

PETROLEUM DEVELOPMENT CORP Weld County CO

Well Name: **Becker Ranch 5M-403**

Surface Location: Becker Ranch 5MR-HZ Pad Sec.5-T3N-R64W
North American Datum 1983 , US State Plane 1983 , Colorado Northern Zone
Ground Elevation: 4782.0

+N/-S

0.0

+E/-W

0.0

Northing

1339344.02

Easting

3258929.10

Latitude

40.261180

Longitude

-104.572190

Slot

RKB - 15' WELL @ 4797.0ft (RKB - 15')

WELLBORE TARGET DETAILS				
Name	TVD	+N/-S	+E/-W	Shape
SHL 211'FNL, 1905'FEL	1.0	0.0	0.0	Point
BHL 500'FSL, 2455'FEL	6991.0	-4597.5	-569.5	Point

T

M

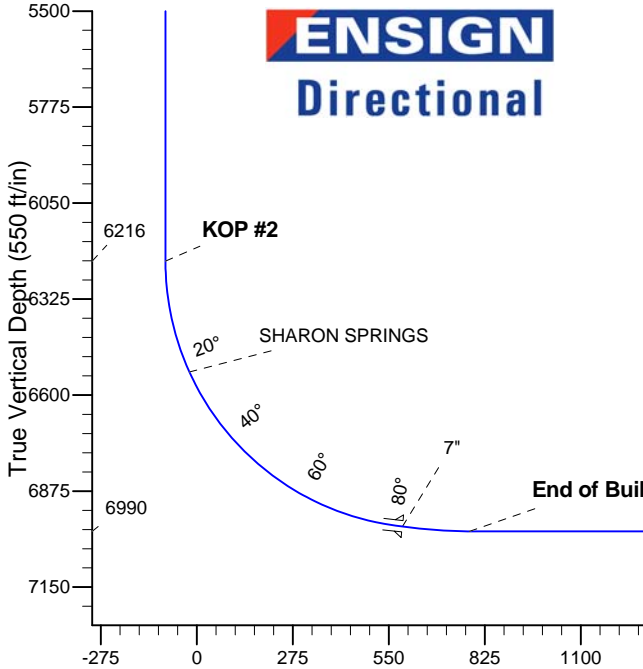
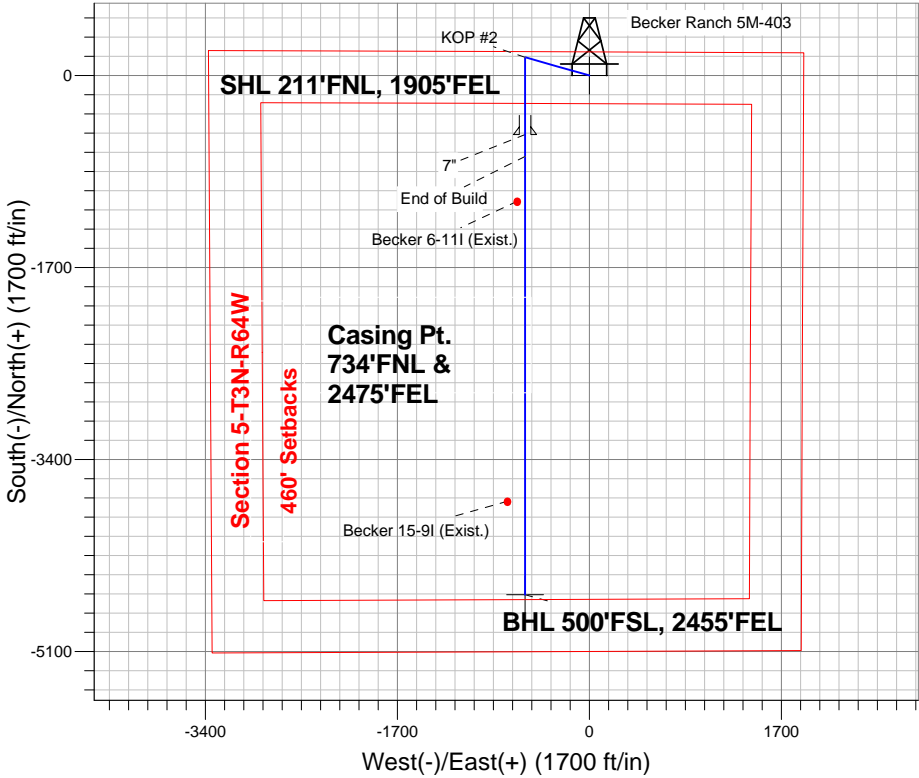
Azimuths to True North
Magnetic North: 8.42°

Magnetic Field
Strength: 52819.3snT
Dip Angle: 66.88°
Date: 12/2/2013
Model: IGRF2010

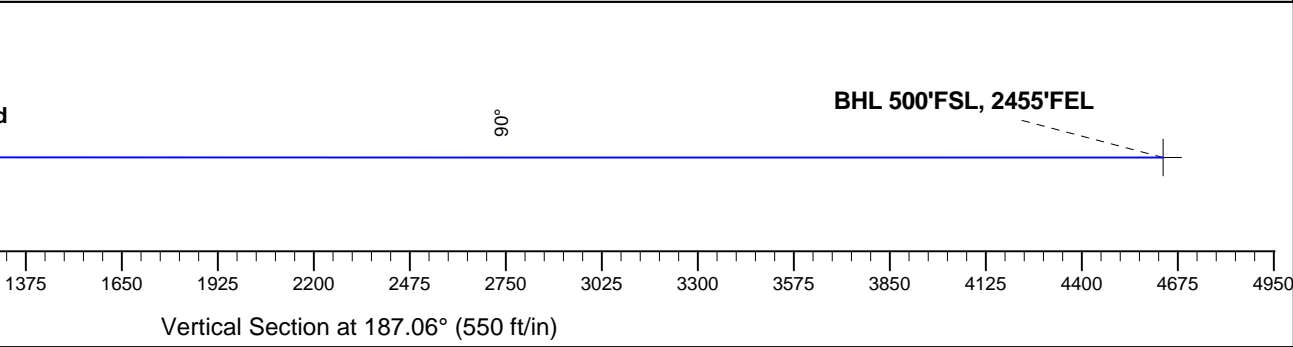
ANNOTATIONS

TVD	MD	Annotation
1000.0	1000.0	KOP #1
6216.5	6257.7	KOP #2
6990.3	7571.5	End of Build

Becker Ranch 5MR-HZ Pad Sec.5-T3N-R64W
Becker Ranch 5M-403
Plan #1 (12-02-13)
14:58, December 03 2013



SECTION DETAILS											
Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	DLeg	TFace	Target	VSec	
1	0.0	0.00	0.00	0.0	0.0	0.0	0.00	0.00	0.0		
2	1000.0	0.00	0.00	1000.0	0.0	0.0	0.00	0.00	0.0		
3	1411.9	8.24	285.79	1410.5	8.0	-28.4	2.00	285.79	-4.5		
4	5129.3	8.24	285.79	5089.5	153.0	-541.0	0.00	0.00	-85.3		
5	5541.2	0.00	0.00	5500.0	161.0	-569.5	2.00	180.00	-89.8		
6	6257.7	0.00	0.00	6216.5	161.0	-569.5	0.00	0.00	-89.8		
7	7377.7	84.00	180.00	6976.3	-523.1	-569.5	7.50	180.00	589.1		
8	7451.7	84.00	180.00	6984.0	-596.7	-569.5	0.00	0.00	662.2		
9	7571.5	89.99	180.00	6990.3	-716.3	-569.5	5.00	0.00	780.8		
10	11452.8	89.99	180.00	6991.0	-4597.5	-569.5	0.00	0.00	4632.6	BHL 500'FSL, 2455'FEL	





PETROLEUM DEVELOPMENT CORP Weld County CO

SEC.5-T3N-R64W

Becker Ranch 5MR-HZ Pad Sec.5-T3N-R64W

Becker Ranch 5M-403

Wellbore #1

Plan: Plan #1 (12-02-13)

Standard Planning Report

03 December, 2013

Database:	Landmark	Local Co-ordinate Reference:	Well Becker Ranch 5M-403
Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	TVD Reference:	WELL @ 4797.0ft (RKB - 15')
Project:	SEC.5-T3N-R64W	MD Reference:	WELL @ 4797.0ft (RKB - 15')
Site:	Becker Ranch 5MR-HZ Pad Sec.5-T3N-R64W	North Reference:	True
Well:	Becker Ranch 5M-403	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Plan #1 (12-02-13)		

Project	SEC.5-T3N-R64W, Weld County, CO		
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						Becker Ranch 5MR-HZ Pad Sec.5-T3N-R64W											
Site Position:						Northing:			1,339,344.02 ft			Latitude:			40.261180		
From:			Lat/Long			Easting:			3,258,929.10 ft			Longitude:			-104.572190		
Position Uncertainty:			0.0 ft			Slot Radius:			"			Grid Convergence:			0.60 °		

Well	Becker Ranch 5M-403					
Well Position	+N/-S	0.0 ft	Northing:	1,339,344.02 ft	Latitude:	40.261180
	+E/-W	0.0 ft	Easting:	3,258,929.10 ft	Longitude:	-104.572190
Position Uncertainty		0.0 ft	Wellhead Elevation:	ft	Ground Level:	4,782.0 ft

Wellbore	Wellbore #1				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	12/2/2013	8.42	66.88	52,819

Design	Plan #1 (12-02-13)			
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	187.06

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	
1,411.9	8.24	285.79	1,410.5	8.0	-28.4	2.00	2.00	0.00	285.79	
5,129.3	8.24	285.79	5,089.5	153.0	-541.0	0.00	0.00	0.00	0.00	
5,541.2	0.00	0.00	5,500.0	161.0	-569.5	2.00	-2.00	0.00	180.00	
6,257.7	0.00	0.00	6,216.5	161.0	-569.5	0.00	0.00	0.00	0.00	
7,377.7	84.00	180.00	6,976.3	-523.1	-569.5	7.50	7.50	0.00	180.00	
7,451.7	84.00	180.00	6,984.0	-596.7	-569.5	0.00	0.00	0.00	0.00	
7,571.5	89.99	180.00	6,990.3	-716.3	-569.5	5.00	5.00	0.00	0.00	
11,452.8	89.99	180.00	6,991.0	-4,597.5	-569.5	0.00	0.00	0.00	0.00	BHL 500'FSL, 2455

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Well:	Becker Ranch 5M-403	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Plan #1 (12-02-13)		

