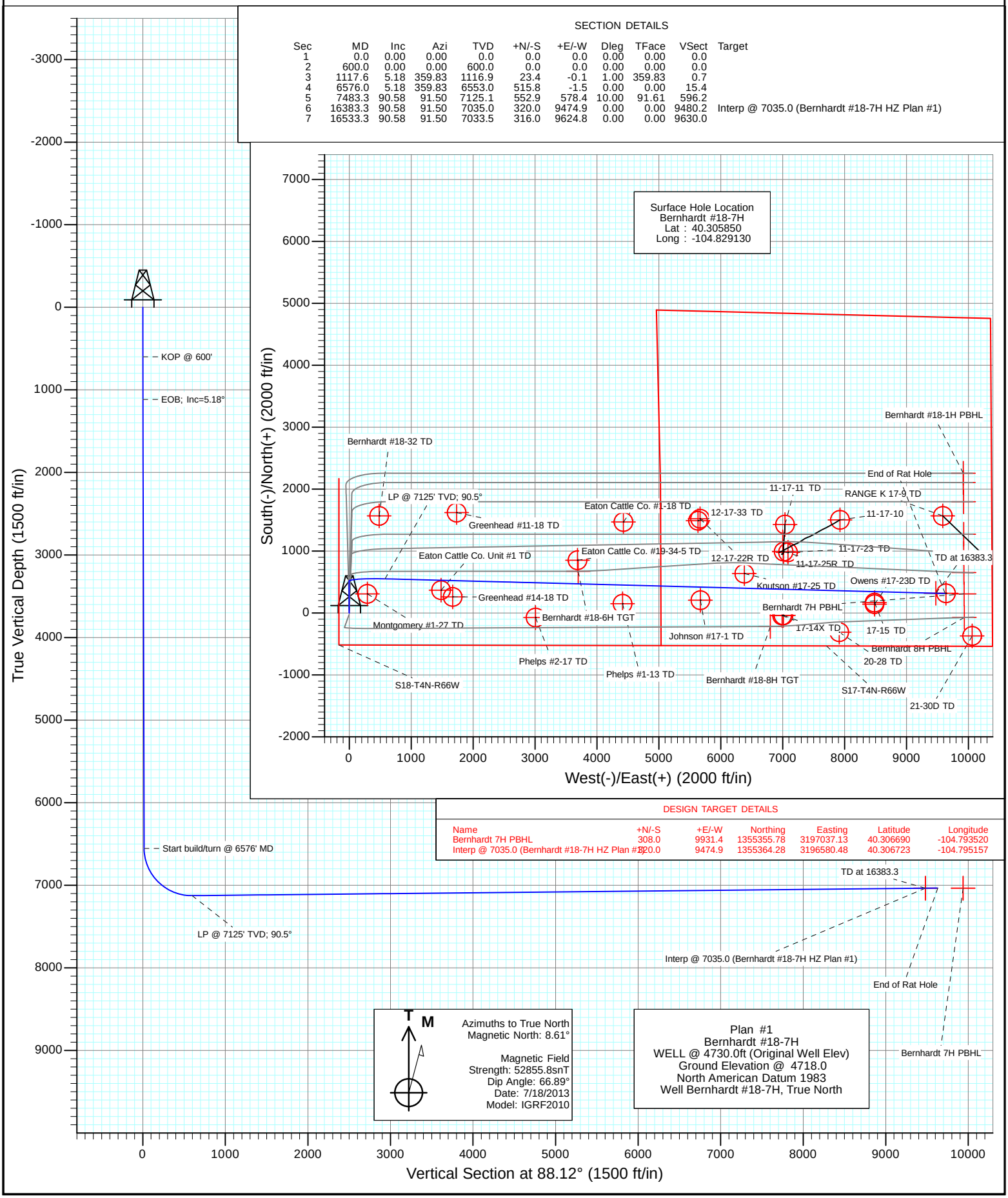
K.P. KAUFFMAN COMPANY, INC.

Project: Wattenberg
Site: S18-T4N-R66W (Bernhardt)
Well: Bernhardt #18-7H
Wellbore: HZ
Design: Plan #1

CATHEDRAL

SECTION DETAILS

Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	VSect	Target
1	0.0	0.00	0.00	0.0	0.0	0.0	0.00	0.00	0.0	
2	600.0	0.00	0.00	600.0	0.0	0.0	0.00	0.00	0.0	
3	1117.6	5.18	359.83	1116.9	23.4	-0.1	1.00	359.83	0.7	
4	6576.0	5.18	359.83	6553.0	515.8	-1.5	0.00	0.00	15.4	
5	7483.3	90.58	91.50	7125.1	552.9	578.4	10.00	91.61	596.2	
6	16383.3	90.58	91.50	7035.0	320.0	9474.9	0.00	0.00	9480.2	Interp @ 7035.0 (Bernhardt #18-7H HZ Plan #1)
7	16533.3	90.58	91.50	7033.5	316.0	9624.8	0.00	0.00	9630.0	



DESIGN TARGET DETAILS

Name	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
Bernhardt 7H PBHL	308.0	9931.4	1355355.78	3197037.13	40.306690	-104.793520
Interp @ 7035.0 (Bernhardt #18-7H HZ Plan #1)	320.0	9474.9	1355364.28	3196580.48	40.306723	-104.795157

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Azimuths to True North
Magnetic North: 8.61°

Magnetic Field
Strength: 52855.8snT
Dip Angle: 66.89°
Date: 7/18/2013
Model: IGRF2010

Plan #1
Bernhardt #18-7H
WELL @ 4730.0ft (Original Well Elev)
Ground Elevation @ 4718.0
North American Datum 1983
Well Bernhardt #18-7H, True North

Planning Report

Database:	USA EDM 5000 Multi Users DB	**Local Co-ordinate Reference:**	Well Bernhardt #18-7H
Company:	K. P. Kauffman Company, Inc.	**TVD Reference:**	WELL @ 4730.0ft (Original Well Elev)
Project:	Wattenberg	**MD Reference:**	WELL @ 4730.0ft (Original Well Elev)
Site:	S18-T4N-R66W (Bernhardt)	**North Reference:**	True
Well:	Bernhardt #18-7H	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	HZ		
Design:	Plan #1		

Project Wattenberg

Map System:	US State Plane 1983	**System Datum:**	Mean Sea Level
Geo Datum:	North American Datum 1983		
Map Zone:	Colorado Northern Zone		

Site S18-T4N-R66W (Bernhardt)

Site Position:		**Northing:**	1,354,998.15 ft	**Latitude:**	40.305920
From:	Lat/Long	**Easting:**	3,187,108.12 ft	**Longitude:**	-104.829130
Position Uncertainty:	0.0 ft	**Slot Radius:**	13.200 in	**Grid Convergence:**	0.43 °

Well Bernhardt #18-7H

Well Position	**+N/-S**	0.0 ft	**Northing:**	1,354,972.63 ft	**Latitude:**	40.305850
	+E/-W	0.0 ft	**Easting:**	3,187,108.32 ft	**Longitude:**	-104.829130
Position Uncertainty		0.0 ft	**Wellhead Elevation:**	ft	**Ground Level:**	4,718.0 ft

Wellbore HZ

Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	7/18/2013	8.61	66.89	52,856

Design Plan #1

Audit Notes:

Version:		**Phase:**	PLAN	**Tie On Depth:**	0.0
Vertical Section:	**Depth From (TVD) (ft)**	**+N/-S (ft)**	**+E/-W (ft)**	**Direction (°)**	
	0.0	0.0	0.0	88.12	

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	
600.0	0.00	0.00	600.0	0.0	0.0	0.00	0.00	0.00	0.00	
1,117.6	5.18	359.83	1,116.9	23.4	-0.1	1.00	1.00	0.00	359.83	
6,576.0	5.18	359.83	6,553.0	515.8	-1.5	0.00	0.00	0.00	0.00	
7,483.3	90.58	91.50	7,125.1	552.9	578.4	10.00	9.41	10.10	91.61	
16,383.3	90.58	91.50	7,035.0	320.0	9,474.9	0.00	0.00	0.00	0.00	Interp @ 7035.0 (Berr
16,533.3	90.58	91.50	7,033.5	316.0	9,624.8	0.00	0.00	0.00	0.00	

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Project:	Wattenberg	**MD Reference:**	WELL @ 4730.0ft (Original Well Elev)
Site:	S18-T4N-R66W (Bernhardt)	**North Reference:**	True
Well:	Bernhardt #18-7H	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	HZ		
Design:	Plan #1		

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)	Comments / Formations
0.0	0.00	0.00	0.0	0.0	0.0	0.0	0.00	0.00	
100.0	0.00	0.00	100.0	0.0	0.0	0.0	0.00	0.00	
200.0	0.00	0.00	200.0	0.0	0.0	0.0	0.00	0.00	
300.0	0.00	0.00	300.0	0.0	0.0	0.0	0.00	0.00	
400.0	0.00	0.00	400.0	0.0	0.0	0.0	0.00	0.00	
500.0	0.00	0.00	500.0	0.0	0.0	0.0	0.00	0.00	
600.0	0.00	0.00	600.0	0.0	0.0	0.0	0.00	0.00	KOP @ 600'
700.0	1.00	359.83	700.0	0.9	0.0	0.0	1.00	1.00	
800.0	2.00	359.83	800.0	3.5	0.0	0.1	1.00	1.00	
900.0	3.00	359.83	899.9	7.9	0.0	0.2	1.00	1.00	
1,000.0	4.00	359.83	999.7	14.0	0.0	0.4	1.00	1.00	
1,100.0	5.00	359.83	1,099.4	21.8	-0.1	0.7	1.00	1.00	
1,117.6	5.18	359.83	1,116.9	23.4	-0.1	0.7	1.00	1.00	EOB; Inc=5.18°
1,200.0	5.18	359.83	1,199.0	30.8	-0.1	0.9	0.00	0.00	
1,300.0	5.18	359.83	1,298.6	39.8	-0.1	1.2	0.00	0.00	
1,400.0	5.18	359.83	1,398.1	48.8	-0.1	1.5	0.00	0.00	
1,500.0	5.18	359.83	1,497.7	57.9	-0.2	1.7	0.00	0.00	
1,600.0	5.18	359.83	1,597.3	66.9	-0.2	2.0	0.00	0.00	
1,700.0	5.18	359.83	1,696.9	75.9	-0.2	2.3	0.00	0.00	
1,800.0	5.18	359.83	1,796.5	84.9	-0.3	2.5	0.00	0.00	
1,900.0	5.18	359.83	1,896.1	93.9	-0.3	2.8	0.00	0.00	
2,000.0	5.18	359.83	1,995.7	103.0	-0.3	3.1	0.00	0.00	
2,100.0	5.18	359.83	2,095.3	112.0	-0.3	3.3	0.00	0.00	
2,200.0	5.18	359.83	2,194.9	121.0	-0.4	3.6	0.00	0.00	
2,300.0	5.18	359.83	2,294.5	130.0	-0.4	3.9	0.00	0.00	
2,400.0	5.18	359.83	2,394.1	139.1	-0.4	4.1	0.00	0.00	
2,500.0	5.18	359.83	2,493.7	148.1	-0.4	4.4	0.00	0.00	
2,600.0	5.18	359.83	2,593.3	157.1	-0.5	4.7	0.00	0.00	
2,700.0	5.18	359.83	2,692.8	166.1	-0.5	5.0	0.00	0.00	
2,800.0	5.18	359.83	2,792.4	175.1	-0.5	5.2	0.00	0.00	
2,900.0	5.18	359.83	2,892.0	184.2	-0.6	5.5	0.00	0.00	
3,000.0	5.18	359.83	2,991.6	193.2	-0.6	5.8	0.00	0.00	
3,100.0	5.18	359.83	3,091.2	202.2	-0.6	6.0	0.00	0.00	
3,200.0	5.18	359.83	3,190.8	211.2	-0.6	6.3	0.00	0.00	
3,300.0	5.18	359.83	3,290.4	220.2	-0.7	6.6	0.00	0.00	
3,400.0	5.18	359.83	3,390.0	229.3	-0.7	6.8	0.00	0.00	
3,500.0	5.18	359.83	3,489.6	238.3	-0.7	7.1	0.00	0.00	
3,600.0	5.18	359.83	3,589.2	247.3	-0.7	7.4	0.00	0.00	
3,700.0	5.18	359.83	3,688.8	256.3	-0.8	7.6	0.00	0.00	
3,800.0	5.18	359.83	3,788.4	265.3	-0.8	7.9	0.00	0.00	
3,900.0	5.18	359.83	3,888.0	274.4	-0.8	8.2	0.00	0.00	
4,000.0	5.18	359.83	3,987.5	283.4	-0.8	8.5	0.00	0.00	
4,100.0	5.18	359.83	4,087.1	292.4	-0.9	8.7	0.00	0.00	
4,200.0	5.18	359.83	4,186.7	301.4	-0.9	9.0	0.00	0.00	
4,300.0	5.18	359.83	4,286.3	310.5	-0.9	9.3	0.00	0.00	
4,400.0	5.18	359.83	4,385.9	319.5	-1.0	9.5	0.00	0.00	
4,500.0	5.18	359.83	4,485.5	328.5	-1.0	9.8	0.00	0.00	
4,600.0	5.18	359.83	4,585.1	337.5	-1.0	10.1	0.00	0.00	
4,700.0	5.18	359.83	4,684.7	346.5	-1.0	10.3	0.00	0.00	
4,800.0	5.18	359.83	4,784.3	355.6	-1.1	10.6	0.00	0.00	
4,900.0	5.18	359.83	4,883.9	364.6	-1.1	10.9	0.00	0.00	
5,000.0	5.18	359.83	4,983.5	373.6	-1.1	11.1	0.00	0.00	

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Project:	Wattenberg	**MD Reference:**	WELL @ 4730.0ft (Original Well Elev)
Site:	S18-T4N-R66W (Bernhardt)	**North Reference:**	True
Well:	Bernhardt #18-7H	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	HZ		
Design:	Plan #1		

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)	Comments / Formations
5,100.0	5.18	359.83	5,083.1	382.6	-1.1	11.4	0.00	0.00	
5,200.0	5.18	359.83	5,182.7	391.6	-1.2	11.7	0.00	0.00	
5,300.0	5.18	359.83	5,282.2	400.7	-1.2	11.9	0.00	0.00	
5,400.0	5.18	359.83	5,381.8	409.7	-1.2	12.2	0.00	0.00	
5,500.0	5.18	359.83	5,481.4	418.7	-1.3	12.5	0.00	0.00	
5,600.0	5.18	359.83	5,581.0	427.7	-1.3	12.8	0.00	0.00	
5,700.0	5.18	359.83	5,680.6	436.7	-1.3	13.0	0.00	0.00	
5,800.0	5.18	359.83	5,780.2	445.8	-1.3	13.3	0.00	0.00	
5,900.0	5.18	359.83	5,879.8	454.8	-1.4	13.6	0.00	0.00	
6,000.0	5.18	359.83	5,979.4	463.8	-1.4	13.8	0.00	0.00	
6,100.0	5.18	359.83	6,079.0	472.8	-1.4	14.1	0.00	0.00	
6,200.0	5.18	359.83	6,178.6	481.9	-1.4	14.4	0.00	0.00	
6,300.0	5.18	359.83	6,278.2	490.9	-1.5	14.6	0.00	0.00	
6,400.0	5.18	359.83	6,377.8	499.9	-1.5	14.9	0.00	0.00	
6,500.0	5.18	359.83	6,477.4	508.9	-1.5	15.2	0.00	0.00	
6,576.0	5.18	359.83	6,553.0	515.8	-1.5	15.4	0.00	0.00	Start build/turn @ 6576' MD
6,600.0	5.64	25.02	6,576.9	517.9	-1.0	15.9	10.00	1.94	
6,700.0	13.29	68.90	6,675.6	526.5	11.8	29.1	10.00	7.64	
6,800.0	22.82	79.02	6,770.6	534.4	41.6	59.1	10.00	9.53	
6,900.0	32.62	83.31	6,859.0	541.2	87.5	105.3	10.00	9.80	
7,000.0	42.51	85.78	6,938.2	546.9	148.2	166.0	10.00	9.89	
7,100.0	52.43	87.45	7,005.7	551.1	221.6	239.6	10.00	9.92	
7,200.0	62.38	88.73	7,059.5	553.9	305.7	323.7	10.00	9.94	
7,300.0	72.33	89.79	7,098.0	555.0	397.9	415.9	10.00	9.95	
7,400.0	82.29	90.74	7,119.9	554.6	495.3	513.3	10.00	9.96	
7,483.3	90.58	91.50	7,125.1	552.9	578.4	596.2	10.00	9.96	LP @ 7125' TVD; 90.5°
7,500.0	90.58	91.50	7,124.9	552.5	595.1	612.9	0.00	0.00	
7,600.0	90.58	91.50	7,123.9	549.9	695.0	712.7	0.00	0.00	
7,700.0	90.58	91.50	7,122.9	547.3	795.0	812.5	0.00	0.00	
7,800.0	90.58	91.50	7,121.9	544.6	894.9	912.3	0.00	0.00	
7,900.0	90.58	91.50	7,120.9	542.0	994.9	1,012.2	0.00	0.00	
8,000.0	90.58	91.50	7,119.9	539.4	1,094.9	1,112.0	0.00	0.00	
8,100.0	90.58	91.50	7,118.8	536.8	1,194.8	1,211.8	0.00	0.00	
8,200.0	90.58	91.50	7,117.8	534.2	1,294.8	1,311.6	0.00	0.00	
8,300.0	90.58	91.50	7,116.8	531.6	1,394.7	1,411.4	0.00	0.00	
8,400.0	90.58	91.50	7,115.8	528.9	1,494.7	1,511.3	0.00	0.00	
8,500.0	90.58	91.50	7,114.8	526.3	1,594.7	1,611.1	0.00	0.00	
8,600.0	90.58	91.50	7,113.8	523.7	1,694.6	1,710.9	0.00	0.00	
8,700.0	90.58	91.50	7,112.8	521.1	1,794.6	1,810.7	0.00	0.00	
8,800.0	90.58	91.50	7,111.8	518.5	1,894.6	1,910.5	0.00	0.00	
8,900.0	90.58	91.50	7,110.8	515.9	1,994.5	2,010.4	0.00	0.00	
9,000.0	90.58	91.50	7,109.7	513.2	2,094.5	2,110.2	0.00	0.00	
9,100.0	90.58	91.50	7,108.7	510.6	2,194.4	2,210.0	0.00	0.00	
9,200.0	90.58	91.50	7,107.7	508.0	2,294.4	2,309.8	0.00	0.00	
9,300.0	90.58	91.50	7,106.7	505.4	2,394.4	2,409.7	0.00	0.00	
9,400.0	90.58	91.50	7,105.7	502.8	2,494.3	2,509.5	0.00	0.00	
9,500.0	90.58	91.50	7,104.7	500.1	2,594.3	2,609.3	0.00	0.00	
9,600.0	90.58	91.50	7,103.7	497.5	2,694.2	2,709.1	0.00	0.00	
9,700.0	90.58	91.50	7,102.7	494.9	2,794.2	2,808.9	0.00	0.00	
9,800.0	90.58	91.50	7,101.6	492.3	2,894.2	2,908.8	0.00	0.00	
9,900.0	90.58	91.50	7,100.6	489.7	2,994.1	3,008.6	0.00	0.00	
10,000.0	90.58	91.50	7,099.6	487.1	3,094.1	3,108.4	0.00	0.00	

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Well:	Bernhardt #18-7H	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	HZ		
Design:	Plan #1		

