

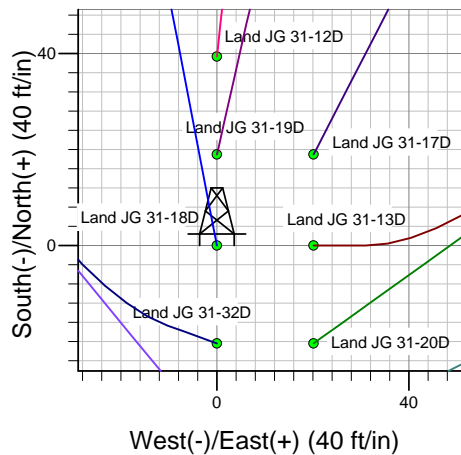
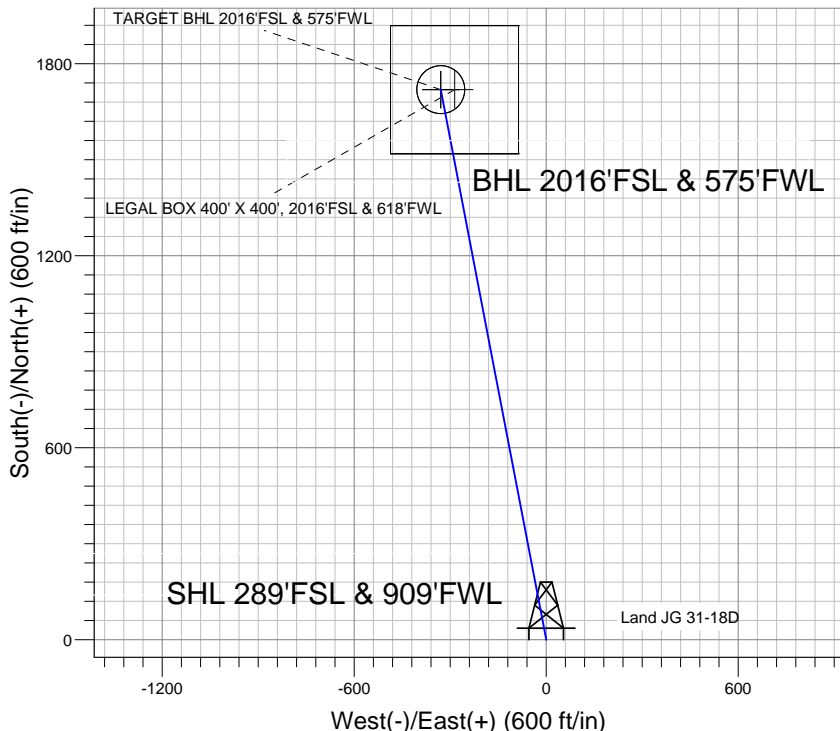
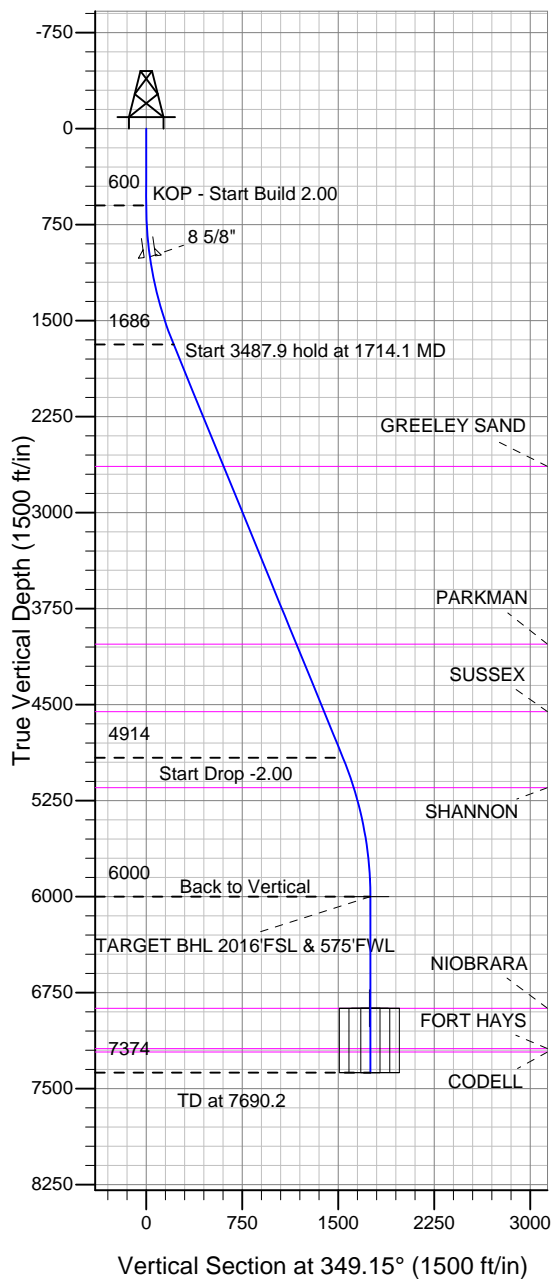
### Well Name: Land JG 31-18D

Surface Location: Land JG (West) Pad Sec.31-T2N-R64W  
North American Datum 1983 , US State Plane 1983 , Colorado Northern Zone

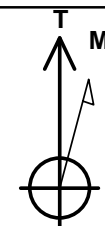
Ground Elevation: 4933.0

+N/-S	+E/-W	Northing	Easting	Latitude	Longitude	Slot
0.0	0.0	1276279.83	3251968.44	40.088267	-104.599425	
Original Well Elev WELL @ 4947.0ft (Original Well Elev)						

### Great Western



Land JG (West) Pad Sec.31-T2N-R64W  
Land JG 31-18D  
Plan #1 (11-07-12)  
8:04, November 09 2012



Azimuths to True North  
Magnetic North: 8.56°

Magnetic Field  
Strength: 52836.9snT  
Dip Angle: 66.78°  
Date: 11/7/2012  
Model: IGRF2010

### WELLBORE TARGET DETAILS (LAT/LONG)

Name	TVD	+N/-S	+E/-W	Latitude	Longitude	Shape
TARGET BHL 2016'FSL & 575'FWL	6000.0	1719.1	-329.6	40.092986	-104.600603	Point
LEGAL BOX 400' X 400', 2016'FSL & 618'FWL	6872.0	1719.1	-286.6	40.092986	-104.600449	Rectangle (Sides: L400.0 W400.0)
TARGET CIRCLE 2016'FSL & 575'FWL	6872.0	1719.1	-329.6	40.092986	-104.600603	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	1714.1	22.28	349.15	1686.3	210.1	-40.3	2.00	349.15	213.9	
4	5202.1	22.28	349.15	4913.7	1509.0	-289.3	0.00	0.00	1536.5	
5	6316.2	0.00	0.00	6000.0	1719.1	-329.6	2.00	180.00	1750.4	TARGET BHL 2016'FSL & 575'FWL
6	7690.2	0.00	0.00	7374.0	1719.1	-329.6	0.00	0.00	1750.4	



## **Great Western**

**SEC.31-T2N-R64W**

**Land JG (West) Pad Sec.31-T2N-R64W**

**Land JG 31-18D**

**Wellbore #1**

**Plan: Plan #1 (11-07-12)**

## **Standard Planning Report**

**09 November, 2012**

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	
1,714.1	22.28	349.15	1,686.3	210.1	-40.3	2.00	2.00	0.00	349.15	
5,202.1	22.28	349.15	4,913.7	1,509.0	-289.3	0.00	0.00	0.00	0.00	
6,316.2	0.00	0.00	6,000.0	1,719.1	-329.6	2.00	-2.00	0.00	180.00	TARGET BHL 2016
7,690.2	0.00	0.00	7,374.0	1,719.1	-329.6	0.00	0.00	0.00	0.00	

<b>Database:</b>	Landmark	<b>Local Co-ordinate Reference:</b>	Well Land JG 31-18D
<b>Company:</b>	Great Western	<b>TVD Reference:</b>	WELL @ 4947.0ft (Original Well Elev)
<b>Project:</b>	SEC.31-T2N-R64W	<b>MD Reference:</b>	WELL @ 4947.0ft (Original Well Elev)
<b>Site:</b>	Land JG (West) Pad Sec.31-T2N-R64W	<b>North Reference:</b>	True
<b>Well:</b>	Land JG 31-18D	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Wellbore #1		
<b>Design:</b>	Plan #1 (11-07-12)		

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
<b>KOP - Start Build 2.00</b>									
640.0	0.80	349.15	640.0	0.3	-0.1	0.3	2.00	2.00	0.00
680.0	1.60	349.15	680.0	1.1	-0.2	1.1	2.00	2.00	0.00
720.0	2.40	349.15	720.0	2.5	-0.5	2.5	2.00	2.00	0.00
760.0	3.20	349.15	759.9	4.4	-0.8	4.5	2.00	2.00	0.00
800.0	4.00	349.15	799.8	6.9	-1.3	7.0	2.00	2.00	0.00
840.0	4.80	349.15	839.7	9.9	-1.9	10.0	2.00	2.00	0.00
880.0	5.60	349.15	879.6	13.4	-2.6	13.7	2.00	2.00	0.00
920.0	6.40	349.15	919.3	17.5	-3.4	17.9	2.00	2.00	0.00
960.0	7.20	349.15	959.1	22.2	-4.3	22.6	2.00	2.00	0.00
1,000.0	8.00	349.15	998.7	27.4	-5.2	27.9	2.00	2.00	0.00
1,001.3	8.03	349.15	1,000.0	27.6	-5.3	28.1	2.00	2.00	0.00
<b>8 5/8"</b>									
1,040.0	8.80	349.15	1,038.3	33.1	-6.3	33.7	2.00	2.00	0.00
1,080.0	9.60	349.15	1,077.8	39.4	-7.6	40.1	2.00	2.00	0.00
1,120.0	10.40	349.15	1,117.1	46.2	-8.9	47.1	2.00	2.00	0.00
1,160.0	11.20	349.15	1,156.4	53.6	-10.3	54.6	2.00	2.00	0.00
1,200.0	12.00	349.15	1,195.6	61.5	-11.8	62.6	2.00	2.00	0.00
1,240.0	12.80	349.15	1,234.7	69.9	-13.4	71.2	2.00	2.00	0.00
1,280.0	13.60	349.15	1,273.6	78.9	-15.1	80.3	2.00	2.00	0.00
1,320.0	14.40	349.15	1,312.4	88.4	-16.9	90.0	2.00	2.00	0.00
1,360.0	15.20	349.15	1,351.1	98.4	-18.9	100.2	2.00	2.00	0.00
1,400.0	16.00	349.15	1,389.6	109.0	-20.9	111.0	2.00	2.00	0.00
1,440.0	16.80	349.15	1,428.0	120.1	-23.0	122.3	2.00	2.00	0.00
1,480.0	17.60	349.15	1,466.2	131.7	-25.2	134.1	2.00	2.00	0.00
1,520.0	18.40	349.15	1,504.3	143.8	-27.6	146.5	2.00	2.00	0.00
1,560.0	19.20	349.15	1,542.1	156.5	-30.0	159.3	2.00	2.00	0.00
1,600.0	20.00	349.15	1,579.8	169.7	-32.5	172.8	2.00	2.00	0.00
1,640.0	20.80	349.15	1,617.3	183.4	-35.2	186.7	2.00	2.00	0.00
1,680.0	21.60	349.15	1,654.6	197.6	-37.9	201.2	2.00	2.00	0.00
1,714.1	22.28	349.15	1,686.3	210.1	-40.3	213.9	2.00	2.00	0.00
<b>Start 3487.9 hold at 1714.1 MD</b>									
1,720.0	22.28	349.15	1,691.7	212.3	-40.7	216.2	0.00	0.00	0.00
1,760.0	22.28	349.15	1,728.7	227.2	-43.6	231.3	0.00	0.00	0.00
1,800.0	22.28	349.15	1,765.7	242.1	-46.4	246.5	0.00	0.00	0.00
1,840.0	22.28	349.15	1,802.7	257.0	-49.3	261.7	0.00	0.00	0.00
1,880.0	22.28	349.15	1,839.7	271.9	-52.1	276.8	0.00	0.00	0.00

<b>Database:</b>	Landmark	<b>Local Co-ordinate Reference:</b>	Well Land JG 31-18D
<b>Company:</b>	Great Western	<b>TVD Reference:</b>	WELL @ 4947.0ft (Original Well Elev)
<b>Project:</b>	SEC.31-T2N-R64W	<b>MD Reference:</b>	WELL @ 4947.0ft (Original Well Elev)
<b>Site:</b>	Land JG (West) Pad Sec.31-T2N-R64W	<b>North Reference:</b>	True
<b>Well:</b>	Land JG 31-18D	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Wellbore #1		
<b>Design:</b>	Plan #1 (11-07-12)		

