

**Job Number: 12-233**  
**Company: Unit Petroleum**  
**Lease/Well: M&M Farms 20 #1H**  
**Location: Reno County**  
**Rig Name: Unit # 331**  
**RKB:**   
**G.L. or M.S.L.:**

**State/Country: Kansas**  
**Declination: 4.71**  
**Grid: -0.09**  
**File name: C:\WINSERVE\M&M20\_1H.SVY**  
**Date/Time: 03-Jan-13 / 12:24**  
**Curve Name: As Drilled**

**As Drilled**

WINSERVE SURVEY CALCULATIONS  
*Minimum Curvature Method*  
*Vertical Section Plane 180.00*  
*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>Dogleg Severity Deg/100</i>
2790.00	.10	95.42	2789.93	9.80	1.09	-9.80	.00
2875.00	.20	93.70	2874.93	9.78	1.31	-9.78	.12
2993.00	.30	293.30	2992.93	9.89	1.23	-9.89	.42
3064.00	.50	244.20	3063.93	9.83	.78	-9.83	.53
3094.00	.40	256.00	3093.93	9.75	.56	-9.75	.45
3126.00	.60	214.20	3125.93	9.58	.36	-9.58	1.26
3158.00	1.40	193.40	3157.92	9.06	.18	-9.06	2.71
3189.00	3.80	186.40	3188.89	7.67	-.03	-7.67	7.80
3221.00	6.50	186.30	3220.75	4.82	-.34	-4.82	8.44
3253.00	8.90	186.20	3252.46	.56	-.81	-.56	7.50
3285.00	11.20	184.20	3283.97	-5.00	-1.30	5.00	7.27
3317.00	13.80	181.90	3315.21	-11.92	-1.66	11.92	8.27
3349.00	16.40	182.00	3346.10	-20.25	-1.94	20.25	8.13
3380.00	19.40	181.80	3375.60	-29.77	-2.26	29.77	9.68
3412.00	22.50	181.10	3405.48	-41.21	-2.54	41.21	9.72
3444.00	25.60	180.00	3434.70	-54.25	-2.66	54.25	9.79
3476.00	29.00	179.40	3463.13	-68.92	-2.58	68.92	10.66
3508.00	32.40	179.30	3490.64	-85.25	-2.39	85.25	10.63
3539.00	36.10	179.30	3516.26	-102.70	-2.18	102.70	11.94
3571.00	39.60	179.50	3541.52	-122.33	-1.97	122.33	10.94
3603.00	42.90	179.70	3565.58	-143.42	-1.83	143.42	10.32
3634.00	46.90	180.00	3587.53	-165.30	-1.77	165.30	12.92
3666.00	50.60	179.60	3608.63	-189.35	-1.69	189.35	11.60
3698.00	51.90	179.60	3628.66	-214.31	-1.51	214.31	4.06
3730.00	52.20	179.30	3648.34	-239.54	-1.27	239.54	1.19

Measured Depth FT	Incl Angle Deg	Drift Direction Deg	True Vertical Depth	N-S FT	E-W FT	Vertical Section FT	Dogleg Severity Deg/100
3761.00	52.40	179.30	3667.29	-264.07	-.97	264.07	.65
3793.00	52.60	179.30	3686.78	-289.45	-.66	289.45	.62
3825.00	52.50	179.50	3706.23	-314.86	-.39	314.86	.59
3857.00	53.40	179.50	3725.51	-340.39	-.17	340.39	2.81
3887.00	56.60	179.80	3742.72	-364.97	-.02	364.97	10.70
3919.00	60.20	179.80	3759.48	-392.22	.07	392.22	11.25
3951.00	63.90	179.60	3774.48	-420.48	.22	420.48	11.58
3982.00	67.70	179.80	3787.18	-448.75	.37	448.75	12.27
4014.00	71.00	179.70	3798.47	-478.69	.50	478.69	10.32
4046.00	73.90	180.30	3808.12	-509.19	.50	509.19	9.24
4078.00	77.40	180.60	3816.05	-540.19	.25	540.19	10.98
4109.00	80.40	181.00	3822.01	-570.60	-.17	570.60	9.76
4141.00	84.10	181.10	3826.33	-602.30	-.75	602.30	11.57
4212.00	88.90	181.50	3830.66	-673.13	-2.36	673.13	6.78
4243.00	88.80	181.00	3831.28	-704.12	-3.04	704.12	1.64
4274.00	89.20	181.00	3831.82	-735.11	-3.58	735.11	1.29
4305.00	89.50	180.90	3832.18	-766.10	-4.09	766.10	1.02
4336.00	89.70	180.60	3832.39	-797.10	-4.50	797.10	1.16
4367.00	89.80	180.90	3832.53	-828.09	-4.90	828.09	1.02
4398.00	90.20	181.00	3832.53	-859.09	-5.42	859.09	1.33
4429.00	90.20	180.80	3832.42	-890.09	-5.90	890.09	.65
4460.00	90.20	180.60	3832.31	-921.08	-6.28	921.08	.65
4490.00	90.20	180.50	3832.21	-951.08	-6.57	951.08	.33
4520.00	90.20	180.50	3832.10	-981.08	-6.83	981.08	.00
4551.00	90.30	180.40	3831.97	-1012.08	-7.07	1012.08	.46
4611.00	90.50	180.20	3831.55	-1072.08	-7.39	1072.08	.47
4673.00	90.60	180.10	3830.95	-1134.07	-7.55	1134.07	.23
4735.00	90.50	179.80	3830.36	-1196.07	-7.50	1196.07	.51
4797.00	90.20	180.00	3829.98	-1258.07	-7.39	1258.07	.58
4859.00	89.30	179.50	3830.25	-1320.07	-7.12	1320.07	1.66
4922.00	89.70	179.70	3830.80	-1383.06	-6.68	1383.06	.71
4983.00	90.10	180.00	3830.91	-1444.06	-6.52	1444.06	.82
5044.00	90.10	179.80	3830.80	-1505.06	-6.41	1505.06	.33
5106.00	89.60	180.20	3830.96	-1567.06	-6.41	1567.06	1.03
5169.00	88.80	180.40	3831.84	-1630.05	-6.74	1630.05	1.31
5231.00	88.90	180.90	3833.09	-1692.04	-7.45	1692.04	.82
5293.00	90.60	180.90	3833.36	-1754.03	-8.42	1754.03	2.74
5356.00	89.40	180.20	3833.36	-1817.02	-9.02	1817.02	2.21
5418.00	89.70	180.00	3833.84	-1879.02	-9.13	1879.02	.58
5480.00	90.30	180.10	3833.84	-1941.02	-9.19	1941.02	.98
5543.00	89.30	179.40	3834.06	-2004.02	-8.91	2004.02	1.94
5605.00	89.80	179.70	3834.55	-2066.01	-8.42	2066.01	.94
5667.00	89.80	179.40	3834.77	-2128.01	-7.94	2128.01	.48
5729.00	89.30	179.40	3835.25	-2190.01	-7.29	2190.01	.81
5792.00	89.60	179.80	3835.86	-2253.00	-6.85	2253.00	.79

