

# PETROLEUM DEVELOPMENT CORP Weld County CO

Well Name: **Bernhardt Farms 13S-203**

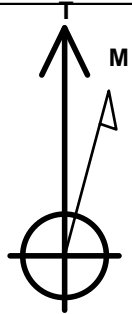
Surface Location: Bernhardt Farms 13SW-HZ Pad Sec.13-T4N-R67W  
North American Datum 1983 , US State Plane 1983 , Colorado Northern Zone  
Ground Elevation: 4737.0

+N/-S	+E/-W	Northing	Easting	Latitude	Longitude	Slot
0.0	0.0	1357036.42	3186255.24	40.311540	-104.832110	

RKB - 15' WELL @ 4752.0ft (RKB - 15')

## WELLBORE TARGET DETAILS

Name	TVD	+N/-S	+E/-W	Shape
SHL 2578'FSL, 671'FEL	1.0	0.0	0.0	Point
BHL 500'FSL, 1130'FEL	7032.0	-7329.8	-477.0	Point



Azimuths to True North  
Magnetic North: 8.57°

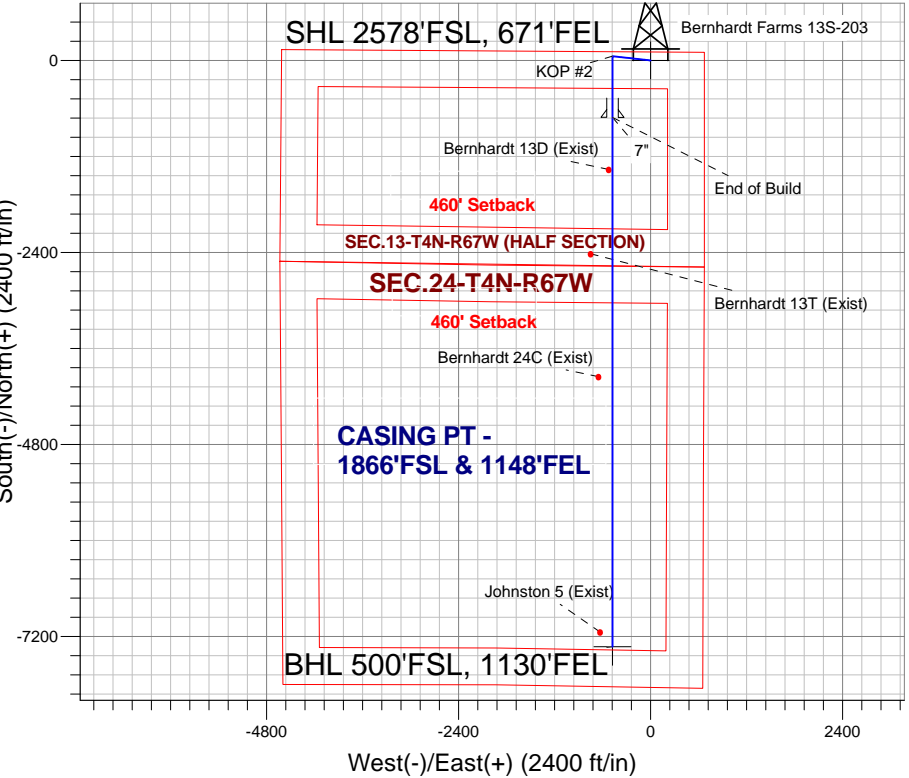
Magnetic Field  
Strength: 52824.5nT  
Dip Angle: 66.89°  
Date: 11/12/2013  
Model: IGRF2010

Bernhardt Farms 13SW-HZ Pad Sec.13-T4N-R67W  
Bernhardt Farms 13S-203  
Plan #1 (11-12-13)  
11:32, November 19 2013

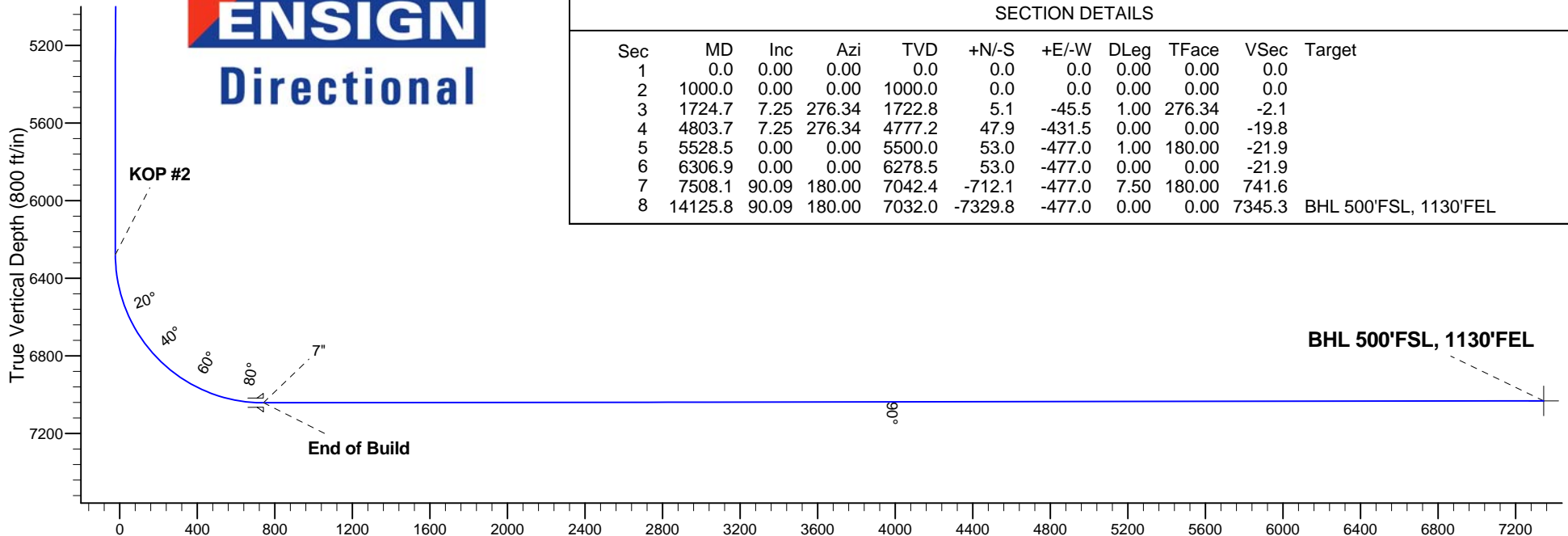
## ANNOTATIONS

TVD	MD	Annotation
1000.0	1000.0	KOP #1
6278.4	6306.9	KOP #2
7042.4	7508.1	End of Build

South(-)/North(+) (2400 ft/in)



**ENSIGN**  
Directional



## SECTION DETAILS

Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	DLeg	TFace	VSec	Target
1	0.0	0.00	0.00	0.0	0.0	0.0	0.00	0.00	0.0	
2	1000.0	0.00	0.00	1000.0	0.0	0.0	0.00	0.00	0.0	
3	1724.7	7.25	276.34	1722.8	5.1	-45.5	1.00	276.34	-2.1	
4	4803.7	7.25	276.34	4777.2	47.9	-431.5	0.00	0.00	-19.8	
5	5528.5	0.00	0.00	5500.0	53.0	-477.0	1.00	180.00	-21.9	
6	6306.9	0.00	0.00	6278.5	53.0	-477.0	0.00	0.00	-21.9	
7	7508.1	90.09	180.00	7042.4	-712.1	-477.0	7.50	180.00	741.6	
8	14125.8	90.09	180.00	7032.0	-7329.8	-477.0	0.00	0.00	7345.3	BHL 500'FSL, 1130'FEL

