

**Job Number:** 125464  
**Company:** Anadarko  
**Lease/Well:** Saddleback 6-29  
**Location:** Saddleback 18-29  
**Rig Name:** Xtreme 11  
**RKB:** 5031  
**G.L. or M.S.L.:** GL

**State/Country:** CO/USA  
**Declination:** 8.7  
**Grid:** True  
**File name:** C:\WINSERVE\125464.SVY  
**Date/Time:** 25-Jul-12 / 11:50  
**Curve Name:** Saddleback 6-29

### Cathedral Energy Services

WINSERVE SURVEY CALCULATIONS  
*Minimum Curvature Method*  
*Vertical Section Plane 131.86*  
*Vertical Section Referenced to Wellhead*  
*Rectangular Coordinates Referenced to Wellhead*

<i>Measured Depth FT</i>	<i>Incl Angle Deg</i>	<i>Drift Direction Deg</i>	<i>True Vertical Depth</i>	<i>N-S FT</i>	<i>E-W FT</i>	<i>Vertical Section FT</i>	<i>C L O S U R E</i>		<i>Dogleg Severity Deg/100</i>
							<i>Distance FT</i>	<i>Direction Deg</i>	
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
77.00	.60	191.40	77.00	-.40	-.08	.20	.40	191.40	.78
164.00	.90	128.80	163.99	-1.27	.36	1.12	1.32	164.06	.94
253.00	2.40	154.80	252.95	-3.39	1.70	3.53	3.80	153.38	1.84
369.00	3.90	151.70	368.78	-9.07	4.61	9.48	10.17	153.07	1.30
462.00	5.40	147.90	461.47	-15.56	8.43	16.66	17.70	151.55	1.65
553.00	5.10	145.50	552.09	-22.52	13.00	24.71	26.00	150.01	.41
644.00	5.10	132.60	642.73	-28.59	18.27	32.68	33.93	147.43	1.26
735.00	5.30	118.60	733.36	-33.34	24.93	40.82	41.63	143.21	1.41
825.00	5.80	120.60	822.93	-37.64	32.50	49.32	49.73	139.20	.60
910.00	6.40	122.80	907.45	-42.40	40.18	58.21	58.41	136.54	.76
972.00	7.70	126.90	968.98	-46.76	46.40	65.76	65.88	135.22	2.25
1063.00	9.80	135.90	1058.92	-55.99	56.67	79.57	79.66	134.65	2.75