Measured Depth FT	Incl Angle Deg	Drift Direction Deg	True Vertical Depth	N-S FT	E-W FT	Vertical Section FT	Dogleg Severity Deg/100
5854.00	89.30	180.00	3836.45	-2315.00	-6.74	2315.00	.58
5916.00	88.10	179.80	3837.86	-2376.98	-6.63	2376.98	1.96
5978.00	88.40	179.50	3839.75	-2438.95	-6.25	2438.95	.68
6040.00	88.20	179.40	3841.59	-2500.92	-5.66	2500.92	.36
6101.00	88.00	179.70	3843.61	-2561.88	-5.18	2561.88	.59
6164.00	88.60	179.70	3845.48	-2624.86	-4.85	2624.86	.95
6226.00	90.10	179.50	3846.19	-2686.85	-4.42	2686.85	2.44
6289.00	90.70	179.10	3845.75	-2749.84	-3.65	2749.84	1.14
6353.00	90.30	178.90	3845.19	-2813.83	-2.53	2813.83	.70
6416.00	90.10	178.60	3844.97	-2876.81	-1.16	2876.81	.57
6479.00	90.20	178.60	3844.80	-2939.80	.38	2939.80	.16
6541.00	89.90	178.30	3844.75	-3001.77	2.06	3001.77	.68
6605.00	89.10	178.70	3845.31	-3065.75	3.74	3065.75	1.40
6668.00	89.90	178.80	3845.86	-3128.73	5.11	3128.73	1.28
6731.00	90.00	178.80	3845.91	-3191.72	6.43	3191.72	.16
6794.00	89.60	178.60	3846.13	-3254.70	7.86	3254.70	.71
6857.00	90.40	178.60	3846.13	-3317.68	9.40	3317.68	1.27
6920.00	89.90	179.30	3845.97	-3380.67	10.55	3380.67	1.37
6983.00	90.10	179.50	3845.97	-3443.66	11.21	3443.66	.45
7046.00	89.60	179.30	3846.13	-3506.66	11.87	3506.66	.85
7110.00	90.30	179.30	3846.19	-3570.66	12.65	3570.66	1.09
7173.00	90.30	179.00	3845.86	-3633.65	13.59	3633.65	.48
7236.00	89.80	179.30	3845.80	-3696.64	14.52	3696.64	.93
7299.00	90.40	179.30	3845.69	-3759.64	15.29	3759.64	.95
7362.00	89.50	178.70	3845.75	-3822.62	16.39	3822.62	1.72
7425.00	90.20	178.70	3845.91	-3885.61	17.82	3885.61	1.11
7488.00	88.80	179.70	3846.46	-3948.60	18.70	3948.60	2.73
7551.00	89.30	179.80	3847.51	-4011.59	18.98	4011.59	.81
7614.00	89.60	180.30	3848.11	-4074.58	18.92	4074.58	.93
7678.00	89.20	180.80	3848.78	-4138.58	18.31	4138.58	1.00
7741.00	89.80	181.10	3849.33	-4201.57	17.26	4201.57	1.06
7803.00	89.30	180.30	3849.82	-4263.56	16.50	4263.56	1.52
7867.00	87.80	180.20	3851.44	-4327.54	16.22	4327.54	2.35
7930.00	88.00	180.20	3853.75	-4390.49	16.00	4390.49	.32
7992.00	88.30	180.00	3855.75	-4452.46	15.90	4452.46	.58
8055.00	88.90	179.40	3857.29	-4515.44	16.23	4515.44	1.35
8118.00	89.10	179.30	3858.39	-4578.43	16.94	4578.43	.35
8150.00	89.60	179.30	3858.75	-4610.42	17.33	4610.42	1.56
8182.00	90.00	179.40	3858.86	-4642.42	17.70	4642.42	1.29
<b>TD Bit Proj</b>							
8232.00	90.00	179.40	3858.86	-4692.42	18.22	4692.42	.00