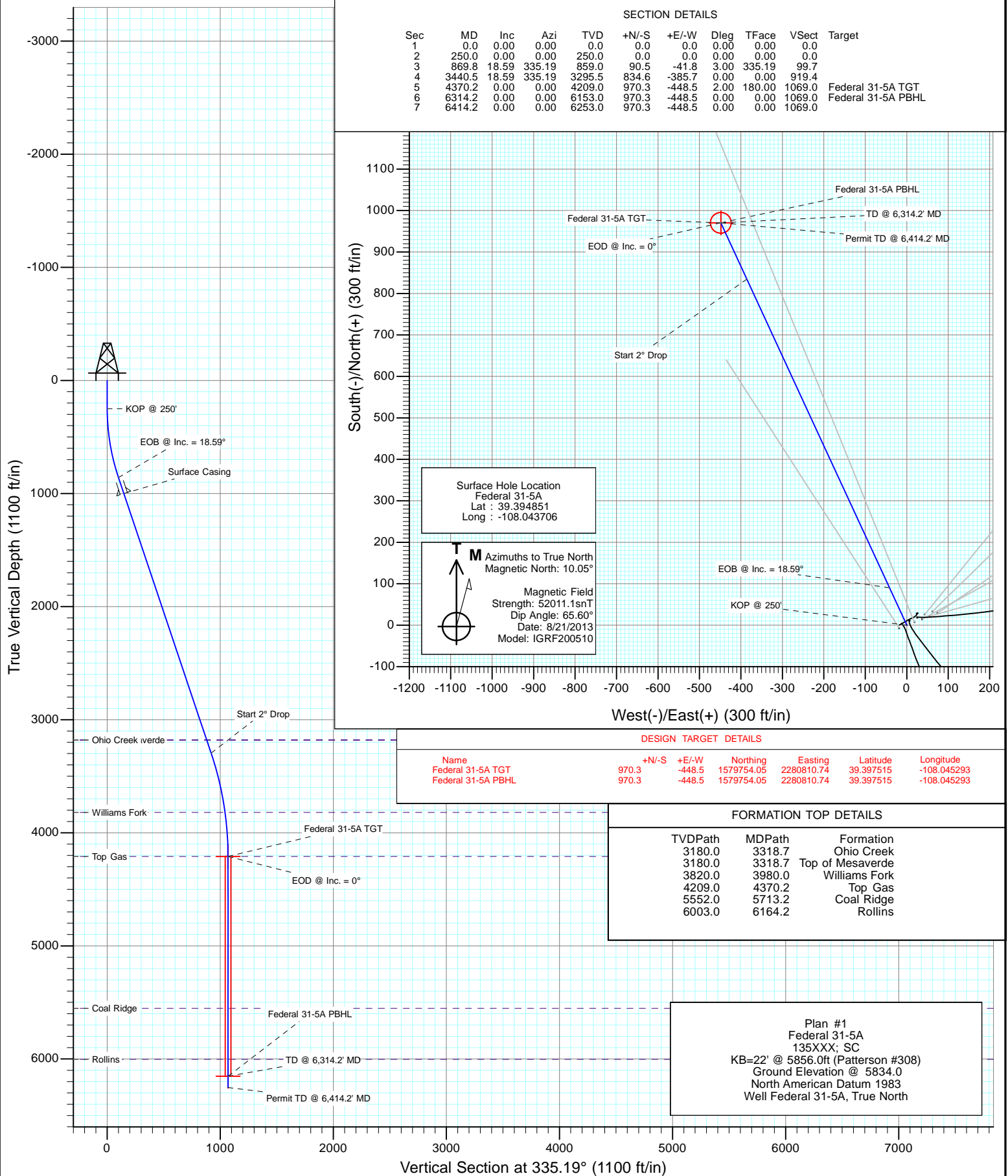


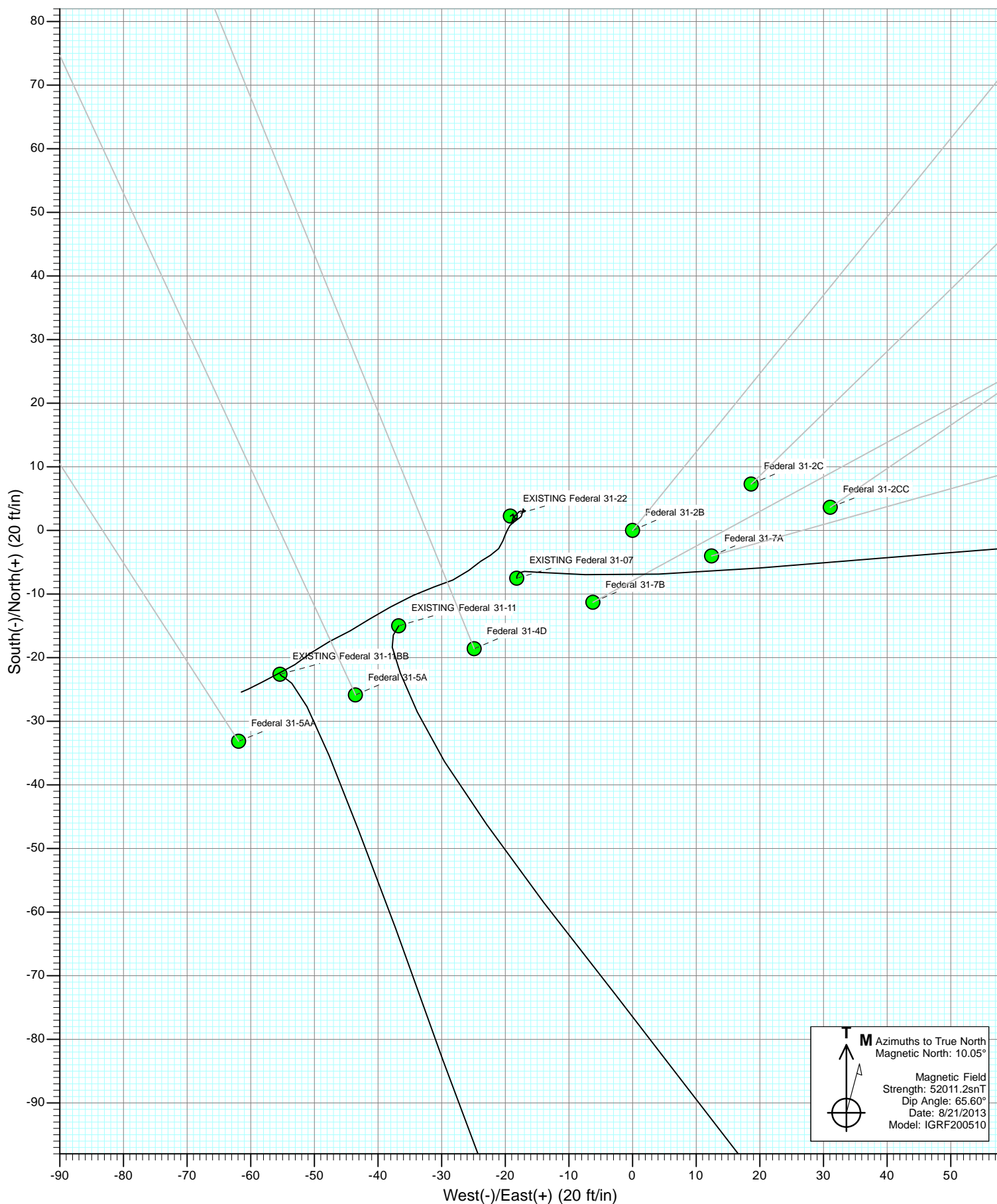


Project: S. Piceance (Parachute)  
Site: PF-31 Pad - S31-T7S-R95W  
Well: Federal 31-5A  
Wellbore: DD  
Design: Plan #1



