



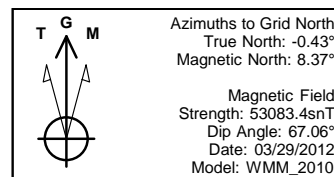
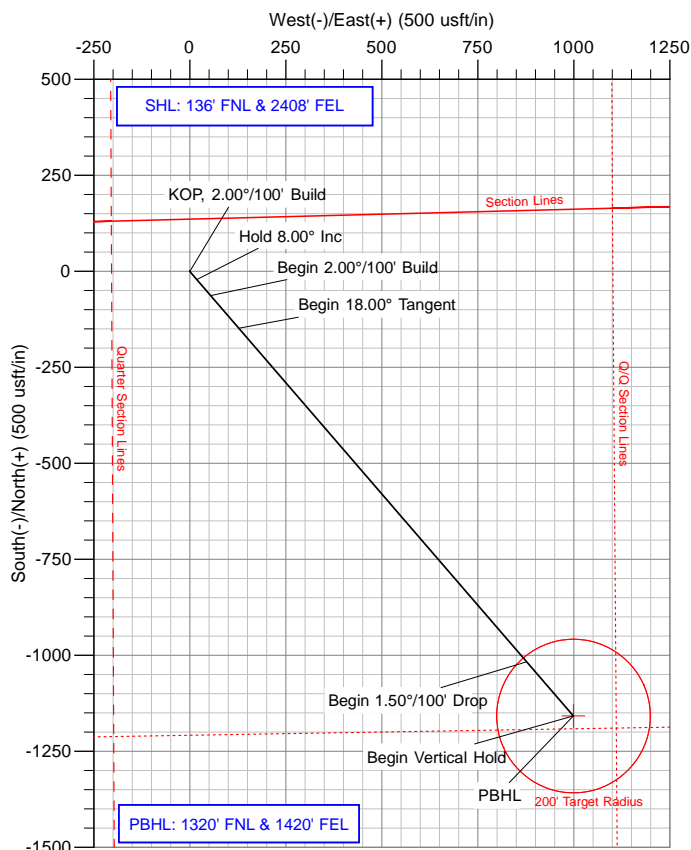
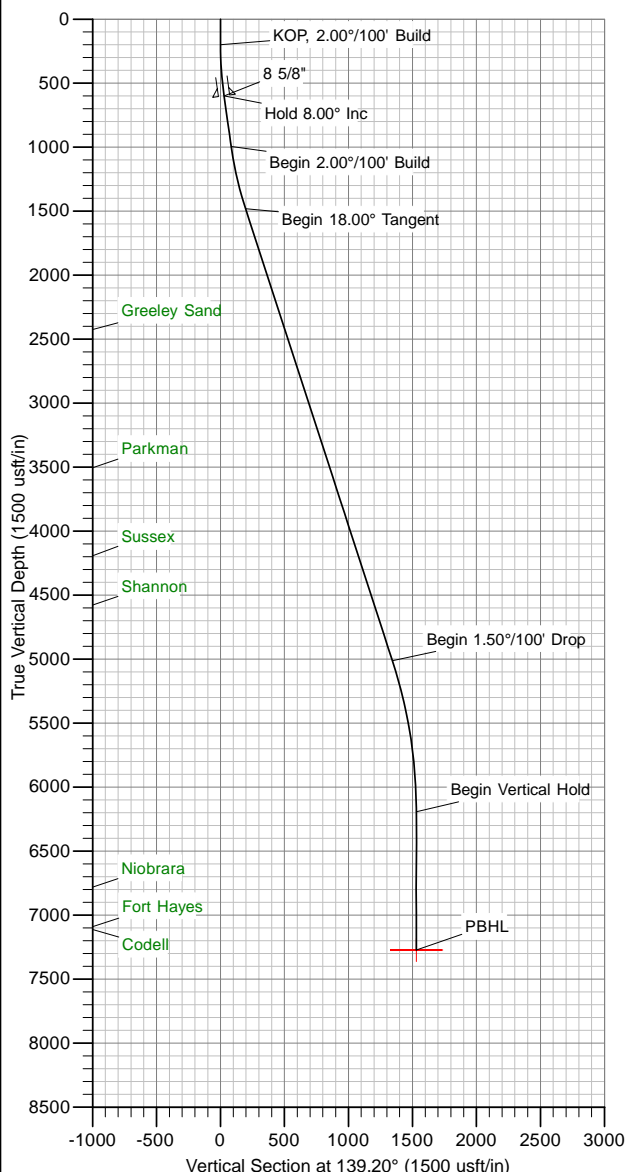
Company: Great Western  
Site: Dettner FD  
Well: #25-7D  
Project: Weld County, Colorado (NAD 83)  
Rig Name: Cade 22



