

State of West Virginia
Department of Environmental Protection - Office of Oil and Gas
Well Operator's Report of Well Work

Revised

PM

API 47-033-5780 County HARRISON District TEN MILE
Quad SALEM 7.5' Pad Name W.B. CARPENTER Field/Pool Name WOLF SUMMIT
Farm name JUNKINS, EARL & BELVA Well Number 237
Operator (as registered with the OOG) H.G. ENERGY LLC
Address 5260 DuPONT ROAD City PARKERSBURG State WV Zip 26101

As Drilled location NAD 83/UTM Attach an as-drilled plat, profile view, and deviation survey
Top hole Northing 4,347,315 M Easting 542,622 M
Landing Point of Curve Northing _____ Easting _____
Bottom Hole Northing 4,347,412 M Easting 542,646 M

Elevation (ft) 1,390' GL Type of Well New Existing Type of Report Interim Final
Permit Type Deviated Horizontal Horizontal 6A Vertical Depth Type Deep Shallow
Type of Operation Convert Deepen Drill Plug Back Redrilling Rework Stimulate
Well Type Brine Disposal CBM Gas Oil Secondary Recovery Solution Mining Storage Other _____
Type of Completion Single Multiple Fluids Produced Brine Gas NGL Oil Other _____
Drilled with Cable Rotary

Drilling Media Surface hole Air Mud Fresh Water Intermediate hole Air Mud Fresh Water Brine
Production hole Air Mud Fresh Water Brine
Mud Type(s) and Additive(s)
N/A

Date permit issued 8/08/13 Date drilling commenced 11/1/13 Date drilling ceased 11/7/13
Date completion activities began 11/21/13 Date completion activities ceased 12/5/13
Verbal plugging (Y/N) N Date permission granted _____ Granted by _____

RECEIVED
Office of Oil and Gas

Please note: Operator is required to submit a plugging application within 5 days of verbal permission to plug

Freshwater depth(s) ft None Open mine(s) (Y/N) depths N
Salt water depth(s) ft None Void(s) encountered (Y/N) depths N
Coal depth(s) ft 740'-747' Cavern(s) encountered (Y/N) depths N
Is coal being mined in area (Y/N) N

Reviewed by:

04/04/2014

API 47-033 - 5780 Farm name JUNKINS, EARL & BELVA Well number 237

CASING STRINGS	Hole Size	Casing Size	Depth	New or Used	Grade wt/ft	Basket Depth(s)	Did cement circulate (Y/N) * Provide details below*
Conductor	12 1/4"	11 5/8"	30'	Used	LS		Sand In
Surface	8 3/4"	7"	837'	New	LS	64'	Y
Coal							
Intermediate 1							
Intermediate 2							
Intermediate 3							
Production	6 1/2"	4 1/2"	3204.05'	New	J-55		Y
Tubing							
Packer type and depth set							

Comment Details Circulated Est. 20 bbls to surface on 7" surface cement job. Circulated Est. 10 bbls to surface on 4 1/2" cement job.

CEMENT DATA	Class/Type of Cement	Number of Sacks	Slurry wt (ppg)	Yield (ft ³ /sks)	Volume (ft ³)	Cement Top (MD)	WOC (hrs)
Conductor							
Surface	Reg Neat	215	15.6	1.18	254	Surface	8
Coal							
Intermediate 1							
Intermediate 2							
Intermediate 3							
Production	50:50 Pozmix/ Econo	200/80	14.2/11.8	1.27/2.93	254/234	Surface	8
Tubing							

Drillers TD (ft) 3291' Loggers TD (ft) 3255'

Deepest formation penetrated Fifth Sand Plug back to (ft) N/A

Plug back procedure N/A

Kick off depth (ft) 850'

Check all wireline logs run caliper density deviated/directional induction
 neutron resistivity gamma ray temperature sonic

Well cored Yes No Conventional Sidewall Were cuttings collected Yes No

DESCRIBE THE CENTRALIZER PLACEMENT USED FOR EACH CASING STRING _____

15 Centralizers every 64' from bottom on 4 1/2", Centralizer placed mid string on 7"

WAS WELL COMPLETED AS SHOT HOLE Yes No DETAILS _____

WAS WELL COMPLETED OPEN HOLE? Yes No DETAILS _____

WERE TRACERS USED Yes No TYPE OF TRACER(S) USED _____

API 47- 033 - 5780 Farm name JUNKINS, EARL & BELVA Well number 237

<u>PRODUCING FORMATION(S)</u>	<u>DEPTHS</u>	
Fifth Sand	3052'-3067'	TVD 3014'-3029' MD
_____	_____	_____
_____	_____	_____
_____	_____	_____

Please insert additional pages as applicable.

GAS TEST Build up Drawdown Open Flow OIL TEST Flow Pump
 SHUT-IN PRESSURE Surface _____ psi Bottom Hole _____ psi DURATION OF TEST _____ hrs
 OPEN FLOW Gas _____ mcfpd Oil _____ bpd NGL _____ bpd Water _____ bpd GAS MEASURED BY
 Estimated Orifice Pilot

LITHOLOGY/ FORMATION	TOP DEPTH IN FT NAME TVD	BOTTOM DEPTH IN FT TVD	TOP DEPTH IN FT MD	BOTTOM DEPTH IN FT MD	DESCRIBE ROCK TYPE AND RECORD QUANTITY AND TYPE OF FLUID (FRESHWATER, BRINE, OIL, GAS, H ₂ S, ETC)
Sand/Shale	0	740	0	740	
Pittsburgh Coal	740	747	740	747	
Sand/Shale	747	2090	747	2112	
Big Lime	2090	2176	2112	2202	
Big Injun	2176	2230	2202	2260	
Shale	2230	2640	2260	2680	
Fifty Foot	2640	2680	2680	2720	
Shale	2680	2733	2720	2774	
Sand	2733	2890	2774	2932	
Shale	2890	3052	2932	3096	
Fifth Sand	3052	3067	3096	3110	Drilled directional N 20 degrees E a distance of 399'
Shale	3067	3246	3110	3291	
TD	3246		3291		

Please insert additional pages as applicable.

Drilling Contractor Decker Drilling
 Address 11565 State Route 676 City Vincent State OH Zip 45784

Logging Company Weatherford International
 Address 777 North River Avenue City Weston State WV Zip 26452

Cementing Company Baker Hughes
 Address 2228 Philippi Pike City Clarksburg State WV Zip 26301

Stimulating Company Producers Service Corp.
 Address 109 South Graham Street City Zanesville State OH Zip 43701

Please insert additional pages as applicable.

