



Company: Anadarko

Site: Morton

Well: 15-1

Project: Weld County, Colorado (NAD83)

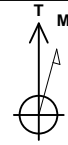
Rig Name: Xtreme 11



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	233.31	549.45	-9.38	-12.59	15.69	15.69	Hold 6.00° Inc
967.84	6.00	233.31	965.00	-35.47	-47.61	59.37	59.37	Begin 2.00°/100' Build
1467.74	16.00	233.31	1455.10	-92.38	-124.00	154.63	154.63	Begin 16.00° Tangent
5754.10	16.00	233.31	5575.45	-798.15	-1071.34	1335.97	1335.97	Begin 2.00°/100' Drop
6554.00	0.00	0.00	6365.00	-864.43	-1160.31	1446.92	1446.92	Begin Vertical Hold
8237.00	0.00	0.00	8048.00	-864.43	-1160.31	1446.92	1446.92	PBHL



Azimuths to True North  
Magnetic North: 8.81°

Magnetic Field  
Strength: 52916.0nT  
Dip Angle: 66.76°  
Date: 11/21/2011  
Model: WMM\_2010

US State Plane 1983  
Colorado Northern Zone

Created By: Megan Pope  
Date: 12:37, November 28 2011  
Plan: Design #1

#### SURFACE LOCATION

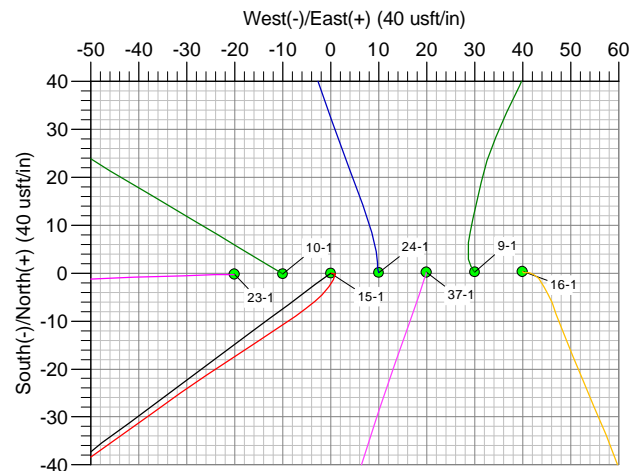
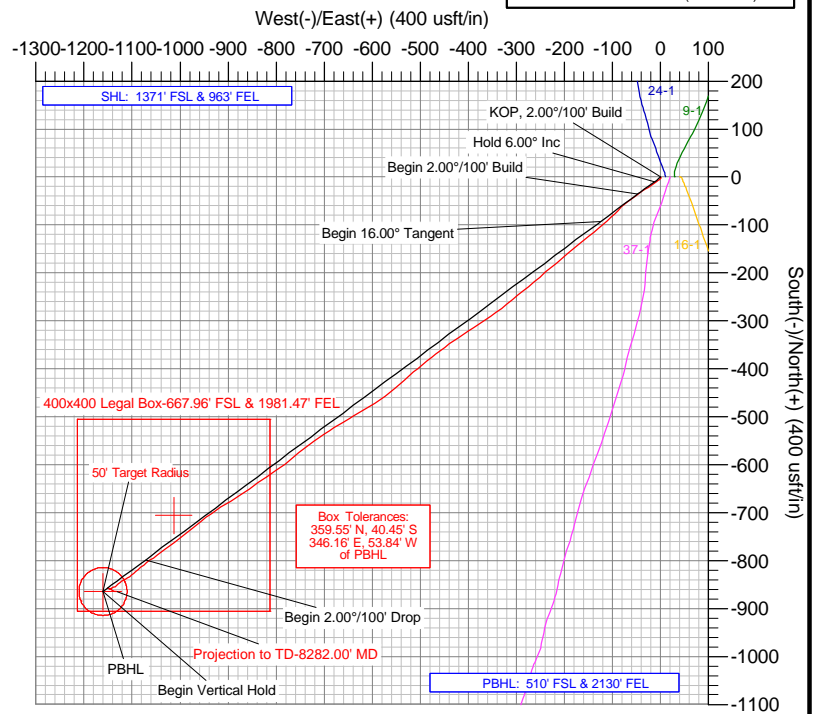
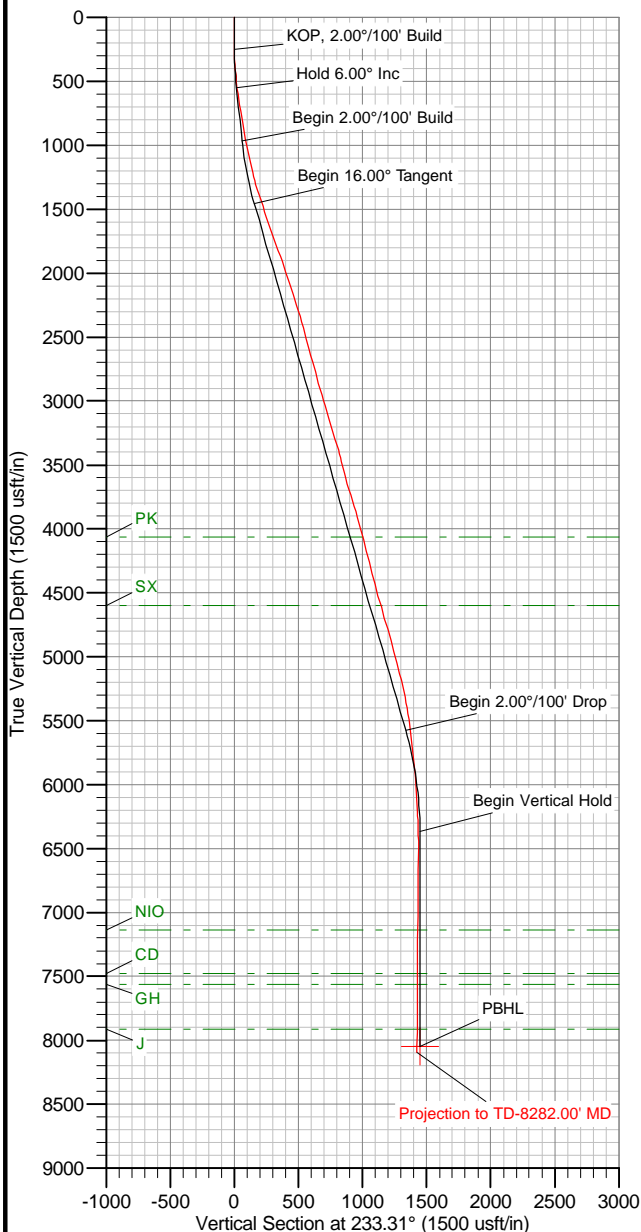
Northing: 1271418.69  
Easting: 3186546.10  
Latitude: 40° 4' 35.4355 N  
Longitude: 104° 50' 0.150 W  
Ground Elevation: 4898.00  
WELL @ 4913.00usft (Xtreme 11)

