



# **Piceance Energy, LLC**

**Mesa County, CO**

**Piceance 28-05**

**Piceance 28-03W**

**Slot A-1**

**Plan: Design #1**

## **Standard Planning Report**

**29 April, 2015**

# **Archer**



Project: Mesa County, CO  
Site: Piceance 28-05  
Well: Piceance 28-03W  
Wellbore: Slot A-1  
Design: Design #1  
Latitude: 39° 15' 4.280 N  
Longitude: 107° 46' 46.710 W  
Ground Level: 7556.00  
Well @ 7578.00usft

# Archer

### PROJECT DETAILS: Mesa County, CO

Geodetic System: US State Plane 1983  
Datum: North American Datum 1983  
Ellipsoid: GRS 1980  
Zone: Colorado Central Zone  
System Datum: Mean Sea Level

### REFERENCE INFORMATION

Co-ordinate (N/E) Reference: Well Piceance 28-03W, True North  
Vertical (TVD) Reference: Well @ 7578.00usft  
Section (VS) Reference: Slot - (0.00N, 0.00E)  
Measured Depth Reference: Well @ 7578.00usft  
Calculation Method: Minimum Curvature

### WELL DETAILS: Piceance 28-03W

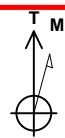
+N/-S	+E/-W	Northing	Ground Level: Easting	Latitude	Longitude	Slot
0.00	0.00	1524478.964	2354514.290	39° 15' 4.280 N	107° 46' 46.710 W	

### WELLBORE TARGET DETAILS (MAP CO-ORDINATES AND LAT/LONG)

Name	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude	Shape
Piceance federal 28-03W tgt	7883.00	891.34	-306.77	1525377.715	2354229.982	39° 15' 13.090 N	107° 46' 50.610 W	Circle (Radius: 50.00)

### SECTION DETAILS

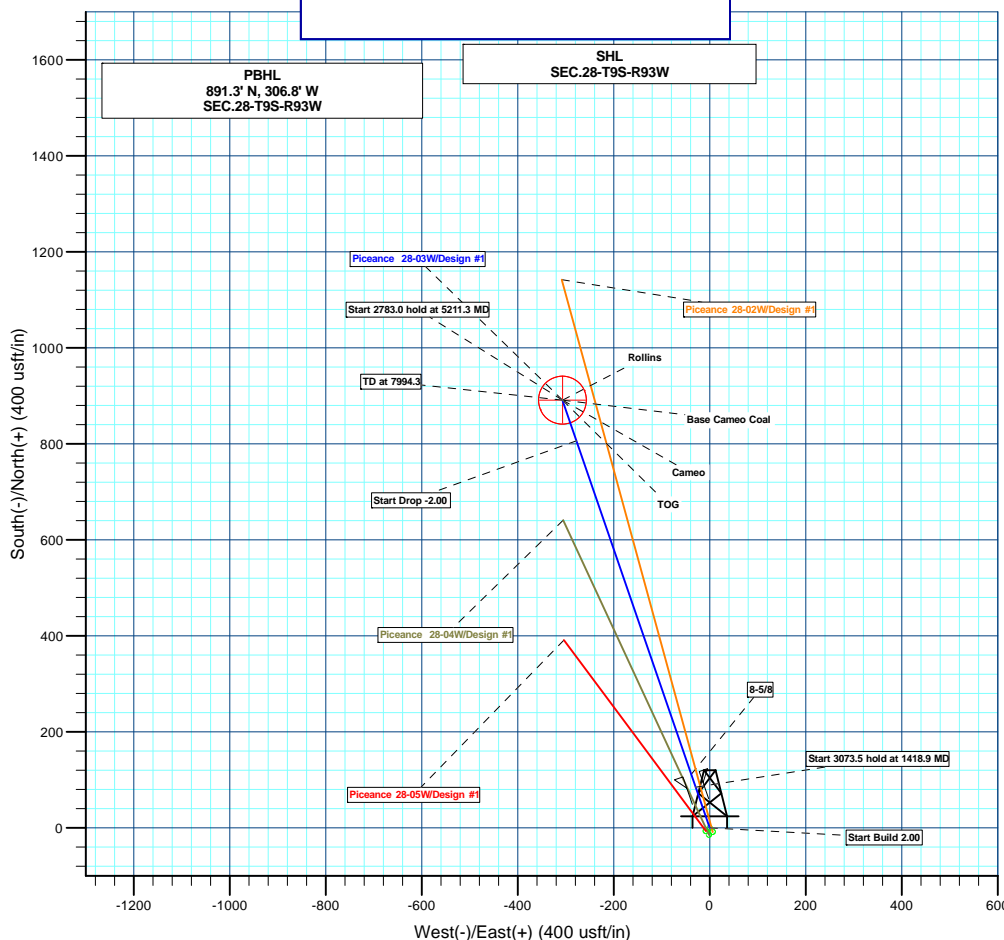
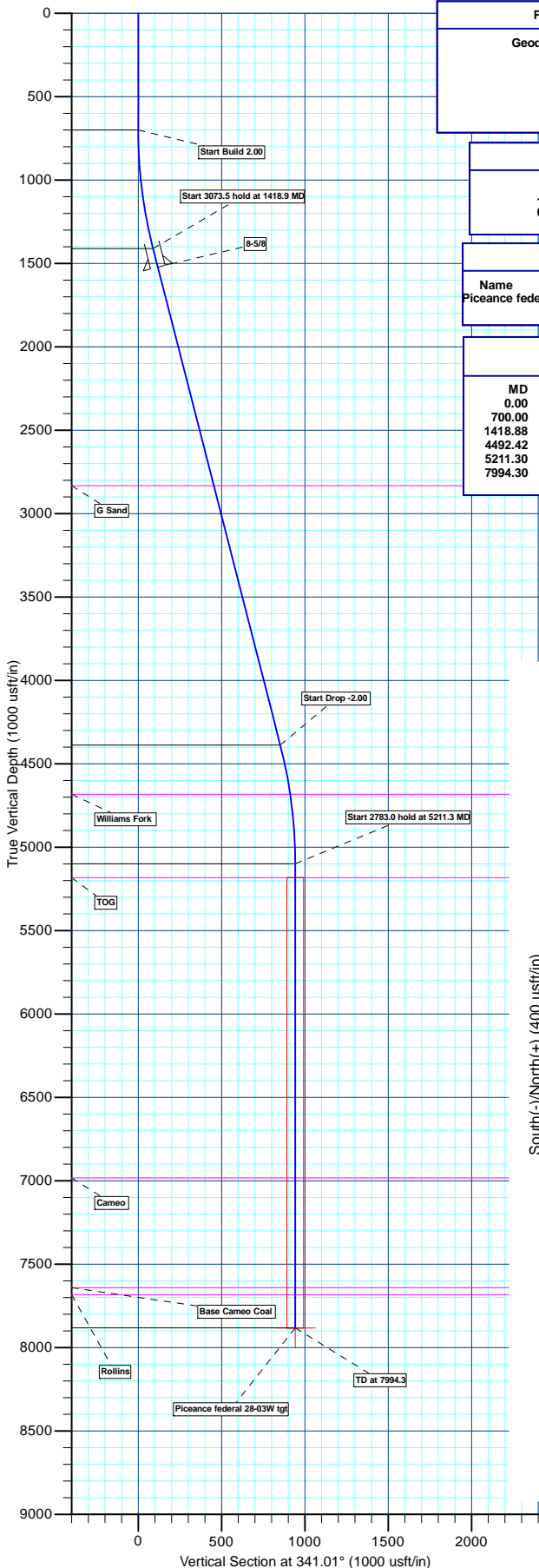
MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	VSec	Annotation
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
700.00	0.00	0.00	700.00	0.00	0.00	0.00	0.00	0.00	Start Build 2.00
1418.88	14.38	341.01	1411.36	84.84	-29.20	2.00	341.01	89.72	Start 3073.5 hold at 1418.9 MD
4492.42	14.38	341.01	4388.64	806.49	-277.57	0.00	0.00	852.92	Start Drop -2.00
5211.30	0.00	0.00	5100.00	891.33	-306.77	2.00	180.00	942.64	Start 2783.0 hold at 5211.3 MD
7994.30	0.00	0.00	7883.00	891.33	-306.77	0.00	0.00	942.64	TD at 7994.3



Azimuths to True North  
Magnetic North: 9.72°  
Magnetic Field  
Strength: 51741.9snT  
Dip Angle: 65.47°  
Date: 04/27/2015  
Model: IGRF2010

### FORMATION TOP DETAILS

TVDPPath	MDPath	Formation
2833.00	2886.49	G Sand
4683.00	4792.82	Williams Fork
5183.00	5294.30	TOG
6983.00	7094.30	Cameo
7641.00	7752.30	Base Cameo Coal
7683.00	7794.30	Rollins



Plan: Design #1 (Piceance 28-03W/Slot A-1)

Created By: Ricky Osburn Date: 8:24, April 29 2015



<b>Database:</b>	EDMDBBW	<b>Local Co-ordinate Reference:</b>	Well Piceance 28-03W
<b>Company:</b>	Piceance Energy, LLC	<b>TVD Reference:</b>	Well @ 7578.00usft
<b>Project:</b>	Mesa County, CO	<b>MD Reference:</b>	Well @ 7578.00usft
<b>Site:</b>	Piceance 28-05	<b>North Reference:</b>	True
<b>Well:</b>	Piceance 28-03W	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Slot A-1		
<b>Design:</b>	Design #1		

Project	Mesa County, CO		
Map System:	US State Plane 1983	System Datum:	Mean Sea Level
Geo Datum:	North American Datum 1983		
Map Zone:	Colorado Central Zone		

