



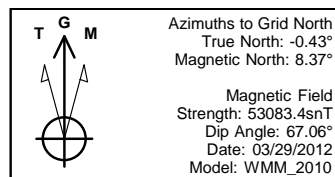
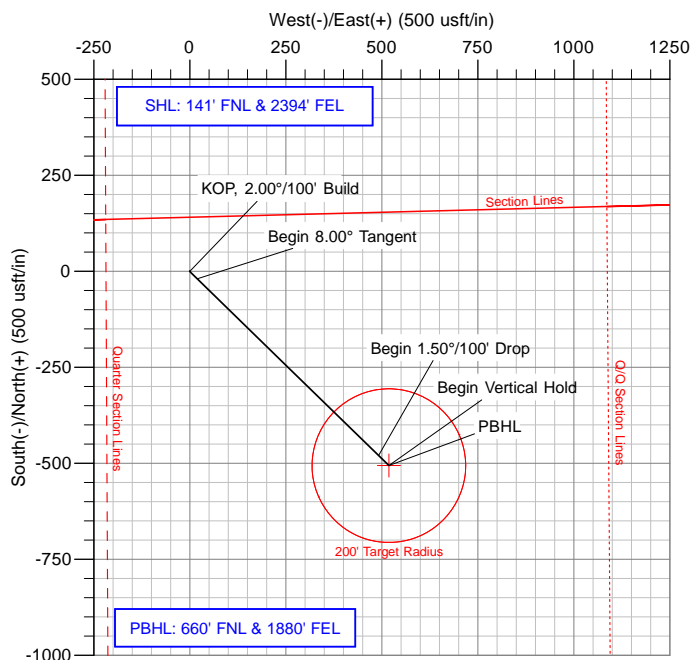
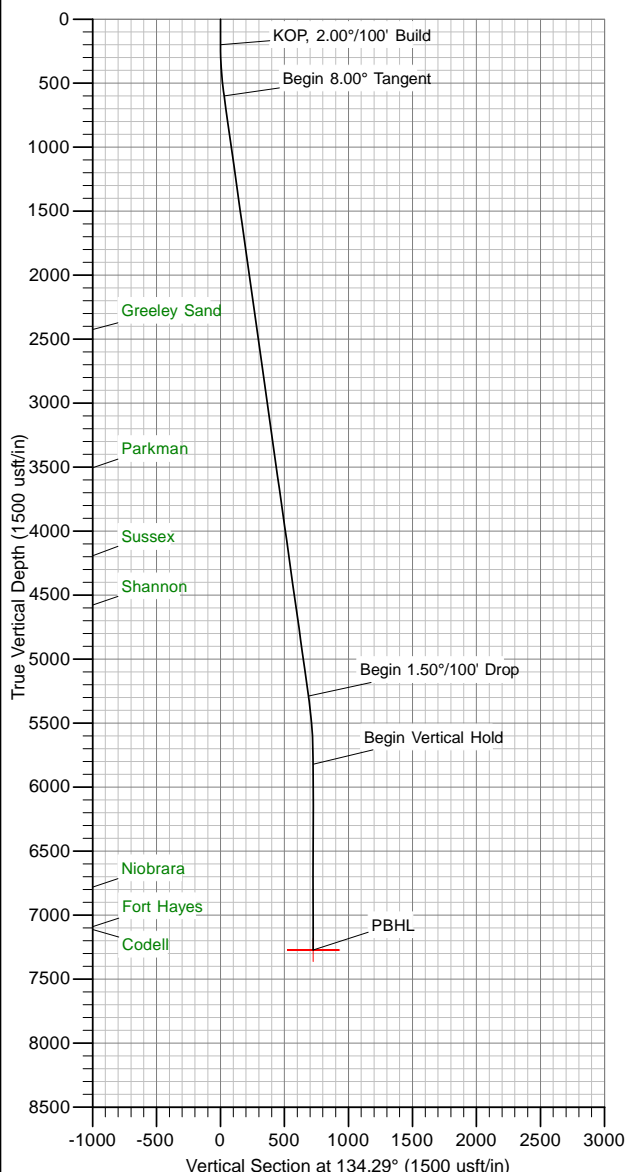
Company: Great Western
 Site: Dettler FD
 Well: #25-2D
 Project: Weld County, Colorado (NAD 83)
 Rig Name: Cade 22



