



Piceance Energy, LLC

Mesa County, CO

Piceance 28-05

Piceance 28-06M

Slot A-7

Plan: Design #1

Standard Planning Report

29 April, 2015

Archer



Project: Mesa County, CO
Site: Piceance 28-05
Well: Piceance 28-06M
Wellbore: Slot A-7
Design: Design #1
Latitude: 39° 15' 3.590 N
Longitude: 107° 46' 45.990 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 28-06M, 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 28-06M

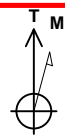
+N/-S	+E/-W	North	Ground Level:	Latitude	Longitude	Slot
0.00	0.00	1524407.756	7556.00	39° 15' 3.590 N	107° 46' 45.990 W	

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

Name	TVD	+N/-S	+E/-W	North	Easting	Latitude	Longitude	Shape
Piceance Federal 28-06M tgt	7896.00	192.27	1350.61	1524566.085	2355924.171	39° 15' 5.490 N	107° 46' 28.820 W	Circle (Radius: 50.00)

SECTION DETAILS

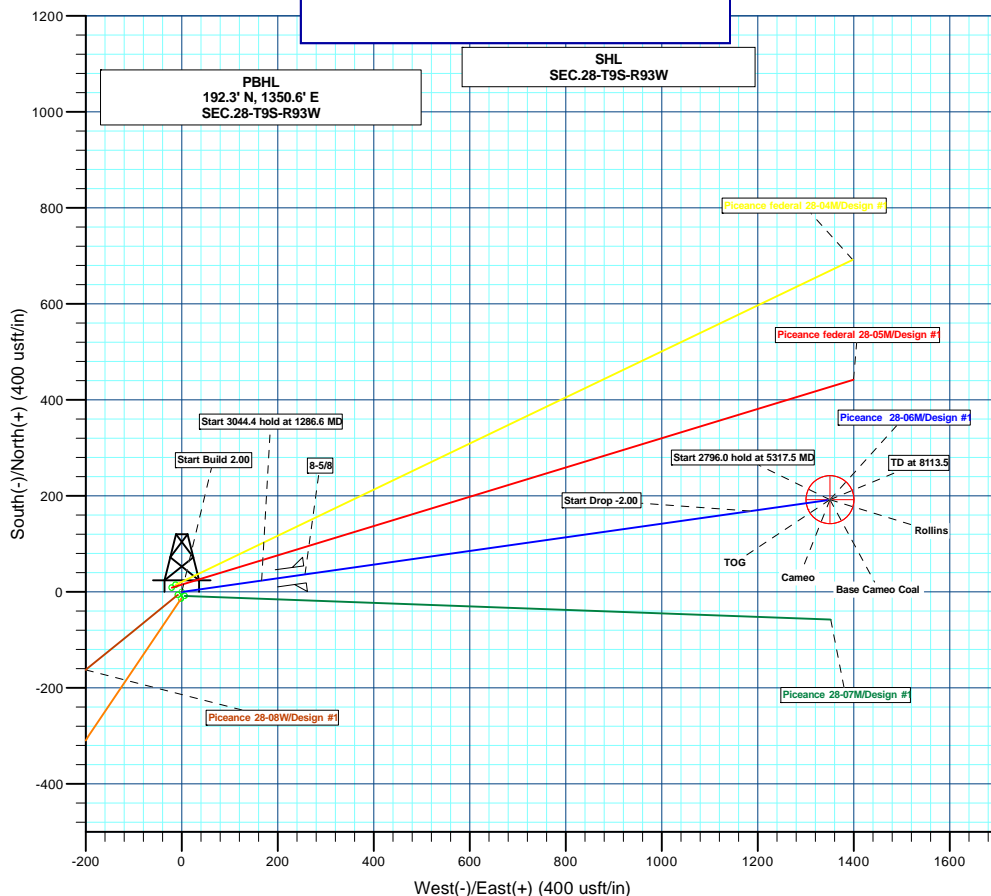
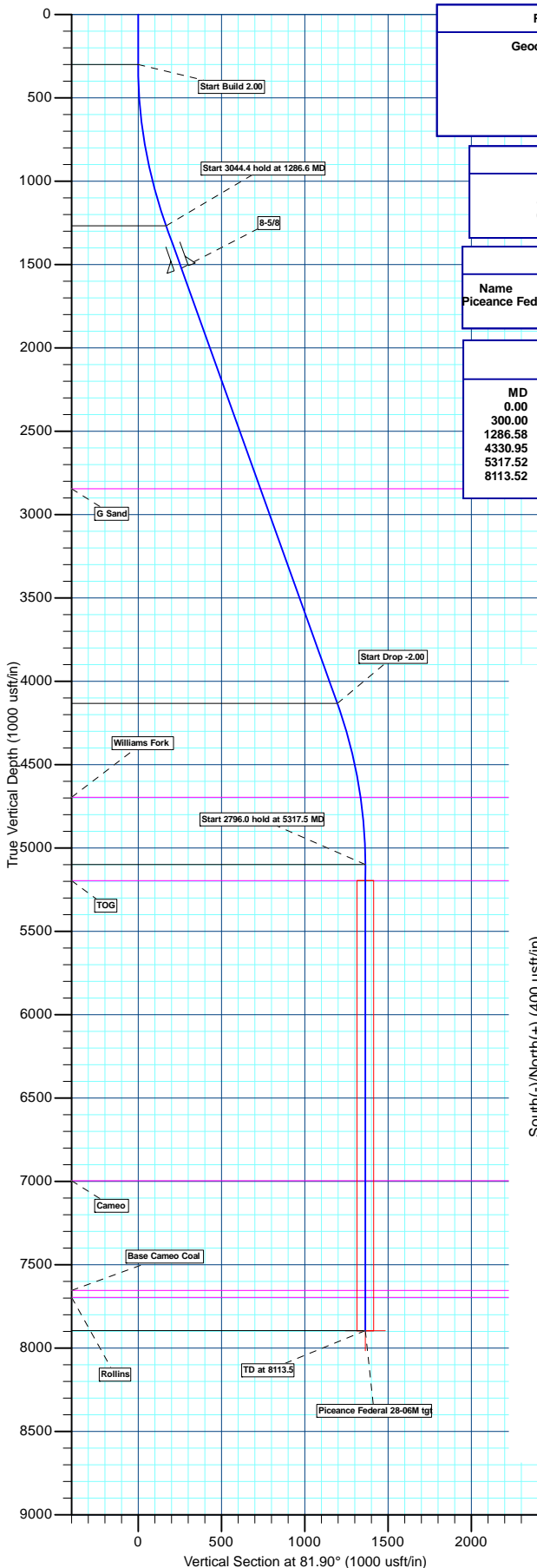
MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	VSec	Annotation
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	Start Build 2.00
300.00	0.00	0.00	300.00	0.00	0.00	0.00	0.00	0.00	Start 3044.4 hold at 1286.6 MD
1286.58	19.73	81.90	1267.19	23.71	166.53	2.00	81.90	168.21	Start Drop -2.00
4330.95	19.73	81.90	4132.81	168.56	1184.09	0.00	0.00	1196.03	Start 2796.0 hold at 5317.5 MD
5317.52	0.00	0.00	5100.00	192.27	1350.61	2.00	180.00	1364.23	TD at 8113.5
8113.52	0.00	0.00	7896.00	192.27	1350.61	0.00	0.00	1364.23	



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
2846.00	2963.87	G Sand
4696.00	4912.17	Williams Fork
5196.00	5413.52	TOG
6996.00	7213.52	Cameo
7654.00	7871.52	Base Cameo Coal
7696.00	7913.52	Rollins



Plan: Design #1 (Piceance 28-06M/Slot A-7)

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



Archer
Planning Report

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Database:	EDMDBBW	Local Co-ordinate Reference:	Well Piceance 28-06M
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 28-06M	Survey Calculation Method:	Minimum Curvature
Wellbore:	Slot A-7		
Design:	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 28-06M					
Well Position	+N/-S	31.35 usft	Northing:	1,524,407.756 usft	Latitude:	39° 15' 3.590 N
	+E/-W	-25.17 usft	Easting:	2,354,569.158 usft	Longitude:	107° 46' 45.990 W
Position Uncertainty		0.00 usft	Wellhead Elevation:	0.00 usft	Ground Level:	7,556.00 usft

Wellbore	Slot A-7				
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	81.90

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	
300.00	0.00	0.00	300.00	0.00	0.00	0.00	0.00	0.00	0.00	
1,286.58	19.73	81.90	1,267.19	23.71	166.53	2.00	2.00	0.00	81.90	
4,330.95	19.73	81.90	4,132.81	168.56	1,184.09	0.00	0.00	0.00	0.00	
5,317.52	0.00	0.00	5,100.00	192.27	1,350.61	2.00	-2.00	0.00	180.00	
8,113.52	0.00	0.00	7,896.00	192.27	1,350.61	0.00	0.00	0.00	0.00	Piceance Federal 28-0



