

87.04757

HG Energy, LLC

Roane County, West Virginia

J.H Starr #117

J.H Starr #117

Wellbore #1

Design: Wellbore #1

Survey Report - Geographic

31 August, 2015



OCT 08 2015

10/30/2015

87.04757

HP
Survey Report - Geographic



Company: HG Energy, LLC	Local Co-ordinate Reference: Well J.H Starr #117
Project: Roane County, West Virginia	TVD Reference: Well @ 1072.0usft (Decker #9)
Site: J.H Starr #117	MD Reference: Well @ 1072.0usft (Decker #9)
Well: J.H Starr #117	North Reference: Grid
Wellbore: Wellbore #1	Survey Calculation Method: Minimum Curvature
Design: Wellbore #1	Database: Compass

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 J.H Starr #117

Site Position:		Northing: 14,057,830.97 usft	Latitude: 38° 42' 42.500 N
From: Lat/Long		Easting: 1,558,306.53 usft	Longitude: 81° 17' 16.300 W
Position Uncertainty: 0.0 usft		Slot Radius: 13-3/16 "	Grid Convergence: -0.18 °

Well J.H Starr #117

Well Position	+N/-S 0.0 usft	Northing: 14,057,830.97 usft	Latitude: 38° 42' 42.500 N
	+E/-W 0.0 usft	Easting: 1,558,306.53 usft	Longitude: 81° 17' 16.300 W
Position Uncertainty	0.0 usft	Wellhead Elevation: 0.0 usft	Ground Level: 1,064.0 usft

Wellbore Wellbore #1

Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2015	8/6/2015	-8.00	66.34	51,903

Design Wellbore #1

Audit Notes:

Version: 1.0	Phase: ACTUAL	Tie On Depth: 0.0
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Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)	Direction (°)
	0.0	0.0	0.0	217.82

Survey Program	Date 8/31/2015
From (usft)	To (usft)
556.0	2,600.0 MWD (Wellbore #1)
	Tool Name MWD default
	Description MWD - Standard

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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
0.0	0.00	0.00	0.0	0.0	0.0	14,057,830.97	1,558,306.53	38° 42' 42.500 N	81° 17' 16.300 W
556.0	0.88	167.79	556.0	-4.2	0.9	14,057,826.79	1,558,307.43	38° 42' 42.459 N	81° 17' 16.288 W
First MWD Survey @ 556' MD / 556' TVD									
586.0	1.02	163.47	586.0	-4.7	1.0	14,057,826.31	1,558,307.55	38° 42' 42.454 N	81° 17' 16.287 W
616.0	1.41	180.48	616.0	-5.3	1.1	14,057,825.69	1,558,307.63	38° 42' 42.448 N	81° 17' 16.286 W
646.0	2.52	190.26	645.9	-6.3	1.0	14,057,824.67	1,558,307.51	38° 42' 42.438 N	81° 17' 16.287 W
676.0	3.89	198.77	675.9	-7.9	0.5	14,057,823.06	1,558,307.06	38° 42' 42.422 N	81° 17' 16.293 W
706.0	4.99	203.26	705.8	-10.1	-0.3	14,057,820.89	1,558,306.22	38° 42' 42.400 N	81° 17' 16.303 W
736.0	6.01	209.70	735.7	-12.6	-1.6	14,057,818.33	1,558,304.93	38° 42' 42.375 N	81° 17' 16.320 W
766.0	6.50	214.50	765.5	-15.4	-3.3	14,057,815.57	1,558,303.19	38° 42' 42.348 N	81° 17' 16.342 W
796.0	6.98	217.36	795.3	-18.2	-5.4	14,057,812.72	1,558,301.12	38° 42' 42.319 N	81° 17' 16.368 W
826.0	7.38	217.76	825.1	-21.2	-7.7	14,057,809.75	1,558,298.83	38° 42' 42.290 N	81° 17' 16.396 W

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Project: Roane County, West Virginia
Site: J.H Starr #117
Well: J.H Starr #117
Wellbore: Wellbore #1
Design: Wellbore #1

Local Co-ordinate Reference: Well J.H Starr #117
TVD Reference: Well @ 1072.0usft (Decker #9)
MD Reference: Well @ 1072.0usft (Decker #9)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Database: Compass

Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
856.0	7.82	217.58	854.8	-24.4	-10.1	14,057,806.61	1,558,296.41	38° 42' 42.259 N	81° 17' 16.427 W
886.0	8.31	220.36	884.5	-27.6	-12.8	14,057,803.34	1,558,293.76	38° 42' 42.226 N	81° 17' 16.460 W
916.0	8.79	222.48	914.2	-31.0	-15.7	14,057,799.99	1,558,290.81	38° 42' 42.193 N	81° 17' 16.497 W
946.0	9.50	221.37	943.8	-34.5	-18.9	14,057,796.44	1,558,287.62	38° 42' 42.158 N	81° 17' 16.537 W
976.0	10.52	222.08	973.3	-38.4	-22.4	14,057,792.55	1,558,284.15	38° 42' 42.119 N	81° 17' 16.581 W
1,006.0	11.71	220.58	1,002.8	-42.8	-26.2	14,057,788.21	1,558,280.33	38° 42' 42.076 N	81° 17' 16.629 W
1,036.0	12.59	220.67	1,032.1	-47.5	-30.3	14,057,783.42	1,558,276.22	38° 42' 42.029 N	81° 17' 16.681 W
1,066.0	13.70	218.99	1,061.3	-52.8	-34.7	14,057,778.18	1,558,271.86	38° 42' 41.977 N	81° 17' 16.735 W
1,096.0	14.58	217.58	1,090.4	-58.5	-39.2	14,057,772.42	1,558,267.32	38° 42' 41.920 N	81° 17' 16.793 W
1,126.0	15.38	216.88	1,119.4	-64.7	-43.9	14,057,766.25	1,558,262.63	38° 42' 41.859 N	81° 17' 16.851 W
1,156.0	16.31	217.67	1,148.2	-71.2	-48.9	14,057,759.73	1,558,257.67	38° 42' 41.794 N	81° 17' 16.914 W
1,186.0	17.19	217.36	1,177.0	-78.1	-54.1	14,057,752.87	1,558,252.40	38° 42' 41.726 N	81° 17' 16.980 W
1,216.0	18.21	215.87	1,205.5	-85.4	-59.6	14,057,745.55	1,558,246.96	38° 42' 41.654 N	81° 17' 17.048 W
1,246.0	19.49	214.98	1,233.9	-93.3	-65.2	14,057,737.65	1,558,241.35	38° 42' 41.575 N	81° 17' 17.119 W
1,276.0	20.42	214.59	1,262.1	-101.7	-71.0	14,057,729.24	1,558,235.51	38° 42' 41.492 N	81° 17' 17.192 W
1,306.0	21.08	214.19	1,290.2	-110.5	-77.0	14,057,720.47	1,558,229.51	38° 42' 41.405 N	81° 17' 17.268 W
1,336.0	21.92	214.90	1,318.1	-119.6	-83.3	14,057,711.41	1,558,223.27	38° 42' 41.315 N	81° 17' 17.346 W
1,366.0	22.32	215.69	1,345.9	-128.8	-89.8	14,057,702.20	1,558,216.74	38° 42' 41.224 N	81° 17' 17.428 W
1,396.0	22.89	216.39	1,373.6	-138.1	-96.6	14,057,692.87	1,558,209.96	38° 42' 41.131 N	81° 17' 17.513 W
1,426.0	23.51	217.67	1,401.2	-147.5	-103.7	14,057,683.44	1,558,202.84	38° 42' 41.038 N	81° 17' 17.603 W
1,456.0	24.39	218.20	1,428.6	-157.1	-111.2	14,057,673.83	1,558,195.35	38° 42' 40.943 N	81° 17' 17.697 W
1,486.0	25.19	218.38	1,455.8	-167.0	-119.0	14,057,663.96	1,558,187.56	38° 42' 40.845 N	81° 17' 17.795 W
1,516.0	27.31	217.76	1,482.7	-177.5	-127.1	14,057,653.51	1,558,179.38	38° 42' 40.741 N	81° 17' 17.898 W
1,546.0	29.30	216.48	1,509.1	-188.8	-135.7	14,057,642.17	1,558,170.80	38° 42' 40.629 N	81° 17' 18.005 W
1,576.0	30.80	214.90	1,535.1	-201.0	-144.5	14,057,629.97	1,558,162.04	38° 42' 40.508 N	81° 17' 18.116 W
1,606.0	31.60	214.37	1,560.7	-213.8	-153.3	14,057,617.18	1,558,153.21	38° 42' 40.381 N	81° 17' 18.226 W
1,636.0	32.70	213.40	1,586.1	-227.0	-162.2	14,057,603.93	1,558,144.31	38° 42' 40.250 N	81° 17' 18.338 W
1,666.0	33.80	212.69	1,611.2	-240.8	-171.2	14,057,590.14	1,558,135.34	38° 42' 40.113 N	81° 17' 18.451 W
