

PICEANCE VLY NAD 83

RU 31-06S-094W

RWF 34-31 Pad

RWF 533-31 - Slot B10

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 533-31 - Slot B10
Company:	PICEANCE VLY NAD 83	TVD Reference:	WELL @ 5733.0usft (SSD 537 (26' KB) kjs)
Project:	RU 31-06S-094W	MD Reference:	WELL @ 5733.0usft (SSD 537 (26' KB) kjs)
Site:	RWF 34-31 Pad	North Reference:	True
Well:	RWF 533-31	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 533-31 - Slot B10					
Well Position	+N/-S	0.0 usft	Northing:	1,607,171.89 usft	Latitude:	39° 28' 31.043 N
	+E/-W	0.0 usft	Easting:	2,314,319.21 usft	Longitude:	107° 55' 45.623 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	28.10

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	
400.0	7.00	28.08	399.3	15.1	8.0	2.50	2.50	0.00	28.080	
2,748.2	7.00	28.08	2,730.0	267.6	142.7	0.00	0.00	0.00	0.000	
3,316.9	24.06	28.11	3,275.9	401.4	214.2	3.00	3.00	0.00	0.000	
4,621.3	24.06	28.11	4,467.0	870.5	464.8	0.00	0.00	0.00	0.000	
5,824.4	0.00	0.00	5,635.0	1,090.1	582.1	2.00	-2.00	0.00	180.000	Top Gas (25' Radius)
8,374.4	0.00	0.00	8,185.0	1,090.1	582.1	0.00	0.00	0.00	0.000	

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Site:	RWF 34-31 Pad	North Reference:	True
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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	1,607,171.89	2,314,319.21	39° 28' 31.043 N	107° 55' 45.623 W	
120.0	0.00	0.00	120.0	0.0	0.0	1,607,171.89	2,314,319.21	39° 28' 31.043 N	107° 55' 45.623 W	
Start Build 2.50										
400.0	7.00	28.08	399.3	15.1	8.0	1,607,186.74	2,314,327.65	39° 28' 31.192 N	107° 55' 45.520 W	
Hold 7.00 Inclination										
1,106.0	7.00	28.08	1,100.0	91.0	48.5	1,607,261.54	2,314,370.16	39° 28' 31.942 N	107° 55' 45.004 W	
9 5/8"										
2,244.4	7.00	28.08	2,230.0	213.4	113.8	1,607,382.16	2,314,438.72	39° 28' 33.152 N	107° 55' 44.171 W	
Top of "G" Sand										
2,345.2	7.00	28.08	2,330.0	224.2	119.6	1,607,392.84	2,314,444.79	39° 28' 33.259 N	107° 55' 44.097 W	
Base of "G" Sand										
2,748.2	7.00	28.08	2,730.0	267.6	142.7	1,607,435.54	2,314,469.06	39° 28' 33.688 N	107° 55' 43.802 W	
Start Build 3.00										
3,316.9	24.06	28.11	3,275.9	401.4	214.2	1,607,567.40	2,314,544.09	39° 28' 35.010 N	107° 55' 42.891 W	
Hold 24.06 Inclination										
4,621.3	24.06	28.11	4,467.0	870.5	464.8	1,608,029.64	2,314,807.10	39° 28' 39.647 N	107° 55' 39.695 W	
Start Drop -2.00										
4,717.0	22.15	28.11	4,555.0	903.6	482.5	1,608,062.28	2,314,825.67	39° 28' 39.974 N	107° 55' 39.470 W	
Mesaverde										
5,824.4	0.00	0.00	5,635.0	1,090.1	582.1	1,608,246.00	2,314,930.20	39° 28' 41.817 N	107° 55' 38.199 W	
Top Gas - Approx. Top Gas										
7,234.4	0.00	0.00	7,045.0	1,090.1	582.1	1,608,246.00	2,314,930.20	39° 28' 41.817 N	107° 55' 38.199 W	
Cameo Coals										
8,049.4	0.00	0.00	7,860.0	1,090.1	582.1	1,608,246.00	2,314,930.20	39° 28' 41.817 N	107° 55' 38.199 W	
Coal D										
8,119.4	0.00	0.00	7,930.0	1,090.1	582.1	1,608,246.00	2,314,930.20	39° 28' 41.817 N	107° 55' 38.199 W	
Base L. Cameo Pay										
8,224.4	0.00	0.00	8,035.0	1,090.1	582.1	1,608,246.00	2,314,930.20	39° 28' 41.817 N	107° 55' 38.199 W	
Rollins SS										
8,374.4	0.00	0.00	8,185.0	1,090.1	582.1	1,608,246.00	2,314,930.20	39° 28' 41.817 N	107° 55' 38.199 W	
TD at 8374.4 - TD										

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) R1 - plan hits target center - Circle (radius 25.0)	0.00	0.00	5,635.0	1,090.1	582.1	1,608,246.00	2,314,930.20	39° 28' 41.817 N	107° 55' 38.199 W	

Casing Points										
Measured Depth (usft)	Vertical Depth (usft)	Name				Casing Diameter (in)	Hole Diameter (in)			
1,106.0	1,100.0	9 5/8"				9.625	12.250			

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Project:	RU 31-06S-094W	MD Reference:	WELL @ 5733.0usft (SSD 537 (26' KB) kjs)
Site:	RWF 34-31 Pad	North Reference:	True
Well:	RWF 533-31	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Design #1 18Feb10 kjs		

Formations						
Measured Depth (usft)	Vertical Depth (usft)	Name	Lithology	Dip (°)	Dip Direction (°)	
2,244.4	2,230.0	Top of "G" Sand				
2,345.2	2,330.0	Base of "G" Sand				
4,717.0	4,555.0	Mesaverde				
5,824.4	5,635.0	Approx. Top Gas				
7,234.4	7,045.0	Cameo Coals				
8,049.4	7,860.0	Coal D				
8,119.4	7,930.0	Base L. Cameo Pay				
8,224.4	8,035.0	Rollins SS				
8,374.4	8,185.0	TD		0.000		

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 2.50	
400.0	399.3	15.1	8.0	Hold 7.00 Inclination	
2,748.2	2,730.0	267.6	142.7	Start Build 3.00	
3,316.9	3,275.9	401.4	214.2	Hold 24.06 Inclination	
4,621.3	4,467.0	870.5	464.8	Start Drop -2.00	
5,824.4	5,635.0	1,090.1	582.1	Top Gas	
8,374.4	8,185.0	1,090.1	582.1	TD at 8374.4	