

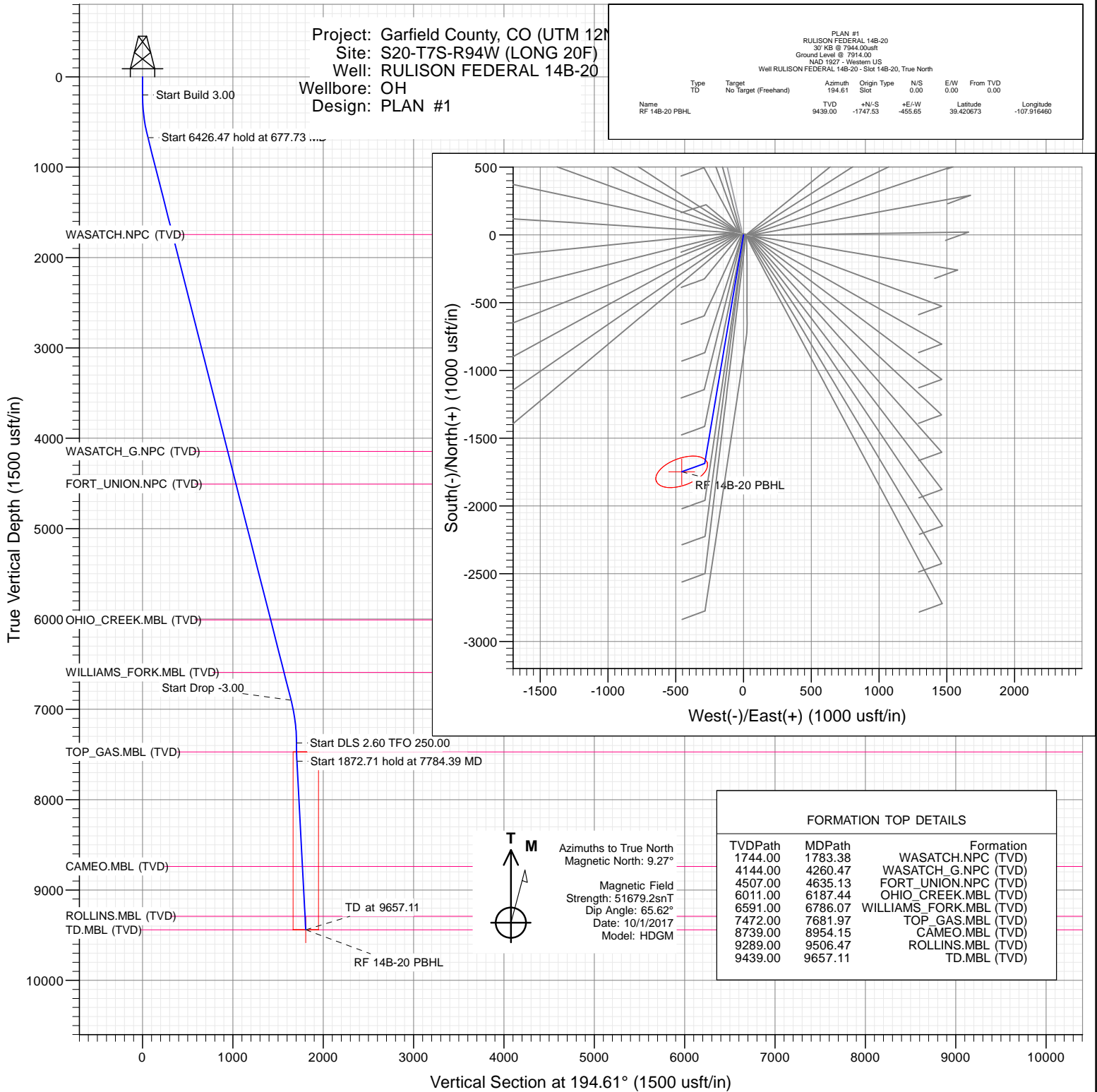


## SECTION DETAILS

Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	Vsect	Target
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
2	200.00	0.00	0.00	200.00	0.00	0.00	0.00	0.00	0.00	
3	677.73	14.33	189.62	672.77	-58.60	-9.93	3.00	189.62	59.21	
4	7104.21	14.33	189.62	6899.23	-1627.06	-275.72	0.00	0.00	1643.98	
5	7581.94	0.00	0.00	7372.00	-1685.66	-285.65	3.00	180.00	1703.19	
6	7784.39	5.26	250.00	7574.17	-1688.84	-294.37	2.60	250.00	1708.47	
7	9657.11	5.26	250.00	9439.00	-1747.53	-455.65	0.00	0.00	1805.96	RF 14B-20 PBHL

