

# HG Energy, LLC

Harrison County, West Virginia

Sarah E. Adams #243

Sarah E. Adams #243

Wellbore #1

Design: Wellbore #1

## Survey Report - Geographic

08 May, 2014

Received

JUN 18 2014

Office of Oil and Gas  
WV Dept. of Environmental Protection



DDC  
Survey Report - Geographic



<b>Company:</b>	HG Energy, LLC	<b>Local Co-ordinate Reference:</b>	Well Sarah E. Adams #243
<b>Project:</b>	Harrison County, West Virginia	<b>TVD Reference:</b>	WELL @ 1350.0usft (Decker #6)
<b>Site:</b>	Sarah E. Adams #243	<b>MD Reference:</b>	WELL @ 1350.0usft (Decker #6)
<b>Well:</b>	Sarah E. Adams #243	<b>North Reference:</b>	Grid
<b>Wellbore:</b>	Wellbore #1	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	Wellbore #1	<b>Database:</b>	EDM 5000.1 Single User Db

<b>Project</b>	Harrison County, West Virginia		
<b>Map System:</b>	Universal Transverse Mercator	<b>System Datum:</b>	Mean Sea Level
<b>Geo Datum:</b>	NAD83 West Virginia - HARN		
<b>Map Zone:</b>	Zone 17N (84 W to 78 W)		

<b>Site</b>	Sarah E. Adams #243			
<b>Site Position:</b>	<b>Northing:</b>	14,261,444.00 usft	<b>Latitude:</b>	39° 16' 13.359 N
<b>From:</b>	<b>Easting:</b>	1,779,734.00 usft	<b>Longitude:</b>	80° 30' 27.824 W
<b>Position Uncertainty:</b>	<b>Slot Radius:</b>	13-3/16 "	<b>Grid Convergence:</b>	0.31 °

<b>Well</b>	Sarah E. Adams #243					
<b>Well Position</b>	<b>+N/-S</b>	0.0 usft	<b>Northing:</b>	14,261,444.00 usft	<b>Latitude:</b>	39° 16' 13.359 N
	<b>+E/-W</b>	0.0 usft	<b>Easting:</b>	1,779,734.00 usft	<b>Longitude:</b>	80° 30' 27.824 W
<b>Position Uncertainty</b>		0.0 usft	<b>Wellhead Elevation:</b>	usft	<b>Ground Level:</b>	1,342.0 usft

<b>Wellbore</b>	Wellbore #1				
<b>Magnetics</b>	<b>Model Name</b>	<b>Sample Date</b>	<b>Declination (°)</b>	<b>Dip Angle (°)</b>	<b>Field Strength (nT)</b>
	IGRF2010	5/2/2014	-8.66	66.77	52,266

<b>Design</b>	Wellbore #1				
<b>Audit Notes:</b>					
<b>Version:</b>	1.0	<b>Phase:</b>	ACTUAL	<b>Tie On Depth:</b>	0.0
<b>Vertical Section:</b>	<b>Depth From (TVD) (usft)</b>	<b>+N/-S (usft)</b>	<b>+E/-W (usft)</b>	<b>Direction (°)</b>	
	0.0	0.0	0.0		333.00

<b>Survey Program</b>	<b>Date</b>	5/8/2014			
<b>From (usft)</b>	<b>To (usft)</b>	<b>Survey (Wellbore)</b>	<b>Tool Name</b>	<b>Description</b>	
850.0	3,258.0	MWD (Wellbore #1)	MWD default	MWD - Standard	

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<b>Survey</b>	Office of Oil and Gas WV Dept. of Environmental Protection									
<b>Measured Depth (usft)</b>	<b>Inclination (°)</b>	<b>Azimuth (°)</b>	<b>Vertical Depth (usft)</b>	<b>+N/-S (usft)</b>	<b>+E/-W (usft)</b>	<b>Map Northing (usft)</b>	<b>Map Easting (usft)</b>	<b>Latitude</b>	<b>Longitude</b>	
0.0	0.00	0.00	0.0	0.0	0.0	14,261,444.00	1,779,734.00	39° 16' 13.359 N	80° 30' 27.824 W	
850.0	0.00	0.00	850.0	0.0	0.0	14,261,444.00	1,779,734.00	39° 16' 13.359 N	80° 30' 27.824 W	
<b>FIRST MWD SURVEY @ 850' MD / 850' TVD</b>										
863.0	0.60	61.90	863.0	0.0	0.1	14,261,444.03	1,779,734.06	39° 16' 13.359 N	80° 30' 27.824 W	
893.0	0.50	33.00	893.0	0.2	0.3	14,261,444.21	1,779,734.27	39° 16' 13.361 N	80° 30' 27.821 W	
923.0	0.70	353.00	923.0	0.5	0.3	14,261,444.51	1,779,734.32	39° 16' 13.364 N	80° 30' 27.820 W	
953.0	1.70	343.80	953.0	1.1	0.2	14,261,445.12	1,779,734.17	39° 16' 13.370 N	80° 30' 27.822 W	
983.0	3.00	347.30	983.0	2.3	-0.1	14,261,446.31	1,779,733.88	39° 16' 13.382 N	80° 30' 27.826 W	
1,013.0	4.10	346.70	1,012.9	4.1	-0.5	14,261,448.12	1,779,733.46	39° 16' 13.400 N	80° 30' 27.831 W	
1,043.0	5.00	343.80	1,042.8	6.4	-1.2	14,261,450.42	1,779,732.84	39° 16' 13.422 N	80° 30' 27.839 W	
1,073.0	5.90	342.10	1,072.7	9.1	-2.0	14,261,453.14	1,779,732.01	39° 16' 13.449 N	80° 30' 27.849 W	
1,103.0	6.30	337.20	1,102.5	12.1	-3.1	14,261,456.12	1,779,730.89	39° 16' 13.479 N	80° 30' 27.863 W	

