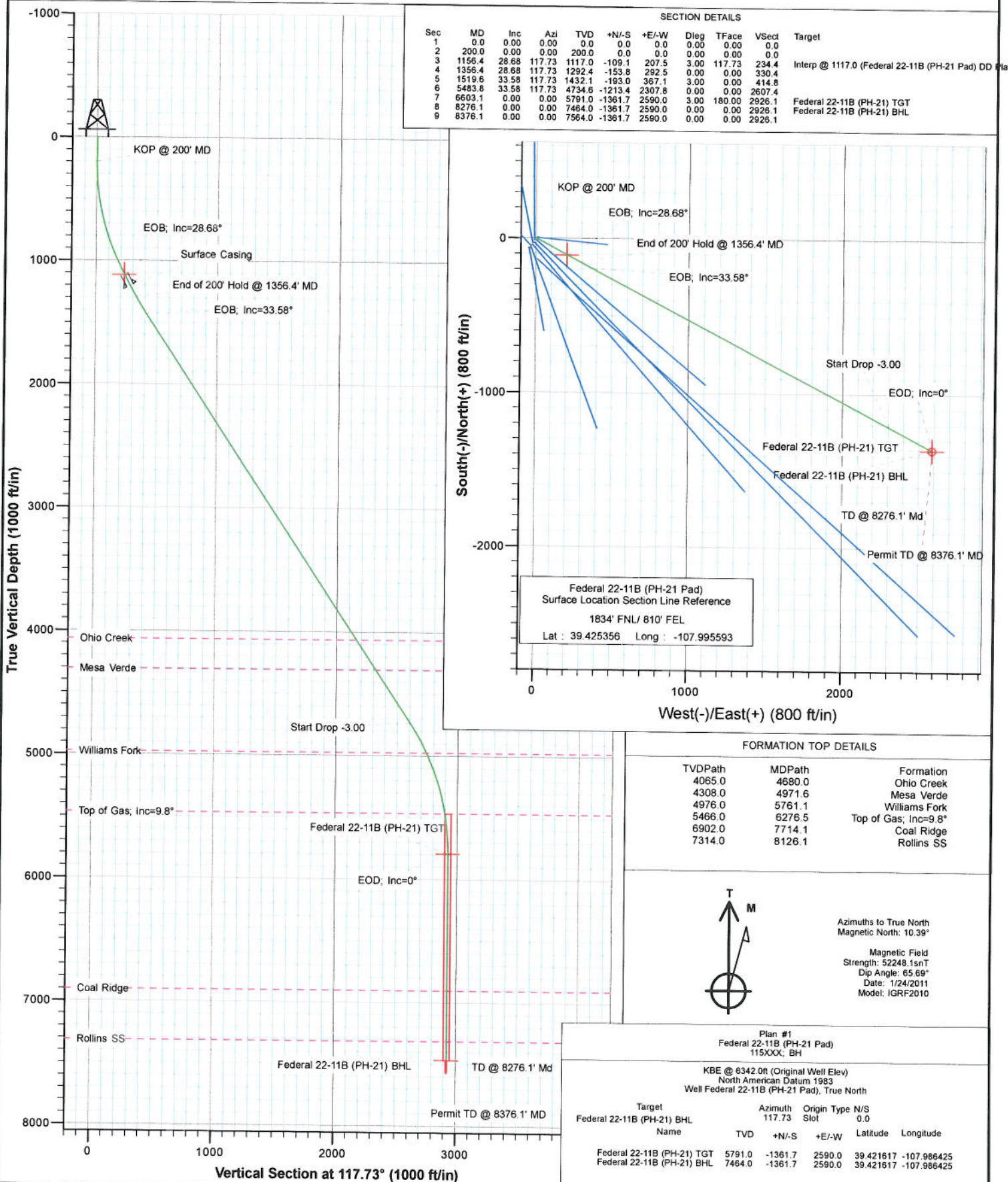




Project: S. Piceance (Parachute)  
Site: SENE S21-T7S-R95W (PH-21 Pad)  
Well: Federal 22-11B (PH-21 Pad)  
Wellbore: DD  
Plan: Plan #1



# Cathedral Energy Services

## Planning Report

**Database:** EDM 5000.1 US Multi Users DB  
**Company:** EnCana Oil & Gas (USA) Inc  
**Project:** S. Piceance (Parachute)  
**Site:** SENE S21-T7S-R95W (PH-21 Pad)  
**Well:** Federal 22-11B (PH-21 Pad)  
**Wellbore:** DD  
**Design:** Plan #1

