



Antero Resources

Speakman

Speakman A Pad

BAT 33B-24-07-96 (JOB# 112047) - Slot BAT 33B

33B

UWI:

Plan: PROPOSAL#4

Standard Planning Report - Geographic

28 March, 2013

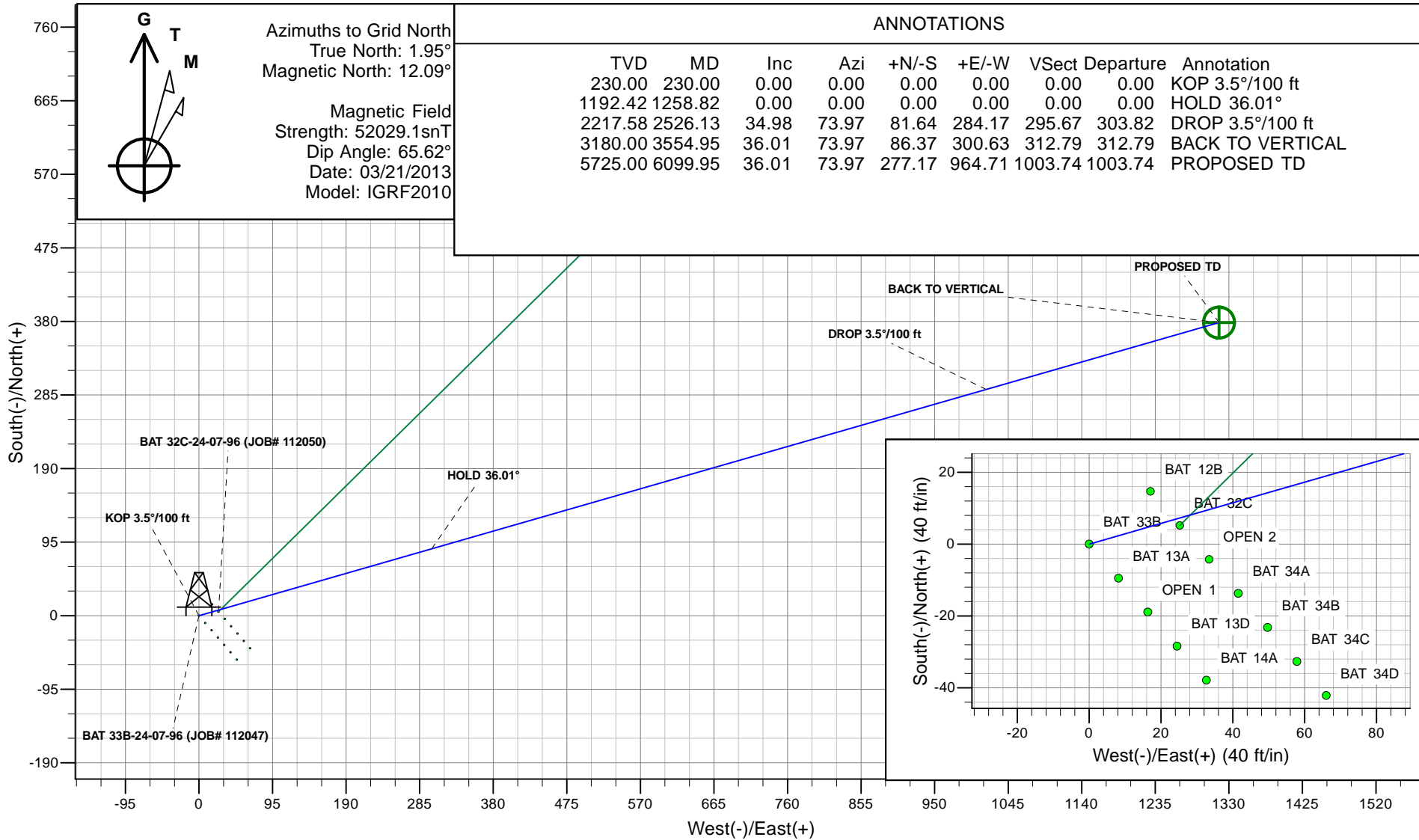




PLAN SECTION VIEW

Antero Resources
BAT 33B-24-07-96 (JOB# 112047)

Project: Speakman
Site: Speakman A Pad
Well: BAT 33B-24-07-96 (JOB# 112047)
Wellbore: 33B
Design: PROPOSAL#4