Project: Garfield County, CO (UTM 12N)  
Site: S20-T7S-R94W (LONG 20F)  
Well: RULISON FEDERAL 14B-20  
Wellbore: OH  
Design: PLAN #1

PLAN #1 RULISON FEDERAL 14B-20 30' KB @ 7944.00usft Ground Level @ 7914.00 NAD 1927 - Western US Well RULISON FEDERAL 14B-20 - Slot 14B-20, True North							
Type	Target	TD	Target	TD	Origin	N/S	E/W
TD	No Target (Freehand)	TD	No Target (Freehand)	TD	TD	TD	TD
Name	RF 14B-20 PBHL	TD	TD	TD	TD	TD	TD
		9439.00	-1747.53	-455.65	Latitude	Longitude	
					39.420673	-107.916460	



## WELL DETAILS: RULISON FEDERAL 14B-20

		7914.00			
+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
0.00	0.00	14331754.00	2511718.70	39.425468	-107.914848

14B-20

CATHEDRAL



# Cathedral Energy Services

## Planning Report

<b>Database:</b>	USA EDM 5000 Multi Users DB	<b>Local Co-ordinate Reference:</b>	Well RULISON FEDERAL 14B-20 - Slot 14B-20
<b>Company:</b>	Caerus Oil & Gas	<b>TVD Reference:</b>	30' KB @ 7944.00usft
<b>Project:</b>	Garfield County, CO (UTM 12N)	<b>MD Reference:</b>	30' KB @ 7944.00usft
<b>Site:</b>	S20-T7S-R94W (LONG 20F)	<b>North Reference:</b>	True
<b>Well:</b>	RULISON FEDERAL 14B-20	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	OH		
<b>Design:</b>	PLAN #1		

<b>Project</b>	Garfield County, CO (UTM 12N)		
<b>Map System:</b>	Universal Transverse Mercator (US Survey Feet)	<b>System Datum:</b>	Mean Sea Level
<b>Geo Datum:</b>	NAD 1927 - Western US		
<b>Map Zone:</b>	Zone 12N (114 W to 108 W)		

Site		S20-T7S-R94W (LONG 20F)			
Site Position:		Northing:	14,331,773.27 usft	Latitude:	39.425526
From:	Map	Easting:	2,511,668.92 usft	Longitude:	-107.915021
Position Uncertainty:	0.00 usft	Slot Radius:	13-3/16"	Grid Convergence:	1.96 °

Well	RULISON FEDERAL 14B-20 - Slot 14B-20					
Well Position	+N/-S	0.00 usft	Northing:	14,331,754.00 usft	Latitude:	39.425468
	+E/-W	0.00 usft	Easting:	2,511,718.70 usft	Longitude:	-107.914848
Position Uncertainty		0.00 usft	Wellhead Elevation:	usft	Ground Level:	7,914.00 usft

<b>Wellbore</b>	OH				
<b>Magnetics</b>	<b>Model Name</b>	<b>Sample Date</b>	<b>Declination (°)</b>	<b>Dip Angle (°)</b>	<b>Field Strength (nT)</b>
	HDGM	10/1/2017	9.27	65.62	51,679.20000000

<b>Design</b>	PLAN #1			
<b>Audit Notes:</b>				
<b>Version:</b>	<b>Phase:</b>	PLAN	<b>Tie On Depth:</b>	0.00
<b>Vertical Section:</b>	<b>Depth From (TVD) (usft)</b>	<b>+N/-S (usft)</b>	<b>+E/-W (usft)</b>	<b>Direction (°)</b>
	0.00	0.00	0.00	194.61

