



+N/-S  
0.0

+E/-W  
0.0

Northing  
1782441.90

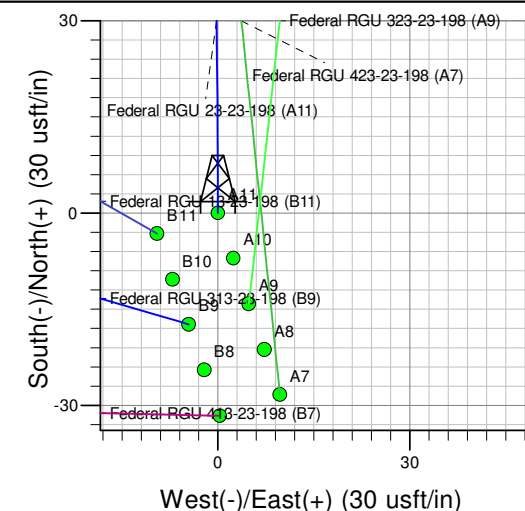
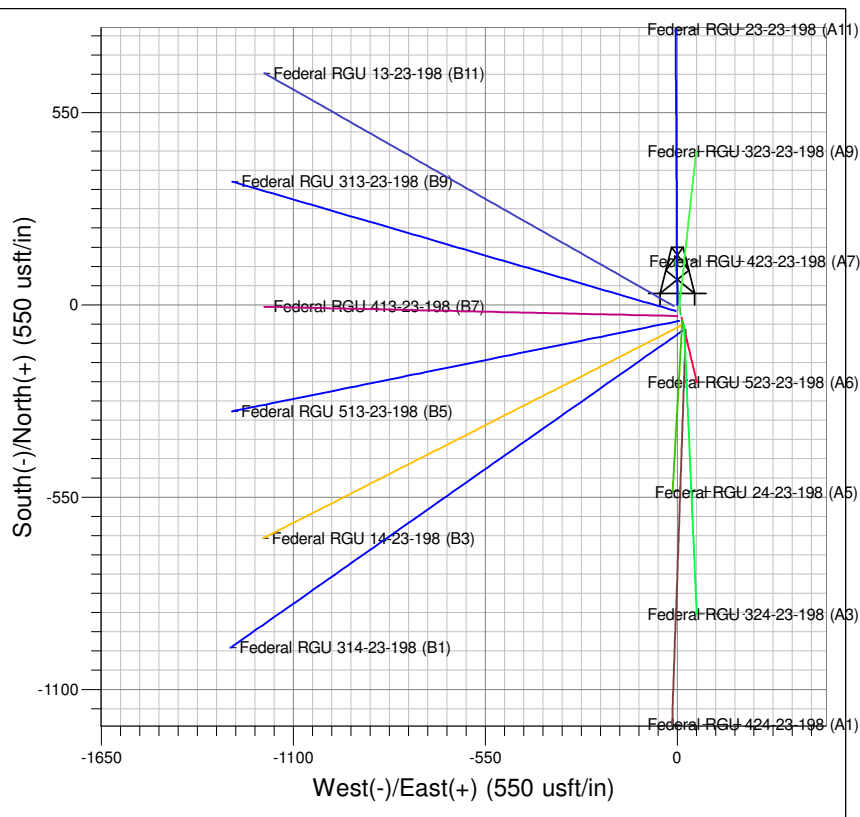
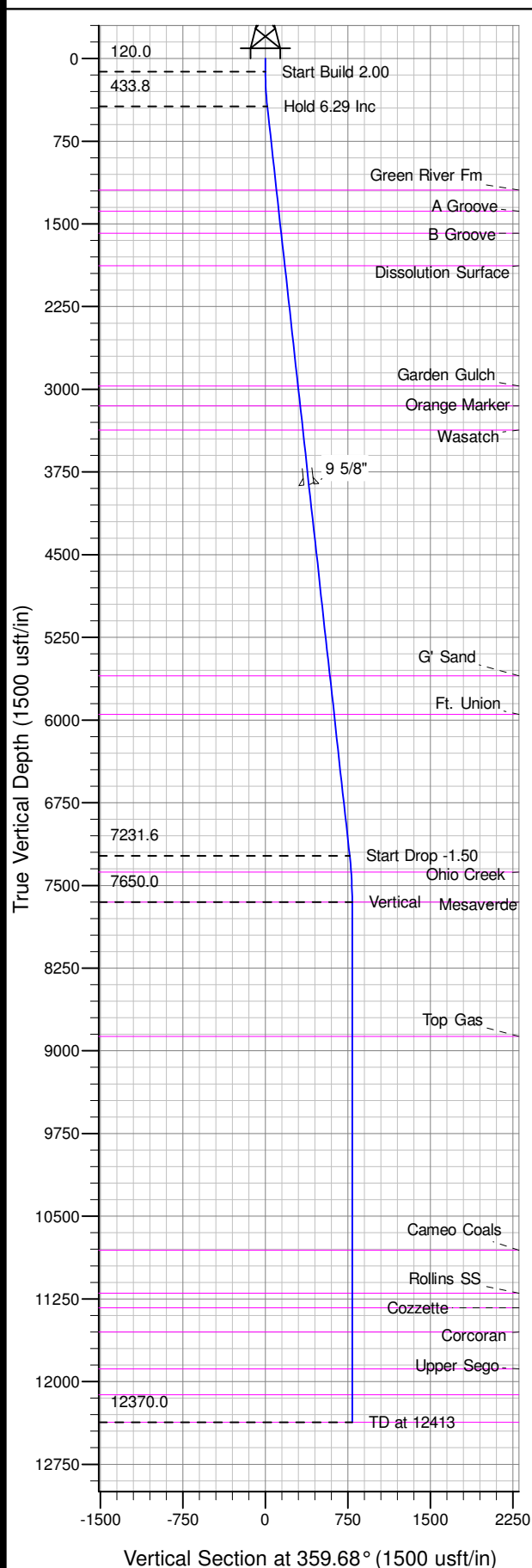
Easting  
2197466.10

