

# Archer

## **Piceance Energy, LLC**

**Mesa County, CO**

**Gunderson**

**Gunderson 29-11E**

**Wellbore #1**

**Plan: Design #1**

## **Standard Planning Report**

**03 October, 2014**

# Archer



Project: Mesa County, CO  
Site: Gunderson  
Well: Gunderson 29-11E  
Wellbore: Wellbore #1  
Design: Design #1  
Latitude: 39.248820  
Longitude: -107.787725  
Ground Level: 7536.00  
WELL @ 7560.00usft (Original Well Elev)

# 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 Gunderson 29-11E, True North  
Vertical (TVD) Reference: WELL @ 7560.00usft (Original Well Elev)  
Section (VS) Reference: Slot - (0.00N, 0.00E)  
Measured Depth Reference: WELL @ 7560.00usft (Original Well Elev)  
Calculation Method: Minimum Curvature

### WELL DETAILS: Gunderson 29-11E

+N/-S	+E/-W	Northing	Ground Level	7536.00	Latitude	Longitude	Slot
0.00	0.00	1523673.846	Easting	2352204.089	39.248820	-107.787725	

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

Name	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude	Shape
Gunderson 29-11E tgt	7680.00	-239.52	266.42	1523427.691	2352464.390	39.248162	-107.786785	Circle (Radius: 50.00)

### SECTION DETAILS

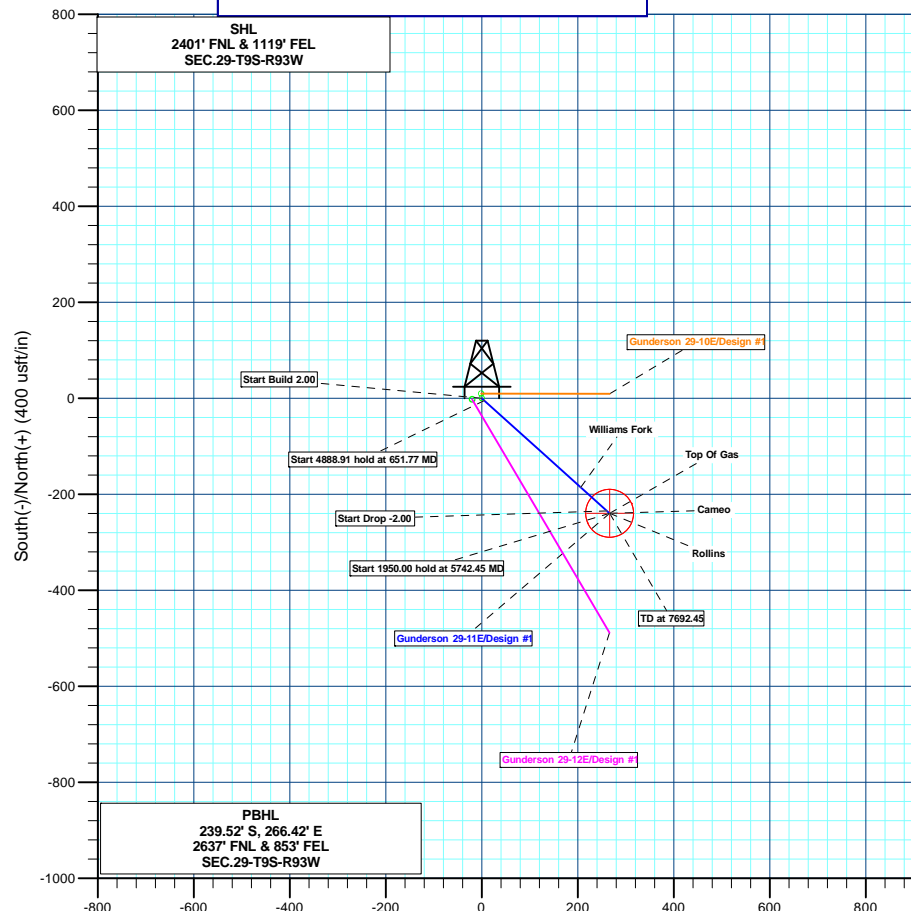
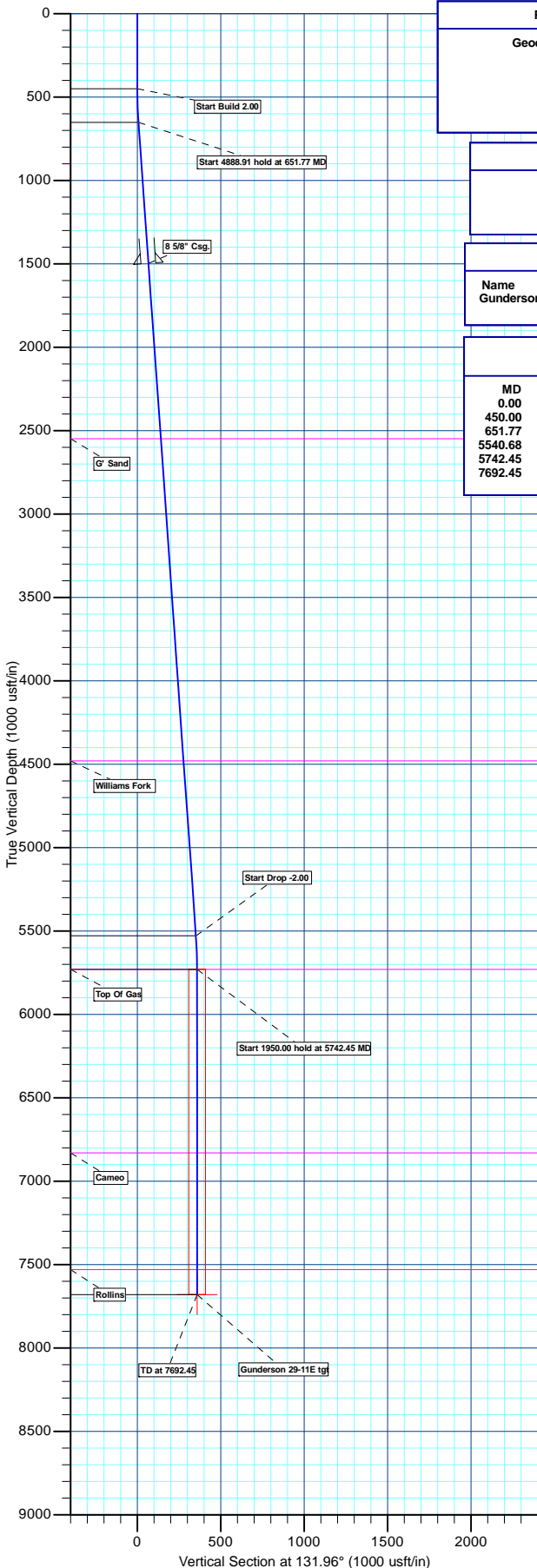
MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	Vsect	Annotation
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
450.00	0.00	0.00	450.00	0.00	0.00	0.00	0.00	0.00	Start Build 2.00
651.77	4.04	131.96	651.61	-4.75	5.28	2.00	131.96	7.10	Start 4888.91 hold at 651.77 MD
5540.68	4.04	131.96	5528.39	-234.77	261.13	0.00	0.00	351.16	Start Drop -2.00
5742.45	0.00	0.00	5730.00	-239.52	266.42	2.00	180.00	358.26	Start 1950.00 hold at 5742.45 MD
7692.45	0.00	0.00	7680.00	-239.52	266.42	0.00	0.00	358.26	TD at 7692.45



Azimuths to True North  
Magnetic North: 9.80°  
Magnetic Field  
Strength: 51796.9snT  
Dip Angle: 65.48°  
Date: 10/02/2014  
Model: IGRF2010

### FORMATION TOP DETAILS

TVDPATH	MDPATH	Formation
2548.00	2552.88	G' Sand
4480.00	4489.68	Williams Fork
5730.00	5742.45	Top Of Gas
6830.00	6842.45	Cameo
7530.00	7542.45	Rollins



Plan: Design #1 (Gunderson 29-11E/Wellbore #1)

Created By: Ricky Osburn Date: 6:34, October 03 2014

<b>Database:</b>	EDMDBBW	<b>Local Co-ordinate Reference:</b>	Well Gunderson 29-11E
<b>Company:</b>	Piceance Energy, LLC	<b>TVD Reference:</b>	WELL @ 7560.00usft (Original Well Elev)
<b>Project:</b>	Mesa County, CO	<b>MD Reference:</b>	WELL @ 7560.00usft (Original Well Elev)
<b>Site:</b>	Gunderson	<b>North Reference:</b>	True
<b>Well:</b>	Gunderson 29-11E	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Wellbore #1		
<b>Design:</b>	Design #1		

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

<b>Site</b>	Gunderson			
<b>Site Position:</b>		<b>Northing:</b>	1,523,671.416 usft	<b>Latitude:</b> 39.248803
<b>From:</b>	Lat/Long	<b>Easting:</b>	2,352,063.747 usft	<b>Longitude:</b> -107.788221
<b>Position Uncertainty:</b>	0.00 usft	<b>Slot Radius:</b>	13-3/16"	<b>Grid Convergence:</b> -1.44 °

Well	Gunderson 29-11E					
Well Position	+N/-S	5.96 usft	Northing:	1,523,673.846 usft	Latitude:	39.248820
	+E/-W	140.24 usft	Easting:	2,352,204.089 usft	Longitude:	-107.787725
Position Uncertainty		0.00 usft	Wellhead Elevation:	usft	Ground Level:	7,536.00 usft

<b>Wellbore</b>	Wellbore #1				
<b>Magnetics</b>	<b>Model Name</b>	<b>Sample Date</b>	<b>Declination (°)</b>	<b>Dip Angle (°)</b>	<b>Field Strength (nT)</b>
	IGRF2010	10/02/14	9.80	65.48	51,797

<b>Design</b>	Design #1			
<b>Audit Notes:</b>				
<b>Version:</b>	<b>Phase:</b>	PLAN	<b>Tie On Depth:</b>	0.00
<b>Vertical Section:</b>	<b>Depth From (TVD) (usft)</b>	<b>+N/-S (usft)</b>	<b>+E/-W (usft)</b>	<b>Direction (°)</b>
	0.00	0.00	0.00	131.96

<b>Plan Sections</b>										
<b>Measured Depth (usft)</b>	<b>Inclination (°)</b>	<b>Azimuth (°)</b>	<b>Vertical Depth (usft)</b>	<b>+N/-S (usft)</b>	<b>+E/-W (usft)</b>	<b>Dogleg Rate (°/100usft)</b>	<b>Build Rate (°/100usft)</b>	<b>Turn Rate (°/100usft)</b>	<b>TFO (°)</b>	<b>Target</b>
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
450.00	0.00	0.00	450.00	0.00	0.00	0.00	0.00	0.00	0.00	
651.77	4.04	131.96	651.61	-4.75	5.28	2.00	2.00	0.00	131.96	
5,540.68	4.04	131.96	5,528.39	-234.77	261.13	0.00	0.00	0.00	0.00	
5,742.45	0.00	0.00	5,730.00	-239.52	266.42	2.00	-2.00	0.00	180.00	
7,692.45	0.00	0.00	7,680.00	-239.52	266.42	0.00	0.00	0.00	0.00	Gunderson 29-11E tg

<b>Database:</b>	EDMDBBW	<b>Local Co-ordinate Reference:</b>	Well Gunderson 29-11E
<b>Company:</b>	Piceance Energy, LLC	<b>TVD Reference:</b>	WELL @ 7560.00usft (Original Well Elev)
<b>Project:</b>	Mesa County, CO	<b>MD Reference:</b>	WELL @ 7560.00usft (Original Well Elev)
<b>Site:</b>	Gunderson	<b>North Reference:</b>	True
<b>Well:</b>	Gunderson 29-11E	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Wellbore #1		
<b>Design:</b>	Design #1		

Planned Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
100.00	0.00	0.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00
200.00	0.00	0.00	200.00	0.00	0.00	0.00	0.00	0.00	0.00
300.00	0.00	0.00	300.00	0.00	0.00	0.00	0.00	0.00	0.00
400.00	0.00	0.00	400.00	0.00	0.00	0.00	0.00	0.00	0.00
Start Build 2.00									
450.00	0.00	0.00	450.00	0.00	0.00	0.00	0.00	0.00	0.00
500.00	1.00	131.96	500.00	-0.29	0.32	0.44	2.00	2.00	0.00
600.00	3.00	131.96	599.93	-2.62	2.92	3.93	2.00	2.00	0.00
Start 4888.91 hold at 651.77 MD									
651.77	4.04	131.96	651.61	-4.75	5.28	7.10	2.00	2.00	0.00
700.00	4.04	131.96	699.71	-7.02	7.81	10.50	0.00	0.00	0.00
800.00	4.04	131.96	799.47	-11.72	13.04	17.53	0.00	0.00	0.00
900.00	4.04	131.96	899.22	-16.43	18.27	24.57	0.00	0.00	0.00
1,000.00	4.04	131.96	998.97	-21.13	23.51	31.61	0.00	0.00	0.00
1,100.00	4.04	131.96	1,098.72	-25.84	28.74	38.65	0.00	0.00	0.00
1,200.00	4.04	131.96	1,198.47	-30.54	33.97	45.68	0.00	0.00	0.00
1,300.00	4.04	131.96	1,298.23	-35.25	39.21	52.72	0.00	0.00	0.00
1,400.00	4.04	131.96	1,397.98	-39.95	44.44	59.76	0.00	0.00	0.00
8 5/8" Csg.									
1,500.00	4.04	131.96	1,497.73	-44.66	49.67	66.80	0.00	0.00	0.00
1,600.00	4.04	131.96	1,597.48	-49.36	54.91	73.83	0.00	0.00	0.00
1,700.00	4.04	131.96	1,697.23	-54.07	60.14	80.87	0.00	0.00	0.00
1,800.00	4.04	131.96	1,796.99	-58.77	65.37	87.91	0.00	0.00	0.00
1,900.00	4.04	131.96	1,896.74	-63.48	70.61	94.95	0.00	0.00	0.00
2,000.00	4.04	131.96	1,996.49	-68.18	75.84	101.98	0.00	0.00	0.00
2,100.00	4.04	131.96	2,096.24	-72.89	81.07	109.02	0.00	0.00	0.00
2,200.00	4.04	131.96	2,195.99	-77.59	86.31	116.06	0.00	0.00	0.00
2,300.00	4.04	131.96	2,295.75	-82.30	91.54	123.10	0.00	0.00	0.00
2,400.00	4.04	131.96	2,395.50	-87.00	96.77	130.13	0.00	0.00	0.00
2,500.00	4.04	131.96	2,495.25	-91.71	102.01	137.17	0.00	0.00	0.00
G' Sand									
2,552.88	4.04	131.96	2,548.00	-94.20	104.77	140.89	0.00	0.00	0.00
2,600.00	4.04	131.96	2,595.00	-96.41	107.24	144.21	0.00	0.00	0.00
2,700.00	4.04	131.96	2,694.75	-101.12	112.47	151.24	0.00	0.00	0.00
2,800.00	4.04	131.96	2,794.51	-105.82	117.71	158.28	0.00	0.00	0.00
2,900.00	4.04	131.96	2,894.26	-110.53	122.94	165.32	0.00	0.00	0.00
3,000.00	4.04	131.96	2,994.01	-115.23	128.17	172.36	0.00	0.00	0.00
3,100.00	4.04	131.96	3,093.76	-119.94	133.41	179.39	0.00	0.00	0.00
3,200.00	4.04	131.96	3,193.52	-124.64	138.64	186.43	0.00	0.00	0.00
3,300.00	4.04	131.96	3,293.27	-129.35	143.87	193.47	0.00	0.00	0.00
3,400.00	4.04	131.96	3,393.02	-134.05	149.11	200.51	0.00	0.00	0.00
3,500.00	4.04	131.96	3,492.77	-138.76	154.34	207.54	0.00	0.00	0.00
3,600.00	4.04	131.96	3,592.52	-143.46	159.57	214.58	0.00	0.00	0.00
3,700.00	4.04	131.96	3,692.28	-148.17	164.81	221.62	0.00	0.00	0.00
3,800.00	4.04	131.96	3,792.03	-152.87	170.04	228.66	0.00	0.00	0.00
3,900.00	4.04	131.96	3,891.78	-157.58	175.27	235.69	0.00	0.00	0.00
4,000.00	4.04	131.96	3,991.53	-162.28	180.51	242.73	0.00	0.00	0.00
4,100.00	4.04	131.96	4,091.28	-166.99	185.74	249.77	0.00	0.00	0.00
4,200.00	4.04	131.96	4,191.04	-171.69	190.97	256.81	0.00	0.00	0.00
4,300.00	4.04	131.96	4,290.79	-176.40	196.21	263.84	0.00	0.00	0.00
4,400.00	4.04	131.96	4,390.54	-181.10	201.44	270.88	0.00	0.00	0.00
Williams Fork									
4,489.68	4.04	131.96	4,480.00	-185.32	206.13	277.19	0.00	0.00	0.00

