



REFERENCE INFORMATION
Co-ordinate (N/E) Reference: Well McPherson A01 (111358) - Slot A01, Grid North
Vertical (TVD) Reference: KB @ 5472.00ft (Original Well Elev)
Section (VS) Reference: Slot - A01(0.00N, 0.00E)
Measured Depth Reference: KB @ 5472.00ft (Original Well Elev)
Calculation Method: Minimum Curvature

PROJECT DETAILS: McPherson
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

SECTION DETAILS									
MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	VSect	Target
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
1120.00	0.00	0.00	1120.00	0.00	0.00	0.00	0.00	0.00	
1975.01	17.10	283.78	1962.37	30.17	-123.00	2.00	283.78	126.65	
4130.56	17.10	283.78	4022.63	181.17	-738.58	0.00	0.00	760.47	
4985.57	0.00	0.00	4865.00	211.34	-861.57	2.00	180.00	887.12	
7760.57	0.00	0.00	7640.00	211.34	-861.57	0.00	0.00	887.12	A01 BH

# **Antero Resources**

**McPherson**

**McPherson A Pad**

**McPherson A01 (111358) - Slot A01**

**A01**

**Plan: McPherson A01 P02**

## **Standard Planning Report - Geographic**

**03 August, 2011**

# ARK Directional Services

## Planning Report - Geographic

<b>Database:</b>	EDM 5000 SERVER DB	<b>Local Co-ordinate Reference:</b>	Well McPherson A01 (111358) - Slot A01
<b>Company:</b>	Antero Resources	<b>TVD Reference:</b>	KB @ 5472.00ft (Original Well Elev)
<b>Project:</b>	McPherson	<b>MD Reference:</b>	KB @ 5472.00ft (Original Well Elev)
<b>Site:</b>	McPherson A Pad	<b>North Reference:</b>	Grid
<b>Well:</b>	McPherson A01 (111358)	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	A01		
<b>Design:</b>	McPherson A01 P02		

<b>Project</b>	McPherson		
<b>Map System:</b>	Universal Transverse Mercator	<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)		

<b>Site</b>	McPherson A Pad				
<b>Site Position:</b>	<b>Northing:</b>	14,367,218.62 usft	<b>Latitude:</b>	39.531108419°N	
<b>From:</b>	Map	<b>Easting:</b>	885,836.08 usft	<b>Longitude:</b>	107.676038841°W
<b>Position Uncertainty:</b>	0.00 ft	<b>Slot Radius:</b>	13.20 in	<b>Grid Convergence:</b>	-1.70 °

<b>Well</b>	McPherson A01 (111358) - Slot A01					
<b>Well Position</b>	<b>+N/-S</b>	0.00 ft	<b>Northing:</b>	14,367,218.50 usft	<b>Latitude:</b>	39.531108898°N
	<b>+E/-W</b>	0.00 ft	<b>Easting:</b>	885,846.08 usft	<b>Longitude:</b>	107.676003400°W
<b>Position Uncertainty</b>		0.00 ft	<b>Wellhead Elevation:</b>		<b>Ground Level:</b>	5,448.00 ft

<b>Wellbore</b>	A01				
<b>Magnetics</b>	<b>Model Name</b>	<b>Sample Date</b>	<b>Declination</b>	<b>Dip Angle</b>	<b>Field Strength</b>
	IGRF2010	03/11/2011	(°)	(°)	(nT)
			10.16	65.82	52,276

<b>Design</b>	McPherson A01 P02			
<b>Audit Notes:</b>				
<b>Version:</b>	<b>Phase:</b>	PLAN	<b>Tie On Depth:</b>	0.00
<b>Vertical Section:</b>	<b>Depth From (TVD)</b>	<b>+N/-S</b>	<b>+E/-W</b>	<b>Direction</b>
	(ft)	(ft)	(ft)	(°)
	0.00	0.00	0.00	283.78

<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	
1,120.00	0.00	0.00	1,120.00	0.00	0.00	0.00	0.00	0.00	0.00	
1,975.01	17.10	283.78	1,962.37	30.17	-123.00	2.00	2.00	0.00	283.78	
4,130.56	17.10	283.78	4,022.63	181.17	-738.58	0.00	0.00	0.00	0.00	
4,985.57	0.00	0.00	4,865.00	211.34	-861.57	2.00	-2.00	0.00	180.00	
7,760.57	0.00	0.00	7,640.00	211.34	-861.57	0.00	0.00	0.00	0.00	A01 BH

