

# **HG Energy, LLC**

**Roane County, West Virginia**

**SB Kinkead #108**

**SB Kinkead #108**

**Wellbore #1**

**Design: Wellbore #1**

## **Survey Report - Geographic**

**13 January, 2015**



**DDC**  
Survey Report - Geographic



<b>Company:</b>	HG Energy, LLC	<b>Local Co-ordinate Reference:</b>	Well SB Kinkead #108
<b>Project:</b>	Roane County, West Virginia	<b>TVD Reference:</b>	well @ 1118.0usft
<b>Site:</b>	SB Kinkead #108	<b>MD Reference:</b>	well @ 1118.0usft
<b>Well:</b>	SB Kinkead #108	<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>	Roane 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>	SB Kinkead #108				
<b>Site Position:</b>		<b>Northing:</b>	14,059,526.90 usft	<b>Latitude:</b>	38° 42' 59.300 N
<b>From:</b>	Lat/Long	<b>Easting:</b>	1,559,278.46 usft	<b>Longitude:</b>	81° 17' 4.100 W
<b>Position Uncertainty:</b>	0.0 usft	<b>Slot Radius:</b>	13-3/16 "	<b>Grid Convergence:</b>	-0.18 °

<b>Well</b>	SB Kinkead #108					
<b>Well Position</b>	+N/-S	0.0 usft	<b>Northing:</b>	14,059,526.90 usft	<b>Latitude:</b>	38° 42' 59.300 N
	+E/-W	0.0 usft	<b>Easting:</b>	1,559,278.46 usft	<b>Longitude:</b>	81° 17' 4.100 W
<b>Position Uncertainty</b>		0.0 usft	<b>Wellhead Elevation:</b>	0.0 usft	<b>Ground Level:</b>	1,110.0 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	12/23/2014	-8.02	66.37	51,991

<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		226.00

<b>Survey Program</b>	Date 1/13/2015			
<b>From (usft)</b>	<b>To (usft)</b>	<b>Survey (Wellbore)</b>	<b>Tool Name</b>	<b>Description</b>
500.0	2,447.0	MWD Survey (Wellbore #1)	MWD default	MWD - Standard

<b>Survey</b>										
<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	14,059,526.90	1,559,278.46	38° 42' 59.300 N	81° 17' 4.100 W	
500.0	0.00	0.00	500.0	0.0	0.0	14,059,526.90	1,559,278.46	38° 42' 59.300 N	81° 17' 4.100 W	
<b>First Survey @ 500' MD / 500' TVD</b>										
560.0	0.90	128.20	560.0	-0.3	0.4	14,059,526.60	1,559,278.83	38° 42' 59.297 N	81° 17' 4.095 W	
590.0	0.80	134.70	590.0	-0.6	0.7	14,059,526.31	1,559,279.16	38° 42' 59.294 N	81° 17' 4.091 W	
620.0	0.70	128.90	620.0	-0.8	1.0	14,059,526.05	1,559,279.45	38° 42' 59.292 N	81° 17' 4.087 W	
650.0	1.10	204.70	650.0	-1.2	1.0	14,059,525.67	1,559,279.48	38° 42' 59.288 N	81° 17' 4.087 W	
680.0	2.20	226.50	680.0	-1.9	0.5	14,059,525.01	1,559,278.94	38° 42' 59.281 N	81° 17' 4.094 W	
710.0	3.80	228.30	709.9	-2.9	-0.7	14,059,523.96	1,559,277.78	38° 42' 59.271 N	81° 17' 4.108 W	
740.0	5.50	229.90	739.8	-4.5	-2.5	14,059,522.37	1,559,275.94	38° 42' 59.255 N	81° 17' 4.132 W	
770.0	7.10	229.90	769.7	-6.6	-5.0	14,059,520.25	1,559,273.42	38° 42' 59.234 N	81° 17' 4.163 W	
800.0	8.10	228.00	799.4	-9.3	-8.0	14,059,517.64	1,559,270.43	38° 42' 59.208 N	81° 17' 4.201 W	



**DDC**  
Survey Report - Geographic



<b>Company:</b>	HG Energy, LLC	<b>Local Co-ordinate Reference:</b>	Well SB Kinkead #108
<b>Project:</b>	Roane County, West Virginia	<b>TVD Reference:</b>	well @ 1118.0usft
<b>Site:</b>	SB Kinkead #108	<b>MD Reference:</b>	well @ 1118.0usft
<b>Well:</b>	SB Kinkead #108	<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

