ENSIGN Directional

Well Name: Campbell JF 17-8D

Surface Location: Campbell JF 17-6D Pad Sec.17-T2N-R65W

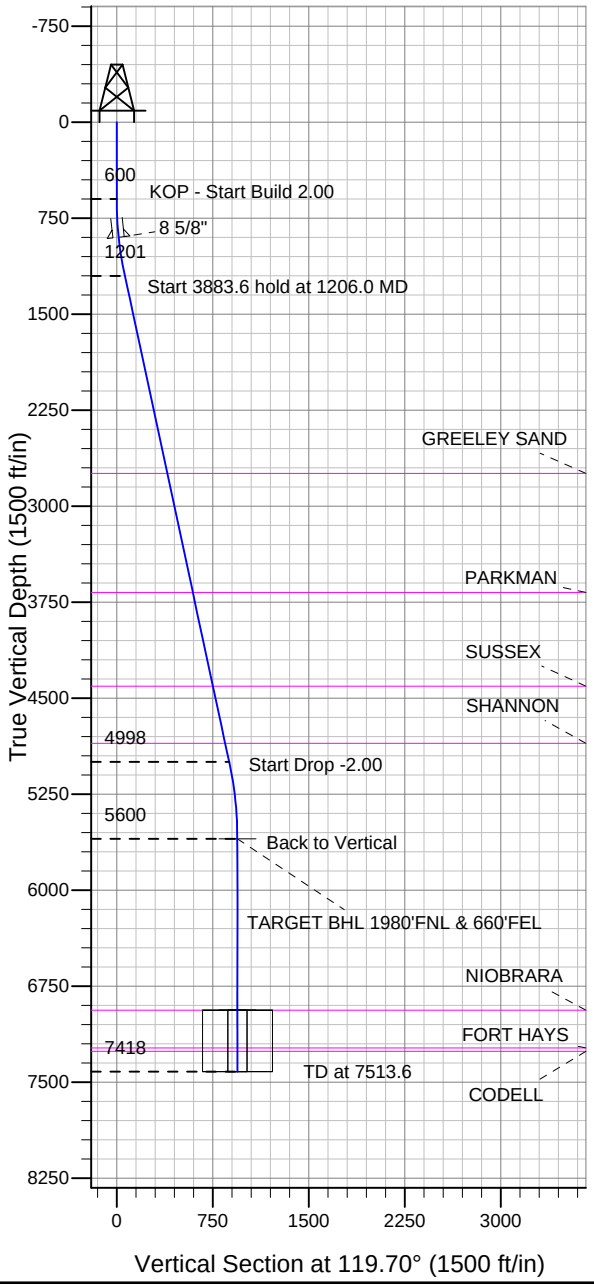
North American Datum 1983 US State Plane 1983 Colorado Northern Zone

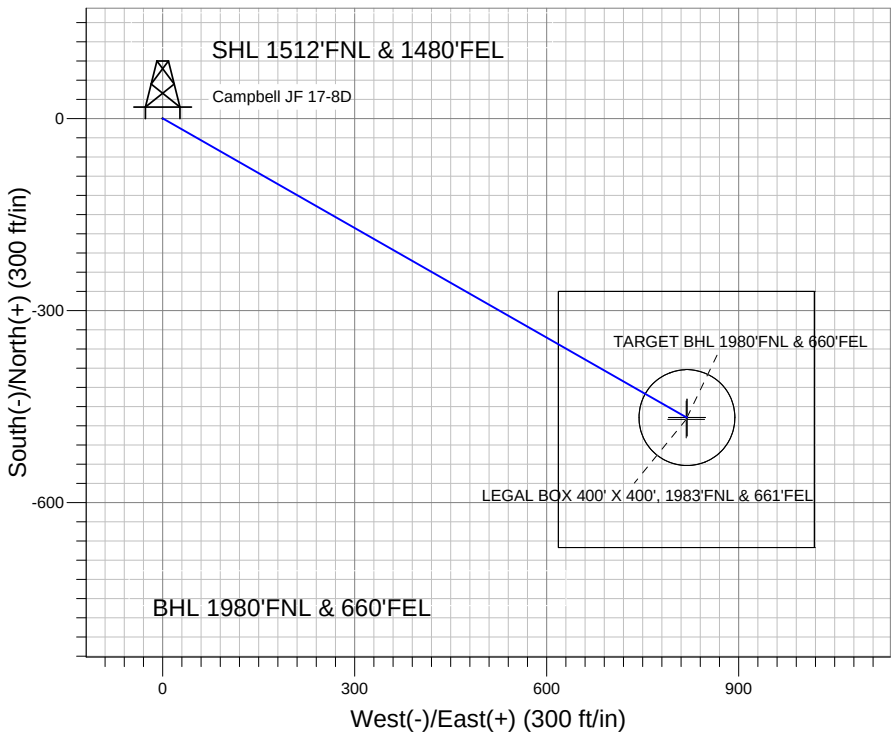
Ground Elevation: 4916.0

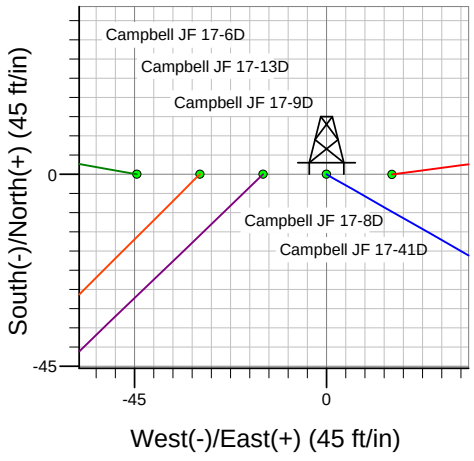
+N/-S	+E/-W	Northing	Easting	Latittude	Longitude	Slot
0.0	0.0	1295554.56	3228212.30	40.141808	-104.683694	

Original Well Elev WELL @ 4930.0ft (Original Well Elev)

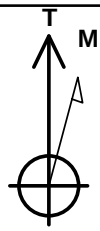
Great Western







Campbell JF 17-6D Pad Sec.17-T2N-R65W
Campbell JF 17-8D
Plan #1 (10-04-12)



Azimuths to True North
Magnetic North: 8.62°

Magnetic Field
Strength: 52865.8snT
Dip Angle: 66.81°
Date: 10/5/2012
Model: IGRF2010

WELLBORE TARGET DETAILS (LAT/LONG)

Name	TVD	+N/-S	+E/-W	Latitude	Longitude	Shape
TARGET BHL 1980'FNL & 660'FEL	5600.0	-467.3	819.2	40.140525	-104.680764	Point
LEGAL BOX 400' X 400', 1983'FNL & 661'FEL	6938.0	-470.3	818.2	40.140517	-104.680768	Rectangle (Sides: L400.0 W400.0)
TARGET CIRCLE 1980'FNL & 660'FEL	6938.0	-467.3	819.2	40.140525	-104.680764	Circle (Radius: 75.0)

SECTION DETAILS

Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	DLeg	TFace	VSec	Target
1	0.0	0.00	0.00	0.0	0.0	0.0	0.00	0.00	0.0	
2	600.0	0.00	0.00	600.0	0.0	0.0	0.00	0.00	0.0	
3	1206.0	12.12	119.70	1201.5	-31.6	55.5	2.00	119.70	63.9	
4	5089.6	12.12	119.70	4998.5	-435.7	763.7	0.00	0.00	879.3	
5	5695.6	0.00	0.00	5600.0	-467.3	819.2	2.00	180.00	943.1	TARGET BHL 1980'FNL & 660'FEL
6	7513.6	0.00	0.00	7418.0	-467.3	819.2	0.00	0.00	943.1	

ENSIGN Directional

Great Western

SEC.17-T2N-R65W
Campbell JF 17-6D Pad Sec.17-T2N-R65W
Campbell JF 17-8D

Wellbore #1

Plan: Plan #1 (10-04-12)

Standard Planning Report

05 October, 2012

Database:	Landmark	**Local Co-ordinate Reference:**	Well Campbell JF 17-8D
Company:	Great Western	**TVD Reference:**	WELL @ 4930.0ft (Original Well Elev)
Project:	SEC.17-T2N-R65W	**MD Reference:**	WELL @ 4930.0ft (Original Well Elev)
Site:	Campbell JF 17-6D Pad Sec.17-T2N-R65W	**North Reference:**	True
Well:	Campbell JF 17-8D	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Plan #1 (10-04-12)		

Project SEC.17-T2N-R65W, Weld County, CO

Map System:	US State Plane 1983	**System Datum:**	Mean Sea Level
Geo Datum:	North American Datum 1983		Using Well Reference Point
Map Zone:	Colorado Northern Zone		Using geodetic scale factor

