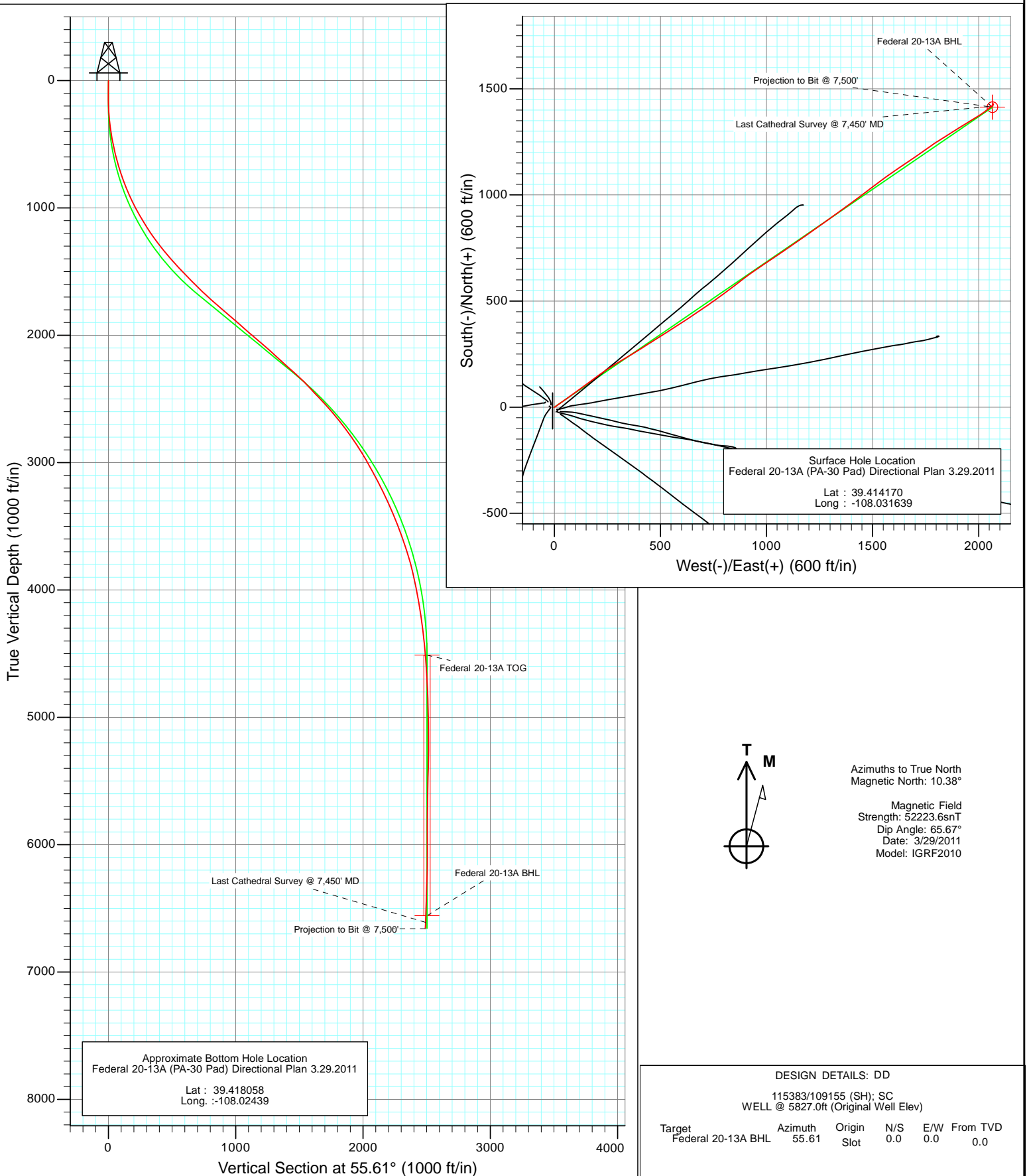


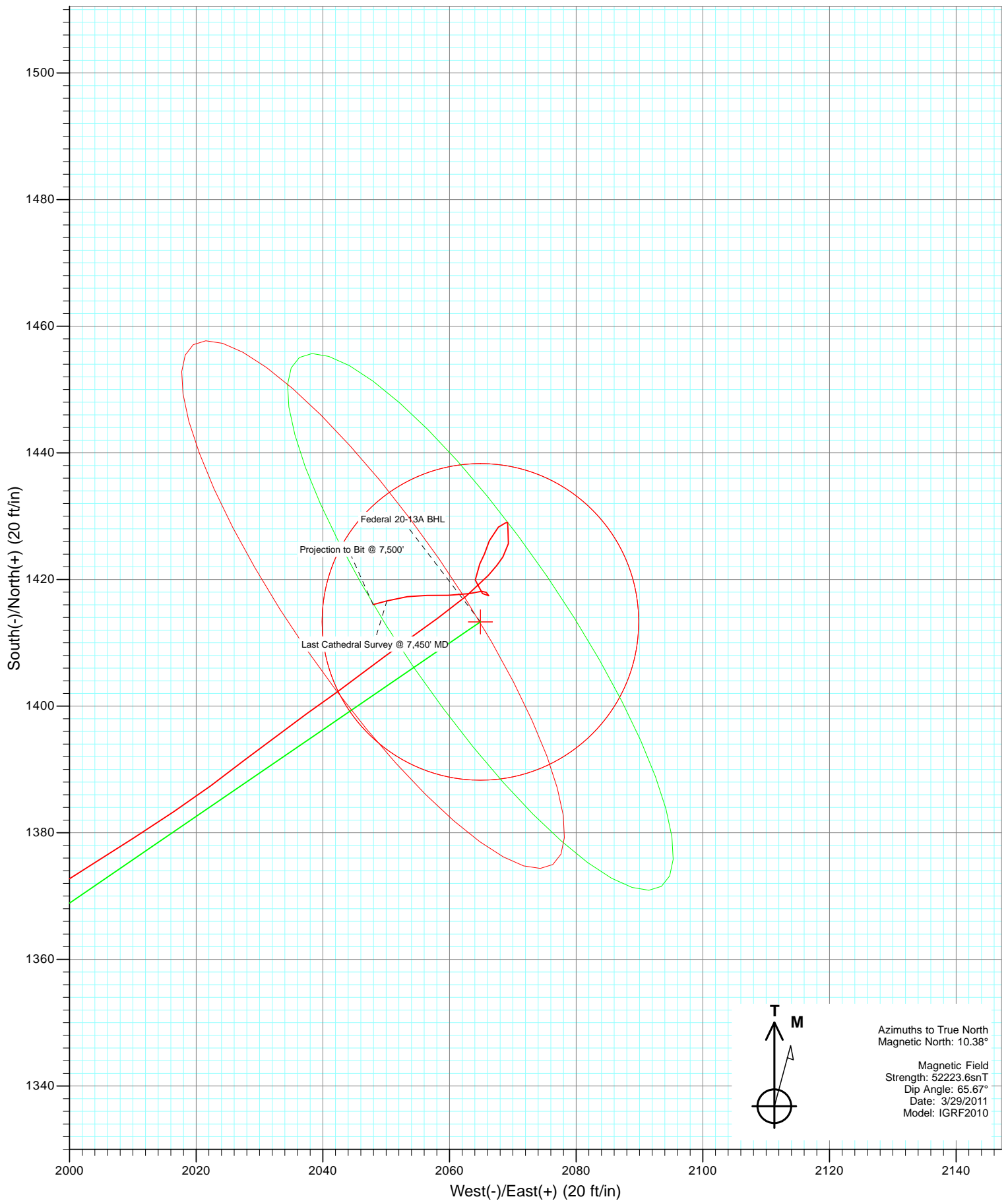


Project: S. Piceance (Parachute)
 Site: SESE 19-7S-95W (PA-30 Pad)
 Well: Federal 20-13A (PA-30 Pad) Directional Plan 3.29.2011
 Wellbore: DD
 Design: FINAL



