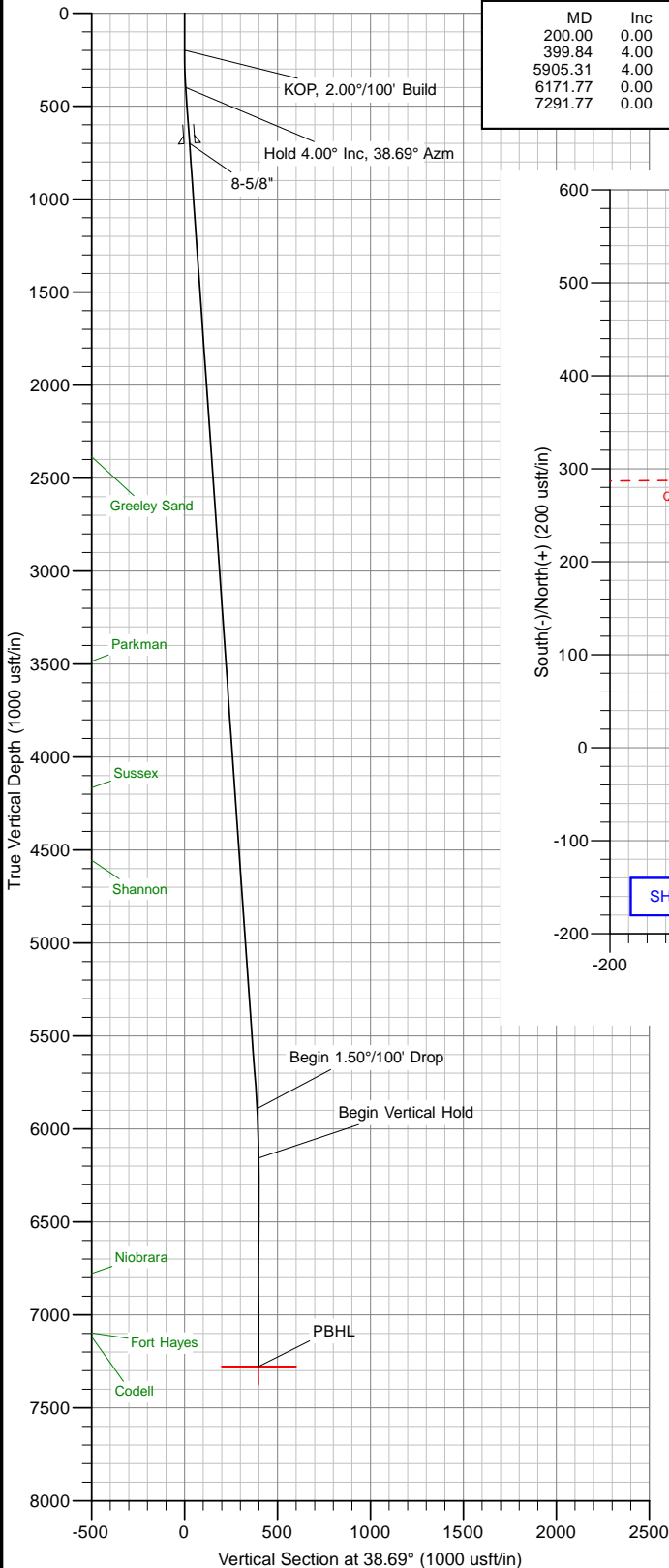




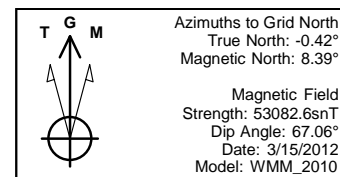
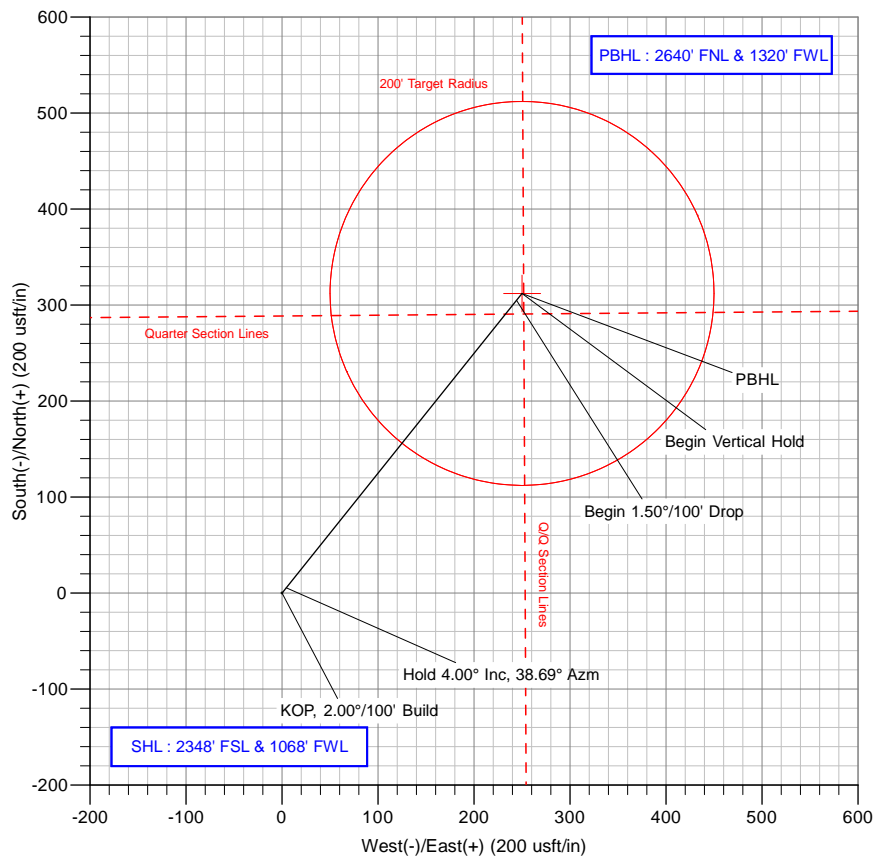
Company: Great Western  
Site: Great Western  
Well: 25-22-14  
Project: Weld County, Colorado (NAD 83)  
Rig Name: Cade 22



Planning: 936.442.2510 Fax: 936.442.2515  
Operations: 936.442.2500 Fax: 936.442.2599



ANNOTATIONS									
MD	Inc	Azi	TVD	+N/-S	+E/-W	Vsect	Departure	Annotation	
200.00	0.00	0.00	200.00	0.00	0.00	0.00	0.00	KOP, 2.00°/100' Build	
399.84	4.00	38.69	399.68	5.44	4.36	6.97	6.97	Hold 4.00° Inc, 38.69° Azm	
5905.31	4.00	38.69	5891.76	304.95	244.25	390.70	390.70	Begin 1.50°/100' Drop	
6171.77	0.00	0.00	6158.00	312.20	250.05	399.99	399.99	Begin Vertical Hold	
7291.77	0.00	0.00	7278.00	312.20	250.05	399.99	399.99	PBHL	