**Local Co-ordinate Reference:** Well Federal 22-11B (PH-21 Pad)  
**TVD Reference:** KBE @ 6342.0ft (Original Well Elev)  
**MD Reference:** KBE @ 6342.0ft (Original Well Elev)  
**North Reference:** True  
**Survey Calculation Method:** Minimum Curvature

**Project** S. Piceance (Parachute), Garfield County, CO

**Map System:** US State Plane 1983  
**Geo Datum:** North American Datum 1983  
**Map Zone:** Colorado Central Zone  
**System Datum:** Mean Sea Level

**Site** SENE S21-T7S-R95W (PH-21 Pad)

**Site Position:** Northing: 1,589,456.28 ft Latitude: 39.425231  
**From:** Lat/Long Easting: 2,295,105.61 ft Longitude: -107.995671  
**Position Uncertainty:** 0.0 ft Slot Radius: 13.200 in Grid Convergence: -1.57 °

**Well** Federal 22-11B (PH-21 Pad)

**Well Position** +N/-S 0.0 ft Northing: 1,589,501.18 ft Latitude: 39.425356  
 +E/-W 0.0 ft Easting: 2,295,128.88 ft Longitude: -107.995593  
**Position Uncertainty** 0.0 ft Wellhead Elevation: ft Ground Level: 6,320.0 ft

**Wellbore** DD

Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	1/24/2011	10.39	65.69	52,248

**Design** Plan #1

**Audit Notes:**

**Version:** Phase: PLAN Tie On Depth: 0.0

Vertical Section:	Depth From (TVD) (ft)	+N/-S (ft)	+E/-W (ft)	Direction (°)
	0.0	0.0	0.0	117.73

### Plan Sections

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	
200.0	0.00	0.00	200.0	0.0	0.0	0.00	0.00	0.00	0.00	
1,156.4	28.68	117.73	1,117.0	-109.1	207.5	3.00	3.00	12.31	117.73	Interp @ 1117.0 (Fed)
1,356.4	28.68	117.73	1,292.4	-153.8	292.5	0.00	0.00	0.00	0.00	
1,519.6	33.58	117.73	1,432.1	-193.0	367.1	3.00	3.00	0.00	0.00	
5,483.8	33.58	117.73	4,734.6	-1,213.4	2,307.8	0.00	0.00	0.00	0.00	
6,603.1	0.00	0.00	5,791.0	-1,361.7	2,590.0	3.00	-3.00	0.00	180.00	Federal 22-11B (PH-2)
8,276.1	0.00	0.00	7,464.0	-1,361.7	2,590.0	0.00	0.00	0.00	0.00	Federal 22-11B (PH-2)
8,376.1	0.00	0.00	7,564.0	-1,361.7	2,590.0	0.00	0.00	0.00	0.00	



# Cathedral Energy Services

## Planning Report

**Database:** EDM 5000.1 US Multi Users DB  
**Company:** EnCana Oil & Gas (USA) Inc  
**Project:** S. Piceance (Parachute)  
**Site:** SENE S21-T7S-R95W (PH-21 Pad)  
**Well:** Federal 22-11B (PH-21 Pad)  
**Wellbore:** DD  
**Design:** Plan #1

**Local Co-ordinate Reference:** Well Federal 22-11B (PH-21 Pad)  
**TVD Reference:** KBE @ 6342.0ft (Original Well Elev)  
**MD Reference:** KBE @ 6342.0ft (Original Well Elev)  
**North Reference:** True  
**Survey Calculation Method:** Minimum Curvature

