

**HG Energy, LLC**  
Roane County, West Virginia  
SB Kinkead # 109  
SB Kinkead #109  
Wellbore #1

Survey: ADC MWD

## **HG Energy EOW Report**

03 February, 2015



Received  
Office of Oil & Gas  
APR 09 2015

06/12/2015



**DDC**  
HG Energy EOW Report

**Company:** HG Energy, LLC  
**Project:** Roane County, West Virginia  
**Site:** SB Kinkead # 109  
**Well:** SB Kinkead #109  
**Wellbore:** Wellbore #1  
**Design:** Wellbore #1

**Local Co-ordinate Reference:** Well SB Kinkead #109  
**TVD Reference:** well @ 1118.0usft (Decker 9)  
**MD Reference:** well @ 1118.0usft (Decker 9)  
**North Reference:** Grid  
**Survey Calculation Method:** Minimum Curvature  
**Database:** 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 # 109  
**Site Position:** Lat/Long  
**From:** 14,059,786.28 usft  
**Position Uncertainty:** 0.0 usft

**Northing:** 14,059,786.28 usft  
**Easting:** 1,560,428.08 usft  
**Slot Radius:** 13-3/16 "

**Latitude:** 38° 43' 1.900 N  
**Longitude:** 81° 16' 49.600 W  
**Grid Convergence:** -0.18 °

**Well:** SB Kinkead #109  
**Well Position:** +N/-S 0.0 usft  
**Position Uncertainty:** +E/-W 0.0 usft

**Northing:** 14,059,786.28 usft  
**Easting:** 1,560,428.08 usft  
**Wellhead Elevation:** 0.0 usft

**Latitude:** 38° 43' 1.900 N  
**Longitude:** 81° 16' 49.600 W  
**Ground Level:** 1,110.0 usft

**Wellbore:** Wellbore #1

**Magnetics:** Model Name IGRF2010  
**Sample Date:** 1/23/2015  
**Declination (°):** -8.03  
**Dip Angle (°):** 66.36  
**Field Strength (nT):** 51,980

**Design:** Wellbore #1

**Audit Notes:**  
**Version:** 1.0  
**Phase:** ACTUAL  
**Tie On Depth:** 0.0

**Vertical Section:** Depth From (TVD) (usft)  
**From (usft):** 500.0  
**To (usft):** 2,629.0  
**ADC MWD (Wellbore #1):** 09

