



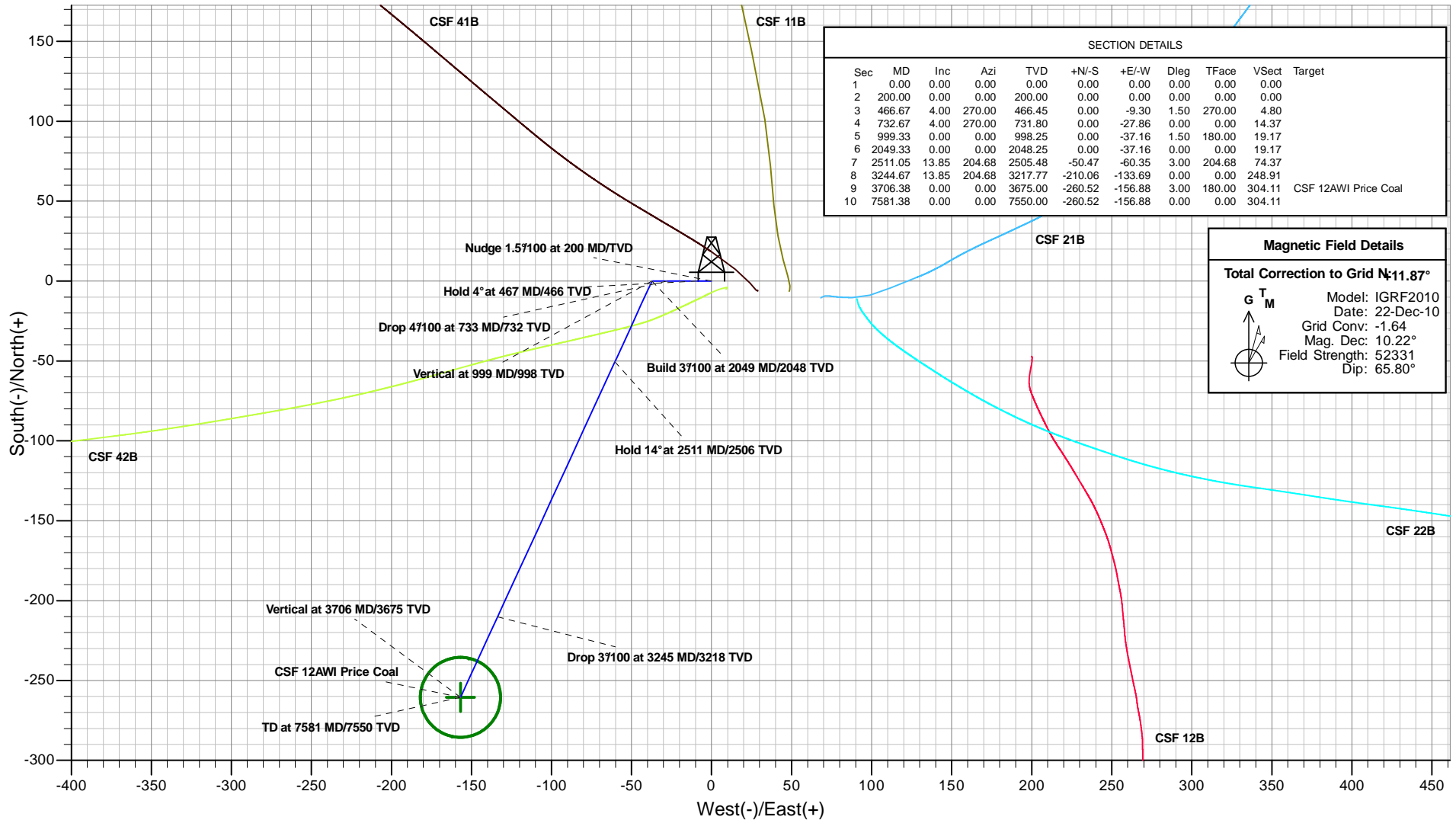
Antero Resources

CSF 12AWI-08-07-91 (111251)



PLAN VIEW

Project: Castle Springs Federal
 Site: CSF T Pad
 Well: CSF 12AWI-08-07-91 (111251)
 Wellbore: CSF 12AWI
 Design: CSF 12AWI P01



Plan: CSF 12AWI P01
 Created By: ARK Directional Services
 Date: 14:51, September 22 2010

