

US ROCKIES REGION PLANNING

COLORADO NORTHERN ZONE - 83

WELD_HOWARD 4 PAD

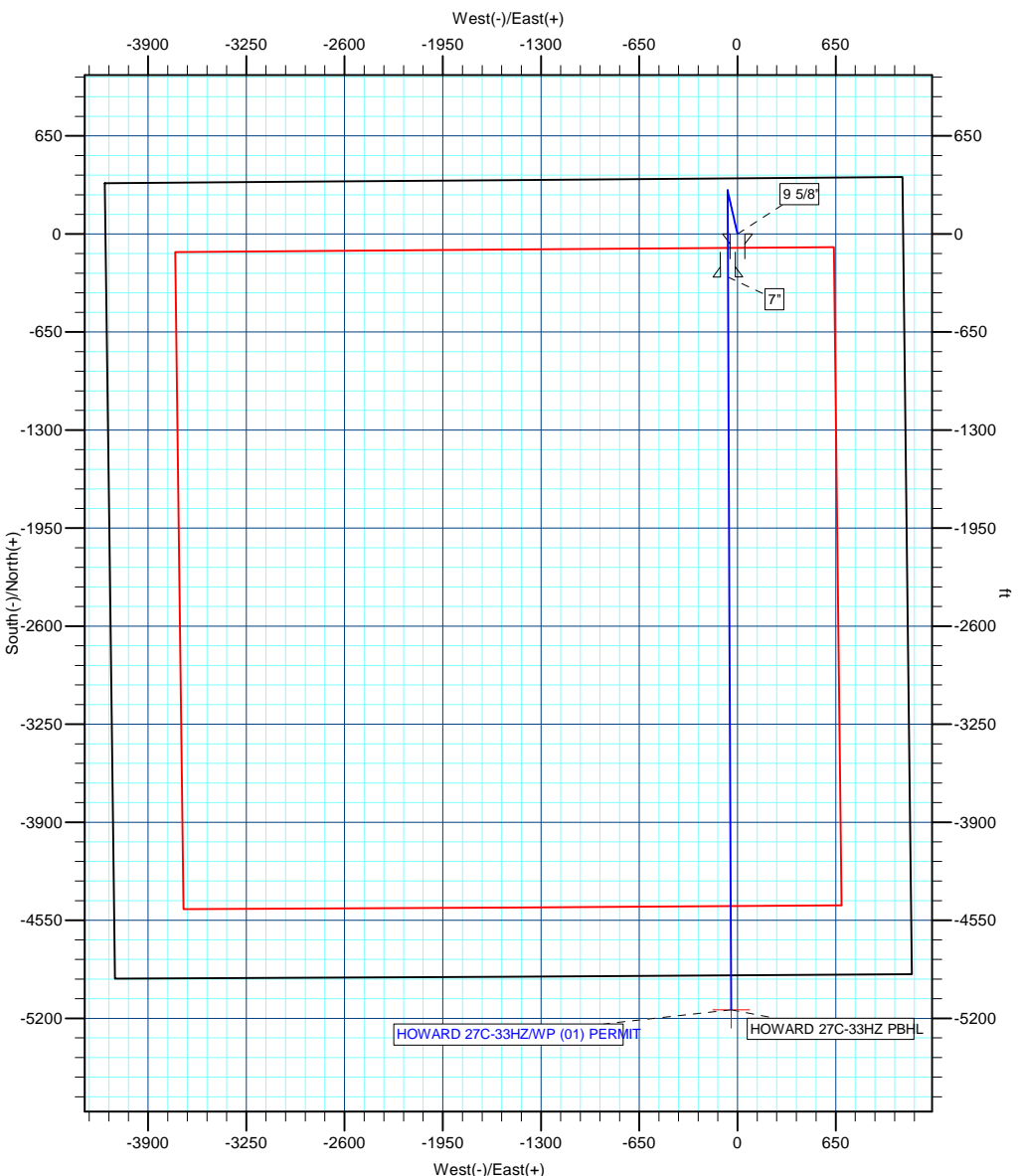
HOWARD 27C-33HZ

Wellbore #1

Plan: WP (01) PERMIT

Standard Planning Report

10 December, 2012



Project: COLORADO NORTHERN ZONE - 83
Site: WELD HOWARD 4 PAD
Well: HOWARD 27C-33HZ
Wellbore: Wellbore #1
Design: WP (01) PERMIT
Latitude: 40.028392
Longitude: -104.890029
GL: 4983.00
KB: 17'RKB+4983'GL @ 5000.00ft

