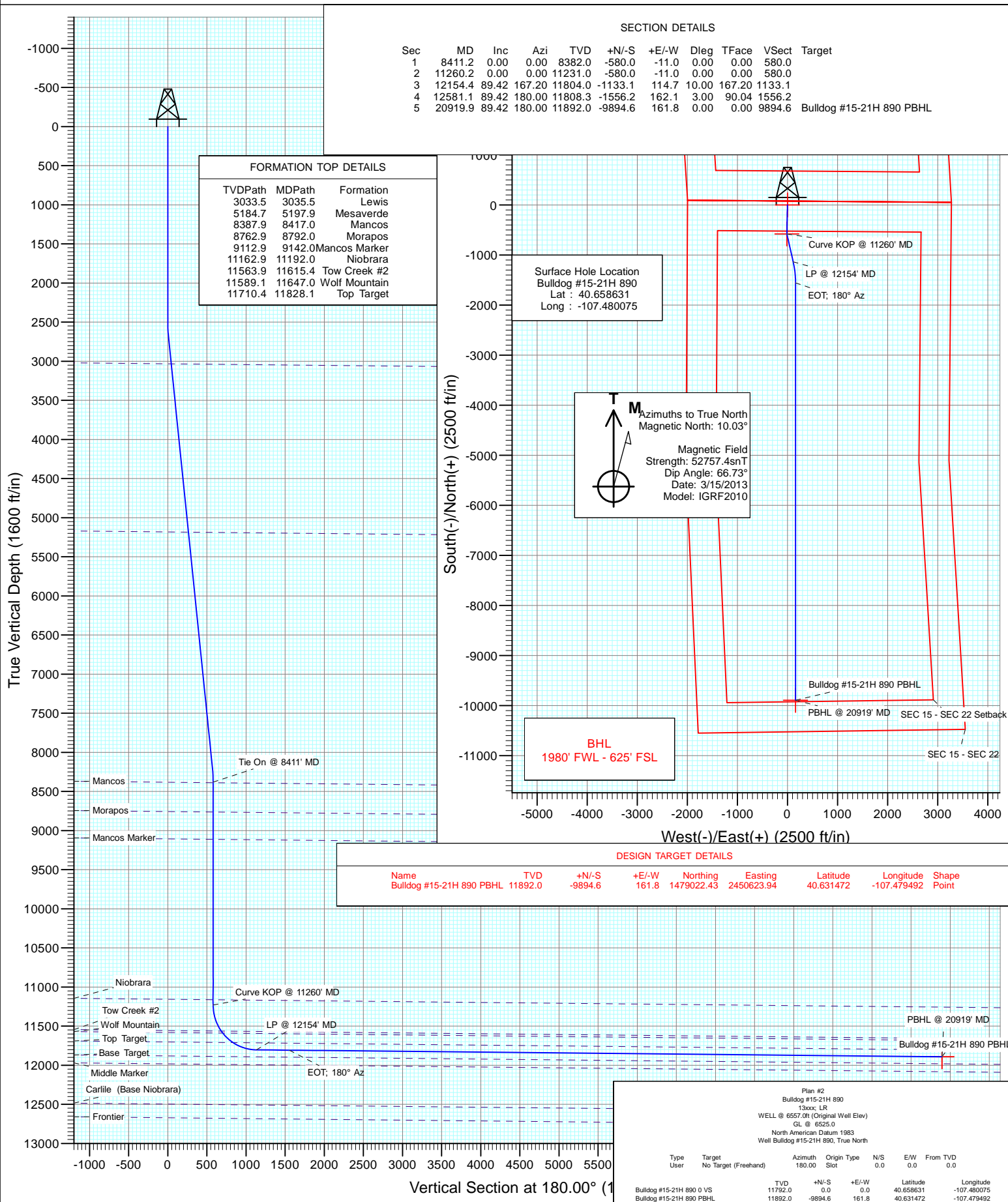




Project: Moffat County, CO
Site: SEC 15-T8N-R90W
Well: Bulldog #15-21H 890
Wellbore: Hz
Design: Plan #2