#### DESIGN TARGET DETAILS

Name	TVD	+N/-S	+E/-W	Latitude	Longitude
PBHL v1 - Morton 15-1	8048.00	-864.43	-1160.31	40° 4' 26.8924 N	104° 50' 15.076 W

#### FORMATION TOP DETAILS

TVDPath	MDPath	Formation
4063.00	4180.71	PK
4598.00	4737.27	SX
7138.00	7327.00	NIO
7478.00	7667.00	CD
7563.00	7752.00	GH
7913.00	8102.00	J



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**

**15-1**

**Wellbore #1**

**Survey: MS MWD**

## **Standard Survey Report**

**28 November, 2011**

<b>Company:</b>	Anadarko	<b>Local Co-ordinate Reference:</b>	Well 15-1
<b>Project:</b>	Weld County, Colorado (NAD83)	<b>TVD Reference:</b>	WELL @ 4913.00usft (Xtreme 11)
<b>Site:</b>	Morton	<b>MD Reference:</b>	WELL @ 4913.00usft (Xtreme 11)
<b>Well:</b>	15-1	<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>	15-1				
<b>Well Position</b>	<b>+N/-S</b>	0.00 usft	<b>Northing:</b>	1,271,418.69 usft	<b>Latitude:</b> 40° 4' 35.4355 N
	<b>+E/-W</b>	0.00 usft	<b>Easting:</b>	3,186,546.10 usft	<b>Longitude:</b> 104° 50' 0.150 W
<b>Position Uncertainty</b>		0.00 usft	<b>Wellhead Elevation:</b>	usft	<b>Ground Level:</b> 4,898.00 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	11/21/11	8.81	66.76	52,916

