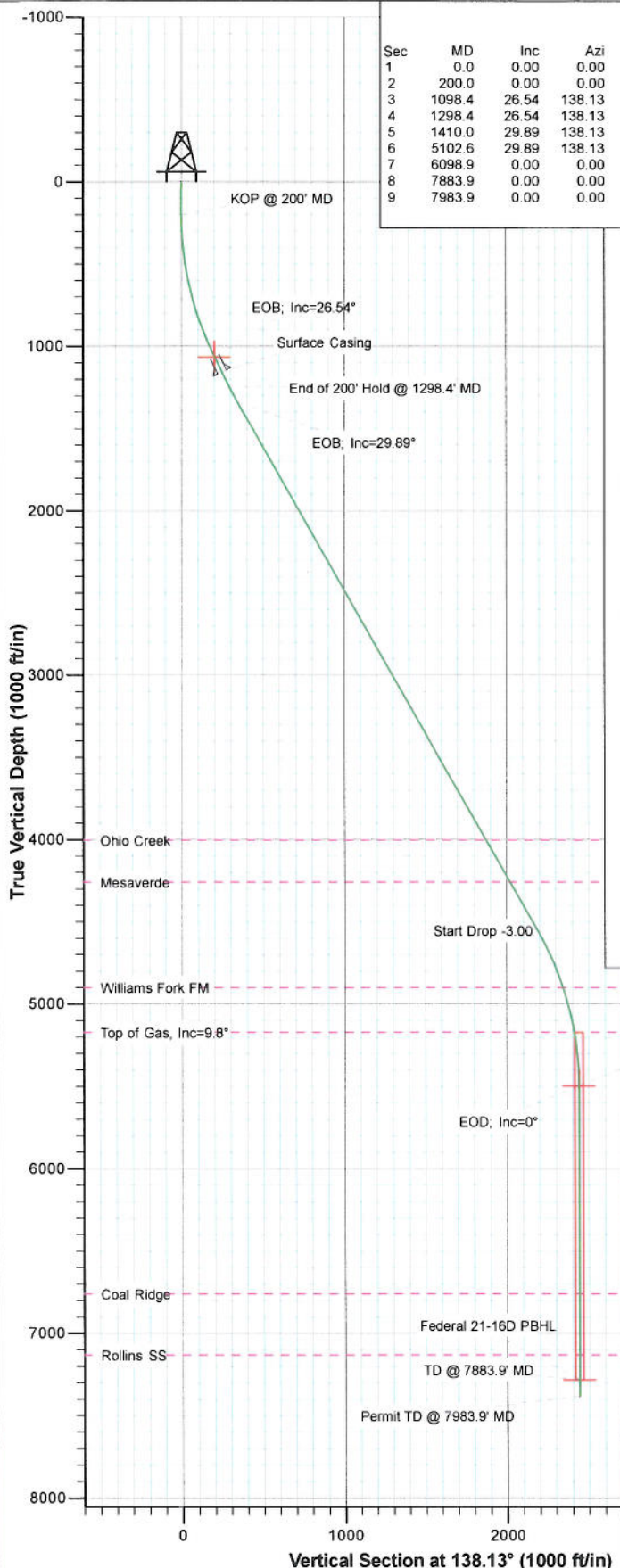


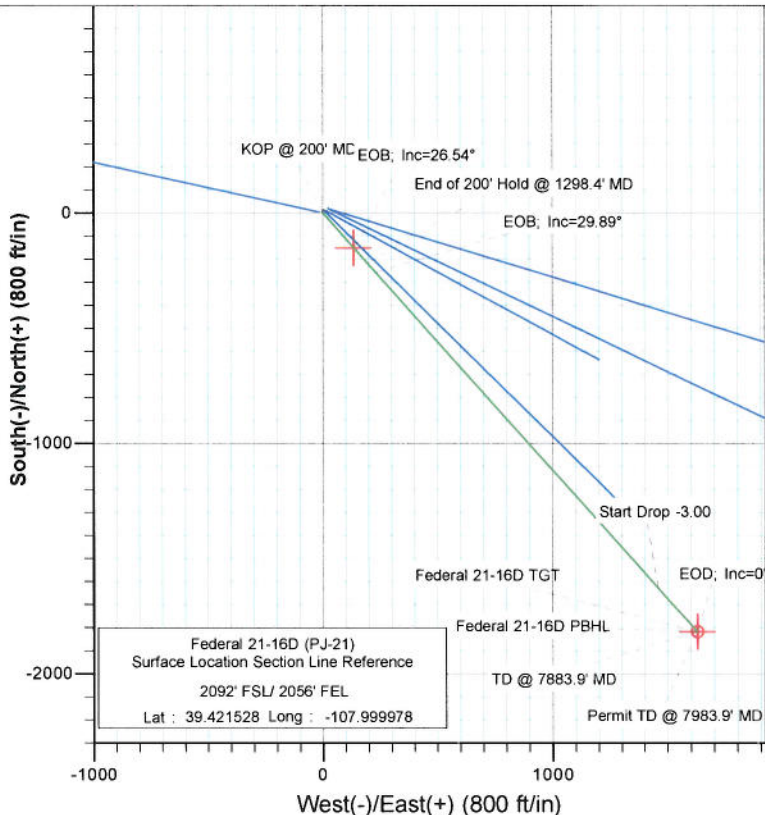


Project: S. Piceance (Parachute)  
 Site: NWSE S21-T7S-R95W (PJ-21)  
 Well: Federal 21-16D (PJ-21)  
 Wellbore: DD  
 Plan: Plan #1



SECTION DETAILS

Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	Vsect	Target
1	0.0	0.00	0.00	0.0	0.0	0.0	0.00	0.00	0.0	
2	200.0	0.00	0.00	200.0	0.0	0.0	0.00	0.00	0.0	
3	1098.4	26.54	138.13	1066.6	-152.2	136.4	2.95	138.13	204.4	Interp @ 1066.6 (Federal 21-16D (PJ-21) DD Plan #
4	1298.4	26.54	138.13	1245.5	-218.7	196.1	0.00	0.00	293.7	
5	1410.0	29.89	138.13	1343.9	-258.0	231.3	3.00	0.00	346.5	
6	5102.6	29.89	138.13	4545.3	-1628.3	1459.5	0.00	0.00	2186.6	
7	6098.9	0.00	0.00	5497.0	-1817.5	1629.0	3.00	180.00	2440.7	Federal 21-16D TGT
8	7883.9	0.00	0.00	7282.0	-1817.5	1629.0	0.00	0.00	2440.7	Federal 21-16D PBHL
9	7983.9	0.00	0.00	7382.0	-1817.5	1629.0	0.00	0.00	2440.7	



FORMATION TOP DETAILS

TVDPath	MDPath	Formation
4004.0	4478.3	Ohio Creek
