

# **PICEANCE HL NAD 83**

**RG 14-02S-098W**

**Federal RG 24-14-298 Pad**

**Federal RG 531-23-298 - Slot A1**

**Wellbore #1**

**Plan: Plan #2 13Apr11 kjs**

## **Standard Planning Report - Geographic**

**09 August, 2011**

**Williams**  
Planning Report - Geographic

<b>Database:</b>	Compass R5000 WIN AUTH	<b>Local Co-ordinate Reference:</b>	Well Federal RG 531-23-298 - Slot A1
<b>Company:</b>	PICEANCE HL NAD 83	<b>TVD Reference:</b>	KELLY BUSHING @ 6708.0usft (Frontier 10 (22' RKB) kjs)
<b>Project:</b>	RG 14-02S-098W	<b>MD Reference:</b>	KELLY BUSHING @ 6708.0usft (Frontier 10 (22' RKB) kjs)
<b>Site:</b>	Federal RG 24-14-298 Pad	<b>North Reference:</b>	True
<b>Well:</b>	Federal RG 531-23-298	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Wellbore #1		
<b>Design:</b>	Plan #2 13Apr11 kjs		

<b>Project</b>	RG 14-02S-098W, Rio Blanco County, CO, RG 14-02S-098W		
<b>Map System:</b>	US State Plane 1983	<b>System Datum:</b>	Mean Sea Level
<b>Geo Datum:</b>	North American Datum 1983		
<b>Map Zone:</b>	Colorado Central Zone		Using geodetic scale factor

Site		Federal RG 24-14-298 Pad			
Site Position:		Northing:	1,754,584.50 usft	Latitude:	39° 52' 13.383 N
From:	Map	Easting:	2,196,448.10 usft	Longitude:	108° 21' 47.349 W
Position Uncertainty:	0.0 usft	Slot Radius:	13.200 in	Grid Convergence:	-1.806 °

Well	Federal RG 531-23-298 - Slot A1					
Well Position	+N/-S	0.0 usft	Northing:	1,754,509.60 usft	Latitude:	39° 52' 12.642 N
	+E/-W	0.0 usft	Easting:	2,196,444.80 usft	Longitude:	108° 21' 47.361 W
Position Uncertainty		0.0 usft	Wellhead Elevation:		Ground Level:	6,686.0 usft

<b>Wellbore</b>	Wellbore #1				
<b>Magnetics</b>	<b>Model Name</b>	<b>Sample Date</b>	<b>Declination (°)</b>	<b>Dip Angle (°)</b>	<b>Field Strength (nT)</b>
	IGRF2010	4/19/2010	10.715	66.010	52,516

<b>Design</b>	Plan #2 13Apr11 kjs			
<b>Audit Notes:</b>				
<b>Version:</b>	<b>Phase:</b>	PLAN	<b>Tie On Depth:</b>	0.0
<b>Vertical Section:</b>	<b>Depth From (TVD) (usft)</b>	<b>+N/-S (usft)</b>	<b>+E/-W (usft)</b>	<b>Direction (°)</b>
	0.0	0.0	0.0	139.25

<b>Plan Sections</b>										
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	
1,036.6	18.33	139.25	1,021.0	-110.1	94.9	2.00	2.00	0.00	139.251	
5,224.7	18.33	139.25	4,996.6	-1,108.1	954.7	0.00	0.00	0.00	0.000	
6,446.8	0.00	0.00	6,198.0	-1,254.9	1,081.3	1.50	-1.50	0.00	180.000	
6,546.8	0.00	0.00	6,298.0	-1,254.9	1,081.3	0.00	0.00	0.00	0.000	Mesaverde (25' Radiu
11,156.8	0.00	0.00	10,908.0	-1,254.9	1,081.3	0.00	0.00	0.00	0.000	

