



ANNOTATIONS									
TVD	MD	Inc	Azi	+N/-S	+E/-W	VSect	Departure	Annotation	
120.0	120.0	0.00	0.00	0.0	0.0	0.0	0.0	Start Build 2.00	
790.0	796.3	13.53	280.28	14.2	-78.2	79.4	79.4	Hold 13.53 Inc	
5120.7	5250.5	13.53	280.28	200.1	-1103.2	1121.2	1121.2	Start Drop -1.50	
6014.0	6152.1	0.00	0.00	219.1	-1207.4	1227.1	1227.1	Vertical	
10234.0	10372.1	0.00	0.00	219.1	-1207.4	1227.1	1227.1	TD at 10372	

# **PICEANCE HL NAD 83**

**BC 31-01S-098W**

**BCU 12-31-198 Pad**

**Federal BCU 42-36-199 - Slot A7**

**Wellbore #1**

**Plan: Design #1 14oct10 jjb**

## **Standard Planning Report - Geographic**

**15 November, 2010**



**Williams**  
Planning Report - Geographic

<b>Database:</b>	Compass R5000 WIN AUTH	<b>Local Co-ordinate Reference:</b>	Well Federal BCU 42-36-199 (A7) - Slot A7
<b>Company:</b>	PICEANCE HL NAD 83	<b>TVD Reference:</b>	KELLY BUSHING @ 6864.0usft (Frontier 10 (22' RKB) jib)
<b>Project:</b>	BC 31-01S-098W	<b>MD Reference:</b>	KELLY BUSHING @ 6864.0usft (Frontier 10 (22' RKB) jib)
<b>Site:</b>	BCU 12-31-198 Pad	<b>North Reference:</b>	True
<b>Well:</b>	Federal BCU 42-36-199	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Wellbore #1		
<b>Design:</b>	Design #1 14oct10 jib		

<b>Project</b>	BC 31-01S-098W, Rio Blanco County, CO, BC 31-01S-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

<b>Site</b>	BCU 12-31-198 Pad		
<b>Site Position:</b>		<b>Northing:</b>	1,807,786.60 usft
<b>From:</b>	Map	<b>Easting:</b>	2,176,137.10 usft
<b>Position Uncertainty:</b>	0.0 usft	<b>Slot Radius:</b>	13.200 in
		<b>Latitude:</b>	40° 0' 52.447 N
		<b>Longitude:</b>	108° 26' 29.793 W
		<b>Grid Convergence:</b>	-1.855 °

<b>Well</b>	Federal BCU 42-36-199 - Slot A7		
<b>Well Position</b>	<b>+N/-S</b>	0.0 usft	<b>Northing:</b> 1,807,815.96 usft
	<b>+E/-W</b>	0.0 usft	<b>Easting:</b> 2,176,125.34 usft
<b>Position Uncertainty</b>	0.0 usft	<b>Wellhead Elevation:</b>	<b>Latitude:</b> 40° 0' 52.733 N
			<b>Longitude:</b> 108° 26' 29.956 W
			<b>Ground Level:</b> 6,842.0 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>
	IGRF2005-10	10/14/2010	10.682	66.111	52,564

<b>Design</b>	Design #1 14oct10 jib			
<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	280.28

<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	
796.3	13.53	280.28	790.0	14.2	-78.2	2.00	2.00	0.00	280.283	
5,250.5	13.53	280.28	5,120.7	200.1	-1,103.2	0.00	0.00	0.00	0.000	
6,152.1	0.00	0.00	6,014.0	219.1	-1,207.4	1.50	-1.50	0.00	180.000	Mesaverde (25' Radiu
10,372.1	0.00	0.00	10,234.0	219.1	-1,207.4	0.00	0.00	0.00	0.000	

**Williams**  
Planning Report - Geographic

<b>Database:</b>	Compass R5000 WIN AUTH	<b>Local Co-ordinate Reference:</b>	Well Federal BCU 42-36-199 (A7) - Slot A7
<b>Company:</b>	PICEANCE HL NAD 83	<b>TVD Reference:</b>	KELLY BUSHING @ 6864.0usft (Frontier 10 (22' RKB) jib)
<b>Project:</b>	BC 31-01S-098W	<b>MD Reference:</b>	KELLY BUSHING @ 6864.0usft (Frontier 10 (22' RKB) jib)
<b>Site:</b>	BCU 12-31-198 Pad	<b>North Reference:</b>	True
<b>Well:</b>	Federal BCU 42-36-199	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Wellbore #1		
<b>Design:</b>	Design #1 14oct10 jib		