<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		233.31

<b>Survey Program</b>	<b>Date</b>	11/25/11			
<b>From (usft)</b>	<b>To (usft)</b>	<b>Survey (Wellbore)</b>	<b>Tool Name</b>	<b>Description</b>	
102.00	8,282.00	MS MWD (Wellbore #1)	MWD	MWD - Standard	

<b>Survey</b>										
<b>Measured Depth (usft)</b>	<b>Inclination (°)</b>	<b>Azimuth (°)</b>	<b>Vertical Depth (usft)</b>	<b>+N/-S (usft)</b>	<b>+E/-W (usft)</b>	<b>Vertical Section (usft)</b>	<b>Dogleg Rate (°/100usft)</b>	<b>Build Rate (°/100usft)</b>	<b>Turn Rate (°/100usft)</b>	
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
102.00	0.40	91.40	102.00	-0.01	0.36	-0.28	0.39	0.39	0.00	
191.00	0.40	103.90	191.00	-0.09	0.97	-0.72	0.10	0.00	14.04	
281.00	1.80	210.30	280.98	-1.39	0.56	0.38	2.17	1.56	118.22	
371.00	3.30	222.60	370.89	-4.51	-1.91	4.23	1.76	1.67	13.67	
462.00	5.60	235.60	461.61	-8.95	-7.34	11.24	2.74	2.53	14.29	
553.00	7.10	236.40	552.05	-14.57	-15.69	21.29	1.65	1.65	0.88	
644.00	8.20	236.60	642.24	-21.26	-25.79	33.39	1.21	1.21	0.22	
734.00	9.30	233.60	731.19	-29.11	-37.01	47.07	1.32	1.22	-3.33	
825.00	10.10	235.40	820.89	-38.00	-49.49	62.39	0.94	0.88	1.98	
957.00	10.50	233.50	950.76	-51.73	-68.69	85.99	0.40	0.30	-1.44	
1,047.00	11.40	226.10	1,039.13	-62.77	-81.69	103.01	1.85	1.00	-8.22	
1,138.00	13.10	224.30	1,128.05	-76.39	-95.37	122.12	1.91	1.87	-1.98	
1,229.00	13.80	228.50	1,216.56	-90.96	-110.71	143.12	1.32	0.77	4.62	
1,320.00	16.40	228.90	1,304.41	-106.60	-128.52	166.75	2.86	2.86	0.44	

