

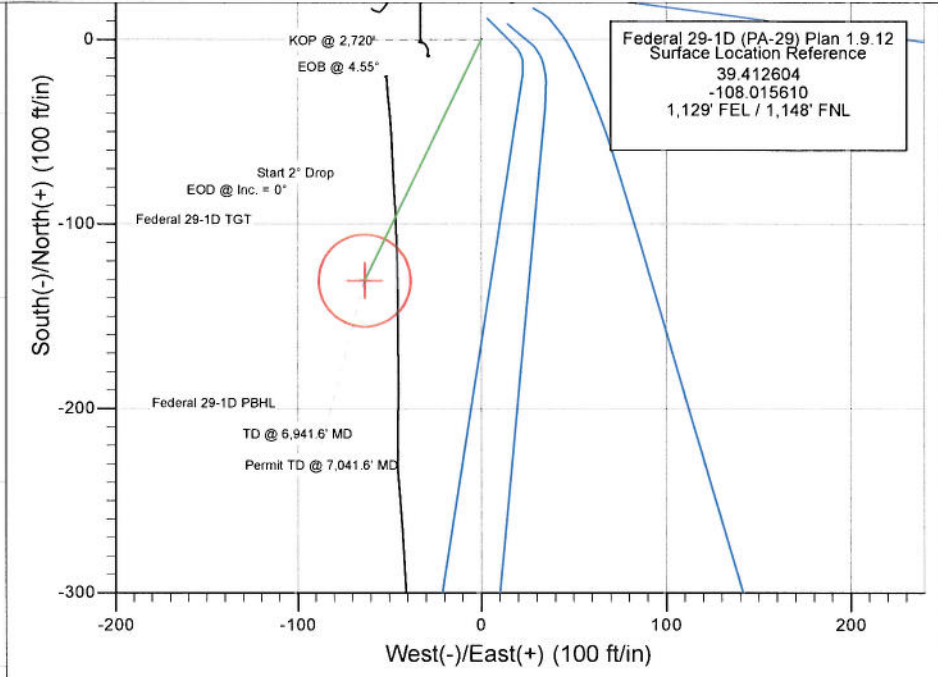
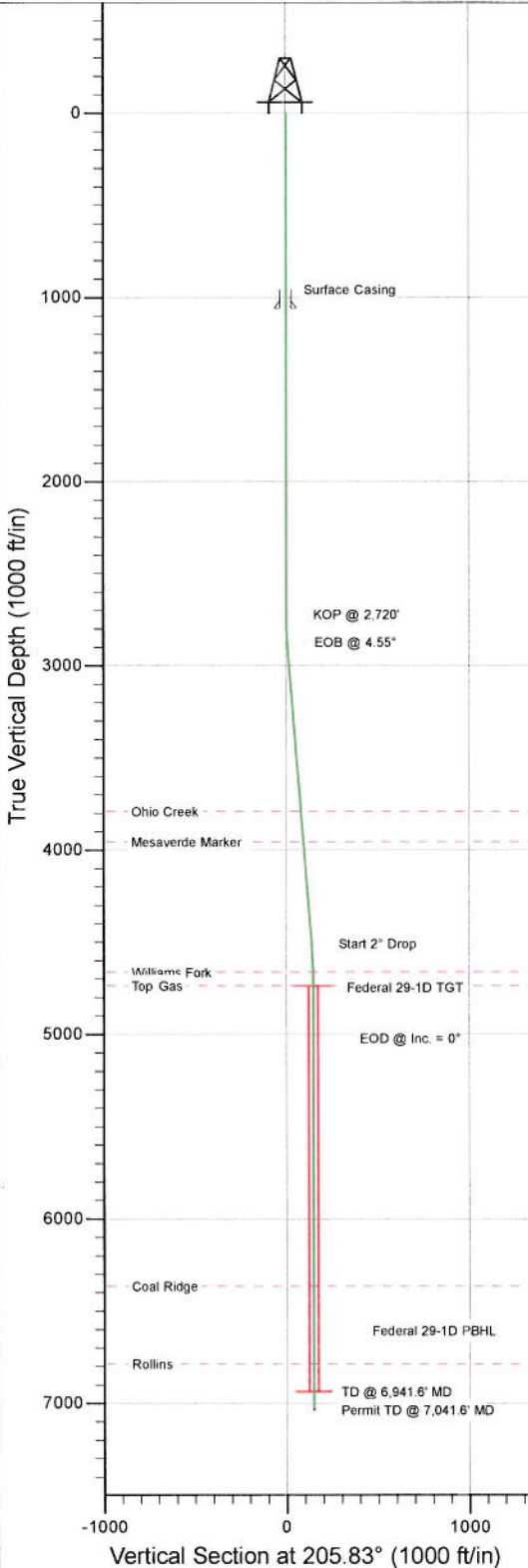