Plan: PROPOSAL#4
Created By: ARK Directional Services
Date: 13:01, March 28 2013

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

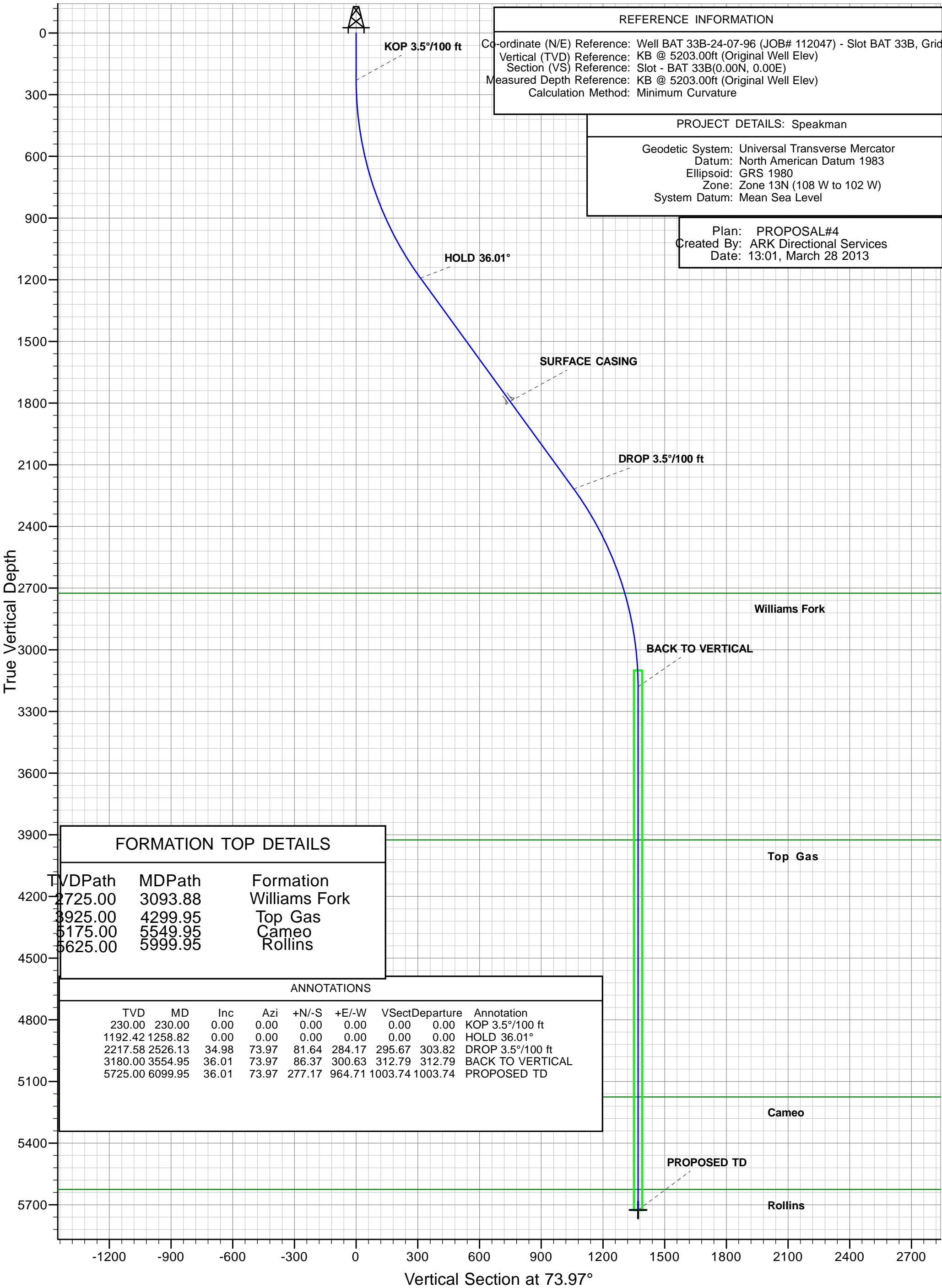
REFERENCE INFORMATION

Co-ordinate (N/E) Reference: Well BAT 33B-24-07-96 (JOB# 112047) - Slot BAT 33B, Grid North
Vertical (TVD) Reference: KB @ 5203.00ft (Original Well Elev)
Section (VS) Reference: Slot - BAT 33B(0.00N, 0.00E)
Measured Depth Reference: KB @ 5203.00ft (Original Well Elev)
Calculation Method: Minimum Curvature



VERTICAL

SECTION VIEW





ARK Directional Services

Planning Report - Geographic



Database:	EDM5000	Local Co-ordinate Reference:	Well BAT 33B-24-07-96 (JOB# 112047) - Slot BAT 33B
Company:	Antero Resources	TVD Reference:	KB @ 5203.00ft (Original Well Elev)
Project:	Speakman	MD Reference:	KB @ 5203.00ft (Original Well Elev)
Site:	Speakman A Pad	North Reference:	Grid
Well:	BAT 33B-24-07-96 (JOB# 112047)	Survey Calculation Method:	Minimum Curvature
Wellbore:	33B		
Design:	PROPOSAL#4		

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:	14,330,542.67 usft
From:	Map	Easting:	776,091.31 usft
Position Uncertainty:	0.00 ft	Slot Radius:	13.200 in
		Latitude:	39.420918160°N
		Longitude:	108.060333667°W
		Grid Convergence:	-1.94 °

Well	BAT 33B-24-07-96 (JOB# 112047) - Slot BAT 33B		
Well Position	+N/-S	0.00 ft	Northing:
	+E/-W	0.00 ft	Easting:
Position Uncertainty	0.00 ft	Wellhead Elevation:	
		Latitude:	39.420876310°N
		Longitude:	108.060392193°W
		Ground Level:	5,183.00 ft

Wellbore UWI	33B				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	03/21/13	10.15	65.62	52,029

Design	PROPOSAL#4			
Audit Notes:				
Version:	Phase:	PROTOTYPE	Tie On Depth:	0.00
Vertical Section:	Depth From (TVD) (ft)	+N/-S (ft)	+E/-W (ft)	Direction (°)
	0.00	0.00	0.00	73.97

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	
230.00	0.00	0.00	230.00	0.00	0.00	0.00	0.00	0.00	0.00	
1,258.82	36.01	73.97	1,192.42	86.37	300.63	3.50	3.50	0.00	73.97	
2,526.13	36.01	73.97	2,217.58	292.11	1,016.72	0.00	0.00	0.00	0.00	
3,554.95	0.00	0.00	3,180.00	378.48	1,317.35	3.50	-3.50	0.00	180.00	
6,099.95	0.00	0.00	5,725.00	378.48	1,317.35	0.00	0.00	0.00	0.00	BAT 33B



