

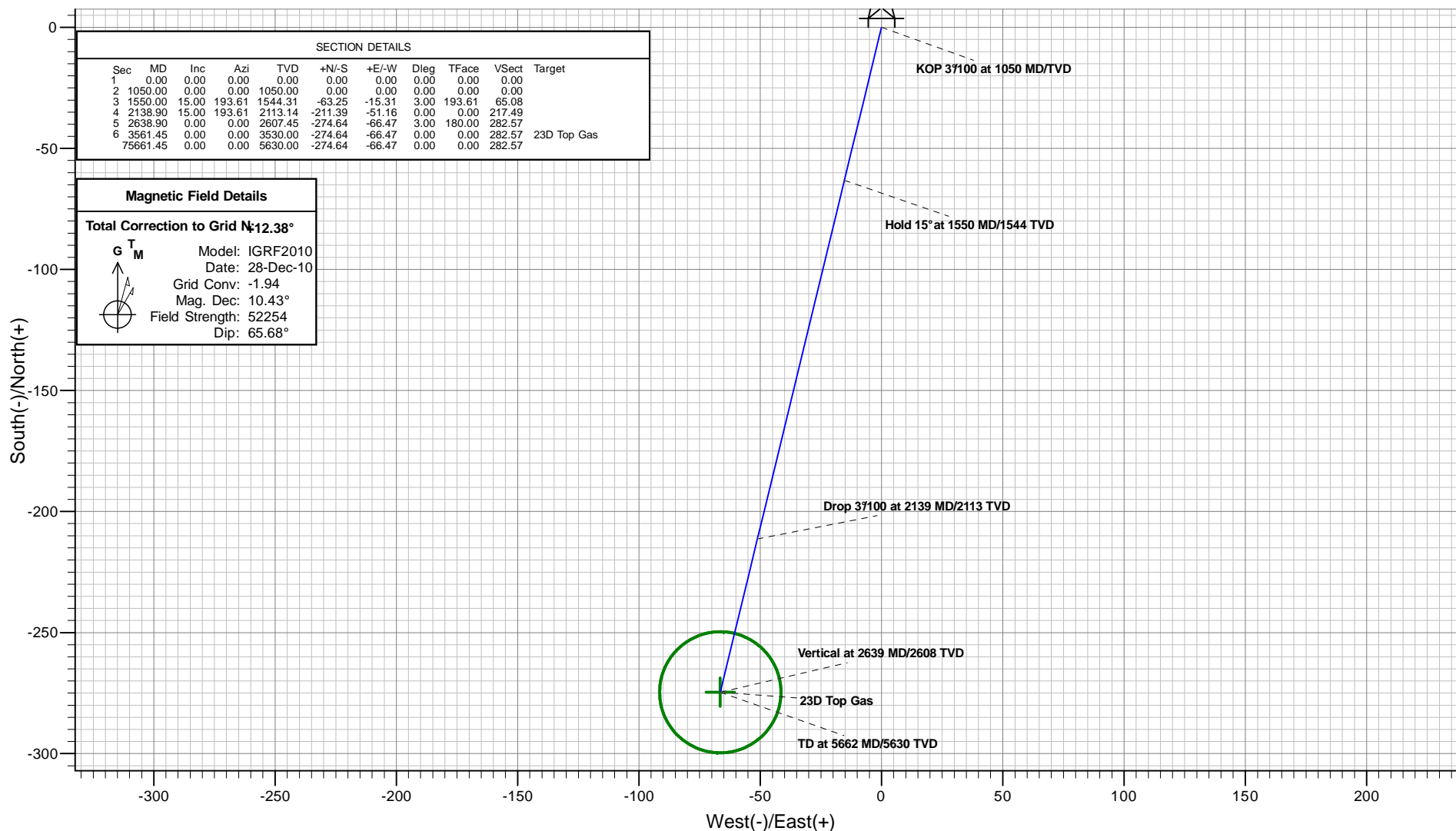


PLAN VIEW

Antero Resources

BAT 23D-24-07-96 (111257)

Project: Speakman
Site: Speakman A Pad
Well: BAT 23D-24-07-96 (111257)
Wellbore: BAT 23D
Design: BAT 23D P01



Plan: BAT 23D P01
Created By: ARK Directional Services
Date: 10:45, October 19 2010

