

PETROLEUM DEVELOPMENT CORP Weld County CO

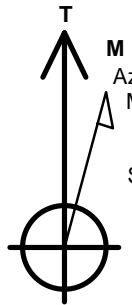
Well Name: **Bernhardt 6K-403**

Surface Location: Bernhardt 4N66W6K Pad Sec.6-T4N-R66W
 North American Datum 1983 , US State Plane 1983 , Colorado Northern Zone
 Ground Elevation: 4713.0

+N/-S	+E/-W	Northing	Easting	Latitude	Longitude	Slot
0.0	0.0	1367096.67	3187949.64	40.339120	-104.825760	
RKB - 15' WELL @ 4728.0ft (RKB - 15')						

WELLBORE TARGET DETAILS

Name	TVD	+N/-S	+E/-W	Shape
SHL 1901'FSL & 1123'FWL, Sec.6	1.0	0.0	0.0	Point
BHL 2158'FNL & 1395'FWL, Sec.7	7185.0	-4051.1	281.6	Point



Azimuths to True North
 Magnetic North: 8.46°

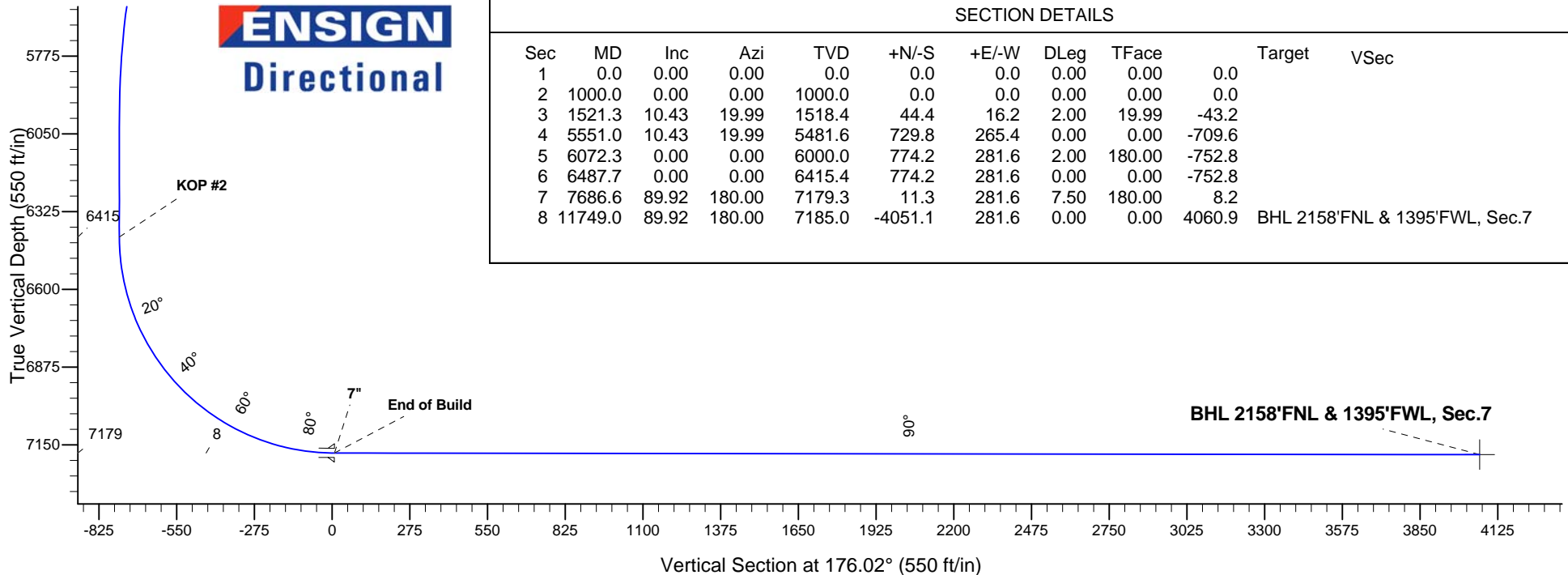
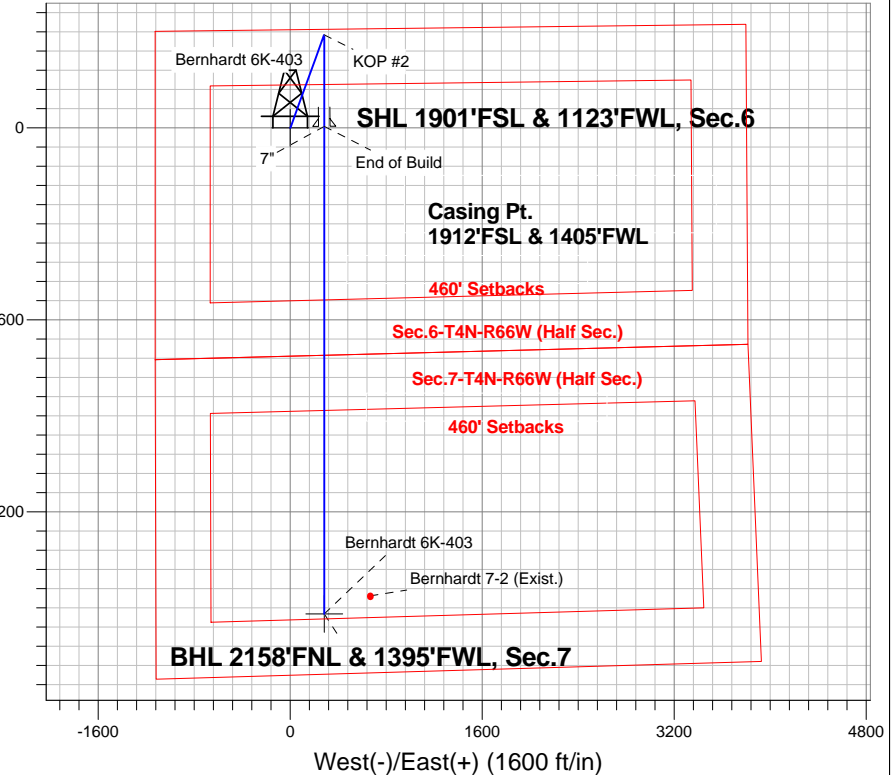
Magnetic Field
 Strength: 52754.8snT
 Dip Angle: 66.88°
 Date: 9/3/2014
 Model: IGRF2010

ANNOTATIONS

TVD	MD	Annotation
1000.0	1000.0	KOP #1
6415.4	6487.7	KOP #2
7179.3	7686.6	End of Build

Bernhardt 4N66W6K Pad Sec.6-T4N-R66W
 Bernhardt 6K-403
 Plan #2 (9-3-14)
 9:16, September 11 2014

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



SECTION DETAILS

Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	DLeg	TFace	Target	VSec
1	0.0	0.00	0.00	0.0	0.0	0.0	0.00	0.00	0.0	
2	1000.0	0.00	0.00	1000.0	0.0	0.0	0.00	0.00	0.0	
3	1521.3	10.43	19.99	1518.4	44.4	16.2	2.00	19.99	-43.2	
4	5551.0	10.43	19.99	5481.6	729.8	265.4	0.00	0.00	-709.6	
5	6072.3	0.00	0.00	6000.0	774.2	281.6	2.00	180.00	-752.8	
6	6487.7	0.00	0.00	6415.4	774.2	281.6	0.00	0.00	-752.8	
7	7686.6	89.92	180.00	7179.3	11.3	281.6	7.50	180.00	8.2	
8	11749.0	89.92	180.00	7185.0	-4051.1	281.6	0.00	0.00	4060.9	BHL 2158'FNL & 1395'FWL, Sec.7



PETROLEUM DEVELOPMENT CORP Weld County CO

SEC.6-T4N-R66W

Bernhardt 4N66W6K Pad Sec.6-T4N-R66W

Bernhardt 6K-403

Wellbore #1

Plan: Plan #2 (9-3-14)

Standard Planning Report

11 September, 2014

Database:	Landmark	Local Co-ordinate Reference:	Well Bernhardt 6K-403
Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	TVD Reference:	WELL @ 4728.0ft (RKB - 15')
Project:	SEC.6-T4N-R66W	MD Reference:	WELL @ 4728.0ft (RKB - 15')
Site:	Bernhardt 4N66W6K Pad Sec.6-T4N-R66W	North Reference:	True
Well:	Bernhardt 6K-403	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Plan #2 (9-3-14)		

Project	SEC.6-T4N-R66W, Weld County, CO		
Map System:	US State Plane 1983	System Datum:	Mean Sea Level
Geo Datum:	North American Datum 1983		Using Well Reference Point
Map Zone:	Colorado Northern Zone		Using geodetic scale factor

Site						Bernhardt 4N66W6K Pad Sec.6-T4N-R66W											
Site Position:						Northing:			1,367,096.68 ft			Latitude:			40.339120		
From:			Lat/Long			Easting:			3,187,949.64 ft			Longitude:			-104.825760		
Position Uncertainty:			0.0 ft			Slot Radius:			"			Grid Convergence:			0.44 °		

Well	Bernhardt 6K-403					
Well Position	+N/-S	0.0 ft	Northing:	1,367,096.67 ft	Latitude:	40.339120
	+E/-W	0.0 ft	Easting:	3,187,949.64 ft	Longitude:	-104.825760
Position Uncertainty		0.0 ft	Wellhead Elevation:	ft	Ground Level:	4,713.0 ft

Wellbore	Wellbore #1				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	9/3/2014	8.46	66.88	52,755

Design	Plan #2 (9-3-14)			
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	176.02

Plan Sections										
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)	TFO (°)	Target
0.0	0.00	0.00	0.0	0.0	0.0	0.00	0.00	0.00	0.00	
1,000.0	0.00	0.00	1,000.0	0.0	0.0	0.00	0.00	0.00	0.00	
1,521.3	10.43	19.99	1,518.4	44.4	16.2	2.00	2.00	0.00	19.99	
5,551.0	10.43	19.99	5,481.6	729.8	265.4	0.00	0.00	0.00	0.00	
6,072.3	0.00	0.00	6,000.0	774.2	281.6	2.00	-2.00	0.00	180.00	
6,487.7	0.00	0.00	6,415.4	774.2	281.6	0.00	0.00	0.00	0.00	
7,686.6	89.92	180.00	7,179.3	11.3	281.6	7.50	7.50	0.00	180.00	
11,749.0	89.92	180.00	7,185.0	-4,051.1	281.6	0.00	0.00	0.00	0.00	BHL 2158'FNL & 13

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Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	TVD Reference:	WELL @ 4728.0ft (RKB - 15')
Project:	SEC.6-T4N-R66W	MD Reference:	WELL @ 4728.0ft (RKB - 15')
Site:	Bernhardt 4N66W6K Pad Sec.6-T4N-R66W	North Reference:	True
Well:	Bernhardt 6K-403	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Plan #2 (9-3-14)		

