

US ROCKIES REGION PLANNING

COLORADO NORTHERN ZONE - 83

WELD_WARDELL 5 PAD

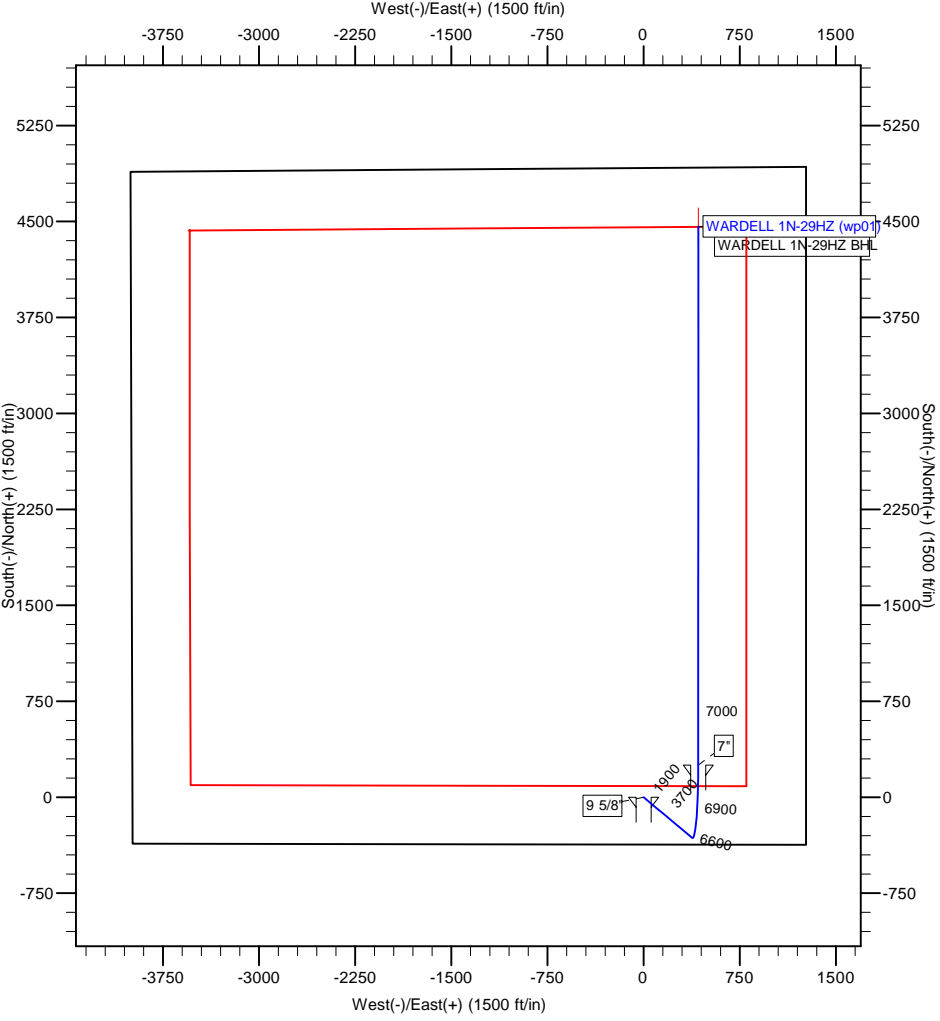
WARDELL 1N-29HZ

WARDELL 1N-29HZ

Plan: WARDELL 1N-29HZ (wp01)

Standard Planning Report

30 November, 2011



Azimuths to True North
Magnetic North: 8.74°

Magnetic Field
Strength: 52981.1snT
Dip Angle: 66.88°
Date: 11/30/2011
Model: IGRF2010



Project: COLORADO NORTHERN ZONE - 83
Site: WELD WARDELL 5 PAD
Well: WARDELL 1N-29HZ
Wellbore: WARDELL 1N-29HZ
Section: SHL:
Design: WARDELL 1N-29HZ (wp01)
Latitude: 40.190184
Longitude: -104.682450
GL: 4870.00
KB: GL + rkb @ 4887.00ft

