

Caerus Oil & Gas

Garfield County, CO (UTM 12N)

S26-T6S-R97W (MESA F26)

PUCKETT 13B-26

OH

Design: SURVEYS

Standard Survey Report

10 January, 2018

Cathedral Energy Services

Survey Report

Company:	Caerus Oil & Gas	Local Co-ordinate Reference:	Well PUCKETT 13B-26
Project:	Garfield County, CO (UTM 12N)	TVD Reference:	30' KB @ 8352.00usft
Site:	S26-T6S-R97W (MESA F26)	MD Reference:	30' KB @ 8352.00usft
Well:	PUCKETT 13B-26	North Reference:	True
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	SURVEYS	Database:	USA EDM 5000 Multi Users DB

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

Site	S26-T6S-R97W (MESA F26), GRAVITY = 0.9987g		
Site Position:		Northing:	14,354,512.70 usft
From:	Map	Easting:	2,433,169.20 usft
Position Uncertainty:	0.00 usft	Slot Radius:	13-3/16 "
		Latitude:	39.494943
		Longitude:	-108.190140
		Grid Convergence:	1.79 °

Well	PUCKETT 13B-26		
Well Position	+N/-S	0.00 usft	Northing:
	+E/-W	0.00 usft	Easting:
Position Uncertainty	0.00 usft	Wellhead Elevation:	0.00 usft
		Latitude:	39.495032
		Longitude:	-108.190206
		Ground Level:	8,322.00 usft

Wellbore	OH				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	HDGM	9/23/2016	9.78	65.83	51,819.50000000

Design	SURVEYS				
Audit Notes:					
Version:	1.0	Phase:	ACTUAL	Tie On Depth:	0.00
Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)	Direction (°)	
	0.00	0.00	0.00	253.88	

Survey Program	Date	1/10/2018			
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description	
206.00	481.00	Survey #1 (OH)	INC+TREND	Inclinometer + known azi trend	
572.00	8,866.00	Survey #2 (OH)	MWD+HDGM	OWSG MWD + HDGM	

Survey										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
206.00	2.02	272.29	205.96	0.15	-3.63	3.45	0.98	0.98	0.00	
297.00	4.83	258.14	296.79	-0.58	-8.98	8.79	3.20	3.09	-15.55	
390.00	7.82	255.24	389.21	-3.00	-18.93	19.02	3.23	3.22	-3.12	
481.00	10.81	257.52	479.00	-6.42	-33.25	33.73	3.31	3.29	2.51	
572.00	13.67	250.93	567.93	-11.78	-51.75	52.99	3.49	3.14	-7.24	
666.00	14.11	242.40	659.19	-20.71	-72.41	75.31	2.23	0.47	-9.07	
761.00	12.26	240.56	751.68	-31.04	-91.46	96.48	2.00	-1.95	-1.94	
855.00	10.77	253.22	843.80	-38.48	-108.56	114.98	3.11	-1.59	13.47	
950.00	10.37	256.12	937.19	-43.09	-125.36	132.40	0.70	-0.42	3.05	

