

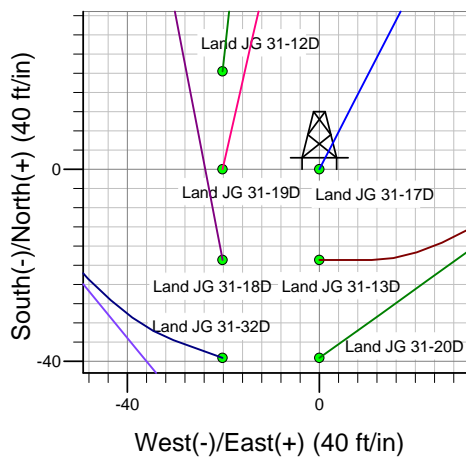
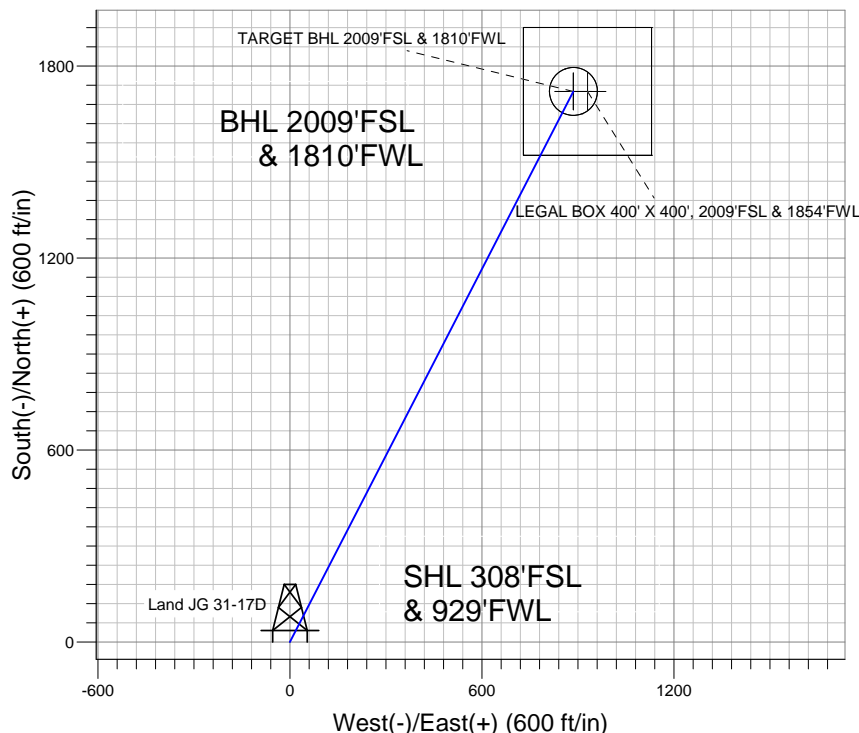
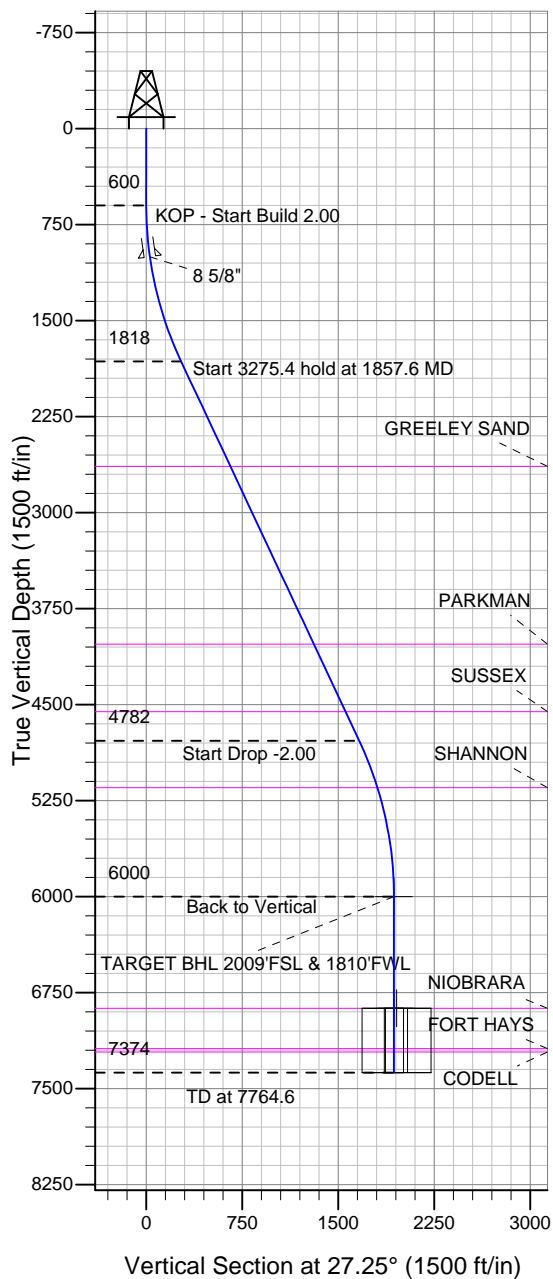
Well Name: Land JG 31-17D

Surface Location: Land JG (East) 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	1276298.97	3251988.39	40.088319	-104.599353	
Original Well Elev WELL @ 4947.0ft (Original Well Elev)						

Great Western



Land JG (East) Pad Sec.31-T2N-R64W
Land JG 31-17D
Plan #1 (11-05-12)
16:06, November 08 2012



Azimuths to True North
Magnetic North: 8.56°

Magnetic Field
Strength: 52837.5snT
Dip Angle: 66.78°
Date: 11/5/2012
Model: IGRF2010

WELLBORE TARGET DETAILS (LAT/LONG)

Name	TVD	+N/-S	+E/-W	Latitude	Longitude	Shape
TARGET BHL 2009'FSL & 1810'FWL	6000.0	1720.6	886.1	40.093042	-104.596186	Point
LEGAL BOX 400' X 400', 2009'FSL & 1854'FWL	6872.0	1720.6	930.1	40.093042	-104.596029	Rectangle (Sides: L400.0 W400.0)
TARGET CIRCLE 2009'FSL & 1810'FWL	6872.0	1720.6	886.1	40.093042	-104.596186	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	1857.6	25.15	27.25	1817.6	241.5	124.4	2.00	27.25	271.6	
4	5133.0	25.15	27.25	4782.4	1479.1	761.7	0.00	0.00	1663.7	
5	6390.6	0.00	0.00	6000.0	1720.6	886.1	2.00	180.00	1935.3	TARGET BHL 2009'FSL & 1810'FWL
6	7764.6	0.00	0.00	7374.0	1720.6	886.1	0.00	0.00	1935.3	



Great Western

SEC.31-T2N-R64W

Land JG (East) Pad Sec.31-T2N-R64W

Land JG 31-17D

Wellbore #1

Plan: Plan #1 (11-05-12)

Standard Planning Report

08 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	
1,857.6	25.15	27.25	1,817.6	241.5	124.4	2.00	2.00	0.00	27.25	
5,133.0	25.15	27.25	4,782.4	1,479.1	761.7	0.00	0.00	0.00	0.00	
6,390.6	0.00	0.00	6,000.0	1,720.6	886.1	2.00	-2.00	0.00	180.00	TARGET BHL 2009
7,764.6	0.00	0.00	7,374.0	1,720.6	886.1	0.00	0.00	0.00	0.00	

Database:	Landmark	Local Co-ordinate Reference:	Well Land JG 31-17D
Company:	Great Western	TVD Reference:	WELL @ 4947.0ft (Original Well Elev)
Project:	SEC.31-T2N-R64W	MD Reference:	WELL @ 4947.0ft (Original Well Elev)
Site:	Land JG (East) Pad Sec.31-T2N-R64W	North Reference:	True
Well:	Land JG 31-17D	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Plan #1 (11-05-12)		

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	27.25	640.0	0.2	0.1	0.3	2.00	2.00	0.00
680.0	1.60	27.25	680.0	1.0	0.5	1.1	2.00	2.00	0.00
720.0	2.40	27.25	720.0	2.2	1.2	2.5	2.00	2.00	0.00
760.0	3.20	27.25	759.9	4.0	2.0	4.5	2.00	2.00	0.00
800.0	4.00	27.25	799.8	6.2	3.2	7.0	2.00	2.00	0.00
840.0	4.80	27.25	839.7	8.9	4.6	10.0	2.00	2.00	0.00
880.0	5.60	27.25	879.6	12.2	6.3	13.7	2.00	2.00	0.00
920.0	6.40	27.25	919.3	15.9	8.2	17.9	2.00	2.00	0.00
960.0	7.20	27.25	959.1	20.1	10.3	22.6	2.00	2.00	0.00
1,000.0	8.00	27.25	998.7	24.8	12.8	27.9	2.00	2.00	0.00
1,001.3	8.03	27.25	1,000.0	24.9	12.8	28.1	2.00	2.00	0.00
8 5/8"									
1,040.0	8.80	27.25	1,038.3	30.0	15.4	33.7	2.00	2.00	0.00
1,080.0	9.60	27.25	1,077.8	35.7	18.4	40.1	2.00	2.00	0.00
1,120.0	10.40	27.25	1,117.1	41.8	21.5	47.1	2.00	2.00	0.00
1,160.0	11.20	27.25	1,156.4	48.5	25.0	54.6	2.00	2.00	0.00
1,200.0	12.00	27.25	1,195.6	55.7	28.7	62.6	2.00	2.00	0.00
1,240.0	12.80	27.25	1,234.7	63.3	32.6	71.2	2.00	2.00	0.00
1,280.0	13.60	27.25	1,273.6	71.4	36.8	80.3	2.00	2.00	0.00
1,320.0	14.40	27.25	1,312.4	80.0	41.2	90.0	2.00	2.00	0.00
1,360.0	15.20	27.25	1,351.1	89.1	45.9	100.2	2.00	2.00	0.00
1,400.0	16.00	27.25	1,389.6	98.7	50.8	111.0	2.00	2.00	0.00
1,440.0	16.80	27.25	1,428.0	108.7	56.0	122.3	2.00	2.00	0.00
1,480.0	17.60	27.25	1,466.2	119.2	61.4	134.1	2.00	2.00	0.00
1,520.0	18.40	27.25	1,504.3	130.2	67.1	146.5	2.00	2.00	0.00
1,560.0	19.20	27.25	1,542.1	141.7	73.0	159.3	2.00	2.00	0.00
1,600.0	20.00	27.25	1,579.8	153.6	79.1	172.8	2.00	2.00	0.00
1,640.0	20.80	27.25	1,617.3	166.0	85.5	186.7	2.00	2.00	0.00
1,680.0	21.60	27.25	1,654.6	178.9	92.1	201.2	2.00	2.00	0.00
1,720.0	22.40	27.25	1,691.7	192.2	99.0	216.2	2.00	2.00	0.00
1,760.0	23.20	27.25	1,728.6	206.0	106.1	231.7	2.00	2.00	0.00
1,800.0	24.00	27.25	1,765.2	220.2	113.4	247.7	2.00	2.00	0.00
1,840.0	24.80	27.25	1,801.6	234.9	121.0	264.2	2.00	2.00	0.00
1,857.6	25.15	27.25	1,817.6	241.5	124.4	271.6	2.00	2.00	0.00
Start 3275.4 hold at 1857.6 MD									
1,880.0	25.15	27.25	1,837.9	250.0	128.7	281.1	0.00	0.00	0.00

