



Piceance Energy, LLC

Mesa County, CO

Piceance 29-11

Piceance Federal 29-18W

Slot B-8

Plan: Design #1

Standard Planning Report

15 September, 2015



Project: Mesa County, CO
Site: Piceance 29-11
Well: Piceance Federal 29-18W
Wellbore: Slot B-8
Design: Design #1
Latitude: 39° 14' 44.920 N
Longitude: 107° 47' 35.980 W
Ground Level: 7908.0
Well @ 7930.0usft

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 Federal 29-18W, True North
Vertical (TVD) Reference: Well @ 7930.0usft
Section (VS) Reference: Slot - (0.0N, 0.0E)
Measured Depth Reference: Well @ 7930.0usft
Calculation Method: Minimum Curvature

WELL DETAILS: Piceance Federal 29-18W

+N/-S	+E/-W	Northing	Ground Level:	Latitude	Longitude	Slot
0.0	0.0	1522618.45	7908.0	39° 14' 44.920 N	107° 47' 35.980 W	
			Easting 2350590.42			

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

Name	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude	Shape
Piceance Federal 28-18W tgt	7942.0	-899.3	-1678.8	1521761.76	2348889.43	39° 14' 36.030 N	107° 47' 57.320 W	Circle (Radius: 50.0)

SECTION DETAILS

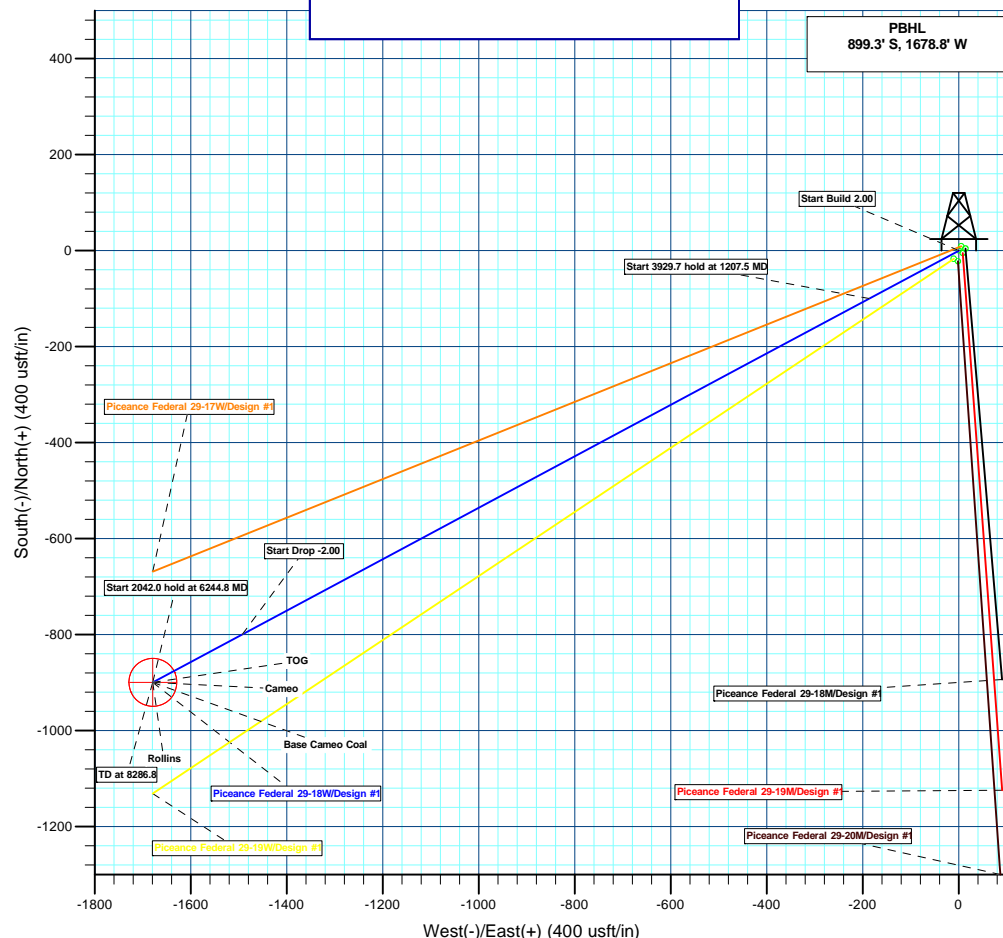
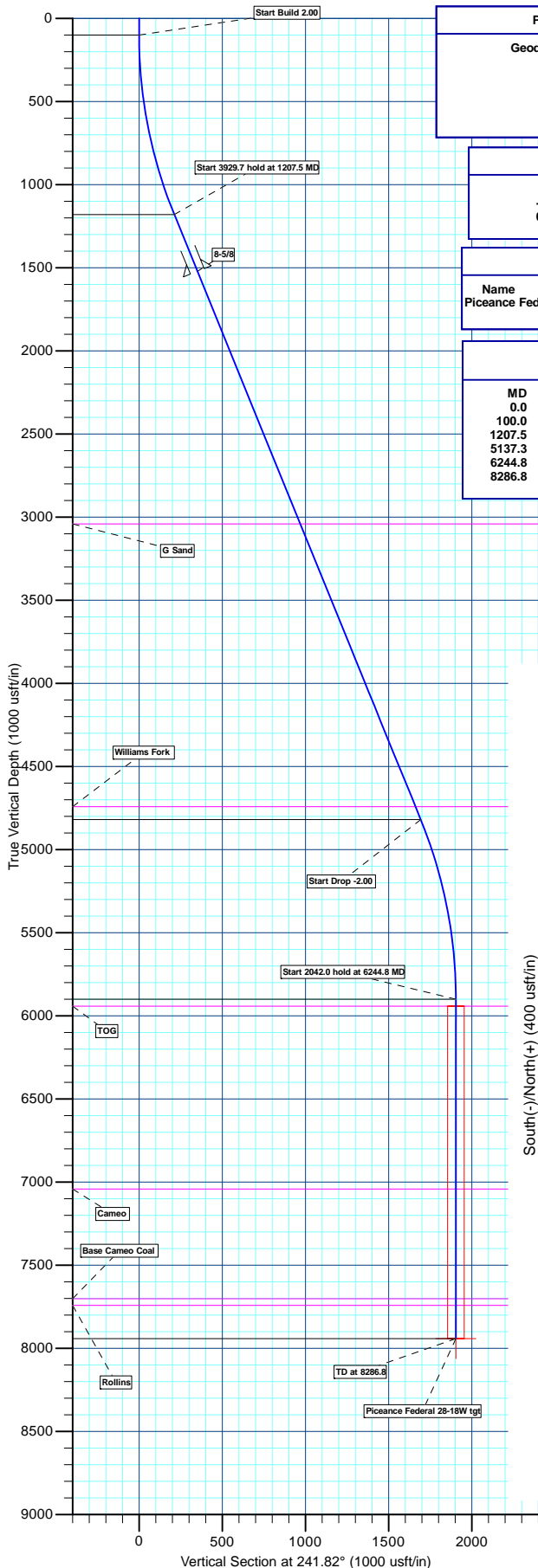
MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	VSec	Annotation
0.0	0.00	0.00	0.0	0.0	0.0	0.00	0.00	0.0	
100.0	0.00	0.00	100.0	0.0	0.0	0.00	0.00	0.0	Start Build 2.00
1207.5	22.15	241.82	1180.1	-99.8	-186.4	2.00	241.82	211.4	Start 3929.7 hold at 1207.5 MD
5137.3	22.15	241.82	4819.9	-799.5	-1492.5	0.00	0.00	1693.1	Start Drop -2.00
6244.8	0.00	0.00	5900.0	-899.3	-1678.8	2.00	180.00	1904.5	Start 2042.0 hold at 6244.8 MD
8286.8	0.00	0.00	7942.0	-899.3	-1678.8	0.00	0.00	1904.5	TD at 8286.8



Azimuths to True North
Magnetic North: 9.68°
Magnetic Field
Strength: 51697.2snT
Dip Angle: 65.45°
Date: 09/09/2015
Model: IGRF2010

FORMATION TOP DETAILS

TVDPATH	MDPATH	Formation
3042.0	3217.7	G Sand
4742.0	5053.2	Williams Fork
5942.0	6286.8	TOG
7042.0	7386.8	Cameo
7702.0	8046.8	Base Cameo Coal
7742.0	8086.8	Rollins



Plan: Design #1 (Piceance Federal 29-18W/Slot B-8)

Created By: Ricky Osburn Date: 8:32, September 15 2015



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Planning Report

Database:	EDMDBBW	Local Co-ordinate Reference:	Well Piceance Federal 29-18W
Company:	Piceance Energy, LLC	TVD Reference:	Well @ 7930.0usft
Project:	Mesa County, CO	MD Reference:	Well @ 7930.0usft
Site:	Piceance 29-11	North Reference:	True
Well:	Piceance Federal 29-18W	Survey Calculation Method:	Minimum Curvature
Wellbore:	Slot B-8		
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 29-11			
Site Position:		Northing:	1,522,571.34 usft	Latitude:	39° 14' 44.450 N
From:	Lat/Long	Easting:	2,350,572.70 usft	Longitude:	107° 47' 36.190 W
Position Uncertainty:	0.0 usft	Slot Radius:	13-3/16 "	Grid Convergence:	-1.45 °

Well		Piceance Federal 29-18W				
Well Position	+N/-S	47.5 usft	Northing:	1,522,618.45 usft	Latitude:	39° 14' 44.920 N
	+E/-W	16.5 usft	Easting:	2,350,590.42 usft	Longitude:	107° 47' 35.980 W
Position Uncertainty		0.0 usft	Wellhead Elevation:	0.0 usft	Ground Level:	7,908.0 usft

Wellbore	Slot B-8				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	2015/09/09	9.68	65.45	51,697

Design	Design #1			
Audit Notes:				
Version:	Phase:	PLAN	Tie On Depth:	0.0
Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)	Direction (°)
	0.0	0.0	0.0	241.82

