



Well: Goudy 1S-11HM (H)
 Site: Goudy
 Project: Marshall County, West Virginia.
 Design: rev6
 Rig: Nabors B28

SECTION DETAILS

Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	VSect	Annotation
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
2	1127.00	0.00	0.00	1127.00	0.00	0.00	0.00	0.00	0.00	KOP Begin 1°/100' build
3	1627.00	5.00	225.00	1626.37	-15.42	-15.42	1.00	225.00	8.65	Begin 5.00° tangent
4	2731.84	5.00	225.00	2727.00	-83.51	-83.51	0.00	0.00	45.92	Begin 3°/100' build/turn
5	3804.52	36.79	203.45	3717.01	-420.11	-248.72	3.00	-24.40	299.13	Begin 36.79° tangent
6	6762.77	36.79	203.45	6086.22	-2045.31	-953.56	0.00	0.00	1551.00	Begin 8°/100' build/turn
7	6994.36	50.00	184.31	6254.86	-2198.72	-988.12	8.00	-52.21	1680.93	Begin 10°/100' build/turn
8	7493.77	89.00	149.97	6431.00	-2633.49	-869.96	10.00	-47.47	2128.68	Begin 89.00° lateral
9	19600.81	89.00	149.97	6641.50	-13113.39	5186.75	0.00	0.00	14102.63	PBHL/TD 19600.81 MD 6641.50 TVD

ANNOTATIONS SURVEYS

MD	Inc	Azi	TVD	+N/-S	+E/-W	VSect	Annotation
198.00	0.21	349.21	198.00	0.36	-0.07	-0.36	MWD surveys
19526.00	89.76	150.60	6519.05	-13058.31	5142.69	14034.46	Survey @ 19526.00 MD 6519.05 TVD
19588.00	89.76	150.60	6519.31	-13112.32	5173.13	14095.89	Survey Proj. to 19588.00 MD 6519.31 TVD

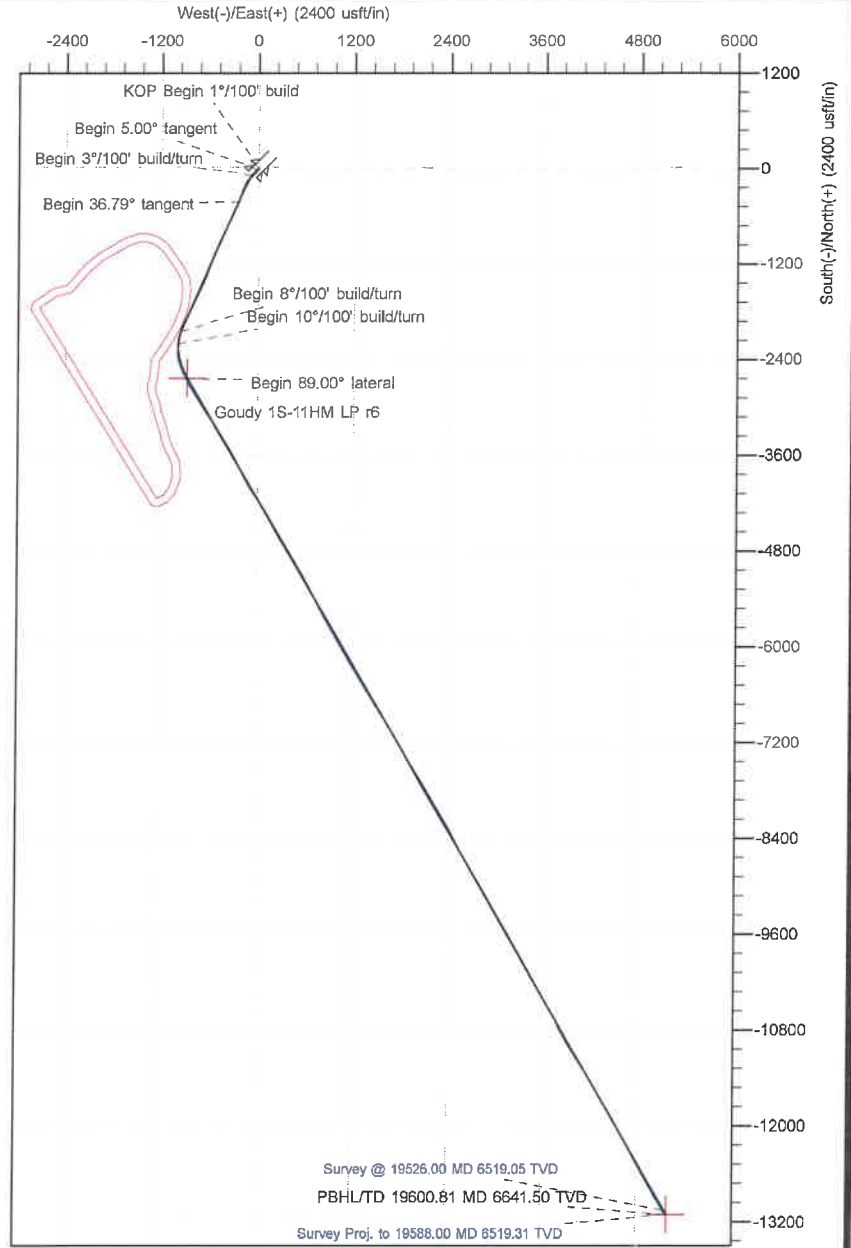
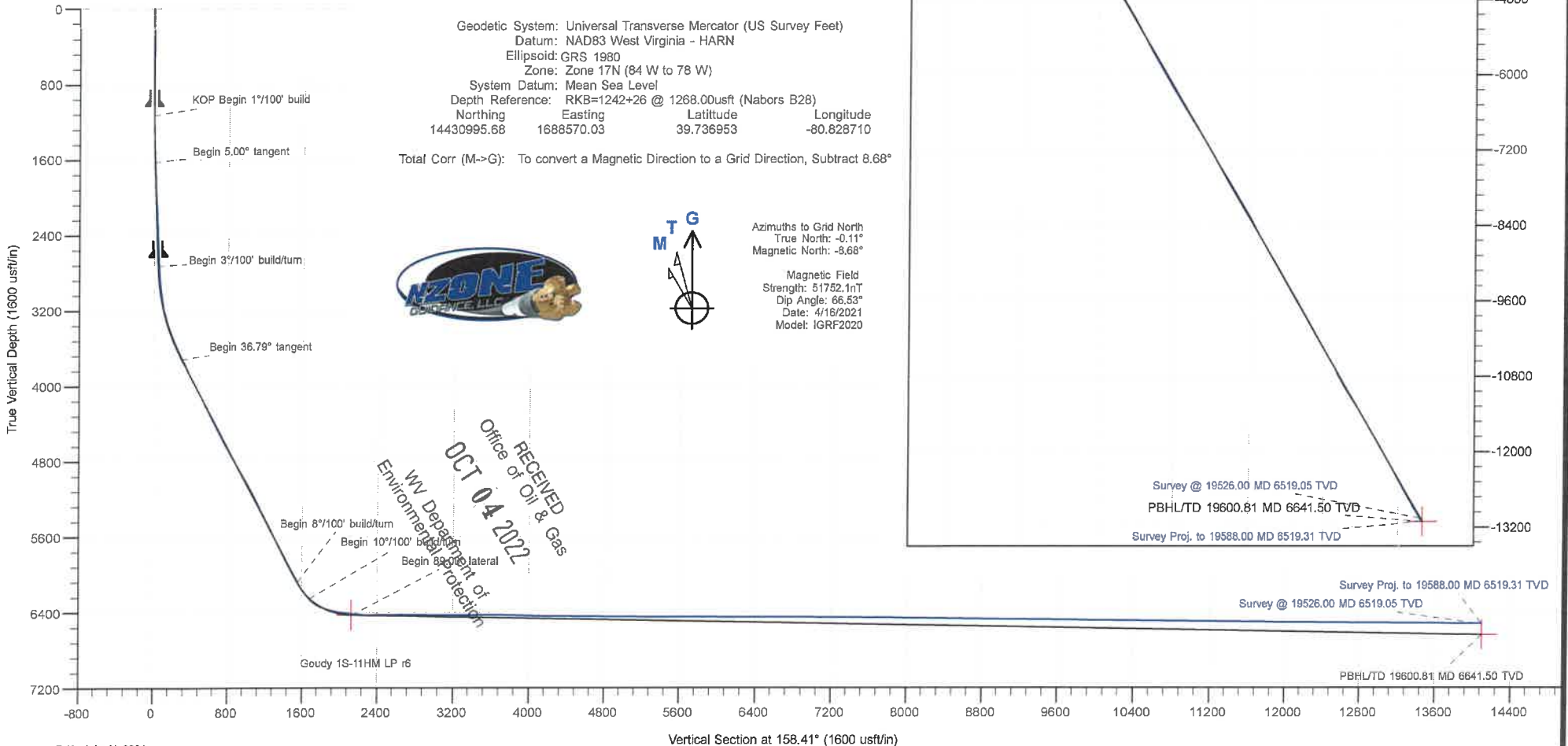
Geodetic System: Universal Transverse Mercator (US Survey Feet)
 Datum: NAD83 West Virginia - HARN
 Ellipsoid: GRS 1980
 Zone: Zone 17N (84 W to 78 W)
 System Datum: Mean Sea Level
 Depth Reference: RKB=1242+26 @ 1268.00usft (Nabors B28)
 Northing: 14430995.68 Easting: 1688570.03 Latitude: 39.736953 Longitude: -80.828710

Total Corr (M->G): To convert a Magnetic Direction to a Grid Direction, Subtract 8.68°



Azimuths to Grid North
 True North: -0.11°
 Magnetic North: -8.68°

Magnetic Field
 Strength: 51752.1nT
 Dip Angle: 66.53°
 Date: 4/16/2021
 Model: IGRF2020



Company:	Tug Hill Operating LLC	Local Co-ordinate Reference:	Well Goudy 1S-11HM (H)
Project:	Marshall County, West Virginia.	TVD Reference:	RKB=1242+26 @ 1268.00usft (Nabors B28)
Site:	Goudy	MD Reference:	RKB=1242+26 @ 1268.00usft (Nabors B28)
Well:	Goudy 1S-11HM (H)	North Reference:	Grid
Wellbore:	Original Hole	Survey Calculation Method:	Minimum Curvature
Design:	Surveys Original Hole	Database:	DB_Dec2220_v16

Project	Marshall County, West Virginia.		
Map System:	Universal Transverse Mercator (US Survey Feet)	System Datum:	Mean Sea Level
Geo Datum:	NAD83 West Virginia - HARN		
Map Zone:	Zone 17N (84 W to 78 W)		

Site	Goudy				
Site Position:	Northing:	14,430,942.40 usft	Latitude:	39.736807	
From:	Lat/Long	Easting:	1,688,559.77 usft	Longitude:	-80.828748
Position Uncertainty:	0.00 usft	Slot Radius:	13-3/16 "		

Well	Goudy 1S-11HM (H)					
Well Position	+N/-S	0.00 usft	Northing:	14,430,995.69 usft	Latitude:	39.736953
	+E/-W	0.00 usft	Easting:	1,688,570.03 usft	Longitude:	-80.828711
Position Uncertainty	0.00 usft		Wellhead Elevation:	usft	Ground Level:	1,242.00 usft
Grid Convergence:	0.11 °					