**Vertical Section:** +N/-S (usft) 0.0  
**+E/-W (usft):** 0.0  
**Direction (°):** 216.75

**Survey Program:** From (usft) 500.0  
**Date:** 2/3/2015  
**Survey (Wellbore #1):** 09

**Tool Name:** MWD default  
**Description:** MWD - Standard

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 Design: Wellbore #1

Local Co-ordinate Reference: Well SB Kinkead #109  
 well @ 1118.0usft (Decker 9)  
 MD Reference: well @ 1118.0usft (Decker 9)  
 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)	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	0.0	
500.0	0.00	0.00	500.0	0.0	0.0	0.0	0.0	0.0	0.0	
<b>First Survey @ 500' MD / 500' TVD</b>										
562.0	1.80	103.70	562.0	-0.2	0.9	-0.4	2.90	1.0	103.70	
592.0	1.60	108.90	592.0	-0.5	1.8	-0.7	0.84	1.9	104.87	
622.0	1.70	105.00	622.0	-0.7	2.6	-1.0	0.50	2.7	105.51	
652.0	1.30	128.10	652.0	-1.1	3.3	-1.1	2.39	3.5	107.59	
682.0	1.50	170.00	681.9	-1.7	3.7	-0.9	3.39	4.0	114.28	
712.0	2.10	198.20	711.9	-2.6	3.6	-0.1	3.51	4.4	125.74	
742.0	3.30	216.00	741.9	-3.8	2.9	1.3	4.83	4.8	142.73	
772.0	4.60	223.90	771.8	-5.3	1.5	3.4	4.69	5.6	163.98	
802.0	6.20	228.60	801.7	-7.3	-0.5	6.1	5.53	7.3	184.04	
832.0	7.80	232.40	831.5	-9.6	-3.3	9.7	5.55	10.2	199.20	
862.0	9.10	233.80	861.1	-12.2	-6.9	13.9	4.39	14.0	209.30	
892.0	10.30	233.30	890.7	-15.2	-10.9	18.8	4.01	18.8	215.65	
922.0	11.60	235.40	920.2	-18.6	-15.6	24.2	4.53	24.2	219.99	
952.0	12.70	233.60	949.5	-22.2	-20.7	30.2	3.88	30.4	222.97	
982.0	13.50	232.80	978.7	-26.3	-26.1	36.7	2.73	37.1	224.83	
1,012.0	14.40	232.80	1,007.8	-30.7	-31.9	43.7	3.00	44.3	226.13	
1,042.0	15.30	231.70	1,036.8	-35.4	-38.0	51.1	3.14	51.9	227.03	
1,072.0	15.50	230.50	1,065.7	-40.4	-44.2	58.8	1.25	59.9	227.57	
1,102.0	15.60	227.20	1,094.7	-45.7	-50.2	66.7	2.97	67.9	227.72	
1,132.0	15.80	222.70	1,123.5	-51.4	-56.0	74.7	4.11	76.0	227.42	
1,162.0	16.30	220.10	1,152.4	-57.6	-61.5	83.0	2.92	84.3	226.83	
1,192.0	17.10	219.20	1,181.1	-64.3	-67.0	91.6	2.80	92.8	226.16	
1,222.0	17.50	218.80	1,209.7	-71.2	-72.6	100.5	1.39	101.7	225.54	
1,252.0	18.40	216.20	1,238.3	-78.6	-78.2	109.7	4.02	110.8	224.87	

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Company: HG Energy, LLC  
 Project: Roane County, West Virginia  
 Site: SB Kinkead # 109  
 Well: SB Kinkead #109  
 Wellbore: Wellbore #1  
 Design: Wellbore #1

Local Co-ordinate Reference:  
 TVD Reference: well @ 1118.0usft (Decker 9)  
 MD Reference: well @ 1118.0usft (Decker 9)  
 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 (°)
1,282.0	19.10	216.40	1,266.7	-86.3	-83.9	119.4	2.34	120.4	224.18
1,312.0	19.80	214.20	1,295.0	-94.5	-89.7	129.3	3.38	130.3	223.50
1,342.0	20.30	214.70	1,323.2	-103.0	-95.5	139.6	1.76	140.4	222.84
1,372.0	21.20	212.00	1,351.2	-111.8	-101.3	150.2	4.38	150.9	222.18
1,402.0	22.00	213.80	1,379.1	-121.1	-107.3	161.2	3.46	161.8	221.55
1,432.0	23.10	213.90	1,406.8	-130.7	-113.7	172.7	3.67	173.2	221.04
1,462.0	24.30	216.20	1,434.3	-140.5	-120.7	184.8	5.05	185.2	220.65
1,492.0	25.70	217.90	1,461.5	-150.6	-128.3	197.5	5.24	197.9	220.42
1,522.0	26.90	218.90	1,488.4	-161.1	-136.6	210.8	4.26	211.2	220.29
1,552.0	27.30	218.20	1,515.1	-171.7	-145.1	224.4	1.71	224.8	220.19
1,582.0	28.10	219.00	1,541.6	-182.6	-153.8	238.4	2.94	238.8	220.10
1,612.0	28.90	219.10	1,568.0	-193.8	-162.8	252.7	2.67	253.1	220.04
1,642.0	29.10	217.70	1,594.2	-205.2	-171.8	267.2	2.36	267.6	219.95
1,672.0	29.40	216.20	1,620.4	-216.9	-180.6	281.8	2.64	282.2	219.79
1,702.0	29.80	216.00	1,646.5	-228.8	-189.4	296.7	1.37	297.0	219.61
1,762.0	33.39	218.50	1,697.6	-253.8	-208.4	328.1	6.37	328.4	219.39
1,792.0	35.00	220.90	1,722.4	-266.8	-219.2	344.9	7.00	345.3	219.40
1,882.0	42.90	227.30	1,792.4	-307.2	-258.7	400.9	9.84	401.6	220.10
1,912.0	43.00	227.30	1,814.3	-321.0	-273.7	421.0	0.33	421.9	220.45
1,942.0	43.80	226.10	1,836.1	-335.2	-288.7	441.3	3.83	442.4	220.74
1,972.0	45.00	224.70	1,857.6	-349.9	-303.6	462.0	5.16	463.3	220.95
2,002.0	46.10	224.00	1,878.6	-365.2	-318.6	483.3	4.03	484.7	221.10
2,032.0	46.70	222.70	1,899.3	-381.0	-333.5	504.8	3.72	506.4	221.20
2,062.0	47.00	222.30	1,919.8	-397.2	-348.3	526.6	1.65	528.3	221.25
2,122.0	47.90	221.70	1,960.3	-430.0	-377.9	570.7	1.38	572.5	221.31
2,152.0	46.00	221.00	1,980.7	-446.5	-392.5	592.6	4.05	594.5	221.31
2,182.0	46.60	220.60	2,001.3	-463.1	-406.7	614.4	1.03	616.3	221.29