Measured Depth FT	Incl Angle Deg	Drift Direction Deg	True Vertical Depth	N-S FT	E-W FT	Vertical Section FT	C L O S U R E		Dogleg Severity Deg/100
							Distance FT	Direction Deg	
1154.00	11.00	141.60	1148.43	-68.35	67.45	95.85	96.03	135.38	1.74
1245.00	11.30	143.40	1237.71	-82.31	78.16	113.14	113.51	136.48	.50
1335.00	14.40	143.10	1325.45	-98.35	90.14	132.76	133.41	137.49	3.45
1426.00	15.70	132.20	1413.34	-115.67	106.06	156.18	156.93	137.48	3.42
1517.00	15.10	126.40	1501.08	-130.97	124.72	180.29	180.86	136.40	1.82
1608.00	14.70	126.00	1589.02	-144.80	143.60	203.58	203.93	135.24	.45
1698.00	14.20	125.40	1676.17	-157.90	161.84	225.90	226.11	134.29	.58
1789.00	12.90	125.20	1764.64	-170.22	179.24	247.08	247.19	133.52	1.43
1880.00	12.10	120.50	1853.48	-180.92	195.76	266.53	266.56	132.74	1.42
1971.00	11.10	118.70	1942.62	-189.97	211.66	284.41	284.41	131.91	1.17
2061.00	9.40	128.10	2031.19	-198.66	225.04	300.18	300.19	131.44	2.64
2152.00	9.60	137.40	2120.95	-208.84	236.03	315.15	315.15	131.50	1.70
2243.00	8.40	136.60	2210.82	-219.25	245.73	329.32	329.33	131.74	1.33
2333.00	7.30	135.90	2299.98	-228.13	254.23	341.58	341.58	131.90	1.23
2424.00	8.60	141.60	2390.10	-237.62	262.48	354.05	354.06	132.15	1.67
2515.00	10.50	141.60	2479.84	-249.45	271.86	368.93	368.96	132.54	2.09
2605.00	11.70	134.90	2568.16	-262.32	283.41	386.13	386.18	132.79	1.96
2696.00	13.10	137.10	2657.03	-276.39	296.97	405.61	405.69	132.94	1.62
2786.00	14.20	134.10	2744.49	-291.54	311.84	426.80	426.90	133.07	1.45
2877.00	14.50	127.10	2832.66	-306.18	328.94	449.31	449.39	132.95	1.93
2968.00	13.00	127.40	2921.05	-319.27	346.16	470.87	470.92	132.69	1.65
3059.00	11.50	127.90	3009.97	-331.06	361.45	490.12	490.15	132.49	1.65
3150.00	9.90	127.60	3099.39	-341.41	374.81	506.97	506.99	132.33	1.76
3240.00	8.80	127.50	3188.19	-350.32	386.40	521.55	521.56	132.20	1.22
3331.00	8.00	124.60	3278.21	-358.15	397.14	534.78	534.78	132.05	.99
3422.00	7.90	133.80	3368.34	-366.08	406.86	547.31	547.31	131.98	1.40
3513.00	8.70	135.30	3458.39	-375.30	416.22	560.43	560.43	132.04	.91
3604.00	9.10	134.70	3548.29	-385.25	426.17	574.49	574.49	132.11	.45
3694.00	11.10	134.80	3636.90	-396.36	437.38	590.25	590.26	132.18	2.22
3785.00	11.60	140.30	3726.12	-409.57	449.44	608.05	608.07	132.34	1.31
3876.00	10.90	140.40	3815.37	-423.24	460.77	625.61	625.65	132.57	.77
3966.00	11.00	147.10	3903.73	-437.01	470.86	642.31	642.41	132.86	1.42
4057.00	12.00	138.50	3992.91	-451.39	481.84	660.08	660.24	133.13	2.18
4148.00	13.20	129.70	4081.73	-465.11	496.11	679.86	680.04	133.15	2.48