Completed by Roger Heldman Telephone 304-420-1107
 Signature  Title Operations Manager Date 1/31/14

Submission of Hydraulic Fracturing Chemical Disclosure Information Attach copy of FRACFOCUS Registry

04/04/2014



SURVEY CALCULATION PROGRAM

TARGET DETAILS

v1.00.02

OPERATOR:	HG Energy, LLC	Supervisors:	TARGET N-S
WELL:	W.B. Carpenter #237	Jeff Gibson	Directional
		L. PENNISI / R. BUHRMAN / S. HISER	TARGET E-W
LOCATION:	Harrison County, WV		TARGET RADIUS
JOB NUMBER:	AM-13862		TARGET DISPLACEMENT
COMMENTS:			TARGET CLOSURE
		MAG DEC.(-/+)	TARGET TVD
		-8.63	Horizontal
		GRID CORR.(-/+)	DIP AZ
		0.64	DIP DEG UP+/DN-
		TOTAL CORR.(-/+)	TARGET INCLINATION
		-7.99	
DATE:	1/30/2014	TIME:	11:44 AM
		GRID	

MINIMUM CURVATURE CALCULATIONS(SPE-3362)										PROPOSED DIRECTION		TARGET TRACKING		CLOSURE		BUILD		WALK	
										20.00		TO CENTER		DIR		RATE/		RATE/	
SVY	MD	INC	TRUE	TVD	SECT	N-S	E-W	DLS/	ABOVE(+)	RIGHT(+)	DIR	DISTANCE	RATE/	BUILD	RATE/	WALK			
NUM			AZM					100.00	BELOW(-)	LEFT(-)	(DEG AZ)	(FEET)	%/100'	%/100'	%/100'	%/100'			
TIE	850	0.0	0.0	850.00	0.00	0.00	0.00		-850.00	0.02	63.43	0.00							
1	914	2.5	109.5	913.98	0.01	-0.47	1.32	3.91	-913.98	1.41	109.50	1.40	3.91	3.19					
2	925	2.6	112.9	924.97	0.00	-0.64	1.77	1.65	-924.97	1.90	109.95	1.89	0.91	1.37					
3	955	2.8	111.1	954.94	-0.05	-1.17	3.08	0.72	-954.94	3.31	110.81	3.30	0.67	-0.28					
4	985	2.7	83.9	984.90	0.25	-1.36	4.47	4.32	-984.90	4.68	106.93	4.67	-0.33	-4.31					
5	1015	3.4	61.5	1014.86	1.23	-0.86	5.95	4.56	-1014.86	5.90	98.23	6.02	2.33	-3.95					
6	1045	4.3	51.0	1044.79	2.86	0.27	7.61	3.80	-1044.79	7.07	87.96	7.61	3.00	-0.47					
7	1075	5.1	36.3	1074.69	5.10	2.05	9.27	4.80	-1074.69	8.03	77.51	9.50	2.67	-0.80					
8	1105	6.2	29.4	1104.55	7.98	4.54	10.86	4.30	-1104.55	8.67	67.31	11.77	3.67	-0.45					
9	1135	6.2	29.6	1134.37	11.18	7.36	12.45	0.07	-1134.37	9.20	59.42	14.47	0.00	0.01					
10	1165	6.0	23.4	1164.20	14.34	10.21	13.88	2.29	-1164.20	9.56	53.66	17.23	-0.67	-0.44					
11	1195	5.6	17.6	1194.05	17.37	13.04	14.94	2.36	-1194.05	9.59	48.88	19.83	-1.33	-0.39					
12	1225	5.6	11.1	1223.91	20.27	15.87	15.67	2.11	-1223.91	9.31	44.62	22.30	0.00	-0.42					
13	1255	6.2	11.3	1253.75	23.32	18.90	16.26	2.00	-1253.75	8.84	40.72	24.93	2.00	0.01					
14	1285	7.1	14.3	1283.54	26.77	22.28	17.04	3.21	-1283.54	8.41	37.40	28.05	3.00	0.23					
15	1315	8.0	16.7	1313.28	30.70	26.08	18.10	3.18	-1313.28	8.10	34.76	31.74	3.00	0.21					
16	1345	8.5	18.2	1342.97	35.00	30.19	19.39	1.81	-1342.97	7.91	32.72	35.88	1.67	0.14					
17	1375	8.80	20.70	1372.63	39.51	34.44	20.89	1.60	-1372.63	7.87	31.25	40.28	1.00	0.25					
18	1405	9.30	20.80	1402.26	44.23	38.85	22.57	1.67	-1402.26	7.93	30.15	44.93	1.67	0.01					
19	1435	9.80	20.80	1431.84	49.20	43.50	24.33	1.67	-1431.84	8.00	29.22	49.85	1.67	0.00					
20	1465	10.70	19.60	1461.36	54.54	48.51	26.17	3.08	-1461.36	8.02	28.35	55.12	3.00	-0.14					
21	1495	11.70	19.30	1490.79	60.37	54.01	28.11	3.34	-1490.79	7.96	27.50	60.89	3.33	-0.04					
22	1525	13.30	18.70	1520.08	66.86	60.15	30.23	5.35	-1520.08	7.85	26.68	67.32	5.33	-0.09					
23	1555	13.90	19.80	1549.24	73.91	66.81	32.55	2.18	-1549.24	7.76	25.98	74.32	2.00	0.17					
24	1585	14.00	20.80	1578.35	81.14	73.59	35.06	0.87	-1578.35	7.79	25.48	81.52	0.33	0.16					
25	1615	13.30	21.80	1607.51	88.22	80.19	37.63	2.46	-1607.51	7.95	25.14	88.58	-2.33	0.16					
26	1645	13.10	23.40	1636.71	95.07	86.51	40.26	1.39	-1636.71	8.26	24.96	95.42	-0.67	0.24					
27	1675	12.80	23.60	1665.95	101.78	92.68	42.94	1.01	-1665.95	8.67	24.86	102.14	-1.00	0.03					
28	1705	12.70	25.20	1695.21	108.38	98.71	45.68	1.22	-1695.21	9.18	24.83	108.76	-0.33	0.24					
29	1735	12.80	23.40	1724.47	114.98	104.74	48.40	1.37	-1724.47	9.68	24.80	115.38	0.33	-0.26					
30	1765	13.10	21.60	1753.71	121.69	110.95	50.97	1.68	-1753.71	9.97	24.68	122.10	1.00	-0.27					
31	1795	13.00	20.60	1782.93	128.47	117.27	53.41	0.82	-1782.93	10.10	24.49	128.86	-0.33	-0.15					
32	1825	13.20	20.10	1812.15	135.27	123.65	55.78	0.77	-1812.15	10.14	24.28	135.64	0.67	-0.08					
33	1855	13.20	20.90	1841.36	142.12	130.06	58.18	0.61	-1841.36	10.20	24.10	142.48	0.00	0.12					
34	1885	13.50	19.90	1870.55	149.04	136.55	60.59	1.26	-1870.55	10.25	23.93	149.39	1.00	-0.15					
35	1915	13.90	20.80	1899.70	156.15	143.22	63.06	1.51	-1899.70	10.29	23.77	156.48	1.33	0.14					
36	1945	14.20	20.80	1928.80	163.43	150.02	65.65	1.00	-1928.80	10.39	23.63	163.76	1.00	0.00					
37	1975	15.00	20.80	1957.83	170.99	157.09	68.33	2.67	-1957.83	10.50	23.51	171.31	2.67	0.00					
38	2005	15.50	22.90	1986.77	178.88	164.42	71.27	2.48	-1986.77	10.76	23.44	179.20	1.67	0.37					
39	2035	16.50	23.90	2015.61	187.13	172.00	74.56	3.46	-2015.61	11.25	23.44	187.47	3.33	0.18					
40	2065	16.70	25.30	2044.36	195.67	179.79	78.13	1.49	-2044.36	11.94	23.49	196.04	0.67	0.27					
41	2095	16.50	23.60	2073.11	204.22	187.60	81.67	1.75	-2073.11	12.60	23.53	204.60	-0.67	-0.32					
42	2125	16.80	23.00	2101.85	212.80	195.49	85.07	1.15	-2101.85	13.10	23.52	213.20	1.00	-0.11					
43	2155	17.00	23.30	2130.56	221.51	203.51	88.50	0.73	-2130.56	13.58	23.50	221.92	0.67	0.06					
44	2185	17.20	21.90	2159.23	230.32	211.65	91.89	1.53	-2159.23	13.98	23.47	230.74	0.67	-0.27					
45	2215	17.50	22.00	2187.87	239.26	219.95	95.24	1.00	-2187.87	14.28	23.41	239.68	1.00	0.02					
46	2245	18.10	23.30	2216.43	248.42	228.41	98.77	2.40	-2216.43	14.71	23.38	248.42	0.67	0.26					
47	2275	17.40	22.90	2245.00	257.55	236.83	102.36	2.37	-2245.00	15.20	23.37	258.00	-2.33	-0.08					

