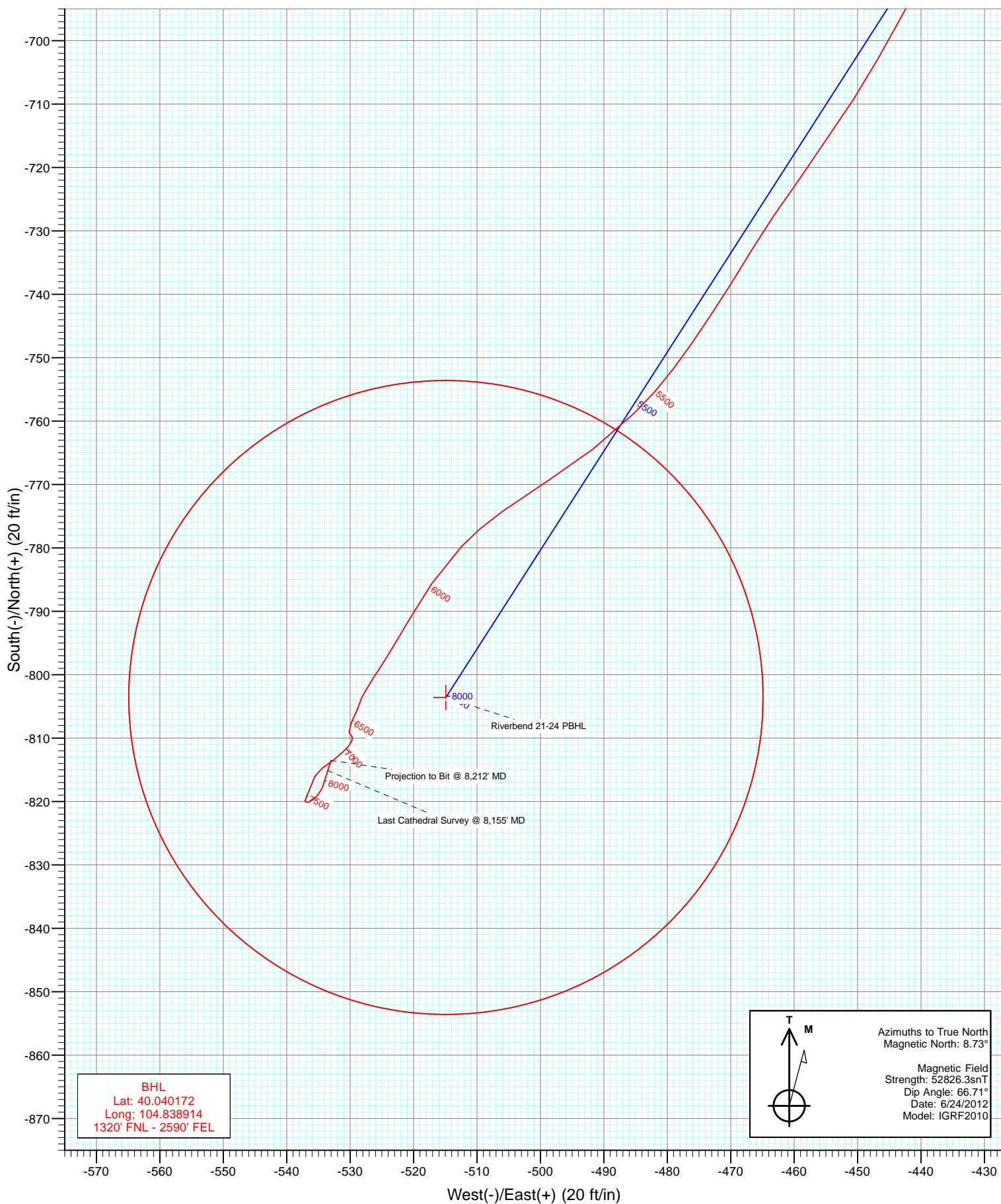


Type	Target	Target	Azimuth	Origin Type	N/S	E/W	From TVD
Target	Riverbend 21-24 PBHL	212.65	Slot	0.0	0.0	-4940.0	
Name	Riverbend 21-24 PBHL	TVD	+N/-S	+E/-W	Latitude	Longitude	
		8080.0	-803.6	-514.9	40.040172	-104.838914	

DD  
Riverbend 21-24  
125412; 176355; DN  
Mean Sea Level  
North American Datum 1983  
Well Riverbend 21-24, True North



