



# **Anadarko Petroleum Corporation**

**Dacono**

**Dacono 11 Pad**

**Dacono 29-2 (111427)**

**Dacono 29-2**

**Survey: 29-2 MWD**

## **Standard Survey Report**

**15 February, 2012**

# ARK Directional Services

## Survey Report

<b>Company:</b>	Anadarko Petroleum Corporation	<b>Local Co-ordinate Reference:</b>	Well Dacono 29-2 (111427)
<b>Project:</b>	Dacono	<b>TVD Reference:</b>	KB @ 5031.00ft (Original Well Elev)
<b>Site:</b>	Dacono 11 Pad	<b>MD Reference:</b>	KB @ 5031.00ft (Original Well Elev)
<b>Well:</b>	Dacono 29-2 (111427)	<b>North Reference:</b>	True
<b>Wellbore:</b>	Dacono 29-2	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	Dacono 29-2	<b>Database:</b>	EDM5000

<b>Project</b>	Dacono		
<b>Map System:</b>	Universal Transverse Mercator	<b>System Datum:</b>	Mean Sea Level
<b>Geo Datum:</b>	NAD83 Colorado - HARN		
<b>Map Zone:</b>	Zone 13N (108 W to 102 W)		

<b>Site</b>	Dacono 11 Pad		
<b>Site Position:</b>		<b>Northing:</b>	14,556,637.29 usft
<b>From:</b>	Lat/Long	<b>Easting:</b>	1,647,890.09 usft
<b>Position Uncertainty:</b>	0.00 ft	<b>Slot Radius:</b>	13.20 in
		<b>Latitude:</b>	40.082118°N
		<b>Longitude:</b>	104.973282°W
		<b>Grid Convergence:</b>	0.02 °

<b>Well</b>	Dacono 29-2 (111427)		
<b>Well Position</b>	<b>+N/-S</b>	0.00 ft	<b>Northing:</b> 14,556,617.26 usft
	<b>+E/-W</b>	0.00 ft	<b>Easting:</b> 1,647,890.10 usft
<b>Position Uncertainty</b>	0.00 ft	<b>Wellhead Elevation:</b>	ft
		<b>Latitude:</b>	40.082063°N
		<b>Longitude:</b>	104.973282°W
		<b>Ground Level:</b>	5,016.00 ft

<b>Wellbore</b>	Dacono 29-2		
<b>Magnetics</b>	<b>Model Name</b>	<b>Sample Date</b>	<b>Declination (°)</b>
	IGRF2010	04/10/12	8.84
			<b>Dip Angle (°)</b>
			66.73
			<b>Field Strength (nT)</b>
			52,853

<b>Design</b>	Dacono 29-2		
<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) (ft)</b>	<b>+N/-S (ft)</b>	<b>+E/-W (ft)</b>
	0.00	0.00	0.00
			<b>Direction (°)</b>
			345.16

<b>Survey Program</b>	<b>Date</b>	02/15/12		
<b>From (ft)</b>	<b>To (ft)</b>	<b>Survey (Wellbore)</b>	<b>Tool Name</b>	<b>Description</b>
140.00	8,710.00	29-2 MWD (Dacono 29-2)	MWD	MWD - Standard

<b>Survey</b>									
<b>Measured Depth (ft)</b>	<b>Inclination (°)</b>	<b>Azimuth (°)</b>	<b>Vertical Depth (ft)</b>	<b>+N/-S (ft)</b>	<b>+E/-W (ft)</b>	<b>Vertical Section (ft)</b>	<b>Dogleg Rate (°/100ft)</b>	<b>Build Rate (°/100ft)</b>	<b>Turn Rate (°/100ft)</b>
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
<b>29-2 LW</b>									
140.00	0.09	168.80	140.00	-0.11	0.02	-0.11	0.06	0.06	0.00
202.00	0.48	355.20	202.00	0.10	0.01	0.10	0.92	0.63	-280.00
295.00	1.41	335.22	294.99	1.53	-0.50	1.61	1.05	1.00	-21.48
404.00	3.21	331.84	403.89	5.44	-2.51	5.90	1.66	1.65	-3.10
494.00	4.92	335.75	493.66	11.18	-5.28	12.16	1.92	1.90	4.34
582.00	6.42	337.64	581.23	19.17	-8.70	20.76	1.72	1.70	2.15
672.00	8.31	342.74	670.48	30.04	-12.55	32.25	2.22	2.10	5.67
761.00	8.70	342.65	758.51	42.60	-16.46	45.40	0.44	0.44	-0.10
847.00	10.02	345.02	843.36	56.04	-20.34	59.38	1.60	1.53	2.76

