



Vertical Section at 177.70° (1000 ft/in)

Cathedral Energy Services

Planning Report

Database:	USA EDM 5000 Multi Users DB	Local Co-ordinate Reference:	Well Morning Fresh 14N-22HZ
Company:	Anadarko Petroleum Corporation	TVD Reference:	KB=17' @ 4903.0ft (Original Well Elev)
Project:	DJ Wattenberg	MD Reference:	KB=17' @ 4903.0ft (Original Well Elev)
Site:	Morning Fresh Pad	North Reference:	Grid
Well:	Morning Fresh 14N-22HZ	Survey Calculation Method:	Minimum Curvature
Wellbore:	HZ		
Design:	Plan #1		

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		Morning Fresh Pad			
Site Position:		Northing:	1,322,529.35 ft	Latitude:	40.216404
From:	Lat/Long	Easting:	3,205,006.35 ft	Longitude:	-104.765921
Position Uncertainty:	0.0 ft	Slot Radius:	13.200 in	Grid Convergence:	0.47 °

Well	Morning Fresh 14N-22HZ					
Well Position	+N/-S	0.0 ft	Northing:	1,322,500.14 ft	Latitude:	40.216324
	+E/-W	0.0 ft	Easting:	3,204,999.33 ft	Longitude:	-104.765947
Position Uncertainty		0.0 ft	Wellhead Elevation:	ft	Ground Level:	4,886.0 ft

Wellbore	HZ				
Magnetics	Model Name	Sample Date	Declination	Dip Angle	Field Strength
			(°)	(°)	(nT)
	IGRF2010	10/8/2013	8.54	66.82	52,790

Design	Plan #1			
Audit Notes:				
Version:	Phase:	PLAN	Tie On Depth:	0.0
Vertical Section:	Depth From (TVD)	+N/-S	+E/-W	Direction
	(ft)	(ft)	(ft)	(°)
	0.0	0.0	0.0	177.70

Plan Sections										
Measured Depth	Inclination	Azimuth	Vertical Depth	+N/-S	+E/-W	Dogleg Rate	Build Rate	Turn Rate	TFO	Target
(ft)	(°)	(°)	(ft)	(ft)	(ft)	(°/100ft)	(°/100ft)	(°/100ft)	(°)	
0.0	0.00	0.00	0.0	0.0	0.0	0.00	0.00	0.00	0.00	
1,100.0	0.00	0.00	1,100.0	0.0	0.0	0.00	0.00	0.00	0.00	
1,381.4	5.63	13.39	1,380.9	13.4	3.2	2.00	2.00	0.00	13.39	
6,382.6	5.63	13.39	6,358.1	490.5	116.8	0.00	0.00	0.00	0.00	
6,664.0	0.00	0.00	6,639.0	503.9	120.0	2.00	-2.00	0.00	180.00	Morning Fresh 14N-2:
7,564.0	90.00	179.24	7,212.0	-69.0	127.6	10.00	10.00	19.92	179.24	
12,213.3	90.00	179.24	7,212.0	-4,717.9	189.6	0.00	0.00	0.00	0.00	Morning Fresh 14N-2:

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Project:	DJ Wattenberg	MD Reference:	KB=17' @ 4903.0ft (Original Well Elev)
Site:	Morning Fresh Pad	North Reference:	Grid
Well:	Morning Fresh 14N-22HZ	Survey Calculation Method:	Minimum Curvature
Wellbore:	HZ		
Design:	Plan #1		

