	1.55	64.028	
500.0	500.0	489.7	489.2	1.0	1.0	90.34	90.34	-0.6	106.8	107.4	105.4	2.01	53.431	
600.0	600.0	585.3	584.1	1.2	1.3	90.53	90.53	-1.1	118.1	119.1	116.6	2.50	47.591	
700.0	700.0	684.4	682.3	1.5	1.6	90.72	90.72	-1.7	131.3	132.5	129.4	3.04	43.641	
800.0	800.0	783.5	780.6	1.7	1.9	90.88	90.88	-2.2	144.5	145.8	142.2	3.58	40.769	
900.0	900.0	882.6	878.8	1.9	2.2	91.01	91.01	-2.8	157.7	159.1	155.0	4.12	38.599	
1,000.0	1,000.0	981.7	977.0	2.1	2.5	91.11	91.11	-3.3	170.9	172.5	167.8	4.67	36.908	
1,100.0	1,100.0	1,080.6	1,075.0	2.3	2.9	-173.34	-173.34	-3.9	184.1	187.1	182.4	4.72	39.683	
1,200.0	1,199.9	1,179.1	1,172.7	2.5	3.2	-173.36	-173.36	-4.4	197.2	204.3	199.2	5.14	39.720	
1,300.0	1,299.7	1,277.2	1,269.8	2.8	3.5	-173.44	-173.44	-5.0	210.3	224.1	218.5	5.57	40.210	
1,381.2	1,380.6	1,356.4	1,348.3	2.9	3.8	-173.55	-173.55	-5.4	220.9	242.0	236.0	5.92	40.890	
1,400.0	1,399.3	1,374.6	1,366.4	3.0	3.8	-173.58	-173.58	-5.5	223.3	246.3	240.3	6.00	41.056	
1,500.0	1,498.8	1,471.9	1,462.8	3.2	4.2	-173.74	-173.74	-6.1	236.3	269.4	262.9	6.44	41.847	
1,600.0	1,598.3	1,569.2	1,559.3	3.5	4.5	-173.88	-173.88	-6.6	249.2	292.5	285.6	6.88	42.512	
1,700.0	1,697.8	1,666.5	1,655.7	3.7	4.8	-173.99	-173.99	-7.2	262.2	315.6	308.2	7.33	43.077	
1,800.0	1,797.3	1,763.8	1,752.1	4.0	5.2	-174.09	-174.09	-7.7	275.2	338.7	330.9	7.77	43.562	
1,900.0	1,896.8	1,861.1	1,848.6	4.3	5.5	-174.18	-174.18	-8.3	288.1	361.7	353.5	8.23	43.981	
2,000.0	1,996.3	1,958.4	1,945.0	4.5	5.8	-174.26	-174.26	-8.8	301.1	384.8	376.2	8.68	44.347	
2,100.0	2,095.8	2,055.7	2,041.4	4.8	6.1	-174.32	-174.32	-9.4	314.1	407.9	398.8	9.13	44.668	
2,200.0	2,195.3	2,153.0	2,137.8	5.1	6.5	-174.38	-174.38	-9.9	327.1	431.0	421.4	9.59	44.953	
2,300.0	2,294.8	2,250.3	2,234.3	5.3	6.8	-174.44	-174.44	-10.4	340.0	454.1	444.1	10.05	45.205	
2,400.0	2,394.3	2,347.6	2,330.7	5.6	7.1	-174.49	-174.49	-11.0	353.0	477.2	466.7	10.50	45.432	
2,500.0	2,493.8	2,444.9	2,427.1	5.9	7.4	-174.53	-174.53	-11.5	366.0	500.3	489.3	10.96	45.635	
2,600.0	2,593.3	2,542.2	2,523.5	6.2	7.8	-174.57	-174.57	-12.1	378.9	523.4	512.0	11.42	45.819	
2,700.0	2,692.8	2,639.5	2,620.0	6.5	8.1	-174.61	-174.61	-12.6	391.9	546.5	534.6	11.88	45.985	
2,800.0	2,792.3	2,736.8	2,716.4	6.7	8.4	-174.65	-174.65	-13.2	404.9	569.6	557.2	12.35	46.137	
2,900.0	2,891.8	2,834.1	2,812.8	7.0	8.8	-174.68	-174.68	-13.7	417.8	592.7	579.9	12.81	46.275	
3,000.0	2,991.3	2,931.4	2,909.2	7.3	9.1	-174.71	-174.71	-14.3	430.8	615.8	602.5	13.27	46.402	
3,100.0	3,090.8	3,028.7	3,005.7	7.6	9.4	-174.73	-174.73	-14.8	443.8	638.9	625.1	13.73	46.519	
3,200.0	3,190.3	3,126.0	3,102.1	7.9	9.8	-174.76	-174.76	-15.4	456.8	662.0	647.8	14.20	46.627	
3,300.0	3,289.8	3,223.3	3,198.5	8.2	10.1	-174.78	-174.78	-15.9	469.7	685.1	670.4	14.66	46.727	
3,400.0	3,389.3	3,320.6	3,294.9	8.5	10.4	-174.80	-174.80	-16.4	482.7	708.2	693.0	15.13	46.819	
3,500.0	3,488.8	3,417.9	3,391.4	8.8	10.7	-174.82	-174.82	-17.0	495.7	731.3	715.7	15.59	46.905	
3,600.0	3,588.3	3,515.2	3,487.8	9.0	11.1	-174.84	-174.84	-17.5	508.6	754.4	738.3	16.06	46.985	
3,631.3	3,619.4	3,545.6	3,517.9	9.1	11.2	-174.85	-174.85	-17.7	512.7	761.6	745.4	16.20	47.009	
3,700.0	3,687.9	3,612.6	3,584.4	9.3	11.4	-174.88	-174.88	-18.1	521.6	776.9	760.3	16.54	46.982	
3,800.0	3,787.6	3,710.5	3,681.4	9.5	11.7	-174.90	-174.90	-18.6	534.7	796.9	779.9	16.99	46.895	
3,900.0	3,887.6	3,809.0	3,779.0	9.7	12.1	-174.91	-174.91	-19.2	547.8	814.4	797.0	17.44	46.691	
4,000.0	3,987.5	3,907.9	3,877.0	9.9	12.4	-174.89	-174.89	-19.7	561.0	829.4	811.5	17.88	46.378	
4,012.5	4,000.0	3,920.2	3,889.2	9.9	12.4	89.64	89.64	-19.8	562.6	831.1	813.1	17.93	46.339	
4,100.0	4,087.5	4,007.0	3,975.2	10.0	12.7	89.68	89.68	-20.3	574.2	842.7	824.4	18.32	46.005	
4,200.0	4,187.5	4,106.1	4,073.4	10.2	13.1	89.72	89.72	-20.9	587.4	856.1	837.3	18.76	45.625	
4,300.0	4,287.5	4,205.2	4,171.7	10.4	13.4	89.76	89.76	-21.4	600.6	869.4	850.2	19.21	45.260	
4,400.0	4,387.5	4,304.3	4,269.9	10.6	13.7	89.80	89.80	-22.0	613.8	882.7	863.1	19.66	44.910	
4,500.0	4,487.5	4,403.4	4,368.1	10.8	14.1	89.84	89.84	-22.5	627.0	896.0	875.9	20.10	44.573	
4,600.0	4,587.5	4,502.5	4,466.3	11.0	14.4	89.88	89.88	-23.1	640.3	909.4	888.8	20.55	44.250	
4,700.0	4,687.5	4,601.6	4,564.5	11.2	14.7	89.91	89.91	-23.6	653.5	922.7	901.7	21.00	43.939	