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)	Comments / Formations
10,100.0	90.58	91.50	7,098.6	484.4	3,194.0	3,208.2	0.00	0.00	
10,200.0	90.58	91.50	7,097.6	481.8	3,294.0	3,308.0	0.00	0.00	
10,300.0	90.58	91.50	7,096.6	479.2	3,394.0	3,407.9	0.00	0.00	
10,400.0	90.58	91.50	7,095.6	476.6	3,493.9	3,507.7	0.00	0.00	
10,500.0	90.58	91.50	7,094.6	474.0	3,593.9	3,607.5	0.00	0.00	
10,600.0	90.58	91.50	7,093.5	471.4	3,693.8	3,707.3	0.00	0.00	
10,700.0	90.58	91.50	7,092.5	468.7	3,793.8	3,807.1	0.00	0.00	
10,800.0	90.58	91.50	7,091.5	466.1	3,893.8	3,907.0	0.00	0.00	
10,900.0	90.58	91.50	7,090.5	463.5	3,993.7	4,006.8	0.00	0.00	
11,000.0	90.58	91.50	7,089.5	460.9	4,093.7	4,106.6	0.00	0.00	
11,100.0	90.58	91.50	7,088.5	458.3	4,193.6	4,206.4	0.00	0.00	
11,200.0	90.58	91.50	7,087.5	455.6	4,293.6	4,306.2	0.00	0.00	
11,300.0	90.58	91.50	7,086.5	453.0	4,393.6	4,406.1	0.00	0.00	
11,400.0	90.58	91.50	7,085.4	450.4	4,493.5	4,505.9	0.00	0.00	
11,500.0	90.58	91.50	7,084.4	447.8	4,593.5	4,605.7	0.00	0.00	
11,600.0	90.58	91.50	7,083.4	445.2	4,693.4	4,705.5	0.00	0.00	
11,700.0	90.58	91.50	7,082.4	442.6	4,793.4	4,805.4	0.00	0.00	
11,800.0	90.58	91.50	7,081.4	439.9	4,893.4	4,905.2	0.00	0.00	
11,900.0	90.58	91.50	7,080.4	437.3	4,993.3	5,005.0	0.00	0.00	
12,000.0	90.58	91.50	7,079.4	434.7	5,093.3	5,104.8	0.00	0.00	
12,100.0	90.58	91.50	7,078.4	432.1	5,193.3	5,204.6	0.00	0.00	
12,200.0	90.58	91.50	7,077.3	429.5	5,293.2	5,304.5	0.00	0.00	
12,300.0	90.58	91.50	7,076.3	426.9	5,393.2	5,404.3	0.00	0.00	
12,400.0	90.58	91.50	7,075.3	424.2	5,493.1	5,504.1	0.00	0.00	
12,500.0	90.58	91.50	7,074.3	421.6	5,593.1	5,603.9	0.00	0.00	
12,600.0	90.58	91.50	7,073.3	419.0	5,693.1	5,703.7	0.00	0.00	
12,700.0	90.58	91.50	7,072.3	416.4	5,793.0	5,803.6	0.00	0.00	
12,800.0	90.58	91.50	7,071.3	413.8	5,893.0	5,903.4	0.00	0.00	
12,900.0	90.58	91.50	7,070.3	411.1	5,992.9	6,003.2	0.00	0.00	
13,000.0	90.58	91.50	7,069.2	408.5	6,092.9	6,103.0	0.00	0.00	
13,100.0	90.58	91.50	7,068.2	405.9	6,192.9	6,202.8	0.00	0.00	
13,200.0	90.58	91.50	7,067.2	403.3	6,292.8	6,302.7	0.00	0.00	
13,300.0	90.58	91.50	7,066.2	400.7	6,392.8	6,402.5	0.00	0.00	
13,400.0	90.58	91.50	7,065.2	398.1	6,492.7	6,502.3	0.00	0.00	
13,500.0	90.58	91.50	7,064.2	395.4	6,592.7	6,602.1	0.00	0.00	
13,600.0	90.58	91.50	7,063.2	392.8	6,692.7	6,701.9	0.00	0.00	
13,700.0	90.58	91.50	7,062.2	390.2	6,792.6	6,801.8	0.00	0.00	
13,800.0	90.58	91.50	7,061.1	387.6	6,892.6	6,901.6	0.00	0.00	
13,900.0	90.58	91.50	7,060.1	385.0	6,992.5	7,001.4	0.00	0.00	
14,000.0	90.58	91.50	7,059.1	382.4	7,092.5	7,101.2	0.00	0.00	
14,100.0	90.58	91.50	7,058.1	379.7	7,192.5	7,201.1	0.00	0.00	
14,200.0	90.58	91.50	7,057.1	377.1	7,292.4	7,300.9	0.00	0.00	
14,300.0	90.58	91.50	7,056.1	374.5	7,392.4	7,400.7	0.00	0.00	
14,400.0	90.58	91.50	7,055.1	371.9	7,492.3	7,500.5	0.00	0.00	
14,500.0	90.58	91.50	7,054.1	369.3	7,592.3	7,600.3	0.00	0.00	
14,600.0	90.58	91.50	7,053.1	366.6	7,692.3	7,700.2	0.00	0.00	
14,700.0	90.58	91.50	7,052.0	364.0	7,792.2	7,800.0	0.00	0.00	
14,800.0	90.58	91.50	7,051.0	361.4	7,892.2	7,899.8	0.00	0.00	
14,900.0	90.58	91.50	7,050.0	358.8	7,992.1	7,999.6	0.00	0.00	
15,000.0	90.58	91.50	7,049.0	356.2	8,092.1	8,099.4	0.00	0.00	
15,100.0	90.58	91.50	7,048.0	353.6	8,192.1	8,199.3	0.00	0.00	
15,200.0	90.58	91.50	7,047.0	350.9	8,292.0	8,299.1	0.00	0.00	

Database:	USA EDM 5000 Multi Users DB	**Local Co-ordinate Reference:**	Well Bernhardt #18-7H
Company:	K. P. Kauffman Company, Inc.	**TVD Reference:**	WELL @ 4730.0ft (Original Well Elev)
Project:	Wattenberg	**MD Reference:**	WELL @ 4730.0ft (Original Well Elev)
Site:	S18-T4N-R66W (Bernhardt)	**North Reference:**	True
Well:	Bernhardt #18-7H	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	HZ		
Design:	Plan #1		

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)	Comments / Formations
15,300.0	90.58	91.50	7,046.0	348.3	8,392.0	8,398.9	0.00	0.00	
15,400.0	90.58	91.50	7,045.0	345.7	8,492.0	8,498.7	0.00	0.00	
15,500.0	90.58	91.50	7,043.9	343.1	8,591.9	8,598.5	0.00	0.00	
15,600.0	90.58	91.50	7,042.9	340.5	8,691.9	8,698.4	0.00	0.00	
15,700.0	90.58	91.50	7,041.9	337.9	8,791.8	8,798.2	0.00	0.00	
15,800.0	90.58	91.50	7,040.9	335.2	8,891.8	8,898.0	0.00	0.00	
15,900.0	90.58	91.50	7,039.9	332.6	8,991.8	8,997.8	0.00	0.00	
16,000.0	90.58	91.50	7,038.9	330.0	9,091.7	9,097.6	0.00	0.00	
16,100.0	90.58	91.50	7,037.9	327.4	9,191.7	9,197.5	0.00	0.00	
16,200.0	90.58	91.50	7,036.9	324.8	9,291.6	9,297.3	0.00	0.00	
16,300.0	90.58	91.50	7,035.8	322.2	9,391.6	9,397.1	0.00	0.00	
16,383.3	90.58	91.50	7,035.0	320.0	9,474.9	9,480.2	0.00	0.00	TD at 16383.3 - Interp @ 7035.0 (Bernhardt #18
16,400.0	90.58	91.50	7,034.8	319.5	9,491.6	9,496.9	0.00	0.00	
16,500.0	90.58	91.50	7,033.8	316.9	9,591.5	9,596.8	0.00	0.00	
16,533.3	90.58	91.50	7,033.5	316.0	9,624.8	9,630.0	0.00	0.00	End of Rat Hole - Bernhardt 7H PBHL

Targets

Target Name - hit/miss target - Shape	Dip Angle (°)	Dip Dir. (°)	TVD (ft)	+N/-S (ft)	+E/-W (ft)	Northing (ft)	Easting (ft)	Latitude	Longitude
Bernhardt 7H PBHL	0.00	0.46	7,035.0	308.0	9,931.4	1,355,355.78	3,197,037.13	40.306690	-104.793520
- plan misses target center by 306.7ft at 16533.3ft MD (7033.5 TVD, 316.0 N, 9624.8 E)									
- Point									
Interp @ 7035.0 (Bernha	0.00	0.00	7,035.0	320.0	9,474.9	1,355,364.28	3,196,580.48	40.306723	-104.795157
- plan hits target center									
- Point									

Plan Annotations

Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates +N/-S (ft)	Local Coordinates +E/-W (ft)	Comment
600.0	600.0	0.0	0.0	KOP @ 600'
1,117.6	1,116.9	23.4	-0.1	EOB; Inc=5.18°
6,576.0	6,553.0	515.8	-1.5	Start build/turn @ 6576' MD
7,483.3	7,125.1	552.9	578.4	LP @ 7125' TVD; 90.5°
16,383.3	7,035.0	320.0	9,474.9	TD at 16383.3
16,533.3	7,033.5	316.0	9,624.8	End of Rat Hole

K. P. Kauffman Company, Inc.

Wattenberg
S18-T4N-R66W (Bernhardt)
Bernhardt #18-7H
HZ
Plan #1

Anticollision Report

19 July, 2013

Company:	K. P. Kauffman Company, Inc.	**Local Co-ordinate Reference:**	Well Bernhardt #18-7H
Project:	Wattenberg	**TVD Reference:**	WELL @ 4730.0ft (Original Well Elev)
Reference Site:	S18-T4N-R66W (Bernhardt)	**MD Reference:**	WELL @ 4730.0ft (Original Well Elev)
Site Error:	0.0ft	**North Reference:**	True
Reference Well:	Bernhardt #18-7H	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.0ft	**Output errors are at**	2.00 sigma
Reference Wellbore	HZ	**Database:**	USA EDM 5000 Multi Users DB
Reference Design:	Plan #1	**Offset TVD Reference:**	Offset Datum

Reference	Plan #1

Filter type:	NO GLOBAL FILTER: Using user defined selection & filtering criteria		
Interpolation Method:	MD Interval 100.0ft	**Error Model:**	ISCWSA
Depth Range:	Unlimited	**Scan Method:**	Closest Approach 3D
Results Limited by:	Maximum center-center distance of 500.0ft	**Error Surface:**	Elliptical Conic
Warning Levels Evaluated at:	2.00 **Sigma**		

Survey Tool Program **Date** 7/19/2013

From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description
0.0	16,533.3	Plan #1 (HZ)	Geolink MWD	Geolink MWD

Company:	K. P. Kauffman Company, Inc.	**Local Co-ordinate Reference:**	Well Bernhardt #18-7H
Project:	Wattenberg	**TVD Reference:**	WELL @ 4730.0ft (Original Well Elev)
Reference Site:	S18-T4N-R66W (Bernhardt)	**MD Reference:**	WELL @ 4730.0ft (Original Well Elev)
Site Error:	0.0ft	**North Reference:**	True
Reference Well:	Bernhardt #18-7H	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.0ft	**Output errors are at**	2.00 sigma
Reference Wellbore	HZ	**Database:**	USA EDM 5000 Multi Users DB
Reference Design:	Plan #1	**Offset TVD Reference:**	Offset Datum

Summary

Site Name Offset Well - Wellbore - Design	Reference Measured Depth (ft)	Offset Measured Depth (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Separation Factor	Warning
S18-T4N-R66W (Bernhardt)						
Bernhardt #18-1H - Hz - Plan #1	200.0	200.0	149.4	148.7	227.609	CC, ES
Bernhardt #18-1H - Hz - Plan #1	1,700.0	1,646.4	263.4	257.6	45.395	SF
Bernhardt #18-2H - Hz - Plan #1	300.0	300.0	123.9	122.9	123.213	CC, ES
Bernhardt #18-2H - Hz - Plan #1	1,600.0	1,563.7	200.6	195.1	36.600	SF
Bernhardt #18-3H - Hz - Plan #1	400.0	400.0	102.0	100.7	75.319	CC, ES
Bernhardt #18-3H - Hz - Plan #1	1,500.0	1,476.5	147.6	142.4	28.639	SF
Bernhardt #18-4H - Hz - Plan #1	500.0	500.0	76.5	74.8	44.915	CC, ES
Bernhardt #18-4H - Hz - Plan #1	1,400.0	1,386.7	97.3	92.5	20.188	SF
Bernhardt #18-5H - Hz - Plan #1	1,105.4	1,100.9	50.8	47.0	13.360	CC, ES
Bernhardt #18-5H - Hz - Plan #1	7,800.0	7,817.2	499.7	450.2	10.092	SF
Bernhardt #18-6H - HZ - Plan #1	1,101.8	1,099.6	25.4	21.6	6.693	CC
Bernhardt #18-6H - HZ - Plan #1	16,533.3	16,539.8	351.0	-125.4	0.737	Level 1, ES, SF
Bernhardt #18-8H - HZ - Plan #1	200.0	200.0	25.7	25.0	39.090	CC
Bernhardt #18-8H - HZ - Plan #1	16,533.3	16,603.2	397.8	-80.1	0.832	Level 1, ES, SF
BERNHARDT #8-32 (EXISTING) - EXISTING - EXISTIN						Out of range
EATON CATTLE CO. #1-18 (EXISTING) - EXISTING - E						Out of range
EATON CATTLE CO. #19-34-5 (EXISTING) - EXISTING	10,583.1	7,081.7	381.1	277.1	3.666	CC
EATON CATTLE CO. #19-34-5 (EXISTING) - EXISTING	10,600.0	7,081.5	381.4	277.1	3.655	ES, SF
EATON CATTLE CO. UNIT #1 (EXISTING) - EXISTING -	8,392.6	7,103.9	159.4	108.5	3.129	CC
EATON CATTLE CO. UNIT #1 (EXISTING) - EXISTING -	8,400.0	7,103.8	159.6	108.5	3.122	ES, SF
FR-LORENZ #11-17-11 (EXISTING) - EXISTING - EXIST						Out of range
FRONT RANGE #11-17-10 (EXISTING) - EXISTING - EX						Out of range
FRONT RANGE #11-17-23 (EXISTING) - EXISTING - EX						Out of range
FRONT RANGE #11-17-25R (EXISTING) - EXISTING - E						Out of range
FRONT RANGE #12-17-22R - EXISTING - EXISTING						Out of range
FRONT RANGE #12-17-33 (EXISTING) - EXISTING - EX						Out of range
GREENHEAD #11-18 (EXISTING) - EXISTING - EXISTIN						Out of range
GREENHEAD #14-18 (EXISTING) - EXISTING - EXISTI	8,583.1	7,102.0	264.1	208.6	4.764	CC, ES
GREENHEAD #14-18 (EXISTING) - EXISTING - EXISTI	8,600.0	7,101.8	264.6	208.8	4.740	SF
JOHNSON #17-1 (EXISTING) - EXISTING - EXISTING	12,584.3	7,061.5	211.9	58.8	1.384	Level 3, CC, ES, SF
KNUTSON #17-25 (EXISTING) - EXISTING - EXISTING	13,281.5	7,054.4	235.1	64.8	1.380	Level 3, CC, ES, SF
MONTGOMERY#1-27 (EXISTING) - EXISTING - EXISTI	7,176.9	7,036.4	243.8	217.4	9.229	CC, ES
MONTGOMERY#1-27 (EXISTING) - EXISTING - EXISTI	7,200.0	7,047.5	244.6	218.0	9.198	SF
OWENS K #17-15 (EXISTING) - EXISTING - EXISTING	15,398.1	7,033.0	177.5	-45.0	0.798	Level 1, CC
OWENS K #17-15 (EXISTING) - EXISTING - EXISTING	15,400.0	7,033.0	177.5	-45.0	0.798	Level 1, ES, SF
OWENS K #17-23D (EXISTING) - EXISTING - EXISTING	15,398.2	7,033.0	202.7	-19.8	0.911	Level 1, CC
OWENS K #17-23D (EXISTING) - EXISTING - EXISTING	15,400.0	7,033.0	202.7	-19.9	0.911	Level 1, ES, SF
OWENS K #20-28 (EXISTING) - EXISTING - EXISTING						Out of range
PHELPS #1-13 (EXISTING) - EXISTING - EXISTING	11,329.0	7,074.2	301.9	179.7	2.470	CC, ES, SF
PHELPS #2-17 (EXISTING) - EXISTING - EXISTING						Out of range
RANGE K #17-9 (EXISTING) - EXISTING - EXISTING						Out of range
RICHARDSON #17-14 (EXISTING) - EXISTING - EXIST	13,910.0	7,048.0	425.8	240.0	2.292	CC, ES, SF
RICHARDSON K #17-14X (EXISTING) - EXISTING - EX	13,932.2	7,047.8	421.9	235.5	2.264	CC, ES, SF
UPRC #17-1616 (EXISTING) - EXISTING - EXISTING	16,533.3	7,021.5	14.1	-236.2	0.056	Level 1, CC, ES, SF

Company:	K. P. Kauffman Company, Inc.	**Local Co-ordinate Reference:**	Well Bernhardt #18-7H
Project:	Wattenberg	**TVD Reference:**	WELL @ 4730.0ft (Original Well Elev)
Reference Site:	S18-T4N-R66W (Bernhardt)	**MD Reference:**	WELL @ 4730.0ft (Original Well Elev)
Site Error:	0.0ft	**North Reference:**	True
Reference Well:	Bernhardt #18-7H	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.0ft	**Output errors are at**	2.00 sigma
Reference Wellbore	HZ	**Database:**	USA EDM 5000 Multi Users DB
Reference Design:	Plan #1	**Offset TVD Reference:**	Offset Datum

Offset Design S18-T4N-R66W (Bernhardt) - Bernhardt #18-1H - Hz - Plan #1

Offset Site Error: 0.0 ft

Survey Program: 0-Geolink MWD

Offset Well Error: 0.0 ft

Reference Measured Depth (ft)	Reference Vertical Depth (ft)	Offset Measured Depth (ft)	Offset Vertical Depth (ft)	Semi Major Axis Reference (ft)	Semi Major Axis Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Total Uncertainty Axis	Separation Factor	Warning
0.0	0.0	0.0	0.0	0.0	0.0	0.00	149.4	0.0	149.4				
100.0	100.0	100.0	100.0	0.2	0.2	0.00	149.4	0.0	149.4	149.1	0.31	486.256	
200.0	200.0	200.0	200.0	0.3	0.3	0.00	149.4	0.0	149.4	148.7	0.66	227.609	CC, ES
300.0	300.0	297.5	297.4	0.5	0.5	-0.01	150.2	0.0	150.2	149.2	1.00	150.088	
400.0	400.0	394.8	394.8	0.7	0.7	-0.03	152.7	-0.1	152.8	151.4	1.35	113.548	
500.0	500.0	492.1	492.0	0.9	0.9	-0.08	156.8	-0.2	157.0	155.3	1.69	92.923	
600.0	600.0	589.2	588.9	1.0	1.0	-0.13	162.6	-0.4	163.0	160.9	2.03	80.126	
700.0	700.0	686.2	685.6	1.2	1.3	-0.02	170.0	-0.6	169.7	167.3	2.38	71.381	
800.0	800.0	783.0	782.0	1.4	1.5	-0.10	179.0	-0.8	176.4	173.7	2.72	64.836	
900.0	899.9	879.8	878.2	1.6	1.7	-0.18	189.6	-1.1	183.1	180.0	3.06	59.748	
1,000.0	999.7	976.4	974.1	1.8	2.0	-0.26	201.9	-1.5	189.7	186.3	3.41	55.675	
1,100.0	1,099.4	1,073.0	1,069.6	2.0	2.3	-0.35	215.7	-1.9	196.2	192.4	3.75	52.338	
1,200.0	1,199.0	1,169.4	1,164.7	2.2	2.6	-0.45	231.1	-2.3	203.3	199.2	4.09	49.672	
1,300.0	1,298.6	1,265.5	1,259.4	2.4	2.9	-0.55	248.1	-2.8	212.0	207.5	4.44	47.790	
1,400.0	1,398.1	1,361.3	1,353.4	2.6	3.2	-0.64	266.6	-3.3	222.3	217.6	4.78	46.534	
1,500.0	1,497.7	1,456.8	1,446.7	2.8	3.6	-0.74	286.6	-3.8	234.4	229.3	5.12	45.775	
1,600.0	1,597.3	1,551.9	1,539.3	3.0	4.0	-0.82	308.0	-4.4	248.1	242.6	5.46	45.420	
1,700.0	1,696.9	1,646.4	1,631.1	3.3	4.4	-0.90	330.9	-5.1	263.4	257.6	5.80	45.395	SF
1,800.0	1,796.5	1,740.5	1,722.0	3.5	4.9	-0.98	355.1	-5.8	280.4	274.2	6.14	45.644	
1,900.0	1,896.1	1,834.1	1,812.0	3.7	5.3	-1.04	380.7	-6.5	298.9	292.4	6.48	46.124	
2,000.0	1,995.7	1,927.0	1,901.0	3.9	5.8	-1.10	407.6	-7.2	319.1	312.3	6.82	46.798	
2,100.0	2,095.3	2,019.3	1,988.9	4.2	6.3	-1.16	435.7	-8.0	340.8	333.7	7.15	47.637	
2,200.0	2,194.9	2,110.9	2,075.7	4.4	6.9	-1.21	465.0	-8.8	364.1	356.6	7.49	48.617	
2,300.0	2,294.5	2,207.7	2,167.2	4.6	7.4	-1.25	496.7	-9.7	388.3	380.4	7.83	49.564	
2,400.0	2,394.1	2,304.8	2,258.8	4.9	8.0	-1.29	528.5	-10.6	412.4	404.2	8.18	50.430	
2,500.0	2,493.7	2,401.8	2,350.5	5.1	8.5	-1.33	560.3	-11.5	436.5	428.0	8.52	51.226	
2,600.0	2,593.3	2,498.9	2,442.2	5.3	9.1	-1.36	592.1	-12.4	460.7	451.8	8.87	51.961	
2,700.0	2,692.8	2,595.9	2,533.9	5.6	9.7	-1.39	623.9	-13.3	484.8	475.6	9.21	52.642	

