



Cathedral Energy Services

Survey Report

Company:	Caerus Oil & Gas	Local Co-ordinate Reference:	Well PUCKETT 34C-23 - Slot B-4
Project:	Garfield County, CO (UTM 12N)	TVD Reference:	30' KB @ 8426.00usft
Site:	S26-T6S-R97W (697 26A)	MD Reference:	30' KB @ 8426.00usft
Well:	PUCKETT 34C-23	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 (697 26A)		
Site Position:		Northing:	14,356,905.20 usft
From:	Map	Easting:	2,433,730.50 usft
Position Uncertainty:	0.00 usft	Slot Radius:	13-3/16"
		Latitude:	39.501458
		Longitude:	-108.187888
		Grid Convergence:	1.79 °

Well	PUCKETT 34C-23 - Slot B-4					
Well Position	+N/-S	0.00 usft	Northing:	14,356,023.14 usft	Latitude:	39.498903
	+E/-W	0.00 usft	Easting:	2,435,302.88 usft	Longitude:	-108.182419
Position Uncertainty		0.00 usft	Wellhead Elevation:	0.00 usft	Ground Level:	8,396.00 usft

Wellbore	OH				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	HDGM	8/17/2016	9.78	65.85	51,825

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	15.35	

Survey Program	Date	4/13/2017			
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description	
147.00	9,343.00	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		
147.00	2.15	57.80	146.97	1.47	2.33	2.03	1.46	1.46		
178.00	3.52	44.79	177.93	2.45	3.50	3.29	4.85	4.42		
209.00	4.48	45.67	208.85	3.98	5.03	5.17	3.10	3.10		
300.00	8.04	29.14	299.30	12.02	10.68	14.42	4.35	3.91		
392.00	11.47	27.03	389.96	25.79	17.97	29.63	3.75	3.73		
484.00	13.45	24.84	479.79	43.65	26.62	49.14	2.21	2.15		
575.00	14.24	22.90	568.14	63.57	35.42	70.68	1.01	0.87		
670.00	16.83	17.02	659.67	87.49	44.00	96.01	3.19	2.73		
764.00	17.58	10.25	749.47	114.47	50.51	123.76	2.27	0.80		
859.00	17.80	12.36	839.98	142.77	56.17	152.55	0.71	0.23		
953.00	17.93	14.73	929.45	170.80	62.92	181.36	0.79	0.14		
1,048.00	18.37	15.78	1,019.72	199.35	70.71	210.96	0.58	0.46		

