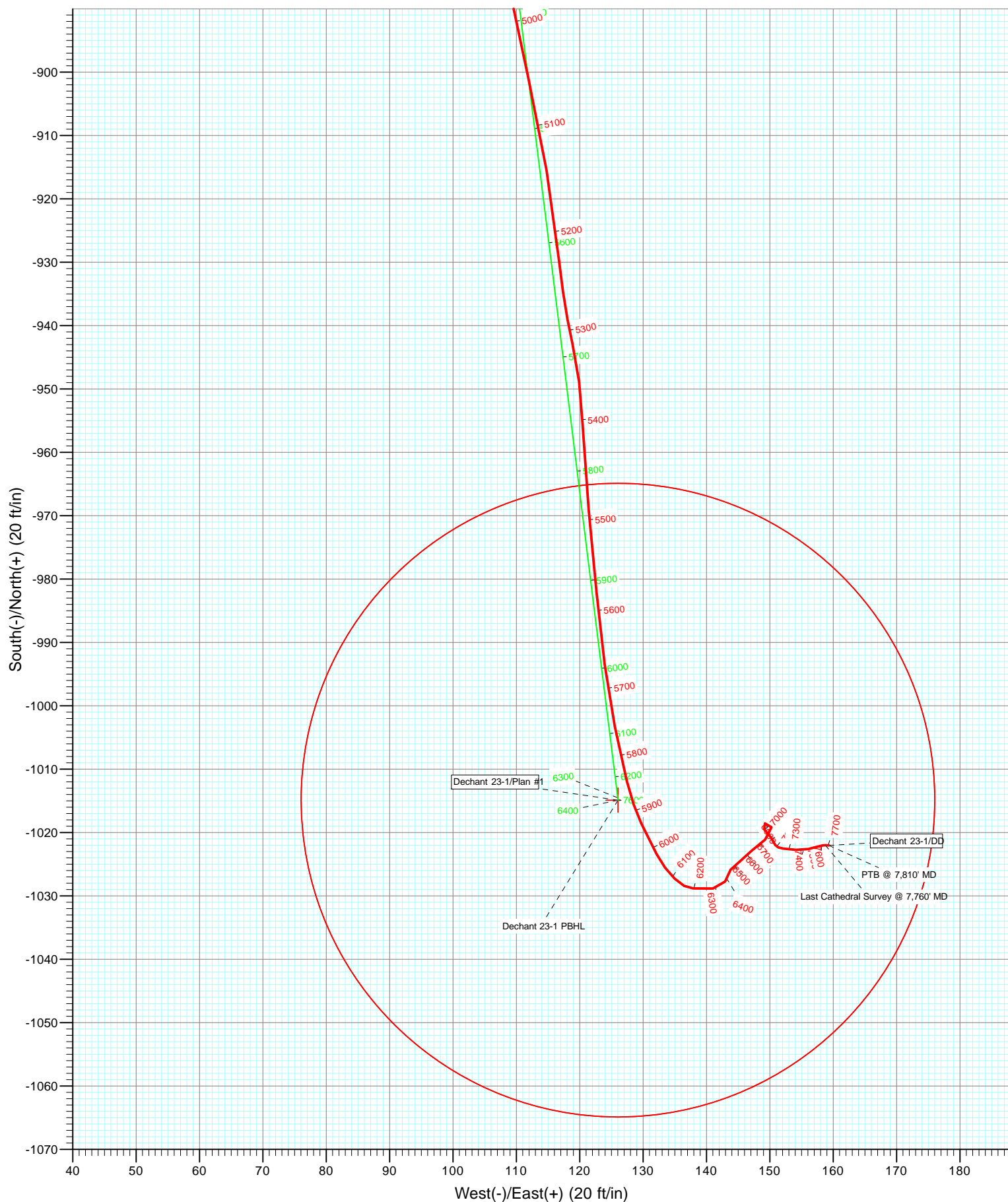


Azimuths to True North
Magnetic North: 8.68°

Magnetic Field
Strength: 52959.4snT
Dip Angle: 66.87°
Date: 1/27/2012
Model: IGRF2010

