

HG Energy, LLC
Roane County, West Virginia
CB Ferrell #1110
CB Ferrell #1110
Wellbore #1

Design: Wellbore #1

HG Energy EOW Report

17 February, 2015

Received

APR 20 2015

Office of Oil and Gas
WV Dept. of Environmental Protection



06/12/2015



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HG Energy EOW Report

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WV Dept. of Environmental Protection

Company: HG Energy, LLC
Project: Roane County, West Virginia
Site: CB Ferrell #110
Well: CB Ferrell #110
Wellbore: Wellbore #1
Design: Wellbore #1

Local Co-ordinate Reference: Well CB Ferrell #110
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 (°)	
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	
First Survey @ 500' MD / 500' TVD										
561.0	0.80	121.70	561.0	-0.2	0.4	0.4	1.31	0.4	121.70	
591.0	0.80	126.60	591.0	-0.5	0.7	0.8	0.23	0.8	122.91	
621.0	1.10	125.50	621.0	-0.8	1.1	1.3	1.00	1.3	124.04	
651.0	1.60	129.90	651.0	-1.2	1.7	2.0	1.70	2.0	125.45	
681.0	2.30	124.30	681.0	-1.8	2.5	3.0	2.42	3.1	125.83	
711.0	2.80	130.20	710.9	-2.6	3.5	4.3	1.88	4.4	126.35	
741.0	3.30	129.20	740.9	-3.6	4.8	5.8	1.68	6.0	127.23	
771.0	3.90	132.20	770.8	-4.9	6.2	7.7	2.10	7.9	128.09	
801.0	4.70	131.50	800.7	-6.4	7.9	9.9	2.67	10.1	128.92	
831.0	5.50	130.60	830.6	-8.1	9.9	12.5	2.68	12.8	129.35	
861.0	6.40	131.00	860.5	-10.1	12.2	15.6	3.00	15.9	129.64	
891.0	7.60	131.00	890.2	-12.5	15.0	19.2	4.00	19.5	129.89	
921.0	8.90	130.70	919.9	-15.4	18.3	23.4	4.34	23.9	130.06	
951.0	10.10	130.70	949.5	-18.6	22.0	28.3	4.00	28.8	130.17	
981.0	11.30	131.40	979.0	-22.2	26.2	33.8	4.02	34.4	130.32	
1,011.0	12.60	132.90	1,008.3	-26.4	30.8	39.9	4.45	40.6	130.61	
1,041.0	13.90	132.50	1,037.5	-31.1	35.9	46.8	4.34	47.5	130.91	
1,071.0	14.90	134.00	1,066.6	-36.2	41.3	54.2	3.56	54.9	131.23	
1,101.0	15.90	133.70	1,095.5	-41.7	47.0	62.1	3.34	62.9	131.56	
1,131.0	16.90	134.00	1,124.3	-47.6	53.1	70.5	3.35	71.3	131.83	
1,161.0	17.90	132.90	1,152.9	-53.7	59.7	79.4	3.51	80.3	132.01	
1,191.0	18.90	131.50	1,181.4	-60.1	66.7	88.7	3.64	89.8	132.03	
1,221.0	19.70	129.50	1,209.7	-66.5	74.2	98.5	3.46	99.7	131.88	
1,251.0	20.90	126.30	1,237.9	-72.9	82.4	108.6	5.45	110.1	131.50	



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Well: CB Ferrell #110
Wellbore: Wellbore #1
Design: Wellbore #1

