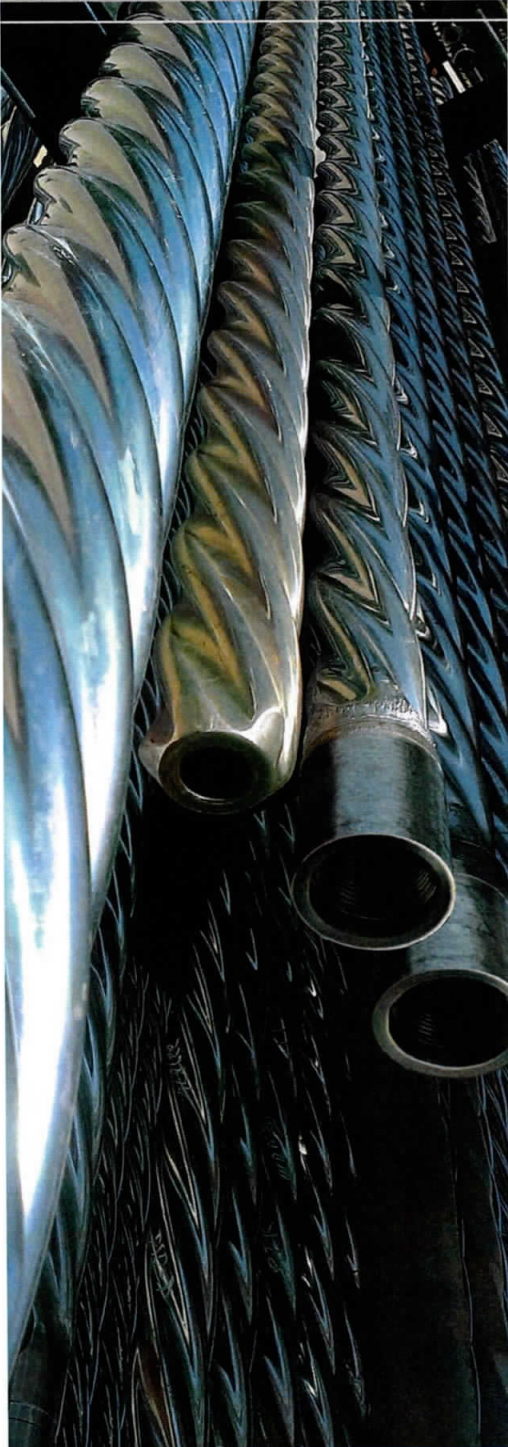




PRODIRECTIONAL



**EP Bell 509
Lincoln County, WV
Noah Horn 294 Rig**

July 31, 2019

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Survey Certification Report



July 31, 2019

HG Energy

Operator Name: HG Energy
Well Name: EP Bell 509
County/Parish: Lincoln County
State: WV
Rig Name: Noah Horn 294
Job Number: LWW3513619

This is to certify the surveys performed on the referenced well by Professional Directional Ent., Inc. are true and correct MWD Surveys, data provided as follows:

<u>Surveyor</u>	<u>Surveyed Depths</u>	<u>Projection to Bit</u>	<u>Dates Performed</u>	<u>Type of Survey</u>
ProDirectional	560'MD – 2,630'MD	2,697'MD	07/08/19 – 07/10/19	MWD-OWSG

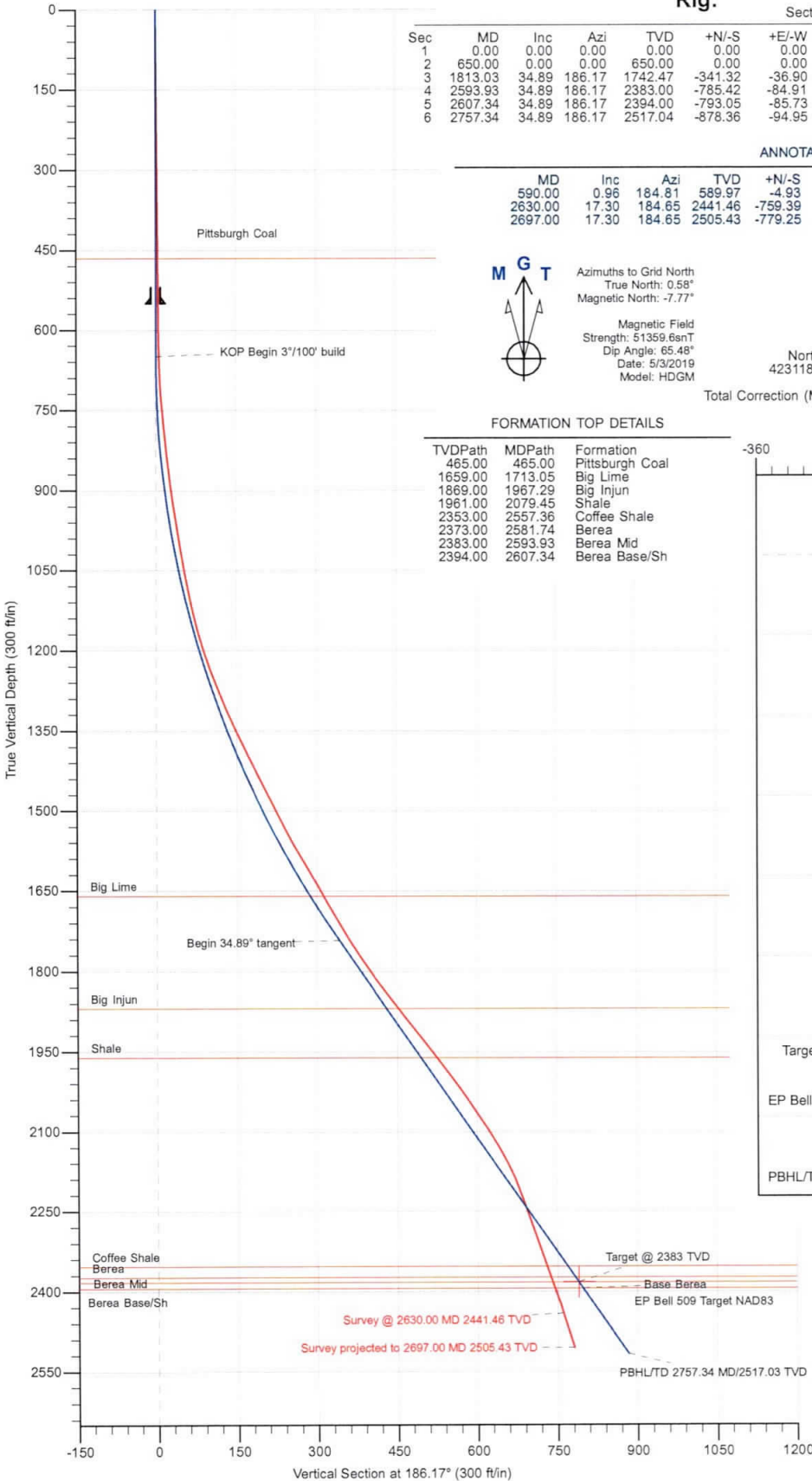
Sincerely,

John Jordan
Well Planning Analyst
Professional Directional

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HG Energy LLC

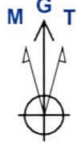
Well: EP Bell 509
 Site: EP Bell
 Project: Lincoln County, West Virginia UTM83
 Design: plan2
 Rig:



