



Piceance Energy, LLC

**Mesa County, CO
Gunderson
Gunderson 29-09M**

Slot A-3

Survey: Survey #1

Standard Survey Report

20 June, 2015



Project: Mesa County, CO
 Site: Gunderson
 Well: Gunderson 29-09M
 Wellbore: Slot A-3
 Design: Design #1
 Latitude: 39.248808
 Longitude: -107.788150
 Ground Level: 7531.00
 Well @ 7553.00usft

Archer

PROJECT DETAILS: Mesa County, CO

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

REFERENCE INFORMATION

Co-ordinate (NE) Reference: Well Gunderson 29-09M, True North
 Vertical (TVD) Reference: Well @ 7553.00usft
 Section (VS) Reference: Slot - (0.00N, 0.00E)
 Measured Depth Reference: Well @ 7553.00usft
 Calculation Method: Minimum Curvature

WELL DETAILS: Gunderson 29-09M

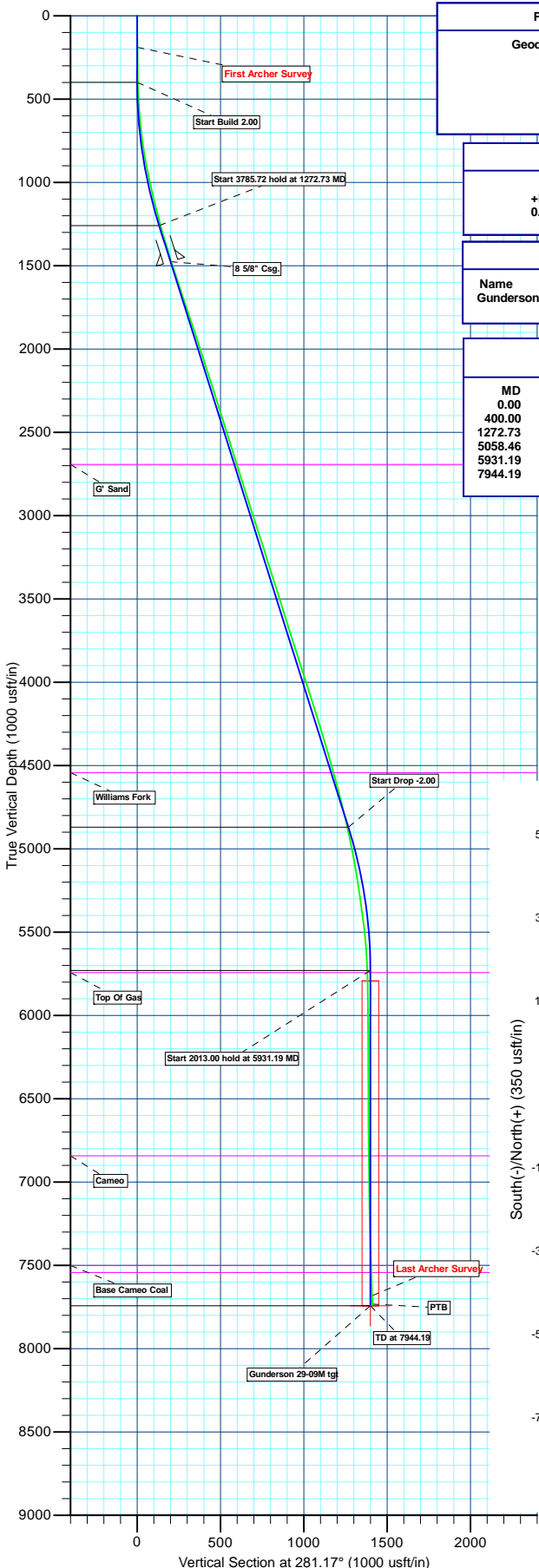
+N/-S	+E/-W	Northing	Ground Level:	7531.00	Latitude	Slot
0.00	0.00	1523672.771	Easting	2352083.809	39.248808	

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

Name	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude	Shape
Gunderson 29-09M tgt	7743.00	271.13	-1372.83	1523978.391	2350718.240	39.249553	-107.792998	Circle (Radius: 50.00)

