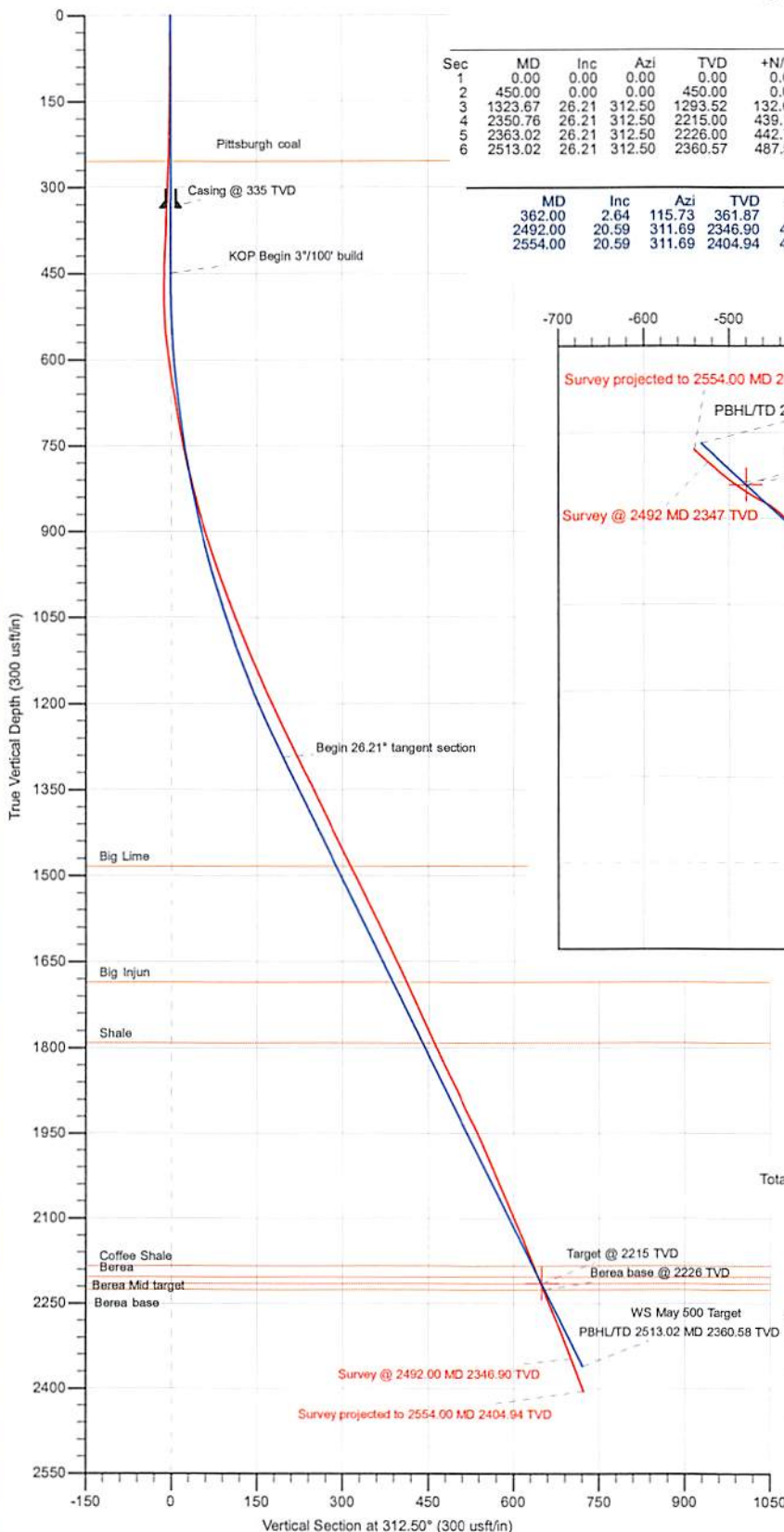


HG Energy LLC

JUL 23 2018

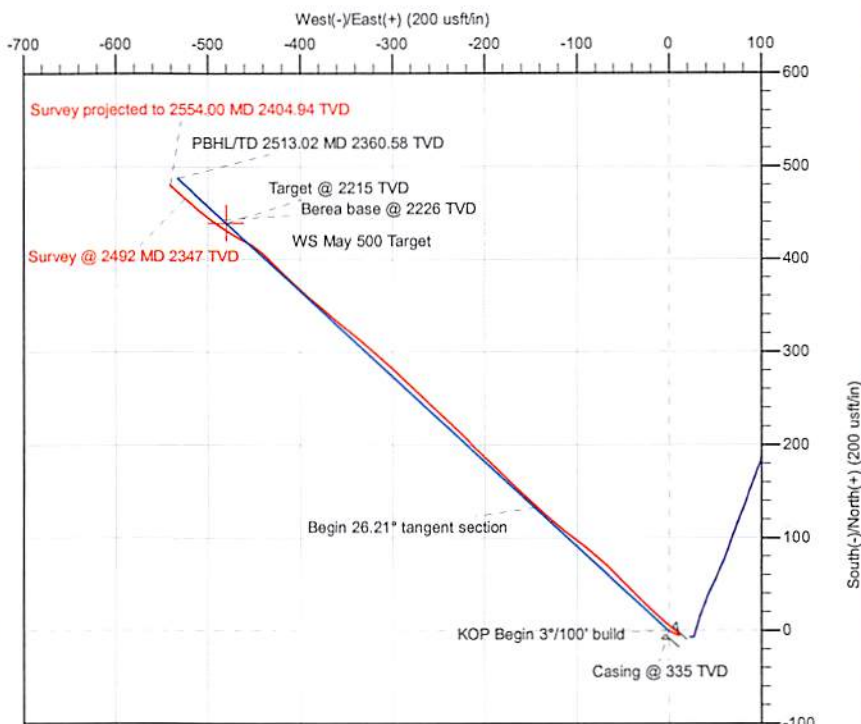
WV Department of
Environmental Protection

Well: W.S. May No. 500
Site: W.S. May
Project: Lincoln County, West Virginia UTM83
Design: plan2
Rig:



Section Details										
Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	VSect	Annotation
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
2	450.00	0.00	0.00	450.00	0.00	0.00	0.00	0.00	0.00	KOP Begin 3°/100' build
3	1323.67	26.21	312.50	1293.52	132.67	-144.78	3.00	312.50	196.37	Begin 26.21° tangent section
4	2350.76	26.21	312.50	2215.00	439.13	-479.23	0.00	0.00	650.00	Target @ 2215 TVD
5	2363.02	26.21	312.50	2226.00	442.79	-483.22	0.00	0.00	655.42	Berea base @ 2226 TVD
6	2513.02	26.21	312.50	2360.57	487.55	-532.07	0.00	0.00	721.66	PBHL/TD 2513.02 MD 2360.58 TVD

ANNOTATIONS									
MD	Inc	Azi	TVD	+N/-S	+E/-W	VSect	Annotation		
362.00	2.64	115.73	361.87	-3.62	7.51	-7.98	MWD surveys		
2492.00	20.59	311.69	2346.90	465.87	-524.36	701.33	Survey @ 2492.00 MD 2346.90 TVD		
2554.00	20.59	311.69	2404.94	480.37	-540.64	723.14	Survey projected to 2554.00 MD 2404.94 TVD		



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
Depth Reference: RKB=721+6 @ 727.00usft

Northing	Easting	Latitude	Longitude
4232553.00	416525.00	38° 14' 13.5810 N	81° 57' 13.8173 W

Total Correction (M->T): To convert a Magnetic Direction to a True Direction, Subtract 8.35°