1,696.0	35.09	213.00	1,636.0	-255.1	-180.4	14,057,575.88	1,558,126.14	38° 42' 39.972 N	81° 17' 18.566 W
1,726.0	36.59	213.00	1,660.3	-269.8	-190.0	14,057,561.15	1,558,116.57	38° 42' 39.826 N	81° 17' 18.687 W
1,756.0	38.71	212.69	1,684.0	-285.2	-199.9	14,057,545.76	1,558,106.63	38° 42' 39.674 N	81° 17' 18.811 W
1,786.0	40.70	213.66	1,707.1	-301.2	-210.4	14,057,529.72	1,558,096.14	38° 42' 39.515 N	81° 17' 18.943 W
1,816.0	42.51	215.29	1,729.6	-317.7	-221.7	14,057,513.30	1,558,084.87	38° 42' 39.352 N	81° 17' 19.085 W
1,846.0	44.41	216.17	1,751.3	-334.4	-233.7	14,057,496.55	1,558,072.81	38° 42' 39.186 N	81° 17' 19.236 W
1,876.0	46.18	217.67	1,772.4	-351.5	-246.5	14,057,479.51	1,558,060.00	38° 42' 39.017 N	81° 17' 19.397 W
1,906.0	47.90	218.38	1,792.9	-368.7	-260.0	14,057,462.22	1,558,046.48	38° 42' 38.846 N	81° 17' 19.567 W
1,936.0	49.58	219.48	1,812.7	-386.3	-274.2	14,057,444.68	1,558,032.31	38° 42' 38.672 N	81° 17' 19.745 W
1,966.0	50.11	220.89	1,832.0	-403.8	-289.0	14,057,427.16	1,558,017.51	38° 42' 38.498 N	81° 17' 19.931 W
1,996.0	50.69	222.48	1,851.1	-421.1	-304.4	14,057,409.90	1,558,002.14	38° 42' 38.327 N	81° 17' 20.125 W
2,026.0	51.30	223.80	1,870.0	-438.1	-320.3	14,057,392.89	1,557,986.20	38° 42' 38.158 N	81° 17' 20.325 W
2,056.0	51.70	224.99	1,888.7	-454.8	-336.8	14,057,376.12	1,557,969.77	38° 42' 37.992 N	81° 17' 20.532 W
2,086.0	51.88	223.80	1,907.2	-471.7	-353.2	14,057,359.27	1,557,953.28	38° 42' 37.825 N	81° 17' 20.739 W
2,116.0	50.42	223.49	1,926.1	-488.6	-369.4	14,057,342.37	1,557,937.16	38° 42' 37.657 N	81° 17' 20.942 W
2,146.0	48.08	221.99	1,945.6	-505.3	-384.8	14,057,325.68	1,557,921.73	38° 42' 37.492 N	81° 17' 21.136 W
2,176.0	46.18	221.07	1,966.1	-521.7	-399.4	14,057,309.23	1,557,907.15	38° 42' 37.328 N	81° 17' 21.320 W
2,206.0	46.18	220.36	1,986.8	-538.1	-413.5	14,057,292.82	1,557,893.03	38° 42' 37.166 N	81° 17' 21.497 W
2,236.0	46.49	220.18	2,007.5	-554.7	-427.5	14,057,276.26	1,557,879.00	38° 42' 37.002 N	81° 17' 21.674 W
2,266.0	47.02	220.36	2,028.1	-571.4	-441.6	14,057,259.59	1,557,864.88	38° 42' 36.836 N	81° 17' 21.851 W
2,296.0	47.42	220.36	2,048.5	-588.2	-455.9	14,057,242.81	1,557,850.62	38° 42' 36.670 N	81° 17' 22.030 W
2,326.0	47.50	220.36	2,068.8	-605.0	-470.2	14,057,225.97	1,557,836.31	38° 42' 36.503 N	81° 17' 22.210 W
2,356.0	48.08	219.88	2,088.9	-622.0	-484.5	14,057,208.97	1,557,821.99	38° 42' 36.334 N	81° 17' 22.390 W
2,386.0	48.61	219.79	2,108.8	-639.2	-498.9	14,057,191.76	1,557,807.63	38° 42' 36.164 N	81° 17' 22.571 W
2,416.0	48.92	218.99	2,128.6	-656.6	-513.2	14,057,174.33	1,557,793.31	38° 42' 35.995 N	81° 17' 22.754 W
2,446.0	47.81	217.98	2,148.6	-674.2	-527.2	14,057,156.78	1,557,779.36	38° 42' 35.817 N	81° 17' 22.926 W
2,476.0	47.11	216.48	2,168.8	-691.8	-540.5	14,057,139.18	1,557,765.99	38° 42' 35.643 N	81° 17' 23.094 W

