

WELL NAME:	Pendleton S-1HM		
STATE:	WV	COUNTY:	Marshall
DISTRICT:	Franklin		
DF Elev:	1,272'	GL Elev:	1,272'
TD:	16,441'		
TH Latitude:	39.753526		
TH Longitude:	-80.734111		
BH Latitude:	39.73432		
BH Longitude:	-80.715102		

FORMATION TOPS	
Formation	Depth TVD
Deepest Fresh Water	914
Sewickley Coal	816
Pittsburgh Coal	908
Big Lime	2177
Weir	2478
Berea	2663
Gordon	2925
Rhinestreet	6020
Genesee/Burkett	6528
Tully	6559
Hamilton	6595
Marcellus	6659
Landing Depth	6692
Onondaga	6709
Pilot Hole TD	6809

CASING SUMMARY							
Type	Hole Size (in)	Csg Size (in)	Depth (MD)	Depth (TVD)	Weight (lb/ft)	Grade	Top of Cement
Conductor	36	30	120'	120'	8W	BW	Surface
Surface	17 1/2	13 3/8	1,040'	1,040'	54.5	J55	Surface
Intermediate 1	12 1/4	9 5/8	2,841'	2,800'	36	J55	Surface
Production	8 7/8 x 8 3/4	5 1/2	16,441'	6,852'	20	CYHP110	Surface

CEMENT SUMMARY				DRILLING DETAILS	
Type	Sacks	Class	Density (ppg)	Fluid Type	Centralizer Notes
Conductor	338	A	15.6	Air	None
Surface	1,082	A	15.6	Air	3 Centralizers at equal distance
Intermediate 1	817	A	15	Air	1 Centralizer every other joint
Production	3,639	A	14.5	Air / SOBMM	1 every other joint in lateral; 1 per joint in curve; 1 every other joint to surface

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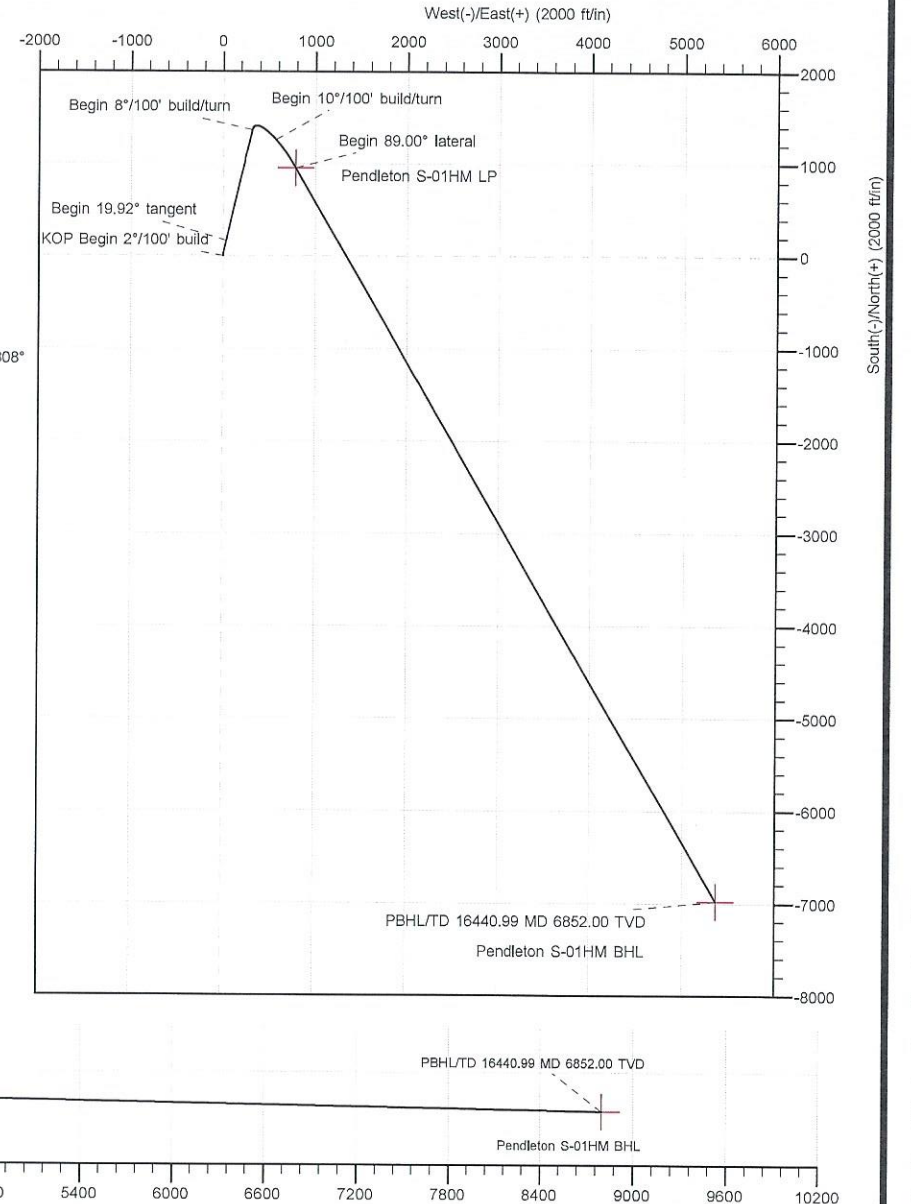
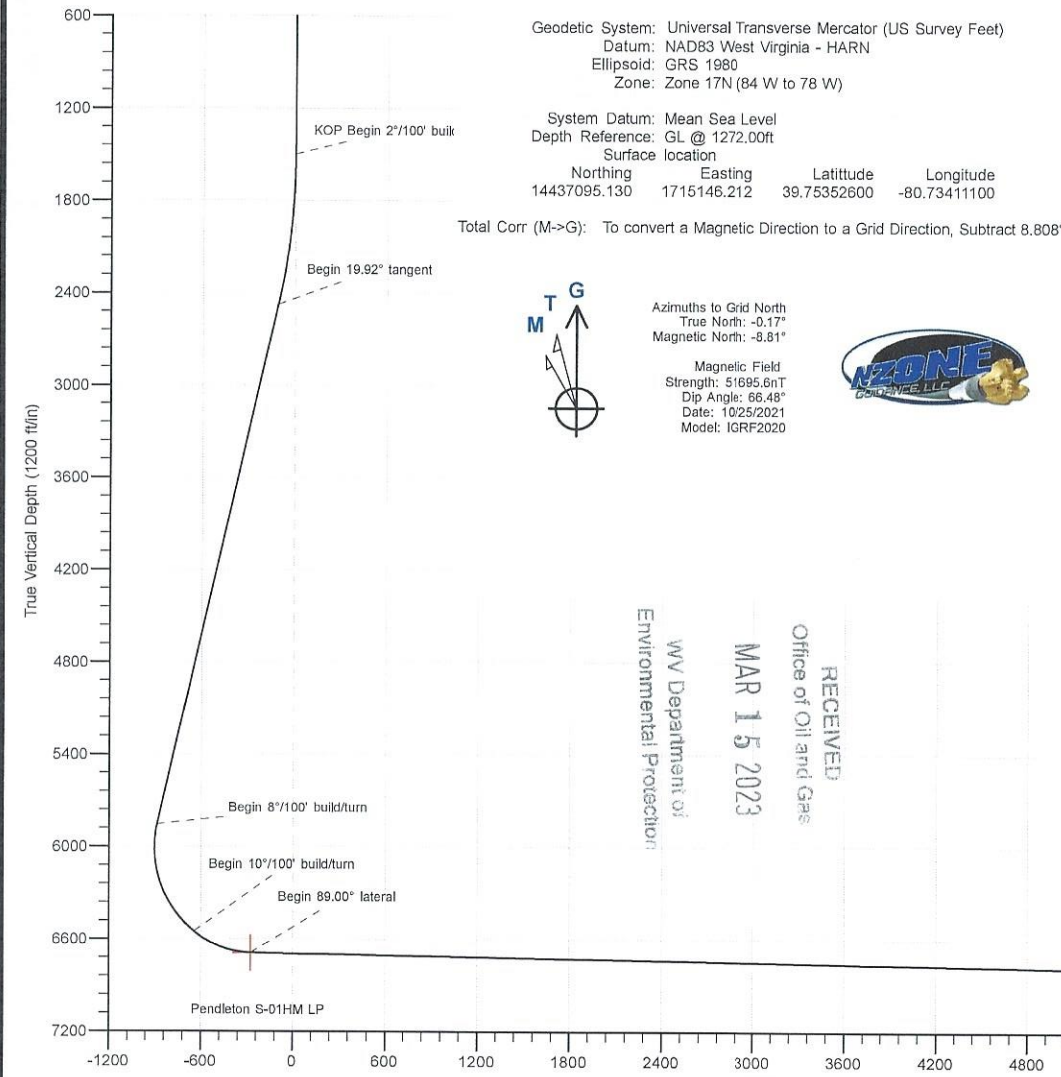
Well: Pendleton S-01 HM (slot I)
 Site: Pendleton
 Project: Marshall County, West Virginia NAD83 UTM 17N
 Design: rev0
 Rig:

SECTION DETAILS

Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	V Sect	Annotation
2	1500.00	0.00	0.00	1500.00	0.00	0.00	0.00	0.000	0.00	KOP Begin 2°/100' build
3	2495.85	19.92	13.12	2475.91	166.88	38.89	2.00	13.120	-108.58	Begin 19.92° tangent
4	6092.91	19.92	13.12	5857.83	1360.26	317.04	0.00	0.000	-885.08	Begin 8°/100' build/turn
5	6880.59	50.00	138.36	6552.77	1254.58	574.44	8.00	135.404	-644.40	Begin 10°/100' build/turn
6	7284.70	89.00	150.00	6692.00	951.27	787.20	10.00	18.128	-274.26	Begin 89.00° lateral
7	16440.99	89.00	150.00	6852.00	-6976.98	5364.83	0.00	0.000	8801.12	PBHL/TD 16440.99 MD 6852.00 TVD

DESIGN TARGET DETAILS

Name	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
Pendleton S-01HM LP	6692.00	951.27	787.20	14437095.130	1715146.212	39.75613200	-80.73130000
- plan misses target center by 0.01ft at 7284.71ft MD (6692.00 TVD, 951.27 N, 787.20 E)							
Pendleton S-01HM BHL	6852.00	-6976.98	5364.83	14437095.130	1715146.212	39.75613200	-80.73130000
- plan hits target center							



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Planning Report - Geographic

Database:	DB_Dec2220_v16	Local Co-ordinate Reference:	Well Pendleton S-01 HM (slot I)
Company:	Tug Hill Operating LLC	TVD Reference:	GL @ 1272.00ft
Project:	Marshall County, West Virginia NAD83 UTM 17N	MD Reference:	GL @ 1272.00ft
Site:	Pendleton	North Reference:	Grid
Well:	Pendleton S-01 HM (slot I)	Survey Calculation Method:	Minimum Curvature
Wellbore:	Original Hole		
Design:	rev0		