FORMATION TOP DETAILS

TVDPath	MDPath	Formation
255.00	255.00	Pittsburgh coal
1484.00	1535.98	Big Lime
1686.00	1761.13	Big Injun
1792.00	1879.28	Shale
2184.00	2316.20	Coffee Shale
2204.00	2338.49	Berea
2215.00	2350.76	Berea Mid target
2226.00	2363.02	Berea base



Azimuths to Grid North
True North: 0.59°
Magnetic North: -7.76°

Magnetic Field
Strength: 51497.4snT
Dip Angle: 65.62°
Date: 6/1/2018
Model: HDGM



Standard_Report



Company:	HG Energy LLC	Local Co-ordinate Reference:	Well W.S. May No. 500
Project:	Lincoln County, West Virginia UTM83	TVD Reference:	RKB=721+6 @ 727.00usft
Site:	W.S. May	MD Reference:	RKB=721+6 @ 727.00usft
Well:	W.S. May No. 500	North Reference:	Grid
Wellbore:	Original hole	Survey Calculation Method:	Minimum Curvature
Design:	Surveys Original hole	Database:	DB_Jul2216dt_v14

Project	Lincoln County, West Virginia UTM83		
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	W.S. May				
Site Position:		Northing:	4,232,249.00 m	Latitude:	38° 14' 3.6738 N
From:	Map	Easting:	416,390.00 m	Longitude:	81° 57' 19.2409 W
Position Uncertainty:	0.00 usft	Slot Radius:	13-3/16 "	Grid Convergence:	-0.59 °

Well	W.S. May No. 500					
Well Position	+N/-S	0.00 usft	Northing:	4,232,553.00 m	Latitude:	38° 14' 13.5810 N
	+E/-W	0.00 usft	Easting:	416,525.00 m	Longitude:	81° 57' 13.8173 W
Position Uncertainty		0.00 usft	Wellhead Elevation:	usft	Ground Level:	721.00 usft