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Oct 17 2015

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Survey Report - Geographic



Company: HG Energy, LLC
Project: Roane County, West Virginia
Site: J.H Starr #117
Well: J.H Starr #117
Wellbore: Wellbore #1
Design: Wellbore #1

Local Co-ordinate Reference: Well J.H Starr #117
TVD Reference: Well @ 1072.0usft (Decker #9)
MD Reference: Well @ 1072.0usft (Decker #9)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Database: Compass

Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
2,506.0	45.78	216.00	2,189.5	-709.3	-553.4	14,057,121.64	1,557,753.13	38° 42' 35.469 N	81° 17' 23.256 W
2,536.0	44.19	214.76	2,210.7	-726.6	-565.7	14,057,104.36	1,557,740.85	38° 42' 35.297 N	81° 17' 23.410 W
2,600.0	44.19	214.76	2,256.6	-763.3	-591.1	14,057,067.71	1,557,715.42	38° 42' 34.934 N	81° 17' 23.730 W

TD @ 2600' MD / 2257' TVD

Design Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
556.0	556.0	-4.2	0.9	First MWD Survey @ 556' MD / 556' TVD
2,600.0	2,256.6	-763.3	-591.1	TD @ 2600' MD / 2257' TVD

Checked By: _____ Approved By: _____ Date: _____

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HG Energy, LLC
Roane County, West Virginia
J.H Starr #117
J.H Starr #117
Wellbore #1

Design: Wellbore #1

HG Energy EOW Report

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 Site: J.H Starr #117
 Well: J.H Starr #117
 Wellbore: Wellbore #1
 Design: Wellbore #1

Local Co-ordinate Reference: Well J.H Starr #117
 TVD Reference: Well @ 1072.0usft (Decker #8)
 MD Reference: Well @ 1072.0usft (Decker #9)
 North Reference: Grid
 Survey Calculation Method: Minimum Curvature
 Database: Compass

Project: Roane County, West Virginia

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: J.H Starr #117

Site Position: 38° 42' 42.500 N
 From: La/Long 14,057,830.96 usft 81° 17' 16.300 W
 Position Uncertainty: 0.0 usft Grid Convergence: -0.18°

Well: J.H Starr #117

Well Position: +N/-S 0.0 usft Latitude: 38° 42' 42.500 N
 +E/-W 0.0 usft Easting: 14,057,830.96 usft 81° 17' 16.300 W
 Position Uncertainty: 0.0 usft Wellhead Elevation: 0.0 usft Ground Level: 1,084.0 usft

Wellbore: Wellbore #1

Magnetics: Model Name IGRF2015 Sample Date 8/6/2015 Declination (-) -8.00 Dip Angle (°) 66.34 Field Strength (nT) 51,903

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 0.0 217.82

Survey Program: Date 8/31/2015
 From (usft) To (usft) Survey (Wellbore) Tool Name Description
 556.0 2,600.0 MWD (Wellbore #1) MWD default MWD - Standard

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 North Reference: Grid
 Survey Calculation Method: Minimum Curvature
 Database: Compass

