

# HG Energy, LLC

Harrison County, West Virginia

W.B. Carpenter #140

W.B. Carpenter #140

Wellbore #1

Survey: MWD

## DDC Survey Report

13 December, 2013

Received

JAN 21 2014

Office of Oil and Gas  
WV Dept. of Environmental Protection



02/28/2014



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I **Larry Wright**, certify that I am employed by **The Appalachian Directional Drilling Company (ADC)**. That I did on the day(s) of **8/27/13** thru **8/29/13** conduct or supervise the taking of a **MWD Survey** from a depth of **805** feet to a depth of **3271** 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 **W.B. Carpenter # 140** API No. **47-033-05747** 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.  
com, c=US  
Date: 2013.12.19 10:40:49 -06'00'

Received

JAN 27 2014

Office of Oil and Gas  
WV Dept. of Environmental Protection

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

02/28/2014

DDC  
Survey Report



<b>Company:</b>	HG Energy, LLC	<b>Local Co-ordinate Reference:</b>	Well W.B. Carpenter #140
<b>Project:</b>	Harrison County, West Virginia	<b>TVD Reference:</b>	WELL @ 1315.0usft (Decker #6)
<b>Site:</b>	W.B. Carpenter #140	<b>MD Reference:</b>	WELL @ 1315.0usft (Decker #6)
<b>Well:</b>	W.B. Carpenter #140	<b>North Reference:</b>	Grid
<b>Wellbore:</b>	Wellbore #1	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	Wellbore #1	<b>Database:</b>	EDM 5000.1 Single User Db

<b>Project</b>	Harrison County, West Virginia		
<b>Map System:</b>	Universal Transverse Mercator	<b>System Datum:</b>	Mean Sea Level
<b>Geo Datum:</b>	NAD83 West Virginia - HARN		
<b>Map Zone:</b>	Zone 17N (84 W to 78 W)		

<b>Site</b>	W.B. Carpenter #140				
<b>Site Position:</b>		<b>Northing:</b>	14,263,965.50 usft	<b>Latitude:</b>	39° 16' 38.300 N
<b>From:</b>	Lat/Long	<b>Easting:</b>	1,779,533.54 usft	<b>Longitude:</b>	80° 30' 30.200 W
<b>Position Uncertainty:</b>	0.0 usft	<b>Slot Radius:</b>	13-3/16 "	<b>Grid Convergence:</b>	0.31 °

<b>Well</b>	W.B. Carpenter #140					
<b>Well Position</b>	<b>+N/-S</b>	0.0 usft	<b>Northing:</b>	14,263,965.50 usft	<b>Latitude:</b>	39° 16' 38.300 N
	<b>+E/-W</b>	0.0 usft	<b>Easting:</b>	1,779,533.54 usft	<b>Longitude:</b>	80° 30' 30.200 W
<b>Position Uncertainty</b>		0.0 usft	<b>Wellhead Elevation:</b>	usft	<b>Ground Level:</b>	1,307.0 usft

<b>Wellbore</b>	Wellbore #1				
<b>Magnetics</b>	<b>Model Name</b>	<b>Sample Date</b>	<b>Declination (°)</b>	<b>Dip Angle (°)</b>	<b>Field Strength (nT)</b>
	IGRF2010	12/13/2013	-8.64	66.82	52,317

<b>Design</b>	Wellbore #1				
<b>Audit Notes:</b>					
<b>Version:</b>	1.0	<b>Phase:</b>	ACTUAL	<b>Tie On Depth:</b>	0.0
<b>Vertical Section:</b>	<b>Depth From (TVD) (usft)</b>	<b>+N/-S (usft)</b>	<b>+E/-W (usft)</b>	<b>Direction (°)</b>	
	0.0	0.0	0.0	178.61	

<b>Survey Program</b>	<b>Date</b>	12/13/2013			
<b>From (usft)</b>	<b>To (usft)</b>	<b>Survey (Wellbore)</b>	<b>Tool Name</b>	<b>Description</b>	
805.0	3,271.0	MWD (Wellbore #1)			

<b>Survey</b>										
<b>Measured Depth (usft)</b>	<b>Inclination (°)</b>	<b>Azimuth (°)</b>	<b>Vertical Depth (usft)</b>	<b>+N/-S (usft)</b>	<b>+E/-W (usft)</b>	<b>Vertical Section (usft)</b>	<b>Dogleg Rate (°/100usft)</b>	<b>Build Rate (°/100usft)</b>	<b>Turn Rate (°/100usft)</b>	
<b>FIRST SURVEY @ 805' MD / 805' TVD</b>										
805.0	0.00	0.00	805.0	0.0	0.0	0.0	0.00	0.00	0.00	
845.0	1.71	121.60	845.0	-0.3	0.5	0.3	4.28	4.28	0.00	
875.0	1.71	114.62	875.0	-0.7	1.3	0.8	0.69	0.00	-23.27	
905.0	2.02	130.22	905.0	-1.3	2.1	1.3	1.97	1.03	52.00	
935.0	2.59	146.21	934.9	-2.2	2.9	2.2	2.85	1.90	53.30	
965.0	3.30	164.80	964.9	-3.6	3.5	3.6	3.94	2.37	61.97	
995.0	3.78	182.12	994.8	-5.4	3.7	5.5	3.89	1.60	57.73	
1,025.0	4.61	189.72	1,024.8	-7.6	3.4	7.6	3.32	2.77	25.33	
1,055.0	5.49	189.02	1,054.6	-10.2	3.0	10.2	2.94	2.93	-2.33	