Wellbore	Original hole				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	HDGM	6/1/2018	-8.35	65.62	51,497.40000000

Design	Surveys Original hole				
Audit Notes:					
Version:	1.0	Phase:	ACTUAL	Tie On Depth:	0.00
Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)	Direction (°)	
	0.00	0.00	0.00	312.50	

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WV Department of
Environmental Protection

JUL 23 2018

Standard_Report



Company:	HG Energy LLC	Local Co-ordinate Reference:	Well W.S. May No. 500
Project:	Lincoln County, West Virginia UTM83	TVD Reference:	RKB=721+6 @ 727.00usft
Site:	W.S. May	MD Reference:	RKB=721+6 @ 727.00usft
Well:	W.S. May No. 500	North Reference:	Grid
Wellbore:	Original hole	Survey Calculation Method:	Minimum Curvature
Design:	Surveys Original hole	Database:	DB_Jul2216dt_v14

WV Department of
Environmental Protection

Survey Program	Date	6/21/2018		
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description
362.00	2,492.00	MWD (Original hole)	MWD	OWSG MWD - Standard
2,554.00	2,554.00	Projection (Original hole)	MWD	OWSG MWD - Standard

MD (usft)	Inc (°)	Azi (azimuth) (°)	TVD (usft)	N/S (usft)	E/W (usft)	DLeg (°/100usft)	V. Sec (usft)	Northing (m)	Easting (m)
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4,232,553.00	416,525.00
362.00	2.64	115.73	361.87	-3.62	7.51	0.73	-7.98	4,232,551.90	416,527.29
MWD surveys									
392.00	2.49	105.36	391.84	-4.09	8.76	1.62	-9.23	4,232,551.75	416,527.67
422.00	2.46	108.08	421.81	-4.46	10.00	0.40	-10.39	4,232,551.64	416,528.05
452.00	1.79	101.50	451.79	-4.76	11.07	2.37	-11.38	4,232,551.55	416,528.38
482.00	1.01	20.96	481.79	-4.60	11.63	6.35	-11.68	4,232,551.60	416,528.54
512.00	2.26	327.01	511.78	-3.86	11.40	6.18	-11.01	4,232,551.82	416,528.47
542.00	4.13	312.47	541.73	-2.64	10.28	6.74	-9.36	4,232,552.20	416,528.13
572.00	5.90	306.23	571.61	-1.00	8.24	6.17	-6.75	4,232,552.70	416,527.51
602.00	7.35	309.35	601.41	1.13	5.51	4.98	-3.30	4,232,553.35	416,526.68
632.00	8.64	310.56	631.12	3.82	2.32	4.34	0.87	4,232,554.16	416,525.71
662.00	9.36	309.36	660.75	6.83	-1.28	2.48	5.56	4,232,555.08	416,524.61
692.00	9.71	310.78	690.33	10.03	-5.08	1.41	10.52	4,232,556.06	416,523.45
722.00	10.48	310.44	719.87	13.45	-9.08	2.57	15.78	4,232,557.10	416,522.23
752.00	11.63	312.48	749.31	17.26	-13.38	4.05	21.53	4,232,558.26	416,520.92
782.00	12.53	313.52	778.65	21.54	-17.97	3.09	27.81	4,232,559.57	416,519.52
812.00	13.31	314.93	807.89	26.22	-22.78	2.80	34.51	4,232,560.99	416,518.06
842.00	14.81	315.75	836.99	31.41	-27.90	5.04	41.79	4,232,562.57	416,516.50
872.00	16.11	316.22	865.90	37.16	-33.45	4.35	49.77	4,232,564.33	416,514.80
902.00	17.29	315.38	894.64	43.34	-39.46	4.01	58.38	4,232,566.21	416,512.97

JUL 23 2018

Standard_Report



WV Department of
Environmental Protection

Company: HG Energy LLC
Project: Lincoln County, West Virginia UTM83
Site: W.S. May
Well: W.S. May No. 500
Wellbore: Original hole
Design: Surveys Original hole

Local Co-ordinate Reference: Well W.S. May No. 500
TVD Reference: RKB=721+6 @ 727.00usft
MD Reference: RKB=721+6 @ 727.00usft
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Database: DB_Jul2216dt_v14