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 Guttersten 31Q-401
Project:	SEC.31-T3N-R63W	TVD Reference:	WELL @ 4838.0ft (Original Well Elev)
Reference Site:	Guttersten 31Q-401 Pad Sec.31-T3N-R63W	MD Reference:	WELL @ 4838.0ft (Original Well Elev)
Site Error:	0.0ft	North Reference:	True
Reference Well:	Guttersten 31Q-401	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 (5-31-13)	Offset TVD Reference:	Offset Datum

Offset Design Guttersten 31Q-401 Pad Sec.31-T3N-R63W - Guttersten 31T-201 - Wellbore #1 - Plan #1 (1-09-13)													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
4,800.0	4,787.5	4,722.7	4,684.7	11.4	15.1	89.96	89.96	-24.3	668.8	935.5	914.0	21.48	43.560	
4,900.0	4,887.5	4,870.9	4,832.3	11.6	15.4	89.99	89.99	-24.8	681.3	943.9	922.0	21.95	43.002	
5,000.0	4,987.5	5,020.1	4,981.4	11.8	15.6	90.00	90.00	-25.0	686.2	947.2	924.8	22.42	42.256	
5,100.0	5,087.5	5,126.2	5,087.5	12.0	15.8	90.00	90.00	-25.0	686.2	947.2	924.4	22.82	41.507	
5,200.0	5,187.5	5,226.2	5,187.5	12.2	15.9	90.00	90.00	-25.0	686.2	947.2	924.0	23.22	40.795	
5,300.0	5,287.5	5,326.2	5,287.5	12.4	16.1	90.00	90.00	-25.0	686.2	947.2	923.6	23.62	40.105	
5,400.0	5,387.5	5,426.2	5,387.5	12.6	16.2	90.00	90.00	-25.0	686.2	947.2	923.2	24.02	39.435	
5,500.0	5,487.5	5,526.2	5,487.5	12.8	16.4	90.00	90.00	-25.0	686.2	947.2	922.8	24.42	38.784	
5,600.0	5,587.5	5,626.2	5,587.5	13.0	16.5	90.00	90.00	-25.0	686.2	947.2	922.4	24.83	38.153	
5,700.0	5,687.5	5,726.2	5,687.5	13.2	16.7	90.00	90.00	-25.0	686.2	947.2	922.0	25.23	37.539	
5,800.0	5,787.5	5,826.2	5,787.5	13.4	16.8	90.00	90.00	-25.0	686.2	947.2	921.6	25.64	36.942	
5,900.0	5,887.5	5,926.2	5,887.5	13.6	17.0	90.00	90.00	-25.0	686.2	947.2	921.2	26.05	36.363	
6,000.0	5,987.5	6,027.2	5,988.3	13.8	17.2	89.65	89.65	-19.2	686.1	947.2	920.7	26.46	35.797	
6,038.9	6,026.4	6,065.8	6,026.4	13.8	17.2	89.30	89.30	-13.5	686.1	947.1	920.5	26.62	35.584	
6,066.7	6,054.2	6,093.0	6,053.1	13.9	17.3	88.99	88.99	-8.3	686.0	947.2	920.4	26.73	35.435	
6,100.0	6,087.5	6,125.2	6,084.5	14.0	17.3	89.24	89.24	-0.9	685.9	947.2	920.4	26.87	35.255	
6,150.0	6,137.4	6,173.1	6,130.4	14.1	17.4	88.63	88.63	12.5	685.8	947.4	920.3	27.07	35.003	
6,200.0	6,186.9	6,220.3	6,174.9	14.2	17.5	88.03	88.03	28.5	685.6	947.7	920.4	27.26	34.761	
6,250.0	6,235.8	6,267.0	6,217.8	14.3	17.5	87.44	87.44	46.9	685.3	948.1	920.6	27.47	34.515	
6,300.0	6,283.9	6,313.2	6,259.0	14.4	17.6	86.87	86.87	67.8	685.1	948.6	920.9	27.68	34.271	
6,350.0	6,331.1	6,358.9	6,298.5	14.5	17.7	86.31	86.31	90.8	684.8	949.1	921.2	27.90	34.016	
6,400.0	6,377.1	6,404.2	6,336.1	14.6	17.8	85.76	85.76	115.8	684.5	949.7	921.6	28.14	33.746	
6,450.0	6,421.7	6,450.0	6,372.7	14.7	17.8	85.22	85.22	143.5	684.2	950.4	922.0	28.41	33.449	
6,500.0	6,464.7	6,493.4	6,405.7	14.8	17.9	84.73	84.73	171.6	683.8	951.2	922.4	28.71	33.126	
6,550.0	6,505.9	6,537.4	6,437.5	14.9	18.1	84.24	84.24	202.0	683.5	951.9	922.9	29.05	32.764	
6,600.0	6,545.3	6,581.1	6,467.3	15.1	18.2	83.78	83.78	233.9	683.1	952.7	923.3	29.44	32.361	
6,650.0	6,582.5	6,624.4	6,495.1	15.2	18.3	83.35	83.35	267.2	682.7	953.5	923.6	29.88	31.914	
6,700.0	6,617.4	6,667.5	6,520.7	15.4	18.5	82.93	82.93	301.8	682.2	954.3	923.9	30.37	31.421	
6,750.0	6,650.0	6,710.3	6,544.2	15.7	18.7	82.55	82.55	337.6	681.8	955.1	924.2	30.93	30.883	
6,800.0	6,680.0	6,750.0	6,564.1	16.0	18.9	82.21	82.21	371.9	681.4	955.9	924.3	31.52	30.322	
6,850.0	6,707.3	6,795.2	6,584.7	16.3	19.1	81.87	81.87	412.2	680.9	956.6	924.3	32.24	29.674	
6,900.0	6,731.8	6,837.3	6,601.6	16.6	19.4	81.57	81.57	450.7	680.4	957.3	924.3	33.00	29.009	
6,950.0	6,753.4	6,879.3	6,616.4	17.1	19.7	81.31	81.31	490.0	679.9	957.9	924.1	33.83	28.316	
7,000.0	6,772.1	6,921.1	6,628.9	17.5	20.0	81.08	81.08	529.9	679.5	958.4	923.7	34.73	27.600	
7,050.0	6,787.6	6,962.8	6,639.2	18.0	20.4	80.88	80.88	570.3	679.0	958.9	923.2	35.69	26.868	
7,100.0	6,800.0	7,004.3	6,647.3	18.6	20.8	80.71	80.71	611.0	678.5	959.3	922.6	36.71	26.130	
7,150.0	6,809.2	7,050.0	6,653.6	19.1	21.3	80.57	80.57	656.2	677.9	959.7	921.8	37.85	25.356	
7,186.7	6,814.0	7,076.2	6,656.0	19.6	21.6	80.50	80.50	682.3	677.6	959.9	921.2	38.63	24.847	
7,200.0	6,815.3	7,087.2	6,656.7	19.8	21.7	80.48	80.48	693.3	677.5	959.9	921.0	38.93	24.657	
7,260.7	6,821.7	7,140.5	6,658.0	20.5	22.3	80.22	80.22	746.6	676.8	960.7	920.3	40.37	23.798	
7,300.0	6,825.1	7,175.6	6,657.7	21.0	22.7	80.00	80.00	781.7	676.4	961.3	920.0	41.35	23.248	
7,374.7	6,828.0	7,250.2	6,656.9	22.1	23.7	79.76	79.76	856.2	675.5	961.9	918.5	43.41	22.161	
7,400.0	6,828.1	7,275.5	6,656.7	22.4	24.0	79.73	79.73	881.5	675.2	962.0	917.8	44.11	21.807	
7,500.0	6,828.6	7,375.5	6,655.6	23.9	25.4	79.64	79.64	981.5	674.0	962.2	915.2	47.00	20.472	
7,600.0	6,829.1	7,475.5	6,654.6	25.4	26.8	79.55	79.55	1,081.5	672.7	962.4	912.4	50.01	19.245	
7,700.0	6,829.6	7,575.5	6,653.6	27.0	28.3	79.46	79.46	1,181.5	671.5	962.6	909.5	53.11	18.125	
7,800.0	6,830.2	7,675.4	6,652.6	28.6	29.9	79.37	79.37	1,281.4	670.3	962.8	906.5	56.30	17.103	
7,900.0	6,830.7	7,775.4	6,651.6	30.2	31.5	79.28	79.28	1,381.4	669.1	963.1	903.5	59.55	16.172	
8,000.0	6,831.2	7,875.4	6,650.6	31.9	33.1	79.19	79.19	1,481.4	667.9	963.3	900.4	62.86	15.324	
8,100.0	6,831.7	7,975.4	6,649.6	33.6	34.8	79.10	79.10	1,581.4	666.6	963.5	897.3	66.22	14.551	
8,200.0	6,832.2	8,075.4	6,648.6	35.3	36.4	79.01	79.01	1,681.4	665.4	963.8	894.1	69.62	13.844	

