

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

API 47 - 51 - 01942 County MARSHALL District LIBERTY  
Quad CAMERON Pad Name TCO-MSH-PAD1 Field/Pool Name VICTORY FIELD WET  
Farm name COLUMBIA GAS TRANSMISSION, LLC Well Number COLUMBIA GAS TRANSMISSION MSH 9H  
Operator (as registered with the OOG) SWN PRODUCTION COMPANY, LLC  
Address PO BOX 12359 City SPRING State TX Zip 77391-2359

As Drilled location NAD 83/UTM Attach an as-drilled plat, profile view, and deviation survey  
Top hole Northing 4,400,581.00 Easting 532,983.08  
Landing Point of Curve Northing 4,400,405.70 Easting 533,025.04  
Bottom Hole Northing 4,399,143.87 Easting 534,426.76

Elevation (ft) 783.8 GL Type of Well  New  Existing Type of Report  Interim  Final  
Permit Type  Deviated  Horizontal  Horizontal 6A  Vertical Depth Type  Deep  Shallow  
Type of Operation  Convert  Deepen  Drill  Plug Back  Redrilling  Rework  Stimulate  
Well Type  Brine Disposal  CBM  Gas  Oil  Secondary Recovery  Solution Mining  Storage  Other \_\_\_\_\_  
Type of Completion  Single  Multiple Fluids Produced  Brine  Gas  NGL  Oil  Other \_\_\_\_\_  
Drilled with  Cable  Rotary

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

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Date permit issued 09/01/2017 Date drilling commenced 12/05/2017 Date drilling ceased 02/28/2018  
Date completion activities began 03/26/2018 Date completion activities ceased 05/19/2018  
Verbal plugging (Y/N) N Date permission granted N/A Granted by N/A

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

Freshwater depth(s) ft 300 Open mine(s) (Y/N) depths N  
Salt water depth(s) ft 629 Void(s) encountered (Y/N) depths N  
Coal depth(s) ft 467 Cavern(s) encountered (Y/N) depths N  
Is coal being mined in area (Y/N) N

Reviewed  
*Jim Unlue* 8/13/18

Reviewed by: \_\_\_\_\_

API 47- 51 - 01942 Farm name COLUMBIA GAS TRANSMISSION, LLC Well number COLUMBIA GAS TRANSMISSION MSH 9H

CASING STRINGS	Hole Size	Casing Size	Depth	New or Used	Grade wt/ft	Basket Depth(s)	Did cement circulate (Y/ N) * Provide details below*
Conductor	24	20	126	NEW	J-55/94#		Y
Surface	17.5	13.375	347	NEW	J-55/54.50#	129.6	Y, 30
Coal	SEE INTERMEDIATE						
Intermediate 1	12.25	9.625	2047	NEW	J-55/36#		Y, 40
Intermediate 2							
Intermediate 3							
Production	8.75/8.50	5.5	13019	NEW	HCP-110/20#		Y
Tubing		2.375	6715	NEW	P-110/4.7#		N
Packer type and depth set							

Comment Details CEMENT BASKET 5' ABOVE PIN

CEMENT DATA	Class/Type of Cement	Number of Sacks	Slurry wt (ppg)	Yield (ft <sup>3</sup> /sks)	Volume (ft <sup>3</sup> )	Cement Top (MD)	WOC (hrs)
Conductor	CLASS A	GROUT TO INTERMEDIATE				SURFACE	24
Surface	CLASS A	393	15.60	1.20	471.6	SURFACE	8
Coal	SEE INTERMEDIATE						
Intermediate 1	CLASS H	866	16.40	1.07	926.62	SURFACE	8
Intermediate 2							
Intermediate 3							
Production	CLASS A	2,295	15.60	1.19	2731.05	SURFACE	24
Tubing							

Drillers TD (ft) 13019 Loggers TD (ft) 13019

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

Plug back procedure N/A

Kick off depth (ft) 5625'

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

Well cored  Yes  No Conventional Sidewall Were cuttings collected  Yes  No

DESCRIBE THE CENTRALIZER PLACEMENT USED FOR EACH CASING STRING \_\_\_\_\_

SURFACE: 7 CENTRALIZERS - EVERY THIRD JOINT OF CASING

INTERMEDIATE: 24 CENTRALIZERS - EVERY THIRD JOINT OF CASING

PRODUCTION: 181 CENTRALIZERS - EVERY THIRD JOINT FROM SURFACE TO TOP OF CURVE, THEN EVERY JOINT UNTIL TD

WAS WELL COMPLETED AS SHOT HOLE  Yes  No DETAILS \_\_\_\_\_

WAS WELL COMPLETED OPEN HOLE?  Yes  No DETAILS \_\_\_\_\_

WERE TRACERS USED  Yes  No TYPE OF TRACER(S) USED \_\_\_\_\_

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# SOUTHWESTERN ENERGY

Location: Marshall County, WV  
 Field: Marshall  
 Slot: Slot 9H  
 Well: Columbia Gas Transmission MSH 9H  
 Wellbore: Columbia Gas Transmission MSH 9H-PWP

Facility: Columbia Gas Transmission MSH Pad

Grid System: NAD83 UTM Zone 17 North, US feet

\* = Height was transformed from a different geoidic datum

North Reference: Grid north

Scale: True distance

Depths are in feet

Created by: Inhouse on 2018-02-28

Databases: WA, Pennsylvania

True vertical depths are referenced to SDC 42 (KB)

Measured depths are referenced to SDC 42 (KB)

SDC 42 (KB) to Mean Sea Level: 809.8 feet

Mean Sea Level to Mud line (At Slot Slot 9H): -783.6 ft

Coordinates are in feet referenced to Slot

2 1/2" x 20ft Conductor: 0.42° Inc, 125.00ft MD, 125.00ft TVD, 0.30ft VS

APS EM <17.5>(207-316) : 0.77° Inc, 207.00ft MD, 206.99ft TVD, 1.00ft VS

L13.375in Casing Surface : 0.47° Inc, 343.00ft MD, 342.98ft TVD, 2.40ft VS

APS EM <12.25>(364-1989) : 0.30° Inc, 364.00ft MD, 363.98ft TVD, 2.51ft VS

9.625in Casing Intermediate : 2.81° Inc, 2047.00ft MD, 2045.04ft TVD, 21.68ft VS

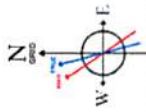
APS EM <8.75>(2072-5447) : 2.67° Inc, 2072.00ft MD, 2070.01ft TVD, 21.50ft VS

