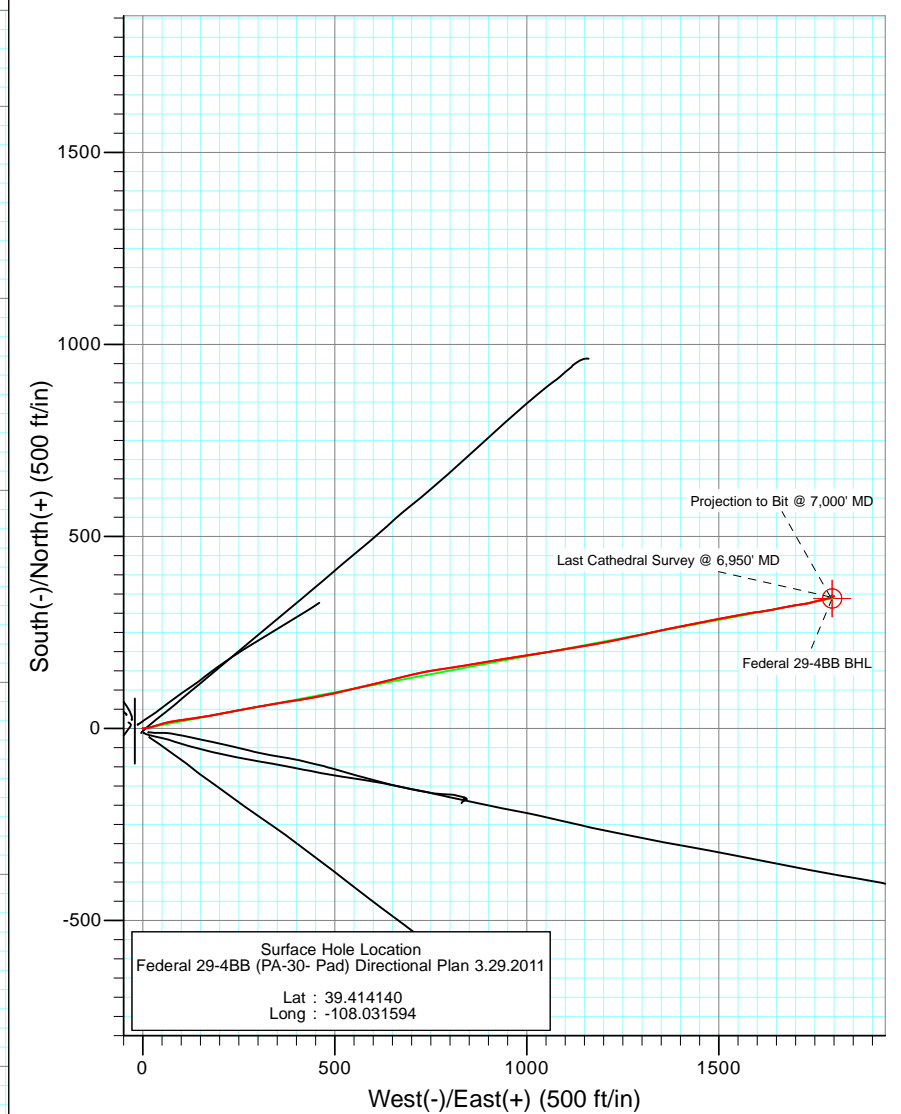