<b>Database:</b>	EDMDBBW	<b>Local Co-ordinate Reference:</b>	Well Gunderson 29-11E
<b>Company:</b>	Piceance Energy, LLC	<b>TVD Reference:</b>	WELL @ 7560.00usft (Original Well Elev)
<b>Project:</b>	Mesa County, CO	<b>MD Reference:</b>	WELL @ 7560.00usft (Original Well Elev)
<b>Site:</b>	Gunderson	<b>North Reference:</b>	True
<b>Well:</b>	Gunderson 29-11E	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Wellbore #1		
<b>Design:</b>	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	4.04	131.96	4,490.29	-185.81	206.67	277.92	0.00	0.00	0.00
4,600.00	4.04	131.96	4,590.04	-190.51	211.91	284.96	0.00	0.00	0.00
4,700.00	4.04	131.96	4,689.80	-195.22	217.14	291.99	0.00	0.00	0.00
4,800.00	4.04	131.96	4,789.55	-199.92	222.37	299.03	0.00	0.00	0.00
4,900.00	4.04	131.96	4,889.30	-204.63	227.61	306.07	0.00	0.00	0.00
5,000.00	4.04	131.96	4,989.05	-209.33	232.84	313.11	0.00	0.00	0.00
5,100.00	4.04	131.96	5,088.80	-214.04	238.07	320.14	0.00	0.00	0.00
5,200.00	4.04	131.96	5,188.56	-218.74	243.31	327.18	0.00	0.00	0.00
5,300.00	4.04	131.96	5,288.31	-223.45	248.54	334.22	0.00	0.00	0.00
5,400.00	4.04	131.96	5,388.06	-228.15	253.77	341.26	0.00	0.00	0.00
5,500.00	4.04	131.96	5,487.81	-232.86	259.01	348.29	0.00	0.00	0.00
Start Drop -2.00									
5,540.68	4.04	131.96	5,528.39	-234.77	261.13	351.16	0.00	0.00	0.00
5,600.00	2.85	131.96	5,587.60	-237.16	263.78	354.72	2.00	-2.00	0.00
5,700.00	0.85	131.96	5,687.55	-239.31	266.18	357.94	2.00	-2.00	0.00
Start 1950.00 hold at 5742.45 MD - Top Of Gas									
5,742.45	0.00	0.00	5,730.00	-239.52	266.42	358.26	2.00	-2.00	0.00
5,800.00	0.00	0.00	5,787.55	-239.52	266.42	358.26	0.00	0.00	0.00
5,900.00	0.00	0.00	5,887.55	-239.52	266.42	358.26	0.00	0.00	0.00
6,000.00	0.00	0.00	5,987.55	-239.52	266.42	358.26	0.00	0.00	0.00
6,100.00	0.00	0.00	6,087.55	-239.52	266.42	358.26	0.00	0.00	0.00
6,200.00	0.00	0.00	6,187.55	-239.52	266.42	358.26	0.00	0.00	0.00
6,300.00	0.00	0.00	6,287.55	-239.52	266.42	358.26	0.00	0.00	0.00
6,400.00	0.00	0.00	6,387.55	-239.52	266.42	358.26	0.00	0.00	0.00
6,500.00	0.00	0.00	6,487.55	-239.52	266.42	358.26	0.00	0.00	0.00
6,600.00	0.00	0.00	6,587.55	-239.52	266.42	358.26	0.00	0.00	0.00
6,700.00	0.00	0.00	6,687.55	-239.52	266.42	358.26	0.00	0.00	0.00
6,800.00	0.00	0.00	6,787.55	-239.52	266.42	358.26	0.00	0.00	0.00
Cameo									
6,842.45	0.00	0.00	6,830.00	-239.52	266.42	358.26	0.00	0.00	0.00
6,900.00	0.00	0.00	6,887.55	-239.52	266.42	358.26	0.00	0.00	0.00
7,000.00	0.00	0.00	6,987.55	-239.52	266.42	358.26	0.00	0.00	0.00
7,100.00	0.00	0.00	7,087.55	-239.52	266.42	358.26	0.00	0.00	0.00
7,200.00	0.00	0.00	7,187.55	-239.52	266.42	358.26	0.00	0.00	0.00
7,300.00	0.00	0.00	7,287.55	-239.52	266.42	358.26	0.00	0.00	0.00
7,400.00	0.00	0.00	7,387.55	-239.52	266.42	358.26	0.00	0.00	0.00
7,500.00	0.00	0.00	7,487.55	-239.52	266.42	358.26	0.00	0.00	0.00
Rollins									
7,542.45	0.00	0.00	7,530.00	-239.52	266.42	358.26	0.00	0.00	0.00
7,600.00	0.00	0.00	7,587.55	-239.52	266.42	358.26	0.00	0.00	0.00
TD at 7692.45									
7,692.45	0.00	0.00	7,680.00	-239.52	266.42	358.26	0.00	0.00	0.00

Design Targets									
Target Name	Dip Angle (°)	Dip Dir. (°)	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Northing (usft)	Easting (usft)	Latitude	Longitude
- hit/miss target									
- Shape									
Gunderson 29-11E tgt	0.00	0.00	7,680.00	-239.52	266.42	1,523,427.691	2,352,464.390	39.248162	-107.786785
- plan hits target center									
- Circle (radius 50.00)									

<b>Database:</b>	EDMDBBW	<b>Local Co-ordinate Reference:</b>	Well Gunderson 29-11E
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<b>Project:</b>	Mesa County, CO	<b>MD Reference:</b>	WELL @ 7560.00usft (Original Well Elev)
<b>Site:</b>	Gunderson	<b>North Reference:</b>	True
<b>Well:</b>	Gunderson 29-11E	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Wellbore #1		
<b>Design:</b>	Design #1		

Casing Points					
Measured Depth (usft)	Vertical Depth (usft)	Name	Casing Diameter (")	Hole Diameter (")	
1,500.00	1,497.73	8 5/8" Csg.	8-5/8	12-1/4	

Formations					
Measured Depth (usft)	Vertical Depth (usft)	Name	Lithology	Dip (°)	Dip Direction (°)
2,552.88	2,548.00	G' Sand		0.00	
4,489.68	4,480.00	Williams Fork		0.00	
5,742.45	5,730.00	Top Of Gas		0.00	
6,842.45	6,830.00	Cameo		0.00	
7,542.45	7,530.00	Rollins		0.00	

Plan Annotations				
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
450.00	450.00	0.00	0.00	Start Build 2.00
651.77	651.61	-4.75	5.28	Start 4888.91 hold at 651.77 MD
5,540.68	5,528.39	-234.77	261.13	Start Drop -2.00
5,742.45	5,730.00	-239.52	266.42	Start 1950.00 hold at 5742.45 MD
7,692.45	7,680.00	-239.52	266.42	TD at 7692.45



# **Piceance Energy, LLC**

**Mesa County, CO**

**Gunderson**

**Gunderson 29-11E**

**Wellbore #1**

**Design #1**

## **Anticollision Report**

**03 October, 2014**

# **Archer**



<b>Company:</b>	Piceance Energy, LLC	<b>Local Co-ordinate Reference:</b>	Well Gunderson 29-11E
<b>Project:</b>	Mesa County, CO	<b>TVD Reference:</b>	WELL @ 7560.00usft (Original Well Elev)
<b>Reference Site:</b>	Gunderson	<b>MD Reference:</b>	WELL @ 7560.00usft (Original Well Elev)
<b>Site Error:</b>	0.00 usft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Gunderson 29-11E	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.00 usft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	Wellbore #1	<b>Database:</b>	EDMDBBW
<b>Reference Design:</b>	Design #1	<b>Offset TVD Reference:</b>	Reference Datum

<b>Reference</b>	Design #1		
<b>Filter type:</b>	NO GLOBAL FILTER: Using user defined selection & filtering criteria		
<b>Interpolation Method:</b>	MD Interval 30.00usft	<b>Error Model:</b>	ISCWSA
<b>Depth Range:</b>	Unlimited	<b>Scan Method:</b>	Closest Approach 3D
<b>Results Limited by:</b>	Maximum center-center distance of 9,999.98 usft	<b>Error Surface:</b>	Elliptical Conic
<b>Warning Levels Evaluated at:</b>	2.00 Sigma	<b>Casing Method:</b>	Not applied

<b>Survey Tool Program</b>	<b>Date</b>	10/03/14		
<b>From (usft)</b>	<b>To (usft)</b>	<b>Survey (Wellbore)</b>	<b>Tool Name</b>	<b>Description</b>
0.00	7,692.45	Design #1 (Wellbore #1)	MWD	MWD - Standard

Summary						
Site Name	Reference Measured Depth (usft)	Offset Measured Depth (usft)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Separation Factor	Warning
Offset Well - Wellbore - Design						
Gunderson						
Gunderson 29-10E - Wellbore #1 - Design #1	381.48	381.49	9.94	8.51	6.964	CC
Gunderson 29-10E - Wellbore #1 - Design #1	420.00	419.98	10.03	8.43	6.281	ES
Gunderson 29-10E - Wellbore #1 - Design #1	480.00	479.90	10.87	9.02	5.864	SF
Gunderson 29-12E - Wellbore #1 - Design #1	497.08	497.35	18.48	16.58	9.731	CC
Gunderson 29-12E - Wellbore #1 - Design #1	510.00	510.26	18.50	16.54	9.468	ES
Gunderson 29-12E - Wellbore #1 - Design #1	7,692.45	7,710.36	248.76	214.25	7.209	SF

<b>Offset Design</b>	Gunderson - Gunderson 29-10E - Wellbore #1 - Design #1											<b>Offset Site Error:</b>	0.00 usft
<b>Survey Program:</b>	O-MWD											<b>Offset Well Error:</b>	0.00 usft
<b>Reference</b>	<b>Offset</b>	<b>Semi Major Axis</b>		<b>Distance</b>				<b>Minimum Separation</b>		<b>Separation Factor</b>	<b>Warning</b>		
<b>Measured Depth (usft)</b>	<b>Vertical Depth (usft)</b>	<b>Measured Depth (usft)</b>	<b>Vertical Depth (usft)</b>	<b>Reference (usft)</b>	<b>Offset (usft)</b>	<b>Azimuth from North (°)</b>	<b>Offset Wellbore Centre +N/-S (usft)</b>	<b>+E/-W (usft)</b>	<b>Between Centres (usft)</b>	<b>Between Ellipses (usft)</b>			
0.00	0.00	0.00	0.00	0.00	0.00	-6.50	9.94	-1.13	10.01				
30.00	30.00	30.00	30.00	0.01	0.03	-6.50	9.94	-1.13	10.01	9.98	0.03	309.193	
60.00	60.00	60.00	60.00	0.04	0.05	-6.50	9.94	-1.13	10.01	9.92	0.09	109.127	
90.00	90.00	90.00	90.00	0.07	0.08	-6.50	9.94	-1.13	10.01	9.86	0.15	66.256	
120.00	120.00	120.00	120.00	0.13	0.13	-6.50	9.94	-1.13	10.01	9.75	0.26	38.383	
150.00	150.00	150.00	150.00	0.20	0.20	-6.50	9.94	-1.13	10.01	9.61	0.40	25.298	
180.00	180.00	180.00	180.00	0.27	0.27	-6.50	9.94	-1.13	10.01	9.48	0.53	18.866	
210.00	210.00	210.00	210.00	0.33	0.33	-6.50	9.94	-1.13	10.01	9.34	0.67	15.042	
240.00	240.00	240.00	240.00	0.40	0.40	-6.50	9.94	-1.13	10.01	9.21	0.80	12.507	
270.00	270.00	270.00	270.00	0.47	0.47	-6.50	9.94	-1.13	10.01	9.07	0.94	10.703	
300.00	300.00	300.00	300.00	0.53	0.53	-6.50	9.94	-1.13	10.01	8.94	1.07	9.354	
330.00	330.00	330.01	330.01	0.60	0.60	-5.60	9.94	-0.98	9.99	8.79	1.20	8.315	
360.00	360.00	360.02	360.01	0.67	0.66	-2.90	9.94	-0.50	9.95	8.62	1.33	7.467	
381.48	381.48	381.49	381.48	0.72	0.71	0.15	9.94	0.03	9.94	8.51	1.43	6.964	CC
390.00	390.00	390.01	389.99	0.74	0.73	1.62	9.94	0.28	9.94	8.48	1.46	6.788	
420.00	420.00	419.98	419.94	0.80	0.79	7.90	9.94	1.38	10.03	8.43	1.60	6.281	ES
450.00	450.00	449.93	449.86	0.87	0.86	15.66	9.93	2.79	10.32	8.59	1.73	5.962	
480.00	480.00	479.90	479.79	0.93	0.92	22.64	9.93	4.30	10.87	9.02	1.85	5.864	SF
510.00	510.00	509.87	509.73	0.99	0.99	27.35	9.92	5.82	11.65	9.67	1.98	5.883	
540.00	539.99	539.85	539.67	1.05	1.06	30.05	9.92	7.34	12.56	10.45	2.11	5.964	
570.00	569.96	569.83	569.61	1.11	1.12	31.06	9.92	8.85	13.54	11.31	2.23	6.073	