ARK Directional Services

Planning Report - Geographic



Database:	EDM5000	Local Co-ordinate Reference:	Well BAT 33B-24-07-96 (JOB# 112047) - Slot BAT 33B
Company:	Antero Resources	TVD Reference:	KB @ 5203.00ft (Original Well Elev)
Project:	Speakman	MD Reference:	KB @ 5203.00ft (Original Well Elev)
Site:	Speakman A Pad	North Reference:	Grid
Well:	BAT 33B-24-07-96 (JOB# 112047)	Survey Calculation Method:	Minimum Curvature
Wellbore:	33B		
Design:	PROPOSAL#4		

Planned Survey										
Measured Depth (ft)	Inc. (°)	Az. (°)	Vertical Depth (ft)	Subsea (ft)	+N/-S (ft)	+E/-W (ft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
0.00	0.00	0.00	0.00	-5,203.00	0.00	0.00	14,330,527.99	776,074.26	39.420876310°N	108.060392193°W
100.00	0.00	0.00	100.00	-5,103.00	0.00	0.00	14,330,527.99	776,074.26	39.420876310°N	108.060392193°W
200.00	0.00	0.00	200.00	-5,003.00	0.00	0.00	14,330,527.99	776,074.26	39.420876310°N	108.060392193°W
KOP 3.5°/100 ft										
230.00	0.00	0.00	230.00	-4,973.00	0.00	0.00	14,330,527.99	776,074.26	39.420876310°N	108.060392193°W
300.00	2.45	73.97	299.98	-4,903.02	0.41	1.44	14,330,528.40	776,075.69	39.420877577°N	108.060387158°W
400.00	5.95	73.97	399.69	-4,803.31	2.44	8.48	14,330,530.43	776,082.73	39.420883778°N	108.060362514°W
500.00	9.45	73.97	498.78	-4,704.22	6.13	21.35	14,330,534.13	776,095.61	39.420895122°N	108.060317430°W
600.00	12.95	73.97	596.86	-4,606.14	11.50	40.02	14,330,539.49	776,114.27	39.420911567°N	108.060252074°W
700.00	16.45	73.97	693.57	-4,509.43	18.50	64.40	14,330,546.49	776,138.66	39.420933051°N	108.060166688°W
800.00	19.95	73.97	788.55	-4,414.45	27.13	94.42	14,330,555.12	776,168.67	39.420959495°N	108.060061593°W
900.00	23.45	73.97	881.45	-4,321.55	37.33	129.95	14,330,565.33	776,204.20	39.420990800°N	108.059937179°W
1,000.00	26.95	73.97	971.92	-4,231.08	49.09	170.86	14,330,577.08	776,245.12	39.421026849°N	108.059793912°W
1,100.00	30.45	73.97	1,059.62	-4,143.38	62.35	217.01	14,330,590.34	776,291.27	39.421067507°N	108.059632324°W
1,200.00	33.95	73.97	1,144.23	-4,058.77	77.06	268.22	14,330,605.05	776,342.48	39.421112622°N	108.059453019°W
HOLD 36.01°										
1,258.82	36.01	73.97	1,192.42	-4,010.58	86.37	300.63	14,330,614.36	776,374.88	39.421141174°N	108.059339544°W
1,300.00	36.01	73.97	1,225.73	-3,977.27	93.06	323.90	14,330,621.05	776,398.15	39.421161674°N	108.059258068°W
1,400.00	36.01	73.97	1,306.62	-3,896.38	109.29	380.40	14,330,637.28	776,454.66	39.421211456°N	108.059060213°W
1,500.00	36.01	73.97	1,387.52	-3,815.48	125.53	436.91	14,330,653.52	776,511.16	39.421261238°N	108.058862359°W
1,600.00	36.01	73.97	1,468.41	-3,734.59	141.76	493.41	14,330,669.75	776,567.67	39.421311019°N	108.058664504°W
1,700.00	36.01	73.97	1,549.30	-3,653.70	157.99	549.92	14,330,685.98	776,624.17	39.421360800°N	108.058466649°W
1,800.00	36.01	73.97	1,630.19	-3,572.81	174.23	606.42	14,330,702.22	776,680.68	39.421410581°N	108.058268794°W
1,900.00	36.01	73.97	1,711.09	-3,491.91	190.46	662.93	14,330,718.45	776,737.18	39.421460362°N	108.058070938°W
SURFACE CASING										
2,000.00	36.01	73.97	1,791.98	-3,411.02	206.70	719.43	14,330,734.69	776,793.69	39.421510142°N	108.057873082°W
2,100.00	36.01	73.97	1,872.87	-3,330.13	222.93	775.94	14,330,750.92	776,850.19	39.421559921°N	108.057675226°W
2,200.00	36.01	73.97	1,953.76	-3,249.24	239.16	832.44	14,330,767.15	776,906.70	39.421609701°N	108.057477369°W
2,300.00	36.01	73.97	2,034.66	-3,168.34	255.40	888.95	14,330,783.39	776,963.20	39.421659480°N	108.057279512°W
2,400.00	36.01	73.97	2,115.55	-3,087.45	271.63	945.45	14,330,799.62	777,019.71	39.421709259°N	108.057081655°W
2,500.00	36.01	73.97	2,196.44	-3,006.56	287.87	1,001.96	14,330,815.86	777,076.21	39.421759037°N	108.056883798°W
DROP 3.5°/100 ft										
2,526.13	36.01	73.97	2,217.58	-2,985.42	292.11	1,016.72	14,330,820.10	777,090.98	39.421772044°N	108.056832098°W
2,600.00	33.42	73.97	2,278.29	-2,924.71	303.72	1,057.16	14,330,831.72	777,131.41	39.421807661°N	108.056690526°W
2,700.00	29.92	73.97	2,363.39	-2,839.61	318.22	1,107.61	14,330,846.21	777,181.87	39.421852112°N	108.056513842°W
2,800.00	26.42	73.97	2,451.52	-2,751.48	331.26	1,152.98	14,330,859.25	777,227.24	39.421892081°N	108.056354970°W
2,900.00	22.92	73.97	2,542.38	-2,660.62	342.78	1,193.10	14,330,870.77	777,267.35	39.421927420°N	108.056214503°W
3,000.00	19.42	73.97	2,635.62	-2,567.39	352.75	1,227.81	14,330,880.74	777,302.06	39.421957996°N	108.056092965°W
Williams Fork										
3,093.88	16.14	73.97	2,725.00	-2,478.00	360.67	1,255.36	14,330,888.66	777,329.61	39.421982266°N	108.055996494°W
3,100.00	15.92	73.97	2,730.88	-2,472.12	361.14	1,256.98	14,330,889.13	777,331.24	39.421983697°N	108.055990808°W
3,200.00	12.42	73.97	2,827.82	-2,375.18	367.90	1,280.51	14,330,895.89	777,354.77	39.422004425°N	108.055908415°W
3,300.00	8.92	73.97	2,926.08	-2,276.92	373.01	1,298.31	14,330,901.00	777,372.56	39.422020104°N	108.055846093°W
3,400.00	5.42	73.97	3,025.28	-2,177.72	376.46	1,310.31	14,330,904.45	777,384.56	39.422030674°N	108.055804075°W
3,500.00	1.92	73.97	3,125.06	-2,077.94	378.23	1,316.47	14,330,906.22	777,390.72	39.422036098°N	108.055782516°W
BACK TO VERTICAL										
3,554.95	0.00	73.97	3,180.00	-2,023.00	378.48	1,317.35	14,330,906.47	777,391.61	39.422036879°N	108.055779412°W
3,600.00	0.00	0.00	3,225.05	-1,977.95	378.48	1,317.35	14,330,906.47	777,391.61	39.422036879°N	108.055779412°W
3,700.00	0.00	0.00	3,325.05	-1,877.95	378.48	1,317.35	14,330,906.47	777,391.61	39.422036879°N	108.055779412°W



