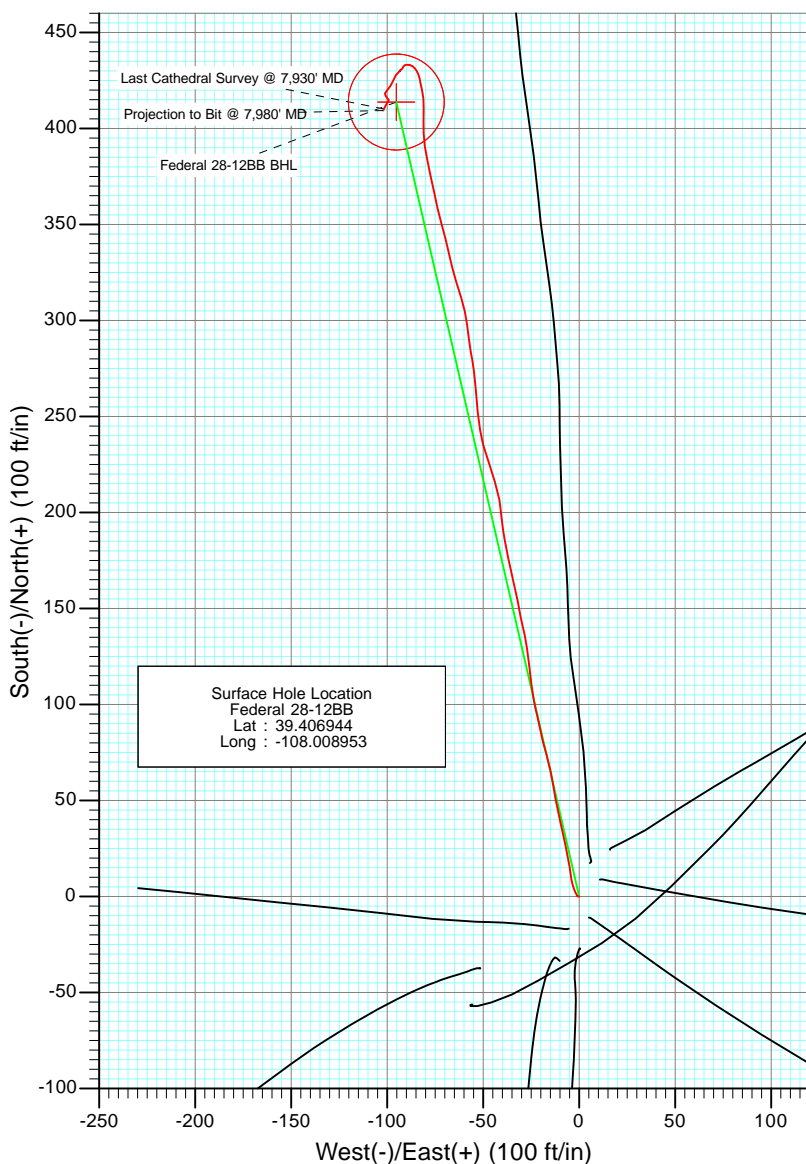