Database:	Landmark	Local Co-ordinate Reference:	Well Land JG 31-17D
Company:	Great Western	TVD Reference:	WELL @ 4947.0ft (Original Well Elev)
Project:	SEC.31-T2N-R64W	MD Reference:	WELL @ 4947.0ft (Original Well Elev)
Site:	Land JG (East) Pad Sec.31-T2N-R64W	North Reference:	True
Well:	Land JG 31-17D	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Plan #1 (11-05-12)		

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	25.15	27.25	1,874.1	265.1	136.5	298.1	0.00	0.00	0.00
1,960.0	25.15	27.25	1,910.3	280.2	144.3	315.2	0.00	0.00	0.00
2,000.0	25.15	27.25	1,946.5	295.3	152.1	332.2	0.00	0.00	0.00
2,040.0	25.15	27.25	1,982.7	310.4	159.9	349.2	0.00	0.00	0.00
2,080.0	25.15	27.25	2,018.9	325.5	167.6	366.2	0.00	0.00	0.00
2,120.0	25.15	27.25	2,055.1	340.6	175.4	383.2	0.00	0.00	0.00
2,160.0	25.15	27.25	2,091.3	355.8	183.2	400.2	0.00	0.00	0.00
2,200.0	25.15	27.25	2,127.5	370.9	191.0	417.2	0.00	0.00	0.00
2,240.0	25.15	27.25	2,163.7	386.0	198.8	434.2	0.00	0.00	0.00
2,280.0	25.15	27.25	2,199.9	401.1	206.6	451.2	0.00	0.00	0.00
2,320.0	25.15	27.25	2,236.2	416.2	214.3	468.2	0.00	0.00	0.00
2,360.0	25.15	27.25	2,272.4	431.3	222.1	485.2	0.00	0.00	0.00
2,400.0	25.15	27.25	2,308.6	446.4	229.9	502.2	0.00	0.00	0.00
2,440.0	25.15	27.25	2,344.8	461.5	237.7	519.2	0.00	0.00	0.00
2,480.0	25.15	27.25	2,381.0	476.7	245.5	536.2	0.00	0.00	0.00
2,520.0	25.15	27.25	2,417.2	491.8	253.3	553.2	0.00	0.00	0.00
2,560.0	25.15	27.25	2,453.4	506.9	261.0	570.2	0.00	0.00	0.00
2,600.0	25.15	27.25	2,489.6	522.0	268.8	587.2	0.00	0.00	0.00
2,640.0	25.15	27.25	2,525.8	537.1	276.6	604.2	0.00	0.00	0.00
2,680.0	25.15	27.25	2,562.0	552.2	284.4	621.2	0.00	0.00	0.00
2,720.0	25.15	27.25	2,598.2	567.3	292.2	638.2	0.00	0.00	0.00
2,760.0	25.15	27.25	2,634.4	582.5	300.0	655.2	0.00	0.00	0.00
2,765.0	25.15	27.25	2,639.0	584.4	300.9	657.3	0.00	0.00	0.00
GREELEY SAND									
2,800.0	25.15	27.25	2,670.6	597.6	307.7	672.2	0.00	0.00	0.00
2,840.0	25.15	27.25	2,706.9	612.7	315.5	689.2	0.00	0.00	0.00
2,880.0	25.15	27.25	2,743.1	627.8	323.3	706.2	0.00	0.00	0.00
2,920.0	25.15	27.25	2,779.3	642.9	331.1	723.2	0.00	0.00	0.00
2,960.0	25.15	27.25	2,815.5	658.0	338.9	740.2	0.00	0.00	0.00
3,000.0	25.15	27.25	2,851.7	673.1	346.7	757.2	0.00	0.00	0.00
3,040.0	25.15	27.25	2,887.9	688.3	354.4	774.2	0.00	0.00	0.00
3,080.0	25.15	27.25	2,924.1	703.4	362.2	791.2	0.00	0.00	0.00
3,120.0	25.15	27.25	2,960.3	718.5	370.0	808.2	0.00	0.00	0.00
3,160.0	25.15	27.25	2,996.5	733.6	377.8	825.2	0.00	0.00	0.00
3,200.0	25.15	27.25	3,032.7	748.7	385.6	842.2	0.00	0.00	0.00
3,240.0	25.15	27.25	3,068.9	763.8	393.4	859.2	0.00	0.00	0.00
3,280.0	25.15	27.25	3,105.1	778.9	401.1	876.2	0.00	0.00	0.00
3,320.0	25.15	27.25	3,141.3	794.1	408.9	893.2	0.00	0.00	0.00
3,360.0	25.15	27.25	3,177.5	809.2	416.7	910.2	0.00	0.00	0.00
3,400.0	25.15	27.25	3,213.8	824.3	424.5	927.2	0.00	0.00	0.00
3,440.0	25.15	27.25	3,250.0	839.4	432.3	944.2	0.00	0.00	0.00
3,480.0	25.15	27.25	3,286.2	854.5	440.1	961.2	0.00	0.00	0.00
3,520.0	25.15	27.25	3,322.4	869.6	447.8	978.2	0.00	0.00	0.00
3,560.0	25.15	27.25	3,358.6	884.7	455.6	995.2	0.00	0.00	0.00
3,600.0	25.15	27.25	3,394.8	899.9	463.4	1,012.2	0.00	0.00	0.00
3,640.0	25.15	27.25	3,431.0	915.0	471.2	1,029.2	0.00	0.00	0.00
3,680.0	25.15	27.25	3,467.2	930.1	479.0	1,046.2	0.00	0.00	0.00
3,720.0	25.15	27.25	3,503.4	945.2	486.8	1,063.2	0.00	0.00	0.00
3,760.0	25.15	27.25	3,539.6	960.3	494.5	1,080.2	0.00	0.00	0.00
3,800.0	25.15	27.25	3,575.8	975.4	502.3	1,097.2	0.00	0.00	0.00
3,840.0	25.15	27.25	3,612.0	990.5	510.1	1,114.2	0.00	0.00	0.00
3,880.0	25.15	27.25	3,648.2	1,005.7	517.9	1,131.2	0.00	0.00	0.00
3,920.0	25.15	27.25	3,684.5	1,020.8	525.7	1,148.2	0.00	0.00	0.00
3,960.0	25.15	27.25	3,720.7	1,035.9	533.5	1,165.2	0.00	0.00	0.00

Database:	Landmark	Local Co-ordinate Reference:	Well Land JG 31-17D
Company:	Great Western	TVD Reference:	WELL @ 4947.0ft (Original Well Elev)
Project:	SEC.31-T2N-R64W	MD Reference:	WELL @ 4947.0ft (Original Well Elev)
Site:	Land JG (East) Pad Sec.31-T2N-R64W	North Reference:	True
Well:	Land JG 31-17D	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Plan #1 (11-05-12)		

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	25.15	27.25	3,756.9	1,051.0	541.2	1,182.2	0.00	0.00	0.00
4,040.0	25.15	27.25	3,793.1	1,066.1	549.0	1,199.2	0.00	0.00	0.00
4,080.0	25.15	27.25	3,829.3	1,081.2	556.8	1,216.2	0.00	0.00	0.00
4,120.0	25.15	27.25	3,865.5	1,096.3	564.6	1,233.2	0.00	0.00	0.00
4,160.0	25.15	27.25	3,901.7	1,111.5	572.4	1,250.2	0.00	0.00	0.00
4,200.0	25.15	27.25	3,937.9	1,126.6	580.2	1,267.2	0.00	0.00	0.00
4,240.0	25.15	27.25	3,974.1	1,141.7	588.0	1,284.2	0.00	0.00	0.00
4,280.0	25.15	27.25	4,010.3	1,156.8	595.7	1,301.2	0.00	0.00	0.00
4,299.5	25.15	27.25	4,028.0	1,164.2	599.5	1,309.5	0.00	0.00	0.00
PARKMAN									
4,320.0	25.15	27.25	4,046.5	1,171.9	603.5	1,318.2	0.00	0.00	0.00
4,360.0	25.15	27.25	4,082.7	1,187.0	611.3	1,335.2	0.00	0.00	0.00
4,400.0	25.15	27.25	4,118.9	1,202.1	619.1	1,352.2	0.00	0.00	0.00
4,440.0	25.15	27.25	4,155.1	1,217.3	626.9	1,369.2	0.00	0.00	0.00
4,480.0	25.15	27.25	4,191.4	1,232.4	634.7	1,386.2	0.00	0.00	0.00
4,520.0	25.15	27.25	4,227.6	1,247.5	642.4	1,403.2	0.00	0.00	0.00
4,560.0	25.15	27.25	4,263.8	1,262.6	650.2	1,420.2	0.00	0.00	0.00
4,600.0	25.15	27.25	4,300.0	1,277.7	658.0	1,437.2	0.00	0.00	0.00
4,640.0	25.15	27.25	4,336.2	1,292.8	665.8	1,454.2	0.00	0.00	0.00
4,680.0	25.15	27.25	4,372.4	1,307.9	673.6	1,471.2	0.00	0.00	0.00
4,720.0	25.15	27.25	4,408.6	1,323.1	681.4	1,488.2	0.00	0.00	0.00
4,760.0	25.15	27.25	4,444.8	1,338.2	689.1	1,505.2	0.00	0.00	0.00
4,800.0	25.15	27.25	4,481.0	1,353.3	696.9	1,522.2	0.00	0.00	0.00
4,840.0	25.15	27.25	4,517.2	1,368.4	704.7	1,539.2	0.00	0.00	0.00
4,880.0	25.15	27.25	4,553.4	1,383.5	712.5	1,556.2	0.00	0.00	0.00
4,880.6	25.15	27.25	4,554.0	1,383.8	712.6	1,556.5	0.00	0.00	0.00
SUSSEX									
4,920.0	25.15	27.25	4,589.6	1,398.6	720.3	1,573.2	0.00	0.00	0.00
4,960.0	25.15	27.25	4,625.8	1,413.7	728.1	1,590.2	0.00	0.00	0.00
5,000.0	25.15	27.25	4,662.1	1,428.9	735.8	1,607.2	0.00	0.00	0.00
5,040.0	25.15	27.25	4,698.3	1,444.0	743.6	1,624.2	0.00	0.00	0.00
5,080.0	25.15	27.25	4,734.5	1,459.1	751.4	1,641.2	0.00	0.00	0.00
5,120.0	25.15	27.25	4,770.7	1,474.2	759.2	1,658.2	0.00	0.00	0.00
5,133.0	25.15	27.25	4,782.4	1,479.1	761.7	1,663.7	0.00	0.00	0.00
Start Drop -2.00									
5,160.0	24.61	27.25	4,806.9	1,489.2	766.9	1,675.1	2.00	-2.00	0.00
5,200.0	23.81	27.25	4,843.4	1,503.8	774.4	1,691.5	2.00	-2.00	0.00
5,240.0	23.01	27.25	4,880.1	1,517.9	781.7	1,707.4	2.00	-2.00	0.00
5,280.0	22.21	27.25	4,917.0	1,531.6	788.7	1,722.8	2.00	-2.00	0.00
5,320.0	21.41	27.25	4,954.2	1,544.8	795.6	1,737.6	2.00	-2.00	0.00
5,360.0	20.61	27.25	4,991.5	1,557.6	802.1	1,752.0	2.00	-2.00	0.00
5,400.0	19.81	27.25	5,029.1	1,569.8	808.4	1,765.8	2.00	-2.00	0.00
5,440.0	19.01	27.25	5,066.8	1,581.7	814.5	1,779.1	2.00	-2.00	0.00
5,480.0	18.21	27.25	5,104.7	1,593.0	820.4	1,791.8	2.00	-2.00	0.00
5,520.0	17.41	27.25	5,142.8	1,603.9	826.0	1,804.1	2.00	-2.00	0.00
5,525.5	17.30	27.25	5,148.0	1,605.3	826.7	1,805.7	2.00	-2.00	0.00
SHANNON									
5,560.0	16.61	27.25	5,181.0	1,614.3	831.3	1,815.8	2.00	-2.00	0.00
5,600.0	15.81	27.25	5,219.4	1,624.2	836.4	1,826.9	2.00	-2.00	0.00
5,640.0	15.01	27.25	5,258.0	1,633.7	841.3	1,837.6	2.00	-2.00	0.00
5,680.0	14.21	27.25	5,296.7	1,642.6	845.9	1,847.7	2.00	-2.00	0.00
5,720.0	13.41	27.25	5,335.5	1,651.1	850.3	1,857.2	2.00	-2.00	0.00
5,760.0	12.61	27.25	5,374.5	1,659.1	854.4	1,866.2	2.00	-2.00	0.00

