

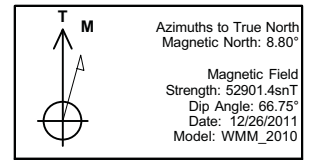


Company: Anadarko  
 Site: Morton  
 Well: 21-12  
 Project: Weld County, Colorado (NAD83)  
 Rig Name: Xtreme 11



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	
250.00	0.00	0.00	250.00	0.00	0.00	0.00	0.00	KOP, 2.00°/100' Build	
550.00	6.00	278.24	549.45	2.25	-15.53	15.69	15.69	Begin 6.00° Tangent	
967.84	6.00	278.24	965.00	8.51	-58.76	59.37	59.37	Begin 2.00°/100' Build	
1167.85	10.00	278.24	1163.03	12.50	-86.30	87.20	87.20	Begin 10.00° Tangent	
5741.00	10.00	278.24	5666.70	126.29	-872.24	881.34	881.34	Begin 1.50°/100' Drop	
6407.68	0.00	0.00	6330.00	134.60	-929.68	939.37	939.37	Begin Vertical Hold	
8142.68	0.00	0.00	8065.00	134.60	-929.68	939.37	939.37	PBHL	



US State Plane 1983  
 Colorado Northern Zone

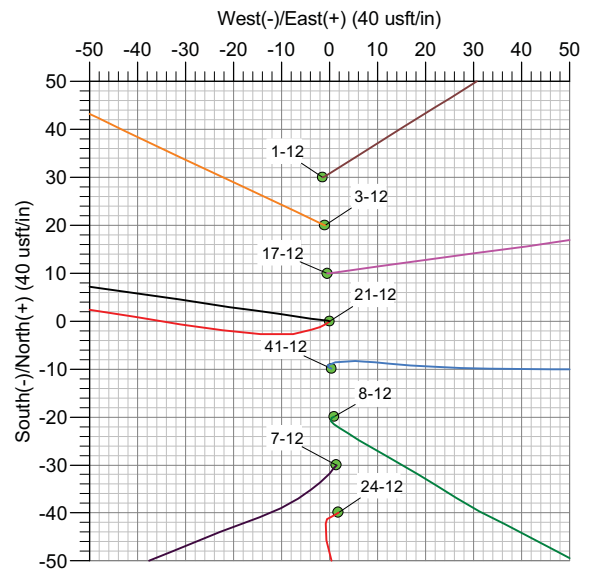
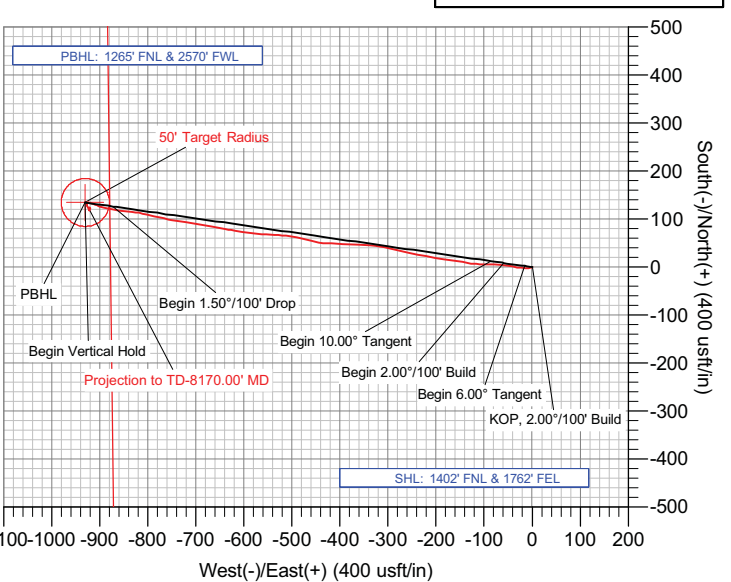
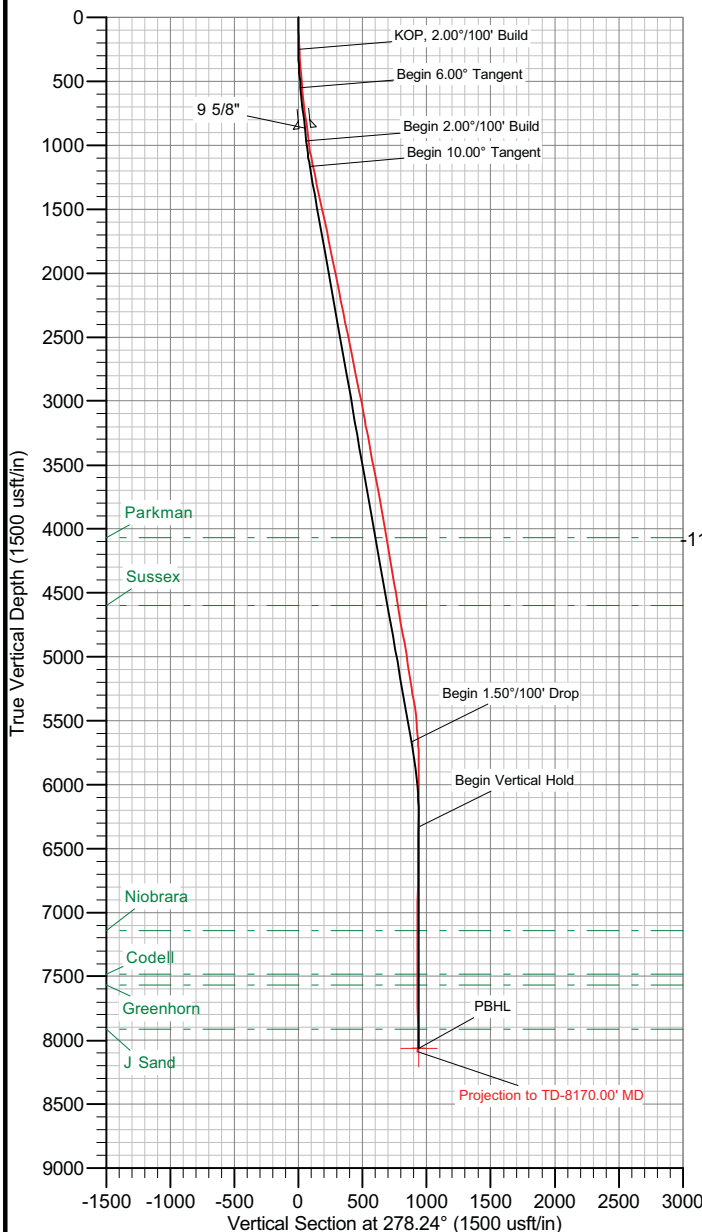
Created By: Megan Pope  
 Date: 9:40, December 30 2011  
 Plan: Design #2