Local Co-ordinate Reference: Well CB Ferrell #110
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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 (°)
1,281.0	22.10	125.80	1,265.8	-79.4	91.3	119.3	4.05	121.0	131.00
1,311.0	23.70	125.80	1,293.4	-86.2	100.8	130.5	5.33	132.6	130.54
1,341.0	25.40	126.70	1,320.7	-93.6	110.8	142.6	5.80	145.1	130.18
1,371.0	27.00	126.90	1,347.6	-101.5	121.4	155.5	5.34	158.3	129.89
1,401.0	28.70	127.60	1,374.1	-110.0	132.6	169.1	5.77	172.3	129.68
1,431.0	29.80	127.70	1,400.3	-119.0	144.2	183.4	3.67	186.9	129.52
1,461.0	31.00	129.20	1,426.2	-128.4	156.1	198.2	4.73	202.1	129.44
1,491.0	32.30	129.50	1,451.7	-138.4	168.3	213.6	4.36	217.9	129.44
1,521.0	33.30	132.50	1,476.9	-149.1	180.5	229.6	6.36	234.1	129.55
1,551.0	34.30	134.00	1,501.9	-160.5	192.7	246.2	4.34	250.8	129.79
1,581.0	34.30	136.20	1,526.6	-172.5	204.6	263.0	4.13	267.6	130.13
1,611.0	34.20	139.70	1,551.4	-185.0	215.9	279.9	6.57	284.3	130.59
1,641.0	33.90	140.40	1,576.3	-197.9	226.7	296.7	1.65	300.9	131.12
1,671.0	34.00	142.20	1,601.2	-210.9	237.2	313.4	3.37	317.4	131.65
1,701.0	33.90	144.80	1,626.1	-224.4	247.1	330.1	4.85	333.8	132.24
1,731.0	34.50	144.40	1,650.9	-238.2	256.9	347.0	2.14	350.3	132.83
1,761.0	35.00	145.20	1,675.5	-252.1	266.8	364.0	2.26	367.1	133.38
1,791.0	36.30	146.70	1,699.9	-266.6	276.5	381.4	5.22	384.1	133.95
1,821.0	37.90	145.90	1,723.8	-281.7	286.6	399.4	5.57	401.8	134.50
1,851.0	39.50	146.60	1,747.3	-297.3	297.0	418.1	5.53	420.2	135.02
1,881.0	40.90	147.40	1,770.2	-313.5	307.6	437.4	4.97	439.2	135.55
1,911.0	41.40	147.70	1,792.8	-330.2	318.1	457.0	1.79	458.5	136.06
1,941.0	41.80	147.70	1,815.2	-347.0	328.8	476.7	1.33	478.0	136.54
1,971.0	41.40	147.00	1,837.6	-363.8	339.5	496.5	2.04	497.6	136.97
2,001.0	42.20	147.70	1,860.0	-380.6	350.3	516.4	3.09	517.3	137.37
2,031.0	44.30	147.50	1,881.8	-398.0	361.3	536.8	7.01	537.5	137.76
2,061.0	46.30	148.10	1,902.9	-416.0	372.7	558.0	6.82	558.5	138.14



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Well: CB Ferrell #110
Wellbore: Wellbore #1
Design: Wellbore #1

Local Co-ordinate Reference: Well CB Ferrell #110
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 (°)
2,091.0	47.90	149.20	1,923.4	-434.8	384.1	579.7	5.97	580.2	138.54
2,121.0	47.90	149.20	1,943.5	-453.9	395.5	601.7	0.00	602.0	138.93
2,151.0	47.20	148.60	1,963.7	-472.8	407.0	623.7	2.76	623.9	139.28
2,181.0	46.30	148.20	1,984.3	-491.5	418.4	645.3	3.15	645.4	139.59
2,211.0	46.30	148.50	2,005.0	-509.9	429.8	666.8	0.72	666.9	139.87
2,241.0	46.40	147.70	2,025.7	-528.3	441.3	688.3	1.96	688.4	140.13
2,271.0	46.70	147.70	2,046.3	-546.8	452.9	710.0	1.00	710.0	140.36
2,301.0	46.70	147.80	2,066.9	-565.2	464.5	731.6	0.24	731.6	140.58
2,331.0	46.70	147.70	2,087.5	-583.7	476.2	753.3	0.24	753.3	140.79
2,361.0	46.60	147.70	2,108.1	-602.1	487.9	774.9	0.33	775.0	140.99
2,391.0	46.70	147.40	2,128.7	-620.5	499.6	796.6	0.80	796.6	141.16
2,421.0	46.20	147.30	2,149.3	-638.8	511.3	818.2	1.68	818.3	141.33
2,451.0	44.20	147.00	2,170.5	-656.7	522.8	839.4	6.70	839.4	141.48
2,481.0	42.70	146.70	2,192.3	-674.0	534.1	859.9	5.05	860.0	141.60
2,511.0	41.10	146.00	2,214.6	-690.7	545.2	879.8	5.56	879.9	141.71
2,541.0	39.30	145.60	2,237.5	-706.7	556.1	899.1	6.06	899.3	141.80
2,571.0	37.40	145.10	2,261.0	-722.0	566.7	917.7	6.42	917.8	141.87
2,601.0	35.40	145.10	2,285.2	-736.6	576.9	935.4	6.67	935.6	141.93
2,660.0	35.40	145.10	2,333.3	-764.6	596.4	969.5	0.00	969.7	142.05

