

HG Energy, LLC

Harrison County, West Virginia

WF Williams #130

WF Williams #130

Wellbore #1

Survey: MWD

DDC Survey Report

11 December, 2013

Received

JAN 21 2014

Office of Oil and Gas
WV Dept. of Environmental Protection



02/28/2014



I **Larry Wright**, certify that I am employed by **The Appalachian Directional Drilling Company (ADC)**. That I did on the day(s) of **8/06/13** thru **8/09/13** conduct or supervise the taking of a **MWD Survey** from a depth of **700** feet to a depth of **3122** 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 **H G Energy, LLC** for the **W.F. Williams #130** API No. **47-033-05749** 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 16:13:07 -06'00'

Received

JAN 21 2014
Office of Oil and Gas
WV Dept. of Environmental Protection

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

02/28/2014

DDC
Survey Report



Company:	HG Energy, LLC	Local Co-ordinate Reference:	Well WF Williams #130
Project:	Harrison County, West Virginia	TVD Reference:	WELL @ 1314.0usft (Decker #6)
Site:	WF Williams #130	MD Reference:	WELL @ 1314.0usft (Decker #6)
Well:	WF Williams #130	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	WF Williams #130				
Site Position:		Northing:	14,263,374.28 usft	Latitude:	39° 16' 32.300 N
From:	Lat/Long	Easting:	1,782,382.45 usft	Longitude:	80° 29' 54.000 W
Position Uncertainty:	0.0 usft	Slot Radius:	13-3/16 "	Grid Convergence:	0.32 °

Well	WF Williams #130					
Well Position	+N/-S	0.0 usft	Northing:	14,263,374.28 usft	Latitude:	39° 16' 32.300 N
	+E/-W	0.0 usft	Easting:	1,782,382.45 usft	Longitude:	80° 29' 54.000 W
Position Uncertainty		0.0 usft	Wellhead Elevation:	usft	Ground Level:	1,305.0 usft

Wellbore	Wellbore #1				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	12/11/2013	-8.65	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	177.43	

Survey Program	Date	12/11/2013			
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description	
700.0	3,122.0	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 @ 700' MD / 700' TVD										
700.0	0.00	0.00	700.0	0.0	0.0	0.0	0.00	0.00	0.00	
726.0	0.88	151.08	726.0	-0.2	0.1	0.2	3.38	3.38	0.00	
756.0	1.32	158.42	756.0	-0.7	0.3	0.7	1.54	1.47	24.47	
786.0	2.20	159.30	786.0	-1.6	0.7	1.6	2.93	2.93	2.93	
816.0	3.12	156.51	815.9	-2.8	1.2	2.9	3.10	3.07	9.30	
846.0	4.31	164.09	845.9	-4.7	1.8	4.8	4.28	3.97	25.27	
876.0	5.19	169.41	875.8	-7.1	2.4	7.2	3.28	2.93	17.73	
906.0	6.02	170.59	905.6	-10.0	2.9	10.1	2.79	2.77	3.93	
936.0	6.90	168.70	935.4	-13.3	3.5	13.4	3.02	2.93	-6.30	

