

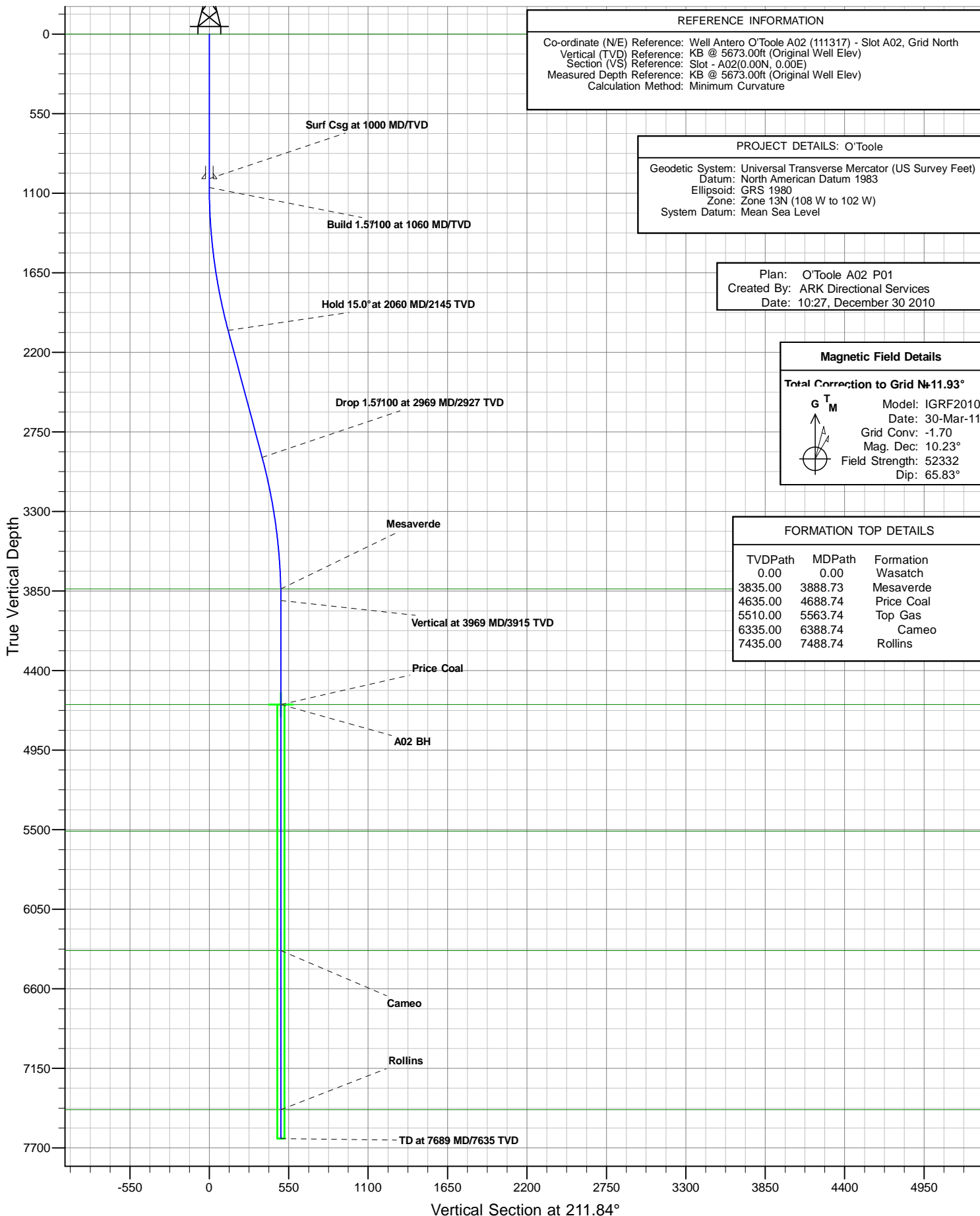


# Antero Resources



Antero O'Toole A02 (111317)