4259.0	4772.4	Mesaverde
4900.0	5491.7	Williams Fork FM
5172.0	5772.3	Top of Gas, Inc=9.8°
6760.0	7361.9	Coal Ridge
7132.0	7733.9	Rollins SS



Azimuths to True North  
 Magnetic North: 10.40°  
 Magnetic Field  
 Strength: 52246.8nT  
 Dip Angle: 65.69°  
 Date: 1/19/2011  
 Model: IGRF2010

Plan #1 Federal 21-16D (PJ-21)					
WELL @ 6323.0ft (Original Well Elev)					
Well Federal 21-16D (PJ-21), True North					
North American Datum 1983					
Target	Azimuth	Origin Type	N/S		
Federal 21-16D PBHL	138.13	Slot	0.0		
Name	TVD	+N/-S	+E/-W	Latitude	Longitude
Federal 21-16D TGT	5497.0	-1817.5	1629.0	39.416538	-107.994212
Federal 21-16D PBHL	7282.0	-1817.5	1629.0	39.416538	-107.994212

# Cathedral Energy Services

## Planning Report

**Database:** EDM 5000.1 US Multi Users DB  
**Company:** EnCana Oil & Gas (USA) Inc  
**Project:** S. Piceance (Parachute)  
**Site:** NWSE S21-T7S-R95W (PJ-21)  
**Well:** Federal 21-16D (PJ-21)  
**Wellbore:** DD  
**Design:** Plan #1

