

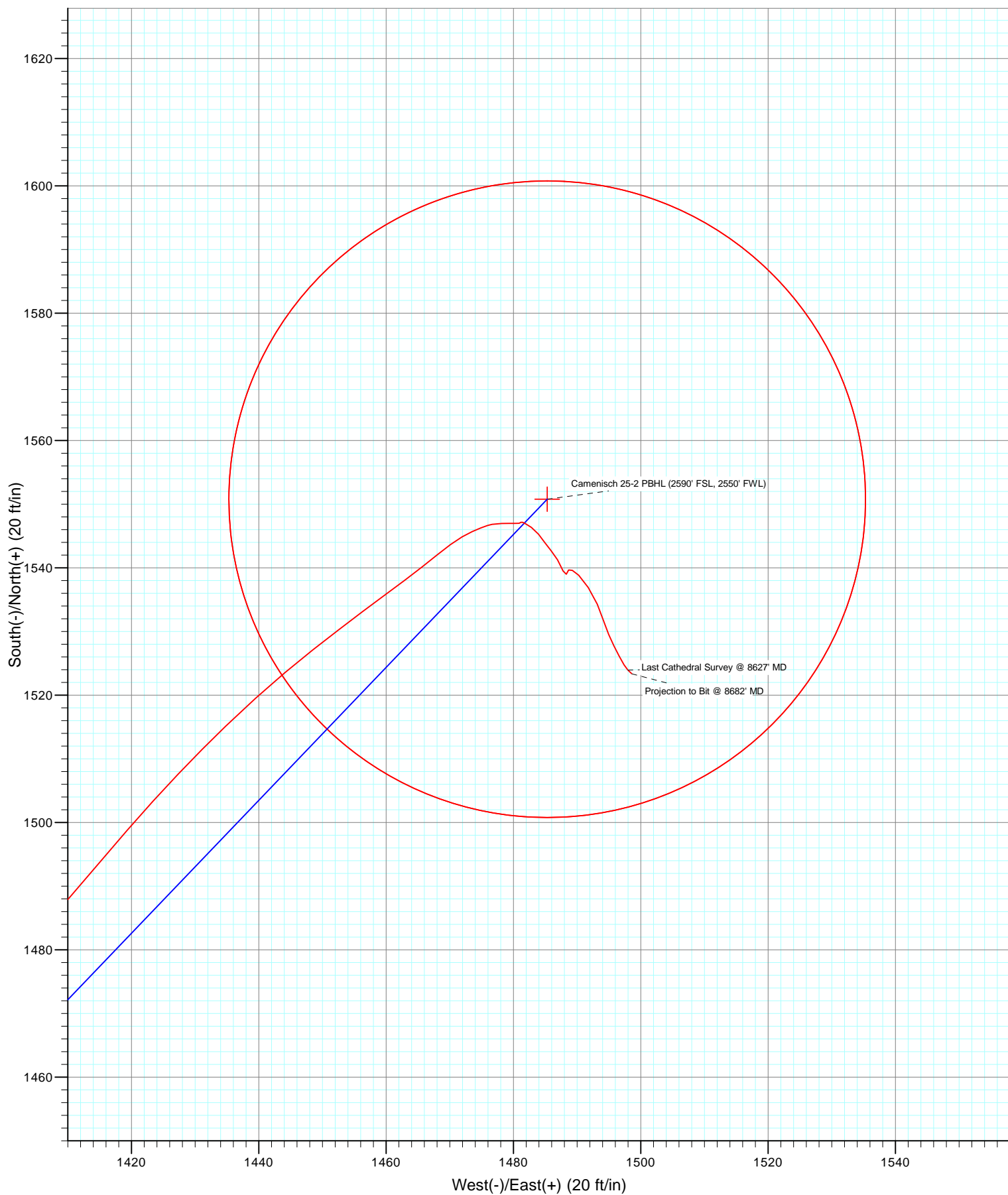
#### DESIGN TARGET DETAILS

No target data is available.



