

Great Western

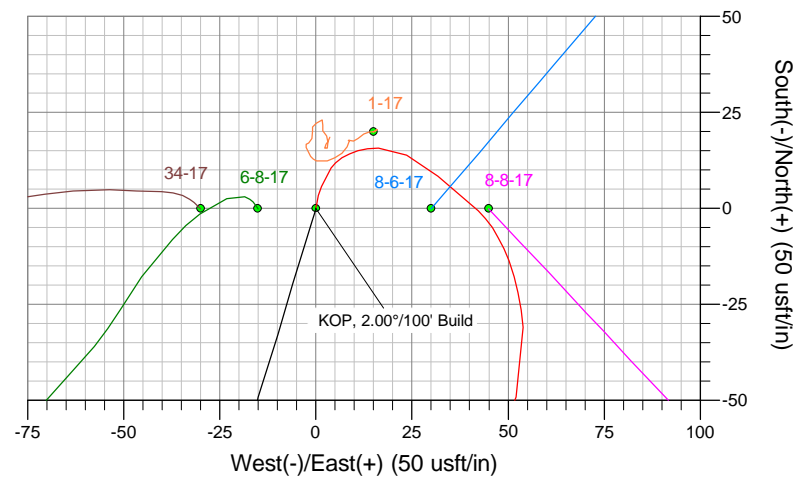
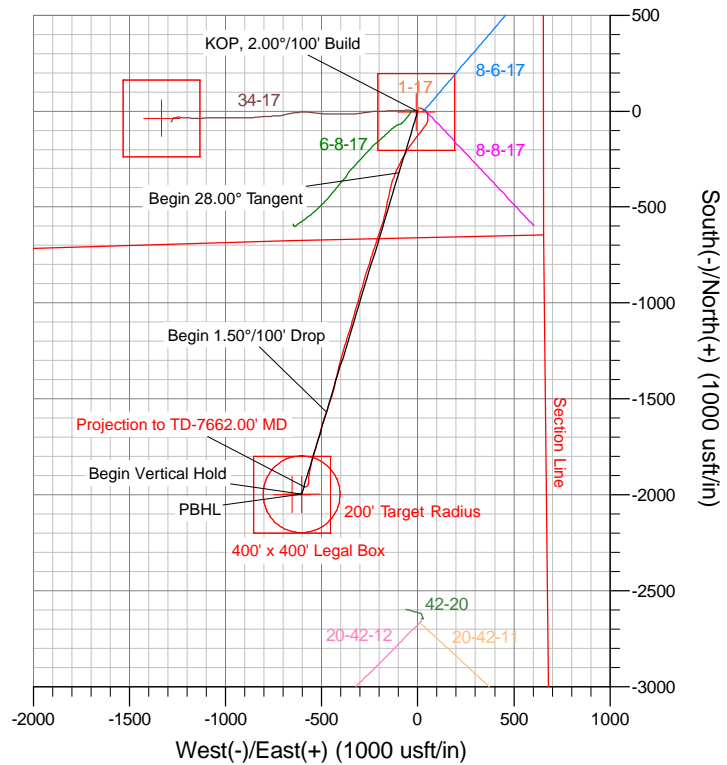
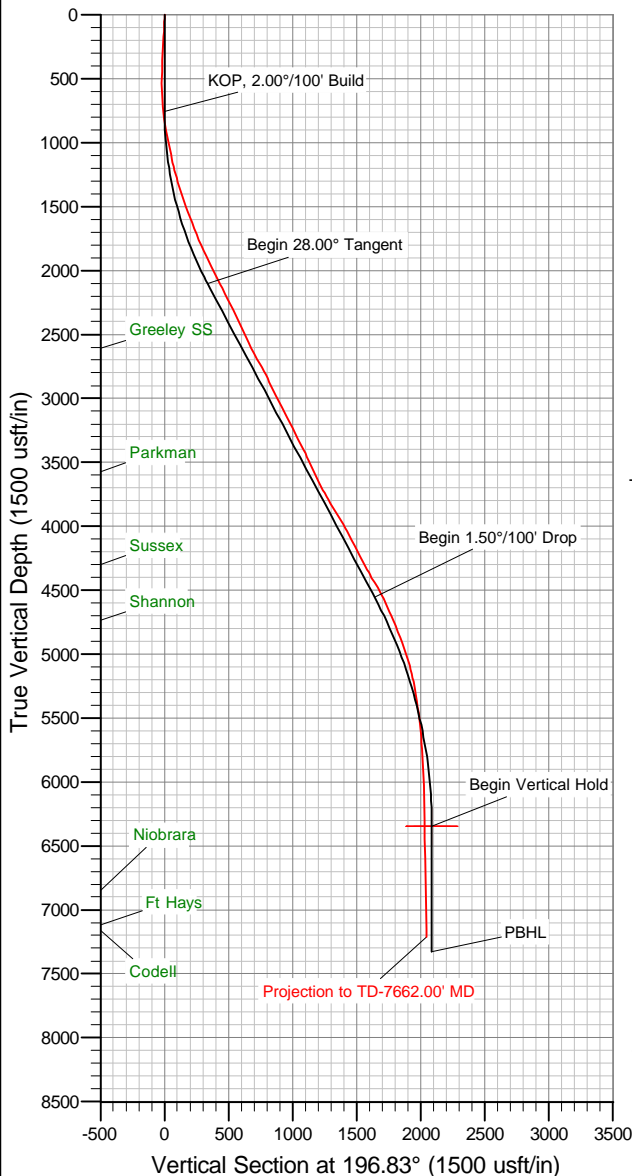
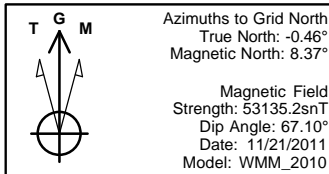
Company: Great Western
Site: Hood
Well: 6-2-20
Project: Weld County, Colorado (NAD 83)
Rig Name: Cade 22



