

HG Energy, LLC

Harrison County, West Virginia

J.M. Fultz #238

J.M. Fultz #238

Wellbore #1

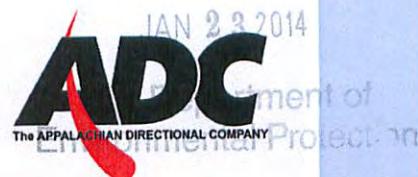
Survey: MWD

DDC Survey Report

11 December, 2013

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IAN 23 2014



02/28/2014



I **Larry Wright**, certify that I am employed by **The Appalachian Directional Drilling Company (ADC)**. That I did on the day(s) of **11/18/13** thru **11/20/13** conduct or supervise the taking of a **MWD Survey** from a depth of **850** feet to a depth of **3410** feet, that the data is true, correct, complete and within the limitations of the tool as set forth by **The Appalachian Directional Drilling Company (ADC)**.; that I am authorized and qualified to make this report; that this survey was conducted at the request of **HG Energy, LLC** for the **J.M. Fultz #238** API No. **47-033-05781** in **Harrison, County WV**; and that I have reviewed this report and find that it conforms to the principles and procedures as set forth by **The Appalachian Directional Drilling Company (ADC)**.

Larry Wright

Digitally signed by Larry Wright
DN: cn=Larry Wright, o=The
Directional Drilling Company,
ou=GM of Guidance Services,
email=larryw@directionaldrillers.co
m, c=US
Date: 2013.12.12 16:27:55 -0600

• 1200 Heavy Haul Road • *Morgan Town, WV 26501* •
• *PH 304-777-2310* • *FAX 304-777-2317* •

02/28/2014

DDC
Survey Report - Geographic



Company:	HG Energy, LLC	Local Co-ordinate Reference:	Well J.M. Fultz #238
Project:	Harrison County, West Virginia	TVD Reference:	WELL @ 1393.0usft (Decker #6)
Site:	J.M. Fultz #238	MD Reference:	WELL @ 1393.0usft (Decker #6)
Well:	J.M. Fultz #238	North Reference:	Grid
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	EDM 5000.1 Single User Db

Project	Harrison 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	J.M. Fultz #238				
Site Position:		Northing:	14,262,785.95 usft	Latitude:	39° 16' 26.600 N
From:	Lat/Long	Easting:	1,780,231.74 usft	Longitude:	80° 30' 21.400 W
Position Uncertainty:	0.0 usft	Slot Radius:	13-3/16 "	Grid Convergence:	0.31 °

Well	J.M. Fultz #238					
Well Position	+N/-S	0.0 usft	Northing:	14,262,785.95 usft	Latitude:	39° 16' 26.600 N
	+E/-W	0.0 usft	Easting:	1,780,231.74 usft	Longitude:	80° 30' 21.400 W
Position Uncertainty		0.0 usft	Wellhead Elevation:	usft	Ground Level:	1,385.0 usft

Wellbore	Wellbore #1				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	12/11/2013	-8.64	66.81	52,315

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	119.48	

Survey Program	Date	12/11/2013			
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description	
850.0	3,410.0	MWD (Wellbore #1)			

