

HG Energy, LLC
Lincoln County, West Virginia
Austin Griffith #102
Austin Griffith #102

Wellbore #1

Survey: MWD

Survey Report - Geographic

15 October, 2014

Received
Office of Oil & Gas
OCT 30 2014



11/07/2014

DDC
Survey Report - Geographic



Company: HG Energy, LLC	Local Co-ordinate Reference: Well Austin Griffith #102
Project: Lincoln County, West Virginia	TVD Reference: WELL @ 869.0usft (Decker #9)
Site: Austin Griffith #102	MD Reference: WELL @ 869.0usft (Decker #9)
Well: Austin Griffith #102	North Reference: Grid
Wellbore: Wellbore #1	Survey Calculation Method: Minimum Curvature
Design: Wellbore #1	Database: EDM 5000.1 Single User Db

Project	Lincoln 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	Austin Griffith #102				
Site Position:		Northing:	13,882,076.02 usft	Latitude:	38° 13' 31.600 N
From:	Lat/Long	Easting:	1,364,544.39 usft	Longitude:	81° 57' 38.400 W
Position Uncertainty:	0.0 usft	Slot Radius:	13-3/16 "	Grid Convergence:	-0.59 °

Well	Austin Griffith #102					
Well Position	+N/-S	0.0 usft	Northing:	13,882,076.01 usft	Latitude:	38° 13' 31.600 N
	+E/-W	0.0 usft	Easting:	1,364,544.39 usft	Longitude:	81° 57' 38.400 W
Position Uncertainty	0.0 usft		Wellhead Elevation:	0.0 usft	Ground Level:	861.0 usft

Wellbore	Wellbore #1				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	9/10/2014	-7.43	66.09	51,843

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	226.50	

Survey Program	Date	9/30/2014			
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description	
650.0	2,563.0	MWD (Wellbore #1)	MWD default	MWD - Standard	

Survey											
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	13,882,076.01	1,364,544.39	38° 13' 31.600 N	81° 57' 38.400 W		
650.0	0.00	0.00	650.0	0.0	0.0	13,882,076.01	1,364,544.39	38° 13' 31.600 N	81° 57' 38.400 W		
FIRST SURVEY @ 650' MD / 650' TVD											
685.0	1.00	136.60	685.0	-0.2	0.2	13,882,075.78	1,364,544.60	38° 13' 31.598 N	81° 57' 38.397 W		
715.0	0.80	147.40	715.0	-0.6	0.5	13,882,075.42	1,364,544.89	38° 13' 31.594 N	81° 57' 38.394 W		
745.0	0.70	197.20	745.0	-0.9	0.6	13,882,075.07	1,364,544.95	38° 13' 31.591 N	81° 57' 38.393 W		
775.0	2.10	227.20	775.0	-1.5	0.1	13,882,074.52	1,364,544.49	38° 13' 31.585 N	81° 57' 38.399 W		
805.0	3.80	236.90	804.9	-2.4	-1.1	13,882,073.60	1,364,543.26	38° 13' 31.576 N	81° 57' 38.414 W		
835.0	5.80	241.90	834.8	-3.7	-3.3	13,882,072.34	1,364,541.09	38° 13' 31.563 N	81° 57' 38.441 W		
865.0	7.30	237.50	864.6	-5.4	-6.2	13,882,070.61	1,364,538.14	38° 13' 31.546 N	81° 57' 38.478 W		
895.0	8.20	231.70	894.4	-7.8	-9.5	13,882,068.26	1,364,534.85	38° 13' 31.522 N	81° 57' 38.518 W		
925.0	9.40	229.00	924.0	-10.7	-13.1	13,882,065.32	1,364,531.33	38° 13' 31.493 N	81° 57' 38.562 W		

