

US ROCKIES REGION PLANNING

COLORADO NORTHERN ZONE - 83

ADAMS_SUN EMPIRE PAD

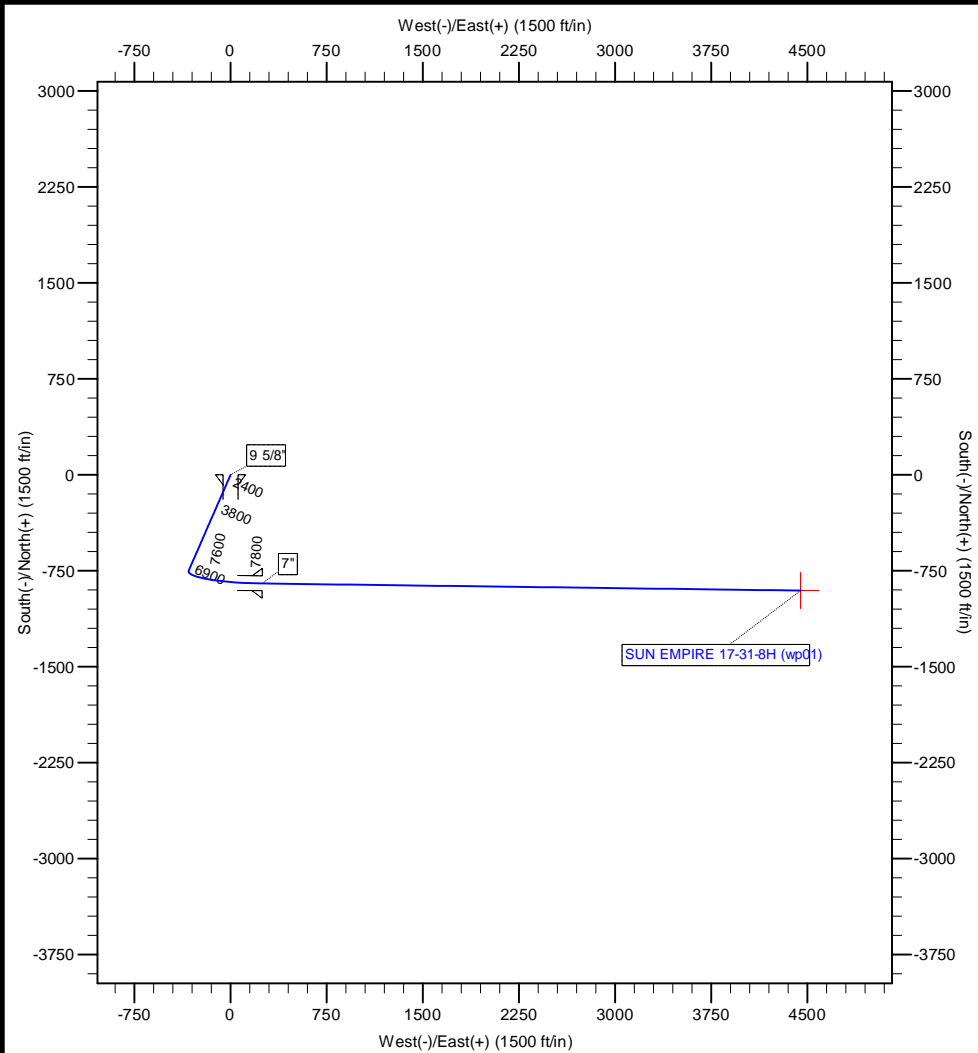
SUN EMPIRE 17-31-8H

SUN EMPIRE 17-31-8H

Plan: SUN EMPIRE 17-31-8H (wp01)

Standard Planning Report

21 October, 2011



Project: COLORADO NORTHERN ZONE - 83
Site: ADAMS_SUN EMPIRE PAD
Well: SUN EMPIRE 17-31-8H
Wellbore: SUN EMPIRE 17-31-8H
Section:
SHL:
Design: SUN EMPIRE 17-31-8H (wp01)
Latitude: 39.795293
Longitude: -104.695532
GL: 5448.00
KB: 25' RKB + 5448' GL @ 5473.00ft

WELL DETAILS: SUN EMPIRE 17-31-8H

| +N/-S | +E/-W | Northing | Ground Level: Easting | 5448.00 Latitude 39.795293 | Longitude -104.695532 | Slot |
|-------|-------|------------|--------------------------|----------------------------------|--------------------------|------|
| 0.00 | 0.00 | 1169303.37 | 3226048.00 | | | |

