Piceance Energy, LLC

Mesa County, CO
Piceance 28-05
Piceance Federal 28-01M

Slot A-4

Plan: Design #1

Standard Planning Report

28 April, 2015

Archer

Project: Mesa County, CO
Site: Piceance 28-05
Well: Piceance Federal 28-01M
Wellbore: Slot A-4
Design: Design #1
Latitude: 39° 15' 3.970 N
Longitude: 107° 46' 46.390 W
Ground Level: 7556.0
Well @ 7578.0usft

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 28-01M, True North
Vertical (TVD) Reference: Well @ 7578.0usft
Section (VS) Reference: Slot - (0.0N, 0.0E)
Measured Depth Reference: Well @ 7578.0usft
Calculation Method: Minimum Curvature

WELL DETAILS: Piceance Federal 28-01M

Ground Level: 7556.0

+N/-S	+E/-W	Northing	Easting	Latitude	Longitude	Slot
0.0	0.0	1524446.98	2354538.67	39° 15' 3.970 N	107° 46' 46.390 W	

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

Name	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude	Shape
Piceance Federal 28-01M tgt	7920.0	1403.3	1424.5	1525814.10	2355997.91	39° 15' 17.840 N	107° 46' 28.280 W	Circle (Radius: 50.0)

SECTION DETAILS

MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	VSect	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
1571.0	29.42	45.43	1507.2	259.3	263.2	2.00	45.43	369.4	Start 2566.5 hold at 1571.0 MD
4137.6	29.42	45.43	3742.8	1144.0	1161.3	0.00	0.00	1630.2	Start Drop -2.00
5608.6	0.00	0.00	5150.0	1403.3	1424.5	2.00	180.00	1999.6	Start 2770.0 hold at 5608.6 MD
8378.6	0.00	0.00	7920.0	1403.3	1424.5	0.00	0.00	1999.6	TD at 8378.6

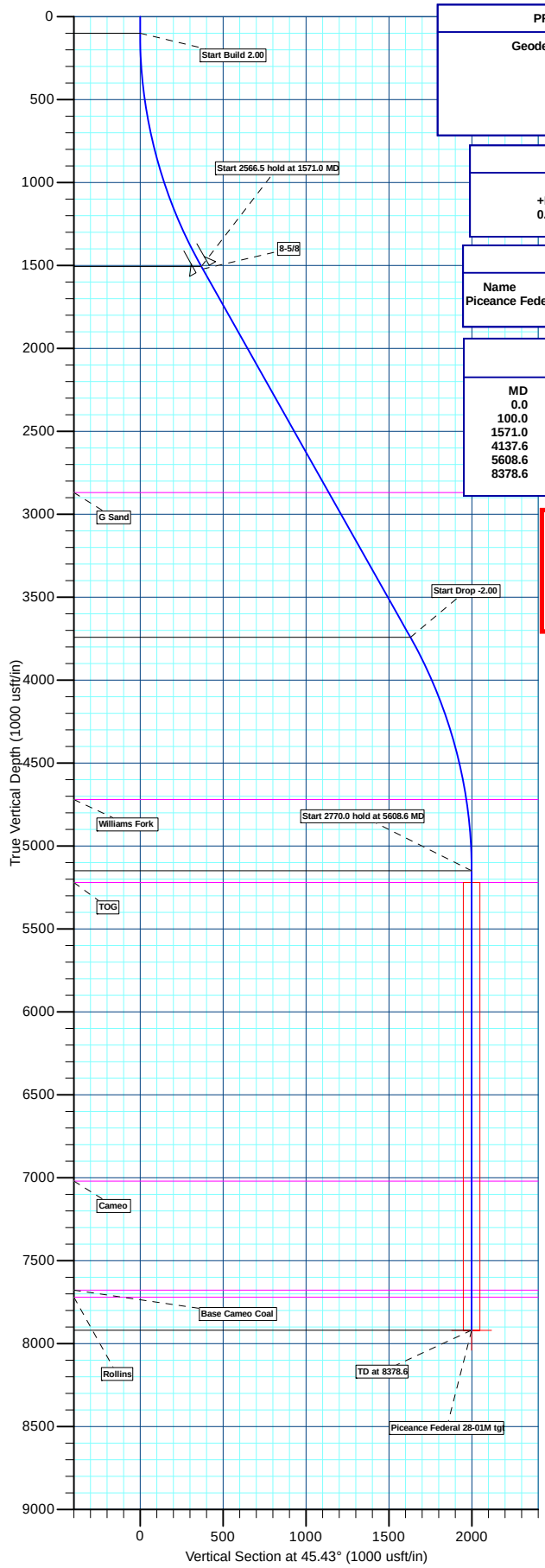
T M

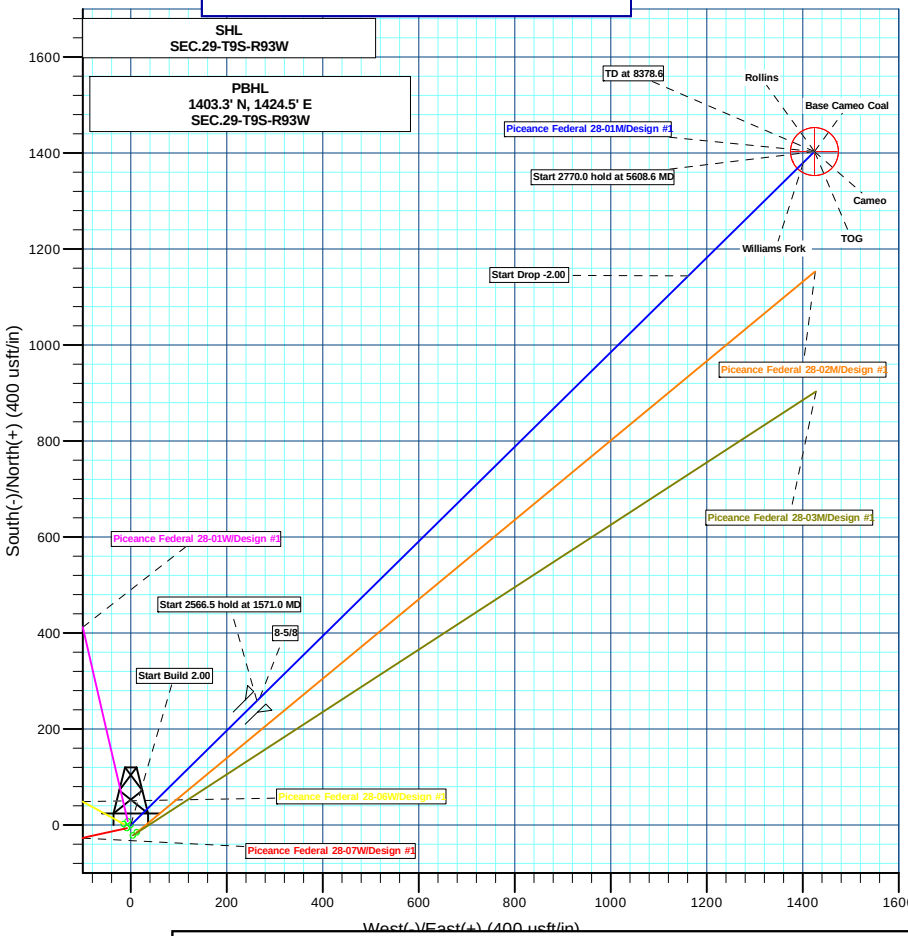
Azimuths to True North
Magnetic North: 9.72°

Magnetic Field
Strength: 51741.9snT
Dip Angle: 65.47°
Date: 04/27/2015
Model: IGRF2010

FORMATION TOP DETAILS

TVDPath	MDPath	Formation
2870.0	3135.6	G Sand
4720.0	5176.9	Williams Fork
5220.0	5678.6	TOG
7020.0	7478.6	Cameo
7678.0	8136.6	Base Cameo Coal
7720.0	8178.6	Rollins





Plan: Design #1 (Piceance Federal 28-01M/Slot A-4)

Created By: Ricky Osburn Date: 10:51, April 28 2015

Database:	EDMDBBW	**Local Co-ordinate Reference:**	Well Piceance Federal 28-01M
Company:	Piceance Energy, LLC	**TVD Reference:**	Well @ 7578.0usft
Project:	Mesa County, CO	**MD Reference:**	Well @ 7578.0usft
Site:	Piceance 28-05	**North Reference:**	True
Well:	Piceance Federal 28-01M	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	Slot A-4		
Design:	Design #1		

Project Mesa County, CO

Map System:	US State Plane 1983	**System Datum:**	Mean Sea Level
Geo Datum:	North American Datum 1983		
Map Zone:	Colorado Central Zone		

Site Piceance 28-05

Site Position:		**Northing:**	1,524,375.79 usft	**Latitude:**	39° 15' 3.280 N
From:	Lat/Long	**Easting:**	2,354,593.53 usft	**Longitude:**	107° 46' 45.670 W
Position Uncertainty:	0.0 usft	**Slot Radius:**	13-3/16 "	**Grid Convergence:**	-1.44 °

Well Piceance Federal 28-01M

Well Position	**+N/-S**	69.8 usft	**Northing:**	1,524,446.98 usft	**Latitude:**	39° 15' 3.970 N
	+E/-W	-56.6 usft	**Easting:**	2,354,538.67 usft	**Longitude:**	107° 46' 46.390 W
Position Uncertainty		0.0 usft	**Wellhead Elevation:**	0.0 usft	**Ground Level:**	7,556.0 usft

Wellbore Slot A-4

Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	2015/04/27	9.73	65.47	51,742

Design Design #1

Audit Notes:

Version:		**Phase:**	PLAN	**Tie On Depth:**	0.0

Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)	Direction (°)
	0.0	0.0	0.0	45.43

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	
1,571.0	29.42	45.43	1,507.2	259.3	263.2	2.00	2.00	0.00	45.43	
4,137.6	29.42	45.43	3,742.8	1,144.0	1,161.3	0.00	0.00	0.00	0.00	
5,608.6	0.00	0.00	5,150.0	1,403.3	1,424.5	2.00	-2.00	0.00	180.00	
8,378.6	0.00	0.00	7,920.0	1,403.3	1,424.5	0.00	0.00	0.00	0.00	Piceance Federal 28-