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

Company:	K. P. Kauffman Company, Inc.	**Local Co-ordinate Reference:**	Well Bernhardt #18-7H
Project:	Wattenberg	**TVD Reference:**	WELL @ 4730.0ft (Original Well Elev)
Reference Site:	S18-T4N-R66W (Bernhardt)	**MD Reference:**	WELL @ 4730.0ft (Original Well Elev)
Site Error:	0.0ft	**North Reference:**	True
Reference Well:	Bernhardt #18-7H	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.0ft	**Output errors are at**	2.00 sigma
Reference Wellbore	HZ	**Database:**	USA EDM 5000 Multi Users DB
Reference Design:	Plan #1	**Offset TVD Reference:**	Offset Datum

Offset Design S18-T4N-R66W (Bernhardt) - Bernhardt #18-2H - Hz - Plan #1

Offset Site Error: 0.0 ft

Survey Program: 0-Geolink MWD

Offset Well Error: 0.0 ft

Reference Measured Depth (ft)	Reference Vertical Depth (ft)	Offset Measured Depth (ft)	Offset Vertical Depth (ft)	Semi Major Axis Reference (ft)	Semi Major Axis Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Total Uncertainty Axis	Separation Factor	Warning
0.0	0.0	0.0	0.0	0.0	0.0	0.00	123.9	0.0	123.9				
100.0	100.0	100.0	100.0	0.2	0.2	0.00	123.9	0.0	123.9	123.6	0.31	403.242	
200.0	200.0	200.0	200.0	0.3	0.3	0.00	123.9	0.0	123.9	123.2	0.66	188.751	
300.0	300.0	300.0	300.0	0.5	0.5	0.00	123.9	0.0	123.9	122.9	1.01	123.213	CC, ES
400.0	400.0	397.9	397.9	0.7	0.7	0.01	124.7	0.0	124.7	123.4	1.35	92.340	
500.0	500.0	495.7	495.7	0.9	0.8	0.03	127.2	0.1	127.3	125.6	1.70	75.051	
600.0	600.0	593.4	593.3	1.0	1.0	0.08	131.4	0.2	131.5	129.5	2.04	64.453	
700.0	700.0	691.0	690.7	1.2	1.2	0.30	137.2	0.3	136.6	134.3	2.39	57.273	
800.0	800.0	788.5	787.9	1.4	1.4	0.37	144.7	0.5	141.7	139.0	2.73	51.899	
900.0	899.9	885.9	884.9	1.6	1.6	0.45	153.8	0.7	146.7	143.6	3.07	47.721	
1,000.0	999.7	983.3	981.6	1.8	1.9	0.54	164.5	0.9	151.7	148.3	3.42	44.377	
1,100.0	1,099.4	1,080.5	1,078.1	2.0	2.1	0.64	176.9	1.2	156.6	152.8	3.76	41.637	
1,200.0	1,199.0	1,177.7	1,174.2	2.2	2.4	0.75	190.9	1.6	162.0	157.9	4.11	39.472	
1,300.0	1,298.6	1,274.6	1,269.9	2.4	2.7	0.86	206.5	1.9	169.2	164.7	4.45	38.015	
1,400.0	1,398.1	1,371.3	1,365.1	2.6	3.0	0.97	223.7	2.3	178.0	173.2	4.79	37.122	
1,500.0	1,497.7	1,467.7	1,459.6	2.8	3.4	1.06	242.4	2.7	188.5	183.3	5.14	36.679	
1,600.0	1,597.3	1,563.7	1,553.4	3.0	3.8	1.15	262.6	3.2	200.6	195.1	5.48	36.600	SF
1,700.0	1,696.9	1,659.2	1,646.5	3.3	4.2	1.23	284.3	3.7	214.4	208.6	5.82	36.820	
1,800.0	1,796.5	1,754.4	1,738.8	3.5	4.6	1.31	307.4	4.3	229.9	223.7	6.17	37.288	
1,900.0	1,896.1	1,848.9	1,830.1	3.7	5.0	1.37	331.9	4.8	247.0	240.5	6.51	37.963	
2,000.0	1,995.7	1,943.0	1,920.5	3.9	5.5	1.43	357.8	5.4	265.7	258.9	6.85	38.814	
2,100.0	2,095.3	2,036.4	2,009.9	4.2	6.0	1.48	384.9	6.1	286.0	278.8	7.18	39.813	
2,200.0	2,194.9	2,129.2	2,098.2	4.4	6.5	1.52	413.3	6.7	307.9	300.4	7.52	40.941	
2,300.0	2,294.5	2,224.7	2,188.8	4.6	7.0	1.56	443.7	7.4	331.1	323.2	7.86	42.104	
2,400.0	2,394.1	2,322.0	2,281.0	4.9	7.6	1.59	474.7	8.1	354.3	346.1	8.21	43.166	
2,500.0	2,493.7	2,419.2	2,373.2	5.1	8.1	1.62	505.8	8.9	377.5	369.0	8.55	44.143	
2,600.0	2,593.3	2,516.5	2,465.4	5.3	8.7	1.64	536.8	9.6	400.8	391.9	8.90	45.045	
2,700.0	2,692.8	2,613.8	2,557.5	5.6	9.2	1.67	567.8	10.3	424.0	414.8	9.24	45.880	
2,800.0	2,792.4	2,711.0	2,649.7	5.8	9.8	1.69	598.8	11.0	447.3	437.7	9.59	46.655	
2,900.0	2,892.0	2,808.3	2,741.9	6.0	10.3	1.71	629.9	11.7	470.5	460.6	9.93	47.377	
3,000.0	2,991.6	2,905.5	2,834.1	6.3	10.9	1.72	660.9	12.5	493.7	483.5	10.28	48.050	

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

Company:	K. P. Kauffman Company, Inc.	**Local Co-ordinate Reference:**	Well Bernhardt #18-7H
Project:	Wattenberg	**TVD Reference:**	WELL @ 4730.0ft (Original Well Elev)
Reference Site:	S18-T4N-R66W (Bernhardt)	**MD Reference:**	WELL @ 4730.0ft (Original Well Elev)
Site Error:	0.0ft	**North Reference:**	True
Reference Well:	Bernhardt #18-7H	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.0ft	**Output errors are at**	2.00 sigma
Reference Wellbore	HZ	**Database:**	USA EDM 5000 Multi Users DB
Reference Design:	Plan #1	**Offset TVD Reference:**	Offset Datum

Offset Design S18-T4N-R66W (Bernhardt) - Bernhardt #18-3H - Hz - Plan #1

Offset Site Error: 0.0 ft

Survey Program: 0-Geolink MWD

Offset Well Error: 0.0 ft

Reference Measured Depth (ft)	Reference Vertical Depth (ft)	Offset Measured Depth (ft)	Offset Vertical Depth (ft)	Semi Major Axis Reference (ft)	Semi Major Axis Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Total Uncertainty Axis	Separation Factor	Warning
0.0	0.0	0.0	0.0	0.0	0.0	0.00	102.0	0.0	102.0				
100.0	100.0	100.0	100.0	0.2	0.2	0.00	102.0	0.0	102.0	101.7	0.31	332.086	
200.0	200.0	200.0	200.0	0.3	0.3	0.00	102.0	0.0	102.0	101.4	0.66	155.445	
300.0	300.0	300.0	300.0	0.5	0.5	0.00	102.0	0.0	102.0	101.0	1.01	101.471	
400.0	400.0	400.0	400.0	0.7	0.7	0.00	102.0	0.0	102.0	100.7	1.35	75.319	CC, ES
500.0	500.0	498.2	498.2	0.9	0.8	0.01	102.9	0.0	102.9	101.2	1.70	60.496	
600.0	600.0	596.4	596.4	1.0	1.0	0.05	105.4	0.1	105.4	103.4	2.05	51.526	
700.0	700.0	694.5	694.4	1.2	1.2	0.29	109.6	0.2	108.8	106.5	2.39	45.505	
800.0	800.0	792.6	792.3	1.4	1.4	0.38	115.4	0.4	112.2	109.5	2.74	40.999	
900.0	899.9	890.6	890.0	1.6	1.6	0.48	123.0	0.6	115.6	112.5	3.08	37.497	
1,000.0	999.7	988.5	987.5	1.8	1.8	0.61	132.2	0.9	118.9	115.4	3.43	34.693	
1,100.0	1,099.4	1,086.4	1,084.8	2.0	2.0	0.76	143.1	1.2	122.1	118.4	3.77	32.397	
1,200.0	1,199.0	1,184.2	1,181.8	2.2	2.3	0.92	155.6	1.6	126.0	121.8	4.12	30.605	
1,300.0	1,298.6	1,281.9	1,278.4	2.4	2.6	1.08	169.7	2.0	131.5	127.0	4.46	29.465	
1,400.0	1,398.1	1,379.3	1,374.6	2.6	2.9	1.23	185.5	2.4	138.7	133.9	4.81	28.845	
1,500.0	1,497.7	1,476.5	1,470.2	2.8	3.2	1.38	202.8	2.9	147.6	142.4	5.15	28.639	SF
1,600.0	1,597.3	1,573.4	1,565.2	3.0	3.5	1.51	221.7	3.5	158.2	152.7	5.50	28.768	
1,700.0	1,696.9	1,669.8	1,659.5	3.3	3.9	1.62	242.1	4.1	170.4	164.6	5.84	29.173	
1,800.0	1,796.5	1,765.9	1,753.0	3.5	4.3	1.72	264.0	4.7	184.3	178.2	6.18	29.805	
1,900.0	1,896.1	1,861.5	1,845.7	3.7	4.7	1.81	287.3	5.4	199.9	193.4	6.53	30.628	
2,000.0	1,995.7	1,956.5	1,937.4	3.9	5.2	1.88	312.0	6.1	217.1	210.3	6.87	31.613	
2,100.0	2,095.3	2,053.2	2,030.4	4.2	5.6	1.95	338.5	6.9	235.7	228.5	7.21	32.680	
2,200.0	2,194.9	2,151.4	2,124.9	4.4	6.1	2.00	365.5	7.6	254.5	246.9	7.56	33.659	
2,300.0	2,294.5	2,249.6	2,219.3	4.6	6.6	2.05	392.5	8.4	273.2	265.3	7.91	34.553	
2,400.0	2,394.1	2,347.9	2,313.7	4.9	7.1	2.09	419.6	9.2	291.9	283.7	8.25	35.371	
2,500.0	2,493.7	2,446.1	2,408.2	5.1	7.6	2.13	446.6	10.0	310.7	302.1	8.60	36.124	
2,600.0	2,593.3	2,544.3	2,502.6	5.3	8.0	2.16	473.6	10.8	329.4	320.5	8.95	36.819	
2,700.0	2,692.8	2,642.6	2,597.0	5.6	8.5	2.19	500.6	11.6	348.2	338.9	9.29	37.462	
2,800.0	2,792.4	2,740.8	2,691.5	5.8	9.0	2.21	527.6	12.3	366.9	357.3	9.64	38.060	
2,900.0	2,892.0	2,839.0	2,785.9	6.0	9.5	2.24	554.7	13.1	385.6	375.6	9.99	38.615	
3,000.0	2,991.6	2,937.2	2,880.3	6.3	10.0	2.26	581.7	13.9	404.4	394.0	10.33	39.134	
3,100.0	3,091.2	3,035.5	2,974.8	6.5	10.5	2.28	608.7	14.7	423.1	412.4	10.68	39.619	
3,200.0	3,190.8	3,133.7	3,069.2	6.7	11.0	2.29	635.7	15.5	441.9	430.8	11.03	40.074	
3,300.0	3,290.4	3,231.9	3,163.7	6.9	11.5	2.31	662.7	16.3	460.6	449.2	11.37	40.501	
3,400.0	3,390.0	3,330.2	3,258.1	7.2	12.0	2.33	689.7	17.0	479.3	467.6	11.72	40.903	
3,500.0	3,489.6	3,428.4	3,352.5	7.4	12.5	2.34	716.8	17.8	498.1	486.0	12.06	41.282	

Company:	K. P. Kauffman Company, Inc.	**Local Co-ordinate Reference:**	Well Bernhardt #18-7H
Project:	Wattenberg	**TVD Reference:**	WELL @ 4730.0ft (Original Well Elev)
Reference Site:	S18-T4N-R66W (Bernhardt)	**MD Reference:**	WELL @ 4730.0ft (Original Well Elev)
Site Error:	0.0ft	**North Reference:**	True
Reference Well:	Bernhardt #18-7H	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.0ft	**Output errors are at**	2.00 sigma
Reference Wellbore	HZ	**Database:**	USA EDM 5000 Multi Users DB
Reference Design:	Plan #1	**Offset TVD Reference:**	Offset Datum

Offset Design S18-T4N-R66W (Bernhardt) - Bernhardt #18-4H - Hz - Plan #1

Offset Site Error: 0.0 ft

Survey Program: 0-Geolink MWD

Offset Well Error: 0.0 ft

Reference Measured Depth (ft)	Reference Vertical Depth (ft)	Offset Measured Depth (ft)	Offset Vertical Depth (ft)	Semi Major Axis Reference (ft)	Semi Major Axis Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Total Uncertainty Axis	Separation Factor	Warning
0.0	0.0	0.0	0.0	0.0	0.0	0.00	76.5	0.0	76.5				
100.0	100.0	100.0	100.0	0.2	0.2	0.00	76.5	0.0	76.5	76.2	0.31	249.071	
200.0	200.0	200.0	200.0	0.3	0.3	0.00	76.5	0.0	76.5	75.9	0.66	116.587	
300.0	300.0	300.0	300.0	0.5	0.5	0.00	76.5	0.0	76.5	75.5	1.01	76.105	
400.0	400.0	400.0	400.0	0.7	0.7	0.00	76.5	0.0	76.5	75.2	1.35	56.490	
500.0	500.0	500.0	500.0	0.9	0.9	0.00	76.5	0.0	76.5	74.8	1.70	44.915	CC, ES
600.0	600.0	598.7	598.7	1.0	1.0	0.03	77.4	0.0	77.4	75.3	2.05	37.738	
700.0	700.0	697.3	697.3	1.2	1.2	0.28	79.9	0.1	79.1	76.7	2.40	32.994	
800.0	800.0	795.9	795.8	1.4	1.4	0.42	84.1	0.3	80.8	78.0	2.74	29.444	
900.0	899.9	894.5	894.2	1.6	1.6	0.60	90.1	0.6	82.4	79.3	3.09	26.686	
1,000.0	999.7	993.1	992.5	1.8	1.8	0.83	97.7	0.9	84.1	80.6	3.43	24.479	
1,100.0	1,099.4	1,091.6	1,090.5	2.0	2.0	1.11	107.0	1.3	85.7	81.9	3.78	22.672	
1,200.0	1,199.0	1,190.1	1,188.4	2.2	2.2	1.41	118.0	1.8	87.8	83.7	4.13	21.293	
1,300.0	1,298.6	1,288.5	1,286.0	2.4	2.5	1.73	130.6	2.4	91.7	87.2	4.47	20.505	
1,400.0	1,398.1	1,386.7	1,383.1	2.6	2.7	2.02	144.9	3.0	97.3	92.5	4.82	20.188	SF
1,500.0	1,497.7	1,484.7	1,479.9	2.8	3.0	2.29	160.8	3.7	104.6	99.4	5.17	20.245	
1,600.0	1,597.3	1,582.4	1,576.0	3.0	3.4	2.53	178.4	4.5	113.6	108.1	5.51	20.606	
1,700.0	1,696.9	1,681.2	1,672.9	3.3	3.7	2.73	197.4	5.3	123.9	118.1	5.86	21.146	
1,800.0	1,796.5	1,780.7	1,770.5	3.5	4.0	2.91	216.6	6.1	134.4	128.2	6.21	21.638	
1,900.0	1,896.1	1,880.1	1,868.1	3.7	4.4	3.06	235.8	7.0	144.8	138.3	6.56	22.077	
2,000.0	1,995.7	1,979.6	1,965.6	3.9	4.8	3.18	255.1	7.8	155.3	148.4	6.91	22.473	
2,100.0	2,095.3	2,079.0	2,063.2	4.2	5.1	3.30	274.3	8.7	165.7	158.4	7.26	22.830	
2,200.0	2,194.9	2,178.5	2,160.8	4.4	5.5	3.40	293.5	9.5	176.2	168.5	7.61	23.155	
2,300.0	2,294.5	2,277.9	2,258.4	4.6	5.8	3.48	312.8	10.3	186.6	178.6	7.96	23.451	
2,400.0	2,394.1	2,377.4	2,355.9	4.9	6.2	3.56	332.0	11.2	197.0	188.7	8.31	23.722	
2,500.0	2,493.7	2,476.8	2,453.5	5.1	6.6	3.63	351.3	12.0	207.5	198.8	8.66	23.972	
2,600.0	2,593.3	2,576.3	2,551.1	5.3	6.9	3.70	370.5	12.9	217.9	208.9	9.00	24.202	
2,700.0	2,692.8	2,675.7	2,648.6	5.6	7.3	3.75	389.7	13.7	228.4	219.0	9.35	24.415	
2,800.0	2,792.4	2,775.2	2,746.2	5.8	7.7	3.81	409.0	14.5	238.8	229.1	9.70	24.613	
2,900.0	2,892.0	2,874.6	2,843.8	6.0	8.0	3.86	428.2	15.4	249.3	239.2	10.05	24.797	
3,000.0	2,991.6	2,974.1	2,941.3	6.3	8.4	3.90	447.4	16.2	259.7	249.3	10.40	24.968	
3,100.0	3,091.2	3,073.5	3,038.9	6.5	8.8	3.94	466.7	17.1	270.2	259.4	10.75	25.129	
3,200.0	3,190.8	3,173.0	3,136.5	6.7	9.2	3.98	485.9	17.9	280.6	269.5	11.10	25.279	
3,300.0	3,290.4	3,272.4	3,234.1	6.9	9.5	4.01	505.1	18.8	291.1	279.6	11.45	25.420	
3,400.0	3,390.0	3,371.9	3,331.6	7.2	9.9	4.05	524.4	19.6	301.5	289.7	11.80	25.553	
3,500.0	3,489.6	3,471.3	3,429.2	7.4	10.3	4.08	543.6	20.4	312.0	299.8	12.15	25.678	
3,600.0	3,589.2	3,570.8	3,526.8	7.6	10.7	4.11	562.9	21.3	322.4	309.9	12.50	25.796	
3,700.0	3,688.8	3,670.3	3,624.3	7.9	11.0	4.13	582.1	22.1	332.9	320.0	12.85	25.908	
3,800.0	3,788.4	3,769.7	3,721.9	8.1	11.4	4.16	601.3	23.0	343.3	330.1	13.20	26.014	
3,900.0	3,888.0	3,869.2	3,819.5	8.3	11.8	4.18	620.6	23.8	353.8	340.2	13.55	26.114	
4,000.0	3,987.5	3,968.6	3,917.1	8.6	12.2	4.21	639.8	24.6	364.2	350.3	13.90	26.209	
4,100.0	4,087.1	4,068.1	4,014.6	8.8	12.5	4.23	659.0	25.5	374.7	360.4	14.25	26.300	
4,200.0	4,186.7	4,167.5	4,112.2	9.1	12.9	4.25	678.3	26.3	385.1	370.5	14.60	26.386	
4,300.0	4,286.3	4,267.0	4,209.8	9.3	13.3	4.27	697.5	27.2	395.6	380.6	14.94	26.469	
4,400.0	4,385.9	4,366.4	4,307.3	9.5	13.7	4.28	716.8	28.0	406.0	390.7	15.29	26.547	
4,500.0	4,485.5	4,465.9	4,404.9	9.8	14.0	4.30	736.0	28.9	416.5	400.8	15.64	26.622	
4,600.0	4,585.1	4,565.3	4,502.5	10.0	14.4	4.32	755.2	29.7	426.9	410.9	15.99	26.694	
4,700.0	4,684.7	4,664.8	4,600.0	10.2	14.8	4.33	774.5	30.5	437.4	421.0	16.34	26.762	
4,800.0	4,784.3	4,764.2	4,697.6	10.5	15.2	4.35	793.7	31.4	447.8	431.1	16.69	26.828	
4,900.0	4,883.9	4,863.7	4,795.2	10.7	15.5	4.36	812.9	32.2	458.3	441.2	17.04	26.891	
5,000.0	4,983.5	4,963.1	4,892.8	10.9	15.9	4.37	832.2	33.1	468.7	451.3	17.39	26.952	
5,100.0	5,083.1	5,062.6	4,990.3	11.2	16.3	4.39	851.4	33.9	479.2	461.4	17.74	27.010	