Survey										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude	
850.0	0.00	0.00	850.0	0.0	0.0	14,262,785.95	1,780,231.74	39° 16' 26.600 N	80° 30' 21.400 W	
TIE IN @ 850' MD / 850' TVD										
900.0	1.90	156.60	900.0	-0.8	0.3	14,262,785.18	1,780,232.06	39° 16' 26.592 N	80° 30' 21.396 W	
930.0	2.50	150.60	930.0	-1.8	0.8	14,262,784.16	1,780,232.58	39° 16' 26.582 N	80° 30' 21.389 W	
960.0	2.40	152.00	959.9	-2.9	1.5	14,262,783.03	1,780,233.20	39° 16' 26.571 N	80° 30' 21.382 W	
990.0	2.60	150.40	989.9	-4.1	2.1	14,262,781.89	1,780,233.83	39° 16' 26.560 N	80° 30' 21.374 W	
1,020.0	3.00	133.70	1,019.9	-5.2	3.0	14,262,780.75	1,780,234.73	39° 16' 26.549 N	80° 30' 21.362 W	
1,050.0	3.90	127.70	1,049.8	-6.4	4.4	14,262,779.59	1,780,236.11	39° 16' 26.537 N	80° 30' 21.345 W	
1,080.0	4.80	119.20	1,079.7	-7.6	6.3	14,262,778.35	1,780,238.01	39° 16' 26.525 N	80° 30' 21.321 W	
1,110.0	5.50	117.70	1,109.6	-8.9	8.6	14,262,777.07	1,780,240.38	39° 16' 26.512 N	80° 30' 21.291 W	
1,140.0	5.90	123.30	1,139.5	-10.4	11.2	14,262,775.56	1,780,242.94	39° 16' 26.497 N	80° 30' 21.258 W	
1,170.0	6.00	117.60	1,169.3	-12.0	13.9	14,262,773.98	1,780,245.62	39° 16' 26.481 N	80° 30' 21.224 W	

