

US ROCKIES REGION PLANNING

COLORADO NORTHERN ZONE - 83

ADAMS_SUN EMPIRE PAD

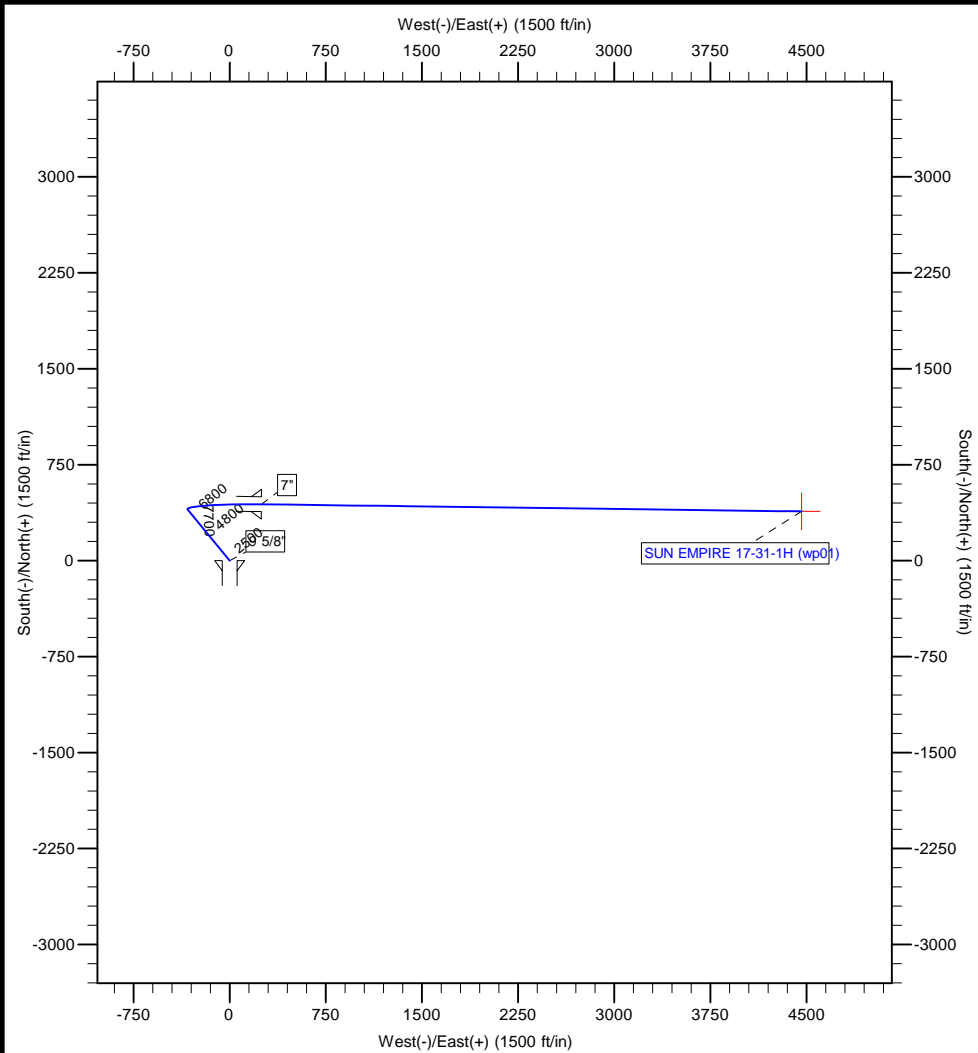
SUN EMPIRE 17-31-1H

SUN EMPIRE 17-31-1H

Plan: SUN EMPIRE 17-31-1H (wp01)

Standard Planning Report

24 October, 2011



Project: COLORADO NORTHERN ZONE - 83
Site: ADAMS_SUN EMPIRE PAD
Well: SUN EMPIRE 17-31-1H
Wellbore: SUN EMPIRE 17-31-1H
Section:
SHL:
Design: SUN EMPIRE 17-31-1H (wp01)
Latitude: 39.795375
Longitude: -104.695531
GL: 5446.00
KB: 25' RKB + 5446. GL @ 5471.00ft

