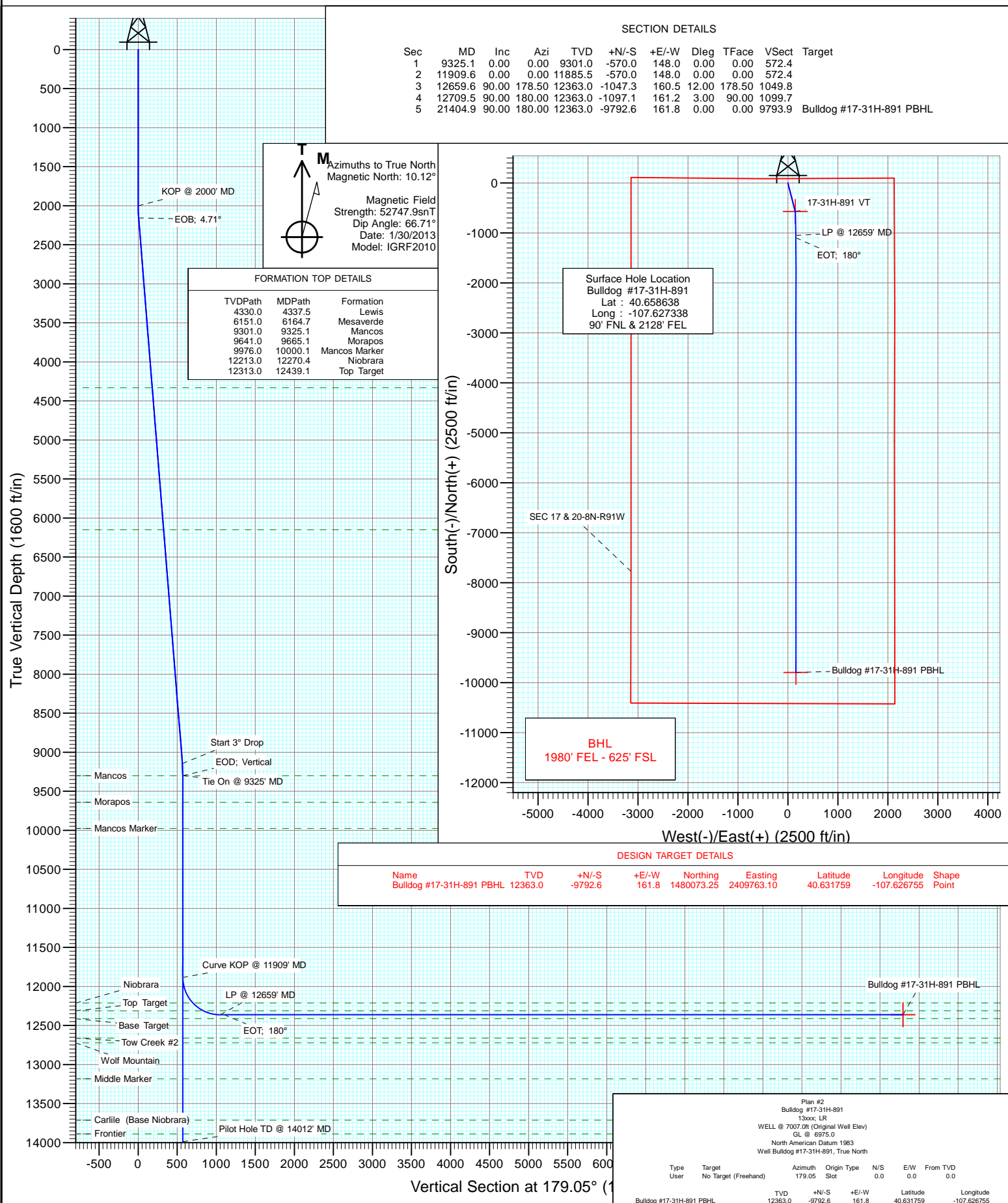




Project: Moffat County, CO
Site: SEC 17-T8N-R91W
Well: Bulldog #17-31H-891
Wellbore: Hz
Design: Plan #2