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

Company:	K. P. Kauffman Company, Inc.	**Local Co-ordinate Reference:**	Well Bernhardt #18-7H
Project:	Wattenberg	**TVD Reference:**	WELL @ 4730.0ft (Original Well Elev)
Reference Site:	S18-T4N-R66W (Bernhardt)	**MD Reference:**	WELL @ 4730.0ft (Original Well Elev)
Site Error:	0.0ft	**North Reference:**	True
Reference Well:	Bernhardt #18-7H	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.0ft	**Output errors are at**	2.00 sigma
Reference Wellbore	HZ	**Database:**	USA EDM 5000 Multi Users DB
Reference Design:	Plan #1	**Offset TVD Reference:**	Offset Datum

Offset Design S18-T4N-R66W (Bernhardt) - Bernhardt #18-4H - Hz - Plan #1

Offset Site Error: 0.0 ft

Survey Program: 0-Geolink MWD

Offset Well Error: 0.0 ft

Reference Measured Depth (ft)	Reference Vertical Depth (ft)	Offset Measured Depth (ft)	Offset Vertical Depth (ft)	Semi Major Axis Reference (ft)	Semi Major Axis Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Total Uncertainty Axis	Separation Factor	Warning
5,200.0	5,182.7	5,162.0	5,087.9	11.4	16.7	4.40	870.6	34.7	489.6	471.5	18.09	27.066	

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

Company:	K. P. Kauffman Company, Inc.	**Local Co-ordinate Reference:**	Well Bernhardt #18-7H
Project:	Wattenberg	**TVD Reference:**	WELL @ 4730.0ft (Original Well Elev)
Reference Site:	S18-T4N-R66W (Bernhardt)	**MD Reference:**	WELL @ 4730.0ft (Original Well Elev)
Site Error:	0.0ft	**North Reference:**	True
Reference Well:	Bernhardt #18-7H	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.0ft	**Output errors are at**	2.00 sigma
Reference Wellbore	HZ	**Database:**	USA EDM 5000 Multi Users DB
Reference Design:	Plan #1	**Offset TVD Reference:**	Offset Datum

Offset Design S18-T4N-R66W (Bernhardt) - Bernhardt #18-5H - Hz - Plan #1

Offset Site Error: 0.0 ft

Survey Program: 0-Geolink MWD

Offset Well Error: 0.0 ft

Reference Measured Depth (ft)	Reference Vertical Depth (ft)	Offset Measured Depth (ft)	Offset Vertical Depth (ft)	Semi Major Axis Reference (ft)	Semi Major Axis Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Total Uncertainty Axis	Separation Factor	Warning
0.0	0.0	0.0	0.0	0.0	0.0	0.00	51.0	0.0	51.0				
100.0	100.0	100.0	100.0	0.2	0.2	0.00	51.0	0.0	51.0	50.7	0.31	166.056	
200.0	200.0	200.0	200.0	0.3	0.3	0.00	51.0	0.0	51.0	50.4	0.66	77.729	
300.0	300.0	300.0	300.0	0.5	0.5	0.00	51.0	0.0	51.0	50.0	1.01	50.739	
400.0	400.0	400.0	400.0	0.7	0.7	0.00	51.0	0.0	51.0	49.7	1.35	37.662	
500.0	500.0	500.0	500.0	0.9	0.9	0.00	51.0	0.0	51.0	49.3	1.70	29.945	
600.0	600.0	600.0	600.0	1.0	1.0	0.00	51.0	0.0	51.0	49.0	2.05	24.852	
700.0	700.0	699.1	699.1	1.2	1.2	0.20	51.9	0.0	51.0	48.6	2.40	21.252	
800.0	800.0	798.2	798.2	1.4	1.4	0.30	54.4	0.1	51.0	48.2	2.75	18.560	
900.0	899.9	897.4	897.2	1.6	1.6	0.45	58.7	0.2	50.9	47.8	3.09	16.468	
1,000.0	999.7	996.5	996.2	1.8	1.7	0.67	64.7	0.4	50.9	47.4	3.44	14.796	
1,100.0	1,099.4	1,095.6	1,095.0	2.0	1.9	0.96	72.4	0.6	50.8	47.0	3.78	13.427	
1,105.4	1,104.7	1,100.9	1,100.3	2.0	2.0	0.97	72.9	0.6	50.8	47.0	3.80	13.360	CC, ES
1,200.0	1,199.0	1,194.7	1,193.6	2.2	2.2	1.29	81.8	0.9	51.3	47.2	4.13	12.420	
1,300.0	1,298.6	1,293.8	1,292.1	2.4	2.4	1.62	92.9	1.2	53.5	49.1	4.48	11.948	
1,400.0	1,398.1	1,392.7	1,390.2	2.6	2.6	1.92	105.7	1.6	57.5	52.6	4.83	11.903	
1,500.0	1,497.7	1,491.5	1,488.0	2.8	2.9	2.18	120.2	2.0	63.1	58.0	5.18	12.197	
1,600.0	1,597.3	1,591.0	1,586.2	3.0	3.2	2.39	136.0	2.5	70.0	64.5	5.53	12.675	
1,700.0	1,696.9	1,690.8	1,684.7	3.3	3.5	2.55	151.8	3.0	77.0	71.1	5.88	13.103	
1,800.0	1,796.5	1,790.6	1,783.2	3.5	3.8	2.69	167.7	3.4	83.9	77.7	6.23	13.483	
1,900.0	1,896.1	1,890.3	1,881.6	3.7	4.1	2.81	183.6	3.9	90.9	84.3	6.58	13.823	
2,000.0	1,995.7	1,990.1	1,980.1	3.9	4.4	2.92	199.5	4.4	97.8	90.9	6.93	14.129	
2,100.0	2,095.3	2,089.8	2,078.6	4.2	4.7	3.01	215.3	4.8	104.8	97.5	7.28	14.405	
2,200.0	2,194.9	2,189.6	2,177.1	4.4	5.0	3.08	231.2	5.3	111.8	104.1	7.63	14.656	
2,300.0	2,294.5	2,289.3	2,275.6	4.6	5.3	3.15	247.1	5.8	118.7	110.7	7.98	14.885	
2,400.0	2,394.1	2,389.1	2,374.1	4.9	5.7	3.21	262.9	6.2	125.7	117.3	8.32	15.095	
2,500.0	2,493.7	2,488.9	2,472.6	5.1	6.0	3.27	278.8	6.7	132.6	123.9	8.67	15.288	
2,600.0	2,593.3	2,588.6	2,571.0	5.3	6.3	3.32	294.7	7.2	139.6	130.5	9.02	15.466	
2,700.0	2,692.8	2,688.4	2,669.5	5.6	6.6	3.36	310.5	7.6	146.5	137.1	9.37	15.630	
2,800.0	2,792.4	2,788.1	2,768.0	5.8	6.9	3.40	326.4	8.1	153.5	143.8	9.72	15.783	
2,900.0	2,892.0	2,887.9	2,866.5	6.0	7.2	3.44	342.3	8.6	160.4	150.4	10.07	15.925	
3,000.0	2,991.6	2,987.6	2,965.0	6.3	7.6	3.47	358.1	9.0	167.4	157.0	10.42	16.058	
3,100.0	3,091.2	3,087.4	3,063.5	6.5	7.9	3.50	374.0	9.5	174.3	163.6	10.77	16.182	
3,200.0	3,190.8	3,187.2	3,162.0	6.7	8.2	3.53	389.9	10.0	181.3	170.2	11.12	16.298	
3,300.0	3,290.4	3,286.9	3,260.5	6.9	8.5	3.56	405.8	10.4	188.2	176.8	11.47	16.407	
3,400.0	3,390.0	3,386.7	3,358.9	7.2	8.9	3.58	421.6	10.9	195.2	183.4	11.82	16.510	
3,500.0	3,489.6	3,486.4	3,457.4	7.4	9.2	3.61	437.5	11.4	202.2	190.0	12.17	16.607	
3,600.0	3,589.2	3,586.2	3,555.9	7.6	9.5	3.63	453.4	11.8	209.1	196.6	12.52	16.698	
3,700.0	3,688.8	3,686.0	3,654.4	7.9	9.8	3.65	469.2	12.3	216.1	203.2	12.87	16.785	
3,800.0	3,788.4	3,785.7	3,752.9	8.1	10.1	3.67	485.1	12.8	223.0	209.8	13.22	16.866	
3,900.0	3,888.0	3,885.5	3,851.4	8.3	10.5	3.68	501.0	13.2	230.0	216.4	13.57	16.944	
4,000.0	3,987.5	3,985.2	3,949.9	8.6	10.8	3.70	516.8	13.7	236.9	223.0	13.92	17.018	
4,100.0	4,087.1	4,085.0	4,048.3	8.8	11.1	3.72	532.7	14.2	243.9	229.6	14.27	17.088	
4,200.0	4,186.7	4,184.7	4,146.8	9.1	11.4	3.73	548.6	14.6	250.8	236.2	14.62	17.155	
4,300.0	4,286.3	4,284.5	4,245.3	9.3	11.8	3.75	564.4	15.1	257.8	242.8	14.97	17.218	
4,400.0	4,385.9	4,384.3	4,343.8	9.5	12.1	3.76	580.3	15.6	264.7	249.4	15.32	17.279	
4,500.0	4,485.5	4,484.0	4,442.3	9.8	12.4	3.77	596.2	16.0	271.7	256.0	15.67	17.337	
4,600.0	4,585.1	4,583.8	4,540.8	10.0	12.7	3.78	612.1	16.5	278.6	262.6	16.02	17.393	
4,700.0	4,684.7	4,683.5	4,639.3	10.2	13.1	3.80	627.9	17.0	285.6	269.2	16.37	17.446	
4,800.0	4,784.3	4,783.3	4,737.8	10.5	13.4	3.81	643.8	17.4	292.6	275.8	16.72	17.497	
4,900.0	4,883.9	4,883.0	4,836.2	10.7	13.7	3.82	659.7	17.9	299.5	282.4	17.07	17.545	
5,000.0	4,983.5	4,982.8	4,934.7	10.9	14.0	3.83	675.5	18.4	306.5	289.0	17.42	17.592	

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

Company:	K. P. Kauffman Company, Inc.	**Local Co-ordinate Reference:**	Well Bernhardt #18-7H
Project:	Wattenberg	**TVD Reference:**	WELL @ 4730.0ft (Original Well Elev)
Reference Site:	S18-T4N-R66W (Bernhardt)	**MD Reference:**	WELL @ 4730.0ft (Original Well Elev)
Site Error:	0.0ft	**North Reference:**	True
Reference Well:	Bernhardt #18-7H	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.0ft	**Output errors are at**	2.00 sigma
Reference Wellbore	HZ	**Database:**	USA EDM 5000 Multi Users DB
Reference Design:	Plan #1	**Offset TVD Reference:**	Offset Datum

Offset Design S18-T4N-R66W (Bernhardt) - Bernhardt #18-5H - Hz - Plan #1

Offset Site Error: 0.0 ft

Survey Program: 0-Geolink MWD

Offset Well Error: 0.0 ft

Reference Measured Depth (ft)	Reference Vertical Depth (ft)	Offset Measured Depth (ft)	Offset Vertical Depth (ft)	Semi Major Axis Reference (ft)	Semi Major Axis Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Total Uncertainty Axis	Separation Factor	Warning
5,100.0	5,083.1	5,082.6	5,033.2	11.2	14.4	3.84	691.4	18.8	313.4	295.6	17.77	17.637	
5,200.0	5,182.7	5,182.3	5,131.7	11.4	14.7	3.85	707.3	19.3	320.4	302.2	18.12	17.680	
5,300.0	5,282.2	5,282.1	5,230.2	11.6	15.0	3.85	723.1	19.8	327.3	308.9	18.47	17.722	
5,400.0	5,381.8	5,381.8	5,328.7	11.9	15.3	3.86	739.0	20.2	334.3	315.5	18.82	17.762	
5,500.0	5,481.4	5,481.6	5,427.2	12.1	15.7	3.87	754.9	20.7	341.2	322.1	19.17	17.801	
5,600.0	5,581.0	5,581.4	5,525.6	12.3	16.0	3.88	770.7	21.2	348.2	328.7	19.52	17.838	
5,700.0	5,680.6	5,681.1	5,624.1	12.6	16.3	3.89	786.6	21.6	355.1	335.3	19.87	17.874	
5,800.0	5,780.2	5,780.9	5,722.6	12.8	16.6	3.89	802.5	22.1	362.1	341.9	20.22	17.909	
5,900.0	5,879.8	5,880.6	5,821.1	13.0	17.0	3.90	818.4	22.6	369.0	348.5	20.57	17.942	
6,000.0	5,979.4	5,980.4	5,919.6	13.3	17.3	3.91	834.2	23.1	376.0	355.1	20.92	17.974	
6,100.0	6,079.0	6,080.1	6,018.1	13.5	17.6	3.91	850.1	23.5	383.0	361.7	21.27	18.006	
6,200.0	6,178.6	6,179.9	6,116.6	13.7	18.0	3.92	866.0	24.0	389.9	368.3	21.62	18.036	
6,300.0	6,278.2	6,279.7	6,215.0	14.0	18.3	3.92	881.8	24.5	396.9	374.9	21.97	18.065	
6,400.0	6,377.8	6,379.4	6,313.5	14.2	18.6	3.93	897.7	24.9	403.8	381.5	22.32	18.094	
6,500.0	6,477.4	6,479.2	6,412.0	14.4	18.9	3.94	913.6	25.4	410.8	388.1	22.67	18.121	
6,600.0	6,576.9	6,578.9	6,510.5	14.7	19.3	-21.05	929.4	25.9	417.7	394.7	23.02	18.146	
6,700.0	6,675.6	6,676.0	6,606.3	14.9	19.6	-65.26	944.9	27.9	424.4	401.0	23.34	18.183	
6,800.0	6,770.6	6,771.8	6,699.4	15.1	19.9	-76.00	960.2	43.6	431.7	408.0	23.70	18.219	
6,900.0	6,859.0	6,869.9	6,790.7	15.4	20.3	-80.89	975.5	75.6	439.8	415.6	24.21	18.167	
7,000.0	6,938.2	6,970.5	6,877.3	15.8	20.7	-83.87	990.4	124.4	448.3	423.3	25.01	17.925	
7,100.0	7,005.7	7,073.8	6,956.0	16.3	21.1	-85.95	1,004.3	189.6	457.0	430.7	26.25	17.408	
7,200.0	7,059.5	7,179.9	7,023.5	17.0	21.7	-87.49	1,016.7	270.4	465.6	437.5	28.07	16.584	
7,300.0	7,098.0	7,289.0	7,076.2	18.0	22.5	-88.63	1,027.0	365.1	473.6	443.0	30.54	15.505	
7,400.0	7,119.9	7,400.8	7,110.9	19.2	23.5	-89.42	1,034.6	471.0	480.7	447.1	33.64	14.290	
7,500.0	7,124.9	7,515.0	7,124.6	20.8	24.7	-89.94	1,038.9	584.0	486.6	449.3	37.27	13.055	
7,600.0	7,123.9	7,617.4	7,124.0	22.5	26.1	-89.98	1,040.8	686.5	491.0	449.8	41.19	11.919	
7,700.0	7,122.9	7,717.3	7,123.0	24.3	27.5	-89.99	1,042.5	786.3	495.3	450.1	45.27	10.941	
7,800.0	7,121.9	7,817.2	7,122.0	26.3	29.2	-89.99	1,044.3	886.2	499.7	450.2	49.51	10.092 SF	

Company:	K. P. Kauffman Company, Inc.	**Local Co-ordinate Reference:**	Well Bernhardt #18-7H
Project:	Wattenberg	**TVD Reference:**	WELL @ 4730.0ft (Original Well Elev)
Reference Site:	S18-T4N-R66W (Bernhardt)	**MD Reference:**	WELL @ 4730.0ft (Original Well Elev)
Site Error:	0.0ft	**North Reference:**	True
Reference Well:	Bernhardt #18-7H	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.0ft	**Output errors are at**	2.00 sigma
Reference Wellbore	HZ	**Database:**	USA EDM 5000 Multi Users DB
Reference Design:	Plan #1	**Offset TVD Reference:**	Offset Datum