Wellbore	Original Hole				
Magnetics	Model Name	Sample Date	Declination (")	Dip Angle (")	Field Strength (nT)
	IGRF2020	4/16/2021	-8.57	66.53	51,752.12310860

Design	Surveys Original Hole				
Audit Notes:					
Version:	1.0	Phase:	ACTUAL	Tie On Depth:	0.00
Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)	Direction (")	
	0.00	0.00	0.00	158.41	

Survey Program	Date	7/11/2021			
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description	
198.00	961.00	MWD surf (Original Hole)	MWD	MWD - Standard	
1,036.00	2,549.00	MWD int (Original Hole)	MWD	MWD - Standard	
2,692.00	5,139.00	MWD int2 (Original Hole)	MWD	MWD - Standard	
5,276.00	19,526.00	MWD (Original Hole)	MWD	MWD - Standard	
19,588.00	19,588.00	Projection (Original Hole)	MWD	MWD - Standard	

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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)	
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
198.00	0.21	349.21	198.00	0.36	-0.07	-0.36	0.11	0.11	0.00	
MWD surveys										
228.00	0.18	336.99	228.00	0.45	-0.10	-0.46	0.17	-0.10	-40.73	
258.00	0.26	354.57	258.00	0.56	-0.12	-0.57	0.35	0.27	58.60	
288.00	0.09	24.45	288.00	0.65	-0.12	-0.65	0.62	-0.57	99.60	

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Site:	Goudy	MD Reference:	RKB=1242+26 @ 1268.00usft (Nabors B28)
Well:	Goudy 1S-11HM (H)	North Reference:	Grid
Wellbore:	Original Hole	Survey Calculation Method:	Minimum Curvature
Design:	Surveys Original Hole	Database:	DB_Dec2220_v16

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)
319.00	0.18	351.76	319.00	0.72	-0.12	-0.72	0.37	0.29	-105.45
349.00	0.40	28.23	349.00	0.86	-0.07	-0.83	0.92	0.73	121.57
379.00	0.35	45.64	379.00	1.02	0.04	-0.93	0.41	-0.17	58.03
409.00	0.22	42.30	409.00	1.13	0.15	-0.99	0.44	-0.43	-11.13
439.00	0.26	51.53	439.00	1.21	0.24	-1.04	0.19	0.13	30.77
470.00	0.35	16.28	470.00	1.35	0.32	-1.13	0.66	0.29	-113.71
500.00	0.22	18.21	500.00	1.49	0.36	-1.25	0.43	-0.43	6.43
530.00	0.35	59.61	530.00	1.59	0.46	-1.31	0.78	0.43	138.00
561.00	0.18	75.52	561.00	1.65	0.59	-1.32	0.59	-0.55	51.32
590.00	0.35	82.02	590.00	1.67	0.72	-1.29	0.59	0.59	22.41
620.00	0.31	73.41	619.99	1.71	0.89	-1.26	0.21	-0.13	-28.70
651.00	0.26	105.40	650.99	1.71	1.04	-1.21	0.53	-0.16	103.19
682.00	0.31	119.73	681.99	1.65	1.18	-1.10	0.28	0.16	46.23
712.00	0.18	145.92	711.99	1.58	1.28	-0.99	0.56	-0.43	87.30
742.00	0.31	134.58	741.99	1.48	1.36	-0.87	0.46	0.43	-37.80
772.00	0.18	105.05	771.99	1.41	1.46	-0.77	0.59	-0.43	-98.43
804.00	0.31	115.16	803.99	1.36	1.59	-0.68	0.43	0.41	31.59
835.00	0.22	168.24	834.99	1.27	1.68	-0.56	0.81	-0.29	171.23
867.00	0.31	148.03	866.99	1.13	1.74	-0.41	0.40	0.28	-63.16
898.00	0.40	175.50	897.99	0.95	1.79	-0.23	0.61	0.29	88.61
961.00	0.18	248.93	960.99	0.70	1.71	-0.02	0.62	-0.35	116.56
1,036.00	0.53	277.23	1,035.99	0.70	1.26	-0.19	0.51	0.47	37.73
1,099.00	0.66	266.77	1,098.99	0.72	0.61	-0.44	0.27	0.21	-16.60
1,131.00	1.10	244.80	1,130.98	0.58	0.15	-0.48	1.71	1.38	-68.66
1,162.00	1.41	231.79	1,161.98	0.21	-0.42	-0.35	1.35	1.00	-41.97
1,194.00	1.71	233.37	1,193.96	-0.32	-1.11	-0.12	0.95	0.94	4.94
1,225.00	2.02	225.28	1,224.95	-0.98	-1.87	0.22	1.31	1.00	-26.10
1,257.00	2.24	229.77	1,256.92	-1.78	-2.75	0.64	0.86	0.69	14.03
1,289.00	2.55	225.46	1,288.90	-2.68	-3.74	1.12	1.12	0.97	-13.47
1,320.00	2.59	223.70	1,319.87	-3.67	-4.71	1.68	0.29	0.13	-5.68
1,352.00	2.50	220.54	1,351.83	-4.72	-5.66	2.31	0.52	-0.28	-9.88
1,383.00	2.68	218.17	1,382.80	-5.81	-6.55	2.99	0.68	0.66	-7.65
1,415.00	2.86	218.69	1,414.77	-7.02	-7.51	3.76	0.57	0.26	1.63
1,446.00	2.94	217.46	1,445.73	-8.25	-8.48	4.55	0.33	0.26	-3.97
1,477.00	2.90	216.67	1,476.69	-9.51	-9.43	5.37	0.18	0.26	-3.97
1,509.00	3.25	213.42	1,508.64	-10.92	-10.42	6.32	1.22	1.09	10.16
1,541.00	3.60	212.45	1,540.58	-12.52	-11.45	7.43	1.11	1.09	-3.03
1,572.00	3.64	210.95	1,571.52	-14.19	-12.48	8.60	0.33	1.13	-4.84
1,604.00	3.91	213.15	1,603.45	-15.97	-13.60	9.85	0.96	0.84	6.88
1,635.00	4.31	216.23	1,634.37	-17.80	-14.87	11.08	1.47	1.29	9.94
1,667.00	4.53	217.02	1,666.28	-19.78	-16.34	12.38	0.71	0.69	2.47
1,699.00	4.75	221.95	1,698.17	-21.77	-17.99	13.63	1.42	0.69	15.41
1,730.00	5.05	223.53	1,729.06	-23.72	-19.78	14.77	1.06	0.97	5.10
1,762.00	5.27	221.95	1,760.93	-25.83	-21.74	16.02	0.82	0.69	-4.94

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1,793.00	5.58	222.56	1,791.79	-28.00	-23.71	17.31	1.02	1.00	1.97
1,825.00	5.71	221.95	1,823.63	-30.33	-25.82	18.70	0.45	0.41	-1.91
1,856.00	6.02	230.82	1,854.47	-32.50	-28.11	19.88	3.09	1.00	28.61
1,888.00	5.93	227.13	1,886.30	-34.69	-30.63	20.98	1.23	-0.28	-11.53
1,920.00	5.49	223.18	1,918.14	-36.93	-32.89	22.24	1.84	-1.38	-12.34
1,951.00	6.59	215.79	1,948.97	-39.45	-34.94	23.83	4.34	3.55	-23.84
1,983.00	7.29	214.04	1,980.73	-42.62	-37.15	25.96	2.28	2.19	-5.47
2,014.00	7.47	215.53	2,011.48	-45.89	-39.42	28.17	0.85	0.58	4.81
2,045.00	7.56	216.23	2,042.21	-49.18	-41.80	30.35	0.41	0.29	2.26
2,077.00	7.25	217.46	2,073.94	-52.48	-44.27	32.51	1.09	-0.97	3.84
2,108.00	7.25	221.59	2,104.70	-55.50	-46.76	34.40	1.68	0.00	13.32
2,140.00	7.38	222.12	2,136.43	-58.53	-49.48	36.22	0.46	0.41	1.66
2,171.00	7.25	227.89	2,167.18	-61.32	-52.27	37.79	2.41	-0.42	18.61
2,203.00	7.51	232.76	2,198.92	-63.94	-55.43	39.06	2.12	0.81	15.22
2,234.00	7.87	232.58	2,229.64	-66.45	-58.73	40.18	1.16	1.16	-0.58
2,266.00	7.60	231.44	2,261.35	-69.10	-62.12	41.40	0.97	-0.84	-3.56
2,298.00	6.33	228.89	2,293.11	-71.58	-65.11	42.60	4.08	-3.97	-7.97
2,329.00	6.02	235.22	2,323.93	-73.63	-67.73	43.55	2.41	-1.00	20.42
2,361.00	4.79	222.91	2,355.79	-75.57	-70.02	44.50	5.26	-3.84	-38.47
2,392.00	4.61	218.61	2,386.69	-77.49	-71.67	45.68	1.28	-0.58	-13.87
2,424.00	4.04	212.19	2,418.59	-79.45	-73.08	46.99	2.33	-1.78	-20.06
2,455.00	3.82	209.82	2,449.52	-81.27	-74.17	48.28	0.88	-0.71	-7.65
2,486.00	4.04	213.68	2,480.45	-83.08	-75.29	49.54	1.11	0.71	12.45
2,518.00	4.35	219.75	2,512.36	-84.95	-76.69	50.77	1.69	0.97	18.97
2,549.00	4.83	223.26	2,543.26	-86.80	-78.34	51.88	1.79	1.55	11.32
2,692.00	5.76	223.79	2,685.65	-96.37	-87.43	57.43	0.65	0.65	0.37
2,770.00	7.47	222.47	2,763.13	-102.93	-93.56	61.28	2.20	2.19	-1.69
2,865.00	11.69	224.32	2,856.78	-114.38	-104.46	67.91	4.45	4.44	1.95
2,960.00	12.96	217.20	2,949.60	-129.75	-117.63	77.36	2.08	1.34	-7.49
3,054.00	12.88	215.44	3,041.22	-146.68	-130.08	88.53	0.43	-0.09	-1.87
3,148.00	15.51	211.13	3,132.34	-165.98	-142.65	101.84	3.01	2.80	-4.59
3,243.00	18.81	204.46	3,223.11	-190.80	-155.56	120.17	4.04	3.47	-7.02
3,337.00	22.54	202.79	3,311.04	-221.22	-168.82	143.58	4.05	3.97	-1.78
3,431.00	25.44	202.26	3,396.91	-256.52	-183.45	171.02	3.99	3.09	-0.56
3,526.00	27.38	200.24	3,482.00	-295.90	-198.74	202.01	2.25	2.04	-2.13
3,621.00	30.23	200.24	3,565.23	-338.85	-214.57	236.12	2.25	2.04	0.00
3,715.00	32.71	200.50	3,645.40	-384.85	-231.66	272.60	2.64	2.64	0.28
3,810.00	33.13	201.91	3,725.15	-432.98	-250.34	310.48	0.92	0.44	1.48
3,904.00	33.75	201.82	3,803.59	-481.05	-269.63	348.09	0.66	0.66	-0.10
3,999.00	36.31	204.46	3,881.38	-531.16	-291.09	386.79	3.13	2.69	2.78
4,094.00	37.57	206.30	3,957.31	-582.73	-315.57	425.73	1.76	1.33	1.94
4,188.00	37.35	204.81	4,031.92	-634.31	-340.23	464.61	0.99	-0.23	-1.59
4,283.00	36.34	203.14	4,107.95	-686.35	-363.38	504.48	1.50	-1.06	-1.76

