

Cathedral Energy

Planning Report

Database:	EDM 5000.1 US Multi Users DB	Local Co-ordinate Reference:	Site Antelope I-31 Pad (was 31 C)
Company:	Bonanza Creek Energy Operating Company, LLC	TVD Reference:	WELL @ 4550.0ft (Original Well Elev)
Project:	Weld County	MD Reference:	WELL @ 4550.0ft (Original Well Elev)
Site:	Antelope I-31 Pad (was 31 C)	North Reference:	True
Well:	Antelope 24-31	Survey Calculation Method:	Minimum Curvature
Wellbore:	DD		
Design:	Plan #1		

Project	Weld County		
Map System:	US State Plane 1983	System Datum:	Mean Sea Level
Geo Datum:	North American Datum 1983		
Map Zone:	Colorado Northern Zone		

Site		Antelope I-31 Pad (was 31 C)			
Site Position:		Northing:	1,373,335.76 ft	Latitude:	40.352700
From:	Lat/Long	Easting:	3,314,711.44 ft	Longitude:	-104.370800
Position Uncertainty:	0.0 ft	Slot Radius:	13.200 in	Grid Convergence:	0.73 °

Well	Antelope 24-31					
Well Position	+N/-S	21.8 ft	Northing:	1,373,357.61 ft	Latitude:	40.352760
	+E/-W	0.0 ft	Easting:	3,314,711.16 ft	Longitude:	-104.370800
Position Uncertainty		0.0 ft	Wellhead Elevation:	ft	Ground Level:	4,540.0 ft

Wellbore	DD				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	12/8/2010	8.72	67.10	53,206

Design	Plan #1			
Audit Notes:				
Version:	Phase:	PLAN	Tie On Depth:	0.0
Vertical Section:	Depth From (TVD) (ft)	+N/-S (ft)	+E/-W (ft)	Direction (°)
	0.0	21.8	0.0	137.32

Plan Sections										
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)	TFO (°)	Target
0.0	0.00	0.00	0.0	21.8	0.0	0.00	0.00	0.00	0.00	
600.0	0.00	0.00	600.0	21.8	0.0	0.00	0.00	0.00	0.00	
1,157.0	11.14	137.32	1,153.5	-17.8	36.6	2.00	2.00	0.00	137.32	
5,471.3	11.14	137.32	5,386.5	-630.6	601.7	0.00	0.00	0.00	0.00	
6,028.3	0.00	0.00	5,940.0	-670.3	638.3	2.00	-2.00	0.00	180.00	Antelope 24-31 TGT
6,728.3	0.00	0.00	6,640.0	-670.3	638.3	0.00	0.00	0.00	0.00	Antelope 24-31 PBHL

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Well:	Antelope 24-31	Survey Calculation Method:	Minimum Curvature
Wellbore:	DD		
Design:	Plan #1		