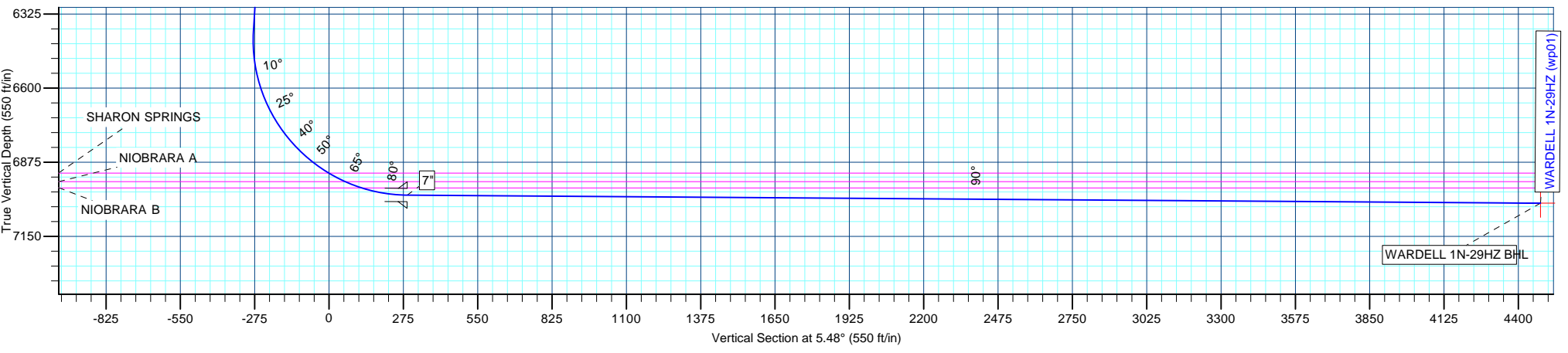
WELL DETAILS: WARDELL 1N-29HZ						
+N/-S	+E/-W	Northing	Ground Level: Easting	4870.00 Latitude 40.190184	Longitude -104.682450	Slot
0.00	0.00	1313179.53	3228397.60			

SECTION DETAILS								
MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	VSect
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1400.00	0.00	0.00	1400.00	0.00	0.00	0.00	0.00	0.00
1691.74	5.83	129.90	1691.24	-9.52	11.39	2.00	129.90	-8.39
6413.50	5.83	129.90	6388.54	-317.41	379.66	0.00	0.00	-279.72
7346.57	89.57	0.00	6997.00	250.00	427.00	10.00	-129.79	289.62
7349.43	89.59	0.01	6997.02	252.87	427.00	1.00	25.97	292.48
11558.43	89.59	0.01	7027.00	4461.76	427.92	0.00	0.00	4482.23

WELLBORE TARGET DETAILS (MAP CO-ORDINATES AND LAT/LONG)							
Name	TVD	+N/-S	+E/-W	Latitude	Longitude	Shape	
WARDELL 1N-29HZ BHL	7027.00	4461.76	427.92	40.202432	-104.680918	Point	

FORMATION TOP DETAILS		
TVDPath	MDPath	Formation
3994.00	4006.50	PARKMAN
4577.00	4592.53	SUSSEX
6915.00	7040.08	SHARON SPRINGS
6947.00	7109.36	NIOBRARA A
6970.00	7174.00	NIOBRARA B

CASING DETAILS			
TVD	MD	Name	Size
900.00	900.00	9 5/8"	9-5/8
6997.00	7346.57	7"	7



Anadarko Petroleum Corp

Planning Report

Database:	edmp	Local Co-ordinate Reference:	Well WARDELL 1N-29HZ
Company:	US ROCKIES REGION PLANNING	TVD Reference:	GL + rkb @ 4887.00ft
Project:	COLORADO NORTHERN ZONE - 83	MD Reference:	GL + rkb @ 4887.00ft
Site:	WELD_WARDELL 5 PAD	North Reference:	True
Well:	WARDELL 1N-29HZ	Survey Calculation Method:	Minimum Curvature
Wellbore:	WARDELL 1N-29HZ		
Design:	WARDELL 1N-29HZ (wp01)		