DD Dechant 23-1 125088 135055; LR KBE @ 4853.0ft (Original Well Elev) North American Datum 1983 Well Dechant 23-1, True North						
Type Target	Target Dechant 23-1 PBHL	Azimuth 172.92	Origin Slot	Type Slot	N/S 0.0	E/W 0.0
Name Dechant 23-1 PBHL	TVD 7698.0	+N/-S -1014.9	+E/-W 126.0	Latitude 40.163140	Longitude -104.612031	From TVD 0.0



Cathedral Energy Services

Survey Report

Company:	Anadarko Petroleum Corporation	Local Co-ordinate Reference:	Well Dechant 23-1
Project:	DJ Wattenberg	TVD Reference:	KBE @ 4853.0ft (Original Well Elev)
Site:	NESW Sec1-T2N-R65W (Dechant 23-1)	MD Reference:	KBE @ 4853.0ft (Original Well Elev)
Well:	Dechant 23-1	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		NESW Sec1-T2N-R65W (Dechant 23-1)			
Site Position:		Northing:	1,304,604.07 ft	Latitude:	40.166119
From:	Lat/Long	Easting:	3,248,038.33 ft	Longitude:	-104.612481
Position Uncertainty:	0.0 ft	Slot Radius:	13.200 in	Grid Convergence:	0.57 °

Well	Dechant 23-1					
Well Position	+N/-S	0.0 ft	Northing:	1,304,533.76 ft	Latitude:	40.165926
	+E/-W	0.0 ft	Easting:	3,248,038.75 ft	Longitude:	-104.612482
Position Uncertainty		0.0 ft	Wellhead Elevation:	ft	Ground Level:	4,838.0 ft

Wellbore	DD				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	1/27/2012	8.68	66.87	52,959

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	172.92	

Survey Program	Date	2/1/2012			
From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description	
214.0	7,810.0	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		
214.0	0.30	356.40	214.0	0.6	0.0	-0.6	0.14	0.14		
308.0	0.80	192.00	308.0	0.2	-0.2	-0.2	1.16	0.53		
416.0	3.40	181.10	415.9	-3.8	-0.4	3.7	2.42	2.41		
504.0	6.10	178.40	503.6	-11.1	-0.3	10.9	3.08	3.07		
590.0	8.10	178.00	588.9	-21.7	0.0	21.5	2.33	2.33		
684.0	10.60	180.30	681.7	-37.0	0.2	36.7	2.69	2.66		
799.0	11.00	179.30	794.6	-58.5	0.3	58.1	0.38	0.35		
891.0	13.20	176.00	884.6	-77.8	1.1	77.3	2.51	2.39		
982.0	14.20	173.60	973.0	-99.2	3.1	98.8	1.26	1.10		
1,070.0	14.30	174.10	1,058.3	-120.8	5.4	120.5	0.18	0.11		
1,158.0	15.00	166.70	1,143.4	-142.6	9.1	142.7	2.27	0.80		
1,248.0	14.80	168.30	1,230.4	-165.2	14.2	165.7	0.51	-0.22		