MD (usft)	Inc (°)	Azi (azimuth) (°)	TVD (usft)	N/S (usft)	EW (usft)	V. Sec (usft)	D/Leg (°/100usft)	Closure Distance (usft)	Closure Azimuth (°)	
0.0	0.00	0.00	0.0	0.0	0.0	0.0	0.00	0.0	0.00	
556.0	0.88	167.79	556.0	-4.2	0.9	2.7	0.16	4.3	167.79	
First MWD Survey @ 556' MD / 556' TVD										
586.0	1.02	163.47	586.0	-4.7	1.0	3.0	0.52	4.8	167.55	
616.0	1.41	180.48	616.0	-5.3	1.1	3.5	1.76	5.4	168.22	
646.0	2.52	190.26	645.9	-6.3	1.0	4.4	3.85	6.4	171.15	
676.0	3.89	198.77	675.9	-7.9	0.5	5.9	4.82	7.9	176.13	
706.0	4.99	203.26	705.8	-10.1	-0.3	8.1	3.84	10.1	181.75	
736.0	6.01	209.70	735.7	-12.6	-1.6	11.0	3.97	12.7	187.22	
766.0	6.50	214.50	765.5	-15.4	-3.3	14.2	2.39	15.8	192.24	
796.0	6.98	217.36	795.3	-18.2	-5.4	17.7	1.95	19.0	196.51	
826.0	7.38	217.76	825.1	-21.2	-7.7	21.5	1.34	22.6	199.93	
856.0	7.82	217.58	854.8	-24.4	-10.1	25.4	1.47	26.4	202.56	
886.0	8.31	220.36	884.5	-27.6	-12.8	29.7	2.09	30.4	204.80	
916.0	8.79	222.48	914.2	-31.0	-15.7	34.1	1.91	34.7	206.91	
946.0	9.50	221.37	943.8	-34.5	-18.9	38.9	2.44	39.4	208.71	
976.0	10.52	222.08	973.3	-38.4	-22.4	44.1	3.42	44.5	210.22	
1,006.0	11.71	220.58	1,002.8	-42.8	-26.2	49.8	4.08	50.1	211.49	
1,036.0	12.59	220.67	1,032.1	-47.5	-30.3	56.1	2.93	58.4	212.51	
1,066.0	13.70	218.99	1,061.3	-52.8	-34.7	63.0	3.91	63.2	213.29	
1,096.0	14.58	217.58	1,090.4	-58.5	-39.2	70.3	3.15	70.5	213.81	
1,126.0	15.38	216.88	1,119.4	-64.7	-43.9	78.0	2.73	78.2	214.15	
1,156.0	16.31	217.67	1,148.2	-71.2	-48.9	86.2	3.18	86.4	214.45	
1,186.0	17.19	217.36	1,177.0	-78.1	-54.1	94.9	2.95	95.0	214.72	
1,216.0	18.21	215.87	1,205.5	-85.4	-59.6	104.0	3.72	104.1	214.89	
1,246.0	19.49	214.98	1,233.9	-93.3	-65.2	113.7	4.37	113.8	214.93	
1,276.0	20.42	214.59	1,262.1	-101.7	-71.0	123.9	3.13	124.1	214.92	

10/30/2015



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Company: HG Energy, LLC OCT 08 2015

Project: Roane County, West Virginia

Site: J.H Starr #117

Well: J.H Starr #117

Wellbore: Wellbore #1

Design: Wellbore #1

Local Co-ordinate Reference: Well J.H Starr #117

TVD Reference: Well @ 1072.0usft (Decker #9)

MD Reference: Well @ 1072.0usft (Decker #9)