DESIGN TARGET DETAILS					
Name	TVD	+N/-S	+E/-W	Latitude	Longitude
PBHL v2 - Morton 21-12 - plan hits target center	8065.00	134.60	-929.68	40° 4' 9.3352 N	104° 50' 22.094 W

FORMATION TOP DETAILS		
TVDPath	MDPath	Formation
4070.00	4119.67	Parkman
4600.00	4657.85	Sussex
7140.00	7217.68	Niobrara
7480.00	7557.68	Codell
7565.00	7642.68	Greenhorn
7915.00	7992.68	J Sand

**SURFACE LOCATION**

Northing: 1268637.32  
 Easting: 3185790.72  
 Latitude: 40° 4' 8.0052 N  
 Longitude: 104° 50' 10.135 W  
 Ground Elevation: 4905.00  
 WELL @ 4920.00ustf (Xtreme 11)



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.



# **Anadarko**

**Weld County, Colorado (NAD83)**

**Morton**

**21-12**

**Wellbore #1**

**Survey: MS MWD**

## **Standard Survey Report**

**30 December, 2011**



<b>Company:</b>	Anadarko	<b>Local Co-ordinate Reference:</b>	Well 21-12
<b>Project:</b>	Weld County, Colorado (NAD83)	<b>TVD Reference:</b>	WELL @ 4920.00usft (Xtreme 11)
<b>Site:</b>	Morton	<b>MD Reference:</b>	WELL @ 4920.00usft (Xtreme 11)
<b>Well:</b>	21-12	<b>North Reference:</b>	True
<b>Wellbore:</b>	Wellbore #1	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	Surveys	<b>Database:</b>	Southern Region

<b>Project</b>	Weld County, Colorado (NAD83)		
<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>	21-12				
<b>Well Position</b>	<b>+N/-S</b>	0.00 usft	<b>Northing:</b>	1,268,637.32 usft	<b>Latitude:</b> 40° 4' 8.0052 N
	<b>+E/-W</b>	0.00 usft	<b>Easting:</b>	3,185,790.72 usft	<b>Longitude:</b> 104° 50' 10.135 W
<b>Position Uncertainty</b>		0.00 usft	<b>Wellhead Elevation:</b>	usft	<b>Ground Level:</b> 4,905.00 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	12/26/11	8.80	66.75	52,901

<b>Design</b>	Surveys				
<b>Audit Notes:</b>					
<b>Version:</b>	1.0	<b>Phase:</b>	ACTUAL	<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		278.24

<b>Survey Program</b>	<b>Date</b>	12/30/11			
<b>From (usft)</b>	<b>To (usft)</b>	<b>Survey (Wellbore)</b>	<b>Tool Name</b>	<b>Description</b>	
103.00	8,170.00	MS MWD (Wellbore #1)	MWD	MWD - Standard	

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
103.00	1.30	234.30	102.99	-0.68	-0.95	0.84	1.26	1.26	0.00
192.00	2.50	255.10	191.94	-1.77	-3.64	3.35	1.53	1.35	23.37
282.00	2.60	260.50	281.85	-2.61	-7.55	7.10	0.29	0.11	6.00
388.00	4.80	273.70	387.63	-2.72	-14.35	13.81	2.21	2.08	12.45
479.00	5.20	278.60	478.28	-1.86	-22.23	21.73	0.64	0.44	5.38
570.00	5.90	277.60	568.85	-0.62	-30.94	30.53	0.78	0.77	-1.10
660.00	6.40	279.90	658.34	0.85	-40.47	40.17	0.62	0.56	2.56
751.00	7.20	278.30	748.69	2.54	-51.11	50.95	0.90	0.88	-1.76
839.00	7.30	277.10	835.99	4.03	-62.11	62.05	0.21	0.11	-1.36
969.00	7.30	272.50	964.94	5.41	-78.56	78.53	0.45	0.00	-3.54
1,060.00	9.10	266.90	1,055.01	5.28	-91.52	91.34	2.16	1.98	-6.15
1,150.00	11.80	273.00	1,143.51	5.37	-107.82	107.48	3.24	3.00	6.78
1,241.00	12.10	278.80	1,232.54	7.32	-126.54	126.28	1.36	0.33	6.37
1,332.00	11.80	278.10	1,321.57	10.09	-145.18	145.13	0.37	-0.33	-0.77