API: 47-051-01942-0000

Job#: 8990352

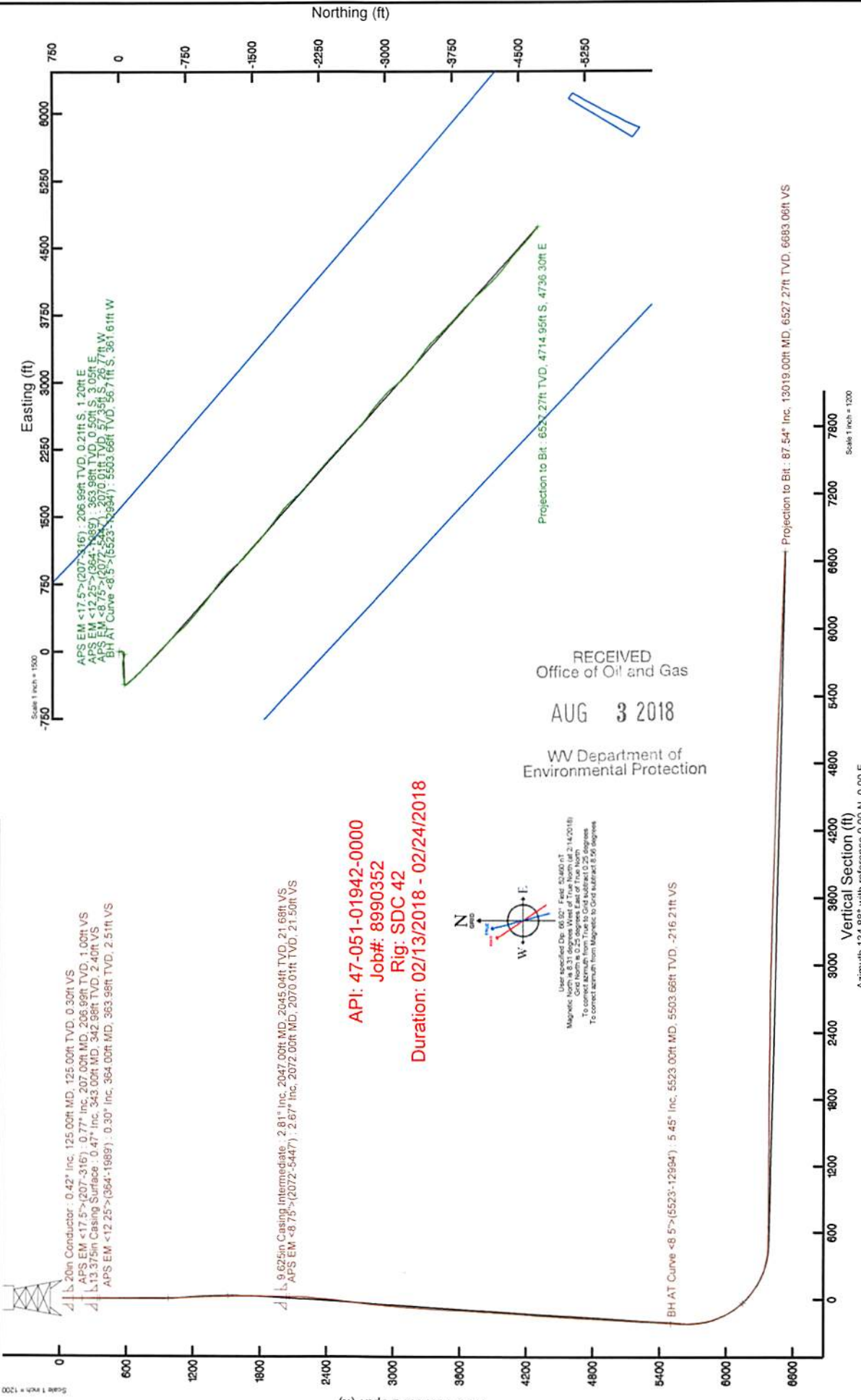
Rig: SDC 42

Duration: 02/13/2018 - 02/24/2018



User specified Dip: 68.00° Field: 50460 mT  
 Magnetic North is 8.31 degrees West of True North (at 2/14/2018)  
 Grid North is 0.25 degrees East of True North  
 To correct azimuth from Magnetic to Grid add/subtract 8.36 degrees

BH AT Curve <8.5>(5523-12594) : 5.45° Inc, 5523.00ft MD, 5503.66ft TVD, -2.16 21ft VS



Scale 1 inch = 1500

Scale 1 inch = 1200

APS EM <17.5>(207-316) : 206.99ft TVD, 0.21ft S, 1.20ft E  
 APS EM <12.25>(364-1989) : 363.98ft TVD, 0.15ft S, 2.05ft E  
 APS EM <8.75>(2072-5447) : 2070.01ft TVD, 57.35ft S, 26.77ft W  
 BH AT Curve <8.5>(5523-12594) : 5503.66ft TVD, 56.7ft S, 361.61ft W

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Projection to Bit : 87.54° Inc, 13019.00ft MD, 6527.27ft TVD, 6683.06ft VS

Vertical Section (ft)  
 Azimuth 134.88° with reference 0.00 N, 0.00 E

Scale 1 inch = 1200

Location Information			
Facility Name	Grid East (US ft)	Grid North (US ft)	Longitude
Columbia Gas Transmission MSH Pad	1748565.880	14437578.433	80°36'54.713"W
Slot	Local N (ft)	Local E (ft)	Longitude
Slot 9H	-5.73	63.02	80°36'53.900"W
SDC 42 (KB) to Mud line (At Slot Slot 9H)	1748629.880	14437572.710	26ft
Mean Sea Level to Mud line (At Slot Slot 9H)			-783.6ft
SDC 42 (KB) to Mean Sea Level			809.8ft



REFERENCE WELLPATH IDENTIFICATION			
Operator	SOUTHWESTERN ENERGY	Slot	Slot 9H
Area	Marshall County, WV	Well	Columbia Gas Transmission MSH 9H
Field	Marshall	Wellbore	Columbia Gas Transmission MSH 9H AWB
Facility	Columbia Gas Transmission MSH Pad		

REPORT SETUP INFORMATION			
Projection System	NAD83 / UTM Zone 17 North, US feet	Software System	WellArchitect® 5.0
North Reference	Grid	User	Thomsuzc
Scale	0.999613	Report Generated	2/28/2018 at 10:19:17 AM
Convergence at slot	0.25° East	Database/Source file	WA_Pennsylvania/Columbia_Gas_Transmission_MSH_9H_AWP_Proj_13019_MD.xml

WELLPATH LOCATION						
	Local coordinates		Grid coordinates		Geographic coordinates	
	North[ft]	East[ft]	Easting[US ft]	Northing[US ft]	Latitude	Longitude
Slot Location	-5.73	63.02	1748628.88	14437572.71	39°45'16.213"N	80°36'53.906"W
Facility Reference Pt			1748565.88	14437578.43	39°45'16.272"N	80°36'54.713"W
Field Reference Pt			0.00	0.00	0°00'00.000"	85°29'19.478"W

WELLPATH DATUM			
Calculation method	Minimum curvature	SDC 42 (KB) to Facility Vertical Datum	809.80ft
Horizontal Reference Pt	Slot	SDC 42 (KB) to Mean Sea Level	809.80ft
Vertical Reference Pt	SDC 42 (KB)	SDC 42 (KB) to Mud Line at Slot (Slot 9H)	26.00ft
MD Reference Pt	SDC 42 (KB)	Section Origin	N 0.00, E 0.00 ft
Field Vertical Reference	Mean Sea Level	Section Azimuth	134.88°

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## REFERENCE WELLPATH IDENTIFICATION

Operator	SOUTHWESTERN ENERGY
Area	Marshall County, WV
Field	Marshall
Facility	Columbia Gas Transmission MSH Pad
Slot	Slot 9H
Well	Columbia Gas Transmission MSH 9H AWB
Wellbore	Columbia Gas Transmission MSH 9H AWB

