

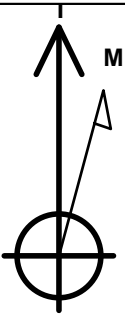
PETROLEUM DEVELOPMENT CORP Weld County CO

Well Name: Heinrich 7E-223

Surface Location: Heinrich 5N67W7EJ Pad Sec.7-T5N-R67W
North American Datum 1983 , US State Plane 1983 , Colorado Northern Zone
Ground Elevation: 4967.0
+N/-S +E/-W Northing Easting Latitude Longitude Slot
0.0 0.0 1396555.15 3155586.05 40.420600 -104.941190
Original Well Elev WELL @ 4982.0ft (Original Well Elev)

WELLBORE TARGET DETAILS

Name	TVD	+N/-S	+E/-W	Shape
SHL 308'FNL & 877'FWL	1.0	0.0	0.0	Point
BHL 500'FSL & 483'FWL	7027.0	-4470.1	-453.9	Point



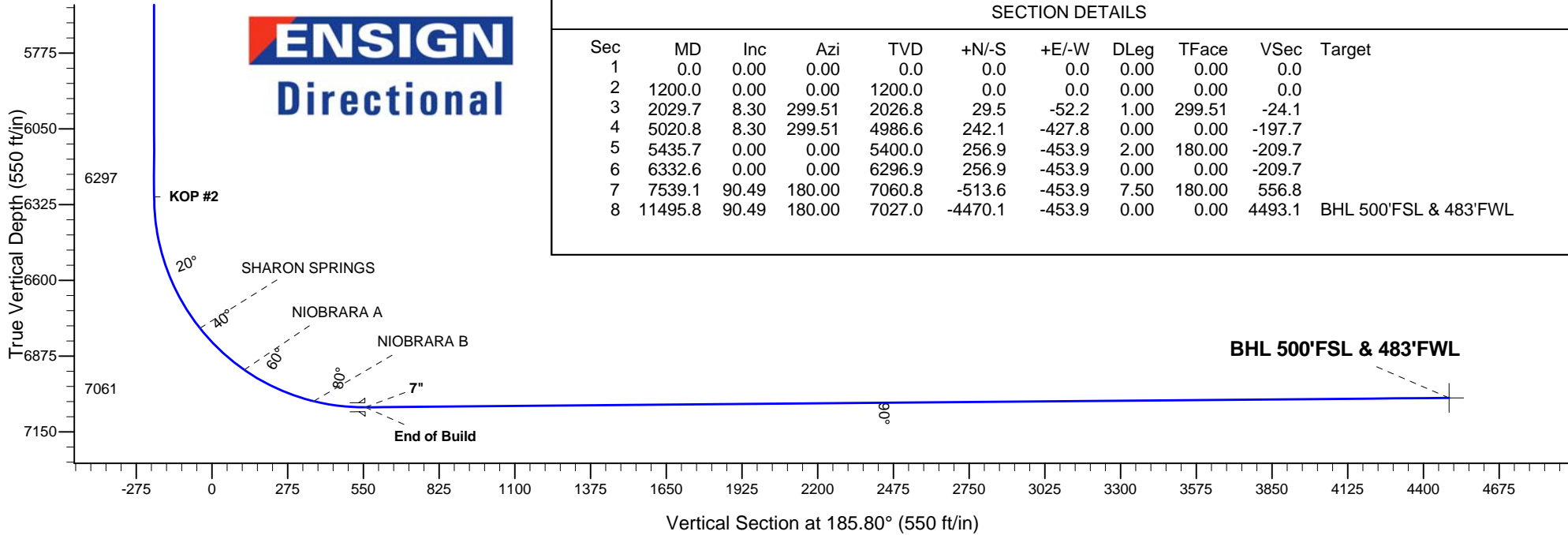
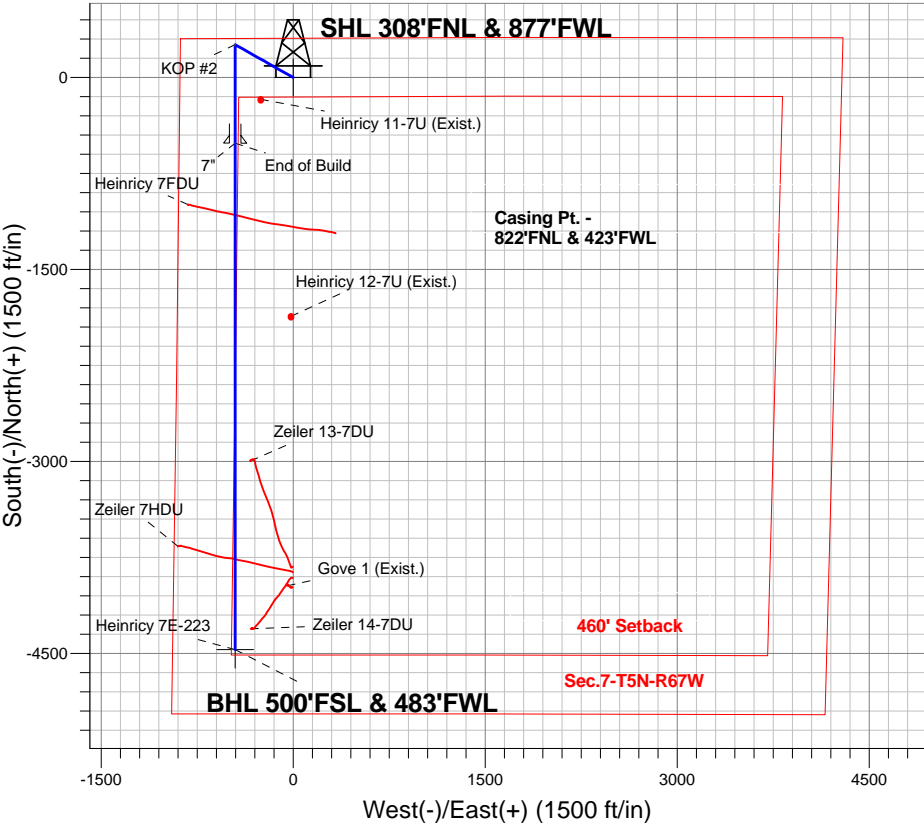
Azimuths to True North
Magnetic North: 8.50°

Magnetic Field
Strength: 52761.3nT
Dip Angle: 66.92°
Date: 11/18/2014
Model: IGRF2010

ANNOTATIONS

TVD	MD	Annotation
1200.0	1200.0	KOP #1
6296.9	6332.6	KOP #2
7060.8	7539.1	End of Build

Heinrich 5N67W7EJ Pad Sec.7-T5N-R67W
Heinrich 7E-223
Plan #1 (11-10-14)





PETROLEUM DEVELOPMENT CORP Weld County CO

SEC.7-T5N-R67W

Heinricy 5N67W7EJ Pad Sec.7-T5N-R67W

Heinricy 7E-223

Wellbore #1

Plan: Plan #1 (11-10-14)

Standard Planning Report

18 November, 2014

Database:	landmark	Local Co-ordinate Reference:	Well Heinrich 7E-223
Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	TVD Reference:	WELL @ 4982.0ft (Original Well Elev)
Project:	SEC.7-T5N-R67W	MD Reference:	WELL @ 4982.0ft (Original Well Elev)
Site:	Heinrich 5N67W7EJ Pad Sec.7-T5N-R67W	North Reference:	True
Well:	Heinrich 7E-223	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Plan #1 (11-10-14)		

Project	SEC.7-T5N-R67W, 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	Heinrich 5N67W7EJ Pad Sec.7-T5N-R67W		
Site Position:		Northing:	1,396,555.16 ft
From:	Lat/Long	Easting:	3,155,586.05 ft
Position Uncertainty:	0.0 ft	Slot Radius:	"
		Latitude:	40.420600
		Longitude:	-104.941190
		Grid Convergence:	0.36 °

Well	Heinrich 7E-223		
Well Position	+N/-S	0.0 ft	Northing:
	+E/-W	0.0 ft	Easting:
Position Uncertainty		0.0 ft	Wellhead Elevation:
			Latitude:
			Longitude:
			Ground Level:

Wellbore	Wellbore #1				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	11/18/2014	8.50	66.92	52,761

Design	Plan #1 (11-10-14)			
Audit Notes:				
Version:	Phase:	PROTOTYPE	Tie On Depth:	0.0
Vertical Section:	Depth From (TVD) (ft)	+N/-S (ft)	+E/-W (ft)	Direction (°)
	0.0	0.0	0.0	185.80

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	
1,200.0	0.00	0.00	1,200.0	0.0	0.0	0.00	0.00	0.00	0.00	
2,029.7	8.30	299.51	2,026.8	29.5	-52.2	1.00	1.00	0.00	299.51	
5,020.8	8.30	299.51	4,986.6	242.1	-427.8	0.00	0.00	0.00	0.00	
5,435.7	0.00	0.00	5,400.0	256.9	-453.9	2.00	-2.00	0.00	180.00	
6,332.6	0.00	0.00	6,296.9	256.9	-453.9	0.00	0.00	0.00	0.00	
7,539.1	90.49	180.00	7,060.8	-513.6	-453.9	7.50	7.50	0.00	180.00	
11,495.8	90.49	180.00	7,027.0	-4,470.1	-453.9	0.00	0.00	0.00	0.00	BHL 500'FSL & 483

Database:	landmark	Local Co-ordinate Reference:	Well Heinrich 7E-223
Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	TVD Reference:	WELL @ 4982.0ft (Original Well Elev)
Project:	SEC.7-T5N-R67W	MD Reference:	WELL @ 4982.0ft (Original Well Elev)
Site:	Heinrich 5N67W7EJ Pad Sec.7-T5N-R67W	North Reference:	True
Well:	Heinrich 7E-223	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Plan #1 (11-10-14)		

Planned Survey									
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
0.0	0.00	0.00	0.0	0.0	0.0	0.0	0.00	0.00	0.00
100.0	0.00	0.00	100.0	0.0	0.0	0.0	0.00	0.00	0.00
200.0	0.00	0.00	200.0	0.0	0.0	0.0	0.00	0.00	0.00
300.0	0.00	0.00	300.0	0.0	0.0	0.0	0.00	0.00	0.00
400.0	0.00	0.00	400.0	0.0	0.0	0.0	0.00	0.00	0.00
500.0	0.00	0.00	500.0	0.0	0.0	0.0	0.00	0.00	0.00
600.0	0.00	0.00	600.0	0.0	0.0	0.0	0.00	0.00	0.00
700.0	0.00	0.00	700.0	0.0	0.0	0.0	0.00	0.00	0.00
800.0	0.00	0.00	800.0	0.0	0.0	0.0	0.00	0.00	0.00
900.0	0.00	0.00	900.0	0.0	0.0	0.0	0.00	0.00	0.00
1,000.0	0.00	0.00	1,000.0	0.0	0.0	0.0	0.00	0.00	0.00
1,100.0	0.00	0.00	1,100.0	0.0	0.0	0.0	0.00	0.00	0.00
1,200.0	0.00	0.00	1,200.0	0.0	0.0	0.0	0.00	0.00	0.00
KOP #1									
1,300.0	1.00	299.51	1,300.0	0.4	-0.8	-0.4	1.00	1.00	0.00
1,400.0	2.00	299.51	1,400.0	1.7	-3.0	-1.4	1.00	1.00	0.00
1,500.0	3.00	299.51	1,499.9	3.9	-6.8	-3.2	1.00	1.00	0.00
1,600.0	4.00	299.51	1,599.7	6.9	-12.1	-5.6	1.00	1.00	0.00
1,700.0	5.00	299.51	1,699.4	10.7	-19.0	-8.8	1.00	1.00	0.00
1,800.0	6.00	299.51	1,798.9	15.5	-27.3	-12.6	1.00	1.00	0.00
1,900.0	7.00	299.51	1,898.3	21.0	-37.2	-17.2	1.00	1.00	0.00
2,000.0	8.00	299.51	1,997.4	27.5	-48.5	-22.4	1.00	1.00	0.00
2,029.7	8.30	299.51	2,026.8	29.5	-52.2	-24.1	1.00	1.00	0.00
2,100.0	8.30	299.51	2,096.4	34.5	-61.0	-28.2	0.00	0.00	0.00
2,200.0	8.30	299.51	2,195.3	41.6	-73.6	-34.0	0.00	0.00	0.00
2,300.0	8.30	299.51	2,294.3	48.7	-86.1	-39.8	0.00	0.00	0.00
2,400.0	8.30	299.51	2,393.2	55.9	-98.7	-45.6	0.00	0.00	0.00
2,500.0	8.30	299.51	2,492.2	63.0	-111.3	-51.4	0.00	0.00	0.00
2,600.0	8.30	299.51	2,591.1	70.1	-123.8	-57.2	0.00	0.00	0.00
2,700.0	8.30	299.51	2,690.1	77.2	-136.4	-63.0	0.00	0.00	0.00
2,800.0	8.30	299.51	2,789.0	84.3	-148.9	-68.8	0.00	0.00	0.00
2,900.0	8.30	299.51	2,888.0	91.4	-161.5	-74.6	0.00	0.00	0.00
3,000.0	8.30	299.51	2,986.9	98.5	-174.0	-80.4	0.00	0.00	0.00
3,100.0	8.30	299.51	3,085.9	105.6	-186.6	-86.2	0.00	0.00	0.00
3,200.0	8.30	299.51	3,184.9	112.7	-199.2	-92.0	0.00	0.00	0.00
3,300.0	8.30	299.51	3,283.8	119.8	-211.7	-97.8	0.00	0.00	0.00
3,400.0	8.30	299.51	3,382.8	126.9	-224.3	-103.6	0.00	0.00	0.00
3,500.0	8.30	299.51	3,481.7	134.0	-236.8	-109.4	0.00	0.00	0.00
3,520.5	8.30	299.51	3,502.0	135.5	-239.4	-110.6	0.00	0.00	0.00
PARKMAN									
3,600.0	8.30	299.51	3,580.7	141.1	-249.4	-115.2	0.00	0.00	0.00
3,700.0	8.30	299.51	3,679.6	148.3	-262.0	-121.0	0.00	0.00	0.00
3,800.0	8.30	299.51	3,778.6	155.4	-274.5	-126.8	0.00	0.00	0.00
3,900.0	8.30	299.51	3,877.5	162.5	-287.1	-132.6	0.00	0.00	0.00
4,000.0	8.30	299.51	3,976.5	169.6	-299.6	-138.4	0.00	0.00	0.00
4,100.0	8.30	299.51	4,075.4	176.7	-312.2	-144.2	0.00	0.00	0.00
4,148.1	8.30	299.51	4,123.0	180.1	-318.2	-147.0	0.00	0.00	0.00
SUSSEX									
4,200.0	8.30	299.51	4,174.4	183.8	-324.8	-150.0	0.00	0.00	0.00
4,300.0	8.30	299.51	4,273.3	190.9	-337.3	-155.8	0.00	0.00	0.00
4,400.0	8.30	299.51	4,372.3	198.0	-349.9	-161.6	0.00	0.00	0.00
4,500.0	8.30	299.51	4,471.2	205.1	-362.4	-167.4	0.00	0.00	0.00
4,600.0	8.30	299.51	4,570.2	212.2	-375.0	-173.3	0.00	0.00	0.00

Database:	landmark	Local Co-ordinate Reference:	Well Heinricy 7E-223
Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	TVD Reference:	WELL @ 4982.0ft (Original Well Elev)
Project:	SEC.7-T5N-R67W	MD Reference:	WELL @ 4982.0ft (Original Well Elev)
Site:	Heinricy 5N67W7EJ Pad Sec.7-T5N-R67W	North Reference:	True
Well:	Heinricy 7E-223	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Plan #1 (11-10-14)		