# ARK Directional Services

## Planning Report - Geographic

<b>Database:</b>	EDM 5000 SERVER DB	<b>Local Co-ordinate Reference:</b>	Well McPherson A01 (111358) - Slot A01
<b>Company:</b>	Antero Resources	<b>TVD Reference:</b>	KB @ 5472.00ft (Original Well Elev)
<b>Project:</b>	McPherson	<b>MD Reference:</b>	KB @ 5472.00ft (Original Well Elev)
<b>Site:</b>	McPherson A Pad	<b>North Reference:</b>	Grid
<b>Well:</b>	McPherson A01 (111358)	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	A01		
<b>Design:</b>	McPherson A01 P02		

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	14,367,218.50	885,846.08	39.531108898°N	107.676003400°W	
100.00	0.00	0.00	100.00	0.00	0.00	14,367,218.50	885,846.08	39.531108898°N	107.676003400°W	
200.00	0.00	0.00	200.00	0.00	0.00	14,367,218.50	885,846.08	39.531108898°N	107.676003400°W	
300.00	0.00	0.00	300.00	0.00	0.00	14,367,218.50	885,846.08	39.531108898°N	107.676003400°W	
400.00	0.00	0.00	400.00	0.00	0.00	14,367,218.50	885,846.08	39.531108898°N	107.676003400°W	
500.00	0.00	0.00	500.00	0.00	0.00	14,367,218.50	885,846.08	39.531108898°N	107.676003400°W	
600.00	0.00	0.00	600.00	0.00	0.00	14,367,218.50	885,846.08	39.531108898°N	107.676003400°W	
700.00	0.00	0.00	700.00	0.00	0.00	14,367,218.50	885,846.08	39.531108898°N	107.676003400°W	
800.00	0.00	0.00	800.00	0.00	0.00	14,367,218.50	885,846.08	39.531108898°N	107.676003400°W	
900.00	0.00	0.00	900.00	0.00	0.00	14,367,218.50	885,846.08	39.531108898°N	107.676003400°W	
1,000.00	0.00	0.00	1,000.00	0.00	0.00	14,367,218.50	885,846.08	39.531108898°N	107.676003400°W	
1,030.00	0.00	0.00	1,030.00	0.00	0.00	14,367,218.50	885,846.08	39.531108898°N	107.676003400°W	
<b>Surf Csg at 1030 MD/1000 TVD</b>										
1,100.00	0.00	0.00	1,100.00	0.00	0.00	14,367,218.50	885,846.08	39.531108898°N	107.676003400°W	
1,120.00	0.00	0.00	1,120.00	0.00	0.00	14,367,218.50	885,846.08	39.531108898°N	107.676003400°W	
<b>KOP 2°/100 at 1120 MD/TVD</b>										
1,200.00	1.60	283.78	1,199.99	0.27	-1.08	14,367,218.77	885,845.00	39.531109539°N	107.676007272°W	
1,300.00	3.60	283.78	1,299.88	1.35	-5.49	14,367,219.85	885,840.59	39.531112144°N	107.676022993°W	
1,400.00	5.60	283.78	1,399.55	3.26	-13.28	14,367,221.76	885,832.80	39.531116750°N	107.676050787°W	
1,500.00	7.60	283.78	1,498.89	6.00	-24.44	14,367,224.50	885,821.64	39.531123350°N	107.676090621°W	
1,600.00	9.60	283.78	1,597.76	9.56	-38.96	14,367,228.06	885,807.12	39.531131938°N	107.676142445°W	
1,700.00	11.60	283.78	1,696.05	13.94	-56.83	14,367,232.44	885,789.26	39.531142502°N	107.676206197°W	
1,800.00	13.60	283.78	1,793.63	19.14	-78.01	14,367,237.64	885,768.07	39.531155029°N	107.676281799°W	
1,900.00	15.60	283.78	1,890.40	25.14	-102.49	14,367,243.64	885,743.59	39.531169504°N	107.676369158°W	
1,975.01	17.10	283.78	1,962.37	30.17	-123.00	14,367,248.67	885,723.08	39.531181631°N	107.676442340°W	
<b>Hold 17° at 1975 MD/1962 TVD</b>										
2,000.00	17.10	283.78	1,986.26	31.92	-130.14	14,367,250.42	885,715.95	39.531185851°N	107.676467808°W	
2,100.00	17.10	283.78	2,081.84	38.93	-158.69	14,367,257.43	885,687.39	39.531202737°N	107.676569720°W	