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<b>Site:</b>	Sarah E. Adams #243	<b>MD Reference:</b>	WELL @ 1350.0usft (Decker #6)
<b>Well:</b>	Sarah E. Adams #243	<b>North Reference:</b>	Grid
<b>Wellbore:</b>	Wellbore #1	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	Wellbore #1	<b>Database:</b>	EDM 5000.1 Single User Db

Office of Oil and Gas  
WV Dept. of Environmental Protection

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
1,133.0	6.90	336.00	1,132.3	15.3	-4.5	14,261,459.29	1,779,729.52	39° 16' 13.510 N	80° 30' 27.880 W
1,163.0	7.30	338.30	1,162.1	18.7	-5.9	14,261,462.71	1,779,728.09	39° 16' 13.544 N	80° 30' 27.898 W
1,193.0	7.70	340.10	1,191.8	22.4	-7.3	14,261,466.37	1,779,726.70	39° 16' 13.580 N	80° 30' 27.916 W
1,223.0	8.30	339.10	1,221.5	26.3	-8.8	14,261,470.28	1,779,725.24	39° 16' 13.619 N	80° 30' 27.934 W
1,253.0	9.10	338.70	1,251.2	30.5	-10.4	14,261,474.51	1,779,723.61	39° 16' 13.661 N	80° 30' 27.954 W
1,283.0	9.90	338.90	1,280.8	35.1	-12.2	14,261,479.13	1,779,721.82	39° 16' 13.707 N	80° 30' 27.977 W
1,313.0	11.20	336.70	1,310.3	40.2	-14.3	14,261,484.21	1,779,719.73	39° 16' 13.757 N	80° 30' 28.003 W
1,343.0	12.40	333.40	1,339.6	45.8	-16.9	14,261,489.77	1,779,717.14	39° 16' 13.812 N	80° 30' 28.036 W
1,373.0	13.00	330.60	1,368.9	51.6	-20.0	14,261,495.59	1,779,714.04	39° 16' 13.870 N	80° 30' 28.075 W
1,403.0	13.40	330.10	1,398.1	57.5	-23.3	14,261,501.54	1,779,710.65	39° 16' 13.929 N	80° 30' 28.117 W
1,433.0	13.80	333.40	1,427.3	63.8	-26.7	14,261,507.75	1,779,707.32	39° 16' 13.991 N	80° 30' 28.159 W
1,463.0	14.60	335.60	1,456.3	70.4	-29.8	14,261,514.40	1,779,704.15	39° 16' 14.056 N	80° 30' 28.199 W
1,493.0	15.60	339.30	1,485.3	77.6	-32.8	14,261,521.61	1,779,701.16	39° 16' 14.128 N	80° 30' 28.237 W
1,523.0	16.90	339.90	1,514.1	85.5	-35.8	14,261,529.48	1,779,698.24	39° 16' 14.206 N	80° 30' 28.273 W
1,553.0	16.40	340.00	1,542.9	93.6	-38.7	14,261,537.56	1,779,695.29	39° 16' 14.286 N	80° 30' 28.310 W
1,583.0	14.80	343.50	1,571.7	101.2	-41.2	14,261,545.21	1,779,692.76	39° 16' 14.362 N	80° 30' 28.342 W
1,613.0	13.90	343.40	1,600.8	108.3	-43.4	14,261,552.34	1,779,690.64	39° 16' 14.432 N	80° 30' 28.368 W
1,643.0	14.10	338.70	1,629.9	115.2	-45.7	14,261,559.20	1,779,688.28	39° 16' 14.500 N	80° 30' 28.398 W
1,673.0	15.20	335.50	1,658.9	122.2	-48.7	14,261,566.18	1,779,685.32	39° 16' 14.569 N	80° 30' 28.435 W
1,703.0	16.40	333.10	1,687.8	129.5	-52.2	14,261,573.54	1,779,681.78	39° 16' 14.642 N	80° 30' 28.480 W
1,733.0	17.50	330.70	1,716.5	137.2	-56.3	14,261,581.25	1,779,677.65	39° 16' 14.719 N	80° 30' 28.532 W
1,763.0	18.70	328.20	1,745.0	145.3	-61.1	14,261,589.27	1,779,672.91	39° 16' 14.798 N	80° 30' 28.591 W
1,793.0	19.40	327.00	1,773.4	153.5	-66.3	14,261,597.53	1,779,667.66	39° 16' 14.880 N	80° 30' 28.658 W
1,823.0	18.90	326.30	1,801.7	161.8	-71.7	14,261,605.75	1,779,662.25	39° 16' 14.962 N	80° 30' 28.726 W
1,853.0	18.10	323.50	1,830.2	169.5	-77.2	14,261,613.54	1,779,656.78	39° 16' 15.039 N	80° 30' 28.795 W
1,883.0	17.80	320.40	1,858.7	176.8	-82.9	14,261,620.82	1,779,651.09	39° 16' 15.112 N	80° 30' 28.867 W