DDC  
Survey Report



<b>Company:</b>	HG Energy, LLC	<b>Local Co-ordinate Reference:</b>	Well W.B. Carpenter #140
<b>Project:</b>	Harrison County, West Virginia	<b>TVD Reference:</b>	WELL @ 1315.0usft (Decker #6)
<b>Site:</b>	W.B. Carpenter #140	<b>MD Reference:</b>	WELL @ 1315.0usft (Decker #6)
<b>Well:</b>	W.B. Carpenter #140	<b>North Reference:</b>	Grid
<b>Wellbore:</b>	Wellbore #1	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	Wellbore #1	<b>Database:</b>	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)
1,085.0	6.50	189.50	1,084.5	-13.3	2.5	13.3	3.37	3.37	1.60
1,115.0	7.29	190.12	1,114.3	-16.8	1.9	16.8	2.64	2.63	2.07
1,145.0	7.78	189.59	1,144.0	-20.7	1.2	20.7	1.65	1.63	-1.77
1,175.0	8.39	187.92	1,173.7	-24.9	0.6	24.9	2.18	2.03	-5.57
1,205.0	9.32	185.11	1,203.4	-29.4	0.1	29.4	3.42	3.10	-9.37
1,235.0	10.59	186.51	1,232.9	-34.6	-0.5	34.6	4.31	4.23	4.67
1,265.0	12.00	187.22	1,262.3	-40.4	-1.2	40.4	4.72	4.70	2.37
1,295.0	12.70	184.62	1,291.6	-46.8	-1.8	46.8	2.98	2.33	-8.67
1,325.0	13.10	181.50	1,320.9	-53.5	-2.2	53.4	2.68	1.33	-10.40
1,355.0	13.01	177.59	1,350.1	-60.3	-2.1	60.2	2.96	-0.30	-13.03
1,385.0	13.40	173.81	1,379.3	-67.1	-1.6	67.0	3.16	1.30	-12.60
1,415.0	14.59	174.03	1,408.4	-74.3	-0.8	74.3	3.97	3.97	0.73
1,445.0	16.00	174.69	1,437.3	-82.2	-0.1	82.2	4.74	4.70	2.20
1,475.0	17.40	175.53	1,466.1	-90.8	0.7	90.8	4.74	4.67	2.80
1,505.0	18.28	176.10	1,494.6	-99.9	1.3	99.9	2.99	2.93	1.90
1,535.0	18.19	176.71	1,523.1	-109.3	1.9	109.3	0.70	-0.30	2.03
1,565.0	18.59	178.21	1,551.6	-118.8	2.3	118.8	2.07	1.33	5.00
1,595.0	18.41	179.79	1,580.0	-128.3	2.5	128.3	1.78	-0.60	5.27
1,625.0	18.19	179.39	1,608.5	-137.7	2.6	137.7	0.84	-0.73	-1.33
1,655.0	18.81	178.82	1,637.0	-147.2	2.7	147.2	2.15	2.07	-1.90
1,685.0	20.21	177.59	1,665.3	-157.2	3.0	157.3	4.86	4.67	-4.10
1,715.0	21.88	177.20	1,693.3	-168.0	3.5	168.0	5.59	5.57	-1.30
1,745.0	22.81	178.82	1,721.0	-179.4	3.9	179.4	3.72	3.10	5.40
1,775.0	23.20	179.22	1,748.6	-191.1	4.1	191.2	1.40	1.30	1.33
1,805.0	22.72	181.19	1,776.2	-202.8	4.1	202.9	3.02	-1.60	6.57
1,835.0	21.62	182.60	1,804.0	-214.1	3.7	214.2	4.07	-3.67	4.70
1,865.0	21.40	184.23	1,831.9	-225.1	3.1	225.1	2.12	-0.73	5.43
1,895.0	21.71	184.93	1,859.8	-236.1	2.2	236.1	1.34	1.03	2.33
1,925.0	22.41	186.60	1,887.6	-247.3	1.0	247.3	3.13	2.33	5.57
1,955.0	22.59	187.52	1,915.4	-258.7	-0.4	258.6	1.32	0.60	3.07
1,985.0	22.72	188.49	1,943.0	-270.1	-2.0	270.0	1.32	0.43	3.23
2,015.0	23.29	190.42	1,970.7	-281.7	-3.9	281.5	3.15	1.90	6.43
2,045.0	24.08	192.40	1,998.1	-293.5	-6.3	293.3	3.74	2.63	6.60
2,075.0	24.39	191.70	2,025.5	-305.6	-8.9	305.3	1.41	1.03	-2.33
2,105.0	25.40	190.82	2,052.7	-317.9	-11.3	317.6	3.59	3.37	-2.93
2,135.0	25.88	189.59	2,079.7	-330.7	-13.6	330.3	2.39	1.60	-4.10
2,165.0	26.72	189.41	2,106.6	-343.8	-15.8	343.3	2.81	2.80	-0.60
2,195.0	27.20	188.31	2,133.4	-357.3	-17.9	356.7	2.31	1.60	-3.67
2,225.0	27.60	188.31	2,160.0	-370.9	-19.9	370.3	1.33	1.33	0.00
2,255.0	27.11	185.59	2,186.7	-384.6	-21.6	384.0	4.47	-1.63	-9.07
2,285.0	26.41	183.22	2,213.4	-398.1	-22.6	397.4	4.25	-2.33	-7.90
2,315.0	25.62	180.62	2,240.4	-411.2	-23.1	410.5	4.62	-2.63	-8.67
2,345.0	24.61	178.69	2,267.6	-424.0	-23.0	423.3	4.33	-3.37	-6.43
2,375.0	23.99	176.10	2,294.9	-436.3	-22.4	435.6	4.11	-2.07	-8.63