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Well:	J.M. Fultz #238	North Reference:	Grid
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	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
1,200.0	5.90	115.60	1,199.1	-13.4	16.7	14,262,772.59	1,780,248.40	39° 16' 26.467 N	80° 30' 21.189 W
1,230.0	5.90	114.00	1,229.0	-14.6	19.5	14,262,771.30	1,780,251.20	39° 16' 26.454 N	80° 30' 21.153 W
1,260.0	6.00	114.00	1,258.8	-15.9	22.3	14,262,770.03	1,780,254.04	39° 16' 26.441 N	80° 30' 21.117 W
1,290.0	5.80	114.70	1,288.7	-17.2	25.1	14,262,768.76	1,780,256.85	39° 16' 26.429 N	80° 30' 21.082 W
1,320.0	5.70	117.80	1,318.5	-18.5	27.8	14,262,767.43	1,780,259.55	39° 16' 26.415 N	80° 30' 21.048 W
1,350.0	5.70	116.20	1,348.4	-19.9	30.5	14,262,766.08	1,780,262.20	39° 16' 26.402 N	80° 30' 21.014 W
1,380.0	5.20	117.50	1,378.2	-21.2	33.0	14,262,764.79	1,780,264.74	39° 16' 26.389 N	80° 30' 20.982 W
1,410.0	5.30	116.50	1,408.1	-22.4	35.5	14,262,763.55	1,780,267.19	39° 16' 26.377 N	80° 30' 20.951 W
1,440.0	5.60	116.60	1,438.0	-23.7	38.0	14,262,762.27	1,780,269.74	39° 16' 26.364 N	80° 30' 20.918 W
1,470.0	6.40	114.60	1,467.8	-25.0	40.8	14,262,760.92	1,780,272.57	39° 16' 26.350 N	80° 30' 20.882 W
1,500.0	7.60	114.20	1,497.6	-26.5	44.2	14,262,759.41	1,780,275.90	39° 16' 26.335 N	80° 30' 20.840 W
1,530.0	8.70	111.40	1,527.3	-28.2	48.1	14,262,757.77	1,780,279.82	39° 16' 26.319 N	80° 30' 20.790 W
1,560.0	10.00	111.00	1,556.9	-29.9	52.6	14,262,756.01	1,780,284.36	39° 16' 26.301 N	80° 30' 20.733 W
1,590.0	10.90	110.00	1,586.4	-31.8	57.7	14,262,754.11	1,780,289.46	39° 16' 26.282 N	80° 30' 20.668 W
1,620.0	11.60	110.30	1,615.8	-33.9	63.2	14,262,752.09	1,780,294.95	39° 16' 26.262 N	80° 30' 20.598 W
1,650.0	12.40	109.70	1,645.1	-36.0	69.1	14,262,749.96	1,780,300.82	39° 16' 26.240 N	80° 30' 20.524 W
1,680.0	13.20	109.60	1,674.4	-38.2	75.3	14,262,747.72	1,780,307.07	39° 16' 26.218 N	80° 30' 20.444 W
1,710.0	14.40	109.70	1,703.5	-40.6	82.1	14,262,745.32	1,780,313.81	39° 16' 26.194 N	80° 30' 20.359 W
1,740.0	15.60	108.20	1,732.5	-43.1	89.4	14,262,742.80	1,780,321.16	39° 16' 26.169 N	80° 30' 20.265 W
1,770.0	16.90	107.20	1,761.3	-45.7	97.4	14,262,740.25	1,780,329.16	39° 16' 26.143 N	80° 30' 20.164 W
1,800.0	18.20	107.50	1,789.9	-48.4	106.1	14,262,737.55	1,780,337.79	39° 16' 26.116 N	80° 30' 20.054 W
1,830.0	19.20	110.00	1,818.3	-51.5	115.2	14,262,734.46	1,780,346.89	39° 16' 26.085 N	80° 30' 19.939 W
1,860.0	19.30	111.50	1,846.7	-55.0	124.4	14,262,730.95	1,780,356.14	39° 16' 26.050 N	80° 30' 19.821 W
1,890.0	19.20	112.60	1,875.0	-58.7	133.6	14,262,727.24	1,780,365.31	39° 16' 26.012 N	80° 30' 19.705 W
1,920.0	19.70	114.20	1,903.3	-62.7	142.7	14,262,723.27	1,780,374.48	39° 16' 25.973 N	80° 30' 19.589 W
1,950.0	20.10	115.20	1,931.5	-66.9	152.0	14,262,719.00	1,780,383.75	39° 16' 25.930 N	80° 30' 19.471 W
1,980.0	21.20	116.80	1,959.5	-71.6	161.5	14,262,714.36	1,780,393.26	39° 16' 25.884 N	80° 30' 19.350 W