WELL DETAILS: SUN EMPIRE 17-31-1H

+N/-S	+E/-W	Northing	Ground Level: Easting	5446.00 Latitude 39.795375	Longitude -104.695531	Slot
0.00	0.00	1169333.24	3226048.01			

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
2020.00	0.00	0.00	2020.00	0.00	0.00	0.00	0.00	0.00
2313.64	5.87	320.61	2313.13	11.62	-9.54	2.00	320.61	-8.51
7226.48	5.87	320.61	7200.18	400.09	-328.58	0.00	0.00	-292.89
8168.59	90.43	90.73	7809.00	441.00	248.00	10.00	129.94	285.07
8171.30	90.45	90.75	7808.98	440.97	250.70	1.00	49.88	287.76
12382.09	90.45	90.75	7776.00	385.80	4461.00	0.00	0.00	4477.66

WELLBORE TARGET DETAILS (MAP CO-ORDINATES AND LAT/LONG)

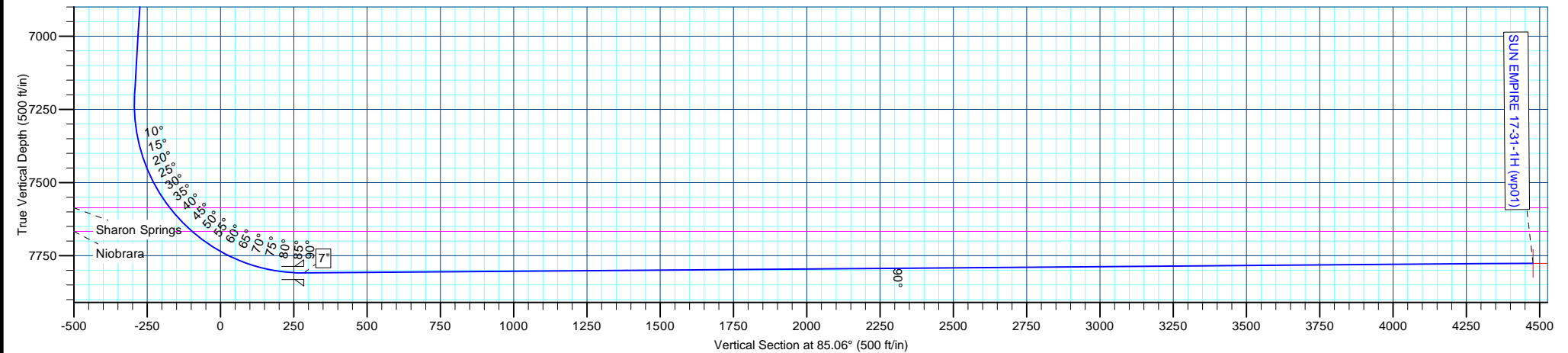
Name	TVD	+N/-S	+E/-W	Latitude	Longitude	Shape
SUN EMPIRE 17-31-1H BHL	7776.00	385.80	4461.00	39.796433	-104.679655	Point

FORMATION TOP DETAILS

TVDPath	MDPath	Formation
1723.00	1723.00	Fox Hills
2633.00	2635.20	Parkman
4956.00	4970.46	Sussex
5296.00	5312.25	Shannon
7586.00	7639.84	Sharon Springs
7667.00	7751.36	Niobrara

CASING DETAILS

TVD	MD	Name	Size
1870.00	1870.00	9 5/8"	9-5/8
7809.00	8168.00	7"	7



Anadarko Petroleum Corp

Planning Report

Database:	edmp	Local Co-ordinate Reference:	Well SUN EMPIRE 17-31-1H
Company:	US ROCKIES REGION PLANNING	TVD Reference:	25' RKB + 5446. GL @ 5471.00ft
Project:	COLORADO NORTHERN ZONE - 83	MD Reference:	25' RKB + 5446. GL @ 5471.00ft
Site:	ADAMS_SUN EMPIRE PAD	North Reference:	True
Well:	SUN EMPIRE 17-31-1H	Survey Calculation Method:	Minimum Curvature
Wellbore:	SUN EMPIRE 17-31-1H		
Design:	SUN EMPIRE 17-31-1H (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	ADAMS_SUN EMPIRE PAD				
Site Position:		Northing:	1,169,333.24 usft	Latitude:	39.795375
From:	Lat/Long	Easting:	3,226,048.01 usft	Longitude:	-104.695531
Position Uncertainty:	0.00 ft	Slot Radius:	13-3/16 "	Grid Convergence:	0.52 °

