

PICEANCE VLY NAD 83

PA 29-06S-095W

DOE 3-W-29 Pad

PA 312-29 - Slot A8

Wellbore #1

Plan: Plan #1 05Feb09 kjs

Standard Planning Report - Geographic

23 March, 2010

Williams

Planning Report - Geographic

Database:	Compass R5000 WIN AUTH	Local Co-ordinate Reference:	Well PA 312-29 - Slot A8
Company:	PICEANCE VLY NAD 83	TVD Reference:	WELL @ 5702.0usft (Nabors 577 (26') kjs)
Project:	PA 29-06S-095W	MD Reference:	WELL @ 5702.0usft (Nabors 577 (26') kjs)
Site:	DOE 3-W-29 Pad	North Reference:	True
Well:	PA 312-29	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Plan #1 05Feb09 kjs		

Project	PA 29-06S-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	DOE 3-W-29 Pad				
Site Position:		Northing:	1,613,247.00 usft	Latitude:	39° 29' 23.965 N
From:	Map	Easting:	2,287,962.20 usft	Longitude:	108° 1' 23.779 W
Position Uncertainty:	0.0 usft	Slot Radius:	13.200 in	Grid Convergence:	-1.591 °

Well	PA 312-29 - Slot A8					
Well Position	+N/-S	0.0 usft	Northing:	1,613,235.20 usft	Latitude:	39° 29' 23.853 N
	+E/-W	0.0 usft	Easting:	2,287,980.30 usft	Longitude:	108° 1' 23.544 W
Position Uncertainty		0.0 usft	Wellhead Elevation:		Ground Level:	5,676.0 usft

Wellbore	Wellbore #1				
Magnetics	Model Name	Sample Date	Declination	Dip Angle	Field Strength
	IGRF2010	2/3/2009	(°)	(°)	(nT)
			10.666	65.794	52,486

Design	Plan #1 05Feb09 kjs			
Audit Notes:				
Version:	Phase:	PLAN	Tie On Depth:	0.0
Vertical Section:	Depth From (TVD)	+N/-S	+E/-W	Direction
	(usft)	(usft)	(usft)	(°)
	0.0	0.0	0.0	324.21

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	
150.0	0.00	0.00	150.0	0.0	0.0	0.00	0.00	0.00	0.000	
396.2	8.00	8.00	395.4	17.0	2.4	3.25	3.25	0.00	8.000	
1,519.7	38.96	322.96	1,418.2	387.1	-205.5	3.00	2.76	-4.01	-53.288	
4,884.2	38.96	322.96	4,034.5	2,075.7	-1,479.7	0.00	0.00	0.00	0.000	
6,432.1	8.00	322.97	5,437.0	2,562.0	-1,846.6	2.00	-2.00	0.00	179.998	Top Gas (25' Radius)
6,832.1	0.00	0.00	5,835.7	2,584.3	-1,863.4	2.00	-2.00	9.26	180.000	
8,583.4	0.00	0.00	7,587.0	2,584.3	-1,863.4	0.00	0.00	0.00	0.000	