Cathedral Energy Services

Planning Report

Database:	USA EDM 5000 Multi Users DB	Local Co-ordinate Reference:	Well Bulldog #17-31H-891
Company:	Axia Energy	TVD Reference:	WELL @ 7007.0ft (Original Well Elev)
Project:	Moffat County, CO	MD Reference:	WELL @ 7007.0ft (Original Well Elev)
Site:	SEC 17-T8N-R91W	North Reference:	True
Well:	Bulldog #17-31H-891	Survey Calculation Method:	Minimum Curvature
Wellbore:	Hz		
Design:	Plan #2		

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

Site		SEC 17-T8N-R91W			
Site Position:		Northing:	1,489,855.99 ft	Latitude:	40.658607
From:	Lat/Long	Easting:	2,409,819.60 ft	Longitude:	-107.627397
Position Uncertainty:	0.0 ft	Slot Radius:	13.200 in	Grid Convergence:	-1.37 °

Well	Bulldog #17-31H-891					
Well Position	+N/-S	0.0 ft	Northing:	1,489,866.87 ft	Latitude:	40.658638
	+E/-W	0.0 ft	Easting:	2,409,836.24 ft	Longitude:	-107.627338
Position Uncertainty		0.0 ft	Wellhead Elevation:	ft	Ground Level:	6,975.0 ft

Wellbore	Hz				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	1/30/2013	10.12	66.71	52,748

Design	Plan #2			
Audit Notes:				
Version:	Phase:	PLAN	Tie On Depth:	9,325.1
Vertical Section:	Depth From (TVD) (ft)	+N/-S (ft)	+E/-W (ft)	Direction (°)
	0.0	0.0	0.0	179.05

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
9,325.1	0.00	0.00	9,301.0	-570.0	148.0	0.00	0.00	0.00	0.00	
11,909.6	0.00	0.00	11,885.5	-570.0	148.0	0.00	0.00	0.00	0.00	
12,659.6	90.00	178.50	12,363.0	-1,047.3	160.5	12.00	12.00	0.00	178.50	
12,709.5	90.00	180.00	12,363.0	-1,097.1	161.2	3.00	0.00	3.00	90.00	
21,404.9	90.00	180.00	12,363.0	-9,792.6	161.8	0.00	0.00	0.00	0.00	Bulldog #17-31H-891

Cathedral Energy Services

Planning Report

Database:	USA EDM 5000 Multi Users DB	Local Co-ordinate Reference:	Well Bulldog #17-31H-891
Company:	Axia Energy	TVD Reference:	WELL @ 7007.0ft (Original Well Elev)
Project:	Moffat County, CO	MD Reference:	WELL @ 7007.0ft (Original Well Elev)
Site:	SEC 17-T8N-R91W	North Reference:	True
Well:	Bulldog #17-31H-891	Survey Calculation Method:	Minimum Curvature
Wellbore:	Hz		
Design:	Plan #2		