Site	Piceance 28-05				
Site Position:		Northing:	1,524,375.785 usft	Latitude:	39° 15' 3.280 N
From:	Lat/Long	Easting:	2,354,593.535 usft	Longitude:	107° 46' 45.670 W
Position Uncertainty:	0.00 usft	Slot Radius:	13-3/16"	Grid Convergence:	-1.44 °

Well	Piceance 28-03W					
Well Position	+N/-S	101.16 usft	Northing:	1,524,478.964 usft	Latitude:	39° 15' 4.280 N
	+E/-W	-81.81 usft	Easting:	2,354,514.290 usft	Longitude:	107° 46' 46.710 W
Position Uncertainty		0.00 usft	Wellhead Elevation:	0.00 usft	Ground Level:	7,556.00 usft

Wellbore	Slot A-1				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	2015/04/27	9.73	65.47	51,742

Design	Design #1			
Audit Notes:				
Version:	Phase:	PLAN	Tie On Depth:	0.00
Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)	Direction (°)
	0.00	0.00	0.00	341.01

Plan Sections										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	TFO (°)	Target
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
700.00	0.00	0.00	700.00	0.00	0.00	0.00	0.00	0.00	0.00	
1,418.88	14.38	341.01	1,411.36	84.84	-29.20	2.00	2.00	0.00	341.01	
4,492.42	14.38	341.01	4,388.64	806.49	-277.57	0.00	0.00	0.00	0.00	
5,211.30	0.00	0.00	5,100.00	891.33	-306.77	2.00	-2.00	0.00	180.00	
7,994.30	0.00	0.00	7,883.00	891.33	-306.77	0.00	0.00	0.00	0.00	Piceance federal 28-0



Database:	EDMDBBW	Local Co-ordinate Reference:	Well Piceance 28-03W
Company:	Piceance Energy, LLC	TVD Reference:	Well @ 7578.00usft
Project:	Mesa County, CO	MD Reference:	Well @ 7578.00usft
Site:	Piceance 28-05	North Reference:	True
Well:	Piceance 28-03W	Survey Calculation Method:	Minimum Curvature
Wellbore:	Slot A-1		
Design:	Design #1		

Planned Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
100.00	0.00	0.00	100.00	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
300.00	0.00	0.00	300.00	0.00	0.00	0.00	0.00	0.00	0.00
400.00	0.00	0.00	400.00	0.00	0.00	0.00	0.00	0.00	0.00
500.00	0.00	0.00	500.00	0.00	0.00	0.00	0.00	0.00	0.00
600.00	0.00	0.00	600.00	0.00	0.00	0.00	0.00	0.00	0.00
Start Build 2.00									
700.00	0.00	0.00	700.00	0.00	0.00	0.00	0.00	0.00	0.00
800.00	2.00	341.01	799.98	1.65	-0.57	1.75	2.00	2.00	0.00
900.00	4.00	341.01	899.84	6.60	-2.27	6.98	2.00	2.00	0.00
1,000.00	6.00	341.01	999.45	14.84	-5.11	15.69	2.00	2.00	0.00
1,100.00	8.00	341.01	1,098.70	26.36	-9.07	27.88	2.00	2.00	0.00
1,200.00	10.00	341.01	1,197.47	41.15	-14.16	43.52	2.00	2.00	0.00
1,300.00	12.00	341.01	1,295.62	59.19	-20.37	62.60	2.00	2.00	0.00
1,400.00	14.00	341.01	1,393.06	80.46	-27.69	85.10	2.00	2.00	0.00
Start 3073.5 hold at 1418.9 MD									
1,418.88	14.38	341.01	1,411.36	84.84	-29.20	89.72	2.00	2.00	0.00
1,500.00	14.38	341.01	1,489.94	103.89	-35.75	109.87	0.00	0.00	0.00
8-5/8									
1,533.10	14.38	341.01	1,522.00	111.66	-38.43	118.09	0.00	0.00	0.00
1,600.00	14.38	341.01	1,586.81	127.37	-43.84	134.70	0.00	0.00	0.00
1,700.00	14.38	341.01	1,683.67	150.85	-51.92	159.53	0.00	0.00	0.00
1,800.00	14.38	341.01	1,780.54	174.32	-60.00	184.36	0.00	0.00	0.00
1,900.00	14.38	341.01	1,877.41	197.80	-68.08	209.19	0.00	0.00	0.00
2,000.00	14.38	341.01	1,974.28	221.28	-76.16	234.02	0.00	0.00	0.00
2,100.00	14.38	341.01	2,071.15	244.76	-84.24	258.85	0.00	0.00	0.00
2,200.00	14.38	341.01	2,168.01	268.24	-92.32	283.69	0.00	0.00	0.00
2,300.00	14.38	341.01	2,264.88	291.72	-100.40	308.52	0.00	0.00	0.00
2,400.00	14.38	341.01	2,361.75	315.20	-108.48	333.35	0.00	0.00	0.00
2,500.00	14.38	341.01	2,458.62	338.68	-116.56	358.18	0.00	0.00	0.00
2,600.00	14.38	341.01	2,555.49	362.16	-124.64	383.01	0.00	0.00	0.00
2,700.00	14.38	341.01	2,652.35	385.64	-132.73	407.84	0.00	0.00	0.00
2,800.00	14.38	341.01	2,749.22	409.12	-140.81	432.67	0.00	0.00	0.00
G Sand									
2,886.49	14.38	341.01	2,833.00	429.43	-147.80	454.15	0.00	0.00	0.00
2,900.00	14.38	341.01	2,846.09	432.60	-148.89	457.50	0.00	0.00	0.00
3,000.00	14.38	341.01	2,942.96	456.08	-156.97	482.33	0.00	0.00	0.00
3,100.00	14.38	341.01	3,039.83	479.56	-165.05	507.17	0.00	0.00	0.00
3,200.00	14.38	341.01	3,136.70	503.04	-173.13	532.00	0.00	0.00	0.00
3,300.00	14.38	341.01	3,233.56	526.52	-181.21	556.83	0.00	0.00	0.00
3,400.00	14.38	341.01	3,330.43	550.00	-189.29	581.66	0.00	0.00	0.00
3,500.00	14.38	341.01	3,427.30	573.48	-197.37	606.49	0.00	0.00	0.00
3,600.00	14.38	341.01	3,524.17	596.95	-205.45	631.32	0.00	0.00	0.00
3,700.00	14.38	341.01	3,621.04	620.43	-213.54	656.15	0.00	0.00	0.00
3,800.00	14.38	341.01	3,717.90	643.91	-221.62	680.98	0.00	0.00	0.00
3,900.00	14.38	341.01	3,814.77	667.39	-229.70	705.81	0.00	0.00	0.00
4,000.00	14.38	341.01	3,911.64	690.87	-237.78	730.65	0.00	0.00	0.00
4,100.00	14.38	341.01	4,008.51	714.35	-245.86	755.48	0.00	0.00	0.00
4,200.00	14.38	341.01	4,105.38	737.83	-253.94	780.31	0.00	0.00	0.00
4,300.00	14.38	341.01	4,202.24	761.31	-262.02	805.14	0.00	0.00	0.00
4,400.00	14.38	341.01	4,299.11	784.79	-270.10	829.97	0.00	0.00	0.00
Start Drop -2.00									
4,492.42	14.38	341.01	4,388.64	806.49	-277.57	852.92	0.00	0.00	0.00



Database:	EDMDBBW	Local Co-ordinate Reference:	Well Piceance 28-03W
Company:	Piceance Energy, LLC	TVD Reference:	Well @ 7578.00usft
Project:	Mesa County, CO	MD Reference:	Well @ 7578.00usft
Site:	Piceance 28-05	North Reference:	True
Well:	Piceance 28-03W	Survey Calculation Method:	Minimum Curvature
Wellbore:	Slot A-1		
Design:	Design #1		

