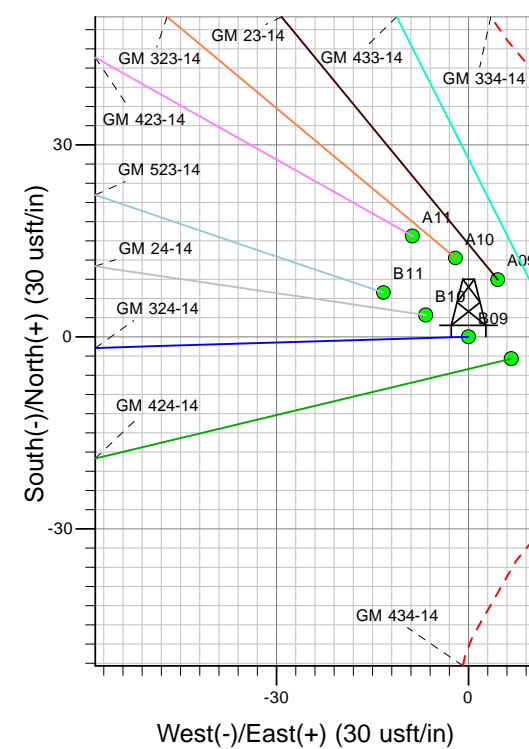
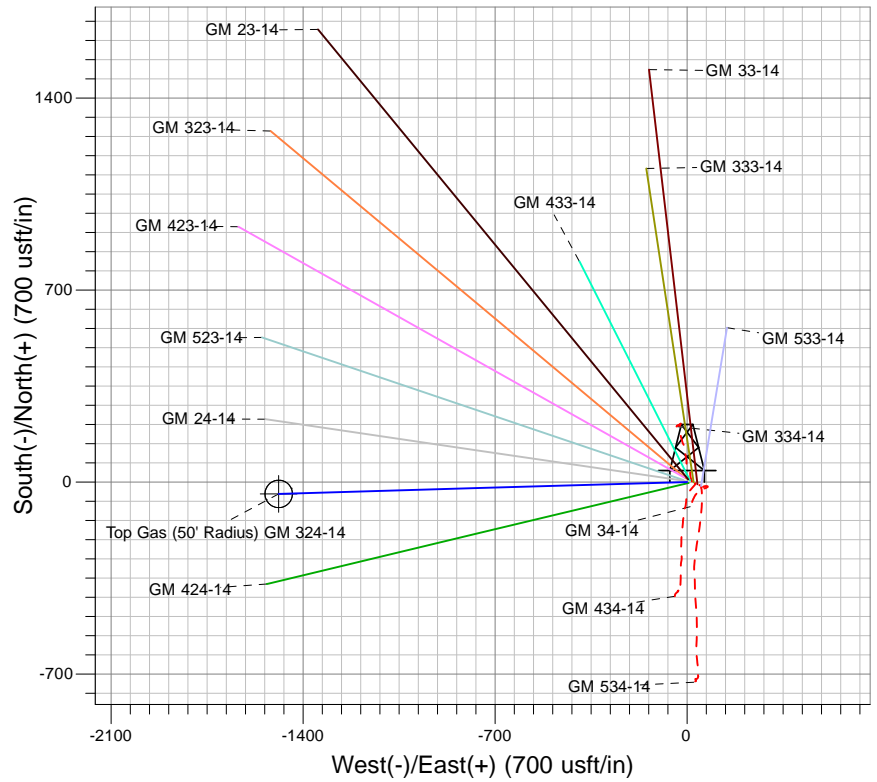
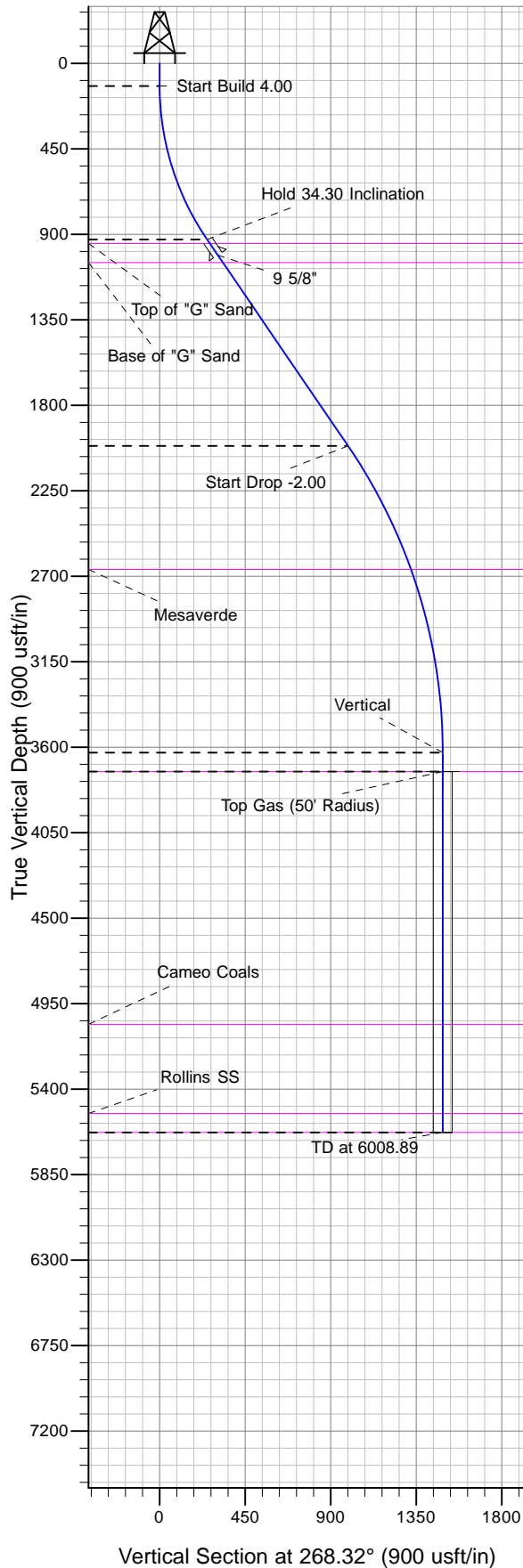