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 Guttersen 31Q-401
Project:	SEC.31-T3N-R63W	TVD Reference:	WELL @ 4838.0ft (Original Well Elev)
Reference Site:	Guttersen 31Q-401 Pad Sec.31-T3N-R63W	MD Reference:	WELL @ 4838.0ft (Original Well Elev)
Site Error:	0.0ft	North Reference:	True
Reference Well:	Guttersen 31Q-401	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 (5-31-13)	Offset TVD Reference:	Offset Datum

Offset Design Guttersen 31Q-401 Pad Sec.31-T3N-R63W - Guttersen 31T-201 - Wellbore #1 - Plan #1 (1-09-13)													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)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
8,300.0	6,832.8	8,175.4	6,647.5	37.1	38.2	78.92	78.92	1,781.3	664.2	964.0	890.9	73.05	13.196	
8,400.0	6,833.3	8,275.4	6,646.5	38.8	39.9	78.83	78.83	1,881.3	663.0	964.2	887.7	76.51	12.602	
8,500.0	6,833.8	8,375.4	6,645.5	40.6	41.6	78.74	78.74	1,981.3	661.8	964.5	884.5	80.00	12.056	
8,600.0	6,834.3	8,475.4	6,644.5	42.4	43.4	78.65	78.65	2,081.3	660.6	964.7	881.2	83.51	11.552	
8,700.0	6,834.8	8,575.3	6,643.5	44.2	45.1	78.56	78.56	2,181.2	659.3	965.0	877.9	87.04	11.086	
8,800.0	6,835.4	8,675.3	6,642.5	46.0	46.9	78.47	78.47	2,281.2	658.1	965.2	874.6	90.59	10.655	
8,900.0	6,835.9	8,775.3	6,641.5	47.8	48.7	78.38	78.38	2,381.2	656.9	965.5	871.3	94.15	10.255	
9,000.0	6,836.4	8,875.3	6,640.5	49.6	50.5	78.29	78.29	2,481.2	655.7	965.7	868.0	97.72	9.882	
9,100.0	6,836.9	8,975.3	6,639.4	51.5	52.3	78.20	78.20	2,581.1	654.5	966.0	864.7	101.30	9.535	
9,200.0	6,837.4	9,075.3	6,638.4	53.3	54.2	78.11	78.11	2,681.1	653.2	966.2	861.3	104.90	9.211	
9,300.0	6,838.0	9,175.3	6,637.4	55.2	56.0	78.02	78.02	2,781.1	652.0	966.5	858.0	108.50	8.908	
9,400.0	6,838.5	9,275.3	6,636.4	57.0	57.8	77.93	77.93	2,881.1	650.8	966.7	854.6	112.11	8.623	
9,500.0	6,839.0	9,375.2	6,635.4	58.9	59.7	77.85	77.85	2,981.0	649.6	967.0	851.3	115.72	8.356	
9,600.0	6,839.5	9,475.2	6,634.4	60.7	61.5	77.76	77.76	3,081.0	648.4	967.3	847.9	119.34	8.105	
9,700.0	6,840.0	9,575.2	6,633.4	62.6	63.3	77.67	77.67	3,181.0	647.2	967.5	844.6	122.97	7.868	
9,800.0	6,840.6	9,675.2	6,632.4	64.5	65.2	77.58	77.58	3,281.0	645.9	967.8	841.2	126.60	7.645	
9,900.0	6,841.1	9,775.2	6,631.3	66.3	67.1	77.49	77.49	3,380.9	644.7	968.1	837.8	130.23	7.433	
10,000.0	6,841.6	9,875.2	6,630.3	68.2	68.9	77.40	77.40	3,480.9	643.5	968.4	834.5	133.87	7.234	
10,100.0	6,842.1	9,975.2	6,629.3	70.1	70.8	77.31	77.31	3,580.9	642.3	968.6	831.1	137.51	7.044	
10,200.0	6,842.7	10,075.2	6,628.3	72.0	72.6	77.22	77.22	3,680.9	641.1	968.9	827.8	141.15	6.864	
10,300.0	6,843.2	10,175.2	6,627.3	73.8	74.5	77.13	77.13	3,780.8	639.8	969.2	824.4	144.79	6.694	
10,400.0	6,843.7	10,275.1	6,626.3	75.7	76.4	77.04	77.04	3,880.8	638.6	969.5	821.0	148.44	6.531	
10,500.0	6,844.2	10,375.1	6,625.3	77.6	78.3	76.95	76.95	3,980.8	637.4	969.8	817.7	152.08	6.377	
10,600.0	6,844.7	10,475.1	6,624.3	79.5	80.1	76.86	76.86	4,080.8	636.2	970.1	814.3	155.73	6.229	
10,700.0	6,845.3	10,575.1	6,623.3	81.4	82.0	76.78	76.78	4,180.7	635.0	970.4	811.0	159.38	6.088	
10,800.0	6,845.8	10,675.1	6,622.2	83.3	83.9	76.69	76.69	4,280.7	633.8	970.6	807.6	163.02	5.954	
10,900.0	6,846.3	10,775.1	6,621.2	85.2	85.8	76.60	76.60	4,380.7	632.5	970.9	804.3	166.67	5.825	
11,000.0	6,846.8	10,875.1	6,620.2	87.0	87.7	76.51	76.51	4,480.7	631.3	971.2	800.9	170.32	5.702	
11,100.0	6,847.3	10,975.1	6,619.2	88.9	89.5	76.42	76.42	4,580.6	630.1	971.5	797.6	173.97	5.585	
11,200.0	6,847.9	11,075.0	6,618.2	90.8	91.2	76.33	76.33	4,680.6	628.9	971.8	794.5	177.35	5.480	
11,228.0	6,848.0	11,093.9	6,618.0	91.4	91.5	76.31	76.31	4,699.5	628.7	972.0	793.8	178.14	5.456	
11,228.4	6,848.0	11,093.9	6,618.0	91.4	91.5	76.31	76.31	4,699.5	628.7	972.0	793.8	178.14	5.456 SF	