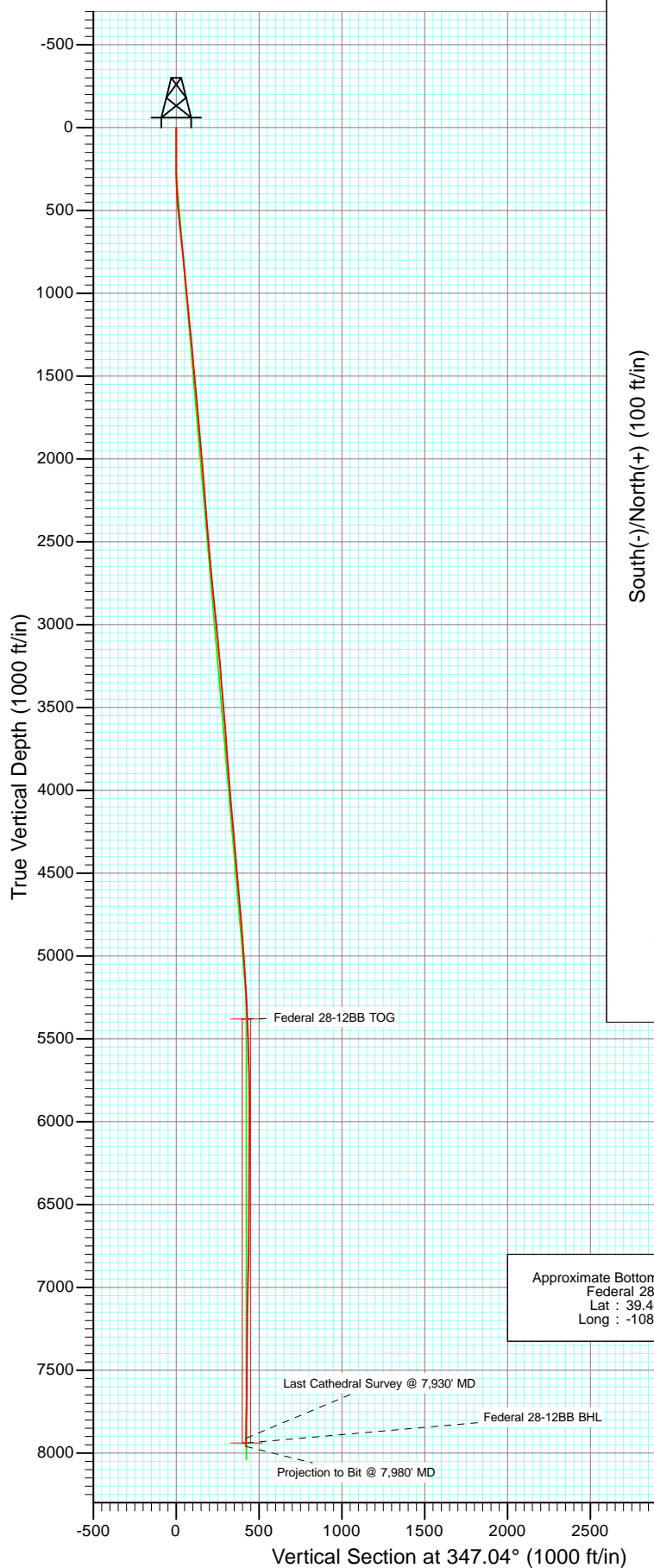