North Reference: Grid

Survey Calculation Method: Minimum Curvature

Database: Compass

MD (usft)	Inc (")	Azi (azimuth) (")	TVD (usft)	NIS (usft)	E/W (usft)	V. Sec (usft)	DLeg ("/100usft)	Closure Distance (usft)	Closure Azimuth (")
1,306.0	21.08	214.19	1,280.2	-110.5	-77.0	134.5	2.25	134.7	214.88
1,336.0	21.92	214.90	1,318.1	-119.6	-83.3	145.5	2.93	145.7	214.85
1,366.0	22.32	215.69	1,345.9	-128.8	-88.8	156.8	1.66	157.0	214.89
1,396.0	22.89	216.39	1,373.6	-138.1	-96.6	168.3	2.10	168.5	214.96
1,426.0	23.51	217.67	1,401.2	-147.5	-103.7	180.1	2.66	180.3	215.10
1,456.0	24.39	218.20	1,428.6	-157.1	-111.2	192.3	3.02	192.5	215.28
1,486.0	25.19	218.38	1,455.8	-167.0	-119.0	204.9	2.68	205.0	215.46
1,516.0	27.31	217.76	1,482.7	-177.5	-127.1	218.1	7.13	218.3	215.62
1,546.0	29.30	216.48	1,508.1	-188.8	-135.7	232.4	6.93	232.5	215.71
1,576.0	30.80	214.90	1,535.1	-201.0	-144.5	247.4	5.65	247.5	215.71
1,606.0	31.60	214.37	1,560.7	-213.8	-153.3	262.9	2.82	263.1	215.85
1,636.0	32.70	213.40	1,586.1	-227.0	-162.2	278.8	4.05	279.0	215.55
1,666.0	33.80	212.69	1,611.2	-240.8	-171.2	295.2	3.89	295.5	215.41
1,696.0	35.09	213.00	1,636.0	-255.1	-180.4	312.1	4.34	312.4	215.27
1,726.0	36.59	213.00	1,660.3	-269.8	-180.0	329.8	5.00	330.0	215.15
1,756.0	38.71	212.69	1,684.0	-285.2	-199.9	347.9	7.09	348.3	215.03
1,786.0	40.70	213.66	1,707.1	-301.2	-210.4	367.0	6.95	367.4	214.93
1,816.0	42.51	215.29	1,729.6	-317.7	-221.7	386.9	7.03	387.4	214.91
1,846.0	44.41	216.17	1,751.3	-334.4	-233.7	407.5	6.65	408.0	214.95
1,876.0	46.18	217.67	1,772.4	-351.5	-246.5	428.8	6.89	429.3	215.05
1,906.0	47.90	218.38	1,792.9	-368.7	-260.0	450.7	5.99	451.2	215.19
1,936.0	49.58	219.48	1,812.7	-386.3	-274.2	473.3	6.24	473.7	215.37
1,966.0	50.11	220.89	1,832.0	-403.8	-289.0	496.2	4.00	496.6	215.59
1,996.0	50.69	222.48	1,851.1	-421.1	-304.4	519.3	4.52	519.6	215.86
2,026.0	51.30	223.80	1,870.0	-438.1	-320.3	542.5	3.98	542.7	216.18
2,056.0	51.70	224.99	1,886.7	-454.8	-336.8	565.8	3.38	565.9	216.51
2,086.0	51.88	223.80	1,907.2	-471.7	-353.2	589.2	3.17	589.3	216.83

Survey

10/30/2015



87-04757

Received HP
Office of Oil & Gas HG Energy EOW Report

OCT 08 2015

Company: HG Energy, LLC
Project: Roane County, West Virginia
Site: J.H Starr #117
Well: J.H Starr #117
Wellbore: Wellbore #1
Design: Wellbore #1

Local Co-ordinate Reference: Well J.H Starr #117
TVD Reference: Well @ 1072.0usft (Decker #9)
MD Reference: Well @ 1072.0usft (Decker #9)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Database: Compass

MD (usft)	Inc (°)	Azi (azimuth) (°)	TVD (usft)	N/S (usft)	E/W (usft)	V. Sec (usft)	DLeg (°/100usft)	Closure Distance (usft)	Closure Azimuth (°)
2,116.0	50.42	223.49	1,926.1	-488.6	-369.4	612.5	4.93	612.5	217.09
2,146.0	48.08	221.99	1,945.6	-505.3	-384.8	635.1	8.67	635.1	217.29
2,176.0	46.18	221.07	1,986.1	-521.7	-399.4	657.0	6.72	657.0	217.43
2,206.0	46.18	220.36	1,986.8	-538.1	-413.5	678.7	1.71	678.7	217.54
2,236.0	46.49	220.18	2,007.5	-554.7	-427.5	700.3	1.12	700.3	217.62
2,266.0	47.02	220.36	2,028.1	-571.4	-441.6	722.2	1.82	722.2	217.70
2,296.0	47.42	220.36	2,048.5	-588.2	-455.9	744.2	1.33	744.2	217.78
2,326.0	47.50	220.36	2,068.8	-605.0	-470.2	766.2	0.27	766.2	217.86
2,356.0	48.08	219.88	2,088.9	-622.0	-484.5	788.4	2.27	788.4	217.92
2,386.0	48.61	219.79	2,108.8	-639.2	-498.9	810.8	1.78	810.9	217.97
2,416.0	48.92	218.99	2,128.6	-656.6	-513.2	833.4	2.26	833.4	218.01
2,446.0	47.81	217.98	2,148.6	-674.2	-527.2	855.8	4.47	855.8	218.02
2,476.0	47.11	216.48	2,168.8	-691.8	-540.5	877.9	4.36	877.9	218.00
2,506.0	45.78	216.00	2,189.5	-709.3	-553.4	899.7	4.58	899.7	217.96
2,536.0	44.19	214.76	2,210.7	-726.6	-565.7	920.8	6.05	920.8	217.90
2,600.0	44.19	214.76	2,256.6	-763.3	-591.1	965.4	0.00	965.4	217.76
TD @ 2600' MD / 2257' TVD									