Planned Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Comments / Formations
0.0	0.00	0.00	0.0	0.0	0.0	0.0	0.00	0.00	
0.5	0.00	0.00	0.5	0.0	0.0	0.0	0.00	0.00	SHL - 552' FNL, 1981' FWL
100.0	0.00	0.00	100.0	0.0	0.0	0.0	0.00	0.00	
200.0	0.00	0.00	200.0	0.0	0.0	0.0	0.00	0.00	
300.0	0.00	0.00	300.0	0.0	0.0	0.0	0.00	0.00	
400.0	0.00	0.00	400.0	0.0	0.0	0.0	0.00	0.00	
500.0	0.00	0.00	500.0	0.0	0.0	0.0	0.00	0.00	
600.0	0.00	0.00	600.0	0.0	0.0	0.0	0.00	0.00	
700.0	0.00	0.00	700.0	0.0	0.0	0.0	0.00	0.00	
751.0	0.00	0.00	751.0	0.0	0.0	0.0	0.00	0.00	Fox Hills Base
800.0	0.00	0.00	800.0	0.0	0.0	0.0	0.00	0.00	
900.0	0.00	0.00	900.0	0.0	0.0	0.0	0.00	0.00	
1,000.0	0.00	0.00	1,000.0	0.0	0.0	0.0	0.00	0.00	
1,100.0	0.00	0.00	1,100.0	0.0	0.0	0.0	0.00	0.00	KOP @ 1,100' MD
1,200.0	2.00	13.39	1,200.0	1.7	0.4	-1.7	2.00	2.00	
1,300.0	4.00	13.39	1,299.8	6.8	1.6	-6.7	2.00	2.00	
1,381.4	5.63	13.39	1,380.9	13.4	3.2	-13.3	2.00	2.00	EOB @ Inc. = 5.63°
1,400.0	5.63	13.39	1,399.5	15.2	3.6	-15.1	0.00	0.00	
1,500.0	5.63	13.39	1,499.0	24.7	5.9	-24.5	0.00	0.00	
1,600.0	5.63	13.39	1,598.5	34.3	8.2	-33.9	0.00	0.00	
1,700.0	5.63	13.39	1,698.0	43.8	10.4	-43.4	0.00	0.00	
1,800.0	5.63	13.39	1,797.5	53.4	12.7	-52.8	0.00	0.00	
1,900.0	5.63	13.39	1,897.0	62.9	15.0	-62.3	0.00	0.00	
2,000.0	5.63	13.39	1,996.6	72.4	17.3	-71.7	0.00	0.00	
2,100.0	5.63	13.39	2,096.1	82.0	19.5	-81.1	0.00	0.00	
2,200.0	5.63	13.39	2,195.6	91.5	21.8	-90.6	0.00	0.00	
2,300.0	5.63	13.39	2,295.1	101.1	24.1	-100.0	0.00	0.00	
2,400.0	5.63	13.39	2,394.6	110.6	26.3	-109.5	0.00	0.00	
2,500.0	5.63	13.39	2,494.2	120.1	28.6	-118.9	0.00	0.00	
2,600.0	5.63	13.39	2,593.7	129.7	30.9	-128.3	0.00	0.00	
2,700.0	5.63	13.39	2,693.2	139.2	33.2	-137.8	0.00	0.00	
2,800.0	5.63	13.39	2,792.7	148.8	35.4	-147.2	0.00	0.00	
2,900.0	5.63	13.39	2,892.2	158.3	37.7	-156.7	0.00	0.00	
3,000.0	5.63	13.39	2,991.7	167.8	40.0	-166.1	0.00	0.00	
3,100.0	5.63	13.39	3,091.3	177.4	42.2	-175.5	0.00	0.00	
3,200.0	5.63	13.39	3,190.8	186.9	44.5	-185.0	0.00	0.00	
3,300.0	5.63	13.39	3,290.3	196.5	46.8	-194.4	0.00	0.00	
3,400.0	5.63	13.39	3,389.8	206.0	49.1	-203.9	0.00	0.00	
3,500.0	5.63	13.39	3,489.3	215.5	51.3	-213.3	0.00	0.00	
3,600.0	5.63	13.39	3,588.9	225.1	53.6	-222.7	0.00	0.00	
3,700.0	5.63	13.39	3,688.4	234.6	55.9	-232.2	0.00	0.00	
3,800.0	5.63	13.39	3,787.9	244.1	58.1	-241.6	0.00	0.00	
3,900.0	5.63	13.39	3,887.4	253.7	60.4	-251.1	0.00	0.00	
4,000.0	5.63	13.39	3,986.9	263.2	62.7	-260.5	0.00	0.00	
4,027.2	5.63	13.39	4,014.0	265.8	63.3	-263.1	0.00	0.00	Parkman
4,100.0	5.63	13.39	4,086.4	272.8	65.0	-269.9	0.00	0.00	
4,200.0	5.63	13.39	4,186.0	282.3	67.2	-279.4	0.00	0.00	
4,300.0	5.63	13.39	4,285.5	291.8	69.5	-288.8	0.00	0.00	
4,400.0	5.63	13.39	4,385.0	301.4	71.8	-298.3	0.00	0.00	
4,500.0	5.63	13.39	4,484.5	310.9	74.0	-307.7	0.00	0.00	
4,522.6	5.63	13.39	4,507.0	313.1	74.6	-309.8	0.00	0.00	Sussex
4,600.0	5.63	13.39	4,584.0	320.5	76.3	-317.1	0.00	0.00	

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Well:	Morning Fresh 14N-22HZ	Survey Calculation Method:	Minimum Curvature
Wellbore:	HZ		
Design:	Plan #1		