Project: S. Piceance (Parachute)  
 Site: PL 28 Pad (S28-T7S-R95W)  
 Well: Federal 28-12BB  
 Wellbore: DD  
 Design: FINAL



Azimuths to True North  
 Magnetic North: 10.45°

Magnetic Field  
 Strength: 52321.9nT  
 Dip Angle: 65.70°  
 Date: 6/11/2010  
 Model: IGRF200510

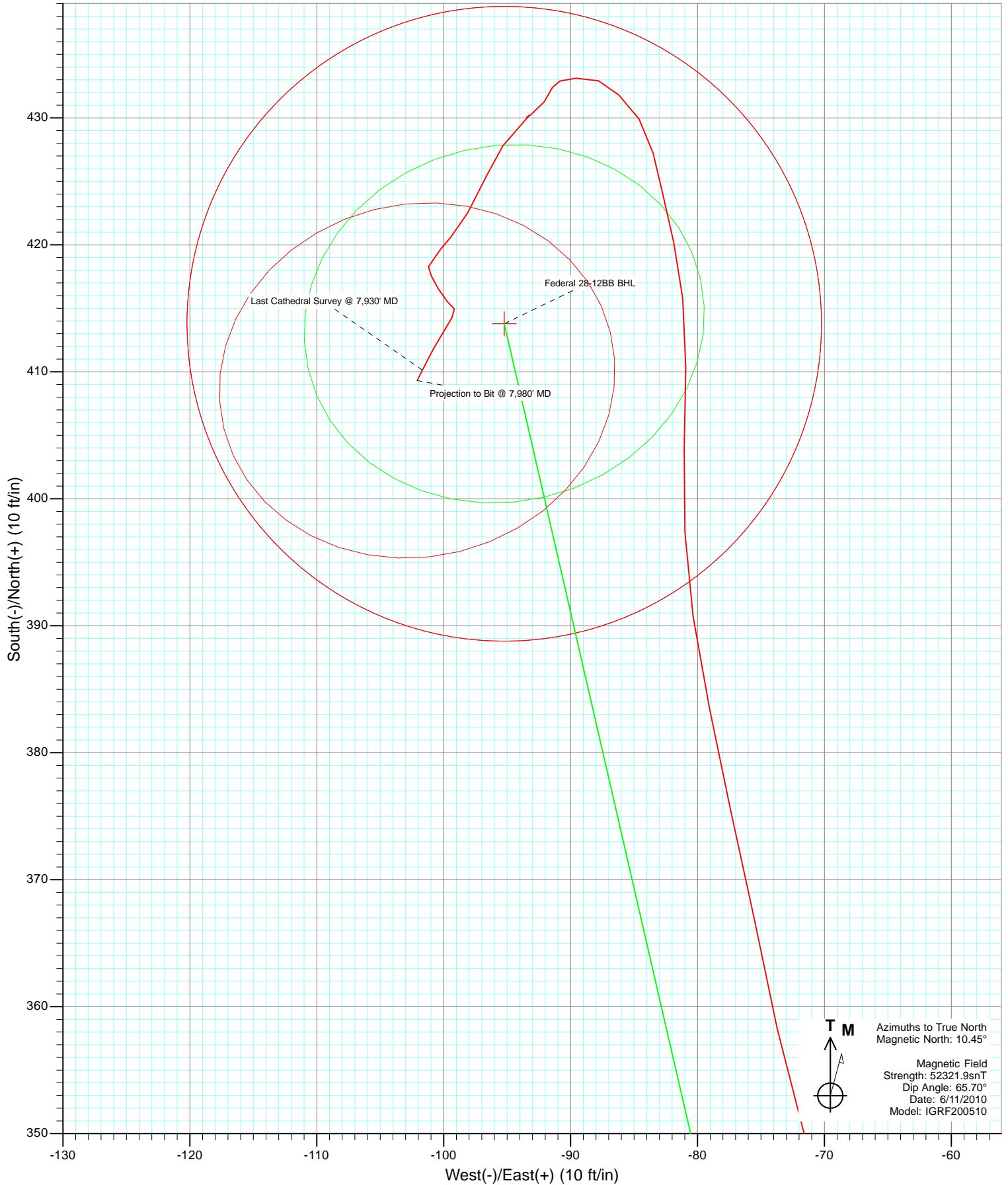
DD  
 Federal 28-12BB  
 115432/114755 (SH); 115527/115455 (MH) SC

WELL @ 7186.0ft (Original Well Elev)  
 North American Datum 1983  
 Well Federal 28-12BB, True North

Target	Azimuth	Origin Type	N/S	E/W	From TVD
Federal 28-12BB BHL	413.8	Slot	47.04	0.0	0.0
Name	TVD	+N/-S	+E/-W	Latitude	Longitude
Federal 28-12BB TOG	5380.0	413.8	-95.2	39.408080	-108.009290
Federal 28-12BB BHL	7939.0	413.8	-95.2	39.408080	-108.009290

