



# CATHEDRAL

WELL DETAILS: PUCKETT 31C-26

+N/-S	+E/-W	Northing	Ground Level:	8396.00		
0.00	0.00	14356000.65	Easting		Latitude	Longitude
			2435322.73		39.498840	-108.182351

B-8



# Cathedral Energy Services

## Survey Report

<b>Company:</b>	Caerus Oil & Gas	<b>Local Co-ordinate Reference:</b>	Well PUCKETT 31C-26 - Slot B-8
<b>Project:</b>	Garfield County, CO (UTM 12N)	<b>TVD Reference:</b>	30' KB @ 8426.00usft
<b>Site:</b>	S26-T6S-R97W (697 26A)	<b>MD Reference:</b>	30' KB @ 8426.00usft
<b>Well:</b>	PUCKETT 31C-26	<b>North Reference:</b>	True
<b>Wellbore:</b>	OH	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	FINAL	<b>Database:</b>	USA EDM 5000 Multi Users DB

<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)		

<b>Site</b>	S26-T6S-R97W (697 26A)		
<b>Site Position:</b>		<b>Northing:</b>	14,356,905.20 usft
<b>From:</b>	Map	<b>Easting:</b>	2,433,730.50 usft
<b>Position Uncertainty:</b>	0.00 usft	<b>Slot Radius:</b>	13-3/16"
		<b>Latitude:</b>	39.501458
		<b>Longitude:</b>	-108.187888
		<b>Grid Convergence:</b>	1.79 °

Well	PUCKETT 31C-26 - Slot B-8					
Well Position	+N/-S	0.00 usft	Northing:	14,356,000.65 usft	Latitude:	39.498840
	+E/-W	0.00 usft	Easting:	2,435,322.73 usft	Longitude:	-108.182351
Position Uncertainty		0.00 usft	Wellhead Elevation:	0.00 usft	Ground Level:	8,396.00 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	3/14/2017	9.73	65.83	51,758

<b>Design</b>	FINAL				
<b>Audit Notes:</b>					
<b>Version:</b>	1.0	<b>Phase:</b>	ACTUAL	<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	63.47	

<b>Survey Program</b>	<b>Date</b>	3/20/2017			
<b>From (usft)</b>	<b>To (usft)</b>	<b>Survey (Wellbore)</b>	<b>Tool Name</b>	<b>Description</b>	
180.00	9,070.00	Survey #1 (OH)	MWD+HDGM	OWSG MWD + HDGM	

<b>Survey</b>										
<b>Measured Depth (usft)</b>	<b>Inclination (°)</b>	<b>Azimuth (°)</b>	<b>Vertical Depth (usft)</b>	<b>+N/-S (usft)</b>	<b>+E/-W (usft)</b>	<b>Vertical Section (usft)</b>	<b>Dogleg Rate (°/100usf)</b>	<b>Build Rate (°/100u)</b>	<b>Formations / Comments</b>	
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
180.00	2.15	51.39	179.96	2.11	2.64	3.30	1.19	1.19		
210.00	2.90	46.64	209.93	2.98	3.63	4.58	2.59	2.50		
301.00	3.65	63.78	300.78	5.84	7.90	9.68	1.35	0.82		
393.00	4.22	83.21	392.57	7.53	13.89	15.79	1.57	0.62		
485.00	5.63	78.55	484.23	8.83	21.68	23.34	1.59	1.53		
576.00	6.55	72.48	574.71	11.28	31.00	32.77	1.23	1.01		
671.00	6.37	69.50	669.11	14.76	41.10	43.37	0.40	-0.19		
765.00	6.64	66.60	762.51	18.74	50.98	53.98	0.45	0.29		
860.00	6.81	59.56	856.85	23.77	60.87	65.08	0.89	0.18		
954.00	6.94	51.96	950.18	30.10	70.15	76.21	0.98	0.14		
1,049.00	7.03	57.02	1,044.47	36.80	79.55	87.61	0.65	0.09		
1,143.00	7.43	54.03	1,137.73	43.50	89.29	99.32	0.58	0.43		

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## Survey Report

<b>Company:</b>	Caerus Oil & Gas	<b>Local Co-ordinate Reference:</b>	Well PUCKETT 31C-26 - Slot B-8
<b>Project:</b>	Garfield County, CO (UTM 12N)	<b>TVD Reference:</b>	30' KB @ 8426.00usft
<b>Site:</b>	S26-T6S-R97W (697 26A)	<b>MD Reference:</b>	30' KB @ 8426.00usft
<b>Well:</b>	PUCKETT 31C-26	<b>North Reference:</b>	True
<b>Wellbore:</b>	OH	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	FINAL	<b>Database:</b>	USA EDM 5000 Multi Users DB

Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usf)	Build Rate (°/100u)	Formations / Comments
1,238.00	7.30	60.44	1,231.95	50.09	99.51	111.41	0.88	-0.14	
1,332.00	7.25	70.02	1,325.19	55.06	110.28	123.26	1.29	-0.05	
1,427.00	7.91	69.94	1,419.36	59.35	122.06	135.71	0.69	0.69	
1,522.00	8.17	67.39	1,513.43	64.19	134.43	148.94	0.46	0.27	
1,616.00	8.00	69.41	1,606.49	69.06	146.72	162.11	0.35	-0.18	
1,711.00	7.52	72.40	1,700.62	73.26	158.83	174.83	0.66	-0.51	
1,805.00	7.30	76.70	1,793.84	76.49	170.51	186.72	0.63	-0.23	
1,900.00	7.78	74.24	1,888.02	79.63	182.57	198.91	0.61	0.51	
1,994.00	7.82	71.61	1,981.15	83.37	194.76	211.49	0.38	0.04	
2,089.00	8.00	65.89	2,075.25	88.11	206.93	224.50	0.85	0.19	
2,184.00	7.87	65.98	2,169.34	93.46	218.90	237.60	0.14	-0.14	
2,278.00	7.73	72.13	2,262.47	98.02	230.80	250.28	0.90	-0.15	
2,373.00	7.56	72.84	2,356.62	101.83	242.85	262.76	0.20	-0.18	
2,468.00	8.13	71.43	2,450.73	105.81	255.19	275.58	0.63	0.60	
2,603.00	8.48	68.97	2,584.32	112.42	273.53	294.94	0.37	0.26	
2,698.00	8.75	68.97	2,678.25	117.53	286.81	309.10	0.28	0.28	
2,792.00	8.97	69.06	2,771.13	122.71	300.33	323.52	0.23	0.23	
2,886.00	8.31	66.33	2,864.06	128.06	313.39	337.59	0.83	-0.70	
2,981.00	8.26	68.62	2,958.07	133.30	326.04	351.25	0.35	-0.05	
3,075.00	9.01	70.38	3,051.00	138.24	339.26	365.28	0.85	0.80	
3,170.00	8.17	69.23	3,144.94	143.13	352.58	379.38	0.90	-0.88	
3,264.00	8.92	66.07	3,237.89	148.45	365.48	393.31	0.94	0.80	
3,358.00	8.66	63.78	3,330.79	154.53	378.49	407.66	0.46	-0.28	
3,453.00	8.53	62.03	3,424.72	161.00	391.13	421.86	0.31	-0.14	
3,547.00	8.61	61.41	3,517.67	167.64	403.47	435.86	0.13	0.09	
3,642.00	6.94	66.24	3,611.80	173.35	414.96	448.70	1.89	-1.76	
3,736.00	6.90	61.15	3,705.11	178.36	425.11	460.01	0.65	-0.04	
3,831.00	6.81	69.94	3,799.44	183.05	435.40	471.31	1.11	-0.09	
3,925.00	6.37	68.09	3,892.81	186.91	445.47	482.05	0.52	-0.47	
4,019.00	6.20	69.23	3,986.25	190.65	455.05	492.30	0.22	-0.18	
4,114.00	6.02	66.95	4,080.71	194.42	464.43	502.37	0.32	-0.19	
4,208.00	5.76	65.45	4,174.21	198.31	473.26	512.01	0.32	-0.28	
4,303.00	6.42	68.09	4,268.68	202.27	482.53	522.06	0.75	0.69	
4,397.00	6.11	62.90	4,362.12	206.51	491.85	532.30	0.69	-0.33	
4,492.00	6.86	64.13	4,456.51	211.29	501.46	543.03	0.80	0.79	
4,586.00	7.25	67.04	4,549.80	216.06	511.97	554.57	0.56	0.41	
4,681.00	7.87	69.85	4,643.97	220.64	523.60	567.01	0.76	0.65	
4,775.00	7.95	70.38	4,737.08	225.04	535.76	579.86	0.12	0.09	
4,870.00	6.99	67.21	4,831.27	229.48	547.28	592.15	1.10	-1.01	
4,964.00	5.85	76.53	4,924.68	232.81	557.21	602.53	1.64	-1.21	
5,059.00	6.64	69.14	5,019.12	235.90	567.05	612.71	1.18	0.83	
5,153.00	8.04	65.01	5,112.35	240.61	578.09	624.69	1.59	1.49	
5,248.00	8.09	60.62	5,206.41	246.69	589.94	638.01	0.65	0.05	
5,343.00	8.13	61.15	5,300.46	253.22	601.65	651.40	0.09	0.04	
5,437.00	7.91	57.89	5,393.54	259.86	612.95	664.47	0.54	-0.23	
5,532.00	7.73	54.38	5,487.65	267.06	623.68	677.29	0.54	-0.19	
5,626.00	7.69	55.52	5,580.81	274.30	634.00	689.76	0.17	-0.04	
5,721.00	7.60	61.94	5,674.96	280.85	644.78	702.34	0.90	-0.09	
5,815.00	6.99	59.48	5,768.20	286.68	655.20	714.26	0.73	-0.65	
5,910.00	6.77	63.61	5,862.52	292.11	665.19	725.62	0.57	-0.23	
6,004.00	6.15	61.06	5,955.92	297.00	674.56	736.19	0.73	-0.66	
6,099.00	5.67	59.30	6,050.42	301.86	683.05	745.96	0.54	-0.51	
6,193.00	5.41	57.02	6,143.98	306.65	690.76	754.99	0.36	-0.28	