US State Plane 1983  
Colorado Northern Zone

Created By: Allen Slack  
Date: 16:54, March 15 2012  
Plan: Design #1

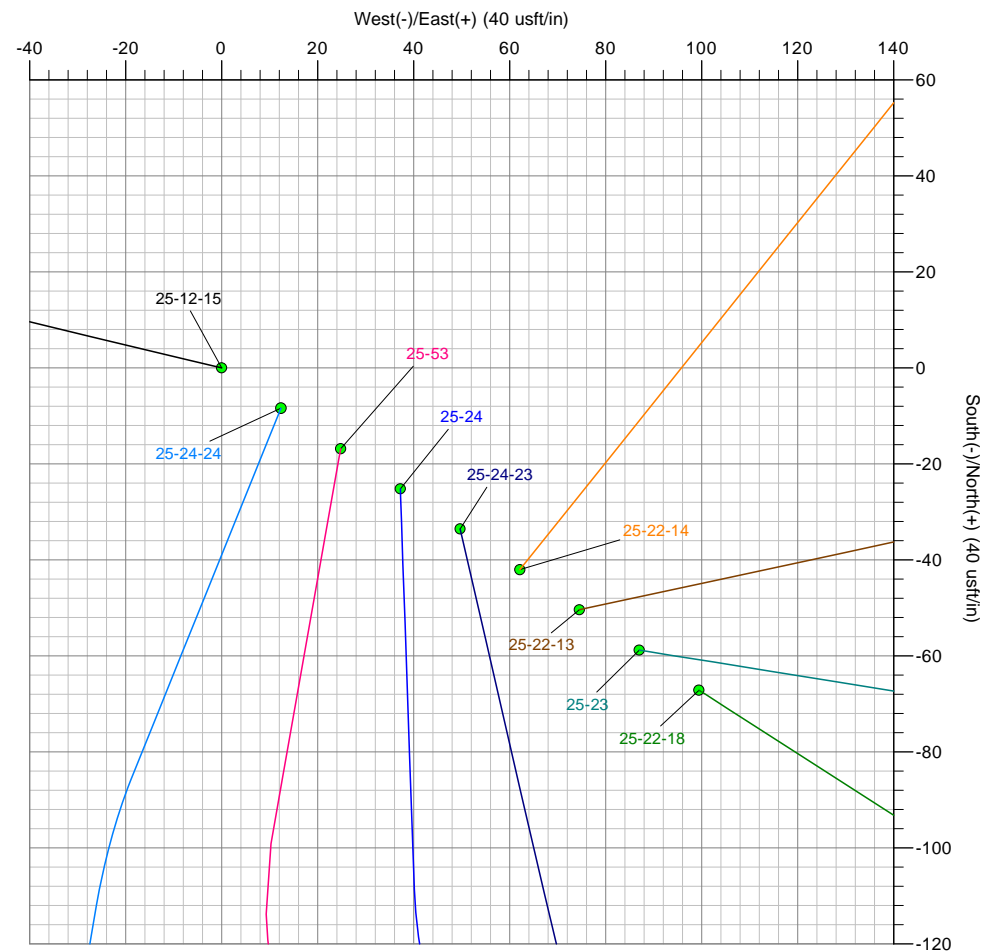
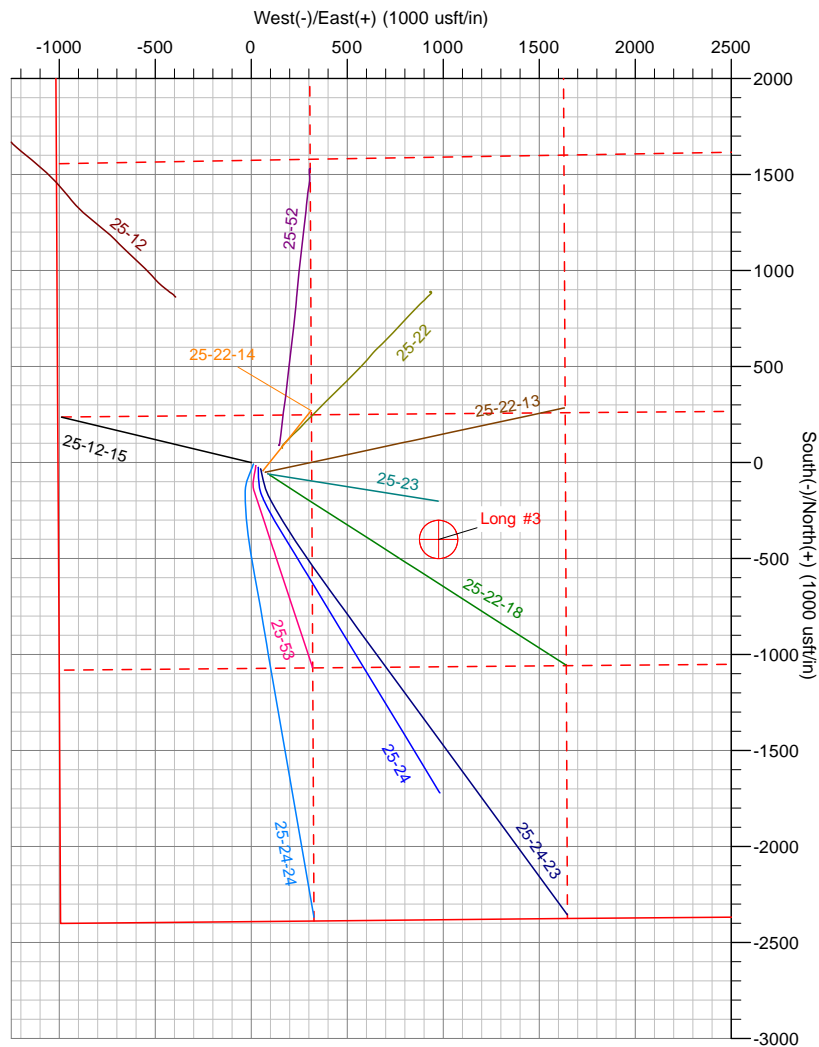
The customer should only rely on this document after independently verifying all paths, targets, coordinates, lease and hard lines represented. Any decisions made or wells drilled utilizing this or any other information supplied by MS Energy are at the sole risk and responsibility of the customer. MS Energy is not responsible for the accuracy of this schematic or the information contained herein.



