

PICEANCE VLY NAD 83

PA 29-06S-095W

DOE 3-W-29 Pad

PA 512-29 - Slot A10

Wellbore #1

Plan: Plan #1 05Feb09 kjs

Standard Planning Report - Geographic

07 August, 2009

Williams Production RMT Company

Planning Report - Geographic

Database: EDMDB_COMPASS	Local Co-ordinate Reference: Well PA 512-29 - Slot A10
Company: PICEANCE VLY NAD 83	TVD Reference: WELL @ 5702.0ft (Nabors 577 (26') kjs)
Project: PA 29-06S-095W	MD Reference: WELL @ 5702.0ft (Nabors 577 (26') kjs)
Site: DOE 3-W-29 Pad	North Reference: True
Well: PA 512-29	Survey Calculation Method: Minimum Curvature
Wellbore: Wellbore #1	
Design: Plan #1 05Feb09 kjs	

Project PA 29-06S-095W, 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	Using geodetic scale factor		

Site DOE 3-W-29 Pad			
Site Position:	Northing: 1,613,247.00 ft	Latitude: 39° 29' 23.965 N	
From: Map	Easting: 2,287,962.20 ft	Longitude: 108° 1' 23.779 W	
Position Uncertainty: 0.0 ft	Slot Radius: in	Grid Convergence: -1.59 °	

Well PA 512-29 - Slot A10			
Well Position	+N/-S 0.0 ft	Northing: 1,613,243.20 ft	Latitude: 39° 29' 23.929 N
	+E/-W 0.0 ft	Easting: 2,287,968.10 ft	Longitude: 108° 1' 23.703 W
Position Uncertainty	0.0 ft	Wellhead Elevation: ft	Ground Level: 5,676.0 ft

Wellbore Wellbore #1					
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2005	2/3/2009	10.64	65.76	52,543

Design Plan #1 05Feb09 kjs				
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	334.01

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	
120.0	0.00	0.00	120.0	0.0	0.0	0.00	0.00	0.00	0.00	
234.3	4.00	35.00	234.2	3.3	2.3	3.50	3.50	0.00	35.00	
1,344.4	40.62	333.38	1,248.3	372.3	-143.0	3.50	3.30	-5.55	-65.93	
5,140.0	40.62	333.38	4,129.3	2,581.6	-1,250.1	0.00	0.00	0.00	0.00	
6,671.1	10.00	333.38	5,497.0	3,159.9	-1,539.9	2.00	-2.00	0.00	-180.00	Top Gas (25' Radius)
7,171.1	0.00	0.00	5,994.5	3,198.8	-1,559.4	2.00	-2.00	0.00	180.00	
8,823.6	0.00	0.00	7,647.0	3,198.8	-1,559.4	0.00	0.00	0.00	0.00	

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Site:	DOE 3-W-29 Pad	North Reference:	True
Well:	PA 512-29	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Plan #1 05Feb09 kjs		