ARK Directional Services

Planning Report - Geographic



Database:	EDM5000	Local Co-ordinate Reference:	Well BAT 33B-24-07-96 (JOB# 112047) - Slot BAT 33B
Company:	Antero Resources	TVD Reference:	KB @ 5203.00ft (Original Well Elev)
Project:	Speakman	MD Reference:	KB @ 5203.00ft (Original Well Elev)
Site:	Speakman A Pad	North Reference:	Grid
Well:	BAT 33B-24-07-96 (JOB# 112047)	Survey Calculation Method:	Minimum Curvature
Wellbore:	33B		
Design:	PROPOSAL#4		

Planned Survey										
Measured Depth (ft)	Inc. (°)	Az. (°)	Vertical Depth (ft)	Subsea (ft)	+N/-S (ft)	+E/-W (ft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
3,800.00	0.00	0.00	3,425.05	-1,777.95	378.48	1,317.35	14,330,906.47	777,391.61	39.422036879°N	108.055779412°W
3,900.00	0.00	0.00	3,525.05	-1,677.95	378.48	1,317.35	14,330,906.47	777,391.61	39.422036879°N	108.055779412°W
4,000.00	0.00	0.00	3,625.05	-1,577.95	378.48	1,317.35	14,330,906.47	777,391.61	39.422036879°N	108.055779412°W
4,100.00	0.00	0.00	3,725.05	-1,477.95	378.48	1,317.35	14,330,906.47	777,391.61	39.422036879°N	108.055779412°W
4,200.00	0.00	0.00	3,825.05	-1,377.95	378.48	1,317.35	14,330,906.47	777,391.61	39.422036879°N	108.055779412°W
Top Gas										
4,299.95	0.00	0.00	3,925.00	-1,278.00	378.48	1,317.35	14,330,906.47	777,391.61	39.422036879°N	108.055779412°W
4,300.00	0.00	0.00	3,925.05	-1,277.95	378.48	1,317.35	14,330,906.47	777,391.61	39.422036879°N	108.055779412°W
4,400.00	0.00	0.00	4,025.05	-1,177.95	378.48	1,317.35	14,330,906.47	777,391.61	39.422036879°N	108.055779412°W
4,500.00	0.00	0.00	4,125.05	-1,077.95	378.48	1,317.35	14,330,906.47	777,391.61	39.422036879°N	108.055779412°W
4,600.00	0.00	0.00	4,225.05	-977.95	378.48	1,317.35	14,330,906.47	777,391.61	39.422036879°N	108.055779412°W
4,700.00	0.00	0.00	4,325.05	-877.95	378.48	1,317.35	14,330,906.47	777,391.61	39.422036879°N	108.055779412°W
4,800.00	0.00	0.00	4,425.05	-777.95	378.48	1,317.35	14,330,906.47	777,391.61	39.422036879°N	108.055779412°W
4,900.00	0.00	0.00	4,525.05	-677.95	378.48	1,317.35	14,330,906.47	777,391.61	39.422036879°N	108.055779412°W
5,000.00	0.00	0.00	4,625.05	-577.95	378.48	1,317.35	14,330,906.47	777,391.61	39.422036879°N	108.055779412°W
5,100.00	0.00	0.00	4,725.05	-477.95	378.48	1,317.35	14,330,906.47	777,391.61	39.422036879°N	108.055779412°W
5,200.00	0.00	0.00	4,825.05	-377.95	378.48	1,317.35	14,330,906.47	777,391.61	39.422036879°N	108.055779412°W
5,300.00	0.00	0.00	4,925.05	-277.95	378.48	1,317.35	14,330,906.47	777,391.61	39.422036879°N	108.055779412°W
5,400.00	0.00	0.00	5,025.05	-177.95	378.48	1,317.35	14,330,906.47	777,391.61	39.422036879°N	108.055779412°W
5,500.00	0.00	0.00	5,125.05	-77.95	378.48	1,317.35	14,330,906.47	777,391.61	39.422036879°N	108.055779412°W
Cameo										
5,549.95	0.00	0.00	5,175.00	-28.00	378.48	1,317.35	14,330,906.47	777,391.61	39.422036879°N	108.055779412°W
5,600.00	0.00	0.00	5,225.05	22.05	378.48	1,317.35	14,330,906.47	777,391.61	39.422036879°N	108.055779412°W
5,700.00	0.00	0.00	5,325.05	122.05	378.48	1,317.35	14,330,906.47	777,391.61	39.422036879°N	108.055779412°W
5,800.00	0.00	0.00	5,425.05	222.05	378.48	1,317.35	14,330,906.47	777,391.61	39.422036879°N	108.055779412°W
5,900.00	0.00	0.00	5,525.05	322.05	378.48	1,317.35	14,330,906.47	777,391.61	39.422036879°N	108.055779412°W
Rollins										
5,999.95	0.00	0.00	5,625.00	422.00	378.48	1,317.35	14,330,906.47	777,391.61	39.422036879°N	108.055779412°W
6,000.00	0.00	0.00	5,625.05	422.05	378.48	1,317.35	14,330,906.47	777,391.61	39.422036879°N	108.055779412°W
PROPOSED TD										
6,099.95	0.00	0.00	5,725.00	522.00	378.48	1,317.35	14,330,906.47	777,391.61	39.422036879°N	108.055779412°W