2,200.00	17.10	283.78	2,177.42	45.93	-187.25	14,367,264.43	885,658.83	39.531219624°N	107.676671631°W	
2,300.00	17.10	283.78	2,273.00	52.94	-215.81	14,367,271.44	885,630.27	39.531236511°N	107.676773543°W	
2,400.00	17.10	283.78	2,368.58	59.94	-244.37	14,367,278.44	885,601.72	39.531253397°N	107.676875454°W	
2,500.00	17.10	283.78	2,464.15	66.95	-272.93	14,367,285.45	885,573.16	39.531270283°N	107.676977366°W	
2,600.00	17.10	283.78	2,559.73	73.95	-301.48	14,367,292.45	885,544.60	39.531287169°N	107.677079278°W	
2,700.00	17.10	283.78	2,655.31	80.96	-330.04	14,367,299.46	885,516.04	39.531304056°N	107.677181190°W	
2,800.00	17.10	283.78	2,750.89	87.96	-358.60	14,367,306.46	885,487.49	39.531320942°N	107.677283101°W	
2,900.00	17.10	283.78	2,846.47	94.97	-387.16	14,367,313.47	885,458.93	39.531337828°N	107.677385013°W	
3,000.00	17.10	283.78	2,942.05	101.97	-415.71	14,367,320.47	885,430.37	39.531354713°N	107.677486925°W	
3,100.00	17.10	283.78	3,037.63	108.98	-444.27	14,367,327.48	885,401.81	39.531371599°N	107.677588837°W	
3,200.00	17.10	283.78	3,133.21	115.98	-472.83	14,367,334.48	885,373.25	39.531388485°N	107.677690749°W	
3,300.00	17.10	283.78	3,228.79	122.99	-501.39	14,367,341.49	885,344.70	39.531405370°N	107.677792661°W	
3,400.00	17.10	283.78	3,324.37	129.99	-529.94	14,367,348.49	885,316.14	39.531422256°N	107.677894573°W	
3,500.00	17.10	283.78	3,419.95	137.00	-558.50	14,367,355.50	885,287.58	39.531439141°N	107.677996485°W	
3,600.00	17.10	283.78	3,515.53	144.00	-587.06	14,367,362.50	885,259.02	39.531456026°N	107.678098397°W	
3,700.00	17.10	283.78	3,611.11	151.01	-615.62	14,367,369.51	885,230.47	39.531472912°N	107.678200310°W	
3,800.00	17.10	283.78	3,706.68	158.01	-644.18	14,367,376.51	885,201.91	39.531489797°N	107.678302222°W	
3,900.00	17.10	283.78	3,802.26	165.02	-672.73	14,367,383.52	885,173.35	39.531506682°N	107.678404134°W	
4,000.00	17.10	283.78	3,897.84	172.02	-701.29	14,367,390.52	885,144.79	39.531523567°N	107.678506047°W	
4,100.00	17.10	283.78	3,993.42	179.03	-729.85	14,367,397.53	885,116.24	39.531540452°N	107.678607959°W	
4,130.56	17.10	283.78	4,022.63	181.17	-738.58	14,367,399.67	885,107.51	39.531545612°N	107.678639103°W	
<b>Drop 2°/100 at 4131 MD/4023 TVD</b>										
4,200.00	15.71	283.78	4,089.24	185.84	-757.62	14,367,404.34	885,088.46	39.531556873°N	107.678707077°W	
4,216.36	15.38	283.78	4,105.00	186.89	-761.88	14,367,405.39	885,084.20	39.531559391°N	107.678722272°W	
<b>Mesaverde</b>										
4,300.00	13.71	283.78	4,185.96	191.89	-782.29	14,367,410.39	885,063.80	39.531571455°N	107.678795088°W	

# ARK Directional Services

## Planning Report - Geographic

<b>Database:</b>	EDM 5000 SERVER DB	<b>Local Co-ordinate Reference:</b>	Well McPherson A01 (111358) - Slot A01
<b>Company:</b>	Antero Resources	<b>TVD Reference:</b>	KB @ 5472.00ft (Original Well Elev)
<b>Project:</b>	McPherson	<b>MD Reference:</b>	KB @ 5472.00ft (Original Well Elev)
<b>Site:</b>	McPherson A Pad	<b>North Reference:</b>	Grid
<b>Well:</b>	McPherson A01 (111358)	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	A01		
<b>Design:</b>	McPherson A01 P02		