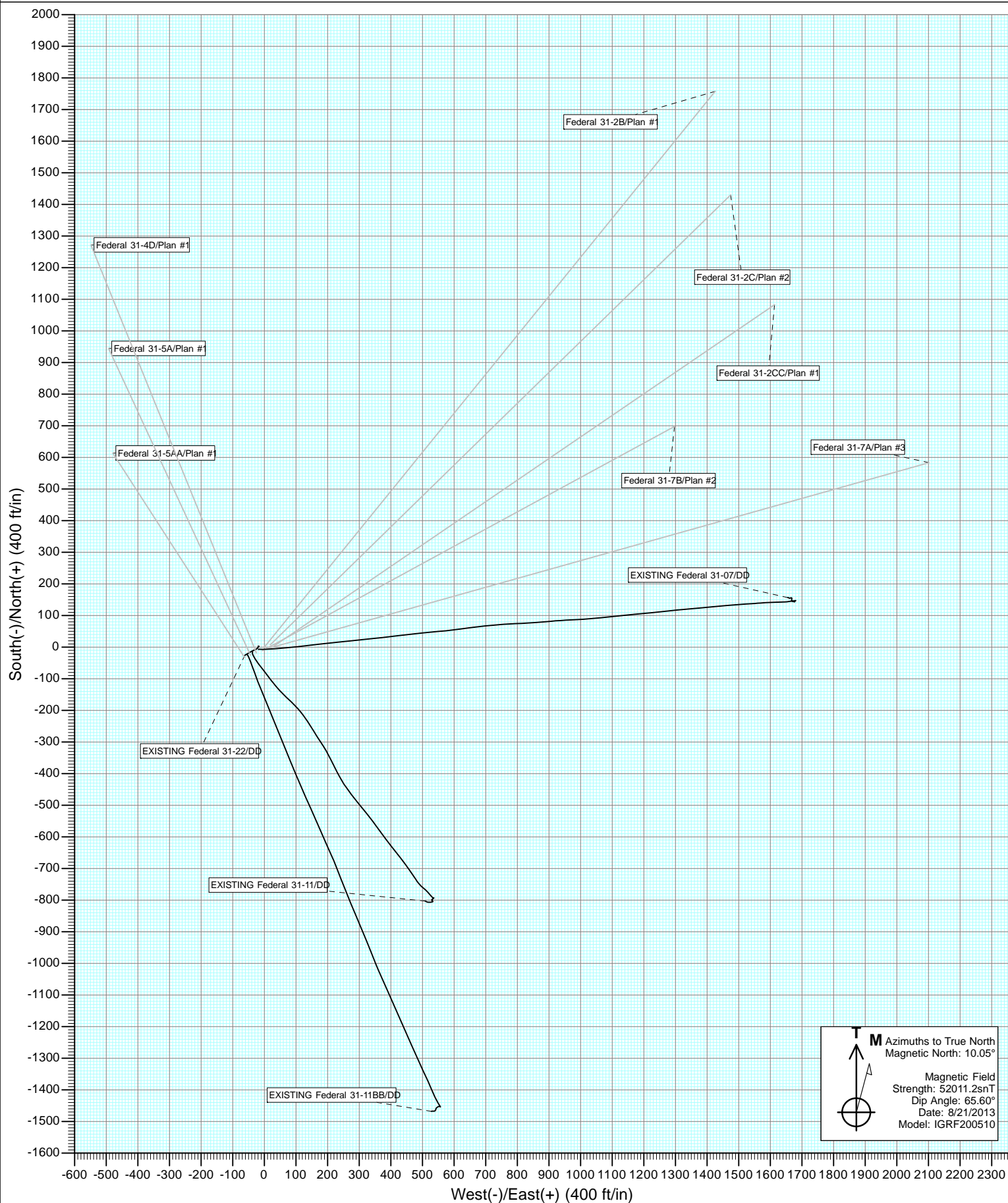


Project: S. Piceance (Parachute)  
Site: PF-31 Pad - S31-T7S-R95W



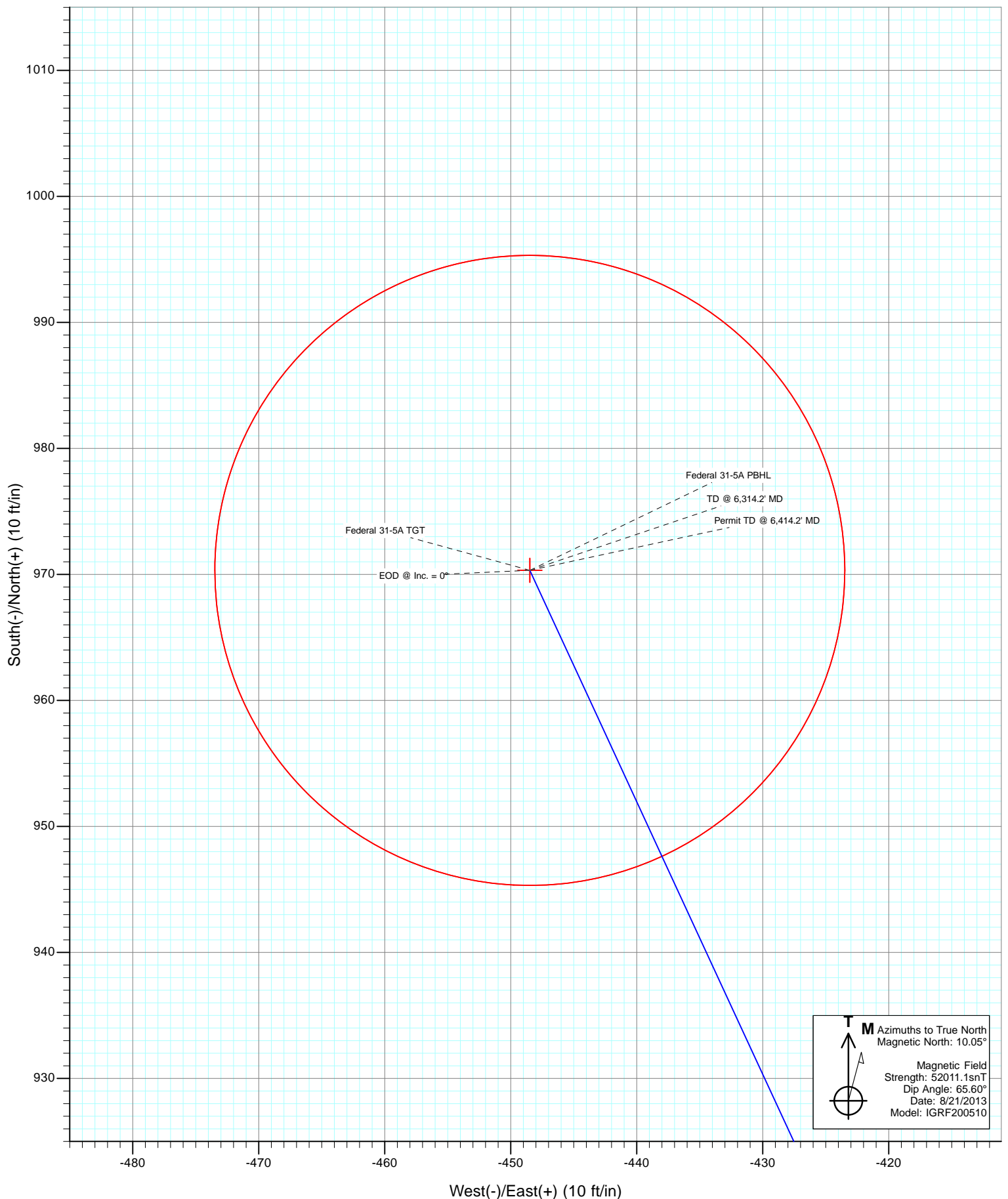


Project: S. Piceance (Parachute)  
Site: PF-31 Pad - S31-T7S-R95W





Project: S. Piceance (Parachute)  
Site: PF-31 Pad - S31-T7S-R95W  
Well: Federal 31-5A  
Wellbore: DD  
Design: Plan #1



