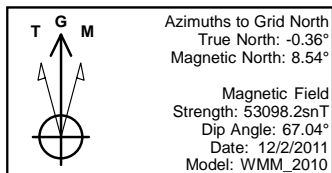
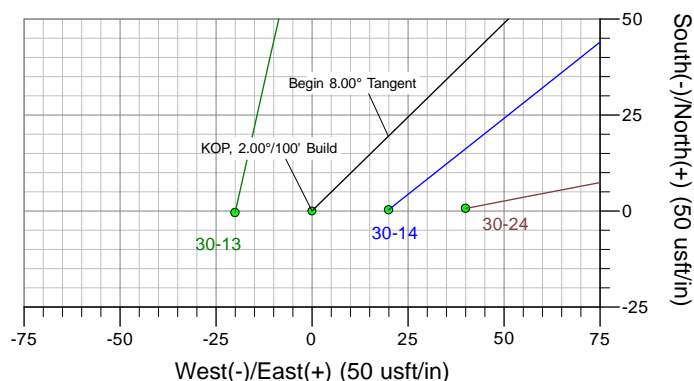
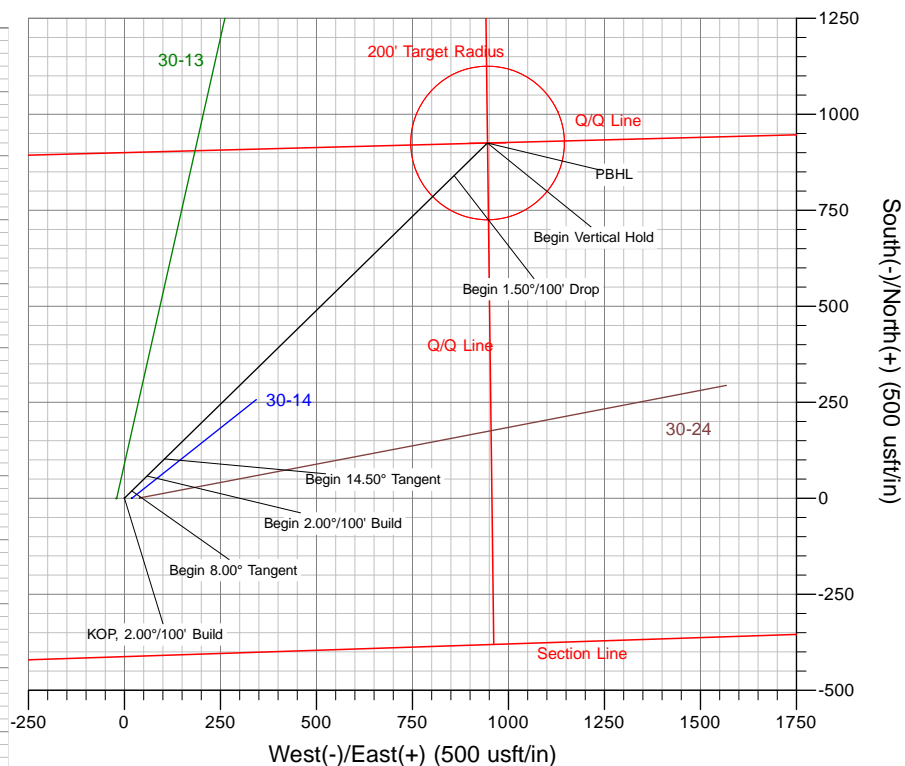
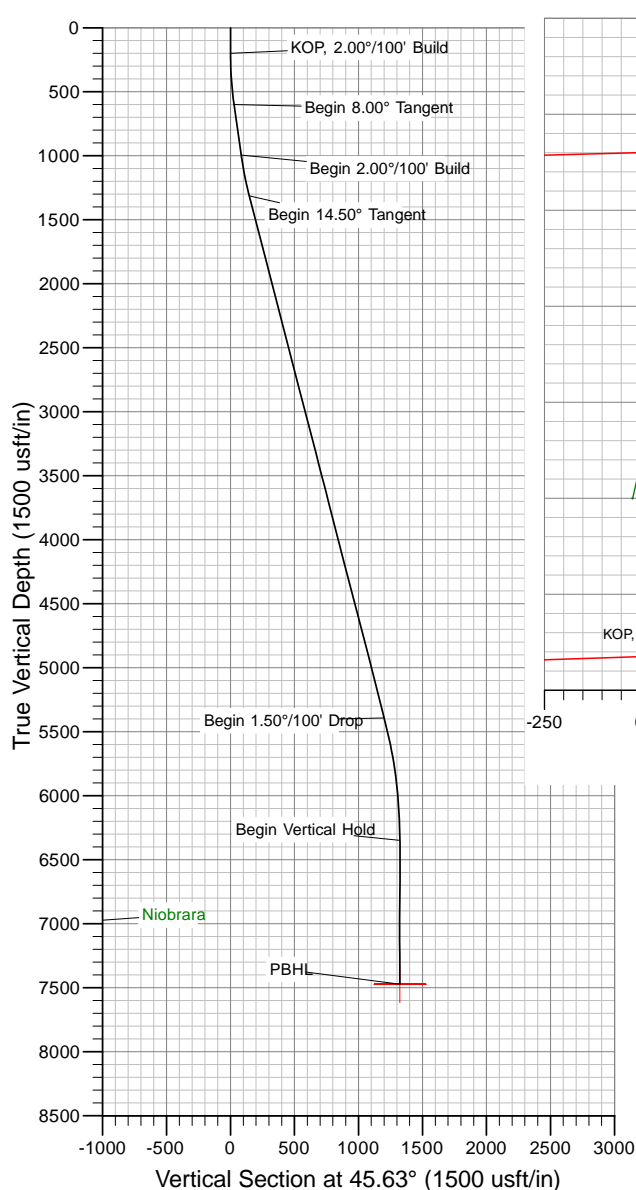