2,010.0	22.40	117.40	1,987.4	-76.7	171.4	14,262,709.29	1,780,403.18	39° 16' 25.833 N	80° 30' 19.224 W
2,040.0	24.00	119.00	2,015.0	-82.2	181.9	14,262,703.70	1,780,413.59	39° 16' 25.777 N	80° 30' 19.092 W
2,070.0	25.10	119.60	2,042.3	-88.3	192.7	14,262,697.60	1,780,424.46	39° 16' 25.716 N	80° 30' 18.955 W
2,100.0	25.00	118.90	2,069.4	-94.6	203.8	14,262,691.39	1,780,435.54	39° 16' 25.654 N	80° 30' 18.814 W
2,130.0	25.30	119.30	2,096.6	-100.8	214.9	14,262,685.19	1,780,446.68	39° 16' 25.592 N	80° 30' 18.673 W
2,160.0	27.10	121.00	2,123.5	-107.4	226.4	14,262,678.53	1,780,458.13	39° 16' 25.526 N	80° 30' 18.528 W
2,190.0	28.70	122.80	2,150.0	-114.8	238.3	14,262,671.11	1,780,470.04	39° 16' 25.452 N	80° 30' 18.377 W
2,220.0	30.20	124.00	2,176.1	-123.0	250.6	14,262,662.99	1,780,482.35	39° 16' 25.371 N	80° 30' 18.221 W
2,250.0	31.10	125.20	2,202.0	-131.6	263.2	14,262,654.30	1,780,494.94	39° 16' 25.284 N	80° 30' 18.061 W
2,280.0	31.30	124.70	2,227.6	-140.5	275.9	14,262,645.40	1,780,507.68	39° 16' 25.195 N	80° 30' 17.900 W
2,310.0	30.70	121.90	2,253.3	-149.0	288.9	14,262,636.92	1,780,520.59	39° 16' 25.111 N	80° 30' 17.736 W
2,340.0	29.50	120.80	2,279.3	-156.9	301.7	14,262,629.09	1,780,533.43	39° 16' 25.033 N	80° 30' 17.573 W
2,370.0	29.10	121.20	2,305.5	-164.4	314.3	14,262,621.52	1,780,546.02	39° 16' 24.957 N	80° 30' 17.414 W
2,400.0	29.50	121.50	2,331.6	-172.1	326.8	14,262,613.89	1,780,558.55	39° 16' 24.881 N	80° 30' 17.255 W
2,430.0	29.80	122.70	2,357.7	-179.9	339.4	14,262,606.00	1,780,571.13	39° 16' 24.803 N	80° 30' 17.095 W
2,460.0	30.00	123.70	2,383.7	-188.1	351.9	14,262,597.81	1,780,583.64	39° 16' 24.721 N	80° 30' 16.937 W
2,490.0	29.70	124.60	2,409.7	-196.5	364.3	14,262,589.43	1,780,596.00	39° 16' 24.637 N	80° 30' 16.780 W
2,520.0	29.50	126.00	2,435.8	-205.1	376.4	14,262,580.87	1,780,608.09	39° 16' 24.552 N	80° 30' 16.627 W
2,550.0	29.30	125.70	2,461.9	-213.7	388.3	14,262,572.24	1,780,620.03	39° 16' 24.466 N	80° 30' 16.476 W
2,580.0	28.50	124.70	2,488.2	-222.1	400.1	14,262,563.88	1,780,631.87	39° 16' 24.383 N	80° 30' 16.325 W
2,610.0	28.20	123.50	2,514.6	-230.0	411.9	14,262,555.90	1,780,643.67	39° 16' 24.303 N	80° 30' 16.176 W
2,640.0	28.30	124.40	2,541.0	-238.0	423.7	14,262,547.97	1,780,655.45	39° 16' 24.224 N	80° 30' 16.027 W
2,670.0	28.30	125.00	2,567.4	-246.1	435.4	14,262,539.87	1,780,667.14	39° 16' 24.143 N	80° 30' 15.879 W
2,700.0	28.30	125.60	2,593.9	-254.3	447.0	14,262,531.65	1,780,678.75	39° 16' 24.062 N	80° 30' 15.731 W
2,730.0	28.10	126.10	2,620.3	-262.6	458.5	14,262,523.35	1,780,690.24	39° 16' 23.979 N	80° 30' 15.586 W
2,760.0	28.30	126.90	2,646.7	-271.0	469.9	14,262,514.92	1,780,701.63	39° 16' 23.895 N	80° 30' 15.441 W
2,790.0	26.90	125.70	2,673.3	-279.3	481.1	14,262,506.69	1,780,712.83	39° 16' 23.813 N	80° 30' 15.300 W
2,820.0	26.50	125.40	2,700.1	-287.1	492.1	14,262,498.85	1,780,723.80	39° 16' 23.735 N	80° 30' 15.161 W