## VERTICAL SECTION VIEW





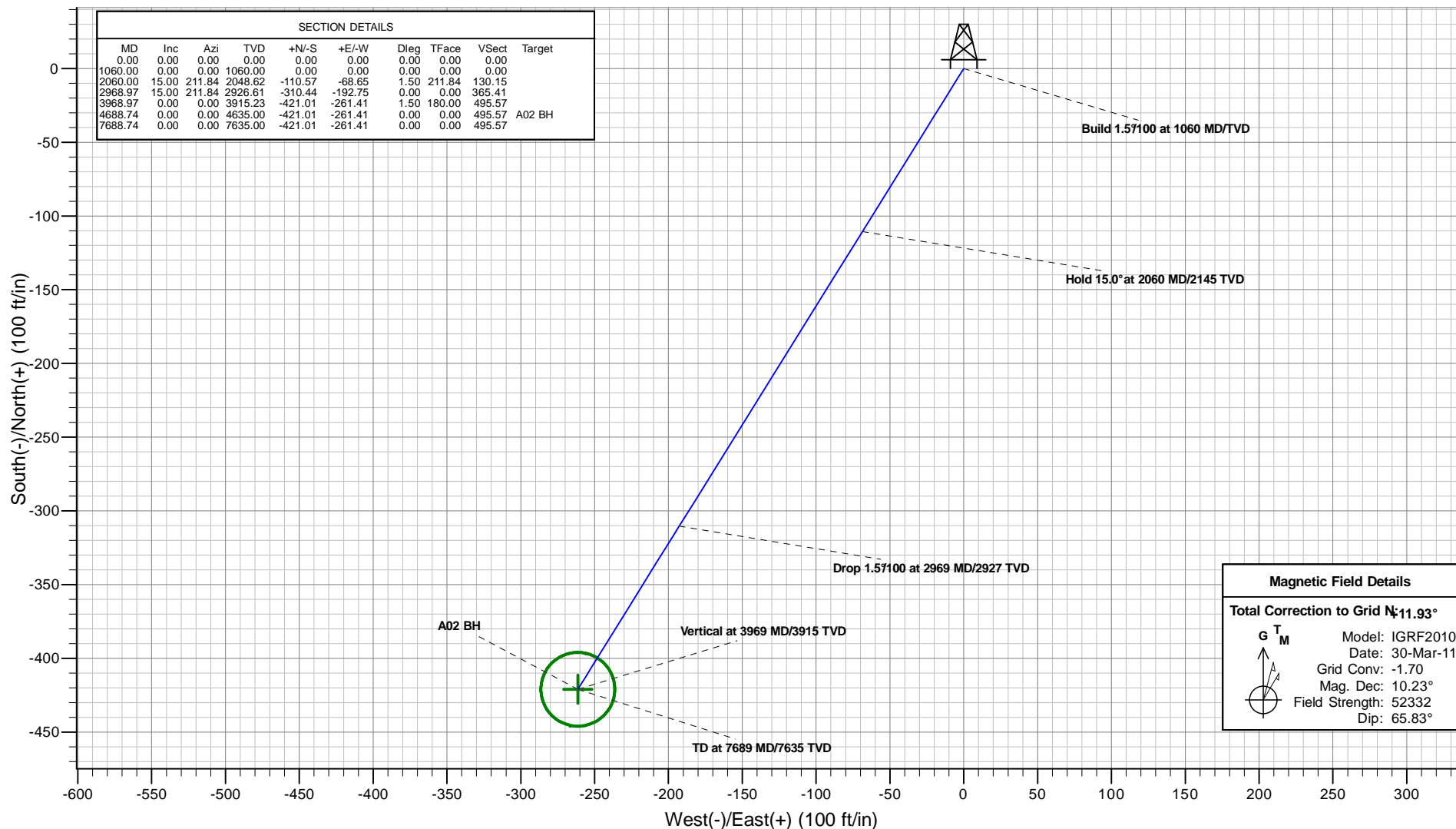
# Antero Resources

## Antero O'Toole A02 (111317)



### PLAN VIEW

Project: O'Toole  
Site: O'Toole A Pad  
Well: Antero O'Toole A02 (111317)  
Wellbore: O'Toole A02  
Design: O'Toole A02 P01



Plan: O'Toole A02 P01  
Created By: ARK Directional Services  
Date: 10:23, December 30 2010