Database:	Landmark	Local Co-ordinate Reference:	Well Land JG 31-17D
Company:	Great Western	TVD Reference:	WELL @ 4947.0ft (Original Well Elev)
Project:	SEC.31-T2N-R64W	MD Reference:	WELL @ 4947.0ft (Original Well Elev)
Site:	Land JG (East) Pad Sec.31-T2N-R64W	North Reference:	True
Well:	Land JG 31-17D	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Plan #1 (11-05-12)		

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	11.81	27.25	5,413.6	1,666.7	858.3	1,874.7	2.00	-2.00	0.00	
5,840.0	11.01	27.25	5,452.8	1,673.7	861.9	1,882.6	2.00	-2.00	0.00	
5,880.0	10.21	27.25	5,492.1	1,680.2	865.3	1,890.0	2.00	-2.00	0.00	
5,920.0	9.41	27.25	5,531.6	1,686.3	868.4	1,896.8	2.00	-2.00	0.00	
5,960.0	8.61	27.25	5,571.1	1,691.9	871.3	1,903.0	2.00	-2.00	0.00	
6,000.0	7.81	27.25	5,610.7	1,697.0	873.9	1,908.8	2.00	-2.00	0.00	
6,040.0	7.01	27.25	5,650.3	1,701.5	876.3	1,913.9	2.00	-2.00	0.00	
6,080.0	6.21	27.25	5,690.0	1,705.6	878.4	1,918.5	2.00	-2.00	0.00	
6,120.0	5.41	27.25	5,729.8	1,709.2	880.2	1,922.6	2.00	-2.00	0.00	
6,160.0	4.61	27.25	5,769.7	1,712.3	881.8	1,926.1	2.00	-2.00	0.00	
6,200.0	3.81	27.25	5,809.6	1,714.9	883.2	1,929.0	2.00	-2.00	0.00	
6,240.0	3.01	27.25	5,849.5	1,717.1	884.3	1,931.4	2.00	-2.00	0.00	
6,280.0	2.21	27.25	5,889.5	1,718.7	885.1	1,933.2	2.00	-2.00	0.00	
6,320.0	1.41	27.25	5,929.4	1,719.8	885.7	1,934.5	2.00	-2.00	0.00	
6,360.0	0.61	27.25	5,969.4	1,720.4	886.0	1,935.2	2.00	-2.00	0.00	
6,390.6	0.00	0.00	6,000.0	1,720.6	886.1	1,935.3	2.00	-2.00	-89.17	
Back to Vertical - TARGET BHL 2009'FSL & 1810'FWL										
6,400.0	0.00	0.00	6,009.4	1,720.6	886.1	1,935.3	0.00	0.00	0.00	
6,440.0	0.00	0.00	6,049.4	1,720.6	886.1	1,935.3	0.00	0.00	0.00	
6,480.0	0.00	0.00	6,089.4	1,720.6	886.1	1,935.3	0.00	0.00	0.00	
6,520.0	0.00	0.00	6,129.4	1,720.6	886.1	1,935.3	0.00	0.00	0.00	
6,560.0	0.00	0.00	6,169.4	1,720.6	886.1	1,935.3	0.00	0.00	0.00	
6,600.0	0.00	0.00	6,209.4	1,720.6	886.1	1,935.3	0.00	0.00	0.00	
6,640.0	0.00	0.00	6,249.4	1,720.6	886.1	1,935.3	0.00	0.00	0.00	
6,680.0	0.00	0.00	6,289.4	1,720.6	886.1	1,935.3	0.00	0.00	0.00	
6,720.0	0.00	0.00	6,329.4	1,720.6	886.1	1,935.3	0.00	0.00	0.00	
6,760.0	0.00	0.00	6,369.4	1,720.6	886.1	1,935.3	0.00	0.00	0.00	
6,800.0	0.00	0.00	6,409.4	1,720.6	886.1	1,935.3	0.00	0.00	0.00	
6,840.0	0.00	0.00	6,449.4	1,720.6	886.1	1,935.3	0.00	0.00	0.00	
6,880.0	0.00	0.00	6,489.4	1,720.6	886.1	1,935.3	0.00	0.00	0.00	
6,920.0	0.00	0.00	6,529.4	1,720.6	886.1	1,935.3	0.00	0.00	0.00	
6,960.0	0.00	0.00	6,569.4	1,720.6	886.1	1,935.3	0.00	0.00	0.00	
7,000.0	0.00	0.00	6,609.4	1,720.6	886.1	1,935.3	0.00	0.00	0.00	
7,040.0	0.00	0.00	6,649.4	1,720.6	886.1	1,935.3	0.00	0.00	0.00	
7,080.0	0.00	0.00	6,689.4	1,720.6	886.1	1,935.3	0.00	0.00	0.00	
7,120.0	0.00	0.00	6,729.4	1,720.6	886.1	1,935.3	0.00	0.00	0.00	
7,160.0	0.00	0.00	6,769.4	1,720.6	886.1	1,935.3	0.00	0.00	0.00	
7,200.0	0.00	0.00	6,809.4	1,720.6	886.1	1,935.3	0.00	0.00	0.00	
7,240.0	0.00	0.00	6,849.4	1,720.6	886.1	1,935.3	0.00	0.00	0.00	
7,262.6	0.00	0.00	6,872.0	1,720.6	886.1	1,935.3	0.00	0.00	0.00	
NIORARA - LEGAL BOX 400' X 400', 2009'FSL & 1854'FWL - TARGET CIRCLE 2009'FSL & 1810'FWL										
7,280.0	0.00	0.00	6,889.4	1,720.6	886.1	1,935.3	0.00	0.00	0.00	
7,320.0	0.00	0.00	6,929.4	1,720.6	886.1	1,935.3	0.00	0.00	0.00	
7,360.0	0.00	0.00	6,969.4	1,720.6	886.1	1,935.3	0.00	0.00	0.00	
7,400.0	0.00	0.00	7,009.4	1,720.6	886.1	1,935.3	0.00	0.00	0.00	
7,440.0	0.00	0.00	7,049.4	1,720.6	886.1	1,935.3	0.00	0.00	0.00	
7,480.0	0.00	0.00	7,089.4	1,720.6	886.1	1,935.3	0.00	0.00	0.00	
7,520.0	0.00	0.00	7,129.4	1,720.6	886.1	1,935.3	0.00	0.00	0.00	
7,560.0	0.00	0.00	7,169.4	1,720.6	886.1	1,935.3	0.00	0.00	0.00	
7,577.6	0.00	0.00	7,187.0	1,720.6	886.1	1,935.3	0.00	0.00	0.00	
FORT HAYS										
7,600.0	0.00	0.00	7,209.4	1,720.6	886.1	1,935.3	0.00	0.00	0.00	
7,604.6	0.00	0.00	7,214.0	1,720.6	886.1	1,935.3	0.00	0.00	0.00	

Database:	Landmark	Local Co-ordinate Reference:	Well Land JG 31-17D
Company:	Great Western	TVD Reference:	WELL @ 4947.0ft (Original Well Elev)
Project:	SEC.31-T2N-R64W	MD Reference:	WELL @ 4947.0ft (Original Well Elev)
Site:	Land JG (East) Pad Sec.31-T2N-R64W	North Reference:	True
Well:	Land JG 31-17D	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Plan #1 (11-05-12)		

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)
CODELL									
7,640.0	0.00	0.00	7,249.4	1,720.6	886.1	1,935.3	0.00	0.00	0.00
7,680.0	0.00	0.00	7,289.4	1,720.6	886.1	1,935.3	0.00	0.00	0.00
7,720.0	0.00	0.00	7,329.4	1,720.6	886.1	1,935.3	0.00	0.00	0.00
7,760.0	0.00	0.00	7,369.4	1,720.6	886.1	1,935.3	0.00	0.00	0.00
7,764.6	0.00	0.00	7,374.0	1,720.6	886.1	1,935.3	0.00	0.00	0.00
TD at 7764.6									

Targets									
Target Name	Dip Angle (°)	Dip Dir. (°)	TVD (ft)	+N/-S (ft)	+E/-W (ft)	Northing (ft)	Easting (ft)	Latitude	Longitude
- hit/miss target									
- Shape									
LEGAL BOX 400' X 400'	0.00	0.00	6,872.0	1,720.6	930.1	1,278,028.86	3,252,900.93	40.093042	-104.596029
- plan misses target center by 44.0ft at 7262.6ft MD (6872.0 TVD, 1720.6 N, 886.1 E)									
- Rectangle (sides W400.0 H400.0 D502.0)									
TARGET BHL 2009'F	0.00	0.00	6,000.0	1,720.6	886.1	1,278,028.40	3,252,856.91	40.093042	-104.596186
- plan hits target center									
- Point									
TARGET CIRCLE 200'	0.00	0.00	6,872.0	1,720.6	886.1	1,278,028.40	3,252,856.91	40.093042	-104.596186
- plan hits target center									
- Circle (radius 75.0)									

Casing Points					
Measured Depth (ft)	Vertical Depth (ft)	Name	Casing Diameter (")	Hole Diameter (")	
1,001.3	1,000.0	8 5/8"	8-5/8	12-1/4	

Formations					
Measured Depth (ft)	Vertical Depth (ft)	Name	Lithology	Dip (°)	Dip Direction (°)
2,765.0	2,639.0	GREELEY SAND		0.00	
4,299.5	4,028.0	PARKMAN		0.00	
4,880.6	4,554.0	SUSSEX		0.00	
5,525.5	5,148.0	SHANNON		0.00	
7,262.6	6,872.0	NIOBRARA		0.00	
7,577.6	7,187.0	FORT HAYS		0.00	
7,604.6	7,214.0	CODELL		0.00	

