

103.02774

<b>Job Number:</b> 23D0113031	<b>State/Country:</b> West Virginia
<b>Company:</b> Stone Energy	<b>Declination:</b> -8.45
<b>Lease/Well:</b> Bowyers 4H	<b>Grid:</b> North
<b>Location:</b> New Martinsville	<b>File name:</b> D:\WINSERVE\STONEJ~1\BOW4H.SVY
<b>Rig Name:</b> Saxon 141	<b>Date/Time:</b> 11-Feb-13 / 16:24
<b>RKB:</b> 18	<b>Curve Name:</b> Bowyers 4H As Drilled
<b>G.L. or M.S.L.:</b> 1156	

**Scientific Drilling**

WINSERVE SURVEY CALCULATIONS  
*Minimum Curvature Method*  
*Vertical Section Plane 171.27*  
*Vertical Section Referenced to Wellhead*  
*Rectangular Coordinates Referenced to Wellhead*

<b>Measured Depth FT</b>	<b>Incl Angle Deg</b>	<b>Drift Direction Deg</b>	<b>True Vertical Depth</b>	<b>N-S FT</b>	<b>E-W FT</b>	<b>Vertical Section FT</b>	<b>CLOSURE</b>		<b>Dogleg Severity Deg/100</b>
							<b>Distance FT</b>	<b>Direction Deg</b>	
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
18.00	.00	.00	18.00	.00	.00	.00	.00	.00	.00
103.00	.77	194.79	103.00	-5.55	-1.15	.52	.57	194.79	.91
203.00	.31	190.39	202.99	-1.47	-.37	1.40	1.51	194.00	.46
303.00	.26	215.54	302.99	-1.92	-.55	1.81	2.00	195.91	.13
403.00	.19	235.67	402.99	-2.20	-.82	2.05	2.34	200.37	.10
503.00	.19	235.86	502.99	-2.38	-1.09	2.19	2.62	204.57	.00
603.00	.13	228.62	602.99	-2.55	-1.31	2.32	2.87	207.22	.06
703.00	.20	220.41	702.99	-2.76	-1.51	2.50	3.15	208.69	.07
803.00	.12	255.04	802.99	-2.92	-1.72	2.62	3.39	210.57	.12
903.00	.12	261.41	902.99	-2.96	-1.93	2.63	3.53	213.08	.01
1003.00	.24	357.04	1002.99	-2.77	-2.04	2.43	3.44	216.44	.28
1103.00	.10	283.13	1102.99	-2.54	-2.14	2.19	3.32	220.12	.23
1203.00	.17	330.48	1202.99	-2.39	-2.30	2.01	3.32	223.87	.13
1303.00	.23	333.58	1302.99	-2.08	-2.46	1.68	3.22	229.76	.06
1403.00	.35	337.28	1402.99	-1.62	-2.67	1.20	3.12	238.72	.12
1503.00	.39	345.55	1502.98	-1.01	-2.87	.56	3.04	250.63	.07
1603.00	.47	349.39	1602.98	-.28	-3.03	-.19	3.04	264.79	.08
1703.00	.45	342.77	1702.98	.50	-3.22	-.99	3.26	278.86	.06
1803.00	.45	339.63	1802.97	1.25	-3.48	-1.76	3.69	289.71	.02
1903.00	.51	2.42	1902.97	2.06	-3.59	-2.58	4.14	299.80	.20
2003.00	.62	12.67	2002.97	3.03	-3.46	-3.52	4.60	311.25	.15
2103.00	.56	26.68	2102.96	4.00	-3.12	-4.42	5.07	322.03	.16
2203.00	.59	35.30	2202.96	4.85	-2.60	-5.19	5.51	331.81	.09
2303.00	.55	50.03	2302.95	5.58	-1.94	-5.81	5.91	340.87	.15
2403.00	.38	165.98	2402.95	5.57	-1.49	-5.73	5.76	345.04	.79
2503.00	.84	187.11	2502.94	4.52	-1.50	-4.69	4.76	341.66	.50
2603.00	1.96	204.24	2602.91	2.23	-2.29	-2.55	3.20	314.25	1.18
2703.00	3.43	208.17	2702.80	-1.97	-4.41	1.27	4.82	245.95	1.48
2803.00	5.26	213.90	2802.51	-8.41	-8.37	7.04	11.87	224.89	1.88