Vertical Section at 183.72° (800 ft/in)



# **PETROLEUM DEVELOPMENT CORP Weld County CO**

**SEC.13-T4N-R67W**

**Bernhardt Farms 13SW-HZ Pad Sec.13-T4N-R67W**

**Bernhardt Farms 13S-203**

**Wellbore #1**

**Plan: Plan #1 (11-12-13)**

## **Standard Planning Report**

**19 November, 2013**

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	
1,724.7	7.25	276.34	1,722.8	5.1	-45.5	1.00	1.00	0.00	276.34	
4,803.7	7.25	276.34	4,777.2	47.9	-431.5	0.00	0.00	0.00	0.00	
5,528.5	0.00	0.00	5,500.0	53.0	-477.0	1.00	-1.00	0.00	180.00	
6,306.9	0.00	0.00	6,278.5	53.0	-477.0	0.00	0.00	0.00	0.00	
7,508.1	90.09	180.00	7,042.4	-712.1	-477.0	7.50	7.50	0.00	180.00	
14,125.8	90.09	180.00	7,032.0	-7,329.8	-477.0	0.00	0.00	0.00	0.00	BHL 500'FSL, 1130

<b>Database:</b>	Landmark	<b>Local Co-ordinate Reference:</b>	Well Bernhardt Farms 13S-203
<b>Company:</b>	PETROLEUM DEVELOPMENT CORP Weld County CO	<b>TVD Reference:</b>	WELL @ 4752.0ft (RKB - 15')
<b>Project:</b>	SEC.13-T4N-R67W	<b>MD Reference:</b>	WELL @ 4752.0ft (RKB - 15')
<b>Site:</b>	Bernhardt Farms 13SW-HZ Pad Sec.13-T4N-R67W	<b>North Reference:</b>	True
<b>Well:</b>	Bernhardt Farms 13S-203	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Wellbore #1		
<b>Design:</b>	Plan #1 (11-12-13)		

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
<b>SHL 2578'FSL, 671'FEL</b>									
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
<b>KOP #1</b>									
1,100.0	1.00	276.34	1,100.0	0.1	-0.9	0.0	1.00	1.00	0.00
1,200.0	2.00	276.34	1,200.0	0.4	-3.5	-0.2	1.00	1.00	0.00
1,300.0	3.00	276.34	1,299.9	0.9	-7.8	-0.4	1.00	1.00	0.00
1,400.0	4.00	276.34	1,399.7	1.5	-13.9	-0.6	1.00	1.00	0.00
1,500.0	5.00	276.34	1,499.4	2.4	-21.7	-1.0	1.00	1.00	0.00
1,600.0	6.00	276.34	1,598.9	3.5	-31.2	-1.4	1.00	1.00	0.00
1,700.0	7.00	276.34	1,698.3	4.7	-42.4	-1.9	1.00	1.00	0.00
1,724.7	7.25	276.34	1,722.8	5.1	-45.5	-2.1	1.00	1.00	0.00
1,800.0	7.25	276.34	1,797.5	6.1	-54.9	-2.5	0.00	0.00	0.00
1,900.0	7.25	276.34	1,896.7	7.5	-67.5	-3.1	0.00	0.00	0.00
2,000.0	7.25	276.34	1,995.9	8.9	-80.0	-3.7	0.00	0.00	0.00
2,100.0	7.25	276.34	2,095.1	10.3	-92.5	-4.3	0.00	0.00	0.00
2,200.0	7.25	276.34	2,194.3	11.7	-105.1	-4.8	0.00	0.00	0.00
2,300.0	7.25	276.34	2,293.5	13.1	-117.6	-5.4	0.00	0.00	0.00
2,400.0	7.25	276.34	2,392.7	14.5	-130.2	-6.0	0.00	0.00	0.00
2,500.0	7.25	276.34	2,491.9	15.9	-142.7	-6.6	0.00	0.00	0.00
2,600.0	7.25	276.34	2,591.1	17.2	-155.2	-7.1	0.00	0.00	0.00
2,700.0	7.25	276.34	2,690.3	18.6	-167.8	-7.7	0.00	0.00	0.00
2,800.0	7.25	276.34	2,789.5	20.0	-180.3	-8.3	0.00	0.00	0.00
2,900.0	7.25	276.34	2,888.7	21.4	-192.9	-8.9	0.00	0.00	0.00
3,000.0	7.25	276.34	2,987.9	22.8	-205.4	-9.4	0.00	0.00	0.00
3,100.0	7.25	276.34	3,087.1	24.2	-217.9	-10.0	0.00	0.00	0.00
3,200.0	7.25	276.34	3,186.3	25.6	-230.5	-10.6	0.00	0.00	0.00
3,300.0	7.25	276.34	3,285.5	27.0	-243.0	-11.2	0.00	0.00	0.00
3,400.0	7.25	276.34	3,384.7	28.4	-255.5	-11.7	0.00	0.00	0.00
3,500.0	7.25	276.34	3,483.9	29.8	-268.1	-12.3	0.00	0.00	0.00
3,600.0	7.25	276.34	3,583.1	31.2	-280.6	-12.9	0.00	0.00	0.00
3,700.0	7.25	276.34	3,682.3	32.6	-293.2	-13.5	0.00	0.00	0.00
3,800.0	7.25	276.34	3,781.5	34.0	-305.7	-14.0	0.00	0.00	0.00
3,900.0	7.25	276.34	3,880.7	35.4	-318.2	-14.6	0.00	0.00	0.00
4,000.0	7.25	276.34	3,979.9	36.7	-330.8	-15.2	0.00	0.00	0.00
4,100.0	7.25	276.34	4,079.1	38.1	-343.3	-15.8	0.00	0.00	0.00
4,200.0	7.25	276.34	4,178.3	39.5	-355.8	-16.3	0.00	0.00	0.00
4,300.0	7.25	276.34	4,277.5	40.9	-368.4	-16.9	0.00	0.00	0.00
4,400.0	7.25	276.34	4,376.7	42.3	-380.9	-17.5	0.00	0.00	0.00
4,500.0	7.25	276.34	4,475.9	43.7	-393.5	-18.1	0.00	0.00	0.00
4,600.0	7.25	276.34	4,575.1	45.1	-406.0	-18.6	0.00	0.00	0.00
4,700.0	7.25	276.34	4,674.3	46.5	-418.5	-19.2	0.00	0.00	0.00

<b>Database:</b>	Landmark	<b>Local Co-ordinate Reference:</b>	Well Bernhardt Farms 13S-203
<b>Company:</b>	PETROLEUM DEVELOPMENT CORP Weld County CO	<b>TVD Reference:</b>	WELL @ 4752.0ft (RKB - 15')
<b>Project:</b>	SEC.13-T4N-R67W	<b>MD Reference:</b>	WELL @ 4752.0ft (RKB - 15')
<b>Site:</b>	Bernhardt Farms 13SW-HZ Pad Sec.13-T4N-R67W	<b>North Reference:</b>	True
<b>Well:</b>	Bernhardt Farms 13S-203	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Wellbore #1		
<b>Design:</b>	Plan #1 (11-12-13)		

