

Cathedral Energy Services

Survey Report

Company:	Caerus Oil & Gas	Local Co-ordinate Reference:	Well PUCKETT 12B-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 12B-26	North Reference:	True
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	FINAL	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 12B-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:	39.495086
		Longitude:	-108.190245
		Ground Level:	8,322.00 usft

Wellbore	OH				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	HDGM	12/14/2017	9.68	65.78	51,669.90000000

Design	FINAL				
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	299.92	

Survey Program	Date	12/26/2017			
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description	
145.00	8,916.00	Survey #1 (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 (°/100usf)	Build Rate (°/100u)	Formations / Comments	
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
145.00	0.66	323.19	145.00	0.67	-0.50	0.77	0.46	0.46		
206.00	2.81	304.82	205.97	1.80	-1.94	2.58	3.60	3.52		
297.00	6.33	305.78	296.66	6.01	-7.84	9.79	3.87	3.87		
390.00	10.42	301.48	388.65	13.40	-19.18	23.31	4.45	4.40		
481.00	13.23	300.95	477.71	23.06	-35.13	41.95	3.09	3.09		
572.00	15.73	299.46	565.81	34.48	-54.80	64.70	2.78	2.75		
666.00	17.40	296.82	655.91	47.09	-78.44	91.48	1.95	1.78		
761.00	17.62	296.82	746.51	59.99	-103.95	120.02	0.23	0.23		
855.00	15.91	300.51	836.51	72.95	-127.75	147.11	2.14	-1.82		
950.00	14.19	303.59	928.25	86.00	-148.67	171.75	2.00	-1.81		
1,044.00	14.02	299.37	1,019.42	97.96	-168.19	194.64	1.11	-0.18		
1,139.00	14.46	297.79	1,111.50	109.14	-188.71	218.00	0.62	0.46		

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Well:	PUCKETT 12B-26	North Reference:	True
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	FINAL	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 (°/100usf)	Build Rate (°/100u)	Formations / Comments
1,233.00	12.48	296.38	1,202.91	119.12	-208.20	239.87	2.14	-2.11	
1,328.00	10.02	295.33	1,296.08	127.22	-224.86	258.35	2.60	-2.59	
1,422.00	8.61	296.47	1,388.84	133.86	-238.56	273.53	1.51	-1.50	
1,516.00	9.32	310.53	1,481.70	141.94	-250.64	288.03	2.44	0.76	
1,611.00	11.12	312.20	1,575.19	153.09	-263.28	304.55	1.92	1.89	
1,705.00	12.79	307.45	1,667.15	165.51	-278.25	323.72	2.06	1.78	
1,800.00	13.45	303.15	1,759.67	177.95	-295.85	345.18	1.24	0.69	
1,894.00	12.74	302.09	1,851.23	189.43	-313.78	366.45	0.80	-0.76	
1,989.00	13.27	298.40	1,943.79	200.18	-332.25	387.82	1.04	0.56	
2,083.00	15.12	298.14	2,034.92	211.10	-352.55	410.86	1.97	1.97	
2,178.00	14.85	296.12	2,126.69	222.30	-374.41	435.39	0.62	-0.28	
2,272.00	13.84	292.25	2,217.76	231.86	-395.63	458.55	1.48	-1.07	
2,367.00	13.49	295.33	2,310.07	240.90	-416.16	480.86	0.85	-0.37	
2,461.00	13.62	297.96	2,401.45	250.78	-435.85	502.85	0.67	0.14	
2,598.00	13.27	295.76	2,534.70	265.18	-464.26	534.65	0.45	-0.26	
2,692.00	12.66	304.03	2,626.31	275.63	-482.51	555.69	2.08	-0.65	
2,787.00	11.73	301.83	2,719.16	286.55	-499.35	575.72	1.09	-0.98	
2,881.00	10.46	299.28	2,811.41	295.76	-514.91	593.81	1.45	-1.35	
2,976.00	11.21	308.42	2,904.72	305.72	-529.67	611.56	1.97	0.79	
3,070.00	11.12	306.75	2,996.94	316.82	-544.09	629.60	0.36	-0.10	
3,164.00	12.66	309.65	3,088.92	328.82	-559.28	648.75	1.76	1.64	
3,259.00	13.89	312.11	3,181.38	343.11	-575.76	670.16	1.42	1.29	
3,353.00	13.05	310.35	3,272.80	357.55	-592.22	691.63	0.99	-0.89	
3,448.00	13.80	310.62	3,365.20	371.87	-608.99	713.31	0.79	0.79	
3,542.00	12.66	310.71	3,456.70	385.89	-625.31	734.44	1.21	-1.21	
3,637.00	13.84	309.12	3,549.17	399.85	-642.02	755.89	1.30	1.24	
3,731.00	14.99	305.52	3,640.21	414.00	-660.63	779.09	1.55	1.22	
3,826.00	14.50	304.11	3,732.08	427.81	-680.48	803.17	0.64	-0.52	
3,920.00	14.02	303.41	3,823.19	440.68	-699.73	826.28	0.54	-0.51	
4,015.00	15.21	304.55	3,915.11	454.08	-719.60	850.18	1.29	1.25	
4,109.00	14.94	302.27	4,005.88	467.55	-740.00	874.58	0.69	-0.29	
4,204.00	15.34	297.26	4,097.59	479.84	-761.53	899.37	1.44	0.42	
4,298.00	14.50	298.84	4,188.42	491.21	-782.89	923.56	0.99	-0.89	
4,392.00	13.32	298.40	4,279.66	502.04	-802.72	946.15	1.26	-1.26	
4,487.00	12.57	299.10	4,372.24	512.27	-821.38	967.42	0.81	-0.79	
4,581.00	11.82	296.12	4,464.12	521.49	-838.96	987.26	1.04	-0.80	
4,676.00	13.14	300.60	4,556.88	531.27	-857.00	1,007.77	1.72	1.39	
4,770.00	11.82	301.13	4,648.65	541.68	-874.43	1,028.08	1.41	-1.40	
4,865.00	11.43	296.20	4,741.71	550.87	-891.21	1,047.20	1.12	-0.41	
4,959.00	11.51	292.07	4,833.83	558.51	-908.26	1,065.78	0.88	0.09	
5,054.00	12.17	296.29	4,926.81	566.50	-926.02	1,085.17	1.15	0.69	
5,148.00	13.01	300.42	5,018.55	576.25	-944.03	1,105.64	1.31	0.89	
5,242.00	14.15	297.26	5,109.92	586.87	-963.37	1,127.69	1.45	1.21	
5,337.00	13.67	298.93	5,202.14	597.62	-983.51	1,150.52	0.66	-0.51	
5,432.00	13.05	297.87	5,294.57	608.06	-1,002.82	1,172.46	0.70	-0.65	
5,526.00	13.80	297.26	5,386.00	618.16	-1,022.17	1,194.27	0.81	0.80	
5,620.00	13.49	298.75	5,477.35	628.57	-1,041.75	1,216.43	0.50	-0.33	
5,715.00	12.88	299.19	5,569.84	639.06	-1,060.71	1,238.09	0.65	-0.64	
5,809.00	12.35	298.66	5,661.57	648.99	-1,078.67	1,258.62	0.58	-0.56	
5,904.00	11.38	298.84	5,754.54	658.39	-1,095.80	1,278.15	1.02	-1.02	
5,998.00	10.68	298.75	5,846.80	667.05	-1,111.56	1,296.13	0.74	-0.74	
6,093.00	9.27	298.31	5,940.36	674.91	-1,126.01	1,312.58	1.49	-1.48	
6,187.00	8.09	302.53	6,033.29	682.06	-1,138.26	1,326.75	1.43	-1.26	