Survey

MD (usft)	Inc (°)	Azi (azimuth) (°)	TVD (usft)	N/S (usft)	E/W (usft)	DLeg (°/100usft)	V. Sec (usft)	Northing (m)	Easting (m)
932.00	18.07	314.50	923.22	49.77	-45.91	2.75	67.48	4,232,568.17	416,511.01
962.00	18.83	314.14	951.68	56.41	-52.71	2.56	76.97	4,232,570.19	416,508.93
992.00	19.82	313.17	979.99	63.26	-59.89	3.47	86.89	4,232,572.28	416,506.74
1,022.00	20.57	313.19	1,008.14	70.35	-67.44	2.50	97.25	4,232,574.44	416,504.44
1,052.00	21.40	312.03	1,036.15	77.62	-75.35	3.09	107.99	4,232,576.66	416,502.03
1,082.00	22.03	310.16	1,064.02	84.91	-83.72	3.12	119.09	4,232,578.88	416,499.48
1,112.00	22.18	308.48	1,091.82	92.06	-92.45	2.17	130.36	4,232,581.06	416,496.82
1,142.00	22.22	308.29	1,119.60	99.10	-101.34	0.27	141.66	4,232,583.21	416,494.11
1,172.00	23.19	308.59	1,147.27	106.30	-110.40	3.26	153.22	4,232,585.40	416,491.35
1,202.00	23.98	309.60	1,174.76	113.87	-119.72	2.96	165.20	4,232,587.71	416,488.51
1,232.00	24.79	310.11	1,202.09	121.81	-129.23	2.79	177.57	4,232,590.13	416,485.61
1,262.00	25.25	311.17	1,229.27	130.07	-138.85	2.14	190.25	4,232,592.65	416,482.68
1,292.00	26.19	312.27	1,256.30	138.74	-148.57	3.51	203.27	4,232,595.29	416,479.72
1,322.00	26.35	313.38	1,283.20	147.76	-158.31	1.72	216.54	4,232,598.04	416,476.75
1,352.00	26.30	313.50	1,310.09	156.91	-167.97	0.24	229.85	4,232,600.83	416,473.80
1,382.00	26.03	314.18	1,337.02	166.07	-177.51	1.34	243.07	4,232,603.62	416,470.90
1,412.00	26.00	314.55	1,363.98	175.28	-186.92	0.55	256.22	4,232,606.42	416,468.03
1,442.00	26.14	314.56	1,390.92	184.53	-196.31	0.47	269.40	4,232,609.24	416,465.16
1,472.00	26.07	314.40	1,417.86	193.77	-205.73	0.33	282.59	4,232,612.06	416,462.29
1,502.00	26.34	314.66	1,444.78	203.06	-215.17	0.98	295.83	4,232,614.89	416,459.42
1,532.00	26.64	313.84	1,471.63	212.40	-224.76	1.58	309.21	4,232,617.74	416,456.49
1,562.00	26.65	313.26	1,498.45	221.67	-234.51	0.87	322.66	4,232,620.57	416,453.52
1,592.00	25.94	312.79	1,525.34	230.74	-244.22	2.47	335.95	4,232,623.33	416,450.56
1,622.00	25.92	313.10	1,552.32	239.68	-253.83	0.46	349.06	4,232,626.05	416,447.63
1,652.00	25.80	312.98	1,579.32	248.61	-263.39	0.44	362.15	4,232,628.78	416,444.72
1,682.00	25.63	312.88	1,606.35	257.47	-272.92	0.58	375.16	4,232,631.48	416,441.81
1,712.00	25.43	312.79	1,633.42	266.26	-282.40	0.68	388.09	4,232,634.16	416,438.92

JUL 23 2018

Standard_Report



WV Department of
Environmental Protection

Company: HG Energy LLC
Project: Lincoln County, West Virginia UTM83
Site: W.S. May
Well: W.S. May No. 500
Wellbore: Original hole
Design: Surveys Original hole

Local Co-ordinate Reference: Well W.S. May No. 500
TVD Reference: RKB=721+6 @ 727.00usft
MD Reference: RKB=721+6 @ 727.00usft
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Database: DB_Jul2216dt_v14