Site Campbell JF 17-6D Pad Sec.17-T2N-R65W

Site Position:		**Northing:**	1,295,554.20 ft	**Latitude:**	40.141808
From:	Lat/Long	**Easting:**	3,228,167.85 ft	**Longitude:**	-104.683853
Position Uncertainty:	0.0 ft	**Slot Radius:**	"	**Grid Convergence:**	0.53 °

Well Campbell JF 17-8D

Well Position	**+N/-S**	-0.1 ft	**Northing:**	1,295,554.56 ft	**Latitude:**	40.141808
	+E/-W	44.5 ft	**Easting:**	3,228,212.30 ft	**Longitude:**	-104.683694
Position Uncertainty		0.0 ft	**Wellhead Elevation:**	ft	**Ground Level:**	4,916.0 ft

Wellbore Wellbore #1

Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	10/5/2012	8.62	66.81	52,866

Design Plan #1 (10-04-12)

Audit Notes:

Version:		**Phase:**	PROTOTYPE	**Tie On Depth:**	0.0

Vertical Section:	Depth From (TVD) (ft)	+N/-S (ft)	+E/-W (ft)	Direction (°)
	0.0	0.0	0.0	119.70

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	
1,206.0	12.12	119.70	1,201.5	-31.6	55.5	2.00	2.00	0.00	119.70	
5,089.6	12.12	119.70	4,998.5	-435.7	763.7	0.00	0.00	0.00	0.00	
5,695.6	0.00	0.00	5,600.0	-467.3	819.2	2.00	-2.00	0.00	180.00	TARGET BHL 198(
7,513.6	0.00	0.00	7,418.0	-467.3	819.2	0.00	0.00	0.00	0.00	

Database:	Landmark	**Local Co-ordinate Reference:**	Well Campbell JF 17-8D
Company:	Great Western	**TVD Reference:**	WELL @ 4930.0ft (Original Well Elev)
Project:	SEC.17-T2N-R65W	**MD Reference:**	WELL @ 4930.0ft (Original Well Elev)
Site:	Campbell JF 17-6D Pad Sec.17-T2N-R65W	**North Reference:**	True
Well:	Campbell JF 17-8D	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Plan #1 (10-04-12)		

Planned Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
0.0	0.00	0.00	0.0	0.0	0.0	0.0	0.00	0.00	0.00
40.0	0.00	0.00	40.0	0.0	0.0	0.0	0.00	0.00	0.00
80.0	0.00	0.00	80.0	0.0	0.0	0.0	0.00	0.00	0.00
120.0	0.00	0.00	120.0	0.0	0.0	0.0	0.00	0.00	0.00
160.0	0.00	0.00	160.0	0.0	0.0	0.0	0.00	0.00	0.00
200.0	0.00	0.00	200.0	0.0	0.0	0.0	0.00	0.00	0.00
240.0	0.00	0.00	240.0	0.0	0.0	0.0	0.00	0.00	0.00
280.0	0.00	0.00	280.0	0.0	0.0	0.0	0.00	0.00	0.00
320.0	0.00	0.00	320.0	0.0	0.0	0.0	0.00	0.00	0.00
360.0	0.00	0.00	360.0	0.0	0.0	0.0	0.00	0.00	0.00
400.0	0.00	0.00	400.0	0.0	0.0	0.0	0.00	0.00	0.00
440.0	0.00	0.00	440.0	0.0	0.0	0.0	0.00	0.00	0.00
480.0	0.00	0.00	480.0	0.0	0.0	0.0	0.00	0.00	0.00
520.0	0.00	0.00	520.0	0.0	0.0	0.0	0.00	0.00	0.00
560.0	0.00	0.00	560.0	0.0	0.0	0.0	0.00	0.00	0.00
600.0	0.00	0.00	600.0	0.0	0.0	0.0	0.00	0.00	0.00
KOP - Start Build 2.00									
640.0	0.80	119.70	640.0	-0.1	0.2	0.3	2.00	2.00	0.00
680.0	1.60	119.70	680.0	-0.6	1.0	1.1	2.00	2.00	0.00
720.0	2.40	119.70	720.0	-1.2	2.2	2.5	2.00	2.00	0.00
760.0	3.20	119.70	759.9	-2.2	3.9	4.5	2.00	2.00	0.00
800.0	4.00	119.70	799.8	-3.5	6.1	7.0	2.00	2.00	0.00
840.0	4.80	119.70	839.7	-5.0	8.7	10.0	2.00	2.00	0.00
880.0	5.60	119.70	879.6	-6.8	11.9	13.7	2.00	2.00	0.00
900.6	6.01	119.70	900.0	-7.8	13.7	15.8	2.00	2.00	0.00
8 5/8"									
920.0	6.40	119.70	919.3	-8.8	15.5	17.9	2.00	2.00	0.00
960.0	7.20	119.70	959.1	-11.2	19.6	22.6	2.00	2.00	0.00
1,000.0	8.00	119.70	998.7	-13.8	24.2	27.9	2.00	2.00	0.00
1,040.0	8.80	119.70	1,038.3	-16.7	29.3	33.7	2.00	2.00	0.00
1,080.0	9.60	119.70	1,077.8	-19.9	34.8	40.1	2.00	2.00	0.00
1,120.0	10.40	119.70	1,117.1	-23.3	40.9	47.1	2.00	2.00	0.00
1,160.0	11.20	119.70	1,156.4	-27.0	47.4	54.6	2.00	2.00	0.00
1,200.0	12.00	119.70	1,195.6	-31.0	54.4	62.6	2.00	2.00	0.00
1,206.0	12.12	119.70	1,201.5	-31.6	55.5	63.9	2.00	2.00	0.00
Start 3883.6 hold at 1206.0 MD									
1,240.0	12.12	119.70	1,234.7	-35.2	61.7	71.0	0.00	0.00	0.00
1,280.0	12.12	119.70	1,273.8	-39.3	69.0	79.4	0.00	0.00	0.00
1,320.0	12.12	119.70	1,312.9	-43.5	76.3	87.8	0.00	0.00	0.00
1,360.0	12.12	119.70	1,352.1	-47.7	83.6	96.2	0.00	0.00	0.00
1,400.0	12.12	119.70	1,391.2	-51.8	90.8	104.6	0.00	0.00	0.00
1,440.0	12.12	119.70	1,430.3	-56.0	98.1	113.0	0.00	0.00	0.00
1,480.0	12.12	119.70	1,469.4	-60.1	105.4	121.4	0.00	0.00	0.00
1,520.0	12.12	119.70	1,508.5	-64.3	112.7	129.8	0.00	0.00	0.00
1,560.0	12.12	119.70	1,547.6	-68.5	120.0	138.2	0.00	0.00	0.00
1,600.0	12.12	119.70	1,586.7	-72.6	127.3	146.6	0.00	0.00	0.00
1,640.0	12.12	119.70	1,625.8	-76.8	134.6	155.0	0.00	0.00	0.00
1,680.0	12.12	119.70	1,664.9	-81.0	141.9	163.4	0.00	0.00	0.00
1,720.0	12.12	119.70	1,704.0	-85.1	149.2	171.8	0.00	0.00	0.00
1,760.0	12.12	119.70	1,743.1	-89.3	156.5	180.2	0.00	0.00	0.00
1,800.0	12.12	119.70	1,782.3	-93.4	163.8	188.6	0.00	0.00	0.00
1,840.0	12.12	119.70	1,821.4	-97.6	171.1	197.0	0.00	0.00	0.00
1,880.0	12.12	119.70	1,860.5	-101.8	178.4	205.4	0.00	0.00	0.00

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Project:	SEC.17-T2N-R65W	**MD Reference:**	WELL @ 4930.0ft (Original Well Elev)
Site:	Campbell JF 17-6D Pad Sec.17-T2N-R65W	**North Reference:**	True
Well:	Campbell JF 17-8D	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Plan #1 (10-04-12)		