Design Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates +N/-S (usft)	Local Coordinates +E/-W (usft)	Comment
556.0	556.0	-4.2	0.9	First MMD Survey @ 556' MD / 556' TVD
2,600.0	2,256.6	-763.3	-591.1	TD @ 2600' MD / 2257' TVD

Checked By: _____

Approved By: _____

Date: _____

10/30/2015

87.04757

Company Name: HG Energy, LLC
 JH Starr #117
 Roane County, West Virginia
 Rig: Decker #8
 Created By: Shane Robbins
 Date: 03/12/2015

JH Starr #117
 Roane County, West Virginia
 Q150653 & AM-150563
 Design #1

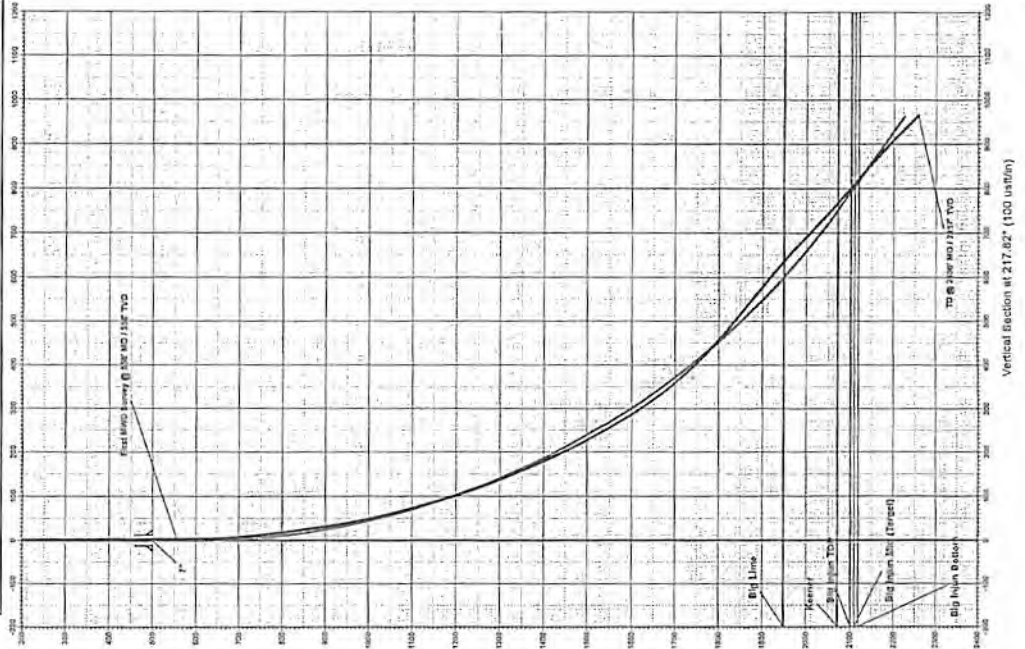
DESIGN TARGET DETAILS

Name	TVD	MSL	ASZ	WOB	Wobbling	Balling	Latitude	Longitude
Target JH Starr #117	2100.0	428.1	-425.1	14257100.24	1557912.28	31° 42' 30.20" N	81° 17' 21.05" W	