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
0.0	0.00	0.00	0.0	0.0	0.0	0.00	0.00	0.00	0.00	
100.0	0.00	0.00	100.0	0.0	0.0	0.00	0.00	0.00	0.00	
1,207.5	22.15	241.82	1,180.1	-99.8	-186.4	2.00	2.00	0.00	241.82	
5,137.3	22.15	241.82	4,819.9	-799.5	-1,492.5	0.00	0.00	0.00	0.00	
6,244.8	0.00	0.00	5,900.0	-899.3	-1,678.8	2.00	-2.00	0.00	180.00	
8,286.8	0.00	0.00	7,942.0	-899.3	-1,678.8	0.00	0.00	0.00	0.00	Piceance Federal 28-



Archer

Planning Report

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Company:	Piceance Energy, LLC	TVD Reference:	Well @ 7930.0usft
Project:	Mesa County, CO	MD Reference:	Well @ 7930.0usft
Site:	Piceance 29-11	North Reference:	True
Well:	Piceance Federal 29-18W	Survey Calculation Method:	Minimum Curvature
Wellbore:	Slot B-8		
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)
0.0	0.00	0.00	0.0	0.0	0.0	0.0	0.00	0.00	0.00
Start Build 2.00									
100.0	0.00	0.00	100.0	0.0	0.0	0.0	0.00	0.00	0.00
200.0	2.00	241.82	200.0	-0.8	-1.5	1.7	2.00	2.00	0.00
300.0	4.00	241.82	299.8	-3.3	-6.2	7.0	2.00	2.00	0.00
400.0	6.00	241.82	399.5	-7.4	-13.8	15.7	2.00	2.00	0.00
500.0	8.00	241.82	498.7	-13.2	-24.6	27.9	2.00	2.00	0.00
600.0	10.00	241.82	597.5	-20.6	-38.4	43.5	2.00	2.00	0.00
700.0	12.00	241.82	695.6	-29.6	-55.2	62.6	2.00	2.00	0.00
800.0	14.00	241.82	793.1	-40.2	-75.0	85.1	2.00	2.00	0.00
900.0	16.00	241.82	889.6	-52.4	-97.8	111.0	2.00	2.00	0.00
1,000.0	18.00	241.82	985.3	-66.2	-123.6	140.2	2.00	2.00	0.00
1,100.0	20.00	241.82	1,079.8	-81.6	-152.3	172.8	2.00	2.00	0.00
Start 3929.7 hold at 1207.5 MD									
1,207.5	22.15	241.82	1,180.1	-99.8	-186.4	211.4	2.00	2.00	0.00
1,300.0	22.15	241.82	1,265.8	-116.3	-217.1	246.3	0.00	0.00	0.00
1,400.0	22.15	241.82	1,358.4	-134.1	-250.3	284.0	0.00	0.00	0.00
1,500.0	22.15	241.82	1,451.0	-151.9	-283.6	321.7	0.00	0.00	0.00
8-5/8									
1,576.6	22.15	241.82	1,522.0	-165.6	-309.0	350.6	0.00	0.00	0.00
1,600.0	22.15	241.82	1,543.7	-169.7	-316.8	359.4	0.00	0.00	0.00
1,700.0	22.15	241.82	1,636.3	-187.5	-350.1	397.1	0.00	0.00	0.00
1,800.0	22.15	241.82	1,728.9	-205.3	-383.3	434.8	0.00	0.00	0.00
1,900.0	22.15	241.82	1,821.5	-223.1	-416.5	472.5	0.00	0.00	0.00
2,000.0	22.15	241.82	1,914.1	-240.9	-449.8	510.2	0.00	0.00	0.00
2,100.0	22.15	241.82	2,006.7	-258.7	-483.0	547.9	0.00	0.00	0.00
2,200.0	22.15	241.82	2,099.4	-276.5	-516.2	585.6	0.00	0.00	0.00
2,300.0	22.15	241.82	2,192.0	-294.3	-549.5	623.3	0.00	0.00	0.00
2,400.0	22.15	241.82	2,284.6	-312.2	-582.7	661.0	0.00	0.00	0.00
2,500.0	22.15	241.82	2,377.2	-330.0	-615.9	698.7	0.00	0.00	0.00
2,600.0	22.15	241.82	2,469.8	-347.8	-649.2	736.5	0.00	0.00	0.00
2,700.0	22.15	241.82	2,562.5	-365.6	-682.4	774.2	0.00	0.00	0.00
2,800.0	22.15	241.82	2,655.1	-383.4	-715.6	811.9	0.00	0.00	0.00
2,900.0	22.15	241.82	2,747.7	-401.2	-748.9	849.6	0.00	0.00	0.00
3,000.0	22.15	241.82	2,840.3	-419.0	-782.1	887.3	0.00	0.00	0.00
3,100.0	22.15	241.82	2,932.9	-436.8	-815.4	925.0	0.00	0.00	0.00
3,200.0	22.15	241.82	3,025.6	-454.6	-848.6	962.7	0.00	0.00	0.00
G Sand									
3,217.7	22.15	241.82	3,042.0	-457.7	-854.5	969.4	0.00	0.00	0.00
3,300.0	22.15	241.82	3,118.2	-472.4	-881.8	1,000.4	0.00	0.00	0.00
3,400.0	22.15	241.82	3,210.8	-490.2	-915.1	1,038.1	0.00	0.00	0.00
3,500.0	22.15	241.82	3,303.4	-508.0	-948.3	1,075.8	0.00	0.00	0.00
3,600.0	22.15	241.82	3,396.0	-525.8	-981.5	1,113.5	0.00	0.00	0.00
3,700.0	22.15	241.82	3,488.7	-543.6	-1,014.8	1,151.2	0.00	0.00	0.00
3,800.0	22.15	241.82	3,581.3	-561.4	-1,048.0	1,188.9	0.00	0.00	0.00
3,900.0	22.15	241.82	3,673.9	-579.2	-1,081.2	1,226.6	0.00	0.00	0.00
4,000.0	22.15	241.82	3,766.5	-597.0	-1,114.5	1,264.3	0.00	0.00	0.00
4,100.0	22.15	241.82	3,859.1	-614.8	-1,147.7	1,302.0	0.00	0.00	0.00
4,200.0	22.15	241.82	3,951.8	-632.6	-1,180.9	1,339.7	0.00	0.00	0.00
4,300.0	22.15	241.82	4,044.4	-650.4	-1,214.2	1,377.4	0.00	0.00	0.00
4,400.0	22.15	241.82	4,137.0	-668.2	-1,247.4	1,415.1	0.00	0.00	0.00
4,500.0	22.15	241.82	4,229.6	-686.0	-1,280.7	1,452.8	0.00	0.00	0.00
4,600.0	22.15	241.82	4,322.2	-703.9	-1,313.9	1,490.5	0.00	0.00	0.00
4,700.0	22.15	241.82	4,414.9	-721.7	-1,347.1	1,528.2	0.00	0.00	0.00



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Planning Report

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Company:	Piceance Energy, LLC	TVD Reference:	Well @ 7930.0usft
Project:	Mesa County, CO	MD Reference:	Well @ 7930.0usft
Site:	Piceance 29-11	North Reference:	True
Well:	Piceance Federal 29-18W	Survey Calculation Method:	Minimum Curvature
Wellbore:	Slot B-8		
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)
4,800.0	22.15	241.82	4,507.5	-739.5	-1,380.4	1,565.9	0.00	0.00	0.00
4,900.0	22.15	241.82	4,600.1	-757.3	-1,413.6	1,603.7	0.00	0.00	0.00
5,000.0	22.15	241.82	4,692.7	-775.1	-1,446.8	1,641.4	0.00	0.00	0.00
Williams Fork									
5,053.2	22.15	241.82	4,742.0	-784.5	-1,464.5	1,661.4	0.00	0.00	0.00
5,100.0	22.15	241.82	4,785.3	-792.9	-1,480.1	1,679.1	0.00	0.00	0.00
Start Drop -2.00									
5,137.3	22.15	241.82	4,819.9	-799.5	-1,492.5	1,693.1	0.00	0.00	0.00
5,200.0	20.90	241.82	4,878.2	-810.4	-1,512.7	1,716.1	2.00	-2.00	0.00
5,300.0	18.90	241.82	4,972.2	-826.4	-1,542.7	1,750.2	2.00	-2.00	0.00
5,400.0	16.90	241.82	5,067.4	-841.0	-1,569.8	1,780.9	2.00	-2.00	0.00
5,500.0	14.90	241.82	5,163.6	-853.9	-1,594.0	1,808.3	2.00	-2.00	0.00
5,600.0	12.90	241.82	5,260.6	-865.2	-1,615.1	1,832.3	2.00	-2.00	0.00
5,700.0	10.90	241.82	5,358.5	-875.0	-1,633.3	1,852.9	2.00	-2.00	0.00
5,800.0	8.90	241.82	5,457.0	-883.1	-1,648.4	1,870.1	2.00	-2.00	0.00
5,900.0	6.90	241.82	5,556.0	-889.6	-1,660.6	1,883.8	2.00	-2.00	0.00
6,000.0	4.90	241.82	5,655.5	-894.4	-1,669.6	1,894.1	2.00	-2.00	0.00
6,100.0	2.90	241.82	5,755.3	-897.6	-1,675.6	1,900.9	2.00	-2.00	0.00
6,200.0	0.90	241.82	5,855.2	-899.2	-1,678.5	1,904.2	2.00	-2.00	0.00
Start 2042.0 hold at 6244.8 MD									
6,244.8	0.00	0.00	5,900.0	-899.3	-1,678.8	1,904.5	2.00	-2.00	0.00
TOG									
6,286.8	0.00	0.00	5,942.0	-899.3	-1,678.8	1,904.5	0.00	0.00	0.00
6,300.0	0.00	0.00	5,955.2	-899.3	-1,678.8	1,904.5	0.00	0.00	0.00
6,400.0	0.00	0.00	6,055.2	-899.3	-1,678.8	1,904.5	0.00	0.00	0.00
6,500.0	0.00	0.00	6,155.2	-899.3	-1,678.8	1,904.5	0.00	0.00	0.00
6,600.0	0.00	0.00	6,255.2	-899.3	-1,678.8	1,904.5	0.00	0.00	0.00
6,700.0	0.00	0.00	6,355.2	-899.3	-1,678.8	1,904.5	0.00	0.00	0.00
6,800.0	0.00	0.00	6,455.2	-899.3	-1,678.8	1,904.5	0.00	0.00	0.00
6,900.0	0.00	0.00	6,555.2	-899.3	-1,678.8	1,904.5	0.00	0.00	0.00
7,000.0	0.00	0.00	6,655.2	-899.3	-1,678.8	1,904.5	0.00	0.00	0.00
7,100.0	0.00	0.00	6,755.2	-899.3	-1,678.8	1,904.5	0.00	0.00	0.00
7,200.0	0.00	0.00	6,855.2	-899.3	-1,678.8	1,904.5	0.00	0.00	0.00
7,300.0	0.00	0.00	6,955.2	-899.3	-1,678.8	1,904.5	0.00	0.00	0.00
Cameo									
7,386.8	0.00	0.00	7,042.0	-899.3	-1,678.8	1,904.5	0.00	0.00	0.00
7,400.0	0.00	0.00	7,055.2	-899.3	-1,678.8	1,904.5	0.00	0.00	0.00
7,500.0	0.00	0.00	7,155.2	-899.3	-1,678.8	1,904.5	0.00	0.00	0.00
7,600.0	0.00	0.00	7,255.2	-899.3	-1,678.8	1,904.5	0.00	0.00	0.00
7,700.0	0.00	0.00	7,355.2	-899.3	-1,678.8	1,904.5	0.00	0.00	0.00
7,800.0	0.00	0.00	7,455.2	-899.3	-1,678.8	1,904.5	0.00	0.00	0.00
7,900.0	0.00	0.00	7,555.2	-899.3	-1,678.8	1,904.5	0.00	0.00	0.00
8,000.0	0.00	0.00	7,655.2	-899.3	-1,678.8	1,904.5	0.00	0.00	0.00
Base Cameo Coal									
8,046.8	0.00	0.00	7,702.0	-899.3	-1,678.8	1,904.5	0.00	0.00	0.00
Rollins									
8,086.8	0.00	0.00	7,742.0	-899.3	-1,678.8	1,904.5	0.00	0.00	0.00
8,100.0	0.00	0.00	7,755.2	-899.3	-1,678.8	1,904.5	0.00	0.00	0.00
8,200.0	0.00	0.00	7,855.2	-899.3	-1,678.8	1,904.5	0.00	0.00	0.00
TD at 8286.8									
8,286.8	0.00	0.00	7,942.0	-899.3	-1,678.8	1,904.5	0.00	0.00	0.00