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	22.28	349.15	1,876.8	286.8	-55.0	292.0	0.00	0.00	0.00
1,960.0	22.28	349.15	1,913.8	301.7	-57.8	307.2	0.00	0.00	0.00
2,000.0	22.28	349.15	1,950.8	316.6	-60.7	322.3	0.00	0.00	0.00
2,040.0	22.28	349.15	1,987.8	331.5	-63.5	337.5	0.00	0.00	0.00
2,080.0	22.28	349.15	2,024.8	346.4	-66.4	352.7	0.00	0.00	0.00
2,120.0	22.28	349.15	2,061.8	361.2	-69.3	367.8	0.00	0.00	0.00
2,160.0	22.28	349.15	2,098.8	376.1	-72.1	383.0	0.00	0.00	0.00
2,200.0	22.28	349.15	2,135.8	391.0	-75.0	398.2	0.00	0.00	0.00
2,240.0	22.28	349.15	2,172.9	405.9	-77.8	413.3	0.00	0.00	0.00
2,280.0	22.28	349.15	2,209.9	420.8	-80.7	428.5	0.00	0.00	0.00
2,320.0	22.28	349.15	2,246.9	435.7	-83.5	443.7	0.00	0.00	0.00
2,360.0	22.28	349.15	2,283.9	450.6	-86.4	458.8	0.00	0.00	0.00
2,400.0	22.28	349.15	2,320.9	465.5	-89.2	474.0	0.00	0.00	0.00
2,440.0	22.28	349.15	2,357.9	480.4	-92.1	489.2	0.00	0.00	0.00
2,480.0	22.28	349.15	2,394.9	495.3	-95.0	504.3	0.00	0.00	0.00
2,520.0	22.28	349.15	2,431.9	510.2	-97.8	519.5	0.00	0.00	0.00
2,560.0	22.28	349.15	2,469.0	525.1	-100.7	534.7	0.00	0.00	0.00
2,600.0	22.28	349.15	2,506.0	540.0	-103.5	549.8	0.00	0.00	0.00
2,640.0	22.28	349.15	2,543.0	554.9	-106.4	565.0	0.00	0.00	0.00
2,680.0	22.28	349.15	2,580.0	569.8	-109.2	580.2	0.00	0.00	0.00
2,720.0	22.28	349.15	2,617.0	584.7	-112.1	595.3	0.00	0.00	0.00
2,743.8	22.28	349.15	2,639.0	593.5	-113.8	604.3	0.00	0.00	0.00
GREELEY SAND									
2,760.0	22.28	349.15	2,654.0	599.6	-115.0	610.5	0.00	0.00	0.00
2,800.0	22.28	349.15	2,691.0	614.5	-117.8	625.7	0.00	0.00	0.00
2,840.0	22.28	349.15	2,728.1	629.4	-120.7	640.8	0.00	0.00	0.00
2,880.0	22.28	349.15	2,765.1	644.3	-123.5	656.0	0.00	0.00	0.00
2,920.0	22.28	349.15	2,802.1	659.2	-126.4	671.2	0.00	0.00	0.00
2,960.0	22.28	349.15	2,839.1	674.1	-129.2	686.3	0.00	0.00	0.00
3,000.0	22.28	349.15	2,876.1	689.0	-132.1	701.5	0.00	0.00	0.00
3,040.0	22.28	349.15	2,913.1	703.9	-134.9	716.7	0.00	0.00	0.00
3,080.0	22.28	349.15	2,950.1	718.7	-137.8	731.8	0.00	0.00	0.00
3,120.0	22.28	349.15	2,987.1	733.6	-140.7	747.0	0.00	0.00	0.00
3,160.0	22.28	349.15	3,024.2	748.5	-143.5	762.2	0.00	0.00	0.00
3,200.0	22.28	349.15	3,061.2	763.4	-146.4	777.3	0.00	0.00	0.00
3,240.0	22.28	349.15	3,098.2	778.3	-149.2	792.5	0.00	0.00	0.00
3,280.0	22.28	349.15	3,135.2	793.2	-152.1	807.7	0.00	0.00	0.00
3,320.0	22.28	349.15	3,172.2	808.1	-154.9	822.8	0.00	0.00	0.00
3,360.0	22.28	349.15	3,209.2	823.0	-157.8	838.0	0.00	0.00	0.00
3,400.0	22.28	349.15	3,246.2	837.9	-160.6	853.2	0.00	0.00	0.00
3,440.0	22.28	349.15	3,283.2	852.8	-163.5	868.3	0.00	0.00	0.00
3,480.0	22.28	349.15	3,320.3	867.7	-166.4	883.5	0.00	0.00	0.00
3,520.0	22.28	349.15	3,357.3	882.6	-169.2	898.7	0.00	0.00	0.00
3,560.0	22.28	349.15	3,394.3	897.5	-172.1	913.8	0.00	0.00	0.00
3,600.0	22.28	349.15	3,431.3	912.4	-174.9	929.0	0.00	0.00	0.00
3,640.0	22.28	349.15	3,468.3	927.3	-177.8	944.2	0.00	0.00	0.00
3,680.0	22.28	349.15	3,505.3	942.2	-180.6	959.3	0.00	0.00	0.00
3,720.0	22.28	349.15	3,542.3	957.1	-183.5	974.5	0.00	0.00	0.00
3,760.0	22.28	349.15	3,579.3	972.0	-186.3	989.7	0.00	0.00	0.00
3,800.0	22.28	349.15	3,616.4	986.9	-189.2	1,004.8	0.00	0.00	0.00
3,840.0	22.28	349.15	3,653.4	1,001.8	-192.1	1,020.0	0.00	0.00	0.00
3,880.0	22.28	349.15	3,690.4	1,016.7	-194.9	1,035.2	0.00	0.00	0.00
3,920.0	22.28	349.15	3,727.4	1,031.6	-197.8	1,050.4	0.00	0.00	0.00
3,960.0	22.28	349.15	3,764.4	1,046.5	-200.6	1,065.5	0.00	0.00	0.00

<b>Database:</b>	Landmark	<b>Local Co-ordinate Reference:</b>	Well Land JG 31-18D
<b>Company:</b>	Great Western	<b>TVD Reference:</b>	WELL @ 4947.0ft (Original Well Elev)
<b>Project:</b>	SEC.31-T2N-R64W	<b>MD Reference:</b>	WELL @ 4947.0ft (Original Well Elev)
<b>Site:</b>	Land JG (West) Pad Sec.31-T2N-R64W	<b>North Reference:</b>	True
<b>Well:</b>	Land JG 31-18D	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Wellbore #1		
<b>Design:</b>	Plan #1 (11-07-12)		

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)
4,000.0	22.28	349.15	3,801.4	1,061.4	-203.5	1,080.7	0.00	0.00	0.00
4,040.0	22.28	349.15	3,838.4	1,076.3	-206.3	1,095.9	0.00	0.00	0.00
4,080.0	22.28	349.15	3,875.5	1,091.1	-209.2	1,111.0	0.00	0.00	0.00
4,120.0	22.28	349.15	3,912.5	1,106.0	-212.0	1,126.2	0.00	0.00	0.00
4,160.0	22.28	349.15	3,949.5	1,120.9	-214.9	1,141.4	0.00	0.00	0.00
4,200.0	22.28	349.15	3,986.5	1,135.8	-217.8	1,156.5	0.00	0.00	0.00
4,240.0	22.28	349.15	4,023.5	1,150.7	-220.6	1,171.7	0.00	0.00	0.00
4,244.9	22.28	349.15	4,028.0	1,152.5	-221.0	1,173.5	0.00	0.00	0.00
<b>PARKMAN</b>									
4,280.0	22.28	349.15	4,060.5	1,165.6	-223.5	1,186.9	0.00	0.00	0.00
4,320.0	22.28	349.15	4,097.5	1,180.5	-226.3	1,202.0	0.00	0.00	0.00
4,360.0	22.28	349.15	4,134.5	1,195.4	-229.2	1,217.2	0.00	0.00	0.00
4,400.0	22.28	349.15	4,171.6	1,210.3	-232.0	1,232.4	0.00	0.00	0.00
4,440.0	22.28	349.15	4,208.6	1,225.2	-234.9	1,247.5	0.00	0.00	0.00
4,480.0	22.28	349.15	4,245.6	1,240.1	-237.8	1,262.7	0.00	0.00	0.00
4,520.0	22.28	349.15	4,282.6	1,255.0	-240.6	1,277.9	0.00	0.00	0.00
4,560.0	22.28	349.15	4,319.6	1,269.9	-243.5	1,293.0	0.00	0.00	0.00
4,600.0	22.28	349.15	4,356.6	1,284.8	-246.3	1,308.2	0.00	0.00	0.00
4,640.0	22.28	349.15	4,393.6	1,299.7	-249.2	1,323.4	0.00	0.00	0.00
4,680.0	22.28	349.15	4,430.6	1,314.6	-252.0	1,338.5	0.00	0.00	0.00
4,720.0	22.28	349.15	4,467.7	1,329.5	-254.9	1,353.7	0.00	0.00	0.00
4,760.0	22.28	349.15	4,504.7	1,344.4	-257.7	1,368.9	0.00	0.00	0.00
4,800.0	22.28	349.15	4,541.7	1,359.3	-260.6	1,384.0	0.00	0.00	0.00
4,813.3	22.28	349.15	4,554.0	1,364.2	-261.5	1,389.1	0.00	0.00	0.00
<b>SUSSEX</b>									
4,840.0	22.28	349.15	4,578.7	1,374.2	-263.5	1,399.2	0.00	0.00	0.00
4,880.0	22.28	349.15	4,615.7	1,389.1	-266.3	1,414.4	0.00	0.00	0.00
4,920.0	22.28	349.15	4,652.7	1,404.0	-269.2	1,429.5	0.00	0.00	0.00
4,960.0	22.28	349.15	4,689.7	1,418.9	-272.0	1,444.7	0.00	0.00	0.00
5,000.0	22.28	349.15	4,726.7	1,433.8	-274.9	1,459.9	0.00	0.00	0.00
5,040.0	22.28	349.15	4,763.8	1,448.6	-277.7	1,475.0	0.00	0.00	0.00
5,080.0	22.28	349.15	4,800.8	1,463.5	-280.6	1,490.2	0.00	0.00	0.00
5,120.0	22.28	349.15	4,837.8	1,478.4	-283.4	1,505.4	0.00	0.00	0.00
5,160.0	22.28	349.15	4,874.8	1,493.3	-286.3	1,520.5	0.00	0.00	0.00
5,200.0	22.28	349.15	4,911.8	1,508.2	-289.2	1,535.7	0.00	0.00	0.00
5,202.1	22.28	349.15	4,913.7	1,509.0	-289.3	1,536.5	0.00	0.00	0.00
<b>Start Drop -2.00</b>									
5,240.0	21.52	349.15	4,948.9	1,522.9	-292.0	1,550.6	2.00	-2.00	0.00
5,280.0	20.72	349.15	4,986.2	1,537.1	-294.7	1,565.1	2.00	-2.00	0.00
5,320.0	19.92	349.15	5,023.7	1,550.7	-297.3	1,578.9	2.00	-2.00	0.00
5,360.0	19.12	349.15	5,061.4	1,563.8	-299.8	1,592.3	2.00	-2.00	0.00
5,400.0	18.32	349.15	5,099.3	1,576.4	-302.2	1,605.2	2.00	-2.00	0.00
5,440.0	17.52	349.15	5,137.4	1,588.5	-304.6	1,617.5	2.00	-2.00	0.00
5,451.1	17.30	349.15	5,148.0	1,591.8	-305.2	1,620.8	2.00	-2.00	0.00
<b>SHANNON</b>									
5,480.0	16.72	349.15	5,175.6	1,600.1	-306.8	1,629.2	2.00	-2.00	0.00
5,520.0	15.92	349.15	5,214.0	1,611.1	-308.9	1,640.5	2.00	-2.00	0.00
5,560.0	15.12	349.15	5,252.5	1,621.7	-310.9	1,651.2	2.00	-2.00	0.00
5,600.0	14.32	349.15	5,291.2	1,631.6	-312.8	1,661.4	2.00	-2.00	0.00
5,640.0	13.52	349.15	5,330.0	1,641.1	-314.6	1,671.0	2.00	-2.00	0.00
5,680.0	12.72	349.15	5,369.0	1,650.0	-316.3	1,680.1	2.00	-2.00	0.00
5,720.0	11.92	349.15	5,408.1	1,658.4	-317.9	1,688.6	2.00	-2.00	0.00
5,760.0	11.12	349.15	5,447.3	1,666.2	-319.4	1,696.6	2.00	-2.00	0.00

<b>Database:</b>	Landmark	<b>Local Co-ordinate Reference:</b>	Well Land JG 31-18D
<b>Company:</b>	Great Western	<b>TVD Reference:</b>	WELL @ 4947.0ft (Original Well Elev)
<b>Project:</b>	SEC.31-T2N-R64W	<b>MD Reference:</b>	WELL @ 4947.0ft (Original Well Elev)
<b>Site:</b>	Land JG (West) Pad Sec.31-T2N-R64W	<b>North Reference:</b>	True
<b>Well:</b>	Land JG 31-18D	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Wellbore #1		
<b>Design:</b>	Plan #1 (11-07-12)		

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)
5,800.0	10.32	349.15	5,486.6	1,673.6	-320.9	1,704.0	2.00	-2.00	0.00
5,840.0	9.52	349.15	5,526.0	1,680.3	-322.1	1,710.9	2.00	-2.00	0.00
5,880.0	8.72	349.15	5,565.5	1,686.6	-323.3	1,717.3	2.00	-2.00	0.00
5,920.0	7.92	349.15	5,605.0	1,692.2	-324.4	1,723.1	2.00	-2.00	0.00
5,960.0	7.12	349.15	5,644.7	1,697.4	-325.4	1,728.3	2.00	-2.00	0.00
6,000.0	6.32	349.15	5,684.4	1,702.0	-326.3	1,733.0	2.00	-2.00	0.00
6,040.0	5.52	349.15	5,724.2	1,706.0	-327.1	1,737.1	2.00	-2.00	0.00
6,080.0	4.72	349.15	5,764.1	1,709.6	-327.8	1,740.7	2.00	-2.00	0.00
6,120.0	3.92	349.15	5,803.9	1,712.5	-328.3	1,743.7	2.00	-2.00	0.00
6,160.0	3.12	349.15	5,843.9	1,714.9	-328.8	1,746.2	2.00	-2.00	0.00
6,200.0	2.32	349.15	5,883.8	1,716.8	-329.1	1,748.1	2.00	-2.00	0.00
6,240.0	1.52	349.15	5,923.8	1,718.1	-329.4	1,749.4	2.00	-2.00	0.00
6,280.0	0.72	349.15	5,963.8	1,718.9	-329.5	1,750.2	2.00	-2.00	0.00
6,316.2	0.00	0.00	6,000.0	1,719.1	-329.6	1,750.4	2.00	-2.00	0.00
<b>Back to Vertical - TARGET BHL 2016'FSL &amp; 575'FWL</b>									
6,320.0	0.00	0.00	6,003.8	1,719.1	-329.6	1,750.4	0.00	0.00	0.00
6,360.0	0.00	0.00	6,043.8	1,719.1	-329.6	1,750.4	0.00	0.00	0.00
6,400.0	0.00	0.00	6,083.8	1,719.1	-329.6	1,750.4	0.00	0.00	0.00
6,440.0	0.00	0.00	6,123.8	1,719.1	-329.6	1,750.4	0.00	0.00	0.00
6,480.0	0.00	0.00	6,163.8	1,719.1	-329.6	1,750.4	0.00	0.00	0.00
6,520.0	0.00	0.00	6,203.8	1,719.1	-329.6	1,750.4	0.00	0.00	0.00
6,560.0	0.00	0.00	6,243.8	1,719.1	-329.6	1,750.4	0.00	0.00	0.00
6,600.0	0.00	0.00	6,283.8	1,719.1	-329.6	1,750.4	0.00	0.00	0.00
6,640.0	0.00	0.00	6,323.8	1,719.1	-329.6	1,750.4	0.00	0.00	0.00
6,680.0	0.00	0.00	6,363.8	1,719.1	-329.6	1,750.4	0.00	0.00	0.00
6,720.0	0.00	0.00	6,403.8	1,719.1	-329.6	1,750.4	0.00	0.00	0.00
6,760.0	0.00	0.00	6,443.8	1,719.1	-329.6	1,750.4	0.00	0.00	0.00
6,800.0	0.00	0.00	6,483.8	1,719.1	-329.6	1,750.4	0.00	0.00	0.00
6,840.0	0.00	0.00	6,523.8	1,719.1	-329.6	1,750.4	0.00	0.00	0.00
6,880.0	0.00	0.00	6,563.8	1,719.1	-329.6	1,750.4	0.00	0.00	0.00
6,920.0	0.00	0.00	6,603.8	1,719.1	-329.6	1,750.4	0.00	0.00	0.00
6,960.0	0.00	0.00	6,643.8	1,719.1	-329.6	1,750.4	0.00	0.00	0.00
7,000.0	0.00	0.00	6,683.8	1,719.1	-329.6	1,750.4	0.00	0.00	0.00
7,040.0	0.00	0.00	6,723.8	1,719.1	-329.6	1,750.4	0.00	0.00	0.00
7,080.0	0.00	0.00	6,763.8	1,719.1	-329.6	1,750.4	0.00	0.00	0.00
7,120.0	0.00	0.00	6,803.8	1,719.1	-329.6	1,750.4	0.00	0.00	0.00
7,160.0	0.00	0.00	6,843.8	1,719.1	-329.6	1,750.4	0.00	0.00	0.00
7,188.2	0.00	0.00	6,872.0	1,719.1	-329.6	1,750.4	0.00	0.00	0.00
<b>NIORARA - LEGAL BOX 400' X 400', 2016'FSL &amp; 618'FWL - TARGET CIRCLE 2016'FSL &amp; 575'FWL</b>									
7,200.0	0.00	0.00	6,883.8	1,719.1	-329.6	1,750.4	0.00	0.00	0.00
7,240.0	0.00	0.00	6,923.8	1,719.1	-329.6	1,750.4	0.00	0.00	0.00
7,280.0	0.00	0.00	6,963.8	1,719.1	-329.6	1,750.4	0.00	0.00	0.00
7,320.0	0.00	0.00	7,003.8	1,719.1	-329.6	1,750.4	0.00	0.00	0.00
7,360.0	0.00	0.00	7,043.8	1,719.1	-329.6	1,750.4	0.00	0.00	0.00
7,400.0	0.00	0.00	7,083.8	1,719.1	-329.6	1,750.4	0.00	0.00	0.00
7,440.0	0.00	0.00	7,123.8	1,719.1	-329.6	1,750.4	0.00	0.00	0.00
7,480.0	0.00	0.00	7,163.8	1,719.1	-329.6	1,750.4	0.00	0.00	0.00
7,503.2	0.00	0.00	7,187.0	1,719.1	-329.6	1,750.4	0.00	0.00	0.00
<b>FORT HAYS</b>									
7,520.0	0.00	0.00	7,203.8	1,719.1	-329.6	1,750.4	0.00	0.00	0.00
7,530.2	0.00	0.00	7,214.0	1,719.1	-329.6	1,750.4	0.00	0.00	0.00
<b>CODELL</b>									
7,560.0	0.00	0.00	7,243.8	1,719.1	-329.6	1,750.4	0.00	0.00	0.00