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	650.00	0.00	0.00	650.00	0.00	0.00	0.00	0.00	0.00	KOP Begin 3 1/100' build
3	1813.03	34.89	186.17	1742.47	-341.32	-36.90	3.00	186.17	343.31	Begin 34.89° tangent
4	2593.93	34.89	186.17	2383.00	-785.42	-84.91	0.00	0.00	790.00	Target @ 2383 TVD
5	2607.34	34.89	186.17	2394.00	-793.05	-85.73	0.00	0.00	797.67	Base Berea
6	2757.34	34.89	186.17	2517.04	-878.36	-94.95	0.00	0.00	883.47	PBHL/TD 2757.34 MD/2517.03 TVD

ANNOTATIONS SURVEYS

MD	Inc	Azi	TVD	+N/-S	+E/-W	Vsect	Annotation
590.00	0.96	184.81	589.97	-4.93	-0.41	4.94	MWD surveys
2630.00	17.30	184.65	2441.46	-759.39	-53.79	760.78	Survey @ 2630.00 MD 2441.46 TVD
2697.00	17.30	184.65	2505.43	-779.25	-55.41	780.69	Survey projected to 2697.00 MD 2505.43 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=903+8 @ 911.00ft

Magnetic Field
 Strength: 51359.6nT
 Dip Angle: 65.48°
 Date: 5/3/2019
 Model: HDGM

Geodetic System: Universal Transverse Mercator
 Datum: NAD83 West Virginia - HARN
 Ellipsoid: GRS 1980
 Zone: Zone 17N (84 W to 78 W)

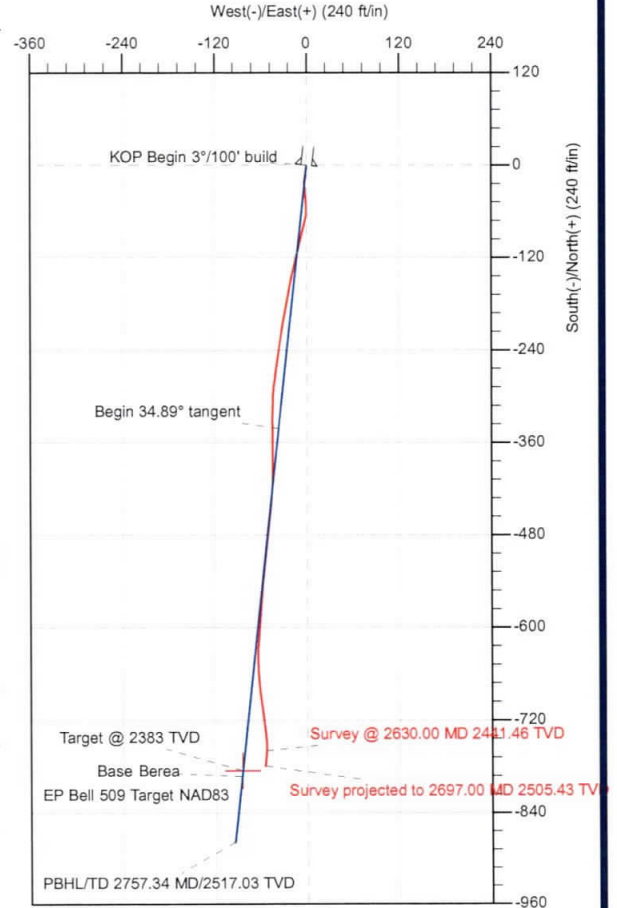
System Datum: Mean Sea Level
 Depth Reference: RKB=903+8 @ 911.00ft

Northing: 4231186.00 Easting: 4179332.00 Latitude: 38° 13' 29.5029 N Longitude: 81° 56' 40.0512 W

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

FORMATION TOP DETAILS

TVDPPath	MDPath	Formation
465.00	465.00	Pittsburgh Coal
1659.00	1713.05	Big Lime
1869.00	1967.29	Big Injun
1961.00	2079.45	Shale
2353.00	2557.36	Coffee Shale
2373.00	2581.74	Berea
2383.00	2593.93	Berea Mid
2394.00	2607.34	Berea Base/Sh



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Survey Report



Company:	HG Energy LLC	Local Co-ordinate Reference:	Well EP Bell 509
Project:	Lincoln County, West Virginia UTM83	TVD Reference:	RKB=903+8 @ 911.00ft
Site:	EP Bell	MD Reference:	RKB=903+8 @ 911.00ft
Well:	EP Bell 509	North Reference:	Grid
Wellbore:	Original Hole	Survey Calculation Method:	Minimum Curvature
Design:	Surveys Original Hole	Database:	DB_Jul2216dt_v14

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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	EP Bell				
Site Position:		Northing:	4,230,894.00 m	Latitude:	38° 13' 19.8673 N
From:	Map	Easting:	416,841.00 m	Longitude:	81° 57' 0.1198 W
Position Uncertainty:	0.00 ft	Slot Radius:	13-3/16 "	Grid Convergence:	-0.59 °

Well	EP Bell 509					
Well Position	+N/-S	0.00 ft	Northing:	4,231,186.00 m	Latitude:	38° 13' 29.5029 N
	+E/-W	0.00 ft	Easting:	417,332.00 m	Longitude:	81° 56' 40.0512 W
Position Uncertainty		0.00 ft	Wellhead Elevation:	ft	Ground Level:	903.00 ft

Wellbore	Original Hole				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	HDGM	5/3/2019	-8.35	65.48	51,359.60000000

Design	Surveys Original Hole				
Audit Notes:					
Version:	1.0	Phase:	ACTUAL	Tie On Depth:	0.00
Vertical Section:	Depth From (TVD) (ft)	+N/-S (ft)	+E/-W (ft)	Direction (°)	
	0.00	0.00	0.00	186.17	

Survey Program	Date 7/10/2019				
From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description	
590.00	2,630.00	MWD (Original Hole)	MWD	OWSG MWD - Standard	
2,697.00	2,697.00	Projection (Original Hole)	MWD	OWSG MWD - Standard	