Well	SUN EMPIRE 17-31-1H					
Well Position	+N/-S	0.00 ft	Northing:	1,169,333.24 usft	Latitude:	39.795375
	+E/-W	0.00 ft	Easting:	3,226,048.01 usft	Longitude:	-104.695531
Position Uncertainty		0.00 ft	Wellhead Elevation:		Ground Level:	5,446.00 ft

Wellbore	SUN EMPIRE 17-31-1H				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	10/21/2011	8.73	66.56	52,777

Design	SUN EMPIRE 17-31-1H (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	85.06

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	
2,020.00	0.00	0.00	2,020.00	0.00	0.00	0.00	0.00	0.00	0.00	
2,313.64	5.87	320.61	2,313.13	11.62	-9.54	2.00	2.00	0.00	320.61	
7,226.48	5.87	320.61	7,200.18	400.09	-328.58	0.00	0.00	0.00	0.00	
8,168.60	90.43	90.73	7,809.00	441.00	248.00	10.00	8.98	13.81	129.94	
8,171.30	90.45	90.75	7,808.98	440.97	250.70	1.00	0.64	0.76	49.88	
12,382.09	90.45	90.75	7,776.00	385.80	4,461.00	0.00	0.00	0.00	0.00	SUN EMPIRE 17-31-'

Anadarko Petroleum Corp

Planning Report

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Company:	US ROCKIES REGION PLANNING	TVD Reference:	25' RKB + 5446. GL @ 5471.00ft
Project:	COLORADO NORTHERN ZONE - 83	MD Reference:	25' RKB + 5446. GL @ 5471.00ft
Site:	ADAMS_SUN EMPIRE PAD	North Reference:	True
Well:	SUN EMPIRE 17-31-1H	Survey Calculation Method:	Minimum Curvature
Wellbore:	SUN EMPIRE 17-31-1H		
Design:	SUN EMPIRE 17-31-1H (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
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	0.00	0.00	1,500.00	0.00	0.00	0.00	0.00	0.00	0.00
1,600.00	0.00	0.00	1,600.00	0.00	0.00	0.00	0.00	0.00	0.00
1,700.00	0.00	0.00	1,700.00	0.00	0.00	0.00	0.00	0.00	0.00
1,723.00	0.00	0.00	1,723.00	0.00	0.00	0.00	0.00	0.00	0.00
Fox Hills									
1,800.00	0.00	0.00	1,800.00	0.00	0.00	0.00	0.00	0.00	0.00
1,870.00	0.00	0.00	1,870.00	0.00	0.00	0.00	0.00	0.00	0.00
9 5/8"									
1,900.00	0.00	0.00	1,900.00	0.00	0.00	0.00	0.00	0.00	0.00
2,000.00	0.00	0.00	2,000.00	0.00	0.00	0.00	0.00	0.00	0.00
2,020.00	0.00	0.00	2,020.00	0.00	0.00	0.00	0.00	0.00	0.00
Start Build 2.00									
2,100.00	1.60	320.61	2,099.99	0.86	-0.71	-0.63	2.00	2.00	0.00
2,200.00	3.60	320.61	2,199.88	4.37	-3.59	-3.20	2.00	2.00	0.00
2,300.00	5.60	320.61	2,299.55	10.57	-8.68	-7.73	2.00	2.00	0.00
2,313.64	5.87	320.61	2,313.13	11.62	-9.54	-8.51	2.00	2.00	0.00
Start 4912.84 hold at 2313.64 MD									
2,400.00	5.87	320.61	2,399.03	18.45	-15.15	-13.50	0.00	0.00	0.00
2,500.00	5.87	320.61	2,498.51	26.36	-21.64	-19.29	0.00	0.00	0.00
2,600.00	5.87	320.61	2,597.98	34.26	-28.14	-25.08	0.00	0.00	0.00
2,635.20	5.87	320.61	2,633.00	37.05	-30.42	-27.12	0.00	0.00	0.00
Parkman									
2,700.00	5.87	320.61	2,697.46	42.17	-34.63	-30.87	0.00	0.00	0.00
2,800.00	5.87	320.61	2,796.93	50.08	-41.13	-36.66	0.00	0.00	0.00
2,900.00	5.87	320.61	2,896.41	57.98	-47.62	-42.45	0.00	0.00	0.00
3,000.00	5.87	320.61	2,995.88	65.89	-54.11	-48.24	0.00	0.00	0.00
3,100.00	5.87	320.61	3,095.36	73.80	-60.61	-54.02	0.00	0.00	0.00
3,200.00	5.87	320.61	3,194.83	81.71	-67.10	-59.81	0.00	0.00	0.00
3,300.00	5.87	320.61	3,294.31	89.61	-73.60	-65.60	0.00	0.00	0.00
3,400.00	5.87	320.61	3,393.78	97.52	-80.09	-71.39	0.00	0.00	0.00
3,500.00	5.87	320.61	3,493.26	105.43	-86.58	-77.18	0.00	0.00	0.00
3,600.00	5.87	320.61	3,592.73	113.34	-93.08	-82.97	0.00	0.00	0.00
3,700.00	5.87	320.61	3,692.21	121.24	-99.57	-88.76	0.00	0.00	0.00
3,800.00	5.87	320.61	3,791.68	129.15	-106.07	-94.54	0.00	0.00	0.00
3,900.00	5.87	320.61	3,891.16	137.06	-112.56	-100.33	0.00	0.00	0.00
4,000.00	5.87	320.61	3,990.64	144.97	-119.05	-106.12	0.00	0.00	0.00
4,100.00	5.87	320.61	4,090.11	152.87	-125.55	-111.91	0.00	0.00	0.00
4,200.00	5.87	320.61	4,189.59	160.78	-132.04	-117.70	0.00	0.00	0.00