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	
BAT 33B - plan hits target center - Circle (radius 20.00)	0.00	0.00	5,725.00	378.48	1,317.35	14,330,906.47	777,391.61	39.422036879°N	108.055779412°W	

Casing Points					
Measured Depth (ft)	Vertical Depth (ft)	Name	Casing Diameter (in)	Hole Diameter (in)	
2,000.00	1,791.98	SURFACE CASING	5.500	6.000	



ARK Directional Services
Planning Report - Geographic



Database:	EDM5000	Local Co-ordinate Reference:	Well BAT 33B-24-07-96 (JOB# 112047) - Slot BAT 33B
Company:	Antero Resources	TVD Reference:	KB @ 5203.00ft (Original Well Elev)
Project:	Speakman	MD Reference:	KB @ 5203.00ft (Original Well Elev)
Site:	Speakman A Pad	North Reference:	Grid
Well:	BAT 33B-24-07-96 (JOB# 112047)	Survey Calculation Method:	Minimum Curvature
Wellbore:	33B		
Design:	PROPOSAL#4		

Formations						
Measured Depth (ft)	Vertical Depth (ft)	Subsea Depth (ft)	Name	Lithology	Dip (°)	Dip Direction (°)
3,093.88	2,725.00	2,478.00	Williams Fork		0.00	
4,299.95	3,925.00	1,278.00	Top Gas			
5,549.95	5,175.00	28.00	Cameo			
5,999.95	5,625.00	-422.00	Rollins			

Plan Annotations					
Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates			
		+N/-S (ft)	+E/-W (ft)	Comment	
230.00	230.00	0.00	0.00	KOP 3.5°/100 ft	
1,258.82	1,192.42	0.00	0.00	HOLD 36.01°	
2,526.13	2,217.58	81.64	284.17	DROP 3.5°/100 ft	
3,554.95	3,180.00	86.37	300.63	BACK TO VERTICAL	
6,099.95	5,725.00	277.17	964.71	PROPOSED TD	



Antero Resources

Speakman

Speakman A Pad

BAT 33B-24-07-96 (JOB# 112047)

33B

PROPOSAL#4

Anticollision Report

28 March, 2013





ARK Directional Services

Anticollision Report



Company:	Antero Resources	Local Co-ordinate Reference:	Well BAT 33B-24-07-96 (JOB# 112047) - Slot BAT 33B
Project:	Speakman	TVD Reference:	KB @ 5203.00ft (Original Well Elev)
Reference Site:	Speakman A Pad	MD Reference:	KB @ 5203.00ft (Original Well Elev)
Site Error:	0.00 ft	North Reference:	Grid
Reference Well:	BAT 33B-24-07-96 (JOB# 112047)	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 ft	Output errors are at	2.00 sigma
Reference Wellbore	33B	Database:	EDM5000
Reference Design:	PROPOSAL#4	Offset TVD Reference:	Offset Datum

Reference	PROPOSAL#4		
Filter type:	NO GLOBAL FILTER: Using user defined selection & filtering criteria		
Interpolation Method:	MD Interval 100.00ft	Error Model:	ISCWSA
Depth Range:	Unlimited	Scan Method:	Travelling Cylinder
Results Limited by:	Maximum center-center distance of 9,842.52 ft	Error Surface:	Elliptical Conic
Warning Levels Evaluated at:	2.00 Sigma	Casing Method:	Not applied

Survey Tool Program	Date	03/28/13		
From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description
0.00	6,099.95	PROPOSAL#4 (33B)	MWD	MWD - Standard

Summary	Reference Measured Depth (ft)	Offset Measured Depth (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Separation Factor	Warning
Site Name						
Offset Well - Wellbore - Design						
Speakman A Pad						
BAT 32C-24-07-96 (JOB# 112050) - BAT 32C - PROPOS	200.00	200.00	25.74	25.11	40.898	CC, ES
BAT 32C-24-07-96 (JOB# 112050) - BAT 32C - PROPOS	905.61	900.00	71.20	65.15	11.773	SF