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## Survey Report

<b>Company:</b>	Caerus Oil & Gas	<b>Local Co-ordinate Reference:</b>	Well PUCKETT 31C-26 - Slot B-8
<b>Project:</b>	Garfield County, CO (UTM 12N)	<b>TVD Reference:</b>	30' KB @ 8426.00usft
<b>Site:</b>	S26-T6S-R97W (697 26A)	<b>MD Reference:</b>	30' KB @ 8426.00usft
<b>Well:</b>	PUCKETT 31C-26	<b>North Reference:</b>	True
<b>Wellbore:</b>	OH	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	FINAL	<b>Database:</b>	USA EDM 5000 Multi Users DB

### Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usf)	Build Rate (°/100u)	Formations / Comments
6,288.00	4.97	56.22	6,238.59	311.37	697.94	763.52	0.47	-0.46	
6,382.00	4.04	49.81	6,332.30	315.77	703.85	770.78	1.12	-0.99	
6,477.00	2.51	56.40	6,427.14	319.08	708.14	776.10	1.66	-1.61	
6,571.00	1.49	27.75	6,521.08	321.30	710.43	779.13	1.49	-1.09	
6,666.00	1.49	185.51	6,616.07	321.17	710.88	779.48	3.08	0.00	
6,760.00	1.36	223.39	6,710.04	319.14	710.00	777.79	0.99	-0.14	
6,949.00	1.45	280.61	6,899.00	317.95	706.11	773.77	0.71	0.05	
7,138.00	2.51	240.18	7,087.89	316.33	700.17	767.73	0.89	0.56	
7,327.00	2.46	247.91	7,276.71	312.75	692.82	759.56	0.18	-0.03	
7,516.00	3.25	250.46	7,465.47	309.43	684.01	750.20	0.42	0.42	
7,705.00	3.16	256.18	7,654.18	306.40	673.90	739.80	0.18	-0.05	
7,894.00	4.13	256.18	7,842.80	303.53	662.23	728.08	0.51	0.51	
8,083.00	4.48	260.57	8,031.26	300.69	648.34	714.38	0.25	0.19	
8,272.00	5.05	255.21	8,219.61	297.36	633.02	699.18	0.38	0.30	
8,335.00	5.05	255.21	8,282.36	295.94	627.66	693.75	0.00	0.00	
8,462.00	5.45	263.38	8,408.83	293.82	616.26	682.61	0.67	0.31	
8,651.00	6.72	258.64	8,596.77	290.61	596.50	663.50	0.72	0.67	
8,840.00	7.21	257.85	8,784.37	285.93	574.07	641.34	0.26	0.26	
9,007.00	7.38	257.32	8,950.02	281.37	553.36	620.77	0.11	0.10	LAST SURVEY @ 9007' MD
9,070.00	7.38	257.32	9,012.50	279.60	545.46	612.91	0.00	0.00	PTB @ 9070' MD

### 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									
PUCKETT 31C-26 PBHI	0.00	0.00	9,016.00	257.04	557.09	14,356,275.00	2,435,871.50	39.499545	-108.180377
- actual wellpath misses target center by 25.61usft at 9070.00usft MD (9012.50 TVD, 279.60 N, 545.46 E)									
- Ellipse (radii L200.00 W100.00 on 240.00 azi)									
PUCKETT 31C-26 PBHI	0.00	0.00	9,016.00	393.96	542.66	14,356,411.40	2,435,852.80	39.499921	-108.180429
- actual wellpath misses target center by 114.45usft at 9070.00usft MD (9012.50 TVD, 279.60 N, 545.46 E)									
- Ellipse (radii L200.00 W100.00 on 240.00 azi)									

### Design Annotations

	Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
			+N/-S (usft)	+E/-W (usft)	
	9,007.00	8,950.02	281.37	553.36	LAST SURVEY @ 9007' MD
	9,070.00	9,012.50	279.60	545.46	PTB @ 9070' MD

Checked By: \_\_\_\_\_ Approved By: \_\_\_\_\_ Date: \_\_\_\_\_