



# **Piceance Energy, LLC**

**Mesa County, CO**

**Piceance 28-05**

**Piceance 28-04W**

**Slot B-2**

**Plan: Design #1**

## **Standard Planning Report**

**29 April, 2015**

# **Archer**



Project: Mesa County, CO  
Site: Piceance 28-05  
Well: Piceance 28-04W  
Wellbore: Slot B-2  
Design: Design #1  
Latitude: 39° 15' 4.140 N  
Longitude: 107° 46' 46.730 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 (NE) Reference: Well Piceance 28-04W, 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 28-04W

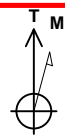
+N/-S	+E/-W	Northing	Ground Level: Easting	Latitude	Longitude	Slot
0.00	0.00	1524464.844	2354512.362	39° 15' 4.140 N	107° 46' 46.730 W	

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

Name	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude	Shape
Piceance Federal 28-04W tgt	7876.00	655.61	-303.63	1525127.861	2354225.281	39° 15' 10.620 N	107° 46' 50.590 W	Circle (Radius: 50.00)

### SECTION DETAILS

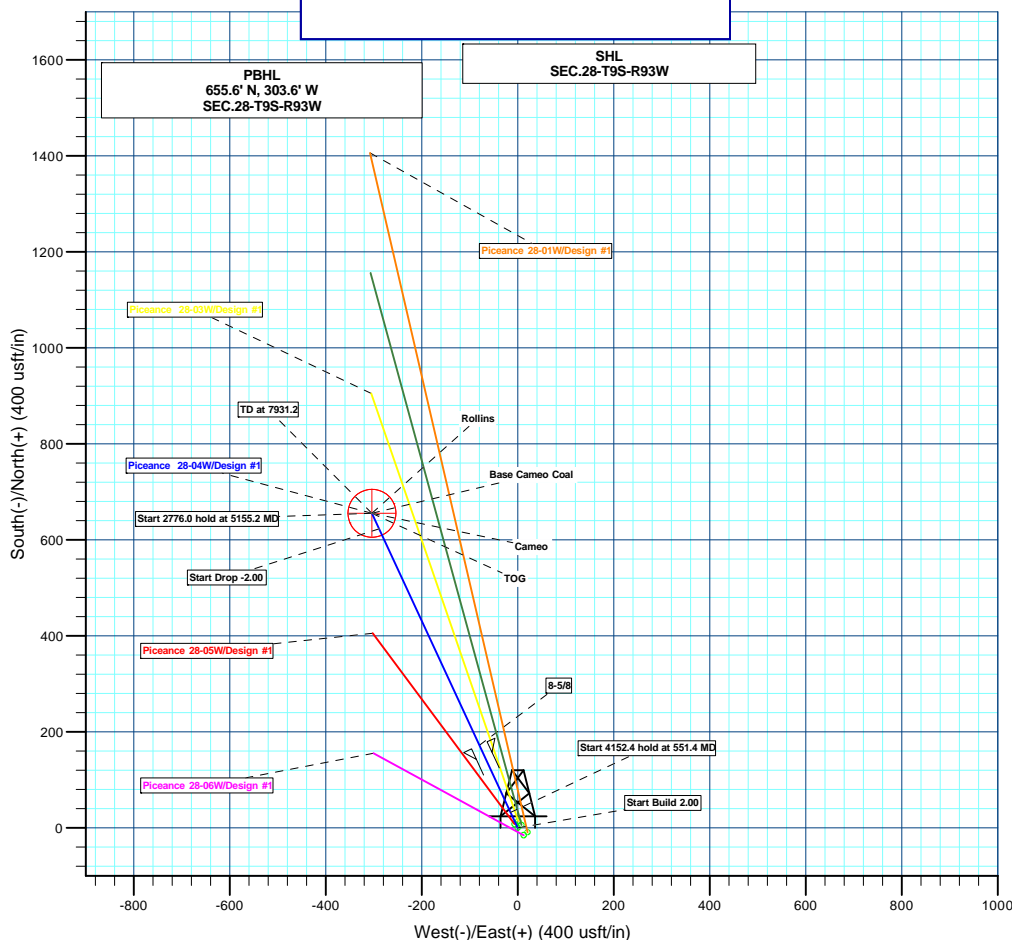
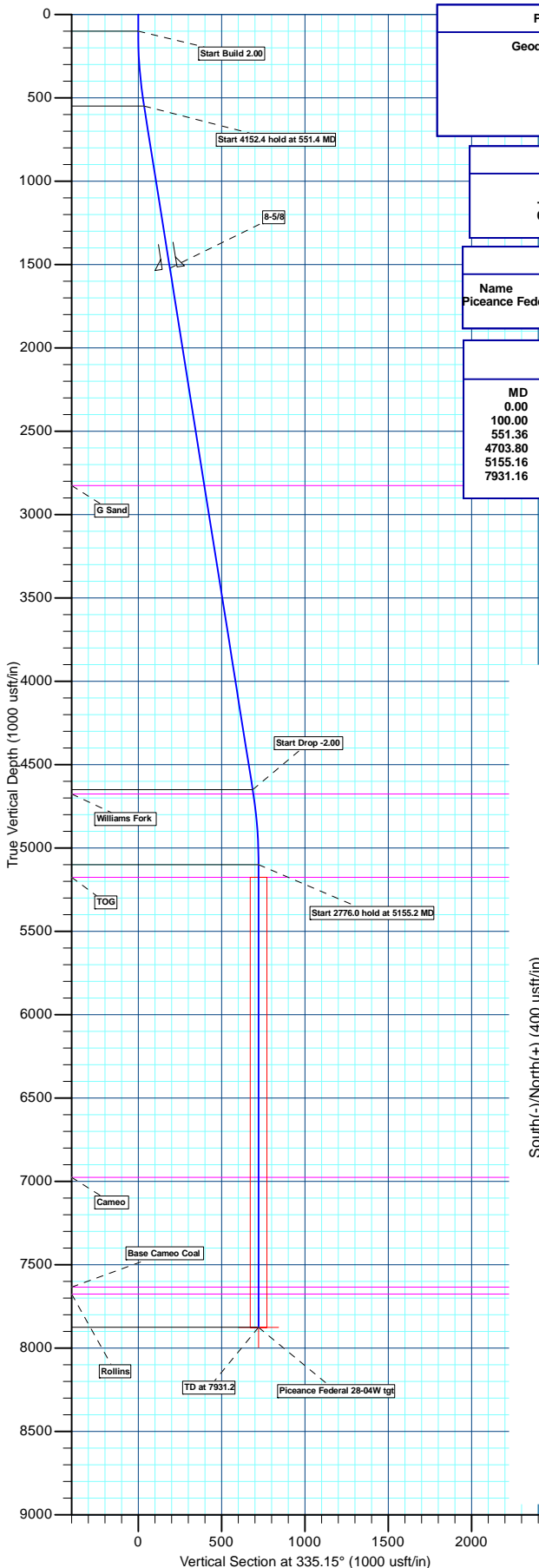
MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	Vsect	Annotation
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
100.00	0.00	0.00	100.00	0.00	0.00	0.00	0.00	0.00	Start Build 2.00
551.36	9.03	335.15	549.49	32.20	-14.91	2.00	335.15	35.48	Start 4152.4 hold at 551.4 MD
4703.80	9.03	335.15	4650.51	623.40	-288.71	0.00	0.00	687.01	Start Drop -2.00
5155.16	0.00	0.00	5100.00	655.60	-303.63	2.00	180.00	722.50	Start 2776.0 hold at 5155.2 MD
7931.16	0.00	0.00	7876.00	655.60	-303.63	0.00	0.00	722.50	TD at 7931.2



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

TVDPath	MDPath	Formation
2826.00	2856.42	G Sand
4676.00	4729.60	Williams Fork
5176.00	5231.16	TOG
6976.00	7031.16	Cameo
7634.00	7689.16	Base Cameo Coal
7676.00	7731.16	Rollins



Plan: Design #1 (Piceance 28-04W/Slot B-2)

Created By: Ricky Osburn Date: 8:26, April 29 2015



# Archer

## Planning Report

# Archer

<b>Database:</b>	EDMDBBW	<b>Local Co-ordinate Reference:</b>	Well Piceance 28-04W
<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 28-04W	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Slot B-2		
<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 28-04W					
Well Position	+N/-S	86.99 usft	Northing:	1,524,464.844 usft	Latitude:	39° 15' 4.140 N
	+E/-W	-83.38 usft	Easting:	2,354,512.362 usft	Longitude:	107° 46' 46.730 W
Position Uncertainty		0.00 usft	Wellhead Elevation:	0.00 usft	Ground Level:	7,556.00 usft

Wellbore	Slot B-2				
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	335.15

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	
100.00	0.00	0.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	
551.36	9.03	335.15	549.49	32.20	-14.91	2.00	2.00	0.00	335.15	
4,703.80	9.03	335.15	4,650.51	623.40	-288.71	0.00	0.00	0.00	0.00	
5,155.16	0.00	0.00	5,100.00	655.60	-303.63	2.00	-2.00	0.00	180.00	
7,931.16	0.00	0.00	7,876.00	655.60	-303.63	0.00	0.00	0.00	0.00	Piceance Federal 28-4