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4,377.00	35.51	202.17	4,184.07	-737.24	-384.63	543.99	1.07	-0.88	-1.03
4,472.00	37.57	204.98	4,260.40	-789.06	-407.28	583.83	2.79	2.17	2.96
4,567.00	36.61	204.89	4,336.18	-841.01	-431.43	623.25	1.01	-1.01	-0.09
4,662.00	35.99	204.10	4,412.74	-892.18	-454.75	662.26	0.82	-0.65	-0.83
4,757.00	35.51	203.84	4,489.84	-942.90	-477.30	701.12	0.53	-0.51	-0.27
4,855.00	36.43	205.07	4,569.15	-995.29	-501.13	741.06	1.19	0.94	1.26
4,950.00	37.88	205.51	4,644.87	-1,047.17	-525.65	780.28	1.55	1.53	0.46
5,044.00	39.20	203.40	4,718.39	-1,100.48	-549.88	820.94	1.98	1.40	-2.24
5,139.00	39.11	201.73	4,792.06	-1,155.87	-572.89	863.97	1.11	-0.09	-1.76
5,276.00	36.40	197.36	4,900.39	-1,234.83	-601.03	927.04	2.78	-1.98	-3.19
5,371.00	37.01	198.32	4,976.55	-1,288.88	-618.43	970.90	0.88	0.64	1.01
5,466.00	36.97	200.87	5,052.44	-1,342.72	-637.59	1,013.91	1.62	-0.04	2.68
5,561.00	36.97	204.48	5,128.35	-1,395.42	-659.61	1,054.80	2.29	0.00	3.80
5,655.00	35.69	206.23	5,204.07	-1,445.74	-683.44	1,092.83	1.75	-1.36	1.86
5,750.00	36.62	204.74	5,280.78	-1,496.33	-707.55	1,131.00	1.35	0.98	-1.57
5,844.00	36.66	203.95	5,356.21	-1,547.44	-730.68	1,170.02	0.50	0.04	-0.84
5,939.00	36.09	203.77	5,432.70	-1,598.97	-753.47	1,209.54	0.61	-0.60	-0.19
6,034.00	35.91	204.21	5,509.55	-1,649.99	-776.17	1,248.62	0.33	-0.19	0.46
6,128.00	36.31	204.65	5,585.49	-1,700.42	-799.08	1,287.09	0.51	0.43	0.47
6,222.00	36.84	203.69	5,660.98	-1,751.52	-822.01	1,326.17	0.83	0.56	-1.02
6,316.00	36.88	205.09	5,736.19	-1,802.88	-845.30	1,365.35	0.89	0.04	1.49
6,410.00	37.10	207.55	5,811.28	-1,853.56	-870.37	1,403.25	1.59	0.23	2.62
6,505.00	37.10	205.18	5,887.06	-1,904.90	-895.81	1,441.62	1.50	0.00	-2.49
6,600.00	37.32	203.33	5,962.72	-1,957.27	-919.41	1,481.64	1.20	0.23	-1.95
6,694.00	38.37	201.84	6,036.95	-2,010.52	-941.55	1,523.01	1.48	1.12	-1.59
6,741.00	38.24	201.31	6,073.83	-2,037.61	-952.26	1,544.26	0.75	-0.28	-1.13
6,788.00	38.24	196.83	6,110.75	-2,065.09	-961.76	1,566.31	5.90	0.00	-9.53
6,835.00	39.12	191.38	6,147.45	-2,093.56	-968.90	1,590.15	7.48	1.87	-11.60
6,881.00	40.48	188.48	6,182.80	-2,122.55	-973.97	1,615.25	5.00	2.96	-6.30
6,928.00	43.16	185.76	6,217.82	-2,153.64	-977.83	1,642.74	6.88	5.70	-5.79
6,975.00	46.15	183.73	6,251.25	-2,186.56	-980.55	1,672.35	7.05	6.36	-4.32
7,022.00	51.78	184.00	6,282.10	-2,221.92	-982.94	1,704.34	11.99	11.98	0.57
7,070.00	57.71	184.09	6,309.79	-2,261.00	-985.70	1,739.67	12.36		0.19
7,117.00	63.43	180.04	6,332.88	-2,301.88	-987.14	1,777.15			
7,164.00	67.82	175.56	6,352.28	-2,344.63	-985.47	1,817.52			-8.62
7,211.00	72.18	169.76	6,368.37	-2,388.40	-979.80	1,860.30			-9.53
7,258.00	76.09	164.57	6,381.22	-2,432.45	-969.74	1,904.96			-12.34
7,305.00	78.55	161.50	6,391.54	-2,476.29	-956.36	1,950.66			-11.04
7,352.00	80.40	158.42	6,400.13	-2,519.70	-940.52	1,996.84	7.55	3.94	-6.55
7,399.00	81.93	154.91	6,407.35	-2,562.33	-922.13	2,043.25	8.07	3.26	-7.47
7,447.00	83.52	153.15	6,413.43	-2,605.13	-901.28	2,090.72	4.92	3.31	-3.67
7,494.00	84.26	152.27	6,418.43	-2,646.66	-879.85	2,137.22	2.44	1.57	-1.87
7,541.00	85.23	151.57	6,422.73	-2,687.96	-857.82	2,183.73	2.54	2.06	-1.49

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Company:	Tug Hill Operating LLC	Local Co-ordinate Reference:	Well Goudy 1S-11HM (H)
Project:	Marshall County, West Virginia.	TVD Reference:	RKB=1242+26 @ 1268.00usft (Nabors B28)
Site:	Goudy	MD Reference:	RKB=1242+26 @ 1268.00usft (Nabors B28)
Well:	Goudy 1S-11HM (H)	North Reference:	Grid
Wellbore:	Original Hole	Survey Calculation Method:	Minimum Curvature
Design:	Surveys Original Hole	Database:	DB_Dec2220_v16

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)
7,588.00	86.95	149.02	6,425.94	-2,728.68	-834.59	2,230.14	6.53	3.66	-5.43
7,636.00	88.04	148.84	6,428.04	-2,769.75	-809.84	2,277.44	2.30	2.27	-0.38
7,730.00	91.34	149.11	6,428.54	-2,850.29	-761.40	2,370.15	3.52	3.51	0.29
7,825.00	90.07	147.88	6,427.38	-2,931.28	-711.76	2,463.72	1.86	-1.34	-1.29
7,919.00	90.20	147.44	6,427.15	-3,010.70	-661.47	2,556.07	0.49	0.14	-0.47
8,014.00	90.29	147.52	6,426.75	-3,090.80	-610.40	2,649.35	0.13	0.09	0.08
8,107.00	90.55	146.82	6,426.07	-3,168.95	-559.99	2,740.56	0.80	0.28	-0.75
8,200.00	89.27	148.67	6,426.21	-3,247.59	-510.36	2,831.95	2.42	-1.38	1.99
8,294.00	88.75	149.11	6,427.84	-3,328.06	-461.80	2,924.64	0.72	-0.55	0.47
8,388.00	88.70	148.40	6,429.93	-3,408.40	-413.05	3,017.29	0.76	-0.05	-0.76
8,482.00	89.05	150.78	6,431.77	-3,489.45	-365.48	3,110.15	2.56	0.37	2.53
8,577.00	90.64	151.22	6,432.03	-3,572.54	-319.43	3,204.35	1.74	1.67	0.46
8,669.00	91.12	151.57	6,430.62	-3,653.30	-275.39	3,295.65	0.65	0.52	0.38
8,764.00	89.98	152.36	6,429.71	-3,737.14	-230.74	3,390.05	1.46	-1.20	0.83
8,858.00	90.68	152.97	6,429.16	-3,820.64	-187.57	3,483.57	0.99	0.74	0.65
8,952.00	91.16	150.95	6,427.66	-3,903.60	-143.39	3,576.96	2.21	0.51	-2.15
9,046.00	89.36	149.55	6,427.23	-3,985.20	-96.75	3,670.00	2.43	-1.91	-1.49
9,141.00	88.79	146.82	6,428.76	-4,065.91	-46.68	3,763.47	2.94	-0.60	-2.87
9,235.00	88.09	148.14	6,431.32	-4,145.14	3.83	3,855.73	1.59	-0.74	1.40
9,330.00	88.09	148.31	6,434.49	-4,225.85	53.83	3,949.18	0.18	0.00	0.18
9,423.00	88.22	148.75	6,437.48	-4,305.13	102.35	4,040.75	0.49	0.14	0.47
9,516.00	89.01	149.55	6,439.73	-4,384.95	150.03	4,132.51	1.21	0.85	0.86
9,610.00	89.05	149.02	6,441.32	-4,465.75	198.03	4,225.31	0.57	0.04	-0.56
9,704.00	89.76	150.25	6,442.30	-4,546.85	245.55	4,318.20	1.51	0.76	1.31
9,799.00	90.51	149.81	6,442.07	-4,629.15	293.00	4,412.19	0.92	0.79	-0.46
9,894.00	89.41	150.16	6,442.14	-4,711.41	340.52	4,506.16	1.22	-1.16	0.37
9,988.00	89.98	150.07	6,442.64	-4,792.91	387.36	4,599.17	0.61	0.61	-0.10
10,083.00	90.11	149.81	6,442.57	-4,875.13	434.95	4,693.14	0.31	0.14	-0.27
10,177.00	89.01	150.07	6,443.29	-4,956.48	482.03	4,786.11	1.20	-1.17	0.28
10,272.00	89.01	149.98	6,444.93	-5,038.76	529.49	4,880.08	0.09	0.00	-0.09
10,366.00	88.88	150.07	6,446.66	-5,120.18	576.44	4,973.06	0.17	-0.14	0.10
10,460.00	89.01	150.25	6,448.39	-5,201.70	623.21	5,066.07	0.24	0.14	0.19
10,555.00	89.63	152.01	6,449.52	-5,284.88	669.07	5,160.29	1.96	0.65	1.85
10,649.00	89.41	151.48	6,450.31	-5,367.68	713.57	5,253.65	0.61	0.61	-0.56
10,743.00	91.87	153.15	6,449.26	-5,450.90	757.23	5,347.11	3.16	0.62	1.78
10,837.00	90.68	152.36	6,447.16	-5,534.45	800.26	5,440.62	1.39	0.76	-0.84
10,931.00	89.58	151.65	6,446.95	-5,617.45	844.38	5,534.03	0.76	-1.17	-0.76
11,025.00	89.67	152.36	6,447.57	-5,700.45	888.50	5,627.44	0.76	0.76	0.76
11,119.00	90.15	150.34	6,447.71	-5,782.94	933.57	5,720.73	2.21	0.76	-2.15
11,214.00	89.98	149.81	6,447.61	-5,865.27	980.96	5,814.72	0.59	-0.18	-0.56
11,308.00	89.80	149.37	6,447.79	-5,946.34	1,028.54	5,907.61	0.51	-0.19	-0.47
11,403.00	89.76	149.90	6,448.15	-6,028.30	1,076.56	6,001.50	0.56	-0.04	0.56
11,498.00	90.02	149.63	6,448.33	-6,110.38	1,124.40	6,095.42	0.39	0.27	-0.28
11,592.00	90.29	149.02	6,448.08	-6,191.23	1,172.35	6,188.24	0.71	0.29	-0.65