Database:	EDMDBBW	Local Co-ordinate Reference:	Well Piceance 28-06M
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 28-06M	Survey Calculation Method:	Minimum Curvature
Wellbore:	Slot A-7		
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
Start Build 2.00									
300.00	0.00	0.00	300.00	0.00	0.00	0.00	0.00	0.00	0.00
400.00	2.00	81.90	399.98	0.25	1.73	1.75	2.00	2.00	0.00
500.00	4.00	81.90	499.84	0.98	6.91	6.98	2.00	2.00	0.00
600.00	6.00	81.90	599.45	2.21	15.54	15.69	2.00	2.00	0.00
700.00	8.00	81.90	698.70	3.93	27.60	27.88	2.00	2.00	0.00
800.00	10.00	81.90	797.47	6.13	43.09	43.52	2.00	2.00	0.00
900.00	12.00	81.90	895.62	8.82	61.98	62.60	2.00	2.00	0.00
1,000.00	14.00	81.90	993.06	11.99	84.25	85.10	2.00	2.00	0.00
1,100.00	16.00	81.90	1,089.64	15.64	109.87	110.98	2.00	2.00	0.00
1,200.00	18.00	81.90	1,185.27	19.76	138.81	140.21	2.00	2.00	0.00
Start 3044.4 hold at 1286.6 MD									
1,286.58	19.73	81.90	1,267.19	23.71	166.53	168.21	2.00	2.00	0.00
1,300.00	19.73	81.90	1,279.83	24.35	171.01	172.74	0.00	0.00	0.00
1,400.00	19.73	81.90	1,373.95	29.10	204.44	206.50	0.00	0.00	0.00
1,500.00	19.73	81.90	1,468.08	33.86	237.86	240.26	0.00	0.00	0.00
8-5/8									
1,557.28	19.73	81.90	1,522.00	36.59	257.01	259.60	0.00	0.00	0.00
1,600.00	19.73	81.90	1,562.21	38.62	271.29	274.02	0.00	0.00	0.00
1,700.00	19.73	81.90	1,656.34	43.38	304.71	307.78	0.00	0.00	0.00
1,800.00	19.73	81.90	1,750.47	48.14	338.14	341.54	0.00	0.00	0.00
1,900.00	19.73	81.90	1,844.60	52.89	371.56	375.31	0.00	0.00	0.00
2,000.00	19.73	81.90	1,938.73	57.65	404.98	409.07	0.00	0.00	0.00
2,100.00	19.73	81.90	2,032.85	62.41	438.41	442.83	0.00	0.00	0.00
2,200.00	19.73	81.90	2,126.98	67.17	471.83	476.59	0.00	0.00	0.00
2,300.00	19.73	81.90	2,221.11	71.93	505.26	510.35	0.00	0.00	0.00
2,400.00	19.73	81.90	2,315.24	76.69	538.68	544.11	0.00	0.00	0.00
2,500.00	19.73	81.90	2,409.37	81.44	572.11	577.87	0.00	0.00	0.00
2,600.00	19.73	81.90	2,503.50	86.20	605.53	611.64	0.00	0.00	0.00
2,700.00	19.73	81.90	2,597.63	90.96	638.95	645.40	0.00	0.00	0.00
2,800.00	19.73	81.90	2,691.75	95.72	672.38	679.16	0.00	0.00	0.00
2,900.00	19.73	81.90	2,785.88	100.48	705.80	712.92	0.00	0.00	0.00
G Sand									
2,963.87	19.73	81.90	2,846.00	103.52	727.15	734.48	0.00	0.00	0.00
3,000.00	19.73	81.90	2,880.01	105.23	739.23	746.68	0.00	0.00	0.00
3,100.00	19.73	81.90	2,974.14	109.99	772.65	780.44	0.00	0.00	0.00
3,200.00	19.73	81.90	3,068.27	114.75	806.08	814.20	0.00	0.00	0.00
3,300.00	19.73	81.90	3,162.40	119.51	839.50	847.96	0.00	0.00	0.00
3,400.00	19.73	81.90	3,256.52	124.27	872.92	881.73	0.00	0.00	0.00
3,500.00	19.73	81.90	3,350.65	129.03	906.35	915.49	0.00	0.00	0.00
3,600.00	19.73	81.90	3,444.78	133.78	939.77	949.25	0.00	0.00	0.00
3,700.00	19.73	81.90	3,538.91	138.54	973.20	983.01	0.00	0.00	0.00
3,800.00	19.73	81.90	3,633.04	143.30	1,006.62	1,016.77	0.00	0.00	0.00
3,900.00	19.73	81.90	3,727.17	148.06	1,040.05	1,050.53	0.00	0.00	0.00
4,000.00	19.73	81.90	3,821.30	152.82	1,073.47	1,084.29	0.00	0.00	0.00
4,100.00	19.73	81.90	3,915.42	157.57	1,106.90	1,118.05	0.00	0.00	0.00
4,200.00	19.73	81.90	4,009.55	162.33	1,140.32	1,151.82	0.00	0.00	0.00
4,300.00	19.73	81.90	4,103.68	167.09	1,173.74	1,185.58	0.00	0.00	0.00
Start Drop -2.00									
4,330.95	19.73	81.90	4,132.81	168.56	1,184.09	1,196.03	0.00	0.00	0.00
4,400.00	18.35	81.90	4,198.08	171.74	1,206.39	1,218.55	2.00	-2.00	0.00



Database:	EDMDBBW	Local Co-ordinate Reference:	Well Piceance 28-06M
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 28-06M	Survey Calculation Method:	Minimum Curvature
Wellbore:	Slot A-7		
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	16.35	81.90	4,293.53	175.94	1,235.91	1,248.37	2.00	-2.00	0.00	
4,600.00	14.35	81.90	4,389.96	179.67	1,262.12	1,274.84	2.00	-2.00	0.00	
4,700.00	12.35	81.90	4,487.25	182.93	1,284.98	1,297.93	2.00	-2.00	0.00	
4,800.00	10.35	81.90	4,585.29	185.70	1,304.46	1,317.61	2.00	-2.00	0.00	
4,900.00	8.35	81.90	4,683.96	187.99	1,320.55	1,333.86	2.00	-2.00	0.00	
Williams Fork										
4,912.17	8.11	81.90	4,696.00	188.24	1,322.27	1,335.60	2.00	-2.00	0.00	
5,000.00	6.35	81.90	4,783.13	189.79	1,333.21	1,346.65	2.00	-2.00	0.00	
5,100.00	4.35	81.90	4,882.69	191.11	1,342.44	1,355.98	2.00	-2.00	0.00	
5,200.00	2.35	81.90	4,982.51	191.93	1,348.23	1,361.82	2.00	-2.00	0.00	
5,300.00	0.35	81.90	5,082.48	192.26	1,350.56	1,364.18	2.00	-2.00	0.00	
Start 2796.0 hold at 5317.5 MD										
5,317.52	0.00	0.00	5,100.00	192.27	1,350.61	1,364.23	2.00	-2.00	0.00	
5,400.00	0.00	0.00	5,182.48	192.27	1,350.61	1,364.23	0.00	0.00	0.00	
TOG										
5,413.52	0.00	0.00	5,196.00	192.27	1,350.61	1,364.23	0.00	0.00	0.00	
5,500.00	0.00	0.00	5,282.48	192.27	1,350.61	1,364.23	0.00	0.00	0.00	
5,600.00	0.00	0.00	5,382.48	192.27	1,350.61	1,364.23	0.00	0.00	0.00	
5,700.00	0.00	0.00	5,482.48	192.27	1,350.61	1,364.23	0.00	0.00	0.00	
5,800.00	0.00	0.00	5,582.48	192.27	1,350.61	1,364.23	0.00	0.00	0.00	
5,900.00	0.00	0.00	5,682.48	192.27	1,350.61	1,364.23	0.00	0.00	0.00	
6,000.00	0.00	0.00	5,782.48	192.27	1,350.61	1,364.23	0.00	0.00	0.00	
6,100.00	0.00	0.00	5,882.48	192.27	1,350.61	1,364.23	0.00	0.00	0.00	
6,200.00	0.00	0.00	5,982.48	192.27	1,350.61	1,364.23	0.00	0.00	0.00	
6,300.00	0.00	0.00	6,082.48	192.27	1,350.61	1,364.23	0.00	0.00	0.00	
6,400.00	0.00	0.00	6,182.48	192.27	1,350.61	1,364.23	0.00	0.00	0.00	
6,500.00	0.00	0.00	6,282.48	192.27	1,350.61	1,364.23	0.00	0.00	0.00	
6,600.00	0.00	0.00	6,382.48	192.27	1,350.61	1,364.23	0.00	0.00	0.00	
6,700.00	0.00	0.00	6,482.48	192.27	1,350.61	1,364.23	0.00	0.00	0.00	
6,800.00	0.00	0.00	6,582.48	192.27	1,350.61	1,364.23	0.00	0.00	0.00	
6,900.00	0.00	0.00	6,682.48	192.27	1,350.61	1,364.23	0.00	0.00	0.00	
7,000.00	0.00	0.00	6,782.48	192.27	1,350.61	1,364.23	0.00	0.00	0.00	
7,100.00	0.00	0.00	6,882.48	192.27	1,350.61	1,364.23	0.00	0.00	0.00	
7,200.00	0.00	0.00	6,982.48	192.27	1,350.61	1,364.23	0.00	0.00	0.00	
Cameo										
7,213.52	0.00	0.00	6,996.00	192.27	1,350.61	1,364.23	0.00	0.00	0.00	
7,300.00	0.00	0.00	7,082.48	192.27	1,350.61	1,364.23	0.00	0.00	0.00	
7,400.00	0.00	0.00	7,182.48	192.27	1,350.61	1,364.23	0.00	0.00	0.00	
7,500.00	0.00	0.00	7,282.48	192.27	1,350.61	1,364.23	0.00	0.00	0.00	
7,600.00	0.00	0.00	7,382.48	192.27	1,350.61	1,364.23	0.00	0.00	0.00	
7,700.00	0.00	0.00	7,482.48	192.27	1,350.61	1,364.23	0.00	0.00	0.00	
7,800.00	0.00	0.00	7,582.48	192.27	1,350.61	1,364.23	0.00	0.00	0.00	
Base Cameo Coal										
7,871.52	0.00	0.00	7,654.00	192.27	1,350.61	1,364.23	0.00	0.00	0.00	
7,900.00	0.00	0.00	7,682.48	192.27	1,350.61	1,364.23	0.00	0.00	0.00	
Rollins										
7,913.52	0.00	0.00	7,696.00	192.27	1,350.61	1,364.23	0.00	0.00	0.00	
8,000.00	0.00	0.00	7,782.48	192.27	1,350.61	1,364.23	0.00	0.00	0.00	
8,100.00	0.00	0.00	7,882.48	192.27	1,350.61	1,364.23	0.00	0.00	0.00	
TD at 8113.5										
8,113.52	0.00	0.00	7,896.00	192.27	1,350.61	1,364.23	0.00	0.00	0.00	