Database:	EDMDBBW	**Local Co-ordinate Reference:**	Well Piceance Federal 28-01M
Company:	Piceance Energy, LLC	**TVD Reference:**	Well @ 7578.0usft
Project:	Mesa County, CO	**MD Reference:**	Well @ 7578.0usft
Site:	Piceance 28-05	**North Reference:**	True
Well:	Piceance Federal 28-01M	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	Slot A-4		
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	45.43	200.0	1.2	1.2	1.7	2.00	2.00	0.00
300.0	4.00	45.43	299.8	4.9	5.0	7.0	2.00	2.00	0.00
400.0	6.00	45.43	399.5	11.0	11.2	15.7	2.00	2.00	0.00
500.0	8.00	45.43	498.7	19.6	19.9	27.9	2.00	2.00	0.00
600.0	10.00	45.43	597.5	30.5	31.0	43.5	2.00	2.00	0.00
700.0	12.00	45.43	695.6	43.9	44.6	62.6	2.00	2.00	0.00
800.0	14.00	45.43	793.1	59.7	60.6	85.1	2.00	2.00	0.00
900.0	16.00	45.43	889.6	77.9	79.1	111.0	2.00	2.00	0.00
1,000.0	18.00	45.43	985.3	98.4	99.9	140.2	2.00	2.00	0.00
1,100.0	20.00	45.43	1,079.8	121.2	123.1	172.8	2.00	2.00	0.00
1,200.0	22.00	45.43	1,173.2	146.4	148.6	208.6	2.00	2.00	0.00
1,300.0	24.00	45.43	1,265.2	173.8	176.4	247.7	2.00	2.00	0.00
1,400.0	26.00	45.43	1,355.8	203.5	206.5	289.9	2.00	2.00	0.00
1,500.0	28.00	45.43	1,444.9	235.3	238.9	335.3	2.00	2.00	0.00
Start 2566.5 hold at 1571.0 MD									
1,571.0	29.42	45.43	1,507.2	259.3	263.2	369.4	2.00	2.00	0.00
8-5/8									
1,588.0	29.42	45.43	1,522.0	265.1	269.1	377.8	0.00	0.00	0.00
1,600.0	29.42	45.43	1,532.5	269.3	273.3	383.7	0.00	0.00	0.00
1,700.0	29.42	45.43	1,619.6	303.7	308.3	432.8	0.00	0.00	0.00
1,800.0	29.42	45.43	1,706.7	338.2	343.3	481.9	0.00	0.00	0.00
1,900.0	29.42	45.43	1,793.8	372.7	378.3	531.0	0.00	0.00	0.00
2,000.0	29.42	45.43	1,880.9	407.2	413.3	580.2	0.00	0.00	0.00
2,100.0	29.42	45.43	1,968.0	441.6	448.3	629.3	0.00	0.00	0.00
2,200.0	29.42	45.43	2,055.1	476.1	483.3	678.4	0.00	0.00	0.00
2,300.0	29.42	45.43	2,142.2	510.6	518.3	727.5	0.00	0.00	0.00
2,400.0	29.42	45.43	2,229.3	545.0	553.3	776.7	0.00	0.00	0.00
2,500.0	29.42	45.43	2,316.4	579.5	588.3	825.8	0.00	0.00	0.00
2,600.0	29.42	45.43	2,403.5	614.0	623.3	874.9	0.00	0.00	0.00
2,700.0	29.42	45.43	2,490.6	648.5	658.3	924.0	0.00	0.00	0.00
2,800.0	29.42	45.43	2,577.7	682.9	693.2	973.1	0.00	0.00	0.00
2,900.0	29.42	45.43	2,664.8	717.4	728.2	1,022.3	0.00	0.00	0.00
3,000.0	29.42	45.43	2,751.9	751.9	763.2	1,071.4	0.00	0.00	0.00
3,100.0	29.42	45.43	2,839.0	786.4	798.2	1,120.5	0.00	0.00	0.00
G Sand									
3,135.6	29.42	45.43	2,870.0	798.6	810.7	1,138.0	0.00	0.00	0.00
3,200.0	29.42	45.43	2,926.1	820.8	833.2	1,169.6	0.00	0.00	0.00
3,300.0	29.42	45.43	3,013.2	855.3	868.2	1,218.7	0.00	0.00	0.00
3,400.0	29.42	45.43	3,100.3	889.8	903.2	1,267.9	0.00	0.00	0.00
3,500.0	29.42	45.43	3,187.4	924.2	938.2	1,317.0	0.00	0.00	0.00
3,600.0	29.42	45.43	3,274.5	958.7	973.2	1,366.1	0.00	0.00	0.00
3,700.0	29.42	45.43	3,361.7	993.2	1,008.2	1,415.2	0.00	0.00	0.00
3,800.0	29.42	45.43	3,448.8	1,027.7	1,043.2	1,464.3	0.00	0.00	0.00
3,900.0	29.42	45.43	3,535.9	1,062.1	1,078.2	1,513.5	0.00	0.00	0.00
4,000.0	29.42	45.43	3,623.0	1,096.6	1,113.2	1,562.6	0.00	0.00	0.00
4,100.0	29.42	45.43	3,710.1	1,131.1	1,148.2	1,611.7	0.00	0.00	0.00
Start Drop -2.00									
4,137.6	29.42	45.43	3,742.8	1,144.0	1,161.3	1,630.2	0.00	0.00	0.00
4,200.0	28.17	45.43	3,797.5	1,165.1	1,182.7	1,660.2	2.00	-2.00	0.00
4,300.0	26.17	45.43	3,886.5	1,197.2	1,215.3	1,705.9	2.00	-2.00	0.00
4,400.0	24.17	45.43	3,977.0	1,227.0	1,245.6	1,748.4	2.00	-2.00	0.00

Database:	EDMDBBW	**Local Co-ordinate Reference:**	Well Piceance Federal 28-01M
Company:	Piceance Energy, LLC	**TVD Reference:**	Well @ 7578.0usft
Project:	Mesa County, CO	**MD Reference:**	Well @ 7578.0usft
Site:	Piceance 28-05	**North Reference:**	True
Well:	Piceance Federal 28-01M	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	Slot A-4		
Design:	Design #1		

Planned Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
4,500.0	22.17	45.43	4,068.9	1,254.6	1,273.6	1,787.8	2.00	-2.00	0.00
4,600.0	20.17	45.43	4,162.1	1,280.0	1,299.3	1,823.9	2.00	-2.00	0.00
4,700.0	18.17	45.43	4,256.6	1,303.0	1,322.7	1,856.7	2.00	-2.00	0.00
4,800.0	16.17	45.43	4,352.1	1,323.7	1,343.7	1,886.2	2.00	-2.00	0.00
4,900.0	14.17	45.43	4,448.6	1,342.1	1,362.4	1,912.4	2.00	-2.00	0.00
5,000.0	12.17	45.43	4,546.0	1,358.1	1,378.6	1,935.2	2.00	-2.00	0.00
5,100.0	10.17	45.43	4,644.1	1,371.7	1,392.4	1,954.6	2.00	-2.00	0.00
Williams Fork									
5,176.9	8.63	45.43	4,720.0	1,380.5	1,401.4	1,967.1	2.00	-2.00	0.00
5,200.0	8.17	45.43	4,742.8	1,382.9	1,403.8	1,970.5	2.00	-2.00	0.00
5,300.0	6.17	45.43	4,842.0	1,391.6	1,412.7	1,983.0	2.00	-2.00	0.00
5,400.0	4.17	45.43	4,941.6	1,398.0	1,419.1	1,992.0	2.00	-2.00	0.00
5,500.0	2.17	45.43	5,041.5	1,401.9	1,423.0	1,997.5	2.00	-2.00	0.00
Start 2770.0 hold at 5608.6 MD									
5,608.6	0.00	0.00	5,150.0	1,403.3	1,424.5	1,999.6	2.00	-2.00	-41.84
TOG									
5,678.6	0.00	0.00	5,220.0	1,403.3	1,424.5	1,999.6	0.00	0.00	0.00
5,700.0	0.00	0.00	5,241.4	1,403.3	1,424.5	1,999.6	0.00	0.00	0.00
5,800.0	0.00	0.00	5,341.4	1,403.3	1,424.5	1,999.6	0.00	0.00	0.00
5,900.0	0.00	0.00	5,441.4	1,403.3	1,424.5	1,999.6	0.00	0.00	0.00
6,000.0	0.00	0.00	5,541.4	1,403.3	1,424.5	1,999.6	0.00	0.00	0.00
6,100.0	0.00	0.00	5,641.4	1,403.3	1,424.5	1,999.6	0.00	0.00	0.00
6,200.0	0.00	0.00	5,741.4	1,403.3	1,424.5	1,999.6	0.00	0.00	0.00
6,300.0	0.00	0.00	5,841.4	1,403.3	1,424.5	1,999.6	0.00	0.00	0.00
6,400.0	0.00	0.00	5,941.4	1,403.3	1,424.5	1,999.6	0.00	0.00	0.00
6,500.0	0.00	0.00	6,041.4	1,403.3	1,424.5	1,999.6	0.00	0.00	0.00
6,600.0	0.00	0.00	6,141.4	1,403.3	1,424.5	1,999.6	0.00	0.00	0.00
6,700.0	0.00	0.00	6,241.4	1,403.3	1,424.5	1,999.6	0.00	0.00	0.00
6,800.0	0.00	0.00	6,341.4	1,403.3	1,424.5	1,999.6	0.00	0.00	0.00
6,900.0	0.00	0.00	6,441.4	1,403.3	1,424.5	1,999.6	0.00	0.00	0.00
7,000.0	0.00	0.00	6,541.4	1,403.3	1,424.5	1,999.6	0.00	0.00	0.00
7,100.0	0.00	0.00	6,641.4	1,403.3	1,424.5	1,999.6	0.00	0.00	0.00
7,200.0	0.00	0.00	6,741.4	1,403.3	1,424.5	1,999.6	0.00	0.00	0.00
7,300.0	0.00	0.00	6,841.4	1,403.3	1,424.5	1,999.6	0.00	0.00	0.00
7,400.0	0.00	0.00	6,941.4	1,403.3	1,424.5	1,999.6	0.00	0.00	0.00
Cameo									
7,478.6	0.00	0.00	7,020.0	1,403.3	1,424.5	1,999.6	0.00	0.00	0.00
7,500.0	0.00	0.00	7,041.4	1,403.3	1,424.5	1,999.6	0.00	0.00	0.00
7,600.0	0.00	0.00	7,141.4	1,403.3	1,424.5	1,999.6	0.00	0.00	0.00
7,700.0	0.00	0.00	7,241.4	1,403.3	1,424.5	1,999.6	0.00	0.00	0.00
7,800.0	0.00	0.00	7,341.4	1,403.3	1,424.5	1,999.6	0.00	0.00	0.00
7,900.0	0.00	0.00	7,441.4	1,403.3	1,424.5	1,999.6	0.00	0.00	0.00
8,000.0	0.00	0.00	7,541.4	1,403.3	1,424.5	1,999.6	0.00	0.00	0.00
8,100.0	0.00	0.00	7,641.4	1,403.3	1,424.5	1,999.6	0.00	0.00	0.00
Base Cameo Coal									
8,136.6	0.00	0.00	7,678.0	1,403.3	1,424.5	1,999.6	0.00	0.00	0.00
Rollins									
8,178.6	0.00	0.00	7,720.0	1,403.3	1,424.5	1,999.6	0.00	0.00	0.00
8,200.0	0.00	0.00	7,741.4	1,403.3	1,424.5	1,999.6	0.00	0.00	0.00
8,300.0	0.00	0.00	7,841.4	1,403.3	1,424.5	1,999.6	0.00	0.00	0.00
TD at 8378.6									
8,378.6	0.00	0.00	7,920.0	1,403.3	1,424.5	1,999.6	0.00	0.00	0.00