Anadarko
 Petroleum Corporation

Magnetic Field
 Strength: 52765.0nT
 Dip Angle: 66.68°
 Date: 12/7/2012
 Model: IGRF2010

Azimuths to True North
 Magnetic North: 8.70°

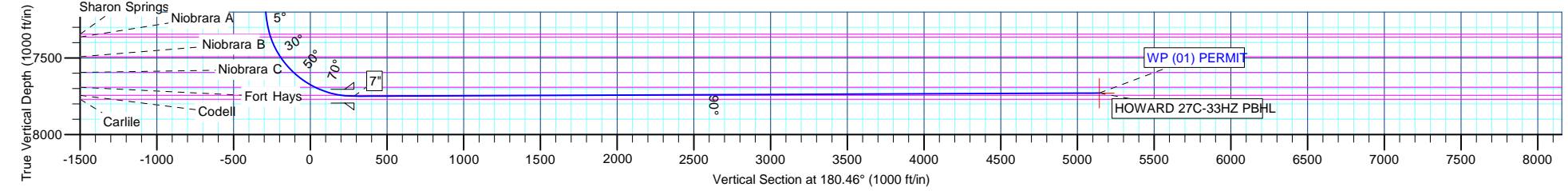
WELL DETAILS: HOWARD 27C-33HZ						
+N/-S	+E/-W	Northing	Ground Level: Easting	4983.00 Latitude	Longitude	Slot
0.00	0.00	1253776.80	3170813.08	40.028392	-104.890029	

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
1100.00	0.00	0.00	1100.00	0.00	0.00	0.00	0.00	0.00
1243.48	2.87	347.18	1243.42	3.50	-0.80	2.00	347.18	-3.50
7040.96	2.87	347.18	7033.63	286.50	-65.20	0.00	0.00	-285.96
7184.44	0.00	0.00	7177.05	290.00	-66.00	2.00	180.00	-289.45
8086.80	90.24	179.74	7750.00	-285.31	-63.43	10.00	179.74	285.82
2944.78	90.24	179.74	7730.00	-5143.20	-41.73	0.00	0.00	5143.37

WELLBORE TARGET DETAILS (MAP CO-ORDINATES AND LAT/LONG)						
Name	TVD	+N/-S	+E/-W	Latitude	Longitude	Shape
HOWARD 27C-33HZ PBHL	7730.00	-5143.20	-41.73	40.014273	-104.890178	Point

FORMATION TOP DETAILS		
TVDPath	MDPath	Formation
4780.00	4784.50	Sussex
7345.00	7354.89	Sharon Springs
7364.00	7374.88	Niobrara A
7492.00	7517.90	Niobrara B
7595.00	7652.85	Niobrara C
7691.00	7822.12	Fort Hays
7744.00	8001.39	Codell

CASING DETAILS			
TVD	MD	Name	Size
900.00	900.00	9 5/8"	9-5/8
7750.00	8086.80	7"	7



Andarko Petroleum Corporation

Planning Report

Database:	edmp	Local Co-ordinate Reference:	Well HOWARD 27C-33HZ
Company:	US ROCKIES REGION PLANNING	TVD Reference:	17'RKB+4983'GL @ 5000.00ft
Project:	COLORADO NORTHERN ZONE - 83	MD Reference:	17'RKB+4983'GL @ 5000.00ft
Site:	WELD_HOWARD 4 PAD	North Reference:	True
Well:	HOWARD 27C-33HZ	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	WP (01) PERMIT		

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_HOWARD 4 PAD			
Site Position:		Northing:	1,253,776.80 usft	Latitude: 40.028392
From:	Lat/Long	Easting:	3,170,813.08 usft	Longitude: -104.890029
Position Uncertainty:	0.00 ft	Slot Radius:	13-3/16 "	Grid Convergence: 0.39 °

Well	HOWARD 27C-33HZ			
Well Position	+N/-S	0.00 ft	Northing:	1,253,776.80 usft
	+E/-W	0.00 ft	Easting:	3,170,813.08 usft
Position Uncertainty		0.00 ft	Wellhead Elevation:	Ground Level: 4,983.00 ft