Database:	EDMDBBW	Local Co-ordinate Reference:	Well Piceance 28-06M
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 28-06M	Survey Calculation Method:	Minimum Curvature
Wellbore:	Slot A-7		
Design:	Design #1		

Design Targets									
Target Name									
- hit/miss target	Dip Angle	Dip Dir.	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
- Shape	(°)	(°)	(usft)	(usft)	(usft)	(usft)	(usft)		
Piceance Federal 28-06I - plan hits target center - Circle (radius 50.00)	0.00	0.00	7,896.00	192.27	1,350.61	1,524,566.085	2,355,924.171	39° 15' 5.490 N	107° 46' 28.820 W

Casing Points				
Measured Depth (usft)	Vertical Depth (usft)	Name	Casing Diameter (")	Hole Diameter (")
1,557.28	1,522.00	8-5/8	8-5/8	12-1/4

Formations					
Measured Depth (usft)	Vertical Depth (usft)	Name	Lithology	Dip (°)	Dip Direction (°)
2,963.87	2,846.00	G Sand		0.00	
4,912.17	4,696.00	Williams Fork		0.00	
5,413.52	5,196.00	TOG		0.00	
7,213.52	6,996.00	Cameo		0.00	
7,871.52	7,654.00	Base Cameo Coal		0.00	
7,913.52	7,696.00	Rollins		0.00	

Plan Annotations				
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
300.00	300.00	0.00	0.00	Start Build 2.00
1,286.58	1,267.19	23.71	166.53	Start 3044.4 hold at 1286.6 MD
4,330.95	4,132.81	168.56	1,184.09	Start Drop -2.00
5,317.52	5,100.00	192.27	1,350.61	Start 2796.0 hold at 5317.5 MD
8,113.52	7,896.00	192.27	1,350.61	TD at 8113.5



Piceance Energy, LLC

Mesa County, CO

Piceance 28-05

Piceance Federal 28-06M

Slot A-7

Design #1

Anticollision Report

28 April, 2015

Archer



Company:	Piceance Energy, LLC	Local Co-ordinate Reference:	Well Piceance Federal 28-06M
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 28-06M	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 usft	Output errors are at	2.00 sigma
Reference Wellbore	Slot A-7	Database:	EDMDBBW
Reference Design:	Design #1	Offset TVD Reference:	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	8,113.5	Design #1 (Slot A-7)	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 28-04M - Slot A-6 - Design #1	300.0	300.0	19.7	18.6	18.351	CC, ES
Piceance federal 28-04M - Slot A-6 - Design #1	2,500.0	2,504.5	197.0	171.9	7.850	SF
Piceance federal 28-05M - Slot B-6 - Design #1	300.0	300.0	22.4	21.3	20.837	CC, ES
Piceance federal 28-05M - Slot B-6 - Design #1	3,300.0	3,332.2	145.8	108.8	3.948	SF
Piceance Federal 28-07M - Slot A-8 - Design #1	465.7	465.6	9.1	7.3	5.056	CC
Piceance Federal 28-07M - Slot A-8 - Design #1	500.0	499.8	9.2	7.3	4.732	ES
Piceance Federal 28-07M - Slot A-8 - Design #1	8,113.5	8,108.6	249.9	187.3	3.989	SF
Piceance Federal 28-08W - Slot B-7 - Design #1	300.0	300.0	9.9	8.9	9.248	CC, ES
Piceance Federal 28-08W - Slot B-7 - Design #1	400.0	400.0	11.5	10.0	7.489	SF
Piceance Federal 28-09W - Slot B-8 - Design #1	100.0	100.0	14.3	14.1	81.287	CC, ES
Piceance Federal 28-09W - Slot B-8 - Design #1	400.0	397.5	29.9	28.3	19.490	SF

Offset Design		Piceance 28-05 - Piceance federal 28-04M - Slot A-6 - 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	-39.67	15.2	-12.6	19.7					
100.0	100.0	100.0	100.0	0.1	0.1	-39.67	15.2	-12.6	19.7	19.5	0.18	112.457		
200.0	200.0	200.0	200.0	0.3	0.3	-39.67	15.2	-12.6	19.7	19.1	0.62	31.553		
300.0	300.0	300.0	300.0	0.5	0.5	-39.67	15.2	-12.6	19.7	18.6	1.07	18.351	CC, ES	
400.0	400.0	400.0	400.0	0.8	0.8	-125.67	15.2	-12.6	20.7	19.2	1.52	13.588		
500.0	499.8	499.8	499.8	1.0	1.0	-135.77	15.2	-12.6	24.1	22.1	1.99	12.123		
600.0	599.5	600.1	600.1	1.2	1.2	-144.49	15.9	-11.0	29.9	27.4	2.47	12.085		
700.0	698.7	700.6	700.4	1.5	1.4	-148.97	18.2	-6.3	36.8	33.8	2.96	12.413		
800.0	797.5	801.2	800.7	1.8	1.7	-150.89	22.0	1.7	44.5	41.0	3.47	12.805		
900.0	895.6	902.1	900.8	2.2	1.9	-151.27	27.4	12.8	52.8	48.8	4.01	13.166		
1,000.0	993.1	1,003.1	1,000.5	2.6	2.2	-150.71	34.2	27.1	61.7	57.2	4.59	13.454		
1,100.0	1,089.6	1,104.2	1,099.7	3.1	2.6	-149.59	42.6	44.6	71.3	66.1	5.23	13.641		
1,200.0	1,185.3	1,205.5	1,198.4	3.7	3.0	-148.11	52.6	65.3	81.5	75.6	5.95	13.714		
1,300.0	1,279.8	1,306.8	1,296.2	4.3	3.5	-146.42	64.0	89.2	92.4	85.7	6.76	13.674		
1,400.0	1,374.0	1,408.4	1,393.3	4.9	4.0	-144.02	77.0	116.2	102.2	94.6	7.68	13.306		
1,500.0	1,468.1	1,510.1	1,489.3	5.6	4.6	-140.52	91.4	146.3	110.2	101.4	8.79	12.536		

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



Archer

Anticollision Report

Archer

Company:	Piceance Energy, LLC	Local Co-ordinate Reference:	Well Piceance Federal 28-06M
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 28-06M	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 usft	Output errors are at	2.00 sigma
Reference Wellbore	Slot A-7	Database:	EDMDBBW
Reference Design:	Design #1	Offset TVD Reference:	Reference Datum