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**Well:** SB Kinkead #109  
**Wellbore:** Wellbore #1  
**Design:** Wellbore #1

**Local Co-ordinate Reference:** Well SB Kinkead #109  
**TVD Reference:** well @ 1118.0usft (Decker 9)  
**MD Reference:** well @ 1118.0usft (Decker 9)  
**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 (°)
2,212.0	46.70	220.50	2,021.9	-479.6	-420.9	636.1	0.41	638.1	221.27
2,242.0	46.70	220.20	2,042.5	-496.3	-435.0	657.9	0.73	660.0	221.24
2,302.0	47.60	219.90	2,083.3	-530.0	-463.3	701.8	1.54	703.9	221.16
2,332.0	47.90	219.00	2,103.4	-547.1	-477.4	724.0	2.44	726.1	221.11
2,362.0	48.20	218.70	2,123.5	-564.5	-491.4	746.3	1.25	748.4	221.04
2,392.0	48.70	218.60	2,143.4	-582.0	-505.5	768.8	1.69	770.9	220.97
2,482.0	45.80	216.10	2,204.5	-634.5	-545.6	834.8	3.81	836.8	220.69
2,572.0	42.10	213.90	2,269.3	-685.6	-581.4	897.2	4.45	899.0	220.30
2,629.0	42.10	213.90	2,311.6	-717.4	-602.7	935.4	0.00	937.0	220.04

TD @ 2629' MD / 2312' TVD

Survey Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates +N/-S (usft)	Local Coordinates +E/-W (usft)	Comment
500.0	500.0	0.0	0.0	First Survey @ 500' MD / 500' TVD
2,629.0	2,311.6	-717.4	-602.7	TD @ 2629' MD / 2312' TVD

Checked By: \_\_\_\_\_

Approved By: \_\_\_\_\_

Date: \_\_\_\_\_

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**HG Energy, LLC**  
Roane County, West Virginia  
SB Kinkead # 109  
SB Kinkead #109