Planned Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
1,920.0	12.12	119.70	1,899.6	-105.9	185.7	213.8	0.00	0.00	0.00
1,960.0	12.12	119.70	1,938.7	-110.1	193.0	222.2	0.00	0.00	0.00
2,000.0	12.12	119.70	1,977.8	-114.2	200.3	230.6	0.00	0.00	0.00
2,040.0	12.12	119.70	2,016.9	-118.4	207.6	239.0	0.00	0.00	0.00
2,080.0	12.12	119.70	2,056.0	-122.6	214.9	247.4	0.00	0.00	0.00
2,120.0	12.12	119.70	2,095.1	-126.7	222.2	255.8	0.00	0.00	0.00
2,160.0	12.12	119.70	2,134.2	-130.9	229.4	264.2	0.00	0.00	0.00
2,200.0	12.12	119.70	2,173.3	-135.1	236.7	272.6	0.00	0.00	0.00
2,240.0	12.12	119.70	2,212.4	-139.2	244.0	281.0	0.00	0.00	0.00
2,280.0	12.12	119.70	2,251.6	-143.4	251.3	289.4	0.00	0.00	0.00
2,320.0	12.12	119.70	2,290.7	-147.5	258.6	297.8	0.00	0.00	0.00
2,360.0	12.12	119.70	2,329.8	-151.7	265.9	306.2	0.00	0.00	0.00
2,400.0	12.12	119.70	2,368.9	-155.9	273.2	314.6	0.00	0.00	0.00
2,440.0	12.12	119.70	2,408.0	-160.0	280.5	322.9	0.00	0.00	0.00
2,480.0	12.12	119.70	2,447.1	-164.2	287.8	331.3	0.00	0.00	0.00
2,520.0	12.12	119.70	2,486.2	-168.3	295.1	339.7	0.00	0.00	0.00
2,560.0	12.12	119.70	2,525.3	-172.5	302.4	348.1	0.00	0.00	0.00
2,600.0	12.12	119.70	2,564.4	-176.7	309.7	356.5	0.00	0.00	0.00
2,640.0	12.12	119.70	2,603.5	-180.8	317.0	364.9	0.00	0.00	0.00
2,680.0	12.12	119.70	2,642.6	-185.0	324.3	373.3	0.00	0.00	0.00
2,720.0	12.12	119.70	2,681.7	-189.2	331.6	381.7	0.00	0.00	0.00
2,760.0	12.12	119.70	2,720.9	-193.3	338.9	390.1	0.00	0.00	0.00
2,782.7	12.12	119.70	2,743.0	-195.7	343.0	394.9	0.00	0.00	0.00
GREELEY SAND									
2,800.0	12.12	119.70	2,760.0	-197.5	346.2	398.5	0.00	0.00	0.00
2,840.0	12.12	119.70	2,799.1	-201.6	353.5	406.9	0.00	0.00	0.00
2,880.0	12.12	119.70	2,838.2	-205.8	360.8	415.3	0.00	0.00	0.00
2,920.0	12.12	119.70	2,877.3	-210.0	368.1	423.7	0.00	0.00	0.00
2,960.0	12.12	119.70	2,916.4	-214.1	375.3	432.1	0.00	0.00	0.00
3,000.0	12.12	119.70	2,955.5	-218.3	382.6	440.5	0.00	0.00	0.00
3,040.0	12.12	119.70	2,994.6	-222.4	389.9	448.9	0.00	0.00	0.00
3,080.0	12.12	119.70	3,033.7	-226.6	397.2	457.3	0.00	0.00	0.00
3,120.0	12.12	119.70	3,072.8	-230.8	404.5	465.7	0.00	0.00	0.00
3,160.0	12.12	119.70	3,111.9	-234.9	411.8	474.1	0.00	0.00	0.00
3,200.0	12.12	119.70	3,151.0	-239.1	419.1	482.5	0.00	0.00	0.00
3,240.0	12.12	119.70	3,190.2	-243.3	426.4	490.9	0.00	0.00	0.00
3,280.0	12.12	119.70	3,229.3	-247.4	433.7	499.3	0.00	0.00	0.00
3,320.0	12.12	119.70	3,268.4	-251.6	441.0	507.7	0.00	0.00	0.00
3,360.0	12.12	119.70	3,307.5	-255.7	448.3	516.1	0.00	0.00	0.00
3,400.0	12.12	119.70	3,346.6	-259.9	455.6	524.5	0.00	0.00	0.00
3,440.0	12.12	119.70	3,385.7	-264.1	462.9	532.9	0.00	0.00	0.00
3,480.0	12.12	119.70	3,424.8	-268.2	470.2	541.3	0.00	0.00	0.00
3,520.0	12.12	119.70	3,463.9	-272.4	477.5	549.7	0.00	0.00	0.00
3,560.0	12.12	119.70	3,503.0	-276.5	484.8	558.1	0.00	0.00	0.00
3,600.0	12.12	119.70	3,542.1	-280.7	492.1	566.5	0.00	0.00	0.00
3,640.0	12.12	119.70	3,581.2	-284.9	499.4	574.9	0.00	0.00	0.00
3,680.0	12.12	119.70	3,620.3	-289.0	506.7	583.3	0.00	0.00	0.00
3,720.0	12.12	119.70	3,659.5	-293.2	514.0	591.7	0.00	0.00	0.00
3,734.9	12.12	119.70	3,674.0	-294.7	516.7	594.8	0.00	0.00	0.00
PARKMAN									
3,760.0	12.12	119.70	3,698.6	-297.4	521.2	600.1	0.00	0.00	0.00
3,800.0	12.12	119.70	3,737.7	-301.5	528.5	608.5	0.00	0.00	0.00
3,840.0	12.12	119.70	3,776.8	-305.7	535.8	616.9	0.00	0.00	0.00
3,880.0	12.12	119.70	3,815.9	-309.8	543.1	625.3	0.00	0.00	0.00

Database:	Landmark	**Local Co-ordinate Reference:**	Well Campbell JF 17-8D
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Site:	Campbell JF 17-6D Pad Sec.17-T2N-R65W	**North Reference:**	True
Well:	Campbell JF 17-8D	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Plan #1 (10-04-12)		

Planned Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
3,920.0	12.12	119.70	3,855.0	-314.0	550.4	633.7	0.00	0.00	0.00
3,960.0	12.12	119.70	3,894.1	-318.2	557.7	642.1	0.00	0.00	0.00
4,000.0	12.12	119.70	3,933.2	-322.3	565.0	650.5	0.00	0.00	0.00
4,040.0	12.12	119.70	3,972.3	-326.5	572.3	658.9	0.00	0.00	0.00
4,080.0	12.12	119.70	4,011.4	-330.6	579.6	667.3	0.00	0.00	0.00
4,120.0	12.12	119.70	4,050.5	-334.8	586.9	675.7	0.00	0.00	0.00
4,160.0	12.12	119.70	4,089.6	-339.0	594.2	684.1	0.00	0.00	0.00
4,200.0	12.12	119.70	4,128.8	-343.1	601.5	692.5	0.00	0.00	0.00
4,240.0	12.12	119.70	4,167.9	-347.3	608.8	700.9	0.00	0.00	0.00
4,280.0	12.12	119.70	4,207.0	-351.5	616.1	709.3	0.00	0.00	0.00
4,320.0	12.12	119.70	4,246.1	-355.6	623.4	717.7	0.00	0.00	0.00
4,360.0	12.12	119.70	4,285.2	-359.8	630.7	726.1	0.00	0.00	0.00
4,400.0	12.12	119.70	4,324.3	-363.9	638.0	734.5	0.00	0.00	0.00
4,440.0	12.12	119.70	4,363.4	-368.1	645.3	742.9	0.00	0.00	0.00
4,480.0	12.12	119.70	4,402.5	-372.3	652.6	751.3	0.00	0.00	0.00
4,484.6	12.12	119.70	4,407.0	-372.7	653.4	752.2	0.00	0.00	0.00
SUSSEX									
4,520.0	12.12	119.70	4,441.6	-376.4	659.9	759.7	0.00	0.00	0.00
4,560.0	12.12	119.70	4,480.7	-380.6	667.1	768.1	0.00	0.00	0.00
4,600.0	12.12	119.70	4,519.8	-384.8	674.4	776.5	0.00	0.00	0.00
4,640.0	12.12	119.70	4,558.9	-388.9	681.7	784.9	0.00	0.00	0.00
4,680.0	12.12	119.70	4,598.1	-393.1	689.0	793.3	0.00	0.00	0.00
4,720.0	12.12	119.70	4,637.2	-397.2	696.3	801.7	0.00	0.00	0.00
4,760.0	12.12	119.70	4,676.3	-401.4	703.6	810.1	0.00	0.00	0.00
4,800.0	12.12	119.70	4,715.4	-405.6	710.9	818.5	0.00	0.00	0.00
4,840.0	12.12	119.70	4,754.5	-409.7	718.2	826.9	0.00	0.00	0.00
4,880.0	12.12	119.70	4,793.6	-413.9	725.5	835.3	0.00	0.00	0.00
4,920.0	12.12	119.70	4,832.7	-418.0	732.8	843.7	0.00	0.00	0.00
4,940.8	12.12	119.70	4,853.0	-420.2	736.6	848.0	0.00	0.00	0.00
SHANNON									
4,960.0	12.12	119.70	4,871.8	-422.2	740.1	852.1	0.00	0.00	0.00
5,000.0	12.12	119.70	4,910.9	-426.4	747.4	860.5	0.00	0.00	0.00
5,040.0	12.12	119.70	4,950.0	-430.5	754.7	868.9	0.00	0.00	0.00
5,080.0	12.12	119.70	4,989.1	-434.7	762.0	877.3	0.00	0.00	0.00
5,089.6	12.12	119.70	4,998.5	-435.7	763.7	879.3	0.00	0.00	0.00
Start Drop -2.00									
5,120.0	11.51	119.70	5,028.3	-438.8	769.1	885.5	2.00	-2.00	0.00
5,160.0	10.71	119.70	5,067.5	-442.6	775.8	893.2	2.00	-2.00	0.00
5,200.0	9.91	119.70	5,106.9	-446.1	782.1	900.4	2.00	-2.00	0.00
5,240.0	9.11	119.70	5,146.3	-449.4	787.8	907.0	2.00	-2.00	0.00
5,280.0	8.31	119.70	5,185.9	-452.4	793.1	913.0	2.00	-2.00	0.00
5,320.0	7.51	119.70	5,225.5	-455.1	797.8	918.5	2.00	-2.00	0.00
5,360.0	6.71	119.70	5,265.2	-457.6	802.1	923.5	2.00	-2.00	0.00
5,400.0	5.91	119.70	5,304.9	-459.8	806.0	927.9	2.00	-2.00	0.00
5,440.0	5.11	119.70	5,344.8	-461.7	809.3	931.7	2.00	-2.00	0.00
5,480.0	4.31	119.70	5,384.6	-463.3	812.2	935.0	2.00	-2.00	0.00
5,520.0	3.51	119.70	5,424.5	-464.7	814.5	937.7	2.00	-2.00	0.00
5,560.0	2.71	119.70	5,464.5	-465.7	816.4	939.9	2.00	-2.00	0.00
5,600.0	1.91	119.70	5,504.4	-466.5	817.8	941.5	2.00	-2.00	0.00
5,640.0	1.11	119.70	5,544.4	-467.1	818.7	942.6	2.00	-2.00	0.00
5,680.0	0.31	119.70	5,584.4	-467.3	819.2	943.1	2.00	-2.00	0.00
5,695.6	0.00	0.00	5,600.0	-467.3	819.2	943.1	2.00	-2.00	0.00
Back to Vertical									