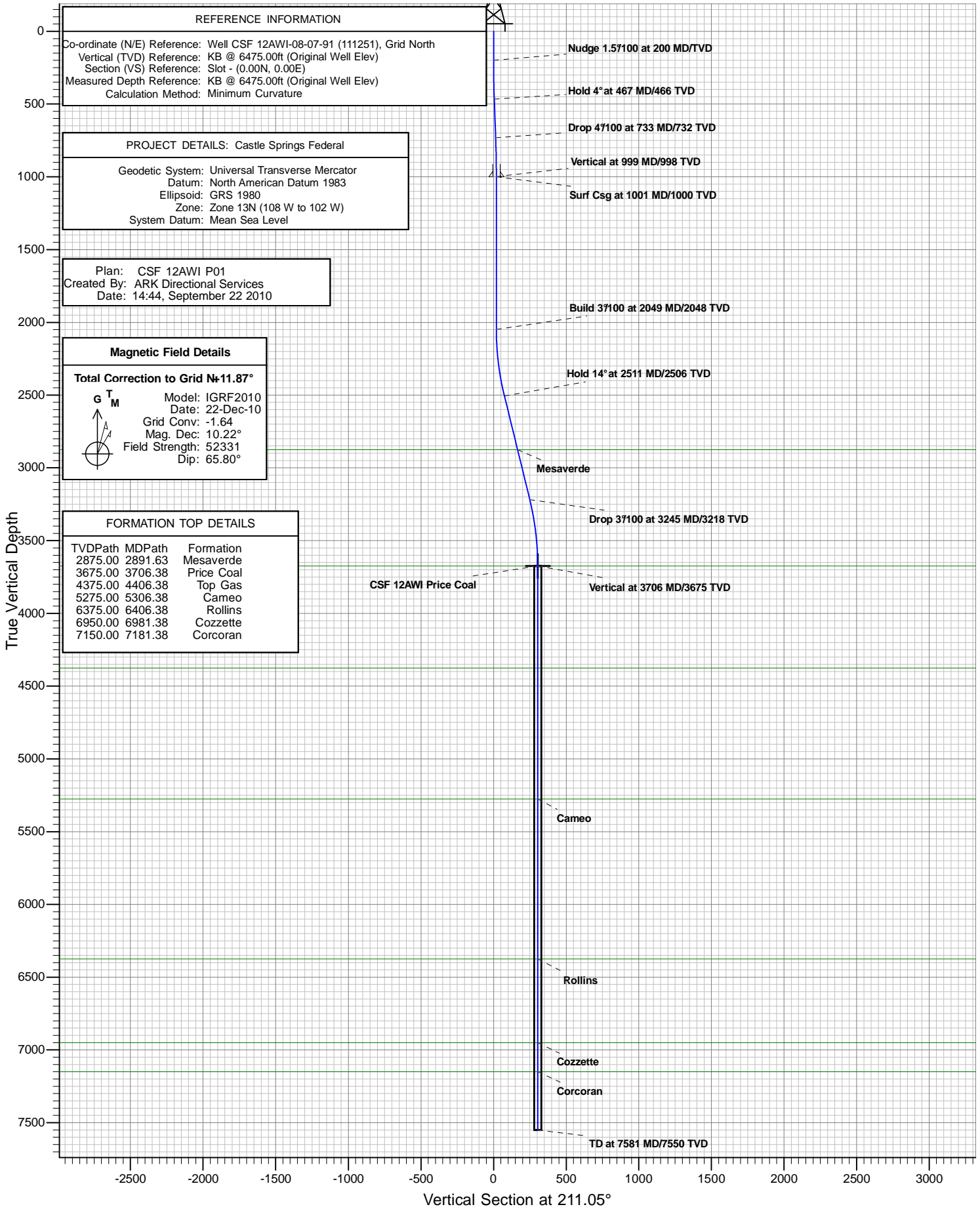
PROJECT DETAILS: Castle Springs Federal

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 CSF 12AWI-08-07-91 (111251), Grid North
 Vertical (TVD) Reference: KB @ 6475.00ft (Original Well Elev)
 Section (VS) Reference: Slot - (0.00N, 0.00E)
 Measured Depth Reference: KB @ 6475.00ft (Original Well Elev)
 Calculation Method: Minimum Curvature