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Survey Report



<b>Company:</b>	HG Energy, LLC	<b>Local Co-ordinate Reference:</b>	Well W.B. Carpenter #140
<b>Project:</b>	Harrison County, West Virginia	<b>TVD Reference:</b>	WELL @ 1315.0usft (Decker #6)
<b>Site:</b>	W.B. Carpenter #140	<b>MD Reference:</b>	WELL @ 1315.0usft (Decker #6)
<b>Well:</b>	W.B. Carpenter #140	<b>North Reference:</b>	Grid
<b>Wellbore:</b>	Wellbore #1	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	Wellbore #1	<b>Database:</b>	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)
2,405.0	23.51	174.82	2,322.4	-448.3	-21.5	447.7	2.35	-1.60	-4.27
2,435.0	22.81	172.10	2,350.0	-460.0	-20.1	459.4	4.26	-2.33	-9.07
2,465.0	22.02	170.12	2,377.7	-471.3	-18.4	470.8	3.64	-2.63	-6.60
2,495.0	21.31	166.82	2,405.6	-482.2	-16.2	481.7	4.70	-2.37	-11.00
2,525.0	20.30	163.70	2,433.6	-492.5	-13.5	492.0	5.00	-3.37	-10.40
2,555.0	19.12	161.81	2,461.9	-502.2	-10.5	501.8	4.47	-3.93	-6.30
2,585.0	18.11	161.90	2,490.3	-511.3	-7.5	510.9	3.37	-3.37	0.30
2,615.0	17.09	164.89	2,518.9	-520.0	-4.9	519.7	4.54	-3.40	9.97
2,645.0	16.61	168.89	2,547.6	-528.4	-2.9	528.2	4.18	-1.60	13.33
2,675.0	16.48	173.50	2,576.4	-536.9	-1.6	536.7	4.40	-0.43	15.37
2,705.0	16.48	177.81	2,605.1	-545.3	-1.0	545.1	4.07	0.00	14.37
2,735.0	16.08	179.79	2,633.9	-553.7	-0.8	553.6	2.28	-1.33	6.60
2,765.0	15.51	180.32	2,662.8	-561.9	-0.8	561.7	1.96	-1.90	1.77
2,795.0	15.60	182.60	2,691.7	-569.9	-1.0	569.8	2.06	0.30	7.60
2,825.0	16.22	185.50	2,720.5	-578.1	-1.6	577.9	3.36	2.07	9.67
2,855.0	17.18	189.10	2,749.3	-586.7	-2.7	586.5	4.70	3.20	12.00
2,885.0	18.11	192.00	2,777.9	-595.6	-4.4	595.3	4.26	3.10	9.67
2,915.0	18.26	190.73	2,806.4	-604.8	-6.2	604.5	1.41	0.50	-4.23
2,945.0	18.41	189.19	2,834.8	-614.1	-7.8	613.7	1.69	0.50	-5.13
2,975.0	18.41	184.23	2,863.3	-623.5	-8.9	623.1	5.22	0.00	-16.53
3,005.0	17.09	179.00	2,891.9	-632.6	-9.2	632.2	6.90	-4.40	-17.43
3,035.0	15.82	171.61	2,920.7	-641.1	-8.5	640.7	8.15	-4.23	-24.63
3,065.0	15.21	165.73	2,949.6	-648.9	-7.0	648.6	5.62	-2.03	-19.60
3,095.0	15.12	159.53	2,978.5	-656.4	-4.6	656.1	5.41	-0.30	-20.67
3,125.0	14.50	154.30	3,007.5	-663.5	-1.6	663.2	4.91	-2.07	-17.43
3,155.0	13.71	151.31	3,036.6	-670.0	1.7	669.8	3.58	-2.63	-9.97
3,185.0	13.01	146.61	3,065.8	-675.9	5.3	675.8	4.31	-2.33	-15.67
3,215.0	12.49	141.20	3,095.1	-681.3	9.2	681.3	4.34	-1.73	-18.03
<b>TD @ 3271' MD / 3150' TVD</b>									
3,271.0	12.49	141.20	3,149.7	-690.7	16.7	690.9	0.00	0.00	0.00

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
805.0	805.0	0.0	0.0	FIRST SURVEY @ 805' MD / 805' TVD
3,271.0	3,149.7	-690.7	16.7	TD @ 3271' MD / 3150' TVD

Checked By: \_\_\_\_\_ Approved By: \_\_\_\_\_ Date: \_\_\_\_\_

Received  
JAN 21 2014

# **HG Energy, LLC**

Harrison County, West Virginia

W.B. Carpenter #140

W.B. Carpenter #140

Wellbore #1

Design: Wellbore #1

## **Survey Report - Geographic**

07 January, 2014

Received

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Office of Oil and Gas  
WV Dept. of Environmental Protection



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DDC  
Survey Report - Geographic