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 Gunderson 29-11E
Project:	Mesa County, CO	TVD Reference:	WELL @ 7560.00usft (Original Well Elev)
Reference Site:	Gunderson	MD Reference:	WELL @ 7560.00usft (Original Well Elev)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Gunderson 29-11E	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	EDMDBBW
Reference Design:	Design #1	Offset TVD Reference:	Reference Datum

Offset Design Gunderson - Gunderson 29-10E - Wellbore #1 - Design #1													Offset Site Error:	0.00 usft
Survey Program: 0-MWD													Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis			Distance							
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Azimuth from North (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning	
600.00	599.93	599.82	599.56	1.17	1.19	30.72	9.91	10.37	14.59	12.24	2.35	6.196		
630.00	629.88	629.79	629.49	1.23	1.26	29.31	9.91	11.89	15.70	13.22	2.49	6.315		
660.00	659.81	659.76	659.42	1.29	1.33	27.09	9.91	13.41	16.90	14.28	2.62	6.451		
690.00	689.74	689.73	689.35	1.36	1.40	24.91	9.90	14.92	18.14	15.39	2.75	6.588		
720.00	719.66	719.70	719.28	1.42	1.47	23.02	9.90	16.44	19.40	16.51	2.89	6.714		
750.00	749.59	749.66	749.21	1.49	1.54	21.36	9.89	17.96	20.69	17.66	3.03	6.832		
780.00	779.52	779.63	779.14	1.56	1.61	19.89	9.89	19.47	21.99	18.82	3.17	6.944		
810.00	809.44	809.60	809.07	1.63	1.68	18.59	9.89	20.99	23.30	19.99	3.31	7.049		
840.00	839.37	839.56	839.00	1.70	1.75	17.43	9.88	22.51	24.62	21.17	3.45	7.145		
870.00	869.29	869.53	868.92	1.77	1.82	16.38	9.88	24.02	25.95	22.36	3.59	7.237		
900.00	899.22	899.50	898.85	1.84	1.90	15.44	9.87	25.54	27.29	23.56	3.73	7.323		
930.00	929.14	929.46	928.78	1.91	1.97	14.59	9.87	27.05	28.63	24.77	3.87	7.402		
960.00	959.07	959.43	958.71	1.99	2.04	13.81	9.87	28.57	29.99	25.98	4.01	7.477		
990.00	988.99	989.40	988.64	2.06	2.11	13.10	9.86	30.09	31.34	27.19	4.15	7.549		
1,020.00	1,018.92	1,019.37	1,018.57	2.13	2.18	12.45	9.86	31.60	32.70	28.41	4.29	7.615		
1,050.00	1,048.85	1,049.33	1,048.50	2.21	2.25	11.86	9.85	33.12	34.07	29.63	4.44	7.677		
1,080.00	1,078.77	1,079.30	1,078.42	2.28	2.33	11.30	9.85	34.64	35.44	30.86	4.58	7.736		
1,110.00	1,108.70	1,109.27	1,108.35	2.36	2.40	10.79	9.85	36.15	36.81	32.08	4.72	7.792		
1,140.00	1,138.62	1,139.23	1,138.28	2.43	2.47	10.32	9.84	37.67	38.18	33.31	4.87	7.844		
1,170.00	1,168.55	1,169.20	1,168.21	2.51	2.54	9.88	9.84	39.19	39.56	34.55	5.01	7.894		
1,200.00	1,198.47	1,199.17	1,198.14	2.58	2.61	9.47	9.83	40.70	40.94	35.78	5.15	7.942		
1,230.00	1,228.40	1,229.13	1,228.07	2.66	2.69	9.08	9.83	42.22	42.32	37.02	5.30	7.986		
1,260.00	1,258.33	1,259.10	1,258.00	2.73	2.76	8.72	9.83	43.74	43.70	38.26	5.44	8.028		
1,290.00	1,288.25	1,289.07	1,287.92	2.81	2.83	8.38	9.82	45.25	45.08	39.50	5.59	8.069		
1,320.00	1,318.18	1,319.03	1,317.85	2.89	2.90	8.06	9.82	46.77	46.47	40.74	5.73	8.107		
1,350.00	1,348.10	1,349.00	1,347.78	2.96	2.98	7.77	9.81	48.29	47.85	41.98	5.88	8.144		
1,380.00	1,378.03	1,378.97	1,377.71	3.04	3.05	7.48	9.81	49.80	49.24	43.22	6.02	8.179		
1,410.00	1,407.95	1,408.93	1,407.64	3.12	3.12	7.21	9.81	51.32	50.63	44.47	6.17	8.212		
1,440.00	1,437.88	1,438.90	1,437.57	3.19	3.19	6.96	9.80	52.84	52.02	45.71	6.31	8.244		
1,470.00	1,467.80	1,468.87	1,467.49	3.27	3.26	6.72	9.80	54.35	53.41	46.96	6.45	8.275		
1,500.00	1,497.73	1,498.84	1,497.42	3.35	3.34	6.49	9.79	55.87	54.80	48.21	6.60	8.304		
1,530.00	1,527.66	1,528.80	1,527.35	3.42	3.41	6.28	9.79	57.39	56.20	49.45	6.74	8.332		
1,560.00	1,557.58	1,558.77	1,557.28	3.50	3.48	6.07	9.79	58.90	57.59	50.70	6.89	8.359		
1,590.00	1,587.51	1,588.74	1,587.21	3.58	3.55	5.88	9.78	60.42	58.99	51.95	7.03	8.385		
1,620.00	1,617.43	1,618.70	1,617.14	3.65	3.63	5.69	9.78	61.94	60.38	53.20	7.18	8.409		
1,650.00	1,647.36	1,648.67	1,647.07	3.73	3.70	5.51	9.77	63.45	61.78	54.45	7.33	8.433		
1,680.00	1,677.28	1,678.64	1,676.99	3.81	3.77	5.34	9.77	64.97	63.17	55.70	7.47	8.456		
1,710.00	1,707.21	1,708.60	1,706.92	3.89	3.84	5.18	9.77	66.49	64.57	56.95	7.62	8.478		
1,740.00	1,737.14	1,738.57	1,736.85	3.96	3.92	5.02	9.76	68.00	65.97	58.20	7.76	8.499		
1,770.00	1,767.06	1,768.54	1,766.78	4.04	3.99	4.87	9.76	69.52	67.36	59.46	7.91	8.520		
1,800.00	1,796.99	1,798.50	1,796.71	4.12	4.06	4.73	9.75	71.04	68.76	60.71	8.05	8.539		
1,830.00	1,826.91	1,828.47	1,826.64	4.20	4.13	4.59	9.75	72.55	70.16	61.96	8.20	8.558		
1,860.00	1,856.84	1,858.44	1,856.57	4.27	4.21	4.45	9.75	74.07	71.56	63.22	8.34	8.577		
1,890.00	1,886.76	1,888.41	1,886.49	4.35	4.28	4.33	9.74	75.59	72.96	64.47	8.49	8.595		
1,920.00	1,916.69	1,918.37	1,916.42	4.43	4.35	4.20	9.74	77.10	74.36	65.72	8.63	8.612		
1,950.00	1,946.61	1,948.34	1,946.35	4.51	4.43	4.09	9.73	78.62	75.76	66.98	8.78	8.628		
1,980.00	1,976.54	1,978.31	1,976.28	4.59	4.50	3.97	9.73	80.14	77.16	68.23	8.93	8.644		
2,010.00	2,006.47	2,008.27	2,006.21	4.66	4.57	3.86	9.73	81.65	78.56	69.49	9.07	8.660		
2,040.00	2,036.39	2,038.24	2,036.14	4.74	4.64	3.76	9.72	83.17	79.96	70.74	9.22	8.675		
2,070.00	2,066.32	2,068.21	2,066.07	4.82	4.72	3.65	9.72	84.69	81.36	72.00	9.36	8.690		
2,100.00	2,096.24	2,098.17	2,095.99	4.90	4.79	3.55	9.71	86.20	82.76	73.25	9.51	8.704		
2,130.00	2,126.17	2,128.14	2,125.92	4.97	4.86	3.46	9.71	87.72	84.16	74.51	9.65	8.718		

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



# Archer

## Anticollision Report



<b>Company:</b>	Piceance Energy, LLC	<b>Local Co-ordinate Reference:</b>	Well Gunderson 29-11E
<b>Project:</b>	Mesa County, CO	<b>TVD Reference:</b>	WELL @ 7560.00usft (Original Well Elev)
<b>Reference Site:</b>	Gunderson	<b>MD Reference:</b>	WELL @ 7560.00usft (Original Well Elev)
<b>Site Error:</b>	0.00 usft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Gunderson 29-11E	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.00 usft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	Wellbore #1	<b>Database:</b>	EDMDBBW
<b>Reference Design:</b>	Design #1	<b>Offset TVD Reference:</b>	Reference Datum

Offset Design Gunderson - Gunderson 29-10E - Wellbore #1 - Design #1													Offset Site Error:	0.00 usft
Survey Program: 0-MWD													Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis			Distance						Warning	
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Azimuth from North (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor		
2,160.00	2,156.09	2,158.11	2,155.85	5.05	4.93	3.37	9.71	89.24	85.57	75.77	9.80	8.731		
2,190.00	2,186.02	2,188.07	2,185.78	5.13	5.01	3.28	9.70	90.75	86.97	77.02	9.95	8.744		
2,220.00	2,215.95	2,218.04	2,215.71	5.21	5.08	3.19	9.70	92.27	88.37	78.28	10.09	8.757		
2,250.00	2,245.87	2,248.01	2,245.64	5.29	5.15	3.11	9.69	93.79	89.77	79.54	10.24	8.769		
2,280.00	2,275.80	2,277.98	2,275.56	5.37	5.22	3.02	9.69	95.30	91.18	80.79	10.38	8.781		
2,310.00	2,305.72	2,307.94	2,305.49	5.44	5.30	2.95	9.69	96.82	92.58	82.05	10.53	8.792		
2,340.00	2,335.65	2,337.91	2,335.42	5.52	5.37	2.87	9.68	98.34	93.98	83.31	10.68	8.803		
2,370.00	2,365.57	2,367.88	2,365.35	5.60	5.44	2.80	9.68	99.85	95.38	84.56	10.82	8.814		
2,400.00	2,395.50	2,397.84	2,395.28	5.68	5.52	2.72	9.68	101.37	96.79	85.82	10.97	8.825		
2,430.00	2,425.42	2,427.81	2,425.21	5.76	5.59	2.65	9.67	102.89	98.19	87.08	11.11	8.835		
2,460.00	2,455.35	2,457.78	2,455.14	5.83	5.66	2.58	9.67	104.40	99.60	88.34	11.26	8.846		
2,490.00	2,485.28	2,487.74	2,485.06	5.91	5.73	2.52	9.66	105.92	101.00	89.59	11.41	8.855		
2,520.00	2,515.20	2,517.71	2,514.99	5.99	5.81	2.45	9.66	107.44	102.40	90.85	11.55	8.865		
2,550.00	2,545.13	2,547.68	2,544.92	6.07	5.88	2.39	9.66	108.95	103.81	92.11	11.70	8.874		
2,580.00	2,575.05	2,577.64	2,574.85	6.15	5.95	2.33	9.65	110.47	105.21	93.37	11.84	8.883		
2,610.00	2,604.98	2,607.61	2,604.78	6.23	6.03	2.27	9.65	111.99	106.62	94.63	11.99	8.892		
2,640.00	2,634.90	2,637.58	2,634.71	6.30	6.10	2.21	9.64	113.50	108.02	95.88	12.14	8.901		
2,670.00	2,664.83	2,667.55	2,664.64	6.38	6.17	2.16	9.64	115.02	109.42	97.14	12.28	8.910		
2,700.00	2,694.76	2,697.51	2,694.56	6.46	6.24	2.10	9.64	116.54	110.83	98.40	12.43	8.918		
2,730.00	2,724.68	2,727.48	2,724.49	6.54	6.32	2.05	9.63	118.05	112.23	99.66	12.57	8.926		
2,760.00	2,754.61	2,757.45	2,754.42	6.62	6.39	2.00	9.63	119.57	113.64	100.92	12.72	8.934		
2,790.00	2,784.53	2,787.41	2,784.35	6.70	6.46	1.94	9.62	121.09	115.04	102.18	12.87	8.942		
2,820.00	2,814.46	2,817.38	2,814.28	6.77	6.53	1.90	9.62	122.60	116.45	103.44	13.01	8.949		
2,850.00	2,844.38	2,847.35	2,844.21	6.85	6.61	1.85	9.62	124.12	117.85	104.69	13.16	8.957		
2,880.00	2,874.31	2,877.31	2,874.13	6.93	6.68	1.80	9.61	125.64	119.26	105.95	13.30	8.964		
2,910.00	2,904.23	2,907.28	2,904.06	7.01	6.75	1.75	9.61	127.15	120.66	107.21	13.45	8.971		
2,940.00	2,934.16	2,937.25	2,933.99	7.09	6.83	1.71	9.60	128.67	122.07	108.47	13.60	8.978		
2,970.00	2,964.09	2,967.21	2,963.92	7.17	6.90	1.66	9.60	130.19	123.47	109.73	13.74	8.985		
3,000.00	2,994.01	2,997.18	2,993.85	7.24	6.97	1.62	9.60	131.70	124.88	110.99	13.89	8.991		
3,030.00	3,023.94	3,027.15	3,023.78	7.32	7.04	1.58	9.59	133.22	126.29	112.25	14.04	8.998		
3,060.00	3,053.86	3,057.12	3,053.71	7.40	7.12	1.54	9.59	134.74	127.69	113.51	14.18	9.004		
3,090.00	3,083.79	3,087.08	3,083.63	7.48	7.19	1.50	9.58	136.25	129.10	114.77	14.33	9.010		
3,120.00	3,113.71	3,117.05	3,113.56	7.56	7.26	1.46	9.58	137.77	130.50	116.03	14.47	9.016		
3,150.00	3,143.64	3,147.02	3,143.49	7.64	7.34	1.42	9.58	139.29	131.91	117.29	14.62	9.022		
3,180.00	3,173.56	3,176.98	3,173.42	7.72	7.41	1.38	9.57	140.80	133.31	118.55	14.77	9.028		
3,210.00	3,203.49	3,206.95	3,203.35	7.79	7.48	1.34	9.57	142.32	134.72	119.81	14.91	9.034		
3,240.00	3,233.42	3,236.92	3,233.28	7.87	7.55	1.31	9.56	143.84	136.13	121.07	15.06	9.040		
3,270.00	3,263.34	3,266.88	3,263.21	7.95	7.63	1.27	9.56	145.35	137.53	122.33	15.20	9.045		
3,300.00	3,293.27	3,296.85	3,293.13	8.03	7.70	1.24	9.56	146.87	138.94	123.59	15.35	9.051		
3,330.00	3,323.19	3,326.82	3,323.06	8.11	7.77	1.20	9.55	148.39	140.34	124.85	15.50	9.056		
3,360.00	3,353.12	3,356.78	3,352.99	8.19	7.85	1.17	9.55	149.90	141.75	126.11	15.64	9.061		
3,390.00	3,383.04	3,386.75	3,382.92	8.26	7.92	1.14	9.54	151.42	143.16	127.37	15.79	9.066		
3,420.00	3,412.97	3,416.72	3,412.85	8.34	7.99	1.10	9.54	152.94	144.56	128.63	15.94	9.071		
3,450.00	3,442.90	3,446.69	3,442.78	8.42	8.06	1.07	9.54	154.45	145.97	129.89	16.08	9.076		
3,480.00	3,472.82	3,476.65	3,472.71	8.50	8.14	1.04	9.53	155.97	147.37	131.15	16.23	9.081		
3,510.00	3,502.75	3,506.62	3,502.63	8.58	8.21	1.01	9.53	157.49	148.78	132.41	16.37	9.086		
3,540.00	3,532.67	3,536.59	3,532.56	8.66	8.28	0.98	9.52	159.00	150.19	133.67	16.52	9.091		
3,570.00	3,562.60	3,566.55	3,562.49	8.74	8.36	0.95	9.52	160.52	151.59	134.93	16.67	9.095		
3,600.00	3,592.52	3,596.52	3,592.42	8.81	8.43	0.92	9.52	162.04	153.00	136.19	16.81	9.100		
3,630.00	3,622.45	3,626.49	3,622.35	8.89	8.50	0.89	9.51	163.55	154.41	137.45	16.96	9.104		
3,660.00	3,652.37	3,656.45	3,652.28	8.97	8.57	0.87	9.51	165.07	155.81	138.71	17.11	9.109		
3,690.00	3,682.30	3,686.42	3,682.20	9.05	8.65	0.84	9.50	166.59	157.22	139.97	17.25	9.113		