03/28/2014

103.02774

Measured Depth FT	Incl Angle Deg	Drift Direction Deg	True Vertical Depth			Vertical Section FT	C L O S U R E		Dogleg Severity Deg/100
				N-S FT	E-W FT		Distance FT	Direction Deg	
2903.00	6.44	216.19	2901.99	-16.74	-14.24	14.38	21.98	220.39	1.20
3003.00	7.43	216.17	3001.25	-26.48	-21.37	22.93	34.03	218.90	.99
3103.00	7.80	216.78	3100.37	-37.14	-29.25	32.27	47.27	218.22	.38
3203.00	8.40	216.40	3199.37	-48.45	-37.65	42.18	61.36	217.85	.60
3303.00	9.26	217.36	3298.19	-60.73	-46.86	52.91	76.71	217.66	.87
3403.00	9.38	216.19	3396.87	-73.70	-56.56	64.26	92.90	217.50	.22
3503.00	9.04	220.04	3495.58	-86.29	-66.42	75.21	108.90	217.59	.70
3603.00	8.91	217.17	3594.35	-98.48	-76.16	85.78	124.49	217.72	.47
3703.00	8.12	213.63	3693.25	-110.53	-84.75	96.39	139.28	217.48	.95
3803.00	7.93	214.63	3792.27	-122.09	-92.58	106.62	153.22	217.17	.24
3903.00	7.77	213.98	3891.34	-133.37	-100.28	116.60	166.86	216.94	.18
4003.00	7.47	209.56	3990.45	-144.63	-107.26	126.67	180.06	216.56	.66
4103.00	5.97	216.75	4089.77	-154.45	-113.58	135.42	191.72	216.33	1.72
4203.00	4.56	225.54	4189.34	-161.40	-119.53	141.39	200.84	216.52	1.62
4303.00	4.12	222.76	4289.06	-166.82	-124.81	145.95	208.34	216.80	.49
4403.00	2.17	213.55	4388.90	-171.04	-128.29	149.58	213.80	216.87	2.01
4503.00	1.62	206.29	4488.85	-173.88	-129.96	152.14	217.08	216.78	.60
4603.00	1.19	198.85	4588.82	-176.13	-130.92	154.22	219.46	216.62	.47
4703.00	.84	190.41	4688.80	-177.84	-131.39	155.83	221.11	216.46	.38
4803.00	.06	121.35	4788.80	-178.58	-131.48	156.56	221.76	216.36	.82
4903.00	.56	343.21	4888.79	-178.14	-131.58	156.11	221.47	216.45	.61
4963.75	.65	353.07	4949.54	-177.52	-131.70	155.47	221.04	216.57	.23
4997.00	.29	327.37	4982.79	-177.26	-131.77	155.21	220.87	216.63	1.23
5060.00	.33	332.34	5045.79	-176.96	-131.94	154.89	220.74	216.71	.08
5124.00	.42	312.46	5109.79	-176.64	-132.20	154.53	220.64	216.81	.25
5155.00	.42	324.45	5140.79	-176.47	-132.35	154.34	220.59	216.87	.28
5187.00	.50	315.98	5172.79	-176.28	-132.52	154.12	220.53	216.93	.33
5218.00	.94	188.00	5203.78	-176.43	-132.65	154.26	220.73	216.94	4.22
5250.00	3.32	182.93	5235.76	-177.62	-132.73	155.41	221.73	216.77	7.45
5281.00	5.28	185.81	5266.67	-179.93	-132.92	157.67	223.70	216.45	6.36
5313.00	7.02	185.13	5298.49	-183.35	-133.24	161.00	226.65	216.01	5.44
5344.00	8.53	186.12	5329.20	-187.52	-133.66	165.06	230.28	215.48	4.89
5376.00	9.72	187.99	5360.79	-192.55	-134.29	169.94	234.76	214.89	3.83
5408.00	10.79	189.24	5392.28	-198.19	-135.14	175.38	239.88	214.29	3.42
5440.00	11.88	189.28	5423.66	-204.39	-136.16	181.36	245.59	213.67	3.41
5471.00	12.52	190.71	5453.96	-210.84	-137.29	187.56	251.61	213.07	2.28
5502.00	13.83	194.90	5484.14	-217.73	-138.87	194.13	258.24	212.53	5.23
5534.00	15.21	200.16	5515.12	-225.36	-141.30	201.31	266.00	212.09	5.96
5565.00	16.68	207.35	5544.93	-233.13	-144.75	208.46	274.42	211.84	7.93
5597.00	17.30	210.22	5575.53	-241.32	-149.25	215.88	283.75	211.74	3.26
5629.00	16.84	210.98	5606.12	-249.41	-154.03	223.14	293.14	211.70	1.60
5660.00	17.03	212.25	5635.78	-257.10	-158.77	230.02	302.17	211.70	1.34
5692.00	18.76	212.65	5666.23	-265.40	-164.04	237.42	312.00	211.72	5.42
5724.00	20.89	213.91	5696.33	-274.46	-170.00	245.48	322.85	211.77	6.79
5755.00	22.20	215.25	5725.17	-283.83	-176.47	253.76	334.22	211.87	4.51
5787.00	23.05	216.17	5754.70	-293.83	-183.65	262.55	346.50	212.01	2.88
5819.00	24.95	216.43	5783.94	-304.32	-191.36	271.75	359.48	212.16	5.95
5851.00	26.77	216.34	5812.73	-315.55	-199.64	281.60	373.40	212.32	5.69
5883.00	28.73	215.48	5841.05	-327.62	-208.37	292.20	388.27	212.46	6.25
5914.00	30.56	213.60	5867.99	-340.25	-217.06	303.37	403.60	212.54	6.62