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
SHL 211'FNL, 1905'FEL									
100.0	0.00	0.00	100.0	0.0	0.0	0.0	0.00	0.00	0.00
200.0	0.00	0.00	200.0	0.0	0.0	0.0	0.00	0.00	0.00
300.0	0.00	0.00	300.0	0.0	0.0	0.0	0.00	0.00	0.00
400.0	0.00	0.00	400.0	0.0	0.0	0.0	0.00	0.00	0.00
500.0	0.00	0.00	500.0	0.0	0.0	0.0	0.00	0.00	0.00
600.0	0.00	0.00	600.0	0.0	0.0	0.0	0.00	0.00	0.00
700.0	0.00	0.00	700.0	0.0	0.0	0.0	0.00	0.00	0.00
800.0	0.00	0.00	800.0	0.0	0.0	0.0	0.00	0.00	0.00
900.0	0.00	0.00	900.0	0.0	0.0	0.0	0.00	0.00	0.00
1,000.0	0.00	0.00	1,000.0	0.0	0.0	0.0	0.00	0.00	0.00
KOP #1									
1,100.0	2.00	285.79	1,100.0	0.5	-1.7	-0.3	2.00	2.00	0.00
1,200.0	4.00	285.79	1,199.8	1.9	-6.7	-1.1	2.00	2.00	0.00
1,300.0	6.00	285.79	1,299.5	4.3	-15.1	-2.4	2.00	2.00	0.00
1,400.0	8.00	285.79	1,398.7	7.6	-26.8	-4.2	2.00	2.00	0.00
1,411.9	8.24	285.79	1,410.5	8.0	-28.4	-4.5	2.00	2.00	0.00
1,500.0	8.24	285.79	1,497.7	11.5	-40.6	-6.4	0.00	0.00	0.00
1,600.0	8.24	285.79	1,596.6	15.4	-54.4	-8.6	0.00	0.00	0.00
1,700.0	8.24	285.79	1,695.6	19.3	-68.2	-10.7	0.00	0.00	0.00
1,800.0	8.24	285.79	1,794.6	23.2	-82.0	-12.9	0.00	0.00	0.00
1,900.0	8.24	285.79	1,893.5	27.1	-95.7	-15.1	0.00	0.00	0.00
2,000.0	8.24	285.79	1,992.5	31.0	-109.5	-17.3	0.00	0.00	0.00
2,100.0	8.24	285.79	2,091.5	34.9	-123.3	-19.4	0.00	0.00	0.00
2,200.0	8.24	285.79	2,190.4	38.8	-137.1	-21.6	0.00	0.00	0.00
2,300.0	8.24	285.79	2,289.4	42.7	-150.9	-23.8	0.00	0.00	0.00
2,400.0	8.24	285.79	2,388.4	46.6	-164.7	-26.0	0.00	0.00	0.00
2,500.0	8.24	285.79	2,487.4	50.5	-178.5	-28.1	0.00	0.00	0.00
2,600.0	8.24	285.79	2,586.3	54.4	-192.3	-30.3	0.00	0.00	0.00
2,700.0	8.24	285.79	2,685.3	58.3	-206.1	-32.5	0.00	0.00	0.00
2,800.0	8.24	285.79	2,784.3	62.2	-219.8	-34.7	0.00	0.00	0.00
2,900.0	8.24	285.79	2,883.2	66.1	-233.6	-36.8	0.00	0.00	0.00
3,000.0	8.24	285.79	2,982.2	70.0	-247.4	-39.0	0.00	0.00	0.00
3,100.0	8.24	285.79	3,081.2	73.8	-261.2	-41.2	0.00	0.00	0.00
3,200.0	8.24	285.79	3,180.1	77.7	-275.0	-43.4	0.00	0.00	0.00
3,300.0	8.24	285.79	3,279.1	81.6	-288.8	-45.5	0.00	0.00	0.00
3,400.0	8.24	285.79	3,378.1	85.5	-302.6	-47.7	0.00	0.00	0.00
3,500.0	8.24	285.79	3,477.0	89.4	-316.4	-49.9	0.00	0.00	0.00
3,600.0	8.24	285.79	3,576.0	93.3	-330.1	-52.1	0.00	0.00	0.00
3,700.0	8.24	285.79	3,675.0	97.2	-343.9	-54.2	0.00	0.00	0.00
3,725.3	8.24	285.79	3,700.0	98.2	-347.4	-54.8	0.00	0.00	0.00
PARKMAN									
3,800.0	8.24	285.79	3,773.9	101.1	-357.7	-56.4	0.00	0.00	0.00
3,900.0	8.24	285.79	3,872.9	105.0	-371.5	-58.6	0.00	0.00	0.00
4,000.0	8.24	285.79	3,971.9	108.9	-385.3	-60.8	0.00	0.00	0.00
4,100.0	8.24	285.79	4,070.8	112.8	-399.1	-62.9	0.00	0.00	0.00
4,200.0	8.24	285.79	4,169.8	116.7	-412.9	-65.1	0.00	0.00	0.00
4,300.0	8.24	285.79	4,268.8	120.6	-426.7	-67.3	0.00	0.00	0.00
4,400.0	8.24	285.79	4,367.7	124.5	-440.5	-69.4	0.00	0.00	0.00
4,432.6	8.24	285.79	4,400.0	125.8	-444.9	-70.2	0.00	0.00	0.00
SUSSEX									

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Well:	Becker Ranch 5M-403	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Plan #1 (12-02-13)		

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)
4,500.0	8.24	285.79	4,466.7	128.4	-454.2	-71.6	0.00	0.00	0.00
4,600.0	8.24	285.79	4,565.7	132.3	-468.0	-73.8	0.00	0.00	0.00
4,700.0	8.24	285.79	4,664.7	136.2	-481.8	-76.0	0.00	0.00	0.00
4,800.0	8.24	285.79	4,763.6	140.1	-495.6	-78.1	0.00	0.00	0.00
4,900.0	8.24	285.79	4,862.6	144.0	-509.4	-80.3	0.00	0.00	0.00
5,000.0	8.24	285.79	4,961.6	147.9	-523.2	-82.5	0.00	0.00	0.00
5,100.0	8.24	285.79	5,060.5	151.8	-537.0	-84.7	0.00	0.00	0.00
5,129.3	8.24	285.79	5,089.5	153.0	-541.0	-85.3	0.00	0.00	0.00
5,139.9	8.03	285.79	5,100.0	153.4	-542.5	-85.5	2.00	-2.00	0.00
SHANNON									
5,200.0	6.82	285.79	5,159.6	155.5	-549.9	-86.7	2.00	-2.00	0.00
5,300.0	4.82	285.79	5,259.1	158.2	-559.7	-88.3	2.00	-2.00	0.00
5,400.0	2.82	285.79	5,358.9	160.1	-566.1	-89.3	2.00	-2.00	0.00
5,500.0	0.82	285.79	5,458.8	160.9	-569.2	-89.7	2.00	-2.00	0.00
5,541.2	0.00	0.00	5,500.0	161.0	-569.5	-89.8	2.00	-2.00	0.00
5,600.0	0.00	0.00	5,558.8	161.0	-569.5	-89.8	0.00	0.00	0.00
5,700.0	0.00	0.00	5,658.8	161.0	-569.5	-89.8	0.00	0.00	0.00
5,800.0	0.00	0.00	5,758.8	161.0	-569.5	-89.8	0.00	0.00	0.00
5,900.0	0.00	0.00	5,858.8	161.0	-569.5	-89.8	0.00	0.00	0.00
6,000.0	0.00	0.00	5,958.8	161.0	-569.5	-89.8	0.00	0.00	0.00
6,100.0	0.00	0.00	6,058.8	161.0	-569.5	-89.8	0.00	0.00	0.00
6,200.0	0.00	0.00	6,158.8	161.0	-569.5	-89.8	0.00	0.00	0.00
6,257.7	0.00	0.00	6,216.5	161.0	-569.5	-89.8	0.00	0.00	0.00
KOP #2									
6,300.0	3.17	180.00	6,258.8	159.8	-569.5	-88.6	7.49	7.49	0.00
6,400.0	10.67	180.00	6,358.0	147.8	-569.5	-76.7	7.50	7.50	0.00
6,500.0	18.17	180.00	6,454.8	122.9	-569.5	-52.0	7.50	7.50	0.00
6,585.1	24.55	180.00	6,534.0	91.9	-569.5	-21.2	7.50	7.50	0.00
SHARON SPRINGS									
6,600.0	25.67	180.00	6,547.5	85.6	-569.5	-15.0	7.50	7.50	0.00
6,700.0	33.17	180.00	6,634.5	36.5	-569.5	33.7	7.50	7.50	0.00
6,800.0	40.67	180.00	6,714.4	-23.5	-569.5	93.3	7.50	7.50	0.00
6,900.0	48.17	180.00	6,785.8	-93.4	-569.5	162.7	7.50	7.50	0.00
7,000.0	55.67	180.00	6,847.4	-172.1	-569.5	240.8	7.50	7.50	0.00
7,100.0	63.17	180.00	6,898.3	-258.1	-569.5	326.2	7.50	7.50	0.00
7,200.0	70.67	180.00	6,937.4	-350.1	-569.5	417.4	7.50	7.50	0.00
7,300.0	78.17	180.00	6,964.3	-446.3	-569.5	512.9	7.50	7.50	0.00
7,377.7	84.00	180.00	6,976.3	-523.0	-569.5	589.1	7.50	7.50	0.00
7"									
7,400.0	84.00	180.00	6,978.6	-545.2	-569.5	611.1	0.02	0.02	0.00
7,451.7	84.00	180.00	6,984.0	-596.7	-569.5	662.2	0.00	0.00	0.00
7,500.0	86.41	180.00	6,988.1	-644.8	-569.5	709.9	5.00	5.00	0.00
7,571.5	89.99	180.00	6,990.3	-716.2	-569.5	780.8	5.00	5.00	0.00
End of Build									
7,600.0	89.99	180.00	6,990.3	-744.7	-569.5	809.1	0.01	0.01	0.00
7,700.0	89.99	180.00	6,990.3	-844.7	-569.5	908.3	0.00	0.00	0.00
7,800.0	89.99	180.00	6,990.4	-944.7	-569.5	1,007.5	0.00	0.00	0.00
7,900.0	89.99	180.00	6,990.4	-1,044.7	-569.5	1,106.8	0.00	0.00	0.00
8,000.0	89.99	180.00	6,990.4	-1,144.7	-569.5	1,206.0	0.00	0.00	0.00
8,100.0	89.99	180.00	6,990.4	-1,244.7	-569.5	1,305.3	0.00	0.00	0.00
8,200.0	89.99	180.00	6,990.4	-1,344.7	-569.5	1,404.5	0.00	0.00	0.00
8,300.0	89.99	180.00	6,990.4	-1,444.7	-569.5	1,503.8	0.00	0.00	0.00