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



# Archer

## Anticollision Report



<b>Company:</b>	Piceance Energy, LLC	<b>Local Co-ordinate Reference:</b>	Well Gunderson 29-11E
<b>Project:</b>	Mesa County, CO	<b>TVD Reference:</b>	WELL @ 7560.00usft (Original Well Elev)
<b>Reference Site:</b>	Gunderson	<b>MD Reference:</b>	WELL @ 7560.00usft (Original Well Elev)
<b>Site Error:</b>	0.00 usft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Gunderson 29-11E	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.00 usft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	Wellbore #1	<b>Database:</b>	EDMDBBW
<b>Reference Design:</b>	Design #1	<b>Offset TVD Reference:</b>	Reference Datum

Offset Design Gunderson - Gunderson 29-10E - Wellbore #1 - Design #1													Offset Site Error:	0.00 usft
Survey Program: 0-MWD													Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis			Distance						Warning	
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Azimuth from North (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor		
3,720.00	3,712.23	3,716.39	3,712.13	9.13	8.72	0.81	9.50	168.10	158.63	141.23	17.40	9.117		
3,750.00	3,742.15	3,746.35	3,742.06	9.21	8.79	0.79	9.50	169.62	160.03	142.49	17.55	9.121		
3,780.00	3,772.08	3,776.32	3,771.99	9.29	8.87	0.76	9.49	171.14	161.44	143.75	17.69	9.125		
3,810.00	3,802.00	3,806.29	3,801.92	9.37	8.94	0.74	9.49	172.65	162.85	145.01	17.84	9.129		
3,840.00	3,831.93	3,836.26	3,831.85	9.44	9.01	0.71	9.48	174.17	164.25	146.27	17.98	9.133		
3,870.00	3,861.85	3,866.22	3,861.78	9.52	9.08	0.69	9.48	175.69	165.66	147.53	18.13	9.137		
3,900.00	3,891.78	3,896.19	3,891.70	9.60	9.16	0.66	9.48	177.20	167.07	148.79	18.28	9.141		
3,930.00	3,921.71	3,926.16	3,921.63	9.68	9.23	0.64	9.47	178.72	168.47	150.05	18.42	9.145		
3,960.00	3,951.63	3,956.12	3,951.56	9.76	9.30	0.61	9.47	180.24	169.88	151.31	18.57	9.149		
3,990.00	3,981.56	3,986.09	3,981.49	9.84	9.38	0.59	9.46	181.75	171.29	152.57	18.72	9.152		
4,020.00	4,011.48	4,016.06	4,011.42	9.92	9.45	0.57	9.46	183.27	172.69	153.83	18.86	9.156		
4,050.00	4,041.41	4,046.02	4,041.35	9.99	9.52	0.55	9.46	184.79	174.10	155.09	19.01	9.159		
4,080.00	4,071.33	4,075.99	4,071.28	10.07	9.59	0.53	9.45	186.30	175.51	156.35	19.15	9.163		
4,110.00	4,101.26	4,105.96	4,101.20	10.15	9.67	0.50	9.45	187.82	176.92	157.61	19.30	9.166		
4,140.00	4,131.18	4,135.92	4,131.13	10.23	9.74	0.48	9.45	189.34	178.32	158.88	19.45	9.170		
4,170.00	4,161.11	4,165.89	4,161.06	10.31	9.81	0.46	9.44	190.85	179.73	160.14	19.59	9.173		
4,200.00	4,191.04	4,195.86	4,190.99	10.39	9.89	0.44	9.44	192.37	181.14	161.40	19.74	9.176		
4,230.00	4,220.96	4,225.83	4,220.92	10.47	9.96	0.42	9.43	193.89	182.54	162.66	19.89	9.179		
4,260.00	4,250.89	4,255.79	4,250.85	10.54	10.03	0.40	9.43	195.40	183.95	163.92	20.03	9.183		
4,290.00	4,280.81	4,285.76	4,280.77	10.62	10.10	0.38	9.43	196.92	185.36	165.18	20.18	9.186		
4,320.00	4,310.74	4,315.73	4,310.70	10.70	10.18	0.36	9.42	198.44	186.77	166.44	20.33	9.189		
4,350.00	4,340.66	4,345.69	4,340.63	10.78	10.25	0.34	9.42	199.95	188.17	167.70	20.47	9.192		
4,380.00	4,370.59	4,375.66	4,370.56	10.86	10.32	0.33	9.41	201.47	189.58	168.96	20.62	9.195		
4,410.00	4,400.52	4,405.63	4,400.49	10.94	10.40	0.31	9.41	202.99	190.99	170.22	20.76	9.198		
4,440.00	4,430.44	4,435.59	4,430.42	11.02	10.47	0.29	9.41	204.50	192.39	171.48	20.91	9.201		
4,470.00	4,460.37	4,465.56	4,460.35	11.10	10.54	0.27	9.40	206.02	193.80	172.74	21.06	9.204		
4,500.00	4,490.29	4,495.53	4,490.27	11.17	10.61	0.25	9.40	207.54	195.21	174.01	21.20	9.206		
4,530.00	4,520.22	4,525.49	4,520.20	11.25	10.69	0.24	9.39	209.05	196.62	175.27	21.35	9.209		
4,560.00	4,550.14	4,555.46	4,550.13	11.33	10.76	0.22	9.39	210.57	198.02	176.53	21.50	9.212		
4,590.00	4,580.07	4,585.43	4,580.06	11.41	10.83	0.20	9.39	212.09	199.43	177.79	21.64	9.215		
4,620.00	4,609.99	4,615.39	4,609.99	11.49	10.91	0.19	9.38	213.60	200.84	179.05	21.79	9.217		
4,650.00	4,639.92	4,645.36	4,639.92	11.57	10.98	0.17	9.38	215.12	202.25	180.31	21.94	9.220		
4,680.00	4,669.85	4,675.33	4,669.85	11.65	11.05	0.15	9.37	216.63	203.65	181.57	22.08	9.223		
4,710.00	4,699.77	4,705.30	4,699.77	11.73	11.12	0.14	9.37	218.15	205.06	182.83	22.23	9.225		
4,740.00	4,729.70	4,735.26	4,729.70	11.80	11.20	0.12	9.37	219.67	206.47	184.09	22.37	9.228		
4,770.00	4,759.62	4,765.23	4,759.63	11.88	11.27	0.11	9.36	221.18	207.88	185.35	22.52	9.230		
4,800.00	4,789.55	4,795.20	4,789.56	11.96	11.34	0.09	9.36	222.70	209.28	186.62	22.67	9.233		
4,830.00	4,819.47	4,825.16	4,819.49	12.04	11.42	0.08	9.35	224.22	210.69	187.88	22.81	9.235		
4,860.00	4,849.40	4,855.13	4,849.42	12.12	11.49	0.06	9.35	225.73	212.10	189.14	22.96	9.238		
4,890.00	4,879.33	4,885.10	4,879.35	12.20	11.56	0.05	9.35	227.25	213.51	190.40	23.11	9.240		
4,920.00	4,909.25	4,915.06	4,909.27	12.28	11.63	0.03	9.34	228.77	214.91	191.66	23.25	9.242		
4,950.00	4,939.18	4,945.03	4,939.20	12.35	11.71	0.02	9.34	230.28	216.32	192.92	23.40	9.245		
4,980.00	4,969.10	4,975.00	4,969.13	12.43	11.78	0.00	9.33	231.80	217.73	194.18	23.55	9.247		
5,010.00	4,999.03	5,004.96	4,999.06	12.51	11.85	-0.01	9.33	233.32	219.14	195.44	23.69	9.249		
5,040.00	5,028.95	5,034.93	5,028.99	12.59	11.93	-0.03	9.33	234.83	220.54	196.70	23.84	9.251		
5,070.00	5,058.88	5,064.90	5,058.92	12.67	12.00	-0.04	9.32	236.35	221.95	197.97	23.99	9.254		
5,100.00	5,088.80	5,094.87	5,088.84	12.75	12.07	-0.05	9.32	237.87	223.36	199.23	24.13	9.256		
5,130.00	5,118.73	5,124.83	5,118.77	12.83	12.14	-0.07	9.31	239.38	224.77	200.49	24.28	9.258		
5,160.00	5,148.66	5,154.80	5,148.70	12.91	12.22	-0.08	9.31	240.90	226.17	201.75	24.42	9.260		
5,190.00	5,178.58	5,184.77	5,178.63	12.98	12.29	-0.09	9.31	242.42	227.58	203.01	24.57	9.262		
5,220.00	5,208.51	5,214.73	5,208.56	13.06	12.36	-0.10	9.30	243.93	228.99	204.27	24.72	9.264		
5,250.00	5,238.43	5,244.70	5,238.49	13.14	12.44	-0.12	9.30	245.45	230.40	205.53	24.86	9.266		

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 Gunderson 29-11E
Project:	Mesa County, CO	TVD Reference:	WELL @ 7560.00usft (Original Well Elev)
Reference Site:	Gunderson	MD Reference:	WELL @ 7560.00usft (Original Well Elev)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Gunderson 29-11E	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	EDMDBBW
Reference Design:	Design #1	Offset TVD Reference:	Reference Datum