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Company:	Tug Hill Operating LLC	Local Co-ordinate Reference:	Well Goudy 1S-11HM (H)
Project:	Marshall County, West Virginia.	TVD Reference:	RKB=1242+26 @ 1268.00usft (Nabors B28)
Site:	Goudy	MD Reference:	RKB=1242+26 @ 1268.00usft (Nabors B28)
Well:	Goudy 1S-11HM (H)	North Reference:	Grid
Wellbore:	Original Hole	Survey Calculation Method:	Minimum Curvature
Design:	Surveys Original Hole	Database:	DB_Dec2220_v16

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)
11,686.00	89.41	149.02	6,448.33	-6,271.82	1,220.74	6,280.98	0.94	-0.94	0.00
11,781.00	89.19	148.84	6,449.49	-6,353.18	1,269.76	6,374.67	0.30	-0.23	-0.19
11,875.00	88.88	149.02	6,451.07	-6,433.68	1,318.27	6,467.38	0.38	-0.33	0.19
11,970.00	89.80	149.81	6,452.16	-6,515.46	1,366.60	6,561.20	1.28	0.97	0.83
12,065.00	89.58	149.28	6,452.68	-6,597.35	1,414.75	6,655.06	0.60	-0.23	-0.56
12,160.00	89.05	148.49	6,453.81	-6,678.68	1,463.84	6,748.74	1.00	-0.56	-0.83
12,254.00	90.11	149.28	6,454.50	-6,759.15	1,512.41	6,841.44	1.41	1.13	0.84
12,349.00	90.29	150.25	6,454.17	-6,841.23	1,560.25	6,935.36	1.04	0.19	1.02
12,443.00	90.24	149.98	6,453.74	-6,922.73	1,607.09	7,028.38	0.29	-0.05	-0.29
12,537.00	90.55	150.34	6,453.09	-7,004.26	1,653.86	7,121.40	0.51	0.33	0.38
12,632.00	90.11	149.63	6,452.54	-7,086.52	1,701.38	7,215.38	0.88	-0.46	-0.75
12,726.00	88.66	148.93	6,453.55	-7,167.32	1,749.39	7,308.18	1.71	-1.54	-0.74
12,821.00	89.27	149.55	6,455.27	-7,248.94	1,797.97	7,401.95	0.92	0.64	0.65
12,914.00	88.92	149.81	6,456.73	-7,329.21	1,844.91	7,493.86	0.47	-0.38	0.28
13,009.00	89.71	148.40	6,457.87	-7,410.72	1,893.69	7,587.60	1.70	0.83	-1.48
13,103.00	89.89	147.96	6,458.20	-7,490.59	1,943.25	7,680.10	0.51	0.19	-0.47
13,198.00	89.45	147.52	6,458.75	-7,570.93	1,993.96	7,773.46	0.65	-0.46	-0.46
13,292.00	89.23	147.44	6,459.83	-7,650.18	2,044.49	7,865.75	0.25	-0.23	-0.09
13,387.00	89.10	149.02	6,461.21	-7,730.94	2,094.50	7,959.24	1.67	-0.14	1.66
13,482.00	90.29	149.46	6,461.72	-7,812.57	2,143.08	8,053.02	1.34	1.25	0.46
13,576.00	89.49	150.42	6,461.90	-7,893.93	2,190.17	8,145.99	1.33	-0.85	1.02
13,670.00	88.97	149.98	6,463.16	-7,975.49	2,236.88	8,239.02	0.72	-0.55	-0.47
13,764.00	89.05	151.04	6,464.79	-8,057.30	2,283.14	8,332.11	1.13	0.09	1.13
13,859.00	88.97	150.78	6,466.43	-8,140.30	2,329.32	8,426.29	0.29	-0.08	-0.27
13,954.00	88.88	150.25	6,468.21	-8,222.98	2,376.07	8,520.37	0.57	-0.09	-0.56
14,048.00	89.05	151.04	6,469.91	-8,304.90	2,422.15	8,613.49	0.86	0.18	0.84
14,142.00	89.36	151.57	6,471.21	-8,387.35	2,467.28	8,706.76	0.65	0.33	0.56
14,236.00	89.45	152.45	6,472.19	-8,470.35	2,511.39	8,800.17	0.94	0.10	0.94
14,331.00	89.63	151.92	6,472.95	-8,554.37	2,555.72	8,894.60	0.59	0.19	-0.56
14,425.00	89.89	151.74	6,473.35	-8,637.23	2,600.09	8,987.98	0.34	0.28	-0.19
14,520.00	89.23	149.63	6,474.07	-8,720.06	2,646.60	9,082.11	2.33	-0.69	-2.22
14,614.00	89.10	148.23	6,475.44	-8,800.56	2,695.11	9,174.82	1.50	-0.14	-1.49
14,709.00	88.75	149.02	6,477.23	-8,881.66	2,744.56	9,268.42	0.91	-0.37	-0.83
14,803.00	89.63	149.37	6,478.56	-8,962.38	2,792.69	9,361.20	1.01	0.94	0.37
14,898.00	89.49	148.84	6,479.29	-9,043.90	2,841.47	9,454.94	0.58	0.15	0.56
14,993.00	89.58	150.07	6,480.06	-9,125.71	2,889.75	9,548.78	1.30	0.04	1.29
15,088.00	89.49	149.28	6,480.83	-9,207.71	2,937.71	9,642.67	0.84	-0.09	-0.09
15,182.00	89.10	150.60	6,481.98	-9,289.06	2,984.79	9,735.64	1.46	-0.11	1.40
15,277.00	89.85	150.69	6,482.85	-9,371.86	3,031.36	9,829.76	0.80	0.09	0.09
15,371.00	89.58	149.81	6,483.32	-9,453.47	3,078.00	9,922.81	0.98	-0.29	-0.94
15,466.00	89.63	150.25	6,483.98	-9,535.76	3,125.46	10,016.79	0.47	0.05	0.46
15,561.00	89.23	148.93	6,484.92	-9,617.69	3,173.54	10,110.66	1.45	-0.42	-1.39
15,656.00	88.88	149.19	6,486.49	-9,699.16	3,222.38	10,204.39	0.46	-0.37	0.27

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Company:	Tug Hill Operating LLC	Local Co-ordinate Reference:	Well Goudy 1S-11HM (H)
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Site:	Goudy	MD Reference:	RKB=1242+26 @ 1268.00usft (Nabors B28)
Well:	Goudy 1S-11HM (H)	North Reference:	Grid
Wellbore:	Original Hole	Survey Calculation Method:	Minimum Curvature
Design:	Surveys Original Hole	Database:	DB_Dec2220_v16

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)
15,750.00	89.01	149.90	6,488.22	-9,780.18	3,270.02	10,297.25	0.77	0.14	0.76
15,845.00	89.27	150.51	6,489.65	-9,862.61	3,317.22	10,391.26	0.70	0.27	0.64
15,940.00	89.71	150.16	6,490.49	-9,945.15	3,364.23	10,485.32	0.59	0.46	-0.37
16,034.00	89.36	150.34	6,491.25	-10,026.76	3,410.88	10,578.36	0.42	-0.37	0.19
16,129.00	90.02	150.86	6,491.77	-10,109.52	3,457.51	10,672.48	0.88	0.69	0.55
16,224.00	90.07	150.78	6,491.69	-10,192.47	3,503.83	10,766.65	0.10	0.05	-0.08
16,319.00	89.19	150.42	6,492.31	-10,275.23	3,550.46	10,860.76	1.00	-0.93	-0.38
16,414.00	88.62	150.51	6,494.12	-10,357.87	3,597.28	10,954.83	0.61	-0.60	0.09
16,508.00	89.27	150.42	6,495.85	-10,439.64	3,643.61	11,047.92	0.70	0.69	-0.10
16,603.00	88.79	149.63	6,497.46	-10,521.92	3,691.07	11,141.89	0.97	-0.51	-0.83
16,697.00	89.76	151.13	6,498.65	-10,603.63	3,737.52	11,234.95	1.90	1.03	1.60
16,792.00	89.76	151.83	6,499.05	-10,687.10	3,782.88	11,329.26	0.74	0.00	0.74
16,887.00	89.71	152.45	6,499.49	-10,771.09	3,827.28	11,423.69	0.65	-0.05	0.65
16,981.00	90.37	150.78	6,499.42	-10,853.78	3,871.96	11,517.02	1.91	0.70	-1.78
17,076.00	89.19	148.67	6,499.79	-10,935.82	3,919.85	11,610.93	2.54	-1.24	-2.22
17,170.00	88.57	147.96	6,501.62	-11,015.79	3,969.22	11,703.45	1.00	-0.66	-0.76
17,265.00	89.41	148.67	6,503.30	-11,096.62	4,019.11	11,796.97	1.16	0.88	0.75
17,359.00	89.05	148.75	6,504.56	-11,176.94	4,067.92	11,889.61	0.39	-0.38	0.09
17,453.00	89.19	149.46	6,506.01	-11,257.59	4,116.18	11,982.36	0.77	0.15	0.76
17,547.00	89.80	149.63	6,506.83	-11,338.62	4,163.82	12,075.24	0.67	0.65	0.18
17,641.00	89.41	149.98	6,507.48	-11,419.86	4,211.10	12,168.18	0.56	-0.41	0.37
17,735.00	89.14	150.51	6,508.67	-11,501.46	4,257.75	12,261.22	0.63	-0.29	0.56
17,828.00	89.19	150.25	6,510.03	-11,582.30	4,303.71	12,353.29	0.28	0.05	-0.28
17,923.00	89.27	148.93	6,511.30	-11,664.22	4,351.79	12,447.16	1.39	0.08	-1.39
18,017.00	89.98	149.37	6,511.92	-11,744.92	4,399.99	12,539.93	0.89	0.76	0.47
18,111.00	88.84	149.02	6,512.89	-11,825.65	4,448.13	12,632.71	1.27	-1.21	-0.37
18,206.00	89.71	149.55	6,514.09	-11,907.32	4,496.64	12,726.50	1.07	0.92	0.56
18,300.00	89.76	150.25	6,514.52	-11,988.64	4,543.79	12,819.47	0.75	0.05	0.74
18,395.00	90.29	150.95	6,514.48	-12,071.40	4,590.42	12,913.58	0.92	0.56	0.74
18,490.00	89.63	150.42	6,514.55	-12,154.24	4,636.93	13,007.72	0.89	-0.69	-0.56
18,585.00	90.59	150.60	6,514.37	-12,236.93	4,683.70	13,101.82	1.03	1.01	0.19
18,679.00	90.37	151.04	6,513.58	-12,318.99	4,729.53	13,194.99	0.52	-0.23	0.47
18,773.00	90.46	150.34	6,512.90	-12,400.96	4,775.54	13,288.14	0.75	0.10	-0.74
18,868.00	89.41	150.86	6,513.01	-12,483.72	4,822.18	13,382.25	1.23	-1.11	0.55
18,962.00	88.53	150.69	6,514.70	-12,565.74	4,868.06	13,475.40	0.95	-0.94	0.88
19,057.00	88.88	151.13	6,516.84	-12,648.74	4,914.24	13,569.57	0.59	0.88	0.46
19,151.00	89.63	150.95	6,518.07	-12,730.98	4,959.75	13,662.78	0.82	0.88	0.19
19,245.00	89.05	150.60	6,519.15	-12,813.00	5,005.64	13,755.94	0.72	0.88	-0.37
19,340.00	90.37	151.04	6,519.63	-12,895.95	5,051.96	13,850.10	1.46	1.39	0.88
19,434.00	90.29	150.78	6,519.09	-12,978.09	5,097.66	13,943.30	0.29	-0.88	-0.28
19,526.00	89.76	150.60	6,519.05	-13,058.31	5,142.69	14,034.46	0.61	0.88	-0.20
Survey @ 19526.00 MD 6519.05 TVD									
19,588.00	89.76	150.60	6,519.31	-13,112.32	5,173.13	14,095.89	0.00	0.00	0.00
Survey Proj. to 19588.00 MD 6519.31 TVD									