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	VSec	Departure	Annotation
200.00	0.00	0.00	200.00	0.00	0.00	0.00	0.00	KOP, 2.00°/100' Build
600.00	8.00	139.20	598.70	-21.11	18.22	27.88	27.88	Hold 8.00° Inc
1000.00	8.00	139.20	994.81	-63.25	54.59	83.55	83.55	Begin 2.00°/100' Build
1499.84	18.00	139.20	1481.22	-148.25	127.96	195.83	195.83	Begin 18.00° Tangent
5212.09	18.00	139.20	5011.85	-1016.50	877.37	1342.78	1342.78	Begin 1.50°/100' Drop
6411.87	0.00	0.00	6192.00	-1157.97	999.48	1529.66	1529.66	Begin Vertical Hold
7491.87	0.00	0.00	7272.00	-1157.97	999.48	1529.66	1529.66	PBHL



US State Plane 1983  
Colorado Northern Zone

Created By: Allen Slack  
Date: 16:21, March 30 2012  
Plan: Design #1

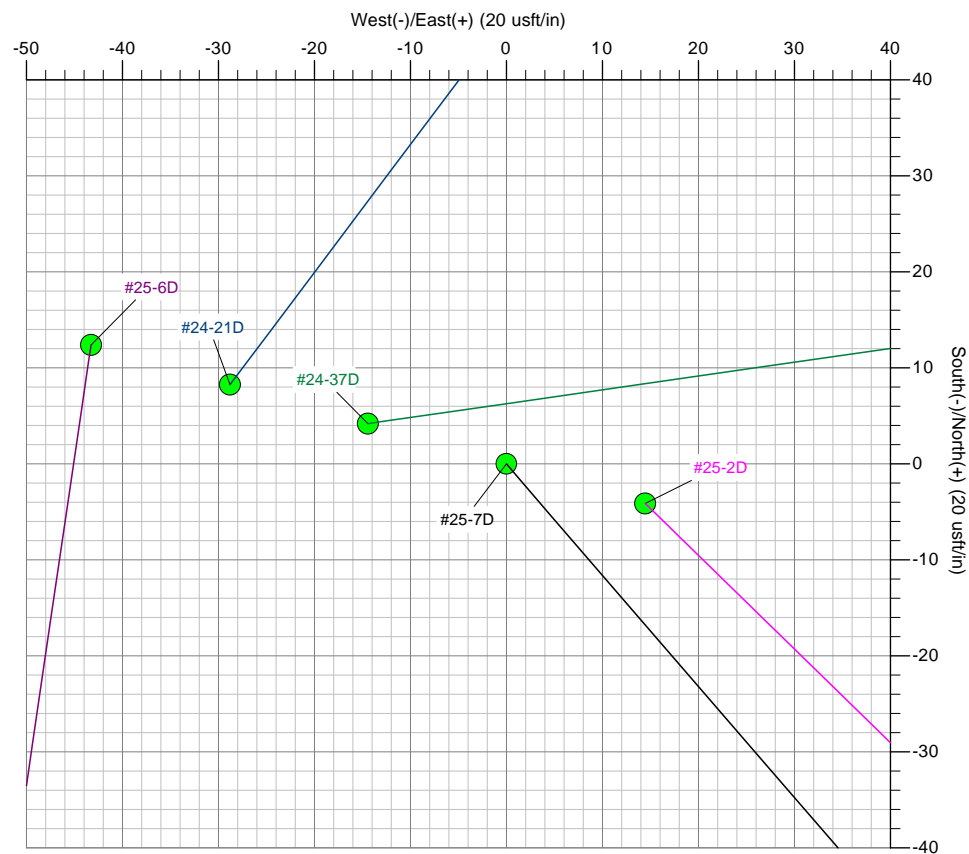
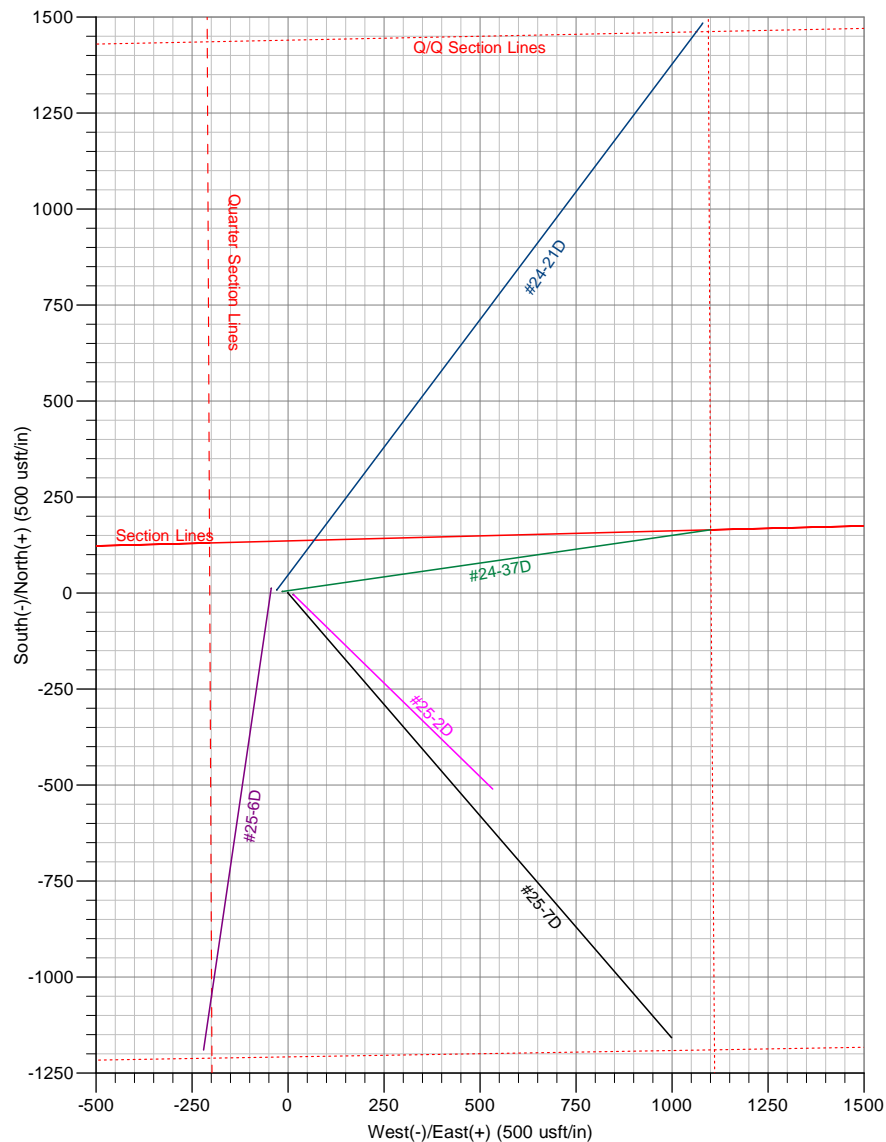
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Company: Great Western  
Site: Detterer FD  
Well: #25-7D  
Project: Weld County, Colorado (NAD 83)  
Rig Name: Cade 22