## WELLPATH DATA (175 stations) † = interpolated/extrapolated station

MD	Inclination	Azimuth	TVD	Vert Sect	North	East	Grid East	Grid North	Latitude	Longitude	Closure Dist	Closure Dir	DLS	Build Rate	Turn Rate
[ft]	[°]	[°]	[ft]	[ft]	[ft]	[ft]	[US ft]	[US ft]	[°N]	[°W]	[ft]	[°]	[°/100ft]	[°/100ft]	[°/100ft]
0.00	0.00	100.160	0.00	0.00	0.00	0.00	1748628.88	14437572.71	39°45'16.213"N	80°36'53.906"W	0.00	0.00	0.00	0.00	0.00
26.00	0.00	100.160	26.00	0.00	0.00	0.00	1748628.88	14437572.71	39°45'16.213"N	80°36'53.906"W	0.00	0.00	0.00	0.00	0.00
207.00	0.770	100.160	206.99	1.00	-0.21	1.20	1748630.08	14437572.50	39°45'16.211"N	80°36'53.891"W	1.22	100.160	0.43	0.43	55.34
300.00	0.780	96.710	299.99	2.01	-0.40	2.44	1748631.32	14437572.31	39°45'16.209"N	80°36'53.875"W	2.47	99.278	0.05	0.01	-3.71
316.00	0.690	99.310	315.98	2.17	-0.43	2.64	1748631.52	14437572.28	39°45'16.208"N	80°36'53.872"W	2.68	99.174	0.60	-0.56	16.25
364.00	0.300	100.980	363.98	2.81	-0.50	3.05	1748631.93	14437572.21	39°45'16.208"N	80°36'53.867"W	3.09	99.260	0.81	-0.81	3.48
423.00	0.600	92.220	422.98	2.87	-0.54	3.51	1748632.39	14437572.17	39°45'16.207"N	80°36'53.861"W	3.55	98.725	0.52	0.51	-14.85
520.00	0.720	177.510	519.98	3.69	-1.17	4.05	1748632.93	14437571.54	39°45'16.201"N	80°36'53.854"W	4.21	106.094	0.93	0.12	87.93
609.00	1.220	185.290	608.96	4.71	-2.67	3.98	1748632.86	14437570.04	39°45'16.186"N	80°36'53.855"W	4.80	123.827	0.58	0.56	8.74
693.00	1.120	195.190	692.95	5.68	-4.35	3.69	1748632.56	14437568.36	39°45'16.170"N	80°36'53.859"W	5.70	139.736	0.27	-0.12	11.79
774.00	0.580	167.630	773.94	6.42	-5.52	3.57	1748632.45	14437567.20	39°45'16.158"N	80°36'53.861"W	6.57	147.116	0.82	-0.67	-34.02
857.00	0.510	53.650	856.94	6.83	-5.71	3.95	1748632.83	14437567.00	39°45'16.156"N	80°36'53.856"W	6.94	145.288	1.10	-0.08	-137.33
940.00	0.450	214.640	939.93	6.94	-5.76	4.07	1748632.95	14437566.95	39°45'16.156"N	80°36'53.854"W	7.05	144.766	1.14	-0.07	193.96
1021.00	1.810	198.370	1020.92	7.57	-7.23	3.48	1748632.36	14437565.48	39°45'16.141"N	80°36'53.862"W	8.03	154.291	1.71	1.66	-20.09
1105.00	2.980	183.240	1104.84	9.61	-10.67	2.94	1748631.82	14437562.04	39°45'16.107"N	80°36'53.869"W	11.07	164.593	1.57	1.39	-18.01
1185.00	3.660	174.920	1184.71	12.95	-15.29	3.05	1748631.93	14437557.42	39°45'16.061"N	80°36'53.868"W	15.59	168.722	1.04	0.85	-10.40
1270.00	3.590	186.230	1269.54	16.69	-20.64	3.00	1748631.88	14437552.08	39°45'16.009"N	80°36'53.869"W	20.86	171.727	0.84	-0.08	13.31
1354.00	3.500	201.630	1353.38	19.35	-25.64	1.77	1748630.65	14437547.08	39°45'15.959"N	80°36'53.885"W	25.70	176.049	1.14	-0.11	18.33
1435.00	2.860	197.330	1434.26	21.26	-29.87	0.26	1748629.14	14437542.86	39°45'15.918"N	80°36'53.905"W	29.87	179.507	0.84	-0.79	-5.31
1519.00	2.970	202.040	1518.15	23.07	-33.88	-1.18	1748627.70	14437538.84	39°45'15.878"N	80°36'53.923"W	33.90	182.001	0.31	0.13	5.61
1601.00	3.760	217.400	1600.01	24.24	-37.99	-3.61	1748625.27	14437534.74	39°45'15.837"N	80°36'53.955"W	38.16	185.434	1.45	0.96	18.73
1685.00	4.290	226.110	1683.80	24.54	-42.35	-7.55	1748621.33	14437530.37	39°45'15.794"N	80°36'54.005"W	43.02	190.109	0.96	0.63	10.37
1770.00	4.220	228.870	1768.57	24.25	-46.62	-12.20	1748616.69	14437526.11	39°45'15.753"N	80°36'54.065"W	48.19	194.664	0.25	-0.08	3.25
1854.00	3.950	232.700	1852.35	23.64	-50.40	-16.83	1748612.06	14437522.33	39°45'15.715"N	80°36'54.124"W	53.14	198.462	0.46	-0.32	4.56
1938.00	3.090	236.190	1936.19	22.80	-53.41	-21.01	1748607.88	14437519.32	39°45'15.686"N	80°36'54.178"W	57.40	201.471	1.05	-1.02	4.15
1989.00	3.140	236.720	1987.12	22.25	-54.95	-23.32	1748605.57	14437517.79	39°45'15.671"N	80°36'54.208"W	59.69	202.997	0.11	0.10	1.04
2072.00	2.670	233.360	2070.01	21.50	-57.35	-26.77	1748602.12	14437515.39	39°45'15.647"N	80°36'54.252"W	63.29	205.027	0.60	-0.57	-4.05
2114.00	2.560	231.740	2111.97	21.24	-58.51	-28.29	1748600.60	14437514.22	39°45'15.636"N	80°36'54.272"W	64.99	205.806	0.32	-0.26	-3.86
2197.00	4.430	283.990	2194.83	18.27	-58.88	-32.86	1748596.03	14437513.85	39°45'15.632"N	80°36'54.330"W	67.43	209.163	4.22	2.25	62.95
2278.00	5.620	289.080	2275.52	12.01	-56.83	-39.64	1748589.25	14437515.80	39°45'15.653"N	80°36'54.417"W	69.29	214.898	1.57	1.47	6.28

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# Actual Wellpath Report

Columbia Gas Transmission MSH 9H AWP Proj: 13019'MD  
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REFERENCE WELLPATH IDENTIFICATION			
Operator	SOUTHWESTERN ENERGY	Slot	Slot 9H
Area	Marshall County, WV	Well	Columbia Gas Transmission MSH 9H
Field	Marshall	Wellbore	Columbia Gas Transmission MSH 9H AWB
Facility	Columbia Gas Transmission MSH Pad		

### WELLPATH DATA (175 stations)

MD [ft]	Inclination [°]	Azimuth [°]	TVD [ft]	Vert Sect [ft]	North [ft]	East [ft]	Grid East [US ft]	Grid North [US ft]	Latitude	Longitude	Closure Dist [ft]	Closure Dir [°]	DLS [°/100ft]	Build Rate [°/100ft]	Turn Rate [°/100ft]
2361.00	7.060	284.810	2358.01	3.94	-54.20	-48.42	1748580.48	14437518.53	39°45'15.679"N	80°36'54.529"W	72.68	221.775	1.82	1.73	-5.14
2445.00	7.640	279.960	2441.32	-5.11	-51.91	-58.91	1748570.00	14437520.82	39°45'15.702"N	80°36'54.663"W	78.52	228.611	1.01	0.69	-5.77
2528.00	7.670	283.930	2523.58	-14.38	-49.63	-69.72	1748559.19	14437523.10	39°45'15.725"N	80°36'54.802"W	85.58	234.556	0.64	0.04	4.78
2611.00	7.800	283.110	2605.82	-23.92	-47.02	-80.58	1748548.33	14437525.71	39°45'15.752"N	80°36'54.940"W	93.29	239.738	0.21	0.16	-0.99
2695.00	7.330	282.900	2689.09	-33.31	-44.53	-91.35	1748537.56	14437528.20	39°45'15.777"N	80°36'55.078"W	101.63	244.015	0.56	-0.56	-0.25
2778.00	7.180	281.260	2771.43	-42.12	-42.33	-101.60	1748527.32	14437530.39	39°45'15.799"N	80°36'55.209"W	110.07	247.381	0.31	-0.18	-1.98
2861.00	6.830	282.280	2853.81	-50.60	-40.27	-111.51	1748517.41	14437532.46	39°45'15.820"N	80°36'55.336"W	118.56	250.144	0.45	-0.42	1.23
2943.00	6.740	273.700	2935.23	-58.33	-38.92	-121.08	1748507.85	14437533.80	39°45'15.833"N	80°36'55.459"W	127.18	252.180	1.24	-0.11	-10.46
3025.00	6.800	271.980	3016.66	-65.51	-38.44	-130.73	1748498.20	14437534.28	39°45'15.838"N	80°36'55.582"W	136.27	253.613	0.26	0.07	-2.10
3107.00	5.960	267.480	3098.15	-71.95	-38.46	-139.84	1748489.10	14437534.26	39°45'15.839"N	80°36'55.699"W	145.03	254.621	1.19	-1.02	-5.49
3192.00	5.620	266.140	3182.72	-77.68	-38.94	-148.40	1748480.54	14437533.79	39°45'15.834"N	80°36'55.808"W	153.42	255.298	0.43	-0.40	-1.58
3277.00	5.310	267.200	3267.33	-83.07	-39.41	-156.48	1748472.46	14437533.32	39°45'15.830"N	80°36'55.912"W	161.37	255.864	0.38	-0.36	1.25
3361.00	5.030	265.610	3350.99	-88.09	-39.88	-164.03	1748464.91	14437532.84	39°45'15.826"N	80°36'56.009"W	168.81	256.335	0.37	-0.33	-1.89
3446.00	5.050	265.330	3435.66	-92.95	-40.47	-171.48	1748457.47	14437532.26	39°45'15.820"N	80°36'56.104"W	176.19	256.720	0.04	0.02	-0.33
3530.00	4.640	263.040	3519.36	-97.45	-41.18	-178.53	1748450.42	14437531.54	39°45'15.813"N	80°36'56.194"W	183.22	257.010	0.54	-0.49	-2.73
3615.00	5.110	261.180	3604.06	-101.81	-42.18	-185.69	1748443.26	14437530.55	39°45'15.804"N	80°36'56.286"W	190.42	257.202	0.58	0.55	-2.19
3697.00	5.120	269.240	3685.73	-106.53	-42.79	-192.95	1748436.00	14437529.94	39°45'15.798"N	80°36'56.379"W	197.64	257.497	0.88	0.01	9.83
3780.00	4.930	273.270	3768.41	-111.79	-42.63	-200.22	1748428.74	14437530.09	39°45'15.800"N	80°36'56.472"W	204.71	257.979	0.48	-0.23	4.86
3863.00	4.240	269.740	3851.15	-116.62	-42.45	-206.85	1748422.11	14437530.28	39°45'15.802"N	80°36'56.557"W	211.16	258.404	0.90	-0.83	-4.25
3946.00	4.850	268.900	3933.88	-121.22	-42.53	-213.42	1748415.54	14437530.20	39°45'15.802"N	80°36'56.641"W	217.62	258.731	0.74	0.73	-1.01
4029.00	5.280	264.580	4016.56	-126.10	-42.95	-220.73	1748408.23	14437529.77	39°45'15.798"N	80°36'56.735"W	224.87	258.988	0.69	0.52	-5.20
4113.00	5.740	270.940	4100.17	-131.59	-43.25	-228.78	1748400.19	14437529.48	39°45'15.795"N	80°36'56.838"W	232.83	259.295	0.91	0.55	7.57
4194.00	6.160	271.330	4180.74	-137.66	-43.08	-237.18	1748391.80	14437529.64	39°45'15.797"N	80°36'56.945"W	241.06	259.704	0.52	0.52	0.48
4278.00	7.030	267.210	4264.18	-144.39	-43.23	-246.82	1748382.16	14437529.50	39°45'15.796"N	80°36'57.069"W	250.57	260.066	1.18	1.04	-4.90
4360.00	6.940	262.360	4345.57	-150.78	-44.13	-256.74	1748372.24	14437528.60	39°45'15.787"N	80°36'57.196"W	260.50	260.247	0.73	-0.11	-5.91
4444.00	6.530	262.240	4428.99	-156.77	-45.45	-266.50	1748362.48	14437527.28	39°45'15.775"N	80°36'57.321"W	270.35	260.321	0.49	-0.49	-0.14
4527.00	5.980	258.960	4511.50	-162.05	-46.92	-275.42	1748353.57	14437525.81	39°45'15.761"N	80°36'57.435"W	279.39	260.333	0.79	-0.66	-3.95
4609.00	5.690	255.920	4593.07	-166.54	-48.72	-283.56	1748345.43	14437524.01	39°45'15.743"N	80°36'57.539"W	287.71	260.250	0.52	-0.35	-3.71
4691.00	4.960	258.670	4674.72	-170.61	-50.41	-290.98	1748338.02	14437522.32	39°45'15.727"N	80°36'57.635"W	295.31	260.172	0.94	-0.89	3.35
4776.00	4.340	257.970	4759.44	-174.41	-51.80	-297.72	1748331.27	14437520.93	39°45'15.713"N	80°36'57.721"W	302.20	260.130	0.73	-0.73	-0.82