Survey											
MD (usft)	Inc (°)	Azi (azimuth) (°)	TVD (usft)	N/S (usft)	E/W (usft)	DLeg (°/100usft)	V. Sec (usft)	Northing (m)	Easting (m)		
1,742.00	25.49	313.51	1,660.50	275.08	-291.81	1.05	400.99	4,232,636.85	416,436.06		
1,772.00	25.42	313.08	1,687.59	283.93	-301.20	0.66	413.88	4,232,639.54	416,433.20		
1,802.00	24.53	312.00	1,714.79	292.49	-310.53	3.33	426.55	4,232,642.15	416,430.35		
1,832.00	23.89	309.89	1,742.15	300.55	-319.82	3.59	438.84	4,232,644.61	416,427.52		
1,862.00	24.19	309.61	1,769.55	308.37	-329.21	1.07	451.05	4,232,646.99	416,424.66		
1,892.00	25.65	309.76	1,796.75	316.44	-338.94	4.87	463.68	4,232,649.45	416,421.69		
1,922.00	26.10	309.30	1,823.74	324.77	-349.04	1.64	476.75	4,232,651.99	416,418.61		
1,952.00	25.72	308.92	1,850.73	333.04	-359.21	1.38	489.84	4,232,654.51	416,415.51		
1,982.00	26.00	309.11	1,877.72	341.28	-369.38	0.97	502.90	4,232,657.02	416,412.41		
2,012.00	25.80	309.68	1,904.71	349.60	-379.50	1.06	515.98	4,232,659.56	416,409.33		
2,042.00	25.43	311.60	1,931.76	358.04	-389.34	3.03	528.94	4,232,662.13	416,406.33		
2,072.00	24.38	312.70	1,958.97	366.52	-398.71	3.83	541.58	4,232,664.71	416,403.47		
2,102.00	22.83	313.22	1,986.46	374.70	-407.50	5.21	553.59	4,232,667.21	416,400.79		
2,132.00	22.14	313.53	2,014.18	382.58	-415.84	2.33	565.06	4,232,669.61	416,398.25		
2,162.00	22.57	314.94	2,041.93	390.54	-424.02	2.29	576.46	4,232,672.04	416,395.76		
2,192.00	22.87	315.32	2,069.60	398.75	-432.19	1.11	588.04	4,232,674.54	416,393.27		
2,222.00	23.32	311.91	2,097.20	406.86	-440.71	4.70	599.80	4,232,677.01	416,390.67		
2,252.00	23.24	303.58	2,124.76	414.11	-450.06	10.97	611.59	4,232,679.22	416,387.82		
2,282.00	23.17	297.76	2,152.34	420.13	-460.22	7.64	623.14	4,232,681.06	416,384.73		
2,312.00	22.16	299.55	2,180.02	425.67	-470.36	4.08	634.37	4,232,682.74	416,381.63		
2,342.00	22.06	302.24	2,207.81	431.47	-480.05	3.39	645.42	4,232,684.51	416,378.68		
2,372.00	22.57	305.85	2,235.57	437.84	-489.48	4.87	656.69	4,232,686.45	416,375.81		
2,402.00	22.50	307.20	2,263.28	444.69	-498.72	1.74	668.12	4,232,688.54	416,372.99		
2,432.00	22.02	308.77	2,291.04	451.68	-507.68	2.55	679.45	4,232,690.67	416,370.26		
2,462.00	21.52	310.57	2,318.90	458.78	-516.24	2.78	690.56	4,232,692.84	416,367.65		
2,492.00	20.59	311.69	2,346.90	465.87	-524.36	3.38	701.33	4,232,695.00	416,365.17		
Survey @ 2492.00 MD 2346.90 TVD											

Standard_Report



Company: HG Energy LLC	Local Co-ordinate Reference: Well W.S. May No. 500
Project: Lincoln County, West Virginia UTM83	TVD Reference: RKB=721+6 @ 727.00usft
Site: W.S. May	MD Reference: RKB=721+6 @ 727.00usft
Well: W.S. May No. 500	North Reference: Grid
Wellbore: Original hole	Survey Calculation Method: Minimum Curvature
Design: Surveys Original hole	Database: DB_Jul2216dt_v14

MD (usft)	Inc (°)	Azi (azimuth) (°)	TVD (usft)	N/S (usft)	E/W (usft)	DLeg (°/100usft)	V. Sec (usft)	Northing (m)	Easting (m)
2,554.00	20.59	311.69	2,404.94	480.37	-540.64	0.00	723.14	4,232,699.42	416,360.21
Survey projected to 2554.00 MD 2404.94 TVD									

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
362.00	361.87	-3.62	7.51	MWD surveys
2,492.00	2,346.90	465.87	-524.36	Survey @ 2492.00 MD 2346.90 TVD

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Environmental Protection

Report

Company:	HG Energy LLC	Local Co-ordinate Reference:	Well W.S. May No. 500
Project:	Lincoln County, West Virginia UTM83	TVD Reference:	RKB=721+6 @ 727.00usft
Site:	W.S. May	MD Reference:	RKB=721+6 @ 727.00usft
Well:	W.S. May No. 500	North Reference:	Grid
Wellbore:	Original hole	Survey Calculation Method:	Minimum Curvature
Design:	Surveys Original hole	Database:	DB_Jul2216dt_v14

Project	Lincoln County, West Virginia UTM83		
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	W.S. May				
Site Position:		Northing:	4,232,249.00 m	Latitude:	38° 14' 3.6738 N
From:	Map	Easting:	416,390.00 m	Longitude:	81° 57' 19.2409 W
Position Uncertainty:	0.00 usft	Slot Radius:	13-3/16 "	Grid Convergence:	-0.59 °