PROJECT DETAILS: O'Toole

Geodetic System: Universal Transverse Mercator (US Survey Feet)  
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 Antero O'Toole A02 (111317) - Slot A02, Grid North  
Vertical (TVD) Reference: KB @ 5673.00ft (Original Well Elev)  
Section (VS) Reference: Slot - A02(0.00N, 0.00E)  
Measured Depth Reference: KB @ 5673.00ft (Original Well Elev)  
Calculation Method: Minimum Curvature

# **Antero Resources**

**O'Toole**

**O'Toole A Pad**

**Antero O'Toole A02 (111317) - Slot A02**

**O'Toole A02**

**Plan: O'Toole A02 P01**

## **Standard Planning Report - Geographic**

**30 December, 2010**

## Planning Report - Geographic

<b>Database:</b>	EDM 5000 SERVER DB	<b>Local Co-ordinate Reference:</b>	Well Antero O'Toole A02 (111317) - Slot A02
<b>Company:</b>	Antero Resources	<b>TVD Reference:</b>	KB @ 5673.00ft (Original Well Elev)
<b>Project:</b>	O'Toole	<b>MD Reference:</b>	KB @ 5673.00ft (Original Well Elev)
<b>Site:</b>	O'Toole A Pad	<b>North Reference:</b>	Grid
<b>Well:</b>	Antero O'Toole A02 (111317)	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	O'Toole A02		
<b>Design:</b>	O'Toole A02 P01		

<b>Project</b>	O'Toole		
<b>Map System:</b>	Universal Transverse Mercator (US Survey Feet)	<b>System Datum:</b>	Mean Sea Level
<b>Geo Datum:</b>	North American Datum 1983		
<b>Map Zone:</b>	Zone 13N (108 W to 102 W)		

Site		O'Toole A Pad			
Site Position:		Northing:	14,364,078.526 usft	Latitude:	39.522763688°N
From:	Map	Easting:	889,150.833 usft	Longitude:	107.663965951°W
Position Uncertainty:	0.00 ft	Slot Radius:	13.20 in	Grid Convergence:	-1.70 °

Well	Antero O'Toole A02 (111317) - Slot A02					
Well Position	+N/-S	0.00 ft	Northing:	14,364,078.385 usft	Latitude:	39.522764316°N
	+E/-W	0.00 ft	Easting:	889,163.332 usft	Longitude:	107.663921661°W
Position Uncertainty		0.00 ft	Wellhead Elevation:		Ground Level:	5,649.00 ft

<b>Wellbore</b>	O'Toole A02				
<b>Magnetics</b>	<b>Model Name</b>	<b>Sample Date</b>	<b>Declination (°)</b>	<b>Dip Angle (°)</b>	<b>Field Strength (nT)</b>
	IGRF2010	3/30/2011	10.23	65.83	52,332

<b>Design</b>	O'Toole A02 P01				
<b>Audit Notes:</b>					
<b>Version:</b>	<b>Phase:</b>	PROTOTYPE		<b>Tie On Depth:</b>	0.00
<b>Vertical Section:</b>	<b>Depth From (TVD) (ft)</b>	<b>+N/-S (ft)</b>	<b>+E/-W (ft)</b>	<b>Direction (°)</b>	
	4,635.00	0.00	0.00	211.84	

<b>Plan Sections</b>										
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	
1,060.00	0.00	0.00	1,060.00	0.00	0.00	0.00	0.00	0.00	0.00	
2,060.00	15.00	211.84	2,048.62	-110.57	-68.65	1.50	1.50	0.00	211.84	
2,968.97	15.00	211.84	2,926.61	-310.44	-192.75	0.00	0.00	0.00	0.00	
3,968.97	0.00	0.00	3,915.23	-421.01	-261.41	1.50	-1.50	0.00	180.00	
4,688.74	0.00	0.00	4,635.00	-421.01	-261.41	0.00	0.00	0.00	0.00	A02 BH
7,688.74	0.00	0.00	7,635.00	-421.01	-261.41	0.00	0.00	0.00	0.00	

