

PICEANCE VLY NAD 83

RU 31-06S-094W

RWF 13-31 Pad

RWF 413-31 - Slot B5

Wellbore #1

Plan: Plan #2 09Apr10 kjs

Standard Planning Report - Geographic

12 April, 2010

Williams
Planning Report - Geographic

Database:	Compass R5000 WIN AUTH	Local Co-ordinate Reference:	Well RWF 413-31 - Slot B5
Company:	PICEANCE VLY NAD 83	TVD Reference:	KB H&P @ 5382.0usft (H&P)
Project:	RU 31-06S-094W	MD Reference:	KB H&P @ 5382.0usft (H&P)
Site:	RWF 13-31 Pad	North Reference:	True
Well:	RWF 413-31	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Plan #2 09Apr10 kjs		

Project	RU 31-06S-094W, 31-06S-094W		
Map System:	US State Plane 1983	System Datum:	Mean Sea Level
Geo Datum:	North American Datum 1983		
Map Zone:	Colorado Central Zone		

Site		RWF 13-31 Pad			
Site Position:		Northing:	1,608,890.20 usft	Latitude:	39° 28' 47.650 N
From:	Map	Easting:	2,312,921.60 usft	Longitude:	107° 56' 4.027 W
Position Uncertainty:	0.0 usft	Slot Radius:	13.200 in	Grid Convergence:	-1.535 °

Well	RWF 413-31 - Slot B5					
Well Position	+N/-S	0.0 usft	Northing:	1,608,913.15 usft	Latitude:	39° 28' 47.883 N
	+E/-W	0.0 usft	Easting:	2,312,943.35 usft	Longitude:	107° 56' 3.758 W
Position Uncertainty		0.0 usft	Wellhead Elevation:		Ground Level:	5,358.0 usft

Wellbore	Wellbore #1				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF200510	11/24/2008	10.632	65.816	52,537

Design	Plan #2 09Apr10 kjs			
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	185.49

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	0.000	
120.0	0.00	0.00	120.0	0.0	0.0	0.00	0.00	0.00	0.000	
370.0	5.00	185.56	369.7	-10.9	-1.1	2.00	2.00	0.00	185.560	
2,425.1	5.00	185.56	2,417.0	-189.1	-18.4	0.00	0.00	0.00	0.000	
2,799.0	12.48	185.46	2,786.3	-245.6	-23.8	2.00	2.00	-0.03	-0.167	
4,499.6	12.48	185.46	4,446.7	-611.4	-58.8	0.00	0.00	0.00	0.000	
5,331.5	0.00	0.00	5,272.0	-701.2	-67.4	1.50	-1.50	0.00	180.000	Top Gas (25' Radius)
7,881.5	0.00	0.00	7,822.0	-701.2	-67.4	0.00	0.00	0.00	0.000	