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
9,325.1	0.00	0.00	9,301.0	-570.0	148.0	572.4	0.00	0.00	Tie On @ 9325' MD - Mancos
9,400.0	0.00	0.00	9,375.9	-570.0	148.0	572.4	0.00	0.00	
9,500.0	0.00	0.00	9,475.9	-570.0	148.0	572.4	0.00	0.00	
9,600.0	0.00	0.00	9,575.9	-570.0	148.0	572.4	0.00	0.00	
9,665.1	0.00	0.00	9,641.0	-570.0	148.0	572.4	0.00	0.00	Morapos
9,700.0	0.00	0.00	9,675.9	-570.0	148.0	572.4	0.00	0.00	
9,800.0	0.00	0.00	9,775.9	-570.0	148.0	572.4	0.00	0.00	
9,900.0	0.00	0.00	9,875.9	-570.0	148.0	572.4	0.00	0.00	
10,000.0	0.00	0.00	9,975.9	-570.0	148.0	572.4	0.00	0.00	
10,000.1	0.00	0.00	9,976.0	-570.0	148.0	572.4	0.00	0.00	Mancos Marker
10,100.0	0.00	0.00	10,075.9	-570.0	148.0	572.4	0.00	0.00	
10,200.0	0.00	0.00	10,175.9	-570.0	148.0	572.4	0.00	0.00	
10,300.0	0.00	0.00	10,275.9	-570.0	148.0	572.4	0.00	0.00	
10,400.0	0.00	0.00	10,375.9	-570.0	148.0	572.4	0.00	0.00	
10,500.0	0.00	0.00	10,475.9	-570.0	148.0	572.4	0.00	0.00	
10,600.0	0.00	0.00	10,575.9	-570.0	148.0	572.4	0.00	0.00	
10,700.0	0.00	0.00	10,675.9	-570.0	148.0	572.4	0.00	0.00	
10,800.0	0.00	0.00	10,775.9	-570.0	148.0	572.4	0.00	0.00	
10,900.0	0.00	0.00	10,875.9	-570.0	148.0	572.4	0.00	0.00	
11,000.0	0.00	0.00	10,975.9	-570.0	148.0	572.4	0.00	0.00	
11,100.0	0.00	0.00	11,075.9	-570.0	148.0	572.4	0.00	0.00	
11,200.0	0.00	0.00	11,175.9	-570.0	148.0	572.4	0.00	0.00	
11,300.0	0.00	0.00	11,275.9	-570.0	148.0	572.4	0.00	0.00	
11,400.0	0.00	0.00	11,375.9	-570.0	148.0	572.4	0.00	0.00	
11,500.0	0.00	0.00	11,475.9	-570.0	148.0	572.4	0.00	0.00	
11,600.0	0.00	0.00	11,575.9	-570.0	148.0	572.4	0.00	0.00	
11,700.0	0.00	0.00	11,675.9	-570.0	148.0	572.4	0.00	0.00	
11,800.0	0.00	0.00	11,775.9	-570.0	148.0	572.4	0.00	0.00	
11,900.0	0.00	0.00	11,875.9	-570.0	148.0	572.4	0.00	0.00	
11,909.6	0.00	0.00	11,885.5	-570.0	148.0	572.4	0.00	0.00	Curve KOP @ 11909' MD
12,000.0	10.85	178.50	11,975.4	-578.5	148.2	580.9	12.00	12.00	
12,100.0	22.85	178.50	12,070.9	-607.4	149.0	609.8	12.00	12.00	
12,200.0	34.85	178.50	12,158.4	-655.6	150.2	658.0	12.00	12.00	
12,270.4	43.30	178.50	12,213.0	-699.9	151.4	702.3	12.00	12.00	Niobrara
12,300.0	46.85	178.50	12,233.9	-720.9	152.0	723.3	12.00	12.00	
12,400.0	58.85	178.50	12,294.2	-800.4	154.0	802.8	12.00	12.00	
12,439.1	63.54	178.50	12,313.0	-834.6	154.9	837.1	12.00	12.00	Top Target
12,500.0	70.85	178.50	12,336.6	-890.7	156.4	893.2	12.00	12.00	
12,600.0	82.85	178.50	12,359.3	-987.9	158.9	990.4	12.00	12.00	
12,659.6	90.00	178.50	12,363.0	-1,047.3	160.5	1,049.8	12.00	12.00	LP @ 12659' MD
12,700.0	90.00	179.71	12,363.0	-1,087.7	161.1	1,090.2	3.00	0.00	
12,709.5	90.00	180.00	12,363.0	-1,097.1	161.2	1,099.7	3.00	0.00	EOT; 180°
12,800.0	90.00	180.00	12,363.0	-1,187.7	161.2	1,190.2	0.00	0.00	
12,900.0	90.00	180.00	12,363.0	-1,287.7	161.2	1,290.2	0.00	0.00	
13,000.0	90.00	180.00	12,363.0	-1,387.7	161.2	1,390.2	0.00	0.00	
13,100.0	90.00	180.00	12,363.0	-1,487.7	161.2	1,490.2	0.00	0.00	
13,200.0	90.00	180.00	12,363.0	-1,587.7	161.2	1,590.1	0.00	0.00	
13,300.0	90.00	180.00	12,363.0	-1,687.7	161.2	1,690.1	0.00	0.00	
13,400.0	90.00	180.00	12,363.0	-1,787.7	161.2	1,790.1	0.00	0.00	
13,500.0	90.00	180.00	12,363.0	-1,887.7	161.2	1,890.1	0.00	0.00	
13,600.0	90.00	180.00	12,363.0	-1,987.7	161.2	1,990.1	0.00	0.00	
13,700.0	90.00	180.00	12,363.0	-2,087.7	161.2	2,090.1	0.00	0.00	

