



## **PICEANCE HL NAD 83**

**RG 29-02S-098W**

**RG 24-29-298 Pad**

**RG 421-32-298 - Slot B10**

**Wellbore #1**

**Plan: Design #1 11Jun13 kjs**

## **Standard Planning Report - Geographic**

**12 July, 2013**



**IBM Global Services**  
Planning Report - Geographic

<b>Database:</b>	COMPASS-PICEANCE	<b>Local Co-ordinate Reference:</b>	Well RG 421-32-298 - Slot B10
<b>Company:</b>	PICEANCE HL NAD 83	<b>TVD Reference:</b>	KELLY BUSHING @ 7072.00usft (Original Well Elev)
<b>Project:</b>	RG 29-02S-098W	<b>MD Reference:</b>	KELLY BUSHING @ 7072.00usft (Original Well Elev)
<b>Site:</b>	RG 24-29-298 Pad	<b>North Reference:</b>	True
<b>Well:</b>	RG 421-32-298	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Wellbore #1		
<b>Design:</b>	Design #1 11Jun13 kjs		

<b>Project</b>	RG 29-02S-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		

<b>Site</b>	RG 24-29-298 Pad			
<b>Site Position:</b>		<b>Northing:</b>	1,745,100.90 usft	<b>Latitude:</b> 39.84293
<b>From:</b> Map		<b>Easting:</b>	2,179,973.10 usft	<b>Longitude:</b> -108.42073
<b>Position Uncertainty:</b>	0.00 usft	<b>Slot Radius:</b>	13.200 in	<b>Grid Convergence:</b> -1.8421 °

<b>Well</b>	RG 421-32-298 - Slot B10			
<b>Well Position</b>	<b>+N/-S</b>	0.00 usft	<b>Northing:</b>	1,745,060.40 usft
	<b>+E/-W</b>	0.00 usft	<b>Easting:</b>	2,179,956.80 usft
<b>Position Uncertainty</b>	0.00 usft		<b>Wellhead Elevation:</b>	
			<b>Ground Level:</b>	7,046.00 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	6/11/2013	10.3298	65.8910	52,174

<b>Design</b>	Design #1 11Jun13 kjs			
<b>Audit Notes:</b>				
<b>Version:</b>	<b>Phase:</b>	PLAN	<b>Tie On Depth:</b>	0.00
<b>Vertical Section:</b>	<b>Depth From (TVD) (usft)</b>	<b>+N/-S (usft)</b>	<b>+E/-W (usft)</b>	<b>Direction (°)</b>
	0.00	0.00	0.00	170.28

<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
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0000	
120.00	0.00	0.00	120.00	0.00	0.00	0.00	0.00	0.00	0.0000	
785.63	23.30	170.28	767.44	-131.56	22.54	3.50	3.50	0.00	170.2787	
4,514.17	23.30	170.28	4,191.98	-1,585.02	271.54	0.00	0.00	0.00	0.0000	
5,679.03	0.00	0.00	5,325.00	-1,815.24	310.98	2.00	-2.00	0.00	180.0000	
5,779.03	0.00	0.00	5,425.00	-1,815.24	310.98	0.00	0.00	0.00	0.0000	Mesaverde (50' Radius
10,074.03	0.00	0.00	9,720.00	-1,815.24	310.98	0.00	0.00	0.00	0.0000	