Database:	USA EDM 5000 Multi Users DB	Local Co-ordinate Reference:	Well Bulldog #15-21H 890
Company:	Axia Energy	TVD Reference:	WELL @ 6557.0ft (Original Well Elev)
Project:	Moffat County, CO	MD Reference:	WELL @ 6557.0ft (Original Well Elev)
Site:	SEC 15-T8N-R90W	North Reference:	True
Well:	Bulldog #15-21H 890	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 15-T8N-R90W			
Site Position:		Northing:	1,488,924.54 ft	Latitude:	40.658650
From:	Lat/Long	Easting:	2,450,707.10 ft	Longitude:	-107.479989
Position Uncertainty:	0.0 ft	Slot Radius:	13.200 in	Grid Convergence:	-1.28 °

Well	Bulldog #15-21H 890					
Well Position	+N/-S	0.0 ft	Northing:	1,488,918.14 ft	Latitude:	40.658631
	+E/-W	0.0 ft	Easting:	2,450,683.09 ft	Longitude:	-107.480075
Position Uncertainty		0.0 ft	Wellhead Elevation:	ft	Ground Level:	6,525.0 ft

Wellbore	Hz				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	3/15/2013	10.03	66.73	52,757

Design	Plan #2			
Audit Notes:				
Version:	Phase:	PLAN	Tie On Depth:	8,411.2
Vertical Section:	Depth From (TVD) (ft)	+N/-S (ft)	+E/-W (ft)	Direction (°)
	0.0	0.0	0.0	180.00

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
8,411.2	0.00	0.00	8,382.0	-580.0	-11.0	0.00	0.00	0.00	0.00	
11,260.2	0.00	0.00	11,231.0	-580.0	-11.0	0.00	0.00	0.00	0.00	
12,154.4	89.42	167.20	11,804.0	-1,133.1	114.7	10.00	10.00	0.00	167.20	
12,581.1	89.42	180.00	11,808.3	-1,556.2	162.1	3.00	0.00	3.00	90.04	
20,919.9	89.42	180.00	11,892.0	-9,894.6	161.8	0.00	0.00	0.00	0.00	Bulldog #15-21H 890

Database: USA EDM 5000 Multi Users DB
Company: Axia Energy
Project: Moffat County, CO
Site: SEC 15-T8N-R90W
Well: Bulldog #15-21H 890
Wellbore: Hz
Design: Plan #2

Local Co-ordinate Reference:
TVD Reference:
MD Reference:
North Reference:
Survey Calculation Method:

Well Bulldog #15-21H 890
 WELL @ 6557.0ft (Original Well Elev)
 WELL @ 6557.0ft (Original Well Elev)
 True
 Minimum Curvature