Company: Great Western  
Site: Great Western  
Project: Weld County, Colorado (NAD 83)  
Rig Name: Cade 22



Planning: 936.442.2510 Fax: 936.442.2515  
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MS Energy is not responsible for the accuracy of this schematic or the information contained herein.



# **Great Western**

**Weld County, Colorado (NAD 83)**

**Great Western**

**25-22-14**

**Wellbore #1**

**Plan: Design #1**

## **Standard Planning Report**

**15 March, 2012**

<b>Database:</b>	Southern Region	<b>Local Co-ordinate Reference:</b>	Well 25-22-14
<b>Company:</b>	Great Western	<b>TVD Reference:</b>	WELL @ 4765.00usft (Cade 22)
<b>Project:</b>	Weld County, Colorado (NAD 83)	<b>MD Reference:</b>	WELL @ 4765.00usft (Cade 22)
<b>Site:</b>	Great Western	<b>North Reference:</b>	Grid
<b>Well:</b>	25-22-14	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Wellbore #1		
<b>Design:</b>	Design #1		

<b>Project</b>	Weld County, Colorado (NAD 83)		
<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 Northern Zone		

<b>Well</b>	25-22-14			
<b>Well Position</b>	<b>+N/-S</b>	1,410,042.95 usft	<b>Northing:</b>	1,410,042.95 usft
	<b>+E/-W</b>	3,181,549.13 usft	<b>Easting:</b>	3,181,549.13 usft
<b>Position Uncertainty</b>		0.00 usft	<b>Wellhead Elevation:</b>	
			<b>Latitude:</b>	40° 27' 25.6904 N
			<b>Longitude:</b>	104° 50' 51.312 W
			<b>Ground Level:</b>	4,751.00 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>
	WMM_2010	3/15/2012	8.81	67.06	53,083

<b>Design</b>	Design #1			
<b>Audit Notes:</b>				
<b>Version:</b>	<b>Phase:</b>	PROTOTYPE	<b>Tie On Depth:</b>	0.00
<b>Vertical Section:</b>	<b>Depth From (TVD) (usft)</b>	<b>+N/-S (usft)</b>	<b>+E/-W (usft)</b>	<b>Direction (°)</b>
	0.00	0.00	0.00	38.69

<b>Plan Sections</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>Dogleg Rate (°/100usft)</b>	<b>Build Rate (°/100usft)</b>	<b>Turn Rate (°/100usft)</b>	<b>TFO (°)</b>	<b>Target</b>
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
200.00	0.00	0.00	200.00	0.00	0.00	0.00	0.00	0.00	0.00	
399.84	4.00	38.69	399.68	5.44	4.36	2.00	2.00	0.00	38.69	
5,905.31	4.00	38.69	5,891.76	304.95	244.25	0.00	0.00	0.00	0.00	
6,171.77	0.00	0.00	6,158.00	312.20	250.05	1.50	-1.50	0.00	180.00	
7,291.77	0.00	0.00	7,278.00	312.20	250.05	0.00	0.00	0.00	0.00	PBHL v1 - Great W

<b>Database:</b>	Southern Region	<b>Local Co-ordinate Reference:</b>	Well 25-22-14
<b>Company:</b>	Great Western	<b>TVD Reference:</b>	WELL @ 4765.00usft (Cade 22)
<b>Project:</b>	Weld County, Colorado (NAD 83)	<b>MD Reference:</b>	WELL @ 4765.00usft (Cade 22)
<b>Site:</b>	Great Western	<b>North Reference:</b>	Grid
<b>Well:</b>	25-22-14	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Wellbore #1		
<b>Design:</b>	Design #1		