Survey										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude	
830.0	9.50	227.30	829.0	-12.3	-11.4	14,059,514.55	1,559,267.04	38° 42' 59.178 N	81° 17' 4.244 W	
860.0	10.50	227.10	858.6	-15.9	-15.2	14,059,511.01	1,559,263.22	38° 42' 59.142 N	81° 17' 4.292 W	
890.0	11.50	227.00	888.0	-19.8	-19.4	14,059,507.11	1,559,259.03	38° 42' 59.104 N	81° 17' 4.344 W	
920.0	12.00	228.30	917.4	-23.9	-23.9	14,059,502.99	1,559,254.51	38° 42' 59.063 N	81° 17' 4.401 W	
950.0	12.80	228.70	946.7	-28.2	-28.8	14,059,498.72	1,559,249.69	38° 42' 59.021 N	81° 17' 4.462 W	
980.0	13.90	229.60	975.9	-32.7	-34.0	14,059,494.20	1,559,244.45	38° 42' 58.976 N	81° 17' 4.528 W	
1,010.0	15.20	229.70	1,004.9	-37.6	-39.8	14,059,489.32	1,559,238.70	38° 42' 58.927 N	81° 17' 4.600 W	
1,040.0	16.40	230.90	1,033.8	-42.8	-46.0	14,059,484.10	1,559,232.42	38° 42' 58.875 N	81° 17' 4.679 W	
1,070.0	16.10	229.20	1,062.6	-48.2	-52.5	14,059,478.71	1,559,225.98	38° 42' 58.822 N	81° 17' 4.760 W	
1,100.0	15.60	227.60	1,091.5	-53.6	-58.6	14,059,473.27	1,559,219.85	38° 42' 58.768 N	81° 17' 4.838 W	
1,130.0	15.80	224.20	1,120.3	-59.3	-64.4	14,059,467.63	1,559,214.03	38° 42' 58.712 N	81° 17' 4.911 W	
1,160.0	16.30	223.10	1,149.2	-65.3	-70.2	14,059,461.62	1,559,208.30	38° 42' 58.652 N	81° 17' 4.983 W	
1,190.0	16.90	221.40	1,177.9	-71.6	-75.9	14,059,455.28	1,559,202.54	38° 42' 58.589 N	81° 17' 5.055 W	
1,220.0	17.50	222.50	1,206.6	-78.2	-81.8	14,059,448.68	1,559,196.61	38° 42' 58.524 N	81° 17' 5.130 W	
1,250.0	18.10	223.90	1,235.1	-84.9	-88.1	14,059,442.00	1,559,190.33	38° 42' 58.458 N	81° 17' 5.209 W	
1,280.0	18.80	224.70	1,263.6	-91.7	-94.8	14,059,435.20	1,559,183.70	38° 42' 58.390 N	81° 17' 5.292 W	
1,310.0	19.50	225.60	1,291.9	-98.6	-101.7	14,059,428.27	1,559,176.72	38° 42' 58.322 N	81° 17' 5.380 W	
1,340.0	19.90	226.70	1,320.2	-105.6	-109.0	14,059,421.26	1,559,169.43	38° 42' 58.252 N	81° 17' 5.472 W	
1,370.0	20.20	228.50	1,348.4	-112.6	-116.6	14,059,414.33	1,559,161.83	38° 42' 58.183 N	81° 17' 5.568 W	
1,400.0	20.70	228.70	1,376.5	-119.5	-124.5	14,059,407.40	1,559,153.97	38° 42' 58.115 N	81° 17' 5.667 W	
1,430.0	21.10	228.90	1,404.5	-126.5	-132.5	14,059,400.35	1,559,145.92	38° 42' 58.045 N	81° 17' 5.768 W	
1,460.0	21.60	228.10	1,432.4	-133.8	-140.7	14,059,393.11	1,559,137.74	38° 42' 57.973 N	81° 17' 5.871 W	
1,490.0	22.20	226.70	1,460.3	-141.4	-149.0	14,059,385.53	1,559,129.50	38° 42' 57.898 N	81° 17' 5.974 W	
1,520.0	22.80	227.30	1,488.0	-149.2	-157.4	14,059,377.70	1,559,121.11	38° 42' 57.820 N	81° 17' 6.080 W	
1,550.0	23.60	228.00	1,515.6	-157.2	-166.1	14,059,369.74	1,559,112.37	38° 42' 57.741 N	81° 17' 6.190 W	
1,580.0	24.50	227.30	1,543.0	-165.4	-175.1	14,059,361.51	1,559,103.34	38° 42' 57.659 N	81° 17' 6.304 W	