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Planning Report

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Company:	US ROCKIES REGION PLANNING	TVD Reference:	25' RKB + 5446. GL @ 5471.00ft
Project:	COLORADO NORTHERN ZONE - 83	MD Reference:	25' RKB + 5446. GL @ 5471.00ft
Site:	ADAMS_SUN EMPIRE PAD	North Reference:	True
Well:	SUN EMPIRE 17-31-1H	Survey Calculation Method:	Minimum Curvature
Wellbore:	SUN EMPIRE 17-31-1H		
Design:	SUN EMPIRE 17-31-1H (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)
4,300.00	5.87	320.61	4,289.06	168.69	-138.54	-123.49	0.00	0.00	0.00
4,400.00	5.87	320.61	4,388.54	176.59	-145.03	-129.27	0.00	0.00	0.00
4,500.00	5.87	320.61	4,488.01	184.50	-151.52	-135.06	0.00	0.00	0.00
4,600.00	5.87	320.61	4,587.49	192.41	-158.02	-140.85	0.00	0.00	0.00
4,700.00	5.87	320.61	4,686.96	200.32	-164.51	-146.64	0.00	0.00	0.00
4,800.00	5.87	320.61	4,786.44	208.22	-171.01	-152.43	0.00	0.00	0.00
4,900.00	5.87	320.61	4,885.91	216.13	-177.50	-158.22	0.00	0.00	0.00
4,970.46	5.87	320.61	4,956.00	221.70	-182.07	-162.30	0.00	0.00	0.00
Sussex									
5,000.00	5.87	320.61	4,985.39	224.04	-183.99	-164.01	0.00	0.00	0.00
5,100.00	5.87	320.61	5,084.86	231.95	-190.49	-169.79	0.00	0.00	0.00
5,200.00	5.87	320.61	5,184.34	239.85	-196.98	-175.58	0.00	0.00	0.00
5,300.00	5.87	320.61	5,283.81	247.76	-203.48	-181.37	0.00	0.00	0.00
5,312.25	5.87	320.61	5,296.00	248.73	-204.27	-182.08	0.00	0.00	0.00
Shannon									
5,400.00	5.87	320.61	5,383.29	255.67	-209.97	-187.16	0.00	0.00	0.00
5,500.00	5.87	320.61	5,482.76	263.57	-216.46	-192.95	0.00	0.00	0.00
5,600.00	5.87	320.61	5,582.24	271.48	-222.96	-198.74	0.00	0.00	0.00
5,700.00	5.87	320.61	5,681.71	279.39	-229.45	-204.53	0.00	0.00	0.00
5,800.00	5.87	320.61	5,781.19	287.30	-235.94	-210.31	0.00	0.00	0.00
5,900.00	5.87	320.61	5,880.66	295.20	-242.44	-216.10	0.00	0.00	0.00
6,000.00	5.87	320.61	5,980.14	303.11	-248.93	-221.89	0.00	0.00	0.00
6,100.00	5.87	320.61	6,079.61	311.02	-255.43	-227.68	0.00	0.00	0.00
6,200.00	5.87	320.61	6,179.09	318.93	-261.92	-233.47	0.00	0.00	0.00
6,300.00	5.87	320.61	6,278.56	326.83	-268.41	-239.26	0.00	0.00	0.00
6,400.00	5.87	320.61	6,378.04	334.74	-274.91	-245.04	0.00	0.00	0.00
6,500.00	5.87	320.61	6,477.51	342.65	-281.40	-250.83	0.00	0.00	0.00
6,600.00	5.87	320.61	6,576.99	350.55	-287.90	-256.62	0.00	0.00	0.00
6,700.00	5.87	320.61	6,676.46	358.46	-294.39	-262.41	0.00	0.00	0.00
6,800.00	5.87	320.61	6,775.94	366.37	-300.88	-268.20	0.00	0.00	0.00
6,900.00	5.87	320.61	6,875.41	374.28	-307.38	-273.99	0.00	0.00	0.00
7,000.00	5.87	320.61	6,974.89	382.18	-313.87	-279.78	0.00	0.00	0.00
7,100.00	5.87	320.61	7,074.36	390.09	-320.37	-285.56	0.00	0.00	0.00
7,200.00	5.87	320.61	7,173.84	398.00	-326.86	-291.35	0.00	0.00	0.00
7,226.48	5.87	320.61	7,200.18	400.09	-328.58	-292.89	0.00	0.00	0.00
Start DLS 10.00 TFO 129.94									
7,300.00	5.74	39.22	7,273.42	405.86	-328.64	-292.45	10.00	-0.18	106.93
7,400.00	14.29	72.70	7,371.88	413.42	-313.66	-276.87	10.00	8.54	33.48
7,500.00	23.97	80.50	7,466.26	420.46	-281.76	-244.48	10.00	9.69	7.81
7,600.00	33.84	83.96	7,553.69	426.76	-233.91	-196.27	10.00	9.86	3.45
7,639.84	37.79	84.87	7,586.00	429.02	-210.71	-172.96	10.00	9.91	2.30
Sharon Springs									
7,700.00	43.76	85.98	7,631.54	432.13	-171.57	-133.70	10.00	9.93	1.85
7,751.36	48.86	86.75	7,667.00	434.47	-134.52	-96.58	10.00	9.94	1.50
Niobrara									
7,800.00	53.70	87.38	7,697.41	436.41	-96.63	-58.67	10.00	9.95	1.29
7,900.00	63.66	88.46	7,749.33	439.46	-11.36	26.54	10.00	9.96	1.08
8,000.00	73.63	89.37	7,785.70	441.19	81.64	119.35	10.00	9.96	0.91
8,001.04	73.73	89.38	7,785.99	441.20	82.63	120.34	10.00	9.97	0.85
SUN EMPIRE 17-31-1H heel									
8,100.00	83.59	90.19	7,805.43	441.55	179.54	216.92	10.00	9.97	0.82
8,168.00	90.37	90.73	7,809.00	441.01	247.41	284.48	10.00	9.97	0.79
7"									