Planned Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
100.00	0.00	0.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00
200.00	0.00	0.00	200.00	0.00	0.00	0.00	0.00	0.00	0.00
<b>KOP, 2.00°/100' Build</b>									
300.00	2.00	38.69	299.98	1.36	1.09	1.75	2.00	2.00	0.00
399.84	4.00	38.69	399.68	5.44	4.36	6.97	2.00	2.00	0.00
<b>Hold 4.00° Inc, 38.69° Azm</b>									
400.00	4.00	38.69	399.84	5.45	4.36	6.98	0.00	0.00	0.00
500.00	4.00	38.69	499.59	10.89	8.72	13.95	0.00	0.00	0.00
600.00	4.00	38.69	599.35	16.33	13.08	20.92	0.00	0.00	0.00
700.00	4.00	38.69	699.11	21.77	17.43	27.89	0.00	0.00	0.00
700.89	4.00	38.69	700.00	21.82	17.47	27.95	0.00	0.00	0.00
<b>8-5/8"</b>									
800.00	4.00	38.69	798.86	27.21	21.79	34.86	0.00	0.00	0.00
900.00	4.00	38.69	898.62	32.65	26.15	41.83	0.00	0.00	0.00
1,000.00	4.00	38.69	998.38	38.09	30.51	48.80	0.00	0.00	0.00
1,100.00	4.00	38.69	1,098.14	43.53	34.86	55.77	0.00	0.00	0.00
1,200.00	4.00	38.69	1,197.89	48.97	39.22	62.74	0.00	0.00	0.00
1,300.00	4.00	38.69	1,297.65	54.41	43.58	69.71	0.00	0.00	0.00
1,400.00	4.00	38.69	1,397.41	59.85	47.94	76.68	0.00	0.00	0.00
1,500.00	4.00	38.69	1,497.16	65.29	52.29	83.65	0.00	0.00	0.00
1,600.00	4.00	38.69	1,596.92	70.73	56.65	90.62	0.00	0.00	0.00
1,700.00	4.00	38.69	1,696.68	76.17	61.01	97.59	0.00	0.00	0.00
1,800.00	4.00	38.69	1,796.43	81.61	65.37	104.56	0.00	0.00	0.00
1,900.00	4.00	38.69	1,896.19	87.05	69.72	111.53	0.00	0.00	0.00
2,000.00	4.00	38.69	1,995.95	92.49	74.08	118.50	0.00	0.00	0.00
2,100.00	4.00	38.69	2,095.70	97.93	78.44	125.47	0.00	0.00	0.00
2,200.00	4.00	38.69	2,195.46	103.37	82.79	132.44	0.00	0.00	0.00
2,300.00	4.00	38.69	2,295.22	108.81	87.15	139.41	0.00	0.00	0.00
2,390.00	4.00	38.69	2,385.00	113.71	91.07	145.68	0.00	0.00	0.00
<b>Greeley Sand</b>									
2,400.00	4.00	38.69	2,394.97	114.25	91.51	146.38	0.00	0.00	0.00
2,500.00	4.00	38.69	2,494.73	119.69	95.87	153.35	0.00	0.00	0.00
2,600.00	4.00	38.69	2,594.49	125.13	100.22	160.32	0.00	0.00	0.00
2,700.00	4.00	38.69	2,694.24	130.57	104.58	167.29	0.00	0.00	0.00
2,800.00	4.00	38.69	2,794.00	136.01	108.94	174.26	0.00	0.00	0.00
2,900.00	4.00	38.69	2,893.76	141.45	113.30	181.23	0.00	0.00	0.00
3,000.00	4.00	38.69	2,993.51	146.89	117.65	188.20	0.00	0.00	0.00
3,100.00	4.00	38.69	3,093.27	152.33	122.01	195.17	0.00	0.00	0.00
3,200.00	4.00	38.69	3,193.03	157.77	126.37	202.14	0.00	0.00	0.00
3,300.00	4.00	38.69	3,292.78	163.21	130.72	209.11	0.00	0.00	0.00
3,400.00	4.00	38.69	3,392.54	168.65	135.08	216.08	0.00	0.00	0.00
3,492.68	4.00	38.69	3,485.00	173.69	139.12	222.54	0.00	0.00	0.00
<b>Parkman</b>									
3,500.00	4.00	38.69	3,492.30	174.09	139.44	223.05	0.00	0.00	0.00
3,600.00	4.00	38.69	3,592.06	179.53	143.80	230.02	0.00	0.00	0.00
3,700.00	4.00	38.69	3,691.81	184.97	148.15	236.99	0.00	0.00	0.00
3,800.00	4.00	38.69	3,791.57	190.41	152.51	243.96	0.00	0.00	0.00
3,900.00	4.00	38.69	3,891.33	195.85	156.87	250.93	0.00	0.00	0.00
4,000.00	4.00	38.69	3,991.08	201.29	161.23	257.90	0.00	0.00	0.00
4,100.00	4.00	38.69	4,090.84	206.73	165.58	264.87	0.00	0.00	0.00
4,174.34	4.00	38.69	4,165.00	210.78	168.82	270.05	0.00	0.00	0.00
<b>Sussex</b>									