Database:	Landmark	**Local Co-ordinate Reference:**	Well Campbell JF 17-8D
Company:	Great Western	**TVD Reference:**	WELL @ 4930.0ft (Original Well Elev)
Project:	SEC.17-T2N-R65W	**MD Reference:**	WELL @ 4930.0ft (Original Well Elev)
Site:	Campbell JF 17-6D Pad Sec.17-T2N-R65W	**North Reference:**	True
Well:	Campbell JF 17-8D	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Plan #1 (10-04-12)		

Planned Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
5,720.0	0.00	0.00	5,624.4	-467.3	819.2	943.1	0.00	0.00	0.00
5,760.0	0.00	0.00	5,664.4	-467.3	819.2	943.1	0.00	0.00	0.00
5,800.0	0.00	0.00	5,704.4	-467.3	819.2	943.1	0.00	0.00	0.00
5,840.0	0.00	0.00	5,744.4	-467.3	819.2	943.1	0.00	0.00	0.00
5,880.0	0.00	0.00	5,784.4	-467.3	819.2	943.1	0.00	0.00	0.00
5,920.0	0.00	0.00	5,824.4	-467.3	819.2	943.1	0.00	0.00	0.00
5,960.0	0.00	0.00	5,864.4	-467.3	819.2	943.1	0.00	0.00	0.00
6,000.0	0.00	0.00	5,904.4	-467.3	819.2	943.1	0.00	0.00	0.00
6,040.0	0.00	0.00	5,944.4	-467.3	819.2	943.1	0.00	0.00	0.00
6,080.0	0.00	0.00	5,984.4	-467.3	819.2	943.1	0.00	0.00	0.00
6,120.0	0.00	0.00	6,024.4	-467.3	819.2	943.1	0.00	0.00	0.00
6,160.0	0.00	0.00	6,064.4	-467.3	819.2	943.1	0.00	0.00	0.00
6,200.0	0.00	0.00	6,104.4	-467.3	819.2	943.1	0.00	0.00	0.00
6,240.0	0.00	0.00	6,144.4	-467.3	819.2	943.1	0.00	0.00	0.00
6,280.0	0.00	0.00	6,184.4	-467.3	819.2	943.1	0.00	0.00	0.00
6,320.0	0.00	0.00	6,224.4	-467.3	819.2	943.1	0.00	0.00	0.00
6,360.0	0.00	0.00	6,264.4	-467.3	819.2	943.1	0.00	0.00	0.00
6,400.0	0.00	0.00	6,304.4	-467.3	819.2	943.1	0.00	0.00	0.00
6,440.0	0.00	0.00	6,344.4	-467.3	819.2	943.1	0.00	0.00	0.00
6,480.0	0.00	0.00	6,384.4	-467.3	819.2	943.1	0.00	0.00	0.00
6,520.0	0.00	0.00	6,424.4	-467.3	819.2	943.1	0.00	0.00	0.00
6,560.0	0.00	0.00	6,464.4	-467.3	819.2	943.1	0.00	0.00	0.00
6,600.0	0.00	0.00	6,504.4	-467.3	819.2	943.1	0.00	0.00	0.00
6,640.0	0.00	0.00	6,544.4	-467.3	819.2	943.1	0.00	0.00	0.00
6,680.0	0.00	0.00	6,584.4	-467.3	819.2	943.1	0.00	0.00	0.00
6,720.0	0.00	0.00	6,624.4	-467.3	819.2	943.1	0.00	0.00	0.00
6,760.0	0.00	0.00	6,664.4	-467.3	819.2	943.1	0.00	0.00	0.00
6,800.0	0.00	0.00	6,704.4	-467.3	819.2	943.1	0.00	0.00	0.00
6,840.0	0.00	0.00	6,744.4	-467.3	819.2	943.1	0.00	0.00	0.00
6,880.0	0.00	0.00	6,784.4	-467.3	819.2	943.1	0.00	0.00	0.00
6,920.0	0.00	0.00	6,824.4	-467.3	819.2	943.1	0.00	0.00	0.00
6,960.0	0.00	0.00	6,864.4	-467.3	819.2	943.1	0.00	0.00	0.00
7,000.0	0.00	0.00	6,904.4	-467.3	819.2	943.1	0.00	0.00	0.00
7,033.6	0.00	0.00	6,938.0	-467.3	819.2	943.1	0.00	0.00	0.00
NIOBRARA									
7,040.0	0.00	0.00	6,944.4	-467.3	819.2	943.1	0.00	0.00	0.00
7,080.0	0.00	0.00	6,984.4	-467.3	819.2	943.1	0.00	0.00	0.00
7,120.0	0.00	0.00	7,024.4	-467.3	819.2	943.1	0.00	0.00	0.00
7,160.0	0.00	0.00	7,064.4	-467.3	819.2	943.1	0.00	0.00	0.00
7,200.0	0.00	0.00	7,104.4	-467.3	819.2	943.1	0.00	0.00	0.00
7,240.0	0.00	0.00	7,144.4	-467.3	819.2	943.1	0.00	0.00	0.00
7,280.0	0.00	0.00	7,184.4	-467.3	819.2	943.1	0.00	0.00	0.00
7,320.0	0.00	0.00	7,224.4	-467.3	819.2	943.1	0.00	0.00	0.00
7,328.6	0.00	0.00	7,233.0	-467.3	819.2	943.1	0.00	0.00	0.00
FORT HAYS									
7,353.6	0.00	0.00	7,258.0	-467.3	819.2	943.1	0.00	0.00	0.00
CODELL									
7,360.0	0.00	0.00	7,264.4	-467.3	819.2	943.1	0.00	0.00	0.00
7,400.0	0.00	0.00	7,304.4	-467.3	819.2	943.1	0.00	0.00	0.00
7,440.0	0.00	0.00	7,344.4	-467.3	819.2	943.1	0.00	0.00	0.00
7,480.0	0.00	0.00	7,384.4	-467.3	819.2	943.1	0.00	0.00	0.00
7,513.6	0.00	0.00	7,418.0	-467.3	819.2	943.1	0.00	0.00	0.00
TD at 7513.6									