Database:	Landmark	Local Co-ordinate Reference:	Well Land JG 31-17D
Company:	Great Western	TVD Reference:	WELL @ 4947.0ft (Original Well Elev)
Project:	SEC.31-T2N-R64W	MD Reference:	WELL @ 4947.0ft (Original Well Elev)
Site:	Land JG (East) Pad Sec.31-T2N-R64W	North Reference:	True
Well:	Land JG 31-17D	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Plan #1 (11-05-12)		

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
1,857.6	1,817.6	241.5	124.4	Start 3275.4 hold at 1857.6 MD
5,133.0	4,782.4	1,479.1	761.7	Start Drop -2.00
6,390.6	6,000.0	1,720.6	886.1	Back to Vertical
7,764.6	7,374.0	1,720.6	886.1	TD at 7764.6



Great Western

SEC.31-T2N-R64W

Land JG (East) Pad Sec.31-T2N-R64W

Land JG 31-17D

Wellbore #1

Plan #1 (11-05-12)

Anticollision Report

08 November, 2012

Company:	Great Western	Local Co-ordinate Reference:	Well Land JG 31-17D
Project:	SEC.31-T2N-R64W	TVD Reference:	WELL @ 4947.0ft (Original Well Elev)
Reference Site:	Land JG (East) Pad Sec.31-T2N-R64W	MD Reference:	WELL @ 4947.0ft (Original Well Elev)
Site Error:	0.0ft	North Reference:	True
Reference Well:	Land JG 31-17D	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 (11-05-12)	Offset TVD Reference:	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	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)			
1,500.0	1,485.3	1,483.1	1,450.3	4.1	5.5	46.80	150.0	172.3	116.4	108.6	7.83	14.864		
1,600.0	1,579.8	1,580.1	1,538.8	4.7	6.2	45.36	182.8	194.3	125.7	117.1	8.68	14.483		
1,700.0	1,673.2	1,676.8	1,625.8	5.3	7.0	44.05	218.2	217.4	134.9	125.3	9.59	14.059		
1,800.0	1,765.2	1,773.2	1,711.1	6.0	7.9	42.85	256.3	241.5	143.7	133.2	10.56	13.609		
1,857.6	1,817.6	1,828.7	1,759.4	6.4	8.4	42.21	279.4	255.8	148.7	137.6	11.14	13.348		
1,900.0	1,856.0	1,870.3	1,795.3	6.7	8.8	41.73	297.2	266.8	152.5	140.9	11.59	13.160		
2,000.0	1,946.5	1,969.8	1,881.3	7.5	9.7	40.66	340.0	293.0	161.5	148.9	12.65	12.773		
2,100.0	2,037.0	2,069.4	1,967.3	8.3	10.7	39.69	382.7	319.2	170.6	156.9	13.70	12.453		
2,200.0	2,127.5	2,168.9	2,053.3	9.1	11.6	38.83	425.5	345.4	179.8	165.0	14.76	12.184		
2,300.0	2,218.1	2,268.5	2,139.3	9.9	12.6	38.05	468.2	371.6	189.0	173.2	15.81	11.956		
2,400.0	2,308.6	2,368.0	2,225.3	10.7	13.6	37.34	511.0	397.8	198.2	181.3	16.85	11.761		
2,500.0	2,399.1	2,467.5	2,311.3	11.5	14.5	36.69	553.7	424.0	207.4	189.6	17.89	11.593		
2,600.0	2,489.6	2,567.1	2,397.3	12.3	15.5	36.10	596.5	450.2	216.7	197.8	18.93	11.448		
2,700.0	2,580.1	2,666.6	2,483.3	13.1	16.5	35.56	639.2	476.4	226.0	206.0	19.96	11.320		
2,800.0	2,670.6	2,766.2	2,569.3	14.0	17.4	35.06	682.0	502.6	235.3	214.3	20.99	11.208		
2,900.0	2,761.2	2,865.7	2,655.3	14.8	18.4	34.60	724.7	528.8	244.6	222.6	22.02	11.109		
3,000.0	2,851.7	2,965.3	2,741.3	15.6	19.4	34.17	767.5	555.0	254.0	230.9	23.04	11.021		
3,100.0	2,942.2	3,064.8	2,827.3	16.4	20.4	33.78	810.3	581.2	263.3	239.3	24.07	10.942		
3,200.0	3,032.7	3,164.4	2,913.3	17.2	21.4	33.41	853.0	607.4	272.7	247.6	25.08	10.871		
3,300.0	3,123.2	3,263.9	2,999.3	18.1	22.3	33.06	895.8	633.6	282.1	256.0	26.10	10.807		
3,400.0	3,213.8	3,363.5	3,085.3	18.9	23.3	32.74	938.5	659.8	291.4	264.3	27.11	10.749		
3,500.0	3,304.3	3,463.0	3,171.3	19.7	24.3	32.44	981.3	686.0	300.8	272.7	28.13	10.696		
3,600.0	3,394.8	3,562.5	3,257.3	20.5	25.3	32.15	1,024.0	712.2	310.2	281.1	29.14	10.647		
3,700.0	3,485.3	3,662.1	3,343.2	21.4	26.3	31.89	1,066.8	738.4	319.6	289.5	30.15	10.603		
3,800.0	3,575.8	3,761.6	3,429.2	22.2	27.3	31.63	1,109.5	764.6	329.0	297.9	31.15	10.562		
3,900.0	3,666.3	3,861.2	3,515.2	23.0	28.2	31.39	1,152.3	790.8	338.5	306.3	32.16	10.525		
4,000.0	3,756.9	3,960.7	3,601.2	23.9	29.2	31.17	1,195.0	817.0	347.9	314.7	33.16	10.490		
4,100.0	3,847.4	4,060.3	3,687.2	24.7	30.2	30.96	1,237.8	843.3	357.3	323.2	34.17	10.458		
4,200.0	3,937.9	4,159.8	3,773.2	25.5	31.2	30.75	1,280.5	869.5	366.8	331.6	35.17	10.428		
4,300.0	4,028.4	4,259.4	3,859.2	26.3	32.2	30.56	1,323.3	895.7	376.2	340.0	36.17	10.401		
4,400.0	4,118.9	4,358.9	3,945.2	27.2	33.2	30.38	1,366.0	921.9	385.6	348.5	37.17	10.375		
4,500.0	4,209.5	4,458.5	4,031.2	28.0	34.2	30.20	1,408.8	948.1	395.1	356.9	38.17	10.351		
4,600.0	4,300.0	4,558.0	4,117.2	28.8	35.1	30.04	1,451.5	974.3	404.5	365.4	39.17	10.328		
4,700.0	4,390.5	4,657.6	4,203.2	29.7	36.1	29.88	1,494.3	1,000.5	414.0	373.8	40.17	10.307		
4,800.0	4,481.0	4,757.1	4,289.2	30.5	37.1	29.73	1,537.0	1,026.7	423.4	382.3	41.16	10.287		
4,900.0	4,571.5	4,856.6	4,375.2	31.3	38.1	29.58	1,579.8	1,052.9	432.9	390.7	42.16	10.268		
5,000.0	4,662.1	4,956.2	4,461.2	32.1	39.1	29.44	1,622.5	1,079.1	442.4	399.2	43.16	10.250		
5,100.0	4,752.6	5,055.7	4,547.2	33.0	40.1	29.31	1,665.3	1,105.3	451.8	407.7	44.15	10.234		
5,133.0	4,782.4	5,088.6	4,575.5	33.3	40.4	29.27	1,679.4	1,113.9	454.9	410.5	44.48	10.228 SF		
5,200.0	4,843.4	5,155.2	4,633.1	33.7	41.1	29.21	1,708.0	1,131.5	462.0	416.9	45.10	10.243		
5,300.0	4,935.6	5,254.3	4,718.7	34.3	42.0	28.97	1,750.6	1,157.6	475.0	429.1	45.85	10.360		
5,400.0	5,029.1	5,352.9	4,803.9	34.9	43.0	28.59	1,792.9	1,183.5	491.1	444.6	46.43	10.575		
5,500.0	5,123.7	5,450.9	4,888.5	35.4	44.0	28.08	1,835.0	1,209.3	510.2	463.3	46.87	10.885		
5,600.0	5,219.4	5,548.1	4,972.5	35.9	44.9	27.48	1,876.7	1,234.9	532.5	485.3	47.17	11.288		
5,700.0	5,316.1	5,644.4	5,055.7	36.3	45.9	26.80	1,918.1	1,260.2	557.8	510.5	47.35	11.782		
5,800.0	5,413.6	5,739.8	5,138.1	36.7	46.8	26.08	1,959.1	1,285.4	586.3	538.9	47.41	12.367		
5,900.0	5,511.8	5,834.1	5,219.5	37.0	47.8	25.32	1,999.6	1,310.2	618.0	570.6	47.38	13.043		
6,000.0	5,610.7	5,927.1	5,299.9	37.3	48.7	24.57	2,039.5	1,334.7	652.8	605.6	47.27	13.812		
6,100.0	5,709.9	6,026.5	5,385.9	37.5	49.6	23.73	2,082.1	1,360.7	690.7	643.7	47.03	14.685		
6,200.0	5,809.6	6,146.5	5,491.4	37.7	50.5	22.75	2,130.7	1,390.5	729.0	682.4	46.65	15.627		
6,300.0	5,909.5	6,269.1	5,601.7	37.8	51.3	21.86	2,176.4	1,418.6	766.8	720.5	46.25	16.578		
6,390.6	6,000.0	6,382.5	5,705.5	37.9	52.0	48.36	2,215.1	1,442.3	800.4	754.5	45.86	17.452		