**Wellbore #1**

**Design: Wellbore #1**

## **Survey Report - Geographic**

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Survey Report - Geographic



<b>Company:</b>	HG Energy, LLC	<b>Local Co-ordinate Reference:</b>	Well SB Kinkead #109
<b>Project:</b>	Roane County, West Virginia	<b>TVD Reference:</b>	well @ 1118.0usft (Decker 9)
<b>Site:</b>	SB Kinkead # 109	<b>MD Reference:</b>	well @ 1118.0usft (Decker 9)
<b>Well:</b>	SB Kinkead #109	<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 # 109				
<b>Site Position:</b>		<b>Northing:</b>	14,059,786.29 usft	<b>Latitude:</b>	38° 43' 1.900 N
<b>From:</b>	Lat/Long	<b>Easting:</b>	1,560,428.08 usft	<b>Longitude:</b>	81° 16' 49.600 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 #109					
<b>Well Position</b>	+N/-S	0.0 usft	<b>Northing:</b>	14,059,786.29 usft	<b>Latitude:</b>	38° 43' 1.900 N
	+E/-W	0.0 usft	<b>Easting:</b>	1,560,428.08 usft	<b>Longitude:</b>	81° 16' 49.600 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	1/23/2015	-8.03	66.36	51,980

<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	216.75	

<b>Survey Program</b>	<b>Date</b>	2/3/2015			
<b>From (usft)</b>	<b>To (usft)</b>	<b>Survey (Wellbore)</b>	<b>Tool Name</b>	<b>Description</b>	
500.0	2,629.0	ADC MWD (Wellbore #1)	MWD default	MWD - Standard	

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<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	14,059,786.29	1,560,428.08	38° 43' 1.900 N	81° 16' 49.600 W	
500.0	0.00	0.00	500.0	0.0	0.0	14,059,786.29	1,560,428.08	38° 43' 1.900 N	81° 16' 49.600 W	
<b>First Survey @ 500' MD / 500' TVD</b>										
562.0	1.80	103.70	562.0	-0.2	0.9	14,059,786.06	1,560,429.03	38° 43' 1.898 N	81° 16' 49.588 W	
592.0	1.60	108.90	592.0	-0.5	1.8	14,059,785.81	1,560,429.88	38° 43' 1.895 N	81° 16' 49.577 W	
622.0	1.70	105.00	622.0	-0.7	2.6	14,059,785.56	1,560,430.71	38° 43' 1.893 N	81° 16' 49.567 W	
652.0	1.30	128.10	652.0	-1.1	3.3	14,059,785.23	1,560,431.41	38° 43' 1.890 N	81° 16' 49.558 W	
682.0	1.50	170.00	681.9	-1.7	3.7	14,059,784.64	1,560,431.74	38° 43' 1.884 N	81° 16' 49.554 W	
712.0	2.10	198.20	711.9	-2.6	3.6	14,059,783.73	1,560,431.64	38° 43' 1.875 N	81° 16' 49.555 W	
742.0	3.30	216.00	741.9	-3.8	2.9	14,059,782.51	1,560,430.96	38° 43' 1.863 N	81° 16' 49.564 W	
772.0	4.60	223.90	771.8	-5.3	1.5	14,059,780.94	1,560,429.62	38° 43' 1.847 N	81° 16' 49.580 W	
802.0	6.20	228.60	801.7	-7.3	-0.5	14,059,779.00	1,560,427.57	38° 43' 1.828 N	81° 16' 49.606 W	