# Planning Report - Geographic

<b>Database:</b>	EDM 5000 SERVER DB	<b>Local Co-ordinate Reference:</b>	Well Antero O'Toole A02 (111317) - Slot A02
<b>Company:</b>	Antero Resources	<b>TVD Reference:</b>	KB @ 5673.00ft (Original Well Elev)
<b>Project:</b>	O'Toole	<b>MD Reference:</b>	KB @ 5673.00ft (Original Well Elev)
<b>Site:</b>	O'Toole A Pad	<b>North Reference:</b>	Grid
<b>Well:</b>	Antero O'Toole A02 (111317)	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	O'Toole A02		
<b>Design:</b>	O'Toole A02 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	14,364,078.385	889,163.332	39.522764316°N	107.663921661°W	
Wasatch										
100.00	0.00	0.00	100.00	0.00	0.00	14,364,078.385	889,163.332	39.522764316°N	107.663921661°W	
200.00	0.00	0.00	200.00	0.00	0.00	14,364,078.385	889,163.332	39.522764316°N	107.663921661°W	
300.00	0.00	0.00	300.00	0.00	0.00	14,364,078.385	889,163.332	39.522764316°N	107.663921661°W	
400.00	0.00	0.00	400.00	0.00	0.00	14,364,078.385	889,163.332	39.522764316°N	107.663921661°W	
500.00	0.00	0.00	500.00	0.00	0.00	14,364,078.385	889,163.332	39.522764316°N	107.663921661°W	
600.00	0.00	0.00	600.00	0.00	0.00	14,364,078.385	889,163.332	39.522764316°N	107.663921661°W	
700.00	0.00	0.00	700.00	0.00	0.00	14,364,078.385	889,163.332	39.522764316°N	107.663921661°W	
800.00	0.00	0.00	800.00	0.00	0.00	14,364,078.385	889,163.332	39.522764316°N	107.663921661°W	
900.00	0.00	0.00	900.00	0.00	0.00	14,364,078.385	889,163.332	39.522764316°N	107.663921661°W	
1,000.00	0.00	0.00	1,000.00	0.00	0.00	14,364,078.385	889,163.332	39.522764316°N	107.663921661°W	
Surf Csg at 1000 MD/TVD										
1,060.00	0.00	0.00	1,060.00	0.00	0.00	14,364,078.385	889,163.332	39.522764316°N	107.663921661°W	
Build 1.5°/100 at 1060 MD/TVD										
1,100.00	0.60	211.84	1,100.00	-0.18	-0.11	14,364,078.207	889,163.221	39.522763819°N	107.663922033°W	
1,200.00	2.10	211.84	1,199.97	-2.18	-1.35	14,364,076.205	889,161.979	39.522758227°N	107.663926225°W	
1,300.00	3.60	211.84	1,299.84	-6.40	-3.98	14,364,071.981	889,159.356	39.522746426°N	107.663935073°W	
1,400.00	5.10	211.84	1,399.55	-12.85	-7.98	14,364,065.538	889,155.355	39.522728423°N	107.663948569°W	
1,500.00	6.60	211.84	1,499.03	-21.51	-13.35	14,364,056.879	889,149.979	39.522704231°N	107.663966706°W	
1,600.00	8.10	211.84	1,598.20	-32.37	-20.10	14,364,046.011	889,143.231	39.522673867°N	107.663989470°W	
1,700.00	9.60	211.84	1,697.01	-45.44	-28.22	14,364,032.941	889,135.116	39.522637351°N	107.664016845°W	
1,800.00	11.10	211.84	1,795.38	-60.71	-37.69	14,364,017.678	889,125.639	39.522594709°N	107.664048814°W	
1,900.00	12.60	211.84	1,893.25	-78.15	-48.52	14,364,000.233	889,114.807	39.522545969°N	107.664085354°W	
2,000.00	14.10	211.84	1,990.54	-97.77	-60.70	14,363,980.617	889,102.628	39.522491165°N	107.664126440°W	