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Company:	Tug Hill Operating LLC	Local Co-ordinate Reference:	Well Goudy 1S-11HM (H)
Project:	Marshall County, West Virginia.	TVD Reference:	RKB=1242+26 @ 1268.00usft (Nabors B28)
Site:	Goudy	MD Reference:	RKB=1242+26 @ 1268.00usft (Nabors B28)
Well:	Goudy 1S-11HM (H)	North Reference:	Grid
Wellbore:	Original Hole	Survey Calculation Method:	Minimum Curvature
Design:	Surveys Original Hole	Database:	DB_Dec2220_v16

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)
-----------------------	-----------------	-------------	-----------------------	--------------	--------------	-------------------------	-------------------------	------------------------	-----------------------

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
198.00	198.00	0.36	-0.07	MWD surveys
19,526.00	6,519.05	-13,058.31	5,142.69	Survey @ 19526.00 MD 6519.05 TVD

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Company:	Tug Hill Operating LLC	Local Co-ordinate Reference:	Well Goudy 1S-11HM (H)
Project:	Marshall County, West Virginia.	TVD Reference:	RKB=1242+26 @ 1268.00usft (Nabors B28)
Site:	Goudy	MD Reference:	RKB=1242+26 @ 1268.00usft (Nabors B28)
Well:	Goudy 1S-11HM (H)	North Reference:	Grid
Wellbore:	Original Hole	Survey Calculation Method:	Minimum Curvature
Design:	Surveys Original Hole	Database:	DB_Dec2220_v16

Project	Marshall County, West Virginia.		
Map System:	Universal Transverse Mercator (US Survey Feet)	System Datum:	Mean Sea Level
Geo Datum:	NAD83 West Virginia - HARN		
Map Zone:	Zone 17N (84 W to 78 W)		

Site	Goudy			
Site Position:	Northing:	14,430,942.40 usft	Latitude:	39.736807
From:	Lat/Long	Easting:	1,688,559.77 usft	Longitude:
Position Uncertainty:	0.00 usft	Slot Radius:	13-3/16 "	Grid Convergence:
				0.11 °

Well	Goudy 1S-11HM (H)			
Well Position	+N/-S	0.00 usft	Northing:	14,430,995.69 usft
	+E/-W	0.00 usft	Easting:	1,688,570.03 usft
Position Uncertainty	0.00 usft	Wellhead Elevation:	usft	Ground Level:
				1,242.00 usft

Wellbore	Original Hole				
Magnetics	Model Name	Sample Date	Declination	Dip Angle	Field Strength
	IGRF2020	4/16/2021	(°)	(°)	(nT)
			-8.57	66.53	51,752.12310860

Design	Surveys Original Hole			
Audit Notes:				
Version:	1.0	Phase:	ACTUAL	Tie On Depth:
				0.00
Vertical Section:	Depth From (TVD)	+N/-S	+E/-W	Direction
	(usft)	(usft)	(usft)	(°)
	0.00	0.00	0.00	158.41

Survey Program	Date	7/11/2021		
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description
198.00	961.00	MWD surf (Original Hole)	MWD	MWD - Standard
1,036.00	2,549.00	MWD int (Original Hole)	MWD	MWD - Standard
2,692.00	5,139.00	MWD int2 (Original Hole)	MWD	MWD - Standard
5,276.00	19,526.00	MWD (Original Hole)	MWD	MWD - Standard
19,588.00	19,588.00	Projection (Original Hole)	MWD	MWD - Standard

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Survey										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude	
0.00	0.00	0.00	0.00	0.00	0.00	14,430,995.69	1,688,570.03	39.736953	-80.828711	
198.00	0.21	349.21	198.00	0.36	-0.07	14,430,996.04	1,688,569.96	39.736954	-80.828711	
MWD surveys										
228.00	0.18	336.99	228.00	0.45	-0.10	14,430,996.14	1,688,569.93	39.736955	-80.828711	
258.00	0.26	354.57	258.00	0.56	-0.12	14,430,996.25	1,688,569.91	39.736955	-80.828711	
288.00	0.09	24.45	288.00	0.65	-0.12	14,430,996.34	1,688,569.91	39.736955	-80.828711	
319.00	0.18	351.76	319.00	0.72	-0.12	14,430,996.41	1,688,569.91	39.736955	-80.828711	
349.00	0.40	28.23	349.00	0.86	-0.07	14,430,996.55	1,688,569.96	39.736956	-80.828711	

Company:	Tug Hill Operating LLC	Local Co-ordinate Reference:	Well Goudy 1S-11HM (H)
Project:	Marshall County, West Virginia.	TVD Reference:	RKB=1242+26 @ 1268.00usft (Nabors B28)
Site:	Goudy	MD Reference:	RKB=1242+26 @ 1268.00usft (Nabors B28)
Well:	Goudy 1S-11HM (H)	North Reference:	Grid
Wellbore:	Original Hole	Survey Calculation Method:	Minimum Curvature
Design:	Surveys Original Hole	Database:	DB_Dec2220__v16

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
379.00	0.35	45.64	379.00	1.02	0.04	14,430,996.71	1,688,570.07	39.736956	-80.828711
409.00	0.22	42.30	409.00	1.13	0.15	14,430,996.81	1,688,570.18	39.736956	-80.828710
439.00	0.26	51.53	439.00	1.21	0.24	14,430,996.90	1,688,570.27	39.736957	-80.828710
470.00	0.35	16.28	470.00	1.35	0.32	14,430,997.03	1,688,570.35	39.736957	-80.828710
500.00	0.22	18.21	500.00	1.49	0.36	14,430,997.17	1,688,570.39	39.736957	-80.828709
530.00	0.35	59.61	530.00	1.59	0.46	14,430,997.28	1,688,570.49	39.736958	-80.828709
561.00	0.18	75.52	561.00	1.65	0.59	14,430,997.34	1,688,570.62	39.736958	-80.828709
590.00	0.35	82.02	590.00	1.67	0.72	14,430,997.36	1,688,570.75	39.736958	-80.828708
620.00	0.31	73.41	619.99	1.71	0.89	14,430,997.40	1,688,570.92	39.736958	-80.828708
651.00	0.26	105.40	650.99	1.71	1.04	14,430,997.40	1,688,571.07	39.736958	-80.828707
682.00	0.31	119.73	681.99	1.65	1.18	14,430,997.34	1,688,571.21	39.736958	-80.828707
712.00	0.18	145.92	711.99	1.58	1.28	14,430,997.26	1,688,571.31	39.736958	-80.828706
742.00	0.31	134.58	741.99	1.48	1.36	14,430,997.17	1,688,571.39	39.736957	-80.828706
772.00	0.18	105.05	771.99	1.41	1.46	14,430,997.10	1,688,571.49	39.736957	-80.828705
804.00	0.31	115.16	803.99	1.36	1.59	14,430,997.05	1,688,571.62	39.736957	-80.828705
835.00	0.22	168.24	834.99	1.27	1.68	14,430,996.95	1,688,571.71	39.736957	-80.828705
867.00	0.31	148.03	866.99	1.13	1.74	14,430,996.82	1,688,571.77	39.736956	-80.828705
898.00	0.40	175.50	897.99	0.95	1.79	14,430,996.64	1,688,571.82	39.736956	-80.828704
961.00	0.18	248.93	960.99	0.70	1.71	14,430,996.38	1,688,571.74	39.736955	-80.828705
1,036.00	0.53	277.23	1,035.99	0.70	1.26	14,430,996.39	1,688,571.29	39.736955	-80.828706
1,099.00	0.66	266.77	1,098.99	0.72	0.61	14,430,996.40	1,688,570.64	39.736955	-80.828709
1,131.00	1.10	244.80	1,130.98	0.58	0.15	14,430,996.26	1,688,570.18	39.736955	-80.828710
1,162.00	1.41	231.79	1,161.98	0.21	-0.42	14,430,995.90	1,688,569.61	39.736954	-80.828712
1,194.00	1.71	233.37	1,193.96	-0.32	-1.11	14,430,995.37	1,688,568.92	39.736952	-80.828715
1,225.00	2.02	225.28	1,224.95	-0.98	-1.87	14,430,994.71	1,688,568.16	39.736951	-80.828717
1,257.00	2.24	229.77	1,256.92	-1.78	-2.75	14,430,993.91	1,688,567.28	39.736948	-80.828720
1,289.00	2.55	225.46	1,288.90	-2.68	-3.74	14,430,993.01	1,688,566.29	39.736946	-80.828724
1,320.00	2.59	223.70	1,319.87	-3.67	-4.71	14,430,992.02	1,688,565.32	39.736943	-80.828727
1,352.00	2.50	220.54	1,351.83	-4.72	-5.66	14,430,990.96	1,688,564.36	39.736940	-80.828731
1,383.00	2.68	218.17	1,382.80	-5.81	-6.55	14,430,989.88	1,688,563.48	39.736937	-80.828734
1,415.00	2.86	218.69	1,414.77	-7.02	-7.51	14,430,988.67	1,688,562.52	39.736934	-80.828737
1,446.00	2.94	217.46	1,445.73	-8.25	-8.48	14,430,987.43	1,688,561.55	39.736931	-80.828741
1,477.00	2.90	216.67	1,476.69	-9.51	-9.43	14,430,986.17	1,688,560.60	39.736927	-80.828744
1,509.00	3.25	213.42	1,508.64	-10.92	-10.42	14,430,984.77	1,688,559.61	39.736923	-80.828748
1,541.00	3.60	212.45	1,540.58	-12.52	-11.45	14,430,983.16	1,688,558.58	39.736919	-80.828752
1,572.00	3.64	210.95	1,571.52	-14.19	-12.48	14,430,981.50	1,688,557.55	39.736914	-80.828755
1,604.00	3.91	213.15	1,603.45	-15.97	-13.60	14,430,979.71	1,688,556.43	39.736909	-80.828759
1,635.00	4.31	216.23	1,634.37	-17.80	-14.87	14,430,977.89	1,688,555.16	39.736904	-80.828764
1,667.00	4.53	217.02	1,666.28	-19.78	-16.34	14,430,975.91	1,688,553.69	39.736899	-80.828769
1,699.00	4.75	221.95	1,698.17	-21.77	-17.99	14,430,973.91	1,688,552.04	39.736894	-80.828775
1,730.00	5.05	223.53	1,729.06	-23.72	-19.78	14,430,971.97	1,688,550.25	39.736888	-80.828781
1,762.00	5.27	221.95	1,760.93	-25.83	-21.74	14,430,969.86	1,688,548.29	39.736882	-80.828788
1,793.00	5.58	222.56	1,791.79	-28.00	-23.71	14,430,967.69	1,688,546.32	39.736876	-80.828795
1,825.00	5.71	221.95	1,823.63	-30.33	-25.82	14,430,965.36	1,688,544.21	39.736870	-80.828803
1,856.00	6.02	230.82	1,854.47	-32.50	-28.11	14,430,963.18	1,688,541.91	39.736864	-80.828811
1,888.00	5.93	227.13	1,886.30	-34.69	-30.63	14,430,961.00	1,688,539.40	39.736858	-80.828820
1,920.00	5.49	223.18	1,918.14	-36.93	-32.89	14,430,958.76	1,688,537.14	39.736852	-80.828828
1,951.00	6.59	215.79	1,948.97	-39.45	-34.94	14,430,956.23	1,688,535.09	39.736846	-80.828835
1,983.00	7.29	214.04	1,980.73	-42.62	-37.15	14,430,953.06	1,688,532.88	39.736840	-80.828843
2,014.00	7.47	215.53	2,011.48	-45.89	-39.42	14,430,949.79	1,688,530.61	39.736834	-80.828851
2,045.00	7.56	216.23	2,042.21	-49.18	-41.80	14,430,946.51	1,688,528.23	39.736828	-80.828860
2,077.00	7.25	217.46	2,073.94	-52.48	-44.27	14,430,943.21	1,688,525.76	39.736822	-80.828869
2,108.00	7.25	221.59	2,104.70	-55.50	-46.76	14,430,940.19	1,688,523.27	39.736816	-80.828877
2,140.00	7.38	222.12	2,136.43	-58.53	-49.48	14,430,937.16	1,688,520.55	39.736793	-80.828887
2,171.00	7.25	227.89	2,167.18	-61.32	-52.27	14,430,934.37	1,688,517.76	39.736785	-80.828897