Formations						
	Measured Depth (ft)	Vertical Depth (ft)	Name	Lithology	Dip (°)	Dip Direction (°)
	2,743.8	2,639.0	GREELEY SAND		0.00	
	4,244.9	4,028.0	PARKMAN		0.00	
	4,813.3	4,554.0	SUSSEX		0.00	
	5,451.1	5,148.0	SHANNON		0.00	
	7,188.2	6,872.0	NIOBRARA		0.00	
	7,503.2	7,187.0	FORT HAYS		0.00	
	7,530.2	7,214.0	CODELL		0.00	



<b>Database:</b>	Landmark	<b>Local Co-ordinate Reference:</b>	Well Land JG 31-18D
<b>Company:</b>	Great Western	<b>TVD Reference:</b>	WELL @ 4947.0ft (Original Well Elev)
<b>Project:</b>	SEC.31-T2N-R64W	<b>MD Reference:</b>	WELL @ 4947.0ft (Original Well Elev)
<b>Site:</b>	Land JG (West) Pad Sec.31-T2N-R64W	<b>North Reference:</b>	True
<b>Well:</b>	Land JG 31-18D	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Wellbore #1		
<b>Design:</b>	Plan #1 (11-07-12)		

Plan Annotations				
Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment
		+N/-S (ft)	+E/-W (ft)	
600.0	600.0	0.0	0.0	KOP - Start Build 2.00
1,714.1	1,686.3	210.1	-40.3	Start 3487.9 hold at 1714.1 MD
5,202.1	4,913.7	1,509.0	-289.3	Start Drop -2.00
6,316.2	6,000.0	1,719.1	-329.6	Back to Vertical
7,690.2	7,374.0	1,719.1	-329.6	TD at 7690.2



## **Great Western**

**SEC.31-T2N-R64W**

**Land JG (West) Pad Sec.31-T2N-R64W**

**Land JG 31-18D**

**Wellbore #1**

**Plan #1 (11-07-12)**

## **Anticollision Report**

**09 November, 2012**



<b>Company:</b>	Great Western	<b>Local Co-ordinate Reference:</b>	Well Land JG 31-18D
<b>Project:</b>	SEC.31-T2N-R64W	<b>TVD Reference:</b>	WELL @ 4947.0ft (Original Well Elev)
<b>Reference Site:</b>	Land JG (West) Pad Sec.31-T2N-R64W	<b>MD Reference:</b>	WELL @ 4947.0ft (Original Well Elev)
<b>Site Error:</b>	0.0ft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Land JG 31-18D	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.0ft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	Wellbore #1	<b>Database:</b>	Landmark
<b>Reference Design:</b>	Plan #1 (11-07-12)	<b>Offset TVD Reference:</b>	Offset Datum

Offset Design Land JG (East) Pad Sec.31-T2N-R64W - Land JG 31-13D - Wellbore #1 - Plan #1 (11-05-12)													Offset Site Error:	0.0 ft
Survey Program: 0-MWD													Offset Well Error:	0.0 ft
Reference		Offset		Semi Major Axis			Distance							Warning
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor		
1,200.0	1,195.6	1,176.8	1,162.8	2.8	3.6	89.05	84.1	130.2	147.5	141.8	5.67	26.009		
1,300.0	1,293.1	1,271.2	1,252.6	3.2	4.1	89.20	107.2	148.1	170.7	164.3	6.42	26.581		
1,400.0	1,389.6	1,364.8	1,340.6	3.6	4.7	89.40	132.8	167.0	195.7	188.4	7.27	26.909		
1,500.0	1,485.3	1,457.7	1,426.8	4.1	5.3	89.61	160.8	186.8	222.3	214.1	8.22	27.035		
1,600.0	1,579.8	1,549.6	1,511.2	4.7	6.0	89.80	191.1	207.4	250.5	241.2	9.28	27.006		
1,700.0	1,673.2	1,640.8	1,593.6	5.3	6.7	89.97	223.7	228.9	280.3	269.9	10.43	26.866		
1,714.1	1,686.3	1,653.6	1,605.1	5.4	6.8	90.00	228.5	232.0	284.7	274.1	10.61	26.839		
1,800.0	1,765.7	1,731.2	1,674.1	6.0	7.5	90.45	258.3	251.0	311.7	300.0	11.69	26.653		
1,900.0	1,858.2	1,820.7	1,752.4	6.7	8.3	90.48	295.0	273.9	344.5	331.5	12.99	26.526		
2,000.0	1,950.8	1,913.2	1,832.4	7.4	9.2	90.20	334.6	298.2	378.4	364.0	14.33	26.405		
2,100.0	2,043.3	2,007.3	1,913.7	8.1	10.1	89.95	375.0	323.0	412.3	396.6	15.70	26.267		
2,200.0	2,135.8	2,101.3	1,994.9	8.8	11.0	89.74	415.4	347.7	446.2	429.2	17.08	26.130		
2,300.0	2,228.4	2,195.4	2,076.2	9.5	11.9	89.56	455.8	372.5	480.2	461.7	18.47	25.998		
2,400.0	2,320.9	2,289.4	2,157.4	10.2	12.8	89.40	496.2	397.3	514.1	494.3	19.87	25.875		
2,500.0	2,413.4	2,383.5	2,238.7	11.0	13.7	89.26	536.6	422.0	548.1	526.8	21.28	25.759		
2,600.0	2,506.0	2,477.5	2,319.9	11.7	14.6	89.14	577.0	446.8	582.1	559.4	22.69	25.652		
2,700.0	2,598.5	2,571.6	2,401.2	12.4	15.5	89.03	617.4	471.5	616.0	591.9	24.11	25.553		
2,800.0	2,691.0	2,665.6	2,482.4	13.2	16.5	88.93	657.7	496.3	650.0	624.5	25.53	25.461		
2,900.0	2,783.6	2,759.7	2,563.7	13.9	17.4	88.84	698.1	521.0	684.0	657.0	26.95	25.376		
3,000.0	2,876.1	2,853.7	2,644.9	14.6	18.3	88.76	738.5	545.8	717.9	689.6	28.38	25.297		
3,100.0	2,968.6	2,947.8	2,726.1	15.4	19.2	88.69	778.9	570.5	751.9	722.1	29.81	25.224		
3,200.0	3,061.2	3,041.8	2,807.4	16.1	20.2	88.62	819.3	595.3	785.9	754.6	31.24	25.155		
3,300.0	3,153.7	3,135.9	2,888.6	16.9	21.1	88.56	859.7	620.1	819.8	787.2	32.67	25.092		
3,400.0	3,246.2	3,229.9	2,969.9	17.6	22.0	88.50	900.1	644.8	853.8	819.7	34.11	25.033		
3,500.0	3,338.8	3,323.9	3,051.1	18.3	22.9	88.45	940.5	669.6	887.8	852.2	35.54	24.977		
3,600.0	3,431.3	3,418.0	3,132.4	19.1	23.9	88.41	980.9	694.3	921.8	884.8	36.98	24.926		
3,700.0	3,523.8	3,512.0	3,213.6	19.8	24.8	88.36	1,021.3	719.1	955.7	917.3	38.42	24.877		
3,800.0	3,616.4	3,606.1	3,294.9	20.6	25.7	88.32	1,061.7	743.8	989.7	949.8	39.86	24.831		
3,900.0	3,708.9	3,700.1	3,376.1	21.3	26.7	88.28	1,102.1	768.6	1,023.7	982.4	41.30	24.788		
4,000.0	3,801.4	3,794.2	3,457.4	22.1	27.6	88.24	1,142.4	793.4	1,057.7	1,014.9	42.74	24.748		
4,100.0	3,894.0	3,888.2	3,538.6	22.8	28.5	88.21	1,182.8	818.1	1,091.6	1,047.5	44.18	24.710		
4,200.0	3,986.5	3,982.3	3,619.9	23.5	29.4	88.18	1,223.2	842.9	1,125.6	1,080.0	45.62	24.674		
4,300.0	4,079.0	4,076.3	3,701.1	24.3	30.4	88.15	1,263.6	867.6	1,159.6	1,112.5	47.06	24.639		
4,400.0	4,171.6	4,170.4	3,782.4	25.0	31.3	88.12	1,304.0	892.4	1,193.6	1,145.1	48.51	24.607		
4,500.0	4,264.1	4,264.4	3,863.6	25.8	32.2	88.09	1,344.4	917.1	1,227.5	1,177.6	49.95	24.576		
4,600.0	4,356.6	4,358.5	3,944.8	26.5	33.2	88.07	1,384.8	941.9	1,261.5	1,210.1	51.39	24.547		
4,700.0	4,449.2	4,452.5	4,026.1	27.3	34.1	88.04	1,425.2	966.7	1,295.5	1,242.7	52.84	24.519		
4,800.0	4,541.7	4,546.6	4,107.3	28.0	35.0	88.02	1,465.6	991.4	1,329.5	1,275.2	54.28	24.492		
4,900.0	4,634.2	4,640.6	4,188.6	28.8	36.0	88.00	1,506.0	1,016.2	1,363.4	1,307.7	55.73	24.467		
5,000.0	4,726.7	4,734.7	4,269.8	29.5	36.9	87.98	1,546.4	1,040.9	1,397.4	1,340.2	57.17	24.443		
5,100.0	4,819.3	4,828.7	4,351.1	30.2	37.8	87.96	1,586.8	1,065.7	1,431.4	1,372.8	58.62	24.420		
5,202.1	4,913.7	4,924.7	4,434.0	31.0	38.8	87.94	1,628.0	1,090.9	1,466.1	1,406.0	60.09	24.397		
5,300.0	5,005.0	5,016.8	4,513.5	31.6	39.7	88.56	1,667.5	1,115.2	1,499.4	1,437.8	61.62	24.333		
5,400.0	5,099.3	5,110.6	4,594.6	32.1	40.6	89.07	1,707.8	1,139.9	1,533.5	1,470.5	63.02	24.334		
5,500.0	5,194.8	5,204.2	4,675.4	32.6	41.5	89.45	1,748.0	1,164.5	1,567.7	1,503.4	64.34	24.365		
5,600.0	5,291.2	5,297.3	4,755.9	33.1	42.5	89.72	1,788.0	1,189.0	1,602.1	1,536.5	65.59	24.426		
5,700.0	5,388.5	5,390.0	4,835.9	33.4	43.4	89.89	1,827.8	1,213.4	1,636.5	1,569.7	66.75	24.517		
5,800.0	5,486.6	5,482.0	4,915.4	33.8	44.3	89.97	1,867.3	1,237.6	1,671.1	1,603.3	67.83	24.638		
5,900.0	5,585.2	5,573.2	4,994.2	34.1	45.2	89.96	1,906.5	1,261.7	1,706.0	1,637.2	68.82	24.788		
6,000.0	5,684.4	5,663.7	5,072.3	34.3	46.1	89.88	1,945.3	1,285.5	1,741.2	1,671.4	69.73	24.969		
6,100.0	5,784.0	5,753.1	5,149.6	34.5	47.0	89.74	1,983.7	1,309.0	1,776.7	1,706.2	70.56	25.181		
6,200.0	5,883.8	5,841.5	5,226.0	34.7	47.9	89.55	2,021.7	1,332.3	1,812.7	1,741.4	71.30	25.425		

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

<b>Company:</b>	Great Western	<b>Local Co-ordinate Reference:</b>	Well Land JG 31-18D
<b>Project:</b>	SEC.31-T2N-R64W	<b>TVD Reference:</b>	WELL @ 4947.0ft (Original Well Elev)
<b>Reference Site:</b>	Land JG (West) Pad Sec.31-T2N-R64W	<b>MD Reference:</b>	WELL @ 4947.0ft (Original Well Elev)
<b>Site Error:</b>	0.0ft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Land JG 31-18D	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.0ft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	Wellbore #1	<b>Database:</b>	Landmark
<b>Reference Design:</b>	Plan #1 (11-07-12)	<b>Offset TVD Reference:</b>	Offset Datum