Well	W.S. May No. 500					
Well Position	+N/-S	0.00 usft	Northing:	4,232,553.00 m	Latitude:	38° 14' 13.5810 N
	+E/-W	0.00 usft	Easting:	416,525.00 m	Longitude:	81° 57' 13.8173 W
Position Uncertainty		0.00 usft	Wellhead Elevation:	usft	Ground Level:	721.00 usft

Wellbore	Original hole					
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)	
	HDGM	6/1/2018	-8.35	65.62	51,497.40000000	

Design	Surveys Original hole				
Audit Notes:					
Version:	1.0	Phase:	ACTUAL	Tie On Depth:	0.00
Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)	Direction (°)	
	0.00	0.00	0.00	312.50	

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Report

WV Department of
Environmental Protection

Company: HG Energy LLC
Project: Lincoln County, West Virginia UTM83
Site: W.S. May
Well: W.S. May No. 500
Wellbore: Original hole
Design: Surveys Original hole

Local Co-ordinate Reference: Well W.S. May No. 500
TVD Reference: RKB=721+6 @ 727.00usft
MD Reference: RKB=721+6 @ 727.00usft
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Database: DB_Jul2216dt_v14

Survey Program Date 6/21/2018

From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description
362.00	2,492.00	MWD (Original hole)	MWD	OWSG MWD - Standard
2,554.00	2,554.00	Projection (Original hole)	MWD	OWSG MWD - Standard

MD (usft)	Inc (°)	Azi (azimuth) (°)	TVD (usft)	N/S (usft)	E/W (usft)	DLeg (°/100usft)	V. Sec (usft)	Northing (m)	Easting (m)	Closure Azimuth (°)
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4,232,553.00	416,525.00	0.00
362.00	2.64	115.73	361.87	-3.62	7.51	0.73	-7.98	4,232,551.90	416,527.29	115.73
MWD surveys										
392.00	2.49	105.36	391.84	-4.09	8.76	1.62	-9.23	4,232,551.75	416,527.67	115.04
422.00	2.46	108.08	421.81	-4.46	10.00	0.40	-10.39	4,232,551.64	416,528.05	114.05
452.00	1.79	101.50	451.79	-4.76	11.07	2.37	-11.38	4,232,551.55	416,528.38	113.25
482.00	1.01	20.96	481.79	-4.60	11.63	6.35	-11.68	4,232,551.60	416,528.54	111.60
512.00	2.26	327.01	511.78	-3.86	11.40	6.18	-11.01	4,232,551.82	416,528.47	108.71
542.00	4.13	312.47	541.73	-2.64	10.28	6.74	-9.36	4,232,552.20	416,528.13	104.38
572.00	5.90	306.23	571.61	-1.00	8.24	6.17	-6.75	4,232,552.70	416,527.51	96.88
602.00	7.35	309.35	601.41	1.13	5.51	4.98	-3.30	4,232,553.35	416,526.68	78.38
632.00	8.64	310.56	631.12	3.82	2.32	4.34	0.87	4,232,554.16	416,525.71	31.27
662.00	9.36	309.36	660.75	6.83	-1.28	2.48	5.56	4,232,555.08	416,524.61	349.37
692.00	9.71	310.78	690.33	10.03	-5.08	1.41	10.52	4,232,556.06	416,523.45	333.12
722.00	10.48	310.44	719.87	13.45	-9.08	2.57	15.78	4,232,557.10	416,522.23	325.99
752.00	11.63	312.48	749.31	17.26	-13.38	4.05	21.53	4,232,558.26	416,520.92	322.21
782.00	12.53	313.52	778.65	21.54	-17.97	3.09	27.81	4,232,559.57	416,519.52	320.17
812.00	13.31	314.93	807.89	26.22	-22.78	2.80	34.51	4,232,560.99	416,518.06	319.02
842.00	14.81	315.75	836.99	31.41	-27.90	5.04	41.79	4,232,562.57	416,516.50	318.39
872.00	16.11	316.22	865.90	37.16	-33.45	4.35	49.77	4,232,564.33	416,514.80	318.01
902.00	17.29	315.38	894.64	43.34	-39.46	4.01	58.38	4,232,566.21	416,512.97	317.68

JUL 23 2018

Report

WV Department of
Environmental Protection

Company: HG Energy LLC
Project: Lincoln County, West Virginia UTM83
Site: W.S. May
Well: W.S. May No. 500
Wellbore: Original hole
Design: Surveys Original hole

Local Co-ordinate Reference: Well W.S. May No. 500
TVD Reference: RKB=721+6 @ 727.00usft
MD Reference: RKB=721+6 @ 727.00usft
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Database: DB_Jul2216dt_v14