# Cathedral Energy Services

## Survey Report

<b>Company:</b>	Anadarko Petroleum Corporation	<b>Local Co-ordinate Reference:</b>	Well Riverbend 21-24
<b>Project:</b>	DJ Wattenberg	<b>TVD Reference:</b>	Mean Sea Level
<b>Site:</b>	NWNE Sec24-T1N-R67W (Riverbend 2-24)	<b>MD Reference:</b>	KB=15' @ 4940.0ft (Xtreme 11)
<b>Well:</b>	Riverbend 21-24	<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		NWNE Sec24-T1N-R67W (Riverbend 2-24)			
Site Position:		Northing:	1,258,980.36 ft	Latitude:	40.042378
From:	Lat/Long	Easting:	3,185,610.05 ft	Longitude:	-104.837075
Position Uncertainty:	0.0 ft	Slot Radius:	13.200 in	Grid Convergence:	0.43 °

Well		Riverbend 21-24				
Well Position	+N/-S	0.0 ft	Northing:	1,258,980.35 ft	Latitude:	40.042378
	+E/-W	0.0 ft	Easting:	3,185,610.05 ft	Longitude:	-104.837075
Position Uncertainty		0.0 ft	Wellhead Elevation:	ft	Ground Level:	4,925.0 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	6/24/2012	8.73	66.71	52,826

<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) (ft)</b>	<b>+N/-S (ft)</b>	<b>+E/-W (ft)</b>	<b>Direction (°)</b>	
	-4,940.0	0.0	0.0	212.65	

<b>Survey Program</b>	<b>Date</b>	7/16/2012			
<b>From (ft)</b>	<b>To (ft)</b>	<b>Survey (Wellbore)</b>	<b>Tool Name</b>	<b>Description</b>	
109.0	8,212.0	Survey #1 (DD)	MWD	Geolink MWD	

<b>Survey</b>									
<b>Measured Depth (ft)</b>	<b>Inclination (°)</b>	<b>Azimuth (°)</b>	<b>TVD Below System (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	
109.0	0.90	274.40	109.0	0.1	-0.9	0.4	0.83	0.83	
171.0	0.80	284.30	171.0	0.2	-1.8	0.8	0.29	-0.16	
264.0	1.00	268.60	264.0	0.4	-3.2	1.4	0.34	0.22	
358.0	1.90	226.40	357.9	-0.7	-5.1	3.4	1.43	0.96	
448.0	2.70	216.80	447.9	-3.5	-7.5	7.0	0.98	0.89	
535.0	3.50	206.20	534.7	-7.5	-9.9	11.6	1.13	0.92	
625.0	4.30	190.50	624.5	-13.3	-11.7	17.5	1.47	0.89	
713.0	5.80	180.80	712.2	-21.0	-12.4	24.3	1.96	1.70	
800.0	7.60	182.30	798.6	-31.1	-12.7	33.0	2.08	2.07	
887.0	8.60	186.40	884.7	-43.3	-13.6	43.8	1.33	1.15	
925.0	8.90	189.30	922.3	-49.0	-14.4	49.1	1.40	0.79	
1,035.0	8.40	195.10	1,031.0	-65.2	-17.9	64.6	0.91	-0.45	