Cathedral Energy Services

Planning Report

Database:	USA EDM 5000 Multi Users DB	Local Co-ordinate Reference:	Well Bulldog #17-31H-891
Company:	Axia Energy	TVD Reference:	WELL @ 7007.0ft (Original Well Elev)
Project:	Moffat County, CO	MD Reference:	WELL @ 7007.0ft (Original Well Elev)
Site:	SEC 17-T8N-R91W	North Reference:	True
Well:	Bulldog #17-31H-891	Survey Calculation Method:	Minimum Curvature
Wellbore:	Hz		
Design:	Plan #2		

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
13,800.0	90.00	180.00	12,363.0	-2,187.7	161.2	2,190.1	0.00	0.00	
13,900.0	90.00	180.00	12,363.0	-2,287.7	161.2	2,290.0	0.00	0.00	
14,000.0	90.00	180.00	12,363.0	-2,387.7	161.3	2,390.0	0.00	0.00	
14,100.0	90.00	180.00	12,363.0	-2,487.7	161.3	2,490.0	0.00	0.00	
14,200.0	90.00	180.00	12,363.0	-2,587.7	161.3	2,590.0	0.00	0.00	
14,300.0	90.00	180.00	12,363.0	-2,687.7	161.3	2,690.0	0.00	0.00	
14,400.0	90.00	180.00	12,363.0	-2,787.7	161.3	2,790.0	0.00	0.00	
14,500.0	90.00	180.00	12,363.0	-2,887.7	161.3	2,890.0	0.00	0.00	
14,600.0	90.00	180.00	12,363.0	-2,987.7	161.3	2,990.0	0.00	0.00	
14,700.0	90.00	180.00	12,363.0	-3,087.7	161.3	3,089.9	0.00	0.00	
14,800.0	90.00	180.00	12,363.0	-3,187.7	161.3	3,189.9	0.00	0.00	
14,900.0	90.00	180.00	12,363.0	-3,287.7	161.3	3,289.9	0.00	0.00	
15,000.0	90.00	180.00	12,363.0	-3,387.7	161.3	3,389.9	0.00	0.00	
15,100.0	90.00	180.00	12,363.0	-3,487.7	161.3	3,489.9	0.00	0.00	
15,200.0	90.00	180.00	12,363.0	-3,587.7	161.3	3,589.9	0.00	0.00	
15,300.0	90.00	180.00	12,363.0	-3,687.7	161.4	3,689.9	0.00	0.00	
15,400.0	90.00	180.00	12,363.0	-3,787.7	161.4	3,789.8	0.00	0.00	
15,500.0	90.00	180.00	12,363.0	-3,887.7	161.4	3,889.8	0.00	0.00	
15,600.0	90.00	180.00	12,363.0	-3,987.7	161.4	3,989.8	0.00	0.00	
15,700.0	90.00	180.00	12,363.0	-4,087.7	161.4	4,089.8	0.00	0.00	
15,800.0	90.00	180.00	12,363.0	-4,187.7	161.4	4,189.8	0.00	0.00	
15,900.0	90.00	180.00	12,363.0	-4,287.7	161.4	4,289.8	0.00	0.00	