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Well:	PUCKETT 34C-23	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
1,142.00	18.33	17.19	1,108.94	227.73	79.11	240.54	0.47	-0.04	
1,237.00	18.28	13.59	1,199.14	256.48	87.02	270.36	1.19	-0.05	
1,331.00	18.59	11.65	1,288.32	285.48	93.51	300.05	0.73	0.33	
1,426.00	18.59	15.35	1,378.36	314.92	100.58	330.31	1.24	0.00	
1,520.00	19.12	22.55	1,467.33	343.59	110.45	360.57	2.54	0.56	
1,615.00	19.91	26.68	1,556.88	372.41	123.68	391.87	1.67	0.83	
1,709.00	18.63	25.89	1,645.61	400.22	137.42	422.32	1.39	-1.36	
1,804.00	18.24	24.49	1,735.73	427.40	150.21	451.92	0.62	-0.41	
1,899.00	17.67	19.65	1,826.11	454.51	161.23	480.98	1.68	-0.60	
1,993.00	16.88	18.16	1,915.87	480.92	170.28	508.83	0.96	-0.84	
2,088.00	17.84	20.09	2,006.54	507.69	179.57	537.11	1.18	1.01	
2,183.00	18.63	21.85	2,096.77	535.44	190.22	566.69	1.01	0.83	
2,277.00	18.06	21.41	2,186.00	562.94	201.13	596.10	0.62	-0.61	
2,372.00	18.02	19.92	2,276.33	590.47	211.51	625.39	0.49	-0.04	
2,464.00	17.58	18.51	2,363.92	617.02	220.77	653.45	0.67	-0.48	
2,604.00	17.23	19.48	2,497.51	656.62	234.40	695.24	0.32	-0.25	
2,699.00	16.83	20.09	2,588.35	682.80	243.81	722.98	0.46	-0.42	
2,793.00	18.06	19.92	2,678.02	709.28	253.45	751.06	1.31	1.31	
2,887.00	17.53	18.95	2,767.52	736.37	263.01	779.72	0.65	-0.56	
2,982.00	15.86	18.33	2,858.52	762.22	271.74	806.96	1.77	-1.76	
3,076.00	15.38	14.91	2,949.05	786.46	278.99	832.26	1.10	-0.51	
3,171.00	15.25	15.78	3,040.67	810.66	285.63	857.35	0.28	-0.14	
3,265.00	15.43	17.63	3,131.32	834.47	292.78	882.20	0.55	0.19	
3,359.00	16.74	16.58	3,221.64	859.37	300.43	908.23	1.43	1.39	
3,454.00	17.71	17.45	3,312.38	886.26	308.66	936.35	1.06	1.02	
3,548.00	17.93	16.31	3,401.87	913.79	317.02	965.11	0.44	0.23	
3,643.00	18.28	16.93	3,492.17	942.08	325.46	994.62	0.42	0.37	
3,737.00	17.36	15.17	3,581.66	969.72	333.42	1,023.38	1.13	-0.98	
3,832.00	18.02	15.35	3,672.16	997.57	341.02	1,052.25	0.70	0.69	
3,926.00	18.33	17.02	3,761.47	1,025.72	349.20	1,081.56	0.64	0.33	
4,020.00	18.28	15.61	3,850.72	1,054.05	357.49	1,111.08	0.47	-0.05	
4,115.00	18.59	17.37	3,940.84	1,082.85	366.02	1,141.11	0.67	0.33	
4,209.00	18.85	17.81	4,029.87	1,111.61	375.14	1,171.26	0.31	0.28	
4,304.00	18.50	16.31	4,119.87	1,140.69	384.07	1,201.66	0.63	-0.37	
4,398.00	18.37	17.19	4,209.05	1,169.15	392.63	1,231.38	0.33	-0.14	
4,493.00	17.80	17.81	4,299.35	1,197.28	401.50	1,260.85	0.63	-0.60	
4,587.00	17.89	16.49	4,388.83	1,224.80	409.99	1,289.64	0.44	0.10	
4,682.00	18.55	15.70	4,479.07	1,253.34	418.22	1,319.34	0.74	0.69	
4,776.00	16.79	14.73	4,568.63	1,280.87	425.72	1,347.87	1.90	-1.87	
4,871.00	17.58	16.05	4,659.39	1,307.93	433.18	1,375.93	0.93	0.83	
4,965.00	18.81	16.58	4,748.69	1,336.09	441.42	1,405.28	1.32	1.31	
5,060.00	17.01	14.99	4,839.08	1,364.20	449.39	1,434.49	1.96	-1.89	
5,154.00	15.86	12.80	4,929.24	1,390.01	455.79	1,461.07	1.39	-1.22	
5,249.00	14.94	12.97	5,020.83	1,414.60	461.42	1,486.28	0.97	-0.97	
5,344.00	15.21	16.14	5,112.56	1,438.50	467.63	1,510.97	0.91	0.28	
5,438.00	16.48	18.60	5,202.99	1,462.99	475.31	1,536.61	1.53	1.35	
5,533.00	17.71	19.39	5,293.79	1,489.39	484.41	1,564.48	1.32	1.29	
5,627.00	17.18	18.77	5,383.46	1,516.02	493.62	1,592.60	0.60	-0.56	
5,722.00	18.15	17.81	5,473.98	1,543.39	502.66	1,621.39	1.07	1.02	
5,816.00	17.75	17.02	5,563.41	1,571.03	511.33	1,650.34	0.50	-0.43	
5,911.00	17.01	17.19	5,654.07	1,598.15	519.68	1,678.70	0.78	-0.78	
6,005.00	16.44	16.14	5,744.09	1,624.07	527.44	1,705.75	0.69	-0.61	
6,100.00	14.55	13.68	5,835.64	1,648.58	534.00	1,731.12	2.11	-1.99	

