

PICEANCE VLY NAD 83

RU 31-06S-094W

RWF 13-31 Pad

RWF 414-31 - Slot A5

Wellbore #1

Plan: Plan #2 08Apr10 kjs

Standard Planning Report - Geographic

12 April, 2010

Williams
Planning Report - Geographic

Database:	Compass R5000 WIN AUTH	Local Co-ordinate Reference:	Well RWF 414-31 - Slot A5
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 414-31	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Plan #2 08Apr10 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 414-31 - Slot A5					
Well Position	+N/-S	0.0 usft	Northing:	1,608,904.33 usft	Latitude:	39° 28' 47.797 N
	+E/-W	0.0 usft	Easting:	2,312,948.06 usft	Longitude:	107° 56' 3.695 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 08Apr10 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	178.63

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	
520.0	12.00	178.62	517.1	-41.7	1.0	3.00	3.00	0.00	178.620	
2,457.3	12.00	178.62	2,412.0	-444.4	10.7	0.00	0.00	0.00	0.000	
2,840.0	25.39	178.63	2,773.7	-566.8	13.6	3.50	3.50	0.00	0.000	
4,217.8	25.39	178.63	4,018.4	-1,157.5	27.8	0.00	0.00	0.00	0.000	
5,487.6	0.00	0.00	5,247.0	-1,434.2	34.4	2.00	-2.00	0.00	180.000	Top Gas (25' Radius)
8,037.6	0.00	0.00	7,797.0	-1,434.2	34.4	0.00	0.00	0.00	0.000	

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Wellbore:	Wellbore #1		
Design:	Plan #2 08Apr10 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	1,608,904.33	2,312,948.06	39° 28' 47.797 N	107° 56' 3.695 W	
120.0	0.00	0.00	120.0	0.0	0.0	1,608,904.33	2,312,948.06	39° 28' 47.797 N	107° 56' 3.695 W	
Start Build 3.00										
520.0	12.00	178.62	517.1	-41.7	1.0	1,608,862.60	2,312,947.95	39° 28' 47.385 N	107° 56' 3.682 W	
Hold 12.00 Inclination										
1,115.9	12.00	178.62	1,100.0	-165.6	4.0	1,608,738.70	2,312,947.61	39° 28' 46.161 N	107° 56' 3.644 W	
9 5/8"										
1,946.1	12.00	178.62	1,912.0	-338.1	8.1	1,608,566.10	2,312,947.14	39° 28' 44.455 N	107° 56' 3.591 W	
Top of "G" Sand										
2,048.3	12.00	178.62	2,012.0	-359.4	8.7	1,608,544.84	2,312,947.09	39° 28' 44.245 N	107° 56' 3.585 W	
Base of "G" Sand										
2,457.3	12.00	178.62	2,412.0	-444.4	10.7	1,608,459.82	2,312,946.86	39° 28' 43.405 N	107° 56' 3.558 W	
Start Build 3.50										
2,840.0	25.39	178.63	2,773.7	-566.8	13.6	1,608,337.42	2,312,946.50	39° 28' 42.196 N	107° 56' 3.521 W	
Hold 25.39 Inclination										
4,217.8	25.39	178.63	4,018.4	-1,157.5	27.8	1,607,746.51	2,312,944.80	39° 28' 36.357 N	107° 56' 3.341 W	
Start Drop -2.00										
4,420.0	21.35	178.63	4,204.0	-1,237.7	29.7	1,607,666.31	2,312,944.57	39° 28' 35.564 N	107° 56' 3.316 W	
Mesaverde										
5,487.6	0.00	0.00	5,247.0	-1,434.2	34.4	1,607,469.70	2,312,944.00	39° 28' 33.622 N	107° 56' 3.256 W	
Top Gas - Approx. Top Gas										
6,902.6	0.00	0.00	6,662.0	-1,434.2	34.4	1,607,469.70	2,312,944.00	39° 28' 33.622 N	107° 56' 3.256 W	
Cameo Coals										
7,717.6	0.00	0.00	7,477.0	-1,434.2	34.4	1,607,469.70	2,312,944.00	39° 28' 33.622 N	107° 56' 3.256 W	
Coal D										
7,787.6	0.00	0.00	7,547.0	-1,434.2	34.4	1,607,469.70	2,312,944.00	39° 28' 33.622 N	107° 56' 3.256 W	
Base L. Cameo Pay										
7,887.6	0.00	0.00	7,647.0	-1,434.2	34.4	1,607,469.70	2,312,944.00	39° 28' 33.622 N	107° 56' 3.256 W	
Rollins SS										
8,037.6	0.00	0.00	7,797.0	-1,434.2	34.4	1,607,469.70	2,312,944.00	39° 28' 33.622 N	107° 56' 3.256 W	
TD at 8037.6 - 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	5,247.0	-1,434.2	34.4	1,607,469.70	2,312,944.00	39° 28' 33.622 N	107° 56' 3.256 W	

Casing Points					
Measured Depth (usft)	Vertical Depth (usft)	Name		Casing Diameter (in)	Hole Diameter (in)
1,115.9	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 414-31	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
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Formations						
Measured Depth (usft)	Vertical Depth (usft)	Name	Lithology	Dip (°)	Dip Direction (°)	
1,946.1	1,912.0	Top of "G" Sand				
2,048.3	2,012.0	Base of "G" Sand				
4,420.0	4,204.0	Mesaverde				
5,487.6	5,247.0	Approx. Top Gas				
6,902.6	6,662.0	Cameo Coals				
7,717.6	7,477.0	Coal D				
7,787.6	7,547.0	Base L. Cameo Pay				
7,887.6	7,647.0	Rollins SS				
8,037.6	7,797.0	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	
520.0	517.1	-41.7	1.0	Hold 12.00 Inclination	
2,457.3	2,412.0	-444.4	10.7	Start Build 3.50	
2,840.0	2,773.7	-566.8	13.6	Hold 25.39 Inclination	
4,217.8	4,018.4	-1,157.5	27.8	Start Drop -2.00	
5,487.6	5,247.0	-1,434.2	34.4	Top Gas	
8,037.6	7,797.0	-1,434.2	34.4	TD at 8037.6	