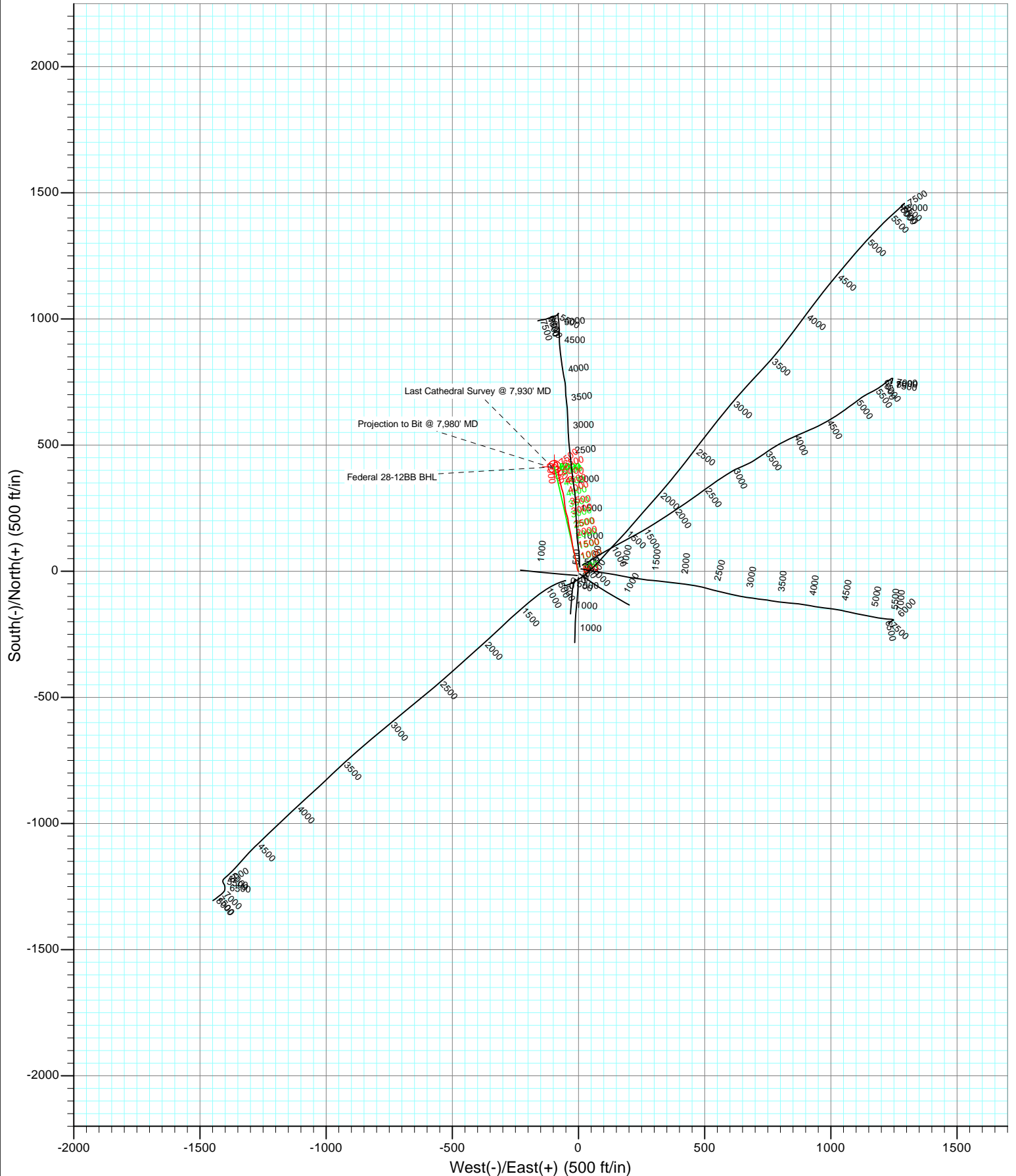


Project: S. Piceance (Parachute)  
Site: PL 28 Pad (S28-T7S-R95W)  
Well: Federal 28-12BB  
Design: FINAL





Project: S. Piceance (Parachute)  
Site: PL 28 Pad (S28-T7S-R95W)  
Well: Federal 28-12BB  
Design: FINAL