Database:	EDMDBBW	**Local Co-ordinate Reference:**	Well Piceance Federal 28-01M
Company:	Piceance Energy, LLC	**TVD Reference:**	Well @ 7578.0usft
Project:	Mesa County, CO	**MD Reference:**	Well @ 7578.0usft
Site:	Piceance 28-05	**North Reference:**	True
Well:	Piceance Federal 28-01M	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	Slot A-4		
Design:	Design #1		

Design Targets

Target Name - hit/miss target - Shape	Dip Angle (°)	Dip Dir. (°)	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Northing (usft)	Easting (usft)	Latitude	Longitude
Piceance Federal 28-01I - plan hits target center - Circle (radius 50.0)	0.00	0.00	7,920.0	1,403.3	1,424.5	1,525,814.10	2,355,997.91	39° 15' 17.840 N	107° 46' 28.280 W

Casing Points

Measured Depth (usft)	Vertical Depth (usft)	Name	Casing Diameter (")	Hole Diameter (")
1,588.0	1,522.0	8-5/8	8-5/8	12-1/4

Formations

Measured Depth (usft)	Vertical Depth (usft)	Name	Lithology	Dip (°)	Dip Direction (°)
3,135.6	2,870.0	G Sand		0.00	
5,176.9	4,720.0	Williams Fork		0.00	
5,678.6	5,220.0	TOG		0.00	
7,478.6	7,020.0	Cameo		0.00	
8,136.6	7,678.0	Base Cameo Coal		0.00	
8,178.6	7,720.0	Rollins		0.00	

Plan Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates +N/-S (usft)	Local Coordinates +E/-W (usft)	Comment
100.0	100.0	0.0	0.0	Start Build 2.00
1,571.0	1,507.2	259.3	263.2	Start 2566.5 hold at 1571.0 MD
4,137.6	3,742.8	1,144.0	1,161.3	Start Drop -2.00
5,608.6	5,150.0	1,403.3	1,424.5	Start 2770.0 hold at 5608.6 MD
8,378.6	7,920.0	1,403.3	1,424.5	TD at 8378.6

Piceance Energy, LLC

Mesa County, CO
Piceance 28-05
Piceance Federal 28-01M

Slot A-4
Design #1

Anticollision Report

28 April, 2015

Archer

Company:	Piceance Energy, LLC	**Local Co-ordinate Reference:**	Well Piceance Federal 28-01M
Project:	Mesa County, CO	**TVD Reference:**	Well @ 7578.0usft
Reference Site:	Piceance 28-05	**MD Reference:**	Well @ 7578.0usft
Site Error:	0.0 usft	**North Reference:**	True
Reference Well:	Piceance Federal 28-01M	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.0 usft	**Output errors are at**	2.00 sigma
Reference Wellbore	Slot A-4	**Database:**	EDMDBBW
Reference Design:	Design #1	**Offset TVD Reference:**	Reference Datum

Reference Design #1

Filter type:	NO GLOBAL FILTER: Using user defined selection & filtering criteria		
Interpolation Method:	MD Interval 100.0usft	**Error Model:**	ISCWSA
Depth Range:	Unlimited	**Scan Method:**	Closest Approach 3D
Results Limited by:	Maximum center-center distance of 1,000.0 usft	**Error Surface:**	Elliptical Conic
Warning Levels Evaluated at:	2.00 **Sigma**	**Casing Method:**	Not applied

Survey Tool Program **Date** 2015/04/28

From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description
0.0	8,378.6	Design #1 (Slot A-4)	MWD	MWD - Standard

Summary

Site Name / Offset Well - Wellbore - Design	Reference Measured Depth (usft)	Offset Measured Depth (usft)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Separation Factor	Warning
Piceance 28-05						
Piceance Federal 28-01W - Slot A-3 - Design #1	100.0	100.0	10.3	10.1	58.478	CC, ES
Piceance Federal 28-01W - Slot A-3 - Design #1	300.0	299.1	16.2	15.1	14.744	SF
Piceance Federal 28-02M - Slot A-5 - Design #1	100.0	100.0	19.7	19.5	112.458	CC
Piceance Federal 28-02M - Slot A-5 - Design #1	300.0	300.0	20.3	19.2	18.624	ES
Piceance Federal 28-02M - Slot A-5 - Design #1	1,900.0	1,898.7	67.9	46.9	3.235	SF
Piceance Federal 28-03M - Slot B-5 - Design #1	100.0	100.0	21.8	21.6	124.141	CC, ES
Piceance Federal 28-03M - Slot B-5 - Design #1	8,378.6	8,249.7	499.8	433.8	7.568	SF
Piceance Federal 28-06W - Slot B-3 - Design #1	100.0	100.0	14.3	14.1	81.583	CC, ES
Piceance Federal 28-06W - Slot B-3 - Design #1	400.0	399.5	26.9	25.2	15.837	SF
Piceance Federal 28-07W - Slot B-4 - Design #1	100.0	100.0	9.9	9.8	56.675	CC, ES
Piceance Federal 28-07W - Slot B-4 - Design #1	300.0	299.8	16.9	15.7	14.004	SF

Offset Design Piceance 28-05 - Piceance Federal 28-01W - Slot A-3 - Design #1

Survey Program: 0-MWD

Offset Site Error: 0.0 usft

Offset Well Error: 0.0 usft

Reference Measured Depth (usft)	Reference Vertical Depth (usft)	Offset Measured Depth (usft)	Offset Vertical Depth (usft)	Semi Major Axis Reference (usft)	Semi Major Axis Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	Offset Wellbore Centre +E/-W (usft)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning
0.0	0.0	0.0	0.0	0.0	0.0	-37.87	8.1	-6.3	10.3				
100.0	100.0	100.0	100.0	0.1	0.1	-37.87	8.1	-6.3	10.3	10.1	0.18	58.478	CC, ES
200.0	200.0	199.6	199.6	0.3	0.3	-88.18	9.8	-6.7	11.7	11.0	0.63	18.645	
300.0	299.8	299.1	299.0	0.6	0.6	-97.44	14.8	-7.9	16.2	15.1	1.10	14.744	SF
400.0	399.5	398.3	397.7	0.8	0.8	-104.77	23.2	-9.8	24.3	22.7	1.62	15.002	
500.0	498.7	496.9	495.6	1.1	1.1	-109.33	34.8	-12.5	35.9	33.7	2.20	16.354	
600.0	597.5	594.8	592.4	1.4	1.4	-112.06	49.6	-15.9	50.9	48.1	2.83	17.968	
700.0	695.6	692.0	687.8	1.8	1.8	-113.69	67.5	-20.1	69.2	65.7	3.54	19.549	
800.0	793.1	788.1	781.5	2.3	2.2	-114.68	88.2	-24.9	90.8	86.5	4.33	20.989	
900.0	889.6	883.2	873.5	2.8	2.7	-115.26	111.7	-30.3	115.6	110.4	5.19	22.258	
1,000.0	985.3	977.0	963.4	3.3	3.2	-115.58	137.9	-36.4	143.5	137.4	6.14	23.361	
1,100.0	1,079.8	1,069.5	1,051.1	4.0	3.7	-115.70	166.4	-43.0	174.5	167.3	7.17	24.316	
1,200.0	1,173.2	1,160.6	1,136.6	4.6	4.3	-115.69	197.2	-50.1	208.3	200.1	8.29	25.144	
1,300.0	1,265.2	1,250.2	1,219.5	5.4	5.0	-115.57	230.0	-57.7	245.1	235.6	9.48	25.857	
1,400.0	1,355.8	1,340.4	1,302.1	6.2	5.6	-115.45	265.2	-65.9	284.5	273.7	10.75	26.455	
1,500.0	1,444.9	1,431.4	1,385.5	7.1	6.3	-115.70	301.1	-74.2	325.4	313.3	12.09	26.921	