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Wellbore:	Original Hole	Survey Calculation Method:	Minimum Curvature
Design:	Surveys Original Hole	Database:	DB_Dec2220_v16

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
2,203.00	7.51	232.76	2,198.92	-63.94	-55.43	14,430,931.75	1,688,514.60	39.736778	-80.828908
2,234.00	7.87	232.58	2,229.64	-66.45	-58.73	14,430,929.23	1,688,511.30	39.736771	-80.828920
2,266.00	7.60	231.44	2,261.35	-69.10	-62.12	14,430,926.58	1,688,507.91	39.736764	-80.828932
2,298.00	6.33	228.89	2,293.11	-71.58	-65.11	14,430,924.10	1,688,504.92	39.736757	-80.828943
2,329.00	6.02	235.22	2,323.93	-73.63	-67.73	14,430,922.05	1,688,502.30	39.736751	-80.828952
2,361.00	4.79	222.91	2,355.79	-75.57	-70.02	14,430,920.12	1,688,500.01	39.736746	-80.828960
2,392.00	4.61	218.61	2,386.69	-77.49	-71.67	14,430,918.19	1,688,498.35	39.736741	-80.828966
2,424.00	4.04	212.19	2,418.59	-79.45	-73.08	14,430,916.24	1,688,496.95	39.736735	-80.828971
2,455.00	3.82	209.82	2,449.52	-81.27	-74.17	14,430,914.42	1,688,495.86	39.736730	-80.828975
2,486.00	4.04	213.68	2,480.45	-83.08	-75.29	14,430,912.61	1,688,494.74	39.736726	-80.828979
2,518.00	4.35	219.75	2,512.36	-84.95	-76.69	14,430,910.74	1,688,493.34	39.736720	-80.828984
2,549.00	4.83	223.26	2,543.26	-86.80	-78.34	14,430,908.89	1,688,491.69	39.736715	-80.828990
2,692.00	5.76	223.79	2,685.65	-96.37	-87.43	14,430,899.32	1,688,482.60	39.736689	-80.829022
2,770.00	7.47	222.47	2,763.13	-102.93	-93.56	14,430,892.75	1,688,476.47	39.736671	-80.829044
2,865.00	11.69	224.32	2,856.78	-114.38	-104.46	14,430,881.31	1,688,465.57	39.736640	-80.829083
2,960.00	12.96	217.20	2,949.60	-129.75	-117.63	14,430,865.94	1,688,452.40	39.736598	-80.829130
3,054.00	12.88	215.44	3,041.22	-146.68	-130.08	14,430,849.00	1,688,439.95	39.736551	-80.829174
3,148.00	15.51	211.13	3,132.34	-165.98	-142.65	14,430,829.71	1,688,427.38	39.736498	-80.829219
3,243.00	18.81	204.46	3,223.11	-190.80	-155.56	14,430,804.88	1,688,414.47	39.736430	-80.829265
3,337.00	22.54	202.79	3,311.04	-221.22	-168.82	14,430,774.47	1,688,401.21	39.736347	-80.829313
3,431.00	25.44	202.26	3,396.91	-256.52	-183.45	14,430,739.17	1,688,386.58	39.736250	-80.829365
3,526.00	27.38	200.24	3,482.00	-295.90	-198.74	14,430,699.78	1,688,371.29	39.736142	-80.829420
3,621.00	30.23	200.24	3,565.23	-338.85	-214.57	14,430,656.84	1,688,355.45	39.736024	-80.829476
3,715.00	32.71	200.50	3,645.40	-384.85	-231.66	14,430,610.84	1,688,338.37	39.735898	-80.829537
3,810.00	33.13	201.91	3,725.15	-432.98	-250.34	14,430,562.71	1,688,319.69	39.735765	-80.829604
3,904.00	33.75	201.82	3,803.59	-481.05	-269.63	14,430,514.64	1,688,300.40	39.735634	-80.829673
3,999.00	36.31	204.46	3,881.38	-531.16	-291.09	14,430,464.52	1,688,278.94	39.735496	-80.829750
4,094.00	37.57	206.30	3,957.31	-582.73	-315.57	14,430,412.95	1,688,254.46	39.735355	-80.829837
4,188.00	37.35	204.81	4,031.92	-634.31	-340.23	14,430,361.38	1,688,229.80	39.735213	-80.829925
4,283.00	36.34	203.14	4,107.95	-686.35	-363.38	14,430,309.34	1,688,206.65	39.735070	-80.830008
4,377.00	35.51	202.17	4,184.07	-737.24	-384.63	14,430,258.44	1,688,185.40	39.734931	-80.830084
4,472.00	37.57	204.98	4,260.40	-789.06	-407.28	14,430,206.63	1,688,162.75	39.734788	-80.830165
4,567.00	36.61	204.89	4,336.18	-841.01	-431.43	14,430,154.68	1,688,138.60	39.734646	-80.830251
4,662.00	35.99	204.10	4,412.74	-892.18	-454.75	14,430,103.50	1,688,115.28	39.734505	-80.830334
4,757.00	35.51	203.84	4,489.84	-942.90	-477.30	14,430,052.79	1,688,092.73	39.734366	-80.830415
4,855.00	36.43	205.07	4,569.15	-995.29	-501.13	14,430,000.39	1,688,068.89	39.734223	-80.830500
4,950.00	37.88	205.51	4,644.87	-1,047.17	-525.65	14,429,948.52	1,688,044.38	39.734080	-80.830588
5,044.00	39.20	203.40	4,718.39	-1,100.48	-549.88	14,429,895.21	1,688,020.15	39.733934	-80.830674
5,139.00	39.11	201.73	4,792.06	-1,155.87	-572.89	14,429,839.82	1,687,997.14	39.733782	-80.830756
5,276.00	36.40	197.36	4,900.39	-1,234.83	-601.03	14,429,760.85	1,687,969.00	39.733635	-80.830857
5,371.00	37.01	198.32	4,976.55	-1,288.88	-618.43	14,429,706.80	1,687,951.60	39.733417	-80.830919
5,466.00	36.97	200.87	5,052.44	-1,342.72	-637.59	14,429,652.97	1,687,932.43	39.733268	-80.830988
5,561.00	36.97	204.48	5,128.35	-1,395.42	-659.61	14,429,600.27	1,687,910.42	39.733120	-80.831066
5,655.00	35.69	206.23	5,204.07	-1,445.74	-683.44	14,429,549.94	1,687,886.59	39.732986	-80.831151
5,750.00	36.62	204.74	5,280.78	-1,496.33	-707.55	14,429,499.35	1,687,862.48	39.732848	-80.831238
5,844.00	36.66	203.95	5,356.21	-1,547.44	-730.68	14,429,448.24	1,687,839.35	39.732707	-80.831320
5,939.00	36.09	203.77	5,432.70	-1,598.97	-753.47	14,429,396.72	1,687,816.56	39.732566	-80.831402
6,034.00	35.91	204.21	5,509.55	-1,649.99	-776.17	14,429,345.70	1,687,793.86	39.732426	-80.831483
6,128.00	36.31	204.65	5,585.49	-1,700.42	-799.08	14,429,295.26	1,687,770.95	39.732288	-80.831565
6,222.00	36.84	203.69	5,660.98	-1,751.52	-822.01	14,429,244.16	1,687,748.02	39.732147	-80.831646
6,316.00	36.88	205.09	5,736.19	-1,802.88	-845.30	14,429,192.81	1,687,724.73	39.732006	-80.831730
6,410.00	37.10	207.55	5,811.28	-1,853.56	-870.37	14,429,142.13	1,687,699.66	39.731867	-80.831819
6,505.00	37.10	205.18	5,887.06	-1,904.90	-895.81	14,429,090.79	1,687,674.21	39.731726	-80.831910
6,600.00	37.32	203.33	5,962.72	-1,957.27	-919.41	14,429,038.42	1,687,650.62	39.731583	-80.831994
6,694.00	38.37	201.84	6,036.95	-2,010.52	-941.55	14,428,985.17	1,687,628.48	39.731437	-80.832073

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Company:	Tug Hill Operating LLC	Local Co-ordinate Reference:	Well Goudy 1S-11HM (H)
Project:	Marshall County, West Virginia.	TVD Reference:	RKB=1242+26 @ 1268.00usft (Nabors B28)
Site:	Goudy	MD Reference:	RKB=1242+26 @ 1268.00usft (Nabors B28)
Well:	Goudy 1S-11HM (H)	North Reference:	Grid
Wellbore:	Original Hole	Survey Calculation Method:	Minimum Curvature
Design:	Surveys Original Hole	Database:	DB_Dec2220_v16