VERTICAL SECTION VIEW



Antero Resources

Castle Springs Federal

CSF T Pad

CSF 12AWI-08-07-91 (111251)

CSF 12AWI

Plan: CSF 12AWI P01

Standard Planning Report - Geographic

22 September, 2010

ARK Directional Services

Planning Report - Geographic

Database:	EDM SERVER DB	Local Co-ordinate Reference:	Well CSF 12AWI-08-07-91 (111251)
Company:	Antero Resources	TVD Reference:	KB @ 6475.00ft (Original Well Elev)
Project:	Castle Springs Federal	MD Reference:	KB @ 6475.00ft (Original Well Elev)
Site:	CSF T Pad	North Reference:	Grid
Well:	CSF 12AWI-08-07-91 (111251)	Survey Calculation Method:	Minimum Curvature
Wellbore:	CSF 12AWI		
Design:	CSF 12AWI P01		

Project	Castle Springs Federal		
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	CSF T Pad				
Site Position:	Northing:	14,342,039.093 usft	Latitude:	39.464062872°N	
From:	Map	Easting:	911,229.958 usft	Longitude:	107.583509317°W
Position Uncertainty:	0.00 ft	Slot Radius:	13.20 in	Grid Convergence:	-1.64 °

Well	CSF 12AWI-08-07-91 (111251)					
Well Position	+N/-S	0.00 ft	Northing:	14,342,039.093 usft	Latitude:	39.464062872°N
	+E/-W	0.00 ft	Easting:	911,229.958 usft	Longitude:	107.583509317°W
Position Uncertainty		0.00 ft	Wellhead Elevation:		Ground Level:	6,451.00 ft

Wellbore	CSF 12AWI				
Magnetics	Model Name	Sample Date	Declination	Dip Angle	Field Strength
	IGRF2010	2010/12/22	(°)	(°)	(nT)
			10.22	65.80	52,331

Design	CSF 12AWI P01			
Audit Notes:				
Version:	Phase:	PROTOTYPE	Tie On Depth:	0.00
Vertical Section:	Depth From (TVD)	+N/-S	+E/-W	Direction
	(ft)	(ft)	(ft)	(°)
	3,675.00	0.00	0.00	211.05

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	
200.00	0.00	0.00	200.00	0.00	0.00	0.00	0.00	0.00	0.00	
466.67	4.00	270.00	466.45	0.00	-9.30	1.50	1.50	0.00	270.00	
732.67	4.00	270.00	731.80	0.00	-27.86	0.00	0.00	0.00	0.00	
999.33	0.00	0.00	998.25	0.00	-37.16	1.50	-1.50	0.00	180.00	
2,049.33	0.00	0.00	2,048.25	0.00	-37.16	0.00	0.00	0.00	0.00	
2,511.05	13.85	204.68	2,505.48	-50.47	-60.35	3.00	3.00	0.00	204.68	
3,244.67	13.85	204.68	3,217.77	-210.06	-133.69	0.00	0.00	0.00	0.00	
3,706.38	0.00	0.00	3,675.00	-260.52	-156.88	3.00	-3.00	0.00	180.00	CSF 12AWI Price Co
7,581.38	0.00	0.00	7,550.00	-260.52	-156.88	0.00	0.00	0.00	0.00	