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<b>Database:</b>	Compass R5000 WIN AUTH	<b>Local Co-ordinate Reference:</b>	Well Federal RG 531-23-298 - Slot A1
<b>Company:</b>	PICEANCE HL NAD 83	<b>TVD Reference:</b>	KELLY BUSHING @ 6708.0usft (Frontier 10 (22' RKB) kjs)
<b>Project:</b>	RG 14-02S-098W	<b>MD Reference:</b>	KELLY BUSHING @ 6708.0usft (Frontier 10 (22' RKB) kjs)
<b>Site:</b>	Federal RG 24-14-298 Pad	<b>North Reference:</b>	True
<b>Well:</b>	Federal RG 531-23-298	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Wellbore #1		
<b>Design:</b>	Plan #2 13Apr11 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	1,754,509.60	2,196,444.80	39° 52' 12.642 N	108° 21' 47.361 W	
120.0	0.00	0.00	120.0	0.0	0.0	1,754,509.60	2,196,444.80	39° 52' 12.642 N	108° 21' 47.361 W	
Start Build 2.00										
814.8	13.90	139.25	808.0	-63.5	54.7	1,754,444.39	2,196,497.50	39° 52' 12.015 N	108° 21' 46.659 W	
Green River Fm										
960.0	16.80	139.25	948.0	-92.6	79.8	1,754,414.50	2,196,521.65	39° 52' 11.727 N	108° 21' 46.337 W	
A Groove										
1,036.6	18.33	139.25	1,021.0	-110.1	94.9	1,754,396.52	2,196,536.18	39° 52' 11.554 N	108° 21' 46.144 W	
Hold 18.33 Inclination										
1,159.8	18.33	139.25	1,138.0	-139.5	120.2	1,754,366.38	2,196,560.54	39° 52' 11.264 N	108° 21' 45.819 W	
B Groove										
1,496.9	18.33	139.25	1,458.0	-219.8	189.4	1,754,283.91	2,196,627.19	39° 52' 10.470 N	108° 21' 44.932 W	
Dissolution Surface										
2,202.7	18.33	139.25	2,128.0	-388.0	334.3	1,754,111.24	2,196,766.72	39° 52' 8.808 N	108° 21' 43.073 W	
Garden Gulch										
2,402.9	18.33	139.25	2,318.0	-435.7	375.4	1,754,062.28	2,196,806.29	39° 52' 8.337 N	108° 21' 42.546 W	
Orange Marker										
2,618.9	18.33	139.25	2,523.0	-487.2	419.7	1,754,009.45	2,196,848.99	39° 52' 7.828 N	108° 21' 41.978 W	
Wasatch										
3,409.0	18.33	139.25	3,273.0	-675.4	581.9	1,753,816.17	2,197,005.19	39° 52' 5.968 N	108° 21' 39.897 W	
9 5/8"										
4,583.6	18.33	139.25	4,388.0	-955.3	823.1	1,753,528.82	2,197,237.40	39° 52' 3.202 N	108° 21' 36.805 W	
G' Sand										
4,878.5	18.33	139.25	4,668.0	-1,025.6	883.6	1,753,456.66	2,197,295.71	39° 52' 2.507 N	108° 21' 36.028 W	
Ft. Union										
5,224.7	18.33	139.25	4,996.6	-1,108.1	954.7	1,753,371.97	2,197,364.15	39° 52' 1.692 N	108° 21' 35.117 W	
Start Drop -1.50										
6,296.8	2.25	139.25	6,048.0	-1,252.7	1,079.3	1,753,223.49	2,197,484.15	39° 52' 0.262 N	108° 21' 33.519 W	
Ohio Creek										
6,446.8	0.00	0.00	6,198.0	-1,254.9	1,081.3	1,753,221.20	2,197,486.00	39° 52' 0.240 N	108° 21' 33.494 W	
Vertical										
6,546.8	0.00	0.00	6,298.0	-1,254.9	1,081.3	1,753,221.20	2,197,486.00	39° 52' 0.240 N	108° 21' 33.494 W	
Mesaverde - Mesaverde - Mesaverde (25' Radius) Federal RG 531-23-298										
7,356.8	0.00	0.00	7,108.0	-1,254.9	1,081.3	1,753,221.20	2,197,486.00	39° 52' 0.240 N	108° 21' 33.494 W	
Top Gas										
9,356.8	0.00	0.00	9,108.0	-1,254.9	1,081.3	1,753,221.20	2,197,486.00	39° 52' 0.240 N	108° 21' 33.494 W	
Cameo Coals										
9,946.8	0.00	0.00	9,698.0	-1,254.9	1,081.3	1,753,221.20	2,197,486.00	39° 52' 0.240 N	108° 21' 33.494 W	
Rollins SS										
10,081.8	0.00	0.00	9,833.0	-1,254.9	1,081.3	1,753,221.20	2,197,486.00	39° 52' 0.240 N	108° 21' 33.494 W	
Cozzette										
10,311.8	0.00	0.00	10,063.0	-1,254.9	1,081.3	1,753,221.20	2,197,486.00	39° 52' 0.240 N	108° 21' 33.494 W	
Corcoran										
10,666.8	0.00	0.00	10,418.0	-1,254.9	1,081.3	1,753,221.20	2,197,486.00	39° 52' 0.240 N	108° 21' 33.494 W	
Upper Sego										
10,906.8	0.00	0.00	10,658.0	-1,254.9	1,081.3	1,753,221.20	2,197,486.00	39° 52' 0.240 N	108° 21' 33.494 W	
Lower Sego										
11,156.8	0.00	0.00	10,908.0	-1,254.9	1,081.3	1,753,221.20	2,197,486.00	39° 52' 0.240 N	108° 21' 33.494 W	
TD at 11156.8 - TD										