Database:	EDMDBBW	Local Co-ordinate Reference:	Well Piceance 28-04W
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 28-04W	Survey Calculation Method:	Minimum Curvature
Wellbore:	Slot B-2		
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
Start Build 2.00									
100.00	0.00	0.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00
200.00	2.00	335.15	199.98	1.58	-0.73	1.75	2.00	2.00	0.00
300.00	4.00	335.15	299.84	6.33	-2.93	6.98	2.00	2.00	0.00
400.00	6.00	335.15	399.45	14.24	-6.60	15.69	2.00	2.00	0.00
500.00	8.00	335.15	498.70	25.30	-11.72	27.88	2.00	2.00	0.00
Start 4152.4 hold at 551.4 MD									
551.36	9.03	335.15	549.49	32.20	-14.91	35.48	2.00	2.00	0.00
600.00	9.03	335.15	597.53	39.12	-18.12	43.12	0.00	0.00	0.00
700.00	9.03	335.15	696.29	53.36	-24.71	58.81	0.00	0.00	0.00
800.00	9.03	335.15	795.06	67.60	-31.31	74.50	0.00	0.00	0.00
900.00	9.03	335.15	893.82	81.84	-37.90	90.19	0.00	0.00	0.00
1,000.00	9.03	335.15	992.58	96.07	-44.49	105.88	0.00	0.00	0.00
1,100.00	9.03	335.15	1,091.34	110.31	-51.09	121.57	0.00	0.00	0.00
1,200.00	9.03	335.15	1,190.10	124.55	-57.68	137.26	0.00	0.00	0.00
1,300.00	9.03	335.15	1,288.86	138.79	-64.28	152.95	0.00	0.00	0.00
1,400.00	9.03	335.15	1,387.62	153.02	-70.87	168.64	0.00	0.00	0.00
1,500.00	9.03	335.15	1,486.39	167.26	-77.46	184.33	0.00	0.00	0.00
8-5/8									
1,536.06	9.03	335.15	1,522.00	172.40	-79.84	189.99	0.00	0.00	0.00
1,600.00	9.03	335.15	1,585.15	181.50	-84.06	200.02	0.00	0.00	0.00
1,700.00	9.03	335.15	1,683.91	195.74	-90.65	215.71	0.00	0.00	0.00
1,800.00	9.03	335.15	1,782.67	209.97	-97.24	231.40	0.00	0.00	0.00
1,900.00	9.03	335.15	1,881.43	224.21	-103.84	247.09	0.00	0.00	0.00
2,000.00	9.03	335.15	1,980.19	238.45	-110.43	262.78	0.00	0.00	0.00
2,100.00	9.03	335.15	2,078.95	252.69	-117.03	278.47	0.00	0.00	0.00
2,200.00	9.03	335.15	2,177.71	266.92	-123.62	294.16	0.00	0.00	0.00
2,300.00	9.03	335.15	2,276.48	281.16	-130.21	309.85	0.00	0.00	0.00
2,400.00	9.03	335.15	2,375.24	295.40	-136.81	325.54	0.00	0.00	0.00
2,500.00	9.03	335.15	2,474.00	309.64	-143.40	341.23	0.00	0.00	0.00
2,600.00	9.03	335.15	2,572.76	323.87	-149.99	356.92	0.00	0.00	0.00
2,700.00	9.03	335.15	2,671.52	338.11	-156.59	372.61	0.00	0.00	0.00
2,800.00	9.03	335.15	2,770.28	352.35	-163.18	388.30	0.00	0.00	0.00
G Sand									
2,856.42	9.03	335.15	2,826.00	360.38	-166.90	397.15	0.00	0.00	0.00
2,900.00	9.03	335.15	2,869.04	366.59	-169.78	403.99	0.00	0.00	0.00
3,000.00	9.03	335.15	2,967.81	380.82	-176.37	419.68	0.00	0.00	0.00
3,100.00	9.03	335.15	3,066.57	395.06	-182.96	435.37	0.00	0.00	0.00
3,200.00	9.03	335.15	3,165.33	409.30	-189.56	451.06	0.00	0.00	0.00
3,300.00	9.03	335.15	3,264.09	423.54	-196.15	466.75	0.00	0.00	0.00
3,400.00	9.03	335.15	3,362.85	437.77	-202.74	482.44	0.00	0.00	0.00
3,500.00	9.03	335.15	3,461.61	452.01	-209.34	498.13	0.00	0.00	0.00
3,600.00	9.03	335.15	3,560.37	466.25	-215.93	513.82	0.00	0.00	0.00
3,700.00	9.03	335.15	3,659.14	480.49	-222.53	529.51	0.00	0.00	0.00
3,800.00	9.03	335.15	3,757.90	494.72	-229.12	545.20	0.00	0.00	0.00
3,900.00	9.03	335.15	3,856.66	508.96	-235.71	560.89	0.00	0.00	0.00
4,000.00	9.03	335.15	3,955.42	523.20	-242.31	576.59	0.00	0.00	0.00
4,100.00	9.03	335.15	4,054.18	537.44	-248.90	592.28	0.00	0.00	0.00
4,200.00	9.03	335.15	4,152.94	551.67	-255.50	607.97	0.00	0.00	0.00
4,300.00	9.03	335.15	4,251.70	565.91	-262.09	623.66	0.00	0.00	0.00
4,400.00	9.03	335.15	4,350.47	580.15	-268.68	639.35	0.00	0.00	0.00
4,500.00	9.03	335.15	4,449.23	594.39	-275.28	655.04	0.00	0.00	0.00
4,600.00	9.03	335.15	4,547.99	608.62	-281.87	670.73	0.00	0.00	0.00



Database:	EDMDBBW	Local Co-ordinate Reference:	Well Piceance 28-04W
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 28-04W	Survey Calculation Method:	Minimum Curvature
Wellbore:	Slot B-2		
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)	
<b>Start Drop -2.00</b>										
4,703.80	9.03	335.15	4,650.51	623.40	-288.71	687.01	0.00	0.00	0.00	
<b>Williams Fork</b>										
4,729.60	8.51	335.15	4,676.00	626.97	-290.37	690.95	2.00	-2.00	0.00	
4,800.00	7.10	335.15	4,745.75	635.65	-294.39	700.51	2.00	-2.00	0.00	
4,900.00	5.10	335.15	4,845.18	645.30	-298.85	711.14	2.00	-2.00	0.00	
5,000.00	3.10	335.15	4,944.91	651.79	-301.86	718.30	2.00	-2.00	0.00	
5,100.00	1.10	335.15	5,044.84	655.12	-303.40	721.97	2.00	-2.00	0.00	
<b>Start 2776.0 hold at 5155.2 MD</b>										
5,155.16	0.00	0.00	5,100.00	655.60	-303.63	722.50	2.00	-2.00	0.00	
5,200.00	0.00	0.00	5,144.84	655.60	-303.63	722.50	0.00	0.00	0.00	
<b>TOG</b>										
5,231.16	0.00	0.00	5,176.00	655.60	-303.63	722.50	0.00	0.00	0.00	
5,300.00	0.00	0.00	5,244.84	655.60	-303.63	722.50	0.00	0.00	0.00	
5,400.00	0.00	0.00	5,344.84	655.60	-303.63	722.50	0.00	0.00	0.00	
5,500.00	0.00	0.00	5,444.84	655.60	-303.63	722.50	0.00	0.00	0.00	
5,600.00	0.00	0.00	5,544.84	655.60	-303.63	722.50	0.00	0.00	0.00	
5,700.00	0.00	0.00	5,644.84	655.60	-303.63	722.50	0.00	0.00	0.00	
5,800.00	0.00	0.00	5,744.84	655.60	-303.63	722.50	0.00	0.00	0.00	
5,900.00	0.00	0.00	5,844.84	655.60	-303.63	722.50	0.00	0.00	0.00	
6,000.00	0.00	0.00	5,944.84	655.60	-303.63	722.50	0.00	0.00	0.00	
6,100.00	0.00	0.00	6,044.84	655.60	-303.63	722.50	0.00	0.00	0.00	
6,200.00	0.00	0.00	6,144.84	655.60	-303.63	722.50	0.00	0.00	0.00	
6,300.00	0.00	0.00	6,244.84	655.60	-303.63	722.50	0.00	0.00	0.00	
6,400.00	0.00	0.00	6,344.84	655.60	-303.63	722.50	0.00	0.00	0.00	
6,500.00	0.00	0.00	6,444.84	655.60	-303.63	722.50	0.00	0.00	0.00	
6,600.00	0.00	0.00	6,544.84	655.60	-303.63	722.50	0.00	0.00	0.00	
6,700.00	0.00	0.00	6,644.84	655.60	-303.63	722.50	0.00	0.00	0.00	
6,800.00	0.00	0.00	6,744.84	655.60	-303.63	722.50	0.00	0.00	0.00	
6,900.00	0.00	0.00	6,844.84	655.60	-303.63	722.50	0.00	0.00	0.00	
7,000.00	0.00	0.00	6,944.84	655.60	-303.63	722.50	0.00	0.00	0.00	
<b>Cameo</b>										
7,031.16	0.00	0.00	6,976.00	655.60	-303.63	722.50	0.00	0.00	0.00	
7,100.00	0.00	0.00	7,044.84	655.60	-303.63	722.50	0.00	0.00	0.00	
7,200.00	0.00	0.00	7,144.84	655.60	-303.63	722.50	0.00	0.00	0.00	
7,300.00	0.00	0.00	7,244.84	655.60	-303.63	722.50	0.00	0.00	0.00	
7,400.00	0.00	0.00	7,344.84	655.60	-303.63	722.50	0.00	0.00	0.00	
7,500.00	0.00	0.00	7,444.84	655.60	-303.63	722.50	0.00	0.00	0.00	
7,600.00	0.00	0.00	7,544.84	655.60	-303.63	722.50	0.00	0.00	0.00	
<b>Base Cameo Coal</b>										
7,689.16	0.00	0.00	7,634.00	655.60	-303.63	722.50	0.00	0.00	0.00	
7,700.00	0.00	0.00	7,644.84	655.60	-303.63	722.50	0.00	0.00	0.00	
<b>Rollins</b>										
7,731.16	0.00	0.00	7,676.00	655.60	-303.63	722.50	0.00	0.00	0.00	
7,800.00	0.00	0.00	7,744.84	655.60	-303.63	722.50	0.00	0.00	0.00	
7,900.00	0.00	0.00	7,844.84	655.60	-303.63	722.50	0.00	0.00	0.00	
<b>TD at 7931.2</b>										
7,931.16	0.00	0.00	7,876.00	655.60	-303.63	722.50	0.00	0.00	0.00	



Database:	EDMDBBW	Local Co-ordinate Reference:	Well Piceance 28-04W
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 28-04W	Survey Calculation Method:	Minimum Curvature
Wellbore:	Slot B-2		
Design:	Design #1		

Design Targets									
Target Name	Dip Angle	Dip Dir.	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
- hit/miss target	(°)	(°)	(usft)	(usft)	(usft)	(usft)	(usft)		
- Shape									
Piceance Federal 28-04' - plan hits target center - Circle (radius 50.00)	0.00	0.00	7,876.00	655.61	-303.63	1,525,127.861	2,354,225.281	39° 15' 10.620 N	107° 46' 50.590 W

Casing Points				
Measured Depth	Vertical Depth	Name		Hole Diameter
(usft)	(usft)			(")
1,536.06	1,522.00	8-5/8		12-1/4

Formations					
Measured Depth	Vertical Depth	Name		Dip	Dip Direction
(usft)	(usft)			(°)	(°)
2,856.42	2,826.00	G Sand		0.00	
4,729.60	4,676.00	Williams Fork		0.00	
5,231.16	5,176.00	TOG		0.00	
7,031.16	6,976.00	Cameo		0.00	
7,689.16	7,634.00	Base Cameo Coal		0.00	
7,731.16	7,676.00	Rollins		0.00	

Plan Annotations				
Measured Depth	Vertical Depth	Local Coordinates		Comment
(usft)	(usft)	+N/-S (usft)	+E/-W (usft)	
100.00	100.00	0.00	0.00	Start Build 2.00
551.36	549.49	32.20	-14.91	Start 4152.4 hold at 551.4 MD
4,703.80	4,650.51	623.40	-288.71	Start Drop -2.00
5,155.16	5,100.00	655.60	-303.63	Start 2776.0 hold at 5155.2 MD
7,931.16	7,876.00	655.60	-303.63	TD at 7931.2



# **Piceance Energy, LLC**

**Mesa County, CO**

**Piceance 28-05**

**Piceance Federal 28-04W**

**Slot B-2**

**Design #1**

## **Anticollision Report**

**28 April, 2015**

# **Archer**



# Archer

## Anticollision Report

# Archer

<b>Company:</b>	Piceance Energy, LLC	<b>Local Co-ordinate Reference:</b>	Well Piceance Federal 28-04W
<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 28-04W	<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 B-2	<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	7,931.2	Design #1 (Slot B-2)	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 28-01W - Slot A-3 - Design #1	100.0	100.0	22.4	22.2	127.696	CC
Piceance Federal 28-01W - Slot A-3 - Design #1	200.0	200.5	22.6	22.0	34.440	ES
Piceance Federal 28-01W - Slot A-3 - Design #1	900.0	901.5	37.7	32.4	7.215	SF
Piceance Federal 28-02W - Slot A-2 - Design #1	209.0	209.0	9.7	9.0	14.547	CC, ES
Piceance Federal 28-02W - Slot A-2 - Design #1	900.0	900.8	24.2	19.2	4.921	SF
Piceance federal 28-03W - Slot A-1 - Design #1	364.3	363.9	7.4	6.0	5.290	CC, ES
Piceance federal 28-03W - Slot A-1 - Design #1	2,200.0	2,208.4	36.7	22.4	2.569	SF
Piceance Federal 28-05W - Slot B-1 - Design #1	600.0	598.7	10.2	7.5	3.696	CC, ES
Piceance Federal 28-05W - Slot B-1 - Design #1	700.0	698.5	12.2	8.8	3.549	SF
Piceance Federal 28-06W - Slot B-3 - Design #1	100.0	100.0	19.7	19.5	112.457	CC, ES
Piceance Federal 28-06W - Slot B-3 - Design #1	7,931.2	7,872.1	500.1	463.1	13.515	SF