Azimuths to True North  
Magnetic North: 8.71°

Magnetic Field  
Strength: 52805.7nT  
Dip Angle: 66.73°  
Date: 10/22/2012  
Model: IGRF2010



# Cathedral Energy Services

## Survey Report

<b>Company:</b>	Anadarko Petroleum Corporation	<b>Local Co-ordinate Reference:</b>	Well Camenisch 25-2
<b>Project:</b>	DJ Wattenberg	<b>TVD Reference:</b>	WELL @ 5046.0ft (Xtreme)
<b>Site:</b>	S2-T1N-R67W (Camenisch 19-2-9F)	<b>MD Reference:</b>	WELL @ 5046.0ft (Xtreme)
<b>Well:</b>	Camenisch 25-2	<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>	DJ Wattenberg		
<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 Northern Zone		

Site		S2-T1N-R67W (Camenisch 19-2-9F)			
Site Position:		Northing:	1,271,017.29 ft	Latitude:	40.075572
From:	Lat/Long	Easting:	3,178,075.18 ft	Longitude:	-104.863678
Position Uncertainty:	0.0 ft	Slot Radius:	13.200 in	Grid Convergence:	0.41 °

Well		Camenisch 25-2				
Well Position	+N/-S	0.0 ft	Northing:	1,271,032.22 ft	Latitude:	40.075613
	+E/-W	0.0 ft	Easting:	3,178,075.07 ft	Longitude:	-104.863678
Position Uncertainty		0.0 ft	Wellhead Elevation:	ft	Ground Level:	5,031.0 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>
	IGRF2010	10/22/2012	8.71	66.73	52,806

<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 (ft)</b>	<b>+E/-W (ft)</b>	<b>Direction (°)</b>	
	0.0	0.0	0.0	43.76	

<b>Survey Program</b>	<b>Date</b>	10/27/2012			
<b>From (ft)</b>	<b>To (ft)</b>	<b>Survey (Wellbore)</b>	<b>Tool Name</b>	<b>Description</b>	
135.0	8,682.0	Survey #1 (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		
135.0	0.40	198.00	135.0	-0.4	-0.1	-0.4	0.30	0.30		
194.0	0.20	70.40	194.0	-0.6	-0.1	-0.5	0.92	-0.34		
282.0	2.20	29.60	282.0	0.9	0.9	1.3	2.33	2.27		
369.0	4.00	31.10	368.8	5.0	3.3	5.8	2.07	2.07		
461.0	5.20	35.00	460.5	11.1	7.3	13.1	1.35	1.30		
551.0	6.50	40.20	550.1	18.4	12.9	22.2	1.56	1.44		
641.0	8.00	43.40	639.4	26.8	20.5	33.6	1.73	1.67		
731.0	9.80	43.50	728.3	36.9	30.1	47.5	2.00	2.00		
821.0	11.50	41.90	816.7	49.1	41.4	64.1	1.92	1.89		
884.0	11.40	40.40	878.5	58.6	49.6	76.6	0.50	-0.16		
945.0	10.90	37.10	938.3	67.7	57.0	88.3	1.33	-0.82		
1,036.0	11.30	53.50	1,027.6	79.9	69.3	105.7	3.49	0.44		