Offset Design S18-T4N-R66W (Bernhardt) - Bernhardt #18-6H - HZ - Plan #1

Offset Site Error: 0.0 ft

Survey Program: 0-Geolink MWD

Offset Well Error: 0.0 ft

Reference Measured Depth (ft)	Reference Vertical Depth (ft)	Offset Measured Depth (ft)	Offset Vertical Depth (ft)	Semi Major Axis Reference (ft)	Semi Major Axis Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Total Uncertainty Axis	Separation Factor	Warning
0.0	0.0	0.0	0.0	0.0	0.0	0.00	25.5	0.0	25.5				
100.0	100.0	100.0	100.0	0.2	0.2	0.00	25.5	0.0	25.5	25.2	0.31	83.001	
200.0	200.0	200.0	200.0	0.3	0.3	0.00	25.5	0.0	25.5	24.8	0.66	38.852	
300.0	300.0	300.0	300.0	0.5	0.5	0.00	25.5	0.0	25.5	24.5	1.01	25.362	
400.0	400.0	400.0	400.0	0.7	0.7	0.00	25.5	0.0	25.5	24.1	1.35	18.825	
500.0	500.0	500.0	500.0	0.9	0.9	0.00	25.5	0.0	25.5	23.8	1.70	14.967	
600.0	600.0	600.0	600.0	1.0	1.0	0.00	25.5	0.0	25.5	23.4	2.05	12.422	
700.0	700.0	699.6	699.6	1.2	1.2	0.25	26.4	0.0	25.5	23.1	2.40	10.619	
800.0	800.0	799.1	799.1	1.4	1.4	0.47	29.0	0.1	25.5	22.7	2.75	9.271	
900.0	899.9	898.7	898.5	1.6	1.6	0.84	33.3	0.3	25.5	22.4	3.10	8.225	
1,000.0	999.7	998.2	997.9	1.8	1.7	1.36	39.3	0.5	25.4	22.0	3.44	7.388	
1,100.0	1,099.4	1,097.8	1,097.2	2.0	1.9	2.04	47.1	0.8	25.4	21.6	3.79	6.705	
1,101.8	1,101.2	1,099.6	1,099.0	2.0	2.0	2.05	47.3	0.8	25.4	21.6	3.79	6.693	CC
1,200.0	1,199.0	1,197.3	1,196.3	2.2	2.2	2.80	56.6	1.1	26.0	21.8	4.14	6.275	
1,300.0	1,298.6	1,297.3	1,295.7	2.4	2.4	3.49	67.0	1.5	27.3	22.8	4.49	6.092	
1,400.0	1,398.1	1,397.3	1,395.2	2.6	2.6	4.11	77.3	1.8	28.7	23.9	4.84	5.936	
1,500.0	1,497.7	1,497.3	1,494.6	2.8	2.8	4.68	87.7	2.2	30.1	24.9	5.19	5.801	
1,600.0	1,597.3	1,597.3	1,594.1	3.0	3.1	5.20	98.1	2.6	31.5	25.9	5.54	5.684	
1,700.0	1,696.9	1,697.3	1,693.5	3.3	3.3	5.68	108.4	2.9	32.9	27.0	5.89	5.581	
1,800.0	1,796.5	1,797.3	1,793.0	3.5	3.6	6.11	118.8	3.3	34.3	28.0	6.24	5.489	
1,900.0	1,896.1	1,897.3	1,892.4	3.7	3.8	6.52	129.2	3.7	35.7	29.1	6.59	5.407	
2,000.0	1,995.7	1,997.3	1,991.9	3.9	4.0	6.89	139.6	4.0	37.0	30.1	6.95	5.334	
2,100.0	2,095.3	2,097.3	2,091.3	4.2	4.3	7.23	149.9	4.4	38.4	31.1	7.30	5.267	
2,200.0	2,194.9	2,197.2	2,190.8	4.4	4.5	7.55	160.3	4.8	39.8	32.2	7.65	5.207	
2,300.0	2,294.5	2,297.2	2,290.2	4.6	4.8	7.85	170.7	5.1	41.2	33.2	8.00	5.152	
2,400.0	2,394.1	2,397.2	2,389.7	4.9	5.0	8.13	181.0	5.5	42.6	34.3	8.36	5.101	
2,500.0	2,493.7	2,497.2	2,489.1	5.1	5.3	8.39	191.4	5.9	44.0	35.3	8.71	5.055	
2,600.0	2,593.3	2,597.2	2,588.6	5.3	5.5	8.64	201.8	6.2	45.4	36.4	9.07	5.012	
2,700.0	2,692.8	2,697.2	2,688.0	5.6	5.8	8.87	212.2	6.6	46.8	37.4	9.42	4.972	
2,800.0	2,792.4	2,797.2	2,787.5	5.8	6.0	9.09	222.5	7.0	48.2	38.5	9.77	4.935	
2,900.0	2,892.0	2,897.2	2,886.9	6.0	6.3	9.29	232.9	7.3	49.6	39.5	10.13	4.901	
3,000.0	2,991.6	2,997.2	2,986.4	6.3	6.5	9.49	243.3	7.7	51.0	40.6	10.48	4.869	
3,100.0	3,091.2	3,097.2	3,085.8	6.5	6.8	9.67	253.6	8.0	52.4	41.6	10.84	4.838	
3,200.0	3,190.8	3,197.1	3,185.3	6.7	7.0	9.84	264.0	8.4	53.8	42.7	11.19	4.810	
3,300.0	3,290.4	3,297.1	3,284.7	6.9	7.2	10.01	274.4	8.8	55.3	43.7	11.55	4.784	
3,400.0	3,390.0	3,397.1	3,384.2	7.2	7.5	10.17	284.8	9.1	56.7	44.8	11.91	4.759	
3,500.0	3,489.6	3,497.1	3,483.6	7.4	7.7	10.32	295.1	9.5	58.1	45.8	12.26	4.735	
3,600.0	3,589.2	3,597.1	3,583.1	7.6	8.0	10.46	305.5	9.9	59.5	46.9	12.62	4.713	
3,700.0	3,688.8	3,697.1	3,682.5	7.9	8.2	10.59	315.9	10.2	60.9	47.9	12.97	4.692	
3,800.0	3,788.4	3,797.1	3,782.0	8.1	8.5	10.72	326.2	10.6	62.3	49.0	13.33	4.672	
3,900.0	3,888.0	3,897.1	3,881.4	8.3	8.7	10.85	336.6	11.0	63.7	50.0	13.69	4.653	
4,000.0	3,987.5	3,997.1	3,980.9	8.6	9.0	10.97	347.0	11.3	65.1	51.1	14.04	4.635	
4,100.0	4,087.1	4,097.1	4,080.3	8.8	9.2	11.08	357.4	11.7	66.5	52.1	14.40	4.618	
4,200.0	4,186.7	4,197.0	4,179.8	9.1	9.5	11.19	367.7	12.1	67.9	53.2	14.76	4.602	
4,300.0	4,286.3	4,297.0	4,279.2	9.3	9.7	11.29	378.1	12.4	69.3	54.2	15.11	4.586	
4,400.0	4,385.9	4,397.0	4,378.7	9.5	10.0	11.39	388.5	12.8	70.7	55.3	15.47	4.571	
4,500.0	4,485.5	4,497.0	4,478.1	9.8	10.2	11.49	398.8	13.2	72.1	56.3	15.83	4.557	
4,600.0	4,585.1	4,597.0	4,577.6	10.0	10.5	11.58	409.2	13.5	73.5	57.4	16.19	4.543	
4,700.0	4,684.7	4,697.0	4,677.0	10.2	10.7	11.67	419.6	13.9	75.0	58.4	16.54	4.530	
4,800.0	4,784.3	4,797.0	4,776.5	10.5	11.0	11.76	430.0	14.3	76.4	59.5	16.90	4.518	
4,900.0	4,883.9	4,897.0	4,875.9	10.7	11.2	11.84	440.3	14.6	77.8	60.5	17.26	4.506	
5,000.0	4,983.5	4,997.0	4,975.4	10.9	11.5	11.92	450.7	15.0	79.2	61.6	17.62	4.494	

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

Company:	K. P. Kauffman Company, Inc.	**Local Co-ordinate Reference:**	Well Bernhardt #18-7H
Project:	Wattenberg	**TVD Reference:**	WELL @ 4730.0ft (Original Well Elev)
Reference Site:	S18-T4N-R66W (Bernhardt)	**MD Reference:**	WELL @ 4730.0ft (Original Well Elev)
Site Error:	0.0ft	**North Reference:**	True
Reference Well:	Bernhardt #18-7H	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.0ft	**Output errors are at**	2.00 sigma
Reference Wellbore	HZ	**Database:**	USA EDM 5000 Multi Users DB
Reference Design:	Plan #1	**Offset TVD Reference:**	Offset Datum

Offset Design S18-T4N-R66W (Bernhardt) - Bernhardt #18-6H - HZ - Plan #1

Offset Site Error: 0.0 ft

Survey Program: 0-Geolink MWD

Offset Well Error: 0.0 ft

Reference		Offset		Semi Major Axis			Offset Wellbore Centre		Distance				
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	+N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Total Uncertainty Axis	Separation Factor	Warning
5,100.0	5,083.1	5,097.0	5,074.8	11.2	11.7	12.00	461.1	15.4	80.6	62.6	17.98	4.483	
5,200.0	5,182.7	5,196.9	5,174.3	11.4	12.0	12.07	471.4	15.7	82.0	63.7	18.33	4.473	
5,300.0	5,282.2	5,296.9	5,273.7	11.6	12.2	12.14	481.8	16.1	83.4	64.7	18.69	4.462	
5,400.0	5,381.8	5,396.9	5,373.2	11.9	12.5	12.21	492.2	16.5	84.8	65.8	19.05	4.453	
5,500.0	5,481.4	5,496.9	5,472.6	12.1	12.8	12.28	502.6	16.8	86.2	66.8	19.41	4.443	
5,600.0	5,581.0	5,596.9	5,572.1	12.3	13.0	12.34	512.9	17.2	87.6	67.9	19.77	4.434	
5,700.0	5,680.6	5,696.9	5,671.5	12.6	13.3	12.41	523.3	17.6	89.0	68.9	20.12	4.425	
5,800.0	5,780.2	5,796.9	5,771.0	12.8	13.5	12.47	533.7	17.9	90.5	70.0	20.48	4.416	
5,900.0	5,879.8	5,896.9	5,870.4	13.0	13.8	12.53	544.0	18.3	91.9	71.0	20.84	4.408	
6,000.0	5,979.4	5,996.9	5,969.9	13.3	14.0	12.58	554.4	18.7	93.3	72.1	21.20	4.400	
6,100.0	6,079.0	6,096.9	6,069.3	13.5	14.3	12.64	564.8	19.0	94.7	73.1	21.56	4.392	
6,200.0	6,178.6	6,196.8	6,168.8	13.7	14.5	12.69	575.2	19.4	96.1	74.2	21.92	4.385	
6,300.0	6,278.2	6,296.8	6,268.2	14.0	14.8	12.75	585.5	19.8	97.5	75.2	22.27	4.378	
6,400.0	6,377.8	6,396.8	6,367.7	14.2	15.0	12.80	595.9	20.1	98.9	76.3	22.63	4.371	
6,500.0	6,477.4	6,496.8	6,467.1	14.4	15.3	12.85	606.3	20.5	100.3	77.3	22.99	4.364	
6,600.0	6,576.9	6,596.5	6,566.2	14.7	15.5	-12.40	616.6	20.9	101.7	78.3	23.33	4.357	
6,700.0	6,675.6	6,692.9	6,661.5	14.9	15.8	-57.27	626.6	30.8	102.8	79.3	23.51	4.371	
6,800.0	6,770.6	6,789.8	6,754.3	15.1	16.0	-68.65	636.2	56.8	104.3	80.6	23.70	4.399	
6,900.0	6,859.0	6,887.2	6,841.8	15.4	16.3	-74.39	645.4	98.4	106.2	82.1	24.08	4.408	
7,000.0	6,938.2	6,985.3	6,921.5	15.8	16.7	-78.38	653.8	154.6	108.4	83.5	24.87	4.359	
7,100.0	7,005.7	7,084.1	6,991.0	16.3	17.2	-81.59	661.1	224.2	111.0	84.8	26.22	4.232	
7,200.0	7,059.5	7,183.6	7,048.0	17.0	17.9	-84.31	667.1	305.5	113.8	85.6	28.24	4.030	
7,300.0	7,098.0	7,283.9	7,090.4	18.0	18.8	-86.65	671.6	396.1	116.9	86.0	30.90	3.782	
7,400.0	7,119.9	7,385.0	7,116.6	19.2	20.0	-88.62	674.5	493.6	120.0	85.9	34.07	3.522	
7,500.0	7,124.9	7,486.9	7,125.3	20.8	21.4	-90.17	675.5	595.0	123.0	85.4	37.57	3.274	
7,600.0	7,123.9	7,587.0	7,124.4	22.5	23.1	-90.19	675.5	695.0	125.6	84.1	41.48	3.029	
7,700.0	7,122.9	7,686.9	7,123.4	24.3	24.8	-90.20	675.5	795.0	128.2	82.7	45.58	2.814	
7,800.0	7,121.9	7,786.9	7,122.4	26.3	26.7	-90.21	675.5	895.0	130.9	81.0	49.83	2.626	
7,900.0	7,120.9	7,886.9	7,121.4	28.4	28.8	-90.22	675.5	994.9	133.5	79.3	54.20	2.462	
8,000.0	7,119.9	7,986.8	7,120.5	30.5	30.8	-90.23	675.5	1,094.9	136.1	77.4	58.67	2.320	
8,100.0	7,118.8	8,086.8	7,119.5	32.7	33.0	-90.24	675.5	1,194.8	138.7	75.5	63.20	2.195	
8,200.0	7,117.8	8,186.8	7,118.5	34.9	35.2	-90.25	675.5	1,294.8	141.3	73.5	67.80	2.085	
8,300.0	7,116.8	8,286.7	7,117.5	37.2	37.4	-90.26	675.5	1,394.8	143.9	71.5	72.44	1.987	
8,400.0	7,115.8	8,386.7	7,116.5	39.5	39.7	-90.27	675.5	1,494.7	146.6	69.4	77.11	1.901	
8,500.0	7,114.8	8,486.7	7,115.6	41.8	42.0	-90.28	675.5	1,594.7	149.2	67.4	81.82	1.823	
8,600.0	7,113.8	8,586.6	7,114.6	44.1	44.3	-90.29	675.5	1,694.6	151.8	65.2	86.56	1.754	
8,700.0	7,112.8	8,686.6	7,113.6	46.5	46.6	-90.30	675.5	1,794.6	154.4	63.1	91.32	1.691	
8,800.0	7,111.8	8,786.5	7,112.6	48.8	48.9	-90.30	675.5	1,894.6	157.0	60.9	96.09	1.634	
8,900.0	7,110.8	8,886.5	7,111.7	51.2	51.3	-90.31	675.5	1,994.5	159.6	58.8	100.89	1.582	
9,000.0	7,109.7	8,986.5	7,110.7	53.6	53.7	-90.32	675.5	2,094.5	162.3	56.6	105.69	1.535	
9,100.0	7,108.7	9,086.4	7,109.7	55.9	56.0	-90.33	675.5	2,194.4	164.9	54.4	110.51	1.492	Level 3
9,200.0	7,107.7	9,186.4	7,108.7	58.3	58.4	-90.33	675.5	2,294.4	167.5	52.2	115.35	1.452	Level 3
9,300.0	7,106.7	9,286.4	7,107.8	60.7	60.8	-90.34	675.5	2,394.4	170.1	49.9	120.18	1.415	Level 3
9,400.0	7,105.7	9,386.3	7,106.8	63.1	63.2	-90.35	675.5	2,494.3	172.7	47.7	125.03	1.382	Level 3
9,500.0	7,104.7	9,486.3	7,105.8	65.5	65.6	-90.35	675.5	2,594.3	175.4	45.5	129.89	1.350	Level 3
9,600.0	7,103.7	9,586.3	7,104.8	68.0	68.0	-90.36	675.5	2,694.2	178.0	43.2	134.75	1.321	Level 3
9,700.0	7,102.7	9,686.2	7,103.8	70.4	70.4	-90.36	675.5	2,794.2	180.6	41.0	139.62	1.293	Level 3
9,800.0	7,101.6	9,786.2	7,102.9	72.8	72.9	-90.37	675.5	2,894.2	183.2	38.7	144.49	1.268	Level 3
9,900.0	7,100.6	9,886.2	7,101.9	75.2	75.3	-90.37	675.5	2,994.1	185.8	36.5	149.37	1.244	Level 2
10,000.0	7,099.6	9,986.1	7,100.9	77.7	77.7	-90.38	675.5	3,094.1	188.4	34.2	154.25	1.222	Level 2
10,100.0	7,098.6	10,086.1	7,099.9	80.1	80.1	-90.38	675.5	3,194.1	191.1	31.9	159.14	1.201	Level 2
10,200.0	7,097.6	10,186.1	7,099.0	82.5	82.6	-90.39	675.5	3,294.0	193.7	29.7	164.03	1.181	Level 2

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

Company:	K. P. Kauffman Company, Inc.	**Local Co-ordinate Reference:**	Well Bernhardt #18-7H
Project:	Wattenberg	**TVD Reference:**	WELL @ 4730.0ft (Original Well Elev)
Reference Site:	S18-T4N-R66W (Bernhardt)	**MD Reference:**	WELL @ 4730.0ft (Original Well Elev)
Site Error:	0.0ft	**North Reference:**	True
Reference Well:	Bernhardt #18-7H	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.0ft	**Output errors are at**	2.00 sigma
Reference Wellbore	HZ	**Database:**	USA EDM 5000 Multi Users DB
Reference Design:	Plan #1	**Offset TVD Reference:**	Offset Datum

Offset Design S18-T4N-R66W (Bernhardt) - Bernhardt #18-6H - HZ - Plan #1 — **Offset Site Error:** 0.0 ft

Survey Program: 0-Geolink MWD — **Offset Well Error:** 0.0 ft

Reference Measured Depth (ft)	Reference Vertical Depth (ft)	Offset Measured Depth (ft)	Offset Vertical Depth (ft)	Semi Major Axis Reference (ft)	Semi Major Axis Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Total Uncertainty Axis	Separation Factor	Warning
10,300.0	7,096.6	10,286.0	7,098.0	85.0	85.0	-90.39	675.5	3,394.0	196.3	27.4	168.92	1.162	Level 2
10,400.0	7,095.6	10,386.0	7,097.0	87.4	87.4	-90.40	675.5	3,493.9	198.9	25.1	173.82	1.144	Level 2
10,500.0	7,094.6	10,486.0	7,096.0	89.8	89.9	-90.40	675.5	3,593.9	201.5	22.8	178.72	1.128	Level 2
10,600.0	7,093.5	10,585.9	7,095.1	92.3	92.3	-90.41	675.5	3,693.9	204.2	20.5	183.62	1.112	Level 2
10,700.0	7,092.5	10,682.6	7,094.1	94.7	94.7	-90.41	676.2	3,790.5	207.5	19.1	188.44	1.101	Level 2
10,800.0	7,091.5	10,778.9	7,093.2	97.2	97.0	-90.41	678.6	3,886.8	212.6	19.3	193.25	1.100	Level 2
10,900.0	7,090.5	10,875.1	7,092.2	99.6	99.4	-90.41	682.5	3,982.9	219.3	21.2	198.06	1.107	Level 2
11,000.0	7,089.5	10,971.4	7,091.3	102.1	101.7	-90.41	688.1	4,079.0	227.7	24.8	202.87	1.122	Level 2
11,100.0	7,088.5	11,071.0	7,090.4	104.5	104.2	-90.40	694.5	4,178.4	236.8	29.0	207.76	1.140	Level 2
11,200.0	7,087.5	11,170.5	7,089.4	107.0	106.6	-90.40	701.0	4,277.8	245.8	33.2	212.65	1.156	Level 2
11,300.0	7,086.5	11,270.1	7,088.4	109.4	109.1	-90.39	707.4	4,377.1	254.9	37.3	217.55	1.172	Level 2
11,400.0	7,085.4	11,369.7	7,087.5	111.9	111.5	-90.39	713.8	4,476.5	264.0	41.5	222.44	1.187	Level 2
11,500.0	7,084.4	11,469.3	7,086.5	114.3	114.0	-90.39	720.2	4,575.9	273.0	45.7	227.34	1.201	Level 2
11,600.0	7,083.4	11,568.9	7,085.6	116.8	116.4	-90.38	726.7	4,675.3	282.1	49.9	232.24	1.215	Level 2
11,700.0	7,082.4	11,668.5	7,084.6	119.2	118.9	-90.38	733.1	4,774.6	291.2	54.0	237.13	1.228	Level 2
11,800.0	7,081.4	11,768.1	7,083.6	121.7	121.3	-90.38	739.5	4,874.0	300.2	58.2	242.03	1.240	Level 2
11,900.0	7,080.4	11,867.7	7,082.7	124.2	123.8	-90.37	746.0	4,973.4	309.3	62.4	246.94	1.253	Level 3
12,000.0	7,079.4	11,967.2	7,081.7	126.6	126.2	-90.37	752.4	5,072.8	318.4	66.5	251.84	1.264	Level 3
12,100.0	7,078.4	12,066.8	7,080.8	129.1	128.7	-90.37	758.8	5,172.1	327.4	70.7	256.74	1.275	Level 3
12,200.0	7,077.3	12,166.4	7,079.8	131.5	131.1	-90.37	765.3	5,271.5	336.5	74.9	261.64	1.286	Level 3
12,300.0	7,076.3	12,266.0	7,078.8	134.0	133.6	-90.36	771.7	5,370.9	345.6	79.0	266.55	1.296	Level 3
12,400.0	7,075.3	12,365.6	7,077.9	136.5	136.0	-90.36	778.1	5,470.3	354.6	83.2	271.45	1.306	Level 3
12,500.0	7,074.3	12,465.2	7,076.9	138.9	138.5	-90.36	784.6	5,569.6	363.7	87.3	276.36	1.316	Level 3
12,600.0	7,073.3	12,564.8	7,076.0	141.4	140.9	-90.36	791.0	5,669.0	372.8	91.5	281.27	1.325	Level 3
12,700.0	7,072.3	12,664.4	7,075.0	143.8	143.4	-90.36	797.4	5,768.4	381.8	95.7	286.17	1.334	Level 3
12,800.0	7,071.3	12,768.0	7,074.0	146.3	145.9	-90.35	803.8	5,871.8	390.6	99.4	291.18	1.341	Level 3
12,900.0	7,070.3	12,875.2	7,073.0	148.8	148.6	-90.35	808.6	5,978.9	397.7	101.4	296.28	1.342	Level 3
13,000.0	7,069.2	12,982.5	7,071.9	151.2	151.2	-90.36	811.4	6,086.2	402.9	101.5	301.39	1.337	Level 3
13,100.0	7,068.2	13,090.1	7,070.9	153.7	153.8	-90.36	812.2	6,193.7	406.3	99.8	306.51	1.326	Level 3
13,200.0	7,067.2	13,197.7	7,069.9	156.2	156.5	-90.37	811.0	6,301.3	407.8	96.1	311.63	1.308	Level 3
13,300.0	7,066.2	13,305.4	7,068.8	158.6	159.1	-90.37	807.7	6,408.9	407.4	90.6	316.75	1.286	Level 3
13,400.0	7,065.2	13,407.0	7,067.8	161.1	161.6	-90.38	803.3	6,510.5	405.7	83.9	321.72	1.261	Level 3
13,500.0	7,064.2	13,507.0	7,066.9	163.5	164.1	-90.39	799.0	6,610.3	403.9	77.3	326.66	1.237	Level 2
13,600.0	7,063.2	13,606.9	7,065.9	166.0	166.5	-90.40	794.6	6,710.2	402.2	70.6	331.59	1.213	Level 2
13,700.0	7,062.2	13,706.9	7,065.0	168.5	169.0	-90.41	790.2	6,810.1	400.4	63.9	336.52	1.190	Level 2
13,800.0	7,061.1	13,806.9	7,064.0	170.9	171.4	-90.42	785.9	6,910.0	398.7	57.2	341.45	1.168	Level 2
13,900.0	7,060.1	13,906.9	7,063.0	173.4	173.9	-90.43	781.5	7,009.9	396.9	50.6	346.39	1.146	Level 2
14,000.0	7,059.1	14,006.9	7,062.1	175.9	176.3	-90.44	777.2	7,109.8	395.2	43.9	351.32	1.125	Level 2
14,100.0	7,058.1	14,106.9	7,061.1	178.3	178.8	-90.45	772.8	7,209.7	393.4	37.2	356.25	1.104	Level 2
14,200.0	7,057.1	14,206.9	7,060.2	180.8	181.2	-90.46	768.4	7,309.5	391.7	30.5	361.19	1.084	Level 2
14,300.0	7,056.1	14,306.8	7,059.2	183.3	183.7	-90.47	764.1	7,409.4	390.0	23.8	366.12	1.065	Level 2
14,400.0	7,055.1	14,406.8	7,058.2	185.7	186.1	-90.48	759.7	7,509.3	388.2	17.2	371.06	1.046	Level 2
14,500.0	7,054.1	14,506.8	7,057.3	188.2	188.6	-90.49	755.4	7,609.2	386.5	10.5	375.99	1.028	Level 2
14,600.0	7,053.1	14,606.8	7,056.3	190.7	191.0	-90.50	751.0	7,709.1	384.7	3.8	380.93	1.010	Level 2
14,700.0	7,052.0	14,706.8	7,055.4	193.1	193.5	-90.51	746.6	7,809.0	383.0	-2.9	385.86	0.993	Level 1
14,800.0	7,051.0	14,806.8	7,054.4	195.6	196.0	-90.52	742.3	7,908.8	381.2	-9.6	390.80	0.976	Level 1
14,900.0	7,050.0	14,906.8	7,053.4	198.1	198.4	-90.53	737.9	8,008.7	379.5	-16.2	395.73	0.959	Level 1
15,000.0	7,049.0	15,006.7	7,052.5	200.5	200.9	-90.54	733.5	8,108.6	377.7	-22.9	400.67	0.943	Level 1
15,100.0	7,048.0	15,106.7	7,051.5	203.0	203.3	-90.55	729.2	8,208.5	376.0	-29.6	405.61	0.927	Level 1
15,200.0	7,047.0	15,206.7	7,050.6	205.5	205.8	-90.56	724.8	8,308.4	374.3	-36.3	410.54	0.912	Level 1
15,300.0	7,046.0	15,306.7	7,049.6	207.9	208.2	-90.57	720.5	8,408.3	372.5	-43.0	415.48	0.897	Level 1
15,400.0	7,045.0	15,406.7	7,048.6	210.4	210.7	-90.58	716.1	8,508.2	370.8	-49.6	420.42	0.882	Level 1