DDC  
Survey Report - Geographic



<b>Company:</b>	HG Energy, LLC	<b>Local Co-ordinate Reference:</b>	Well SB Kinkead #109
<b>Project:</b>	Roane County, West Virginia	<b>TVD Reference:</b>	well @ 1118.0usft (Decker 9)
<b>Site:</b>	SB Kinkead # 109	<b>MD Reference:</b>	well @ 1118.0usft (Decker 9)
<b>Well:</b>	SB Kinkead #109	<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
832.0	7.80	232.40	831.5	-9.6	-3.3	14,059,776.69	1,560,424.74	38° 43' 1.805 N	81° 16' 49.642 W
862.0	9.10	233.80	861.1	-12.2	-6.9	14,059,774.05	1,560,421.21	38° 43' 1.779 N	81° 16' 49.686 W
892.0	10.30	233.30	890.7	-15.2	-10.9	14,059,771.04	1,560,417.15	38° 43' 1.749 N	81° 16' 49.737 W
922.0	11.60	235.40	920.2	-18.6	-15.6	14,059,767.73	1,560,412.51	38° 43' 1.716 N	81° 16' 49.796 W
952.0	12.70	233.60	949.5	-22.2	-20.7	14,059,764.06	1,560,407.38	38° 43' 1.680 N	81° 16' 49.860 W
982.0	13.50	232.80	978.7	-26.3	-26.1	14,059,759.98	1,560,401.93	38° 43' 1.639 N	81° 16' 49.929 W
1,012.0	14.40	232.80	1,007.8	-30.7	-31.9	14,059,755.61	1,560,396.17	38° 43' 1.596 N	81° 16' 50.002 W
1,042.0	15.30	231.70	1,036.8	-35.4	-38.0	14,059,750.90	1,560,390.10	38° 43' 1.549 N	81° 16' 50.078 W
1,072.0	15.50	230.50	1,065.7	-40.4	-44.2	14,059,745.90	1,560,383.90	38° 43' 1.499 N	81° 16' 50.156 W
1,102.0	15.60	227.20	1,094.7	-45.7	-50.2	14,059,740.61	1,560,377.84	38° 43' 1.447 N	81° 16' 50.232 W
1,132.0	15.80	222.70	1,123.5	-51.4	-56.0	14,059,734.86	1,560,372.11	38° 43' 1.390 N	81° 16' 50.304 W
1,162.0	16.30	220.10	1,152.4	-57.6	-61.5	14,059,728.64	1,560,366.63	38° 43' 1.328 N	81° 16' 50.373 W
1,192.0	17.10	219.20	1,181.1	-64.3	-67.0	14,059,722.00	1,560,361.13	38° 43' 1.262 N	81° 16' 50.443 W
1,222.0	17.50	218.80	1,209.7	-71.2	-72.6	14,059,715.07	1,560,355.52	38° 43' 1.194 N	81° 16' 50.513 W
1,252.0	18.40	216.20	1,238.3	-78.6	-78.2	14,059,707.73	1,560,349.90	38° 43' 1.121 N	81° 16' 50.584 W
1,282.0	19.10	216.40	1,266.7	-86.3	-83.9	14,059,699.96	1,560,344.19	38° 43' 1.044 N	81° 16' 50.656 W
1,312.0	19.80	214.20	1,295.0	-94.5	-89.7	14,059,691.81	1,560,338.42	38° 43' 0.963 N	81° 16' 50.728 W
1,342.0	20.30	214.70	1,323.2	-103.0	-95.5	14,059,683.33	1,560,332.60	38° 43' 0.879 N	81° 16' 50.801 W
1,372.0	21.20	212.00	1,351.2	-111.8	-101.3	14,059,674.45	1,560,326.76	38° 43' 0.791 N	81° 16' 50.875 W
1,402.0	22.00	213.80	1,379.1	-121.1	-107.3	14,059,665.18	1,560,320.76	38° 43' 0.699 N	81° 16' 50.950 W
1,432.0	23.10	213.90	1,406.8	-130.7	-113.7	14,059,655.63	1,560,314.35	38° 43' 0.605 N	81° 16' 51.030 W
1,462.0	24.30	216.20	1,434.3	-140.5	-120.7	14,059,645.76	1,560,307.42	38° 43' 0.507 N	81° 16' 51.117 W
1,492.0	25.70	217.90	1,461.5	-150.6	-128.3	14,059,635.64	1,560,299.78	38° 43' 0.407 N	81° 16' 51.214 W
1,522.0	26.90	218.90	1,488.4	-161.1	-136.6	14,059,625.23	1,560,291.52	38° 43' 0.303 N	81° 16' 51.317 W