Planned Survey									
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
4,613.9	8.30	299.51	4,584.0	213.2	-376.7	-174.1	0.00	0.00	0.00
SHANNON									
4,700.0	8.30	299.51	4,669.2	219.3	-387.5	-179.1	0.00	0.00	0.00
4,800.0	8.30	299.51	4,768.1	226.4	-400.1	-184.9	0.00	0.00	0.00
4,900.0	8.30	299.51	4,867.1	233.5	-412.7	-190.7	0.00	0.00	0.00
5,000.0	8.30	299.51	4,966.0	240.7	-425.2	-196.5	0.00	0.00	0.00
5,020.8	8.30	299.51	4,986.6	242.1	-427.8	-197.7	0.00	0.00	0.00
5,100.0	6.71	299.51	5,065.1	247.2	-436.8	-201.8	2.00	-2.00	0.00
5,200.0	4.71	299.51	5,164.6	252.1	-445.5	-205.8	2.00	-2.00	0.00
5,300.0	2.71	299.51	5,264.4	255.3	-451.1	-208.4	2.00	-2.00	0.00
5,400.0	0.71	299.51	5,364.3	256.8	-453.7	-209.6	2.00	-2.00	0.00
5,435.7	0.00	0.00	5,400.0	256.9	-453.9	-209.7	2.00	-2.00	0.00
5,500.0	0.00	0.00	5,464.3	256.9	-453.9	-209.7	0.00	0.00	0.00
5,600.0	0.00	0.00	5,564.3	256.9	-453.9	-209.7	0.00	0.00	0.00
5,700.0	0.00	0.00	5,664.3	256.9	-453.9	-209.7	0.00	0.00	0.00
5,800.0	0.00	0.00	5,764.3	256.9	-453.9	-209.7	0.00	0.00	0.00
5,900.0	0.00	0.00	5,864.3	256.9	-453.9	-209.7	0.00	0.00	0.00
6,000.0	0.00	0.00	5,964.3	256.9	-453.9	-209.7	0.00	0.00	0.00
6,100.0	0.00	0.00	6,064.3	256.9	-453.9	-209.7	0.00	0.00	0.00
6,200.0	0.00	0.00	6,164.3	256.9	-453.9	-209.7	0.00	0.00	0.00
6,300.0	0.00	0.00	6,264.3	256.9	-453.9	-209.7	0.00	0.00	0.00
6,332.6	0.00	0.00	6,296.9	256.9	-453.9	-209.7	0.00	0.00	0.00
KOP #2									
6,400.0	5.06	180.00	6,364.3	253.9	-453.9	-206.8	7.50	7.50	0.00
6,500.0	12.56	180.00	6,463.0	238.6	-453.9	-191.5	7.50	7.50	0.00
6,600.0	20.06	180.00	6,558.9	210.6	-453.9	-163.6	7.50	7.50	0.00
6,700.0	27.56	180.00	6,650.3	170.2	-453.9	-123.5	7.50	7.50	0.00
6,800.0	35.06	180.00	6,735.7	118.3	-453.9	-71.8	7.50	7.50	0.00
6,847.8	38.65	180.00	6,774.0	89.6	-453.9	-43.3	7.50	7.50	0.00
SHARON SPRINGS									
6,900.0	42.56	180.00	6,813.6	55.7	-453.9	-9.5	7.50	7.50	0.00
7,000.0	50.06	180.00	6,882.6	-16.6	-453.9	62.3	7.50	7.50	0.00
7,069.9	55.30	180.00	6,925.0	-72.2	-453.9	117.6	7.50	7.50	0.00
NIORARA A									
7,100.0	57.56	180.00	6,941.6	-97.2	-453.9	142.6	7.50	7.50	0.00
7,200.0	65.06	180.00	6,989.6	-184.9	-453.9	229.8	7.50	7.50	0.00
7,300.0	72.56	180.00	7,025.7	-278.0	-453.9	322.5	7.50	7.50	0.00
7,349.4	76.26	180.00	7,039.0	-325.6	-453.9	369.8	7.50	7.50	0.00
NIORARA B									
7,400.0	80.06	180.00	7,049.4	-375.1	-453.9	419.1	7.50	7.50	0.00
7,500.0	87.56	180.00	7,060.2	-474.5	-453.9	517.9	7.50	7.50	0.00
7,539.1	90.49	180.00	7,060.8	-513.6	-453.9	556.8	7.50	7.50	0.00
End of Build - 7"									
7,600.0	90.49	180.00	7,060.3	-574.5	-453.9	617.4	0.00	0.00	0.00
7,700.0	90.49	180.00	7,059.5	-674.5	-453.9	716.9	0.00	0.00	0.00
7,800.0	90.49	180.00	7,058.6	-774.5	-453.9	816.4	0.00	0.00	0.00
7,900.0	90.49	180.00	7,057.8	-874.5	-453.9	915.8	0.00	0.00	0.00
8,000.0	90.49	180.00	7,056.9	-974.5	-453.9	1,015.3	0.00	0.00	0.00
8,100.0	90.49	180.00	7,056.0	-1,074.4	-453.9	1,114.8	0.00	0.00	0.00
8,200.0	90.49	180.00	7,055.2	-1,174.4	-453.9	1,214.3	0.00	0.00	0.00
8,300.0	90.49	180.00	7,054.3	-1,274.4	-453.9	1,313.8	0.00	0.00	0.00
8,400.0	90.49	180.00	7,053.5	-1,374.4	-453.9	1,413.3	0.00	0.00	0.00

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Project:	SEC.7-T5N-R67W	MD Reference:	WELL @ 4982.0ft (Original Well Elev)
Site:	Heinrich 5N67W7EJ Pad Sec.7-T5N-R67W	North Reference:	True
Well:	Heinrich 7E-223	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Plan #1 (11-10-14)		

Planned Survey									
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
8,500.0	90.49	180.00	7,052.6	-1,474.4	-453.9	1,512.8	0.00	0.00	0.00
8,600.0	90.49	180.00	7,051.8	-1,574.4	-453.9	1,612.2	0.00	0.00	0.00
8,700.0	90.49	180.00	7,050.9	-1,674.4	-453.9	1,711.7	0.00	0.00	0.00
8,800.0	90.49	180.00	7,050.1	-1,774.4	-453.9	1,811.2	0.00	0.00	0.00
8,900.0	90.49	180.00	7,049.2	-1,874.4	-453.9	1,910.7	0.00	0.00	0.00
9,000.0	90.49	180.00	7,048.3	-1,974.4	-453.9	2,010.2	0.00	0.00	0.00
9,100.0	90.49	180.00	7,047.5	-2,074.4	-453.9	2,109.7	0.00	0.00	0.00
9,200.0	90.49	180.00	7,046.6	-2,174.4	-453.9	2,209.1	0.00	0.00	0.00
9,300.0	90.49	180.00	7,045.8	-2,274.4	-453.9	2,308.6	0.00	0.00	0.00
9,400.0	90.49	180.00	7,044.9	-2,374.4	-453.9	2,408.1	0.00	0.00	0.00
9,500.0	90.49	180.00	7,044.1	-2,474.4	-453.9	2,507.6	0.00	0.00	0.00
9,600.0	90.49	180.00	7,043.2	-2,574.4	-453.9	2,607.1	0.00	0.00	0.00
9,700.0	90.49	180.00	7,042.4	-2,674.4	-453.9	2,706.6	0.00	0.00	0.00
9,800.0	90.49	180.00	7,041.5	-2,774.4	-453.9	2,806.1	0.00	0.00	0.00
9,900.0	90.49	180.00	7,040.6	-2,874.4	-453.9	2,905.5	0.00	0.00	0.00
10,000.0	90.49	180.00	7,039.8	-2,974.4	-453.9	3,005.0	0.00	0.00	0.00
10,100.0	90.49	180.00	7,038.9	-3,074.4	-453.9	3,104.5	0.00	0.00	0.00
10,200.0	90.49	180.00	7,038.1	-3,174.4	-453.9	3,204.0	0.00	0.00	0.00
10,300.0	90.49	180.00	7,037.2	-3,274.4	-453.9	3,303.5	0.00	0.00	0.00
10,400.0	90.49	180.00	7,036.4	-3,374.4	-453.9	3,403.0	0.00	0.00	0.00
10,500.0	90.49	180.00	7,035.5	-3,474.4	-453.9	3,502.4	0.00	0.00	0.00
10,600.0	90.49	180.00	7,034.7	-3,574.4	-453.9	3,601.9	0.00	0.00	0.00
10,700.0	90.49	180.00	7,033.8	-3,674.4	-453.9	3,701.4	0.00	0.00	0.00
10,800.0	90.49	180.00	7,033.0	-3,774.4	-453.9	3,800.9	0.00	0.00	0.00
10,900.0	90.49	180.00	7,032.1	-3,874.3	-453.9	3,900.4	0.00	0.00	0.00
11,000.0	90.49	180.00	7,031.2	-3,974.3	-453.9	3,999.9	0.00	0.00	0.00
11,100.0	90.49	180.00	7,030.4	-4,074.3	-453.9	4,099.4	0.00	0.00	0.00
11,200.0	90.49	180.00	7,029.5	-4,174.3	-453.9	4,198.8	0.00	0.00	0.00
11,300.0	90.49	180.00	7,028.7	-4,274.3	-453.9	4,298.3	0.00	0.00	0.00
11,400.0	90.49	180.00	7,027.8	-4,374.3	-453.9	4,397.8	0.00	0.00	0.00
11,495.8	90.49	180.00	7,027.0	-4,470.1	-453.9	4,493.1	0.00	0.00	0.00

Targets									
Target Name	Dip Angle (°)	Dip Dir. (°)	TVD (ft)	+N/-S (ft)	+E/-W (ft)	Northing (ft)	Easting (ft)	Latitude	Longitude
- hit/miss target									
- Shape									
SHL 308'FNL & 877'F	0.00	0.00	1.0	0.0	0.0	1,396,555.16	3,155,586.05	40.420600	-104.941190
- plan hits target									
- Point									
BHL 500'FSL & 483'F	0.00	0.00	7,027.0	-4,470.1	-453.9	1,392,082.46	3,155,160.31	40.408330	-104.942820
- plan hits target									
- Point									

Casing Points					
Measured Depth (ft)	Vertical Depth (ft)	Name	Casing Diameter (")	Hole Diameter (")	
7,539.1	7,060.8	7"	7	7-1/2	

Database:	landmark	Local Co-ordinate Reference:	Well Heinrich 7E-223
Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	TVD Reference:	WELL @ 4982.0ft (Original Well Elev)
Project:	SEC.7-T5N-R67W	MD Reference:	WELL @ 4982.0ft (Original Well Elev)
Site:	Heinricy 5N67W7EJ Pad Sec.7-T5N-R67W	North Reference:	True
Well:	Heinricy 7E-223	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Plan #1 (11-10-14)		

Formations						
Measured Depth (ft)	Vertical Depth (ft)	Name	Lithology	Dip (°)	Dip Direction (°)	
3,520.5	3,502.0	PARKMAN		0.00		
4,148.1	4,123.0	SUSSEX		0.00		
4,613.9	4,584.0	SHANNON		0.00		
6,847.8	6,774.0	SHARON SPRINGS		0.00		
7,069.9	6,925.0	NIOBRARA A		0.00		
7,349.4	7,039.0	NIOBRARA B		0.00		
	7,118.0	NIOBRARA C		0.00		

Plan Annotations				
Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment
		+N/-S (ft)	+E/-W (ft)	
1,200.0	1,200.0	0.0	0.0	KOP #1
6,332.6	6,296.9	29.5	-52.2	KOP #2
7,539.1	7,060.8	242.1	-427.8	End of Build



PETROLEUM DEVELOPMENT CORP Weld County CO

SEC.7-T5N-R67W

Heinricy 5N67W7EJ Pad Sec.7-T5N-R67W

Heinricy 7E-223

Wellbore #1

Plan #1 (11-10-14)

Anticollision Report

18 November, 2014



Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Heinrich 7E-223
Project:	SEC.7-T5N-R67W	TVD Reference:	WELL @ 4982.0ft (Original Well Elev)
Reference Site:	Heinricy 5N67W7EJ Pad Sec.7-T5N-R67W	MD Reference:	WELL @ 4982.0ft (Original Well Elev)
Site Error:	0.0ft	North Reference:	True
Reference Well:	Heinricy 7E-223	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 (11-10-14)	Offset TVD Reference:	Offset Datum

Reference	Plan #1 (11-10-14)
Filter type:	NO GLOBAL FILTER: Using user defined selection & filtering criteria
Interpolation Method:	MD Interval 100.0ft
Depth Range:	Unlimited
Results Limited by:	Maximum center-center distance of 1,000.0ft
Warning Levels Evaluated at:	2.00 Sigma
Error Model:	ISCWSA
Scan Method:	Closest Approach 3D
Error Surface:	Elliptical Conic

Survey Tool Program		Date	11/18/2014		
From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description	
0.0	11,495.8	Plan #1 (11-10-14) (Wellbore #1)	MWD	MWD - Standard	

Summary						
Site Name	Reference Measured Depth (ft)	Offset Measured Depth (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Separation Factor	Warning
Offset Well - Wellbore - Design						
Existing Wells Sec.7-T5N-R67W						
Gove 1 (Exist.) - Wellbore #1 - Wellbore #1	10,994.1	7,009.7	403.9	310.7	4.334	CC
Gove 1 (Exist.) - Wellbore #1 - Wellbore #1	11,000.0	7,009.7	403.9	310.6	4.329	ES, SF
Heinricy 11-7U (Exist.) - Wellbore #1 - Wellbore #1	7,184.9	6,971.1	200.6	45.2	1.291	Level 3, CC, ES, SF
Heinricy 12-7U (Exist.) - Wellbore #1 - Wellbore #1	8,890.9	7,045.3	437.2	256.5	2.420	CC
Heinricy 12-7U (Exist.) - Wellbore #1 - Wellbore #1	8,900.0	7,045.2	437.3	256.5	2.418	ES, SF
Heinricy 5N67W7EJ Pad Sec.7-T5N-R67W						
Heinricy 7E-303 - Wellbore #1 - Plan #1 (11-10-14)	800.0	800.0	29.1	25.8	8.645	CC
Heinricy 7E-303 - Wellbore #1 - Plan #1 (11-10-14)	900.0	899.8	29.4	25.6	7.719	ES
Heinricy 7E-303 - Wellbore #1 - Plan #1 (11-10-14)	11,495.8	11,619.1	273.7	102.9	1.603	SF
Heinricy 7J-243 - Wellbore #1 - Plan #1 (11-10-14)	1,200.0	1,200.0	58.3	53.1	11.276	CC
Heinricy 7J-243 - Wellbore #1 - Plan #1 (11-10-14)	1,300.0	1,300.0	58.7	53.1	10.464	ES
Heinricy 7J-243 - Wellbore #1 - Plan #1 (11-10-14)	11,495.8	11,483.8	582.0	406.5	3.317	SF
Heinricy 7J-343 - Wellbore #1 - Plan #1 (11-10-14)	1,200.0	1,200.0	29.1	24.0	5.638	CC
Heinricy 7J-343 - Wellbore #1 - Plan #1 (11-10-14)	1,300.0	1,300.0	29.6	24.0	5.271	ES
Heinricy 7J-343 - Wellbore #1 - Plan #1 (11-10-14)	11,495.8	11,566.4	300.7	128.4	1.746	SF
Heinricy Pad Sec.7-T5N-R67W						
Heinricy 7FDU - Wellbore #1 - Wellbore #1	8,020.3	7,222.0	368.7	326.5	8.720	CC, ES
Heinricy 7FDU - Wellbore #1 - Wellbore #1	8,100.0	7,220.9	377.3	333.7	8.669	SF
Zeiler 23-7DU Pad Sec.7-T5N-R67W						
Zeiler 13-7DU - Wellbore #1 - Wellbore #1	10,017.6	7,146.6	120.2	39.2	1.485	Level 3, CC, ES, SF
Zeiler 14-7DU - Wellbore #1 - Wellbore #1	11,331.0	7,064.3	131.8	30.8	1.305	Level 3, CC, ES, SF
Zeiler 7H DU - Wellbore #1 - Wellbore #1	10,687.6	7,134.8	447.3	358.5	5.040	CC
Zeiler 7H DU - Wellbore #1 - Wellbore #1	10,700.0	7,134.7	447.5	358.5	5.029	ES, SF

Offset Design	Existing Wells Sec.7-T5N-R67W - Gove 1 (Exist.) - Wellbore #1 - Wellbore #1											Offset Site Error:	0.0ft
Survey Program:	100-NS-GYRO-MS											Offset Well Error:	0.0ft
Reference	Offset	Semi Major Axis		Distance									
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
10,100.0	7,038.9	7,004.4	7,004.0	62.2	14.6	-89.11	-3,968.3	-50.0	981.1	904.7	76.41	12.839	
10,200.0	7,038.1	7,005.1	7,004.7	64.0	14.6	-89.20	-3,968.4	-50.0	890.9	812.6	78.28	11.381	

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 Heinrich 7E-223
Project:	SEC.7-T5N-R67W	TVD Reference:	WELL @ 4982.0ft (Original Well Elev)
Reference Site:	Heinrich 5N67W7EJ Pad Sec.7-T5N-R67W	MD Reference:	WELL @ 4982.0ft (Original Well Elev)
Site Error:	0.0ft	North Reference:	True
Reference Well:	Heinrich 7E-223	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 (11-10-14)	Offset TVD Reference:	Offset Datum