Planned Survey										
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude	
4,400.00	11.71	283.78	4,283.50	197.13	-803.65	14,367,415.63	885,042.43	39.531584089°N	107.678871348°W	
4,500.00	9.71	283.78	4,381.76	201.56	-821.70	14,367,420.06	885,024.38	39.531594761°N	107.678935762°W	
4,600.00	7.71	283.78	4,480.60	205.17	-836.41	14,367,423.67	885,009.67	39.531603458°N	107.678988253°W	
4,700.00	5.71	283.78	4,579.91	207.95	-847.76	14,367,426.45	884,998.32	39.531610168°N	107.679028756°W	
4,800.00	3.71	283.78	4,679.56	209.91	-855.74	14,367,428.41	884,990.34	39.531614884°N	107.679057222°W	
4,900.00	1.71	283.78	4,779.45	211.04	-860.33	14,367,429.54	884,985.75	39.531617600°N	107.679073616°W	
4,985.57	0.00	0.00	4,865.00	211.34	-861.57	14,367,429.84	884,984.51	39.531618334°N	107.679078044°W	
<b>Vertical at 4986 MD/4865 TVD - Price Coal</b>										
5,000.00	0.00	0.00	4,879.43	211.34	-861.57	14,367,429.84	884,984.51	39.531618334°N	107.679078044°W	
5,100.00	0.00	0.00	4,979.43	211.34	-861.57	14,367,429.84	884,984.51	39.531618334°N	107.679078044°W	
5,200.00	0.00	0.00	5,079.43	211.34	-861.57	14,367,429.84	884,984.51	39.531618334°N	107.679078044°W	
5,300.00	0.00	0.00	5,179.43	211.34	-861.57	14,367,429.84	884,984.51	39.531618334°N	107.679078044°W	
5,400.00	0.00	0.00	5,279.43	211.34	-861.57	14,367,429.84	884,984.51	39.531618334°N	107.679078044°W	
5,500.00	0.00	0.00	5,379.43	211.34	-861.57	14,367,429.84	884,984.51	39.531618334°N	107.679078044°W	
5,600.00	0.00	0.00	5,479.43	211.34	-861.57	14,367,429.84	884,984.51	39.531618334°N	107.679078044°W	
5,700.00	0.00	0.00	5,579.43	211.34	-861.57	14,367,429.84	884,984.51	39.531618334°N	107.679078044°W	
5,800.00	0.00	0.00	5,679.43	211.34	-861.57	14,367,429.84	884,984.51	39.531618334°N	107.679078044°W	
5,885.57	0.00	0.00	5,765.00	211.34	-861.57	14,367,429.84	884,984.51	39.531618334°N	107.679078044°W	
<b>Top Gas</b>										
5,900.00	0.00	0.00	5,779.43	211.34	-861.57	14,367,429.84	884,984.51	39.531618334°N	107.679078044°W	
6,000.00	0.00	0.00	5,879.43	211.34	-861.57	14,367,429.84	884,984.51	39.531618334°N	107.679078044°W	
6,100.00	0.00	0.00	5,979.43	211.34	-861.57	14,367,429.84	884,984.51	39.531618334°N	107.679078044°W	
6,200.00	0.00	0.00	6,079.43	211.34	-861.57	14,367,429.84	884,984.51	39.531618334°N	107.679078044°W	
6,300.00	0.00	0.00	6,179.43	211.34	-861.57	14,367,429.84	884,984.51	39.531618334°N	107.679078044°W	
6,400.00	0.00	0.00	6,279.43	211.34	-861.57	14,367,429.84	884,984.51	39.531618334°N	107.679078044°W	
6,500.00	0.00	0.00	6,379.43	211.34	-861.57	14,367,429.84	884,984.51	39.531618334°N	107.679078044°W	
6,600.00	0.00	0.00	6,479.43	211.34	-861.57	14,367,429.84	884,984.51	39.531618334°N	107.679078044°W	
6,700.00	0.00	0.00	6,579.43	211.34	-861.57	14,367,429.84	884,984.51	39.531618334°N	107.679078044°W	
6,710.57	0.00	0.00	6,590.00	211.34	-861.57	14,367,429.84	884,984.51	39.531618334°N	107.679078044°W	
<b>Cameo</b>										
6,800.00	0.00	0.00	6,679.43	211.34	-861.57	14,367,429.84	884,984.51	39.531618334°N	107.679078044°W	
6,900.00	0.00	0.00	6,779.43	211.34	-861.57	14,367,429.84	884,984.51	39.531618334°N	107.679078044°W	
7,000.00	0.00	0.00	6,879.43	211.34	-861.57	14,367,429.84	884,984.51	39.531618334°N	107.679078044°W	
7,100.00	0.00	0.00	6,979.43	211.34	-861.57	14,367,429.84	884,984.51	39.531618334°N	107.679078044°W	
7,200.00	0.00	0.00	7,079.43	211.34	-861.57	14,367,429.84	884,984.51	39.531618334°N	107.679078044°W	
7,300.00	0.00	0.00	7,179.43	211.34	-861.57	14,367,429.84	884,984.51	39.531618334°N	107.679078044°W	
7,400.00	0.00	0.00	7,279.43	211.34	-861.57	14,367,429.84	884,984.51	39.531618334°N	107.679078044°W	
7,500.00	0.00	0.00	7,379.43	211.34	-861.57	14,367,429.84	884,984.51	39.531618334°N	107.679078044°W	
7,600.00	0.00	0.00	7,479.43	211.34	-861.57	14,367,429.84	884,984.51	39.531618334°N	107.679078044°W	
7,610.57	0.00	0.00	7,490.00	211.34	-861.57	14,367,429.84	884,984.51	39.531618334°N	107.679078044°W	
<b>Rollins</b>										
7,700.00	0.00	0.00	7,579.43	211.34	-861.57	14,367,429.84	884,984.51	39.531618334°N	107.679078044°W	
7,760.57	0.00	0.00	7,640.00	211.34	-861.57	14,367,429.84	884,984.51	39.531618334°N	107.679078044°W	
<b>A01 BH</b>										