04/04/2014



SURVEY CALCULATION PROGRAM

TARGET DETAILS

v1.00.02

OPERATOR:	HG Energy, LLC	Supervisors:	
WELL:	W.B. Carpenter #237		
LOCATION:	Harrison County, WV		
JOB NUMBER:	AM-13862		
COMMENTS:			
		MAG DEC.(-/+)	-8.63
		GRID CORR.(-/+)	0.64
		TOTAL CORR.(-/+)	-7.99
DATE:	1/30/2014	TIME:	11:44 AM
		GRID	

TARGET N-S	Directional
TARGET E-W	
TARGET RADIUS	
TARGET DISPLACEMENT	
TARGET CLOSURE	
TARGET TVD	Horizontal
DIP AZ	
DIP DEG UP+/DN-	
TARGET INCLINATION	

MINIMUM CURVATURE CALCULATIONS(SPE-3362)					PROPOSED DIRECTION				20.00		TARGET TRACKING		CLOSURE		BUILD	WALK
SVY	NUM	MD	INC	TRUE	AZM	TVD	SECT	N-S	E-W	DLS/100.00	TO CENTER		DIR (DEG AZ)	DISTANCE (FEET)	RATE/ %/100'	RATE/ %/100'
											ABOVE(+)	RIGHT(+)				
											BELOW(-)	LEFT(-)				
48	2305	16.40	20.30	2273.71	266.27	244.93	105.57	4.18	-2273.71	15.45	23.32	266.71	-3.33	-0.50		
49	2335	15.70	18.50	2302.54	274.56	252.75	108.33	2.86	-2302.54	15.37	23.20	274.99	-2.33	-0.33		
50	2365	15.20	20.40	2331.45	282.55	260.29	110.99	2.37	-2331.45	15.29	23.09	282.96	-1.67	0.34		
51	2395	14.90	23.90	2360.42	290.33	267.50	113.92	3.19	-2360.42	15.58	23.07	290.75	-1.00	0.61		
52	2425	14.40	26.50	2389.45	297.89	274.36	117.15	2.75	-2389.45	16.26	23.12	298.33	-1.67	0.44		
53	2455	13.60	28.10	2418.56	305.08	280.81	120.47	2.96	-2418.56	17.18	23.22	305.57	-2.67	0.26		
54	2485	12.90	25.50	2447.76	311.91	286.95	123.58	3.06	-2447.76	18.00	23.30	312.43	-2.33	-0.40		
55	2515	12.10	22.90	2477.05	318.38	292.87	126.24	3.26	-2477.05	18.48	23.32	318.92	-2.67	-0.38		
56	2545	10.80	19.10	2506.45	324.33	298.42	128.39	5.01	-2506.45	18.59	23.28	324.87	-4.33	-0.50		
57	2575	9.90	16.70	2535.96	329.72	303.55	130.05	3.33	-2535.96	18.40	23.19	330.23	-3.00	-0.29		
58	2605	9.30	15.00	2565.54	334.71	308.36	131.42	2.21	-2565.54	18.04	23.08	335.19	-2.00	-0.19		
59	2635	8.20	14.00	2595.19	339.25	312.78	132.56	3.70	-2595.19	17.61	22.97	339.71	-3.67	-0.10		
60	2665	7.60	13.40	2624.91	343.35	316.78	133.54	2.02	-2624.91	17.15	22.86	343.78	-2.00	-0.05		
61	2695	7.60	10.50	2654.65	347.28	320.66	134.36	1.28	-2654.65	16.60	22.73	347.67	0.00	-0.26		
62	2725	8.10	6.90	2684.36	351.29	324.71	134.97	2.34	-2684.36	15.79	22.57	351.65	1.67	-0.33		
63	2755	7.80	2.10	2714.08	355.29	328.84	135.30	2.43	-2714.08	14.69	22.36	355.59	-1.00	-0.44		
64	2785	8.00	356.80	2743.79	359.14	332.96	135.26	2.52	-2743.79	13.24	22.11	359.39	0.67	0.49		
65	2815	8.30	355.40	2773.49	363.03	337.20	134.97	1.20	-2773.49	11.52	21.81	363.21	1.00	-0.13		
66	2845	8.30	1.50	2803.18	367.05	341.53	134.85	2.93	-2803.18	9.93	21.55	367.19	0.00	-0.59		
67	2875	8.30	10.70	2832.86	371.24	345.82	135.31	4.42	-2832.86	8.89	21.37	371.35	0.00	0.88		
68	2905	8.50	11.60	2862.54	375.57	350.12	136.16	0.80	-2862.54	8.22	21.25	375.66	0.67	0.09		
69	2935	8.70	6.70	2892.20	379.98	354.55	136.87	2.53	-2892.20	7.37	21.11	380.05	0.67	-0.49		
70	2965	8.10	2.90	2921.88	384.20	358.91	137.24	2.72	-2921.88	6.23	20.93	384.25	-2.00	-0.37		
71	2995	7.50	359.10	2951.60	388.05	362.98	137.32	2.64	-2951.60	4.91	20.72	388.08	-2.00	0.34		
72	3025	6.90	354.20	2981.37	391.51	366.73	137.11	2.86	-2981.37	3.42	20.50	391.52	-2.00	-0.41		
73	3055	6.30	348.10	3011.17	394.53	370.13	136.58	3.07	-3011.17	1.77	20.25	394.53	-2.00	-0.47		
74	3085	5.70	341.50	3041.01	397.09	373.16	135.77	3.04	-3041.01	-0.03	19.99	397.09	-2.00	-0.46		
75	3115	5.40	333.20	3070.87	399.22	375.83	134.66	2.85	-3070.87	-1.98	19.71	399.23	-1.00	-0.53		
76	3145	4.90	335.30	3100.74	401.10	378.25	133.49	1.78	-3100.74	3.91	19.44	401.12	-1.67	0.13		
77	3175	4.70	338.70	3130.64	402.93	380.56	132.51	1.16	-3130.64	5.63	19.20	402.97	-0.67	0.19		
78	3205	4.30	335.70	3160.55	404.66	382.73	131.60	1.55	-3160.55	7.22	18.98	404.72	-1.33	-0.16		
79	3235	3.80	332.30	3190.47	406.13	384.64	130.68	1.85	-3190.47	8.74	18.76	406.23	-1.67	-0.16		
80	3291	3.80	332.30	3246.35	408.63	387.92	128.95	0.00	-3246.35	11.49	18.39	408.79	0.00	0.00		
81																
82																
83																
TD																