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Survey Report



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Well:	WF Williams #130	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)
966.0	7.38	167.21	965.2	-16.9	4.3	17.1	1.71	1.60	-4.97
996.0	7.78	171.38	995.0	-20.8	5.0	21.0	2.27	1.33	13.90
1,026.0	7.91	176.22	1,024.7	-24.9	5.5	25.1	2.24	0.43	16.13
1,056.0	8.00	177.49	1,054.4	-29.0	5.7	29.3	0.66	0.30	4.23
1,086.0	8.70	176.70	1,084.1	-33.4	5.9	33.6	2.36	2.33	-2.63
1,116.0	9.58	176.70	1,113.7	-38.2	6.2	38.4	2.93	2.93	0.00
1,146.0	10.20	178.11	1,143.2	-43.3	6.4	43.5	2.22	2.07	4.70
1,176.0	10.50	181.18	1,172.7	-48.7	6.4	48.9	2.09	1.00	10.23
1,206.0	10.99	182.68	1,202.2	-54.3	6.3	54.5	1.88	1.63	5.00
1,236.0	11.51	182.59	1,231.6	-60.1	6.0	60.3	1.73	1.73	-0.30
1,266.0	11.82	181.32	1,261.0	-66.2	5.8	66.4	1.34	1.03	-4.23
1,296.0	12.22	183.82	1,292.3	-72.8	5.5	73.0	2.05	1.25	7.81
1,326.0	13.01	186.81	1,321.6	-79.4	4.9	79.5	3.42	2.63	9.97
1,356.0	14.59	189.01	1,350.7	-86.4	3.9	86.5	5.55	5.27	7.33
1,386.0	15.91	191.60	1,379.7	-94.2	2.5	94.2	4.95	4.40	8.63
1,418.0	15.82	187.60	1,408.5	-102.3	1.1	102.2	3.66	-0.30	-13.33
1,448.0	15.29	184.00	1,437.4	-110.3	0.3	110.2	3.67	-1.77	-12.00
1,478.0	14.41	177.58	1,466.4	-118.0	0.2	117.9	6.22	-2.93	-21.40
1,508.0	14.99	174.90	1,495.5	-125.6	0.7	125.5	2.98	1.93	-8.93
1,538.0	15.29	173.41	1,524.4	-133.4	1.5	133.3	1.64	1.00	-4.97
1,568.0	16.00	175.90	1,553.3	-141.4	2.2	141.4	3.26	2.37	8.30
1,598.0	16.92	169.41	1,582.1	-149.8	3.3	149.8	6.85	3.07	-21.63
1,628.0	17.49	166.90	1,610.7	-158.5	5.1	158.6	3.12	1.90	-8.37
1,658.0	17.40	167.30	1,639.4	-167.3	7.1	167.4	0.50	-0.30	1.33
1,688.0	16.39	168.70	1,666.1	-175.2	8.8	175.5	3.89	-3.61	5.00
1,716.0	15.21	170.59	1,695.0	-183.3	10.3	183.5	4.29	-3.93	6.30
1,746.0	14.19	172.40	1,724.0	-190.8	11.4	191.1	3.73	-3.40	6.03
1,776.0	14.11	173.58	1,753.1	-198.1	12.3	198.4	1.00	-0.27	3.93
1,806.0	14.50	174.11	1,782.2	-205.4	13.1	205.8	1.37	1.30	1.77
1,836.0	14.72	177.01	1,811.2	-213.0	13.7	213.4	2.55	0.73	9.67
1,866.0	14.90	180.70	1,840.2	-220.6	13.9	221.0	3.20	0.60	12.30
1,896.0	15.29	180.92	1,869.2	-228.5	13.7	228.8	1.31	1.30	0.73
1,926.0	15.29	182.59	1,898.1	-236.4	13.5	236.7	1.47	0.00	5.57
1,956.0	15.12	185.49	1,927.1	-244.2	12.9	244.5	2.60	-0.57	9.67
1,986.0	15.38	186.41	1,956.0	-252.1	12.1	252.3	1.18	0.87	3.07
2,016.0	15.82	186.19	1,984.9	-260.1	11.2	260.3	1.48	1.47	-0.73
2,046.0	16.22	185.10	2,013.7	-268.3	10.4	268.5	1.67	1.33	-3.63
2,076.0	16.61	185.80	2,042.5	-276.8	9.6	276.9	1.46	1.30	2.33
2,106.0	17.09	185.10	2,071.2	-285.4	8.8	285.5	1.74	1.60	-2.33
2,136.0	16.30	182.81	2,100.0	-294.0	8.2	294.1	3.43	-2.63	-7.63
2,166.0	14.99	179.51	2,128.9	-302.1	8.0	302.1	5.28	-4.37	-11.00
2,196.0	13.80	177.10	2,157.9	-309.5	8.2	309.6	4.44	-3.97	-8.03
2,226.0	13.80	176.09	2,187.1	-316.7	8.7	316.8	0.80	0.00	-3.37
2,256.0	13.89	176.70	2,216.2	-323.9	9.1	323.9	0.57	0.30	2.03

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WV Dept. of Environmental Protection