1,610.0	24.60	226.50	1,570.2	-173.9	-184.2	14,059,352.99	1,559,094.24	38° 42' 57.575 N	81° 17' 6.418 W	
1,640.0	24.80	224.70	1,597.5	-182.7	-193.2	14,059,344.22	1,559,085.28	38° 42' 57.488 N	81° 17' 6.531 W	
1,670.0	24.60	224.30	1,624.8	-191.6	-202.0	14,059,335.28	1,559,076.50	38° 42' 57.399 N	81° 17' 6.642 W	
1,700.0	24.70	223.50	1,652.0	-200.6	-210.6	14,059,326.26	1,559,067.82	38° 42' 57.310 N	81° 17' 6.751 W	
1,730.0	24.40	222.80	1,679.3	-209.7	-219.2	14,059,317.17	1,559,059.30	38° 42' 57.219 N	81° 17' 6.858 W	
1,760.0	25.20	224.00	1,706.5	-218.9	-227.8	14,059,308.03	1,559,050.65	38° 42' 57.129 N	81° 17' 6.967 W	
1,790.0	26.60	225.70	1,733.5	-228.2	-237.1	14,059,298.74	1,559,041.40	38° 42' 57.037 N	81° 17' 7.083 W	
1,820.0	27.30	225.90	1,760.3	-237.6	-246.8	14,059,289.27	1,559,031.66	38° 42' 56.943 N	81° 17' 7.206 W	
1,850.0	27.70	226.10	1,786.9	-247.3	-256.8	14,059,279.64	1,559,021.69	38° 42' 56.847 N	81° 17' 7.331 W	
1,880.0	27.40	225.10	1,813.5	-257.0	-266.7	14,059,269.93	1,559,011.78	38° 42' 56.751 N	81° 17' 7.456 W	
1,910.0	26.20	224.00	1,840.3	-266.6	-276.2	14,059,260.30	1,559,002.29	38° 42' 56.655 N	81° 17' 7.575 W	
1,940.0	25.90	223.50	1,867.2	-276.1	-285.3	14,059,250.78	1,558,993.18	38° 42' 56.561 N	81° 17' 7.690 W	
1,970.0	25.40	222.10	1,894.3	-285.6	-294.1	14,059,241.25	1,558,984.35	38° 42' 56.466 N	81° 17' 7.801 W	
2,000.0	25.40	221.60	1,921.4	-295.2	-302.7	14,059,231.67	1,558,975.77	38° 42' 56.371 N	81° 17' 7.909 W	
2,030.0	25.60	222.90	1,948.4	-304.8	-311.4	14,059,222.11	1,558,967.08	38° 42' 56.277 N	81° 17' 8.018 W	
2,060.0	25.40	223.00	1,975.5	-314.2	-320.2	14,059,212.66	1,558,958.28	38° 42' 56.183 N	81° 17' 8.129 W	
2,090.0	25.00	222.10	2,002.7	-323.6	-328.8	14,059,203.25	1,558,949.65	38° 42' 56.090 N	81° 17' 8.237 W	
2,120.0	25.50	223.30	2,029.8	-333.1	-337.5	14,059,193.84	1,558,940.97	38° 42' 55.996 N	81° 17' 8.347 W	
2,150.0	26.00	223.50	2,056.8	-342.5	-346.4	14,059,184.37	1,558,932.01	38° 42' 55.902 N	81° 17' 8.459 W	
2,180.0	26.50	224.10	2,083.7	-352.1	-355.6	14,059,174.80	1,558,922.83	38° 42' 55.807 N	81° 17' 8.575 W	
2,210.0	27.20	223.90	2,110.5	-361.8	-365.0	14,059,165.05	1,558,913.42	38° 42' 55.711 N	81° 17' 8.693 W	
2,240.0	27.60	224.20	2,137.1	-371.8	-374.6	14,059,155.13	1,558,903.82	38° 42' 55.612 N	81° 17' 8.814 W	
2,270.0	28.20	223.20	2,163.6	-381.9	-384.3	14,059,144.98	1,558,894.12	38° 42' 55.512 N	81° 17' 8.936 W	
2,300.0	28.30	222.10	2,190.1	-392.4	-394.0	14,059,134.54	1,558,884.50	38° 42' 55.408 N	81° 17' 9.057 W	
2,330.0	28.10	221.00	2,216.5	-403.0	-403.4	14,059,123.93	1,558,875.10	38° 42' 55.303 N	81° 17' 9.175 W	
2,360.0	27.80	220.20	2,243.0	-413.6	-412.5	14,059,113.25	1,558,865.95	38° 42' 55.197 N	81° 17' 9.290 W	
2,447.0	27.80	220.20	2,320.0	-444.6	-438.7	14,059,082.26	1,558,839.76	38° 42' 54.890 N	81° 17' 9.620 W	

