

PE file



# Reliance

Well Services, LLC

## 15 BPM X-Link Frac

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HG Energy, LLC  
Treater: Tony Lewellen  
Date: 8/4/2022  
Lease: C.B. Ferrell  
Well #: 128  
Roane County, WV

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# Reliance

Well Services

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# Reliance

WELL SERVICES LLC

810 Cranberry Street  
Suite 310  
Erie, PA 16507  
Phone 814 454 1644  
Fax 814 454 1644  
24 Hours 412 906 5902

Operator: HG Energy, LLC  
Lease: C.B. Ferrell  
Well #: 128  
Location: Roane County, WV

Supervisor: Tony Lewellen  
Pump Time: 12:47 PM  
Flush Time: 1:00 PM  
Date: 8/4/2022

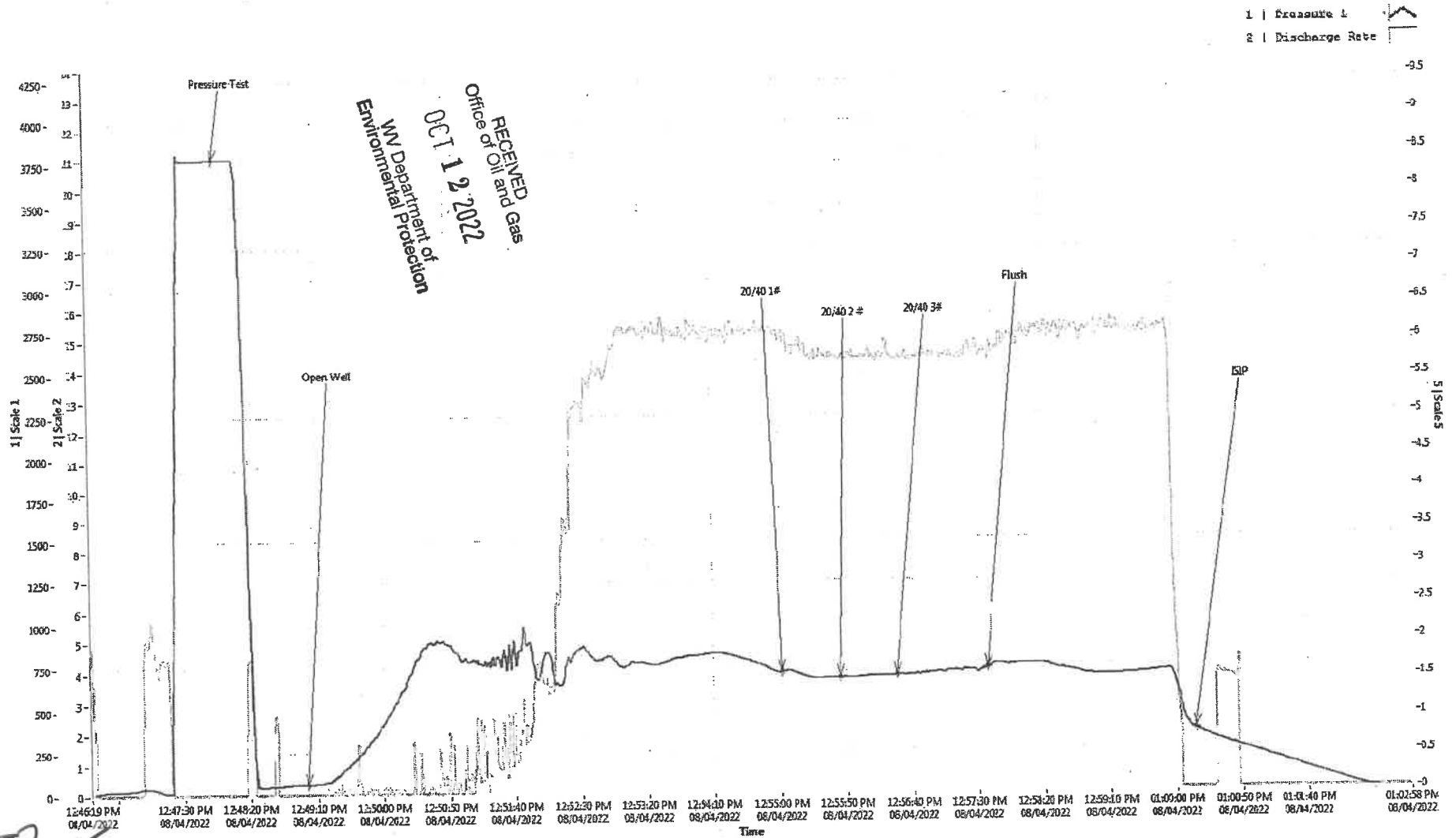
Stage	Depth	Breakdown (psi)	Clean Vol H2O (bbls)	Slurry Discharge (bbls)	Acid 15% HCL (gals)	(In Acid) 4 AND 1 Acid Inhibitor (gals)	API 20/40 Sand (sacks)	Ave. Treating (psi)	Pro Gel 4.0L Guar Gel (lbs)	GB-LEB Gel Breaker (gals)	BXL-10C X-Linker (gals)	BXL-A Breaker Activator (gals)	AP-1 Breaker (lbs)	Pro CLA Firm LP Clay Control (gals)	Pro NE-1 Biocide/Surfactant (gals)
1	2371	904	145	150	<u>250.00</u>	<u>1.25</u>	<u>30.00</u>	720	<u>25.00</u>	<u>0.25</u>	<u>5.00</u>	<u>5.00</u>	<u>5.00</u>	<u>5.00</u>	<u>5.00</u>
	Total				250.00	1.25	30.00		25.00	0.25	5.00	5.00	5.00	5.00	5.00

Comments:

Stage 1 8/4/2022: Treated per design.