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

Company:	Piceance Energy, LLC	**Local Co-ordinate Reference:**	Well Piceance Federal 28-01M
Project:	Mesa County, CO	**TVD Reference:**	Well @ 7578.0usft
Reference Site:	Piceance 28-05	**MD Reference:**	Well @ 7578.0usft
Site Error:	0.0 usft	**North Reference:**	True
Reference Well:	Piceance Federal 28-01M	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.0 usft	**Output errors are at**	2.00 sigma
Reference Wellbore	Slot A-4	**Database:**	EDMDBBW
Reference Design:	Design #1	**Offset TVD Reference:**	Reference Datum

Offset Design Piceance 28-05 - Piceance Federal 28-01W - Slot A-3 - Design #1

Offset Site Error: 0.0 usft

Survey Program: 0-MWD

Offset Well Error: 0.0 usft

Reference Measured Depth (usft)	Reference Vertical Depth (usft)	Offset Measured Depth (usft)	Offset Vertical Depth (usft)	Semi Major Axis Reference (usft)	Semi Major Axis Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	Offset Wellbore Centre +E/-W (usft)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning
1,600.0	1,532.5	1,521.7	1,468.1	8.0	7.0	-116.43	336.6	-82.4	367.7	354.3	13.47	27.301	
1,700.0	1,619.6	1,611.8	1,550.5	9.0	7.7	-117.61	372.0	-90.6	410.6	395.7	14.88	27.586	
1,800.0	1,706.7	1,701.8	1,632.9	10.0	8.4	-118.57	407.4	-98.8	453.6	437.3	16.30	27.822	
1,900.0	1,793.8	1,791.9	1,715.2	10.9	9.1	-119.35	442.9	-107.0	496.6	478.9	17.73	28.020	
2,000.0	1,880.9	1,882.0	1,797.6	11.9	9.8	-120.02	478.3	-115.3	539.8	520.6	19.15	28.187	
2,100.0	1,968.0	1,972.0	1,880.0	12.9	10.5	-120.59	513.7	-123.5	583.0	562.4	20.58	28.331	
2,200.0	2,055.1	2,062.1	1,962.4	13.9	11.3	-121.07	549.1	-131.7	626.2	604.2	22.00	28.457	
2,300.0	2,142.2	2,152.1	2,044.8	14.8	12.0	-121.50	584.6	-139.9	669.4	646.0	23.43	28.566	
2,400.0	2,229.3	2,242.2	2,127.2	15.8	12.7	-121.87	620.0	-148.1	712.7	687.8	24.87	28.663	
2,500.0	2,316.4	2,332.3	2,209.6	16.8	13.4	-122.20	655.4	-156.3	756.0	729.7	26.30	28.748	
2,600.0	2,403.5	2,422.3	2,292.0	17.8	14.1	-122.50	690.8	-164.5	799.3	771.6	27.73	28.825	
2,700.0	2,490.6	2,512.4	2,374.4	18.8	14.8	-122.76	726.3	-172.7	842.7	813.5	29.16	28.894	
2,800.0	2,577.7	2,602.4	2,456.7	19.7	15.5	-123.00	761.7	-180.9	886.0	855.4	30.60	28.956	
2,900.0	2,664.8	2,692.5	2,539.1	20.7	16.2	-123.22	797.1	-189.1	929.4	897.3	32.03	29.012	
3,000.0	2,751.9	2,782.5	2,621.5	21.7	16.9	-123.42	832.5	-197.3	972.7	939.3	33.47	29.064	

Company:	Piceance Energy, LLC	**Local Co-ordinate Reference:**	Well Piceance Federal 28-01M
Project:	Mesa County, CO	**TVD Reference:**	Well @ 7578.0usft
Reference Site:	Piceance 28-05	**MD Reference:**	Well @ 7578.0usft
Site Error:	0.0 usft	**North Reference:**	True
Reference Well:	Piceance Federal 28-01M	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.0 usft	**Output errors are at**	2.00 sigma
Reference Wellbore	Slot A-4	**Database:**	EDMDBBW
Reference Design:	Design #1	**Offset TVD Reference:**	Reference Datum

Offset Design Piceance 28-05 - Piceance Federal 28-02M - Slot A-5 - Design #1

Offset Site Error: 0.0 usft

Survey Program: 0-MWD

Offset Well Error: 0.0 usft

Reference Measured Depth (usft)	Reference Vertical Depth (usft)	Offset Measured Depth (usft)	Offset Vertical Depth (usft)	Semi Major Axis Reference (usft)	Semi Major Axis Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	Offset Wellbore Centre +E/-W (usft)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning
0.0	0.0	0.0	0.0	0.0	0.0	140.33	-15.2	12.6	19.7				
100.0	100.0	100.0	100.0	0.1	0.1	140.33	-15.2	12.6	19.7	19.5	0.18	112.458	CC
200.0	200.0	200.0	200.0	0.3	0.3	94.88	-14.1	13.9	19.9	19.2	0.62	31.957	
300.0	299.8	300.0	299.8	0.6	0.6	94.82	-10.7	18.0	20.3	19.2	1.09	18.624	ES
400.0	399.5	400.0	399.4	0.8	0.8	94.72	-5.2	24.7	21.1	19.5	1.61	13.090	
500.0	498.7	500.0	498.7	1.1	1.1	94.59	2.6	34.1	22.1	19.9	2.20	10.066	
600.0	597.5	600.0	597.4	1.4	1.4	94.44	12.6	46.1	23.5	20.6	2.88	8.172	
700.0	695.6	699.9	695.6	1.8	1.8	94.28	24.7	60.8	25.2	21.5	3.65	6.889	
800.0	793.1	799.9	793.0	2.3	2.3	94.12	39.0	78.2	27.1	22.6	4.54	5.975	
900.0	889.6	899.9	889.5	2.8	2.8	93.95	55.5	98.1	29.4	23.8	5.54	5.301	
1,000.0	985.3	999.8	985.1	3.3	3.3	93.79	74.1	120.6	31.9	25.2	6.66	4.789	
1,100.0	1,079.8	1,099.8	1,079.6	4.0	4.0	93.63	94.9	145.7	34.7	26.8	7.91	4.392	
1,200.0	1,173.2	1,199.7	1,172.9	4.6	4.7	93.47	117.7	173.3	37.9	28.6	9.29	4.078	
1,300.0	1,265.2	1,299.6	1,264.9	5.4	5.4	93.33	142.5	203.3	41.3	30.5	10.79	3.825	
1,400.0	1,355.8	1,399.5	1,355.4	6.2	6.2	93.19	169.4	235.9	44.9	32.5	12.42	3.618	
1,500.0	1,444.9	1,499.4	1,444.7	7.1	7.1	93.83	197.9	270.4	48.9	34.7	14.17	3.449	
1,600.0	1,532.5	1,599.3	1,533.9	8.0	8.0	97.70	226.6	305.0	53.2	37.2	15.96	3.331	
1,700.0	1,619.6	1,699.1	1,623.0	9.0	8.9	101.89	255.2	339.6	57.9	40.2	17.70	3.269	
1,800.0	1,706.7	1,798.9	1,712.1	10.0	9.8	105.43	283.8	374.3	62.8	43.4	19.37	3.241	
1,900.0	1,793.8	1,898.7	1,801.2	10.9	10.7	108.45	312.5	408.9	67.9	46.9	21.00	3.235	SF
2,000.0	1,880.9	1,998.5	1,890.3	11.9	11.6	111.03	341.1	443.5	73.3	50.7	22.59	3.243	
2,100.0	1,968.0	2,098.3	1,979.5	12.9	12.5	113.27	369.7	478.2	78.7	54.5	24.14	3.260	
2,200.0	2,055.1	2,198.1	2,068.6	13.9	13.4	115.21	398.4	512.8	84.2	58.6	25.67	3.282	
2,300.0	2,142.2	2,297.9	2,157.7	14.8	14.3	116.91	427.0	547.4	89.9	62.7	27.17	3.307	
2,400.0	2,229.3	2,397.7	2,246.8	15.8	15.2	118.41	455.6	582.1	95.5	66.9	28.66	3.334	
2,500.0	2,316.4	2,497.5	2,335.9	16.8	16.1	119.74	484.3	616.7	101.3	71.2	30.14	3.361	
2,600.0	2,403.5	2,597.3	2,425.1	17.8	17.0	120.93	512.9	651.3	107.1	75.5	31.60	3.389	
2,700.0	2,490.6	2,697.1	2,514.2	18.8	17.9	121.99	541.5	686.0	112.9	79.9	33.06	3.417	
2,800.0	2,577.7	2,797.0	2,603.3	19.7	18.8	122.95	570.2	720.6	118.8	84.3	34.51	3.444	
2,900.0	2,664.8	2,896.8	2,692.4	20.7	19.7	123.82	598.8	755.2	124.7	88.8	35.95	3.470	
3,000.0	2,751.9	2,996.6	2,781.5	21.7	20.6	124.61	627.4	789.9	130.7	93.3	37.38	3.495	
3,100.0	2,839.0	3,096.4	2,870.7	22.7	21.5	125.33	656.1	824.5	136.6	97.8	38.82	3.520	
3,200.0	2,926.1	3,196.2	2,959.8	23.7	22.5	125.99	684.7	859.2	142.6	102.4	40.24	3.543	
3,300.0	3,013.2	3,296.0	3,048.9	24.7	23.4	126.60	713.3	893.8	148.6	106.9	41.67	3.566	
3,400.0	3,100.3	3,395.8	3,138.0	25.7	24.3	127.16	742.0	928.4	154.6	111.5	43.09	3.588	
3,500.0	3,187.4	3,495.6	3,227.1	26.6	25.2	127.68	770.6	963.1	160.6	116.1	44.51	3.609	
3,600.0	3,274.5	3,595.4	3,316.3	27.6	26.1	128.16	799.2	997.7	166.7	120.7	45.93	3.629	
3,700.0	3,361.7	3,695.2	3,405.4	28.6	27.0	128.61	827.9	1,032.3	172.7	125.4	47.34	3.648	
3,800.0	3,448.8	3,795.0	3,494.5	29.6	27.9	129.03	856.5	1,067.0	178.8	130.0	48.76	3.666	
3,900.0	3,535.9	3,894.8	3,583.6	30.6	28.8	129.41	885.1	1,101.6	184.8	134.6	50.17	3.684	
4,000.0	3,623.0	3,994.7	3,672.7	31.6	29.7	129.78	913.8	1,136.2	190.9	139.3	51.58	3.701	
4,100.0	3,710.1	4,094.5	3,761.9	32.6	30.6	130.12	942.4	1,170.9	197.0	144.0	52.99	3.717	
4,200.0	3,797.5	4,192.5	3,849.5	33.5	31.5	130.43	970.3	1,204.6	202.8	148.5	54.33	3.733	
4,300.0	3,886.5	4,288.3	3,936.4	34.2	32.2	130.70	996.0	1,235.7	208.2	152.9	55.39	3.759	
4,400.0	3,977.0	4,384.0	4,024.5	34.9	32.8	130.97	1,019.9	1,264.6	213.4	157.0	56.36	3.786	
4,500.0	4,068.9	4,479.6	4,113.7	35.6	33.3	131.24	1,041.8	1,291.1	218.2	161.0	57.25	3.812	
4,600.0	4,162.1	4,575.1	4,203.9	36.2	33.9	131.50	1,061.8	1,315.3	222.7	164.7	58.04	3.838	
4,700.0	4,256.6	4,670.5	4,295.0	36.7	34.3	131.77	1,079.8	1,337.1	226.9	168.2	58.73	3.863	
4,800.0	4,352.1	4,765.8	4,386.9	37.2	34.8	132.04	1,095.9	1,356.6	230.8	171.5	59.34	3.890	
4,900.0	4,448.6	4,861.0	4,479.5	37.7	35.1	132.31	1,110.1	1,373.7	234.4	174.5	59.84	3.916	
5,000.0	4,546.0	4,956.2	4,572.7	38.0	35.5	132.58	1,122.2	1,388.4	237.6	177.3	60.25	3.943	
5,100.0	4,644.1	5,051.3	4,666.5	38.4	35.8	132.85	1,132.4	1,400.6	240.5	179.9	60.57	3.971	

