

Azimuths to True North  
 Magnetic North: 8.57°  
 Magnetic Field  
 Strength: 52829.0snT  
 Dip Angle: 66.78°  
 Date: 12/10/2012  
 Model: IGRF2010



Project: COLORADO NORTHERN ZONE - 83  
 Site: WELD SPARBOE 4 PAD  
 Well: SPARBOE 7C-3HZ  
 Wellbore: Wellbore #1  
 Design: ACTUAL  
 Latitude: 40.101501  
 Longitude: -104.646028  
 GL: 4977.00  
 KB: 16'RKB+4977'GL @ 4993.00ft (XTREME 23)

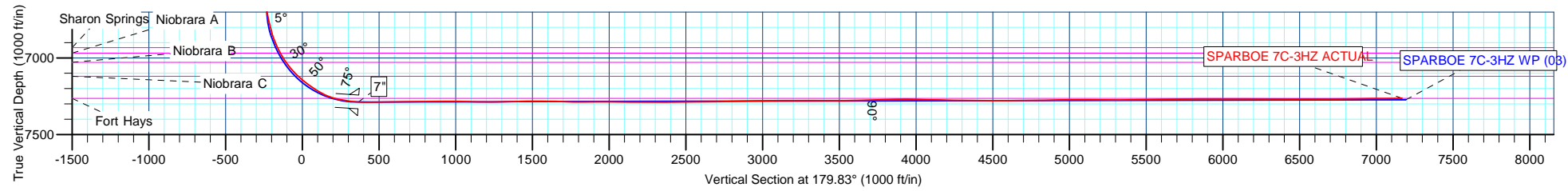
WELL DETAILS: SPARBOE 7C-3HZ						
+N/-S	+E/-W	Northing	Ground Level: Easting	4977.00	Latitude	Slot
0.00	0.00	1280971.47	3238883.55		40.101501	-104.646028

ANNOTATIONS									
TVD	MD	Inc	Azi	+N/-S	+E/-W	VSect	Departure	Annotation	
1775.98	1776.00	0.27	340.35	1.40	-1.93	-1.41	8.49	TIE ON	
1884.98	1885.00	0.44	351.60	2.06	-2.08	-2.07	9.17	FIRST MWD SURVEY	
7287.76	7685.00	86.28	179.21	-368.68	-760.80	366.42	1403.39	7 IN. CASING	
7264.48	14432.00	90.80	177.59	-7113.86	-730.49	7111.66	8149.51	LAST MWD SURVEY	
7263.70	14488.00	90.80	177.59	-7169.80	-728.13	7167.61	8205.50	PROJECTION TO TD	

WELLBORE TARGET DETAILS (MAP CO-ORDINATES AND LAT/LONG)							
Name	TVD	+N/-S	+E/-W	Latitude	Longitude	Shape	Point
SPARBOE 7C-3HZ PBHL	7273.00	-7195.21	-738.72	40.081749	-104.648668		

FORMATION TOP DETAILS		
TVDPath	MDPath	Formation
746.00	746.01	Fox Hills
4992.00	5044.77	Sussex
6933.00	7015.31	Sharon Springs
6969.00	7055.78	Niobrara A
7029.00	7126.56	Niobrara B
7120.00	7246.64	Niobrara C
7264.00	7527.37	Fort Hays

CASING DETAILS			
TVD	MD	Name	Size
7287.76	7685.00	7"	7"



# **US ROCKIES REGION PLANNING**

**COLORADO NORTHERN ZONE - 83**

**WELD\_SPARBOE 4 PAD**

**SPARBOE 7C-3HZ**

**Wellbore #1**

**Design: ACTUAL**

## **Standard Survey Report**

**30 January, 2013**

# Anadarko Petroleum Corp

## Survey Report

<b>Company:</b>	US ROCKIES REGION PLANNING	<b>Local Co-ordinate Reference:</b>	Well SPARBOE 7C-3HZ
<b>Project:</b>	COLORADO NORTHERN ZONE - 83	<b>TVD Reference:</b>	16'RKB+4977'GL @ 4993.00ft (XTREME 23)
<b>Site:</b>	WELD_SPARBOE 4 PAD	<b>MD Reference:</b>	16'RKB+4977'GL @ 4993.00ft (XTREME 23)
<b>Well:</b>	SPARBOE 7C-3HZ	<b>North Reference:</b>	True
<b>Wellbore:</b>	Wellbore #1	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	ACTUAL	<b>Database:</b>	edmp