Wellbore	Wellbore #1				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	12/7/2012	8.70	66.68	52,765

Design	WP (01) PERMIT			
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	180.46

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	
1,100.00	0.00	0.00	1,100.00	0.00	0.00	0.00	0.00	0.00	0.00	
1,243.48	2.87	347.18	1,243.42	3.50	-0.80	2.00	2.00	0.00	347.18	
7,040.96	2.87	347.18	7,033.63	286.50	-65.20	0.00	0.00	0.00	0.00	
7,184.44	0.00	0.00	7,177.05	290.00	-66.00	2.00	-2.00	0.00	180.00	
8,086.80	90.24	179.74	7,750.00	-285.31	-63.43	10.00	10.00	0.00	179.74	
12,944.78	90.24	179.74	7,730.00	-5,143.20	-41.73	0.00	0.00	0.00	0.00	HOWARD 27C-33HZ

Andarko Petroleum Corporation

Planning Report

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Company:	US ROCKIES REGION PLANNING	TVD Reference:	17'RKB+4983'GL @ 5000.00ft
Project:	COLORADO NORTHERN ZONE - 83	MD Reference:	17'RKB+4983'GL @ 5000.00ft
Site:	WELD_HOWARD 4 PAD	North Reference:	True
Well:	HOWARD 27C-33HZ	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	WP (01) PERMIT		

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
Start Build 2.00									
1,200.00	2.00	347.18	1,199.98	1.70	-0.39	-1.70	2.00	2.00	0.00
1,243.48	2.87	347.18	1,243.42	3.50	-0.80	-3.50	2.00	2.00	0.00
Start 5797.49 hold at 1243.48 MD									
1,300.00	2.87	347.18	1,299.87	6.26	-1.43	-6.25	0.00	0.00	0.00
1,400.00	2.87	347.18	1,399.74	11.14	-2.54	-11.12	0.00	0.00	0.00
1,500.00	2.87	347.18	1,499.62	16.02	-3.65	-15.99	0.00	0.00	0.00
1,600.00	2.87	347.18	1,599.49	20.91	-4.76	-20.87	0.00	0.00	0.00
1,700.00	2.87	347.18	1,699.37	25.79	-5.87	-25.74	0.00	0.00	0.00
1,800.00	2.87	347.18	1,799.24	30.67	-6.98	-30.61	0.00	0.00	0.00
1,900.00	2.87	347.18	1,899.12	35.55	-8.09	-35.48	0.00	0.00	0.00
2,000.00	2.87	347.18	1,998.99	40.43	-9.20	-40.36	0.00	0.00	0.00
2,100.00	2.87	347.18	2,098.87	45.31	-10.31	-45.23	0.00	0.00	0.00
2,200.00	2.87	347.18	2,198.74	50.19	-11.42	-50.10	0.00	0.00	0.00
2,300.00	2.87	347.18	2,298.62	55.08	-12.53	-54.97	0.00	0.00	0.00
2,400.00	2.87	347.18	2,398.49	59.96	-13.65	-59.84	0.00	0.00	0.00
2,500.00	2.87	347.18	2,498.36	64.84	-14.76	-64.72	0.00	0.00	0.00
2,600.00	2.87	347.18	2,598.24	69.72	-15.87	-69.59	0.00	0.00	0.00
2,700.00	2.87	347.18	2,698.11	74.60	-16.98	-74.46	0.00	0.00	0.00
2,800.00	2.87	347.18	2,797.99	79.48	-18.09	-79.33	0.00	0.00	0.00
2,900.00	2.87	347.18	2,897.86	84.36	-19.20	-84.20	0.00	0.00	0.00
3,000.00	2.87	347.18	2,997.74	89.24	-20.31	-89.08	0.00	0.00	0.00
3,100.00	2.87	347.18	3,097.61	94.13	-21.42	-93.95	0.00	0.00	0.00
3,200.00	2.87	347.18	3,197.49	99.01	-22.53	-98.82	0.00	0.00	0.00
3,300.00	2.87	347.18	3,297.36	103.89	-23.64	-103.69	0.00	0.00	0.00
3,400.00	2.87	347.18	3,397.24	108.77	-24.75	-108.57	0.00	0.00	0.00
3,500.00	2.87	347.18	3,497.11	113.65	-25.87	-113.44	0.00	0.00	0.00
3,600.00	2.87	347.18	3,596.99	118.53	-26.98	-118.31	0.00	0.00	0.00
3,700.00	2.87	347.18	3,696.86	123.41	-28.09	-123.18	0.00	0.00	0.00
3,800.00	2.87	347.18	3,796.73	128.30	-29.20	-128.05	0.00	0.00	0.00
3,900.00	2.87	347.18	3,896.61	133.18	-30.31	-132.93	0.00	0.00	0.00
4,000.00	2.87	347.18	3,996.48	138.06	-31.42	-137.80	0.00	0.00	0.00
4,100.00	2.87	347.18	4,096.36	142.94	-32.53	-142.67	0.00	0.00	0.00
4,200.00	2.87	347.18	4,196.23	147.82	-33.64	-147.54	0.00	0.00	0.00
4,300.00	2.87	347.18	4,296.11	152.70	-34.75	-152.41	0.00	0.00	0.00
4,400.00	2.87	347.18	4,395.98	157.58	-35.86	-157.29	0.00	0.00	0.00
4,500.00	2.87	347.18	4,495.86	162.46	-36.97	-162.16	0.00	0.00	0.00
4,600.00	2.87	347.18	4,595.73	167.35	-38.09	-167.03	0.00	0.00	0.00
4,700.00	2.87	347.18	4,695.61	172.23	-39.20	-171.90	0.00	0.00	0.00
4,784.50	2.87	347.18	4,780.00	176.35	-40.14	-176.02	0.00	0.00	0.00
Sussex									