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Guttersen 31Q-401
Project:	SEC.31-T3N-R63W	TVD Reference:	WELL @ 4838.0ft (Original Well Elev)
Reference Site:	Guttersen 31Q-401 Pad Sec.31-T3N-R63W	MD Reference:	WELL @ 4838.0ft (Original Well Elev)
Site Error:	0.0ft	North Reference:	True
Reference Well:	Guttersen 31Q-401	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 (5-31-13)	Offset TVD Reference:	Offset Datum

Offset Design Guttersen 31Q-401 Pad Sec.31-T3N-R63W - Guttersen 31T-441 - Wellbore #1 - Plan #1 (1-09-13)													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 (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	90.00	90.00	0.0	61.5	61.5				
100.0	100.0	100.0	100.0	0.1	0.1	90.00	90.00	0.0	61.5	61.5	61.3	0.22	273.522	
200.0	200.0	200.0	200.0	0.3	0.3	90.00	90.00	0.0	61.5	61.5	60.8	0.67	91.174	
300.0	300.0	300.0	300.0	0.6	0.6	90.00	90.00	0.0	61.5	61.5	60.4	1.12	54.704	
400.0	400.0	400.0	400.0	0.8	0.8	90.00	90.00	0.0	61.5	61.5	59.9	1.57	39.075	
500.0	500.0	500.0	500.0	1.0	1.0	90.00	90.00	0.0	61.5	61.5	59.5	2.02	30.391	
600.0	600.0	600.0	600.0	1.2	1.2	90.00	90.00	0.0	61.5	61.5	59.0	2.47	24.866	
700.0	700.0	700.0	700.0	1.5	1.5	90.00	90.00	0.0	61.5	61.5	58.6	2.92	21.040	
800.0	800.0	800.0	800.0	1.7	1.7	90.00	90.00	0.0	61.5	61.5	58.1	3.37	18.235	
900.0	900.0	900.0	900.0	1.9	1.9	90.00	90.00	0.0	61.5	61.5	57.7	3.82	16.090	
1,000.0	1,000.0	1,000.0	1,000.0	2.1	2.1	90.00	90.00	0.0	61.5	61.5	57.2	4.27	14.396 CC, ES	
1,100.0	1,100.0	1,098.4	1,098.3	2.3	2.3	-174.53	-174.53	-0.1	62.7	64.1	59.4	4.69	13.670	
1,200.0	1,199.9	1,196.3	1,196.2	2.5	2.5	-174.53	-174.53	-0.5	66.5	71.8	66.7	5.08	14.133	
1,300.0	1,299.7	1,293.5	1,293.2	2.8	2.7	-174.53	-174.53	-1.0	72.7	84.7	79.2	5.48	15.445	
1,381.2	1,380.6	1,371.6	1,371.0	2.9	2.9	-174.53	-174.53	-1.7	79.5	98.8	93.0	5.81	17.010	
1,400.0	1,399.3	1,389.6	1,388.9	3.0	3.0	-174.53	-174.53	-1.8	81.2	102.6	96.7	5.89	17.417	
1,500.0	1,498.8	1,487.3	1,486.1	3.2	3.2	-174.53	-174.53	-2.8	91.3	122.7	116.4	6.30	19.459	
1,600.0	1,598.3	1,585.3	1,583.5	3.5	3.4	-174.52	-174.52	-3.7	101.4	142.8	136.1	6.72	21.241	
1,700.0	1,697.8	1,683.2	1,681.0	3.7	3.7	-174.52	-174.52	-4.6	111.5	162.9	155.8	7.15	22.796	
1,800.0	1,797.3	1,781.2	1,778.4	4.0	3.9	-174.51	-174.51	-5.6	121.6	183.1	175.5	7.58	24.162	
1,900.0	1,896.8	1,879.1	1,875.8	4.3	4.2	-174.51	-174.51	-6.5	131.7	203.2	195.2	8.01	25.366	
2,000.0	1,996.3	1,977.1	1,973.3	4.5	4.5	-174.51	-174.51	-7.4	141.8	223.3	214.9	8.45	26.438	
2,100.0	2,095.8	2,075.0	2,070.7	4.8	4.7	-174.51	-174.51	-8.4	151.9	243.5	234.6	8.89	27.396	
2,200.0	2,195.3	2,173.0	2,168.1	5.1	5.0	-174.50	-174.50	-9.3	162.1	263.6	254.3	9.33	28.255	
2,300.0	2,294.8	2,270.9	2,265.5	5.3	5.3	-174.50	-174.50	-10.3	172.2	283.7	273.9	9.77	29.030	
2,400.0	2,394.3	2,368.9	2,363.0	5.6	5.6	-174.50	-174.50	-11.2	182.3	303.8	293.6	10.22	29.732	
2,500.0	2,493.8	2,466.9	2,460.4	5.9	5.8	-174.50	-174.50	-12.1	192.4	324.0	313.3	10.67	30.371	
2,600.0	2,593.3	2,564.8	2,557.8	6.2	6.1	-174.50	-174.50	-13.1	202.5	344.1	333.0	11.12	30.954	
2,700.0	2,692.8	2,662.8	2,655.2	6.5	6.4	-174.50	-174.50	-14.0	212.6	364.2	352.7	11.57	31.488	
2,800.0	2,792.3	2,760.7	2,752.7	6.7	6.7	-174.50	-174.50	-14.9	222.7	384.4	372.4	12.02	31.979	
2,900.0	2,891.8	2,858.7	2,850.1	7.0	6.9	-174.50	-174.50	-15.9	232.8	404.5	392.0	12.47	32.431	
3,000.0	2,991.3	2,956.6	2,947.5	7.3	7.2	-174.50	-174.50	-16.8	242.9	424.6	411.7	12.93	32.850	
3,100.0	3,090.8	3,054.6	3,044.9	7.6	7.5	-174.50	-174.50	-17.7	253.0	444.8	431.4	13.38	33.238	
3,200.0	3,190.3	3,152.5	3,142.4	7.9	7.8	-174.50	-174.50	-18.7	263.1	464.9	451.1	13.84	33.599	
3,300.0	3,289.8	3,250.5	3,239.8	8.2	8.1	-174.50	-174.50	-19.6	273.2	485.0	470.7	14.29	33.935	
3,400.0	3,389.3	3,348.4	3,337.2	8.5	8.4	-174.50	-174.50	-20.5	283.3	505.2	490.4	14.75	34.249	
3,500.0	3,488.8	3,446.4	3,434.6	8.8	8.6	-174.50	-174.50	-21.5	293.4	525.3	510.1	15.21	34.543	
3,600.0	3,588.3	3,544.3	3,532.1	9.0	8.9	-174.49	-174.49	-22.4	303.5	545.4	529.7	15.66	34.818	
3,631.3	3,619.4	3,574.9	3,562.5	9.1	9.0	-174.49	-174.49	-22.7	306.7	551.7	535.9	15.81	34.901	
3,700.0	3,687.9	3,646.8	3,634.0	9.3	9.2	-174.51	-174.51	-23.4	314.0	564.8	548.7	16.13	35.013	
3,800.0	3,787.6	3,763.0	3,749.8	9.5	9.5	-174.52	-174.52	-24.2	323.3	579.7	563.1	16.57	34.982	
3,900.0	3,887.6	3,880.5	3,867.2	9.7	9.7	-174.53	-174.53	-24.8	329.2	588.9	571.9	16.99	34.666	
4,000.0	3,987.5	3,998.6	3,985.3	9.9	9.9	-174.53	-174.53	-25.0	331.5	592.4	575.0	17.39	34.063	
4,012.5	4,000.0	4,013.4	4,000.0	9.9	9.9	90.00	90.00	-25.0	331.5	592.5	575.0	17.44	33.966	
4,100.0	4,087.5	4,100.9	4,087.5	10.0	10.1	90.00	90.00	-25.0	331.5	592.5	574.7	17.79	33.304	
4,200.0	4,187.5	4,200.9	4,187.5	10.2	10.3	90.00	90.00	-25.0	331.5	592.5	574.3	18.20	32.554	
4,300.0	4,287.5	4,300.9	4,287.5	10.4	10.5	90.00	90.00	-25.0	331.5	592.5	573.9	18.61	31.835	
4,400.0	4,387.5	4,400.9	4,387.5	10.6	10.7	90.00	90.00	-25.0	331.5	592.5	573.5	19.02	31.143	
4,500.0	4,487.5	4,500.9	4,487.5	10.8	10.8	90.00	90.00	-25.0	331.5	592.5	573.0	19.44	30.479	
4,600.0	4,587.5	4,600.9	4,587.5	11.0	11.0	90.00	90.00	-25.0	331.5	592.5	572.6	19.86	29.840	
4,700.0	4,687.5	4,700.9	4,687.5	11.2	11.2	90.00	90.00	-25.0	331.5	592.5	572.2	20.27	29.225	