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Wellbore:	Wellbore #1		
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Planned Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
8,400.0	89.99	180.00	6,990.5	-1,544.7	-569.5	1,603.0	0.00	0.00	0.00
8,500.0	89.99	180.00	6,990.5	-1,644.7	-569.5	1,702.2	0.00	0.00	0.00
8,600.0	89.99	180.00	6,990.5	-1,744.7	-569.5	1,801.5	0.00	0.00	0.00
8,700.0	89.99	180.00	6,990.5	-1,844.7	-569.5	1,900.7	0.00	0.00	0.00
8,800.0	89.99	180.00	6,990.5	-1,944.7	-569.5	2,000.0	0.00	0.00	0.00
8,900.0	89.99	180.00	6,990.6	-2,044.7	-569.5	2,099.2	0.00	0.00	0.00
9,000.0	89.99	180.00	6,990.6	-2,144.7	-569.5	2,198.4	0.00	0.00	0.00
9,100.0	89.99	180.00	6,990.6	-2,244.7	-569.5	2,297.7	0.00	0.00	0.00
9,200.0	89.99	180.00	6,990.6	-2,344.7	-569.5	2,396.9	0.00	0.00	0.00
9,300.0	89.99	180.00	6,990.6	-2,444.7	-569.5	2,496.2	0.00	0.00	0.00
9,400.0	89.99	180.00	6,990.6	-2,544.7	-569.5	2,595.4	0.00	0.00	0.00
9,500.0	89.99	180.00	6,990.7	-2,644.7	-569.5	2,694.7	0.00	0.00	0.00
9,600.0	89.99	180.00	6,990.7	-2,744.7	-569.5	2,793.9	0.00	0.00	0.00
9,700.0	89.99	180.00	6,990.7	-2,844.7	-569.5	2,893.1	0.00	0.00	0.00
9,800.0	89.99	180.00	6,990.7	-2,944.7	-569.5	2,992.4	0.00	0.00	0.00
9,900.0	89.99	180.00	6,990.7	-3,044.7	-569.5	3,091.6	0.00	0.00	0.00
10,000.0	89.99	180.00	6,990.7	-3,144.7	-569.5	3,190.9	0.00	0.00	0.00
10,100.0	89.99	180.00	6,990.8	-3,244.7	-569.5	3,290.1	0.00	0.00	0.00
10,200.0	89.99	180.00	6,990.8	-3,344.7	-569.5	3,389.4	0.00	0.00	0.00
10,300.0	89.99	180.00	6,990.8	-3,444.7	-569.5	3,488.6	0.00	0.00	0.00
10,400.0	89.99	180.00	6,990.8	-3,544.7	-569.5	3,587.8	0.00	0.00	0.00
10,500.0	89.99	180.00	6,990.8	-3,644.7	-569.5	3,687.1	0.00	0.00	0.00
10,600.0	89.99	180.00	6,990.9	-3,744.7	-569.5	3,786.3	0.00	0.00	0.00
10,700.0	89.99	180.00	6,990.9	-3,844.7	-569.5	3,885.6	0.00	0.00	0.00
10,800.0	89.99	180.00	6,990.9	-3,944.7	-569.5	3,984.8	0.00	0.00	0.00
10,900.0	89.99	180.00	6,990.9	-4,044.7	-569.5	4,084.0	0.00	0.00	0.00
11,000.0	89.99	180.00	6,990.9	-4,144.7	-569.5	4,183.3	0.00	0.00	0.00
11,100.0	89.99	180.00	6,990.9	-4,244.7	-569.5	4,282.5	0.00	0.00	0.00
11,200.0	89.99	180.00	6,991.0	-4,344.7	-569.5	4,381.8	0.00	0.00	0.00
11,300.0	89.99	180.00	6,991.0	-4,444.7	-569.5	4,481.0	0.00	0.00	0.00
11,400.0	89.99	180.00	6,991.0	-4,544.7	-569.5	4,580.3	0.00	0.00	0.00
11,452.8	89.99	180.00	6,991.0	-4,597.5	-569.5	4,632.6	0.00	0.00	0.00

BHL 500'FSL, 2455'FEL

Casing Points

Measured Depth (ft)	Vertical Depth (ft)	Name	Casing Diameter (")	Hole Diameter (")
7,377.7	6,976.3	7"	7	7-1/2

Formations

Measured Depth (ft)	Vertical Depth (ft)	Name	Lithology	Dip (°)	Dip Direction (°)
3,725.3	3,700.0	PARKMAN			
4,432.6	4,400.0	SUSSEX			
5,139.9	5,100.0	SHANNON			
6,585.1	6,534.0	SHARON SPRINGS			

Database:	Landmark	Local Co-ordinate Reference:	Well Becker Ranch 5M-403
Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	TVD Reference:	WELL @ 4797.0ft (RKB - 15')
Project:	SEC.5-T3N-R64W	MD Reference:	WELL @ 4797.0ft (RKB - 15')
Site:	Becker Ranch 5MR-HZ Pad Sec.5-T3N-R64W	North Reference:	True
Well:	Becker Ranch 5M-403	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Plan #1 (12-02-13)		

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
6,257.7	6,216.5	161.0	-569.5	KOP #2
7,571.5	6,990.3	-716.2	-569.5	End of Build



PETROLEUM DEVELOPMENT CORP Weld County CO

SEC.5-T3N-R64W

Becker Ranch 5MR-HZ Pad Sec.5-T3N-R64W

Becker Ranch 5M-403

Wellbore #1

Plan #1 (12-02-13)

Anticollision Report

03 December, 2013



Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Becker Ranch 5M-403
Project:	SEC.5-T3N-R64W	TVD Reference:	WELL @ 4797.0ft (RKB - 15')
Reference Site:	Becker Ranch 5MR-HZ Pad Sec.5-T3N-R64W	MD Reference:	WELL @ 4797.0ft (RKB - 15')
Site Error:	0.0ft	North Reference:	True
Reference Well:	Becker Ranch 5M-403	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 (12-02-13)	Offset TVD Reference:	Offset Datum

Reference	Plan #1 (12-02-13)		
Filter type:	NO GLOBAL FILTER: Using user defined selection & filtering criteria		
Interpolation Method:	MD Interval 100.0ft	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	12/3/2013		
From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description
0.0	11,452.8	Plan #1 (12-02-13) (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						
Becker Ranch 5MR-HZ Pad Sec.5-T3N-R64W						
Becker Ranch 5M-323 - Wellbore #1 - Plan #1 (12-02-13)	1,000.0	1,000.0	30.7	26.4	7.189	CC, ES
Becker Ranch 5M-323 - Wellbore #1 - Plan #1 (12-02-13)	11,453.4	11,315.7	358.3	191.8	2.151	SF
Becker Ranch 5R-203 - Wellbore #1 - Plan #1 (12-02-13)	1,000.0	999.0	89.3	85.0	20.924	CC, ES
Becker Ranch 5R-203 - Wellbore #1 - Plan #1 (12-02-13)	1,100.0	1,096.2	92.5	87.8	19.701	SF
Becker Ranch 5R-443 - Wellbore #1 - Plan #1 (12-02-13)	1,000.0	1,000.0	61.4	57.1	14.378	CC, ES
Becker Ranch 5R-443 - Wellbore #1 - Plan #1 (12-02-13)	11,453.4	11,417.9	658.8	478.9	3.663	SF
Existing Wells Sec.5-T3N-R64W						
Becker 15-9I (Exist.) - Wellbore #1 - Wellbore #1	10,625.8	6,945.9	156.3	-57.0	0.733	Level 1, CC, ES, SF
Becker 6-11I (Exist.) - Wellbore #1 - Wellbore #1	7,970.0	6,981.4	69.7	-96.6	0.419	Level 1, CC, ES, SF

Offset Design		Becker Ranch 5MR-HZ Pad Sec.5-T3N-R64W - Becker Ranch 5M-323 - Wellbore #1 - Plan #1 (12-02-1										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	90.01	0.0	30.7	30.7					
100.0	100.0	100.0	100.0	0.1	0.1	90.01	0.0	30.7	30.7	30.5	0.22	136.588		
200.0	200.0	200.0	200.0	0.3	0.3	90.01	0.0	30.7	30.7	30.0	0.67	45.529		
300.0	300.0	300.0	300.0	0.6	0.6	90.01	0.0	30.7	30.7	29.6	1.12	27.318		
400.0	400.0	400.0	400.0	0.8	0.8	90.01	0.0	30.7	30.7	29.1	1.57	19.513		
500.0	500.0	500.0	500.0	1.0	1.0	90.01	0.0	30.7	30.7	28.7	2.02	15.176		
600.0	600.0	600.0	600.0	1.2	1.2	90.01	0.0	30.7	30.7	28.2	2.47	12.417		
700.0	700.0	700.0	700.0	1.5	1.5	90.01	0.0	30.7	30.7	27.8	2.92	10.507		
800.0	800.0	800.0	800.0	1.7	1.7	90.01	0.0	30.7	30.7	27.3	3.37	9.106		
900.0	900.0	900.0	900.0	1.9	1.9	90.01	0.0	30.7	30.7	26.9	3.82	8.035		
1,000.0	1,000.0	1,000.0	1,000.0	2.1	2.1	90.01	0.0	30.7	30.7	26.4	4.27	7.189	CC, ES	
1,100.0	1,100.0	1,100.0	1,100.0	2.4	2.4	165.05	0.0	30.7	32.4	27.7	4.71	6.877		
1,200.0	1,199.8	1,199.8	1,199.8	2.6	2.6	167.09	0.0	30.7	37.5	32.3	5.14	7.293		
1,300.0	1,299.5	1,299.5	1,299.5	2.8	2.8	169.49	0.0	30.7	46.0	40.4	5.56	8.270		
1,400.0	1,398.7	1,398.7	1,398.7	3.0	3.0	171.65	0.0	30.7	58.0	52.0	5.98	9.696		
1,500.0	1,497.7	1,497.7	1,497.7	3.3	3.3	173.29	0.0	30.7	72.2	65.8	6.42	11.247		
1,600.0	1,596.6	1,599.4	1,599.4	3.6	3.5	174.02	0.9	29.2	84.9	78.0	6.86	12.376		

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 Becker Ranch 5M-403
Project:	SEC.5-T3N-R64W	TVD Reference:	WELL @ 4797.0ft (RKB - 15')
Reference Site:	Becker Ranch 5MR-HZ Pad Sec.5-T3N-R64W	MD Reference:	WELL @ 4797.0ft (RKB - 15')
Site Error:	0.0ft	North Reference:	True
Reference Well:	Becker Ranch 5M-403	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 (12-02-13)	Offset TVD Reference:	Offset Datum