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
756.00	0.00	0.00	756.00	0.00	0.00	0.00	0.00	KOP, 2.00°/100' Build
2156.20	28.00	196.83	2101.11	-321.05	-97.12	335.42	335.42	Begin 28.00° Tangent
4933.82	28.00	196.83	4553.52	-1569.38	-474.73	1639.61	1639.61	Begin 1.50°/100' Drop
6800.75	0.00	0.00	6347.00	-1997.45	-604.22	2086.84	2086.84	Begin Vertical Hold
7778.75	0.00	0.00	7325.00	-1997.45	-604.22	2086.84	2086.84	PBHL



US State Plane 1983
Colorado Northern Zone

Created By: Megan Pope
Date: 12:46, November 28 2011
Plan: Design #1

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Great Western

Weld County, Colorado (NAD 83)

Hood

6-2-20

Wellbore #1

Survey: MS MWD

Standard Survey Report

28 November, 2011

Company:	Great Western	Local Co-ordinate Reference:	Well 6-2-20
Project:	Weld County, Colorado (NAD 83)	TVD Reference:	WELL @ 4785.00usft (Cade 22)
Site:	Hood	MD Reference:	WELL @ 4785.00usft (Cade 22)
Well:	6-2-20	North Reference:	Grid
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Surveys	Database:	Southern Region

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	6-2-20				
Well Position	+N/-S	0.00 usft	Northing:	1,419,464.47 usft	Latitude: 40° 28' 57.6842 N
	+E/-W	0.00 usft	Easting:	3,196,170.22 usft	Longitude: 104° 47' 41.198 W
Position Uncertainty		0.00 usft	Wellhead Elevation:	usft	Ground Level: 4,771.00 usft

Wellbore	Wellbore #1				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	WMM_2010	11/21/11	8.82	67.10	53,135

Design	Surveys				
Audit Notes:					
Version:	1.0	Phase:	ACTUAL	Tie On Depth:	0.00
Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)	Direction (°)	
	0.00	0.00	0.00		196.83

Survey Program	Date	11/28/11			
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description	
82.00	7,662.00	MS MWD (Wellbore #1)	MWD	MWD - Standard	