Offset Design Piceance 28-05 - Piceance federal 28-04M - Slot A-6 - 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	1,562.2	1,611.6	1,583.9	6.3	5.3	-135.99	107.3	179.4	116.8	106.6	10.12	11.541		
1,700.0	1,656.3	1,712.7	1,676.8	7.0	6.1	-130.49	124.6	215.4	122.4	110.8	11.67	10.492		
1,800.0	1,750.5	1,812.4	1,767.2	7.7	6.9	-124.29	142.8	253.4	128.2	114.8	13.41	9.555		
1,900.0	1,844.6	1,911.3	1,856.6	8.4	7.7	-118.54	161.1	291.4	135.2	120.0	15.20	8.896		
2,000.0	1,938.7	2,010.2	1,946.0	9.1	8.5	-113.40	179.3	329.4	143.4	126.4	16.96	8.456		
2,100.0	2,032.9	2,109.0	2,035.4	9.8	9.4	-108.84	197.6	367.5	152.7	134.0	18.68	8.172		
2,200.0	2,127.0	2,207.9	2,124.9	10.5	10.2	-104.81	215.8	405.5	162.8	142.4	20.36	7.998		
2,300.0	2,221.1	2,306.8	2,214.3	11.2	11.1	-101.27	234.1	443.5	173.6	151.7	21.98	7.900		
2,400.0	2,315.2	2,405.6	2,303.7	11.9	11.9	-98.15	252.3	481.5	185.1	161.5	23.56	7.856		
2,500.0	2,409.4	2,504.5	2,393.1	12.6	12.8	-95.40	270.6	519.6	197.0	171.9	25.09	7.850 SF		
2,600.0	2,503.5	2,603.4	2,482.5	13.3	13.6	-92.96	288.8	557.6	209.3	182.7	26.59	7.870		
2,700.0	2,597.6	2,702.2	2,571.9	14.0	14.5	-90.79	307.1	595.6	221.9	193.8	28.06	7.909		
2,800.0	2,691.8	2,801.1	2,661.4	14.7	15.4	-88.86	325.3	633.6	234.8	205.3	29.50	7.960		
2,900.0	2,785.9	2,900.0	2,750.8	15.4	16.2	-87.13	343.6	671.7	248.0	217.1	30.92	8.020		
3,000.0	2,880.0	2,998.8	2,840.2	16.1	17.1	-85.58	361.8	709.7	261.3	229.0	32.32	8.085		
3,100.0	2,974.1	3,097.7	2,929.6	16.8	18.0	-84.18	380.1	747.7	274.9	241.1	33.71	8.154		
3,200.0	3,068.3	3,196.6	3,019.0	17.5	18.8	-82.91	398.3	785.7	288.5	253.4	35.08	8.224		
3,300.0	3,162.4	3,295.4	3,108.5	18.2	19.7	-81.75	416.6	823.8	302.3	265.9	36.45	8.295		
3,400.0	3,256.5	3,394.3	3,197.9	18.9	20.6	-80.70	434.8	861.8	316.2	278.4	37.80	8.366		
3,500.0	3,350.7	3,493.2	3,287.3	19.6	21.5	-79.73	453.1	899.8	330.2	291.1	39.14	8.437		
3,600.0	3,444.8	3,592.0	3,376.7	20.3	22.3	-78.84	471.3	937.9	344.3	303.9	40.48	8.506		
3,700.0	3,538.9	3,690.9	3,466.1	21.0	23.2	-78.02	489.6	975.9	358.5	316.7	41.82	8.573		
3,800.0	3,633.0	3,789.8	3,555.5	21.7	24.1	-77.27	507.8	1,013.9	372.7	329.6	43.14	8.639		
3,900.0	3,727.2	3,888.6	3,645.0	22.4	24.9	-76.57	526.1	1,051.9	387.0	342.6	44.47	8.704		
4,000.0	3,821.3	3,987.5	3,734.4	23.2	25.8	-75.92	544.3	1,090.0	401.4	355.6	45.79	8.766		
4,100.0	3,915.4	4,086.4	3,823.8	23.9	26.7	-75.31	562.6	1,128.0	415.8	368.7	47.10	8.827		
4,200.0	4,009.6	4,188.6	3,916.4	24.6	27.6	-74.77	581.3	1,167.0	430.0	381.6	48.41	8.883		
4,300.0	4,103.7	4,296.4	4,015.4	25.3	28.3	-74.59	599.8	1,205.5	442.8	393.1	49.69	8.910		
4,400.0	4,198.1	4,404.7	4,116.4	25.9	28.9	-74.90	616.7	1,240.8	453.7	402.7	50.97	8.902		
4,500.0	4,293.5	4,513.3	4,219.1	26.4	29.5	-75.25	632.0	1,272.6	463.6	411.5	52.06	8.905		
4,600.0	4,390.0	4,622.2	4,323.3	26.9	30.1	-75.55	645.6	1,301.0	472.3	419.3	53.03	8.906		
4,700.0	4,487.2	4,731.3	4,428.9	27.3	30.6	-75.80	657.6	1,325.9	480.0	426.1	53.89	8.906		
4,800.0	4,585.3	4,840.7	4,535.6	27.6	31.0	-76.02	667.8	1,347.2	486.5	431.9	54.64	8.903		
4,900.0	4,684.0	4,950.2	4,643.4	27.9	31.3	-76.19	676.2	1,364.8	491.9	436.6	55.28	8.898		
5,000.0	4,783.1	5,059.9	4,752.0	28.2	31.6	-76.32	682.9	1,378.7	496.2	440.3	55.81	8.891		
5,100.0	4,882.7	5,169.7	4,861.2	28.4	31.9	-76.42	687.7	1,388.8	499.3	443.0	56.22	8.880		
5,200.0	4,982.5	5,279.6	4,970.9	28.5	32.0	-76.48	690.8	1,395.2	501.2	444.7	56.53	8.866		
5,300.0	5,082.5	5,389.5	5,080.7	28.6	32.1	-76.51	692.0	1,397.7	502.0	445.3	56.73	8.849		
5,400.0	5,182.5	5,491.2	5,182.5	28.7	32.2	5.39	692.1	1,397.8	502.0	445.1	56.89	8.824		
5,500.0	5,282.5	5,591.2	5,282.5	28.8	32.3	5.39	692.1	1,397.8	502.0	445.0	57.06	8.798		
5,600.0	5,382.5	5,691.2	5,382.5	28.9	32.4	5.39	692.1	1,397.8	502.0	444.8	57.23	8.771		
5,700.0	5,482.5	5,791.2	5,482.5	28.9	32.4	5.39	692.1	1,397.8	502.0	444.6	57.41	8.744		
5,800.0	5,582.5	5,891.2	5,582.5	29.0	32.5	5.39	692.1	1,397.8	502.0	444.4	57.59	8.717		
5,900.0	5,682.5	5,991.2	5,682.5	29.1	32.6	5.39	692.1	1,397.8	502.0	444.2	57.77	8.689		
6,000.0	5,782.5	6,091.2	5,782.5	29.2	32.7	5.39	692.1	1,397.8	502.0	444.1	57.96	8.661		
6,100.0	5,882.5	6,191.2	5,882.5	29.3	32.8	5.39	692.1	1,397.8	502.0	443.9	58.15	8.633		
6,200.0	5,982.5	6,291.2	5,982.5	29.4	32.8	5.39	692.1	1,397.8	502.0	443.7	58.34	8.605		
6,300.0	6,082.5	6,391.2	6,082.5	29.5	32.9	5.39	692.1	1,397.8	502.0	443.5	58.53	8.576		
6,400.0	6,182.5	6,491.2	6,182.5	29.6	33.0	5.39	692.1	1,397.8	502.0	443.3	58.73	8.548		
6,500.0	6,282.5	6,591.2	6,282.5	29.7	33.1	5.39	692.1	1,397.8	502.0	443.1	58.93	8.519		
6,600.0	6,382.5	6,691.2	6,382.5	29.8	33.2	5.39	692.1	1,397.8	502.0	442.9	59.13	8.489		
6,700.0	6,482.5	6,791.2	6,482.5	29.9	33.3	5.39	692.1	1,397.8	502.0	442.7	59.34	8.460		

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 28-06M
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 28-06M	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 usft	Output errors are at	2.00 sigma
Reference Wellbore	Slot A-7	Database:	EDMDBBW
Reference Design:	Design #1	Offset TVD Reference:	Reference Datum

Offset Design Piceance 28-05 - Piceance federal 28-04M - Slot A-6 - 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		
6,800.0	6,582.5	6,891.2	6,582.5	30.0	33.4	5.39	692.1	1,397.8	502.0	442.5	59.55	8.430		
6,900.0	6,682.5	6,991.2	6,682.5	30.1	33.5	5.39	692.1	1,397.8	502.0	442.3	59.76	8.401		
7,000.0	6,782.5	7,091.2	6,782.5	30.2	33.6	5.39	692.1	1,397.8	502.0	442.0	59.97	8.371		
7,100.0	6,882.5	7,191.2	6,882.5	30.3	33.7	5.39	692.1	1,397.8	502.0	441.8	60.19	8.341		
7,200.0	6,982.5	7,291.2	6,982.5	30.4	33.8	5.39	692.1	1,397.8	502.0	441.6	60.41	8.310		
7,300.0	7,082.5	7,391.2	7,082.5	30.5	33.9	5.39	692.1	1,397.8	502.0	441.4	60.63	8.280		
7,400.0	7,182.5	7,491.2	7,182.5	30.7	34.0	5.39	692.1	1,397.8	502.0	441.2	60.85	8.250		
7,500.0	7,282.5	7,591.2	7,282.5	30.8	34.1	5.39	692.1	1,397.8	502.0	440.9	61.08	8.219		
7,600.0	7,382.5	7,691.2	7,382.5	30.9	34.2	5.39	692.1	1,397.8	502.0	440.7	61.31	8.189		
7,700.0	7,482.5	7,791.2	7,482.5	31.0	34.3	5.39	692.1	1,397.8	502.0	440.5	61.54	8.158		
7,800.0	7,582.5	7,891.2	7,582.5	31.1	34.4	5.39	692.1	1,397.8	502.0	440.2	61.77	8.127		
7,900.0	7,682.5	7,991.2	7,682.5	31.2	34.5	5.39	692.1	1,397.8	502.0	440.0	62.01	8.096		
8,000.0	7,782.5	8,091.2	7,782.5	31.3	34.6	5.39	692.1	1,397.8	502.0	439.8	62.25	8.065		
8,100.0	7,882.5	8,191.2	7,882.5	31.5	34.7	5.39	692.1	1,397.8	502.0	439.5	62.49	8.034		
8,113.5	7,896.0	8,204.8	7,896.0	31.5	34.7	5.39	692.1	1,397.8	502.0	439.5	62.52	8.030		



Archer

Anticollision Report

Archer

Company:	Piceance Energy, LLC	Local Co-ordinate Reference:	Well Piceance Federal 28-06M
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 28-06M	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 usft	Output errors are at	2.00 sigma
Reference Wellbore	Slot A-7	Database:	EDMDBBW
Reference Design:	Design #1	Offset TVD Reference:	Reference Datum