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 |
| 2030.00 | 0.00 | 0.00 | 2030.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 2499.25 | 9.39 | 203.54 | 2497.16 | -35.15 | -15.32 | 2.00 | 203.54 | -8.00 |
| 7276.91 | 9.39 | 203.54 | 7210.86 | -749.40 | -326.49 | 0.00 | 0.00 | -170.63 |
| 8217.06 | 90.39 | 90.72 | 7813.00 | -849.00 | 248.00 | 10.00 | -112.49 | 412.19 |
| 8221.01 | 90.41 | 90.76 | 7812.97 | -849.05 | 251.96 | 1.00 | 66.27 | 416.07 |
| 12417.84 | 90.41 | 90.76 | 7783.00 | -904.44 | 4448.31 | 0.00 | 0.00 | 4539.33 |

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

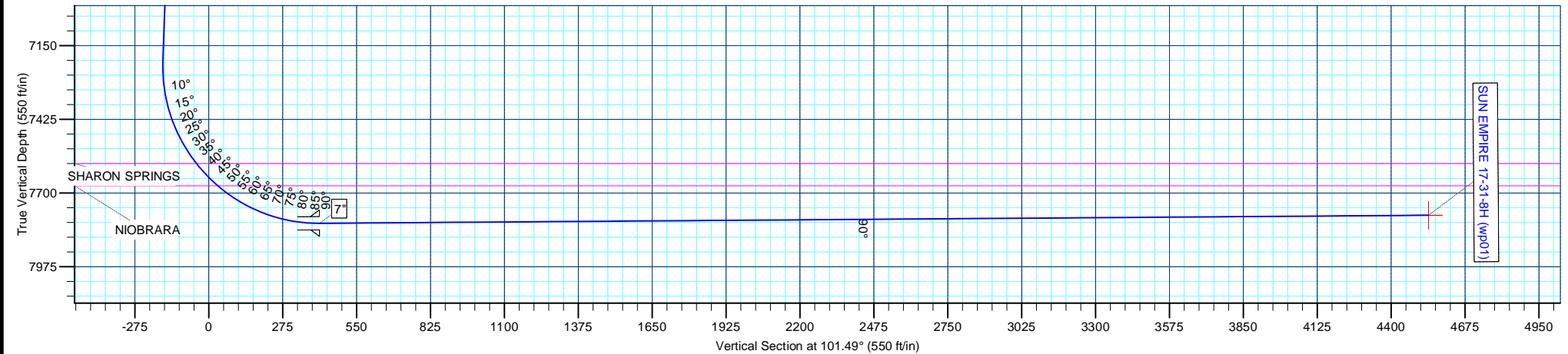
| Name | TVD | +N/-S | +E/-W | Latitude | Longitude | Shape |
|-------------------------|---------|---------|---------|-----------|-------------|-------|
| SUN EMPIRE 17-31-8H BHL | 7783.00 | -904.44 | 4448.31 | 39.792809 | -104.679702 | Point |

FORMATION TOP DETAILS

| TVDPath | MDPath | Formation |
|---------|---------|----------------|
| 1726.00 | 1726.00 | FOX HILLS |
| 2633.00 | 2636.94 | PARKMAN |
| 4963.00 | 4998.55 | SUSSEX |
| 5303.00 | 5343.16 | SHANNON |
| 7590.00 | 7686.28 | SHARON SPRINGS |
| 7673.00 | 7801.42 | NIOBRARA |

CASING DETAILS

| TVD | MD | Name | Size |
|---------|---------|--------|-------|
| 1880.00 | 1880.00 | 9 5/8" | 9-5/8 |
| 7813.00 | 8217.06 | 7" | 7 |



Anadarko Petroleum Corp

Planning Report

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|------------------|-----------------------------|-------------------------------------|--------------------------------|
| Database: | edmp | Local Co-ordinate Reference: | Well SUN EMPIRE 17-31-8H |
| Company: | US ROCKIES REGION PLANNING | TVD Reference: | 25' RKB + 5448' GL @ 5473.00ft |
| Project: | COLORADO NORTHERN ZONE - 83 | MD Reference: | 25' RKB + 5448' GL @ 5473.00ft |
| Site: | ADAMS_SUN EMPIRE PAD | North Reference: | True |
| Well: | SUN EMPIRE 17-31-8H | Survey Calculation Method: | Minimum Curvature |
| Wellbore: | SUN EMPIRE 17-31-8H | | |
| Design: | SUN EMPIRE 17-31-8H (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 17-31-8H | | | | | |
|----------------------|---------------------|-----------|---------------------|-------------------|---------------|-------------|
| Well Position | +N/-S | -29.88 ft | Northing: | 1,169,303.36 usft | Latitude: | 39.795293 |
| | +E/-W | -0.28 ft | Easting: | 3,226,048.00 usft | Longitude: | -104.695532 |
| Position Uncertainty | | 0.00 ft | Wellhead Elevation: | | Ground Level: | 5,448.00 ft |