Survey										
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
590.00	0.96	184.81	589.97	-4.93	-0.41	4.94	0.16	0.16	0.00	0.00
MWD surveys										
620.00	0.94	196.99	619.97	-5.41	-0.51	5.43	0.68	-0.07	40.60	
650.00	1.56	187.77	649.96	-6.05	-0.63	6.08	2.17	2.07	-30.73	
680.00	2.63	193.09	679.94	-7.13	-0.85	7.18	3.62	3.57	17.73	
710.00	3.91	189.96	709.89	-8.80	-1.18	8.88	4.31	4.27	-10.43	
740.00	4.59	186.55	739.81	-11.00	-1.49	11.10	2.42	2.27	-11.37	
770.00	5.20	189.67	769.70	-13.54	-1.86	13.66	2.22	2.03	10.40	
800.00	5.92	186.56	799.56	-16.41	-2.26	16.56	2.60	2.40	-10.37	

Survey Report



Company:	HG Energy LLC	Local Co-ordinate Reference:	Well EP Bell 509
Project:	Lincoln County, West Virginia UTM83	TVD Reference:	RKB=903+8 @ 911.00ft
Site:	EP Bell	MD Reference:	RKB=903+8 @ 911.00ft
Well:	EP Bell 509	North Reference:	Grid
Wellbore:	Original Hole	Survey Calculation Method:	Minimum Curvature
Design:	Surveys Original Hole	Database:	DB_Jul2216dt_v14

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Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
830.00	6.36	181.23	829.39	-19.61	-2.48	19.76	2.40	1.47	-17.77
860.00	6.94	178.76	859.18	-23.09	-2.47	23.22	2.16	1.93	-8.23
890.00	7.61	177.01	888.94	-26.88	-2.33	26.98	2.35	2.23	-5.83
920.00	8.42	175.31	918.65	-31.05	-2.05	31.09	2.81	2.70	-5.67
950.00	8.92	174.30	948.31	-35.56	-1.63	35.53	1.74	1.67	-3.37
980.00	9.86	174.23	977.90	-40.43	-1.15	40.32	3.13	3.13	-0.23
1,010.00	10.38	174.27	1,007.44	-45.67	-0.62	45.47	1.73	1.73	0.13
1,040.00	10.07	175.69	1,036.96	-50.98	-0.15	50.70	1.33	-1.03	4.73
1,070.00	10.74	179.22	1,066.47	-56.39	0.08	56.05	3.08	2.23	11.77
1,100.00	11.49	187.20	1,095.91	-62.15	-0.25	61.81	5.70	2.50	26.60
1,130.00	12.92	193.53	1,125.23	-68.37	-1.41	68.13	6.52	4.77	21.10
1,160.00	15.06	193.74	1,154.34	-75.42	-3.12	75.32	7.14	7.13	0.70
1,190.00	17.40	193.35	1,183.14	-83.57	-5.08	83.63	7.81	7.80	-1.30
1,220.00	19.18	193.85	1,211.62	-92.72	-7.30	92.97	5.96	5.93	1.67
1,250.00	20.60	193.71	1,239.83	-102.63	-9.73	103.09	4.74	4.73	-0.47
1,280.00	21.48	194.59	1,267.83	-113.08	-12.36	113.75	3.12	2.93	2.93
1,310.00	22.61	194.13	1,295.64	-123.99	-15.16	124.90	3.81	3.77	-1.53
1,340.00	24.11	192.92	1,323.18	-135.55	-17.93	136.69	5.25	5.00	-4.03
1,370.00	25.32	191.40	1,350.43	-147.81	-20.57	149.17	4.56	4.03	-5.07
1,400.00	25.86	189.85	1,377.49	-160.55	-22.96	162.08	2.87	1.80	-5.17
1,430.00	26.94	190.21	1,404.36	-173.68	-25.28	175.39	3.64	3.60	1.20
1,460.00	27.77	189.74	1,431.00	-187.26	-27.67	189.15	2.86	2.77	-1.57
1,490.00	26.87	190.46	1,457.66	-200.81	-30.08	202.88	3.20	-3.00	2.40
1,520.00	26.49	189.92	1,484.46	-214.07	-32.47	216.32	1.50	-1.27	-1.80
1,550.00	27.04	189.97	1,511.25	-227.38	-34.80	229.80	1.83	1.83	0.17
1,580.00	28.60	188.69	1,537.78	-241.19	-37.07	243.78	5.57	5.20	-4.27
1,610.00	29.51	188.65	1,564.01	-255.60	-39.26	258.34	3.03	3.03	-0.13
1,640.00	30.32	188.14	1,590.01	-270.40	-41.45	273.29	2.83	2.70	-1.70
1,670.00	30.77	185.97	1,615.85	-285.53	-43.32	288.53	3.97	1.50	-7.23
1,700.00	29.63	182.55	1,641.78	-300.57	-44.44	303.60	6.88	-3.80	-11.40
1,730.00	29.79	180.74	1,667.83	-315.43	-44.87	318.42	3.04	0.53	-6.03
1,760.00	30.25	179.37	1,693.81	-330.44	-44.88	333.35	2.75	1.53	-4.57
1,790.00	31.34	179.15	1,719.58	-345.80	-44.68	348.59	3.65	3.63	-0.73
1,820.00	32.28	178.98	1,745.07	-361.61	-44.43	364.29	3.15	3.13	-0.57
1,850.00	33.97	179.92	1,770.20	-378.00	-44.27	380.57	5.89	5.63	3.13
1,880.00	35.55	181.04	1,794.84	-395.10	-44.42	397.59	5.68	5.27	3.73
1,910.00	36.50	182.73	1,819.10	-412.73	-45.00	415.18	4.58	3.17	5.63
1,940.00	37.56	185.11	1,843.06	-430.75	-46.24	433.23	5.94	3.53	7.93
1,970.00	37.94	185.72	1,866.78	-449.04	-47.97	451.59	1.78	1.27	2.03
2,000.00	37.45	185.50	1,890.51	-467.29	-49.77	469.94	1.69	-1.63	-0.73
2,030.00	38.47	186.82	1,914.17	-485.64	-51.75	488.39	4.35	3.40	4.40
2,060.00	39.16	186.60	1,937.54	-504.32	-53.95	507.19	2.35	2.30	-0.73
2,090.00	38.20	186.54	1,960.96	-522.94	-56.09	525.94	3.20	-3.20	-0.20

Survey Report



Company:	HG Energy LLC	Local Co-ordinate Reference:	Well EP Bell 509
Project:	Lincoln County, West Virginia UTM83	TVD Reference:	RKB=903+8 @ 911.00ft
Site:	EP Bell	MD Reference:	RKB=903+8 @ 911.00ft
Well:	EP Bell 509	North Reference:	Grid
Wellbore:	Original Hole	Survey Calculation Method:	Minimum Curvature
Design:	Surveys Original Hole	Database:	DB_Jul2216dt_v14