Project	COLORADO NORTHERN ZONE - 83		
Map System:	US State Plane 1983	System Datum:	Mean Sea Level
Geo Datum:	North American Datum 1983		
Map Zone:	Colorado Northern Zone		

Site	WELD_WARDELL 5 PAD			
Site Position:		Northing:	1,313,179.46 usft	Latitude: 40.190185
From:	Lat/Long	Easting:	3,228,349.55 usft	Longitude: -104.682622
Position Uncertainty:	0.00 ft	Slot Radius:	13-3/16 "	Grid Convergence: 0.53 °

Well	WARDELL 1N-29HZ			
Well Position	+N/-S	-0.37 ft	Northing:	1,313,179.53 usft
	+E/-W	48.05 ft	Easting:	3,228,397.60 usft
Position Uncertainty		0.00 ft	Wellhead Elevation:	Latitude: 40.190184
				Longitude: -104.682450
				Ground Level: 4,870.00 ft

Wellbore	WARDELL 1N-29HZ				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	11/30/2011	8.74	66.88	52,981

Design	WARDELL 1N-29HZ (wp01)			
Audit Notes:				
Version:	Phase:	PLAN	Tie On Depth:	0.00
Vertical Section:	Depth From (TVD) (ft)	+N/-S (ft)	+E/-W (ft)	Direction (°)
	0.00	0.00	0.00	5.48

Plan Sections										
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	TFO (°)	Target
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
1,400.00	0.00	0.00	1,400.00	0.00	0.00	0.00	0.00	0.00	0.00	
1,691.74	5.83	129.90	1,691.24	-9.52	11.39	2.00	2.00	0.00	129.90	
6,413.50	5.83	129.90	6,388.54	-317.41	379.66	0.00	0.00	0.00	0.00	
7,346.57	89.57	0.00	6,997.00	250.00	427.00	10.00	8.97	-13.92	-129.79	
7,349.43	89.59	0.01	6,997.02	252.87	427.00	1.00	0.90	0.44	25.97	
11,558.43	89.59	0.01	7,027.00	4,461.76	427.92	0.00	0.00	0.00	0.00	WARDELL 1N-29HZ I

Anadarko Petroleum Corp

Planning Report

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Company:	US ROCKIES REGION PLANNING	TVD Reference:	GL + rkb @ 4887.00ft
Project:	COLORADO NORTHERN ZONE - 83	MD Reference:	GL + rkb @ 4887.00ft
Site:	WELD_WARDELL 5 PAD	North Reference:	True
Well:	WARDELL 1N-29HZ	Survey Calculation Method:	Minimum Curvature
Wellbore:	WARDELL 1N-29HZ		
Design:	WARDELL 1N-29HZ (wp01)		