Project: S. Piceance (Parachute)
 Site: PA-29 Pad
 Well: Federal 29-1D (PA-29) Plan 1.9.12
 Wellbore: OH
 Design: Plan #2



SECTION DETAILS

Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	VSect	Target
1	0.0	0.00	0.00	0.0	0.0	0.0	0.00	0.00	0.0	
2	2720.0	0.00	0.00	2720.0	0.0	0.0	0.00	0.00	0.0	
3	2871.7	4.55	205.83	2871.5	-5.4	-2.6	3.00	205.83	6.0	Federal 29-1D TGT
4	4513.1	4.55	205.83	4507.7	-122.6	-59.4	0.00	0.00	136.2	Federal 29-1D PBHL
5	4740.6	0.00	0.00	4735.0	-130.7	-63.3	2.00	180.00	145.3	
6	6941.6	0.00	0.00	6936.0	-130.7	-63.3	0.00	0.00	145.3	
7	7041.6	0.00	0.00	7036.0	-130.7	-63.3	0.00	0.00	145.3	



FORMATION TOP DETAILS

TVDPATH	MDPATH	FORMATION
3790.0	3793.1	Ohio Creek
3955.0	3958.6	Mesaverde Marker
4662.0	4667.6	Williams Fork
4735.0	4740.6	Top Gas
6364.0	6369.6	Coal Ridge
6786.0	6791.6	Rollins



Azimuths to True North
 Magnetic North: 10.20°
 Magnetic Field
 Strength: 52137.3snT
 Dip Angle: 65.65°
 Date: 6/11/2012
 Model: IGRF200510

Federal 29-1D (PA-29) Plan 1.9.12
 Bottom Hole Location
 39.412245
 -108.01534
 1,193' FEL / 1,278' FNL

Target	Azimuth	Origin Type	N/S	E/W	From TVD
No Target (Freehand)	205.83	Spot	0.0	0.0	0.0
Name	TVD	+N/-S	+E/-W	Latitude	
Federal 29-1D TGT	4735.0	-130.7	-63.3	39.412245	-108.015834
Federal 29-1D PBHL	6936.0	-130.7	-63.3	39.412245	-108.015834

Cathedral Energy Services

Planning Report

Database: USA EDM 5000 Multi Users DB	Local Co-ordinate Reference: Well Federal 29-1D (PA-29) Plan 1.9.12
Company: EnCana Oil & Gas (USA) Inc	TVD Reference: KBE @ 6213.0ft (Original Well Elev)
Project: S. Piceance (Parachute)	MD Reference: KBE @ 6213.0ft (Original Well Elev)
Site: PA-29 Pad	North Reference: True
Well: Federal 29-1D (PA-29) Plan 1.9.12	Survey Calculation Method: Minimum Curvature
Wellbore: OH	
Design: Plan #2	

Project	S. Piceance (Parachute), Garfield 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	PA-29 Pad				
Site Position:		Northing:	1,585,028.43 ft	Latitude:	39.412645
From:	Lat/Long	Easting:	2,289,373.78 ft	Longitude:	-108.015520
Position Uncertainty:	0.0 ft	Slot Radius:	13.200 in	Grid Convergence:	-1.59 °

Well	Federal 29-1D (PA-29) Plan 1.9.12					
Well Position	+N/-S	0.0 ft	Northing:	1,585,014.19 ft	Latitude:	39.412604
	+E/-W	0.0 ft	Easting:	2,289,347.95 ft	Longitude:	-108.015610
Position Uncertainty		0.0 ft	Wellhead Elevation:	ft	Ground Level:	6,191.0 ft

Wellbore	OH				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF200510	6/11/2012	10.19	65.65	52,137

Design	Plan #2			
Audit Notes:				
Version:	Phase:	PLAN	Tie On Depth:	0.0
Vertical Section:	Depth From (TVD) (ft)	+N/-S (ft)	+E/-W (ft)	Direction (°)
	0.0	0.0	0.0	205.83