Survey										
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	
2,120.00	36.86	185.09	1,984.75	-541.12	-57.95	544.21	5.35	-4.47	-4.83	
2,150.00	35.16	184.93	2,009.02	-558.69	-59.49	561.85	5.68	-5.67	-0.53	
2,180.00	34.56	183.56	2,033.64	-575.79	-60.76	578.98	3.29	-2.00	-4.57	
2,210.00	34.64	184.17	2,058.33	-592.79	-61.91	596.01	1.19	0.27	2.03	
2,240.00	34.29	184.34	2,083.06	-609.72	-63.17	612.97	1.21	-1.17	0.57	
2,270.00	32.14	182.25	2,108.16	-626.12	-64.12	629.38	8.12	-7.17	-6.97	
2,300.00	29.43	179.59	2,133.93	-641.47	-64.38	644.67	10.11	-9.03	-8.87	
2,330.00	26.57	177.16	2,160.42	-655.54	-64.00	658.62	10.26	-9.53	-8.10	
2,360.00	23.37	173.66	2,187.61	-668.16	-63.01	671.06	11.74	-10.67	-11.67	
2,390.00	20.84	173.15	2,215.41	-679.37	-61.71	682.07	8.46	-8.43	-1.70	
2,420.00	20.17	174.03	2,243.51	-689.82	-60.54	692.33	2.46	-2.23	2.93	
2,450.00	19.94	174.31	2,271.69	-700.05	-59.49	702.39	0.83	-0.77	0.93	
2,480.00	19.78	172.17	2,299.90	-710.17	-58.29	712.32	2.48	-0.53	-7.13	
2,510.00	19.41	170.73	2,328.17	-720.12	-56.80	722.05	2.03	-1.23	-4.80	
2,540.00	19.33	170.52	2,356.47	-729.94	-55.18	731.64	0.35	-0.27	-0.70	
2,570.00	20.10	173.98	2,384.71	-739.96	-53.82	741.46	4.66	2.57	11.53	
2,600.00	19.19	180.87	2,412.97	-750.02	-53.35	751.41	8.29	-3.03	22.97	
2,630.00	17.30	184.65	2,441.46	-759.39	-53.79	760.78	7.43	-6.30	12.60	
Survey @ 2630.00 MD 2441.46 TVD										
2,697.00	17.30	184.65	2,505.43	-779.25	-55.41	780.69	0.00	0.00	0.00	
Survey projected to 2697.00 MD 2505.43 TVD										

Design Annotations					
Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment	
		+N/-S (ft)	+E/-W (ft)		
590.00	589.97	-4.93	-0.41	MWD surveys	
2,630.00	2,441.46	-759.39	-53.79	Survey @ 2630.00 MD 2441.46 TVD	

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Survey Report - Geographic



Company:	HG Energy LLC	Local Co-ordinate Reference:	Well EP Bell 509
Project:	Lincoln County, West Virginia UTM83	TVD Reference:	RKB=903+8 @ 911.00ft
Site:	EP Bell	MD Reference:	RKB=903+8 @ 911.00ft
Well:	EP Bell 509	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	EP Bell				
Site Position:		Northing:	4,230,894.00 m	Latitude:	38° 13' 19.8673 N
From:	Map	Easting:	416,841.00 m	Longitude:	81° 57' 0.1198 W
Position Uncertainty:	0.00 ft	Slot Radius:	13-3/16 "	Grid Convergence:	-0.59 °

Well	EP Bell 509					
Well Position	+N/-S	0.00 ft	Northing:	4,231,186.00 m	Latitude:	38° 13' 29.5029 N
	+E/-W	0.00 ft	Easting:	417,332.00 m	Longitude:	81° 56' 40.0512 W
Position Uncertainty		0.00 ft	Wellhead Elevation:	ft	Ground Level:	903.00 ft

Wellbore	Original Hole				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	HDGM	5/3/2019	-8.35	65.48	51,359.60000000

Design	Surveys Original Hole				
Audit Notes:					
Version:	1.0	Phase:	ACTUAL	Tie On Depth:	0.00
Vertical Section:	Depth From (TVD) (ft)	+N/-S (ft)	+E/-W (ft)	Direction (°)	
	0.00	0.00	0.00	186.17	

Survey Program	Date	7/10/2019			
From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description	
590.00	2,630.00	MWD (Original Hole)	MWD	OWSG MWD - Standard	
2,697.00	2,697.00	Projection (Original Hole)	MWD	OWSG MWD - Standard	

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Environmental Protection

Survey										
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Map Northing (m)	Map Easting (m)	Latitude	Longitude	
0.00	0.00	0.00	0.00	0.00	0.00	4,231,186.00	417,332.00	38° 13' 29.5029 N	81° 56' 40.0512 W	
590.00	0.96	184.81	589.97	-4.93	-0.41	4,231,184.50	417,331.87	38° 13' 29.4542 N	81° 56' 40.0558 W	
MWD surveys										
620.00	0.94	196.99	619.97	-5.41	-0.51	4,231,184.36	417,331.84	38° 13' 29.4494 N	81° 56' 40.0569 W	
650.00	1.56	187.77	649.96	-6.05	-0.63	4,231,184.16	417,331.81	38° 13' 29.4430 N	81° 56' 40.0584 W	
680.00	2.63	193.09	679.94	-7.13	-0.85	4,231,183.83	417,331.74	38° 13' 29.4324 N	81° 56' 40.0609 W	
710.00	3.91	189.96	709.89	-8.80	-1.18	4,231,183.32	417,331.64	38° 13' 29.4158 N	81° 56' 40.0649 W	
740.00	4.59	186.55	739.81	-11.00	-1.49	4,231,182.65	417,331.54	38° 13' 29.3940 N	81° 56' 40.0685 W	
770.00	5.20	189.67	769.70	-13.54	-1.86	4,231,181.88	417,331.43	38° 13' 29.3689 N	81° 56' 40.0728 W	
800.00	5.92	186.56	799.56	-16.41	-2.26	4,231,181.00	417,331.31	38° 13' 29.3404 N	81° 56' 40.0775 W	
830.00	6.36	181.23	829.39	-19.61	-2.48	4,231,180.03	417,331.24	38° 13' 29.3088 N	81° 56' 40.0797 W	

Survey Report - Geographic



Company:	HG Energy LLC	Local Co-ordinate Reference:	Well EP Bell 509
Project:	Lincoln County, West Virginia UTM83	TVD Reference:	RKB=903+8 @ 911.00ft
Site:	EP Bell	MD Reference:	RKB=903+8 @ 911.00ft
Well:	EP Bell 509	North Reference:	Grid
Wellbore:	Original Hole	Survey Calculation Method:	Minimum Curvature
Design:	Surveys Original Hole	Database:	DB_Jul2216dt_v14