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# Actual Wellpath Report

Columbia Gas Transmission MSH 9H AWP Proj: 13019'MD  
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REFERENCE WELLPATH IDENTIFICATION			
Operator	SOUTHWESTERN ENERGY	Slot	Slot 9H
Area	Marshall County, WV	Well	Columbia Gas Transmission MSH 9H
Field	Marshall	Wellbore	Columbia Gas Transmission MSH 9H AWB
Facility	Columbia Gas Transmission MSH Pad		

WELLPATH DATA (175 stations)															
MD [ft]	Inclination [°]	Azimuth [°]	TVD [ft]	Vert Sect [ft]	North [ft]	East [ft]	Grid East [US ft]	Grid North [US ft]	Latitude	Longitude	Closure Dist [ft]	Closure Dir [°]	DLS [°/100ft]	Build Rate [°/100ft]	Turn Rate [°/100ft]
4860.00	4.560	267.480	4843.19	-178.41	-52.61	-304.17	1748324.83	14437520.12	39°45'15.706"N	80°36'57.804"W	308.68	260.187	0.92	0.26	11.32
4944.00	4.720	272.130	4926.91	-183.20	-52.63	-310.96	1748318.04	14437520.10	39°45'15.706"N	80°36'57.890"W	315.38	260.394	0.49	0.19	5.54
5029.00	4.640	274.430	5011.63	-188.39	-52.23	-317.88	1748311.12	14437520.50	39°45'15.710"N	80°36'57.979"W	322.14	260.669	0.24	-0.09	2.71
5113.00	4.700	267.670	5095.35	-193.31	-52.11	-324.71	1748304.30	14437520.62	39°45'15.712"N	80°36'58.066"W	328.86	260.883	0.66	0.07	-8.05
5196.00	5.230	263.780	5178.04	-198.00	-52.66	-331.87	1748297.14	14437520.07	39°45'15.706"N	80°36'58.158"W	336.02	260.984	0.76	0.64	-4.69
5280.00	5.290	261.620	5261.69	-202.72	-53.64	-339.50	1748289.51	14437519.09	39°45'15.697"N	80°36'58.256"W	343.71	261.022	0.25	0.07	-2.57
5364.00	5.130	261.280	5345.34	-207.26	-54.77	-347.04	1748281.97	14437517.96	39°45'15.686"N	80°36'58.353"W	351.34	261.031	0.19	-0.19	-0.40
5447.00	5.320	262.810	5427.99	-211.83	-55.82	-354.53	1748274.49	14437516.92	39°45'15.676"N	80°36'58.449"W	358.90	261.053	0.28	0.23	1.84
5523.00	5.450	262.760	5503.66	-216.21	-56.71	-361.61	1748267.41	14437516.02	39°45'15.668"N	80°36'58.539"W	366.03	261.087	0.17	0.17	-0.07
5615.00	4.500	255.000	5595.31	-220.71	-58.20	-369.43	1748259.60	14437514.54	39°45'15.653"N	80°36'58.639"W	373.98	261.048	1.26	-1.03	-8.43
5640.00	3.570	216.720	5620.25	-221.09	-59.07	-370.84	1748258.18	14437513.66	39°45'15.645"N	80°36'58.658"W	375.52	260.949	11.14	-3.72	-153.12
5697.00	3.580	178.860	5677.15	-219.56	-62.28	-371.87	1748257.16	14437510.46	39°45'15.613"N	80°36'58.671"W	377.04	260.493	4.07	0.02	-66.42
5737.00	7.100	171.890	5716.97	-216.68	-65.97	-371.49	1748257.53	14437506.76	39°45'15.577"N	80°36'58.666"W	377.30	259.930	8.93	8.80	-17.43
5777.00	8.000	162.450	5756.63	-212.24	-71.08	-370.30	1748258.72	14437501.66	39°45'15.526"N	80°36'58.651"W	377.06	259.135	3.82	2.25	-23.60
5817.00	11.150	152.840	5796.07	-206.09	-77.17	-367.70	1748261.32	14437495.57	39°45'15.466"N	80°36'58.618"W	375.71	258.147	8.80	7.87	-24.03
5859.00	14.210	144.130	5837.04	-197.14	-84.97	-362.82	1748266.20	14437487.78	39°45'15.388"N	80°36'58.556"W	372.64	256.820	8.57	7.29	-20.74
5900.00	16.400	140.240	5876.58	-186.41	-93.49	-356.17	1748272.85	14437479.25	39°45'15.304"N	80°36'58.472"W	368.24	255.292	5.90	5.34	-9.49
5941.00	19.020	139.310	5915.64	-173.98	-103.01	-348.11	1748280.90	14437469.74	39°45'15.209"N	80°36'58.369"W	363.03	253.516	6.43	6.39	-2.27
5983.00	23.690	139.280	5954.74	-158.74	-114.60	-338.14	1748290.87	14437458.15	39°45'15.095"N	80°36'58.242"W	357.03	251.278	11.12	11.12	-0.07
6025.00	27.630	139.160	5992.59	-140.60	-128.37	-326.26	1748302.74	14437444.39	39°45'14.958"N	80°36'58.091"W	350.61	248.523	9.38	9.38	-0.29
6068.00	30.360	138.320	6030.20	-119.81	-144.03	-312.51	1748316.49	14437428.73	39°45'14.803"N	80°36'57.915"W	344.11	245.256	6.42	6.35	-1.95
6110.00	33.750	137.410	6065.79	-97.55	-160.55	-297.55	1748331.44	14437412.22	39°45'14.639"N	80°36'57.725"W	338.11	241.650	8.15	8.07	-2.17
6152.00	37.790	136.340	6099.86	-73.02	-178.46	-280.77	1748348.22	14437394.32	39°45'14.461"N	80°36'57.511"W	332.68	237.559	9.73	9.62	-2.55
6194.00	40.870	134.640	6132.35	-46.41	-197.43	-262.10	1748366.88	14437375.36	39°45'14.273"N	80°36'57.273"W	328.14	233.011	7.77	7.33	-4.05
6235.00	44.810	134.940	6162.41	-18.54	-217.07	-242.32	1748386.65	14437355.73	39°45'14.078"N	80°36'57.021"W	325.33	228.147	9.62	9.61	0.73
6276.00	47.180	133.840	6190.89	10.95	-237.69	-221.25	1748407.72	14437335.11	39°45'13.873"N	80°36'56.752"W	324.73	222.948	6.09	5.78	-2.68
6316.00	50.460	133.950	6217.22	41.05	-258.56	-199.56	1748429.40	14437314.25	39°45'13.666"N	80°36'56.475"W	326.62	217.661	8.20	8.20	0.27
6357.00	53.840	133.280	6242.37	73.41	-280.89	-176.12	1748452.83	14437291.93	39°45'13.444"N	80°36'56.177"W	331.54	212.088	8.34	8.24	-1.63
6398.00	57.130	132.780	6265.60	107.17	-303.94	-151.42	1748477.51	14437268.89	39°45'13.215"N	80°36'55.862"W	339.57	206.483	8.09	8.02	-1.22
6440.00	60.290	132.520	6287.41	143.03	-328.25	-125.03	1748503.90	14437244.59	39°45'12.974"N	80°36'55.525"W	351.25	200.852	7.54	7.52	-0.62