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



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# **Great Western**

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

**Detterer FD**

**#25-7D**

**Wellbore #1**

**Plan: Design #1**

## **Standard Planning Report**

**30 March, 2012**

<b>Database:</b>	Southern Region	<b>Local Co-ordinate Reference:</b>	Well #25-7D
<b>Company:</b>	Great Western	<b>TVD Reference:</b>	WELL @ 4760.00usft (Cade 22)
<b>Project:</b>	Weld County, Colorado (NAD 83)	<b>MD Reference:</b>	WELL @ 4760.00usft (Cade 22)
<b>Site:</b>	Detterer FD	<b>North Reference:</b>	Grid
<b>Well:</b>	#25-7D	<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>	#25-7D			
<b>Well Position</b>	<b>+N/-S</b>	1,412,898.16 usft	<b>Northing:</b>	1,412,898.16 usft
	<b>+E/-W</b>	3,183,314.05 usft	<b>Easting:</b>	3,183,314.05 usft
<b>Position Uncertainty</b>		0.00 usft	<b>Wellhead Elevation:</b>	
			<b>Latitude:</b>	40° 27' 53.7757 N
			<b>Longitude:</b>	104° 50' 28.205 W
			<b>Ground Level:</b>	4,744.00 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	03/29/2012	8.80	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	139.20

<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	
600.00	8.00	139.20	598.70	-21.11	18.22	2.00	2.00	0.00	139.20	
1,000.00	8.00	139.20	994.81	-63.25	54.59	0.00	0.00	0.00	0.00	
1,499.84	18.00	139.20	1,481.22	-148.25	127.96	2.00	2.00	0.00	0.00	
5,212.09	18.00	139.20	5,011.85	-1,016.50	877.37	0.00	0.00	0.00	0.00	
6,411.87	0.00	0.00	6,192.00	-1,157.97	999.48	1.50	-1.50	0.00	180.00	
7,491.87	0.00	0.00	7,272.00	-1,157.97	999.48	0.00	0.00	0.00	0.00	0.00 PBHL - Detterer FD

