



PICEANCE HL NAD 83

BC 30-01N-098W

BCU 33-30-198 Pad

BCU 23-30-198 - Slot A03

Wellbore #1

Plan: Design #1 09May13 kjs

Standard Planning Report - Geographic

01 August, 2013



IBM Global Services
Planning Report - Geographic

Database:	COMPASS-PICEANCE	Local Co-ordinate Reference:	Well BCU 23-30-198 - Slot A03
Company:	PICEANCE HL NAD 83	TVD Reference:	KELLY BUSHING @ 6759.00usft (Cyclone 29 (21' RKB) kjs)
Project:	BC 30-01N-098W	MD Reference:	KELLY BUSHING @ 6759.00usft (Cyclone 29 (21' RKB) kjs)
Site:	BCU 33-30-198 Pad	North Reference:	True
Well:	BCU 23-30-198	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Design #1 09May13 kjs		

Project	BC 30-01N-098W		
Map System:	US State Plane 1983	System Datum:	Mean Sea Level
Geo Datum:	North American Datum 1983		
Map Zone:	Colorado Central Zone		

Site	BCU 33-30-198 Pad			
Site Position:		Northing:	1,811,400.30 usft	Latitude: 40.02472
From:	Map	Easting:	2,178,828.40 usft	Longitude: -108.43243
Position Uncertainty:	0.00 usft	Slot Radius:	13.200 in	Grid Convergence: -1.85 °

Well	BCU 23-30-198 - Slot A03			
Well Position	+N/-S	0.00 usft	Northing:	1,811,441.30 usft
	+E/-W	0.00 usft	Easting:	2,178,807.30 usft
Position Uncertainty	0.00 usft		Wellhead Elevation:	
			Ground Level:	6,738.00 usft

Wellbore	Wellbore #1				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	5/9/2013	10.37	66.04	52,282

Design	Design #1 09May13 kjs			
Audit Notes:				
Version:	Phase:	PLAN	Tie On Depth:	0.00
Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)	Direction (°)
	0.00	0.00	0.00	291.79

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
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
120.00	0.00	0.00	120.00	0.00	0.00	0.00	0.00	0.00	0.00	
599.20	9.58	291.79	596.97	14.85	-37.13	2.00	2.00	0.00	291.79	
7,237.94	9.58	291.79	7,143.04	425.22	-1,063.42	0.00	0.00	0.00	0.00	
7,876.87	0.00	0.00	7,779.00	445.01	-1,112.93	1.50	-1.50	0.00	180.00	
7,976.87	0.00	0.00	7,879.00	445.01	-1,112.93	0.00	0.00	0.00	0.00	Top Gas (50' Radius)
10,646.87	0.00	0.00	10,549.00	445.01	-1,112.93	0.00	0.00	0.00	0.00	



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Planning Report - Geographic