<b>Company:</b>	Anadarko	<b>Local Co-ordinate Reference:</b>	Well 15-1
<b>Project:</b>	Weld County, Colorado (NAD83)	<b>TVD Reference:</b>	WELL @ 4913.00usft (Xtreme 11)
<b>Site:</b>	Morton	<b>MD Reference:</b>	WELL @ 4913.00usft (Xtreme 11)
<b>Well:</b>	15-1	<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)	
1,410.00	17.80	232.90	1,390.43	-123.25	-149.07	193.18	2.03	1.56	4.44	
1,501.00	18.10	230.10	1,477.00	-140.71	-171.01	221.20	1.00	0.33	-3.08	
1,592.00	19.40	229.40	1,563.17	-159.62	-193.33	250.39	1.45	1.43	-0.77	
1,683.00	19.50	230.80	1,648.98	-179.05	-216.57	280.64	0.52	0.11	1.54	
1,774.00	19.00	227.70	1,734.90	-198.62	-239.30	310.56	1.25	-0.55	-3.41	
1,865.00	20.00	230.60	1,820.68	-218.47	-262.28	340.85	1.53	1.10	3.19	
1,956.00	18.80	232.80	1,906.51	-237.21	-285.99	371.06	1.54	-1.32	2.42	
2,046.00	18.60	228.90	1,991.76	-255.42	-308.36	399.87	1.41	-0.22	-4.33	
2,137.00	18.50	232.60	2,078.04	-273.73	-330.76	428.78	1.30	-0.11	4.07	
2,228.00	17.90	236.40	2,164.49	-290.24	-353.88	457.18	1.46	-0.66	4.18	
2,319.00	18.20	235.40	2,251.01	-306.04	-377.23	485.35	0.47	0.33	-1.10	
2,410.00	16.70	236.60	2,337.82	-321.31	-399.84	512.60	1.70	-1.65	1.32	
2,500.00	15.40	237.10	2,424.31	-334.92	-420.67	537.44	1.45	-1.44	0.56	
2,591.00	14.90	234.20	2,512.15	-348.33	-440.31	561.19	1.00	-0.55	-3.19	
2,682.00	14.00	232.10	2,600.27	-361.94	-458.48	583.90	1.14	-0.99	-2.31	
2,773.00	15.20	230.50	2,688.33	-376.29	-476.37	606.82	1.39	1.32	-1.76	
2,863.00	16.20	231.90	2,774.97	-391.54	-495.36	631.15	1.19	1.11	1.56	
2,954.00	15.20	229.20	2,862.57	-407.17	-514.38	655.74	1.36	-1.10	-2.97	
3,045.00	15.90	226.80	2,950.24	-423.49	-532.50	680.03	1.04	0.77	-2.64	
3,136.00	17.10	231.30	3,037.50	-440.39	-552.02	705.79	1.93	1.32	4.95	
3,227.00	17.00	234.00	3,124.50	-456.58	-573.23	732.46	0.88	-0.11	2.97	
3,317.00	16.60	237.10	3,210.66	-471.29	-594.67	758.44	1.09	-0.44	3.44	
3,408.00	17.00	239.40	3,297.78	-485.13	-617.03	784.64	0.85	0.44	2.53	
3,499.00	17.10	238.20	3,384.78	-498.95	-639.85	811.20	0.40	0.11	-1.32	
3,590.00	14.20	239.60	3,472.40	-511.65	-660.85	835.63	3.21	-3.19	1.54	
3,681.00	14.10	238.40	3,560.64	-523.11	-679.92	857.76	0.34	-0.11	-1.32	
3,771.00	15.60	234.90	3,647.63	-535.81	-699.16	880.78	1.94	1.67	-3.89	
3,862.00	17.50	234.70	3,734.85	-550.75	-720.34	906.69	2.09	2.09	-0.22	
3,953.00	17.10	232.80	3,821.74	-566.75	-742.16	933.75	0.76	-0.44	-2.09	
4,044.00	15.90	230.10	3,908.99	-582.83	-762.39	959.58	1.56	-1.32	-2.97	
4,135.00	15.20	231.70	3,996.66	-598.22	-781.31	983.95	0.90	-0.77	1.76	
4,225.00	15.40	235.40	4,083.47	-612.32	-800.41	1,007.68	1.11	0.22	4.11	
4,316.00	13.80	237.30	4,171.53	-625.05	-819.49	1,030.59	1.84	-1.76	2.09	
4,407.00	14.20	234.70	4,259.83	-637.36	-837.73	1,052.57	0.82	0.44	-2.86	
4,497.00	14.30	234.30	4,347.06	-650.23	-855.77	1,074.72	0.16	0.11	-0.44	
4,588.00	14.30	237.70	4,435.24	-662.79	-874.39	1,097.16	0.92	0.00	3.74	
4,679.00	15.70	237.70	4,523.14	-675.37	-894.30	1,120.65	1.54	1.54	0.00	
4,770.00	15.70	237.30	4,610.74	-688.61	-915.07	1,145.21	0.12	0.00	-0.44	
4,861.00	16.10	235.00	4,698.26	-702.49	-935.76	1,170.10	0.82	0.44	-2.53	
4,951.00	16.30	230.10	4,784.69	-717.75	-955.68	1,195.19	1.53	0.22	-5.44	
5,042.00	15.50	231.20	4,872.21	-733.57	-974.95	1,220.09	0.94	-0.88	1.21	
5,133.00	15.20	231.00	4,959.96	-748.69	-993.70	1,244.16	0.33	-0.33	-0.22	
5,224.00	14.80	232.90	5,047.86	-763.21	-1,012.24	1,267.70	0.70	-0.44	2.09	
5,315.00	14.00	234.50	5,136.00	-776.61	-1,030.47	1,290.33	0.98	-0.88	1.76	