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Site:	Austin Griffith #102	MD Reference:	WELL @ 869.0usft (Decker #9)
Well:	Austin Griffith #102	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
955.0	10.80	221.30	953.5	-14.4	-16.8	13,882,061.60	1,364,527.62	38° 13' 31.456 N	81° 57' 38.608 W
985.0	12.10	226.80	983.0	-18.7	-20.9	13,882,057.34	1,364,523.47	38° 13' 31.413 N	81° 57' 38.722 W
1,015.0	13.60	229.70	1,012.2	-23.1	-25.9	13,882,052.90	1,364,518.49	38° 13' 31.369 N	81° 57' 38.793 W
1,045.0	14.80	232.10	1,041.3	-27.7	-31.6	13,882,048.27	1,364,512.78	38° 13' 31.322 N	81° 57' 38.870 W
1,075.0	15.70	232.80	1,070.2	-32.5	-37.9	13,882,043.46	1,364,506.52	38° 13' 31.274 N	81° 57' 38.952 W
1,105.0	16.20	233.40	1,099.1	-37.5	-44.5	13,882,038.51	1,364,499.93	38° 13' 31.225 N	81° 57' 39.036 W
1,135.0	16.50	231.30	1,127.9	-42.7	-51.1	13,882,033.35	1,364,493.24	38° 13' 31.173 N	81° 57' 39.118 W
1,165.0	16.80	229.30	1,156.6	-48.1	-57.8	13,882,027.86	1,364,486.63	38° 13' 31.118 N	81° 57' 39.197 W
1,195.0	16.90	225.40	1,185.3	-54.0	-64.1	13,882,021.97	1,364,480.24	38° 13' 31.059 N	81° 57' 39.274 W
1,225.0	17.60	223.40	1,214.0	-60.4	-70.4	13,882,015.62	1,364,474.02	38° 13' 30.996 N	81° 57' 39.352 W
1,255.0	17.80	223.50	1,242.5	-67.0	-76.6	13,882,008.99	1,364,467.75	38° 13' 30.929 N	81° 57' 39.428 W
1,285.0	17.40	221.90	1,271.1	-73.7	-82.8	13,882,002.33	1,364,461.59	38° 13' 30.863 N	81° 57' 39.499 W
1,315.0	16.90	218.70	1,299.8	-80.4	-88.5	13,881,995.59	1,364,455.87	38° 13' 30.796 N	81° 57' 39.568 W
1,345.0	17.10	220.40	1,328.5	-87.2	-94.1	13,881,988.83	1,364,450.29	38° 13' 30.728 N	81° 57' 39.642 W
1,375.0	17.50	222.80	1,357.1	-93.8	-100.0	13,881,982.16	1,364,444.36	38° 13' 30.662 N	81° 57' 39.717 W
1,405.0	17.70	224.40	1,385.7	-100.4	-106.3	13,881,975.59	1,364,438.11	38° 13' 30.596 N	81° 57' 39.797 W
1,435.0	17.10	224.40	1,414.4	-106.8	-112.6	13,881,969.18	1,364,431.83	38° 13' 30.532 N	81° 57' 39.872 W
1,465.0	16.20	225.00	1,443.1	-112.9	-118.6	13,881,963.07	1,364,425.79	38° 13' 30.471 N	81° 57' 39.945 W
1,495.0	16.20	224.60	1,471.9	-118.9	-124.5	13,881,957.13	1,364,419.89	38° 13' 30.412 N	81° 57' 40.018 W
1,525.0	16.50	224.30	1,500.7	-124.9	-130.4	13,881,951.10	1,364,413.98	38° 13' 30.351 N	81° 57' 40.094 W
1,555.0	16.60	227.20	1,529.5	-130.9	-136.5	13,881,945.14	1,364,407.86	38° 13' 30.292 N	81° 57' 40.171 W
1,585.0	15.40	228.70	1,558.3	-136.4	-142.7	13,881,939.60	1,364,401.72	38° 13' 30.236 N	81° 57' 40.243 W
1,615.0	14.70	228.40	1,587.3	-141.6	-148.5	13,881,934.44	1,364,395.88	38° 13' 30.185 N	81° 57' 40.313 W
1,645.0	14.90	226.00	1,616.3	-146.8	-154.1	13,881,929.24	1,364,390.26	38° 13' 30.133 N	81° 57' 40.385 W
1,675.0	16.10	226.40	1,645.2	-152.3	-159.9	13,881,923.69	1,364,384.47	38° 13' 30.077 N	81° 57' 40.465 W
1,705.0	17.60	228.90	1,673.9	-158.2	-166.3	13,881,917.84	1,364,378.04	38° 13' 30.019 N	81° 57' 40.549 W
1,735.0	18.10	227.10	1,702.4	-164.3	-173.2	13,881,911.68	1,364,371.21	38° 13' 29.957 N	81° 57' 40.635 W
1,765.0	18.10	228.20	1,731.0	-170.6	-180.1	13,881,905.41	1,364,364.32	38° 13' 29.895 N	81° 57' 40.720 W
1,795.0	17.90	227.10	1,759.5	-176.8	-186.9	13,881,899.16	1,364,357.47	38° 13' 29.832 N	81° 57' 40.805 W