1,552.0	27.30	218.20	1,515.1	-171.7	-145.1	14,059,614.54	1,560,283.01	38° 43' 0.197 N	81° 16' 51.424 W
1,582.0	28.10	219.00	1,541.6	-182.6	-153.8	14,059,603.64	1,560,274.31	38° 43' 0.089 N	81° 16' 51.534 W
1,612.0	28.90	219.10	1,568.0	-193.8	-162.8	14,059,592.53	1,560,265.29	38° 42' 59.979 N	81° 16' 51.647 W
1,642.0	29.10	217.70	1,594.2	-205.2	-171.8	14,059,581.13	1,560,256.26	38° 42' 59.866 N	81° 16' 51.761 W
1,672.0	29.40	216.20	1,620.4	-216.9	-180.6	14,059,569.42	1,560,247.45	38° 42' 59.750 N	81° 16' 51.872 W
1,702.0	29.80	216.00	1,646.5	-228.8	-189.4	14,059,557.44	1,560,238.71	38° 42' 59.631 N	81° 16' 51.981 W
1,762.0	33.39	218.50	1,697.6	-253.8	-208.4	14,059,532.45	1,560,219.67	38° 42' 59.384 N	81° 16' 52.221 W
1,792.0	35.00	220.90	1,722.4	-266.8	-219.2	14,059,519.49	1,560,208.89	38° 42' 59.255 N	81° 16' 52.356 W
1,882.0	42.90	227.30	1,792.4	-307.2	-258.7	14,059,479.12	1,560,169.40	38° 42' 58.855 N	81° 16' 52.853 W
1,912.0	43.00	227.30	1,814.3	-321.0	-273.7	14,059,465.26	1,560,154.38	38° 42' 58.717 N	81° 16' 53.042 W
1,942.0	43.80	226.10	1,836.1	-335.2	-288.7	14,059,451.12	1,560,139.38	38° 42' 58.577 N	81° 16' 53.231 W
1,972.0	45.00	224.70	1,857.6	-349.9	-303.6	14,059,436.38	1,560,124.44	38° 42' 58.431 N	81° 16' 53.419 W
2,002.0	46.10	224.00	1,878.6	-365.2	-318.6	14,059,421.07	1,560,109.47	38° 42' 58.279 N	81° 16' 53.607 W
2,032.0	46.70	222.70	1,899.3	-381.0	-333.5	14,059,405.27	1,560,094.56	38° 42' 58.122 N	81° 16' 53.795 W
2,062.0	47.10	222.30	1,919.8	-397.2	-348.3	14,059,389.12	1,560,079.76	38° 42' 57.962 N	81° 16' 53.981 W
2,122.0	47.80	221.70	1,960.3	-430.0	-377.9	14,059,356.27	1,560,050.18	38° 42' 57.636 N	81° 16' 54.353 W
2,152.0	46.70	221.00	1,980.7	-446.5	-392.5	14,059,339.74	1,560,035.63	38° 42' 57.472 N	81° 16' 54.536 W
2,182.0	46.60	220.60	2,001.3	-463.1	-406.7	14,059,323.22	1,560,021.38	38° 42' 57.309 N	81° 16' 54.715 W
2,212.0	46.70	220.50	2,021.9	-479.6	-420.9	14,059,306.65	1,560,007.19	38° 42' 57.144 N	81° 16' 54.894 W
2,242.0	46.70	220.20	2,042.5	-496.3	-435.0	14,059,290.01	1,559,993.06	38° 42' 56.979 N	81° 16' 55.071 W
2,302.0	47.60	219.90	2,083.3	-530.0	-463.3	14,059,256.34	1,559,964.75	38° 42' 56.646 N	81° 16' 55.427 W
2,332.0	47.90	219.00	2,103.4	-547.1	-477.4	14,059,239.19	1,559,950.64	38° 42' 56.476 N	81° 16' 55.605 W
2,362.0	48.20	218.70	2,123.5	-564.5	-491.4	14,059,221.81	1,559,936.65	38° 42' 56.303 N	81° 16' 55.781 W
2,392.0	48.70	218.60	2,143.4	-582.0	-505.5	14,059,204.28	1,559,922.63	38° 42' 56.130 N	81° 16' 55.957 W
2,482.0	45.80	216.10	2,204.5	-634.5	-545.6	14,059,151.77	1,559,882.51	38° 42' 55.609 N	81° 16' 56.461 W
2,572.0	42.10	213.90	2,269.3	-685.6	-581.4	14,059,100.65	1,559,846.67	38° 42' 55.102 N	81° 16' 56.912 W
2,629.0	42.10	213.90	2,311.6	-717.4	-602.7	14,059,068.93	1,559,825.35	38° 42' 54.788 N	81° 16' 57.369 W