Survey										
MD (usft)	Inc (°)	Azi (azimuth) (°)	TVD (usft)	N/S (usft)	E/W (usft)	DLeg (°/100usft)	V. Sec (usft)	Northing (m)	Easting (m)	Closure Azimuth (°)
932.00	18.07	314.50	923.22	49.77	-45.91	2.75	67.48	4,232,568.17	416,511.01	317.31
962.00	18.83	314.14	951.68	56.41	-52.71	2.56	76.97	4,232,570.19	416,508.93	316.94
992.00	19.82	313.17	979.99	63.26	-59.89	3.47	86.89	4,232,572.28	416,506.74	316.57
1,022.00	20.57	313.19	1,008.14	70.35	-67.44	2.50	97.25	4,232,574.44	416,504.44	316.21
1,052.00	21.40	312.03	1,036.15	77.62	-75.35	3.09	107.99	4,232,576.66	416,502.03	315.85
1,082.00	22.03	310.16	1,064.02	84.91	-83.72	3.12	119.09	4,232,578.88	416,499.48	315.41
1,112.00	22.18	308.48	1,091.82	92.06	-92.45	2.17	130.36	4,232,581.06	416,496.82	314.88
1,142.00	22.22	308.29	1,119.60	99.10	-101.34	0.27	141.66	4,232,583.21	416,494.11	314.36
1,172.00	23.19	308.59	1,147.27	106.30	-110.40	3.26	153.22	4,232,585.40	416,491.35	313.92
1,202.00	23.98	309.60	1,174.76	113.87	-119.72	2.96	165.20	4,232,587.71	416,488.51	313.57
1,232.00	24.79	310.11	1,202.09	121.81	-129.23	2.79	177.57	4,232,590.13	416,485.61	313.31
1,262.00	25.25	311.17	1,229.27	130.07	-138.85	2.14	190.25	4,232,592.65	416,482.68	313.13
1,292.00	26.19	312.27	1,256.30	138.74	-148.57	3.51	203.27	4,232,595.29	416,479.72	313.04
1,322.00	26.35	313.38	1,283.20	147.76	-158.31	1.72	216.54	4,232,598.04	416,476.75	313.03
1,352.00	26.30	313.50	1,310.09	156.91	-167.97	0.24	229.85	4,232,600.83	416,473.80	313.05
1,382.00	26.03	314.18	1,337.02	166.07	-177.51	1.34	243.07	4,232,603.62	416,470.90	313.09
1,412.00	26.00	314.55	1,363.98	175.28	-186.92	0.55	256.22	4,232,606.42	416,468.03	313.16
1,442.00	26.14	314.56	1,390.92	184.53	-196.31	0.47	269.40	4,232,609.24	416,465.16	313.23
1,472.00	26.07	314.40	1,417.86	193.77	-205.73	0.33	282.59	4,232,612.06	416,462.29	313.29
1,502.00	26.34	314.66	1,444.78	203.06	-215.17	0.98	295.83	4,232,614.89	416,459.42	313.34
1,532.00	26.64	313.84	1,471.63	212.40	-224.76	1.58	309.21	4,232,617.74	416,456.49	313.38
1,562.00	26.65	313.26	1,498.45	221.67	-234.51	0.87	322.66	4,232,620.57	416,453.52	313.39
1,592.00	25.94	312.79	1,525.34	230.74	-244.22	2.47	335.95	4,232,623.33	416,450.56	313.37
1,622.00	25.92	313.10	1,552.32	239.68	-253.83	0.46	349.06	4,232,626.05	416,447.63	313.36
1,652.00	25.80	312.98	1,579.32	248.61	-263.39	0.44	362.15	4,232,628.78	416,444.72	313.35
1,682.00	25.63	312.88	1,606.35	257.47	-272.92	0.58	375.16	4,232,631.48	416,441.81	313.33
1,712.00	25.43	312.79	1,633.42	266.26	-282.40	0.68	388.09	4,232,634.16	416,438.92	313.32

JUL 23 2018

Report

WV Department of
Environmental Protection

Company: HG Energy LLC
Project: Lincoln County, West Virginia UTM83
Site: W.S. May
Well: W.S. May No. 500
Wellbore: Original hole
Design: Surveys Original hole

Local Co-ordinate Reference: Well W.S. May No. 500
TVD Reference: RKB=721+6 @ 727.00usft
MD Reference: RKB=721+6 @ 727.00usft
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Database: DB_Jul2216dt_v14