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HG ENERGY, LLC – FERRELL #128 – STAGE 1 COMMENTS



**JOB COMMENTS AND DETAILS**

<b>Job Name</b>	Farrell #128
<b>Location</b>	Roane County, WV
<b>Company</b>	HG Energy, LLC
<b>Comments</b>	Stage 1 of 1. Treated per design.

**GRAPH NOTES AND RANGES**

Timestamp	Annotation	Pressure 1	Discharge Rate	Stage Total (bbl)	Grand Total (bbl)	Grand Total (gal)
8/4/2022 12:47:56 PM	Pressure Test	3780.81	0.00	3.12	31.97	1342.79
8/4/2022 12:49:02 PM	Open Well	56.61	0.00	0.12	32.48	1364.01
8/4/2022 12:55:01 PM	20/40 1#	706.13	15.24	43.26	75.62	3165.48
8/4/2022 12:55:45 PM	20/40 2 #	673.42	14.41	10.46	86.33	3615.95
8/4/2022 12:56:28 PM	20/40 3#	685.16	14.32	10.09	96.66	4049.79
8/4/2022 12:57:37 PM	Flush	729.44	14.66	16.37	113.27	4747.00
8/4/2022 1:00:14 PM	ISIP	355.06	0.00	35.98	149.49	6278.56

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**Quality Control Job Sheet**

Customer	HG Energy, LLC	
Date	8/4/2022	
Well	CB Ferrell #128	

**PHYSICAL INVENTORY**

Chemical	Starting Inventory	Final Inventory	Total Pumped
Pro Gel 4.0L	200.00	175.00	25.00
GB-LEB	2.50	2.25	0.25
BXL-10C	5.00	0.00	5.00
BXL-A	5.00	0.00	5.00
AP-1 Breaker	20.00	15.00	5.00
Pro CLA Firm LP	5.00	0.00	5.00
Pro NE-1	5.00	0.00	5.00

Acid	Acid Volume Out	Gals 4 N 1 Added	Acid Volume In	Total
Acid 15%	250	1.25	0	251.25



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**PRODIRECTIONAL**



**CB Ferrell No. 128  
Roane County, WV  
Noah Horn 294 Rig**

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**June 29, 2022**

**Survey Certification Report**



June 29, 2022



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Operator Name: HG Energy  
Well Name: CB Ferrell No. 128  
County/Parish: Roane County,  
State: WV  
Rig Name: Noah Horn 294  
Job Number: LWW3146222

This is to certify the surveys performed on the referenced well by Professional Directional Ent., Inc. are true and correct MWD Surveys, data provided as follows:

<u>Surveyor</u>	<u>Surveyed Depths</u>	<u>Projection to Bit</u>	<u>Dates Performed</u>	<u>Type of Survey</u>
ProDirectional	529' MD – 2,308' MD	2,369' MD	06/20/22 – 06/22/22	MWD

Sincerely,

Mike Coats  
Regulatory Specialist  
Professional Directional

850 Conroe Park West Drive | Conroe, TX 77303 | Phone: 936.441.7266

prodirectional.com



HG Energy LLC  
Roane County, West Virginia  
CB Ferrell  
CB Ferrell #128  
Prelim A - CB Ferrell #128



Universal Transverse Mercator (US Survey Feet)  
NAD83 West Virginia - HARN  
GRS 1980  
Zone 17N (84 W to 78 W)  
Mean Sea Level



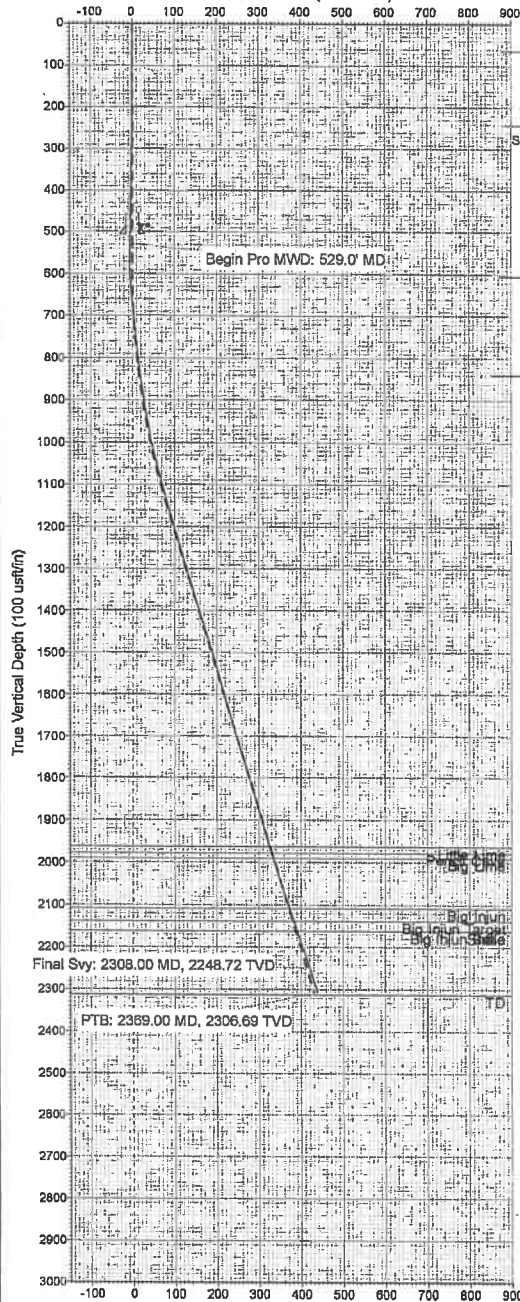
Azimuths to Grid North  
True North: 0.16°  
Magnetic North: -8.22°