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 Guttersen 31Q-401
Project:	SEC.31-T3N-R63W	TVD Reference:	WELL @ 4838.0ft (Original Well Elev)
Reference Site:	Guttersen 31Q-401 Pad Sec.31-T3N-R63W	MD Reference:	WELL @ 4838.0ft (Original Well Elev)
Site Error:	0.0ft	North Reference:	True
Reference Well:	Guttersen 31Q-401	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 (5-31-13)	Offset TVD Reference:	Offset Datum

Offset Design Guttersen 31Q-401 Pad Sec.31-T3N-R63W - Guttersen 31T-441 - Wellbore #1 - Plan #1 (1-09-13)													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)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
4,800.0	4,787.5	4,800.9	4,787.5	11.4	11.4	90.00	90.00	-25.0	331.5	592.5	571.8	20.69	28.633	
4,900.0	4,887.5	4,900.9	4,887.5	11.6	11.6	90.00	90.00	-25.0	331.5	592.5	571.4	21.11	28.063	
5,000.0	4,987.5	5,000.9	4,987.5	11.8	11.8	90.00	90.00	-25.0	331.5	592.5	570.9	21.53	27.514	
5,100.0	5,087.5	5,100.9	5,087.5	12.0	12.0	90.00	90.00	-25.0	331.5	592.5	570.5	21.96	26.985	
5,200.0	5,187.5	5,200.9	5,187.5	12.2	12.2	90.00	90.00	-25.0	331.5	592.5	570.1	22.38	26.474	
5,300.0	5,287.5	5,300.9	5,287.5	12.4	12.4	90.00	90.00	-25.0	331.5	592.5	569.7	22.80	25.981	
5,400.0	5,387.5	5,400.9	5,387.5	12.6	12.6	90.00	90.00	-25.0	331.5	592.5	569.2	23.23	25.505	
5,500.0	5,487.5	5,500.9	5,487.5	12.8	12.8	90.00	90.00	-25.0	331.5	592.5	568.8	23.66	25.045	
5,600.0	5,587.5	5,600.9	5,587.5	13.0	13.0	90.00	90.00	-25.0	331.5	592.5	568.4	24.08	24.601	
5,700.0	5,687.5	5,700.9	5,687.5	13.2	13.2	90.00	90.00	-25.0	331.5	592.5	568.0	24.51	24.171	
5,800.0	5,787.5	5,800.9	5,787.5	13.4	13.4	90.00	90.00	-25.0	331.5	592.5	567.5	24.94	23.756	
5,900.0	5,887.5	5,900.9	5,887.5	13.6	13.6	90.00	90.00	-25.0	331.5	592.5	567.1	25.37	23.354	
6,000.0	5,987.5	6,000.9	5,987.5	13.8	13.8	90.00	90.00	-25.0	331.5	592.5	566.7	25.80	22.964	
6,066.7	6,054.2	6,067.6	6,054.2	13.9	13.9	90.00	90.00	-25.0	331.5	592.5	566.4	26.09	22.711	
6,100.0	6,087.5	6,101.2	6,087.8	14.0	14.0	90.66	90.66	-24.3	331.5	592.5	566.2	26.23	22.587	
6,150.0	6,137.4	6,151.7	6,138.2	14.1	14.1	90.66	90.66	-20.4	331.4	592.5	566.0	26.44	22.408	
6,200.0	6,186.9	6,202.2	6,188.1	14.2	14.2	90.65	90.65	-13.2	331.3	592.5	565.8	26.64	22.236	
6,250.0	6,235.8	6,252.6	6,237.5	14.3	14.3	90.64	90.64	-2.7	331.2	592.5	565.6	26.85	22.068	
6,300.0	6,283.9	6,303.1	6,286.0	14.4	14.4	90.63	90.63	11.0	331.0	592.4	565.4	27.05	21.900	
6,350.0	6,331.1	6,353.6	6,333.6	14.5	14.5	90.62	90.62	27.9	330.8	592.4	565.2	27.27	21.728	
6,400.0	6,377.1	6,404.0	6,379.9	14.6	14.6	90.60	90.60	47.9	330.6	592.4	564.9	27.49	21.547	
6,450.0	6,421.7	6,454.4	6,424.7	14.7	14.7	90.58	90.58	70.8	330.3	592.4	564.7	27.75	21.351	
6,500.0	6,464.7	6,504.8	6,468.0	14.8	14.8	90.56	90.56	96.7	330.0	592.4	564.4	28.03	21.135	
6,550.0	6,505.9	6,555.2	6,509.4	14.9	15.0	90.53	90.53	125.4	329.6	592.4	564.0	28.35	20.894	
6,600.0	6,545.3	6,605.6	6,548.9	15.1	15.1	90.51	90.51	156.7	329.3	592.3	563.6	28.72	20.622	
6,650.0	6,582.5	6,656.0	6,586.1	15.2	15.2	90.48	90.48	190.6	328.8	592.3	563.2	29.15	20.318	
6,700.0	6,617.4	6,706.3	6,621.1	15.4	15.4	90.45	90.45	226.8	328.4	592.3	562.6	29.65	19.978	
6,750.0	6,650.0	6,756.6	6,653.6	15.7	15.7	90.41	90.41	265.2	327.9	592.3	562.0	30.21	19.602	
6,800.0	6,680.0	6,806.9	6,683.4	16.0	16.0	90.38	90.38	305.6	327.4	592.2	561.4	30.86	19.192	
6,850.0	6,707.3	6,857.1	6,710.5	16.3	16.3	90.34	90.34	347.9	326.9	592.2	560.6	31.58	18.751	
6,900.0	6,731.8	6,907.4	6,734.8	16.6	16.7	90.31	90.31	391.9	326.4	592.2	559.8	32.39	18.283	
6,950.0	6,753.4	6,957.6	6,756.1	17.1	17.1	90.27	90.27	437.3	325.8	592.1	558.8	33.28	17.793	
7,000.0	6,772.1	7,007.8	6,774.4	17.5	17.6	90.23	90.23	484.0	325.3	592.1	557.8	34.25	17.289	
7,050.0	6,787.6	7,057.9	6,789.6	18.0	18.1	90.19	90.19	531.8	324.7	592.1	556.8	35.29	16.775	
7,100.0	6,800.0	7,108.0	6,801.6	18.6	18.6	90.14	90.14	580.5	324.1	592.0	555.6	36.41	16.259	
7,150.0	6,809.2	7,158.1	6,810.3	19.1	19.2	90.10	90.10	629.8	323.5	592.0	554.4	37.59	15.747	
7,186.7	6,814.0	7,194.8	6,814.7	19.6	19.6	90.07	90.07	666.2	323.0	592.0	553.5	38.50	15.377	
7,200.0	6,815.3	7,208.1	6,816.1	19.8	19.8	90.07	90.07	679.5	322.9	591.9	553.1	38.84	15.243	
7,260.7	6,821.7	7,268.8	6,822.5	20.5	20.6	90.07	90.07	739.8	322.1	591.9	551.5	40.41	14.648	
7,300.0	6,825.1	7,308.2	6,825.6	21.0	21.1	90.05	90.05	779.0	321.7	591.9	550.4	41.47	14.273	
7,374.7	6,828.0	7,382.9	6,828.0	22.1	22.1	90.01	90.01	853.7	320.7	591.8	548.3	43.54	13.592	
7,400.0	6,828.1	7,408.2	6,828.2	22.4	22.5	90.01	90.01	879.0	320.4	591.8	547.5	44.27	13.369	
7,500.0	6,828.6	7,508.2	6,828.7	23.9	23.9	90.01	90.01	979.0	319.2	591.8	544.5	47.21	12.535	
7,600.0	6,829.1	7,608.2	6,829.2	25.4	25.5	90.01	90.01	1,079.0	318.0	591.7	541.4	50.27	11.770	
7,700.0	6,829.6	7,708.2	6,829.7	27.0	27.0	90.01	90.01	1,178.9	316.8	591.6	538.2	53.44	11.071	
7,800.0	6,830.2	7,808.2	6,830.2	28.6	28.6	90.01	90.01	1,278.9	315.6	591.6	534.9	56.69	10.436	
7,900.0	6,830.7	7,908.2	6,830.8	30.2	30.3	90.01	90.01	1,378.9	314.3	591.5	531.5	60.01	9.857	
8,000.0	6,831.2	8,008.2	6,831.3	31.9	32.0	90.01	90.01	1,478.9	313.1	591.5	528.1	63.39	9.331	
8,100.0	6,831.7	8,108.2	6,831.8	33.6	33.7	90.01	90.01	1,578.9	311.9	591.4	524.6	66.82	8.851	
8,200.0	6,832.2	8,208.2	6,832.3	35.3	35.4	90.01	90.01	1,678.9	310.7	591.3	521.0	70.29	8.413	
8,300.0	6,832.8	8,308.2	6,832.8	37.1	37.1	90.01	90.01	1,778.9	309.5	591.3	517.5	73.80	8.012	

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 Guttersen 31Q-401
Project:	SEC.31-T3N-R63W	TVD Reference:	WELL @ 4838.0ft (Original Well Elev)
Reference Site:	Guttersen 31Q-401 Pad Sec.31-T3N-R63W	MD Reference:	WELL @ 4838.0ft (Original Well Elev)
Site Error:	0.0ft	North Reference:	True
Reference Well:	Guttersen 31Q-401	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 (5-31-13)	Offset TVD Reference:	Offset Datum