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

<b>Site</b> WELD_SPARBOE 4 PAD			
<b>Site Position:</b>		<b>Northing:</b>	1,280,971.47 usft
<b>From:</b>	Lat/Long	<b>Easting:</b>	3,238,883.56 usft
<b>Position Uncertainty:</b>	0.00 ft	<b>Slot Radius:</b>	13-3/16 "
		<b>Latitude:</b>	40.101501
		<b>Longitude:</b>	-104.646028
		<b>Grid Convergence:</b>	0.55 °

<b>Well</b> SPARBOE 7C-3HZ			
<b>Well Position</b>	+N/-S 0.00 ft	<b>Northing:</b>	1,280,971.47 usft
	+E/-W 0.00 ft	<b>Easting:</b>	3,238,883.56 usft
<b>Position Uncertainty</b>	0.00 ft	<b>Wellhead Elevation:</b>	ft
		<b>Latitude:</b>	40.101501
		<b>Longitude:</b>	-104.646028
		<b>Ground Level:</b>	4,977.00 ft

<b>Wellbore</b> Wellbore #1					
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	12/10/2012	8.57	66.78	52,829

<b>Design</b> ACTUAL					
<b>Audit Notes:</b>					
<b>Version:</b>	1.0	<b>Phase:</b>	ACTUAL	<b>Tie On Depth:</b>	0.00
<b>Vertical Section:</b>	<b>Depth From (TVD) (ft)</b>	<b>+N/-S (ft)</b>	<b>+E/-W (ft)</b>	<b>Direction (°)</b>	
	0.00	0.00	0.00		286.99

<b>Survey Program</b>		<b>Date</b> 1/30/2013			
From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description	
16.00	1,776.00	Survey #1 (Wellbore #1)	NS-GYRO-MS	NORTH SENSING GYROCOMPASSING M/S	
1,885.00	14,488.00	Survey #2 (Wellbore #1)	MWD	MWD - STANDARD	

<b>Survey</b>										
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	
16.00	0.00	0.00	16.00	0.00	0.00	0.00	0.00	0.00	0.00	
116.00	0.40	110.90	116.00	-0.12	0.33	-0.35	0.40	0.40	0.00	
216.00	0.33	29.13	216.00	0.00	0.79	-0.76	0.48	-0.07	-81.77	
316.00	0.31	96.48	316.00	0.22	1.20	-1.08	0.36	-0.02	67.35	
416.00	0.23	143.64	416.00	0.03	1.59	-1.51	0.23	-0.08	47.16	
516.00	0.28	299.99	516.00	-0.01	1.50	-1.43	0.50	0.05	156.35	
616.00	0.32	318.35	615.99	0.32	1.10	-0.96	0.10	0.04	18.36	
716.00	0.40	321.83	715.99	0.81	0.70	-0.43	0.08	0.08	3.48	
816.00	0.06	181.13	815.99	1.03	0.48	-0.16	0.45	-0.34	-140.70	

# Anadarko Petroleum Corp

## Survey Report

<b>Company:</b>	US ROCKIES REGION PLANNING	<b>Local Co-ordinate Reference:</b>	Well SPARBOE 7C-3HZ
<b>Project:</b>	COLORADO NORTHERN ZONE - 83	<b>TVD Reference:</b>	16'RKB+4977'GL @ 4993.00ft (XTREME 23)
<b>Site:</b>	WELD_SPARBOE 4 PAD	<b>MD Reference:</b>	16'RKB+4977'GL @ 4993.00ft (XTREME 23)
<b>Well:</b>	SPARBOE 7C-3HZ	<b>North Reference:</b>	True
<b>Wellbore:</b>	Wellbore #1	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	ACTUAL	<b>Database:</b>	edmp

