

HG Energy, LLC

Roane County, West Virginia

SB Kinkead #104

SB Kinkead #104

Wellbore #1

Design: Wellbore #1

Survey Report - Geographic

05 May, 2015



JUN 08 2015

WV Department of
Environmental Protection

HP
Survey Report - Geographic



Company:	HG Energy, LLC	Local Co-ordinate Reference:	Well SB Kinkead #104
Project:	Roane County, West Virginia	TVD Reference:	well @ 1118.0usft (Yosk #2)
Site:	SB Kinkead #104	MD Reference:	well @ 1118.0usft (Yosk #2)
Well:	SB Kinkead #104	North Reference:	Grid
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	Compass

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

Site	SB Kinkead #104				
Site Position:		Northing:	14,059,526.95 usft	Latitude:	38° 42' 59.300 N
From:	Lat/Long	Easting:	1,559,262.61 usft	Longitude:	81° 17' 4.300 W
Position Uncertainty:	0.0 usft	Slot Radius:	13-3/16 "	Grid Convergence:	-0.18 °

Well	SB Kinkead #104					
Well Position	+N/-S	0.0 usft	Northing:	14,059,526.95 usft	Latitude:	38° 42' 59.300 N
	+E/-W	0.0 usft	Easting:	1,559,262.61 usft	Longitude:	81° 17' 4.300 W
Position Uncertainty		0.0 usft	Wellhead Elevation:	0.0 usft	Ground Level:	1,110.0 usft

Wellbore	Wellbore #1			
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Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	12/23/2014	-8.02	66.37	51,991

Design	Wellbore #1				
Audit Notes:					
Version:	1.0	Phase:	ACTUAL	Tie On Depth:	0.0

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

Survey Program	Date 5/5/2015			
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description
550.0	2,630.0	MWD (Wellbore #1)	MWD default	MWD - Standard

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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	14,059,526.95	1,559,262.61	38° 42' 59.300 N	81° 17' 4.300 W
550.0	0.00	0.00	550.0	0.0	0.0	14,059,526.95	1,559,262.61	38° 42' 59.300 N	81° 17' 4.300 W
FIRST SURVEY @ 550' MD / 550' TVD									
562.0	0.80	113.90	562.0	0.0	0.1	14,059,526.91	1,559,262.69	38° 42' 59.300 N	81° 17' 4.299 W
592.0	1.00	112.50	592.0	-0.2	0.5	14,059,526.73	1,559,263.12	38° 42' 59.298 N	81° 17' 4.294 W
622.0	1.40	87.20	622.0	-0.3	1.1	14,059,526.64	1,559,263.73	38° 42' 59.297 N	81° 17' 4.286 W
652.0	2.30	66.50	652.0	0.0	2.0	14,059,526.90	1,559,264.65	38° 42' 59.300 N	81° 17' 4.274 W
682.0	3.60	60.30	681.9	0.7	3.4	14,059,527.61	1,559,266.02	38° 42' 59.307 N	81° 17' 4.257 W
712.0	4.90	54.00	711.9	1.9	5.3	14,059,528.83	1,559,267.87	38° 42' 59.319 N	81° 17' 4.234 W
742.0	6.20	47.80	741.7	3.7	7.5	14,059,530.67	1,559,270.11	38° 42' 59.337 N	81° 17' 4.206 W
772.0	7.50	42.30	771.5	6.3	10.0	14,059,533.21	1,559,272.63	38° 42' 59.362 N	81° 17' 4.174 W
802.0	8.60	41.10	801.2	9.4	12.8	14,059,536.34	1,559,275.42	38° 42' 59.393 N	81° 17' 4.139 W

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Survey Report - Geographic



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Project:	Roane County, West Virginia	TVD Reference:	well @ 1118.0usft (Yosk #2)
Site:	SB Kinkead #104	MD Reference:	well @ 1118.0usft (Yosk #2)
Well:	SB Kinkead #104	North Reference:	Grid
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	Compass