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
KOP #1									
1,100.0	2.00	19.99	1,100.0	1.6	0.6	-1.6	2.00	2.00	0.00
1,200.0	4.00	19.99	1,199.8	6.6	2.4	-6.4	2.00	2.00	0.00
1,300.0	6.00	19.99	1,299.5	14.7	5.4	-14.3	2.00	2.00	0.00
1,400.0	8.00	19.99	1,398.7	26.2	9.5	-25.5	2.00	2.00	0.00
1,500.0	10.00	19.99	1,497.5	40.9	14.9	-39.8	2.00	2.00	0.00
1,521.3	10.43	19.99	1,518.4	44.4	16.2	-43.2	2.00	2.00	0.00
1,600.0	10.43	19.99	1,595.8	57.8	21.0	-56.2	0.00	0.00	0.00
1,700.0	10.43	19.99	1,694.2	74.8	27.2	-72.8	0.00	0.00	0.00
1,800.0	10.43	19.99	1,792.5	91.8	33.4	-89.3	0.00	0.00	0.00
1,900.0	10.43	19.99	1,890.9	108.9	39.6	-105.8	0.00	0.00	0.00
2,000.0	10.43	19.99	1,989.2	125.9	45.8	-122.4	0.00	0.00	0.00
2,100.0	10.43	19.99	2,087.6	142.9	52.0	-138.9	0.00	0.00	0.00
2,200.0	10.43	19.99	2,185.9	159.9	58.2	-155.5	0.00	0.00	0.00
2,300.0	10.43	19.99	2,284.3	176.9	64.3	-172.0	0.00	0.00	0.00
2,400.0	10.43	19.99	2,382.6	193.9	70.5	-188.5	0.00	0.00	0.00
2,500.0	10.43	19.99	2,481.0	210.9	76.7	-205.1	0.00	0.00	0.00
2,600.0	10.43	19.99	2,579.3	227.9	82.9	-221.6	0.00	0.00	0.00
2,700.0	10.43	19.99	2,677.7	244.9	89.1	-238.1	0.00	0.00	0.00
2,800.0	10.43	19.99	2,776.0	261.9	95.3	-254.7	0.00	0.00	0.00
2,900.0	10.43	19.99	2,874.4	278.9	101.5	-271.2	0.00	0.00	0.00
3,000.0	10.43	19.99	2,972.7	295.9	107.6	-287.7	0.00	0.00	0.00
3,100.0	10.43	19.99	3,071.1	312.9	113.8	-304.3	0.00	0.00	0.00
3,200.0	10.43	19.99	3,169.4	329.9	120.0	-320.8	0.00	0.00	0.00
3,300.0	10.43	19.99	3,267.8	346.9	126.2	-337.4	0.00	0.00	0.00
3,400.0	10.43	19.99	3,366.1	363.9	132.4	-353.9	0.00	0.00	0.00
3,500.0	10.43	19.99	3,464.5	381.0	138.6	-370.4	0.00	0.00	0.00
3,600.0	10.43	19.99	3,562.8	398.0	144.8	-387.0	0.00	0.00	0.00
3,700.0	10.43	19.99	3,661.2	415.0	150.9	-403.5	0.00	0.00	0.00
3,800.0	10.43	19.99	3,759.5	432.0	157.1	-420.0	0.00	0.00	0.00
3,900.0	10.43	19.99	3,857.9	449.0	163.3	-436.6	0.00	0.00	0.00
4,000.0	10.43	19.99	3,956.2	466.0	169.5	-453.1	0.00	0.00	0.00
4,100.0	10.43	19.99	4,054.6	483.0	175.7	-469.6	0.00	0.00	0.00
4,200.0	10.43	19.99	4,152.9	500.0	181.9	-486.2	0.00	0.00	0.00
4,300.0	10.43	19.99	4,251.3	517.0	188.1	-502.7	0.00	0.00	0.00
4,400.0	10.43	19.99	4,349.6	534.0	194.2	-519.3	0.00	0.00	0.00
4,500.0	10.43	19.99	4,447.9	551.0	200.4	-535.8	0.00	0.00	0.00
4,600.0	10.43	19.99	4,546.3	568.0	206.6	-552.3	0.00	0.00	0.00
4,700.0	10.43	19.99	4,644.6	585.0	212.8	-568.9	0.00	0.00	0.00
4,800.0	10.43	19.99	4,743.0	602.0	219.0	-585.4	0.00	0.00	0.00
4,900.0	10.43	19.99	4,841.3	619.0	225.2	-601.9	0.00	0.00	0.00
5,000.0	10.43	19.99	4,939.7	636.0	231.4	-618.5	0.00	0.00	0.00

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Site:	Bernhardt 4N66W6K Pad Sec.6-T4N-R66W	North Reference:	True
Well:	Bernhardt 6K-403	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Plan #2 (9-3-14)		

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)
5,100.0	10.43	19.99	5,038.0	653.1	237.5	-635.0	0.00	0.00	0.00
5,200.0	10.43	19.99	5,136.4	670.1	243.7	-651.5	0.00	0.00	0.00
5,300.0	10.43	19.99	5,234.7	687.1	249.9	-668.1	0.00	0.00	0.00
5,400.0	10.43	19.99	5,333.1	704.1	256.1	-684.6	0.00	0.00	0.00
5,500.0	10.43	19.99	5,431.4	721.1	262.3	-701.2	0.00	0.00	0.00
5,551.0	10.43	19.99	5,481.6	729.8	265.4	-709.6	0.00	0.00	0.00
5,600.0	9.45	19.99	5,529.9	737.7	268.3	-717.3	2.00	-2.00	0.00
5,700.0	7.45	19.99	5,628.8	751.5	273.3	-730.7	2.00	-2.00	0.00
5,800.0	5.45	19.99	5,728.1	762.0	277.2	-741.0	2.00	-2.00	0.00
5,900.0	3.45	19.99	5,827.8	769.3	279.8	-748.1	2.00	-2.00	0.00
6,000.0	1.45	19.99	5,927.7	773.3	281.3	-752.0	2.00	-2.00	0.00
6,072.3	0.00	0.00	6,000.0	774.2	281.6	-752.8	2.00	-2.00	0.00
6,100.0	0.00	0.00	6,027.7	774.2	281.6	-752.8	0.00	0.00	0.00
6,200.0	0.00	0.00	6,127.7	774.2	281.6	-752.8	0.00	0.00	0.00
6,300.0	0.00	0.00	6,227.7	774.2	281.6	-752.8	0.00	0.00	0.00
6,400.0	0.00	0.00	6,327.7	774.2	281.6	-752.8	0.00	0.00	0.00
6,487.7	0.00	0.00	6,415.4	774.2	281.6	-752.8	0.00	0.00	0.00
KOP #2									
6,500.0	0.93	180.00	6,427.7	774.1	281.6	-752.7	7.53	7.53	0.00
6,600.0	8.43	180.00	6,527.3	766.0	281.6	-744.6	7.50	7.50	0.00
6,700.0	15.93	180.00	6,625.0	744.9	281.6	-723.6	7.50	7.50	0.00
6,800.0	23.43	180.00	6,719.1	711.2	281.6	-690.0	7.50	7.50	0.00
6,900.0	30.93	180.00	6,808.0	665.6	281.6	-644.5	7.50	7.50	0.00
7,000.0	38.43	180.00	6,890.2	608.7	281.6	-587.7	7.50	7.50	0.00
7,100.0	45.93	180.00	6,964.2	541.6	281.6	-520.8	7.50	7.50	0.00
7,200.0	53.43	180.00	7,028.9	465.5	281.6	-444.8	7.50	7.50	0.00
7,300.0	60.93	180.00	7,083.1	381.5	281.6	-361.0	7.50	7.50	0.00
7,400.0	68.43	180.00	7,125.8	291.2	281.6	-270.9	7.50	7.50	0.00
7,500.0	75.93	180.00	7,156.4	196.0	281.6	-176.0	7.50	7.50	0.00
7,600.0	83.43	180.00	7,174.3	97.7	281.6	-78.0	7.50	7.50	0.00
7,686.6	89.92	180.00	7,179.3	11.3	281.6	8.2	7.50	7.50	0.00
End of Build - 7"									
7,700.0	89.92	180.00	7,179.3	-2.1	281.6	21.6	0.00	0.00	0.00
7,800.0	89.92	180.00	7,179.5	-102.1	281.6	121.4	0.00	0.00	0.00
7,900.0	89.92	180.00	7,179.6	-202.1	281.6	221.1	0.00	0.00	0.00
8,000.0	89.92	180.00	7,179.8	-302.1	281.6	320.9	0.00	0.00	0.00
8,100.0	89.92	180.00	7,179.9	-402.1	281.6	420.6	0.00	0.00	0.00
8,200.0	89.92	180.00	7,180.0	-502.1	281.6	520.4	0.00	0.00	0.00
8,300.0	89.92	180.00	7,180.2	-602.1	281.6	620.2	0.00	0.00	0.00
8,400.0	89.92	180.00	7,180.3	-702.1	281.6	719.9	0.00	0.00	0.00
8,500.0	89.92	180.00	7,180.5	-802.1	281.6	819.7	0.00	0.00	0.00
8,600.0	89.92	180.00	7,180.6	-902.1	281.6	919.4	0.00	0.00	0.00
8,700.0	89.92	180.00	7,180.7	-1,002.1	281.6	1,019.2	0.00	0.00	0.00
8,800.0	89.92	180.00	7,180.9	-1,102.1	281.6	1,119.0	0.00	0.00	0.00
8,900.0	89.92	180.00	7,181.0	-1,202.1	281.6	1,218.7	0.00	0.00	0.00
9,000.0	89.92	180.00	7,181.2	-1,302.1	281.6	1,318.5	0.00	0.00	0.00
9,100.0	89.92	180.00	7,181.3	-1,402.1	281.6	1,418.2	0.00	0.00	0.00
9,200.0	89.92	180.00	7,181.4	-1,502.1	281.6	1,518.0	0.00	0.00	0.00
9,300.0	89.92	180.00	7,181.6	-1,602.1	281.6	1,617.8	0.00	0.00	0.00
9,400.0	89.92	180.00	7,181.7	-1,702.1	281.6	1,717.5	0.00	0.00	0.00
9,500.0	89.92	180.00	7,181.9	-1,802.1	281.6	1,817.3	0.00	0.00	0.00
9,600.0	89.92	180.00	7,182.0	-1,902.1	281.6	1,917.0	0.00	0.00	0.00
9,700.0	89.92	180.00	7,182.1	-2,002.1	281.6	2,016.8	0.00	0.00	0.00