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
8,411.2	0.00	0.00	8,382.0	-580.0	-11.0	580.0	0.00	0.00	Tie On @ 8411' MD
8,417.0	0.00	0.00	8,387.9	-580.0	-11.0	580.0	0.00	0.00	Mancos
8,500.0	0.00	0.00	8,470.8	-580.0	-11.0	580.0	0.00	0.00	
8,600.0	0.00	0.00	8,570.8	-580.0	-11.0	580.0	0.00	0.00	
8,700.0	0.00	0.00	8,670.8	-580.0	-11.0	580.0	0.00	0.00	
8,792.0	0.00	0.00	8,762.9	-580.0	-11.0	580.0	0.00	0.00	Morapos
8,800.0	0.00	0.00	8,770.8	-580.0	-11.0	580.0	0.00	0.00	
8,900.0	0.00	0.00	8,870.8	-580.0	-11.0	580.0	0.00	0.00	
9,000.0	0.00	0.00	8,970.8	-580.0	-11.0	580.0	0.00	0.00	
9,100.0	0.00	0.00	9,070.8	-580.0	-11.0	580.0	0.00	0.00	
9,142.0	0.00	0.00	9,112.9	-580.0	-11.0	580.0	0.00	0.00	Mancos Marker
9,200.0	0.00	0.00	9,170.8	-580.0	-11.0	580.0	0.00	0.00	
9,300.0	0.00	0.00	9,270.8	-580.0	-11.0	580.0	0.00	0.00	
9,400.0	0.00	0.00	9,370.8	-580.0	-11.0	580.0	0.00	0.00	
9,500.0	0.00	0.00	9,470.8	-580.0	-11.0	580.0	0.00	0.00	
9,600.0	0.00	0.00	9,570.8	-580.0	-11.0	580.0	0.00	0.00	
9,700.0	0.00	0.00	9,670.8	-580.0	-11.0	580.0	0.00	0.00	
9,800.0	0.00	0.00	9,770.8	-580.0	-11.0	580.0	0.00	0.00	
9,900.0	0.00	0.00	9,870.8	-580.0	-11.0	580.0	0.00	0.00	
10,000.0	0.00	0.00	9,970.8	-580.0	-11.0	580.0	0.00	0.00	
10,100.0	0.00	0.00	10,070.8	-580.0	-11.0	580.0	0.00	0.00	
10,200.0	0.00	0.00	10,170.8	-580.0	-11.0	580.0	0.00	0.00	
10,300.0	0.00	0.00	10,270.8	-580.0	-11.0	580.0	0.00	0.00	
10,400.0	0.00	0.00	10,370.8	-580.0	-11.0	580.0	0.00	0.00	
10,500.0	0.00	0.00	10,470.8	-580.0	-11.0	580.0	0.00	0.00	
10,600.0	0.00	0.00	10,570.8	-580.0	-11.0	580.0	0.00	0.00	
10,700.0	0.00	0.00	10,670.8	-580.0	-11.0	580.0	0.00	0.00	
10,800.0	0.00	0.00	10,770.8	-580.0	-11.0	580.0	0.00	0.00	
10,900.0	0.00	0.00	10,870.8	-580.0	-11.0	580.0	0.00	0.00	
11,000.0	0.00	0.00	10,970.8	-580.0	-11.0	580.0	0.00	0.00	
11,100.0	0.00	0.00	11,070.8	-580.0	-11.0	580.0	0.00	0.00	
11,192.0	0.00	0.00	11,162.9	-580.0	-11.0	580.0	0.00	0.00	Niobrara
11,200.0	0.00	0.00	11,170.8	-580.0	-11.0	580.0	0.00	0.00	
11,260.2	0.00	0.00	11,231.0	-580.0	-11.0	580.0	0.00	0.00	Curve KOP @ 11260' MD
11,300.0	3.98	167.20	11,270.8	-581.3	-10.7	581.3	10.00	10.00	
11,400.0	13.98	167.20	11,369.4	-596.5	-7.2	596.5	10.00	10.00	
11,500.0	23.98	167.20	11,463.9	-628.2	0.0	628.2	10.00	10.00	
11,600.0	33.98	167.20	11,551.3	-675.4	10.7	675.4	10.00	10.00	
11,615.4	35.52	167.20	11,563.9	-684.0	12.6	684.0	10.00	10.00	Tow Creek #2
11,647.0	38.68	167.20	11,589.1	-702.6	16.8	702.6	10.00	10.00	Wolf Mountain
11,700.0	43.98	167.20	11,628.9	-736.7	24.6	736.7	10.00	10.00	
11,800.0	53.98	167.20	11,694.4	-810.2	41.3	810.2	10.00	10.00	
11,828.1	56.79	167.20	11,710.4	-832.7	46.4	832.7	10.00	10.00	Top Target
11,900.0	63.98	167.20	11,745.9	-893.6	60.3	893.6	10.00	10.00	
12,000.0	73.98	167.20	11,781.7	-984.5	80.9	984.5	10.00	10.00	
12,100.0	83.98	167.20	11,800.8	-1,080.1	102.6	1,080.1	10.00	10.00	
12,154.4	89.42	167.20	11,804.0	-1,133.1	114.7	1,133.1	10.00	10.00	LP @ 12154' MD
12,200.0	89.42	168.57	11,804.4	-1,177.6	124.2	1,177.6	3.00	0.00	
12,300.0	89.42	171.57	11,805.4	-1,276.1	141.5	1,276.1	3.00	0.00	
12,400.0	89.42	174.57	11,806.4	-1,375.4	153.5	1,375.4	3.00	0.00	
12,500.0	89.42	177.57	11,807.5	-1,475.1	160.4	1,475.1	3.00	0.00	
12,581.1	89.42	180.00	11,808.3	-1,556.2	162.1	1,556.2	3.00	0.00	EOT; 180° Az

Database: USA EDM 5000 Multi Users DB
Company: Axia Energy
Project: Moffat County, CO
Site: SEC 15-T8N-R90W
Well: Bulldog #15-21H 890
Wellbore: Hz
Design: Plan #2