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N-S (usft)	+E-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
6,741.00	38.24	201.31	6,073.83	-2,037.61	-952.26	14,428,958.08	1,687,617.77	39.731362	-80.832112
6,788.00	38.24	196.83	6,110.75	-2,065.09	-961.76	14,428,930.60	1,687,608.27	39.731287	-80.832146
6,835.00	39.12	191.38	6,147.45	-2,093.56	-968.90	14,428,902.13	1,687,601.13	39.731209	-80.832171
6,881.00	40.48	188.48	6,182.80	-2,122.55	-973.97	14,428,873.13	1,687,596.06	39.731129	-80.832189
6,928.00	43.16	185.76	6,217.82	-2,153.64	-977.83	14,428,842.04	1,687,592.20	39.731044	-80.832203
6,975.00	46.15	183.73	6,251.25	-2,186.56	-980.55	14,428,809.13	1,687,589.48	39.730953	-80.832213
7,022.00	51.78	184.00	6,282.10	-2,221.92	-982.94	14,428,773.77	1,687,587.09	39.730856	-80.832222
7,070.00	57.71	184.09	6,309.79	-2,261.00	-985.70	14,428,734.69	1,687,584.32	39.730749	-80.832232
7,117.00	63.43	180.04	6,332.88	-2,301.88	-987.14	14,428,693.81	1,687,582.89	39.730637	-80.832237
7,164.00	67.82	175.56	6,352.28	-2,344.63	-985.47	14,428,651.06	1,687,584.56	39.730519	-80.832232
7,211.00	72.18	169.76	6,368.37	-2,388.40	-979.80	14,428,607.29	1,687,590.23	39.730399	-80.832212
7,258.00	76.09	164.57	6,381.22	-2,432.45	-969.74	14,428,563.24	1,687,600.29	39.730278	-80.832176
7,305.00	78.55	161.50	6,391.54	-2,476.29	-956.36	14,428,519.39	1,687,613.67	39.730158	-80.832129
7,352.00	80.40	158.42	6,400.13	-2,519.70	-940.52	14,428,475.99	1,687,629.51	39.730038	-80.832073
7,399.00	81.93	154.91	6,407.35	-2,562.33	-922.13	14,428,433.36	1,687,647.90	39.729921	-80.832008
7,447.00	83.52	153.15	6,413.43	-2,605.13	-901.28	14,428,390.55	1,687,668.75	39.729803	-80.831934
7,494.00	84.26	152.27	6,418.43	-2,646.66	-879.85	14,428,349.02	1,687,690.18	39.729689	-80.831858
7,541.00	85.23	151.57	6,422.73	-2,687.96	-857.82	14,428,307.73	1,687,712.21	39.729576	-80.831780
7,588.00	86.95	149.02	6,425.94	-2,728.68	-834.59	14,428,267.01	1,687,735.44	39.729464	-80.831698
7,636.00	88.04	148.84	6,428.04	-2,769.75	-809.84	14,428,225.93	1,687,760.19	39.729351	-80.831610
7,730.00	91.34	149.11	6,428.54	-2,850.29	-761.40	14,428,145.39	1,687,808.63	39.729129	-80.831438
7,825.00	90.07	147.88	6,427.38	-2,931.28	-711.76	14,428,064.41	1,687,858.27	39.728907	-80.831262
7,919.00	90.20	147.44	6,427.15	-3,010.70	-661.47	14,427,984.99	1,687,908.55	39.728688	-80.831084
8,014.00	90.29	147.52	6,426.75	-3,090.80	-610.40	14,427,904.88	1,687,959.63	39.728468	-80.830903
8,107.00	90.55	146.82	6,426.07	-3,168.95	-559.99	14,427,826.74	1,688,010.04	39.728253	-80.830724
8,200.00	89.27	148.67	6,426.21	-3,247.59	-510.36	14,427,748.10	1,688,059.67	39.728037	-80.830548
8,294.00	88.75	149.11	6,427.84	-3,328.06	-461.80	14,427,667.63	1,688,108.23	39.727816	-80.830376
8,388.00	88.70	148.40	6,429.93	-3,408.40	-413.05	14,427,587.28	1,688,156.98	39.727595	-80.830203
8,482.00	89.05	150.78	6,431.77	-3,489.45	-365.48	14,427,506.24	1,688,204.55	39.727372	-80.830034
8,577.00	90.64	151.22	6,432.03	-3,572.54	-319.43	14,427,423.15	1,688,250.60	39.727144	-80.829871
8,669.00	91.12	151.57	6,430.62	-3,653.30	-275.39	14,427,342.39	1,688,294.64	39.726922	-80.829715
8,764.00	89.98	152.36	6,429.71	-3,737.14	-230.74	14,427,258.54	1,688,339.29	39.726691	-80.829557
8,858.00	90.68	152.97	6,429.16	-3,820.64	-187.57	14,427,175.04	1,688,382.45	39.726462	-80.829404
8,952.00	91.16	150.95	6,427.66	-3,903.60	-143.39	14,427,092.09	1,688,426.64	39.726234	-80.829247
9,046.00	89.36	149.55	6,427.23	-3,985.20	-96.75	14,427,010.49	1,688,473.28	39.726009	-80.829082
9,141.00	88.79	146.82	6,428.76	-4,065.91	-46.68	14,426,929.78	1,688,523.35	39.725787	-80.828904
9,235.00	88.09	148.14	6,431.32	-4,145.14	3.83	14,426,850.55	1,688,573.86	39.725569	-80.828725
9,330.00	88.09	148.31	6,434.49	-4,225.85	53.83	14,426,769.83	1,688,623.86	39.725347	-80.828548
9,423.00	88.22	148.75	6,437.48	-4,305.13	102.35	14,426,690.55	1,688,672.38	39.725129	-80.828376
9,516.00	89.01	149.55	6,439.73	-4,384.95	150.03	14,426,610.73	1,688,720.06	39.724910	-80.828207
9,610.00	89.05	149.02	6,441.32	-4,465.75	198.03	14,426,529.93	1,688,768.06	39.724688	-80.828037
9,704.00	89.76	150.25	6,442.30	-4,546.85	245.55	14,426,448.83	1,688,815.58	39.724465	-80.827868
9,799.00	90.51	149.81	6,442.07	-4,629.15	293.00	14,426,366.54	1,688,863.03	39.724239	-80.827700
9,894.00	89.41	150.16	6,442.14	-4,711.41	340.52	14,426,284.28	1,688,910.55	39.724012	-80.827532
9,988.00	89.98	150.07	6,442.64	-4,792.91	387.36	14,426,202.78	1,688,957.39	39.723788	-80.827366
10,083.00	90.11	149.81	6,442.57	-4,875.13	434.95	14,426,120.56	1,689,004.98	39.723562	-80.827197
10,177.00	89.01	150.07	6,443.29	-4,956.48	482.03	14,426,039.20	1,689,052.06	39.723338	-80.827030
10,272.00	89.01	149.98	6,444.93	-5,038.76	529.49	14,425,956.92	1,689,099.52	39.723114	-80.826862
10,366.00	88.88	150.07	6,446.66	-5,120.18	576.44	14,425,875.51	1,689,146.47	39.722889	-80.826695
10,460.00	89.01	150.25	6,448.39	-5,201.70	623.21	14,425,793.99	1,689,193.24	39.722665	-80.826527
10,555.00	89.63	152.01	6,449.52	-5,284.88	669.07	14,425,710.80	1,689,239.10	39.722436	-80.826367
10,649.00	89.41	151.48	6,450.31	-5,367.68	713.57	14,425,628.01	1,689,283.60	39.722208	-80.826209
10,743.00	91.87	153.15	6,449.26	-5,450.90	757.23	14,425,544.78	1,689,327.26	39.721979	-80.826055
10,837.00	90.68	152.36	6,447.16	-5,534.45	800.26	14,425,461.23	1,689,370.28	39.721750	-80.825902
10,931.00	89.58	151.65	6,446.95	-5,617.45	844.38	14,425,378.24	1,689,414.41	39.721522	-80.825746

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Company:	Tug Hill Operating LLC	Local Co-ordinate Reference:	Well Goudy 1S-11HM (H)
Project:	Marshall County, West Virginia.	TVD Reference:	RKB=1242+26 @ 1268.00usft (Nabors B28)
Site:	Goudy	MD Reference:	RKB=1242+26 @ 1268.00usft (Nabors B28)
Well:	Goudy 1S-11HM (H)	North Reference:	Grid
Wellbore:	Original Hole	Survey Calculation Method:	Minimum Curvature
Design:	Surveys Original Hole	Database:	DB_Dec2220_v16