DDC
Survey Report



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Project:	Harrison County, West Virginia	TVD Reference:	WELL @ 1314.0usft (Decker #6)
Site:	WF Williams #130	MD Reference:	WELL @ 1314.0usft (Decker #6)
Well:	WF Williams #130	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)
2,286.0	14.11	177.49	2,245.3	-331.1	9.5	331.2	0.97	0.73	2.63
2,316.0	14.11	179.38	2,274.4	-338.4	9.7	338.5	1.54	0.00	6.30
2,346.0	14.11	181.32	2,303.5	-345.7	9.6	345.8	1.58	0.00	6.47
2,376.0	13.89	180.79	2,332.6	-353.0	9.5	353.1	0.85	-0.73	-1.77
2,406.0	13.58	179.12	2,361.7	-360.1	9.5	360.2	1.68	-1.03	-5.57
2,436.0	14.11	178.59	2,390.9	-367.3	9.7	367.3	1.82	1.77	-1.77
2,466.0	14.99	178.90	2,419.9	-374.8	9.8	374.9	2.94	2.93	1.03
2,496.0	15.51	180.22	2,448.8	-382.7	9.9	382.8	2.08	1.73	4.40
2,526.0	15.21	178.81	2,477.8	-390.7	9.9	390.7	1.60	-1.00	-4.70
2,556.0	14.90	174.29	2,506.7	-398.4	10.4	398.5	4.05	-1.03	-15.07
2,586.0	14.41	168.48	2,535.8	-405.9	11.5	406.0	5.16	-1.63	-19.37
2,616.0	13.80	167.21	2,564.9	-413.1	13.1	413.2	2.28	-2.03	-4.23
2,646.0	13.80	171.78	2,594.0	-420.1	14.4	420.3	3.63	0.00	15.23
2,676.0	13.58	176.22	2,623.1	-427.2	15.1	427.4	3.58	-0.73	14.80
2,706.0	14.19	179.91	2,652.3	-434.3	15.4	434.6	3.58	2.03	12.30
2,736.0	15.38	182.81	2,681.3	-442.0	15.2	442.2	4.67	3.97	9.67
2,766.0	16.22	183.38	2,710.1	-450.2	14.7	450.4	2.85	2.80	1.90
2,796.0	16.30	182.99	2,738.9	-458.5	14.3	458.7	0.45	0.27	-1.30
2,826.0	15.82	182.02	2,767.8	-466.8	13.9	467.0	1.83	-1.60	-3.23
2,856.0	14.81	180.31	2,796.7	-474.8	13.7	474.9	3.69	-3.37	-5.70
2,886.0	14.11	178.11	2,825.8	-482.2	13.8	482.4	2.97	-2.33	-7.33
2,916.0	13.32	175.60	2,854.9	-489.3	14.2	489.5	3.30	-2.63	-8.37
2,946.0	13.01	173.58	2,884.1	-496.1	14.9	496.3	1.85	-1.03	-6.73
2,976.0	12.70	170.81	2,913.4	-502.8	15.8	503.0	2.30	-1.03	-9.23
3,006.0	12.39	166.59	2,942.6	-509.1	17.0	509.4	3.22	-1.03	-14.07
3,036.0	12.00	163.08	2,972.0	-515.3	18.7	515.6	2.79	-1.30	-11.70
TD @ 3122' MD / 3056' TVD									
3,122.0	12.00	163.00	3,056.1	-532.4	23.9	532.9	0.02	0.00	-0.09

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
700.0	700.0	0.0	0.0	TIE IN @ 700' MD / 700' TVD
3,122.0	3,056.1	-532.4	23.9	TD @ 3122' MD / 3056' TVD

Checked By: _____ Approved By: _____ Date: _____

Received

JAN 21 2014

HG Energy, LLC
Harrison County, West Virginia
WF Williams #130
WF Williams #130

Wellbore #1

Design: Wellbore #1

Survey Report - Geographic

07 January, 2014

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JAN 2 - 2014

Office of Oil and Gas
WV Dept. of Environmental Protection



02/28/2014

DDC
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Well: WF Williams #130	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	WF Williams #130				
Site Position:		Northing:	14,263,374.28 usft	Latitude:	39° 16' 32.300 N
From:	Lat/Long	Easting:	1,782,382.45 usft	Longitude:	80° 29' 54.000 W
Position Uncertainty:	0.0 usft	Slot Radius:	13-3/16 "	Grid Convergence:	0.32 °

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Well Position	+N/-S	0.0 usft	Northing:	14,263,374.28 usft	Latitude:	39° 16' 32.300 N
	+E/-W	0.0 usft	Easting:	1,782,382.45 usft	Longitude:	80° 29' 54.000 W
Position Uncertainty	0.0 usft	Wellhead Elevation:	usft	Ground Level:	1,306.0 usft	

