



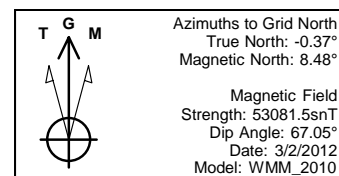
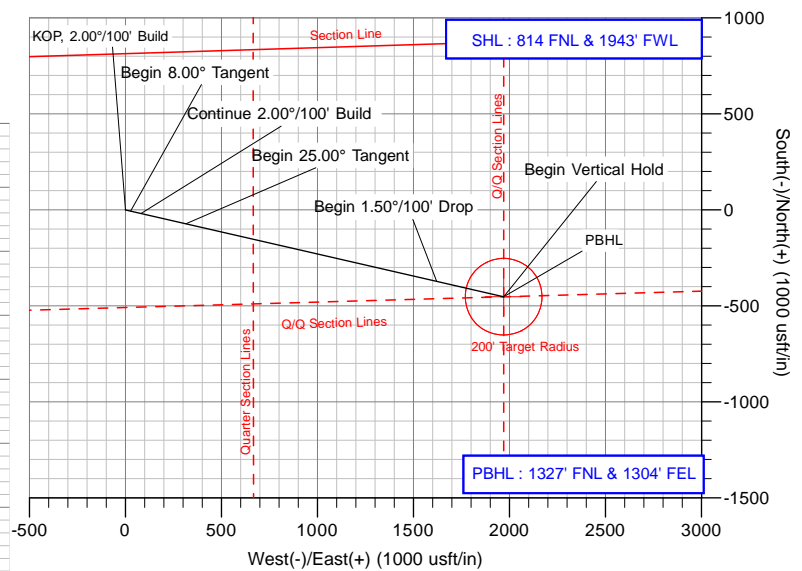
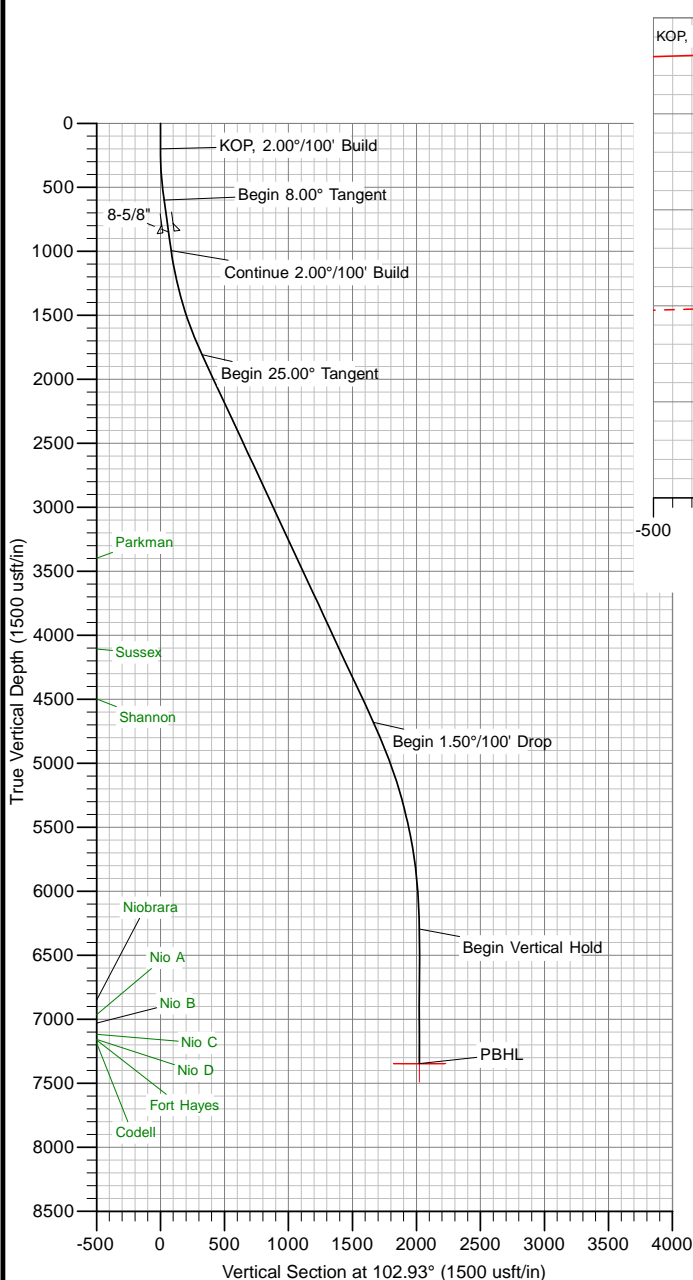
Company: Great Western  
Site: H-Y  
Well: 29-51  
Project: Weld County, Colorado (NAD 83)  
Rig Name: Cade 22