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REFERENCE WELLPATH IDENTIFICATION			
Operator	SOUTHWESTERN ENERGY	Slot	Slot 9H
Area	Marshall County, WV	Well	Columbia Gas Transmission MSH 9H
Field	Marshall	Wellbore	Columbia Gas Transmission MSH 9H AWB
Facility	Columbia Gas Transmission MSH Pad		

WELLPATH DATA (175 stations)															
MD [ft]	Inclination [°]	Azimuth [°]	TVD [ft]	Vert Sect [ft]	North [ft]	East [ft]	Grid East [US ft]	Grid North [US ft]	Latitude	Longitude	Closure Dist [ft]	Closure Dir [°]	DLS [°/100ft]	Build Rate [°/100ft]	Turn Rate [°/100ft]
6482.00	63.750	132.760	6307.12	180.08	-353.37	-97.75	1748531.17	14437219.48	39°45'12.725"N	80°36'55.177"W	366.64	195.462	8.25	8.24	0.57
6525.00	67.540	132.550	6324.85	219.22	-379.91	-68.94	1748559.96	14437192.95	39°45'12.461"N	80°36'54.810"W	386.11	190.286	8.83	8.81	-0.49
6567.00	70.980	132.870	6339.72	258.46	-406.55	-40.09	1748588.81	14437166.32	39°45'12.197"N	80°36'54.442"W	408.52	185.631	8.22	8.19	0.76
6609.00	74.810	133.530	6352.07	298.58	-434.02	-10.83	1748618.05	14437138.86	39°45'11.924"N	80°36'54.069"W	434.16	181.430	9.24	9.12	1.57
6650.00	78.290	133.530	6361.60	338.44	-461.48	18.07	1748646.95	14437111.41	39°45'11.651"N	80°36'53.700"W	461.84	177.757	8.49	8.49	0.00
6691.00	81.160	133.590	6368.92	378.77	-489.28	47.30	1748676.17	14437083.62	39°45'11.375"N	80°36'53.327"W	491.56	174.478	7.00	7.00	0.15
6733.00	84.330	133.810	6374.22	420.42	-518.06	77.42	1748706.27	14437054.85	39°45'11.090"N	80°36'52.943"W	523.81	171.500	7.57	7.55	0.52
6774.00	86.740	133.130	6377.41	461.28	-546.18	107.09	1748735.92	14437026.74	39°45'10.810"N	80°36'52.565"W	556.58	168.907	6.11	5.88	-1.66
6816.00	89.940	134.040	6378.63	503.24	-575.12	137.49	1748766.32	14436997.81	39°45'10.523"N	80°36'52.177"W	591.33	166.555	7.92	7.62	2.17
6858.00	89.600	136.430	6378.80	545.24	-604.94	167.06	1748795.88	14436968.01	39°45'10.227"N	80°36'51.800"W	627.58	164.562	5.75	-0.81	5.69
6941.00	90.150	139.010	6378.98	628.13	-666.34	222.90	1748851.69	14436906.63	39°45'09.618"N	80°36'51.089"W	702.63	161.504	3.18	0.66	3.11
7025.00	89.570	134.730	6379.18	712.06	-727.63	280.31	1748909.08	14436845.36	39°45'09.010"N	80°36'50.357"W	779.76	158.931	5.14	-0.69	-5.10
7110.00	89.750	131.790	6379.69	797.01	-785.87	342.21	1748970.95	14436787.14	39°45'08.432"N	80°36'49.568"W	857.15	156.470	3.47	0.21	-3.46
7192.00	89.690	131.500	6380.09	878.88	-840.36	403.48	1749032.20	14436732.67	39°45'07.891"N	80°36'48.786"W	932.21	154.353	0.36	-0.07	-0.35
7276.00	89.720	129.240	6380.52	962.61	-894.77	467.47	1749096.17	14436678.29	39°45'07.350"N	80°36'47.970"W	1009.52	152.415	2.69	0.04	-2.69
7359.00	89.600	129.890	6381.01	1045.26	-947.63	531.46	1749160.13	14436625.44	39°45'06.825"N	80°36'47.154"W	1086.49	150.715	0.80	-0.14	0.78
7441.00	89.690	127.300	6381.52	1126.75	-998.78	595.54	1749224.19	14436574.32	39°45'06.317"N	80°36'46.336"W	1162.85	149.194	3.16	0.11	-3.16
7523.00	89.350	125.410	6382.21	1207.84	-1047.39	661.57	1749290.20	14436525.73	39°45'05.834"N	80°36'45.493"W	1238.83	147.722	2.34	-0.41	-2.30
7606.00	89.780	125.870	6382.84	1289.76	-1095.75	729.02	1749357.62	14436477.39	39°45'05.353"N	80°36'44.633"W	1316.11	146.363	0.76	0.52	0.55
7688.00	89.910	128.290	6383.06	1371.00	-1145.18	794.44	1749423.01	14436427.97	39°45'04.861"N	80°36'43.798"W	1393.76	145.250	2.96	0.16	2.95
7772.00	89.940	133.450	6383.17	1454.76	-1200.13	857.94	1749486.48	14436373.05	39°45'04.316"N	80°36'42.988"W	1475.25	144.440	6.14	0.04	6.14
7855.00	89.940	137.620	6383.26	1537.74	-1259.35	916.06	1749544.59	14436313.85	39°45'03.728"N	80°36'42.247"W	1557.29	143.968	5.02	0.00	5.02
7939.00	89.910	139.670	6383.37	1621.55	-1322.40	971.56	1749600.06	14436250.82	39°45'03.102"N	80°36'41.540"W	1640.94	143.695	2.44	-0.04	2.44
8022.00	89.940	134.880	6383.48	1704.46	-1383.36	1027.86	1749656.34	14436189.89	39°45'02.498"N	80°36'40.823"W	1723.42	143.387	5.77	0.04	-5.77
8106.00	89.910	130.210	6383.59	1788.36	-1440.14	1089.73	1749718.19	14436133.13	39°45'01.934"N	80°36'40.034"W	1805.97	142.886	5.56	-0.04	-5.56
8190.00	89.350	133.030	6384.13	1872.22	-1495.92	1152.52	1749780.95	14436077.37	39°45'01.380"N	80°36'39.233"W	1888.41	142.388	3.42	-0.67	3.36
8272.00	89.480	131.260	6384.96	1954.12	-1550.94	1213.31	1749841.72	14436022.37	39°45'00.834"N	80°36'38.457"W	1969.15	141.964	2.16	0.16	-2.16
8356.00	89.260	129.130	6385.89	2037.83	-1605.15	1277.47	1749905.85	14435968.19	39°45'00.295"N	80°36'37.639"W	2051.44	141.485	2.55	-0.26	-2.54
8438.00	88.980	128.790	6387.15	2119.38	-1656.70	1341.22	1749969.58	14435916.65	39°44'59.783"N	80°36'36.826"W	2131.56	141.007	0.54	-0.34	-0.41
8520.00	89.290	129.090	6388.39	2200.93	-1708.23	1404.99	1750033.33	14435865.14	39°44'59.271"N	80°36'36.012"W	2211.80	140.563	0.53	0.38	0.37