PROJECT DETAILS: Speakman

Geodetic System: Universal Transverse Mercator
Datum: North American Datum 1983
Ellipsoid: GRS 1980
Zone: Zone 13N (108 W to 102 W)
System Datum: Mean Sea Level

REFERENCE INFORMATION

Co-ordinate (N/E) Reference: Well BAT 23D-24-07-96 (111257) - Slot BAT 23D, Grid North
Vertical (TVD) Reference: KB @ 5202.00ft (Original Well Elev)
Section (VS) Reference: Slot - BAT 23D(0.00N, 0.00E)
Measured Depth Reference: KB @ 5202.00ft (Original Well Elev)
Calculation Method: Minimum Curvature

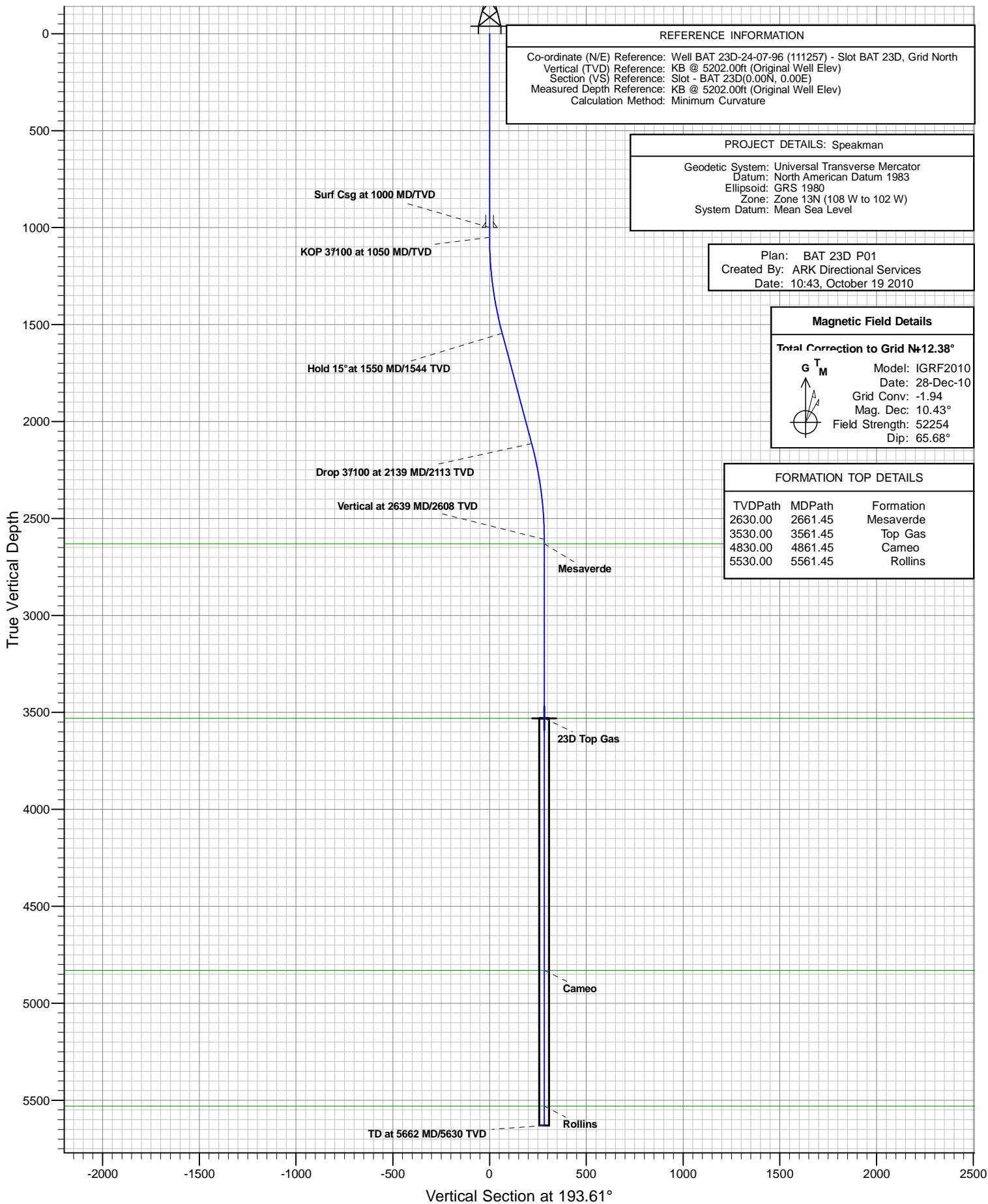


Antero Resources

BAT 23D-24-07-96 (111257)