# Cathedral Energy Services

## Survey Report

<b>Company:</b>	EnCana Oil & Gas (USA) Inc	<b>Local Co-ordinate Reference:</b>	Well Federal 28-12BB
<b>Project:</b>	S. Piceance (Parachute)	<b>TVD Reference:</b>	WELL @ 7186.0ft (Original Well Elev)
<b>Site:</b>	PL 28 Pad (S28-T7S-R95W)	<b>MD Reference:</b>	WELL @ 7186.0ft (Original Well Elev)
<b>Well:</b>	Federal 28-12BB	<b>North Reference:</b>	True
<b>Wellbore:</b>	DD	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	DD	<b>Database:</b>	USA EDM 5000 Multi Users DB

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

Site		PL 28 Pad (S28-T7S-R95W)			
Site Position:		Northing:	1,582,914.36 ft	Latitude:	39.406980
From:	Lat/Long	Easting:	2,291,178.00 ft	Longitude:	-108.008930
Position Uncertainty:	0.0 ft	Slot Radius:	13.200 in	Grid Convergence:	-1.58 °

Well		Federal 28-12BB				
Well Position	+N/-S	0.0 ft	Northing:	1,582,901.42 ft	Latitude:	39.406944
	+E/-W	0.0 ft	Easting:	2,291,171.14 ft	Longitude:	-108.008953
Position Uncertainty		0.0 ft	Wellhead Elevation:	ft	Ground Level:	7,164.0 ft

<b>Wellbore</b>	DD				
<b>Magnetics</b>	<b>Model Name</b>	<b>Sample Date</b>	<b>Declination (°)</b>	<b>Dip Angle (°)</b>	<b>Field Strength (nT)</b>
	IGRF200510	6/11/2010	10.45	65.70	52,322

<b>Design</b>	DD				
<b>Audit Notes:</b>					
<b>Version:</b>	1.0	<b>Phase:</b>	ACTUAL	<b>Tie On Depth:</b>	0.0
<b>Vertical Section:</b>	<b>Depth From (TVD)</b>	<b>+N/-S</b>	<b>+E/-W</b>	<b>Direction</b>	
	(ft)	(ft)	(ft)	(°)	
	0.0	0.0	0.0	347.04	

<b>Survey Program</b>	<b>Date</b>	11/28/2011			
<b>From (ft)</b>	<b>To (ft)</b>	<b>Survey (Wellbore)</b>	<b>Tool Name</b>	<b>Description</b>	
125.0	1,200.0	Survey #1 (DD)	MWD	Geolink MWD	
1,353.0	7,980.0	Survey #2 (DD)	MWD	Geolink MWD	

<b>Survey</b>										
<b>Measured Depth (ft)</b>	<b>Inclination (°)</b>	<b>Azimuth (°)</b>	<b>Vertical Depth (ft)</b>	<b>+N/-S (ft)</b>	<b>+E/-W (ft)</b>	<b>Vertical Section (ft)</b>	<b>Dogleg Rate (°/100ft)</b>	<b>Build Rate (°/100ft)</b>	<b>Formations / Comments</b>	
0.0	0.00	0.00	0.0	0.0	0.0	0.0	0.00	0.00		
125.0	0.40	274.20	125.0	0.0	-0.4	0.1	0.32	0.32		
156.0	0.30	267.00	156.0	0.0	-0.6	0.2	0.35	-0.32		
187.0	0.30	294.30	187.0	0.1	-0.8	0.2	0.46	0.00		
217.0	0.20	290.70	217.0	0.1	-0.9	0.3	0.34	-0.33		
248.0	0.50	333.40	248.0	0.3	-1.0	0.5	1.22	0.97		
278.0	1.10	332.50	278.0	0.6	-1.2	0.9	2.00	2.00		
309.0	1.40	335.20	309.0	1.2	-1.5	1.5	0.99	0.97		
340.0	1.90	333.80	340.0	2.0	-1.9	2.4	1.62	1.61		
371.0	2.70	339.20	370.9	3.2	-2.4	3.6	2.67	2.58		
402.0	3.50	340.00	401.9	4.8	-3.0	5.3	2.58	2.58		
495.0	5.50	352.50	494.6	11.8	-4.5	12.6	2.38	2.15		