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# Actual Wellpath Report

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REFERENCE WELLPATH IDENTIFICATION			
Operator	SOUTHWESTERN ENERGY	Slot	Slot 9H
Area	Marshall County, WV	Well	Columbia Gas Transmission MSH 9H
Field	Marshall	Wellbore	Columbia Gas Transmission MSH 9H AWB
Facility	Columbia Gas Transmission MSH Pad		

WELLPATH DATA (175 stations)															
MD [ft]	Inclination [°]	Azimuth [°]	TVD [ft]	Vert Sect [ft]	North [ft]	East [ft]	Grid East [US ft]	Grid North [US ft]	Latitude	Longitude	Closure Dist [ft]	Closure Dir [°]	DLS [°/100ft]	Build Rate [°/100ft]	Turn Rate [°/100ft]
8600.00	89.350	127.330	6389.34	2280.38	-1757.71	1467.85	1750096.16	14435815.68	39°44'58.779"N	80°36'35.210"W	2290.00	140.135	2.20	0.08	-2.20
8683.00	89.850	128.940	6389.91	2362.80	-1808.96	1533.13	1750161.41	14435764.45	39°44'58.270"N	80°36'34.377"W	2371.25	139.718	2.03	0.60	1.94
8766.00	89.750	129.690	6390.20	2445.41	-1861.55	1597.34	1750225.60	14435711.88	39°44'57.747"N	80°36'33.558"W	2452.93	139.368	0.91	-0.12	0.90
8849.00	89.690	136.300	6390.61	2528.32	-1918.12	1658.01	1750286.25	14435655.34	39°44'57.186"N	80°36'32.784"W	2535.39	139.160	7.96	-0.07	7.96
8933.00	89.780	138.550	6391.00	2612.23	-1979.97	1714.84	1750343.05	14435593.51	39°44'56.572"N	80°36'32.060"W	2619.34	139.104	2.68	0.11	2.68
9013.00	89.820	134.860	6391.28	2692.17	-2038.19	1769.69	1750397.88	14435535.32	39°44'55.994"N	80°36'31.361"W	2699.26	139.033	4.61	0.05	-4.61
9097.00	88.710	130.640	6392.36	2776.09	-2095.19	1831.35	1750459.52	14435478.34	39°44'55.428"N	80°36'30.575"W	2782.74	138.844	5.19	-1.32	-5.02
9181.00	88.250	130.670	6394.58	2859.83	-2149.89	1895.06	1750523.20	14435423.65	39°44'54.885"N	80°36'29.763"W	2865.88	138.605	0.55	-0.55	0.04
9265.00	87.880	130.880	6397.42	2943.56	-2204.72	1958.63	1750586.75	14435368.85	39°44'54.340"N	80°36'28.952"W	2949.07	138.383	0.51	-0.44	0.25
9348.00	88.000	131.570	6400.40	3026.34	-2259.38	2021.02	1750649.11	14435314.20	39°44'53.797"N	80°36'28.156"W	3031.39	138.187	0.84	0.14	0.83
9431.00	88.580	132.240	6402.88	3109.19	-2314.79	2082.76	1750710.83	14435258.81	39°44'53.247"N	80°36'27.369"W	3113.87	138.020	1.07	0.70	0.81
9514.00	88.580	130.950	6404.94	3192.03	-2369.88	2144.81	1750772.86	14435203.75	39°44'52.700"N	80°36'26.577"W	3196.33	137.854	1.55	0.00	-1.55
9598.00	88.650	133.970	6406.97	3275.92	-2426.56	2206.76	1750834.78	14435147.09	39°44'52.137"N	80°36'25.788"W	3279.94	137.716	3.60	0.08	3.60
9682.00	88.460	133.680	6409.09	3359.88	-2484.71	2267.34	1750895.34	14435088.97	39°44'51.560"N	80°36'25.015"W	3363.72	137.619	0.41	-0.23	-0.35
9764.00	88.520	130.260	6411.25	3441.73	-2539.52	2328.28	1750956.25	14435034.18	39°44'51.016"N	80°36'24.238"W	3445.29	137.485	4.17	0.07	-4.17
9847.00	88.680	132.010	6413.28	3524.53	-2594.10	2390.77	1751018.72	14434979.62	39°44'50.474"N	80°36'23.441"W	3527.77	137.336	2.12	0.19	2.11
9930.00	88.150	135.080	6415.57	3607.46	-2651.25	2450.90	1751078.83	14434922.49	39°44'49.906"N	80°36'22.675"W	3610.55	137.249	3.75	-0.64	3.70
10015.00	88.150	132.430	6418.32	3692.39	-2710.00	2512.26	1751140.16	14434863.76	39°44'49.323"N	80°36'21.892"W	3695.34	137.168	3.12	0.00	-3.12
10097.00	88.030	127.700	6421.05	3774.04	-2762.74	2574.96	1751202.84	14434811.05	39°44'48.799"N	80°36'21.093"W	3776.66	137.015	5.77	-0.15	-5.77
10181.00	88.150	124.770	6423.85	3857.03	-2812.35	2642.67	1751270.53	14434761.45	39°44'48.306"N	80°36'20.228"W	3859.15	136.782	3.49	0.14	-3.49
10263.00	87.910	128.970	6426.67	3938.16	-2861.51	2708.22	1751336.05	14434712.31	39°44'47.817"N	80°36'19.392"W	3939.89	136.577	5.13	-0.29	5.12
10348.00	88.090	131.880	6429.64	4022.84	-2916.59	2772.88	1751400.68	14434657.25	39°44'47.270"N	80°36'18.567"W	4024.35	136.447	3.43	0.21	3.42
10430.00	88.000	130.920	6432.44	4104.64	-2970.79	2834.35	1751462.13	14434603.08	39°44'46.732"N	80°36'17.783"W	4105.99	136.346	1.18	-0.11	-1.17
10515.00	88.460	135.470	6435.06	4189.54	-3028.93	2896.27	1751524.03	14434544.96	39°44'46.154"N	80°36'16.994"W	4190.80	136.283	5.38	0.54	5.35
10597.00	88.400	141.920	6437.31	4271.29	-3090.47	2950.35	1751578.08	14434483.44	39°44'45.544"N	80°36'16.305"W	4272.65	136.329	7.86	-0.07	7.87
10680.00	88.620	140.070	6439.47	4353.78	-3154.94	3002.57	1751630.28	14434418.99	39°44'44.904"N	80°36'15.640"W	4355.35	136.418	2.24	0.27	-2.23
10763.00	88.340	133.340	6441.68	4436.66	-3215.30	3059.43	1751687.12	14434358.66	39°44'44.305"N	80°36'14.916"W	4438.27	136.423	8.11	-0.34	-8.11
10845.00	88.610	130.220	6443.86	4518.50	-3269.91	3120.55	1751748.22	14434304.07	39°44'43.763"N	80°36'14.136"W	4519.97	136.339	3.82	0.33	-3.80
10928.00	88.060	126.970	6446.27	4600.96	-3321.65	3185.39	1751813.03	14434252.35	39°44'43.249"N	80°36'13.309"W	4602.18	136.200	3.97	-0.66	-3.92
11010.00	87.810	125.550	6449.23	4681.98	-3370.12	3251.46	1751879.08	14434203.90	39°44'42.767"N	80°36'12.466"W	4682.92	136.027	1.76	-0.30	-1.73

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**REFERENCE WELLPATH IDENTIFICATION**

Operator	SOUTHWESTERN ENERGY
Area	Marshall County, WV
Field	Marshall
Facility	Columbia Gas Transmission MSH Pad
Slot	Wellbore
Slot 9H	Columbia Gas Transmission MSH 9H