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)
4,800.0	7.25	276.34	4,773.5	47.9	-431.1	-19.8	0.00	0.00	0.00
4,803.7	7.25	276.34	4,777.2	47.9	-431.5	-19.8	0.00	0.00	0.00
4,900.0	6.28	276.34	4,872.8	49.2	-442.8	-20.3	1.00	-1.00	0.00
5,000.0	5.28	276.34	4,972.3	50.3	-452.8	-20.8	1.00	-1.00	0.00
5,100.0	4.28	276.34	5,071.9	51.2	-461.1	-21.2	1.00	-1.00	0.00
5,200.0	3.28	276.34	5,171.7	52.0	-467.7	-21.5	1.00	-1.00	0.00
5,300.0	2.28	276.34	5,271.6	52.5	-472.5	-21.7	1.00	-1.00	0.00
5,400.0	1.28	276.34	5,371.6	52.8	-475.6	-21.8	1.00	-1.00	0.00
5,500.0	0.28	276.34	5,471.5	53.0	-477.0	-21.9	1.00	-1.00	0.00
5,528.5	0.00	0.00	5,500.0	53.0	-477.0	-21.9	1.00	-1.00	0.00
5,600.0	0.00	0.00	5,571.5	53.0	-477.0	-21.9	0.00	0.00	0.00
5,700.0	0.00	0.00	5,671.5	53.0	-477.0	-21.9	0.00	0.00	0.00
5,800.0	0.00	0.00	5,771.5	53.0	-477.0	-21.9	0.00	0.00	0.00
5,900.0	0.00	0.00	5,871.5	53.0	-477.0	-21.9	0.00	0.00	0.00
6,000.0	0.00	0.00	5,971.5	53.0	-477.0	-21.9	0.00	0.00	0.00
6,100.0	0.00	0.00	6,071.5	53.0	-477.0	-21.9	0.00	0.00	0.00
6,200.0	0.00	0.00	6,171.5	53.0	-477.0	-21.9	0.00	0.00	0.00
6,300.0	0.00	0.00	6,271.5	53.0	-477.0	-21.9	0.00	0.00	0.00
6,306.9	0.00	0.00	6,278.4	53.0	-477.0	-21.9	0.00	0.00	0.00
<b>KOP #2</b>									
6,400.0	6.98	180.00	6,371.3	47.3	-477.0	-16.3	7.50	7.50	0.00
6,500.0	14.48	180.00	6,469.5	28.7	-477.0	2.3	7.50	7.50	0.00
6,600.0	21.98	180.00	6,564.4	-2.5	-477.0	33.5	7.50	7.50	0.00
6,700.0	29.48	180.00	6,654.4	-45.9	-477.0	76.8	7.50	7.50	0.00
6,800.0	36.98	180.00	6,738.0	-100.7	-477.0	131.5	7.50	7.50	0.00
6,900.0	44.48	180.00	6,813.7	-165.9	-477.0	196.5	7.50	7.50	0.00
7,000.0	51.98	180.00	6,880.3	-240.4	-477.0	270.9	7.50	7.50	0.00
7,100.0	59.48	180.00	6,936.6	-323.0	-477.0	353.3	7.50	7.50	0.00
7,200.0	66.98	180.00	6,981.6	-412.2	-477.0	442.3	7.50	7.50	0.00
7,300.0	74.48	180.00	7,014.5	-506.6	-477.0	536.5	7.50	7.50	0.00
7,400.0	81.98	180.00	7,034.9	-604.4	-477.0	634.1	7.50	7.50	0.00
7,500.0	89.48	180.00	7,042.4	-704.0	-477.0	733.5	7.50	7.50	0.00
7,508.1	90.09	180.00	7,042.4	-712.1	-477.0	741.6	7.50	7.50	0.00
<b>End of Build - 7"</b>									
7,600.0	90.09	180.00	7,042.3	-804.0	-477.0	833.3	0.00	0.00	0.00
7,700.0	90.09	180.00	7,042.1	-904.0	-477.0	933.1	0.00	0.00	0.00
7,800.0	90.09	180.00	7,041.9	-1,004.0	-477.0	1,032.9	0.00	0.00	0.00
7,900.0	90.09	180.00	7,041.8	-1,104.0	-477.0	1,132.7	0.00	0.00	0.00
8,000.0	90.09	180.00	7,041.6	-1,204.0	-477.0	1,232.5	0.00	0.00	0.00
8,100.0	90.09	180.00	7,041.5	-1,304.0	-477.0	1,332.3	0.00	0.00	0.00
8,200.0	90.09	180.00	7,041.3	-1,404.0	-477.0	1,432.0	0.00	0.00	0.00
8,300.0	90.09	180.00	7,041.2	-1,504.0	-477.0	1,531.8	0.00	0.00	0.00
8,400.0	90.09	180.00	7,041.0	-1,604.0	-477.0	1,631.6	0.00	0.00	0.00
8,500.0	90.09	180.00	7,040.8	-1,704.0	-477.0	1,731.4	0.00	0.00	0.00
8,600.0	90.09	180.00	7,040.7	-1,804.0	-477.0	1,831.2	0.00	0.00	0.00
8,700.0	90.09	180.00	7,040.5	-1,904.0	-477.0	1,931.0	0.00	0.00	0.00
8,800.0	90.09	180.00	7,040.4	-2,004.0	-477.0	2,030.8	0.00	0.00	0.00
8,900.0	90.09	180.00	7,040.2	-2,104.0	-477.0	2,130.6	0.00	0.00	0.00
9,000.0	90.09	180.00	7,040.1	-2,204.0	-477.0	2,230.4	0.00	0.00	0.00
9,100.0	90.09	180.00	7,039.9	-2,304.0	-477.0	2,330.1	0.00	0.00	0.00
9,200.0	90.09	180.00	7,039.7	-2,404.0	-477.0	2,429.9	0.00	0.00	0.00
9,300.0	90.09	180.00	7,039.6	-2,504.0	-477.0	2,529.7	0.00	0.00	0.00

<b>Database:</b>	Landmark	<b>Local Co-ordinate Reference:</b>	Well Bernhardt Farms 13S-203
<b>Company:</b>	PETROLEUM DEVELOPMENT CORP Weld County CO	<b>TVD Reference:</b>	WELL @ 4752.0ft (RKB - 15')
<b>Project:</b>	SEC.13-T4N-R67W	<b>MD Reference:</b>	WELL @ 4752.0ft (RKB - 15')
<b>Site:</b>	Bernhardt Farms 13SW-HZ Pad Sec.13-T4N-R67W	<b>North Reference:</b>	True
<b>Well:</b>	Bernhardt Farms 13S-203	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Wellbore #1		
<b>Design:</b>	Plan #1 (11-12-13)		