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Well:	Bernhardt 6K-403	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Plan #2 (9-3-14)		

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)
9,800.0	89.92	180.00	7,182.3	-2,102.1	281.6	2,116.5	0.00	0.00	0.00
9,900.0	89.92	180.00	7,182.4	-2,202.1	281.6	2,216.3	0.00	0.00	0.00
10,000.0	89.92	180.00	7,182.6	-2,302.1	281.6	2,316.1	0.00	0.00	0.00
10,100.0	89.92	180.00	7,182.7	-2,402.1	281.6	2,415.8	0.00	0.00	0.00
10,200.0	89.92	180.00	7,182.8	-2,502.1	281.6	2,515.6	0.00	0.00	0.00
10,300.0	89.92	180.00	7,183.0	-2,602.1	281.6	2,615.3	0.00	0.00	0.00
10,400.0	89.92	180.00	7,183.1	-2,702.1	281.6	2,715.1	0.00	0.00	0.00
10,500.0	89.92	180.00	7,183.3	-2,802.1	281.6	2,814.9	0.00	0.00	0.00
10,600.0	89.92	180.00	7,183.4	-2,902.1	281.6	2,914.6	0.00	0.00	0.00
10,700.0	89.92	180.00	7,183.5	-3,002.1	281.6	3,014.4	0.00	0.00	0.00
10,800.0	89.92	180.00	7,183.7	-3,102.1	281.6	3,114.1	0.00	0.00	0.00
10,900.0	89.92	180.00	7,183.8	-3,202.1	281.6	3,213.9	0.00	0.00	0.00
11,000.0	89.92	180.00	7,184.0	-3,302.1	281.6	3,313.7	0.00	0.00	0.00
11,100.0	89.92	180.00	7,184.1	-3,402.1	281.6	3,413.4	0.00	0.00	0.00
11,200.0	89.92	180.00	7,184.2	-3,502.1	281.6	3,513.2	0.00	0.00	0.00
11,300.0	89.92	180.00	7,184.4	-3,602.1	281.6	3,612.9	0.00	0.00	0.00
11,400.0	89.92	180.00	7,184.5	-3,702.1	281.6	3,712.7	0.00	0.00	0.00
11,500.0	89.92	180.00	7,184.7	-3,802.1	281.6	3,812.5	0.00	0.00	0.00
11,600.0	89.92	180.00	7,184.8	-3,902.1	281.6	3,912.2	0.00	0.00	0.00
11,700.0	89.92	180.00	7,184.9	-4,002.1	281.6	4,012.0	0.00	0.00	0.00
11,749.0	89.92	180.00	7,185.0	-4,051.1	281.6	4,060.9	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									
BHL 2158'FNL & 1396'FSL	0.00	0.00	7,185.0	-4,051.1	281.6	1,363,048.02	3,188,262.03	40.328000	-104.824750
- plan hits target center									
- Point									
SHL 1901'FSL & 1123'FSL	0.00	0.00	1.0	0.0	0.0	1,367,096.68	3,187,949.64	40.339120	-104.825760
- plan hits target center									
- Point									

Casing Points

Measured Depth (ft)	Vertical Depth (ft)	Name	Casing Diameter (")	Hole Diameter (")
7,686.6	7,179.3	7"	7	7-1/2

Plan Annotations

Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment
		+N/-S (ft)	+E/-W (ft)	
1,000.0	1,000.0	0.0	0.0	KOP #1
6,487.7	6,415.4	774.2	281.6	KOP #2
7,686.6	7,179.3	11.3	281.6	End of Build



PETROLEUM DEVELOPMENT CORP Weld County CO

SEC.6-T4N-R66W

Bernhardt 4N66W6K Pad Sec.6-T4N-R66W

Bernhardt 6K-403

Wellbore #1

Plan #2 (9-3-14)

Anticollision Report

11 September, 2014



Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Bernhardt 6K-403
Project:	SEC.6-T4N-R66W	TVD Reference:	WELL @ 4728.0ft (RKB - 15')
Reference Site:	Bernhardt 4N66W6K Pad Sec.6-T4N-R66W	MD Reference:	WELL @ 4728.0ft (RKB - 15')
Site Error:	0.0ft	North Reference:	True
Reference Well:	Bernhardt 6K-403	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	Landmark
Reference Design:	Plan #2 (9-3-14)	Offset TVD Reference:	Offset Datum

Reference	Plan #2 (9-3-14)
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	9/11/2014		
From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description	
0.0	11,749.0	Plan #2 (9-3-14) (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						
Bernhardt 4N66W6K Pad Sec.6-T4N-R66W						
Bernhardt 6K-323 - Wellbore #1 - Plan #2 (9-3-14)	800.0	800.0	31.5	28.1	9.349	CC, ES
Bernhardt 6K-323 - Wellbore #1 - Plan #2 (9-3-14)	11,749.0	11,666.7	341.8	179.7	2.108	SF
Bernhardt 6O-243 - Wellbore #1 - Plan #2 (9-3-14)	200.0	200.0	90.1	89.4	133.626	CC, ES
Bernhardt 6O-243 - Wellbore #1 - Plan #2 (9-3-14)	6,600.0	6,708.4	990.1	948.5	23.829	SF
Bernhardt 6O-443 - Wellbore #1 - Plan #2 (9-3-14)	400.0	400.0	60.3	58.8	38.344	CC, ES
Bernhardt 6O-443 - Wellbore #1 - Plan #2 (9-3-14)	11,749.0	11,796.3	658.3	492.2	3.964	SF
Existing Wells Sec.6-T4N-R66W						
Bernhardt 7-2 (Exist.) - Wellbore #1 - Wellbore #1	11,599.7	7,185.8	384.8	160.6	1.716	CC
Bernhardt 7-2 (Exist.) - Wellbore #1 - Wellbore #1	11,600.0	7,185.8	384.8	160.6	1.716	ES, SF

Offset Design	Bernhardt 4N66W6K Pad Sec.6-T4N-R66W - Bernhardt 6K-323 - Wellbore #1 - Plan #2 (9-3-14)												Offset Site Error:	0.0ft
Survey Program:	0-MWD												Offset Well Error:	0.0ft
Reference Measured Depth (ft)	Vertical Depth (ft)	Offset Measured Depth (ft)	Vertical Depth (ft)	Semi Major Axis Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+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	76.63	7.3	30.7	31.5					
100.0	100.0	100.0	100.0	0.1	0.1	76.63	7.3	30.7	31.5	31.3	0.22	140.229		
200.0	200.0	200.0	200.0	0.3	0.3	76.63	7.3	30.7	31.5	30.8	0.67	46.743		
300.0	300.0	300.0	300.0	0.6	0.6	76.63	7.3	30.7	31.5	30.4	1.12	28.046		
400.0	400.0	400.0	400.0	0.8	0.8	76.63	7.3	30.7	31.5	29.9	1.57	20.033		
500.0	500.0	500.0	500.0	1.0	1.0	76.63	7.3	30.7	31.5	29.5	2.02	15.581		
600.0	600.0	600.0	600.0	1.2	1.2	76.63	7.3	30.7	31.5	29.0	2.47	12.748		
700.0	700.0	700.0	700.0	1.5	1.5	76.63	7.3	30.7	31.5	28.6	2.92	10.787		
800.0	800.0	800.0	800.0	1.7	1.7	76.63	7.3	30.7	31.5	28.1	3.37	9.349	CC, ES	
900.0	900.0	899.1	899.1	1.9	1.9	74.73	8.7	31.7	32.9	29.1	3.82	8.612		
1,000.0	1,000.0	998.0	997.8	2.1	2.1	69.86	12.8	34.8	37.1	32.8	4.26	8.705		
1,100.0	1,100.0	1,096.6	1,096.0	2.4	2.4	45.41	19.5	39.9	43.4	38.7	4.70	9.217		
1,200.0	1,199.8	1,194.9	1,193.6	2.6	2.6	43.04	29.0	47.0	50.3	45.2	5.15	9.776		
1,300.0	1,299.5	1,292.9	1,290.5	2.8	2.9	42.10	41.1	56.1	57.9	52.3	5.60	10.336		
1,400.0	1,398.7	1,391.2	1,387.0	3.1	3.2	42.12	55.9	67.2	65.9	59.8	6.06	10.867		
1,500.0	1,497.5	1,490.4	1,484.1	3.3	3.5	43.38	72.1	79.4	72.9	66.4	6.56	11.119		
1,600.0	1,595.8	1,590.2	1,581.8	3.6	3.9	45.72	88.4	91.7	78.3	71.2	7.11	11.022		

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 Bernhardt 6K-403
Project:	SEC.6-T4N-R66W	TVD Reference:	WELL @ 4728.0ft (RKB - 15')
Reference Site:	Bernhardt 4N66W6K Pad Sec.6-T4N-R66W	MD Reference:	WELL @ 4728.0ft (RKB - 15')
Site Error:	0.0ft	North Reference:	True
Reference Well:	Bernhardt 6K-403	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	Landmark
Reference Design:	Plan #2 (9-3-14)	Offset TVD Reference:	Offset Datum