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Survey										
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Map Northing (m)	Map Easting (m)	Latitude	Longitude	
860.00	6.94	178.76	859.18	-23.09	-2.47	4,231,178.97	417,331.25	38° 13' 29.2744 N	81° 56' 40.0792 W	
890.00	7.61	177.01	888.94	-26.88	-2.33	4,231,177.81	417,331.29	38° 13' 29.2369 N	81° 56' 40.0770 W	
920.00	8.42	175.31	918.65	-31.05	-2.05	4,231,176.54	417,331.38	38° 13' 29.1957 N	81° 56' 40.0729 W	
950.00	8.92	174.30	948.31	-35.56	-1.63	4,231,175.17	417,331.50	38° 13' 29.1512 N	81° 56' 40.0672 W	
980.00	9.86	174.23	977.90	-40.43	-1.15	4,231,173.68	417,331.65	38° 13' 29.1031 N	81° 56' 40.0604 W	
1,010.00	10.38	174.27	1,007.44	-45.67	-0.62	4,231,172.08	417,331.81	38° 13' 29.0513 N	81° 56' 40.0531 W	
1,040.00	10.07	175.69	1,036.96	-50.98	-0.15	4,231,170.47	417,331.95	38° 13' 28.9989 N	81° 56' 40.0466 W	
1,070.00	10.74	179.22	1,066.47	-56.39	0.08	4,231,168.82	417,332.03	38° 13' 28.9454 N	81° 56' 40.0429 W	
1,100.00	11.49	187.20	1,095.91	-62.15	-0.25	4,231,167.06	417,331.92	38° 13' 28.8884 N	81° 56' 40.0464 W	
1,130.00	12.92	193.53	1,125.23	-68.37	-1.41	4,231,165.16	417,331.57	38° 13' 28.8267 N	81° 56' 40.0602 W	
1,160.00	15.06	193.74	1,154.34	-75.42	-3.12	4,231,163.02	417,331.05	38° 13' 28.7569 N	81° 56' 40.0807 W	
1,190.00	17.40	193.35	1,183.14	-83.57	-5.08	4,231,160.53	417,330.45	38° 13' 28.6761 N	81° 56' 40.1042 W	
1,220.00	19.18	193.85	1,211.62	-92.72	-7.30	4,231,157.74	417,329.77	38° 13' 28.5854 N	81° 56' 40.1308 W	
1,250.00	20.60	193.71	1,239.83	-102.63	-9.73	4,231,154.72	417,329.03	38° 13' 28.4871 N	81° 56' 40.1600 W	
1,280.00	21.48	194.59	1,267.83	-113.08	-12.36	4,231,151.54	417,328.23	38° 13' 28.3836 N	81° 56' 40.1917 W	
1,310.00	22.61	194.13	1,295.64	-123.99	-15.16	4,231,148.21	417,327.38	38° 13' 28.2754 N	81° 56' 40.2253 W	
1,340.00	24.11	192.92	1,323.18	-135.55	-17.93	4,231,144.69	417,326.53	38° 13' 28.1608 N	81° 56' 40.2587 W	
1,370.00	25.32	191.40	1,350.43	-147.81	-20.57	4,231,140.95	417,325.73	38° 13' 28.0393 N	81° 56' 40.2902 W	
1,400.00	25.86	189.85	1,377.49	-160.55	-22.96	4,231,137.07	417,325.00	38° 13' 27.9131 N	81° 56' 40.3185 W	
1,430.00	26.94	190.21	1,404.36	-173.68	-25.28	4,231,133.07	417,324.29	38° 13' 27.7830 N	81° 56' 40.3459 W	
1,460.00	27.77	189.74	1,431.00	-187.26	-27.67	4,231,128.93	417,323.57	38° 13' 27.6485 N	81° 56' 40.3741 W	
1,490.00	26.87	190.46	1,457.66	-200.81	-30.08	4,231,124.80	417,322.83	38° 13' 27.5143 N	81° 56' 40.4026 W	
1,520.00	26.49	189.92	1,484.46	-214.07	-32.47	4,231,120.76	417,322.10	38° 13' 27.3829 N	81° 56' 40.4308 W	
1,550.00	27.04	189.97	1,511.25	-227.38	-34.80	4,231,116.70	417,321.39	38° 13' 27.2511 N	81° 56' 40.4583 W	
1,580.00	28.60	188.69	1,537.78	-241.19	-37.07	4,231,112.49	417,320.70	38° 13' 27.1143 N	81° 56' 40.4850 W	
1,610.00	29.51	188.65	1,564.01	-255.60	-39.26	4,231,108.10	417,320.03	38° 13' 26.9716 N	81° 56' 40.5107 W	
1,640.00	30.32	188.14	1,590.01	-270.40	-41.45	4,231,103.59	417,319.37	38° 13' 26.8251 N	81° 56' 40.5361 W	
1,670.00	30.77	185.97	1,615.85	-285.53	-43.32	4,231,098.98	417,318.80	38° 13' 26.6753 N	81° 56' 40.5576 W	
1,700.00	29.63	182.55	1,641.78	-300.57	-44.44	4,231,094.39	417,318.45	38° 13' 26.5264 N	81° 56' 40.5699 W	
1,730.00	29.79	180.74	1,667.83	-315.43	-44.87	4,231,089.86	417,318.32	38° 13' 26.3794 N	81° 56' 40.5733 W	
1,760.00	30.25	179.37	1,693.81	-330.44	-44.88	4,231,085.29	417,318.32	38° 13' 26.2310 N	81° 56' 40.5715 W	
1,790.00	31.34	179.15	1,719.58	-345.80	-44.68	4,231,080.61	417,318.38	38° 13' 26.0792 N	81° 56' 40.5671 W	
1,820.00	32.28	178.98	1,745.07	-361.61	-44.43	4,231,075.79	417,318.46	38° 13' 25.9229 N	81° 56' 40.5618 W	
1,850.00	33.97	179.92	1,770.20	-378.00	-44.27	4,231,070.79	417,318.51	38° 13' 25.7608 N	81° 56' 40.5578 W	
1,880.00	35.55	181.04	1,794.84	-395.10	-44.42	4,231,065.58	417,318.46	38° 13' 25.5917 N	81° 56' 40.5575 W	
1,910.00	36.50	182.73	1,819.10	-412.73	-45.00	4,231,060.20	417,318.28	38° 13' 25.4173 N	81° 56' 40.5625 W	
1,940.00	37.56	185.11	1,843.06	-430.75	-46.24	4,231,054.71	417,317.91	38° 13' 25.2390 N	81° 56' 40.5757 W	
1,970.00	37.94	185.72	1,866.78	-449.04	-47.97	4,231,049.14	417,317.38	38° 13' 25.0580 N	81° 56' 40.5951 W	
2,000.00	37.45	185.50	1,890.51	-467.29	-49.77	4,231,043.57	417,316.83	38° 13' 24.8773 N	81° 56' 40.6153 W	
2,030.00	38.47	186.82	1,914.17	-485.64	-51.75	4,231,037.98	417,316.23	38° 13' 24.6957 N	81° 56' 40.6378 W	
2,060.00	39.16	186.60	1,937.54	-504.32	-53.95	4,231,032.29	417,315.56	38° 13' 24.5108 N	81° 56' 40.6629 W	
2,090.00	38.20	186.54	1,960.96	-522.94	-56.09	4,231,026.61	417,314.90	38° 13' 24.3265 N	81° 56' 40.6874 W	
2,120.00	36.86	185.09	1,984.75	-541.12	-57.95	4,231,021.07	417,314.34	38° 13' 24.1465 N	81° 56' 40.7084 W	
2,150.00	35.16	184.93	2,009.02	-558.69	-59.49	4,231,015.72	417,313.87	38° 13' 23.9726 N	81° 56' 40.7254 W	
2,180.00	34.56	183.56	2,033.64	-575.79	-60.76	4,231,010.50	417,313.48	38° 13' 23.8034 N	81° 56' 40.7392 W	
2,210.00	34.64	184.17	2,058.33	-592.79	-61.91	4,231,005.32	417,313.13	38° 13' 23.6352 N	81° 56' 40.7514 W	
2,240.00	34.29	184.34	2,083.06	-609.72	-63.17	4,231,000.16	417,312.75	38° 13' 23.4677 N	81° 56' 40.7650 W	
2,270.00	32.14	182.25	2,108.16	-626.12	-64.12	4,230,995.16	417,312.46	38° 13' 23.3054 N	81° 56' 40.7749 W	
2,300.00	29.43	179.59	2,133.93	-641.47	-64.38	4,230,990.49	417,312.38	38° 13' 23.1536 N	81° 56' 40.7762 W	
2,330.00	26.57	177.16	2,160.42	-655.54	-64.00	4,230,986.20	417,312.49	38° 13' 23.0145 N	81° 56' 40.7695 W	
2,360.00	23.37	173.66	2,187.61	-668.16	-63.01	4,230,982.35	417,312.80	38° 13' 22.8898 N	81° 56' 40.7555 W	
2,390.00	20.84	173.15	2,215.41	-679.37	-61.71	4,230,978.93	417,313.19	38° 13' 22.7791 N	81° 56' 40.7379 W	
2,420.00	20.17	174.03	2,243.51	-689.82	-60.54	4,230,975.75	417,313.55	38° 13' 22.6760 N	81° 56' 40.7218 W	
2,450.00	19.94	174.31	2,271.69	-700.05	-59.49	4,230,972.63	417,313.87	38° 13' 22.5749 N	81° 56' 40.7074 W	
2,480.00	19.78	172.17	2,299.90	-710.17	-58.29	4,230,969.54	417,314.23	38° 13' 22.4749 N	81° 56' 40.6911 W	