Planned Survey										
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Map Northing (ft)	Map Easting (ft)	Latitude	Longitude	
0.0	0.00	0.00	0.0	0.0	0.0	1,613,243.20	2,287,968.10	39° 29' 23.929 N	108° 1' 23.703 W	
120.0	0.00	0.00	120.0	0.0	0.0	1,613,243.20	2,287,968.10	39° 29' 23.929 N	108° 1' 23.703 W	
234.3	4.00	35.00	234.2	3.3	2.3	1,613,246.40	2,287,970.48	39° 29' 23.961 N	108° 1' 23.674 W	
1,344.4	40.62	333.38	1,248.3	372.3	-143.0	1,613,619.31	2,287,835.50	39° 29' 27.609 N	108° 1' 25.527 W	
2,324.1	40.62	333.38	1,992.0	942.6	-428.8	1,614,197.31	2,287,565.68	39° 29' 33.245 N	108° 1' 29.172 W	
Top of "G" Sand										
2,455.9	40.62	333.38	2,092.0	1,019.3	-467.2	1,614,275.04	2,287,529.40	39° 29' 34.003 N	108° 1' 29.662 W	
Base of "G" Sand										
2,587.6	40.62	333.38	2,192.0	1,096.0	-505.6	1,614,352.76	2,287,493.12	39° 29' 34.761 N	108° 1' 30.153 W	
9 5/8"										
5,130.4	40.62	333.38	4,122.0	2,576.0	-1,247.3	1,615,852.78	2,286,792.89	39° 29' 49.388 N	108° 1' 39.614 W	
Mesaverde										
5,140.0	40.62	333.38	4,129.3	2,581.6	-1,250.1	1,615,858.46	2,286,790.24	39° 29' 49.444 N	108° 1' 39.650 W	
6,671.1	10.00	333.38	5,497.0	3,159.9	-1,539.9	1,616,444.54	2,286,516.63	39° 29' 55.159 N	108° 1' 43.347 W	
Approx. Top Gas										
7,171.1	0.00	0.00	5,994.5	3,198.8	-1,559.4	1,616,483.97	2,286,498.22	39° 29' 55.543 N	108° 1' 43.596 W	
8,103.6	0.00	0.00	6,927.0	3,198.8	-1,559.4	1,616,483.97	2,286,498.22	39° 29' 55.543 N	108° 1' 43.596 W	
Cameo Coals										
8,673.6	0.00	0.00	7,497.0	3,198.8	-1,559.4	1,616,483.97	2,286,498.22	39° 29' 55.543 N	108° 1' 43.596 W	
Rollins SS										
8,823.6	0.00	0.00	7,647.0	3,198.8	-1,559.4	1,616,483.97	2,286,498.22	39° 29' 55.543 N	108° 1' 43.596 W	
TD										

Targets										
Target Name	Dip Angle (°)	Dip Dir. (°)	TVD (ft)	+N/-S (ft)	+E/-W (ft)	Northing (ft)	Easting (ft)	Latitude	Longitude	
Top Gas (25' Radius) P/	0.00	0.00	5,497.0	3,180.1	-1,549.6	1,616,465.00	2,286,507.50	39° 29' 55.358 N	108° 1' 43.470 W	
- plan misses by 22.2ft at 6673.0ft MD (5498.9 TVD, 3160.2 N, -1540.0 E)										
- Circle (radius 25.0)										
TD / PBHL PA 512-29	0.00	0.00	7,647.0	3,180.1	-1,549.6	1,616,465.00	2,286,507.50	39° 29' 55.358 N	108° 1' 43.470 W	
- plan misses by 21.1ft at 8823.6ft MD (7647.0 TVD, 3198.8 N, -1559.4 E)										
- Point										

Casing Points										
Measured Depth (ft)	Vertical Depth (ft)	Name	Casing Diameter (in)	Hole Diameter (in)						
2,587.6	2,192.0	9 5/8"	9.625	12.250						

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Project: PA 29-06S-095W	MD Reference: WELL @ 5702.0ft (Nabors 577 (26') kjs)
Site: DOE 3-W-29 Pad	North Reference: True
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Wellbore: Wellbore #1	
Design: Plan #1 05Feb09 kjs	

Formations						
Measured Depth (ft)	Vertical Depth (ft)	Name	Lithology	Dip (°)	Dip Direction (°)	
2,324.1	1,992.00	Top of "G" Sand				
2,455.9	2,092.00	Base of "G" Sand				
5,130.4	4,122.00	Mesaverde				
6,671.1	5,497.00	Approx. Top Gas				
8,103.6	6,927.00	Cameo Coals				
8,673.6	7,497.00	Rollins SS				
8,823.6	7,647.00	TD				

Plan Annotations					
Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment	
		+N/-S (ft)	+E/-W (ft)		
120.0	120.0	0.0	0.0	Start Build 3.50	
234.3	234.2	3.3	2.3	Begin 3.5/100 Build & Turn	
1,344.4	1,248.3	372.3	-143.0	Hold 40.62 Inclination	
5,140.0	4,129.3	2,581.6	-1,250.1	Begin 2/100 Drop	
6,671.1	5,497.0	3,159.9	-1,539.9	Top Gas	
7,171.1	5,994.5	3,198.8	-1,559.4	Vertical	
8,823.6	7,647.0	3,198.8	-1,559.4	TD at 8823.6	