SECTION DETAILS

MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	V Sect	Annotation
0.00	0.00	0.00	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	Start Build 2.00
1272.73	17.45	281.17	1259.30	25.56	-129.41	2.00	281.17	131.91	Start 3785.72 hold at 1272.73 MD
5058.46	17.45	281.17	4870.70	245.57	-1243.42	0.00	0.00	0.00	Start Drop -2.00
5931.19	0.00	0.00	5730.00	271.13	-1372.83	2.00	180.00	1399.35	Start 2013.00 hold at 5931.19 MD
7944.19	0.00	0.00	7743.00	271.13	-1372.83	0.00	0.00	1399.35	TD at 7944.19

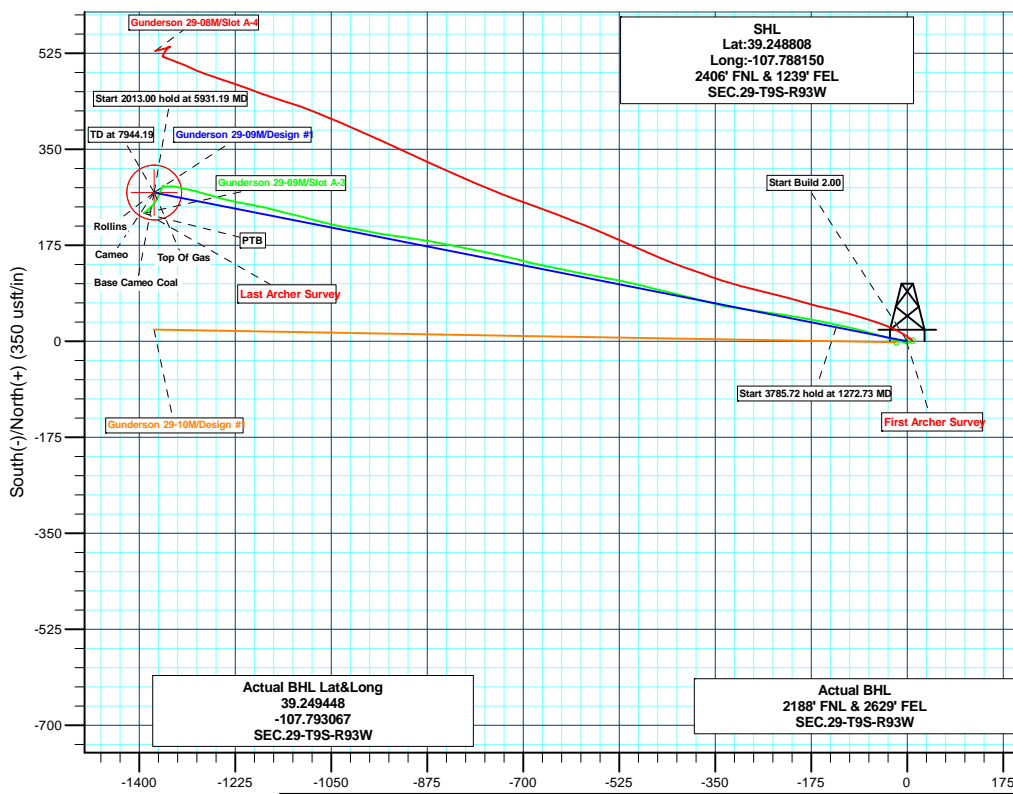


Azimuths to True North
 Magnetic North: 9.80°

Magnetic Field
 Strength: 51797.5snT
 Dip Angle: 65.48°
 Date: 09/30/2014
 Model: IGRF2010

FORMATION TOP DETAILS

TVDPath	MDPath	Formation
2693.00	2775.64	G' Sand
4543.00	4714.93	Williams Fork
5743.00	5944.19	Top Of Gas
6843.00	7044.19	Cameo
7501.00	7702.19	Base Cameo Coal
7543.00	7744.19	Rollins



Plan: Design #1 (Gunderson 29-09M/Slot A-3)

Created By: Ricky Osburn Date: 14:12, August 03 2015



Archer Survey Report

Company: Piceance Energy, LLC	Local Co-ordinate Reference: Well Gunderson 29-09M
Project: Mesa County, CO	TVD Reference: Well @ 7558.0usft
Site: Gunderson	MD Reference: Well @ 7558.0usft
Well: Gunderson 29-09M	North Reference: True
Wellbore: Slot A-3	Survey Calculation Method: Minimum Curvature
Design: Slot A-3	Database: EDMDBBW