2,060.00	15.00	211.84	2,048.62	-110.57	-68.65	14,363,967.811	889,094.677	39.522455387°N	107.664153262°W	
Hold 15.0° at 2060 MD/2145 TVD										
2,100.00	15.00	211.84	2,087.25	-119.37	-74.12	14,363,959.016	889,089.216	39.522430814°N	107.664171684°W	
2,200.00	15.00	211.84	2,183.85	-141.36	-87.77	14,363,937.028	889,075.564	39.522369382°N	107.664217739°W	
2,300.00	15.00	211.84	2,280.44	-163.35	-101.42	14,363,915.040	889,061.911	39.522307949°N	107.664263794°W	
2,400.00	15.00	211.84	2,377.03	-185.33	-115.07	14,363,893.051	889,048.259	39.522246516°N	107.664309849°W	
2,500.00	15.00	211.84	2,473.62	-207.32	-128.73	14,363,871.063	889,034.606	39.522185084°N	107.664355904°W	
2,600.00	15.00	211.84	2,570.22	-229.31	-142.38	14,363,849.075	889,020.954	39.522123651°N	107.664401959°W	
2,700.00	15.00	211.84	2,666.81	-251.30	-156.03	14,363,827.087	889,007.302	39.522062218°N	107.664448014°W	
2,800.00	15.00	211.84	2,763.40	-273.29	-169.68	14,363,805.099	888,993.649	39.522000786°N	107.664494069°W	
2,900.00	15.00	211.84	2,859.99	-295.28	-183.34	14,363,783.110	888,979.997	39.521939353°N	107.664540123°W	
2,968.97	15.00	211.84	2,926.61	-310.44	-192.75	14,363,767.945	888,970.581	39.521896983°N	107.664571887°W	
Drop 1.5°/100 at 2969 MD/2927 TVD										
3,000.00	14.53	211.84	2,956.62	-317.16	-196.92	14,363,761.226	888,966.409	39.521878209°N	107.664585961°W	
3,100.00	13.03	211.84	3,053.74	-337.40	-209.49	14,363,740.984	888,953.840	39.521821655°N	107.664628358°W	
3,200.00	11.53	211.84	3,151.44	-355.48	-220.71	14,363,722.908	888,942.618	39.521771155°N	107.664666217°W	
3,300.00	10.03	211.84	3,249.67	-371.37	-230.58	14,363,707.012	888,932.748	39.521726743°N	107.664699511°W	
3,400.00	8.53	211.84	3,348.36	-385.08	-239.09	14,363,693.306	888,924.238	39.521688449°N	107.664728219°W	
3,500.00	7.03	211.84	3,447.44	-396.59	-246.24	14,363,681.799	888,917.093	39.521656300°N	107.664752320°W	
3,600.00	5.53	211.84	3,546.83	-405.89	-252.01	14,363,672.500	888,911.319	39.521630318°N	107.664771798°W	
3,700.00	4.03	211.84	3,646.48	-412.97	-256.41	14,363,665.414	888,906.919	39.521610521°N	107.664786639°W	
3,800.00	2.53	211.84	3,746.31	-417.84	-259.44	14,363,660.546	888,903.897	39.521596922°N	107.664796834°W	
3,888.73	1.20	211.84	3,835.00	-420.30	-260.96	14,363,658.088	888,902.371	39.521590053°N	107.664801984°W	
Mesaverde										
3,900.00	1.03	211.84	3,846.26	-420.48	-261.08	14,363,657.901	888,902.255	39.521589531°N	107.664802375°W	
3,968.97	0.00	0.00	3,915.23	-421.01	-261.41	14,363,657.372	888,901.926	39.521588053°N	107.664803483°W	
Vertical at 3969 MD/3915 TVD										
4,000.00	0.00	0.00	3,946.26	-421.01	-261.41	14,363,657.372	888,901.926	39.521588053°N	107.664803483°W	
4,100.00	0.00	0.00	4,046.26	-421.01	-261.41	14,363,657.372	888,901.926	39.521588053°N	107.664803483°W	