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Site:	S26-T6S-R97W (MESA F26)	MD Reference:	30' KB @ 8352.00usft
Well:	PUCKETT 13B-26	North Reference:	True
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	SURVEYS	Database:	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 (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
1,044.00	10.94	259.98	1,029.57	-46.68	-142.36	149.72	0.97	0.61	4.11
1,139.00	12.66	260.69	1,122.56	-49.93	-161.51	169.02	1.82	1.81	0.75
1,233.00	12.00	252.25	1,214.40	-54.57	-180.98	189.02	2.04	-0.70	-8.98
1,328.00	10.24	245.22	1,307.61	-61.13	-198.06	207.24	2.34	-1.85	-7.40
1,422.00	11.43	250.84	1,399.94	-67.69	-214.44	224.80	1.69	1.27	5.98
1,516.00	11.21	248.03	1,492.11	-74.16	-231.71	243.19	0.63	-0.23	-2.99
1,611.00	11.16	254.45	1,585.31	-80.08	-249.13	261.57	1.31	-0.05	6.76
1,705.00	10.99	258.40	1,677.56	-84.32	-266.68	279.60	0.83	-0.18	4.20
1,800.00	10.85	256.82	1,770.84	-88.18	-284.25	297.56	0.35	-0.15	-1.66
1,894.00	11.91	259.37	1,862.99	-91.99	-302.40	316.05	1.25	1.13	2.71
1,989.00	12.57	256.91	1,955.83	-96.14	-322.10	336.13	0.89	0.69	-2.59
2,083.00	12.61	254.80	2,047.57	-101.14	-341.97	356.61	0.49	0.04	-2.24
2,178.00	13.18	257.35	2,140.18	-106.23	-362.54	377.79	0.85	0.60	2.68
2,272.00	11.56	257.08	2,231.99	-110.69	-382.18	397.89	1.72	-1.72	-0.29
2,367.00	12.92	257.26	2,324.83	-115.16	-401.82	417.99	1.43	1.43	0.19
2,461.00	13.98	258.66	2,416.25	-119.71	-423.20	439.80	1.18	1.13	1.49
2,534.00	13.98	256.73	2,487.09	-123.47	-440.43	457.39	0.64	0.00	-2.64
2,628.00	13.80	256.99	2,578.34	-128.60	-462.41	479.93	0.20	-0.19	0.28
2,722.00	13.10	256.20	2,669.76	-133.66	-483.67	501.77	0.77	-0.74	-0.84
2,817.00	13.14	256.38	2,762.28	-138.77	-504.62	523.31	0.06	0.04	0.19
2,911.00	12.57	250.32	2,853.93	-144.73	-524.64	544.20	1.56	-0.61	-6.45
3,006.00	12.31	242.58	2,946.71	-152.88	-543.36	564.45	1.77	-0.27	-8.15
3,100.00	11.21	246.54	3,038.73	-161.13	-560.64	583.34	1.45	-1.17	4.21
3,194.00	12.35	256.82	3,130.76	-167.06	-578.81	602.44	2.54	1.21	10.94
3,289.00	13.14	256.82	3,223.42	-171.84	-599.22	623.37	0.83	0.83	0.00
3,383.00	13.27	252.42	3,314.94	-177.53	-619.91	644.83	1.08	0.14	-4.68
3,478.00	13.54	255.76	3,407.35	-183.56	-641.08	666.84	0.86	0.28	3.52
3,572.00	13.58	253.57	3,498.73	-189.39	-662.33	688.88	0.55	0.04	-2.33
3,667.00	14.02	253.39	3,590.99	-195.84	-684.06	711.54	0.47	0.46	-0.19
3,761.00	14.77	257.96	3,682.04	-201.59	-706.69	734.87	1.45	0.80	4.86
3,856.00	13.36	255.41	3,774.19	-206.88	-729.15	757.93	1.62	-1.48	-2.68
3,950.00	12.31	252.16	3,865.84	-212.69	-749.20	778.80	1.36	-1.12	-3.46
4,045.00	12.39	251.37	3,958.64	-219.05	-768.50	799.10	0.20	0.08	-0.83
4,139.00	11.65	251.90	4,050.58	-225.22	-787.08	818.66	0.80	-0.79	0.56
4,234.00	10.64	250.14	4,143.79	-231.18	-804.45	837.00	1.12	-1.06	-1.85
4,328.00	10.06	242.84	4,236.26	-237.87	-819.91	853.72	1.52	-0.62	-7.77
4,423.00	10.37	247.33	4,329.76	-244.95	-835.19	870.36	0.90	0.33	4.73
4,517.00	10.55	259.28	4,422.21	-249.82	-851.45	887.33	2.31	0.19	12.71
4,612.00	10.20	256.38	4,515.66	-253.41	-868.17	904.40	0.66	-0.37	-3.05
4,706.00	10.94	258.31	4,608.06	-257.18	-884.99	921.60	0.87	0.79	2.05
4,800.00	12.26	252.95	4,700.14	-261.92	-903.27	940.48	1.81	1.40	-5.70
4,895.00	11.95	248.82	4,793.03	-268.43	-922.09	960.36	0.97	-0.33	-4.35
4,989.00	10.81	252.78	4,885.18	-274.55	-939.58	978.87	1.47	-1.21	4.21