ARK Directional Services

Planning Report - Geographic

Database:	EDM SERVER DB	Local Co-ordinate Reference:	Well CSF 12AWI-08-07-91 (111251)
Company:	Antero Resources	TVD Reference:	KB @ 6475.00ft (Original Well Elev)
Project:	Castle Springs Federal	MD Reference:	KB @ 6475.00ft (Original Well Elev)
Site:	CSF T Pad	North Reference:	Grid
Well:	CSF 12AWI-08-07-91 (111251)	Survey Calculation Method:	Minimum Curvature
Wellbore:	CSF 12AWI		
Design:	CSF 12AWI 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	14,342,039.093	911,229.958	39.464062872°N	107.583509317°W	
100.00	0.00	0.00	100.00	0.00	0.00	14,342,039.093	911,229.958	39.464062872°N	107.583509317°W	
200.00	0.00	0.00	200.00	0.00	0.00	14,342,039.093	911,229.958	39.464062872°N	107.583509317°W	
Nudge 1.5°/100 at 200 MD/TVD										
300.00	1.50	270.00	299.99	0.00	-1.31	14,342,039.093	911,228.649	39.464062769°N	107.583513950°W	
400.00	3.00	270.00	399.91	0.00	-5.23	14,342,039.093	911,224.723	39.464062460°N	107.583527846°W	
466.67	4.00	270.00	466.45	0.00	-9.30	14,342,039.093	911,220.653	39.464062140°N	107.583542252°W	
Hold 4° at 467 MD/466 TVD										
500.00	4.00	270.00	499.70	0.00	-11.63	14,342,039.093	911,218.328	39.464061957°N	107.583550482°W	
600.00	4.00	270.00	599.46	0.00	-18.61	14,342,039.093	911,211.352	39.464061408°N	107.583575174°W	
700.00	4.00	270.00	699.22	0.00	-25.58	14,342,039.093	911,204.377	39.464060859°N	107.583599865°W	
732.67	4.00	270.00	731.80	0.00	-27.86	14,342,039.093	911,202.098	39.464060680°N	107.583607930°W	
Drop 4°/100 at 733 MD/732 TVD										
800.00	2.99	270.00	799.01	0.00	-31.96	14,342,039.093	911,197.993	39.464060357°N	107.583622459°W	
900.00	1.49	270.00	898.93	0.00	-35.87	14,342,039.093	911,194.085	39.464060049°N	107.583636294°W	
999.33	0.00	0.00	998.25	0.00	-37.16	14,342,039.093	911,192.793	39.464059948°N	107.583640865°W	
Vertical at 999 MD/998 TVD										
1,000.00	0.00	0.00	998.92	0.00	-37.16	14,342,039.093	911,192.793	39.464059948°N	107.583640865°W	
1,001.00	0.00	0.00	999.92	0.00	-37.16	14,342,039.093	911,192.793	39.464059948°N	107.583640865°W	
Surf Csg at 1001 MD/1000 TVD										
1,100.00	0.00	0.00	1,098.92	0.00	-37.16	14,342,039.093	911,192.793	39.464059948°N	107.583640865°W	
1,200.00	0.00	0.00	1,198.92	0.00	-37.16	14,342,039.093	911,192.793	39.464059948°N	107.583640865°W	
1,300.00	0.00	0.00	1,298.92	0.00	-37.16	14,342,039.093	911,192.793	39.464059948°N	107.583640865°W	
1,400.00	0.00	0.00	1,398.92	0.00	-37.16	14,342,039.093	911,192.793	39.464059948°N	107.583640865°W	
1,500.00	0.00	0.00	1,498.92	0.00	-37.16	14,342,039.093	911,192.793	39.464059948°N	107.583640865°W	
1,600.00	0.00	0.00	1,598.92	0.00	-37.16	14,342,039.093	911,192.793	39.464059948°N	107.583640865°W	
1,700.00	0.00	0.00	1,698.92	0.00	-37.16	14,342,039.093	911,192.793	39.464059948°N	107.583640865°W	
1,800.00	0.00	0.00	1,798.92	0.00	-37.16	14,342,039.093	911,192.793	39.464059948°N	107.583640865°W	
1,900.00	0.00	0.00	1,898.92	0.00	-37.16	14,342,039.093	911,192.793	39.464059948°N	107.583640865°W	
2,000.00	0.00	0.00	1,998.92	0.00	-37.16	14,342,039.093	911,192.793	39.464059948°N	107.583640865°W	
2,049.33	0.00	0.00	2,048.25	0.00	-37.16	14,342,039.093	911,192.793	39.464059948°N	107.583640865°W	
Build 3°/100 at 2049 MD/2048 TVD										
2,100.00	1.52	204.68	2,098.91	-0.61	-37.45	14,342,038.482	911,192.513	39.464058250°N	107.583641797°W	
2,200.00	4.52	204.68	2,198.76	-5.40	-39.64	14,342,033.695	911,190.313	39.464044944°N	107.583649096°W	
2,300.00	7.52	204.68	2,298.20	-14.93	-44.02	14,342,024.167	911,185.935	39.464018456°N	107.583663626°W	
2,400.00	10.52	204.68	2,396.95	-29.17	-50.57	14,342,009.923	911,179.390	39.463978860°N	107.583685348°W	
2,500.00	13.52	204.68	2,494.75	-48.09	-59.26	14,341,991.002	911,170.695	39.463926263°N	107.583714201°W	
2,511.05	13.85	204.68	2,505.48	-50.47	-60.35	14,341,988.626	911,169.604	39.463919660°N	107.583717824°W	
Hold 14° at 2511 MD/2506 TVD										
2,600.00	13.85	204.68	2,591.85	-69.82	-69.25	14,341,969.276	911,160.712	39.463865870°N	107.583747332°W	
2,700.00	13.85	204.68	2,688.94	-91.57	-79.24	14,341,947.522	911,150.716	39.463805399°N	107.583780505°W	
2,800.00	13.85	204.68	2,786.03	-113.32	-89.24	14,341,925.768	911,140.720	39.463744927°N	107.583813678°W	
2,891.63	13.85	204.68	2,875.00	-133.26	-98.40	14,341,905.834	911,131.561	39.463689515°N	107.583844076°W	
Mesaverde										
2,900.00	13.85	204.68	2,883.12	-135.08	-99.23	14,341,904.014	911,130.725	39.463684455°N	107.583846851°W	
3,000.00	13.85	204.68	2,980.22	-156.83	-109.23	14,341,882.260	911,120.729	39.463623983°N	107.583880025°W	
3,100.00	13.85	204.68	3,077.31	-178.59	-119.23	14,341,860.506	911,110.733	39.463563512°N	107.583913198°W	
3,200.00	13.85	204.68	3,174.40	-200.34	-129.22	14,341,838.753	911,100.737	39.463503040°N	107.583946371°W	
3,244.67	13.85	204.68	3,217.77	-210.06	-133.69	14,341,829.036	911,096.272	39.463476029°N	107.583961188°W	
Drop 3°/100 at 3245 MD/3218 TVD										
3,300.00	12.19	204.68	3,271.68	-221.39	-138.89	14,341,817.707	911,091.066	39.463444539°N	107.583978463°W	
3,400.00	9.19	204.68	3,369.93	-238.24	-146.64	14,341,800.852	911,083.321	39.463397683°N	107.584004166°W	
3,500.00	6.19	204.68	3,469.02	-250.40	-152.22	14,341,788.692	911,077.734	39.463363880°N	107.584022709°W	