<b>Offset Design</b> Land JG (East) Pad Sec.31-T2N-R64W - Land JG 31-13D - Wellbore #1 - Plan #1 (11-05-12)												<b>Offset Site Error:</b>	0.0 ft
Survey Program: 0-MWD												<b>Offset Well Error:</b>	0.0 ft
Reference		Offset		Semi Major Axis			Distance						
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
6,300.0	5,983.8	5,928.7	5,301.3	34.8	48.7	89.31	2,059.2	1,355.2	1,849.3	1,777.4	71.96	25.700	
6,316.2	6,000.0	5,942.8	5,313.4	34.8	48.9	78.42	2,065.2	1,358.9	1,855.3	1,783.3	72.06	25.748	
6,400.0	6,083.8	6,036.3	5,394.4	34.9	49.7	77.30	2,105.1	1,383.4	1,886.4	1,814.2	72.22	26.120	
6,500.0	6,183.8	6,213.1	5,551.0	34.9	51.0	75.45	2,175.0	1,426.2	1,921.2	1,848.9	72.33	26.561	
6,600.0	6,283.8	6,401.0	5,722.7	35.0	52.2	73.82	2,240.1	1,466.1	1,952.1	1,879.6	72.45	26.944	
6,700.0	6,383.8	6,599.5	5,909.1	35.1	53.3	72.45	2,298.2	1,501.7	1,978.5	1,905.9	72.58	27.259	
6,800.0	6,483.8	6,807.4	6,108.9	35.2	54.2	71.35	2,347.2	1,531.8	1,999.9	1,927.2	72.74	27.495	
6,900.0	6,583.8	7,023.1	6,319.9	35.3	54.9	70.54	2,384.8	1,554.8	2,015.9	1,942.9	72.92	27.646	
7,000.0	6,683.8	7,244.4	6,539.3	35.3	55.5	70.03	2,409.2	1,569.8	2,026.0	1,952.9	73.12	27.706	
7,100.0	6,783.8	7,468.9	6,763.5	35.4	55.8	69.83	2,419.1	1,575.9	2,030.1	1,956.7	73.36	27.674	
7,200.0	6,883.8	7,589.2	6,883.8	35.5	55.8	69.82	2,419.3	1,576.0	2,030.1	1,956.6	73.54	27.607	
7,300.0	6,983.8	7,689.2	6,983.8	35.6	55.9	69.82	2,419.3	1,576.0	2,030.1	1,956.4	73.70	27.545	
7,400.0	7,083.8	7,789.2	7,083.8	35.7	55.9	69.82	2,419.3	1,576.0	2,030.1	1,956.3	73.87	27.483	
7,500.0	7,183.8	7,889.2	7,183.8	35.8	56.0	69.82	2,419.3	1,576.0	2,030.1	1,956.1	74.04	27.420	
7,600.0	7,283.8	7,989.2	7,283.8	35.9	56.0	69.82	2,419.3	1,576.0	2,030.1	1,955.9	74.21	27.357	
7,690.2	7,374.0	8,079.5	7,374.0	36.0	56.1	69.82	2,419.3	1,576.0	2,030.1	1,955.8	74.37	27.299	

<b>Company:</b>	Great Western	<b>Local Co-ordinate Reference:</b>	Well Land JG 31-18D
<b>Project:</b>	SEC.31-T2N-R64W	<b>TVD Reference:</b>	WELL @ 4947.0ft (Original Well Elev)
<b>Reference Site:</b>	Land JG (West) Pad Sec.31-T2N-R64W	<b>MD Reference:</b>	WELL @ 4947.0ft (Original Well Elev)
<b>Site Error:</b>	0.0ft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Land JG 31-18D	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.0ft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	Wellbore #1	<b>Database:</b>	Landmark
<b>Reference Design:</b>	Plan #1 (11-07-12)	<b>Offset TVD Reference:</b>	Offset Datum

Offset Design													Offset Site Error:	0.0 ft
Survey Program: 0-MWD													Offset Well Error:	0.0 ft
Reference		Offset		Semi Major Axis			Distance							Warning
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor		
0.0	0.0	0.0	0.0	0.0	0.0	46.76	18.9	20.1	27.7					
100.0	100.0	100.0	100.0	0.1	0.1	46.76	18.9	20.1	27.7	27.4	0.22	123.031		
200.0	200.0	200.0	200.0	0.3	0.3	46.76	18.9	20.1	27.7	27.0	0.67	41.010		
300.0	300.0	300.0	300.0	0.6	0.6	46.76	18.9	20.1	27.7	26.5	1.12	24.606		
400.0	400.0	400.0	400.0	0.8	0.8	46.76	18.9	20.1	27.7	26.1	1.57	17.576		
500.0	500.0	500.0	500.0	1.0	1.0	46.76	18.9	20.1	27.7	25.6	2.02	13.670		
600.0	600.0	600.0	600.0	1.2	1.2	46.76	18.9	20.1	27.7	25.2	2.47	11.185 CC, ES		
700.0	700.0	699.1	699.1	1.5	1.5	59.40	20.5	20.9	28.4	25.4	2.92	9.720		
800.0	799.8	798.1	797.9	1.7	1.7	64.22	25.0	23.3	30.6	27.3	3.37	9.106		
900.0	899.5	897.0	896.4	1.9	1.9	70.74	32.6	27.2	34.8	31.0	3.83	9.105 SF		
1,000.0	998.7	995.6	994.3	2.2	2.2	77.49	43.2	32.6	41.3	37.0	4.32	9.554		
1,100.0	1,097.5	1,093.9	1,091.5	2.5	2.4	83.46	56.7	39.6	50.1	45.3	4.87	10.294		
1,200.0	1,195.6	1,191.9	1,187.7	2.8	2.8	88.31	73.1	48.0	61.5	56.0	5.50	11.183		
1,300.0	1,293.1	1,289.5	1,282.8	3.2	3.1	92.07	92.3	57.9	75.2	69.0	6.21	12.106		
1,400.0	1,389.6	1,386.5	1,376.7	3.6	3.6	94.92	114.3	69.3	91.2	84.2	7.02	12.991		
1,500.0	1,485.3	1,483.0	1,469.1	4.1	4.0	97.07	139.0	82.0	109.6	101.6	7.94	13.796		
1,600.0	1,579.8	1,578.9	1,560.0	4.7	4.6	98.68	166.2	96.0	130.1	121.1	8.97	14.505		
1,700.0	1,673.2	1,674.2	1,649.2	5.3	5.1	99.89	195.9	111.3	152.7	142.6	10.10	15.117		
1,714.1	1,686.3	1,687.6	1,661.7	5.4	5.2	100.03	200.3	113.5	156.1	145.8	10.27	15.200		
1,800.0	1,765.7	1,768.8	1,736.7	6.0	5.8	100.80	228.0	127.8	177.2	165.9	11.33	15.635		
1,900.0	1,858.2	1,863.0	1,822.5	6.7	6.5	100.73	262.5	145.6	203.0	190.4	12.61	16.092		
2,000.0	1,950.8	1,959.4	1,909.8	7.4	7.2	100.34	298.9	164.3	229.4	215.4	13.95	16.439		
2,100.0	2,043.3	2,055.9	1,997.1	8.1	8.0	100.03	335.3	183.1	255.8	240.5	15.31	16.706		
2,200.0	2,135.8	2,152.3	2,084.4	8.8	8.7	99.77	371.8	201.9	282.2	265.5	16.68	16.915		
2,300.0	2,228.4	2,248.8	2,171.7	9.5	9.5	99.56	408.2	220.6	308.6	290.6	18.07	17.082		
2,400.0	2,320.9	2,345.2	2,259.0	10.2	10.3	99.39	444.7	239.4	335.1	315.6	19.46	17.217		
2,500.0	2,413.4	2,441.6	2,346.3	11.0	11.0	99.24	481.1	258.2	361.5	340.6	20.86	17.328		
2,600.0	2,506.0	2,538.1	2,433.6	11.7	11.8	99.11	517.6	276.9	387.9	365.7	22.27	17.420		
2,700.0	2,598.5	2,634.5	2,520.9	12.4	12.6	98.99	554.0	295.7	414.4	390.7	23.68	17.498		
2,800.0	2,691.0	2,731.0	2,608.2	13.2	13.4	98.89	590.4	314.5	440.8	415.7	25.10	17.564		
2,900.0	2,783.6	2,827.4	2,695.4	13.9	14.2	98.81	626.9	333.2	467.2	440.7	26.52	17.621		
3,000.0	2,876.1	2,923.8	2,782.7	14.6	15.0	98.73	663.3	352.0	493.7	465.7	27.94	17.671		
3,100.0	2,968.6	3,020.3	2,870.0	15.4	15.8	98.66	699.8	370.8	520.1	490.7	29.36	17.714		
3,200.0	3,061.2	3,116.7	2,957.3	16.1	16.6	98.59	736.2	389.5	546.5	515.7	30.79	17.752		
3,300.0	3,153.7	3,213.2	3,044.6	16.9	17.3	98.53	772.6	408.3	573.0	540.7	32.22	17.785		
3,400.0	3,246.2	3,309.6	3,131.9	17.6	18.1	98.48	809.1	427.1	599.4	565.8	33.65	17.815		
3,500.0	3,338.8	3,406.0	3,219.2	18.3	18.9	98.43	845.5	445.8	625.8	590.8	35.08	17.842		
3,600.0	3,431.3	3,502.5	3,306.5	19.1	19.7	98.39	882.0	464.6	652.3	615.8	36.51	17.866		
3,700.0	3,523.8	3,598.9	3,393.8	19.8	20.5	98.35	918.4	483.4	678.7	640.8	37.94	17.888		
3,800.0	3,616.4	3,695.4	3,481.1	20.6	21.3	98.31	954.8	502.1	705.2	665.8	39.38	17.907		
3,900.0	3,708.9	3,791.8	3,568.4	21.3	22.1	98.27	991.3	520.9	731.6	690.8	40.81	17.925		
4,000.0	3,801.4	3,888.3	3,655.7	22.1	22.9	98.24	1,027.7	539.7	758.0	715.8	42.25	17.942		
4,100.0	3,894.0	3,984.7	3,743.0	22.8	23.7	98.21	1,064.2	558.4	784.5	740.8	43.69	17.957		
4,200.0	3,986.5	4,081.1	3,830.3	23.5	24.5	98.18	1,100.6	577.2	810.9	765.8	45.12	17.970		
4,300.0	4,079.0	4,177.6	3,917.6	24.3	25.3	98.16	1,137.0	595.9	837.3	790.8	46.56	17.983		
4,400.0	4,171.6	4,274.0	4,004.9	25.0	26.1	98.13	1,173.5	614.7	863.8	815.8	48.00	17.995		
4,500.0	4,264.1	4,370.5	4,092.2	25.8	26.9	98.11	1,209.9	633.5	890.2	840.8	49.44	18.006		
4,600.0	4,356.6	4,466.9	4,179.5	26.5	27.7	98.08	1,246.4	652.2	916.7	865.8	50.88	18.016		
4,700.0	4,449.2	4,563.3	4,266.8	27.3	28.5	98.06	1,282.8	671.0	943.1	890.8	52.32	18.025		
4,800.0	4,541.7	4,659.8	4,354.1	28.0	29.3	98.04	1,319.2	689.8	969.5	915.8	53.76	18.034		
4,900.0	4,634.2	4,756.2	4,441.4	28.8	30.1	98.02	1,355.7	708.5	996.0	940.8	55.20	18.042		
5,000.0	4,726.7	4,852.7	4,528.7	29.5	30.9	98.01	1,392.1	727.3	1,022.4	965.8	56.64	18.050		

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

<b>Company:</b>	Great Western	<b>Local Co-ordinate Reference:</b>	Well Land JG 31-18D
<b>Project:</b>	SEC.31-T2N-R64W	<b>TVD Reference:</b>	WELL @ 4947.0ft (Original Well Elev)
<b>Reference Site:</b>	Land JG (West) Pad Sec.31-T2N-R64W	<b>MD Reference:</b>	WELL @ 4947.0ft (Original Well Elev)
<b>Site Error:</b>	0.0ft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Land JG 31-18D	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.0ft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	Wellbore #1	<b>Database:</b>	Landmark
<b>Reference Design:</b>	Plan #1 (11-07-12)	<b>Offset TVD Reference:</b>	Offset Datum

Offset Design Land JG (East) Pad Sec.31-T2N-R64W - Land JG 31-17D - Wellbore #1 - Plan #1 (11-05-12)													Offset Site Error:	0.0 ft
Survey Program: 0-MWD													Offset Well Error:	0.0 ft
Reference		Offset		Semi Major Axis			Distance							
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning	
5,100.0	4,819.3	4,949.1	4,616.0	30.2	31.7	97.99	1,428.6	746.1	1,048.9	990.8	58.09	18.057		
5,202.1	4,913.7	5,047.5	4,705.1	31.0	32.5	97.97	1,465.8	765.2	1,075.8	1,016.3	59.56	18.064		
5,300.0	5,005.0	5,144.0	4,792.4	31.6	33.3	98.39	1,502.2	784.0	1,101.5	1,040.5	60.97	18.067		
5,400.0	5,099.3	5,261.9	4,900.3	32.1	34.1	98.69	1,544.4	805.7	1,126.2	1,063.9	62.25	18.091		
5,500.0	5,194.8	5,381.2	5,011.4	32.6	34.8	98.95	1,583.1	825.6	1,148.4	1,085.0	63.40	18.113		
5,600.0	5,291.2	5,501.8	5,125.4	33.1	35.4	99.17	1,617.9	843.6	1,168.3	1,103.9	64.47	18.123		
5,700.0	5,388.5	5,623.5	5,242.1	33.4	36.0	99.37	1,648.8	859.5	1,185.7	1,120.3	65.42	18.124		
5,800.0	5,486.6	5,746.3	5,361.1	33.8	36.5	99.53	1,675.4	873.2	1,200.6	1,134.3	66.27	18.116		
5,900.0	5,585.2	5,869.9	5,482.2	34.1	36.9	99.66	1,697.6	884.6	1,212.9	1,145.9	67.01	18.100		
6,000.0	5,684.4	5,994.3	5,605.0	34.3	37.3	99.77	1,715.2	893.7	1,222.6	1,155.0	67.64	18.077		
6,100.0	5,784.0	6,119.3	5,729.1	34.5	37.5	99.84	1,728.1	900.3	1,229.7	1,161.6	68.14	18.048		
6,200.0	5,883.8	6,244.6	5,854.1	34.7	37.8	99.89	1,736.2	904.5	1,234.2	1,165.7	68.51	18.014		
6,300.0	5,983.8	6,370.2	5,979.6	34.8	37.9	99.91	1,739.5	906.2	1,235.9	1,167.2	68.77	17.972		
6,316.2	6,000.0	6,390.6	6,000.0	34.8	37.9	89.05	1,739.5	906.2	1,236.0	1,167.2	68.80	17.964		
6,400.0	6,083.8	6,474.3	6,083.8	34.9	38.0	89.05	1,739.5	906.2	1,236.0	1,167.0	68.93	17.931		
6,500.0	6,183.8	6,574.3	6,183.8	34.9	38.0	89.05	1,739.5	906.2	1,236.0	1,166.9	69.09	17.890		
6,600.0	6,283.8	6,674.3	6,283.8	35.0	38.1	89.05	1,739.5	906.2	1,236.0	1,166.7	69.25	17.849		
6,700.0	6,383.8	6,774.3	6,383.8	35.1	38.2	89.05	1,739.5	906.2	1,236.0	1,166.6	69.41	17.808		
6,800.0	6,483.8	6,874.3	6,483.8	35.2	38.3	89.05	1,739.5	906.2	1,236.0	1,166.4	69.57	17.766		
6,900.0	6,583.8	6,974.3	6,583.8	35.3	38.3	89.05	1,739.5	906.2	1,236.0	1,166.2	69.74	17.723		
7,000.0	6,683.8	7,074.3	6,683.8	35.3	38.4	89.05	1,739.5	906.2	1,236.0	1,166.1	69.91	17.680		
7,100.0	6,783.8	7,174.3	6,783.8	35.4	38.5	89.05	1,739.5	906.2	1,236.0	1,165.9	70.08	17.637		
7,200.0	6,883.8	7,274.3	6,883.8	35.5	38.6	89.05	1,739.5	906.2	1,236.0	1,165.7	70.25	17.593		
7,300.0	6,983.8	7,374.3	6,983.8	35.6	38.7	89.05	1,739.5	906.2	1,236.0	1,165.5	70.43	17.549		
7,400.0	7,083.8	7,474.3	7,083.8	35.7	38.7	89.05	1,739.5	906.2	1,236.0	1,165.4	70.61	17.505		
7,500.0	7,183.8	7,574.3	7,183.8	35.8	38.8	89.05	1,739.5	906.2	1,236.0	1,165.2	70.79	17.460		
7,600.0	7,283.8	7,674.3	7,283.8	35.9	38.9	89.05	1,739.5	906.2	1,236.0	1,165.0	70.97	17.415		
7,690.2	7,374.0	7,764.6	7,374.0	36.0	39.0	89.05	1,739.5	906.2	1,236.0	1,164.8	71.14	17.374		