HG Energy, LLC

Harrison County, West Virginia

W.B. Carpenter #237

W.B. Carpenter #237

Wellbore #1

Survey: MWD

DDC Survey Report

11 December, 2013



04/04/2014



I **Larry Wright**, certify that I am employed by **The Appalachian Directional Drilling Company (ADC)**. That I did on the day(s) of **11/04/13** thru **11/06/13** conduct or supervise the taking of a **MWD Survey** from a depth of **850** feet to a depth of **3291** 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 #237** API No. **47-033-05780** 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: 2013.12.12 16:25:40 -06'00'

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

04/04/2014

DDC
Survey Report



Company:	HG Energy, LLC	Local Co-ordinate Reference:	Well W.B. Carpenter #237
Project:	Harrison County, West Virginia	TVD Reference:	WELL @ 1393.0usft (Decker #6)
Site:	W.B. Carpenter #237	MD Reference:	WELL @ 1393.0usft (Decker #6)
Well:	W.B. Carpenter #237	North Reference:	Grid
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	EDM 5000.1 Single User Db

Project	Harrison 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	W.B. Carpenter #237				
Site Position:		Northing:	14,262,785.77 usft	Latitude:	39° 16' 26.600 N
From:	Lat/Long	Easting:	1,780,200.29 usft	Longitude:	80° 30' 21.800 W
Position Uncertainty:	0.0 usft	Slot Radius:	13-3/16 "	Grid Convergence:	0.31 °

Well	W.B. Carpenter #237					
Well Position	+N/-S	0.0 usft	Northing:	14,262,785.77 usft	Latitude:	39° 16' 26.600 N
	+E/-W	0.0 usft	Easting:	1,780,200.29 usft	Longitude:	80° 30' 21.800 W
Position Uncertainty	0.0 usft		Wellhead Elevation:	usft	Ground Level:	1,385.0 usft

Wellbore	Wellbore #1				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	12/11/2013	-8.64	66.81	52,315

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	18.39	

Survey Program	Date	12/11/2013			
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description	
850.0	3,291.0	MWD (Wellbore #1)			

Survey										
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)	
TIE IN @ 850' MD / 850' TVD										
850.0	0.00	0.00	850.0	0.0	0.0	0.0	0.00	0.00	0.00	0.00
914.0	2.50	109.50	914.0	-0.5	1.3	0.0	3.91	3.91	0.00	
925.0	2.60	112.90	925.0	-0.6	1.8	-0.1	1.65	0.91	30.91	
955.0	2.80	111.10	954.9	-1.2	3.1	-0.1	0.72	0.67	-6.00	
985.0	2.70	83.90	984.9	-1.4	4.5	0.1	4.32	-0.33	-90.67	
1,015.0	3.40	61.50	1,014.9	-0.9	6.0	1.1	4.56	2.33	-74.67	
1,045.0	4.30	51.00	1,044.8	0.3	7.6	2.7	3.80	3.00	-35.00	
1,075.0	5.10	36.30	1,074.7	2.1	9.3	4.9	4.80	2.67	-49.00	
1,105.0	6.20	29.40	1,104.5	4.5	10.9	7.7	4.30	3.67	-23.00	

DDC
Survey Report



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Project:	Harrison County, West Virginia	TVD Reference:	WELL @ 1393.0usft (Decker #6)
Site:	W.B. Carpenter #237	MD Reference:	WELL @ 1393.0usft (Decker #6)
Well:	W.B. Carpenter #237	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)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	
1,135.0	6.20	29.60	1,134.4	7.4	12.5	10.9	0.07	0.00	0.67	
1,165.0	6.00	23.40	1,164.2	10.2	13.9	14.1	2.29	-0.67	-20.67	
1,195.0	5.60	17.60	1,194.0	13.0	14.9	17.1	2.36	-1.33	-19.33	
1,225.0	5.60	11.10	1,223.9	15.9	15.7	20.0	2.11	0.00	-21.67	
1,255.0	6.20	11.30	1,253.7	18.9	16.3	23.1	2.00	2.00	0.67	
1,285.0	7.10	14.30	1,283.5	22.3	17.0	26.5	3.21	3.00	10.00	
1,315.0	8.00	16.70	1,313.3	26.1	18.1	30.5	3.18	3.00	8.00	
1,345.0	8.50	18.20	1,343.0	30.2	19.4	34.8	1.81	1.67	5.00	
1,375.0	8.80	20.70	1,372.6	34.4	20.9	39.3	1.60	1.00	8.33	
1,405.0	9.30	20.80	1,402.3	38.9	22.6	44.0	1.67	1.67	0.33	
1,435.0	9.80	20.80	1,431.8	43.5	24.3	49.0	1.67	1.67	0.00	
1,465.0	10.70	19.60	1,461.4	48.5	26.2	54.3	3.08	3.00	-4.00	
1,495.0	11.70	19.30	1,490.8	54.0	28.1	60.1	3.34	3.33	-1.00	
1,525.0	13.30	18.70	1,520.1	60.1	30.2	66.6	5.35	5.33	-2.00	
1,555.0	13.90	19.80	1,549.2	66.8	32.6	73.7	2.18	2.00	3.67	
1,585.0	14.00	20.80	1,578.4	73.6	35.1	80.9	0.87	0.33	3.33	
1,615.0	13.30	21.80	1,607.5	80.2	37.6	88.0	2.46	-2.33	3.33	
1,645.0	13.10	23.40	1,636.7	86.5	40.3	94.8	1.39	-0.67	5.33	
1,675.0	12.80	23.60	1,666.0	92.7	42.9	101.5	1.01	-1.00	0.67	
1,705.0	12.70	25.20	1,695.2	98.7	45.7	108.1	1.22	-0.33	5.33	
1,735.0	12.80	23.40	1,724.5	104.7	48.4	114.7	1.37	0.33	-6.00	
1,765.0	13.10	21.60	1,753.7	111.0	51.0	121.4	1.68	1.00	-6.00	
1,795.0	13.00	20.60	1,782.9	117.3	53.4	128.1	0.82	-0.33	-3.33	
1,825.0	13.20	20.10	1,812.2	123.6	55.8	134.9	0.77	0.67	-1.67	
1,855.0	13.20	20.90	1,841.4	130.1	58.2	141.8	0.61	0.00	2.67	
1,885.0	13.50	19.90	1,870.6	136.8	60.6	148.7	1.26	1.00	-3.33	
1,915.0	13.90	20.80	1,899.7	143.2	63.1	155.8	1.51	1.33	3.00	
1,945.0	14.20	20.80	1,928.8	150.0	65.6	163.1	1.00	1.00	0.00	
1,975.0	15.00	20.80	1,957.8	157.1	68.3	170.6	2.67	2.67	0.00	
2,005.0	15.50	22.90	1,986.8	164.4	71.3	178.5	2.48	1.67	7.00	
2,035.0	16.50	23.90	2,015.6	172.0	74.6	186.7	3.46	3.33	3.33	
2,065.0	16.70	25.30	2,044.4	179.8	78.1	195.3	1.49	0.67	4.67	
2,095.0	16.50	23.60	2,073.1	187.6	81.7	203.8	1.75	-0.67	-5.67	
2,125.0	16.80	23.00	2,101.9	195.5	85.1	212.3	1.15	1.00	-2.00	
2,155.0	17.00	23.30	2,130.6	203.5	88.5	221.0	0.73	0.67	1.00	
2,185.0	17.20	21.90	2,159.2	211.7	91.9	229.8	1.53	0.67	-4.67	
2,215.0	17.50	22.00	2,187.9	220.0	95.2	238.8	1.00	1.00	0.33	
2,245.0	18.10	23.30	2,216.4	228.4	98.8	247.9	2.40	2.00	4.33	
2,275.0	17.40	22.90	2,245.0	236.8	102.4	257.0	2.37	-2.33	-1.33	
2,305.0	16.40	20.30	2,273.7	244.9	105.6	265.7	4.18	-3.33	-8.67	
2,335.0	15.70	18.50	2,302.5	252.8	108.3	274.0	2.86	-2.33	-6.00	
2,365.0	15.20	20.40	2,331.5	260.3	111.0	282.0	2.37	-1.67	6.33	
2,395.0	14.90	23.90	2,360.4	267.5	113.9	289.8	3.19	-1.00	11.67	
2,425.0	14.40	26.50	2,389.4	274.4	117.1	297.3	2.75	-1.67	8.67	