Offset Design Existing Wells Sec.7-T5N-R67W - Gove 1 (Exist.) - Wellbore #1 - Wellbore #1													Offset Site Error:	0.0 ft
Survey Program: 100-NS-GYRO-MS													Offset Well Error:	0.0 ft
Reference		Offset		Semi Major Axis			Distance							
Measured Depth	Vertical Depth	Measured Depth	Vertical Depth	Reference	Offset	Highside Toolface	Offset Wellbore Centre		Between Centres	Between Ellipses	Minimum Separation	Separation Factor	Warning	
(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(°)	+N/-S (ft)	+E/-W (ft)	(ft)	(ft)	(ft)			
10,300.0	7,037.2	7,005.8	7,005.3	65.9	14.6	-89.30	-3,968.4	-50.0	803.0	722.9	80.15	10.019		
10,400.0	7,036.4	7,006.4	7,006.0	67.8	14.6	-89.39	-3,968.4	-50.0	718.4	636.4	82.02	8.758		
10,500.0	7,035.5	7,007.0	7,006.6	69.6	14.6	-89.47	-3,968.4	-50.0	638.2	554.3	83.90	7.606		
10,600.0	7,034.7	7,007.6	7,007.2	71.5	14.6	-89.56	-3,968.4	-50.0	564.3	478.5	85.78	6.579		
10,700.0	7,033.8	7,008.1	7,007.7	73.4	14.6	-89.64	-3,968.4	-50.0	499.6	412.0	87.66	5.700		
10,800.0	7,033.0	7,008.7	7,008.3	75.2	14.6	-89.71	-3,968.4	-50.0	448.1	358.6	89.54	5.005		
10,900.0	7,032.1	7,009.2	7,008.8	77.1	14.6	-89.79	-3,968.4	-50.0	414.7	323.3	91.42	4.536		
10,994.1	7,031.3	7,009.7	7,009.3	78.9	14.6	-89.86	-3,968.4	-50.0	403.9	310.7	93.20	4.334 CC		
11,000.0	7,031.2	7,009.7	7,009.3	79.0	14.6	-89.86	-3,968.4	-50.0	403.9	310.6	93.31	4.329 ES, SF		
11,100.0	7,030.4	7,010.2	7,009.8	80.9	14.6	-89.93	-3,968.4	-50.0	417.6	322.4	95.20	4.386		
11,200.0	7,029.5	7,010.7	7,010.3	82.7	14.6	-90.00	-3,968.4	-50.0	453.4	356.3	97.09	4.670		
11,300.0	7,028.7	7,011.2	7,010.7	84.6	14.6	-90.06	-3,968.4	-50.0	506.7	407.7	98.98	5.119		
11,400.0	7,027.8	7,011.6	7,011.2	86.5	14.6	-90.13	-3,968.4	-50.0	572.6	471.8	100.87	5.677		
11,495.8	7,027.0	7,012.0	7,011.6	88.3	14.6	-90.18	-3,968.5	-50.0	644.1	541.4	102.68	6.273		

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Heinrich 7E-223
Project:	SEC.7-T5N-R67W	TVD Reference:	WELL @ 4982.0ft (Original Well Elev)
Reference Site:	Heinrich 5N67W7EJ Pad Sec.7-T5N-R67W	MD Reference:	WELL @ 4982.0ft (Original Well Elev)
Site Error:	0.0ft	North Reference:	True
Reference Well:	Heinrich 7E-223	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 (11-10-14)	Offset TVD Reference:	Offset Datum

Offset Design Existing Wells Sec.7-T5N-R67W - Heinrich 11-7U (Exist.) - Wellbore #1 - Wellbore #1													Offset Site Error:	0.0 ft
Survey Program: 7840-UNKNOWN													Offset Well Error:	0.0 ft
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference	Offset	Semi Major Axis	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
0.0	0.0	0.0	0.0	0.0	0.0	-124.05	-124.05	-171.2	-253.4	306.0				
100.0	100.0	88.0	88.0	0.1	1.8	-124.05	-124.05	-171.2	-253.4	305.8	303.9	1.87	163.309	
200.0	200.0	188.0	188.0	0.3	3.8	-124.05	-124.05	-171.2	-253.4	305.8	301.7	4.10	74.636	
300.0	300.0	288.0	288.0	0.6	5.8	-124.05	-124.05	-171.2	-253.4	305.8	299.5	6.32	48.371	
400.0	400.0	388.0	388.0	0.8	7.8	-124.05	-124.05	-171.2	-253.4	305.8	297.3	8.55	35.780	
500.0	500.0	488.0	488.0	1.0	9.8	-124.05	-124.05	-171.2	-253.4	305.8	295.0	10.77	28.390	
600.0	600.0	588.0	588.0	1.2	11.8	-124.05	-124.05	-171.2	-253.4	305.8	292.8	13.00	23.530	
700.0	700.0	688.0	688.0	1.5	13.8	-124.05	-124.05	-171.2	-253.4	305.8	290.6	15.22	20.091	
800.0	800.0	788.0	788.0	1.7	15.8	-124.05	-124.05	-171.2	-253.4	305.8	288.4	17.45	17.529	
900.0	900.0	888.0	888.0	1.9	17.8	-124.05	-124.05	-171.2	-253.4	305.8	286.1	19.67	15.546	
1,000.0	1,000.0	988.0	988.0	2.1	19.8	-124.05	-124.05	-171.2	-253.4	305.8	283.9	21.90	13.967	
1,100.0	1,100.0	1,088.0	1,088.0	2.4	21.8	-124.05	-124.05	-171.2	-253.4	305.8	281.7	24.12	12.679	
1,200.0	1,200.0	1,188.0	1,188.0	2.6	23.8	-124.05	-124.05	-171.2	-253.4	305.8	279.5	26.34	11.608	
1,300.0	1,300.0	1,288.0	1,288.0	2.8	25.8	-63.71	-63.71	-171.2	-253.4	305.4	276.9	28.56	10.693	
1,400.0	1,400.0	1,388.0	1,388.0	3.0	27.8	-64.16	-64.16	-171.2	-253.4	304.3	273.5	30.77	9.888	
1,500.0	1,499.9	1,487.9	1,487.9	3.2	29.8	-64.92	-64.92	-171.2	-253.4	302.4	269.4	32.98	9.169	
1,600.0	1,599.7	1,587.7	1,587.7	3.5	31.8	-66.00	-66.00	-171.2	-253.4	299.9	264.7	35.19	8.521	
1,700.0	1,699.4	1,687.4	1,687.4	3.7	33.7	-67.41	-67.41	-171.2	-253.4	296.7	259.3	37.41	7.933	
1,800.0	1,798.9	1,786.9	1,786.9	3.9	35.7	-69.16	-69.16	-171.2	-253.4	293.2	253.6	39.63	7.399	
1,900.0	1,898.3	1,886.3	1,886.3	4.2	37.7	-71.28	-71.28	-171.2	-253.4	289.3	247.5	41.86	6.912	
2,000.0	1,997.4	1,985.4	1,985.4	4.4	39.7	-73.78	-73.78	-171.2	-253.4	285.4	241.3	44.10	6.471	
2,100.0	2,096.4	2,084.4	2,084.4	4.7	41.7	-76.57	-76.57	-171.2	-253.4	281.7	235.3	46.37	6.074	
2,200.0	2,195.3	2,183.3	2,183.3	5.0	43.7	-79.43	-79.43	-171.2	-253.4	278.6	230.0	48.65	5.727	
2,300.0	2,294.3	2,282.3	2,282.3	5.3	45.6	-82.34	-82.34	-171.2	-253.4	276.3	225.4	50.94	5.424	
2,400.0	2,393.2	2,381.2	2,381.2	5.6	47.6	-85.30	-85.30	-171.2	-253.4	274.8	221.5	53.24	5.161	
2,500.0	2,492.2	2,480.2	2,480.2	5.9	49.6	-88.27	-88.27	-171.2	-253.4	273.9	218.4	55.54	4.933	
2,557.8	2,549.4	2,537.4	2,537.4	6.1	50.7	-90.00	-90.00	-171.2	-253.4	273.8	216.9	56.87	4.815	
2,600.0	2,591.1	2,579.1	2,579.1	6.3	51.6	-91.26	-91.26	-171.2	-253.4	273.9	216.0	57.84	4.736	
2,700.0	2,690.1	2,678.1	2,678.1	6.6	53.6	-94.24	-94.24	-171.2	-253.4	274.6	214.4	60.13	4.566	
2,800.0	2,789.0	2,777.0	2,777.0	6.9	55.5	-97.20	-97.20	-171.2	-253.4	276.0	213.6	62.43	4.422	
2,900.0	2,888.0	2,876.0	2,876.0	7.2	57.5	-100.12	-100.12	-171.2	-253.4	278.2	213.5	64.71	4.299	
3,000.0	2,986.9	2,974.9	2,974.9	7.6	59.5	-102.99	-102.99	-171.2	-253.4	281.2	214.2	67.00	4.197	
3,100.0	3,085.9	3,073.9	3,073.9	7.9	61.5	-105.79	-105.79	-171.2	-253.4	284.8	215.5	69.27	4.111	
3,200.0	3,184.9	3,172.9	3,172.9	8.2	63.5	-108.52	-108.52	-171.2	-253.4	289.1	217.5	71.53	4.041	
3,300.0	3,283.8	3,271.8	3,271.8	8.5	65.4	-111.16	-111.16	-171.2	-253.4	294.0	220.2	73.79	3.985	
3,400.0	3,382.8	3,370.8	3,370.8	8.9	67.4	-113.71	-113.71	-171.2	-253.4	299.6	223.5	76.04	3.940	
3,500.0	3,481.7	3,469.7	3,469.7	9.2	69.4	-116.17	-116.17	-171.2	-253.4	305.7	227.4	78.28	3.906	
3,600.0	3,580.7	3,568.7	3,568.7	9.6	71.4	-118.52	-118.52	-171.2	-253.4	312.4	231.9	80.51	3.880	
3,700.0	3,679.6	3,667.6	3,667.6	9.9	73.4	-120.78	-120.78	-171.2	-253.4	319.6	236.9	82.73	3.863	
3,800.0	3,778.6	3,766.6	3,766.6	10.2	75.3	-122.94	-122.94	-171.2	-253.4	327.3	242.3	84.94	3.853	
3,900.0	3,877.5	3,865.5	3,865.5	10.6	77.3	-124.99	-124.99	-171.2	-253.4	335.4	248.2	87.15	3.848	
4,000.0	3,976.5	3,964.5	3,964.5	10.9	79.3	-126.95	-126.95	-171.2	-253.4	343.9	254.6	89.36	3.849	
4,100.0	4,075.4	4,063.4	4,063.4	11.3	81.3	-128.81	-128.81	-171.2	-253.4	352.8	261.3	91.56	3.854	
4,200.0	4,174.4	4,162.4	4,162.4	11.6	83.2	-130.58	-130.58	-171.2	-253.4	362.1	268.4	93.75	3.863	
4,300.0	4,273.3	4,261.3	4,261.3	11.9	85.2	-132.26	-132.26	-171.2	-253.4	371.7	275.8	95.95	3.874	
4,400.0	4,372.3	4,360.3	4,360.3	12.3	87.2	-133.85	-133.85	-171.2	-253.4	381.6	283.5	98.13	3.889	
4,500.0	4,471.2	4,459.2	4,459.2	12.6	89.2	-135.37	-135.37	-171.2	-253.4	391.8	291.5	100.32	3.906	
4,600.0	4,570.2	4,558.2	4,558.2	13.0	91.2	-136.80	-136.80	-171.2	-253.4	402.3	299.8	102.50	3.924	
4,700.0	4,669.2	4,657.2	4,657.2	13.3	93.1	-138.17	-138.17	-171.2	-253.4	413.0	308.3	104.69	3.945	
4,800.0	4,768.1	4,756.1	4,756.1	13.7	95.1	-139.46	-139.46	-171.2	-253.4	423.9	317.0	106.87	3.966	
4,900.0	4,867.1	4,855.1	4,855.1	14.0	97.1	-140.69	-140.69	-171.2	-253.4	435.0	325.9	109.05	3.989	

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 Heinrich 7E-223
Project:	SEC.7-T5N-R67W	TVD Reference:	WELL @ 4982.0ft (Original Well Elev)
Reference Site:	Heinricy 5N67W7EJ Pad Sec.7-T5N-R67W	MD Reference:	WELL @ 4982.0ft (Original Well Elev)
Site Error:	0.0ft	North Reference:	True
Reference Well:	Heinricy 7E-223	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 (11-10-14)	Offset TVD Reference:	Offset Datum

Offset Design Existing Wells Sec.7-T5N-R67W - Heinrich 11-7U (Exist.) - Wellbore #1 - Wellbore #1													Offset Site Error:	0.0 ft
Survey Program: 7840-UNKNOWN													Offset Well Error:	0.0 ft
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference	Offset	Semi Major Axis	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
5,000.0	4,966.0	4,954.0	4,954.0	14.4	99.1	-141.86		-171.2	-253.4	446.3	335.1	111.23	4.012	
5,100.0	5,065.1	5,053.1	5,053.1	14.7	101.1	-142.99		-171.2	-253.4	456.9	343.3	113.61	4.022	
5,200.0	5,164.6	5,152.6	5,152.6	14.9	103.1	-143.82		-171.2	-253.4	464.9	348.9	115.97	4.009	
5,300.0	5,264.4	5,252.4	5,252.4	15.1	105.0	-144.35		-171.2	-253.4	470.2	351.9	118.25	3.976	
5,400.0	5,364.3	5,352.3	5,352.3	15.3	107.0	-144.59		-171.2	-253.4	472.6	352.1	120.46	3.923	
5,500.0	5,464.3	5,452.3	5,452.3	15.4	109.0	-154.90		-171.2	-253.4	472.8	350.1	122.63	3.855	
5,600.0	5,564.3	5,552.3	5,552.3	15.6	111.0	-154.90		-171.2	-253.4	472.8	348.0	124.82	3.788	
5,700.0	5,664.3	5,652.3	5,652.3	15.7	113.0	-154.90		-171.2	-253.4	472.8	345.8	127.01	3.722	
5,800.0	5,764.3	5,752.3	5,752.3	15.9	115.0	-154.90		-171.2	-253.4	472.8	343.6	129.20	3.659	
5,900.0	5,864.3	5,852.3	5,852.3	16.1	117.0	-154.90		-171.2	-253.4	472.8	341.4	131.40	3.598	
6,000.0	5,964.3	5,952.3	5,952.3	16.3	119.0	-154.90		-171.2	-253.4	472.8	339.2	133.59	3.539	
6,100.0	6,064.3	6,052.3	6,052.3	16.4	121.0	-154.90		-171.2	-253.4	472.8	337.0	135.79	3.482	
6,200.0	6,164.3	6,152.3	6,152.3	16.6	123.0	-154.90		-171.2	-253.4	472.8	334.8	137.99	3.426	
6,300.0	6,264.3	6,252.3	6,252.3	16.8	125.0	-154.90		-171.2	-253.4	472.8	332.6	140.19	3.372	
6,400.0	6,364.3	6,352.3	6,352.3	16.9	127.0	-25.34		-171.2	-253.4	470.1	328.2	141.84	3.314	
6,500.0	6,463.0	6,451.0	6,451.0	17.0	129.0	-26.63		-171.2	-253.4	456.3	314.7	141.56	3.223	
6,600.0	6,558.9	6,546.9	6,546.9	17.1	130.9	-29.21		-171.2	-253.4	431.3	291.7	139.55	3.090	
6,700.0	6,650.3	6,638.3	6,638.3	17.1	132.8	-33.52		-171.2	-253.4	396.0	259.4	136.62	2.899	
6,800.0	6,735.7	6,723.7	6,723.7	17.1	134.5	-40.24		-171.2	-253.4	352.2	217.6	134.56	2.617	
6,900.0	6,813.6	6,801.6	6,801.6	17.1	136.0	-50.19		-171.2	-253.4	302.8	166.6	136.28	2.222	
7,000.0	6,882.6	6,870.6	6,870.6	17.1	137.4	-63.66		-171.2	-253.4	253.3	109.8	143.47	1.765	
7,100.0	6,941.6	6,929.6	6,929.6	17.2	138.6	-78.80		-171.2	-253.4	213.8	61.8	151.95	1.407	Level 3
7,184.9	6,983.1	6,971.1	6,971.1	17.4	139.4	-90.00		-171.2	-253.4	200.6	45.2	155.34	1.291	Level 3, CC, ES, SF
7,200.0	6,989.6	6,977.6	6,977.6	17.4	139.6	-91.64		-171.2	-253.4	201.0	45.5	155.51	1.293	Level 3
7,300.0	7,025.7	7,013.7	7,013.7	17.8	140.3	-99.07		-171.2	-253.4	227.2	71.9	155.29	1.463	Level 3
7,400.0	7,049.4	7,037.4	7,037.4	18.5	140.7	-99.96		-171.2	-253.4	286.0	129.9	156.11	1.832	
7,500.0	7,060.2	7,048.2	7,048.2	19.4	141.0	-93.69		-171.2	-253.4	363.6	204.4	159.14	2.285	
7,600.0	7,060.3	7,048.3	7,048.3	20.5	141.0	-89.01		-171.2	-253.4	450.4	289.9	160.43	2.807	
7,700.0	7,059.5	7,047.5	7,047.5	21.6	140.9	-88.77		-171.2	-253.4	541.7	380.1	161.61	3.352	
7,800.0	7,058.6	7,046.6	7,046.6	22.9	140.9	-88.53		-171.2	-253.4	635.7	472.8	162.89	3.903	
7,900.0	7,057.8	7,045.8	7,045.8	24.3	140.9	-88.28		-171.2	-253.4	731.3	567.0	164.25	4.452	
8,000.0	7,056.9	7,044.9	7,044.9	25.7	140.9	-88.04		-171.2	-253.4	827.9	662.2	165.68	4.997	
8,100.0	7,056.0	7,044.0	7,044.0	27.2	140.9	-87.79		-171.2	-253.4	925.2	758.1	167.16	5.535	

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Heinrich 7E-223
Project:	SEC.7-T5N-R67W	TVD Reference:	WELL @ 4982.0ft (Original Well Elev)
Reference Site:	Heinricy 5N67W7EJ Pad Sec.7-T5N-R67W	MD Reference:	WELL @ 4982.0ft (Original Well Elev)
Site Error:	0.0ft	North Reference:	True
Reference Well:	Heinricy 7E-223	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 (11-10-14)	Offset TVD Reference:	Offset Datum