Offset Design Piceance 28-05 - Piceance federal 28-05M - Slot B-6 - 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	-66.00	9.1	-20.5	22.4					
100.0	100.0	100.0	100.0	0.1	0.1	-66.00	9.1	-20.5	22.4	22.2	0.18	127.696		
200.0	200.0	200.0	200.0	0.3	0.3	-66.00	9.1	-20.5	22.4	21.8	0.62	35.828		
300.0	300.0	300.0	300.0	0.5	0.5	-66.00	9.1	-20.5	22.4	21.3	1.07	20.837 CC, ES		
400.0	400.0	400.0	400.0	0.8	0.8	-150.11	9.1	-20.5	23.9	22.4	1.53	15.593		
500.0	499.8	499.8	499.8	1.0	1.0	-155.31	9.1	-20.5	28.5	26.5	2.01	14.208		
600.0	599.5	599.5	599.5	1.2	1.2	-160.96	9.1	-20.5	36.6	34.1	2.50	14.635		
700.0	698.7	698.7	698.7	1.5	1.4	-165.62	9.1	-20.5	48.3	45.3	3.01	16.076		
800.0	797.5	799.5	799.5	1.8	1.7	-168.58	9.6	-18.8	62.0	58.5	3.50	17.724		
900.0	895.6	900.8	900.7	2.2	1.9	-170.05	11.2	-13.7	75.9	71.9	3.98	19.053		
1,000.0	993.1	1,002.6	1,002.1	2.6	2.1	-170.72	13.8	-5.2	89.9	85.4	4.48	20.070		
1,100.0	1,089.6	1,104.9	1,103.6	3.1	2.4	-170.89	17.4	6.9	103.9	99.0	4.99	20.842		
1,200.0	1,185.3	1,207.7	1,205.1	3.7	2.7	-170.74	22.2	22.5	118.0	112.5	5.51	21.413		
1,300.0	1,279.8	1,311.0	1,306.4	4.3	3.0	-170.37	28.0	41.6	132.1	126.1	6.05	21.827		
1,400.0	1,374.0	1,415.0	1,407.6	4.9	3.4	-169.72	35.0	64.5	144.1	137.5	6.59	21.860		
1,500.0	1,468.1	1,519.8	1,508.6	5.6	3.9	-168.70	43.1	91.0	152.7	145.5	7.18	21.267		
1,600.0	1,562.2	1,624.9	1,608.9	6.3	4.4	-167.30	52.3	121.1	157.9	150.0	7.83	20.166		
1,700.0	1,656.3	1,730.2	1,708.1	7.0	5.1	-165.45	62.6	154.8	159.7	151.2	8.54	18.695		
1,800.0	1,750.5	1,835.3	1,805.8	7.7	5.8	-163.08	73.9	191.9	158.4	149.1	9.38	16.896		
1,900.0	1,844.6	1,940.0	1,901.7	8.4	6.6	-160.02	86.2	232.3	154.2	143.8	10.37	14.869		
2,000.0	1,938.7	2,041.2	1,993.1	9.1	7.4	-156.30	98.9	273.8	147.8	136.3	11.55	12.796		
2,100.0	2,032.9	2,140.5	2,082.6	9.8	8.2	-152.28	111.4	314.9	141.9	129.0	12.92	10.984		
2,200.0	2,127.0	2,239.8	2,172.2	10.5	9.1	-147.94	123.9	355.9	136.7	122.2	14.49	9.436		
2,300.0	2,221.1	2,339.1	2,261.7	11.2	10.0	-143.28	136.4	397.0	132.4	116.2	16.27	8.139		
2,400.0	2,315.2	2,438.4	2,351.3	11.9	10.8	-138.36	148.9	438.0	129.1	110.8	18.24	7.075		
2,500.0	2,409.4	2,537.7	2,440.8	12.6	11.7	-133.21	161.5	479.0	126.7	106.3	20.37	6.220		
2,600.0	2,503.5	2,637.0	2,530.4	13.3	12.6	-127.91	174.0	520.1	125.4	102.8	22.60	5.548		
2,666.6	2,566.2	2,703.2	2,590.0	13.7	13.2	-124.35	182.3	547.4	125.2	101.0	24.12	5.189		
2,700.0	2,597.6	2,736.3	2,619.9	14.0	13.5	-122.56	186.5	561.1	125.2	100.3	24.89	5.032		
2,800.0	2,691.8	2,835.7	2,709.5	14.7	14.3	-117.23	199.0	602.2	126.2	99.0	27.16	4.645		
2,900.0	2,785.9	2,935.0	2,799.0	15.4	15.2	-112.03	211.5	643.2	128.2	98.8	29.36	4.365		
3,000.0	2,880.0	3,034.3	2,888.6	16.1	16.1	-107.02	224.0	684.2	131.2	99.7	31.46	4.171		
3,100.0	2,974.1	3,133.6	2,978.2	16.8	17.0	-102.27	236.6	725.3	135.2	101.8	33.42	4.045		
3,200.0	3,068.3	3,232.9	3,067.7	17.5	17.9	-97.83	249.1	766.3	140.1	104.8	35.24	3.975		
3,300.0	3,162.4	3,332.2	3,157.3	18.2	18.8	-93.70	261.6	807.4	145.8	108.8	36.92	3.948 SF		
3,400.0	3,256.5	3,431.5	3,246.8	18.9	19.7	-89.89	274.1	848.4	152.1	113.7	38.47	3.955		
3,500.0	3,350.7	3,530.8	3,336.4	19.6	20.6	-86.40	286.6	889.4	159.2	119.3	39.89	3.989		
3,600.0	3,444.8	3,630.1	3,425.9	20.3	21.5	-83.22	299.1	930.5	166.7	125.5	41.22	4.044		
3,700.0	3,538.9	3,729.4	3,515.5	21.0	22.4	-80.31	311.7	971.5	174.7	132.2	42.47	4.114		
3,800.0	3,633.0	3,828.7	3,605.0	21.7	23.3	-77.67	324.2	1,012.5	183.1	139.5	43.64	4.196		
3,900.0	3,727.2	3,928.0	3,694.6	22.4	24.2	-75.26	336.7	1,053.6	191.9	147.1	44.76	4.287		
4,000.0	3,821.3	4,027.3	3,784.2	23.2	25.1	-73.06	349.2	1,094.6	201.0	155.2	45.84	4.385		
4,100.0	3,915.4	4,127.0	3,874.1	23.9	26.0	-71.06	361.8	1,135.8	210.3	163.5	46.87	4.488		
4,200.0	4,009.6	4,230.2	3,968.1	24.6	26.8	-69.69	374.2	1,176.4	218.8	170.9	47.91	4.568		
4,300.0	4,103.7	4,333.8	4,064.0	25.3	27.5	-69.25	385.6	1,213.9	225.7	176.6	49.06	4.600		
4,400.0	4,198.1	4,437.7	4,161.5	25.9	28.1	-69.51	396.0	1,248.2	231.1	180.8	50.30	4.594		
4,500.0	4,293.5	4,541.6	4,260.4	26.4	28.6	-69.81	405.5	1,279.0	235.9	184.5	51.34	4.594		
4,600.0	4,390.0	4,645.7	4,360.4	26.9	29.1	-70.06	413.8	1,306.5	240.2	187.9	52.28	4.594		
4,700.0	4,487.2	4,749.8	4,461.4	27.3	29.6	-70.27	421.1	1,330.4	243.9	190.8	53.10	4.593		
4,800.0	4,585.3	4,854.0	4,563.4	27.6	29.9	-70.45	427.4	1,350.9	247.1	193.2	53.82	4.591		
4,900.0	4,684.0	4,958.2	4,666.1	27.9	30.3	-70.59	432.5	1,367.8	249.7	195.3	54.42	4.588		
5,000.0	4,783.1	5,062.5	4,769.4	28.2	30.5	-70.71	436.6	1,381.1	251.8	196.8	54.92	4.584		

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



Archer

Anticollision Report

Archer

Company:	Piceance Energy, LLC	Local Co-ordinate Reference:	Well Piceance Federal 28-06M
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 28-06M	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 usft	Output errors are at	2.00 sigma
Reference Wellbore	Slot A-7	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)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor		
5,100.0	4,882.7	5,166.8	4,873.3	28.4	30.8	-70.79	439.5	1,390.8	253.3	198.0	55.31	4.579		
5,200.0	4,982.5	5,271.1	4,977.4	28.5	30.9	-70.84	441.4	1,396.9	254.2	198.6	55.60	4.572		
5,300.0	5,082.5	5,375.5	5,081.7	28.6	31.0	-70.86	442.1	1,399.3	254.6	198.8	55.79	4.564		
5,400.0	5,182.5	5,476.3	5,182.5	28.7	31.1	11.04	442.2	1,399.4	254.6	198.7	55.95	4.551		
5,500.0	5,282.5	5,576.3	5,282.5	28.8	31.2	11.04	442.2	1,399.4	254.6	198.5	56.12	4.536		
5,600.0	5,382.5	5,676.3	5,382.5	28.9	31.3	11.04	442.2	1,399.4	254.6	198.3	56.30	4.522		
5,700.0	5,482.5	5,776.3	5,482.5	28.9	31.3	11.04	442.2	1,399.4	254.6	198.1	56.48	4.508		
5,800.0	5,582.5	5,876.3	5,582.5	29.0	31.4	11.04	442.2	1,399.4	254.6	197.9	56.67	4.493		
5,900.0	5,682.5	5,976.3	5,682.5	29.1	31.5	11.04	442.2	1,399.4	254.6	197.8	56.85	4.479		
6,000.0	5,782.5	6,076.3	5,782.5	29.2	31.6	11.04	442.2	1,399.4	254.6	197.6	57.04	4.464		
6,100.0	5,882.5	6,176.3	5,882.5	29.3	31.7	11.04	442.2	1,399.4	254.6	197.4	57.23	4.449		
6,200.0	5,982.5	6,276.3	5,982.5	29.4	31.8	11.04	442.2	1,399.4	254.6	197.2	57.43	4.434		
6,300.0	6,082.5	6,376.3	6,082.5	29.5	31.9	11.04	442.2	1,399.4	254.6	197.0	57.62	4.418		
6,400.0	6,182.5	6,476.3	6,182.5	29.6	31.9	11.04	442.2	1,399.4	254.6	196.8	57.82	4.403		
6,500.0	6,282.5	6,576.3	6,282.5	29.7	32.0	11.04	442.2	1,399.4	254.6	196.6	58.03	4.388		
6,600.0	6,382.5	6,676.3	6,382.5	29.8	32.1	11.04	442.2	1,399.4	254.6	196.4	58.23	4.372		
6,700.0	6,482.5	6,776.3	6,482.5	29.9	32.2	11.04	442.2	1,399.4	254.6	196.2	58.44	4.357		
6,800.0	6,582.5	6,876.3	6,582.5	30.0	32.3	11.04	442.2	1,399.4	254.6	196.0	58.65	4.341		
6,900.0	6,682.5	6,976.3	6,682.5	30.1	32.4	11.04	442.2	1,399.4	254.6	195.7	58.87	4.325		
7,000.0	6,782.5	7,076.3	6,782.5	30.2	32.5	11.04	442.2	1,399.4	254.6	195.5	59.08	4.309		
7,100.0	6,882.5	7,176.3	6,882.5	30.3	32.6	11.04	442.2	1,399.4	254.6	195.3	59.30	4.293		
7,200.0	6,982.5	7,276.3	6,982.5	30.4	32.7	11.04	442.2	1,399.4	254.6	195.1	59.53	4.277		
7,300.0	7,082.5	7,376.3	7,082.5	30.5	32.8	11.04	442.2	1,399.4	254.6	194.9	59.75	4.261		
7,400.0	7,182.5	7,476.3	7,182.5	30.7	32.9	11.04	442.2	1,399.4	254.6	194.6	59.98	4.245		
7,500.0	7,282.5	7,576.3	7,282.5	30.8	33.0	11.04	442.2	1,399.4	254.6	194.4	60.21	4.229		
7,600.0	7,382.5	7,676.3	7,382.5	30.9	33.1	11.04	442.2	1,399.4	254.6	194.2	60.44	4.213		
7,700.0	7,482.5	7,776.3	7,482.5	31.0	33.2	11.04	442.2	1,399.4	254.6	193.9	60.67	4.196		
7,800.0	7,582.5	7,876.3	7,582.5	31.1	33.4	11.04	442.2	1,399.4	254.6	193.7	60.91	4.180		
7,900.0	7,682.5	7,976.3	7,682.5	31.2	33.5	11.04	442.2	1,399.4	254.6	193.5	61.15	4.164		
8,000.0	7,782.5	8,076.3	7,782.5	31.3	33.6	11.04	442.2	1,399.4	254.6	193.2	61.39	4.147		
8,100.0	7,882.5	8,176.3	7,882.5	31.5	33.7	11.04	442.2	1,399.4	254.6	193.0	61.64	4.131		
8,113.5	7,896.0	8,189.8	7,896.0	31.5	33.7	11.04	442.2	1,399.4	254.6	192.9	61.67	4.129		