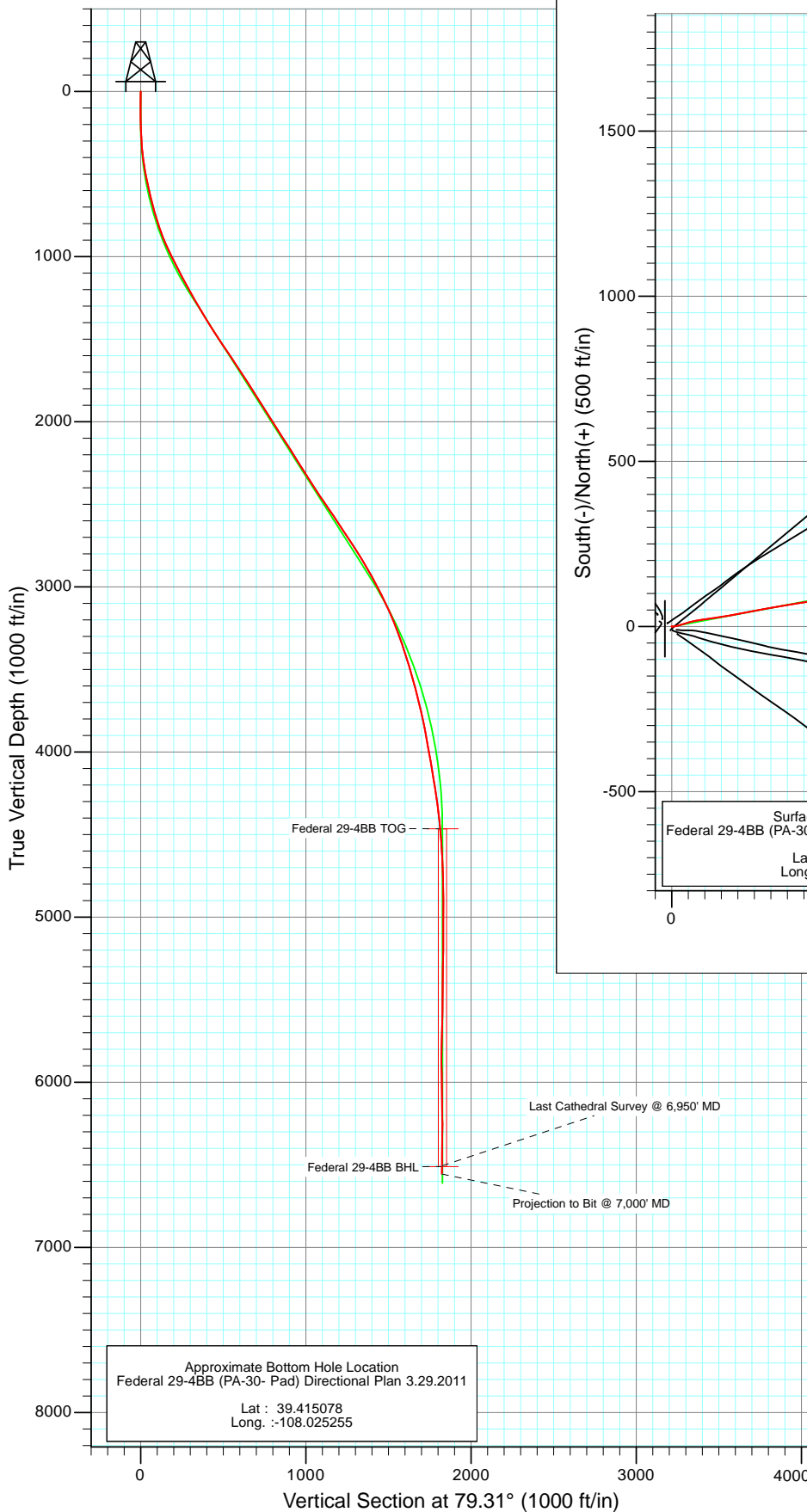