Offset Design		Piceance 28-05 - Piceance Federal 28-01W - Slot A-3 - Design #1											Offset Site Error:	0.0 usf
Survey Program:		0-MWD											Offset Well Error:	0.0 usf
Reference		Offset		Semi Major Axis			Distance							
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	
0.0	0.0	0.0	0.0	0.0	0.0	114.00	-9.1	20.5	22.4					
100.0	100.0	100.0	100.0	0.1	0.1	114.00	-9.1	20.5	22.4	22.2	0.18	127.696	CC	
200.0	200.0	200.5	200.5	0.3	0.3	138.21	-7.4	20.1	22.6	22.0	0.66	34.440	ES	
300.0	299.8	300.9	300.8	0.6	0.6	136.37	-2.2	18.9	23.4	22.3	1.15	20.330		
400.0	399.5	401.4	400.8	0.8	0.8	133.57	6.3	16.9	24.8	23.1	1.67	14.851		
500.0	498.7	501.8	500.5	1.1	1.1	130.15	18.3	14.1	26.8	24.6	2.23	12.004		
600.0	597.5	602.2	599.6	1.4	1.4	125.82	33.7	10.5	29.2	26.4	2.85	10.264		
700.0	696.3	702.4	698.0	1.8	1.8	116.84	52.4	6.2	31.0	27.4	3.56	8.701		
800.0	795.1	802.3	795.2	2.1	2.3	103.02	74.3	1.1	33.1	28.7	4.39	7.545		
900.0	893.8	901.5	891.1	2.5	2.8	86.35	99.4	-4.7	37.7	32.4	5.22	7.215	SF	
1,000.0	992.6	1,000.0	985.3	2.9	3.3	70.37	127.5	-11.2	46.4	40.4	5.91	7.847		
1,100.0	1,091.3	1,097.1	1,077.1	3.2	3.9	57.65	158.2	-18.3	59.8	53.3	6.45	9.275		
1,200.0	1,190.1	1,193.1	1,166.8	3.6	4.6	48.33	191.6	-26.1	77.7	70.8	6.92	11.232		
1,300.0	1,288.9	1,287.6	1,253.9	3.9	5.2	41.65	227.3	-34.3	99.8	92.4	7.39	13.504		
1,400.0	1,387.6	1,384.1	1,342.1	4.3	6.0	36.94	265.2	-43.1	124.2	116.3	7.88	15.759		
1,500.0	1,486.4	1,480.6	1,430.5	4.7	6.7	33.79	303.2	-51.9	149.2	140.8	8.40	17.754		

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 28-04W
<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 28-04W	<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 B-2	<b>Database:</b>	EDMDBBW
<b>Reference Design:</b>	Design #1	<b>Offset TVD Reference:</b>	Reference Datum

Offset Design Piceance 28-05 - Piceance Federal 28-01W - Slot A-3 - 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		
1,600.0	1,585.1	1,577.2	1,518.8	5.0	7.5	31.54	341.2	-60.7	174.5	165.5	8.95	19.502		
1,700.0	1,683.9	1,673.7	1,607.1	5.4	8.2	29.86	379.2	-69.5	200.0	190.5	9.51	21.038		
1,800.0	1,782.7	1,770.3	1,695.5	5.8	9.0	28.56	417.2	-78.3	225.6	215.5	10.07	22.391		
1,900.0	1,881.4	1,866.8	1,783.8	6.1	9.7	27.52	455.1	-87.1	251.3	240.6	10.65	23.590		
2,000.0	1,980.2	1,963.4	1,872.1	6.5	10.5	26.68	493.1	-95.9	277.0	265.8	11.23	24.658		
2,100.0	2,079.0	2,060.0	1,960.5	6.8	11.2	25.98	531.1	-104.7	302.8	291.0	11.82	25.615		
2,200.0	2,177.7	2,156.5	2,048.8	7.2	12.0	25.39	569.1	-113.5	328.7	316.3	12.41	26.475		
2,300.0	2,276.5	2,253.1	2,137.1	7.6	12.8	24.89	607.1	-122.3	354.5	341.5	13.01	27.253		
2,400.0	2,375.2	2,349.6	2,225.5	7.9	13.5	24.45	645.0	-131.1	380.4	366.8	13.61	27.959		
2,500.0	2,474.0	2,446.2	2,313.8	8.3	14.3	24.07	683.0	-139.9	406.3	392.1	14.21	28.603		
2,600.0	2,572.8	2,542.7	2,402.1	8.7	15.0	23.73	721.0	-148.7	432.2	417.4	14.81	29.192		
2,700.0	2,671.5	2,639.3	2,490.5	9.0	15.8	23.44	759.0	-157.5	458.2	442.8	15.41	29.734		
2,800.0	2,770.3	2,735.8	2,578.8	9.4	16.6	23.17	797.0	-166.3	484.1	468.1	16.01	30.232		
2,900.0	2,869.0	2,832.4	2,667.1	9.8	17.3	22.93	835.0	-175.1	510.1	493.4	16.62	30.693		
3,000.0	2,967.8	2,928.9	2,755.5	10.1	18.1	22.72	872.9	-183.9	536.0	518.8	17.22	31.120		
3,100.0	3,066.6	3,025.5	2,843.8	10.5	18.8	22.52	910.9	-192.8	562.0	544.2	17.83	31.517		
3,200.0	3,165.3	3,122.0	2,932.1	10.9	19.6	22.35	948.9	-201.6	588.0	569.5	18.44	31.887		
3,300.0	3,264.1	3,218.6	3,020.5	11.2	20.4	22.18	986.9	-210.4	613.9	594.9	19.05	32.233		
3,400.0	3,362.9	3,315.2	3,108.8	11.6	21.1	22.03	1,024.9	-219.2	639.9	620.3	19.66	32.556		
3,500.0	3,461.6	3,411.7	3,197.1	12.0	21.9	21.90	1,062.8	-228.0	665.9	645.6	20.27	32.859		
3,600.0	3,560.4	3,508.3	3,285.4	12.3	22.6	21.77	1,100.8	-236.8	691.9	671.0	20.87	33.144		
3,700.0	3,659.1	3,604.8	3,373.8	12.7	23.4	21.65	1,138.8	-245.6	717.9	696.4	21.49	33.412		
3,800.0	3,757.9	3,708.5	3,468.7	13.1	24.2	21.53	1,179.4	-255.0	743.8	721.6	22.11	33.637		
3,900.0	3,856.7	3,839.9	3,590.6	13.4	25.0	21.45	1,227.3	-266.1	766.6	743.9	22.78	33.659		
4,000.0	3,955.4	3,974.0	3,717.1	13.8	25.7	21.46	1,270.5	-276.1	785.1	761.6	23.44	33.493		
4,100.0	4,054.2	4,110.1	3,847.5	14.1	26.3	21.54	1,308.3	-284.8	798.9	774.8	24.10	33.156		
4,200.0	4,152.9	4,247.7	3,981.1	14.5	26.9	21.70	1,340.4	-292.3	808.1	783.3	24.74	32.667		
4,300.0	4,251.7	4,386.1	4,116.9	14.9	27.3	21.94	1,366.3	-298.3	812.5	787.1	25.36	32.033		
4,400.0	4,350.5	4,524.7	4,254.0	15.2	27.7	22.27	1,385.9	-302.8	812.2	786.2	25.97	31.269		
4,500.0	4,449.2	4,662.8	4,391.5	15.6	28.0	22.68	1,398.9	-305.8	807.2	780.6	26.57	30.383		
4,600.0	4,548.0	4,799.9	4,528.5	16.0	28.2	23.19	1,405.4	-307.3	797.4	770.3	27.15	29.376		
4,700.0	4,646.7	4,918.2	4,646.7	16.3	28.3	23.72	1,406.3	-307.6	783.7	756.0	27.68	28.308		
4,800.0	4,745.7	5,017.2	4,745.7	16.6	28.4	24.04	1,406.3	-307.6	770.8	742.7	28.03	27.499		
4,900.0	4,845.2	5,116.7	4,845.2	16.9	28.4	24.28	1,406.3	-307.6	761.0	732.8	28.29	26.902		
5,000.0	4,944.9	5,216.4	4,944.9	17.1	28.5	24.45	1,406.3	-307.6	754.5	726.0	28.50	26.473		
5,100.0	5,044.8	5,316.3	5,044.8	17.2	28.6	24.54	1,406.3	-307.6	751.2	722.5	28.66	26.209		
5,179.4	5,124.2	5,395.7	5,124.2	17.3	28.6	24.56	1,406.3	-307.6	750.3	721.5	28.83	26.027		
5,200.0	5,144.8	5,416.3	5,144.8	17.4	28.7	-0.30	1,406.3	-307.6	750.7	721.8	28.87	26.005		
5,300.0	5,244.8	5,516.3	5,244.8	17.5	28.7	-0.30	1,406.3	-307.6	750.7	721.5	29.20	25.705		
5,400.0	5,344.8	5,616.3	5,344.8	17.6	28.8	-0.30	1,406.3	-307.6	750.7	721.2	29.54	25.410		
5,500.0	5,444.8	5,716.3	5,444.8	17.8	28.9	-0.30	1,406.3	-307.6	750.7	720.8	29.88	25.120		
5,600.0	5,544.8	5,816.3	5,544.8	17.9	29.0	-0.30	1,406.3	-307.6	750.7	720.5	30.23	24.833		
5,700.0	5,644.8	5,916.3	5,644.8	18.1	29.1	-0.30	1,406.3	-307.6	750.7	720.1	30.58	24.551		
5,800.0	5,744.8	6,016.3	5,744.8	18.2	29.2	-0.30	1,406.3	-307.6	750.7	719.8	30.93	24.274		
5,900.0	5,844.8	6,116.3	5,844.8	18.4	29.3	-0.30	1,406.3	-307.6	750.7	719.4	31.28	24.000		
6,000.0	5,944.8	6,216.3	5,944.8	18.5	29.3	-0.30	1,406.3	-307.6	750.7	719.1	31.63	23.731		
6,100.0	6,044.8	6,316.3	6,044.8	18.7	29.4	-0.30	1,406.3	-307.6	750.7	718.7	31.99	23.467		
6,200.0	6,144.8	6,416.3	6,144.8	18.8	29.5	-0.30	1,406.3	-307.6	750.7	718.4	32.35	23.206		
6,300.0	6,244.8	6,516.3	6,244.8	19.0	29.6	-0.30	1,406.3	-307.6	750.7	718.0	32.71	22.950		
6,400.0	6,344.8	6,616.3	6,344.8	19.2	29.7	-0.30	1,406.3	-307.6	750.7	717.6	33.07	22.697		
6,500.0	6,444.8	6,716.3	6,444.8	19.3	29.8	-0.30	1,406.3	-307.6	750.7	717.3	33.44	22.449		
6,600.0	6,544.8	6,816.3	6,544.8	19.5	29.9	-0.30	1,406.3	-307.6	750.7	716.9	33.81	22.205		