Local Co-ordinate Reference: Well Bulldog #15-21H 890
TVD Reference: WELL @ 6557.0ft (Original Well Elev)
MD Reference: WELL @ 6557.0ft (Original Well Elev)
North Reference: True
Survey Calculation Method: Minimum Curvature

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
12,600.0	89.42	180.00	11,808.5	-1,575.1	162.1	1,575.1	0.00	0.00	
12,700.0	89.42	180.00	11,809.5	-1,675.1	162.1	1,675.1	0.00	0.00	
12,800.0	89.42	180.00	11,810.5	-1,775.1	162.1	1,775.1	0.00	0.00	
12,900.0	89.42	180.00	11,811.5	-1,875.1	162.1	1,875.1	0.00	0.00	
13,000.0	89.42	180.00	11,812.5	-1,975.1	162.1	1,975.1	0.00	0.00	
13,100.0	89.42	180.00	11,813.5	-2,075.1	162.1	2,075.1	0.00	0.00	
13,200.0	89.42	180.00	11,814.5	-2,175.1	162.1	2,175.1	0.00	0.00	
13,300.0	89.42	180.00	11,815.5	-2,275.1	162.1	2,275.1	0.00	0.00	
13,400.0	89.42	180.00	11,816.5	-2,375.1	162.1	2,375.1	0.00	0.00	
13,500.0	89.42	180.00	11,817.5	-2,475.1	162.1	2,475.1	0.00	0.00	
13,600.0	89.42	180.00	11,818.5	-2,575.1	162.1	2,575.1	0.00	0.00	
13,700.0	89.42	180.00	11,819.5	-2,675.0	162.1	2,675.0	0.00	0.00	
13,800.0	89.42	180.00	11,820.5	-2,775.0	162.1	2,775.0	0.00	0.00	
13,900.0	89.42	180.00	11,821.5	-2,875.0	162.1	2,875.0	0.00	0.00	
14,000.0	89.42	180.00	11,822.5	-2,975.0	162.1	2,975.0	0.00	0.00	
14,100.0	89.42	180.00	11,823.5	-3,075.0	162.1	3,075.0	0.00	0.00	
14,200.0	89.42	180.00	11,824.5	-3,175.0	162.1	3,175.0	0.00	0.00	
14,300.0	89.42	180.00	11,825.5	-3,275.0	162.0	3,275.0	0.00	0.00	
14,400.0	89.42	180.00	11,826.5	-3,375.0	162.0	3,375.0	0.00	0.00	
14,500.0	89.42	180.00	11,827.5	-3,475.0	162.0	3,475.0	0.00	0.00	
14,600.0	89.42	180.00	11,828.5	-3,575.0	162.0	3,575.0	0.00	0.00	
14,700.0	89.42	180.00	11,829.6	-3,675.0	162.0	3,675.0	0.00	0.00	
14,800.0	89.42	180.00	11,830.6	-3,775.0	162.0	3,775.0	0.00	0.00	
14,900.0	89.42	180.00	11,831.6	-3,875.0	162.0	3,875.0	0.00	0.00	
15,000.0	89.42	180.00	11,832.6	-3,975.0	162.0	3,975.0	0.00	0.00	
15,100.0	89.42	180.00	11,833.6	-4,075.0	162.0	4,075.0	0.00	0.00	
15,200.0	89.42	180.00	11,834.6	-4,175.0	162.0	4,175.0	0.00	0.00	
15,300.0	89.42	180.00	11,835.6	-4,275.0	162.0	4,275.0	0.00	0.00	
15,400.0	89.42	180.00	11,836.6	-4,375.0	162.0	4,375.0	0.00	0.00	
15,500.0	89.42	180.00	11,837.6	-4,475.0	162.0	4,475.0	0.00	0.00	
15,600.0	89.42	180.00	11,838.6	-4,574.9	162.0	4,574.9	0.00	0.00	
15,700.0	89.42	180.00	11,839.6	-4,674.9	162.0	4,674.9	0.00	0.00	
15,800.0	89.42	180.00	11,840.6	-4,774.9	162.0	4,774.9	0.00	0.00	
15,900.0	89.42	180.00	11,841.6	-4,874.9	162.0	4,874.9	0.00	0.00	
16,000.0	89.42	180.00	11,842.6	-4,974.9	162.0	4,974.9	0.00	0.00	
16,100.0	89.42	180.00	11,843.6	-5,074.9	162.0	5,074.9	0.00	0.00	
16,200.0	89.42	180.00	11,844.6	-5,174.9	162.0	5,174.9	0.00	0.00	
16,300.0	89.42	180.00	11,845.6	-5,274.9	162.0	5,274.9	0.00	0.00	
16,400.0	89.42	180.00	11,846.6	-5,374.9	162.0	5,374.9	0.00	0.00	
16,500.0	89.42	180.00	11,847.6	-5,474.9	162.0	5,474.9	0.00	0.00	
16,600.0	89.42	180.00	11,848.6	-5,574.9	162.0	5,574.9	0.00	0.00	
16,700.0	89.42	180.00	11,849.6	-5,674.9	162.0	5,674.9	0.00	0.00	
16,800.0	89.42	180.00	11,850.6	-5,774.9	162.0	5,774.9	0.00	0.00	
16,900.0	89.42	180.00	11,851.6	-5,874.9	162.0	5,874.9	0.00	0.00	
17,000.0	89.42	180.00	11,852.6	-5,974.9	162.0	5,974.9	0.00	0.00	
17,100.0	89.42	180.00	11,853.6	-6,074.9	162.0	6,074.9	0.00	0.00	
17,200.0	89.42	180.00	11,854.7	-6,174.9	161.9	6,174.9	0.00	0.00	
17,300.0	89.42	180.00	11,855.7	-6,274.9	161.9	6,274.9	0.00	0.00	
17,400.0	89.42	180.00	11,856.7	-6,374.9	161.9	6,374.9	0.00	0.00	
17,500.0	89.42	180.00	11,857.7	-6,474.9	161.9	6,474.9	0.00	0.00	
17,600.0	89.42	180.00	11,858.7	-6,574.8	161.9	6,574.8	0.00	0.00	
17,700.0	89.42	180.00	11,859.7	-6,674.8	161.9	6,674.8	0.00	0.00	