Planned Survey										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	
4,500.00	14.23	341.01	4,395.98	808.26	-278.18	854.79	2.00	-2.00	0.00	
4,600.00	12.23	341.01	4,493.32	829.89	-285.62	877.67	2.00	-2.00	0.00	
4,700.00	10.23	341.01	4,591.41	848.30	-291.96	897.14	2.00	-2.00	0.00	
Williams Fork										
4,792.82	8.37	341.01	4,683.00	862.48	-296.84	912.13	2.00	-2.00	0.00	
4,800.00	8.23	341.01	4,690.11	863.46	-297.18	913.17	2.00	-2.00	0.00	
4,900.00	6.23	341.01	4,789.31	875.35	-301.27	925.75	2.00	-2.00	0.00	
5,000.00	4.23	341.01	4,888.89	883.97	-304.23	934.85	2.00	-2.00	0.00	
5,100.00	2.23	341.01	4,988.72	889.29	-306.07	940.48	2.00	-2.00	0.00	
5,200.00	0.23	341.01	5,088.70	891.31	-306.76	942.62	2.00	-2.00	0.00	
Start 2783.0 hold at 5211.3 MD										
5,211.30	0.00	0.00	5,100.00	891.33	-306.77	942.64	2.00	-2.00	0.00	
TOG										
5,294.30	0.00	0.00	5,183.00	891.33	-306.77	942.64	0.00	0.00	0.00	
5,300.00	0.00	0.00	5,188.70	891.33	-306.77	942.64	0.00	0.00	0.00	
5,400.00	0.00	0.00	5,288.70	891.33	-306.77	942.64	0.00	0.00	0.00	
5,500.00	0.00	0.00	5,388.70	891.33	-306.77	942.64	0.00	0.00	0.00	
5,600.00	0.00	0.00	5,488.70	891.33	-306.77	942.64	0.00	0.00	0.00	
5,700.00	0.00	0.00	5,588.70	891.33	-306.77	942.64	0.00	0.00	0.00	
5,800.00	0.00	0.00	5,688.70	891.33	-306.77	942.64	0.00	0.00	0.00	
5,900.00	0.00	0.00	5,788.70	891.33	-306.77	942.64	0.00	0.00	0.00	
6,000.00	0.00	0.00	5,888.70	891.33	-306.77	942.64	0.00	0.00	0.00	
6,100.00	0.00	0.00	5,988.70	891.33	-306.77	942.64	0.00	0.00	0.00	
6,200.00	0.00	0.00	6,088.70	891.33	-306.77	942.64	0.00	0.00	0.00	
6,300.00	0.00	0.00	6,188.70	891.33	-306.77	942.64	0.00	0.00	0.00	
6,400.00	0.00	0.00	6,288.70	891.33	-306.77	942.64	0.00	0.00	0.00	
6,500.00	0.00	0.00	6,388.70	891.33	-306.77	942.64	0.00	0.00	0.00	
6,600.00	0.00	0.00	6,488.70	891.33	-306.77	942.64	0.00	0.00	0.00	
6,700.00	0.00	0.00	6,588.70	891.33	-306.77	942.64	0.00	0.00	0.00	
6,800.00	0.00	0.00	6,688.70	891.33	-306.77	942.64	0.00	0.00	0.00	
6,900.00	0.00	0.00	6,788.70	891.33	-306.77	942.64	0.00	0.00	0.00	
7,000.00	0.00	0.00	6,888.70	891.33	-306.77	942.64	0.00	0.00	0.00	
Cameo										
7,094.30	0.00	0.00	6,983.00	891.33	-306.77	942.64	0.00	0.00	0.00	
7,100.00	0.00	0.00	6,988.70	891.33	-306.77	942.64	0.00	0.00	0.00	
7,200.00	0.00	0.00	7,088.70	891.33	-306.77	942.64	0.00	0.00	0.00	
7,300.00	0.00	0.00	7,188.70	891.33	-306.77	942.64	0.00	0.00	0.00	
7,400.00	0.00	0.00	7,288.70	891.33	-306.77	942.64	0.00	0.00	0.00	
7,500.00	0.00	0.00	7,388.70	891.33	-306.77	942.64	0.00	0.00	0.00	
7,600.00	0.00	0.00	7,488.70	891.33	-306.77	942.64	0.00	0.00	0.00	
7,700.00	0.00	0.00	7,588.70	891.33	-306.77	942.64	0.00	0.00	0.00	
Base Cameo Coal										
7,752.30	0.00	0.00	7,641.00	891.33	-306.77	942.64	0.00	0.00	0.00	
Rollins										
7,794.30	0.00	0.00	7,683.00	891.33	-306.77	942.64	0.00	0.00	0.00	
7,800.00	0.00	0.00	7,688.70	891.33	-306.77	942.64	0.00	0.00	0.00	
7,900.00	0.00	0.00	7,788.70	891.33	-306.77	942.64	0.00	0.00	0.00	
TD at 7994.3										
7,994.30	0.00	0.00	7,883.00	891.33	-306.77	942.64	0.00	0.00	0.00	



<b>Database:</b>	EDMDBBW	<b>Local Co-ordinate Reference:</b>	Well Piceance 28-03W
<b>Company:</b>	Piceance Energy, LLC	<b>TVD Reference:</b>	Well @ 7578.00usft
<b>Project:</b>	Mesa County, CO	<b>MD Reference:</b>	Well @ 7578.00usft
<b>Site:</b>	Piceance 28-05	<b>North Reference:</b>	True
<b>Well:</b>	Piceance 28-03W	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Slot A-1		
<b>Design:</b>	Design #1		

Design Targets									
Target Name	Dip Angle (°)	Dip Dir. (°)	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Northing (usft)	Easting (usft)	Latitude	Longitude
- hit/miss target									
- Shape									
Piceance federal 28-03V	0.00	0.00	7,883.00	891.34	-306.77	1,525,377.715	2,354,229.982	39° 15' 13.090 N	107° 46' 50.610 W
- plan hits target center									
- Circle (radius 50.00)									

Casing Points				
Measured Depth (usft)	Vertical Depth (usft)	Name	Casing Diameter (")	Hole Diameter (")
1,533.10	1,522.00	8-5/8	8-5/8	12-1/4

Formations					
Measured Depth (usft)	Vertical Depth (usft)	Name	Lithology	Dip (°)	Dip Direction (°)
2,886.49	2,833.00	G Sand		0.00	
4,792.82	4,683.00	Williams Fork		0.00	
5,294.30	5,183.00	TOG		0.00	
7,094.30	6,983.00	Cameo		0.00	
7,752.30	7,641.00	Base Cameo Coal		0.00	
7,794.30	7,683.00	Rollins		0.00	

Plan Annotations				
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
700.00	700.00	0.00	0.00	Start Build 2.00
1,418.88	1,411.36	84.84	-29.20	Start 3073.5 hold at 1418.9 MD
4,492.42	4,388.64	806.49	-277.57	Start Drop -2.00
5,211.30	5,100.00	891.33	-306.77	Start 2783.0 hold at 5211.3 MD
7,994.30	7,883.00	891.33	-306.77	TD at 7994.3



# **Piceance Energy, LLC**

**Mesa County, CO**

**Piceance 28-05**

**Piceance federal 28-03W**

**Slot A-1**

**Design #1**

## **Anticollision Report**

**28 April, 2015**

# **Archer**



<b>Company:</b>	Piceance Energy, LLC	<b>Local Co-ordinate Reference:</b>	Well Piceance federal 28-03W
<b>Project:</b>	Mesa County, CO	<b>TVD Reference:</b>	Well @ 7578.0usft
<b>Reference Site:</b>	Piceance 28-05	<b>MD Reference:</b>	Well @ 7578.0usft
<b>Site Error:</b>	0.0 usft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Piceance federal 28-03W	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.0 usft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	Slot A-1	<b>Database:</b>	EDMDBBW
<b>Reference Design:</b>	Design #1	<b>Offset TVD Reference:</b>	Reference Datum

Reference	Design #1		
Filter type:	NO GLOBAL FILTER: Using user defined selection & filtering criteria		
Interpolation Method:	MD Interval 100.0usft	Error Model:	ISCWSA
Depth Range:	Unlimited	Scan Method:	Closest Approach 3D
Results Limited by:	Maximum center-center distance of 1,000.0 usft	Error Surface:	Elliptical Conic
Warning Levels Evaluated at:	2.00 Sigma	Casing Method:	Not applied

Survey Tool Program		Date	2015/04/28		
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description	
0.0	7,994.3	Design #1 (Slot A-1)	MWD	MWD - Standard	

Summary						
Site Name	Reference Measured Depth (usft)	Offset Measured Depth (usft)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Separation Factor	Warning
Offset Well - Wellbore - Design						
Piceance 28-05						
Piceance Federal 28-02W - Slot A-2 - Design #1	429.6	429.9	3.9	2.3	2.359	CC, ES, SF
Piceance Federal 28-04W - Slot B-2 - Design #1	363.9	364.3	7.4	6.0	5.294	CC, ES
Piceance Federal 28-04W - Slot B-2 - Design #1	2,200.0	2,190.5	36.4	22.2	2.561	SF
Piceance Federal 28-05W - Slot B-1 - Design #1	134.2	134.2	9.9	9.6	30.196	CC
Piceance Federal 28-05W - Slot B-1 - Design #1	200.0	200.0	10.1	9.4	16.101	ES
Piceance Federal 28-05W - Slot B-1 - Design #1	1,600.0	1,592.6	52.6	44.2	6.227	SF

Piceance 28-05 - Piceance Federal 28-02W - Slot A-2 - Design #1													Offset Site Error:	0.0 usft
Survey Program: 0-MWD													Offset Well Error:	0.0 usft
Reference		Offset		Semi Major Axis			Distance						Warning	
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor		
0.0	0.0	0.0	0.0	0.0	0.0	142.13	-8.1	6.3	10.3					
100.0	100.0	100.0	100.0	0.1	0.1	142.13	-8.1	6.3	10.3	10.1	0.18	58.479		
200.0	200.0	200.0	200.0	0.3	0.3	142.13	-8.1	6.3	10.3	9.6	0.62	16.408		
300.0	300.0	300.3	300.3	0.5	0.5	137.67	-6.4	5.8	8.7	7.6	1.08	8.039		
400.0	400.0	400.3	400.2	0.8	0.8	106.77	-1.3	4.4	4.6	3.1	1.53	3.027		
429.6	429.6	429.9	429.6	0.8	0.8	78.35	0.8	3.9	3.9	2.3	1.67	2.359	CC, ES, SF	
500.0	500.0	500.0	499.5	1.0	1.0	16.99	7.0	2.2	7.4	5.4	2.01	3.679		
600.0	600.0	598.7	597.4	1.2	1.3	-3.12	18.6	-1.0	18.8	16.3	2.48	7.578		
700.0	700.0	696.6	694.1	1.4	1.6	-8.59	33.3	-5.0	34.2	31.2	2.97	11.530		
800.0	800.0	793.7	789.4	1.7	2.0	8.26	51.0	-9.9	51.3	47.9	3.41	15.047		
900.0	899.8	890.2	883.5	1.9	2.4	7.37	71.7	-15.5	68.4	64.5	3.90	17.543		
1,000.0	999.5	986.2	976.3	2.1	2.8	6.98	95.3	-22.0	85.4	81.0	4.40	19.390		
1,100.0	1,098.7	1,081.6	1,067.8	2.4	3.4	6.83	121.7	-29.2	102.3	97.3	4.92	20.768		
1,200.0	1,197.5	1,176.6	1,157.8	2.7	3.9	6.82	150.9	-37.2	119.0	113.5	5.46	21.794		
1,300.0	1,295.6	1,271.0	1,246.2	3.0	4.5	6.90	182.8	-45.9	135.5	129.5	6.01	22.560		
1,400.0	1,393.1	1,369.3	1,337.6	3.4	5.2	7.08	217.7	-55.5	150.6	144.1	6.58	22.897		
1,500.0	1,489.9	1,468.5	1,429.8	3.8	5.9	7.36	253.0	-65.1	163.5	156.3	7.15	22.868		
1,600.0	1,586.8	1,567.6	1,521.9	4.2	6.6	7.60	288.3	-74.8	176.3	168.5	7.72	22.817		
1,700.0	1,683.7	1,666.8	1,614.1	4.7	7.3	7.81	323.6	-84.4	189.1	180.7	8.31	22.747		
1,800.0	1,780.5	1,766.0	1,706.3	5.1	8.0	7.99	358.9	-94.1	201.8	192.9	8.91	22.667		
1,900.0	1,877.4	1,865.2	1,798.5	5.6	8.7	8.15	394.2	-103.7	214.6	205.1	9.51	22.580		