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Project	Marshall County, West Virginia NAD83 UTM 17N		
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	Pendleton				
Site Position:		Northing:	14,437,088.243 usft	Latitude:	39.75350685
From:	Lat/Long	Easting:	1,715,175.249 usft	Longitude:	-80.73400776
Position Uncertainty:	0.00 ft	Slot Radius:	13-3/16 "		

Well	Pendleton S-01 HM (slot I)					
Well Position	+N/-S	0.00 ft	Northing:	14,437,095.130 usft	Latitude:	39.75352600
	+E/-W	0.00 ft	Easting:	1,715,146.212 usft	Longitude:	-80.73411100
Position Uncertainty	0.00 ft		Wellhead Elevation:	ft	Ground Level:	1,272.00 ft
Grid Convergence:						

Wellbore	Original Hole				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2020	10/25/2021	-8.638	66.480	51,695.61732070

Design	rev0			
Audit Notes:				
Version:	Phase:	PLAN	Tie On Depth:	0.00
Vertical Section:	Depth From (TVD) (ft)	+N/-S (ft)	+E/-W (ft)	Direction (°)
	0.00	0.00	0.00	142.44

Plan Survey Tool Program		Date			
Depth From (ft)	Depth To (ft)	Survey (Wellbore)	Tool Name	Remarks	
1	0.00	16,440.98 rev0 (Original Hole)			

Plan Sections										
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)	TFO (°)	Target
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.000	
1,500.00	0.00	0.00	1,500.00	0.00	0.00	0.00	0.00	0.00	0.000	
2,495.85	19.92	13.12	2,475.91	166.88	38.89	2.00	2.00	0.00	13.120	
6,092.91	19.92	13.12	5,857.83	1,360.26	317.04	0.00	0.00	0.00	0.000	
6,880.59	50.00	138.36	6,552.77	1,254.58	574.44	8.00	3.82	15.90	135.404	
7,284.70	89.00	150.00	6,692.00	951.27	787.20	10.00	9.65	2.88	18.128	
16,440.99	89.00	150.00	6,852.00	-6,976.98	5,364.83	0.00	0.00	0.00	0.000	Pendleton S-01HM BI

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 Project: Marshall County, West Virginia NAD83 UTM
 17N
 Site: Pendleton
 Well: Pendleton S-01 HM (slot I)
 Wellbore: Original Hole
 Design: rev0

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

Well Pendleton S-01 HM (slot I)
 GL @ 1272.00ft
 GL @ 1272.00ft
 Grid
 Minimum Curvature