Database:	COMPASS-PICEANCE	Local Co-ordinate Reference:	Well BCU 23-30-198 - Slot A03
Company:	PICEANCE HL NAD 83	TVD Reference:	KELLY BUSHING @ 6759.00usft (Cyclone 29 (21' RKB) kjs)
Project:	BC 30-01N-098W	MD Reference:	KELLY BUSHING @ 6759.00usft (Cyclone 29 (21' RKB) kjs)
Site:	BCU 33-30-198 Pad	North Reference:	True
Well:	BCU 23-30-198	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Design #1 09May13 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	1,811,441.30	2,178,807.30	40.02483	-108.43251	
120.00	0.00	0.00	120.00	0.00	0.00	1,811,441.30	2,178,807.30	40.02483	-108.43251	
Start Build 2.00										
500.00	7.60	291.79	498.89	9.34	-23.37	1,811,451.39	2,178,784.25	40.02486	-108.43259	
599.20	9.58	291.79	596.97	14.85	-37.13	1,811,457.34	2,178,770.67	40.02487	-108.43264	
Hold 9.58 Inclination										
733.10	9.58	291.79	729.00	23.12	-57.83	1,811,466.28	2,178,750.25	40.02490	-108.43271	
Green River Fm										
930.86	9.58	291.79	924.00	35.35	-88.40	1,811,479.48	2,178,720.09	40.02493	-108.43282	
A Groove										
1,000.00	9.58	291.79	992.17	39.62	-99.09	1,811,484.10	2,178,709.54	40.02494	-108.43286	
1,133.69	9.58	291.79	1,124.00	47.89	-119.76	1,811,493.03	2,178,689.15	40.02496	-108.43293	
B Groove										
1,500.00	9.58	291.79	1,485.20	70.53	-176.38	1,811,517.48	2,178,633.28	40.02503	-108.43314	
1,539.35	9.58	291.79	1,524.00	72.96	-182.47	1,811,520.11	2,178,627.28	40.02503	-108.43316	
Dissolution Surface										
2,000.00	9.58	291.79	1,978.22	101.44	-253.68	1,811,550.87	2,178,557.02	40.02511	-108.43341	
2,299.97	9.58	291.79	2,274.00	119.98	-300.05	1,811,570.90	2,178,511.27	40.02516	-108.43358	
Garden Gulch										
2,497.73	9.58	291.79	2,469.00	132.20	-330.62	1,811,584.11	2,178,481.11	40.02520	-108.43369	
Orange Marker										
2,500.00	9.58	291.79	2,471.24	132.34	-330.98	1,811,584.26	2,178,480.77	40.02520	-108.43369	
2,730.99	9.58	291.79	2,699.00	146.62	-366.68	1,811,599.68	2,178,445.54	40.02524	-108.43381	
Wasatch										
3,000.00	9.58	291.79	2,964.26	163.25	-408.27	1,811,617.64	2,178,404.51	40.02528	-108.43396	
3,238.06	9.58	291.79	3,199.00	177.97	-445.07	1,811,633.54	2,178,368.20	40.02532	-108.43409	
9 5/8"										
3,500.00	9.58	291.79	3,457.28	194.16	-485.57	1,811,651.03	2,178,328.25	40.02537	-108.43424	
4,000.00	9.58	291.79	3,950.30	225.07	-562.86	1,811,684.42	2,178,251.99	40.02545	-108.43452	
4,500.00	9.58	291.79	4,443.32	255.97	-640.16	1,811,717.80	2,178,175.73	40.02554	-108.43479	
4,632.53	9.58	291.79	4,574.00	264.17	-660.65	1,811,726.65	2,178,155.52	40.02556	-108.43486	
Top of "G" Sand										
4,982.41	9.58	291.79	4,919.00	285.79	-714.74	1,811,750.01	2,178,102.16	40.02562	-108.43506	
Fort Union										
5,000.00	9.58	291.79	4,936.35	286.88	-717.46	1,811,751.19	2,178,099.47	40.02562	-108.43507	
5,500.00	9.58	291.79	5,429.37	317.79	-794.75	1,811,784.57	2,178,023.22	40.02571	-108.43534	
6,000.00	9.58	291.79	5,922.39	348.70	-872.05	1,811,817.96	2,177,946.96	40.02579	-108.43562	
6,290.67	9.58	291.79	6,209.00	366.66	-916.98	1,811,837.37	2,177,902.63	40.02584	-108.43578	
Ohio Creek										
6,483.36	9.58	291.79	6,399.00	378.57	-946.77	1,811,850.23	2,177,873.24	40.02587	-108.43589	
Mesaverde										
6,500.00	9.58	291.79	6,415.41	379.60	-949.34	1,811,851.35	2,177,870.70	40.02588	-108.43590	
7,000.00	9.58	291.79	6,908.43	410.51	-1,026.64	1,811,884.73	2,177,794.44	40.02596	-108.43617	
7,237.94	9.58	291.79	7,143.04	425.22	-1,063.42	1,811,900.62	2,177,758.15	40.02600	-108.43630	
Start Drop -1.50										
7,500.00	5.65	291.79	7,402.75	438.12	-1,095.68	1,811,914.55	2,177,726.33	40.02604	-108.43642	
7,876.87	0.00	0.00	7,779.00	445.01	-1,112.93	1,811,922.00	2,177,709.31	40.02605	-108.43648	
Vertical										
7,976.87	0.00	0.00	7,879.00	445.01	-1,112.93	1,811,922.00	2,177,709.31	40.02605	-108.43648	
Top Gas - Approx. Top Gas										
8,000.00	0.00	0.00	7,902.13	445.01	-1,112.93	1,811,922.00	2,177,709.31	40.02605	-108.43648	