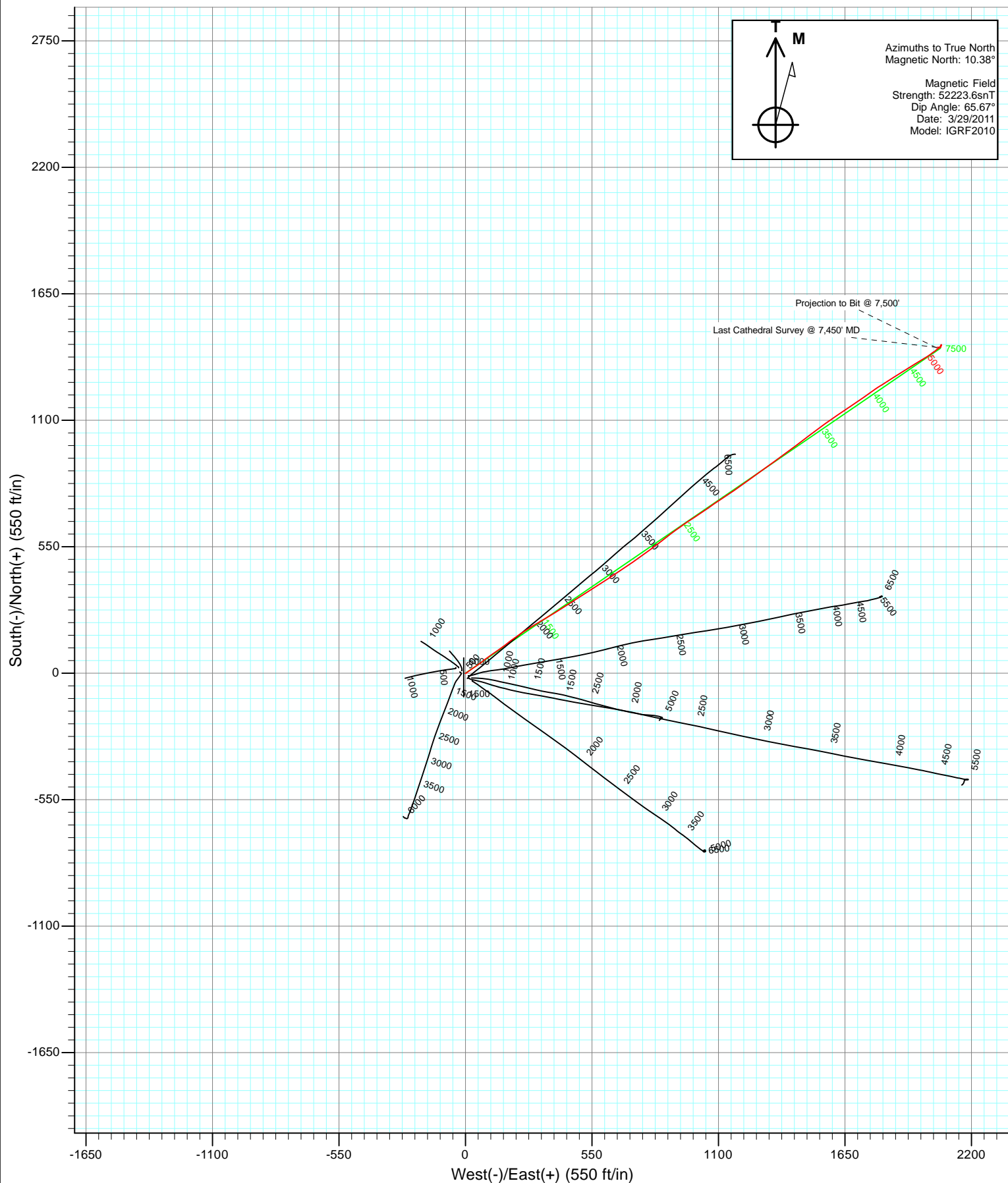


Project: S. Piceance (Parachute)
Site: SESE 19-7S-95W (PA-30 Pad)
Well: Federal 20-13A (PA-30 Pad) Directional Plan 3.29.2011
Wellbore: DD
Design: FINAL