Offset Design Gunderson - Gunderson 29-10E - Wellbore #1 - Design #1													Offset Site Error:	0.00 usft
Survey Program: 0-MWD													Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis			Distance						Warning	
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Azimuth from North (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor		
5,280.00	5,268.36	5,274.67	5,268.42	13.22	12.51	-0.13	9.29	246.97	231.80	206.79	25.01	9.268		
5,310.00	5,298.28	5,304.63	5,298.34	13.30	12.58	-0.14	9.29	248.48	233.21	208.06	25.16	9.270		
5,340.00	5,328.21	5,334.60	5,328.27	13.38	12.65	-0.15	9.29	250.00	234.62	209.32	25.30	9.272		
5,370.00	5,358.14	5,364.57	5,358.20	13.46	12.73	-0.17	9.28	251.52	236.03	210.58	25.45	9.274		
5,400.00	5,388.06	5,394.53	5,388.13	13.54	12.80	-0.18	9.28	253.03	237.43	211.84	25.60	9.276		
5,430.00	5,417.99	5,424.50	5,418.06	13.61	12.87	-0.19	9.27	254.55	238.84	213.10	25.74	9.278		
5,460.00	5,447.91	5,454.47	5,447.99	13.69	12.95	-0.20	9.27	256.07	240.25	214.36	25.89	9.280		
5,490.00	5,477.84	5,484.44	5,477.92	13.77	13.02	-0.21	9.27	257.58	241.66	215.62	26.03	9.282		
5,520.00	5,507.76	5,514.40	5,507.84	13.85	13.09	-0.22	9.26	259.10	243.07	216.88	26.18	9.284		
5,550.00	5,537.69	5,544.37	5,537.77	13.93	13.17	-0.23	9.26	260.62	244.46	218.14	26.33	9.286		
5,580.00	5,567.63	5,574.34	5,567.71	13.99	13.24	-0.20	9.25	262.13	245.70	219.23	26.47	9.283		
5,610.00	5,597.59	5,604.32	5,597.65	14.05	13.31	-0.12	9.25	263.62	246.73	220.13	26.60	9.276		
5,640.00	5,627.57	5,634.30	5,627.60	14.10	13.36	-0.05	9.25	264.85	247.55	220.84	26.71	9.270		
5,670.00	5,657.55	5,664.28	5,657.57	14.15	13.41	0.01	9.25	265.77	248.16	221.34	26.81	9.256		
5,700.00	5,687.55	5,694.27	5,687.55	14.21	13.46	0.04	9.24	266.37	248.56	221.64	26.92	9.235		
5,730.00	5,717.55	5,724.27	5,717.55	14.26	13.51	0.06	9.24	266.66	248.75	221.73	27.02	9.206		
5,760.00	5,747.55	5,754.26	5,747.55	14.31	13.57	0.06	9.24	266.68	248.77	221.64	27.13	9.170		
5,790.00	5,777.55	5,784.26	5,777.55	14.36	13.62	0.06	9.24	266.68	248.77	221.53	27.24	9.133		
5,820.00	5,807.55	5,814.26	5,807.55	14.41	13.68	0.06	9.24	266.68	248.77	221.42	27.35	9.097		
5,850.00	5,837.55	5,844.26	5,837.55	14.46	13.73	0.06	9.24	266.68	248.77	221.31	27.46	9.061		
5,880.00	5,867.55	5,874.26	5,867.55	14.51	13.79	0.06	9.24	266.68	248.77	221.20	27.56	9.025		
5,910.00	5,897.55	5,904.26	5,897.55	14.56	13.85	0.06	9.24	266.68	248.77	221.09	27.67	8.990		
5,940.00	5,927.55	5,934.26	5,927.55	14.61	13.90	0.06	9.24	266.68	248.77	220.98	27.78	8.954		
5,970.00	5,957.55	5,964.26	5,957.55	14.66	13.96	0.06	9.24	266.68	248.77	220.87	27.89	8.919		
6,000.00	5,987.55	5,994.26	5,987.55	14.71	14.02	0.06	9.24	266.68	248.77	220.77	28.00	8.884		
6,030.00	6,017.55	6,024.26	6,017.55	14.76	14.08	0.06	9.24	266.68	248.77	220.66	28.11	8.850		
6,060.00	6,047.55	6,054.26	6,047.55	14.81	14.13	0.06	9.24	266.68	248.77	220.55	28.22	8.815		
6,090.00	6,077.55	6,084.26	6,077.55	14.86	14.19	0.06	9.24	266.68	248.77	220.44	28.33	8.781		
6,120.00	6,107.55	6,114.26	6,107.55	14.91	14.25	0.06	9.24	266.68	248.77	220.32	28.44	8.747		
6,150.00	6,137.55	6,144.26	6,137.55	14.96	14.30	0.06	9.24	266.68	248.77	220.21	28.55	8.713		
6,180.00	6,167.55	6,174.26	6,167.55	15.01	14.36	0.06	9.24	266.68	248.77	220.10	28.66	8.679		
6,210.00	6,197.55	6,204.26	6,197.55	15.06	14.42	0.06	9.24	266.68	248.77	219.99	28.77	8.646		
6,240.00	6,227.55	6,234.26	6,227.55	15.11	14.48	0.06	9.24	266.68	248.77	219.88	28.88	8.612		
6,270.00	6,257.55	6,264.26	6,257.55	15.16	14.54	0.06	9.24	266.68	248.77	219.77	29.00	8.579		
6,300.00	6,287.55	6,294.26	6,287.55	15.21	14.59	0.06	9.24	266.68	248.77	219.66	29.11	8.547		
6,330.00	6,317.55	6,324.26	6,317.55	15.26	14.65	0.06	9.24	266.68	248.77	219.55	29.22	8.514		
6,360.00	6,347.55	6,354.26	6,347.55	15.31	14.71	0.06	9.24	266.68	248.77	219.43	29.33	8.481		
6,390.00	6,377.55	6,384.26	6,377.55	15.36	14.77	0.06	9.24	266.68	248.77	219.32	29.44	8.449		
6,420.00	6,407.55	6,414.26	6,407.55	15.41	14.83	0.06	9.24	266.68	248.77	219.21	29.56	8.417		
6,450.00	6,437.55	6,444.26	6,437.55	15.47	14.88	0.06	9.24	266.68	248.77	219.10	29.67	8.385		
6,480.00	6,467.55	6,474.26	6,467.55	15.52	14.94	0.06	9.24	266.68	248.77	218.98	29.78	8.353		
6,510.00	6,497.55	6,504.26	6,497.55	15.57	15.00	0.06	9.24	266.68	248.77	218.87	29.89	8.322		
6,540.00	6,527.55	6,534.26	6,527.55	15.62	15.06	0.06	9.24	266.68	248.77	218.76	30.01	8.290		
6,570.00	6,557.55	6,564.26	6,557.55	15.67	15.12	0.06	9.24	266.68	248.77	218.65	30.12	8.259		
6,600.00	6,587.55	6,594.26	6,587.55	15.72	15.18	0.06	9.24	266.68	248.77	218.53	30.23	8.228		
6,630.00	6,617.55	6,624.26	6,617.55	15.78	15.24	0.06	9.24	266.68	248.77	218.42	30.35	8.197		
6,660.00	6,647.55	6,654.26	6,647.55	15.83	15.29	0.06	9.24	266.68	248.77	218.30	30.46	8.167		
6,690.00	6,677.55	6,684.26	6,677.55	15.88	15.35	0.06	9.24	266.68	248.77	218.19	30.58	8.136		
6,720.00	6,707.55	6,714.26	6,707.55	15.93	15.41	0.06	9.24	266.68	248.77	218.08	30.69	8.106		
6,750.00	6,737.55	6,744.26	6,737.55	15.99	15.47	0.06	9.24	266.68	248.77	217.96	30.80	8.076		
6,780.00	6,767.55	6,774.26	6,767.55	16.04	15.53	0.06	9.24	266.68	248.77	217.85	30.92	8.046		
6,810.00	6,797.55	6,804.26	6,797.55	16.09	15.59	0.06	9.24	266.68	248.77	217.73	31.03	8.016		

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



# Archer

## Anticollision Report

# Archer

<b>Company:</b>	Piceance Energy, LLC	<b>Local Co-ordinate Reference:</b>	Well Gunderson 29-11E
<b>Project:</b>	Mesa County, CO	<b>TVD Reference:</b>	WELL @ 7560.00usft (Original Well Elev)
<b>Reference Site:</b>	Gunderson	<b>MD Reference:</b>	WELL @ 7560.00usft (Original Well Elev)
<b>Site Error:</b>	0.00 usft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Gunderson 29-11E	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.00 usft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	Wellbore #1	<b>Database:</b>	EDMDBBW
<b>Reference Design:</b>	Design #1	<b>Offset TVD Reference:</b>	Reference Datum

Offset Design Gunderson - Gunderson 29-10E - Wellbore #1 - Design #1													Offset Site Error: 0.00 usft
Survey Program: 0-MWD													Offset Well Error: 0.00 usft
Reference		Offset		Semi Major Axis			Distance						Warning
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Azimuth from North (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	
6,840.00	6,827.55	6,834.26	6,827.55	16.15	15.65	0.06	9.24	266.68	248.77	217.62	31.15	7.987	
6,870.00	6,857.55	6,864.26	6,857.55	16.20	15.71	0.06	9.24	266.68	248.77	217.50	31.26	7.957	
6,900.00	6,887.55	6,894.26	6,887.55	16.25	15.77	0.06	9.24	266.68	248.77	217.39	31.38	7.928	
6,930.00	6,917.55	6,924.26	6,917.55	16.31	15.83	0.06	9.24	266.68	248.77	217.27	31.49	7.899	
6,960.00	6,947.55	6,954.26	6,947.55	16.36	15.89	0.06	9.24	266.68	248.77	217.16	31.61	7.870	
6,990.00	6,977.55	6,984.26	6,977.55	16.41	15.95	0.06	9.24	266.68	248.77	217.04	31.72	7.842	
7,020.00	7,007.55	7,014.26	7,007.55	16.47	16.01	0.06	9.24	266.68	248.77	216.93	31.84	7.813	
7,050.00	7,037.55	7,044.26	7,037.55	16.52	16.06	0.06	9.24	266.68	248.77	216.81	31.96	7.785	
7,080.00	7,067.55	7,074.26	7,067.55	16.57	16.12	0.06	9.24	266.68	248.77	216.69	32.07	7.757	
7,110.00	7,097.55	7,104.26	7,097.55	16.63	16.18	0.06	9.24	266.68	248.77	216.58	32.19	7.729	
7,140.00	7,127.55	7,134.26	7,127.55	16.68	16.24	0.06	9.24	266.68	248.77	216.46	32.30	7.701	
7,170.00	7,157.55	7,164.26	7,157.55	16.74	16.30	0.06	9.24	266.68	248.77	216.35	32.42	7.673	
7,200.00	7,187.55	7,194.26	7,187.55	16.79	16.36	0.06	9.24	266.68	248.77	216.23	32.54	7.646	
7,230.00	7,217.55	7,224.26	7,217.55	16.84	16.42	0.06	9.24	266.68	248.77	216.11	32.65	7.618	
7,260.00	7,247.55	7,254.26	7,247.55	16.90	16.48	0.06	9.24	266.68	248.77	215.99	32.77	7.591	
7,290.00	7,277.55	7,284.26	7,277.55	16.95	16.54	0.06	9.24	266.68	248.77	215.88	32.89	7.564	
7,320.00	7,307.55	7,314.26	7,307.55	17.01	16.60	0.06	9.24	266.68	248.77	215.76	33.00	7.537	
7,350.00	7,337.55	7,344.26	7,337.55	17.06	16.66	0.06	9.24	266.68	248.77	215.64	33.12	7.511	
7,380.00	7,367.55	7,374.26	7,367.55	17.12	16.73	0.06	9.24	266.68	248.77	215.53	33.24	7.484	
7,410.00	7,397.55	7,404.26	7,397.55	17.17	16.79	0.06	9.24	266.68	248.77	215.41	33.36	7.458	
7,440.00	7,427.55	7,434.26	7,427.55	17.23	16.85	0.06	9.24	266.68	248.77	215.29	33.47	7.431	
7,470.00	7,457.55	7,464.26	7,457.55	17.28	16.91	0.06	9.24	266.68	248.77	215.17	33.59	7.405	
7,500.00	7,487.55	7,494.26	7,487.55	17.34	16.97	0.06	9.24	266.68	248.77	215.06	33.71	7.379	
7,530.00	7,517.55	7,524.26	7,517.55	17.39	17.03	0.06	9.24	266.68	248.77	214.94	33.83	7.354	
7,560.00	7,547.55	7,554.26	7,547.55	17.45	17.09	0.06	9.24	266.68	248.77	214.82	33.95	7.328	
7,590.00	7,577.55	7,584.26	7,577.55	17.50	17.15	0.06	9.24	266.68	248.77	214.70	34.07	7.303	
7,620.00	7,607.55	7,614.26	7,607.55	17.56	17.21	0.06	9.24	266.68	248.77	214.58	34.18	7.277	
7,650.00	7,637.55	7,644.26	7,637.55	17.61	17.27	0.06	9.24	266.68	248.77	214.46	34.30	7.252	
7,680.00	7,667.55	7,674.26	7,667.55	17.67	17.33	0.06	9.24	266.68	248.77	214.34	34.42	7.227	
7,692.45	7,680.00	7,686.72	7,680.00	17.69	17.36	0.06	9.24	266.68	248.77	214.30	34.47	7.217	



# Archer

## Anticollision Report



<b>Company:</b>	Piceance Energy, LLC	<b>Local Co-ordinate Reference:</b>	Well Gunderson 29-11E
<b>Project:</b>	Mesa County, CO	<b>TVD Reference:</b>	WELL @ 7560.00usft (Original Well Elev)
<b>Reference Site:</b>	Gunderson	<b>MD Reference:</b>	WELL @ 7560.00usft (Original Well Elev)
<b>Site Error:</b>	0.00 usft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Gunderson 29-11E	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.00 usft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	Wellbore #1	<b>Database:</b>	EDMDBBW
<b>Reference Design:</b>	Design #1	<b>Offset TVD Reference:</b>	Reference Datum

Offset Design Gunderson - Gunderson 29-12E - Wellbore #1 - Design #1													Offset Site Error:	0.00 usft
Survey Program: 0-MWD													Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis			Distance							Warning
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Azimuth from North (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor		
0.00	0.00	0.00	0.00	0.00	0.00	-96.48	-2.26	-19.88	20.01					
30.00	30.00	30.00	30.00	0.01	0.03	-96.48	-2.26	-19.88	20.01	19.98	0.03	618.169		
60.00	60.00	60.00	60.00	0.04	0.05	-96.48	-2.26	-19.88	20.01	19.92	0.09	218.177		
90.00	90.00	90.00	90.00	0.07	0.08	-96.48	-2.26	-19.88	20.01	19.86	0.15	132.465		
120.00	120.00	120.00	120.00	0.13	0.13	-96.48	-2.26	-19.88	20.01	19.75	0.26	76.738		
150.00	150.00	150.00	150.00	0.20	0.20	-96.48	-2.26	-19.88	20.01	19.61	0.40	50.578		
180.00	180.00	180.00	180.00	0.27	0.27	-96.48	-2.26	-19.88	20.01	19.48	0.53	37.719		
210.00	210.00	210.00	210.00	0.33	0.33	-96.48	-2.26	-19.88	20.01	19.34	0.67	30.073		
240.00	240.00	240.00	240.00	0.40	0.40	-96.48	-2.26	-19.88	20.01	19.21	0.80	25.005		
270.00	270.00	270.00	270.00	0.47	0.47	-96.48	-2.26	-19.88	20.01	19.07	0.94	21.398		
300.00	300.00	300.00	300.00	0.53	0.53	-96.48	-2.26	-19.88	20.01	18.94	1.07	18.701		
330.00	330.00	330.08	330.08	0.60	0.60	-96.89	-2.39	-19.80	19.94	18.75	1.20	16.645		
360.00	360.00	360.16	360.16	0.67	0.66	-98.15	-2.80	-19.56	19.76	18.43	1.33	14.896		
390.00	390.00	390.23	390.21	0.74	0.72	-100.30	-3.48	-19.16	19.47	18.02	1.45	13.385		
420.00	420.00	420.27	420.24	0.80	0.78	-103.41	-4.43	-18.60	19.12	17.54	1.58	12.079		
450.00	450.00	450.29	450.22	0.87	0.84	-107.55	-5.65	-17.88	18.76	17.04	1.71	10.961		
480.00	480.00	480.28	480.16	0.93	0.90	-112.35	-7.15	-17.00	18.51	16.68	1.83	10.115		
497.08	497.08	497.35	497.20	0.97	0.94	-115.16	-8.11	-16.43	18.48	16.58	1.90	9.731 CC		
510.00	510.00	510.26	510.07	0.99	0.96	-117.31	-8.90	-15.97	18.50	16.54	1.95	9.468 ES		
540.00	539.99	540.22	539.94	1.05	1.03	-122.26	-10.93	-14.77	18.71	16.63	2.08	8.997		
570.00	569.96	570.16	569.76	1.11	1.10	-127.06	-13.23	-13.42	19.16	16.96	2.21	8.681		
600.00	599.93	600.08	599.53	1.17	1.17	-131.59	-15.79	-11.92	19.84	17.50	2.34	8.491		
630.00	629.88	630.01	629.28	1.23	1.25	-135.65	-18.59	-10.27	20.71	18.24	2.48	8.369		
660.00	659.81	659.97	659.07	1.29	1.33	-138.67	-21.42	-8.61	21.69	19.08	2.62	8.293		
690.00	689.74	689.94	688.85	1.36	1.41	-141.21	-24.25	-6.94	22.72	19.96	2.76	8.238		
720.00	719.66	719.90	718.64	1.42	1.49	-143.54	-27.08	-5.27	23.79	20.89	2.90	8.194		
750.00	749.59	749.87	748.42	1.49	1.58	-145.66	-29.91	-3.61	24.90	21.85	3.05	8.165		
780.00	779.52	779.84	778.21	1.56	1.66	-147.59	-32.74	-1.94	26.04	22.84	3.20	8.147		
810.00	809.44	809.80	807.99	1.63	1.75	-149.37	-35.57	-0.28	27.20	23.86	3.34	8.137		
840.00	839.37	839.77	837.78	1.70	1.83	-151.00	-38.40	1.39	28.39	24.90	3.49	8.133		
870.00	869.29	869.73	867.57	1.77	1.92	-152.49	-41.23	3.05	29.60	25.96	3.64	8.135		
900.00	899.22	899.70	897.35	1.84	2.01	-153.87	-44.06	4.72	30.83	27.04	3.79	8.143		
930.00	929.14	929.67	927.14	1.91	2.09	-155.14	-46.89	6.38	32.08	28.14	3.93	8.152		
960.00	959.07	959.63	956.92	1.99	2.18	-156.32	-49.72	8.05	33.34	29.25	4.08	8.164		
990.00	988.99	989.60	986.71	2.06	2.27	-157.41	-52.55	9.72	34.61	30.38	4.23	8.179		
1,020.00	1,018.92	1,019.56	1,016.49	2.13	2.36	-158.42	-55.38	11.38	35.90	31.52	4.38	8.195		
1,050.00	1,048.85	1,049.53	1,046.28	2.21	2.45	-159.36	-58.21	13.05	37.19	32.66	4.53	8.212		
1,080.00	1,078.77	1,079.50	1,076.06	2.28	2.54	-160.24	-61.04	14.71	38.50	33.82	4.68	8.231		
1,110.00	1,108.70	1,109.46	1,105.85	2.36	2.63	-161.07	-63.87	16.38	39.81	34.98	4.83	8.250		
1,140.00	1,138.62	1,139.43	1,135.63	2.43	2.72	-161.83	-66.70	18.04	41.13	36.16	4.97	8.269		
1,170.00	1,168.55	1,169.39	1,165.42	2.51	2.81	-162.56	-69.53	19.71	42.46	37.34	5.12	8.288		
1,200.00	1,198.47	1,199.36	1,195.21	2.58	2.90	-163.23	-72.36	21.37	43.79	38.52	5.27	8.308		
1,230.00	1,228.40	1,229.33	1,224.99	2.66	2.99	-163.87	-75.19	23.04	45.13	39.71	5.42	8.328		
1,260.00	1,258.33	1,259.29	1,254.78	2.73	3.08	-164.47	-78.02	24.71	46.48	40.91	5.57	8.347		
1,290.00	1,288.25	1,289.26	1,284.56	2.81	3.17	-165.04	-80.85	26.37	47.83	42.11	5.72	8.367		
1,320.00	1,318.18	1,319.22	1,314.35	2.89	3.26	-165.57	-83.68	28.04	49.18	43.32	5.87	8.386		
1,350.00	1,348.10	1,349.19	1,344.13	2.96	3.35	-166.08	-86.51	29.70	50.54	44.53	6.01	8.405		
1,380.00	1,378.03	1,379.15	1,373.92	3.04	3.44	-166.56	-89.34	31.37	51.91	45.74	6.16	8.423		
1,410.00	1,407.95	1,409.12	1,403.70	3.12	3.53	-167.02	-92.17	33.03	53.27	46.96	6.31	8.441		
1,440.00	1,437.88	1,439.09	1,433.49	3.19	3.62	-167.45	-95.00	34.70	54.64	48.18	6.46	8.459		
1,470.00	1,467.80	1,469.05	1,463.27	3.27	3.71	-167.86	-97.83	36.36	56.01	49.41	6.61	8.477		
1,500.00	1,497.73	1,499.02	1,493.06	3.35	3.80	-168.26	-100.66	38.03	57.39	50.63	6.76	8.494		

