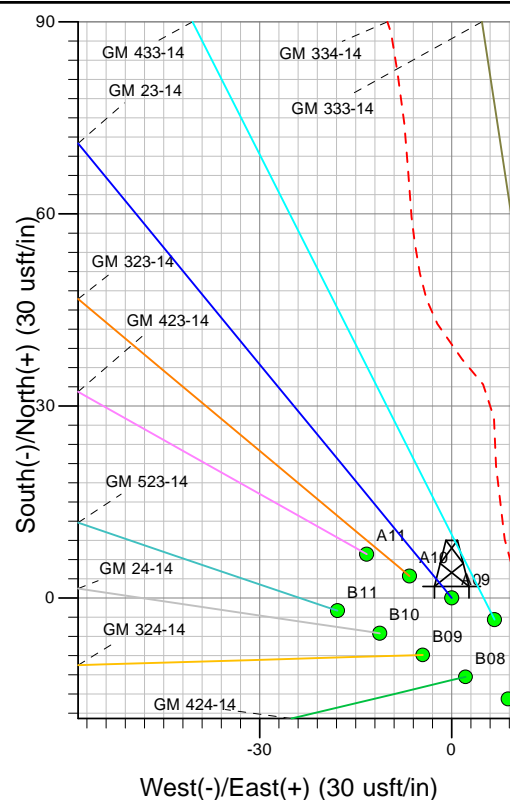
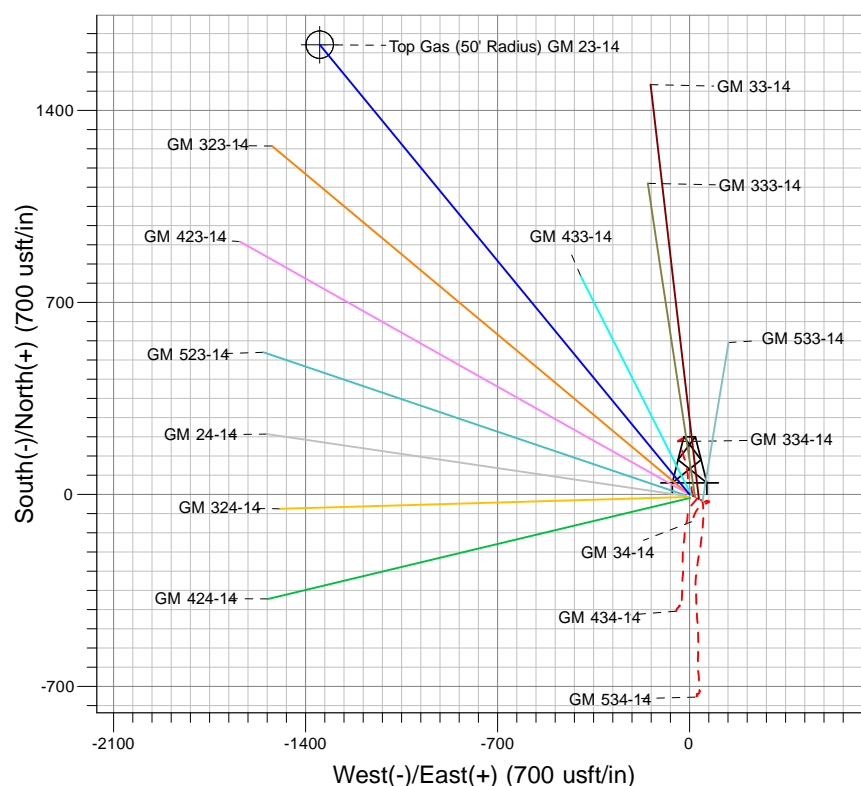
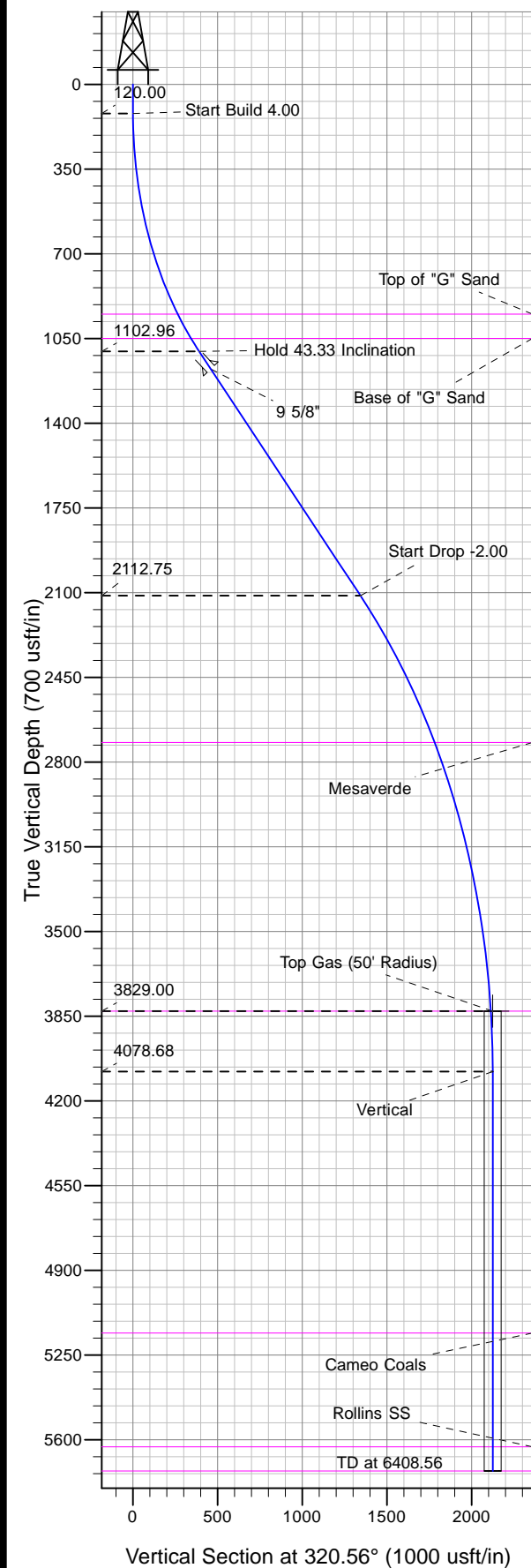