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Planned Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
0.00	0.00	0.00	0.00	0.00	0.00	14,437,095.130	1,715,146.212	39.75352600	-80.73411100
100.00	0.00	0.00	100.00	0.00	0.00	14,437,095.130	1,715,146.212	39.75352600	-80.73411100
200.00	0.00	0.00	200.00	0.00	0.00	14,437,095.130	1,715,146.212	39.75352600	-80.73411100
300.00	0.00	0.00	300.00	0.00	0.00	14,437,095.130	1,715,146.212	39.75352600	-80.73411100
400.00	0.00	0.00	400.00	0.00	0.00	14,437,095.130	1,715,146.212	39.75352600	-80.73411100
500.00	0.00	0.00	500.00	0.00	0.00	14,437,095.130	1,715,146.212	39.75352600	-80.73411100
600.00	0.00	0.00	600.00	0.00	0.00	14,437,095.130	1,715,146.212	39.75352600	-80.73411100
700.00	0.00	0.00	700.00	0.00	0.00	14,437,095.130	1,715,146.212	39.75352600	-80.73411100
800.00	0.00	0.00	800.00	0.00	0.00	14,437,095.130	1,715,146.212	39.75352600	-80.73411100
900.00	0.00	0.00	900.00	0.00	0.00	14,437,095.130	1,715,146.212	39.75352600	-80.73411100
1,000.00	0.00	0.00	1,000.00	0.00	0.00	14,437,095.130	1,715,146.212	39.75352600	-80.73411100
1,100.00	0.00	0.00	1,100.00	0.00	0.00	14,437,095.130	1,715,146.212	39.75352600	-80.73411100
1,200.00	0.00	0.00	1,200.00	0.00	0.00	14,437,095.130	1,715,146.212	39.75352600	-80.73411100
1,300.00	0.00	0.00	1,300.00	0.00	0.00	14,437,095.130	1,715,146.212	39.75352600	-80.73411100
1,400.00	0.00	0.00	1,400.00	0.00	0.00	14,437,095.130	1,715,146.212	39.75352600	-80.73411100
1,500.00	0.00	0.00	1,500.00	0.00	0.00	14,437,095.130	1,715,146.212	39.75352600	-80.73411100
KOP Begin 2°/100' build									
1,600.00	2.00	13.12	1,599.98	1.70	0.40	14,437,096.830	1,715,146.608	39.75353067	-80.73410957
1,700.00	4.00	13.12	1,699.84	6.80	1.58	14,437,101.926	1,715,147.796	39.75354465	-80.73410529
1,800.00	6.00	13.12	1,799.45	15.28	3.56	14,437,110.414	1,715,149.774	39.75356795	-80.73409816
1,900.00	8.00	13.12	1,898.70	27.15	6.33	14,437,122.282	1,715,152.540	39.75360052	-80.73408820
2,000.00	10.00	13.12	1,997.47	42.39	9.88	14,437,137.517	1,715,156.091	39.75364233	-80.73407540
2,100.00	12.00	13.12	2,095.62	60.97	14.21	14,437,156.098	1,715,160.422	39.75369332	-80.73405980
2,200.00	14.00	13.12	2,193.06	82.88	19.32	14,437,178.005	1,715,165.528	39.75375344	-80.73404140
2,300.00	16.00	13.12	2,289.64	108.08	25.19	14,437,203.210	1,715,171.402	39.75382261	-80.73402023
2,400.00	18.00	13.12	2,385.27	136.55	31.83	14,437,231.683	1,715,178.038	39.75390075	-80.73399632
2,495.85	19.92	13.12	2,475.91	166.88	38.89	14,437,262.008	1,715,185.106	39.75398398	-80.73397085
Begin 19.92° tangent									
2,500.00	19.92	13.12	2,479.82	168.26	39.22	14,437,263.385	1,715,185.427	39.75398776	-80.73396969
2,600.00	19.92	13.12	2,573.84	201.43	46.95	14,437,296.562	1,715,193.160	39.75407881	-80.73394183
2,700.00	19.92	13.12	2,667.85	234.61	54.68	14,437,329.738	1,715,200.892	39.75416986	-80.73391397
2,800.00	19.92	13.12	2,761.87	267.79	62.41	14,437,362.915	1,715,208.625	39.75426090	-80.73388611
2,900.00	19.92	13.12	2,855.89	300.96	70.15	14,437,396.091	1,715,216.357	39.75435195	-80.73385824
3,000.00	19.92	13.12	2,949.91	334.14	77.88	14,437,429.268	1,715,224.090	39.75444300	-80.73383038
3,100.00	19.92	13.12	3,043.93	367.31	85.61	14,437,462.444	1,715,231.822	39.75453405	-80.73380252
3,200.00	19.92	13.12	3,137.95	400.49	93.34	14,437,495.621	1,715,239.555	39.75462510	-80.73377465
3,300.00	19.92	13.12	3,231.97	433.67	101.08	14,437,528.797	1,715,247.287	39.75471615	-80.73374679
3,400.00	19.92	13.12	3,325.99	466.84	108.81	14,437,561.974	1,715,255.020	39.75480720	-80.73371893
3,500.00	19.92	13.12	3,420.00	500.02	116.54	14,437,595.150	1,715,262.753	39.75489825	-80.73369106
3,600.00	19.92	13.12	3,514.02	533.20	124.27	14,437,628.327	1,715,270.485	39.75498930	-80.73366320
3,700.00	19.92	13.12	3,608.04	566.37	132.01	14,437,661.503	1,715,278.218	39.75508034	-80.73363534
3,800.00	19.92	13.12	3,702.06	599.55	139.74	14,437,694.680	1,715,285.950	39.75517139	-80.73360747
3,900.00	19.92	13.12	3,796.08	632.73	147.47	14,437,727.856	1,715,293.683	39.75526244	-80.73357961
4,000.00	19.92	13.12	3,890.10	665.90	155.20	14,437,761.033	1,715,301.415	39.75535349	-80.73355174
4,100.00	19.92	13.12	3,984.12	699.08	162.94	14,437,794.209	1,715,309.148	39.75544454	-80.73352388
4,200.00	19.92	13.12	4,078.14	732.26	170.67	14,437,827.386	1,715,316.880	39.75553559	-80.73349602
4,300.00	19.92	13.12	4,172.15	765.43	178.40	14,437,860.563	1,715,324.613	39.75562664	-80.73346815
4,400.00	19.92	13.12	4,266.17	798.61	186.13	14,437,893.739	1,715,332.345	39.75571769	-80.73344029
4,500.00	19.92	13.12	4,360.19	831.79	193.87	14,437,926.916	1,715,340.078	39.75580874	-80.73341242
4,600.00	19.92	13.12	4,454.21	864.96	201.60	14,437,960.092	1,715,347.810	39.75589978	-80.73338456
4,700.00	19.92	13.12	4,548.23	898.14	209.33	14,437,993.269	1,715,355.543	39.75599083	-80.73335670
4,800.00	19.92	13.12	4,642.25	931.32	217.06	14,438,026.445	1,715,363.275	39.75608188	-80.73332883
4,900.00	19.92	13.12	4,736.27	964.49	224.80	14,438,059.622	1,715,371.008	39.75617293	-80.73330097