Cathedral Energy Services

Survey Report

Company:	Anadarko Petroleum Corporation	Local Co-ordinate Reference:	Well Dechant 23-1
Project:	DJ Wattenberg	TVD Reference:	KBE @ 4853.0ft (Original Well Elev)
Site:	NESW Sec1-T2N-R65W (Dechant 23-1)	MD Reference:	KBE @ 4853.0ft (Original Well Elev)
Well:	Dechant 23-1	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
1,337.0	14.60	167.00	1,316.5	-187.3	19.0	188.2	0.43	-0.22	
1,426.0	14.50	165.80	1,402.7	-209.0	24.2	210.4	0.36	-0.11	
1,515.0	13.80	166.50	1,489.0	-230.2	29.5	232.0	0.81	-0.79	
1,603.0	13.70	166.00	1,574.4	-250.5	34.4	252.8	0.18	-0.11	
1,690.0	12.30	171.20	1,659.2	-269.6	38.3	272.3	2.10	-1.61	
1,780.0	11.70	168.70	1,747.2	-288.0	41.6	291.0	0.88	-0.67	
1,868.0	10.90	173.20	1,833.5	-305.1	44.3	308.2	1.35	-0.91	
1,958.0	11.20	176.30	1,921.9	-322.2	45.9	325.4	0.74	0.33	
2,047.0	10.50	173.60	2,009.3	-338.9	47.4	342.2	0.97	-0.79	
2,136.0	9.90	174.50	2,096.9	-354.6	49.0	357.9	0.70	-0.67	
2,225.0	11.00	175.70	2,184.4	-370.7	50.4	374.1	1.26	1.24	
2,315.0	10.40	176.80	2,272.8	-387.3	51.5	390.7	0.70	-0.67	
2,401.0	10.50	175.80	2,357.4	-402.9	52.5	406.3	0.24	0.12	
2,489.0	12.00	179.20	2,443.7	-420.1	53.2	423.4	1.86	1.70	
2,577.0	12.00	178.00	2,529.8	-438.3	53.6	441.6	0.28	0.00	
2,666.0	12.50	174.30	2,616.8	-457.2	54.9	460.5	1.05	0.56	
2,754.0	13.30	170.40	2,702.5	-476.6	57.5	480.1	1.34	0.91	
2,843.0	13.10	169.90	2,789.2	-496.7	61.0	500.4	0.26	-0.22	
2,932.0	12.50	170.70	2,876.0	-516.1	64.3	520.1	0.70	-0.67	
3,021.0	11.60	173.30	2,963.0	-534.5	66.9	538.7	1.18	-1.01	
3,111.0	11.20	171.40	3,051.2	-552.1	69.3	556.4	0.61	-0.44	
3,199.0	10.60	173.40	3,137.6	-568.6	71.5	573.1	0.81	-0.68	
3,289.0	11.20	176.00	3,226.0	-585.5	73.1	590.1	0.86	0.67	
3,377.0	9.40	173.80	3,312.6	-601.2	74.4	605.8	2.09	-2.05	
3,464.0	9.60	180.10	3,398.4	-615.5	75.2	620.1	1.22	0.23	
3,552.0	10.30	175.80	3,485.1	-630.7	75.8	635.3	1.16	0.80	
3,640.0	11.30	177.90	3,571.5	-647.2	76.7	651.7	1.22	1.14	
3,728.0	11.30	170.10	3,657.8	-664.3	78.5	668.9	1.74	0.00	
3,815.0	10.30	170.60	3,743.3	-680.4	81.2	685.2	1.15	-1.15	
3,905.0	10.90	168.50	3,831.8	-696.6	84.2	701.7	0.79	0.67	
3,994.0	10.50	167.70	3,919.2	-712.8	87.6	718.2	0.48	-0.45	
4,083.0	10.20	167.70	4,006.8	-728.4	91.0	734.1	0.34	-0.34	
4,172.0	9.10	166.80	4,094.5	-743.0	94.3	748.9	1.25	-1.24	
4,259.0	8.30	172.90	4,180.5	-755.9	96.6	762.1	1.40	-0.92	
4,348.0	9.60	178.40	4,268.4	-769.7	97.7	775.9	1.75	1.46	
4,437.0	9.30	177.20	4,356.2	-784.3	98.2	790.4	0.40	-0.34	
4,525.0	9.90	175.00	4,443.0	-798.9	99.2	805.1	0.80	0.68	
4,615.0	9.70	172.60	4,531.7	-814.2	100.9	820.4	0.51	-0.22	
4,704.0	10.40	175.80	4,619.3	-829.6	102.4	835.9	1.01	0.79	
4,792.0	8.90	180.10	4,706.0	-844.4	103.0	850.6	1.89	-1.70	
4,882.0	9.30	174.00	4,794.9	-858.5	103.7	864.8	1.16	0.44	
4,971.0	9.50	167.60	4,882.7	-872.9	106.1	879.3	1.20	0.22	
5,059.0	9.40	169.30	4,969.5	-887.0	109.0	893.7	0.34	-0.11	
5,147.0	9.50	166.90	5,056.3	-901.2	111.9	908.1	0.46	0.11	
5,235.0	9.70	170.70	5,143.1	-915.6	114.8	922.7	0.75	0.23	
5,322.0	9.50	173.60	5,228.9	-929.9	116.8	937.2	0.60	-0.23	
5,411.0	7.60	167.30	5,316.9	-943.0	118.9	950.4	2.38	-2.13	
5,499.0	8.90	177.50	5,404.0	-955.4	120.5	963.0	2.22	1.48	
5,587.0	9.10	174.40	5,490.9	-969.2	121.4	976.7	0.60	0.23	
5,676.0	7.70	174.80	5,578.9	-982.1	122.7	989.7	1.57	-1.57	
5,766.0	6.90	172.10	5,668.2	-993.5	124.0	1,001.2	0.97	-0.89	
5,853.0	6.10	169.20	5,754.7	-1,003.2	125.5	1,011.0	0.99	-0.92	
5,942.0	5.40	165.70	5,843.2	-1,011.9	127.5	1,019.9	0.88	-0.79	