**TD @ 2447' MD / 2320' TVD**

**DDC**  
Survey Report - Geographic



<b>Company:</b>	HG Energy, LLC	<b>Local Co-ordinate Reference:</b>	Well SB Kinkead #108
<b>Project:</b>	Roane County, West Virginia	<b>TVD Reference:</b>	well @ 1118.0usft
<b>Site:</b>	SB Kinkead #108	<b>MD Reference:</b>	well @ 1118.0usft
<b>Well:</b>	SB Kinkead #108	<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

Design Annotations					
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment	
		+N-S (usft)	+E-W (usft)		
500.0	500.0	0.0	0.0	First Survey @ 500' MD / 500' TVD	
2,447.0	2,320.0	-444.6	-438.7	TD @ 2447' MD / 2320' TVD	

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



**HG Energy, LLC**  
Roane County, West Virginia  
SB Kinhead #108  
SB Kinhead #108  
Wellbore #1

Design: Wellbore #1

## **HG Energy EOW Report**

13 January, 2015



**DDC**  
HG Energy EOW Report



<b>Company:</b> HG Energy, LLC	<b>Local Co-ordinate Reference:</b> Well SB Kinkead #108
<b>Project:</b> Roane County, West Virginia	<b>TVD Reference:</b> well @ 1118.0usft
<b>Site:</b> SB Kinkead #108	<b>MD Reference:</b> well @ 1118.0usft
<b>Well:</b> SB Kinkead #108	<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

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

**Site:** SB Kinkead #108

<b>Site Position:</b>	<b>Northing:</b> 14,059,526.89 usft	<b>Latitude:</b> 38° 42' 59.300 N
<b>From:</b> Lat/Long	<b>Easting:</b> 1,559,278.45 usft	<b>Longitude:</b> 81° 17' 4.100 W
<b>Position Uncertainty:</b> 0.0 usft	<b>Slot Radius:</b> 13-3/16 "	<b>Grid Convergence:</b> -0.18 °

**Well:** SB Kinkead #108

<b>Well Position</b>	<b>North:</b> 14,059,526.89 usft	<b>Latitude:</b> 38° 42' 59.300 N
<b>+N/-S</b>	<b>Easting:</b> 1,559,278.45 usft	<b>Longitude:</b> 81° 17' 4.100 W
<b>+E/-W</b>	<b>Wellhead Elevation:</b> 0.0 usft	<b>Ground Level:</b> 1,110.0 usft

**Wellbore:** 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	12/23/2014	-8.02	66.37	51,991

**Design:** 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	226.00

<b>Survey Program</b>	<b>Date</b>	1/13/2015
<b>From (usft)</b>	<b>To (usft)</b>	<b>Survey (Wellbore)</b>
500.0	2,447.0	MWD Survey (Wellbore #1)
		<b>Tool Name</b>
		MWD default
		<b>Description</b>
		MWD - Standard



DDC

HG Energy EOW Report



**Company:** HG Energy, LLC  
**Project:** Roane County, West Virginia  
**Site:** SB Kinkead #108  
**Well:** SB Kinkead #108  
**Wellbore:** Wellbore #1  
**Design:** Wellbore #1