Archer

Planning Report

Database:	EDMDBBW	Local Co-ordinate Reference:	Well Piceance Federal 29-18W
Company:	Piceance Energy, LLC	TVD Reference:	Well @ 7930.0usft
Project:	Mesa County, CO	MD Reference:	Well @ 7930.0usft
Site:	Piceance 29-11	North Reference:	True
Well:	Piceance Federal 29-18W	Survey Calculation Method:	Minimum Curvature
Wellbore:	Slot B-8		
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 28-18'	0.00	0.00	7,942.0	-899.3	-1,678.8	1,521,761.76	2,348,889.43	39° 14' 36.030 N	107° 47' 57.320 W
- plan hits target center									
- Circle (radius 50.0)									

Casing Points					
Measured Depth	Vertical Depth			Casing Diameter	Hole Diameter
(usft)	(usft)		Name	(")	(")
1,576.6	1,522.0	8-5/8		8-5/8	12-1/4

Formations						
Measured Depth	Vertical Depth				Dip	Dip Direction
(usft)	(usft)		Name	Lithology	(°)	(°)
3,217.7	3,042.0	G Sand			0.00	
5,053.2	4,742.0	Williams Fork			0.00	
6,286.8	5,942.0	TOG			0.00	
7,386.8	7,042.0	Cameo			0.00	
8,046.8	7,702.0	Base Cameo Coal			0.00	
8,086.8	7,742.0	Rollins			0.00	

Plan Annotations					
Measured Depth	Vertical Depth	Local Coordinates			
(usft)	(usft)	+N/-S	+E/-W	Comment	
(usft)	(usft)	(usft)	(usft)		
100.0	100.0	0.0	0.0	Start Build 2.00	
1,207.5	1,180.1	-99.8	-186.4	Start 3929.7 hold at 1207.5 MD	
5,137.3	4,819.9	-799.5	-1,492.5	Start Drop -2.00	
6,244.8	5,900.0	-899.3	-1,678.8	Start 2042.0 hold at 6244.8 MD	
8,286.8	7,942.0	-899.3	-1,678.8	TD at 8286.8	



Piceance Energy, LLC

Mesa County, CO

Piceance 29-11

Piceance Federal 29-18W

Slot B-8

Design #1

Anticollision Report

15 September, 2015



Archer

Anticollision Report

Company:	Piceance Energy, LLC	Local Co-ordinate Reference:	Well Piceance Federal 29-18W
Project:	Mesa County, CO	TVD Reference:	Well @ 7930.0usft
Reference Site:	Piceance 29-11	MD Reference:	Well @ 7930.0usft
Site Error:	0.0 usft	North Reference:	True
Reference Well:	Piceance Federal 29-18W	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 usft	Output errors are at	2.00 sigma
Reference Wellbore	Slot B-8	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	2015/09/09		
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description	
0.0	8,286.8	Design #1 (Slot B-8)	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 29-11						
Piceance Federal 29-17W - Slot B-7 - Design #1	100.0	100.0	10.6	10.5	60.696	CC, ES
Piceance Federal 29-17W - Slot B-7 - Design #1	8,286.8	8,283.4	230.7	155.7	3.078	SF
Piceance Federal 29-18M - Slot A-7 - Design #1	100.0	100.0	14.7	14.6	84.002	CC, ES
Piceance Federal 29-18M - Slot A-7 - Design #1	400.0	399.8	28.9	27.4	19.315	SF
Piceance Federal 29-19M - Slot A-8 - Design #1	100.0	100.0	10.0	9.8	57.174	CC, ES
Piceance Federal 29-19M - Slot A-8 - Design #1	300.0	299.7	15.3	14.3	14.548	SF
Piceance Federal 29-19W - Slot B-9 - Design #1	529.2	527.8	12.7	10.4	5.605	CC
Piceance Federal 29-19W - Slot B-9 - Design #1	600.0	598.4	13.1	10.3	4.802	ES
Piceance Federal 29-19W - Slot B-9 - Design #1	2,100.0	2,099.8	62.1	38.9	2.678	SF
Piceance Federal 29-20M - Slot A-9 - Design #1	259.4	258.9	20.9	20.0	23.650	CC, ES
Piceance Federal 29-20M - Slot A-9 - Design #1	400.0	398.1	25.2	23.6	15.860	SF

Piceance 29-11 - Piceance Federal 29-17W - Slot B-7 - 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	31.17	9.1	5.5	10.6					
100.0	100.0	100.0	100.0	0.1	0.1	31.17	9.1	5.5	10.6	10.5	0.18	60.696	CC, ES	
200.0	200.0	200.0	200.0	0.3	0.3	153.52	9.1	5.5	12.2	11.6	0.62	19.779		
300.0	299.8	299.8	299.8	0.5	0.5	161.37	9.1	5.5	17.0	15.9	1.07	15.881		
400.0	399.5	399.5	399.5	0.8	0.8	167.62	9.1	5.5	25.4	23.9	1.54	16.552		
500.0	498.7	498.7	498.7	1.1	1.0	171.58	9.1	5.5	37.4	35.4	2.01	18.657		
600.0	597.5	599.2	599.2	1.4	1.2	173.66	8.5	3.9	51.3	48.8	2.46	20.822		
700.0	695.6	700.2	700.1	1.9	1.4	174.50	6.5	-1.0	65.2	62.3	2.94	22.190		
800.0	793.1	801.8	801.2	2.3	1.6	174.76	3.2	-9.2	79.2	75.8	3.45	22.979		
900.0	889.6	903.8	902.5	2.8	1.9	174.70	-1.5	-20.9	93.2	89.2	3.98	23.411		
1,000.0	985.3	1,006.3	1,003.7	3.4	2.2	174.43	-7.6	-35.9	107.1	102.6	4.54	23.604		
1,100.0	1,079.8	1,109.4	1,104.8	4.1	2.6	174.03	-15.0	-54.4	121.0	115.9	5.12	23.626		
1,200.0	1,173.2	1,212.9	1,205.6	4.8	3.0	173.53	-23.8	-76.4	134.9	129.1	5.73	23.514		
1,300.0	1,265.8	1,317.2	1,306.1	5.6	3.5	172.92	-34.1	-101.9	147.2	140.8	6.37	23.088		
1,400.0	1,358.4	1,422.2	1,406.3	6.3	4.1	172.07	-45.8	-131.0	156.0	148.9	7.05	22.139		
1,500.0	1,451.0	1,527.7	1,505.8	7.1	4.8	170.97	-59.0	-163.7	161.3	153.5	7.75	20.823		

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



Archer

Anticollision Report

Company:	Piceance Energy, LLC	Local Co-ordinate Reference:	Well Piceance Federal 29-18W
Project:	Mesa County, CO	TVD Reference:	Well @ 7930.0usft
Reference Site:	Piceance 29-11	MD Reference:	Well @ 7930.0usft
Site Error:	0.0 usft	North Reference:	True
Reference Well:	Piceance Federal 29-18W	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 usft	Output errors are at	2.00 sigma
Reference Wellbore	Slot B-8	Database:	EDMDBBW
Reference Design:	Design #1	Offset TVD Reference:	Reference Datum

