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FEB 25 2015

WV Department of  
Environmental Protection



**HG Energy, LLC**  
Roane County, West Virginia  
SB Kinhead #103  
SB Kinhead #103  
Wellbore #1

Design: Wellbore #1

## **HG Energy EOW Report**

12 January, 2015



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HG Energy EOW Report

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

Well SB Kinkead #103  
well @ 1122.0usft (Decker #9)  
well @ 1122.0usft (Decker #9)  
Grid  
Minimum Curvature  
EDM 5000.1 Single User Db

Company: HG Energy, LLC  
Project: Roane County, West Virginia  
Site: SB Kinkead #103  
Well: SB Kinkead #103  
Wellbore: Wellbore #1  
Design: Wellbore #1

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)

Well SB Kinkead #103  
Well Position: +N/-S 0.0 usft  
                  +E/-W 0.0 usft  
Position Uncertainty: 0.0 usft

Well SB Kinkead #103  
Well Position: +N/-S 0.0 usft  
                  +E/-W 0.0 usft  
Position Uncertainty: 0.0 usft

Site Position: 38° 43' 2.900 N  
From: 81° 17' 10.600 W  
Position Uncertainty: -0.18 °

Site Position: 14,059,892.56 usft  
From: 1,558,764.60 usft  
Position Uncertainty: 13-3/16 "

Well SB Kinkead #103  
Well Position: +N/-S 0.0 usft  
                  +E/-W 0.0 usft  
Position Uncertainty: 0.0 usft

Well SB Kinkead #103  
Well Position: 38° 43' 2.900 N  
                  81° 17' 10.600 W  
Position Uncertainty: 1,114.0 usft

Wellbore: Wellbore #1

Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF200510	12/13/2014	-7.95	66.43	51,939

Design	Wellbore #1	Phase:	Tie On Depth:	Direction (°)
Audit Notes:		ACTUAL	0.0	34.00
Version:	1.0			

Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)	Direction (°)
	0.0	0.0	0.0	34.00

Survey Program	Date	Tool Name	Description
From (usft)	1/12/2015	MWD default	MWD - Standard
To (usft)			
562.0		MWD (Wellbore #1)	
2,380.0		MWD (Wellbore #1)	



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HG Energy EOW Report

**Company:** HG Energy, LLC  
**Project:** Roane County, West Virginia  
**Site:** SB Kinkead #103  
**Well:** SB Kinkead #103  
**Wellbore:** Wellbore #1  
**Design:** Wellbore #1

**Local Co-ordinate Reference:** Well SB Kinkead #103  
**TVD Reference:** well @ 1122.0usft (Decker #9)  
**MD Reference:** well @ 1122.0usft (Decker #9)  
**North Reference:** Grid  
**Survey Calculation Method:** Minimum Curvature  
**Database:** EDM 5000.1 Single User Db