DDC
Survey Report



Company:	HG Energy, LLC	Local Co-ordinate Reference:	Well W.B. Carpenter #237
Project:	Harrison County, West Virginia	TVD Reference:	WELL @ 1393.0usft (Decker #6)
Site:	W.B. Carpenter #237	MD Reference:	WELL @ 1393.0usft (Decker #6)
Well:	W.B. Carpenter #237	North Reference:	Grid
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	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)
2,455.0	13.60	28.10	2,418.6	280.8	120.5	304.5	2.96	-2.67	5.33
2,485.0	12.90	25.50	2,447.8	286.9	123.6	311.3	3.06	-2.33	-8.67
2,515.0	12.10	22.90	2,477.0	292.9	126.2	317.7	3.26	-2.67	-8.67
2,545.0	10.80	19.10	2,506.5	298.4	128.4	323.7	5.01	-4.33	-12.67
2,575.0	9.90	16.70	2,536.0	303.5	130.0	329.1	3.33	-3.00	-8.00
2,605.0	9.30	15.00	2,565.5	308.4	131.4	334.1	2.21	-2.00	-5.67
2,635.0	8.20	14.00	2,595.2	312.8	132.6	338.6	3.70	-3.67	-3.33
2,665.0	7.60	13.40	2,624.9	316.8	133.5	342.7	2.02	-2.00	-2.00
2,695.0	7.60	10.50	2,654.6	320.7	134.4	346.7	1.28	0.00	-9.67
2,725.0	8.10	6.90	2,684.4	324.7	135.0	350.7	2.34	1.67	-12.00
2,755.0	7.80	2.10	2,714.1	328.8	135.3	354.7	2.43	-1.00	-16.00
2,785.0	8.00	356.80	2,743.8	333.0	135.3	358.6	2.52	0.67	-17.67
2,815.0	8.30	355.40	2,773.5	337.2	135.0	362.6	1.20	1.00	-4.67
2,845.0	8.30	1.50	2,803.2	341.5	134.9	366.6	2.93	0.00	20.33
2,875.0	8.30	10.70	2,832.9	345.8	135.3	370.8	4.42	0.00	30.67
2,905.0	8.50	11.60	2,862.5	350.1	136.2	375.2	0.80	0.67	3.00
2,935.0	8.70	6.70	2,892.2	354.5	136.9	379.6	2.53	0.67	-16.33
2,965.0	8.10	2.90	2,921.9	358.9	137.2	383.9	2.72	-2.00	-12.67
2,995.0	7.50	359.10	2,951.6	363.0	137.3	387.8	2.64	-2.00	-12.67
3,025.0	6.90	354.20	2,981.4	366.7	137.1	391.3	2.86	-2.00	-16.33
3,055.0	6.30	348.10	3,011.2	370.1	136.6	394.3	3.07	-2.00	-20.33
3,085.0	5.70	341.50	3,041.0	373.2	135.8	398.9	3.04	-2.00	-22.00
3,115.0	5.40	333.20	3,070.9	375.8	134.7	399.1	2.85	-1.00	-27.67
3,145.0	4.90	335.30	3,100.7	378.3	133.5	401.0	1.78	-1.67	7.00
3,175.0	4.70	338.70	3,130.6	380.6	132.5	402.9	1.16	-0.67	11.33
3,205.0	4.30	335.70	3,160.5	382.7	131.6	404.7	1.55	-1.33	-10.00
3,235.0	3.80	332.30	3,190.5	384.6	130.7	406.2	1.85	-1.67	-11.33
TD @ 3291' MD / 3246' TVD									
3,291.0	3.80	332.30	3,246.3	387.9	129.0	408.8	0.00	0.00	0.00

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
850.0	850.0	0.0	0.0	TIE IN @ 850' MD / 850' TVD
3,291.0	3,246.3	387.9	129.0	TD @ 3291' MD / 3246' TVD

Checked By: _____ Approved By: _____ Date: _____

HG Energy, LLC

Harrison County, West Virginia

W.B. Carpenter #237

W.B. Carpenter #237

Wellbore #1

Design: Wellbore #1

Survey Report - Geographic

07 January, 2014



04/04/2014

DDC
Survey Report - Geographic



Company:	HG Energy, LLC	Local Co-ordinate Reference:	Well W.B. Carpenter #237
Project:	Harrison County, West Virginia	TVD Reference:	WELL @ 1393.0usft (Decker #6)
Site:	W.B. Carpenter #237	MD Reference:	WELL @ 1393.0usft (Decker #6)
Well:	W.B. Carpenter #237	North Reference:	Grid
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	EDM 5000.1 Single User Db

Project	Harrison 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	W.B. Carpenter #237				
Site Position:		Northing:	14,262,785.77 usft	Latitude:	39° 16' 26.600 N
From:	Lat/Long	Easting:	1,780,200.29 usft	Longitude:	80° 30' 21.800 W
Position Uncertainty:	0.0 usft	Slot Radius:	13-3/16 "	Grid Convergence:	0.31 °

Well	W.B. Carpenter #237					
Well Position	+N-S	0.0 usft	Northing:	14,262,785.77 usft	Latitude:	39° 16' 26.600 N
	+E-W	0.0 usft	Easting:	1,780,200.29 usft	Longitude:	80° 30' 21.800 W
Position Uncertainty	0.0 usft	Wellhead Elevation:	usft	Ground Level:	1,385.0 usft	