Offset Design													Offset Site Error:	0.0 usft
Piceance 29-11 - Piceance Federal 29-17W - Slot B-7 - 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		
1,600.0	1,543.7	1,633.3	1,604.0	7.9	5.5	169.56	-73.5	-199.8	163.1	154.6	8.50	19.183		
1,700.0	1,636.3	1,734.9	1,697.4	8.7	6.3	167.95	-88.4	-236.9	162.4	153.1	9.29	17.470		
1,800.0	1,728.9	1,834.8	1,789.1	9.4	7.1	166.33	-103.2	-273.5	161.6	151.5	10.14	15.946		
1,900.0	1,821.5	1,934.7	1,880.9	10.2	7.9	164.69	-117.9	-310.1	161.0	150.0	11.04	14.584		
2,000.0	1,914.1	2,034.6	1,972.6	11.0	8.7	163.04	-132.6	-346.7	160.5	148.5	12.01	13.367		
2,100.0	2,006.7	2,134.5	2,064.4	11.8	9.5	161.39	-147.4	-383.4	160.2	147.1	13.04	12.281		
2,200.0	2,099.4	2,234.4	2,156.2	12.6	10.3	159.73	-162.1	-420.0	159.9	145.8	14.14	11.310		
2,300.0	2,192.0	2,334.3	2,247.9	13.4	11.1	158.06	-176.9	-456.6	159.8	144.5	15.31	10.443		
2,312.6	2,203.6	2,346.8	2,259.5	13.5	11.2	157.85	-178.7	-461.2	159.8	144.4	15.46	10.340		
2,400.0	2,284.6	2,434.1	2,339.7	14.2	11.9	156.40	-191.6	-493.2	159.9	143.4	16.54	9.668		
2,500.0	2,377.2	2,534.0	2,431.4	14.9	12.8	154.73	-206.3	-529.9	160.1	142.3	17.83	8.976		
2,600.0	2,469.8	2,633.9	2,523.2	15.7	13.6	153.08	-221.1	-566.5	160.4	141.2	19.19	8.358		
2,700.0	2,562.5	2,733.8	2,615.0	16.5	14.4	151.43	-235.8	-603.1	160.9	140.2	20.61	7.805		
2,800.0	2,655.1	2,833.7	2,706.7	17.3	15.2	149.79	-250.6	-639.8	161.4	139.4	22.09	7.310		
2,900.0	2,747.7	2,933.6	2,798.5	18.1	16.1	148.16	-265.3	-676.4	162.2	138.6	23.62	6.867		
3,000.0	2,840.3	3,033.5	2,890.2	18.9	16.9	146.55	-280.0	-713.0	163.0	137.8	25.20	6.470		
3,100.0	2,932.9	3,133.4	2,982.0	19.7	17.7	144.96	-294.8	-749.6	164.0	137.2	26.82	6.114		
3,200.0	3,025.6	3,233.3	3,073.7	20.5	18.6	143.39	-309.5	-786.3	165.1	136.6	28.49	5.794		
3,300.0	3,118.2	3,333.2	3,165.5	21.3	19.4	141.84	-324.2	-822.9	166.3	136.1	30.20	5.507		
3,400.0	3,210.8	3,433.1	3,257.3	22.0	20.2	140.31	-339.0	-859.5	167.7	135.7	31.95	5.248		
3,500.0	3,303.4	3,533.0	3,349.0	22.8	21.1	138.81	-353.7	-896.1	169.1	135.4	33.72	5.015		
3,600.0	3,396.0	3,632.8	3,440.8	23.6	21.9	137.33	-368.5	-932.8	170.7	135.2	35.53	4.804		
3,700.0	3,488.7	3,732.7	3,532.5	24.4	22.7	135.89	-383.2	-969.4	172.4	135.0	37.36	4.614		
3,800.0	3,581.3	3,832.6	3,624.3	25.2	23.5	134.47	-397.9	-1,006.0	174.2	135.0	39.21	4.442		
3,900.0	3,673.9	3,932.5	3,716.1	26.0	24.4	133.08	-412.7	-1,042.6	176.1	135.0	41.08	4.286		
4,000.0	3,766.5	4,032.4	3,807.8	26.8	25.2	131.72	-427.4	-1,079.3	178.1	135.1	42.96	4.145		
4,100.0	3,859.1	4,132.3	3,899.6	27.6	26.0	130.40	-442.2	-1,115.9	180.2	135.3	44.86	4.017		
4,200.0	3,951.8	4,232.2	3,991.3	28.4	26.9	129.10	-456.9	-1,152.5	182.4	135.6	46.76	3.900		
4,300.0	4,044.4	4,332.1	4,083.1	29.2	27.7	127.84	-471.6	-1,189.1	184.7	136.0	48.68	3.794		
4,400.0	4,137.0	4,432.0	4,174.9	29.9	28.5	126.60	-486.4	-1,225.8	187.0	136.4	50.59	3.697		
4,500.0	4,229.6	4,531.9	4,266.6	30.7	29.4	125.40	-501.1	-1,262.4	189.5	137.0	52.51	3.608		
4,600.0	4,322.2	4,631.8	4,358.4	31.5	30.2	124.23	-515.8	-1,299.0	192.0	137.6	54.44	3.527		
4,700.0	4,414.9	4,731.7	4,450.1	32.3	31.1	123.09	-530.6	-1,335.6	194.6	138.3	56.36	3.454		
4,800.0	4,507.5	4,831.5	4,541.9	33.1	31.9	121.98	-545.3	-1,372.3	197.3	139.0	58.28	3.386		
4,900.0	4,600.1	4,931.4	4,633.6	33.9	32.7	120.91	-560.1	-1,408.9	200.1	139.9	60.20	3.324		
5,000.0	4,692.7	5,031.3	4,725.4	34.7	33.6	119.86	-574.8	-1,445.5	202.9	140.8	62.11	3.267		
5,100.0	4,785.3	5,129.7	4,816.0	35.5	34.3	118.97	-589.2	-1,481.2	206.0	142.1	63.87	3.225		
5,200.0	4,878.2	5,226.9	4,906.5	36.2	34.9	118.76	-602.3	-1,513.9	210.0	144.8	65.17	3.222		
5,300.0	4,972.2	5,324.0	4,998.2	36.8	35.4	118.64	-614.3	-1,543.7	213.7	147.5	66.25	3.226		
5,400.0	5,067.4	5,421.2	5,090.9	37.3	35.9	118.54	-625.1	-1,570.6	217.1	149.9	67.23	3.229		
5,500.0	5,163.6	5,518.3	5,184.5	37.7	36.3	118.46	-634.8	-1,594.6	220.1	152.0	68.10	3.232		
5,600.0	5,260.6	5,615.4	5,278.9	38.1	36.7	118.39	-643.2	-1,615.6	222.7	153.9	68.88	3.234		
5,700.0	5,358.5	5,712.5	5,374.1	38.5	37.1	118.33	-650.5	-1,633.6	225.0	155.5	69.55	3.235		
5,800.0	5,457.0	5,809.6	5,469.8	38.7	37.3	118.28	-656.6	-1,648.7	226.9	156.8	70.12	3.236		
5,900.0	5,556.0	5,906.7	5,566.0	39.0	37.6	118.24	-661.4	-1,660.7	228.4	157.8	70.59	3.236		
6,000.0	5,655.5	6,003.8	5,662.6	39.2	37.8	118.21	-665.0	-1,669.7	229.5	158.6	70.96	3.235		
6,100.0	5,755.3	6,100.0	5,758.6	39.3	37.9	118.19	-667.4	-1,675.6	230.3	159.0	71.22	3.233		
6,200.0	5,855.2	6,198.0	5,856.5	39.4	38.0	118.18	-668.6	-1,678.5	230.6	159.2	71.42	3.229		
6,300.0	5,955.2	6,296.6	5,955.2	39.5	38.1	0.00	-668.7	-1,678.8	230.7	159.1	71.55	3.224		
6,400.0	6,055.2	6,396.6	6,055.2	39.6	38.2	0.00	-668.7	-1,678.8	230.7	159.0	71.70	3.217		
6,500.0	6,155.2	6,496.6	6,155.2	39.6	38.2	0.00	-668.7	-1,678.8	230.7	158.8	71.85	3.211		
6,600.0	6,255.2	6,596.6	6,255.2	39.7	38.3	0.00	-668.7	-1,678.8	230.7	158.7	72.00	3.204		

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



Archer

Anticollision Report

Company:	Piceance Energy, LLC	Local Co-ordinate Reference:	Well Piceance Federal 29-18W
Project:	Mesa County, CO	TVD Reference:	Well @ 7930.0usft
Reference Site:	Piceance 29-11	MD Reference:	Well @ 7930.0usft
Site Error:	0.0 usft	North Reference:	True
Reference Well:	Piceance Federal 29-18W	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 usft	Output errors are at	2.00 sigma
Reference Wellbore	Slot B-8	Database:	EDMDBBW
Reference Design:	Design #1	Offset TVD Reference:	Reference Datum