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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
6,194.00	13.40	12.27	5,926.85	1,670.69	539.11	1,753.80	1.28	-1.22	
6,289.00	12.74	10.95	6,019.39	1,691.73	543.44	1,775.24	0.76	-0.69	
6,383.00	10.24	13.32	6,111.50	1,710.04	547.33	1,793.92	2.71	-2.66	
6,478.00	9.98	11.65	6,205.03	1,726.32	550.94	1,810.58	0.41	-0.27	
6,572.00	7.56	11.04	6,297.92	1,740.37	553.77	1,824.87	2.58	-2.57	
6,667.00	6.90	6.56	6,392.17	1,752.18	555.62	1,836.75	0.91	-0.69	
6,761.00	5.45	3.39	6,485.62	1,762.24	556.52	1,846.69	1.58	-1.54	
6,856.00	5.27	357.59	6,580.20	1,771.10	556.61	1,855.26	0.60	-0.19	
6,950.00	4.04	357.59	6,673.89	1,778.73	556.29	1,862.53	1.31	-1.31	
7,045.00	1.93	13.41	6,768.76	1,783.63	556.52	1,867.31	2.36	-2.22	
7,234.00	1.06	336.67	6,957.70	1,788.33	556.56	1,871.86	0.66	-0.46	
7,423.00	1.49	355.13	7,146.65	1,792.38	555.66	1,875.53	0.31	0.23	
7,517.00	1.27	332.37	7,240.62	1,794.52	555.08	1,877.44	0.62	-0.23	
7,706.00	2.11	306.53	7,429.54	1,798.45	551.31	1,880.23	0.59	0.44	
7,895.00	2.73	299.14	7,618.37	1,802.71	544.58	1,882.56	0.37	0.33	
8,084.00	2.99	281.21	7,807.14	1,805.86	535.81	1,883.28	0.49	0.14	
8,273.00	4.13	281.65	7,995.77	1,808.19	524.31	1,882.48	0.60	0.60	
8,463.00	4.61	253.79	8,185.24	1,807.44	510.28	1,878.04	1.13	0.25	
8,652.00	5.27	252.03	8,373.54	1,802.65	494.73	1,869.30	0.36	0.35	
8,841.00	5.89	257.92	8,561.64	1,797.94	476.99	1,860.07	0.45	0.33	
9,030.00	6.28	254.41	8,749.58	1,793.13	457.55	1,850.29	0.29	0.21	
9,219.00	6.46	253.97	8,937.41	1,787.42	437.37	1,839.44	0.10	0.10	
9,282.00	6.64	255.29	9,000.00	1,785.51	430.44	1,835.77	0.37	0.29	LAST SURVEY @ 9282' MD
9,343.00	6.64	255.29	9,060.59	1,783.72	423.62	1,832.23	0.00	0.00	PTB @ 9343' MD

Targets									
Target Name	Dip Angle (°)	Dip Dir. (°)	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Northing (usft)	Easting (usft)	Latitude	Longitude
PUCKETT 34C-23 PBHI	0.00	0.00	9,036.00	1,865.51	391.99	14,357,900.00	2,435,636.30	39.504023	-108.181030
- hit/miss target									
- Shape									
- actual wellpath misses target center by 88.05usft at 9319.71usft MD (9037.46 TVD, 1784.41 N, 426.23 E)									
- Circle (radius 100.00)									
PUCKETT 34C-23 PBHI	0.00	0.00	9,036.00	1,788.67	401.59	14,357,823.50	2,435,648.30	39.503812	-108.180996
- hit/miss target									
- Shape									
- actual wellpath misses target center by 25.02usft at 9320.89usft MD (9038.63 TVD, 1784.37 N, 426.09 E)									
- Ellipse (radii L200.00 W100.00 on 250.00 azi)									

Design Annotations					
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates			
		+N/-S (usft)	+E/-W (usft)	Comment	
9,282.00	9,000.00	1,785.51	430.44	LAST SURVEY @ 9282' MD	
9,343.00	9,060.59	1,783.72	423.62	PTB @ 9343' MD	

Checked By: _____ Approved By: _____ Date: _____