VERTICAL SECTION VIEW



Antero Resources

Speakman

Speakman A Pad

BAT 23D-24-07-96 (111257) - Slot BAT 23D

BAT 23D

Plan: BAT 23D P01

Standard Planning Report - Geographic

19 October, 2010

ARK Directional Services

Planning Report - Geographic

Database:	EDM SERVER DB	Local Co-ordinate Reference:	Well BAT 23D-24-07-96 (111257) - Slot BAT 23D
Company:	Antero Resources	TVD Reference:	KB @ 5202.00ft (Original Well Elev)
Project:	Speakman	MD Reference:	KB @ 5202.00ft (Original Well Elev)
Site:	Speakman A Pad	North Reference:	Grid
Well:	BAT 23D-24-07-96 (111257)	Survey Calculation Method:	Minimum Curvature
Wellbore:	BAT 23D		
Design:	BAT 23D P01		

Project	Speakman		
Map System:	Universal Transverse Mercator	System Datum:	Mean Sea Level
Geo Datum:	North American Datum 1983		
Map Zone:	Zone 13N (108 W to 102 W)		

Site	Speakman A Pad		
Site Position:		Northing:	14,330,542.672 usft
From:	Map	Easting:	776,091.308 usft
Position Uncertainty:	0.00 ft	Slot Radius:	13.20 in
		Latitude:	39.420918160°N
		Longitude:	108.060333667°W
		Grid Convergence:	-1.94 °

Well	BAT 23D-24-07-96 (111257) - Slot BAT 23D		
Well Position	+N/-S	0.00 ft	Northing:
	+E/-W	0.00 ft	Easting:
Position Uncertainty	0.00 ft		Wellhead Elevation:
			Latitude:
			Longitude:
			Ground Level:

Wellbore	BAT 23D				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	2010/12/28	10.43	65.68	52,254

Design	BAT 23D P01			
Audit Notes:				
Version:	Phase:	PROTOTYPE	Tie On Depth:	0.00
Vertical Section:	Depth From (TVD)	+N/-S	+E/-W	Direction
	(ft)	(ft)	(ft)	(°)
	3,530.00	0.00	0.00	193.61

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
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
1,050.00	0.00	0.00	1,050.00	0.00	0.00	0.00	0.00	0.00	0.00	
1,550.00	15.00	193.61	1,544.31	-63.25	-15.31	3.00	3.00	0.00	193.61	
2,138.90	15.00	193.61	2,113.14	-211.39	-51.16	0.00	0.00	0.00	0.00	
2,638.90	0.00	0.00	2,607.45	-274.64	-66.47	3.00	-3.00	0.00	180.00	
3,561.45	0.00	0.00	3,530.00	-274.64	-66.47	0.00	0.00	0.00	0.00	23D Top Gas
5,661.45	0.00	0.00	5,630.00	-274.64	-66.47	0.00	0.00	0.00	0.00	

ARK Directional Services

Planning Report - Geographic

Database:	EDM SERVER DB	Local Co-ordinate Reference:	Well BAT 23D-24-07-96 (111257) - Slot BAT 23D
Company:	Antero Resources	TVD Reference:	KB @ 5202.00ft (Original Well Elev)
Project:	Speakman	MD Reference:	KB @ 5202.00ft (Original Well Elev)
Site:	Speakman A Pad	North Reference:	Grid
Well:	BAT 23D-24-07-96 (111257)	Survey Calculation Method:	Minimum Curvature
Wellbore:	BAT 23D		
Design:	BAT 23D P01		