Project: S. Piceance (Parachute)
Site: SESE 19-7S-95W (PA-30 Pad)
Federal 20-13A (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 20-13A (PA-30 Pad) Directional Plan
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 20-13A (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 20-13A (PA-30 Pad) Directional Plan 3.29.2011			
Well Position	+N/-S	0.0 ft	Northing:	1,585,710.15 ft
	+E/-W	0.0 ft	Easting:	2,284,836.83 ft
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	55.61

Survey Program	Date	10/24/2011			
From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description	
96.0	1,075.0	Survey #1 (DD)	MWD	Geolink MWD	
1,163.0	7,500.0	Survey #2 (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	
96.0	0.60	209.70	96.0	-0.4	-0.2	-0.5	0.62	0.62	
127.0	0.20	198.10	127.0	-0.6	-0.3	-0.6	1.31	-1.29	
158.0	1.00	73.40	158.0	-0.6	-0.1	-0.4	3.63	2.58	
188.0	1.80	64.90	188.0	-0.3	0.6	0.3	2.75	2.67	
219.0	2.50	60.50	219.0	0.2	1.6	1.4	2.32	2.26	
265.0	4.10	52.70	264.9	1.7	3.8	4.1	3.60	3.48	
311.0	5.60	53.10	310.7	4.0	6.9	8.0	3.26	3.26	
356.0	7.40	53.30	355.4	7.1	11.0	13.1	4.00	4.00	
402.0	8.90	56.80	401.0	10.8	16.3	19.6	3.43	3.26	
495.0	10.90	56.30	492.6	19.6	29.7	35.6	2.15	2.15	
587.0	14.00	54.50	582.4	30.9	46.0	55.4	3.40	3.37	