<b>Company:</b>	HG Energy, LLC	<b>Local Co-ordinate Reference:</b>	Well W.B. Carpenter #140
<b>Project:</b>	Harrison County, West Virginia	<b>TVD Reference:</b>	WELL @ 1315.0usft (Decker #6)
<b>Site:</b>	W.B. Carpenter #140	<b>MD Reference:</b>	WELL @ 1315.0usft (Decker #6)
<b>Well:</b>	W.B. Carpenter #140	<b>North Reference:</b>	Grid
<b>Wellbore:</b>	Wellbore #1	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	Wellbore #1	<b>Database:</b>	EDM 5000.1 Single User Db

<b>Project</b>	Harrison County, West Virginia		
<b>Map System:</b>	Universal Transverse Mercator	<b>System Datum:</b>	Mean Sea Level
<b>Geo Datum:</b>	NAD83 West Virginia - HARN		
<b>Map Zone:</b>	Zone 17N (84 W to 78 W)		

<b>Site</b>	W.B. Carpenter #140				
<b>Site Position:</b>		<b>Northing:</b>	14,263,965.50 usft	<b>Latitude:</b>	39° 16' 38.300 N
<b>From:</b>	Lat/Long	<b>Easting:</b>	1,779,533.54 usft	<b>Longitude:</b>	80° 30' 30.200 W
<b>Position Uncertainty:</b>	0.0 usft	<b>Slot Radius:</b>	13-3/16 "	<b>Grid Convergence:</b>	0.31 °

<b>Well</b>	W.B. Carpenter #140					
<b>Well Position</b>	<b>+N/-S</b>	0.0 usft	<b>Northing:</b>	14,263,965.50 usft	<b>Latitude:</b>	39° 16' 38.300 N
	<b>+E/-W</b>	0.0 usft	<b>Easting:</b>	1,779,533.54 usft	<b>Longitude:</b>	80° 30' 30.200 W
<b>Position Uncertainty</b>		0.0 usft	<b>Wellhead Elevation:</b>	usft	<b>Ground Level:</b>	1,307.0 usft

<b>Wellbore</b>	Wellbore #1				
<b>Magnetics</b>	<b>Model Name</b>	<b>Sample Date</b>	<b>Declination (°)</b>	<b>Dip Angle (°)</b>	<b>Field Strength (nT)</b>
	IGRF2010	12/13/2013	-8.64	66.82	52,317

<b>Design</b>	Wellbore #1				
<b>Audit Notes:</b>					
<b>Version:</b>	1.0	<b>Phase:</b>	ACTUAL	<b>Tie On Depth:</b>	0.0
<b>Vertical Section:</b>	<b>Depth From (TVD) (usft)</b>	<b>+N/-S (usft)</b>	<b>+E/-W (usft)</b>	<b>Direction (°)</b>	
	0.0	0.0	0.0	178.61	

<b>Survey Program</b>	<b>Date</b>	12/13/2013			
<b>From (usft)</b>	<b>To (usft)</b>	<b>Survey (Wellbore)</b>	<b>Tool Name</b>	<b>Description</b>	
805.0	3,271.0	MWD (Wellbore #1)			

<b>Survey</b>										
<b>Measured Depth (usft)</b>	<b>Inclination (°)</b>	<b>Azimuth (°)</b>	<b>Vertical Depth (usft)</b>	<b>+N/-S (usft)</b>	<b>+E/-W (usft)</b>	<b>Map Northing (usft)</b>	<b>Map Easting (usft)</b>	<b>Latitude</b>	<b>Longitude</b>	
805.0	0.00	0.00	805.0	0.0	0.0	14,263,965.50	1,779,533.54	39° 16' 38.300 N	80° 30' 30.200 W	
<b>FIRST SURVEY @ 805' MD / 805' TVD</b>										
845.0	1.71	121.60	845.0	-0.3	0.5	14,263,965.18	1,779,534.05	39° 16' 38.297 N	80° 30' 30.194 W	
875.0	1.71	114.62	875.0	-0.7	1.3	14,263,964.76	1,779,534.84	39° 16' 38.293 N	80° 30' 30.184 W	
905.0	2.02	130.22	905.0	-1.3	2.1	14,263,964.23	1,779,535.65	39° 16' 38.287 N	80° 30' 30.173 W	
935.0	2.59	146.21	934.9	-2.2	2.9	14,263,963.33	1,779,536.43	39° 16' 38.278 N	80° 30' 30.163 W	
965.0	3.30	164.80	964.9	-3.6	3.5	14,263,961.93	1,779,537.03	39° 16' 38.265 N	80° 30' 30.156 W	
995.0	3.78	182.12	994.8	-5.4	3.7	14,263,960.11	1,779,537.22	39° 16' 38.247 N	80° 30' 30.154 W	
1,025.0	4.61	189.72	1,024.8	-7.6	3.4	14,263,957.93	1,779,536.88	39° 16' 38.225 N	80° 30' 30.157 W	
1,055.0	5.49	189.02	1,054.6	-10.2	3.0	14,263,955.33	1,779,536.55	39° 16' 38.199 N	80° 30' 30.162 W	
1,085.0	6.50	189.50	1,084.5	-13.3	2.5	14,263,952.24	1,779,536.05	39° 16' 38.169 N	80° 30' 30.169 W	
1,115.0	7.29	190.12	1,114.3	-16.8	1.9	14,263,948.69	1,779,535.43	39° 16' 38.134 N	80° 30' 30.177 W	