Planned Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Comments / Formations
0.0	0.00	0.00	0.0	21.8	0.0	0.0	0.00	0.00	
100.0	0.00	0.00	100.0	21.8	0.0	0.0	0.00	0.00	
200.0	0.00	0.00	200.0	21.8	0.0	0.0	0.00	0.00	
300.0	0.00	0.00	300.0	21.8	0.0	0.0	0.00	0.00	
400.0	0.00	0.00	400.0	21.8	0.0	0.0	0.00	0.00	
500.0	0.00	0.00	500.0	21.8	0.0	0.0	0.00	0.00	
600.0	0.00	0.00	600.0	21.8	0.0	0.0	0.00	0.00	KOP @ 600'
700.0	2.00	137.32	700.0	20.6	1.2	1.7	2.00	2.00	
800.0	4.00	137.32	799.8	16.7	4.7	7.0	2.00	2.00	
900.0	6.00	137.32	899.5	10.3	10.6	15.7	2.00	2.00	
1,000.0	8.00	137.32	998.7	1.4	18.9	27.9	2.00	2.00	
1,100.0	10.00	137.32	1,097.5	-10.1	29.5	43.5	2.00	2.00	
1,157.0	11.14	137.32	1,153.5	-17.8	36.6	54.0	2.00	2.00	EOB @ Inc. = 11.14°
1,200.0	11.14	137.32	1,195.7	-23.9	42.2	62.3	0.00	0.00	
1,300.0	11.14	137.32	1,293.8	-38.1	55.3	81.6	0.00	0.00	
1,400.0	11.14	137.32	1,391.9	-52.3	68.4	100.9	0.00	0.00	
1,500.0	11.14	137.32	1,490.0	-66.6	81.5	120.2	0.00	0.00	
1,600.0	11.14	137.32	1,588.2	-80.8	94.6	139.6	0.00	0.00	
1,700.0	11.14	137.32	1,686.3	-95.0	107.7	158.9	0.00	0.00	
1,800.0	11.14	137.32	1,784.4	-109.2	120.8	178.2	0.00	0.00	
1,900.0	11.14	137.32	1,882.5	-123.4	133.9	197.5	0.00	0.00	
2,000.0	11.14	137.32	1,980.6	-137.6	147.0	216.9	0.00	0.00	
2,100.0	11.14	137.32	2,078.7	-151.8	160.1	236.2	0.00	0.00	
2,200.0	11.14	137.32	2,176.8	-166.0	173.2	255.5	0.00	0.00	
2,300.0	11.14	137.32	2,275.0	-180.2	186.3	274.8	0.00	0.00	
2,400.0	11.14	137.32	2,373.1	-194.4	199.4	294.1	0.00	0.00	
2,500.0	11.14	137.32	2,471.2	-208.6	212.5	313.5	0.00	0.00	
2,600.0	11.14	137.32	2,569.3	-222.8	225.6	332.8	0.00	0.00	
2,700.0	11.14	137.32	2,667.4	-237.0	238.7	352.1	0.00	0.00	
2,800.0	11.14	137.32	2,765.5	-251.2	251.8	371.4	0.00	0.00	
2,900.0	11.14	137.32	2,863.7	-265.4	264.9	390.7	0.00	0.00	
3,000.0	11.14	137.32	2,961.8	-279.6	278.0	410.1	0.00	0.00	
3,100.0	11.14	137.32	3,059.9	-293.8	291.1	429.4	0.00	0.00	
3,200.0	11.14	137.32	3,158.0	-308.0	304.2	448.7	0.00	0.00	
3,300.0	11.14	137.32	3,256.1	-322.2	317.3	468.0	0.00	0.00	
3,400.0	11.14	137.32	3,354.2	-336.4	330.4	487.3	0.00	0.00	
3,500.0	11.14	137.32	3,452.4	-350.6	343.5	506.7	0.00	0.00	
3,600.0	11.14	137.32	3,550.5	-364.8	356.6	526.0	0.00	0.00	
3,700.0	11.14	137.32	3,648.6	-379.0	369.7	545.3	0.00	0.00	
3,800.0	11.14	137.32	3,746.7	-393.2	382.8	564.6	0.00	0.00	
3,900.0	11.14	137.32	3,844.8	-407.4	395.9	583.9	0.00	0.00	
4,000.0	11.14	137.32	3,942.9	-421.6	409.0	603.3	0.00	0.00	
4,100.0	11.14	137.32	4,041.0	-435.8	422.1	622.6	0.00	0.00	
4,200.0	11.14	137.32	4,139.2	-450.0	435.2	641.9	0.00	0.00	
4,300.0	11.14	137.32	4,237.3	-464.2	448.2	661.2	0.00	0.00	
4,400.0	11.14	137.32	4,335.4	-478.4	461.3	680.5	0.00	0.00	
4,500.0	11.14	137.32	4,433.5	-492.7	474.4	699.9	0.00	0.00	
4,600.0	11.14	137.32	4,531.6	-506.9	487.5	719.2	0.00	0.00	
4,700.0	11.14	137.32	4,629.7	-521.1	500.6	738.5	0.00	0.00	
4,800.0	11.14	137.32	4,727.9	-535.3	513.7	757.8	0.00	0.00	
4,900.0	11.14	137.32	4,826.0	-549.5	526.8	777.1	0.00	0.00	
5,000.0	11.14	137.32	4,924.1	-563.7	539.9	796.5	0.00	0.00	