DDC
Survey Report



Company:	HG Energy, LLC	Local Co-ordinate Reference:	Well J.M. Fultz #238
Project:	Harrison County, West Virginia	TVD Reference:	WELL @ 1393.0usft (Decker #6)
Site:	J.M. Fultz #238	MD Reference:	WELL @ 1393.0usft (Decker #6)
Well:	J.M. Fultz #238	North Reference:	Grid
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
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Position Uncertainty:	0.0 usft	Slot Radius:	13-3/16 "	Grid Convergence:	0.31 °

Well	J.M. Fultz #238					
Well Position	+N/-S	0.0 usft	Northing:	14,262,785.95 usft	Latitude:	39° 16' 26.600 N
	+E/-W	0.0 usft	Easting:	1,780,231.74 usft	Longitude:	80° 30' 21.400 W
Position Uncertainty		0.0 usft	Wellhead Elevation:	usft	Ground Level:	1,385.0 usft

Wellbore	Wellbore #1				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
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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	119.48

Survey Program	Date	12/11/2013			
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description	
850.0	3,410.0	MWD (Wellbore #1)			

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)	
TIE IN @ 850' MD / 850' TVD										
850.0	0.00	0.00	850.0	0.0	0.0	0.0	0.00	0.00	0.00	
900.0	1.90	156.60	900.0	-0.8	0.3	0.7	3.80	3.80	0.00	
930.0	2.50	150.60	930.0	-1.8	0.8	1.6	2.14	2.00	-20.00	
960.0	2.40	152.00	959.9	-2.9	1.5	2.7	0.39	-0.33	4.67	
990.0	2.60	150.40	989.9	-4.1	2.1	3.8	0.71	0.67	-5.33	
1,020.0	3.00	133.70	1,019.9	-5.2	3.0	5.2	3.01	1.33	-55.67	
1,050.0	3.90	127.70	1,049.8	-6.4	4.4	6.9	3.23	3.00	-20.00	
1,080.0	4.80	119.20	1,079.7	-7.6	6.3	9.2	3.68	3.00	-28.33	
1,110.0	5.50	117.70	1,109.6	-8.9	8.6	11.9	2.38	2.33	-5.00	

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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)
1,140.0	5.90	123.30	1,139.5	-10.4	11.2	14.9	2.28	1.33	18.67
1,170.0	6.00	117.60	1,169.3	-12.0	13.9	18.0	2.00	0.33	-19.00
1,200.0	5.90	115.60	1,199.1	-13.4	16.7	21.1	0.77	-0.33	-6.67
1,230.0	5.90	114.00	1,229.0	-14.6	19.5	24.2	0.55	0.00	-5.33
1,260.0	6.00	114.00	1,258.8	-15.9	22.3	27.2	0.33	0.33	0.00
1,290.0	5.80	114.70	1,288.7	-17.2	25.1	30.3	0.71	-0.67	2.33
1,320.0	5.70	117.80	1,318.5	-18.5	27.8	33.3	1.09	-0.33	10.33
1,350.0	5.70	116.20	1,348.4	-19.9	30.5	36.3	0.53	0.00	-5.33