1,913.0	17.10	318.20	1,887.3	183.6	-88.8	14,261,627.64	1,779,645.23	39° 16' 15.179 N	80° 30' 28.941 W
1,943.0	16.40	318.10	1,916.1	190.1	-94.5	14,261,634.08	1,779,639.46	39° 16' 15.243 N	80° 30' 29.014 W
1,973.0	15.90	320.60	1,944.9	196.4	-100.0	14,261,640.41	1,779,634.02	39° 16' 15.306 N	80° 30' 29.082 W
2,003.0	15.30	323.80	1,973.8	202.8	-104.9	14,261,646.78	1,779,629.08	39° 16' 15.369 N	80° 30' 29.145 W
2,033.0	14.90	327.80	2,002.7	209.2	-109.3	14,261,653.24	1,779,624.68	39° 16' 15.433 N	80° 30' 29.200 W
2,063.0	14.70	331.50	2,031.7	215.9	-113.2	14,261,659.85	1,779,620.81	39° 16' 15.499 N	80° 30' 29.249 W
2,093.0	14.90	336.70	2,060.7	222.7	-116.5	14,261,666.74	1,779,617.47	39° 16' 15.567 N	80° 30' 29.291 W
2,123.0	15.90	338.60	2,089.7	230.1	-119.6	14,261,674.11	1,779,614.44	39° 16' 15.640 N	80° 30' 29.329 W
2,153.0	17.00	341.50	2,118.4	238.1	-122.4	14,261,682.09	1,779,611.55	39° 16' 15.719 N	80° 30' 29.365 W
2,183.0	17.80	341.70	2,147.1	246.6	-125.3	14,261,690.60	1,779,608.72	39° 16' 15.804 N	80° 30' 29.401 W
2,213.0	18.10	342.90	2,175.6	255.4	-128.1	14,261,699.41	1,779,605.91	39° 16' 15.891 N	80° 30' 29.436 W
2,243.0	18.30	340.80	2,204.1	264.3	-131.0	14,261,708.31	1,779,602.99	39° 16' 15.979 N	80° 30' 29.473 W
2,273.0	18.20	337.70	2,232.6	273.1	-134.3	14,261,717.10	1,779,599.67	39° 16' 16.066 N	80° 30' 29.514 W
2,303.0	18.20	333.70	2,261.1	281.6	-138.2	14,261,725.63	1,779,595.81	39° 16' 16.151 N	80° 30' 29.563 W
2,333.0	18.00	331.10	2,289.6	289.9	-142.5	14,261,733.89	1,779,591.50	39° 16' 16.233 N	80° 30' 29.617 W
2,363.0	17.60	330.10	2,318.2	297.9	-147.0	14,261,741.88	1,779,586.99	39° 16' 16.312 N	80° 30' 29.674 W
2,393.0	17.20	326.70	2,346.8	305.5	-151.7	14,261,749.52	1,779,582.30	39° 16' 16.388 N	80° 30' 29.733 W
2,423.0	16.60	323.20	2,375.5	312.7	-156.7	14,261,756.66	1,779,577.30	39° 16' 16.458 N	80° 30' 29.796 W
2,453.0	15.40	322.60	2,404.3	319.3	-161.7	14,261,763.25	1,779,572.31	39° 16' 16.524 N	80° 30' 29.859 W
2,483.0	14.30	323.90	2,433.3	325.4	-166.3	14,261,769.41	1,779,567.71	39° 16' 16.585 N	80° 30' 29.917 W
2,513.0	13.20	329.50	2,462.5	331.4	-170.2	14,261,775.36	1,779,563.79	39° 16' 16.644 N	80° 30' 29.967 W
2,543.0	12.20	334.60	2,491.8	337.2	-173.3	14,261,781.17	1,779,560.69	39° 16' 16.702 N	80° 30' 30.006 W
2,573.0	12.20	339.00	2,521.1	343.0	-175.8	14,261,787.00	1,779,558.19	39° 16' 16.759 N	80° 30' 30.037 W
2,603.0	12.60	339.30	2,550.4	349.0	-178.1	14,261,793.02	1,779,555.90	39° 16' 16.819 N	80° 30' 30.066 W
2,633.0	12.90	338.20	2,579.6	355.2	-180.5	14,261,799.19	1,779,553.50	39° 16' 16.880 N	80° 30' 30.096 W
2,663.0	13.20	336.70	2,608.9	361.4	-183.1	14,261,805.44	1,779,550.90	39° 16' 16.942 N	80° 30' 30.128 W
2,693.0	13.80	334.50	2,638.0	367.8	-186.0	14,261,811.82	1,779,548.00	39° 16' 17.005 N	80° 30' 30.165 W
2,723.0	13.80	334.10	2,667.2	374.3	-189.1	14,261,818.26	1,779,544.90	39° 16' 17.069 N	80° 30' 30.204 W
2,753.0	13.80	334.70	2,696.3	380.7	-192.2	14,261,824.72	1,779,541.81	39° 16' 17.133 N	80° 30' 30.243 W