Well Name: GM 324-14
 Surface Location: GM 34-14 Pad
 North American Datum 1983 , US State Plane 1983 , Colorado Central Zone
 Ground Elevation: 5173.00
 +N/-S 0.00 +E/-W 0.00 Northing 1592874.50 Easting 2272794.70 Latitude 39.43291 Longitude -108.07495 Slot B09
 KELLY BUSHING @ 5199.00usft (Nabors rig (26' RKB) kjs)



Project: GV 14-07S-096W
 Site: GM 34-14 Pad
 Well: GM 324-14
 Design #1 23Apr13 kjs

T M
 Azimuths to True North
 Magnetic North: 10.11°
 Magnetic Field
 Strength: 52065.0snT
 Dip Angle: 65.64°
 Date: 4/23/2013
 Model: IGRF2005-10

ANNOTATIONS

TVD	MD	Inc	Azi	+N/-S	+E/-W	VSect	Departure	Annotation
120.00	120.00	0.00	0.00	0.00	0.00	0.00	0.00	Start Build 4.00
927.26	977.58	34.30	268.32	-7.30	-249.03	249.14	249.14	Hold 34.30 Inclination
2014.48	2293.73	34.30	268.32	-29.04	-990.46	990.89	990.89	Start Drop -2.00
3629.00	4008.89	0.00	0.00	-43.64	-1488.53	1489.17	1489.17	Vertical
3729.00	4108.89	0.00	0.00	-43.64	-1488.53	1489.17	1489.17	Top Gas
5629.00	6008.89	0.00	0.00	-43.64	-1488.53	1489.17	1489.17	TD at 6008.89



PICEANCE VLY NAD 83

GV 14-07S-096W

GM 34-14 Pad

GM 324-14 - Slot B09

Wellbore #1

Plan: Design #1 23Apr13 kjs

Standard Planning Report - Geographic

20 September, 2013



IBM Global Services
Planning Report - Geographic

Database:	COMPASS-PICEANCE	Local Co-ordinate Reference:	Well GM 324-14 - Slot B09
Company:	PICEANCE VLY NAD 83	TVD Reference:	KELLY BUSHING @ 5199.00usft (Nabors rig (26' RKB) kjs)
Project:	GV 14-07S-096W	MD Reference:	KELLY BUSHING @ 5199.00usft (Nabors rig (26' RKB) kjs)
Site:	GM 34-14 Pad	North Reference:	True
Well:	GM 324-14	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Design #1 23Apr13 kjs		