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	9.70	39.70	830.8	13.0	15.9	14,059,539.98	1,559,278.51	38° 42' 59.429 N	81° 17' 4.100 W
862.0	10.90	38.30	860.3	17.2	19.3	14,059,544.15	1,559,281.88	38° 42' 59.471 N	81° 17' 4.057 W
892.0	12.10	37.20	889.7	21.9	22.9	14,059,548.88	1,559,285.54	38° 42' 59.518 N	81° 17' 4.011 W
922.0	13.30	37.30	919.0	27.2	26.9	14,059,554.13	1,559,289.53	38° 42' 59.570 N	81° 17' 3.961 W
952.0	14.30	37.40	948.1	32.9	31.3	14,059,559.82	1,559,293.87	38° 42' 59.626 N	81° 17' 3.907 W
982.0	15.30	36.70	977.1	39.0	35.9	14,059,565.94	1,559,298.49	38° 42' 59.687 N	81° 17' 3.849 W
1,012.0	16.10	35.80	1,006.0	45.5	40.7	14,059,572.48	1,559,303.29	38° 42' 59.752 N	81° 17' 3.788 W
1,042.0	17.00	37.50	1,034.8	52.4	45.8	14,059,579.34	1,559,308.39	38° 42' 59.819 N	81° 17' 3.724 W
1,072.0	17.80	40.50	1,063.4	59.4	51.4	14,059,586.30	1,559,314.04	38° 42' 59.889 N	81° 17' 3.653 W
1,102.0	18.70	43.20	1,091.9	66.4	57.7	14,059,593.30	1,559,320.31	38° 42' 59.958 N	81° 17' 3.574 W
1,132.0	19.30	43.60	1,120.3	73.4	64.4	14,059,600.39	1,559,327.02	38° 43' 0.028 N	81° 17' 3.490 W
1,162.0	20.00	43.10	1,148.5	80.8	71.3	14,059,607.73	1,559,333.95	38° 43' 0.101 N	81° 17' 3.403 W
1,192.0	20.30	42.30	1,176.7	88.4	78.3	14,059,615.32	1,559,340.95	38° 43' 0.176 N	81° 17' 3.315 W
1,222.0	21.00	42.50	1,204.7	96.2	85.5	14,059,623.14	1,559,348.09	38° 43' 0.254 N	81° 17' 3.225 W
1,252.0	21.70	43.10	1,232.7	104.2	92.9	14,059,631.15	1,559,355.51	38° 43' 0.333 N	81° 17' 3.132 W
1,282.0	22.00	43.00	1,260.5	112.4	100.5	14,059,639.31	1,559,363.13	38° 43' 0.414 N	81° 17' 3.036 W
1,312.0	22.50	42.60	1,288.3	120.7	108.2	14,059,647.64	1,559,370.85	38° 43' 0.497 N	81° 17' 2.939 W
1,342.0	23.10	41.90	1,316.0	129.3	116.1	14,059,656.25	1,559,378.66	38° 43' 0.582 N	81° 17' 2.840 W
1,372.0	23.70	41.90	1,343.5	138.2	124.0	14,059,665.12	1,559,386.62	38° 43' 0.670 N	81° 17' 2.740 W
1,402.0	24.20	41.70	1,370.9	147.3	132.1	14,059,674.20	1,559,394.74	38° 43' 0.760 N	81° 17' 2.638 W
1,432.0	24.80	42.30	1,398.2	156.5	140.5	14,059,683.44	1,559,403.06	38° 43' 0.852 N	81° 17' 2.533 W
1,462.0	25.60	43.40	1,425.3	165.9	149.1	14,059,692.80	1,559,411.75	38° 43' 0.945 N	81° 17' 2.424 W
1,492.0	26.70	45.60	1,452.3	175.3	158.4	14,059,702.23	1,559,421.02	38° 43' 1.038 N	81° 17' 2.308 W
1,522.0	27.90	46.90	1,478.9	184.8	168.3	14,059,711.74	1,559,430.96	38° 43' 1.132 N	81° 17' 2.182 W
1,552.0	28.80	47.80	1,505.3	194.4	178.8	14,059,721.39	1,559,441.44	38° 43' 1.228 N	81° 17' 2.051 W
1,582.0	29.50	48.00	1,531.5	204.2	189.7	14,059,731.19	1,559,452.28	38° 43' 1.325 N	81° 17' 1.914 W