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Survey	MD (usft)	Inc (°)	Azi (azimuth) (°)	TVD (usft)	WV Department of Environmental Protection (usft)	V. Sec (usft)	DLeg (°/100usft)	Closure Distance (usft)	Closure Azimuth (°)	
	0.0	0.00	0.00	0.0	0.0	0.0	0.00	0.0	0.00	
	562.0	1.60	187.90	561.9	-7.8	-1.1	-7.0	7.8	187.90	
<b>First MWD Survey @ 562' MD / 562' TVD</b>										
	592.0	1.60	184.50	591.9	-8.6	-1.2	-7.8	8.7	187.74	
	622.0	1.00	170.00	621.9	-9.3	-1.2	-8.3	9.4	187.10	
	652.0	0.80	109.90	651.9	-9.6	-0.9	-8.5	9.7	185.43	
	682.0	1.60	59.00	681.9	-9.5	-0.4	-8.0	9.5	182.17	
	712.0	2.70	43.40	711.9	-8.7	0.5	-7.0	8.7	176.81	
	742.0	4.00	37.10	741.8	-7.4	1.6	-5.2	7.6	167.75	
	772.0	5.50	32.60	771.7	-5.3	3.0	-2.7	6.1	150.60	
	802.0	6.70	29.30	801.6	-2.6	4.6	0.4	5.3	119.30	
	832.0	8.00	27.40	831.3	0.8	6.5	4.3	6.5	83.15	
	862.0	8.90	25.60	861.0	4.7	8.4	8.6	9.7	60.72	
	892.0	9.60	25.40	890.6	9.1	10.5	13.4	13.9	49.16	
	922.0	10.20	25.50	920.1	13.7	12.7	18.5	18.7	42.79	
	952.0	11.00	25.60	949.6	18.7	15.1	24.0	24.0	38.89	
	982.0	11.80	25.00	979.0	24.1	17.6	29.8	29.8	36.21	
	1,012.0	12.40	25.00	1,008.4	29.8	20.3	36.0	36.0	34.27	
	1,042.0	13.10	25.30	1,037.6	35.8	23.1	42.6	42.6	32.86	
	1,072.0	13.30	25.80	1,066.8	41.9	26.1	49.3	49.4	31.85	
	1,102.0	13.90	25.80	1,096.0	48.3	29.1	56.3	56.4	31.09	
	1,132.0	14.20	26.50	1,125.1	54.8	32.3	63.5	63.7	30.53	
	1,162.0	14.80	26.70	1,154.1	61.5	35.7	71.0	71.2	30.11	
	1,192.0	15.40	27.20	1,183.1	68.5	39.2	78.7	79.0	29.80	
	1,222.0	16.00	27.60	1,212.0	75.7	43.0	86.8	87.1	29.58	
	1,252.0	16.20	29.30	1,240.8	83.0	46.9	95.1	95.4	29.48	
	1,282.0	16.00	32.10	1,269.6	90.2	51.2	103.4	103.7	29.58	

05/01/2015



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Local Co-ordinate Reference:  
TVD Reference: well @ 1122.0usft (Decker #9)  
MD Reference: well @ 1122.0usft (Decker #9)  
North Reference: Grid  
Survey Calculation Method: Minimum Curvature  
Database: EDM 5000.1 Single User Db

Company: HG Energy, LLC  
Project: Roane County, West Virginia  
Site: SB Kinkead #103  
Well: SB Kinkead #103  
Wellbore: Wellbore #1  
Design: Wellbore #1

Well SB Kinkead #103  
well @ 1122.0usft (Decker #9)  
well @ 1122.0usft (Decker #9)  
Grid  
Minimum Curvature  
EDM 5000.1 Single User Db