Archer
Anticollision Report

Archer

Company:	Piceance Energy, LLC	Local Co-ordinate Reference:	Well Piceance Federal 28-06M
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 28-06M	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 usft	Output errors are at	2.00 sigma
Reference Wellbore	Slot A-7	Database:	EDMDBBW
Reference Design:	Design #1	Offset TVD Reference:	Reference Datum

Offset Design Piceance 28-05 - Piceance Federal 28-07M - Slot A-8 - 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	300.0	300.0	0.5	0.5	142.13	-8.1	6.3	10.3	9.2	1.07	9.543		
400.0	400.0	400.0	400.0	0.8	0.8	69.42	-8.1	6.3	9.5	8.0	1.52	6.267		
465.7	465.6	465.6	465.6	0.9	0.9	83.45	-8.1	7.0	9.1	7.3	1.80	5.056 CC		
500.0	499.8	499.8	499.8	1.0	1.0	91.08	-8.2	8.0	9.2	7.3	1.95	4.732 ES		
600.0	599.5	599.7	599.6	1.2	1.2	110.29	-8.3	13.2	10.8	8.4	2.42	4.475		
700.0	698.7	699.8	699.2	1.5	1.4	122.26	-8.7	22.0	13.8	10.9	2.94	4.699		
800.0	797.5	799.9	798.6	1.8	1.7	128.58	-9.1	34.1	17.7	14.2	3.51	5.045		
900.0	895.6	900.2	897.6	2.2	2.0	131.59	-9.7	49.8	22.2	18.1	4.14	5.377		
1,000.0	993.1	1,000.5	996.1	2.6	2.4	132.73	-10.4	69.0	27.3	22.5	4.83	5.646		
1,100.0	1,089.6	1,100.9	1,094.0	3.1	2.8	132.81	-11.2	91.6	32.8	27.2	5.62	5.841		
1,200.0	1,185.3	1,201.4	1,191.0	3.7	3.3	132.28	-12.2	117.6	38.8	32.3	6.51	5.961		
1,300.0	1,279.8	1,302.0	1,287.2	4.3	3.8	131.37	-13.3	147.0	45.2	37.7	7.52	6.015		
1,400.0	1,374.0	1,402.7	1,382.3	4.9	4.5	128.45	-14.5	179.9	50.7	42.0	8.70	5.830		
1,500.0	1,468.1	1,502.5	1,476.1	5.6	5.1	124.49	-15.7	214.1	55.6	45.5	10.04	5.535		
1,600.0	1,562.2	1,602.3	1,569.8	6.3	5.8	121.17	-17.0	248.3	60.7	49.2	11.43	5.307		
1,700.0	1,656.3	1,702.1	1,663.6	7.0	6.5	118.37	-18.3	282.6	65.9	53.1	12.84	5.131		
1,800.0	1,750.5	1,801.9	1,757.4	7.7	7.2	115.99	-19.5	316.8	71.3	57.0	14.27	4.994		
1,900.0	1,844.6	1,901.8	1,851.1	8.4	7.9	113.94	-20.8	351.0	76.8	61.0	15.71	4.886		
2,000.0	1,938.7	2,001.6	1,944.9	9.1	8.6	112.17	-22.0	385.3	82.3	65.2	17.15	4.799		
2,100.0	2,032.9	2,101.4	2,038.6	9.8	9.3	110.63	-23.3	419.5	88.0	69.4	18.60	4.729		
2,200.0	2,127.0	2,201.2	2,132.4	10.5	10.0	109.27	-24.6	453.7	93.7	73.6	20.05	4.672		
2,300.0	2,221.1	2,301.0	2,226.1	11.2	10.7	108.07	-25.8	488.0	99.4	77.9	21.49	4.624		
2,400.0	2,315.2	2,400.8	2,319.9	11.9	11.4	107.00	-27.1	522.2	105.2	82.2	22.94	4.585		
2,500.0	2,409.4	2,500.7	2,413.6	12.6	12.2	106.04	-28.3	556.4	111.0	86.6	24.38	4.552		
2,600.0	2,503.5	2,600.5	2,507.4	13.3	12.9	105.18	-29.6	590.7	116.8	91.0	25.83	4.523		
2,700.0	2,597.6	2,700.3	2,601.1	14.0	13.6	104.40	-30.9	624.9	122.7	95.4	27.27	4.499		
2,800.0	2,691.8	2,800.1	2,694.9	14.7	14.3	103.69	-32.1	659.1	128.6	99.9	28.71	4.478		
2,900.0	2,785.9	2,899.9	2,788.6	15.4	15.0	103.04	-33.4	693.4	134.5	104.3	30.15	4.460		
3,000.0	2,880.0	2,999.7	2,882.4	16.1	15.8	102.45	-34.6	727.6	140.4	108.8	31.59	4.444		
3,100.0	2,974.1	3,099.5	2,976.1	16.8	16.5	101.90	-35.9	761.8	146.3	113.3	33.02	4.430		
3,200.0	3,068.3	3,199.4	3,069.9	17.5	17.2	101.40	-37.2	796.0	152.2	117.8	34.46	4.418		
3,300.0	3,162.4	3,299.2	3,163.6	18.2	17.9	100.94	-38.4	830.3	158.2	122.3	35.90	4.407		
3,400.0	3,256.5	3,399.0	3,257.4	18.9	18.6	100.51	-39.7	864.5	164.2	126.8	37.33	4.397		
3,500.0	3,350.7	3,498.8	3,351.1	19.6	19.4	100.11	-40.9	898.7	170.1	131.4	38.77	4.389		
3,600.0	3,444.8	3,598.6	3,444.9	20.3	20.1	99.73	-42.2	933.0	176.1	135.9	40.20	4.381		
3,700.0	3,538.9	3,698.4	3,538.7	21.0	20.8	99.38	-43.5	967.2	182.1	140.5	41.63	4.374		
3,800.0	3,633.0	3,798.2	3,632.4	21.7	21.5	99.06	-44.7	1,001.4	188.1	145.0	43.06	4.368		
3,900.0	3,727.2	3,898.1	3,726.2	22.4	22.2	98.75	-46.0	1,035.7	194.1	149.6	44.49	4.362		
4,000.0	3,821.3	3,997.9	3,819.9	23.2	23.0	98.46	-47.2	1,069.9	200.1	154.2	45.93	4.357		
4,100.0	3,915.4	4,097.7	3,913.7	23.9	23.7	98.19	-48.5	1,104.1	206.1	158.7	47.36	4.352		
4,200.0	4,009.6	4,197.5	4,007.4	24.6	24.4	97.93	-49.8	1,138.4	212.1	163.3	48.79	4.348		
4,300.0	4,103.7	4,297.3	4,101.2	25.3	25.1	97.69	-51.0	1,172.6	218.1	167.9	50.22	4.344		
4,400.0	4,198.1	4,397.4	4,195.5	25.9	25.8	97.64	-52.2	1,205.8	224.0	172.5	51.50	4.349		
4,500.0	4,293.5	4,497.5	4,291.1	26.4	26.3	97.66	-53.3	1,235.7	229.3	176.8	52.52	4.366		
4,600.0	4,390.0	4,597.7	4,387.7	26.9	26.7	97.67	-54.3	1,262.3	234.0	180.6	53.42	4.380		
4,700.0	4,487.2	4,698.0	4,485.2	27.3	27.1	97.69	-55.2	1,285.5	238.1	183.9	54.22	4.391		
4,800.0	4,585.3	4,798.2	4,583.5	27.6	27.5	97.70	-55.9	1,305.3	241.6	186.7	54.92	4.400		
4,900.0	4,684.0	4,898.5	4,682.5	27.9	27.8	97.72	-56.5	1,321.6	244.5	189.0	55.51	4.405		
5,000.0	4,783.1	4,998.9	4,782.0	28.2	28.0	97.72	-57.0	1,334.5	246.8	190.8	56.00	4.407		