<b>Plan Sections</b>										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	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	
200.00	0.00	0.00	200.00	0.00	0.00	0.00	0.00	0.00	0.00	
677.73	14.33	189.62	672.77	-58.60	-9.93	3.00	3.00	0.00	189.62	
7,104.21	14.33	189.62	6,899.23	-1,627.06	-275.72	0.00	0.00	0.00	0.00	
7,581.94	0.00	0.00	7,372.00	-1,685.66	-285.65	3.00	-3.00	0.00	180.00	
7,784.39	5.26	250.00	7,574.17	-1,688.84	-294.37	2.60	2.60	-54.33	250.00	
9,657.11	5.26	250.00	9,439.00	-1,747.53	-455.65	0.00	0.00	0.00	0.00	RF 14B-20 PBHL

# Cathedral Energy Services

## Planning Report

<b>Database:</b>	USA EDM 5000 Multi Users DB	<b>Local Co-ordinate Reference:</b>	Well RULISON FEDERAL 14B-20 - Slot 14B-20
<b>Company:</b>	Caerus Oil & Gas	<b>TVD Reference:</b>	30' KB @ 7944.00usft
<b>Project:</b>	Garfield County, CO (UTM 12N)	<b>MD Reference:</b>	30' KB @ 7944.00usft
<b>Site:</b>	S20-T7S-R94W (LONG 20F)	<b>North Reference:</b>	True
<b>Well:</b>	RULISON FEDERAL 14B-20	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	OH		
<b>Design:</b>	PLAN #1		