Project: S. Piceance (Parachute)
 Site: SESE 19-7S-95W (PA-30 Pad)
 Well: Federal 29-4BB (PA-30- Pad) Directional Plan 3.29.2011
 Wellbore: DD
 Design: FINAL



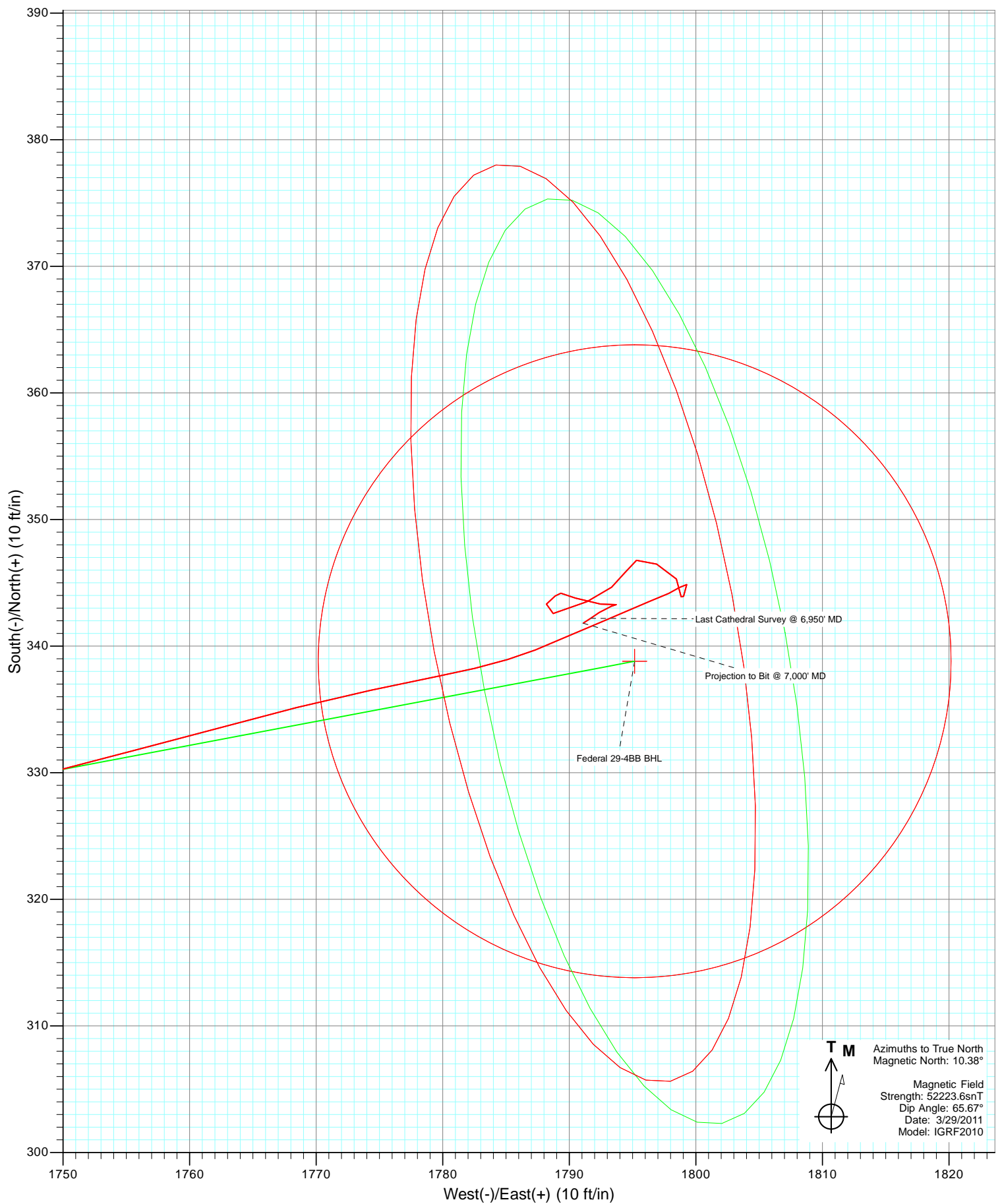
Azimuths to True North
 Magnetic North: 10.38°

Magnetic Field
 Strength: 52223.6nT
 Dip Angle: 65.67°
 Date: 3/29/2011
 Model: IGRF2010

DESIGN DETAILS: DD				
115384/109255 (SH); SC				
WELL @ 5827.0ft (Original Well Elev)				
Target	Azimuth	Origin	N/S	E/W From TVD
Federal 29-4BB BHL	79.31	Slot	0.0	0.0 0.0