Magnetic Field  
Strength: 50852.8nT  
Dip Angle: 65.57°  
Date: 5/10/2022  
Model: HDGM

Azimuth Corrections

Total Magnetic Corr. (M to G): Subtract 8.22°

Vertical Section at 288.50° (100 usft/in)



RKB Elevation: KB @ 1118.00usft

+N/-S	+E/-W	Northing	Easting	Latitude	Longitude	Slot
0.00	0.00	14059578.48	1560288.75	38.716623	-81.280898	

SECTION DETAILS

Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	VSect
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	600.00	0.00	0.00	600.00	0.00	0.00	0.00	0.00	0.00
3	1160.33	16.81	286.50	1162.33	23.18	-78.25	3.00	288.50	81.61
4	2192.09	16.81	286.50	2140.00	107.92	-364.35	0.00	0.00	379.99
5	2369.09	16.81	286.50	2306.57	122.22	-412.59	0.00	0.00	430.31

Targets

Name	TVD	+N/-S	+E/-W	Northing	Easting
BHL (CB Ferrell #128)	2140.00	107.91	-364.35	14058886.38	1558934.40

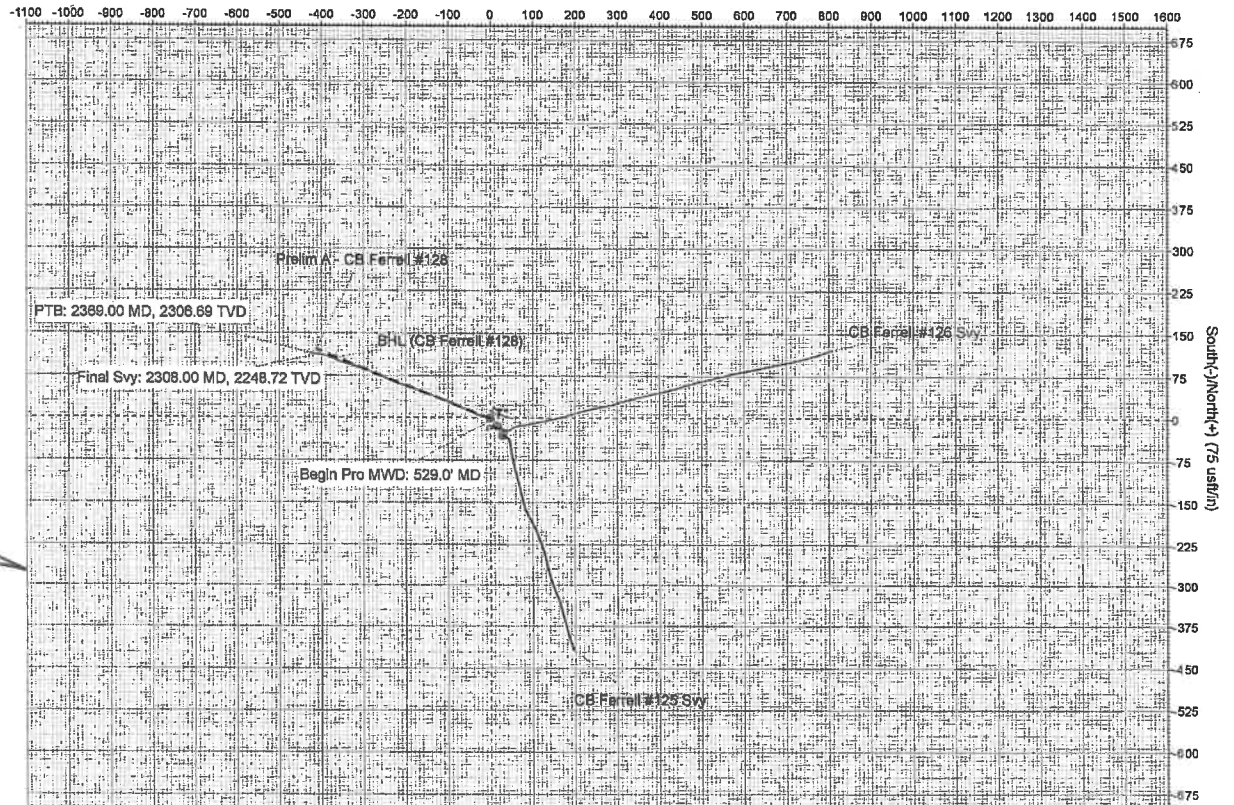
Formations

TVDP	MD	Formation
1964.00	2008.24	Little/Lime
1979.00	2023.81	Pencil Cave
1991.00	2036.44	Big Lime
2109.00	2159.71	Big Injun
2140.00	2192.08	Big Injun Target
2164.00	2217.16	Big Injun Base
2164.00	2217.16	Shale

Casing

TVDP	MD	Name	Size
505.00	605.00	7"	7"

West(-)/East(+) (100 usft/in)



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**ProDirectional**  
Survey Report

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**Company:** HG Energy LLC  
**Project:** Roane County, West Virginia  
**Site:** CB Ferrell  
**Well:** CB Ferrell #128  
**Wellbore:** OH  
**Design:** CB Ferrell #128 Svy

**Local Co-ordinate Reference:** Well CB Ferrell #128  
**TVD Reference:** KB @ 1118.00usft  
**MD Reference:** KB @ 1118.00usft  
**North Reference:** Grid  
**Survey Calculation Method:** Minimum Curvature  
**Database:** WellPlanner1