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	V Sect	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	102.93	598.70	-6.24	27.17	27.88	27.88	Begin 8.00° Tangent
1000.00	8.00	102.93	994.81	-18.69	81.43	83.55	83.55	Continue 2.00°/100' Build
1849.95	25.00	102.93	1806.77	-72.49	315.84	324.06	324.06	Begin 25.00° Tangent
5019.93	25.00	102.93	4679.78	-372.17	1621.54	1663.70	1663.70	Begin 1.50°/100' Drop
6686.53	0.00	0.00	6294.00	-452.23	1970.32	2021.55	2021.55	Begin Vertical Hold
7738.53	0.00	0.00	7346.00	-452.23	1970.32	2021.55	2021.55	PBHL



US State Plane 1983  
Colorado Northern Zone

Created By: Allen Slack  
Date: 10:54, March 09 2012  
Plan: Design #1

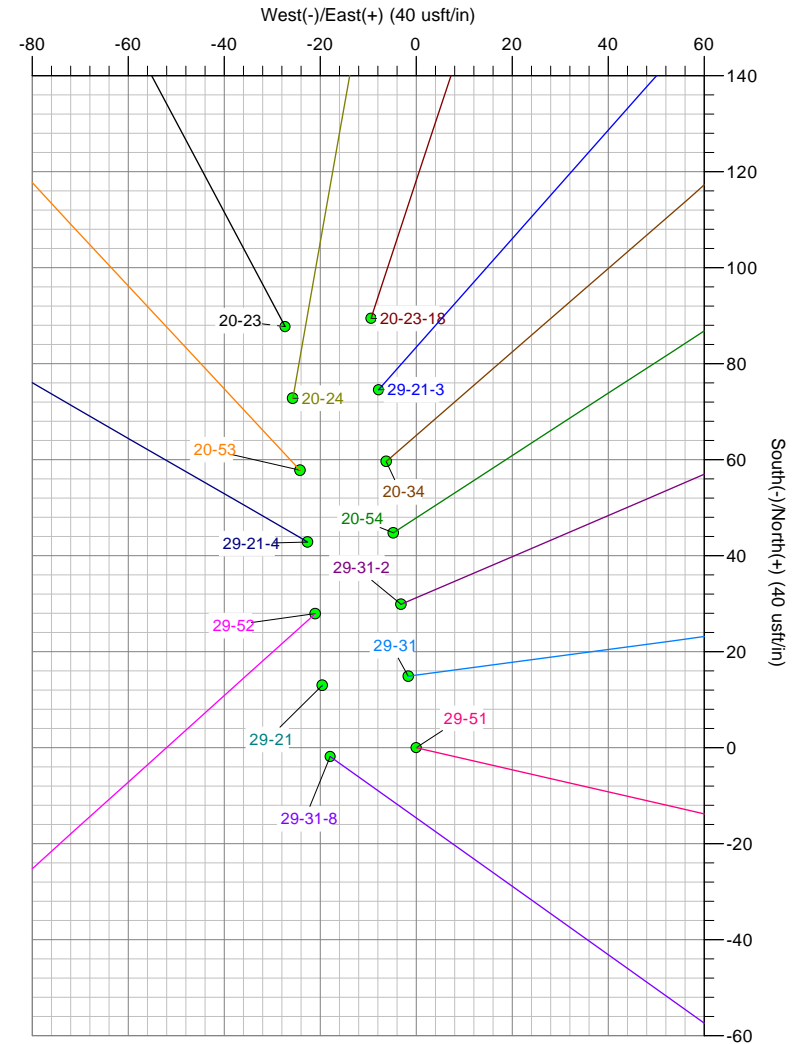
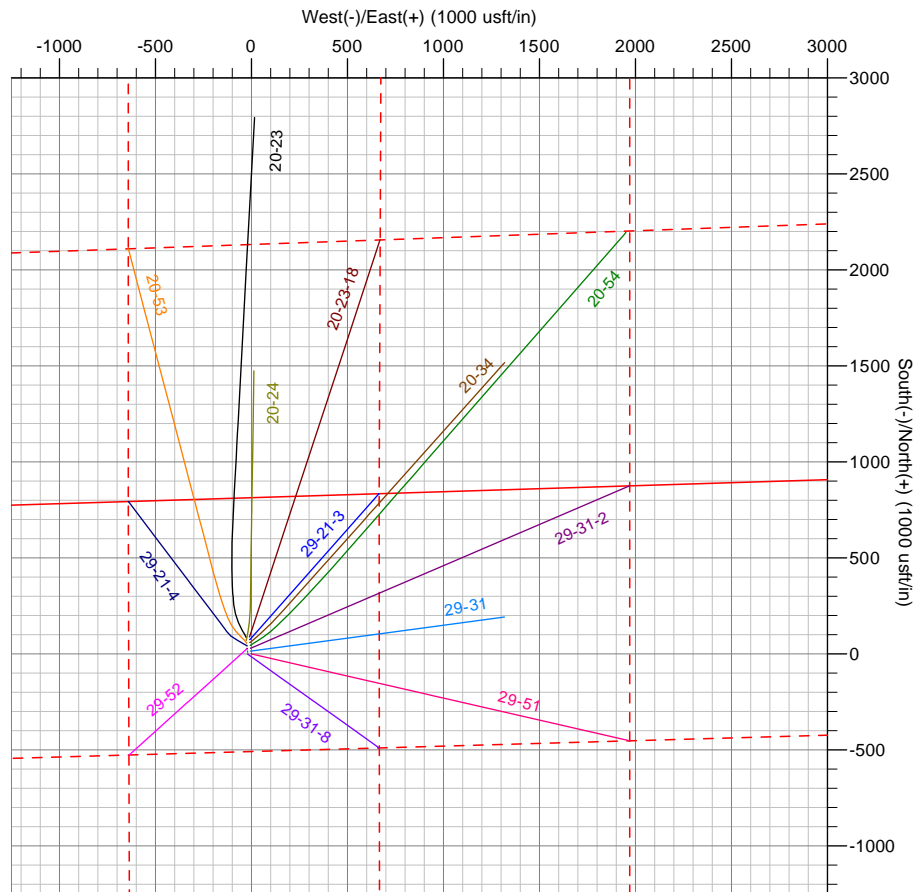
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Company: Great Western  
Site: H-Y  
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# **Great Western**

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

**H-Y**

**29-51**

**Wellbore #1**

**Plan: Design #1**

## **Standard Planning Report**

**09 March, 2012**

<b>Database:</b>	Southern Region	<b>Local Co-ordinate Reference:</b>	Well 29-51
<b>Company:</b>	Great Western	<b>TVD Reference:</b>	WELL @ 4797.00usft (Cade 22)
<b>Project:</b>	Weld County, Colorado (NAD 83)	<b>MD Reference:</b>	WELL @ 4797.00usft (Cade 22)
<b>Site:</b>	H-Y	<b>North Reference:</b>	Grid
<b>Well:</b>	29-51	<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>	29-51			
<b>Well Position</b>	<b>+N/-S</b>	1,412,001.44 usft	<b>Northing:</b>	1,412,001.44 usft
	<b>+E/-W</b>	3,161,530.33 usft	<b>Easting:</b>	3,161,530.33 usft
<b>Position Uncertainty</b>		0.00 usft	<b>Wellhead Elevation:</b>	<b>Latitude:</b> 40° 27' 46.4189 N
				<b>Longitude:</b> 104° 55' 10.120 W
				<b>Ground Level:</b> 4,783.00 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	3/2/2012	8.85	67.05	53,081