TD @ 2629' MD / 2312' TVD

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DDC  
Survey Report - Geographic



<b>Company:</b> HG Energy, LLC	<b>Local Co-ordinate Reference:</b> Well SB Kinkead #109
<b>Project:</b> Roane County, West Virginia	<b>TVD Reference:</b> well @ 1118.0usft (Decker 9)
<b>Site:</b> SB Kinkead # 109	<b>MD Reference:</b> well @ 1118.0usft (Decker 9)
<b>Well:</b> SB Kinkead #109	<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)	
2,629.0	2,311.6	-717.4	-602.7	TD @ 2629' MD / 2312' TVD

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

Received  
Office of Oil & Gas  
APR 09 2015



Company Name: HG Energy, LLC  
 SB Kinkead #109  
 Roane County, West Virginia  
 Rig/Deckler 9  
 Created By: Shane Robbins  
 Date: 2/3/2015

SB Kinkead #109  
 Roane County, West Virginia  
 Q150102 & AM-150094  
 Design #1

DESIGN TARGET DETAILS

Name	TVD	+N/S	+E/W	Northing	Eastng	Latitude	Longitude
PH-L SB Kinkead #109 - plain this Target Center	2161.0	-425.0	-466.7	14259181.20	1503981.39	38°42'55.726" N	81°16'55.465" W

ANNOTATIONS

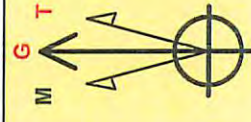
US	ft	TD	+N/S	+E/W	Vector	Departure	Amplitude
500.0	0.00	500.0	-425.0	-466.7	@ 100° MD / 500' TVD		
2523.0	42.10	213.30	2311.6	-717.4	-602.7	935.4	945.9 TD @ 2523' MD / 2312' TVD

PROJECT DETAILS:

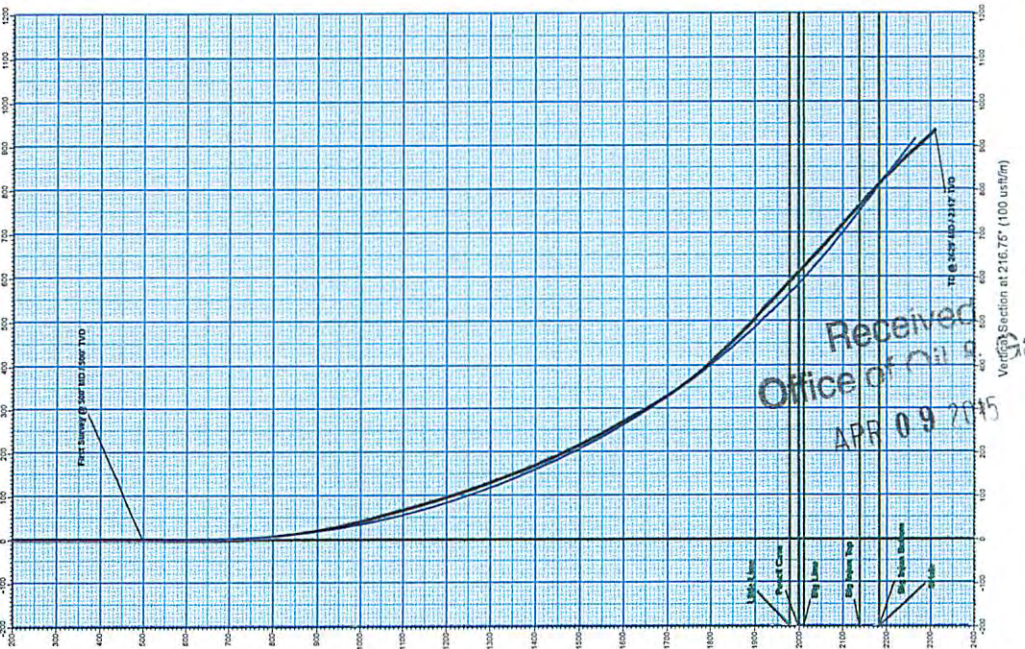
Roane County, West Virginia  
 Geodetic System: Universal Transverse Mercator  
 Datum: NAD83 West Virginia - HARN  
 Ellipsoid: GRS 1980  
 Zone: 17N (84 W to 78 W)  
 System Datum: Mean Sea Level

