

PICEANCE VLY NAD 83

RU 31-06S-094W

RWF 13-31 Pad

RWF 313-31 - Slot B2

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 313-31 - Slot B2
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 313-31	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 313-31 - Slot B2					
Well Position	+N/-S	0.0 usft	Northing:	1,608,902.55 usft	Latitude:	39° 28' 47.773 N
	+E/-W	0.0 usft	Easting:	2,312,923.50 usft	Longitude:	107° 56' 4.007 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	201.97

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	
150.0	0.00	0.00	150.0	0.0	0.0	0.00	0.00	0.00	0.000	
305.3	3.11	201.97	305.2	-3.9	-1.6	2.00	2.00	0.00	201.965	
4,886.8	3.11	201.97	4,880.0	-234.1	-94.4	0.00	0.00	0.00	0.000	
5,093.9	0.00	0.00	5,087.0	-239.3	-96.5	1.50	-1.50	0.00	180.000	
5,293.9	0.00	0.00	5,287.0	-239.3	-96.5	0.00	0.00	0.00	0.000	Top Gas (25' Radius)
7,843.9	0.00	0.00	7,837.0	-239.3	-96.5	0.00	0.00	0.00	0.000	

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Site:	RWF 13-31 Pad	North Reference:	True
Well:	RWF 313-31	Survey Calculation Method:	Minimum Curvature
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	1,608,902.55	2,312,923.50	39° 28' 47.773 N	107° 56' 4.007 W	
150.0	0.00	0.00	150.0	0.0	0.0	1,608,902.55	2,312,923.50	39° 28' 47.773 N	107° 56' 4.007 W	
Start Build 2.00										
305.3	3.11	201.97	305.2	-3.9	-1.6	1,608,898.69	2,312,921.83	39° 28' 47.734 N	107° 56' 4.027 W	
Hold 3.11 Inclination										
1,101.2	3.11	201.97	1,100.0	-43.9	-17.7	1,608,859.14	2,312,904.63	39° 28' 47.339 N	107° 56' 4.233 W	
9 5/8"										
1,929.5	3.11	201.97	1,927.0	-85.5	-34.5	1,608,817.99	2,312,886.74	39° 28' 46.928 N	107° 56' 4.447 W	
Top of "G" Sand										
2,029.6	3.11	201.97	2,027.0	-90.5	-36.5	1,608,813.01	2,312,884.57	39° 28' 46.878 N	107° 56' 4.473 W	
Base of "G" Sand										
4,252.9	3.11	201.97	4,247.0	-202.3	-81.6	1,608,702.54	2,312,836.54	39° 28' 45.774 N	107° 56' 5.048 W	
Mesaverde										
4,886.8	3.11	201.97	4,880.0	-234.1	-94.4	1,608,671.04	2,312,822.84	39° 28' 45.459 N	107° 56' 5.212 W	
Start Drop -1.50										
5,093.9	0.00	0.00	5,087.0	-239.3	-96.5	1,608,665.90	2,312,820.60	39° 28' 45.408 N	107° 56' 5.238 W	
Vertical										
5,293.9	0.00	0.00	5,287.0	-239.3	-96.5	1,608,665.90	2,312,820.60	39° 28' 45.408 N	107° 56' 5.238 W	
Top Gas - Approx. Top Gas										
6,703.9	0.00	0.00	6,697.0	-239.3	-96.5	1,608,665.90	2,312,820.60	39° 28' 45.408 N	107° 56' 5.238 W	
Cameo Coals										
7,533.9	0.00	0.00	7,527.0	-239.3	-96.5	1,608,665.90	2,312,820.60	39° 28' 45.408 N	107° 56' 5.238 W	
Coal D										
7,603.9	0.00	0.00	7,597.0	-239.3	-96.5	1,608,665.90	2,312,820.60	39° 28' 45.408 N	107° 56' 5.238 W	
Base L. Cameo Pay										
7,693.9	0.00	0.00	7,687.0	-239.3	-96.5	1,608,665.90	2,312,820.60	39° 28' 45.408 N	107° 56' 5.238 W	
Rollins SS										
7,843.9	0.00	0.00	7,837.0	-239.3	-96.5	1,608,665.90	2,312,820.60	39° 28' 45.408 N	107° 56' 5.238 W	
TD at 7843.9 - 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) R\ - plan hits target center - Circle (radius 25.0)	0.00	0.00	5,287.0	-239.3	-96.5	1,608,665.90	2,312,820.60	39° 28' 45.408 N	107° 56' 5.238 W	

Casing Points								
Measured Depth (usft)	Vertical Depth (usft)	Name			Casing Diameter (in)	Hole Diameter (in)		
1,101.2	1,100.0	9 5/8"			9.625	12.250		

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Well:	RWF 313-31	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Plan #2 09Apr10 kjs		

Formations						
Measured Depth (usft)	Vertical Depth (usft)	Name	Lithology	Dip (°)	Dip Direction (°)	
1,929.5	1,927.0	Top of "G" Sand				
2,029.6	2,027.0	Base of "G" Sand				
4,252.9	4,247.0	Mesaverde				
5,293.9	5,287.0	Approx. Top Gas				
6,703.9	6,697.0	Cameo Coals				
7,533.9	7,527.0	Coal D				
7,603.9	7,597.0	Base L. Cameo Pay				
7,693.9	7,687.0	Rollins SS				
7,843.9	7,837.0	TD				

Plan Annotations					
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates			
		+N/-S (usft)	+E/-W (usft)	Comment	
150.0	150.0	0.0	0.0	Start Build 2.00	
305.3	305.2	-3.9	-1.6	Hold 3.11 Inclination	
4,886.8	4,880.0	-234.1	-94.4	Start Drop -1.50	
5,093.9	5,087.0	-239.3	-96.5	Vertical	
5,293.9	5,287.0	-239.3	-96.5	Top Gas	
7,843.9	7,837.0	-239.3	-96.5	TD at 7843.9	