<b>Project</b>	Roane County, West Virginia		
<b>Map System:</b>	Universal Transverse Mercator (US Survey Feet)	<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>	CB Ferrell		
<b>Site Position:</b>	<b>Northing:</b>	14,059,548.50 usft	<b>Latitude:</b> 38.716540
<b>From:</b> Map	<b>Easting:</b>	1,560,328.20 usft	<b>Longitude:</b> -81.280792
<b>Position Uncertainty:</b> 0.00 usft	<b>Slot Radius:</b>	13-3/16 "	<b>Grid Convergence:</b> -0.18 °

<b>Well</b>	CB Ferrell #128		
<b>Well Position</b>	<b>+N/-S</b>	0.00 usft	<b>Northing:</b> 14,059,578.48 usft
	<b>+E/-W</b>	0.00 usft	<b>Easting:</b> 1,560,298.75 usft
<b>Position Uncertainty</b>	0.00 usft	<b>Wellhead Elevation:</b>	usft
			<b>Latitude:</b> 38.716623
			<b>Longitude:</b> -81.280896
			<b>Ground Level:</b> 1,110.00 usft

<b>Wellbore</b>	OH		
<b>Magnetics</b>	<b>Model Name</b>	<b>Sample Date</b>	<b>Declination</b>
	HDGM	5/10/2022	(°) -8.40
			<b>Dip Angle</b> (°) 65.57
			<b>Field Strength</b> (nT) 50,852.80

<b>Design</b>	CB Ferrell #128 Svy		
<b>Audit Notes:</b>			
<b>Version:</b> 1.0	<b>Phase:</b>	ACTUAL	<b>Tie On Depth:</b> 0.00
<b>Vertical Section:</b>	<b>Depth From (TVD)</b>	<b>+N/-S</b>	<b>+E/-W</b>
	(usft)	(usft)	(usft)
	0.00	0.00	0.00
			<b>Direction</b> (°) 286.50

<b>Survey Program</b>	<b>Date</b>	6/29/2022		
<b>From</b>	<b>To</b>	<b>Survey (Wellbore)</b>	<b>Tool Name</b>	<b>Description</b>
(usft)	(usft)			
529.00	2,369.00	Survey #1 (OH)	MWD	MWD - Standard

**ProDirectional**  
Survey Report

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WV Department of  
Environmental Protection

**Company:** HG Energy LLC  
**Project:** Roane County, West Virginia  
**Site:** CB Ferrell  
**Well:** CB Ferrell #128  
**Wellbore:** OH  
**Design:** CB Ferrell #128 Svy

**Local Co-ordinate Reference:** Well CB Ferrell #128  
**TVD Reference:** KB @ 1118.00usft  
**MD Reference:** KB @ 1118.00usft  
**North Reference:** Grid  
**Survey Calculation Method:** Minimum Curvature  
**Database:** WellPlanner1

**Survey**

MD (usft)	Inc (°)	Azi (azimuth) (°)	TVD (usft)	V. Sec (usft)	N/S (usft)	E/W (usft)	Closure Distance (usft)	Closure Azimuth (°)	Northing (usft)	Easting (usft)
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	14,059,578.48	1,560,298.75
529.00	1.16	113.88	528.96	-5.31	-2.17	4.90	5.35	113.88	14,059,576.31	1,560,303.65
Begin Pro MWD: 529.0' MD										
544.00	1.30	108.60	543.96	-5.63	-2.28	5.20	5.68	113.72	14,059,576.20	1,560,303.95
574.00	0.53	99.73	573.96	-6.11	-2.42	5.66	6.15	113.13	14,059,576.06	1,560,304.41
604.00	1.66	279.72	603.95	-5.82	-2.37	5.36	5.86	113.80	14,059,576.11	1,560,304.11
634.00	4.34	276.83	633.91	-4.26	-2.16	3.81	4.38	119.53	14,059,576.32	1,560,302.56
664.00	6.41	281.26	663.78	-1.48	-1.70	1.04	1.99	148.50	14,059,576.78	1,560,299.79
694.00	6.30	280.33	693.59	1.83	-1.07	-2.22	2.47	244.23	14,059,577.41	1,560,296.53
724.00	6.39	280.96	723.41	5.12	-0.46	-5.48	5.50	285.20	14,059,578.02	1,560,293.27
754.00	6.22	279.16	753.23	8.40	0.12	-8.72	8.73	270.76	14,059,578.60	1,560,290.03
784.00	6.00	276.81	783.06	11.56	0.56	-11.89	11.90	272.70	14,059,579.04	1,560,286.86
814.00	6.45	283.82	812.88	14.78	1.15	-15.08	15.12	274.36	14,059,579.63	1,560,283.67
844.00	7.72	288.97	842.65	18.48	2.21	-18.62	18.75	276.76	14,059,580.69	1,560,280.13
874.00	8.69	288.59	872.34	22.76	3.58	-22.67	22.96	278.98	14,059,582.06	1,560,276.08
904.00	9.59	289.49	901.96	27.52	5.14	-27.18	27.66	280.71	14,059,583.62	1,560,271.57
934.00	9.83	290.12	931.53	32.57	6.85	-31.94	32.67	282.11	14,059,585.33	1,560,266.81
964.00	10.38	287.46	961.07	37.83	8.55	-36.92	37.90	283.03	14,059,587.03	1,560,261.83
994.00	11.85	286.82	990.50	43.61	10.25	-42.45	43.67	283.57	14,059,588.73	1,560,256.30
1,024.00	13.61	288.13	1,019.76	50.22	12.24	-48.75	50.27	284.09	14,059,590.72	1,560,250.00
1,054.00	14.27	288.75	1,048.88	57.44	14.53	-55.61	57.47	284.64	14,059,593.01	1,560,243.14
1,084.00	14.46	287.64	1,077.94	64.88	16.85	-62.68	64.90	285.05	14,059,595.33	1,560,236.07
1,114.00	15.07	287.08	1,106.95	72.53	19.13	-69.98	72.54	285.29	14,059,597.61	1,560,228.77
1,144.00	15.22	287.30	1,135.91	80.36	21.45	-77.46	80.38	285.47	14,059,599.93	1,560,221.29
1,174.00	15.67	288.73	1,164.83	88.35	23.92	-85.06	88.36	285.71	14,059,602.40	1,560,213.69
1,204.00	15.91	288.90	1,193.69	96.51	26.55	-92.79	96.51	285.97	14,059,605.03	1,560,205.96
1,234.00	16.61	287.34	1,222.49	104.90	29.16	-100.77	104.91	286.14	14,059,607.64	1,560,197.98