Survey	MD (usft)	Inc (°)	Azi (azimuth) (°)	TVD (usft)	N/S (usft)	E/W (usft)	V. Sec (usft)	D/Leg (°/100usft)	Closure Distance (usft)	Closure Azimuth (°)
	1,312.0	16.00	32.70	1,298.5	97.2	55.6	111.7	0.55	112.0	29.78
	1,342.0	15.80	31.90	1,327.3	104.1	60.0	119.9	0.99	120.2	29.96
	1,372.0	15.60	31.50	1,356.2	111.0	64.3	128.0	0.76	128.3	30.07
	1,402.0	15.80	32.60	1,385.1	117.9	68.6	136.1	1.20	136.4	30.19
	1,432.0	15.90	34.70	1,413.9	124.7	73.1	144.3	1.94	144.6	30.38
	1,462.0	15.90	35.40	1,442.8	131.5	77.8	152.5	0.64	152.8	30.63
	1,492.0	15.80	35.40	1,471.7	138.1	82.6	160.7	0.33	160.9	30.88
	1,522.0	15.80	35.20	1,500.5	144.8	87.3	168.9	0.18	169.1	31.09
	1,552.0	15.80	35.20	1,529.4	151.5	92.0	177.0	0.00	177.2	31.28
	1,582.0	15.70	34.90	1,558.3	158.1	96.7	185.2	0.43	185.4	31.44
	1,612.0	15.70	34.30	1,587.1	164.8	101.3	193.3	0.54	193.5	31.58
	1,642.0	15.50	33.80	1,616.0	171.5	105.8	201.4	0.80	201.5	31.68
	1,672.0	14.80	32.60	1,645.0	178.1	110.1	209.2	2.56	209.4	31.73
	1,702.0	15.00	33.20	1,674.0	184.5	114.3	216.9	0.84	217.1	31.77
	1,732.0	15.80	35.70	1,702.9	191.1	118.8	224.9	3.46	225.0	31.87
	1,762.0	16.10	37.10	1,731.8	197.7	123.7	233.1	1.63	233.2	32.03
	1,792.0	16.30	37.10	1,760.6	204.4	128.8	241.5	0.67	241.6	32.21
	1,822.0	16.40	37.10	1,789.4	211.2	133.8	249.9	0.33	250.0	32.37
	1,852.0	16.40	37.10	1,818.1	217.9	139.0	258.4	0.00	258.4	32.53
	1,882.0	16.40	37.10	1,846.9	224.7	144.1	266.8	0.00	266.9	32.67
	1,912.0	16.80	37.50	1,875.7	231.5	149.3	275.4	1.39	275.4	32.81
	1,942.0	16.70	37.30	1,904.4	238.3	154.5	284.0	0.38	284.0	32.95
	1,972.0	16.70	37.10	1,933.1	245.2	159.7	292.6	0.19	292.6	33.08
	2,002.0	17.20	36.40	1,961.8	252.2	165.0	301.3	1.80	301.4	33.19
	2,032.0	17.10	36.50	1,990.5	259.3	170.2	310.2	0.35	310.2	33.28
	2,062.0	16.20	35.20	2,019.2	266.3	175.2	318.8	3.25	318.8	33.35
	2,092.0	15.90	34.50	2,048.1	273.1	180.0	327.1	1.19	327.1	33.39



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 Well: SB Kinkead #103  
 Wellbore: Wellbore #1  
 Design: Wellbore #1

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Local Co-ordinate Reference: Well SB Kinkead #103  
 TVD Reference: well @ 1122.0usft (Decker #8)  
 MD Reference: well @ 1122.0usft (Decker #8)  
 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 (°)
	2,122.0	16.10	33.90	2,076.9	279.9	184.6	335.3	0.87	335.4	33.41
	2,152.0	16.00	33.80	2,105.7	286.8	189.3	343.6	0.35	343.6	33.42
	2,182.0	16.20	33.70	2,134.6	293.8	193.9	351.9	0.67	352.0	33.42
	2,212.0	16.31	33.70	2,163.4	300.7	198.5	360.3	0.37	360.4	33.43
	2,242.0	16.30	33.60	2,192.1	307.8	203.2	368.8	0.10	368.8	33.44
	2,272.0	14.90	33.40	2,221.0	314.5	207.7	376.8	4.67	376.9	33.44
	2,302.0	13.70	32.60	2,250.1	320.7	211.7	384.2	4.05	384.3	33.43
	2,380.0	13.70	32.60	2,325.9	336.3	221.6	402.7	0.00	402.7	33.39

TD @ 2380' MD / 2326' TVD

Design Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates +N/-S (usft)	Local Coordinates +E/-W (usft)	Comment
562.0	561.9	-7.8	-1.1	First MWD Survey @ 562' MD / 562' TVD
2,380.0	2,325.9	336.3	221.6	TD @ 2380' MD / 2326' TVD

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

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

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

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**HG Energy, LLC**  
Roane County, West Virginia  
SB Kinkead #103  
SB Kinkead #103

Wellbore #1

Design: Wellbore #1

## Survey Report - Geographic

12 January, 2015



05/01/2015

FEB 25 2015



<b>Company:</b>	HG Energy, LLC	<b>Local Co-ordinate Reference:</b>	Well SB Kinhead #103
<b>Project:</b>	Roane County, West Virginia	<b>TVD Reference:</b>	well @ 1122.0usft (Decker #9)
<b>Site:</b>	SB Kinhead #103	<b>MD Reference:</b>	well @ 1122.0usft (Decker #9)
<b>Well:</b>	SB Kinhead #103	<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 Kinhead #103		
<b>Site Position:</b>		<b>Northing:</b>	14,059,892.56 usft
<b>From:</b>	Lat/Long	<b>Easting:</b>	1,558,764.61 usft
<b>Position Uncertainty:</b>	0.0 usft	<b>Slot Radius:</b>	13-3/16 "
		<b>Latitude:</b>	38° 43' 2.900 N
		<b>Longitude:</b>	81° 17' 10.600 W
		<b>Grid Convergence:</b>	-0.18 °