Project	GV 14-07S-096W, Garfield County, CO, 14-07S-096W		
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	GM 34-14 Pad				
Site Position:		Northing:	1,592,854.30 usft	Latitude:	39.43286
From:	Map	Easting:	2,272,852.10 usft	Longitude:	-108.07474
Position Uncertainty:	0.00 usft	Slot Radius:	13.200 in	Grid Convergence:	-1.62 °

Well	GM 324-14 - Slot B09					
Well Position	+N/-S	0.00 usft	Northing:	1,592,874.50 usft	Latitude:	39.43291
	+E/-W	0.00 usft	Easting:	2,272,794.70 usft	Longitude:	-108.07495
Position Uncertainty		0.00 usft	Wellhead Elevation:		Ground Level:	5,173.00 usft

Wellbore	Wellbore #1				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2005-10	4/23/2013	10.11	65.64	52,065

Design	Design #1 23Apr13 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	268.32

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	
977.58	34.30	268.32	927.26	-7.30	-249.03	4.00	4.00	0.00	268.32	
2,293.73	34.30	268.32	2,014.48	-29.04	-990.46	0.00	0.00	0.00	0.00	
4,008.89	0.00	0.00	3,629.00	-43.64	-1,488.53	2.00	-2.00	0.00	180.00	
4,108.89	0.00	0.00	3,729.00	-43.64	-1,488.53	0.00	0.00	0.00	0.00	Top Gas (50' Radius)
6,008.89	0.00	0.00	5,629.00	-43.64	-1,488.53	0.00	0.00	0.00	0.00	