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<b>Site:</b>	S2-T1N-R67W (Camenisch 19-2-9F)	<b>MD Reference:</b>	WELL @ 5046.0ft (Xtreme)
<b>Well:</b>	Camenisch 25-2	<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
1,127.0	12.80	56.90	1,116.6	90.7	85.0	124.3	1.82	1.65	
1,218.0	17.00	51.20	1,204.5	104.6	103.8	147.3	4.88	4.62	
1,308.0	19.30	42.10	1,290.1	123.9	124.0	175.2	4.05	2.56	
1,399.0	20.30	46.20	1,375.7	145.9	145.5	206.0	1.88	1.10	
1,490.0	22.80	45.10	1,460.3	169.3	169.4	239.4	2.78	2.75	
1,581.0	24.60	39.10	1,543.7	196.5	193.8	275.9	3.30	1.98	
1,671.0	26.40	41.10	1,624.9	226.1	218.8	314.6	2.22	2.00	
1,762.0	26.60	41.50	1,706.3	256.6	245.6	355.2	0.29	0.22	
1,853.0	25.50	40.20	1,788.1	286.8	271.7	395.1	1.36	-1.21	
1,943.0	25.80	43.00	1,869.2	315.9	297.6	434.0	1.39	0.33	
2,034.0	24.50	40.40	1,951.6	344.8	323.3	472.6	1.87	-1.43	
2,125.0	23.70	44.80	2,034.7	372.1	348.4	509.8	2.16	-0.88	
2,215.0	24.50	44.10	2,116.8	398.4	374.2	546.5	0.94	0.89	
2,306.0	24.80	47.30	2,199.5	424.9	401.3	584.4	1.50	0.33	
2,397.0	26.20	47.60	2,281.7	451.4	430.2	623.5	1.54	1.54	
2,488.0	24.20	45.70	2,364.0	477.9	458.4	662.2	2.37	-2.20	
2,578.0	24.70	45.50	2,445.9	504.0	485.0	699.5	0.56	0.56	
2,669.0	24.90	44.70	2,528.6	530.9	512.0	737.6	0.43	0.22	
2,760.0	26.80	43.30	2,610.4	559.5	539.6	777.3	2.19	2.09	
2,850.0	25.00	40.80	2,691.4	588.7	565.9	816.6	2.34	-2.00	
2,941.0	25.40	45.00	2,773.7	617.0	592.3	855.3	2.01	0.44	
3,032.0	26.10	44.00	2,855.7	645.2	620.0	894.8	0.91	0.77	
3,123.0	25.80	43.20	2,937.5	674.1	647.5	934.6	0.51	-0.33	
3,213.0	25.40	42.90	3,018.7	702.5	674.0	973.5	0.47	-0.44	
3,304.0	25.80	44.30	3,100.8	730.9	701.1	1,012.8	0.80	0.44	
3,395.0	26.40	45.50	3,182.5	759.3	729.4	1,052.9	0.88	0.66	
3,486.0	24.90	44.00	3,264.5	787.3	757.1	1,092.2	1.80	-1.65	
3,577.0	24.30	45.00	3,347.3	814.3	783.7	1,130.1	0.80	-0.66	
3,667.0	24.60	41.80	3,429.2	841.3	809.3	1,167.4	1.51	0.33	
3,758.0	23.90	42.70	3,512.2	869.0	834.4	1,204.7	0.87	-0.77	
3,849.0	25.30	43.00	3,594.9	896.8	860.1	1,242.6	1.54	1.54	
3,939.0	24.60	43.20	3,676.5	924.5	886.1	1,280.6	0.78	-0.78	
4,030.0	25.20	45.20	3,759.0	952.0	912.8	1,318.9	1.14	0.66	
4,121.0	25.80	43.50	3,841.2	980.0	940.2	1,358.0	1.04	0.66	
4,212.0	26.00	45.20	3,923.0	1,008.4	968.0	1,397.8	0.85	0.22	
4,302.0	25.40	44.40	4,004.1	1,036.1	995.5	1,436.8	0.77	-0.67	
4,393.0	26.50	41.80	4,086.0	1,065.2	1,022.6	1,476.6	1.74	1.21	
4,484.0	27.30	40.00	4,167.1	1,096.3	1,049.6	1,517.7	1.25	0.88	
4,574.0	26.80	41.60	4,247.3	1,127.3	1,076.3	1,558.6	0.98	-0.56	
4,665.0	27.60	41.30	4,328.2	1,158.4	1,103.9	1,600.2	0.89	0.88	
4,756.0	28.00	43.10	4,408.7	1,189.9	1,132.4	1,642.6	1.02	0.44	
4,846.0	25.60	41.40	4,489.0	1,219.9	1,159.7	1,683.1	2.80	-2.67	
4,937.0	24.10	45.00	4,571.6	1,247.8	1,185.8	1,721.4	2.34	-1.65	
5,027.0	24.70	44.10	4,653.6	1,274.3	1,211.9	1,758.5	0.78	0.67	
5,118.0	25.10	42.80	4,736.1	1,302.1	1,238.2	1,796.8	0.74	0.44	
5,209.0	25.40	44.60	4,818.4	1,330.2	1,265.1	1,835.7	0.91	0.33	
5,299.0	24.30	44.80	4,900.1	1,357.0	1,291.7	1,873.5	1.23	-1.22	
5,390.0	23.10	43.10	4,983.4	1,383.4	1,317.1	1,910.0	1.52	-1.32	
5,481.0	20.50	39.90	5,067.9	1,408.6	1,339.5	1,943.8	3.14	-2.86	
5,572.0	20.40	42.20	5,153.2	1,432.6	1,360.4	1,975.6	0.89	-0.11	
5,662.0	20.40	43.00	5,237.5	1,455.7	1,381.6	2,006.9	0.31	0.00	
5,753.0	18.40	40.30	5,323.4	1,478.2	1,401.7	2,037.1	2.41	-2.20	
5,844.0	16.20	41.10	5,410.2	1,498.8	1,419.3	2,064.1	2.43	-2.42	

