

Project: SEC.9-T1N-R67W
Site: NRC 17-9 Pad Sec.9-T1N-R67W
Well: NRC 40-9
Plan: Wellbore #1



Anadarko, Weld County CO

SEC.9-T1N-R67W

NRC 17-9 Pad Sec.9-T1N-R67W

NRC 40-9

Wellbore #1

Survey: Survey #1

Standard Survey Report

03 September, 2010

Company:	Anadarko, Weld County CO	Local Co-ordinate Reference:	Well NRC 40-9
Project:	SEC.9-T1N-R67W	TVD Reference:	WELL @ 5012.0ft (Original Well Elev)
Site:	NRC 17-9 Pad Sec.9-T1N-R67W	MD Reference:	WELL @ 5012.0ft (Original Well Elev)
Well:	NRC 40-9	North Reference:	True
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	EDM den0-adp01 Server Data

Project	SEC.9-T1N-R67W, Weld County, Colorado		
Map System:	US State Plane 1983	System Datum:	Mean Sea Level
Geo Datum:	North American Datum 1983		Using Well Reference Point
Map Zone:	Colorado Northern Zone		Using geodetic scale factor

Site	NRC 17-9 Pad Sec.9-T1N-R67W		
Site Position:		Northing:	1,268,177.88 ft
From:	Lat/Long	Easting:	3,170,044.82 ft
Position Uncertainty:	0.0 ft	Slot Radius:	"
		Latitude:	40° 4' 4.580 N
		Longitude:	104° 53' 32.712 W
		Grid Convergence:	0.39 °

Well	NRC 40-9		
Well Position	+N/-S	0.0 ft	Northing: 1,268,193.56 ft
	+E/-W	0.0 ft	Easting: 3,170,048.35 ft
Position Uncertainty	0.0 ft	Wellhead Elevation:	ft
		Latitude:	40° 4' 4.735 N
		Longitude:	104° 53' 32.665 W
		Ground Level:	4,997.0 ft

Wellbore	Wellbore #1				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	8/20/2010	9.01	66.79	53,027

Design	Wellbore #1				
Audit Notes:					
Version:	1.0	Phase:	ACTUAL	Tie On Depth:	0.0
Vertical Section:	Depth From (TVD) (ft)	+N/-S (ft)	+E/-W (ft)	Direction (°)	
	0.0	0.0	0.0	116.48	

Survey Program	Date	9/3/2010			
From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description	
146.0	8,600.0	Survey #1 (Wellbore #1)	MWD	MWD - Standard	

Survey										
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)	
0.0	0.00	0.00	0.0	0.0	0.0	0.0	0.00	0.00	0.00	
146.0	0.00	3.80	146.0	0.0	0.0	0.0	0.00	0.00	0.00	
239.0	0.40	165.50	239.0	-0.3	0.1	0.2	0.43	0.43	0.00	
332.0	0.80	151.40	332.0	-1.2	0.5	1.0	0.46	0.43	-15.16	
426.0	1.80	141.20	426.0	-2.9	1.7	2.8	1.09	1.06	-10.85	
519.0	3.00	132.60	518.9	-5.7	4.4	6.5	1.34	1.29	-9.25	
611.0	4.30	127.50	610.7	-9.4	8.9	12.2	1.46	1.41	-5.54	
704.0	5.60	126.30	703.3	-14.2	15.4	20.1	1.40	1.40	-1.29	
796.0	7.40	128.70	794.8	-20.6	23.6	30.3	1.98	1.96	2.61	
888.0	9.40	128.80	885.8	-29.0	34.1	43.4	2.17	2.17	0.11	
972.0	9.60	129.00	968.6	-37.7	44.9	57.0	0.24	0.24	0.24	
1,103.0	8.70	129.20	1,097.9	-50.9	61.0	77.3	0.69	-0.69	0.15	
1,238.0	11.90	122.40	1,230.8	-64.8	80.7	101.1	2.53	2.37	-5.04	