TD @ 2660' MD / 2333' TVD

Design Annotations	Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates +N/-S (usft)	Local Coordinates +E/-W (usft)	Comment
	2,660.0	2,333.3	-764.6	596.4	TD @ 2660' MD / 2333' TVD

06/12/2015

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HG Energy EOW Report



Company: HG Energy, LLC	Well: Wellbore #1
Project: Roane County, West Virginia	Wellbore: Wellbore #1
Site: CB Ferrell #110	Design: Wellbore #1
Well: CB Ferrell #110	
Local Co-ordinate Reference: TVD Reference: MD Reference: North Reference: Survey Calculation Method: Database:	Well CB Ferrell #110 well @ 1118.0usft (Decker #9) well @ 1118.0usft (Decker #9) Grid Minimum Curvature EDM 5000.1 Single User Db

Checked By: _____ Approved By: _____ Date: _____

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HG Energy, LLC
Roane County, West Virginia
CB Ferrell #110
CB Ferrell #110

Wellbore #1

Design: Wellbore #1

Survey Report - Geographic

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Company:	HG Energy, LLC	Local Co-ordinate Reference:	Well CB Ferrell #110
Project:	Roane County, West Virginia	TVD Reference:	well @ 1118.0usft (Decker #9)
Site:	CB Ferrell #110	MD Reference:	well @ 1118.0usft (Decker #9)
Well:	CB Ferrell #110	North Reference:	Grid
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	EDM 5000.1 Single User Db

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	CB Ferrell #110				
Site Position:		Northing:	14,059,786.24 usft	Latitude:	38° 43' 1.900 N
From:	Lat/Long	Easting:	1,560,443.93 usft	Longitude:	81° 16' 49.400 W
Position Uncertainty:	0.0 usft	Slot Radius:	13-3/16 "	Grid Convergence:	-0.18 °

Well	CB Ferrell #110					
Well Position	+N/-S	0.0 usft	Northing:	14,059,786.24 usft	Latitude:	38° 43' 1.900 N
	+E/-W	0.0 usft	Easting:	1,560,443.93 usft	Longitude:	81° 16' 49.400 W
Position Uncertainty	0.0 usft		Wellhead Elevation:	0.0 usft	Ground Level:	1,110.0 usft

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

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	140.75

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Survey Program	Date 2/17/2015				
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description	APR 20 2015
500.0	2,660.0	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	14,059,786.24	1,560,443.93	38° 43' 1.900 N	81° 16' 49.400 W
500.0	0.00	0.00	500.0	0.0	0.0	14,059,786.24	1,560,443.93	38° 43' 1.900 N	81° 16' 49.400 W
First Survey @ 500' MD / 500' TVD									
561.0	0.80	121.70	561.0	-0.2	0.4	14,059,786.01	1,560,444.29	38° 43' 1.898 N	81° 16' 49.395 W
591.0	0.80	126.60	591.0	-0.5	0.7	14,059,785.78	1,560,444.64	38° 43' 1.895 N	81° 16' 49.391 W
621.0	1.10	125.50	621.0	-0.8	1.1	14,059,785.49	1,560,445.04	38° 43' 1.893 N	81° 16' 49.386 W
651.0	1.60	129.90	651.0	-1.2	1.7	14,059,785.05	1,560,445.60	38° 43' 1.888 N	81° 16' 49.379 W
681.0	2.30	124.30	681.0	-1.8	2.5	14,059,784.44	1,560,446.41	38° 43' 1.882 N	81° 16' 49.369 W
711.0	2.80	130.20	710.9	-2.6	3.5	14,059,783.63	1,560,447.47	38° 43' 1.874 N	81° 16' 49.355 W
741.0	3.30	129.20	740.9	-3.6	4.8	14,059,782.61	1,560,448.70	38° 43' 1.864 N	81° 16' 49.340 W
771.0	3.90	132.20	770.8	-4.9	6.2	14,059,781.38	1,560,450.12	38° 43' 1.852 N	81° 16' 49.322 W
801.0	4.70	131.50	800.7	-6.4	7.9	14,059,779.88	1,560,451.80	38° 43' 1.837 N	81° 16' 49.300 W