MD (usft)	Inc (°)	Azi (azimuth) (°)	TVD (usft)	N/S (usft)	E/W (usft)	DLeg (°/100usft)	V. Sec (usft)	Northing (m)	Easting (m)	Closure Azimuth (°)
1,742.00	25.49	313.51	1,660.50	275.08	-291.81	1.05	400.99	4,232,636.85	416,436.06	313.31
1,772.00	25.42	313.08	1,687.59	283.93	-301.20	0.66	413.88	4,232,639.54	416,433.20	313.31
1,802.00	24.53	312.00	1,714.79	292.49	-310.53	3.33	426.55	4,232,642.15	416,430.35	313.29
1,832.00	23.89	309.89	1,742.15	300.55	-319.82	3.59	438.84	4,232,644.61	416,427.52	313.22
1,862.00	24.19	309.61	1,769.55	308.37	-329.21	1.07	451.05	4,232,646.99	416,424.66	313.13
1,892.00	25.65	309.76	1,796.75	316.44	-338.94	4.87	463.68	4,232,649.45	416,421.69	313.03
1,922.00	26.10	309.30	1,823.74	324.77	-349.04	1.64	476.75	4,232,651.99	416,418.61	312.94
1,952.00	25.72	308.92	1,850.73	333.04	-359.21	1.38	489.84	4,232,654.51	416,415.51	312.84
1,982.00	26.00	309.11	1,877.72	341.28	-369.38	0.97	502.90	4,232,657.02	416,412.41	312.74
2,012.00	25.80	309.68	1,904.71	349.60	-379.50	1.06	515.98	4,232,659.56	416,409.33	312.65
2,042.00	25.43	311.60	1,931.76	358.04	-389.34	3.03	528.94	4,232,662.13	416,406.33	312.60
2,072.00	24.38	312.70	1,958.97	366.52	-398.71	3.83	541.58	4,232,664.71	416,403.47	312.59
2,102.00	22.83	313.22	1,986.46	374.70	-407.50	5.21	553.59	4,232,667.21	416,400.79	312.60
2,132.00	22.14	313.53	2,014.18	382.58	-415.84	2.33	565.06	4,232,669.61	416,398.25	312.61
2,162.00	22.57	314.94	2,041.93	390.54	-424.02	2.29	576.46	4,232,672.04	416,395.76	312.65
2,192.00	22.87	315.32	2,069.60	398.75	-432.19	1.11	588.04	4,232,674.54	416,393.27	312.70
2,222.00	23.32	311.91	2,097.20	406.86	-440.71	4.70	599.80	4,232,677.01	416,390.67	312.71
2,252.00	23.24	303.58	2,124.76	414.11	-450.06	10.97	611.59	4,232,679.22	416,387.82	312.62
2,282.00	23.17	297.76	2,152.34	420.13	-460.22	7.64	623.14	4,232,681.06	416,384.73	312.39
2,312.00	22.16	299.55	2,180.02	425.67	-470.36	4.08	634.37	4,232,682.74	416,381.63	312.14
2,342.00	22.06	302.24	2,207.81	431.47	-480.05	3.39	645.42	4,232,684.51	416,378.68	311.95
2,372.00	22.57	305.85	2,235.57	437.84	-489.48	4.87	656.69	4,232,686.45	416,375.81	311.81
2,402.00	22.50	307.20	2,263.28	444.69	-498.72	1.74	668.12	4,232,688.54	416,372.99	311.72
2,432.00	22.02	308.77	2,291.04	451.68	-507.68	2.55	679.45	4,232,690.67	416,370.26	311.66
2,462.00	21.52	310.57	2,318.90	458.78	-516.24	2.78	690.56	4,232,692.84	416,367.65	311.63
2,492.00	20.59	311.69	2,346.90	465.87	-524.36	3.38	701.33	4,232,695.00	416,365.17	311.62

Survey @ 2492.00 MD 2346.90 TVD

Report

Company: HG Energy LLC	Local Co-ordinate Reference: Well W.S. May No. 500
Project: Lincoln County, West Virginia UTM83	TVD Reference: RKB=721+6 @ 727.00usft
Site: W.S. May	MD Reference: RKB=721+6 @ 727.00usft
Well: W.S. May No. 500	North Reference: Grid
Wellbore: Original hole	Survey Calculation Method: Minimum Curvature
Design: Surveys Original hole	Database: DB_Jul2216dt_v14

MD (usft)	Inc (°)	Azi (azimuth) (°)	TVD (usft)	N/S (usft)	E/W (usft)	DLeg (°/100usft)	V. Sec (usft)	Northing (m)	Easting (m)	Closure Azimuth (°)
2,554.00	20.59	311.69	2,404.94	480.37	-540.64	0.00	723.14	4,232,699.42	416,360.21	311.62
Survey projected to 2554.00 MD 2404.94 TVD										

Design Annotations					
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment	
		+N/-S (usft)	+E/-W (usft)		
362.00	361.87	-3.62	7.51		MWD surveys
2,492.00	2,346.90	465.87	-524.36		Survey @ 2492.00 MD 2346.90 TVD
2,554.00	2,404.94	480.37	-540.64		Survey projected to 2554.00 MD 2404.94 TVD

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 Office of Oil and Gas

JUL 23 2018

 WV Department of
 Environmental Protection