### 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	KOP @ 200' MD
300.0	3.00	117.73	300.0	-1.2	2.3	2.6	3.00	3.00	
400.0	6.00	117.73	399.6	-4.9	9.3	10.5	3.00	3.00	
500.0	9.00	117.73	498.8	-10.9	20.8	23.5	3.00	3.00	
600.0	12.00	117.73	597.1	-19.4	36.9	41.7	3.00	3.00	
700.0	15.00	117.73	694.3	-30.3	57.6	65.1	3.00	3.00	
800.0	17.99	117.73	790.2	-43.5	82.7	93.4	3.00	3.00	
900.0	20.99	117.73	884.4	-59.0	112.2	126.8	3.00	3.00	
1,000.0	23.99	117.73	976.8	-76.8	146.1	165.1	3.00	3.00	
1,100.0	26.99	117.73	1,067.1	-96.8	184.2	208.1	3.00	3.00	
1,156.4	28.68	117.73	1,117.0	-109.1	207.5	234.4	3.00	3.00	EOB; Inc=28.68° - Interp @ 1117.0 (Federal 22
1,200.0	28.68	117.73	1,155.2	-118.8	226.0	255.4	0.00	0.00	
1,256.4	28.68	117.73	1,204.7	-131.4	250.0	282.4	0.00	0.00	Surface Casing
1,300.0	28.68	117.73	1,242.9	-141.2	268.5	303.4	0.00	0.00	
1,356.4	28.68	117.73	1,292.4	-153.8	292.5	330.4	0.00	0.00	End of 200' Hold @ 1356.4' MD
1,400.0	29.99	117.73	1,330.4	-163.7	311.4	351.8	3.00	3.00	
1,500.0	32.99	117.73	1,415.7	-188.0	357.6	404.0	3.00	3.00	
1,519.6	33.58	117.73	1,432.1	-193.0	367.1	414.8	3.00	3.00	EOB; Inc=33.58°
1,600.0	33.58	117.73	1,499.0	-213.7	406.5	459.3	0.00	0.00	
1,700.0	33.58	117.73	1,582.3	-239.5	455.5	514.6	0.00	0.00	
1,800.0	33.58	117.73	1,665.7	-265.2	504.4	569.9	0.00	0.00	
1,900.0	33.58	117.73	1,749.0	-290.9	553.4	625.2	0.00	0.00	
2,000.0	33.58	117.73	1,832.3	-316.7	602.3	680.5	0.00	0.00	
2,100.0	33.58	117.73	1,915.6	-342.4	651.3	735.8	0.00	0.00	
2,200.0	33.58	117.73	1,998.9	-368.2	700.2	791.1	0.00	0.00	
2,300.0	33.58	117.73	2,082.2	-393.9	749.2	846.4	0.00	0.00	
2,400.0	33.58	117.73	2,165.5	-419.6	798.1	901.7	0.00	0.00	
2,500.0	33.58	117.73	2,248.8	-445.4	847.1	957.1	0.00	0.00	
2,600.0	33.58	117.73	2,332.2	-471.1	896.1	1,012.4	0.00	0.00	
2,700.0	33.58	117.73	2,415.5	-496.9	945.0	1,067.7	0.00	0.00	
2,800.0	33.58	117.73	2,498.8	-522.6	994.0	1,123.0	0.00	0.00	
2,900.0	33.58	117.73	2,582.1	-548.3	1,042.9	1,178.3	0.00	0.00	
3,000.0	33.58	117.73	2,665.4	-574.1	1,091.9	1,233.6	0.00	0.00	
3,100.0	33.58	117.73	2,748.7	-599.8	1,140.8	1,288.9	0.00	0.00	
3,200.0	33.58	117.73	2,832.0	-625.6	1,189.8	1,344.2	0.00	0.00	
3,300.0	33.58	117.73	2,915.3	-651.3	1,238.8	1,399.5	0.00	0.00	
3,400.0	33.58	117.73	2,998.6	-677.0	1,287.7	1,454.8	0.00	0.00	
3,500.0	33.58	117.73	3,082.0	-702.8	1,336.7	1,510.2	0.00	0.00	
3,600.0	33.58	117.73	3,165.3	-728.5	1,385.6	1,565.5	0.00	0.00	
3,700.0	33.58	117.73	3,248.6	-754.3	1,434.6	1,620.8	0.00	0.00	
3,800.0	33.58	117.73	3,331.9	-780.0	1,483.5	1,676.1	0.00	0.00	
3,900.0	33.58	117.73	3,415.2	-805.7	1,532.5	1,731.4	0.00	0.00	
4,000.0	33.58	117.73	3,498.5	-831.5	1,581.4	1,786.7	0.00	0.00	
4,100.0	33.58	117.73	3,581.8	-857.2	1,630.4	1,842.0	0.00	0.00	
4,200.0	33.58	117.73	3,665.1	-883.0	1,679.4	1,897.3	0.00	0.00	
4,300.0	33.58	117.73	3,748.4	-908.7	1,728.3	1,952.6	0.00	0.00	
4,400.0	33.58	117.73	3,831.8	-934.4	1,777.3	2,008.0	0.00	0.00	
4,500.0	33.58	117.73	3,915.1	-960.2	1,826.2	2,063.3	0.00	0.00	
4,600.0	33.58	117.73	3,998.4	-985.9	1,875.2	2,118.6	0.00	0.00	
4,680.0	33.58	117.73	4,065.0	-1,006.5	1,914.3	2,162.8	0.00	0.00	Ohio Creek

# Cathedral Energy Services

## Planning Report

**Database:** EDM 5000.1 US Multi Users DB  
**Company:** EnCana Oil & Gas (USA) Inc  
**Project:** S. Piceance (Parachute)  
**Site:** SENE S21-T7S-R95W (PH-21 Pad)  
**Well:** Federal 22-11B (PH-21 Pad)  
**Wellbore:** DD  
**Design:** Plan #1