<b>Database:</b>	Southern Region	<b>Local Co-ordinate Reference:</b>	Well 25-22-14
<b>Company:</b>	Great Western	<b>TVD Reference:</b>	WELL @ 4765.00usft (Cade 22)
<b>Project:</b>	Weld County, Colorado (NAD 83)	<b>MD Reference:</b>	WELL @ 4765.00usft (Cade 22)
<b>Site:</b>	Great Western	<b>North Reference:</b>	Grid
<b>Well:</b>	25-22-14	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Wellbore #1		
<b>Design:</b>	Design #1		

Planned Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
4,200.00	4.00	38.69	4,190.60	212.17	169.94	271.84	0.00	0.00	0.00
4,300.00	4.00	38.69	4,290.35	217.61	174.30	278.81	0.00	0.00	0.00
4,400.00	4.00	38.69	4,390.11	223.05	178.66	285.78	0.00	0.00	0.00
4,500.00	4.00	38.69	4,489.87	228.49	183.01	292.75	0.00	0.00	0.00
4,565.29	4.00	38.69	4,555.00	232.05	185.86	297.30	0.00	0.00	0.00
<b>Shannon</b>									
4,600.00	4.00	38.69	4,589.62	233.93	187.37	299.72	0.00	0.00	0.00
4,700.00	4.00	38.69	4,689.38	239.37	191.73	306.69	0.00	0.00	0.00
4,800.00	4.00	38.69	4,789.14	244.82	196.08	313.66	0.00	0.00	0.00
4,900.00	4.00	38.69	4,888.89	250.26	200.44	320.63	0.00	0.00	0.00
5,000.00	4.00	38.69	4,988.65	255.70	204.80	327.60	0.00	0.00	0.00
5,100.00	4.00	38.69	5,088.41	261.14	209.16	334.57	0.00	0.00	0.00
5,200.00	4.00	38.69	5,188.16	266.58	213.51	341.54	0.00	0.00	0.00
5,300.00	4.00	38.69	5,287.92	272.02	217.87	348.51	0.00	0.00	0.00
5,400.00	4.00	38.69	5,387.68	277.46	222.23	355.48	0.00	0.00	0.00
5,500.00	4.00	38.69	5,487.43	282.90	226.59	362.45	0.00	0.00	0.00
5,600.00	4.00	38.69	5,587.19	288.34	230.94	369.42	0.00	0.00	0.00
5,700.00	4.00	38.69	5,686.95	293.78	235.30	376.39	0.00	0.00	0.00
5,800.00	4.00	38.69	5,786.70	299.22	239.66	383.36	0.00	0.00	0.00
5,900.00	4.00	38.69	5,886.46	304.66	244.01	390.33	0.00	0.00	0.00
5,905.31	4.00	38.69	5,891.76	304.95	244.25	390.70	0.00	0.00	0.00
<b>Begin 1.50°/100' Drop</b>									
6,000.00	2.58	38.69	5,986.29	309.18	247.64	396.13	1.50	-1.50	0.00
6,100.00	1.08	38.69	6,086.24	311.67	249.63	399.32	1.50	-1.50	0.00
6,171.77	0.00	0.00	6,158.00	312.20	250.05	399.99	1.50	-1.50	0.00
<b>Begin Vertical Hold</b>									
6,200.00	0.00	0.00	6,186.23	312.20	250.05	399.99	0.00	0.00	0.00
6,300.00	0.00	0.00	6,286.23	312.20	250.05	399.99	0.00	0.00	0.00
6,400.00	0.00	0.00	6,386.23	312.20	250.05	399.99	0.00	0.00	0.00
6,500.00	0.00	0.00	6,486.23	312.20	250.05	399.99	0.00	0.00	0.00
6,600.00	0.00	0.00	6,586.23	312.20	250.05	399.99	0.00	0.00	0.00
6,700.00	0.00	0.00	6,686.23	312.20	250.05	399.99	0.00	0.00	0.00
6,791.77	0.00	0.00	6,778.00	312.20	250.05	399.99	0.00	0.00	0.00
<b>Niobrara</b>									
6,800.00	0.00	0.00	6,786.23	312.20	250.05	399.99	0.00	0.00	0.00
6,900.00	0.00	0.00	6,886.23	312.20	250.05	399.99	0.00	0.00	0.00
7,000.00	0.00	0.00	6,986.23	312.20	250.05	399.99	0.00	0.00	0.00
7,100.00	0.00	0.00	7,086.23	312.20	250.05	399.99	0.00	0.00	0.00
7,111.77	0.00	0.00	7,098.00	312.20	250.05	399.99	0.00	0.00	0.00
<b>Fort Hayes</b>									
7,131.77	0.00	0.00	7,118.00	312.20	250.05	399.99	0.00	0.00	0.00
<b>Codell</b>									
7,200.00	0.00	0.00	7,186.23	312.20	250.05	399.99	0.00	0.00	0.00
7,291.77	0.00	0.00	7,278.00	312.20	250.05	399.99	0.00	0.00	0.00
<b>PBHL</b>									