**Local Co-ordinate Reference:** Well Federal 21-16D (PJ-21)  
**TVD Reference:** WELL @ 6323.0ft (Original Well Elev)  
**MD Reference:** WELL @ 6323.0ft (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** NWSE S21-T7S-R95W (PJ-21)

**Site Position:** Northing: 1,588,155.39 ft Latitude: 39.421569  
**From:** Lat/Long Easting: 2,293,889.70 ft Longitude: -107.999847  
**Position Uncertainty:** 0.0 ft Slot Radius: 13.200 in Grid Convergence: -1.58 °

**Well** Federal 21-16D (PJ-21)

**Well Position** +N/-S 0.0 ft Northing: 1,588,141.46 ft Latitude: 39.421528  
 +E/-W 0.0 ft Easting: 2,293,852.30 ft Longitude: -107.999978  
**Position Uncertainty** 0.0 ft Wellhead Elevation: ft Ground Level: 6,301.0 ft

**Wellbore** DD

Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	1/19/2011	10.40	65.69	52,247

**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	138.13

### 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	
1,098.4	26.54	138.13	1,066.6	-152.2	136.4	2.95	2.95	15.38	138.13	Interp @ 1066.6 (Fed
1,298.4	26.54	138.13	1,245.5	-218.7	196.1	0.00	0.00	0.00	0.00	
1,410.0	29.89	138.13	1,343.9	-258.0	231.3	3.00	3.00	0.00	0.00	
5,102.6	29.89	138.13	4,545.3	-1,628.3	1,459.5	0.00	0.00	0.00	0.00	
6,098.9	0.00	0.00	5,497.0	-1,817.5	1,629.0	3.00	-3.00	0.00	180.00	Federal 21-16D TGT
7,883.9	0.00	0.00	7,282.0	-1,817.5	1,629.0	0.00	0.00	0.00	0.00	Federal 21-16D PBHL
7,983.9	0.00	0.00	7,382.0	-1,817.5	1,629.0	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: NWSE S21-T7S-R95W (PJ-21)  
Well: Federal 21-16D (PJ-21)  
Wellbore: DD  
Design: Plan #1