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





# Archer

## Anticollision Report

# Archer

<b>Company:</b>	Piceance Energy, LLC	<b>Local Co-ordinate Reference:</b>	Well Piceance federal 28-03W
<b>Project:</b>	Mesa County, CO	<b>TVD Reference:</b>	Well @ 7578.0usft
<b>Reference Site:</b>	Piceance 28-05	<b>MD Reference:</b>	Well @ 7578.0usft
<b>Site Error:</b>	0.0 usft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Piceance federal 28-03W	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.0 usft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	Slot A-1	<b>Database:</b>	EDMDBBW
<b>Reference Design:</b>	Design #1	<b>Offset TVD Reference:</b>	Reference Datum

Offset Design Piceance 28-05 - Piceance Federal 28-02W - Slot A-2 - Design #1													Offset Site Error:	0.0 usft
Survey Program: 0-MWD													Offset Well Error:	0.0 usft
Reference		Offset		Semi Major Axis			Distance						Warning	
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor		
2,000.0	1,974.3	1,964.3	1,890.7	6.1	9.4	8.30	429.5	-113.4	227.4	217.3	10.11	22.492		
2,100.0	2,071.1	2,063.5	1,982.8	6.6	10.1	8.43	464.8	-123.0	240.2	229.5	10.72	22.405		
2,200.0	2,168.0	2,162.7	2,075.0	7.1	10.9	8.54	500.1	-132.7	253.0	241.7	11.34	22.319		
2,300.0	2,264.9	2,261.9	2,167.2	7.5	11.6	8.64	535.4	-142.4	265.8	253.9	11.95	22.236		
2,400.0	2,361.8	2,361.0	2,259.4	8.0	12.3	8.74	570.7	-152.0	278.6	266.1	12.58	22.156		
2,500.0	2,458.6	2,460.2	2,351.6	8.5	13.0	8.82	606.0	-161.7	291.4	278.2	13.20	22.080		
2,600.0	2,555.5	2,559.4	2,443.7	9.0	13.7	8.90	641.3	-171.3	304.2	290.4	13.82	22.007		
2,700.0	2,652.4	2,658.6	2,535.9	9.5	14.4	8.98	676.5	-181.0	317.0	302.6	14.45	21.938		
2,800.0	2,749.2	2,757.8	2,628.1	10.0	15.2	9.04	711.8	-190.6	329.8	314.8	15.08	21.872		
2,900.0	2,846.1	2,856.9	2,720.3	10.5	15.9	9.10	747.1	-200.3	342.6	326.9	15.71	21.809		
3,000.0	2,943.0	2,956.1	2,812.5	11.0	16.6	9.16	782.4	-209.9	355.4	339.1	16.34	21.750		
3,100.0	3,039.8	3,055.3	2,904.6	11.5	17.3	9.22	817.7	-219.6	368.2	351.3	16.97	21.693		
3,200.0	3,136.7	3,154.5	2,996.8	12.1	18.0	9.27	853.0	-229.2	381.0	363.4	17.61	21.640		
3,300.0	3,233.6	3,253.6	3,089.0	12.6	18.8	9.31	888.3	-238.9	393.8	375.6	18.24	21.588		
3,400.0	3,330.4	3,352.8	3,181.2	13.1	19.5	9.36	923.6	-248.5	406.7	387.8	18.88	21.540		
3,500.0	3,427.3	3,457.5	3,278.6	13.6	20.2	9.40	960.6	-258.7	419.2	399.7	19.52	21.472		
3,600.0	3,524.2	3,574.3	3,388.5	14.1	20.9	9.50	998.6	-269.1	428.7	408.5	20.17	21.255		
3,700.0	3,621.0	3,691.7	3,500.6	14.6	21.4	9.66	1,032.5	-278.3	434.1	413.3	20.80	20.873		
3,800.0	3,717.9	3,809.5	3,614.3	15.1	21.9	9.89	1,061.9	-286.4	435.5	414.1	21.42	20.336		
3,900.0	3,814.8	3,927.2	3,729.1	15.6	22.4	10.19	1,086.8	-293.2	432.8	410.7	22.02	19.654		
4,000.0	3,911.6	4,044.3	3,844.4	16.1	22.8	10.57	1,107.1	-298.7	426.0	403.4	22.61	18.839		
4,100.0	4,008.5	4,160.7	3,959.6	16.6	23.1	11.04	1,122.7	-303.0	415.2	392.0	23.19	17.900		
4,200.0	4,105.4	4,275.8	4,074.1	17.1	23.3	11.63	1,133.6	-306.0	400.4	376.7	23.77	16.843		
4,300.0	4,202.2	4,389.3	4,187.4	17.6	23.5	12.36	1,140.1	-307.8	381.8	357.5	24.36	15.677		
4,400.0	4,299.1	4,500.9	4,299.0	18.1	23.6	13.29	1,142.2	-308.3	359.5	334.5	24.95	14.407		
4,500.0	4,396.0	4,597.9	4,396.0	18.6	23.7	14.25	1,142.2	-308.3	335.3	309.8	25.54	13.127		
4,600.0	4,493.3	4,695.2	4,493.3	19.0	23.8	15.16	1,142.2	-308.3	313.2	287.1	26.06	12.018		
4,700.0	4,591.4	4,793.3	4,591.4	19.4	23.9	16.04	1,142.2	-308.3	294.4	267.8	26.55	11.090		
4,800.0	4,690.1	4,892.0	4,690.1	19.7	23.9	16.86	1,142.2	-308.3	279.0	252.0	26.99	10.336		
4,900.0	4,789.3	4,991.2	4,789.3	19.9	24.0	17.57	1,142.2	-308.3	267.0	239.6	27.39	9.746		
5,000.0	4,888.9	5,090.8	4,888.9	20.1	24.1	18.13	1,142.2	-308.3	258.3	230.6	27.73	9.316		
5,100.0	4,988.7	5,190.6	4,988.7	20.3	24.2	18.49	1,142.2	-308.3	253.0	225.0	27.98	9.039		
5,200.0	5,088.7	5,290.6	5,088.7	20.4	24.3	18.63	1,142.2	-308.3	250.9	222.8	28.16	8.912		
5,242.6	5,131.3	5,333.2	5,131.3	20.5	24.3	18.64	1,142.2	-308.3	250.8	222.5	28.28	8.867		
5,300.0	5,188.7	5,390.6	5,188.7	20.5	24.4	-0.36	1,142.2	-308.3	250.9	222.5	28.45	8.818		
5,400.0	5,288.7	5,490.6	5,288.7	20.7	24.5	-0.36	1,142.2	-308.3	250.9	222.1	28.79	8.714		
5,500.0	5,388.7	5,590.6	5,388.7	20.8	24.6	-0.36	1,142.2	-308.3	250.9	221.8	29.14	8.611		
5,600.0	5,488.7	5,690.6	5,488.7	20.9	24.7	-0.36	1,142.2	-308.3	250.9	221.4	29.48	8.510		
5,700.0	5,588.7	5,790.6	5,588.7	21.0	24.8	-0.36	1,142.2	-308.3	250.9	221.1	29.83	8.411		
5,800.0	5,688.7	5,890.6	5,688.7	21.2	24.9	-0.36	1,142.2	-308.3	250.9	220.7	30.18	8.313		
5,900.0	5,788.7	5,990.6	5,788.7	21.3	25.0	-0.36	1,142.2	-308.3	250.9	220.4	30.54	8.216		
6,000.0	5,888.7	6,090.6	5,888.7	21.4	25.1	-0.36	1,142.2	-308.3	250.9	220.0	30.89	8.121		
6,100.0	5,988.7	6,190.6	5,988.7	21.5	25.2	-0.36	1,142.2	-308.3	250.9	219.7	31.25	8.028		
6,200.0	6,088.7	6,290.6	6,088.7	21.7	25.3	-0.36	1,142.2	-308.3	250.9	219.3	31.61	7.936		
6,300.0	6,188.7	6,390.6	6,188.7	21.8	25.4	-0.36	1,142.2	-308.3	250.9	218.9	31.98	7.846		
6,400.0	6,288.7	6,490.6	6,288.7	21.9	25.6	-0.36	1,142.2	-308.3	250.9	218.6	32.34	7.758		
6,500.0	6,388.7	6,590.6	6,388.7	22.1	25.7	-0.36	1,142.2	-308.3	250.9	218.2	32.71	7.670		
6,600.0	6,488.7	6,690.6	6,488.7	22.2	25.8	-0.36	1,142.2	-308.3	250.9	217.8	33.08	7.585		
6,700.0	6,588.7	6,790.6	6,588.7	22.3	25.9	-0.36	1,142.2	-308.3	250.9	217.5	33.45	7.500		
6,800.0	6,688.7	6,890.6	6,688.7	22.5	26.0	-0.36	1,142.2	-308.3	250.9	217.1	33.83	7.417		
6,900.0	6,788.7	6,990.6	6,788.7	22.6	26.1	-0.36	1,142.2	-308.3	250.9	216.7	34.20	7.336		
7,000.0	6,888.7	7,090.6	6,888.7	22.8	26.3	-0.36	1,142.2	-308.3	250.9	216.3	34.58	7.256		