Offset Design		Bernhardt 4N66W6K Pad Sec.6-T4N-R66W - Bernhardt 6K-323 - Wellbore #1 - Plan #2 (9-3-14)											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	Offset		+N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)					
1,700.0	1,694.2	1,690.0	1,679.5	3.9	4.3	47.81	104.8	104.0	83.7	76.1	7.68	10.897			
1,800.0	1,792.5	1,789.8	1,777.2	4.3	4.7	49.65	121.1	116.3	89.3	81.0	8.29	10.767			
1,900.0	1,890.9	1,889.6	1,874.9	4.6	5.1	51.27	137.5	128.6	94.9	86.0	8.92	10.634			
2,000.0	1,989.2	1,989.5	1,972.6	5.0	5.5	52.70	153.8	140.9	100.6	91.0	9.57	10.504			
2,100.0	2,087.6	2,089.3	2,070.3	5.3	5.9	53.99	170.1	153.2	106.3	96.1	10.24	10.379			
2,200.0	2,185.9	2,189.1	2,168.0	5.7	6.3	55.14	186.5	165.5	112.1	101.2	10.92	10.259			
2,300.0	2,284.3	2,288.9	2,265.6	6.1	6.7	56.18	202.8	177.8	117.9	106.3	11.62	10.146			
2,400.0	2,382.6	2,388.7	2,363.3	6.4	7.1	57.12	219.2	190.1	123.8	111.4	12.33	10.040			
2,500.0	2,481.0	2,488.5	2,461.0	6.8	7.6	57.97	235.5	202.4	129.6	116.6	13.04	9.940			
2,600.0	2,579.3	2,588.3	2,558.7	7.2	8.0	58.76	251.9	214.7	135.6	121.8	13.77	9.847			
2,700.0	2,677.7	2,688.1	2,656.4	7.6	8.4	59.47	268.2	227.0	141.5	127.0	14.50	9.760			
2,800.0	2,776.0	2,787.9	2,754.1	7.9	8.9	60.13	284.5	239.3	147.5	132.2	15.24	9.678			
2,900.0	2,874.4	2,887.7	2,851.8	8.3	9.3	60.74	300.9	251.6	153.4	137.5	15.98	9.603			
3,000.0	2,972.7	2,987.5	2,949.5	8.7	9.7	61.30	317.2	263.9	159.4	142.7	16.73	9.532			
3,100.0	3,071.1	3,087.3	3,047.2	9.1	10.1	61.82	333.6	276.2	165.4	148.0	17.48	9.466			
3,200.0	3,169.4	3,187.2	3,144.9	9.5	10.6	62.30	349.9	288.5	171.5	153.2	18.23	9.404			
3,300.0	3,267.8	3,287.0	3,242.5	9.9	11.0	62.75	366.2	300.8	177.5	158.5	18.99	9.347			
3,400.0	3,366.1	3,386.8	3,340.2	10.3	11.5	63.17	382.6	313.1	183.5	163.8	19.75	9.292			
3,500.0	3,464.5	3,486.6	3,437.9	10.7	11.9	63.57	398.9	325.4	189.6	169.1	20.51	9.242			
3,600.0	3,562.8	3,586.4	3,535.6	11.1	12.3	63.94	415.3	337.7	195.6	174.4	21.28	9.194			
3,700.0	3,661.2	3,686.2	3,633.3	11.5	12.8	64.29	431.6	350.0	201.7	179.6	22.05	9.149			
3,800.0	3,759.5	3,786.0	3,731.0	11.8	13.2	64.61	448.0	362.3	207.8	185.0	22.82	9.106			
3,900.0	3,857.9	3,885.8	3,828.7	12.2	13.6	64.92	464.3	374.6	213.8	190.3	23.59	9.067			
4,000.0	3,956.2	3,985.6	3,926.4	12.6	14.1	65.21	480.6	386.9	219.9	195.6	24.36	9.029			
4,100.0	4,054.6	4,085.4	4,024.1	13.0	14.5	65.49	497.0	399.2	226.0	200.9	25.13	8.993			
4,200.0	4,152.9	4,185.2	4,121.8	13.4	14.9	65.75	513.3	411.5	232.1	206.2	25.91	8.959			
4,300.0	4,251.3	4,285.1	4,219.5	13.8	15.4	66.00	529.7	423.8	238.2	211.5	26.68	8.927			
4,400.0	4,349.6	4,384.9	4,317.1	14.2	15.8	66.24	546.0	436.1	244.3	216.9	27.46	8.897			
4,500.0	4,447.9	4,484.7	4,414.8	14.6	16.3	66.46	562.3	448.4	250.4	222.2	28.24	8.868			
4,600.0	4,546.3	4,584.5	4,512.5	15.0	16.7	66.67	578.7	460.7	256.5	227.5	29.02	8.840			
4,700.0	4,644.6	4,684.3	4,610.2	15.4	17.1	66.88	595.0	473.0	262.7	232.9	29.80	8.814			
4,800.0	4,743.0	4,784.1	4,707.9	15.8	17.6	67.07	611.4	485.3	268.8	238.2	30.58	8.789			
4,900.0	4,841.3	4,883.9	4,805.6	16.2	18.0	67.26	627.7	497.6	274.9	243.5	31.36	8.766			
5,000.0	4,939.7	4,983.7	4,903.3	16.6	18.5	67.44	644.1	509.9	281.0	248.9	32.14	8.743			
5,100.0	5,038.0	5,083.5	5,001.0	17.0	18.9	67.61	660.4	522.2	287.1	254.2	32.92	8.721			
5,200.0	5,136.4	5,183.3	5,098.7	17.4	19.3	67.77	676.7	534.5	293.3	259.6	33.71	8.700			
5,300.0	5,234.7	5,283.1	5,196.4	17.8	19.8	67.93	693.1	546.8	299.4	264.9	34.49	8.680			
5,400.0	5,333.1	5,382.9	5,294.1	18.2	20.2	68.08	709.4	559.1	305.5	270.3	35.28	8.661			
5,500.0	5,431.4	5,482.8	5,391.7	18.6	20.7	68.22	725.8	571.4	311.7	275.6	36.06	8.643			
5,600.0	5,529.9	5,588.3	5,495.3	19.0	21.1	68.51	742.1	583.7	317.3	280.4	36.82	8.616			
5,700.0	5,628.8	5,695.6	5,601.2	19.2	21.4	68.84	755.6	593.8	321.7	284.3	37.43	8.595			
5,800.0	5,728.1	5,803.0	5,707.8	19.5	21.7	69.09	765.9	601.6	325.1	287.1	37.95	8.567			
5,900.0	5,827.8	5,910.4	5,814.9	19.7	21.9	69.26	773.1	607.0	327.4	289.1	38.38	8.532			
6,000.0	5,927.7	6,017.9	5,922.3	19.9	22.0	69.35	777.0	610.0	328.7	290.0	38.72	8.490			
6,100.0	6,027.7	6,123.4	6,027.7	20.0	22.2	69.36	777.9	610.6	329.0	290.0	38.99	8.438			
6,200.0	6,127.7	6,223.4	6,127.7	20.1	22.3	69.36	777.9	610.6	329.0	289.7	39.28	8.375			
6,300.0	6,227.7	6,323.4	6,227.7	20.3	22.4	69.36	777.9	610.6	329.0	289.4	39.58	8.314			
6,400.0	6,327.7	6,423.4	6,327.7	20.4	22.6	69.36	777.9	610.6	329.0	289.1	39.87	8.252			
6,483.3	6,411.0	6,506.8	6,411.0	20.5	22.6	-90.08	774.1	610.6	329.0	288.8	40.16	8.193			
6,500.0	6,427.7	6,523.4	6,427.5	20.6	22.6	-89.68	772.3	610.6	329.0	288.8	40.25	8.174			
6,600.0	6,527.3	6,621.9	6,524.3	20.6	22.6	-87.88	754.1	610.6	329.2	288.7	40.52	8.125			

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 Bernhardt 6K-403
Project:	SEC.6-T4N-R66W	TVD Reference:	WELL @ 4728.0ft (RKB - 15')
Reference Site:	Bernhardt 4N66W6K Pad Sec.6-T4N-R66W	MD Reference:	WELL @ 4728.0ft (RKB - 15')
Site Error:	0.0ft	North Reference:	True
Reference Well:	Bernhardt 6K-403	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	Landmark
Reference Design:	Plan #2 (9-3-14)	Offset TVD Reference:	Offset Datum