Andarko Petroleum Corporation

Planning Report

Database:	edmp	Local Co-ordinate Reference:	Well HOWARD 27C-33HZ
Company:	US ROCKIES REGION PLANNING	TVD Reference:	17'RKB+4983'GL @ 5000.00ft
Project:	COLORADO NORTHERN ZONE - 83	MD Reference:	17'RKB+4983'GL @ 5000.00ft
Site:	WELD_HOWARD 4 PAD	North Reference:	True
Well:	HOWARD 27C-33HZ	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	WP (01) PERMIT		

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)
4,800.00	2.87	347.18	4,795.48	177.11	-40.31	-176.78	0.00	0.00	0.00
4,900.00	2.87	347.18	4,895.36	181.99	-41.42	-181.65	0.00	0.00	0.00
5,000.00	2.87	347.18	4,995.23	186.87	-42.53	-186.52	0.00	0.00	0.00
5,100.00	2.87	347.18	5,095.10	191.75	-43.64	-191.39	0.00	0.00	0.00
5,200.00	2.87	347.18	5,194.98	196.63	-44.75	-196.26	0.00	0.00	0.00
5,300.00	2.87	347.18	5,294.85	201.52	-45.86	-201.14	0.00	0.00	0.00
5,400.00	2.87	347.18	5,394.73	206.40	-46.97	-206.01	0.00	0.00	0.00
5,500.00	2.87	347.18	5,494.60	211.28	-48.08	-210.88	0.00	0.00	0.00
5,600.00	2.87	347.18	5,594.48	216.16	-49.19	-215.75	0.00	0.00	0.00
5,700.00	2.87	347.18	5,694.35	221.04	-50.31	-220.63	0.00	0.00	0.00
5,800.00	2.87	347.18	5,794.23	225.92	-51.42	-225.50	0.00	0.00	0.00
5,900.00	2.87	347.18	5,894.10	230.80	-52.53	-230.37	0.00	0.00	0.00
6,000.00	2.87	347.18	5,993.98	235.68	-53.64	-235.24	0.00	0.00	0.00
6,100.00	2.87	347.18	6,093.85	240.57	-54.75	-240.11	0.00	0.00	0.00
6,200.00	2.87	347.18	6,193.73	245.45	-55.86	-244.99	0.00	0.00	0.00
6,300.00	2.87	347.18	6,293.60	250.33	-56.97	-249.86	0.00	0.00	0.00
6,400.00	2.87	347.18	6,393.47	255.21	-58.08	-254.73	0.00	0.00	0.00
6,500.00	2.87	347.18	6,493.35	260.09	-59.19	-259.60	0.00	0.00	0.00
6,600.00	2.87	347.18	6,593.22	264.97	-60.30	-264.47	0.00	0.00	0.00
6,700.00	2.87	347.18	6,693.10	269.85	-61.42	-269.35	0.00	0.00	0.00
6,800.00	2.87	347.18	6,792.97	274.74	-62.53	-274.22	0.00	0.00	0.00
6,900.00	2.87	347.18	6,892.85	279.62	-63.64	-279.09	0.00	0.00	0.00
7,000.00	2.87	347.18	6,992.72	284.50	-64.75	-283.96	0.00	0.00	0.00
7,040.96	2.87	347.18	7,033.63	286.50	-65.20	-285.96	0.00	0.00	0.00
Start Drop -2.00									
7,100.00	1.69	347.18	7,092.62	288.79	-65.72	-288.24	2.00	-2.00	0.00
7,184.44	0.00	0.00	7,177.05	290.00	-66.00	-289.45	2.00	-2.00	0.00
Start Build 10.00									
7,200.00	1.56	179.74	7,192.61	289.79	-66.00	-289.24	10.00	10.00	0.00
7,250.00	6.56	179.74	7,242.47	286.25	-65.98	-285.71	10.00	10.00	0.00
7,300.00	11.56	179.74	7,291.83	278.39	-65.95	-277.84	10.00	10.00	0.00
7,350.00	16.56	179.74	7,340.32	266.25	-65.89	-265.70	10.00	10.00	0.00
7,354.89	17.05	179.74	7,345.00	264.83	-65.89	-264.29	10.00	10.00	0.00
Sharon Springs									
7,374.88	19.04	179.74	7,364.00	258.64	-65.86	-258.10	10.00	10.00	0.00
Niobrara A									
7,400.00	21.56	179.74	7,387.56	249.93	-65.82	-249.38	10.00	10.00	0.00
7,450.00	26.56	179.74	7,433.20	229.55	-65.73	-229.01	10.00	10.00	0.00
7,500.00	31.56	179.74	7,476.90	205.28	-65.62	-204.74	10.00	10.00	0.00
7,517.90	33.35	179.74	7,492.00	195.67	-65.58	-195.14	10.00	10.00	0.00
Niobrara B									
7,550.00	36.56	179.74	7,518.31	177.29	-65.50	-176.75	10.00	10.00	0.00
7,600.00	41.56	179.74	7,557.12	145.79	-65.36	-145.26	10.00	10.00	0.00
7,650.00	46.56	179.74	7,593.05	111.04	-65.20	-110.50	10.00	10.00	0.00
7,652.85	46.84	179.74	7,595.00	108.96	-65.19	-108.43	10.00	10.00	0.00
Niobrara C									
7,700.00	51.56	179.74	7,625.80	73.28	-65.03	-72.75	10.00	10.00	0.00
7,750.00	56.56	179.74	7,655.14	32.81	-64.85	-32.29	10.00	10.00	0.00
7,800.00	61.56	179.74	7,680.84	-10.06	-64.66	10.58	10.00	10.00	0.00
7,822.12	63.77	179.74	7,691.00	-29.70	-64.57	30.23	10.00	10.00	0.00
Fort Hays									
7,850.00	66.56	179.74	7,702.71	-55.00	-64.46	55.52	10.00	10.00	0.00
7,900.00	71.56	179.74	7,720.58	-101.68	-64.25	102.20	10.00	10.00	0.00

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Company:	US ROCKIES REGION PLANNING	TVD Reference:	17'RKB+4983'GL @ 5000.00ft
Project:	COLORADO NORTHERN ZONE - 83	MD Reference:	17'RKB+4983'GL @ 5000.00ft
Site:	WELD_HOWARD 4 PAD	North Reference:	True
Well:	HOWARD 27C-33HZ	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	WP (01) PERMIT		