Survey Report - Geographic



Company:	HG Energy LLC	Local Co-ordinate Reference:	Well EP Bell 509
Project:	Lincoln County, West Virginia UTM83	TVD Reference:	RKB=903+8 @ 911.00ft
Site:	EP Bell	MD Reference:	RKB=903+8 @ 911.00ft
Well:	EP Bell 509	North Reference:	Grid
Wellbore:	Original Hole	Survey Calculation Method:	Minimum Curvature
Design:	Surveys Original Hole	Database:	DB_Jul2216dt_v14

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Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Map Northing (m)	Map Easting (m)	Latitude	Longitude
2,510.00	19.41	170.73	2,328.17	-720.12	-56.80	4,230,966.51	417,314.69	38° 13' 22.3767 N	81° 56' 40.6711 W
2,540.00	19.33	170.52	2,356.47	-729.94	-55.18	4,230,963.52	417,315.18	38° 13' 22.2798 N	81° 56' 40.6495 W
2,570.00	20.10	173.98	2,384.71	-739.96	-53.82	4,230,960.46	417,315.60	38° 13' 22.1808 N	81° 56' 40.6312 W
2,600.00	19.19	180.87	2,412.97	-750.02	-53.35	4,230,957.40	417,315.74	38° 13' 22.0814 N	81° 56' 40.6241 W
2,630.00	17.30	184.65	2,441.46	-759.39	-53.79	4,230,954.54	417,315.60	38° 13' 21.9886 N	81° 56' 40.6283 W
Survey @ 2630.00 MD 2441.46 TVD									
2,697.00	17.30	184.65	2,505.43	-779.25	-55.41	4,230,948.49	417,315.11	38° 13' 21.7921 N	81° 56' 40.6460 W
Survey projected to 2697.00 MD 2505.43 TVD									

Design Annotations

Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment
		+N/-S (ft)	+E/-W (ft)	
590.00	589.97	-4.93	-0.41	MWD surveys
2,630.00	2,441.46	-759.39	-53.79	Survey @ 2630.00 MD 2441.46 TVD
2,697.00	2,505.43	-779.25	-55.41	Survey projected to 2697.00 MD 2505.43 TVD

HG Energy LLC

Lincoln County, West Virginia UTM83

EP Bell

EP Bell 509

Original Hole

Design: Surveys Original Hole

Completion Report

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Completion Report

Company: HG Energy LLC
Project: Lincoln County, West Virginia UTM83
Site: EP Bell
Well: EP Bell 509
Wellbore: Original Hole
Design: Surveys Original Hole

Local Co-ordinate Reference: Well EP Bell 509
TVD Reference: RKB=903+8 @ 911.00ft
MD Reference: RKB=903+8 @ 911.00ft
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Database: DB_Jul2216dt_v14

Project: Lincoln County, West Virginia UTM83
Map System: Universal Transverse Mercator
Geo Datum: NAD83 West Virginia - HARN
Map Zone: Zone 17N (84 W to 78 W)

System Datum: Mean Sea Level

Site: EP Bell
Site Position: 4,230,894.00 m Northing: 38° 13' 19.8673 N
From: Map 416,841.00 m Easting: 81° 57' 0.1198 W
Position Uncertainty: 0.00 ft Slot Radius: 13-3/16 " Grid Convergence: -0.59 °

Well: EP Bell 509
Well Position: +N/-S 0.00 ft Northing: 4,231,186.00 m Latitude: 38° 13' 29.5029 N
Position Uncertainty: +E/-W 0.00 ft Easting: 417,332.00 m Longitude: 81° 56' 40.0512 W
 Wellhead Elevation: 0.00 ft Ground Level: 903.00 ft

Wellbore	Original Hole
Magnetics	
Model Name	HDGM
Sample Date	5/3/2019
Declination (°)	-8.35
Dip Angle (°)	65.48
Field Strength (nT)	51,359.60000000