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)	
916.00	0.18	262.21	915.99	0.95	0.32	-0.03	0.18	0.12	81.08	
1,016.00	0.24	255.25	1,015.99	0.88	-0.03	0.29	0.07	0.06	-6.96	
1,116.00	0.30	268.12	1,115.99	0.82	-0.50	0.72	0.08	0.06	12.87	
1,216.00	0.22	154.85	1,215.99	0.64	-0.68	0.83	0.44	-0.08	-113.27	
1,316.00	0.24	240.20	1,315.99	0.36	-0.78	0.85	0.31	0.02	85.35	
1,416.00	0.28	232.09	1,415.99	0.10	-1.15	1.13	0.05	0.04	-8.11	
1,516.00	0.44	345.23	1,515.99	0.32	-1.44	1.47	0.61	0.16	113.14	
1,616.00	0.46	336.98	1,615.98	1.07	-1.70	1.94	0.07	0.02	-8.25	
1,716.00	0.12	190.51	1,715.98	1.33	-1.87	2.18	0.56	-0.34	-146.47	
1,776.00	0.27	340.35	1,775.98	1.40	-1.93	2.26	0.63	0.25	249.73	
<b>TIE ON</b>										
1,885.00	0.44	351.60	1,884.98	2.06	-2.08	2.59	0.17	0.16	10.32	
<b>FIRST MWD SURVEY</b>										
1,977.00	2.36	307.07	1,976.95	3.55	-3.64	4.52	2.25	2.09	-48.40	
2,071.00	4.72	298.50	2,070.76	6.56	-8.59	10.13	2.57	2.51	-9.12	
2,165.00	6.76	297.25	2,164.29	10.94	-16.91	19.37	2.17	2.17	-1.33	
2,258.00	8.07	293.63	2,256.51	16.06	-27.75	31.24	1.49	1.41	-3.89	
2,351.00	8.87	288.15	2,348.49	20.91	-40.55	44.89	1.22	0.86	-5.89	
2,445.00	10.05	286.09	2,441.22	25.45	-55.31	60.34	1.31	1.26	-2.19	
2,538.00	11.63	282.19	2,532.55	29.67	-72.28	77.79	1.87	1.70	-4.19	
2,631.00	10.56	280.72	2,623.81	33.24	-89.81	95.60	1.19	-1.15	-1.58	
2,725.00	10.71	292.23	2,716.21	38.15	-106.36	112.87	2.26	0.16	12.24	
2,818.00	11.55	293.86	2,807.46	45.18	-122.88	130.72	0.96	0.90	1.75	
2,903.00	11.49	287.50	2,890.75	51.17	-138.73	147.63	1.50	-0.07	-7.48	
2,989.00	10.78	284.85	2,975.13	55.81	-154.68	164.23	1.02	-0.83	-3.08	
3,074.00	11.20	285.57	3,058.57	60.06	-170.31	180.43	0.52	0.49	0.85	
3,159.00	11.86	285.89	3,141.86	64.67	-186.66	197.41	0.78	0.78	0.38	
3,245.00	10.66	286.12	3,226.20	69.30	-202.81	214.20	1.40	-1.40	0.27	
3,330.00	10.82	285.50	3,309.71	73.61	-218.05	230.04	0.23	0.19	-0.73	
3,415.00	11.53	285.78	3,393.10	78.05	-233.91	246.51	0.84	0.84	0.33	
3,501.00	10.25	285.08	3,477.55	82.38	-249.57	262.75	1.50	-1.49	-0.81	
3,586.00	9.43	284.14	3,561.30	86.05	-263.62	277.26	0.98	-0.96	-1.11	
3,672.00	10.35	283.75	3,646.02	89.61	-277.96	292.01	1.07	1.07	-0.45	
3,757.00	12.16	287.36	3,729.38	94.09	-293.92	308.59	2.28	2.13	4.25	
3,843.00	12.36	287.88	3,813.42	99.62	-311.33	326.85	0.27	0.23	0.60	
3,928.00	10.85	288.05	3,896.68	104.89	-327.59	343.95	1.78	-1.78	0.20	
4,014.00	10.94	283.39	3,981.13	109.29	-343.23	360.18	1.03	0.10	-5.42	
4,099.00	10.57	284.38	4,064.64	113.10	-358.63	376.02	0.49	-0.44	1.16	
4,184.00	12.54	282.47	4,147.91	117.02	-375.19	393.01	2.36	2.32	-2.25	
4,270.00	12.32	282.63	4,231.90	121.05	-393.26	411.47	0.26	-0.26	0.19	
4,355.00	11.52	285.99	4,315.06	125.37	-410.27	429.00	1.25	-0.94	3.95	
4,441.00	10.51	286.07	4,399.48	129.90	-426.06	445.42	1.17	-1.17	0.09	
4,526.00	11.05	290.84	4,482.98	134.95	-441.12	461.30	1.23	0.64	5.61	