1,612.0	30.50	47.90	1,557.5	214.3	200.8	14,059,741.23	1,559,463.42	38° 43' 1.425 N	81° 17' 1.774 W
1,642.0	31.30	48.20	1,583.3	224.6	212.3	14,059,751.53	1,559,474.88	38° 43' 1.527 N	81° 17' 1.630 W
1,672.0	32.20	48.00	1,608.8	235.1	224.0	14,059,762.07	1,559,486.63	38° 43' 1.632 N	81° 17' 1.482 W
1,702.0	32.80	46.70	1,634.1	246.1	235.9	14,059,773.00	1,559,498.48	38° 43' 1.740 N	81° 17' 1.333 W
1,732.0	33.20	44.70	1,659.2	257.5	247.6	14,059,784.41	1,559,510.17	38° 43' 1.853 N	81° 17' 1.185 W
1,762.0	33.90	44.10	1,684.2	269.3	259.2	14,059,796.25	1,559,521.77	38° 43' 1.971 N	81° 17' 1.040 W
1,792.0	35.20	44.20	1,708.9	281.5	271.0	14,059,808.46	1,559,533.62	38° 43' 2.092 N	81° 17' 0.890 W
1,822.0	37.40	44.70	1,733.1	294.2	283.4	14,059,821.14	1,559,546.06	38° 43' 2.218 N	81° 17' 0.734 W
1,852.0	39.70	44.30	1,756.6	307.5	296.6	14,059,834.47	1,559,559.16	38° 43' 2.350 N	81° 17' 0.569 W
1,882.0	41.50	44.10	1,779.4	321.5	310.2	14,059,848.47	1,559,572.77	38° 43' 2.489 N	81° 17' 0.398 W
1,912.0	43.10	43.70	1,801.5	336.1	324.2	14,059,863.02	1,559,586.77	38° 43' 2.633 N	81° 17' 0.222 W
1,942.0	44.00	43.00	1,823.3	351.1	338.3	14,059,878.05	1,559,600.96	38° 43' 2.782 N	81° 17' 0.043 W
1,972.0	45.30	41.90	1,844.6	366.7	352.6	14,059,893.60	1,559,615.19	38° 43' 2.936 N	81° 16' 59.864 W
2,002.0	46.90	41.90	1,865.4	382.7	367.0	14,059,909.69	1,559,629.62	38° 43' 3.096 N	81° 16' 59.683 W
2,032.0	48.50	41.70	1,885.6	399.3	381.8	14,059,926.23	1,559,644.41	38° 43' 3.260 N	81° 16' 59.497 W
2,062.0	49.80	41.40	1,905.2	416.3	396.9	14,059,943.22	1,559,659.46	38° 43' 3.428 N	81° 16' 59.307 W
2,092.0	50.50	41.30	1,924.5	433.6	412.1	14,059,960.51	1,559,674.68	38° 43' 3.600 N	81° 16' 59.116 W
2,122.0	50.80	40.60	1,943.5	451.1	427.3	14,059,978.03	1,559,689.88	38° 43' 3.774 N	81° 16' 58.925 W
2,152.0	50.90	39.30	1,962.4	468.9	442.2	14,059,995.86	1,559,704.82	38° 43' 3.950 N	81° 16' 58.737 W
2,182.0	50.90	38.30	1,981.3	487.1	456.8	14,060,014.01	1,559,719.41	38° 43' 4.130 N	81° 16' 58.554 W
2,212.0	49.80	39.50	2,000.5	505.0	471.3	14,060,031.98	1,559,733.91	38° 43' 4.308 N	81° 16' 58.371 W
2,242.0	49.50	40.60	2,019.9	522.5	486.0	14,060,049.48	1,559,748.62	38° 43' 4.482 N	81° 16' 58.186 W
2,301.0	49.50	40.60	2,058.2	556.6	515.2	14,060,083.55	1,559,777.82	38° 43' 4.820 N	81° 16' 57.819 W
2,371.0	49.50	40.60	2,168.6	654.8	599.3	14,060,181.70	1,559,861.94	38° 43' 5.793 N	81° 16' 56.761 W
2,630.0	49.50	40.60	2,271.9	746.6	678.0	14,060,273.50	1,559,940.63	38° 43' 6.703 N	81° 16' 55.771 W