Offset Design		Speakman A Pad - BAT 32C-24-07-96 (JOB# 112050) - BAT 32C - PROPOSAL#1											Offset Site Error:	0.00 ft
Survey Program: 0-MWD													Offset Well Error:	0.00 ft
Reference		Offset		Semi Major Axis			Distance							Warning
Measured Depth	Vertical Depth	Measured Depth	Vertical Depth	Reference	Offset	Highside Toolface	Offset Wellbore Centre		Between Centres	Between Ellipses	Minimum Separation	Separation Factor		
(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(°)	+N/-S (ft)	+E/-W (ft)		(ft)	(ft)	(ft)		
0.00	0.00	0.00	0.00	0.00	0.00	78.33	5.21	25.21	25.74					
100.00	100.00	100.00	100.00	0.09	0.09	78.33	5.21	25.21	25.74	25.56	0.18	143.141		
200.00	200.00	200.00	200.00	0.31	0.31	78.33	5.21	25.21	25.74	25.11	0.63	40.898	CC, ES	
301.13	301.10	300.00	299.94	0.54	0.55	1.06	7.35	27.38	26.83	25.75	1.08	24.839		
402.71	402.39	400.00	399.50	0.78	0.80	-8.05	13.78	33.89	27.70	26.16	1.54	17.961		
504.14	502.86	500.00	498.32	1.07	1.10	-22.29	24.46	44.72	29.42	27.39	2.03	14.512		
605.27	601.99	600.00	596.03	1.44	1.49	-39.08	39.35	59.83	33.79	31.17	2.62	12.911		
705.97	699.29	700.00	692.26	1.93	1.99	-54.42	58.41	79.15	42.15	38.68	3.47	12.163		
806.12	794.30	800.00	786.66	2.52	2.60	-66.10	81.55	102.62	54.74	50.12	4.62	11.842		
905.61	886.60	900.00	878.86	3.24	3.32	-74.29	108.70	130.16	71.20	65.15	6.05	11.773	SF	
1,004.36	975.80	1,000.00	968.54	4.07	4.15	-79.92	139.75	161.64	91.09	83.39	7.70	11.823		
1,102.27	1,061.58	1,100.00	1,055.34	5.03	5.10	-83.82	174.59	196.97	114.08	104.50	9.58	11.910		
1,199.31	1,143.65	1,200.00	1,138.96	6.10	6.16	-86.55	213.08	236.00	139.88	128.22	11.66	11.996		
1,295.47	1,222.08	1,300.00	1,219.99	7.28	7.31	-88.80	254.22	277.72	167.69	153.76	13.93	12.036		
1,391.22	1,299.52	1,400.00	1,300.88	8.50	8.48	-90.67	295.51	319.59	195.79	179.54	16.24	12.054		
1,487.01	1,377.01	1,500.00	1,381.76	9.72	9.65	-92.07	336.80	361.46	224.04	205.47	18.57	12.067		
1,582.80	1,454.50	1,600.00	1,462.65	10.95	10.83	-93.15	378.09	403.33	252.40	231.50	20.90	12.079		
1,678.59	1,531.98	1,700.00	1,543.53	12.19	12.01	-94.01	419.38	445.20	280.83	257.59	23.23	12.088		
1,774.38	1,609.47	1,800.00	1,624.41	13.43	13.19	-94.71	460.67	487.06	309.31	283.74	25.57	12.096		
1,870.17	1,686.96	1,900.00	1,705.30	14.67	14.37	-95.30	501.95	528.93	337.83	309.91	27.91	12.103		
1,965.96	1,764.45	2,000.00	1,786.18	15.91	15.56	-95.79	543.24	570.80	366.37	336.12	30.25	12.110		
2,061.75	1,841.93	2,100.00	1,867.07	17.16	16.74	-96.21	584.53	612.67	394.95	362.35	32.60	12.115		
2,157.54	1,919.42	2,200.00	1,947.95	18.40	17.93	-96.58	625.82	654.54	423.54	388.59	34.95	12.120		
2,253.33	1,996.91	2,300.00	2,028.84	19.65	19.12	-96.90	667.11	696.41	452.14	414.85	37.29	12.124		

CC - Min centre to center distance or convergent point, SF - min separation factor, ES - min ellipse separation



ARK Directional Services

Anticollision Report



Company:	Antero Resources	Local Co-ordinate Reference:	Well BAT 33B-24-07-96 (JOB# 112047) - Slot BAT 33B
Project:	Speakman	TVD Reference:	KB @ 5203.00ft (Original Well Elev)
Reference Site:	Speakman A Pad	MD Reference:	KB @ 5203.00ft (Original Well Elev)
Site Error:	0.00 ft	North Reference:	Grid
Reference Well:	BAT 33B-24-07-96 (JOB# 112047)	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 ft	Output errors are at	2.00 sigma
Reference Wellbore	33B	Database:	EDM5000
Reference Design:	PROPOSAL#4	Offset TVD Reference:	Offset Datum