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





# Archer

## Anticollision Report



<b>Company:</b>	Piceance Energy, LLC	<b>Local Co-ordinate Reference:</b>	Well Gunderson 29-11E
<b>Project:</b>	Mesa County, CO	<b>TVD Reference:</b>	WELL @ 7560.00usft (Original Well Elev)
<b>Reference Site:</b>	Gunderson	<b>MD Reference:</b>	WELL @ 7560.00usft (Original Well Elev)
<b>Site Error:</b>	0.00 usft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Gunderson 29-11E	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.00 usft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	Wellbore #1	<b>Database:</b>	EDMDBBW
<b>Reference Design:</b>	Design #1	<b>Offset TVD Reference:</b>	Reference Datum

Offset Design Gunderson - Gunderson 29-12E - Wellbore #1 - Design #1													Offset Site Error:	0.00 usft
Survey Program: 0-MWD													Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis			Distance						Warning	
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Azimuth from North (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor		
1,530.00	1,527.66	1,528.98	1,522.85	3.42	3.90	-168.63	-103.49	39.70	58.77	51.86	6.90	8.511		
1,560.00	1,557.58	1,558.95	1,552.63	3.50	3.99	-168.99	-106.32	41.36	60.15	53.09	7.05	8.527		
1,590.00	1,587.51	1,588.92	1,582.42	3.58	4.08	-169.33	-109.15	43.03	61.53	54.33	7.20	8.543		
1,620.00	1,617.43	1,618.88	1,612.20	3.65	4.17	-169.65	-111.98	44.69	62.91	55.56	7.35	8.559		
1,650.00	1,647.36	1,648.85	1,641.99	3.73	4.26	-169.97	-114.81	46.36	64.30	56.80	7.50	8.574		
1,680.00	1,677.28	1,678.81	1,671.77	3.81	4.35	-170.26	-117.64	48.02	65.69	58.04	7.65	8.589		
1,710.00	1,707.21	1,708.78	1,701.56	3.89	4.44	-170.55	-120.47	49.69	67.08	59.28	7.80	8.604		
1,740.00	1,737.14	1,738.75	1,731.34	3.96	4.54	-170.83	-123.30	51.35	68.47	60.52	7.94	8.618		
1,770.00	1,767.06	1,768.71	1,761.13	4.04	4.63	-171.09	-126.13	53.02	69.86	61.77	8.09	8.632		
1,800.00	1,796.99	1,798.68	1,790.92	4.12	4.72	-171.34	-128.96	54.69	71.25	63.01	8.24	8.646		
1,830.00	1,826.91	1,828.64	1,820.70	4.20	4.81	-171.59	-131.79	56.35	72.65	64.26	8.39	8.659		
1,860.00	1,856.84	1,858.61	1,850.49	4.27	4.90	-171.82	-134.62	58.02	74.05	65.51	8.54	8.672		
1,890.00	1,886.76	1,888.58	1,880.27	4.35	4.99	-172.05	-137.45	59.68	75.45	66.76	8.69	8.685		
1,920.00	1,916.69	1,918.54	1,910.06	4.43	5.09	-172.26	-140.28	61.35	76.84	68.01	8.84	8.697		
1,950.00	1,946.61	1,948.51	1,939.84	4.51	5.18	-172.47	-143.11	63.01	78.24	69.26	8.98	8.709		
1,980.00	1,976.54	1,978.47	1,969.63	4.59	5.27	-172.68	-145.94	64.68	79.65	70.51	9.13	8.721		
2,010.00	2,006.47	2,008.44	1,999.41	4.66	5.36	-172.87	-148.77	66.34	81.05	71.77	9.28	8.732		
2,040.00	2,036.39	2,038.41	2,029.20	4.74	5.45	-173.06	-151.60	68.01	82.45	73.02	9.43	8.744		
2,070.00	2,066.32	2,068.37	2,058.98	4.82	5.54	-173.24	-154.43	69.68	83.86	74.28	9.58	8.755		
2,100.00	2,096.24	2,098.34	2,088.77	4.90	5.64	-173.42	-157.26	71.34	85.26	75.53	9.73	8.765		
2,130.00	2,126.17	2,128.30	2,118.56	4.97	5.73	-173.59	-160.09	73.01	86.67	76.79	9.88	8.776		
2,160.00	2,156.09	2,158.27	2,148.34	5.05	5.82	-173.76	-162.92	74.67	88.07	78.05	10.02	8.786		
2,190.00	2,186.02	2,188.24	2,178.13	5.13	5.91	-173.92	-165.75	76.34	89.48	79.31	10.17	8.796		
2,220.00	2,215.95	2,218.20	2,207.91	5.21	6.00	-174.07	-168.58	78.00	90.89	80.57	10.32	8.806		
2,250.00	2,245.87	2,248.17	2,237.70	5.29	6.10	-174.22	-171.41	79.67	92.30	81.83	10.47	8.815		
2,280.00	2,275.80	2,278.13	2,267.48	5.37	6.19	-174.37	-174.24	81.33	93.70	83.09	10.62	8.825		
2,310.00	2,305.72	2,308.10	2,297.27	5.44	6.28	-174.51	-177.07	83.00	95.11	84.35	10.77	8.834		
2,340.00	2,335.65	2,338.07	2,327.05	5.52	6.37	-174.65	-179.90	84.67	96.52	85.61	10.92	8.843		
2,370.00	2,365.57	2,368.03	2,356.84	5.60	6.47	-174.78	-182.73	86.33	97.93	86.87	11.06	8.852		
2,400.00	2,395.50	2,398.00	2,386.62	5.68	6.56	-174.91	-185.56	88.00	99.35	88.13	11.21	8.860		
2,430.00	2,425.42	2,427.96	2,416.41	5.76	6.65	-175.04	-188.39	89.66	100.76	89.40	11.36	8.868		
2,460.00	2,455.35	2,457.93	2,446.20	5.83	6.74	-175.16	-191.22	91.33	102.17	90.66	11.51	8.877		
2,490.00	2,485.28	2,487.90	2,475.98	5.91	6.83	-175.28	-194.05	92.99	103.58	91.92	11.66	8.885		
2,520.00	2,515.20	2,517.86	2,505.77	5.99	6.93	-175.40	-196.88	94.66	105.00	93.19	11.81	8.892		
2,550.00	2,545.13	2,547.83	2,535.55	6.07	7.02	-175.51	-199.71	96.32	106.41	94.45	11.96	8.900		
2,580.00	2,575.05	2,577.79	2,565.34	6.15	7.11	-175.62	-202.54	97.99	107.82	95.72	12.10	8.908		
2,610.00	2,604.98	2,607.76	2,595.12	6.23	7.20	-175.73	-205.37	99.66	109.24	96.98	12.25	8.915		
2,640.00	2,634.90	2,637.73	2,624.91	6.30	7.29	-175.83	-208.20	101.32	110.65	98.25	12.40	8.922		
2,670.00	2,664.83	2,667.69	2,654.69	6.38	7.39	-175.93	-211.03	102.99	112.07	99.52	12.55	8.929		
2,700.00	2,694.76	2,697.66	2,684.48	6.46	7.48	-176.03	-213.86	104.65	113.48	100.78	12.70	8.936		
2,730.00	2,724.68	2,727.62	2,714.27	6.54	7.57	-176.13	-216.69	106.32	114.90	102.05	12.85	8.943		
2,760.00	2,754.61	2,757.59	2,744.05	6.62	7.66	-176.22	-219.52	107.98	116.31	103.32	13.00	8.950		
2,790.00	2,784.53	2,787.56	2,773.84	6.70	7.76	-176.32	-222.35	109.65	117.73	104.58	13.14	8.956		
2,820.00	2,814.46	2,817.52	2,803.62	6.77	7.85	-176.41	-225.18	111.32	119.15	105.85	13.29	8.963		
2,850.00	2,844.38	2,847.49	2,833.41	6.85	7.94	-176.49	-228.01	112.98	120.56	107.12	13.44	8.969		
2,880.00	2,874.31	2,877.45	2,863.19	6.93	8.03	-176.58	-230.84	114.65	121.98	108.39	13.59	8.975		
2,910.00	2,904.23	2,907.42	2,892.98	7.01	8.13	-176.66	-233.67	116.31	123.40	109.66	13.74	8.981		
2,940.00	2,934.16	2,937.38	2,922.76	7.09	8.22	-176.75	-236.50	117.98	124.82	110.93	13.89	8.987		
2,970.00	2,964.09	2,967.35	2,952.55	7.17	8.31	-176.83	-239.33	119.64	126.23	112.20	14.04	8.993		
3,000.00	2,994.01	2,997.32	2,982.33	7.24	8.40	-176.90	-242.16	121.31	127.65	113.47	14.19	8.999		
3,030.00	3,023.94	3,027.28	3,012.12	7.32	8.49	-176.98	-244.99	122.97	129.07	114.74	14.33	9.004		
3,060.00	3,053.86	3,057.25	3,041.91	7.40	8.59	-177.06	-247.82	124.64	130.49	116.01	14.48	9.010		

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



# Archer

## Anticollision Report



<b>Company:</b>	Piceance Energy, LLC	<b>Local Co-ordinate Reference:</b>	Well Gunderson 29-11E
<b>Project:</b>	Mesa County, CO	<b>TVD Reference:</b>	WELL @ 7560.00usft (Original Well Elev)
<b>Reference Site:</b>	Gunderson	<b>MD Reference:</b>	WELL @ 7560.00usft (Original Well Elev)
<b>Site Error:</b>	0.00 usft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Gunderson 29-11E	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.00 usft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	Wellbore #1	<b>Database:</b>	EDMDBBW
<b>Reference Design:</b>	Design #1	<b>Offset TVD Reference:</b>	Reference Datum