<b>Well</b>	SB Kinhead #103		
<b>Well Position</b>	+N/-S	0.0 usft	<b>Northing:</b> 14,059,892.56 usft
	+E/-W	0.0 usft	<b>Easting:</b> 1,558,764.61 usft
<b>Position Uncertainty</b>	0.0 usft	<b>Wellhead Elevation:</b>	0.0 usft
		<b>Latitude:</b>	38° 43' 2.900 N
		<b>Longitude:</b>	81° 17' 10.600 W
		<b>Ground Level:</b>	1,114.0 usft

<b>Wellbore</b>	Wellbore #1		
<b>Magnetics</b>	<b>Model Name</b>	<b>Sample Date</b>	<b>Declination (°)</b>
	IGRF200510	12/13/2014	-7.95
			<b>Dip Angle (°)</b> 66.43
			<b>Field Strength (nT)</b> 51,939

<b>Design</b>	Wellbore #1		
<b>Audit Notes:</b>		<b>Phase:</b>	ACTUAL
<b>Version:</b>	1.0	<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>
	0.0	0.0	0.0
			<b>Direction (°)</b> 34.00

<b>Survey Program</b>	Date 1/12/2015		
<b>From (usft)</b>	<b>To (usft)</b>	<b>Survey (Wellbore)</b>	<b>Tool Name</b>
562.0	2,380.0	MWD (Wellbore #1)	MWD default
			<b>Description</b> MWD - Standard

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
0.0	0.00	0.00	0.0	0.0	0.0	14,059,892.56	1,558,764.61	38° 43' 2.900 N	81° 17' 10.600 W
562.0	1.60	187.90	561.9	-7.8	-1.1	14,059,884.79	1,558,763.53	38° 43' 2.823 N	81° 17' 10.613 W
<b>First MWD Survey @ 562' MD / 562' TVD</b>									
592.0	1.60	184.50	591.9	-8.6	-1.2	14,059,883.96	1,558,763.44	38° 43' 2.815 N	81° 17' 10.614 W
622.0	1.00	170.00	621.9	-9.3	-1.2	14,059,883.28	1,558,763.45	38° 43' 2.808 N	81° 17' 10.614 W
652.0	0.80	109.90	651.9	-9.6	-0.9	14,059,882.95	1,558,763.69	38° 43' 2.805 N	81° 17' 10.611 W
682.0	1.60	59.00	681.9	-9.5	-0.4	14,059,883.10	1,558,764.25	38° 43' 2.806 N	81° 17' 10.604 W
712.0	2.70	43.40	711.9	-8.7	0.5	14,059,883.83	1,558,765.09	38° 43' 2.814 N	81° 17' 10.594 W
742.0	4.00	37.10	741.8	-7.4	1.6	14,059,885.17	1,558,766.21	38° 43' 2.827 N	81° 17' 10.579 W
772.0	5.50	32.60	771.7	-5.3	3.0	14,059,887.22	1,558,767.62	38° 43' 2.847 N	81° 17' 10.562 W
802.0	6.70	29.30	801.6	-2.6	4.6	14,059,889.96	1,558,769.25	38° 43' 2.874 N	81° 17' 10.541 W
832.0	8.00	27.40	831.3	0.8	6.5	14,059,893.34	1,558,771.07	38° 43' 2.908 N	81° 17' 10.519 W