**ProDirectional**  
Survey Report

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**OCT 12 2022**  
WV Department of  
Environmental Protection

Company: HG Energy LLC  
Project: Roane County, West Virginia  
Site: CB Ferrell  
Well: CB Ferrell #128  
Wellbore: OH  
Design: CB Ferrell #128 Svy

Local Co-ordinate Reference: Well CB Ferrell #128  
TVD Reference: KB @ 1118.00usft  
MD Reference: KB @ 1118.00usft  
North Reference: Grid  
Survey Calculation Method: Minimum Curvature  
Database: WellPlanner1

MD (usft)	Inc (°)	Azi (azimuth) (°)	TVD (usft)	V. Sec (usft)	N/S (usft)	E/W (usft)	Closure Distance (usft)	Closure Azimuth (°)	Northing (usft)	Easting (usft)
1,264.00	16.83	285.66	1,251.23	113.53	31.61	-109.05	113.54	286.17	14,059,610.09	1,560,189.70
1,294.00	16.55	284.31	1,279.96	122.15	33.84	-117.37	122.15	286.08	14,059,612.32	1,560,181.38
1,324.00	16.26	282.93	1,308.74	130.61	35.84	-125.60	130.61	285.92	14,059,614.32	1,560,173.15
1,354.00	16.75	283.98	1,337.51	139.12	37.82	-133.89	139.13	285.77	14,059,616.30	1,560,164.86
1,384.00	17.31	285.23	1,366.19	147.90	40.04	-142.39	147.91	285.70	14,059,618.52	1,560,156.36
1,414.00	17.23	286.49	1,394.84	156.80	42.47	-150.96	156.82	285.71	14,059,620.95	1,560,147.79
1,444.00	17.15	287.50	1,423.50	165.67	45.06	-159.44	165.68	285.78	14,059,623.54	1,560,139.31
1,474.00	16.91	286.72	1,452.18	174.45	47.65	-167.83	174.47	285.85	14,059,626.13	1,560,130.92
1,504.00	16.80	286.75	1,480.89	183.15	50.15	-176.16	183.16	285.89	14,059,628.63	1,560,122.59
1,534.00	16.58	286.41	1,509.63	191.77	52.61	-184.42	191.78	285.92	14,059,631.09	1,560,114.33
1,564.00	16.45	285.96	1,538.39	200.30	54.99	-192.61	200.31	285.93	14,059,633.47	1,560,106.14
1,594.00	16.10	284.55	1,567.19	208.70	57.20	-200.72	208.71	285.91	14,059,635.68	1,560,098.03
1,624.00	15.70	283.99	1,596.04	216.91	59.23	-208.69	216.93	285.84	14,059,637.71	1,560,090.06
1,654.00	15.56	284.60	1,624.93	224.99	61.22	-216.52	225.01	285.79	14,059,639.70	1,560,082.23
1,684.00	15.38	285.34	1,653.85	232.99	63.29	-224.25	233.01	285.76	14,059,641.77	1,560,074.50
1,714.00	16.25	285.90	1,682.71	241.16	65.49	-232.12	241.18	285.76	14,059,643.97	1,560,066.63
1,738.00	16.98	288.34	1,705.71	248.03	67.51	-238.68	248.04	285.79	14,059,645.99	1,560,060.07
1,768.00	16.97	288.80	1,734.40	256.78	70.30	-246.98	256.79	285.89	14,059,648.78	1,560,051.77
1,798.00	16.96	289.02	1,763.10	265.52	73.14	-255.26	265.53	285.99	14,059,651.62	1,560,043.49
1,828.00	17.00	287.66	1,791.79	274.28	75.90	-263.58	274.29	286.06	14,059,654.38	1,560,035.17
1,858.00	16.65	286.47	1,820.50	282.96	78.45	-271.88	282.97	286.09	14,059,656.93	1,560,026.87
1,888.00	16.64	286.97	1,849.25	291.56	80.92	-280.11	291.56	286.11	14,059,659.40	1,560,018.64
1,918.00	16.36	286.58	1,878.01	300.08	83.38	-288.27	300.08	286.13	14,059,661.86	1,560,010.48
1,948.00	16.77	284.30	1,906.77	308.63	85.65	-296.51	308.63	286.11	14,059,664.13	1,560,002.24
1,978.00	17.17	283.62	1,935.46	317.37	87.76	-305.01	317.38	286.05	14,059,666.24	1,559,993.74
2,008.00	16.75	282.11	1,964.16	326.11	89.71	-313.54	326.12	285.97	14,059,668.19	1,559,985.21
2,038.00	16.63	283.63	1,992.89	334.70	91.63	-321.94	334.72	285.89	14,059,670.11	1,559,976.81