Survey Design												Land JG (East) Pad Sec.31-T2N-R64W - Land JG 31-20D - Wellbore #1 - Plan #1 (11-05-12)		Offset Site Error: 0.0 ft	
Survey Program: 0-MWD												Offset Well Error: 0.0 ft			
Reference		Offset		Semi Major Axis			Distance						Warning		
Measured Depth	Vertical Depth	Measured Depth	Vertical Depth	Reference	Offset	Highside Toolface	Offset Wellbore Centre		Between Centres	Between Ellipses	Minimum Separation	Separation Factor			
(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(°)	+N/-S (ft)	+E/-W (ft)	(ft)	(ft)	(ft)				
0.0	0.0	0.0	0.0	0.0	0.0	135.35	-20.4	20.1	28.7						
100.0	100.0	100.0	100.0	0.1	0.1	135.35	-20.4	20.1	28.7	28.4	0.22	127.546			
200.0	200.0	200.0	200.0	0.3	0.3	135.35	-20.4	20.1	28.7	28.0	0.67	42.515			
300.0	300.0	300.0	300.0	0.6	0.6	135.35	-20.4	20.1	28.7	27.5	1.12	25.509			
400.0	400.0	400.0	400.0	0.8	0.8	135.35	-20.4	20.1	28.7	27.1	1.57	18.221 CC			
500.0	500.0	499.8	499.8	1.0	1.0	131.96	-19.4	21.6	29.0	27.0	2.02	14.370 ES			
600.0	600.0	599.4	599.2	1.2	1.2	122.39	-16.4	25.8	30.5	28.1	2.46	12.400			
700.0	700.0	698.5	698.0	1.5	1.5	122.27	-11.3	32.8	35.6	32.7	2.92	12.195 SF			
800.0	799.8	797.1	795.8	1.7	1.7	114.88	-4.4	42.5	45.4	42.0	3.40	13.360			
900.0	899.5	894.8	892.4	1.9	2.0	110.84	4.4	54.8	59.2	55.3	3.90	15.197			
1,000.0	998.7	991.6	987.5	2.2	2.4	108.89	15.1	69.6	76.7	72.3	4.43	17.307			
1,100.0	1,097.5	1,087.3	1,080.8	2.5	2.8	108.10	27.4	86.8	97.7	92.7	5.02	19.461			
1,200.0	1,195.6	1,181.7	1,172.0	2.8	3.2	107.88	41.3	106.3	122.1	116.4	5.67	21.521			
1,300.0	1,293.1	1,274.6	1,261.1	3.2	3.7	107.94	56.8	127.8	149.8	143.4	6.40	23.411			
1,400.0	1,389.6	1,366.0	1,347.8	3.6	4.2	108.09	73.6	151.3	180.7	173.5	7.20	25.098			
1,500.0	1,485.3	1,455.7	1,432.0	4.1	4.8	108.27	91.6	176.5	214.8	206.7	8.08	26.581			
1,600.0	1,579.8	1,543.6	1,513.4	4.7	5.4	108.41	110.8	203.2	251.9	242.9	9.04	27.864			
1,700.0	1,673.2	1,634.5	1,597.1	5.3	6.1	108.71	131.6	232.3	291.4	281.3	10.10	28.856			
1,714.1	1,686.3	1,647.4	1,609.0	5.4	6.2	108.78	134.5	236.4	297.0	286.8	10.25	28.973			
1,800.0	1,765.7	1,725.8	1,681.1	6.0	6.8	109.83	152.5	261.4	331.6	320.4	11.24	29.515			
1,900.0	1,858.2	1,817.2	1,765.0	6.7	7.5	110.81	173.4	290.6	372.0	359.6	12.40	29.989			
2,000.0	1,950.8	1,908.5	1,849.0	7.4	8.2	111.60	194.3	319.8	412.4	398.8	13.59	30.347			
2,100.0	2,043.3	2,099.8	1,933.0	8.1	8.9	112.24	215.2	349.0	452.9	438.1	14.79	30.624			
2,200.0	2,135.8	2,091.2	2,017.0	8.8	9.6	112.78	236.1	378.1	493.4	477.4	16.00	30.840			
2,300.0	2,228.4	2,182.5	2,101.0	9.5	10.4	113.24	257.0	407.3	533.9	516.7	17.22	31.014			
2,400.0	2,320.9	2,273.8	2,184.9	10.2	11.1	113.64	277.9	436.5	574.5	556.1	18.44	31.155			
2,500.0	2,413.4	2,365.2	2,268.9	11.0	11.8	113.98	298.8	465.7	615.1	595.5	19.67	31.271			
2,600.0	2,506.0	2,456.5	2,352.9	11.7	12.5	114.28	319.7	494.9	655.7	634.8	20.90	31.368			
2,700.0	2,598.5	2,547.8	2,436.9	12.4	13.3	114.54	340.7	524.0	696.4	674.2	22.14	31.449			
2,800.0	2,691.0	2,639.1	2,520.9	13.2	14.0	114.78	361.6	553.2	737.0	713.6	23.38	31.519			
2,900.0	2,783.6	2,730.5	2,604.9	13.9	14.7	114.99	382.5	582.4	777.7	753.0	24.63	31.578			
3,000.0	2,876.1	2,821.8	2,688.8	14.6	15.5	115.18	403.4	611.6	818.3	792.4	25.87	31.629			
3,100.0	2,968.6	2,913.1	2,772.8	15.4	16.2	115.35	424.3	640.7	859.0	831.9	27.12	31.674			
3,200.0	3,061.2	3,004.5	2,856.8	16.1	16.9	115.51	445.2	669.9	899.6	871.3	28.37	31.713			
3,300.0	3,153.7	3,095.8	2,940.8	16.9	17.7	115.65	466.1	699.1	940.3	910.7	29.62	31.748			
3,400.0	3,246.2	3,187.1	3,024.8	17.6	18.4	115.78	487.0	728.3	981.0	950.1	30.87	31.778			
3,500.0	3,338.8	3,278.5	3,108.7	18.3	19.1	115.90	507.9	757.4	1,021.7	989.6	32.12	31.805			
3,600.0	3,431.3	3,369.8	3,192.7	19.1	19.9	116.02	528.8	786.6	1,062.4	1,029.0	33.38	31.830			
3,700.0	3,523.8	3,461.1	3,276.7	19.8	20.6	116.12	549.7	815.8	1,103.1	1,068.4	34.63	31.852			
3,800.0	3,616.4	3,552.5	3,360.7	20.6	21.3	116.21	570.6	845.0	1,143.7	1,107.9	35.89	31.871			
3,900.0	3,708.9	3,643.8	3,444.7	21.3	22.1	116.30	591.5	874.2	1,184.4	1,147.3	37.14	31.889			
4,000.0	3,801.4	3,735.1	3,528.6	22.1	22.8	116.39	612.4	903.3	1,225.1	1,186.7	38.40	31.905			
4,100.0	3,894.0	3,826.4	3,612.6	22.8	23.5	116.47	633.3	932.5	1,265.8	1,226.2	39.66	31.920			
4,200.0	3,986.5	3,917.8	3,696.6	23.5	24.3	116.54	654.3	961.7	1,306.5	1,265.6	40.91	31.933			
4,300.0	4,079.0	4,009.1	3,780.6	24.3	25.0	116.61	675.2	990.9	1,347.2	1,305.1	42.17	31.946			
4,400.0	4,171.6	4,100.4	3,864.6	25.0	25.7	116.67	696.1	1,020.0	1,387.9	1,344.5	43.43	31.957			
4,500.0	4,264.1	4,191.8	3,948.6	25.8	26.5	116.73	717.0	1,049.2	1,428.6	1,384.0	44.69	31.967			
4,600.0	4,356.6	4,283.1	4,032.5	26.5	27.2	116.79	737.9	1,078.4	1,469.4	1,423.4	45.95	31.977			
4,700.0	4,449.2	4,374.4	4,116.5	27.3	27.9	116.85	758.8	1,107.6	1,510.1	1,462.9	47.21	31.985			
4,800.0	4,541.7	4,465.8	4,200.5	28.0	28.7	116.90	779.7	1,136.7	1,550.8	1,502.3	48.47	31.994			
4,900.0	4,634.2	4,557.1	4,284.5	28.8	29.4	116.95	800.6	1,165.9	1,591.5	1,541.7	49.73	32.001			
5,000.0	4,726.7	4,648.4	4,368.5	29.5	30.2	116.99	821.5	1,195.1	1,632.2	1,581.2	50.99	32.008			



<b>Company:</b>	Great Western	<b>Local Co-ordinate Reference:</b>	Well Land JG 31-18D
<b>Project:</b>	SEC.31-T2N-R64W	<b>TVD Reference:</b>	WELL @ 4947.0ft (Original Well Elev)
<b>Reference Site:</b>	Land JG (West) Pad Sec.31-T2N-R64W	<b>MD Reference:</b>	WELL @ 4947.0ft (Original Well Elev)
<b>Site Error:</b>	0.0ft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Land JG 31-18D	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.0ft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	Wellbore #1	<b>Database:</b>	Landmark
<b>Reference Design:</b>	Plan #1 (11-07-12)	<b>Offset TVD Reference:</b>	Offset Datum

Offset Design Land JG (East) Pad Sec.31-T2N-R64W - Land JG 31-20D - Wellbore #1 - Plan #1 (11-05-12)													Offset Site Error: 0.0 ft
Survey Program: 0-MWD													Offset Well Error: 0.0 ft
Reference		Offset		Semi Major Axis			Distance						Warning
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	
5,100.0	4,819.3	4,739.7	4,452.4	30.2	30.9	117.04	842.4	1,224.3	1,672.9	1,620.6	52.25	32.015	
5,202.1	4,913.7	4,833.0	4,538.2	31.0	31.6	117.08	863.7	1,254.1	1,714.5	1,660.9	53.54	32.021	
5,300.0	5,005.0	4,922.7	4,620.7	31.6	32.4	117.83	884.3	1,282.7	1,753.6	1,698.7	54.89	31.946	
5,400.0	5,099.3	5,014.9	4,705.5	32.1	33.1	118.44	905.4	1,312.2	1,792.1	1,736.0	56.16	31.911	
5,500.0	5,194.8	5,107.6	4,790.7	32.6	33.9	118.92	926.6	1,341.8	1,829.1	1,771.7	57.38	31.875	
5,600.0	5,291.2	5,202.0	4,877.5	33.1	34.6	119.27	948.2	1,372.0	1,864.6	1,806.0	58.56	31.839	
5,700.0	5,388.5	5,352.1	5,017.0	33.4	35.5	119.35	980.4	1,416.8	1,897.0	1,837.2	59.82	31.713	
5,800.0	5,486.6	5,506.8	5,163.7	33.8	36.3	119.41	1,009.0	1,456.7	1,925.0	1,864.1	60.96	31.580	
5,900.0	5,585.2	5,665.6	5,316.8	34.1	37.0	119.45	1,033.5	1,491.0	1,948.4	1,886.4	61.95	31.451	
6,000.0	5,684.4	5,827.9	5,475.4	34.3	37.6	119.48	1,053.4	1,518.8	1,966.9	1,904.1	62.79	31.325	
6,100.0	5,784.0	5,993.0	5,638.5	34.5	38.1	119.50	1,068.3	1,539.5	1,980.5	1,917.0	63.47	31.204	
6,200.0	5,883.8	6,160.0	5,804.7	34.7	38.4	119.51	1,077.8	1,552.7	1,989.0	1,925.0	63.97	31.093	
6,300.0	5,983.8	6,328.1	5,972.7	34.8	38.6	119.51	1,081.6	1,558.0	1,992.4	1,928.1	64.30	30.985	
6,316.2	6,000.0	6,355.4	6,000.0	34.8	38.7	108.66	1,081.6	1,558.2	1,992.5	1,928.1	64.34	30.968	
6,400.0	6,083.8	6,439.2	6,083.8	34.9	38.7	108.66	1,081.6	1,558.2	1,992.5	1,928.0	64.48	30.903	
6,500.0	6,183.8	6,539.2	6,183.8	34.9	38.8	108.66	1,081.6	1,558.2	1,992.5	1,927.8	64.64	30.822	
6,600.0	6,283.8	6,639.2	6,283.8	35.0	38.9	108.66	1,081.6	1,558.2	1,992.5	1,927.7	64.81	30.741	
6,700.0	6,383.8	6,739.2	6,383.8	35.1	38.9	108.66	1,081.6	1,558.2	1,992.5	1,927.5	64.99	30.659	
6,800.0	6,483.8	6,839.2	6,483.8	35.2	39.0	108.66	1,081.6	1,558.2	1,992.5	1,927.3	65.16	30.577	
6,900.0	6,583.8	6,939.2	6,583.8	35.3	39.1	108.66	1,081.6	1,558.2	1,992.5	1,927.1	65.34	30.493	
7,000.0	6,683.8	7,039.2	6,683.8	35.3	39.2	108.66	1,081.6	1,558.2	1,992.5	1,926.9	65.52	30.409	
7,100.0	6,783.8	7,139.2	6,783.8	35.4	39.3	108.66	1,081.6	1,558.2	1,992.5	1,926.8	65.71	30.324	
7,200.0	6,883.8	7,239.2	6,883.8	35.5	39.3	108.66	1,081.6	1,558.2	1,992.5	1,926.6	65.89	30.239	
7,300.0	6,983.8	7,339.2	6,983.8	35.6	39.4	108.66	1,081.6	1,558.2	1,992.5	1,926.4	66.08	30.152	
7,400.0	7,083.8	7,439.2	7,083.8	35.7	39.5	108.66	1,081.6	1,558.2	1,992.5	1,926.2	66.27	30.065	
7,500.0	7,183.8	7,539.2	7,183.8	35.8	39.6	108.66	1,081.6	1,558.2	1,992.5	1,926.0	66.46	29.978	
7,600.0	7,283.8	7,639.2	7,283.8	35.9	39.7	108.66	1,081.6	1,558.2	1,992.5	1,925.8	66.66	29.890	
7,690.2	7,374.0	7,729.4	7,374.0	36.0	39.8	108.66	1,081.6	1,558.2	1,992.5	1,925.6	66.84	29.810	

<b>Company:</b>	Great Western	<b>Local Co-ordinate Reference:</b>	Well Land JG 31-18D
<b>Project:</b>	SEC.31-T2N-R64W	<b>TVD Reference:</b>	WELL @ 4947.0ft (Original Well Elev)
<b>Reference Site:</b>	Land JG (West) Pad Sec.31-T2N-R64W	<b>MD Reference:</b>	WELL @ 4947.0ft (Original Well Elev)
<b>Site Error:</b>	0.0ft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Land JG 31-18D	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.0ft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	Wellbore #1	<b>Database:</b>	Landmark
<b>Reference Design:</b>	Plan #1 (11-07-12)	<b>Offset TVD Reference:</b>	Offset Datum