Offset Design													Piceance 29-11 - Piceance Federal 29-17W - Slot B-7 - 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				
6,700.0	6,355.2	6,696.6	6,355.2	39.8	38.4	0.00	-668.7	-1,678.8	230.7	158.5	72.16	3.197				
6,800.0	6,455.2	6,796.6	6,455.2	39.8	38.4	0.00	-668.7	-1,678.8	230.7	158.4	72.32	3.190				
6,900.0	6,555.2	6,896.6	6,555.2	39.9	38.5	0.00	-668.7	-1,678.8	230.7	158.2	72.48	3.183				
7,000.0	6,655.2	6,996.6	6,655.2	40.0	38.6	0.00	-668.7	-1,678.8	230.7	158.0	72.64	3.176				
7,100.0	6,755.2	7,096.6	6,755.2	40.1	38.7	0.00	-668.7	-1,678.8	230.7	157.9	72.80	3.168				
7,200.0	6,855.2	7,196.6	6,855.2	40.1	38.8	0.00	-668.7	-1,678.8	230.7	157.7	72.97	3.161				
7,300.0	6,955.2	7,296.6	6,955.2	40.2	38.8	0.00	-668.7	-1,678.8	230.7	157.5	73.14	3.154				
7,400.0	7,055.2	7,396.6	7,055.2	40.3	38.9	0.00	-668.7	-1,678.8	230.7	157.4	73.32	3.146				
7,500.0	7,155.2	7,496.6	7,155.2	40.4	39.0	0.00	-668.7	-1,678.8	230.7	157.2	73.49	3.139				
7,600.0	7,255.2	7,596.6	7,255.2	40.4	39.1	0.00	-668.7	-1,678.8	230.7	157.0	73.67	3.131				
7,700.0	7,355.2	7,696.6	7,355.2	40.5	39.2	0.00	-668.7	-1,678.8	230.7	156.8	73.85	3.124				
7,800.0	7,455.2	7,796.6	7,455.2	40.6	39.3	0.00	-668.7	-1,678.8	230.7	156.6	74.03	3.116				
7,900.0	7,555.2	7,896.6	7,555.2	40.7	39.3	0.00	-668.7	-1,678.8	230.7	156.5	74.21	3.108				
8,000.0	7,655.2	7,996.6	7,655.2	40.8	39.4	0.00	-668.7	-1,678.8	230.7	156.3	74.40	3.100				
8,100.0	7,755.2	8,096.6	7,755.2	40.8	39.5	0.00	-668.7	-1,678.8	230.7	156.1	74.59	3.093				
8,200.0	7,855.2	8,196.6	7,855.2	40.9	39.6	0.00	-668.7	-1,678.8	230.7	155.9	74.78	3.085				
8,286.8	7,942.0	8,283.4	7,942.0	41.0	39.7	0.00	-668.7	-1,678.8	230.7	155.7	74.95	3.078 SF				



Archer

Anticollision Report

Company:	Piceance Energy, LLC	Local Co-ordinate Reference:	Well Piceance Federal 29-18W
Project:	Mesa County, CO	TVD Reference:	Well @ 7930.0usft
Reference Site:	Piceance 29-11	MD Reference:	Well @ 7930.0usft
Site Error:	0.0 usft	North Reference:	True
Reference Well:	Piceance Federal 29-18W	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 usft	Output errors are at	2.00 sigma
Reference Wellbore	Slot B-8	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	74.05	4.0	14.2	14.7					
100.0	100.0	100.0	100.0	0.1	0.1	74.05	4.0	14.2	14.7	14.6	0.18	84.002 CC, ES		
200.0	200.0	200.0	200.0	0.3	0.3	-169.05	4.0	14.2	16.4	15.8	0.62	26.690		
300.0	299.8	300.0	300.0	0.5	0.5	-167.11	2.3	14.3	21.2	20.2	1.05	20.252		
400.0	399.5	399.8	399.6	0.8	0.7	-160.72	-2.9	14.8	28.9	27.4	1.50	19.315 SF		
500.0	498.7	499.1	498.5	1.1	1.0	-153.98	-11.5	15.5	40.1	38.1	2.01	19.977		
600.0	597.5	597.7	596.4	1.4	1.2	-148.35	-23.4	16.5	54.9	52.4	2.59	21.240		
700.0	695.6	695.5	693.0	1.9	1.6	-143.96	-38.5	17.8	73.6	70.3	3.24	22.680		
800.0	793.1	793.0	789.1	2.3	1.9	-141.63	-55.1	19.2	95.5	91.5	3.95	24.163		
900.0	889.6	889.9	884.6	2.8	2.3	-141.11	-71.5	20.6	120.1	115.4	4.69	32.232		
1,000.0	985.3	986.1	979.4	3.4	2.7	-141.52	-87.9	22.0	147.3	141.8	5.45	27.028		
1,100.0	1,079.8	1,081.5	1,073.4	4.1	3.0	-142.37	-104.1	23.4	177.2	171.0	6.23	28.426		
1,200.0	1,173.2	1,175.9	1,166.4	4.8	3.4	-143.44	-120.1	24.7	209.8	202.8	7.03	29.827		
1,300.0	1,265.8	1,269.7	1,258.8	5.6	3.7	-144.78	-136.0	26.1	244.1	236.2	7.84	31.142		
1,400.0	1,358.4	1,363.5	1,351.3	6.3	4.1	-145.82	-152.0	27.4	278.4	269.8	8.64	32.232		
1,500.0	1,451.0	1,457.3	1,443.7	7.1	4.5	-146.63	-167.9	28.8	312.9	303.4	9.44	33.133		
1,600.0	1,543.7	1,551.1	1,536.1	7.9	4.8	-147.27	-183.8	30.1	347.3	337.1	10.25	33.887		
1,700.0	1,636.3	1,644.9	1,628.6	8.7	5.2	-147.81	-199.7	31.5	381.8	370.8	11.06	34.529		
1,800.0	1,728.9	1,738.7	1,721.0	9.4	5.6	-148.25	-215.7	32.8	416.3	404.5	11.87	35.080		
1,900.0	1,821.5	1,832.5	1,813.4	10.2	5.9	-148.62	-231.6	34.2	450.9	438.2	12.68	35.558		
2,000.0	1,914.1	1,926.4	1,905.9	11.0	6.3	-148.95	-247.5	35.6	485.4	471.9	13.49	35.977		
2,100.0	2,006.7	2,020.2	1,998.3	11.8	6.7	-149.23	-263.4	36.9	520.0	505.7	14.31	36.347		
2,200.0	2,099.4	2,114.0	2,090.8	12.6	7.1	-149.47	-279.4	38.3	554.6	539.4	15.12	36.676		
2,300.0	2,192.0	2,207.8	2,183.2	13.4	7.4	-149.69	-295.3	39.6	589.1	573.2	15.94	36.971		
2,400.0	2,284.6	2,301.6	2,275.6	14.2	7.8	-149.88	-311.2	41.0	623.7	607.0	16.75	37.236		
2,500.0	2,377.2	2,395.4	2,368.1	14.9	8.2	-150.05	-327.1	42.3	658.3	640.8	17.57	37.475		
2,600.0	2,469.8	2,489.2	2,460.5	15.7	8.5	-150.21	-343.1	43.7	692.9	674.5	18.38	37.693		
2,700.0	2,562.5	2,583.0	2,552.9	16.5	8.9	-150.35	-359.0	45.0	727.5	708.3	19.20	37.892		
2,800.0	2,655.1	2,676.8	2,645.4	17.3	9.3	-150.47	-374.9	46.4	762.1	742.1	20.02	38.074		
2,900.0	2,747.7	2,770.6	2,737.8	18.1	9.6	-150.59	-390.9	47.7	796.7	775.9	20.83	38.241		
3,000.0	2,840.3	2,864.4	2,830.2	18.9	10.0	-150.70	-406.8	49.1	831.4	809.7	21.65	38.396		
3,100.0	2,932.9	2,958.2	2,922.7	19.7	10.4	-150.79	-422.7	50.5	866.0	843.5	22.47	38.539		
3,200.0	3,025.6	3,052.0	3,015.1	20.5	10.7	-150.88	-438.6	51.8	900.6	877.3	23.29	38.672		
3,300.0	3,118.2	3,145.9	3,107.6	21.3	11.1	-150.97	-454.6	53.2	935.2	911.1	24.11	38.796		
3,400.0	3,210.8	3,239.7	3,200.0	22.0	11.5	-151.05	-470.5	54.5	969.8	944.9	24.92	38.911		