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



<b>Company:</b>	Piceance Energy, LLC	<b>Local Co-ordinate Reference:</b>	Well Piceance Federal 28-04W
<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 28-04W	<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 B-2	<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
Piceance 28-05 - Piceance Federal 28-01W - Slot A-3 - Design #1													Offset Well Error:	0.0 usft
Survey Program: 0-MWD														
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		
6,700.0	6,644.8	6,916.3	6,644.8	19.6	30.0	-0.30	1,406.3	-307.6	750.7	716.5	34.18	21.965		
6,800.0	6,744.8	7,016.3	6,744.8	19.8	30.1	-0.30	1,406.3	-307.6	750.7	716.2	34.55	21.729		
6,900.0	6,844.8	7,116.3	6,844.8	20.0	30.2	-0.30	1,406.3	-307.6	750.7	715.8	34.92	21.497		
7,000.0	6,944.8	7,216.3	6,944.8	20.1	30.3	-0.30	1,406.3	-307.6	750.7	715.4	35.30	21.269		
7,100.0	7,044.8	7,316.3	7,044.8	20.3	30.4	-0.30	1,406.3	-307.6	750.7	715.0	35.67	21.044		
7,200.0	7,144.8	7,416.3	7,144.8	20.5	30.6	-0.30	1,406.3	-307.6	750.7	714.7	36.05	20.824		
7,300.0	7,244.8	7,516.3	7,244.8	20.6	30.7	-0.30	1,406.3	-307.6	750.7	714.3	36.43	20.607		
7,400.0	7,344.8	7,616.3	7,344.8	20.8	30.8	-0.30	1,406.3	-307.6	750.7	713.9	36.81	20.393		
7,500.0	7,444.8	7,716.3	7,444.8	21.0	30.9	-0.30	1,406.3	-307.6	750.7	713.5	37.19	20.183		
7,600.0	7,544.8	7,816.3	7,544.8	21.2	31.0	-0.30	1,406.3	-307.6	750.7	713.1	37.58	19.977		
7,700.0	7,644.8	7,916.3	7,644.8	21.3	31.1	-0.30	1,406.3	-307.6	750.7	712.7	37.96	19.774		
7,800.0	7,744.8	8,016.3	7,744.8	21.5	31.2	-0.30	1,406.3	-307.6	750.7	712.4	38.35	19.575		
7,900.0	7,844.8	8,116.3	7,844.8	21.7	31.3	-0.30	1,406.3	-307.6	750.7	712.0	38.74	19.378		
7,931.2	7,876.0	8,147.5	7,876.0	21.7	31.4	-0.30	1,406.3	-307.6	750.7	711.8	38.86	19.318		



# Archer

## Anticollision Report

# Archer

<b>Company:</b>	Piceance Energy, LLC	<b>Local Co-ordinate Reference:</b>	Well Piceance Federal 28-04W
<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 28-04W	<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 B-2	<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		
0.0	0.0	0.0	0.0	0.0	0.0	52.34	6.1	7.9	9.9					
100.0	100.0	100.0	100.0	0.1	0.1	52.34	6.1	7.9	9.9	9.8	0.18	56.675		
200.0	200.0	200.0	200.0	0.3	0.3	87.30	6.1	7.9	9.7	9.1	0.63	15.518		
209.0	209.0	209.0	209.0	0.3	0.3	89.15	6.1	7.9	9.7	9.0	0.67	14.547 CC, ES		
300.0	299.8	299.9	299.9	0.6	0.5	107.02	7.8	7.4	10.4	9.3	1.09	9.535		
400.0	399.5	399.9	399.8	0.8	0.8	121.36	12.8	6.0	12.7	11.1	1.61	7.881		
500.0	498.7	500.1	499.5	1.1	1.0	129.71	21.2	3.7	16.0	13.8	2.17	7.386		
600.0	597.5	600.4	599.1	1.4	1.3	133.18	33.0	0.5	19.7	16.9	2.72	7.213		
700.0	696.3	700.7	698.2	1.8	1.6	128.95	48.2	-3.6	21.8	18.5	3.32	6.558		
800.0	795.1	800.9	796.5	2.1	2.0	117.51	66.6	-8.7	22.7	18.6	4.05	5.598		
900.0	893.8	900.8	893.8	2.5	2.4	99.14	88.3	-14.6	24.2	19.2	4.91	4.921 SF		
1,000.0	992.6	1,000.0	989.6	2.9	2.9	77.65	113.1	-21.4	28.8	23.2	5.68	5.079		
1,100.0	1,091.3	1,098.3	1,083.7	3.2	3.4	59.49	140.8	-29.0	38.4	32.2	6.21	6.193		
1,200.0	1,190.1	1,195.6	1,175.7	3.6	4.0	46.88	171.3	-37.3	53.0	46.3	6.63	7.994		
1,300.0	1,288.9	1,291.9	1,265.6	3.9	4.7	38.55	204.3	-46.4	71.8	64.8	7.05	10.189		
1,400.0	1,387.6	1,389.4	1,356.3	4.3	5.3	33.30	239.0	-55.9	92.8	85.3	7.51	12.348		
1,500.0	1,486.4	1,486.9	1,446.9	4.7	6.0	29.99	273.7	-65.3	114.2	106.2	8.02	14.244		
1,600.0	1,585.1	1,584.4	1,537.5	5.0	6.7	27.73	308.4	-74.8	135.9	127.3	8.55	15.899		
1,700.0	1,683.9	1,681.9	1,628.1	5.4	7.4	26.09	343.1	-84.3	157.7	148.6	9.09	17.347		
1,800.0	1,782.7	1,779.4	1,718.8	5.8	8.1	24.85	377.8	-93.8	179.6	170.0	9.65	18.620		
1,900.0	1,881.4	1,876.9	1,809.4	6.1	8.8	23.88	412.5	-103.3	201.6	191.4	10.21	19.745		
2,000.0	1,980.2	1,974.4	1,900.0	6.5	9.5	23.10	447.2	-112.8	223.7	212.9	10.78	20.745		
2,100.0	2,079.0	2,071.9	1,990.6	6.8	10.2	22.46	481.9	-122.3	245.7	234.4	11.36	21.639		
2,200.0	2,177.7	2,169.4	2,081.3	7.2	10.9	21.93	516.6	-131.8	267.8	255.9	11.93	22.442		
2,300.0	2,276.5	2,266.9	2,171.9	7.6	11.6	21.47	551.3	-141.3	289.9	277.4	12.51	23.168		
2,400.0	2,375.2	2,364.4	2,262.5	7.9	12.3	21.08	586.0	-150.8	312.0	298.9	13.10	23.826		
2,500.0	2,474.0	2,461.9	2,353.1	8.3	13.0	20.75	620.7	-160.3	334.2	320.5	13.68	24.426		
2,600.0	2,572.8	2,559.4	2,443.8	8.7	13.7	20.45	655.4	-169.7	356.3	342.0	14.27	24.974		
2,700.0	2,671.5	2,656.9	2,534.4	9.0	14.4	20.19	690.1	-179.2	378.5	363.6	14.85	25.478		
2,800.0	2,770.3	2,754.4	2,625.0	9.4	15.1	19.96	724.8	-188.7	400.6	385.2	15.44	25.941		
2,900.0	2,869.0	2,851.9	2,715.6	9.8	15.8	19.75	759.5	-198.2	422.8	406.7	16.03	26.369		
3,000.0	2,967.8	2,949.4	2,806.2	10.1	16.5	19.56	794.2	-207.7	444.9	428.3	16.62	26.766		
3,100.0	3,066.6	3,046.9	2,896.9	10.5	17.3	19.40	828.9	-217.2	467.1	449.9	17.21	27.134		
3,200.0	3,165.3	3,144.4	2,987.5	10.9	18.0	19.24	863.6	-226.7	489.3	471.5	17.81	27.478		
3,300.0	3,264.1	3,241.9	3,078.1	11.2	18.7	19.10	898.3	-236.2	511.5	493.1	18.40	27.798		
3,400.0	3,362.9	3,339.4	3,168.7	11.6	19.4	18.97	933.0	-245.7	533.6	514.6	18.99	28.098		
3,500.0	3,461.6	3,441.1	3,263.3	12.0	20.1	18.85	969.1	-255.5	555.8	536.2	19.59	28.365		
3,600.0	3,560.4	3,562.9	3,377.7	12.3	20.8	18.77	1,009.3	-266.5	575.2	554.9	20.22	28.449		
3,700.0	3,659.1	3,686.6	3,495.6	12.7	21.4	18.79	1,045.2	-276.4	590.4	569.6	20.82	28.351		
3,800.0	3,757.9	3,811.6	3,616.4	13.1	21.9	18.88	1,076.6	-284.9	601.4	580.0	21.43	28.070		
3,900.0	3,856.7	3,937.6	3,739.3	13.4	22.4	19.06	1,103.0	-292.2	608.1	586.1	22.01	27.622		
4,000.0	3,955.4	4,064.1	3,863.9	13.8	22.8	19.33	1,124.2	-298.0	610.5	587.9	22.59	27.019		
4,100.0	4,054.2	4,190.5	3,989.2	14.1	23.1	19.69	1,140.1	-302.3	608.5	585.3	23.16	26.270		
4,200.0	4,152.9	4,316.4	4,114.6	14.5	23.4	20.14	1,150.6	-305.2	602.2	578.5	23.72	25.390		
4,300.0	4,251.7	4,441.3	4,239.4	14.9	23.5	20.70	1,155.8	-306.6	591.7	567.4	24.26	24.384		
4,400.0	4,350.5	4,552.4	4,350.5	15.2	23.6	21.31	1,156.4	-306.8	577.5	552.7	24.79	23.297		
4,500.0	4,449.2	4,651.1	4,449.2	15.6	23.7	21.89	1,156.4	-306.8	562.9	537.6	25.30	22.246		
4,600.0	4,548.0	4,749.9	4,548.0	16.0	23.8	22.50	1,156.4	-306.8	548.3	522.5	25.83	21.226		
4,700.0	4,646.7	4,848.7	4,646.7	16.3	23.9	23.14	1,156.4	-306.8	533.9	507.5	26.38	20.241		
4,800.0	4,745.7	4,947.7	4,745.7	16.6	24.0	23.65	1,156.4	-306.8	520.9	494.1	26.79	19.443		
4,900.0	4,845.2	5,047.1	4,845.2	16.9	24.1	24.05	1,156.4	-306.8	511.2	484.0	27.12	18.848		
5,000.0	4,944.9	5,146.8	4,944.9	17.1	24.2	24.32	1,156.4	-306.8	504.6	477.2	27.40	18.420		