Local Co-ordinate Reference: Well Federal 21-16D (PJ-21)  
TVD Reference: WELL @ 6323.0ft (Original Well Elev)  
MD Reference: WELL @ 6323.0ft (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	2.95	138.13	300.0	-1.9	1.7	2.6	2.95	2.95	
400.0	5.91	138.13	399.6	-7.7	6.9	10.3	2.95	2.95	
500.0	8.86	138.13	498.8	-17.2	15.5	23.2	2.95	2.95	
600.0	11.82	138.13	597.2	-30.6	27.4	41.1	2.95	2.95	
700.0	14.77	138.13	694.5	-47.7	42.8	64.1	2.95	2.95	
800.0	17.73	138.13	790.5	-68.6	61.5	92.1	2.95	2.95	
900.0	20.68	138.13	884.9	-93.1	83.4	125.0	2.95	2.95	
1,000.0	23.63	138.13	977.5	-121.1	108.6	162.7	2.95	2.95	
1,098.4	26.54	138.13	1,066.6	-152.2	136.4	204.4	2.95	2.95	EOB; Inc=26.54° - Interp @ 1066.6 (Federal 21
1,100.0	26.54	138.13	1,068.0	-152.7	136.9	205.1	0.00	0.00	
1,198.0	26.54	138.13	1,155.7	-185.3	166.1	248.9	0.00	0.00	Surface Casing
1,200.0	26.54	138.13	1,157.5	-186.0	166.7	249.8	0.00	0.00	
1,298.4	26.54	138.13	1,245.5	-218.7	196.1	293.7	0.00	0.00	End of 200' Hold @ 1298.4' MD
1,300.0	26.59	138.13	1,247.0	-219.3	196.5	294.5	3.00	3.00	
1,400.0	29.59	138.13	1,335.2	-254.3	228.0	341.5	3.00	3.00	
1,410.0	29.89	138.13	1,343.9	-258.0	231.3	346.5	3.00	3.00	EOB; Inc=29.89°
1,500.0	29.89	138.13	1,421.9	-291.4	261.2	391.4	0.00	0.00	
1,600.0	29.89	138.13	1,508.6	-328.5	294.5	441.2	0.00	0.00	
1,700.0	29.89	138.13	1,595.3	-365.6	327.7	491.0	0.00	0.00	
1,800.0	29.89	138.13	1,682.0	-402.8	361.0	540.9	0.00	0.00	
1,900.0	29.89	138.13	1,768.7	-439.9	394.3	590.7	0.00	0.00	
2,000.0	29.89	138.13	1,855.4	-477.0	427.5	640.5	0.00	0.00	
2,100.0	29.89	138.13	1,942.1	-514.1	460.8	690.4	0.00	0.00	
2,200.0	29.89	138.13	2,028.8	-551.2	494.0	740.2	0.00	0.00	
2,300.0	29.89	138.13	2,115.5	-588.3	527.3	790.0	0.00	0.00	
2,400.0	29.89	138.13	2,202.2	-625.4	560.6	839.9	0.00	0.00	
2,500.0	29.89	138.13	2,288.9	-662.5	593.8	889.7	0.00	0.00	
2,600.0	29.89	138.13	2,375.6	-699.6	627.1	939.5	0.00	0.00	
2,700.0	29.89	138.13	2,462.3	-736.7	660.3	989.4	0.00	0.00	
2,800.0	29.89	138.13	2,549.0	-773.8	693.6	1,039.2	0.00	0.00	
2,900.0	29.89	138.13	2,635.7	-810.9	726.9	1,089.0	0.00	0.00	
3,000.0	29.89	138.13	2,722.4	-848.1	760.1	1,138.9	0.00	0.00	
3,100.0	29.89	138.13	2,809.1	-885.2	793.4	1,188.7	0.00	0.00	
3,200.0	29.89	138.13	2,895.8	-922.3	826.6	1,238.5	0.00	0.00	
3,300.0	29.89	138.13	2,982.5	-959.4	859.9	1,288.4	0.00	0.00	
3,400.0	29.89	138.13	3,069.2	-996.5	893.2	1,338.2	0.00	0.00	
3,500.0	29.89	138.13	3,155.9	-1,033.6	926.4	1,388.0	0.00	0.00	
3,600.0	29.89	138.13	3,242.6	-1,070.7	959.7	1,437.8	0.00	0.00	
3,700.0	29.89	138.13	3,329.3	-1,107.8	992.9	1,487.7	0.00	0.00	
3,800.0	29.89	138.13	3,416.0	-1,144.9	1,026.2	1,537.5	0.00	0.00	
3,900.0	29.89	138.13	3,502.7	-1,182.0	1,059.5	1,587.3	0.00	0.00	
4,000.0	29.89	138.13	3,589.4	-1,219.1	1,092.7	1,637.2	0.00	0.00	
4,100.0	29.89	138.13	3,676.1	-1,256.2	1,126.0	1,687.0	0.00	0.00	
4,200.0	29.89	138.13	3,762.8	-1,293.4	1,159.3	1,736.8	0.00	0.00	
4,300.0	29.89	138.13	3,849.5	-1,330.5	1,192.5	1,786.7	0.00	0.00	
4,400.0	29.89	138.13	3,936.2	-1,367.6	1,225.8	1,836.5	0.00	0.00	
4,478.3	29.89	138.13	4,004.0	-1,396.6	1,251.8	1,875.5	0.00	0.00	Ohio Creek
4,500.0	29.89	138.13	4,022.9	-1,404.7	1,259.0	1,886.3	0.00	0.00	
4,600.0	29.89	138.13	4,109.6	-1,441.8	1,292.3	1,936.2	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:** NWSE S21-T7S-R95W (PJ-21)  
**Well:** Federal 21-16D (PJ-21)  
**Wellbore:** DD  
**Design:** Plan #1

