

# **PICEANCE VLY NAD 83**

**PA 29-06S-095W**

**DOE 2-W-29 Pad**

**PA 22-29 - Slot A11**

**Wellbore #1**

**Plan: Plan #2 08jan10 kjs**

## **Standard Planning Report - Geographic**

**23 February, 2010**

**Williams**  
Planning Report - Geographic

<b>Database:</b>	Compass R5000 WIN AUTH	<b>Local Co-ordinate Reference:</b>	Well PA 22-29 - Slot A11
<b>Company:</b>	PICEANCE VLY NAD 83	<b>TVD Reference:</b>	Corrected Elev. @ 5916.0usft (Cyclone 17 (21' KB) kjs)
<b>Project:</b>	PA 29-06S-095W	<b>MD Reference:</b>	Corrected Elev. @ 5916.0usft (Cyclone 17 (21' KB) kjs)
<b>Site:</b>	DOE 2-W-29 Pad	<b>North Reference:</b>	True
<b>Well:</b>	PA 22-29	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Wellbore #1		
<b>Design:</b>	Plan #2 08jan10 kjs		

<b>Project</b>	PA 29-06S-095W, Garfield 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		Using geodetic scale factor

<b>Site</b>	DOE 2-W-29 Pad		
<b>Site Position:</b>		<b>Northing:</b>	1,616,110.00 usft
<b>From:</b>	Map	<b>Easting:</b>	2,290,002.20 usft
<b>Position Uncertainty:</b>	0.0 usft	<b>Slot Radius:</b>	0.000 in
		<b>Latitude:</b>	39° 29' 52.810 N
		<b>Longitude:</b>	108° 0' 58.779 W
		<b>Grid Convergence:</b>	-1.587 °

<b>Well</b>	PA 22-29 - Slot A11		
<b>Well Position</b>	<b>+N/-S</b>	0.0 usft	<b>Northing:</b>
	<b>+E/-W</b>	0.0 usft	<b>Easting:</b>
<b>Position Uncertainty</b>	0.0 usft		<b>Wellhead Elevation:</b>
			<b>Latitude:</b>
			<b>Longitude:</b>
			<b>Ground Level:</b>

<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>
	IGRF2005-10	8/20/2009	10.575	65.797	52,460

<b>Design</b>	Plan #2 08jan10 kjs			
<b>Audit Notes:</b>				
<b>Version:</b>	<b>Phase:</b>	PLAN	<b>Tie On Depth:</b>	0.0
<b>Vertical Section:</b>	<b>Depth From (TVD) (usft)</b>	<b>+N/-S (usft)</b>	<b>+E/-W (usft)</b>	<b>Direction (°)</b>
	0.0	0.0	0.0	250.11

<b>Plan Sections</b>										
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	0.000	
120.0	0.00	0.00	120.0	0.0	0.0	0.00	0.00	0.00	0.000	
453.3	10.00	225.00	451.6	-20.5	-20.5	3.00	3.00	0.00	225.000	
1,842.5	36.41	251.64	1,719.6	-240.0	-506.6	2.00	1.90	1.92	34.813	
3,960.1	36.41	251.64	3,423.9	-635.9	-1,699.5	0.00	0.00	0.00	0.000	
6,387.2	0.00	251.50	5,691.0	-870.7	-2,407.1	1.50	-1.50	0.00	180.000	Top Gas (25' Radius)
8,537.2	0.00	251.50	7,841.0	-870.7	-2,407.1	0.00	0.00	0.00	251.500	

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<b>Project:</b>	PA 29-06S-095W	<b>MD Reference:</b>	Corrected Elev. @ 5916.0usft (Cyclone 17 (21' KB) kjs)
<b>Site:</b>	DOE 2-W-29 Pad	<b>North Reference:</b>	True
<b>Well:</b>	PA 22-29	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Wellbore #1		
<b>Design:</b>	Plan #2 08jan10 kjs		