# Cathedral Energy Services

## Survey Report

<b>Company:</b>	Anadarko Petroleum Corporation	<b>Local Co-ordinate Reference:</b>	Well Riverbend 21-24
<b>Project:</b>	DJ Wattenberg	<b>TVD Reference:</b>	Mean Sea Level
<b>Site:</b>	NWNE Sec24-T1N-R67W (Riverbend 2-24)	<b>MD Reference:</b>	KB=15' @ 4940.0ft (Xtreme 11)
<b>Well:</b>	Riverbend 21-24	<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 (°)	TVD Below System (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Formations / Comments
1,123.0	9.20	205.20	1,118.0	-77.8	-22.6	77.7	1.97	0.91	
1,211.0	10.50	218.20	1,204.7	-90.4	-30.5	92.6	2.92	1.48	
1,299.0	11.80	220.50	1,291.1	-103.6	-41.3	109.5	1.56	1.48	
1,387.0	13.30	226.20	1,377.0	-117.4	-54.5	128.3	2.21	1.70	
1,475.0	15.30	227.60	1,462.2	-132.3	-70.4	149.3	2.31	2.27	
1,563.0	15.20	229.20	1,547.1	-147.6	-87.7	171.6	0.49	-0.11	
1,652.0	16.10	226.00	1,632.8	-163.8	-105.4	194.8	1.40	1.01	
1,741.0	15.70	221.00	1,718.4	-181.5	-122.2	218.7	1.60	-0.45	
1,831.0	14.00	218.40	1,805.4	-199.2	-136.9	241.6	2.03	-1.89	
1,919.0	14.20	215.70	1,890.8	-216.3	-149.8	263.0	0.78	0.23	
2,008.0	13.10	214.00	1,977.3	-233.6	-161.8	284.0	1.32	-1.24	
2,096.0	12.20	212.40	2,063.1	-249.7	-172.4	303.2	1.10	-1.02	
2,185.0	11.30	212.50	2,150.3	-265.0	-182.1	321.3	1.01	-1.01	
2,272.0	10.20	212.90	2,235.7	-278.6	-190.9	337.6	1.27	-1.26	
2,359.0	10.80	216.10	2,321.3	-291.7	-199.9	353.4	0.96	0.69	
2,447.0	9.90	210.50	2,407.8	-304.9	-208.6	369.2	1.53	-1.02	
2,534.0	10.80	213.70	2,493.4	-318.1	-216.9	384.8	1.23	1.03	
2,622.0	10.90	207.30	2,579.9	-332.3	-225.3	401.4	1.37	0.11	
2,711.0	11.80	208.00	2,667.1	-347.9	-233.4	418.8	1.02	1.01	
2,801.0	10.60	209.20	2,755.4	-363.2	-241.8	436.2	1.36	-1.33	
2,890.0	9.90	207.20	2,843.0	-377.2	-249.2	452.0	0.88	-0.79	
2,978.0	11.00	208.60	2,929.5	-391.3	-256.7	467.9	1.28	1.25	
3,066.0	10.20	206.70	3,016.0	-405.6	-264.2	484.1	0.99	-0.91	
3,154.0	9.00	205.30	3,102.8	-418.8	-270.7	498.6	1.39	-1.36	
3,244.0	7.80	208.70	3,191.8	-430.5	-276.6	511.7	1.44	-1.33	
3,254.2	7.84	210.25	3,202.0	-431.7	-277.3	513.1	2.09	0.37	Riverbend 21-24 PBHL
3,332.0	8.30	221.40	3,279.0	-440.5	-283.7	523.9	2.09	0.59	
3,420.0	7.40	215.10	3,366.1	-449.9	-291.2	535.9	1.41	-1.02	
3,509.0	7.80	222.50	3,454.3	-459.0	-298.5	547.6	1.19	0.45	
3,599.0	9.00	220.40	3,543.4	-468.9	-307.2	560.6	1.38	1.33	
3,688.0	10.50	216.70	3,631.1	-480.7	-316.6	575.5	1.83	1.69	
3,775.0	10.60	218.10	3,716.6	-493.4	-326.3	591.4	0.32	0.11	
3,864.0	11.60	212.80	3,804.0	-507.3	-336.2	608.5	1.60	1.12	
3,954.0	10.40	212.20	3,892.3	-521.8	-345.4	625.7	1.34	-1.33	
4,042.0	10.20	212.90	3,978.9	-535.1	-353.9	641.4	0.27	-0.23	
4,129.0	10.20	207.70	4,064.5	-548.4	-361.6	656.8	1.06	0.00	
4,216.0	10.80	212.30	4,150.1	-562.1	-369.6	672.6	1.18	0.69	
4,305.0	10.90	208.00	4,237.5	-576.5	-378.0	689.4	0.92	0.11	
4,395.0	10.10	207.80	4,326.0	-591.0	-385.6	705.7	0.89	-0.89	
4,483.0	9.00	212.40	4,412.7	-603.7	-392.9	720.3	1.52	-1.25	
4,571.0	8.10	212.20	4,499.8	-614.7	-399.9	733.4	1.02	-1.02	
4,659.0	9.60	208.40	4,586.7	-626.4	-406.7	746.9	1.83	1.70	
4,749.0	11.20	207.80	4,675.2	-640.8	-414.4	763.1	1.78	1.78	
4,836.0	11.20	205.70	4,760.6	-655.9	-422.0	779.9	0.47	0.00	
4,925.0	10.30	207.20	4,848.0	-670.7	-429.3	796.4	1.06	-1.01	
5,014.0	9.40	209.20	4,935.7	-684.1	-436.5	811.5	1.08	-1.01	
5,102.0	9.10	208.00	5,022.6	-696.6	-443.3	825.7	0.41	-0.34	
5,191.0	9.90	212.10	5,110.3	-709.3	-450.7	840.3	1.18	0.90	
5,280.0	9.50	216.10	5,198.1	-721.7	-459.1	855.3	0.88	-0.45	
5,368.0	8.40	211.30	5,285.0	-733.0	-466.7	869.0	1.51	-1.25	
5,456.0	7.30	213.20	5,372.2	-743.2	-473.1	881.0	1.28	-1.25	
5,544.0	6.40	216.90	5,459.5	-751.8	-479.1	891.5	1.14	-1.02	
5,632.0	5.90	226.60	5,547.0	-758.8	-485.3	900.8	1.31	-0.57	