Planned Survey									
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
100.00	0.00	0.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00
200.00	0.00	0.00	200.00	0.00	0.00	0.00	0.00	0.00	0.00
300.00	0.00	0.00	300.00	0.00	0.00	0.00	0.00	0.00	0.00
400.00	0.00	0.00	400.00	0.00	0.00	0.00	0.00	0.00	0.00
500.00	0.00	0.00	500.00	0.00	0.00	0.00	0.00	0.00	0.00
600.00	0.00	0.00	600.00	0.00	0.00	0.00	0.00	0.00	0.00
700.00	0.00	0.00	700.00	0.00	0.00	0.00	0.00	0.00	0.00
800.00	0.00	0.00	800.00	0.00	0.00	0.00	0.00	0.00	0.00
900.00	0.00	0.00	900.00	0.00	0.00	0.00	0.00	0.00	0.00
9 5/8"									
1,000.00	0.00	0.00	1,000.00	0.00	0.00	0.00	0.00	0.00	0.00
1,100.00	0.00	0.00	1,100.00	0.00	0.00	0.00	0.00	0.00	0.00
1,200.00	0.00	0.00	1,200.00	0.00	0.00	0.00	0.00	0.00	0.00
1,300.00	0.00	0.00	1,300.00	0.00	0.00	0.00	0.00	0.00	0.00
1,400.00	0.00	0.00	1,400.00	0.00	0.00	0.00	0.00	0.00	0.00
1,500.00	2.00	129.90	1,499.98	-1.12	1.34	-0.99	2.00	2.00	0.00
1,600.00	4.00	129.90	1,599.84	-4.48	5.35	-3.94	2.00	2.00	0.00
1,691.74	5.83	129.90	1,691.24	-9.52	11.39	-8.39	2.00	2.00	0.00
1,700.00	5.83	129.90	1,699.45	-10.06	12.03	-8.86	0.00	0.00	0.00
1,800.00	5.83	129.90	1,798.94	-16.58	19.83	-14.61	0.00	0.00	0.00
1,900.00	5.83	129.90	1,898.42	-23.10	27.63	-20.36	0.00	0.00	0.00
2,000.00	5.83	129.90	1,997.90	-29.62	35.43	-26.10	0.00	0.00	0.00
2,100.00	5.83	129.90	2,097.38	-36.14	43.23	-31.85	0.00	0.00	0.00
2,200.00	5.83	129.90	2,196.86	-42.66	51.03	-37.60	0.00	0.00	0.00
2,300.00	5.83	129.90	2,296.34	-49.18	58.83	-43.34	0.00	0.00	0.00
2,400.00	5.83	129.90	2,395.83	-55.70	66.63	-49.09	0.00	0.00	0.00
2,500.00	5.83	129.90	2,495.31	-62.22	74.43	-54.83	0.00	0.00	0.00
2,600.00	5.83	129.90	2,594.79	-68.75	82.23	-60.58	0.00	0.00	0.00
2,700.00	5.83	129.90	2,694.27	-75.27	90.03	-66.33	0.00	0.00	0.00
2,800.00	5.83	129.90	2,793.75	-81.79	97.82	-72.07	0.00	0.00	0.00
2,900.00	5.83	129.90	2,893.24	-88.31	105.62	-77.82	0.00	0.00	0.00
3,000.00	5.83	129.90	2,992.72	-94.83	113.42	-83.57	0.00	0.00	0.00
3,100.00	5.83	129.90	3,092.20	-101.35	121.22	-89.31	0.00	0.00	0.00
3,200.00	5.83	129.90	3,191.68	-107.87	129.02	-95.06	0.00	0.00	0.00
3,300.00	5.83	129.90	3,291.16	-114.39	136.82	-100.81	0.00	0.00	0.00
3,400.00	5.83	129.90	3,390.65	-120.91	144.62	-106.55	0.00	0.00	0.00
3,500.00	5.83	129.90	3,490.13	-127.43	152.42	-112.30	0.00	0.00	0.00
3,600.00	5.83	129.90	3,589.61	-133.95	160.22	-118.04	0.00	0.00	0.00
3,700.00	5.83	129.90	3,689.09	-140.47	168.02	-123.79	0.00	0.00	0.00
3,800.00	5.83	129.90	3,788.57	-146.99	175.82	-129.54	0.00	0.00	0.00
3,900.00	5.83	129.90	3,888.06	-153.51	183.62	-135.28	0.00	0.00	0.00
4,000.00	5.83	129.90	3,987.54	-160.04	191.42	-141.03	0.00	0.00	0.00
4,006.50	5.83	129.90	3,994.00	-160.46	191.92	-141.40	0.00	0.00	0.00
PARKMAN									
4,100.00	5.83	129.90	4,087.02	-166.56	199.22	-146.78	0.00	0.00	0.00
4,200.00	5.83	129.90	4,186.50	-173.08	207.02	-152.52	0.00	0.00	0.00
4,300.00	5.83	129.90	4,285.98	-179.60	214.82	-158.27	0.00	0.00	0.00
4,400.00	5.83	129.90	4,385.46	-186.12	222.62	-164.02	0.00	0.00	0.00
4,500.00	5.83	129.90	4,484.95	-192.64	230.41	-169.76	0.00	0.00	0.00
4,592.53	5.83	129.90	4,577.00	-198.67	237.63	-175.08	0.00	0.00	0.00
SUSSEX									
4,600.00	5.83	129.90	4,584.43	-199.16	238.21	-175.51	0.00	0.00	0.00