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Site:	DOE 3-W-29 Pad	North Reference:	True
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Wellbore:	Wellbore #1		
Design:	Plan #1 05Feb09 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	1,613,235.20	2,287,980.30	39° 29' 23.853 N	108° 1' 23.544 W	
150.0	0.00	0.00	150.0	0.0	0.0	1,613,235.20	2,287,980.30	39° 29' 23.853 N	108° 1' 23.544 W	
Start Build 3.25										
396.2	8.00	8.00	395.4	17.0	2.4	1,613,252.11	2,287,983.16	39° 29' 24.021 N	108° 1' 23.514 W	
Begin 3°/100 Build & Turn										
1,519.7	38.96	322.96	1,418.2	387.1	-205.5	1,613,627.84	2,287,785.62	39° 29' 27.679 N	108° 1' 26.166 W	
Hold 38.96 Inclination										
2,251.2	38.96	322.96	1,987.0	754.2	-482.5	1,614,002.49	2,287,518.92	39° 29' 31.307 N	108° 1' 29.699 W	
Top of "G" Sand										
2,379.8	38.96	322.96	2,087.0	818.8	-531.2	1,614,068.36	2,287,472.03	39° 29' 31.945 N	108° 1' 30.321 W	
Base of "G" Sand										
2,508.4	38.96	322.96	2,187.0	883.3	-579.9	1,614,134.22	2,287,425.15	39° 29' 32.583 N	108° 1' 30.942 W	
9 5/8"										
4,884.2	38.96	322.96	4,034.5	2,075.7	-1,479.7	1,615,351.10	2,286,558.88	39° 29' 44.368 N	108° 1' 42.420 W	
Begin 2°/100 Drop										
4,951.1	37.62	322.96	4,087.0	2,108.8	-1,504.7	1,615,384.87	2,286,534.85	39° 29' 44.695 N	108° 1' 42.738 W	
Mesaverde										
6,432.1	8.00	322.97	5,437.0	2,562.0	-1,846.6	1,615,847.38	2,286,205.61	39° 29' 49.174 N	108° 1' 47.101 W	
Top Gas - Approx. Top Gas										
6,832.1	0.00	0.00	5,835.7	2,584.3	-1,863.4	1,615,870.10	2,286,189.45	39° 29' 49.394 N	108° 1' 47.315 W	
Vertical										
7,878.4	0.00	0.00	6,882.0	2,584.3	-1,863.4	1,615,870.10	2,286,189.45	39° 29' 49.394 N	108° 1' 47.315 W	
Cameo Coals										
8,433.4	0.00	0.00	7,437.0	2,584.3	-1,863.4	1,615,870.10	2,286,189.45	39° 29' 49.394 N	108° 1' 47.315 W	
Rollins SS										
8,583.4	0.00	0.00	7,587.0	2,584.3	-1,863.4	1,615,870.10	2,286,189.45	39° 29' 49.394 N	108° 1' 47.315 W	
TD at 8583.4 - TD										

Design Targets										
Target Name	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	5,437.0	2,572.3	-1,854.4	1,615,857.90	2,286,198.10	39° 29' 49.275 N	108° 1' 47.200 W	
- plan misses target center by 12.8usft at 6433.0usft MD (5437.9 TVD, 2562.1 N, -1846.7 E)										
- Circle (radius 25.0)										
Top Gas (25' Radius) P/	0.00	0.00	5,437.0	2,572.3	-1,854.4	1,615,857.90	2,286,198.10	39° 29' 49.275 N	108° 1' 47.200 W	
- plan misses target center by 12.8usft at 6433.0usft MD (5437.9 TVD, 2562.1 N, -1846.7 E)										
- Circle (radius 25.0)										
TD / PBHL PA 312-29	0.00	0.00	7,587.0	2,572.3	-1,854.4	1,615,857.90	2,286,198.10	39° 29' 49.275 N	108° 1' 47.200 W	
- plan misses target center by 15.0usft at 8583.4usft MD (7587.0 TVD, 2584.3 N, -1863.4 E)										
- Point										

Casing Points					
Measured Depth (usft)	Vertical Depth (usft)	Name	Casing Diameter (in)	Hole Diameter (in)	
2,508.4	2,187.0	9 5/8"	9.625	12.250	

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Project:	PA 29-06S-095W	MD Reference:	WELL @ 5702.0usft (Nabors 577 (26') kjs)
Site:	DOE 3-W-29 Pad	North Reference:	True
Well:	PA 312-29	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Plan #1 05Feb09 kjs		

Formations						
Measured Depth (usft)	Vertical Depth (usft)	Name	Lithology	Dip (°)	Dip Direction (°)	
2,251.2	1,987.0	Top of "G" Sand				
2,379.8	2,087.0	Base of "G" Sand				
4,951.1	4,087.0	Mesaverde				
6,432.1	5,437.0	Approx. Top Gas				
7,878.4	6,882.0	Cameo Coals				
8,433.4	7,437.0	Rollins SS				
8,583.4	7,587.0	TD				

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 3.25	
396.2	395.4	17.0	2.4	Begin 3°/100 Build & Turn	
1,519.7	1,418.2	387.1	-205.5	Hold 38.96 Inclination	
4,884.2	4,034.5	2,075.7	-1,479.7	Begin 2°/100 Drop	
6,432.1	5,437.0	2,562.0	-1,846.6	Top Gas	
6,832.1	5,835.7	2,584.3	-1,863.4	Vertical	
8,583.4	7,587.0	2,584.3	-1,863.4	TD at 8583.4	