Measured Depth FT	Incl Angle Deg	Drift Direction Deg	True Vertical Depth	N-S FT	E-W FT	Vertical Section FT	C L O S U R E		Dogleg Severity Deg/100
							Distance FT	Direction Deg	
4238.00	11.20	130.90	4169.69	-477.40	510.62	698.87	699.03	133.07	2.24
4329.00	11.30	134.10	4258.94	-489.39	523.70	716.62	716.78	133.06	.69
4420.00	12.20	127.30	4348.04	-501.42	537.76	735.11	735.26	133.00	1.81
4510.00	13.00	126.30	4435.87	-513.18	553.48	754.67	754.78	132.84	.92
4601.00	13.50	125.90	4524.45	-525.46	570.33	775.42	775.49	132.66	.56
4692.00	12.90	127.50	4613.04	-537.88	587.00	796.11	796.16	132.50	.77
4782.00	14.20	129.50	4700.54	-551.01	603.49	817.16	817.20	132.40	1.54
4873.00	14.00	130.00	4788.80	-565.19	620.53	839.31	839.34	132.33	.26
4964.00	14.40	127.80	4877.02	-579.20	637.90	861.60	861.62	132.24	.74
5055.00	14.70	124.90	4965.10	-592.74	656.31	884.35	884.36	132.09	.87
5145.00	13.60	128.10	5052.37	-605.80	674.01	906.25	906.25	131.95	1.50
5236.00	12.40	127.20	5141.03	-618.31	690.21	926.66	926.66	131.86	1.34
5327.00	10.30	125.80	5230.25	-628.98	704.59	944.49	944.49	131.75	2.33
5417.00	8.60	126.50	5319.02	-637.69	716.53	959.19	959.20	131.67	1.89
5508.00	7.00	126.50	5409.18	-645.04	726.46	971.49	971.50	131.60	1.76
5599.00	5.30	128.40	5499.65	-650.95	734.21	981.21	981.22	131.56	1.88
5690.00	3.80	129.90	5590.36	-655.49	739.81	988.42	988.43	131.54	1.65
5780.00	2.90	126.90	5680.21	-658.77	743.92	993.66	993.68	131.53	1.02
5871.00	2.40	125.10	5771.11	-661.25	747.32	997.85	997.87	131.50	.56
5962.00	2.50	158.60	5862.03	-664.19	749.61	1001.51	1001.53	131.54	1.55
6052.00	2.40	164.80	5951.95	-667.84	750.82	1004.85	1004.86	131.65	.31
6143.00	1.80	174.40	6042.89	-671.10	751.46	1007.50	1007.50	131.77	.76
6234.00	1.80	177.90	6133.84	-673.95	751.65	1009.55	1009.55	131.88	.12
6325.00	1.40	185.90	6224.81	-676.48	751.59	1011.19	1011.19	131.99	.50
6415.00	1.30	183.10	6314.78	-678.60	751.42	1012.48	1012.48	132.08	.13
6506.00	1.10	188.40	6405.76	-680.49	751.23	1013.60	1013.62	132.17	.25
6597.00	.50	181.10	6496.75	-681.75	751.10	1014.34	1014.37	132.23	.67
6687.00	.60	152.20	6586.75	-682.56	751.31	1015.04	1015.07	132.26	.32
6778.00	.30	114.90	6677.75	-683.08	751.75	1015.72	1015.74	132.26	.44
6869.00	.30	148.10	6768.75	-683.39	752.09	1016.17	1016.20	132.26	.19
6960.00	.40	110.50	6859.75	-683.70	752.51	1016.70	1016.72	132.26	.27
7051.00	.70	58.80	6950.74	-683.52	753.29	1017.16	1017.18	132.22	.60
7141.00	.70	59.70	7040.73	-682.96	754.23	1017.48	1017.50	132.16	.01
7232.00	.90	47.40	7131.73	-682.20	755.24	1017.72	1017.73	132.09	.29

Measured Depth FT	Incl Angle Deg	Drift Direction Deg	True Vertical Depth	N-S FT	E-W FT	Vertical Section FT	C L O S U R E		Dogleg Severity Deg/100
							Distance FT	Direction Deg	
7323.00	1.10	64.60	7222.71	-681.34	756.55	1018.13	1018.13	132.01	.39
7414.00	.60	62.00	7313.70	-680.74	757.76	1018.63	1018.63	131.94	.55
7505.00	.50	45.60	7404.70	-680.24	758.47	1018.82	1018.82	131.89	.20
7595.00	2.70	81.90	7494.66	-679.67	760.85	1020.21	1020.21	131.77	2.57
7686.00	4.00	91.00	7585.50	-679.42	766.14	1023.99	1024.00	131.57	1.54
7777.00	4.80	101.90	7676.23	-680.26	773.04	1029.69	1029.73	131.35	1.27
7824.00	5.10	95.00	7723.06	-680.85	777.05	1033.07	1033.13	131.22	1.42
7868.00	5.00	91.50	7766.89	-681.07	780.91	1036.09	1036.18	131.09	.74
7958.00	4.40	83.40	7856.59	-680.77	788.26	1041.37	1041.54	130.82	.99
8049.00	4.00	84.90	7947.34	-680.09	794.89	1045.85	1046.12	130.55	.46
8140.00	3.30	84.20	8038.16	-679.54	800.66	1049.78	1050.16	130.32	.77
8231.00	2.90	77.30	8129.02	-678.77	805.51	1052.88	1053.37	130.12	.60
8273.00	3.10	78.70	8170.97	-678.32	807.66	1054.18	1054.72	130.03	.51
--Projection to Bit--									
8328.00	3.10	78.70	8225.89	-677.73	810.58	1055.96	1056.58	129.90	.00