Database:	Landmark	**Local Co-ordinate Reference:**	Well Campbell JF 17-8D
Company:	Great Western	**TVD Reference:**	WELL @ 4930.0ft (Original Well Elev)
Project:	SEC.17-T2N-R65W	**MD Reference:**	WELL @ 4930.0ft (Original Well Elev)
Site:	Campbell JF 17-6D Pad Sec.17-T2N-R65W	**North Reference:**	True
Well:	Campbell JF 17-8D	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Plan #1 (10-04-12)		

Casing Points

Measured Depth (ft)	Vertical Depth (ft)	Name	Casing Diameter (")	Hole Diameter (")
900.6	900.0	8 5/8"	8-5/8	12-1/4

Formations

Measured Depth (ft)	Vertical Depth (ft)	Name	Lithology	Dip (°)	Dip Direction (°)
2,782.7	2,743.0	GREELEY SAND		0.00	
3,734.9	3,674.0	PARKMAN		0.00	
4,484.6	4,407.0	SUSSEX		0.00	
4,940.8	4,853.0	SHANNON		0.00	
7,033.6	6,938.0	NIOBRARA		0.00	
7,328.6	7,233.0	FORT HAYS		0.00	
7,353.6	7,258.0	CODELL		0.00	

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 - Start Build 2.00
1,206.0	1,201.5	-31.6	55.5	Start 3883.6 hold at 1206.0 MD
5,089.6	4,998.5	-435.7	763.7	Start Drop -2.00
5,695.6	5,600.0	-467.3	819.2	Back to Vertical
7,513.6	7,418.0	-467.3	819.2	TD at 7513.6

ENSIGN Directional

Great Western

SEC.17-T2N-R65W
Campbell JF 17-6D Pad Sec.17-T2N-R65W
Campbell JF 17-8D

Wellbore #1
Plan #1 (10-04-12)

Anticollision Report

05 October, 2012

Company:	Great Western	**Local Co-ordinate Reference:**	Well Campbell JF 17-8D
Project:	SEC.17-T2N-R65W	**TVD Reference:**	WELL @ 4930.0ft (Original Well Elev)
Reference Site:	Campbell JF 17-6D Pad Sec.17-T2N-R65W	**MD Reference:**	WELL @ 4930.0ft (Original Well Elev)
Site Error:	0.0ft	**North Reference:**	True
Reference Well:	Campbell JF 17-8D	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.0ft	**Output errors are at**	2.00 sigma
Reference Wellbore	Wellbore #1	**Database:**	Landmark
Reference Design:	Plan #1 (10-04-12)	**Offset TVD Reference:**	Offset Datum

Reference Plan #1 (10-04-12)

Filter type:	NO GLOBAL FILTER: Using user defined selection & filtering criteria		
Interpolation Method:	Stations	**Error Model:**	ISCWSA
Depth Range:	Unlimited	**Scan Method:**	Closest Approach 3D
Results Limited by:	Maximum center-center distance of 10,000.0ft	**Error Surface:**	Elliptical Conic

Warning Levels Evaluated at: 2.00 **Sigma**

Survey Tool Program **Date** 10/5/2012

From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description
0.0	7,513.6	Plan #1 (10-04-12) (Wellbore #1)	MWD	MWD - Standard

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
Campbell JF 17-6D Pad Sec.17-T2N-R65W						
Campbell JF 17-41D - Wellbore #1 - Plan #1 (10-04-12)	200.0	200.0	15.4	14.7	22.805	CC, ES
Campbell JF 17-41D - Wellbore #1 - Plan #1 (10-04-12)	400.0	398.6	22.3	20.7	14.275	SF
Campbell JF 17-9D - Wellbore #1 - Plan #1 (10-04-12)	600.0	600.0	14.8	12.3	5.993	CC, ES
Campbell JF 17-9D - Wellbore #1 - Plan #1 (10-04-12)	700.0	700.0	16.4	13.5	5.635	SF

Offset Design Campbell JF 17-6D Pad Sec.17-T2N-R65W - Campbell JF 17-41D - Wellbore #1 - Plan #1 (10-04-12) **Offset Site Error:** 0.0 ft

Survey Program: 0-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)	Minimum Separation (ft)	Separation Factor	Warning
0.0	0.0	0.0	0.0	0.0	0.0	90.06	0.0	15.4	15.4	15.4	0.00	N/A	
100.0	100.0	100.0	100.0	0.1	0.1	90.06	0.0	15.4	15.4	15.2	0.22	68.414	
200.0	200.0	200.0	200.0	0.3	0.3	90.06	0.0	15.4	15.4	14.7	0.67	22.805	CC, ES
300.0	300.0	299.4	299.4	0.6	0.6	89.30	0.2	17.1	17.1	16.0	1.11	15.350	
400.0	400.0	398.6	398.5	0.8	0.8	87.73	0.9	22.2	22.3	20.7	1.56	14.275	SF
500.0	500.0	497.3	496.8	1.0	1.0	86.28	2.0	30.7	30.9	28.9	2.03	15.238	
600.0	600.0	595.4	594.1	1.2	1.3	85.24	3.5	42.4	42.9	40.4	2.52	17.034	
700.0	700.0	692.7	690.2	1.4	1.6	-36.02	5.5	57.3	57.0	54.0	2.91	19.553	
800.0	799.8	789.4	785.2	1.6	2.0	-38.53	7.9	75.3	71.6	68.3	3.34	21.420	
900.0	899.5	885.4	878.9	1.9	2.4	-41.44	10.6	96.3	87.1	83.3	3.80	22.913	
1,000.0	998.7	980.7	971.1	2.1	2.9	-44.46	13.8	120.2	103.6	99.3	4.30	24.090	
1,100.0	1,097.5	1,075.6	1,062.0	2.4	3.4	-47.46	17.3	147.0	121.2	116.3	4.86	24.951	
1,206.0	1,201.5	1,179.7	1,161.4	2.8	4.0	-50.90	21.3	177.8	139.2	133.7	5.54	25.143	
1,300.0	1,293.4	1,272.1	1,249.6	3.1	4.6	-53.99	24.9	205.2	154.6	148.3	6.22	24.841	
1,400.0	1,391.2	1,370.4	1,343.4	3.5	5.2	-56.66	28.7	234.2	171.3	164.3	6.99	24.487	
1,500.0	1,488.9	1,468.7	1,437.3	4.0	5.8	-58.86	32.6	263.3	188.3	180.5	7.81	24.120	
1,600.0	1,586.7	1,567.1	1,531.1	4.4	6.4	-60.70	36.4	292.4	205.5	196.9	8.64	23.776	
1,700.0	1,684.5	1,665.4	1,624.9	4.8	7.0	-62.25	40.2	321.5	222.9	213.4	9.50	23.459	
1,800.0	1,782.3	1,763.7	1,718.8	5.3	7.6	-63.57	44.0	350.6	240.5	230.1	10.38	23.173	
1,900.0	1,880.0	1,862.0	1,812.6	5.7	8.2	-64.71	47.8	379.7	258.1	246.8	11.26	22.917	
2,000.0	1,977.8	1,960.3	1,906.4	6.2	8.9	-65.71	51.7	408.7	275.8	263.7	12.16	22.687	
2,100.0	2,075.6	2,058.6	2,000.2	6.6	9.5	-66.59	55.5	437.8	293.6	280.6	13.06	22.482	
2,200.0	2,173.3	2,156.9	2,094.1	7.1	10.1	-67.37	59.3	466.9	311.5	297.5	13.97	22.297	

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

Company:	Great Western	**Local Co-ordinate Reference:**	Well Campbell JF 17-8D
Project:	SEC.17-T2N-R65W	**TVD Reference:**	WELL @ 4930.0ft (Original Well Elev)
Reference Site:	Campbell JF 17-6D Pad Sec.17-T2N-R65W	**MD Reference:**	WELL @ 4930.0ft (Original Well Elev)
Site Error:	0.0ft	**North Reference:**	True
Reference Well:	Campbell JF 17-8D	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.0ft	**Output errors are at**	2.00 sigma
Reference Wellbore	Wellbore #1	**Database:**	Landmark
Reference Design:	Plan #1 (10-04-12)	**Offset TVD Reference:**	Offset Datum

Offset Design Campbell JF 17-6D Pad Sec.17-T2N-R65W - Campbell JF 17-41D - Wellbore #1 - Plan #1 (10-04-12)