**Local Co-ordinate Reference:** Well SB Kinkead #108  
**TVD Reference:** well @ 1118.0usft  
**MD Reference:** well @ 1118.0usft  
**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)	EW (usft)	V. Sec (usft)	D/Leg (°/100usft)	Closure Distance (usft)	Closure Azimuth (°)	
0.0	0.00	0.00	0.0	0.0	0.0	0.0	0.0	0.0	0.00	
500.0	0.00	0.00	500.0	0.0	0.0	0.0	0.0	0.0	0.00	
<b>First Survey @ 500' MD / 500' TVD</b>										
560.0	0.90	128.20	560.0	-0.3	0.4	-0.1	1.50	0.5	128.20	
590.0	0.80	134.70	590.0	-0.6	0.7	-0.1	0.46	0.9	129.68	
620.0	0.70	128.90	620.0	-0.8	1.0	-0.1	0.42	1.3	130.38	
650.0	1.10	204.70	650.0	-1.2	1.0	0.1	3.83	1.6	140.24	
680.0	2.20	226.50	680.0	-1.9	0.5	1.0	4.16	1.9	165.69	
710.0	3.80	228.30	709.9	-2.9	-0.7	2.5	5.34	3.0	193.02	
740.0	5.50	229.90	739.8	-4.5	-2.5	5.0	5.68	5.2	209.12	
770.0	7.10	229.90	769.7	-6.6	-5.0	8.2	5.33	8.3	217.17	
800.0	8.10	228.00	799.4	-9.3	-8.0	12.2	3.44	12.3	220.94	
830.0	9.50	227.30	829.0	-12.3	-11.4	16.8	4.68	16.8	222.76	
860.0	10.50	227.10	858.6	-15.9	-15.2	22.0	3.34	22.0	223.81	
890.0	11.50	227.00	888.0	-19.8	-19.4	27.7	3.33	27.7	224.48	
920.0	12.00	228.30	917.4	-23.9	-23.9	33.8	1.89	33.8	225.05	
950.0	12.80	228.70	946.7	-28.2	-28.8	40.3	2.68	40.3	225.60	
980.0	13.90	229.60	975.9	-32.7	-34.0	47.2	3.73	47.2	226.13	
1,010.0	15.20	229.70	1,004.9	-37.6	-39.8	54.7	4.33	54.7	226.61	
1,040.0	16.40	230.90	1,033.8	-42.8	-46.0	62.8	4.15	62.9	227.09	
1,070.0	16.10	229.20	1,062.6	-48.2	-52.5	71.2	1.87	71.2	227.44	
1,100.0	15.60	227.60	1,091.5	-53.6	-58.6	79.4	2.21	79.4	227.54	
1,130.0	15.80	224.20	1,120.3	-59.3	-64.4	87.5	3.14	87.5	227.39	
1,160.0	16.30	223.10	1,149.2	-65.3	-70.2	95.8	1.95	95.8	227.07	
1,190.0	16.90	221.40	1,177.9	-71.6	-75.9	104.4	2.57	104.4	226.67	
1,220.0	17.50	222.50	1,206.6	-78.2	-81.8	113.2	2.27	113.2	226.30	
1,250.0	18.10	223.90	1,235.1	-84.9	-88.1	122.4	2.46	122.4	226.07	

DDC

HG Energy EOW Report



**Company:** HG Energy, LLC  
**Project:** Roane County, West Virginia  
**Site:** SB Kinhead #108  
**Well:** SB Kinhead #108  
**Wellbore:** Wellbore #1  
**Design:** Wellbore #1