DDC
Survey Report - Geographic



Company:	HG Energy, LLC	Local Co-ordinate Reference:	Well CB Ferrell #110
Project:	Roane County, West Virginia	TVD Reference:	well @ 1118.0usft (Decker #9)
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Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
831.0	5.50	130.60	830.6	-8.1	9.9	14,059,778.13	1,560,453.81	38° 43' 1.820 N	81° 16' 49.275 W
861.0	6.40	131.00	860.5	-10.1	12.2	14,059,776.10	1,560,456.17	38° 43' 1.800 N	81° 16' 49.245 W
891.0	7.60	131.00	890.2	-12.5	15.0	14,059,773.70	1,560,458.93	38° 43' 1.776 N	81° 16' 49.210 W
921.0	8.90	130.70	919.9	-15.4	18.3	14,059,770.89	1,560,462.18	38° 43' 1.749 N	81° 16' 49.169 W
951.0	10.10	130.70	949.5	-18.6	22.0	14,059,767.66	1,560,465.94	38° 43' 1.717 N	81° 16' 49.122 W
981.0	11.30	131.40	979.0	-22.2	26.2	14,059,764.00	1,560,470.14	38° 43' 1.681 N	81° 16' 49.068 W
1,011.0	12.60	132.90	1,008.3	-26.4	30.8	14,059,759.83	1,560,474.74	38° 43' 1.640 N	81° 16' 49.010 W
1,041.0	13.90	132.50	1,037.5	-31.1	35.9	14,059,755.16	1,560,479.79	38° 43' 1.594 N	81° 16' 48.946 W
1,071.0	14.90	134.00	1,066.6	-36.2	41.3	14,059,750.05	1,560,485.22	38° 43' 1.543 N	81° 16' 48.877 W
1,101.0	15.90	133.70	1,095.5	-41.7	47.0	14,059,744.53	1,560,490.97	38° 43' 1.489 N	81° 16' 48.805 W
1,131.0	16.90	134.00	1,124.3	-47.6	53.1	14,059,738.66	1,560,497.08	38° 43' 1.431 N	81° 16' 48.727 W
1,161.0	17.90	132.90	1,152.9	-53.7	59.7	14,059,732.50	1,560,503.59	38° 43' 1.370 N	81° 16' 48.645 W
1,191.0	18.90	131.50	1,181.4	-60.1	66.7	14,059,726.14	1,560,510.61	38° 43' 1.308 N	81° 16' 48.556 W
1,221.0	19.70	129.50	1,209.7	-66.5	74.2	14,059,719.70	1,560,518.15	38° 43' 1.244 N	81° 16' 48.461 W
1,251.0	20.90	126.30	1,237.9	-72.9	82.4	14,059,713.32	1,560,526.36	38° 43' 1.181 N	81° 16' 48.357 W
1,281.0	22.10	125.80	1,265.8	-79.4	91.3	14,059,706.85	1,560,535.25	38° 43' 1.118 N	81° 16' 48.244 W
1,311.0	23.70	125.80	1,293.4	-86.2	100.8	14,059,700.02	1,560,544.72	38° 43' 1.050 N	81° 16' 48.125 W
1,341.0	25.40	126.70	1,320.7	-93.6	110.8	14,059,692.65	1,560,554.77	38° 43' 0.978 N	81° 16' 47.997 W
1,371.0	27.00	126.90	1,347.6	-101.5	121.4	14,059,684.71	1,560,565.37	38° 43' 0.900 N	81° 16' 47.863 W
1,401.0	28.70	127.60	1,374.1	-110.0	132.6	14,059,676.23	1,560,576.53	38° 43' 0.816 N	81° 16' 47.722 W
1,431.0	29.80	127.70	1,400.3	-119.0	144.2	14,059,667.27	1,560,588.13	38° 43' 0.728 N	81° 16' 47.575 W
1,461.0	31.00	129.20	1,426.2	-128.4	156.1	14,059,657.83	1,560,600.02	38° 43' 0.635 N	81° 16' 47.425 W
1,491.0	32.30	129.50	1,451.7	-138.4	168.3	14,059,647.85	1,560,612.19	38° 43' 0.537 N	81° 16' 47.271 W
1,521.0	33.30	132.50	1,476.9	-149.1	180.5	14,059,637.19	1,560,624.45	38° 43' 0.432 N	81° 16' 47.116 W
1,551.0	34.30	134.00	1,501.9	-160.5	192.7	14,059,625.75	1,560,636.60	38° 43' 0.319 N	81° 16' 46.962 W
1,581.0	34.30	136.20	1,526.6	-172.5	204.6	14,059,613.78	1,560,648.53	38° 43' 0.201 N	81° 16' 46.811 W
1,611.0	34.20	139.70	1,551.4	-185.0	215.9	14,059,601.25	1,560,659.84	38° 43' 0.077 N	81° 16' 46.668 W