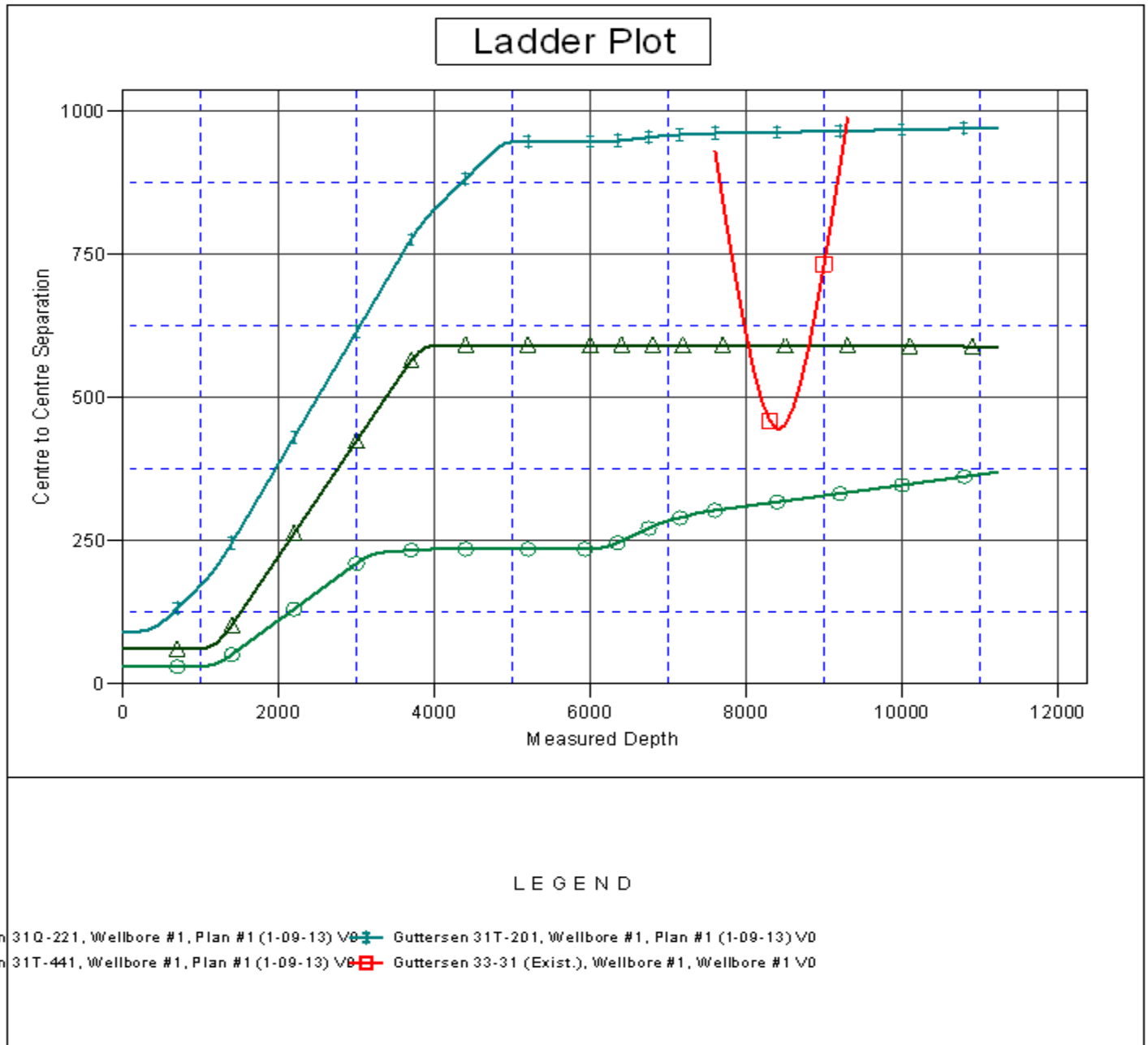
Offset Design Guttersen 31Q-401 Pad Sec.31-T3N-R63W - Guttersen 31T-441 - Wellbore #1 - Plan #1 (1-09-13)												Offset Site Error: 0.0 ft	
Survey Program: 0-MWD												Offset Well Error: 0.0 ft	
Reference		Offset		Semi Major Axis			Distance						Warning
Measured Depth	Vertical Depth	Measured Depth	Vertical Depth	Reference	Offset	Highside Toolface	Offset Wellbore Centre		Between Centres	Between Ellipses	Minimum Separation	Separation Factor	
(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(°)	+N/-S (ft)	+E/-W (ft)	(ft)	(ft)	(ft)		
8,400.0	6,833.3	8,408.2	6,833.3	38.8	38.9	90.01	1,878.9	308.2	591.2	513.9	77.34	7.644	
8,500.0	6,833.8	8,508.2	6,833.9	40.6	40.7	90.01	1,978.9	307.0	591.1	510.2	80.91	7.306	
8,600.0	6,834.3	8,608.2	6,834.4	42.4	42.5	90.01	2,078.9	305.8	591.1	506.6	84.50	6.995	
8,700.0	6,834.8	8,708.2	6,834.9	44.2	44.3	90.01	2,178.9	304.6	591.0	502.9	88.12	6.707	
8,800.0	6,835.4	8,808.2	6,835.4	46.0	46.1	90.01	2,278.8	303.4	591.0	499.2	91.75	6.441	
8,900.0	6,835.9	8,908.2	6,835.9	47.8	47.9	90.01	2,378.8	302.1	590.9	495.5	95.40	6.194	
9,000.0	6,836.4	9,008.2	6,836.5	49.6	49.7	90.01	2,478.8	300.9	590.8	491.8	99.06	5.964	
9,100.0	6,836.9	9,108.2	6,837.0	51.5	51.6	90.01	2,578.8	299.7	590.8	488.0	102.74	5.750	
9,200.0	6,837.4	9,208.2	6,837.5	53.3	53.4	90.01	2,678.8	298.5	590.7	484.3	106.43	5.550	
9,300.0	6,838.0	9,308.2	6,838.0	55.2	55.2	90.01	2,778.8	297.3	590.7	480.5	110.13	5.363	
9,400.0	6,838.5	9,408.2	6,838.5	57.0	57.1	90.01	2,878.8	296.0	590.6	476.8	113.84	5.188	
9,500.0	6,839.0	9,508.2	6,839.1	58.9	58.9	90.00	2,978.8	294.8	590.5	473.0	117.56	5.023	
9,600.0	6,839.5	9,608.2	6,839.6	60.7	60.8	90.00	3,078.8	293.6	590.5	469.2	121.29	4.868	