Wellbore	Wellbore #1				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	12/11/2013	-8.64	66.81	52,315

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	18.39	

Survey Program	Date	12/11/2013			
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description	
850.0	3,291.0	MWD (Wellbore #1)			

Survey										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N-S (usft)	+E-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude	
850.0	0.00	0.00	850.0	0.0	0.0	14,262,785.77	1,780,200.29	39° 16' 26.600 N	80° 30' 21.800 W	
TIE IN @ 850' MD / 850' TVD										
914.0	2.50	109.50	914.0	-0.5	1.3	14,262,785.31	1,780,201.61	39° 16' 26.595 N	80° 30' 21.783 W	
925.0	2.60	112.90	925.0	-0.6	1.8	14,262,785.13	1,780,202.06	39° 16' 26.594 N	80° 30' 21.778 W	
955.0	2.80	111.10	954.9	-1.2	3.1	14,262,784.60	1,780,203.37	39° 16' 26.588 N	80° 30' 21.761 W	
985.0	2.70	83.90	984.9	-1.4	4.5	14,262,784.41	1,780,204.76	39° 16' 26.586 N	80° 30' 21.743 W	
1,015.0	3.40	61.50	1,014.9	-0.9	6.0	14,262,784.91	1,780,206.24	39° 16' 26.591 N	80° 30' 21.724 W	
1,045.0	4.30	51.00	1,044.8	0.3	7.6	14,262,786.05	1,780,207.90	39° 16' 26.602 N	80° 30' 21.703 W	
1,075.0	5.10	36.30	1,074.7	2.1	9.3	14,262,787.83	1,780,209.56	39° 16' 26.620 N	80° 30' 21.682 W	
1,105.0	6.20	29.40	1,104.5	4.5	10.9	14,262,790.31	1,780,211.15	39° 16' 26.644 N	80° 30' 21.662 W	
1,135.0	6.20	29.60	1,134.4	7.4	12.5	14,262,793.13	1,780,212.74	39° 16' 26.672 N	80° 30' 21.641 W	
1,165.0	6.00	23.40	1,164.2	10.2	13.9	14,262,795.98	1,780,214.17	39° 16' 26.700 N	80° 30' 21.623 W	



Company: HG Energy, LLC	Project: Harrison County, West Virginia	Site: W.B. Carpenter #237	Well: W.B. Carpenter #237	Wellbore: Wellbore #1	Design: Wellbore #1
Local Co-ordinate Reference:	TVD Reference: WELL @ 1393, 0usft (Decker #6)	MID Reference: WELL @ 1393, 0usft (Decker #6)	North Reference: Gird	Survey Calculation Method: Minimum Curvature	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
1,195.0	5.60	17.60	1,194.0	13.0	14.9	14,262,798.82	1,780,215.23	39° 16' 26.728 N	80° 30' 21.609 W	
1,225.0	5.60	11.10	1,223.9	15.9	15.7	14,262,801.65	1,780,215.96	39° 16' 26.756 N	80° 30' 21.600 W	
1,255.0	6.20	11.30	1,253.7	18.9	16.3	14,262,804.67	1,780,216.56	39° 16' 26.786 N	80° 30' 21.592 W	
1,285.0	7.10	14.30	1,283.5	22.3	17.0	14,262,808.06	1,780,217.33	39° 16' 26.819 N	80° 30' 21.582 W	
1,315.0	8.00	16.70	1,313.3	26.1	18.1	14,262,811.85	1,780,218.39	39° 16' 26.857 N	80° 30' 21.568 W	
1,345.0	8.50	18.20	1,343.0	30.2	19.4	14,262,815.96	1,780,219.68	39° 16' 26.897 N	80° 30' 21.551 W	
1,375.0	8.80	20.70	1,372.6	34.4	20.9	14,262,820.21	1,780,221.19	39° 16' 26.939 N	80° 30' 21.532 W	
1,405.0	9.30	20.80	1,402.3	38.9	22.6	14,262,824.63	1,780,222.86	39° 16' 26.983 N	80° 30' 21.510 W	
1,435.0	9.80	20.80	1,431.8	43.5	24.3	14,262,829.28	1,780,224.62	39° 16' 27.029 N	80° 30' 21.487 W	
1,465.0	10.70	19.60	1,461.4	48.5	26.2	14,262,834.29	1,780,226.47	39° 16' 27.078 N	80° 30' 21.464 W	
1,495.0	11.70	19.30	1,490.8	54.0	28.1	14,262,839.76	1,780,228.41	39° 16' 27.132 N	80° 30' 21.439 W	
1,525.0	13.30	18.70	1,520.1	60.1	30.2	14,262,845.92	1,780,230.52	39° 16' 27.193 N	80° 30' 21.411 W	
1,555.0	13.90	19.80	1,549.2	66.8	32.6	14,262,852.58	1,780,232.84	39° 16' 27.259 N	80° 30' 21.381 W	
1,585.0	14.00	20.80	1,578.4	73.6	35.1	14,262,859.36	1,780,235.35	39° 16' 27.326 N	80° 30' 21.349 W	
1,615.0	13.30	21.80	1,607.5	80.2	37.6	14,262,866.96	1,780,237.92	39° 16' 27.391 N	80° 30' 21.316 W	
1,645.0	13.10	23.40	1,636.7	86.5	40.3	14,262,872.29	1,780,240.56	39° 16' 27.453 N	80° 30' 21.282 W	
1,675.0	12.80	23.60	1,666.0	92.7	42.9	14,262,878.45	1,780,243.24	39° 16' 27.514 N	80° 30' 21.247 W	
1,705.0	12.70	25.20	1,695.2	98.7	45.7	14,262,884.48	1,780,245.97	39° 16' 27.573 N	80° 30' 21.212 W	
1,735.0	12.80	23.40	1,724.5	104.7	48.4	14,262,890.51	1,780,248.69	39° 16' 27.633 N	80° 30' 21.177 W	
1,765.0	13.10	21.60	1,753.7	111.0	51.0	14,262,896.72	1,780,251.27	39° 16' 27.694 N	80° 30' 21.144 W	
1,795.0	13.00	20.60	1,782.9	117.3	53.4	14,262,903.04	1,780,253.70	39° 16' 27.757 N	80° 30' 21.112 W	
1,825.0	13.20	20.10	1,812.2	123.6	55.8	14,262,909.42	1,780,256.07	39° 16' 27.819 N	80° 30' 21.082 W	
1,855.0	13.20	20.90	1,841.4	130.1	58.2	14,262,915.84	1,780,258.47	39° 16' 27.883 N	80° 30' 21.051 W	
1,885.0	13.50	19.90	1,870.6	136.6	60.6	14,262,922.33	1,780,260.88	39° 16' 27.947 N	80° 30' 21.020 W	
1,915.0	13.90	20.80	1,899.7	143.2	63.1	14,262,928.99	1,780,263.35	39° 16' 28.013 N	80° 30' 20.988 W	
1,945.0	14.20	20.80	1,928.8	150.0	65.6	14,262,935.80	1,780,265.94	39° 16' 28.080 N	80° 30' 20.954 W	
1,975.0	15.00	20.80	1,957.8	157.1	68.3	14,262,942.87	1,780,268.62	39° 16' 28.150 N	80° 30' 20.920 W	
2,005.0	15.50	22.90	1,986.8	164.4	71.3	14,262,950.19	1,780,271.56	39° 16' 28.222 N	80° 30' 20.882 W	
2,035.0	16.50	23.90	2,015.6	172.0	74.6	14,262,957.78	1,780,274.85	39° 16' 28.297 N	80° 30' 20.840 W	
2,065.0	16.70	25.30	2,044.4	179.8	78.1	14,262,965.57	1,780,278.42	39° 16' 28.373 N	80° 30' 20.794 W	
2,095.0	16.80	23.60	2,073.1	187.6	81.7	14,262,973.37	1,780,281.97	39° 16' 28.450 N	80° 30' 20.748 W	
2,125.0	16.80	23.00	2,101.9	195.5	85.1	14,262,981.26	1,780,285.36	39° 16' 28.528 N	80° 30' 20.704 W	
2,155.0	17.00	23.30	2,130.6	203.5	88.5	14,262,989.28	1,780,288.79	39° 16' 28.607 N	80° 30' 20.660 W	
2,185.0	17.20	21.90	2,159.2	211.7	91.9	14,262,997.43	1,780,292.18	39° 16' 28.688 N	80° 30' 20.616 W	
2,215.0	17.50	22.00	2,187.9	220.0	95.2	14,263,005.72	1,780,295.53	39° 16' 28.770 N	80° 30' 20.573 W	
2,245.0	18.10	23.30	2,216.4	228.4	98.8	14,263,014.19	1,780,299.06	39° 16' 28.853 N	80° 30' 20.528 W	
2,275.0	17.40	22.90	2,245.0	236.8	102.4	14,263,022.60	1,780,302.65	39° 16' 28.936 N	80° 30' 20.481 W	
2,305.0	20.30	244.9	2,273.7	105.6	105.6	14,263,030.70	1,780,306.86	39° 16' 29.016 N	80° 30' 20.440 W	
2,335.0	18.50	252.8	2,302.5	108.3	108.3	14,263,038.53	1,780,308.62	39° 16' 29.093 N	80° 30' 20.404 W	
2,365.0	20.40	260.3	2,331.5	111.0	111.0	14,263,046.06	1,780,311.28	39° 16' 29.168 N	80° 30' 20.370 W	
2,395.0	23.90	267.5	2,360.4	113.9	113.9	14,263,053.27	1,780,314.21	39° 16' 29.239 N	80° 30' 20.332 W	
2,425.0	23.90	117.1	2,389.4	117.1	117.1	14,263,060.14	1,780,317.44	39° 16' 29.306 N	80° 30' 20.291 W	
2,455.0	28.10	280.8	2,418.6	120.5	120.5	14,263,066.59	1,780,320.77	39° 16' 29.370 N	80° 30' 20.248 W	
2,485.0	25.50	286.9	2,447.8	123.6	123.6	14,263,072.72	1,780,323.87	39° 16' 29.430 N	80° 30' 20.208 W	
2,515.0	22.90	292.9	2,477.0	126.2	126.2	14,263,078.64	1,780,326.53	39° 16' 29.489 N	80° 30' 20.174 W	
2,545.0	19.10	298.4	2,506.5	128.4	128.4	14,263,084.19	1,780,328.68	39° 16' 29.544 N	80° 30' 20.146 W	
2,575.0	16.70	303.5	2,536.0	130.0	130.0	14,263,089.32	1,780,330.34	39° 16' 29.594 N	80° 30' 20.125 W	
2,605.0	9.30	308.4	2,565.5	131.4	131.4	14,263,094.13	1,780,331.71	39° 16' 29.642 N	80° 30' 20.107 W	
2,635.0	14.00	312.8	2,595.2	132.6	132.6	14,263,098.55	1,780,332.85	39° 16' 29.685 N	80° 30' 20.092 W	
2,665.0	13.40	316.8	2,624.9	133.5	133.5	14,263,102.56	1,780,333.83	39° 16' 29.725 N	80° 30' 20.079 W	
2,695.0	10.50	320.7	2,654.6	134.4	134.4	14,263,106.44	1,780,334.65	39° 16' 29.763 N	80° 30' 20.069 W	
2,725.0	8.10	324.7	2,684.4	135.0	135.0	14,263,110.48	1,780,335.27	39° 16' 29.803 N	80° 30' 20.060 W	
2,755.0	7.80	328.8	2,714.1	135.3	135.3	14,263,114.62	1,780,335.59	39° 16' 29.844 N	80° 30' 20.056 W	
2,785.0	8.00	333.0	2,743.8	135.3	135.3	14,263,118.74	1,780,335.55	39° 16' 29.885 N	80° 30' 20.056 W	
2,815.0	8.30	335.40	2,773.5	135.0	135.0	14,263,122.98	1,780,335.26	39° 16' 29.927 N	80° 30' 20.060 W	