| | | | | | |
|------------------|---------------------|--------------------|----------------------------|--------------------------|--------------------------------|
| Wellbore | SUN EMPIRE 17-31-8H | | | | |
| Magnetics | Model Name | Sample Date | Declination (°) | Dip Angle (°) | Field Strength (nT) |
| | IGRF2010 | 10/21/2011 | 8.73 | 66.56 | 52,777 |

| | | | | |
|--------------------------|----------------------------------|-----------------------|-----------------------|--------------------------|
| Design | SUN EMPIRE 17-31-8H (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 | 101.49 |

| 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 | |
| 2,030.00 | 0.00 | 0.00 | 2,030.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | |
| 2,499.25 | 9.39 | 203.54 | 2,497.16 | -35.15 | -15.32 | 2.00 | 2.00 | 0.00 | 203.54 | |
| 7,276.91 | 9.39 | 203.54 | 7,210.86 | -749.40 | -326.49 | 0.00 | 0.00 | 0.00 | 0.00 | |
| 8,217.06 | 90.39 | 90.72 | 7,813.00 | -849.00 | 248.00 | 10.00 | 8.62 | -12.00 | -112.49 | |
| 8,221.02 | 90.41 | 90.76 | 7,812.97 | -849.05 | 251.96 | 1.00 | 0.40 | 0.92 | 66.27 | |
| 12,417.84 | 90.41 | 90.76 | 7,783.00 | -904.44 | 4,448.31 | 0.00 | 0.00 | 0.00 | 0.00 | SUN EMPIRE 17-31-8H |

Anadarko Petroleum Corp

Planning Report

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|------------------|-----------------------------|-------------------------------------|--------------------------------|
| Database: | edmp | Local Co-ordinate Reference: | Well SUN EMPIRE 17-31-8H |
| Company: | US ROCKIES REGION PLANNING | TVD Reference: | 25' RKB + 5448' GL @ 5473.00ft |
| Project: | COLORADO NORTHERN ZONE - 83 | MD Reference: | 25' RKB + 5448' GL @ 5473.00ft |
| Site: | ADAMS_SUN EMPIRE PAD | North Reference: | True |
| Well: | SUN EMPIRE 17-31-8H | Survey Calculation Method: | Minimum Curvature |
| Wellbore: | SUN EMPIRE 17-31-8H | | |
| Design: | SUN EMPIRE 17-31-8H (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 |
| 1,726.00 | 0.00 | 0.00 | 1,726.00 | 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 |
| 1,880.00 | 0.00 | 0.00 | 1,880.00 | 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 |
| 2,030.00 | 0.00 | 0.00 | 2,030.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Start Build 2.00 | | | | | | | | | |
| 2,100.00 | 1.40 | 203.54 | 2,099.99 | -0.78 | -0.34 | -0.18 | 2.00 | 2.00 | 0.00 |
| 2,200.00 | 3.40 | 203.54 | 2,199.90 | -4.62 | -2.01 | -1.05 | 2.00 | 2.00 | 0.00 |
| 2,300.00 | 5.40 | 203.54 | 2,299.60 | -11.66 | -5.08 | -2.65 | 2.00 | 2.00 | 0.00 |
| 2,400.00 | 7.40 | 203.54 | 2,398.97 | -21.87 | -9.53 | -4.98 | 2.00 | 2.00 | 0.00 |
| 2,499.25 | 9.39 | 203.54 | 2,497.16 | -35.15 | -15.32 | -8.00 | 2.00 | 2.00 | 0.00 |
| Start 4777.65 hold at 2499.25 MD | | | | | | | | | |
| 2,500.00 | 9.39 | 203.54 | 2,497.89 | -35.27 | -15.36 | -8.03 | 0.00 | 0.00 | 0.00 |
| 2,600.00 | 9.39 | 203.54 | 2,596.56 | -50.22 | -21.88 | -11.43 | 0.00 | 0.00 | 0.00 |
| 2,636.94 | 9.39 | 203.54 | 2,633.00 | -55.74 | -24.28 | -12.69 | 0.00 | 0.00 | 0.00 |
| PARKMAN | | | | | | | | | |
| 2,700.00 | 9.39 | 203.54 | 2,695.22 | -65.17 | -28.39 | -14.84 | 0.00 | 0.00 | 0.00 |
| 2,800.00 | 9.39 | 203.54 | 2,793.88 | -80.12 | -34.90 | -18.24 | 0.00 | 0.00 | 0.00 |
| 2,900.00 | 9.39 | 203.54 | 2,892.54 | -95.06 | -41.42 | -21.65 | 0.00 | 0.00 | 0.00 |
| 3,000.00 | 9.39 | 203.54 | 2,991.20 | -110.01 | -47.93 | -25.05 | 0.00 | 0.00 | 0.00 |
| 3,100.00 | 9.39 | 203.54 | 3,089.86 | -124.96 | -54.44 | -28.45 | 0.00 | 0.00 | 0.00 |
| 3,200.00 | 9.39 | 203.54 | 3,188.52 | -139.91 | -60.96 | -31.86 | 0.00 | 0.00 | 0.00 |
| 3,300.00 | 9.39 | 203.54 | 3,287.19 | -154.86 | -67.47 | -35.26 | 0.00 | 0.00 | 0.00 |
| 3,400.00 | 9.39 | 203.54 | 3,385.85 | -169.81 | -73.98 | -38.67 | 0.00 | 0.00 | 0.00 |
| 3,500.00 | 9.39 | 203.54 | 3,484.51 | -184.76 | -80.50 | -42.07 | 0.00 | 0.00 | 0.00 |
| 3,600.00 | 9.39 | 203.54 | 3,583.17 | -199.71 | -87.01 | -45.47 | 0.00 | 0.00 | 0.00 |
| 3,700.00 | 9.39 | 203.54 | 3,681.83 | -214.66 | -93.52 | -48.88 | 0.00 | 0.00 | 0.00 |
| 3,800.00 | 9.39 | 203.54 | 3,780.49 | -229.61 | -100.04 | -52.28 | 0.00 | 0.00 | 0.00 |
| 3,900.00 | 9.39 | 203.54 | 3,879.16 | -244.56 | -106.55 | -55.68 | 0.00 | 0.00 | 0.00 |
| 4,000.00 | 9.39 | 203.54 | 3,977.82 | -259.51 | -113.06 | -59.09 | 0.00 | 0.00 | 0.00 |
| 4,100.00 | 9.39 | 203.54 | 4,076.48 | -274.46 | -119.58 | -62.49 | 0.00 | 0.00 | 0.00 |
| 4,200.00 | 9.39 | 203.54 | 4,175.14 | -289.41 | -126.09 | -65.90 | 0.00 | 0.00 | 0.00 |
| 4,300.00 | 9.39 | 203.54 | 4,273.80 | -304.36 | -132.60 | -69.30 | 0.00 | 0.00 | 0.00 |
| 4,400.00 | 9.39 | 203.54 | 4,372.46 | -319.31 | -139.11 | -72.70 | 0.00 | 0.00 | 0.00 |