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

Company:	Great Western	Local Co-ordinate Reference:	Well Land JG 31-17D
Project:	SEC.31-T2N-R64W	TVD Reference:	WELL @ 4947.0ft (Original Well Elev)
Reference Site:	Land JG (East) Pad Sec.31-T2N-R64W	MD Reference:	WELL @ 4947.0ft (Original Well Elev)
Site Error:	0.0ft	North Reference:	True
Reference Well:	Land JG 31-17D	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 (11-05-12)	Offset TVD Reference:	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						
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
6,400.0	6,009.4	6,394.4	5,716.6	37.9	52.1	48.26	2,219.0	1,444.6	803.8	758.0	45.84	17.535	
6,500.0	6,109.4	6,523.5	5,837.2	38.0	52.9	47.30	2,258.3	1,468.7	838.3	792.6	45.71	18.340	
6,600.0	6,209.4	6,656.9	5,963.8	38.1	53.5	46.51	2,294.0	1,490.6	868.7	823.0	45.70	19.010	
6,700.0	6,309.4	6,794.2	6,096.1	38.1	54.1	45.88	2,325.5	1,509.9	894.8	849.0	45.78	19.544	
6,800.0	6,409.4	6,934.9	6,233.3	38.2	54.7	45.39	2,352.1	1,526.2	916.3	870.4	45.93	19.949	
6,900.0	6,509.4	7,078.5	6,374.6	38.3	55.1	45.02	2,373.3	1,539.2	933.2	887.1	46.14	20.227	
7,000.0	6,609.4	7,224.3	6,519.3	38.4	55.4	44.76	2,388.6	1,548.6	945.2	898.8	46.37	20.382	
7,100.0	6,709.4	7,371.5	6,666.1	38.4	55.7	44.62	2,397.7	1,554.2	952.2	905.6	46.64	20.418	
7,200.0	6,809.4	7,514.9	6,809.4	38.5	55.8	44.57	2,400.4	1,555.8	954.3	907.4	46.92	20.340	
7,300.0	6,909.4	7,614.9	6,909.4	38.6	55.8	44.57	2,400.4	1,555.8	954.3	907.1	47.17	20.233	
7,400.0	7,009.4	7,714.9	7,009.4	38.7	55.9	44.57	2,400.4	1,555.8	954.3	906.9	47.42	20.124	
7,500.0	7,109.4	7,814.9	7,109.4	38.8	56.0	44.57	2,400.4	1,555.8	954.3	906.6	47.68	20.014	
7,600.0	7,209.4	7,914.9	7,209.4	38.9	56.0	44.57	2,400.4	1,555.8	954.3	906.4	47.94	19.905	
7,700.0	7,309.4	8,014.9	7,309.4	38.9	56.1	44.57	2,400.4	1,555.8	954.3	906.1	48.21	19.796	
7,764.6	7,374.0	8,079.5	7,374.0	39.0	56.1	44.57	2,400.4	1,555.8	954.3	905.9	48.38	19.725	

Company:	Great Western	Local Co-ordinate Reference:	Well Land JG 31-17D
Project:	SEC.31-T2N-R64W	TVD Reference:	WELL @ 4947.0ft (Original Well Elev)
Reference Site:	Land JG (East) Pad Sec.31-T2N-R64W	MD Reference:	WELL @ 4947.0ft (Original Well Elev)
Site Error:	0.0ft	North Reference:	True
Reference Well:	Land JG 31-17D	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 (11-05-12)	Offset TVD Reference:	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	-44.64	20.4	-20.1	28.7					
100.0	100.0	100.0	100.0	0.1	0.1	-44.64	20.4	-20.1	28.7	28.4	0.22	127.559		
200.0	200.0	200.0	200.0	0.3	0.3	-44.64	20.4	-20.1	28.7	28.0	0.67	42.520 CC, ES		
300.0	300.0	299.3	299.3	0.6	0.6	-42.07	22.1	-20.0	29.8	28.7	1.12	26.553		
400.0	400.0	398.4	398.3	0.8	0.8	-35.48	27.2	-19.4	33.5	31.9	1.58	21.239		
500.0	500.0	497.0	496.5	1.0	1.0	-27.39	35.7	-18.5	40.4	38.3	2.05	19.722		
600.0	600.0	595.0	593.7	1.2	1.3	-19.97	47.4	-17.2	50.9	48.3	2.53	20.078		
700.0	700.0	692.2	689.8	1.5	1.6	-42.17	62.3	-15.6	63.8	60.8	2.98	21.401		
800.0	799.8	789.0	784.8	1.7	2.0	-39.64	80.4	-13.7	77.5	74.1	3.45	22.466		
900.0	899.5	885.2	878.7	1.9	2.4	-38.53	101.5	-11.4	91.9	87.9	3.94	23.325		
1,000.0	998.7	981.0	971.3	2.2	2.8	-38.29	125.6	-8.8	106.7	102.2	4.45	23.969		
1,100.0	1,097.5	1,076.2	1,062.6	2.5	3.3	-38.60	152.6	-5.9	121.9	116.9	5.00	24.399		
1,200.0	1,195.6	1,170.9	1,152.4	2.8	3.9	-39.25	182.4	-2.7	137.5	132.0	5.59	24.622		
1,300.0	1,293.1	1,265.0	1,240.6	3.2	4.5	-40.14	215.0	0.8	153.7	147.4	6.24	24.640		
1,400.0	1,389.6	1,358.6	1,327.3	3.6	5.1	-41.17	250.2	4.6	170.3	163.3	6.94	24.521		
1,500.0	1,485.3	1,451.7	1,412.2	4.1	5.8	-42.30	288.0	8.6	187.3	179.6	7.75	24.185		
1,600.0	1,579.8	1,544.2	1,495.4	4.7	6.6	-43.48	328.2	13.0	204.9	196.3	8.63	23.736		
1,700.0	1,673.2	1,636.2	1,576.8	5.3	7.4	-44.69	370.9	17.6	223.1	213.4	9.62	23.186		
1,800.0	1,765.2	1,734.3	1,662.9	6.0	8.3	-46.20	417.8	22.6	240.3	229.6	10.76	22.336		
1,857.6	1,817.6	1,791.0	1,712.5	6.4	8.8	-47.24	444.9	25.5	249.3	237.9	11.48	21.712		
1,900.0	1,856.0	1,832.8	1,749.2	6.7	9.1	-48.12	464.8	27.7	255.7	243.7	12.05	21.219		
2,000.0	1,946.5	1,931.2	1,835.5	7.5	10.0	-50.04	511.9	32.7	271.0	257.6	13.43	20.180		
2,100.0	2,037.0	2,029.6	1,921.8	8.3	10.9	-51.74	558.9	37.8	286.6	271.8	14.86	19.293		
2,200.0	2,127.5	2,128.1	2,008.1	9.1	11.8	-53.28	605.9	42.9	302.4	286.1	16.32	18.534		
2,300.0	2,218.1	2,226.5	2,094.4	9.9	12.7	-54.66	653.0	47.9	318.4	300.6	17.81	17.883		
2,400.0	2,308.6	2,324.9	2,180.8	10.7	13.6	-55.91	700.0	53.0	334.6	315.3	19.32	17.320		
2,500.0	2,399.1	2,423.4	2,267.1	11.5	14.5	-57.04	747.0	58.0	350.9	330.0	20.85	16.831		
2,600.0	2,489.6	2,521.8	2,353.4	12.3	15.4	-58.07	794.1	63.1	367.3	344.9	22.39	16.403		
2,700.0	2,580.1	2,620.2	2,439.7	13.1	16.3	-59.02	841.1	68.2	383.8	359.9	23.95	16.027		
2,800.0	2,670.6	2,718.7	2,526.1	14.0	17.2	-59.89	888.2	73.2	400.4	374.9	25.51	15.695		
2,900.0	2,761.2	2,817.1	2,612.4	14.8	18.1	-60.68	935.2	78.3	417.1	390.0	27.09	15.399		
3,000.0	2,851.7	2,915.5	2,698.7	15.6	19.0	-61.42	982.2	83.3	433.9	405.2	28.67	15.135		
3,100.0	2,942.2	3,014.0	2,785.0	16.4	19.9	-62.10	1,029.3	88.4	450.7	420.5	30.26	14.898		
3,200.0	3,032.7	3,112.4	2,871.3	17.2	20.8	-62.73	1,076.3	93.5	467.6	435.8	31.85	14.684		
3,300.0	3,123.2	3,210.9	2,957.7	18.1	21.7	-63.32	1,123.3	98.5	484.6	451.1	33.44	14.490		
3,400.0	3,213.8	3,309.3	3,044.0	18.9	22.6	-63.87	1,170.4	103.6	501.6	466.5	35.04	14.313		
3,500.0	3,304.3	3,407.7	3,130.3	19.7	23.6	-64.38	1,217.4	108.6	518.6	482.0	36.64	14.152		
3,600.0	3,394.8	3,506.2	3,216.6	20.5	24.5	-64.86	1,264.4	113.7	535.7	497.4	38.25	14.005		
3,700.0	3,485.3	3,604.6	3,303.0	21.4	25.4	-65.31	1,311.5	118.8	552.8	512.9	39.86	13.869		
3,800.0	3,575.8	3,703.0	3,389.3	22.2	26.3	-65.74	1,358.5	123.8	569.9	528.5	41.47	13.745		
3,900.0	3,666.3	3,801.5	3,475.6	23.0	27.2	-66.14	1,405.6	128.9	587.1	544.0	43.08	13.629		
4,000.0	3,756.9	3,899.9	3,561.9	23.9	28.1	-66.51	1,452.6	134.0	604.3	559.6	44.69	13.522		
4,100.0	3,847.4	3,998.3	3,648.2	24.7	29.0	-66.87	1,499.6	139.0	621.5	575.2	46.30	13.423		
4,200.0	3,937.9	4,096.8	3,734.6	25.5	29.9	-67.21	1,546.7	144.1	638.8	590.8	47.92	13.331		
4,300.0	4,028.4	4,195.2	3,820.9	26.3	30.8	-67.52	1,593.7	149.1	656.0	606.5	49.53	13.244		
4,400.0	4,118.9	4,293.6	3,907.2	27.2	31.7	-67.83	1,640.7	154.2	673.3	622.1	51.15	13.164		
4,500.0	4,209.5	4,392.1	3,993.5	28.0	32.6	-68.11	1,687.8	159.3	690.6	637.8	52.76	13.088		
4,600.0	4,300.0	4,490.5	4,079.9	28.8	33.5	-68.39	1,734.8	164.3	707.9	653.5	54.38	13.017		
4,700.0	4,390.5	4,588.9	4,166.2	29.7	34.4	-68.65	1,781.8	169.4	725.2	669.2	56.00	12.950		
4,800.0	4,481.0	4,687.4	4,252.5	30.5	35.3	-68.89	1,828.9	174.4	742.6	684.9	57.62	12.887		
4,900.0	4,571.5	4,785.8	4,338.8	31.3	36.2	-69.13	1,875.9	179.5	759.9	700.7	59.24	12.828		
5,000.0	4,662.1	4,884.3	4,425.1	32.1	37.2	-69.36	1,923.0	184.6	777.3	716.4	60.86	12.772		

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

Company:	Great Western	Local Co-ordinate Reference:	Well Land JG 31-17D
Project:	SEC.31-T2N-R64W	TVD Reference:	WELL @ 4947.0ft (Original Well Elev)
Reference Site:	Land JG (East) Pad Sec.31-T2N-R64W	MD Reference:	WELL @ 4947.0ft (Original Well Elev)
Site Error:	0.0ft	North Reference:	True
Reference Well:	Land JG 31-17D	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 (11-05-12)	Offset TVD Reference:	Offset Datum