Wellbore	Wellbore #1				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	12/11/2013	-8.65	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	177.43	

Survey Program	Date	12/11/2013			
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description	
700.0	3,122.0	MWD (Wellbore #1)			

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Survey	Office of Oil and Gas WV Dept. of Environmental Protection									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude	
700.0	0.00	0.00	700.0	0.0	0.0	14,263,374.28	1,782,382.45	39° 16' 32.300 N	80° 29' 54.000 W	
TIE IN @ 700' MD / 700' TVD										
726.0	0.88	151.08	726.0	-0.2	0.1	14,263,374.11	1,782,382.55	39° 16' 32.298 N	80° 29' 53.999 W	
756.0	1.32	158.42	756.0	-0.7	0.3	14,263,373.58	1,782,382.79	39° 16' 32.293 N	80° 29' 53.996 W	
786.0	2.20	159.30	786.0	-1.6	0.7	14,263,372.72	1,782,383.12	39° 16' 32.285 N	80° 29' 53.992 W	
816.0	3.12	156.51	815.9	-2.8	1.2	14,263,371.44	1,782,383.65	39° 16' 32.272 N	80° 29' 53.985 W	
846.0	4.31	164.09	845.9	-4.7	1.8	14,263,369.60	1,782,384.28	39° 16' 32.254 N	80° 29' 53.977 W	
876.0	5.19	169.41	875.8	-7.1	2.4	14,263,367.19	1,782,384.84	39° 16' 32.230 N	80° 29' 53.970 W	
906.0	6.02	170.59	905.6	-10.0	2.9	14,263,364.30	1,782,385.35	39° 16' 32.201 N	80° 29' 53.964 W	
936.0	6.90	168.70	935.4	-13.3	3.5	14,263,360.98	1,782,385.96	39° 16' 32.168 N	80° 29' 53.956 W	
966.0	7.38	167.21	965.2	-16.9	4.3	14,263,357.33	1,782,386.74	39° 16' 32.132 N	80° 29' 53.947 W	
996.0	7.78	171.38	995.0	-20.8	5.0	14,263,353.45	1,782,387.47	39° 16' 32.094 N	80° 29' 53.938 W	

DDC
Survey Report - Geographic



Company: HG Energy, LLC
Project: Harrison County, West Virginia
Site: WF Williams #130
Well: WF Williams #130
Wellbore: Wellbore #1
Design: Wellbore #1