16,000.0	90.00	180.00	12,363.0	-4,387.7	161.4	4,389.8	0.00	0.00	
16,100.0	90.00	180.00	12,363.0	-4,487.7	161.4	4,489.7	0.00	0.00	
16,200.0	90.00	180.00	12,363.0	-4,587.7	161.4	4,589.7	0.00	0.00	
16,300.0	90.00	180.00	12,363.0	-4,687.7	161.4	4,689.7	0.00	0.00	
16,400.0	90.00	180.00	12,363.0	-4,787.7	161.4	4,789.7	0.00	0.00	
16,500.0	90.00	180.00	12,363.0	-4,887.7	161.4	4,889.7	0.00	0.00	
16,600.0	90.00	180.00	12,363.0	-4,987.7	161.4	4,989.7	0.00	0.00	
16,700.0	90.00	180.00	12,363.0	-5,087.7	161.5	5,089.7	0.00	0.00	
16,800.0	90.00	180.00	12,363.0	-5,187.7	161.5	5,189.7	0.00	0.00	
16,900.0	90.00	180.00	12,363.0	-5,287.7	161.5	5,289.6	0.00	0.00	
17,000.0	90.00	180.00	12,363.0	-5,387.7	161.5	5,389.6	0.00	0.00	
17,100.0	90.00	180.00	12,363.0	-5,487.7	161.5	5,489.6	0.00	0.00	
17,200.0	90.00	180.00	12,363.0	-5,587.7	161.5	5,589.6	0.00	0.00	
17,300.0	90.00	180.00	12,363.0	-5,687.7	161.5	5,689.6	0.00	0.00	
17,400.0	90.00	180.00	12,363.0	-5,787.7	161.5	5,789.6	0.00	0.00	
17,500.0	90.00	180.00	12,363.0	-5,887.7	161.5	5,889.6	0.00	0.00	
17,600.0	90.00	180.00	12,363.0	-5,987.7	161.5	5,989.5	0.00	0.00	
17,700.0	90.00	180.00	12,363.0	-6,087.7	161.5	6,089.5	0.00	0.00	
17,800.0	90.00	180.00	12,363.0	-6,187.7	161.5	6,189.5	0.00	0.00	
17,900.0	90.00	180.00	12,363.0	-6,287.7	161.5	6,289.5	0.00	0.00	
18,000.0	90.00	180.00	12,363.0	-6,387.7	161.6	6,389.5	0.00	0.00	
18,100.0	90.00	180.00	12,363.0	-6,487.7	161.6	6,489.5	0.00	0.00	
18,200.0	90.00	180.00	12,363.0	-6,587.7	161.6	6,589.5	0.00	0.00	
18,300.0	90.00	180.00	12,363.0	-6,687.7	161.6	6,689.5	0.00	0.00	
18,400.0	90.00	180.00	12,363.0	-6,787.7	161.6	6,789.4	0.00	0.00	
18,500.0	90.00	180.00	12,363.0	-6,887.7	161.6	6,889.4	0.00	0.00	
18,600.0	90.00	180.00	12,363.0	-6,987.7	161.6	6,989.4	0.00	0.00	
18,700.0	90.00	180.00	12,363.0	-7,087.7	161.6	7,089.4	0.00	0.00	
18,800.0	90.00	180.00	12,363.0	-7,187.7	161.6	7,189.4	0.00	0.00	
18,900.0	90.00	180.00	12,363.0	-7,287.7	161.6	7,289.4	0.00	0.00	