Planned Survey									
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
9,400.0	90.09	180.00	7,039.4	-2,604.0	-477.0	2,629.5	0.00	0.00	0.00
9,500.0	90.09	180.00	7,039.3	-2,704.0	-477.0	2,729.3	0.00	0.00	0.00
9,600.0	90.09	180.00	7,039.1	-2,804.0	-477.0	2,829.1	0.00	0.00	0.00
9,700.0	90.09	180.00	7,039.0	-2,904.0	-477.0	2,928.9	0.00	0.00	0.00
9,800.0	90.09	180.00	7,038.8	-3,004.0	-477.0	3,028.7	0.00	0.00	0.00
9,900.0	90.09	180.00	7,038.6	-3,104.0	-477.0	3,128.5	0.00	0.00	0.00
10,000.0	90.09	180.00	7,038.5	-3,204.0	-477.0	3,228.2	0.00	0.00	0.00
10,100.0	90.09	180.00	7,038.3	-3,304.0	-477.0	3,328.0	0.00	0.00	0.00
10,200.0	90.09	180.00	7,038.2	-3,404.0	-477.0	3,427.8	0.00	0.00	0.00
10,300.0	90.09	180.00	7,038.0	-3,504.0	-477.0	3,527.6	0.00	0.00	0.00
10,400.0	90.09	180.00	7,037.9	-3,604.0	-477.0	3,627.4	0.00	0.00	0.00
10,500.0	90.09	180.00	7,037.7	-3,704.0	-477.0	3,727.2	0.00	0.00	0.00
10,600.0	90.09	180.00	7,037.5	-3,804.0	-477.0	3,827.0	0.00	0.00	0.00
10,700.0	90.09	180.00	7,037.4	-3,904.0	-477.0	3,926.8	0.00	0.00	0.00
10,800.0	90.09	180.00	7,037.2	-4,004.0	-477.0	4,026.6	0.00	0.00	0.00
10,900.0	90.09	180.00	7,037.1	-4,104.0	-477.0	4,126.3	0.00	0.00	0.00
11,000.0	90.09	180.00	7,036.9	-4,204.0	-477.0	4,226.1	0.00	0.00	0.00
11,100.0	90.09	180.00	7,036.8	-4,304.0	-477.0	4,325.9	0.00	0.00	0.00
11,200.0	90.09	180.00	7,036.6	-4,404.0	-477.0	4,425.7	0.00	0.00	0.00
11,300.0	90.09	180.00	7,036.4	-4,504.0	-477.0	4,525.5	0.00	0.00	0.00
11,400.0	90.09	180.00	7,036.3	-4,604.0	-477.0	4,625.3	0.00	0.00	0.00
11,500.0	90.09	180.00	7,036.1	-4,704.0	-477.0	4,725.1	0.00	0.00	0.00
11,600.0	90.09	180.00	7,036.0	-4,804.0	-477.0	4,824.9	0.00	0.00	0.00
11,700.0	90.09	180.00	7,035.8	-4,904.0	-477.0	4,924.7	0.00	0.00	0.00
11,800.0	90.09	180.00	7,035.7	-5,004.0	-477.0	5,024.4	0.00	0.00	0.00
11,900.0	90.09	180.00	7,035.5	-5,104.0	-477.0	5,124.2	0.00	0.00	0.00
12,000.0	90.09	180.00	7,035.3	-5,204.0	-477.0	5,224.0	0.00	0.00	0.00
12,100.0	90.09	180.00	7,035.2	-5,304.0	-477.0	5,323.8	0.00	0.00	0.00
12,200.0	90.09	180.00	7,035.0	-5,404.0	-477.0	5,423.6	0.00	0.00	0.00
12,300.0	90.09	180.00	7,034.9	-5,504.0	-477.0	5,523.4	0.00	0.00	0.00
12,400.0	90.09	180.00	7,034.7	-5,604.0	-477.0	5,623.2	0.00	0.00	0.00
12,500.0	90.09	180.00	7,034.6	-5,704.0	-477.0	5,723.0	0.00	0.00	0.00
12,600.0	90.09	180.00	7,034.4	-5,804.0	-477.0	5,822.8	0.00	0.00	0.00
12,700.0	90.09	180.00	7,034.2	-5,904.0	-477.0	5,922.5	0.00	0.00	0.00
12,800.0	90.09	180.00	7,034.1	-6,004.0	-477.0	6,022.3	0.00	0.00	0.00
12,900.0	90.09	180.00	7,033.9	-6,104.0	-477.0	6,122.1	0.00	0.00	0.00
13,000.0	90.09	180.00	7,033.8	-6,204.0	-477.0	6,221.9	0.00	0.00	0.00
13,100.0	90.09	180.00	7,033.6	-6,304.0	-477.0	6,321.7	0.00	0.00	0.00
13,200.0	90.09	180.00	7,033.5	-6,404.0	-477.0	6,421.5	0.00	0.00	0.00
13,300.0	90.09	180.00	7,033.3	-6,504.0	-477.0	6,521.3	0.00	0.00	0.00
13,400.0	90.09	180.00	7,033.1	-6,604.0	-477.0	6,621.1	0.00	0.00	0.00
13,500.0	90.09	180.00	7,033.0	-6,704.0	-477.0	6,720.9	0.00	0.00	0.00
13,600.0	90.09	180.00	7,032.8	-6,804.0	-477.0	6,820.6	0.00	0.00	0.00
13,700.0	90.09	180.00	7,032.7	-6,904.0	-477.0	6,920.4	0.00	0.00	0.00
13,800.0	90.09	180.00	7,032.5	-7,004.0	-477.0	7,020.2	0.00	0.00	0.00
13,900.0	90.09	180.00	7,032.4	-7,104.0	-477.0	7,120.0	0.00	0.00	0.00
14,000.0	90.09	180.00	7,032.2	-7,204.0	-477.0	7,219.8	0.00	0.00	0.00
14,100.0	90.09	180.00	7,032.0	-7,304.0	-477.0	7,319.6	0.00	0.00	0.00
14,125.8	90.09	180.00	7,032.0	-7,329.8	-477.0	7,345.3	0.00	0.00	0.00
BHL 500'FSL, 1130'FEL									

<b>Database:</b>	Landmark	<b>Local Co-ordinate Reference:</b>	Well Bernhardt Farms 13S-203
<b>Company:</b>	PETROLEUM DEVELOPMENT CORP Weld County CO	<b>TVD Reference:</b>	WELL @ 4752.0ft (RKB - 15')
<b>Project:</b>	SEC.13-T4N-R67W	<b>MD Reference:</b>	WELL @ 4752.0ft (RKB - 15')
<b>Site:</b>	Bernhardt Farms 13SW-HZ Pad Sec.13-T4N-R67W	<b>North Reference:</b>	True
<b>Well:</b>	Bernhardt Farms 13S-203	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Wellbore #1		
<b>Design:</b>	Plan #1 (11-12-13)		

Casing Points					
Measured Depth (ft)	Vertical Depth (ft)	Name	Casing Diameter (")	Hole Diameter (")	
7,508.1	7,042.4	7"	7	7-1/2	

Plan Annotations					
Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates			
		+N/-S (ft)	+E/-W (ft)	Comment	
1,000.0	1,000.0	0.0	0.0	KOP #1	
6,306.9	6,278.4	53.0	-477.0	KOP #2	
7,508.1	7,042.4	-712.1	-477.0	End of Build	



# **PETROLEUM DEVELOPMENT CORP Weld County CO**

**SEC.13-T4N-R67W**

**Bernhardt Farms 13SW-HZ Pad Sec.13-T4N-R67W**

**Bernhardt Farms 13S-203**

**Wellbore #1**

**Plan #1 (11-12-13)**

## **Anticollision Report**

**19 November, 2013**



<b>Company:</b>	PETROLEUM DEVELOPMENT CORP Weld County CO	<b>Local Co-ordinate Reference:</b>	Well Bernhardt Farms 13S-203
<b>Project:</b>	SEC.13-T4N-R67W	<b>TVD Reference:</b>	WELL @ 4752.0ft (RKB - 15')
<b>Reference Site:</b>	Bernhardt Farms 13SW-HZ Pad Sec.13-T4N-R67W	<b>MD Reference:</b>	WELL @ 4752.0ft (RKB - 15')
<b>Site Error:</b>	0.0ft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Bernhardt Farms 13S-203	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.0ft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	Wellbore #1	<b>Database:</b>	Landmark
<b>Reference Design:</b>	Plan #1 (11-12-13)	<b>Offset TVD Reference:</b>	Offset Datum