Anadarko Petroleum Corp

Planning Report

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Company:	US ROCKIES REGION PLANNING	TVD Reference:	GL + rkb @ 4887.00ft
Project:	COLORADO NORTHERN ZONE - 83	MD Reference:	GL + rkb @ 4887.00ft
Site:	WELD_WARDELL 5 PAD	North Reference:	True
Well:	WARDELL 1N-29HZ	Survey Calculation Method:	Minimum Curvature
Wellbore:	WARDELL 1N-29HZ		
Design:	WARDELL 1N-29HZ (wp01)		

Planned Survey									
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
4,700.00	5.83	129.90	4,683.91	-205.68	246.01	-181.25	0.00	0.00	0.00
4,800.00	5.83	129.90	4,783.39	-212.20	253.81	-187.00	0.00	0.00	0.00
4,900.00	5.83	129.90	4,882.87	-218.72	261.61	-192.75	0.00	0.00	0.00
5,000.00	5.83	129.90	4,982.36	-225.24	269.41	-198.49	0.00	0.00	0.00
5,100.00	5.83	129.90	5,081.84	-231.76	277.21	-204.24	0.00	0.00	0.00
5,200.00	5.83	129.90	5,181.32	-238.28	285.01	-209.99	0.00	0.00	0.00
5,300.00	5.83	129.90	5,280.80	-244.81	292.81	-215.73	0.00	0.00	0.00
5,400.00	5.83	129.90	5,380.28	-251.33	300.61	-221.48	0.00	0.00	0.00
5,500.00	5.83	129.90	5,479.77	-257.85	308.41	-227.23	0.00	0.00	0.00
5,600.00	5.83	129.90	5,579.25	-264.37	316.21	-232.97	0.00	0.00	0.00
5,700.00	5.83	129.90	5,678.73	-270.89	324.01	-238.72	0.00	0.00	0.00
5,800.00	5.83	129.90	5,778.21	-277.41	331.81	-244.46	0.00	0.00	0.00
5,900.00	5.83	129.90	5,877.69	-283.93	339.61	-250.21	0.00	0.00	0.00
6,000.00	5.83	129.90	5,977.18	-290.45	347.41	-255.96	0.00	0.00	0.00
6,100.00	5.83	129.90	6,076.66	-296.97	355.21	-261.70	0.00	0.00	0.00
6,200.00	5.83	129.90	6,176.14	-303.49	363.00	-267.45	0.00	0.00	0.00
6,300.00	5.83	129.90	6,275.62	-310.01	370.80	-273.20	0.00	0.00	0.00
6,400.00	5.83	129.90	6,375.10	-316.53	378.60	-278.94	0.00	0.00	0.00
6,413.50	5.83	129.90	6,388.54	-317.41	379.66	-279.72	0.00	0.00	0.00
6,500.00	6.64	42.26	6,474.68	-316.53	386.41	-278.19	10.00	0.93	-101.32
6,600.00	15.55	16.32	6,572.76	-299.34	394.08	-260.35	10.00	8.91	-25.94
6,700.00	25.28	9.52	6,666.38	-265.33	401.40	-225.79	10.00	9.73	-6.80