### Planned Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100u)	Comments / Formations
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	
200.00	0.00	0.00	200.00	0.00	0.00	0.00	0.00	0.00	
300.00	3.00	189.62	299.95	-2.58	-0.44	2.61	3.00	3.00	
400.00	6.00	189.62	399.63	-10.32	-1.75	10.42	3.00	3.00	
500.00	9.00	189.62	498.77	-23.18	-3.93	23.42	3.00	3.00	
600.00	12.00	189.62	597.08	-41.15	-6.97	41.58	3.00	3.00	
677.73	14.33	189.62	672.77	-58.60	-9.93	59.21	3.00	3.00	
700.00	14.33	189.62	694.34	-64.04	-10.85	64.70	0.00	0.00	
800.00	14.33	189.62	791.23	-88.44	-14.99	89.36	0.00	0.00	
900.00	14.33	189.62	888.12	-112.85	-19.12	114.02	0.00	0.00	
1,000.00	14.33	189.62	985.00	-137.26	-23.26	138.68	0.00	0.00	
1,100.00	14.33	189.62	1,081.89	-161.66	-27.40	163.34	0.00	0.00	
1,200.00	14.33	189.62	1,178.78	-186.07	-31.53	188.00	0.00	0.00	
1,300.00	14.33	189.62	1,275.67	-210.47	-35.67	212.66	0.00	0.00	
1,400.00	14.33	189.62	1,372.55	-234.88	-39.80	237.32	0.00	0.00	
1,500.00	14.33	189.62	1,469.44	-259.29	-43.94	261.98	0.00	0.00	
1,600.00	14.33	189.62	1,566.33	-283.69	-48.07	286.64	0.00	0.00	
1,700.00	14.33	189.62	1,663.22	-308.10	-52.21	311.30	0.00	0.00	
1,783.38	14.33	189.62	1,744.00	-328.45	-55.66	331.86	0.00	0.00	WASATCH.NPC (TVD)
1,800.00	14.33	189.62	1,760.11	-332.51	-56.35	335.96	0.00	0.00	
1,900.00	14.33	189.62	1,856.99	-356.91	-60.48	360.62	0.00	0.00	
2,000.00	14.33	189.62	1,953.88	-381.32	-64.62	385.28	0.00	0.00	
2,100.00	14.33	189.62	2,050.77	-405.72	-68.75	409.94	0.00	0.00	
2,200.00	14.33	189.62	2,147.66	-430.13	-72.89	434.60	0.00	0.00	
2,300.00	14.33	189.62	2,244.54	-454.54	-77.03	459.26	0.00	0.00	
2,400.00	14.33	189.62	2,341.43	-478.94	-81.16	483.92	0.00	0.00	
2,500.00	14.33	189.62	2,438.32	-503.35	-85.30	508.58	0.00	0.00	
2,600.00	14.33	189.62	2,535.21	-527.75	-89.43	533.24	0.00	0.00	
2,700.00	14.33	189.62	2,632.10	-552.16	-93.57	557.90	0.00	0.00	
2,800.00	14.33	189.62	2,728.98	-576.57	-97.70	582.56	0.00	0.00	
2,900.00	14.33	189.62	2,825.87	-600.97	-101.84	607.22	0.00	0.00	
3,000.00	14.33	189.62	2,922.76	-625.38	-105.98	631.88	0.00	0.00	
3,100.00	14.33	189.62	3,019.65	-649.78	-110.11	656.54	0.00	0.00	
3,200.00	14.33	189.62	3,116.53	-674.19	-114.25	681.20	0.00	0.00	
3,300.00	14.33	189.62	3,213.42	-698.60	-118.38	705.86	0.00	0.00	
3,400.00	14.33	189.62	3,310.31	-723.00	-122.52	730.52	0.00	0.00	
3,500.00	14.33	189.62	3,407.20	-747.41	-126.66	755.18	0.00	0.00	
3,600.00	14.33	189.62	3,504.09	-771.82	-130.79	779.84	0.00	0.00	
3,700.00	14.33	189.62	3,600.97	-796.22	-134.93	804.50	0.00	0.00	
3,800.00	14.33	189.62	3,697.86	-820.63	-139.06	829.16	0.00	0.00	
3,900.00	14.33	189.62	3,794.75	-845.03	-143.20	853.82	0.00	0.00	
4,000.00	14.33	189.62	3,891.64	-869.44	-147.33	878.48	0.00	0.00	
4,100.00	14.33	189.62	3,988.52	-893.85	-151.47	903.14	0.00	0.00	
4,200.00	14.33	189.62	4,085.41	-918.25	-155.61	927.80	0.00	0.00	
4,260.47	14.33	189.62	4,144.00	-933.01	-158.11	942.72	0.00	0.00	WASATCH_G.NPC (TVD)
4,300.00	14.33	189.62	4,182.30	-942.66	-159.74	952.46	0.00	0.00	
4,400.00	14.33	189.62	4,279.19	-967.06	-163.88	977.12	0.00	0.00	
4,500.00	14.33	189.62	4,376.08	-991.47	-168.01	1,001.78	0.00	0.00	
4,600.00	14.33	189.62	4,472.96	-1,015.88	-172.15	1,026.44	0.00	0.00	
4,635.13	14.33	189.62	4,507.00	-1,024.45	-173.60	1,035.11	0.00	0.00	FORT_UNION.NPC (TVD)
4,700.00	14.33	189.62	4,569.85	-1,040.28	-176.29	1,051.10	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 RULISON FEDERAL 14B-20 - Slot 14B-20
<b>Company:</b>	Caerus Oil & Gas	<b>TVD Reference:</b>	30' KB @ 7944.00usft
<b>Project:</b>	Garfield County, CO (UTM 12N)	<b>MD Reference:</b>	30' KB @ 7944.00usft
<b>Site:</b>	S20-T7S-R94W (LONG 20F)	<b>North Reference:</b>	True
<b>Well:</b>	RULISON FEDERAL 14B-20	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	OH		
<b>Design:</b>	PLAN #1		