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Local Co-ordinate Reference: Well SB Kinkead #103  
 TVD Reference: well @ 1122.0usft (Decker #9)  
 MD Reference: well @ 1122.0usft (Decker #9)  
 North Reference: Grid  
 Survey Calculation Method: Minimum Curvature  
 Database: EDM 5000.1 Single User Db

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 Environmental Protection

Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
862.0	8.90	25.60	861.0	4.7	8.4	14,059,897.28	1,558,773.03	38° 43' 2.947 N	81° 17' 10.494 W
892.0	9.60	25.40	890.6	9.1	10.5	14,059,901.64	1,558,775.10	38° 43' 2.990 N	81° 17' 10.468 W
922.0	10.20	25.50	920.1	13.7	12.7	14,059,906.29	1,558,777.32	38° 43' 3.036 N	81° 17' 10.440 W
952.0	11.00	25.60	949.6	18.7	15.1	14,059,911.27	1,558,779.70	38° 43' 3.085 N	81° 17' 10.410 W
982.0	11.80	25.00	979.0	24.1	17.6	14,059,916.63	1,558,782.23	38° 43' 3.139 N	81° 17' 10.378 W
1,012.0	12.40	25.00	1,008.4	29.8	20.3	14,059,922.33	1,558,784.89	38° 43' 3.195 N	81° 17' 10.345 W
1,042.0	13.10	25.30	1,037.6	35.8	23.1	14,059,928.33	1,558,787.71	38° 43' 3.254 N	81° 17' 10.310 W
1,072.0	13.30	25.80	1,066.8	41.9	26.1	14,059,934.51	1,558,790.66	38° 43' 3.316 N	81° 17' 10.273 W
1,102.0	13.90	25.80	1,096.0	48.3	29.1	14,059,940.86	1,558,793.73	38° 43' 3.378 N	81° 17' 10.234 W
1,132.0	14.20	26.50	1,125.1	54.8	32.3	14,059,947.39	1,558,796.94	38° 43' 3.443 N	81° 17' 10.194 W
1,162.0	14.80	26.70	1,154.1	61.5	35.7	14,059,954.11	1,558,800.30	38° 43' 3.510 N	81° 17' 10.152 W
1,192.0	15.40	27.20	1,183.1	68.5	39.2	14,059,961.08	1,558,803.85	38° 43' 3.579 N	81° 17' 10.107 W
1,222.0	16.00	27.60	1,212.0	75.7	43.0	14,059,968.28	1,558,807.58	38° 43' 3.650 N	81° 17' 10.061 W
1,252.0	16.20	29.30	1,240.8	83.0	46.9	14,059,975.60	1,558,811.55	38° 43' 3.723 N	81° 17' 10.011 W
1,282.0	16.00	32.10	1,269.6	90.2	51.2	14,059,982.75	1,558,815.79	38° 43' 3.793 N	81° 17' 9.958 W
1,312.0	16.00	32.70	1,298.5	97.2	55.6	14,059,989.73	1,558,820.22	38° 43' 3.863 N	81° 17' 9.902 W
1,342.0	15.80	31.90	1,327.3	104.1	60.0	14,059,996.68	1,558,824.61	38° 43' 3.931 N	81° 17' 9.847 W
1,372.0	15.60	31.50	1,356.2	111.0	64.3	14,060,003.58	1,558,828.88	38° 43' 4.000 N	81° 17' 9.793 W
1,402.0	15.80	32.60	1,385.1	117.9	68.6	14,060,010.46	1,558,833.19	38° 43' 4.068 N	81° 17' 9.739 W
1,432.0	15.90	34.70	1,413.9	124.7	73.1	14,060,017.28	1,558,837.73	38° 43' 4.136 N	81° 17' 9.682 W
1,462.0	15.90	35.40	1,442.8	131.5	77.8	14,060,024.01	1,558,842.45	38° 43' 4.202 N	81° 17' 9.623 W
1,492.0	15.80	35.40	1,471.7	138.1	82.6	14,060,030.69	1,558,847.20	38° 43' 4.268 N	81° 17' 9.563 W
1,522.0	15.80	35.20	1,500.5	144.8	87.3	14,060,037.36	1,558,851.92	38° 43' 4.334 N	81° 17' 9.504 W