Local Co-ordinate Reference: Well WF Williams #130
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MD Reference: WELL @ 1314.0usft (Decker #6)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Database: 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
1,026.0	7.91	176.22	1,024.7	-24.9	5.5	14,263,349.38	1,782,387.91	39° 16' 32.053 N	80° 29' 53.932 W
1,056.0	8.00	177.49	1,054.4	-29.0	5.7	14,263,345.24	1,782,388.14	39° 16' 32.013 N	80° 29' 53.930 W
1,086.0	8.70	176.70	1,084.1	-33.4	5.9	14,263,340.88	1,782,388.36	39° 16' 31.969 N	80° 29' 53.927 W
1,116.0	9.58	176.70	1,113.7	-38.2	6.2	14,263,336.13	1,782,388.63	39° 16' 31.922 N	80° 29' 53.924 W
1,146.0	10.20	178.11	1,143.2	-43.3	6.4	14,263,330.98	1,782,388.87	39° 16' 31.872 N	80° 29' 53.922 W
1,176.0	10.50	181.18	1,172.7	-48.7	6.4	14,263,325.59	1,782,388.90	39° 16' 31.818 N	80° 29' 53.921 W
1,206.0	10.99	182.68	1,202.2	-54.3	6.3	14,263,320.00	1,782,388.71	39° 16' 31.763 N	80° 29' 53.924 W
1,236.0	11.51	182.59	1,231.6	-60.1	6.0	14,263,314.16	1,782,388.44	39° 16' 31.705 N	80° 29' 53.928 W
1,266.0	11.82	181.32	1,261.0	-66.2	5.8	14,263,308.09	1,782,388.23	39° 16' 31.645 N	80° 29' 53.931 W
1,296.0	12.22	183.82	1,292.3	-72.8	5.5	14,263,301.44	1,782,387.93	39° 16' 31.579 N	80° 29' 53.935 W
1,326.0	13.01	186.81	1,321.6	-79.4	4.9	14,263,294.92	1,782,387.32	39° 16' 31.515 N	80° 29' 53.944 W
1,356.0	14.59	189.01	1,350.7	-86.4	3.9	14,263,287.83	1,782,386.33	39° 16' 31.445 N	80° 29' 53.957 W
1,386.0	15.91	191.60	1,379.7	-94.2	2.5	14,263,280.07	1,782,384.91	39° 16' 31.368 N	80° 29' 53.975 W
1,416.0	15.82	187.60	1,408.5	-102.3	1.1	14,263,271.99	1,782,383.54	39° 16' 31.289 N	80° 29' 53.993 W
1,446.0	15.29	184.00	1,437.4	-110.3	0.3	14,263,263.99	1,782,382.72	39° 16' 31.210 N	80° 29' 54.004 W
1,476.0	14.41	177.58	1,466.4	-118.0	0.2	14,263,256.31	1,782,382.60	39° 16' 31.134 N	80° 29' 54.006 W
1,506.0	14.99	174.90	1,495.5	-125.6	0.7	14,263,248.72	1,782,383.11	39° 16' 31.059 N	80° 29' 54.001 W
1,536.0	15.29	173.41	1,524.4	-133.4	1.5	14,263,240.93	1,782,383.91	39° 16' 30.981 N	80° 29' 53.991 W
1,566.0	16.00	175.90	1,553.3	-141.4	2.2	14,263,232.87	1,782,384.66	39° 16' 30.902 N	80° 29' 53.982 W
1,596.0	16.92	169.41	1,582.1	-149.8	3.3	14,263,224.46	1,782,385.75	39° 16' 30.818 N	80° 29' 53.969 W
1,626.0	17.49	166.90	1,610.7	-158.5	5.1	14,263,215.77	1,782,387.58	39° 16' 30.733 N	80° 29' 53.946 W
1,656.0	17.40	167.30	1,639.4	-167.3	7.1	14,263,207.01	1,782,389.59	39° 16' 30.646 N	80° 29' 53.921 W
1,686.0	16.39	168.70	1,666.1	-175.2	8.8	14,263,199.05	1,782,391.28	39° 16' 30.567 N	80° 29' 53.900 W
1,716.0	15.21	170.59	1,695.0	-183.3	10.3	14,263,191.02	1,782,392.75	39° 16' 30.487 N	80° 29' 53.882 W
1,746.0	14.19	172.40	1,724.0	-190.8	11.4	14,263,183.49	1,782,393.88	39° 16' 30.413 N	80° 29' 53.868 W
1,776.0	14.11	173.58	1,753.1	-198.1	12.3	14,263,176.21	1,782,394.78	39° 16' 30.341 N	80° 29' 53.857 W