Planned Survey									
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Comments / Formations
4,700.0	5.63	13.39	4,683.6	330.0	78.6	-326.6	0.00	0.00	
4,800.0	5.63	13.39	4,783.1	339.5	80.9	-336.0	0.00	0.00	
4,900.0	5.63	13.39	4,882.6	349.1	83.1	-345.5	0.00	0.00	
5,000.0	5.63	13.39	4,982.1	358.6	85.4	-354.9	0.00	0.00	
5,100.0	5.63	13.39	5,081.6	368.2	87.7	-364.3	0.00	0.00	
5,200.0	5.63	13.39	5,181.1	377.7	89.9	-373.8	0.00	0.00	
5,300.0	5.63	13.39	5,280.7	387.2	92.2	-383.2	0.00	0.00	
5,400.0	5.63	13.39	5,380.2	396.8	94.5	-392.7	0.00	0.00	
5,500.0	5.63	13.39	5,479.7	406.3	96.8	-402.1	0.00	0.00	
5,600.0	5.63	13.39	5,579.2	415.9	99.0	-411.5	0.00	0.00	
5,700.0	5.63	13.39	5,678.7	425.4	101.3	-421.0	0.00	0.00	
5,800.0	5.63	13.39	5,778.3	434.9	103.6	-430.4	0.00	0.00	
5,900.0	5.63	13.39	5,877.8	444.5	105.8	-439.9	0.00	0.00	
6,000.0	5.63	13.39	5,977.3	454.0	108.1	-449.3	0.00	0.00	
6,100.0	5.63	13.39	6,076.8	463.5	110.4	-458.7	0.00	0.00	
6,200.0	5.63	13.39	6,176.3	473.1	112.7	-468.2	0.00	0.00	
6,300.0	5.63	13.39	6,275.8	482.6	114.9	-477.6	0.00	0.00	
6,382.6	5.63	13.39	6,358.1	490.5	116.8	-485.4	0.00	0.00	Start 2° Drop
6,400.0	5.28	13.39	6,375.4	492.1	117.2	-487.0	2.00	-2.00	
6,500.0	3.28	13.39	6,475.1	499.4	118.9	-494.2	2.00	-2.00	
6,600.0	1.28	13.39	6,575.0	503.2	119.8	-498.0	2.00	-2.00	
6,664.0	0.00	0.00	6,639.0	503.9	120.0	-498.7	2.00	-2.00	Start 10° Build
6,700.0	3.60	179.24	6,675.0	502.8	120.0	-497.6	10.00	10.00	
6,750.0	8.60	179.24	6,724.7	497.5	120.1	-492.3	10.00	10.00	
6,800.0	13.60	179.24	6,773.7	487.9	120.2	-482.7	10.00	10.00	
6,850.0	18.60	179.24	6,821.7	474.0	120.4	-468.8	10.00	10.00	
6,900.0	23.60	179.24	6,868.4	456.0	120.6	-450.8	10.00	10.00	
6,950.0	28.60	179.24	6,913.3	434.0	120.9	-428.8	10.00	10.00	
7,000.0	33.60	179.24	6,956.1	408.2	121.3	-403.0	10.00	10.00	
7,050.0	38.60	179.24	6,996.5	378.8	121.7	-373.6	10.00	10.00	
7,100.0	43.60	179.24	7,034.1	345.9	122.1	-340.7	10.00	10.00	
7,150.0	48.60	179.24	7,068.8	309.9	122.6	-304.7	10.00	10.00	
7,175.2	51.12	179.24	7,085.0	290.7	122.8	-285.5	10.00	10.00	Sharon Springs
7,200.0	53.60	179.24	7,100.2	271.0	123.1	-265.9	10.00	10.00	
7,250.0	58.60	179.24	7,128.0	229.5	123.7	-224.4	10.00	10.00	
7,288.5	62.45	179.24	7,147.0	196.0	124.1	-190.9	10.00	10.00	Niorara A
7,300.0	63.60	179.24	7,152.2	185.8	124.2	-180.6	10.00	10.00	
7,350.0	68.60	179.24	7,172.5	140.1	124.9	-135.0	10.00	10.00	
7,400.0	73.60	179.24	7,188.6	92.8	125.5	-87.7	10.00	10.00	
7,408.6	74.46	179.24	7,191.0	84.6	125.6	-79.5	10.00	10.00	Niobrara B
7,450.0	78.60	179.24	7,200.7	44.3	126.1	-39.2	10.00	10.00	
7,500.0	83.60	179.24	7,208.4	-5.1	126.8	10.2	10.00	10.00	
7,550.0	88.60	179.24	7,211.8	-55.0	127.5	60.0	10.00	10.00	
7,563.5	89.95	179.24	7,212.0	-68.5	127.6	73.5	10.00	10.00	7" - 620' FNL, 2110' FWL
7,564.0	90.00	179.24	7,212.0	-69.0	127.6	74.0	10.00	10.00	LP @ 7212' TVD, 90°
7,600.0	90.00	179.24	7,212.0	-105.0	128.1	110.0	0.00	0.00	
7,700.0	90.00	179.24	7,212.0	-204.9	129.5	210.0	0.00	0.00	
7,800.0	90.00	179.24	7,212.0	-304.9	130.8	309.9	0.00	0.00	
7,900.0	90.00	179.24	7,212.0	-404.9	132.1	409.9	0.00	0.00	
8,000.0	90.00	179.24	7,212.0	-504.9	133.4	509.9	0.00	0.00	
8,100.0	90.00	179.24	7,212.0	-604.9	134.8	609.8	0.00	0.00	
8,200.0	90.00	179.24	7,212.0	-704.9	136.1	709.8	0.00	0.00	