# Planning Report - Geographic

<b>Database:</b>	EDM 5000 SERVER DB	<b>Local Co-ordinate Reference:</b>	Well Antero O'Toole A02 (111317) - Slot A02
<b>Company:</b>	Antero Resources	<b>TVD Reference:</b>	KB @ 5673.00ft (Original Well Elev)
<b>Project:</b>	O'Toole	<b>MD Reference:</b>	KB @ 5673.00ft (Original Well Elev)
<b>Site:</b>	O'Toole A Pad	<b>North Reference:</b>	Grid
<b>Well:</b>	Antero O'Toole A02 (111317)	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	O'Toole A02		
<b>Design:</b>	O'Toole A02 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
4,200.00	0.00	0.00	4,146.26	-421.01	-261.41	14,363,657.372	888,901.926	39.521588053°N	107.664803483°W
4,300.00	0.00	0.00	4,246.26	-421.01	-261.41	14,363,657.372	888,901.926	39.521588053°N	107.664803483°W
4,400.00	0.00	0.00	4,346.26	-421.01	-261.41	14,363,657.372	888,901.926	39.521588053°N	107.664803483°W
4,500.00	0.00	0.00	4,446.26	-421.01	-261.41	14,363,657.372	888,901.926	39.521588053°N	107.664803483°W
4,600.00	0.00	0.00	4,546.26	-421.01	-261.41	14,363,657.372	888,901.926	39.521588053°N	107.664803483°W
4,688.74	0.00	0.00	4,635.00	-421.01	-261.41	14,363,657.372	888,901.926	39.521588053°N	107.664803483°W
Price Coal									
4,700.00	0.00	0.00	4,646.26	-421.01	-261.41	14,363,657.372	888,901.926	39.521588053°N	107.664803483°W
4,800.00	0.00	0.00	4,746.26	-421.01	-261.41	14,363,657.372	888,901.926	39.521588053°N	107.664803483°W
4,900.00	0.00	0.00	4,846.26	-421.01	-261.41	14,363,657.372	888,901.926	39.521588053°N	107.664803483°W
5,000.00	0.00	0.00	4,946.26	-421.01	-261.41	14,363,657.372	888,901.926	39.521588053°N	107.664803483°W
5,100.00	0.00	0.00	5,046.26	-421.01	-261.41	14,363,657.372	888,901.926	39.521588053°N	107.664803483°W
5,200.00	0.00	0.00	5,146.26	-421.01	-261.41	14,363,657.372	888,901.926	39.521588053°N	107.664803483°W
5,300.00	0.00	0.00	5,246.26	-421.01	-261.41	14,363,657.372	888,901.926	39.521588053°N	107.664803483°W
5,400.00	0.00	0.00	5,346.26	-421.01	-261.41	14,363,657.372	888,901.926	39.521588053°N	107.664803483°W
5,500.00	0.00	0.00	5,446.26	-421.01	-261.41	14,363,657.372	888,901.926	39.521588053°N	107.664803483°W
5,563.74	0.00	0.00	5,510.00	-421.01	-261.41	14,363,657.372	888,901.926	39.521588053°N	107.664803483°W
Top Gas									
5,600.00	0.00	0.00	5,546.26	-421.01	-261.41	14,363,657.372	888,901.926	39.521588053°N	107.664803483°W
5,700.00	0.00	0.00	5,646.26	-421.01	-261.41	14,363,657.372	888,901.926	39.521588053°N	107.664803483°W
5,800.00	0.00	0.00	5,746.26	-421.01	-261.41	14,363,657.372	888,901.926	39.521588053°N	107.664803483°W
5,900.00	0.00	0.00	5,846.26	-421.01	-261.41	14,363,657.372	888,901.926	39.521588053°N	107.664803483°W
6,000.00	0.00	0.00	5,946.26	-421.01	-261.41	14,363,657.372	888,901.926	39.521588053°N	107.664803483°W
6,100.00	0.00	0.00	6,046.26	-421.01	-261.41	14,363,657.372	888,901.926	39.521588053°N	107.664803483°W
6,200.00	0.00	0.00	6,146.26	-421.01	-261.41	14,363,657.372	888,901.926	39.521588053°N	107.664803483°W
6,300.00	0.00	0.00	6,246.26	-421.01	-261.41	14,363,657.372	888,901.926	39.521588053°N	107.664803483°W
6,388.74	0.00	0.00	6,335.00	-421.01	-261.41	14,363,657.372	888,901.926	39.521588053°N	107.664803483°W
Cameo									
6,400.00	0.00	0.00	6,346.26	-421.01	-261.41	14,363,657.372	888,901.926	39.521588053°N	107.664803483°W
6,500.00	0.00	0.00	6,446.26	-421.01	-261.41	14,363,657.372	888,901.926	39.521588053°N	107.664803483°W
6,600.00	0.00	0.00	6,546.26	-421.01	-261.41	14,363,657.372	888,901.926	39.521588053°N	107.664803483°W
6,700.00	0.00	0.00	6,646.26	-421.01	-261.41	14,363,657.372	888,901.926	39.521588053°N	107.664803483°W
6,800.00	0.00	0.00	6,746.26	-421.01	-261.41	14,363,657.372	888,901.926	39.521588053°N	107.664803483°W
6,900.00	0.00	0.00	6,846.26	-421.01	-261.41	14,363,657.372	888,901.926	39.521588053°N	107.664803483°W
7,000.00	0.00	0.00	6,946.26	-421.01	-261.41	14,363,657.372	888,901.926	39.521588053°N	107.664803483°W
7,100.00	0.00	0.00	7,046.26	-421.01	-261.41	14,363,657.372	888,901.926	39.521588053°N	107.664803483°W
7,200.00	0.00	0.00	7,146.26	-421.01	-261.41	14,363,657.372	888,901.926	39.521588053°N	107.664803483°W
7,300.00	0.00	0.00	7,246.26	-421.01	-261.41	14,363,657.372	888,901.926	39.521588053°N	107.664803483°W
7,400.00	0.00	0.00	7,346.26	-421.01	-261.41	14,363,657.372	888,901.926	39.521588053°N	107.664803483°W
7,488.74	0.00	0.00	7,435.00	-421.01	-261.41	14,363,657.372	888,901.926	39.521588053°N	107.664803483°W
Rollins									
7,500.00	0.00	0.00	7,446.26	-421.01	-261.41	14,363,657.372	888,901.926	39.521588053°N	107.664803483°W
7,600.00	0.00	0.00	7,546.26	-421.01	-261.41	14,363,657.372	888,901.926	39.521588053°N	107.664803483°W
7,688.74	0.00	0.00	7,635.00	-421.01	-261.41	14,363,657.372	888,901.926	39.521588053°N	107.664803483°W
TD at 7689 MD/7635 TVD									