WELL DETAILS:

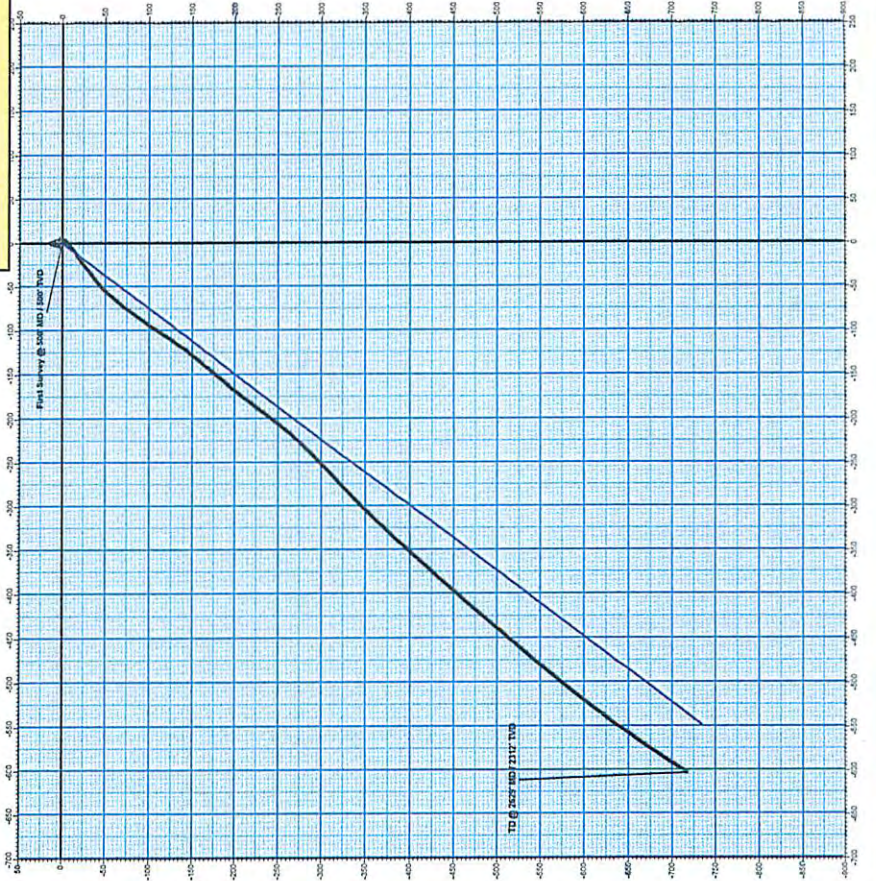
	SB Kinkead #109
+N/S	0.0
+E/W	0.0
Ground Level	1110.0
Northing	14259786.28
Eastng	15039428.09
Latitude	38°42'15.00" N
Longitude	81°16'59.00" W



Azimuths to Grid North  
 Magnetic North: -7.86°  
 Magnetic Field  
 Strength: 51980.4snT  
 Dip Angle: 66.36°  
 Date: 1/23/2015  
 Model: IGRF2010



# HG Energy



06/12/2015