<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	102.93

<b>Plan Sections</b>										
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	
600.00	8.00	102.93	598.70	-6.24	27.17	2.00	2.00	0.00	102.93	PBHL v1 - H-Y 29-51
1,000.00	8.00	102.93	994.81	-18.69	81.43	0.00	0.00	0.00	0.00	
1,849.95	25.00	102.93	1,806.77	-72.49	315.84	2.00	2.00	0.00	0.00	
5,019.93	25.00	102.93	4,679.78	-372.17	1,621.54	0.00	0.00	0.00	0.00	
6,686.53	0.00	0.01	6,294.00	-452.23	1,970.32	1.50	-1.50	0.00	180.00	
7,738.53	0.00	0.01	7,346.00	-452.23	1,970.32	0.00	0.00	0.00	0.00	PBHL v1 - H-Y 29-51

<b>Database:</b>	Southern Region	<b>Local Co-ordinate Reference:</b>	Well 29-51
<b>Company:</b>	Great Western	<b>TVD Reference:</b>	WELL @ 4797.00usft (Cade 22)
<b>Project:</b>	Weld County, Colorado (NAD 83)	<b>MD Reference:</b>	WELL @ 4797.00usft (Cade 22)
<b>Site:</b>	H-Y	<b>North Reference:</b>	Grid
<b>Well:</b>	29-51	<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	102.93	299.98	-0.39	1.70	1.75	2.00	2.00	0.00
400.00	4.00	102.93	399.84	-1.56	6.80	6.98	2.00	2.00	0.00
500.00	6.00	102.93	499.45	-3.51	15.30	15.69	2.00	2.00	0.00
600.00	8.00	102.93	598.70	-6.24	27.17	27.88	2.00	2.00	0.00
<b>Begin 8.00° Tangent</b>									
700.00	8.00	102.93	697.73	-9.35	40.74	41.80	0.00	0.00	0.00
800.00	8.00	102.93	796.76	-12.46	54.30	55.71	0.00	0.00	0.00
853.77	8.00	102.93	850.00	-14.14	61.60	63.20	0.00	0.00	0.00
<b>8-5/8"</b>									
900.00	8.00	102.93	895.78	-15.58	67.87	69.63	0.00	0.00	0.00
1,000.00	8.00	102.93	994.81	-18.69	81.43	83.55	0.00	0.00	0.00
<b>Continue 2.00°/100' Build</b>									
1,100.00	10.00	102.93	1,093.57	-22.19	96.68	99.19	2.00	2.00	0.00
1,200.00	12.00	102.93	1,191.73	-26.46	115.27	118.27	2.00	2.00	0.00
1,300.00	14.00	102.93	1,289.16	-31.49	137.20	140.77	2.00	2.00	0.00
1,400.00	16.00	102.93	1,385.75	-37.28	162.42	166.65	2.00	2.00	0.00
1,500.00	18.00	102.93	1,481.38	-43.82	190.92	195.88	2.00	2.00	0.00
1,600.00	20.00	102.93	1,575.92	-51.10	222.65	228.44	2.00	2.00	0.00
1,700.00	22.00	102.93	1,669.28	-59.12	257.57	264.27	2.00	2.00	0.00