Planned Survey										
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude	
0.00	0.00	0.00	0.00	0.00	0.00	14,330,471.156	776,123.194	39.420724994°N	108.060212334°W	
100.00	0.00	0.00	100.00	0.00	0.00	14,330,471.156	776,123.194	39.420724994°N	108.060212334°W	
200.00	0.00	0.00	200.00	0.00	0.00	14,330,471.156	776,123.194	39.420724994°N	108.060212334°W	
300.00	0.00	0.00	300.00	0.00	0.00	14,330,471.156	776,123.194	39.420724994°N	108.060212334°W	
400.00	0.00	0.00	400.00	0.00	0.00	14,330,471.156	776,123.194	39.420724994°N	108.060212334°W	
500.00	0.00	0.00	500.00	0.00	0.00	14,330,471.156	776,123.194	39.420724994°N	108.060212334°W	
600.00	0.00	0.00	600.00	0.00	0.00	14,330,471.156	776,123.194	39.420724994°N	108.060212334°W	
700.00	0.00	0.00	700.00	0.00	0.00	14,330,471.156	776,123.194	39.420724994°N	108.060212334°W	
800.00	0.00	0.00	800.00	0.00	0.00	14,330,471.156	776,123.194	39.420724994°N	108.060212334°W	
900.00	0.00	0.00	900.00	0.00	0.00	14,330,471.156	776,123.194	39.420724994°N	108.060212334°W	
1,000.00	0.00	0.00	1,000.00	0.00	0.00	14,330,471.156	776,123.194	39.420724994°N	108.060212334°W	
Surf Csg at 1000 MD/TVD										
1,050.00	0.00	0.00	1,050.00	0.00	0.00	14,330,471.156	776,123.194	39.420724994°N	108.060212334°W	
KOP 3°/100 at 1050 MD/TVD										
1,100.00	1.50	193.61	1,099.99	-0.64	-0.15	14,330,470.520	776,123.040	39.420723235°N	108.060212802°W	
1,200.00	4.50	193.61	1,199.85	-5.72	-1.38	14,330,465.434	776,121.809	39.420709171°N	108.060216544°W	
1,300.00	7.50	193.61	1,299.29	-15.88	-3.84	14,330,455.276	776,119.351	39.420681083°N	108.060224018°W	
1,400.00	10.50	193.61	1,398.04	-31.08	-7.52	14,330,440.073	776,115.671	39.420639046°N	108.060235204°W	
1,500.00	13.50	193.61	1,495.85	-51.29	-12.41	14,330,419.868	776,110.781	39.420583177°N	108.060250070°W	
1,550.00	15.00	193.61	1,544.31	-63.25	-15.31	14,330,407.906	776,107.886	39.420550101°N	108.060258871°W	
Hold 15° at 1550 MD/1544 TVD										
1,600.00	15.00	193.61	1,592.60	-75.83	-18.35	14,330,395.328	776,104.842	39.420515322°N	108.060268125°W	
1,700.00	15.00	193.61	1,689.20	-100.98	-24.44	14,330,370.172	776,098.753	39.420445765°N	108.060286634°W	
1,800.00	15.00	193.61	1,785.79	-126.14	-30.53	14,330,345.017	776,092.665	39.420376208°N	108.060305142°W	
1,900.00	15.00	193.61	1,882.38	-151.30	-36.62	14,330,319.861	776,086.577	39.420306651°N	108.060323650°W	
2,000.00	15.00	193.61	1,978.97	-176.45	-42.71	14,330,294.706	776,080.488	39.420237094°N	108.060342158°W	
