

# **PICEANCE VLY NAD 83**

**PA 21-06S-095W**

**PA 22-21 Pad**

**PA 411-21 - Slot B10**

**Wellbore #1**

**Plan: Design #1 18Mar10 kjs**

## **Standard Planning Report - Geographic**

**20 April, 2010**

**Williams**  
Planning Report - Geographic

<b>Database:</b>	Compass R5000 WIN AUTH	<b>Local Co-ordinate Reference:</b>	Well PA 411-21 - Slot B10
<b>Company:</b>	PICEANCE VLY NAD 83	<b>TVD Reference:</b>	KELLY BUSHING @ 6049.0usft (Nabors 577 (26' KB) JMS)
<b>Project:</b>	PA 21-06S-095W	<b>MD Reference:</b>	KELLY BUSHING @ 6049.0usft (Nabors 577 (26' KB) JMS)
<b>Site:</b>	PA 22-21 Pad	<b>North Reference:</b>	True
<b>Well:</b>	PA 411-21	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Wellbore #1		
<b>Design:</b>	Design #1 18Mar10 kjs		

<b>Project</b>	PA 21-06S-095W, Garfield County, CO, 21-06S-095W		
<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>	PA 22-21 Pad		
<b>Site Position:</b>		<b>Northing:</b>	1,620,681.59 usft
<b>From:</b>	Map	<b>Easting:</b>	2,292,411.75 usft
<b>Position Uncertainty:</b>	0.0 usft	<b>Slot Radius:</b>	13.200 in
		<b>Latitude:</b>	39° 30' 38.635 N
		<b>Longitude:</b>	108° 0' 29.662 W
		<b>Grid Convergence:</b>	-1.582 °

Well	PA 411-21 - Slot B10					
Well Position	+N/-S	0.0 usft	Northing:	1,620,690.69 usft	Latitude:	39° 30' 38.734 N
	+E/-W	0.0 usft	Easting:	2,292,444.41 usft	Longitude:	108° 0' 29.248 W
Position Uncertainty		0.0 usft	Wellhead Elevation:		Ground Level:	6,023.0 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	3/18/2010	10.520	65.783	52,382

<b>Design</b>	Design #1 18Mar10 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	340.15

<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	
150.0	0.00	0.00	150.0	0.0	0.0	0.00	0.00	0.00	0.000	
1,076.0	18.52	355.00	1,060.0	147.8	-12.9	2.00	2.00	0.00	355.000	
1,576.0	18.52	355.00	1,534.1	306.0	-26.8	0.00	0.00	0.00	0.000	
1,868.7	18.52	336.50	1,811.8	395.0	-49.4	2.00	0.00	-6.32	-98.800	
5,580.9	18.52	336.50	5,331.9	1,476.2	-519.5	0.00	0.00	0.00	0.000	
6,815.4	0.00	0.00	6,545.0	1,657.6	-598.4	1.50	-1.50	0.00	180.000	Top Gas (25' Radius)
8,965.4	0.00	0.00	8,695.0	1,657.6	-598.4	0.00	0.00	0.00	0.000	TD / PBHL PA 411-21

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<b>Company:</b>	PICEANCE VLY NAD 83	<b>TVD Reference:</b>	KELLY BUSHING @ 6049.0usft (Nabors 577 (26' KB) JMS)
<b>Project:</b>	PA 21-06S-095W	<b>MD Reference:</b>	KELLY BUSHING @ 6049.0usft (Nabors 577 (26' KB) JMS)
<b>Site:</b>	PA 22-21 Pad	<b>North Reference:</b>	True
<b>Well:</b>	PA 411-21	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Wellbore #1		
<b>Design:</b>	Design #1 18Mar10 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	1,620,690.69	2,292,444.41	39° 30' 38.734 N	108° 0' 29.248 W
150.0	0.00	0.00	150.0	0.0	0.0	1,620,690.69	2,292,444.41	39° 30' 38.734 N	108° 0' 29.248 W
1,076.0	18.52	355.00	1,060.0	147.8	-12.9	1,620,838.78	2,292,435.56	39° 30' 40.195 N	108° 0' 29.413 W
1,576.0	18.52	355.00	1,534.1	306.0	-26.8	1,620,997.31	2,292,426.09	39° 30' 41.758 N	108° 0' 29.590 W
1,868.7	18.52	336.50	1,811.8	395.0	-49.4	1,621,086.91	2,292,405.95	39° 30' 42.638 N	108° 0' 29.878 W
5,580.9	18.52	336.50	5,331.9	1,476.2	-519.5	1,622,180.63	2,291,965.83	39° 30' 53.324 N	108° 0' 35.877 W
6,815.4	0.00	0.00	6,545.0	1,657.6	-598.4	1,622,364.10	2,291,892.00	39° 30' 55.116 N	108° 0' 36.884 W
8,965.4	0.00	0.00	8,695.0	1,657.6	-598.4	1,622,364.10	2,291,892.00	39° 30' 55.116 N	108° 0' 36.884 W

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
Top Gas (25' Radius) P4 - plan hits target center - Circle (radius 25.0)	0.00	0.00	6,545.0	1,657.6	-598.4	1,622,364.10	2,291,892.00	39° 30' 55.116 N	108° 0' 36.884 W
TD / PBHL PA 411-21 - plan hits target center - Point	0.00	0.00	8,695.0	1,657.6	-598.4	1,622,364.10	2,291,892.00	39° 30' 55.116 N	108° 0' 36.884 W

Casing Points					
Measured Depth (usft)	Vertical Depth (usft)	Name	Casing Diameter (in)	Hole Diameter (in)	
1,126.0	1,107.4	9 5/8"	9.625	12.250	

Formations						
Measured Depth (usft)	Vertical Depth (usft)	Name	Lithology	Dip (°)	Dip Direction (°)	
2,937.2	2,825.0	Top of "G" Sand		0.000		
3,042.6	2,925.0	Base of "G" Sand		0.000		
5,336.4	5,100.0	Mesaverde		0.000		
6,815.4	6,545.0	Approx. Top Gas		0.000		
8,080.4	7,810.0	Cameo Coals		0.000		
8,815.4	8,545.0	Rollins SS		0.000		
8,965.4	8,695.0	TD		0.000		

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Plan Annotations				
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
150.0	150.0	0.0	0.0	Start Build 2.00
1,076.0	1,060.0	147.8	-12.9	Hold 18.52 Inclination
1,576.0	1,534.1	306.0	-26.8	Begin 2°/100 Turn
1,868.7	1,811.8	395.0	-49.4	Hold 336.50 Azimuth
5,580.9	5,331.9	1,476.2	-519.5	Start Drop -1.50
6,815.4	6,545.0	1,657.6	-598.4	Top Gas
8,965.4	8,695.0	1,657.6	-598.4	TD at 8965.4