ARK Directional Services

Planning Report - Geographic

Database:	EDM SERVER DB	Local Co-ordinate Reference:	Well CSF 12AWI-08-07-91 (111251)
Company:	Antero Resources	TVD Reference:	KB @ 6475.00ft (Original Well Elev)
Project:	Castle Springs Federal	MD Reference:	KB @ 6475.00ft (Original Well Elev)
Site:	CSF T Pad	North Reference:	Grid
Well:	CSF 12AWI-08-07-91 (111251)	Survey Calculation Method:	Minimum Curvature
Wellbore:	CSF 12AWI		
Design:	CSF 12AWI 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	
3,600.00	3.19	204.68	3,568.67	-257.83	-155.64	14,341,781.261	911,074.319	39.463343223°N	107.584034041°W	
3,700.00	0.19	204.68	3,668.62	-260.51	-156.87	14,341,778.579	911,073.087	39.463335768°N	107.584038131°W	
3,706.38	0.00	0.00	3,675.00	-260.52	-156.88	14,341,778.569	911,073.082	39.463335741°N	107.584038146°W	
Vertical at 3706 MD/3675 TVD - Price Coal - CSF 12AWI Price Coal										
3,800.00	0.00	0.00	3,768.62	-260.52	-156.88	14,341,778.569	911,073.082	39.463335741°N	107.584038146°W	
3,900.00	0.00	0.00	3,868.62	-260.52	-156.88	14,341,778.569	911,073.082	39.463335741°N	107.584038146°W	
4,000.00	0.00	0.00	3,968.62	-260.52	-156.88	14,341,778.569	911,073.082	39.463335741°N	107.584038146°W	
4,100.00	0.00	0.00	4,068.62	-260.52	-156.88	14,341,778.569	911,073.082	39.463335741°N	107.584038146°W	
4,200.00	0.00	0.00	4,168.62	-260.52	-156.88	14,341,778.569	911,073.082	39.463335741°N	107.584038146°W	
4,300.00	0.00	0.00	4,268.62	-260.52	-156.88	14,341,778.569	911,073.082	39.463335741°N	107.584038146°W	
4,400.00	0.00	0.00	4,368.62	-260.52	-156.88	14,341,778.569	911,073.082	39.463335741°N	107.584038146°W	
4,406.38	0.00	0.00	4,375.00	-260.52	-156.88	14,341,778.569	911,073.082	39.463335741°N	107.584038146°W	
Top Gas										
4,500.00	0.00	0.00	4,468.62	-260.52	-156.88	14,341,778.569	911,073.082	39.463335741°N	107.584038146°W	
4,600.00	0.00	0.00	4,568.62	-260.52	-156.88	14,341,778.569	911,073.082	39.463335741°N	107.584038146°W	
4,700.00	0.00	0.00	4,668.62	-260.52	-156.88	14,341,778.569	911,073.082	39.463335741°N	107.584038146°W	
4,800.00	0.00	0.00	4,768.62	-260.52	-156.88	14,341,778.569	911,073.082	39.463335741°N	107.584038146°W	
4,900.00	0.00	0.00	4,868.62	-260.52	-156.88	14,341,778.569	911,073.082	39.463335741°N	107.584038146°W	
5,000.00	0.00	0.00	4,968.62	-260.52	-156.88	14,341,778.569	911,073.082	39.463335741°N	107.584038146°W	
5,100.00	0.00	0.00	5,068.62	-260.52	-156.88	14,341,778.569	911,073.082	39.463335741°N	107.584038146°W	
5,200.00	0.00	0.00	5,168.62	-260.52	-156.88	14,341,778.569	911,073.082	39.463335741°N	107.584038146°W	
5,300.00	0.00	0.00	5,268.62	-260.52	-156.88	14,341,778.569	911,073.082	39.463335741°N	107.584038146°W	
5,306.38	0.00	0.00	5,275.00	-260.52	-156.88	14,341,778.569	911,073.082	39.463335741°N	107.584038146°W	
