



# Cathedral Energy Services

## Survey Report

<b>Company:</b>	Caerus Oil & Gas	<b>Local Co-ordinate Reference:</b>	Well PUCKETT 32C-26 - Slot B-11
<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 32C-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)		

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

Well	PUCKETT 32C-26 - Slot B-11					
Well Position	+N/-S	0.00 usft	Northing:	14,355,983.78 usft	Latitude:	39.498792
	+E/-W	0.00 usft	Easting:	2,435,337.62 usft	Longitude:	-108.182300
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	3/1/2017	9.73	65.83	51,763

<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)</b>	<b>+N/-S</b>	<b>+E/-W</b>	<b>Direction</b>	
	(usft)	(usft)	(usft)	(°)	
	0.00	0.00	0.00	144.55	

<b>Survey Program</b>	<b>Date</b>	3/10/2017			
<b>From (usft)</b>	<b>To (usft)</b>	<b>Survey (Wellbore)</b>	<b>Tool Name</b>	<b>Description</b>	
210.00	9,063.00	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		
210.00	1.49	167.58	209.98	-2.67	0.59	2.51	0.71	0.71		
270.00	2.15	142.27	269.95	-4.32	1.44	4.36	1.71	1.10		
301.00	2.55	152.99	300.92	-5.39	2.11	5.62	1.91	1.29		
392.00	4.26	124.96	391.76	-9.13	5.80	10.81	2.57	1.88		
421.00	4.70	120.47	420.67	-10.35	7.71	12.91	1.94	1.52		
482.00	4.92	117.66	481.46	-12.83	12.18	17.52	0.53	0.36		
575.00	5.45	121.97	574.08	-17.02	19.46	25.15	0.71	0.57		
669.00	6.42	154.66	667.60	-24.14	25.50	34.45	3.68	1.03		
764.00	7.73	153.52	761.87	-34.66	30.62	45.99	1.39	1.38		
858.00	8.57	144.64	854.93	-46.03	37.49	59.24	1.61	0.89		
953.00	8.44	144.91	948.88	-57.51	45.60	73.29	0.14	-0.14		
1,142.00	9.23	144.64	1,135.64	-81.22	62.34	102.32	0.42	0.42		

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<b>Site:</b>	S26-T6S-R97W (697 26A)	<b>MD Reference:</b>	30' KB @ 8426.00usft
<b>Well:</b>	PUCKETT 32C-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
1,236.00	8.83	149.48	1,228.48	-93.58	70.37	117.05	0.91	-0.43	
1,331.00	9.93	151.32	1,322.20	-107.05	78.00	132.45	1.20	1.16	
1,425.00	10.99	149.04	1,414.64	-121.84	86.50	149.43	1.21	1.13	
1,520.00	10.90	137.35	1,507.92	-136.22	97.25	167.37	2.33	-0.09	
1,615.00	9.98	131.11	1,601.35	-148.24	109.54	184.29	1.53	-0.97	
1,709.00	9.32	129.26	1,694.02	-158.41	121.57	199.55	0.78	-0.70	
1,804.00	9.54	138.58	1,787.75	-169.18	132.73	214.80	1.62	0.23	
1,898.00	9.67	145.08	1,880.43	-181.50	142.40	230.44	1.16	0.14	
1,993.00	9.32	145.17	1,974.13	-194.35	151.36	246.11	0.37	-0.37	
2,087.00	8.75	148.16	2,066.96	-206.68	159.48	260.86	0.79	-0.61	
2,182.00	9.45	151.85	2,160.77	-219.69	166.98	275.81	0.96	0.74	
2,277.00	10.81	153.52	2,254.28	-234.54	174.63	292.35	1.46	1.43	
2,371.00	11.56	154.13	2,346.50	-250.91	182.67	310.34	0.81	0.80	
2,466.00	12.79	153.96	2,439.36	-268.92	191.44	330.10	1.30	1.29	
2,509.00	13.80	152.99	2,481.21	-277.77	195.86	339.87	2.41	2.35	
2,604.00	13.67	151.32	2,573.49	-297.71	206.39	362.23	0.44	-0.14	
2,698.00	13.58	150.44	2,664.85	-317.05	217.16	384.23	0.24	-0.10	
2,793.00	14.02	151.06	2,757.10	-336.83	228.24	406.76	0.49	0.46	
2,887.00	12.74	149.30	2,848.55	-355.70	239.04	428.40	1.43	-1.36	
2,981.00	11.21	147.81	2,940.50	-372.35	249.20	447.86	1.66	-1.63	
3,076.00	10.28	148.77	3,033.83	-387.41	258.51	465.53	1.00	-0.98	
3,170.00	8.97	144.38	3,126.51	-400.54	267.13	481.22	1.60	-1.39	
3,265.00	9.27	146.75	3,220.31	-412.96	275.64	496.28	0.51	0.32	
3,359.00	9.14	145.70	3,313.10	-425.46	284.00	511.31	0.23	-0.14	
3,454.00	9.05	144.91	3,406.91	-437.81	292.54	526.32	0.16	-0.09	
3,548.00	9.05	144.73	3,499.74	-449.89	301.06	541.11	0.03	0.00	
3,642.00	8.92	145.08	3,592.58	-461.90	309.50	555.79	0.15	-0.14	
3,737.00	8.04	144.82	3,686.54	-473.37	317.55	569.80	0.93	-0.93	
3,831.00	8.53	148.42	3,779.56	-484.69	324.98	583.33	0.76	0.52	
3,926.00	8.70	149.83	3,873.49	-496.90	332.29	597.51	0.29	0.18	
4,020.00	9.23	151.67	3,966.34	-509.68	339.44	612.07	0.64	0.56	
4,114.00	9.84	150.53	4,059.04	-523.31	346.96	627.54	0.68	0.65	
4,209.00	9.40	149.30	4,152.71	-537.05	354.92	643.34	0.51	-0.46	
4,303.00	10.20	152.03	4,245.33	-551.00	362.74	659.25	0.98	0.85	
4,398.00	9.58	151.85	4,338.92	-565.40	370.42	675.43	0.65	-0.65	
4,492.00	10.02	152.11	4,431.55	-579.52	377.93	691.29	0.47	0.47	
4,587.00	9.27	151.67	4,525.21	-593.56	385.43	707.08	0.79	-0.79	
4,681.00	9.36	151.15	4,617.97	-606.92	392.71	722.18	0.13	0.10	
4,776.00	9.01	150.36	4,711.75	-620.16	400.12	737.26	0.39	-0.37	
4,870.00	7.91	151.15	4,804.72	-632.22	406.88	751.01	1.18	-1.17	
4,965.00	7.47	145.17	4,898.87	-643.01	413.56	763.68	0.96	-0.46	
5,059.00	8.17	147.63	4,992.00	-653.67	420.63	776.46	0.83	0.74	
5,154.00	8.61	150.62	5,085.98	-665.57	427.73	790.27	0.65	0.46	
5,249.00	9.80	152.99	5,179.76	-678.97	434.89	805.34	1.31	1.25	
5,343.00	10.85	149.83	5,272.23	-693.75	442.97	822.06	1.27	1.12	
5,438.00	10.72	148.51	5,365.56	-709.01	452.08	839.78	0.29	-0.14	
5,532.00	10.59	147.89	5,457.93	-723.78	461.24	857.12	0.18	-0.14	
5,627.00	10.94	146.66	5,551.26	-738.71	470.83	874.85	0.44	0.37	
5,721.00	9.98	149.04	5,643.70	-753.14	479.92	891.88	1.12	-1.02	
5,816.00	9.98	148.25	5,737.26	-767.20	488.49	908.30	0.14	0.00	
5,910.00	8.48	147.28	5,830.04	-779.96	496.52	923.36	1.60	-1.60	
6,005.00	7.34	143.94	5,924.14	-790.76	503.88	936.42	1.29	-1.20	
6,099.00	6.33	143.76	6,017.47	-799.79	510.48	947.61	1.07	-1.07	