DDC
Survey Report - Geographic



Company: HG Energy, LLC	Local Co-ordinate Reference: Well W.B. Carpenter #237
Project: Harrison County, West Virginia	TVD Reference: WELL @ 1393.0usft (Decker #6)
Site: W.B. Carpenter #237	MD Reference: WELL @ 1393.0usft (Decker #6)
Well: W.B. Carpenter #237	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
2,845.0	8.30	1.50	2,803.2	341.5	134.9	14,263,127.30	1,780,335.15	39° 16' 29.969 N	80° 30' 20.061 W
2,875.0	8.30	10.70	2,832.9	345.8	135.3	14,263,131.59	1,780,335.60	39° 16' 30.012 N	80° 30' 20.055 W
2,905.0	8.50	11.60	2,862.5	350.1	136.2	14,263,135.89	1,780,336.45	39° 16' 30.054 N	80° 30' 20.044 W
2,935.0	8.70	6.70	2,892.2	354.5	136.9	14,263,140.32	1,780,337.16	39° 16' 30.098 N	80° 30' 20.034 W
2,965.0	8.10	2.90	2,921.9	358.9	137.2	14,263,144.68	1,780,337.53	39° 16' 30.141 N	80° 30' 20.029 W
2,995.0	7.50	359.10	2,951.6	363.0	137.3	14,263,148.75	1,780,337.61	39° 16' 30.181 N	80° 30' 20.028 W
3,025.0	6.90	354.20	2,981.4	366.7	137.1	14,263,152.50	1,780,337.40	39° 16' 30.219 N	80° 30' 20.030 W
3,055.0	6.30	348.10	3,011.2	370.1	136.6	14,263,155.91	1,780,336.88	39° 16' 30.252 N	80° 30' 20.037 W
3,085.0	5.70	341.50	3,041.0	373.2	135.8	14,263,158.93	1,780,336.06	39° 16' 30.282 N	80° 30' 20.047 W
3,115.0	5.40	333.20	3,070.9	375.8	134.7	14,263,161.60	1,780,334.95	39° 16' 30.309 N	80° 30' 20.061 W
3,145.0	4.90	335.30	3,100.7	378.3	133.5	14,263,164.03	1,780,333.78	39° 16' 30.333 N	80° 30' 20.076 W
3,175.0	4.70	338.70	3,130.6	380.6	132.5	14,263,166.34	1,780,332.80	39° 16' 30.356 N	80° 30' 20.088 W
3,205.0	4.30	335.70	3,160.5	382.7	131.6	14,263,168.51	1,780,331.89	39° 16' 30.377 N	80° 30' 20.099 W
3,235.0	3.80	332.30	3,190.5	384.6	130.7	14,263,170.41	1,780,330.97	39° 16' 30.396 N	80° 30' 20.111 W
3,291.0	3.80	332.30	3,246.3	387.9	129.0	14,263,173.70	1,780,329.24	39° 16' 30.428 N	80° 30' 20.133 W