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
600.23	8.00	134.29	598.93	-19.49	19.98	27.91	27.91	Begin 8.00° Tangent
5335.53	8.00	134.29	5288.09	-479.94	492.00	687.32	687.32	Begin 1.50°/100' Drop
5869.17	0.00	0.00	5820.00	-505.93	518.64	724.54	724.54	Begin Vertical Hold
7321.17	0.00	0.00	7272.00	-505.93	518.64	724.54	724.54	PBHL



US State Plane 1983
 Colorado Northern Zone

Created By: Allen Slack
 Date: 14:54, March 30 2012
 Plan: Design #1

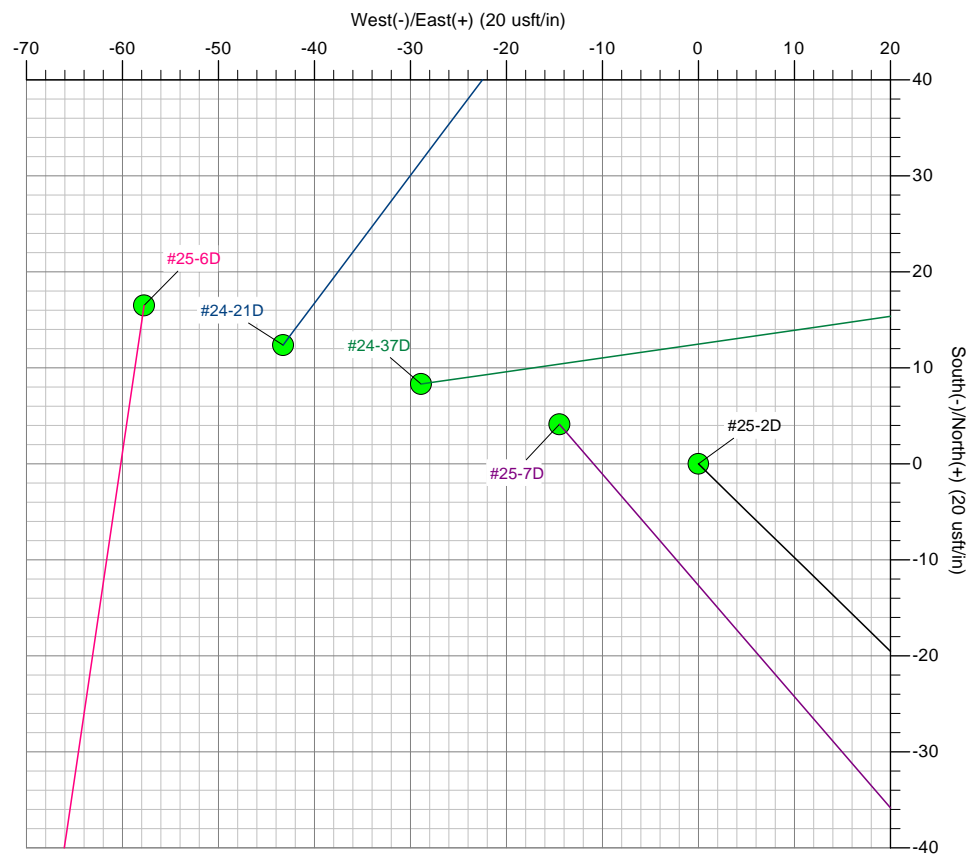
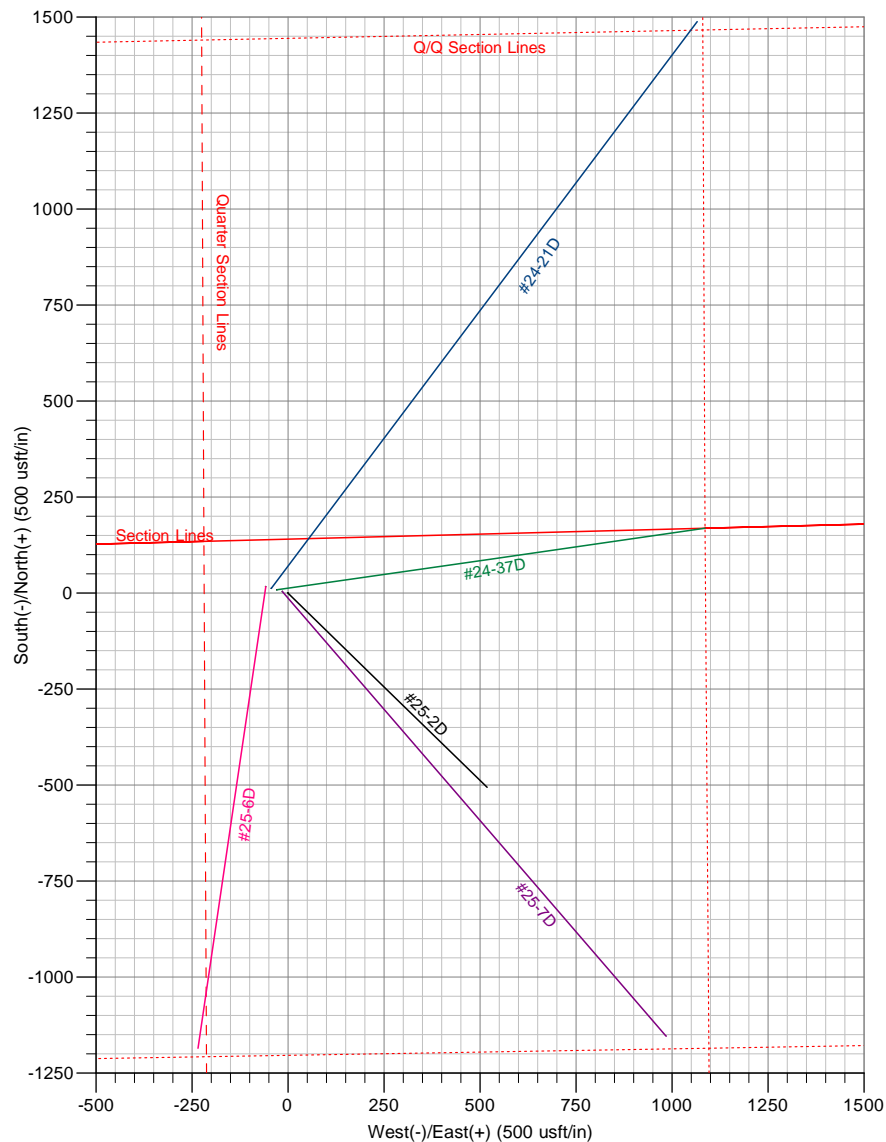
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Company: Great Western
Site: Detterer FD
Well: #25-2D
Project: Weld County, Colorado (NAD 83)
Rig Name: Cade 22