# Cathedral Energy Services

## Planning Report

<b>Database:</b>	USA EDM 5000 Multi Users DB	<b>Local Co-ordinate Reference:</b>	Well Federal 31-5A
<b>Company:</b>	EnCana Oil & Gas (USA) Inc	<b>TVD Reference:</b>	KB=22' @ 5856.0ft (Patterson #308)
<b>Project:</b>	S. Piceance (Parachute)	<b>MD Reference:</b>	KB=22' @ 5856.0ft (Patterson #308)
<b>Site:</b>	PF-31 Pad - S31-T7S-R95W	<b>North Reference:</b>	True
<b>Well:</b>	Federal 31-5A	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	DD		
<b>Design:</b>	Plan #1		

<b>Project</b>	S. Piceance (Parachute), Garfield County, CO		
<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 Central Zone		

Site		PF-31 Pad - S31-T7S-R95W			
Site Position:		Northing:	1,578,802.25 ft	Latitude:	39.394940
From:	Lat/Long	Easting:	2,281,293.81 ft	Longitude:	-108.043490
Position Uncertainty:	0.0 ft	Slot Radius:	13.200 in	Grid Convergence:	-1.60 °

Well	Federal 31-5A					
Well Position	+N/-S	0.0 ft	Northing:	1,578,771.55 ft	Latitude:	39.394851
	+E/-W	0.0 ft	Easting:	2,281,231.88 ft	Longitude:	-108.043706
Position Uncertainty		0.0 ft	Wellhead Elevation:	ft	Ground Level:	5,834.0 ft

<b>Wellbore</b>	DD				
<b>Magnetics</b>	<b>Model Name</b>	<b>Sample Date</b>	<b>Declination (°)</b>	<b>Dip Angle (°)</b>	<b>Field Strength (nT)</b>
	IGRF200510	8/21/2013	10.05	65.60	52,011

<b>Design</b>	Plan #1				
<b>Audit Notes:</b>					
<b>Version:</b>	<b>Phase:</b>	PLAN	<b>Tie On Depth:</b>	0.0	
<b>Vertical Section:</b>	<b>Depth From (TVD) (ft)</b>	<b>+N/-S (ft)</b>	<b>+E/-W (ft)</b>	<b>Direction (°)</b>	
	0.0	0.0	0.0	335.19	

<b>Plan Sections</b>										
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)	TFO (°)	Target
0.0	0.00	0.00	0.0	0.0	0.0	0.00	0.00	0.00	0.00	
250.0	0.00	0.00	250.0	0.0	0.0	0.00	0.00	0.00	0.00	
869.8	18.59	335.19	859.0	90.5	-41.8	3.00	3.00	0.00	335.19	
3,440.5	18.59	335.19	3,295.5	834.6	-385.7	0.00	0.00	0.00	0.00	
4,370.2	0.00	0.00	4,209.0	970.3	-448.5	2.00	-2.00	0.00	180.00	Federal 31-5A TGT
6,314.2	0.00	0.00	6,153.0	970.3	-448.5	0.00	0.00	0.00	0.00	Federal 31-5A PBHL
6,414.2	0.00	0.00	6,253.0	970.3	-448.5	0.00	0.00	0.00	0.00	

# Cathedral Energy Services

## Planning Report

<b>Database:</b>	USA EDM 5000 Multi Users DB	<b>Local Co-ordinate Reference:</b>	Well Federal 31-5A
<b>Company:</b>	EnCana Oil & Gas (USA) Inc	<b>TVD Reference:</b>	KB=22' @ 5856.0ft (Patterson #308)
<b>Project:</b>	S. Piceance (Parachute)	<b>MD Reference:</b>	KB=22' @ 5856.0ft (Patterson #308)
<b>Site:</b>	PF-31 Pad - S31-T7S-R95W	<b>North Reference:</b>	True
<b>Well:</b>	Federal 31-5A	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	DD		
<b>Design:</b>	Plan #1		