# Anadarko Petroleum Corp

## Survey Report

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<b>Project:</b>	COLORADO NORTHERN ZONE - 83	<b>TVD Reference:</b>	16'RKB+4977'GL @ 4993.00ft (XTREME 23)
<b>Site:</b>	WELD_SPARBOE 4 PAD	<b>MD Reference:</b>	16'RKB+4977'GL @ 4993.00ft (XTREME 23)
<b>Well:</b>	SPARBOE 7C-3HZ	<b>North Reference:</b>	True
<b>Wellbore:</b>	Wellbore #1	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	ACTUAL	<b>Database:</b>	edmp

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)
4,612.00	11.77	290.40	4,567.28	140.94	-457.05	478.28	0.84	0.84	-0.51
4,697.00	11.34	289.68	4,650.56	146.77	-473.04	495.28	0.53	-0.51	-0.85
4,782.00	10.69	289.56	4,733.99	152.23	-488.34	511.51	0.77	-0.76	-0.14
4,868.00	10.77	285.38	4,818.49	157.03	-503.60	527.51	0.91	0.09	-4.86
4,953.00	10.92	282.80	4,901.97	160.92	-519.11	543.48	0.60	0.18	-3.04
5,039.00	11.41	283.66	4,986.34	164.73	-535.32	560.09	0.60	0.57	1.00
5,124.00	12.17	286.84	5,069.55	169.32	-552.07	577.45	1.18	0.89	3.74
5,209.00	10.11	281.93	5,152.95	173.45	-567.94	593.84	2.67	-2.42	-5.78
5,295.00	10.61	281.59	5,237.54	176.60	-583.08	609.24	0.59	0.58	-0.40
5,380.00	11.50	287.41	5,320.97	180.71	-598.84	625.50	1.68	1.05	6.85
5,466.00	11.27	286.05	5,405.28	185.60	-615.09	642.48	0.41	-0.27	-1.58
5,551.00	11.34	286.12	5,488.63	190.22	-631.10	659.14	0.08	0.08	0.08
5,636.00	10.23	287.27	5,572.12	194.78	-646.34	675.04	1.33	-1.31	1.35
5,722.00	9.17	289.37	5,656.89	199.32	-660.10	689.53	1.30	-1.23	2.44
5,807.00	7.73	287.96	5,740.97	203.33	-671.92	702.01	1.71	-1.69	-1.66
5,893.00	7.75	283.81	5,826.19	206.50	-683.06	713.58	0.65	0.02	-4.83
5,978.00	7.91	290.23	5,910.40	209.89	-694.11	725.15	1.05	0.19	7.55
6,063.00	7.79	289.22	5,994.60	213.80	-705.04	736.74	0.22	-0.14	-1.19
6,148.00	8.11	289.29	6,078.78	217.68	-716.14	748.49	0.38	0.38	0.08
6,234.00	7.39	289.25	6,164.00	221.51	-727.08	760.08	0.84	-0.84	-0.05
6,319.00	6.31	287.92	6,248.39	224.75	-736.69	770.21	1.28	-1.27	-1.56
6,404.00	5.56	286.34	6,332.93	227.34	-745.09	779.00	0.90	-0.88	-1.86
