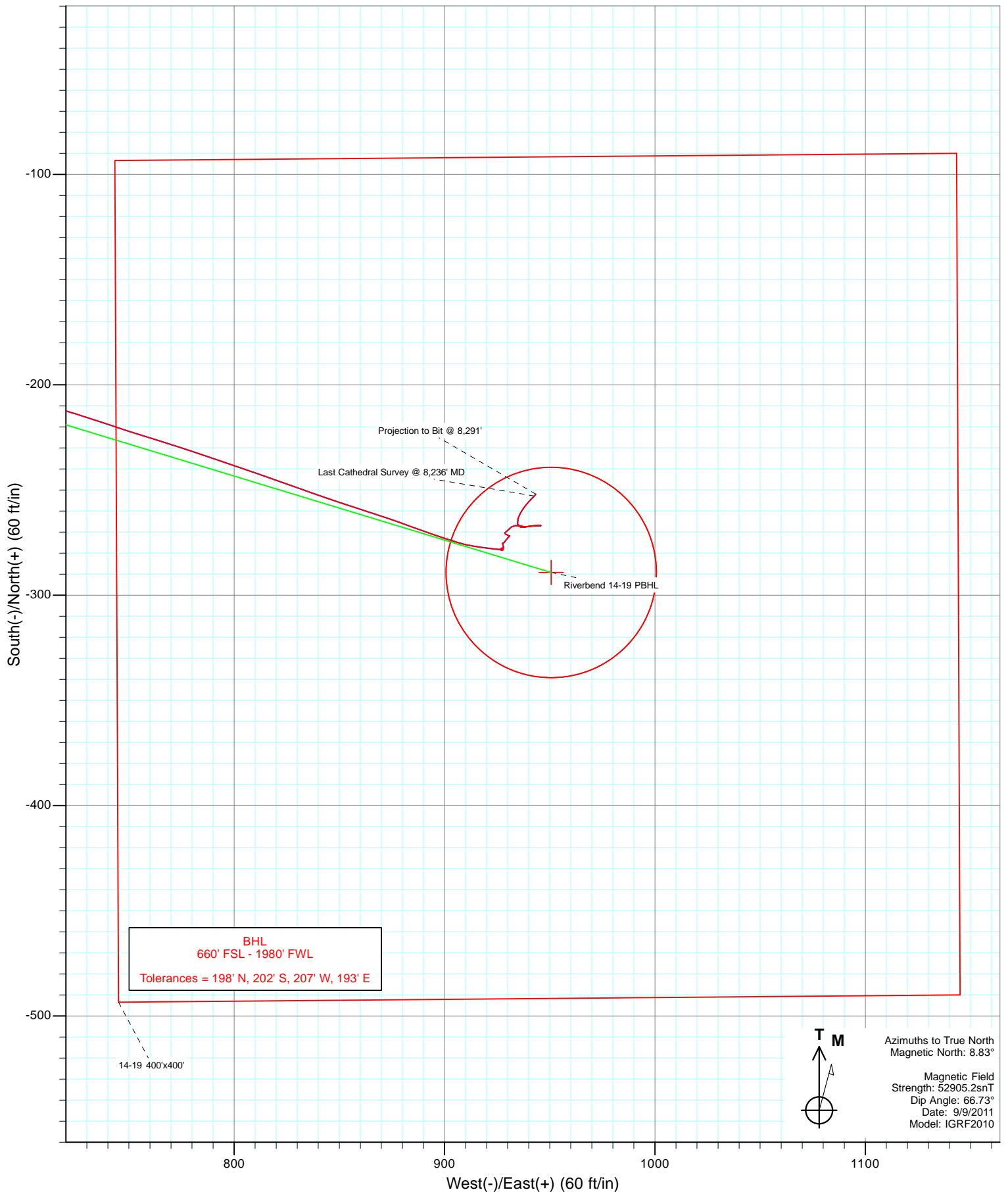


DD							
Riverbend 14-19							
115370, 106955; LR							
KBE @ 4951.0ft (Xtreme 14)							
North American Datum 1983							
Well Riverbend 14-19, True North							
Type	Target		Azimuth	Origin Type	N/S	E/W	From TVD
Target	Riverbend 14-19 PBHL		106.92	Slot	0.0	0.0	0.0
Name	TVD		+N/-S	+E/-W	Latitude		Longitude
Riverbend 14-19 PBHL	8129.0		-289.2	950.7	40.031319		-104.822544