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 28-04W
<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 28-04W	<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 B-2	<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		
5,100.0	5,044.8	5,246.7	5,044.8	17.2	24.3	24.47	1,156.4	-306.8	501.3	473.7	27.61	18.155		
5,179.4	5,124.2	5,326.1	5,124.2	17.3	24.3	24.51	1,156.4	-306.8	500.5	472.6	27.81	17.998		
5,200.0	5,144.8	5,346.7	5,144.8	17.4	24.4	-0.36	1,156.4	-306.8	500.8	473.0	27.85	17.982		
5,300.0	5,244.8	5,446.7	5,244.8	17.5	24.4	-0.36	1,156.4	-306.8	500.8	472.6	28.20	17.759		
5,400.0	5,344.8	5,546.7	5,344.8	17.6	24.5	-0.36	1,156.4	-306.8	500.8	472.3	28.55	17.540		
5,500.0	5,444.8	5,646.7	5,444.8	17.8	24.6	-0.36	1,156.4	-306.8	500.8	471.9	28.91	17.325		
5,600.0	5,544.8	5,746.7	5,544.8	17.9	24.7	-0.36	1,156.4	-306.8	500.8	471.5	29.26	17.113		
5,700.0	5,644.8	5,846.7	5,644.8	18.1	24.9	-0.36	1,156.4	-306.8	500.8	471.2	29.62	16.905		
5,800.0	5,744.8	5,946.7	5,744.8	18.2	25.0	-0.36	1,156.4	-306.8	500.8	470.8	29.99	16.701		
5,900.0	5,844.8	6,046.7	5,844.8	18.4	25.1	-0.36	1,156.4	-306.8	500.8	470.5	30.35	16.500		
6,000.0	5,944.8	6,146.7	5,944.8	18.5	25.2	-0.36	1,156.4	-306.8	500.8	470.1	30.72	16.303		
6,100.0	6,044.8	6,246.7	6,044.8	18.7	25.3	-0.36	1,156.4	-306.8	500.8	469.7	31.09	16.110		
6,200.0	6,144.8	6,346.7	6,144.8	18.8	25.4	-0.36	1,156.4	-306.8	500.8	469.4	31.46	15.920		
6,300.0	6,244.8	6,446.7	6,244.8	19.0	25.5	-0.36	1,156.4	-306.8	500.8	469.0	31.83	15.733		
6,400.0	6,344.8	6,546.7	6,344.8	19.2	25.6	-0.36	1,156.4	-306.8	500.8	468.6	32.21	15.550		
6,500.0	6,444.8	6,646.7	6,444.8	19.3	25.7	-0.36	1,156.4	-306.8	500.8	468.2	32.58	15.370		
6,600.0	6,544.8	6,746.7	6,544.8	19.5	25.8	-0.36	1,156.4	-306.8	500.8	467.8	32.96	15.194		
6,700.0	6,644.8	6,846.7	6,644.8	19.6	26.0	-0.36	1,156.4	-306.8	500.8	467.5	33.34	15.021		
6,800.0	6,744.8	6,946.7	6,744.8	19.8	26.1	-0.36	1,156.4	-306.8	500.8	467.1	33.72	14.850		
6,900.0	6,844.8	7,046.7	6,844.8	20.0	26.2	-0.36	1,156.4	-306.8	500.8	466.7	34.11	14.683		
7,000.0	6,944.8	7,146.7	6,944.8	20.1	26.3	-0.36	1,156.4	-306.8	500.8	466.3	34.49	14.519		
7,100.0	7,044.8	7,246.7	7,044.8	20.3	26.5	-0.36	1,156.4	-306.8	500.8	465.9	34.88	14.358		
7,200.0	7,144.8	7,346.7	7,144.8	20.5	26.6	-0.36	1,156.4	-306.8	500.8	465.5	35.27	14.200		
7,300.0	7,244.8	7,446.7	7,244.8	20.6	26.7	-0.36	1,156.4	-306.8	500.8	465.2	35.66	14.045		
7,400.0	7,344.8	7,546.7	7,344.8	20.8	26.8	-0.36	1,156.4	-306.8	500.8	464.8	36.05	13.893		
7,500.0	7,444.8	7,646.7	7,444.8	21.0	27.0	-0.36	1,156.4	-306.8	500.8	464.4	36.44	13.743		
7,600.0	7,544.8	7,746.7	7,544.8	21.2	27.1	-0.36	1,156.4	-306.8	500.8	464.0	36.83	13.596		
7,700.0	7,644.8	7,846.7	7,644.8	21.3	27.2	-0.36	1,156.4	-306.8	500.8	463.6	37.23	13.452		
7,800.0	7,744.8	7,946.7	7,744.8	21.5	27.4	-0.36	1,156.4	-306.8	500.8	463.2	37.63	13.310		
7,900.0	7,844.8	8,046.7	7,844.8	21.7	27.5	-0.36	1,156.4	-306.8	500.8	462.8	38.02	13.171		
7,931.2	7,876.0	8,077.9	7,876.0	21.7	27.5	-0.36	1,156.4	-306.8	500.8	462.7	38.15	13.128		



# Archer

## Anticollision Report

# Archer

<b>Company:</b>	Piceance Energy, LLC	<b>Local Co-ordinate Reference:</b>	Well Piceance Federal 28-04W
<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 28-04W	<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 B-2	<b>Database:</b>	EDMDBBW
<b>Reference Design:</b>	Design #1	<b>Offset TVD Reference:</b>	Reference Datum

Offset Design Piceance 28-05 - Piceance federal 28-03W - Slot A-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		
0.0	0.0	0.0	0.0	0.0	0.0	6.34	14.2	1.6	14.3					
100.0	100.0	100.0	100.0	0.1	0.1	6.34	14.2	1.6	14.3	14.1	0.18	81.287		
200.0	200.0	200.0	200.0	0.3	0.3	35.26	14.2	1.6	12.8	12.1	0.67	19.194		
300.0	299.8	299.8	299.8	0.6	0.5	54.83	14.2	1.6	9.0	7.9	1.13	8.002		
364.3	363.9	363.9	363.9	0.7	0.7	89.94	14.2	1.6	7.4	6.0	1.39	5.290 CC, ES		
400.0	399.5	399.5	399.5	0.8	0.8	115.27	14.2	1.6	8.2	6.6	1.60	5.115		
500.0	498.7	498.7	498.7	1.1	1.0	154.59	14.2	1.6	17.3	15.1	2.22	7.810		
600.0	597.5	597.5	597.5	1.4	1.2	166.42	14.2	1.6	31.8	29.1	2.71	11.724		
700.0	696.3	696.3	696.3	1.8	1.4	170.89	14.2	1.6	47.2	44.1	3.14	15.034		
800.0	795.1	797.1	797.1	2.1	1.7	172.86	15.7	1.0	61.2	57.6	3.57	17.127		
900.0	893.8	898.8	898.7	2.5	1.9	173.51	20.7	-0.7	71.8	67.7	4.01	17.885		
1,000.0	992.6	1,001.2	1,000.7	2.9	2.1	173.44	29.1	-3.6	78.9	74.4	4.47	17.656		
1,100.0	1,091.3	1,104.0	1,102.6	3.2	2.4	172.84	41.1	-7.7	82.5	77.6	4.94	16.713		
1,200.0	1,190.1	1,206.9	1,204.2	3.6	2.7	171.69	56.5	-13.0	82.7	77.2	5.42	15.247		
1,300.0	1,288.9	1,309.6	1,305.0	3.9	3.0	169.85	75.3	-19.5	79.4	73.5	5.93	13.396		
1,400.0	1,387.6	1,411.9	1,404.6	4.3	3.4	166.97	97.4	-27.1	72.8	66.4	6.46	11.265		
1,500.0	1,486.4	1,511.6	1,501.2	4.7	3.8	162.94	120.8	-35.1	64.6	57.5	7.05	9.165		
1,600.0	1,585.1	1,611.2	1,597.6	5.0	4.3	157.77	144.1	-43.2	56.8	49.1	7.70	7.368		
1,700.0	1,683.9	1,710.7	1,694.0	5.4	4.7	151.04	167.5	-51.2	49.5	41.0	8.49	5.833		
1,800.0	1,782.7	1,810.2	1,790.5	5.8	5.2	142.19	190.9	-59.3	43.2	33.7	9.48	4.561		
1,900.0	1,881.4	1,909.8	1,886.9	6.1	5.6	130.71	214.3	-67.3	38.3	27.6	10.70	3.576		
2,000.0	1,980.2	2,009.3	1,983.3	6.5	6.1	116.61	237.6	-75.3	35.2	23.2	12.09	2.916		
2,072.1	2,051.4	2,081.1	2,052.8	6.7	6.5	105.41	254.5	-81.1	34.6	21.5	13.04	2.651		
2,100.0	2,079.0	2,108.9	2,079.7	6.8	6.6	101.02	261.0	-83.4	34.7	21.3	13.36	2.594		
2,200.0	2,177.7	2,208.4	2,176.2	7.2	7.1	86.04	284.4	-91.4	36.7	22.4	14.27	2.569 SF		
2,300.0	2,276.5	2,308.0	2,272.6	7.6	7.6	73.35	307.8	-99.5	40.8	26.0	14.80	2.760		
2,400.0	2,375.2	2,407.5	2,369.0	7.9	8.1	63.39	331.1	-107.5	46.6	31.5	15.11	3.084		
2,500.0	2,474.0	2,507.0	2,465.4	8.3	8.6	55.79	354.5	-115.6	53.5	38.1	15.37	3.480		
2,600.0	2,572.8	2,606.6	2,561.9	8.7	9.1	49.99	377.9	-123.6	61.1	45.4	15.64	3.906		
2,700.0	2,671.5	2,706.1	2,658.3	9.0	9.6	45.51	401.2	-131.6	69.2	53.2	15.94	4.338		
2,800.0	2,770.3	2,805.7	2,754.7	9.4	10.1	41.97	424.6	-139.7	77.6	61.3	16.28	4.764		
2,900.0	2,869.0	2,905.2	2,851.2	9.8	10.6	39.14	448.0	-147.7	86.2	69.6	16.66	5.176		
3,000.0	2,967.8	3,004.8	2,947.6	10.1	11.1	36.82	471.4	-155.8	95.0	78.0	17.06	5.570		
3,100.0	3,066.6	3,104.3	3,044.0	10.5	11.6	34.91	494.7	-163.8	104.0	86.5	17.49	5.945		
3,200.0	3,165.3	3,203.9	3,140.4	10.9	12.1	33.29	518.1	-171.9	113.0	95.1	17.93	6.302		
3,300.0	3,264.1	3,303.4	3,236.9	11.2	12.6	31.92	541.5	-179.9	122.1	103.7	18.39	6.639		
3,400.0	3,362.9	3,402.9	3,333.3	11.6	13.1	30.73	564.9	-188.0	131.3	112.4	18.87	6.959		
3,500.0	3,461.6	3,502.5	3,429.7	12.0	13.6	29.71	588.2	-196.0	140.5	121.2	19.35	7.262		
3,600.0	3,560.4	3,602.0	3,526.1	12.3	14.1	28.81	611.6	-204.0	149.8	130.0	19.85	7.548		
3,700.0	3,659.1	3,701.6	3,622.6	12.7	14.6	28.01	635.0	-212.1	159.1	138.7	20.35	7.820		
3,800.0	3,757.9	3,801.1	3,719.0	13.1	15.1	27.30	658.3	-220.1	168.4	147.6	20.85	8.077		
3,900.0	3,856.7	3,900.7	3,815.4	13.4	15.6	26.67	681.7	-228.2	177.8	156.4	21.36	8.322		
4,000.0	3,955.4	4,000.2	3,911.8	13.8	16.1	26.10	705.1	-236.2	187.1	165.3	21.88	8.554		
4,100.0	4,054.2	4,099.8	4,008.3	14.1	16.6	25.58	728.5	-244.3	196.5	174.1	22.40	8.774		
4,200.0	4,152.9	4,199.3	4,104.7	14.5	17.1	25.11	751.8	-252.3	205.9	183.0	22.92	8.985		
4,300.0	4,251.7	4,298.8	4,201.1	14.9	17.6	24.69	775.2	-260.4	215.3	191.9	23.44	9.185		
4,400.0	4,350.5	4,398.4	4,297.5	15.2	18.1	24.29	798.6	-268.4	224.7	200.8	23.97	9.375		
4,500.0	4,449.2	4,498.4	4,394.4	15.6	18.6	23.93	822.1	-276.5	234.2	209.7	24.50	9.558		
4,600.0	4,548.0	4,606.7	4,499.8	16.0	19.1	23.74	845.4	-284.5	241.6	216.6	25.01	9.662		
4,700.0	4,646.7	4,715.4	4,606.6	16.3	19.4	23.85	865.0	-291.3	245.5	219.9	25.55	9.609		
4,800.0	4,745.7	4,824.3	4,714.1	16.6	19.7	24.10	880.8	-296.7	247.2	221.2	26.02	9.500		
4,900.0	4,845.2	4,933.2	4,822.3	16.9	20.0	24.29	892.7	-300.8	248.5	222.1	26.40	9.413		

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 28-04W
<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 28-04W	<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 B-2	<b>Database:</b>	EDMDBBW
<b>Reference Design:</b>	Design #1	<b>Offset TVD Reference:</b>	Reference Datum