2,100.00	15.00	193.61	2,075.57	-201.61	-48.79	14,330,269.550	776,074.400	39.420167537°N	108.060360667°W	
2,138.90	15.00	193.61	2,113.14	-211.39	-51.16	14,330,259.766	776,072.032	39.420140482°N	108.060367866°W	
Drop 3°/100 at 2139 MD/2113 TVD										
2,200.00	13.17	193.61	2,172.40	-225.84	-54.66	14,330,245.315	776,068.534	39.420100524°N	108.060378498°W	
2,300.00	10.17	193.61	2,270.33	-245.49	-59.42	14,330,225.662	776,063.778	39.420046184°N	108.060392957°W	
2,400.00	7.17	193.61	2,369.17	-260.14	-62.96	14,330,211.018	776,060.234	39.420005691°N	108.060403732°W	
2,500.00	4.17	193.61	2,468.67	-269.74	-65.28	14,330,201.422	776,057.911	39.419979157°N	108.060410792°W	
2,600.00	1.17	193.61	2,568.55	-274.26	-66.38	14,330,196.900	776,056.817	39.419966653°N	108.060414119°W	
2,638.90	0.00	0.00	2,607.45	-274.64	-66.47	14,330,196.515	776,056.723	39.419965589°N	108.060414402°W	
Vertical at 2639 MD/2608 TVD										
2,661.45	0.00	0.00	2,630.00	-274.64	-66.47	14,330,196.515	776,056.723	39.419965589°N	108.060414402°W	
Mesaverde										
2,700.00	0.00	0.00	2,668.55	-274.64	-66.47	14,330,196.515	776,056.723	39.419965589°N	108.060414402°W	
2,800.00	0.00	0.00	2,768.55	-274.64	-66.47	14,330,196.515	776,056.723	39.419965589°N	108.060414402°W	
2,900.00	0.00	0.00	2,868.55	-274.64	-66.47	14,330,196.515	776,056.723	39.419965589°N	108.060414402°W	
3,000.00	0.00	0.00	2,968.55	-274.64	-66.47	14,330,196.515	776,056.723	39.419965589°N	108.060414402°W	
3,100.00	0.00	0.00	3,068.55	-274.64	-66.47	14,330,196.515	776,056.723	39.419965589°N	108.060414402°W	
3,200.00	0.00	0.00	3,168.55	-274.64	-66.47	14,330,196.515	776,056.723	39.419965589°N	108.060414402°W	
3,300.00	0.00	0.00	3,268.55	-274.64	-66.47	14,330,196.515	776,056.723	39.419965589°N	108.060414402°W	
3,400.00	0.00	0.00	3,368.55	-274.64	-66.47	14,330,196.515	776,056.723	39.419965589°N	108.060414402°W	
3,500.00	0.00	0.00	3,468.55	-274.64	-66.47	14,330,196.515	776,056.723	39.419965589°N	108.060414402°W	
3,561.45	0.00	0.00	3,530.00	-274.64	-66.47	14,330,196.515	776,056.723	39.419965589°N	108.060414402°W	
Top Gas										
3,600.00	0.00	0.00	3,568.55	-274.64	-66.47	14,330,196.515	776,056.723	39.419965589°N	108.060414402°W	
3,700.00	0.00	0.00	3,668.55	-274.64	-66.47	14,330,196.515	776,056.723	39.419965589°N	108.060414402°W	
3,800.00	0.00	0.00	3,768.55	-274.64	-66.47	14,330,196.515	776,056.723	39.419965589°N	108.060414402°W	
3,900.00	0.00	0.00	3,868.55	-274.64	-66.47	14,330,196.515	776,056.723	39.419965589°N	108.060414402°W	