Cathedral Energy Services

Survey Report

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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 20-13A (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
679.0	16.60	53.40	671.1	45.2	65.6	79.7	2.84	2.83	
771.0	19.60	52.60	758.6	62.4	88.4	108.2	3.27	3.26	
863.0	22.20	55.20	844.5	81.7	114.9	141.0	3.00	2.83	
955.0	24.50	55.10	929.0	102.6	144.8	177.5	2.50	2.50	
1,075.0	29.40	52.10	1,035.9	134.9	188.5	231.8	4.24	4.08	
1,163.0	31.70	54.90	1,111.7	161.5	224.5	276.5	3.07	2.61	
1,259.0	32.90	57.80	1,192.8	189.9	267.2	327.7	2.04	1.25	
1,354.0	38.00	59.30	1,270.2	218.6	314.2	382.7	5.45	5.37	
1,449.0	40.60	58.30	1,343.7	249.8	365.7	442.8	2.82	2.74	
1,544.0	40.60	58.60	1,415.8	282.1	418.3	504.6	0.21	0.00	
1,640.0	43.00	56.70	1,487.4	316.4	472.4	568.5	2.83	2.50	
1,735.0	44.30	57.60	1,556.2	351.9	527.5	634.0	1.52	1.37	
1,831.0	46.00	57.80	1,623.9	388.3	585.0	702.1	1.78	1.77	
1,927.0	47.30	56.50	1,689.8	426.2	643.6	771.8	1.67	1.35	
2,023.0	49.00	55.30	1,753.8	466.3	702.8	843.3	2.00	1.77	
2,116.0	49.30	54.00	1,814.6	507.0	760.2	913.7	1.11	0.32	
2,212.0	49.50	53.60	1,877.1	550.0	819.0	986.5	0.38	0.21	
2,307.0	48.30	52.00	1,939.6	593.3	876.0	1,058.0	1.79	-1.26	
2,402.0	49.80	54.60	2,001.8	636.1	933.6	1,129.7	2.60	1.58	
2,498.0	49.40	56.80	2,064.0	677.3	994.0	1,202.8	1.79	-0.42	
2,593.0	48.20	54.90	2,126.6	717.5	1,053.1	1,274.3	1.96	-1.26	
2,689.0	47.00	56.50	2,191.4	757.4	1,111.7	1,345.2	1.75	-1.25	
2,784.0	48.50	55.60	2,255.2	796.7	1,170.0	1,415.5	1.73	1.58	
2,880.0	47.30	53.70	2,319.6	837.9	1,228.1	1,486.7	1.93	-1.25	
2,975.0	44.30	54.40	2,385.8	877.9	1,283.2	1,554.8	3.20	-3.16	
3,071.0	42.50	53.90	2,455.6	916.5	1,336.7	1,620.7	1.91	-1.87	
3,166.0	43.00	53.80	2,525.3	954.5	1,388.7	1,685.2	0.53	0.53	
3,262.0	41.80	53.10	2,596.2	993.1	1,440.8	1,749.8	1.34	-1.25	
3,357.0	38.90	53.00	2,668.6	1,030.0	1,489.9	1,811.3	3.05	-3.05	
3,453.0	35.80	52.90	2,744.9	1,065.1	1,536.4	1,869.5	3.23	-3.23	
3,548.0	33.80	55.80	2,822.9	1,096.8	1,580.4	1,923.6	2.73	-2.11	
3,644.0	33.00	54.90	2,903.1	1,126.8	1,623.9	1,976.5	0.98	-0.83	
3,739.0	29.90	56.40	2,984.1	1,154.8	1,664.8	2,026.0	3.37	-3.26	
3,835.0	28.70	55.90	3,067.8	1,180.9	1,703.8	2,073.0	1.28	-1.25	
3,930.0	27.30	55.00	3,151.7	1,206.2	1,740.5	2,117.6	1.54	-1.47	
4,026.0	26.10	54.00	3,237.5	1,231.3	1,775.7	2,160.7	1.33	-1.25	
4,121.0	24.10	58.60	3,323.5	1,253.7	1,809.1	2,201.0	2.94	-2.11	
4,217.0	23.10	58.00	3,411.5	1,273.9	1,841.8	2,239.4	1.07	-1.04	
4,312.0	20.50	57.10	3,499.7	1,292.8	1,871.6	2,274.6	2.76	-2.74	
4,408.0	19.50	56.90	3,589.9	1,310.7	1,899.1	2,307.5	1.04	-1.04	
4,503.0	18.50	58.70	3,679.7	1,327.1	1,925.3	2,338.4	1.22	-1.05	
4,599.0	16.10	58.70	3,771.4	1,342.0	1,949.7	2,366.9	2.50	-2.50	
4,694.0	13.00	59.40	3,863.3	1,354.3	1,970.1	2,390.7	3.27	-3.26	
4,790.0	11.60	57.50	3,957.1	1,364.9	1,987.6	2,411.1	1.52	-1.46	
4,885.0	10.50	58.10	4,050.3	1,374.6	2,003.0	2,429.3	1.16	-1.16	
4,980.0	8.90	56.10	4,144.0	1,383.3	2,016.4	2,445.3	1.72	-1.68	
5,076.0	7.70	51.50	4,239.0	1,391.5	2,027.6	2,459.2	1.43	-1.25	
5,171.0	7.30	55.10	4,333.2	1,398.9	2,037.6	2,471.5	0.65	-0.42	
5,266.0	5.70	52.50	4,427.5	1,405.2	2,046.3	2,482.3	1.71	-1.68	
5,361.0	4.20	55.20	4,522.2	1,410.1	2,052.9	2,490.5	1.60	-1.58	
5,457.0	3.60	52.90	4,618.0	1,413.9	2,058.1	2,497.0	0.65	-0.62	
5,553.0	3.10	51.30	4,713.8	1,417.3	2,062.6	2,502.6	0.53	-0.52	
5,648.0	2.80	42.10	4,808.7	1,420.7	2,066.1	2,507.4	0.59	-0.32	