Offset Design Becker Ranch 5MR-HZ Pad Sec.5-T3N-R64W - Becker Ranch 5M-323 - Wellbore #1 - Plan #1 (12-02-1													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
1,700.0	1,695.6	1,702.0	1,701.8	3.9	3.7	173.78		3.6	24.6	94.3	87.0	7.30	12.920	
1,800.0	1,794.6	1,802.9	1,802.4	4.2	3.9	172.99		7.8	17.6	101.0	93.3	7.74	13.052	
1,900.0	1,893.5	1,902.7	1,901.8	4.5	4.2	172.26		12.1	10.4	107.5	99.3	8.18	13.135	
2,000.0	1,992.5	2,002.5	2,001.3	4.8	4.4	171.62		16.3	3.2	114.0	105.4	8.64	13.205	
2,100.0	2,091.5	2,102.2	2,100.7	5.1	4.6	171.04		20.6	-3.9	120.6	111.5	9.09	13.263	
2,200.0	2,190.4	2,202.0	2,200.1	5.5	4.9	170.52		24.8	-11.1	127.2	117.6	9.55	13.312	
2,300.0	2,289.4	2,301.8	2,299.6	5.8	5.1	170.06		29.1	-18.2	133.7	123.7	10.01	13.353	
2,400.0	2,388.4	2,401.6	2,399.0	6.1	5.4	169.64		33.4	-25.4	140.3	129.8	10.48	13.388	
2,500.0	2,487.4	2,501.3	2,498.4	6.5	5.6	169.25		37.6	-32.6	146.9	135.9	10.95	13.417	
2,600.0	2,586.3	2,601.1	2,597.8	6.8	5.9	168.90		41.9	-39.7	153.5	142.1	11.42	13.441	
2,700.0	2,685.3	2,700.9	2,697.3	7.1	6.1	168.58		46.1	-46.9	160.1	148.2	11.89	13.462	
2,800.0	2,784.3	2,800.7	2,796.7	7.5	6.4	168.28		50.4	-54.0	166.7	154.3	12.37	13.480	
2,900.0	2,883.2	2,900.5	2,896.1	7.8	6.6	168.01		54.6	-61.2	173.3	160.4	12.84	13.494	
3,000.0	2,982.2	3,000.2	2,995.6	8.2	6.9	167.75		58.9	-68.4	179.9	166.6	13.32	13.507	
3,100.0	3,081.2	3,100.0	3,095.0	8.5	7.1	167.52		63.2	-75.5	186.5	172.7	13.80	13.517	
3,200.0	3,180.1	3,199.8	3,194.4	8.8	7.4	167.30		67.4	-82.7	193.1	178.8	14.28	13.526	
3,300.0	3,279.1	3,299.6	3,293.9	9.2	7.7	167.09		71.7	-89.8	199.7	185.0	14.76	13.533	
3,400.0	3,378.1	3,399.4	3,393.3	9.5	7.9	166.90		75.9	-97.0	206.4	191.1	15.24	13.539	
3,500.0	3,477.0	3,499.1	3,492.7	9.9	8.2	166.72		80.2	-104.2	213.0	197.3	15.72	13.544	
3,600.0	3,576.0	3,598.9	3,592.1	10.2	8.5	166.55		84.4	-111.3	219.6	203.4	16.21	13.548	
3,700.0	3,675.0	3,698.7	3,691.6	10.6	8.7	166.39		88.7	-118.5	226.2	209.5	16.69	13.551	
3,800.0	3,773.9	3,798.5	3,791.0	10.9	9.0	166.24		93.0	-125.6	232.9	215.7	17.18	13.554	
3,900.0	3,872.9	3,898.2	3,890.4	11.3	9.2	166.10		97.2	-132.8	239.5	221.8	17.67	13.556	
4,000.0	3,971.9	3,998.0	3,989.9	11.6	9.5	165.96		101.5	-140.0	246.1	228.0	18.15	13.557	
4,100.0	4,070.8	4,097.8	4,089.3	12.0	9.8	165.84		105.7	-147.1	252.7	234.1	18.64	13.558	
4,200.0	4,169.8	4,197.6	4,188.7	12.3	10.0	165.71		110.0	-154.3	259.4	240.2	19.13	13.559	
4,300.0	4,268.8	4,297.4	4,288.2	12.7	10.3	165.60		114.2	-161.4	266.0	246.4	19.62	13.559	
4,400.0	4,367.7	4,397.1	4,387.6	13.0	10.6	165.49		118.5	-168.6	272.6	252.5	20.11	13.559	
4,500.0	4,466.7	4,496.9	4,487.0	13.4	10.8	165.39		122.8	-175.8	279.3	258.7	20.60	13.559	
4,600.0	4,565.7	4,596.7	4,586.4	13.7	11.1	165.29		127.0	-182.9	285.9	264.8	21.09	13.558	
4,700.0	4,664.7	4,696.5	4,685.9	14.0	11.4	165.19		131.3	-190.1	292.6	271.0	21.58	13.558	
4,800.0	4,763.6	4,796.3	4,785.3	14.4	11.6	165.10		135.5	-197.2	299.2	277.1	22.07	13.557	
4,900.0	4,862.6	4,896.0	4,884.7	14.7	11.9	165.02		139.8	-204.4	305.8	283.3	22.56	13.556	
5,000.0	4,961.6	4,995.8	4,984.2	15.1	12.2	164.93		144.0	-211.6	312.5	289.4	23.05	13.555	
5,100.0	5,060.5	5,095.6	5,083.6	15.4	12.4	164.85		148.3	-218.7	319.1	295.6	23.55	13.553	
5,200.0	5,159.6	5,195.4	5,183.1	15.8	12.7	164.76		152.6	-225.9	324.9	300.9	24.04	13.514	
5,300.0	5,259.1	5,293.4	5,280.7	16.0	13.0	164.52		156.7	-232.8	327.6	303.1	24.49	13.374	
5,400.0	5,358.9	5,384.4	5,371.5	16.2	13.1	164.32		159.5	-237.6	328.8	303.9	24.85	13.230	
5,500.0	5,458.8	5,475.4	5,462.5	16.3	13.3	164.22		160.9	-239.9	329.3	304.2	25.16	13.090	
5,600.0	5,558.8	5,571.7	5,558.8	16.5	13.5	90.00		161.0	-240.1	329.4	303.9	25.50	12.918	
5,700.0	5,658.8	5,671.7	5,658.8	16.6	13.7	90.00		161.0	-240.1	329.4	303.5	25.90	12.718	
5,800.0	5,758.8	5,771.7	5,758.8	16.8	13.9	90.00		161.0	-240.1	329.4	303.1	26.30	12.522	
5,900.0	5,858.8	5,871.7	5,858.8	17.0	14.1	90.00		161.0	-240.1	329.4	302.7	26.71	12.331	
6,000.0	5,958.8	5,971.7	5,958.8	17.1	14.3	90.00		161.0	-240.1	329.4	302.3	27.12	12.145	
6,100.0	6,058.8	6,071.7	6,058.8	17.3	14.5	90.00		161.0	-240.1	329.4	301.9	27.53	11.964	
6,149.8	6,108.6	6,121.5	6,108.6	17.4	14.6	90.00		161.0	-240.1	329.4	301.6	27.74	11.875	
6,200.0	6,158.8	6,171.6	6,158.7	17.5	14.6	90.29		159.3	-240.1	329.4	301.5	27.91	11.802	
6,300.0	6,258.8	6,270.0	6,256.2	17.6	14.8	-87.67		146.6	-240.1	329.7	301.5	28.14	11.715	
6,400.0	6,358.0	6,366.5	6,349.4	17.7	14.9	-85.32		122.0	-240.1	330.5	302.2	28.28	11.686	
6,500.0	6,454.8	6,461.4	6,437.4	17.8	15.0	-83.07		86.5	-240.1	331.8	303.4	28.41	11.681	
6,600.0	6,547.5	6,554.9	6,519.1	17.9	15.0	-80.97		41.2	-240.1	333.6	305.0	28.57	11.677	

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 Becker Ranch 5M-403
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Site Error:	0.0ft	North Reference:	True
Reference Well:	Becker Ranch 5M-403	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 (12-02-13)	Offset TVD Reference:	Offset Datum

Offset Design Becker Ranch 5MR-HZ Pad Sec.5-T3N-R64W - Becker Ranch 5M-323 - Wellbore #1 - Plan #1 (12-02-1													Offset Site Error:	0.0 ft
Survey Program: 0-MWD													Offset Well Error:	0.0 ft
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Semi Major Axis (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
6,700.0	6,634.5	6,647.2	6,593.7	18.0	15.1	-79.04	-13.0	-240.1	335.6	306.8	28.80	11.653		
6,800.0	6,714.4	6,738.4	6,660.5	18.1	15.3	-77.31	-75.0	-240.1	337.7	308.6	29.14	11.590		
6,900.0	6,785.8	6,828.6	6,718.9	18.2	15.5	-75.79	-143.8	-240.1	339.9	310.2	29.63	11.471		
7,000.0	6,847.4	6,918.0	6,768.3	18.4	15.8	-74.51	-218.2	-240.1	341.9	311.6	30.29	11.286		
7,100.0	6,898.3	7,006.8	6,808.5	18.7	16.4	-73.47	-297.3	-240.1	343.6	312.5	31.16	11.028		
7,200.0	6,937.4	7,095.1	6,839.1	19.2	17.1	-72.67	-380.1	-240.1	345.1	312.8	32.26	10.698		
7,300.0	6,964.3	7,183.0	6,859.8	19.9	17.9	-72.14	-465.4	-240.1	346.1	312.5	33.59	10.303		
7,400.0	6,978.6	7,270.6	6,870.6	20.8	18.8	-71.82	-552.4	-240.1	346.7	311.5	35.22	9.845		
7,500.0	6,988.1	7,362.4	6,872.1	21.8	19.9	-70.64	-644.1	-240.1	349.2	312.2	37.04	9.428		
7,600.0	6,990.3	7,462.4	6,871.5	23.0	21.2	-70.17	-744.1	-240.1	350.2	311.0	39.19	8.935		
7,700.0	6,990.3	7,562.4	6,871.0	24.2	22.6	-70.08	-844.1	-240.1	350.4	308.6	41.76	8.389		
7,800.0	6,990.4	7,662.4	6,870.4	25.6	24.0	-69.99	-944.0	-240.1	350.5	306.1	44.48	7.880		
7,900.0	6,990.4	7,762.4	6,869.8	27.0	25.5	-69.90	-1,044.0	-240.1	350.7	303.4	47.32	7.412		
8,000.0	6,990.4	7,862.4	6,869.3	28.5	27.1	-69.81	-1,144.0	-240.1	350.9	300.7	50.26	6.983		
8,100.0	6,990.4	7,962.3	6,868.7	30.0	28.7	-69.72	-1,244.0	-240.1	351.1	297.9	53.27	6.591		
8,200.0	6,990.4	8,062.3	6,868.2	31.6	30.3	-69.64	-1,344.0	-240.1	351.3	295.0	56.36	6.234		
8,300.0	6,990.4	8,162.3	6,867.6	33.2	32.0	-69.55	-1,444.0	-240.1	351.5	292.0	59.50	5.909		
8,400.0	6,990.5	8,262.3	6,867.1	34.8	33.7	-69.46	-1,544.0	-240.1	351.7	289.1	62.69	5.611		
8,500.0	6,990.5	8,362.3	6,866.5	36.5	35.4	-69.37	-1,644.0	-240.1	351.9	286.0	65.91	5.340		
8,600.0	6,990.5	8,462.3	6,865.9	38.2	37.2	-69.28	-1,744.0	-240.1	352.2	283.0	69.17	5.091		
8,700.0	6,990.5	8,562.3	6,865.4	39.9	38.9	-69.20	-1,844.0	-240.1	352.4	279.9	72.46	4.863		
8,800.0	6,990.5	8,662.3	6,864.8	41.6	40.7	-69.11	-1,944.0	-240.1	352.6	276.8	75.78	4.653		
8,900.0	6,990.6	8,762.3	6,864.3	43.4	42.5	-69.02	-2,044.0	-240.1	352.8	273.7	79.11	4.459		
9,000.0	6,990.6	8,862.3	6,863.7	45.1	44.3	-68.93	-2,144.0	-240.1	353.0	270.5	82.46	4.280		
9,100.0	6,990.6	8,962.3	6,863.1	46.9	46.1	-68.85	-2,244.0	-240.1	353.2	267.4	85.83	4.115		
9,200.0	6,990.6	9,062.3	6,862.6	48.7	47.9	-68.76	-2,344.0	-240.1	353.4	264.2	89.21	3.961		
9,300.0	6,990.6	9,162.3	6,862.0	50.5	49.7	-68.67	-2,444.0	-240.1	353.6	261.0	92.60	3.819		
9,400.0	6,990.6	9,262.3	6,861.5	52.3	51.5	-68.59	-2,544.0	-240.1	353.8	257.8	96.00	3.686		
9,500.0	6,990.7	9,362.3	6,860.9	54.1	53.4	-68.50	-2,644.0	-240.1	354.0	254.6	99.41	3.561		
9,600.0	6,990.7	9,462.3	6,860.4	55.9	55.2	-68.41	-2,744.0	-240.1	354.2	251.4	102.82	3.445		
9,700.0	6,990.7	9,562.3	6,859.8	57.8	57.0	-68.33	-2,844.0	-240.1	354.4	248.2	106.25	3.336		
9,800.0	6,990.7	9,662.3	6,859.2	59.6	58.9	-68.24	-2,944.0	-240.1	354.7	245.0	109.67	3.234		
9,900.0	6,990.7	9,762.3	6,858.7	61.4	60.7	-68.15	-3,044.0	-240.1	354.9	241.8	113.10	3.138		
10,000.0	6,990.7	9,862.3	6,858.1	63.3	62.6	-68.07	-3,144.0	-240.1	355.1	238.5	116.54	3.047		
10,100.0	6,990.8	9,962.3	6,857.6	65.1	64.5	-67.98	-3,244.0	-240.1	355.3	235.3	119.97	2.961		
10,200.0	6,990.8	10,062.3	6,857.0	67.0	66.3	-67.90	-3,344.0	-240.1	355.5	232.1	123.41	2.881		
10,300.0	6,990.8	10,162.3	6,856.4	68.8	68.2	-67.81	-3,444.0	-240.1	355.7	228.9	126.85	2.804		
10,400.0	6,990.8	10,262.3	6,855.9	70.7	70.1	-67.72	-3,544.0	-240.1	356.0	225.7	130.30	2.732		
10,500.0	6,990.8	10,362.3	6,855.3	72.5	71.9	-67.64	-3,644.0	-240.1	356.2	222.4	133.74	2.663		
10,600.0	6,990.9	10,462.3	6,854.8	74.4	73.8	-67.55	-3,744.0	-240.1	356.4	219.2	137.18	2.598		
10,700.0	6,990.9	10,562.3	6,854.2	76.3	75.7	-67.47	-3,844.0	-240.1	356.6	216.0	140.63	2.536		
10,800.0	6,990.9	10,662.3	6,853.7	78.1	77.6	-67.38	-3,944.0	-240.1	356.8	212.8	144.07	2.477		
10,900.0	6,990.9	10,762.3	6,853.1	80.0	79.5	-67.30	-4,043.9	-240.1	357.1	209.5	147.51	2.421		
11,000.0	6,990.9	10,862.3	6,852.5	81.9	81.3	-67.21	-4,143.9	-240.1	357.3	206.3	150.95	2.367		
11,100.0	6,990.9	10,962.3	6,852.0	83.7	83.2	-67.13	-4,243.9	-240.1	357.5	203.1	154.40	2.315		
11,200.0	6,991.0	11,062.3	6,851.4	85.6	85.1	-67.04	-4,343.9	-240.1	357.7	199.9	157.84	2.266		
11,300.0	6,991.0	11,162.3	6,850.9	87.5	87.0	-66.96	-4,443.9	-240.1	357.9	196.7	161.27	2.220		
11,400.0	6,991.0	11,262.3	6,850.3	89.4	88.9	-66.87	-4,543.9	-240.1	358.2	193.5	164.71	2.175		
11,453.4	6,991.0	11,315.7	6,850.0	90.4	89.9	-66.83	-4,597.4	-240.1	358.3	191.8	166.55	2.151 SF		