Company:	Anadarko, Weld County CO	Local Co-ordinate Reference:	Well NRC 40-9
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Site:	NRC 17-9 Pad Sec.9-T1N-R67W	MD Reference:	WELL @ 5012.0ft (Original Well Elev)
Well:	NRC 40-9	North Reference:	True
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	EDM den0-adp01 Server Data

Survey										
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)	
1,329.0	13.10	119.80	1,319.6	-74.9	97.6	120.7	1.46	1.32	-2.86	
1,417.0	14.90	119.80	1,405.0	-85.5	116.0	142.0	2.05	2.05	0.00	
1,506.0	17.40	117.20	1,490.5	-97.3	137.8	166.7	2.92	2.81	-2.92	
1,597.0	18.60	116.20	1,577.0	-109.9	162.9	194.9	1.36	1.32	-1.10	
1,685.0	18.10	115.50	1,660.5	-122.0	187.9	222.6	0.62	-0.57	-0.80	
1,775.0	20.10	116.10	1,745.6	-134.8	214.4	252.0	2.23	2.22	0.67	
1,864.0	21.00	115.00	1,828.9	-148.3	242.6	283.2	1.10	1.01	-1.24	
1,953.0	20.50	115.20	1,912.1	-161.7	271.1	314.8	0.57	-0.56	0.22	
2,043.0	22.80	113.70	1,995.8	-175.4	301.4	347.9	2.63	2.56	-1.67	
2,134.0	24.10	116.30	2,079.3	-190.7	334.2	384.1	1.83	1.43	2.86	
2,225.0	23.60	117.10	2,162.5	-207.2	367.0	420.9	0.65	-0.55	0.88	
2,314.0	24.40	115.10	2,243.8	-223.1	399.5	457.1	1.28	0.90	-2.25	
2,402.0	24.10	112.90	2,324.0	-237.8	432.5	493.2	1.08	-0.34	-2.50	
2,493.0	25.40	112.90	2,406.7	-252.7	467.6	531.2	1.43	1.43	0.00	
2,581.0	26.50	113.30	2,485.8	-267.8	503.1	569.7	1.27	1.25	0.45	
2,670.0	25.90	112.90	2,565.7	-283.2	539.2	608.9	0.70	-0.67	-0.45	
2,759.0	25.90	115.90	2,645.7	-299.3	574.6	647.7	1.47	0.00	3.37	
2,849.0	25.40	115.20	2,726.9	-316.1	609.7	686.7	0.65	-0.56	-0.78	
2,940.0	25.80	116.40	2,808.9	-333.2	645.1	726.0	0.72	0.44	1.32	
3,029.0	26.10	116.50	2,888.9	-350.5	680.0	765.0	0.34	0.34	0.11	
3,119.0	26.70	117.60	2,969.6	-368.7	715.6	805.0	0.86	0.67	1.22	
3,208.0	26.10	119.00	3,049.3	-387.5	750.5	844.5	0.97	-0.67	1.57	
3,297.0	26.00	120.00	3,129.2	-406.7	784.5	883.6	0.51	-0.11	1.12	
3,386.0	25.40	118.70	3,209.4	-425.6	818.1	922.1	0.93	-0.67	-1.46	
3,474.0	24.60	116.20	3,289.2	-442.8	851.1	959.3	1.51	-0.91	-2.84	