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

Company:	K. P. Kauffman Company, Inc.	**Local Co-ordinate Reference:**	Well Bernhardt #18-7H
Project:	Wattenberg	**TVD Reference:**	WELL @ 4730.0ft (Original Well Elev)
Reference Site:	S18-T4N-R66W (Bernhardt)	**MD Reference:**	WELL @ 4730.0ft (Original Well Elev)
Site Error:	0.0ft	**North Reference:**	True
Reference Well:	Bernhardt #18-7H	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.0ft	**Output errors are at**	2.00 sigma
Reference Wellbore	HZ	**Database:**	USA EDM 5000 Multi Users DB
Reference Design:	Plan #1	**Offset TVD Reference:**	Offset Datum

Offset Design S18-T4N-R66W (Bernhardt) - Bernhardt #18-6H - HZ - Plan #1

Offset Site Error: 0.0 ft

Survey Program: 0-Geolink MWD

Offset Well Error: 0.0 ft

Reference Measured Depth (ft)	Reference Vertical Depth (ft)	Offset Measured Depth (ft)	Offset Vertical Depth (ft)	Semi Major Axis Reference (ft)	Semi Major Axis Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Total Uncertainty Axis	Separation Factor	Warning
15,500.0	7,043.9	15,506.7	7,047.7	212.9	213.2	-90.59	711.7	8,608.0	369.0	-56.3	425.35	0.868	Level 1
15,600.0	7,042.9	15,606.6	7,046.7	215.3	215.6	-90.60	707.4	8,707.9	367.3	-63.0	430.29	0.854	Level 1
15,700.0	7,041.9	15,706.6	7,045.8	217.8	218.1	-90.61	703.0	8,807.8	365.5	-69.7	435.23	0.840	Level 1
15,800.0	7,040.9	15,806.6	7,044.8	220.3	220.5	-90.63	698.7	8,907.7	363.8	-76.4	440.16	0.826	Level 1
15,900.0	7,039.9	15,906.6	7,043.8	222.7	223.0	-90.64	694.3	9,007.6	362.0	-83.1	445.10	0.813	Level 1
16,000.0	7,038.9	16,006.6	7,042.9	225.2	225.5	-90.65	689.9	9,107.5	360.3	-89.7	450.04	0.801	Level 1
16,100.0	7,037.9	16,106.6	7,041.9	227.7	227.9	-90.66	685.6	9,207.4	358.6	-96.4	454.98	0.788	Level 1
16,200.0	7,036.9	16,206.6	7,041.0	230.2	230.4	-90.67	681.2	9,307.2	356.8	-103.1	459.92	0.776	Level 1
16,300.0	7,035.8	16,306.5	7,040.0	232.6	232.8	-90.68	676.9	9,407.1	355.1	-109.8	464.85	0.764	Level 1
16,400.0	7,034.8	16,406.5	7,039.0	235.1	235.3	-90.69	672.5	9,507.0	353.3	-116.5	469.79	0.752	Level 1
16,500.0	7,033.8	16,506.5	7,038.1	237.6	237.8	-90.71	668.1	9,606.9	351.6	-123.2	474.73	0.741	Level 1
16,533.3	7,033.5	16,539.8	7,037.8	238.4	238.6	-90.71	666.7	9,640.1	351.0	-125.4	476.37	0.737	Level 1, ES, SF

Company:	K. P. Kauffman Company, Inc.	**Local Co-ordinate Reference:**	Well Bernhardt #18-7H
Project:	Wattenberg	**TVD Reference:**	WELL @ 4730.0ft (Original Well Elev)
Reference Site:	S18-T4N-R66W (Bernhardt)	**MD Reference:**	WELL @ 4730.0ft (Original Well Elev)
Site Error:	0.0ft	**North Reference:**	True
Reference Well:	Bernhardt #18-7H	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.0ft	**Output errors are at**	2.00 sigma
Reference Wellbore	HZ	**Database:**	USA EDM 5000 Multi Users DB
Reference Design:	Plan #1	**Offset TVD Reference:**	Offset Datum

Offset Design S18-T4N-R66W (Bernhardt) - Bernhardt #18-8H - HZ - Plan #1

Offset Site Error: 0.0 ft

Survey Program: 0-Geolink MWD

Offset Well Error: 0.0 ft

Reference Measured Depth (ft)	Reference Vertical Depth (ft)	Offset Measured Depth (ft)	Offset Vertical Depth (ft)	Semi Major Axis Reference (ft)	Semi Major Axis Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Total Uncertainty Axis	Separation Factor	Warning
0.0	0.0	0.0	0.0	0.0	0.0	-173.76	-25.5	-2.8	25.7				
100.0	100.0	100.0	100.0	0.2	0.2	-173.76	-25.5	-2.8	25.7	25.3	0.31	83.510	
200.0	200.0	200.0	200.0	0.3	0.3	-173.76	-25.5	-2.8	25.7	25.0	0.66	39.090	CC
300.0	300.0	299.6	299.6	0.5	0.5	-173.32	-26.3	-3.1	26.5	25.5	1.00	26.377	
400.0	400.0	399.1	399.0	0.7	0.7	-172.17	-28.8	-4.0	29.0	27.7	1.35	21.466	
500.0	500.0	499.0	498.9	0.9	0.9	-170.89	-32.1	-5.1	32.5	30.8	1.70	19.094	
600.0	600.0	598.9	598.7	1.0	1.0	-169.86	-35.4	-6.3	36.0	33.9	2.05	17.536	
700.0	700.0	698.8	698.6	1.2	1.2	-169.07	-38.7	-7.5	40.3	37.9	2.40	16.796	
800.0	800.0	798.6	798.3	1.4	1.4	-168.99	-42.0	-8.7	46.4	43.6	2.75	16.871	
900.0	899.9	898.3	898.0	1.6	1.6	-169.28	-45.3	-9.9	54.1	51.0	3.09	17.486	
1,000.0	999.7	997.9	997.5	1.8	1.8	-169.78	-48.6	-11.1	63.6	60.1	3.44	18.478	
1,100.0	1,099.4	1,097.2	1,096.8	2.0	2.0	-170.38	-51.9	-12.3	74.8	71.0	3.79	19.747	
1,200.0	1,199.0	1,196.5	1,195.9	2.2	2.1	-170.95	-55.2	-13.4	87.1	83.0	4.13	21.066	
1,300.0	1,298.6	1,295.7	1,295.1	2.4	2.3	-171.38	-58.5	-14.6	99.4	95.0	4.48	22.185	
1,400.0	1,398.1	1,394.9	1,394.3	2.6	2.5	-171.72	-61.8	-15.8	111.8	107.0	4.83	23.143	
1,500.0	1,497.7	1,494.2	1,493.5	2.8	2.7	-171.99	-65.1	-17.0	124.2	119.0	5.18	23.972	
1,600.0	1,597.3	1,593.4	1,592.6	3.0	2.9	-172.21	-68.4	-18.2	136.5	131.0	5.53	24.698	
1,700.0	1,696.9	1,692.6	1,691.8	3.3	3.1	-172.40	-71.7	-19.3	148.9	143.0	5.88	25.338	
1,800.0	1,796.5	1,791.9	1,791.0	3.5	3.2	-172.56	-75.0	-20.5	161.3	155.0	6.23	25.906	
1,900.0	1,896.1	1,891.1	1,890.1	3.7	3.4	-172.69	-78.3	-21.7	173.6	167.1	6.57	26.415	
2,000.0	1,995.7	1,990.3	1,989.3	3.9	3.6	-172.81	-81.6	-22.9	186.0	179.1	6.92	26.872	
2,100.0	2,095.3	2,089.6	2,088.5	4.2	3.8	-172.91	-84.9	-24.0	198.4	191.1	7.27	27.286	
2,200.0	2,194.9	2,188.8	2,187.6	4.4	4.0	-173.00	-88.1	-25.2	210.7	203.1	7.62	27.662	
2,300.0	2,294.5	2,288.0	2,286.8	4.6	4.2	-173.08	-91.4	-26.4	223.1	215.2	7.97	28.005	
2,400.0	2,394.1	2,387.3	2,386.0	4.9	4.3	-173.15	-94.7	-27.6	235.5	227.2	8.32	28.319	
2,500.0	2,493.7	2,486.5	2,485.2	5.1	4.5	-173.21	-98.0	-28.8	247.9	239.2	8.66	28.608	
2,600.0	2,593.3	2,585.7	2,584.3	5.3	4.7	-173.27	-101.3	-29.9	260.2	251.2	9.01	28.875	
2,700.0	2,692.8	2,685.0	2,683.5	5.6	4.9	-173.33	-104.6	-31.1	272.6	263.2	9.36	29.122	
2,800.0	2,792.4	2,784.2	2,782.7	5.8	5.1	-173.37	-107.9	-32.3	285.0	275.3	9.71	29.352	
2,900.0	2,892.0	2,883.4	2,881.8	6.0	5.3	-173.42	-111.2	-33.5	297.4	287.3	10.06	29.565	
3,000.0	2,991.6	2,982.6	2,981.0	6.3	5.5	-173.46	-114.5	-34.7	309.7	299.3	10.41	29.764	
3,100.0	3,091.2	3,081.9	3,080.2	6.5	5.6	-173.50	-117.8	-35.8	322.1	311.3	10.75	29.951	
3,200.0	3,190.8	3,181.1	3,179.3	6.7	5.8	-173.53	-121.1	-37.0	334.5	323.4	11.10	30.125	
3,300.0	3,290.4	3,280.3	3,278.5	6.9	6.0	-173.57	-124.4	-38.2	346.8	335.4	11.45	30.289	
3,400.0	3,390.0	3,379.6	3,377.7	7.2	6.2	-173.60	-127.7	-39.4	359.2	347.4	11.80	30.444	
3,500.0	3,489.6	3,478.8	3,476.8	7.4	6.4	-173.62	-130.9	-40.6	371.6	359.4	12.15	30.589	
3,600.0	3,589.2	3,578.0	3,576.0	7.6	6.6	-173.65	-134.2	-41.7	384.0	371.5	12.50	30.727	
3,700.0	3,688.8	3,677.3	3,675.2	7.9	6.7	-173.67	-137.5	-42.9	396.3	383.5	12.84	30.857	
3,800.0	3,788.4	3,776.5	3,774.4	8.1	6.9	-173.70	-140.8	-44.1	408.7	395.5	13.19	30.980	
3,900.0	3,888.0	3,875.7	3,873.5	8.3	7.1	-173.72	-144.1	-45.3	421.1	407.5	13.54	31.097	
4,000.0	3,987.5	3,975.0	3,972.7	8.6	7.3	-173.74	-147.4	-46.5	433.5	419.6	13.89	31.208	
4,100.0	4,087.1	4,074.2	4,071.9	8.8	7.5	-173.76	-150.7	-47.6	445.8	431.6	14.24	31.313	
4,200.0	4,186.7	4,173.4	4,171.0	9.1	7.7	-173.78	-154.0	-48.8	458.2	443.6	14.59	31.414	
4,300.0	4,286.3	4,272.7	4,270.2	9.3	7.8	-173.80	-157.3	-50.0	470.6	455.7	14.93	31.509	
4,400.0	4,385.9	4,371.9	4,369.4	9.5	8.0	-173.81	-160.6	-51.2	483.0	467.7	15.28	31.601	
4,500.0	4,485.5	4,471.1	4,468.5	9.8	8.2	-173.83	-163.9	-52.4	495.3	479.7	15.63	31.688	
14,900.0	7,050.0	14,973.0	7,052.5	198.1	199.5	90.32	-139.8	8,010.0	498.9	101.6	397.31	1.256	Level 3
15,000.0	7,049.0	15,072.8	7,051.6	200.5	201.9	90.33	-136.2	8,109.8	492.7	90.5	402.24	1.225	Level 2
15,100.0	7,048.0	15,172.6	7,050.7	203.0	204.4	90.35	-132.7	8,209.5	486.5	79.4	407.17	1.195	Level 2
15,200.0	7,047.0	15,272.4	7,049.8	205.5	206.8	90.37	-129.1	8,309.3	480.3	68.2	412.10	1.166	Level 2
15,300.0	7,046.0	15,372.2	7,048.8	207.9	209.3	90.38	-125.5	8,409.0	474.1	57.1	417.02	1.137	Level 2
15,400.0	7,045.0	15,472.1	7,047.9	210.4	211.8	90.40	-121.9	8,508.7	468.0	46.0	421.95	1.109	Level 2

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

Company:	K. P. Kauffman Company, Inc.	**Local Co-ordinate Reference:**	Well Bernhardt #18-7H
Project:	Wattenberg	**TVD Reference:**	WELL @ 4730.0ft (Original Well Elev)
Reference Site:	S18-T4N-R66W (Bernhardt)	**MD Reference:**	WELL @ 4730.0ft (Original Well Elev)
Site Error:	0.0ft	**North Reference:**	True
Reference Well:	Bernhardt #18-7H	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.0ft	**Output errors are at**	2.00 sigma
Reference Wellbore	HZ	**Database:**	USA EDM 5000 Multi Users DB
Reference Design:	Plan #1	**Offset TVD Reference:**	Offset Datum

Offset Design S18-T4N-R66W (Bernhardt) - Bernhardt #18-8H - HZ - Plan #1

Offset Site Error: 0.0 ft

Survey Program: 0-Geolink MWD

Offset Well Error: 0.0 ft

Reference Measured Depth (ft)	Reference Vertical Depth (ft)	Offset Measured Depth (ft)	Offset Vertical Depth (ft)	Semi Major Axis Reference (ft)	Semi Major Axis Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Total Uncertainty Axis	Separation Factor	Warning
15,500.0	7,043.9	15,571.9	7,047.0	212.9	214.2	90.42	-118.4	8,608.5	461.8	34.9	426.88	1.082	Level 2
15,600.0	7,042.9	15,671.7	7,046.1	215.3	216.7	90.44	-114.8	8,708.2	455.6	23.8	431.81	1.055	Level 2
15,700.0	7,041.9	15,771.5	7,045.2	217.8	219.2	90.46	-111.2	8,808.0	449.4	12.6	436.74	1.029	Level 2
15,800.0	7,040.9	15,871.3	7,044.3	220.3	221.6	90.48	-107.6	8,907.7	443.2	1.5	441.67	1.003	Level 2
15,900.0	7,039.9	15,971.1	7,043.4	222.7	224.1	90.50	-104.1	9,007.4	437.0	-9.6	446.60	0.978	Level 1
16,000.0	7,038.9	16,070.9	7,042.5	225.2	226.5	90.52	-100.5	9,107.2	430.8	-20.7	451.53	0.954	Level 1
16,100.0	7,037.9	16,170.7	7,041.6	227.7	229.0	90.54	-96.9	9,206.9	424.6	-31.9	456.46	0.930	Level 1
16,200.0	7,036.9	16,270.5	7,040.7	230.2	231.5	90.56	-93.3	9,306.7	418.4	-43.0	461.39	0.907	Level 1
16,300.0	7,035.8	16,370.3	7,039.8	232.6	233.9	90.59	-89.8	9,406.4	412.2	-54.1	466.31	0.884	Level 1
16,400.0	7,034.8	16,470.1	7,038.9	235.1	236.4	90.61	-86.2	9,506.1	406.0	-65.2	471.24	0.862	Level 1
16,500.0	7,033.8	16,569.9	7,038.0	237.6	238.9	90.63	-82.6	9,605.9	399.8	-76.4	476.17	0.840	Level 1
16,533.3	7,033.5	16,603.2	7,037.7	238.4	239.7	90.64	-81.4	9,639.1	397.8	-80.1	477.81	0.832	Level 1, ES, SF

Company:	K. P. Kauffman Company, Inc.	**Local Co-ordinate Reference:**	Well Bernhardt #18-7H
Project:	Wattenberg	**TVD Reference:**	WELL @ 4730.0ft (Original Well Elev)
Reference Site:	S18-T4N-R66W (Bernhardt)	**MD Reference:**	WELL @ 4730.0ft (Original Well Elev)
Site Error:	0.0ft	**North Reference:**	True
Reference Well:	Bernhardt #18-7H	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.0ft	**Output errors are at**	2.00 sigma
Reference Wellbore	HZ	**Database:**	USA EDM 5000 Multi Users DB
Reference Design:	Plan #1	**Offset TVD Reference:**	Offset Datum

Offset Design S18-T4N-R66W (Bernhardt) - EATON CATTLE CO. #19-34-5 (EXISTING) - EXISTING - EXISTING

Offset Site Error: 0.0 ft

Survey Program: 8000-Geolink MWD

Offset Well Error: 0.0 ft

Reference Measured Depth (ft)	Reference Vertical Depth (ft)	Offset Measured Depth (ft)	Offset Vertical Depth (ft)	Semi Major Axis Reference (ft)	Semi Major Axis Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Total Uncertainty Axis	Separation Factor	Warning
10,300.0	7,096.6	7,084.6	7,084.6	85.0	12.4	-90.43	852.7	3,686.9	474.7	377.7	96.99	4.894	
10,400.0	7,095.6	7,083.6	7,083.6	87.4	12.4	-90.28	852.7	3,686.9	422.7	323.3	99.44	4.251	
10,500.0	7,094.6	7,082.6	7,082.6	89.8	12.4	-90.13	852.7	3,686.9	390.0	288.1	101.89	3.828	
10,583.1	7,093.7	7,081.7	7,081.7	91.9	12.4	-90.00	852.7	3,686.9	381.1	277.1	103.93	3.666	CC
10,600.0	7,093.5	7,081.5	7,081.5	92.3	12.4	-89.97	852.7	3,686.9	381.4	277.1	104.34	3.655	ES, SF
10,700.0	7,092.5	7,080.5	7,080.5	94.7	12.4	-89.82	852.7	3,686.9	398.6	291.8	106.80	3.732	
10,800.0	7,091.5	7,079.5	7,079.5	97.2	12.4	-89.67	852.7	3,686.9	438.5	329.2	109.25	4.014	
10,900.0	7,090.5	7,078.5	7,078.5	99.6	12.4	-89.52	852.7	3,686.9	495.6	383.9	111.70	4.437	