Offset Site Error: 0.0 ft

Survey Program: 0-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)	Minimum Separation (ft)	Separation Factor	Warning
2,300.0	2,271.1	2,255.2	2,187.9	7.5	10.7	-68.06	63.1	496.0	329.4	314.5	14.89	22.131	
2,400.0	2,368.9	2,353.5	2,281.7	8.0	11.3	-68.68	67.0	525.1	347.4	331.6	15.80	21.982	
2,500.0	2,466.6	2,451.8	2,375.6	8.4	11.9	-69.24	70.8	554.2	365.4	348.7	16.73	21.846	
2,600.0	2,564.4	2,550.1	2,469.4	8.9	12.6	-69.75	74.6	583.3	383.4	365.8	17.65	21.723	
2,700.0	2,662.2	2,648.4	2,563.2	9.4	13.2	-70.21	78.4	612.3	401.5	382.9	18.58	21.611	
2,800.0	2,760.0	2,746.7	2,657.0	9.8	13.8	-70.63	82.2	641.4	419.5	400.0	19.51	21.508	
2,900.0	2,857.7	2,845.1	2,750.9	10.3	14.4	-71.02	86.1	670.5	437.6	417.2	20.44	21.414	
3,000.0	2,955.5	2,943.4	2,844.7	10.8	15.0	-71.38	89.9	699.6	455.8	434.4	21.37	21.328	
3,100.0	3,053.3	3,041.7	2,938.5	11.2	15.7	-71.71	93.7	728.7	473.9	451.6	22.30	21.248	
3,200.0	3,151.0	3,140.0	3,032.4	11.7	16.3	-72.01	97.5	757.8	492.0	468.8	23.24	21.174	
3,300.0	3,248.8	3,238.3	3,126.2	12.1	16.9	-72.29	101.3	786.9	510.2	486.0	24.17	21.105	
3,400.0	3,346.6	3,336.6	3,220.0	12.6	17.5	-72.56	105.2	815.9	528.3	503.2	25.11	21.042	
3,500.0	3,444.4	3,434.9	3,313.8	13.1	18.1	-72.80	109.0	845.0	546.5	520.5	26.05	20.982	
3,600.0	3,542.1	3,533.2	3,407.7	13.5	18.8	-73.04	112.8	874.1	564.7	537.7	26.99	20.927	
3,700.0	3,639.9	3,631.5	3,501.5	14.0	19.4	-73.25	116.6	903.2	582.9	555.0	27.92	20.875	
3,800.0	3,737.7	3,729.8	3,595.3	14.5	20.0	-73.45	120.5	932.3	601.1	572.2	28.86	20.826	
3,900.0	3,835.4	3,828.1	3,689.2	14.9	20.6	-73.65	124.3	961.4	619.3	589.5	29.80	20.780	
4,000.0	3,933.2	3,926.4	3,783.0	15.4	21.3	-73.83	128.1	990.5	637.5	606.8	30.74	20.737	
4,100.0	4,031.0	4,024.7	3,876.8	15.9	21.9	-74.00	131.9	1,019.5	655.8	624.1	31.68	20.697	
4,200.0	4,128.8	4,123.1	3,970.6	16.3	22.5	-74.16	135.7	1,048.6	674.0	641.4	32.62	20.658	
4,300.0	4,226.5	4,221.4	4,064.5	16.8	23.1	-74.31	139.6	1,077.7	692.2	658.6	33.57	20.622	
4,400.0	4,324.3	4,319.7	4,158.3	17.3	23.7	-74.45	143.4	1,106.8	710.4	675.9	34.51	20.588	
4,500.0	4,422.1	4,418.0	4,252.1	17.7	24.4	-74.59	147.2	1,135.9	728.7	693.2	35.45	20.555	
4,600.0	4,519.8	4,516.3	4,346.0	18.2	25.0	-74.72	151.0	1,165.0	746.9	710.5	36.39	20.524	
4,700.0	4,617.6	4,614.6	4,439.8	18.7	25.6	-74.85	154.9	1,194.0	765.2	727.8	37.33	20.495	
4,800.0	4,715.4	4,712.9	4,533.6	19.1	26.2	-74.97	158.7	1,223.1	783.4	745.1	38.28	20.467	
4,900.0	4,813.1	4,811.2	4,627.4	19.6	26.8	-75.08	162.5	1,252.2	801.7	762.5	39.22	20.440	
5,000.0	4,910.9	4,909.5	4,721.3	20.1	27.5	-75.19	166.3	1,281.3	819.9	779.8	40.16	20.415	
5,089.6	4,998.5	4,997.6	4,805.3	20.5	28.0	-75.28	169.7	1,307.4	836.3	795.3	41.01	20.393	
5,100.0	5,008.7	5,007.8	4,815.1	20.5	28.1	-75.33	170.1	1,310.4	838.2	797.1	41.11	20.390	
5,200.0	5,106.9	5,106.0	4,908.8	20.9	28.7	-75.66	174.0	1,339.4	857.0	815.0	41.94	20.433	
5,300.0	5,205.7	5,222.7	5,020.5	21.1	29.4	-75.76	178.4	1,372.9	876.0	833.3	42.69	20.520	
5,400.0	5,304.9	5,352.4	5,146.0	21.4	29.9	-75.73	182.6	1,405.1	892.7	849.4	43.29	20.620	
5,500.0	5,404.6	5,483.4	5,274.3	21.6	30.4	-75.61	186.1	1,431.9	906.7	862.9	43.78	20.710	
5,600.0	5,504.4	5,615.7	5,404.8	21.7	30.8	-75.41	188.9	1,453.0	918.1	873.9	44.15	20.794	
5,695.6	5,600.0	5,743.1	5,531.4	21.8	31.0	44.57	190.8	1,467.6	926.4	882.0	44.40	20.865	
5,700.0	5,604.4	5,749.0	5,537.3	21.9	31.1	44.59	190.9	1,468.1	926.7	882.3	44.41	20.869	
5,800.0	5,704.4	5,883.3	5,671.2	22.0	31.3	44.94	192.1	1,477.2	932.2	887.5	44.61	20.896	
5,900.0	5,804.4	6,016.6	5,804.4	22.1	31.4	45.05	192.4	1,480.1	933.9	889.0	44.84	20.827	
6,000.0	5,904.4	6,116.6	5,904.4	22.2	31.5	45.05	192.4	1,480.1	933.9	888.8	45.06	20.723	
6,100.0	6,004.4	6,216.6	6,004.4	22.3	31.6	45.05	192.4	1,480.1	933.9	888.6	45.30	20.617	
6,200.0	6,104.4	6,316.6	6,104.4	22.4	31.7	45.05	192.4	1,480.1	933.9	888.3	45.53	20.510	
6,300.0	6,204.4	6,416.6	6,204.4	22.5	31.8	45.05	192.4	1,480.1	933.9	888.1	45.77	20.403	
6,400.0	6,304.4	6,516.6	6,304.4	22.7	31.9	45.05	192.4	1,480.1	933.9	887.8	46.01	20.296	
6,500.0	6,404.4	6,616.6	6,404.4	22.8	32.0	45.05	192.4	1,480.1	933.9	887.6	46.26	20.189	
6,600.0	6,504.4	6,716.6	6,504.4	22.9	32.0	45.05	192.4	1,480.1	933.9	887.4	46.50	20.081	
6,700.0	6,604.4	6,816.6	6,604.4	23.0	32.1	45.05	192.4	1,480.1	933.9	887.1	46.76	19.973	
6,800.0	6,704.4	6,916.6	6,704.4	23.2	32.2	45.05	192.4	1,480.1	933.9	886.8	47.01	19.865	
6,900.0	6,804.4	7,016.6	6,804.4	23.3	32.3	45.05	192.4	1,480.1	933.9	886.6	47.27	19.757	
7,000.0	6,904.4	7,116.6	6,904.4	23.4	32.4	45.05	192.4	1,480.1	933.9	886.3	47.53	19.649	
7,100.0	7,004.4	7,216.6	7,004.4	23.6	32.5	45.05	192.4	1,480.1	933.9	886.1	47.79	19.541	
7,200.0	7,104.4	7,316.6	7,104.4	23.7	32.6	45.05	192.4	1,480.1	933.9	885.8	48.05	19.433	

Company:	Great Western	**Local Co-ordinate Reference:**	Well Campbell JF 17-8D
Project:	SEC.17-T2N-R65W	**TVD Reference:**	WELL @ 4930.0ft (Original Well Elev)
Reference Site:	Campbell JF 17-6D Pad Sec.17-T2N-R65W	**MD Reference:**	WELL @ 4930.0ft (Original Well Elev)
Site Error:	0.0ft	**North Reference:**	True
Reference Well:	Campbell JF 17-8D	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.0ft	**Output errors are at**	2.00 sigma
Reference Wellbore	Wellbore #1	**Database:**	Landmark
Reference Design:	Plan #1 (10-04-12)	**Offset TVD Reference:**	Offset Datum