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<b>Project:</b>	Harrison County, West Virginia	<b>TVD Reference:</b>	WELL @ 1350.0usft (Decker #6)
<b>Site:</b>	Sarah E. Adams #243	<b>MD Reference:</b>	WELL @ 1350.0usft (Decker #6)
<b>Well:</b>	Sarah E. Adams #243	<b>North Reference:</b>	Grid
<b>Wellbore:</b>	Wellbore #1	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	Wellbore #1	<b>Database:</b>	EDM 5000.1 Single User Db

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
2,783.0	14.30	335.60	2,725.4	387.3	-195.3	14,261,831.33	1,779,538.75	39° 16' 17.199 N	80° 30' 30.281 W
2,813.0	15.20	338.70	2,754.4	394.4	-198.2	14,261,838.37	1,779,535.79	39° 16' 17.269 N	80° 30' 30.318 W
2,843.0	16.30	338.90	2,783.3	402.0	-201.2	14,261,845.96	1,779,532.85	39° 16' 17.344 N	80° 30' 30.355 W
2,873.0	17.10	341.00	2,812.0	410.1	-204.1	14,261,854.06	1,779,529.89	39° 16' 17.424 N	80° 30' 30.392 W
2,903.0	18.30	337.90	2,840.6	418.6	-207.3	14,261,862.59	1,779,526.69	39° 16' 17.509 N	80° 30' 30.432 W
2,933.0	18.90	337.70	2,869.0	427.5	-210.9	14,261,871.45	1,779,523.07	39° 16' 17.596 N	80° 30' 30.478 W
2,963.0	19.00	334.20	2,897.4	436.3	-214.9	14,261,880.34	1,779,519.10	39° 16' 17.685 N	80° 30' 30.528 W
2,993.0	19.30	329.90	2,925.8	445.0	-219.5	14,261,889.03	1,779,514.49	39° 16' 17.771 N	80° 30' 30.586 W
3,023.0	19.10	326.80	2,954.1	453.4	-224.7	14,261,897.43	1,779,509.32	39° 16' 17.854 N	80° 30' 30.651 W
3,053.0	18.20	320.90	2,982.5	461.2	-230.3	14,261,905.17	1,779,503.67	39° 16' 17.931 N	80° 30' 30.722 W
3,083.0	16.60	315.70	3,011.1	467.9	-236.3	14,261,911.87	1,779,497.72	39° 16' 17.997 N	80° 30' 30.797 W
3,113.0	14.90	313.70	3,040.0	473.6	-242.1	14,261,917.60	1,779,491.94	39° 16' 18.054 N	80° 30' 30.871 W
3,143.0	13.70	313.10	3,069.1	478.7	-247.4	14,261,922.70	1,779,486.56	39° 16' 18.105 N	80° 30' 30.939 W
3,173.0	12.50	316.10	3,098.3	483.5	-252.3	14,261,927.46	1,779,481.71	39° 16' 18.152 N	80° 30' 31.000 W
3,203.0	11.90	316.40	3,127.6	488.0	-256.7	14,261,932.04	1,779,477.33	39° 16' 18.198 N	80° 30' 31.056 W
3,258.0	11.90	316.40	3,181.4	496.3	-264.5	14,261,940.26	1,779,469.51	39° 16' 18.280 N	80° 30' 31.154 W

TD @ 3258' MD / 3181' TVD

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
850.0	850.0	0.0	0.0	FIRST MWD SURVEY @ 850' MD / 850' TVD
3,258.0	3,181.4	496.3	-264.5	TD @ 3258' MD / 3181' TVD

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

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JUN 18 2014

Office of Oil and Gas  
WV Dept. of Environmental Protection

# HG Energy, LLC

Harrison County, West Virginia

Sarah E. Adams #243

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Wellbore #1

Design: Wellbore #1

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08 May, 2014

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Well:	Sarah E. Adams #243
Wellbore:	Wellbore #1
Design:	Wellbore #1

Project:	Harrison County, West Virginia
Map System:	Universal Transverse Mercator
Geo Datum:	NAD83 West Virginia - HARN
Map Zone:	Zone 17N (84 W to 78 W)

Site:	Sarah E. Adams #243
Site Position:	Map
From:	0.0 usft
Position Uncertainty:	0.0 usft
Latitude:	39° 16' 13.359 N
Longitude:	80° 30' 27.824 W
Northing:	14,261,444.00 usft
Easting:	1,779,734.00 usft
Slot Radius:	13-3/16 "
Grid Convergence:	0.31 °

Well:	Sarah E. Adams #243
Well Position:	+N/S 0.0 usft
	+E/W 0.0 usft
Position Uncertainty:	0.0 usft
Latitude:	39° 16' 13.359 N
Longitude:	80° 30' 27.824 W
Northing:	14,261,444.00 usft
Easting:	1,779,734.00 usft
Wellhead Elevation:	usft
Ground Level:	1,342.0 usft