Cameo										
5,400.00	0.00	0.00	5,368.62	-260.52	-156.88	14,341,778.569	911,073.082	39.463335741°N	107.584038146°W	
5,500.00	0.00	0.00	5,468.62	-260.52	-156.88	14,341,778.569	911,073.082	39.463335741°N	107.584038146°W	
5,600.00	0.00	0.00	5,568.62	-260.52	-156.88	14,341,778.569	911,073.082	39.463335741°N	107.584038146°W	
5,700.00	0.00	0.00	5,668.62	-260.52	-156.88	14,341,778.569	911,073.082	39.463335741°N	107.584038146°W	
5,800.00	0.00	0.00	5,768.62	-260.52	-156.88	14,341,778.569	911,073.082	39.463335741°N	107.584038146°W	
5,900.00	0.00	0.00	5,868.62	-260.52	-156.88	14,341,778.569	911,073.082	39.463335741°N	107.584038146°W	
6,000.00	0.00	0.00	5,968.62	-260.52	-156.88	14,341,778.569	911,073.082	39.463335741°N	107.584038146°W	
6,100.00	0.00	0.00	6,068.62	-260.52	-156.88	14,341,778.569	911,073.082	39.463335741°N	107.584038146°W	
6,200.00	0.00	0.00	6,168.62	-260.52	-156.88	14,341,778.569	911,073.082	39.463335741°N	107.584038146°W	
6,300.00	0.00	0.00	6,268.62	-260.52	-156.88	14,341,778.569	911,073.082	39.463335741°N	107.584038146°W	
6,400.00	0.00	0.00	6,368.62	-260.52	-156.88	14,341,778.569	911,073.082	39.463335741°N	107.584038146°W	
6,406.38	0.00	0.00	6,375.00	-260.52	-156.88	14,341,778.569	911,073.082	39.463335741°N	107.584038146°W	
Rollins										
6,500.00	0.00	0.00	6,468.62	-260.52	-156.88	14,341,778.569	911,073.082	39.463335741°N	107.584038146°W	
6,600.00	0.00	0.00	6,568.62	-260.52	-156.88	14,341,778.569	911,073.082	39.463335741°N	107.584038146°W	
6,700.00	0.00	0.00	6,668.62	-260.52	-156.88	14,341,778.569	911,073.082	39.463335741°N	107.584038146°W	
6,800.00	0.00	0.00	6,768.62	-260.52	-156.88	14,341,778.569	911,073.082	39.463335741°N	107.584038146°W	
6,900.00	0.00	0.00	6,868.62	-260.52	-156.88	14,341,778.569	911,073.082	39.463335741°N	107.584038146°W	
6,981.38	0.00	0.00	6,950.00	-260.52	-156.88	14,341,778.569	911,073.082	39.463335741°N	107.584038146°W	
Cozzette										
7,000.00	0.00	0.00	6,968.62	-260.52	-156.88	14,341,778.569	911,073.082	39.463335741°N	107.584038146°W	
7,100.00	0.00	0.00	7,068.62	-260.52	-156.88	14,341,778.569	911,073.082	39.463335741°N	107.584038146°W	
7,181.38	0.00	0.00	7,150.00	-260.52	-156.88	14,341,778.569	911,073.082	39.463335741°N	107.584038146°W	
Corcoran										
7,200.00	0.00	0.00	7,168.62	-260.52	-156.88	14,341,778.569	911,073.082	39.463335741°N	107.584038146°W	
7,300.00	0.00	0.00	7,268.62	-260.52	-156.88	14,341,778.569	911,073.082	39.463335741°N	107.584038146°W	
7,400.00	0.00	0.00	7,368.62	-260.52	-156.88	14,341,778.569	911,073.082	39.463335741°N	107.584038146°W	
7,500.00	0.00	0.00	7,468.62	-260.52	-156.88	14,341,778.569	911,073.082	39.463335741°N	107.584038146°W	
7,581.38	0.00	0.00	7,550.00	-260.52	-156.88	14,341,778.569	911,073.082	39.463335741°N	107.584038146°W	
TD at 7581 MD/7550 TVD										