Offset Design													Offset Site Error:	0.0 ft
Survey Program: 0-MWD													Offset Well Error:	0.0 ft
Reference		Offset		Semi Major Axis			Distance							Warning
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor		
0.0	0.0	0.0	0.0	0.0	0.0	0.00	39.3	0.0	39.3					
100.0	100.0	100.0	100.0	0.1	0.1	0.00	39.3	0.0	39.3	39.1	0.22	175.042		
200.0	200.0	200.0	200.0	0.3	0.3	0.00	39.3	0.0	39.3	38.7	0.67	58.347 CC, ES		
300.0	300.0	298.6	298.6	0.6	0.6	0.25	41.0	0.2	41.1	39.9	1.12	36.544		
400.0	400.0	397.0	396.8	0.8	0.8	0.90	46.1	0.7	46.2	44.6	1.58	29.214		
500.0	500.0	494.9	494.4	1.0	1.0	1.71	54.4	1.6	54.7	52.7	2.04	26.816		
600.0	600.0	592.1	590.9	1.2	1.3	2.49	66.0	2.9	66.7	64.2	2.50	26.624		
700.0	700.0	688.7	686.4	1.5	1.6	14.24	80.7	4.4	80.3	77.3	2.96	27.160		
800.0	799.8	784.9	780.8	1.7	2.0	15.46	98.5	6.4	93.9	90.5	3.41	27.501		
900.0	899.5	880.5	874.1	1.9	2.4	16.87	119.3	8.6	107.6	103.7	3.88	27.713		
1,000.0	998.7	975.7	966.3	2.2	2.8	18.39	143.1	11.2	121.3	117.0	4.36	27.816		
1,100.0	1,097.5	1,070.4	1,057.1	2.5	3.3	19.99	169.8	14.0	135.2	130.3	4.86	27.813		
1,200.0	1,195.6	1,164.7	1,146.6	2.8	3.9	21.63	199.3	17.2	149.2	143.8	5.38	27.700		
1,300.0	1,293.1	1,258.5	1,234.6	3.2	4.4	23.29	231.6	20.7	163.3	157.4	5.95	27.458		
1,400.0	1,389.6	1,351.8	1,321.0	3.6	5.1	24.96	266.5	24.4	177.7	171.1	6.54	27.167		
1,500.0	1,485.3	1,444.6	1,405.8	4.1	5.8	26.62	304.0	28.5	192.2	185.0	7.21	26.658		
1,600.0	1,579.8	1,537.0	1,489.0	4.7	6.5	28.26	344.0	32.8	207.1	199.1	7.95	26.062		
1,700.0	1,673.2	1,628.9	1,570.4	5.3	7.3	29.89	386.4	37.3	222.2	213.4	8.76	25.362		
1,714.1	1,686.3	1,642.3	1,582.2	5.4	7.4	30.12	392.8	38.0	224.4	215.5	8.89	25.249		
1,800.0	1,765.7	1,726.9	1,656.4	6.0	8.2	31.67	433.2	42.4	237.4	227.7	9.72	24.437		
1,900.0	1,858.2	1,825.5	1,742.8	6.7	9.1	33.27	480.3	47.4	252.8	242.1	10.73	23.566		
2,000.0	1,950.8	1,924.1	1,829.2	7.4	10.0	34.69	527.4	52.5	268.4	256.6	11.78	22.778		
2,100.0	2,043.3	2,022.7	1,915.7	8.1	10.9	35.95	574.5	57.6	284.1	271.3	12.87	22.069		
2,200.0	2,135.8	2,121.2	2,002.1	8.8	11.8	37.08	621.6	62.7	300.0	286.0	13.99	21.435		
2,300.0	2,228.4	2,219.8	2,088.6	9.5	12.7	38.10	668.7	67.7	315.9	300.8	15.14	20.867		
2,400.0	2,320.9	2,318.4	2,175.0	10.2	13.6	39.02	715.8	72.8	331.9	315.6	16.31	20.358		
2,500.0	2,413.4	2,416.9	2,261.5	11.0	14.5	39.85	762.9	77.9	348.1	330.6	17.49	19.902		
2,600.0	2,506.0	2,515.5	2,347.9	11.7	15.4	40.61	810.0	82.9	364.2	345.5	18.69	19.491		
2,700.0	2,598.5	2,614.1	2,434.3	12.4	16.3	41.31	857.1	88.0	380.5	360.6	19.90	19.121		
2,800.0	2,691.0	2,712.7	2,520.8	13.2	17.2	41.95	904.2	93.1	396.7	375.6	21.12	18.786		
2,900.0	2,783.6	2,811.2	2,607.2	13.9	18.1	42.54	951.3	98.1	413.1	390.7	22.35	18.482		
3,000.0	2,876.1	2,909.8	2,693.7	14.6	19.0	43.08	998.4	103.2	429.4	405.8	23.59	18.205		
3,100.0	2,968.6	3,008.4	2,780.1	15.4	19.9	43.58	1,045.5	108.3	445.8	421.0	24.84	17.952		
3,200.0	3,061.2	3,107.0	2,866.6	16.1	20.8	44.05	1,092.6	113.3	462.3	436.2	26.09	17.720		
3,300.0	3,153.7	3,205.5	2,953.0	16.9	21.7	44.49	1,139.7	118.4	478.7	451.4	27.35	17.506		
3,400.0	3,246.2	3,304.1	3,039.4	17.6	22.6	44.89	1,186.8	123.5	495.2	466.6	28.61	17.310		
3,500.0	3,338.8	3,402.7	3,125.9	18.3	23.5	45.27	1,233.9	128.5	511.7	481.8	29.88	17.128		
3,600.0	3,431.3	3,501.3	3,212.3	19.1	24.4	45.63	1,281.0	133.6	528.2	497.1	31.15	16.960		
3,700.0	3,523.8	3,599.8	3,298.8	19.8	25.3	45.97	1,328.2	138.7	544.8	512.4	32.42	16.803		
3,800.0	3,616.4	3,698.4	3,385.2	20.6	26.2	46.28	1,375.3	143.7	561.4	527.7	33.70	16.658		
3,900.0	3,708.9	3,797.0	3,471.7	21.3	27.1	46.58	1,422.4	148.8	577.9	543.0	34.98	16.522		
4,000.0	3,801.4	3,895.5	3,558.1	22.1	28.0	46.86	1,469.5	153.9	594.5	558.3	36.26	16.395		
4,100.0	3,894.0	3,994.1	3,644.5	22.8	28.9	47.13	1,516.6	158.9	611.1	573.6	37.55	16.277		
4,200.0	3,986.5	4,092.7	3,731.0	23.5	29.9	47.38	1,563.7	164.0	627.7	588.9	38.83	16.165		
4,300.0	4,079.0	4,191.3	3,817.4	24.3	30.8	47.62	1,610.8	169.1	644.4	604.3	40.12	16.060		
4,400.0	4,171.6	4,289.8	3,903.9	25.0	31.7	47.84	1,657.9	174.1	661.0	619.6	41.41	15.961		
4,500.0	4,264.1	4,388.4	3,990.3	25.8	32.6	48.06	1,705.0	179.2	677.7	635.0	42.71	15.868		
4,600.0	4,356.6	4,487.0	4,076.8	26.5	33.5	48.26	1,752.1	184.3	694.3	650.3	44.00	15.780		
4,700.0	4,449.2	4,585.6	4,163.2	27.3	34.4	48.46	1,799.2	189.4	711.0	665.7	45.29	15.697		
4,800.0	4,541.7	4,684.1	4,249.6	28.0	35.3	48.65	1,846.3	194.4	727.7	681.1	46.59	15.618		
4,900.0	4,634.2	4,782.7	4,336.1	28.8	36.2	48.83	1,893.4	199.5	744.4	696.5	47.89	15.543		
5,000.0	4,726.7	4,881.3	4,422.5	29.5	37.1	49.00	1,940.5	204.6	761.0	711.9	49.19	15.472		

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

Survey Design													Offset Site Error:	
Land JG (West) Pad Sec.31-T2N-R64W - Land JG 31-12D - Wellbore #1 - Plan #1 (11-07-12)													0.0 ft	
Survey Program: 0-MWD													Offset Well Error:	
Reference		Offset		Semi Major Axis			Distance						Warning	
Measured Depth	Vertical Depth	Measured Depth	Vertical Depth	Reference	Offset	Highside Toolface	Offset Wellbore Centre		Between Centres	Between Ellipses	Minimum Separation	Separation Factor		
(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(°)	+N-S (ft)	+E-W (ft)	(ft)	(ft)	(ft)			
5,100.0	4,819.3	4,979.8	4,509.0	30.2	38.0	49.16	1,987.6	209.6	777.7	727.2	50.49	15.405		
5,202.1	4,913.7	5,080.5	4,597.2	31.0	39.0	49.32	2,035.7	214.8	794.8	743.0	51.81	15.339		
5,300.0	5,005.0	5,197.3	4,700.3	31.6	39.9	49.69	2,090.3	220.7	811.4	758.3	53.11	15.276		
5,400.0	5,099.3	5,326.6	4,816.8	32.1	40.8	50.03	2,146.1	226.7	827.1	772.8	54.25	15.246		
5,500.0	5,194.8	5,457.0	4,936.7	32.6	41.5	50.33	2,196.9	232.1	841.2	786.0	55.28	15.217		
5,600.0	5,291.2	5,588.3	5,059.7	33.1	42.2	50.59	2,242.5	237.1	853.9	797.7	56.22	15.189		
5,700.0	5,388.5	5,720.4	5,185.5	33.4	42.9	50.81	2,282.8	241.4	865.0	807.9	57.05	15.162		
5,800.0	5,486.6	5,853.3	5,313.7	33.8	43.5	51.00	2,317.4	245.1	874.5	816.7	57.77	15.138		
5,900.0	5,585.2	5,986.7	5,443.9	34.1	43.9	51.16	2,346.2	248.2	882.3	824.0	58.38	15.115		
6,000.0	5,684.4	6,120.7	5,575.9	34.3	44.3	51.28	2,369.0	250.7	888.5	829.7	58.87	15.094		
6,100.0	5,784.0	6,255.0	5,709.2	34.5	44.7	51.36	2,385.6	252.5	893.1	833.8	59.23	15.077		
6,200.0	5,883.8	6,389.7	5,843.4	34.7	44.9	51.42	2,396.1	253.6	895.9	836.4	59.49	15.061		
6,300.0	5,983.8	6,524.5	5,978.1	34.8	45.0	51.44	2,400.3	254.0	897.0	837.4	59.61	15.047		
6,316.2	6,000.0	6,546.3	6,000.0	34.8	45.0	40.59	2,400.3	254.0	897.0	837.4	59.62	15.045		
6,400.0	6,083.8	6,630.1	6,083.8	34.9	45.1	40.59	2,400.3	254.0	897.0	837.3	59.77	15.009		
6,500.0	6,183.8	6,730.1	6,183.8	34.9	45.2	40.59	2,400.3	254.0	897.0	837.1	59.95	14.963		
6,600.0	6,283.8	6,830.1	6,283.8	35.0	45.2	40.59	2,400.3	254.0	897.0	836.9	60.13	14.917		
6,700.0	6,383.8	6,930.1	6,383.8	35.1	45.3	40.59	2,400.3	254.0	897.0	836.7	60.32	14.871		
6,800.0	6,483.8	7,030.1	6,483.8	35.2	45.3	40.59	2,400.3	254.0	897.0	836.5	60.51	14.824		
6,900.0	6,583.8	7,130.1	6,583.8	35.3	45.4	40.59	2,400.3	254.0	897.0	836.3	60.71	14.777		
7,000.0	6,683.8	7,230.1	6,683.8	35.3	45.5	40.59	2,400.3	254.0	897.0	836.1	60.90	14.729		
7,100.0	6,783.8	7,330.1	6,783.8	35.4	45.5	40.59	2,400.3	254.0	897.0	835.9	61.10	14.682		
7,200.0	6,883.8	7,430.1	6,883.8	35.5	45.6	40.59	2,400.3	254.0	897.0	835.7	61.30	14.633		
7,300.0	6,983.8	7,530.1	6,983.8	35.6	45.7	40.59	2,400.3	254.0	897.0	835.5	61.50	14.585		
7,400.0	7,083.8	7,630.1	7,083.8	35.7	45.7	40.59	2,400.3	254.0	897.0	835.3	61.71	14.536		
7,500.0	7,183.8	7,730.1	7,183.8	35.8	45.8	40.59	2,400.3	254.0	897.0	835.1	61.92	14.487		
7,600.0	7,283.8	7,830.1	7,283.8	35.9	45.9	40.59	2,400.3	254.0	897.0	834.9	62.13	14.438		
7,656.4	7,340.2	7,886.5	7,340.2	35.9	45.9	40.59	2,400.3	254.0	897.0	834.8	62.25	14.410		
7,690.2	7,374.0	7,910.3	7,364.0	36.0	45.9	40.59	2,400.3	254.0	897.1	834.8	62.31	14.397 SF		