Wellbore:	Wellbore #1				
Magnetics:	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	5/2/2014	-8.66	66.77	52.266

Design:	Wellbore #1				
Audit Notes:	1.0	Phase:	ACTUAL	Tie On Depth:	0.0
Version:	1.0	Depth From (TVD) (usft)	0.0	+N/S (usft)	0.0
		+E/W (usft)	0.0	Direction (°)	333.00

Survey Program	Date	To (usft)	From (usft)	Tool Name	Description
	5/8/2014	Survey (Wellbore)	3,258.0	MWD default	MWD - Standard
		MWD (Wellbore #1)	850.0		

33-05782



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JUN 18 2014  
Office of Oil and Gas  
WV Dept. of Environmental Protection

Local Co-ordinate Reference:  
TVD Reference:  
MD Reference:  
North Reference:  
Survey Calculation Method:  
Database:

Well Sarah E. Adams #243  
WELL @ 1350.0usft (Decker #6)  
WELL @ 1350.0usft (Decker #6)  
Grid  
Minimum Curvature  
EDM 5000.1 Single User Db

Company:  
Project:  
Site:  
Well:  
Wellbore:  
Design:

HG Energy, LLC  
Harrison County, West Virginia  
Sarah E. Adams #243  
Sarah E. Adams #243  
Wellbore #1  
Wellbore #1

MD (usft)	Inc (°)	Azi (azimuth) (°)	TVD (usft)	N/S (usft)	E/W (usft)	V. Sec (usft)	D/Leg (°/100usft)	Closure Distance (usft)	Closure Azimuth (°)
0.0	0.00	0.00	0.00	0.0	0.0	0.0	0.00	0.0	0.00
850.0	0.00	0.00	850.0	0.0	0.0	0.0	0.00	0.0	0.00
<b>FIRST MWD SURVEY @ 850' MD / 850' TVD</b>									
863.0	0.60	61.90	863.0	0.0	0.1	0.0	4.62	0.1	61.90
893.0	0.50	33.00	893.0	0.2	0.3	0.1	0.97	0.3	51.35
923.0	0.70	353.00	923.0	0.5	0.3	0.3	1.50	0.6	32.14
953.0	1.70	343.80	953.0	1.1	0.2	0.9	3.38	1.1	8.77
983.0	3.00	347.30	983.0	2.3	-0.1	2.1	4.36	2.3	356.92
1,013.0	4.10	346.70	1,012.9	4.1	-0.5	3.9	3.67	4.2	352.48
1,043.0	5.00	343.80	1,042.8	6.4	-1.2	6.2	3.10	6.5	349.80
1,073.0	5.90	342.10	1,072.7	9.1	-2.0	9.1	3.05	9.4	347.70
1,103.0	6.30	337.20	1,102.5	12.1	-3.1	12.2	2.19	12.5	345.63
1,133.0	6.90	336.00	1,132.3	15.3	-4.5	15.7	2.05	15.9	343.68
1,163.0	7.30	338.30	1,162.1	18.7	-5.9	19.4	1.64	19.6	342.46
1,193.0	7.70	340.10	1,191.8	22.4	-7.3	23.2	1.55	23.5	341.92
1,223.0	8.30	339.10	1,221.5	26.3	-8.8	27.4	2.05	27.7	341.57
1,253.0	9.10	338.70	1,251.2	30.5	-10.4	31.9	2.67	32.2	341.19
1,283.0	9.90	338.90	1,280.8	35.1	-12.2	36.8	2.67	37.2	340.87
1,313.0	11.20	336.70	1,310.3	40.2	-14.3	42.3	4.54	42.7	340.47
1,343.0	12.40	333.40	1,339.6	45.8	-16.9	48.4	4.59	48.8	339.78
1,373.0	13.00	330.60	1,368.9	51.6	-20.0	55.0	2.86	55.3	338.85
1,403.0	13.40	330.10	1,398.1	57.5	-23.3	61.9	1.39	62.1	337.91
1,433.0	13.80	333.40	1,427.3	63.8	-26.7	68.9	2.91	69.1	337.29
1,463.0	14.60	335.60	1,456.3	70.4	-29.8	76.3	3.22	76.5	337.02
1,493.0	15.60	339.30	1,485.3	77.6	-32.8	84.1	4.63	84.3	337.07
1,523.0	16.90	339.90	1,514.1	85.5	-35.8	92.4	4.37	92.7	337.30
1,553.0	16.40	340.00	1,542.9	93.6	-38.7	100.9	1.67	101.2	337.52

DDC  
HG Energy EOW Report



WV Dept. of Environmental Protection  
 Office of Oil and Gas  
 JUN 18 2014  
 Received

**Company:** HG Energy, LLC  
**Project:** Harrison County, West Virginia  
**Site:** Sarah E. Adams #243  
**Well:** Sarah E. Adams #243  
**Wellbore:** Wellbore #1  
**Design:** Wellbore #1