**Local Co-ordinate Reference:** Well SB Kinhead #108  
**TVD Reference:** well @ 1118.0usft  
**IMD Reference:** well @ 1118.0usft  
**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 (°)
	1,280.0	18.80	224.70	1,263.6	-91.7	-94.8	131.9	2.48	131.9	225.94
	1,310.0	19.50	225.60	1,291.9	-98.6	-101.7	141.7	2.53	141.7	225.89
	1,340.0	19.90	226.70	1,320.2	-105.6	-109.0	151.8	1.82	151.8	225.91
	1,370.0	20.20	228.50	1,348.4	-112.6	-116.6	162.1	2.29	162.1	226.01
	1,400.0	20.70	228.70	1,376.5	-119.5	-124.5	172.6	1.68	172.6	226.17
	1,430.0	21.10	228.90	1,404.5	-126.5	-132.5	183.2	1.35	183.3	226.32
	1,460.0	21.60	228.10	1,432.4	-133.8	-140.7	194.2	1.93	194.2	226.45
	1,490.0	22.20	226.70	1,460.3	-141.4	-149.0	205.3	2.65	205.4	226.50
	1,520.0	22.80	227.30	1,488.0	-149.2	-157.4	216.8	2.14	216.8	226.52
	1,550.0	23.60	228.00	1,515.6	-157.2	-166.1	228.6	2.82	228.6	226.58
	1,580.0	24.50	227.30	1,543.0	-165.4	-175.1	240.9	3.15	240.9	226.64
	1,610.0	24.60	226.50	1,570.2	-173.9	-184.2	253.3	1.16	253.3	226.65
	1,640.0	24.80	224.70	1,597.5	-182.7	-193.2	265.9	2.59	265.9	226.60
	1,670.0	24.60	224.30	1,624.8	-191.6	-202.0	278.4	0.87	278.4	226.51
	1,700.0	24.70	223.50	1,652.0	-200.6	-210.6	290.9	1.16	290.9	226.39
	1,730.0	24.40	222.80	1,679.3	-209.7	-219.2	303.3	1.39	303.3	226.26
	1,760.0	25.20	224.00	1,706.5	-218.9	-227.8	315.9	3.15	315.9	226.15
	1,790.0	26.60	225.70	1,733.5	-228.2	-237.1	329.0	5.28	329.0	226.10
	1,820.0	27.30	225.90	1,760.3	-237.6	-246.8	342.6	2.35	342.6	226.08
	1,850.0	27.70	226.10	1,786.9	-247.3	-256.8	356.5	1.37	356.5	226.08
	1,880.0	27.40	225.10	1,813.5	-257.0	-266.7	370.3	1.84	370.3	226.06
	1,910.0	26.20	224.00	1,840.3	-266.6	-276.2	383.9	4.33	383.9	226.01
	1,940.0	25.90	223.50	1,867.2	-276.1	-285.3	397.0	1.24	397.0	225.94
	1,970.0	25.40	222.10	1,894.3	-285.6	-294.1	410.0	2.62	410.0	225.84
	2,000.0	25.40	221.60	1,921.4	-295.2	-302.7	422.8	0.71	422.8	225.72
	2,030.0	25.60	222.90	1,948.4	-304.8	-311.4	435.7	1.98	435.7	225.61
	2,060.0	25.40	223.00	1,975.5	-314.2	-320.2	448.6	0.68	448.6	225.54



**DDC**  
HG Energy EOW Report



**Company:** HG Energy, LLC  
**Project:** Roane County, West Virginia  
**Site:** SB Kinkead #108  
**Well:** SB Kinkead #108  
**Wellbore:** Wellbore #1  
**Design:** Wellbore #1

**Local Co-ordinate Reference:** Well SB Kinkead #108  
**TVD Reference:** well @ 1118.0usft  
**IMD Reference:** well @ 1118.0usft  
**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 (°)
2,090.0	25.00	222.10	2,002.7	-323.6	-328.8	461.4	1.85	461.4	225.45
2,120.0	25.50	223.30	2,029.8	-333.1	-337.5	474.1	2.39	474.2	225.38
2,150.0	26.00	223.50	2,056.8	-342.5	-346.4	487.1	1.69	487.2	225.33
2,180.0	26.50	224.10	2,083.7	-352.1	-355.6	500.4	1.89	500.4	225.29
2,210.0	27.20	223.90	2,110.5	-361.8	-365.0	513.9	2.35	514.0	225.25
2,240.0	27.60	224.20	2,137.1	-371.8	-374.6	527.7	1.41	527.8	225.22
<del>2,270.0</del>	28.20	223.20	2,163.6	-381.9	-384.3	541.8	2.54	541.8	225.18
2,300.0	28.30	222.10	2,190.1	-392.4	-394.0	555.9	1.77	556.0	225.12
2,330.0	28.10	221.00	2,216.5	-403.0	-403.4	570.1	1.86	570.2	225.03
2,360.0	27.80	220.20	2,243.0	-413.6	-412.5	584.1	1.60	584.2	224.92
2,447.0	27.80	220.20	2,320.0	-444.6	-438.7	624.4	0.00	624.6	224.62