# Cathedral Energy Services

## Survey Report

<b>Company:</b>	EnCana Oil & Gas (USA) Inc	<b>Local Co-ordinate Reference:</b>	Well Federal 28-12BB
<b>Project:</b>	S. Piceance (Parachute)	<b>TVD Reference:</b>	WELL @ 7186.0ft (Original Well Elev)
<b>Site:</b>	PL 28 Pad (S28-T7S-R95W)	<b>MD Reference:</b>	WELL @ 7186.0ft (Original Well Elev)
<b>Well:</b>	Federal 28-12BB	<b>North Reference:</b>	True
<b>Wellbore:</b>	DD	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	DD	<b>Database:</b>	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
586.0	6.00	348.80	585.2	20.8	-6.0	21.6	0.68	0.55	
678.0	6.10	348.60	676.6	30.3	-7.9	31.3	0.11	0.11	
770.0	5.80	346.80	768.1	39.7	-9.9	40.9	0.38	-0.33	
862.0	5.60	349.00	859.7	48.6	-11.8	50.0	0.32	-0.22	
953.0	5.40	350.80	950.3	57.2	-13.4	58.7	0.29	-0.22	
1,045.0	5.50	348.10	1,041.9	65.8	-15.0	67.4	0.30	0.11	
1,136.0	5.80	344.20	1,132.4	74.5	-17.1	76.4	0.54	0.33	
1,200.0	5.80	344.70	1,196.1	80.7	-18.9	82.9	0.08	0.00	
1,353.0	5.01	350.95	1,348.4	94.7	-22.0	97.3	0.64	-0.52	
1,449.0	4.83	346.82	1,444.1	102.8	-23.5	105.5	0.41	-0.19	
1,544.0	5.71	353.24	1,538.7	111.4	-25.0	114.2	1.11	0.93	
1,640.0	5.32	353.24	1,634.2	120.6	-26.1	123.3	0.41	-0.41	
1,735.0	4.79	353.42	1,728.8	128.9	-27.1	131.7	0.56	-0.56	
1,830.0	5.23	345.86	1,823.5	137.0	-28.6	139.9	0.83	0.46	
1,926.0	5.27	349.72	1,919.1	145.6	-30.4	148.7	0.37	0.04	
2,021.0	4.70	348.41	2,013.7	153.7	-32.0	157.0	0.61	-0.60	
2,116.0	4.53	346.91	2,108.4	161.2	-33.6	164.6	0.22	-0.18	
2,211.0	4.39	348.23	2,203.1	168.4	-35.2	172.0	0.18	-0.15	
2,306.0	3.87	347.44	2,297.9	175.1	-36.7	178.8	0.55	-0.55	
2,402.0	4.88	349.11	2,393.6	182.2	-38.1	186.2	1.06	1.05	
2,497.0	5.14	350.43	2,488.2	190.4	-39.6	194.4	0.30	0.27	
2,592.0	4.48	355.70	2,582.9	198.3	-40.6	202.4	0.84	-0.69	