1,825.0	17.90	228.90	1,788.0	-183.0	-193.8	13,881,892.99	1,364,350.62	38° 13' 29.770 N	81° 57' 40.889 W
1,855.0	17.20	227.40	1,816.6	-189.0	-200.5	13,881,886.96	1,364,343.88	38° 13' 29.710 N	81° 57' 40.968 W
1,885.0	16.10	228.30	1,845.4	-194.8	-206.9	13,881,881.19	1,364,337.51	38° 13' 29.652 N	81° 57' 41.041 W
1,915.0	14.90	225.60	1,874.3	-200.3	-212.7	13,881,875.72	1,364,331.65	38° 13' 29.598 N	81° 57' 41.108 W
1,945.0	14.20	225.80	1,903.3	-205.5	-218.1	13,881,870.46	1,364,326.25	38° 13' 29.545 N	81° 57' 41.170 W
1,975.0	13.30	223.70	1,932.5	-210.6	-223.2	13,881,865.40	1,364,321.23	38° 13' 29.495 N	81° 57' 41.226 W
2,005.0	12.50	222.00	1,961.7	-215.5	-227.7	13,881,860.49	1,364,316.67	38° 13' 29.399 N	81° 57' 41.280 W
2,035.0	12.00	223.90	1,991.0	-220.2	-232.1	13,881,855.83	1,364,312.34	38° 13' 29.355 N	81° 57' 41.331 W
2,065.0	11.20	223.00	2,020.4	-224.6	-236.2	13,881,851.45	1,364,308.19	38° 13' 29.314 N	81° 57' 41.378 W
2,095.0	10.20	221.10	2,049.9	-228.7	-239.9	13,881,847.32	1,364,304.46	38° 13' 29.274 N	81° 57' 41.419 W
2,125.0	10.00	218.20	2,079.4	-232.7	-243.3	13,881,843.27	1,364,301.10	38° 13' 29.234 N	81° 57' 41.458 W
2,155.0	9.40	217.60	2,109.0	-236.7	-246.4	13,881,839.28	1,364,297.99	38° 13' 29.197 N	81° 57' 41.493 W
2,185.0	8.50	218.20	2,138.6	-240.4	-249.3	13,881,835.60	1,364,295.13	38° 13' 29.163 N	81° 57' 41.529 W
2,215.0	8.80	222.20	2,168.3	-243.8	-252.2	13,881,832.16	1,364,292.21	38° 13' 29.129 N	81° 57' 41.573 W
2,245.0	10.10	229.60	2,197.9	-247.3	-255.7	13,881,828.75	1,364,288.67	38° 13' 29.093 N	81° 57' 41.628 W
2,275.0	11.80	232.10	2,227.3	-250.8	-260.1	13,881,825.16	1,364,284.25	38° 13' 29.056 N	81° 57' 41.690 W
2,305.0	12.20	234.70	2,256.7	-254.6	-265.2	13,881,821.45	1,364,279.24	38° 13' 29.019 N	81° 57' 41.755 W
2,335.0	12.40	235.00	2,286.0	-258.2	-270.4	13,881,817.77	1,364,274.01	38° 13' 28.979 N	81° 57' 41.825 W
2,365.0	14.10	234.30	2,315.2	-262.2	-276.0	13,881,813.79	1,364,268.41	38° 13' 28.935 N	81° 57' 41.901 W
2,395.0	14.90	235.10	2,344.2	-266.6	-282.1	13,881,809.45	1,364,262.28	38° 13' 28.892 N	81° 57' 41.977 W
2,425.0	13.90	233.50	2,373.3	-270.9	-288.2	13,881,805.10	1,364,256.22	38° 13' 28.850 N	81° 57' 42.046 W
2,455.0	13.00	232.80	2,402.5	-275.1	-293.8	13,881,800.92	1,364,250.63	38° 13' 28.810 N	81° 57' 42.109 W
2,485.0	11.70	231.00	2,431.8	-279.0	-298.8	13,881,796.96	1,364,245.58	38° 13' 28.781 N	81° 57' 42.153 W
2,508.0	11.10	230.60	2,454.3	-281.9	-302.3	13,881,794.09	1,364,242.06	38° 13' 28.714 N	81° 57' 42.255 W
2,563.0	11.10	230.60	2,508.3	-288.6	-310.5	13,881,787.37	1,364,233.87		

TD @ 2563' MD / 2508' TVD

DDC
Survey Report - Geographic



Company:	HG Energy, LLC	Local Co-ordinate Reference:	Well Austin Griffith #102
Project:	Lincoln County, West Virginia	TVD Reference:	WELL @ 869.0usft (Decker #9)
Site:	Austin Griffith #102	MD Reference:	WELL @ 869.0usft (Decker #9)
Well:	Austin Griffith #102	North Reference:	Grid
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	EDM 5000.1 Single User Db

Survey Annotations				
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
650.0	650.0	0.0	0.0	FIRST SURVEY @ 650' MD / 650' TVD
2,563.0	2,508.3	-288.6	-310.5	TD @ 2563' MD / 2508' TVD

Checked By: _____ Approved By: _____ Date: _____

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