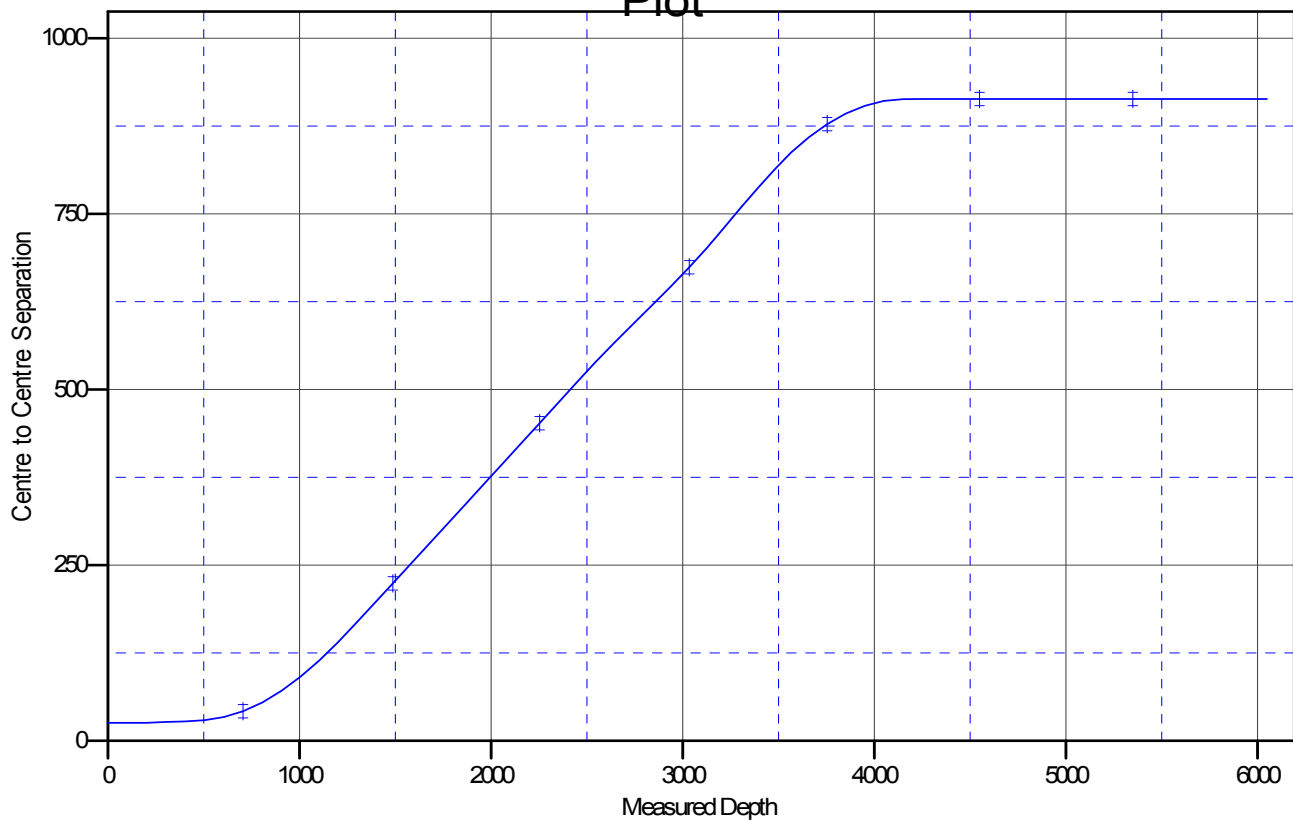
Offset Design												Offset Site Error:	0.00 ft
Survey Program: 0-MWD												Offset Well Error:	0.00 ft
Reference				Offset			Semi Major Axis		Distance				Warning
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	
2,349.12	2,074.39	2,400.00	2,109.72	20.90	20.30	-97.18	708.40	738.28	480.76	441.12	39.64	12.128	
2,444.91	2,151.88	2,500.00	2,190.61	22.15	21.49	-97.43	749.68	780.15	509.39	467.40	41.99	12.132	
2,541.63	2,230.20	2,600.00	2,271.49	23.37	22.68	-97.64	790.97	822.01	538.01	493.69	44.31	12.141	
2,641.78	2,313.46	2,700.00	2,352.37	24.48	23.87	-97.46	832.26	863.88	566.15	519.58	46.57	12.157	
2,742.06	2,400.11	2,800.00	2,433.26	25.42	25.06	-96.73	873.55	905.75	593.57	544.95	48.61	12.210	
2,841.47	2,488.89	2,900.00	2,514.14	26.24	26.25	-95.53	914.84	947.62	620.49	570.01	50.48	12.292	
2,939.30	2,578.76	3,000.00	2,595.03	26.94	27.44	-93.92	956.12	989.49	647.24	595.11	52.13	12.415	
3,034.91	2,668.66	3,100.00	2,675.91	27.52	28.63	-91.97	997.41	1,031.36	674.24	620.70	53.54	12.593	
3,127.75	2,757.63	3,200.00	2,756.80	27.98	29.82	-89.74	1,038.70	1,073.23	701.97	647.29	54.68	12.837	
3,217.41	2,844.84	3,300.00	2,837.75	28.35	30.99	-87.28	1,079.93	1,115.03	730.86	675.33	55.53	13.162	
3,305.28	2,931.29	3,400.00	2,921.02	28.63	31.90	-84.89	1,118.78	1,154.43	759.52	703.58	55.95	13.576	
3,392.18	3,017.49	3,500.00	3,007.52	28.83	32.73	-82.67	1,154.00	1,190.14	786.93	730.79	56.14	14.018	
3,478.09	3,103.16	3,600.00	3,096.91	28.95	33.47	-80.57	1,185.44	1,222.02	812.89	756.76	56.13	14.483	
3,564.55	3,189.60	3,700.00	3,188.88	29.02	34.11	101.41	1,212.99	1,249.96	837.21	781.27	55.95	14.965	
3,658.02	3,283.07	3,800.00	3,283.07	29.07	34.67	-2.90	1,236.54	1,273.85	859.17	803.43	55.74	15.414	
3,754.08	3,379.13	3,900.00	3,379.13	29.12	35.13	-1.55	1,256.02	1,293.60	877.86	822.29	55.57	15.796	
3,851.65	3,476.70	4,000.00	3,476.70	29.17	35.50	-0.53	1,271.34	1,309.13	892.90	837.43	55.46	16.099	
3,950.38	3,575.43	4,100.00	3,575.43	29.23	35.78	0.19	1,282.45	1,320.40	903.97	848.56	55.41	16.314	
4,049.89	3,674.93	4,200.00	3,674.93	29.28	35.97	0.63	1,289.31	1,327.35	910.88	855.46	55.42	16.435	
4,149.80	3,774.85	4,300.00	3,774.85	29.34	36.07	0.79	1,291.89	1,329.97	913.49	857.99	55.50	16.459	
4,249.80	3,874.85	4,400.00	3,874.85	29.40	36.11	0.79	1,291.91	1,329.99	913.52	857.90	55.62	16.424	
4,349.80	3,974.85	4,500.00	3,974.85	29.47	36.16	0.79	1,291.91	1,329.99	913.52	857.77	55.75	16.387	
4,449.80	4,074.85	4,600.00	4,074.85	29.53	36.21	0.79	1,291.91	1,329.99	913.52	857.64	55.88	16.348	
4,549.80	4,174.85	4,700.00	4,174.85	29.60	36.26	0.79	1,291.91	1,329.99	913.52	857.50	56.01	16.309	
4,649.80	4,274.85	4,800.00	4,274.85	29.66	36.31	0.79	1,291.91	1,329.99	913.52	857.36	56.15	16.269	
4,749.80	4,374.85	4,900.00	4,374.85	29.73	36.37	0.79	1,291.91	1,329.99	913.52	857.22	56.29	16.228	
4,849.80	4,474.85	5,000.00	4,474.85	29.80	36.42	0.79	1,291.91	1,329.99	913.52	857.08	56.44	16.186	
4,949.80	4,574.85	5,100.00	4,574.85	29.87	36.48	0.79	1,291.91	1,329.99	913.52	856.93	56.59	16.144	
5,049.80	4,674.85	5,200.00	4,674.85	29.95	36.54	0.79	1,291.91	1,329.99	913.52	856.78	56.74	16.101	
5,149.80	4,774.85	5,300.00	4,774.85	30.02	36.59	0.79	1,291.91	1,329.99	913.52	856.62	56.89	16.057	
5,249.80	4,874.85	5,400.00	4,874.85	30.10	36.65	0.79	1,291.91	1,329.99	913.52	856.47	57.05	16.013	
5,349.80	4,974.85	5,500.00	4,974.85	30.18	36.72	0.79	1,291.91	1,329.99	913.52	856.31	57.21	15.968	
5,449.80	5,074.85	5,600.00	5,074.85	30.25	36.78	0.79	1,291.91	1,329.99	913.52	856.14	57.37	15.923	
5,549.80	5,174.85	5,700.00	5,174.85	30.34	36.84	0.79	1,291.91	1,329.99	913.52	855.98	57.54	15.877	
5,649.80	5,274.85	5,800.00	5,274.85	30.42	36.91	0.79	1,291.91	1,329.99	913.52	855.81	57.71	15.830	
5,749.80	5,374.85	5,900.00	5,374.85	30.50	36.97	0.79	1,291.91	1,329.99	913.52	855.64	57.88	15.783	
5,849.80	5,474.85	6,000.00	5,474.85	30.59	37.04	0.79	1,291.91	1,329.99	913.52	855.46	58.06	15.735	
5,949.80	5,574.85	6,100.00	5,574.85	30.67	37.11	0.79	1,291.91	1,329.99	913.52	855.28	58.23	15.687	
6,049.80	5,674.85	6,200.00	5,674.85	30.76	37.18	0.79	1,291.91	1,329.99	913.52	855.10	58.42	15.638	