ANNOTATIONS

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
600.00	8.00	45.63	598.70	19.50	19.93	27.88	27.88	Begin 8.00° Tangent
1000.00	8.00	45.63	994.81	58.43	59.72	83.55	83.55	Begin 2.00°/100' Build
1325.07	14.50	45.63	1313.46	102.75	105.03	146.94	146.94	Begin 14.50° Tangent
5537.34	14.50	45.63	5391.53	840.34	859.01	1201.70	1201.70	Begin 1.50°/100' Drop
6504.09	0.00	0.00	6348.00	925.44	946.00	1323.39	1323.39	Begin Vertical Hold
7628.09	0.00	0.00	7472.00	925.44	946.00	1323.39	1323.39	PBHL


 US State Plane 1983
 Colorado Northern Zone

 Created By: Vanessa Thom
 Date: 10:49, December 06 2011
 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.

Great Western

Weld County, Colorado (NAD 83)

Raindance

30-53

Wellbore #1

Plan: Design #1

Standard Planning Report

06 December, 2011

Database:	Southern Region	Local Co-ordinate Reference:	Well 30-53
Company:	Great Western	TVD Reference:	WELL @ 4967.00usft (Cade 22)
Project:	Weld County, Colorado (NAD 83)	MD Reference:	WELL @ 4967.00usft (Cade 22)
Site:	Raindance	North Reference:	Grid
Well:	30-53	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	30-53			
Well Position	+N/-S	1,407,816.07 usft	Northing:	1,407,816.07 usft
	+E/-W	3,154,952.74 usft	Easting:	3,154,952.74 usft
Position Uncertainty		0.00 usft	Wellhead Elevation:	
			Latitude:	40° 27' 5.4770 N
			Longitude:	104° 56' 35.558 W
			Ground Level:	4,953.00 usft

Wellbore	Wellbore #1				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	WMM_2010	12/2/2011	8.90	67.04	53,098