<b>Database:</b>	Southern Region	<b>Local Co-ordinate Reference:</b>	Well 25-22-14
<b>Company:</b>	Great Western	<b>TVD Reference:</b>	WELL @ 4765.00usft (Cade 22)
<b>Project:</b>	Weld County, Colorado (NAD 83)	<b>MD Reference:</b>	WELL @ 4765.00usft (Cade 22)
<b>Site:</b>	Great Western	<b>North Reference:</b>	Grid
<b>Well:</b>	25-22-14	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Wellbore #1		
<b>Design:</b>	Design #1		

Design Targets									
Target Name	Dip Angle (°)	Dip Dir. (°)	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Northing (usft)	Easting (usft)	Latitude	Longitude
PBHL v1 - Great Wes - hit/miss target - Shape - plan hits target center - Circle (radius 200.00)	0.00	0.00	7,278.00	312.20	250.05	1,410,355.14	3,181,799.18	40° 27' 28.7573 N	104° 50' 48.047 W

Casing Points					
Measured Depth (usft)	Vertical Depth (usft)	Name	Casing Diameter (")	Hole Diameter (")	
700.89	700.00	8-5/8"	8-5/8	12-1/4	

Formations						
Measured Depth (usft)	Vertical Depth (usft)	Name	Lithology	Dip (°)	Dip Direction (°)	
2,390.00	2,385.00	Greeley Sand		0.00		
3,492.68	3,485.00	Parkman		0.00		
4,174.34	4,165.00	Sussex		0.00		
4,565.29	4,555.00	Shannon		0.00		
6,791.77	6,778.00	Niobrara		0.00		
7,111.77	7,098.00	Fort Hayes		0.00		
7,131.77	7,118.00	Codell		0.00		

Plan Annotations				
Measured Depth (usft)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Comment
200.00	200.00	0.00	0.00	KOP, 2.00°/100' Build
399.84	399.68	5.44	4.36	Hold 4.00° Inc, 38.69° Azm
5,905.31	5,891.76	304.95	244.25	Begin 1.50°/100' Drop
6,171.77	6,158.00	312.20	250.05	Begin Vertical Hold
7,291.77	7,278.00	312.20	250.05	PBHL