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MD Reference: WELL @ 6557.0ft (Original Well Elev)
North Reference: True
Survey Calculation Method: Minimum Curvature

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
17,800.0	89.42	180.00	11,860.7	-6,774.8	161.9	6,774.8	0.00	0.00	
17,900.0	89.42	180.00	11,861.7	-6,874.8	161.9	6,874.8	0.00	0.00	
18,000.0	89.42	180.00	11,862.7	-6,974.8	161.9	6,974.8	0.00	0.00	
18,100.0	89.42	180.00	11,863.7	-7,074.8	161.9	7,074.8	0.00	0.00	
18,200.0	89.42	180.00	11,864.7	-7,174.8	161.9	7,174.8	0.00	0.00	
18,300.0	89.42	180.00	11,865.7	-7,274.8	161.9	7,274.8	0.00	0.00	
18,400.0	89.42	180.00	11,866.7	-7,374.8	161.9	7,374.8	0.00	0.00	
18,500.0	89.42	180.00	11,867.7	-7,474.8	161.9	7,474.8	0.00	0.00	
18,600.0	89.42	180.00	11,868.7	-7,574.8	161.9	7,574.8	0.00	0.00	
18,700.0	89.42	180.00	11,869.7	-7,674.8	161.9	7,674.8	0.00	0.00	
18,800.0	89.42	180.00	11,870.7	-7,774.8	161.9	7,774.8	0.00	0.00	
18,900.0	89.42	180.00	11,871.7	-7,874.8	161.9	7,874.8	0.00	0.00	
19,000.0	89.42	180.00	11,872.7	-7,974.8	161.9	7,974.8	0.00	0.00	
19,100.0	89.42	180.00	11,873.7	-8,074.8	161.9	8,074.8	0.00	0.00	
19,200.0	89.42	180.00	11,874.7	-8,174.8	161.9	8,174.8	0.00	0.00	
19,300.0	89.42	180.00	11,875.7	-8,274.8	161.9	8,274.8	0.00	0.00	
19,400.0	89.42	180.00	11,876.7	-8,374.8	161.9	8,374.8	0.00	0.00	
19,500.0	89.42	180.00	11,877.7	-8,474.8	161.9	8,474.8	0.00	0.00	
19,600.0	89.42	180.00	11,878.7	-8,574.7	161.9	8,574.7	0.00	0.00	
19,700.0	89.42	180.00	11,879.8	-8,674.7	161.9	8,674.7	0.00	0.00	
19,800.0	89.42	180.00	11,880.8	-8,774.7	161.9	8,774.7	0.00	0.00	
19,900.0	89.42	180.00	11,881.8	-8,874.7	161.9	8,874.7	0.00	0.00	
20,000.0	89.42	180.00	11,882.8	-8,974.7	161.8	8,974.7	0.00	0.00	
20,100.0	89.42	180.00	11,883.8	-9,074.7	161.8	9,074.7	0.00	0.00	
20,200.0	89.42	180.00	11,884.8	-9,174.7	161.8	9,174.7	0.00	0.00	
20,300.0	89.42	180.00	11,885.8	-9,274.7	161.8	9,274.7	0.00	0.00	
20,400.0	89.42	180.00	11,886.8	-9,374.7	161.8	9,374.7	0.00	0.00	
20,500.0	89.42	180.00	11,887.8	-9,474.7	161.8	9,474.7	0.00	0.00	
20,600.0	89.42	180.00	11,888.8	-9,574.7	161.8	9,574.7	0.00	0.00	
20,700.0	89.42	180.00	11,889.8	-9,674.7	161.8	9,674.7	0.00	0.00	
20,800.0	89.42	180.00	11,890.8	-9,774.7	161.8	9,774.7	0.00	0.00	
20,900.0	89.42	180.00	11,891.8	-9,874.7	161.8	9,874.7	0.00	0.00	
20,919.9	89.42	180.00	11,892.0	-9,894.6	161.8	9,894.6	0.00	0.00	PBHL @ 20919' MD