Offset Design		Land JG (West) Pad Sec.31-T2N-R64W - Land JG 31-19D - Wellbore #1 - Plan #1 (11-07-12)											Offset Site Error:	0.0 ft
Survey Program: 0-MWD													Offset Well Error:	0.0 ft
Reference		Offset		Semi Major Axis			Distance							Warning
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor		
0.0	0.0	0.0	0.0	0.0	0.0	0.00	18.9	0.0	18.9	18.9	0.00	N/A		
100.0	100.0	100.0	100.0	0.1	0.1	0.00	18.9	0.0	18.9	18.7	0.22	84.298		
200.0	200.0	200.0	200.0	0.3	0.3	0.00	18.9	0.0	18.9	18.3	0.67	28.099		
300.0	300.0	300.0	300.0	0.6	0.6	0.00	18.9	0.0	18.9	17.8	1.12	16.860		
400.0	400.0	400.0	400.0	0.8	0.8	0.00	18.9	0.0	18.9	17.4	1.57	12.043 CC, ES		
500.0	500.0	499.3	499.3	1.0	1.0	1.06	20.6	0.4	20.6	18.6	2.02	10.206		
600.0	600.0	598.4	598.2	1.2	1.2	3.39	25.6	1.5	25.7	23.3	2.48	10.395		
700.0	700.0	697.2	696.6	1.5	1.5	17.41	34.0	3.4	32.6	29.7	2.93	11.150		
800.0	799.8	795.6	794.4	1.7	1.7	21.45	45.5	6.0	39.8	36.4	3.38	11.768		
900.0	899.5	893.8	891.3	1.9	2.0	25.89	60.3	9.4	47.3	43.5	3.84	12.330		
1,000.0	998.7	991.6	987.4	2.2	2.4	30.44	78.3	13.5	55.4	51.1	4.31	12.860		
1,100.0	1,097.5	1,089.1	1,082.5	2.5	2.8	34.92	99.4	18.3	64.3	59.5	4.82	13.347		
1,200.0	1,195.6	1,188.0	1,178.3	2.8	3.2	39.51	123.1	23.6	73.1	67.7	5.38	13.589		
1,300.0	1,293.1	1,287.5	1,274.8	3.2	3.6	44.79	147.0	29.1	79.9	73.9	6.03	13.252		
1,400.0	1,389.6	1,387.0	1,371.1	3.6	4.1	50.97	170.9	34.5	85.1	78.3	6.82	12.488		
1,500.0	1,485.3	1,486.2	1,467.4	4.1	4.6	58.22	194.8	39.9	89.3	81.6	7.77	11.493		
1,600.0	1,579.8	1,585.2	1,563.3	4.7	5.1	66.60	218.6	45.3	93.4	84.5	8.93	10.461		
1,700.0	1,673.2	1,683.8	1,658.8	5.3	5.5	75.99	242.3	50.7	98.5	88.3	10.26	9.600		
1,714.1	1,686.3	1,697.7	1,672.3	5.4	5.6	77.38	245.7	51.4	99.4	88.9	10.46	9.502		
1,800.0	1,765.7	1,782.0	1,754.0	6.0	6.0	85.48	266.0	56.1	105.9	94.2	11.64	9.091		
1,900.0	1,858.2	1,880.3	1,849.2	6.7	6.5	93.61	289.6	61.4	115.8	102.8	12.94	8.945 SF		
2,000.0	1,950.8	1,978.5	1,944.4	7.4	7.0	100.37	313.3	66.8	127.7	113.5	14.15	9.025		
2,100.0	2,043.3	2,076.7	2,039.6	8.1	7.5	105.94	336.9	72.1	141.0	125.8	15.26	9.240		
2,200.0	2,135.8	2,175.0	2,134.8	8.8	8.0	110.52	360.5	77.5	155.5	139.2	16.32	9.529		
2,300.0	2,228.4	2,273.2	2,230.0	9.5	8.5	114.32	384.2	82.9	170.8	153.5	17.33	9.856		
2,400.0	2,320.9	2,371.5	2,325.2	10.2	9.0	117.48	407.8	88.2	186.7	168.4	18.31	10.198		
2,500.0	2,413.4	2,469.7	2,420.4	11.0	9.4	120.15	431.4	93.6	203.1	183.8	19.26	10.541		
2,600.0	2,506.0	2,568.0	2,515.7	11.7	9.9	122.42	455.1	99.0	219.8	199.6	20.20	10.878		
2,700.0	2,598.5	2,666.2	2,610.9	12.4	10.4	124.36	478.7	104.3	236.8	215.7	21.14	11.204		
2,800.0	2,691.0	2,764.4	2,706.1	13.2	10.9	126.05	502.3	109.7	254.1	232.0	22.06	11.517		
2,900.0	2,783.6	2,862.7	2,801.3	13.9	11.4	127.52	526.0	115.0	271.5	248.5	22.98	11.814		
3,000.0	2,876.1	2,960.9	2,896.5	14.6	11.9	128.81	549.6	120.4	289.1	265.2	23.90	12.097		
3,100.0	2,968.6	3,059.2	2,991.7	15.4	12.4	129.96	573.2	125.8	306.8	282.0	24.81	12.365		
3,200.0	3,061.2	3,157.4	3,086.9	16.1	12.9	130.97	596.9	131.1	324.7	298.9	25.73	12.619		
3,300.0	3,153.7	3,255.7	3,182.1	16.9	13.4	131.89	620.5	136.5	342.6	315.9	26.64	12.859		
3,400.0	3,246.2	3,353.9	3,277.3	17.6	13.9	132.71	644.1	141.9	360.6	333.0	27.56	13.086		
3,500.0	3,338.8	3,452.1	3,372.5	18.3	14.4	133.46	667.8	147.2	378.6	350.2	28.47	13.301		
3,600.0	3,431.3	3,550.4	3,467.7	19.1	14.9	134.13	691.4	152.6	396.8	367.4	29.38	13.504		
3,700.0	3,523.8	3,648.6	3,562.9	19.8	15.4	134.75	715.1	158.0	414.9	384.6	30.29	13.697		
3,800.0	3,616.4	3,746.9	3,658.1	20.6	15.9	135.32	738.7	163.3	433.1	401.9	31.21	13.880		
3,900.0	3,708.9	3,845.1	3,753.3	21.3	16.4	135.84	762.3	168.7	451.4	419.3	32.12	14.053		
4,000.0	3,801.4	3,943.3	3,848.5	22.1	16.9	136.32	786.0	174.0	469.7	436.6	33.03	14.218		
4,100.0	3,894.0	4,041.6	3,943.7	22.8	17.4	136.76	809.6	179.4	488.0	454.0	33.95	14.375		
4,200.0	3,986.5	4,139.8	4,038.9	23.5	17.9	137.17	833.2	184.8	506.3	471.4	34.86	14.524		
4,300.0	4,079.0	4,238.1	4,134.1	24.3	18.4	137.55	856.9	190.1	524.7	488.9	35.78	14.665		
4,400.0	4,171.6	4,336.3	4,229.3	25.0	18.9	137.91	880.5	195.5	543.0	506.4	36.69	14.801		
4,500.0	4,264.1	4,434.6	4,324.6	25.8	19.4	138.25	904.1	200.9	561.4	523.8	37.61	14.930		
4,600.0	4,356.6	4,532.8	4,419.8	26.5	19.9	138.56	927.8	206.2	579.9	541.3	38.52	15.053		
4,700.0	4,449.2	4,631.0	4,515.0	27.3	20.4	138.85	951.4	211.6	598.3	558.9	39.44	15.171		
4,800.0	4,541.7	4,727.7	4,608.7	28.0	20.8	139.13	974.6	216.8	616.8	576.4	40.34	15.291		
4,900.0	4,634.2	4,816.9	4,695.5	28.8	21.2	139.52	994.3	221.3	636.2	595.1	41.09	15.481		
5,000.0	4,726.7	4,905.2	4,782.2	29.5	21.5	140.10	1,011.2	225.1	657.0	615.3	41.71	15.752		

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Offset Design      Land JG (West) Pad Sec.31-T2N-R64W -    Land JG 31-19D - Wellbore #1 - Plan #1 (11-07-12)													Offset Site Error:	0.0 ft
Survey Program: 0-MWD													Offset Well Error:	0.0 ft
Reference		Offset		Semi Major Axis			Distance							Warning
Measured Depth	Vertical Depth	Measured Depth	Vertical Depth	Reference	Offset	Highside Toolface	Offset Wellbore Centre		Between Centres	Between Ellipses	Minimum Separation	Separation Factor		
(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(°)	+N/-S (ft)	+E/-W (ft)	(ft)	(ft)	(ft)			
5,100.0	4,819.3	4,992.6	4,868.3	30.2	21.8	140.85	1,025.3	228.3	679.4	637.1	42.22	16.089		
5,202.1	4,913.7	5,080.6	4,955.5	31.0	22.0	141.75	1,036.9	231.0	703.8	661.1	42.65	16.502		
5,300.0	5,005.0	5,164.3	5,038.8	31.6	22.2	142.97	1,045.5	232.9	727.5	684.6	42.92	16.953		
5,400.0	5,099.3	5,249.4	5,123.6	32.1	22.4	144.15	1,051.9	234.4	750.8	707.7	43.08	17.428		
5,500.0	5,194.8	5,334.1	5,208.1	32.6	22.5	145.28	1,055.8	235.3	773.0	729.8	43.18	17.902		
5,600.0	5,291.2	5,418.3	5,292.4	33.1	22.6	146.36	1,057.2	235.6	794.2	751.0	43.22	18.377		
5,700.0	5,388.5	5,514.5	5,388.5	33.4	22.7	147.46	1,057.2	235.6	813.7	770.5	43.20	18.836		
5,800.0	5,486.6	5,612.5	5,486.6	33.8	22.8	148.36	1,057.2	235.6	830.4	787.2	43.21	19.217		
5,900.0	5,585.2	5,711.2	5,585.2	34.1	22.9	149.08	1,057.2	235.6	844.3	801.0	43.25	19.522		
6,000.0	5,684.4	5,810.4	5,684.4	34.3	23.0	149.63	1,057.2	235.6	855.3	812.0	43.30	19.751		
6,100.0	5,784.0	5,909.9	5,784.0	34.5	23.1	150.02	1,057.2	235.6	863.3	819.9	43.37	19.905		
6,200.0	5,883.8	6,009.8	5,883.8	34.7	23.2	150.26	1,057.2	235.6	868.3	824.9	43.45	19.983		
6,300.0	5,983.8	6,109.7	5,983.8	34.8	23.4	150.36	1,057.2	235.6	870.3	826.8	43.55	19.985		
6,316.2	6,000.0	6,125.9	6,000.0	34.8	23.4	139.51	1,057.2	235.6	870.4	826.8	43.57	19.978		
6,400.0	6,083.8	6,209.7	6,083.8	34.9	23.5	139.51	1,057.2	235.6	870.4	826.6	43.77	19.884		
6,500.0	6,183.8	6,309.7	6,183.8	34.9	23.6	139.51	1,057.2	235.6	870.4	826.3	44.03	19.768		
6,600.0	6,283.8	6,409.7	6,283.8	35.0	23.7	139.51	1,057.2	235.6	870.4	826.1	44.29	19.652		
6,700.0	6,383.8	6,509.7	6,383.8	35.1	23.8	139.51	1,057.2	235.6	870.4	825.8	44.55	19.536		
6,800.0	6,483.8	6,609.7	6,483.8	35.2	24.0	139.51	1,057.2	235.6	870.4	825.6	44.82	19.421		
6,900.0	6,583.8	6,709.7	6,583.8	35.3	24.1	139.51	1,057.2	235.6	870.4	825.3	45.09	19.305		
7,000.0	6,683.8	6,809.7	6,683.8	35.3	24.2	139.51	1,057.2	235.6	870.4	825.0	45.36	19.189		
7,100.0	6,783.8	6,909.7	6,783.8	35.4	24.4	139.51	1,057.2	235.6	870.4	824.7	45.63	19.074		
7,200.0	6,883.8	7,009.7	6,883.8	35.5	24.5	139.51	1,057.2	235.6	870.4	824.5	45.91	18.959		
7,300.0	6,983.8	7,109.7	6,983.8	35.6	24.6	139.51	1,057.2	235.6	870.4	824.2	46.19	18.844		
7,400.0	7,083.8	7,209.7	7,083.8	35.7	24.8	139.51	1,057.2	235.6	870.4	823.9	46.47	18.730		
7,500.0	7,183.8	7,309.7	7,183.8	35.8	24.9	139.51	1,057.2	235.6	870.4	823.6	46.75	18.616		
7,600.0	7,283.8	7,409.7	7,283.8	35.9	25.0	139.51	1,057.2	235.6	870.4	823.3	47.04	18.502		
7,690.2	7,374.0	7,499.9	7,374.0	36.0	25.1	139.51	1,057.2	235.6	870.4	823.1	47.30	18.400		

<b>Company:</b>	Great Western	<b>Local Co-ordinate Reference:</b>	Well Land JG 31-18D
<b>Project:</b>	SEC.31-T2N-R64W	<b>TVD Reference:</b>	WELL @ 4947.0ft (Original Well Elev)
<b>Reference Site:</b>	Land JG (West) Pad Sec.31-T2N-R64W	<b>MD Reference:</b>	WELL @ 4947.0ft (Original Well Elev)
<b>Site Error:</b>	0.0ft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Land JG 31-18D	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.0ft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	Wellbore #1	<b>Database:</b>	Landmark
<b>Reference Design:</b>	Plan #1 (11-07-12)	<b>Offset TVD Reference:</b>	Offset Datum