1,552.0	15.80	35.20	1,529.4	151.5	92.0	14,060,044.03	1,558,856.62	38° 43' 4.401 N	81° 17' 9.445 W
1,582.0	15.70	34.90	1,558.3	158.1	96.7	14,060,050.70	1,558,861.30	38° 43' 4.467 N	81° 17' 9.386 W
1,612.0	15.70	34.30	1,587.1	164.8	101.3	14,060,057.38	1,558,865.91	38° 43' 4.533 N	81° 17' 9.328 W
1,642.0	15.50	33.80	1,616.0	171.5	105.8	14,060,064.06	1,558,870.43	38° 43' 4.599 N	81° 17' 9.271 W
1,672.0	14.80	32.60	1,645.0	178.1	110.1	14,060,070.62	1,558,874.72	38° 43' 4.664 N	81° 17' 9.217 W
1,702.0	15.00	33.20	1,674.0	184.5	114.3	14,060,077.10	1,558,878.91	38° 43' 4.728 N	81° 17' 9.165 W
1,732.0	15.80	35.70	1,702.9	191.1	118.8	14,060,083.67	1,558,883.42	38° 43' 4.793 N	81° 17' 9.108 W
1,762.0	16.10	37.10	1,731.8	197.7	123.7	14,060,090.30	1,558,888.31	38° 43' 4.859 N	81° 17' 9.046 W
1,792.0	16.30	37.10	1,760.6	204.4	128.8	14,060,096.98	1,558,893.36	38° 43' 4.925 N	81° 17' 8.983 W
1,822.0	16.40	37.10	1,789.4	211.2	133.8	14,060,103.71	1,558,898.46	38° 43' 4.992 N	81° 17' 8.919 W
1,852.0	16.40	37.10	1,818.1	217.9	139.0	14,060,110.47	1,558,903.57	38° 43' 5.059 N	81° 17' 8.855 W
1,882.0	16.40	37.10	1,846.9	224.7	144.1	14,060,117.22	1,558,908.68	38° 43' 5.126 N	81° 17' 8.790 W
1,912.0	16.80	37.50	1,875.7	231.5	149.3	14,060,124.04	1,558,913.87	38° 43' 5.194 N	81° 17' 8.725 W
1,942.0	16.70	37.30	1,904.4	238.3	154.5	14,060,130.91	1,558,919.12	38° 43' 5.262 N	81° 17' 8.659 W
1,972.0	16.70	37.10	1,933.1	245.2	159.7	14,060,137.78	1,558,924.33	38° 43' 5.330 N	81° 17' 8.594 W
2,002.0	17.20	36.40	1,961.8	252.2	165.0	14,060,144.78	1,558,929.56	38° 43' 5.399 N	81° 17' 8.528 W
2,032.0	17.10	36.50	1,990.5	259.3	170.2	14,060,151.90	1,558,934.82	38° 43' 5.470 N	81° 17' 8.462 W
2,062.0	16.20	35.20	2,019.2	266.3	175.2	14,060,158.87	1,558,939.86	38° 43' 5.539 N	81° 17' 8.399 W
2,092.0	15.90	34.50	2,048.1	273.1	180.0	14,060,165.67	1,558,944.60	38° 43' 5.606 N	81° 17' 8.339 W
2,122.0	16.10	33.90	2,076.9	279.9	184.6	14,060,172.51	1,558,949.24	38° 43' 5.674 N	81° 17' 8.281 W
2,152.0	16.00	33.80	2,105.7	286.8	189.3	14,060,179.40	1,558,953.86	38° 43' 5.742 N	81° 17' 8.223 W
2,182.0	16.20	33.70	2,134.6	293.8	193.9	14,060,186.32	1,558,958.49	38° 43' 5.811 N	81° 17' 8.164 W
2,212.0	16.31	33.70	2,163.4	300.7	198.5	14,060,193.30	1,558,963.15	38° 43' 5.880 N	81° 17' 8.106 W
2,242.0	16.30	33.60	2,192.1	307.8	203.2	14,060,200.31	1,558,967.81	38° 43' 5.949 N	81° 17' 8.047 W
2,272.0	14.90	33.40	2,221.0	314.5	207.7	14,060,207.04	1,558,972.27	38° 43' 6.016 N	81° 17' 7.991 W
2,302.0	13.70	32.60	2,250.1	320.7	211.7	14,060,213.25	1,558,976.30	38° 43' 6.078 N	81° 17' 7.941 W
2,380.0	13.70	32.60	2,325.9	336.3	221.6	14,060,228.82	1,558,986.26	38° 43' 6.232 N	81° 17' 7.816 W