# ARK Directional Services

## Survey Report

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<b>Project:</b>	Dacono	<b>TVD Reference:</b>	KB @ 5031.00ft (Original Well Elev)
<b>Site:</b>	Dacono 11 Pad	<b>MD Reference:</b>	KB @ 5031.00ft (Original Well Elev)
<b>Well:</b>	Dacono 29-2 (111427)	<b>North Reference:</b>	True
<b>Wellbore:</b>	Dacono 29-2	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	Dacono 29-2	<b>Database:</b>	EDM5000

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)
898.00	10.28	345.72	893.56	64.74	-22.60	68.37	0.56	0.51	1.37
955.00	10.28	345.72	949.65	74.59	-25.11	78.54	0.00	0.00	0.00
985.00	10.20	343.84	979.17	79.74	-26.51	83.87	1.15	-0.27	-6.27
1,075.00	12.22	349.86	1,067.45	96.77	-30.41	101.33	2.59	2.24	6.69
1,165.00	14.02	350.56	1,155.10	116.90	-33.87	121.68	2.01	2.00	0.78
1,255.00	16.30	352.84	1,241.96	140.19	-37.24	145.05	2.62	2.53	2.53
1,345.00	18.98	351.35	1,327.72	167.20	-41.01	172.13	3.02	2.98	-1.66
1,431.00	21.01	349.86	1,408.53	196.20	-45.83	201.40	2.43	2.36	-1.73
1,521.00	21.62	348.54	1,492.38	228.34	-51.97	234.03	0.86	0.68	-1.47
1,609.00	22.10	345.46	1,574.05	260.25	-59.34	266.77	1.41	0.55	-3.50
1,700.00	23.69	341.02	1,657.89	294.11	-69.59	302.12	2.58	1.75	-4.88
1,789.00	23.99	339.05	1,739.29	327.92	-81.87	337.95	0.96	0.34	-2.21
1,878.00	23.82	340.54	1,820.66	361.76	-94.33	373.85	0.70	-0.19	1.67
1,967.00	25.71	343.13	1,901.47	397.18	-105.92	411.06	2.45	2.12	2.91
2,054.00	26.59	347.35	1,979.57	434.24	-115.66	449.38	2.36	1.01	4.85
2,145.00	27.60	349.23	2,060.59	474.82	-124.06	490.76	1.45	1.11	2.07
2,233.00	26.81	346.65	2,138.86	514.16	-132.45	530.94	1.61	-0.90	-2.93
2,320.00	27.42	346.34	2,216.29	552.72	-141.71	570.58	0.72	0.70	-0.36
2,408.00	27.29	345.33	2,294.45	591.92	-151.61	611.01	0.55	-0.15	-1.15
2,497.00	26.89	346.03	2,373.69	631.19	-161.63	651.54	0.57	-0.45	0.79
2,586.00	26.72	345.24	2,453.13	670.07	-171.59	691.67	0.44	-0.19	-0.89
2,676.00	24.39	345.72	2,534.32	707.65	-181.33	730.49	2.60	-2.59	0.53
2,765.00	24.61	344.32	2,615.30	743.30	-190.87	767.40	0.70	0.25	-1.57
2,854.00	25.09	343.22	2,696.06	779.21	-201.33	804.78	0.75	0.54	-1.24
2,943.00	23.51	344.14	2,777.18	814.35	-211.63	841.39	1.83	-1.78	1.03
3,031.00	26.28	348.54	2,857.00	850.34	-220.30	878.40	3.78	3.15	5.00
3,120.00	27.82	347.66	2,936.26	889.94	-228.65	918.82	1.79	1.73	-0.99
3,208.00	27.82	347.13	3,014.09	930.02	-237.61	959.86	0.28	0.00	-0.60
3,296.00	28.61	347.04	3,091.63	970.57	-246.91	1,001.44	0.90	0.90	-0.10
3,385.00	28.61	346.25	3,169.77	1,012.04	-256.76	1,044.04	0.43	0.00	-0.89
3,476.00	28.08	346.56	3,249.86	1,054.03	-266.91	1,087.24	0.60	-0.58	0.34
3,565.00	27.82	347.22	3,328.47	1,094.66	-276.38	1,128.93	0.45	-0.29	0.74
3,653.00	26.50	345.33	3,406.77	1,133.68	-285.89	1,169.09	1.79	-1.50	-2.15
3,743.00	25.00	348.14	3,487.83	1,171.72	-294.88	1,208.16	2.15	-1.67	3.12
3,831.00	25.49	349.46	3,567.43	1,208.53	-302.17	1,245.62	0.85	0.56	1.50
3,919.00	25.71	346.96	3,646.79	1,245.75	-309.94	1,283.58	1.25	0.25	-2.84
4,006.00	26.28	345.64	3,724.99	1,282.79	-318.98	1,321.70	0.93	0.66	-1.52
4,093.00	26.28	343.22	3,803.00	1,319.89	-329.31	1,360.21	1.23	0.00	-2.78
4,183.00	26.50	345.15	3,883.62	1,358.37	-340.21	1,400.20	0.98	0.24	2.14
4,273.00	26.81	343.84	3,964.06	1,397.28	-351.01	1,440.57	0.74	0.34	-1.46
4,361.00	26.10	343.13	4,042.85	1,434.86	-362.15	1,479.76	0.88	-0.81	-0.81
4,450.00	25.09	344.63	4,123.11	1,471.79	-372.83	1,518.19	1.35	-1.13	1.69
4,539.00	25.71	345.46	4,203.51	1,508.68	-382.68	1,556.37	0.80	0.70	0.93