Offset Design Campbell JF 17-6D Pad Sec.17-T2N-R65W - Campbell JF 17-41D - Wellbore #1 - Plan #1 (10-04-12)

Offset Site Error: 0.0 ft

Survey Program: 0-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)	Minimum Separation (ft)	Separation Factor	Warning
7,300.0	7,204.4	7,416.6	7,204.4	23.8	32.8	45.05	192.4	1,480.1	933.9	885.5	48.32	19.326	
7,400.0	7,304.4	7,516.6	7,304.4	24.0	32.9	45.05	192.4	1,480.1	933.9	885.3	48.59	19.218	
7,500.0	7,404.4	7,616.6	7,404.4	24.1	33.0	45.05	192.4	1,480.1	933.9	885.0	48.87	19.110	
7,513.6	7,418.0	7,630.1	7,418.0	24.1	33.0	45.05	192.4	1,480.1	933.9	885.0	48.90	19.096	

Company:	Great Western	**Local Co-ordinate Reference:**	Well Campbell JF 17-8D
Project:	SEC.17-T2N-R65W	**TVD Reference:**	WELL @ 4930.0ft (Original Well Elev)
Reference Site:	Campbell JF 17-6D Pad Sec.17-T2N-R65W	**MD Reference:**	WELL @ 4930.0ft (Original Well Elev)
Site Error:	0.0ft	**North Reference:**	True
Reference Well:	Campbell JF 17-8D	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.0ft	**Output errors are at**	2.00 sigma
Reference Wellbore	Wellbore #1	**Database:**	Landmark
Reference Design:	Plan #1 (10-04-12)	**Offset TVD Reference:**	Offset Datum

Offset Design Campbell JF 17-6D Pad Sec.17-T2N-R65W - Campbell JF 17-9D - Wellbore #1 - Plan #1 (10-04-12) **Offset Site Error:** 0.0 ft

Survey Program: 0-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)	Minimum Separation (ft)	Separation Factor	Warning
0.0	0.0	0.0	0.0	0.0	0.0	-89.97	0.0	-14.8	14.8	14.8	0.00	N/A	
100.0	100.0	100.0	100.0	0.1	0.1	-89.97	0.0	-14.8	14.8	14.6	0.22	65.926	
200.0	200.0	200.0	200.0	0.3	0.3	-89.97	0.0	-14.8	14.8	14.1	0.67	21.975	
300.0	300.0	300.0	300.0	0.6	0.6	-89.97	0.0	-14.8	14.8	13.7	1.12	13.185	
400.0	400.0	400.0	400.0	0.8	0.8	-89.97	0.0	-14.8	14.8	13.2	1.57	9.418	
500.0	500.0	500.0	500.0	1.0	1.0	-89.97	0.0	-14.8	14.8	12.8	2.02	7.325	
600.0	600.0	600.0	600.0	1.2	1.2	-89.97	0.0	-14.8	14.8	12.3	2.47	5.993	CC, ES
700.0	700.0	700.0	700.0	1.4	1.5	153.34	0.0	-14.8	16.4	13.5	2.90	5.635	SF
800.0	799.8	799.8	799.8	1.6	1.7	159.68	0.0	-14.8	21.2	17.8	3.32	6.373	
900.0	899.5	899.5	899.5	1.9	1.9	165.52	0.0	-14.8	29.5	25.7	3.75	7.875	
1,000.0	998.7	998.7	998.7	2.1	2.1	169.70	0.0	-14.8	41.4	37.2	4.17	9.922	
1,100.0	1,097.5	1,097.5	1,097.5	2.4	2.4	172.48	0.0	-14.8	56.9	52.3	4.60	12.356	
1,206.0	1,201.5	1,201.5	1,201.5	2.8	2.6	174.42	0.0	-14.8	77.1	72.0	5.06	15.236	
1,300.0	1,293.4	1,293.4	1,293.4	3.1	2.8	175.55	0.0	-14.8	96.7	91.3	5.48	17.652	
1,400.0	1,391.2	1,391.2	1,391.2	3.5	3.0	176.35	0.0	-14.8	117.7	111.8	5.94	19.830	
1,500.0	1,488.9	1,488.9	1,488.9	4.0	3.2	176.90	0.0	-14.8	138.7	132.3	6.39	21.684	
1,600.0	1,586.7	1,585.1	1,585.1	4.4	3.4	176.86	-0.9	-15.7	160.1	153.2	6.84	23.413	
1,700.0	1,684.5	1,680.6	1,680.5	4.8	3.6	175.87	-3.9	-18.9	182.6	175.3	7.27	25.121	
1,800.0	1,782.3	1,775.2	1,774.8	5.3	3.8	174.26	-9.1	-24.3	206.3	198.6	7.71	26.760	
1,900.0	1,880.0	1,868.9	1,867.9	5.7	4.0	172.26	-16.4	-31.9	231.4	223.3	8.17	28.319	
2,000.0	1,977.8	1,961.4	1,959.4	6.2	4.2	170.04	-25.7	-41.6	258.2	249.5	8.66	29.803	
2,100.0	2,075.6	2,053.4	2,050.0	6.6	4.4	167.70	-36.9	-53.2	286.7	277.5	9.19	31.210	
2,200.0	2,173.3	2,148.4	2,143.3	7.1	4.7	165.55	-49.1	-65.9	316.1	306.3	9.74	32.451	
2,300.0	2,271.1	2,243.3	2,236.6	7.5	5.0	163.76	-61.4	-78.7	345.8	335.5	10.31	33.547	
2,400.0	2,368.9	2,338.3	2,329.9	8.0	5.3	162.26	-73.6	-91.4	375.8	364.9	10.89	34.497	
2,500.0	2,466.6	2,433.3	2,423.2	8.4	5.6	160.97	-85.8	-104.1	406.0	394.5	11.49	35.345	
2,600.0	2,564.4	2,528.2	2,516.5	8.9	5.9	159.86	-98.1	-116.9	436.4	424.3	12.09	36.095	
2,700.0	2,662.2	2,623.2	2,609.8	9.4	6.3	158.90	-110.3	-129.6	466.9	454.2	12.70	36.764	
2,800.0	2,760.0	2,718.1	2,703.1	9.8	6.6	158.05	-122.6	-142.3	497.5	484.2	13.31	37.362	
2,900.0	2,857.7	2,813.1	2,796.4	10.3	7.0	157.30	-134.8	-155.1	528.2	514.2	13.94	37.901	
3,000.0	2,955.5	2,908.1	2,889.7	10.8	7.3	156.64	-147.0	-167.8	558.9	544.4	14.56	38.388	
3,100.0	3,053.3	3,003.0	2,983.0	11.2	7.7	156.04	-159.3	-180.5	589.7	574.6	15.19	38.830	
3,200.0	3,151.0	3,098.0	3,076.3	11.7	8.0	155.50	-171.5	-193.3	620.6	604.8	15.82	39.232	
3,300.0	3,248.8	3,192.9	3,169.6	12.1	8.4	155.01	-183.8	-206.0	651.5	635.1	16.45	39.599	
3,400.0	3,346.6	3,287.9	3,262.9	12.6	8.8	154.57	-196.0	-218.7	682.5	665.4	17.09	39.936	
3,500.0	3,444.4	3,382.9	3,356.2	13.1	9.2	154.17	-208.2	-231.5	713.5	695.8	17.73	40.246	
3,600.0	3,542.1	3,477.8	3,449.5	13.5	9.5	153.80	-220.5	-244.2	744.5	726.1	18.37	40.532	
3,700.0	3,639.9	3,572.8	3,542.8	14.0	9.9	153.45	-232.7	-256.9	775.6	756.6	19.01	40.796	
3,800.0	3,737.7	3,667.7	3,636.1	14.5	10.3	153.14	-245.0	-269.7	806.6	787.0	19.65	41.042	
3,900.0	3,835.4	3,762.7	3,729.4	14.9	10.7	152.85	-257.2	-282.4	837.7	817.4	20.30	41.270	
4,000.0	3,933.2	3,857.7	3,822.8	15.4	11.1	152.58	-269.4	-295.1	868.8	847.9	20.94	41.483	
4,100.0	4,031.0	3,952.6	3,916.1	15.9	11.4	152.32	-281.7	-307.9	900.0	878.4	21.59	41.681	
4,200.0	4,128.8	4,047.6	4,009.4	16.3	11.8	152.09	-293.9	-320.6	931.1	908.9	22.24	41.867	
4,300.0	4,226.5	4,142.5	4,102.7	16.8	12.2	151.87	-306.2	-333.3	962.3	939.4	22.89	42.041	
4,400.0	4,324.3	4,237.5	4,196.0	17.3	12.6	151.66	-318.4	-346.1	993.4	969.9	23.54	42.205	
4,500.0	4,422.1	4,332.5	4,289.3	17.7	13.0	151.47	-330.6	-358.8	1,024.6	1,000.4	24.19	42.359	
4,600.0	4,519.8	4,427.4	4,382.6	18.2	13.4	151.29	-342.9	-371.5	1,055.8	1,030.9	24.84	42.504	
4,700.0	4,617.6	4,522.4	4,475.9	18.7	13.8	151.11	-355.1	-384.3	1,087.0	1,061.5	25.49	42.641	
4,800.0	4,715.4	4,617.3	4,569.2	19.1	14.2	150.95	-367.4	-397.0	1,118.2	1,092.0	26.14	42.771	
4,900.0	4,813.1	4,712.3	4,662.5	19.6	14.6	150.80	-379.6	-409.8	1,149.4	1,122.6	26.80	42.893	
5,000.0	4,910.9	4,807.3	4,755.8	20.1	15.0	150.65	-391.8	-422.5	1,180.6	1,153.2	27.45	43.009	
5,089.6	4,998.5	4,892.3	4,839.4	20.5	15.3	150.53	-402.8	-433.9	1,208.6	1,180.6	28.04	43.108	