Offset Design Existing Wells Sec.7-T5N-R67W - Heinrich 12-7U (Exist.) - Wellbore #1 - Wellbore #1												Offset Site Error:	0.0 ft
Survey Program: 7860-UNKNOWN												Offset Well Error:	0.0 ft
Reference	Offset	Semi Major Axis		Distance									
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
8,000.0	7,056.9	7,052.9	7,052.9	25.7	141.1	-91.00	-1,865.3	-16.7	992.3	826.4	165.99	5.978	
8,100.0	7,056.0	7,052.0	7,052.0	27.2	141.0	-90.89	-1,865.3	-16.7	903.7	736.1	167.51	5.395	
8,200.0	7,055.2	7,051.2	7,051.2	28.8	141.0	-90.77	-1,865.3	-16.7	817.6	648.5	169.07	4.836	
8,300.0	7,054.3	7,050.3	7,050.3	30.4	141.0	-90.66	-1,865.3	-16.7	735.0	564.4	170.67	4.307	
8,400.0	7,053.5	7,049.5	7,049.5	32.0	141.0	-90.55	-1,865.3	-16.7	657.3	485.0	172.31	3.815	
8,500.0	7,052.6	7,048.6	7,048.6	33.6	141.0	-90.44	-1,865.3	-16.7	586.5	412.5	173.97	3.371	
8,600.0	7,051.8	7,047.8	7,047.8	35.3	141.0	-90.33	-1,865.3	-16.7	525.1	349.5	175.66	2.989	
8,700.0	7,050.9	7,046.9	7,046.9	37.0	140.9	-90.21	-1,865.3	-16.7	477.1	299.7	177.37	2.690	
8,800.0	7,050.1	7,046.1	7,046.1	38.7	140.9	-90.10	-1,865.3	-16.7	446.6	267.5	179.10	2.493	
8,890.9	7,049.3	7,045.3	7,045.3	40.3	140.9	-90.00	-1,865.3	-16.7	437.2	256.5	180.68	2.420 CC	
8,900.0	7,049.2	7,045.2	7,045.2	40.5	140.9	-89.99	-1,865.3	-16.7	437.3	256.5	180.84	2.418 ES, SF	
9,000.0	7,048.3	7,044.3	7,044.3	42.2	140.9	-89.88	-1,865.3	-16.7	450.6	268.0	182.60	2.468	
9,100.0	7,047.5	7,043.5	7,043.5	44.0	140.9	-89.77	-1,865.3	-16.7	484.7	300.3	184.37	2.629	
9,200.0	7,046.6	7,042.6	7,042.6	45.8	140.9	-89.65	-1,865.3	-16.7	535.5	349.3	186.14	2.877	
9,300.0	7,045.8	7,041.8	7,041.8	47.6	140.8	-89.54	-1,865.3	-16.7	598.8	410.9	187.93	3.186	
9,400.0	7,044.9	7,040.9	7,040.9	49.4	140.8	-89.43	-1,865.3	-16.7	671.1	481.4	189.73	3.537	
9,500.0	7,044.1	7,040.1	7,040.1	51.2	140.8	-89.32	-1,865.3	-16.7	749.8	558.3	191.53	3.915	
9,600.0	7,043.2	7,039.2	7,039.2	53.0	140.8	-89.21	-1,865.3	-16.7	833.1	639.7	193.34	4.309	
9,700.0	7,042.4	7,038.4	7,038.4	54.8	140.8	-89.09	-1,865.3	-16.7	919.7	724.5	195.15	4.713	

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Heinrich 7E-223
Project:	SEC.7-T5N-R67W	TVD Reference:	WELL @ 4982.0ft (Original Well Elev)
Reference Site:	Heinrich 5N67W7EJ Pad Sec.7-T5N-R67W	MD Reference:	WELL @ 4982.0ft (Original Well Elev)
Site Error:	0.0ft	North Reference:	True
Reference Well:	Heinrich 7E-223	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 (11-10-14)	Offset TVD Reference:	Offset Datum

Offset Design Heinrich 5N67W7EJ Pad Sec.7-T5N-R67W - Heinrich 7E-303 - Wellbore #1 - Plan #1 (11-10-14)													Offset Site Error:	0.0 ft
Survey Program: 0-MWD													Offset Well Error:	0.0 ft
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Semi Major Axis Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning	
0.0	0.0	0.0	0.0	0.0	0.0	0.00	29.1	0.0	29.1					
100.0	100.0	100.0	100.0	0.1	0.1	0.00	29.1	0.0	29.1	28.9	0.22	129.668		
200.0	200.0	200.0	200.0	0.3	0.3	0.00	29.1	0.0	29.1	28.5	0.67	43.223		
300.0	300.0	300.0	300.0	0.6	0.6	0.00	29.1	0.0	29.1	28.0	1.12	25.934		
400.0	400.0	400.0	400.0	0.8	0.8	0.00	29.1	0.0	29.1	27.6	1.57	18.524		
500.0	500.0	500.0	500.0	1.0	1.0	0.00	29.1	0.0	29.1	27.1	2.02	14.408		
600.0	600.0	600.0	600.0	1.2	1.2	0.00	29.1	0.0	29.1	26.7	2.47	11.788		
700.0	700.0	700.0	700.0	1.5	1.5	0.00	29.1	0.0	29.1	26.2	2.92	9.975		
800.0	800.0	800.0	800.0	1.7	1.7	0.00	29.1	0.0	29.1	25.8	3.37	8.645 CC		
900.0	900.0	899.8	899.8	1.9	1.9	-1.61	29.4	-0.8	29.4	25.6	3.81	7.719 ES		
1,000.0	1,000.0	999.6	999.6	2.1	2.1	-6.26	30.2	-3.3	30.4	26.1	4.25	7.157		
1,100.0	1,100.0	1,099.3	1,099.1	2.4	2.3	-13.30	31.5	-7.4	32.4	27.7	4.68	6.914		
1,200.0	1,200.0	1,198.7	1,198.4	2.6	2.6	-21.63	33.3	-13.2	35.9	30.8	5.13	6.996		
1,300.0	1,300.0	1,298.0	1,297.4	2.8	2.8	31.07	35.7	-20.6	40.5	35.0	5.57	7.274		
1,400.0	1,400.0	1,397.2	1,396.1	3.0	3.0	24.59	38.5	-29.6	45.6	39.6	6.01	7.584		
1,500.0	1,499.9	1,496.3	1,494.6	3.2	3.3	19.10	41.9	-40.3	50.9	44.5	6.45	7.896		
1,600.0	1,599.7	1,595.2	1,592.7	3.5	3.6	14.35	45.8	-52.5	56.5	49.6	6.89	8.200		
1,700.0	1,699.4	1,694.0	1,690.4	3.7	3.9	10.18	50.2	-66.4	62.3	55.0	7.33	8.495		
1,800.0	1,798.9	1,792.7	1,787.7	3.9	4.2	6.45	55.1	-81.8	68.3	60.5	7.78	8.779		
1,900.0	1,898.3	1,891.2	1,884.6	4.2	4.5	3.06	60.5	-98.8	74.4	66.2	8.22	9.051		
2,000.0	1,997.4	1,989.8	1,981.3	4.4	4.9	-0.04	66.3	-117.3	80.7	72.0	8.66	9.312		
2,100.0	2,096.4	2,089.5	2,078.9	4.7	5.3	-2.83	72.5	-136.7	86.5	77.4	9.12	9.484		
2,200.0	2,195.3	2,189.3	2,176.6	5.0	5.7	-5.27	78.6	-156.2	92.4	82.8	9.59	9.641		
2,300.0	2,294.3	2,289.1	2,274.2	5.3	6.1	-7.41	84.8	-175.6	98.5	88.4	10.06	9.793		
2,400.0	2,393.2	2,388.8	2,371.9	5.6	6.5	-9.30	91.0	-195.0	104.7	94.2	10.54	9.938		
2,500.0	2,492.2	2,488.6	2,469.5	5.9	6.9	-10.97	97.1	-214.4	111.0	100.0	11.02	10.073		
2,600.0	2,591.1	2,588.3	2,567.2	6.3	7.3	-12.47	103.3	-233.8	117.4	105.9	11.51	10.200		
2,700.0	2,690.1	2,688.1	2,664.8	6.6	7.7	-13.81	109.4	-253.3	123.9	111.9	12.01	10.317		
2,800.0	2,789.0	2,787.8	2,762.5	6.9	8.2	-15.02	115.6	-272.7	130.4	117.9	12.51	10.424		
2,900.0	2,888.0	2,887.6	2,860.1	7.2	8.6	-16.11	121.7	-292.1	136.9	123.9	13.01	10.524		
3,000.0	2,986.9	2,987.3	2,957.8	7.6	9.0	-17.10	127.9	-311.5	143.6	130.0	13.53	10.615		
3,100.0	3,085.9	3,087.1	3,055.4	7.9	9.5	-18.01	134.0	-330.9	150.2	136.2	14.04	10.698		
3,200.0	3,184.9	3,186.8	3,153.1	8.2	9.9	-18.83	140.2	-350.3	156.9	142.4	14.56	10.775		
3,300.0	3,283.8	3,286.6	3,250.7	8.5	10.3	-19.59	146.4	-369.8	163.6	148.5	15.09	10.845		
3,400.0	3,382.8	3,386.3	3,348.4	8.9	10.8	-20.29	152.5	-389.2	170.4	154.8	15.62	10.909		
3,500.0	3,481.7	3,486.1	3,446.0	9.2	11.2	-20.94	158.7	-408.6	177.2	161.0	16.15	10.969		
3,600.0	3,580.7	3,585.8	3,543.7	9.6	11.7	-21.54	164.8	-428.0	183.9	167.3	16.69	11.023		
3,700.0	3,679.6	3,685.6	3,641.3	9.9	12.1	-22.09	171.0	-447.4	190.8	173.5	17.23	11.074		
3,800.0	3,778.6	3,785.3	3,739.0	10.2	12.6	-22.61	177.1	-466.9	197.6	179.8	17.77	11.120		
3,900.0	3,877.5	3,885.1	3,836.6	10.6	13.0	-23.09	183.3	-486.3	204.4	186.1	18.31	11.163		
4,000.0	3,976.5	3,984.8	3,934.3	10.9	13.4	-23.54	189.5	-505.7	211.3	192.4	18.86	11.203		
4,100.0	4,075.4	4,084.6	4,031.9	11.3	13.9	-23.97	195.6	-525.1	218.1	198.7	19.41	11.239		
4,200.0	4,174.4	4,184.3	4,129.5	11.6	14.3	-24.36	201.8	-544.5	225.0	205.1	19.96	11.273		
4,300.0	4,273.3	4,284.1	4,227.2	11.9	14.8	-24.74	207.9	-564.0	231.9	211.4	20.51	11.305		
4,400.0	4,372.3	4,383.8	4,324.8	12.3	15.2	-25.09	214.1	-583.4	238.8	217.7	21.07	11.334		
4,500.0	4,471.2	4,483.6	4,422.5	12.6	15.7	-25.42	220.2	-602.8	245.7	224.1	21.63	11.362		
4,600.0	4,570.2	4,583.3	4,520.1	13.0	16.1	-25.74	226.4	-622.2	252.6	230.4	22.18	11.387		
4,700.0	4,669.2	4,683.1	4,617.8	13.3	16.6	-26.03	232.5	-641.6	259.5	236.8	22.74	11.411		
4,800.0	4,768.1	4,782.9	4,715.5	13.7	17.0	-26.32	238.7	-661.1	266.5	243.2	23.31	11.434		
4,900.0	4,867.1	4,892.7	4,823.4	14.0	17.4	-26.73	244.8	-680.4	271.5	247.7	23.86	11.382		
5,000.0	4,966.0	5,002.8	4,932.3	14.4	17.7	-27.35	249.7	-695.9	272.9	248.5	24.42	11.177		

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 Heinrich 7E-223
Project:	SEC.7-T5N-R67W	TVD Reference:	WELL @ 4982.0ft (Original Well Elev)
Reference Site:	Heinrich 5N67W7EJ Pad Sec.7-T5N-R67W	MD Reference:	WELL @ 4982.0ft (Original Well Elev)
Site Error:	0.0ft	North Reference:	True
Reference Well:	Heinrich 7E-223	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 (11-10-14)	Offset TVD Reference:	Offset Datum

Offset Design Heinrich 5N67W7EJ Pad Sec.7-T5N-R67W - Heinrich 7E-303 - Wellbore #1 - Plan #1 (11-10-14)													Offset Site Error:	0.0 ft
Survey Program: 0-MWD													Offset Well Error:	0.0 ft
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference	Offset	Semi Major Axis	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
5,100.0	5,065.1	5,112.8	5,041.6	14.7	17.9	-28.09		253.4	-707.4	271.6	246.7	24.95	10.886	
5,200.0	5,164.6	5,222.7	5,151.2	14.9	18.1	-28.71		255.7	-714.8	269.7	244.3	25.40	10.617	
5,300.0	5,264.4	5,332.4	5,260.9	15.1	18.3	-29.19		256.8	-718.2	267.1	241.3	25.79	10.357	
5,400.0	5,364.3	5,435.9	5,364.3	15.3	18.4	-29.48		256.9	-718.5	264.8	238.6	26.12	10.135	
5,456.8	5,421.1	5,492.7	5,421.1	15.3	18.5	-29.54		256.9	-718.5	264.3	238.0	26.32	10.043	
5,500.0	5,464.3	5,535.9	5,464.3	15.4	18.6	-90.00		256.9	-718.5	264.6	238.1	26.46	9.998	
5,600.0	5,564.3	5,635.9	5,564.3	15.6	18.7	-90.00		256.9	-718.5	264.6	237.7	26.84	9.857	
5,700.0	5,664.3	5,735.9	5,664.3	15.7	18.9	-90.00		256.9	-718.5	264.6	237.3	27.22	9.718	
5,800.0	5,764.3	5,835.9	5,764.3	15.9	19.0	-90.00		256.9	-718.5	264.6	237.0	27.61	9.583	
5,900.0	5,864.3	5,935.9	5,864.3	16.1	19.1	-90.00		256.9	-718.5	264.6	236.6	27.99	9.451	
6,000.0	5,964.3	6,035.9	5,964.3	16.3	19.3	-90.00		256.9	-718.5	264.6	236.2	28.38	9.322	
6,100.0	6,064.3	6,135.9	6,064.3	16.4	19.4	-90.00		256.9	-718.5	264.6	235.8	28.77	9.196	
6,200.0	6,164.3	6,235.9	6,164.3	16.6	19.6	-90.00		256.9	-718.5	264.6	235.4	29.16	9.072	
6,300.0	6,264.3	6,335.9	6,264.3	16.8	19.7	-90.00		256.9	-718.5	264.6	235.0	29.55	8.952	
6,344.1	6,308.4	6,379.9	6,308.4	16.9	19.8	90.19		256.9	-718.5	264.6	234.9	29.69	8.909	
6,400.0	6,364.3	6,435.8	6,364.3	16.9	19.9	90.64		256.9	-718.5	264.6	234.7	29.85	8.863	
6,500.0	6,463.0	6,536.2	6,464.5	17.0	20.0	93.04		252.7	-718.5	264.9	235.1	29.88	8.867	
6,600.0	6,558.9	6,638.2	6,564.9	17.1	20.1	95.44		235.2	-718.5	265.8	235.9	29.83	8.910	
6,700.0	6,650.3	6,741.8	6,663.6	17.1	20.1	97.76		204.0	-718.5	267.0	237.3	29.76	8.972	
6,800.0	6,735.7	6,846.9	6,758.5	17.1	20.2	99.93		158.9	-718.5	268.6	238.9	29.74	9.033	
6,900.0	6,813.6	6,953.7	6,847.6	17.1	20.2	101.92		100.3	-718.5	270.4	240.6	29.81	9.073	
7,000.0	6,882.6	7,061.9	6,928.7	17.1	20.2	103.69		28.8	-718.5	272.3	242.3	30.03	9.070	
7,100.0	6,941.6	7,171.4	6,999.7	17.2	20.3	105.20		-54.5	-718.5	274.2	243.8	30.44	9.008	
7,200.0	6,989.6	7,282.1	7,058.6	17.4	20.5	106.43		-148.2	-718.5	275.9	244.7	31.11	8.866	
7,300.0	7,025.7	7,393.8	7,103.7	17.8	20.8	107.36		-250.2	-718.5	277.2	245.1	32.07	8.643	
7,400.0	7,049.4	7,506.2	7,133.5	18.5	21.3	107.96		-358.4	-718.5	278.1	244.8	33.34	8.341	
7,500.0	7,060.2	7,618.9	7,147.2	19.4	22.0	108.24		-470.3	-718.5	278.6	243.6	34.93	7.975	
7,600.0	7,060.3	7,724.3	7,147.3	20.5	23.0	108.20		-575.6	-718.5	278.5	241.6	36.95	7.538	
7,700.0	7,059.5	7,824.3	7,146.0	21.6	24.0	108.12		-675.6	-718.5	278.4	239.1	39.28	7.087	
7,800.0	7,058.6	7,924.3	7,144.7	22.9	25.1	108.03		-775.6	-718.5	278.2	236.4	41.81	6.654	
7,900.0	7,057.8	8,024.3	7,143.4	24.3	26.4	107.95		-875.6	-718.5	278.1	233.6	44.51	6.248	
8,000.0	7,056.9	8,124.3	7,142.1	25.7	27.7	107.86		-975.6	-718.5	278.0	230.6	47.35	5.871	
8,100.0	7,056.0	8,224.3	7,140.8	27.2	29.1	107.77		-1,075.5	-718.5	277.8	227.5	50.30	5.524	
8,200.0	7,055.2	8,324.3	7,139.6	28.8	30.6	107.69		-1,175.5	-718.5	277.7	224.3	53.35	5.205	
8,300.0	7,054.3	8,424.3	7,138.3	30.4	32.1	107.60		-1,275.5	-718.5	277.6	221.1	56.48	4.915	
8,400.0	7,053.5	8,524.3	7,137.0	32.0	33.7	107.52		-1,375.5	-718.5	277.4	217.8	59.67	4.649	
8,500.0	7,052.6	8,624.3	7,135.7	33.6	35.3	107.43		-1,475.5	-718.5	277.3	214.4	62.93	4.406	
8,600.0	7,051.8	8,724.3	7,134.4	35.3	36.9	107.34		-1,575.5	-718.5	277.2	210.9	66.24	4.184	
8,700.0	7,050.9	8,824.3	7,133.1	37.0	38.6	107.26		-1,675.5	-718.5	277.0	207.4	69.60	3.981	
8,800.0	7,050.1	8,924.3	7,131.8	38.7	40.3	107.17		-1,775.5	-718.5	276.9	203.9	72.99	3.794	
8,900.0	7,049.2	9,024.3	7,130.5	40.5	42.0	107.09		-1,875.5	-718.5	276.8	200.4	76.41	3.622	
9,000.0	7,048.3	9,124.3	7,129.2	42.2	43.7	107.00		-1,975.5	-718.5	276.7	196.8	79.87	3.464	
9,100.0	7,047.5	9,224.3	7,127.9	44.0	45.4	106.91		-2,075.5	-718.5	276.5	193.2	83.35	3.318	
9,200.0	7,046.6	9,324.2	7,126.6	45.8	47.2	106.83		-2,175.4	-718.5	276.4	189.5	86.86	3.182	
9,300.0	7,045.8	9,424.2	7,125.3	47.6	48.9	106.74		-2,275.4	-718.5	276.3	185.9	90.38	3.057	
9,400.0	7,044.9	9,524.2	7,124.1	49.4	50.7	106.65		-2,375.4	-718.5	276.1	182.2	93.93	2.940	
9,500.0	7,044.1	9,624.2	7,122.8	51.2	52.5	106.57		-2,475.4	-718.5	276.0	178.5	97.49	2.831	
9,600.0	7,043.2	9,724.2	7,121.5	53.0	54.3	106.48		-2,575.4	-718.5	275.9	174.8	101.07	2.730	
9,700.0	7,042.4	9,824.2	7,120.2	54.8	56.1	106.39		-2,675.4	-718.5	275.8	171.1	104.66	2.635	
9,800.0	7,041.5	9,924.2	7,118.9	56.7	57.9	106.31		-2,775.4	-718.5	275.7	167.4	108.27	2.546	
9,900.0	7,040.6	10,024.2	7,117.6	58.5	59.7	106.22		-2,875.4	-718.5	275.5	163.6	111.89	2.463	