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

#25-2D

Wellbore #1

Plan: Design #1

Standard Planning Report

30 March, 2012

Database:	Southern Region	Local Co-ordinate Reference:	Well #25-2D
Company:	Great Western	TVD Reference:	WELL @ 4760.00usft (Cade 22)
Project:	Weld County, Colorado (NAD 83)	MD Reference:	WELL @ 4760.00usft (Cade 22)
Site:	Detterer FD	North Reference:	Grid
Well:	#25-2D	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Design #1		

Project	Weld County, Colorado (NAD 83)		
Map System:	US State Plane 1983	System Datum:	Mean Sea Level
Geo Datum:	North American Datum 1983		
Map Zone:	Colorado Northern Zone		

Well	#25-2D			
Well Position	+N/-S	1,412,894.04 usft	Northing:	1,412,894.04 usft
	+E/-W	3,183,328.52 usft	Easting:	3,183,328.52 usft
Position Uncertainty		0.00 usft	Wellhead Elevation:	
			Latitude:	40° 27' 53.7339 N
			Longitude:	104° 50' 28.018 W
			Ground Level:	4,744.00 usft

Wellbore	Wellbore #1				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	WMM_2010	03/29/2012	8.80	67.06	53,083

Design	Design #1			
Audit Notes:				
Version:	Phase:	PROTOTYPE	Tie On Depth:	0.00
Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)	Direction (°)
	0.00	0.00	0.00	134.29

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	
200.00	0.00	0.00	200.00	0.00	0.00	0.00	0.00	0.00	0.00	
600.23	8.00	134.29	598.93	-19.49	19.98	2.00	2.00	0.00	134.29	
5,335.53	8.00	134.29	5,288.09	-479.94	492.00	0.00	0.00	0.00	0.00	
5,869.17	0.00	0.00	5,820.00	-505.93	518.64	1.50	-1.50	0.00	180.00	
7,321.17	0.00	0.00	7,272.00	-505.93	518.64	0.00	0.00	0.00	0.00	PBHL - Detterer FD

Database:	Southern Region	Local Co-ordinate Reference:	Well #25-2D
Company:	Great Western	TVD Reference:	WELL @ 4760.00usft (Cade 22)
Project:	Weld County, Colorado (NAD 83)	MD Reference:	WELL @ 4760.00usft (Cade 22)
Site:	Detterer FD	North Reference:	Grid
Well:	#25-2D	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	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
KOP, 2.00°/100' Build									
300.00	2.00	134.29	299.98	-1.22	1.25	1.75	2.00	2.00	0.00
400.00	4.00	134.29	399.84	-4.87	5.00	6.98	2.00	2.00	0.00
500.00	6.00	134.29	499.45	-10.96	11.23	15.69	2.00	2.00	0.00
600.23	8.00	134.29	598.93	-19.49	19.98	27.91	2.00	2.00	0.00
Begin 8.00° Tangent									
601.31	8.00	134.29	600.00	-19.60	20.09	28.06	0.00	0.00	0.00
8 5/8"									
700.00	8.00	134.29	697.73	-29.19	29.93	41.81	0.00	0.00	0.00
800.00	8.00	134.29	796.75	-38.92	39.89	55.73	0.00	0.00	0.00