9,700.0	6,840.0	9,708.2	6,840.1	62.6	62.7	90.00	3,178.8	292.4	590.4	465.4	125.02	4.723	
9,800.0	6,840.6	9,808.2	6,840.6	64.5	64.5	90.00	3,278.8	291.2	590.4	461.6	128.76	4.585	
9,900.0	6,841.1	9,908.2	6,841.1	66.3	66.4	90.00	3,378.7	289.9	590.3	457.8	132.51	4.455	
10,000.0	6,841.6	10,008.2	6,841.7	68.2	68.3	90.00	3,478.7	288.7	590.2	454.0	136.26	4.332	
10,100.0	6,842.1	10,108.2	6,842.2	70.1	70.2	90.00	3,578.7	287.5	590.2	450.2	140.02	4.215	
10,200.0	6,842.7	10,208.2	6,842.7	72.0	72.0	90.00	3,678.7	286.3	590.1	446.3	143.78	4.104	
10,300.0	6,843.2	10,308.2	6,843.2	73.8	73.9	90.00	3,778.7	285.1	590.1	442.5	147.54	3.999	
10,400.0	6,843.7	10,408.2	6,843.7	75.7	75.8	90.00	3,878.7	283.8	590.0	438.7	151.31	3.899	
10,500.0	6,844.2	10,508.2	6,844.3	77.6	77.7	90.00	3,978.7	282.6	589.9	434.8	155.09	3.804	
10,600.0	6,844.7	10,608.2	6,844.8	79.5	79.6	90.00	4,078.7	281.4	589.9	431.0	158.86	3.713	
10,700.0	6,845.3	10,708.2	6,845.3	81.4	81.5	90.00	4,178.7	280.2	589.8	427.2	162.64	3.626	
10,800.0	6,845.8	10,808.2	6,845.8	83.3	83.3	90.00	4,278.7	279.0	589.8	423.3	166.43	3.544	
10,900.0	6,846.3	10,908.2	6,846.3	85.2	85.2	90.00	4,378.7	277.7	589.7	419.5	170.21	3.464	
11,000.0	6,846.8	11,008.2	6,846.9	87.0	87.1	90.00	4,478.7	276.5	589.6	415.6	174.00	3.389	
11,100.0	6,847.3	11,108.2	6,847.4	88.9	89.0	90.00	4,578.6	275.3	589.6	411.8	177.79	3.316	
11,200.0	6,847.9	11,208.2	6,847.9	90.8	90.9	90.00	4,678.6	274.1	589.5	408.0	181.56	3.247	
11,221.7	6,848.0	11,229.4	6,848.0	91.2	91.2	90.00	4,699.9	273.8	589.5	407.2	182.29	3.234	
11,228.0	6,848.0	11,229.4	6,848.0	91.4	91.2	90.00	4,699.9	273.8	589.5	407.1	182.41	3.232	
11,228.4	6,848.0	11,229.4	6,848.0	91.4	91.2	90.00	4,699.9	273.8	589.5	407.1	182.42	3.232 SF	