### Planned Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Comments / Formations
0.0	0.00	0.00	0.0	0.0	0.0	0.0	0.00	0.00	
100.0	0.00	0.00	100.0	0.0	0.0	0.0	0.00	0.00	
200.0	0.00	0.00	200.0	0.0	0.0	0.0	0.00	0.00	
250.0	0.00	0.00	250.0	0.0	0.0	0.0	0.00	0.00	KOP @ 250'
300.0	1.50	335.19	300.0	0.6	-0.3	0.7	3.00	3.00	
400.0	4.50	335.19	399.8	5.3	-2.5	5.9	3.00	3.00	
500.0	7.50	335.19	499.3	14.8	-6.9	16.3	3.00	3.00	
600.0	10.50	335.19	598.0	29.0	-13.4	32.0	3.00	3.00	
700.0	13.50	335.19	695.8	47.9	-22.1	52.8	3.00	3.00	
800.0	16.50	335.19	792.4	71.4	-33.0	78.6	3.00	3.00	
869.8	18.59	335.19	859.0	90.5	-41.8	99.7	3.00	3.00	EOB @ Inc. = 18.59°
900.0	18.59	335.19	887.6	99.2	-45.9	109.3	0.00	0.00	
1,000.0	18.59	335.19	982.4	128.2	-59.2	141.2	0.00	0.00	
1,018.6	18.59	335.19	1,000.0	133.6	-61.7	147.1	0.00	0.00	Surface Casing
1,100.0	18.59	335.19	1,077.2	157.1	-72.6	173.1	0.00	0.00	
1,200.0	18.59	335.19	1,171.9	186.1	-86.0	205.0	0.00	0.00	
1,300.0	18.59	335.19	1,266.7	215.0	-99.4	236.9	0.00	0.00	
1,400.0	18.59	335.19	1,361.5	244.0	-112.8	268.8	0.00	0.00	
1,500.0	18.59	335.19	1,456.3	272.9	-126.1	300.6	0.00	0.00	
1,600.0	18.59	335.19	1,551.1	301.8	-139.5	332.5	0.00	0.00	
1,700.0	18.59	335.19	1,645.8	330.8	-152.9	364.4	0.00	0.00	
1,800.0	18.59	335.19	1,740.6	359.7	-166.3	396.3	0.00	0.00	
1,900.0	18.59	335.19	1,835.4	388.7	-179.6	428.2	0.00	0.00	
2,000.0	18.59	335.19	1,930.2	417.6	-193.0	460.1	0.00	0.00	
2,100.0	18.59	335.19	2,025.0	446.6	-206.4	492.0	0.00	0.00	
2,200.0	18.59	335.19	2,119.7	475.5	-219.8	523.8	0.00	0.00	
2,300.0	18.59	335.19	2,214.5	504.5	-233.2	555.7	0.00	0.00	
2,400.0	18.59	335.19	2,309.3	533.4	-246.5	587.6	0.00	0.00	
2,500.0	18.59	335.19	2,404.1	562.3	-259.9	619.5	0.00	0.00	
2,600.0	18.59	335.19	2,498.9	591.3	-273.3	651.4	0.00	0.00	
2,700.0	18.59	335.19	2,593.6	620.2	-286.7	683.3	0.00	0.00	
2,800.0	18.59	335.19	2,688.4	649.2	-300.0	715.2	0.00	0.00	
2,900.0	18.59	335.19	2,783.2	678.1	-313.4	747.1	0.00	0.00	
3,000.0	18.59	335.19	2,878.0	707.1	-326.8	778.9	0.00	0.00	
3,100.0	18.59	335.19	2,972.8	736.0	-340.2	810.8	0.00	0.00	
3,200.0	18.59	335.19	3,067.5	765.0	-353.6	842.7	0.00	0.00	
3,300.0	18.59	335.19	3,162.3	793.9	-366.9	874.6	0.00	0.00	
3,318.7	18.59	335.19	3,180.0	799.3	-369.4	880.5	0.00	0.00	Top of Mesaverde - Ohio Creek
3,400.0	18.59	335.19	3,257.1	822.8	-380.3	906.5	0.00	0.00	
3,440.5	18.59	335.19	3,295.5	834.6	-385.7	919.4	0.00	0.00	Start 2° Drop
3,500.0	17.40	335.19	3,352.1	851.3	-393.4	937.8	2.00	-2.00	
3,600.0	15.40	335.19	3,448.0	876.9	-405.3	966.0	2.00	-2.00	
3,700.0	13.40	335.19	3,544.8	899.5	-415.7	990.9	2.00	-2.00	
3,800.0	11.40	335.19	3,642.5	919.0	-424.7	1,012.4	2.00	-2.00	
3,900.0	9.40	335.19	3,740.9	935.4	-432.3	1,030.4	2.00	-2.00	
3,980.0	7.80	335.19	3,820.0	946.2	-437.3	1,042.4	2.00	-2.00	Williams Fork
4,000.0	7.40	335.19	3,839.8	948.6	-438.5	1,045.1	2.00	-2.00	
4,100.0	5.40	335.19	3,939.2	958.8	-443.1	1,056.2	2.00	-2.00	
4,200.0	3.40	335.19	4,038.9	965.7	-446.4	1,063.9	2.00	-2.00	
4,300.0	1.40	335.19	4,138.8	969.5	-448.1	1,068.1	2.00	-2.00	
4,370.2	0.00	0.00	4,209.0	970.3	-448.5	1,069.0	2.00	-2.00	EOD @ Inc. = 0° - Top Gas
4,400.0	0.00	0.00	4,238.8	970.3	-448.5	1,069.0	0.00	0.00	