**WELLPATH DATA (175 stations)**

MD	Inclination	Azimuth	TVD	Vert Sect	North	East	Grid East	Grid North	Latitude	Longitude	Closure Dist	Closure Dir	DLS	Build Rate	Turn Rate
(ft)	(°)	(°)	(ft)	(ft)	(ft)	(ft)	(US ft)	(US ft)	(°N)	(°W)	(ft)	(°)	(ft/100ft)	(%/100ft)	(%/100ft)
11093.00	88.060	125.280	6452.22	4763.80	-3418.19	3319.06	1751946.65	14434155.85	39°44'42.28"N	80°36'11.60"W	4764.47	135.843	0.44	0.30	-0.33
11176.00	88.180	127.610	6454.94	4845.85	-3467.46	3385.79	1752013.35	14434106.59	39°44'41.79"N	80°36'10.75"W	4846.32	135.683	2.81	0.14	2.81
11260.00	88.000	136.300	6457.74	4929.61	-3523.54	3448.16	1752303.78	14434050.54	39°44'41.24"N	80°36'09.95"W	4930.02	135.619	10.34	-0.21	10.35
11343.00	88.060	134.770	6460.60	5012.55	-3582.73	3506.26	1752137.78	14433991.37	39°44'40.65"N	80°36'09.21"W	5012.97	135.618	1.84	0.07	-1.84
11427.00	88.000	134.680	6463.49	5096.50	-3641.76	3565.96	1752193.46	14433932.37	39°44'40.06"N	80°36'08.45"W	5096.91	135.602	0.24	-0.07	-0.23
11511.00	87.750	134.210	6466.60	5180.44	-3700.48	3625.94	1752253.41	14433873.66	39°44'39.486"N	80°36'07.691"W	5180.83	135.583	0.53	-0.30	-0.44
11592.00	88.370	133.800	6469.34	5261.39	-3756.72	3684.17	1752311.62	14433817.45	39°44'38.927"N	80°36'06.949"W	5261.76	135.559	0.92	0.77	-0.51
11677.00	87.540	130.310	6472.38	5346.22	-3813.62	3747.23	1752374.65	14433760.58	39°44'38.362"N	80°36'06.145"W	5346.53	135.503	4.22	-0.98	-4.11
11757.00	87.720	133.500	6475.69	5426.03	-3866.99	3806.71	1752434.11	14433707.22	39°44'37.832"N	80°36'05.386"W	5426.30	135.450	3.99	0.23	3.99
11840.00	87.660	137.040	6479.03	5508.95	-3925.90	3865.07	1752492.45	14433648.33	39°44'37.247"N	80°36'04.642"W	5509.22	135.447	4.26	-0.07	4.27
11924.00	87.540	136.720	6482.55	5592.70	-3987.16	3922.43	1752549.79	14433587.10	39°44'36.639"N	80°36'03.912"W	5593.12	135.469	0.41	-0.14	-0.38
12008.00	87.600	136.700	6486.11	5676.72	-4048.25	3979.98	1752607.31	14433526.03	39°44'36.033"N	80°36'03.178"W	5677.02	135.487	0.08	0.07	-0.02
12091.00	88.150	138.040	6489.19	5759.57	-4109.27	4036.15	1752663.46	14433465.03	39°44'35.428"N	80°36'02.463"W	5759.92	135.514	1.74	0.66	1.61
12175.00	87.410	135.400	6492.44	5843.45	-4170.38	4093.69	1752720.98	14433403.96	39°44'34.821"N	80°36'01.730"W	5843.83	135.532	3.26	-0.88	-3.14
12260.00	87.630	133.500	6496.12	5928.37	-4229.84	4164.31	1752781.58	14433344.51	39°44'34.231"N	80°36'00.957"W	5928.73	135.516	2.25	0.26	-2.24
12342.00	87.600	130.790	6499.53	6010.19	-4284.81	4215.05	1752842.29	14433289.56	39°44'33.685"N	80°36'00.183"W	6010.51	135.470	3.30	-0.04	-3.30
12426.00	87.510	127.570	6503.12	6093.69	-4337.82	4280.10	1752907.31	14433236.57	39°44'33.158"N	80°35'59.353"W	6093.93	135.384	3.83	-0.11	-3.83
12510.00	88.060	126.920	6506.37	6176.88	-4388.62	4346.91	1752974.10	14433185.79	39°44'32.653"N	80°35'58.500"W	6177.03	135.274	1.01	0.65	-0.77
12594.00	87.570	129.280	6509.57	6260.23	-4440.41	4412.96	1753040.13	14433134.02	39°44'32.138"N	80°35'57.658"W	6260.31	135.178	2.87	-0.58	2.81
12675.00	87.450	133.660	6513.09	6340.99	-4493.99	4473.59	1753100.73	14433080.47	39°44'31.606"N	80°35'56.885"W	6341.05	135.130	5.40	-0.15	5.41
12758.00	87.480	132.760	6516.76	6423.87	-4550.76	4534.02	1753161.14	14433023.72	39°44'31.043"N	80°35'56.114"W	6423.92	135.106	1.08	0.04	-1.08
12843.00	87.630	130.870	6520.39	6508.67	-4607.38	4597.31	1753224.40	14432967.12	39°44'30.480"N	80°35'55.307"W	6508.70	135.063	2.23	0.18	-2.22
12927.00	88.000	128.240	6523.59	6592.24	-4660.83	4662.02	1753289.09	14432913.69	39°44'29.949"N	80°35'54.482"W	6592.25	134.993	3.16	0.44	-3.13
12994.00	87.540	124.840	6526.20	6658.47	-4700.68	4715.80	1753342.85	14432873.85	39°44'29.553"N	80°35'53.796"W	6658.47	134.908	5.12	-0.69	-5.07
13019.00	87.540	124.840	6527.27	6683.06	-4714.95	4736.30	1753363.34	14432859.59	39°44'29.411"N	80°35'53.534"W	6683.06	134.871	0.00	0.00	0.00

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# Actual Wellpath Report

Columbia Gas Transmission MSH 9H AWP Proj: 13019'MD  
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REFERENCE WELLPATH IDENTIFICATION			
Operator	SOUTHWESTERN ENERGY	Slot	Slot 9H
Area	Marshall County, WV	Well	Columbia Gas Transmission MSH 9H
Field	Marshall	Wellbore	Columbia Gas Transmission MSH 9H AWB
Facility	Columbia Gas Transmission MSH Pad		

HOLE & CASING SECTIONS										
- Ref Wellbore: Columbia Gas Transmission MSH 9H AWB      Ref Wellpath: Columbia Gas Transmission MSH 9H AWP Proj: 13019'MD										
String/Diameter	Start MD [ft]	End MD [ft]	Interval [ft]	Start TVD [ft]	End TVD [ft]	Start N/S [ft]	Start E/W [ft]	End N/S [ft]	End E/W [ft]	
20in Conductor	26.00	125.00	99.00	26.00	125.00	0.00	0.00	-0.06	0.36	
17.5in Open Hole	125.00	355.00	230.00	125.00	354.98	-0.06	0.36	-0.49	3.00	
13.375in Casing Surface	26.00	343.00	317.00	26.00	342.98	0.00	0.00	-0.47	2.91	
12.25in Open Hole	355.00	2067.00	1712.00	354.98	2065.02	-0.49	3.00	-57.21	-26.58	
9.625in Casing Intermediate	26.00	2047.00	2021.00	26.00	2045.04	0.00	0.00	-56.64	-25.81	
8.75in Open Hole	2067.00	5605.00	3538.00	2065.02	5585.34	-57.21	-26.58	-58.00	-368.66	
8.5in Open Hole	5605.00	13019.00	7414.00	5585.34	6527.27	-58.00	-368.66	-4714.95	4736.30	

TARGETS								
Name	TVD [ft]	North [ft]	East [ft]	Grid East [US ft]	Grid North [US ft]	Latitude	Longitude	Shape
Columbia Gas Transmission MSH 9H LP Rev-1	6382.00	-560.00	120.25	1748749.08	14437012.93	39°45'10.673"N	80°36'52.397"W	point
Columbia Gas Transmission MSH 9H BHL Rev-1	6530.00	-4716.58	4736.84	1753363.88	14432857.96	39°44'29.395"N	80°35'53.528"W	point