Offset Design Gunderson - Gunderson 29-12E - Wellbore #1 - Design #1													Offset Site Error:	0.00 usft
Survey Program: 0-MWD													Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis			Distance							Warning
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Azimuth from North (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor		
3,090.00	3,083.79	3,087.21	3,071.69	7.48	8.68	-177.13	-250.65	126.31	131.91	117.28	14.63	9.015		
3,120.00	3,113.71	3,117.18	3,101.48	7.56	8.77	-177.20	-253.48	127.97	133.33	118.55	14.78	9.021		
3,150.00	3,143.64	3,147.15	3,131.26	7.64	8.86	-177.27	-256.31	129.64	134.75	119.82	14.93	9.026		
3,180.00	3,173.56	3,177.11	3,161.05	7.72	8.96	-177.34	-259.15	131.30	136.16	121.09	15.08	9.031		
3,210.00	3,203.49	3,207.08	3,190.83	7.79	9.05	-177.41	-261.98	132.97	137.58	122.36	15.23	9.036		
3,240.00	3,233.42	3,237.04	3,220.62	7.87	9.14	-177.47	-264.81	134.63	139.00	123.63	15.37	9.041		
3,270.00	3,263.34	3,267.01	3,250.40	7.95	9.23	-177.54	-267.64	136.30	140.42	124.90	15.52	9.046		
3,300.00	3,293.27	3,296.98	3,280.19	8.03	9.33	-177.60	-270.47	137.96	141.84	126.17	15.67	9.051		
3,330.00	3,323.19	3,326.94	3,309.97	8.11	9.42	-177.66	-273.30	139.63	143.26	127.44	15.82	9.055		
3,360.00	3,353.12	3,356.91	3,339.76	8.19	9.51	-177.73	-276.13	141.30	144.69	128.72	15.97	9.060		
3,390.00	3,383.04	3,386.87	3,369.55	8.26	9.60	-177.79	-278.96	142.96	146.11	129.99	16.12	9.065		
3,420.00	3,412.97	3,416.84	3,399.33	8.34	9.70	-177.84	-281.79	144.63	147.53	131.26	16.27	9.069		
3,450.00	3,442.90	3,446.81	3,429.12	8.42	9.79	-177.90	-284.62	146.29	148.95	132.53	16.42	9.074		
3,480.00	3,472.82	3,476.77	3,458.90	8.50	9.88	-177.96	-287.45	147.96	150.37	133.80	16.56	9.078		
3,510.00	3,502.75	3,506.74	3,488.69	8.58	9.97	-178.01	-290.28	149.62	151.79	135.08	16.71	9.082		
3,540.00	3,532.67	3,536.70	3,518.47	8.66	10.06	-178.07	-293.11	151.29	153.21	136.35	16.86	9.086		
3,570.00	3,562.60	3,566.67	3,548.26	8.74	10.16	-178.12	-295.94	152.95	154.63	137.62	17.01	9.091		
3,600.00	3,592.52	3,596.64	3,578.04	8.81	10.25	-178.17	-298.77	154.62	156.05	138.90	17.16	9.095		
3,630.00	3,622.45	3,626.60	3,607.83	8.89	10.34	-178.22	-301.60	156.29	157.48	140.17	17.31	9.099		
3,660.00	3,652.37	3,656.57	3,637.62	8.97	10.43	-178.28	-304.43	157.95	158.90	141.44	17.46	9.103		
3,690.00	3,682.30	3,686.53	3,667.40	9.05	10.53	-178.32	-307.26	159.62	160.32	142.72	17.61	9.106		
3,720.00	3,712.23	3,716.50	3,697.19	9.13	10.62	-178.37	-310.09	161.28	161.74	143.99	17.75	9.110		
3,750.00	3,742.15	3,746.47	3,726.97	9.21	10.71	-178.42	-312.92	162.95	163.16	145.26	17.90	9.114		
3,780.00	3,772.08	3,776.43	3,756.76	9.29	10.80	-178.47	-315.75	164.61	164.59	146.54	18.05	9.118		
3,810.00	3,802.00	3,806.40	3,786.54	9.37	10.90	-178.51	-318.58	166.28	166.01	147.81	18.20	9.121		
3,840.00	3,831.93	3,836.36	3,816.33	9.44	10.99	-178.56	-321.41	167.94	167.43	149.08	18.35	9.125		
3,870.00	3,861.85	3,866.33	3,846.11	9.52	11.08	-178.61	-324.24	169.61	168.86	150.36	18.50	9.129		
3,900.00	3,891.78	3,896.30	3,875.90	9.60	11.17	-178.65	-327.07	171.28	170.28	151.63	18.65	9.132		
3,930.00	3,921.71	3,926.26	3,905.68	9.68	11.27	-178.69	-329.90	172.94	171.70	152.91	18.79	9.135		
3,960.00	3,951.63	3,956.23	3,935.47	9.76	11.36	-178.73	-332.73	174.61	173.12	154.18	18.94	9.139		
3,990.00	3,981.56	3,986.19	3,965.26	9.84	11.45	-178.78	-335.56	176.27	174.55	155.45	19.09	9.142		
4,020.00	4,011.48	4,016.16	3,995.04	9.92	11.54	-178.82	-338.39	177.94	175.97	156.73	19.24	9.146		
4,050.00	4,041.41	4,046.13	4,024.83	9.99	11.64	-178.86	-341.22	179.60	177.39	158.00	19.39	9.149		
4,080.00	4,071.33	4,076.09	4,054.61	10.07	11.73	-178.90	-344.05	181.27	178.82	159.28	19.54	9.152		
4,110.00	4,101.26	4,106.06	4,084.40	10.15	11.82	-178.94	-346.88	182.93	180.24	160.55	19.69	9.155		
4,140.00	4,131.18	4,136.02	4,114.18	10.23	11.91	-178.98	-349.71	184.60	181.66	161.83	19.84	9.158		
4,170.00	4,161.11	4,165.99	4,143.97	10.31	12.01	-179.01	-352.54	186.27	183.09	163.10	19.98	9.161		
4,200.00	4,191.04	4,195.96	4,173.75	10.39	12.10	-179.05	-355.37	187.93	184.51	164.38	20.13	9.164		
4,230.00	4,220.96	4,225.92	4,203.54	10.47	12.19	-179.09	-358.20	189.60	185.93	165.65	20.28	9.167		
4,260.00	4,250.89	4,255.89	4,233.32	10.54	12.28	-179.12	-361.03	191.26	187.36	166.93	20.43	9.170		
4,290.00	4,280.81	4,285.85	4,263.11	10.62	12.38	-179.16	-363.86	192.93	188.78	168.20	20.58	9.173		
4,320.00	4,310.74	4,315.82	4,292.90	10.70	12.47	-179.20	-366.69	194.59	190.21	169.48	20.73	9.176		
4,350.00	4,340.66	4,345.79	4,322.68	10.78	12.56	-179.23	-369.52	196.26	191.63	170.75	20.88	9.179		
4,380.00	4,370.59	4,375.75	4,352.47	10.86	12.65	-179.26	-372.35	197.92	193.05	172.03	21.03	9.182		
4,410.00	4,400.52	4,405.72	4,382.25	10.94	12.75	-179.30	-375.18	199.59	194.48	173.30	21.17	9.184		
4,440.00	4,430.44	4,435.68	4,412.04	11.02	12.84	-179.33	-378.01	201.26	195.90	174.58	21.32	9.187		
4,470.00	4,460.37	4,465.65	4,441.82	11.10	12.93	-179.36	-380.84	202.92	197.33	175.86	21.47	9.190		
4,500.00	4,490.29	4,495.61	4,471.61	11.17	13.02	-179.40	-383.67	204.59	198.75	177.13	21.62	9.193		
4,530.00	4,520.22	4,525.58	4,501.39	11.25	13.12	-179.43	-386.50	206.25	200.18	178.41	21.77	9.195		
4,560.00	4,550.14	4,555.55	4,531.18	11.33	13.21	-179.46	-389.33	207.92	201.60	179.68	21.92	9.198		
4,590.00	4,580.07	4,585.51	4,560.97	11.41	13.30	-179.49	-392.16	209.58	203.03	180.96	22.07	9.200		
4,620.00	4,609.99	4,615.48	4,590.75	11.49	13.39	-179.52	-394.99	211.25	204.45	182.23	22.22	9.203		

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





# Archer

## Anticollision Report



<b>Company:</b>	Piceance Energy, LLC	<b>Local Co-ordinate Reference:</b>	Well Gunderson 29-11E
<b>Project:</b>	Mesa County, CO	<b>TVD Reference:</b>	WELL @ 7560.00usft (Original Well Elev)
<b>Reference Site:</b>	Gunderson	<b>MD Reference:</b>	WELL @ 7560.00usft (Original Well Elev)
<b>Site Error:</b>	0.00 usft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Gunderson 29-11E	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.00 usft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	Wellbore #1	<b>Database:</b>	EDMDBBW
<b>Reference Design:</b>	Design #1	<b>Offset TVD Reference:</b>	Reference Datum

Offset Design Gunderson - Gunderson 29-12E - Wellbore #1 - Design #1													Offset Site Error:	0.00 usft
Survey Program: 0-MWD													Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis			Distance							Warning
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Azimuth from North (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor		
4,650.00	4,639.92	4,645.44	4,620.54	11.57	13.49	-179.55	-397.82	212.91	205.87	183.51	22.36	9.205		
4,680.00	4,669.85	4,675.41	4,650.32	11.65	13.58	-179.58	-400.65	214.58	207.30	184.79	22.51	9.208		
4,710.00	4,699.77	4,705.38	4,680.11	11.73	13.67	-179.61	-403.48	216.25	208.72	186.06	22.66	9.210		
4,740.00	4,729.70	4,735.34	4,709.89	11.80	13.76	-179.64	-406.31	217.91	210.15	187.34	22.81	9.213		
4,770.00	4,759.62	4,765.31	4,739.68	11.88	13.86	-179.67	-409.14	219.58	211.57	188.61	22.96	9.215		
4,800.00	4,789.55	4,795.27	4,769.46	11.96	13.95	-179.69	-411.97	221.24	213.00	189.89	23.11	9.217		
4,830.00	4,819.47	4,825.24	4,799.25	12.04	14.04	-179.72	-414.80	222.91	214.42	191.17	23.26	9.220		
4,860.00	4,849.40	4,855.21	4,829.03	12.12	14.13	-179.75	-417.63	224.57	215.85	192.44	23.41	9.222		
4,890.00	4,879.33	4,885.17	4,858.82	12.20	14.23	-179.78	-420.46	226.24	217.27	193.72	23.55	9.224		
4,920.00	4,909.25	4,915.14	4,888.61	12.28	14.32	-179.80	-423.29	227.90	218.70	195.00	23.70	9.226		
4,950.00	4,939.18	4,945.10	4,918.39	12.35	14.41	-179.83	-426.12	229.57	220.12	196.27	23.85	9.229		
4,980.00	4,969.10	4,975.07	4,948.18	12.43	14.50	-179.86	-428.95	231.24	221.55	197.55	24.00	9.231		
5,010.00	4,999.03	5,005.04	4,977.96	12.51	14.60	-179.88	-431.78	232.90	222.97	198.82	24.15	9.233		
5,040.00	5,028.95	5,035.00	5,007.75	12.59	14.69	-179.91	-434.61	234.57	224.40	200.10	24.30	9.235		
5,070.00	5,058.88	5,064.97	5,037.53	12.67	14.78	-179.93	-437.44	236.23	225.83	201.38	24.45	9.237		
5,100.00	5,088.80	5,094.93	5,067.32	12.75	14.87	-179.96	-440.27	237.90	227.25	202.65	24.60	9.239		
5,130.00	5,118.73	5,124.90	5,097.10	12.83	14.97	-179.98	-443.10	239.56	228.68	203.93	24.75	9.241		
5,160.00	5,148.66	5,154.87	5,126.89	12.91	15.06	180.00	-445.93	241.23	230.10	205.21	24.89	9.243		
5,190.00	5,178.58	5,184.83	5,156.68	12.98	15.15	179.97	-448.76	242.89	231.53	206.48	25.04	9.245		
5,220.00	5,208.51	5,214.80	5,186.46	13.06	15.24	179.95	-451.59	244.56	232.95	207.76	25.19	9.247		
5,250.00	5,238.43	5,244.76	5,216.25	13.14	15.34	179.93	-454.42	246.23	234.38	209.04	25.34	9.249		
5,280.00	5,268.36	5,274.73	5,246.03	13.22	15.43	179.90	-457.25	247.89	235.80	210.32	25.49	9.251		
5,310.00	5,298.28	5,304.70	5,275.82	13.30	15.52	179.88	-460.08	249.56	237.23	211.59	25.64	9.253		
5,340.00	5,328.21	5,334.66	5,305.60	13.38	15.61	179.86	-462.91	251.22	238.66	212.87	25.79	9.255		
5,370.00	5,358.14	5,364.63	5,335.39	13.46	15.71	179.84	-465.74	252.89	240.08	214.15	25.94	9.257		
5,400.00	5,388.06	5,394.59	5,365.17	13.54	15.80	179.81	-468.57	254.55	241.51	215.42	26.08	9.259		
5,430.00	5,417.99	5,424.56	5,394.96	13.61	15.89	179.79	-471.40	256.22	242.93	216.70	26.23	9.261		
5,460.00	5,447.91	5,455.22	5,425.44	13.69	15.98	179.76	-474.29	257.92	244.35	217.97	26.38	9.262		
5,490.00	5,477.84	5,487.59	5,457.64	13.77	16.06	179.75	-477.10	259.57	245.54	219.01	26.53	9.256		
5,520.00	5,507.76	5,519.98	5,489.91	13.85	16.13	179.77	-479.59	261.04	246.44	219.77	26.67	9.240		
5,550.00	5,537.69	5,552.39	5,522.21	13.93	16.19	179.83	-481.78	262.32	247.06	220.25	26.81	9.216		
5,580.00	5,567.63	5,584.80	5,554.55	13.99	16.26	179.90	-483.64	263.42	247.55	220.61	26.94	9.190		
5,610.00	5,597.59	5,617.21	5,586.91	14.05	16.31	179.95	-485.20	264.34	247.95	220.89	27.06	9.164		
5,640.00	5,627.57	5,649.63	5,619.30	14.10	16.36	180.00	-486.43	265.06	248.27	221.11	27.16	9.140		
5,670.00	5,657.55	5,682.05	5,651.70	14.15	16.42	-179.97	-487.36	265.61	248.51	221.25	27.27	9.113		
5,700.00	5,687.55	5,714.47	5,684.12	14.21	16.47	-179.95	-487.96	265.96	248.67	221.30	27.37	9.084		
5,730.00	5,717.55	5,746.90	5,716.54	14.26	16.52	-179.94	-488.25	266.13	248.75	221.27	27.48	9.052		
5,760.00	5,747.55	5,777.91	5,747.55	14.31	16.57	-179.94	-488.28	266.15	248.76	221.17	27.59	9.018		
5,790.00	5,777.55	5,807.91	5,777.55	14.36	16.61	-179.94	-488.28	266.15	248.76	221.06	27.69	8.983		
5,820.00	5,807.55	5,837.91	5,807.55	14.41	16.65	-179.94	-488.28	266.15	248.76	220.96	27.79	8.950		
5,850.00	5,837.55	5,867.91	5,837.55	14.46	16.69	-179.94	-488.28	266.15	248.76	220.86	27.89	8.918		
5,880.00	5,867.55	5,897.91	5,867.55	14.51	16.73	-179.94	-488.28	266.15	248.76	220.76	27.99	8.886		
5,910.00	5,897.55	5,927.91	5,897.55	14.56	16.77	-179.94	-488.28	266.15	248.76	220.66	28.10	8.854		
5,940.00	5,927.55	5,957.91	5,927.55	14.61	16.81	-179.94	-488.28	266.15	248.76	220.56	28.20	8.822		
5,970.00	5,957.55	5,987.91	5,957.55	14.66	16.85	-179.94	-488.28	266.15	248.76	220.46	28.30	8.790		
6,000.00	5,987.55	6,017.91	5,987.55	14.71	16.89	-179.94	-488.28	266.15	248.76	220.36	28.40	8.759		
6,030.00	6,017.55	6,047.91	6,017.55	14.76	16.94	-179.94	-488.28	266.15	248.76	220.25	28.50	8.728		
6,060.00	6,047.55	6,077.91	6,047.55	14.81	16.98	-179.94	-488.28	266.15	248.76	220.15	28.60	8.696		
6,090.00	6,077.55	6,107.91	6,077.55	14.86	17.02	-179.94	-488.28	266.15	248.76	220.05	28.71	8.665		
6,120.00	6,107.55	6,137.91	6,107.55	14.91	17.06	-179.94	-488.28	266.15	248.76	219.95	28.81	8.634		
6,150.00	6,137.55	6,167.91	6,137.55	14.96	17.10	-179.94	-488.28	266.15	248.76	219.84	28.91	8.604		
6,180.00	6,167.55	6,197.91	6,167.55	15.01	17.15	-179.94	-488.28	266.15	248.76	219.74	29.02	8.573		