Anadarko Petroleum Corp

Planning Report

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|------------------|-----------------------------|-------------------------------------|--------------------------------|
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| Project: | COLORADO NORTHERN ZONE - 83 | MD Reference: | 25' RKB + 5448' GL @ 5473.00ft |
| Site: | ADAMS_SUN EMPIRE PAD | North Reference: | True |
| Well: | SUN EMPIRE 17-31-8H | Survey Calculation Method: | Minimum Curvature |
| Wellbore: | SUN EMPIRE 17-31-8H | | |
| Design: | SUN EMPIRE 17-31-8H (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) |
| 4,500.00 | 9.39 | 203.54 | 4,471.12 | -334.26 | -145.63 | -76.11 | 0.00 | 0.00 | 0.00 |
| 4,600.00 | 9.39 | 203.54 | 4,569.79 | -349.21 | -152.14 | -79.51 | 0.00 | 0.00 | 0.00 |
| 4,700.00 | 9.39 | 203.54 | 4,668.45 | -364.16 | -158.65 | -82.92 | 0.00 | 0.00 | 0.00 |
| 4,800.00 | 9.39 | 203.54 | 4,767.11 | -379.11 | -165.17 | -86.32 | 0.00 | 0.00 | 0.00 |
| 4,900.00 | 9.39 | 203.54 | 4,865.77 | -394.06 | -171.68 | -89.72 | 0.00 | 0.00 | 0.00 |
| 4,998.55 | 9.39 | 203.54 | 4,963.00 | -408.79 | -178.10 | -93.08 | 0.00 | 0.00 | 0.00 |
| SUSSEX | | | | | | | | | |
| 5,000.00 | 9.39 | 203.54 | 4,964.43 | -409.01 | -178.19 | -93.13 | 0.00 | 0.00 | 0.00 |
| 5,100.00 | 9.39 | 203.54 | 5,063.09 | -423.96 | -184.71 | -96.53 | 0.00 | 0.00 | 0.00 |
| 5,200.00 | 9.39 | 203.54 | 5,161.75 | -438.91 | -191.22 | -99.94 | 0.00 | 0.00 | 0.00 |
| 5,300.00 | 9.39 | 203.54 | 5,260.42 | -453.86 | -197.73 | -103.34 | 0.00 | 0.00 | 0.00 |
| 5,343.16 | 9.39 | 203.54 | 5,303.00 | -460.31 | -200.54 | -104.81 | 0.00 | 0.00 | 0.00 |
| SHANNON | | | | | | | | | |
| 5,400.00 | 9.39 | 203.54 | 5,359.08 | -468.81 | -204.25 | -106.74 | 0.00 | 0.00 | 0.00 |
| 5,500.00 | 9.39 | 203.54 | 5,457.74 | -483.76 | -210.76 | -110.15 | 0.00 | 0.00 | 0.00 |
| 5,600.00 | 9.39 | 203.54 | 5,556.40 | -498.71 | -217.27 | -113.55 | 0.00 | 0.00 | 0.00 |
| 5,700.00 | 9.39 | 203.54 | 5,655.06 | -513.66 | -223.79 | -116.96 | 0.00 | 0.00 | 0.00 |
| 5,800.00 | 9.39 | 203.54 | 5,753.72 | -528.61 | -230.30 | -120.36 | 0.00 | 0.00 | 0.00 |
| 5,900.00 | 9.39 | 203.54 | 5,852.38 | -543.56 | -236.81 | -123.76 | 0.00 | 0.00 | 0.00 |
| 6,000.00 | 9.39 | 203.54 | 5,951.05 | -558.51 | -243.33 | -127.17 | 0.00 | 0.00 | 0.00 |
| 6,100.00 | 9.39 | 203.54 | 6,049.71 | -573.45 | -249.84 | -130.57 | 0.00 | 0.00 | 0.00 |
| 6,200.00 | 9.39 | 203.54 | 6,148.37 | -588.40 | -256.35 | -133.98 | 0.00 | 0.00 | 0.00 |
| 6,300.00 | 9.39 | 203.54 | 6,247.03 | -603.35 | -262.87 | -137.38 | 0.00 | 0.00 | 0.00 |