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



Company:	Piceance Energy, LLC	Local Co-ordinate Reference:	Well Piceance federal 28-03W
Project:	Mesa County, CO	TVD Reference:	Well @ 7578.0usft
Reference Site:	Piceance 28-05	MD Reference:	Well @ 7578.0usft
Site Error:	0.0 usft	North Reference:	True
Reference Well:	Piceance federal 28-03W	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 usft	Output errors are at	2.00 sigma
Reference Wellbore	Slot A-1	Database:	EDMDBBW
Reference Design:	Design #1	Offset TVD Reference:	Reference Datum

Offset Design												Offset Site Error:	0.0 usft
Survey Program: 0-MWD												Offset Well Error:	0.0 usft
Reference		Offset		Semi Major Axis		Distance							Warning
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	Offset Wellbore Centre +E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	
7,100.0	6,988.7	7,190.6	6,988.7	22.9	26.4	-0.36	1,142.2	-308.3	250.9	216.0	34.96	7.177	
7,200.0	7,088.7	7,290.6	7,088.7	23.1	26.5	-0.36	1,142.2	-308.3	250.9	215.6	35.34	7.100	
7,300.0	7,188.7	7,390.6	7,188.7	23.2	26.6	-0.36	1,142.2	-308.3	250.9	215.2	35.72	7.024	
7,400.0	7,288.7	7,490.6	7,288.7	23.4	26.8	-0.36	1,142.2	-308.3	250.9	214.8	36.10	6.949	
7,500.0	7,388.7	7,590.6	7,388.7	23.5	26.9	-0.36	1,142.2	-308.3	250.9	214.4	36.49	6.876	
7,600.0	7,488.7	7,690.6	7,488.7	23.7	27.0	-0.36	1,142.2	-308.3	250.9	214.0	36.88	6.804	
7,700.0	7,588.7	7,790.6	7,588.7	23.8	27.2	-0.36	1,142.2	-308.3	250.9	213.6	37.26	6.733	
7,800.0	7,688.7	7,890.6	7,688.7	24.0	27.3	-0.36	1,142.2	-308.3	250.9	213.3	37.65	6.664	
7,900.0	7,788.7	7,990.6	7,788.7	24.1	27.4	-0.36	1,142.2	-308.3	250.9	212.9	38.04	6.595	
7,994.3	7,883.0	8,084.9	7,883.0	24.3	27.5	-0.36	1,142.2	-308.3	250.9	212.5	38.41	6.532	



# Archer

## Anticollision Report

# Archer

<b>Company:</b>	Piceance Energy, LLC	<b>Local Co-ordinate Reference:</b>	Well Piceance federal 28-03W
<b>Project:</b>	Mesa County, CO	<b>TVD Reference:</b>	Well @ 7578.0usft
<b>Reference Site:</b>	Piceance 28-05	<b>MD Reference:</b>	Well @ 7578.0usft
<b>Site Error:</b>	0.0 usft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Piceance federal 28-03W	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.0 usft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	Slot A-1	<b>Database:</b>	EDMDBBW
<b>Reference Design:</b>	Design #1	<b>Offset TVD Reference:</b>	Reference Datum

Offset Design Piceance 28-05 - Piceance Federal 28-04W - Slot B-2 - Design #1													Offset Site Error:	0.0 usft
Survey Program: 0-MWD													Offset Well Error:	0.0 usft
Reference		Offset		Semi Major Axis			Distance							Warning
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor		
0.0	0.0	0.0	0.0	0.0	0.0	-173.66	-14.2	-1.6	14.3					
100.0	100.0	100.0	100.0	0.1	0.1	-173.66	-14.2	-1.6	14.3	14.1	0.18	81.287		
200.0	200.0	200.4	200.4	0.3	0.3	-169.58	-12.6	-2.3	12.8	12.2	0.63	20.366		
300.0	300.0	300.5	300.4	0.5	0.6	-149.90	-7.8	-4.5	9.0	7.9	1.09	8.290		
363.9	363.9	364.3	363.9	0.7	0.7	-114.91	-3.1	-6.7	7.4	6.0	1.39	5.294 CC, ES		
400.0	400.0	400.2	399.6	0.8	0.8	-89.35	0.1	-8.2	8.2	6.6	1.56	5.234		
500.0	500.0	499.1	497.8	1.0	1.1	-50.22	11.0	-13.2	17.4	15.3	2.03	8.540		
600.0	600.0	597.6	595.1	1.2	1.4	-38.43	24.6	-19.5	31.8	29.3	2.51	12.667		
700.0	700.0	696.3	692.7	1.4	1.8	-33.96	38.7	-26.0	47.2	44.2	2.97	15.869		
800.0	800.0	795.4	790.5	1.7	2.1	-12.99	52.8	-32.6	61.1	57.6	3.42	17.832		
900.0	899.8	894.8	888.7	1.9	2.5	-12.32	66.9	-39.1	71.6	67.7	3.90	18.341		
1,000.0	999.5	994.5	987.2	2.1	2.8	-12.36	81.1	-45.7	78.7	74.3	4.39	17.910		
1,100.0	1,098.7	1,094.5	1,085.9	2.4	3.2	-12.91	95.4	-52.3	82.4	77.5	4.89	16.839		
1,200.0	1,197.5	1,194.4	1,184.6	2.7	3.6	-14.00	109.6	-58.9	82.8	77.4	5.40	15.317		
1,300.0	1,295.6	1,294.4	1,283.3	3.0	3.9	-15.74	123.8	-65.5	79.8	73.8	5.92	13.466		
1,400.0	1,393.1	1,394.1	1,381.8	3.4	4.3	-18.46	138.0	-72.1	73.5	67.1	6.47	11.373		
1,500.0	1,489.9	1,493.6	1,480.1	3.8	4.6	-22.40	152.2	-78.6	65.3	58.3	7.03	9.289		
1,600.0	1,586.8	1,593.2	1,578.4	4.2	5.0	-27.45	166.4	-85.2	57.5	49.8	7.67	7.489		
1,700.0	1,683.7	1,692.7	1,676.7	4.7	5.4	-34.02	180.5	-91.7	50.2	41.7	8.44	5.946		
1,800.0	1,780.5	1,792.3	1,775.0	5.1	5.7	-42.66	194.7	-98.3	43.7	34.4	9.39	4.658		
1,900.0	1,877.4	1,891.8	1,873.4	5.6	6.1	-53.89	208.9	-104.9	38.6	28.1	10.59	3.650		
2,000.0	1,974.3	1,991.4	1,971.7	6.1	6.5	-67.78	223.1	-111.4	35.4	23.5	11.96	2.961		
2,081.1	2,052.8	2,072.1	2,051.4	6.5	6.7	-80.34	234.5	-116.8	34.6	21.5	13.04	2.651		
2,100.0	2,071.1	2,090.9	2,070.0	6.6	6.8	-83.31	237.2	-118.0	34.6	21.3	13.26	2.610		
2,200.0	2,168.0	2,190.5	2,168.3	7.1	7.2	-98.43	251.4	-124.6	36.4	22.2	14.20	2.561 SF		
2,300.0	2,264.9	2,290.0	2,266.6	7.5	7.5	-111.36	265.6	-131.1	40.4	25.6	14.76	2.736		
2,400.0	2,361.8	2,389.5	2,364.9	8.0	7.9	-121.56	279.7	-137.7	46.0	31.0	15.09	3.051		
2,500.0	2,458.6	2,489.1	2,463.2	8.5	8.3	-129.35	293.9	-144.3	52.8	37.5	15.35	3.443		
2,600.0	2,555.5	2,588.6	2,561.5	9.0	8.6	-135.29	308.1	-150.8	60.4	44.8	15.61	3.867		
2,700.0	2,652.4	2,688.2	2,659.8	9.5	9.0	-139.88	322.3	-157.4	68.4	52.5	15.91	4.300		
2,800.0	2,749.2	2,787.7	2,758.2	10.0	9.4	-143.48	336.4	-163.9	76.8	60.6	16.25	4.727		
2,900.0	2,846.1	2,887.3	2,856.5	10.5	9.7	-146.37	350.6	-170.5	85.4	68.8	16.62	5.141		
3,000.0	2,943.0	2,986.8	2,954.8	11.0	10.1	-148.73	364.8	-177.1	94.2	77.2	17.01	5.538		
3,100.0	3,039.8	3,086.4	3,053.1	11.5	10.4	-150.68	379.0	-183.6	103.2	85.7	17.44	5.916		
3,200.0	3,136.7	3,185.9	3,151.4	12.1	10.8	-152.32	393.1	-190.2	112.2	94.3	17.88	6.274		
3,300.0	3,233.6	3,285.4	3,249.7	12.6	11.2	-153.71	407.3	-196.8	121.3	103.0	18.34	6.614		
3,400.0	3,330.4	3,385.0	3,348.0	13.1	11.5	-154.91	421.5	-203.3	130.5	111.7	18.81	6.936		
3,500.0	3,427.3	3,484.5	3,446.3	13.6	11.9	-155.95	435.6	-209.9	139.7	120.4	19.29	7.241		
3,600.0	3,524.2	3,584.1	3,544.6	14.1	12.3	-156.86	449.8	-216.5	149.0	129.2	19.78	7.529		
3,700.0	3,621.0	3,683.6	3,643.0	14.6	12.6	-157.66	464.0	-223.0	158.3	138.0	20.28	7.803		
3,800.0	3,717.9	3,783.2	3,741.3	15.1	13.0	-158.38	478.2	-229.6	167.6	146.8	20.79	8.062		
3,900.0	3,814.8	3,882.7	3,839.6	15.6	13.4	-159.02	492.3	-236.1	176.9	155.6	21.30	8.308		
4,000.0	3,911.6	3,982.2	3,937.9	16.1	13.7	-159.60	506.5	-242.7	186.3	164.5	21.81	8.542		
4,100.0	4,008.5	4,081.8	4,036.2	16.6	14.1	-160.12	520.7	-249.3	195.7	173.3	22.33	8.764		
4,200.0	4,105.4	4,181.3	4,134.5	17.1	14.4	-160.59	534.9	-255.8	205.1	182.2	22.85	8.975		
4,300.0	4,202.2	4,280.9	4,232.8	17.6	14.8	-161.02	549.0	-262.4	214.5	191.1	23.37	9.176		
4,400.0	4,299.1	4,380.4	4,331.1	18.1	15.2	-161.42	563.2	-269.0	223.9	200.0	23.90	9.368		
4,500.0	4,396.0	4,480.0	4,429.4	18.6	15.5	-161.78	577.4	-275.5	233.3	208.9	24.43	9.551		
4,600.0	4,493.3	4,579.7	4,527.9	19.0	15.9	-162.02	591.6	-282.1	240.8	215.9	24.94	9.657		
4,700.0	4,591.4	4,679.6	4,626.6	19.4	16.3	-161.97	605.8	-288.7	245.1	219.6	25.46	9.626		
4,800.0	4,690.1	4,774.0	4,720.0	19.7	16.6	-161.76	618.5	-294.6	246.8	220.9	25.93	9.519		
4,900.0	4,789.3	4,866.7	4,812.1	19.9	16.8	-161.59	628.3	-299.1	248.1	221.8	26.31	9.432		

