

# **PICEANCE VLY NAD 83**

**RU 31-06S-094W**

**RWF 34-31 Pad**

**RWF 333-31 - Slot A11**

**Wellbore #1**

**Plan: Design #1 18Feb10 kjs**

## **Standard Planning Report - Geographic**

**05 May, 2010**

**Williams**  
Planning Report - Geographic

<b>Database:</b>	Compass R5000 WIN AUTH	<b>Local Co-ordinate Reference:</b>	Well RWF 333-31 - Slot A11
<b>Company:</b>	PICEANCE VLY NAD 83	<b>TVD Reference:</b>	WELL @ 5733.0usft (SSD 573 (26' KB) kjs)
<b>Project:</b>	RU 31-06S-094W	<b>MD Reference:</b>	WELL @ 5733.0usft (SSD 573 (26' KB) kjs)
<b>Site:</b>	RWF 34-31 Pad	<b>North Reference:</b>	True
<b>Well:</b>	RWF 333-31	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Wellbore #1		
<b>Design:</b>	Design #1 18Feb10 kjs		

<b>Project</b>	RU 31-06S-094W, 31-06S-094W		
<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		

Site		RWF 34-31 Pad			
Site Position:		Northing:	1,607,154.40 usft	Latitude:	39° 28' 30.868 N
From:	Map	Easting:	2,314,309.20 usft	Longitude:	107° 55' 45.744 W
Position Uncertainty:	0.0 usft	Slot Radius:	13.200 in	Grid Convergence:	-1.532 °

Well	RWF 333-31 - Slot A11					
Well Position	+N/-S	0.0 usft	Northing:	1,607,179.38 usft	Latitude:	39° 28' 31.120 N
	+E/-W	0.0 usft	Easting:	2,314,329.22 usft	Longitude:	107° 55' 45.498 W
Position Uncertainty		0.0 usft	Wellhead Elevation:		Ground Level:	5,707.0 usft

<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>
	IGRF2010	2/18/2010	10.490	65.770	52,383

<b>Design</b>	Design #1 18Feb10 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	14.81

<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	
470.0	10.50	14.81	468.0	30.9	8.2	3.00	3.00	0.00	14.810	
2,770.5	10.50	14.81	2,730.0	436.2	115.3	0.00	0.00	0.00	0.000	
3,322.9	29.83	14.81	3,246.1	619.5	163.8	3.50	3.50	0.00	0.000	
4,922.3	29.83	14.81	4,633.5	1,388.7	367.2	0.00	0.00	0.00	0.000	
6,014.0	8.00	14.81	5,660.0	1,728.8	457.1	2.00	-2.00	0.00	180.000	Top Gas (25' Radius)
6,414.0	0.00	0.00	6,058.7	1,755.7	464.3	2.00	-2.00	0.00	180.000	
8,565.3	0.00	0.00	8,210.0	1,755.7	464.3	0.00	0.00	0.00	0.000	