Offset Design													Offset Site Error:	0.0 ft
Survey Program: 0-MWD													Offset Well Error:	0.0 ft
Reference		Offset		Semi Major Axis			Distance							Warning
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor		
0.0	0.0	0.0	0.0	0.0	0.0	180.00	-20.4	0.0	20.4					
100.0	100.0	100.0	100.0	0.1	0.1	180.00	-20.4	0.0	20.4	20.2	0.22	90.763		
200.0	200.0	200.0	200.0	0.3	0.3	180.00	-20.4	0.0	20.4	19.7	0.67	30.254		
300.0	300.0	300.2	300.2	0.6	0.6	-175.25	-19.8	-1.6	19.9	18.8	1.12	17.770		
399.8	399.8	400.0	399.8	0.8	0.8	-160.00	-18.0	-6.6	19.2	17.6	1.57	12.223 CC		
400.0	400.0	400.2	400.0	0.8	0.8	-159.96	-18.0	-6.6	19.2	17.6	1.57	12.217 ES		
500.0	500.0	500.0	499.5	1.0	1.0	-135.65	-14.8	-14.4	20.6	18.6	2.04	10.138		
600.0	600.0	599.6	598.5	1.2	1.3	-109.81	-8.4	-23.3	24.8	22.3	2.50	9.930 SF		
700.0	700.0	698.8	696.8	1.5	1.6	-79.69	1.3	-32.8	32.6	29.7	2.97	10.981		
800.0	799.8	797.7	794.2	1.7	1.9	-68.58	14.3	-42.9	42.6	39.2	3.44	12.379		
900.0	899.5	896.2	890.8	1.9	2.3	-61.85	30.5	-53.7	53.6	49.7	3.94	13.608		
1,000.0	998.7	994.4	986.4	2.2	2.7	-57.46	49.9	-65.0	65.1	60.6	4.47	14.557		
1,100.0	1,097.5	1,092.3	1,080.9	2.5	3.2	-54.40	72.4	-77.0	76.7	71.7	5.04	15.223		
1,200.0	1,195.6	1,189.9	1,174.2	2.8	3.7	-52.16	98.1	-89.5	88.5	82.8	5.66	15.631		
1,300.0	1,293.1	1,287.1	1,266.2	3.2	4.3	-50.46	126.7	-102.5	100.3	93.9	6.34	15.819		
1,400.0	1,389.6	1,384.1	1,356.9	3.6	5.0	-49.13	158.3	-116.0	112.1	105.0	7.09	15.817		
1,500.0	1,485.3	1,480.8	1,446.1	4.1	5.7	-48.07	192.8	-130.1	123.8	115.9	7.90	15.676		
1,600.0	1,579.8	1,577.2	1,533.8	4.7	6.4	-47.20	230.2	-144.6	135.5	126.7	8.79	15.419		
1,700.0	1,673.2	1,673.3	1,619.8	5.3	7.2	-46.48	270.3	-159.6	147.0	137.3	9.75	15.080		
1,714.1	1,686.3	1,686.9	1,631.8	5.4	7.3	-46.38	276.2	-161.8	148.7	138.8	9.89	15.030		
1,800.0	1,765.7	1,769.0	1,704.0	6.0	8.1	-45.69	313.1	-175.1	159.4	148.6	10.77	14.797		
1,900.0	1,858.2	1,867.0	1,789.1	6.7	9.0	-44.46	358.9	-191.2	173.4	161.6	11.78	14.719		
2,000.0	1,950.8	1,966.0	1,875.0	7.4	9.9	-43.38	405.3	-207.5	187.5	174.7	12.79	14.659		
2,100.0	2,043.3	2,064.9	1,960.9	8.1	10.9	-42.45	451.6	-223.8	201.7	187.9	13.81	14.609		
2,200.0	2,135.8	2,163.8	2,046.8	8.8	11.9	-41.65	498.0	-240.1	216.0	201.2	14.82	14.569		
2,300.0	2,228.4	2,262.8	2,132.6	9.5	12.8	-40.95	544.3	-256.4	230.3	214.4	15.84	14.536		
2,400.0	2,320.9	2,361.7	2,218.5	10.2	13.8	-40.32	590.7	-272.7	244.6	227.7	16.86	14.508		
2,500.0	2,413.4	2,460.6	2,304.4	11.0	14.7	-39.77	637.0	-289.0	258.9	241.1	17.88	14.485		
2,600.0	2,506.0	2,559.6	2,390.2	11.7	15.7	-39.27	683.4	-305.3	273.3	254.4	18.89	14.466		
2,700.0	2,598.5	2,658.5	2,476.1	12.4	16.7	-38.83	729.8	-321.7	287.7	267.8	19.91	14.451		
2,800.0	2,691.0	2,757.5	2,562.0	13.2	17.6	-38.42	776.1	-338.0	302.1	281.2	20.92	14.437		
2,900.0	2,783.6	2,856.4	2,647.8	13.9	18.6	-38.06	822.5	-354.3	316.5	294.5	21.94	14.426		
3,000.0	2,876.1	2,955.3	2,733.7	14.6	19.6	-37.72	868.8	-370.6	330.9	308.0	22.95	14.416		
3,100.0	2,968.6	3,054.3	2,819.6	15.4	20.6	-37.42	915.2	-386.9	345.3	321.4	23.97	14.408		
3,200.0	3,061.2	3,153.2	2,905.5	16.1	21.5	-37.13	961.5	-403.2	359.8	334.8	24.98	14.401		
3,300.0	3,153.7	3,252.1	2,991.3	16.9	22.5	-36.87	1,007.9	-419.5	374.2	348.2	26.00	14.395		
3,400.0	3,246.2	3,351.1	3,077.2	17.6	23.5	-36.63	1,054.3	-435.8	388.7	361.7	27.01	14.390		
3,500.0	3,338.8	3,450.0	3,163.1	18.3	24.4	-36.41	1,100.6	-452.1	403.2	375.1	28.03	14.385		
3,600.0	3,431.3	3,548.9	3,248.9	19.1	25.4	-36.20	1,147.0	-468.4	417.6	388.6	29.04	14.381		
3,700.0	3,523.8	3,647.9	3,334.8	19.8	26.4	-36.01	1,193.3	-484.7	432.1	402.0	30.05	14.378		
3,800.0	3,616.4	3,746.8	3,420.7	20.6	27.4	-35.82	1,239.7	-501.0	446.6	415.5	31.07	14.375		
3,900.0	3,708.9	3,845.8	3,506.5	21.3	28.4	-35.65	1,286.0	-517.3	461.1	429.0	32.08	14.372		
4,000.0	3,801.4	3,944.7	3,592.4	22.1	29.3	-35.49	1,332.4	-533.6	475.6	442.5	33.09	14.370		
4,100.0	3,894.0	4,043.6	3,678.3	22.8	30.3	-35.34	1,378.8	-549.9	490.0	455.9	34.11	14.368		
4,200.0	3,986.5	4,142.6	3,764.1	23.5	31.3	-35.20	1,425.1	-566.2	504.5	469.4	35.12	14.367		
4,300.0	4,079.0	4,241.5	3,850.0	24.3	32.3	-35.07	1,471.5	-582.5	519.0	482.9	36.13	14.365		
4,400.0	4,171.6	4,340.4	3,935.9	25.0	33.2	-34.94	1,517.8	-598.8	533.5	496.4	37.14	14.364		
4,500.0	4,264.1	4,439.4	4,021.8	25.8	34.2	-34.82	1,564.2	-615.2	548.0	509.9	38.16	14.363		
4,600.0	4,356.6	4,538.3	4,107.6	26.5	35.2	-34.71	1,610.5	-631.5	562.5	523.4	39.17	14.362		
4,700.0	4,449.2	4,637.3	4,193.5	27.3	36.2	-34.60	1,656.9	-647.8	577.0	536.9	40.18	14.361		
4,800.0	4,541.7	4,736.2	4,279.4	28.0	37.1	-34.50	1,703.3	-664.1	591.5	550.4	41.19	14.360		
4,900.0	4,634.2	4,835.1	4,365.2	28.8	38.1	-34.40	1,749.6	-680.4	606.1	563.9	42.21	14.360		

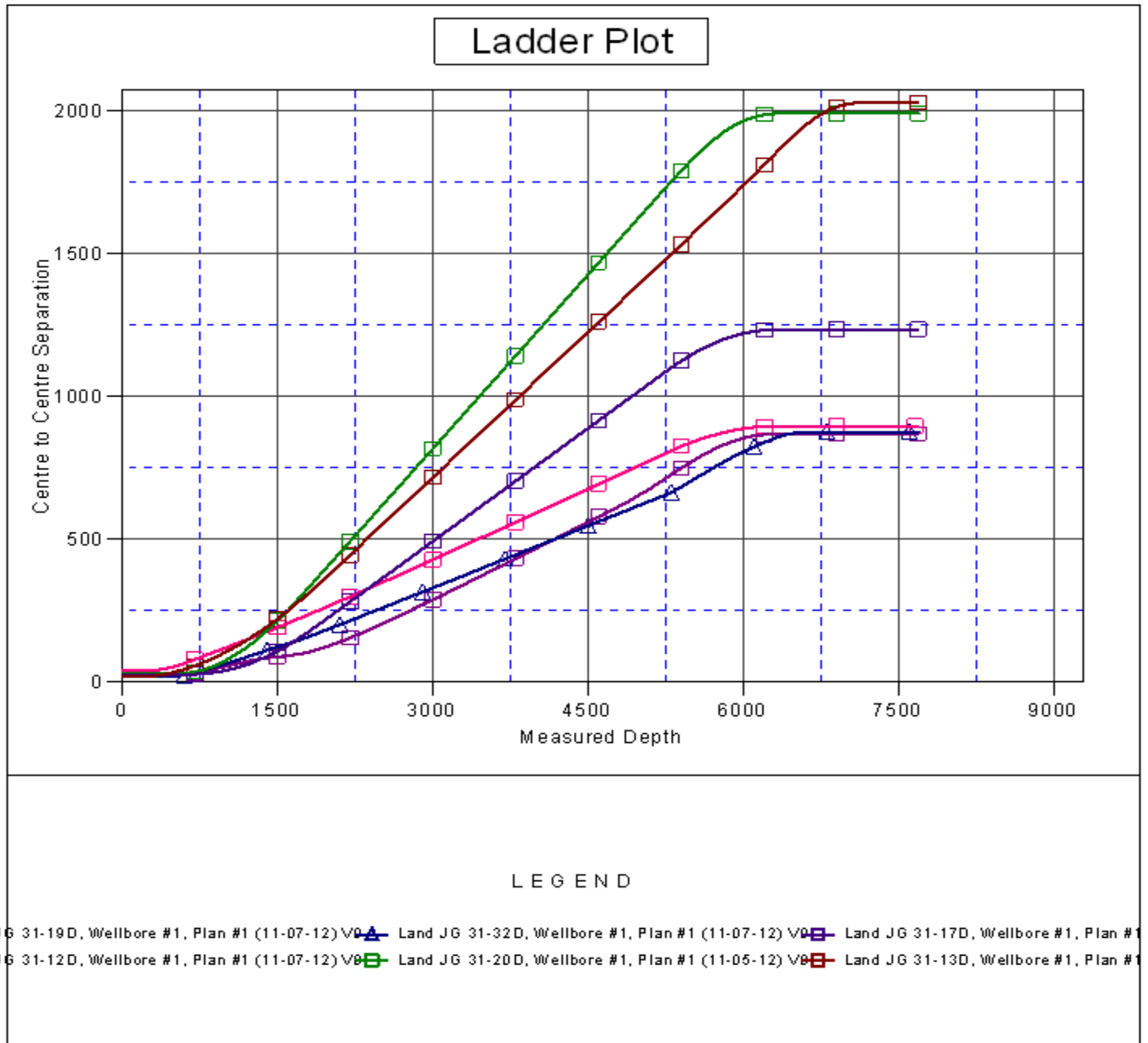
CC - Min centre to center distance or convergent point, SF - min separation factor, ES - min ellipse separation

Offset Design      Land JG (West) Pad Sec.31-T2N-R64W - Land JG 31-32D - Wellbore #1 - Plan #1 (11-07-12)													Offset Site Error:      0.0 ft	
Survey Program:    0-MWD													Offset Well Error:      0.0 ft	
Reference		Offset		Semi Major Axis			Distance						Warning	
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor		
5,000.0	4,726.7	4,934.1	4,451.1	29.5	39.1	-34.31	1,796.0	-696.7	620.6	577.3	43.22	14.359		
5,100.0	4,819.3	5,033.0	4,537.0	30.2	40.1	-34.22	1,842.3	-713.0	635.1	590.8	44.23	14.359		
5,202.1	4,913.7	5,134.0	4,624.6	31.0	41.1	-34.13	1,889.6	-729.6	649.9	604.6	45.26	14.358		
5,300.0	5,005.0	5,230.6	4,708.5	31.6	42.0	-34.15	1,934.9	-745.6	665.5	619.3	46.18	14.410		
5,400.0	5,099.3	5,328.8	4,793.7	32.1	43.0	-34.04	1,980.9	-761.7	684.2	637.3	46.94	14.575		
5,500.0	5,194.8	5,426.7	4,878.7	32.6	44.0	-33.82	2,026.8	-777.9	705.8	658.3	47.58	14.835		
5,600.0	5,291.2	5,552.4	4,989.1	33.1	45.0	-33.41	2,083.3	-797.8	728.3	680.2	48.09	15.145		
5,700.0	5,388.5	5,679.7	5,103.6	33.4	45.9	-33.02	2,135.9	-816.2	749.8	701.3	48.50	15.461		
5,800.0	5,486.6	5,808.5	5,221.8	33.8	46.7	-32.63	2,184.2	-833.2	770.3	721.5	48.83	15.776		
5,900.0	5,585.2	5,939.0	5,343.7	34.1	47.4	-32.26	2,227.9	-848.6	789.6	740.6	49.06	16.094		
6,000.0	5,684.4	6,070.9	5,469.1	34.3	48.1	-31.88	2,266.7	-862.3	807.8	758.6	49.21	16.414		
6,100.0	5,784.0	6,204.3	5,597.6	34.5	48.7	-31.52	2,300.4	-874.1	824.7	775.4	49.27	16.738		
6,200.0	5,883.8	6,339.0	5,729.0	34.7	49.2	-31.15	2,328.6	-884.0	840.4	791.2	49.23	17.071		
6,300.0	5,983.8	6,475.1	5,862.9	34.8	49.6	-30.78	2,351.2	-892.0	854.7	805.6	49.09	17.410		
6,316.2	6,000.0	6,497.3	5,884.9	34.8	49.7	-41.58	2,354.3	-893.1	856.9	807.8	49.07	17.465		
6,400.0	6,083.8	6,612.6	5,999.3	34.9	49.9	-41.21	2,367.9	-897.9	866.6	817.5	49.10	17.652		
6,500.0	6,183.8	6,751.6	6,137.7	34.9	50.2	-40.94	2,378.5	-901.6	874.2	824.9	49.22	17.762		
6,600.0	6,283.8	6,891.3	6,277.3	35.0	50.3	-40.83	2,382.8	-903.1	877.2	827.7	49.42	17.750		
6,700.0	6,383.8	6,997.7	6,383.8	35.1	50.4	-40.83	2,382.9	-903.1	877.2	827.6	49.64	17.671		
6,800.0	6,483.8	7,097.7	6,483.8	35.2	50.4	-40.83	2,382.9	-903.1	877.2	827.3	49.87	17.591		
6,900.0	6,583.8	7,197.7	6,583.8	35.3	50.5	-40.83	2,382.9	-903.1	877.2	827.1	50.10	17.511		
7,000.0	6,683.8	7,297.7	6,683.8	35.3	50.5	-40.83	2,382.9	-903.1	877.2	826.9	50.33	17.430		
7,100.0	6,783.8	7,397.7	6,783.8	35.4	50.6	-40.83	2,382.9	-903.1	877.2	826.7	50.56	17.349		
7,200.0	6,883.8	7,497.7	6,883.8	35.5	50.7	-40.83	2,382.9	-903.1	877.2	826.4	50.80	17.268		
7,300.0	6,983.8	7,597.7	6,983.8	35.6	50.7	-40.83	2,382.9	-903.1	877.2	826.2	51.04	17.187		
7,400.0	7,083.8	7,697.7	7,083.8	35.7	50.8	-40.83	2,382.9	-903.1	877.2	825.9	51.28	17.105		
7,500.0	7,183.8	7,797.7	7,183.8	35.8	50.9	-40.83	2,382.9	-903.1	877.2	825.7	51.53	17.024		
7,600.0	7,283.8	7,897.7	7,283.8	35.9	50.9	-40.83	2,382.9	-903.1	877.2	825.4	51.78	16.942		
7,690.2	7,374.0	7,987.9	7,374.0	36.0	51.0	-40.83	2,382.9	-903.1	877.2	825.2	52.00	16.868		



<b>Company:</b>	Great Western	<b>Local Co-ordinate Reference:</b>	Well Land JG 31-18D
<b>Project:</b>	SEC.31-T2N-R64W	<b>TVD Reference:</b>	WELL @ 4947.0ft (Original Well Elev)
<b>Reference Site:</b>	Land JG (West) Pad Sec.31-T2N-R64W	<b>MD Reference:</b>	WELL @ 4947.0ft (Original Well Elev)
<b>Site Error:</b>	0.0ft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Land JG 31-18D	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.0ft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	Wellbore #1	<b>Database:</b>	Landmark
<b>Reference Design:</b>	Plan #1 (11-07-12)	<b>Offset TVD Reference:</b>	Offset Datum

Reference Depths are relative to WELL @ 4947.0ft (Original Well Elev) Coordinates are relative to: Land JG 31-18D  
 Offset Depths are relative to Offset Datum  
 Central Meridian is -105.500000 °  
 Coordinate System is US State Plane 1983, Colorado Northern Zone  
 Grid Convergence at Surface is: 0.58°





<b>Company:</b>	Great Western	<b>Local Co-ordinate Reference:</b>	Well Land JG 31-18D
<b>Project:</b>	SEC.31-T2N-R64W	<b>TVD Reference:</b>	WELL @ 4947.0ft (Original Well Elev)
<b>Reference Site:</b>	Land JG (West) Pad Sec.31-T2N-R64W	<b>MD Reference:</b>	WELL @ 4947.0ft (Original Well Elev)
<b>Site Error:</b>	0.0ft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Land JG 31-18D	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.0ft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	Wellbore #1	<b>Database:</b>	Landmark
<b>Reference Design:</b>	Plan #1 (11-07-12)	<b>Offset TVD Reference:</b>	Offset Datum

Reference Depths are relative to WELL @ 4947.0ft (Original Well Elev) Coordinates are relative to: Land JG 31-18D  
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: 0.58°