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<b>Well:</b>	Camenisch 25-2	<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
5,934.0	12.80	46.30	5,497.4	1,515.1	1,434.8	2,086.6	4.04	-3.78	
6,025.0	10.30	51.90	5,586.5	1,527.1	1,448.5	2,104.8	3.01	-2.75	
6,116.0	7.70	53.80	5,676.4	1,535.7	1,459.8	2,118.8	2.88	-2.86	
6,207.0	5.40	50.60	5,766.8	1,542.0	1,468.0	2,129.1	2.56	-2.53	
6,297.0	3.10	66.50	5,856.5	1,545.7	1,473.5	2,135.5	2.85	-2.56	
6,388.0	1.10	80.60	5,947.5	1,546.8	1,476.7	2,138.5	2.25	-2.20	
6,479.0	0.80	90.40	6,038.5	1,547.0	1,478.2	2,139.6	0.37	-0.33	
6,570.0	0.70	86.50	6,129.4	1,547.0	1,479.4	2,140.5	0.12	-0.11	
6,660.0	0.50	95.90	6,219.4	1,547.0	1,480.3	2,141.1	0.25	-0.22	
6,751.0	0.30	73.60	6,310.4	1,547.0	1,480.9	2,141.6	0.27	-0.22	
6,841.0	0.10	38.90	6,400.4	1,547.1	1,481.2	2,141.9	0.25	-0.22	
6,932.0	0.30	103.50	6,491.4	1,547.1	1,481.5	2,142.1	0.30	0.22	
7,023.0	0.40	127.40	6,582.4	1,546.9	1,482.0	2,142.2	0.19	0.11	
7,114.0	0.90	120.00	6,673.4	1,546.4	1,482.8	2,142.4	0.56	0.55	
7,205.0	1.10	144.10	6,764.4	1,545.3	1,484.0	2,142.4	0.51	0.22	
7,296.0	1.00	143.40	6,855.4	1,543.9	1,484.9	2,142.1	0.11	-0.11	
7,387.0	1.00	140.60	6,946.4	1,542.7	1,485.9	2,141.9	0.05	0.00	
7,478.0	1.20	148.30	7,037.4	1,541.3	1,486.9	2,141.6	0.27	0.22	
7,568.0	1.30	158.20	7,127.3	1,539.5	1,487.8	2,140.9	0.26	0.11	
7,659.0	0.60	15.40	7,218.3	1,539.0	1,488.3	2,140.9	1.99	-0.77	
7,750.0	0.40	54.60	7,309.3	1,539.7	1,488.7	2,141.7	0.42	-0.22	
7,840.0	0.50	124.50	7,399.3	1,539.6	1,489.3	2,142.0	0.58	0.11	
7,931.0	1.10	130.40	7,490.3	1,538.8	1,490.3	2,142.1	0.66	0.66	
8,022.0	2.00	148.10	7,581.3	1,536.9	1,491.8	2,141.8	1.11	0.99	
8,112.0	1.80	155.50	7,671.2	1,534.3	1,493.2	2,140.9	0.35	-0.22	
8,203.0	1.60	163.70	7,762.2	1,531.8	1,494.1	2,139.7	0.35	-0.22	
8,294.0	1.40	154.80	7,853.2	1,529.5	1,495.0	2,138.7	0.34	-0.22	
8,384.0	1.10	156.50	7,943.2	1,527.8	1,495.8	2,138.0	0.34	-0.33	
8,475.0	1.10	148.80	8,034.1	1,526.2	1,496.6	2,137.4	0.16	0.00	
8,566.0	1.00	152.60	8,125.1	1,524.8	1,497.4	2,136.9	0.13	-0.11	
8,627.0	0.90	133.90	8,186.1	1,524.0	1,498.0	2,136.7	0.53	-0.16	
8,682.0	0.90	133.90	8,241.1	1,523.4	1,498.6	2,136.7	0.00	0.00	

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									
Camenisch 25-2 PBHL (	0.00	0.00	8,201.0	1,550.8	1,485.3	1,272,593.62	3,179,549.22	40.079870	-104.858370
- survey misses target center by 33.2ft at 8627.0ft MD (8186.1 TVD, 1524.0 N, 1498.0 E)									
- Circle (radius 50.0)									

Survey Annotations					
Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates			
		+N/-S (ft)	+E/-W (ft)	Comment	
8,627.0	8,186.1	1,524.0	1,498.0	Last Cathedral Survey @ 8627' MD	
8,682.0	8,241.1	1,523.4	1,498.6	Projection to Bit @ 8682' MD	

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