# Cathedral Energy Services

## Planning Report

<b>Database:</b>	USA EDM 5000 Multi Users DB	<b>Local Co-ordinate Reference:</b>	Well Federal 31-5A
<b>Company:</b>	EnCana Oil & Gas (USA) Inc	<b>TVD Reference:</b>	KB=22' @ 5856.0ft (Patterson #308)
<b>Project:</b>	S. Piceance (Parachute)	<b>MD Reference:</b>	KB=22' @ 5856.0ft (Patterson #308)
<b>Site:</b>	PF-31 Pad - S31-T7S-R95W	<b>North Reference:</b>	True
<b>Well:</b>	Federal 31-5A	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	DD		
<b>Design:</b>	Plan #1		

### Planned Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Comments / Formations
4,500.0	0.00	0.00	4,338.8	970.3	-448.5	1,069.0	0.00	0.00	
4,600.0	0.00	0.00	4,438.8	970.3	-448.5	1,069.0	0.00	0.00	
4,700.0	0.00	0.00	4,538.8	970.3	-448.5	1,069.0	0.00	0.00	
4,800.0	0.00	0.00	4,638.8	970.3	-448.5	1,069.0	0.00	0.00	
4,900.0	0.00	0.00	4,738.8	970.3	-448.5	1,069.0	0.00	0.00	
5,000.0	0.00	0.00	4,838.8	970.3	-448.5	1,069.0	0.00	0.00	
5,100.0	0.00	0.00	4,938.8	970.3	-448.5	1,069.0	0.00	0.00	
5,200.0	0.00	0.00	5,038.8	970.3	-448.5	1,069.0	0.00	0.00	
5,300.0	0.00	0.00	5,138.8	970.3	-448.5	1,069.0	0.00	0.00	
5,400.0	0.00	0.00	5,238.8	970.3	-448.5	1,069.0	0.00	0.00	
5,500.0	0.00	0.00	5,338.8	970.3	-448.5	1,069.0	0.00	0.00	
5,600.0	0.00	0.00	5,438.8	970.3	-448.5	1,069.0	0.00	0.00	
5,700.0	0.00	0.00	5,538.8	970.3	-448.5	1,069.0	0.00	0.00	
5,713.2	0.00	0.00	5,552.0	970.3	-448.5	1,069.0	0.00	0.00	Coal Ridge
5,800.0	0.00	0.00	5,638.8	970.3	-448.5	1,069.0	0.00	0.00	
5,900.0	0.00	0.00	5,738.8	970.3	-448.5	1,069.0	0.00	0.00	
6,000.0	0.00	0.00	5,838.8	970.3	-448.5	1,069.0	0.00	0.00	
6,100.0	0.00	0.00	5,938.8	970.3	-448.5	1,069.0	0.00	0.00	
6,164.2	0.00	0.00	6,003.0	970.3	-448.5	1,069.0	0.00	0.00	Rollins
6,200.0	0.00	0.00	6,038.8	970.3	-448.5	1,069.0	0.00	0.00	
6,300.0	0.00	0.00	6,138.8	970.3	-448.5	1,069.0	0.00	0.00	
6,314.2	0.00	0.00	6,153.0	970.3	-448.5	1,069.0	0.00	0.00	TD @ 6,314.2' MD