Offset Design Bernhardt 4N66W6K Pad Sec.6-T4N-R66W - Bernhardt 6K-323 - Wellbore #1 - Plan #2 (9-3-14)													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)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
6,700.0	6,625.0	6,719.2	6,616.8	20.5	22.4	-86.13		724.1	610.6	329.8	289.3	40.50	8.142	
6,800.0	6,719.1	6,815.3	6,703.6	20.3	22.2	-84.46		683.2	610.6	330.6	290.4	40.21	8.222	
6,900.0	6,808.0	6,910.3	6,783.8	20.0	21.8	-82.89		632.3	610.6	331.6	291.9	39.66	8.360	
7,000.0	6,890.2	7,004.4	6,856.3	19.7	21.5	-81.46		572.5	610.6	332.7	293.8	38.93	8.547	
7,100.0	6,964.2	7,097.6	6,920.4	19.2	21.1	-80.17		504.9	610.6	333.9	295.9	38.07	8.770	
7,200.0	7,028.9	7,190.0	6,975.4	18.8	20.7	-79.05		430.7	610.6	335.1	297.9	37.21	9.007	
7,300.0	7,083.1	7,281.9	7,020.8	18.5	20.3	-78.11		350.9	610.6	336.2	299.8	36.43	9.230	
7,400.0	7,125.8	7,373.2	7,056.1	18.2	19.9	-77.35		266.7	610.6	337.2	301.3	35.86	9.403	
7,500.0	7,156.4	7,464.1	7,081.0	18.0	19.6	-76.79		179.3	610.6	337.9	302.3	35.60	9.494	
7,600.0	7,174.3	7,554.8	7,095.3	17.9	19.3	-76.44		89.8	610.6	338.4	302.7	35.71	9.476	
7,700.0	7,179.3	7,646.8	7,099.1	18.1	19.0	-76.29		-2.0	610.6	338.6	302.4	36.26	9.339	
7,800.0	7,179.5	7,746.8	7,099.1	18.6	18.7	-76.26		-102.0	610.6	338.7	301.4	37.25	9.093	
7,900.0	7,179.6	7,846.8	7,099.0	19.2	19.5	-76.23		-202.0	610.6	338.7	300.2	38.56	8.785	
8,000.0	7,179.8	7,946.8	7,098.9	20.1	20.4	-76.20		-302.0	610.6	338.8	298.6	40.18	8.432	
8,100.0	7,179.9	8,046.8	7,098.9	21.1	21.5	-76.17		-402.0	610.6	338.8	296.8	42.07	8.054	
8,200.0	7,180.0	8,146.8	7,098.8	22.2	22.7	-76.14		-502.0	610.6	338.9	294.7	44.20	7.667	
8,300.0	7,180.2	8,246.8	7,098.8	23.4	23.9	-76.10		-602.0	610.6	338.9	292.4	46.53	7.284	
8,400.0	7,180.3	8,346.8	7,098.7	24.7	25.2	-76.07		-702.0	610.6	339.0	289.9	49.04	6.913	
8,500.0	7,180.5	8,446.8	7,098.6	26.1	26.6	-76.04		-802.0	610.6	339.0	287.3	51.69	6.558	
8,600.0	7,180.6	8,546.8	7,098.6	27.5	28.1	-76.01		-902.0	610.6	339.1	284.6	54.47	6.224	
8,700.0	7,180.7	8,646.8	7,098.6	29.0	29.5	-75.98		-1,002.0	610.6	339.1	281.7	57.37	5.911	
8,800.0	7,180.9	8,746.8	7,098.5	30.6	31.1	-75.95		-1,102.0	610.6	339.2	278.8	60.35	5.620	
8,900.0	7,181.0	8,846.8	7,098.5	32.2	32.6	-75.92		-1,202.0	610.6	339.2	275.8	63.41	5.349	
9,000.0	7,181.2	8,946.8	7,098.4	33.8	34.2	-75.88		-1,302.0	610.6	339.2	272.7	66.55	5.098	
9,100.0	7,181.3	9,046.8	7,098.4	35.4	35.9	-75.85		-1,402.0	610.6	339.3	269.6	69.74	4.865	
9,200.0	7,181.4	9,146.8	7,098.3	37.1	37.5	-75.82		-1,502.0	610.6	339.3	266.4	72.98	4.650	
9,300.0	7,181.6	9,246.8	7,098.3	38.8	39.2	-75.79		-1,602.0	610.6	339.4	263.1	76.27	4.450	
9,400.0	7,181.7	9,346.8	7,098.2	40.5	40.9	-75.76		-1,702.0	610.6	339.4	259.8	79.59	4.265	
9,500.0	7,181.9	9,446.8	7,098.2	42.2	42.6	-75.73		-1,802.0	610.6	339.5	256.5	82.95	4.092	
9,600.0	7,182.0	9,546.8	7,098.1	44.0	44.4	-75.70		-1,902.0	610.6	339.5	253.2	86.34	3.932	
9,700.0	7,182.1	9,646.8	7,098.1	45.7	46.1	-75.66		-2,002.0	610.6	339.6	249.8	89.76	3.783	
9,800.0	7,182.3	9,746.8	7,098.0	47.5	47.9	-75.63		-2,102.0	610.6	339.6	246.4	93.20	3.644	
9,900.0	7,182.4	9,846.8	7,098.0	49.3	49.6	-75.60		-2,202.0	610.6	339.7	243.0	96.66	3.514	
10,000.0	7,182.6	9,946.8	7,097.9	51.1	51.4	-75.57		-2,302.0	610.6	339.7	239.6	100.14	3.393	
10,100.0	7,182.7	10,046.8	7,097.8	52.9	53.2	-75.54		-2,402.0	610.6	339.8	236.1	103.63	3.279	
10,200.0	7,182.8	10,146.8	7,097.8	54.7	55.0	-75.51		-2,502.0	610.6	339.8	232.7	107.14	3.172	
10,300.0	7,183.0	10,246.8	7,097.7	56.5	56.8	-75.48		-2,602.0	610.6	339.9	229.2	110.67	3.071	
10,400.0	7,183.1	10,346.8	7,097.7	58.3	58.6	-75.44		-2,702.0	610.6	339.9	225.7	114.20	2.976	
10,500.0	7,183.3	10,446.8	7,097.6	60.2	60.4	-75.41		-2,802.0	610.6	340.0	222.2	117.75	2.887	
10,600.0	7,183.4	10,546.8	7,097.6	62.0	62.3	-75.38		-2,902.0	610.6	340.0	218.7	121.30	2.803	
10,700.0	7,183.5	10,646.8	7,097.5	63.8	64.1	-75.35		-3,002.0	610.6	340.1	215.2	124.87	2.723	
10,800.0	7,183.7	10,746.8	7,097.5	65.7	65.9	-75.32		-3,102.0	610.6	340.1	211.7	128.44	2.648	
10,900.0	7,183.8	10,846.8	7,097.4	67.5	67.8	-75.29		-3,202.0	610.6	340.2	208.1	132.02	2.576	
11,000.0	7,184.0	10,946.8	7,097.4	69.4	69.6	-75.26		-3,302.0	610.6	340.2	204.6	135.61	2.509	
11,100.0	7,184.1	11,046.8	7,097.3	71.2	71.5	-75.23		-3,402.0	610.6	340.2	201.0	139.20	2.444	
11,200.0	7,184.2	11,146.8	7,097.3	73.1	73.3	-75.19		-3,502.0	610.6	340.3	197.5	142.80	2.383	
11,300.0	7,184.4	11,246.8	7,097.2	75.0	75.2	-75.16		-3,602.0	610.6	340.3	193.9	146.41	2.325	
11,400.0	7,184.5	11,346.8	7,097.2	76.8	77.0	-75.13		-3,702.0	610.6	340.4	190.4	150.01	2.269	
11,500.0	7,184.7	11,446.8	7,097.1	78.7	78.9	-75.10		-3,802.0	610.6	340.4	186.8	153.63	2.216	
11,600.0	7,184.8	11,546.8	7,097.1	80.6	80.8	-75.07		-3,902.0	610.6	340.5	183.3	157.24	2.165	
11,700.0	7,184.9	11,646.8	7,097.0	82.4	82.6	-75.04		-4,002.0	610.6	340.5	179.7	160.86	2.117	

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 Bernhardt 6K-403
Project:	SEC.6-T4N-R66W	TVD Reference:	WELL @ 4728.0ft (RKB - 15')
Reference Site:	Bernhardt 4N66W6K Pad Sec.6-T4N-R66W	MD Reference:	WELL @ 4728.0ft (RKB - 15')
Site Error:	0.0ft	North Reference:	True
Reference Well:	Bernhardt 6K-403	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	Landmark
Reference Design:	Plan #2 (9-3-14)	Offset TVD Reference:	Offset Datum

Offset Design Bernhardt 4N66W6K Pad Sec.6-T4N-R66W - Bernhardt 6K-323 - Wellbore #1 - Plan #2 (9-3-14)												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
11,701.6	7,184.9	11,648.4	7,097.0	82.5	82.6	-75.04	-4,003.6	610.6	340.5	179.6	160.92	2.116	
11,749.0	7,185.0	11,666.7	7,097.0	83.4	83.0	-75.03	-4,021.9	610.6	341.8	179.7	162.11	2.108 SF	

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Bernhardt 6K-403
Project:	SEC.6-T4N-R66W	TVD Reference:	WELL @ 4728.0ft (RKB - 15')
Reference Site:	Bernhardt 4N66W6K Pad Sec.6-T4N-R66W	MD Reference:	WELL @ 4728.0ft (RKB - 15')
Site Error:	0.0ft	North Reference:	True
Reference Well:	Bernhardt 6K-403	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	Landmark
Reference Design:	Plan #2 (9-3-14)	Offset TVD Reference:	Offset Datum

Offset Design Bernhardt 4N66W6K Pad Sec.6-T4N-R66W - Bernhardt 6O-243 - Wellbore #1 - Plan #2 (9-3-14)													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
0.0	0.0	0.0	0.0	0.0	0.0	73.56	73.56	25.5	86.4	90.1				
100.0	100.0	100.0	100.0	0.1	0.1	73.56	73.56	25.5	86.4	90.1	89.9	0.22	400.877	
200.0	200.0	200.0	200.0	0.3	0.3	73.56	73.56	25.5	86.4	90.1	89.4	0.67	133.626 CC, ES	
300.0	300.0	297.0	297.0	0.6	0.6	73.27	73.27	26.4	87.8	91.7	90.6	1.11	82.292	
400.0	400.0	393.8	393.7	0.8	0.8	72.47	72.47	29.0	91.9	96.6	95.1	1.56	61.820	
500.0	500.0	490.2	489.7	1.0	1.0	71.30	71.30	33.4	98.8	104.8	102.8	2.02	51.960	
600.0	600.0	585.9	584.8	1.2	1.3	69.95	69.95	39.5	108.3	116.3	113.8	2.48	46.963	
700.0	700.0	680.8	678.5	1.5	1.6	68.57	68.57	47.2	120.3	131.0	128.1	2.94	44.577	
800.0	800.0	774.6	770.7	1.7	1.9	67.26	67.26	56.5	134.8	149.0	145.6	3.41	43.717	
900.0	900.0	867.2	861.1	1.9	2.3	66.07	66.07	67.2	151.5	170.3	166.4	3.89	43.809	
1,000.0	1,000.0	958.3	949.5	2.1	2.8	65.03	65.03	79.4	170.4	194.7	190.3	4.37	44.518	
1,100.0	1,100.0	1,053.2	1,040.9	2.4	3.2	44.08	44.08	93.1	191.9	220.2	215.4	4.81	45.757	
1,200.0	1,199.8	1,150.4	1,134.5	2.6	3.8	43.85	43.85	107.3	214.1	243.4	238.1	5.29	46.039	
1,300.0	1,299.5	1,248.2	1,228.6	2.8	4.3	44.18	44.18	121.6	236.3	264.2	258.4	5.78	45.729	
1,400.0	1,398.7	1,346.4	1,323.1	3.1	4.8	44.95	44.95	135.9	258.7	282.5	276.3	6.28	44.965	
1,500.0	1,497.5	1,444.8	1,417.9	3.3	5.4	46.11	46.11	150.3	281.1	298.6	291.8	6.82	43.784	
1,600.0	1,595.8	1,543.4	1,512.8	3.6	5.9	47.64	47.64	164.7	303.5	313.2	305.8	7.40	42.352	
1,700.0	1,694.2	1,642.0	1,607.7	3.9	6.5	49.09	49.09	179.1	326.0	328.0	320.0	8.00	41.010	
1,800.0	1,792.5	1,740.6	1,702.6	4.3	7.0	50.41	50.41	193.5	348.4	343.0	334.4	8.62	39.778	
1,900.0	1,890.9	1,839.1	1,797.5	4.6	7.6	51.62	51.62	207.9	370.9	358.1	348.9	9.27	38.650	
2,000.0	1,989.2	1,937.7	1,892.4	5.0	8.1	52.73	52.73	222.3	393.3	373.4	363.5	9.93	37.619	
2,100.0	2,087.6	2,036.3	1,987.3	5.3	8.7	53.76	53.76	236.6	415.8	388.8	378.2	10.60	36.676	
2,200.0	2,185.9	2,134.9	2,082.2	5.7	9.2	54.70	54.70	251.0	438.2	404.4	393.1	11.29	35.815	
2,300.0	2,284.3	2,233.4	2,177.1	6.1	9.8	55.58	55.58	265.4	460.6	420.0	408.0	11.99	35.027	
2,400.0	2,382.6	2,332.0	2,272.0	6.4	10.3	56.39	56.39	279.8	483.1	435.7	423.0	12.70	34.306	
2,500.0	2,481.0	2,430.6	2,366.9	6.8	10.9	57.15	57.15	294.2	505.5	451.5	438.1	13.42	33.644	
2,600.0	2,579.3	2,529.2	2,461.8	7.2	11.5	57.86	57.86	308.6	528.0	467.4	453.2	14.15	33.036	
2,700.0	2,677.7	2,627.7	2,556.7	7.6	12.0	58.52	58.52	323.0	550.4	483.3	468.4	14.88	32.476	
2,800.0	2,776.0	2,726.3	2,651.6	7.9	12.6	59.14	59.14	337.4	572.9	499.3	483.6	15.62	31.960	
2,900.0	2,874.4	2,824.9	2,746.5	8.3	13.1	59.72	59.72	351.8	595.3	515.3	498.9	16.37	31.483	
3,000.0	2,972.7	2,923.5	2,841.4	8.7	13.7	60.26	60.26	366.1	617.8	531.4	514.3	17.12	31.041	
3,100.0	3,071.1	3,022.0	2,936.3	9.1	14.2	60.77	60.77	380.5	640.2	547.5	529.7	17.88	30.631	
3,200.0	3,169.4	3,120.6	3,031.2	9.5	14.8	61.26	61.26	394.9	662.6	563.7	545.1	18.64	30.250	
3,300.0	3,267.8	3,219.2	3,126.1	9.9	15.4	61.71	61.71	409.3	685.1	579.9	560.5	19.40	29.895	
3,400.0	3,366.1	3,317.8	3,221.0	10.3	15.9	62.15	62.15	423.7	707.5	596.2	576.0	20.17	29.563	
3,500.0	3,464.5	3,416.3	3,315.9	10.7	16.5	62.55	62.55	438.1	730.0	612.4	591.5	20.94	29.254	
3,600.0	3,562.8	3,514.9	3,410.8	11.1	17.0	62.94	62.94	452.5	752.4	628.8	607.0	21.71	28.963	
3,700.0	3,661.2	3,613.5	3,505.7	11.5	17.6	63.31	63.31	466.9	774.9	645.1	622.6	22.48	28.691	
3,800.0	3,759.5	3,712.1	3,600.6	11.8	18.1	63.66	63.66	481.3	797.3	661.4	638.2	23.26	28.435	
3,900.0	3,857.9	3,810.6	3,695.5	12.2	18.7	63.99	63.99	495.6	819.8	677.8	653.8	24.04	28.194	
4,000.0	3,956.2	3,909.2	3,790.4	12.6	19.3	64.31	64.31	510.0	842.2	694.2	669.4	24.82	27.967	
4,100.0	4,054.6	4,007.8	3,885.3	13.0	19.8	64.61	64.61	524.4	864.6	710.6	685.0	25.61	27.753	
4,200.0	4,152.9	4,106.3	3,980.2	13.4	20.4	64.90	64.90	538.8	887.1	727.1	700.7	26.39	27.551	
4,300.0	4,251.3	4,204.9	4,075.1	13.8	20.9	65.18	65.18	553.2	909.5	743.5	716.4	27.18	27.359	
4,400.0	4,349.6	4,303.5	4,170.0	14.2	21.5	65.44	65.44	567.6	932.0	760.0	732.0	27.97	27.177	
4,500.0	4,447.9	4,402.1	4,264.9	14.6	22.0	65.70	65.70	582.0	954.4	776.5	747.7	28.75	27.005	
4,600.0	4,546.3	4,500.6	4,359.8	15.0	22.6	65.94	65.94	596.4	976.9	793.0	763.5	29.54	26.841	
4,700.0	4,644.6	4,599.2	4,454.7	15.4	23.2	66.17	66.17	610.8	999.3	809.5	779.2	30.34	26.685	
4,800.0	4,743.0	4,697.8	4,549.6	15.8	23.7	66.39	66.39	625.1	1,021.7	826.0	794.9	31.13	26.537	
4,900.0	4,841.3	4,796.4	4,644.5	16.2	24.3	66.61	66.61	639.5	1,044.2	842.6	810.7	31.92	26.395	
5,000.0	4,939.7	4,894.9	4,739.4	16.6	24.8	66.82	66.82	653.9	1,066.6	859.1	826.4	32.72	26.260	