<b>Reference</b>	Plan #1 (11-12-13)		
<b>Filter type:</b>	NO GLOBAL FILTER: Using user defined selection & filtering criteria		
<b>Interpolation Method:</b>	MD Interval 1,000.0ft	<b>Error Model:</b>	ISCWSA
<b>Depth Range:</b>	Unlimited	<b>Scan Method:</b>	Closest Approach 3D
<b>Results Limited by:</b>	Maximum center-center distance of 1,000.0ft	<b>Error Surface:</b>	Elliptical Conic
<b>Warning Levels Evaluated at:</b>	2.00 Sigma		

<b>Survey Tool Program</b>	<b>Date</b> 11/19/2013			
<b>From (ft)</b>	<b>To (ft)</b>	<b>Survey (Wellbore)</b>	<b>Tool Name</b>	<b>Description</b>
0.0	14,125.8	Plan #1 (11-12-13) (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
<b>Offset Well - Wellbore - Design</b>						
Bernhardt Farms 13SW-HZ Pad Sec.13-T4N-R67W						
Bernhardt Farms 13S-423 - Wellbore #1 - Plan #1 (11-12)	1,000.0	1,000.0	31.2	26.9	7.306	CC, ES
Bernhardt Farms 13S-423 - Wellbore #1 - Plan #1 (11-12)	14,125.8	14,314.8	398.7	156.1	1.643	SF
Bernhardt Farms 13S-443 - Wellbore #1 - Plan #1 (11-13)	0.0	0.0	31.2			
Bernhardt Farms 13S-443 - Wellbore #1 - Plan #1 (11-13)	14,125.8	14,391.6	558.0	297.3	2.141	SF
Bernhardt Farms 13W-343 - Wellbore #1 - Plan #1 (11-1)	1,000.0	1,000.0	61.5	57.2	14.393	CC, ES
Bernhardt Farms 13W-343 - Wellbore #1 - Plan #1 (11-1)	14,125.8	14,180.5	729.9	447.4	2.583	SF
Bernhardt Farms 13W-403 - Wellbore #1 - Plan #1 (11-1)	1,000.0	1,000.0	89.2	85.0	20.892	CC, ES, SF
<b>Existing Wells - Sec.13-T4N-R67W</b>						
Bernhardt 13D (Exist) - Wellbore #1 - Wellbore #1	8,233.7	7,005.3	88.8	-83.0	0.517	Level 1, CC, ES, SF
Bernhardt 13T (Exist) - Wellbore #1 - Wellbore #1	9,228.4	7,005.7	273.8	84.5	1.446	Level 3, CC, ES, SF
Bernhardt 24C (Exist) - Wellbore #1 - Wellbore #1	10,729.4	7,006.3	176.7	-40.4	0.814	Level 1, CC, ES, SF
Johnston 5 (Exist) - Wellbore #1 - Wellbore #1	13,889.9	7,005.4	164.1	-113.1	0.592	Level 1, CC, ES, SF

<b>Offset Design</b> Bernhardt Farms 13SW-HZ Pad Sec.13-T4N-R67W - Bernhardt Farms 13S-423 - Wellbore #1 - Plan #1											
Survey Program: 0-MWD											
Offset Site Error: 0.0ft											
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)
0.0	0.0	0.0	0.0	0.0	0.0	20.95	29.1	11.2	31.2		
1,000.0	1,000.0	1,000.0	1,000.0	2.1	2.1	20.95	29.1	11.2	31.2	26.9	4.27
2,000.0	1,995.9	1,995.9	1,995.9	4.5	4.4	160.99	29.1	11.2	93.4	84.7	8.64
3,000.0	2,987.9	2,998.4	2,997.0	7.6	6.6	168.34	38.2	-40.2	166.2	153.1	13.06
4,000.0	3,979.9	3,996.0	3,992.9	10.8	8.9	170.91	48.0	-96.0	235.4	217.8	17.61
5,000.0	4,972.3	4,979.4	4,974.9	13.9	11.2	172.36	57.1	-147.7	305.2	283.1	22.10
6,000.0	5,971.5	5,976.0	5,971.5	15.7	13.3	89.28	57.1	-147.8	329.2	303.1	26.12
7,000.0	6,880.3	7,026.7	6,979.4	17.6	15.5	-114.55	-123.0	-147.8	363.3	333.8	29.51
8,000.0	7,041.6	8,189.0	7,260.2	28.7	28.2	-123.58	-1,204.1	-147.8	395.2	346.0	49.15
9,000.0	7,040.1	9,189.0	7,259.7	45.6	45.4	-123.71	-2,204.1	-147.8	395.7	317.1	78.61
10,000.0	7,038.5	10,189.0	7,259.2	63.8	63.8	-123.84	-3,204.1	-147.8	396.3	286.4	109.96
11,000.0	7,036.9	11,189.0	7,258.6	82.5	82.5	-123.96	-4,204.1	-147.9	396.9	255.0	141.91
12,000.0	7,035.3	12,189.0	7,258.1	101.3	101.5	-124.09	-5,204.1	-147.9	397.5	223.4	174.08
											2.283

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

<b>Company:</b>	PETROLEUM DEVELOPMENT CORP Weld County CO	<b>Local Co-ordinate Reference:</b>	Well Bernhardt Farms 13S-203
<b>Project:</b>	SEC.13-T4N-R67W	<b>TVD Reference:</b>	WELL @ 4752.0ft (RKB - 15')
<b>Reference Site:</b>	Bernhardt Farms 13SW-HZ Pad Sec.13-T4N-R67W	<b>MD Reference:</b>	WELL @ 4752.0ft (RKB - 15')
<b>Site Error:</b>	0.0ft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Bernhardt Farms 13S-203	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.0ft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	Wellbore #1	<b>Database:</b>	Landmark
<b>Reference Design:</b>	Plan #1 (11-12-13)	<b>Offset TVD Reference:</b>	Offset Datum

Offset Design											Bernhardt Farms 13SW-HZ Pad Sec.13-T4N-R67W - Bernhardt Farms 13S-423 - Wellbore #1 - Plan #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 (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		
13,000.0	7,033.8	13,189.0	7,257.6	120.3	120.5	-124.21	-6,204.1	-147.9	398.1	191.7	206.33	1.929		
14,000.0	7,032.2	14,189.0	7,257.1	139.3	139.5	-124.34	-7,204.1	-147.9	398.7	160.1	238.60	1.671		
14,125.8	7,032.0	14,314.8	7,257.0	141.7	141.9	-124.35	-7,329.9	-147.9	398.7	156.1	242.66	1.643 SF		