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



# Archer

## Anticollision Report

# Archer

<b>Company:</b>	Piceance Energy, LLC	<b>Local Co-ordinate Reference:</b>	Well Piceance federal 28-03W
<b>Project:</b>	Mesa County, CO	<b>TVD Reference:</b>	Well @ 7578.0usft
<b>Reference Site:</b>	Piceance 28-05	<b>MD Reference:</b>	Well @ 7578.0usft
<b>Site Error:</b>	0.0 usft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Piceance federal 28-03W	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.0 usft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	Slot A-1	<b>Database:</b>	EDMDBBW
<b>Reference Design:</b>	Design #1	<b>Offset TVD Reference:</b>	Reference Datum

Offset Design Piceance 28-05 - Piceance Federal 28-04W - Slot B-2 - Design #1													Offset Site Error:	0.0 usft
Survey Program: 0-MWD													Offset Well Error:	0.0 usft
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning	
5,000.0	4,888.9	4,959.4	4,904.4	20.1	17.0	-161.47	635.4	-302.4	249.1	222.5	26.62	9.359		
5,100.0	4,988.7	5,052.0	4,996.9	20.3	17.2	-161.40	639.8	-304.4	249.7	222.8	26.86	9.294		
5,200.0	5,088.7	5,144.7	5,089.5	20.4	17.3	-161.37	641.4	-305.2	249.9	222.8	27.05	9.238		
5,300.0	5,188.7	5,243.9	5,188.7	20.5	17.4	179.64	641.4	-305.2	249.9	222.5	27.36	9.132		
5,400.0	5,288.7	5,343.9	5,288.7	20.7	17.6	179.64	641.4	-305.2	249.9	222.2	27.73	9.012		
5,500.0	5,388.7	5,443.9	5,388.7	20.8	17.7	179.64	641.4	-305.2	249.9	221.8	28.09	8.895		
5,600.0	5,488.7	5,543.9	5,488.7	20.9	17.9	179.64	641.4	-305.2	249.9	221.4	28.46	8.780		
5,700.0	5,588.7	5,643.9	5,588.7	21.0	18.0	179.64	641.4	-305.2	249.9	221.1	28.83	8.667		
5,800.0	5,688.7	5,743.9	5,688.7	21.2	18.1	179.64	641.4	-305.2	249.9	220.7	29.21	8.556		
5,900.0	5,788.7	5,843.9	5,788.7	21.3	18.3	179.64	641.4	-305.2	249.9	220.3	29.58	8.448		
6,000.0	5,888.7	5,943.9	5,888.7	21.4	18.4	179.64	641.4	-305.2	249.9	219.9	29.96	8.341		
6,100.0	5,988.7	6,043.9	5,988.7	21.5	18.6	179.64	641.4	-305.2	249.9	219.6	30.34	8.237		
6,200.0	6,088.7	6,143.9	6,088.7	21.7	18.8	179.64	641.4	-305.2	249.9	219.2	30.72	8.135		
6,300.0	6,188.7	6,243.9	6,188.7	21.8	18.9	179.64	641.4	-305.2	249.9	218.8	31.10	8.035		
6,400.0	6,288.7	6,343.9	6,288.7	21.9	19.1	179.64	641.4	-305.2	249.9	218.4	31.49	7.937		
6,500.0	6,388.7	6,443.9	6,388.7	22.1	19.2	179.64	641.4	-305.2	249.9	218.0	31.87	7.840		
6,600.0	6,488.7	6,543.9	6,488.7	22.2	19.4	179.64	641.4	-305.2	249.9	217.6	32.26	7.746		
6,700.0	6,588.7	6,643.9	6,588.7	22.3	19.6	179.64	641.4	-305.2	249.9	217.2	32.65	7.654		
6,800.0	6,688.7	6,743.9	6,688.7	22.5	19.7	179.64	641.4	-305.2	249.9	216.9	33.04	7.563		
6,900.0	6,788.7	6,843.9	6,788.7	22.6	19.9	179.64	641.4	-305.2	249.9	216.5	33.43	7.474		
7,000.0	6,888.7	6,943.9	6,888.7	22.8	20.0	179.64	641.4	-305.2	249.9	216.1	33.83	7.387		
7,100.0	6,988.7	7,043.9	6,988.7	22.9	20.2	179.64	641.4	-305.2	249.9	215.7	34.22	7.302		
7,200.0	7,088.7	7,143.9	7,088.7	23.1	20.4	179.64	641.4	-305.2	249.9	215.3	34.62	7.218		
7,300.0	7,188.7	7,243.9	7,188.7	23.2	20.5	179.64	641.4	-305.2	249.9	214.9	35.02	7.136		
7,400.0	7,288.7	7,343.9	7,288.7	23.4	20.7	179.64	641.4	-305.2	249.9	214.5	35.42	7.056		
7,500.0	7,388.7	7,443.9	7,388.7	23.5	20.9	179.64	641.4	-305.2	249.9	214.1	35.82	6.977		
7,600.0	7,488.7	7,543.9	7,488.7	23.7	21.1	179.64	641.4	-305.2	249.9	213.7	36.22	6.900		
7,700.0	7,588.7	7,643.9	7,588.7	23.8	21.2	179.64	641.4	-305.2	249.9	213.3	36.62	6.824		
7,800.0	7,688.7	7,743.9	7,688.7	24.0	21.4	179.64	641.4	-305.2	249.9	212.9	37.03	6.749		
7,900.0	7,788.7	7,843.9	7,788.7	24.1	21.6	179.64	641.4	-305.2	249.9	212.5	37.43	6.676		
7,960.3	7,849.0	7,904.2	7,849.0	24.2	21.7	179.64	641.4	-305.2	249.9	212.2	37.67	6.633		
7,994.3	7,883.0	7,931.2	7,876.0	24.3	21.7	179.64	641.4	-305.2	250.0	212.2	37.80	6.614		



# Archer

## Anticollision Report

# Archer

<b>Company:</b>	Piceance Energy, LLC	<b>Local Co-ordinate Reference:</b>	Well Piceance federal 28-03W
<b>Project:</b>	Mesa County, CO	<b>TVD Reference:</b>	Well @ 7578.0usft
<b>Reference Site:</b>	Piceance 28-05	<b>MD Reference:</b>	Well @ 7578.0usft
<b>Site Error:</b>	0.0 usft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Piceance federal 28-03W	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.0 usft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	Slot A-1	<b>Database:</b>	EDMDBBW
<b>Reference Design:</b>	Design #1	<b>Offset TVD Reference:</b>	Reference Datum