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	1,807,815.96	2,176,125.34	40° 0' 52.733 N	108° 26' 29.956 W
120.0	0.00	0.00	120.0	0.0	0.0	1,807,815.96	2,176,125.34	40° 0' 52.733 N	108° 26' 29.956 W
796.3	13.53	280.28	790.0	14.2	-78.2	1,807,832.66	2,176,047.66	40° 0' 52.873 N	108° 26' 30.961 W
5,250.5	13.53	280.28	5,120.7	200.1	-1,103.2	1,808,051.72	2,175,029.17	40° 0' 54.711 N	108° 26' 44.135 W
6,152.1	0.00	0.00	6,014.0	219.1	-1,207.4	1,808,074.00	2,174,925.60	40° 0' 54.898 N	108° 26' 45.474 W
10,372.1	0.00	0.00	10,234.0	219.1	-1,207.4	1,808,074.00	2,174,925.60	40° 0' 54.898 N	108° 26' 45.474 W

Design Targets									
Target Name	Dip Angle (°)	Dip Dir. (°)	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Northing (usft)	Easting (usft)	Latitude	Longitude
- hit/miss target									
- Shape									
Mesaverde (25' Radius)	0.00	358.14	6,014.0	219.1	-1,207.4	1,808,074.00	2,174,925.60	40° 0' 54.898 N	108° 26' 45.474 W
- plan hits target center									
- Circle (radius 25.0)									

Casing Points					
Measured Depth (usft)	Vertical Depth (usft)	Name	Casing Diameter (in)	Hole Diameter (in)	
3,309.0	3,233.1	9 5/8"	9.625	13.500	

Formations						
Measured Depth (usft)	Vertical Depth (usft)	Name	Lithology	Dip (°)	Dip Direction (°)	
626.6	624.0	Green River Fm				
820.9	814.0	A Groove				
1,016.4	1,004.0	B Groove				
1,376.4	1,354.0	Dissolution Surface				
2,147.7	2,104.0	Garden Gulch				
2,332.9	2,284.0	Orange Marker				
2,559.2	2,504.0	Wasatch				
4,420.8	4,314.0	G' Sand				
4,708.8	4,594.0	Ft. Union				
5,972.1	5,834.0	Ohio Creek				
6,152.1	6,014.0	Mesaverde				
7,852.1	7,714.0	Top Gas				
8,782.1	8,644.0	Cameo Coals				
9,202.1	9,064.0	Rollins SS				
9,327.1	9,189.0	Cozzette				
9,502.1	9,364.0	Corcoran				
9,842.1	9,704.0	Upper Sego				
10,072.1	9,934.0	Lower Sego				



**Williams**  
Planning Report - Geographic

<b>Database:</b>	Compass R5000 WIN AUTH	<b>Local Co-ordinate Reference:</b>	Well Federal BCU 42-36-199 (A7) - Slot A7
<b>Company:</b>	PICEANCE HL NAD 83	<b>TVD Reference:</b>	KELLY BUSHING @ 6864.0usft (Frontier 10 (22' RKB) jjb)
<b>Project:</b>	BC 31-01S-098W	<b>MD Reference:</b>	KELLY BUSHING @ 6864.0usft (Frontier 10 (22' RKB) jjb)
<b>Site:</b>	BCU 12-31-198 Pad	<b>North Reference:</b>	True
<b>Well:</b>	Federal BCU 42-36-199	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Wellbore #1		
<b>Design:</b>	Design #1 14oct10 jjb		

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 2.00
796.3	790.0	14.2	-78.2	Hold 13.53 Inc
5,250.5	5,120.7	200.1	-1,103.2	Start Drop -1.50
6,152.1	6,014.0	219.1	-1,207.4	Vertical
10,372.1	10,234.0	219.1	-1,207.4	TD at 10372