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<b>Company:</b>	PICEANCE VLY NAD 83	<b>TVD Reference:</b>	WELL @ 5733.0usft (SSD 573 (26' KB) kjs)
<b>Project:</b>	RU 31-06S-094W	<b>MD Reference:</b>	WELL @ 5733.0usft (SSD 573 (26' KB) kjs)
<b>Site:</b>	RWF 34-31 Pad	<b>North Reference:</b>	True
<b>Well:</b>	RWF 333-31	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Wellbore #1		
<b>Design:</b>	Design #1 18Feb10 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	1,607,179.38	2,314,329.22	39° 28' 31.120 N	107° 55' 45.498 W	
120.0	0.00	0.00	120.0	0.0	0.0	1,607,179.38	2,314,329.22	39° 28' 31.120 N	107° 55' 45.498 W	
<b>Start Build 3.00</b>										
470.0	10.50	14.81	468.0	30.9	8.2	1,607,210.07	2,314,338.21	39° 28' 31.425 N	107° 55' 45.394 W	
<b>Hold 10.50 Inclination</b>										
1,112.7	10.50	14.81	1,100.0	144.2	38.1	1,607,322.47	2,314,371.17	39° 28' 32.545 N	107° 55' 45.012 W	
<b>9 5/8"</b>										
2,262.0	10.50	14.81	2,230.0	346.6	91.6	1,607,523.44	2,314,430.10	39° 28' 34.546 N	107° 55' 44.329 W	
<b>Top of "G" Sand</b>										
2,363.7	10.50	14.81	2,330.0	364.5	96.4	1,607,541.22	2,314,435.31	39° 28' 34.723 N	107° 55' 44.269 W	
<b>Base of "G" Sand</b>										
2,770.5	10.50	14.81	2,730.0	436.2	115.3	1,607,612.36	2,314,456.17	39° 28' 35.431 N	107° 55' 44.027 W	
<b>Start Build 3.50</b>										
3,322.9	29.83	14.81	3,246.1	619.5	163.8	1,607,794.24	2,314,509.51	39° 28' 37.242 N	107° 55' 43.409 W	
<b>Hold 29.83 Inclination</b>										
4,837.5	29.83	14.81	4,560.0	1,347.9	356.4	1,608,517.31	2,314,721.55	39° 28' 44.442 N	107° 55' 40.952 W	
<b>Mesaverde</b>										
4,922.3	29.83	14.81	4,633.5	1,388.7	367.2	1,608,557.77	2,314,733.41	39° 28' 44.845 N	107° 55' 40.815 W	
<b>Start Drop -2.00</b>										
6,014.0	8.00	14.81	5,660.0	1,728.8	457.1	1,608,895.34	2,314,832.40	39° 28' 48.207 N	107° 55' 39.668 W	
<b>Top Gas - Approx. Top Gas</b>										
6,414.0	0.00	0.00	6,058.7	1,755.7	464.3	1,608,922.09	2,314,840.25	39° 28' 48.473 N	107° 55' 39.577 W	
<b>Vertical</b>										
7,420.3	0.00	0.00	7,065.0	1,755.7	464.3	1,608,922.09	2,314,840.25	39° 28' 48.473 N	107° 55' 39.577 W	
<b>Cameo Coals</b>										
8,240.3	0.00	0.00	7,885.0	1,755.7	464.3	1,608,922.09	2,314,840.25	39° 28' 48.473 N	107° 55' 39.577 W	
<b>Coal D</b>										
8,310.3	0.00	0.00	7,955.0	1,755.7	464.3	1,608,922.09	2,314,840.25	39° 28' 48.473 N	107° 55' 39.577 W	
<b>Base L. Cameo Pay</b>										
8,415.3	0.00	0.00	8,060.0	1,755.7	464.3	1,608,922.09	2,314,840.25	39° 28' 48.473 N	107° 55' 39.577 W	
<b>Rollins SS</b>										
8,565.3	0.00	0.00	8,210.0	1,755.7	464.3	1,608,922.09	2,314,840.25	39° 28' 48.473 N	107° 55' 39.577 W	
<b>TD</b>										

Design Targets										
Target Name	Dip Angle (°)	Dip Dir. (°)	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Northing (usft)	Easting (usft)	Latitude	Longitude	
- hit/miss target										
- Shape										
Top Gas (25' Radius) R\	0.00	0.00	5,660.0	1,747.6	462.1	1,608,914.00	2,314,837.90	39° 28' 48.392 N	107° 55' 39.604 W	
- plan misses target center by 19.3usft at 6015.3usft MD (5661.3 TVD, 1729.0 N, 457.2 E)										
- Circle (radius 25.0)										

Casing Points										
Measured Depth (usft)	Vertical Depth (usft)	Name	Casing Diameter (in)	Hole Diameter (in)						
1,112.7	1,100.0	9 5/8"	9.625	12.250						

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<b>Site:</b>	RWF 34-31 Pad	<b>North Reference:</b>	True
<b>Well:</b>	RWF 333-31	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Wellbore #1		
<b>Design:</b>	Design #1 18Feb10 kjs		

Formations						
Measured Depth (usft)	Vertical Depth (usft)	Name	Lithology	Dip (°)	Dip Direction (°)	
2,262.0	2,230.0	Top of "G" Sand				
2,363.7	2,330.0	Base of "G" Sand				
4,837.5	4,560.0	Mesaverde				
6,014.0	5,660.0	Approx. Top Gas				
7,420.3	7,065.0	Cameo Coals				
8,240.3	7,885.0	Coal D				
8,310.3	7,955.0	Base L. Cameo Pay				
8,415.3	8,060.0	Rollins SS				
8,565.3	8,210.0	TD				

Plan Annotations					
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates			
		+N/-S (usft)	+E/-W (usft)	Comment	
120.0	120.0	0.0	0.0	Start Build 3.00	
470.0	468.0	30.9	8.2	Hold 10.50 Inclination	
2,770.5	2,730.0	436.2	115.3	Start Build 3.50	
3,322.9	3,246.1	619.5	163.8	Hold 29.83 Inclination	
4,922.3	4,633.5	1,388.7	367.2	Start Drop -2.00	
6,014.0	5,660.0	1,728.8	457.1	Top Gas	
6,414.0	6,058.7	1,755.7	464.3	Vertical	
8,565.3	8,210.0	1,755.7	464.3	TD at 8565.3	