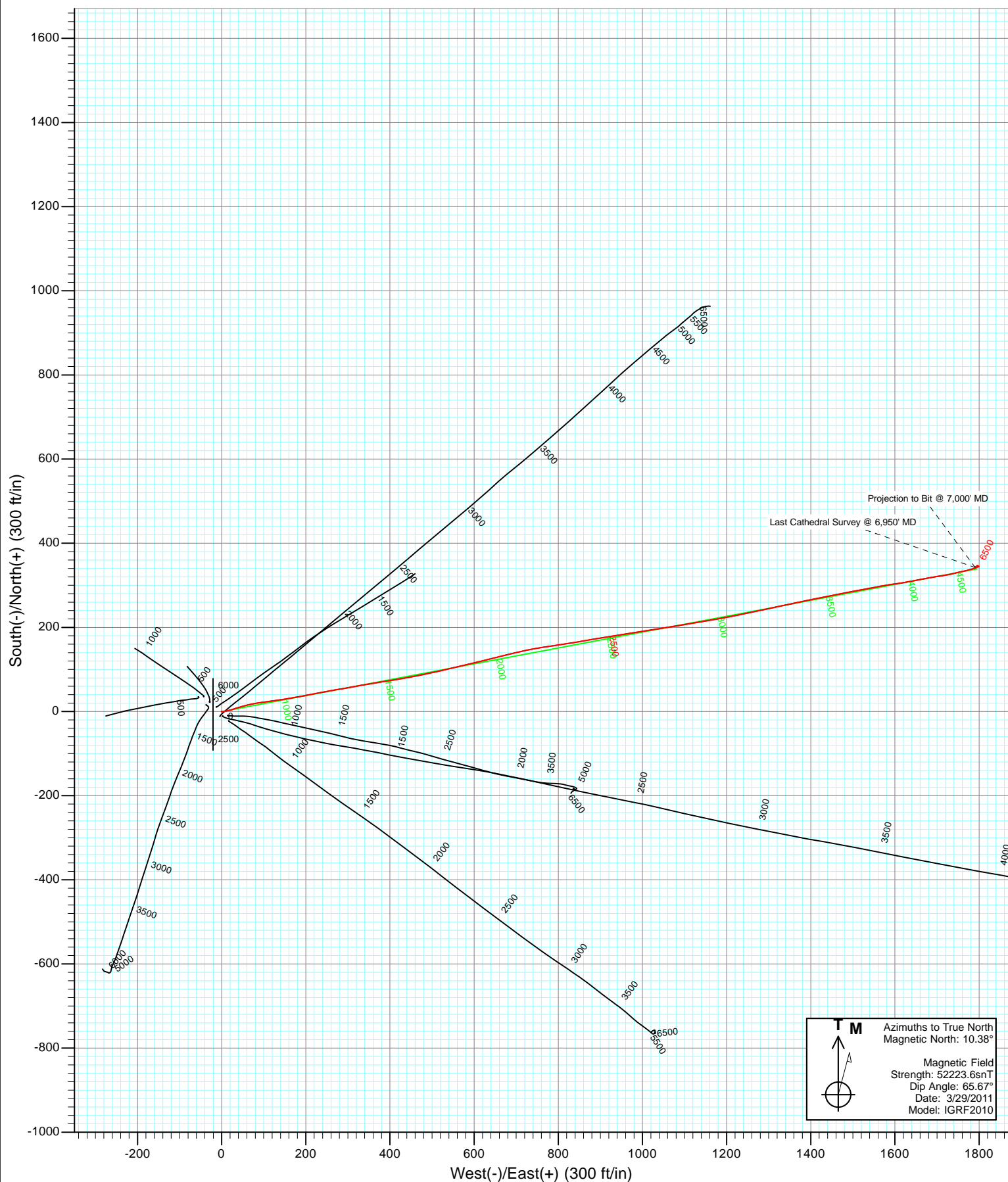


Project: S. Piceance (Parachute)
Site: SESE 19-7S-95W (PA-30 Pad)
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Wellbore: DD
Design: FINAL





Project: S. Piceance (Parachute)
Site: SESE 19-7S-95W (PA-30 Pad)
Federal 29-4BB (PA-30- Pad) Directional Plan 3.29.2011
Wellbore: DD
Design: DD



Cathedral Energy Services

Survey Report

Company:	EnCana Oil & Gas (USA) Inc	Local Co-ordinate Reference:	Well Federal 29-4BB (PA-30- Pad) Directional Pla
Project:	S. Piceance (Parachute)	TVD Reference:	WELL @ 5827.0ft (Original Well Elev)
Site:	SESE 19-7S-95W (PA-30 Pad)	MD Reference:	WELL @ 5827.0ft (Original Well Elev)
Well:	Federal 29-4BB (PA-30- Pad) Directional Plan	North Reference:	True
Wellbore:	DD 3.29.2011	Survey Calculation Method:	Minimum Curvature
Design:	DD	Database:	USA EDM 5000 Multi Users DB

Project	S. Piceance (Parachute), Garfield County, CO		
Map System:	US State Plane 1983	System Datum:	Mean Sea Level
Geo Datum:	North American Datum 1983		
Map Zone:	Colorado Central Zone		