900.00	8.00	134.29	895.78	-48.64	49.86	69.66	0.00	0.00	0.00
1,000.00	8.00	134.29	994.80	-58.36	59.83	83.58	0.00	0.00	0.00
1,100.00	8.00	134.29	1,093.83	-68.09	69.80	97.51	0.00	0.00	0.00
1,200.00	8.00	134.29	1,192.86	-77.81	79.77	111.43	0.00	0.00	0.00
1,300.00	8.00	134.29	1,291.88	-87.53	89.73	125.36	0.00	0.00	0.00
1,400.00	8.00	134.29	1,390.91	-97.26	99.70	139.28	0.00	0.00	0.00
1,500.00	8.00	134.29	1,489.93	-106.98	109.67	153.21	0.00	0.00	0.00
1,600.00	8.00	134.29	1,588.96	-116.71	119.64	167.13	0.00	0.00	0.00
1,700.00	8.00	134.29	1,687.98	-126.43	129.61	181.06	0.00	0.00	0.00
1,800.00	8.00	134.29	1,787.01	-136.15	139.57	194.98	0.00	0.00	0.00
1,900.00	8.00	134.29	1,886.04	-145.88	149.54	208.91	0.00	0.00	0.00
2,000.00	8.00	134.29	1,985.06	-155.60	159.51	222.83	0.00	0.00	0.00
2,100.00	8.00	134.29	2,084.09	-165.32	169.48	236.76	0.00	0.00	0.00
2,200.00	8.00	134.29	2,183.11	-175.05	179.45	250.69	0.00	0.00	0.00
2,300.00	8.00	134.29	2,282.14	-184.77	189.42	264.61	0.00	0.00	0.00
2,400.00	8.00	134.29	2,381.16	-194.50	199.38	278.54	0.00	0.00	0.00
2,444.27	8.00	134.29	2,425.00	-198.80	203.80	284.70	0.00	0.00	0.00
Greeley Sand									
2,500.00	8.00	134.29	2,480.19	-204.22	209.35	292.46	0.00	0.00	0.00
2,600.00	8.00	134.29	2,579.22	-213.94	219.32	306.39	0.00	0.00	0.00
2,700.00	8.00	134.29	2,678.24	-223.67	229.29	320.31	0.00	0.00	0.00
2,800.00	8.00	134.29	2,777.27	-233.39	239.26	334.24	0.00	0.00	0.00
2,900.00	8.00	134.29	2,876.29	-243.12	249.22	348.16	0.00	0.00	0.00
3,000.00	8.00	134.29	2,975.32	-252.84	259.19	362.09	0.00	0.00	0.00
3,100.00	8.00	134.29	3,074.34	-262.56	269.16	376.01	0.00	0.00	0.00
3,200.00	8.00	134.29	3,173.37	-272.29	279.13	389.94	0.00	0.00	0.00
3,300.00	8.00	134.29	3,272.39	-282.01	289.10	403.86	0.00	0.00	0.00
3,400.00	8.00	134.29	3,371.42	-291.73	299.06	417.79	0.00	0.00	0.00
3,500.00	8.00	134.29	3,470.45	-301.46	309.03	431.72	0.00	0.00	0.00
3,534.89	8.00	134.29	3,505.00	-304.85	312.51	436.57	0.00	0.00	0.00
Parkman									
3,600.00	8.00	134.29	3,569.47	-311.18	319.00	445.64	0.00	0.00	0.00
3,700.00	8.00	134.29	3,668.50	-320.91	328.97	459.57	0.00	0.00	0.00
3,800.00	8.00	134.29	3,767.52	-330.63	338.94	473.49	0.00	0.00	0.00
3,900.00	8.00	134.29	3,866.55	-340.35	348.90	487.42	0.00	0.00	0.00
4,000.00	8.00	134.29	3,965.57	-350.08	358.87	501.34	0.00	0.00	0.00
4,100.00	8.00	134.29	4,064.60	-359.80	368.84	515.27	0.00	0.00	0.00
4,200.00	8.00	134.29	4,163.63	-369.52	378.81	529.19	0.00	0.00	0.00
4,227.64	8.00	134.29	4,191.00	-372.21	381.56	533.04	0.00	0.00	0.00
Sussex									