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 Heinricy 7E-223
Project:	SEC.7-T5N-R67W	TVD Reference:	WELL @ 4982.0ft (Original Well Elev)
Reference Site:	Heinricy 5N67W7EJ Pad Sec.7-T5N-R67W	MD Reference:	WELL @ 4982.0ft (Original Well Elev)
Site Error:	0.0ft	North Reference:	True
Reference Well:	Heinricy 7E-223	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 (11-10-14)	Offset TVD Reference:	Offset Datum

Offset Design Heinricy 5N67W7EJ Pad Sec.7-T5N-R67W - Heinricy 7E-303 - Wellbore #1 - Plan #1 (11-10-14)												Offset Site Error:	0.0 ft
Survey Program: 0-MWD												Offset Well Error:	0.0 ft
Reference		Offset		Semi Major Axis		Distance							
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
10,000.0	7,039.8	10,124.2	7,116.3	60.4	61.5	106.13	-2,975.4	-718.5	275.4	159.9	115.52	2.384	
10,100.0	7,038.9	10,224.2	7,115.0	62.2	63.3	106.04	-3,075.4	-718.5	275.3	156.1	119.16	2.310	
10,200.0	7,038.1	10,324.2	7,113.7	64.0	65.2	105.96	-3,175.3	-718.5	275.2	152.4	122.81	2.241	
10,300.0	7,037.2	10,424.2	7,112.4	65.9	67.0	105.87	-3,275.3	-718.5	275.0	148.6	126.47	2.175	
10,400.0	7,036.4	10,524.2	7,111.1	67.8	68.9	105.78	-3,375.3	-718.5	274.9	144.8	130.14	2.113	
10,500.0	7,035.5	10,624.2	7,109.8	69.6	70.7	105.69	-3,475.3	-718.5	274.8	141.0	133.81	2.054	
10,600.0	7,034.7	10,724.2	7,108.6	71.5	72.6	105.61	-3,575.3	-718.5	274.7	137.2	137.49	1.998	
10,700.0	7,033.8	10,824.2	7,107.3	73.4	74.4	105.52	-3,675.3	-718.5	274.6	133.4	141.18	1.945	
10,800.0	7,033.0	10,924.2	7,106.0	75.2	76.3	105.43	-3,775.3	-718.5	274.5	129.6	144.88	1.894	
10,900.0	7,032.1	11,024.2	7,104.7	77.1	78.1	105.34	-3,875.3	-718.5	274.3	125.8	148.59	1.846	
11,000.0	7,031.2	11,124.2	7,103.4	79.0	80.0	105.26	-3,975.3	-718.5	274.2	121.9	152.30	1.801	
11,100.0	7,030.4	11,224.2	7,102.1	80.9	81.9	105.17	-4,075.3	-718.5	274.1	118.1	156.01	1.757	
11,200.0	7,029.5	11,324.2	7,100.8	82.7	83.7	105.08	-4,175.3	-718.5	274.0	114.3	159.73	1.715	
11,300.0	7,028.7	11,424.2	7,099.5	84.6	85.6	104.99	-4,275.2	-718.5	273.9	110.4	163.46	1.676	
11,400.0	7,027.8	11,524.2	7,098.2	86.5	87.5	104.90	-4,375.2	-718.5	273.8	106.6	167.19	1.637	
11,477.0	7,027.2	11,601.2	7,097.2	88.0	88.9	104.84	-4,452.2	-718.5	273.7	103.6	170.07	1.609	
11,495.8	7,027.0	11,619.1	7,097.0	88.3	89.2	104.82	-4,470.1	-718.5	273.7	102.9	170.75	1.603 SF	

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Heinrich 7E-223
Project:	SEC.7-T5N-R67W	TVD Reference:	WELL @ 4982.0ft (Original Well Elev)
Reference Site:	Heinrich 5N67W7EJ Pad Sec.7-T5N-R67W	MD Reference:	WELL @ 4982.0ft (Original Well Elev)
Site Error:	0.0ft	North Reference:	True
Reference Well:	Heinrich 7E-223	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 (11-10-14)	Offset TVD Reference:	Offset Datum

Offset Design		Heinricy 5N67W7EJ Pad Sec.7-T5N-R67W - Heinricy 7J-243 - Wellbore #1 - Plan #1 (11-10-14)											Offset Site Error:		0.0 ft
Survey Program: 0-MWD													Offset Well Error:		0.0 ft
Reference		Offset		Semi Major Axis		Highside Toolface (°)	Offset Wellbore Centre		Distance		Minimum Separation (ft)	Separation Factor	Warning		
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)		+N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)					
0.0	0.0	0.0	0.0	0.0	0.0	180.00	-58.3	0.0	58.3						
100.0	100.0	100.0	100.0	0.1	0.1	180.00	-58.3	0.0	58.3	58.1	0.22	259.337			
200.0	200.0	200.0	200.0	0.3	0.3	180.00	-58.3	0.0	58.3	57.6	0.67	86.446			
300.0	300.0	300.0	300.0	0.6	0.6	180.00	-58.3	0.0	58.3	57.2	1.12	51.867			
400.0	400.0	400.0	400.0	0.8	0.8	180.00	-58.3	0.0	58.3	56.7	1.57	37.048			
500.0	500.0	500.0	500.0	1.0	1.0	180.00	-58.3	0.0	58.3	56.3	2.02	28.815			
600.0	600.0	600.0	600.0	1.2	1.2	180.00	-58.3	0.0	58.3	55.8	2.47	23.576			
700.0	700.0	700.0	700.0	1.5	1.5	180.00	-58.3	0.0	58.3	55.4	2.92	19.949			
800.0	800.0	800.0	800.0	1.7	1.7	180.00	-58.3	0.0	58.3	54.9	3.37	17.289			
900.0	900.0	900.0	900.0	1.9	1.9	180.00	-58.3	0.0	58.3	54.5	3.82	15.255			
1,000.0	1,000.0	1,000.0	1,000.0	2.1	2.1	180.00	-58.3	0.0	58.3	54.0	4.27	13.649			
1,100.0	1,100.0	1,100.0	1,100.0	2.4	2.4	180.00	-58.3	0.0	58.3	53.6	4.72	12.349			
1,200.0	1,200.0	1,200.0	1,200.0	2.6	2.6	180.00	-58.3	0.0	58.3	53.1	5.17	11.276 CC			
1,300.0	1,300.0	1,300.0	1,300.0	2.8	2.8	-120.24	-58.3	0.0	58.7	53.1	5.61	10.464 ES			
1,400.0	1,400.0	1,400.0	1,400.0	3.0	3.0	-122.39	-58.3	0.0	60.1	54.0	6.05	9.931			
1,500.0	1,499.9	1,499.9	1,499.9	3.2	3.3	-125.74	-58.3	0.0	62.5	56.0	6.49	9.634			
1,600.0	1,599.7	1,599.7	1,599.7	3.5	3.5	-130.00	-58.3	0.0	66.3	59.4	6.93	9.559			
1,700.0	1,699.4	1,699.4	1,699.4	3.7	3.7	-134.77	-58.3	0.0	71.6	64.2	7.38	9.702			
1,800.0	1,798.9	1,798.9	1,798.9	3.9	3.9	-139.68	-58.3	0.0	78.6	70.8	7.82	10.051			
1,900.0	1,898.3	1,898.3	1,898.3	4.2	4.2	-144.41	-58.3	0.0	87.6	79.3	8.27	10.594			
2,000.0	1,997.4	1,997.4	1,997.4	4.4	4.4	-148.76	-58.3	0.0	98.5	89.8	8.71	11.311			
2,100.0	2,096.4	2,097.4	2,097.4	4.7	4.6	-152.97	-57.5	0.3	110.6	101.5	9.16	12.078			
2,200.0	2,195.3	2,197.5	2,197.5	5.0	4.8	-157.07	-55.1	1.3	122.4	112.8	9.61	12.739			
2,300.0	2,294.3	2,297.5	2,297.4	5.3	5.0	-161.10	-51.1	2.9	133.8	123.8	10.05	13.316			
2,400.0	2,393.2	2,397.4	2,397.1	5.6	5.3	-165.10	-45.5	5.1	145.2	134.7	10.49	13.835			
2,500.0	2,492.2	2,497.1	2,496.5	5.9	5.5	-169.11	-38.3	8.0	156.5	145.6	10.94	14.313			
2,600.0	2,591.1	2,596.6	2,595.5	6.3	5.7	-173.13	-29.5	11.6	168.1	156.7	11.38	14.767			
2,700.0	2,690.1	2,695.8	2,694.1	6.6	6.0	-177.14	-19.1	15.7	180.1	168.2	11.84	15.206			
2,800.0	2,789.0	2,794.3	2,791.8	6.9	6.2	179.07	-7.9	20.2	192.7	180.4	12.31	15.651			
2,900.0	2,888.0	2,892.7	2,889.5	7.2	6.5	175.75	3.4	24.8	206.0	193.2	12.79	16.104			
3,000.0	2,986.9	2,991.2	2,987.2	7.6	6.7	172.84	14.6	29.3	220.0	206.7	13.29	16.556			
3,100.0	3,085.9	3,089.6	3,084.9	7.9	7.0	170.28	25.9	33.8	234.4	220.6	13.79	16.999			
3,200.0	3,184.9	3,188.0	3,182.6	8.2	7.2	168.01	37.1	38.3	249.2	234.9	14.30	17.430			
3,300.0	3,283.8	3,286.5	3,280.3	8.5	7.5	166.00	48.4	42.8	264.4	249.6	14.82	17.844			
3,400.0	3,382.8	3,384.9	3,377.9	8.9	7.8	164.21	59.6	47.4	279.9	264.6	15.34	18.242			
3,500.0	3,481.7	3,483.3	3,475.6	9.2	8.0	162.61	70.9	51.9	295.6	279.7	15.88	18.621			
3,600.0	3,580.7	3,581.8	3,573.3	9.6	8.3	161.17	82.1	56.4	311.5	295.1	16.41	18.983			
3,700.0	3,679.6	3,680.2	3,671.0	9.9	8.6	159.87	93.4	60.9	327.6	310.7	16.95	19.328			
3,800.0	3,778.6	3,778.6	3,768.7	10.2	8.9	158.69	104.6	65.4	343.9	326.4	17.50	19.655			
3,900.0	3,877.5	3,877.1	3,866.4	10.6	9.2	157.62	115.9	70.0	360.2	342.2	18.04	19.966			
4,000.0	3,976.5	3,975.5	3,964.1	10.9	9.4	156.64	127.1	74.5	376.7	358.1	18.59	20.262			
4,100.0	4,075.4	4,073.9	4,061.7	11.3	9.7	155.74	138.4	79.0	393.3	374.2	19.15	20.544			
4,200.0	4,174.4	4,172.4	4,159.4	11.6	10.0	154.92	149.6	83.5	410.0	390.3	19.70	20.811			
4,300.0	4,273.3	4,270.8	4,257.1	11.9	10.3	154.16	160.9	88.0	426.7	406.5	20.26	21.066			
4,400.0	4,372.3	4,369.3	4,354.8	12.3	10.6	153.45	172.1	92.6	443.5	422.7	20.82	21.308			
4,500.0	4,471.2	4,467.7	4,452.5	12.6	10.9	152.80	183.4	97.1	460.4	439.0	21.38	21.539			
4,600.0	4,570.2	4,566.1	4,550.2	13.0	11.2	152.19	194.6	101.6	477.3	455.4	21.94	21.759			
4,700.0	4,669.2	4,664.6	4,647.9	13.3	11.5	151.63	205.9	106.1	494.3	471.8	22.50	21.969			
4,800.0	4,768.1	4,763.0	4,745.5	13.7	11.8	151.10	217.1	110.6	511.3	488.3	23.07	22.169			
4,900.0	4,867.1	4,861.4	4,843.2	14.0	12.1	150.61	228.4	115.2	528.4	504.8	23.63	22.361			
5,000.0	4,966.0	4,959.9	4,940.9	14.4	12.4	150.15	239.6	119.7	545.5	521.3	24.20	22.544			

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 Heinrich 7E-223
Project:	SEC.7-T5N-R67W	TVD Reference:	WELL @ 4982.0ft (Original Well Elev)
Reference Site:	Heinrich 5N67W7EJ Pad Sec.7-T5N-R67W	MD Reference:	WELL @ 4982.0ft (Original Well Elev)
Site Error:	0.0ft	North Reference:	True
Reference Well:	Heinrich 7E-223	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 (11-10-14)	Offset TVD Reference:	Offset Datum