Archer

Anticollision Report

Company:	Piceance Energy, LLC	Local Co-ordinate Reference:	Well Piceance Federal 29-18W
Project:	Mesa County, CO	TVD Reference:	Well @ 7930.0usft
Reference Site:	Piceance 29-11	MD Reference:	Well @ 7930.0usft
Site Error:	0.0 usft	North Reference:	True
Reference Well:	Piceance Federal 29-18W	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 usft	Output errors are at	2.00 sigma
Reference Wellbore	Slot B-8	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	120.31	-5.1	8.7	10.0					
100.0	100.0	100.0	100.0	0.1	0.1	120.31	-5.1	8.7	10.0	9.8	0.18	57.174 CC, ES		
200.0	200.0	200.0	200.0	0.3	0.3	-129.24	-5.1	8.7	11.0	10.4	0.61	17.977		
300.0	299.8	299.7	299.7	0.5	0.5	-138.56	-6.8	8.8	15.3	14.3	1.05	14.548 SF		
400.0	399.5	399.2	399.0	0.8	0.7	-140.40	-12.0	9.2	23.4	21.9	1.52	15.429		
500.0	498.7	498.2	497.7	1.1	1.0	-139.30	-20.5	9.8	35.2	33.1	2.04	17.213		
600.0	597.5	596.6	595.3	1.4	1.2	-137.52	-32.4	10.7	50.5	47.8	2.63	19.181		
700.0	695.6	694.1	691.7	1.9	1.6	-135.75	-47.5	11.8	69.4	66.1	3.29	21.073		
800.0	793.1	790.6	786.4	2.3	1.9	-134.16	-65.6	13.1	91.9	87.9	4.03	22.792		
900.0	889.6	886.8	880.4	2.8	2.3	-133.08	-86.1	14.6	117.7	112.9	4.84	24.340		
1,000.0	985.3	982.7	974.1	3.4	2.8	-133.18	-106.7	16.1	145.9	140.2	5.68	25.683		
1,100.0	1,079.8	1,077.9	1,067.0	4.1	3.2	-133.94	-127.2	17.6	176.4	169.8	6.56	26.894		
1,200.0	1,173.2	1,172.2	1,159.1	4.8	3.6	-135.01	-147.5	19.1	209.3	201.8	7.47	28.031		
1,300.0	1,265.8	1,266.0	1,250.6	5.6	4.1	-136.46	-167.7	20.5	243.6	235.2	8.38	29.069		
1,400.0	1,358.4	1,359.7	1,342.2	6.3	4.5	-137.59	-187.9	22.0	278.1	268.8	9.30	29.909		
1,500.0	1,451.0	1,453.5	1,433.7	7.1	4.9	-138.46	-208.1	23.5	312.7	302.4	10.22	30.593		
1,600.0	1,543.7	1,547.2	1,525.2	7.9	5.3	-139.16	-228.3	25.0	347.3	336.1	11.14	31.160		
1,700.0	1,636.3	1,640.9	1,616.8	8.7	5.8	-139.74	-248.5	26.5	381.9	369.8	12.07	31.637		
1,800.0	1,728.9	1,734.7	1,708.3	9.4	6.2	-140.22	-268.7	27.9	416.6	403.6	13.00	32.043		
1,900.0	1,821.5	1,828.4	1,799.8	10.2	6.6	-140.62	-288.8	29.4	451.3	437.3	13.93	32.393		
2,000.0	1,914.1	1,922.2	1,891.4	11.0	7.1	-140.97	-309.0	30.9	486.0	471.1	14.86	32.697		
2,100.0	2,006.7	2,015.9	1,982.9	11.8	7.5	-141.27	-329.2	32.4	520.7	504.9	15.80	32.964		
2,200.0	2,099.4	2,109.7	2,074.4	12.6	8.0	-141.54	-349.4	33.8	555.4	538.7	16.73	33.201		
2,300.0	2,192.0	2,203.4	2,166.0	13.4	8.4	-141.77	-369.6	35.3	590.2	572.5	17.66	33.411		
2,400.0	2,284.6	2,297.2	2,257.5	14.2	8.8	-141.98	-389.8	36.8	624.9	606.3	18.60	33.600		
2,500.0	2,377.2	2,390.9	2,349.0	14.9	9.3	-142.16	-410.0	38.3	659.7	640.1	19.53	33.770		
2,600.0	2,469.8	2,484.7	2,440.6	15.7	9.7	-142.33	-430.1	39.7	694.4	674.0	20.47	33.924		
2,700.0	2,562.5	2,578.4	2,532.1	16.5	10.1	-142.48	-450.3	41.2	729.2	707.8	21.41	34.065		
2,800.0	2,655.1	2,672.1	2,623.6	17.3	10.6	-142.62	-470.5	42.7	764.0	741.6	22.34	34.193		
2,900.0	2,747.7	2,765.9	2,715.2	18.1	11.0	-142.74	-490.7	44.2	798.7	775.5	23.28	34.311		
3,000.0	2,840.3	2,859.6	2,806.7	18.9	11.4	-142.86	-510.9	45.6	833.5	809.3	24.22	34.419		
3,100.0	2,932.9	2,953.4	2,898.2	19.7	11.9	-142.96	-531.1	47.1	868.3	843.1	25.15	34.519		
3,200.0	3,025.6	3,047.1	2,989.8	20.5	12.3	-143.06	-551.3	48.6	903.1	877.0	26.09	34.612		
3,300.0	3,118.2	3,140.9	3,081.3	21.3	12.8	-143.15	-571.4	50.1	937.9	910.8	27.03	34.698		
3,400.0	3,210.8	3,234.6	3,172.9	22.0	13.2	-143.23	-591.6	51.5	972.6	944.7	27.97	34.778		

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



Archer

Anticollision Report

Company:	Piceance Energy, LLC	Local Co-ordinate Reference:	Well Piceance Federal 29-18W
Project:	Mesa County, CO	TVD Reference:	Well @ 7930.0usft
Reference Site:	Piceance 29-11	MD Reference:	Well @ 7930.0usft
Site Error:	0.0 usft	North Reference:	True
Reference Well:	Piceance Federal 29-18W	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 usft	Output errors are at	2.00 sigma
Reference Wellbore	Slot B-8	Database:	EDMDBBW
Reference Design:	Design #1	Offset TVD Reference:	Reference Datum

Offset Design Piceance 29-11 - Piceance Federal 29-19W - Slot B-9 - 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	-149.26	-17.2	-10.2	20.0					
100.0	100.0	100.0	100.0	0.1	0.1	-149.26	-17.2	-10.2	20.0	19.8	0.18	114.135		
200.0	200.0	200.0	200.0	0.3	0.3	-33.89	-17.2	-10.2	18.5	17.9	0.62	30.132		
300.0	299.8	299.4	299.4	0.5	0.5	-41.47	-18.2	-11.7	15.9	14.8	1.07	14.858		
400.0	399.5	399.0	398.8	0.8	0.7	-52.83	-21.0	-16.0	13.8	12.3	1.55	8.918		
500.0	498.7	498.6	498.1	1.1	1.0	-68.03	-25.8	-23.2	12.8	10.7	2.08	6.122		
529.2	527.6	527.8	527.0	1.2	1.1	-72.93	-27.6	-25.8	12.7	10.4	2.27	5.605 CC		
600.0	597.5	598.4	597.1	1.4	1.3	-84.80	-32.6	-33.2	13.1	10.3	2.72	4.802 ES		
700.0	695.6	698.3	695.8	1.9	1.6	-99.48	-41.2	-46.2	14.7	11.3	3.45	4.260		
800.0	793.1	798.3	794.0	2.3	2.0	-110.29	-51.8	-62.0	17.4	13.2	4.26	4.097		
900.0	889.6	898.5	891.6	2.8	2.4	-117.58	-64.2	-80.7	20.9	15.8	5.12	4.086		
1,000.0	985.3	998.7	988.4	3.4	3.0	-122.33	-78.6	-102.2	24.9	18.9	6.04	4.120		
1,100.0	1,079.8	1,099.0	1,084.4	4.1	3.5	-125.37	-94.9	-126.6	29.3	22.2	7.06	4.151		
1,200.0	1,173.2	1,199.5	1,179.3	4.8	4.2	-127.27	-113.0	-153.8	34.0	25.8	8.16	4.163		
1,300.0	1,265.8	1,300.1	1,273.2	5.6	4.9	-126.70	-133.0	-183.8	38.1	28.6	9.46	4.024		
1,400.0	1,358.4	1,400.7	1,365.8	6.3	5.7	-121.96	-154.9	-216.5	40.4	29.3	11.09	3.647		
1,500.0	1,451.0	1,500.6	1,457.0	7.1	6.5	-115.19	-177.6	-250.5	42.3	29.3	12.94	3.268		
1,600.0	1,543.7	1,600.5	1,548.1	7.9	7.3	-109.04	-200.3	-284.6	44.7	29.9	14.79	3.020		
1,700.0	1,636.3	1,700.3	1,639.1	8.7	8.1	-103.58	-223.1	-318.7	47.5	30.9	16.60	2.863		
1,800.0	1,728.9	1,800.2	1,730.2	9.4	9.0	-98.77	-245.8	-352.7	50.8	32.4	18.34	2.767		
1,900.0	1,821.5	1,900.1	1,821.3	10.2	9.8	-94.56	-268.6	-386.8	54.3	34.3	20.02	2.712		
2,000.0	1,914.1	1,999.9	1,912.4	11.0	10.7	-90.88	-291.3	-420.9	58.1	36.5	21.64	2.685		
2,100.0	2,006.7	2,099.8	2,003.4	11.8	11.5	-87.66	-314.0	-454.9	62.1	38.9	23.19	2.678 SF		
2,200.0	2,099.4	2,199.6	2,094.5	12.6	12.4	-84.85	-336.8	-489.0	66.3	41.6	24.71	2.683		
2,300.0	2,192.0	2,299.5	2,185.6	13.4	13.2	-82.37	-359.5	-523.1	70.6	44.4	26.18	2.697		
2,400.0	2,284.6	2,399.4	2,276.7	14.2	14.0	-80.18	-382.3	-557.1	75.1	47.4	27.62	2.717		
2,500.0	2,377.2	2,499.2	2,367.7	14.9	14.9	-78.24	-405.0	-591.2	79.6	50.6	29.03	2.741		
2,600.0	2,469.8	2,599.1	2,458.8	15.7	15.7	-76.51	-427.8	-625.3	84.2	53.8	30.43	2.768		
2,700.0	2,562.5	2,699.0	2,549.9	16.5	16.6	-74.96	-450.5	-659.3	88.9	57.1	31.80	2.795		
2,800.0	2,655.1	2,798.8	2,641.0	17.3	17.4	-73.56	-473.2	-693.4	93.6	60.5	33.16	2.824		
2,900.0	2,747.7	2,898.7	2,732.0	18.1	18.3	-72.30	-496.0	-727.5	98.4	63.9	34.51	2.852		
3,000.0	2,840.3	2,998.5	2,823.1	18.9	19.1	-71.16	-518.7	-761.5	103.3	67.4	35.85	2.881		
3,100.0	2,932.9	3,098.4	2,914.2	19.7	20.0	-70.12	-541.5	-795.6	108.2	71.0	37.18	2.909		
3,200.0	3,025.6	3,198.3	3,005.3	20.5	20.8	-69.17	-564.2	-829.7	113.1	74.6	38.50	2.936		
3,300.0	3,118.2	3,298.1	3,096.3	21.3	21.7	-68.30	-586.9	-863.7	118.0	78.2	39.82	2.963		
3,400.0	3,210.8	3,398.0	3,187.4	22.0	22.5	-67.50	-609.7	-897.8	123.0	81.8	41.13	2.989		
3,500.0	3,303.4	3,497.9	3,278.5	22.8	23.4	-66.77	-632.4	-931.9	127.9	85.5	42.44	3.015		
3,600.0	3,396.0	3,597.7	3,369.6	23.6	24.3	-66.09	-655.2	-965.9	132.9	89.2	43.75	3.039		
3,700.0	3,488.7	3,697.6	3,460.7	24.4	25.1	-65.45	-677.9	-1,000.0	138.0	92.9	45.05	3.063		
3,800.0	3,581.3	3,797.5	3,551.7	25.2	26.0	-64.86	-700.6	-1,034.1	143.0	96.7	46.35	3.085		
3,900.0	3,673.9	3,897.3	3,642.8	26.0	26.8	-64.32	-723.4	-1,068.1	148.1	100.4	47.65	3.107		
4,000.0	3,766.5	3,997.2	3,733.9	26.8	27.7	-63.80	-746.1	-1,102.2	153.1	104.2	48.94	3.129		
4,100.0	3,859.1	4,097.0	3,825.0	27.6	28.5	-63.33	-768.9	-1,136.3	158.2	108.0	50.24	3.149		
4,200.0	3,951.8	4,196.9	3,916.0	28.4	29.4	-62.88	-791.6	-1,170.3	163.3	111.8	51.53	3.169		
4,300.0	4,044.4	4,296.8	4,007.1	29.2	30.2	-62.45	-814.3	-1,204.4	168.4	115.6	52.82	3.188		
4,400.0	4,137.0	4,396.6	4,098.2	29.9	31.1	-62.06	-837.1	-1,238.5	173.5	119.4	54.11	3.206		
4,500.0	4,229.6	4,496.5	4,189.3	30.7	31.9	-61.68	-859.8	-1,272.5	178.6	123.2	55.40	3.224		
4,600.0	4,322.2	4,596.4	4,280.3	31.5	32.8	-61.33	-882.6	-1,306.6	183.7	127.0	56.69	3.241		
4,700.0	4,414.9	4,696.2	4,371.4	32.3	33.6	-60.99	-905.3	-1,340.7	188.8	130.9	57.97	3.257		
4,800.0	4,507.5	4,796.1	4,462.5	33.1	34.5	-60.68	-928.0	-1,374.8	194.0	134.7	59.26	3.273		
4,900.0	4,600.1	4,895.9	4,553.6	33.9	35.3	-60.38	-950.8	-1,408.8	199.1	138.5	60.55	3.288		
5,000.0	4,692.7	4,995.8	4,644.6	34.7	36.2	-60.09	-973.5	-1,442.9	204.2	142.4	61.83	3.303		