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)
7,950.00	76.56	179.74	7,734.31	-149.74	-64.04	150.26	10.00	10.00	0.00
8,000.00	81.56	179.74	7,743.80	-198.82	-63.82	199.33	10.00	10.00	0.00
8,001.39	81.69	179.74	7,744.00	-200.19	-63.81	200.70	10.00	10.00	0.00
Codell									
8,050.00	86.56	179.74	7,748.97	-248.53	-63.59	249.04	10.00	10.00	0.00
8,086.80	90.24	179.74	7,750.00	-285.31	-63.43	285.82	10.00	10.00	0.00
Start 4857.98 hold at 8086.80 MD - 7"									
8,100.00	90.24	179.74	7,749.95	-298.51	-63.37	299.02	0.00	0.00	0.00
8,200.00	90.24	179.74	7,749.54	-398.51	-62.92	399.01	0.00	0.00	0.00
8,300.00	90.24	179.74	7,749.13	-498.51	-62.48	499.00	0.00	0.00	0.00
8,400.00	90.24	179.74	7,748.71	-598.51	-62.03	598.99	0.00	0.00	0.00
8,500.00	90.24	179.74	7,748.30	-698.50	-61.59	698.98	0.00	0.00	0.00
8,600.00	90.24	179.74	7,747.89	-798.50	-61.14	798.97	0.00	0.00	0.00
8,700.00	90.24	179.74	7,747.48	-898.50	-60.69	898.96	0.00	0.00	0.00
8,800.00	90.24	179.74	7,747.07	-998.50	-60.25	998.95	0.00	0.00	0.00
8,900.00	90.24	179.74	7,746.66	-1,098.50	-59.80	1,098.95	0.00	0.00	0.00
9,000.00	90.24	179.74	7,746.24	-1,198.50	-59.35	1,198.94	0.00	0.00	0.00
9,100.00	90.24	179.74	7,745.83	-1,298.49	-58.91	1,298.93	0.00	0.00	0.00
9,200.00	90.24	179.74	7,745.42	-1,398.49	-58.46	1,398.92	0.00	0.00	0.00
9,300.00	90.24	179.74	7,745.01	-1,498.49	-58.01	1,498.91	0.00	0.00	0.00
9,400.00	90.24	179.74	7,744.60	-1,598.49	-57.57	1,598.90	0.00	0.00	0.00
9,500.00	90.24	179.74	7,744.19	-1,698.49	-57.12	1,698.89	0.00	0.00	0.00
9,600.00	90.24	179.74	7,743.77	-1,798.48	-56.67	1,798.88	0.00	0.00	0.00
9,700.00	90.24	179.74	7,743.36	-1,898.48	-56.23	1,898.88	0.00	0.00	0.00
9,800.00	90.24	179.74	7,742.95	-1,998.48	-55.78	1,998.87	0.00	0.00	0.00
9,900.00	90.24	179.74	7,742.54	-2,098.48	-55.33	2,098.86	0.00	0.00	0.00
10,000.00	90.24	179.74	7,742.13	-2,198.48	-54.89	2,198.85	0.00	0.00	0.00
10,100.00	90.24	179.74	7,741.71	-2,298.48	-54.44	2,298.84	0.00	0.00	0.00