1,380.0	5.20	117.50	1,378.2	-21.2	33.0	39.1	1.72	-1.67	4.33
1,410.0	5.30	116.50	1,408.1	-22.4	35.5	41.9	0.45	0.33	-3.33
1,440.0	5.60	116.60	1,438.0	-23.7	38.0	44.7	1.00	1.00	0.33
1,470.0	6.40	114.60	1,467.8	-25.0	40.8	47.9	2.76	2.67	-6.67
1,500.0	7.60	114.20	1,497.6	-26.5	44.2	51.5	4.00	4.00	-1.33
1,530.0	8.70	111.40	1,527.3	-28.2	48.1	55.7	3.90	3.67	-9.33
1,560.0	10.00	111.00	1,556.9	-29.9	52.6	60.5	4.34	4.33	-1.33
1,590.0	10.90	110.00	1,586.4	-31.8	57.7	65.9	3.06	3.00	-3.33
1,620.0	11.60	110.30	1,615.8	-33.9	63.2	71.7	2.34	2.33	1.00
1,650.0	12.40	109.70	1,645.1	-36.0	69.1	77.8	2.70	2.67	-2.00
1,680.0	13.20	109.60	1,674.4	-38.2	75.3	84.4	2.67	2.67	-0.33
1,710.0	14.40	109.70	1,703.5	-40.6	82.1	91.4	4.00	4.00	0.33
1,740.0	15.60	108.20	1,732.5	-43.1	89.4	99.1	4.20	4.00	-5.00
1,770.0	16.90	107.20	1,761.3	-45.7	97.4	107.3	4.43	4.33	-3.33
1,800.0	18.20	107.50	1,789.9	-48.4	106.1	116.1	4.34	4.33	1.00
1,830.0	19.20	110.00	1,818.3	-51.5	115.2	125.6	4.27	3.33	8.33
1,860.0	19.30	111.50	1,846.7	-55.0	124.4	135.4	1.68	0.33	5.00
1,890.0	19.20	112.60	1,875.0	-58.7	133.6	145.2	1.25	-0.33	3.67
1,920.0	19.70	114.20	1,903.3	-62.7	142.7	155.1	2.44	1.67	5.33
1,950.0	20.10	115.20	1,931.5	-66.9	152.0	165.3	1.75	1.33	3.33
1,980.0	21.20	116.80	1,959.5	-71.6	161.5	175.8	4.12	3.67	5.33
2,010.0	22.40	117.40	1,987.4	-76.7	171.4	187.0	4.07	4.00	2.00
2,040.0	24.00	119.00	2,015.0	-82.2	181.9	198.8	5.73	5.33	5.33
2,070.0	25.10	119.60	2,042.3	-88.3	192.7	211.2	3.76	3.67	2.00
2,100.0	25.00	118.90	2,069.4	-94.6	203.8	223.9	1.04	-0.33	-2.33
2,130.0	25.30	119.30	2,096.6	-100.8	214.9	236.7	1.15	1.00	1.33
2,160.0	27.10	121.00	2,123.5	-107.4	226.4	249.9	6.50	6.00	5.67
2,190.0	28.70	122.80	2,150.0	-114.8	238.3	264.0	6.03	5.33	6.00
2,220.0	30.20	124.00	2,176.1	-123.0	250.6	278.7	5.37	5.00	4.00
2,250.0	31.10	125.20	2,202.0	-131.6	263.2	293.9	3.63	3.00	4.00
2,280.0	31.30	124.70	2,227.6	-140.5	275.9	309.4	1.09	0.67	-1.67
2,310.0	30.70	121.90	2,253.3	-149.0	288.9	324.8	5.21	-2.00	-9.33
2,340.0	29.50	120.80	2,279.3	-156.9	301.7	339.8	4.40	-4.00	-3.67
2,370.0	29.10	121.20	2,305.5	-164.4	314.3	354.5	1.48	-1.33	1.33
2,400.0	29.50	121.50	2,331.6	-172.1	326.8	369.2	1.42	1.33	1.00
2,430.0	29.80	122.70	2,357.7	-179.9	339.4	384.0	2.22	1.00	4.00