DDC  
Survey Report - Geographic



<b>Company:</b>	HG Energy, LLC	<b>Local Co-ordinate Reference:</b>	Well W.B. Carpenter #140
<b>Project:</b>	Harrison County, West Virginia	<b>TVD Reference:</b>	WELL @ 1315.0usft (Decker #6)
<b>Site:</b>	W.B. Carpenter #140	<b>MD Reference:</b>	WELL @ 1315.0usft (Decker #6)
<b>Well:</b>	W.B. Carpenter #140	<b>North Reference:</b>	Grid
<b>Wellbore:</b>	Wellbore #1	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	Wellbore #1	<b>Database:</b>	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	
1,145.0	7.78	189.59	1,144.0	-20.7	1.2	14,263,944.81	1,779,534.76	39° 16' 38.095 N	80° 30' 30.186 W	
1,175.0	8.39	187.92	1,173.7	-24.9	0.6	14,263,940.64	1,779,534.12	39° 16' 38.054 N	80° 30' 30.194 W	
1,205.0	9.32	185.11	1,203.4	-29.4	0.1	14,263,936.05	1,779,533.60	39° 16' 38.009 N	80° 30' 30.201 W	
1,235.0	10.59	186.51	1,232.9	-34.6	-0.5	14,263,930.90	1,779,533.07	39° 16' 37.958 N	80° 30' 30.208 W	
1,265.0	12.00	187.22	1,262.3	-40.4	-1.2	14,263,925.06	1,779,532.37	39° 16' 37.900 N	80° 30' 30.218 W	
1,295.0	12.70	184.62	1,291.6	-46.8	-1.8	14,263,918.68	1,779,531.71	39° 16' 37.837 N	80° 30' 30.227 W	
1,325.0	13.10	181.50	1,320.9	-53.5	-2.2	14,263,912.00	1,779,531.36	39° 16' 37.771 N	80° 30' 30.231 W	
1,355.0	13.01	177.59	1,350.1	-60.3	-2.1	14,263,905.22	1,779,531.41	39° 16' 37.704 N	80° 30' 30.231 W	
1,385.0	13.40	173.81	1,379.3	-67.1	-1.6	14,263,898.39	1,779,531.93	39° 16' 37.637 N	80° 30' 30.225 W	
1,415.0	14.59	174.03	1,408.4	-74.3	-0.8	14,263,891.18	1,779,532.69	39° 16' 37.565 N	80° 30' 30.216 W	
1,445.0	16.00	174.69	1,437.3	-82.2	-0.1	14,263,883.30	1,779,533.47	39° 16' 37.487 N	80° 30' 30.207 W	
1,475.0	17.40	175.53	1,466.1	-90.8	0.7	14,263,874.72	1,779,534.20	39° 16' 37.402 N	80° 30' 30.198 W	
1,505.0	18.28	176.10	1,494.6	-99.9	1.3	14,263,865.55	1,779,534.87	39° 16' 37.312 N	80° 30' 30.190 W	
1,535.0	18.19	176.71	1,523.1	-109.3	1.9	14,263,856.18	1,779,535.46	39° 16' 37.219 N	80° 30' 30.183 W	
1,565.0	18.59	178.21	1,551.6	-118.8	2.3	14,263,846.73	1,779,535.88	39° 16' 37.126 N	80° 30' 30.178 W	
1,595.0	18.41	179.79	1,580.0	-128.3	2.5	14,263,837.21	1,779,536.04	39° 16' 37.031 N	80° 30' 30.177 W	
1,625.0	18.19	179.39	1,608.5	-137.7	2.6	14,263,827.79	1,779,536.11	39° 16' 36.938 N	80° 30' 30.177 W	
1,655.0	18.81	178.82	1,637.0	-147.2	2.7	14,263,818.27	1,779,536.26	39° 16' 36.844 N	80° 30' 30.176 W	
1,685.0	20.21	177.59	1,665.3	-157.2	3.0	14,263,808.26	1,779,536.58	39° 16' 36.745 N	80° 30' 30.172 W	
1,715.0	21.88	177.20	1,693.3	-168.0	3.5	14,263,797.50	1,779,537.07	39° 16' 36.639 N	80° 30' 30.167 W	
1,745.0	22.81	178.82	1,721.0	-179.4	3.9	14,263,786.10	1,779,537.46	39° 16' 36.526 N	80° 30' 30.162 W	
1,775.0	23.20	179.22	1,748.6	-191.1	4.1	14,263,774.38	1,779,537.66	39° 16' 36.410 N	80° 30' 30.161 W	
1,805.0	22.72	181.19	1,776.2	-202.8	4.1	14,263,762.68	1,779,537.62	39° 16' 36.294 N	80° 30' 30.162 W	
1,835.0	21.62	182.60	1,804.0	-214.1	3.7	14,263,751.36	1,779,537.25	39° 16' 36.183 N	80° 30' 30.168 W	
1,865.0	21.40	184.23	1,831.9	-225.1	3.1	14,263,740.38	1,779,536.60	39° 16' 36.074 N	80° 30' 30.177 W	