ARK Directional Services

Planning Report - Geographic

Database:	EDM SERVER DB	Local Co-ordinate Reference:	Well CSF 12AWI-08-07-91 (111251)
Company:	Antero Resources	TVD Reference:	KB @ 6475.00ft (Original Well Elev)
Project:	Castle Springs Federal	MD Reference:	KB @ 6475.00ft (Original Well Elev)
Site:	CSF T Pad	North Reference:	Grid
Well:	CSF 12AWI-08-07-91 (111251)	Survey Calculation Method:	Minimum Curvature
Wellbore:	CSF 12AWI		
Design:	CSF 12AWI 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									
CSF 12AWI Price Coal - plan hits target center - Circle (radius 25.00)	0.00	360.00	3,675.00	-260.52	-156.88	14,341,778.569	911,073.082	39.463335741°N	107.584038146°W

Casing Points					
Measured Depth	Vertical Depth	Name	Casing Diameter	Hole Diameter	
(ft)	(ft)		(in)	(in)	
1,001.00	999.92	Surf Csg at 1001 MD/1000 TVD	5.50	6.00	

Formations						
Measured Depth	Vertical Depth	Name	Lithology	Dip	Dip Direction	
(ft)	(ft)			(°)	(°)	
2,891.63	2,875.00	Mesaverde				
3,706.38	3,675.00	Price Coal				
4,406.38	4,375.00	Top Gas				
5,306.38	5,275.00	Cameo				
6,406.38	6,375.00	Rollins				
6,981.38	6,950.00	Cozzette				
7,181.38	7,150.00	Corcoran				

Plan Annotations					
Measured Depth	Vertical Depth	Local Coordinates		Comment	
(ft)	(ft)	+N/-S	+E/-W		
		(ft)	(ft)		
200.00	200.00	0.00	0.00	Nudge 1.5°/100 at 200 MD/TVD	
466.67	466.45	0.00	-9.30	Hold 4° at 467 MD/466 TVD	
732.67	731.80	0.00	-27.86	Drop 4°/100 at 733 MD/732 TVD	
999.33	998.25	0.00	-37.16	Vertical at 999 MD/998 TVD	
2,049.33	2,048.25	0.00	-37.16	Build 3°/100 at 2049 MD/2048 TVD	
2,511.05	2,505.48	-50.47	-60.35	Hold 14° at 2511 MD/2506 TVD	
3,244.67	3,217.77	-210.06	-133.69	Drop 3°/100 at 3245 MD/3218 TVD	
3,706.38	3,675.00	-260.52	-156.88	Vertical at 3706 MD/3675 TVD	
7,581.38	7,550.00	-260.52	-156.88	TD at 7581 MD/7550 TVD	