DDC
Survey Report



Company:	HG Energy, LLC	Local Co-ordinate Reference:	Well J.M. Fultz #238
Project:	Harrison County, West Virginia	TVD Reference:	WELL @ 1393.0usft (Decker #6)
Site:	J.M. Fultz #238	MD Reference:	WELL @ 1393.0usft (Decker #6)
Well:	J.M. Fultz #238	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)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
2,460.0	30.00	123.70	2,383.7	-188.1	351.9	398.9	1.79	0.67	3.33
2,490.0	29.70	124.60	2,409.7	-196.5	364.3	413.8	1.80	-1.00	3.00
2,520.0	29.50	126.00	2,435.8	-205.1	376.4	428.5	2.40	-0.67	4.67
2,550.0	29.30	125.70	2,461.9	-213.7	388.3	443.2	0.83	-0.67	-1.00
2,580.0	28.50	124.70	2,488.2	-222.1	400.1	457.6	3.12	-2.67	-3.33
2,610.0	28.20	123.50	2,514.6	-230.0	411.9	471.8	2.15	-1.00	-4.00
2,640.0	28.30	124.40	2,541.0	-238.0	423.7	486.0	1.46	0.33	3.00
2,670.0	28.30	125.00	2,567.4	-246.1	435.4	500.1	0.95	0.00	2.00
2,700.0	28.30	125.60	2,593.9	-254.3	447.0	514.3	0.95	0.00	2.00
2,730.0	28.10	126.10	2,620.3	-262.6	458.5	528.4	1.03	-0.67	1.67
2,760.0	28.30	126.90	2,646.7	-271.0	469.9	542.4	1.43	0.67	2.67
2,790.0	26.90	125.70	2,673.3	-279.3	481.1	556.2	5.02	-4.67	-4.00
2,820.0	26.50	125.40	2,700.1	-287.1	492.1	569.6	1.41	-1.33	-1.00
2,850.0	26.00	125.50	2,727.0	-294.8	502.9	582.8	1.67	-1.67	0.33
2,880.0	26.00	125.70	2,754.0	-302.4	513.6	595.9	0.29	0.00	0.67
2,910.0	26.70	126.30	2,780.9	-310.3	524.3	609.1	2.50	2.33	2.00
2,940.0	26.90	125.90	2,807.7	-318.2	535.3	622.6	0.90	0.67	-1.33
2,970.0	27.70	124.90	2,834.3	-326.2	546.5	636.3	3.07	2.67	-3.33
3,000.0	28.40	124.10	2,860.8	-334.2	558.1	650.3	2.65	2.33	-2.67
3,030.0	27.60	123.10	2,887.3	-342.0	569.8	664.4	3.09	-2.67	-3.33
3,060.0	26.80	121.10	2,914.0	-349.3	581.5	678.1	4.05	-2.67	-6.67
3,090.0	26.10	120.00	2,940.8	-356.1	593.0	691.4	2.85	-2.33	-3.67
3,120.0	25.00	118.10	2,967.9	-362.4	604.3	704.4	4.57	-3.67	-6.33
3,150.0	23.90	116.60	2,995.2	-368.1	615.3	716.8	4.21	-3.67	-5.00
3,180.0	23.00	115.20	3,022.7	-373.3	626.0	728.7	3.53	-3.00	-4.67
3,210.0	22.20	112.70	3,050.4	-378.0	636.6	740.2	4.17	-2.67	-8.33
3,240.0	21.50	110.40	3,078.3	-382.1	646.9	751.2	3.69	-2.33	-7.67
3,270.0	20.70	108.10	3,106.2	-385.6	657.1	761.8	3.84	-2.67	-7.67
3,300.0	19.70	105.70	3,134.4	-388.7	667.0	771.9	4.33	-3.33	-8.00
3,330.0	18.80	103.60	3,162.7	-391.2	676.6	781.5	3.78	-3.00	-7.00
3,360.0	18.00	101.70	3,191.2	-393.2	685.8	790.6	3.33	-2.67	-6.33
TD @ 3410' MD / 3239' TVD									
3,410.0	18.00	101.00	3,238.7	-396.3	701.0	805.3	0.43	0.00	-1.40