1,895.0	21.71	184.93	1,859.8	-236.1	2.2	14,263,729.40	1,779,535.72	39° 16' 35.966 N	80° 30' 30.189 W	
1,925.0	22.41	186.60	1,887.6	-247.3	1.0	14,263,718.19	1,779,534.58	39° 16' 35.855 N	80° 30' 30.204 W	
1,955.0	22.59	187.52	1,915.4	-258.7	-0.4	14,263,706.79	1,779,533.17	39° 16' 35.742 N	80° 30' 30.223 W	
1,985.0	22.72	188.49	1,943.0	-270.1	-2.0	14,263,695.35	1,779,531.56	39° 16' 35.629 N	80° 30' 30.244 W	
2,015.0	23.29	190.42	1,970.7	-281.7	-3.9	14,263,683.79	1,779,529.63	39° 16' 35.515 N	80° 30' 30.269 W	
2,045.0	24.08	192.40	1,998.1	-293.5	-6.3	14,263,671.98	1,779,527.25	39° 16' 35.398 N	80° 30' 30.300 W	
2,075.0	24.39	191.70	2,025.5	-305.6	-8.9	14,263,659.93	1,779,524.68	39° 16' 35.279 N	80° 30' 30.334 W	
2,105.0	25.40	190.82	2,052.7	-317.9	-11.3	14,263,647.55	1,779,522.21	39° 16' 35.157 N	80° 30' 30.366 W	
2,135.0	25.88	189.59	2,079.7	-330.7	-13.6	14,263,634.77	1,779,519.91	39° 16' 35.031 N	80° 30' 30.396 W	
2,165.0	26.72	189.41	2,106.6	-343.8	-15.8	14,263,621.66	1,779,517.72	39° 16' 34.901 N	80° 30' 30.425 W	
2,195.0	27.20	188.31	2,133.4	-357.3	-17.9	14,263,608.23	1,779,515.63	39° 16' 34.769 N	80° 30' 30.453 W	
2,225.0	27.60	188.31	2,160.0	-370.9	-19.9	14,263,594.56	1,779,513.63	39° 16' 34.634 N	80° 30' 30.479 W	
2,255.0	27.11	185.59	2,186.7	-384.6	-21.6	14,263,580.88	1,779,511.96	39° 16' 34.498 N	80° 30' 30.501 W	
2,285.0	26.41	183.22	2,213.4	-398.1	-22.6	14,263,567.42	1,779,510.92	39° 16' 34.365 N	80° 30' 30.515 W	
2,315.0	25.62	180.62	2,240.4	-411.2	-23.1	14,263,554.27	1,779,510.48	39° 16' 34.235 N	80° 30' 30.522 W	
2,345.0	24.61	178.69	2,267.6	-424.0	-23.0	14,263,541.54	1,779,510.55	39° 16' 34.110 N	80° 30' 30.522 W	
2,375.0	23.99	176.10	2,294.9	-436.3	-22.4	14,263,529.21	1,779,511.11	39° 16' 33.988 N	80° 30' 30.516 W	
2,405.0	23.51	174.82	2,322.4	-448.3	-21.5	14,263,517.17	1,779,512.06	39° 16' 33.868 N	80° 30' 30.504 W	
2,435.0	22.81	172.10	2,350.0	-460.0	-20.1	14,263,505.45	1,779,513.40	39° 16' 33.753 N	80° 30' 30.488 W	
2,465.0	22.02	170.12	2,377.7	-471.3	-18.4	14,263,494.15	1,779,515.16	39° 16' 33.641 N	80° 30' 30.466 W	
2,495.0	21.31	166.82	2,405.6	-482.2	-16.2	14,263,483.30	1,779,517.37	39° 16' 33.533 N	80° 30' 30.439 W	
2,525.0	20.30	163.70	2,433.6	-492.5	-13.5	14,263,472.99	1,779,520.08	39° 16' 33.431 N	80° 30' 30.405 W	
2,555.0	19.12	161.81	2,461.9	-502.2	-10.5	14,263,463.33	1,779,523.07	39° 16' 33.336 N	80° 30' 30.368 W	
2,585.0	18.11	161.90	2,490.3	-511.3	-7.5	14,263,454.23	1,779,526.05	39° 16' 33.245 N	80° 30' 30.331 W	
2,615.0	17.09	164.89	2,518.9	-520.0	-4.9	14,263,445.54	1,779,528.65	39° 16' 33.159 N	80° 30' 30.298 W	
2,645.0	16.61	168.89	2,547.6	-528.4	-2.9	14,263,437.08	1,779,530.63	39° 16' 33.076 N	80° 30' 30.274 W	
2,675.0	16.48	173.50	2,576.4	-536.9	-1.6	14,263,428.64	1,779,531.93	39° 16' 32.992 N	80° 30' 30.258 W	
2,705.0	16.48	177.81	2,605.1	-545.3	-1.0	14,263,420.16	1,779,532.58	39° 16' 32.908 N	80° 30' 30.250 W	
2,735.0	16.08	179.79	2,633.9	-553.7	-0.8	14,263,411.76	1,779,532.76	39° 16' 32.825 N	80° 30' 30.248 W	
2,765.0	15.51	180.32	2,662.8	-561.9	-0.8	14,263,403.59	1,779,532.75	39° 16' 32.744 N	80° 30' 30.249 W	