## Planning Report - Geographic

<b>Database:</b>	EDM 5000 SERVER DB	<b>Local Co-ordinate Reference:</b>	Well Antero O'Toole A02 (111317) - Slot A02
<b>Company:</b>	Antero Resources	<b>TVD Reference:</b>	KB @ 5673.00ft (Original Well Elev)
<b>Project:</b>	O'Toole	<b>MD Reference:</b>	KB @ 5673.00ft (Original Well Elev)
<b>Site:</b>	O'Toole A Pad	<b>North Reference:</b>	Grid
<b>Well:</b>	Antero O'Toole A02 (111317)	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	O'Toole A02		
<b>Design:</b>	O'Toole A02 P01		

Design Targets									
Target Name	Dip Angle	Dip Dir.	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
- hit/miss target	(°)	(°)	(ft)	(ft)	(ft)	(usft)	(usft)		
- Shape									
A02 BH	0.00	360.00	4,635.00	-421.01	-261.41	14,363,657.372	888,901.926	39.521588053°N	107.664803483°W
- plan hits target center									
- Circle (radius 25.00)									

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

Formations						
Measured Depth	Vertical Depth	Name		Lithology	Dip	Dip Direction
(ft)	(ft)				(°)	(°)
0.00	0.00	Wasatch				
3,888.73	3,835.00	Mesaverde				
4,688.74	4,635.00	Price Coal				
5,563.74	5,510.00	Top Gas				
6,388.74	6,335.00	Cameo				
7,488.74	7,435.00	Rollins				

Plan Annotations					
Measured Depth	Vertical Depth	Local Coordinates		Comment	
(ft)	(ft)	+N/-S (ft)	+E/-W (ft)		
1,060.00	1,060.00	0.00	0.00	Build 1.5°/100 at 1060 MD/TVD	
2,060.00	2,048.62	-110.57	-68.65	Hold 15.0° at 2060 MD/2145 TVD	
2,968.97	2,926.61	-310.44	-192.75	Drop 1.5°/100 at 2969 MD/2927 TVD	
3,968.97	3,915.23	-421.01	-261.41	Vertical at 3969 MD/3915 TVD	
7,688.74	7,635.00	-421.01	-261.41	TD at 7689 MD/7635 TVD	