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



Archer

Anticollision Report

Archer

Company:	Piceance Energy, LLC	Local Co-ordinate Reference:	Well Piceance Federal 28-06M
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 28-06M	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 usft	Output errors are at	2.00 sigma
Reference Wellbore	Slot A-7	Database:	EDMDBBW
Reference Design:	Design #1	Offset TVD Reference:	Reference Datum

Offset Design Piceance 28-05 - Piceance Federal 28-07M - Slot A-8 - 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)	Semi Major Axis Reference (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Distance Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning
5,100.0	4,882.7	5,099.2	4,881.9	28.4	28.2	97.73		-57.3	1,343.9	248.4	192.0	56.39	4.406	
5,200.0	4,982.5	5,199.6	4,982.1	28.5	28.4	97.74		-57.5	1,349.8	249.5	192.8	56.68	4.401	
5,300.0	5,082.5	5,300.0	5,082.4	28.6	28.5	97.74		-57.6	1,352.1	249.9	193.0	56.89	4.393	
5,400.0	5,182.5	5,400.0	5,182.5	28.7	28.6	179.64		-57.6	1,352.2	249.9	192.9	57.04	4.381	
5,500.0	5,282.5	5,500.0	5,282.5	28.8	28.6	179.64		-57.6	1,352.2	249.9	192.7	57.21	4.368	
5,600.0	5,382.5	5,600.0	5,382.5	28.9	28.7	179.64		-57.6	1,352.2	249.9	192.5	57.39	4.355	
5,700.0	5,482.5	5,700.0	5,482.5	28.9	28.8	179.64		-57.6	1,352.2	249.9	192.3	57.56	4.341	
5,800.0	5,582.5	5,800.0	5,582.5	29.0	28.9	179.64		-57.6	1,352.2	249.9	192.2	57.74	4.328	
5,900.0	5,682.5	5,900.0	5,682.5	29.1	29.0	179.64		-57.6	1,352.2	249.9	192.0	57.93	4.314	
6,000.0	5,782.5	6,000.0	5,782.5	29.2	29.1	179.64		-57.6	1,352.2	249.9	191.8	58.11	4.300	
6,100.0	5,882.5	6,100.0	5,882.5	29.3	29.2	179.64		-57.6	1,352.2	249.9	191.6	58.30	4.286	
6,200.0	5,982.5	6,200.0	5,982.5	29.4	29.3	179.64		-57.6	1,352.2	249.9	191.4	58.49	4.272	
6,300.0	6,082.5	6,300.0	6,082.5	29.5	29.4	179.64		-57.6	1,352.2	249.9	191.2	58.69	4.258	
6,400.0	6,182.5	6,400.0	6,182.5	29.6	29.5	179.64		-57.6	1,352.2	249.9	191.0	58.88	4.244	
6,500.0	6,282.5	6,500.0	6,282.5	29.7	29.6	179.64		-57.6	1,352.2	249.9	190.8	59.08	4.230	
6,600.0	6,382.5	6,600.0	6,382.5	29.8	29.7	179.64		-57.6	1,352.2	249.9	190.6	59.29	4.215	
6,700.0	6,482.5	6,700.0	6,482.5	29.9	29.8	179.64		-57.6	1,352.2	249.9	190.4	59.49	4.201	
6,800.0	6,582.5	6,800.0	6,582.5	30.0	29.9	179.64		-57.6	1,352.2	249.9	190.2	59.70	4.186	
6,900.0	6,682.5	6,900.0	6,682.5	30.1	30.0	179.64		-57.6	1,352.2	249.9	190.0	59.91	4.171	
7,000.0	6,782.5	7,000.0	6,782.5	30.2	30.1	179.64		-57.6	1,352.2	249.9	189.8	60.12	4.157	
7,100.0	6,882.5	7,100.0	6,882.5	30.3	30.2	179.64		-57.6	1,352.2	249.9	189.6	60.34	4.142	
7,200.0	6,982.5	7,200.0	6,982.5	30.4	30.3	179.64		-57.6	1,352.2	249.9	189.3	60.56	4.127	
7,300.0	7,082.5	7,300.0	7,082.5	30.5	30.4	179.64		-57.6	1,352.2	249.9	189.1	60.78	4.112	
7,400.0	7,182.5	7,400.0	7,182.5	30.7	30.5	179.64		-57.6	1,352.2	249.9	188.9	61.00	4.097	
7,500.0	7,282.5	7,500.0	7,282.5	30.8	30.6	179.64		-57.6	1,352.2	249.9	188.7	61.23	4.082	
7,600.0	7,382.5	7,600.0	7,382.5	30.9	30.8	179.64		-57.6	1,352.2	249.9	188.4	61.45	4.066	
7,700.0	7,482.5	7,700.0	7,482.5	31.0	30.9	179.64		-57.6	1,352.2	249.9	188.2	61.69	4.051	
7,800.0	7,582.5	7,800.0	7,582.5	31.1	31.0	179.64		-57.6	1,352.2	249.9	188.0	61.92	4.036	
7,900.0	7,682.5	7,900.0	7,682.5	31.2	31.1	179.64		-57.6	1,352.2	249.9	187.7	62.15	4.021	
8,000.0	7,782.5	8,000.0	7,782.5	31.3	31.2	179.64		-57.6	1,352.2	249.9	187.5	62.39	4.005	
8,100.0	7,882.5	8,100.0	7,882.5	31.5	31.3	179.64		-57.6	1,352.2	249.9	187.3	62.63	3.990	
8,101.4	7,883.8	8,101.4	7,883.8	31.5	31.3	179.64		-57.6	1,352.2	249.9	187.3	62.64	3.990	
8,113.5	7,896.0	8,108.6	7,891.0	31.5	31.3	179.64		-57.6	1,352.2	249.9	187.3	62.66	3.989 SF	



Archer

Anticollision Report

Archer

Company:	Piceance Energy, LLC	Local Co-ordinate Reference:	Well Piceance Federal 28-06M
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 28-06M	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 usft	Output errors are at	2.00 sigma
Reference Wellbore	Slot A-7	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)	+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	56.673		
200.0	200.0	200.0	200.0	0.3	0.3	-127.66	-6.1	-7.9	9.9	9.3	0.62	15.901		
300.0	300.0	300.0	300.0	0.5	0.5	-127.66	-6.1	-7.9	9.9	8.9	1.07	9.248 CC, ES		
400.0	400.0	400.0	400.0	0.8	0.8	154.73	-6.1	-7.9	11.5	10.0	1.53	7.489 SF		
500.0	499.8	499.8	499.8	1.0	1.0	162.54	-6.1	-7.9	16.4	14.4	2.02	8.122		
600.0	599.5	599.5	599.5	1.2	1.2	168.55	-6.1	-7.9	24.8	22.3	2.51	9.878		
700.0	698.7	697.5	697.5	1.5	1.4	171.25	-7.1	-9.2	38.4	35.4	3.00	12.801		
800.0	797.5	794.0	793.8	1.8	1.6	171.63	-10.2	-13.0	58.5	55.0	3.49	16.778		
900.0	895.6	888.2	887.7	2.2	1.8	171.24	-15.2	-19.1	84.9	81.0	3.98	21.320		
1,000.0	993.1	982.5	981.4	2.6	2.0	170.83	-21.5	-26.9	116.7	112.2	4.49	26.016		
1,100.0	1,089.6	1,076.1	1,074.5	3.1	2.3	170.74	-27.9	-34.7	151.8	146.8	4.98	30.460		
1,200.0	1,185.3	1,168.5	1,166.4	3.7	2.5	170.81	-34.1	-42.5	190.1	184.6	5.48	34.667		
1,300.0	1,279.8	1,259.5	1,256.9	4.3	2.8	170.97	-40.3	-50.0	231.5	225.5	5.98	38.720		
1,400.0	1,374.0	1,350.0	1,346.8	4.9	3.0	171.22	-46.4	-57.6	274.1	267.6	6.43	42.590		
1,500.0	1,468.1	1,440.4	1,436.8	5.6	3.3	171.39	-52.6	-65.2	316.7	309.8	6.90	45.861		
1,600.0	1,562.2	1,530.9	1,526.7	6.3	3.5	171.53	-58.7	-72.7	359.3	351.9	7.39	48.633		
1,700.0	1,656.3	1,621.4	1,616.6	7.0	3.8	171.64	-64.8	-80.3	401.9	394.0	7.88	51.025		
1,800.0	1,750.5	1,711.8	1,706.6	7.7	4.0	171.72	-71.0	-87.8	444.5	436.1	8.37	53.089		
1,900.0	1,844.6	1,802.3	1,796.5	8.4	4.3	171.79	-77.1	-95.4	487.1	478.2	8.87	54.886		
2,000.0	1,938.7	1,892.8	1,886.5	9.1	4.6	171.85	-83.2	-102.9	529.7	520.3	9.38	56.460		
2,100.0	2,032.9	1,983.3	1,976.4	9.8	4.8	171.91	-89.4	-110.5	572.3	562.4	9.89	57.848		
2,200.0	2,127.0	2,073.7	2,066.4	10.5	5.1	171.95	-95.5	-118.0	614.9	604.5	10.41	59.079		
2,300.0	2,221.1	2,164.2	2,156.3	11.2	5.4	171.99	-101.6	-125.6	657.5	646.5	10.93	60.178		
2,400.0	2,315.2	2,254.7	2,246.3	11.9	5.7	172.02	-107.8	-133.1	700.1	688.6	11.45	61.163		
2,500.0	2,409.4	2,345.1	2,336.2	12.6	5.9	172.05	-113.9	-140.7	742.7	730.7	11.97	62.050		
2,600.0	2,503.5	2,435.6	2,426.2	13.3	6.2	172.08	-120.0	-148.2	785.3	772.8	12.49	62.853		
2,700.0	2,597.6	2,526.1	2,516.1	14.0	6.5	172.10	-126.1	-155.8	827.9	814.9	13.02	63.583		
2,800.0	2,691.8	2,616.5	2,606.0	14.7	6.7	172.12	-132.3	-163.3	870.5	856.9	13.55	64.249		
2,900.0	2,785.9	2,707.0	2,696.0	15.4	7.0	172.14	-138.4	-170.9	913.1	899.0	14.08	64.858		
3,000.0	2,880.0	2,797.5	2,785.9	16.1	7.3	172.16	-144.5	-178.4	955.7	941.1	14.61	65.417		
3,100.0	2,974.1	2,888.0	2,875.9	16.8	7.6	172.18	-150.7	-186.0	998.3	983.1	15.14	65.933		