| 6,400.00 | 9.39 | 203.54 | 6,345.69 | -618.30 | -269.38 | -140.78 | 0.00 | 0.00 | 0.00 |
| 6,500.00 | 9.39 | 203.54 | 6,444.35 | -633.25 | -275.89 | -144.19 | 0.00 | 0.00 | 0.00 |
| 6,600.00 | 9.39 | 203.54 | 6,543.01 | -648.20 | -282.40 | -147.59 | 0.00 | 0.00 | 0.00 |
| 6,700.00 | 9.39 | 203.54 | 6,641.68 | -663.15 | -288.92 | -151.00 | 0.00 | 0.00 | 0.00 |
| 6,800.00 | 9.39 | 203.54 | 6,740.34 | -678.10 | -295.43 | -154.40 | 0.00 | 0.00 | 0.00 |
| 6,900.00 | 9.39 | 203.54 | 6,839.00 | -693.05 | -301.94 | -157.80 | 0.00 | 0.00 | 0.00 |
| 7,000.00 | 9.39 | 203.54 | 6,937.66 | -708.00 | -308.46 | -161.21 | 0.00 | 0.00 | 0.00 |
| 7,100.00 | 9.39 | 203.54 | 7,036.32 | -722.95 | -314.97 | -164.61 | 0.00 | 0.00 | 0.00 |
| 7,200.00 | 9.39 | 203.54 | 7,134.98 | -737.90 | -321.48 | -168.01 | 0.00 | 0.00 | 0.00 |
| 7,276.91 | 9.39 | 203.54 | 7,210.86 | -749.40 | -326.49 | -170.63 | 0.00 | 0.00 | 0.00 |
| Start DLS 10.00 TFO -112.49 | | | | | | | | | |
| 7,300.00 | 8.76 | 189.40 | 7,233.67 | -752.86 | -327.53 | -170.96 | 10.00 | -2.69 | -61.25 |
| 7,400.00 | 12.25 | 135.36 | 7,332.20 | -767.96 | -321.31 | -161.85 | 10.00 | 3.49 | -54.03 |
| 7,500.00 | 20.54 | 114.79 | 7,428.12 | -782.90 | -297.87 | -135.90 | 10.00 | 8.29 | -20.58 |
| 7,600.00 | 29.87 | 106.17 | 7,518.53 | -797.23 | -257.93 | -93.91 | 10.00 | 9.33 | -8.61 |
| 7,686.28 | 38.17 | 101.96 | 7,590.00 | -808.76 | -211.12 | -45.75 | 10.00 | 9.63 | -4.88 |
| SHARON SPRINGS | | | | | | | | | |
| 7,700.00 | 39.50 | 101.43 | 7,600.68 | -810.50 | -202.70 | -37.15 | 10.00 | 9.71 | -3.83 |
| 7,800.00 | 49.26 | 98.32 | 7,672.07 | -822.32 | -133.86 | 32.66 | 10.00 | 9.76 | -3.11 |
| 7,801.42 | 49.40 | 98.29 | 7,673.00 | -822.48 | -132.80 | 33.74 | 10.00 | 9.80 | -2.62 |
| NIOBRARA | | | | | | | | | |
| 7,900.00 | 59.09 | 96.02 | 7,730.54 | -832.33 | -53.51 | 113.40 | 10.00 | 9.83 | -2.30 |
| 8,000.00 | 68.95 | 94.14 | 7,774.29 | -840.21 | 35.92 | 202.61 | 10.00 | 9.86 | -1.87 |
| 8,051.66 | 74.05 | 93.28 | 7,790.68 | -843.38 | 84.79 | 251.13 | 10.00 | 9.87 | -1.68 |
| SUN EMPIRE 17-31-8H heel | | | | | | | | | |
| 8,100.00 | 78.82 | 92.51 | 7,802.02 | -845.74 | 131.71 | 297.58 | 10.00 | 9.88 | -1.60 |
| 8,200.00 | 88.71 | 90.98 | 7,812.87 | -848.75 | 230.94 | 395.42 | 10.00 | 9.88 | -1.53 |
| 8,217.06 | 90.39 | 90.72 | 7,813.00 | -849.00 | 248.00 | 412.19 | 10.00 | 9.88 | -1.51 |
| Start DLS 1.00 TFO 66.27 - 7" | | | | | | | | | |
| 8,221.02 | 90.41 | 90.76 | 7,812.97 | -849.05 | 251.96 | 416.07 | 1.00 | 0.40 | 0.92 |
| Start 4196.83 hold at 8221.01 MD | | | | | | | | | |