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6,282.00	6.11	299.63	6,127.55	688.15	-1,148.29	1,338.49	2.12	-2.08	
6,376.00	4.97	297.52	6,221.11	692.51	-1,156.25	1,347.56	1.23	-1.21	
6,470.00	4.48	304.47	6,314.80	696.47	-1,162.89	1,355.29	0.80	-0.52	
6,565.00	4.75	294.97	6,409.49	700.23	-1,169.51	1,362.91	0.85	0.28	
6,659.00	4.57	298.31	6,503.18	703.65	-1,176.33	1,370.53	0.35	-0.19	
6,752.00	2.86	308.16	6,595.98	706.84	-1,181.42	1,376.53	1.96	-1.84	
7,037.00	3.47	289.00	6,880.55	714.04	-1,195.17	1,392.03	0.43	0.21	
7,320.00	3.52	285.92	7,163.03	719.21	-1,211.62	1,408.87	0.07	0.02	
7,603.00	4.35	286.98	7,445.36	724.73	-1,230.24	1,427.76	0.29	0.29	
7,887.00	5.27	279.24	7,728.36	729.97	-1,253.41	1,450.46	0.40	0.32	
8,171.00	4.57	280.65	8,011.31	734.15	-1,277.41	1,473.35	0.25	-0.25	
8,454.00	4.75	281.44	8,293.37	738.56	-1,299.97	1,495.10	0.07	0.06	LAST SURVEY - 8454' MD
8,916.00	4.75	281.44	8,753.79	746.15	-1,337.47	1,531.39	0.00	0.00	PTB - 8916' 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 12B-26 BHL	0.00	0.00	8,740.00	636.10	-1,432.15	14,355,155.00	2,431,686.70	39.496831	-108.195318
- actual wellpath misses target center by 145.62usft at 8908.14usft MD (8745.95 TVD, 746.02 N, -1336.83 E)									
- Ellipse (radii L200.00 W100.00 on 250.00 azi)									

Design Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
8,454.00	8,293.37	738.56	-1,299.97	LAST SURVEY - 8454' MD
8,916.00	8,753.79	746.15	-1,337.47	PTB - 8916' MD

Checked By: _____ Approved By: _____ Date: _____