Offset Design													Offset Site Error:	0.0 usft
Survey Program: 0-MWD													Offset Well Error:	0.0 usft
Reference		Offset		Semi Major Axis			Distance							Warning
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor		
0.0	0.0	0.0	0.0	0.0	0.0	-127.66	-6.1	-7.9	9.9					
100.0	100.0	100.0	100.0	0.1	0.1	-127.66	-6.1	-7.9	9.9	9.8	0.18	56.674		
134.2	134.2	134.2	134.2	0.2	0.2	-126.48	-5.9	-8.0	9.9	9.6	0.33	30.196 CC		
200.0	200.0	200.0	199.9	0.3	0.3	-117.67	-4.7	-8.9	10.1	9.4	0.62	16.101 ES		
300.0	300.0	299.7	299.5	0.5	0.6	-92.33	-0.5	-12.0	12.0	10.9	1.09	11.066		
400.0	400.0	398.9	398.4	0.8	0.8	-69.46	6.4	-17.2	18.4	16.8	1.56	11.814		
500.0	500.0	498.3	497.2	1.0	1.1	-57.60	14.9	-23.5	27.9	25.9	2.02	13.842		
600.0	600.0	597.8	596.1	1.2	1.4	-51.87	23.4	-29.8	38.0	35.6	2.47	15.396		
700.0	700.0	697.2	695.0	1.4	1.7	-48.57	31.8	-36.0	48.3	45.4	2.93	16.517		
800.0	800.0	796.8	794.0	1.7	2.0	-28.16	40.3	-42.4	57.2	53.8	3.38	16.927		
900.0	899.8	896.6	893.3	1.9	2.2	-28.59	48.8	-48.7	63.1	59.2	3.85	16.370		
1,000.0	999.5	996.6	992.6	2.1	2.5	-30.43	57.3	-55.0	65.9	61.5	4.33	15.194		
1,100.0	1,098.7	1,096.5	1,092.0	2.4	2.8	-33.77	65.8	-61.3	65.8	61.0	4.83	13.618		
1,200.0	1,197.5	1,196.3	1,191.2	2.7	3.1	-39.03	74.3	-67.6	63.2	57.9	5.36	11.799		
1,300.0	1,295.6	1,295.8	1,290.2	3.0	3.4	-47.07	82.8	-73.9	58.8	52.8	5.95	9.882		
1,400.0	1,393.1	1,395.0	1,388.8	3.4	3.7	-59.25	91.2	-80.2	53.8	47.1	6.67	8.063		
1,500.0	1,489.9	1,493.8	1,487.1	3.8	4.0	-75.47	99.6	-86.5	51.0	43.4	7.55	6.749		
1,513.8	1,503.4	1,507.5	1,500.7	3.8	4.1	-77.82	100.8	-87.3	50.9	43.3	7.68	6.631		
1,600.0	1,586.8	1,592.6	1,585.3	4.2	4.3	-92.11	108.0	-92.7	52.6	44.2	8.45	6.227 SF		
1,700.0	1,683.7	1,691.5	1,683.6	4.7	4.6	-106.65	116.4	-99.0	58.3	49.1	9.20	6.335		
1,800.0	1,780.5	1,790.3	1,781.9	5.1	4.9	-118.06	124.9	-105.3	67.1	57.2	9.81	6.833		
1,900.0	1,877.4	1,889.1	1,880.2	5.6	5.2	-126.61	133.3	-111.5	77.8	67.5	10.34	7.529		
2,000.0	1,974.3	1,988.0	1,978.4	6.1	5.5	-133.00	141.7	-117.8	89.9	79.1	10.83	8.305		
2,100.0	2,071.1	2,086.8	2,076.7	6.6	5.8	-137.84	150.1	-124.0	102.8	91.5	11.31	9.095		
2,200.0	2,168.0	2,185.6	2,175.0	7.1	6.1	-141.58	158.5	-130.3	116.3	104.5	11.79	9.868		
2,300.0	2,264.9	2,284.4	2,273.3	7.5	6.4	-144.54	166.9	-136.5	130.2	117.9	12.28	10.607		
2,400.0	2,361.8	2,383.3	2,371.5	8.0	6.6	-146.93	175.3	-142.8	144.4	131.6	12.77	11.306		
2,500.0	2,458.6	2,482.1	2,469.8	8.5	6.9	-148.89	183.7	-149.1	158.7	145.4	13.27	11.962		
2,600.0	2,555.5	2,580.9	2,568.1	9.0	7.2	-150.52	192.1	-155.3	173.2	159.4	13.77	12.577		
2,700.0	2,652.4	2,679.8	2,666.4	9.5	7.5	-151.91	200.6	-161.6	187.8	173.6	14.28	13.152		
2,800.0	2,749.2	2,778.6	2,764.6	10.0	7.8	-153.09	209.0	-167.8	202.6	187.8	14.80	13.690		
2,900.0	2,846.1	2,877.4	2,862.9	10.5	8.1	-154.11	217.4	-174.1	217.3	202.0	15.31	14.192		
3,000.0	2,943.0	2,976.3	2,961.2	11.0	8.4	-155.00	225.8	-180.3	232.2	216.3	15.83	14.663		
3,100.0	3,039.8	3,075.1	3,059.5	11.5	8.7	-155.78	234.2	-186.6	247.1	230.7	16.36	15.104		
3,200.0	3,136.7	3,173.9	3,157.7	12.1	9.0	-156.48	242.6	-192.9	262.0	245.1	16.88	15.518		
3,300.0	3,233.6	3,272.8	3,256.0	12.6	9.3	-157.10	251.0	-199.1	277.0	259.6	17.41	15.907		
3,400.0	3,330.4	3,371.6	3,354.3	13.1	9.6	-157.65	259.4	-205.4	292.0	274.0	17.94	16.274		
3,500.0	3,427.3	3,470.4	3,452.6	13.6	9.9	-158.16	267.9	-211.6	307.0	288.5	18.47	16.618		
3,600.0	3,524.2	3,569.3	3,550.8	14.1	10.2	-158.61	276.3	-217.9	322.0	303.0	19.01	16.944		
3,700.0	3,621.0	3,668.1	3,649.1	14.6	10.5	-159.02	284.7	-224.1	337.1	317.6	19.54	17.252		
3,800.0	3,717.9	3,766.9	3,747.4	15.1	10.7	-159.40	293.1	-230.4	352.2	332.1	20.08	17.542		
3,900.0	3,814.8	3,865.7	3,845.6	15.6	11.0	-159.75	301.5	-236.6	367.3	346.6	20.61	17.818		
4,000.0	3,911.6	3,964.6	3,943.9	16.1	11.3	-160.07	309.9	-242.9	382.4	361.2	21.15	18.080		
4,100.0	4,008.5	4,063.4	4,042.2	16.6	11.6	-160.37	318.3	-249.2	397.5	375.8	21.69	18.328		
4,200.0	4,105.4	4,162.2	4,140.5	17.1	11.9	-160.64	326.7	-255.4	412.6	390.4	22.23	18.564		
4,300.0	4,202.2	4,261.1	4,238.7	17.6	12.2	-160.90	335.1	-261.7	427.7	405.0	22.76	18.789		
4,400.0	4,299.1	4,359.9	4,337.0	18.1	12.5	-161.13	343.6	-267.9	442.9	419.6	23.30	19.003		
4,500.0	4,396.0	4,458.7	4,435.3	18.6	12.8	-161.36	352.0	-274.2	458.0	434.2	23.85	19.206		
4,600.0	4,493.3	4,557.8	4,533.8	19.0	13.1	-161.58	360.4	-280.5	471.3	446.9	24.37	19.340		
4,700.0	4,591.4	4,657.3	4,632.8	19.4	13.4	-161.63	368.9	-286.8	481.2	456.4	24.88	19.345		
4,800.0	4,690.1	4,757.1	4,732.0	19.7	13.7	-161.54	377.4	-293.1	487.9	462.5	25.37	19.231		
4,900.0	4,789.3	4,846.6	4,821.1	19.9	13.9	-161.40	384.2	-298.2	492.2	466.4	25.76	19.107		

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



# Archer

## Anticollision Report

# Archer

<b>Company:</b>	Piceance Energy, LLC	<b>Local Co-ordinate Reference:</b>	Well Piceance federal 28-03W
<b>Project:</b>	Mesa County, CO	<b>TVD Reference:</b>	Well @ 7578.0usft
<b>Reference Site:</b>	Piceance 28-05	<b>MD Reference:</b>	Well @ 7578.0usft
<b>Site Error:</b>	0.0 usft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Piceance federal 28-03W	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.0 usft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	Slot A-1	<b>Database:</b>	EDMDBBW
<b>Reference Design:</b>	Design #1	<b>Offset TVD Reference:</b>	Reference Datum