Latitude  
39° 56' 48.855 N

Longitude  
108° 21' 45.556 W

Well Name: Federal RGU 23-23-198  
Surface Location: RGU 23-23-198 Pad  
North American Datum 1983 , US State Plane 1983 , Colorado Central Zone  
Ground Elevation: 6542.0  
KELLY BUSHING @ 6570.0usft (Frontier 11 (28' RKB) jib)

True Vertical Depth (1500 usft/in)



Project: RG 23-01S-098W  
Site: RGU 23-23-198 Pad  
Well: Federal RGU 23-23-198  
Plan #1 10may10 jib

Azimuths to True North  
Magnetic North: 10.72°  
Magnetic Field  
Strength: 52552.7snT  
Dip Angle: 66.07°  
Date: 5/10/2010  
Model: IGRF2010

#### SECTION DETAILS

Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	V Sect	Target
1	0.0	0.00	0.00	0.0	0.0	0.0	0.00	0.000	0.0	
2	120.0	0.00	0.00	120.0	0.0	0.0	0.00	0.000	0.0	
3	434.4	6.29	359.68	433.8	17.2	-0.1	2.00	359.675	17.2	
4	7273.4	6.29	359.68	7231.6	766.4	-4.3	0.00	0.000	766.4	
5	7692.6	0.00	0.00	7650.0	789.4	-4.5	1.50	180.000	789.4	Mesaverde (25' Radius) Federal RGU 23-23-198
6	12412.6	0.00	0.00	12370.0	789.4	-4.5	0.00	0.000	789.4	

#### ANNOTATIONS

TVD	MD	Inc	Azi	+N/-S	+E/-W	V Sect	Departure	Annotation
120.0	120.0	0.00	0.00	0.0	0.0	0.0	0.0	Start Build 2.00
433.8	434.4	6.29	359.68	17.2	-0.1	17.2	17.2	Hold 6.29 Inc
7231.6	7273.4	6.29	359.68	766.4	-4.3	766.4	766.4	Start Drop -1.50
7650.0	7692.6	0.00	0.00	789.4	-4.5	789.4	789.4	Vertical
12370.0	12412.6	0.00	0.00	789.4	-4.5	789.4	789.4	TD at 12413

# **PICEANCE HL NAD 83**

**RG 23-01S-098W**

**RGU 23-23-198 Pad**

**Federal RGU 23-23-198 - Slot A11**

**Wellbore #1**

**Plan: Plan #1 10may10 jjb**

## **Standard Planning Report - Geographic**

**13 July, 2010**

**Williams**  
Planning Report - Geographic

<b>Database:</b>	Compass R5000 WIN AUTH	<b>Local Co-ordinate Reference:</b>	Well Federal RGU 23-23-198 (A11) - Slot A11
<b>Company:</b>	PICEANCE HL NAD 83	<b>TVD Reference:</b>	KELLY BUSHING @ 6570.0usft (Frontier 11 (28' RKB) jjb)
<b>Project:</b>	RG 23-01S-098W	<b>MD Reference:</b>	KELLY BUSHING @ 6570.0usft (Frontier 11 (28' RKB) jjb)
<b>Site:</b>	RGU 23-23-198 Pad	<b>North Reference:</b>	True
<b>Well:</b>	Federal RGU 23-23-198	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Wellbore #1		
<b>Design:</b>	Plan #1 10may10 jjb		

<b>Project</b>	RG 23-01S-098W, Rio Blanco County, CO		
<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		

Site		RGU 23-23-198 Pad			
Site Position:		Northing:	1,782,441.90 usft	Latitude:	39° 56' 48.855 N
From:	Map	Easting:	2,197,466.10 usft	Longitude:	108° 21' 45.556 W
Position Uncertainty:	0.0 usft	Slot Radius:	13.200 in	Grid Convergence:	-1.805 °

Well	Federal RGU 23-23-198 - Slot A11					
Well Position	+N/-S	0.0 usft	Northing:	1,782,441.90 usft	Latitude:	39° 56' 48.855 N
	+E/-W	0.0 usft	Easting:	2,197,466.10 usft	Longitude:	108° 21' 45.556 W
Position Uncertainty		0.0 usft	Wellhead Elevation:		Ground Level:	6,542.0 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	5/10/2010	10.718	66.071	52,553