Cathedral Energy Services

Survey Report

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Site:	S26-T6S-R97W (MESA F26)	MD Reference:	30' KB @ 8352.00usft
Well:	PUCKETT 13B-26	North Reference:	True
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	SURVEYS	Database:	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 (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	
5,084.00	11.82	258.93	4,978.34	-279.06	-957.64	997.47	1.65	1.06	6.47	
5,178.00	12.13	259.54	5,070.29	-282.70	-976.80	1,016.89	0.36	0.33	0.65	
5,273.00	11.12	258.05	5,163.34	-286.41	-995.58	1,035.96	1.11	-1.06	-1.57	
5,367.00	12.13	253.39	5,255.41	-291.11	-1,013.91	1,054.87	1.47	1.07	-4.96	
5,462.00	12.83	253.30	5,348.17	-296.99	-1,033.58	1,075.40	0.74	0.74	-0.09	
5,556.00	11.91	252.34	5,439.99	-302.94	-1,052.82	1,095.54	1.00	-0.98	-1.02	
5,651.00	12.39	254.71	5,532.86	-308.60	-1,071.99	1,115.53	0.73	0.51	2.49	
5,745.00	11.38	254.36	5,624.84	-313.76	-1,090.65	1,134.88	1.08	-1.07	-0.37	
5,839.00	10.90	257.43	5,717.07	-318.19	-1,108.26	1,153.03	0.81	-0.51	3.27	
5,934.00	11.56	257.26	5,810.25	-322.25	-1,126.31	1,171.49	0.70	0.69	-0.18	
6,028.00	10.06	252.07	5,902.58	-326.85	-1,143.31	1,189.10	1.90	-1.60	-5.52	
6,123.00	9.93	248.38	5,996.14	-332.42	-1,158.82	1,205.55	0.69	-0.14	-3.88	
6,217.00	8.39	248.47	6,088.94	-337.93	-1,172.73	1,220.45	1.64	-1.64	0.10	
6,312.00	8.22	248.73	6,182.95	-342.93	-1,185.51	1,234.11	0.18	-0.18	0.27	
6,406.00	6.11	251.46	6,276.21	-346.96	-1,196.51	1,245.80	2.27	-2.24	2.90	
6,501.00	5.36	257.17	6,370.73	-349.56	-1,205.63	1,255.28	0.99	-0.79	6.01	
6,595.00	4.79	261.39	6,464.36	-351.12	-1,213.79	1,263.56	0.72	-0.61	4.49	
6,689.00	2.81	247.50	6,558.15	-352.59	-1,219.80	1,269.74	2.31	-2.11	-14.78	
6,973.00	3.08	230.98	6,841.78	-360.05	-1,232.16	1,283.69	0.31	0.10	-5.82	
7,200.00	4.22	238.89	7,068.32	-368.21	-1,244.05	1,297.37	0.55	0.50	3.48	
7,540.00	6.02	233.53	7,406.95	-385.27	-1,269.10	1,326.18	0.55	0.53	-1.58	
7,823.00	8.22	238.54	7,687.75	-404.65	-1,298.30	1,359.60	0.81	0.78	1.77	
8,107.00	10.06	241.44	7,968.14	-427.11	-1,337.40	1,403.41	0.67	0.65	1.02	
8,390.00	11.73	240.47	8,246.03	-453.11	-1,384.15	1,455.53	0.59	0.59	-0.34	
8,672.00	13.58	239.42	8,521.17	-484.08	-1,437.60	1,515.48	0.66	0.66	-0.37	
8,798.00	13.36	234.58	8,643.70	-500.05	-1,462.20	1,543.55	0.91	-0.17	-3.84	
LAST SURVEY -8798' MD										
8,866.00	13.36	234.58	8,709.86	-509.15	-1,475.00	1,558.38	0.00	0.00	0.00	
PROJECTION TO BIT- 8866' MD										

Design Targets										
Target Name	Dip Angle (°)	Dip Dir. (°)	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Northing (usft)	Easting (usft)	Latitude	Longitude	
PUCKETT 13B-26 BHL	0.00	0.00	8,725.00	-433.07	-1,437.21	14,354,067.00	2,431,726.70	39.493843	-108.195297	
- hit/miss target										
- Shape										
- actual wellpath misses target center by 86.25usft at 8863.42usft MD (8707.36 TVD, -508.81 N, -1474.52 E)										
- Ellipse (radii L200.00 W100.00 on 250.00 azi)										

Cathedral Energy Services

Survey Report

Company:	Caerus Oil & Gas	Local Co-ordinate Reference:	Well PUCKETT 13B-26
Project:	Garfield County, CO (UTM 12N)	TVD Reference:	30' KB @ 8352.00usft
Site:	S26-T6S-R97W (MESA F26)	MD Reference:	30' KB @ 8352.00usft
Well:	PUCKETT 13B-26	North Reference:	True
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	SURVEYS	Database:	USA EDM 5000 Multi Users DB

Design Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
8,798.00	8,643.70	-500.05	-1,462.20	LAST SURVEY -8798' MD
8,866.00	8,709.86	-509.15	-1,475.00	PROJECTION TO BIT- 8866' MD

Checked By: _____ Approved By: _____ Date: _____