

# **PICEANCE VLY NAD 83**

**PA 13-07S-095W**

**SP 13-13 Pad East**

**SP 13-13 - Slot A3**

**Wellbore #1**

**Plan: Plug Back 24 Aug11 NF**

## **Survey Report - Geographic**

**24 August, 2011**

**Williams**  
Survey Report - Geographic

<b>Company:</b>	PICEANCE VLY NAD 83	<b>Local Co-ordinate Reference:</b>	Well SP 13-13 - Slot A3
<b>Project:</b>	PA 13-07S-095W	<b>TVD Reference:</b>	KELLY BUSHING @ 8010.0usft (H&P 278 (24' RKB) kjs)
<b>Site:</b>	SP 13-13 Pad East	<b>MD Reference:</b>	KELLY BUSHING @ 8010.0usft (H&P 278 (24' RKB) kjs)
<b>Well:</b>	SP 13-13	<b>North Reference:</b>	True
<b>Wellbore:</b>	Wellbore #1	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	Plug Back 24 Aug11 NF	<b>Database:</b>	Compass R5000 WIN AUTH

<b>Project</b>	PA 13-07S-095W, Garfield 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		Using geodetic scale factor

Site		SP 13-13 Pad East			
Site Position:		Northing:	1,592,728.84 usft	Latitude:	39° 26' 6.316 N
From:	Map	Easting:	2,306,685.15 usft	Longitude:	107° 57' 17.968 W
Position Uncertainty:	0.0 usft	Slot Radius:	13.200 in	Grid Convergence:	-1.548 °

Well	SP 13-13 - Slot A3					
Well Position	+N/-S	0.0 usft	Northing:	1,592,709.50 usft	Latitude:	39° 26' 6.131 N
	+E/-W	0.0 usft	Easting:	2,306,710.65 usft	Longitude:	107° 57' 17.637 W
Position Uncertainty		0.0 usft	Wellhead Elevation:	usft	Ground Level:	7,986.0 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	8/12/2011	10.304	65.692	52,190

<b>Design</b>	Plug Back 24 Aug11 NF				
<b>Audit Notes:</b>					
<b>Version:</b>		<b>Phase:</b>	PLAN	<b>Tie On Depth:</b>	331.0
<b>Vertical Section:</b>	<b>Depth From (TVD) (usft)</b>	<b>+N/-S (usft)</b>	<b>+E/-W (usft)</b>	<b>Direction (°)</b>	
	7,325.0	0.0	0.0	32.08	

<b>Survey Tool Program</b>	<b>Date</b>	8/24/2011			
<b>From (usft)</b>	<b>To (usft)</b>	<b>Survey (Wellbore)</b>	<b>Tool Name</b>	<b>Description</b>	
165.0	331.0	Survey #1 MWD 23Aug11 NF (Wellbore #	MWD	MWD - Standard	
331.0	9,542.9	Plug Back 24 Aug11 NF (Wellbore #1)	MWD	MWD - Standard	

<b>Planned Survey</b>										
<b>Measured Depth (usft)</b>	<b>Inclination (°)</b>	<b>Azimuth (°)</b>	<b>Vertical Depth (usft)</b>	<b>+N/-S (usft)</b>	<b>+E/-W (usft)</b>	<b>Map Northing (usft)</b>	<b>Map Easting (usft)</b>	<b>Latitude</b>	<b>Longitude</b>	
331.0	5.74	33.70	330.4	14.5	9.8	1,592,723.75	2,306,720.83	39° 26' 6.275 N	107° 57' 17.512 W	
<b>Start Drop -2.00</b>										
618.0	0.00	0.00	616.8	26.5	17.8	1,592,735.47	2,306,729.11	39° 26' 6.393 N	107° 57' 17.411 W	
<b>Start 450.0 hold at 618.0 MD</b>										
1,068.0	0.00	0.00	1,066.8	26.5	17.8	1,592,735.47	2,306,729.11	39° 26' 6.393 N	107° 57' 17.411 W	
<b>Start Build 3.00</b>										
1,356.9	8.67	32.02	1,354.7	45.0	29.3	1,592,753.65	2,306,741.17	39° 26' 6.576 N	107° 57' 17.263 W	
<b>Hold 8.67 Inclination</b>										