Offset Design												Offset Site Error:	0.0 ft
Land JG (West) Pad Sec.31-T2N-R64W - Land JG 31-12D - Wellbore #1 - Plan #1 (11-07-12)												Offset Well Error:	0.0 ft
Survey Program: 0-MWD													
Reference		Offset		Semi Major Axis			Distance						
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
5,100.0	4,752.6	4,982.7	4,511.5	33.0	38.1	-69.57	1,970.0	189.6	794.7	732.2	62.48	12.719	
5,133.0	4,782.4	5,015.1	4,539.9	33.3	38.4	-69.64	1,985.5	191.3	800.4	737.4	63.01	12.702	
5,200.0	4,843.4	5,081.1	4,597.8	33.7	39.0	-69.96	2,017.0	194.7	812.3	748.2	64.07	12.679	
5,300.0	4,935.6	5,194.8	4,698.0	34.3	39.9	-70.28	2,070.2	200.4	830.4	764.9	65.49	12.680	
5,400.0	5,029.1	5,315.6	4,806.8	34.9	40.7	-70.57	2,122.6	206.0	847.2	780.5	66.75	12.693	
5,500.0	5,123.7	5,437.3	4,918.5	35.4	41.4	-70.83	2,170.6	211.2	862.5	794.6	67.91	12.701	
5,600.0	5,219.4	5,559.8	5,032.9	35.9	42.1	-71.05	2,214.2	215.9	876.3	807.3	68.98	12.704	
5,700.0	5,316.1	5,683.0	5,149.7	36.3	42.7	-71.25	2,253.0	220.1	888.5	818.6	69.95	12.702	
5,800.0	5,413.6	5,806.8	5,268.7	36.7	43.3	-71.42	2,287.0	223.7	899.2	828.4	70.82	12.697	
5,900.0	5,511.8	5,931.2	5,389.6	37.0	43.7	-71.56	2,316.0	226.9	908.2	836.6	71.57	12.690	
6,000.0	5,610.7	6,056.0	5,512.1	37.3	44.2	-71.67	2,339.8	229.4	915.6	843.4	72.20	12.681	
6,100.0	5,709.9	6,181.2	5,635.9	37.5	44.5	-71.76	2,358.3	231.4	921.3	848.6	72.73	12.668	
6,200.0	5,809.6	6,306.7	5,760.7	37.7	44.8	-71.82	2,371.4	232.8	925.4	852.2	73.13	12.654	
6,300.0	5,909.5	6,432.4	5,886.1	37.8	44.9	-71.86	2,379.1	233.6	927.8	854.3	73.41	12.638	
6,390.6	6,000.0	6,546.3	6,000.0	37.9	45.0	-44.62	2,381.4	233.9	928.4	854.9	73.57	12.621	
6,400.0	6,009.4	6,555.8	6,009.4	37.9	45.1	-44.62	2,381.4	233.9	928.4	854.9	73.58	12.618	
6,500.0	6,109.4	6,655.8	6,109.4	38.0	45.1	-44.62	2,381.4	233.9	928.4	854.7	73.72	12.593	
6,600.0	6,209.4	6,755.8	6,209.4	38.1	45.2	-44.62	2,381.4	233.9	928.4	854.6	73.87	12.568	
6,700.0	6,309.4	6,855.8	6,309.4	38.1	45.2	-44.62	2,381.4	233.9	928.4	854.4	74.02	12.543	
6,800.0	6,409.4	6,955.8	6,409.4	38.2	45.3	-44.62	2,381.4	233.9	928.4	854.3	74.17	12.517	
6,900.0	6,509.4	7,055.8	6,509.4	38.3	45.4	-44.62	2,381.4	233.9	928.4	854.1	74.33	12.491	
7,000.0	6,609.4	7,155.8	6,609.4	38.4	45.4	-44.62	2,381.4	233.9	928.4	854.0	74.49	12.465	
7,100.0	6,709.4	7,255.8	6,709.4	38.4	45.5	-44.62	2,381.4	233.9	928.4	853.8	74.65	12.438	
7,200.0	6,809.4	7,355.8	6,809.4	38.5	45.5	-44.62	2,381.4	233.9	928.4	853.6	74.81	12.411	
7,300.0	6,909.4	7,455.8	6,909.4	38.6	45.6	-44.62	2,381.4	233.9	928.4	853.5	74.97	12.384	
7,400.0	7,009.4	7,555.8	7,009.4	38.7	45.7	-44.62	2,381.4	233.9	928.4	853.3	75.14	12.356	
7,500.0	7,109.4	7,655.8	7,109.4	38.8	45.7	-44.62	2,381.4	233.9	928.4	853.1	75.31	12.329	
7,600.0	7,209.4	7,755.8	7,209.4	38.9	45.8	-44.62	2,381.4	233.9	928.4	853.0	75.48	12.301	
7,700.0	7,309.4	7,855.8	7,309.4	38.9	45.9	-44.62	2,381.4	233.9	928.4	852.8	75.65	12.272	
7,739.1	7,348.5	7,894.9	7,348.5	39.0	45.9	-44.62	2,381.4	233.9	928.4	852.7	75.72	12.261	
7,764.6	7,374.0	7,910.3	7,364.0	39.0	45.9	-44.62	2,381.4	233.9	928.5	852.7	75.76	12.256 SF	

Company:	Great Western	Local Co-ordinate Reference:	Well Land JG 31-17D
Project:	SEC.31-T2N-R64W	TVD Reference:	WELL @ 4947.0ft (Original Well Elev)
Reference Site:	Land JG (East) Pad Sec.31-T2N-R64W	MD Reference:	WELL @ 4947.0ft (Original Well Elev)
Site Error:	0.0ft	North Reference:	True
Reference Well:	Land JG 31-17D	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 (11-05-12)	Offset TVD Reference:	Offset Datum

Offset Design													Offset Site Error:	0.0ft
Survey Program: 0-MWD													Offset Well Error:	0.0ft
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	-133.24	-18.9	-20.1	27.7					
100.0	100.0	100.0	100.0	0.1	0.1	-133.24	-18.9	-20.1	27.7	27.4	0.22	123.031		
200.0	200.0	200.0	200.0	0.3	0.3	-133.24	-18.9	-20.1	27.7	27.0	0.67	41.010		
300.0	300.0	300.0	300.0	0.6	0.6	-133.24	-18.9	-20.1	27.7	26.5	1.12	24.606		
400.0	400.0	400.0	400.0	0.8	0.8	-133.24	-18.9	-20.1	27.7	26.1	1.57	17.576		
500.0	500.0	500.0	500.0	1.0	1.0	-133.24	-18.9	-20.1	27.7	25.6	2.02	13.670		
600.0	600.0	600.0	600.0	1.2	1.2	-133.24	-18.9	-20.1	27.7	25.2	2.47	11.185 CC, ES		
700.0	700.0	700.5	700.5	1.5	1.5	-158.66	-17.2	-20.5	28.4	25.5	2.92	9.712		
800.0	799.8	800.9	800.8	1.7	1.7	-153.71	-12.0	-21.5	30.7	27.3	3.37	9.107 SF		
900.0	899.5	901.2	900.6	1.9	1.9	-147.02	-3.4	-23.1	34.9	31.1	3.83	9.127		
1,000.0	998.7	1,001.2	999.9	2.2	2.2	-140.08	8.6	-25.4	41.5	37.2	4.32	9.603		
1,100.0	1,097.5	1,101.0	1,098.4	2.5	2.5	-133.90	24.0	-28.4	50.5	45.6	4.87	10.372		
1,200.0	1,195.6	1,200.3	1,195.9	2.8	2.8	-128.83	42.6	-31.9	62.0	56.5	5.49	11.285		
1,300.0	1,293.1	1,299.2	1,292.3	3.2	3.2	-124.81	64.4	-36.1	75.9	69.7	6.21	12.226		
1,400.0	1,389.6	1,397.6	1,387.3	3.6	3.6	-121.65	89.4	-40.9	92.2	85.2	7.03	13.120		
1,500.0	1,485.3	1,495.4	1,480.9	4.1	4.1	-119.15	117.4	-46.3	110.8	102.8	7.95	13.929		
1,600.0	1,579.8	1,592.5	1,572.8	4.7	4.6	-117.14	148.2	-52.2	131.6	122.6	8.99	14.638		
1,700.0	1,673.2	1,689.0	1,663.0	5.3	5.2	-115.48	181.9	-58.7	154.5	144.4	10.14	15.246		
1,800.0	1,765.2	1,785.6	1,752.4	6.0	5.9	-114.38	217.8	-65.5	179.4	168.0	11.38	15.767		
1,857.6	1,817.6	1,841.2	1,803.8	6.4	6.3	-114.22	238.5	-69.5	194.4	182.2	12.12	16.035		
1,900.0	1,856.0	1,882.1	1,841.7	6.7	6.5	-114.41	253.7	-72.4	205.6	192.9	12.68	16.209		
2,000.0	1,946.5	1,978.5	1,930.9	7.5	7.2	-114.80	289.6	-79.3	232.0	217.9	14.02	16.541		
2,100.0	2,037.0	2,075.0	2,020.2	8.3	7.9	-115.10	325.5	-86.2	258.4	243.0	15.38	16.795		
2,200.0	2,127.5	2,171.4	2,109.4	9.1	8.6	-115.35	361.5	-93.1	284.8	268.0	16.76	16.993		
2,300.0	2,218.1	2,267.9	2,198.6	9.9	9.3	-115.55	397.4	-100.0	311.2	293.1	18.15	17.150		
2,400.0	2,308.6	2,364.3	2,287.9	10.7	10.0	-115.73	433.3	-106.8	337.6	318.1	19.54	17.278		
2,500.0	2,399.1	2,460.7	2,377.1	11.5	10.7	-115.87	469.2	-113.7	364.1	343.1	20.95	17.382		
2,600.0	2,489.6	2,557.2	2,466.4	12.3	11.4	-116.00	505.1	-120.6	390.5	368.1	22.35	17.469		
2,700.0	2,580.1	2,653.6	2,555.6	13.1	12.1	-116.11	541.0	-127.5	416.9	393.2	23.77	17.542		
2,800.0	2,670.6	2,750.1	2,644.8	14.0	12.8	-116.21	576.9	-134.4	443.4	418.2	25.18	17.604		
2,900.0	2,761.2	2,846.5	2,734.1	14.8	13.5	-116.30	612.9	-141.3	469.8	443.2	26.61	17.658		
3,000.0	2,851.7	2,943.0	2,823.3	15.6	14.2	-116.38	648.8	-148.2	496.2	468.2	28.03	17.704		
3,100.0	2,942.2	3,039.4	2,912.6	16.4	14.9	-116.45	684.7	-155.0	522.7	493.2	29.45	17.745		
3,200.0	3,032.7	3,135.8	3,001.8	17.2	15.6	-116.51	720.6	-161.9	549.1	518.2	30.88	17.780		
3,300.0	3,123.2	3,232.3	3,091.0	18.1	16.4	-116.57	756.5	-168.8	575.5	543.2	32.31	17.812		
3,400.0	3,213.8	3,328.7	3,180.3	18.9	17.1	-116.62	792.4	-175.7	602.0	568.2	33.74	17.840		
3,500.0	3,304.3	3,425.2	3,269.5	19.7	17.8	-116.67	828.3	-182.6	628.4	593.2	35.18	17.865		
3,600.0	3,394.8	3,521.6	3,358.7	20.5	18.5	-116.71	864.3	-189.5	654.8	618.2	36.61	17.887		
3,700.0	3,485.3	3,618.0	3,448.0	21.4	19.2	-116.76	900.2	-196.4	681.3	643.2	38.05	17.907		
3,800.0	3,575.8	3,714.5	3,537.2	22.2	19.9	-116.79	936.1	-203.2	707.7	668.2	39.48	17.926		
3,900.0	3,666.3	3,810.9	3,626.5	23.0	20.6	-116.83	972.0	-210.1	734.2	693.2	40.92	17.942		
4,000.0	3,756.9	3,907.4	3,715.7	23.9	21.4	-116.86	1,007.9	-217.0	760.6	718.2	42.36	17.957		
4,100.0	3,847.4	4,003.8	3,804.9	24.7	22.1	-116.89	1,043.8	-223.9	787.0	743.2	43.79	17.971		
4,200.0	3,937.9	4,100.2	3,894.2	25.5	22.8	-116.92	1,079.7	-230.8	813.5	768.2	45.23	17.984		
4,300.0	4,028.4	4,196.7	3,983.4	26.3	23.5	-116.95	1,115.7	-237.7	839.9	793.2	46.67	17.996		
4,400.0	4,118.9	4,293.1	4,072.7	27.2	24.2	-116.97	1,151.6	-244.6	866.4	818.2	48.11	18.007		
4,500.0	4,209.5	4,389.6	4,161.9	28.0	24.9	-116.99	1,187.5	-251.4	892.8	843.2	49.55	18.017		
4,600.0	4,300.0	4,486.0	4,251.1	28.8	25.7	-117.02	1,223.4	-258.3	919.2	868.2	50.99	18.026		
4,700.0	4,390.5	4,582.4	4,340.4	29.7	26.4	-117.04	1,259.3	-265.2	945.7	893.2	52.44	18.035		
4,800.0	4,481.0	4,678.9	4,429.6	30.5	27.1	-117.06	1,295.2	-272.1	972.1	918.2	53.88	18.043		
4,900.0	4,571.5	4,775.3	4,518.9	31.3	27.8	-117.08	1,331.1	-279.0	998.6	943.2	55.32	18.051		
5,000.0	4,662.1	4,871.8	4,608.1	32.1	28.5	-117.09	1,367.1	-285.9	1,025.0	968.2	56.76	18.058		