Database:	Southern Region	Local Co-ordinate Reference:	Well #25-2D
Company:	Great Western	TVD Reference:	WELL @ 4760.00usft (Cade 22)
Project:	Weld County, Colorado (NAD 83)	MD Reference:	WELL @ 4760.00usft (Cade 22)
Site:	Detterer FD	North Reference:	Grid
Well:	#25-2D	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	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	8.00	134.29	4,262.65	-379.25	388.78	543.12	0.00	0.00	0.00
4,400.00	8.00	134.29	4,361.68	-388.97	398.75	557.04	0.00	0.00	0.00
4,500.00	8.00	134.29	4,460.70	-398.70	408.71	570.97	0.00	0.00	0.00
4,600.00	8.00	134.29	4,559.73	-408.42	418.68	584.89	0.00	0.00	0.00
4,617.44	8.00	134.29	4,577.00	-410.12	420.42	587.32	0.00	0.00	0.00
Shannon									
4,700.00	8.00	134.29	4,658.75	-418.14	428.65	598.82	0.00	0.00	0.00
4,800.00	8.00	134.29	4,757.78	-427.87	438.62	612.74	0.00	0.00	0.00
4,900.00	8.00	134.29	4,856.81	-437.59	448.59	626.67	0.00	0.00	0.00
5,000.00	8.00	134.29	4,955.83	-447.31	458.55	640.60	0.00	0.00	0.00
5,100.00	8.00	134.29	5,054.86	-457.04	468.52	654.52	0.00	0.00	0.00
5,200.00	8.00	134.29	5,153.88	-466.76	478.49	668.45	0.00	0.00	0.00
5,300.00	8.00	134.29	5,252.91	-476.49	488.46	682.37	0.00	0.00	0.00
5,335.53	8.00	134.29	5,288.09	-479.94	492.00	687.32	0.00	0.00	0.00
Begin 1.50°/100' Drop									
5,400.00	7.04	134.29	5,352.01	-485.83	498.04	695.76	1.50	-1.50	0.00
5,500.00	5.54	134.29	5,451.40	-493.48	505.88	706.71	1.50	-1.50	0.00
5,600.00	4.04	134.29	5,551.05	-499.31	511.85	715.06	1.50	-1.50	0.00
5,700.00	2.54	134.29	5,650.88	-503.31	515.96	720.79	1.50	-1.50	0.00
5,800.00	1.04	134.29	5,750.83	-505.49	518.19	723.91	1.50	-1.50	0.00
5,869.17	0.00	0.00	5,820.00	-505.93	518.64	724.54	1.50	-1.50	-194.14
Begin Vertical Hold									
5,900.00	0.00	0.00	5,850.83	-505.93	518.64	724.54	0.00	0.00	0.00
6,000.00	0.00	0.00	5,950.83	-505.93	518.64	724.54	0.00	0.00	0.00
6,100.00	0.00	0.00	6,050.83	-505.93	518.64	724.54	0.00	0.00	0.00
6,200.00	0.00	0.00	6,150.83	-505.93	518.64	724.54	0.00	0.00	0.00
6,300.00	0.00	0.00	6,250.83	-505.93	518.64	724.54	0.00	0.00	0.00
6,400.00	0.00	0.00	6,350.83	-505.93	518.64	724.54	0.00	0.00	0.00
6,500.00	0.00	0.00	6,450.83	-505.93	518.64	724.54	0.00	0.00	0.00
6,600.00	0.00	0.00	6,550.83	-505.93	518.64	724.54	0.00	0.00	0.00
6,700.00	0.00	0.00	6,650.83	-505.93	518.64	724.54	0.00	0.00	0.00
6,800.00	0.00	0.00	6,750.83	-505.93	518.64	724.54	0.00	0.00	0.00
6,829.17	0.00	0.00	6,780.00	-505.93	518.64	724.54	0.00	0.00	0.00
Niobrara									
6,900.00	0.00	0.00	6,850.83	-505.93	518.64	724.54	0.00	0.00	0.00
7,000.00	0.00	0.00	6,950.83	-505.93	518.64	724.54	0.00	0.00	0.00
7,100.00	0.00	0.00	7,050.83	-505.93	518.64	724.54	0.00	0.00	0.00
7,138.17	0.00	0.00	7,089.00	-505.93	518.64	724.54	0.00	0.00	0.00
Fort Hayes									
7,161.17	0.00	0.00	7,112.00	-505.93	518.64	724.54	0.00	0.00	0.00
Codell									
7,200.00	0.00	0.00	7,150.83	-505.93	518.64	724.54	0.00	0.00	0.00
7,300.00	0.00	0.00	7,250.83	-505.93	518.64	724.54	0.00	0.00	0.00
7,321.17	0.00	0.00	7,272.00	-505.93	518.64	724.54	0.00	0.00	0.00
PBHL									

Database:	Southern Region	Local Co-ordinate Reference:	Well #25-2D
Company:	Great Western	TVD Reference:	WELL @ 4760.00usft (Cade 22)
Project:	Weld County, Colorado (NAD 83)	MD Reference:	WELL @ 4760.00usft (Cade 22)
Site:	Detterer FD	North Reference:	Grid
Well:	#25-2D	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	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	-505.93	518.64	1,412,388.11	3,183,847.16	40° 27' 48.6964 N	104° 50' 21.357 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 (°)
2,444.27	2,425.00	Greeley Sand		0.00	
3,534.89	3,505.00	Parkman		0.00	
4,227.64	4,191.00	Sussex		0.00	
4,617.44	4,577.00	Shannon		0.00	
6,829.17	6,780.00	Niobrara		0.00	
7,138.17	7,089.00	Fort Hayes		0.00	
7,161.17	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
600.23	598.93	-19.49	19.98	Begin 8.00° Tangent
5,335.53	5,288.09	-479.94	492.00	Begin 1.50°/100' Drop
5,869.17	5,820.00	-505.93	518.64	Begin Vertical Hold
7,321.17	7,272.00	-505.93	518.64	PBHL