Anadarko Petroleum Corp

Planning Report

Database:	edmp	Local Co-ordinate Reference:	Well SUN EMPIRE 17-31-1H
Company:	US ROCKIES REGION PLANNING	TVD Reference:	25' RKB + 5446. GL @ 5471.00ft
Project:	COLORADO NORTHERN ZONE - 83	MD Reference:	25' RKB + 5446. GL @ 5471.00ft
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Wellbore:	SUN EMPIRE 17-31-1H		
Design:	SUN EMPIRE 17-31-1H (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)	
8,168.60	90.43	90.73	7,809.00	441.00	248.00	285.07	10.00	9.97	0.78	
Start DLS 1.00 TFO 49.88										
8,171.30	90.45	90.75	7,808.98	440.97	250.70	287.76	1.00	0.64	0.76	
Start 4210.79 hold at 8171.30 MD										
8,200.00	90.45	90.75	7,808.75	440.59	279.40	316.32	0.00	0.00	0.00	
8,300.00	90.45	90.75	7,807.97	439.28	379.39	415.83	0.00	0.00	0.00	
8,400.00	90.45	90.75	7,807.19	437.97	479.38	515.33	0.00	0.00	0.00	
8,500.00	90.45	90.75	7,806.40	436.66	579.37	614.84	0.00	0.00	0.00	
8,600.00	90.45	90.75	7,805.62	435.35	679.35	714.34	0.00	0.00	0.00	
8,700.00	90.45	90.75	7,804.84	434.04	779.34	813.84	0.00	0.00	0.00	
8,800.00	90.45	90.75	7,804.06	432.73	879.33	913.35	0.00	0.00	0.00	
8,900.00	90.45	90.75	7,803.27	431.42	979.32	1,012.85	0.00	0.00	0.00	
9,000.00	90.45	90.75	7,802.49	430.11	1,079.31	1,112.35	0.00	0.00	0.00	
9,100.00	90.45	90.75	7,801.71	428.80	1,179.30	1,211.86	0.00	0.00	0.00	
9,200.00	90.45	90.75	7,800.92	427.49	1,279.28	1,311.36	0.00	0.00	0.00	
9,300.00	90.45	90.75	7,800.14	426.18	1,379.27	1,410.86	0.00	0.00	0.00	
9,400.00	90.45	90.75	7,799.36	424.87	1,479.26	1,510.37	0.00	0.00	0.00	
9,500.00	90.45	90.75	7,798.57	423.56	1,579.25	1,609.87	0.00	0.00	0.00	
9,600.00	90.45	90.75	7,797.79	422.25	1,679.24	1,709.38	0.00	0.00	0.00	
9,700.00	90.45	90.75	7,797.01	420.94	1,779.23	1,808.88	0.00	0.00	0.00	
9,800.00	90.45	90.75	7,796.22	419.63	1,879.22	1,908.38	0.00	0.00	0.00	
9,900.00	90.45	90.75	7,795.44	418.32	1,979.20	2,007.89	0.00	0.00	0.00	