Cathedral Energy Services

Planning Report

Database:	USA EDM 5000 Multi Users DB	Local Co-ordinate Reference:	Well Bulldog #17-31H-891
Company:	Axia Energy	TVD Reference:	WELL @ 7007.0ft (Original Well Elev)
Project:	Moffat County, CO	MD Reference:	WELL @ 7007.0ft (Original Well Elev)
Site:	SEC 17-T8N-R91W	North Reference:	True
Well:	Bulldog #17-31H-891	Survey Calculation Method:	Minimum Curvature
Wellbore:	Hz		
Design:	Plan #2		

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
19,000.0	90.00	180.00	12,363.0	-7,387.7	161.6	7,389.4	0.00	0.00	
19,100.0	90.00	180.00	12,363.0	-7,487.7	161.6	7,489.3	0.00	0.00	
19,200.0	90.00	180.00	12,363.0	-7,587.7	161.6	7,589.3	0.00	0.00	
19,300.0	90.00	180.00	12,363.0	-7,687.7	161.7	7,689.3	0.00	0.00	
19,400.0	90.00	180.00	12,363.0	-7,787.7	161.7	7,789.3	0.00	0.00	
19,500.0	90.00	180.00	12,363.0	-7,887.7	161.7	7,889.3	0.00	0.00	
19,600.0	90.00	180.00	12,363.0	-7,987.7	161.7	7,989.3	0.00	0.00	
19,700.0	90.00	180.00	12,363.0	-8,087.7	161.7	8,089.3	0.00	0.00	
19,800.0	90.00	180.00	12,363.0	-8,187.7	161.7	8,189.2	0.00	0.00	
19,900.0	90.00	180.00	12,363.0	-8,287.7	161.7	8,289.2	0.00	0.00	
20,000.0	90.00	180.00	12,363.0	-8,387.7	161.7	8,389.2	0.00	0.00	
20,100.0	90.00	180.00	12,363.0	-8,487.7	161.7	8,489.2	0.00	0.00	
20,200.0	90.00	180.00	12,363.0	-8,587.7	161.7	8,589.2	0.00	0.00	
20,300.0	90.00	180.00	12,363.0	-8,687.7	161.7	8,689.2	0.00	0.00	
20,400.0	90.00	180.00	12,363.0	-8,787.7	161.7	8,789.2	0.00	0.00	
20,500.0	90.00	180.00	12,363.0	-8,887.7	161.7	8,889.2	0.00	0.00	
20,600.0	90.00	180.00	12,363.0	-8,987.7	161.8	8,989.1	0.00	0.00	
20,700.0	90.00	180.00	12,363.0	-9,087.7	161.8	9,089.1	0.00	0.00	
20,800.0	90.00	180.00	12,363.0	-9,187.7	161.8	9,189.1	0.00	0.00	
20,900.0	90.00	180.00	12,363.0	-9,287.7	161.8	9,289.1	0.00	0.00	
21,000.0	90.00	180.00	12,363.0	-9,387.7	161.8	9,389.1	0.00	0.00	
21,100.0	90.00	180.00	12,363.0	-9,487.7	161.8	9,489.1	0.00	0.00	
21,200.0	90.00	180.00	12,363.0	-9,587.7	161.8	9,589.1	0.00	0.00	
21,300.0	90.00	180.00	12,363.0	-9,687.7	161.8	9,689.0	0.00	0.00	
21,400.0	90.00	180.00	12,363.0	-9,787.7	161.8	9,789.0	0.00	0.00	
21,404.9	90.00	180.00	12,363.0	-9,792.6	161.8	9,793.9	0.00	0.00	PBHL @ 21404' MD

Targets

Target Name	Dip Angle (°)	Dip Dir. (°)	TVD (ft)	+N/-S (ft)	+E/-W (ft)	Northing (ft)	Easting (ft)	Latitude	Longitude
- hit/miss target									
- Shape									
Bulldog #17-31H-891 PE	0.00	0.00	12,363.0	-9,792.6	161.8	1,480,073.25	2,409,763.10	40.631759	-107.626755
- plan hits target center									
- Point									

Formations

Measured Depth (ft)	Vertical Depth (ft)	Name	Lithology	Dip (°)	Dip Direction (°)
4,337.5	4,330.0	Lewis			
6,164.7	6,151.0	Mesaverde			
9,325.1	9,301.0	Mancos			
9,665.1	9,641.0	Morapos			
10,000.1	9,976.0	Mancos Marker			
12,270.4	12,213.0	Niobrara			
12,439.1	12,313.0	Top Target			

Cathedral Energy Services

Planning Report

Database:	USA EDM 5000 Multi Users DB	Local Co-ordinate Reference:	Well Bulldog #17-31H-891
Company:	Axia Energy	TVD Reference:	WELL @ 7007.0ft (Original Well Elev)
Project:	Moffat County, CO	MD Reference:	WELL @ 7007.0ft (Original Well Elev)
Site:	SEC 17-T8N-R91W	North Reference:	True
Well:	Bulldog #17-31H-891	Survey Calculation Method:	Minimum Curvature
Wellbore:	Hz		
Design:	Plan #2		

Plan Annotations

Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment
		+N/-S (ft)	+E/-W (ft)	
9,325.1	9,301.0	-570.0	148.0	Tie On @ 9325' MD
11,909.6	11,885.5	-570.0	148.0	Curve KOP @ 11909' MD
12,659.6	12,363.0	-1,047.3	160.5	LP @ 12659' MD
12,709.5	12,363.0	-1,097.1	161.2	EOT; 180°
21,404.9	12,363.0	-9,792.6	161.8	PBHL @ 21404' MD