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
850.0	850.0	0.0	0.0	TIE IN @ 850' MD / 850' TVD
3,410.0	3,238.7	-396.3	701.0	TD @ 3410' MD / 3239' TVD

Checked By: _____ Approved By: _____ Date: _____

HG Energy, LLC

Harrison County, West Virginia

J.M. Fultz #238

J.M. Fultz #238

Wellbore #1

Design: Wellbore #1

Survey Report - Geographic

07 January, 2014



02/28/2014

DDC
Survey Report - Geographic



Company:	HG Energy, LLC	Local Co-ordinate Reference:	Well J.M. Fultz #238
Project:	Harrison County, West Virginia	TVD Reference:	WELL @ 1393.0usft (Decker #6)
Site:	J.M. Fultz #238	MD Reference:	WELL @ 1393.0usft (Decker #6)
Well:	J.M. Fultz #238	North Reference:	Grid
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	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
2,850.0	26.00	125.50	2,727.0	-294.8	502.9	14,262,491.15	1,780,734.61	39° 16' 23.658 N	80° 30' 15.024 W
2,880.0	26.00	125.70	2,754.0	-302.4	513.6	14,262,483.50	1,780,745.30	39° 16' 23.582 N	80° 30' 14.888 W
2,910.0	26.70	126.30	2,780.9	-310.3	524.3	14,262,475.67	1,780,756.07	39° 16' 23.504 N	80° 30' 14.752 W
2,940.0	26.90	125.90	2,807.7	-318.2	535.3	14,262,467.70	1,780,767.00	39° 16' 23.425 N	80° 30' 14.613 W
2,970.0	27.70	124.90	2,834.3	-326.2	546.5	14,262,459.73	1,780,778.22	39° 16' 23.345 N	80° 30' 14.471 W
3,000.0	28.40	124.10	2,860.8	-334.2	558.1	14,262,451.74	1,780,789.84	39° 16' 23.265 N	80° 30' 14.324 W
3,030.0	27.60	123.10	2,887.3	-342.0	569.8	14,262,443.95	1,780,801.57	39° 16' 23.188 N	80° 30' 14.175 W
3,060.0	26.80	121.10	2,914.0	-349.3	581.5	14,262,436.66	1,780,813.19	39° 16' 23.115 N	80° 30' 14.028 W
3,090.0	26.10	120.00	2,940.8	-356.1	593.0	14,262,429.87	1,780,824.69	39° 16' 23.047 N	80° 30' 13.882 W
3,120.0	25.00	118.10	2,967.9	-362.4	604.3	14,262,423.58	1,780,836.00	39° 16' 22.985 N	80° 30' 13.739 W
3,150.0	23.90	116.60	2,995.2	-368.1	615.3	14,262,417.87	1,780,847.03	39° 16' 22.928 N	80° 30' 13.599 W
3,180.0	23.00	115.20	3,022.7	-373.3	626.0	14,262,412.66	1,780,857.76	39° 16' 22.875 N	80° 30' 13.463 W
3,210.0	22.20	112.70	3,050.4	-378.0	636.6	14,262,407.97	1,780,868.30	39° 16' 22.828 N	80° 30' 13.329 W
3,240.0	21.50	110.40	3,078.3	-382.1	646.9	14,262,403.87	1,780,878.68	39° 16' 22.787 N	80° 30' 13.197 W
3,270.0	20.70	108.10	3,106.2	-385.6	657.1	14,262,400.31	1,780,888.87	39° 16' 22.752 N	80° 30' 13.068 W
3,300.0	19.70	105.70	3,134.4	-388.7	667.0	14,262,397.29	1,780,898.78	39° 16' 22.721 N	80° 30' 12.942 W
3,330.0	18.80	103.60	3,162.7	-391.2	676.6	14,262,394.79	1,780,908.35	39° 16' 22.696 N	80° 30' 12.820 W
3,360.0	18.00	101.70	3,191.2	-393.2	685.8	14,262,392.71	1,780,917.58	39° 16' 22.675 N	80° 30' 12.703 W
3,410.0	18.00	101.00	3,238.7	-396.3	701.0	14,262,389.67	1,780,932.73	39° 16' 22.644 N	80° 30' 12.511 W

TD @ 3410' MD / 3239' TVD

Design Annotations				
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
3,410.0	3,238.7	-396.3	701.0	TD @ 3410' MD / 3239' TVD

Checked By: _____ Approved By: _____ Date: _____



PROJECT DETAILS: Harrison County, West Virginia
 Geodetic System: US State Plane 1927 (Exact solution)
 Datum: NAD 1927 (NADCON CONUS)
 Ellipsoid: Clarke 1866
 Zone: West Virginia North 4701
 System Datum: Mean Sea Level

Company Name: HG Energy, LLC
 J.M. Fultz #238
 Harrison County, West Virginia
 Rig: Decker #6
 Created By: James Dawson
 Date: 11/20/2013

J.M. Fultz #238
 Harrison County, West Virginia
Q130957 & AM-13911
 Design #1

HG Energy

M G T
 Azimuths to Grid North
 Correction: -8.00°
 Magnetic Field
 Strength: 52328.4snT
 Dip Angle: 66.82°
 Date: 10/31/2013
 Model: IGRF2010

WELL DETAILS: J.M. Fultz #238
 Ground Level: 1355.0
 Easting: 1175250.9
 Northing: 39° 16' 24.00" N
 Longitude: 80° 30' 51.00" W
 +N/A +EAW
 0.0 0.0

ANNOTATIONS

MD	Inc	AZ	TVD	Vel	Depth	Remarks
3410.0	18.00	101.20	2328.7	701.0	811.6	TD @ 3410' MD / 3239' TVD

DESIGN TARGET DETAILS

Name	TVD	+N/S	+E/W	Northing	Easting	Latitude	Longitude
Target J.M. Fultz #238 - plan hits target center	3537.0	-357.5	535.5	29163.58	171656.58	39° 16' 23.28" N	80° 30' 13.25" W