Offset Design Piceance 28-05 - Piceance federal 28-03W - Slot A-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	4,944.9	5,042.2	4,931.0	17.1	20.2	24.42	900.8	-303.6	249.4	222.7	26.71	9.336		
5,100.0	5,044.8	5,151.2	5,039.9	17.2	20.4	24.48	904.9	-305.0	249.8	222.9	26.96	9.267		
5,200.0	5,144.8	5,256.1	5,144.8	17.4	20.5	-0.36	905.5	-305.2	249.9	222.7	27.21	9.183		
5,300.0	5,244.8	5,356.1	5,244.8	17.5	20.6	-0.36	905.5	-305.2	249.9	222.3	27.57	9.065		
5,400.0	5,344.8	5,456.1	5,344.8	17.6	20.7	-0.36	905.5	-305.2	249.9	222.0	27.93	8.946		
5,500.0	5,444.8	5,556.1	5,444.8	17.8	20.8	-0.36	905.5	-305.2	249.9	221.6	28.30	8.830		
5,600.0	5,544.8	5,656.1	5,544.8	17.9	21.0	-0.36	905.5	-305.2	249.9	221.2	28.67	8.716		
5,700.0	5,644.8	5,756.1	5,644.8	18.1	21.1	-0.36	905.5	-305.2	249.9	220.9	29.04	8.604		
5,800.0	5,744.8	5,856.1	5,744.8	18.2	21.2	-0.36	905.5	-305.2	249.9	220.5	29.42	8.495		
5,900.0	5,844.8	5,956.1	5,844.8	18.4	21.3	-0.36	905.5	-305.2	249.9	220.1	29.79	8.388		
6,000.0	5,944.8	6,056.1	5,944.8	18.5	21.5	-0.36	905.5	-305.2	249.9	219.7	30.17	8.283		
6,100.0	6,044.8	6,156.1	6,044.8	18.7	21.6	-0.36	905.5	-305.2	249.9	219.3	30.55	8.179		
6,200.0	6,144.8	6,256.1	6,144.8	18.8	21.7	-0.36	905.5	-305.2	249.9	219.0	30.93	8.078		
6,300.0	6,244.8	6,356.1	6,244.8	19.0	21.9	-0.36	905.5	-305.2	249.9	218.6	31.32	7.979		
6,400.0	6,344.8	6,456.1	6,344.8	19.2	22.0	-0.36	905.5	-305.2	249.9	218.2	31.70	7.882		
6,500.0	6,444.8	6,556.1	6,444.8	19.3	22.1	-0.36	905.5	-305.2	249.9	217.8	32.09	7.787		
6,600.0	6,544.8	6,656.1	6,544.8	19.5	22.3	-0.36	905.5	-305.2	249.9	217.4	32.48	7.694		
6,700.0	6,644.8	6,756.1	6,644.8	19.6	22.4	-0.36	905.5	-305.2	249.9	217.0	32.87	7.603		
6,800.0	6,744.8	6,856.1	6,744.8	19.8	22.6	-0.36	905.5	-305.2	249.9	216.6	33.26	7.513		
6,900.0	6,844.8	6,956.1	6,844.8	20.0	22.7	-0.36	905.5	-305.2	249.9	216.2	33.66	7.425		
7,000.0	6,944.8	7,056.1	6,944.8	20.1	22.8	-0.36	905.5	-305.2	249.9	215.8	34.05	7.339		
7,100.0	7,044.8	7,156.1	7,044.8	20.3	23.0	-0.36	905.5	-305.2	249.9	215.5	34.45	7.255		
7,200.0	7,144.8	7,256.1	7,144.8	20.5	23.1	-0.36	905.5	-305.2	249.9	215.1	34.84	7.172		
7,300.0	7,244.8	7,356.1	7,244.8	20.6	23.3	-0.36	905.5	-305.2	249.9	214.7	35.24	7.091		
7,400.0	7,344.8	7,456.1	7,344.8	20.8	23.4	-0.36	905.5	-305.2	249.9	214.3	35.64	7.011		
7,500.0	7,444.8	7,556.1	7,444.8	21.0	23.6	-0.36	905.5	-305.2	249.9	213.9	36.04	6.933		
7,600.0	7,544.8	7,656.1	7,544.8	21.2	23.7	-0.36	905.5	-305.2	249.9	213.5	36.44	6.857		
7,700.0	7,644.8	7,756.1	7,644.8	21.3	23.9	-0.36	905.5	-305.2	249.9	213.1	36.85	6.782		
7,800.0	7,744.8	7,856.1	7,744.8	21.5	24.0	-0.36	905.5	-305.2	249.9	212.6	37.25	6.708		
7,900.0	7,844.8	7,956.1	7,844.8	21.7	24.2	-0.36	905.5	-305.2	249.9	212.2	37.66	6.636		
7,931.2	7,876.0	7,987.3	7,876.0	21.7	24.2	-0.36	905.5	-305.2	249.9	212.1	37.78	6.614		



# Archer

## Anticollision Report

# Archer

<b>Company:</b>	Piceance Energy, LLC	<b>Local Co-ordinate Reference:</b>	Well Piceance Federal 28-04W
<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 28-04W	<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 B-2	<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		
0.0	0.0	0.0	0.0	0.0	0.0	-37.87	8.1	-6.3	10.3					
100.0	100.0	100.0	100.0	0.1	0.1	-37.87	8.1	-6.3	10.3	10.1	0.18	58.478		
200.0	200.0	199.6	199.6	0.3	0.3	-14.99	9.5	-7.3	10.3	9.6	0.68	15.250		
300.0	299.8	299.3	299.1	0.6	0.6	-20.78	13.7	-10.4	10.5	9.3	1.18	8.889		
400.0	399.5	398.9	398.4	0.8	0.8	-29.76	20.6	-15.6	11.1	9.4	1.68	6.583		
500.0	498.7	498.8	497.7	1.1	1.1	-44.51	29.1	-21.9	10.9	8.7	2.19	4.995		
585.6	583.4	584.3	582.8	1.4	1.3	-66.71	36.4	-27.3	10.4	7.7	2.67	3.872		
600.0	597.5	598.7	597.0	1.4	1.4	-73.50	37.6	-28.2	10.2	7.5	2.77	3.696 CC, ES		
700.0	696.3	698.5	696.3	1.8	1.7	-101.45	46.1	-34.6	12.2	8.8	3.45	3.549 SF		
800.0	795.1	798.4	795.6	2.1	2.0	-118.76	54.6	-40.9	16.2	12.1	4.04	4.000		
900.0	893.8	898.2	894.8	2.5	2.3	-128.77	63.1	-47.2	21.0	16.4	4.57	4.580		
1,000.0	992.6	998.0	994.1	2.9	2.5	-134.94	71.6	-53.5	26.1	21.1	5.09	5.134		
1,100.0	1,091.3	1,097.9	1,093.4	3.2	2.8	-139.03	80.1	-59.8	31.5	25.9	5.61	5.625		
1,200.0	1,190.1	1,197.7	1,192.6	3.6	3.1	-141.92	88.6	-66.2	37.0	30.9	6.12	6.052		
1,300.0	1,288.9	1,297.5	1,291.9	3.9	3.4	-144.06	97.1	-72.5	42.6	36.0	6.64	6.421		
1,400.0	1,387.6	1,397.4	1,391.2	4.3	3.7	-145.71	105.6	-78.8	48.2	41.1	7.15	6.743		
1,500.0	1,486.4	1,497.2	1,490.5	4.7	4.0	-147.00	114.1	-85.1	53.9	46.2	7.67	7.023		
1,600.0	1,585.1	1,597.0	1,589.7	5.0	4.3	-148.06	122.6	-91.4	59.6	51.4	8.19	7.270		
1,700.0	1,683.9	1,696.9	1,689.0	5.4	4.6	-148.92	131.1	-97.8	65.3	56.5	8.72	7.488		
1,800.0	1,782.7	1,796.7	1,788.3	5.8	4.9	-149.65	139.6	-104.1	71.0	61.7	9.24	7.682		
1,900.0	1,881.4	1,896.5	1,887.5	6.1	5.2	-150.27	148.1	-110.4	76.7	66.9	9.76	7.855		
2,000.0	1,980.2	1,996.4	1,986.8	6.5	5.5	-150.81	156.6	-116.7	82.4	72.1	10.29	8.011		
2,100.0	2,079.0	2,096.2	2,086.1	6.8	5.8	-151.27	165.1	-123.0	88.1	77.3	10.81	8.152		
2,200.0	2,177.7	2,196.0	2,185.3	7.2	6.1	-151.68	173.5	-129.4	93.9	82.5	11.34	8.280		
2,300.0	2,276.5	2,295.9	2,284.6	7.6	6.4	-152.04	182.0	-135.7	99.6	87.7	11.86	8.397		
2,400.0	2,375.2	2,395.7	2,383.9	7.9	6.7	-152.36	190.5	-142.0	105.3	93.0	12.39	8.504		
2,500.0	2,474.0	2,495.5	2,483.2	8.3	7.0	-152.65	199.0	-148.3	111.1	98.2	12.91	8.602		
2,600.0	2,572.8	2,595.4	2,582.4	8.7	7.3	-152.91	207.5	-154.6	116.8	103.4	13.44	8.693		
2,700.0	2,671.5	2,695.2	2,681.7	9.0	7.6	-153.15	216.0	-161.0	122.6	108.6	13.97	8.776		
2,800.0	2,770.3	2,795.0	2,781.0	9.4	7.9	-153.36	224.5	-167.3	128.3	113.8	14.49	8.854		
2,900.0	2,869.0	2,894.9	2,880.2	9.8	8.2	-153.56	233.0	-173.6	134.1	119.1	15.02	8.926		
3,000.0	2,967.8	2,994.7	2,979.5	10.1	8.5	-153.74	241.5	-179.9	139.8	124.3	15.55	8.993		
3,100.0	3,066.6	3,094.5	3,078.8	10.5	8.8	-153.90	250.0	-186.2	145.6	129.5	16.08	9.056		
3,200.0	3,165.3	3,194.4	3,178.0	10.9	9.0	-154.06	258.5	-192.6	151.3	134.7	16.60	9.115		
3,300.0	3,264.1	3,294.2	3,277.3	11.2	9.3	-154.20	267.0	-198.9	157.1	140.0	17.13	9.170		
3,400.0	3,362.9	3,394.0	3,376.6	11.6	9.6	-154.33	275.5	-205.2	162.9	145.2	17.66	9.222		
3,500.0	3,461.6	3,493.9	3,475.9	12.0	9.9	-154.45	284.0	-211.5	168.6	150.4	18.19	9.270		
3,600.0	3,560.4	3,593.7	3,575.1	12.3	10.2	-154.57	292.5	-217.9	174.4	155.7	18.72	9.316		
3,700.0	3,659.1	3,693.5	3,674.4	12.7	10.5	-154.68	301.0	-224.2	180.1	160.9	19.25	9.360		
3,800.0	3,757.9	3,793.4	3,773.7	13.1	10.8	-154.78	309.5	-230.5	185.9	166.1	19.77	9.401		
3,900.0	3,856.7	3,893.2	3,872.9	13.4	11.1	-154.87	318.0	-236.8	191.7	171.4	20.30	9.440		
4,000.0	3,955.4	3,993.0	3,972.2	13.8	11.4	-154.96	326.5	-243.1	197.4	176.6	20.83	9.477		
4,100.0	4,054.2	4,092.9	4,071.5	14.1	11.7	-155.05	335.0	-249.5	203.2	181.8	21.36	9.512		
4,200.0	4,152.9	4,192.7	4,170.7	14.5	12.0	-155.13	343.5	-255.8	208.9	187.1	21.89	9.546		
4,300.0	4,251.7	4,292.5	4,270.0	14.9	12.3	-155.20	352.0	-262.1	214.7	192.3	22.42	9.578		
4,400.0	4,350.5	4,392.4	4,369.3	15.2	12.6	-155.27	360.5	-268.4	220.5	197.5	22.95	9.608		
4,500.0	4,449.2	4,492.2	4,468.6	15.6	12.9	-155.34	369.0	-274.7	226.2	202.8	23.48	9.637		
4,600.0	4,548.0	4,592.0	4,567.8	16.0	13.2	-155.40	377.5	-281.1	232.0	208.0	24.00	9.665		
4,700.0	4,646.7	4,691.9	4,667.1	16.3	13.5	-155.47	386.0	-287.4	237.8	213.2	24.53	9.691		
4,800.0	4,745.7	4,790.5	4,765.1	16.6	13.8	-155.41	394.3	-293.6	242.1	217.1	25.04	9.669		
4,900.0	4,845.2	4,884.0	4,858.4	16.9	14.0	-155.33	400.6	-298.2	245.1	219.7	25.41	9.647		
5,000.0	4,944.9	4,977.5	4,951.7	17.1	14.1	-155.34	404.4	-301.1	247.5	221.8	25.71	9.629		