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 Bernhardt 6K-403
Project:	SEC.6-T4N-R66W	TVD Reference:	WELL @ 4728.0ft (RKB - 15')
Reference Site:	Bernhardt 4N66W6K Pad Sec.6-T4N-R66W	MD Reference:	WELL @ 4728.0ft (RKB - 15')
Site Error:	0.0ft	North Reference:	True
Reference Well:	Bernhardt 6K-403	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	Landmark
Reference Design:	Plan #2 (9-3-14)	Offset TVD Reference:	Offset Datum

Offset Design Bernhardt 4N66W6K Pad Sec.6-T4N-R66W - Bernhardt 6O-243 - Wellbore #1 - Plan #2 (9-3-14)													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	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	5,038.0	4,993.5	4,834.3	17.0	25.4	67.01	668.3	1,089.1	875.7	842.2	33.51	26.131		
5,200.0	5,136.4	5,092.1	4,929.2	17.4	26.0	67.21	682.7	1,111.5	892.3	858.0	34.31	26.008		
5,300.0	5,234.7	5,190.7	5,024.1	17.8	26.5	67.39	697.1	1,134.0	908.8	873.7	35.10	25.890		
5,400.0	5,333.1	5,289.2	5,119.0	18.2	27.1	67.57	711.5	1,156.4	925.4	889.5	35.90	25.777		
5,500.0	5,431.4	5,387.8	5,213.9	18.6	27.6	67.74	725.9	1,178.9	942.0	905.3	36.70	25.669		
5,600.0	5,529.9	5,521.0	5,342.8	19.0	28.3	68.14	744.0	1,207.1	957.2	919.6	37.59	25.466		
5,700.0	5,628.8	5,660.0	5,478.8	19.2	28.7	68.61	759.4	1,231.1	969.5	931.2	38.33	25.296		
5,800.0	5,728.1	5,799.9	5,617.0	19.5	29.2	68.97	771.3	1,249.7	978.9	940.0	38.96	25.127		
5,900.0	5,827.8	5,940.7	5,756.9	19.7	29.5	69.21	779.6	1,262.7	985.5	946.0	39.47	24.968		
6,000.0	5,927.7	6,081.9	5,897.8	19.9	29.7	69.35	784.2	1,269.9	989.1	949.2	39.87	24.810		
6,100.0	6,027.7	6,211.8	6,027.7	20.0	29.8	69.36	785.2	1,271.4	989.9	949.7	40.15	24.651		
6,200.0	6,127.7	6,311.8	6,127.7	20.1	29.9	69.36	785.2	1,271.4	989.9	949.4	40.43	24.483		
6,300.0	6,227.7	6,411.8	6,227.7	20.3	30.0	69.36	785.2	1,271.4	989.9	949.1	40.71	24.315		
6,400.0	6,327.7	6,512.5	6,328.4	20.4	30.1	69.48	783.1	1,271.4	989.8	948.8	41.00	24.143		
6,476.0	6,403.7	6,588.4	6,403.7	20.5	30.1	-90.00	773.7	1,271.4	989.8	948.5	41.25	23.993		
6,500.0	6,427.7	6,611.9	6,426.7	20.6	30.1	-89.72	769.3	1,271.4	989.8	948.5	41.35	23.937		
6,600.0	6,527.3	6,708.4	6,519.7	20.6	30.0	-88.67	743.9	1,271.4	990.1	948.5	41.55	23.829 SF		
6,700.0	6,625.0	6,802.8	6,606.9	20.5	29.8	-87.65	707.8	1,271.4	990.6	949.2	41.49	23.877		
6,800.0	6,719.1	6,895.3	6,687.4	20.3	29.6	-86.67	662.3	1,271.4	991.5	950.3	41.19	24.073		
6,900.0	6,808.0	6,986.1	6,760.5	20.0	29.3	-85.76	608.5	1,271.4	992.6	951.9	40.68	24.401		
7,000.0	6,890.2	7,075.5	6,825.7	19.7	29.0	-84.91	547.4	1,271.4	993.8	953.8	40.01	24.838		
7,100.0	6,964.2	7,163.5	6,882.5	19.2	28.7	-84.15	480.2	1,271.4	995.1	955.8	39.25	25.349		
7,200.0	7,028.9	7,250.0	6,930.4	18.8	28.4	-83.48	408.3	1,271.4	996.3	957.8	38.49	25.883		
7,300.0	7,083.1	7,336.6	6,970.0	18.5	28.1	-82.91	331.3	1,271.4	997.5	959.7	37.82	26.373		
7,400.0	7,125.8	7,422.0	7,000.2	18.2	27.8	-82.44	251.5	1,271.4	998.5	961.2	37.34	26.742		
7,500.0	7,156.4	7,506.9	7,021.3	18.0	27.6	-82.09	169.3	1,271.4	999.3	962.2	37.12	26.919		
7,600.0	7,174.3	7,591.3	7,033.0	17.9	27.4	-81.85	85.8	1,271.4	999.9	962.6	37.25	26.846		

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Bernhardt 6K-403
Project:	SEC.6-T4N-R66W	TVD Reference:	WELL @ 4728.0ft (RKB - 15')
Reference Site:	Bernhardt 4N66W6K Pad Sec.6-T4N-R66W	MD Reference:	WELL @ 4728.0ft (RKB - 15')
Site Error:	0.0ft	North Reference:	True
Reference Well:	Bernhardt 6K-403	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	Landmark
Reference Design:	Plan #2 (9-3-14)	Offset TVD Reference:	Offset Datum