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

Company:	Piceance Energy, LLC	**Local Co-ordinate Reference:**	Well Piceance Federal 28-01M
Project:	Mesa County, CO	**TVD Reference:**	Well @ 7578.0usft
Reference Site:	Piceance 28-05	**MD Reference:**	Well @ 7578.0usft
Site Error:	0.0 usft	**North Reference:**	True
Reference Well:	Piceance Federal 28-01M	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.0 usft	**Output errors are at**	2.00 sigma
Reference Wellbore	Slot A-4	**Database:**	EDMDBBW
Reference Design:	Design #1	**Offset TVD Reference:**	Reference Datum

Offset Design Piceance 28-05 - Piceance Federal 28-02M - Slot A-5 - Design #1

Offset Site Error: 0.0 usft

Survey Program: 0-MWD

Offset Well Error: 0.0 usft

Reference Measured Depth (usft)	Reference Vertical Depth (usft)	Offset Measured Depth (usft)	Offset Vertical Depth (usft)	Semi Major Axis Reference (usft)	Semi Major Axis Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	Offset Wellbore Centre +E/-W (usft)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning
5,200.0	4,742.8	5,146.3	4,760.6	38.7	36.0	133.12	1,140.5	1,410.5	243.1	182.3	60.79	3.999	
5,300.0	4,842.0	5,241.3	4,855.1	38.9	36.2	133.40	1,146.7	1,418.0	245.3	184.4	60.91	4.028	
5,400.0	4,941.6	5,336.2	4,949.7	39.1	36.3	133.68	1,150.9	1,423.0	247.2	186.3	60.94	4.057	
5,500.0	5,041.5	5,431.0	5,044.5	39.2	36.5	133.96	1,153.1	1,425.7	248.8	187.9	60.88	4.087	
5,600.0	5,141.4	5,527.9	5,141.4	39.3	36.5	134.20	1,153.4	1,426.1	249.9	189.1	60.76	4.113	
5,700.0	5,241.4	5,627.9	5,241.4	39.4	36.6	179.64	1,153.4	1,426.1	249.9	189.0	60.90	4.103	
5,800.0	5,341.4	5,727.9	5,341.4	39.4	36.7	179.64	1,153.4	1,426.1	249.9	188.8	61.06	4.093	
5,900.0	5,441.4	5,827.9	5,441.4	39.5	36.7	179.64	1,153.4	1,426.1	249.9	188.7	61.22	4.082	
6,000.0	5,541.4	5,927.9	5,541.4	39.6	36.8	179.64	1,153.4	1,426.1	249.9	188.5	61.38	4.071	
6,100.0	5,641.4	6,027.9	5,641.4	39.6	36.9	179.64	1,153.4	1,426.1	249.9	188.4	61.55	4.060	
6,200.0	5,741.4	6,127.9	5,741.4	39.7	36.9	179.64	1,153.4	1,426.1	249.9	188.2	61.72	4.049	
6,300.0	5,841.4	6,227.9	5,841.4	39.8	37.0	179.64	1,153.4	1,426.1	249.9	188.0	61.89	4.038	
6,400.0	5,941.4	6,327.9	5,941.4	39.8	37.1	179.64	1,153.4	1,426.1	249.9	187.8	62.06	4.027	
6,500.0	6,041.4	6,427.9	6,041.4	39.9	37.1	179.64	1,153.4	1,426.1	249.9	187.7	62.24	4.015	
6,600.0	6,141.4	6,527.9	6,141.4	40.0	37.2	179.64	1,153.4	1,426.1	249.9	187.5	62.42	4.004	
6,700.0	6,241.4	6,627.9	6,241.4	40.0	37.3	179.64	1,153.4	1,426.1	249.9	187.3	62.60	3.992	
6,800.0	6,341.4	6,727.9	6,341.4	40.1	37.4	179.64	1,153.4	1,426.1	249.9	187.1	62.79	3.980	
6,900.0	6,441.4	6,827.9	6,441.4	40.2	37.5	179.64	1,153.4	1,426.1	249.9	186.9	62.97	3.968	
7,000.0	6,541.4	6,927.9	6,541.4	40.2	37.5	179.64	1,153.4	1,426.1	249.9	186.7	63.17	3.956	
7,100.0	6,641.4	7,027.9	6,641.4	40.3	37.6	179.64	1,153.4	1,426.1	249.9	186.5	63.36	3.944	
7,200.0	6,741.4	7,127.9	6,741.4	40.4	37.7	179.64	1,153.4	1,426.1	249.9	186.3	63.55	3.932	
7,300.0	6,841.4	7,227.9	6,841.4	40.5	37.8	179.64	1,153.4	1,426.1	249.9	186.1	63.75	3.920	
7,400.0	6,941.4	7,327.9	6,941.4	40.6	37.9	179.64	1,153.4	1,426.1	249.9	185.9	63.95	3.908	
7,500.0	7,041.4	7,427.9	7,041.4	40.6	38.0	179.64	1,153.4	1,426.1	249.9	185.7	64.16	3.895	
7,600.0	7,141.4	7,527.9	7,141.4	40.7	38.0	179.64	1,153.4	1,426.1	249.9	185.5	64.36	3.883	
7,700.0	7,241.4	7,627.9	7,241.4	40.8	38.1	179.64	1,153.4	1,426.1	249.9	185.3	64.57	3.870	
7,800.0	7,341.4	7,727.9	7,341.4	40.9	38.2	179.64	1,153.4	1,426.1	249.9	185.1	64.78	3.858	
7,900.0	7,441.4	7,827.9	7,441.4	41.0	38.3	179.64	1,153.4	1,426.1	249.9	184.9	65.00	3.845	
8,000.0	7,541.4	7,927.9	7,541.4	41.0	38.4	179.64	1,153.4	1,426.1	249.9	184.7	65.21	3.832	
8,100.0	7,641.4	8,027.9	7,641.4	41.1	38.5	179.64	1,153.4	1,426.1	249.9	184.5	65.43	3.819	
8,200.0	7,741.4	8,127.9	7,741.4	41.2	38.6	179.64	1,153.4	1,426.1	249.9	184.2	65.65	3.807	
8,300.0	7,841.4	8,227.9	7,841.4	41.3	38.7	179.64	1,153.4	1,426.1	249.9	184.0	65.87	3.794	
8,351.0	7,892.4	8,278.9	7,892.4	41.4	38.7	179.64	1,153.4	1,426.1	249.9	183.9	65.99	3.787	
8,378.6	7,920.0	8,302.5	7,916.0	41.4	38.8	179.64	1,153.4	1,426.1	249.9	183.9	66.04	3.784	

Company:	Piceance Energy, LLC	**Local Co-ordinate Reference:**	Well Piceance Federal 28-01M
Project:	Mesa County, CO	**TVD Reference:**	Well @ 7578.0usft
Reference Site:	Piceance 28-05	**MD Reference:**	Well @ 7578.0usft
Site Error:	0.0 usft	**North Reference:**	True
Reference Well:	Piceance Federal 28-01M	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.0 usft	**Output errors are at**	2.00 sigma
Reference Wellbore	Slot A-4	**Database:**	EDMDBBW
Reference Design:	Design #1	**Offset TVD Reference:**	Reference Datum

Offset Design Piceance 28-05 - Piceance Federal 28-03M - Slot B-5 - Design #1 — **Offset Site Error:** 0.0 usft