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<b>Wellbore:</b>	Dacono 29-2	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	Dacono 29-2	<b>Database:</b>	EDM5000

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)
4,626.00	26.72	347.53	4,281.56	1,546.04	-391.64	1,594.78	1.57	1.16	2.38
4,715.00	25.88	347.92	4,361.35	1,584.57	-400.03	1,634.17	0.96	-0.94	0.44
4,805.00	24.30	345.94	4,442.85	1,621.75	-408.64	1,672.31	1.99	-1.76	-2.20
4,895.00	23.60	343.53	4,525.11	1,656.99	-418.24	1,708.84	1.34	-0.78	-2.68
4,982.00	25.18	343.44	4,604.34	1,691.43	-428.46	1,744.75	1.82	1.82	-0.10
5,073.00	24.39	342.74	4,686.96	1,727.93	-439.55	1,782.87	0.93	-0.87	-0.77
5,161.00	24.52	343.12	4,767.06	1,762.75	-450.24	1,819.27	0.23	0.15	0.43
5,250.00	22.50	342.43	4,848.67	1,796.67	-460.75	1,854.74	2.29	-2.27	-0.78
5,340.00	19.20	342.43	4,932.76	1,827.20	-470.41	1,886.74	3.67	-3.67	0.00
5,427.00	17.80	344.23	5,015.27	1,853.64	-478.35	1,914.32	1.74	-1.61	2.07
5,515.00	16.70	343.66	5,099.31	1,878.71	-485.56	1,940.41	1.26	-1.25	-0.65
5,603.00	15.51	343.13	5,183.85	1,902.11	-492.53	1,964.81	1.36	-1.35	-0.60
5,692.00	13.40	341.42	5,270.03	1,923.27	-499.27	1,987.00	2.42	-2.37	-1.92
5,779.00	11.38	340.32	5,355.00	1,940.91	-505.38	2,005.61	2.34	-2.32	-1.26
5,868.00	9.89	339.92	5,442.47	1,956.36	-510.96	2,021.97	1.68	-1.67	-0.45
5,956.00	8.39	340.23	5,529.35	1,969.50	-515.72	2,035.90	1.71	-1.70	0.35
6,044.00	7.29	339.84	5,616.53	1,980.78	-519.82	2,047.85	1.25	-1.25	-0.44
6,133.00	6.02	338.25	5,704.92	1,990.42	-523.50	2,058.11	1.44	-1.43	-1.79
6,222.00	4.31	328.54	5,793.56	1,997.61	-526.97	2,065.95	2.15	-1.92	-10.91
6,310.00	3.91	327.93	5,881.33	2,002.97	-530.29	2,071.98	0.46	-0.45	-0.69
6,399.00	2.02	308.46	5,970.21	2,006.52	-533.13	2,076.14	2.38	-2.12	-21.88
6,490.00	1.89	325.86	6,061.16	2,008.76	-535.23	2,078.84	0.66	-0.14	19.12
6,624.00	0.88	237.84	6,195.13	2,010.04	-537.34	2,080.62	1.54	-0.75	-65.69
