

PICEANCE VLY NAD 83

RU 31-06S-094W

RWF 13-31 Pad

RWF 324-31 - Slot A9

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 324-31 - Slot A9
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 324-31	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 324-31 - Slot A9					
Well Position	+N/-S	0.0 usft	Northing:	1,608,918.47 usft	Latitude:	39° 28' 47.944 N
	+E/-W	0.0 usft	Easting:	2,312,974.52 usft	Longitude:	107° 56' 3.362 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	142.42

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	
620.0	15.00	142.43	614.3	-51.6	39.7	3.00	3.00	0.00	142.430	
2,475.9	15.00	142.43	2,407.0	-432.3	332.6	0.00	0.00	0.00	0.000	
2,846.0	27.95	142.42	2,750.6	-539.5	415.0	3.50	3.50	0.00	0.000	
4,614.5	27.95	142.42	4,312.9	-1,196.4	920.6	0.00	0.00	0.00	0.000	
5,612.2	8.00	142.42	5,257.0	-1,439.2	1,107.5	2.00	-2.00	0.00	180.000	Top Gas (25' Radius)
6,012.2	0.00	0.00	5,655.7	-1,461.3	1,124.5	2.00	-2.00	0.00	180.000	
8,163.5	0.00	0.00	7,807.0	-1,461.3	1,124.5	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	1,608,918.47	2,312,974.52	39° 28' 47.944 N	107° 56' 3.362 W
120.0	0.00	0.00	120.0	0.0	0.0	1,608,918.47	2,312,974.52	39° 28' 47.944 N	107° 56' 3.362 W
Start Build 3.00									
620.0	15.00	142.43	614.3	-51.6	39.7	1,608,865.85	2,313,012.81	39° 28' 47.434 N	107° 56' 2.856 W
Hold 15.00 Inclination									
1,122.8	15.00	142.43	1,100.0	-154.7	119.0	1,608,760.61	2,313,089.36	39° 28' 46.415 N	107° 56' 1.844 W
9 5/8"									
1,958.3	15.00	142.43	1,907.0	-326.1	250.9	1,608,585.74	2,313,216.57	39° 28' 44.721 N	107° 56' 0.163 W
Top of "G" Sand									
2,061.8	15.00	142.43	2,007.0	-347.4	267.2	1,608,564.08	2,313,232.33	39° 28' 44.511 N	107° 55' 59.954 W
Base of "G" Sand									
2,475.9	15.00	142.43	2,407.0	-432.3	332.6	1,608,477.40	2,313,295.38	39° 28' 43.671 N	107° 55' 59.121 W
Start Build 3.50									
2,846.0	27.95	142.42	2,750.6	-539.5	415.0	1,608,368.09	2,313,374.94	39° 28' 42.612 N	107° 55' 58.069 W
Hold 27.95 Inclination									
4,491.3	27.95	142.42	4,204.0	-1,150.6	885.4	1,607,744.53	2,313,828.77	39° 28' 36.571 N	107° 55' 52.071 W
Mesaverde									
4,614.5	27.95	142.42	4,312.9	-1,196.4	920.6	1,607,697.83	2,313,862.76	39° 28' 36.119 N	107° 55' 51.621 W
Start Drop -2.00									
5,612.2	8.00	142.42	5,257.0	-1,439.2	1,107.5	1,607,450.14	2,314,043.03	39° 28' 33.719 N	107° 55' 49.239 W
Top Gas - Approx. Top Gas									
6,012.2	0.00	0.00	5,655.7	-1,461.3	1,124.5	1,607,427.60	2,314,059.44	39° 28' 33.501 N	107° 55' 49.022 W
Vertical									
7,023.5	0.00	0.00	6,667.0	-1,461.3	1,124.5	1,607,427.60	2,314,059.44	39° 28' 33.501 N	107° 55' 49.022 W
Cameo Coals									
7,838.5	0.00	0.00	7,482.0	-1,461.3	1,124.5	1,607,427.60	2,314,059.44	39° 28' 33.501 N	107° 55' 49.022 W
Coal D									
7,908.5	0.00	0.00	7,552.0	-1,461.3	1,124.5	1,607,427.60	2,314,059.44	39° 28' 33.501 N	107° 55' 49.022 W
Base L. Cameo Pay									
8,013.5	0.00	0.00	7,657.0	-1,461.3	1,124.5	1,607,427.60	2,314,059.44	39° 28' 33.501 N	107° 55' 49.022 W
Rollins SS									
8,163.5	0.00	0.00	7,807.0	-1,461.3	1,124.5	1,607,427.60	2,314,059.44	39° 28' 33.501 N	107° 55' 49.022 W
TD at 8163.5									

Design Targets									
Target Name									
- hit/miss target	Dip Angle	Dip Dir.	TVD	+N/-S	+E/-W	Northing	Easting		
- Shape	(°)	(°)	(usft)	(usft)	(usft)	(usft)	(usft)	Latitude	Longitude
Top Gas (25' Radius) R\	0.00	0.00	5,257.0	-1,456.1	1,120.1	1,607,432.90	2,314,055.20	39° 28' 33.552 N	107° 55' 49.078 W
- plan misses target center by 21.0usft at 5613.6usft MD (5258.5 TVD, -1439.3 N, 1107.6 E)									
- Circle (radius 25.0)									

Casing Points										
Measured Depth (usft)	Vertical Depth (usft)	Name				Casing Diameter (in)	Hole Diameter (in)			
1,122.8	1,100.0	9 5/8"				9.625	12.250			

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Well:	RWF 324-31	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
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Formations						
Measured Depth (usft)	Vertical Depth (usft)	Name	Lithology	Dip (°)	Dip Direction (°)	
1,958.3	1,907.0	Top of "G" Sand				
2,061.8	2,007.0	Base of "G" Sand				
4,491.3	4,204.0	Mesaverde				
5,612.2	5,257.0	Approx. Top Gas				
7,023.5	6,667.0	Cameo Coals				
7,838.5	7,482.0	Coal D				
7,908.5	7,552.0	Base L. Cameo Pay				
8,013.5	7,657.0	Rollins SS				
8,163.5	7,807.0	TD				

Plan Annotations				
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
120.0	120.0	0.0	0.0	Start Build 3.00
620.0	614.3	-51.6	39.7	Hold 15.00 Inclination
2,475.9	2,407.0	-432.3	332.6	Start Build 3.50
2,846.0	2,750.6	-539.5	415.0	Hold 27.95 Inclination
4,614.5	4,312.9	-1,196.4	920.6	Start Drop -2.00
5,612.2	5,257.0	-1,439.2	1,107.5	Top Gas
6,012.2	5,655.7	-1,461.3	1,124.5	Vertical
8,163.5	7,807.0	-1,461.3	1,124.5	TD at 8163.5