10,000.00	90.45	90.75	7,794.66	417.01	2,079.19	2,107.39	0.00	0.00	0.00	
10,100.00	90.45	90.75	7,793.87	415.70	2,179.18	2,206.89	0.00	0.00	0.00	
10,200.00	90.45	90.75	7,793.09	414.39	2,279.17	2,306.40	0.00	0.00	0.00	
10,300.00	90.45	90.75	7,792.31	413.08	2,379.16	2,405.90	0.00	0.00	0.00	
10,400.00	90.45	90.75	7,791.52	411.77	2,479.15	2,505.40	0.00	0.00	0.00	
10,500.00	90.45	90.75	7,790.74	410.46	2,579.13	2,604.91	0.00	0.00	0.00	
10,600.00	90.45	90.75	7,789.96	409.15	2,679.12	2,704.41	0.00	0.00	0.00	
10,700.00	90.45	90.75	7,789.17	407.84	2,779.11	2,803.92	0.00	0.00	0.00	
10,800.00	90.45	90.75	7,788.39	406.53	2,879.10	2,903.42	0.00	0.00	0.00	
10,900.00	90.45	90.75	7,787.61	405.22	2,979.09	3,002.92	0.00	0.00	0.00	
11,000.00	90.45	90.75	7,786.82	403.91	3,079.08	3,102.43	0.00	0.00	0.00	
11,100.00	90.45	90.75	7,786.04	402.60	3,179.06	3,201.93	0.00	0.00	0.00	
11,200.00	90.45	90.75	7,785.26	401.29	3,279.05	3,301.43	0.00	0.00	0.00	
11,300.00	90.45	90.75	7,784.48	399.98	3,379.04	3,400.94	0.00	0.00	0.00	
11,400.00	90.45	90.75	7,783.69	398.67	3,479.03	3,500.44	0.00	0.00	0.00	
11,500.00	90.45	90.75	7,782.91	397.36	3,579.02	3,599.94	0.00	0.00	0.00	
11,600.00	90.45	90.75	7,782.13	396.05	3,679.01	3,699.45	0.00	0.00	0.00	
11,700.00	90.45	90.75	7,781.34	394.74	3,778.99	3,798.95	0.00	0.00	0.00	
11,800.00	90.45	90.75	7,780.56	393.43	3,878.98	3,898.46	0.00	0.00	0.00	
11,900.00	90.45	90.75	7,779.78	392.12	3,978.97	3,997.96	0.00	0.00	0.00	
12,000.00	90.45	90.75	7,778.99	390.81	4,078.96	4,097.46	0.00	0.00	0.00	
12,100.00	90.45	90.75	7,778.21	389.50	4,178.95	4,196.97	0.00	0.00	0.00	
12,200.00	90.45	90.75	7,777.43	388.19	4,278.94	4,296.47	0.00	0.00	0.00	
12,300.00	90.45	90.75	7,776.64	386.88	4,378.92	4,395.97	0.00	0.00	0.00	
12,382.09	90.45	90.75	7,776.00	385.80	4,461.00	4,477.66	0.00	0.00	0.00	
TD at 12382.09 - SUN EMPIRE 17-31-1H BHL										