03/21/2014

103-02774

Measured Depth FT	Incl Angle Deg	Drift Direction Deg	True Vertical Depth	N-S		E-W		Vertical Section FT	C L O S U R E		Dogleg Severity Deg/100
				FT	FT	FT	FT		Distance FT	Direction Deg	
5946.00	32.75	213.04	5895.23	-354.29	-226.28	315.84	420.39	212.57	6.91		
5977.00	33.84	213.08	5921.14	-368.55	-235.57	328.53	437.40	212.59	3.52		
6009.00	34.96	213.36	5947.54	-383.67	-245.47	341.97	455.48	212.61	3.53		
6041.00	36.27	213.91	5973.56	-399.19	-255.79	355.74	474.11	212.65	4.21		
6072.00	39.41	214.53	5998.03	-414.91	-266.49	369.65	493.12	212.71	10.20		
6104.00	42.26	214.54	6022.24	-432.14	-278.35	384.89	514.03	212.79	8.91		
6136.00	43.32	214.54	6045.73	-450.05	-290.68	400.72	535.76	212.86	3.31		
6167.00	43.21	214.23	6068.30	-467.58	-302.68	416.23	557.00	212.92	.77		
6199.00	43.80	212.76	6091.51	-485.95	-314.83	432.54	579.03	212.94	3.66		
6230.00	45.62	208.75	6113.54	-504.69	-325.97	449.37	600.81	212.86	10.83		
6261.00	47.40	205.35	6134.88	-524.72	-336.18	467.62	623.18	212.65	9.81		
6293.00	48.41	202.24	6156.34	-546.45	-345.76	487.64	646.65	212.32	7.87		
6324.00	49.44	200.74	6176.71	-568.19	-354.32	507.83	669.61	211.95	4.93		
6356.00	50.76	199.19	6197.23	-591.26	-362.69	529.36	693.64	211.53	5.55		
6388.00	52.40	196.32	6217.12	-615.14	-370.33	551.80	718.01	211.05	8.70		
6420.00	54.13	194.89	6236.26	-639.84	-377.23	575.17	742.76	210.52	6.48		
6452.00	56.57	192.42	6254.45	-665.41	-383.43	599.51	767.98	209.95	9.92		
6484.00	59.07	190.26	6271.50	-691.97	-388.75	624.94	793.69	209.33	9.68		
6515.00	61.23	188.56	6286.93	-718.49	-393.14	650.49	819.01	208.69	8.44		
6547.00	62.88	186.30	6301.92	-746.52	-396.79	677.64	845.42	207.99	8.09		
6579.00	64.70	184.29	6316.06	-775.10	-399.44	705.50	871.97	207.26	8.01		
6611.00	66.50	181.70	6329.28	-804.20	-400.95	734.03	898.61	206.50	9.27		
6642.00	69.75	180.05	6340.83	-832.96	-401.39	762.39	924.63	205.73	11.59		
6674.00	72.30	179.03	6351.23	-863.22	-401.14	792.33	951.87	204.92	8.52		