**Local Co-ordinate Reference:** Well Federal 21-16D (PJ-21)  
**TVD Reference:** WELL @ 6323.0ft (Original Well Elev)  
**MD Reference:** WELL @ 6323.0ft (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	29.89	138.13	4,196.3	-1,478.9	1,325.6	1,986.0	0.00	0.00	
4,772.4	29.89	138.13	4,259.0	-1,505.8	1,349.6	2,022.1	0.00	0.00	Mesaverde
4,800.0	29.89	138.13	4,282.9	-1,516.0	1,358.8	2,035.8	0.00	0.00	
4,900.0	29.89	138.13	4,369.6	-1,553.1	1,392.1	2,085.7	0.00	0.00	
5,000.0	29.89	138.13	4,456.3	-1,590.2	1,425.3	2,135.5	0.00	0.00	
5,100.0	29.89	138.13	4,543.0	-1,627.3	1,458.6	2,185.3	0.00	0.00	
5,102.6	29.89	138.13	4,545.3	-1,628.3	1,459.5	2,186.6	0.00	0.00	Start Drop -3.00
5,200.0	26.97	138.13	4,630.9	-1,662.8	1,490.4	2,233.0	3.00	-3.00	
5,300.0	23.97	138.13	4,721.2	-1,694.8	1,519.1	2,276.0	3.00	-3.00	
5,400.0	20.97	138.13	4,813.6	-1,723.3	1,544.6	2,314.2	3.00	-3.00	
5,491.7	18.22	138.13	4,900.0	-1,746.2	1,565.1	2,344.9	3.00	-3.00	Williams Fork FM
5,500.0	17.97	138.13	4,907.9	-1,748.1	1,566.9	2,347.5	3.00	-3.00	
5,600.0	14.97	138.13	5,003.8	-1,769.2	1,585.8	2,375.9	3.00	-3.00	
5,700.0	11.97	138.13	5,101.0	-1,786.5	1,601.3	2,399.2	3.00	-3.00	
5,772.3	9.80	138.13	5,172.0	-1,796.7	1,610.4	2,412.8	3.00	-3.00	Top of Gas, Inc=9.8°
5,800.0	8.97	138.13	5,199.3	-1,800.1	1,613.4	2,417.3	3.00	-3.00	
5,900.0	5.97	138.13	5,298.5	-1,809.7	1,622.1	2,430.3	3.00	-3.00	
6,000.0	2.97	138.13	5,398.2	-1,815.5	1,627.3	2,438.1	3.00	-3.00	
6,098.9	0.00	0.00	5,497.0	-1,817.5	1,629.0	2,440.7	3.00	-3.00	EOD; Inc=0° - Federal 21-16D TGT
6,100.0	0.00	0.00	5,498.1	-1,817.5	1,629.0	2,440.7	0.00	0.00	
6,200.0	0.00	0.00	5,598.1	-1,817.5	1,629.0	2,440.7	0.00	0.00	
6,300.0	0.00	0.00	5,698.1	-1,817.5	1,629.0	2,440.7	0.00	0.00	
6,400.0	0.00	0.00	5,798.1	-1,817.5	1,629.0	2,440.7	0.00	0.00	
6,500.0	0.00	0.00	5,898.1	-1,817.5	1,629.0	2,440.7	0.00	0.00	
6,600.0	0.00	0.00	5,998.1	-1,817.5	1,629.0	2,440.7	0.00	0.00	
6,700.0	0.00	0.00	6,098.1	-1,817.5	1,629.0	2,440.7	0.00	0.00	
6,800.0	0.00	0.00	6,198.1	-1,817.5	1,629.0	2,440.7	0.00	0.00	
6,900.0	0.00	0.00	6,298.1	-1,817.5	1,629.0	2,440.7	0.00	0.00	
7,000.0	0.00	0.00	6,398.1	-1,817.5	1,629.0	2,440.7	0.00	0.00	
7,100.0	0.00	0.00	6,498.1	-1,817.5	1,629.0	2,440.7	0.00	0.00	
7,200.0	0.00	0.00	6,598.1	-1,817.5	1,629.0	2,440.7	0.00	0.00	
7,300.0	0.00	0.00	6,698.1	-1,817.5	1,629.0	2,440.7	0.00	0.00	
7,361.9	0.00	0.00	6,760.0	-1,817.5	1,629.0	2,440.7	0.00	0.00	Coal Ridge
7,400.0	0.00	0.00	6,798.1	-1,817.5	1,629.0	2,440.7	0.00	0.00	
7,500.0	0.00	0.00	6,898.1	-1,817.5	1,629.0	2,440.7	0.00	0.00	
7,600.0	0.00	0.00	6,998.1	-1,817.5	1,629.0	2,440.7	0.00	0.00	
7,700.0	0.00	0.00	7,098.1	-1,817.5	1,629.0	2,440.7	0.00	0.00	
7,733.9	0.00	0.00	7,132.0	-1,817.5	1,629.0	2,440.7	0.00	0.00	Rollins SS
7,800.0	0.00	0.00	7,198.1	-1,817.5	1,629.0	2,440.7	0.00	0.00	
7,883.9	0.00	0.00	7,282.0	-1,817.5	1,629.0	2,440.7	0.00	0.00	TD @ 7883.9' MD - Federal 21-16D PBHL
7,900.0	0.00	0.00	7,298.1	-1,817.5	1,629.0	2,440.7	0.00	0.00	
7,983.9	0.00	0.00	7,382.0	-1,817.5	1,629.0	2,440.7	0.00	0.00	Permit TD @ 7983.9' MD