1,806.0	14.50	174.11	1,782.2	-205.4	13.1	14,263,168.84	1,782,395.57	39° 16' 30.268 N	80° 29' 53.848 W
1,836.0	14.72	177.01	1,811.2	-213.0	13.7	14,263,161.30	1,782,396.16	39° 16' 30.193 N	80° 29' 53.841 W
1,866.0	14.90	180.70	1,840.2	-220.6	13.9	14,263,153.64	1,782,396.31	39° 16' 30.118 N	80° 29' 53.839 W
1,896.0	15.29	180.92	1,869.2	-228.5	13.7	14,263,145.82	1,782,396.20	39° 16' 30.040 N	80° 29' 53.841 W
1,926.0	15.29	182.59	1,898.1	-236.4	13.5	14,263,137.92	1,782,395.96	39° 16' 29.962 N	80° 29' 53.845 W
1,956.0	15.12	185.49	1,927.1	-244.2	12.9	14,263,130.07	1,782,395.40	39° 16' 29.885 N	80° 29' 53.853 W
1,986.0	15.38	186.41	1,956.0	-252.1	12.1	14,263,122.22	1,782,394.58	39° 16' 29.807 N	80° 29' 53.863 W
2,016.0	15.82	186.19	1,984.9	-260.1	11.2	14,263,114.20	1,782,393.70	39° 16' 29.728 N	80° 29' 53.875 W
2,046.0	16.22	185.10	2,013.7	-268.3	10.4	14,263,105.97	1,782,392.89	39° 16' 29.647 N	80° 29' 53.886 W
2,076.0	16.61	185.80	2,042.5	-276.8	9.6	14,263,097.53	1,782,392.08	39° 16' 29.563 N	80° 29' 53.897 W
2,106.0	17.09	185.10	2,071.2	-285.4	8.8	14,263,088.87	1,782,391.25	39° 16' 29.478 N	80° 29' 53.908 W
2,136.0	16.30	182.81	2,100.0	-294.0	8.2	14,263,080.27	1,782,390.66	39° 16' 29.393 N	80° 29' 53.916 W
2,166.0	14.99	179.51	2,128.9	-302.1	8.0	14,263,072.19	1,782,390.48	39° 16' 29.313 N	80° 29' 53.919 W
2,196.0	13.80	177.10	2,157.9	-309.5	8.2	14,263,064.73	1,782,390.70	39° 16' 29.239 N	80° 29' 53.917 W
2,226.0	13.80	176.09	2,187.1	-316.7	8.7	14,263,057.59	1,782,391.12	39° 16' 29.168 N	80° 29' 53.912 W
2,256.0	13.89	176.70	2,216.2	-323.9	9.1	14,263,050.43	1,782,391.57	39° 16' 29.098 N	80° 29' 53.907 W
2,286.0	14.11	177.49	2,245.3	-331.1	9.5	14,263,043.18	1,782,391.94	39° 16' 29.026 N	80° 29' 53.903 W
2,316.0	14.11	179.38	2,274.4	-338.4	9.7	14,263,035.87	1,782,392.14	39° 16' 28.954 N	80° 29' 53.901 W
2,346.0	14.11	181.32	2,303.5	-345.7	9.6	14,263,028.56	1,782,392.10	39° 16' 28.881 N	80° 29' 53.902 W
2,376.0	13.89	180.79	2,332.6	-353.0	9.5	14,263,021.30	1,782,391.96	39° 16' 28.809 N	80° 29' 53.904 W
2,406.0	13.58	179.12	2,361.7	-360.1	9.5	14,263,014.18	1,782,391.97	39° 16' 28.739 N	80° 29' 53.904 W
2,436.0	14.11	178.59	2,390.9	-367.3	9.7	14,263,007.00	1,782,392.11	39° 16' 28.668 N	80° 29' 53.903 W
2,466.0	14.99	178.90	2,419.9	-374.8	9.8	14,262,999.47	1,782,392.28	39° 16' 28.591 N	80° 29' 53.902 W
2,496.0	15.51	180.22	2,448.8	-382.7	9.9	14,262,991.58	1,782,392.43	39° 16' 28.511 N	80° 29' 53.901 W
2,526.0	15.21	178.81	2,477.8	-390.7	9.9	14,262,983.63	1,782,392.40	39° 16' 28.437 N	80° 29' 53.901 W
2,556.0	14.90	174.29	2,506.7	-398.4	10.4	14,262,975.86	1,782,392.87	39° 16' 28.360 N	80° 29' 53.896 W
2,586.0	14.41	168.48	2,535.8	-405.9	11.5	14,262,968.36	1,782,394.00	39° 16' 28.286 N	80° 29' 53.882 W
2,616.0	13.80	167.21	2,564.9	-413.1	13.1	14,262,961.21	1,782,395.53	39° 16' 28.215 N	80° 29' 53.863 W
2,646.0	13.80	171.78	2,594.0	-420.1	14.4	14,262,954.18	1,782,396.84	39° 16' 28.146 N	80° 29' 53.847 W