Plan Sections										
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)	TFO (°)	Target
0.0	0.00	0.00	0.0	0.0	0.0	0.00	0.00	0.00	0.00	
2,720.0	0.00	0.00	2,720.0	0.0	0.0	0.00	0.00	0.00	0.00	
2,871.7	4.55	205.83	2,871.5	-5.4	-2.6	3.00	3.00	0.00	205.83	
4,513.1	4.55	205.83	4,507.7	-122.6	-59.4	0.00	0.00	0.00	0.00	
4,740.6	0.00	0.00	4,735.0	-130.7	-63.3	2.00	-2.00	0.00	180.00	Federal 29-1D TGT
6,941.6	0.00	0.00	6,936.0	-130.7	-63.3	0.00	0.00	0.00	0.00	Federal 29-1D PBHL
7,041.6	0.00	0.00	7,036.0	-130.7	-63.3	0.00	0.00	0.00	0.00	

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Wellbore: OH
Design: Plan #2

Local Co-ordinate Reference: Well Federal 29-1D (PA-29) Plan 1.9.12
TVD Reference: KBE @ 6213.0ft (Original Well Elev)
MD Reference: KBE @ 6213.0ft (Original Well Elev)
North Reference: True
Survey Calculation Method: Minimum Curvature

Planned Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Comments / Formations
0.0	0.00	0.00	0.0	0.0	0.0	0.0	0.00	0.00	
100.0	0.00	0.00	100.0	0.0	0.0	0.0	0.00	0.00	
200.0	0.00	0.00	200.0	0.0	0.0	0.0	0.00	0.00	
300.0	0.00	0.00	300.0	0.0	0.0	0.0	0.00	0.00	
400.0	0.00	0.00	400.0	0.0	0.0	0.0	0.00	0.00	
500.0	0.00	0.00	500.0	0.0	0.0	0.0	0.00	0.00	
600.0	0.00	0.00	600.0	0.0	0.0	0.0	0.00	0.00	
700.0	0.00	0.00	700.0	0.0	0.0	0.0	0.00	0.00	
800.0	0.00	0.00	800.0	0.0	0.0	0.0	0.00	0.00	
900.0	0.00	0.00	900.0	0.0	0.0	0.0	0.00	0.00	
1,000.0	0.00	0.00	1,000.0	0.0	0.0	0.0	0.00	0.00	
1,056.1	0.00	0.00	1,056.1	0.0	0.0	0.0	0.00	0.00	Surface Casing
1,100.0	0.00	0.00	1,100.0	0.0	0.0	0.0	0.00	0.00	
1,200.0	0.00	0.00	1,200.0	0.0	0.0	0.0	0.00	0.00	
1,300.0	0.00	0.00	1,300.0	0.0	0.0	0.0	0.00	0.00	
1,400.0	0.00	0.00	1,400.0	0.0	0.0	0.0	0.00	0.00	
1,500.0	0.00	0.00	1,500.0	0.0	0.0	0.0	0.00	0.00	
1,600.0	0.00	0.00	1,600.0	0.0	0.0	0.0	0.00	0.00	
1,700.0	0.00	0.00	1,700.0	0.0	0.0	0.0	0.00	0.00	