Database:	COMPASS-PICEANCE	Local Co-ordinate Reference:	Well GM 324-14 - Slot B09
Company:	PICEANCE VLY NAD 83	TVD Reference:	KELLY BUSHING @ 5199.00usft (Nabors rig (26' RKB) kjs)
Project:	GV 14-07S-096W	MD Reference:	KELLY BUSHING @ 5199.00usft (Nabors rig (26' RKB) kjs)
Site:	GM 34-14 Pad	North Reference:	True
Well:	GM 324-14	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Design #1 23Apr13 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	1,592,874.50	2,272,794.70	39.43291	-108.07495	
120.00	0.00	0.00	120.00	0.00	0.00	1,592,874.50	2,272,794.70	39.43291	-108.07495	
Start Build 4.00										
500.00	15.20	268.32	495.56	-1.47	-50.09	1,592,874.45	2,272,744.59	39.43291	-108.07513	
977.58	34.30	268.32	927.26	-7.30	-249.03	1,592,874.25	2,272,545.57	39.43289	-108.07583	
Hold 34.30 Inclination										
1,000.00	34.30	268.32	945.78	-7.67	-261.66	1,592,874.24	2,272,532.94	39.43289	-108.07588	
1,003.90	34.30	268.32	949.00	-7.74	-263.86	1,592,874.24	2,272,530.74	39.43289	-108.07588	
Top of "G" Sand										
1,078.00	34.30	268.32	1,010.21	-8.96	-305.60	1,592,874.20	2,272,488.98	39.43289	-108.07603	
9 5/8"										
1,124.96	34.30	268.32	1,049.00	-9.74	-332.06	1,592,874.17	2,272,462.52	39.43289	-108.07613	
Base of "G" Sand										
1,500.00	34.30	268.32	1,358.81	-15.93	-543.33	1,592,873.97	2,272,251.16	39.43287	-108.07687	
2,000.00	34.30	268.32	1,771.84	-24.19	-824.99	1,592,873.70	2,271,969.39	39.43285	-108.07787	
2,293.73	34.30	268.32	2,014.48	-29.04	-990.46	1,592,873.54	2,271,803.86	39.43283	-108.07846	
Start Drop -2.00										
2,500.00	30.18	268.32	2,188.91	-32.26	-1,100.43	1,592,873.43	2,271,693.85	39.43282	-108.07885	
3,000.00	20.18	268.32	2,640.84	-38.49	-1,312.78	1,592,873.23	2,271,481.42	39.43281	-108.07960	
3,024.64	19.68	268.32	2,664.00	-38.73	-1,321.18	1,592,873.22	2,271,473.02	39.43281	-108.07963	
Mesaverde										
3,500.00	10.18	268.32	3,122.78	-42.32	-1,443.47	1,592,873.10	2,271,350.68	39.43280	-108.08006	
4,000.00	0.18	268.32	3,620.11	-43.64	-1,488.52	1,592,873.06	2,271,305.62	39.43279	-108.08022	
4,008.89	0.00	0.00	3,629.00	-43.64	-1,488.53	1,592,873.06	2,271,305.60	39.43279	-108.08022	
Vertical										
4,108.89	0.00	0.00	3,729.00	-43.64	-1,488.53	1,592,873.06	2,271,305.60	39.43279	-108.08022	
Top Gas - Approx. Top Gas										
4,500.00	0.00	0.00	4,120.11	-43.64	-1,488.53	1,592,873.06	2,271,305.60	39.43279	-108.08022	
5,000.00	0.00	0.00	4,620.11	-43.64	-1,488.53	1,592,873.06	2,271,305.60	39.43279	-108.08022	
5,438.89	0.00	0.00	5,059.00	-43.64	-1,488.53	1,592,873.06	2,271,305.60	39.43279	-108.08022	
Cameo Coals										
5,500.00	0.00	0.00	5,120.11	-43.64	-1,488.53	1,592,873.06	2,271,305.60	39.43279	-108.08022	
5,908.89	0.00	0.00	5,529.00	-43.64	-1,488.53	1,592,873.06	2,271,305.60	39.43279	-108.08022	
Rollins SS										
6,000.00	0.00	0.00	5,620.11	-43.64	-1,488.53	1,592,873.06	2,271,305.60	39.43279	-108.08022	
6,008.89	0.00	0.00	5,629.00	-43.64	-1,488.53	1,592,873.06	2,271,305.60	39.43279	-108.08022	
TD at 6008.89 - 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 (50' Radius) GI - hit/miss target - Shape - plan hits target center - Circle (radius 50.00)	0.00	0.00	3,729.00	-43.64	-1,488.53	1,592,873.06	2,271,305.60	39.43279	-108.08022	

Database:	COMPASS-PICEANCE	Local Co-ordinate Reference:	Well GM 324-14 - Slot B09
Company:	PICEANCE VLY NAD 83	TVD Reference:	KELLY BUSHING @ 5199.00usft (Nabors rig (26' RKB) kjs)
Project:	GV 14-07S-096W	MD Reference:	KELLY BUSHING @ 5199.00usft (Nabors rig (26' RKB) kjs)
Site:	GM 34-14 Pad	North Reference:	True
Well:	GM 324-14	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Design #1 23Apr13 kjs		

Casing Points					
Measured Depth (usft)	Vertical Depth (usft)	Name	Casing Diameter (in)	Hole Diameter (in)	
1,078.00	1,010.21	9 5/8"	9.625	12.250	

Formations						
Measured Depth (usft)	Vertical Depth (usft)	Name	Lithology	Dip (°)	Dip Direction (°)	
1,003.90	949.00	Top of "G" Sand				
1,124.96	1,049.00	Base of "G" Sand				
3,024.64	2,664.00	Mesaverde				
4,108.89	3,729.00	Approx. Top Gas				
5,438.89	5,059.00	Cameo Coals				
5,908.89	5,529.00	Rollins SS				
6,008.89	5,629.00	TD				

Plan Annotations					
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment	
		+N/-S (usft)	+E/-W (usft)		
120.00	120.00	0.00	0.00	Start Build 4.00	
977.58	927.26	-7.30	-249.03	Hold 34.30 Inclination	
2,293.73	2,014.48	-29.04	-990.46	Start Drop -2.00	
4,008.89	3,629.00	-43.64	-1,488.53	Vertical	
4,108.89	3,729.00	-43.64	-1,488.53	Top Gas	
6,008.89	5,629.00	-43.64	-1,488.53	TD at 6008.89	