DDC
Survey Report - Geographic



Company: HG Energy, LLC
 Project: Harrison County, West Virginia
 Site: WF Williams #130
 Well: WF Williams #130
 Wellbore: Wellbore #1
 Design: Wellbore #1

Local Co-ordinate Reference:
 TVD Reference:
 MD Reference:
 North Reference:
 Survey Calculation Method:
 Database:

Well WF Williams #130
 WELL @ 1314.0usft (Decker #6)
 WELL @ 1314.0usft (Decker #6)
 Grid
 Minimum Curvature
 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	
2,676.0	13.58	176.22	2,623.1	-427.2	15.1	14,262,947.13	1,782,397.58	39° 16' 28.076 N	80° 29' 53.838 W	
2,706.0	14.19	179.91	2,652.3	-434.3	15.4	14,262,939.94	1,782,397.82	39° 16' 28.005 N	80° 29' 53.835 W	
2,736.0	15.38	182.81	2,681.3	-442.0	15.2	14,262,932.29	1,782,397.63	39° 16' 27.929 N	80° 29' 53.838 W	
2,766.0	16.22	183.38	2,710.1	-450.2	14.7	14,262,924.13	1,782,397.19	39° 16' 27.848 N	80° 29' 53.844 W	
2,796.0	16.30	182.99	2,738.9	-458.5	14.3	14,262,915.74	1,782,396.72	39° 16' 27.766 N	80° 29' 53.851 W	
2,826.0	15.82	182.02	2,767.8	-466.8	13.9	14,262,907.45	1,782,396.36	39° 16' 27.684 N	80° 29' 53.856 W	
2,856.0	14.81	180.31	2,796.7	-474.8	13.7	14,262,899.53	1,782,396.19	39° 16' 27.605 N	80° 29' 53.859 W	
2,886.0	14.11	178.11	2,825.8	-482.2	13.8	14,262,892.04	1,782,396.29	39° 16' 27.531 N	80° 29' 53.858 W	
2,916.0	13.32	175.60	2,854.9	-489.3	14.2	14,262,884.94	1,782,396.68	39° 16' 27.461 N	80° 29' 53.854 W	
2,946.0	13.01	173.58	2,884.1	-496.1	14.9	14,262,878.14	1,782,397.32	39° 16' 27.394 N	80° 29' 53.846 W	
2,976.0	12.70	170.81	2,913.4	-502.8	15.8	14,262,871.53	1,782,398.22	39° 16' 27.328 N	80° 29' 53.835 W	
3,006.0	12.39	168.59	2,942.6	-509.1	17.0	14,262,865.14	1,782,399.50	39° 16' 27.265 N	80° 29' 53.819 W	
3,036.0	12.00	163.08	2,972.0	-515.3	18.7	14,262,859.03	1,782,401.15	39° 16' 27.205 N	80° 29' 53.798 W	
3,122.0	12.00	163.00	3,056.1	-532.4	23.9	14,262,841.92	1,782,406.37	39° 16' 27.035 N	80° 29' 53.733 W	

TD @ 3122' MD / 3056' TVD

Design Annotations				
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
3,122.0	3,056.1	-532.4	23.9	TD @ 3122' MD / 3056' TVD

Checked By: _____ Approved By: _____ Date: _____

Received

Office of Oil and Gas
 WV Dept. of Environmental Protection

Company Name: HG Energy, LLC
 W.F. Williams #130
 Harrison County, West Virginia
 Rig: Original Well Elev
 Created By: James Dawson
 Date: 08/09/2013

W.F. Williams #130
 Harrison County, West Virginia
 Q130543 & AM-13610
 Design #1

Azimuths to Grid North

Correction: -8.00°

Magnetic Field
 Strength: 52362.2snT
 Dip Angle: 66.85°
 Date: 7/24/2013
 Model: IGRF2010