DDC  
Survey Report - Geographic



<b>Company:</b>	HG Energy, LLC	<b>Local Co-ordinate Reference:</b>	Well W.B. Carpenter #140
<b>Project:</b>	Harrison County, West Virginia	<b>TVD Reference:</b>	WELL @ 1315.0usft (Decker #6)
<b>Site:</b>	W.B. Carpenter #140	<b>MD Reference:</b>	WELL @ 1315.0usft (Decker #6)
<b>Well:</b>	W.B. Carpenter #140	<b>North Reference:</b>	Grid
<b>Wellbore:</b>	Wellbore #1	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	Wellbore #1	<b>Database:</b>	EDM 5000.1 Single User Db

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
2,795.0	15.60	182.60	2,691.7	-569.9	-1.0	14,263,395.55	1,779,532.54	39° 16' 32.665 N	80° 30' 30.252 W
2,825.0	16.22	185.50	2,720.5	-578.1	-1.6	14,263,387.35	1,779,531.96	39° 16' 32.584 N	80° 30' 30.260 W
2,855.0	17.18	189.10	2,749.3	-586.7	-2.7	14,263,378.80	1,779,530.86	39° 16' 32.499 N	80° 30' 30.275 W
2,885.0	18.11	192.00	2,777.9	-595.6	-4.4	14,263,369.87	1,779,529.19	39° 16' 32.411 N	80° 30' 30.297 W
2,915.0	18.26	190.73	2,806.4	-604.8	-6.2	14,263,360.69	1,779,527.34	39° 16' 32.321 N	80° 30' 30.321 W
2,945.0	18.41	189.19	2,834.8	-614.1	-7.8	14,263,351.40	1,779,525.71	39° 16' 32.229 N	80° 30' 30.342 W
2,975.0	18.41	184.23	2,863.3	-623.5	-8.9	14,263,341.99	1,779,524.61	39° 16' 32.136 N	80° 30' 30.357 W
3,005.0	17.09	179.00	2,891.9	-632.6	-9.2	14,263,332.86	1,779,524.33	39° 16' 32.046 N	80° 30' 30.361 W
3,035.0	15.82	171.61	2,920.7	-641.1	-8.5	14,263,324.41	1,779,525.01	39° 16' 31.962 N	80° 30' 30.353 W
3,065.0	15.21	165.73	2,949.6	-648.9	-7.0	14,263,316.55	1,779,526.57	39° 16' 31.884 N	80° 30' 30.333 W
3,095.0	15.12	159.53	2,978.5	-656.4	-4.6	14,263,309.07	1,779,528.91	39° 16' 31.810 N	80° 30' 30.304 W
3,125.0	14.50	154.30	3,007.5	-663.5	-1.6	14,263,302.02	1,779,531.91	39° 16' 31.740 N	80° 30' 30.267 W
3,155.0	13.71	151.31	3,036.6	-670.0	1.7	14,263,295.51	1,779,535.24	39° 16' 31.676 N	80° 30' 30.225 W
3,185.0	13.01	146.61	3,065.8	-675.9	5.3	14,263,289.58	1,779,538.81	39° 16' 31.617 N	80° 30' 30.180 W
3,215.0	12.49	141.20	3,095.1	-681.3	9.2	14,263,284.23	1,779,542.70	39° 16' 31.564 N	80° 30' 30.131 W
3,271.0	12.49	141.20	3,149.7	-690.7	16.7	14,263,274.79	1,779,550.29	39° 16' 31.470 N	80° 30' 30.035 W

TD @ 3271' MD / 3150' TVD

Measured Depth (usft)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Comment
3,271.0	3,149.7	-690.7	16.7	TD @ 3271' MD / 3150' TVD

Checked By: \_\_\_\_\_ Approved By: \_\_\_\_\_ Date: \_\_\_\_\_

Received

JAN 21 2014

Office of Oil and Gas  
WV Dept. of Environmental Protection

W.B. Carpenter #140  
 Harrison County, West Virginia  
 Q130711 & AM-13674  
 Design #1

Company Name: HG Energy, LLC  
 W.B. Carpenter #140  
 Harrison County, West Virginia  
 Rig: Original Well Elev  
 Created By: Guthrey Johnson  
 Date: 08/27/2013



**HG Energy**

WELL DETAILS: W.B. Carpenter #140

+N-S	+E-W	Ground Level:	1307.0
0.0	0.0	Northing	284712.48
		Easting	1714541.3639° 16' 38.200 180° 30' 30.200 W

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

M G T Azimuths to Grid North  
 Magnetic North: -7.99°

Magnetic Field  
 Strength: 52357.2snT  
 Dip Angle: 66.85°  
 Date: 8/14/2013  
 Model: IGRF2010