**Local Co-ordinate Reference:** Well Sarah E. Adams #243  
**TVD Reference:** WELL @ 1350.0usft (Decker #6)  
**MD Reference:** WELL @ 1350.0usft (Decker #6)  
**North Reference:** Grid  
**Survey Calculation Method:** Minimum Curvature  
**Database:** EDM 5000.1 Single User Db

MD (usft)	Inc (°)	Azi (azimuth) (°)	TVD (usft)	N/S (usft)	E/W (usft)	V. Sec (usft)	DLeg (°/100usft)	Closure Distance (usft)	Closure Azimuth (°)
1,583.0	14.80	343.50	1,571.7	101.2	-41.2	108.9	6.19	109.3	337.83
1,613.0	13.90	343.40	1,600.8	108.3	-43.4	116.2	3.00	116.7	338.19
1,643.0	14.10	338.70	1,629.9	115.2	-45.7	123.4	3.85	123.9	338.35
1,673.0	15.20	335.50	1,658.9	122.2	-48.7	131.0	4.55	131.5	338.28
1,703.0	16.40	333.10	1,687.8	129.5	-52.2	139.1	4.55	139.7	338.04
1,733.0	17.50	330.70	1,716.5	137.2	-56.3	147.9	4.34	148.4	337.68
1,763.0	18.70	328.20	1,745.0	145.3	-61.1	157.2	4.76	157.6	337.19
1,793.0	19.40	327.00	1,773.4	153.5	-66.3	166.9	2.67	167.3	336.63
1,823.0	18.90	326.30	1,801.7	161.8	-71.7	176.7	1.83	177.0	336.08
1,853.0	18.10	323.50	1,830.2	169.5	-77.2	186.1	3.98	186.3	335.51
1,883.0	17.80	320.40	1,858.7	176.8	-82.9	195.2	3.34	195.3	334.88
1,913.0	17.10	318.20	1,887.3	183.6	-88.8	203.9	3.21	204.0	334.20
1,943.0	16.40	318.10	1,916.1	190.1	-94.5	212.3	2.34	212.3	333.56
1,973.0	15.90	320.60	1,944.9	196.4	-100.0	220.4	2.85	220.4	333.02
2,003.0	15.30	323.80	1,973.8	202.8	-104.9	228.3	3.50	228.3	332.64
2,033.0	14.90	327.80	2,002.7	209.2	-109.3	236.1	3.72	236.1	332.42
2,063.0	14.70	331.50	2,031.7	215.9	-113.2	243.7	3.22	243.7	332.33
2,093.0	14.90	336.70	2,060.7	222.7	-116.5	251.4	4.48	251.4	332.38
2,123.0	15.90	338.60	2,089.7	230.1	-119.6	259.3	3.73	259.3	332.55
2,153.0	17.00	341.50	2,118.4	238.1	-122.4	267.7	4.57	267.7	332.78
2,183.0	17.80	341.70	2,147.1	246.6	-125.3	276.6	2.67	276.6	333.07
2,213.0	18.10	342.90	2,175.6	255.4	-128.1	285.7	1.59	285.7	333.37
2,243.0	18.30	340.80	2,204.1	264.3	-131.0	295.0	2.29	295.0	333.63
2,273.0	18.20	337.70	2,232.6	273.1	-134.3	304.3	3.25	304.3	333.81
2,303.0	18.20	333.70	2,261.1	281.6	-138.2	313.7	4.16	313.7	333.86
2,333.0	18.00	331.10	2,289.6	289.9	-142.5	323.0	2.77	323.0	333.82
2,363.0	17.60	330.10	2,318.2	297.9	-147.0	332.2	1.68	332.2	333.73

33-0578Z



DDC  
HG Energy EOW Report



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**Site:** Sarah E. Adams #243  
**Well:** Sarah E. Adams #243  
**Wellbore:** Wellbore #1  
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**Local Co-ordinate Reference:** Well Sarah E. Adams #243  
**TVD Reference:** WELL @ 1350.0usft (Decker #6)  
**MD Reference:** WELL @ 1350.0usft (Decker #6)  
**North Reference:** Grid  
**Survey Calculation Method:** Minimum Curvature  
**Database:** EDM 5000.1 Single User Db