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Planning Report - Geographic

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<b>Company:</b>	PICEANCE HL NAD 83	<b>TVD Reference:</b>	KELLY BUSHING @ 6708.0usft (Frontier 10 (22' RKB) kjs)
<b>Project:</b>	RG 14-02S-098W	<b>MD Reference:</b>	KELLY BUSHING @ 6708.0usft (Frontier 10 (22' RKB) kjs)
<b>Site:</b>	Federal RG 24-14-298 Pad	<b>North Reference:</b>	True
<b>Well:</b>	Federal RG 531-23-298	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Wellbore #1		
<b>Design:</b>	Plan #2 13Apr11 kjs		

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
Mesaverde (25' Radius) - plan hits target center - Circle (radius 25.0)	0.00	0.00	6,298.0	-1,254.9	1,081.3	1,753,221.20	2,197,486.00	39° 52' 0.240 N	108° 21' 33.494 W

Casing Points					
Measured Depth (usft)	Vertical Depth (usft)	Name	Casing Diameter (in)	Hole Diameter (in)	
3,409.0	3,273.0	9 5/8"	9.625	12.250	

Formations						
Measured Depth (usft)	Vertical Depth (usft)	Name	Lithology	Dip (°)	Dip Direction (°)	
814.8	808.0	Green River Fm				
960.0	948.0	A Groove				
1,159.8	1,138.0	B Groove				
1,496.9	1,458.0	Dissolution Surface				
2,202.7	2,128.0	Garden Gulch				
2,402.9	2,318.0	Orange Marker				
2,618.9	2,523.0	Wasatch				
4,583.6	4,388.0	G' Sand				
4,878.5	4,668.0	Ft. Union				
6,296.8	6,048.0	Ohio Creek				
6,546.8	6,298.0	Mesaverde				
7,356.8	7,108.0	Top Gas				
9,356.8	9,108.0	Cameo Coals				
9,946.8	9,698.0	Rollins SS				
10,081.8	9,833.0	Cozzette				
10,311.8	10,063.0	Corcoran				
10,666.8	10,418.0	Upper Sego				
10,906.8	10,658.0	Lower Sego				
11,156.8	10,908.0	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 2.00	
1,036.6	1,021.0	-110.1	94.9	Hold 18.33 Inclination	
5,224.7	4,996.6	-1,108.1	954.7	Start Drop -1.50	
6,446.8	6,198.0	-1,254.9	1,081.3	Vertical	
6,546.8	6,298.0	-1,254.9	1,081.3	Mesaverde	
11,156.8	10,908.0	-1,254.9	1,081.3	TD at 11156.8	