6,490.00	4.16	290.97	6,418.62	229.63	-752.00	786.28	1.69	-1.63	5.38
6,575.00	2.51	295.74	6,503.47	231.54	-756.55	791.19	1.97	-1.94	5.61
6,660.00	0.98	229.52	6,588.44	231.88	-758.78	793.42	2.70	-1.80	-77.91
6,708.00	1.29	192.84	6,636.43	231.09	-759.21	793.60	1.61	0.65	-76.42
6,751.00	4.71	180.98	6,679.36	228.85	-759.35	793.08	8.04	7.95	-27.58
6,794.00	9.34	178.58	6,722.03	223.59	-759.30	791.49	10.79	10.77	-5.58
6,836.00	13.82	179.30	6,763.16	215.17	-759.15	788.89	10.67	10.67	1.71
6,879.00	14.49	178.97	6,804.86	204.65	-758.99	785.66	1.57	1.56	-0.77
6,922.00	17.53	175.59	6,846.19	192.81	-758.40	781.64	7.39	7.07	-7.86
6,964.00	21.10	174.48	6,885.82	178.98	-757.18	776.43	8.54	8.50	-2.64
7,007.00	24.47	176.13	6,925.46	162.38	-755.84	770.29	7.98	7.84	3.84
7,050.00	28.51	179.40	6,963.94	143.23	-755.13	764.02	9.99	9.40	7.60
7,092.00	31.89	179.59	7,000.23	122.10	-754.94	757.67	8.05	8.05	0.45
7,135.00	36.22	179.27	7,035.85	98.03	-754.70	750.40	10.08	10.07	-0.74
7,178.00	39.27	180.71	7,069.85	71.71	-754.71	742.72	7.38	7.09	3.35
7,221.00	43.89	181.42	7,102.00	43.19	-755.24	734.89	10.80	10.74	1.65
7,263.00	48.90	182.16	7,130.96	12.80	-756.20	726.93	12.00	11.93	1.76
7,306.00	52.57	182.50	7,158.17	-20.46	-757.56	718.51	8.56	8.53	0.79
7,348.00	55.18	182.80	7,182.93	-54.34	-759.13	710.10	6.24	6.21	0.71
7,391.00	56.87	182.12	7,206.96	-89.97	-760.66	701.15	4.14	3.93	-1.58
7,435.00	60.68	180.78	7,229.76	-127.57	-761.60	691.07	9.04	8.66	-3.05
7,477.00	67.27	180.04	7,248.18	-165.29	-761.86	680.29	15.77	15.69	-1.76

# Anadarko Petroleum Corp

## Survey Report

<b>Company:</b>	US ROCKIES REGION PLANNING	<b>Local Co-ordinate Reference:</b>	Well SPARBOE 7C-3HZ
<b>Project:</b>	COLORADO NORTHERN ZONE - 83	<b>TVD Reference:</b>	16'RKB+4977'GL @ 4993.00ft (XTREME 23)
<b>Site:</b>	WELD_SPARBOE 4 PAD	<b>MD Reference:</b>	16'RKB+4977'GL @ 4993.00ft (XTREME 23)
<b>Well:</b>	SPARBOE 7C-3HZ	<b>North Reference:</b>	True
<b>Wellbore:</b>	Wellbore #1	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	ACTUAL	<b>Database:</b>	edmp