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 Gunderson			
Site Position:	Northing: 1,523,671.42 usft	Latitude:	39° 14' 55.692 N
From: Lat/Long	Easting: 2,352,063.75 usft	Longitude:	107° 47' 17.595 W
Position Uncertainty: 0.0 usft	Slot Radius: 13-3/16"	Grid Convergence:	-1.44 °

Well Gunderson 29-09M			
Well Position	+N/-S 0.0 usft	Northing: 1,523,672.77 usft	Latitude: 39° 14' 55.710 N
	+E/-W 0.0 usft	Easting: 2,352,083.81 usft	Longitude: 107° 47' 17.340 W
Position Uncertainty	0.0 usft	Wellhead Elevation: usft	Ground Level: 7,531.0 usft

Wellbore Slot A-3					
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	09/30/14	9.80	65.48	51,797

Design Slot A-3				
Audit Notes:				
Version: 1.0	Phase: ACTUAL	Tie On Depth: 0.0		
Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)	Direction (°)
	0.0	0.0	0.0	282.42

Survey Program		Date 06/20/15
From (usft)	To (usft)	Survey (Wellbore)
200.0	7,939.0	Survey #1 (Slot A-3)
		Tool Name MWD
		Description MWD - Standard

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	
First Archer Survey										
200.0	1.01	241.30	200.0	-0.8	-1.5	1.3	0.50	0.50	0.00	
293.0	0.66	248.69	293.0	-1.4	-2.8	2.4	0.39	-0.38	7.95	
385.0	0.88	261.43	385.0	-1.7	-4.0	3.5	0.30	0.24	13.85	
477.0	3.12	275.93	476.9	-1.6	-7.1	6.6	2.48	2.43	15.76	
569.0	3.52	286.22	568.8	-0.5	-12.3	11.9	0.78	0.43	11.18	
661.0	5.80	282.35	660.4	1.3	-19.6	19.4	2.50	2.48	-4.21	
753.0	7.87	288.06	751.8	4.2	-30.1	30.3	2.37	2.25	6.21	
846.0	10.02	286.66	843.7	8.5	-43.9	44.7	2.32	2.31	-1.51	
938.0	10.72	286.66	934.1	13.2	-59.8	61.3	0.76	0.76	0.00	
1,030.0	13.10	283.93	1,024.2	18.2	-78.1	80.2	2.66	2.59	-2.97	
1,125.0	13.80	284.02	1,116.6	23.5	-99.6	102.3	0.74	0.74	0.09	



Archer

Survey Report

Company:	Piceance Energy, LLC	Local Co-ordinate Reference:	Well Gunderson 29-09M
Project:	Mesa County, CO	TVD Reference:	Well @ 7558.0usft
Site:	Gunderson	MD Reference:	Well @ 7558.0usft
Well:	Gunderson 29-09M	North Reference:	True
Wellbore:	Slot A-3	Survey Calculation Method:	Minimum Curvature
Design:	Slot A-3	Database:	EDMDBBW