TD @ 2630' MD / 2272' TVD

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Company:	HG Energy, LLC	Local Co-ordinate Reference:	Well SB Kinkead #104
Project:	Roane County, West Virginia	TVD Reference:	well @ 1118.0usft (Yosk #2)
Site:	SB Kinkead #104	MD Reference:	well @ 1118.0usft (Yosk #2)
Well:	SB Kinkead #104	North Reference:	Grid
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	Compass

Design Annotations				
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
550.0	550.0	0.0	0.0	FIRST SURVEY @ 550' MD / 550' TVD
2,630.0	2,271.9	746.6	678.0	TD @ 2630' MD / 2272' TVD

Checked By: _____ Approved By: _____ Date: _____

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HG Energy, LLC

Roane County, West Virginia

SB Kinkead #104

SB Kinkead #104

Wellbore #1

Design: Wellbore #1

DDC Survey Report

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Design:	Wellbore #1	Database:	Compass

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Geo Datum:	NAD83 West Virginia - HARN		
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Well Position	+N/-S	0.0 usft	Northing:	14,059,526.95 usft	Latitude:	38° 42' 59.300 N
	+E/-W	0.0 usft	Easting:	1,559,262.61 usft	Longitude:	81° 17' 4.300 W
Position Uncertainty		0.0 usft	Wellhead Elevation:	0.0 usft	Ground Level:	1,110.0 usft

Wellbore	Wellbore #1			
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Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	12/23/2014	-8.02	66.37	51,991

Design	Wellbore #1				
Audit Notes:					
Version:	1.0	Phase:	ACTUAL	Tie On Depth:	0.0

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

Survey Program	Date 5/5/2015				
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description	
550.0	2,630.0	MWD (Wellbore #1)	MWD default	MWD - Standard	

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Survey	Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
	0.0	0.00	0.00	0.0	0.0	0.0	0.0	0.00	0.00	0.00
FIRST SURVEY @ 550' MD / 550' TVD										
	550.0	0.00	0.00	550.0	0.0	0.0	0.0	0.00	0.00	0.00
	562.0	0.80	113.90	562.0	0.0	0.1	0.0	6.67	6.67	0.00
	592.0	1.00	112.50	592.0	-0.2	0.5	0.2	0.67	0.67	-4.67
	622.0	1.40	87.20	622.0	-0.3	1.1	0.5	2.18	1.33	-84.33
	652.0	2.30	66.50	652.0	0.0	2.0	1.4	3.69	3.00	-69.00
	682.0	3.60	60.30	681.9	0.7	3.4	2.8	4.46	4.33	-20.67
	712.0	4.90	54.00	711.9	1.9	5.3	5.0	4.60	4.33	-21.00
	742.0	6.20	47.80	741.7	3.7	7.5	7.8	4.77	4.33	-20.67
	772.0	7.50	42.30	771.5	6.3	10.0	11.4	4.85	4.33	-18.33