Anadarko Petroleum Corp

Planning Report

Database:	edmp	Local Co-ordinate Reference:	Well SUN EMPIRE 17-31-1H
Company:	US ROCKIES REGION PLANNING	TVD Reference:	25' RKB + 5446. GL @ 5471.00ft
Project:	COLORADO NORTHERN ZONE - 83	MD Reference:	25' RKB + 5446. GL @ 5471.00ft
Site:	ADAMS_SUN EMPIRE PAD	North Reference:	True
Well:	SUN EMPIRE 17-31-1H	Survey Calculation Method:	Minimum Curvature
Wellbore:	SUN EMPIRE 17-31-1H		
Design:	SUN EMPIRE 17-31-1H (wp01)		

Design Targets									
Target Name	Dip Angle	Dip Dir.	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
- hit/miss target	(°)	(°)	(ft)	(ft)	(ft)	(usft)	(usft)		
- Shape									
SUN EMPIRE 17-31-1H	0.00	0.00	7,776.00	385.80	4,461.00	1,169,759.49	3,230,505.32	39.796433	-104.679655
- plan hits target center									
- Point									

Casing Points					
Measured Depth	Vertical Depth	Name		Casing Diameter	Hole Diameter
(ft)	(ft)			(")	(")
1,870.00	1,870.00	9 5/8"		9-5/8	12-1/4
8,168.00	7,809.00	7"		7	8-3/4

Formations					
Measured Depth	Vertical Depth	Name	Lithology	Dip	Dip Direction
(ft)	(ft)			(°)	(°)
1,723.00	1,723.00	Fox Hills			
2,635.20	2,633.00	Parkman			
4,970.46	4,956.00	Sussex			
5,312.25	5,296.00	Shannon			
7,639.84	7,586.00	Sharon Springs			
7,751.36	7,667.00	Niobrara			

Plan Annotations					
Measured Depth	Vertical Depth	Local Coordinates		Comment	
(ft)	(ft)	+N/-S (ft)	+E/-W (ft)		
2,020.00	2,020.00	0.00	0.00	Start Build 2.00	
2,313.64	2,313.13	11.62	-9.54	Start 4912.84 hold at 2313.64 MD	
7,226.48	7,200.18	400.09	-328.58	Start DLS 10.00 TFO 129.94	
8,168.60	7,809.00	441.00	248.00	Start DLS 1.00 TFO 49.88	
8,171.30	7,808.98	440.97	250.70	Start 4210.79 hold at 8171.30 MD	
12,382.09	7,776.00	385.80	4,461.00	TD at 12382.09	