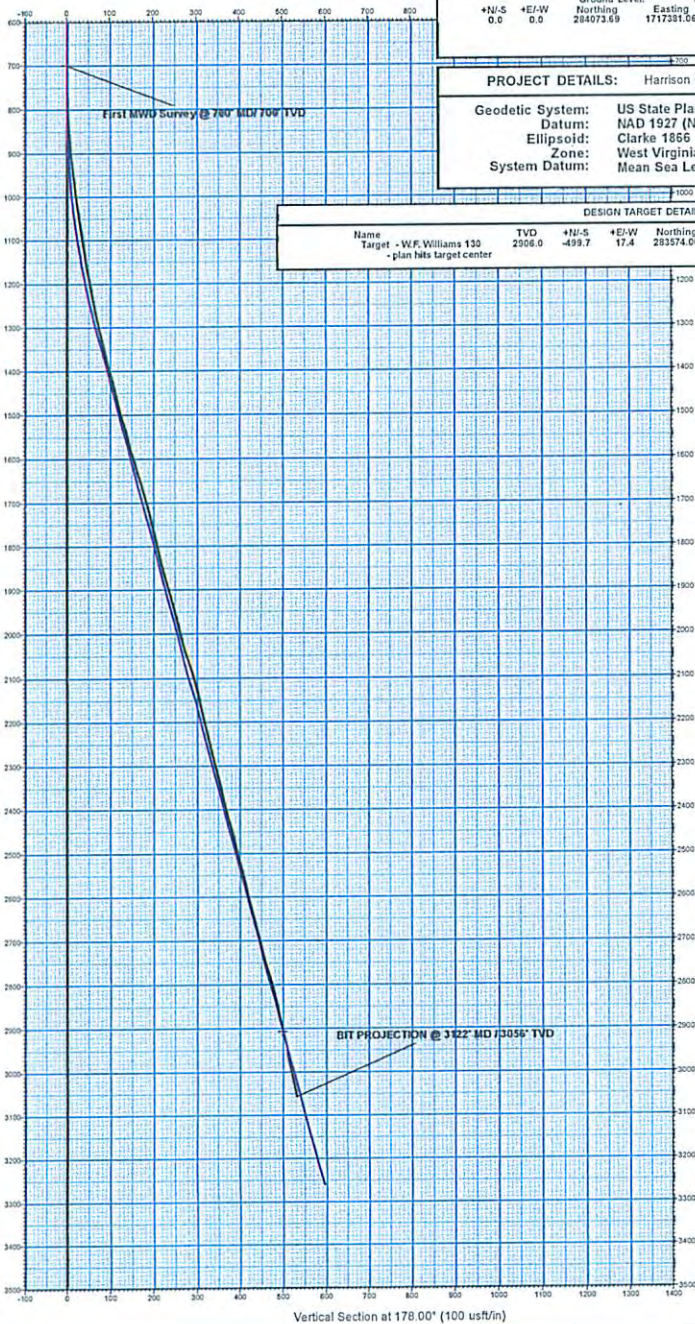
WELL DETAILS: W.F. Williams #130					
Ground Level:	1306.0				
+N-S	+E-W	North	East	Latitude	Longitude
0.0	0.0	284073.69	1717381.06	39° 16' 22.300 N	80° 29' 54.000 W

PROJECT DETAILS:	
Harrison County, West Virginia	
Geodetic System:	US State Plane 1927 (Exact solution)
Datum:	NAD 1927 (NADCON CONUS)
Ellipsoid:	Clarke 1856
Zone:	West Virginia North 4701
System Datum:	Mean Sea Level

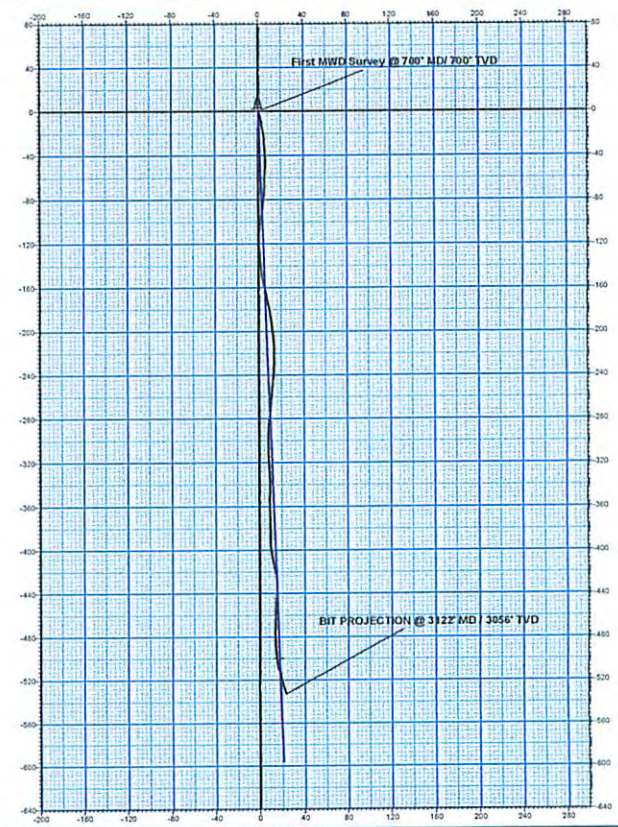
DESIGN TARGET DETAILS						
Name	TVD	+N-S	+E-W	North	East	Latitude
Target - W.F. Williams 130 - plan hits target center	2906.0	-499.7	17.4	283274.00	1717389.51	39° 16' 27.363 N
Longitude: 80° 29' 53.708 W						



HG Energy



ANNOTATIONS							
MD	Inc	Azi	TVD	+N-S	+E-W	Vsect	Departure
3122.0	12.00	163.00	3056.1	-532.4	23.9	632.9	636.7
Annotation: BIT PROJECTION @ 3122' MD / 3056' TVD							



Received

02/28/2014