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

Company:	Great Western	Local Co-ordinate Reference:	Well Land JG 31-17D
Project:	SEC.31-T2N-R64W	TVD Reference:	WELL @ 4947.0ft (Original Well Elev)
Reference Site:	Land JG (East) Pad Sec.31-T2N-R64W	MD Reference:	WELL @ 4947.0ft (Original Well Elev)
Site Error:	0.0ft	North Reference:	True
Reference Well:	Land JG 31-17D	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 (11-05-12)	Offset TVD Reference:	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		
5,100.0	4,752.6	4,968.2	4,697.3	33.0	29.3	-117.11	1,403.0	-292.8	1,051.4	993.2	58.20	18.064		
5,133.0	4,782.4	5,000.0	4,726.8	33.3	29.5	-117.12	1,414.8	-295.0	1,060.2	1,001.5	58.68	18.066		
5,200.0	4,843.4	5,064.7	4,786.7	33.7	30.0	-117.41	1,438.9	-299.6	1,077.5	1,017.9	59.63	18.072		
5,300.0	4,935.6	5,161.6	4,876.3	34.3	30.7	-117.68	1,475.0	-306.6	1,102.2	1,041.2	60.94	18.084		
5,400.0	5,029.1	5,262.2	4,969.6	34.9	31.4	-117.79	1,511.9	-313.6	1,125.1	1,062.9	62.21	18.085		
5,500.0	5,123.7	5,365.9	5,067.0	35.4	32.0	-117.86	1,546.8	-320.3	1,146.1	1,082.8	63.34	18.094		
5,600.0	5,219.4	5,470.5	5,166.5	35.9	32.5	-117.93	1,578.5	-326.4	1,164.9	1,100.6	64.35	18.103		
5,700.0	5,316.1	5,575.8	5,267.8	36.3	33.0	-117.99	1,606.7	-331.8	1,181.6	1,116.4	65.27	18.104		
5,800.0	5,413.6	5,681.8	5,370.7	36.7	33.4	-118.05	1,631.5	-336.6	1,196.1	1,130.1	66.09	18.098		
5,900.0	5,511.8	5,788.3	5,475.1	37.0	33.7	-118.09	1,652.5	-340.6	1,208.4	1,141.6	66.81	18.087		
6,000.0	5,610.7	5,895.4	5,580.7	37.3	34.1	-118.13	1,669.9	-343.9	1,218.5	1,151.1	67.43	18.070		
6,100.0	5,709.9	6,002.8	5,687.2	37.5	34.3	-118.16	1,683.3	-346.5	1,226.3	1,158.3	67.94	18.049		
6,200.0	5,809.6	6,110.5	5,794.5	37.7	34.5	-118.18	1,692.9	-348.3	1,231.8	1,163.5	68.34	18.025		
6,300.0	5,909.5	6,218.4	5,902.2	37.8	34.7	-118.19	1,698.5	-349.4	1,235.0	1,166.4	68.63	17.996		
6,390.6	6,000.0	6,316.2	6,000.0	37.9	34.8	-90.95	1,700.2	-349.7	1,236.0	1,167.2	68.80	17.964		
6,400.0	6,009.4	6,325.7	6,009.4	37.9	34.8	-90.95	1,700.2	-349.7	1,236.0	1,167.2	68.82	17.960		
6,500.0	6,109.4	6,425.7	6,109.4	38.0	34.9	-90.95	1,700.2	-349.7	1,236.0	1,167.0	68.97	17.921		
6,600.0	6,209.4	6,525.7	6,209.4	38.1	35.0	-90.95	1,700.2	-349.7	1,236.0	1,166.8	69.13	17.880		
6,700.0	6,309.4	6,625.7	6,309.4	38.1	35.0	-90.95	1,700.2	-349.7	1,236.0	1,166.7	69.29	17.839		
6,800.0	6,409.4	6,725.7	6,409.4	38.2	35.1	-90.95	1,700.2	-349.7	1,236.0	1,166.5	69.45	17.797		
6,900.0	6,509.4	6,825.7	6,509.4	38.3	35.2	-90.95	1,700.2	-349.7	1,236.0	1,166.4	69.61	17.755		
7,000.0	6,609.4	6,925.7	6,609.4	38.4	35.3	-90.95	1,700.2	-349.7	1,236.0	1,166.2	69.78	17.712		
7,100.0	6,709.4	7,025.7	6,709.4	38.4	35.4	-90.95	1,700.2	-349.7	1,236.0	1,166.0	69.95	17.669		
7,200.0	6,809.4	7,125.7	6,809.4	38.5	35.5	-90.95	1,700.2	-349.7	1,236.0	1,165.8	70.12	17.626		
7,300.0	6,909.4	7,225.7	6,909.4	38.6	35.5	-90.95	1,700.2	-349.7	1,236.0	1,165.7	70.30	17.582		
7,400.0	7,009.4	7,325.7	7,009.4	38.7	35.6	-90.95	1,700.2	-349.7	1,236.0	1,165.5	70.47	17.538		
7,500.0	7,109.4	7,425.7	7,109.4	38.8	35.7	-90.95	1,700.2	-349.7	1,236.0	1,165.3	70.65	17.493		
7,600.0	7,209.4	7,525.7	7,209.4	38.9	35.8	-90.95	1,700.2	-349.7	1,236.0	1,165.1	70.84	17.448		
7,700.0	7,309.4	7,625.7	7,309.4	38.9	35.9	-90.95	1,700.2	-349.7	1,236.0	1,165.0	71.02	17.403		
7,764.6	7,374.0	7,690.2	7,374.0	39.0	36.0	-90.95	1,700.2	-349.7	1,236.0	1,164.8	71.14	17.374		

Company:	Great Western	Local Co-ordinate Reference:	Well Land JG 31-17D
Project:	SEC.31-T2N-R64W	TVD Reference:	WELL @ 4947.0ft (Original Well Elev)
Reference Site:	Land JG (East) Pad Sec.31-T2N-R64W	MD Reference:	WELL @ 4947.0ft (Original Well Elev)
Site Error:	0.0ft	North Reference:	True
Reference Well:	Land JG 31-17D	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 (11-05-12)	Offset TVD Reference:	Offset Datum