Cathedral Energy Services

Survey Report

Company:	Anadarko Petroleum Corporation	Local Co-ordinate Reference:	Well Riverbend 14-19
Project:	DJ Wattenberg	TVD Reference:	KBE @ 4951.0ft (Xtreme 14)
Site:	SWSW Sec19-T1N-R66W (Riverbend 5)	MD Reference:	KBE @ 4951.0ft (Xtreme 14)
Well:	Riverbend 14-19	North Reference:	True
Wellbore:	DD	Survey Calculation Method:	Minimum Curvature
Design:	DD	Database:	USA EDM 5000 Multi Users DB

Project	DJ Wattenberg		
Map System:	US State Plane 1983	System Datum:	Mean Sea Level
Geo Datum:	North American Datum 1983		
Map Zone:	Colorado Northern Zone		

Site		SWSW Sec19-T1N-R66W (Riverbend 5)			
Site Position:		Northing:	1,255,233.31 ft	Latitude:	40.032027
From:	Lat/Long	Easting:	3,188,750.05 ft	Longitude:	-104.825962
Position Uncertainty:	0.0 ft	Slot Radius:	0.000 in	Grid Convergence:	0.44 °

Well	Riverbend 14-19					
Well Position	+N/-S	0.0 ft	Northing:	1,255,264.67 ft	Latitude:	40.032113
	+E/-W	0.0 ft	Easting:	3,188,756.25 ft	Longitude:	-104.825939
Position Uncertainty		0.0 ft	Wellhead Elevation:	ft	Ground Level:	4,929.0 ft

Wellbore	DD				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	9/9/2011	8.83	66.73	52,905

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	106.92	

Survey Program	Date	9/14/2011			
From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description	
86.0	8,291.0	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		
86.0	0.80	29.00	86.0	0.5	0.3	0.1	0.93	0.93		
179.0	1.90	76.80	179.0	1.4	2.1	1.6	1.60	1.18		
272.0	3.60	97.40	271.9	1.4	6.5	5.8	2.09	1.83		
365.0	5.30	107.90	364.6	-0.3	13.5	13.0	2.02	1.83		
456.0	7.60	114.20	455.0	-4.0	23.0	23.2	2.64	2.53		
546.0	9.20	109.90	544.0	-8.9	35.2	36.2	1.91	1.78		
634.0	10.50	109.60	630.7	-14.0	49.3	51.3	1.48	1.48		
721.0	12.40	108.20	716.0	-19.6	65.7	68.5	2.21	2.18		
810.0	14.90	104.40	802.5	-25.4	85.8	89.5	2.98	2.81		
898.0	17.20	105.30	887.0	-31.7	109.4	113.8	2.63	2.61		
975.0	17.60	107.20	960.5	-38.1	131.5	136.9	0.90	0.52		
1,055.0	17.00	103.30	1,036.9	-44.4	154.4	160.6	1.63	-0.75		