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<b>Site:</b>	S26-T6S-R97W (697 26A)	<b>MD Reference:</b>	30' KB @ 8426.00usft
<b>Well:</b>	PUCKETT 32C-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
6,194.00	5.85	146.22	6,111.93	-808.04	516.27	957.68	0.58	-0.51	
6,288.00	4.48	145.08	6,205.55	-815.03	521.03	966.14	1.46	-1.46	
6,383.00	3.12	127.59	6,300.34	-819.65	525.21	972.33	1.87	-1.43	
6,477.00	1.54	147.37	6,394.26	-822.28	527.91	976.03	1.86	-1.68	
6,572.00	0.57	267.43	6,489.25	-823.37	528.13	977.05	1.99	-1.02	
6,761.00	1.06	260.48	6,678.23	-823.71	525.47	975.78	0.26	0.26	
6,950.00	1.89	255.21	6,867.17	-824.79	520.73	973.91	0.44	0.44	
7,139.00	3.16	259.16	7,055.98	-826.57	512.60	970.65	0.68	0.67	
7,328.00	3.56	271.64	7,244.66	-827.38	501.62	964.94	0.44	0.21	
7,517.00	4.40	265.93	7,433.20	-827.72	488.52	957.63	0.49	0.44	
7,706.00	5.85	259.78	7,621.44	-829.95	471.81	949.75	0.82	0.77	
7,895.00	6.77	259.78	7,809.29	-833.63	451.36	940.89	0.49	0.49	
8,084.00	7.78	252.66	7,996.77	-839.42	428.19	932.17	0.72	0.53	
8,273.00	8.97	247.65	8,183.76	-848.84	402.35	924.85	0.74	0.63	
8,462.00	10.11	245.63	8,370.14	-861.29	373.61	918.33	0.63	0.60	
8,557.00	9.32	250.20	8,463.78	-867.33	358.78	914.65	1.16	-0.83	
8,746.00	8.53	250.11	8,650.49	-877.29	331.20	906.77	0.42	-0.42	
8,935.00	8.97	250.20	8,837.29	-887.05	304.15	899.03	0.23	0.23	
9,001.00	9.62	248.88	8,902.42	-890.78	294.17	896.28	1.04	0.98	LAST SURVEY @ 9001' MD
9,063.00	9.62	248.88	8,963.55	-894.51	284.50	893.72	0.00	0.00	PROJECTION @ 9063' MD

Targets									
Target Name	Dip Angle (°)	Dip Dir. (°)	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Northing (usft)	Easting (usft)	Latitude	Longitude
PUCKETT 32C-26 PBHI	0.00	0.00	8,979.00	-890.94	374.68	14,355,105.00	2,435,740.00	39.496347	-108.180973
- actual wellpath misses target center by 91.56usft at 9063.00usft MD (8963.55 TVD, -894.51 N, 284.50 E)									
- Ellipse (radii L200.00 W100.00 on 240.00 azi)									

Design Annotations					
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates			
		+N/-S (usft)	+E/-W (usft)	Comment	
9,001.00	8,902.42	-890.78	294.17	LAST SURVEY @ 9001' MD	
9,063.00	8,963.55	-894.51	284.50	PROJECTION @ 9063' MD	

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