# Cathedral Energy Services

## Planning Report

**Database:** EDM 5000.1 US Multi Users DB  
**Company:** EnCana Oil & Gas (USA) Inc  
**Project:** S. Piceance (Parachute)  
**Site:** NWSE S21-T7S-R95W (PJ-21)  
**Well:** Federal 21-16D (PJ-21)  
**Wellbore:** DD  
**Design:** Plan #1

**Local Co-ordinate Reference:** Well Federal 21-16D (PJ-21)  
**TVD Reference:** WELL @ 6323.0ft (Original Well Elev)  
**MD Reference:** WELL @ 6323.0ft (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
Interp @ 1066.6 (Federal 21-16D) - plan hits target center - Point	0.00	0.00	1,066.6	-152.2	136.4	1,587,985.58	2,293,984.47	39.421110	-107.999495
Federal 21-16D TGT - plan hits target center - Circle (radius 25.0)	0.00	0.00	5,497.0	-1,817.5	1,629.0	1,586,279.88	2,295,430.68	39.416538	-107.994212
Federal 21-16D PBHL - plan hits target center - Circle (radius 25.0)	0.00	0.00	7,282.0	-1,817.5	1,629.0	1,586,279.88	2,295,430.68	39.416538	-107.994212

### Casing Points

Measured Depth (ft)	Vertical Depth (ft)	Name	Casing Diameter (in)	Hole Diameter (in)
1,198.0	1,155.7	Surface Casing	0.000	0.000

### Formations

Measured Depth (ft)	Vertical Depth (ft)	Name	Lithology	Dip (°)	Dip Direction (°)
4,478.3	4,004.0	Ohio Creek		0.00	
4,772.4	4,259.0	Mesaverde		0.00	
5,491.7	4,900.0	Williams Fork FM		0.00	
5,772.3	5,172.0	Top of Gas, Inc=9.8°		0.00	
7,361.9	6,760.0	Coal Ridge		0.00	
7,733.9	7,132.0	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
1,098.4	1,066.6	-152.2	136.4	EOB; Inc=26.54°
1,298.4	1,245.5	-218.7	196.1	End of 200' Hold @ 1298.4' MD
1,410.0	1,343.9	-258.0	231.3	EOB; Inc=29.89°
5,102.6	4,545.3	-1,628.3	1,459.5	Start Drop -3.00
6,098.9	5,497.0	-1,817.5	1,629.0	EOD; Inc=0°
7,883.9	7,282.0	-1,817.5	1,629.0	TD @ 7883.9' MD
7,983.9	7,382.0	-1,817.5	1,629.0	Permit TD @ 7983.9' MD