## ProDirectional Survey Report

**Company:** HG Energy LLC  
**Project:** Roane County, West Virginia  
**Site:** CB Ferrell  
**Well:** CB Ferrell #128  
**Wellbore:** OH  
**Design:** CB Ferrell #128 Svy

**Local Co-ordinate Reference:** Well CB Ferrell #128  
**TVD Reference:** KB @ 1118.00usft  
**MD Reference:** KB @ 1118.00usft  
**North Reference:** Grid  
**Survey Calculation Method:** Minimum Curvature  
**Database:** WellPlanner1

### Survey

MD (usft)	Inc (°)	Azi (azimuth) (°)	TVD (usft)	V. Sec (usft)	N/S (usft)	E/W (usft)	Closure Distance (usft)	Closure Azimuth (°)	Northing (usft)	Easting (usft)
2,068.00	17.00	283.63	2,021.61	343.37	93.68	-330.37	343.39	285.83	14,059,672.16	1,559,968.38
2,098.00	17.94	283.78	2,050.22	352.37	95.81	-339.12	352.39	285.78	14,059,674.29	1,559,959.63
2,128.00	18.70	284.20	2,078.70	361.79	98.09	-348.27	361.82	285.73	14,059,676.57	1,559,950.48
2,158.00	19.30	285.94	2,107.07	371.55	100.63	-357.70	371.59	285.71	14,059,679.11	1,559,941.05
2,188.00	19.93	287.51	2,135.33	381.62	103.53	-367.34	381.65	285.74	14,059,682.01	1,559,931.41
2,218.00	19.64	287.03	2,163.56	391.77	106.55	-377.04	391.80	285.78	14,059,685.03	1,559,921.71
2,248.00	18.97	284.61	2,191.87	401.69	109.25	-386.58	401.72	285.78	14,059,687.73	1,559,912.17
2,278.00	18.75	281.16	2,220.26	411.36	111.42	-396.03	411.40	285.71	14,059,689.90	1,559,902.72
2,308.00	18.14	276.82	2,248.72	420.77	112.90	-405.40	420.82	285.56	14,059,691.38	1,559,893.35
Final Svy: 2308.00 MD, 2248.72 TVD										
2,369.00	18.14	276.82	2,306.69	439.49	115.16	-424.25	439.61	285.19	14,059,693.64	1,559,874.50
PTB: 2369.00 MD, 2306.69 TVD										

### Design Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
529.00	528.96	-2.17	4.90	Begin Pro MWD: 529.0' MD
2,308.00	2,248.72	112.90	-405.40	Final Svy: 2308.00 MD, 2248.72 TVD
2,369.00	2,306.69	115.16	-424.25	PTB: 2369.00 MD, 2306.69 TVD



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# ProDirectional Survey Report

**Company:** HG Energy LLC  
**Project:** Roane County, West Virginia  
**Site:** CB Ferrell  
**Well:** CB Ferrell #128  
**Wellbore:** OH  
**Design:** CB Ferrell #128 Svy

**Local Co-ordinate Reference:** Well CB Ferrell #128  
**TVD Reference:** KB @ 1118.0ft  
**MD Reference:** KB @ 1118.0ft  
**North Reference:** Grid  
**Survey Calculation Method:** Minimum Curvature  
**Database:** WellPlanner1

<b>Project</b>	Roane County, West Virginia		
<b>Map System:</b>	Universal Transverse Mercator (US Survey Feet)	<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>	CB Ferrell				
<b>Site Position:</b>		<b>Northing:</b>	4,285,358.95 m	<b>Latitude:</b>	38° 42' 59.546 N
<b>From:</b>	Map	<b>Easting:</b>	475,588.99 m	<b>Longitude:</b>	81° 16' 50.851 W
<b>Position Uncertainty:</b>	0.0 ft	<b>Slot Radius:</b>	13.200 in	<b>Grid Convergence:</b>	-0.18 °

<b>Well</b>	CB Ferrell #128					
<b>Well Position</b>	<b>+N/-S</b>	0.0 ft	<b>Northing:</b>	4,285,368.09 m	<b>Latitude:</b>	38° 42' 59.841 N
	<b>+E/-W</b>	0.0 ft	<b>Easting:</b>	475,580.01 m	<b>Longitude:</b>	81° 16' 51.224 W
<b>Position Uncertainty</b>		0.0 ft	<b>Wellhead Elevation:</b>	ft	<b>Ground Level:</b>	1,110.0ft

<b>Wellbore</b>	OH				
<b>Magnetics</b>	<b>Model Name</b>	<b>Sample Date</b>	<b>Declination (°)</b>	<b>Dip Angle (°)</b>	<b>Field Strength (nT)</b>
	HDGM	5/10/2022	-8.40	65.57	50,852.80000000

<b>Design</b>	CB Ferrell #128 Svy				
<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) (ft)</b>	<b>+N/-S (ft)</b>	<b>+E/-W (ft)</b>	<b>Direction (°)</b>	
	0.0	0.0	0.0	286.50	

<b>Survey Program</b>	<b>Date</b>	6/29/2022			
<b>From (ft)</b>	<b>To (ft)</b>	<b>Survey (Wellbore)</b>	<b>Tool Name</b>	<b>Description</b>	
529.0	2,369.0	Survey #1 (OH)	MWD	MWD - Standard	