# Cathedral Energy Services

## Survey Report

<b>Company:</b>	Anadarko Petroleum Corporation	<b>Local Co-ordinate Reference:</b>	Well Riverbend 21-24
<b>Project:</b>	DJ Wattenberg	<b>TVD Reference:</b>	Mean Sea Level
<b>Site:</b>	NWNE Sec24-T1N-R67W (Riverbend 2-24)	<b>MD Reference:</b>	KB=15' @ 4940.0ft (Xtreme 11)
<b>Well:</b>	Riverbend 21-24	<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 (°)	TVD Below System (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Formations / Comments
5,721.0	5.10	231.80	5,635.6	-764.4	-491.8	908.9	1.06	-0.90	
5,811.0	5.60	237.70	5,725.2	-769.2	-498.6	916.7	0.83	0.56	
5,900.0	6.00	234.40	5,813.8	-774.3	-506.1	924.9	0.58	0.45	
5,989.0	4.90	223.10	5,902.4	-779.8	-512.4	933.0	1.72	-1.24	
6,079.0	4.70	214.00	5,992.1	-785.6	-517.1	940.5	0.87	-0.22	
6,166.0	4.10	209.90	6,078.8	-791.3	-520.7	947.1	0.78	-0.69	
6,255.0	3.80	211.60	6,167.6	-796.5	-523.8	953.3	0.36	-0.34	
6,343.0	2.60	214.60	6,255.5	-800.7	-526.5	958.2	1.38	-1.36	
6,430.0	1.70	203.80	6,342.4	-803.5	-528.1	961.4	1.13	-1.03	
6,518.0	1.30	197.00	6,430.4	-805.6	-528.9	963.7	0.50	-0.45	
6,607.0	1.60	212.10	6,519.3	-807.6	-529.9	965.9	0.54	0.34	
6,695.0	0.70	138.20	6,607.3	-809.1	-530.2	967.3	1.77	-1.02	
6,783.0	0.50	157.50	6,695.3	-809.8	-529.7	967.6	0.32	-0.23	
6,872.0	0.30	232.30	6,784.3	-810.3	-529.7	968.1	0.57	-0.22	
6,961.0	0.40	192.20	6,873.3	-810.8	-530.0	968.6	0.29	0.11	
7,047.0	0.50	227.70	6,959.3	-811.3	-530.3	969.2	0.34	0.12	
7,135.0	1.20	224.40	7,047.3	-812.3	-531.2	970.5	0.80	0.80	
7,222.0	1.30	234.30	7,134.3	-813.5	-532.7	972.3	0.27	0.11	
7,311.0	1.40	234.30	7,223.3	-814.7	-534.4	974.3	0.11	0.11	
7,401.0	0.90	204.10	7,313.2	-816.0	-535.5	976.0	0.85	-0.56	
7,489.0	1.10	199.90	7,401.2	-817.4	-536.1	977.5	0.24	0.23	
7,577.0	1.00	207.30	7,489.2	-818.9	-536.8	979.1	0.19	-0.11	
7,666.0	0.50	181.50	7,578.2	-820.0	-537.1	980.2	0.66	-0.56	
7,755.0	0.70	65.20	7,667.2	-820.1	-536.6	980.1	1.15	0.22	
7,843.0	0.50	57.40	7,755.2	-819.7	-535.8	979.3	0.24	-0.23	
7,932.0	0.90	38.50	7,844.2	-818.9	-535.1	978.2	0.51	0.45	
8,019.0	0.80	23.60	7,931.2	-817.8	-534.4	976.9	0.28	-0.11	
8,105.0	1.30	14.60	8,017.2	-816.4	-533.9	975.4	0.61	0.58	
8,155.0	1.70	18.90	8,067.1	-815.1	-533.5	974.1	0.83	0.80	Last Cathedral Survey @ 8,155' MD
8,212.0	1.70	18.90	8,124.1	-813.5	-533.0	972.5	0.00	0.00	Projection to Bit @ 8,212' MD

Targets									
Target Name	Dip Angle (°)	Dip Dir. (°)	TVD (ft)	+N/-S (ft)	+E/-W (ft)	Northing (ft)	Easting (ft)	Latitude	Longitude
Riverbend 21-24 PBHL	0.00	0.00	3,140.0	-803.6	-514.9	1,258,172.95	3,185,101.18	40.040172	-104.838914
- actual wellpath misses target center by 445.6ft at 3252.8ft MD (3200.5 TVD, -431.5 N, -277.2 E)									
- Circle (radius 50.0)									

Design Annotations					
Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment	
		+N/-S (ft)	+E/-W (ft)		
8,155.0	8,067.1	-815.1	-533.5	Last Cathedral Survey @ 8,155' MD	
8,212.0	8,124.1	-813.5	-533.0	Projection to Bit @ 8,212' MD	

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