1,800.0	0.00	0.00	1,800.0	0.0	0.0	0.0	0.00	0.00	
1,900.0	0.00	0.00	1,900.0	0.0	0.0	0.0	0.00	0.00	
2,000.0	0.00	0.00	2,000.0	0.0	0.0	0.0	0.00	0.00	
2,100.0	0.00	0.00	2,100.0	0.0	0.0	0.0	0.00	0.00	
2,200.0	0.00	0.00	2,200.0	0.0	0.0	0.0	0.00	0.00	
2,300.0	0.00	0.00	2,300.0	0.0	0.0	0.0	0.00	0.00	
2,400.0	0.00	0.00	2,400.0	0.0	0.0	0.0	0.00	0.00	
2,500.0	0.00	0.00	2,500.0	0.0	0.0	0.0	0.00	0.00	
2,600.0	0.00	0.00	2,600.0	0.0	0.0	0.0	0.00	0.00	
2,700.0	0.00	0.00	2,700.0	0.0	0.0	0.0	0.00	0.00	
2,720.0	0.00	0.00	2,720.0	0.0	0.0	0.0	0.00	0.00	KOP @ 2,720'
2,800.0	2.40	205.83	2,800.0	-1.5	-0.7	1.7	3.00	3.00	
2,871.7	4.55	205.83	2,871.5	-5.4	-2.6	6.0	3.00	3.00	EOB @ 4.55°
2,900.0	4.55	205.83	2,899.8	-7.4	-3.6	8.3	0.00	0.00	
3,000.0	4.55	205.83	2,999.4	-14.6	-7.1	16.2	0.00	0.00	
3,100.0	4.55	205.83	3,099.1	-21.7	-10.5	24.1	0.00	0.00	
3,200.0	4.55	205.83	3,198.8	-28.9	-14.0	32.1	0.00	0.00	
3,300.0	4.55	205.83	3,298.5	-36.0	-17.4	40.0	0.00	0.00	
3,400.0	4.55	205.83	3,398.2	-43.1	-20.9	47.9	0.00	0.00	
3,500.0	4.55	205.83	3,497.9	-50.3	-24.3	55.9	0.00	0.00	
3,600.0	4.55	205.83	3,597.5	-57.4	-27.8	63.8	0.00	0.00	
3,700.0	4.55	205.83	3,697.2	-64.6	-31.3	71.7	0.00	0.00	
3,793.1	4.55	205.83	3,790.0	-71.2	-34.5	79.1	0.00	0.00	Ohio Creek
3,800.0	4.55	205.83	3,796.9	-71.7	-34.7	79.7	0.00	0.00	
3,900.0	4.55	205.83	3,896.6	-78.8	-38.2	87.6	0.00	0.00	
3,958.6	4.55	205.83	3,955.0	-83.0	-40.2	92.2	0.00	0.00	Mesaverde Marker
4,000.0	4.55	205.83	3,996.3	-86.0	-41.6	95.5	0.00	0.00	
4,100.0	4.55	205.83	4,096.0	-93.1	-45.1	103.5	0.00	0.00	
4,200.0	4.55	205.83	4,195.7	-100.3	-48.5	111.4	0.00	0.00	
4,300.0	4.55	205.83	4,295.3	-107.4	-52.0	119.3	0.00	0.00	
4,400.0	4.55	205.83	4,395.0	-114.5	-55.4	127.3	0.00	0.00	
4,500.0	4.55	205.83	4,494.7	-121.7	-58.9	135.2	0.00	0.00	
4,513.1	4.55	205.83	4,507.7	-122.6	-59.4	136.2	0.00	0.00	Start 2° Drop