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Becker Ranch 5M-403
Project:	SEC.5-T3N-R64W	TVD Reference:	WELL @ 4797.0ft (RKB - 15')
Reference Site:	Becker Ranch 5MR-HZ Pad Sec.5-T3N-R64W	MD Reference:	WELL @ 4797.0ft (RKB - 15')
Site Error:	0.0ft	North Reference:	True
Reference Well:	Becker Ranch 5M-403	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 (12-02-13)	Offset TVD Reference:	Offset Datum

Offset Design Becker Ranch 5MR-HZ Pad Sec.5-T3N-R64W - Becker Ranch 5R-203 - Wellbore #1 - Plan #1 (12-02-1													Offset Site Error:	0.0 ft
Survey Program: 0-MWD													Offset Well Error:	0.0 ft
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference	Offset	Semi Major Axis	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
0.0	0.0	0.0	0.0	0.0	0.0	90.01	90.01	0.0	89.3	89.3				
100.0	100.0	99.0	99.0	0.1	0.1	90.01	90.01	0.0	89.3	89.3	89.1	0.22	399.339	
200.0	200.0	199.0	199.0	0.3	0.3	90.01	90.01	0.0	89.3	89.3	88.6	0.67	132.892	
300.0	300.0	299.0	299.0	0.6	0.6	90.01	90.01	0.0	89.3	89.3	88.2	1.12	79.628	
400.0	400.0	399.0	399.0	0.8	0.8	90.01	90.01	0.0	89.3	89.3	87.7	1.57	56.845	
500.0	500.0	499.0	499.0	1.0	1.0	90.01	90.01	0.0	89.3	89.3	87.3	2.02	44.199	
600.0	600.0	599.0	599.0	1.2	1.2	90.01	90.01	0.0	89.3	89.3	86.8	2.47	36.155	
700.0	700.0	699.0	699.0	1.5	1.5	90.01	90.01	0.0	89.3	89.3	86.4	2.92	30.589	
800.0	800.0	799.0	799.0	1.7	1.7	90.01	90.01	0.0	89.3	89.3	85.9	3.37	26.507	
900.0	900.0	899.0	899.0	1.9	1.9	90.01	90.01	0.0	89.3	89.3	85.5	3.82	23.387	
1,000.0	1,000.0	999.0	999.0	2.1	2.1	90.01	90.01	0.0	89.3	89.3	85.0	4.27	20.924 CC, ES	
1,100.0	1,100.0	1,096.2	1,096.2	2.4	2.3	164.05	164.05	0.7	90.8	92.5	87.8	4.69	19.701 SF	
1,200.0	1,199.8	1,192.8	1,192.6	2.6	2.6	163.58	163.58	2.8	95.1	102.0	96.9	5.11	19.976	
1,300.0	1,299.5	1,289.8	1,289.3	2.8	2.8	163.01	163.01	6.3	102.2	117.6	112.1	5.53	21.279	
1,400.0	1,398.7	1,387.9	1,387.0	3.0	3.0	162.87	162.87	10.0	109.7	137.0	131.1	5.94	23.048	
1,500.0	1,497.7	1,485.6	1,484.4	3.3	3.2	163.07	163.07	13.7	117.3	158.4	152.0	6.37	24.851	
1,600.0	1,596.6	1,583.2	1,581.7	3.6	3.5	163.24	163.24	17.3	124.8	179.7	172.9	6.81	26.396	
1,700.0	1,695.6	1,680.9	1,679.0	3.9	3.7	163.37	163.37	21.0	132.3	201.1	193.9	7.25	27.733	
1,800.0	1,794.6	1,778.6	1,776.3	4.2	4.0	163.47	163.47	24.7	139.9	222.5	214.8	7.70	28.899	
1,900.0	1,893.5	1,876.3	1,873.7	4.5	4.2	163.56	163.56	28.4	147.4	243.9	235.8	8.15	29.917	
2,000.0	1,992.5	1,974.0	1,971.0	4.8	4.5	163.63	163.63	32.1	155.0	265.3	256.7	8.61	30.820	
2,100.0	2,091.5	2,071.7	2,068.3	5.1	4.7	163.70	163.70	35.8	162.5	286.7	277.6	9.07	31.622	
2,200.0	2,190.4	2,169.4	2,165.6	5.5	5.0	163.75	163.75	39.4	170.0	308.1	298.5	9.53	32.338	
2,300.0	2,289.4	2,267.0	2,263.0	5.8	5.2	163.80	163.80	43.1	177.6	329.5	319.5	9.99	32.981	
2,400.0	2,388.4	2,364.7	2,360.3	6.1	5.5	163.84	163.84	46.8	185.1	350.8	340.4	10.45	33.560	
2,500.0	2,487.4	2,462.4	2,457.6	6.5	5.7	163.87	163.87	50.5	192.6	372.2	361.3	10.92	34.086	
2,600.0	2,586.3	2,560.1	2,554.9	6.8	6.0	163.91	163.91	54.2	200.2	393.6	382.2	11.39	34.564	
2,700.0	2,685.3	2,657.8	2,652.3	7.1	6.3	163.93	163.93	57.9	207.7	415.0	403.2	11.86	35.000	
2,800.0	2,784.3	2,755.5	2,749.6	7.5	6.5	163.96	163.96	61.5	215.3	436.4	424.1	12.33	35.401	
2,900.0	2,883.2	2,853.2	2,846.9	7.8	6.8	163.98	163.98	65.2	222.8	457.8	445.0	12.80	35.769	
3,000.0	2,982.2	2,950.8	2,944.2	8.2	7.0	164.01	164.01	68.9	230.3	479.2	465.9	13.27	36.108	
3,100.0	3,081.2	3,048.5	3,041.6	8.5	7.3	164.03	164.03	72.6	237.9	500.6	486.8	13.74	36.422	
3,200.0	3,180.1	3,146.2	3,138.9	8.8	7.6	164.04	164.04	76.3	245.4	522.0	507.7	14.22	36.713	
3,300.0	3,279.1	3,243.9	3,236.2	9.2	7.8	164.06	164.06	80.0	252.9	543.3	528.6	14.69	36.984	
3,400.0	3,378.1	3,341.6	3,333.5	9.5	8.1	164.08	164.08	83.6	260.5	564.7	549.6	15.17	37.236	
3,500.0	3,477.0	3,439.3	3,430.9	9.9	8.4	164.09	164.09	87.3	268.0	586.1	570.5	15.64	37.472	
3,600.0	3,576.0	3,537.0	3,528.2	10.2	8.6	164.10	164.10	91.0	275.5	607.5	591.4	16.12	37.692	
3,700.0	3,675.0	3,634.6	3,625.5	10.6	8.9	164.12	164.12	94.7	283.1	628.9	612.3	16.59	37.899	
3,800.0	3,773.9	3,732.3	3,722.8	10.9	9.2	164.13	164.13	98.4	290.6	650.3	633.2	17.07	38.093	
3,900.0	3,872.9	3,830.0	3,820.2	11.3	9.4	164.14	164.14	102.1	298.2	671.7	654.1	17.55	38.276	
4,000.0	3,971.9	3,927.7	3,917.5	11.6	9.7	164.15	164.15	105.8	305.7	693.1	675.0	18.03	38.449	
4,100.0	4,070.8	4,025.4	4,014.8	12.0	9.9	164.16	164.16	109.4	313.2	714.5	695.9	18.50	38.611	
4,200.0	4,169.8	4,123.1	4,112.1	12.3	10.2	164.17	164.17	113.1	320.8	735.8	716.9	18.98	38.765	
4,300.0	4,268.8	4,220.8	4,209.5	12.7	10.5	164.17	164.17	116.8	328.3	757.2	737.8	19.46	38.911	
4,400.0	4,367.7	4,318.4	4,306.8	13.0	10.7	164.18	164.18	120.5	335.8	778.6	758.7	19.94	39.049	
4,500.0	4,466.7	4,416.1	4,404.1	13.4	11.0	164.19	164.19	124.2	343.4	800.0	779.6	20.42	39.180	
4,600.0	4,565.7	4,513.8	4,501.4	13.7	11.3	164.20	164.20	127.9	350.9	821.4	800.5	20.90	39.305	
4,700.0	4,664.7	4,611.5	4,598.8	14.0	11.5	164.20	164.20	131.5	358.5	842.8	821.4	21.38	39.424	
4,800.0	4,763.6	4,709.2	4,696.1	14.4	11.8	164.21	164.21	135.2	366.0	864.2	842.3	21.86	39.537	
4,900.0	4,862.6	4,806.9	4,793.4	14.7	12.1	164.22	164.22	138.9	373.5	885.6	863.2	22.34	39.644	
5,000.0	4,961.6	4,904.6	4,890.7	15.1	12.3	164.22	164.22	142.6	381.1	907.0	884.1	22.82	39.747	