Planned Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100u)	Comments / Formations
4,800.00	14.33	189.62	4,666.74	-1,064.69	-180.42	1,075.76	0.00	0.00	
4,900.00	14.33	189.62	4,763.63	-1,089.09	-184.56	1,100.42	0.00	0.00	
5,000.00	14.33	189.62	4,860.51	-1,113.50	-188.69	1,125.08	0.00	0.00	
5,100.00	14.33	189.62	4,957.40	-1,137.91	-192.83	1,149.74	0.00	0.00	
5,200.00	14.33	189.62	5,054.29	-1,162.31	-196.96	1,174.40	0.00	0.00	
5,300.00	14.33	189.62	5,151.18	-1,186.72	-201.10	1,199.06	0.00	0.00	
5,400.00	14.33	189.62	5,248.06	-1,211.13	-205.24	1,223.72	0.00	0.00	
5,500.00	14.33	189.62	5,344.95	-1,235.53	-209.37	1,248.38	0.00	0.00	
5,600.00	14.33	189.62	5,441.84	-1,259.94	-213.51	1,273.04	0.00	0.00	
5,700.00	14.33	189.62	5,538.73	-1,284.34	-217.64	1,297.70	0.00	0.00	
5,800.00	14.33	189.62	5,635.62	-1,308.75	-221.78	1,322.36	0.00	0.00	
5,900.00	14.33	189.62	5,732.50	-1,333.16	-225.92	1,347.02	0.00	0.00	
6,000.00	14.33	189.62	5,829.39	-1,357.56	-230.05	1,371.68	0.00	0.00	
6,100.00	14.33	189.62	5,926.28	-1,381.97	-234.19	1,396.34	0.00	0.00	
6,187.44	14.33	189.62	6,011.00	-1,403.31	-237.80	1,417.91	0.00	0.00	OHIO_CREEK.MBL (TVD)
6,200.00	14.33	189.62	6,023.17	-1,406.37	-238.32	1,421.00	0.00	0.00	
6,300.00	14.33	189.62	6,120.05	-1,430.78	-242.46	1,445.66	0.00	0.00	
6,400.00	14.33	189.62	6,216.94	-1,455.19	-246.59	1,470.32	0.00	0.00	
6,500.00	14.33	189.62	6,313.83	-1,479.59	-250.73	1,494.98	0.00	0.00	
6,600.00	14.33	189.62	6,410.72	-1,504.00	-254.87	1,519.64	0.00	0.00	
6,700.00	14.33	189.62	6,507.61	-1,528.40	-259.00	1,544.30	0.00	0.00	
6,786.07	14.33	189.62	6,591.00	-1,549.41	-262.56	1,565.53	0.00	0.00	WILLIAMS_FORK.MBL (TVD)
6,800.00	14.33	189.62	6,604.49	-1,552.81	-263.14	1,568.96	0.00	0.00	
6,900.00	14.33	189.62	6,701.38	-1,577.22	-267.27	1,593.62	0.00	0.00	
7,000.00	14.33	189.62	6,798.27	-1,601.62	-271.41	1,618.28	0.00	0.00	
7,100.00	14.33	189.62	6,895.16	-1,626.03	-275.55	1,642.94	0.00	0.00	
7,104.21	14.33	189.62	6,899.23	-1,627.06	-275.72	1,643.98	0.00	0.00	
7,200.00	11.46	189.62	6,992.60	-1,648.13	-279.29	1,665.27	3.00	-3.00	
7,300.00	8.46	189.62	7,091.08	-1,665.18	-282.18	1,682.50	3.00	-3.00	
7,400.00	5.46	189.62	7,190.33	-1,677.12	-284.20	1,694.57	3.00	-3.00	
7,500.00	2.46	189.62	7,290.08	-1,683.93	-285.36	1,701.44	3.00	-3.00	
7,581.94	0.00	0.00	7,372.00	-1,685.66	-285.65	1,703.19	3.00	-3.00	
7,600.00	0.47	250.00	7,390.06	-1,685.69	-285.72	1,703.24	2.60	2.60	
7,681.97	2.60	250.00	7,472.00	-1,686.44	-287.78	1,704.48	2.60	2.60	TOP_GAS.MBL (TVD)
7,700.00	3.07	250.00	7,490.00	-1,686.74	-288.62	1,704.99	2.60	2.60	
7,784.39	5.26	250.00	7,574.17	-1,688.84	-294.37	1,708.47	2.60	2.60	
7,800.00	5.26	250.00	7,589.71	-1,689.32	-295.72	1,709.28	0.00	0.00	
7,900.00	5.26	250.00	7,689.29	-1,692.46	-304.33	1,714.49	0.00	0.00	
8,000.00	5.26	250.00	7,788.87	-1,695.59	-312.94	1,719.69	0.00	0.00	
8,100.00	5.26	250.00	7,888.45	-1,698.73	-321.55	1,724.90	0.00	0.00	
8,200.00	5.26	250.00	7,988.03	-1,701.86	-330.17	1,730.10	0.00	0.00	
8,300.00	5.26	250.00	8,087.61	-1,705.00	-338.78	1,735.31	0.00	0.00	
8,400.00	5.26	250.00	8,187.18	-1,708.13	-347.39	1,740.52	0.00	0.00	
8,500.00	5.26	250.00	8,286.76	-1,711.27	-356.00	1,745.72	0.00	0.00	
8,600.00	5.26	250.00	8,386.34	-1,714.40	-364.61	1,750.93	0.00	0.00	
8,700.00	5.26	250.00	8,485.92	-1,717.53	-373.23	1,756.13	0.00	0.00	
8,800.00	5.26	250.00	8,585.50	-1,720.67	-381.84	1,761.34	0.00	0.00	
8,900.00	5.26	250.00	8,685.08	-1,723.80	-390.45	1,766.55	0.00	0.00	
8,954.15	5.26	250.00	8,739.00	-1,725.50	-395.11	1,769.37	0.00	0.00	CAMEO.MBL (TVD)
9,000.00	5.26	250.00	8,784.66	-1,726.94	-399.06	1,771.75	0.00	0.00	
9,100.00	5.26	250.00	8,884.24	-1,730.07	-407.67	1,776.96	0.00	0.00	
9,200.00	5.26	250.00	8,983.82	-1,733.21	-416.29	1,782.16	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 RULISON FEDERAL 14B-20 - Slot 14B-20
<b>Company:</b>	Caerus Oil & Gas	<b>TVD Reference:</b>	30' KB @ 7944.00usft
<b>Project:</b>	Garfield County, CO (UTM 12N)	<b>MD Reference:</b>	30' KB @ 7944.00usft
<b>Site:</b>	S20-T7S-R94W (LONG 20F)	<b>North Reference:</b>	True
<b>Well:</b>	RULISON FEDERAL 14B-20	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	OH		
<b>Design:</b>	PLAN #1		