Targets

Target Name

- hit/miss target - Shape	Dip Angle (°)	Dip Dir. (°)	TVD (ft)	+N/-S (ft)	+E/-W (ft)	Northing (ft)	Easting (ft)	Latitude	Longitude
Bulldog #15-21H 890 PE - plan hits target center - Point	0.00	0.00	11,892.0	-9,894.6	161.8	1,479,022.43	2,450,623.94	40.631472	-107.479492
Bulldog #15-21H 890 0 \ - plan misses target center by 708.7ft at 11500.0ft MD (11463.9 TVD, -628.2 N, 0.0 E) - Point	0.00	0.00	11,792.0	0.0	0.0	1,488,918.14	2,450,683.09	40.658631	-107.480075

Database: USA EDM 5000 Multi Users DB
Company: Axia Energy
Project: Moffat County, CO
Site: SEC 15-T8N-R90W
Well: Bulldog #15-21H 890
Wellbore: Hz
Design: Plan #2

Local Co-ordinate Reference: Well Bulldog #15-21H 890
TVD Reference: WELL @ 6557.0ft (Original Well Elev)
MD Reference: WELL @ 6557.0ft (Original Well Elev)
North Reference: True
Survey Calculation Method: Minimum Curvature

Formations

Measured Depth (ft)	Vertical Depth (ft)	Name	Lithology	Dip (°)	Dip Direction (°)
3,035.5	3,033.0	Lewis		0.58	180.00
5,197.9	5,182.0	Mesaverde		0.58	180.00
8,417.0	8,382.0	Mancos		0.58	180.00
8,792.0	8,757.0	Morapos		0.58	180.00
9,142.0	9,107.0	Mancos Marker		0.58	180.00
11,192.0	11,157.0	Niobrara		0.58	180.00
11,615.4	11,557.0	Tow Creek #2		0.58	180.00
11,647.0	11,582.0	Wolf Mountain		0.58	180.00
11,828.1	11,702.0	Top Target		0.58	180.00

Plan Annotations

Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment
		+N/-S (ft)	+E/-W (ft)	
8,411.2	8,382.0	-580.0	-11.0	Tie On @ 8411' MD
11,260.2	11,231.0	-580.0	-11.0	Curve KOP @ 11260' MD
12,154.4	11,804.0	-1,133.1	114.7	LP @ 12154' MD
12,581.1	11,808.3	-1,556.2	162.1	EOT; 180° Az
20,919.9	11,892.0	-9,894.6	161.8	PBHL @ 20919' MD