Cathedral Energy Services

Survey Report

Company:	Anadarko Petroleum Corporation	Local Co-ordinate Reference:	Well Riverbend 14-19
Project:	DJ Wattenberg	TVD Reference:	KBE @ 4951.0ft (Xtreme 14)
Site:	SWSW Sec19-T1N-R66W (Riverbend 5)	MD Reference:	KBE @ 4951.0ft (Xtreme 14)
Well:	Riverbend 14-19	North Reference:	True
Wellbore:	DD	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
1,142.0	17.40	105.80	1,120.0	-50.8	179.3	186.3	0.97	0.46	
1,231.0	17.20	108.60	1,205.0	-58.7	204.6	212.8	0.96	-0.22	
1,319.0	18.00	111.80	1,288.9	-67.9	229.5	239.3	1.43	0.91	
1,408.0	17.80	111.20	1,373.6	-77.9	255.0	266.6	0.31	-0.22	
1,496.0	18.80	110.50	1,457.1	-87.7	280.8	294.2	1.16	1.14	
1,584.0	19.80	111.30	1,540.2	-98.1	308.0	323.2	1.18	1.14	
1,671.0	20.10	106.70	1,622.0	-107.8	336.0	352.8	1.84	0.34	
1,760.0	19.90	105.70	1,705.6	-116.2	365.2	383.3	0.45	-0.22	
1,849.0	19.10	105.80	1,789.5	-124.3	393.8	413.0	0.90	-0.90	
1,937.0	18.90	104.90	1,872.7	-131.9	421.5	441.6	0.40	-0.23	
2,027.0	18.90	104.60	1,957.8	-139.3	449.7	470.7	0.11	0.00	
2,115.0	18.60	105.50	2,041.2	-146.7	477.0	499.0	0.47	-0.34	
2,204.0	18.90	103.10	2,125.4	-153.7	504.7	527.6	0.93	0.34	
2,293.0	18.10	105.90	2,209.8	-160.8	532.0	555.8	1.34	-0.90	
2,381.0	17.00	103.40	2,293.7	-167.5	557.7	582.3	1.52	-1.25	
2,470.0	16.80	104.90	2,378.9	-173.8	582.8	608.1	0.54	-0.22	
2,557.0	16.70	107.40	2,462.2	-180.8	606.9	633.2	0.84	-0.11	
2,647.0	17.60	105.70	2,548.2	-188.3	632.3	659.7	1.14	1.00	
2,735.0	18.60	106.40	2,631.9	-195.9	658.6	687.1	1.16	1.14	
2,824.0	18.00	104.30	2,716.4	-203.3	685.5	715.0	1.00	-0.67	
2,914.0	17.50	105.00	2,802.1	-210.2	712.1	742.4	0.60	-0.56	
3,003.0	17.40	108.70	2,887.0	-218.0	737.6	769.1	1.25	-0.11	
3,091.0	18.30	107.10	2,970.7	-226.3	763.3	796.1	1.16	1.02	
3,180.0	16.60	109.00	3,055.6	-234.5	788.6	822.7	2.01	-1.91	
3,267.0	14.30	109.00	3,139.5	-242.1	810.5	845.9	2.64	-2.64	
3,355.0	14.30	110.00	3,224.8	-249.3	831.0	867.6	0.28	0.00	
3,444.0	12.00	108.10	3,311.4	-255.9	850.2	887.8	2.63	-2.58	
3,534.0	12.00	108.20	3,399.5	-261.8	867.9	906.6	0.02	0.00	
3,622.0	9.70	110.30	3,485.9	-267.2	883.6	923.1	2.65	-2.61	
3,711.0	7.60	108.70	3,573.9	-271.7	896.2	936.5	2.37	-2.36	
3,799.0	5.60	107.00	3,661.3	-274.8	905.8	946.6	2.28	-2.27	
3,889.0	4.50	98.80	3,750.9	-276.6	913.5	954.5	1.46	-1.22	
3,977.0	3.10	98.10	3,838.7	-277.5	919.3	960.2	1.59	-1.59	
4,065.0	2.10	95.40	3,926.6	-278.0	923.2	964.2	1.14	-1.14	
4,154.0	1.20	93.20	4,015.6	-278.2	925.8	966.7	1.01	-1.01	
4,241.0	0.50	98.80	4,102.6	-278.3	927.1	967.9	0.81	-0.80	
4,330.0	0.20	51.30	4,191.6	-278.3	927.6	968.4	0.44	-0.34	
4,416.0	0.30	39.60	4,277.6	-278.0	927.8	968.6	0.13	0.12	
4,504.0	0.30	299.70	4,365.6	-277.7	927.8	968.4	0.52	0.00	
4,593.0	0.30	290.40	4,454.6	-277.5	927.4	968.0	0.05	0.00	
4,683.0	0.80	218.30	4,544.6	-277.9	926.8	967.5	0.85	0.56	
4,772.0	0.90	112.10	4,633.6	-278.7	927.0	968.0	1.53	0.11	
4,861.0	0.60	14.70	4,722.6	-278.5	927.8	968.7	1.29	-0.34	
4,950.0	0.90	5.60	4,811.6	-277.3	928.0	968.5	0.36	0.34	
5,038.0	1.10	339.60	4,899.6	-275.9	927.7	967.9	0.56	0.23	
5,126.0	0.30	164.40	4,987.6	-275.3	927.5	967.5	1.59	-0.91	
5,215.0	0.20	76.40	5,076.6	-275.5	927.7	967.7	0.40	-0.11	
5,305.0	0.90	39.10	5,166.6	-274.9	928.3	968.1	0.83	0.78	
5,392.0	2.20	39.50	5,253.5	-273.1	929.8	969.0	1.49	1.49	
5,482.0	0.10	134.20	5,343.5	-271.8	931.0	969.8	2.46	-2.33	
5,570.0	0.20	278.80	5,431.5	-271.8	930.9	969.7	0.33	0.11	
5,658.0	0.70	297.20	5,519.5	-271.6	930.2	969.0	0.58	0.57	
5,748.0	1.00	289.70	5,609.5	-271.0	929.0	967.7	0.35	0.33	