Company:	Antero Resources	Local Co-ordinate Reference:	Well BAT 33B-24-07-96 (JOB# 112047) - Slot BAT 33B
Project:	Speakman	TVD Reference:	KB @ 5203.00ft (Original Well Elev)
Reference Site:	Speakman A Pad	MD Reference:	KB @ 5203.00ft (Original Well Elev)
Site Error:	0.00 ft	North Reference:	Grid
Reference Well:	BAT 33B-24-07-96 (JOB# 112047)	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 ft	Output errors are at	2.00 sigma
Reference Wellbore	33B	Database:	EDM5000
Reference Design:	PROPOSAL#4	Offset TVD Reference:	Offset Datum

Reference Depths are relative to KB @ 5203.00ft (Original Well Elev)
Offset Depths are relative to Offset Datum
Central Meridian is 105.000000000°W

Coordinates are relative to: BAT 33B-24-07-96 (JOB# 112047) - Slot BAT 33B
Coordinate System is Universal Transverse Mercator , Zone 13N (108 W to 102 W)
Grid Convergence at Surface is: -1.94°

Ladder Plot



LEGEND

16 (JOB# 112050), BAT 32C, PROPOSAL#1 V0



ARK Directional Services

Anticollision Report



Company:	Antero Resources	Local Co-ordinate Reference:	Well BAT 33B-24-07-96 (JOB# 112047) - Slot BAT 33B
Project:	Speakman	TVD Reference:	KB @ 5203.00ft (Original Well Elev)
Reference Site:	Speakman A Pad	MD Reference:	KB @ 5203.00ft (Original Well Elev)
Site Error:	0.00 ft	North Reference:	Grid
Reference Well:	BAT 33B-24-07-96 (JOB# 112047)	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 ft	Output errors are at	2.00 sigma
Reference Wellbore	33B	Database:	EDM5000
Reference Design:	PROPOSAL#4	Offset TVD Reference:	Offset Datum

Reference Depths are relative to KB @ 5203.00ft (Original Well Elev)
Offset Depths are relative to Offset Datum
Central Meridian is 105.000000000°W

Coordinates are relative to: BAT 33B-24-07-96 (JOB# 112047) - Slot BAT 33B
Coordinate System is Universal Transverse Mercator, Zone 13N (108 W to 102 W)
Grid Convergence at Surface is: -1.94°