**Local Co-ordinate Reference:** Well Federal 22-11B (PH-21 Pad)  
**TVD Reference:** KBE @ 6342.0ft (Original Well Elev)  
**MD Reference:** KBE @ 6342.0ft (Original Well Elev)  
**North Reference:** True  
**Survey Calculation Method:** Minimum Curvature

### 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
4,700.0	33.58	117.73	4,081.7	-1,011.7	1,924.1	2,173.9	0.00	0.00	
4,800.0	33.58	117.73	4,165.0	-1,037.4	1,973.1	2,229.2	0.00	0.00	
4,900.0	33.58	117.73	4,248.3	-1,063.1	2,022.1	2,284.5	0.00	0.00	
4,971.6	33.58	117.73	4,308.0	-1,081.6	2,057.1	2,324.1	0.00	0.00	Mesa Verde
5,000.0	33.58	117.73	4,331.6	-1,088.9	2,071.0	2,339.8	0.00	0.00	
5,100.0	33.58	117.73	4,414.9	-1,114.6	2,120.0	2,395.1	0.00	0.00	
5,200.0	33.58	117.73	4,498.2	-1,140.4	2,168.9	2,450.4	0.00	0.00	
5,300.0	33.58	117.73	4,581.6	-1,166.1	2,217.9	2,505.7	0.00	0.00	
5,400.0	33.58	117.73	4,664.9	-1,191.8	2,266.8	2,561.1	0.00	0.00	
5,483.8	33.58	117.73	4,734.6	-1,213.4	2,307.8	2,607.4	0.00	0.00	Start Drop -3.00
5,500.0	33.09	117.73	4,748.2	-1,217.6	2,315.7	2,616.3	3.00	-3.00	
5,600.0	30.09	117.73	4,833.4	-1,241.9	2,362.1	2,668.7	3.00	-3.00	
5,700.0	27.09	117.73	4,921.2	-1,264.2	2,404.5	2,716.5	3.00	-3.00	
5,761.1	25.26	117.73	4,976.0	-1,276.7	2,428.3	2,743.5	3.00	-3.00	Williams Fork
5,800.0	24.09	117.73	5,011.4	-1,284.3	2,442.7	2,759.7	3.00	-3.00	
5,900.0	21.09	117.73	5,103.7	-1,302.2	2,476.7	2,798.1	3.00	-3.00	
6,000.0	18.09	117.73	5,197.9	-1,317.8	2,506.4	2,831.7	3.00	-3.00	
6,100.0	15.09	117.73	5,293.7	-1,331.1	2,531.6	2,860.2	3.00	-3.00	
6,200.0	12.09	117.73	5,390.9	-1,342.0	2,552.4	2,883.7	3.00	-3.00	
6,276.5	9.80	117.73	5,466.0	-1,348.8	2,565.3	2,898.3	3.00	-3.00	Top of Gas; Inc=9.8°
6,300.0	9.09	117.73	5,489.2	-1,350.6	2,568.7	2,902.1	3.00	-3.00	
6,400.0	6.09	117.73	5,588.3	-1,356.7	2,580.4	2,915.3	3.00	-3.00	
6,500.0	3.09	117.73	5,687.9	-1,360.4	2,587.5	2,923.3	3.00	-3.00	
6,600.0	0.09	117.73	5,787.9	-1,361.7	2,590.0	2,926.1	3.00	-3.00	
6,603.1	0.00	0.00	5,791.0	-1,361.7	2,590.0	2,926.1	3.00	-3.00	EOD; Inc=0° - Federal 22-11B (PH-21) TGT
6,700.0	0.00	0.00	5,887.9	-1,361.7	2,590.0	2,926.1	0.00	0.00	
6,800.0	0.00	0.00	5,987.9	-1,361.7	2,590.0	2,926.1	0.00	0.00	
6,900.0	0.00	0.00	6,087.9	-1,361.7	2,590.0	2,926.1	0.00	0.00	
7,000.0	0.00	0.00	6,187.9	-1,361.7	2,590.0	2,926.1	0.00	0.00	
7,100.0	0.00	0.00	6,287.9	-1,361.7	2,590.0	2,926.1	0.00	0.00	
7,200.0	0.00	0.00	6,387.9	-1,361.7	2,590.0	2,926.1	0.00	0.00	
7,300.0	0.00	0.00	6,487.9	-1,361.7	2,590.0	2,926.1	0.00	0.00	
7,400.0	0.00	0.00	6,587.9	-1,361.7	2,590.0	2,926.1	0.00	0.00	
7,500.0	0.00	0.00	6,687.9	-1,361.7	2,590.0	2,926.1	0.00	0.00	
7,600.0	0.00	0.00	6,787.9	-1,361.7	2,590.0	2,926.1	0.00	0.00	
7,700.0	0.00	0.00	6,887.9	-1,361.7	2,590.0	2,926.1	0.00	0.00	
7,714.1	0.00	0.00	6,902.0	-1,361.7	2,590.0	2,926.1	0.00	0.00	Coal Ridge
7,800.0	0.00	0.00	6,987.9	-1,361.7	2,590.0	2,926.1	0.00	0.00	
7,900.0	0.00	0.00	7,087.9	-1,361.7	2,590.0	2,926.1	0.00	0.00	
8,000.0	0.00	0.00	7,187.9	-1,361.7	2,590.0	2,926.1	0.00	0.00	
8,100.0	0.00	0.00	7,287.9	-1,361.7	2,590.0	2,926.1	0.00	0.00	
8,126.1	0.00	0.00	7,314.0	-1,361.7	2,590.0	2,926.1	0.00	0.00	Rollins SS
8,200.0	0.00	0.00	7,387.9	-1,361.7	2,590.0	2,926.1	0.00	0.00	
8,276.1	0.00	0.00	7,464.0	-1,361.7	2,590.0	2,926.1	0.00	0.00	TD @ 8276.1' Md - Federal 22-11B (PH-21) BH
8,300.0	0.00	0.00	7,487.9	-1,361.7	2,590.0	2,926.1	0.00	0.00	
8,376.1	0.00	0.00	7,564.0	-1,361.7	2,590.0	2,926.1	0.00	0.00	Permit TD @ 8376.1' MD