ARK Directional Services

Planning Report - Geographic

Database:	EDM SERVER DB	Local Co-ordinate Reference:	Well BAT 23D-24-07-96 (111257) - Slot BAT 23D
Company:	Antero Resources	TVD Reference:	KB @ 5202.00ft (Original Well Elev)
Project:	Speakman	MD Reference:	KB @ 5202.00ft (Original Well Elev)
Site:	Speakman A Pad	North Reference:	Grid
Well:	BAT 23D-24-07-96 (111257)	Survey Calculation Method:	Minimum Curvature
Wellbore:	BAT 23D		
Design:	BAT 23D P01		

Planned Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
4,000.00	0.00	0.00	3,968.55	-274.64	-66.47	14,330,196.515	776,056.723	39.419965589°N	108.060414402°W
4,100.00	0.00	0.00	4,068.55	-274.64	-66.47	14,330,196.515	776,056.723	39.419965589°N	108.060414402°W
4,200.00	0.00	0.00	4,168.55	-274.64	-66.47	14,330,196.515	776,056.723	39.419965589°N	108.060414402°W
4,300.00	0.00	0.00	4,268.55	-274.64	-66.47	14,330,196.515	776,056.723	39.419965589°N	108.060414402°W
4,400.00	0.00	0.00	4,368.55	-274.64	-66.47	14,330,196.515	776,056.723	39.419965589°N	108.060414402°W
4,500.00	0.00	0.00	4,468.55	-274.64	-66.47	14,330,196.515	776,056.723	39.419965589°N	108.060414402°W
4,600.00	0.00	0.00	4,568.55	-274.64	-66.47	14,330,196.515	776,056.723	39.419965589°N	108.060414402°W
4,700.00	0.00	0.00	4,668.55	-274.64	-66.47	14,330,196.515	776,056.723	39.419965589°N	108.060414402°W
4,800.00	0.00	0.00	4,768.55	-274.64	-66.47	14,330,196.515	776,056.723	39.419965589°N	108.060414402°W
4,861.45	0.00	0.00	4,830.00	-274.64	-66.47	14,330,196.515	776,056.723	39.419965589°N	108.060414402°W
Cameo									
4,900.00	0.00	0.00	4,868.55	-274.64	-66.47	14,330,196.515	776,056.723	39.419965589°N	108.060414402°W
5,000.00	0.00	0.00	4,968.55	-274.64	-66.47	14,330,196.515	776,056.723	39.419965589°N	108.060414402°W
5,100.00	0.00	0.00	5,068.55	-274.64	-66.47	14,330,196.515	776,056.723	39.419965589°N	108.060414402°W
5,200.00	0.00	0.00	5,168.55	-274.64	-66.47	14,330,196.515	776,056.723	39.419965589°N	108.060414402°W
5,300.00	0.00	0.00	5,268.55	-274.64	-66.47	14,330,196.515	776,056.723	39.419965589°N	108.060414402°W
5,400.00	0.00	0.00	5,368.55	-274.64	-66.47	14,330,196.515	776,056.723	39.419965589°N	108.060414402°W
5,500.00	0.00	0.00	5,468.55	-274.64	-66.47	14,330,196.515	776,056.723	39.419965589°N	108.060414402°W
5,561.45	0.00	0.00	5,530.00	-274.64	-66.47	14,330,196.515	776,056.723	39.419965589°N	108.060414402°W
Rollins									
5,600.00	0.00	0.00	5,568.55	-274.64	-66.47	14,330,196.515	776,056.723	39.419965589°N	108.060414402°W
5,661.45	0.00	0.00	5,630.00	-274.64	-66.47	14,330,196.515	776,056.723	39.419965589°N	108.060414402°W
TD at 5662 MD/5630 TVD									

Design Targets

Target Name - hit/miss target - Shape	Dip Angle (°)	Dip Dir. (°)	TVD (ft)	+N/-S (ft)	+E/-W (ft)	Northing (usft)	Easting (usft)	Latitude	Longitude
23D Top Gas - plan hits target center - Circle (radius 25.00)	0.00	0.00	3,530.00	-274.64	-66.47	14,330,196.515	776,056.723	39.419965589°N	108.060414402°W

Casing Points

Measured Depth (ft)	Vertical Depth (ft)	Name	Casing Diameter (in)	Hole Diameter (in)
1,000.00	1,000.00	Surf Csg at 1000 MD/TVD	5.50	6.00

Formations

Measured Depth (ft)	Vertical Depth (ft)	Name	Lithology	Dip (°)	Dip Direction (°)
2,661.45	2,630.00	Mesaverde			
3,561.45	3,530.00	Top Gas			
4,861.45	4,830.00	Cameo			
5,561.45	5,530.00	Rollins			

ARK Directional Services

Planning Report - Geographic

Database:	EDM SERVER DB	Local Co-ordinate Reference:	Well BAT 23D-24-07-96 (111257) - Slot BAT 23D
Company:	Antero Resources	TVD Reference:	KB @ 5202.00ft (Original Well Elev)
Project:	Speakman	MD Reference:	KB @ 5202.00ft (Original Well Elev)
Site:	Speakman A Pad	North Reference:	Grid
Well:	BAT 23D-24-07-96 (111257)	Survey Calculation Method:	Minimum Curvature
Wellbore:	BAT 23D		
Design:	BAT 23D P01		

Plan Annotations					
Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates			
		+N/-S (ft)	+E/-W (ft)	Comment	
1,050.00	1,050.00	0.00	0.00	KOP 3°/100 at 1050 MD/TVD	
1,550.00	1,544.31	-63.25	-15.31	Hold 15° at 1550 MD/1544 TVD	
2,138.90	2,113.14	-211.39	-51.16	Drop 3°/100 at 2139 MD/2113 TVD	
2,638.90	2,607.45	-274.64	-66.47	Vertical at 2639 MD/2608 TVD	
5,661.45	5,630.00	-274.64	-66.47	TD at 5662 MD/5630 TVD	