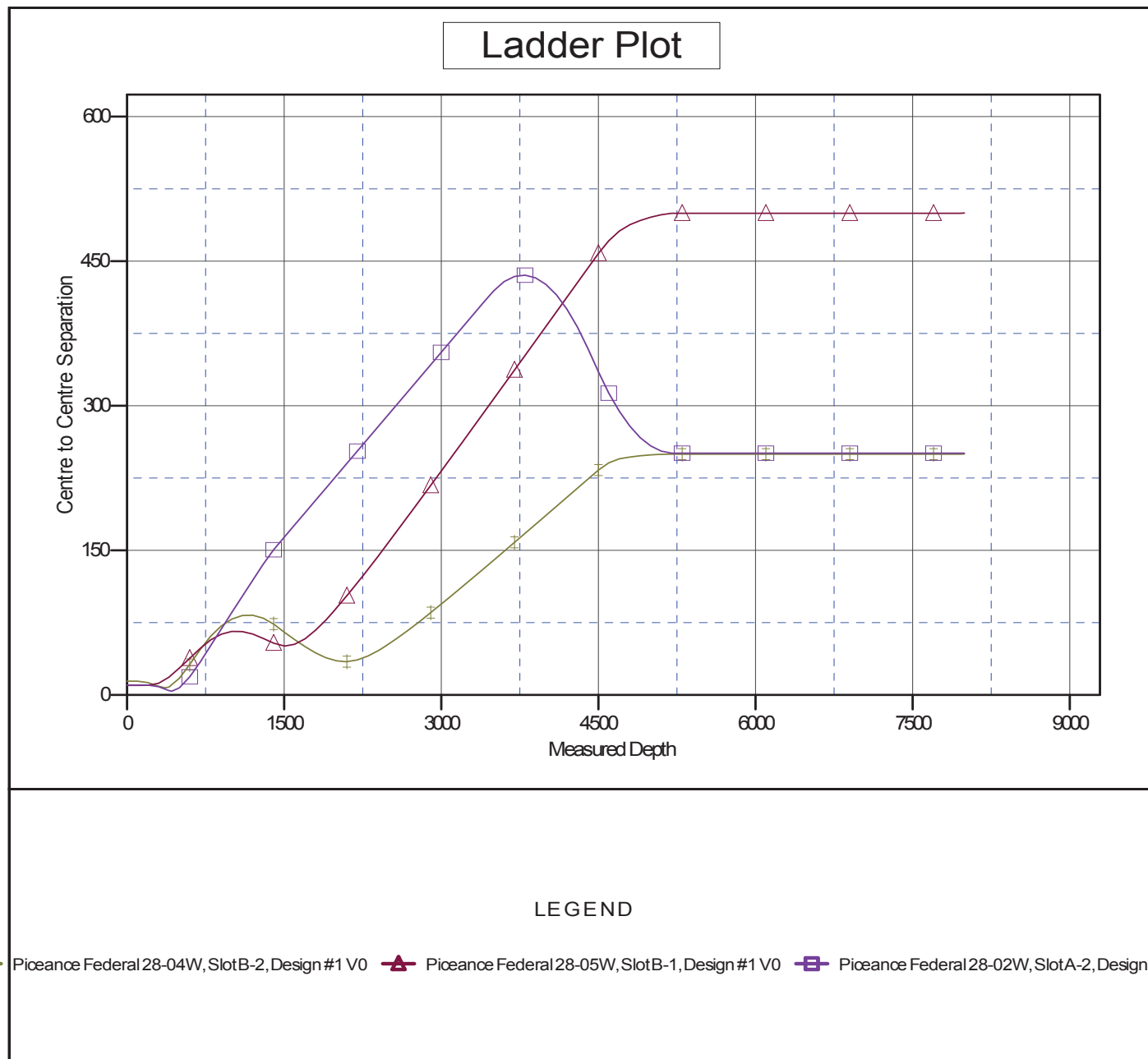
Offset Design Piceance 28-05 - Piceance Federal 28-05W - Slot B-1 - Design #1													Offset Site Error:	0.0 usft
Survey Program: 0-MWD													Offset Well Error:	0.0 usft
Reference		Offset		Semi Major Axis			Distance						Warning	
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor		
5,000.0	4,888.9	4,934.3	4,908.6	20.1	14.1	-161.33	388.7	-301.5	495.6	469.6	26.07	19.012		
5,100.0	4,988.7	5,022.0	4,996.3	20.3	14.2	-161.32	391.1	-303.3	498.2	471.9	26.32	18.932		
5,200.0	5,088.7	5,114.5	5,088.7	20.4	14.4	-161.37	391.5	-303.6	499.8	473.3	26.52	18.843		
5,300.0	5,188.7	5,214.5	5,188.7	20.5	14.5	179.64	391.5	-303.6	499.8	472.9	26.86	18.607		
5,400.0	5,288.7	5,314.5	5,288.7	20.7	14.7	179.64	391.5	-303.6	499.8	472.6	27.23	18.353		
5,500.0	5,388.7	5,414.5	5,388.7	20.8	14.9	179.64	391.5	-303.6	499.8	472.2	27.61	18.105		
5,600.0	5,488.7	5,514.5	5,488.7	20.9	15.0	179.64	391.5	-303.6	499.8	471.8	27.98	17.862		
5,700.0	5,588.7	5,614.5	5,588.7	21.0	15.2	179.64	391.5	-303.6	499.8	471.4	28.36	17.624		
5,800.0	5,688.7	5,714.5	5,688.7	21.2	15.4	179.64	391.5	-303.6	499.8	471.1	28.74	17.391		
5,900.0	5,788.7	5,814.5	5,788.7	21.3	15.6	179.64	391.5	-303.6	499.8	470.7	29.12	17.163		
6,000.0	5,888.7	5,914.5	5,888.7	21.4	15.8	179.64	391.5	-303.6	499.8	470.3	29.51	16.939		
6,100.0	5,988.7	6,014.5	5,988.7	21.5	15.9	179.64	391.5	-303.6	499.8	469.9	29.89	16.721		
6,200.0	6,088.7	6,114.5	6,088.7	21.7	16.1	179.64	391.5	-303.6	499.8	469.5	30.28	16.507		
6,300.0	6,188.7	6,214.5	6,188.7	21.8	16.3	179.64	391.5	-303.6	499.8	469.1	30.67	16.297		
6,400.0	6,288.7	6,314.5	6,288.7	21.9	16.5	179.64	391.5	-303.6	499.8	468.7	31.06	16.092		
6,500.0	6,388.7	6,414.5	6,388.7	22.1	16.7	179.64	391.5	-303.6	499.8	468.3	31.45	15.892		
6,600.0	6,488.7	6,514.5	6,488.7	22.2	16.9	179.64	391.5	-303.6	499.8	468.0	31.84	15.695		
6,700.0	6,588.7	6,614.5	6,588.7	22.3	17.0	179.64	391.5	-303.6	499.8	467.6	32.24	15.503		
6,800.0	6,688.7	6,714.5	6,688.7	22.5	17.2	179.64	391.5	-303.6	499.8	467.2	32.64	15.315		
6,900.0	6,788.7	6,814.5	6,788.7	22.6	17.4	179.64	391.5	-303.6	499.8	466.8	33.03	15.130		
7,000.0	6,888.7	6,914.5	6,888.7	22.8	17.6	179.64	391.5	-303.6	499.8	466.4	33.43	14.949		
7,100.0	6,988.7	7,014.5	6,988.7	22.9	17.8	179.64	391.5	-303.6	499.8	466.0	33.83	14.773		
7,200.0	7,088.7	7,114.5	7,088.7	23.1	18.0	179.64	391.5	-303.6	499.8	465.6	34.23	14.599		
7,300.0	7,188.7	7,214.5	7,188.7	23.2	18.2	179.64	391.5	-303.6	499.8	465.2	34.64	14.429		
7,400.0	7,288.7	7,314.5	7,288.7	23.4	18.4	179.64	391.5	-303.6	499.8	464.8	35.04	14.263		
7,500.0	7,388.7	7,414.5	7,388.7	23.5	18.6	179.64	391.5	-303.6	499.8	464.4	35.45	14.100		
7,600.0	7,488.7	7,514.5	7,488.7	23.7	18.8	179.64	391.5	-303.6	499.8	463.9	35.85	13.940		
7,700.0	7,588.7	7,614.5	7,588.7	23.8	19.0	179.64	391.5	-303.6	499.8	463.5	36.26	13.784		
7,800.0	7,688.7	7,714.5	7,688.7	24.0	19.2	179.64	391.5	-303.6	499.8	463.1	36.67	13.630		
7,900.0	7,788.7	7,814.5	7,788.7	24.1	19.4	179.64	391.5	-303.6	499.8	462.7	37.08	13.480		
7,956.0	7,844.7	7,870.4	7,844.7	24.2	19.5	179.64	391.5	-303.6	499.8	462.5	37.31	13.397		
7,994.3	7,883.0	7,891.8	7,866.0	24.3	19.5	179.64	391.5	-303.6	500.1	462.7	37.43	13.361		



Company:	Piceance Energy, LLC	Local Co-ordinate Reference:	Well Piceance federal 28-03W
Project:	Mesa County, CO	TVD Reference:	Well @ 7578.0usft
Reference Site:	Piceance 28-05	MD Reference:	Well @ 7578.0usft
Site Error:	0.0 usft	North Reference:	True
Reference Well:	Piceance federal 28-03W	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 usft	Output errors are at	2.00 sigma
Reference Wellbore	Slot A-1	Database:	EDMDBBW
Reference Design:	Design #1	Offset TVD Reference:	Reference Datum

Reference Depths are relative to Well @ 7578.0usft  
Offset Depths are relative to Offset Datum  
Central Meridian is 105° 30' 0.000 W

Coordinates are relative to: Piceance federal 28-03W  
Coordinate System is US State Plane 1983, Colorado Central Zone  
Grid Convergence at Surface is: -1.44°





Company:	Piceance Energy, LLC	Local Co-ordinate Reference:	Well Piceance federal 28-03W
Project:	Mesa County, CO	TVD Reference:	Well @ 7578.0usft
Reference Site:	Piceance 28-05	MD Reference:	Well @ 7578.0usft
Site Error:	0.0 usft	North Reference:	True
Reference Well:	Piceance federal 28-03W	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 usft	Output errors are at	2.00 sigma
Reference Wellbore	Slot A-1	Database:	EDMDBBW
Reference Design:	Design #1	Offset TVD Reference:	Reference Datum

Reference Depths are relative to Well @ 7578.0usft

Offset Depths are relative to Offset Datum

Central Meridian is 105° 30' 0.000 W

Coordinates are relative to: Piceance federal 28-03W

Coordinate System is US State Plane 1983, Colorado Central Zone

Grid Convergence at Surface is: -1.44°