10,200.00	90.24	179.74	7,741.30	-2,398.47	-53.99	2,398.83	0.00	0.00	0.00
10,300.00	90.24	179.74	7,740.89	-2,498.47	-53.55	2,498.82	0.00	0.00	0.00
10,400.00	90.24	179.74	7,740.48	-2,598.47	-53.10	2,598.81	0.00	0.00	0.00
10,500.00	90.24	179.74	7,740.07	-2,698.47	-52.65	2,698.81	0.00	0.00	0.00
10,600.00	90.24	179.74	7,739.66	-2,798.47	-52.21	2,798.80	0.00	0.00	0.00
10,700.00	90.24	179.74	7,739.24	-2,898.46	-51.76	2,898.79	0.00	0.00	0.00
10,800.00	90.24	179.74	7,738.83	-2,998.46	-51.31	2,998.78	0.00	0.00	0.00
10,900.00	90.24	179.74	7,738.42	-3,098.46	-50.87	3,098.77	0.00	0.00	0.00
11,000.00	90.24	179.74	7,738.01	-3,198.46	-50.42	3,198.76	0.00	0.00	0.00
11,100.00	90.24	179.74	7,737.60	-3,298.46	-49.97	3,298.75	0.00	0.00	0.00
11,200.00	90.24	179.74	7,737.18	-3,398.45	-49.53	3,398.74	0.00	0.00	0.00
11,300.00	90.24	179.74	7,736.77	-3,498.45	-49.08	3,498.74	0.00	0.00	0.00
11,400.00	90.24	179.74	7,736.36	-3,598.45	-48.63	3,598.73	0.00	0.00	0.00
11,500.00	90.24	179.74	7,735.95	-3,698.45	-48.19	3,698.72	0.00	0.00	0.00
11,600.00	90.24	179.74	7,735.54	-3,798.45	-47.74	3,798.71	0.00	0.00	0.00
11,700.00	90.24	179.74	7,735.13	-3,898.45	-47.29	3,898.70	0.00	0.00	0.00
11,800.00	90.24	179.74	7,734.71	-3,998.44	-46.85	3,998.69	0.00	0.00	0.00
11,900.00	90.24	179.74	7,734.30	-4,098.44	-46.40	4,098.68	0.00	0.00	0.00
12,000.00	90.24	179.74	7,733.89	-4,198.44	-45.95	4,198.67	0.00	0.00	0.00
12,100.00	90.24	179.74	7,733.48	-4,298.44	-45.51	4,298.67	0.00	0.00	0.00
12,200.00	90.24	179.74	7,733.07	-4,398.44	-45.06	4,398.66	0.00	0.00	0.00
12,300.00	90.24	179.74	7,732.66	-4,498.43	-44.61	4,498.65	0.00	0.00	0.00
12,400.00	90.24	179.74	7,732.24	-4,598.43	-44.17	4,598.64	0.00	0.00	0.00
12,500.00	90.24	179.74	7,731.83	-4,698.43	-43.72	4,698.63	0.00	0.00	0.00
12,600.00	90.24	179.74	7,731.42	-4,798.43	-43.27	4,798.62	0.00	0.00	0.00
12,700.00	90.24	179.74	7,731.01	-4,898.43	-42.83	4,898.61	0.00	0.00	0.00