6706.00	73.71	178.08	6360.58	-893.81	-400.37	822.68	979.38	204.13	5.24		
6738.00	74.99	176.84	6369.22	-924.59	-399.00	853.32	1007.01	203.34	5.47		
6769.00	77.14	176.11	6376.68	-954.62	-397.15	883.28	1033.94	202.59	7.30		
6801.00	80.93	175.23	6382.77	-985.94	-394.78	914.60	1062.04	201.82	12.15		
6832.00	85.26	174.30	6386.49	-1016.58	-391.97	945.31	1089.53	201.09	14.28		
6864.00	88.35	173.23	6388.28	-1048.33	-388.50	977.22	1118.01	200.33	10.22		
6896.00	89.40	173.03	6388.90	-1080.10	-384.67	1009.20	1146.55	199.60	3.34		
6959.00	90.10	173.71	6389.18	-1142.67	-377.40	1072.16	1203.39	198.28	1.55		
7020.00	90.07	172.00	6389.09	-1203.20	-369.81	1133.13	1258.75	197.09	2.80		
7082.00	89.60	170.21	6389.27	-1264.45	-360.23	1195.13	1314.76	195.90	2.98		
7142.00	89.40	168.09	6389.79	-1323.37	-348.93	1255.08	1368.60	194.77	3.55		
<b>Check Bottom Line</b>											
7203.00	89.09	165.82	6390.60	-1382.79	-335.17	1315.90	1422.83	193.62	3.76		
7264.00	89.93	166.47	6391.12	-1442.01	-320.56	1376.65	1477.21	192.53	1.74		
7325.00	89.83	165.00	6391.24	-1501.13	-305.53	1437.36	1531.91	191.50	2.42		
7386.00	89.53	164.43	6391.59	-1559.97	-289.45	1497.96	1586.60	190.51	1.06		
7447.00	90.03	164.37	6391.82	-1618.72	-273.05	1558.53	1641.59	189.57	.83		
7509.00	90.74	164.22	6391.40	-1678.41	-256.26	1620.06	1697.86	188.68	1.17		
7570.00	90.87	164.85	6390.55	-1737.19	-240.00	1680.64	1753.69	187.87	1.05		
7630.00	90.47	164.86	6389.84	-1795.10	-224.33	1740.26	1809.06	187.12	.67		
7691.00	90.40	164.87	6389.38	-1853.99	-208.40	1800.88	1865.66	186.41	.12		
7752.00	89.60	164.85	6389.38	-1912.87	-192.47	1861.49	1922.53	185.75	1.31		
7815.00	89.90	165.02	6389.66	-1973.70	-176.09	1924.11	1981.54	185.10	.55		
7879.00	89.77	165.41	6389.84	-2035.58	-159.76	1987.75	2041.84	184.49	.64		
7942.00	90.10	164.81	6389.91	-2096.47	-143.57	2050.39	2101.38	183.92	1.09		
8006.00	90.87	164.68	6389.37	-2158.21	-126.73	2113.97	2161.93	183.36	1.22		