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 Becker Ranch 5M-403
Project:	SEC.5-T3N-R64W	TVD Reference:	WELL @ 4797.0ft (RKB - 15')
Reference Site:	Becker Ranch 5MR-HZ Pad Sec.5-T3N-R64W	MD Reference:	WELL @ 4797.0ft (RKB - 15')
Site Error:	0.0ft	North Reference:	True
Reference Well:	Becker Ranch 5M-403	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 (12-02-13)	Offset TVD Reference:	Offset Datum

Offset Design													Offset Site Error:	0.0 ft
Survey Program: 0-MWD													Offset Well Error:	0.0 ft
Reference		Offset		Semi Major Axis		Highside Toolface (°)	Distance		Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning	
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)		Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)						
5,100.0	5,060.5	5,002.2	4,988.1	15.4	12.6	164.23	146.3	388.6	928.3	905.0	23.30	39.846		
5,200.0	5,159.6	5,100.1	5,085.6	15.8	12.9	164.30	150.0	396.2	948.9	925.1	23.81	39.858		
5,300.0	5,259.1	5,198.6	5,183.7	16.0	13.1	164.33	153.7	403.7	966.3	942.0	24.28	39.795		
5,400.0	5,358.9	5,310.1	5,294.8	16.2	13.4	164.28	157.8	412.1	980.2	955.5	24.75	39.613		
5,500.0	5,458.8	5,454.3	5,438.9	16.3	13.7	164.22	160.7	418.1	987.5	962.3	25.18	39.210		
5,600.0	5,558.8	5,573.3	5,557.8	16.5	13.9	90.00	161.0	418.7	988.2	962.6	25.58	38.637		
5,700.0	5,658.8	5,673.3	5,657.8	16.6	14.1	90.00	161.0	418.7	988.2	962.2	25.97	38.046		
5,800.0	5,758.8	5,773.3	5,757.8	16.8	14.3	90.00	161.0	418.7	988.2	961.8	26.37	37.466		
5,900.0	5,858.8	5,873.3	5,857.8	17.0	14.5	90.00	161.0	418.7	988.2	961.4	26.78	36.902		
6,000.0	5,958.8	5,973.3	5,957.8	17.1	14.7	90.00	161.0	418.7	988.2	961.0	27.18	36.352		
6,061.7	6,020.5	6,035.0	6,019.5	17.2	14.8	90.00	161.0	418.7	988.2	960.7	27.43	36.020		
6,100.0	6,058.8	6,073.3	6,057.8	17.3	14.8	90.02	160.6	418.7	988.2	960.6	27.58	35.830		
6,200.0	6,158.8	6,172.2	6,156.2	17.5	15.0	90.58	150.9	418.7	988.2	960.3	27.91	35.403		
6,300.0	6,258.8	6,267.4	6,248.9	17.6	15.1	-88.23	129.7	418.7	988.7	960.5	28.19	35.071		
6,400.0	6,358.0	6,359.7	6,335.6	17.7	15.2	-86.96	98.4	418.7	989.6	961.2	28.39	34.859		
6,500.0	6,454.8	6,450.0	6,416.3	17.8	15.2	-85.74	57.7	418.7	991.0	962.5	28.56	34.698		
6,600.0	6,547.5	6,537.9	6,489.5	17.9	15.3	-84.60	9.3	418.7	992.7	964.0	28.76	34.522		
6,700.0	6,634.5	6,624.4	6,555.8	18.0	15.4	-83.55	-46.2	418.7	994.7	965.6	29.03	34.263		
6,800.0	6,714.4	6,709.4	6,614.4	18.1	15.6	-82.59	-107.8	418.7	996.7	967.2	29.43	33.866		
6,900.0	6,785.8	6,793.3	6,665.2	18.2	15.9	-81.76	-174.5	418.7	998.7	968.6	30.02	33.271		

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Becker Ranch 5M-403
Project:	SEC.5-T3N-R64W	TVD Reference:	WELL @ 4797.0ft (RKB - 15')
Reference Site:	Becker Ranch 5MR-HZ Pad Sec.5-T3N-R64W	MD Reference:	WELL @ 4797.0ft (RKB - 15')
Site Error:	0.0ft	North Reference:	True
Reference Well:	Becker Ranch 5M-403	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 (12-02-13)	Offset TVD Reference:	Offset Datum

Offset Design Becker Ranch 5MR-HZ Pad Sec.5-T3N-R64W - Becker Ranch 5R-443 - Wellbore #1 - Plan #1 (12-02-1													Offset Site Error:	0.0 ft
Survey Program: 0-MWD													Offset Well Error:	0.0 ft
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+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	0.0	61.4	61.4					
100.0	100.0	100.0	100.0	0.1	0.1	90.00	0.0	61.4	61.4	61.2	0.22	273.175		
200.0	200.0	200.0	200.0	0.3	0.3	90.00	0.0	61.4	61.4	60.7	0.67	91.058		
300.0	300.0	300.0	300.0	0.6	0.6	90.00	0.0	61.4	61.4	60.3	1.12	54.635		
400.0	400.0	400.0	400.0	0.8	0.8	90.00	0.0	61.4	61.4	59.8	1.57	39.025		
500.0	500.0	500.0	500.0	1.0	1.0	90.00	0.0	61.4	61.4	59.4	2.02	30.353		
600.0	600.0	600.0	600.0	1.2	1.2	90.00	0.0	61.4	61.4	58.9	2.47	24.834		
700.0	700.0	700.0	700.0	1.5	1.5	90.00	0.0	61.4	61.4	58.5	2.92	21.013		
800.0	800.0	800.0	800.0	1.7	1.7	90.00	0.0	61.4	61.4	58.0	3.37	18.212		
900.0	900.0	900.0	900.0	1.9	1.9	90.00	0.0	61.4	61.4	57.6	3.82	16.069		
1,000.0	1,000.0	1,000.0	1,000.0	2.1	2.1	90.00	0.0	61.4	61.4	57.1	4.27	14.378 CC, ES		
1,100.0	1,100.0	1,100.0	1,100.0	2.4	2.4	164.64	0.0	61.4	63.1	58.4	4.71	13.396		
1,200.0	1,199.8	1,199.8	1,199.8	2.6	2.6	165.78	0.0	61.4	68.1	63.0	5.14	13.265		
1,300.0	1,299.5	1,299.5	1,299.5	2.8	2.8	167.34	0.0	61.4	76.6	71.1	5.56	13.774		
1,400.0	1,398.7	1,398.7	1,398.7	3.0	3.0	169.03	0.0	61.4	88.6	82.6	5.99	14.795		
1,500.0	1,497.7	1,497.7	1,497.7	3.3	3.3	170.54	0.0	61.4	102.6	96.2	6.42	15.983		
1,600.0	1,596.6	1,596.6	1,596.6	3.6	3.5	171.69	0.0	61.4	116.8	109.9	6.86	17.016		
1,700.0	1,695.6	1,695.6	1,695.6	3.9	3.7	172.60	0.0	61.4	131.0	123.7	7.31	17.922		
1,800.0	1,794.6	1,794.6	1,794.6	4.2	3.9	173.33	0.0	61.4	145.2	137.5	7.76	18.721		
1,900.0	1,893.5	1,893.5	1,893.5	4.5	4.1	173.93	0.0	61.4	159.5	151.3	8.21	19.429		
2,000.0	1,992.5	1,992.5	1,992.5	4.8	4.4	174.43	0.0	61.4	173.7	165.1	8.66	20.061		
2,100.0	2,091.5	2,091.5	2,091.5	5.1	4.6	174.85	0.0	61.4	188.0	178.9	9.11	20.628		
2,200.0	2,190.4	2,190.4	2,190.4	5.5	4.8	175.21	0.0	61.4	202.3	192.7	9.57	21.140		
2,300.0	2,289.4	2,289.4	2,289.4	5.8	5.0	175.53	0.0	61.4	216.5	206.5	10.02	21.603		
2,400.0	2,388.4	2,388.4	2,388.4	6.1	5.3	175.81	0.0	61.4	230.8	220.4	10.48	22.024		
2,500.0	2,487.4	2,487.4	2,487.4	6.5	5.5	176.05	0.0	61.4	245.1	234.2	10.94	22.409		
2,600.0	2,586.3	2,586.3	2,586.3	6.8	5.7	176.27	0.0	61.4	259.4	248.0	11.40	22.761		
2,700.0	2,685.3	2,685.3	2,685.3	7.1	5.9	176.47	0.0	61.4	273.7	261.9	11.86	23.085		
2,800.0	2,784.3	2,784.3	2,784.3	7.5	6.1	176.64	0.0	61.4	288.0	275.7	12.32	23.384		
2,900.0	2,883.2	2,883.2	2,883.2	7.8	6.4	176.80	0.0	61.4	302.3	289.6	12.78	23.661		
3,000.0	2,982.2	2,982.2	2,982.2	8.2	6.6	176.95	0.0	61.4	316.6	303.4	13.24	23.918		
3,100.0	3,081.2	3,081.6	3,081.6	8.5	6.8	176.87	1.1	61.6	330.9	317.2	13.70	24.152		
3,200.0	3,180.1	3,181.1	3,181.0	8.8	7.0	176.24	5.6	62.4	345.0	330.8	14.16	24.362		
3,300.0	3,279.1	3,280.0	3,279.7	9.2	7.3	175.27	12.5	63.6	359.1	344.4	14.62	24.554		
3,400.0	3,378.1	3,378.9	3,378.2	9.5	7.5	174.37	19.4	64.8	373.2	358.2	15.09	24.736		
3,500.0	3,477.0	3,477.7	3,476.8	9.9	7.7	173.53	26.3	66.0	387.5	371.9	15.56	24.907		
3,600.0	3,576.0	3,576.5	3,575.4	10.2	7.9	172.75	33.2	67.2	401.8	385.8	16.03	25.068		
3,700.0	3,675.0	3,675.3	3,674.0	10.6	8.2	172.02	40.1	68.4	416.2	399.7	16.50	25.219		
3,800.0	3,773.9	3,774.2	3,772.5	10.9	8.4	171.34	47.0	69.6	430.7	413.7	16.98	25.362		
3,900.0	3,872.9	3,873.0	3,871.1	11.3	8.6	170.70	53.9	70.8	445.2	427.7	17.46	25.496		
4,000.0	3,971.9	3,971.8	3,969.7	11.6	8.8	170.11	60.8	72.0	459.8	441.8	17.94	25.623		
4,100.0	4,070.8	4,070.6	4,068.3	12.0	9.1	169.55	67.8	73.1	474.4	456.0	18.43	25.743		
4,200.0	4,169.8	4,169.4	4,166.8	12.3	9.3	169.03	74.7	74.3	489.0	470.1	18.91	25.856		
4,300.0	4,268.8	4,268.3	4,265.4	12.7	9.5	168.53	81.6	75.5	503.7	484.3	19.40	25.963		
4,400.0	4,367.7	4,367.1	4,364.0	13.0	9.8	168.07	88.5	76.7	518.5	498.6	19.89	26.065		
4,500.0	4,466.7	4,465.9	4,462.6	13.4	10.0	167.63	95.4	77.9	533.2	512.8	20.38	26.161		
4,600.0	4,565.7	4,564.7	4,561.1	13.7	10.3	167.21	102.3	79.1	548.0	527.1	20.87	26.252		
4,700.0	4,664.7	4,663.6	4,659.7	14.0	10.5	166.82	109.2	80.3	562.8	541.5	21.37	26.339		
4,800.0	4,763.6	4,762.4	4,758.3	14.4	10.7	166.44	116.1	81.5	577.7	555.8	21.86	26.421		
4,900.0	4,862.6	4,861.2	4,856.9	14.7	11.0	166.08	123.0	82.7	592.5	570.2	22.36	26.500		
5,000.0	4,961.6	4,960.0	4,955.4	15.1	11.2	165.75	130.0	83.9	607.4	584.6	22.86	26.575		