TD @ 2380' MD / 2326' TVD



DDC  
Survey Report - Geographic



<b>Company:</b>	HG Energy, LLC	<b>Local Co-ordinate Reference:</b>	Well SB Kinkead #103
<b>Project:</b>	Roane County, West Virginia	<b>TVD Reference:</b>	well @ 1122.0usft (Decker #9)
<b>Site:</b>	SB Kinkead #103	<b>MD Reference:</b>	well @ 1122.0usft (Decker #9)
<b>Well:</b>	SB Kinkead #103	<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)	
562.0	561.9	-7.8	-1.1	First MWD Survey @ 562' MD / 562' TVD
2,380.0	2,325.9	336.3	221.6	TD @ 2380' MD / 2326' TVD

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

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Environmental Protection

05/01/2015

Company Name: HG Energy, LLC  
 SB Kinkead #103  
 Roane County, West Virginia  
 Rig: Decker #9  
 Created By: Shane Robbins  
 Date: 1/12/2015

SB Kinkead #103  
 Roane County, West Virginia  
 Q141366 & AM-141311  
 Design #1

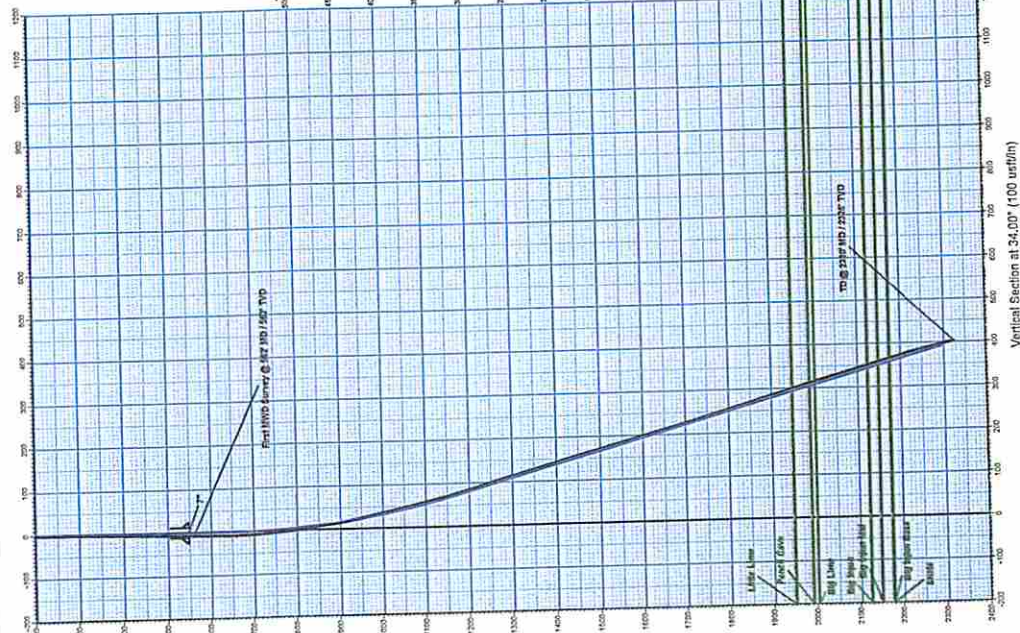
DESIGN TARGET DETAILS

Name	TVD	#103	#EAW	Northing	Easting	Latitude	Longitude
PHIL SB Kinkead #103	2185.0	290.3	156.7	14609182.72	15189602.32	39° 49' 53.78" N	81° 17' 54.41" W