Planned Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100u)	Comments / Formations
9,300.00	5.26	250.00	9,083.40	-1,736.34	-424.90	1,787.37	0.00	0.00	
9,400.00	5.26	250.00	9,182.98	-1,739.48	-433.51	1,792.58	0.00	0.00	
9,500.00	5.26	250.00	9,282.56	-1,742.61	-442.12	1,797.78	0.00	0.00	
9,506.47	5.26	250.00	9,289.00	-1,742.81	-442.68	1,798.12	0.00	0.00	ROLLINS.MBL (TVD)
9,600.00	5.26	250.00	9,382.13	-1,745.74	-450.73	1,802.99	0.00	0.00	
9,657.11	5.26	250.00	9,439.00	-1,747.53	-455.65	1,805.96	0.00	0.00	TD.MBL (TVD)

Targets									
Target Name	Dip Angle (°)	Dip Dir. (°)	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Northing (usft)	Easting (usft)	Latitude	Longitude
- hit/miss target									
- Shape									
RF 14B-20 PBHL	0.00	0.00	9,439.00	-1,747.53	-455.65	14,329,991.90	2,511,323.10	39.420673	-107.916460
- plan hits target center									
- Ellipse (radii L200.00 W100.00 on 250.00 azi)									

Formations						
Measured Depth (usft)	Vertical Depth (usft)	Name	Lithology	Dip (°)	Dip Direction (°)	
1,783.38	1,744.00	WASATCH.NPC (TVD)				
4,260.47	4,144.00	WASATCH_G.NPC (TVD)				
4,635.13	4,507.00	FORT_UNION.NPC (TVD)				
6,187.44	6,011.00	OHIO_CREEK.MBL (TVD)				
6,786.07	6,591.00	WILLIAMS_FORK.MBL (TVD)				
7,681.97	7,472.00	TOP_GAS.MBL (TVD)				
8,954.15	8,739.00	CAMEO.MBL (TVD)				
9,506.47	9,289.00	ROLLINS.MBL (TVD)				
9,657.11	9,439.00	TD.MBL (TVD)				