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 Becker Ranch 5M-403
Project:	SEC.5-T3N-R64W	TVD Reference:	WELL @ 4797.0ft (RKB - 15')
Reference Site:	Becker Ranch 5MR-HZ Pad Sec.5-T3N-R64W	MD Reference:	WELL @ 4797.0ft (RKB - 15')
Site Error:	0.0ft	North Reference:	True
Reference Well:	Becker Ranch 5M-403	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 (12-02-13)	Offset TVD Reference:	Offset Datum

Offset Design Becker Ranch 5MR-HZ Pad Sec.5-T3N-R64W - Becker Ranch 5R-443 - Wellbore #1 - Plan #1 (12-02-1													Offset Site Error:	0.0 ft
Survey Program: 0-MWD													Offset Well Error:	0.0 ft
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference	Offset	Semi Major Axis	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
5,100.0	5,060.5	5,058.9	5,054.0	15.4	11.5	165.42	136.9	85.1	622.3	599.0	23.35	26.646		
5,200.0	5,159.6	5,157.8	5,152.7	15.8	11.7	165.15	143.8	86.3	636.4	612.5	23.87	26.662		
5,300.0	5,259.1	5,257.1	5,251.7	16.0	11.9	164.81	150.7	87.5	647.3	623.0	24.35	26.588		
5,400.0	5,358.9	5,358.8	5,353.3	16.2	12.2	164.43	157.3	88.7	654.8	630.0	24.78	26.424		
5,500.0	5,458.8	5,462.8	5,457.1	16.3	12.4	164.23	160.7	89.3	658.4	633.3	25.14	26.186		
5,600.0	5,558.8	5,564.4	5,558.8	16.5	12.6	90.00	161.0	89.3	658.8	633.3	25.50	25.835		
5,700.0	5,658.8	5,664.4	5,658.8	16.6	12.8	90.00	161.0	89.3	658.8	632.9	25.90	25.431		
5,800.0	5,758.8	5,764.4	5,758.8	16.8	13.0	90.00	161.0	89.3	658.8	632.5	26.32	25.030		
5,900.0	5,858.8	5,864.4	5,858.8	17.0	13.2	90.00	161.0	89.3	658.8	632.0	26.73	24.641		
6,000.0	5,958.8	5,964.4	5,958.8	17.1	13.4	90.00	161.0	89.3	658.8	631.6	27.15	24.263		
6,100.0	6,058.8	6,064.4	6,058.8	17.3	13.6	90.00	161.0	89.3	658.8	631.2	27.57	23.895		
6,200.0	6,158.8	6,164.4	6,158.8	17.5	13.9	90.00	161.0	89.3	658.8	630.8	27.99	23.537		
6,300.0	6,258.8	6,264.4	6,258.8	17.6	14.1	-90.00	159.8	89.3	658.8	630.4	28.38	23.214		
6,400.0	6,358.0	6,364.4	6,358.0	17.7	14.2	-90.00	147.8	89.3	658.8	630.1	28.84	23.001		
6,500.0	6,454.8	6,464.4	6,454.8	17.8	14.3	-90.00	122.9	89.3	658.8	629.9	28.84	22.846		
6,600.0	6,547.5	6,564.4	6,547.5	17.9	14.4	-90.00	85.6	89.3	658.8	629.8	29.01	22.710		
6,700.0	6,634.5	6,664.4	6,634.5	18.0	14.5	-90.00	36.5	89.3	658.8	629.5	29.22	22.543		
6,800.0	6,714.4	6,764.4	6,714.4	18.1	14.6	-90.00	-23.5	89.3	658.8	629.2	29.56	22.289		
6,900.0	6,785.8	6,864.4	6,785.8	18.2	14.9	-90.00	-93.4	89.3	658.8	628.7	30.09	21.894		
7,000.0	6,847.4	6,964.4	6,847.4	18.4	15.3	-90.00	-172.1	89.3	658.8	627.9	30.89	21.324		
7,100.0	6,898.3	7,064.4	6,898.2	18.7	15.9	-90.00	-258.1	89.3	658.8	626.7	32.02	20.572		
7,200.0	6,937.4	7,164.4	6,937.4	19.2	16.6	-90.00	-350.1	89.3	658.8	625.3	33.50	19.667		
7,300.0	6,964.3	7,264.4	6,964.3	19.9	17.5	-90.00	-446.3	89.3	658.8	623.5	35.31	18.658		
7,400.0	6,978.6	7,364.4	6,978.6	20.8	18.6	-90.00	-545.2	89.3	658.8	621.4	37.42	17.605		
7,500.0	6,988.1	7,464.4	6,988.1	21.8	19.8	-90.00	-644.8	89.3	658.8	619.0	39.79	16.558		
7,600.0	6,990.3	7,564.4	6,990.3	23.0	21.1	-90.00	-744.7	89.3	658.8	616.4	42.35	15.556		
7,700.0	6,990.3	7,664.4	6,990.3	24.2	22.5	-90.00	-844.7	89.3	658.8	613.7	45.10	14.608		
7,800.0	6,990.4	7,764.4	6,990.4	25.6	23.9	-90.00	-944.7	89.3	658.8	610.8	47.99	13.728		
7,900.0	6,990.4	7,864.4	6,990.4	27.0	25.4	-90.00	-1,044.7	89.3	658.8	607.8	51.01	12.916		
8,000.0	6,990.4	7,964.4	6,990.4	28.5	27.0	-90.00	-1,144.7	89.3	658.8	604.6	54.13	12.171		
8,100.0	6,990.4	8,064.4	6,990.4	30.0	28.6	-90.00	-1,244.7	89.3	658.8	601.4	57.34	11.490		
8,200.0	6,990.4	8,164.4	6,990.4	31.6	30.2	-90.00	-1,344.7	89.3	658.8	598.2	60.62	10.867		
8,300.0	6,990.4	8,264.4	6,990.4	33.2	31.9	-90.00	-1,444.7	89.3	658.8	594.8	63.96	10.299		
8,400.0	6,990.5	8,364.4	6,990.5	34.8	33.6	-90.00	-1,544.7	89.3	658.8	591.4	67.36	9.780		
8,500.0	6,990.5	8,464.4	6,990.5	36.5	35.3	-90.00	-1,644.7	89.3	658.8	588.0	70.80	9.304		
8,600.0	6,990.5	8,564.4	6,990.5	38.2	37.1	-90.00	-1,744.7	89.3	658.8	584.5	74.28	8.868		
8,700.0	6,990.5	8,664.4	6,990.5	39.9	38.8	-90.00	-1,844.7	89.3	658.8	581.0	77.80	8.468		
8,800.0	6,990.5	8,764.4	6,990.5	41.6	40.6	-90.00	-1,944.7	89.3	658.8	577.4	81.34	8.099		
8,900.0	6,990.6	8,864.4	6,990.6	43.4	42.4	-90.00	-2,044.7	89.3	658.8	573.9	84.91	7.758		
9,000.0	6,990.6	8,964.4	6,990.6	45.1	44.2	-90.00	-2,144.7	89.3	658.8	570.3	88.50	7.443		
9,100.0	6,990.6	9,064.4	6,990.6	46.9	46.0	-90.00	-2,244.7	89.3	658.8	566.7	92.11	7.152		
9,200.0	6,990.6	9,164.4	6,990.6	48.7	47.8	-90.00	-2,344.7	89.3	658.8	563.0	95.74	6.881		
9,300.0	6,990.6	9,264.4	6,990.6	50.5	49.7	-90.00	-2,444.7	89.3	658.8	559.4	99.39	6.628		
9,400.0	6,990.6	9,364.4	6,990.6	52.3	51.5	-90.00	-2,544.7	89.3	658.8	555.7	103.05	6.393		
9,500.0	6,990.7	9,464.4	6,990.7	54.1	53.3	-90.00	-2,644.7	89.3	658.8	552.0	106.72	6.173		
9,600.0	6,990.7	9,564.4	6,990.7	55.9	55.2	-90.00	-2,744.7	89.3	658.8	548.4	110.40	5.967		
9,700.0	6,990.7	9,664.4	6,990.7	57.8	57.0	-90.00	-2,844.7	89.3	658.8	544.7	114.10	5.774		
9,800.0	6,990.7	9,764.4	6,990.7	59.6	58.9	-90.00	-2,944.7	89.3	658.8	541.0	117.80	5.592		
9,900.0	6,990.7	9,864.4	6,990.7	61.4	60.7	-90.00	-3,044.7	89.3	658.8	537.3	121.51	5.421		
10,000.0	6,990.7	9,964.4	6,990.7	63.3	62.6	-90.00	-3,144.7	89.3	658.8	533.5	125.23	5.260		
10,100.0	6,990.8	10,064.4	6,990.8	65.1	64.5	-90.00	-3,244.7	89.3	658.8	529.8	128.96	5.108		

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 Becker Ranch 5M-403
Project:	SEC.5-T3N-R64W	TVD Reference:	WELL @ 4797.0ft (RKB - 15')
Reference Site:	Becker Ranch 5MR-HZ Pad Sec.5-T3N-R64W	MD Reference:	WELL @ 4797.0ft (RKB - 15')
Site Error:	0.0ft	North Reference:	True
Reference Well:	Becker Ranch 5M-403	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 (12-02-13)	Offset TVD Reference:	Offset Datum