Offset Design Heinrich 5N67W7EJ Pad Sec.7-T5N-R67W - Heinrich 7J-243 - Wellbore #1 - Plan #1 (11-10-14)													Offset Site Error:	0.0 ft
Survey Program: 0-MWDD													Offset Well Error:	0.0 ft
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference	Offset	Semi Major Axis	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
5,100.0	5,065.1	5,065.9	5,046.3	14.7	12.6	149.91	149.91	250.2	123.9	561.1	536.3	24.74	22.681	
5,200.0	5,164.6	5,173.3	5,153.4	14.9	12.8	149.86	149.86	257.1	126.7	572.3	547.1	25.19	22.717	
5,300.0	5,264.4	5,281.3	5,261.4	15.1	13.0	149.96	149.96	260.4	128.0	579.2	553.6	25.59	22.632	
5,400.0	5,364.3	5,384.2	5,364.3	15.3	13.2	150.11	150.11	260.6	128.1	581.9	555.9	25.94	22.433	
5,500.0	5,464.3	5,484.2	5,464.3	15.4	13.4	89.63	89.63	260.6	128.1	582.1	555.7	26.30	22.129	
5,600.0	5,564.3	5,584.2	5,564.3	15.6	13.6	89.63	89.63	260.6	128.1	582.1	555.4	26.70	21.802	
5,700.0	5,664.3	5,684.2	5,664.3	15.7	13.8	89.63	89.63	260.6	128.1	582.1	555.0	27.09	21.484	
5,800.0	5,764.3	5,784.2	5,764.3	15.9	14.0	89.63	89.63	260.6	128.1	582.1	554.6	27.49	21.173	
5,900.0	5,864.3	5,884.2	5,864.3	16.1	14.2	89.63	89.63	260.6	128.1	582.1	554.2	27.89	20.870	
6,000.0	5,964.3	5,984.2	5,964.3	16.3	14.4	89.63	89.63	260.6	128.1	582.1	553.8	28.29	20.575	
6,100.0	6,064.3	6,084.2	6,064.3	16.4	14.6	89.63	89.63	260.6	128.1	582.1	553.4	28.69	20.287	
6,200.0	6,164.3	6,184.2	6,164.3	16.6	14.8	89.63	89.63	260.6	128.1	582.1	553.0	29.09	20.005	
6,300.0	6,264.3	6,284.2	6,264.3	16.8	15.0	89.63	89.63	260.6	128.1	582.1	552.6	29.50	19.731	
6,400.0	6,364.3	6,384.6	6,364.6	16.9	15.2	-90.36	-90.36	257.6	128.1	582.1	552.2	29.83	19.513	
6,500.0	6,463.0	6,485.1	6,463.8	17.0	15.2	-90.36	-90.36	242.2	128.1	582.1	552.1	29.99	19.406	
6,600.0	6,558.9	6,585.5	6,560.1	17.1	15.3	-90.34	-90.34	213.8	128.1	582.0	552.0	30.04	19.375	
6,700.0	6,650.3	6,686.0	6,651.9	17.1	15.2	-90.32	-90.32	173.2	128.1	582.0	552.0	30.03	19.385	
6,800.0	6,735.7	6,786.4	6,737.5	17.1	15.2	-90.30	-90.30	120.8	128.1	582.0	552.0	30.02	19.391	
6,900.0	6,813.6	6,886.8	6,815.5	17.1	15.2	-90.27	-90.27	57.7	128.1	582.0	551.9	30.10	19.338	
7,000.0	6,882.6	6,987.1	6,884.5	17.1	15.2	-90.24	-90.24	-15.0	128.1	582.0	551.7	30.36	19.171	
7,100.0	6,941.6	7,087.4	6,943.3	17.2	15.4	-90.20	-90.20	-96.1	128.1	582.0	551.2	30.89	18.845	
7,200.0	6,989.6	7,187.6	6,991.1	17.4	15.8	-90.16	-90.16	-184.2	128.1	582.0	550.3	31.74	18.339	
7,300.0	7,025.7	7,287.8	7,026.8	17.8	16.3	-90.11	-90.11	-277.7	128.1	582.0	549.1	32.95	17.666	
7,400.0	7,049.4	7,387.9	7,050.0	18.5	17.1	-90.07	-90.07	-375.0	128.1	582.0	547.5	34.51	16.864	
7,500.0	7,060.2	7,488.0	7,060.4	19.4	18.0	-90.02	-90.02	-474.5	128.1	582.0	545.6	36.40	15.991	
7,553.1	7,061.7	7,541.1	7,060.7	20.0	18.6	-89.90	-89.90	-527.6	128.1	582.0	544.5	37.53	15.509	
7,600.0	7,060.3	7,588.0	7,060.3	20.5	19.1	-90.00	-90.00	-574.5	128.1	582.0	543.5	38.56	15.095	
7,700.0	7,059.5	7,688.0	7,059.5	21.6	20.3	-90.00	-90.00	-674.5	128.1	582.0	541.1	40.96	14.208	
7,800.0	7,058.6	7,788.0	7,058.6	22.9	21.6	-90.00	-90.00	-774.5	128.1	582.0	538.5	43.58	13.357	
7,900.0	7,057.8	7,888.0	7,057.8	24.3	23.0	-90.00	-90.00	-874.5	128.1	582.0	535.7	46.36	12.555	
8,000.0	7,056.9	7,988.0	7,056.9	25.7	24.4	-90.00	-90.00	-974.5	128.1	582.0	532.8	49.29	11.809	
8,100.0	7,056.0	8,088.0	7,056.0	27.2	25.9	-90.00	-90.00	-1,074.4	128.1	582.0	529.7	52.33	11.122	
8,200.0	7,055.2	8,188.0	7,055.2	28.8	27.5	-90.00	-90.00	-1,174.4	128.1	582.0	526.6	55.48	10.491	
8,300.0	7,054.3	8,288.0	7,054.3	30.4	29.1	-90.00	-90.00	-1,274.4	128.1	582.0	523.3	58.71	9.915	
8,400.0	7,053.5	8,388.0	7,053.5	32.0	30.7	-90.00	-90.00	-1,374.4	128.1	582.0	520.0	62.00	9.387	
8,500.0	7,052.6	8,488.0	7,052.6	33.6	32.4	-90.00	-90.00	-1,474.4	128.1	582.0	516.7	65.36	8.905	
8,600.0	7,051.8	8,588.0	7,051.8	35.3	34.1	-90.00	-90.00	-1,574.4	128.1	582.0	513.3	68.77	8.463	
8,700.0	7,050.9	8,688.0	7,050.9	37.0	35.8	-90.00	-90.00	-1,674.4	128.1	582.0	509.8	72.23	8.059	
8,800.0	7,050.1	8,788.0	7,050.1	38.7	37.6	-90.00	-90.00	-1,774.4	128.1	582.0	506.3	75.72	7.687	
8,900.0	7,049.2	8,888.0	7,049.2	40.5	39.3	-90.00	-90.00	-1,874.4	128.1	582.0	502.8	79.24	7.345	
9,000.0	7,048.3	8,988.0	7,048.3	42.2	41.1	-90.00	-90.00	-1,974.4	128.1	582.0	499.2	82.79	7.030	
9,100.0	7,047.5	9,088.0	7,047.5	44.0	42.9	-90.00	-90.00	-2,074.4	128.1	582.0	495.7	86.37	6.739	
9,200.0	7,046.6	9,188.0	7,046.6	45.8	44.7	-90.00	-90.00	-2,174.4	128.1	582.0	492.1	89.97	6.469	
9,300.0	7,045.8	9,288.0	7,045.8	47.6	46.5	-90.00	-90.00	-2,274.4	128.1	582.0	488.4	93.59	6.219	
9,400.0	7,044.9	9,388.0	7,044.9	49.4	48.3	-90.00	-90.00	-2,374.4	128.1	582.0	484.8	97.23	5.986	
9,500.0	7,044.1	9,488.0	7,044.1	51.2	50.2	-90.00	-90.00	-2,474.4	128.1	582.0	481.2	100.88	5.770	
9,600.0	7,043.2	9,588.0	7,043.2	53.0	52.0	-90.00	-90.00	-2,574.4	128.1	582.0	477.5	104.54	5.567	
9,700.0	7,042.4	9,688.0	7,042.4	54.8	53.8	-90.00	-90.00	-2,674.4	128.1	582.0	473.8	108.22	5.378	
9,800.0	7,041.5	9,788.0	7,041.5	56.7	55.7	-90.00	-90.00	-2,774.4	128.1	582.0	470.1	111.91	5.201	
9,900.0	7,040.6	9,888.0	7,040.6	58.5	57.5	-90.00	-90.00	-2,874.4	128.1	582.0	466.4	115.61	5.034	
10,000.0	7,039.8	9,988.0	7,039.8	60.4	59.4	-90.00	-90.00	-2,974.4	128.1	582.0	462.7	119.32	4.878	

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 Heinricy 7E-223
Project:	SEC.7-T5N-R67W	TVD Reference:	WELL @ 4982.0ft (Original Well Elev)
Reference Site:	Heinricy 5N67W7EJ Pad Sec.7-T5N-R67W	MD Reference:	WELL @ 4982.0ft (Original Well Elev)
Site Error:	0.0ft	North Reference:	True
Reference Well:	Heinricy 7E-223	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 (11-10-14)	Offset TVD Reference:	Offset Datum

Offset Design Heinricy 5N67W7EJ Pad Sec.7-T5N-R67W - Heinricy 7J-243 - Wellbore #1 - Plan #1 (11-10-14)													Offset Site Error:	0.0 ft
Survey Program: 0-MWD													Offset Well Error:	0.0 ft
Reference		Offset		Semi Major Axis			Distance							
Measured Depth	Vertical Depth	Measured Depth	Vertical Depth	Reference	Offset	Highside Toolface	Offset Wellbore Centre		Between Centres	Between Ellipses	Minimum Separation	Separation Factor	Warning	
Depth (ft)	Depth (ft)	Depth (ft)	Depth (ft)	(ft)	(ft)	(°)	+N/-S (ft)	+E/-W (ft)	(ft)	(ft)	(ft)			
10,100.0	7,038.9	10,088.0	7,038.9	62.2	61.2	-90.00	-3,074.4	128.1	582.0	459.0	123.04	4.731		
10,200.0	7,038.1	10,188.0	7,038.1	64.0	63.1	-90.00	-3,174.4	128.1	582.0	455.3	126.76	4.592		
10,300.0	7,037.2	10,288.0	7,037.2	65.9	65.0	-90.00	-3,274.4	128.1	582.0	451.5	130.49	4.460		
10,400.0	7,036.4	10,388.0	7,036.4	67.8	66.8	-90.00	-3,374.4	128.1	582.0	447.8	134.23	4.336		
10,500.0	7,035.5	10,488.0	7,035.5	69.6	68.7	-90.00	-3,474.4	128.1	582.0	444.1	137.98	4.218		
10,600.0	7,034.7	10,588.0	7,034.7	71.5	70.6	-90.00	-3,574.4	128.1	582.0	440.3	141.72	4.107		
10,700.0	7,033.8	10,688.0	7,033.8	73.4	72.5	-90.00	-3,674.4	128.1	582.0	436.6	145.48	4.001		
10,800.0	7,033.0	10,788.0	7,033.0	75.2	74.3	-90.00	-3,774.4	128.1	582.0	432.8	149.24	3.900		
10,900.0	7,032.1	10,888.0	7,032.1	77.1	76.2	-90.00	-3,874.3	128.1	582.0	429.0	153.00	3.804		
11,000.0	7,031.2	10,988.0	7,031.2	79.0	78.1	-90.00	-3,974.3	128.1	582.0	425.3	156.77	3.713		
11,100.0	7,030.4	11,088.0	7,030.4	80.9	80.0	-90.00	-4,074.3	128.1	582.0	421.5	160.54	3.626		
11,200.0	7,029.5	11,188.0	7,029.5	82.7	81.9	-90.00	-4,174.3	128.1	582.0	417.7	164.31	3.542		
11,300.0	7,028.7	11,288.0	7,028.7	84.6	83.8	-90.00	-4,274.3	128.1	582.0	413.9	168.09	3.463		
11,400.0	7,027.8	11,388.0	7,027.8	86.5	85.7	-90.00	-4,374.3	128.1	582.0	410.2	171.87	3.386		
11,495.8	7,027.0	11,483.8	7,027.0	88.3	87.5	-90.00	-4,470.1	128.1	582.0	406.5	175.49	3.317 SF		

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Heinrich 7E-223
Project:	SEC.7-T5N-R67W	TVD Reference:	WELL @ 4982.0ft (Original Well Elev)
Reference Site:	Heinrich 5N67W7EJ Pad Sec.7-T5N-R67W	MD Reference:	WELL @ 4982.0ft (Original Well Elev)
Site Error:	0.0ft	North Reference:	True
Reference Well:	Heinrich 7E-223	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 (11-10-14)	Offset TVD Reference:	Offset Datum

Offset Design		Heinricy 5N67W7EJ Pad Sec.7-T5N-R67W - Heinricy 7J-343 - Wellbore #1 - Plan #1 (11-10-14)											Offset Site Error:	0.0 ft
Survey Program: 0-MWD													Offset Well Error:	0.0 ft
Reference		Offset		Semi Major Axis		Highside Toolface (°)	Offset Wellbore Centre		Distance		Minimum Separation (ft)	Separation Factor	Warning	
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)		+N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)				
0.0	0.0	0.0	0.0	0.0	0.0	180.00	-29.1	0.0	29.1					
100.0	100.0	100.0	100.0	0.1	0.1	180.00	-29.1	0.0	29.1	28.9	0.22	129.668		
200.0	200.0	200.0	200.0	0.3	0.3	180.00	-29.1	0.0	29.1	28.5	0.67	43.223		
300.0	300.0	300.0	300.0	0.6	0.6	180.00	-29.1	0.0	29.1	28.0	1.12	25.934		
400.0	400.0	400.0	400.0	0.8	0.8	180.00	-29.1	0.0	29.1	27.6	1.57	18.524		
500.0	500.0	500.0	500.0	1.0	1.0	180.00	-29.1	0.0	29.1	27.1	2.02	14.408		
600.0	600.0	600.0	600.0	1.2	1.2	180.00	-29.1	0.0	29.1	26.7	2.47	11.788		
700.0	700.0	700.0	700.0	1.5	1.5	180.00	-29.1	0.0	29.1	26.2	2.92	9.974		
800.0	800.0	800.0	800.0	1.7	1.7	180.00	-29.1	0.0	29.1	25.8	3.37	8.645		
900.0	900.0	900.0	900.0	1.9	1.9	180.00	-29.1	0.0	29.1	25.3	3.82	7.628		
1,000.0	1,000.0	1,000.0	1,000.0	2.1	2.1	180.00	-29.1	0.0	29.1	24.9	4.27	6.825		
1,100.0	1,100.0	1,100.0	1,100.0	2.4	2.4	180.00	-29.1	0.0	29.1	24.4	4.72	6.175		
1,200.0	1,200.0	1,200.0	1,200.0	2.6	2.6	180.00	-29.1	0.0	29.1	24.0	5.17	5.638 CC		
1,300.0	1,300.0	1,300.0	1,300.0	2.8	2.8	-120.97	-29.1	0.0	29.6	24.0	5.61	5.271 ES		
1,400.0	1,400.0	1,400.0	1,400.0	3.0	3.0	-125.11	-29.1	0.0	31.0	25.0	6.05	5.126		
1,500.0	1,499.9	1,499.9	1,499.9	3.2	3.3	-131.16	-29.1	0.0	33.7	27.2	6.49	5.194		
1,600.0	1,599.7	1,599.7	1,599.7	3.5	3.5	-138.07	-29.1	0.0	38.0	31.1	6.93	5.484		
1,700.0	1,699.4	1,699.4	1,699.4	3.7	3.7	-144.85	-29.1	0.0	44.2	36.8	7.37	5.992		
1,800.0	1,798.9	1,798.9	1,798.9	3.9	3.9	-150.86	-29.1	0.0	52.3	44.5	7.81	6.697		
1,900.0	1,898.3	1,899.3	1,899.3	4.2	4.2	-156.02	-28.4	-0.4	61.6	53.4	8.25	7.471		
2,000.0	1,997.4	1,999.9	1,999.8	4.4	4.4	-160.57	-26.1	-1.7	71.2	62.5	8.68	8.205		
2,100.0	2,096.4	2,100.6	2,100.4	4.7	4.6	-164.63	-22.3	-3.9	80.7	71.6	9.12	8.852		
2,200.0	2,195.3	2,201.5	2,201.2	5.0	4.8	-168.21	-16.9	-6.9	88.9	79.4	9.56	9.300		
2,300.0	2,294.3	2,302.7	2,302.0	5.3	5.1	-171.58	-10.0	-10.8	95.8	85.8	10.01	9.573		
2,400.0	2,393.2	2,403.9	2,402.8	5.6	5.3	-174.92	-1.5	-15.6	101.4	90.9	10.46	9.693		
2,500.0	2,492.2	2,505.2	2,503.4	5.9	5.5	-178.36	8.6	-21.3	105.7	94.8	10.91	9.686		
2,600.0	2,591.1	2,604.9	2,602.4	6.3	5.8	178.30	19.2	-27.3	109.7	98.3	11.37	9.645		
2,700.0	2,690.1	2,704.7	2,701.4	6.6	6.1	175.20	29.8	-33.3	114.0	102.2	11.85	9.628		
2,800.0	2,789.0	2,804.4	2,800.4	6.9	6.3	172.34	40.4	-39.2	118.7	106.4	12.33	9.629		
2,900.0	2,888.0	2,904.1	2,899.3	7.2	6.6	169.71	50.9	-45.2	123.6	110.8	12.82	9.642		
3,000.0	2,986.9	3,003.8	2,998.3	7.6	6.9	167.27	61.5	-51.2	128.8	115.5	13.33	9.664		
3,100.0	3,085.9	3,103.5	3,097.3	7.9	7.1	165.03	72.1	-57.2	134.2	120.3	13.84	9.693		
3,200.0	3,184.9	3,203.3	3,196.3	8.2	7.4	162.96	82.7	-63.2	139.7	125.4	14.37	9.726		
3,300.0	3,283.8	3,303.0	3,295.3	8.5	7.7	161.06	93.3	-69.1	145.5	130.6	14.91	9.761		
3,400.0	3,382.8	3,402.7	3,394.2	8.9	8.0	159.30	103.9	-75.1	151.4	135.9	15.45	9.797		
3,500.0	3,481.7	3,502.4	3,493.2	9.2	8.3	157.67	114.5	-81.1	157.4	141.4	16.00	9.835		
3,600.0	3,580.7	3,602.2	3,592.2	9.6	8.6	156.17	125.1	-87.1	163.5	147.0	16.57	9.872		
3,700.0	3,679.6	3,701.9	3,691.2	9.9	8.8	154.77	135.7	-93.1	169.8	152.6	17.13	9.909		
3,800.0	3,778.6	3,801.6	3,790.1	10.2	9.1	153.47	146.2	-99.0	176.1	158.4	17.71	9.946		
3,900.0	3,877.5	3,901.3	3,889.1	10.6	9.4	152.27	156.8	-105.0	182.5	164.2	18.29	9.981		
4,000.0	3,976.5	4,001.0	3,988.1	10.9	9.7	151.14	167.4	-111.0	189.0	170.1	18.87	10.016		
4,100.0	4,075.4	4,100.8	4,087.1	11.3	10.0	150.09	178.0	-117.0	195.6	176.1	19.46	10.051		
4,200.0	4,174.4	4,200.5	4,186.1	11.6	10.3	149.11	188.6	-122.9	202.2	182.2	20.05	10.084		
4,300.0	4,273.3	4,300.2	4,285.0	11.9	10.6	148.19	199.2	-128.9	208.9	188.2	20.65	10.116		
4,400.0	4,372.3	4,399.9	4,384.0	12.3	10.9	147.33	209.8	-134.9	215.6	194.4	21.25	10.147		
4,500.0	4,471.2	4,499.7	4,483.0	12.6	11.2	146.52	220.4	-140.9	222.4	200.5	21.85	10.177		
4,600.0	4,570.2	4,599.4	4,582.0	13.0	11.5	145.76	230.9	-146.9	229.2	206.7	22.46	10.206		
4,700.0	4,669.2	4,698.1	4,680.0	13.3	11.8	145.08	241.3	-152.7	236.1	213.1	23.05	10.244		
4,800.0	4,768.1	4,794.5	4,775.9	13.7	12.0	144.99	249.3	-157.2	244.1	220.6	23.54	10.368		
4,900.0	4,867.1	4,890.6	4,871.8	14.0	12.2	145.58	254.4	-160.1	253.5	229.5	23.97	10.573		
5,000.0	4,966.0	4,986.1	4,967.3	14.4	12.4	146.75	256.7	-161.4	264.3	239.9	24.34	10.857		