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Project:	BC 30-01N-098W	MD Reference:	KELLY BUSHING @ 6759.00usft (Cyclone 29 (21' RKB) kjs)
Site:	BCU 33-30-198 Pad	North Reference:	True
Well:	BCU 23-30-198	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Design #1 09May13 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	
8,500.00	0.00	0.00	8,402.13	445.01	-1,112.93	1,811,922.00	2,177,709.31	40.02605	-108.43648	
8,946.87	0.00	0.00	8,849.00	445.01	-1,112.93	1,811,922.00	2,177,709.31	40.02605	-108.43648	
Cameo Coals										
9,000.00	0.00	0.00	8,902.13	445.01	-1,112.93	1,811,922.00	2,177,709.31	40.02605	-108.43648	
9,500.00	0.00	0.00	9,402.13	445.01	-1,112.93	1,811,922.00	2,177,709.31	40.02605	-108.43648	
9,526.87	0.00	0.00	9,429.00	445.01	-1,112.93	1,811,922.00	2,177,709.31	40.02605	-108.43648	
Rollins SS										
9,601.87	0.00	0.00	9,504.00	445.01	-1,112.93	1,811,922.00	2,177,709.31	40.02605	-108.43648	
Cozzette										
9,811.87	0.00	0.00	9,714.00	445.01	-1,112.93	1,811,922.00	2,177,709.31	40.02605	-108.43648	
Corcoran										
10,000.00	0.00	0.00	9,902.13	445.01	-1,112.93	1,811,922.00	2,177,709.31	40.02605	-108.43648	
10,231.87	0.00	0.00	10,134.00	445.01	-1,112.93	1,811,922.00	2,177,709.31	40.02605	-108.43648	
Upper Sego										
10,396.87	0.00	0.00	10,299.00	445.01	-1,112.93	1,811,922.00	2,177,709.31	40.02605	-108.43648	
Lower Sego										
10,500.00	0.00	0.00	10,402.13	445.01	-1,112.93	1,811,922.00	2,177,709.31	40.02605	-108.43648	
10,646.87	0.00	0.00	10,549.00	445.01	-1,112.93	1,811,922.00	2,177,709.31	40.02605	-108.43648	
TD at 10646.87 - 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 (50' Radius) BC - plan hits target center - Circle (radius 50.00)	0.00	0.00	7,879.00	445.01	-1,112.93	1,811,922.00	2,177,709.31	40.02605	-108.43648	

Casing Points					
Measured Depth (usft)	Vertical Depth (usft)	Name	Casing Diameter (in)	Hole Diameter (in)	
3,238.06	3,199.00	9 5/8"	9.625	12.250	

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Project:	BC 30-01N-098W	MD Reference:	KELLY BUSHING @ 6759.00usft (Cyclone 29 (21' RKB) kjs)
Site:	BCU 33-30-198 Pad	North Reference:	True
Well:	BCU 23-30-198	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Design #1 09May13 kjs		

Formations						
Measured Depth (usft)	Vertical Depth (usft)	Name	Lithology	Dip (°)	Dip Direction (°)	
733.10	729.00	Green River Fm				
930.86	924.00	A Groove				
1,133.69	1,124.00	B Groove				
1,539.35	1,524.00	Dissolution Surface				
2,299.97	2,274.00	Garden Gulch				
2,497.73	2,469.00	Orange Marker				
2,730.99	2,699.00	Wasatch				
4,632.53	4,574.00	Top of "G" Sand				
4,982.41	4,919.00	Fort Union				
6,290.67	6,209.00	Ohio Creek				
6,483.36	6,399.00	Mesaverde				
7,976.87	7,879.00	Approx. Top Gas				
8,946.87	8,849.00	Cameo Coals				
9,526.87	9,429.00	Rollins SS				
9,601.87	9,504.00	Cozzette				
9,811.87	9,714.00	Corcoran				
10,231.87	10,134.00	Upper Sego				
10,396.87	10,299.00	Lower Sego				
10,646.87	10,549.00	TD				

Plan Annotations					
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates			
		+N/-S (usft)	+E/-W (usft)	Comment	
120.00	120.00	0.00	0.00	Start Build 2.00	
599.20	596.97	14.85	-37.13	Hold 9.58 Inclination	
7,237.94	7,143.04	425.22	-1,063.42	Start Drop -1.50	
7,876.87	7,779.00	445.01	-1,112.93	Vertical	
7,976.87	7,879.00	445.01	-1,112.93	Top Gas	
10,646.87	10,549.00	445.01	-1,112.93	TD at 10646.87	