Survey Program: 0-MWD — **Offset Well Error:** 0.0 usft

Reference Measured Depth (usft)	Reference Vertical Depth (usft)	Offset Measured Depth (usft)	Offset Vertical Depth (usft)	Semi Major Axis Reference (usft)	Semi Major Axis Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	Offset Wellbore Centre +E/-W (usft)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning
0.0	0.0	0.0	0.0	0.0	0.0	167.48	-21.2	4.7	21.8				
100.0	100.0	100.0	100.0	0.1	0.1	167.48	-21.2	4.7	21.8	21.6	0.18	124.141	CC, ES
200.0	200.0	200.0	200.0	0.3	0.3	125.76	-21.2	4.7	22.7	22.1	0.64	35.255	
300.0	299.8	300.3	300.3	0.6	0.5	131.78	-20.3	6.2	25.2	24.1	1.13	22.224	
400.0	399.5	400.7	400.6	0.8	0.8	135.72	-17.4	10.6	28.5	26.8	1.65	17.283	
500.0	498.7	501.3	500.7	1.1	1.0	137.95	-12.6	18.0	32.3	30.1	2.19	14.750	
600.0	597.5	601.9	600.6	1.4	1.3	138.91	-5.9	28.3	36.7	33.9	2.77	13.224	
700.0	695.6	702.6	700.1	1.8	1.6	138.96	2.7	41.6	41.6	38.1	3.41	12.181	
800.0	793.1	803.4	799.0	2.3	2.0	138.36	13.3	57.8	46.9	42.8	4.12	11.391	
900.0	889.6	904.3	897.2	2.8	2.5	137.34	25.7	76.9	52.8	47.9	4.91	10.744	
1,000.0	985.3	1,005.2	994.7	3.3	3.0	136.05	40.0	99.0	59.1	53.3	5.81	10.183	
1,100.0	1,079.8	1,106.2	1,091.2	4.0	3.5	134.58	56.2	123.9	66.0	59.2	6.82	9.682	
1,200.0	1,173.2	1,207.3	1,186.6	4.6	4.2	133.02	74.3	151.7	73.4	65.5	7.96	9.230	
1,300.0	1,265.2	1,308.4	1,280.9	5.4	4.9	131.42	94.1	182.3	81.4	72.2	9.23	8.821	
1,400.0	1,355.8	1,409.5	1,373.9	6.2	5.6	129.81	115.8	215.6	89.9	79.3	10.64	8.450	
1,500.0	1,444.9	1,509.7	1,464.8	7.1	6.5	128.52	138.8	251.0	99.3	87.1	12.17	8.161	
1,600.0	1,532.5	1,609.1	1,554.8	8.0	7.3	128.68	161.8	286.3	110.6	96.9	13.65	8.099	
1,700.0	1,619.6	1,708.4	1,644.7	9.0	8.1	129.23	184.7	321.6	122.4	107.3	15.12	8.093	
1,800.0	1,706.7	1,807.7	1,734.6	10.0	9.0	129.69	207.6	356.9	134.2	117.6	16.60	8.086	
1,900.0	1,793.8	1,907.0	1,824.6	10.9	9.8	130.07	230.6	392.2	146.1	128.0	18.08	8.077	
2,000.0	1,880.9	2,006.2	1,914.5	11.9	10.7	130.39	253.5	427.5	157.9	138.3	19.57	8.068	
2,100.0	1,968.0	2,105.5	2,004.4	12.9	11.5	130.67	276.5	462.8	169.8	148.7	21.06	8.060	
2,200.0	2,055.1	2,204.8	2,094.4	13.9	12.4	130.92	299.4	498.1	181.6	159.1	22.56	8.051	
2,300.0	2,142.2	2,304.1	2,184.3	14.8	13.2	131.13	322.3	533.4	193.5	169.4	24.05	8.043	
2,400.0	2,229.3	2,403.4	2,274.2	15.8	14.1	131.32	345.3	568.7	205.3	179.8	25.55	8.036	
2,500.0	2,316.4	2,502.7	2,364.1	16.8	14.9	131.48	368.2	604.0	217.2	190.1	27.05	8.029	
2,600.0	2,403.5	2,602.0	2,454.1	17.8	15.8	131.63	391.2	639.3	229.1	200.5	28.55	8.022	
2,700.0	2,490.6	2,701.3	2,544.0	18.8	16.6	131.77	414.1	674.6	240.9	210.9	30.06	8.016	
2,800.0	2,577.7	2,800.6	2,633.9	19.7	17.5	131.89	437.0	709.9	252.8	221.2	31.56	8.010	
2,900.0	2,664.8	2,899.9	2,723.8	20.7	18.4	132.00	460.0	745.2	264.7	231.6	33.06	8.005	
3,000.0	2,751.9	2,999.2	2,813.8	21.7	19.2	132.11	482.9	780.5	276.5	242.0	34.57	8.000	
3,100.0	2,839.0	3,098.5	2,903.7	22.7	20.1	132.20	505.8	815.8	288.4	252.3	36.07	7.995	
3,200.0	2,926.1	3,197.7	2,993.6	23.7	20.9	132.29	528.8	851.1	300.3	262.7	37.58	7.991	
3,300.0	3,013.2	3,297.0	3,083.6	24.7	21.8	132.37	551.7	886.4	312.1	273.1	39.08	7.987	
3,400.0	3,100.3	3,396.3	3,173.5	25.7	22.7	132.44	574.7	921.7	324.0	283.4	40.59	7.983	
3,500.0	3,187.4	3,495.6	3,263.4	26.6	23.5	132.51	597.6	956.9	335.9	293.8	42.10	7.979	
3,600.0	3,274.5	3,594.9	3,353.3	27.6	24.4	132.57	620.5	992.2	347.8	304.2	43.60	7.975	
3,700.0	3,361.7	3,694.2	3,443.3	28.6	25.2	132.63	643.5	1,027.5	359.6	314.5	45.11	7.972	
3,800.0	3,448.8	3,793.5	3,533.2	29.6	26.1	132.69	666.4	1,062.8	371.5	324.9	46.62	7.969	
3,900.0	3,535.9	3,892.8	3,623.1	30.6	27.0	132.74	689.4	1,098.1	383.4	335.2	48.13	7.966	
4,000.0	3,623.0	3,992.1	3,713.0	31.6	27.8	132.79	712.3	1,133.4	395.2	345.6	49.64	7.963	
4,100.0	3,710.1	4,091.4	3,803.0	32.6	28.7	132.84	735.2	1,168.7	407.1	356.0	51.14	7.960	
4,200.0	3,797.5	4,190.1	3,892.4	33.5	29.5	132.92	758.0	1,203.8	418.5	365.9	52.62	7.954	
4,300.0	3,886.5	4,282.3	3,976.6	34.2	30.2	132.94	778.5	1,235.3	428.8	375.0	53.81	7.968	
4,400.0	3,977.0	4,374.4	4,061.8	34.9	30.7	132.99	797.4	1,264.4	438.3	383.4	54.91	7.982	
4,500.0	4,068.9	4,466.4	4,148.1	35.6	31.3	133.04	814.8	1,291.2	447.3	391.3	55.92	7.998	
4,600.0	4,162.1	4,558.3	4,235.3	36.2	31.8	133.11	830.7	1,315.6	455.5	398.7	56.84	8.014	
4,700.0	4,256.6	4,650.2	4,323.3	36.7	32.2	133.18	845.0	1,337.7	463.1	405.4	57.66	8.031	
4,800.0	4,352.1	4,742.0	4,412.1	37.2	32.6	133.26	857.8	1,357.4	470.0	411.6	58.38	8.049	
4,900.0	4,448.6	4,833.7	4,501.5	37.7	33.0	133.36	869.1	1,374.7	476.2	417.1	59.01	8.069	
5,000.0	4,546.0	4,925.4	4,591.5	38.0	33.3	133.46	878.7	1,389.5	481.7	422.1	59.54	8.089	
5,100.0	4,644.1	5,017.1	4,681.9	38.4	33.6	133.57	886.8	1,401.9	486.5	426.5	59.98	8.110	

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

Company:	Piceance Energy, LLC	**Local Co-ordinate Reference:**	Well Piceance Federal 28-01M
Project:	Mesa County, CO	**TVD Reference:**	Well @ 7578.0usft
Reference Site:	Piceance 28-05	**MD Reference:**	Well @ 7578.0usft
Site Error:	0.0 usft	**North Reference:**	True
Reference Well:	Piceance Federal 28-01M	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.0 usft	**Output errors are at**	2.00 sigma
Reference Wellbore	Slot A-4	**Database:**	EDMDBBW
Reference Design:	Design #1	**Offset TVD Reference:**	Reference Datum

