

PICEANCE VLY NAD 83

PA 07-07S-095W

PA 21-7 Pad

PA 332-7 - Slot A9

Wellbore #1

Plan: Plan #1 22Apr09 kjs

Standard Planning Report - Geographic

23 April, 2010

Williams
Planning Report - Geographic

Database:	Compass R5000 WIN AUTH	Local Co-ordinate Reference:	Well PA 332-7 - Slot A9
Company:	PICEANCE VLY NAD 83	TVD Reference:	KELLY BUSHING @ 5109.0usft (SSD (26' KB) JMS)
Project:	PA 07-07S-095W	MD Reference:	KELLY BUSHING @ 5109.0usft (SSD (26' KB) JMS)
Site:	PA 21-7 Pad	North Reference:	True
Well:	PA 332-7	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Plan #1 22Apr09 kjs		

Project	PA 07-07S-095W, Garfield County, CO		
Map System:	US State Plane 1983	System Datum:	Mean Sea Level
Geo Datum:	North American Datum 1983		
Map Zone:	Colorado Central Zone		Using geodetic scale factor

Site		PA 21-7 Pad			
Site Position:		Northing:	1,601,212.50 usft	Latitude:	39° 27' 23.366 N
From:	Map	Easting:	2,281,792.10 usft	Longitude:	108° 2' 38.155 W
Position Uncertainty:	0.0 usft	Slot Radius:	13.200 in	Grid Convergence:	-1.604 °

Well	PA 332-7 - Slot A9					
Well Position	+N/-S	0.0 usft	Northing:	1,601,202.80 usft	Latitude:	39° 27' 23.281 N
	+E/-W	0.0 usft	Easting:	2,281,830.90 usft	Longitude:	108° 2' 37.657 W
Position Uncertainty		0.0 usft	Wellhead Elevation:		Ground Level:	5,083.0 usft

Wellbore	Wellbore #1				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2005-10	4/22/2009	10.625	65.765	52,472

Design	Plan #1 22Apr09 kjs			
Audit Notes:				
Version:	Phase:	PLAN	Tie On Depth:	0.0
Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)	Direction (°)
	0.0	0.0	0.0	110.30

Plan Sections										
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	
2,002.1	37.64	109.56	1,869.6	-199.7	561.9	2.00	2.00	0.00	109.561	
2,654.0	37.64	109.56	2,385.8	-333.0	937.1	0.00	0.00	0.00	0.000	
4,630.1	8.00	109.56	4,187.0	-586.7	1,651.3	1.50	-1.50	0.00	180.000	Top Gas (25' Radius)
5,163.5	0.00	0.00	4,718.6	-599.2	1,686.3	1.50	-1.50	0.00	180.000	
6,781.9	0.00	0.00	6,337.0	-599.2	1,686.3	0.00	0.00	0.00	0.000	

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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	1,601,202.80	2,281,830.90	39° 27' 23.281 N	108° 2' 37.657 W	
120.0	0.00	0.00	120.0	0.0	0.0	1,601,202.80	2,281,830.90	39° 27' 23.281 N	108° 2' 37.657 W	
Start Build 2.00										
1,343.9	24.48	109.56	1,307.0	-86.2	242.6	1,601,109.83	2,282,071.00	39° 27' 22.429 N	108° 2' 34.564 W	
Top of "G" Sand										
1,454.8	26.70	109.56	1,407.0	-102.2	287.7	1,601,092.55	2,282,115.65	39° 27' 22.270 N	108° 2' 33.989 W	
Base of "G" Sand										
2,002.1	37.64	109.56	1,869.6	-199.7	561.9	1,600,987.49	2,282,386.99	39° 27' 21.307 N	108° 2' 30.493 W	
Hold 37.64 Inclination										
2,052.0	37.64	109.56	1,909.1	-209.9	590.6	1,600,976.49	2,282,415.40	39° 27' 21.207 N	108° 2' 30.127 W	
9 5/8"										
2,654.0	37.64	109.56	2,385.8	-333.0	937.1	1,600,843.76	2,282,758.23	39° 27' 19.990 N	108° 2' 25.710 W	
Start Drop -1.50										
3,593.0	23.56	109.56	3,192.0	-492.6	1,386.3	1,600,671.61	2,283,202.83	39° 27' 18.412 N	108° 2' 19.983 W	
Mesaverde										
4,630.1	8.00	109.56	4,187.0	-586.7	1,651.3	1,600,570.10	2,283,465.01	39° 27' 17.481 N	108° 2' 16.605 W	
Top Gas - Approx. Top Gas										
5,163.5	0.00	0.00	4,718.6	-599.2	1,686.3	1,600,556.68	2,283,499.67	39° 27' 17.358 N	108° 2' 16.159 W	
Vertical										
6,081.9	0.00	0.00	5,637.0	-599.2	1,686.3	1,600,556.68	2,283,499.67	39° 27' 17.358 N	108° 2' 16.159 W	
Cameo Coals										
6,631.9	0.00	0.00	6,187.0	-599.2	1,686.3	1,600,556.68	2,283,499.67	39° 27' 17.358 N	108° 2' 16.159 W	
Rollins SS										
6,781.9	0.00	0.00	6,337.0	-599.2	1,686.3	1,600,556.68	2,283,499.67	39° 27' 17.358 N	108° 2' 16.159 W	
TD										

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) P/	0.00	0.00	4,187.0	-593.9	1,669.6	1,600,562.40	2,283,483.10	39° 27' 17.410 N	108° 2' 16.372 W	
- plan misses target center by 19.5usft at 4631.5usft MD (4188.4 TVD, -586.8 N, 1651.4 E)										
- Circle (radius 25.0)										

Casing Points						
Measured Depth (usft)	Vertical Depth (usft)	Name	Casing Diameter (in)	Hole Diameter (in)		
2,052.0	1,909.1	9 5/8"	9.625	12.250		

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Formations						
Measured Depth (usft)	Vertical Depth (usft)	Name	Lithology	Dip (°)	Dip Direction (°)	
1,343.9	1,307.0	Top of "G" Sand				
1,454.8	1,407.0	Base of "G" Sand				
3,593.0	3,192.0	Mesaverde				
4,630.1	4,187.0	Approx. Top Gas				
6,081.9	5,637.0	Cameo Coals				
6,631.9	6,187.0	Rollins SS				
6,781.9	6,337.0	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	
2,002.1	1,869.6	-199.7	561.9	Hold 37.64 Inclination	
2,654.0	2,385.8	-333.0	937.1	Start Drop -1.50	
4,630.1	4,187.0	-586.7	1,651.3	Top Gas	
5,163.5	4,718.6	-599.2	1,686.3	Vertical	
6,781.9	6,337.0	-599.2	1,686.3	TD at 6781.9	