<b>Company:</b>	PETROLEUM DEVELOPMENT CORP Weld County CO	<b>Local Co-ordinate Reference:</b>	Well Bernhardt Farms 13S-203
<b>Project:</b>	SEC.13-T4N-R67W	<b>TVD Reference:</b>	WELL @ 4752.0ft (RKB - 15')
<b>Reference Site:</b>	Bernhardt Farms 13SW-HZ Pad Sec.13-T4N-R67W	<b>MD Reference:</b>	WELL @ 4752.0ft (RKB - 15')
<b>Site Error:</b>	0.0ft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Bernhardt Farms 13S-203	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.0ft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	Wellbore #1	<b>Database:</b>	Landmark
<b>Reference Design:</b>	Plan #1 (11-12-13)	<b>Offset TVD Reference:</b>	Offset Datum

Offset Design		Bernhardt Farms 13SW-HZ Pad Sec.13-T4N-R67W - Bernhardt Farms 13S-443 - Wellbore #1 - Plan #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 (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					
0.0	0.0	0.0	0.0	0.0	0.0	-159.06	-29.1	-11.2	31.2								
1,000.0	1,000.0	985.6	977.3	2.1	2.8	-100.57	-20.7	-111.2	115.3	110.4	4.90	23.518					
2,000.0	1,995.9	1,977.0	1,947.9	4.5	7.3	-9.31	-3.9	-312.4	237.6	228.5	9.08	26.174					
3,000.0	2,987.9	2,973.9	2,923.9	7.6	11.8	-7.99	13.1	-514.7	316.0	301.9	14.05	22.486					
4,000.0	3,979.9	3,970.8	3,899.9	10.8	16.3	-7.19	30.1	-717.0	394.5	375.4	19.08	20.673					
5,000.0	4,972.3	4,967.4	4,875.7	13.9	20.8	-6.63	47.1	-919.2	476.3	452.3	24.03	19.820					
6,000.0	5,971.5	6,068.2	5,971.5	15.7	22.9	-90.02	52.9	-987.5	510.5	482.7	27.82	18.349					
7,000.0	6,880.3	7,115.4	6,976.8	17.6	24.1	106.07	-125.1	-987.5	532.2	500.5	31.68	16.800					
8,000.0	7,041.6	8,276.9	7,260.2	28.7	32.3	113.18	-1,204.1	-987.5	555.3	505.0	50.37	11.025					
9,000.0	7,040.1	9,276.9	7,259.7	45.6	47.7	113.28	-2,204.1	-987.5	555.7	473.6	82.15	6.765					
10,000.0	7,038.5	10,276.9	7,259.2	63.8	65.2	113.38	-3,204.1	-987.5	556.2	440.0	116.20	4.786					
11,000.0	7,036.9	11,276.9	7,258.6	82.5	83.5	113.48	-4,204.1	-987.5	556.6	405.6	150.97	3.687					
12,000.0	7,035.3	12,276.9	7,258.1	101.3	102.1	113.57	-5,204.1	-987.5	557.0	371.0	186.02	2.994					
13,000.0	7,033.8	13,276.9	7,257.6	120.3	120.9	113.67	-6,204.1	-987.5	557.4	336.2	221.20	2.520					
14,000.0	7,032.2	14,276.9	7,257.1	139.3	139.8	113.77	-7,204.1	-987.5	557.8	301.4	256.44	2.175					
14,072.7	7,032.1	14,349.6	7,257.0	140.7	141.1	113.78	-7,276.8	-987.5	557.9	298.9	259.00	2.154					
14,125.8	7,032.0	14,391.6	7,257.0	141.7	141.9	113.78	-7,318.9	-987.5	558.0	297.3	260.68	2.141 SF					

<b>Company:</b>	PETROLEUM DEVELOPMENT CORP Weld County CO	<b>Local Co-ordinate Reference:</b>	Well Bernhardt Farms 13S-203
<b>Project:</b>	SEC.13-T4N-R67W	<b>TVD Reference:</b>	WELL @ 4752.0ft (RKB - 15')
<b>Reference Site:</b>	Bernhardt Farms 13SW-HZ Pad Sec.13-T4N-R67W	<b>MD Reference:</b>	WELL @ 4752.0ft (RKB - 15')
<b>Site Error:</b>	0.0ft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Bernhardt Farms 13S-203	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.0ft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	Wellbore #1	<b>Database:</b>	Landmark
<b>Reference Design:</b>	Plan #1 (11-12-13)	<b>Offset TVD Reference:</b>	Offset Datum

<b>Offset Design</b> Bernhardt Farms 13SW-HZ Pad Sec.13-T4N-R67W - Bernhardt Farms 13W-343 - Wellbore #1 - Plan #													<b>Offset Site Error:</b>	0.0 ft
Survey Program: 0-MWD													<b>Offset Well Error:</b>	0.0 ft
Reference	Offset	Semi Major Axis		Distance										Warning
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor		
0.0	0.0	0.0	0.0	0.0	0.0	18.52	58.3	19.5	61.5					
1,000.0	1,000.0	1,000.0	1,000.0	2.1	2.1	18.52	58.3	19.5	61.5	57.2	4.27	14.393 CC, ES		
2,000.0	1,995.9	1,989.3	1,988.2	4.5	4.3	153.71	58.3	58.7	147.4	138.9	8.53	17.276		
3,000.0	2,987.9	2,972.8	2,970.3	7.6	6.6	167.11	58.3	112.9	320.8	307.8	12.96	24.750		
4,000.0	3,979.9	3,956.4	3,952.4	10.8	9.0	171.05	58.3	167.2	499.2	481.7	17.49	28.540		
5,000.0	4,972.3	4,940.6	4,935.0	13.9	11.4	172.92	58.3	221.4	675.3	653.3	22.04	30.636		
6,000.0	5,971.5	5,977.8	5,971.5	15.7	13.6	89.58	58.3	248.3	725.3	699.1	26.19	27.700		
7,000.0	6,880.3	7,006.1	6,924.3	17.6	16.2	-94.61	-201.8	248.3	727.7	696.4	31.26	23.281		
8,000.0	7,041.6	8,054.7	7,114.0	28.7	28.8	-95.70	-1,204.0	248.3	728.9	672.9	56.02	13.011		
9,000.0	7,040.1	9,054.7	7,114.0	45.6	46.0	-95.82	-2,204.0	248.3	729.1	638.6	90.50	8.056		
10,000.0	7,038.5	10,054.7	7,114.0	63.8	64.4	-95.94	-3,204.0	248.3	729.2	602.1	127.13	5.736		
11,000.0	7,036.9	11,054.7	7,114.0	82.5	83.2	-96.07	-4,204.0	248.3	729.4	564.9	164.46	4.435		
12,000.0	7,035.3	12,054.7	7,114.0	101.3	102.1	-96.19	-5,204.0	248.3	729.6	527.5	202.10	3.610		
13,000.0	7,033.8	13,054.7	7,114.0	120.3	121.1	-96.31	-6,204.0	248.3	729.7	489.8	239.90	3.042		
14,000.0	7,032.2	14,054.7	7,114.0	139.3	140.1	-96.43	-7,204.0	248.3	729.9	452.1	277.78	2.628		
14,125.8	7,032.0	14,180.5	7,114.0	141.7	142.5	-96.45	-7,329.8	248.3	729.9	447.4	282.55	2.583 SF		