Design	Surveys Original Hole
Audit Notes:	
Version:	1.0
Vertical Section:	
Phase:	ACTUAL
Depth From (TVD) (ft)	+N/-S (ft)
0.00	0.00
Tie On Depth:	+E/-W (ft)
0.00	0.00
Direction (°)	186.17

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Completion Report

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Company: HG Energy LLC
Project: Lincoln County, West Virginia UTM83
Site: EP Bell
Well: EP Bell 509
Wellbore: Original Hole
Design: Surveys Original Hole

Local Co-ordinate Reference: Well EP Bell 509
TVD Reference: RKB=903+8 @ 911.00ft
MD Reference: RKB=903+8 @ 911.00ft
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Database: DB_Jul2216ct_v14

Survey Program	From (ft)	To (ft)	Date	Survey (Wellbore)	Tool Name	Description
	590.00	2,630.00	7/10/2019	MWD (Original Hole)	MWD	OWSG MWD - Standard
	2,697.00	2,697.00		Projection (Original Hole)	MWD	OWSG MWD - Standard

Survey	MD (ft)	Inc (°)	Azi (azimuth) (°)	TVD (ft)	DLeg (°/100ust)	N/S (ft)	E/W (ft)	Closure Distance (ft)	Closure Azimuth (°)	Northing (m)	Easting (m)
	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4,231,186.00	417,332.00
	590.00	0.96	184.81	589.97	0.16	-4.93	-0.41	4.94	184.81	4,231,184.50	417,331.87
MWD surveys											
	620.00	0.94	196.99	619.97	0.68	-5.41	-0.51	5.43	185.36	4,231,184.35	417,331.85
	650.00	1.56	187.77	649.96	2.17	-6.05	-0.63	6.08	185.99	4,231,184.16	417,331.81
	680.00	2.63	193.09	679.94	3.62	-7.13	-0.85	7.18	186.77	4,231,183.83	417,331.74
	710.00	3.91	189.96	709.89	4.31	-8.80	-1.18	8.88	187.62	4,231,183.32	417,331.64
	740.00	4.59	186.55	739.81	2.42	-11.00	-1.49	11.10	187.72	4,231,182.65	417,331.55
	770.00	5.20	189.67	769.70	2.22	-13.54	-1.86	13.66	187.81	4,231,181.87	417,331.43
	800.00	5.92	186.56	799.56	2.60	-16.41	-2.26	16.57	187.85	4,231,181.00	417,331.31
	830.00	6.36	181.23	829.39	2.40	-19.61	-2.48	19.77	187.19	4,231,180.02	417,331.25
	860.00	6.94	178.76	859.18	2.16	-23.09	-2.47	23.22	186.11	4,231,178.96	417,331.25
	890.00	7.61	177.01	888.94	2.35	-26.88	-2.33	26.98	184.95	4,231,177.81	417,331.29
	920.00	8.42	175.31	918.65	2.81	-31.05	-2.05	31.12	183.77	4,231,176.53	417,331.38
	950.00	8.92	174.30	948.31	1.74	-35.56	-1.63	35.60	182.63	4,231,175.16	417,331.50
	980.00	9.86	174.23	977.90	3.13	-40.43	-1.15	40.44	181.62	4,231,173.68	417,331.65
	1,010.00	10.38	174.27	1,007.44	1.73	-45.67	-0.62	45.68	180.77	4,231,172.08	417,331.81
	1,040.00	10.07	175.69	1,036.96	1.33	-50.98	-0.15	50.98	180.17	4,231,170.46	417,331.95
	1,070.00	10.74	179.22	1,066.47	3.08	-56.39	0.08	56.39	179.91	4,231,168.81	417,332.03
	1,100.00	11.49	187.20	1,095.91	5.70	-62.15	-0.25	62.15	180.23	4,231,167.06	417,331.92
	1,130.00	12.92	193.53	1,125.23	6.52	-68.37	-1.41	68.39	181.18	4,231,165.16	417,331.57



Completion Report

Company: HG Energy LLC Project: Lincoln County, West Virginia UTM83 Site: EP Bell Well: EP Bell 509 Wellbore: Original Hole Design: Surveys Original Hole	Local Co-ordinate Reference: Well EP Bell 509 TVD Reference: RKB=903+8 @ 911.00ft MD Reference: RKB=903+8 @ 911.00ft North Reference: Grid Survey Calculation Method: Minimum Curvature Database: DB_Jul2216dt_v14
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Survey	MD (ft)	Inc (°)	Azi (azimuth) (°)	TVD (ft)	DLeg (°/100usft)	N/S (ft)	E/W (ft)	Closure Distance (ft)	Closure Azimuth (°)	Northing (m)	Easting (m)
	1,160.00	15.06	193.74	1,154.34	7.14	-75.42	-3.12	75.49	182.37	4,231,163.01	417,331.05
	1,190.00	17.40	193.35	1,183.14	7.81	-83.57	-5.08	83.73	183.48	4,231,160.53	417,330.45
	1,220.00	19.18	193.85	1,211.62	5.96	-92.72	-7.30	93.01	184.50	4,231,157.74	417,329.78
	1,250.00	20.60	193.71	1,239.83	4.74	-102.63	-9.73	103.09	185.42	4,231,154.72	417,329.03
	1,280.00	21.48	194.59	1,267.83	3.12	-113.08	-12.36	113.75	186.24	4,231,151.53	417,328.23
	1,310.00	22.61	194.13	1,295.64	3.81	-123.99	-15.16	124.91	186.97	4,231,148.21	417,327.38
	1,340.00	24.11	192.92	1,323.18	5.25	-135.55	-17.93	136.73	187.54	4,231,144.88	417,326.53
	1,370.00	25.32	191.40	1,350.43	4.56	-147.81	-20.57	149.24	187.92	4,231,140.95	417,325.73
	1,400.00	25.86	189.85	1,377.49	2.87	-160.55	-22.96	162.18	188.14	4,231,137.07	417,325.00
	1,430.00	26.94	190.21	1,404.36	3.64	-173.68	-25.28	175.51	188.28	4,231,133.06	417,324.29
	1,460.00	27.77	189.74	1,431.00	2.86	-187.26	-27.67	189.29	188.41	4,231,128.92	417,323.57
	1,490.00	26.87	190.46	1,457.66	3.20	-200.81	-30.08	203.05	188.52	4,231,124.79	417,322.83
	1,520.00	26.49	189.92	1,484.46	1.50	-214.07	-32.47	216.52	188.62	4,231,120.75	417,322.10
	1,550.00	27.04	189.97	1,511.25	1.83	-227.38	-34.80	230.03	188.70	4,231,116.70	417,321.39
	1,580.00	28.60	188.69	1,537.78	5.57	-241.19	-37.07	244.02	188.74	4,231,112.48	417,320.70
	1,610.00	29.51	188.65	1,564.01	3.03	-255.60	-39.26	258.59	188.73	4,231,108.09	417,320.03
	1,640.00	30.32	188.14	1,590.01	2.83	-270.40	-41.45	273.56	188.71	4,231,103.58	417,319.37
	1,670.00	30.77	185.97	1,615.85	3.97	-285.53	-43.32	288.79	188.63	4,231,098.97	417,318.80
	1,700.00	29.63	182.55	1,641.78	6.88	-300.57	-44.44	303.84	188.41	4,231,094.39	417,318.45
	1,730.00	29.79	180.74	1,667.83	3.04	-315.43	-44.87	318.60	188.10	4,231,089.86	417,318.32
	1,760.00	30.25	179.37	1,693.81	2.75	-330.44	-44.88	333.47	187.74	4,231,085.28	417,318.32
	1,790.00	31.34	179.15	1,719.58	3.65	-345.80	-44.68	348.67	187.36	4,231,080.60	417,318.38
	1,820.00	32.28	178.98	1,745.07	3.15	-361.61	-44.43	364.32	187.00	4,231,075.78	417,318.46
	1,850.00	33.97	179.92	1,770.20	5.89	-378.00	-44.27	380.58	186.68	4,231,070.79	417,318.51
	1,880.00	35.55	181.04	1,794.84	5.68	-395.10	-44.42	397.59	186.41	4,231,065.57	417,318.46
	1,910.00	36.50	182.73	1,819.10	4.58	-412.73	-45.00	415.18	186.22	4,231,060.20	417,318.28
	1,940.00	37.56	185.11	1,843.05	5.94	-430.75	-46.24	433.23	186.13	4,231,054.71	417,317.91