Cathedral Energy Services

Planning Report

Database: USA EDM 5000 Multi Users DB
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Project: S. Piceance (Parachute)
Site: PA-29 Pad
Well: Federal 29-1D (PA-29) Plan 1.9.12
Wellbore: OH
Design: Plan #2

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TVD Reference: KBE @ 6213.0ft (Original Well Elev)
MD Reference: KBE @ 6213.0ft (Original Well Elev)
North Reference: True
Survey Calculation Method: Minimum Curvature

Planned Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Comments / Formations
4,600.0	2.81	205.83	4,594.5	-127.6	-61.8	141.8	2.00	-2.00	
4,667.6	1.46	205.83	4,662.0	-129.9	-62.9	144.3	2.00	-2.00	Williams Fork
4,700.0	0.81	205.83	4,694.4	-130.5	-63.2	145.0	2.00	-2.00	
4,740.6	0.00	0.00	4,735.0	-130.7	-63.3	145.3	2.00	-2.00	EOD @ Inc. = 0° - Top Gas
4,800.0	0.00	0.00	4,794.4	-130.7	-63.3	145.3	0.00	0.00	
4,900.0	0.00	0.00	4,894.4	-130.7	-63.3	145.3	0.00	0.00	
5,000.0	0.00	0.00	4,994.4	-130.7	-63.3	145.3	0.00	0.00	
5,100.0	0.00	0.00	5,094.4	-130.7	-63.3	145.3	0.00	0.00	
5,200.0	0.00	0.00	5,194.4	-130.7	-63.3	145.3	0.00	0.00	
5,300.0	0.00	0.00	5,294.4	-130.7	-63.3	145.3	0.00	0.00	
5,400.0	0.00	0.00	5,394.4	-130.7	-63.3	145.3	0.00	0.00	
5,500.0	0.00	0.00	5,494.4	-130.7	-63.3	145.3	0.00	0.00	
5,600.0	0.00	0.00	5,594.4	-130.7	-63.3	145.3	0.00	0.00	
5,700.0	0.00	0.00	5,694.4	-130.7	-63.3	145.3	0.00	0.00	
5,800.0	0.00	0.00	5,794.4	-130.7	-63.3	145.3	0.00	0.00	
5,900.0	0.00	0.00	5,894.4	-130.7	-63.3	145.3	0.00	0.00	
6,000.0	0.00	0.00	5,994.4	-130.7	-63.3	145.3	0.00	0.00	
6,100.0	0.00	0.00	6,094.4	-130.7	-63.3	145.3	0.00	0.00	
6,200.0	0.00	0.00	6,194.4	-130.7	-63.3	145.3	0.00	0.00	
6,300.0	0.00	0.00	6,294.4	-130.7	-63.3	145.3	0.00	0.00	
6,369.6	0.00	0.00	6,364.0	-130.7	-63.3	145.3	0.00	0.00	Coal Ridge
6,400.0	0.00	0.00	6,394.4	-130.7	-63.3	145.3	0.00	0.00	
6,500.0	0.00	0.00	6,494.4	-130.7	-63.3	145.3	0.00	0.00	
6,600.0	0.00	0.00	6,594.4	-130.7	-63.3	145.3	0.00	0.00	
6,700.0	0.00	0.00	6,694.4	-130.7	-63.3	145.3	0.00	0.00	
6,791.6	0.00	0.00	6,786.0	-130.7	-63.3	145.3	0.00	0.00	Rollins
6,800.0	0.00	0.00	6,794.4	-130.7	-63.3	145.3	0.00	0.00	
6,900.0	0.00	0.00	6,894.4	-130.7	-63.3	145.3	0.00	0.00	
6,941.6	0.00	0.00	6,936.0	-130.7	-63.3	145.3	0.00	0.00	TD @ 6,941.6' MD
7,000.0	0.00	0.00	6,994.4	-130.7	-63.3	145.3	0.00	0.00	
7,041.6	0.00	0.00	7,036.0	-130.7	-63.3	145.3	0.00	0.00	Permit TD @ 7,041.6' MD

Targets

Target Name	Dip Angle (°)	Dip Dir. (°)	TVD (ft)	+N/-S (ft)	+E/-W (ft)	Northing (ft)	Easting (ft)	Latitude	Longitude
Federal 29-1D PBHL - hit/miss target - Shape - plan hits target center - Circle (radius 25.0)	0.00	0.00	6,936.0	-130.7	-63.3	1,584,885.25	2,289,281.06	39.412245	-108.015834
Federal 29-1D TGT - plan hits target center - Point	0.00	0.00	4,735.0	-130.7	-63.3	1,584,885.25	2,289,281.06	39.412245	-108.015834

Casing Points

Measured Depth (ft)	Vertical Depth (ft)	Name	Casing Diameter (in)	Hole Diameter (in)
1,056.1	1,056.1	Surface Casing	0.000	0.000

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MD Reference: KBE @ 6213.0ft (Original Well Elev)
North Reference: True
Survey Calculation Method: Minimum Curvature

Formations

Measured Depth (ft)	Vertical Depth (ft)	Name	Lithology	Dip (°)	Dip Direction (°)
3,793.1	3,790.0	Ohio Creek			
3,958.6	3,955.0	Mesaverde Marker			
4,667.6	4,662.0	Williams Fork			
4,740.6	4,735.0	Top Gas			
6,369.6	6,364.0	Coal Ridge			
6,791.6	6,786.0	Rollins			

Plan Annotations

Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment
		+N/-S (ft)	+E/-W (ft)	
2,720.0	2,720.0	0.0	0.0	KOP @ 2,720'
2,871.7	2,871.5	-5.4	-2.6	EOB @ 4.55°
4,513.1	4,507.7	-122.6	-59.4	Start 2° Drop
4,740.6	4,735.0	-130.7	-63.3	EOD @ Inc. = 0°
6,941.6	6,936.0	-130.7	-63.3	TD @ 6,941.6' MD
7,041.6	7,036.0	-130.7	-63.3	Permit TD @ 7,041.6' MD