1,641.0	33.90	140.40	1,576.3	-197.9	226.7	14,059,588.37	1,560,670.63	38° 42' 59.950 N	81° 16' 46.531 W
1,671.0	34.00	142.20	1,601.2	-210.9	237.2	14,059,575.29	1,560,681.10	38° 42' 59.821 N	81° 16' 46.398 W
1,701.0	33.90	144.80	1,626.1	-224.4	247.1	14,059,561.83	1,560,691.06	38° 42' 59.688 N	81° 16' 46.272 W
1,731.0	34.50	144.40	1,650.9	-238.2	256.9	14,059,548.08	1,560,700.83	38° 42' 59.553 N	81° 16' 46.148 W
1,761.0	35.00	145.20	1,675.5	-252.1	266.8	14,059,534.11	1,560,710.69	38° 42' 59.415 N	81° 16' 46.023 W
1,791.0	36.30	146.70	1,699.9	-266.6	276.5	14,059,519.62	1,560,720.47	38° 42' 59.272 N	81° 16' 45.899 W
1,821.0	37.90	145.90	1,723.8	-281.7	286.6	14,059,504.57	1,560,730.52	38° 42' 59.123 N	81° 16' 45.772 W
1,851.0	39.50	146.60	1,747.3	-297.3	297.0	14,059,488.97	1,560,740.94	38° 42' 58.970 N	81° 16' 45.640 W
1,881.0	40.90	147.40	1,770.2	-313.5	307.6	14,059,472.73	1,560,751.48	38° 42' 58.809 N	81° 16' 45.506 W
1,911.0	41.40	147.70	1,792.8	-330.2	318.1	14,059,456.08	1,560,762.07	38° 42' 58.645 N	81° 16' 45.372 W
1,941.0	41.80	147.70	1,815.2	-347.0	328.8	14,059,439.24	1,560,772.71	38° 42' 58.479 N	81° 16' 45.237 W
1,971.0	41.40	147.00	1,837.6	-363.8	339.5	14,059,422.47	1,560,783.46	38° 42' 58.313 N	81° 16' 45.101 W
2,001.0	42.20	147.70	1,860.0	-380.6	350.3	14,059,405.63	1,560,794.25	38° 42' 58.147 N	81° 16' 44.964 W
2,031.0	44.30	147.50	1,881.8	-398.0	361.3	14,059,388.28	1,560,805.26	38° 42' 57.976 N	81° 16' 44.824 W
2,061.0	46.30	148.10	1,902.9	-416.0	372.7	14,059,370.23	1,560,816.62	38° 42' 57.798 N	81° 16' 44.680 W
2,091.0	47.90	149.20	1,923.4	-434.8	384.1	14,059,351.47	1,560,828.05	38° 42' 57.612 N	81° 16' 44.535 W
2,121.0	47.90	149.20	1,943.5	-453.9	395.5	14,059,332.35	1,560,839.45	38° 42' 57.424 N	81° 16' 44.390 W
2,151.0	47.20	148.60	1,963.7	-472.8	407.0	14,059,313.39	1,560,850.88	38° 42' 57.237 N	81° 16' 44.245 W
2,181.0	46.30	148.20	1,984.3	-491.5	418.4	14,059,294.78	1,560,862.33	38° 42' 57.053 N	81° 16' 44.100 W
2,211.0	46.30	148.50	2,005.0	-509.9	429.8	14,059,276.32	1,560,873.71	38° 42' 56.871 N	81° 16' 43.956 W
2,241.0	46.40	147.70	2,025.7	-528.3	441.3	14,059,257.89	1,560,885.18	38° 42' 56.689 N	81° 16' 43.810 W
2,271.0	46.70	147.70	2,046.3	-546.8	452.9	14,059,239.48	1,560,896.82	38° 42' 56.507 N	81° 16' 43.663 W
2,301.0	46.70	147.80	2,066.9	-565.2	464.5	14,059,221.02	1,560,908.47	38° 42' 56.325 N	81° 16' 43.515 W
2,331.0	46.70	147.70	2,087.5	-583.7	476.2	14,059,202.55	1,560,920.12	38° 42' 56.143 N	81° 16' 43.367 W
2,361.0	46.60	147.70	2,108.1	-602.1	487.9	14,059,184.11	1,560,931.78	38° 42' 55.961 N	81° 16' 43.219 W
2,391.0	46.70	147.40	2,128.7	-620.5	499.6	<u>14,059,165.70</u>	<u>1,560,943.48</u>	38° 42' 55.779 N	81° 16' 43.071 W
2,421.0	46.20	147.30	2,149.3	-638.8	511.3	14,059,147.39	1,560,955.21	38° 42' 55.598 N	81° 16' 42.922 W
2,451.0	44.20	147.00	2,170.5	-656.7	522.8	14,059,129.51	1,560,966.76	38° 42' 55.422 N	81° 16' 42.776 W