Completion Report

Company: HG Energy LLC
 Project: Lincoln County, West Virginia UTM83
 Site: EP Bell
 Well: EP Bell 509
 Wellbore: Original Hole
 Design: Surveys Original Hole

Local Co-ordinate Reference: Well EP Bell 509
 TVD Reference: RKB=903+8 @ 911.00ft
 MD Reference: RKB=903+8 @ 911.00ft
 North Reference: Grid
 Survey Calculation Method: Minimum Curvature
 Database: DB_Jul2216dt_v14

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Survey	MD (ft)	Inc (°)	Azi (azimuth) (°)	TVD (ft)	DLeg (°/100usft)	N/S (ft)	E/W (ft)	Closure Distance (ft)	Closure Azimuth (°)	Northing (m)	Easting (m)
	1,970.00	37.94	185.72	1,866.78	1.78	-449.04	-47.97	451.59	186.10	4,231,049.13	417,317.38
	2,000.00	37.45	185.50	1,890.51	1.69	-467.29	-49.77	469.94	186.08	4,231,043.57	417,316.83
	2,030.00	38.47	186.82	1,914.17	4.35	-485.64	-51.75	488.39	186.08	4,231,037.98	417,316.23
	2,060.00	39.16	186.60	1,937.54	2.35	-504.32	-53.95	507.19	186.11	4,231,032.28	417,315.56
	2,090.00	38.20	186.54	1,960.96	3.20	-522.94	-56.09	525.94	186.12	4,231,026.61	417,314.90
	2,120.00	36.86	185.09	1,984.75	5.35	-541.12	-57.95	544.21	186.11	4,231,021.07	417,314.34
	2,150.00	35.16	184.93	2,009.02	5.68	-558.69	-59.49	561.85	186.08	4,231,015.71	417,313.87
	2,180.00	34.56	183.56	2,033.64	3.29	-575.79	-60.76	578.99	186.02	4,231,010.50	417,313.48
	2,210.00	34.64	184.17	2,058.33	1.19	-592.79	-61.91	596.01	185.96	4,231,005.32	417,313.13
	2,240.00	34.29	184.34	2,083.06	1.21	-609.72	-63.17	612.98	185.91	4,231,000.16	417,312.75
	2,270.00	32.14	182.25	2,108.16	8.12	-626.12	-64.12	629.39	185.85	4,230,995.16	417,312.46
	2,300.00	29.43	179.59	2,133.93	10.11	-641.47	-64.38	644.69	185.73	4,230,990.48	417,312.38
	2,330.00	26.57	177.16	2,160.42	10.26	-655.54	-64.00	658.66	185.58	4,230,986.19	417,312.49
	2,360.00	23.37	173.66	2,187.61	11.74	-668.16	-63.01	671.12	185.39	4,230,982.35	417,312.80
	2,390.00	20.84	173.15	2,215.41	8.46	-679.37	-61.71	682.17	185.19	4,230,978.93	417,313.19
	2,420.00	20.17	174.03	2,243.51	2.46	-689.82	-60.54	692.47	185.02	4,230,975.74	417,313.55
	2,450.00	19.94	174.31	2,271.69	0.83	-700.05	-59.49	702.57	184.86	4,230,972.62	417,313.87
	2,480.00	19.78	172.17	2,299.90	2.48	-710.17	-58.29	712.56	184.69	4,230,969.54	417,314.23
	2,510.00	19.41	170.73	2,328.17	2.03	-720.12	-56.80	722.35	184.51	4,230,966.51	417,314.69
	2,540.00	19.33	170.52	2,356.47	0.35	-729.94	-55.18	732.02	184.32	4,230,963.52	417,315.18
	2,570.00	20.10	173.98	2,384.71	4.66	-739.96	-53.82	741.91	184.16	4,230,960.46	417,315.60
	2,600.00	19.19	180.87	2,412.97	8.29	-750.02	-53.35	751.91	184.07	4,230,957.39	417,315.74
	2,630.00	17.30	184.65	2,441.46	7.43	-759.39	-53.79	761.30	184.05	4,230,954.54	417,315.60
Survey @ 2630.00 MD 2441.46 TVD											
	2,697.00	17.30	184.65	2,505.43	0.00	-779.25	-55.41	781.22	184.07	4,230,948.48	417,315.11
Survey projected to 2697.00 MD 2505.43 TVD											



Completion Report

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Design: Surveys Original Hole

Local Co-ordinate Reference: Well EP Bell 509
TVD Reference: RKB=903+8 @ 911.00ft
MD Reference: RKB=903+8 @ 911.00ft
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Database: DB_Jul2216dt_v14

Design Annotations

Measured Depth (ft)	Vertical Depth (ft)	+N/-S (ft)	Local Coordinates +E/-W (ft)	Comment
590.00	589.97	-4.93	-0.41	MWD surveys
2,630.00	2,441.46	-759.39	-53.79	Survey @ 2630.00 MD 2441.46 TVD
2,697.00	2,505.43	-779.25	-55.41	Survey projected to 2697.00 MD 2505.43 TVD

Checked By: _____ Approved By: _____ Date: _____

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