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)
7,520.00	74.88	179.97	7,262.12	-205.94	-761.87	668.42	17.70	17.70	-0.16
7,563.00	78.82	180.03	7,271.90	-247.80	-761.87	656.18	9.16	9.16	0.14
7,605.00	81.45	179.61	7,279.09	-289.18	-761.74	643.97	6.34	6.26	-1.00
7,637.00	83.21	179.28	7,283.37	-320.89	-761.43	634.40	5.59	5.50	-1.03
7,685.00	86.28	179.21	7,287.76	-368.68	-760.80	619.83	6.39	6.39	-0.15
<b>7 IN. CASING</b>									
7,757.00	90.88	179.10	7,289.55	-440.63	-759.73	597.79	6.39	6.39	-0.15
7,850.00	91.05	178.55	7,287.98	-533.59	-757.83	568.80	0.62	0.18	-0.59
7,944.00	91.05	178.24	7,286.26	-627.54	-755.20	538.82	0.33	0.00	-0.33
8,037.00	90.18	178.93	7,285.26	-720.50	-752.90	509.46	1.19	-0.94	0.74
8,130.00	90.35	179.28	7,284.83	-813.49	-751.45	480.89	0.42	0.18	0.38
8,224.00	90.99	179.81	7,283.73	-907.48	-750.70	452.71	0.88	0.68	0.56
8,317.00	88.95	180.61	7,283.78	-1,000.48	-751.04	425.86	2.36	-2.19	0.86
8,410.00	88.46	180.02	7,285.88	-1,093.45	-751.55	399.17	0.82	-0.53	-0.63
8,504.00	90.44	178.22	7,286.78	-1,187.43	-750.11	370.33	2.85	2.11	-1.91
8,597.00	90.00	178.75	7,286.43	-1,280.39	-747.65	340.81	0.74	-0.47	0.57
8,691.00	91.32	179.45	7,285.34	-1,374.37	-746.17	311.93	1.59	1.40	0.74
8,784.00	91.79	181.51	7,282.82	-1,467.33	-746.95	285.51	2.27	0.51	2.22
8,878.00	89.01	181.15	7,282.16	-1,561.29	-749.13	260.13	2.98	-2.96	-0.38
8,971.00	88.77	181.57	7,283.96	-1,654.25	-751.34	235.08	0.52	-0.26	0.45
9,062.00	88.15	181.00	7,286.41	-1,745.19	-753.38	210.45	0.93	-0.68	-0.63
9,153.00	90.86	179.15	7,287.20	-1,836.18	-753.50	183.97	3.61	2.98	-2.03
9,244.00	90.06	179.77	7,286.47	-1,927.17	-752.64	156.56	1.11	-0.88	0.68
9,335.00	89.63	179.39	7,286.71	-2,018.16	-751.97	129.33	0.63	-0.47	-0.42
9,427.00	90.31	179.95	7,286.76	-2,110.16	-751.44	101.93	0.96	0.74	0.61
9,512.00	89.32	179.80	7,287.03	-2,195.16	-751.26	76.91	1.18	-1.16	-0.18
9,596.00	88.27	178.24	7,288.80	-2,279.13	-749.82	51.00	2.24	-1.25	-1.86
9,681.00	89.88	177.19	7,290.17	-2,364.04	-746.43	22.94	2.26	1.89	-1.24
9,767.00	90.49	178.14	7,289.90	-2,449.97	-742.93	-5.52	1.31	0.71	1.10
9,852.00	91.23	178.70	7,288.62	-2,534.93	-740.59	-32.59	1.09	0.87	0.66
9,937.00	91.48	181.30	7,286.61	-2,619.90	-740.59	-57.42	3.07	0.29	3.06
10,023.00	91.36	181.26	7,284.48	-2,705.85	-742.51	-80.71	0.15	-0.14	-0.05
10,108.00	91.15	181.22	7,282.62	-2,790.81	-744.35	-103.78	0.25	-0.25	-0.05
10,194.00	90.74	180.98	7,281.20	-2,876.78	-746.00	-127.32	0.55	-0.48	-0.28
10,279.00	90.62	181.05	7,280.19	-2,961.76	-747.50	-150.72	0.16	-0.14	0.08
10,365.00	90.37	180.77	7,279.45	-3,047.75	-748.87	-174.54	0.44	-0.29	-0.33
10,450.00	90.49	180.52	7,278.81	-3,132.74	-749.83	-198.47	0.33	0.14	-0.29
10,536.00	90.06	180.22	7,278.40	-3,218.74	-750.38	-223.07	0.61	-0.50	-0.35
10,621.00	90.06	180.38	7,278.31	-3,303.73	-750.83	-247.48	0.19	0.00	0.19
10,706.00	90.00	179.68	7,278.26	-3,388.73	-750.87	-272.28	0.83	-0.07	-0.82
10,792.00	89.94	179.59	7,278.31	-3,474.73	-750.32	-297.94	0.13	-0.07	-0.10
10,877.00	90.37	179.36	7,278.08	-3,559.73	-749.54	-323.53	0.57	0.51	-0.27
10,962.00	91.48	179.66	7,276.71	-3,644.71	-748.82	-349.06	1.35	1.31	0.35