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 28-04W
<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 28-04W	<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 B-2	<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				
5,100.0	5,044.8	5,071.0	5,045.2	17.2	14.3	-155.46	405.7	-302.1	249.4	223.5	25.95	9.612				
5,200.0	5,144.8	5,170.6	5,144.8	17.4	14.5	179.64	405.7	-302.1	249.9	223.7	26.24	9.522				
5,300.0	5,244.8	5,270.6	5,244.8	17.5	14.6	179.64	405.7	-302.1	249.9	223.3	26.63	9.386				
5,400.0	5,344.8	5,370.6	5,344.8	17.6	14.8	179.64	405.7	-302.1	249.9	222.9	27.01	9.253				
5,500.0	5,444.8	5,470.6	5,444.8	17.8	15.0	179.64	405.7	-302.1	249.9	222.5	27.39	9.123				
5,600.0	5,544.8	5,570.6	5,544.8	17.9	15.1	179.64	405.7	-302.1	249.9	222.1	27.78	8.996				
5,700.0	5,644.8	5,670.6	5,644.8	18.1	15.3	179.64	405.7	-302.1	249.9	221.7	28.17	8.872				
5,800.0	5,744.8	5,770.6	5,744.8	18.2	15.5	179.64	405.7	-302.1	249.9	221.3	28.56	8.751				
5,900.0	5,844.8	5,870.6	5,844.8	18.4	15.7	179.64	405.7	-302.1	249.9	220.9	28.95	8.632				
6,000.0	5,944.8	5,970.6	5,944.8	18.5	15.9	179.64	405.7	-302.1	249.9	220.6	29.34	8.516				
6,100.0	6,044.8	6,070.6	6,044.8	18.7	16.0	179.64	405.7	-302.1	249.9	220.2	29.74	8.403				
6,200.0	6,144.8	6,170.6	6,144.8	18.8	16.2	179.64	405.7	-302.1	249.9	219.8	30.14	8.292				
6,300.0	6,244.8	6,270.6	6,244.8	19.0	16.4	179.64	405.7	-302.1	249.9	219.4	30.53	8.184				
6,400.0	6,344.8	6,370.6	6,344.8	19.2	16.6	179.64	405.7	-302.1	249.9	219.0	30.93	8.079				
6,500.0	6,444.8	6,470.6	6,444.8	19.3	16.8	179.64	405.7	-302.1	249.9	218.6	31.33	7.975				
6,600.0	6,544.8	6,570.6	6,544.8	19.5	17.0	179.64	405.7	-302.1	249.9	218.2	31.74	7.874				
6,700.0	6,644.8	6,670.6	6,644.8	19.6	17.2	179.64	405.7	-302.1	249.9	217.8	32.14	7.775				
6,800.0	6,744.8	6,770.6	6,744.8	19.8	17.3	179.64	405.7	-302.1	249.9	217.4	32.54	7.679				
6,900.0	6,844.8	6,870.6	6,844.8	20.0	17.5	179.64	405.7	-302.1	249.9	216.9	32.95	7.584				
7,000.0	6,944.8	6,970.6	6,944.8	20.1	17.7	179.64	405.7	-302.1	249.9	216.5	33.36	7.492				
7,100.0	7,044.8	7,070.6	7,044.8	20.3	17.9	179.64	405.7	-302.1	249.9	216.1	33.77	7.401				
7,200.0	7,144.8	7,170.6	7,144.8	20.5	18.1	179.64	405.7	-302.1	249.9	215.7	34.17	7.312				
7,300.0	7,244.8	7,270.6	7,244.8	20.6	18.3	179.64	405.7	-302.1	249.9	215.3	34.58	7.226				
7,400.0	7,344.8	7,370.6	7,344.8	20.8	18.5	179.64	405.7	-302.1	249.9	214.9	35.00	7.141				
7,500.0	7,444.8	7,470.6	7,444.8	21.0	18.7	179.64	405.7	-302.1	249.9	214.5	35.41	7.058				
7,600.0	7,544.8	7,570.6	7,544.8	21.2	18.9	179.64	405.7	-302.1	249.9	214.1	35.82	6.976				
7,700.0	7,644.8	7,670.6	7,644.8	21.3	19.1	179.64	405.7	-302.1	249.9	213.7	36.23	6.897				
7,800.0	7,744.8	7,770.6	7,744.8	21.5	19.3	179.64	405.7	-302.1	249.9	213.2	36.65	6.819				
7,900.0	7,844.8	7,870.6	7,844.8	21.7	19.5	179.64	405.7	-302.1	249.9	212.8	37.06	6.742				
7,915.9	7,860.7	7,886.5	7,860.7	21.7	19.5	179.64	405.7	-302.1	249.9	212.8	37.13	6.730				
7,931.2	7,876.0	7,891.8	7,866.0	21.7	19.5	179.64	405.7	-302.1	250.1	212.9	37.17	6.728				





# Archer

## Anticollision Report

# Archer

<b>Company:</b>	Piceance Energy, LLC	<b>Local Co-ordinate Reference:</b>	Well Piceance Federal 28-04W
<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 28-04W	<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 B-2	<b>Database:</b>	EDMDBBW
<b>Reference Design:</b>	Design #1	<b>Offset TVD Reference:</b>	Reference Datum

Offset Design Piceance 28-05 - Piceance Federal 28-06W - Slot B-3 - 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	140.33	-15.2	12.6	19.7					
100.0	100.0	100.0	100.0	0.1	0.1	140.33	-15.2	12.6	19.7	19.5	0.18	112.457	CC, ES	
200.0	200.0	200.0	200.0	0.3	0.3	166.37	-15.2	12.6	21.4	20.7	0.68	31.381		
300.0	299.8	299.8	299.8	0.6	0.5	169.01	-15.2	12.6	26.5	25.3	1.20	22.015		
400.0	399.5	399.5	399.5	0.8	0.8	171.70	-15.2	12.6	35.1	33.4	1.73	20.325		
500.0	498.7	500.1	500.1	1.1	1.0	174.95	-14.3	11.1	45.7	43.5	2.24	20.411		
600.0	597.5	600.9	600.8	1.4	1.2	179.13	-11.8	6.4	56.6	53.9	2.70	20.993		
700.0	696.3	700.9	700.4	1.8	1.4	-176.66	-8.0	-0.5	66.1	63.0	3.13	21.147		
800.0	795.1	800.3	799.5	2.1	1.7	-173.45	-4.2	-7.5	75.7	72.2	3.58	21.132		
900.0	893.8	899.8	898.6	2.5	1.9	-170.97	-0.3	-14.6	85.6	81.5	4.06	21.078		
1,000.0	992.6	999.2	997.8	2.9	2.2	-169.01	3.5	-21.6	95.5	91.0	4.55	21.003		
1,100.0	1,091.3	1,098.7	1,096.9	3.2	2.5	-167.42	7.3	-28.6	105.6	100.5	5.05	20.919		
1,200.0	1,190.1	1,198.1	1,196.1	3.6	2.7	-166.10	11.2	-35.6	115.7	110.1	5.55	20.834		
1,300.0	1,288.9	1,297.6	1,295.2	3.9	3.0	-165.00	15.0	-42.7	125.8	119.8	6.06	20.752		
1,400.0	1,387.6	1,397.1	1,394.3	4.3	3.2	-164.06	18.8	-49.7	136.0	129.4	6.58	20.673		
1,500.0	1,486.4	1,496.5	1,493.5	4.7	3.5	-163.25	22.7	-56.7	146.2	139.1	7.10	20.600		
1,600.0	1,585.1	1,596.0	1,592.6	5.0	3.8	-162.55	26.5	-63.7	156.5	148.9	7.62	20.532		
1,700.0	1,683.9	1,695.4	1,691.7	5.4	4.0	-161.93	30.3	-70.7	166.8	158.6	8.15	20.469		
1,800.0	1,782.7	1,794.9	1,790.9	5.8	4.3	-161.39	34.2	-77.8	177.1	168.4	8.68	20.411		
1,900.0	1,881.4	1,894.3	1,890.0	6.1	4.6	-160.90	38.0	-84.8	187.4	178.2	9.20	20.357		
2,000.0	1,980.2	1,993.8	1,989.1	6.5	4.8	-160.47	41.8	-91.8	197.7	187.9	9.73	20.308		
2,100.0	2,079.0	2,093.2	2,088.3	6.8	5.1	-160.08	45.7	-98.8	208.0	197.7	10.27	20.262		
2,200.0	2,177.7	2,192.7	2,187.4	7.2	5.4	-159.73	49.5	-105.9	218.3	207.5	10.80	20.219		
2,300.0	2,276.5	2,292.2	2,286.5	7.6	5.6	-159.40	53.4	-112.9	228.7	217.4	11.33	20.180		
2,400.0	2,375.2	2,391.6	2,385.7	7.9	5.9	-159.11	57.2	-119.9	239.0	227.2	11.87	20.144		
2,500.0	2,474.0	2,491.1	2,484.8	8.3	6.2	-158.84	61.0	-126.9	249.4	237.0	12.40	20.110		
2,600.0	2,572.8	2,590.5	2,583.9	8.7	6.4	-158.59	64.9	-134.0	259.7	246.8	12.94	20.078		
2,700.0	2,671.5	2,690.0	2,683.1	9.0	6.7	-158.36	68.7	-141.0	270.1	256.6	13.47	20.048		
2,800.0	2,770.3	2,789.4	2,782.2	9.4	7.0	-158.15	72.5	-148.0	280.5	266.5	14.01	20.021		
2,900.0	2,869.0	2,888.9	2,881.3	9.8	7.2	-157.96	76.4	-155.0	290.9	276.3	14.55	19.995		
3,000.0	2,967.8	2,988.3	2,980.5	10.1	7.5	-157.77	80.2	-162.0	301.2	286.1	15.08	19.970		
3,100.0	3,066.6	3,087.8	3,079.6	10.5	7.8	-157.60	84.0	-169.1	311.6	296.0	15.62	19.947		
3,200.0	3,165.3	3,187.3	3,178.7	10.9	8.0	-157.44	87.9	-176.1	322.0	305.8	16.16	19.925		
3,300.0	3,264.1	3,286.7	3,277.9	11.2	8.3	-157.29	91.7	-183.1	332.4	315.7	16.70	19.905		
3,400.0	3,362.9	3,386.2	3,377.0	11.6	8.6	-157.15	95.5	-190.1	342.8	325.5	17.24	19.886		
3,500.0	3,461.6	3,485.6	3,476.1	12.0	8.8	-157.02	99.4	-197.2	353.1	335.4	17.77	19.867		
3,600.0	3,560.4	3,585.1	3,575.3	12.3	9.1	-156.89	103.2	-204.2	363.5	345.2	18.31	19.850		
3,700.0	3,659.1	3,684.5	3,674.4	12.7	9.4	-156.77	107.1	-211.2	373.9	355.1	18.85	19.834		
3,800.0	3,757.9	3,784.0	3,773.5	13.1	9.6	-156.66	110.9	-218.2	384.3	364.9	19.39	19.818		
3,900.0	3,856.7	3,883.4	3,872.7	13.4	9.9	-156.56	114.7	-225.3	394.7	374.8	19.93	19.803		
4,000.0	3,955.4	3,982.9	3,971.8	13.8	10.2	-156.45	118.6	-232.3	405.1	384.6	20.47	19.789		
4,100.0	4,054.2	4,082.4	4,070.9	14.1	10.4	-156.36	122.4	-239.3	415.5	394.5	21.01	19.776		
4,200.0	4,152.9	4,181.8	4,170.1	14.5	10.7	-156.27	126.2	-246.3	425.9	404.3	21.55	19.763		
4,300.0	4,251.7	4,281.3	4,269.2	14.9	11.0	-156.18	130.1	-253.3	436.3	414.2	22.09	19.750		
4,400.0	4,350.5	4,380.7	4,368.3	15.2	11.2	-156.10	133.9	-260.4	446.7	424.0	22.63	19.739		
4,500.0	4,449.2	4,480.2	4,467.5	15.6	11.5	-156.02	137.7	-267.4	457.1	433.9	23.17	19.727		
4,600.0	4,548.0	4,579.6	4,566.6	16.0	11.8	-155.95	141.6	-274.4	467.5	443.8	23.71	19.717		
4,700.0	4,646.7	4,679.1	4,665.7	16.3	12.0	-155.87	145.4	-281.4	477.9	453.6	24.25	19.706		
4,800.0	4,745.7	4,778.7	4,765.0	16.6	12.3	-155.80	149.3	-288.5	488.8	462.0	24.78	19.695		
4,900.0	4,845.2	4,875.0	4,861.0	16.9	12.5	-155.88	152.8	-295.0	492.7	467.5	25.23	19.684		
5,000.0	4,944.9	4,967.2	4,953.1	17.1	12.7	-155.46	155.0	-299.0	496.8	471.3	25.57	19.673		
5,100.0	5,044.8	5,059.4	5,045.2	17.2	12.9	-155.48	155.8	-300.5	499.3	473.5	25.85	19.662		