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



Archer

Anticollision Report

Archer

Company:	Piceance Energy, LLC	Local Co-ordinate Reference:	Well Piceance Federal 28-06M
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 28-06M	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 usft	Output errors are at	2.00 sigma
Reference Wellbore	Slot A-7	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)	+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 CC, ES		
200.0	200.0	199.5	199.5	0.3	0.3	-170.75	-15.6	-2.5	15.8	15.2	0.61	26.007		
300.0	300.0	298.8	298.6	0.5	0.5	-164.73	-19.9	-5.4	20.7	19.6	1.06	19.508		
400.0	400.0	397.5	396.9	0.8	0.8	121.58	-27.0	-10.2	29.9	28.3	1.53	19.490 SF		
500.0	499.8	495.0	493.7	1.0	1.1	129.75	-36.7	-16.8	44.9	42.9	2.02	22.189		
600.0	599.5	592.8	590.6	1.2	1.4	135.86	-47.9	-24.3	64.6	62.0	2.53	25.493		
700.0	698.7	690.0	686.9	1.5	1.7	140.48	-58.9	-31.7	87.3	84.2	3.05	28.613		
800.0	797.5	786.4	782.3	1.8	2.0	144.13	-69.9	-39.1	113.0	109.4	3.58	31.531		
900.0	895.6	881.8	876.9	2.2	2.4	147.09	-80.8	-46.5	141.9	137.8	4.13	34.332		
1,000.0	993.1	976.3	970.4	2.6	2.7	149.54	-91.6	-53.7	174.0	169.3	4.69	37.062		
1,100.0	1,089.6	1,069.5	1,062.8	3.1	3.0	151.58	-102.2	-60.9	209.2	203.9	5.26	39.757		
1,200.0	1,185.3	1,161.6	1,154.0	3.7	3.3	153.30	-112.7	-68.0	247.5	241.7	5.84	42.371		
1,300.0	1,279.8	1,252.2	1,243.8	4.3	3.6	154.82	-123.0	-74.9	289.0	282.6	6.42	45.039		
1,400.0	1,374.0	1,342.4	1,333.1	4.9	4.0	156.32	-133.3	-81.9	331.7	324.7	6.97	47.612		
1,500.0	1,468.1	1,432.5	1,422.3	5.6	4.3	157.47	-143.6	-88.8	374.5	367.0	7.52	49.793		
1,600.0	1,562.2	1,522.6	1,511.6	6.3	4.6	158.39	-153.8	-95.7	417.5	409.4	8.08	51.659		
1,700.0	1,656.3	1,612.7	1,600.9	7.0	4.9	159.14	-164.1	-102.6	460.5	451.8	8.64	53.267		
1,800.0	1,750.5	1,702.9	1,690.1	7.7	5.2	159.76	-174.4	-109.6	503.6	494.3	9.21	54.664		
1,900.0	1,844.6	1,793.0	1,779.4	8.4	5.5	160.28	-184.6	-116.5	546.7	536.9	9.78	55.886		
2,000.0	1,938.7	1,883.1	1,868.7	9.1	5.8	160.73	-194.9	-123.4	589.8	579.5	10.35	56.962		
2,100.0	2,032.9	1,973.2	1,958.0	9.8	6.1	161.12	-205.2	-130.3	633.0	622.1	10.93	57.916		
2,200.0	2,127.0	2,063.4	2,047.2	10.5	6.5	161.45	-215.5	-137.2	676.2	664.7	11.51	58.767		
2,300.0	2,221.1	2,153.5	2,136.5	11.2	6.8	161.75	-225.7	-144.2	719.4	707.3	12.08	59.530		
2,400.0	2,315.2	2,243.6	2,225.8	11.9	7.1	162.01	-236.0	-151.1	762.6	749.9	12.66	60.217		
2,500.0	2,409.4	2,333.7	2,315.0	12.6	7.4	162.25	-246.3	-158.0	805.8	792.6	13.25	60.840		
2,600.0	2,503.5	2,423.9	2,404.3	13.3	7.7	162.46	-256.6	-164.9	849.1	835.3	13.83	61.405		
2,700.0	2,597.6	2,514.0	2,493.6	14.0	8.0	162.65	-266.8	-171.9	892.3	877.9	14.41	61.922		
2,800.0	2,691.8	2,604.1	2,582.8	14.7	8.3	162.82	-277.1	-178.8	935.6	920.6	14.99	62.394		
2,900.0	2,785.9	2,694.2	2,672.1	15.4	8.6	162.98	-287.4	-185.7	978.9	963.3	15.58	62.829		

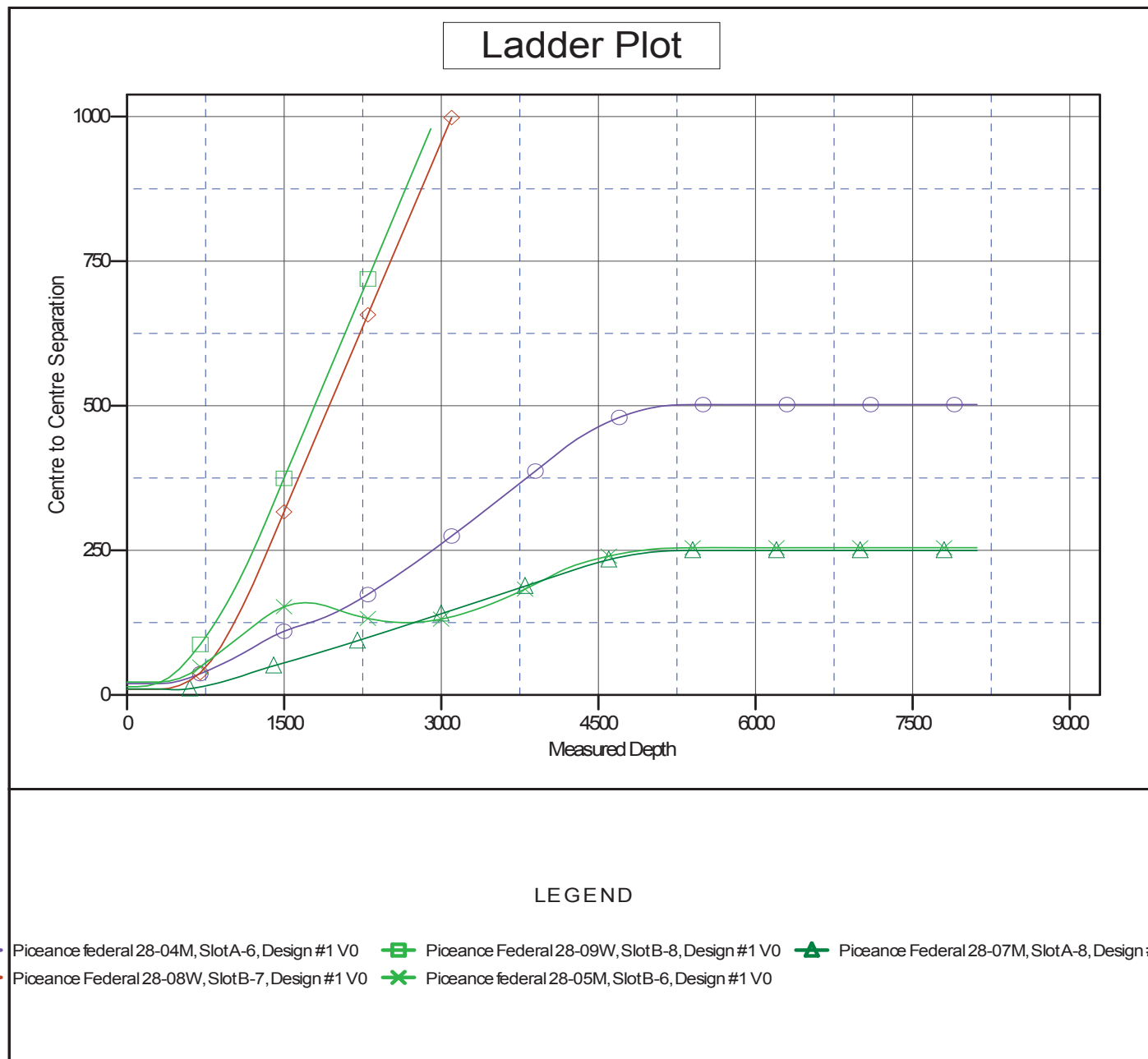
CC - Min centre to center distance or convergent point, SF - min separation factor, ES - min ellipse separation



Company:	Piceance Energy, LLC	Local Co-ordinate Reference:	Well Piceance Federal 28-06M
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 28-06M	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 usft	Output errors are at	2.00 sigma
Reference Wellbore	Slot A-7	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 28-06M
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 28-06M
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 28-06M	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 usft	Output errors are at	2.00 sigma
Reference Wellbore	Slot A-7	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 28-06M

Coordinate System is US State Plane 1983, Colorado Central Zone

Grid Convergence at Surface is: -1.44°