Anadarko Petroleum Corp

Planning Report

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|------------------|-----------------------------|-------------------------------------|--------------------------------|
| Database: | edmp | Local Co-ordinate Reference: | Well SUN EMPIRE 17-31-8H |
| Company: | US ROCKIES REGION PLANNING | TVD Reference: | 25' RKB + 5448' GL @ 5473.00ft |
| Project: | COLORADO NORTHERN ZONE - 83 | MD Reference: | 25' RKB + 5448' GL @ 5473.00ft |
| Site: | ADAMS_SUN EMPIRE PAD | North Reference: | True |
| Well: | SUN EMPIRE 17-31-8H | Survey Calculation Method: | Minimum Curvature |
| Wellbore: | SUN EMPIRE 17-31-8H | | |
| Design: | SUN EMPIRE 17-31-8H (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) |
| 8,300.00 | 90.41 | 90.76 | 7,812.41 | -850.09 | 330.93 | 493.67 | 0.00 | 0.00 | 0.00 |
| 8,400.00 | 90.41 | 90.76 | 7,811.69 | -851.41 | 430.92 | 591.92 | 0.00 | 0.00 | 0.00 |
| 8,500.00 | 90.41 | 90.76 | 7,810.98 | -852.73 | 530.91 | 690.17 | 0.00 | 0.00 | 0.00 |
| 8,600.00 | 90.41 | 90.76 | 7,810.27 | -854.05 | 630.90 | 788.42 | 0.00 | 0.00 | 0.00 |
| 8,700.00 | 90.41 | 90.76 | 7,809.55 | -855.37 | 730.89 | 886.66 | 0.00 | 0.00 | 0.00 |
| 8,800.00 | 90.41 | 90.76 | 7,808.84 | -856.69 | 830.88 | 984.91 | 0.00 | 0.00 | 0.00 |
| 8,900.00 | 90.41 | 90.76 | 7,808.12 | -858.01 | 930.87 | 1,083.16 | 0.00 | 0.00 | 0.00 |
| 9,000.00 | 90.41 | 90.76 | 7,807.41 | -859.33 | 1,030.85 | 1,181.40 | 0.00 | 0.00 | 0.00 |
| 9,100.00 | 90.41 | 90.76 | 7,806.70 | -860.65 | 1,130.84 | 1,279.65 | 0.00 | 0.00 | 0.00 |
| 9,200.00 | 90.41 | 90.76 | 7,805.98 | -861.97 | 1,230.83 | 1,377.90 | 0.00 | 0.00 | 0.00 |
| 9,300.00 | 90.41 | 90.76 | 7,805.27 | -863.29 | 1,330.82 | 1,476.14 | 0.00 | 0.00 | 0.00 |
| 9,400.00 | 90.41 | 90.76 | 7,804.55 | -864.61 | 1,430.81 | 1,574.39 | 0.00 | 0.00 | 0.00 |
| 9,500.00 | 90.41 | 90.76 | 7,803.84 | -865.93 | 1,530.80 | 1,672.64 | 0.00 | 0.00 | 0.00 |
| 9,600.00 | 90.41 | 90.76 | 7,803.12 | -867.25 | 1,630.79 | 1,770.88 | 0.00 | 0.00 | 0.00 |
| 9,700.00 | 90.41 | 90.76 | 7,802.41 | -868.57 | 1,730.77 | 1,869.13 | 0.00 | 0.00 | 0.00 |
| 9,800.00 | 90.41 | 90.76 | 7,801.70 | -869.89 | 1,830.76 | 1,967.38 | 0.00 | 0.00 | 0.00 |
| 9,900.00 | 90.41 | 90.76 | 7,800.98 | -871.21 | 1,930.75 | 2,065.62 | 0.00 | 0.00 | 0.00 |
| 10,000.00 | 90.41 | 90.76 | 7,800.27 | -872.53 | 2,030.74 | 2,163.87 | 0.00 | 0.00 | 0.00 |