3,565.0	26.90	115.10	3,371.2	-459.9	886.8	998.8	2.58	2.53	-1.21	
3,655.0	25.30	115.80	3,452.0	-476.9	922.5	1,038.4	1.81	-1.78	0.78	
3,746.0	24.40	112.50	3,534.5	-492.6	957.4	1,076.6	1.82	-0.99	-3.63	
3,836.0	23.10	114.00	3,616.9	-506.9	990.7	1,112.8	1.59	-1.44	1.67	
3,926.0	24.40	117.00	3,699.3	-522.5	1,023.4	1,149.0	1.97	1.44	3.33	
4,015.0	26.10	120.40	3,779.8	-540.7	1,056.7	1,186.9	2.51	1.91	3.82	
4,106.0	23.90	119.50	3,862.3	-559.9	1,090.0	1,225.3	2.45	-2.42	-0.99	
4,196.0	23.70	115.70	3,944.6	-576.8	1,122.1	1,261.6	1.72	-0.22	-4.22	
4,287.0	24.00	112.90	4,027.9	-591.9	1,155.7	1,298.4	1.29	0.33	-3.08	
4,375.0	24.00	116.10	4,108.2	-606.7	1,188.2	1,334.1	1.48	0.00	3.64	
4,463.0	25.40	116.50	4,188.2	-623.0	1,221.2	1,370.9	1.60	1.59	0.45	
4,552.0	24.10	117.90	4,269.0	-640.0	1,254.3	1,408.1	1.60	-1.46	1.57	
4,641.0	25.50	117.60	4,349.8	-657.4	1,287.4	1,445.5	1.58	1.57	-0.34	
4,729.0	24.10	115.70	4,429.7	-674.0	1,320.4	1,482.4	1.83	-1.59	-2.16	
4,819.0	22.40	114.60	4,512.4	-689.1	1,352.5	1,517.9	1.95	-1.89	-1.22	
4,906.0	19.20	113.90	4,593.7	-701.8	1,380.7	1,548.7	3.69	-3.68	-0.80	
4,997.0	21.40	116.60	4,679.0	-715.3	1,409.2	1,580.3	2.63	2.42	2.97	
5,087.0	22.50	114.60	4,762.5	-729.8	1,439.5	1,613.9	1.48	1.22	-2.22	
5,174.0	19.90	112.90	4,843.6	-742.5	1,468.3	1,645.4	3.07	-2.99	-1.95	
5,265.0	17.30	110.80	4,929.9	-753.3	1,495.2	1,674.3	2.95	-2.86	-2.31	
5,355.0	18.10	114.60	5,015.6	-763.9	1,520.5	1,701.6	1.56	0.89	4.22	
5,442.0	16.80	118.80	5,098.6	-775.6	1,543.8	1,727.6	2.08	-1.49	4.83	
5,533.0	15.30	117.50	5,186.1	-787.5	1,565.9	1,752.8	1.69	-1.65	-1.43	
5,621.0	13.80	114.90	5,271.2	-797.3	1,585.8	1,774.9	1.86	-1.70	-2.95	
5,712.0	12.10	117.10	5,359.9	-806.2	1,604.1	1,795.3	1.94	-1.87	2.42	
5,801.0	9.90	118.30	5,447.3	-814.1	1,619.1	1,812.3	2.49	-2.47	1.35	
5,890.0	8.20	116.10	5,535.2	-820.5	1,631.6	1,826.3	1.95	-1.91	-2.47	
5,980.0	6.60	114.70	5,624.4	-825.5	1,642.0	1,837.8	1.79	-1.78	-1.56	
6,069.0	5.20	113.80	5,712.9	-829.2	1,650.4	1,847.0	1.58	-1.57	-1.01	