6,800.00	35.16	6.35	6,752.69	-215.53	408.13	-175.58	10.00	9.88	-3.16
6,900.00	45.08	4.45	6,829.07	-151.45	414.08	-111.22	10.00	9.93	-1.91
7,000.00	55.03	3.11	6,893.19	-75.04	419.06	-34.69	10.00	9.95	-1.34
7,040.08	59.02	2.66	6,915.00	-41.46	420.75	-1.10	10.00	9.96	-1.11
SHARON SPRINGS									
7,100.00	64.99	2.06	6,943.11	11.37	422.92	51.70	10.00	9.96	-1.00
7,109.36	65.92	1.97	6,947.00	19.89	423.22	60.20	10.00	9.96	-0.94
NIOBRARA A									
7,174.00	72.36	1.39	6,970.00	80.23	424.98	120.43	10.00	9.96	-0.90
NIOBRARA B									
7,200.00	74.96	1.17	6,977.32	105.17	425.54	145.32	10.00	9.97	-0.85
7,300.00	84.92	0.36	6,994.76	203.50	426.85	243.32	10.00	9.97	-0.81
7,346.57	89.57	0.00	6,997.00	250.00	427.00	289.63	10.00	9.97	-0.78
7"									
7,349.43	89.59	0.01	6,997.02	252.87	427.00	292.48	1.00	0.90	0.44
7,400.00	89.59	0.01	6,997.38	303.43	427.01	342.81	0.00	0.00	0.00
7,500.00	89.59	0.01	6,998.09	403.43	427.03	442.36	0.00	0.00	0.00
7,600.00	89.59	0.01	6,998.81	503.43	427.06	541.90	0.00	0.00	0.00
7,700.00	89.59	0.01	6,999.52	603.42	427.08	641.44	0.00	0.00	0.00
7,800.00	89.59	0.01	7,000.23	703.42	427.10	740.98	0.00	0.00	0.00
7,900.00	89.59	0.01	7,000.94	803.42	427.12	840.53	0.00	0.00	0.00
8,000.00	89.59	0.01	7,001.65	903.42	427.14	940.07	0.00	0.00	0.00
8,100.00	89.59	0.01	7,002.37	1,003.41	427.16	1,039.61	0.00	0.00	0.00
8,200.00	89.59	0.01	7,003.08	1,103.41	427.19	1,139.16	0.00	0.00	0.00
8,300.00	89.59	0.01	7,003.79	1,203.41	427.21	1,238.70	0.00	0.00	0.00
8,400.00	89.59	0.01	7,004.50	1,303.41	427.23	1,338.24	0.00	0.00	0.00
8,500.00	89.59	0.01	7,005.22	1,403.40	427.25	1,437.78	0.00	0.00	0.00
8,600.00	89.59	0.01	7,005.93	1,503.40	427.27	1,537.33	0.00	0.00	0.00
8,700.00	89.59	0.01	7,006.64	1,603.40	427.30	1,636.87	0.00	0.00	0.00
8,800.00	89.59	0.01	7,007.35	1,703.40	427.32	1,736.41	0.00	0.00	0.00
8,900.00	89.59	0.01	7,008.07	1,803.39	427.34	1,835.95	0.00	0.00	0.00
9,000.00	89.59	0.01	7,008.78	1,903.39	427.36	1,935.50	0.00	0.00	0.00