**TD @ 2447' MD / 2320' TVD**

**Design Annotations**

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates +N/-S (usft)	Local Coordinates +E/-W (usft)	Comment
2,447.0	2,320.0	-444.6	-438.7	TD @ 2447' MD / 2320' TVD

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



Company Name: HG Energy, LLC  
 SB Kinkead #108  
 Roane County, West Virginia  
 Rig: Yost #2  
 Created By: Shane Robbins  
 Date: 1/13/2015

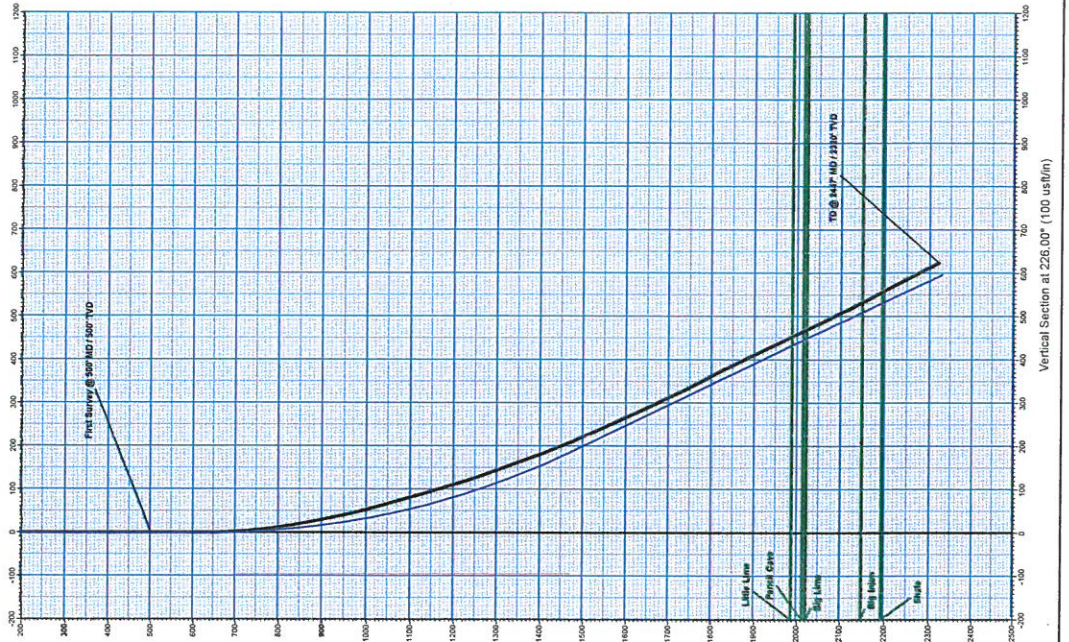
SB Kinkead #108  
 Roane County, West Virginia  
 Q141408 & AM-150021  
 Design #1



# HG Energy

DESIGN TARGET DETAILS					
Name	TVD	+N/S	+E/W	Latitude	Longitude
Target #1 SB Kinkead #108	2176.0	-361.2	-374.1	14659165.87	1558904.40
				38° 42' 56.71" N	81° 17' 8.807" W

ANNOTATIONS								
MD	Inc	AZI	TVD	+N/S	+E/W	V Sect	Departure	Annotation
2441.0	2.700	229.40	2439.9	-446.6	-483.7	0.0	0.0	First Survey @ 500' MD / 500' TVD
2441.0	2.700	229.40	2439.9	-446.6	-483.7	0.0	0.0	TS @ 3447' MD / 2326' TVD



PROJECT DETAILS:	
Geoid System:	Universal Transverse Mercator
Datum:	North American 83
Ellipsoid:	GRS 80
Zone:	Zone 17N (84 W to 78 W)
System Datum:	Mean Sea Level

WELL DETAILS:			
SB Kinkead #108			
+N/S	+E/W	Ground Level:	1110.0
0.0	0.0	Northing	1558276.45
		Longitude	81° 17' 4.00" W

**Azimuths to Grid North**  
 Correction: -7.84°  
**Magnetic Field**  
 Strength: 51990.9snT  
 Dip Angle: 66.37°  
 Date: 12/23/2014  
 Model: IGRF2010