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Well:	Antelope 24-31	Survey Calculation Method:	Minimum Curvature
Wellbore:	DD		
Design:	Plan #1		

Planned Survey									
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Comments / Formations
5,100.0	11.14	137.32	5,022.2	-577.9	553.0	815.8	0.00	0.00	
5,200.0	11.14	137.32	5,120.3	-592.1	566.1	835.1	0.00	0.00	
5,300.0	11.14	137.32	5,218.4	-606.3	579.2	854.4	0.00	0.00	
5,400.0	11.14	137.32	5,316.6	-620.5	592.3	873.7	0.00	0.00	
5,471.3	11.14	137.32	5,386.5	-630.6	601.7	887.5	0.00	0.00	Start Drop -2.00
5,500.0	10.57	137.32	5,414.7	-634.6	605.3	892.9	2.00	-2.00	
5,600.0	8.57	137.32	5,513.3	-646.8	616.6	909.5	2.00	-2.00	
5,700.0	6.57	137.32	5,612.4	-656.5	625.5	922.7	2.00	-2.00	
5,800.0	4.57	137.32	5,711.9	-663.6	632.1	932.4	2.00	-2.00	
5,900.0	2.57	137.32	5,811.7	-668.2	636.3	938.6	2.00	-2.00	
6,000.0	0.57	137.32	5,911.7	-670.2	638.2	941.4	2.00	-2.00	
6,028.3	0.00	0.00	5,940.0	-670.3	638.3	941.5	2.00	-2.00	EOD; Target #1 - Antelope 24-31 TGT
6,100.0	0.00	0.00	6,011.7	-670.3	638.3	941.5	0.00	0.00	
6,200.0	0.00	0.00	6,111.7	-670.3	638.3	941.5	0.00	0.00	
6,238.3	0.00	0.00	6,150.0	-670.3	638.3	941.5	0.00	0.00	Niobrara
6,300.0	0.00	0.00	6,211.7	-670.3	638.3	941.5	0.00	0.00	
6,400.0	0.00	0.00	6,311.7	-670.3	638.3	941.5	0.00	0.00	
6,500.0	0.00	0.00	6,411.7	-670.3	638.3	941.5	0.00	0.00	
6,600.0	0.00	0.00	6,511.7	-670.3	638.3	941.5	0.00	0.00	
6,700.0	0.00	0.00	6,611.7	-670.3	638.3	941.5	0.00	0.00	
6,728.3	0.00	0.00	6,640.0	-670.3	638.3	941.5	0.00	0.00	Antelope 24-31 PBHL

Targets									
Target Name	Dip Angle (°)	Dip Dir. (°)	TVD (ft)	+N/-S (ft)	+E/-W (ft)	Northing (ft)	Easting (ft)	Latitude	Longitude
Antelope 24-31 TGT	0.00	0.00	5,940.0	-670.3	638.3	1,372,673.65	3,315,358.18	40.350860	-104.368510
- hit/miss target									
- Shape									
- plan hits target center									
- Point									
Antelope 24-31 PBHL	0.00	0.00	6,640.0	-670.3	638.3	1,372,673.65	3,315,358.18	40.350860	-104.368510
- plan hits target center									
- Circle (radius 50.0)									

Formations					
Measured Depth (ft)	Vertical Depth (ft)	Name	Lithology	Dip (°)	Dip Direction (°)
6,238.3	6,150.0	Niobrara		0.00	

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Well:	Antelope 24-31	Survey Calculation Method:	Minimum Curvature
Wellbore:	DD		
Design:	Plan #1		

Plan Annotations				
Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment
		+N/-S (ft)	+E/-W (ft)	
600.0	600.0	21.8	0.0	KOP @ 600'
1,157.0	1,153.5	-17.8	36.6	EOB @ Inc. = 11.14°
5,471.3	5,386.5	-630.6	601.7	Start Drop -2.00
6,028.3	5,940.0	-670.3	638.3	EOD; Target #1
6,728.3	6,640.0	-670.3	638.3	TD at 6728.3