Survey										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude	
11,025.00	89.67	152.36	6,447.57	-5,700.45	888.50	14,425,295.24	1,689,458.53	39.721293	-80.825590	
11,119.00	90.15	150.34	6,447.71	-5,782.94	933.57	14,425,212.75	1,689,503.60	39.721067	-80.825430	
11,214.00	89.98	149.81	6,447.61	-5,865.27	980.96	14,425,130.42	1,689,550.99	39.720840	-80.825262	
11,308.00	89.80	149.37	6,447.79	-5,946.34	1,028.54	14,425,049.35	1,689,598.57	39.720617	-80.825093	
11,403.00	89.76	149.90	6,448.15	-6,028.30	1,076.56	14,424,967.38	1,689,646.59	39.720392	-80.824923	
11,498.00	90.02	149.63	6,448.33	-6,110.38	1,124.40	14,424,885.30	1,689,694.43	39.720166	-80.824754	
11,592.00	90.29	149.02	6,448.08	-6,191.23	1,172.35	14,424,804.46	1,689,742.38	39.719944	-80.824584	
11,686.00	89.41	149.02	6,448.33	-6,271.82	1,220.74	14,424,723.87	1,689,790.77	39.719722	-80.824412	
11,781.00	89.19	148.84	6,449.49	-6,353.18	1,269.76	14,424,642.50	1,689,839.79	39.719499	-80.824238	
11,875.00	88.88	149.02	6,451.07	-6,433.68	1,318.27	14,424,562.00	1,689,888.30	39.719277	-80.824066	
11,970.00	89.80	149.81	6,452.16	-6,515.46	1,366.60	14,424,480.22	1,689,936.63	39.719053	-80.823895	
12,065.00	89.58	149.28	6,452.68	-6,597.35	1,414.75	14,424,398.33	1,689,984.78	39.718827	-80.823724	
12,160.00	89.05	148.49	6,453.81	-6,678.68	1,463.84	14,424,317.01	1,690,033.87	39.718604	-80.823550	
12,254.00	90.11	149.28	6,454.50	-6,759.15	1,512.41	14,424,236.54	1,690,082.44	39.718382	-80.823378	
12,349.00	90.29	150.25	6,454.17	-6,841.23	1,560.25	14,424,154.46	1,690,130.28	39.718157	-80.823209	
12,443.00	90.24	149.98	6,453.74	-6,922.73	1,607.09	14,424,072.96	1,690,177.11	39.717933	-80.823043	
12,537.00	90.55	150.34	6,453.09	-7,004.26	1,653.86	14,423,991.43	1,690,223.89	39.717709	-80.822877	
12,632.00	90.11	149.63	6,452.54	-7,086.52	1,701.38	14,423,909.17	1,690,271.41	39.717482	-80.822708	
12,726.00	88.66	148.93	6,453.55	-7,167.32	1,749.39	14,423,828.37	1,690,319.42	39.717260	-80.822538	
12,821.00	89.27	149.55	6,455.27	-7,248.94	1,797.97	14,423,746.74	1,690,368.00	39.717036	-80.822366	
12,914.00	88.92	149.81	6,456.73	-7,329.21	1,844.91	14,423,666.48	1,690,414.94	39.716815	-80.822200	
13,009.00	89.71	148.40	6,457.87	-7,410.72	1,893.69	14,423,584.96	1,690,463.72	39.716591	-80.822027	
13,103.00	89.89	147.96	6,458.20	-7,490.59	1,943.25	14,423,503.09	1,690,513.28	39.716371	-80.821851	
13,198.00	89.45	147.52	6,458.75	-7,570.93	1,993.96	14,423,424.76	1,690,563.98	39.716150	-80.821671	
13,292.00	89.23	147.44	6,459.83	-7,650.18	2,044.49	14,423,345.50	1,690,614.51	39.715933	-80.821492	
13,387.00	89.10	149.02	6,461.21	-7,730.94	2,094.50	14,423,264.75	1,690,664.53	39.715710	-80.821315	
13,482.00	90.29	149.46	6,461.72	-7,812.57	2,143.08	14,423,183.11	1,690,713.11	39.715486	-80.821143	
13,576.00	89.49	150.42	6,461.90	-7,893.93	2,190.17	14,423,101.76	1,690,760.20	39.715262	-80.820976	
13,670.00	88.97	149.98	6,463.16	-7,975.49	2,236.88	14,423,020.20	1,690,806.91	39.715038	-80.820810	
13,764.00	89.05	151.04	6,464.79	-8,057.30	2,283.14	14,422,938.39	1,690,853.17	39.714813	-80.820647	
13,859.00	88.97	150.78	6,466.43	-8,140.30	2,329.32	14,422,855.39	1,690,899.35	39.714585	-80.820483	
13,954.00	88.88	150.25	6,468.21	-8,222.98	2,376.07	14,422,772.70	1,690,946.10	39.714358	-80.820317	
14,048.00	89.05	151.04	6,469.91	-8,304.90	2,422.15	14,422,690.79	1,690,992.18	39.714132	-80.820154	
14,142.00	89.36	151.57	6,471.21	-8,387.35	2,467.28	14,422,608.34	1,691,037.31	39.713906	-80.819994	
14,236.00	89.45	152.45	6,472.19	-8,470.35	2,511.39	14,422,525.34	1,691,081.42	39.713678	-80.819838	
14,331.00	89.63	151.92	6,472.95	-8,554.37	2,555.72	14,422,441.32	1,691,125.75	39.713447	-80.819681	
14,425.00	89.89	151.74	6,473.35	-8,637.23	2,600.09	14,422,358.46	1,691,170.12	39.713219	-80.819524	
14,520.00	89.23	149.63	6,474.07	-8,720.06	2,646.60	14,422,275.63	1,691,216.63	39.712991	-80.819359	
14,614.00	89.10	148.23	6,475.44	-8,800.56	2,695.11	14,422,195.12	1,691,265.14	39.712770	-80.819187	
14,709.00	88.75	149.02	6,477.23	-8,881.66	2,744.56	14,422,114.03	1,691,314.59	39.712547	-80.819012	
14,803.00	89.63	149.37	6,478.56	-8,962.38	2,792.69	14,422,033.30	1,691,362.72	39.712325	-80.818841	
14,898.00	89.49	148.84	6,479.29	-9,043.90	2,841.47	14,421,951.78	1,691,411.50	39.712101	-80.818668	
14,993.00	89.58	150.07	6,480.06	-9,125.71	2,889.75	14,421,869.97	1,691,459.78	39.711876	-80.818497	
15,088.00	89.49	149.28	6,480.83	-9,207.71	2,937.71	14,421,787.97	1,691,507.74	39.711651	-80.818327	
15,182.00	89.10	150.60	6,481.98	-9,289.06	2,984.79	14,421,706.62	1,691,554.82	39.711426	-80.818160	
15,277.00	89.85	150.69	6,482.85	-9,371.86	3,031.36	14,421,623.83	1,691,601.39	39.711199	-80.817995	
15,371.00	89.58	149.81	6,483.32	-9,453.47	3,078.00	14,421,542.22	1,691,648.03	39.710974	-80.817830	
15,466.00	89.63	150.25	6,483.98	-9,535.76	3,125.46	14,421,459.92	1,691,695.49	39.710748	-80.817662	
15,561.00	89.23	148.93	6,484.92	-9,617.69	3,173.54	14,421,378.00	1,691,743.57	39.710523	-80.817492	
15,656.00	88.88	149.19	6,486.49	-9,699.16	3,222.38	14,421,296.53	1,691,792.41	39.710298	-80.817318	
15,750.00	89.01	149.90	6,488.22	-9,780.18	3,270.02	14,421,215.51	1,691,840.05	39.710073	-80.817150	
15,845.00	89.27	150.51	6,489.65	-9,862.61	3,317.22	14,421,133.08	1,691,887.25	39.709849	-80.816982	
15,940.00	89.71	150.16	6,490.49	-9,945.15	3,364.23	14,421,050.53	1,691,934.26	39.709623	-80.816816	
16,034.00	89.36	150.34	6,491.25	-10,026.76	3,410.88	14,420,968.93	1,691,980.90	39.709398	-80.816651	
16,129.00	90.02	150.86	6,491.77	-10,109.52	3,457.51	14,420,886.16	1,692,027.54	39.709171	-80.816485	

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Company:	Tug Hill Operating LLC	Local Co-ordinate Reference:	Well Goudy 1S-11HM (H)
Project:	Marshall County, West Virginia.	TVD Reference:	RKB=1242+26 @ 1268.00usft (Nabors B28)
Site:	Goudy	MD Reference:	RKB=1242+26 @ 1268.00usft (Nabors B28)
Well:	Goudy 1S-11HM (H)	North Reference:	Grid
Wellbore:	Original Hole	Survey Calculation Method:	Minimum Curvature
Design:	Surveys Original Hole	Database:	DB_Dec2220_v16

Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
16,224.00	90.07	150.78	6,491.69	-10,192.47	3,503.83	14,420,803.22	1,692,073.86	39.708943	-80.816321
16,319.00	89.19	150.42	6,492.31	-10,275.23	3,550.46	14,420,720.46	1,692,120.49	39.708715	-80.816156
16,414.00	88.62	150.51	6,494.12	-10,357.87	3,597.28	14,420,637.82	1,692,167.31	39.708488	-80.815990
16,508.00	89.27	150.42	6,495.85	-10,439.64	3,643.61	14,420,556.05	1,692,213.64	39.708263	-80.815826
16,603.00	88.79	149.63	6,497.46	-10,521.92	3,691.07	14,420,473.77	1,692,261.10	39.708037	-80.815658
16,697.00	89.76	151.13	6,498.65	-10,603.63	3,737.52	14,420,392.06	1,692,307.55	39.707812	-80.815493
16,792.00	89.76	151.83	6,499.05	-10,687.10	3,782.88	14,420,308.59	1,692,352.91	39.707583	-80.815333
16,887.00	89.71	152.45	6,499.49	-10,771.09	3,827.28	14,420,224.60	1,692,397.31	39.707352	-80.815175
16,981.00	90.37	150.78	6,499.42	-10,853.78	3,871.96	14,420,141.91	1,692,441.99	39.707124	-80.815017
17,076.00	89.19	148.67	6,499.79	-10,935.82	3,919.85	14,420,059.87	1,692,489.88	39.706899	-80.814848
17,170.00	88.57	147.96	6,501.62	-11,015.79	3,969.22	14,419,979.90	1,692,539.24	39.706679	-80.814673
17,265.00	89.41	148.67	6,503.30	-11,096.62	4,019.11	14,419,899.07	1,692,589.13	39.706457	-80.814496
17,359.00	89.05	148.75	6,504.56	-11,176.94	4,067.92	14,419,818.75	1,692,637.95	39.706236	-80.814323
17,453.00	89.19	149.46	6,506.01	-11,257.59	4,116.18	14,419,738.10	1,692,686.21	39.706014	-80.814152
17,547.00	89.80	149.63	6,506.83	-11,338.62	4,163.82	14,419,657.07	1,692,733.85	39.705791	-80.813983
17,641.00	89.41	149.98	6,507.48	-11,419.86	4,211.10	14,419,575.83	1,692,781.13	39.705568	-80.813816
17,735.00	89.14	150.51	6,508.67	-11,501.46	4,257.75	14,419,494.23	1,692,827.78	39.705343	-80.813650
17,828.00	89.19	150.25	6,510.03	-11,582.30	4,303.71	14,419,413.39	1,692,873.74	39.705121	-80.813487
17,923.00	89.27	148.93	6,511.30	-11,664.22	4,351.79	14,419,331.47	1,692,921.82	39.704896	-80.813317
18,017.00	89.98	149.37	6,511.92	-11,744.92	4,399.99	14,419,250.77	1,692,970.02	39.704674	-80.813146
18,111.00	88.84	149.02	6,512.89	-11,825.65	4,448.13	14,419,170.04	1,693,018.16	39.704452	-80.812976
18,206.00	89.71	149.55	6,514.09	-11,907.32	4,496.64	14,419,088.37	1,693,066.67	39.704227	-80.812804
18,300.00	89.76	150.25	6,514.52	-11,988.64	4,543.79	14,419,007.05	1,693,113.81	39.704004	-80.812637
18,395.00	90.29	150.95	6,514.48	-12,071.40	4,590.42	14,418,924.28	1,693,160.45	39.703776	-80.812472
18,490.00	89.63	150.42	6,514.55	-12,154.24	4,636.93	14,418,841.45	1,693,206.96	39.703548	-80.812307
18,585.00	90.59	150.60	6,514.37	-12,236.93	4,683.70	14,418,758.76	1,693,253.73	39.703321	-80.812141
18,679.00	90.37	151.04	6,513.58	-12,318.99	4,729.53	14,418,676.69	1,693,299.56	39.703095	-80.811979
18,773.00	90.46	150.34	6,512.90	-12,400.96	4,775.54	14,418,594.73	1,693,345.57	39.702870	-80.811816
18,868.00	89.41	150.86	6,513.01	-12,483.72	4,822.18	14,418,511.96	1,693,392.21	39.702642	-80.811651
18,962.00	88.53	150.69	6,514.70	-12,565.74	4,868.06	14,418,429.94	1,693,438.09	39.702417	-80.811488
19,057.00	88.88	151.13	6,516.84	-12,648.74	4,914.24	14,418,346.95	1,693,484.27	39.702189	-80.811325
19,151.00	89.63	150.95	6,518.07	-12,730.98	4,959.75	14,418,264.71	1,693,529.78	39.701963	-80.811163
19,245.00	89.05	150.60	6,519.15	-12,813.00	5,005.64	14,418,182.68	1,693,575.67	39.701737	-80.811001
19,340.00	90.37	151.04	6,519.63	-12,895.95	5,051.96	14,418,099.74	1,693,621.99	39.701509	-80.810837
19,434.00	90.29	150.78	6,519.09	-12,978.09	5,097.66	14,418,017.60	1,693,667.69	39.701283	-80.810675
19,526.00	89.76	150.60	6,519.05	-13,058.31	5,142.69	14,417,937.38	1,693,712.72	39.701063	-80.810516
Survey @ 19526.00 MD 6519.05 TVD									
19,588.00	89.76	150.60	6,519.31	-13,112.32	5,173.13	14,417,883.36	1,693,743.16	39.700914	-80.810408
Survey Proj. to 19588.00 MD 6519.31 TVD									

Design Annotations				
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
198.00	198.00	0.36	-0.07	MWD surveys
19,526.00	6,519.05	-13,058.31	5,142.69	Survey @ 19526.00 MD 6519.05 TVD
19,588.00	6,519.31	-13,112.32	5,173.13	Survey Proj. to 19588.00 MD 6519.31 TVD

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