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



<b>Company:</b>	Piceance Energy, LLC	<b>Local Co-ordinate Reference:</b>	Well Piceance Federal 28-04W
<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 28-04W	<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 B-2	<b>Database:</b>	EDMDBBW
<b>Reference Design:</b>	Design #1	<b>Offset TVD Reference:</b>	Reference Datum

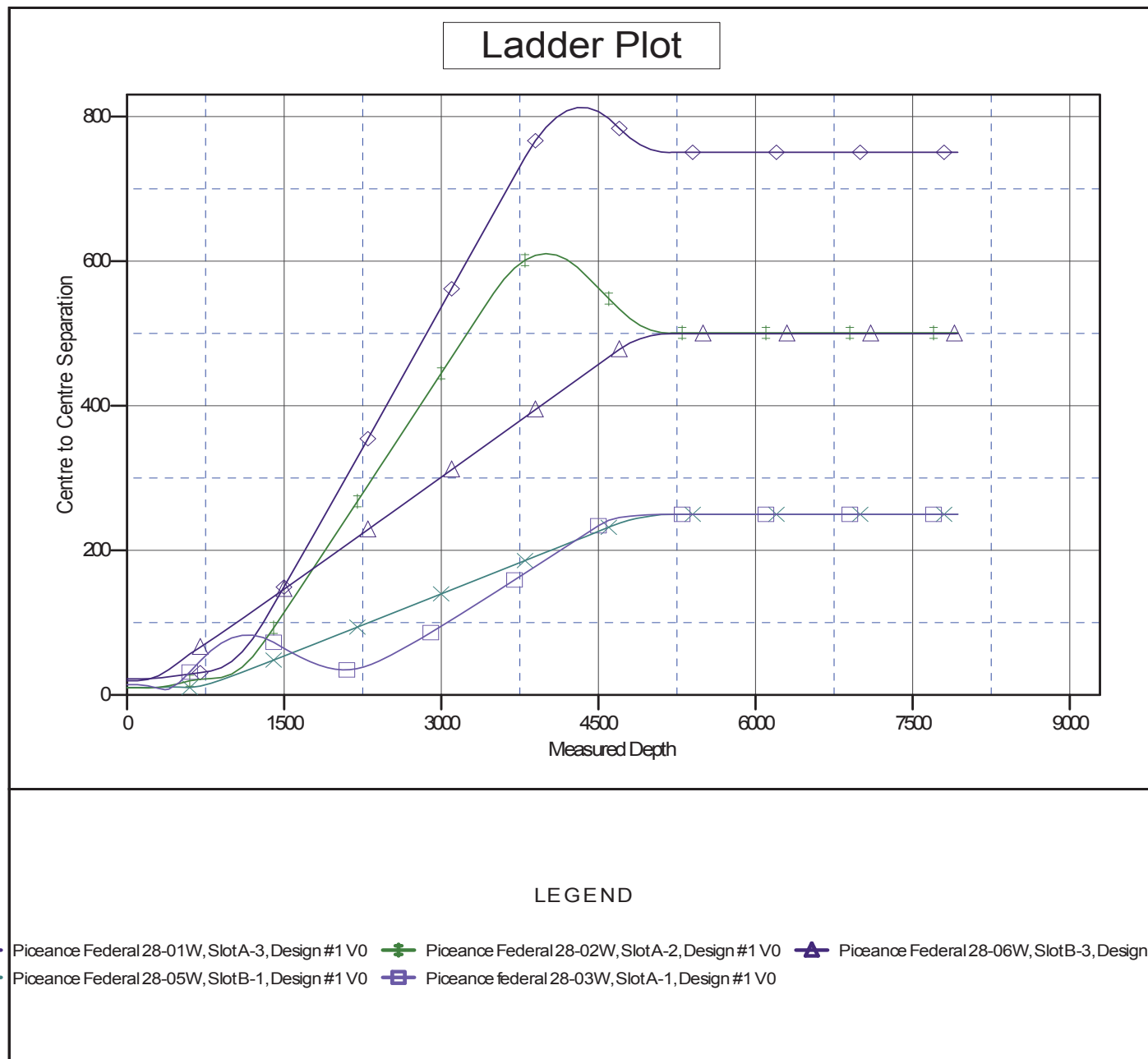
Offset Design Piceance 28-05 - Piceance Federal 28-06W - Slot B-3 - Design #1													Offset Site Error:	0.0 usft
Survey Program: 0-MWD													Offset Well Error:	0.0 usft
Reference		Offset		Semi Major Axis			Distance						Warning	
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	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		
5,200.0	5,144.8	5,159.0	5,144.8	17.4	13.0	179.64	155.8	-300.5	499.8	473.6	26.15	19.111		
5,300.0	5,244.8	5,259.0	5,244.8	17.5	13.2	179.64	155.8	-300.5	499.8	473.3	26.53	18.839		
5,400.0	5,344.8	5,359.0	5,344.8	17.6	13.4	179.64	155.8	-300.5	499.8	472.9	26.91	18.573		
5,500.0	5,444.8	5,459.0	5,444.8	17.8	13.6	179.64	155.8	-300.5	499.8	472.5	27.29	18.314		
5,600.0	5,544.8	5,559.0	5,544.8	17.9	13.8	179.64	155.8	-300.5	499.8	472.1	27.67	18.060		
5,700.0	5,644.8	5,659.0	5,644.8	18.1	14.0	179.64	155.8	-300.5	499.8	471.7	28.06	17.811		
5,800.0	5,744.8	5,759.0	5,744.8	18.2	14.2	179.64	155.8	-300.5	499.8	471.3	28.45	17.569		
5,900.0	5,844.8	5,859.0	5,844.8	18.4	14.4	179.64	155.8	-300.5	499.8	471.0	28.84	17.332		
6,000.0	5,944.8	5,959.0	5,944.8	18.5	14.6	179.64	155.8	-300.5	499.8	470.6	29.23	17.100		
6,100.0	6,044.8	6,059.0	6,044.8	18.7	14.8	179.64	155.8	-300.5	499.8	470.2	29.62	16.873		
6,200.0	6,144.8	6,159.0	6,144.8	18.8	15.0	179.64	155.8	-300.5	499.8	469.8	30.02	16.651		
6,300.0	6,244.8	6,259.0	6,244.8	19.0	15.2	179.64	155.8	-300.5	499.8	469.4	30.41	16.435		
6,400.0	6,344.8	6,359.0	6,344.8	19.2	15.4	179.64	155.8	-300.5	499.8	469.0	30.81	16.223		
6,500.0	6,444.8	6,459.0	6,444.8	19.3	15.6	179.64	155.8	-300.5	499.8	468.6	31.21	16.015		
6,600.0	6,544.8	6,559.0	6,544.8	19.5	15.8	179.64	155.8	-300.5	499.8	468.2	31.61	15.813		
6,700.0	6,644.8	6,659.0	6,644.8	19.6	16.0	179.64	155.8	-300.5	499.8	467.8	32.01	15.614		
6,800.0	6,744.8	6,759.0	6,744.8	19.8	16.2	179.64	155.8	-300.5	499.8	467.4	32.41	15.420		
6,900.0	6,844.8	6,859.0	6,844.8	20.0	16.4	179.64	155.8	-300.5	499.8	467.0	32.82	15.231		
7,000.0	6,944.8	6,959.0	6,944.8	20.1	16.6	179.64	155.8	-300.5	499.8	466.6	33.22	15.045		
7,100.0	7,044.8	7,059.0	7,044.8	20.3	16.8	179.64	155.8	-300.5	499.8	466.2	33.63	14.863		
7,200.0	7,144.8	7,159.0	7,144.8	20.5	17.0	179.64	155.8	-300.5	499.8	465.8	34.03	14.685		
7,300.0	7,244.8	7,259.0	7,244.8	20.6	17.2	179.64	155.8	-300.5	499.8	465.4	34.44	14.511		
7,400.0	7,344.8	7,359.0	7,344.8	20.8	17.4	179.64	155.8	-300.5	499.8	464.9	34.85	14.341		
7,500.0	7,444.8	7,459.0	7,444.8	21.0	17.6	179.64	155.8	-300.5	499.8	464.5	35.26	14.174		
7,600.0	7,544.8	7,559.0	7,544.8	21.2	17.8	179.64	155.8	-300.5	499.8	464.1	35.67	14.010		
7,700.0	7,644.8	7,659.0	7,644.8	21.3	18.0	179.64	155.8	-300.5	499.8	463.7	36.09	13.850		
7,800.0	7,744.8	7,759.0	7,744.8	21.5	18.2	179.64	155.8	-300.5	499.8	463.3	36.50	13.694		
7,900.0	7,844.8	7,859.0	7,844.8	21.7	18.4	179.64	155.8	-300.5	499.8	462.9	36.91	13.540		
7,906.6	7,851.4	7,865.5	7,851.4	21.7	18.4	179.64	155.8	-300.5	499.8	462.9	36.94	13.530		
7,931.2	7,876.0	7,872.1	7,858.0	21.7	18.4	179.64	155.8	-300.5	500.1	463.1	37.00	13.515 SF		



Company:	Piceance Energy, LLC	Local Co-ordinate Reference:	Well Piceance Federal 28-04W
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 28-04W	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 usft	Output errors are at	2.00 sigma
Reference Wellbore	Slot B-2	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 28-04W  
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 28-04W
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 28-04W	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 usft	Output errors are at	2.00 sigma
Reference Wellbore	Slot B-2	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 28-04W

Coordinate System is US State Plane 1983, Colorado Central Zone

Grid Convergence at Surface is: -1.44°