<b>Database:</b>	Southern Region	<b>Local Co-ordinate Reference:</b>	Well #25-7D
<b>Company:</b>	Great Western	<b>TVD Reference:</b>	WELL @ 4760.00usft (Cade 22)
<b>Project:</b>	Weld County, Colorado (NAD 83)	<b>MD Reference:</b>	WELL @ 4760.00usft (Cade 22)
<b>Site:</b>	Detterer FD	<b>North Reference:</b>	Grid
<b>Well:</b>	#25-7D	<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	139.20	299.98	-1.32	1.14	1.75	2.00	2.00	0.00
400.00	4.00	139.20	399.84	-5.28	4.56	6.98	2.00	2.00	0.00
500.00	6.00	139.20	499.45	-11.88	10.25	15.69	2.00	2.00	0.00
600.00	8.00	139.20	598.70	-21.11	18.22	27.88	2.00	2.00	0.00
<b>Hold 8.00° Inc</b>									
601.31	8.00	139.20	600.00	-21.24	18.34	28.06	0.00	0.00	0.00
<b>8 5/8"</b>									
700.00	8.00	139.20	697.73	-31.64	27.31	41.80	0.00	0.00	0.00
800.00	8.00	139.20	796.76	-42.18	36.40	55.71	0.00	0.00	0.00
900.00	8.00	139.20	895.78	-52.71	45.50	69.63	0.00	0.00	0.00
1,000.00	8.00	139.20	994.81	-63.25	54.59	83.55	0.00	0.00	0.00
<b>Begin 2.00°/100' Build</b>									
1,100.00	10.00	139.20	1,093.57	-75.09	64.81	99.19	2.00	2.00	0.00
1,200.00	12.00	139.20	1,191.73	-89.53	77.28	118.27	2.00	2.00	0.00
1,300.00	14.00	139.20	1,289.16	-106.56	91.98	140.77	2.00	2.00	0.00
1,400.00	16.00	139.20	1,385.75	-126.15	108.89	166.65	2.00	2.00	0.00
1,499.84	18.00	139.20	1,481.22	-148.25	127.96	195.83	2.00	2.00	0.00
<b>Begin 18.00° Tangent</b>									
1,600.00	18.00	139.20	1,576.48	-171.67	148.18	226.78	0.00	0.00	0.00
1,700.00	18.00	139.20	1,671.59	-195.06	168.36	257.67	0.00	0.00	0.00
1,800.00	18.00	139.20	1,766.70	-218.45	188.55	288.57	0.00	0.00	0.00
1,900.00	18.00	139.20	1,861.81	-241.84	208.74	319.47	0.00	0.00	0.00
2,000.00	18.00	139.20	1,956.91	-265.23	228.93	350.36	0.00	0.00	0.00
2,100.00	18.00	139.20	2,052.02	-288.62	249.12	381.26	0.00	0.00	0.00
2,200.00	18.00	139.20	2,147.13	-312.01	269.30	412.16	0.00	0.00	0.00
2,300.00	18.00	139.20	2,242.24	-335.40	289.49	443.05	0.00	0.00	0.00
2,400.00	18.00	139.20	2,337.34	-358.79	309.68	473.95	0.00	0.00	0.00
2,492.17	18.00	139.20	2,425.00	-380.34	328.28	502.42	0.00	0.00	0.00
<b>Greeley Sand</b>									
2,500.00	18.00	139.20	2,432.45	-382.17	329.87	504.84	0.00	0.00	0.00
2,600.00	18.00	139.20	2,527.56	-405.56	350.05	535.74	0.00	0.00	0.00
2,700.00	18.00	139.20	2,622.66	-428.95	370.24	566.64	0.00	0.00	0.00
2,800.00	18.00	139.20	2,717.77	-452.34	390.43	597.53	0.00	0.00	0.00
2,900.00	18.00	139.20	2,812.88	-475.73	410.62	628.43	0.00	0.00	0.00
3,000.00	18.00	139.20	2,907.99	-499.12	430.80	659.33	0.00	0.00	0.00
3,100.00	18.00	139.20	3,003.09	-522.51	450.99	690.22	0.00	0.00	0.00
3,200.00	18.00	139.20	3,098.20	-545.90	471.18	721.12	0.00	0.00	0.00
3,300.00	18.00	139.20	3,193.31	-569.28	491.37	752.01	0.00	0.00	0.00
3,400.00	18.00	139.20	3,288.42	-592.67	511.55	782.91	0.00	0.00	0.00
3,500.00	18.00	139.20	3,383.52	-616.06	531.74	813.81	0.00	0.00	0.00
3,600.00	18.00	139.20	3,478.63	-639.45	551.93	844.70	0.00	0.00	0.00
3,627.73	18.00	139.20	3,505.00	-645.94	557.53	853.27	0.00	0.00	0.00
<b>Parkman</b>									
3,700.00	18.00	139.20	3,573.74	-662.84	572.12	875.60	0.00	0.00	0.00
3,800.00	18.00	139.20	3,668.85	-686.23	592.30	906.50	0.00	0.00	0.00
3,900.00	18.00	139.20	3,763.95	-709.62	612.49	937.39	0.00	0.00	0.00
4,000.00	18.00	139.20	3,859.06	-733.01	632.68	968.29	0.00	0.00	0.00
4,100.00	18.00	139.20	3,954.17	-756.40	652.87	999.19	0.00	0.00	0.00
4,200.00	18.00	139.20	4,049.28	-779.78	673.06	1,030.08	0.00	0.00	0.00