# Anadarko Petroleum Corp

## Survey Report

<b>Company:</b>	US ROCKIES REGION PLANNING	<b>Local Co-ordinate Reference:</b>	Well SPARBOE 7C-3HZ
<b>Project:</b>	COLORADO NORTHERN ZONE - 83	<b>TVD Reference:</b>	16'RKB+4977'GL @ 4993.00ft (XTREME 23)
<b>Site:</b>	WELD_SPARBOE 4 PAD	<b>MD Reference:</b>	16'RKB+4977'GL @ 4993.00ft (XTREME 23)
<b>Well:</b>	SPARBOE 7C-3HZ	<b>North Reference:</b>	True
<b>Wellbore:</b>	Wellbore #1	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	ACTUAL	<b>Database:</b>	edmp

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)	
11,048.00	91.54	180.33	7,274.44	-3,730.68	-748.81	-374.19	0.78	0.07	0.78	
11,133.00	91.79	179.81	7,271.97	-3,815.65	-748.91	-398.92	0.68	0.29	-0.61	
11,218.00	91.42	180.60	7,269.59	-3,900.61	-749.22	-423.46	1.03	-0.44	0.93	
11,304.00	87.66	180.64	7,270.28	-3,986.59	-750.15	-447.70	4.37	-4.37	0.05	
11,389.00	88.58	179.92	7,273.07	-4,071.54	-750.56	-472.13	1.37	1.08	-0.85	
11,475.00	89.01	179.98	7,274.88	-4,157.52	-750.49	-497.33	0.50	0.50	0.07	
11,560.00	89.14	180.25	7,276.25	-4,242.51	-750.66	-522.01	0.35	0.15	0.32	
11,646.00	89.26	180.05	7,277.45	-4,328.50	-750.88	-546.92	0.27	0.14	-0.23	
11,731.00	88.89	179.76	7,278.82	-4,413.49	-750.74	-571.90	0.55	-0.44	-0.34	
11,817.00	89.69	180.29	7,279.89	-4,499.48	-750.78	-596.99	1.12	0.93	0.62	
11,902.00	90.55	180.05	7,279.71	-4,584.48	-751.03	-621.59	1.05	1.01	-0.28	
11,987.00	90.74	180.00	7,278.75	-4,669.47	-751.07	-646.40	0.23	0.22	-0.06	
12,073.00	90.86	179.35	7,277.55	-4,755.46	-750.58	-671.99	0.77	0.14	-0.76	
12,158.00	90.80	179.13	7,276.32	-4,840.45	-749.45	-697.91	0.27	-0.07	-0.26	
12,244.00	91.11	178.69	7,274.89	-4,926.42	-747.82	-724.60	0.63	0.36	-0.51	
12,329.00	90.62	178.01	7,273.60	-5,011.37	-745.37	-751.77	0.99	-0.58	-0.80	
12,415.00	89.94	178.73	7,273.18	-5,097.34	-742.93	-779.23	1.15	-0.79	0.84	
12,500.00	89.69	179.29	7,273.46	-5,182.32	-741.46	-805.47	0.72	-0.29	0.66	
12,586.00	89.38	180.32	7,274.16	-5,268.32	-741.16	-830.88	1.25	-0.36	1.20	
12,671.00	90.79	181.04	7,274.03	-5,353.31	-742.17	-854.76	1.86	1.66	0.85	
12,756.00	91.36	180.42	7,272.43	-5,438.29	-743.26	-878.56	0.99	0.67	-0.73	
12,841.00	90.37	180.19	7,271.15	-5,523.28	-743.71	-902.96	1.20	-1.16	-0.27	
12,927.00	90.86	180.64	7,270.23	-5,609.27	-744.33	-927.50	0.77	0.57	0.52	
13,012.00	90.37	181.18	7,269.32	-5,694.25	-745.68	-951.04	0.86	-0.58	0.64	
13,098.00	89.81	180.48	7,269.18	-5,780.24	-746.93	-974.98	1.04	-0.65	-0.81	
13,183.00	90.31	180.84	7,269.09	-5,865.24	-747.91	-998.89	0.72	0.59	0.42	
13,269.00	90.37	180.59	7,268.58	-5,951.23	-748.98	-1,022.99	0.30	0.07	-0.29	
13,354.00	90.74	180.49	7,267.76	-6,036.22	-749.78	-1,047.07	0.45	0.44	-0.12	
13,439.00	90.31	180.31	7,266.98	-6,121.21	-750.37	-1,071.34	0.55	-0.51	-0.21	
13,525.00	89.63	180.64	7,267.02	-6,207.21	-751.09	-1,095.79	0.88	-0.79	0.38	
13,610.00	89.51	179.92	7,267.66	-6,292.21	-751.50	-1,120.23	0.86	-0.14	-0.85	
13,695.00	89.32	179.20	7,268.53	-6,377.20	-750.85	-1,145.70	0.88	-0.22	-0.85	
13,781.00	89.57	178.88	7,269.36	-6,463.18	-749.41	-1,172.20	0.47	0.29	-0.37	
13,866.00	89.51	178.36	7,270.05	-6,548.15	-747.36	-1,198.99	0.62	-0.07	-0.61	
13,952.00	90.99	178.64	7,269.67	-6,634.12	-745.11	-1,226.27	1.75	1.72	0.33	
14,037.00	90.18	178.59	7,268.80	-6,719.09	-743.06	-1,253.07	0.95	-0.95	-0.06	
14,122.00	91.42	178.57	7,267.62	-6,804.06	-740.95	-1,279.91	1.46	1.46	-0.02	
14,208.00	90.43	178.18	7,266.23	-6,890.01	-738.51	-1,307.37	1.24	-1.15	-0.45	
14,293.00	90.31	177.95	7,265.68	-6,974.96	-735.64	-1,334.94	0.31	-0.14	-0.27	
14,378.00	90.49	177.94	7,265.09	-7,059.90	-732.59	-1,362.68	0.21	0.21	-0.01	
14,432.00	90.80	177.59	7,264.48	-7,113.86	-730.49	-1,380.46	0.87	0.57	-0.65	
<b>LAST MWD SURVEY</b>										
14,488.00	90.80	177.59	7,263.70	-7,169.80	-728.13	-1,399.06	0.00	0.00	0.00	
<b>PROJECTION TO TD</b>										