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Well:	NRC 40-9	North Reference:	True
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	EDM den0-adp01 Server Data

Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
6,159.0	2.80	102.10	5,802.7	-831.3	1,656.3	1,853.2	2.80	-2.67	-13.00
6,248.0	2.00	94.80	5,891.6	-831.9	1,659.9	1,856.7	0.96	-0.90	-8.20
6,256.3	1.94	96.10	5,900.0	-831.9	1,660.2	1,857.0	0.93	-0.76	15.61
TARGET BHL 2590'FNL, 50'FEL									
6,337.0	1.40	114.40	5,980.6	-832.5	1,662.5	1,859.3	0.93	-0.67	22.68
6,425.0	0.90	109.30	6,068.6	-833.2	1,664.1	1,861.0	0.58	-0.57	-5.80
6,515.0	0.90	65.20	6,158.6	-833.1	1,665.4	1,862.2	0.75	0.00	-49.00
6,604.0	0.50	56.80	6,247.6	-832.6	1,666.4	1,862.8	0.46	-0.45	-9.44
6,693.0	0.30	352.10	6,336.6	-832.2	1,666.7	1,862.9	0.52	-0.22	-72.70
6,783.0	0.30	69.80	6,426.6	-831.8	1,666.9	1,862.9	0.42	0.00	86.33
6,872.0	0.10	37.90	6,515.6	-831.7	1,667.1	1,863.1	0.25	-0.22	-35.84
6,962.0	0.20	57.20	6,605.6	-831.6	1,667.3	1,863.2	0.12	0.11	21.44
7,053.0	0.40	79.90	6,696.6	-831.4	1,667.7	1,863.5	0.25	0.22	24.95
7,143.0	0.10	132.20	6,786.6	-831.4	1,668.1	1,863.8	0.39	-0.33	58.11
7,233.0	0.50	52.70	6,876.6	-831.2	1,668.5	1,864.1	0.55	0.44	-88.33
7,324.0	0.60	273.70	6,967.6	-831.0	1,668.3	1,863.8	1.13	0.11	-152.75
7,414.0	0.20	299.00	7,057.6	-830.9	1,667.7	1,863.2	0.48	-0.44	28.11
7,503.0	0.40	234.40	7,146.6	-831.0	1,667.3	1,862.9	0.41	0.22	-72.58
7,592.0	0.30	241.50	7,235.6	-831.2	1,666.9	1,862.6	0.12	-0.11	7.98
7,772.0	0.10	206.70	7,415.5	-831.6	1,666.4	1,862.4	0.13	-0.11	-19.33
7,862.0	0.40	184.45	7,505.5	-832.0	1,666.3	1,862.5	0.34	0.33	-24.72
7,952.0	0.40	127.80	7,595.5	-832.5	1,666.6	1,862.9	0.42	0.00	-62.94
8,043.0	0.20	140.40	7,686.5	-832.8	1,666.9	1,863.4	0.23	-0.22	13.85
8,133.0	0.40	196.20	7,776.5	-833.2	1,666.9	1,863.6	0.37	0.22	62.00
8,223.0	0.40	115.10	7,866.5	-833.7	1,667.1	1,863.9	0.58	0.00	-90.11
8,359.0	0.60	27.03	8,002.5	-833.2	1,667.9	1,864.4	0.52	0.15	-64.76
8,449.0	1.10	61.90	8,092.5	-832.4	1,668.8	1,864.9	0.78	0.56	38.74
8,551.0	0.20	13.70	8,194.5	-831.8	1,669.7	1,865.5	0.96	-0.88	-47.25
8,600.0	0.20	13.70	8,243.5	-831.6	1,669.8	1,865.4	0.00	0.00	0.00
TARGET CIRCLE 2590'FNL, 50'FEL - HARDLINES 52'S & 50'E OF BHL									

Wellbore Targets

Target Name	- hit/miss target	Dip Angle (°)	Dip Dir. (°)	TVD (ft)	+N/-S (ft)	+E/-W (ft)	Northing (ft)	Easting (ft)	Latitude	Longitude
TARGET BHL 2590'F	- survey misses target center by 10.9ft at 6256.3ft MD (5899.9 TVD, -831.9 N, 1660.2 E)	0.00	0.00	5,900.0	-842.2	1,656.4	1,267,362.78	3,171,710.43	40° 3' 56.412 N	104° 53' 11.360 W
TARGET CIRCLE 2590'F	- survey misses target center by 17.1ft at 8600.0ft MD (8243.5 TVD, -831.6 N, 1669.8 E)	0.00	0.00	8,244.0	-842.2	1,656.4	1,267,362.76	3,171,710.41	40° 3' 56.412 N	104° 53' 11.361 W
HARDLINES 52'S & 50'E	- survey misses target center by 72.5ft at 8600.0ft MD (8243.5 TVD, -831.6 N, 1669.8 E)	0.00	0.00	8,244.0	-894.2	1,706.4	1,267,311.11	3,171,760.77	40° 3' 55.898 N	104° 53' 10.718 W
Point 1				8,244.0	0.0	0.0	1,267,311.11	3,171,760.77		
Point 2				8,244.0	0.0	-200.0	1,267,309.74	3,171,560.78		
Point 3				8,244.0	0.0	0.0	1,267,311.11	3,171,760.77		
Point 4				8,244.0	200.0	0.0	1,267,511.09	3,171,759.40		

Checked By: _____ Approved By: _____ Date: _____