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	45.63

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	
600.00	8.00	45.63	598.70	19.50	19.93	2.00	2.00	0.00	45.63	PBHL v1 - Raindance
1,000.00	8.00	45.63	994.81	58.43	59.72	0.00	0.00	0.00	0.00	
1,325.07	14.50	45.63	1,313.46	102.75	105.03	2.00	2.00	0.00	0.00	
5,537.34	14.50	45.63	5,391.53	840.34	859.01	0.00	0.00	0.00	0.00	
6,504.09	0.00	0.00	6,348.00	925.44	946.00	1.50	-1.50	0.00	180.00	
7,628.09	0.00	0.00	7,472.00	925.44	946.00	0.00	0.00	0.00	0.00	PBHL v1 - Raindance

Database:	Southern Region	Local Co-ordinate Reference:	Well 30-53
Company:	Great Western	TVD Reference:	WELL @ 4967.00usft (Cade 22)
Project:	Weld County, Colorado (NAD 83)	MD Reference:	WELL @ 4967.00usft (Cade 22)
Site:	Raindance	North Reference:	Grid
Well:	30-53	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	45.63	299.98	1.22	1.25	1.75	2.00	2.00	0.00
400.00	4.00	45.63	399.84	4.88	4.99	6.98	2.00	2.00	0.00
500.00	6.00	45.63	499.45	10.97	11.22	15.69	2.00	2.00	0.00
600.00	8.00	45.63	598.70	19.50	19.93	27.88	2.00	2.00	0.00
Begin 8.00° Tangent									
601.31	8.00	45.63	600.00	19.62	20.06	28.06	0.00	0.00	0.00
9 5/8"									
700.00	8.00	45.63	697.73	29.23	29.88	41.80	0.00	0.00	0.00
800.00	8.00	45.63	796.76	38.96	39.83	55.71	0.00	0.00	0.00
900.00	8.00	45.63	895.78	48.69	49.78	69.63	0.00	0.00	0.00
1,000.00	8.00	45.63	994.81	58.43	59.72	83.55	0.00	0.00	0.00
Begin 2.00°/100' Build									
1,100.00	10.00	45.63	1,093.57	69.36	70.91	99.19	2.00	2.00	0.00
1,200.00	12.00	45.63	1,191.73	82.71	84.54	118.27	2.00	2.00	0.00
1,300.00	14.00	45.63	1,289.16	98.44	100.62	140.77	2.00	2.00	0.00
1,325.07	14.50	45.63	1,313.46	102.75	105.03	146.94	2.00	2.00	0.00
Begin 14.50° Tangent									
1,400.00	14.50	45.63	1,386.00	115.87	118.45	165.70	0.00	0.00	0.00
1,500.00	14.50	45.63	1,482.82	133.38	136.35	190.74	0.00	0.00	0.00
1,600.00	14.50	45.63	1,579.63	150.89	154.25	215.78	0.00	0.00	0.00
1,700.00	14.50	45.63	1,676.45	168.40	172.15	240.82	0.00	0.00	0.00
1,800.00	14.50	45.63	1,773.26	185.92	190.05	265.86	0.00	0.00	0.00
1,900.00	14.50	45.63	1,870.07	203.43	207.95	290.90	0.00	0.00	0.00
2,000.00	14.50	45.63	1,966.89	220.94	225.84	315.94	0.00	0.00	0.00
2,100.00	14.50	45.63	2,063.70	238.45	243.74	340.98	0.00	0.00	0.00
2,200.00	14.50	45.63	2,160.52	255.96	261.64	366.02	0.00	0.00	0.00
2,300.00	14.50	45.63	2,257.33	273.47	279.54	391.06	0.00	0.00	0.00
2,400.00	14.50	45.63	2,354.15	290.98	297.44	416.10	0.00	0.00	0.00
2,500.00	14.50	45.63	2,450.96	308.49	315.34	441.14	0.00	0.00	0.00
2,600.00	14.50	45.63	2,547.77	326.00	333.24	466.18	0.00	0.00	0.00
2,700.00	14.50	45.63	2,644.59	343.51	351.14	491.22	0.00	0.00	0.00
2,800.00	14.50	45.63	2,741.40	361.02	369.04	516.26	0.00	0.00	0.00
2,900.00	14.50	45.63	2,838.22	378.53	386.94	541.30	0.00	0.00	0.00
3,000.00	14.50	45.63	2,935.03	396.04	404.84	566.34	0.00	0.00	0.00
3,100.00	14.50	45.63	3,031.85	413.55	422.74	591.38	0.00	0.00	0.00
3,200.00	14.50	45.63	3,128.66	431.06	440.64	616.42	0.00	0.00	0.00
3,300.00	14.50	45.63	3,225.47	448.57	458.54	641.46	0.00	0.00	0.00
3,400.00	14.50	45.63	3,322.29	466.08	476.44	666.50	0.00	0.00	0.00
3,500.00	14.50	45.63	3,419.10	483.59	494.34	691.54	0.00	0.00	0.00
3,600.00	14.50	45.63	3,515.92	501.10	512.24	716.58	0.00	0.00	0.00
3,700.00	14.50	45.63	3,612.73	518.62	530.14	741.62	0.00	0.00	0.00
3,800.00	14.50	45.63	3,709.54	536.13	548.04	766.66	0.00	0.00	0.00
3,900.00	14.50	45.63	3,806.36	553.64	565.94	791.71	0.00	0.00	0.00
4,000.00	14.50	45.63	3,903.17	571.15	583.84	816.75	0.00	0.00	0.00
4,100.00	14.50	45.63	3,999.99	588.66	601.74	841.79	0.00	0.00	0.00
4,200.00	14.50	45.63	4,096.80	606.17	619.64	866.83	0.00	0.00	0.00
4,300.00	14.50	45.63	4,193.62	623.68	637.53	891.87	0.00	0.00	0.00
4,400.00	14.50	45.63	4,290.43	641.19	655.43	916.91	0.00	0.00	0.00
4,500.00	14.50	45.63	4,387.24	658.70	673.33	941.95	0.00	0.00	0.00
4,600.00	14.50	45.63	4,484.06	676.21	691.23	966.99	0.00	0.00	0.00