Offset Design Piceance 28-05 - Piceance Federal 28-03M - Slot B-5 - Design #1

Offset Site Error: 0.0 usft

Survey Program: 0-MWD

Offset Well Error: 0.0 usft

Reference Measured Depth (usft)	Reference Vertical Depth (usft)	Offset Measured Depth (usft)	Offset Vertical Depth (usft)	Semi Major Axis Reference (usft)	Semi Major Axis Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	Offset Wellbore Centre +E/-W (usft)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning
5,200.0	4,742.8	5,108.7	4,772.7	38.7	33.8	133.68	893.3	1,411.9	490.6	430.3	60.32	8.133	
5,300.0	4,842.0	5,200.0	4,863.6	38.9	34.0	133.81	898.2	1,419.5	494.0	433.4	60.56	8.157	
5,400.0	4,941.6	5,291.7	4,955.1	39.1	34.1	133.94	901.5	1,424.6	496.7	436.0	60.71	8.181	
5,500.0	5,041.5	5,383.2	5,046.5	39.2	34.2	134.08	903.2	1,427.2	498.7	437.9	60.76	8.207	
5,600.0	5,141.4	5,478.1	5,141.4	39.3	34.3	134.21	903.5	1,427.7	499.8	439.0	60.74	8.228	
5,700.0	5,241.4	5,578.1	5,241.4	39.4	34.3	179.64	903.5	1,427.7	499.8	438.9	60.88	8.210	
5,800.0	5,341.4	5,678.1	5,341.4	39.4	34.4	179.64	903.5	1,427.7	499.8	438.8	61.04	8.188	
5,900.0	5,441.4	5,778.1	5,441.4	39.5	34.5	179.64	903.5	1,427.7	499.8	438.6	61.20	8.167	
6,000.0	5,541.4	5,878.1	5,541.4	39.6	34.6	179.64	903.5	1,427.7	499.8	438.4	61.36	8.145	
6,100.0	5,641.4	5,978.1	5,641.4	39.6	34.6	179.64	903.5	1,427.7	499.8	438.3	61.53	8.123	
6,200.0	5,741.4	6,078.1	5,741.4	39.7	34.7	179.64	903.5	1,427.7	499.8	438.1	61.70	8.100	
6,300.0	5,841.4	6,178.1	5,841.4	39.8	34.8	179.64	903.5	1,427.7	499.8	437.9	61.87	8.078	
6,400.0	5,941.4	6,278.1	5,941.4	39.8	34.9	179.64	903.5	1,427.7	499.8	437.7	62.05	8.055	
6,500.0	6,041.4	6,378.1	6,041.4	39.9	35.0	179.64	903.5	1,427.7	499.8	437.6	62.23	8.032	
6,600.0	6,141.4	6,478.1	6,141.4	40.0	35.0	179.64	903.5	1,427.7	499.8	437.4	62.41	8.009	
6,700.0	6,241.4	6,578.1	6,241.4	40.0	35.1	179.64	903.5	1,427.7	499.8	437.2	62.59	7.985	
6,800.0	6,341.4	6,678.1	6,341.4	40.1	35.2	179.64	903.5	1,427.7	499.8	437.0	62.78	7.962	
6,900.0	6,441.4	6,778.1	6,441.4	40.2	35.3	179.64	903.5	1,427.7	499.8	436.8	62.97	7.938	
7,000.0	6,541.4	6,878.1	6,541.4	40.2	35.4	179.64	903.5	1,427.7	499.8	436.6	63.16	7.914	
7,100.0	6,641.4	6,978.1	6,641.4	40.3	35.5	179.64	903.5	1,427.7	499.8	436.4	63.35	7.889	
7,200.0	6,741.4	7,078.1	6,741.4	40.4	35.5	179.64	903.5	1,427.7	499.8	436.2	63.55	7.865	
7,300.0	6,841.4	7,178.1	6,841.4	40.5	35.6	179.64	903.5	1,427.7	499.8	436.1	63.75	7.840	
7,400.0	6,941.4	7,278.1	6,941.4	40.6	35.7	179.64	903.5	1,427.7	499.8	435.8	63.95	7.816	
7,500.0	7,041.4	7,378.1	7,041.4	40.6	35.8	179.64	903.5	1,427.7	499.8	435.6	64.15	7.791	
7,600.0	7,141.4	7,478.1	7,141.4	40.7	35.9	179.64	903.5	1,427.7	499.8	435.4	64.36	7.766	
7,700.0	7,241.4	7,578.1	7,241.4	40.8	36.0	179.64	903.5	1,427.7	499.8	435.2	64.57	7.741	
7,800.0	7,341.4	7,678.1	7,341.4	40.9	36.1	179.64	903.5	1,427.7	499.8	435.0	64.78	7.715	
7,900.0	7,441.4	7,778.1	7,441.4	41.0	36.2	179.64	903.5	1,427.7	499.8	434.8	64.99	7.690	
8,000.0	7,541.4	7,878.1	7,541.4	41.0	36.3	179.64	903.5	1,427.7	499.8	434.6	65.21	7.664	
8,100.0	7,641.4	7,978.1	7,641.4	41.1	36.4	179.64	903.5	1,427.7	499.8	434.4	65.43	7.639	
8,200.0	7,741.4	8,078.1	7,741.4	41.2	36.5	179.64	903.5	1,427.7	499.8	434.1	65.65	7.613	
8,300.0	7,841.4	8,178.1	7,841.4	41.3	36.6	179.64	903.5	1,427.7	499.8	433.9	65.87	7.587	
8,349.8	7,891.2	8,227.9	7,891.2	41.4	36.6	179.64	903.5	1,427.7	499.8	433.8	65.99	7.574	
8,378.6	7,920.0	8,249.7	7,913.0	41.4	36.7	179.64	903.5	1,427.7	499.8	433.8	66.04	7.568	SF

Company:	Piceance Energy, LLC	**Local Co-ordinate Reference:**	Well Piceance Federal 28-01M
Project:	Mesa County, CO	**TVD Reference:**	Well @ 7578.0usft
Reference Site:	Piceance 28-05	**MD Reference:**	Well @ 7578.0usft
Site Error:	0.0 usft	**North Reference:**	True
Reference Well:	Piceance Federal 28-01M	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.0 usft	**Output errors are at**	2.00 sigma
Reference Wellbore	Slot A-4	**Database:**	EDMDBBW
Reference Design:	Design #1	**Offset TVD Reference:**	Reference Datum

Offset Design Piceance 28-05 - Piceance Federal 28-06W - Slot B-3 - Design #1

Offset Site Error: 0.0 usft

Survey Program: 0-MWD

Offset Well Error: 0.0 usft

Reference Measured Depth (usft)	Reference Vertical Depth (usft)	Offset Measured Depth (usft)	Offset Vertical Depth (usft)	Semi Major Axis Reference (usft)	Semi Major Axis Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	Offset Wellbore Centre +E/-W (usft)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning
0.0	0.0	0.0	0.0	0.0	0.0	-81.87	2.0	-14.2	14.3				
100.0	100.0	100.0	100.0	0.1	0.1	-81.87	2.0	-14.2	14.3	14.1	0.18	81.583	CC, ES
200.0	200.0	200.0	200.0	0.3	0.3	-132.44	2.0	-14.2	15.4	14.8	0.65	23.690	
300.0	299.8	299.8	299.8	0.6	0.5	-143.91	2.0	-14.2	19.3	18.2	1.16	16.628	
400.0	399.5	399.5	399.5	0.8	0.8	-154.84	2.0	-14.2	26.9	25.2	1.70	15.837	SF
500.0	498.7	497.9	497.9	1.1	1.0	-160.45	2.8	-15.6	39.2	37.0	2.23	17.619	
600.0	597.5	595.4	595.2	1.4	1.2	-161.45	5.2	-20.0	57.0	54.2	2.76	20.664	
700.0	695.6	692.4	691.9	1.8	1.4	-161.08	8.9	-26.7	79.5	76.2	3.30	24.107	
800.0	793.1	789.0	788.2	2.3	1.7	-161.31	12.6	-33.5	105.4	101.5	3.84	27.449	
900.0	889.6	884.6	883.6	2.8	1.9	-161.86	16.3	-40.2	134.4	130.0	4.39	30.637	
1,000.0	985.3	979.3	977.9	3.3	2.1	-162.51	19.9	-46.9	166.6	161.7	4.94	33.718	
1,100.0	1,079.8	1,072.8	1,071.1	4.0	2.4	-163.18	23.5	-53.5	202.0	196.5	5.50	36.722	
1,200.0	1,173.2	1,165.0	1,163.0	4.6	2.6	-163.82	27.1	-60.0	240.6	234.5	6.06	39.668	
1,300.0	1,265.2	1,255.8	1,253.5	5.4	2.9	-164.41	30.6	-66.5	282.2	275.6	6.63	42.583	
1,400.0	1,355.8	1,345.2	1,342.6	6.2	3.1	-164.94	34.0	-72.8	327.0	319.8	7.20	45.422	
1,500.0	1,444.9	1,432.9	1,430.1	7.1	3.3	-165.42	37.4	-79.0	374.7	367.0	7.77	48.256	
1,600.0	1,532.5	1,519.1	1,515.9	8.0	3.6	-165.93	40.7	-85.0	425.4	417.0	8.33	51.083	
1,700.0	1,619.6	1,604.7	1,601.3	9.0	3.8	-166.52	44.0	-91.1	476.8	467.9	8.88	53.704	
1,800.0	1,706.7	1,690.4	1,686.7	10.0	4.0	-167.00	47.3	-97.1	528.2	518.8	9.44	55.970	
1,900.0	1,793.8	1,776.1	1,772.1	10.9	4.2	-167.39	50.6	-103.2	579.7	569.7	10.00	57.942	
2,000.0	1,880.9	1,861.8	1,857.5	11.9	4.5	-167.72	54.0	-109.2	631.1	620.6	10.58	59.669	
2,100.0	1,968.0	1,947.5	1,942.9	12.9	4.7	-168.00	57.3	-115.3	682.6	671.5	11.16	61.192	
2,200.0	2,055.1	2,033.1	2,028.3	13.9	4.9	-168.24	60.6	-121.3	734.1	722.4	11.74	62.541	
2,300.0	2,142.2	2,118.8	2,113.7	14.8	5.2	-168.44	63.9	-127.4	785.7	773.3	12.33	63.743	
2,400.0	2,229.3	2,204.5	2,199.1	15.8	5.4	-168.63	67.2	-133.4	837.2	824.3	12.92	64.819	
2,500.0	2,316.4	2,290.2	2,284.5	16.8	5.6	-168.79	70.5	-139.5	888.7	875.2	13.51	65.787	
2,600.0	2,403.5	2,375.9	2,369.9	17.8	5.9	-168.93	73.8	-145.5	940.2	926.1	14.10	66.662	
2,700.0	2,490.6	2,461.5	2,455.3	18.8	6.1	-169.06	77.1	-151.6	991.7	977.0	14.70	67.456	

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

Company:	Piceance Energy, LLC	**Local Co-ordinate Reference:**	Well Piceance Federal 28-01M
Project:	Mesa County, CO	**TVD Reference:**	Well @ 7578.0usft
Reference Site:	Piceance 28-05	**MD Reference:**	Well @ 7578.0usft
Site Error:	0.0 usft	**North Reference:**	True
Reference Well:	Piceance Federal 28-01M	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.0 usft	**Output errors are at**	2.00 sigma
Reference Wellbore	Slot A-4	**Database:**	EDMDBBW
Reference Design:	Design #1	**Offset TVD Reference:**	Reference Datum