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



Archer

Anticollision Report

Company:	Piceance Energy, LLC	Local Co-ordinate Reference:	Well Piceance Federal 29-18W
Project:	Mesa County, CO	TVD Reference:	Well @ 7930.0usft
Reference Site:	Piceance 29-11	MD Reference:	Well @ 7930.0usft
Site Error:	0.0 usft	North Reference:	True
Reference Well:	Piceance Federal 29-18W	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 usft	Output errors are at	2.00 sigma
Reference Wellbore	Slot B-8	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	4,785.3	5,096.7	4,736.7	35.5	37.0	-59.84	-996.4	-1,477.2	209.3	146.2	63.12	3.316		
5,200.0	4,878.2	5,201.0	4,832.9	36.2	37.7	-60.05	-1,018.8	-1,510.7	213.3	148.8	64.46	3.309		
5,300.0	4,972.2	5,305.5	4,930.7	36.8	38.3	-60.32	-1,039.2	-1,541.3	216.8	151.2	65.61	3.304		
5,400.0	5,067.4	5,410.0	5,029.8	37.3	38.8	-60.56	-1,057.6	-1,568.9	219.9	153.3	66.66	3.299		
5,500.0	5,163.6	5,514.5	5,130.0	37.7	39.3	-60.78	-1,074.0	-1,593.5	222.7	155.1	67.60	3.294		
5,600.0	5,260.6	5,619.1	5,231.4	38.1	39.7	-60.98	-1,088.4	-1,615.0	225.1	156.7	68.43	3.289		
5,700.0	5,358.5	5,723.7	5,333.6	38.5	40.1	-61.16	-1,100.7	-1,633.5	227.2	158.0	69.16	3.285		
5,800.0	5,457.0	5,828.4	5,436.7	38.7	40.4	-61.32	-1,111.0	-1,648.8	228.8	159.0	69.77	3.280		
5,900.0	5,556.0	5,933.1	5,540.3	39.0	40.7	-61.46	-1,119.1	-1,661.0	230.1	159.8	70.28	3.274		
6,000.0	5,655.5	6,037.8	5,644.4	39.2	40.9	-61.59	-1,125.2	-1,670.1	231.0	160.3	70.68	3.269		
6,100.0	5,755.3	6,142.5	5,748.9	39.3	41.0	-61.70	-1,129.1	-1,676.0	231.6	160.6	70.98	3.263		
6,200.0	5,855.2	6,247.2	5,853.6	39.4	41.1	-61.79	-1,130.9	-1,678.6	231.7	160.5	71.18	3.256		
6,300.0	5,955.2	6,348.9	5,955.2	39.5	41.2	-180.00	-1,131.0	-1,678.8	231.7	160.4	71.32	3.248		
6,400.0	6,055.2	6,448.9	6,055.2	39.6	41.3	-180.00	-1,131.0	-1,678.8	231.7	160.2	71.47	3.242		
6,500.0	6,155.2	6,548.9	6,155.2	39.6	41.3	-180.00	-1,131.0	-1,678.8	231.7	160.1	71.62	3.235		
6,600.0	6,255.2	6,648.9	6,255.2	39.7	41.4	-180.00	-1,131.0	-1,678.8	231.7	159.9	71.77	3.228		
6,700.0	6,355.2	6,748.9	6,355.2	39.8	41.5	-180.00	-1,131.0	-1,678.8	231.7	159.8	71.92	3.221		
6,800.0	6,455.2	6,848.9	6,455.2	39.8	41.5	-180.00	-1,131.0	-1,678.8	231.7	159.6	72.08	3.214		
6,900.0	6,555.2	6,948.9	6,555.2	39.9	41.6	-180.00	-1,131.0	-1,678.8	231.7	159.4	72.23	3.207		
7,000.0	6,655.2	7,048.9	6,655.2	40.0	41.7	-180.00	-1,131.0	-1,678.8	231.7	159.3	72.39	3.200		
7,100.0	6,755.2	7,148.9	6,755.2	40.1	41.7	-180.00	-1,131.0	-1,678.8	231.7	159.1	72.56	3.193		
7,200.0	6,855.2	7,248.9	6,855.2	40.1	41.8	-180.00	-1,131.0	-1,678.8	231.7	159.0	72.72	3.186		
7,300.0	6,955.2	7,348.9	6,955.2	40.2	41.9	-180.00	-1,131.0	-1,678.8	231.7	158.8	72.89	3.178		
7,400.0	7,055.2	7,448.9	7,055.2	40.3	41.9	-180.00	-1,131.0	-1,678.8	231.7	158.6	73.06	3.171		
7,500.0	7,155.2	7,548.9	7,155.2	40.4	42.0	-180.00	-1,131.0	-1,678.8	231.7	158.4	73.23	3.164		
7,600.0	7,255.2	7,648.9	7,255.2	40.4	42.1	-180.00	-1,131.0	-1,678.8	231.7	158.3	73.41	3.156		
7,700.0	7,355.2	7,748.9	7,355.2	40.5	42.2	-180.00	-1,131.0	-1,678.8	231.7	158.1	73.59	3.148		
7,800.0	7,455.2	7,848.9	7,455.2	40.6	42.2	-180.00	-1,131.0	-1,678.8	231.7	157.9	73.77	3.141		
7,900.0	7,555.2	7,948.9	7,555.2	40.7	42.3	-180.00	-1,131.0	-1,678.8	231.7	157.7	73.95	3.133		
8,000.0	7,655.2	8,048.9	7,655.2	40.8	42.4	-180.00	-1,131.0	-1,678.8	231.7	157.5	74.13	3.125		
8,100.0	7,755.2	8,148.9	7,755.2	40.8	42.5	-180.00	-1,131.0	-1,678.8	231.7	157.4	74.32	3.117		
8,200.0	7,855.2	8,248.9	7,855.2	40.9	42.6	-180.00	-1,131.0	-1,678.8	231.7	157.2	74.51	3.110		
8,208.9	7,864.1	8,257.8	7,864.1	40.9	42.6	-180.00	-1,131.0	-1,678.8	231.7	157.2	74.52	3.109		
8,286.8	7,942.0	8,321.7	7,928.0	41.0	42.6	-180.00	-1,131.0	-1,678.8	232.1	157.4	74.74	3.106		



Archer

Anticollision Report

Company:	Piceance Energy, LLC	Local Co-ordinate Reference:	Well Piceance Federal 29-18W
Project:	Mesa County, CO	TVD Reference:	Well @ 7930.0usft
Reference Site:	Piceance 29-11	MD Reference:	Well @ 7930.0usft
Site Error:	0.0 usft	North Reference:	True
Reference Well:	Piceance Federal 29-18W	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 usft	Output errors are at	2.00 sigma
Reference Wellbore	Slot B-8	Database:	EDMDBBW
Reference Design:	Design #1	Offset TVD Reference:	Reference Datum