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Planning Report

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Company:	Anadarko Petroleum Corporation	TVD Reference:	KB=17' @ 4903.0ft (Original Well Elev)
Project:	DJ Wattenberg	MD Reference:	KB=17' @ 4903.0ft (Original Well Elev)
Site:	Morning Fresh Pad	North Reference:	Grid
Well:	Morning Fresh 14N-22HZ	Survey Calculation Method:	Minimum Curvature
Wellbore:	HZ		
Design:	Plan #1		

Planned Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Comments / Formations
8,300.0	90.00	179.24	7,212.0	-804.9	137.4	809.8	0.00	0.00	
8,400.0	90.00	179.24	7,212.0	-904.9	138.8	909.7	0.00	0.00	
8,500.0	90.00	179.24	7,212.0	-1,004.9	140.1	1,009.7	0.00	0.00	
8,600.0	90.00	179.24	7,212.0	-1,104.9	141.4	1,109.7	0.00	0.00	
8,700.0	90.00	179.24	7,212.0	-1,204.9	142.8	1,209.6	0.00	0.00	
8,800.0	90.00	179.24	7,212.0	-1,304.8	144.1	1,309.6	0.00	0.00	
8,900.0	90.00	179.24	7,212.0	-1,404.8	145.4	1,409.5	0.00	0.00	
9,000.0	90.00	179.24	7,212.0	-1,504.8	146.8	1,509.5	0.00	0.00	
9,100.0	90.00	179.24	7,212.0	-1,604.8	148.1	1,609.5	0.00	0.00	
9,200.0	90.00	179.24	7,212.0	-1,704.8	149.4	1,709.4	0.00	0.00	
9,300.0	90.00	179.24	7,212.0	-1,804.8	150.8	1,809.4	0.00	0.00	
9,400.0	90.00	179.24	7,212.0	-1,904.8	152.1	1,909.4	0.00	0.00	
9,500.0	90.00	179.24	7,212.0	-2,004.8	153.4	2,009.3	0.00	0.00	
9,600.0	90.00	179.24	7,212.0	-2,104.8	154.8	2,109.3	0.00	0.00	
9,700.0	90.00	179.24	7,212.0	-2,204.8	156.1	2,209.3	0.00	0.00	
9,800.0	90.00	179.24	7,212.0	-2,304.8	157.4	2,309.2	0.00	0.00	
9,900.0	90.00	179.24	7,212.0	-2,404.8	158.8	2,409.2	0.00	0.00	
10,000.0	90.00	179.24	7,212.0	-2,504.7	160.1	2,509.2	0.00	0.00	
10,100.0	90.00	179.24	7,212.0	-2,604.7	161.4	2,609.1	0.00	0.00	
10,200.0	90.00	179.24	7,212.0	-2,704.7	162.8	2,709.1	0.00	0.00	
10,300.0	90.00	179.24	7,212.0	-2,804.7	164.1	2,809.0	0.00	0.00	
10,400.0	90.00	179.24	7,212.0	-2,904.7	165.4	2,909.0	0.00	0.00	
10,500.0	90.00	179.24	7,212.0	-3,004.7	166.8	3,009.0	0.00	0.00	
10,600.0	90.00	179.24	7,212.0	-3,104.7	168.1	3,108.9	0.00	0.00	
10,700.0	90.00	179.24	7,212.0	-3,204.7	169.4	3,208.9	0.00	0.00	
10,800.0	90.00	179.24	7,212.0	-3,304.7	170.8	3,308.9	0.00	0.00	
10,900.0	90.00	179.24	7,212.0	-3,404.7	172.1	3,408.8	0.00	0.00	
11,000.0	90.00	179.24	7,212.0	-3,504.7	173.4	3,508.8	0.00	0.00	
11,100.0	90.00	179.24	7,212.0	-3,604.6	174.8	3,608.8	0.00	0.00	
11,200.0	90.00	179.24	7,212.0	-3,704.6	176.1	3,708.7	0.00	0.00	
11,300.0	90.00	179.24	7,212.0	-3,804.6	177.4	3,808.7	0.00	0.00	
11,400.0	90.00	179.24	7,212.0	-3,904.6	178.8	3,908.6	0.00	0.00	
11,500.0	90.00	179.24	7,212.0	-4,004.6	180.1	4,008.6	0.00	0.00	
11,600.0	90.00	179.24	7,212.0	-4,104.6	181.4	4,108.6	0.00	0.00	
11,700.0	90.00	179.24	7,212.0	-4,204.6	182.8	4,208.5	0.00	0.00	
11,800.0	90.00	179.24	7,212.0	-4,304.6	184.1	4,308.5	0.00	0.00	
11,900.0	90.00	179.24	7,212.0	-4,404.6	185.4	4,408.5	0.00	0.00	
12,000.0	90.00	179.24	7,212.0	-4,504.6	186.8	4,508.4	0.00	0.00	
12,100.0	90.00	179.24	7,212.0	-4,604.6	188.1	4,608.4	0.00	0.00	
12,200.0	90.00	179.24	7,212.0	-4,704.5	189.4	4,708.4	0.00	0.00	
12,213.3	90.00	179.24	7,212.0	-4,717.8	189.6	4,721.7	0.00	0.00	PBHL - 1' FSL, 2110' FWL