Well Name: GM 23-14
 Surface Location: GM 34-14 Pad
 North American Datum 1983 , US State Plane 1983, Colorado Central Zone
 Ground Elevation: 5173.00

+N/-S	+E/-W	Northing	Easting	Latitude	Longitude	Slot
0.00	0.00	1592883.30	2272799.50	39.43294	-108.07493	A09

KELLY BUSHING @ 5199.00usft (Nabors rig (26' RKB) kjs)



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

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
1102.96	1203.33	43.33	320.56	301.57	-248.09	390.50	390.50	Hold 43.33 Inclination
2112.75	2591.59	43.33	320.56	1037.30	-853.32	1343.18	1343.18	Start Drop -2.00
3829.00	4508.24	5.00	320.56	1632.03	-1342.56	2113.29	2113.29	Top Gas
4078.68	4758.24	0.00	0.00	1640.45	-1349.49	2124.19	2124.19	Vertical
5729.00	6408.56	0.00	0.00	1640.45	-1349.49	2124.19	2124.19	TD at 6408.56



PICEANCE VLY NAD 83

GV 14-07S-096W

GM 34-14 Pad

GM 23-14 - Slot A09

Wellbore #1

Plan: Design #1 23Apr13 kjs

Standard Planning Report - Geographic

18 September, 2013



IBM Global Services
Planning Report - Geographic

Database:	COMPASS-PICEANCE	Local Co-ordinate Reference:	Well GM 23-14 - Slot A09
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 23-14	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 23-14 - Slot A09				
Well Position	+N/-S	0.00 usft	Northing:	1,592,883.30 usft	Latitude: 39.43294
	+E/-W	0.00 usft	Easting:	2,272,799.50 usft	Longitude: -108.07493
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	320.56

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	
1,203.33	43.33	320.56	1,102.96	301.57	-248.09	4.00	4.00	0.00	320.56	
2,591.59	43.33	320.56	2,112.76	1,037.30	-853.32	0.00	0.00	0.00	0.00	
4,508.24	5.00	320.56	3,829.00	1,632.03	-1,342.56	2.00	-2.00	0.00	180.00	Top Gas (50' Radius)
4,758.24	0.00	0.00	4,078.68	1,640.45	-1,349.49	2.00	-2.00	15.78	180.00	
6,408.56	0.00	0.00	5,729.00	1,640.45	-1,349.49	0.00	0.00	0.00	0.00	