Cathedral Energy Services

Survey Report

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Well:	Federal 20-13A (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	1.70	32.20	4,903.6	1,423.6	2,068.4	2,511.0	1.22	-1.16	
5,838.0	1.10	6.90	4,998.6	1,425.7	2,069.3	2,512.9	0.89	-0.63	
5,933.0	1.50	352.50	5,093.5	1,427.8	2,069.3	2,514.0	0.54	0.42	
6,029.0	0.10	88.90	5,189.5	1,429.1	2,069.2	2,514.7	1.58	-1.46	
6,124.0	0.50	254.00	5,284.5	1,428.9	2,068.9	2,514.3	0.63	0.42	
6,219.0	1.10	233.00	5,379.5	1,428.3	2,067.7	2,513.0	0.69	0.63	
6,315.0	2.10	203.50	5,475.5	1,426.1	2,066.3	2,510.6	1.32	1.04	
6,410.0	0.60	187.00	5,570.5	1,424.0	2,065.5	2,508.8	1.61	-1.58	
6,506.0	1.50	212.70	5,666.4	1,422.5	2,064.8	2,507.3	1.04	0.94	
6,601.0	1.80	181.90	5,761.4	1,419.9	2,064.1	2,505.3	0.97	0.32	
6,697.0	1.60	118.00	5,857.4	1,417.8	2,065.2	2,505.0	1.88	-0.21	
6,792.0	0.40	330.60	5,952.4	1,417.5	2,066.2	2,505.7	2.05	-1.26	
6,887.0	0.40	314.30	6,047.3	1,418.0	2,065.8	2,505.6	0.12	0.00	
6,983.0	0.60	262.30	6,143.3	1,418.1	2,065.1	2,505.1	0.49	0.21	
7,078.0	1.80	258.30	6,238.3	1,417.8	2,063.1	2,503.3	1.27	1.26	
7,174.0	2.20	271.00	6,334.3	1,417.5	2,059.8	2,500.4	0.62	0.42	
7,268.0	1.90	268.50	6,428.2	1,417.5	2,056.4	2,497.6	0.33	-0.32	
7,364.0	1.80	263.90	6,524.2	1,417.3	2,053.4	2,495.0	0.19	-0.10	
7,450.0	2.60	254.80	6,610.1	1,416.6	2,050.1	2,491.9	1.01	0.93	Last Cathedral Survey @ 7,450' MD
7,500.0	2.60	254.80	6,660.0	1,416.0	2,047.9	2,489.8	0.00	0.00	Projection to Bit @ 7,500'

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 20-13A TOG	0.00	0.00	4,512.0	1,413.3	2,064.9	1,587,065.38	2,286,940.30	39.418050	-108.024330
- actual wellpath misses target center by 13.2ft at 5351.9ft MD (4513.1 TVD, 1409.7 N, 2052.3 E)									
- Point									
Federal 20-13A BHL	0.00	0.00	6,558.0	1,413.3	2,064.9	1,587,065.38	2,286,940.30	39.418050	-108.024330
- actual wellpath misses target center by 13.2ft at 7397.4ft MD (6557.6 TVD, 1417.1 N, 2052.2 E)									
- Circle (radius 25.0)									

Design Annotations				
Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment
		+N/-S (ft)	+E/-W (ft)	
7,450.0	6,610.1	1,416.6	2,050.1	Last Cathedral Survey @ 7,450' MD
7,500.0	6,660.0	1,416.0	2,047.9	Projection to Bit @ 7,500'

Checked By: _____ Approved By: _____ Date: _____