Offset Design Bernhardt 4N66W6K Pad Sec.6-T4N-R66W - Bernhardt 6O-443 - Wellbore #1 - Plan #2 (9-3-14)												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	Offset		+N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)			
0.0	0.0	0.0	0.0	0.0	0.0	76.02	14.6	58.5	60.3				
100.0	100.0	100.0	100.0	0.1	0.1	76.02	14.6	58.5	60.3	60.1	0.22	268.407	
200.0	200.0	200.0	200.0	0.3	0.3	76.02	14.6	58.5	60.3	59.7	0.67	89.469	
300.0	300.0	300.0	300.0	0.6	0.6	76.02	14.6	58.5	60.3	59.2	1.12	53.681	
400.0	400.0	400.0	400.0	0.8	0.8	76.02	14.6	58.5	60.3	58.8	1.57	38.344	CC, ES
500.0	500.0	498.1	498.1	1.0	1.0	75.31	15.7	59.8	61.9	59.8	2.02	30.690	
600.0	600.0	596.0	595.9	1.2	1.2	73.39	19.0	63.6	66.5	64.0	2.46	27.016	
700.0	700.0	693.4	692.9	1.5	1.5	70.73	24.4	69.9	74.4	71.4	2.91	25.535	
800.0	800.0	790.2	789.0	1.7	1.7	67.84	32.0	78.6	85.5	82.2	3.37	25.407	
900.0	900.0	886.1	883.7	1.9	2.0	65.10	41.6	89.6	100.1	96.3	3.82	26.165	
1,000.0	1,000.0	980.9	976.9	2.1	2.3	62.68	53.1	102.8	118.0	113.7	4.29	27.512	
1,100.0	1,100.0	1,075.1	1,068.9	2.4	2.7	40.84	66.5	118.2	137.9	133.2	4.75	29.066	
1,200.0	1,199.8	1,173.3	1,164.4	2.6	3.1	40.10	81.4	135.3	156.6	151.4	5.21	30.058	
1,300.0	1,299.5	1,272.0	1,260.5	2.8	3.6	40.25	96.4	152.5	172.7	167.0	5.68	30.384	
1,400.0	1,398.7	1,371.0	1,356.8	3.1	4.0	41.08	111.3	169.7	186.2	180.0	6.18	30.144	
1,500.0	1,497.5	1,470.3	1,453.4	3.3	4.5	42.49	126.4	187.0	197.1	190.4	6.69	29.459	
1,600.0	1,595.8	1,569.6	1,550.1	3.6	4.9	44.31	141.4	204.2	206.5	199.2	7.25	28.464	
1,700.0	1,694.2	1,669.0	1,646.8	3.9	5.4	46.01	156.4	221.5	216.0	208.2	7.84	27.538	
1,800.0	1,792.5	1,768.3	1,743.4	4.3	5.9	47.57	171.5	238.8	225.7	217.2	8.46	26.690	
1,900.0	1,890.9	1,867.7	1,840.1	4.6	6.4	49.00	186.5	256.1	235.5	226.4	9.09	25.915	
2,000.0	1,989.2	1,967.0	1,936.8	5.0	6.8	50.32	201.6	273.3	245.5	235.8	9.74	25.208	
2,100.0	2,087.6	2,066.4	2,033.5	5.3	7.3	51.53	216.6	290.6	255.6	245.2	10.41	24.563	
2,200.0	2,185.9	2,165.7	2,130.1	5.7	7.8	52.65	231.6	307.9	265.8	254.7	11.09	23.974	
2,300.0	2,284.3	2,265.1	2,226.8	6.1	8.3	53.69	246.7	325.2	276.1	264.3	11.78	23.437	
2,400.0	2,382.6	2,364.4	2,323.5	6.4	8.8	54.65	261.7	342.4	286.4	273.9	12.48	22.946	
2,500.0	2,481.0	2,463.8	2,420.2	6.8	9.2	55.55	276.8	359.7	296.9	283.7	13.20	22.497	
2,600.0	2,579.3	2,563.1	2,516.8	7.2	9.7	56.38	291.8	377.0	307.4	293.5	13.92	22.085	
2,700.0	2,677.7	2,662.5	2,613.5	7.6	10.2	57.16	306.8	394.3	318.0	303.3	14.65	21.707	
2,800.0	2,776.0	2,761.8	2,710.2	7.9	10.7	57.89	321.9	411.5	328.6	313.2	15.38	21.359	
2,900.0	2,874.4	2,861.2	2,806.8	8.3	11.2	58.57	336.9	428.8	339.3	323.1	16.13	21.038	
3,000.0	2,972.7	2,960.5	2,903.5	8.7	11.7	59.21	352.0	446.1	350.0	333.1	16.87	20.741	
3,100.0	3,071.1	3,059.9	3,000.2	9.1	12.1	59.82	367.0	463.4	360.7	343.1	17.63	20.466	
3,200.0	3,169.4	3,159.2	3,096.9	9.5	12.6	60.39	382.0	480.6	371.5	353.1	18.38	20.211	
3,300.0	3,267.8	3,258.6	3,193.5	9.9	13.1	60.92	397.1	497.9	382.4	363.2	19.14	19.975	
3,400.0	3,366.1	3,357.9	3,290.2	10.3	13.6	61.43	412.1	515.2	393.2	373.3	19.91	19.754	
3,500.0	3,464.5	3,457.3	3,386.9	10.7	14.1	61.91	427.1	532.5	404.1	383.4	20.67	19.548	
3,600.0	3,562.8	3,556.6	3,483.6	11.1	14.6	62.36	442.2	549.7	415.0	393.6	21.44	19.356	
3,700.0	3,661.2	3,656.0	3,580.2	11.5	15.1	62.79	457.2	567.0	426.0	403.8	22.21	19.176	
3,800.0	3,759.5	3,755.3	3,676.9	11.8	15.5	63.20	472.3	584.3	436.9	414.0	22.99	19.007	
3,900.0	3,857.9	3,854.7	3,773.6	12.2	16.0	63.59	487.3	601.6	447.9	424.2	23.77	18.848	
4,000.0	3,956.2	3,954.0	3,870.3	12.6	16.5	63.96	502.3	618.8	458.9	434.4	24.54	18.699	
4,100.0	4,054.6	4,053.4	3,966.9	13.0	17.0	64.32	517.4	636.1	470.0	444.6	25.32	18.558	
4,200.0	4,152.9	4,152.7	4,063.6	13.4	17.5	64.65	532.4	653.4	481.0	454.9	26.11	18.425	
4,300.0	4,251.3	4,252.1	4,160.3	13.8	18.0	64.98	547.5	670.7	492.1	465.2	26.89	18.300	
4,400.0	4,349.6	4,351.4	4,256.9	14.2	18.5	65.29	562.5	687.9	503.1	475.5	27.67	18.181	
4,500.0	4,447.9	4,450.8	4,353.6	14.6	18.9	65.58	577.5	705.2	514.2	485.8	28.46	18.069	
4,600.0	4,546.3	4,550.1	4,450.3	15.0	19.4	65.86	592.6	722.5	525.3	496.1	29.25	17.962	
4,700.0	4,644.6	4,649.5	4,547.0	15.4	19.9	66.13	607.6	739.8	536.4	506.4	30.03	17.861	
4,800.0	4,743.0	4,748.8	4,643.6	15.8	20.4	66.39	622.6	757.0	547.5	516.7	30.82	17.765	
4,900.0	4,841.3	4,848.2	4,740.3	16.2	20.9	66.64	637.7	774.3	558.7	527.1	31.61	17.673	
5,000.0	4,939.7	4,947.5	4,837.0	16.6	21.4	66.88	652.7	791.6	569.8	537.4	32.40	17.585	

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 Bernhardt 6K-403
Project:	SEC.6-T4N-R66W	TVD Reference:	WELL @ 4728.0ft (RKB - 15')
Reference Site:	Bernhardt 4N66W6K Pad Sec.6-T4N-R66W	MD Reference:	WELL @ 4728.0ft (RKB - 15')
Site Error:	0.0ft	North Reference:	True
Reference Well:	Bernhardt 6K-403	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	Landmark
Reference Design:	Plan #2 (9-3-14)	Offset TVD Reference:	Offset Datum

Offset Design Bernhardt 4N66W6K Pad Sec.6-T4N-R66W - Bernhardt 6O-443 - Wellbore #1 - Plan #2 (9-3-14)													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	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	5,038.0	5,046.9	4,933.7	17.0	21.9	67.11	667.8	808.9	581.0	547.8	33.19	17.502		
5,200.0	5,136.4	5,146.2	5,030.3	17.4	22.3	67.33	682.8	826.1	592.1	558.1	33.99	17.423		
5,300.0	5,234.7	5,245.6	5,127.0	17.8	22.8	67.55	697.8	843.4	603.3	568.5	34.78	17.347		
5,400.0	5,333.1	5,344.9	5,223.7	18.2	23.3	67.75	712.9	860.7	614.5	578.9	35.57	17.274		
5,500.0	5,431.4	5,444.3	5,320.4	18.6	23.8	67.95	727.9	878.0	625.7	589.3	36.37	17.204		
5,600.0	5,529.9	5,560.0	5,433.3	19.0	24.3	68.31	744.4	896.9	636.0	598.8	37.16	17.115		
5,700.0	5,628.8	5,680.2	5,551.6	19.2	24.6	68.72	758.4	913.0	644.3	606.5	37.82	17.037		
5,800.0	5,728.1	5,800.8	5,671.1	19.5	25.0	69.02	769.1	925.3	650.7	612.3	38.38	16.952		
5,900.0	5,827.8	5,921.7	5,791.5	19.7	25.2	69.23	776.6	933.9	655.1	616.2	38.84	16.865		
6,000.0	5,927.7	6,042.9	5,912.4	19.9	25.4	69.35	780.7	938.6	657.5	618.3	39.21	16.770		
6,100.0	6,027.7	6,158.2	6,027.7	20.0	25.5	69.36	781.6	939.6	658.0	618.6	39.49	16.665		
6,200.0	6,127.7	6,258.2	6,127.7	20.1	25.6	69.36	781.6	939.6	658.0	618.3	39.77	16.548		
6,300.0	6,227.7	6,358.2	6,227.7	20.3	25.8	69.36	781.6	939.6	658.0	618.0	40.05	16.430		
6,400.0	6,327.7	6,458.2	6,327.7	20.4	25.9	69.36	781.6	939.6	658.0	617.7	40.34	16.312		
6,500.0	6,427.7	6,558.3	6,427.8	20.6	26.0	-90.64	781.5	939.6	658.0	617.4	40.62	16.198		
6,600.0	6,527.3	6,659.3	6,528.4	20.6	26.0	-90.64	773.2	939.6	658.0	617.3	40.71	16.165		
6,700.0	6,625.0	6,760.2	6,627.0	20.5	25.9	-90.62	751.7	939.6	658.0	617.5	40.53	16.235		
6,800.0	6,719.1	6,861.1	6,721.8	20.3	25.8	-90.59	717.4	939.6	658.0	617.9	40.12	16.401		
6,900.0	6,808.0	6,962.0	6,811.3	20.0	25.5	-90.55	671.0	939.6	658.0	618.5	39.52	16.650		
7,000.0	6,890.2	7,062.8	6,893.8	19.7	25.2	-90.50	613.2	939.6	658.0	619.2	38.79	16.963		
7,100.0	6,964.2	7,163.5	6,967.9	19.2	24.8	-90.45	545.2	939.6	658.0	620.0	38.01	17.313		
7,200.0	7,028.9	7,264.1	7,032.4	18.8	24.4	-90.38	468.0	939.6	658.0	620.8	37.25	17.665		
7,300.0	7,083.1	7,364.7	7,086.2	18.5	24.0	-90.31	383.2	939.6	658.0	621.4	36.61	17.972		
7,400.0	7,125.8	7,465.1	7,128.3	18.2	23.6	-90.23	292.1	939.6	658.0	621.8	36.18	18.185		
7,500.0	7,156.4	7,565.3	7,158.1	18.0	23.2	-90.15	196.4	939.6	658.0	622.0	36.04	18.258		
7,600.0	7,174.3	7,665.5	7,175.1	17.9	22.9	-90.07	97.8	939.6	658.0	621.8	36.23	18.161		
7,700.0	7,179.3	7,765.6	7,179.4	18.1	22.7	-90.00	-2.1	939.6	658.0	621.2	36.78	17.889		
7,800.0	7,179.5	7,865.6	7,179.5	18.6	22.7	-90.00	-102.1	939.6	658.0	620.3	37.71	17.449		
7,900.0	7,179.6	7,965.6	7,179.7	19.2	22.8	-90.00	-202.1	939.6	658.0	619.0	38.98	16.881		
8,000.0	7,179.8	8,065.6	7,179.8	20.1	23.2	-90.00	-302.1	939.6	658.0	617.4	40.57	16.217		
8,100.0	7,179.9	8,165.6	7,179.9	21.1	23.9	-90.00	-402.1	939.6	658.0	615.5	42.46	15.498		
8,200.0	7,180.0	8,265.6	7,180.1	22.2	24.8	-90.00	-502.1	939.6	658.0	613.4	44.59	14.755		
8,300.0	7,180.2	8,365.6	7,180.2	23.4	25.9	-90.00	-602.1	939.6	658.0	611.1	46.95	14.016		
8,400.0	7,180.3	8,465.6	7,180.3	24.7	27.1	-90.00	-702.1	939.6	658.0	608.5	49.49	13.297		
8,500.0	7,180.5	8,565.6	7,180.5	26.1	28.3	-90.00	-802.1	939.6	658.0	605.8	52.18	12.609		
8,600.0	7,180.6	8,665.6	7,180.6	27.5	29.7	-90.00	-902.1	939.6	658.0	603.0	55.02	11.959		
8,700.0	7,180.7	8,765.6	7,180.8	29.0	31.1	-90.00	-1,002.1	939.6	658.0	600.0	57.97	11.351		
8,800.0	7,180.9	8,865.6	7,180.9	30.6	32.5	-90.00	-1,102.1	939.6	658.0	597.0	61.02	10.783		
8,900.0	7,181.0	8,965.6	7,181.0	32.2	34.0	-90.00	-1,202.1	939.6	658.0	593.8	64.15	10.257		
9,000.0	7,181.2	9,065.6	7,181.2	33.8	35.6	-90.00	-1,302.1	939.6	658.0	590.6	67.36	9.768		
9,100.0	7,181.3	9,165.6	7,181.3	35.4	37.2	-90.00	-1,402.1	939.6	658.0	587.4	70.63	9.316		
9,200.0	7,181.4	9,265.6	7,181.5	37.1	38.8	-90.00	-1,502.1	939.6	658.0	584.0	73.96	8.897		
9,300.0	7,181.6	9,365.6	7,181.6	38.8	40.4	-90.00	-1,602.1	939.6	658.0	580.7	77.33	8.509		
9,400.0	7,181.7	9,465.6	7,181.7	40.5	42.0	-90.00	-1,702.1	939.6	658.0	577.3	80.75	8.149		
9,500.0	7,181.9	9,565.6	7,181.9	42.2	43.7	-90.00	-1,802.1	939.6	658.0	573.8	84.20	7.815		
9,600.0	7,182.0	9,665.6	7,182.0	44.0	45.4	-90.00	-1,902.1	939.6	658.0	570.3	87.68	7.504		
9,700.0	7,182.1	9,765.6	7,182.2	45.7	47.1	-90.00	-2,002.1	939.6	658.0	566.8	91.20	7.215		
9,800.0	7,182.3	9,865.6	7,182.3	47.5	48.8	-90.00	-2,102.1	939.6	658.0	563.3	94.74	6.946		
9,900.0	7,182.4	9,965.6	7,182.4	49.3	50.6	-90.00	-2,202.1	939.6	658.0	559.7	98.30	6.694		
10,000.0	7,182.6	10,065.6	7,182.6	51.1	52.3	-90.00	-2,302.1	939.6	658.0	556.1	101.88	6.459		
10,100.0	7,182.7	10,165.6	7,182.7	52.9	54.1	-90.00	-2,402.1	939.6	658.0	552.5	105.48	6.238		