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**Project:** Roane County, West Virginia  
**Site:** CB Ferrell  
**Well:** CB Ferrell #128  
**Wellbore:** OH  
**Design:** CB Ferrell #128 Svy

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**TVD Reference:** KB @ 1118.0ft  
**MD Reference:** KB @ 1118.0ft  
**North Reference:** Grid  
**Survey Calculation Method:** Minimum Curvature  
**Database:** WellPlanner1

**Survey**

MD (ft)	Inc (°)	Azi (azimuth) (°)	TVD (ft)	V. Sec (ft)	N/S (ft)	E/W (ft)	Closure Distance (ft)	Closure Azimuth (°)	Northing (m)	Easting (m)
0.0	0.00	0.00	0.0	0.0	0.0	0.0	0.0	0.00	4,285,368.09	475,580.01
529.0	1.16	113.88	529.0	-5.3	-2.2	4.9	5.4	113.88	4,285,367.43	475,581.50
Begin Pro MWD: 529.0' MD										
544.0	1.30	108.60	544.0	-5.6	-2.3	5.2	5.7	113.72	4,285,367.40	475,581.59
574.0	0.53	99.73	574.0	-6.1	-2.4	5.7	6.2	113.13	4,285,367.36	475,581.73
604.0	1.66	279.72	604.0	-5.8	-2.4	5.4	5.9	113.80	4,285,367.37	475,581.65
634.0	4.34	276.83	633.9	-4.3	-2.2	3.8	4.4	119.53	4,285,367.43	475,581.17
664.0	6.41	281.26	663.8	-1.5	-1.7	1.0	2.0	148.50	4,285,367.57	475,580.33
694.0	6.30	280.33	693.6	1.8	-1.1	-2.2	2.5	244.23	4,285,367.76	475,579.33
724.0	6.39	280.96	723.4	5.1	-0.5	-5.5	5.5	265.20	4,285,367.95	475,578.34
754.0	6.22	279.16	753.2	8.4	0.1	-8.7	8.7	270.76	4,285,368.13	475,577.35
784.0	6.00	276.81	783.1	11.6	0.6	-11.9	11.9	272.70	4,285,368.26	475,576.39
814.0	6.45	283.82	812.9	14.8	1.1	-15.1	15.1	274.36	4,285,368.44	475,575.41
844.0	7.72	288.97	842.7	18.5	2.2	-18.6	18.8	276.76	4,285,368.76	475,574.33
874.0	8.69	288.59	872.3	22.8	3.6	-22.7	23.0	278.98	4,285,369.18	475,573.10
904.0	9.59	289.49	902.0	27.5	5.1	-27.2	27.7	280.71	4,285,369.66	475,571.73
934.0	9.83	290.12	931.5	32.6	6.9	-31.9	32.7	282.11	4,285,370.18	475,570.28
964.0	10.38	287.46	961.1	37.8	8.5	-36.9	37.9	283.03	4,285,370.70	475,568.76
994.0	11.85	286.82	990.5	43.6	10.2	-42.4	43.7	283.57	4,285,371.22	475,567.07
1,024.0	13.61	288.13	1,019.8	50.2	12.2	-48.8	50.3	284.09	4,285,371.82	475,565.15
1,054.0	14.27	288.75	1,048.9	57.4	14.5	-55.6	57.5	284.64	4,285,372.52	475,563.06
1,084.0	14.46	287.64	1,077.9	64.9	16.8	-62.7	64.9	285.05	4,285,373.23	475,560.91
1,114.0	15.07	287.08	1,107.0	72.5	19.1	-70.0	72.5	285.29	4,285,373.92	475,558.68
1,144.0	15.22	287.30	1,135.9	80.4	21.4	-77.5	80.4	285.47	4,285,374.63	475,556.40
1,174.0	15.67	288.73	1,164.8	88.4	23.9	-85.1	88.4	285.71	4,285,375.38	475,554.08
1,204.0	15.91	288.90	1,193.7	96.5	26.6	-92.8	96.5	285.97	4,285,376.18	475,551.73
1,234.0	16.61	287.34	1,222.5	104.9	29.2	-100.8	104.9	286.14	4,285,376.98	475,549.30

**ProDirectional**  
Survey Report

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**Site:** CB Ferrell  
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**Wellbore:** OH  
**Design:** CB Ferrell #128 Svy

**Local Co-ordinate Reference:** Well CB Ferrell #128  
**TVD Reference:** KB @ 1118.0ft  
**MD Reference:** KB @ 1118.0ft  
**North Reference:** Grid  
**Survey Calculation Method:** Minimum Curvature  
**Database:** WellPlanner1