<b>Company:</b>	PETROLEUM DEVELOPMENT CORP Weld County CO	<b>Local Co-ordinate Reference:</b>	Well Bernhardt Farms 13S-203
<b>Project:</b>	SEC.13-T4N-R67W	<b>TVD Reference:</b>	WELL @ 4752.0ft (RKB - 15')
<b>Reference Site:</b>	Bernhardt Farms 13SW-HZ Pad Sec.13-T4N-R67W	<b>MD Reference:</b>	WELL @ 4752.0ft (RKB - 15')
<b>Site Error:</b>	0.0ft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Bernhardt Farms 13S-203	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.0ft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	Wellbore #1	<b>Database:</b>	Landmark
<b>Reference Design:</b>	Plan #1 (11-12-13)	<b>Offset TVD Reference:</b>	Offset Datum

<b>Offset Design</b>													Offset Site Error:	0.0 ft
Bernhardt Farms 13SW-HZ Pad Sec.13-T4N-R67W - Bernhardt Farms 13W-403 - Wellbore #1 - Plan #													Offset Well Error:	0.0 ft
Survey Program: 0-MWD														
Reference		Offset		Semi Major Axis			Distance							
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning	
0.0	0.0	0.0	0.0	0.0	0.0	20.11	83.8	30.7	89.2					
1,000.0	1,000.0	1,000.0	1,000.0	2.1	2.1	20.11	83.8	30.7	89.2	85.0	4.27	20.892 CC, ES, SF		
2,000.0	1,995.9	1,977.0	1,970.6	4.5	4.6	160.79	55.4	130.5	217.1	208.5	8.58	25.312		
3,000.0	2,987.9	2,943.9	2,929.2	7.6	7.7	173.81	20.5	253.1	462.2	449.1	13.06	35.391		
4,000.0	3,979.9	3,910.9	3,887.7	10.8	10.9	177.75	-14.4	375.6	714.2	696.5	17.67	40.418		
5,000.0	4,972.3	4,878.7	4,847.1	13.9	14.1	179.64	-49.4	498.2	964.4	942.1	22.34	43.174		

<b>Company:</b>	PETROLEUM DEVELOPMENT CORP Weld County CO	<b>Local Co-ordinate Reference:</b>	Well Bernhardt Farms 13S-203
<b>Project:</b>	SEC.13-T4N-R67W	<b>TVD Reference:</b>	WELL @ 4752.0ft (RKB - 15')
<b>Reference Site:</b>	Bernhardt Farms 13SW-HZ Pad Sec.13-T4N-R67W	<b>MD Reference:</b>	WELL @ 4752.0ft (RKB - 15')
<b>Site Error:</b>	0.0ft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Bernhardt Farms 13S-203	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.0ft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	Wellbore #1	<b>Database:</b>	Landmark
<b>Reference Design:</b>	Plan #1 (11-12-13)	<b>Offset TVD Reference:</b>	Offset Datum

Offset Design Existing Wells - Sec.13-T4N-R67W - Bernhardt 13D (Exist) - Wellbore #1 - Wellbore #1												Offset Site Error:		0.0 ft	
Survey Program: 7600-UNKNOWN												Offset Well Error:		0.0 ft	
Reference		Offset		Semi Major Axis			Distance						Warning		
Measured Depth	Vertical Depth	Measured Depth	Vertical Depth	Reference	Offset	Highside Toolface	Offset Wellbore Centre		Between Centres	Between Ellipses	Minimum Separation	Separation Factor			
(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(°)	+N/-S (ft)	+E/-W (ft)	(ft)	(ft)	(ft)				
8,000.0	7,041.6	7,005.6	7,005.6	28.7	140.1	90.30	-1,362.5	-524.3	165.4	-2.4	167.77	0.986 Level 1			
8,233.7	7,041.3	7,005.3	7,005.3	32.5	140.1	89.86	-1,362.5	-524.3	88.8	-83.0	171.82	0.517 Level 1, CC, ES, SF			
9,000.0	7,040.1	7,004.1	7,004.1	45.6	140.1	88.40	-1,362.5	-524.3	842.9	657.8	185.01	4.556			

<b>Company:</b>	PETROLEUM DEVELOPMENT CORP Weld County CO	<b>Local Co-ordinate Reference:</b>	Well Bernhardt Farms 13S-203
<b>Project:</b>	SEC.13-T4N-R67W	<b>TVD Reference:</b>	WELL @ 4752.0ft (RKB - 15')
<b>Reference Site:</b>	Bernhardt Farms 13SW-HZ Pad Sec.13-T4N-R67W	<b>MD Reference:</b>	WELL @ 4752.0ft (RKB - 15')
<b>Site Error:</b>	0.0ft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Bernhardt Farms 13S-203	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.0ft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	Wellbore #1	<b>Database:</b>	Landmark
<b>Reference Design:</b>	Plan #1 (11-12-13)	<b>Offset TVD Reference:</b>	Offset Datum

<b>Offset Design</b>													Offset Site Error:	0.0 ft
Existing Wells - Sec.13-T4N-R67W - Bernhardt 13T (Exist) - Wellbore #1 - Wellbore #1													Offset Well Error:	0.0 ft
Survey Program: 7600-UNKNOWN														
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	
9,000.0	7,040.1	7,006.1	7,006.1	45.6	140.1	90.07	-2,415.3	-750.3	345.4	160.3	185.07	1.866		
9,228.4	7,039.7	7,005.7	7,005.7	49.7	140.1	89.99	-2,415.3	-750.3	273.8	84.5	189.27	1.446	Level 3, CC, ES, SF	
10,000.0	7,038.5	7,004.5	7,004.5	63.8	140.1	89.74	-2,415.3	-750.3	834.7	631.2	203.45	4.103		

<b>Company:</b>	PETROLEUM DEVELOPMENT CORP Weld County CO	<b>Local Co-ordinate Reference:</b>	Well Bernhardt Farms 13S-203
<b>Project:</b>	SEC.13-T4N-R67W	<b>TVD Reference:</b>	WELL @ 4752.0ft (RKB - 15')
<b>Reference Site:</b>	Bernhardt Farms 13SW-HZ Pad Sec.13-T4N-R67W	<b>MD Reference:</b>	WELL @ 4752.0ft (RKB - 15')
<b>Site Error:</b>	0.0ft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Bernhardt Farms 13S-203	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.0ft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	Wellbore #1	<b>Database:</b>	Landmark
<b>Reference Design:</b>	Plan #1 (11-12-13)	<b>Offset TVD Reference:</b>	Offset Datum

Offset Design Existing Wells - Sec.13-T4N-R67W - Bernhardt 24C (Exist) - Wellbore #1 - Wellbore #1												Offset Site Error:	0.0 ft
Survey Program: 7600-UNKNOWN												Offset Well Error:	0.0 ft
Reference		Offset		Semi Major Axis			Distance						Warning
Measured Depth	Vertical Depth	Measured Depth	Vertical Depth	Reference	Offset	Highside Toolface	Offset Wellbore Centre	Between Centres	Between Ellipses	Minimum Separation	Separation Factor		
(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(°)	+N/-S (ft)	+E/-W (ft)	(ft)	(ft)	(ft)		
10,000.0	7,038.5	7,007.5	7,007.5	63.8	140.1	90.38	-3,952.7	-652.7	769.0	565.5	203.49	3.779	
10,729.4	7,037.3	7,006.3	7,006.3	77.4	140.1	90.01	-3,952.7	-652.7	176.7	-40.4	217.17	0.814 Level 1, CC, ES, SF	
11,000.0	7,036.9	7,005.9	7,005.9	82.5	140.1	89.87	-3,952.7	-652.7	306.6	84.4	222.24	1.380 Level 3	