<b>Company:</b>	Anadarko	<b>Local Co-ordinate Reference:</b>	Well 21-12
<b>Project:</b>	Weld County, Colorado (NAD83)	<b>TVD Reference:</b>	WELL @ 4920.00usft (Xtreme 11)
<b>Site:</b>	Morton	<b>MD Reference:</b>	WELL @ 4920.00usft (Xtreme 11)
<b>Well:</b>	21-12	<b>North Reference:</b>	True
<b>Wellbore:</b>	Wellbore #1	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	Surveys	<b>Database:</b>	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)	
1,423.00	12.70	279.30	1,410.49	13.02	-164.26	164.43	1.03	0.99	1.32	
1,514.00	12.30	279.50	1,499.34	16.23	-183.69	184.12	0.44	-0.44	0.22	
1,604.00	12.00	280.70	1,587.32	19.55	-202.34	203.06	0.44	-0.33	1.33	
1,695.00	11.30	278.10	1,676.45	22.56	-220.47	221.42	0.96	-0.77	-2.86	
1,786.00	11.30	281.30	1,765.68	25.57	-238.03	239.24	0.69	0.00	3.52	
1,877.00	12.00	283.20	1,854.81	29.48	-255.99	257.57	0.88	0.77	2.09	
1,967.00	11.30	281.10	1,942.95	33.31	-273.75	275.70	0.91	-0.78	-2.33	
2,058.00	11.50	282.70	2,032.16	37.02	-291.35	293.65	0.41	0.22	1.76	
2,149.00	10.80	283.40	2,121.44	40.99	-308.49	311.18	0.78	-0.77	0.77	
2,240.00	11.30	276.70	2,210.76	44.01	-325.64	328.59	1.51	0.55	-7.36	
2,330.00	10.90	274.80	2,299.07	45.75	-342.88	345.89	0.60	-0.44	-2.11	
2,421.00	11.00	270.00	2,388.42	46.47	-360.13	363.07	1.01	0.11	-5.27	
2,512.00	12.00	273.00	2,477.59	46.96	-378.26	381.09	1.28	1.10	3.30	
2,603.00	12.80	273.50	2,566.47	48.07	-397.77	400.55	0.89	0.88	0.55	
2,694.00	11.90	272.30	2,655.36	49.06	-417.21	419.93	1.03	-0.99	-1.32	
2,784.00	11.10	274.80	2,743.55	50.16	-435.11	437.81	1.05	-0.89	2.78	
2,875.00	11.70	283.70	2,832.77	53.08	-452.81	455.74	2.04	0.66	9.78	
2,966.00	11.30	283.20	2,921.94	57.30	-470.45	473.81	0.45	-0.44	-0.55	
3,057.00	10.20	282.00	3,011.34	61.01	-487.01	490.73	1.23	-1.21	-1.32	
3,147.00	11.20	278.50	3,099.78	63.96	-503.45	507.42	1.32	1.11	-3.89	
3,238.00	9.90	276.30	3,189.24	66.13	-519.97	524.08	1.50	-1.43	-2.42	
3,329.00	11.00	272.80	3,278.73	67.41	-536.42	540.54	1.40	1.21	-3.85	
3,419.00	11.50	271.40	3,367.00	68.05	-553.96	558.00	0.63	0.56	-1.56	
3,510.00	10.60	276.00	3,456.31	69.14	-571.36	575.37	1.38	-0.99	5.05	
3,601.00	10.50	279.00	3,545.77	71.32	-587.87	592.02	0.61	-0.11	3.30	
3,692.00	10.80	279.70	3,635.20	74.05	-604.46	608.84	0.36	0.33	0.77	
3,783.00	11.10	277.20	3,724.55	76.58	-621.56	626.12	0.62	0.33	-2.75	
3,873.00	9.20	282.30	3,813.14	79.20	-637.19	641.96	2.33	-2.11	5.67	
3,964.00	9.00	280.40	3,902.99	82.04	-651.29	656.33	0.40	-0.22	-2.09	
4,055.00	9.60	275.30	3,992.80	84.02	-665.85	671.02	1.12	0.66	-5.60	
4,146.00	10.50	283.90	4,082.41	86.72	-681.46	686.85	1.92	0.99	9.45	
4,236.00	10.30	280.40	4,170.93	90.14	-697.33	703.05	0.74	-0.22	-3.89	
4,327.00	9.60	277.60	4,260.56	92.61	-712.85	718.77	0.93	-0.77	-3.08	
4,418.00	9.10	277.60	4,350.35	94.57	-727.51	733.55	0.55	-0.55	0.00	
4,509.00	9.10	278.50	4,440.20	96.58	-741.76	747.94	0.16	0.00	0.99	
4,600.00	10.60	282.10	4,529.86	99.40	-757.06	763.49	1.78	1.65	3.96	
4,691.00	9.10	280.60	4,619.52	102.48	-772.32	779.03	1.67	-1.65	-1.65	
4,781.00	9.80	283.40	4,708.30	105.56	-786.77	793.77	0.93	0.78	3.11	
4,872.00	10.70	283.90	4,797.84	109.39	-802.50	809.89	0.99	0.99	0.55	
4,963.00	9.60	282.30	4,887.42	113.03	-818.12	825.87	1.25	-1.21	-1.76	
5,054.00	9.00	274.80	4,977.22	115.25	-832.62	840.54	1.48	-0.66	-8.24	
5,144.00	8.60	274.40	5,066.16	116.35	-846.35	854.28	0.45	-0.44	-0.44	
5,235.00	8.40	276.70	5,156.16	117.65	-859.73	867.72	0.43	-0.22	2.53	
5,326.00	9.00	282.70	5,246.12	119.99	-873.28	881.46	1.19	0.66	6.59	