# ARK Directional Services

## Planning Report - Geographic

<b>Database:</b>	EDM 5000 SERVER DB	<b>Local Co-ordinate Reference:</b>	Well McPherson A01 (111358) - Slot A01
<b>Company:</b>	Antero Resources	<b>TVD Reference:</b>	KB @ 5472.00ft (Original Well Elev)
<b>Project:</b>	McPherson	<b>MD Reference:</b>	KB @ 5472.00ft (Original Well Elev)
<b>Site:</b>	McPherson A Pad	<b>North Reference:</b>	Grid
<b>Well:</b>	McPherson A01 (111358)	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	A01		
<b>Design:</b>	McPherson A01 P02		

Design Targets									
Target Name	Dip Angle (°)	Dip Dir. (°)	TVD (ft)	+N/-S (ft)	+E/-W (ft)	Northing (usft)	Easting (usft)	Latitude	Longitude
A01 BH - plan hits target center - Circle (radius 25.00)	0.00	360.00	7,640.00	211.34	-861.57	14,367,429.84	884,984.51	39.531618334°N	107.679078044°W

Casing Points					
Measured Depth (ft)	Vertical Depth (ft)	Name	Casing Diameter (in)	Hole Diameter (in)	
1,030.00	1,030.00	Surf Csg at 1030 MD/1000 TVD	5.50	6.00	

Formations					
Measured Depth (ft)	Vertical Depth (ft)	Name	Lithology	Dip (°)	Dip Direction (°)
4,216.36	4,105.00	Mesaverde			
4,985.57	4,865.00	Price Coal			
5,885.57	5,765.00	Top Gas			
6,710.57	6,590.00	Cameo			
7,610.57	7,490.00	Rollins			

Plan Annotations					
Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment	
		+N/-S (ft)	+E/-W (ft)		
1,120.00	1,120.00	0.00	0.00	KOP 2°/100 at 1120 MD/TVD	
1,975.01	1,962.37	30.17	-123.00	Hold 17° at 1975 MD/1962 TVD	
4,130.56	4,022.63	181.17	-738.58	Drop 2°/100 at 4131 MD/4023 TVD	
4,985.57	4,865.00	211.34	-861.57	Vertical at 4986 MD/4865 TVD	
7,760.57	7,640.00	211.34	-861.57	TD at 7761 MD/7640 TVD	