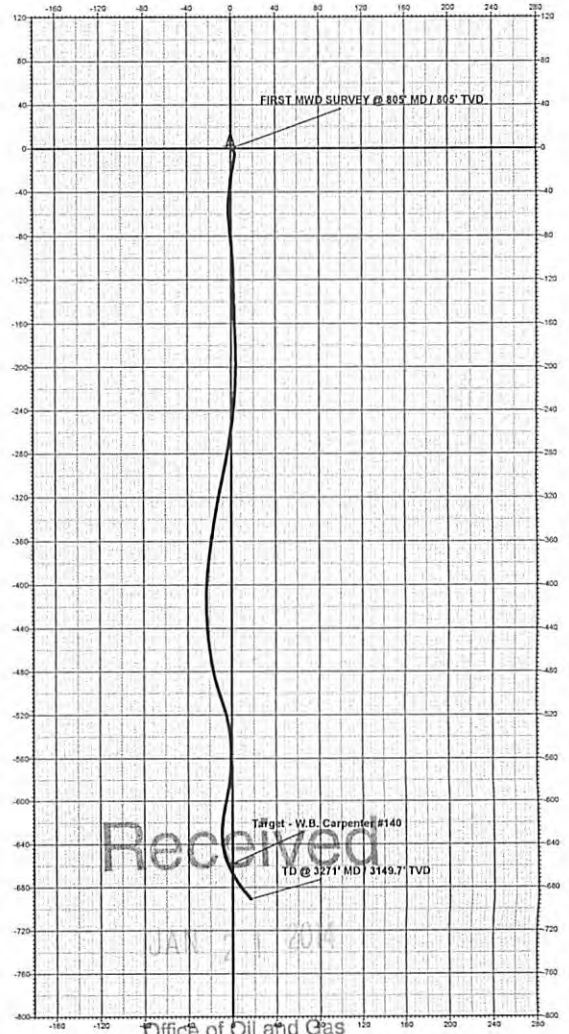
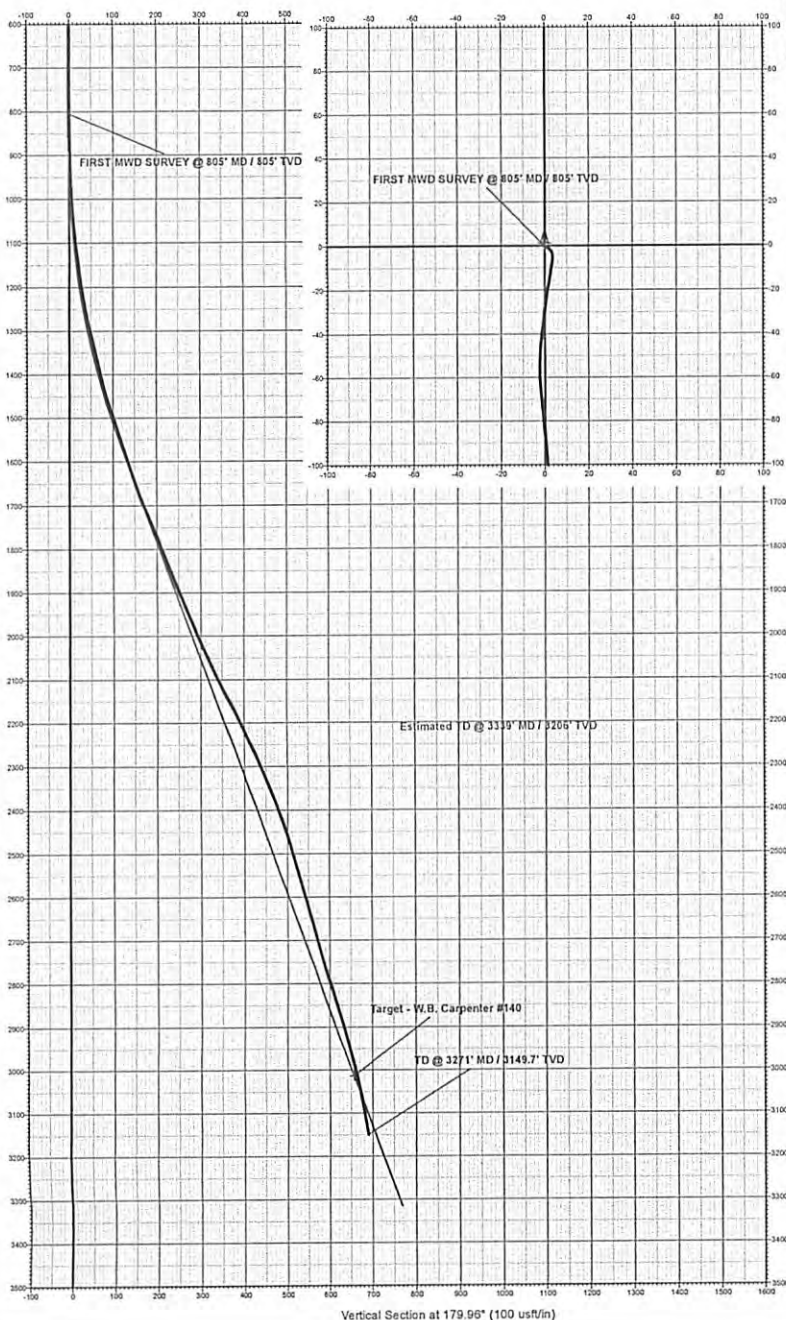
DESIGN TARGET DETAILS

Name	TVD	+N-S	+E-W	Northing	Easting	Latitude	Longitude
Target - W.B. Carpenter #140	3014.5	-67.7	0.5	284054.82	1714541.84	39° 16' 31.800 N	80° 30' 30.100 W

- plan hits target center

ANNOTATIONS

MD	Inc	Az	TVD	+N-S	+E-W	V-Sect	Departure	Annotation
805.0	0.00	360.00	805.0	0.0	0.0	0.0	0.0	FIRST MWD SURVEY @ 805' MD / 805' TVD
3271.0	12.49	141.20	3149.7	-690.7	16.7	690.9	705.3	TD @ 3271' MD / 3149.7' TVD



Received  
 JAN 21 2014

Office of Oil and Gas  
 WV Dept. of Environmental Protection

02/28/2014