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Wellbore:	Wellbore #1		
Design:	Plan #2 09Apr10 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	1,608,913.15	2,312,943.35	39° 28' 47.883 N	107° 56' 3.758 W	
120.0	0.00	0.00	120.0	0.0	0.0	1,608,913.15	2,312,943.35	39° 28' 47.883 N	107° 56' 3.758 W	
Start Build 2.00										
370.0	5.00	185.56	369.7	-10.9	-1.1	1,608,902.34	2,312,942.00	39° 28' 47.776 N	107° 56' 3.771 W	
Hold 5.00 Inclination										
1,103.1	5.00	185.56	1,100.0	-74.4	-7.2	1,608,838.93	2,312,934.11	39° 28' 47.147 N	107° 56' 3.850 W	
9 5/8"										
1,923.2	5.00	185.56	1,917.0	-145.6	-14.2	1,608,768.00	2,312,925.28	39° 28' 46.444 N	107° 56' 3.939 W	
Top of "G" Sand										
2,023.6	5.00	185.56	2,017.0	-154.3	-15.0	1,608,759.32	2,312,924.20	39° 28' 46.358 N	107° 56' 3.950 W	
Base of "G" Sand										
2,425.1	5.00	185.56	2,417.0	-189.1	-18.4	1,608,724.59	2,312,919.88	39° 28' 46.014 N	107° 56' 3.993 W	
Begin 2"/100 Build										
2,799.0	12.48	185.46	2,786.3	-245.6	-23.8	1,608,668.25	2,312,912.94	39° 28' 45.455 N	107° 56' 4.062 W	
2,799.1	12.48	185.46	2,786.4	-245.6	-23.8	1,608,668.23	2,312,912.93	39° 28' 45.455 N	107° 56' 4.062 W	
Hold 12.48 Inclination										
4,276.6	12.48	185.46	4,229.0	-563.4	-54.2	1,608,351.37	2,312,874.06	39° 28' 42.314 N	107° 56' 4.449 W	
Mesaverde										
4,499.5	12.48	185.46	4,446.6	-611.4	-58.8	1,608,303.57	2,312,868.19	39° 28' 41.840 N	107° 56' 4.508 W	
Start Drop -1.50										
4,499.6	12.48	185.46	4,446.7	-611.4	-58.8	1,608,303.55	2,312,868.19	39° 28' 41.840 N	107° 56' 4.508 W	
5,331.5	0.00	0.00	5,272.0	-701.2	-67.4	1,608,214.00	2,312,857.20	39° 28' 40.953 N	107° 56' 4.617 W	
Top Gas - Approx. Top Gas										
6,741.5	0.00	0.00	6,682.0	-701.2	-67.4	1,608,214.00	2,312,857.20	39° 28' 40.953 N	107° 56' 4.617 W	
Cameo Coals										
7,571.5	0.00	0.00	7,512.0	-701.2	-67.4	1,608,214.00	2,312,857.20	39° 28' 40.953 N	107° 56' 4.617 W	
Coal D										
7,641.5	0.00	0.00	7,582.0	-701.2	-67.4	1,608,214.00	2,312,857.20	39° 28' 40.953 N	107° 56' 4.617 W	
Base L. Cameo Pay										
7,731.5	0.00	0.00	7,672.0	-701.2	-67.4	1,608,214.00	2,312,857.20	39° 28' 40.953 N	107° 56' 4.617 W	
Rollins SS										
7,881.5	0.00	0.00	7,822.0	-701.2	-67.4	1,608,214.00	2,312,857.20	39° 28' 40.953 N	107° 56' 4.617 W	
TD										

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) RL	0.00	0.00	5,272.0	-701.2	-67.4	1,608,214.00	2,312,857.20	39° 28' 40.953 N	107° 56' 4.617 W	
- plan hits target center										
- Circle (radius 25.0)										

Casing Points					
Measured Depth (usft)	Vertical Depth (usft)	Name	Casing Diameter (in)	Hole Diameter (in)	
1,103.1	1,100.0	9 5/8"	9.625	12.250	

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Project:	RU 31-06S-094W	MD Reference:	KB H&P @ 5382.0usft (H&P)
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Well:	RWF 413-31	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
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Formations						
Measured Depth (usft)	Vertical Depth (usft)	Name	Lithology	Dip (°)	Dip Direction (°)	
1,923.2	1,917.0	Top of "G" Sand				
2,023.6	2,017.0	Base of "G" Sand				
4,276.6	4,229.0	Mesaverde				
5,331.5	5,272.0	Approx. Top Gas				
6,741.5	6,682.0	Cameo Coals				
7,571.5	7,512.0	Coal D				
7,641.5	7,582.0	Base L. Cameo Pay				
7,731.5	7,672.0	Rollins SS				
7,881.5	7,822.0	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 2.00	
370.0	369.7	-10.9	-1.1	Hold 5.00 Inclination	
2,425.1	2,417.0	-189.1	-18.4	Begin 2°/100 Build	
2,799.1	2,786.4	-245.6	-23.8	Hold 12.48 Inclination	
4,499.5	4,446.6	-611.4	-58.8	Start Drop -1.50	
5,331.5	5,272.0	-701.2	-67.4	Top Gas	
7,881.5	7,822.0	-701.2	-67.4	TD at 7881.5	