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

Company:	Great Western	**Local Co-ordinate Reference:**	Well Campbell JF 17-8D
Project:	SEC.17-T2N-R65W	**TVD Reference:**	WELL @ 4930.0ft (Original Well Elev)
Reference Site:	Campbell JF 17-6D Pad Sec.17-T2N-R65W	**MD Reference:**	WELL @ 4930.0ft (Original Well Elev)
Site Error:	0.0ft	**North Reference:**	True
Reference Well:	Campbell JF 17-8D	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.0ft	**Output errors are at**	2.00 sigma
Reference Wellbore	Wellbore #1	**Database:**	Landmark
Reference Design:	Plan #1 (10-04-12)	**Offset TVD Reference:**	Offset Datum

Offset Design Campbell JF 17-6D Pad Sec.17-T2N-R65W - Campbell JF 17-9D - Wellbore #1 - Plan #1 (10-04-12)

Offset Site Error: 0.0 ft

Survey Program: 0-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)	Minimum Separation (ft)	Separation Factor	Warning
5,100.0	5,008.7	4,902.2	4,849.1	20.5	15.4	150.55	-404.1	-435.2	1,211.8	1,183.7	28.11	43.112	
5,200.0	5,106.9	4,997.7	4,942.9	20.9	15.8	150.67	-416.4	-448.0	1,241.3	1,212.6	28.76	43.168	
5,300.0	5,205.7	5,094.0	5,037.5	21.1	16.2	150.69	-428.8	-460.9	1,267.9	1,238.5	29.37	43.164	
5,400.0	5,304.9	5,222.7	5,164.3	21.4	16.6	150.54	-444.2	-477.0	1,290.7	1,260.7	30.01	43.005	
5,500.0	5,404.6	5,368.8	5,309.1	21.6	17.0	150.40	-457.1	-490.3	1,307.3	1,276.7	30.56	42.770	
5,600.0	5,504.4	5,517.2	5,457.1	21.7	17.3	150.32	-464.9	-498.5	1,317.1	1,286.1	31.03	42.447	
5,695.6	5,600.0	5,660.1	5,600.0	21.8	17.5	-90.00	-467.3	-501.0	1,320.2	1,288.8	31.41	42.038	
5,700.0	5,604.4	5,664.5	5,604.4	21.9	17.5	-90.00	-467.3	-501.0	1,320.2	1,288.8	31.42	42.020	
5,800.0	5,704.4	5,764.5	5,704.4	22.0	17.6	-90.00	-467.3	-501.0	1,320.2	1,288.5	31.72	41.624	
5,900.0	5,804.4	5,864.5	5,804.4	22.1	17.8	-90.00	-467.3	-501.0	1,320.2	1,288.2	32.02	41.235	
6,000.0	5,904.4	5,964.5	5,904.4	22.2	17.9	-90.00	-467.3	-501.0	1,320.2	1,287.9	32.32	40.848	
6,100.0	6,004.4	6,064.5	6,004.4	22.3	18.1	-90.00	-467.3	-501.0	1,320.2	1,287.6	32.63	40.464	
6,200.0	6,104.4	6,164.5	6,104.4	22.4	18.2	-90.00	-467.3	-501.0	1,320.2	1,287.3	32.94	40.083	
6,300.0	6,204.4	6,264.5	6,204.4	22.5	18.4	-90.00	-467.3	-501.0	1,320.2	1,287.0	33.25	39.706	
6,400.0	6,304.4	6,364.5	6,304.4	22.7	18.5	-90.00	-467.3	-501.0	1,320.2	1,286.7	33.57	39.332	
6,500.0	6,404.4	6,464.5	6,404.4	22.8	18.7	-90.00	-467.3	-501.0	1,320.2	1,286.3	33.89	38.961	
6,600.0	6,504.4	6,564.5	6,504.4	22.9	18.8	-90.00	-467.3	-501.0	1,320.2	1,286.0	34.21	38.594	
6,700.0	6,604.4	6,664.5	6,604.4	23.0	19.0	-90.00	-467.3	-501.0	1,320.2	1,285.7	34.53	38.231	
6,800.0	6,704.4	6,764.5	6,704.4	23.2	19.1	-90.00	-467.3	-501.0	1,320.2	1,285.4	34.86	37.872	
6,900.0	6,804.4	6,864.5	6,804.4	23.3	19.3	-90.00	-467.3	-501.0	1,320.2	1,285.0	35.19	37.516	
7,000.0	6,904.4	6,964.5	6,904.4	23.4	19.4	-90.00	-467.3	-501.0	1,320.2	1,284.7	35.52	37.165	
7,100.0	7,004.4	7,064.5	7,004.4	23.6	19.6	-90.00	-467.3	-501.0	1,320.2	1,284.4	35.86	36.817	
7,200.0	7,104.4	7,164.5	7,104.4	23.7	19.7	-90.00	-467.3	-501.0	1,320.2	1,284.0	36.20	36.473	
7,300.0	7,204.4	7,264.5	7,204.4	23.8	19.9	-90.00	-467.3	-501.0	1,320.2	1,283.7	36.54	36.133	
7,400.0	7,304.4	7,364.5	7,304.4	24.0	20.1	-90.00	-467.3	-501.0	1,320.2	1,283.3	36.88	35.798	
7,500.0	7,404.4	7,464.5	7,404.4	24.1	20.2	-90.00	-467.3	-501.0	1,320.2	1,283.0	37.23	35.466	
7,513.6	7,418.0	7,478.1	7,418.0	24.1	20.2	-90.00	-467.3	-501.0	1,320.2	1,282.9	37.27	35.421	

Company:	Great Western	**Local Co-ordinate Reference:**	Well Campbell JF 17-8D
Project:	SEC.17-T2N-R65W	**TVD Reference:**	WELL @ 4930.0ft (Original Well Elev)
Reference Site:	Campbell JF 17-6D Pad Sec.17-T2N-R65W	**MD Reference:**	WELL @ 4930.0ft (Original Well Elev)
Site Error:	0.0ft	**North Reference:**	True
Reference Well:	Campbell JF 17-8D	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.0ft	**Output errors are at**	2.00 sigma
Reference Wellbore	Wellbore #1	**Database:**	Landmark
Reference Design:	Plan #1 (10-04-12)	**Offset TVD Reference:**	Offset Datum

Reference Depths are relative to WELL @ 4930.0ft (Original Well Elev) Coordinates are relative to: Campbell JF 17-8D
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: 0.53°

Company:	Great Western	**Local Co-ordinate Reference:**	Well Campbell JF 17-8D
Project:	SEC.17-T2N-R65W	**TVD Reference:**	WELL @ 4930.0ft (Original Well Elev)
Reference Site:	Campbell JF 17-6D Pad Sec.17-T2N-R65W	**MD Reference:**	WELL @ 4930.0ft (Original Well Elev)
Site Error:	0.0ft	**North Reference:**	True
Reference Well:	Campbell JF 17-8D	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.0ft	**Output errors are at**	2.00 sigma
Reference Wellbore	Wellbore #1	**Database:**	Landmark
Reference Design:	Plan #1 (10-04-12)	**Offset TVD Reference:**	Offset Datum

Reference Depths are relative to WELL @ 4930.0ft (Original Well Elev) Coordinates are relative to: Campbell JF 17-8D
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: 0.53°