Offset Design										Becker Ranch 5MR-HZ Pad Sec.5-T3N-R64W - Becker Ranch 5R-443 - Wellbore #1 - Plan #1 (12-02-1				Offset Site Error:		0.0 ft
Survey Program: 0-MWD														Offset Well Error:		0.0 ft
Reference		Offset		Semi Major Axis		Distance								Warning		
Measured Depth	Vertical Depth	Measured Depth	Vertical Depth	Reference	Offset	Highside Toolface	Offset Wellbore Centre		Between Centres	Between Ellipses	Minimum Separation	Separation Factor				
(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(°)	+N/-S (ft)	+E/-W (ft)	(ft)	(ft)	(ft)					
10,200.0	6,990.8	10,164.4	6,990.8	67.0	66.3	-90.00	-3,344.7	89.3	658.8	526.1	132.69	4.965				
10,300.0	6,990.8	10,264.4	6,990.8	68.8	68.2	-90.00	-3,444.7	89.3	658.8	522.3	136.43	4.829				
10,400.0	6,990.8	10,364.4	6,990.8	70.7	70.1	-90.00	-3,544.7	89.3	658.8	518.6	140.17	4.700				
10,500.0	6,990.8	10,464.4	6,990.8	72.5	71.9	-90.00	-3,644.7	89.3	658.8	514.9	143.92	4.577				
10,600.0	6,990.9	10,564.4	6,990.9	74.4	73.8	-90.00	-3,744.7	89.3	658.8	511.1	147.67	4.461				
10,700.0	6,990.9	10,664.4	6,990.9	76.3	75.7	-90.00	-3,844.7	89.3	658.8	507.3	151.43	4.350				
10,800.0	6,990.9	10,764.4	6,990.9	78.1	77.6	-90.00	-3,944.7	89.3	658.8	503.6	155.19	4.245				
10,900.0	6,990.9	10,864.4	6,990.9	80.0	79.5	-90.00	-4,044.7	89.3	658.8	499.8	158.96	4.144				
11,000.0	6,990.9	10,964.4	6,990.9	81.9	81.3	-90.00	-4,144.7	89.3	658.8	496.0	162.73	4.048				
11,100.0	6,990.9	11,064.4	6,990.9	83.7	83.2	-90.00	-4,244.7	89.3	658.8	492.3	166.50	3.957				
11,200.0	6,991.0	11,164.4	6,991.0	85.6	85.1	-90.00	-4,344.7	89.3	658.8	488.5	170.27	3.869				
11,300.0	6,991.0	11,264.4	6,991.0	87.5	87.0	-90.00	-4,444.7	89.3	658.8	484.7	174.05	3.785				
11,400.0	6,991.0	11,364.4	6,991.0	89.4	88.9	-90.00	-4,544.7	89.3	658.8	480.9	177.83	3.704				
11,453.4	6,991.0	11,417.9	6,991.0	90.4	89.9	-90.00	-4,598.2	89.3	658.8	478.9	179.85	3.663 SF				

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Becker Ranch 5M-403
Project:	SEC.5-T3N-R64W	TVD Reference:	WELL @ 4797.0ft (RKB - 15')
Reference Site:	Becker Ranch 5MR-HZ Pad Sec.5-T3N-R64W	MD Reference:	WELL @ 4797.0ft (RKB - 15')
Site Error:	0.0ft	North Reference:	True
Reference Well:	Becker Ranch 5M-403	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 (12-02-13)	Offset TVD Reference:	Offset Datum

Offset Design		Existing Wells Sec.5-T3N-R64W - Becker 15-9I (Exist.) - Wellbore #1 - Wellbore #1											Offset Site Error:	0.0 ft
Survey Program: 7210-UNKNOWN													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)				
9,700.0	6,990.7	6,945.7	6,945.7	57.8	138.9	89.94	-3,770.5	-725.8	938.9	742.9	196.00	4.790		
9,800.0	6,990.7	6,945.7	6,945.7	59.6	138.9	89.95	-3,770.5	-725.8	840.5	642.6	197.85	4.248		
9,900.0	6,990.7	6,945.7	6,945.7	61.4	138.9	89.95	-3,770.5	-725.8	742.4	542.7	199.70	3.718		
10,000.0	6,990.7	6,945.7	6,945.7	63.3	138.9	89.96	-3,770.5	-725.8	645.0	443.5	201.56	3.200		
10,100.0	6,990.8	6,945.8	6,945.8	65.1	138.9	89.97	-3,770.5	-725.8	548.5	345.1	203.42	2.697		
10,200.0	6,990.8	6,945.8	6,945.8	67.0	138.9	89.97	-3,770.5	-725.8	453.6	248.3	205.29	2.210		
10,300.0	6,990.8	6,945.8	6,945.8	68.8	138.9	89.98	-3,770.5	-725.8	361.4	154.2	207.16	1.744		
10,400.0	6,990.8	6,945.8	6,945.8	70.7	138.9	89.99	-3,770.5	-725.8	274.6	65.6	209.03	1.314	Level 3	
10,500.0	6,990.8	6,945.8	6,945.8	72.5	138.9	89.99	-3,770.5	-725.8	200.6	-10.3	210.90	0.951	Level 1	
10,600.0	6,990.9	6,945.9	6,945.9	74.4	138.9	90.00	-3,770.5	-725.8	158.4	-54.4	212.78	0.745	Level 1	
10,625.8	6,990.9	6,945.9	6,945.9	74.9	138.9	90.00	-3,770.5	-725.8	156.3	-57.0	213.26	0.733	Level 1, CC, ES, SF	
10,700.0	6,990.9	6,945.9	6,945.9	76.3	138.9	90.00	-3,770.5	-725.8	173.0	-41.6	214.65	0.806	Level 1	
10,800.0	6,990.9	6,945.9	6,945.9	78.1	138.9	90.01	-3,770.5	-725.8	234.0	17.5	216.53	1.081	Level 2	
10,900.0	6,990.9	6,945.9	6,945.9	80.0	138.9	90.02	-3,770.5	-725.8	315.6	97.2	218.42	1.445	Level 3	
11,000.0	6,990.9	6,945.9	6,945.9	81.9	138.9	90.02	-3,770.5	-725.8	405.5	185.2	220.30	1.841		
11,100.0	6,990.9	6,945.9	6,945.9	83.7	138.9	90.03	-3,770.5	-725.8	499.3	277.1	222.19	2.247		
11,200.0	6,991.0	6,946.0	6,946.0	85.6	138.9	90.04	-3,770.5	-725.8	595.1	371.0	224.07	2.656		
11,300.0	6,991.0	6,946.0	6,946.0	87.5	138.9	90.04	-3,770.5	-725.8	692.1	466.1	225.96	3.063		
11,400.0	6,991.0	6,946.0	6,946.0	89.4	138.9	90.05	-3,770.5	-725.8	789.8	562.0	227.85	3.466		
11,453.4	6,991.0	6,946.0	6,946.0	90.4	138.9	90.05	-3,770.5	-725.8	842.3	613.4	228.86	3.680		

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Becker Ranch 5M-403
Project:	SEC.5-T3N-R64W	TVD Reference:	WELL @ 4797.0ft (RKB - 15')
Reference Site:	Becker Ranch 5MR-HZ Pad Sec.5-T3N-R64W	MD Reference:	WELL @ 4797.0ft (RKB - 15')
Site Error:	0.0ft	North Reference:	True
Reference Well:	Becker Ranch 5M-403	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 (12-02-13)	Offset TVD Reference:	Offset Datum

Offset Design		Existing Wells Sec.5-T3N-R64W - Becker 6-11I (Exist.) - Wellbore #1 - Wellbore #1											Offset Site Error:	0.0 ft
Survey Program: 7200-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)			
7,000.0	6,847.4	6,838.4	6,838.4	18.4	136.8	7.47	-1,114.8	-639.2	945.2	854.6	90.60	10.433		
7,100.0	6,898.3	6,889.3	6,889.3	18.7	137.8	10.22	-1,114.8	-639.2	859.5	782.5	76.99	11.164		
7,200.0	6,937.4	6,928.4	6,928.4	19.2	138.6	15.39	-1,114.8	-639.2	767.9	699.7	68.18	11.262		
7,300.0	6,964.3	6,955.3	6,955.3	19.9	139.1	26.96	-1,114.8	-639.2	672.1	592.1	79.98	8.403		
7,400.0	6,978.6	6,969.6	6,969.6	20.8	139.4	49.50	-1,114.8	-639.2	573.8	451.1	122.64	4.678		
7,500.0	6,988.1	6,979.1	6,979.1	21.8	139.6	67.12	-1,114.8	-639.2	475.1	327.1	148.00	3.210		
7,600.0	6,990.3	6,981.3	6,981.3	23.0	139.6	89.95	-1,114.8	-639.2	376.5	215.6	160.91	2.340		
7,700.0	6,990.3	6,981.3	6,981.3	24.2	139.6	89.96	-1,114.8	-639.2	278.9	116.6	162.28	1.719		
7,800.0	6,990.4	6,981.4	6,981.4	25.6	139.6	89.98	-1,114.8	-639.2	183.8	20.1	163.72	1.122 Level 2		
7,900.0	6,990.4	6,981.4	6,981.4	27.0	139.6	89.99	-1,114.8	-639.2	98.8	-66.4	165.22	0.598 Level 1		
7,970.0	6,990.4	6,981.4	6,981.4	28.0	139.6	90.00	-1,114.8	-639.2	69.7	-96.6	166.31	0.419 Level 1, CC, ES, SF		
8,000.0	6,990.4	6,981.4	6,981.4	28.5	139.6	90.00	-1,114.8	-639.2	75.9	-90.9	166.77	0.455 Level 1		
8,100.0	6,990.4	6,981.4	6,981.4	30.0	139.6	90.02	-1,114.8	-639.2	147.5	-20.9	168.37	0.876 Level 1		
8,200.0	6,990.4	6,981.4	6,981.4	31.6	139.6	90.03	-1,114.8	-639.2	240.3	70.3	170.01	1.413 Level 3		
8,300.0	6,990.4	6,981.4	6,981.4	33.2	139.6	90.05	-1,114.8	-639.2	337.2	165.6	171.68	1.964		
8,400.0	6,990.5	6,981.5	6,981.5	34.8	139.6	90.06	-1,114.8	-639.2	435.6	262.2	173.37	2.512		
8,500.0	6,990.5	6,981.5	6,981.5	36.5	139.6	90.08	-1,114.8	-639.2	534.5	359.4	175.09	3.053		
8,600.0	6,990.5	6,981.5	6,981.5	38.2	139.6	90.09	-1,114.8	-639.2	633.8	457.0	176.82	3.584		
8,700.0	6,990.5	6,981.5	6,981.5	39.9	139.6	90.10	-1,114.8	-639.2	733.3	554.7	178.58	4.106		
8,800.0	6,990.5	6,981.5	6,981.5	41.6	139.6	90.12	-1,114.8	-639.2	832.9	652.5	180.35	4.618		
8,900.0	6,990.6	6,981.6	6,981.6	43.4	139.6	90.13	-1,114.8	-639.2	932.6	750.4	182.13	5.120		

Reference Depths are relative to WELL @ 4797.0ft (RKB - 15')	Coordinates are relative to: Becker Ranch 5M-403
Offset Depths are relative to Offset Datum	Coordinate System is US State Plane 1983, Colorado Northern Zone
Central Meridian is -105.500000 °	Grid Convergence at Surface is: 0.60°



Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Becker Ranch 5M-403
Project:	SEC.5-T3N-R64W	TVD Reference:	WELL @ 4797.0ft (RKB - 15')
Reference Site:	Becker Ranch 5MR-HZ Pad Sec.5-T3N-R64W	MD Reference:	WELL @ 4797.0ft (RKB - 15')
Site Error:	0.0ft	North Reference:	True
Reference Well:	Becker Ranch 5M-403	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 (12-02-13)	Offset TVD Reference:	Offset Datum

Reference Depths are relative to WELL @ 4797.0ft (RKB - 15')
Offset Depths are relative to Offset Datum
Central Meridian is -105.500000 °

Coordinates are relative to: Becker Ranch 5M-403
Coordinate System is US State Plane 1983, Colorado Northern Zone
Grid Convergence at Surface is: 0.60°