Cathedral Energy Services

Planning Report

Database:	USA EDM 5000 Multi Users DB	Local Co-ordinate Reference:	Well Morning Fresh 14N-22HZ
Company:	Anadarko Petroleum Corporation	TVD Reference:	KB=17' @ 4903.0ft (Original Well Elev)
Project:	DJ Wattenberg	MD Reference:	KB=17' @ 4903.0ft (Original Well Elev)
Site:	Morning Fresh Pad	North Reference:	Grid
Well:	Morning Fresh 14N-22HZ	Survey Calculation Method:	Minimum Curvature
Wellbore:	HZ		
Design:	Plan #1		

Targets									
Target Name									
- hit/miss target	Dip Angle	Dip Dir.	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
- Shape	(°)	(°)	(ft)	(ft)	(ft)	(ft)	(ft)		
Morning Fresh 14N-22H	0.00	0.00	7,212.0	-4,717.9	189.6	1,317,782.25	3,205,188.94	40.203369	-104.765408
- plan hits target center									
- Point									
Morning Fresh 14N-22H	0.00	0.00	6,639.0	503.9	120.0	1,323,004.08	3,205,119.33	40.217705	-104.765502
- plan hits target center									
- Point									

Casing Points				
Measured Depth	Vertical Depth		Casing Diameter	Hole Diameter
(ft)	(ft)	Name	(in)	(in)
7,563.5	7,212.0	7" - 620' FNL, 2110' FWL		

Formations					
Measured Depth	Vertical Depth	Name	Lithology	Dip	Dip Direction
(ft)	(ft)			(°)	(°)
751.0	751.0	Fox Hills Base		0.00	
4,027.2	4,014.0	Parkman		0.00	
4,522.6	4,507.0	Sussex		0.00	
7,175.2	7,085.0	Sharon Springs		0.00	
7,288.5	7,147.0	Niorara A		0.00	
7,408.6	7,191.0	Niobrara B		0.00	

Plan Annotations				
Measured Depth	Vertical Depth	Local Coordinates		Comment
(ft)	(ft)	+N/-S (ft)	+E/-W (ft)	
0.5	0.5	0.0	0.0	SHL - 552' FNL, 1981' FWL
1,100.0	1,100.0	0.0	0.0	KOP @ 1,100' MD
1,381.4	1,380.9	13.4	3.2	EOB @ Inc. = 5.63°
6,382.6	6,358.1	490.5	116.8	Start 2° Drop
6,664.0	6,639.0	503.9	120.0	Start 10° Build
7,564.0	7,212.0	-69.0	127.6	LP @ 7212' TVD, 90°
12,213.3	7,212.0	-4,717.8	189.6	PBHL - 1' FSL, 2110' FWL
12,213.3	7,212.0	-4,717.9	189.6	TD @ 12,213.3' MD