Database:	Southern Region	Local Co-ordinate Reference:	Well 30-53
Company:	Great Western	TVD Reference:	WELL @ 4967.00usft (Cade 22)
Project:	Weld County, Colorado (NAD 83)	MD Reference:	WELL @ 4967.00usft (Cade 22)
Site:	Raindance	North Reference:	Grid
Well:	30-53	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)
4,700.00	14.50	45.63	4,580.87	693.72	709.13	992.03	0.00	0.00	0.00
4,800.00	14.50	45.63	4,677.69	711.23	727.03	1,017.07	0.00	0.00	0.00
4,900.00	14.50	45.63	4,774.50	728.74	744.93	1,042.11	0.00	0.00	0.00
5,000.00	14.50	45.63	4,871.31	746.25	762.83	1,067.15	0.00	0.00	0.00
5,100.00	14.50	45.63	4,968.13	763.76	780.73	1,092.19	0.00	0.00	0.00
5,200.00	14.50	45.63	5,064.94	781.27	798.63	1,117.23	0.00	0.00	0.00
5,300.00	14.50	45.63	5,161.76	798.78	816.53	1,142.27	0.00	0.00	0.00
5,400.00	14.50	45.63	5,258.57	816.29	834.43	1,167.31	0.00	0.00	0.00
5,500.00	14.50	45.63	5,355.39	833.80	852.33	1,192.35	0.00	0.00	0.00
5,537.34	14.50	45.63	5,391.53	840.34	859.01	1,201.70	0.00	0.00	0.00
Begin 1.50°/100' Drop									
5,600.00	13.56	45.63	5,452.33	850.97	869.87	1,216.89	1.50	-1.50	0.00
5,700.00	12.06	45.63	5,549.83	866.47	885.72	1,239.06	1.50	-1.50	0.00
5,800.00	10.56	45.63	5,647.89	880.19	899.74	1,258.68	1.50	-1.50	0.00
5,900.00	9.06	45.63	5,746.42	892.10	911.92	1,275.72	1.50	-1.50	0.00
6,000.00	7.56	45.63	5,845.37	902.21	922.26	1,290.17	1.50	-1.50	0.00
6,100.00	6.06	45.63	5,944.66	910.51	930.73	1,302.03	1.50	-1.50	0.00
6,200.00	4.56	45.63	6,044.23	916.98	937.35	1,311.29	1.50	-1.50	0.00
6,300.00	3.06	45.63	6,144.00	921.63	942.10	1,317.94	1.50	-1.50	0.00
6,400.00	1.56	45.63	6,243.92	924.45	944.99	1,321.97	1.50	-1.50	0.00
6,504.09	0.00	0.00	6,348.00	925.44	946.00	1,323.39	1.50	-1.50	-43.84
Begin Vertical Hold									
6,600.00	0.00	0.00	6,443.91	925.44	946.00	1,323.39	0.00	0.00	0.00
6,700.00	0.00	0.00	6,543.91	925.44	946.00	1,323.39	0.00	0.00	0.00
6,800.00	0.00	0.00	6,643.91	925.44	946.00	1,323.39	0.00	0.00	0.00
6,900.00	0.00	0.00	6,743.91	925.44	946.00	1,323.39	0.00	0.00	0.00
7,000.00	0.00	0.00	6,843.91	925.44	946.00	1,323.39	0.00	0.00	0.00
7,100.00	0.00	0.00	6,943.91	925.44	946.00	1,323.39	0.00	0.00	0.00
7,128.09	0.00	0.00	6,972.00	925.44	946.00	1,323.39	0.00	0.00	0.00
Niobrara									
7,200.00	0.00	0.00	7,043.91	925.44	946.00	1,323.39	0.00	0.00	0.00
7,300.00	0.00	0.00	7,143.91	925.44	946.00	1,323.39	0.00	0.00	0.00
7,400.00	0.00	0.00	7,243.91	925.44	946.00	1,323.39	0.00	0.00	0.00
7,500.00	0.00	0.00	7,343.91	925.44	946.00	1,323.39	0.00	0.00	0.00
7,600.00	0.00	0.00	7,443.91	925.44	946.00	1,323.39	0.00	0.00	0.00
7,628.09	0.00	0.00	7,472.00	925.44	946.00	1,323.39	0.00	0.00	0.00
PBHL									