6,757.00	0.70	253.75	6,328.12	2,009.27	-538.98	2,080.29	0.21	-0.14	11.96
6,892.00	0.31	238.63	6,463.11	2,008.85	-540.09	2,080.17	0.30	-0.29	-11.20
7,024.00	0.40	294.66	6,595.11	2,008.85	-540.81	2,080.36	0.26	0.07	42.45
7,159.00	0.31	22.86	6,730.11	2,009.39	-541.10	2,080.95	0.37	-0.07	65.33
7,292.00	0.62	356.93	6,863.11	2,010.44	-541.00	2,081.94	0.28	0.23	-19.50
7,427.00	0.40	310.26	6,998.10	2,011.47	-541.39	2,083.04	0.33	-0.16	-34.57
7,560.00	0.31	24.53	7,131.10	2,012.10	-541.60	2,083.70	0.33	-0.07	55.84
7,693.00	0.62	5.63	7,264.09	2,013.14	-541.38	2,084.65	0.26	0.23	-14.21
7,827.00	0.62	307.45	7,398.09	2,014.30	-541.88	2,085.90	0.45	0.00	-43.42
7,962.00	0.48	325.95	7,533.08	2,015.22	-542.78	2,087.02	0.17	-0.10	13.70
8,095.00	0.62	32.44	7,666.08	2,016.29	-542.71	2,088.03	0.46	0.11	49.99
8,230.00	0.48	53.22	7,801.07	2,017.24	-541.86	2,088.74	0.18	-0.10	15.39
8,363.00	0.79	20.66	7,934.06	2,018.43	-541.09	2,089.69	0.35	0.23	-24.48
8,493.00	0.88	331.53	8,064.05	2,020.15	-541.25	2,091.39	0.54	0.07	-37.79
8,608.52	0.98	353.93	8,179.56	2,021.91	-541.78	2,093.23	0.32	0.08	19.39
Dacono 29-2 Tgt									
8,631.00	1.01	357.63	8,202.03	2,022.29	-541.81	2,093.61	0.32	0.15	16.48
8,710.00	1.01	357.63	8,281.02	2,023.69	-541.86	2,094.97	0.00	0.00	0.00
Proj to TD at 8710 MD/8281 TVD									

# ARK Directional Services

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<b>Project:</b>	Dacono	<b>TVD Reference:</b>	KB @ 5031.00ft (Original Well Elev)
<b>Site:</b>	Dacono 11 Pad	<b>MD Reference:</b>	KB @ 5031.00ft (Original Well Elev)
<b>Well:</b>	Dacono 29-2 (111427)	<b>North Reference:</b>	True
<b>Wellbore:</b>	Dacono 29-2	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	Dacono 29-2	<b>Database:</b>	EDM5000

Survey Annotations				
Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment
		+N/-S (ft)	+E/-W (ft)	
8,710.00	8,281.02	2,023.69	-541.86	Proj to TD at 8710 MD/8281 TVD

Checked By: \_\_\_\_\_ Approved By: \_\_\_\_\_ Date: \_\_\_\_\_