2,687.0	5.63	350.95	2,677.5	206.6	-41.6	210.7	1.29	1.21	
2,783.0	5.93	342.25	2,773.0	216.0	-43.8	220.3	0.96	0.31	
2,878.0	5.58	342.08	2,867.6	225.1	-46.8	229.8	0.37	-0.37	
2,973.0	5.58	342.69	2,962.1	233.9	-49.6	239.0	0.06	0.00	
3,069.0	5.58	351.75	3,057.7	242.9	-51.6	248.3	0.92	0.00	
3,164.0	5.23	354.03	3,152.2	251.8	-52.7	257.2	0.43	-0.37	
3,260.0	4.61	355.79	3,247.9	260.0	-53.5	265.4	0.66	-0.65	
3,355.0	4.66	354.73	3,342.6	267.7	-54.1	273.0	0.10	0.05	
3,449.0	4.88	350.43	3,436.2	275.4	-55.1	280.7	0.45	0.23	
3,545.0	4.66	352.10	3,531.9	283.3	-56.3	288.7	0.27	-0.23	
3,640.0	4.44	351.48	3,626.6	290.7	-57.4	296.2	0.24	-0.23	
3,735.0	4.22	353.15	3,721.3	297.9	-58.4	303.4	0.27	-0.23	
3,831.0	4.09	347.70	3,817.1	304.7	-59.5	310.3	0.43	-0.14	
3,927.0	4.97	343.40	3,912.8	312.0	-61.4	317.9	0.98	0.92	
4,022.0	4.70	341.11	4,007.4	319.7	-63.9	325.8	0.35	-0.28	
4,117.0	5.10	347.35	4,102.1	327.5	-66.1	333.9	0.70	0.42	
4,212.0	4.39	346.56	4,196.8	335.1	-67.8	341.8	0.75	-0.75	
4,308.0	4.44	346.91	4,292.5	342.3	-69.5	349.2	0.06	0.05	
4,403.0	5.05	343.04	4,387.2	349.9	-71.6	357.0	0.72	0.64	
4,499.0	5.27	348.32	4,482.8	358.3	-73.7	365.7	0.54	0.23	
4,594.0	5.54	347.97	4,577.4	367.0	-75.5	374.6	0.29	0.28	
4,690.0	5.01	347.53	4,672.9	375.6	-77.4	383.4	0.55	-0.55	
4,785.0	4.75	349.11	4,767.6	383.6	-79.1	391.5	0.31	-0.27	
4,880.0	4.09	350.69	4,862.3	390.8	-80.3	398.8	0.71	-0.69	
4,975.0	3.96	358.34	4,957.1	397.4	-81.0	405.4	0.58	-0.14	
5,071.0	3.91	0.62	5,052.9	404.0	-81.0	411.9	0.17	-0.05	
5,167.0	3.69	1.76	5,148.6	410.3	-80.9	418.0	0.24	-0.23	
5,262.0	2.94	352.26	5,243.5	415.8	-81.2	423.4	0.98	-0.79	
5,358.0	2.42	348.93	5,339.4	420.2	-81.9	427.9	0.57	-0.54	
5,453.0	2.20	345.42	5,434.3	424.0	-82.7	431.7	0.28	-0.23	
5,548.0	1.85	348.05	5,529.2	427.2	-83.5	435.1	0.38	-0.37	