Planned Survey										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude	
0.0	0.00	0.00	0.0	0.0	0.0	1,616,085.00	2,290,083.40	39° 29' 52.585 N	108° 0' 57.735 W	
120.0	0.00	0.00	120.0	0.0	0.0	1,616,085.00	2,290,083.40	39° 29' 52.585 N	108° 0' 57.735 W	
<b>Start Build 3.00</b>										
453.3	10.00	225.00	451.6	-20.5	-20.5	1,616,065.06	2,290,062.32	39° 29' 52.383 N	108° 0' 57.996 W	
<b>Begin 2°/100 Build &amp; Turn</b>										
500.0	10.78	227.85	497.5	-26.3	-26.6	1,616,059.43	2,290,056.07	39° 29' 52.325 N	108° 0' 58.074 W	
1,000.0	19.97	243.49	979.3	-96.0	-138.0	1,615,992.88	2,289,942.85	39° 29' 51.637 N	108° 0' 59.494 W	
1,500.0	29.67	249.33	1,432.7	-178.0	-330.6	1,615,916.26	2,289,747.98	39° 29' 50.826 N	108° 1' 1.952 W	
1,842.5	36.41	251.64	1,719.6	-240.0	-506.6	1,615,859.15	2,289,570.34	39° 29' 50.214 N	108° 1' 4.197 W	
<b>Hold 36.41 Inclination</b>										
2,000.0	36.41	251.64	1,846.4	-269.4	-595.3	1,615,832.17	2,289,480.85	39° 29' 49.922 N	108° 1' 5.329 W	
2,500.0	36.41	251.64	2,248.8	-362.9	-877.0	1,615,746.53	2,289,196.73	39° 29' 48.999 N	108° 1' 8.922 W	
2,552.4	36.41	251.64	2,291.0	-372.7	-906.5	1,615,737.55	2,289,166.93	39° 29' 48.902 N	108° 1' 9.299 W	
<b>Top of "G" Sand</b>										
2,676.7	36.41	251.64	2,391.0	-395.9	-976.5	1,615,716.26	2,289,096.33	39° 29' 48.672 N	108° 1' 10.192 W	
<b>Base of "G" Sand</b>										
2,800.9	36.41	251.64	2,491.0	-419.2	-1,046.5	1,615,694.98	2,289,025.72	39° 29' 48.442 N	108° 1' 11.085 W	
<b>9 5/8"</b>										
3,000.0	36.41	251.64	2,651.2	-456.4	-1,158.6	1,615,660.89	2,288,912.61	39° 29' 48.075 N	108° 1' 12.515 W	
3,500.0	36.41	251.64	3,053.6	-549.9	-1,440.3	1,615,575.24	2,288,628.49	39° 29' 47.150 N	108° 1' 16.108 W	
3,960.1	36.41	251.64	3,423.9	-635.9	-1,699.5	1,615,496.43	2,288,367.03	39° 29' 46.300 N	108° 1' 19.414 W	
<b>Start Drop -1.50</b>										
4,000.0	35.81	251.64	3,456.2	-643.3	-1,721.8	1,615,489.65	2,288,344.53	39° 29' 46.227 N	108° 1' 19.699 W	
4,500.0	28.31	251.64	3,879.6	-726.8	-1,973.5	1,615,413.11	2,288,090.62	39° 29' 45.401 N	108° 1' 22.909 W	
5,000.0	20.81	251.64	4,334.0	-792.3	-2,170.6	1,615,353.18	2,287,891.80	39° 29' 44.754 N	108° 1' 25.423 W	
5,055.4	19.98	251.64	4,386.0	-798.3	-2,188.9	1,615,347.61	2,287,873.31	39° 29' 44.694 N	108° 1' 25.657 W	
<b>Mesaverde</b>										
5,500.0	13.31	251.64	4,811.7	-838.4	-2,309.7	1,615,310.89	2,287,751.47	39° 29' 44.298 N	108° 1' 27.198 W	
6,000.0	5.81	251.64	5,304.4	-864.6	-2,388.4	1,615,286.94	2,287,672.03	39° 29' 44.040 N	108° 1' 28.202 W	
6,387.2	0.00	251.50	5,691.0	-870.7	-2,407.1	1,615,281.28	2,287,653.25	39° 29' 43.979 N	108° 1' 28.440 W	
<b>Top Gas - Approx. Top Gas</b>										
6,500.0	0.00	251.50	5,803.8	-870.7	-2,407.1	1,615,281.28	2,287,653.25	39° 29' 43.979 N	108° 1' 28.440 W	
7,000.0	0.00	251.50	6,303.8	-870.7	-2,407.1	1,615,281.28	2,287,653.25	39° 29' 43.979 N	108° 1' 28.440 W	
7,500.0	0.00	251.50	6,803.8	-870.7	-2,407.1	1,615,281.28	2,287,653.25	39° 29' 43.979 N	108° 1' 28.440 W	
7,832.2	0.00	251.50	7,136.0	-870.7	-2,407.1	1,615,281.28	2,287,653.25	39° 29' 43.979 N	108° 1' 28.440 W	
<b>Cameo Coals</b>										
8,000.0	0.00	251.50	7,303.8	-870.7	-2,407.1	1,615,281.28	2,287,653.25	39° 29' 43.979 N	108° 1' 28.440 W	
8,387.2	0.00	251.50	7,691.0	-870.7	-2,407.1	1,615,281.28	2,287,653.25	39° 29' 43.979 N	108° 1' 28.440 W	
<b>Rollins SS</b>										
8,500.0	0.00	251.50	7,803.8	-870.7	-2,407.1	1,615,281.28	2,287,653.25	39° 29' 43.979 N	108° 1' 28.440 W	
8,537.2	0.00	251.50	7,841.0	-870.7	-2,407.1	1,615,281.28	2,287,653.25	39° 29' 43.979 N	108° 1' 28.440 W	
<b>TD</b>										