Site		SESE 19-7S-95W (PA-30 Pad)			
Site Position:		Northing:	1,585,669.17 ft	Latitude:	39.414060
From:	Lat/Long	Easting:	2,284,869.32 ft	Longitude:	-108.031520
Position Uncertainty:	0.0 ft	Slot Radius:	13.200 in	Grid Convergence:	-1.60 °

Well	Federal 29-4BB (PA-30- Pad) Directional Plan 3.29.2011					
Well Position	+N/-S	0.0 ft	Northing:	1,585,698.87 ft	Latitude:	39.414140
	+E/-W	0.0 ft	Easting:	2,284,849.23 ft	Longitude:	-108.031594
Position Uncertainty		0.0 ft	Wellhead Elevation:	ft	Ground Level:	5,805.0 ft

Wellbore	DD				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	3/29/2011	10.39	65.67	52,224

Design	DD				
Audit Notes:					
Version:	1.0	Phase:	ACTUAL	Tie On Depth:	0.0
Vertical Section:	Depth From (TVD)	+N/-S	+E/-W	Direction	
	(ft)	(ft)	(ft)	(°)	
	0.0	0.0	0.0	79.31	

Survey Program	Date	10/20/2011			
From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description	
66.0	7,000.0	Survey #1 (DD)	MWD	Geolink MWD	

Survey										
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Formations / Comments	
0.0	0.00	0.00	0.0	0.0	0.0	0.0	0.00	0.00		
66.0	0.40	296.80	66.0	0.1	-0.2	-0.2	0.61	0.61		
96.0	0.50	145.70	96.0	0.0	-0.2	-0.2	2.91	0.33		
127.0	0.40	6.70	127.0	0.0	-0.1	-0.1	2.72	-0.32		
158.0	0.20	82.70	158.0	0.2	-0.1	0.0	1.30	-0.65		
188.0	1.20	105.80	188.0	0.1	0.3	0.3	3.40	3.33		
219.0	1.80	105.20	219.0	-0.1	1.1	1.0	1.94	1.94		
250.0	2.00	85.80	250.0	-0.2	2.1	2.0	2.16	0.65		
280.0	4.00	73.50	279.9	0.1	3.6	3.6	6.97	6.67		
311.0	4.60	81.40	310.8	0.6	5.9	5.9	2.72	1.94		
402.0	6.50	80.50	401.4	2.0	14.6	14.7	2.09	2.09		
495.0	10.80	71.70	493.3	5.6	28.0	28.6	4.82	4.62		
587.0	13.20	73.20	583.3	11.3	46.3	47.6	2.63	2.61		

Cathedral Energy Services

Survey Report

Company:	EnCana Oil & Gas (USA) Inc	Local Co-ordinate Reference:	Well Federal 29-4BB (PA-30- Pad) Directional Pla
Project:	S. Piceance (Parachute)	TVD Reference:	WELL @ 5827.0ft (Original Well Elev)
Site:	SESE 19-7S-95W (PA-30 Pad)	MD Reference:	WELL @ 5827.0ft (Original Well Elev)
Well:	Federal 29-4BB (PA-30- Pad) Directional Plan	North Reference:	True
Wellbore:	09.2011	Survey Calculation Method:	Minimum Curvature
Design:	DD	Database:	USA EDM 5000 Multi Users DB