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Well Pendleton S-01 HM (slot I)
 GL @ 1272.00ft
 GL @ 1272.00ft
 Grid
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Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
5,000.00	19.92	13.12	4,830.29	997.67	232.53	14,438,092.798	1,715,378.740	39.75626398	-80.73327310
5,100.00	19.92	13.12	4,924.30	1,030.85	240.26	14,438,125.975	1,715,386.473	39.75635503	-80.73324524
5,200.00	19.92	13.12	5,018.32	1,064.02	247.99	14,438,159.151	1,715,394.205	39.75644608	-80.73321737
5,300.00	19.92	13.12	5,112.34	1,097.20	255.73	14,438,192.328	1,715,401.938	39.75653713	-80.73318951
5,400.00	19.92	13.12	5,206.36	1,130.38	263.46	14,438,225.504	1,715,409.670	39.75662817	-80.73316164
5,500.00	19.92	13.12	5,300.38	1,163.55	271.19	14,438,258.681	1,715,417.403	39.75671922	-80.73313378
5,600.00	19.92	13.12	5,394.40	1,196.73	278.92	14,438,291.857	1,715,425.135	39.75681027	-80.73310591
5,700.00	19.92	13.12	5,488.42	1,229.91	286.66	14,438,325.034	1,715,432.868	39.75690132	-80.73307805
5,800.00	19.92	13.12	5,582.43	1,263.08	294.39	14,438,358.210	1,715,440.600	39.75699237	-80.73305018
5,900.00	19.92	13.12	5,676.45	1,296.26	302.12	14,438,391.387	1,715,448.333	39.75708342	-80.73302232
6,000.00	19.92	13.12	5,770.47	1,329.44	309.85	14,438,424.563	1,715,456.065	39.75717447	-80.73299445
6,092.91	19.92	13.12	5,857.83	1,360.26	317.04	14,438,455.388	1,715,463.250	39.75725906	-80.73296856
Begin 8°/100° build/turn									
6,100.00	19.52	14.31	5,864.50	1,362.58	317.61	14,438,457.711	1,715,463.816	39.75726544	-80.73296652
6,150.00	16.96	24.17	5,912.00	1,377.34	322.66	14,438,472.463	1,715,468.869	39.75730591	-80.73294839
6,200.00	15.02	36.92	5,960.07	1,389.17	329.54	14,438,484.300	1,715,475.749	39.75733836	-80.73292378
6,250.00	13.97	52.39	6,008.50	1,398.04	338.21	14,438,498.166	1,715,484.424	39.75736264	-80.73289282
6,300.00	13.99	69.00	6,057.04	1,403.89	348.64	14,438,499.016	1,715,494.852	39.75737862	-80.73285565
6,350.00	15.10	84.36	6,105.45	1,406.70	360.77	14,438,501.823	1,715,506.981	39.75738623	-80.73281246
6,400.00	17.07	96.97	6,153.51	1,406.44	374.54	14,438,501.572	1,715,520.753	39.75738542	-80.73276346
6,450.00	19.66	106.69	6,200.97	1,403.14	389.89	14,438,498.265	1,715,536.101	39.75737622	-80.73270889
6,500.00	22.64	114.09	6,247.60	1,396.79	406.74	14,438,491.919	1,715,552.949	39.75735865	-80.73264901
6,550.00	25.89	119.79	6,293.19	1,387.44	425.00	14,438,482.563	1,715,571.216	39.75733281	-80.73258411
6,600.00	29.31	124.27	6,337.49	1,375.12	444.60	14,438,470.244	1,715,590.812	39.75729881	-80.73251452
6,650.00	32.86	127.87	6,380.31	1,359.89	465.43	14,438,455.021	1,715,611.642	39.75725684	-80.73244056
6,700.00	36.48	130.83	6,421.43	1,341.84	487.39	14,438,436.969	1,715,633.605	39.75720708	-80.73236260
6,750.00	40.17	133.33	6,460.65	1,321.05	510.38	14,438,416.176	1,715,656.594	39.75714979	-80.73228102
6,800.00	43.91	135.46	6,497.78	1,297.61	534.29	14,438,392.742	1,715,680.497	39.75708524	-80.73219623
6,850.00	47.68	137.33	6,532.64	1,271.66	558.99	14,438,366.783	1,715,705.196	39.75701374	-80.73210862
6,880.59	50.00	138.36	6,552.77	1,254.58	574.44	14,438,349.708	1,715,720.651	39.75696672	-80.73205381
Begin 10°/100° build/turn									
6,900.00	51.85	139.13	6,565.00	1,243.25	584.37	14,438,338.382	1,715,730.584	39.75693554	-80.73201859
6,950.00	56.63	140.94	6,594.22	1,212.16	610.41	14,438,307.285	1,715,756.620	39.75684992	-80.73192628
7,000.00	61.43	142.56	6,619.94	1,178.49	636.93	14,438,273.619	1,715,783.139	39.75675725	-80.73183228
7,050.00	66.25	144.04	6,641.98	1,142.51	663.73	14,438,237.640	1,715,809.938	39.75665822	-80.73173731
7,100.00	71.08	145.42	6,660.17	1,104.49	690.60	14,438,199.622	1,715,836.813	39.75655359	-80.73164208
7,150.00	75.93	146.72	6,674.36	1,064.73	717.35	14,438,159.854	1,715,863.560	39.75644416	-80.73154734
7,200.00	80.77	147.96	6,684.46	1,023.51	743.77	14,438,118.638	1,715,889.977	39.75633075	-80.73145379
7,250.00	85.63	149.17	6,690.37	981.16	769.65	14,438,076.289	1,715,915.860	39.75621423	-80.73136214
7,284.70	89.00	150.00	6,692.00	951.27	787.20	14,438,046.398	1,715,933.408	39.75613200	-80.73130003
Begin 89.00° lateral									
7,300.00	89.00	150.00	6,692.27	938.03	794.84	14,438,033.154	1,715,941.054	39.75609556	-80.73127296
7,400.00	89.00	150.00	6,694.01	851.44	844.84	14,437,946.566	1,715,991.049	39.75585736	-80.73109600
7,500.00	89.00	150.00	6,695.76	764.85	894.83	14,437,859.978	1,716,041.043	39.75561915	-80.73091904
7,600.00	89.00	150.00	6,697.51	678.26	944.83	14,437,773.390	1,716,091.038	39.75538094	-80.73074208
7,700.00	89.00	150.00	6,699.26	591.67	994.82	14,437,686.802	1,716,141.032	39.75514274	-80.73056512
7,800.00	89.00	150.00	6,701.00	505.09	1,044.82	14,437,600.214	1,716,191.026	39.75490453	-80.73038817
7,900.00	89.00	150.00	6,702.75	418.50	1,094.81	14,437,513.626	1,716,241.021	39.75466632	-80.73021121
8,000.00	89.00	150.00	6,704.50	331.91	1,144.80	14,437,427.038	1,716,291.015	39.75442811	-80.73003426
8,100.00	89.00	150.00	6,706.25	245.32	1,194.80	14,437,340.450	1,716,341.010	39.75418990	-80.72985731
8,200.00	89.00	150.00	6,707.99	158.73	1,244.79	14,437,253.863	1,716,391.004	39.75395170	-80.72968035
8,300.00	89.00	150.00	6,709.74	72.14	1,294.79	14,437,167.275	1,716,440.998	39.75371349	-80.72950340
8,400.00	89.00	150.00	6,711.49	-14.44	1,344.78	14,437,080.687	1,716,490.993	39.75347528	-80.72932646