Company:	K. P. Kauffman Company, Inc.	**Local Co-ordinate Reference:**	Well Bernhardt #18-7H
Project:	Wattenberg	**TVD Reference:**	WELL @ 4730.0ft (Original Well Elev)
Reference Site:	S18-T4N-R66W (Bernhardt)	**MD Reference:**	WELL @ 4730.0ft (Original Well Elev)
Site Error:	0.0ft	**North Reference:**	True
Reference Well:	Bernhardt #18-7H	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.0ft	**Output errors are at**	2.00 sigma
Reference Wellbore	HZ	**Database:**	USA EDM 5000 Multi Users DB
Reference Design:	Plan #1	**Offset TVD Reference:**	Offset Datum

Offset Design S18-T4N-R66W (Bernhardt) - EATON CATTLE CO. UNIT #1 (EXISTING) - EXISTING - EXISTING

Offset Site Error: 0.0 ft

Survey Program: 8000-Geolink MWD

Offset Well Error: 0.0 ft

Reference Measured Depth (ft)	Reference Vertical Depth (ft)	Offset Measured Depth (ft)	Offset Vertical Depth (ft)	Semi Major Axis Reference (ft)	Semi Major Axis Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Total Uncertainty Axis	Separation Factor	Warning
8,000.0	7,119.9	7,107.9	7,107.9	30.5	12.4	91.43	369.8	1,483.2	423.7	381.8	41.88	10.118	
8,100.0	7,118.8	7,106.8	7,106.8	32.7	12.4	91.06	369.8	1,483.2	333.2	289.0	44.15	7.547	
8,200.0	7,117.8	7,105.8	7,105.8	34.9	12.4	90.70	369.8	1,483.2	250.0	203.6	46.45	5.383	
8,300.0	7,116.8	7,104.8	7,104.8	37.2	12.4	90.34	369.8	1,483.2	184.3	135.6	48.77	3.780	
8,392.6	7,115.9	7,103.9	7,103.9	39.3	12.4	90.00	369.8	1,483.2	159.4	108.5	50.93	3.129	CC
8,400.0	7,115.8	7,103.8	7,103.8	39.5	12.4	89.97	369.8	1,483.2	159.6	108.5	51.11	3.122	ES, SF
8,500.0	7,114.8	7,102.8	7,102.8	41.8	12.4	89.61	369.8	1,483.2	192.2	138.7	53.46	3.595	
8,600.0	7,113.8	7,101.8	7,101.8	44.1	12.4	89.25	369.8	1,483.2	261.6	205.7	55.82	4.686	
8,700.0	7,112.8	7,100.8	7,100.8	46.5	12.4	88.88	369.8	1,483.2	346.2	288.0	58.19	5.950	
8,800.0	7,111.8	7,099.8	7,099.8	48.8	12.4	88.52	369.8	1,483.2	437.4	376.9	60.57	7.222	

Company:	K. P. Kauffman Company, Inc.	**Local Co-ordinate Reference:**	Well Bernhardt #18-7H
Project:	Wattenberg	**TVD Reference:**	WELL @ 4730.0ft (Original Well Elev)
Reference Site:	S18-T4N-R66W (Bernhardt)	**MD Reference:**	WELL @ 4730.0ft (Original Well Elev)
Site Error:	0.0ft	**North Reference:**	True
Reference Well:	Bernhardt #18-7H	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.0ft	**Output errors are at**	2.00 sigma
Reference Wellbore	HZ	**Database:**	USA EDM 5000 Multi Users DB
Reference Design:	Plan #1	**Offset TVD Reference:**	Offset Datum

Offset Design S18-T4N-R66W (Bernhardt) - GREENHEAD #14-18 (EXISTING) - EXISTING - EXISTING

Offset Site Error: 0.0 ft

Survey Program: 8000-Geolink MWD

Offset Well Error: 0.0 ft

Reference Measured Depth (ft)	Reference Vertical Depth (ft)	Offset Measured Depth (ft)	Offset Vertical Depth (ft)	Semi Major Axis Reference (ft)	Semi Major Axis Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Total Uncertainty Axis	Separation Factor	Warning
8,200.0	7,117.8	7,105.8	7,105.8	34.9	12.4	90.84	260.2	1,670.9	465.3	418.9	46.45	10.018	
8,300.0	7,116.8	7,104.8	7,104.8	37.2	12.4	90.62	260.2	1,670.9	387.2	338.4	48.77	7.939	
8,400.0	7,115.8	7,103.8	7,103.8	39.5	12.4	90.40	260.2	1,670.9	321.4	270.3	51.11	6.288	
8,500.0	7,114.8	7,102.8	7,102.8	41.8	12.4	90.18	260.2	1,670.9	276.9	223.4	53.46	5.179	
8,583.1	7,114.0	7,102.0	7,102.0	43.7	12.4	90.00	260.2	1,670.9	264.1	208.6	55.43	4.764	CC, ES
8,600.0	7,113.8	7,101.8	7,101.8	44.1	12.4	89.96	260.2	1,670.9	264.6	208.8	55.83	4.740	SF
8,700.0	7,112.8	7,100.8	7,100.8	46.5	12.4	89.74	260.2	1,670.9	288.8	230.6	58.21	4.961	
8,800.0	7,111.8	7,099.8	7,099.8	48.8	12.4	89.52	260.2	1,670.9	341.7	281.1	60.59	5.639	
8,900.0	7,110.8	7,098.8	7,098.8	51.2	12.4	89.30	260.2	1,670.9	412.5	349.5	62.98	6.549	
9,000.0	7,109.7	7,097.7	7,097.7	53.6	12.4	89.08	260.2	1,670.9	493.5	428.1	65.38	7.547	

Company:	K. P. Kauffman Company, Inc.	**Local Co-ordinate Reference:**	Well Bernhardt #18-7H
Project:	Wattenberg	**TVD Reference:**	WELL @ 4730.0ft (Original Well Elev)
Reference Site:	S18-T4N-R66W (Bernhardt)	**MD Reference:**	WELL @ 4730.0ft (Original Well Elev)
Site Error:	0.0ft	**North Reference:**	True
Reference Well:	Bernhardt #18-7H	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.0ft	**Output errors are at**	2.00 sigma
Reference Wellbore	HZ	**Database:**	USA EDM 5000 Multi Users DB
Reference Design:	Plan #1	**Offset TVD Reference:**	Offset Datum

Offset Design S18-T4N-R66W (Bernhardt) - JOHNSON #17-1 (EXISTING) - EXISTING - EXISTING

Offset Site Error: 0.0 ft

Survey Program: 8000-Geolink MWD

Offset Well Error: 0.0 ft

Reference Measured Depth (ft)	Reference Vertical Depth (ft)	Offset Measured Depth (ft)	Offset Vertical Depth (ft)	Semi Major Axis Reference (ft)	Semi Major Axis Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Total Uncertainty Axis	Separation Factor	Warning
12,200.0	7,077.3	7,065.3	7,065.3	131.5	12.3	91.05	207.6	5,671.9	438.9	295.3	143.64	3.056	
12,300.0	7,076.3	7,064.3	7,064.3	134.0	12.3	90.78	207.6	5,671.9	354.6	208.5	146.11	2.427	
12,400.0	7,075.3	7,063.3	7,063.3	136.5	12.3	90.50	207.6	5,671.9	280.9	132.3	148.58	1.891	
12,500.0	7,074.3	7,062.3	7,062.3	138.9	12.3	90.23	207.6	5,671.9	228.1	77.1	151.04	1.510	
12,584.3	7,073.5	7,061.5	7,061.5	141.0	12.3	90.00	207.6	5,671.9	211.9	58.8	153.12	1.384	Level 3, CC, ES, SF
12,600.0	7,073.3	7,061.3	7,061.3	141.4	12.3	89.96	207.6	5,671.9	212.5	59.0	153.50	1.384	Level 3
12,700.0	7,072.3	7,060.3	7,060.3	143.8	12.3	89.68	207.6	5,671.9	241.4	85.4	155.96	1.548	
12,800.0	7,071.3	7,059.3	7,059.3	146.3	12.3	89.41	207.6	5,671.9	302.3	143.9	158.42	1.908	
12,900.0	7,070.3	7,058.3	7,058.3	148.8	12.3	89.14	207.6	5,671.9	380.1	219.3	160.87	2.363	
13,000.0	7,069.2	7,057.2	7,057.2	151.2	12.3	88.86	207.6	5,671.9	466.5	303.2	163.32	2.856	

Company:	K. P. Kauffman Company, Inc.	**Local Co-ordinate Reference:**	Well Bernhardt #18-7H
Project:	Wattenberg	**TVD Reference:**	WELL @ 4730.0ft (Original Well Elev)
Reference Site:	S18-T4N-R66W (Bernhardt)	**MD Reference:**	WELL @ 4730.0ft (Original Well Elev)
Site Error:	0.0ft	**North Reference:**	True
Reference Well:	Bernhardt #18-7H	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.0ft	**Output errors are at**	2.00 sigma
Reference Wellbore	HZ	**Database:**	USA EDM 5000 Multi Users DB
Reference Design:	Plan #1	**Offset TVD Reference:**	Offset Datum

Offset Design S18-T4N-R66W (Bernhardt) - KNUTSON #17-25 (EXISTING) - EXISTING - EXISTING

Offset Site Error: 0.0 ft

Survey Program: 8000-Geolink MWD

Offset Well Error: 0.0 ft

Reference Measured Depth (ft)	Reference Vertical Depth (ft)	Offset Measured Depth (ft)	Offset Vertical Depth (ft)	Semi Major Axis Reference (ft)	Semi Major Axis Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Total Uncertainty Axis	Separation Factor	Warning
12,900.0	7,070.3	7,058.3	7,058.3	148.8	12.3	-90.94	636.2	6,380.5	448.1	287.2	160.87	2.785	
13,000.0	7,069.2	7,057.2	7,057.2	151.2	12.3	-90.69	636.2	6,380.5	366.7	203.4	163.35	2.245	
13,100.0	7,068.2	7,056.2	7,056.2	153.7	12.3	-90.45	636.2	6,380.5	297.0	131.2	165.82	1.791	
13,200.0	7,067.2	7,055.2	7,055.2	156.2	12.3	-90.20	636.2	6,380.5	248.8	80.5	168.29	1.478	Level 3
13,281.5	7,066.4	7,054.4	7,054.4	158.2	12.3	-90.00	636.2	6,380.5	235.1	64.8	170.30	1.380	Level 3, CC, ES, SF
13,300.0	7,066.2	7,054.2	7,054.2	158.6	12.3	-89.95	636.2	6,380.5	235.8	65.0	170.75	1.381	Level 3
13,400.0	7,065.2	7,053.2	7,053.2	161.1	12.3	-89.71	636.2	6,380.5	263.2	90.0	173.22	1.520	
13,500.0	7,064.2	7,052.2	7,052.2	163.5	12.3	-89.46	636.2	6,380.5	320.9	145.2	175.68	1.827	
13,600.0	7,063.2	7,051.2	7,051.2	166.0	12.3	-89.21	636.2	6,380.5	395.8	217.7	178.13	2.222	
13,700.0	7,062.2	7,050.2	7,050.2	168.5	12.3	-88.97	636.2	6,380.5	480.0	299.4	180.59	2.658	

Company:	K. P. Kauffman Company, Inc.	**Local Co-ordinate Reference:**	Well Bernhardt #18-7H
Project:	Wattenberg	**TVD Reference:**	WELL @ 4730.0ft (Original Well Elev)
Reference Site:	S18-T4N-R66W (Bernhardt)	**MD Reference:**	WELL @ 4730.0ft (Original Well Elev)
Site Error:	0.0ft	**North Reference:**	True
Reference Well:	Bernhardt #18-7H	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.0ft	**Output errors are at**	2.00 sigma
Reference Wellbore	HZ	**Database:**	USA EDM 5000 Multi Users DB
Reference Design:	Plan #1	**Offset TVD Reference:**	Offset Datum

Offset Design S18-T4N-R66W (Bernhardt) - MONTGOMERY#1-27 (EXISTING) - EXISTING - EXISTING

Offset Site Error: 0.0 ft

Survey Program: 8000-Geolink MWD

Offset Well Error: 0.0 ft

Reference Measured Depth (ft)	Reference Vertical Depth (ft)	Offset Measured Depth (ft)	Offset Vertical Depth (ft)	Semi Major Axis Reference (ft)	Semi Major Axis Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Total Uncertainty Axis	Separation Factor	Warning
0.0	0.0	0.0	0.0	0.0	0.0	43.32	309.6	292.0	425.8				
100.0	100.0	88.0	88.0	0.2	0.2	43.32	309.6	292.0	425.6	425.3	0.31	1,384.651	
200.0	200.0	188.0	188.0	0.3	0.3	43.32	309.6	292.0	425.6	425.0	0.66	648.359	
300.0	300.0	288.0	288.0	0.5	0.5	43.32	309.6	292.0	425.6	424.6	1.01	423.279	
400.0	400.0	388.0	388.0	0.7	0.7	43.32	309.6	292.0	425.6	424.3	1.35	314.203	
500.0	500.0	488.0	488.0	0.9	0.9	43.32	309.6	292.0	425.6	423.9	1.70	249.825	
600.0	600.0	588.0	588.0	1.0	1.0	43.32	309.6	292.0	425.6	423.6	2.05	207.342	
700.0	700.0	688.0	688.0	1.2	1.2	43.58	309.6	292.0	425.0	422.6	2.40	176.940	
800.0	800.0	788.0	788.0	1.4	1.4	43.84	309.6	292.0	423.1	420.3	2.75	153.755	
900.0	899.9	887.9	887.9	1.6	1.5	44.27	309.6	292.0	419.9	416.8	3.10	135.308	
1,000.0	999.7	987.7	987.7	1.8	1.7	44.89	309.6	292.0	415.6	412.1	3.46	120.135	
1,100.0	1,099.4	1,087.4	1,087.4	2.0	1.9	45.70	309.6	292.0	410.1	406.2	3.82	107.318	
1,200.0	1,199.0	1,187.0	1,187.0	2.2	2.1	46.62	309.6	292.0	403.8	399.6	4.19	96.406	
1,300.0	1,298.6	1,286.6	1,286.6	2.4	2.2	47.56	309.6	292.0	397.7	393.1	4.56	87.194	
1,400.0	1,398.1	1,386.1	1,386.1	2.6	2.4	48.53	309.6	292.0	391.6	386.7	4.94	79.337	
1,500.0	1,497.7	1,485.7	1,485.7	2.8	2.6	49.53	309.6	292.0	385.7	380.4	5.31	72.568	
1,600.0	1,597.3	1,585.3	1,585.3	3.0	2.8	50.57	309.6	292.0	379.9	374.2	5.70	66.684	
1,700.0	1,696.9	1,684.9	1,684.9	3.3	2.9	51.63	309.6	292.0	374.2	368.1	6.08	61.531	
1,800.0	1,796.5	1,784.5	1,784.5	3.5	3.1	52.73	309.6	292.0	368.7	362.2	6.47	56.986	
1,900.0	1,896.1	1,884.1	1,884.1	3.7	3.3	53.86	309.6	292.0	363.3	356.4	6.86	52.953	
2,000.0	1,995.7	1,983.7	1,983.7	3.9	3.5	55.02	309.6	292.0	358.0	350.7	7.25	49.356	
2,100.0	2,095.3	2,083.3	2,083.3	4.2	3.6	56.22	309.6	292.0	352.9	345.2	7.65	46.133	
2,200.0	2,194.9	2,182.9	2,182.9	4.4	3.8	57.45	309.6	292.0	347.9	339.9	8.05	43.233	
2,300.0	2,294.5	2,282.5	2,282.5	4.6	4.0	58.71	309.6	292.0	343.2	334.7	8.45	40.613	
2,400.0	2,394.1	2,382.1	2,382.1	4.9	4.2	60.01	309.6	292.0	338.5	329.7	8.85	38.240	
2,500.0	2,493.7	2,481.7	2,481.7	5.1	4.3	61.35	309.6	292.0	334.1	324.9	9.26	36.084	
2,600.0	2,593.3	2,581.3	2,581.3	5.3	4.5	62.72	309.6	292.0	329.9	320.2	9.67	34.120	
2,700.0	2,692.8	2,680.8	2,680.8	5.6	4.7	64.13	309.6	292.0	325.8	315.7	10.08	32.328	
2,800.0	2,792.4	2,780.4	2,780.4	5.8	4.9	65.57	309.6	292.0	322.0	311.5	10.49	30.689	
2,900.0	2,892.0	2,880.0	2,880.0	6.0	5.0	67.04	309.6	292.0	318.3	307.4	10.91	29.189	
3,000.0	2,991.6	2,979.6	2,979.6	6.3	5.2	68.55	309.6	292.0	314.9	303.6	11.32	27.813	
3,100.0	3,091.2	3,079.2	3,079.2	6.5	5.4	70.08	309.6	292.0	311.7	300.0	11.74	26.551	
3,200.0	3,190.8	3,178.8	3,178.8	6.7	5.5	71.65	309.6	292.0	308.7	296.6	12.16	25.393	
3,300.0	3,290.4	3,278.4	3,278.4	6.9	5.7	73.25	309.6	292.0	306.0	293.4	12.58	24.328	
3,400.0	3,390.0	3,378.0	3,378.0	7.2	5.9	74.87	309.6	292.0	303.5	290.5	13.00	23.351	
3,500.0	3,489.6	3,477.6	3,477.6	7.4	6.1	76.52	309.6	292.0	301.3	287.9	13.42	22.452	
3,600.0	3,589.2	3,577.2	3,577.2	7.6	6.2	78.20	309.6	292.0	299.3	285.5	13.84	21.627	
3,700.0	3,688.8	3,676.8	3,676.8	7.9	6.4	79.89	309.6	292.0	297.6	283.3	14.26	20.870	
3,800.0	3,788.4	3,776.4	3,776.4	8.1	6.6	81.60	309.6	292.0	296.1	281.5	14.68	20.175	
3,900.0	3,888.0	3,876.0	3,876.0	8.3	6.8	83.33	309.6	292.0	294.9	279.8	15.10	19.539	
4,000.0	3,987.5	3,975.5	3,975.5	8.6	6.9	85.07	309.6	292.0	294.0	278.5	15.51	18.956	
4,100.0	4,087.1	4,075.1	4,075.1	8.8	7.1	86.82	309.6	292.0	293.4	277.5	15.92	18.423	
4,200.0	4,186.7	4,174.7	4,174.7	9.1	7.3	88.57	309.6	292.0	293.0	276.7	16.34	17.937	
4,281.3	4,267.7	4,255.7	4,255.7	9.2	7.4	90.00	309.6	292.0	292.9	276.3	16.67	17.574	
4,300.0	4,286.3	4,274.3	4,274.3	9.3	7.5	90.33	309.6	292.0	292.9	276.2	16.74	17.494	
4,400.0	4,385.9	4,373.9	4,373.9	9.5	7.6	92.09	309.6	292.0	293.1	276.0	17.15	17.092	
4,500.0	4,485.5	4,473.5	4,473.5	9.8	7.8	93.84	309.6	292.0	293.6	276.0	17.55	16.727	
4,600.0	4,585.1	4,573.1	4,573.1	10.0	8.0	95.58	309.6	292.0	294.3	276.4	17.95	16.397	
4,700.0	4,684.7	4,672.7	4,672.7	10.2	8.2	97.32	309.6	292.0	295.4	277.0	18.35	16.099	
4,800.0	4,784.3	4,772.3	4,772.3	10.5	8.3	99.04	309.6	292.0	296.6	277.9	18.74	15.832	
4,900.0	4,883.9	4,871.9	4,871.9	10.7	8.5	100.75	309.6	292.0	298.2	279.1	19.12	15.593	
5,000.0	4,983.5	4,971.5	4,971.5	10.9	8.7	102.43	309.6	292.0	300.0	280.5	19.51	15.381	

Company:	K. P. Kauffman Company, Inc.	**Local Co-ordinate Reference:**	Well Bernhardt #18-7H
Project:	Wattenberg	**TVD Reference:**	WELL @ 4730.0ft (Original Well Elev)
Reference Site:	S18-T4N-R66W (Bernhardt)	**MD Reference:**	WELL @ 4730.0ft (Original Well Elev)
Site Error:	0.0ft	**North Reference:**	True
Reference Well:	Bernhardt #18-7H	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.0ft	**Output errors are at**	2.00 sigma
Reference Wellbore	HZ	**Database:**	USA EDM 5000 Multi Users DB
Reference Design:	Plan #1	**Offset TVD Reference:**	Offset Datum