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Well:	SB Kinkead #104	North Reference:	Grid
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Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N-S (usft)	+E-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
802.0	8.60	41.10	801.2	9.4	12.8	15.6	3.71	3.67	-4.00
832.0	9.70	39.70	830.8	13.0	15.9	20.4	3.74	3.67	-4.67
862.0	10.90	38.30	860.3	17.2	19.3	25.7	4.09	4.00	-4.67
892.0	12.10	37.20	889.7	21.9	22.9	31.7	4.07	4.00	-3.67
922.0	13.30	37.30	919.0	27.2	26.9	38.2	4.00	4.00	0.33
952.0	14.30	37.40	948.1	32.9	31.3	45.4	3.33	3.33	0.33
982.0	15.30	36.70	977.1	39.0	35.9	53.0	3.39	3.33	-2.33
1,012.0	16.10	35.80	1,006.0	45.5	40.7	61.0	2.79	2.67	-3.00
1,042.0	17.00	37.50	1,034.8	52.4	45.8	69.5	3.41	3.00	5.67
1,072.0	17.80	40.50	1,063.4	59.4	51.4	78.5	4.01	2.67	10.00
1,102.0	18.70	43.20	1,091.9	66.4	57.7	87.9	4.12	3.00	9.00
1,132.0	19.30	43.60	1,120.3	73.4	64.4	97.6	2.05	2.00	1.33
1,162.0	20.00	43.10	1,148.5	80.8	71.3	107.7	2.40	2.33	-1.67
1,192.0	20.30	42.30	1,176.7	88.4	78.3	118.1	1.36	1.00	-2.67
1,222.0	21.00	42.50	1,204.7	96.2	85.5	128.6	2.35	2.33	0.67
1,252.0	21.70	43.10	1,232.7	104.2	92.9	139.6	2.44	2.33	2.00
1,282.0	22.00	43.00	1,260.5	112.4	100.5	150.7	1.01	1.00	-0.33
1,312.0	22.50	42.60	1,288.3	120.7	108.2	162.1	1.74	1.67	-1.33
1,342.0	23.10	41.90	1,316.0	129.3	116.1	173.7	2.19	2.00	-2.33
1,372.0	23.70	41.90	1,343.5	138.2	124.0	185.6	2.00	2.00	0.00
1,402.0	24.20	41.70	1,370.9	147.3	132.1	197.8	1.69	1.67	-0.67
1,432.0	24.80	42.30	1,398.2	156.5	140.5	210.2	2.17	2.00	2.00
1,462.0	25.60	43.40	1,425.3	165.9	149.1	223.0	3.09	2.67	3.67
1,492.0	26.70	45.60	1,452.3	175.3	158.4	236.2	4.89	3.67	7.33
1,522.0	27.90	46.90	1,478.9	184.8	168.3	250.0	4.47	4.00	4.33
1,552.0	28.80	47.80	1,505.3	194.4	178.8	264.2	3.32	3.00	3.00
1,582.0	29.50	48.00	1,531.5	204.2	189.7	278.7	2.36	2.33	0.67
1,612.0	30.50	47.90	1,557.5	214.3	200.8	293.7	3.34	3.33	-0.33
1,642.0	31.30	48.20	1,583.3	224.6	212.3	309.0	2.72	2.67	1.00
1,672.0	32.20	48.00	1,608.8	235.1	224.0	324.7	3.02	3.00	-0.67
1,702.0	32.80	46.70	1,634.1	246.1	235.9	340.8	3.07	2.00	-4.33
1,732.0	33.20	44.70	1,659.2	257.5	247.6	357.1	3.87	1.33	-6.67
1,762.0	33.90	44.10	1,684.2	269.3	259.2	373.7	2.58	2.33	-2.00
1,792.0	35.20	44.20	1,708.9	281.5	271.0	390.7	4.34	4.33	0.33
1,822.0	37.40	44.70	1,733.1	294.2	283.4	408.5	7.40	7.33	1.67
1,852.0	39.70	44.30	1,756.6	307.5	296.6	427.2	7.71	7.67	-1.33
1,882.0	41.50	44.10	1,779.4	321.5	310.2	446.7	6.02	6.00	-0.67
1,912.0	43.10	43.70	1,801.5	336.1	324.2	466.9	5.41	5.33	-1.33
1,942.0	44.00	43.00	1,823.3	351.1	338.3	487.5	3.40	3.00	-2.33
1,972.0	45.30	41.90	1,844.6	366.7	352.6	508.6	5.04	4.33	-3.67
2,002.0	46.90	41.90	1,865.4	382.7	367.0	530.2	5.33	5.33	0.00
2,032.0	48.50	41.70	1,885.6	399.3	381.8	552.4	5.36	5.33	-0.67
2,062.0	49.80	41.40	1,905.2	416.3	396.9	575.1	4.40	4.33	-1.00