Survey									
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Formations / Comments
679.0	13.70	77.80	672.8	16.7	67.0	68.9	1.28	0.54	
771.0	16.60	81.60	761.6	20.9	90.6	92.9	3.33	3.15	
863.0	20.00	82.60	848.9	24.9	119.2	121.8	3.71	3.70	
956.0	24.00	80.80	935.1	29.9	153.7	156.6	4.36	4.30	
1,040.0	27.20	78.70	1,010.9	36.4	189.4	192.9	3.96	3.81	
1,163.0	27.60	79.80	1,120.1	47.0	245.0	249.5	0.52	0.33	
1,258.0	28.90	80.50	1,203.8	54.7	289.3	294.4	1.41	1.37	
1,353.0	29.90	79.80	1,286.5	62.6	335.3	341.1	1.11	1.05	
1,448.0	31.20	80.40	1,368.3	70.9	382.8	389.3	1.41	1.37	
1,544.0	32.90	80.50	1,449.7	79.4	433.1	440.3	1.77	1.77	
1,639.0	33.70	78.30	1,529.1	89.0	484.3	492.4	1.52	0.84	
1,735.0	34.20	77.30	1,608.7	100.3	536.7	546.0	0.78	0.52	
1,830.0	33.50	75.40	1,687.6	112.8	588.1	598.8	1.34	-0.74	
1,926.0	32.70	77.00	1,768.1	125.3	639.0	651.2	1.23	-0.83	
2,022.0	32.30	75.80	1,849.0	137.4	689.2	702.7	0.79	-0.42	
2,116.0	32.10	79.60	1,928.6	148.1	738.1	752.8	2.16	-0.21	
2,211.0	32.30	81.60	2,009.0	156.4	788.0	803.4	1.14	0.21	
2,306.0	32.80	81.10	2,089.1	164.1	838.6	854.4	0.60	0.53	
2,402.0	32.50	79.90	2,169.9	172.6	889.6	906.2	0.74	-0.31	
2,497.0	31.70	80.50	2,250.4	181.2	939.4	956.7	0.91	-0.84	
2,593.0	32.30	81.70	2,331.8	189.1	989.6	1,007.5	0.91	0.62	
2,688.0	33.40	81.20	2,411.6	196.7	1,040.6	1,059.0	1.19	1.16	
2,784.0	35.00	80.40	2,491.0	205.4	1,093.9	1,113.0	1.73	1.67	
2,879.0	33.30	79.70	2,569.6	214.6	1,146.4	1,166.3	1.84	-1.79	
2,974.0	33.80	79.90	2,648.8	223.9	1,198.1	1,218.8	0.54	0.53	
3,070.0	33.40	78.00	2,728.7	234.1	1,250.2	1,271.9	1.17	-0.42	
3,166.0	31.40	78.40	2,809.8	244.6	1,300.5	1,323.3	2.10	-2.08	
3,261.0	30.50	77.60	2,891.3	254.7	1,348.3	1,372.2	1.04	-0.95	
3,357.0	28.30	78.00	2,974.9	264.7	1,394.4	1,419.3	2.30	-2.29	
3,452.0	26.10	79.00	3,059.4	273.4	1,436.9	1,462.7	2.37	-2.32	
3,548.0	24.30	79.40	3,146.2	281.0	1,477.1	1,503.6	1.88	-1.87	
3,643.0	21.30	79.50	3,233.8	287.8	1,513.3	1,540.4	3.16	-3.16	
3,739.0	19.90	79.00	3,323.7	294.1	1,546.5	1,574.2	1.47	-1.46	
3,834.0	17.70	80.30	3,413.6	299.6	1,576.6	1,604.8	2.36	-2.32	
3,930.0	14.90	81.80	3,505.7	303.8	1,603.2	1,631.7	2.95	-2.92	
4,025.0	15.00	81.20	3,597.5	307.4	1,627.4	1,656.2	0.19	0.11	
4,121.0	15.30	77.90	3,690.2	312.0	1,652.1	1,681.3	0.95	0.31	
4,216.0	12.40	78.90	3,782.4	316.6	1,674.3	1,704.0	3.06	-3.05	
4,311.0	10.50	81.50	3,875.5	319.8	1,692.9	1,722.9	2.07	-2.00	
4,407.0	9.80	81.40	3,970.0	322.3	1,709.6	1,739.8	0.73	-0.73	
4,503.0	9.90	80.70	4,064.6	324.9	1,725.9	1,756.2	0.16	0.10	
4,598.0	9.10	76.20	4,158.3	328.0	1,741.2	1,771.8	1.15	-0.84	
4,694.0	8.50	74.40	4,253.2	331.7	1,755.4	1,786.5	0.69	-0.62	
4,789.0	7.80	76.20	4,347.2	335.1	1,768.4	1,799.9	0.78	-0.74	
4,884.0	5.90	79.20	4,441.5	337.6	1,779.5	1,811.2	2.03	-2.00	
4,980.0	3.80	68.40	4,537.2	339.7	1,787.3	1,819.3	2.38	-2.19	
5,075.0	2.90	65.20	4,632.0	341.9	1,792.4	1,824.7	0.97	-0.95	
5,170.0	2.30	69.00	4,726.9	343.6	1,796.4	1,828.9	0.66	-0.63	
5,265.0	0.80	53.40	4,821.9	344.6	1,798.7	1,831.4	1.63	-1.58	
5,361.0	0.20	164.10	4,917.9	344.9	1,799.3	1,832.0	0.93	-0.62	
5,456.0	1.00	201.10	5,012.9	343.9	1,799.0	1,831.6	0.89	0.84	
5,552.0	0.90	8.60	5,108.9	343.9	1,798.8	1,831.4	1.97	-0.10	
5,647.0	1.00	324.00	5,203.8	345.3	1,798.5	1,831.3	0.77	0.11	