Offset Design													Offset Site Error:	0.0 usft
Piceance 29-11 - Piceance Federal 29-20M - Slot A-9 - 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		
0.0	0.0	0.0	0.0	0.0	0.0	-175.96	-22.3	-1.6	22.3					
100.0	100.0	100.0	100.0	0.1	0.1	-175.96	-22.3	-1.6	22.3	22.1	0.18	127.273		
200.0	200.0	200.0	200.0	0.3	0.3	-61.74	-22.3	-1.6	21.4	20.8	0.61	34.925		
259.4	259.3	258.9	258.9	0.4	0.4	-68.32	-22.9	-1.5	20.9	20.0	0.88	23.650 CC, ES		
300.0	299.8	299.1	299.1	0.5	0.5	-74.52	-24.0	-1.5	21.2	20.1	1.08	19.704		
400.0	399.5	398.1	397.9	0.8	0.7	-91.87	-29.1	-1.1	25.2	23.6	1.59	15.860 SF		
500.0	498.7	496.5	496.0	1.1	1.0	-105.67	-37.6	-0.5	34.4	32.2	2.13	16.102		
600.0	597.5	594.4	593.1	1.4	1.2	-114.03	-49.3	0.3	48.4	45.6	2.73	17.738		
700.0	695.6	691.4	689.0	1.9	1.6	-118.71	-64.2	1.3	66.6	63.2	3.38	19.682		
800.0	793.1	787.4	783.2	2.3	1.9	-121.31	-82.1	2.6	88.7	84.6	4.12	21.555		
900.0	889.6	882.1	875.7	2.8	2.3	-122.73	-102.9	4.0	114.5	109.6	4.93	23.241		
1,000.0	985.3	976.4	967.0	3.4	2.8	-123.55	-126.4	5.6	143.7	137.9	5.81	24.734		
1,100.0	1,079.8	1,071.2	1,058.6	4.1	3.3	-124.68	-150.7	7.3	175.2	168.4	6.75	25.939		
1,200.0	1,173.2	1,165.2	1,149.4	4.8	3.8	-126.08	-174.7	9.0	208.7	201.0	7.74	26.955		
1,300.0	1,265.8	1,258.7	1,239.8	5.6	4.2	-127.87	-198.7	10.6	243.5	234.8	8.75	27.835		
1,400.0	1,358.4	1,352.2	1,330.2	6.3	4.7	-129.24	-222.6	12.3	278.6	268.8	9.76	28.530		
1,500.0	1,451.0	1,445.7	1,420.5	7.1	5.2	-130.31	-246.6	13.9	313.7	302.9	10.78	29.090		
1,600.0	1,543.7	1,539.1	1,510.9	7.9	5.7	-131.16	-270.5	15.6	348.9	337.1	11.81	29.550		
1,700.0	1,636.3	1,632.6	1,601.2	8.7	6.2	-131.86	-294.5	17.2	384.1	371.3	12.83	29.934		
1,800.0	1,728.9	1,726.1	1,691.6	9.4	6.7	-132.44	-318.4	18.9	419.4	405.6	13.86	30.258		
1,900.0	1,821.5	1,819.6	1,781.9	10.2	7.2	-132.93	-342.3	20.5	454.7	439.8	14.89	30.536		
2,000.0	1,914.1	1,913.1	1,872.3	11.0	7.7	-133.35	-366.3	22.2	490.1	474.2	15.92	30.777		
2,100.0	2,006.7	2,006.6	1,962.6	11.8	8.2	-133.71	-390.2	23.8	525.5	508.5	16.96	30.988		
2,200.0	2,099.4	2,100.1	2,053.0	12.6	8.7	-134.03	-414.2	25.5	560.8	542.9	17.99	31.173		
2,300.0	2,192.0	2,193.6	2,143.3	13.4	9.2	-134.31	-438.1	27.1	596.2	577.2	19.03	31.338		
2,400.0	2,284.6	2,287.0	2,233.7	14.2	9.7	-134.56	-462.1	28.8	631.6	611.6	20.06	31.485		
2,500.0	2,377.2	2,380.5	2,324.1	14.9	10.2	-134.78	-486.0	30.4	667.1	646.0	21.10	31.617		
2,600.0	2,469.8	2,474.0	2,414.4	15.7	10.7	-134.98	-509.9	32.1	702.5	680.4	22.14	31.736		
2,700.0	2,562.5	2,567.5	2,504.8	16.5	11.2	-135.16	-533.9	33.7	737.9	714.8	23.17	31.845		
2,800.0	2,655.1	2,661.0	2,595.1	17.3	11.7	-135.33	-557.8	35.4	773.4	749.2	24.21	31.944		
2,900.0	2,747.7	2,754.5	2,685.5	18.1	12.2	-135.48	-581.8	37.1	808.8	783.6	25.25	32.034		
3,000.0	2,840.3	2,848.0	2,775.8	18.9	12.7	-135.61	-605.7	38.7	844.3	818.0	26.29	32.118		
3,100.0	2,932.9	2,941.5	2,866.2	19.7	13.2	-135.74	-629.7	40.4	879.7	852.4	27.32	32.195		
3,200.0	3,025.6	3,034.9	2,956.5	20.5	13.7	-135.86	-653.6	42.0	915.2	886.8	28.36	32.266		
3,300.0	3,118.2	3,128.4	3,046.9	21.3	14.2	-135.96	-677.5	43.7	950.6	921.2	29.40	32.332		
3,400.0	3,210.8	3,221.9	3,137.2	22.0	14.7	-136.06	-701.5	45.3	986.1	955.6	30.44	32.393		

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



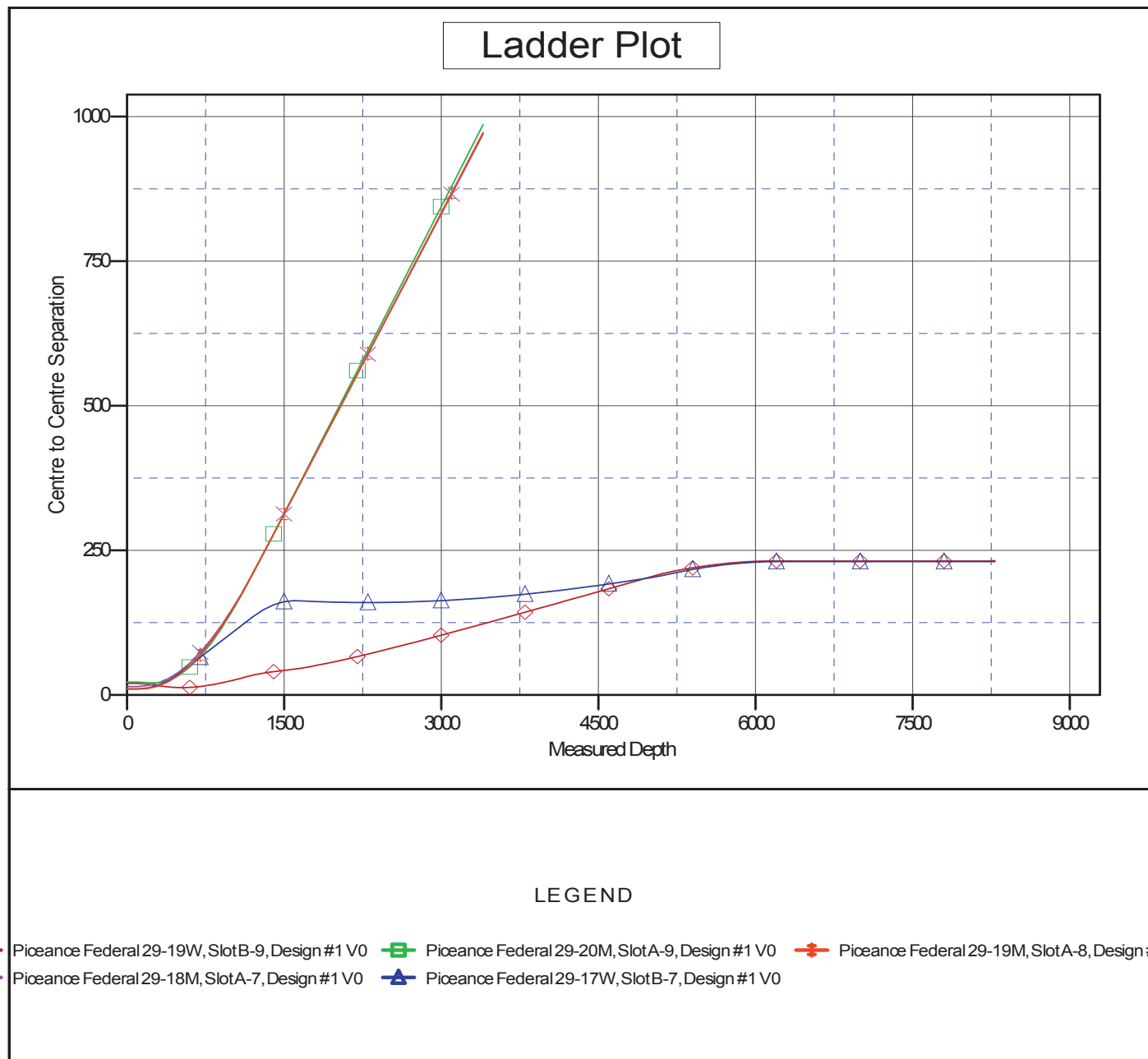
Archer

Anticollision Report

Company:	Piceance Energy, LLC	Local Co-ordinate Reference:	Well Piceance Federal 29-18W
Project:	Mesa County, CO	TVD Reference:	Well @ 7930.0usft
Reference Site:	Piceance 29-11	MD Reference:	Well @ 7930.0usft
Site Error:	0.0 usft	North Reference:	True
Reference Well:	Piceance Federal 29-18W	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 usft	Output errors are at	2.00 sigma
Reference Wellbore	Slot B-8	Database:	EDMDBBW
Reference Design:	Design #1	Offset TVD Reference:	Reference Datum

Reference Depths are relative to Well @ 7930.0usft
Offset Depths are relative to Offset Datum
Central Meridian is 105° 30' 0.000 W

Coordinates are relative to: Piceance Federal 29-18W
Coordinate System is US State Plane 1983, Colorado Central Zone
Grid Convergence at Surface is: -1.45°





Archer

Anticollision Report

Company:	Piceance Energy, LLC	Local Co-ordinate Reference:	Well Piceance Federal 29-18W
Project:	Mesa County, CO	TVD Reference:	Well @ 7930.0usft
Reference Site:	Piceance 29-11	MD Reference:	Well @ 7930.0usft
Site Error:	0.0 usft	North Reference:	True
Reference Well:	Piceance Federal 29-18W	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 usft	Output errors are at	2.00 sigma
Reference Wellbore	Slot B-8	Database:	EDMDBBW
Reference Design:	Design #1	Offset TVD Reference:	Reference Datum

Reference Depths are relative to Well @ 7930.0usft
Offset Depths are relative to Offset Datum
Central Meridian is 105° 30' 0.000 W

Coordinates are relative to: Piceance Federal 29-18W
Coordinate System is US State Plane 1983, Colorado Central Zone
Grid Convergence at Surface is: -1.45°