<b>Company:</b>	Anadarko	<b>Local Co-ordinate Reference:</b>	Well 21-12
<b>Project:</b>	Weld County, Colorado (NAD83)	<b>TVD Reference:</b>	WELL @ 4920.00usft (Xtreme 11)
<b>Site:</b>	Morton	<b>MD Reference:</b>	WELL @ 4920.00usft (Xtreme 11)
<b>Well:</b>	21-12	<b>North Reference:</b>	True
<b>Wellbore:</b>	Wellbore #1	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	Surveys	<b>Database:</b>	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)	
5,417.00	10.40	282.00	5,335.82	123.26	-888.26	896.75	1.54	1.54	-0.77	
5,508.00	8.10	292.70	5,425.63	127.44	-902.21	911.16	3.15	-2.53	11.76	
5,599.00	5.30	288.40	5,516.00	131.25	-912.11	921.51	3.12	-3.08	-4.73	
5,689.00	4.00	286.00	5,605.71	133.42	-919.07	928.71	1.46	-1.44	-2.67	
5,780.00	2.40	290.90	5,696.56	134.98	-923.91	933.71	1.78	-1.76	5.38	
5,871.00	0.60	203.80	5,787.53	135.22	-925.88	935.70	2.69	-1.98	-95.71	
5,962.00	0.70	219.60	5,878.53	134.36	-926.42	936.12	0.22	0.11	17.36	
6,052.00	0.80	198.80	5,968.52	133.34	-926.98	936.52	0.32	0.11	-23.11	
6,143.00	0.80	171.10	6,059.51	132.11	-927.08	936.45	0.42	0.00	-30.44	
6,234.00	1.00	164.00	6,150.50	130.72	-926.77	935.93	0.25	0.22	-7.80	
6,325.00	1.10	156.50	6,241.48	129.15	-926.20	935.15	0.19	0.11	-8.24	
6,461.00	0.70	186.50	6,377.47	127.13	-925.77	934.44	0.45	-0.29	22.06	
6,597.00	1.20	138.20	6,513.45	125.24	-924.92	933.32	0.66	0.37	-35.51	
6,733.00	1.30	146.30	6,649.42	122.90	-923.11	931.20	0.15	0.07	5.96	
6,869.00	0.80	207.10	6,785.40	120.77	-922.69	930.47	0.84	-0.37	44.71	
7,005.00	0.90	125.70	6,921.39	119.30	-922.25	929.83	0.82	0.07	-59.85	
7,142.00	0.40	191.30	7,058.38	118.21	-921.47	928.90	0.60	-0.36	47.88	
7,278.00	1.40	37.50	7,194.37	119.06	-920.56	928.12	1.30	0.74	-113.09	
7,414.00	1.00	20.10	7,330.34	121.49	-919.14	927.06	0.39	-0.29	-12.79	
7,550.00	0.80	305.20	7,466.33	123.15	-919.50	927.66	0.81	-0.15	-55.07	
7,686.00	0.40	314.70	7,602.32	124.03	-920.62	928.89	0.30	-0.29	6.99	
7,822.00	0.40	252.30	7,738.32	124.22	-921.41	929.70	0.30	0.00	-45.88	
7,958.00	0.50	208.80	7,874.31	123.56	-922.15	930.33	0.25	0.07	-31.99	
8,095.00	0.40	144.30	8,011.31	122.65	-922.15	930.21	0.36	-0.07	-47.08	
8,125.00	0.40	137.30	8,041.31	122.48	-922.02	930.06	0.16	0.00	-23.33	
8,170.00	0.40	137.30	8,086.31	122.25	-921.81	929.81	0.00	0.00	0.00	
Projection to TD-8170.00' MD										

Survey Annotations					
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment	
		+N/-S (usft)	+E/-W (usft)		
8,170.00	8,086.31	122.25	-921.81	Projection to TD-8170.00' MD	