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<b>Site:</b>	SP 13-13 Pad East	<b>MD Reference:</b>	KELLY BUSHING @ 8010.0usft (H&P 278 (24' RKB) kjs)
<b>Well:</b>	SP 13-13	<b>North Reference:</b>	True
<b>Wellbore:</b>	Wellbore #1	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	Plug Back 24 Aug11 NF	<b>Database:</b>	Compass R5000 WIN AUTH

Planned Survey										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude	
1,510.0	8.67	32.02	1,506.0	64.5	41.6	1,592,772.88	2,306,753.93	39° 26' 6.769 N	107° 57' 17.107 W	
9 5/8"										
3,972.1	8.67	32.02	3,940.0	379.2	238.3	1,593,082.07	2,306,959.09	39° 26' 9.879 N	107° 57' 14.600 W	
Top of "G" Sand										
4,073.2	8.67	32.02	4,040.0	392.1	246.4	1,593,094.78	2,306,967.51	39° 26' 10.007 N	107° 57' 14.497 W	
Base of "G" Sand										
6,096.4	8.67	32.02	6,040.0	650.6	408.0	1,593,348.84	2,307,136.09	39° 26' 12.562 N	107° 57' 12.436 W	
Mesaverde										
6,959.4	8.67	32.02	6,893.2	760.9	477.0	1,593,457.23	2,307,208.01	39° 26' 13.652 N	107° 57' 11.557 W	
Start Drop -2.00										
7,392.9	0.00	0.00	7,325.0	788.7	494.3	1,593,484.50	2,307,226.10	39° 26' 13.926 N	107° 57' 11.336 W	
Vertical - Approx. Top Gas - Top Gas (25' Radius) SP 13-13										
8,387.9	0.00	0.00	8,320.0	788.7	494.3	1,593,484.50	2,307,226.10	39° 26' 13.926 N	107° 57' 11.336 W	
Cameo Coals										
9,392.9	0.00	0.00	9,325.0	788.7	494.3	1,593,484.50	2,307,226.10	39° 26' 13.926 N	107° 57' 11.336 W	
Rollins SS										
9,542.9	0.00	0.00	9,475.0	788.7	494.3	1,593,484.50	2,307,226.10	39° 26' 13.926 N	107° 57' 11.336 W	
TD at 9542.9										

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										
Top Gas (25' Radius) SF	0.00	0.00	7,325.0	788.7	494.3	1,593,484.50	2,307,226.10	39° 26' 13.926 N	107° 57' 11.336 W	
- plan hits target center										
- Circle (radius 25.0)										

Casing Points					
Measured Depth (usft)	Vertical Depth (usft)	Name	Casing Diameter (in)	Hole Diameter (in)	
1,510.0	1,506.0	9 5/8"	9.625	13.500	

Formations						
Measured Depth (usft)	Vertical Depth (usft)	Name	Lithology	Dip (°)	Dip Direction (°)	
3,972.1	3,940.0	Top of "G" Sand		0.000		
4,073.2	4,040.0	Base of "G" Sand		0.000		
6,096.4	6,040.0	Mesaverde		0.000		
7,392.9	7,325.0	Approx. Top Gas		0.000		
8,387.9	8,320.0	Cameo Coals		0.000		
9,392.9	9,325.0	Rollins SS		0.000		

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Plan Annotations					
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates			
		+N/-S (usft)	+E/-W (usft)	Comment	
331	330	15	10	Start Drop -2.00	
618	617	26	18	Start 450.0 hold at 618.0 MD	
1068	1067	26	18	Start Build 3.00	
1357	1355	45	29	Hold 8.67 Inclination	
6959	6893	761	477	Start Drop -2.00	
7393	7325	789	494	Vertical	
9543	9475	789	494	TD at 9542.9	

Checked By: _____	Approved By: _____	Date: _____
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