Cathedral Energy Services

Survey Report

Company:	Anadarko Petroleum Corporation	Local Co-ordinate Reference:	Well Riverbend 14-19
Project:	DJ Wattenberg	TVD Reference:	KBE @ 4951.0ft (Xtreme 14)
Site:	SWSW Sec19-T1N-R66W (Riverbend 5)	MD Reference:	KBE @ 4951.0ft (Xtreme 14)
Well:	Riverbend 14-19	North Reference:	True
Wellbore:	DD	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
5,836.0	0.70	36.00	5,697.5	-270.3	928.6	967.1	1.56	-0.34	
5,926.0	1.30	60.80	5,787.5	-269.4	929.8	968.0	0.81	0.67	
6,014.0	0.90	18.20	5,875.4	-268.3	930.9	968.7	1.00	-0.45	
6,102.0	1.10	80.70	5,963.4	-267.5	932.0	969.5	1.19	0.23	
6,189.0	1.20	64.10	6,050.4	-266.9	933.6	970.9	0.40	0.11	
6,278.0	1.80	109.50	6,139.4	-267.0	935.8	973.0	1.44	0.67	
6,366.0	1.30	90.10	6,227.4	-267.5	938.1	975.3	0.82	-0.57	
6,454.0	1.50	83.00	6,315.3	-267.3	940.2	977.3	0.30	0.23	
6,542.0	1.10	85.60	6,403.3	-267.1	942.2	979.1	0.46	-0.45	
6,632.0	0.80	88.50	6,493.3	-267.0	943.7	980.5	0.34	-0.33	
6,721.0	0.70	89.70	6,582.3	-267.0	944.8	981.6	0.11	-0.11	
6,810.0	0.30	98.80	6,671.3	-267.0	945.6	982.4	0.46	-0.45	
6,900.0	0.20	348.40	6,761.3	-266.9	945.8	982.6	0.46	-0.11	
6,988.0	0.30	278.80	6,849.3	-266.7	945.6	982.3	0.34	0.11	
7,077.0	0.60	267.00	6,938.3	-266.7	944.9	981.6	0.35	0.34	
7,166.0	1.00	264.30	7,027.3	-266.8	943.6	980.4	0.45	0.45	
7,255.0	1.10	259.30	7,116.3	-267.1	942.0	979.0	0.15	0.11	
7,344.0	1.50	265.20	7,205.2	-267.3	940.0	977.1	0.47	0.45	
7,431.0	1.10	253.40	7,292.2	-267.7	938.1	975.4	0.55	-0.46	
7,521.0	1.50	282.10	7,382.2	-267.7	936.1	973.5	0.84	0.44	
7,610.0	1.60	349.40	7,471.2	-266.2	934.7	971.7	1.93	0.11	
7,700.0	1.80	17.00	7,561.1	-263.6	934.9	971.2	0.93	0.22	
7,788.0	1.60	29.40	7,649.1	-261.2	935.9	971.4	0.47	-0.23	
7,877.0	1.60	34.30	7,738.1	-259.1	937.2	972.1	0.15	0.00	
7,967.0	1.50	39.20	7,828.0	-257.1	938.7	972.9	0.18	-0.11	
8,055.0	1.30	41.80	7,916.0	-255.5	940.1	973.7	0.24	-0.23	
8,142.0	1.10	46.20	8,003.0	-254.2	941.3	974.6	0.25	-0.23	
8,236.0	1.20	40.30	8,096.9	-252.8	942.6	975.4	0.16	0.11	Last Cathedral Survey @ 8,236' MD Projection to Bit @ 8,291'
8,291.0	1.20	40.30	8,151.9	-251.9	943.4	975.9	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
Riverbend 14-19 PBHL	0.00	0.00	8,129.0	-289.2	950.7	1,254,982.70	3,189,709.11	40.031319	-104.822544
- hit/miss target									
- Shape									
- survey misses target center by 37.7ft at 8267.6ft MD (8128.5 TVD, -252.3 N, 943.0 E)									
- Circle (radius 50.0)									

Survey Annotations					
Measured Depth (ft)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Comment	
8,236.0	8,096.9	-252.8	942.6	Last Cathedral Survey @ 8,236' MD	
8,291.0	8,151.9	-251.9	943.4	Projection to Bit @ 8,291'	

Checked By: _____ Approved By: _____ Date: _____