Offset Design													Offset Site Error:	0.0ft
Survey Program: 0-MWD													Offset Well Error:	0.0ft
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	-89.99	0.0	-20.1	20.1					
100.0	100.0	100.0	100.0	0.1	0.1	-89.99	0.0	-20.1	20.1	19.9	0.22	89.630		
200.0	200.0	200.0	200.0	0.3	0.3	-89.99	0.0	-20.1	20.1	19.5	0.67	29.877		
300.0	300.0	300.0	300.0	0.6	0.6	-89.99	0.0	-20.1	20.1	19.0	1.12	17.926		
400.0	400.0	400.0	400.0	0.8	0.8	-89.99	0.0	-20.1	20.1	18.6	1.57	12.804		
500.0	500.0	500.1	500.1	1.0	1.0	-85.05	1.7	-19.8	19.8	17.8	2.02	9.805		
559.7	559.7	559.8	559.7	1.1	1.2	-77.22	4.3	-19.2	19.6	17.4	2.29	8.571 CC		
600.0	600.0	600.0	599.8	1.2	1.2	-69.89	6.8	-18.6	19.8	17.3	2.47	8.007 ES		
700.0	700.0	699.5	699.0	1.5	1.5	-79.06	15.3	-16.7	22.2	19.3	2.94	7.573		
800.0	799.8	798.8	797.5	1.7	1.7	-66.55	27.0	-14.0	27.1	23.7	3.41	7.945		
900.0	899.5	897.8	895.3	1.9	2.0	-59.05	42.1	-10.6	33.5	29.6	3.91	8.580		
1,000.0	998.7	996.6	992.3	2.2	2.4	-54.84	60.4	-6.5	40.9	36.5	4.43	9.237		
1,100.0	1,097.5	1,095.0	1,088.2	2.5	2.8	-52.65	81.8	-1.6	49.1	44.1	5.00	9.820		
1,200.0	1,195.6	1,194.5	1,184.6	2.8	3.2	-52.37	105.7	3.8	56.9	51.3	5.62	10.124		
1,300.0	1,293.1	1,294.3	1,281.3	3.2	3.7	-54.65	129.7	9.3	62.8	56.4	6.34	9.898		
1,400.0	1,389.6	1,394.0	1,378.0	3.6	4.1	-59.04	153.7	14.7	66.8	59.6	7.19	9.294		
1,500.0	1,485.3	1,493.7	1,474.6	4.1	4.6	-65.46	177.7	20.2	69.7	61.5	8.21	8.496		
1,600.0	1,579.8	1,593.1	1,570.9	4.7	5.1	-73.87	201.6	25.6	72.4	63.0	9.40	7.701		
1,700.0	1,673.2	1,692.1	1,666.9	5.3	5.6	-84.03	225.4	31.0	76.1	65.4	10.71	7.107		
1,800.0	1,765.2	1,790.7	1,762.4	6.0	6.1	-95.29	249.1	36.4	82.3	70.3	11.99	6.866 SF		
1,857.6	1,817.6	1,847.1	1,817.1	6.4	6.3	-101.87	262.7	39.5	87.5	74.9	12.64	6.922		
1,900.0	1,856.0	1,888.6	1,857.3	6.7	6.5	-106.52	272.7	41.7	92.2	79.1	13.07	7.049		
2,000.0	1,946.5	1,986.5	1,952.2	7.5	7.0	-115.72	296.2	47.1	105.2	91.2	13.94	7.544		
2,100.0	2,037.0	2,084.4	2,047.0	8.3	7.5	-122.80	319.8	52.4	120.3	105.6	14.68	8.193		
2,200.0	2,127.5	2,182.3	2,141.9	9.1	8.0	-128.26	343.3	57.8	136.8	121.4	15.36	8.905		
2,300.0	2,218.1	2,280.1	2,236.7	9.9	8.5	-132.53	366.9	63.1	154.3	138.3	16.03	9.627		
2,400.0	2,308.6	2,378.0	2,331.6	10.7	9.0	-135.92	390.4	68.4	172.4	155.8	16.69	10.334		
2,500.0	2,399.1	2,475.9	2,426.4	11.5	9.5	-138.67	414.0	73.8	191.1	173.7	17.36	11.010		
2,600.0	2,489.6	2,573.8	2,521.3	12.3	10.0	-140.93	437.5	79.1	210.1	192.0	18.03	11.650		
2,700.0	2,580.1	2,671.6	2,616.1	13.1	10.5	-142.81	461.1	84.5	229.3	210.6	18.72	12.251		
2,800.0	2,670.6	2,769.5	2,711.0	14.0	11.0	-144.40	484.6	89.8	248.8	229.3	19.41	12.815		
2,900.0	2,761.2	2,867.4	2,805.8	14.8	11.4	-145.76	508.2	95.2	268.4	248.3	20.11	13.342		
3,000.0	2,851.7	2,965.2	2,900.7	15.6	11.9	-146.93	531.7	100.5	288.1	267.3	20.82	13.834		
3,100.0	2,942.2	3,063.1	2,995.5	16.4	12.4	-147.96	555.2	105.8	307.9	286.4	21.54	14.295		
3,200.0	3,032.7	3,161.0	3,090.4	17.2	12.9	-148.86	578.8	111.2	327.9	305.6	22.26	14.726		
3,300.0	3,123.2	3,258.9	3,185.2	18.1	13.4	-149.65	602.3	116.5	347.8	324.8	22.99	15.129		
3,400.0	3,213.8	3,356.7	3,280.1	18.9	13.9	-150.36	625.9	121.9	367.9	344.2	23.72	15.507		
3,500.0	3,304.3	3,454.6	3,374.9	19.7	14.4	-151.00	649.4	127.2	388.0	363.5	24.46	15.862		
3,600.0	3,394.8	3,552.5	3,469.8	20.5	14.9	-151.58	673.0	132.6	408.1	382.9	25.20	16.195		
3,700.0	3,485.3	3,650.4	3,564.6	21.4	15.4	-152.10	696.5	137.9	428.3	402.3	25.94	16.509		
3,800.0	3,575.8	3,748.2	3,659.5	22.2	15.9	-152.57	720.1	143.2	448.5	421.8	26.69	16.805		
3,900.0	3,666.3	3,846.1	3,754.3	23.0	16.4	-153.00	743.6	148.6	468.7	441.3	27.44	17.084		
4,000.0	3,756.9	3,944.0	3,849.1	23.9	16.9	-153.40	767.2	153.9	489.0	460.8	28.19	17.348		
4,100.0	3,847.4	4,041.9	3,944.0	24.7	17.4	-153.77	790.7	159.3	509.2	480.3	28.94	17.598		
4,200.0	3,937.9	4,139.7	4,038.8	25.5	17.9	-154.10	814.3	164.6	529.5	499.8	29.69	17.834		
4,300.0	4,028.4	4,237.6	4,133.7	26.3	18.4	-154.42	837.8	170.0	549.8	519.4	30.45	18.058		
4,400.0	4,118.9	4,335.5	4,228.5	27.2	18.9	-154.71	861.4	175.3	570.2	539.0	31.21	18.271		
4,500.0	4,209.5	4,433.4	4,323.4	28.0	19.4	-154.98	884.9	180.6	590.5	558.5	31.96	18.474		
4,600.0	4,300.0	4,531.2	4,418.2	28.8	19.9	-155.23	908.4	186.0	610.9	578.1	32.72	18.667		
4,700.0	4,390.5	4,629.1	4,513.1	29.7	20.3	-155.47	932.0	191.3	631.2	597.7	33.48	18.851		
4,800.0	4,481.0	4,724.7	4,605.7	30.5	20.8	-155.68	955.0	196.5	651.6	617.4	34.23	19.034		
4,900.0	4,571.5	4,800.0	4,679.0	31.3	21.1	-155.92	971.8	200.4	673.5	638.6	34.87	19.316		

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

Company:	Great Western	Local Co-ordinate Reference:	Well Land JG 31-17D
Project:	SEC.31-T2N-R64W	TVD Reference:	WELL @ 4947.0ft (Original Well Elev)
Reference Site:	Land JG (East) Pad Sec.31-T2N-R64W	MD Reference:	WELL @ 4947.0ft (Original Well Elev)
Site Error:	0.0ft	North Reference:	True
Reference Well:	Land JG 31-17D	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 (11-05-12)	Offset TVD Reference:	Offset Datum

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						
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
5,000.0	4,662.1	4,888.6	4,765.8	32.1	21.5	-156.31	989.2	204.3	697.5	662.1	35.42	19.692	
5,100.0	4,752.6	4,968.9	4,844.9	33.0	21.7	-156.75	1,002.8	207.4	723.8	687.9	35.91	20.158	
5,133.0	4,782.4	5,000.0	4,875.6	33.3	21.8	-156.95	1,007.4	208.4	733.0	696.9	36.05	20.330	
5,200.0	4,843.4	5,048.2	4,923.3	33.7	21.9	-157.41	1,014.0	209.9	751.6	715.3	36.33	20.688	
5,300.0	4,935.6	5,127.0	5,001.6	34.3	22.1	-158.10	1,023.1	212.0	778.7	742.1	36.68	21.233	
5,400.0	5,029.1	5,200.0	5,074.3	34.9	22.3	-158.73	1,029.6	213.5	805.0	768.0	36.97	21.772	
5,500.0	5,123.7	5,283.6	5,157.7	35.4	22.4	-159.40	1,034.8	214.7	830.2	793.0	37.20	22.315	
5,600.0	5,219.4	5,361.4	5,235.4	35.9	22.5	-160.01	1,037.5	215.3	854.6	817.2	37.39	22.859	
5,700.0	5,316.1	5,442.1	5,316.1	36.3	22.6	-160.62	1,038.2	215.4	878.0	840.5	37.51	23.405	
5,800.0	5,413.6	5,539.6	5,413.6	36.7	22.7	-161.23	1,038.2	215.4	899.0	861.4	37.62	23.899	
5,900.0	5,511.8	5,637.8	5,511.8	37.0	22.8	-161.72	1,038.2	215.4	916.8	879.1	37.72	24.303	
6,000.0	5,610.7	5,736.6	5,610.7	37.3	22.9	-162.10	1,038.2	215.4	931.4	893.6	37.83	24.622	
6,100.0	5,709.9	5,835.9	5,709.9	37.5	23.0	-162.39	1,038.2	215.4	942.7	904.8	37.92	24.860	
6,200.0	5,809.6	5,935.5	5,809.6	37.7	23.2	-162.59	1,038.2	215.4	950.7	912.7	38.00	25.019	
6,300.0	5,909.5	6,035.4	5,909.5	37.8	23.3	-162.71	1,038.2	215.4	955.4	917.3	38.06	25.101	
6,390.6	6,000.0	6,125.9	6,000.0	37.9	23.4	-135.50	1,038.2	215.4	956.7	918.6	38.11	25.107	
6,400.0	6,009.4	6,135.4	6,009.4	37.9	23.4	-135.50	1,038.2	215.4	956.7	918.6	38.13	25.090	
6,500.0	6,109.4	6,235.4	6,109.4	38.0	23.5	-135.50	1,038.2	215.4	956.7	918.3	38.42	24.901	
6,600.0	6,209.4	6,335.4	6,209.4	38.1	23.6	-135.50	1,038.2	215.4	956.7	918.0	38.71	24.714	
6,700.0	6,309.4	6,435.4	6,309.4	38.1	23.8	-135.50	1,038.2	215.4	956.7	917.7	39.01	24.527	
6,800.0	6,409.4	6,535.4	6,409.4	38.2	23.9	-135.50	1,038.2	215.4	956.7	917.4	39.30	24.342	
6,900.0	6,509.4	6,635.4	6,509.4	38.3	24.0	-135.50	1,038.2	215.4	956.7	917.1	39.60	24.157	
7,000.0	6,609.4	6,735.4	6,609.4	38.4	24.1	-135.50	1,038.2	215.4	956.7	916.8	39.91	23.973	
7,100.0	6,709.4	6,835.4	6,709.4	38.4	24.3	-135.50	1,038.2	215.4	956.7	916.5	40.21	23.791	
7,200.0	6,809.4	6,935.4	6,809.4	38.5	24.4	-135.50	1,038.2	215.4	956.7	916.2	40.52	23.610	
7,300.0	6,909.4	7,035.4	6,909.4	38.6	24.5	-135.50	1,038.2	215.4	956.7	915.9	40.83	23.430	
7,400.0	7,009.4	7,135.4	7,009.4	38.7	24.7	-135.50	1,038.2	215.4	956.7	915.6	41.15	23.252	
7,500.0	7,109.4	7,235.4	7,109.4	38.8	24.8	-135.50	1,038.2	215.4	956.7	915.3	41.46	23.075	
7,600.0	7,209.4	7,335.4	7,209.4	38.9	24.9	-135.50	1,038.2	215.4	956.7	914.9	41.78	22.899	
7,700.0	7,309.4	7,435.4	7,309.4	38.9	25.1	-135.50	1,038.2	215.4	956.7	914.6	42.10	22.724	
7,764.6	7,374.0	7,499.9	7,374.0	39.0	25.1	-135.50	1,038.2	215.4	956.7	914.4	42.31	22.612	

Company:	Great Western	Local Co-ordinate Reference:	Well Land JG 31-17D
Project:	SEC.31-T2N-R64W	TVD Reference:	WELL @ 4947.0ft (Original Well Elev)
Reference Site:	Land JG (East) Pad Sec.31-T2N-R64W	MD Reference:	WELL @ 4947.0ft (Original Well Elev)
Site Error:	0.0ft	North Reference:	True
Reference Well:	Land JG 31-17D	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 (11-05-12)	Offset TVD Reference:	Offset Datum

Reference Depths are relative to WELL @ 4947.0ft (Original Well Elev) Coordinates are relative to: Land JG 31-17D
 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°



Company:	Great Western	Local Co-ordinate Reference:	Well Land JG 31-17D
Project:	SEC.31-T2N-R64W	TVD Reference:	WELL @ 4947.0ft (Original Well Elev)
Reference Site:	Land JG (East) Pad Sec.31-T2N-R64W	MD Reference:	WELL @ 4947.0ft (Original Well Elev)
Site Error:	0.0ft	North Reference:	True
Reference Well:	Land JG 31-17D	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 (11-05-12)	Offset TVD Reference:	Offset Datum

Reference Depths are relative to WELL @ 4947.0ft (Original Well Elev) Coordinates are relative to: Land JG 31-17D
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°