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 - Raindance 3C	0.00	0.00	7,472.00	925.44	946.00	1,408,741.50	3,155,898.74	40° 27' 14.5631 N	104° 56' 23.246 W
- plan hits target center									
- Circle (radius 200.00)									

Database:	Southern Region	Local Co-ordinate Reference:	Well 30-53
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Project:	Weld County, Colorado (NAD 83)	MD Reference:	WELL @ 4967.00usft (Cade 22)
Site:	Raindance	North Reference:	Grid
Well:	30-53	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Design #1		

Casing Points					
Measured Depth (usft)	Vertical Depth (usft)	Name	Casing Diameter (")	Hole Diameter (")	
601.31	600.00	9 5/8"	9-5/8	12-1/4	

Formations					
Measured Depth (usft)	Vertical Depth (usft)	Name	Lithology	Dip (°)	Dip Direction (°)
7,128.09	6,972.00	Niobrara		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	19.50	19.93	Begin 8.00° Tangent	
1,000.00	994.81	58.43	59.72	Begin 2.00°/100' Build	
1,325.07	1,313.46	102.75	105.03	Begin 14.50° Tangent	
5,537.34	5,391.53	840.34	859.01	Begin 1.50°/100' Drop	
6,504.09	6,348.00	925.44	946.00	Begin Vertical Hold	
7,628.09	7,472.00	925.44	946.00	PBHL	