<b>Database:</b>	COMPASS-PICEANCE	<b>Local Co-ordinate Reference:</b>	Well RG 421-32-298 - Slot B10
<b>Company:</b>	PICEANCE HL NAD 83	<b>TVD Reference:</b>	KELLY BUSHING @ 7072.00usft (Original Well Elev)
<b>Project:</b>	RG 29-02S-098W	<b>MD Reference:</b>	KELLY BUSHING @ 7072.00usft (Original Well Elev)
<b>Site:</b>	RG 24-29-298 Pad	<b>North Reference:</b>	True
<b>Well:</b>	RG 421-32-298	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Wellbore #1		
<b>Design:</b>	Design #1 11Jun13 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	
0.00	0.00	0.00	0.00	0.00	0.00	1,745,060.40	2,179,956.80	39.84281	-108.42078	
120.00	0.00	0.00	120.00	0.00	0.00	1,745,060.40	2,179,956.80	39.84281	-108.42078	
Start Build 3.50										
500.00	13.30	170.28	496.60	-43.28	7.41	1,745,016.91	2,179,962.82	39.84269	-108.42076	
785.63	23.30	170.28	767.44	-131.56	22.54	1,744,928.19	2,179,975.10	39.84245	-108.42070	
Hold 23.30 Inclination										
925.60	23.30	170.28	896.00	-186.12	31.89	1,744,873.35	2,179,982.68	39.84230	-108.42067	
Green River Fm										
1,000.00	23.30	170.28	964.33	-215.12	36.85	1,744,844.21	2,179,986.72	39.84222	-108.42065	
1,104.16	23.30	170.28	1,060.00	-255.73	43.81	1,744,803.40	2,179,992.37	39.84211	-108.42063	
A Groove										
1,281.63	23.30	170.28	1,223.00	-324.91	55.66	1,744,733.87	2,180,001.99	39.84192	-108.42059	
B Groove										
1,500.00	23.30	170.28	1,423.56	-410.03	70.25	1,744,648.32	2,180,013.83	39.84169	-108.42053	
1,889.17	23.30	170.28	1,781.00	-561.74	96.23	1,744,495.86	2,180,034.93	39.84127	-108.42044	
Dissolution Surface										
2,000.00	23.30	170.28	1,882.80	-604.94	103.64	1,744,452.44	2,180,040.94	39.84115	-108.42042	
2,170.07	23.30	170.28	2,039.00	-671.24	114.99	1,744,385.81	2,180,050.16	39.84097	-108.42038	
Garden Gulch										
2,493.43	23.30	170.28	2,336.00	-797.29	136.59	1,744,259.13	2,180,067.69	39.84062	-108.42030	
Orange Marker										
2,500.00	23.30	170.28	2,342.03	-799.85	137.03	1,744,256.56	2,180,068.04	39.84062	-108.42030	
2,668.73	23.30	170.28	2,497.00	-865.63	148.30	1,744,190.46	2,180,077.19	39.84044	-108.42026	
Wasatch										
3,000.00	23.30	170.28	2,801.26	-994.76	170.42	1,744,060.68	2,180,095.15	39.84008	-108.42018	
3,213.11	23.30	170.28	2,997.00	-1,077.84	184.65	1,743,977.18	2,180,106.71	39.83985	-108.42013	
9 5/8"										
3,500.00	23.30	170.28	3,260.50	-1,189.67	203.81	1,743,864.79	2,180,122.26	39.83955	-108.42006	
4,000.00	23.30	170.28	3,719.73	-1,384.58	237.20	1,743,668.91	2,180,149.37	39.83901	-108.41994	
4,342.17	23.30	170.28	4,034.00	-1,517.97	260.05	1,743,534.86	2,180,167.92	39.83865	-108.41986	
Top of "G" Sand										
4,500.00	23.30	170.28	4,178.96	-1,579.49	270.59	1,743,473.03	2,180,176.48	39.83848	-108.41982	
4,514.17	23.30	170.28	4,191.98	-1,585.02	271.54	1,743,467.48	2,180,177.25	39.83846	-108.41982	
Start Drop -2.00										
4,579.21	22.00	170.28	4,252.00	-1,609.70	275.77	1,743,442.67	2,180,180.68	39.83839	-108.41980	
Fort Union										
5,000.00	13.58	170.28	4,652.31	-1,736.29	297.46	1,743,315.44	2,180,198.29	39.83805	-108.41973	
5,500.00	3.58	170.28	5,146.09	-1,809.73	310.04	1,743,241.64	2,180,208.50	39.83785	-108.41968	
5,503.92	3.50	170.28	5,150.00	-1,809.97	310.08	1,743,241.40	2,180,208.53	39.83784	-108.41968	
Ohio Creek										
5,679.03	0.00	0.00	5,325.00	-1,815.24	310.98	1,743,236.10	2,180,209.27	39.83783	-108.41968	
Vertical										
5,779.03	0.00	0.00	5,425.00	-1,815.24	310.98	1,743,236.10	2,180,209.27	39.83783	-108.41968	
Mesaverde - Mesaverde										
6,000.00	0.00	0.00	5,645.97	-1,815.24	310.98	1,743,236.10	2,180,209.27	39.83783	-108.41968	
6,500.00	0.00	0.00	6,145.97	-1,815.24	310.98	1,743,236.10	2,180,209.27	39.83783	-108.41968	
6,558.03	0.00	0.00	6,204.00	-1,815.24	310.98	1,743,236.10	2,180,209.27	39.83783	-108.41968	
Approx. Top Gas										
7,000.00	0.00	0.00	6,645.97	-1,815.24	310.98	1,743,236.10	2,180,209.27	39.83783	-108.41968	
7,500.00	0.00	0.00	7,145.97	-1,815.24	310.98	1,743,236.10	2,180,209.27	39.83783	-108.41968	
8,000.00	0.00	0.00	7,645.97	-1,815.24	310.98	1,743,236.10	2,180,209.27	39.83783	-108.41968	