03/21/2014

103.02774

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	
8069.00	90.97	164.89	6388.36	-2218.99	-110.20	2176.56	2221.73	182.84	.37
8133.00	90.64	164.64	6387.46	-2280.74	-93.39	2240.14	2282.65	182.34	.65
8197.00	90.13	165.61	6387.03	-2342.59	-76.96	2303.77	2343.85	181.88	1.71
8260.00	89.77	166.48	6387.08	-2403.73	-61.76	2366.51	2404.52	181.47	1.49
8323.00	89.16	165.75	6387.67	-2464.89	-46.65	2429.25	2465.33	181.08	1.51
8386.00	88.63	165.77	6388.89	-2525.94	-31.15	2491.95	2526.13	180.71	.84
8450.00	88.76	165.52	6390.35	-2587.92	-15.29	2555.62	2587.97	180.34	.44
8513.00	89.16	164.97	6391.49	-2648.84	.75	2618.26	2648.84	179.98	1.08
8577.00	89.90	164.56	6392.01	-2710.58	17.57	2681.85	2710.64	179.63	1.32
8640.00	89.90	163.90	6392.12	-2771.21	34.69	2744.37	2771.43	179.28	1.05
8704.00	88.82	164.53	6392.84	-2832.79	52.10	2807.88	2833.27	178.95	1.95
8768.00	88.69	164.87	6394.23	-2894.51	68.98	2871.45	2895.33	178.63	.57
8831.00	88.42	166.52	6395.82	-2955.54	84.54	2934.13	2956.74	178.36	2.65
8895.00	88.35	167.29	6397.62	-3017.85	99.04	2997.91	3019.47	178.12	1.21
8959.00	88.89	167.94	6399.16	-3080.34	112.76	3061.77	3082.40	177.90	1.32
9023.00	89.09	167.00	6400.29	-3142.80	126.64	3125.61	3145.35	177.69	1.50
<b>Bottom line Check</b>									
9085.00	88.76	166.67	6401.45	-3203.16	140.76	3187.42	3206.25	177.48	.75
9149.00	88.22	166.53	6403.14	-3265.40	155.59	3251.18	3269.10	177.27	.87
9212.00	88.93	166.73	6404.71	-3326.67	170.15	3313.96	3331.02	177.07	1.17
9276.00	89.83	167.26	6405.40	-3389.03	184.55	3377.77	3394.05	176.88	1.63
9340.00	89.77	167.69	6405.62	-3451.50	198.43	3441.63	3457.20	176.71	.68
9404.00	89.73	166.87	6405.90	-3513.93	212.52	3505.48	3520.35	176.54	1.28
9467.00	90.03	167.43	6406.03	-3575.35	226.54	3568.31	3582.52	176.37	1.01
9531.00	89.43	167.72	6406.34	-3637.85	240.31	3632.18	3645.78	176.22	1.04
9595.00	89.43	167.20	6406.97	-3700.32	254.20	3696.03	3709.04	176.07	.81
9658.00	89.06	167.08	6407.80	-3761.74	268.22	3758.87	3771.29	175.92	.62
9722.00	89.46	166.62	6408.63	-3824.05	282.78	3822.67	3834.49	175.77	.95
9786.00	88.93	166.33	6409.53	-3886.27	297.75	3886.44	3897.66	175.62	.94
9850.00	88.46	166.89	6410.99	-3948.52	312.56	3950.21	3960.87	175.47	1.14
9914.00	88.83	166.39	6412.50	-4010.77	327.35	4013.98	4024.10	175.33	.97
9977.00	89.53	166.22	6413.40	-4071.97	342.26	4076.74	4086.33	175.20	1.14
10041.00	90.07	166.73	6413.62	-4134.19	357.23	4140.52	4149.60	175.06	1.16
10104.00	90.34	166.90	6413.40	-4195.53	371.60	4203.32	4211.95	174.94	.51
10168.00	90.37	166.90	6413.00	-4257.86	386.10	4267.14	4275.33	174.82	.05
10232.00	90.20	167.14	6412.68	-4320.23	400.48	4330.96	4338.75	174.70	.46
10295.00	90.17	167.81	6412.48	-4381.73	414.14	4393.82	4401.26	174.60	1.06
10359.00	89.46	167.29	6412.69	-4444.22	427.94	4457.69	4464.78	174.50	1.38
10423.00	89.19	166.52	6413.44	-4506.55	442.44	4521.49	4528.22	174.39	1.27
10487.00	88.72	165.69	6414.61	-4568.67	457.80	4585.22	4591.55	174.28	1.49
10550.00	89.40	165.94	6415.64	-4629.74	473.24	4647.93	4653.86	174.16	1.15
10614.00	89.23	165.21	6416.41	-4691.72	489.18	4711.61	4717.15	174.05	1.17
10677.00	89.03	165.51	6417.36	-4752.66	505.10	4774.27	4779.43	173.93	.57
10741.00	89.19	166.04	6418.36	-4814.69	520.83	4837.96	4842.78	173.83	.86
10804.00	89.03	166.63	6419.34	-4875.90	535.71	4900.72	4905.24	173.73	.97
10868.00	89.73	167.54	6420.03	-4938.28	550.01	4964.55	4968.81	173.64	1.79
10931.00	90.03	167.94	6420.16	-4999.84	563.39	5027.43	5031.48	173.57	.79
10995.00	89.60	168.01	6420.37	-5062.44	576.73	5091.32	5095.18	173.50	.68
11058.00	89.70	168.00	6420.75	-5124.06	589.82	5154.22	5157.90	173.43	.16
11122.00	88.99	167.81	6421.48	-5186.64	603.23	5218.10	5221.60	173.37	1.15