TD @ 3291' MD / 3246' TVD

Design Annotations				
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
3,291.0	3,246.3	387.9	129.0	TD @ 3291' MD / 3246' TVD

Checked By: _____ Approved By: _____ Date: _____

W.B. Carpenter #237
 Harrison County, West Virginia
 Q130959 & AM-13862
 Design #1

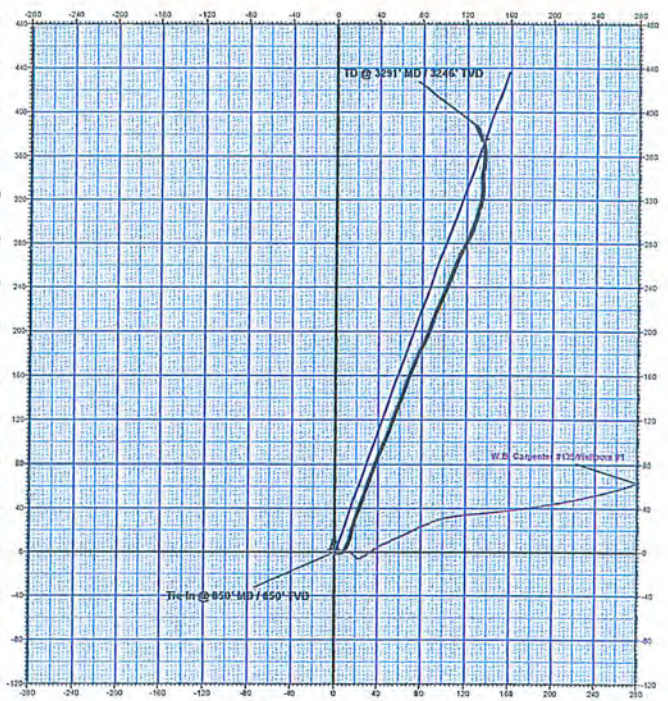
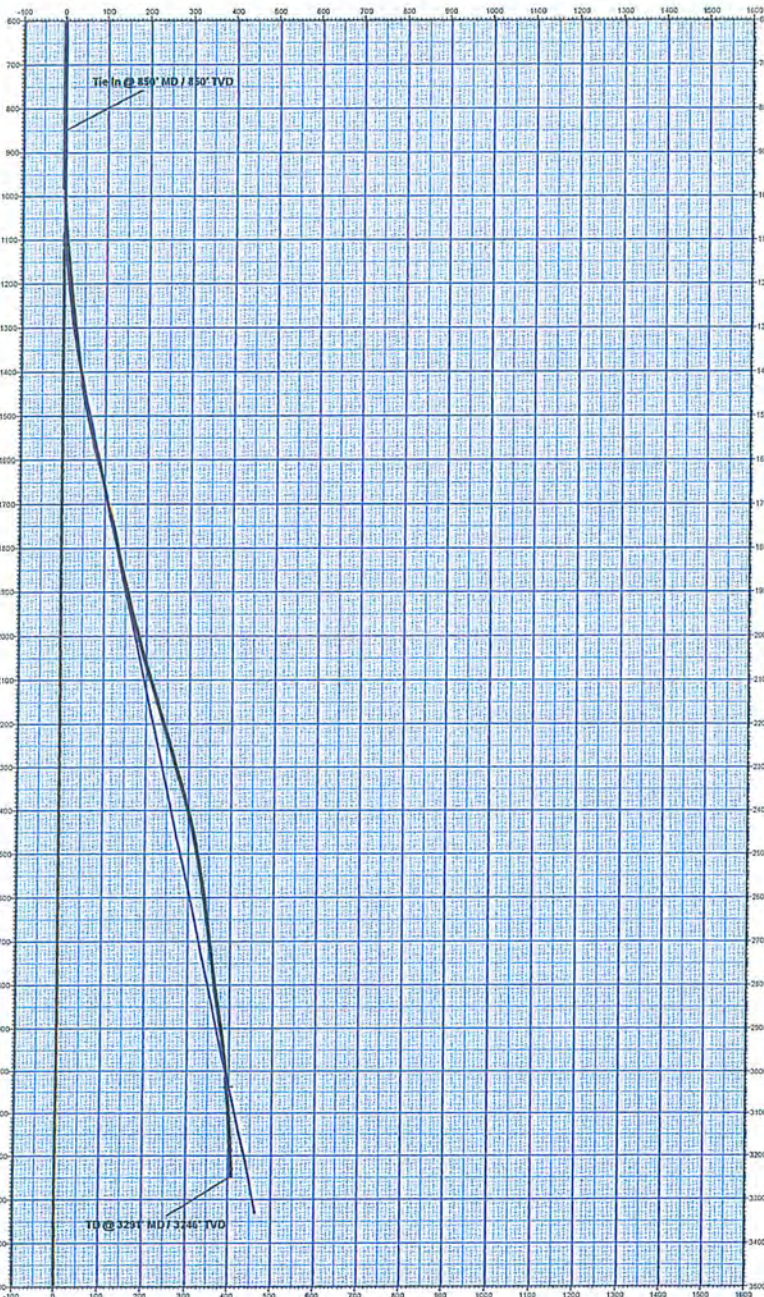
Company Name: HG Energy, LLC
 W.B. Carpenter #237
 Harrison County, West Virginia
 Rig: Decker #6
 Created By: James Dawson
 Date: 11/06/2013



WELL DETAILS:		W.B. Carpenter #237			
Ground Level:		1385.0			
+N-S	+E-W	Northing	Easting	Latitude	Longitude
0.0	0.0	293521.43	1715188.60	39° 19' 26.600 N	80° 30' 21.900 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		

HG Energy



DESIGN TARGET DETAILS					
Name	TVD	+N-S	+E-W	Northing	Easting
Target W.B. Carpenter #237	3037.0	375.3	136.8	293697.31	1715325.41
*plus hits target center					
		Latitude	Longitude		
		39° 16' 30.330 N	80° 30' 29.114 W		

ANNOTATIONS							
MD	Inc	Azi	TVD	+N-S	+E-W	Vsect	Departure
850.0	0.00	360.00	850.0	0.0	0.0	0.0	0.0
3291.0	3.80	332.30	3246.3	387.9	129.0	408.6	423.0
							Annotation
							Tie In @ 850' MD / 850' TVD
							TD @ 3291' MD / 3246' TVD

M G T

Azimuths to Grid North

Correction: -8.00°

Magnetic Field
Strength: 52328.5nT
Dip Angle: 66.82°
Date: 10/31/2013
Model: IGRF2010