1,800.00	24.00	102.93	1,761.32	-67.86	295.66	303.34	2.00	2.00	0.00
1,849.95	25.00	102.93	1,806.77	-72.49	315.84	324.06	2.00	2.00	0.00
<b>Begin 25.00° Tangent</b>									
1,900.00	25.00	102.93	1,852.14	-77.22	336.46	345.21	0.00	0.00	0.00
2,000.00	25.00	102.93	1,942.77	-86.68	377.65	387.47	0.00	0.00	0.00
2,100.00	25.00	102.93	2,033.40	-96.13	418.84	429.73	0.00	0.00	0.00
2,200.00	25.00	102.93	2,124.03	-105.59	460.03	471.99	0.00	0.00	0.00
2,300.00	25.00	102.93	2,214.66	-115.04	501.22	514.25	0.00	0.00	0.00
2,400.00	25.00	102.93	2,305.29	-124.49	542.41	556.51	0.00	0.00	0.00
2,500.00	25.00	102.93	2,395.92	-133.95	583.59	598.77	0.00	0.00	0.00
2,600.00	25.00	102.93	2,486.56	-143.40	624.78	641.03	0.00	0.00	0.00
2,700.00	25.00	102.93	2,577.19	-152.85	665.97	683.29	0.00	0.00	0.00
2,800.00	25.00	102.93	2,667.82	-162.31	707.16	725.55	0.00	0.00	0.00
2,900.00	25.00	102.93	2,758.45	-171.76	748.35	767.81	0.00	0.00	0.00
3,000.00	25.00	102.93	2,849.08	-181.21	789.54	810.07	0.00	0.00	0.00
3,100.00	25.00	102.93	2,939.71	-190.67	830.73	852.33	0.00	0.00	0.00
3,200.00	25.00	102.93	3,030.34	-200.12	871.92	894.59	0.00	0.00	0.00
3,300.00	25.00	102.93	3,120.98	-209.58	913.11	936.85	0.00	0.00	0.00
3,400.00	25.00	102.93	3,211.61	-219.03	954.30	979.11	0.00	0.00	0.00
3,500.00	25.00	102.93	3,302.24	-228.48	995.49	1,021.37	0.00	0.00	0.00
3,600.00	25.00	102.93	3,392.87	-237.94	1,036.68	1,063.63	0.00	0.00	0.00
3,604.56	25.00	102.93	3,397.00	-238.37	1,038.55	1,065.56	0.00	0.00	0.00
<b>Parkman</b>									
3,700.00	25.00	102.93	3,483.50	-247.39	1,077.87	1,105.89	0.00	0.00	0.00
3,800.00	25.00	102.93	3,574.13	-256.84	1,119.06	1,148.15	0.00	0.00	0.00
3,900.00	25.00	102.93	3,664.77	-266.30	1,160.24	1,190.41	0.00	0.00	0.00
4,000.00	25.00	102.93	3,755.40	-275.75	1,201.43	1,232.67	0.00	0.00	0.00
4,100.00	25.00	102.93	3,846.03	-285.21	1,242.62	1,274.93	0.00	0.00	0.00
4,200.00	25.00	102.93	3,936.66	-294.66	1,283.81	1,317.19	0.00	0.00	0.00
4,300.00	25.00	102.93	4,027.29	-304.11	1,325.00	1,359.45	0.00	0.00	0.00