03/31/2023



Planning Report - Geographic

Database:	DB_Dec2220_v16	Local Co-ordinate Reference:	Well Pendleton S-01 HM (slot I)
Company:	Tug Hill Operating LLC	TVD Reference:	GL @ 1272.00ft
Project:	Marshall County, West Virginia NAD83 UTM 17N	MD Reference:	GL @ 1272.00ft
Site:	Pendleton	North Reference:	Grid
Well:	Pendleton S-01 HM (slot I)	Survey Calculation Method:	Minimum Curvature
Wellbore:	Original Hole		
Design:	rev0		

Planned Survey									
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
8,500.00	89.00	150.00	6,713.24	-101.03	1,394.78	14,436,994.099	1,716,540.987	39.75323707	-80.72914951
8,600.00	89.00	150.00	6,714.98	-187.62	1,444.77	14,436,907.511	1,716,590.982	39.75299886	-80.72897256
8,700.00	89.00	150.00	6,716.73	-274.21	1,494.77	14,436,820.923	1,716,640.976	39.75276065	-80.72876962
8,800.00	89.00	150.00	6,718.48	-360.80	1,544.76	14,436,734.335	1,716,690.970	39.75252244	-80.72861867
8,900.00	89.00	150.00	6,720.23	-447.38	1,594.76	14,436,647.747	1,716,740.965	39.75228423	-80.72844173
9,000.00	89.00	150.00	6,721.97	-533.97	1,644.75	14,436,561.159	1,716,790.959	39.75204602	-80.72826479
9,100.00	89.00	150.00	6,723.72	-620.56	1,694.74	14,436,474.571	1,716,840.954	39.75180780	-80.72808785
9,200.00	89.00	150.00	6,725.47	-707.15	1,744.74	14,436,387.984	1,716,890.948	39.75156959	-80.72791091
9,300.00	89.00	150.00	6,727.22	-793.74	1,794.73	14,436,301.396	1,716,940.942	39.75133138	-80.72773397
9,400.00	89.00	150.00	6,728.96	-880.32	1,844.73	14,436,214.808	1,716,990.937	39.75109317	-80.72755703
9,500.00	89.00	150.00	6,730.71	-966.91	1,894.72	14,436,128.220	1,717,040.931	39.75085496	-80.72738010
9,600.00	89.00	150.00	6,732.46	-1,053.50	1,944.72	14,436,041.632	1,717,090.926	39.75061674	-80.72720316
9,700.00	89.00	150.00	6,734.21	-1,140.09	1,994.71	14,435,955.044	1,717,140.920	39.75037853	-80.72702623
9,800.00	89.00	150.00	6,735.95	-1,226.68	2,044.71	14,435,868.456	1,717,190.915	39.75014032	-80.72684930
9,900.00	89.00	150.00	6,737.70	-1,313.26	2,094.70	14,435,781.868	1,717,240.909	39.74990211	-80.72667237
10,000.00	89.00	150.00	6,739.45	-1,399.85	2,144.69	14,435,695.280	1,717,290.903	39.74966389	-80.72649544
10,100.00	89.00	150.00	6,741.20	-1,486.44	2,194.69	14,435,608.692	1,717,340.898	39.74942568	-80.72631851
10,200.00	89.00	150.00	6,742.94	-1,573.03	2,244.68	14,435,522.105	1,717,390.892	39.74918746	-80.72614158
10,300.00	89.00	150.00	6,744.69	-1,659.62	2,294.68	14,435,435.517	1,717,440.887	39.74894925	-80.72596466
10,400.00	89.00	150.00	6,746.44	-1,746.21	2,344.67	14,435,348.929	1,717,490.881	39.74871103	-80.72578773
10,500.00	89.00	150.00	6,748.19	-1,832.79	2,394.67	14,435,262.341	1,717,540.875	39.74847282	-80.72561081
10,600.00	89.00	150.00	6,749.93	-1,919.38	2,444.66	14,435,175.753	1,717,590.870	39.74823460	-80.72543389
10,700.00	89.00	150.00	6,751.68	-2,005.97	2,494.66	14,435,089.165	1,717,640.864	39.74799639	-80.72525697
10,800.00	89.00	150.00	6,753.43	-2,092.56	2,544.65	14,435,002.577	1,717,690.859	39.74775817	-80.72508005
10,900.00	89.00	150.00	6,755.18	-2,179.15	2,594.65	14,434,915.989	1,717,740.853	39.74751996	-80.72490313
11,000.00	89.00	150.00	6,756.92	-2,265.73	2,644.64	14,434,829.401	1,717,790.847	39.74728174	-80.72472621
11,100.00	89.00	150.00	6,758.67	-2,352.32	2,694.63	14,434,742.813	1,717,840.842	39.74704352	-80.72454930
11,200.00	89.00	150.00	6,760.42	-2,438.91	2,744.63	14,434,656.225	1,717,890.836	39.74680531	-80.72437238
11,300.00	89.00	150.00	6,762.16	-2,525.50	2,794.62	14,434,569.638	1,717,940.831	39.74656709	-80.72419547
11,400.00	89.00	150.00	6,763.91	-2,612.09	2,844.62	14,434,483.050	1,717,990.825	39.74632887	-80.72401856
11,500.00	89.00	150.00	6,765.66	-2,698.67	2,894.61	14,434,396.462	1,718,040.819	39.74609065	-80.72384164
11,600.00	89.00	150.00	6,767.41	-2,785.26	2,944.61	14,434,309.874	1,718,090.814	39.74585244	-80.72366473
11,700.00	89.00	150.00	6,769.15	-2,871.85	2,994.60	14,434,223.286	1,718,140.808	39.74561422	-80.72348783
11,800.00	89.00	150.00	6,770.90	-2,958.44	3,044.60	14,434,136.698	1,718,190.803	39.74537600	-80.72331092
11,900.00	89.00	150.00	6,772.65	-3,045.03	3,094.59	14,434,050.110	1,718,240.797	39.74513778	-80.72313401
12,000.00	89.00	150.00	6,774.40	-3,131.61	3,144.59	14,433,963.522	1,718,290.791	39.74489956	-80.72295711
12,100.00	89.00	150.00	6,776.14	-3,218.20	3,194.58	14,433,876.934	1,718,340.786	39.74466134	-80.72278020
12,200.00	89.00	150.00	6,777.89	-3,304.79	3,244.57	14,433,790.346	1,718,390.780	39.74442312	-80.72260330
12,300.00	89.00	150.00	6,779.64	-3,391.38	3,294.57	14,433,703.759	1,718,440.775	39.74418490	-80.72242640
12,400.00	89.00	150.00	6,781.39	-3,477.97	3,344.56	14,433,617.171	1,718,490.769	39.74394668	-80.72224950
12,500.00	89.00	150.00	6,783.13	-3,564.55	3,394.56	14,433,530.583	1,718,540.763	39.74370846	-80.72207260
12,600.00	89.00	150.00	6,784.88	-3,651.14	3,444.55	14,433,443.995	1,718,590.758	39.74347024	-80.72189570
12,700.00	89.00	150.00	6,786.63	-3,737.73	3,494.55	14,433,357.407	1,718,640.752	39.74323202	-80.72171880
12,800.00	89.00	150.00	6,788.38	-3,824.32	3,544.54	14,433,270.819	1,718,690.747	39.74299380	-80.72154191
12,900.00	89.00	150.00	6,790.12	-3,910.91	3,594.54	14,433,184.231	1,718,740.741	39.74275558	-80.72136502
13,000.00	89.00	150.00	6,791.87	-3,997.50	3,644.53	14,433,097.643	1,718,790.735	39.74251735	-80.72118812
13,100.00	89.00	150.00	6,793.62	-4,084.08	3,694.52	14,433,011.055	1,718,840.730	39.74227913	-80.72101123
13,200.00	89.00	150.00	6,795.37	-4,170.67	3,744.52	14,432,924.467	1,718,890.724	39.74204091	-80.72083434
13,300.00	89.00	150.00	6,797.11	-4,257.26	3,794.51	14,432,837.880	1,718,940.719	39.74180269	-80.72065745
13,400.00	89.00	150.00	6,798.86	-4,343.85	3,844.51	14,432,751.292	1,718,990.713	39.74156446	-80.72048056
13,500.00	89.00	150.00	6,800.61	-4,430.44	3,894.50	14,432,664.704	1,719,040.708	39.74132624	-80.72030368
13,600.00	89.00	150.00	6,802.36	-4,517.02	3,944.50	14,432,578.116	1,719,090.702	39.74108802	-80.72012679
13,700.00	89.00	150.00	6,804.10	-4,603.61	3,994.49	14,432,491.528	1,719,140.696	39.74084979	-80.71994991
13,800.00	89.00	150.00	6,805.85	-4,690.20	4,044.49	14,432,404.940	1,719,190.691	39.74061157	-80.71977302