MD (ft)	Inc (")	Azi (azimuth) (°)	TVD (ft)	V. Sec (ft)	N/S (ft)	E/W (ft)	Closure Distance (ft)	Closure Azimuth (°)	Northing (m)	Easting (m)
1,264.0	16.83	285.66	1,251.2	113.5	31.6	-109.0	113.5	286.17	4,285,377.73	475,546.77
1,294.0	16.55	284.31	1,280.0	122.1	33.8	-117.4	122.1	286.08	4,285,378.41	475,544.24
1,324.0	16.26	282.93	1,308.7	130.6	35.8	-125.6	130.6	285.92	4,285,379.01	475,541.73
1,354.0	16.75	283.98	1,337.5	139.1	37.8	-133.9	139.1	285.77	4,285,379.62	475,539.20
1,384.0	17.31	285.23	1,366.2	147.9	40.0	-142.4	147.9	285.70	4,285,380.29	475,536.61
1,414.0	17.23	286.49	1,394.8	156.8	42.5	-151.0	156.8	285.71	4,285,381.04	475,534.00
1,444.0	17.15	287.50	1,423.5	165.7	45.1	-159.4	165.7	285.78	4,285,381.83	475,531.41
1,474.0	16.91	286.72	1,452.2	174.5	47.6	-167.8	174.5	285.85	4,285,382.61	475,528.85
1,504.0	16.80	286.75	1,480.9	183.2	50.2	-176.2	183.2	285.89	4,285,383.38	475,526.32
1,534.0	16.58	286.41	1,509.6	191.8	52.6	-184.4	191.8	285.92	4,285,384.13	475,523.80
1,564.0	16.45	285.96	1,538.4	200.3	55.0	-192.6	200.3	285.93	4,285,384.85	475,521.30
1,594.0	16.10	284.55	1,567.2	208.7	57.2	-200.7	208.7	285.91	4,285,385.53	475,518.83
1,624.0	15.70	283.99	1,596.0	216.9	59.2	-208.7	216.9	285.84	4,285,386.14	475,516.40
1,654.0	15.56	284.60	1,624.9	225.0	61.2	-216.5	225.0	285.79	4,285,386.75	475,514.02
1,684.0	15.38	285.34	1,653.8	233.0	63.3	-224.2	233.0	285.76	4,285,387.38	475,511.66
1,714.0	16.25	285.90	1,682.7	241.2	65.5	-232.1	241.2	285.76	4,285,388.05	475,509.26
1,738.0	16.98	288.34	1,705.7	248.0	67.5	-238.7	248.0	285.79	4,285,388.67	475,507.26
1,768.0	16.97	288.80	1,734.4	256.8	70.3	-247.0	256.8	285.89	4,285,389.52	475,504.73
1,798.0	16.96	289.02	1,763.1	265.5	73.1	-255.3	265.5	285.99	4,285,390.38	475,502.21
1,828.0	17.00	287.66	1,791.8	274.3	75.9	-263.6	274.3	286.06	4,285,391.22	475,499.67
1,858.0	16.65	286.47	1,820.5	283.0	78.4	-271.9	283.0	286.09	4,285,392.00	475,497.14
1,888.0	16.64	286.97	1,849.2	291.6	80.9	-280.1	291.6	286.11	4,285,392.76	475,494.63
1,918.0	16.36	286.58	1,878.0	300.1	83.4	-288.3	300.1	286.13	4,285,393.50	475,492.15
1,948.0	16.77	284.30	1,906.8	308.6	85.7	-296.5	308.6	286.11	4,285,394.20	475,489.63
1,978.0	17.17	283.62	1,935.5	317.4	87.8	-305.0	317.4	286.05	4,285,394.84	475,487.04
2,008.0	16.75	282.11	1,964.2	326.1	89.7	-313.5	326.1	285.97	4,285,395.44	475,484.44
2,038.0	16.63	283.63	1,992.9	334.7	91.6	-321.9	334.7	285.89	4,285,396.02	475,481.88



**ProDirectional**  
Survey Report

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**Company:** HG Energy LLC  
**Project:** Roane County, West Virginia  
**Site:** CB Ferrell  
**Well:** CB Ferrell #128  
**Wellbore:** OH  
**Design:** CB Ferrell #128 Svy

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**TVD Reference:** KB @ 1118.0ft  
**MD Reference:** KB @ 1118.0ft  
**North Reference:** Grid  
**Survey Calculation Method:** Minimum Curvature  
**Database:** WellPlanner1

**Survey**

MD (ft)	Inc (°)	Azi (azimuth) (°)	TVD (ft)	V. Sec (ft)	N/S (ft)	E/W (ft)	Closure Distance (ft)	Closure Azimuth (°)	Northing (m)	Easting (m)
2,068.0	17.00	283.63	2,021.6	343.4	93.7	-330.4	343.4	285.83	4,285,396.64	475,479.31
2,098.0	17.94	283.78	2,050.2	352.4	95.8	-339.1	352.4	285.78	4,285,397.29	475,476.65
2,128.0	18.70	284.20	2,078.7	361.8	98.1	-348.3	361.8	285.73	4,285,397.99	475,473.86
2,158.0	19.30	285.94	2,107.1	371.6	100.6	-357.7	371.6	285.71	4,285,398.76	475,470.98
2,188.0	19.93	287.51	2,135.3	381.6	103.5	-367.3	381.7	285.74	4,285,399.65	475,468.04
2,218.0	19.64	287.03	2,163.6	391.8	106.5	-377.0	391.8	285.78	4,285,400.57	475,465.09
2,248.0	18.97	284.61	2,191.9	401.7	109.3	-386.6	401.7	285.78	4,285,401.39	475,462.18
2,278.0	18.75	281.16	2,220.3	411.4	111.4	-396.0	411.4	285.71	4,285,402.05	475,459.30
2,308.0	18.14	276.82	2,248.7	420.8	112.9	-405.4	420.8	285.56	4,285,402.50	475,456.45
<b>Final Svy: 2308.00 MD, 2248.72 TVD</b>										
2,369.0	18.14	276.82	2,306.7	439.5	115.2	-424.3	439.6	285.19	4,285,403.19	475,450.70
<b>PTB: 2369.00 MD, 2306.69 TVD</b>										

**Design Annotations**

Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment
		+N/-S (ft)	+E/-W (ft)	
2,308.0	2,248.7	112.9	-405.4	Final Svy: 2308.00 MD, 2248.72 TVD
2,369.0	2,306.7	115.2	-424.3	PTB: 2369.00 MD, 2306.69 TVD