Cathedral Energy Services

Survey Report

Company:	Anadarko Petroleum Corporation	Local Co-ordinate Reference:	Well Dechant 23-1
Project:	DJ Wattenberg	TVD Reference:	KBE @ 4853.0ft (Original Well Elev)
Site:	NESW Sec1-T2N-R65W (Dechant 23-1)	MD Reference:	KBE @ 4853.0ft (Original Well Elev)
Well:	Dechant 23-1	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
6,031.0	3.70	155.10	5,931.9	-1,018.6	129.7	1,026.8	2.12	-1.91	
6,119.0	3.40	151.40	6,019.8	-1,023.4	132.1	1,031.9	0.43	-0.34	
6,209.0	2.80	133.90	6,109.6	-1,027.3	135.0	1,036.1	1.24	-0.67	
6,296.0	1.80	92.40	6,196.6	-1,028.8	137.9	1,038.0	2.16	-1.15	
6,385.0	2.20	88.40	6,285.5	-1,028.8	141.0	1,038.4	0.48	0.45	
6,474.0	1.40	13.00	6,374.5	-1,027.7	143.0	1,037.5	2.57	-0.90	
6,562.0	1.30	37.10	6,462.5	-1,025.9	143.8	1,035.8	0.65	-0.11	
6,650.0	1.60	56.50	6,550.4	-1,024.4	145.4	1,034.5	0.65	0.34	
6,738.0	1.50	39.10	6,638.4	-1,022.8	147.2	1,033.2	0.54	-0.11	
6,828.0	2.00	58.70	6,728.3	-1,021.1	149.3	1,031.7	0.86	0.56	
6,917.0	1.50	343.40	6,817.3	-1,019.2	150.3	1,029.9	2.44	-0.56	
7,006.0	1.10	234.90	6,906.3	-1,018.6	149.2	1,029.2	2.39	-0.45	
7,094.0	1.00	128.70	6,994.3	-1,019.5	149.1	1,030.1	1.91	-0.11	
7,183.0	1.10	149.80	7,083.3	-1,020.7	150.2	1,031.5	0.45	0.11	
7,271.0	0.70	151.70	7,171.3	-1,021.9	150.9	1,032.7	0.46	-0.45	
7,361.0	1.30	96.20	7,261.3	-1,022.5	152.1	1,033.5	1.19	0.67	
7,447.0	1.40	94.10	7,347.2	-1,022.7	154.1	1,033.9	0.13	0.12	
7,537.0	1.10	76.50	7,437.2	-1,022.6	156.1	1,034.0	0.54	-0.33	
7,626.0	0.70	74.20	7,526.2	-1,022.2	157.4	1,033.9	0.45	-0.45	
7,716.0	0.50	79.60	7,616.2	-1,022.0	158.4	1,033.8	0.23	-0.22	
7,760.0	0.60	88.70	7,660.2	-1,022.0	158.8	1,033.8	0.30	0.23	Last Cathedral Survey @ 7,760' MD
7,797.4	0.67	96.70	7,697.6	-1,022.0	159.2	1,033.8	0.31	0.19	Dechant 23-1 PBHL
7,810.0	0.70	99.00	7,710.2	-1,022.0	159.3	1,033.9	0.31	0.22	PTB @ 7,810' MD

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									
Dechant 23-1 PBHL	0.00	0.00	7,698.0	-1,014.9	126.0	1,303,520.19	3,248,174.95	40.163140	-104.612031
- actual wellpath misses target center by 33.9ft at 7797.4ft MD (7697.6 TVD, -1022.0 N, 159.2 E)									
- Circle (radius 50.0)									

Design Annotations

Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates	Comment
		+N/-S (ft)	+E/-W (ft)
7,760.0	7,660.2	-1,022.0	158.8
7,810.0	7,710.2	-1,022.0	159.3
Last Cathedral Survey @ 7,760' MD			
PTB @ 7,810' MD			

Checked By: _____ Approved By: _____ Date: _____