| 10,100.00 | 90.41 | 90.76 | 7,799.55 | -873.85 | 2,130.73 | 2,262.12 | 0.00 | 0.00 | 0.00 |
| 10,200.00 | 90.41 | 90.76 | 7,798.84 | -875.17 | 2,230.72 | 2,360.37 | 0.00 | 0.00 | 0.00 |
| 10,300.00 | 90.41 | 90.76 | 7,798.13 | -876.49 | 2,330.71 | 2,458.61 | 0.00 | 0.00 | 0.00 |
| 10,400.00 | 90.41 | 90.76 | 7,797.41 | -877.81 | 2,430.70 | 2,556.86 | 0.00 | 0.00 | 0.00 |
| 10,500.00 | 90.41 | 90.76 | 7,796.70 | -879.13 | 2,530.68 | 2,655.11 | 0.00 | 0.00 | 0.00 |
| 10,600.00 | 90.41 | 90.76 | 7,795.98 | -880.45 | 2,630.67 | 2,753.35 | 0.00 | 0.00 | 0.00 |
| 10,700.00 | 90.41 | 90.76 | 7,795.27 | -881.77 | 2,730.66 | 2,851.60 | 0.00 | 0.00 | 0.00 |
| 10,800.00 | 90.41 | 90.76 | 7,794.55 | -883.09 | 2,830.65 | 2,949.85 | 0.00 | 0.00 | 0.00 |
| 10,900.00 | 90.41 | 90.76 | 7,793.84 | -884.41 | 2,930.64 | 3,048.09 | 0.00 | 0.00 | 0.00 |
| 11,000.00 | 90.41 | 90.76 | 7,793.13 | -885.73 | 3,030.63 | 3,146.34 | 0.00 | 0.00 | 0.00 |
| 11,100.00 | 90.41 | 90.76 | 7,792.41 | -887.05 | 3,130.62 | 3,244.59 | 0.00 | 0.00 | 0.00 |
| 11,200.00 | 90.41 | 90.76 | 7,791.70 | -888.37 | 3,230.61 | 3,342.83 | 0.00 | 0.00 | 0.00 |
| 11,300.00 | 90.41 | 90.76 | 7,790.98 | -889.69 | 3,330.59 | 3,441.08 | 0.00 | 0.00 | 0.00 |
| 11,400.00 | 90.41 | 90.76 | 7,790.27 | -891.01 | 3,430.58 | 3,539.33 | 0.00 | 0.00 | 0.00 |
| 11,500.00 | 90.41 | 90.76 | 7,789.56 | -892.33 | 3,530.57 | 3,637.57 | 0.00 | 0.00 | 0.00 |
| 11,600.00 | 90.41 | 90.76 | 7,788.84 | -893.65 | 3,630.56 | 3,735.82 | 0.00 | 0.00 | 0.00 |
| 11,700.00 | 90.41 | 90.76 | 7,788.13 | -894.97 | 3,730.55 | 3,834.07 | 0.00 | 0.00 | 0.00 |
| 11,800.00 | 90.41 | 90.76 | 7,787.41 | -896.29 | 3,830.54 | 3,932.32 | 0.00 | 0.00 | 0.00 |
| 11,900.00 | 90.41 | 90.76 | 7,786.70 | -897.61 | 3,930.53 | 4,030.56 | 0.00 | 0.00 | 0.00 |
| 12,000.00 | 90.41 | 90.76 | 7,785.98 | -898.93 | 4,030.52 | 4,128.81 | 0.00 | 0.00 | 0.00 |
| 12,100.00 | 90.41 | 90.76 | 7,785.27 | -900.25 | 4,130.50 | 4,227.06 | 0.00 | 0.00 | 0.00 |
| 12,200.00 | 90.41 | 90.76 | 7,784.56 | -901.57 | 4,230.49 | 4,325.30 | 0.00 | 0.00 | 0.00 |
| 12,300.00 | 90.41 | 90.76 | 7,783.84 | -902.88 | 4,330.48 | 4,423.55 | 0.00 | 0.00 | 0.00 |
| 12,400.00 | 90.41 | 90.76 | 7,783.13 | -904.20 | 4,430.47 | 4,521.80 | 0.00 | 0.00 | 0.00 |
| 12,417.84 | 90.41 | 90.76 | 7,783.00 | -904.44 | 4,448.31 | 4,539.33 | 0.00 | 0.00 | 0.00 |
| TD at 12417.84 - SUN EMPIRE 17-31-8H BHL | | | | | | | | | |