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 Heinrich 7E-223
Project:	SEC.7-T5N-R67W	TVD Reference:	WELL @ 4982.0ft (Original Well Elev)
Reference Site:	Heinrich 5N67W7EJ Pad Sec.7-T5N-R67W	MD Reference:	WELL @ 4982.0ft (Original Well Elev)
Site Error:	0.0ft	North Reference:	True
Reference Well:	Heinrich 7E-223	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 (11-10-14)	Offset TVD Reference:	Offset Datum

Offset Design Heinrich 5N67W7EJ Pad Sec.7-T5N-R67W - Heinrich 7J-343 - Wellbore #1 - Plan #1 (11-10-14)													Offset Site Error:	0.0 ft
Survey Program: 0-MWD													Offset Well Error:	0.0 ft
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference	Offset	Semi Major Axis	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
5,100.0	5,065.1	5,083.9	5,065.1	14.7	12.6	148.30		256.9	-161.5	275.5	250.8	24.69	11.160	
5,200.0	5,164.6	5,183.4	5,164.6	14.9	12.7	149.44		256.9	-161.5	284.0	259.0	25.03	11.348	
5,300.0	5,264.4	5,283.2	5,264.4	15.1	12.9	150.15		256.9	-161.5	289.6	264.3	25.37	11.416	
5,400.0	5,364.3	5,383.1	5,364.3	15.3	13.1	150.47		256.9	-161.5	292.2	266.5	25.71	11.367	
5,500.0	5,464.3	5,483.1	5,464.3	15.4	13.3	90.00		256.9	-161.5	292.4	266.3	26.07	11.215	
5,600.0	5,564.3	5,583.1	5,564.3	15.6	13.5	90.00		256.9	-161.5	292.4	265.9	26.47	11.047	
5,700.0	5,664.3	5,683.1	5,664.3	15.7	13.7	90.00		256.9	-161.5	292.4	265.5	26.87	10.883	
5,800.0	5,764.3	5,783.1	5,764.3	15.9	13.9	90.00		256.9	-161.5	292.4	265.1	27.27	10.723	
5,900.0	5,864.3	5,883.1	5,864.3	16.1	14.1	90.00		256.9	-161.5	292.4	264.7	27.67	10.567	
6,000.0	5,964.3	5,983.1	5,964.3	16.3	14.3	90.00		256.9	-161.5	292.4	264.3	28.08	10.415	
6,100.0	6,064.3	6,083.1	6,064.3	16.4	14.5	90.00		256.9	-161.5	292.4	263.9	28.48	10.267	
6,200.0	6,164.3	6,183.1	6,164.3	16.6	14.7	90.00		256.9	-161.5	292.4	263.5	28.89	10.122	
6,300.0	6,264.3	6,283.1	6,264.3	16.8	14.9	90.00		256.9	-161.5	292.4	263.1	29.30	9.981	
6,344.1	6,308.4	6,327.2	6,308.4	16.9	15.0	-90.17		256.9	-161.5	292.4	262.9	29.47	9.922	
6,400.0	6,364.3	6,383.1	6,364.3	16.9	15.2	-90.58		256.9	-161.5	292.4	262.7	29.70	9.845	
6,500.0	6,463.0	6,483.4	6,464.5	17.0	15.3	-92.75		252.7	-161.5	292.8	262.7	30.08	9.734	
6,600.0	6,558.9	6,585.4	6,564.9	17.1	15.4	-94.93		235.2	-161.5	293.5	263.2	30.29	9.690	
6,700.0	6,650.3	6,680.0	6,663.6	17.1	15.4	-97.03		204.0	-161.5	294.7	264.3	30.37	9.701	
6,800.0	6,735.7	6,794.2	6,758.5	17.1	15.4	-99.00		158.9	-161.5	296.1	265.7	30.37	9.751	
6,900.0	6,813.6	6,900.9	6,847.6	17.1	15.4	-100.82		100.3	-161.5	297.7	267.4	30.34	9.812	
7,000.0	6,882.6	7,009.1	6,928.7	17.1	15.4	-102.43		28.8	-161.5	299.5	269.1	30.42	9.845	
7,100.0	6,941.6	7,118.7	6,999.7	17.2	15.4	-103.81		-54.5	-161.5	301.2	270.4	30.71	9.805	
7,200.0	6,989.6	7,229.4	7,058.6	17.4	15.8	-104.94		-148.2	-161.5	302.7	271.3	31.35	9.654	
7,300.0	7,025.7	7,341.1	7,103.7	17.8	16.4	-105.79		-250.2	-161.5	303.9	271.5	32.42	9.373	
7,400.0	7,049.4	7,453.4	7,133.5	18.5	17.2	-106.35		-358.4	-161.5	304.7	270.8	33.97	8.970	
7,500.0	7,060.2	7,566.2	7,147.2	19.4	18.3	-106.60		-470.3	-161.5	305.1	269.1	35.99	8.478	
7,600.0	7,060.3	7,671.5	7,147.3	20.5	19.5	-106.57		-575.6	-161.5	305.1	266.9	38.22	7.982	
7,700.0	7,059.5	7,771.5	7,146.0	21.6	20.7	-106.49		-675.6	-161.5	305.0	264.4	40.58	7.515	
7,800.0	7,058.6	7,871.5	7,144.7	22.9	22.0	-106.41		-775.6	-161.5	304.8	261.7	43.12	7.069	
7,900.0	7,057.8	7,971.5	7,143.4	24.3	23.4	-106.33		-875.6	-161.5	304.7	258.9	45.83	6.648	
8,000.0	7,056.9	8,071.5	7,142.1	25.7	24.8	-106.25		-975.6	-161.5	304.6	255.9	48.68	6.257	
8,100.0	7,056.0	8,171.5	7,140.8	27.2	26.3	-106.17		-1,075.5	-161.5	304.5	252.8	51.64	5.896	
8,200.0	7,055.2	8,271.5	7,139.6	28.8	27.9	-106.10		-1,175.5	-161.5	304.3	249.7	54.69	5.565	
8,300.0	7,054.3	8,371.5	7,138.3	30.4	29.5	-106.02		-1,275.5	-161.5	304.2	246.4	57.83	5.261	
8,400.0	7,053.5	8,471.5	7,137.0	32.0	31.2	-105.94		-1,375.5	-161.5	304.1	243.1	61.03	4.983	
8,500.0	7,052.6	8,571.5	7,135.7	33.6	32.8	-105.86		-1,475.5	-161.5	304.0	239.7	64.29	4.728	
8,600.0	7,051.8	8,671.5	7,134.4	35.3	34.5	-105.78		-1,575.5	-161.5	303.9	236.3	67.61	4.494	
8,700.0	7,050.9	8,771.5	7,133.1	37.0	36.3	-105.70		-1,675.5	-161.5	303.7	232.8	70.97	4.280	
8,800.0	7,050.1	8,871.5	7,131.8	38.7	38.0	-105.62		-1,775.5	-161.5	303.6	229.3	74.36	4.083	
8,900.0	7,049.2	8,971.5	7,130.5	40.5	39.8	-105.54		-1,875.5	-161.5	303.5	225.7	77.79	3.901	
9,000.0	7,048.3	9,071.5	7,129.2	42.2	41.5	-105.46		-1,975.5	-161.5	303.4	222.1	81.25	3.734	
9,100.0	7,047.5	9,171.5	7,127.9	44.0	43.3	-105.38		-2,075.5	-161.5	303.3	218.5	84.74	3.579	
9,200.0	7,046.6	9,271.5	7,126.6	45.8	45.1	-105.30		-2,175.4	-161.5	303.2	214.9	88.25	3.435	
9,300.0	7,045.8	9,371.5	7,125.3	47.6	46.9	-105.22		-2,275.4	-161.5	303.0	211.3	91.78	3.302	
9,400.0	7,044.9	9,471.5	7,124.1	49.4	48.7	-105.14		-2,375.4	-161.5	302.9	207.6	95.33	3.178	
9,500.0	7,044.1	9,571.5	7,122.8	51.2	50.6	-105.06		-2,475.4	-161.5	302.8	203.9	98.90	3.062	
9,600.0	7,043.2	9,671.5	7,121.5	53.0	52.4	-104.98		-2,575.4	-161.5	302.7	200.2	102.49	2.954	
9,700.0	7,042.4	9,771.5	7,120.2	54.8	54.2	-104.90		-2,675.4	-161.5	302.6	196.5	106.08	2.852	
9,800.0	7,041.5	9,871.5	7,118.9	56.7	56.1	-104.82		-2,775.4	-161.5	302.5	192.8	109.69	2.757	
9,900.0	7,040.6	9,971.5	7,117.6	58.5	57.9	-104.74		-2,875.4	-161.5	302.4	189.1	113.32	2.668	
10,000.0	7,039.8	10,071.5	7,116.3	60.4	59.8	-104.66		-2,975.4	-161.5	302.3	185.3	116.95	2.584	

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 Heinrich 7E-223
Project:	SEC.7-T5N-R67W	TVD Reference:	WELL @ 4982.0ft (Original Well Elev)
Reference Site:	Heinricy 5N67W7EJ Pad Sec.7-T5N-R67W	MD Reference:	WELL @ 4982.0ft (Original Well Elev)
Site Error:	0.0ft	North Reference:	True
Reference Well:	Heinricy 7E-223	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 (11-10-14)	Offset TVD Reference:	Offset Datum

Offset Design Heinrich 5N67W7EJ Pad Sec.7-T5N-R67W - Heinrich 7J-343 - Wellbore #1 - Plan #1 (11-10-14)												Offset Site Error:	0.0 ft
Survey Program: 0-MWD												Offset Well Error:	0.0 ft
Reference	Offset	Semi Major Axis		Distance									
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
10,100.0	7,038.9	10,171.5	7,115.0	62.2	61.6	-104.58	-3,075.4	-161.5	302.1	181.6	120.60	2.505	
10,200.0	7,038.1	10,271.5	7,113.7	64.0	63.5	-104.50	-3,175.3	-161.5	302.0	177.8	124.25	2.431	
10,300.0	7,037.2	10,371.5	7,112.4	65.9	65.4	-104.42	-3,275.3	-161.5	301.9	174.0	127.91	2.360	
10,400.0	7,036.4	10,471.5	7,111.1	67.8	67.2	-104.34	-3,375.3	-161.5	301.8	170.2	131.58	2.294	
10,500.0	7,035.5	10,571.5	7,109.8	69.6	69.1	-104.26	-3,475.3	-161.5	301.7	166.5	135.26	2.231	
10,600.0	7,034.7	10,671.5	7,108.6	71.5	71.0	-104.18	-3,575.3	-161.5	301.6	162.7	138.95	2.171	
10,700.0	7,033.8	10,771.5	7,107.3	73.4	72.9	-104.10	-3,675.3	-161.5	301.5	158.9	142.64	2.114	
10,800.0	7,033.0	10,871.5	7,106.0	75.2	74.7	-104.02	-3,775.3	-161.5	301.4	155.1	146.34	2.059	
10,900.0	7,032.1	10,971.5	7,104.7	77.1	76.6	-103.94	-3,875.3	-161.5	301.3	151.2	150.05	2.008	
11,000.0	7,031.2	11,071.5	7,103.4	79.0	78.5	-103.86	-3,975.3	-161.5	301.2	147.4	153.76	1.959	
11,100.0	7,030.4	11,171.5	7,102.1	80.9	80.4	-103.78	-4,075.3	-161.5	301.1	143.6	157.48	1.912	
11,200.0	7,029.5	11,271.5	7,100.8	82.7	82.3	-103.70	-4,175.3	-161.5	301.0	139.8	161.20	1.867	
11,300.0	7,028.7	11,371.5	7,099.5	84.6	84.2	-103.62	-4,275.2	-161.5	300.9	135.9	164.93	1.824	
11,400.0	7,027.8	11,471.5	7,098.2	86.5	86.1	-103.54	-4,375.2	-161.5	300.8	132.1	168.66	1.783	
11,477.1	7,027.2	11,548.6	7,097.2	88.0	87.5	-103.48	-4,452.4	-161.5	300.7	129.1	171.55	1.753	
11,495.8	7,027.0	11,566.4	7,097.0	88.3	87.8	-103.46	-4,470.1	-161.5	300.7	128.4	172.23	1.746 SF	

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Heinrich 7E-223
Project:	SEC.7-T5N-R67W	TVD Reference:	WELL @ 4982.0ft (Original Well Elev)
Reference Site:	Heinricy 5N67W7EJ Pad Sec.7-T5N-R67W	MD Reference:	WELL @ 4982.0ft (Original Well Elev)
Site Error:	0.0ft	North Reference:	True
Reference Well:	Heinricy 7E-223	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 (11-10-14)	Offset TVD Reference:	Offset Datum

Offset Design Heinrich Pad Sec.7-T5N-R67W - Heinrich 7FDU - Wellbore #1 - Wellbore #1												Offset Site Error:	0.0 ft
Survey Program: 222-MWD												Offset Well Error:	0.0 ft
Reference		Offset		Semi Major Axis			Distance						
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
7,100.0	6,941.6	7,107.7	6,952.3	17.2	26.2	37.38	-995.2	-822.2	970.6	939.2	31.40	30.910	
7,200.0	6,989.6	7,157.8	7,002.4	17.4	26.3	47.30	-995.1	-822.5	890.1	858.7	31.43	28.320	
7,300.0	7,025.7	7,195.7	7,040.2	17.8	26.3	60.15	-994.9	-822.6	806.1	773.2	32.89	24.511	
7,400.0	7,049.4	7,219.9	7,064.5	18.5	26.3	74.40	-994.7	-822.7	721.0	686.4	34.67	20.797	
7,500.0	7,060.2	7,230.0	7,074.5	19.4	26.3	87.07	-994.6	-822.7	637.6	602.0	35.63	17.894	
7,600.0	7,060.3	7,229.3	7,073.8	20.5	26.3	90.94	-994.6	-822.7	559.1	522.6	36.49	15.320	
7,700.0	7,059.5	7,227.6	7,072.1	21.6	26.3	90.68	-994.7	-822.7	488.4	450.6	37.73	12.944	
7,800.0	7,058.6	7,225.9	7,070.4	22.9	26.3	90.42	-994.7	-822.7	429.5	390.4	39.07	10.994	
7,900.0	7,057.8	7,224.2	7,068.7	24.3	26.3	90.16	-994.7	-822.7	387.9	347.4	40.49	9.580	
8,000.0	7,056.9	7,222.0	7,066.5	25.7	26.3	89.81	-994.7	-822.7	369.3	327.3	41.98	8.797	
8,020.3	7,056.7	7,222.0	7,066.5	26.0	26.3	89.81	-994.7	-822.7	368.7	326.5	42.29	8.720 CC, ES	
8,100.0	7,056.0	7,220.9	7,065.4	27.2	26.3	89.64	-994.7	-822.7	377.3	333.7	43.52	8.669 SF	
8,200.0	7,055.2	7,219.2	7,063.7	28.8	26.3	89.38	-994.7	-822.7	410.2	365.1	45.11	9.093	
8,300.0	7,054.3	7,217.5	7,062.1	30.4	26.3	89.12	-994.7	-822.7	462.8	416.1	46.74	9.901	
8,400.0	7,053.5	7,215.9	7,060.4	32.0	26.3	88.87	-994.8	-822.7	529.3	480.9	48.41	10.934	
8,500.0	7,052.6	7,214.3	7,058.8	33.6	26.3	88.62	-994.8	-822.7	605.0	554.9	50.10	12.076	
8,600.0	7,051.8	7,212.7	7,057.2	35.3	26.3	88.37	-994.8	-822.7	687.0	635.2	51.82	13.258	
8,700.0	7,050.9	7,211.2	7,055.7	37.0	26.3	88.13	-994.8	-822.6	773.2	719.7	53.55	14.438	
8,800.0	7,050.1	7,209.6	7,054.1	38.7	26.3	87.89	-994.8	-822.6	862.4	807.1	55.31	15.594	
8,900.0	7,049.2	7,208.1	7,052.6	40.5	26.3	87.65	-994.8	-822.6	953.8	896.7	57.08	16.711	