<b>Database:</b>	Southern Region	<b>Local Co-ordinate Reference:</b>	Well #25-7D
<b>Company:</b>	Great Western	<b>TVD Reference:</b>	WELL @ 4760.00usft (Cade 22)
<b>Project:</b>	Weld County, Colorado (NAD 83)	<b>MD Reference:</b>	WELL @ 4760.00usft (Cade 22)
<b>Site:</b>	Detterer FD	<b>North Reference:</b>	Grid
<b>Well:</b>	#25-7D	<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)
4,300.00	18.00	139.20	4,144.38	-803.17	693.24	1,060.98	0.00	0.00	0.00
4,349.01	18.00	139.20	4,191.00	-814.64	703.14	1,076.12	0.00	0.00	0.00
<b>Sussex</b>									
4,400.00	18.00	139.20	4,239.49	-826.56	713.43	1,091.87	0.00	0.00	0.00
4,500.00	18.00	139.20	4,334.60	-849.95	733.62	1,122.77	0.00	0.00	0.00
4,600.00	18.00	139.20	4,429.71	-873.34	753.81	1,153.67	0.00	0.00	0.00
4,700.00	18.00	139.20	4,524.81	-896.73	773.99	1,184.56	0.00	0.00	0.00
4,754.87	18.00	139.20	4,577.00	-909.56	785.07	1,201.52	0.00	0.00	0.00
<b>Shannon</b>									
4,800.00	18.00	139.20	4,619.92	-920.12	794.18	1,215.46	0.00	0.00	0.00
4,900.00	18.00	139.20	4,715.03	-943.51	814.37	1,246.36	0.00	0.00	0.00
5,000.00	18.00	139.20	4,810.14	-966.90	834.56	1,277.25	0.00	0.00	0.00
5,100.00	18.00	139.20	4,905.24	-990.28	854.74	1,308.15	0.00	0.00	0.00
5,200.00	18.00	139.20	5,000.35	-1,013.67	874.93	1,339.04	0.00	0.00	0.00
5,212.09	18.00	139.20	5,011.85	-1,016.50	877.37	1,342.78	0.00	0.00	0.00
<b>Begin 1.50°/100' Drop</b>									
5,300.00	16.68	139.20	5,095.76	-1,036.33	894.49	1,368.98	1.50	-1.50	0.00
5,400.00	15.18	139.20	5,191.92	-1,057.11	912.42	1,396.42	1.50	-1.50	0.00
5,500.00	13.68	139.20	5,288.76	-1,075.97	928.70	1,421.33	1.50	-1.50	0.00
5,600.00	12.18	139.20	5,386.23	-1,092.90	943.32	1,443.71	1.50	-1.50	0.00
5,700.00	10.68	139.20	5,484.24	-1,107.90	956.26	1,463.52	1.50	-1.50	0.00
5,800.00	9.18	139.20	5,582.74	-1,120.95	967.53	1,480.76	1.50	-1.50	0.00
5,900.00	7.68	139.20	5,681.66	-1,132.05	977.10	1,495.42	1.50	-1.50	0.00
6,000.00	6.18	139.20	5,780.92	-1,141.18	984.99	1,507.48	1.50	-1.50	0.00
6,100.00	4.68	139.20	5,880.47	-1,148.34	991.17	1,516.94	1.50	-1.50	0.00
6,200.00	3.18	139.20	5,980.24	-1,153.53	995.64	1,523.79	1.50	-1.50	0.00
6,300.00	1.68	139.20	6,080.14	-1,156.73	998.41	1,528.02	1.50	-1.50	0.00
6,400.00	0.18	139.20	6,180.13	-1,157.96	999.47	1,529.64	1.50	-1.50	0.00
6,411.87	0.00	0.00	6,192.00	-1,157.97	999.48	1,529.66	1.50	-1.50	0.00
<b>Begin Vertical Hold</b>									
6,500.00	0.00	0.00	6,280.13	-1,157.97	999.48	1,529.66	0.00	0.00	0.00
6,600.00	0.00	0.00	6,380.13	-1,157.97	999.48	1,529.66	0.00	0.00	0.00
6,700.00	0.00	0.00	6,480.13	-1,157.97	999.48	1,529.66	0.00	0.00	0.00
6,800.00	0.00	0.00	6,580.13	-1,157.97	999.48	1,529.66	0.00	0.00	0.00
6,900.00	0.00	0.00	6,680.13	-1,157.97	999.48	1,529.66	0.00	0.00	0.00
6,999.87	0.00	0.00	6,780.00	-1,157.97	999.48	1,529.66	0.00	0.00	0.00
<b>Niobrara</b>									
7,000.00	0.00	0.00	6,780.13	-1,157.97	999.48	1,529.66	0.00	0.00	0.00
7,100.00	0.00	0.00	6,880.13	-1,157.97	999.48	1,529.66	0.00	0.00	0.00
7,200.00	0.00	0.00	6,980.13	-1,157.97	999.48	1,529.66	0.00	0.00	0.00
7,300.00	0.00	0.00	7,080.13	-1,157.97	999.48	1,529.66	0.00	0.00	0.00
7,308.87	0.00	0.00	7,089.00	-1,157.97	999.48	1,529.66	0.00	0.00	0.00
<b>Fort Hayes</b>									
7,331.87	0.00	0.00	7,112.00	-1,157.97	999.48	1,529.66	0.00	0.00	0.00
<b>Codell</b>									
7,400.00	0.00	0.00	7,180.13	-1,157.97	999.48	1,529.66	0.00	0.00	0.00
7,491.87	0.00	0.00	7,272.00	-1,157.97	999.48	1,529.66	0.00	0.00	0.00
<b>PBHL</b>									