Office of Oil and Gas
WV Dept. of Environmental Protection

DDC
Survey Report - Geographic



Company:	HG Energy, LLC	Local Co-ordinate Reference:	Well CB Ferrell #110
Project:	Roane County, West Virginia	TVD Reference:	well @ 1118.0usft (Decker #9)
Site:	CB Ferrell #110	MD Reference:	well @ 1118.0usft (Decker #9)
Well:	CB Ferrell #110	North Reference:	Grid
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	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
2,481.0	42.70	146.70	2,192.3	-674.0	534.1	14,059,112.24	1,560,978.04	38° 42' 55.251 N	81° 16' 42.633 W
2,511.0	41.10	146.00	2,214.6	-690.7	545.2	14,059,095.56	1,560,989.14	38° 42' 55.087 N	81° 16' 42.492 W
2,541.0	39.30	145.60	2,237.5	-706.7	556.1	14,059,079.54	1,561,000.02	38° 42' 54.929 N	81° 16' 42.354 W
2,571.0	37.40	145.10	2,261.0	-722.0	566.7	14,059,064.23	1,561,010.60	38° 42' 54.778 N	81° 16' 42.220 W
2,601.0	35.40	145.10	2,285.2	-736.6	576.9	14,059,049.63	1,561,020.79	38° 42' 54.634 N	81° 16' 42.091 W
2,660.0	35.40	145.10	2,333.3	-764.6	596.4	14,059,021.60	1,561,040.34	38° 42' 54.357 N	81° 16' 41.843 W

TD @ 2660' MD / 2333' TVD

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
2,660.0	2,333.3	-764.6	596.4	TD @ 2660' MD / 2333' TVD

Checked By: _____ Approved By: _____ Date: _____

Received

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