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Heinrich 7E-223
Project:	SEC.7-T5N-R67W	TVD Reference:	WELL @ 4982.0ft (Original Well Elev)
Reference Site:	Heinrich 5N67W7EJ Pad Sec.7-T5N-R67W	MD Reference:	WELL @ 4982.0ft (Original Well Elev)
Site Error:	0.0ft	North Reference:	True
Reference Well:	Heinrich 7E-223	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 (11-10-14)	Offset TVD Reference:	Offset Datum

Offset Design Zeiler 23-7DU Pad Sec.7-T5N-R67W - Zeiler 13-7DU - Wellbore #1 - Wellbore #1												Offset Site Error:	0.0 ft
Survey Program: 454-MWD												Offset Well Error:	0.0 ft
Reference		Offset		Semi Major Axis			Distance						
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
9,100.0	7,047.5	7,144.9	7,029.8	44.0	21.4	-89.60	-2,992.0	-333.7	925.5	861.3	64.15	14.428	
9,200.0	7,046.6	7,145.1	7,030.0	45.8	21.4	-89.68	-2,992.0	-333.7	826.4	760.5	65.95	12.531	
9,300.0	7,045.8	7,145.3	7,030.2	47.6	21.4	-89.77	-2,992.0	-333.7	727.6	659.9	67.76	10.738	
9,400.0	7,044.9	7,145.5	7,030.4	49.4	21.4	-89.86	-2,992.0	-333.7	629.2	559.6	69.59	9.043	
9,500.0	7,044.1	7,145.6	7,030.5	51.2	21.4	-89.95	-2,992.0	-333.7	531.4	460.0	71.41	7.441	
9,600.0	7,043.2	7,145.8	7,030.7	53.0	21.4	-90.04	-2,992.0	-333.7	434.6	361.4	73.25	5.933	
9,700.0	7,042.4	7,146.0	7,030.9	54.8	21.4	-90.13	-2,992.0	-333.7	339.6	264.5	75.09	4.523	
9,800.0	7,041.5	7,146.2	7,031.1	56.7	21.4	-90.21	-2,992.0	-333.7	248.6	171.7	76.94	3.232	
9,900.0	7,040.6	7,146.4	7,031.3	58.5	21.4	-90.30	-2,992.0	-333.7	168.2	89.4	78.79	2.135	
10,000.0	7,039.8	7,146.6	7,031.5	60.4	21.4	-90.39	-2,992.0	-333.7	121.5	40.9	80.65	1.507	
10,017.6	7,039.6	7,146.6	7,031.5	60.7	21.4	-90.40	-2,992.0	-333.7	120.2	39.2	80.97	1.485	Level 3, CC, ES, SF
10,100.0	7,038.9	7,146.7	7,031.6	62.2	21.4	-90.48	-2,992.0	-333.7	145.7	63.2	82.51	1.766	
10,200.0	7,038.1	7,146.9	7,031.8	64.0	21.4	-90.56	-2,992.0	-333.7	218.4	134.0	84.37	2.589	
10,300.0	7,037.2	7,147.1	7,032.0	65.9	21.4	-90.65	-2,992.0	-333.7	306.9	220.6	86.24	3.559	
10,400.0	7,036.4	7,147.3	7,032.2	67.8	21.4	-90.74	-2,992.0	-333.7	400.8	312.7	88.11	4.549	
10,500.0	7,035.5	7,147.5	7,032.4	69.6	21.4	-90.82	-2,992.0	-333.7	497.1	407.1	89.98	5.525	
10,600.0	7,034.7	7,147.7	7,032.6	71.5	21.4	-90.91	-2,992.0	-333.7	594.6	502.8	91.86	6.474	
10,700.0	7,033.8	7,147.8	7,032.7	73.4	21.4	-91.00	-2,992.0	-333.7	692.9	599.1	93.73	7.392	
10,800.0	7,033.0	7,148.0	7,032.9	75.2	21.4	-91.09	-2,992.0	-333.7	791.5	695.9	95.61	8.279	
10,900.0	7,032.1	7,148.2	7,033.1	77.1	21.4	-91.17	-2,992.0	-333.7	890.5	793.0	97.49	9.134	
11,000.0	7,031.2	7,148.4	7,033.3	79.0	21.4	-91.26	-2,992.0	-333.7	989.7	890.3	99.38	9.959	

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Heinrich 7E-223
Project:	SEC.7-T5N-R67W	TVD Reference:	WELL @ 4982.0ft (Original Well Elev)
Reference Site:	Heinricy 5N67W7EJ Pad Sec.7-T5N-R67W	MD Reference:	WELL @ 4982.0ft (Original Well Elev)
Site Error:	0.0ft	North Reference:	True
Reference Well:	Heinricy 7E-223	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 (11-10-14)	Offset TVD Reference:	Offset Datum

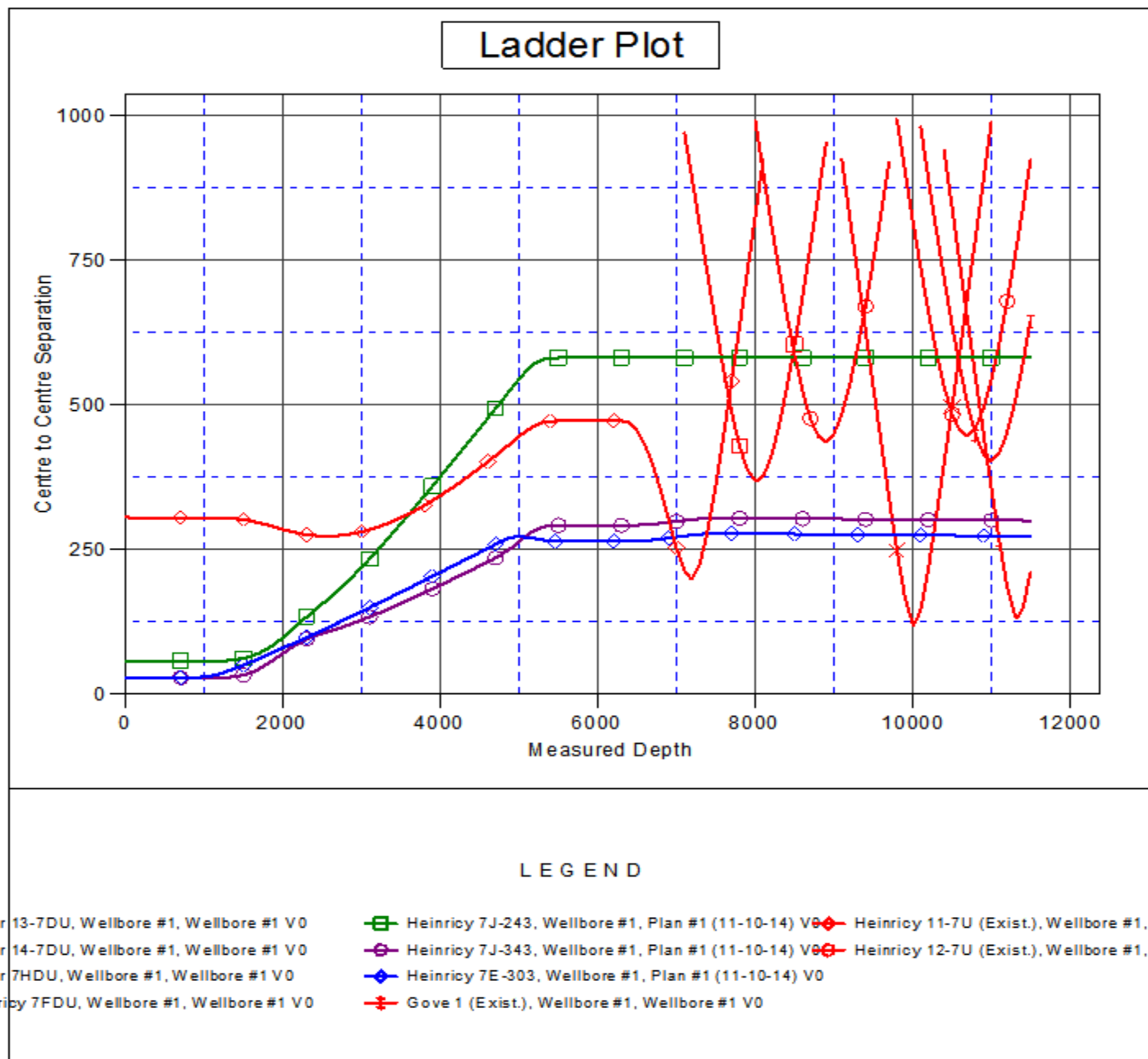
Offset Design Zeiler 23-7DU Pad Sec.7-T5N-R67W - Zeiler 14-7DU - Wellbore #1 - Wellbore #1												Offset Site Error:	0.0 ft
Survey Program: 456-MWD												Offset Well Error:	0.0 ft
Reference		Offset		Semi Major Axis			Distance						Warning
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	
10,400.0	7,036.4	7,072.4	7,027.6	67.8	16.9	-93.54	-4,305.4	-322.1	940.3	856.8	83.46	11.266	
10,500.0	7,035.5	7,071.5	7,026.7	69.6	16.9	-93.15	-4,305.4	-322.1	841.4	756.0	85.34	9.859	
10,600.0	7,034.7	7,070.7	7,025.8	71.5	16.9	-92.76	-4,305.4	-322.1	742.8	655.6	87.22	8.516	
10,700.0	7,033.8	7,069.8	7,024.9	73.4	16.9	-92.38	-4,305.4	-322.1	644.6	555.5	89.10	7.235	
10,800.0	7,033.0	7,068.9	7,024.0	75.2	16.9	-91.99	-4,305.4	-322.1	547.1	456.1	90.98	6.013	
10,900.0	7,032.1	7,068.0	7,023.1	77.1	16.9	-91.61	-4,305.4	-322.1	450.7	357.8	92.86	4.853	
11,000.0	7,031.2	7,067.1	7,022.2	79.0	16.9	-91.23	-4,305.4	-322.1	356.3	261.5	94.74	3.761	
11,100.0	7,030.4	7,066.3	7,021.4	80.9	16.9	-90.86	-4,305.4	-322.1	266.0	169.3	96.62	2.753	
11,200.0	7,029.5	7,065.4	7,020.5	82.7	16.9	-90.49	-4,305.4	-322.1	185.8	87.3	98.50	1.887	
11,300.0	7,028.7	7,064.6	7,019.7	84.6	16.9	-90.12	-4,305.4	-322.1	135.4	35.0	100.38	1.349 Level 3	
11,331.0	7,028.4	7,064.3	7,019.4	85.2	16.9	-90.00	-4,305.4	-322.1	131.8	30.8	100.96	1.305 Level 3, CC, ES, SF	
11,400.0	7,027.8	7,063.7	7,018.8	86.5	16.9	-89.74	-4,305.4	-322.1	148.8	46.5	102.25	1.455 Level 3	
11,495.8	7,027.0	7,062.9	7,018.0	88.3	16.9	-89.38	-4,305.4	-322.1	211.0	106.9	104.04	2.028	

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Heinrich 7E-223
Project:	SEC.7-T5N-R67W	TVD Reference:	WELL @ 4982.0ft (Original Well Elev)
Reference Site:	Heinrich 5N67W7EJ Pad Sec.7-T5N-R67W	MD Reference:	WELL @ 4982.0ft (Original Well Elev)
Site Error:	0.0ft	North Reference:	True
Reference Well:	Heinrich 7E-223	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 (11-10-14)	Offset TVD Reference:	Offset Datum

Offset Design Zeiler 23-7DU Pad Sec.7-T5N-R67W - Zeiler 7HDU - Wellbore #1 - Wellbore #1													Offset Site Error: 0.0 ft	
Survey Program: 454-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)			
9,800.0	7,041.5	7,138.1	7,025.4	56.7	22.2	90.06	-3,661.9	-901.2	993.9	921.7	72.18	13.770		
9,900.0	7,040.6	7,137.7	7,025.0	58.5	22.2	90.01	-3,661.9	-901.2	905.7	831.7	74.03	12.235		
10,000.0	7,039.8	7,137.3	7,024.6	60.4	22.2	89.96	-3,661.9	-901.2	820.3	744.4	75.89	10.809		
10,100.0	7,038.9	7,137.0	7,024.2	62.2	22.2	89.91	-3,661.9	-901.2	738.4	660.7	77.74	9.498		
10,200.0	7,038.1	7,136.6	7,023.8	64.0	22.2	89.86	-3,661.9	-901.2	661.7	582.0	79.61	8.311		
10,300.0	7,037.2	7,136.2	7,023.5	65.9	22.2	89.81	-3,661.9	-901.2	591.8	510.4	81.48	7.264		
10,400.0	7,036.4	7,135.8	7,023.1	67.8	22.2	89.76	-3,661.9	-901.2	531.8	448.4	83.35	6.380		
10,500.0	7,035.5	7,135.5	7,022.7	69.6	22.2	89.72	-3,661.9	-901.2	485.0	399.8	85.22	5.692		
10,600.0	7,034.7	7,135.1	7,022.3	71.5	22.2	89.67	-3,661.9	-901.2	455.8	368.7	87.09	5.233		
10,687.6	7,033.9	7,134.8	7,022.0	73.1	22.2	89.63	-3,661.9	-901.2	447.3	358.5	88.74	5.040 CC		
10,700.0	7,033.8	7,134.7	7,022.0	73.4	22.2	89.62	-3,661.9	-901.2	447.5	358.5	88.97	5.029 ES, SF		
10,800.0	7,033.0	7,134.4	7,021.6	75.2	22.2	89.58	-3,661.9	-901.2	461.2	370.3	90.85	5.076		
10,900.0	7,032.1	7,134.0	7,021.2	77.1	22.2	89.53	-3,661.9	-901.2	495.2	402.4	92.73	5.340		
11,000.0	7,031.2	7,133.6	7,020.9	79.0	22.2	89.48	-3,661.9	-901.2	545.6	451.0	94.62	5.766		
11,100.0	7,030.4	7,133.3	7,020.5	80.9	22.2	89.44	-3,661.9	-901.2	608.4	511.9	96.50	6.305		
11,200.0	7,029.5	7,132.9	7,020.2	82.7	22.2	89.39	-3,661.9	-901.2	680.2	581.8	98.39	6.913		
11,300.0	7,028.7	7,132.6	7,019.8	84.6	22.2	89.35	-3,661.9	-901.2	758.4	658.1	100.28	7.563		
11,400.0	7,027.8	7,132.2	7,019.5	86.5	22.2	89.30	-3,661.9	-901.2	841.2	739.0	102.17	8.233		
11,495.8	7,027.0	7,131.9	7,019.1	88.3	22.2	89.26	-3,661.9	-901.2	923.7	819.7	103.98	8.884		

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Heinrich 7E-223
Project:	SEC.7-T5N-R67W	TVD Reference:	WELL @ 4982.0ft (Original Well Elev)
Reference Site:	Heinricy 5N67W7EJ Pad Sec.7-T5N-R67W	MD Reference:	WELL @ 4982.0ft (Original Well Elev)
Site Error:	0.0ft	North Reference:	True
Reference Well:	Heinricy 7E-223	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 (11-10-14)	Offset TVD Reference:	Offset Datum

Reference Depths are relative to WELL @ 4982.0ft (Original Well Elev) Coordinates are relative to: Heinrich 7E-223
 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: 0.36°



Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Heinrich 7E-223
Project:	SEC.7-T5N-R67W	TVD Reference:	WELL @ 4982.0ft (Original Well Elev)
Reference Site:	Heinricy 5N67W7EJ Pad Sec.7-T5N-R67W	MD Reference:	WELL @ 4982.0ft (Original Well Elev)
Site Error:	0.0ft	North Reference:	True
Reference Well:	Heinricy 7E-223	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 (11-10-14)	Offset TVD Reference:	Offset Datum

Reference Depths are relative to WELL @ 4982.0ft (Original Well Elev) Coordinates are relative to: Heinrich 7E-223
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: 0.36°