Database:	COMPASS-PICEANCE	Local Co-ordinate Reference:	Well GM 23-14 - Slot A09
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 23-14	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	1,592,883.30	2,272,799.50	39.43294	-108.07493	
120.00	0.00	0.00	120.00	0.00	0.00	1,592,883.30	2,272,799.50	39.43294	-108.07493	
Start Build 4.00										
500.00	15.20	320.56	495.56	38.70	-31.83	1,592,922.88	2,272,768.78	39.43304	-108.07505	
1,000.00	35.20	320.56	945.68	202.27	-166.40	1,593,090.19	2,272,638.91	39.43349	-108.07552	
1,004.07	35.36	320.56	949.00	204.09	-167.89	1,593,092.05	2,272,637.47	39.43350	-108.07553	
Top of "G" Sand										
1,130.84	40.43	320.56	1,049.00	264.20	-217.34	1,593,153.54	2,272,589.74	39.43366	-108.07570	
Base of "G" Sand										
1,203.33	43.33	320.56	1,102.96	301.57	-248.09	1,593,191.76	2,272,560.07	39.43377	-108.07581	
Hold 43.33 Inclination										
1,304.00	43.33	320.56	1,176.19	354.93	-291.97	1,593,246.34	2,272,517.72	39.43391	-108.07597	
9 5/8"										
1,500.00	43.33	320.56	1,318.76	458.80	-377.42	1,593,352.58	2,272,435.25	39.43420	-108.07627	
2,000.00	43.33	320.56	1,682.45	723.78	-595.41	1,593,623.62	2,272,224.87	39.43492	-108.07704	
2,500.00	43.33	320.56	2,046.13	988.76	-813.39	1,593,894.66	2,272,014.50	39.43565	-108.07781	
2,591.59	43.33	320.56	2,112.76	1,037.30	-853.32	1,593,944.31	2,271,975.96	39.43579	-108.07796	
Start Drop -2.00										
3,000.00	35.16	320.56	2,428.76	1,236.68	-1,017.34	1,594,148.25	2,271,817.67	39.43633	-108.07854	
3,341.52	28.33	320.56	2,719.00	1,375.39	-1,131.44	1,594,290.13	2,271,707.55	39.43671	-108.07894	
Mesaverde										
3,500.00	25.16	320.56	2,860.50	1,430.47	-1,176.75	1,594,346.47	2,271,663.82	39.43686	-108.07910	
4,000.00	15.16	320.56	3,329.26	1,563.41	-1,286.11	1,594,482.45	2,271,558.27	39.43723	-108.07949	
4,500.00	5.16	320.56	3,820.79	1,631.47	-1,342.10	1,594,552.06	2,271,504.24	39.43742	-108.07969	
4,508.24	5.00	320.56	3,829.00	1,632.03	-1,342.56	1,594,552.64	2,271,503.79	39.43742	-108.07969	
Top Gas - Approx. Top Gas										
4,758.24	0.00	0.00	4,078.68	1,640.45	-1,349.49	1,594,561.25	2,271,497.11	39.43744	-108.07971	
Vertical										
5,000.00	0.00	0.00	4,320.44	1,640.45	-1,349.49	1,594,561.25	2,271,497.11	39.43744	-108.07971	
5,500.00	0.00	0.00	4,820.44	1,640.45	-1,349.49	1,594,561.25	2,271,497.11	39.43744	-108.07971	
5,838.56	0.00	0.00	5,159.00	1,640.45	-1,349.49	1,594,561.25	2,271,497.11	39.43744	-108.07971	
Cameo Coals										
6,000.00	0.00	0.00	5,320.44	1,640.45	-1,349.49	1,594,561.25	2,271,497.11	39.43744	-108.07971	
6,308.56	0.00	0.00	5,629.00	1,640.45	-1,349.49	1,594,561.25	2,271,497.11	39.43744	-108.07971	
Rollins SS										
6,408.56	0.00	0.00	5,729.00	1,640.45	-1,349.49	1,594,561.25	2,271,497.11	39.43744	-108.07971	
TD										

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 (50' Radius) GI	0.00	0.00	3,829.00	1,639.84	-1,348.93	1,594,560.63	2,271,497.65	39.43744	-108.07971	
- plan misses target center by 10.05usft at 4508.68usft MD (3829.44 TVD, 1632.06 N, -1342.59 E)										
- Circle (radius 50.00)										

Database:	COMPASS-PICEANCE	Local Co-ordinate Reference:	Well GM 23-14 - Slot A09
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 23-14	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)	
1,304.00	1,176.19	9 5/8"	9.625	12.250	

Formations						
Measured Depth (usft)	Vertical Depth (usft)	Name	Lithology	Dip (°)	Dip Direction (°)	
1,004.07	949.00	Top of "G" Sand				
1,130.84	1,049.00	Base of "G" Sand				
3,341.52	2,719.00	Mesaverde				
4,508.24	3,829.00	Approx. Top Gas				
5,838.56	5,159.00	Cameo Coals				
6,308.56	5,629.00	Rollins SS				
6,408.56	5,729.00	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 4.00	
1,203.33	1,102.96	301.57	-248.09	Hold 43.33 Inclination	
2,591.59	2,112.76	1,037.30	-853.32	Start Drop -2.00	
4,508.24	3,829.00	1,632.03	-1,342.56	Top Gas	
4,758.24	4,078.68	1,640.45	-1,349.49	Vertical	
6,408.56	5,729.00	1,640.45	-1,349.49	TD at 6408.56	