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 Gunderson 29-11E
Project:	Mesa County, CO	TVD Reference:	WELL @ 7560.00usft (Original Well Elev)
Reference Site:	Gunderson	MD Reference:	WELL @ 7560.00usft (Original Well Elev)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Gunderson 29-11E	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	EDMDBBW
Reference Design:	Design #1	Offset TVD Reference:	Reference Datum

Offset Design Gunderson - Gunderson 29-12E - Wellbore #1 - Design #1													Offset Site Error:	0.00 usft
Survey Program: 0-MWD													Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis			Distance							Warning
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Azimuth from North (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor		
6,210.00	6,197.55	6,227.91	6,197.55	15.06	17.19	-179.94	-488.28	266.15	248.76	219.64	29.12	8.543		
6,240.00	6,227.55	6,257.91	6,227.55	15.11	17.23	-179.94	-488.28	266.15	248.76	219.53	29.22	8.512		
6,270.00	6,257.55	6,287.91	6,257.55	15.16	17.27	-179.94	-488.28	266.15	248.76	219.43	29.33	8.482		
6,300.00	6,287.55	6,317.91	6,287.55	15.21	17.32	-179.94	-488.28	266.15	248.76	219.32	29.43	8.452		
6,330.00	6,317.55	6,347.91	6,317.55	15.26	17.36	-179.94	-488.28	266.15	248.76	219.22	29.54	8.422		
6,360.00	6,347.55	6,377.91	6,347.55	15.31	17.40	-179.94	-488.28	266.15	248.76	219.11	29.64	8.392		
6,390.00	6,377.55	6,407.91	6,377.55	15.36	17.45	-179.94	-488.28	266.15	248.76	219.01	29.75	8.363		
6,420.00	6,407.55	6,437.91	6,407.55	15.41	17.49	-179.94	-488.28	266.15	248.76	218.90	29.85	8.333		
6,450.00	6,437.55	6,467.91	6,437.55	15.47	17.53	-179.94	-488.28	266.15	248.76	218.80	29.96	8.304		
6,480.00	6,467.55	6,497.91	6,467.55	15.52	17.58	-179.94	-488.28	266.15	248.76	218.69	30.06	8.274		
6,510.00	6,497.55	6,527.91	6,497.55	15.57	17.62	-179.94	-488.28	266.15	248.76	218.59	30.17	8.245		
6,540.00	6,527.55	6,557.91	6,527.55	15.62	17.66	-179.94	-488.28	266.15	248.76	218.48	30.28	8.216		
6,570.00	6,557.55	6,587.91	6,557.55	15.67	17.71	-179.94	-488.28	266.15	248.76	218.37	30.38	8.188		
6,600.00	6,587.55	6,617.91	6,587.55	15.72	17.75	-179.94	-488.28	266.15	248.76	218.27	30.49	8.159		
6,630.00	6,617.55	6,647.91	6,617.55	15.78	17.80	-179.94	-488.28	266.15	248.76	218.16	30.60	8.130		
6,660.00	6,647.55	6,677.91	6,647.55	15.83	17.84	-179.94	-488.28	266.15	248.76	218.05	30.70	8.102		
6,690.00	6,677.55	6,707.91	6,677.55	15.88	17.89	-179.94	-488.28	266.15	248.76	217.95	30.81	8.074		
6,720.00	6,707.55	6,737.91	6,707.55	15.93	17.93	-179.94	-488.28	266.15	248.76	217.84	30.92	8.046		
6,750.00	6,737.55	6,767.91	6,737.55	15.99	17.98	-179.94	-488.28	266.15	248.76	217.73	31.03	8.018		
6,780.00	6,767.55	6,797.91	6,767.55	16.04	18.02	-179.94	-488.28	266.15	248.76	217.62	31.13	7.990		
6,810.00	6,797.55	6,827.91	6,797.55	16.09	18.07	-179.94	-488.28	266.15	248.76	217.51	31.24	7.962		
6,840.00	6,827.55	6,857.91	6,827.55	16.15	18.11	-179.94	-488.28	266.15	248.76	217.41	31.35	7.935		
6,870.00	6,857.55	6,887.91	6,857.55	16.20	18.16	-179.94	-488.28	266.15	248.76	217.30	31.46	7.907		
6,900.00	6,887.55	6,917.91	6,887.55	16.25	18.20	-179.94	-488.28	266.15	248.76	217.19	31.57	7.880		
6,930.00	6,917.55	6,947.91	6,917.55	16.31	18.25	-179.94	-488.28	266.15	248.76	217.08	31.68	7.853		
6,960.00	6,947.55	6,977.91	6,947.55	16.36	18.30	-179.94	-488.28	266.15	248.76	216.97	31.79	7.826		
6,990.00	6,977.55	7,007.91	6,977.55	16.41	18.34	-179.94	-488.28	266.15	248.76	216.86	31.90	7.799		
7,020.00	7,007.55	7,037.91	7,007.55	16.47	18.39	-179.94	-488.28	266.15	248.76	216.75	32.00	7.772		
7,050.00	7,037.55	7,067.91	7,037.55	16.52	18.44	-179.94	-488.28	266.15	248.76	216.64	32.11	7.746		
7,080.00	7,067.55	7,097.91	7,067.55	16.57	18.48	-179.94	-488.28	266.15	248.76	216.53	32.22	7.719		
7,110.00	7,097.55	7,127.91	7,097.55	16.63	18.53	-179.94	-488.28	266.15	248.76	216.42	32.33	7.693		
7,140.00	7,127.55	7,157.91	7,127.55	16.68	18.58	-179.94	-488.28	266.15	248.76	216.31	32.45	7.667		
7,170.00	7,157.55	7,187.91	7,157.55	16.74	18.62	-179.94	-488.28	266.15	248.76	216.20	32.56	7.641		
7,200.00	7,187.55	7,217.91	7,187.55	16.79	18.67	-179.94	-488.28	266.15	248.76	216.09	32.67	7.615		
7,230.00	7,217.55	7,247.91	7,217.55	16.84	18.72	-179.94	-488.28	266.15	248.76	215.98	32.78	7.589		
7,260.00	7,247.55	7,277.91	7,247.55	16.90	18.76	-179.94	-488.28	266.15	248.76	215.87	32.89	7.564		
7,290.00	7,277.55	7,307.91	7,277.55	16.95	18.81	-179.94	-488.28	266.15	248.76	215.76	33.00	7.538		
7,320.00	7,307.55	7,337.91	7,307.55	17.01	18.86	-179.94	-488.28	266.15	248.76	215.64	33.11	7.513		
7,350.00	7,337.55	7,367.91	7,337.55	17.06	18.91	-179.94	-488.28	266.15	248.76	215.53	33.22	7.487		
7,380.00	7,367.55	7,397.91	7,367.55	17.12	18.95	-179.94	-488.28	266.15	248.76	215.42	33.33	7.462		
7,410.00	7,397.55	7,427.91	7,397.55	17.17	19.00	-179.94	-488.28	266.15	248.76	215.31	33.45	7.437		
7,440.00	7,427.55	7,457.91	7,427.55	17.23	19.05	-179.94	-488.28	266.15	248.76	215.20	33.56	7.413		
7,470.00	7,457.55	7,487.91	7,457.55	17.28	19.10	-179.94	-488.28	266.15	248.76	215.08	33.67	7.388		
7,500.00	7,487.55	7,517.91	7,487.55	17.34	19.15	-179.94	-488.28	266.15	248.76	214.97	33.78	7.363		
7,530.00	7,517.55	7,547.91	7,517.55	17.39	19.19	-179.94	-488.28	266.15	248.76	214.86	33.90	7.339		
7,560.00	7,547.55	7,577.91	7,547.55	17.45	19.24	-179.94	-488.28	266.15	248.76	214.75	34.01	7.314		
7,590.00	7,577.55	7,607.91	7,577.55	17.50	19.29	-179.94	-488.28	266.15	248.76	214.63	34.12	7.290		
7,620.00	7,607.55	7,637.91	7,607.55	17.56	19.34	-179.94	-488.28	266.15	248.76	214.52	34.23	7.266		
7,650.00	7,637.55	7,667.91	7,637.55	17.61	19.39	-179.94	-488.28	266.15	248.76	214.41	34.35	7.242		
7,680.00	7,667.55	7,697.91	7,667.55	17.67	19.44	-179.94	-488.28	266.15	248.76	214.29	34.46	7.218		
7,692.45	7,680.00	7,710.36	7,680.00	17.69	19.46	-179.94	-488.28	266.15	248.76	214.25	34.51	7.209 SF		

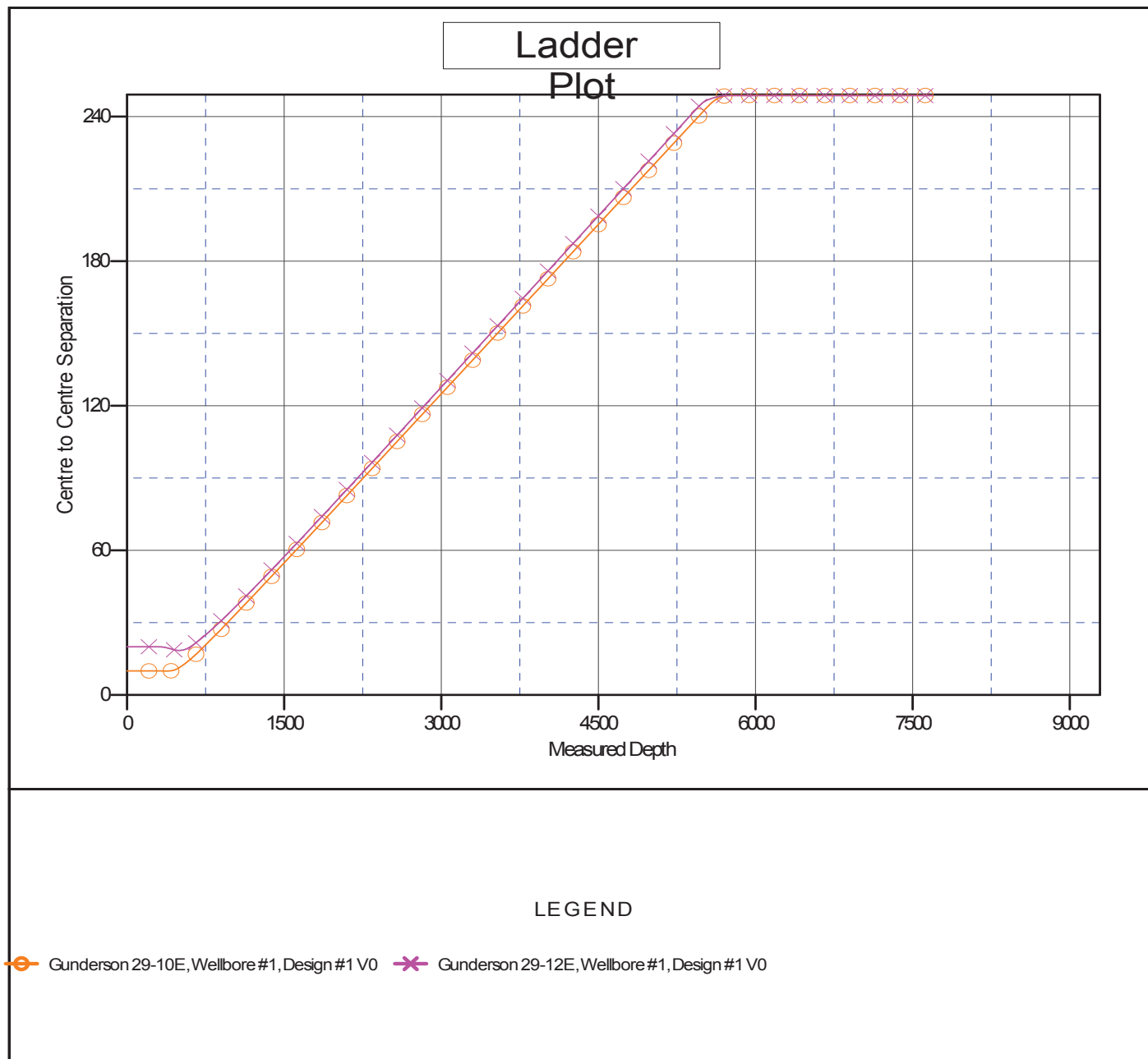
CC - Min centre to center distance or convergent point, SF - min separation factor, ES - min ellipse separation



<b>Company:</b>	Piceance Energy, LLC	<b>Local Co-ordinate Reference:</b>	Well Gunderson 29-11E
<b>Project:</b>	Mesa County, CO	<b>TVD Reference:</b>	WELL @ 7560.00usft (Original Well Elev)
<b>Reference Site:</b>	Gunderson	<b>MD Reference:</b>	WELL @ 7560.00usft (Original Well Elev)
<b>Site Error:</b>	0.00 usft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Gunderson 29-11E	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.00 usft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	Wellbore #1	<b>Database:</b>	EDMDBBW
<b>Reference Design:</b>	Design #1	<b>Offset TVD Reference:</b>	Reference Datum

Reference Depths are relative to WELL @ 7560.00usft (Original Well E  
Offset Depths are relative to Offset Datum  
Central Meridian is -105.500000

Coordinates are relative to: Gunderson 29- 11E  
Coordinate System is US State Plane 1983, Colorado Central Zone  
Grid Convergence at Surface is: -1.44°





<b>Company:</b>	Piceance Energy, LLC	<b>Local Co-ordinate Reference:</b>	Well Gunderson 29-11E
<b>Project:</b>	Mesa County, CO	<b>TVD Reference:</b>	WELL @ 7560.00usft (Original Well Elev)
<b>Reference Site:</b>	Gunderson	<b>MD Reference:</b>	WELL @ 7560.00usft (Original Well Elev)
<b>Site Error:</b>	0.00 usft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Gunderson 29-11E	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.00 usft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	Wellbore #1	<b>Database:</b>	EDMDBBW
<b>Reference Design:</b>	Design #1	<b>Offset TVD Reference:</b>	Reference Datum

Reference Depths are relative to WELL @ 7560.00usft (Original Well E  
Offset Depths are relative to Offset Datum  
Central Meridian is -105.500000

Coordinates are relative to: Gunderson 29- 11E  
Coordinate System is US State Plane 1983, Colorado Central Zone  
Grid Convergence at Surface is: -1.44°