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HP
Survey Report



Company:	HG Energy, LLC	Local Co-ordinate Reference:	Well SB Kinkead #104
Project:	Roane County, West Virginia	TVD Reference:	well @ 1118.0usft (Yosk #2)
Site:	SB Kinkead #104	MD Reference:	well @ 1118.0usft (Yosk #2)
Well:	SB Kinkead #104	North Reference:	Grid
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	Compass

Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
2,092.0	50.50	41.30	1,924.5	433.6	412.1	598.1	2.35	2.33	-0.33
2,122.0	50.80	40.60	1,943.5	451.1	427.3	621.3	2.06	1.00	-2.33
2,152.0	50.90	39.30	1,962.4	468.9	442.2	644.5	3.38	0.33	-4.33
2,182.0	50.90	38.30	1,981.3	487.1	456.8	667.7	2.59	0.00	-3.33
2,212.0	49.80	39.50	2,000.5	505.0	471.3	690.8	4.79	-3.67	4.00
2,242.0	49.50	40.60	2,019.9	522.5	486.0	713.6	2.97	-1.00	3.67
2,301.0	49.50	40.60	2,058.2	556.6	515.2	758.4	0.00	0.00	0.00
<u>2,471.0</u>	49.50	40.60	2,168.6	654.8	599.3	887.6	0.00	0.00	0.00
TD @ 2630' MD / 2272' TVD									
2,630.0	49.50	40.60	2,271.9	746.6	678.0	1,008.4	0.00	0.00	0.00

Design Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
550.0	550.0	0.0	0.0	FIRST SURVEY @ 550' MD / 550' TVD
2,630.0	2,271.9	746.6	678.0	TD @ 2630' MD / 2272' TVD

Checked By: _____ Approved By: _____ Date: _____

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WV Department of
Environmental Protection

Company Name: HG Energy, LLC
 SB Kinkead #104
 Roane County, West Virginia
 Rig: Yost #2
 Created By: Jerry Arsenault
 Date: 1/8/2015

SB Kinkead #104
 Roane County, West Virginia
 Q141412 & AM-141351
 Design #1



DESIGN TARGET DETAILS							
Name	TVD	+N-S	+E/W	Northing	Easting	Latitude	Longitude
Target #1 SB Kinkead #104 *plan hits target center	2170.0	829.0	508.5	14060195.50	1559049.13	38° 42' 5.537 N	81° 16' 56.922 W

PROJECT DETAILS:		Roane 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	

ANNOTATIONS							
MD	Inc	Alt	TVD	+N-S	+E/W	VSecDeparture	Annotation
515.8	0.50	0.20	550.0	0.0	0.0	0.0	FIRST SURVEY @ 550' MD / 550' TVD
2630.0	49.50	40.60	2271.9	745.6	679.0	1508.4	TD @ 2630' MD / 2272' TVD

WELL DETAILS:						SB Kinkead #104
		Ground Level:		1110.0		
+N-S	+E/W	Northing	Easting	Latitude	Longitude	
0.0	0.0	14059526.94	1558262.61	38° 42' 59.300 N	81° 17' 4.300 W	

M G T

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

HG Energy