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 Bernhardt 6K-403
Project:	SEC.6-T4N-R66W	TVD Reference:	WELL @ 4728.0ft (RKB - 15')
Reference Site:	Bernhardt 4N66W6K Pad Sec.6-T4N-R66W	MD Reference:	WELL @ 4728.0ft (RKB - 15')
Site Error:	0.0ft	North Reference:	True
Reference Well:	Bernhardt 6K-403	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	Landmark
Reference Design:	Plan #2 (9-3-14)	Offset TVD Reference:	Offset Datum

Offset Design Bernhardt 4N66W6K Pad Sec.6-T4N-R66W - Bernhardt 6O-443 - Wellbore #1 - Plan #2 (9-3-14)												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
10,200.0	7,182.8	10,265.6	7,182.9	54.7	55.8	-90.00	-2,502.1	939.6	658.0	548.9	109.09	6.032	
10,300.0	7,183.0	10,365.6	7,183.0	56.5	57.6	-90.00	-2,602.1	939.6	658.0	545.3	112.72	5.837	
10,400.0	7,183.1	10,465.6	7,183.1	58.3	59.4	-90.00	-2,702.1	939.6	658.0	541.6	116.37	5.654	
10,500.0	7,183.3	10,565.6	7,183.3	60.2	61.2	-90.00	-2,802.1	939.6	658.0	538.0	120.02	5.482	
10,600.0	7,183.4	10,665.6	7,183.4	62.0	63.0	-90.00	-2,902.1	939.6	658.0	534.3	123.69	5.320	
10,700.0	7,183.5	10,765.6	7,183.6	63.8	64.8	-90.00	-3,002.1	939.6	658.0	530.6	127.37	5.166	
10,800.0	7,183.7	10,865.6	7,183.7	65.7	66.6	-90.00	-3,102.1	939.6	658.0	526.9	131.06	5.021	
10,900.0	7,183.8	10,965.6	7,183.8	67.5	68.4	-90.00	-3,202.1	939.6	658.0	523.2	134.75	4.883	
11,000.0	7,184.0	11,065.6	7,184.0	69.4	70.3	-90.00	-3,302.1	939.6	658.0	519.5	138.46	4.752	
11,100.0	7,184.1	11,165.6	7,184.1	71.2	72.1	-90.00	-3,402.1	939.6	658.0	515.8	142.17	4.628	
11,200.0	7,184.2	11,265.6	7,184.3	73.1	73.9	-90.00	-3,502.1	939.6	658.0	512.1	145.88	4.510	
11,300.0	7,184.4	11,365.6	7,184.4	75.0	75.8	-90.00	-3,602.1	939.6	658.0	508.4	149.61	4.398	
11,400.0	7,184.5	11,465.6	7,184.5	76.8	77.6	-90.00	-3,702.1	939.6	658.0	504.7	153.34	4.291	
11,500.0	7,184.7	11,565.6	7,184.7	78.7	79.4	-90.00	-3,802.1	939.6	658.0	500.9	157.07	4.189	
11,600.0	7,184.8	11,665.6	7,184.8	80.6	81.3	-90.00	-3,902.1	939.6	658.0	497.2	160.81	4.092	
11,700.0	7,184.9	11,765.6	7,185.0	82.4	83.1	-90.00	-4,002.1	939.6	658.0	493.4	164.56	3.999	
11,728.0	7,185.0	11,793.6	7,185.0	83.0	83.7	-90.00	-4,030.1	939.6	658.0	492.4	165.61	3.973	
11,749.0	7,185.0	11,796.3	7,185.0	83.4	83.7	-90.00	-4,032.9	939.6	658.3	492.2	166.05	3.964 SF	

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Bernhardt 6K-403
Project:	SEC.6-T4N-R66W	TVD Reference:	WELL @ 4728.0ft (RKB - 15')
Reference Site:	Bernhardt 4N66W6K Pad Sec.6-T4N-R66W	MD Reference:	WELL @ 4728.0ft (RKB - 15')
Site Error:	0.0ft	North Reference:	True
Reference Well:	Bernhardt 6K-403	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	Landmark
Reference Design:	Plan #2 (9-3-14)	Offset TVD Reference:	Offset Datum

Offset Design Existing Wells Sec.6-T4N-R66W - Bernhardt 7-2 (Exist.) - Wellbore #1 - Wellbore #1													Offset Site Error:	0.0 ft
Survey Program: 7306-UNKNOWN													Offset Well Error:	0.0 ft
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Semi Major Axis (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
10,700.0	7,183.5	7,184.5	7,184.5	63.8	143.7	-89.81	-3,901.7	666.4	978.5	771.0	207.44	4.717		
10,800.0	7,183.7	7,184.7	7,184.7	65.7	143.7	-89.83	-3,901.7	666.4	887.4	678.1	209.29	4.240		
10,900.0	7,183.8	7,184.8	7,184.8	67.5	143.7	-89.85	-3,901.7	666.4	798.5	587.3	211.14	3.782		
11,000.0	7,184.0	7,185.0	7,185.0	69.4	143.7	-89.88	-3,901.7	666.4	712.5	499.5	213.00	3.345		
11,100.0	7,184.1	7,185.1	7,185.1	71.2	143.7	-89.90	-3,901.7	666.4	630.6	415.8	214.86	2.935		
11,200.0	7,184.2	7,185.2	7,185.2	73.1	143.7	-89.92	-3,901.7	666.4	554.8	338.0	216.72	2.560		
11,300.0	7,184.4	7,185.4	7,185.4	75.0	143.7	-89.94	-3,901.7	666.4	487.7	269.1	218.59	2.231		
11,400.0	7,184.5	7,185.5	7,185.5	76.8	143.7	-89.96	-3,901.7	666.4	433.5	213.0	220.46	1.966		
11,500.0	7,184.7	7,185.7	7,185.7	78.7	143.7	-89.98	-3,901.7	666.4	397.5	175.1	222.33	1.788		
11,599.7	7,184.8	7,185.8	7,185.8	80.6	143.7	-90.00	-3,901.7	666.4	384.8	160.6	224.20	1.716 CC		
11,600.0	7,184.8	7,185.8	7,185.8	80.6	143.7	-90.00	-3,901.7	666.4	384.8	160.6	224.20	1.716 ES, SF		
11,700.0	7,184.9	7,185.9	7,185.9	82.4	143.7	-90.02	-3,901.7	666.4	397.6	171.6	226.08	1.759		
11,749.0	7,185.0	7,186.0	7,186.0	83.4	143.7	-90.03	-3,901.7	666.4	412.7	185.7	227.00	1.818		

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Bernhardt 6K-403
Project:	SEC.6-T4N-R66W	TVD Reference:	WELL @ 4728.0ft (RKB - 15')
Reference Site:	Bernhardt 4N66W6K Pad Sec.6-T4N-R66W	MD Reference:	WELL @ 4728.0ft (RKB - 15')
Site Error:	0.0ft	North Reference:	True
Reference Well:	Bernhardt 6K-403	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	Landmark
Reference Design:	Plan #2 (9-3-14)	Offset TVD Reference:	Offset Datum

Reference Depths are relative to WELL @ 4728.0ft (RKB - 15')
Offset Depths are relative to Offset Datum
Central Meridian is -105.500000 °

Coordinates are relative to: Bernhardt 6K-403
Coordinate System is US State Plane 1983, Colorado Northern Zone
Grid Convergence at Surface is: 0.44°



Coordinates are relative to: Bernhardt 6K-403
Coordinate System is US State Plane 1983, Colorado Northern Zone
Grid Convergence at Surface is: 0.44°