03/31/2023





Planning Report - Geographic

Database:	DB_Dec2220_v16	Local Co-ordinate Reference:	Well Pendleton S-01 HM (slot I)
Company:	Tug Hill Operating LLC	TVD Reference:	GL @ 1272.00ft
Project:	Marshall County, West Virginia NAD83 UTM 17N	MD Reference:	GL @ 1272.00ft
Site:	Pendleton	North Reference:	Grid
Well:	Pendleton S-01 HM (slot I)	Survey Calculation Method:	Minimum Curvature
Wellbore:	Original Hole		
Design:	rev0		

Planned Survey									
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
13,900.00	89.00	150.00	6,807.60	-4,776.79	4,094.48	14,432,318.351	1,719,240.685	39.74037334	-80.71959614
14,000.00	89.00	150.00	6,809.35	-4,863.38	4,144.48	14,432,231.763	1,719,290.680	39.74013512	-80.71941926
14,100.00	89.00	150.00	6,811.09	-4,949.96	4,194.47	14,432,145.175	1,719,340.674	39.73899689	-80.71924238
14,200.00	89.00	150.00	6,812.84	-5,036.55	4,244.46	14,432,058.587	1,719,390.668	39.73965867	-80.71906550
14,300.00	89.00	150.00	6,814.59	-5,123.14	4,294.46	14,431,971.999	1,719,440.663	39.73942044	-80.71888862
14,400.00	89.00	150.00	6,816.34	-5,209.73	4,344.45	14,431,885.412	1,719,490.657	39.73918222	-80.71871175
14,500.00	89.00	150.00	6,818.08	-5,296.32	4,394.45	14,431,798.824	1,719,540.652	39.73894399	-80.71853487
14,600.00	89.00	150.00	6,819.83	-5,382.90	4,444.44	14,431,712.236	1,719,590.646	39.73870577	-80.71835800
14,700.00	89.00	150.00	6,821.58	-5,469.49	4,494.44	14,431,625.648	1,719,640.640	39.73846754	-80.71818113
14,800.00	89.00	150.00	6,823.32	-5,556.08	4,544.43	14,431,539.060	1,719,690.635	39.73822931	-80.71800426
14,900.00	89.00	150.00	6,825.07	-5,642.67	4,594.43	14,431,452.472	1,719,740.629	39.73799108	-80.71782739
15,000.00	89.00	150.00	6,826.82	-5,729.26	4,644.42	14,431,365.884	1,719,790.624	39.73775286	-80.71765052
15,100.00	89.00	150.00	6,828.57	-5,815.84	4,694.41	14,431,279.296	1,719,840.618	39.73751463	-80.71747365
15,200.00	89.00	150.00	6,830.31	-5,902.43	4,744.41	14,431,192.708	1,719,890.612	39.73727640	-80.71729679
15,300.00	89.00	150.00	6,832.06	-5,989.02	4,794.40	14,431,106.120	1,719,940.607	39.73703817	-80.71711992
15,400.00	89.00	150.00	6,833.81	-6,075.61	4,844.40	14,431,019.533	1,719,990.601	39.73679994	-80.71694306
15,500.00	89.00	150.00	6,835.56	-6,162.20	4,894.39	14,430,932.945	1,720,040.596	39.73656172	-80.71676619
15,600.00	89.00	150.00	6,837.30	-6,248.79	4,944.39	14,430,846.357	1,720,090.590	39.73632349	-80.71658933
15,700.00	89.00	150.00	6,839.05	-6,335.37	4,994.38	14,430,759.769	1,720,140.584	39.73608526	-80.71641247
15,800.00	89.00	150.00	6,840.80	-6,421.96	5,044.38	14,430,673.181	1,720,190.579	39.73584703	-80.71623561
15,900.00	89.00	150.00	6,842.55	-6,508.55	5,094.37	14,430,586.593	1,720,240.573	39.73560880	-80.71605876
16,000.00	89.00	150.00	6,844.29	-6,595.14	5,144.37	14,430,500.005	1,720,290.568	39.73537057	-80.71588190
16,100.00	89.00	150.00	6,846.04	-6,681.73	5,194.36	14,430,413.417	1,720,340.562	39.73513234	-80.71570504
16,200.00	89.00	150.00	6,847.79	-6,768.31	5,244.35	14,430,326.829	1,720,390.556	39.73489411	-80.71552819
16,300.00	89.00	150.00	6,849.54	-6,854.90	5,294.35	14,430,240.241	1,720,440.551	39.73465588	-80.71535134
16,400.00	89.00	150.00	6,851.28	-6,941.49	5,344.34	14,430,153.654	1,720,490.545	39.73441764	-80.71517449
16,440.99	89.00	150.00	6,852.00	-6,976.98	5,364.83	14,430,118.164	1,720,511.036	39.73432000	-80.71510200

PBHL/TD 16440.99 MD 6852.00 TVD - 20" Casing

Design Targets									
Target Name	Dip Angle (°)	Dip Dir. (°)	TVD (ft)	+N/-S (ft)	+E/-W (ft)	Northing (usft)	Easting (usft)	Latitude	Longitude
Pendleton S-01HM LP - hit/miss target - Shape - Point	0.00	0.00	6,692.00	951.27	787.20	14,438,046.399	1,715,933.415	39.75613200	-80.73130000
- plan misses target center by 0.01ft at 7284.71ft MD (6692.00 TVD, 951.27 N, 787.20 E)									
Pendleton S-01HM BHL - plan hits target center - Point	0.00	0.00	6,852.00	-6,976.98	5,364.83	14,430,118.164	1,720,511.036	39.73432000	-80.71510200

Casing Points					
Measured Depth (ft)	Vertical Depth (ft)	Name	Casing Diameter (")	Hole Diameter (")	
16,440.99	6,852.00	20" Casing	20		

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Office of Oil and Gas
MAR 15 2023

WV Department of Environmental Protection
COMPASS 5000.16 Build 96

03/31/2023

Database:	DB_Dec2220_v16	Local Co-ordinate Reference:	Well Pendleton S-01 HM (slot I)
Company:	Tug Hill Operating LLC	TVD Reference:	GL @ 1272.00ft
Project:	Marshall County, West Virginia NAD83 UTM 17N	MD Reference:	GL @ 1272.00ft
Site:	Pendleton	North Reference:	Grid
Well:	Pendleton S-01 HM (slot I)	Survey Calculation Method:	Minimum Curvature
Wellbore:	Original Hole		
Design:	rev0		

Plan Annotations				
Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment
		+N/-S (ft)	+E/-W (ft)	
1,500.00	1,500.00	0.00	0.00	KOP Begin 2°/100' build
2,495.85	2,475.91	166.88	38.89	Begin 19.92° tangent
6,092.91	5,857.83	1,360.26	317.04	Begin 8°/100' build/turn
6,880.59	6,552.77	1,254.58	574.44	Begin 10°/100' build/turn
7,284.70	6,692.00	951.27	787.20	Begin 89.00° lateral
16,440.99	6,852.00	-6,976.98	5,364.83	PBHL/TD 16440.99 MD 6852.00 TVD

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 MAR 15 2023
 WV Department of
 Environmental Protection