# Cathedral Energy Services

## Survey Report

<b>Company:</b>	EnCana Oil & Gas (USA) Inc	<b>Local Co-ordinate Reference:</b>	Well Federal 28-12BB
<b>Project:</b>	S. Piceance (Parachute)	<b>TVD Reference:</b>	WELL @ 7186.0ft (Original Well Elev)
<b>Site:</b>	PL 28 Pad (S28-T7S-R95W)	<b>MD Reference:</b>	WELL @ 7186.0ft (Original Well Elev)
<b>Well:</b>	Federal 28-12BB	<b>North Reference:</b>	True
<b>Wellbore:</b>	DD	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	DD	<b>Database:</b>	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
5,644.0	1.67	326.26	5,625.2	429.9	-84.6	437.9	0.72	-0.19	
5,740.0	1.32	312.02	5,721.2	431.8	-86.2	440.1	0.53	-0.36	
5,833.0	1.10	295.76	5,814.2	432.9	-87.8	441.6	0.44	-0.24	
5,929.0	1.14	258.93	5,910.1	433.1	-89.6	442.2	0.74	0.04	
6,024.0	0.44	263.68	6,005.1	432.9	-90.8	442.3	0.74	-0.74	
6,120.0	0.62	204.00	6,101.1	432.4	-91.4	441.9	0.57	0.19	
6,215.0	0.97	213.93	6,196.1	431.3	-92.1	440.9	0.39	0.37	
6,310.0	0.79	240.91	6,291.1	430.3	-93.1	440.2	0.47	-0.19	
6,406.0	0.31	68.21	6,387.1	430.0	-93.4	440.0	1.14	-0.50	
6,500.0	0.09	302.61	6,481.1	430.2	-93.3	440.1	0.39	-0.23	
6,595.0	0.62	212.17	6,576.1	429.8	-93.6	439.8	0.66	0.56	
6,691.0	0.70	228.79	6,672.1	429.0	-94.3	439.2	0.22	0.08	
6,786.0	1.14	216.48	6,767.1	427.8	-95.3	438.3	0.51	0.46	
6,882.0	1.93	204.00	6,863.0	425.6	-96.5	436.4	0.89	0.82	
6,978.0	2.20	209.54	6,959.0	422.5	-98.1	433.7	0.35	0.28	
7,040.0	2.20	220.70	7,020.9	420.6	-99.5	432.1	0.69	0.00	
7,073.0	1.71	219.56	7,053.9	419.7	-100.2	431.5	1.49	-1.48	
7,168.0	0.40	195.44	7,148.9	418.3	-101.2	430.3	1.43	-1.38	
7,263.0	0.62	141.86	7,243.9	417.6	-101.0	429.6	0.53	0.23	
7,359.0	0.75	160.14	7,339.9	416.6	-100.4	428.5	0.26	0.14	
7,454.0	0.79	129.82	7,434.9	415.6	-99.7	427.3	0.43	0.04	
7,550.0	0.22	165.15	7,530.9	415.0	-99.2	426.6	0.65	-0.59	
7,645.0	0.66	204.26	7,625.9	414.3	-99.3	426.0	0.54	0.46	
7,740.0	0.83	215.95	7,720.9	413.2	-100.0	425.1	0.24	0.18	
7,836.0	1.19	206.99	7,816.8	411.8	-100.8	423.9	0.41	0.37	
7,930.0	1.05	207.34	7,910.8	410.1	-101.7	422.5	0.15	-0.15	Last Cathedral Survey @ 7,930' MD
7,980.0	1.05	207.34	7,960.8	409.3	-102.1	421.8	0.00	0.00	Projection to Bit @ 7,980' MD

Targets									
Target Name	- hit/miss target	Dip Angle (°)	Dip Dir. (°)	TVD (ft)	+N/-S (ft)	+E/-W (ft)	Northing (ft)	Easting (ft)	
- Shape									Latitude Longitude
Federal 28-12BB TOG		0.00	0.00	5,380.0	413.8	-95.2	1,583,317.67	2,291,087.38	39.408080 -108.009290
- actual wellpath misses target center by 15.3ft at 5398.4ft MD (5379.8 TVD, 421.9 N, -82.2 E)									
- Point									
Federal 28-12BB BHL		0.00	0.00	7,939.0	413.8	-95.2	1,583,317.67	2,291,087.38	39.408080 -108.009290
- actual wellpath misses target center by 7.8ft at 7958.1ft MD (7938.9 TVD, 409.7 N, -101.9 E)									
- Circle (radius 25.0)									

Design Annotations					
Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates			
		+N/-S (ft)	+E/-W (ft)	Comment	
7,930.0	7,910.8	410.1	-101.7	Last Cathedral Survey @ 7,930' MD	
7,980.0	7,960.8	409.3	-102.1	Projection to Bit @ 7,980' MD	

Checked By: \_\_\_\_\_ Approved By: \_\_\_\_\_ Date: \_\_\_\_\_