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)	
1,220.0	14.68	281.82	1,208.6	28.8	-122.3	125.7	1.09	0.93	-2.32	
1,315.0	15.82	282.26	1,300.3	34.0	-146.8	150.6	1.21	1.20	0.46	
1,409.0	16.70	280.68	1,390.5	39.2	-172.6	177.0	1.05	0.94	-1.68	
1,504.0	17.50	279.45	1,481.3	44.1	-200.1	204.9	0.92	0.84	-1.29	
1,599.0	18.54	278.31	1,571.7	48.6	-229.1	234.2	1.16	1.09	-1.20	
1,694.0	17.71	277.51	1,662.0	52.7	-258.4	263.7	0.91	-0.87	-0.84	
1,789.0	18.81	278.92	1,752.2	56.9	-287.8	293.3	1.25	1.16	1.48	
1,884.0	18.33	278.13	1,842.2	61.4	-317.8	323.5	0.57	-0.51	-0.83	
1,979.0	19.38	284.72	1,932.1	67.5	-347.8	354.2	2.50	1.11	6.94	
2,074.0	18.41	283.93	2,022.0	75.2	-377.6	384.9	1.06	-1.02	-0.83	
2,168.0	17.31	284.28	2,111.5	82.2	-405.6	413.7	1.18	-1.17	0.37	
2,264.0	16.61	283.23	2,203.3	88.8	-432.8	441.7	0.80	-0.73	-1.09	
2,359.0	18.19	284.02	2,294.0	95.5	-460.4	470.1	1.68	1.66	0.83	
2,454.0	16.79	283.32	2,384.6	102.3	-488.1	498.7	1.49	-1.47	-0.74	
2,549.0	18.68	282.44	2,475.0	108.7	-516.3	527.6	2.01	1.99	-0.93	
2,644.0	17.62	281.29	2,565.3	114.8	-545.3	557.2	1.18	-1.12	-1.21	
2,739.0	16.57	278.83	2,656.1	119.7	-572.8	585.1	1.34	-1.11	-2.59	
2,834.0	17.93	281.82	2,746.8	124.8	-600.5	613.2	1.71	1.43	3.15	
2,929.0	17.31	281.65	2,837.4	130.6	-628.6	642.0	0.65	-0.65	-0.18	
3,024.0	16.52	281.29	2,928.3	136.1	-655.7	669.6	0.84	-0.83	-0.38	
3,117.0	18.76	284.28	3,016.9	142.4	-683.2	697.8	2.60	2.41	3.22	
3,212.0	18.46	283.84	3,106.9	149.8	-712.6	728.1	0.35	-0.32	-0.46	
3,307.0	17.58	282.09	3,197.3	156.4	-741.2	757.5	1.09	-0.93	-1.84	
3,402.0	16.66	282.26	3,288.1	162.3	-768.5	785.5	0.97	-0.97	0.18	
3,497.0	18.37	281.03	3,378.7	168.0	-796.5	814.0	1.84	1.80	-1.29	
3,592.0	17.58	280.85	3,469.0	173.6	-825.3	843.4	0.83	-0.83	-0.19	
3,687.0	16.61	281.91	3,559.8	179.1	-852.7	871.3	1.07	-1.02	1.12	
3,782.0	18.63	277.87	3,650.4	184.0	-881.0	900.0	2.48	2.13	-4.25	
3,877.0	17.93	279.36	3,740.6	188.4	-910.5	929.7	0.89	-0.74	1.57	
3,972.0	16.92	277.51	3,831.2	192.6	-938.6	958.1	1.21	-1.06	-1.95	
4,067.0	17.31	280.68	3,922.0	197.1	-966.2	986.0	1.06	0.41	3.34	
4,161.0	18.11	280.77	4,011.5	202.4	-994.3	1,014.6	0.85	0.85	0.10	
4,256.0	17.36	279.54	4,102.0	207.5	-1,022.8	1,043.5	0.88	-0.79	-1.29	
4,351.0	17.18	283.40	4,192.8	213.1	-1,050.4	1,071.7	1.22	-0.19	4.06	
4,446.0	17.75	285.16	4,283.4	220.1	-1,078.0	1,100.2	0.82	0.60	1.85	
4,541.0	16.96	283.84	4,374.0	227.2	-1,105.5	1,128.5	0.93	-0.83	-1.39	
4,637.0	15.25	283.84	4,466.3	233.6	-1,131.3	1,155.1	1.78	-1.78	0.00	
4,731.0	15.51	284.55	4,556.9	239.7	-1,155.5	1,180.0	0.34	0.28	0.76	
4,826.0	14.37	281.38	4,648.7	245.2	-1,179.4	1,204.5	1.48	-1.20	-3.34	
4,921.0	14.37	281.82	4,740.7	250.0	-1,202.5	1,228.1	0.11	0.00	0.46	
5,016.0	13.75	279.98	4,832.9	254.3	-1,225.1	1,251.1	0.80	-0.65	-1.94	
5,111.0	11.82	285.78	4,925.5	258.9	-1,245.6	1,272.1	2.44	-2.03	6.11	
5,206.0	10.90	286.39	5,018.7	264.1	-1,263.6	1,290.8	0.98	-0.97	0.64	
5,301.0	9.89	284.90	5,112.1	268.8	-1,280.1	1,307.9	1.10	-1.06	-1.57	
5,396.0	9.01	284.46	5,205.8	272.7	-1,295.2	1,323.5	0.93	-0.93	-0.46	
5,491.0	8.13	283.58	5,299.8	276.1	-1,308.9	1,337.7	0.94	-0.93	-0.93	
5,586.0	7.43	281.56	5,393.9	279.0	-1,321.4	1,350.5	0.79	-0.74	-2.13	
5,681.0	6.20	283.23	5,488.2	281.4	-1,332.5	1,361.8	1.31	-1.29	1.76	
5,775.0	5.45	267.67	5,581.7	282.3	-1,341.9	1,371.2	1.85	-0.80	-16.55	
5,871.0	2.99	263.19	5,677.5	281.9	-1,348.9	1,378.0	2.58	-2.56	-4.67	
5,965.0	2.29	284.19	5,771.4	282.0	-1,353.2	1,382.1	1.26	-0.74	22.34	
6,060.0	1.41	252.38	5,866.3	282.1	-1,356.1	1,385.1	1.39	-0.93	-33.48	
6,155.0	1.01	21.23	5,961.3	282.6	-1,356.9	1,385.9	2.30	-0.42	135.63	
6,250.0	0.57	26.15	6,056.3	283.8	-1,356.4	1,385.7	0.47	-0.46	5.18	