<b>Database:</b>	Southern Region	<b>Local Co-ordinate Reference:</b>	Well #25-7D
<b>Company:</b>	Great Western	<b>TVD Reference:</b>	WELL @ 4760.00usft (Cade 22)
<b>Project:</b>	Weld County, Colorado (NAD 83)	<b>MD Reference:</b>	WELL @ 4760.00usft (Cade 22)
<b>Site:</b>	Detterer FD	<b>North Reference:</b>	Grid
<b>Well:</b>	#25-7D	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Wellbore #1		
<b>Design:</b>	Design #1		

#### Design Targets

##### Target Name

- hit/miss target	Dip Angle (°)	Dip Dir. (°)	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Northing (usft)	Easting (usft)	Latitude	Longitude
- Shape									
PBHL - Detterer FD #:	0.00	0.00	7,272.00	-1,157.97	999.48	1,411,740.19	3,184,313.53	40° 27' 42.2595 N	104° 50' 15.386 W
- plan hits target center									
- Circle (radius 200.00)									

#### Casing Points

Measured Depth (usft)	Vertical Depth (usft)	Name	Casing Diameter (")	Hole Diameter (")
601.31	600.00	8 5/8"	8-5/8	12-1/4

#### Formations

Measured Depth (usft)	Vertical Depth (usft)	Name	Lithology	Dip (°)	Dip Direction (°)
2,492.17	2,425.00	Greeley Sand		0.00	
3,627.73	3,505.00	Parkman		0.00	
4,349.01	4,191.00	Sussex		0.00	
4,754.87	4,577.00	Shannon		0.00	
6,999.87	6,780.00	Niobrara		0.00	
7,308.87	7,089.00	Fort Hayes		0.00	
7,331.87	7,112.00	Codell		0.00	

#### Plan Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
200.00	200.00	0.00	0.00	KOP, 2.00°/100' Build
600.00	598.70	-21.11	18.22	Hold 8.00° Inc
1,000.00	994.81	-63.25	54.59	Begin 2.00°/100' Build
1,499.84	1,481.22	-148.25	127.96	Begin 18.00° Tangent
5,212.09	5,011.85	-1,016.50	877.37	Begin 1.50°/100' Drop
6,411.87	6,192.00	-1,157.97	999.48	Begin Vertical Hold
7,491.87	7,272.00	-1,157.97	999.48	PBHL