Offset Design S18-T4N-R66W (Bernhardt) - MONTGOMERY#1-27 (EXISTING) - EXISTING - EXISTING

Offset Site Error: 0.0 ft

Survey Program: 8000-Geolink MWD

Offset Well Error: 0.0 ft

Reference Measured Depth (ft)	Reference Vertical Depth (ft)	Offset Measured Depth (ft)	Offset Vertical Depth (ft)	Semi Major Axis Reference (ft)	Semi Major Axis Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Total Uncertainty Axis	Separation Factor	Warning
5,100.0	5,083.1	5,071.1	5,071.1	11.2	8.9	104.10	309.6	292.0	302.1	282.2	19.88	15.192	
5,200.0	5,182.7	5,170.7	5,170.7	11.4	9.0	105.74	309.6	292.0	304.4	284.2	20.26	15.027	
5,300.0	5,282.2	5,270.2	5,270.2	11.6	9.2	107.35	309.6	292.0	307.0	286.4	20.63	14.882	
5,400.0	5,381.8	5,369.8	5,369.8	11.9	9.4	108.94	309.6	292.0	309.8	288.8	21.00	14.757	
5,500.0	5,481.4	5,469.4	5,469.4	12.1	9.5	110.50	309.6	292.0	312.9	291.5	21.36	14.649	
5,600.0	5,581.0	5,569.0	5,569.0	12.3	9.7	112.02	309.6	292.0	316.2	294.4	21.72	14.558	
5,700.0	5,680.6	5,668.6	5,668.6	12.6	9.9	113.52	309.6	292.0	319.7	297.6	22.07	14.483	
5,800.0	5,780.2	5,768.2	5,768.2	12.8	10.1	114.98	309.6	292.0	323.4	301.0	22.42	14.422	
5,900.0	5,879.8	5,867.8	5,867.8	13.0	10.2	116.40	309.6	292.0	327.3	304.5	22.77	14.373	
6,000.0	5,979.4	5,967.4	5,967.4	13.3	10.4	117.80	309.6	292.0	331.4	308.3	23.12	14.337	
6,100.0	6,079.0	6,067.0	6,067.0	13.5	10.6	119.15	309.6	292.0	335.7	312.3	23.46	14.311	
6,200.0	6,178.6	6,166.6	6,166.6	13.7	10.8	120.48	309.6	292.0	340.2	316.4	23.80	14.296	
6,300.0	6,278.2	6,266.2	6,266.2	14.0	10.9	121.76	309.6	292.0	344.9	320.8	24.14	14.290	
6,400.0	6,377.8	6,365.8	6,365.8	14.2	11.1	123.02	309.6	292.0	349.8	325.3	24.47	14.292	
6,500.0	6,477.4	6,465.4	6,465.4	14.4	11.3	124.24	309.6	292.0	354.8	330.0	24.81	14.301	
6,600.0	6,576.9	6,564.9	6,564.9	14.7	11.5	100.33	309.6	292.0	359.5	334.4	25.15	14.297	
6,700.0	6,675.6	6,663.6	6,663.6	14.9	11.6	59.53	309.6	292.0	354.4	329.1	25.27	14.023	
6,800.0	6,770.6	6,758.6	6,758.6	15.1	11.8	55.11	309.6	292.0	336.5	311.4	25.08	13.413	
6,900.0	6,859.0	6,847.0	6,847.0	15.4	12.0	59.70	309.6	292.0	308.9	284.0	24.89	12.411	
7,000.0	6,938.2	6,926.2	6,926.2	15.8	12.1	69.41	309.6	292.0	277.4	252.4	25.08	11.060	
7,100.0	7,005.7	6,993.7	6,993.7	16.3	12.2	81.55	309.6	292.0	251.5	225.8	25.75	9.769	
7,176.9	7,048.4	7,036.4	7,036.4	16.8	12.3	90.00	309.6	292.0	243.8	217.4	26.42	9.229	CC, ES
7,200.0	7,059.5	7,047.5	7,047.5	17.0	12.3	92.08	309.6	292.0	244.6	218.0	26.60	9.198	SF
7,300.0	7,098.0	7,086.0	7,086.0	18.0	12.4	97.54	309.6	292.0	267.3	239.6	27.70	9.649	
7,400.0	7,119.9	7,107.9	7,107.9	19.2	12.4	96.19	309.6	292.0	318.3	288.9	29.40	10.825	
7,500.0	7,124.9	7,112.9	7,112.9	20.8	12.4	89.31	309.6	292.0	388.4	357.1	31.31	12.405	
7,600.0	7,123.9	7,111.9	7,111.9	22.5	12.4	89.08	309.6	292.0	469.2	435.9	33.26	14.107	

Company:	K. P. Kauffman Company, Inc.	**Local Co-ordinate Reference:**	Well Bernhardt #18-7H
Project:	Wattenberg	**TVD Reference:**	WELL @ 4730.0ft (Original Well Elev)
Reference Site:	S18-T4N-R66W (Bernhardt)	**MD Reference:**	WELL @ 4730.0ft (Original Well Elev)
Site Error:	0.0ft	**North Reference:**	True
Reference Well:	Bernhardt #18-7H	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.0ft	**Output errors are at**	2.00 sigma
Reference Wellbore	HZ	**Database:**	USA EDM 5000 Multi Users DB
Reference Design:	Plan #1	**Offset TVD Reference:**	Offset Datum

Offset Design S18-T4N-R66W (Bernhardt) - OWENS K #17-15 (EXISTING) - EXISTING - EXISTING

Offset Site Error: 0.0 ft

Survey Program: 8000-Geolink MWD

Offset Well Error: 0.0 ft

Reference Measured Depth (ft)	Reference Vertical Depth (ft)	Offset Measured Depth (ft)	Offset Vertical Depth (ft)	Semi Major Axis Reference (ft)	Semi Major Axis Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Total Uncertainty Axis	Separation Factor	Warning
15,000.0	7,049.0	7,037.0	7,037.0	200.5	12.3	91.30	168.3	8,485.4	435.9	223.2	212.63	2.050	
15,100.0	7,048.0	7,036.0	7,036.0	203.0	12.3	90.97	168.3	8,485.4	346.9	131.8	215.12	1.613	
15,200.0	7,047.0	7,035.0	7,035.0	205.5	12.3	90.65	168.3	8,485.4	266.0	48.4	217.60	1.222	Level 2
15,300.0	7,046.0	7,034.0	7,034.0	207.9	12.3	90.32	168.3	8,485.4	202.8	-17.3	220.08	0.922	Level 1
15,398.1	7,045.0	7,033.0	7,033.0	210.4	12.3	90.00	168.3	8,485.4	177.5	-45.0	222.50	0.798	Level 1, CC
15,400.0	7,045.0	7,033.0	7,033.0	210.4	12.3	89.99	168.3	8,485.4	177.5	-45.0	222.55	0.798	Level 1, ES, SF
15,500.0	7,043.9	7,031.9	7,031.9	212.9	12.3	89.67	168.3	8,485.4	204.7	-20.3	225.01	0.910	Level 1
15,600.0	7,042.9	7,030.9	7,030.9	215.3	12.3	89.34	168.3	8,485.4	268.8	41.4	227.47	1.182	Level 2
15,700.0	7,041.9	7,029.9	7,029.9	217.8	12.3	89.01	168.3	8,485.4	350.2	120.3	229.92	1.523	
15,800.0	7,040.9	7,028.9	7,028.9	220.3	12.3	88.69	168.3	8,485.4	439.3	207.0	232.36	1.891	

Company:	K. P. Kauffman Company, Inc.	**Local Co-ordinate Reference:**	Well Bernhardt #18-7H
Project:	Wattenberg	**TVD Reference:**	WELL @ 4730.0ft (Original Well Elev)
Reference Site:	S18-T4N-R66W (Bernhardt)	**MD Reference:**	WELL @ 4730.0ft (Original Well Elev)
Site Error:	0.0ft	**North Reference:**	True
Reference Well:	Bernhardt #18-7H	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.0ft	**Output errors are at**	2.00 sigma
Reference Wellbore	HZ	**Database:**	USA EDM 5000 Multi Users DB
Reference Design:	Plan #1	**Offset TVD Reference:**	Offset Datum

Offset Design S18-T4N-R66W (Bernhardt) - OWENS K #17-23D (EXISTING) - EXISTING - EXISTING

Offset Site Error: 0.0 ft

Survey Program: 8000-Geolink MWD

Offset Well Error: 0.0 ft

Reference Measured Depth (ft)	Reference Vertical Depth (ft)	Offset Measured Depth (ft)	Offset Vertical Depth (ft)	Semi Major Axis Reference (ft)	Semi Major Axis Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Total Uncertainty Axis	Separation Factor	Warning
15,000.0	7,049.0	7,037.0	7,037.0	200.5	12.3	91.14	143.2	8,484.9	446.8	234.2	212.64	2.101	
15,100.0	7,048.0	7,036.0	7,036.0	203.0	12.3	90.85	143.2	8,484.9	360.5	145.4	215.13	1.676	
15,200.0	7,047.0	7,035.0	7,035.0	205.5	12.3	90.57	143.2	8,484.9	283.5	65.9	217.61	1.303	Level 3
15,300.0	7,046.0	7,034.0	7,034.0	207.9	12.3	90.28	143.2	8,484.9	225.2	5.1	220.08	1.023	Level 2
15,398.2	7,045.0	7,033.0	7,033.0	210.4	12.3	90.00	143.2	8,484.9	202.7	-19.8	222.51	0.911	Level 1, CC
15,400.0	7,045.0	7,033.0	7,033.0	210.4	12.3	89.99	143.2	8,484.9	202.7	-19.9	222.55	0.911	Level 1, ES, SF
15,500.0	7,043.9	7,031.9	7,031.9	212.9	12.3	89.71	143.2	8,484.9	226.8	1.8	225.01	1.008	Level 2
15,600.0	7,042.9	7,030.9	7,030.9	215.3	12.3	89.42	143.2	8,484.9	286.0	58.5	227.47	1.257	Level 3
15,700.0	7,041.9	7,029.9	7,029.9	217.8	12.3	89.14	143.2	8,484.9	363.5	133.6	229.93	1.581	
15,800.0	7,040.9	7,028.9	7,028.9	220.3	12.3	88.85	143.2	8,484.9	450.0	217.6	232.37	1.936	

Company:	K. P. Kauffman Company, Inc.	**Local Co-ordinate Reference:**	Well Bernhardt #18-7H
Project:	Wattenberg	**TVD Reference:**	WELL @ 4730.0ft (Original Well Elev)
Reference Site:	S18-T4N-R66W (Bernhardt)	**MD Reference:**	WELL @ 4730.0ft (Original Well Elev)
Site Error:	0.0ft	**North Reference:**	True
Reference Well:	Bernhardt #18-7H	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.0ft	**Output errors are at**	2.00 sigma
Reference Wellbore	HZ	**Database:**	USA EDM 5000 Multi Users DB
Reference Design:	Plan #1	**Offset TVD Reference:**	Offset Datum

Offset Design S18-T4N-R66W (Bernhardt) - PHELPS #1-13 (EXISTING) - EXISTING - EXISTING

Offset Site Error: 0.0 ft

Survey Program: 8000-Geolink MWD

Offset Well Error: 0.0 ft

Reference Measured Depth (ft)	Reference Vertical Depth (ft)	Offset Measured Depth (ft)	Offset Vertical Depth (ft)	Semi Major Axis Reference (ft)	Semi Major Axis Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Total Uncertainty Axis	Separation Factor	Warning
11,000.0	7,089.5	7,077.5	7,077.5	102.1	12.4	90.63	150.5	4,414.6	446.5	332.4	114.15	3.912	
11,100.0	7,088.5	7,076.5	7,076.5	104.5	12.4	90.44	150.5	4,414.6	378.9	262.3	116.61	3.249	
11,200.0	7,087.5	7,075.5	7,075.5	107.0	12.3	90.25	150.5	4,414.6	328.3	209.2	119.06	2.757	
11,300.0	7,086.5	7,074.5	7,074.5	109.4	12.3	90.06	150.5	4,414.6	303.3	181.8	121.52	2.496	
11,329.0	7,086.2	7,074.2	7,074.2	110.1	12.3	90.00	150.5	4,414.6	301.9	179.7	122.23	2.470	CC, ES, SF
11,400.0	7,085.4	7,073.4	7,073.4	111.9	12.3	89.86	150.5	4,414.6	310.1	186.2	123.98	2.501	
11,500.0	7,084.4	7,072.4	7,072.4	114.3	12.3	89.67	150.5	4,414.6	347.0	220.5	126.43	2.744	
11,600.0	7,083.4	7,071.4	7,071.4	116.8	12.3	89.48	150.5	4,414.6	405.7	276.8	128.89	3.148	
11,700.0	7,082.4	7,070.4	7,070.4	119.2	12.3	89.29	150.5	4,414.6	478.3	347.0	131.34	3.642	

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

Company:	K. P. Kauffman Company, Inc.	**Local Co-ordinate Reference:**	Well Bernhardt #18-7H
Project:	Wattenberg	**TVD Reference:**	WELL @ 4730.0ft (Original Well Elev)
Reference Site:	S18-T4N-R66W (Bernhardt)	**MD Reference:**	WELL @ 4730.0ft (Original Well Elev)
Site Error:	0.0ft	**North Reference:**	True
Reference Well:	Bernhardt #18-7H	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.0ft	**Output errors are at**	2.00 sigma
Reference Wellbore	HZ	**Database:**	USA EDM 5000 Multi Users DB
Reference Design:	Plan #1	**Offset TVD Reference:**	Offset Datum

Offset Design S18-T4N-R66W (Bernhardt) - RICHARDSON #17-14 (EXISTING) - EXISTING - EXISTING

Offset Site Error: 0.0 ft

Survey Program: 8000-Geolink MWD

Offset Well Error: 0.0 ft

Reference Measured Depth (ft)	Reference Vertical Depth (ft)	Offset Measured Depth (ft)	Offset Vertical Depth (ft)	Semi Major Axis Reference (ft)	Semi Major Axis Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Total Uncertainty Axis	Separation Factor	Warning
13,700.0	7,062.2	7,050.2	7,050.2	168.5	12.3	90.29	-40.9	6,991.4	474.7	294.1	180.61	2.629	
13,800.0	7,061.1	7,049.1	7,049.1	170.9	12.3	90.15	-40.9	6,991.4	439.7	256.7	183.08	2.402	
13,900.0	7,060.1	7,048.1	7,048.1	173.4	12.3	90.01	-40.9	6,991.4	425.9	240.3	185.54	2.295	
13,910.0	7,060.0	7,048.0	7,048.0	173.7	12.3	90.00	-40.9	6,991.4	425.8	240.0	185.79	2.292	CC, ES, SF
14,000.0	7,059.1	7,047.1	7,047.1	175.9	12.3	89.88	-40.9	6,991.4	435.2	247.1	188.01	2.315	
14,100.0	7,058.1	7,046.1	7,046.1	178.3	12.3	89.74	-40.9	6,991.4	466.2	275.7	190.47	2.448	

Company:	K. P. Kauffman Company, Inc.	**Local Co-ordinate Reference:**	Well Bernhardt #18-7H
Project:	Wattenberg	**TVD Reference:**	WELL @ 4730.0ft (Original Well Elev)
Reference Site:	S18-T4N-R66W (Bernhardt)	**MD Reference:**	WELL @ 4730.0ft (Original Well Elev)
Site Error:	0.0ft	**North Reference:**	True
Reference Well:	Bernhardt #18-7H	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.0ft	**Output errors are at**	2.00 sigma
Reference Wellbore	HZ	**Database:**	USA EDM 5000 Multi Users DB
Reference Design:	Plan #1	**Offset TVD Reference:**	Offset Datum

Offset Design S18-T4N-R66W (Bernhardt) - RICHARDSON K #17-14X (EXISTING) - EXISTING - EXISTING

Offset Site Error: 0.0 ft

Survey Program: 8000-Geolink MWD

Offset Well Error: 0.0 ft

Reference Measured Depth (ft)	Reference Vertical Depth (ft)	Offset Measured Depth (ft)	Offset Vertical Depth (ft)	Semi Major Axis Reference (ft)	Semi Major Axis Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Total Uncertainty Axis	Separation Factor	Warning
13,700.0	7,062.2	7,050.2	7,050.2	168.5	12.3	90.32	-37.6	7,013.7	481.6	301.0	180.61	2.666	
13,800.0	7,061.1	7,049.1	7,049.1	170.9	12.3	90.18	-37.6	7,013.7	442.1	259.0	183.08	2.415	
13,900.0	7,060.1	7,048.1	7,048.1	173.4	12.3	90.04	-37.6	7,013.7	423.1	237.6	185.54	2.280	
13,932.2	7,059.8	7,047.8	7,047.8	174.2	12.3	90.00	-37.6	7,013.7	421.9	235.5	186.34	2.264	CC, ES, SF
14,000.0	7,059.1	7,047.1	7,047.1	175.9	12.3	89.91	-37.6	7,013.7	427.3	239.3	188.01	2.273	
14,100.0	7,058.1	7,046.1	7,046.1	178.3	12.3	89.77	-37.6	7,013.7	454.0	263.5	190.47	2.384	
14,200.0	7,057.1	7,045.1	7,045.1	180.8	12.3	89.63	-37.6	7,013.7	499.7	306.7	192.94	2.590	

Company:	K. P. Kauffman Company, Inc.	**Local Co-ordinate Reference:**	Well Bernhardt #18-7H
Project:	Wattenberg	**TVD Reference:**	WELL @ 4730.0ft (Original Well Elev)
Reference Site:	S18-T4N-R66W (Bernhardt)	**MD Reference:**	WELL @ 4730.0ft (Original Well Elev)
Site Error:	0.0ft	**North Reference:**	True
Reference Well:	Bernhardt #18-7H	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.0ft	**Output errors are at**	2.00 sigma
Reference Wellbore	HZ	**Database:**	USA EDM 5000 Multi Users DB
Reference Design:	Plan #1	**Offset TVD Reference:**	Offset Datum

Offset Design S18-T4N-R66W (Bernhardt) - UPRC #17-1616 (EXISTING) - EXISTING - EXISTING

Offset Site Error: 0.0 ft

Survey Program: 8000-Geolink MWD

Offset Well Error: 0.0 ft

Reference Measured Depth (ft)	Reference Vertical Depth (ft)	Offset Measured Depth (ft)	Offset Vertical Depth (ft)	Semi Major Axis Reference (ft)	Semi Major Axis Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Total Uncertainty Axis	Separation Factor	Warning
16,100.0	7,037.9	7,025.9	7,025.9	227.7	12.3	-145.35	318.8	9,638.6	447.0	306.7	140.27	3.187	
16,200.0	7,036.9	7,024.9	7,024.9	230.2	12.3	-138.32	318.8	9,638.6	347.0	183.1	163.94	2.117	
16,300.0	7,035.8	7,023.8	7,023.8	232.6	12.3	-128.64	318.8	9,638.6	247.0	54.1	192.87	1.281	Level 3
16,400.0	7,034.8	7,022.8	7,022.8	235.1	12.3	-115.45	318.8	9,638.6	147.0	-76.9	223.94	0.657	Level 1
16,500.0	7,033.8	7,021.8	7,021.8	237.6	12.3	-98.65	318.8	9,638.6	47.1	-199.8	246.93	0.191	Level 1
16,533.3	7,033.5	7,021.5	7,021.5	238.4	12.3	-92.54	318.8	9,638.6	14.1	-236.2	250.28	0.056	Level 1, CC, ES, SF

Company:	K. P. Kauffman Company, Inc.	**Local Co-ordinate Reference:**	Well Bernhardt #18-7H
Project:	Wattenberg	**TVD Reference:**	WELL @ 4730.0ft (Original Well Elev)
Reference Site:	S18-T4N-R66W (Bernhardt)	**MD Reference:**	WELL @ 4730.0ft (Original Well Elev)
Site Error:	0.0ft	**North Reference:**	True
Reference Well:	Bernhardt #18-7H	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.0ft	**Output errors are at**	2.00 sigma
Reference Wellbore	HZ	**Database:**	USA EDM 5000 Multi Users DB
Reference Design:	Plan #1	**Offset TVD Reference:**	Offset Datum

Reference Depths are relative to WELL @ 4730.0ft (Original Well Elev)	Coordinates are relative to: Bernhardt #18-7H
Offset Depths are relative to Offset Datum	Coordinate System is US State Plane 1983, Colorado Northern Zone
Central Meridian is -105.500000 °	Grid Convergence at Surface is: 0.43°