<b>Database:</b>	Southern Region	<b>Local Co-ordinate Reference:</b>	Well 29-51
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<b>Project:</b>	Weld County, Colorado (NAD 83)	<b>MD Reference:</b>	WELL @ 4797.00usft (Cade 22)
<b>Site:</b>	H-Y	<b>North Reference:</b>	Grid
<b>Well:</b>	29-51	<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)	
4,387.95	25.00	102.93	4,107.00	-312.43	1,361.23	1,396.62	0.00	0.00	0.00	
<b>Sussex</b>										
4,400.00	25.00	102.93	4,117.92	-313.57	1,366.19	1,401.71	0.00	0.00	0.00	
4,500.00	25.00	102.93	4,208.55	-323.02	1,407.38	1,443.97	0.00	0.00	0.00	
4,600.00	25.00	102.93	4,299.19	-332.47	1,448.57	1,486.23	0.00	0.00	0.00	
4,700.00	25.00	102.93	4,389.82	-341.93	1,489.76	1,528.50	0.00	0.00	0.00	
4,800.00	25.00	102.93	4,480.45	-351.38	1,530.95	1,570.76	0.00	0.00	0.00	
4,818.26	25.00	102.93	4,497.00	-353.11	1,538.47	1,578.47	0.00	0.00	0.00	
<b>Shannon</b>										
4,900.00	25.00	102.93	4,571.08	-360.84	1,572.14	1,613.02	0.00	0.00	0.00	
5,000.00	25.00	102.93	4,661.71	-370.29	1,613.33	1,655.28	0.00	0.00	0.00	
5,019.93	25.00	102.93	4,679.78	-372.17	1,621.54	1,663.70	0.00	0.00	0.00	
<b>Begin 1.50°/100' Drop</b>										
5,100.00	23.80	102.93	4,752.69	-379.57	1,653.77	1,696.77	1.50	-1.50	0.00	
5,200.00	22.30	102.93	4,844.71	-388.33	1,691.93	1,735.92	1.50	-1.50	0.00	
5,300.00	20.80	102.93	4,937.72	-396.55	1,727.73	1,772.65	1.50	-1.50	0.00	
5,400.00	19.30	102.93	5,031.65	-404.21	1,761.14	1,806.93	1.50	-1.50	0.00	
5,500.00	17.80	102.93	5,126.46	-411.33	1,792.14	1,838.74	1.50	-1.50	0.00	
5,600.00	16.30	102.93	5,222.06	-417.89	1,820.71	1,868.05	1.50	-1.50	0.00	
5,700.00	14.80	102.93	5,318.40	-423.88	1,846.84	1,894.86	1.50	-1.50	0.00	
5,800.00	13.30	102.93	5,415.40	-429.31	1,870.50	1,919.13	1.50	-1.50	0.00	
5,900.00	11.80	102.93	5,513.01	-434.17	1,891.67	1,940.86	1.50	-1.50	0.00	
6,000.00	10.30	102.93	5,611.16	-438.46	1,910.35	1,960.02	1.50	-1.50	0.00	
6,100.00	8.80	102.93	5,709.77	-442.17	1,926.51	1,976.61	1.50	-1.50	0.00	
6,200.00	7.30	102.93	5,808.78	-445.30	1,940.16	1,990.61	1.50	-1.50	0.00	
6,300.00	5.80	102.93	5,908.13	-447.85	1,951.27	2,002.01	1.50	-1.50	0.00	
6,400.00	4.30	102.93	6,007.74	-449.82	1,959.85	2,010.81	1.50	-1.50	0.00	
6,500.00	2.80	102.93	6,107.54	-451.21	1,965.88	2,017.00	1.50	-1.50	0.00	
6,600.00	1.30	102.93	6,207.47	-452.01	1,969.36	2,020.57	1.50	-1.50	0.00	
6,686.53	0.00	0.01	6,294.00	-452.23	1,970.32	2,021.55	1.50	-1.50	0.00	
<b>Begin Vertical Hold</b>										
6,700.00	0.00	0.01	6,307.47	-452.23	1,970.32	2,021.55	0.00	0.00	0.00	
6,800.00	0.00	0.01	6,407.47	-452.23	1,970.32	2,021.55	0.00	0.00	0.00	
6,900.00	0.00	0.01	6,507.47	-452.23	1,970.32	2,021.55	0.00	0.00	0.00	
7,000.00	0.00	0.01	6,607.47	-452.23	1,970.32	2,021.55	0.00	0.00	0.00	
7,100.00	0.00	0.01	6,707.47	-452.23	1,970.32	2,021.55	0.00	0.00	0.00	
7,200.00	0.00	0.01	6,807.47	-452.23	1,970.32	2,021.55	0.00	0.00	0.00	
7,242.53	0.00	0.01	6,850.00	-452.23	1,970.32	2,021.55	0.00	0.00	0.00	
<b>Niobrara</b>										
7,300.00	0.00	0.01	6,907.47	-452.23	1,970.32	2,021.55	0.00	0.00	0.00	
7,356.53	0.00	0.01	6,964.00	-452.23	1,970.32	2,021.55	0.00	0.00	0.00	
<b>Nio A</b>										
7,400.00	0.00	0.01	7,007.47	-452.23	1,970.32	2,021.55	0.00	0.00	0.00	
7,422.53	0.00	0.01	7,030.00	-452.23	1,970.32	2,021.55	0.00	0.00	0.00	
<b>Nio B</b>										
7,500.00	0.00	0.01	7,107.47	-452.23	1,970.32	2,021.55	0.00	0.00	0.00	
7,509.53	0.00	0.01	7,117.00	-452.23	1,970.32	2,021.55	0.00	0.00	0.00	
<b>Nio C</b>										
7,549.53	0.00	0.01	7,157.00	-452.23	1,970.32	2,021.55	0.00	0.00	0.00	
<b>Nio D</b>										
7,553.53	0.00	0.01	7,161.00	-452.23	1,970.32	2,021.55	0.00	0.00	0.00	
<b>Fort Hayes</b>										
7,578.53	0.00	0.01	7,186.00	-452.23	1,970.32	2,021.55	0.00	0.00	0.00	