Cathedral Energy Services

Survey Report

Company:	EnCana Oil & Gas (USA) Inc	Local Co-ordinate Reference:	Well Federal 29-4BB (PA-30- Pad) Directional Pla
Project:	S. Piceance (Parachute)	TVD Reference:	WELL @ 5827.0ft (Original Well Elev)
Site:	SESE 19-7S-95W (PA-30 Pad)	MD Reference:	WELL @ 5827.0ft (Original Well Elev)
Well:	Federal 29-4BB (PA-30- Pad) Directional Plan	North Reference:	True
Wellbore:	DD9.2011	Survey Calculation Method:	Minimum Curvature
Design:	DD	Database:	USA EDM 5000 Multi Users DB

Survey									
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Formations / Comments
5,743.0	1.40	295.40	5,299.8	346.5	1,796.9	1,830.0	0.74	0.42	
5,838.0	0.70	249.40	5,394.8	346.8	1,795.3	1,828.5	1.10	-0.74	
5,933.0	1.10	207.40	5,489.8	345.8	1,794.4	1,827.4	0.78	0.42	
6,028.0	0.80	242.40	5,584.8	344.7	1,793.3	1,826.2	0.67	-0.32	
6,124.0	1.90	238.60	5,680.8	343.5	1,791.4	1,824.0	1.15	1.15	
6,219.0	1.60	265.20	5,775.7	342.6	1,788.7	1,821.2	0.90	-0.32	
6,314.0	1.40	42.90	5,870.7	343.3	1,788.2	1,820.8	2.95	-0.21	
6,410.0	0.40	88.50	5,966.7	344.2	1,789.3	1,822.1	1.20	-1.04	
6,505.0	1.10	116.10	6,061.7	343.8	1,790.5	1,823.2	0.81	0.74	
6,601.0	1.40	93.40	6,157.7	343.3	1,792.5	1,825.1	0.60	0.31	
6,696.0	0.10	67.20	6,252.6	343.3	1,793.7	1,826.3	1.38	-1.37	
6,791.0	0.60	251.10	6,347.6	343.2	1,793.3	1,825.9	0.74	0.53	
6,887.0	0.70	234.50	6,443.6	342.7	1,792.4	1,824.8	0.22	0.10	
6,950.0	0.80	237.50	6,506.6	342.2	1,791.7	1,824.1	0.17	0.16	Last Cathedral Survey @ 6,950' MD
7,000.0	0.80	237.50	6,556.6	341.8	1,791.1	1,823.4	0.00	0.00	Projection to Bit @ 7,000' MD

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									
Federal 29-4BB BHL	0.00	0.00	6,511.0	338.8	1,795.2	1,585,987.53	2,286,653.14	39.415070	-108.025240
- survey misses target center by 6.5ft at 6950.0ft MD (6506.6 TVD, 342.2 N, 1791.7 E)									
- Circle (radius 25.0)									
Federal 29-4BB TOG	0.00	0.00	4,465.0	338.8	1,795.2	1,585,987.53	2,286,653.14	39.415070	-108.025240
- survey misses target center by 13.4ft at 4908.7ft MD (4466.1 TVD, 338.1 N, 1781.9 E)									
- Point									

Survey Annotations				
Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment
		+N/-S (ft)	+E/-W (ft)	
6,950.0	6,506.6	342.2	1,791.7	Last Cathedral Survey @ 6,950' MD
7,000.0	6,556.6	341.8	1,791.1	Projection to Bit @ 7,000' MD

Checked By: _____ Approved By: _____ Date: _____