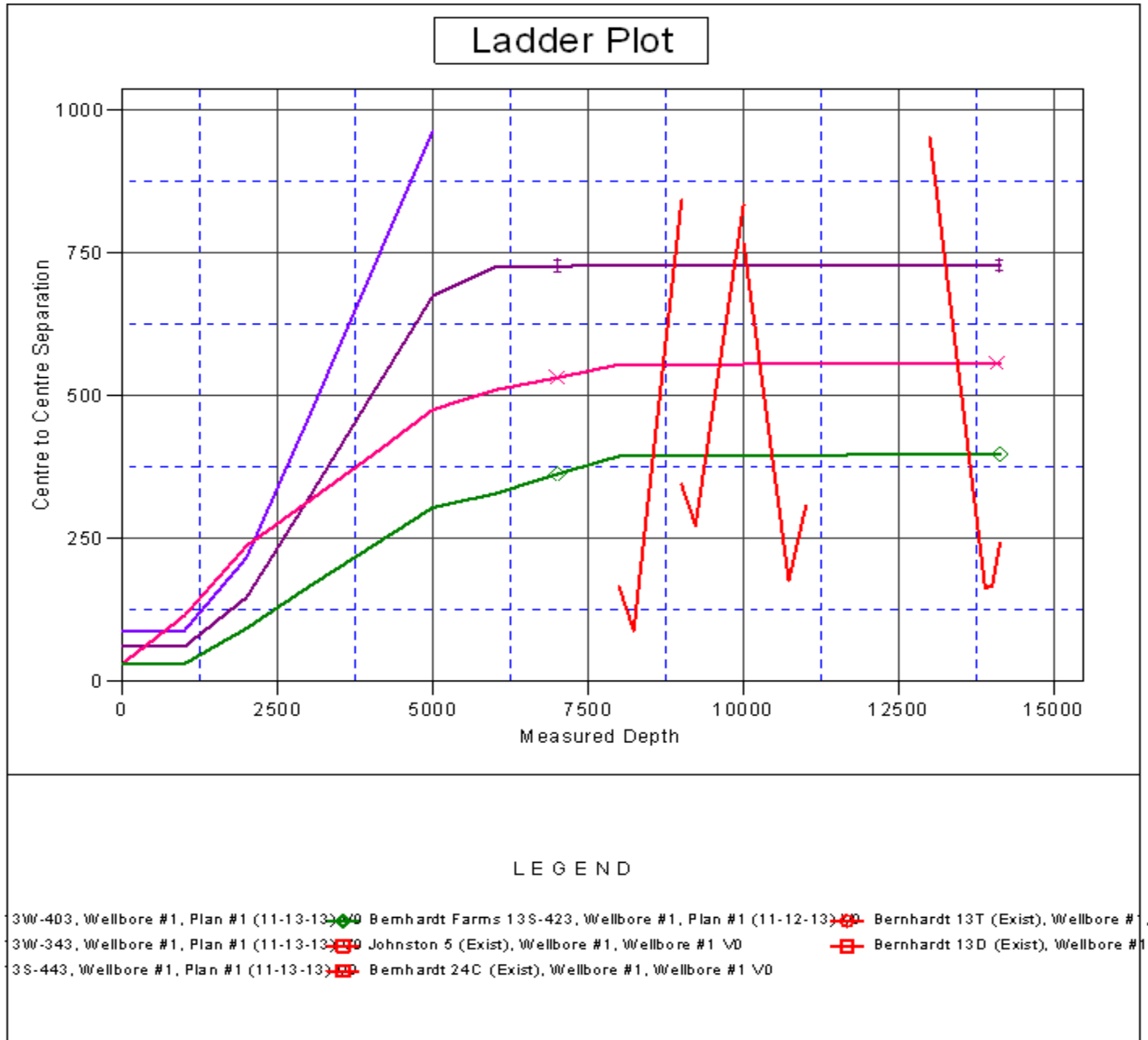
<b>Company:</b>	PETROLEUM DEVELOPMENT CORP Weld County CO	<b>Local Co-ordinate Reference:</b>	Well Bernhardt Farms 13S-203
<b>Project:</b>	SEC.13-T4N-R67W	<b>TVD Reference:</b>	WELL @ 4752.0ft (RKB - 15')
<b>Reference Site:</b>	Bernhardt Farms 13SW-HZ Pad Sec.13-T4N-R67W	<b>MD Reference:</b>	WELL @ 4752.0ft (RKB - 15')
<b>Site Error:</b>	0.0ft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Bernhardt Farms 13S-203	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.0ft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	Wellbore #1	<b>Database:</b>	Landmark
<b>Reference Design:</b>	Plan #1 (11-12-13)	<b>Offset TVD Reference:</b>	Offset Datum

Offset Design Existing Wells - Sec.13-T4N-R67W - Johnston 5 (Exist) - Wellbore #1 - Wellbore #1													Offset Site Error:	0.0 ft
Survey Program: 7600-UNKNOWN													Offset Well Error:	0.0 ft
Reference		Offset		Semi Major Axis			Distance							Warning
Measured Depth	Vertical Depth	Measured Depth	Vertical Depth	Reference	Offset	Highside Toolface	Offset Wellbore Centre		Between Centres	Between Ellipses	Minimum Separation	Separation Factor		
(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(°)	+N/-S (ft)	+E/-W (ft)	(ft)	(ft)	(ft)			
13,000.0	7,033.8	7,006.8	7,006.8	120.3	140.1	90.54	-7,144.0	-633.3	952.9	692.7	260.18	3.663		
13,889.9	7,032.4	7,005.4	7,005.4	137.2	140.1	90.03	-7,144.0	-633.3	164.1	-113.1	277.14	0.592 Level 1, CC, ES, SF		
14,000.0	7,032.2	7,005.2	7,005.2	139.3	140.1	89.97	-7,144.0	-633.3	167.3	-111.9	279.24	0.599 Level 1		
14,125.8	7,032.0	7,005.0	7,005.0	141.7	140.1	89.89	-7,144.0	-633.3	242.7	-38.9	281.64	0.862 Level 1		

<b>Company:</b>	PETROLEUM DEVELOPMENT CORP Weld County CO	<b>Local Co-ordinate Reference:</b>	Well Bernhardt Farms 13S-203
<b>Project:</b>	SEC.13-T4N-R67W	<b>TVD Reference:</b>	WELL @ 4752.0ft (RKB - 15')
<b>Reference Site:</b>	Bernhardt Farms 13SW-HZ Pad Sec.13-T4N-R67W	<b>MD Reference:</b>	WELL @ 4752.0ft (RKB - 15')
<b>Site Error:</b>	0.0ft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Bernhardt Farms 13S-203	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.0ft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	Wellbore #1	<b>Database:</b>	Landmark
<b>Reference Design:</b>	Plan #1 (11-12-13)	<b>Offset TVD Reference:</b>	Offset Datum

Reference Depths are relative to WELL @ 4752.0ft (RKB - 15')  
Offset Depths are relative to Offset Datum  
Central Meridian is -105.500000 °

Coordinates are relative to: Bernhardt Farms 13S-203  
Coordinate System is US State Plane 1983, Colorado Northern Zone  
Grid Convergence at Surface is: 0.43°



Coordinates are relative to: Bernhardt Farms 13S-203  
Coordinate System is US State Plane 1983, Colorado Northern Zone  
Grid Convergence at Surface is: 0.43°