Andarko Petroleum Corporation

Planning Report

Database:	edmp	Local Co-ordinate Reference:	Well HOWARD 27C-33HZ
Company:	US ROCKIES REGION PLANNING	TVD Reference:	17'RKB+4983'GL @ 5000.00ft
Project:	COLORADO NORTHERN ZONE - 83	MD Reference:	17'RKB+4983'GL @ 5000.00ft
Site:	WELD_HOWARD 4 PAD	North Reference:	True
Well:	HOWARD 27C-33HZ	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	WP (01) PERMIT		

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)
12,800.00	90.24	179.74	7,730.60	-4,998.43	-42.38	4,998.60	0.00	0.00	0.00
12,900.00	90.24	179.74	7,730.18	-5,098.42	-41.93	5,098.60	0.00	0.00	0.00
12,944.78	90.24	179.74	7,730.00	-5,143.20	-41.73	5,143.37	0.00	0.00	0.00
TD at 12944.78 - HOWARD 27C-33HZ PBHL									

Design Targets									
Target Name	Dip Angle (°)	Dip Dir. (°)	TVD (ft)	+N/-S (ft)	+E/-W (ft)	Northing (usft)	Easting (usft)	Latitude	Longitude
- hit/miss target									
- Shape									
HOWARD 27C-33HZ PE	0.00	0.00	7,730.00	-5,143.20	-41.73	1,248,633.44	3,170,806.72	40.014273	-104.890178
- 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	
8,086.80	7,750.00	7"	7	7-1/2	

Formations						
Measured Depth (ft)	Vertical Depth (ft)	Name	Lithology	Dip (°)	Dip Direction (°)	
4,784.50	4,780.00	Sussex				
7,354.89	7,345.00	Sharon Springs				
7,374.88	7,364.00	Niobrara A				
7,517.90	7,492.00	Niobrara B				
7,652.85	7,595.00	Niobrara C				
7,822.12	7,691.00	Fort Hays				
8,001.39	7,744.00	Codell				

Plan Annotations					
Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates			
		+N/-S (ft)	+E/-W (ft)	Comment	
1,100.00	1,100.00	0.00	0.00	Start Build 2.00	
1,243.48	1,243.42	3.50	-0.80	Start 5797.49 hold at 1243.48 MD	
7,040.96	7,033.63	286.50	-65.20	Start Drop -2.00	
7,184.44	7,177.05	290.00	-66.00	Start Build 10.00	
8,086.80	7,750.00	-285.31	-63.43	Start 4857.98 hold at 8086.80 MD	
12,944.78	7,730.00	-5,143.20	-41.73	TD at 12944.78	