Offset Design Piceance 28-05 - Piceance Federal 28-07W - Slot B-4 - Design #1

Offset Site Error: 0.0 usft

Survey Program: 0-MWD

Offset Well Error: 0.0 usft

Reference Measured Depth (usft)	Reference Vertical Depth (usft)	Offset Measured Depth (usft)	Offset Vertical Depth (usft)	Semi Major Axis Reference (usft)	Semi Major Axis Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	Offset Wellbore Centre +E/-W (usft)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning
0.0	0.0	0.0	0.0	0.0	0.0	-127.66	-6.1	-7.9	9.9				
100.0	100.0	100.0	100.0	0.1	0.1	-127.66	-6.1	-7.9	9.9	9.8	0.18	56.675	CC, ES
200.0	200.0	200.0	200.0	0.3	0.3	-174.11	-6.1	-7.9	11.7	11.0	0.68	17.085	
300.0	299.8	299.8	299.8	0.6	0.5	-175.93	-6.1	-7.9	16.9	15.7	1.21	14.004	SF
400.0	399.5	399.5	399.5	0.8	0.8	-177.31	-6.1	-7.9	25.6	23.9	1.73	14.809	
500.0	498.7	498.7	498.7	1.1	1.0	-178.17	-6.1	-7.9	37.8	35.5	2.25	16.791	
600.0	597.5	597.5	597.5	1.4	1.2	-178.70	-6.1	-7.9	53.4	50.6	2.77	19.279	
700.0	695.6	695.6	695.6	1.8	1.4	-179.03	-6.1	-7.9	72.5	69.2	3.29	22.026	
800.0	793.1	790.5	790.4	2.3	1.6	-178.79	-6.4	-9.3	96.2	92.4	3.80	25.308	
900.0	889.6	882.8	882.7	2.8	1.8	-177.94	-7.3	-13.6	126.1	121.7	4.32	29.210	
1,000.0	985.3	974.3	973.9	3.3	2.0	-176.94	-8.9	-20.4	161.5	156.7	4.84	33.400	
1,100.0	1,079.8	1,066.3	1,065.6	4.0	2.2	-176.27	-10.5	-27.6	200.6	195.3	5.34	37.552	
1,200.0	1,173.2	1,156.9	1,155.9	4.6	2.4	-175.85	-12.1	-34.8	243.0	237.1	5.85	41.512	
1,300.0	1,265.2	1,245.9	1,244.7	5.4	2.7	-175.58	-13.6	-41.8	288.4	282.0	6.37	45.309	
1,400.0	1,355.8	1,333.4	1,331.8	6.2	2.9	-175.41	-15.2	-48.7	336.9	330.0	6.88	48.973	
1,500.0	1,444.9	1,419.1	1,417.2	7.1	3.1	-175.29	-16.7	-55.4	388.4	381.1	7.39	52.530	
1,600.0	1,532.5	1,503.0	1,500.9	8.0	3.3	-175.25	-18.1	-62.0	442.8	434.9	7.90	56.024	
1,700.0	1,619.6	1,586.5	1,584.1	9.0	3.5	-175.28	-19.6	-68.6	497.9	489.5	8.40	59.261	
1,800.0	1,706.7	1,669.9	1,667.2	10.0	3.7	-175.31	-21.1	-75.2	553.0	544.1	8.91	62.079	
1,900.0	1,793.8	1,753.4	1,750.4	10.9	3.9	-175.33	-22.5	-81.8	608.1	598.7	9.42	64.521	
2,000.0	1,880.9	1,836.8	1,833.6	11.9	4.2	-175.35	-24.0	-88.4	663.2	653.2	9.95	66.665	
2,100.0	1,968.0	1,920.3	1,916.8	12.9	4.4	-175.36	-25.5	-94.9	718.3	707.8	10.48	68.552	
2,200.0	2,055.1	2,003.7	2,000.0	13.9	4.6	-175.37	-26.9	-101.5	773.4	762.3	11.01	70.223	
2,300.0	2,142.2	2,087.2	2,083.2	14.8	4.8	-175.39	-28.4	-108.1	828.4	816.9	11.55	71.709	
2,400.0	2,229.3	2,170.6	2,166.3	15.8	5.0	-175.40	-29.9	-114.7	883.5	871.4	12.10	73.039	
2,500.0	2,316.4	2,254.1	2,249.5	16.8	5.3	-175.40	-31.3	-121.3	938.6	926.0	12.64	74.234	
2,600.0	2,403.5	2,337.6	2,332.7	17.8	5.5	-175.41	-32.8	-127.8	993.7	980.5	13.19	75.312	

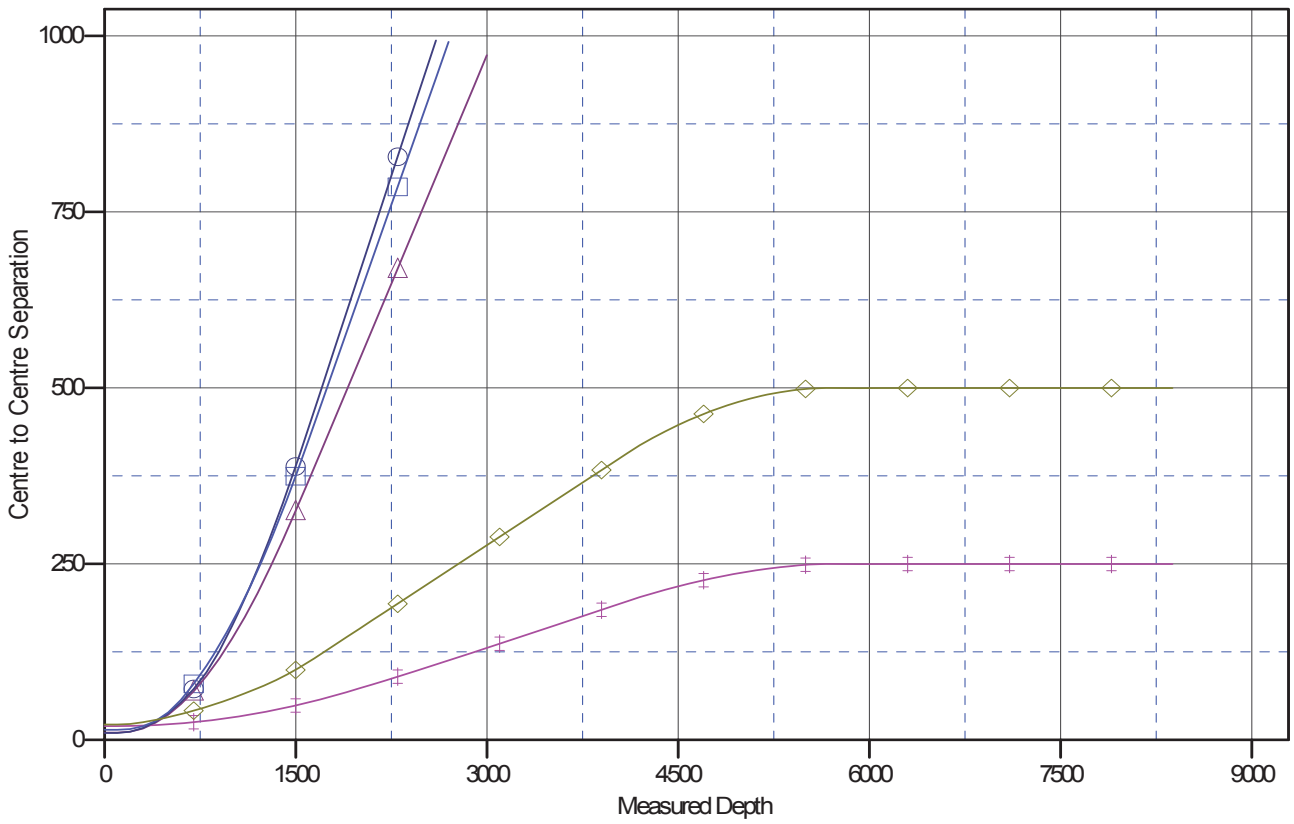
CC - Min centre to center distance or covergent point, SF - min separation factor, ES - min ellipse separation

Company:	Piceance Energy, LLC	**Local Co-ordinate Reference:**	Well Piceance Federal 28-01M
Project:	Mesa County, CO	**TVD Reference:**	Well @ 7578.0usft
Reference Site:	Piceance 28-05	**MD Reference:**	Well @ 7578.0usft
Site Error:	0.0 usft	**North Reference:**	True
Reference Well:	Piceance Federal 28-01M	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.0 usft	**Output errors are at**	2.00 sigma
Reference Wellbore	Slot A-4	**Database:**	EDMDBBW
Reference Design:	Design #1	**Offset TVD Reference:**	Reference Datum

Reference Depths are relative to Well @ 7578.0usft
Offset Depths are relative to Offset Datum
Central Meridian is 105° 30' 0.000 W

Coordinates are relative to: Piceance Federal 28-01M
Coordinate System is US State Plane 1983, Colorado Central Zone
Grid Convergence at Surface is: -1.44°

Ladder Plot



LEGEND

Piceance Federal 28-01W, Slot A-3, Design #1 V0
Piceance Federal 28-07W, Slot B-4, Design #1 V0
Piceance Federal 28-03M, Slot B-5, Design #1
Piceance Federal 28-02M, Slot A-5, Design #1 V0
Piceance Federal 28-06W, Slot B-3, Design #1 V0

Company:	Piceance Energy, LLC	**Local Co-ordinate Reference:**	Well Piceance Federal 28-01M
Project:	Mesa County, CO	**TVD Reference:**	Well @ 7578.0usft
Reference Site:	Piceance 28-05	**MD Reference:**	Well @ 7578.0usft
Site Error:	0.0 usft	**North Reference:**	True
Reference Well:	Piceance Federal 28-01M	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.0 usft	**Output errors are at**	2.00 sigma
Reference Wellbore	Slot A-4	**Database:**	EDMDBBW
Reference Design:	Design #1	**Offset TVD Reference:**	Reference Datum

Reference Depths are relative to Well @ 7578.0usft
Offset Depths are relative to Offset Datum
Central Meridian is 105° 30' 0.000 W

Coordinates are relative to: Piceance Federal 28-01M
Coordinate System is US State Plane 1983, Colorado Central Zone
Grid Convergence at Surface is: -1.44°