**IBM Global Services**  
Planning Report - Geographic

<b>Database:</b>	COMPASS-PICEANCE	<b>Local Co-ordinate Reference:</b>	Well RG 421-32-298 - Slot B10
<b>Company:</b>	PICEANCE HL NAD 83	<b>TVD Reference:</b>	KELLY BUSHING @ 7072.00usft (Original Well Elev)
<b>Project:</b>	RG 29-02S-098W	<b>MD Reference:</b>	KELLY BUSHING @ 7072.00usft (Original Well Elev)
<b>Site:</b>	RG 24-29-298 Pad	<b>North Reference:</b>	True
<b>Well:</b>	RG 421-32-298	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Wellbore #1		
<b>Design:</b>	Design #1 11Jun13 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
8,382.03	0.00	0.00	8,028.00	-1,815.24	310.98	1,743,236.10	2,180,209.27	39.83783	-108.41968
<b>Cameo Coals</b>									
8,500.00	0.00	0.00	8,145.97	-1,815.24	310.98	1,743,236.10	2,180,209.27	39.83783	-108.41968
8,925.03	0.00	0.00	8,571.00	-1,815.24	310.98	1,743,236.10	2,180,209.27	39.83783	-108.41968
<b>Rollins SS</b>									
9,000.00	0.00	0.00	8,645.97	-1,815.24	310.98	1,743,236.10	2,180,209.27	39.83783	-108.41968
9,032.03	0.00	0.00	8,678.00	-1,815.24	310.98	1,743,236.10	2,180,209.27	39.83783	-108.41968
<b>Cozzette</b>									
9,236.03	0.00	0.00	8,882.00	-1,815.24	310.98	1,743,236.10	2,180,209.27	39.83783	-108.41968
<b>Corcoran</b>									
9,500.00	0.00	0.00	9,145.97	-1,815.24	310.98	1,743,236.10	2,180,209.27	39.83783	-108.41968
9,554.03	0.00	0.00	9,200.00	-1,815.24	310.98	1,743,236.10	2,180,209.27	39.83783	-108.41968
<b>Upper Sego</b>									
9,824.03	0.00	0.00	9,470.00	-1,815.24	310.98	1,743,236.10	2,180,209.27	39.83783	-108.41968
<b>Lower Sego</b>									
10,000.00	0.00	0.00	9,645.97	-1,815.24	310.98	1,743,236.10	2,180,209.27	39.83783	-108.41968
10,074.03	0.00	0.00	9,720.00	-1,815.24	310.98	1,743,236.10	2,180,209.27	39.83783	-108.41968
<b>TD at 10074.03 - TD</b>									

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 (50' Radius) - plan hits target center - Circle (radius 50.00)	0.00	0.00	5,425.00	-1,815.24	310.98	1,743,236.10	2,180,209.27	39.83783	-108.41968

Casing Points					
Measured Depth (usft)	Vertical Depth (usft)	Name	Casing Diameter (in)	Hole Diameter (in)	
3,213.11	2,997.00	9 5/8"	9.625	12.250	

<b>Database:</b>	COMPASS-PICEANCE	<b>Local Co-ordinate Reference:</b>	Well RG 421-32-298 - Slot B10
<b>Company:</b>	PICEANCE HL NAD 83	<b>TVD Reference:</b>	KELLY BUSHING @ 7072.00usft (Original Well Elev)
<b>Project:</b>	RG 29-02S-098W	<b>MD Reference:</b>	KELLY BUSHING @ 7072.00usft (Original Well Elev)
<b>Site:</b>	RG 24-29-298 Pad	<b>North Reference:</b>	True
<b>Well:</b>	RG 421-32-298	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Wellbore #1		
<b>Design:</b>	Design #1 11Jun13 kjs		

Formations						
Measured Depth (usft)	Vertical Depth (usft)	Name	Lithology	Dip (°)	Dip Direction (°)	
925.60	896.00	Green River Fm				
1,104.16	1,060.00	A Groove				
1,281.63	1,223.00	B Groove				
1,889.17	1,781.00	Dissolution Surface				
2,170.07	2,039.00	Garden Gulch				
2,493.43	2,336.00	Orange Marker				
2,668.73	2,497.00	Wasatch				
4,342.17	4,034.00	Top of "G" Sand				
4,579.21	4,252.00	Fort Union				
5,503.92	5,150.00	Ohio Creek				
5,779.03	5,425.00	Mesaverde				
6,558.03	6,204.00	Approx. Top Gas				
8,382.03	8,028.00	Cameo Coals				
8,925.03	8,571.00	Rollins SS				
9,032.03	8,678.00	Cozzette				
9,236.03	8,882.00	Corcoran				
9,554.03	9,200.00	Upper Sego				
9,824.03	9,470.00	Lower Sego				
10,074.03	9,720.00	TD				

Plan Annotations				
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
120.00	120.00	0.00	0.00	Start Build 3.50
785.63	767.44	-131.56	22.54	Hold 23.30 Inclination
4,514.17	4,191.98	-1,585.02	271.54	Start Drop -2.00
5,679.03	5,325.00	-1,815.24	310.98	Vertical
5,779.03	5,425.00	-1,815.24	310.98	Mesaverde
10,074.03	9,720.00	-1,815.24	310.98	TD at 10074.03