Archer Survey Report

Company: Piceance Energy, LLC	Local Co-ordinate Reference: Well Gunderson 29-09M
Project: Mesa County, CO	TVD Reference: Well @ 7558.0usft
Site: Gunderson	MD Reference: Well @ 7558.0usft
Well: Gunderson 29-09M	North Reference: True
Wellbore: Slot A-3	Survey Calculation Method: Minimum Curvature
Design: Slot A-3	Database: EDMDBBW

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)
6,344.0	0.31	216.78	6,150.3	284.0	-1,356.4	1,385.7	0.93	-0.28	-180.18
6,439.0	0.97	209.84	6,245.3	283.1	-1,356.9	1,386.0	0.70	0.69	-7.31
6,534.0	1.10	206.85	6,340.3	281.6	-1,357.7	1,386.5	0.15	0.14	-3.15
6,629.0	1.41	202.54	6,435.2	279.7	-1,358.6	1,386.9	0.34	0.33	-4.54
6,724.0	1.49	202.28	6,530.2	277.5	-1,359.5	1,387.4	0.08	0.08	-0.27
6,819.0	1.67	201.93	6,625.2	275.0	-1,360.5	1,387.8	0.19	0.19	-0.37
6,912.0	1.89	205.62	6,718.1	272.4	-1,361.7	1,388.4	0.27	0.24	3.97
7,008.0	2.59	205.71	6,814.1	269.0	-1,363.3	1,389.2	0.73	0.73	0.09
7,103.0	3.65	202.81	6,908.9	264.3	-1,365.4	1,390.3	1.13	1.12	-3.05
7,198.0	2.46	208.26	7,003.8	259.7	-1,367.5	1,391.4	1.29	-1.25	5.74
7,293.0	2.24	214.67	7,098.7	256.4	-1,369.5	1,392.6	0.36	-0.23	6.75
7,388.0	2.64	214.59	7,193.6	253.1	-1,371.8	1,394.2	0.42	0.42	-0.08
7,482.0	2.77	215.82	7,287.5	249.4	-1,374.4	1,395.9	0.15	0.14	1.31
7,577.0	3.52	225.40	7,382.4	245.5	-1,377.8	1,398.4	0.96	0.79	10.08
7,672.0	2.99	233.48	7,477.2	242.0	-1,381.9	1,401.6	0.74	-0.56	8.51
7,767.0	2.99	226.45	7,572.1	238.8	-1,385.7	1,404.6	0.39	0.00	-7.40
Last Archer Survey									
7,889.0	2.86	231.55	7,693.9	234.7	-1,390.4	1,408.3	0.24	-0.11	4.18
PTB - Gunderson 29-09M tgt									
7,939.0	2.86	231.55	7,743.9	233.2	-1,392.3	1,409.9	0.00	0.00	0.00

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
200.0	200.0	-0.8	-1.5	First Archer Survey
7,889.0	7,693.9	234.7	-1,390.4	Last Archer Survey
7,939.0	7,743.9	233.2	-1,392.3	PTB

Checked By: _____ Approved By: _____ Date: _____