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	
82.00	2.20	10.20	81.98	1.55	0.28	-1.56	2.68	2.68	0.00	
171.00	3.30	19.30	170.88	5.65	1.43	-5.82	1.33	1.24	10.22	
262.00	3.60	35.00	261.71	10.46	3.93	-11.15	1.09	0.33	17.25	
353.00	4.40	65.90	352.50	14.23	8.76	-16.15	2.49	0.88	33.96	
444.00	5.40	90.40	443.18	15.62	16.23	-19.65	2.52	1.10	26.92	
536.00	4.40	120.00	534.85	13.83	23.61	-20.07	2.91	-1.09	32.17	
627.00	8.00	126.10	625.31	8.35	31.76	-17.19	4.02	3.96	6.70	
724.00	8.40	134.70	721.32	-0.61	42.25	-11.65	1.33	0.41	8.87	
818.00	10.70	159.30	814.05	-13.61	50.22	-1.51	4.93	2.45	26.17	
912.00	11.40	176.10	906.33	-31.05	53.93	14.10	3.49	0.74	17.87	
1,006.00	11.40	195.00	998.51	-49.30	52.16	32.08	3.96	0.00	20.11	
1,101.00	11.30	212.00	1,091.68	-66.26	44.80	50.45	3.51	-0.11	17.89	
1,197.00	14.20	215.00	1,185.30	-83.89	33.06	70.72	3.10	3.02	3.13	
1,292.00	16.70	216.90	1,276.86	-104.35	18.17	94.62	2.68	2.63	2.00	

Company:	Great Western	Local Co-ordinate Reference:	Well 6-2-20
Project:	Weld County, Colorado (NAD 83)	TVD Reference:	WELL @ 4785.00usft (Cade 22)
Site:	Hood	MD Reference:	WELL @ 4785.00usft (Cade 22)
Well:	6-2-20	North Reference:	Grid
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Surveys	Database:	Southern Region

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)	
1,387.00	19.20	218.30	1,367.23	-127.53	0.29	121.98	2.67	2.63	1.47	
1,481.00	19.80	216.40	1,455.84	-152.47	-18.73	151.37	0.93	0.64	-2.02	
1,573.00	21.30	215.00	1,541.98	-178.71	-37.57	181.93	1.72	1.63	-1.52	
1,666.00	21.60	211.00	1,628.55	-207.22	-56.07	214.58	1.61	0.32	-4.30	
1,760.00	23.10	208.70	1,715.48	-238.22	-73.84	249.40	1.85	1.60	-2.45	
1,855.00	24.80	207.40	1,802.30	-272.26	-91.96	287.23	1.87	1.79	-1.37	
1,949.00	26.10	203.90	1,887.18	-308.67	-109.41	327.13	2.11	1.38	-3.72	
2,041.00	26.50	200.60	1,969.66	-346.39	-124.83	367.70	1.65	0.43	-3.59	
2,134.00	25.60	195.00	2,053.23	-385.23	-137.33	408.49	2.81	-0.97	-6.02	
2,229.00	27.50	192.50	2,138.21	-426.47	-147.40	450.88	2.32	2.00	-2.63	
2,324.00	26.20	190.60	2,222.97	-468.50	-156.00	493.60	1.64	-1.37	-2.00	
2,419.00	25.50	191.80	2,308.46	-509.13	-164.04	534.82	0.92	-0.74	1.26	
2,513.00	25.70	194.80	2,393.24	-548.64	-173.38	575.34	1.40	0.21	3.19	
2,608.00	25.50	197.30	2,478.91	-588.08	-184.73	616.38	1.16	-0.21	2.63	
2,703.00	26.10	198.00	2,564.44	-627.48	-197.27	657.72	0.71	0.63	0.74	
2,798.00	27.80	199.10	2,649.12	-668.29	-210.97	700.75	1.86	1.79	1.16	
2,893.00	29.20	198.10	2,732.61	-711.26	-225.42	746.06	1.56	1.47	-1.05	
2,984.00	27.30	196.40	2,812.77	-752.38	-238.21	789.12	2.27	-2.09	-1.87	
3,082.00	25.40	199.00	2,900.59	-793.82	-251.40	832.61	2.27	-1.94	2.65	
3,174.00	27.10	198.70	2,983.09	-832.33	-264.55	873.27	1.85	1.85	-0.33	
3,268.00	26.90	196.40	3,066.85	-873.01	-277.42	915.93	1.13	-0.21	-2.45	
3,361.00	26.70	195.60	3,149.86	-913.31	-288.97	957.86	0.44	-0.22	-0.86	
3,455.00	26.70	195.00	3,233.84	-954.05	-300.12	1,000.08	0.29	0.00	-0.64	
3,550.00	26.90	195.60	3,318.63	-995.37	-311.42	1,042.90	0.35	0.21	0.63	
3,644.00	27.00	196.90	3,402.43	-1,036.26	-323.34	1,085.50	0.64	0.11	1.38	
3,737.00	24.50	195.50	3,486.19	-1,075.05	-334.64	1,125.89	2.77	-2.69	-1.51	
3,831.00	25.20	197.30	3,571.48	-1,112.94	-345.80	1,165.39	1.10	0.74	1.91	
3,925.00	25.80	197.60	3,656.33	-1,151.54	-357.93	1,205.85	0.65	0.64	0.32	
4,020.00	29.20	197.70	3,740.58	-1,193.34	-371.23	1,249.71	3.58	3.58	0.11	
4,114.00	31.00	195.70	3,821.90	-1,238.49	-384.76	1,296.84	2.19	1.91	-2.13	
4,210.00	31.30	194.60	3,904.06	-1,286.42	-397.73	1,346.48	0.67	0.31	-1.15	
4,304.00	30.40	194.20	3,984.76	-1,333.11	-409.72	1,394.64	0.98	-0.96	-0.43	
4,398.00	28.10	193.10	4,066.77	-1,377.73	-420.57	1,440.49	2.51	-2.45	-1.17	
4,493.00	26.90	191.70	4,151.04	-1,420.57	-430.00	1,484.23	1.43	-1.26	-1.47	
4,588.00	27.30	195.00	4,235.61	-1,462.66	-440.00	1,527.41	1.64	0.42	3.47	
4,682.00	28.10	199.30	4,318.85	-1,504.38	-452.90	1,571.08	2.29	0.85	4.57	
4,777.00	31.10	197.90	4,401.44	-1,548.86	-467.84	1,617.97	3.24	3.16	-1.47	
4,870.00	29.20	197.90	4,481.85	-1,593.30	-482.19	1,664.67	2.04	-2.04	0.00	
4,965.00	26.60	197.40	4,565.81	-1,635.66	-495.68	1,709.11	2.75	-2.74	-0.53	
5,151.00	22.40	196.60	4,735.02	-1,709.39	-518.27	1,786.23	2.27	-2.26	-0.43	
5,247.00	21.20	196.50	4,824.15	-1,743.56	-528.42	1,821.88	1.25	-1.25	-0.10	
5,341.00	20.00	195.80	4,912.14	-1,775.33	-537.63	1,854.95	1.30	-1.28	-0.74	
5,436.00	18.30	194.50	5,001.88	-1,805.40	-545.78	1,886.10	1.84	-1.79	-1.37	
5,530.00	15.50	192.10	5,091.81	-1,831.98	-552.11	1,913.36	3.07	-2.98	-2.55	