Survey

MD (usft)	Inc (°)	Azi (azimuth) (°)	TVD (usft)	N/S (usft)	E/W (usft)	V. Sec (usft)	DLeg (°/100usft)	Closure Distance (usft)	Closure Azimuth (°)
2,393.0	17.20	326.70	2,346.8	305.5	-151.7	341.1	3.64	341.1	333.59
2,423.0	16.60	323.20	2,375.5	312.7	-156.7	349.7	3.94	349.7	333.38
2,453.0	15.40	322.60	2,404.3	319.3	-161.7	357.9	4.04	357.9	333.14
2,483.0	14.30	323.90	2,433.3	325.4	-166.3	365.4	3.83	365.4	332.93
2,513.0	13.20	329.50	2,462.5	331.4	-170.2	372.5	5.75	372.5	332.81
2,543.0	12.20	334.60	2,491.8	337.2	-173.3	379.1	5.00	379.1	332.80
2,573.0	12.20	339.00	2,521.1	343.0	-175.8	385.4	3.10	385.4	332.86
2,603.0	12.60	339.30	2,550.4	349.0	-178.1	391.8	1.35	391.8	332.97
2,633.0	12.90	338.20	2,579.6	355.2	-180.5	398.4	1.29	398.4	333.06
2,663.0	13.20	336.70	2,608.9	361.4	-183.1	405.2	1.51	405.2	333.13
2,693.0	13.80	334.50	2,638.0	367.8	-186.0	412.2	2.63	412.2	333.18
2,723.0	13.80	334.10	2,667.2	374.3	-189.1	419.3	0.32	419.3	333.19
2,753.0	13.80	334.70	2,696.3	380.7	-192.2	426.5	0.48	426.5	333.21
2,783.0	14.30	335.60	2,725.4	387.3	-195.3	433.8	1.82	433.8	333.25
2,813.0	15.20	338.70	2,754.4	394.4	-198.2	441.4	3.99	441.4	333.32
2,843.0	16.30	338.90	2,783.3	402.0	-201.2	449.5	3.67	449.5	333.42
2,873.0	17.10	341.00	2,812.0	410.1	-204.1	458.0	3.34	458.0	333.54
2,903.0	18.30	337.90	2,840.6	418.6	-207.3	467.1	5.08	467.1	333.65
2,933.0	18.90	337.70	2,869.0	427.5	-210.9	476.6	2.01	476.7	333.74
2,963.0	19.00	334.20	2,897.4	436.3	-214.9	486.3	3.80	486.4	333.78
2,993.0	19.30	329.90	2,925.8	445.0	-219.5	496.2	4.81	496.2	333.75
3,023.0	19.10	326.80	2,954.1	453.4	-224.7	506.0	3.46	506.0	333.64
3,053.0	18.20	320.90	2,982.5	461.2	-230.3	515.5	6.96	515.5	333.46
3,083.0	16.60	315.70	3,011.1	467.9	-236.3	524.1	7.43	524.1	333.21
3,113.0	14.90	313.70	3,040.0	473.6	-242.1	531.9	5.95	531.9	332.93
3,143.0	13.70	313.10	3,069.1	478.7	-247.4	538.9	4.03	538.9	332.67
3,173.0	12.50	316.10	3,098.3	483.5	-252.3	545.3	4.60	545.3	332.44

33-05782

**DDC**  
HG Energy EOW Report



<b>Company:</b> HG Energy, LLC	<b>Local Co-ordinate Reference:</b> Well Sarah E. Adams #243
<b>Project:</b> Harrison County, West Virginia	<b>TVD Reference:</b> WELL @ 1350.0usft (Decker #6)
<b>Site:</b> Sarah E. Adams #243	<b>MD Reference:</b> WELL @ 1350.0usft (Decker #6)
<b>Well:</b> Sarah E. Adams #243	<b>North Reference:</b> Grid
<b>Wellbore:</b> Wellbore #1	<b>Survey Calculation Method:</b> Minimum Curvature
<b>Design:</b> Wellbore #1	<b>Database:</b> EDM 5000.1 Single User Db

MD (usft)	Inc (°)	Azi (azimuth) (°)	TVD (usft)	N/S (usft)	E/W (usft)	V. Sec (usft)	DLeg (°/100usft)	Closure Distance (usft)	Closure Azimuth (°)
3,203.0	11.90	316.40	3,127.6	488.0	-256.7	551.4	2.01	551.4	332.26
3,258.0	11.90	316.40	3,181.4	496.3	-264.5	562.2	0.00	562.3	331.94

TD @ 3258' MD / 3181' TVD

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N-S (usft)	+E-W (usft)	
850.0	850.0	0.0	0.0	FIRST MWD SURVEY @ 850' MD / 850' TVD
3,258.0	3,181.4	496.3	-264.5	TD @ 3258' MD / 3181' TVD

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

Office of Oil and Gas  
WV Dept. of Environmental Protection

JUN 18 2014  
Received

33.05782

Sarah E. Adams #243  
 Harrison County, West Virginia  
 Q131083 & AM-140423  
 Design #1

Company Name: HG Energy, LLC  
 Sarah E. Adams #243  
 Harrison County, West Virginia  
 Rig: Decker #6  
 Created By: James Dawson  
 Date: 5/8/2014

PROJECT DETAILS: Harrison County, West Virginia  
 Geodetic System: Universal Transverse Mercator  
 Datum: NAD83 West Virginia - HARN  
 Ellipsoid: GRS 1980  
 Zone: Zone 17N (84 W to 78 W)  
 System Datum: Mean Sea Level