# Anadarko Petroleum Corp

## Survey Report

<b>Company:</b>	US ROCKIES REGION PLANNING	<b>Local Co-ordinate Reference:</b>	Well SPARBOE 7C-3HZ
<b>Project:</b>	COLORADO NORTHERN ZONE - 83	<b>TVD Reference:</b>	16'RKB+4977'GL @ 4993.00ft (XTREME 23)
<b>Site:</b>	WELD_SPARBOE 4 PAD	<b>MD Reference:</b>	16'RKB+4977'GL @ 4993.00ft (XTREME 23)
<b>Well:</b>	SPARBOE 7C-3HZ	<b>North Reference:</b>	True
<b>Wellbore:</b>	Wellbore #1	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	ACTUAL	<b>Database:</b>	edmp

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)

Design Annotations					
Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment	
		+N/-S (ft)	+E/-W (ft)		
1,776.00	1,775.98	1.40	-1.93	TIE ON	
1,885.00	1,884.98	2.06	-2.08	FIRST MWD SURVEY	
7,685.00	7,287.76	-368.68	-760.80	7 IN. CASING	
14,432.00	7,264.48	-7,113.86	-730.49	LAST MWD SURVEY	
14,488.00	7,263.70	-7,169.80	-728.13	PROJECTION TO TD	

Checked By: _____	Approved By: _____	Date: _____
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