| Design Targets | | | | | | | | | |
|---------------------------|---------------|--------------|----------|------------|------------|-----------------|----------------|-----------|-------------|
| Target Name | Dip Angle (°) | Dip Dir. (°) | TVD (ft) | +N/-S (ft) | +E/-W (ft) | Northing (usft) | Easting (usft) | Latitude | Longitude |
| SUN EMPIRE 17-31-8H | 0.00 | 0.00 | 7,783.00 | -904.44 | 4,448.31 | 1,168,439.32 | 3,230,504.32 | 39.792809 | -104.679702 |
| - hit/miss target | | | | | | | | | |
| - Shape | | | | | | | | | |
| - plan hits target center | | | | | | | | | |
| - Point | | | | | | | | | |

Anadarko Petroleum Corp

Planning Report

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|------------------|-----------------------------|-------------------------------------|--------------------------------|
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| Company: | US ROCKIES REGION PLANNING | TVD Reference: | 25' RKB + 5448' GL @ 5473.00ft |
| Project: | COLORADO NORTHERN ZONE - 83 | MD Reference: | 25' RKB + 5448' GL @ 5473.00ft |
| Site: | ADAMS_SUN EMPIRE PAD | North Reference: | True |
| Well: | SUN EMPIRE 17-31-8H | Survey Calculation Method: | Minimum Curvature |
| Wellbore: | SUN EMPIRE 17-31-8H | | |
| Design: | SUN EMPIRE 17-31-8H (wp01) | | |

| Casing Points | | | | | |
|---------------------|---------------------|--------|---------------------|-------------------|--|
| Measured Depth (ft) | Vertical Depth (ft) | Name | Casing Diameter (") | Hole Diameter (") | |
| 1,880.00 | 1,880.00 | 9 5/8" | 9-5/8 | 12-1/4 | |
| 8,217.06 | 7,813.00 | 7" | 7 | 8-3/4 | |

| Formations | | | | | |
|---------------------|---------------------|----------------|-----------|---------|-------------------|
| Measured Depth (ft) | Vertical Depth (ft) | Name | Lithology | Dip (°) | Dip Direction (°) |
| 1,726.00 | 1,726.00 | FOX HILLS | | 0.00 | |
| 2,636.94 | 2,633.00 | PARKMAN | | 0.00 | |
| 4,998.55 | 4,963.00 | SUSSEX | | 0.00 | |
| 5,343.16 | 5,303.00 | SHANNON | | 0.00 | |
| 7,686.28 | 7,590.00 | SHARON SPRINGS | | 0.00 | |
| 7,801.42 | 7,673.00 | NIOBRARA | | 0.00 | |

| Plan Annotations | | | | | |
|---------------------|---------------------|-------------------|------------|----------------------------------|--|
| Measured Depth (ft) | Vertical Depth (ft) | Local Coordinates | | | |
| | | +N/-S (ft) | +E/-W (ft) | Comment | |
| 2,030.00 | 2,030.00 | 0.00 | 0.00 | Start Build 2.00 | |
| 2,499.25 | 2,497.16 | -35.15 | -15.32 | Start 4777.65 hold at 2499.25 MD | |
| 7,276.91 | 7,210.86 | -749.40 | -326.49 | Start DLS 10.00 TFO -112.49 | |
| 8,217.06 | 7,813.00 | -849.00 | 248.00 | Start DLS 1.00 TFO 66.27 | |
| 8,221.02 | 7,812.97 | -849.05 | 251.96 | Start 4196.83 hold at 8221.01 MD | |
| 12,417.84 | 7,783.00 | -904.44 | 4,448.31 | TD at 12417.84 | |