6,400.0	0.00	0.00	6,238.8	970.3	-448.5	1,069.0	0.00	0.00	
6,414.2	0.00	0.00	6,253.0	970.3	-448.5	1,069.0	0.00	0.00	Permit TD @ 6,414.2' MD

### Targets

Target Name - hit/miss target - Shape	Dip Angle (°)	Dip Dir. (°)	TVD (ft)	+N/-S (ft)	+E/-W (ft)	Northing (ft)	Easting (ft)	Latitude	Longitude
Federal 31-5A PBHL - plan hits target center - Circle (radius 25.0)	0.00	0.00	6,153.0	970.3	-448.5	1,579,754.05	2,280,810.74	39.397515	-108.045293
Federal 31-5A TGT - plan hits target center - Point	0.00	0.00	4,209.0	970.3	-448.5	1,579,754.05	2,280,810.74	39.397515	-108.045293

### Casing Points

Measured Depth (ft)	Vertical Depth (ft)	Name	Casing Diameter (in)	Hole Diameter (in)
1,018.6	1,000.0	Surface Casing		

# Cathedral Energy Services

## Planning Report

<b>Database:</b>	USA EDM 5000 Multi Users DB	<b>Local Co-ordinate Reference:</b>	Well Federal 31-5A
<b>Company:</b>	EnCana Oil & Gas (USA) Inc	<b>TVD Reference:</b>	KB=22' @ 5856.0ft (Patterson #308)
<b>Project:</b>	S. Piceance (Parachute)	<b>MD Reference:</b>	KB=22' @ 5856.0ft (Patterson #308)
<b>Site:</b>	PF-31 Pad - S31-T7S-R95W	<b>North Reference:</b>	True
<b>Well:</b>	Federal 31-5A	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	DD		
<b>Design:</b>	Plan #1		

### Formations

Measured Depth (ft)	Vertical Depth (ft)	Name	Lithology	Dip (°)	Dip Direction (°)
3,318.7	3,180.0	Ohio Creek			
3,318.7	3,180.0	Top of Mesaverde			
3,980.0	3,820.0	Williams Fork			
4,370.2	4,209.0	Top Gas			
5,713.2	5,552.0	Coal Ridge			
6,164.2	6,003.0	Rollins			

### Plan Annotations

Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment
		+N/-S (ft)	+E/-W (ft)	
250.0	250.0	0.0	0.0	KOP @ 250'
869.8	859.0	90.5	-41.8	EOB @ Inc. = 18.59°
3,440.5	3,295.5	834.6	-385.7	Start 2° Drop
4,370.2	4,209.0	970.3	-448.5	EOD @ Inc. = 0°
6,314.2	6,153.0	970.3	-448.5	TD @ 6,314.2' MD
6,414.2	6,253.0	970.3	-448.5	Permit TD @ 6,414.2' MD