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<b>Project:</b>	Weld County, Colorado (NAD 83)	<b>MD Reference:</b>	WELL @ 4797.00usft (Cade 22)
<b>Site:</b>	H-Y	<b>North Reference:</b>	Grid
<b>Well:</b>	29-51	<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)
<b>Codell</b>									
7,600.00	0.00	0.01	7,207.47	-452.23	1,970.32	2,021.55	0.00	0.00	0.00
7,700.00	0.00	0.01	7,307.47	-452.23	1,970.32	2,021.55	0.00	0.00	0.00
7,738.53	0.00	0.01	7,346.00	-452.23	1,970.32	2,021.55	0.00	0.00	0.00
<b>PBHL</b>									

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									
PBHL v1 - H-Y 29-51	0.00	0.01	7,346.00	-452.23	1,970.32	1,411,549.21	3,163,500.65	40° 27' 41.8219 N	104° 54' 44.667 W
- plan hits target center									
- Circle (radius 200.00)									

Casing Points					
Measured Depth (usft)	Vertical Depth (usft)	Name	Casing Diameter (")	Hole Diameter (")	
853.77	850.00	8-5/8"	8-5/8	12-1/4	

Formations						
Measured Depth (usft)	Vertical Depth (usft)	Name	Lithology	Dip (°)	Dip Direction (°)	
3,604.56	3,397.00	Parkman		0.00		
4,387.95	4,107.00	Sussex		0.00		
4,818.26	4,497.00	Shannon		0.00		
7,242.53	6,850.00	Niobrara		0.00		
7,356.53	6,964.00	Nio A		0.00		
7,422.53	7,030.00	Nio B		0.00		
7,509.53	7,117.00	Nio C		0.00		
7,549.53	7,157.00	Nio D		0.00		
7,553.53	7,161.00	Fort Hayes		0.00		
7,578.53	7,186.00	Codell		0.00		

Plan Annotations					
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates			
		+N/-S (usft)	+E/-W (usft)	Comment	
200.00	200.00	0.00	0.00	KOP, 2.00°/100' Build	
600.00	598.70	-6.24	27.17	Begin 8.00° Tangent	
1,000.00	994.81	-18.69	81.43	Continue 2.00°/100' Build	
1,849.95	1,806.77	-72.49	315.84	Begin 25.00° Tangent	
5,019.93	4,679.78	-372.17	1,621.54	Begin 1.50°/100' Drop	
6,686.53	6,294.00	-452.23	1,970.32	Begin Vertical Hold	
7,738.53	7,346.00	-452.23	1,970.32	PBHL	