Anadarko Petroleum Corp

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Project:	COLORADO NORTHERN ZONE - 83	MD Reference:	GL + rkb @ 4887.00ft
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Wellbore:	WARDELL 1N-29HZ		
Design:	WARDELL 1N-29HZ (wp01)		

Planned Survey									
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
9,100.00	89.59	0.01	7,009.49	2,003.39	427.38	2,035.04	0.00	0.00	0.00
9,200.00	89.59	0.01	7,010.20	2,103.39	427.41	2,134.58	0.00	0.00	0.00
9,300.00	89.59	0.01	7,010.91	2,203.38	427.43	2,234.13	0.00	0.00	0.00
9,400.00	89.59	0.01	7,011.63	2,303.38	427.45	2,333.67	0.00	0.00	0.00
9,500.00	89.59	0.01	7,012.34	2,403.38	427.47	2,433.21	0.00	0.00	0.00
9,600.00	89.59	0.01	7,013.05	2,503.38	427.49	2,532.75	0.00	0.00	0.00
9,700.00	89.59	0.01	7,013.76	2,603.37	427.52	2,632.30	0.00	0.00	0.00
9,800.00	89.59	0.01	7,014.48	2,703.37	427.54	2,731.84	0.00	0.00	0.00
9,900.00	89.59	0.01	7,015.19	2,803.37	427.56	2,831.38	0.00	0.00	0.00
10,000.00	89.59	0.01	7,015.90	2,903.37	427.58	2,930.93	0.00	0.00	0.00
10,100.00	89.59	0.01	7,016.61	3,003.36	427.60	3,030.47	0.00	0.00	0.00
10,200.00	89.59	0.01	7,017.32	3,103.36	427.62	3,130.01	0.00	0.00	0.00
10,300.00	89.59	0.01	7,018.04	3,203.36	427.65	3,229.55	0.00	0.00	0.00
10,400.00	89.59	0.01	7,018.75	3,303.36	427.67	3,329.10	0.00	0.00	0.00
10,500.00	89.59	0.01	7,019.46	3,403.35	427.69	3,428.64	0.00	0.00	0.00
10,600.00	89.59	0.01	7,020.17	3,503.35	427.71	3,528.18	0.00	0.00	0.00
10,700.00	89.59	0.01	7,020.89	3,603.35	427.73	3,627.73	0.00	0.00	0.00
10,800.00	89.59	0.01	7,021.60	3,703.35	427.76	3,727.27	0.00	0.00	0.00
10,900.00	89.59	0.01	7,022.31	3,803.34	427.78	3,826.81	0.00	0.00	0.00
11,000.00	89.59	0.01	7,023.02	3,903.34	427.80	3,926.35	0.00	0.00	0.00
11,100.00	89.59	0.01	7,023.73	4,003.34	427.82	4,025.90	0.00	0.00	0.00
11,200.00	89.59	0.01	7,024.45	4,103.34	427.84	4,125.44	0.00	0.00	0.00
11,300.00	89.59	0.01	7,025.16	4,203.33	427.87	4,224.98	0.00	0.00	0.00
11,400.00	89.59	0.01	7,025.87	4,303.33	427.89	4,324.52	0.00	0.00	0.00
11,500.00	89.59	0.01	7,026.58	4,403.33	427.91	4,424.07	0.00	0.00	0.00
11,558.43	89.59	0.01	7,027.00	4,461.76	427.92	4,482.23	0.00	0.00	0.00
WARDELL 1N-29HZ BHL									

Design Targets									
Target Name	Dip Angle (°)	Dip Dir. (°)	TVD (ft)	+N/-S (ft)	+E/-W (ft)	Northing (usft)	Easting (usft)	Latitude	Longitude
WARDELL 1N-29HZ BH	0.00	0.00	7,027.00	4,461.76	427.92	1,317,645.04	3,228,784.37	40.202432	-104.680918
- hit/miss target									
- Shape									
- plan hits target center									
- Point									

Casing Points					
Measured Depth (ft)	Vertical Depth (ft)	Name	Casing Diameter (")	Hole Diameter (")	
900.00	900.00	9 5/8"	9-5/8	12-1/4	
7,346.57	6,997.00	7"	7	8-3/4	

Anadarko Petroleum Corp

Planning Report

Database:	edmp	Local Co-ordinate Reference:	Well WARDELL 1N-29HZ
Company:	US ROCKIES REGION PLANNING	TVD Reference:	GL + rkb @ 4887.00ft
Project:	COLORADO NORTHERN ZONE - 83	MD Reference:	GL + rkb @ 4887.00ft
Site:	WELD_WARDELL 5 PAD	North Reference:	True
Well:	WARDELL 1N-29HZ	Survey Calculation Method:	Minimum Curvature
Wellbore:	WARDELL 1N-29HZ		
Design:	WARDELL 1N-29HZ (wp01)		

Formations						
Measured Depth (ft)	Vertical Depth (ft)	Name	Lithology	Dip (°)	Dip Direction (°)	
4,006.50	3,994.00	PARKMAN		0.00		
4,592.53	4,577.00	SUSSEX		0.00		
7,040.08	6,915.00	SHARON SPRINGS		0.00		
7,109.36	6,947.00	NIOBRARA A		0.00		
7,174.00	6,970.00	NIOBRARA B		0.00		