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Survey										
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5,625.00	13.00	192.20	5,183.88	-1,854.84	-557.03	1,936.67	2.63	-2.63	0.11	
5,720.00	10.60	191.40	5,276.87	-1,873.85	-561.02	1,956.02	2.53	-2.53	-0.84	
5,814.00	8.30	189.40	5,369.59	-1,889.02	-563.84	1,971.36	2.47	-2.45	-2.13	
5,908.00	6.70	187.40	5,462.78	-1,901.15	-565.65	1,983.50	1.72	-1.70	-2.13	
6,001.00	5.60	180.30	5,555.25	-1,911.07	-566.37	1,993.20	1.44	-1.18	-7.63	
6,096.00	5.40	189.80	5,649.81	-1,920.11	-567.16	2,002.08	0.98	-0.21	10.00	
6,190.00	4.30	179.10	5,743.47	-1,927.99	-567.86	2,009.83	1.51	-1.17	-11.38	
6,472.00	1.50	202.10	6,025.09	-1,941.99	-569.08	2,023.57	1.06	-0.99	8.16	
6,753.00	0.70	187.80	6,306.04	-1,947.09	-570.70	2,028.93	0.30	-0.28	-5.09	
7,037.00	1.80	216.00	6,589.97	-1,952.42	-573.55	2,034.86	0.43	0.39	9.93	
7,319.00	1.40	234.90	6,871.86	-1,957.99	-578.97	2,041.75	0.23	-0.14	6.70	
7,601.00	1.50	259.20	7,153.77	-1,960.66	-585.42	2,046.18	0.22	0.04	8.62	
7,662.00	1.50	259.20	7,214.75	-1,960.96	-586.99	2,046.92	0.00	0.00	0.00	
Projection to TD-7662.00' MD										

Survey Annotations					
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates			
		+N/-S (usft)	+E/-W (usft)	Comment	
7,662.00	7,214.75	-1,960.96	-586.99	Projection to TD-7662.00' MD	