<b>Company:</b>	Anadarko	<b>Local Co-ordinate Reference:</b>	Well 15-1
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<b>Site:</b>	Morton	<b>MD Reference:</b>	WELL @ 4913.00usft (Xtreme 11)
<b>Well:</b>	15-1	<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)	
5,405.00	12.60	234.30	5,223.59	-788.66	-1,047.31	1,311.03	1.56	-1.56	-0.22	
5,496.00	11.10	236.10	5,312.65	-799.34	-1,062.64	1,329.70	1.70	-1.65	1.98	
5,587.00	9.70	231.20	5,402.15	-809.03	-1,075.88	1,346.12	1.82	-1.54	-5.38	
5,678.00	8.40	229.10	5,492.02	-818.19	-1,086.88	1,360.41	1.47	-1.43	-2.31	
5,769.00	6.90	225.90	5,582.21	-826.35	-1,095.83	1,372.46	1.71	-1.65	-3.52	
5,859.00	7.20	240.70	5,671.53	-832.87	-1,104.64	1,383.41	2.04	0.33	16.44	
5,950.00	6.20	237.30	5,761.91	-838.31	-1,113.74	1,393.97	1.18	-1.10	-3.74	
6,041.00	5.30	236.10	5,852.45	-843.31	-1,121.37	1,403.07	1.00	-0.99	-1.32	
6,132.00	4.30	233.80	5,943.13	-847.67	-1,127.61	1,410.68	1.12	-1.10	-2.53	
6,223.00	4.10	224.10	6,033.89	-852.02	-1,132.63	1,417.30	0.81	-0.22	-10.66	
6,313.00	3.60	248.60	6,123.69	-855.37	-1,137.50	1,423.20	1.89	-0.56	27.22	
6,404.00	3.20	242.10	6,214.53	-857.60	-1,142.40	1,428.47	0.61	-0.44	-7.14	
6,495.00	2.20	281.60	6,305.44	-858.43	-1,146.36	1,432.14	2.26	-1.10	43.41	
6,586.00	1.80	280.90	6,396.38	-857.81	-1,149.47	1,434.27	0.44	-0.44	-0.77	
6,676.00	0.10	11.40	6,486.37	-857.47	-1,150.84	1,435.16	2.00	-1.89	100.56	
6,858.00	0.70	111.60	6,668.36	-857.72	-1,149.78	1,434.46	0.40	0.33	55.05	
7,040.00	0.90	107.10	6,850.34	-858.55	-1,147.38	1,433.03	0.12	0.11	-2.47	
7,222.00	1.10	108.00	7,032.31	-859.51	-1,144.35	1,431.18	0.11	0.11	0.49	
7,403.00	1.20	134.70	7,213.28	-861.38	-1,141.35	1,429.89	0.30	0.06	14.75	
7,584.00	1.00	122.70	7,394.25	-863.57	-1,138.68	1,429.05	0.17	-0.11	-6.63	
7,766.00	0.60	100.60	7,576.23	-864.60	-1,136.40	1,427.84	0.27	-0.22	-12.14	
7,948.00	0.20	80.70	7,758.22	-864.72	-1,135.15	1,426.92	0.23	-0.22	-10.93	
8,129.00	0.60	71.40	7,939.22	-864.37	-1,133.94	1,425.73	0.22	0.22	-5.14	
8,237.00	0.70	81.90	8,047.21	-864.10	-1,132.75	1,424.62	0.14	0.09	9.72	
8,282.00	0.70	81.90	8,092.21	-864.02	-1,132.21	1,424.14	0.00	0.00	0.00	
Projection to TD-8282.00' MD										

Survey Annotations					
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment	
		+N/-S (usft)	+E/-W (usft)		
8,282.00	8,092.21	-864.02	-1,132.21	Projection to TD-8282.00' MD	