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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	
11186.00	89.09	167.75	6422.56	-5249.18	616.77	5281.98	5285.29	173.30	.18
11249.00	88.73	167.70	6423.76	-5310.73	630.16	5344.84	5347.98	173.23	.58
11313.00	89.70	167.90	6424.63	-5373.27	643.69	5408.72	5411.69	173.17	1.55
11376.00	89.73	168.27	6424.95	-5434.91	656.69	5471.62	5474.44	173.11	.59
11440.00	89.23	168.38	6425.53	-5497.59	669.64	5535.53	5538.22	173.06	.80
11504.00	90.10	168.31	6425.90	-5560.27	682.57	5599.45	5602.01	173.00	1.36
11568.00	89.43	168.57	6426.16	-5622.97	695.40	5663.37	5665.80	172.95	1.12
11631.00	90.00	168.76	6426.48	-5684.74	707.78	5726.30	5728.63	172.90	.95
11695.00	88.76	168.59	6427.17	-5747.49	720.35	5790.23	5792.45	172.86	1.96
11759.00	89.63	169.23	6428.07	-5810.28	732.66	5854.17	5856.30	172.81	1.69
11822.00	90.44	170.39	6428.03	-5872.29	743.80	5917.15	5919.21	172.78	2.25
11886.00	90.20	171.25	6427.67	-5935.47	754.01	5981.15	5983.17	172.76	1.40
11949.00	89.46	172.49	6427.86	-5997.83	762.92	6044.14	6046.16	172.75	2.29
12013.00	90.17	173.40	6428.07	-6061.35	770.78	6108.11	6110.16	172.75	1.80
12076.00	88.69	172.37	6428.69	-6123.86	778.58	6171.08	6173.15	172.75	2.86
12140.00	87.92	171.29	6430.59	-6187.18	787.67	6235.05	6237.11	172.74	2.07
12204.00	88.46	170.90	6432.61	-6250.37	797.58	6299.02	6301.06	172.73	1.04
12267.00	89.33	171.41	6433.82	-6312.61	807.26	6362.00	6364.02	172.71	1.60
<b>Proj to Bit</b>									
12325.00	89.33	171.41	6434.50	-6369.96	815.92	6420.00	6422.00	172.70	.00

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