* plan file target location

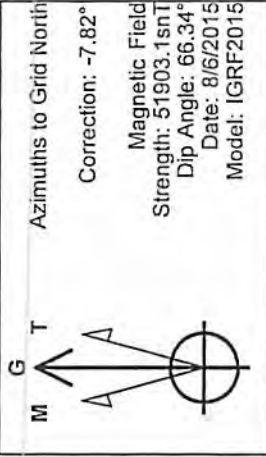
ANNOTATIONS

MD	BS	ASZ	TVD	MSL	ASZ	WOB	Wobbling	Balling	Latitude	Longitude
558.0	0.28	17.29	235.0	-4.2	6.3	2.7	4.3	First MWD Survey @ 558' MD / 658' TVD		
2050.0	44.19	31.26	235.6	-73.3	-81.1	85.4	89.3	TD @ 2100' MD / 2107' TVD		

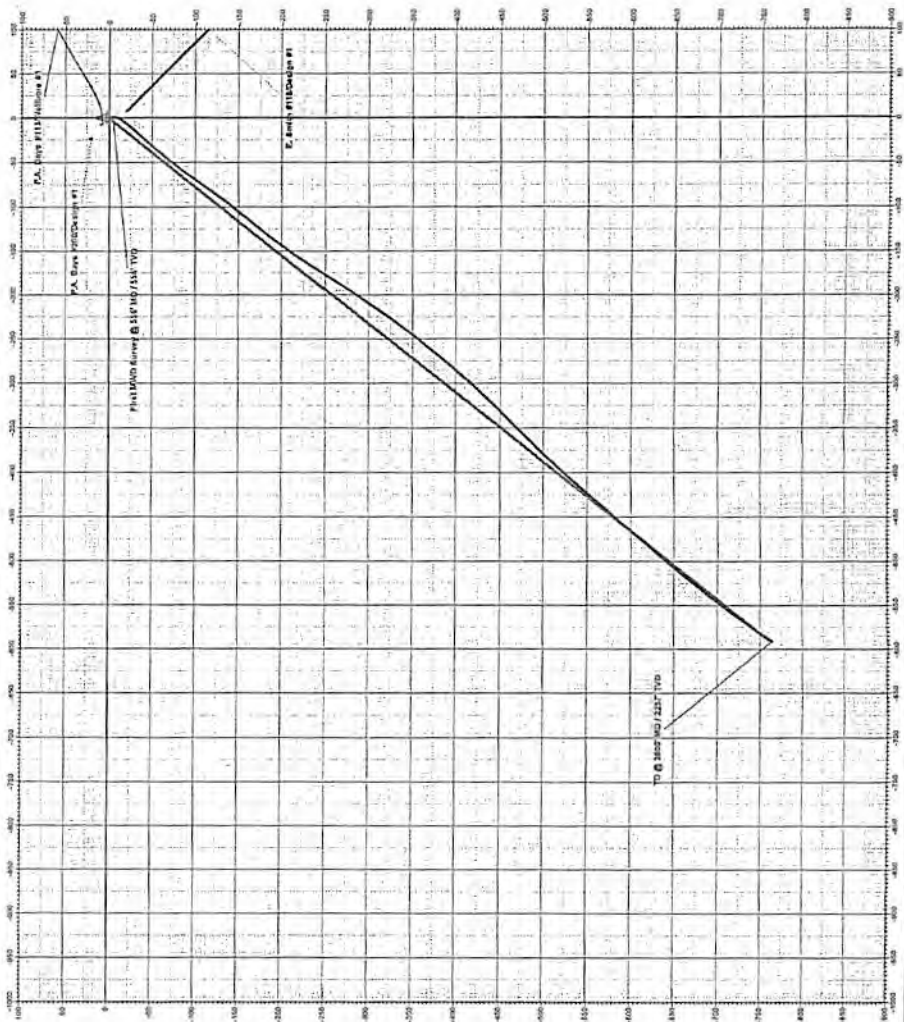


PROJECT DETAILS: Roane County, West Virginia
 Geodetic System: Universal Transverse Mercator
 Datum: NAD83 West Virginia - HARR
 Ellipsoid: GRS 1980 (64 W) to 78 W
 System Datum: Mean Sea Level

WELL DETAILS: JH Starr #117
 Ground Level: 104.8
 North: 14257100.24
 East: 1557912.28
 Magnetic Declination: 21° 42' 42.800" N
 Magnetic Dip: 81° 17' 16.350" W



HG Energy



Permitted
 Office number
 08 2015