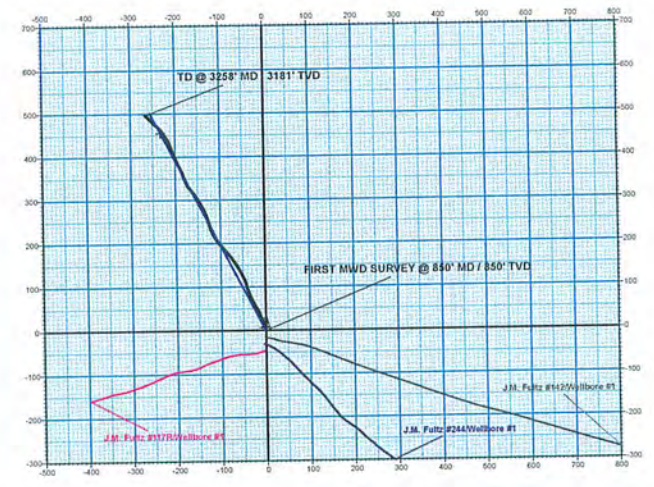
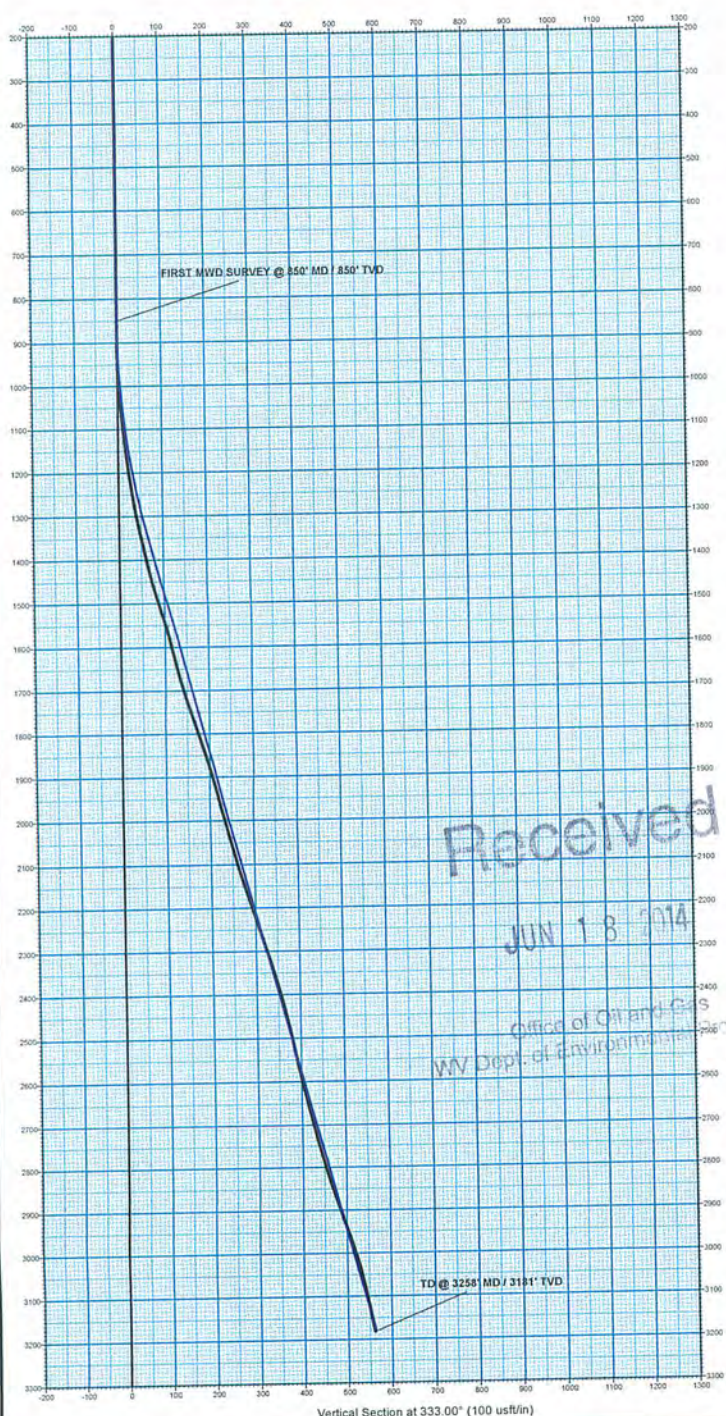


# HG Energy

**Azimuths to Grid North**

Correction: -8.97°

Magnetic Field  
 Strength: 52265.8snT  
 Dip Angle: 66.77°  
 Date: 5/2/2014  
 Model: IGRF2010



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WELL DETAILS:		Sarah E. Adams #243			
Ground Level:		1342.0			
+N-S	+E-W	Northing	Easting	Latitude	Longitude
0.0	0.0	14261444.00	1779734.00	39° 16' 13.359 N	80° 30' 27.824 W

DESIGN TARGET DETAILS						
Name	TVD	+N-S	+E-W	Northing	Easting	Latitude Longitude
Target Sarah E. Adams #243 - plan hits target center	2981.0	454.4	-231.5	14261898.40	1779592.50	39° 16' 17.864 N 80° 30' 30.728 W

ANNOTATIONS								
MD	Inc	Azi	TVD	+N-S	+E-W	Vsect	Departure	Annotation
850.0	0.00	0.00	850.0	0.0	0.0	0.0	0.0	FIRST MWD SURVEY @ 850' MD / 850' TVD
3258.0	11.90	316.40	3181.4	456.3	-264.5	562.2	568.6	TD @ 3258' MD / 3181' TVD

Vertical Section at 333.00° (100 usft/in)