

PICEANCE VLY NAD 83

RU 31-06S-094W

RWF 34-31 Pad

RWF 43-31 - Slot A7

Wellbore #1

Plan: Design #1 18Feb10 kjs

Standard Planning Report - Geographic

05 May, 2010

Williams
Planning Report - Geographic

Database:	Compass R5000 WIN AUTH	Local Co-ordinate Reference:	Well RWF 43-31 - Slot A7
Company:	PICEANCE VLY NAD 83	TVD Reference:	WELL @ 5733.0usft (SSD 573 (26' KB) kjs)
Project:	RU 31-06S-094W	MD Reference:	WELL @ 5733.0usft (SSD 573 (26' KB) kjs)
Site:	RWF 34-31 Pad	North Reference:	True
Well:	RWF 43-31	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Design #1 18Feb10 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 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 43-31 - Slot A7					
Well Position	+N/-S	0.0 usft	Northing:	1,607,149.38 usft	Latitude:	39° 28' 30.823 N
	+E/-W	0.0 usft	Easting:	2,314,329.20 usft	Longitude:	107° 55' 45.488 W
Position Uncertainty		0.0 usft	Wellhead Elevation:		Ground Level:	5,707.0 usft

Wellbore	Wellbore #1				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	2/18/2010	10.490	65.770	52,383

Design	Design #1 18Feb10 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	34.75	

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	
1,005.2	30.98	34.75	962.7	191.9	133.1	3.50	3.50	0.00	34.746	
4,746.6	30.98	34.75	4,170.3	1,774.4	1,230.8	0.00	0.00	0.00	0.000	
6,295.7	0.00	0.00	5,645.0	2,110.2	1,463.7	2.00	-2.00	0.00	180.000	Top Gas (25' Radius)
8,845.7	0.00	0.00	8,195.0	2,110.2	1,463.7	0.00	0.00	0.00	0.000	

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Site:	RWF 34-31 Pad	North Reference:	True
Well:	RWF 43-31	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	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	1,607,149.38	2,314,329.20	39° 28' 30.823 N	107° 55' 45.488 W	
120.0	0.00	0.00	120.0	0.0	0.0	1,607,149.38	2,314,329.20	39° 28' 30.823 N	107° 55' 45.488 W	
Start Build 3.50										
1,005.2	30.98	34.75	962.7	191.9	133.1	1,607,337.65	2,314,467.39	39° 28' 32.720 N	107° 55' 43.790 W	
Hold 30.98 Inclination										
2,483.4	30.98	34.75	2,230.0	817.1	566.8	1,607,951.07	2,314,917.63	39° 28' 38.900 N	107° 55' 38.259 W	
Top of "G" Sand										
2,600.0	30.98	34.75	2,330.0	866.5	601.0	1,607,999.47	2,314,953.16	39° 28' 39.387 N	107° 55' 37.823 W	
Base of "G" Sand										
2,716.7	30.98	34.75	2,430.0	915.8	635.2	1,608,047.87	2,314,988.69	39° 28' 39.875 N	107° 55' 37.386 W	
9 5/8"										
4,746.6	30.98	34.75	4,170.3	1,774.4	1,230.8	1,608,890.23	2,315,606.97	39° 28' 48.361 N	107° 55' 29.791 W	
Start Drop -2.00										
5,177.5	22.36	34.75	4,555.0	1,933.2	1,340.9	1,609,046.00	2,315,721.31	39° 28' 49.930 N	107° 55' 28.386 W	
Mesaverde										
6,295.7	0.00	0.00	5,645.0	2,110.2	1,463.7	1,609,219.70	2,315,848.80	39° 28' 51.680 N	107° 55' 26.819 W	
Top Gas - Approx. Top Gas										
7,705.7	0.00	0.00	7,055.0	2,110.2	1,463.7	1,609,219.70	2,315,848.80	39° 28' 51.680 N	107° 55' 26.819 W	
Cameo Coals										
8,525.7	0.00	0.00	7,875.0	2,110.2	1,463.7	1,609,219.70	2,315,848.80	39° 28' 51.680 N	107° 55' 26.819 W	
Coal D										
8,595.7	0.00	0.00	7,945.0	2,110.2	1,463.7	1,609,219.70	2,315,848.80	39° 28' 51.680 N	107° 55' 26.819 W	
Base L. Cameo Pay										
8,695.7	0.00	0.00	8,045.0	2,110.2	1,463.7	1,609,219.70	2,315,848.80	39° 28' 51.680 N	107° 55' 26.819 W	
Rollins SS										
8,845.7	0.00	0.00	8,195.0	2,110.2	1,463.7	1,609,219.70	2,315,848.80	39° 28' 51.680 N	107° 55' 26.819 W	
TD at 8845.7 - 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) R1	0.00	0.00	5,645.0	2,110.2	1,463.7	1,609,219.70	2,315,848.80	39° 28' 51.680 N	107° 55' 26.819 W	
- plan hits target center										
- Circle (radius 25.0)										

Casing Points							Casing Diameter (in)	Hole Diameter (in)
Measured Depth (usft)	Vertical Depth (usft)	Name						
2,716.7	2,430.0	9 5/8"					9.625	12.250

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Wellbore:	Wellbore #1		
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Formations						
Measured Depth (usft)	Vertical Depth (usft)	Name	Lithology	Dip (°)	Dip Direction (°)	
2,483.4	2,230.0	Top of "G" Sand				
2,600.0	2,330.0	Base of "G" Sand				
5,177.5	4,555.0	Mesaverde				
6,295.7	5,645.0	Approx. Top Gas				
7,705.7	7,055.0	Cameo Coals				
8,525.7	7,875.0	Coal D				
8,595.7	7,945.0	Base L. Cameo Pay				
8,695.7	8,045.0	Rollins SS				
8,845.7	8,195.0	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 3.50	
1,005.2	962.7	191.9	133.1	Hold 30.98 Inclination	
4,746.6	4,170.3	1,774.4	1,230.8	Start Drop -2.00	
6,295.7	5,645.0	2,110.2	1,463.7	Top Gas	
8,845.7	8,195.0	2,110.2	1,463.7	TD at 8845.7	