# Cathedral Energy Services

## Planning Report

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**Company:** EnCana Oil & Gas (USA) Inc  
**Project:** S. Piceance (Parachute)  
**Site:** SENE S21-T7S-R95W (PH-21 Pad)  
**Well:** Federal 22-11B (PH-21 Pad)  
**Wellbore:** DD  
**Design:** Plan #1

**Local Co-ordinate Reference:** Well Federal 22-11B (PH-21 Pad)  
**TVD Reference:** KBE @ 6342.0ft (Original Well Elev)  
**MD Reference:** KBE @ 6342.0ft (Original Well Elev)  
**North Reference:** True  
**Survey Calculation Method:** Minimum Curvature

### 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 22-11B (PH-21) - plan hits target center - Circle (radius 25.0)	0.00	0.00	7,464.0	-1,361.7	2,590.0	1,588,068.82	2,297,680.46	39.421617	-107.986425
Federal 22-11B (PH-21) - plan hits target center - Circle (radius 25.0)	0.00	0.00	5,791.0	-1,361.7	2,590.0	1,588,068.82	2,297,680.46	39.421617	-107.986425
Interp @ 1117.0 (Federal) - plan hits target center - Point	0.00	0.00	1,117.0	-109.1	207.5	1,589,386.41	2,295,333.32	39.425056	-107.994858

### Casing Points

Measured Depth (ft)	Vertical Depth (ft)	Name	Casing Diameter (in)	Hole Diameter (in)
1,256.4	1,204.7	Surface Casing	0.000	0.000

### Formations

Measured Depth (ft)	Vertical Depth (ft)	Name	Lithology	Dip (°)	Dip Direction (°)
4,680.0	4,065.0	Ohio Creek		0.00	
4,971.6	4,308.0	Mesa Verde		0.00	
5,761.1	4,976.0	Williams Fork		0.00	
6,276.5	5,466.0	Top of Gas; Inc=9.8°		0.00	
7,714.1	6,902.0	Coal Ridge		0.00	
8,126.1	7,314.0	Rollins SS		0.00	

### Plan Annotations

Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment
		+N/-S (ft)	+E/-W (ft)	
200.0	200.0	0.0	0.0	KOP @ 200' MD
1,156.4	1,117.0	-109.1	207.5	EOB; Inc=28.68°
1,356.4	1,292.4	-153.8	292.5	End of 200' Hold @ 1356.4' MD
1,519.6	1,432.1	-193.0	367.1	EOB; Inc=33.58°
5,483.8	4,734.6	-1,213.4	2,307.8	Start Drop -3.00
6,603.1	5,791.0	-1,361.7	2,590.0	EOD; Inc=0°
8,276.1	7,464.0	-1,361.7	2,590.0	TD @ 8276.1' Md
8,376.1	7,564.0	-1,361.7	2,590.0	Permit TD @ 8376.1' MD