\*plan hits target center

ANNOTATIONS

MS	ht	3d1	TVD	#103	#EAW	Vsect	Departure	Annotation
662.0	1.00	187.60	551.0	-7.0	-1.1	7.0	7.0	First WVD Survey @ 662 MD / 662 TVD
2382.0	13.70	32.60	2325.9	336.3	221.6	402.7	422.4	TD @ 2380 MD / 2315 TVD



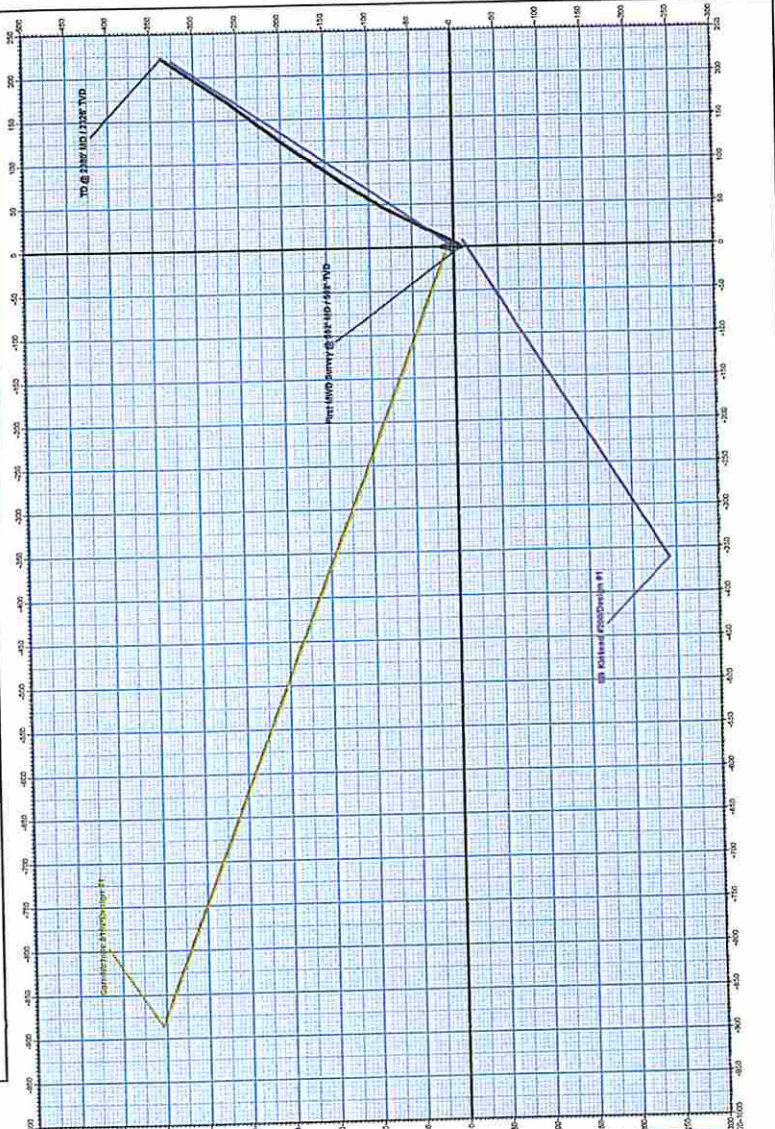
PROJECT DETAILS: Roane County, West Virginia

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 #103

Ground Level: 1114.0  
 Easting: 1507146.0  
 Northing: 31742385.0  
 #103 #EAW: 0.0  
 0.0

Azimuths to Grid North  
 Corrections: -7.77°  
 Magnetic Field  
 Strength: 51939.3snT  
 Dip Angle: 66.43°  
 Date: 12/13/2014  
 Model: IGRF200510



**ADC**  
 The APPALACHIAN DIRECTIONAL COMPANY

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**HG Energy**  
 Environmental Protection