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<b>Site:</b>	DOE 2-W-29 Pad	<b>North Reference:</b>	True
<b>Well:</b>	PA 22-29	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Wellbore #1		
<b>Design:</b>	Plan #2 08jan10 kjs		

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
Top Gas (25' Radius) P/	0.00	0.00	5,691.0	-876.5	-2,425.6	1,615,276.00	2,287,634.60	39° 29' 43.921 N	108° 1' 28.676 W
- plan misses target center by 19.4usft at 6387.2usft MD (5691.0 TVD, -870.7 N, -2407.1 E)									
- Circle (radius 25.0)									
TD / PBHL PA 22-29	0.00	0.00	7,841.0	-876.5	-2,425.6	1,615,276.00	2,287,634.60	39° 29' 43.921 N	108° 1' 28.676 W
- plan misses target center by 19.4usft at 8537.2usft MD (7841.0 TVD, -870.7 N, -2407.1 E)									
- Point									

Casing Points					
Measured Depth (usft)	Vertical Depth (usft)	Name	Casing Diameter (in)	Hole Diameter (in)	
2,800.9	2,491.0	9 5/8"	9.625	12.250	

Formations						
Measured Depth (usft)	Vertical Depth (usft)	Name	Lithology	Dip (°)	Dip Direction (°)	
2,552.4	2,291.0	Top of "G" Sand				
2,676.7	2,391.0	Base of "G" Sand				
5,055.4	4,386.0	Mesaverde				
6,387.2	5,691.0	Approx. Top Gas				
7,832.2	7,136.0	Cameo Coals				
8,387.2	7,691.0	Rollins SS				
8,537.2	7,841.0	TD				

Plan Annotations					
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment	
		+N/-S (usft)	+E/-W (usft)		
120.0	120.0	0.0	0.0	Start Build 3.00	
453.3	451.6	-20.5	-20.5	Begin 2°/100 Build & Turn	
1,842.5	1,719.6	-240.0	-506.6	Hold 36.41 Inclination	
3,960.1	3,423.9	-635.9	-1,699.5	Start Drop -1.50	
6,387.2	5,691.0	-870.7	-2,407.1	Top Gas	
8,537.2	7,841.0	-870.7	-2,407.1	TD at 8537.2	