<b>Design</b>	Plan #1 10may10 jjb			
<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	359.68

<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	
434.4	6.29	359.68	433.8	17.2	-0.1	2.00	2.00	0.00	359.675	
7,273.4	6.29	359.68	7,231.6	766.4	-4.3	0.00	0.00	0.00	0.000	
7,692.6	0.00	0.00	7,650.0	789.4	-4.5	1.50	-1.50	0.00	180.000	Mesaverde (25' Radiu
12,412.6	0.00	0.00	12,370.0	789.4	-4.5	0.00	0.00	0.00	0.000	

**Williams**  
Planning Report - Geographic

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<b>Company:</b>	PICEANCE HL NAD 83	<b>TVD Reference:</b>	KELLY BUSHING @ 6570.0usft (Frontier 11 (28' RKB) jjb)
<b>Project:</b>	RG 23-01S-098W	<b>MD Reference:</b>	KELLY BUSHING @ 6570.0usft (Frontier 11 (28' RKB) jjb)
<b>Site:</b>	RGU 23-23-198 Pad	<b>North Reference:</b>	True
<b>Well:</b>	Federal RGU 23-23-198	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Wellbore #1		
<b>Design:</b>	Plan #1 10may10 jjb		

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	1,782,441.90	2,197,466.10	39° 56' 48.855 N	108° 21' 45.556 W
120.0	0.00	0.00	120.0	0.0	0.0	1,782,441.90	2,197,466.10	39° 56' 48.855 N	108° 21' 45.556 W
434.4	6.29	359.68	433.8	17.2	-0.1	1,782,459.13	2,197,466.54	39° 56' 49.025 N	108° 21' 45.557 W
7,273.4	6.29	359.68	7,231.6	766.4	-4.3	1,783,208.02	2,197,485.91	39° 56' 56.428 N	108° 21' 45.611 W
7,692.6	0.00	0.00	7,650.0	789.4	-4.5	1,783,231.00	2,197,486.50	39° 56' 56.655 N	108° 21' 45.613 W
12,412.6	0.00	0.00	12,370.0	789.4	-4.5	1,783,231.00	2,197,486.50	39° 56' 56.655 N	108° 21' 45.613 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	0.00	7,650.0	789.4	-4.5	1,783,231.00	2,197,486.50	39° 56' 56.655 N	108° 21' 45.613 W
- plan hits target center									
- Circle (radius 25.0)									
Mesaverde (50' Radius)	0.00	0.00	7,650.0	789.4	-4.5	1,783,231.00	2,197,486.50	39° 56' 56.655 N	108° 21' 45.613 W
- plan hits target center									
- Circle (radius 50.0)									

Casing Points					
Measured Depth (usft)	Vertical Depth (usft)	Name	Casing Diameter (in)	Hole Diameter (in)	
3,888.0	3,866.6	9 5/8"	9.625	13.500	

**Williams**  
Planning Report - Geographic

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<b>Company:</b>	PICEANCE HL NAD 83	<b>TVD Reference:</b>	KELLY BUSHING @ 6570.0usft (Frontier 11 (28' RKB) jjb)
<b>Project:</b>	RG 23-01S-098W	<b>MD Reference:</b>	KELLY BUSHING @ 6570.0usft (Frontier 11 (28' RKB) jjb)
<b>Site:</b>	RGU 23-23-198 Pad	<b>North Reference:</b>	True
<b>Well:</b>	Federal RGU 23-23-198	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Wellbore #1		
<b>Design:</b>	Plan #1 10may10 jjb		

Formations						
Measured Depth (usft)	Vertical Depth (usft)	Name	Lithology	Dip (°)	Dip Direction (°)	
1,200.2	1,195.0	Green River Fm				
1,391.4	1,385.0	A Groove				
1,592.6	1,585.0	B Groove				
1,889.4	1,880.0	Dissolution Surface				
2,986.0	2,970.0	Garden Gulch				
3,167.1	3,150.0	Orange Marker				
3,388.4	3,370.0	Wasatch				
5,631.9	5,600.0	G' Sand				
5,984.0	5,950.0	Ft. Union				
7,422.4	7,380.0	Ohio Creek				
7,692.6	7,650.0	Mesaverde				
8,912.6	8,870.0	Top Gas				
10,852.6	10,810.0	Cameo Coals				
11,242.6	11,200.0	Rollins SS				
11,372.6	11,330.0	Cozzette				
11,592.6	11,550.0	Corcoran				
11,927.6	11,885.0	Upper Sego				
12,162.6	12,120.0	Lower Sego				
12,412.6	12,370.0	TD		0.000		

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	
434.4	433.8	17.2	-0.1	Hold 6.29 Inc	
7,273.4	7,231.6	766.4	-4.3	Start Drop -1.50	
7,692.6	7,650.0	789.4	-4.5	Vertical	
12,412.6	12,370.0	789.4	-4.5	TD at 12413	