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Guttersen 31Q-401
Project:	SEC.31-T3N-R63W	TVD Reference:	WELL @ 4838.0ft (Original Well Elev)
Reference Site:	Guttersen 31Q-401 Pad Sec.31-T3N-R63W	MD Reference:	WELL @ 4838.0ft (Original Well Elev)
Site Error:	0.0ft	North Reference:	True
Reference Well:	Guttersen 31Q-401	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 (5-31-13)	Offset TVD Reference:	Offset Datum

Offset Design Guttersen 31Q-401 Pad Sec.31-T3N-R63W - Guttersen 33-31 (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)	Offset Wellbore Centre +E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
7,600.0	6,829.1	6,829.1	6,829.1	25.4	136.6	89.45	1,894.3	162.1	930.9	769.2	161.67	5.758	
7,700.0	6,829.6	6,829.6	6,829.6	27.0	136.6	89.52	1,894.3	162.1	844.4	681.2	163.26	5.172	
7,800.0	6,830.2	6,830.2	6,830.2	28.6	136.6	89.59	1,894.3	162.1	761.3	596.4	164.90	4.617	
7,900.0	6,830.7	6,830.7	6,830.7	30.2	136.6	89.65	1,894.3	162.1	682.7	516.1	166.57	4.098	
8,000.0	6,831.2	6,831.2	6,831.2	31.9	136.6	89.72	1,894.3	162.1	610.4	442.1	168.27	3.627	
8,100.0	6,831.7	6,831.7	6,831.7	33.6	136.6	89.79	1,894.3	162.1	546.8	376.8	170.00	3.217	
8,200.0	6,832.2	6,832.2	6,832.2	35.3	136.6	89.85	1,894.3	162.1	495.5	323.8	171.75	2.885	
8,300.0	6,832.8	6,832.8	6,832.8	37.1	136.7	89.92	1,894.3	162.1	460.5	287.0	173.51	2.654	
8,400.0	6,833.3	6,833.3	6,833.3	38.8	136.7	89.99	1,894.3	162.1	445.6	270.3	175.30	2.542	
8,417.5	6,833.4	6,833.4	6,833.4	39.1	136.7	90.00	1,894.3	162.1	445.2	269.6	175.61	2.535 CC, ES, SF	
8,500.0	6,833.8	6,833.8	6,833.8	40.6	136.7	90.06	1,894.3	162.1	452.8	275.7	177.09	2.557	
8,600.0	6,834.3	6,834.3	6,834.3	42.4	136.7	90.12	1,894.3	162.1	481.2	302.3	178.90	2.690	
8,700.0	6,834.8	6,834.8	6,834.8	44.2	136.7	90.19	1,894.3	162.1	527.3	346.6	180.72	2.918	
8,800.0	6,835.4	6,835.4	6,835.4	46.0	136.7	90.26	1,894.3	162.1	587.0	404.4	182.55	3.215	
8,900.0	6,835.9	6,835.9	6,835.9	47.8	136.7	90.32	1,894.3	162.1	656.5	472.1	184.38	3.561	
9,000.0	6,836.4	6,836.4	6,836.4	49.6	136.7	90.39	1,894.3	162.1	733.1	546.9	186.22	3.937	
9,100.0	6,836.9	6,836.9	6,836.9	51.5	136.7	90.46	1,894.3	162.1	814.9	626.8	188.07	4.333	
9,200.0	6,837.4	6,837.4	6,837.4	53.3	136.7	90.52	1,894.3	162.1	900.3	710.3	189.93	4.740	
9,300.0	6,838.0	6,838.0	6,838.0	55.2	136.8	90.59	1,894.3	162.1	988.4	796.6	191.78	5.154	

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Guttersen 31Q-401
Project:	SEC.31-T3N-R63W	TVD Reference:	WELL @ 4838.0ft (Original Well Elev)
Reference Site:	Guttersen 31Q-401 Pad Sec.31-T3N-R63W	MD Reference:	WELL @ 4838.0ft (Original Well Elev)
Site Error:	0.0ft	North Reference:	True
Reference Well:	Guttersen 31Q-401	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 (5-31-13)	Offset TVD Reference:	Offset Datum

Reference Depths are relative to WELL @ 4838.0ft (Original Well Elev) Coordinates are relative to: Guttersen 31Q-401
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: 0.66°



Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Guttersen 31Q-401
Project:	SEC.31-T3N-R63W	TVD Reference:	WELL @ 4838.0ft (Original Well Elev)
Reference Site:	Guttersen 31Q-401 Pad Sec.31-T3N-R63W	MD Reference:	WELL @ 4838.0ft (Original Well Elev)
Site Error:	0.0ft	North Reference:	True
Reference Well:	Guttersen 31Q-401	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
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