WELLPATH COMPOSITION - Ref Wellbore: Columbia Gas Transmission MSH 9H AWB      Ref Wellpath: Columbia Gas Transmission MSH 9H AWP Proj: 13019'MD				
Start MD [ft]	End MD [ft]	Positional Uncertainty Model	Log Name/Comment	Wellbore
26.00	316.00	BHI NaviTrak (Axial)	01_APS EM <17.5"> (207'-316')	Columbia Gas Transmission MSH 9H AWB
316.00	1989.00	BHI NaviTrak (Axial)	02_APS EM <12.25"> (316')(364'-1989')	Columbia Gas Transmission MSH 9H AWB
1989.00	5447.00	BHI NaviTrak (Axial)	03_APS EM <8.75">(1989')(2072'-5447')	Columbia Gas Transmission MSH 9H AWB
5447.00	12994.00	BHI AutoTrak Curve (Short)	04_BH AT Curve <8.5"> (5447')(5523'-12994')	Columbia Gas Transmission MSH 9H AWB
12994.00	13019.00	Blind Drilling (std)	Projection to bit	Columbia Gas Transmission MSH 9H AWB

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REFERENCE WELLPATH IDENTIFICATION			
Operator	SOUTHWESTERN ENERGY	Slot	Slot 9H
Area	Marshall County, WV	Well	Columbia Gas Transmission MSH 9H
Field	Marshall	Wellbore	Columbia Gas Transmission MSH 9H AWB
Facility	Columbia Gas Transmission MSH Pad		

COMMENTS
<p><b>Wellpath general comments</b>            API: 47-051-01942-0000            Job#: 8990352            Rig: SDC 42            Duration: 02/13/2018 - 02/24/2018</p>

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**COLUMBIA GAS TRANSMISSION UD MSH 9H  
ATTACHMENT 1  
PERF REPORT**

STAGE NUM	Perf Date	Perf Top MD	Perf Bottom MD	# SHOTS PER STG
1	3/27/2018	12,888	12,837	36
2	3/28/2018	12,804	12,732	33
3	3/29/2018	12,699	12,627	33
4	3/29/2018	12,594	12,522	33
5	3/30/2018	12,489	12,417	33
6	3/30/2018	12,384	12,312	33
7	3/31/2018	12,279	12,207	33
8	3/31/2018	12,174	12,102	33
9	4/1/2018	12,069	11,997	33
10	4/1/2018	11,964	11,892	33
11	4/2/2018	11,859	11,787	33
12	4/2/2018	11,754	11,682	33
13	4/3/2018	11,649	11,577	33
14	4/5/2018	11,544	11,472	33
15	4/6/2018	11,439	11,367	33
16	4/6/2018	11,334	11,262	33
17	4/7/2018	11,229	11,157	33
18	4/7/2018	11,124	11,052	33
19	4/7/2018	11,019	10,947	33
20	4/8/2018	10,914	10,842	33
21	4/8/2018	10,809	10,737	33
22	4/9/2018	10,704	10,632	33
23	4/9/2018	10,599	10,527	33
24	4/9/2018	10,494	10,422	33
25	4/10/2018	10,389	10,317	33
26	4/11/2018	10,284	10,212	33
27	4/12/2018	10,179	10,107	33
28	4/12/2018	10,074	10,002	33
29	4/13/2018	9,969	9,897	33
30	4/13/2018	9,864	9,792	33
31	4/15/2018	9,759	9,687	33
32	4/15/2018	9,654	9,582	33
33	4/15/2018	9,549	9,477	33
34	4/16/2018	9,444	9,372	33
35	4/16/2018	9,339	9,267	33
36	4/17/2018	9,234	9,162	33
37	4/18/2018	9,129	9,057	33
38	4/18/2018	9,024	8,952	33
39	4/19/2018	8,919	8,847	33
40	4/19/2018	8,814	8,742	33
41	4/19/2018	8,709	8,637	33
42	4/20/2018	8,604	8,532	33
43	4/20/2018	8,499	8,427	33

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**COLUMBIA GAS TRANSMISSION UD MSH 9H  
ATTACHMENT 1  
PERF REPORT**

STAGE NUM	Perf Date	Perf Top MD	Perf Bottom MD	# SHOTS PER STG
44	4/21/2018	8,394	8,322	33
45	4/21/2018	8,289	8,217	33
46	4/21/2018	8,184	8,112	33
47	4/22/2018	8,079	8,007	33
48	4/22/2018	7,974	7,898	33
49	4/22/2018	7,869	7,797	33
50	4/23/2018	7,764	7,689	33
51	4/24/2018	7,659	7,587	33
52	4/24/2018	7,554	7,482	33
53	4/25/2018	7,449	7,377	33
54	4/25/2018	7,344	7,272	33
55	4/26/2018	7,239	7,167	33
56	4/26/2018	7,134	7,062	33
57	4/26/2018	7,029	6,957	33
58	4/27/2018	6,924	6,852	33
59	4/27/2018	6,819	6,747	33

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COLUMBIA GAS TRANSMISSION UD MSH 9H  
 ATTACHMENT 2  
 STIM REPORT

STAGE NUM	Stim Date	Ave Pump Rate (BPM)	Ave Treatment Pressure (PSI)	Max Breakdown Pressure (PSI)	ISIP (PSI)	Amount of Proppant (lbs)	Amount of water bbls	Amount of nitrogen/other
1	3/28/2018	78	7,929	6,374	4,164	197,260	7,241	0
2	3/28/2018	80	7,531	6,467	4,195	199,520	3,979	0
3	3/29/2018	72	7,735	7,298	4,007	201,040	3,652	0
4	3/30/2018	79	7,985	6,546	4,135	206,340	3,701	0
5	3/30/2018	77	7,978	6,847	4,155	199,200	3,707	0
6	3/31/2018	77	7,837	6,792	4,028	194,700	3,557	0
7	3/31/2018	74	8,056	7,175	4,133	197,700	3,477	0
8	4/1/2018	74	7,880	7,318	4,059	195,040	3,538	0
9	4/1/2018	73	7,696	5,934	3,801	196,880	3,468	0
10	4/2/2018	76	7,771	6,903	3,862	200,640	3,549	0
11	4/2/2018	74	7,426	5,332	4,047	194,254	3,436	0
12	4/3/2018	79	7,815	7,080	4,261	195,480	3,453	0
13	4/5/2018	75	7,625	7,105	4,206	196,080	3,564	0
14	4/6/2018	70	7,589	7,221	4,225	195,760	3,543	0
15	4/6/2018	76	7,700	6,560	4,085	192,260	3,396	0
16	4/6/2018	75	7,802	6,832	4,100	190,640	3,486	0
17	4/7/2018	78	7,790	6,735	4,046	189,120	3,452	0
18	4/7/2018	74	7,746	7,171	4,581	193,840	3,365	0
19	4/8/2018	78	7,776	7,391	4,295	192,160	3,293	0
20	4/8/2018	76	7,945	7,470	4,424	190,400	3,250	0
21	4/8/2018	74	7,207	7,220	4,218	198,320	3,250	0
22	4/9/2018	75	7,876	7,317	4,339	187,500	3,370	0
23	4/9/2018	75	7,942	6,967	4,481	193,400	3,340	0
24	4/10/2018	78	7,938	7,241	4,651	220,780	3,681	0
25	4/11/2018	76	7,663	7,506	4,048	215,470	3,552	0
26	4/11/2018	78	7,630	8,041	4,175	210,465	3,496	0
27	4/12/2018	77	7,463	7,541	4,015	214,405	3,361	0
28	4/13/2018	78	7,979	7,387	4,077	211,645	3,465	0
29	4/13/2018	76	7,496	7,064	4,043	216,365	3,434	0
30	4/15/2018	78	7,207	4,986	4,024	210,200	3,419	0
31	4/15/2018	77	7,416	7,664	4,347	214,675	3,500	0
32	4/15/2018	76	7,350	7,395	4,081	207,580	3,282	0
33	4/16/2018	79	7,671	7,733	3,996	207,920	3,577	0
34	4/16/2018	79	7,384	7,458	4,075	209,400	3,313	0
35	4/17/2018	76	7,775	7,217	4,239	208,200	3,304	0
36	4/18/2018	74	7,303	6,690	4,113	208,046	3,392	0
37	4/18/2018	74	7,139	6,102	4,395	207,220	3,399	0
38	4/19/2018	79	6,954	6,698	4,287	209,120	3,298	0
39	4/19/2018	78	7,117	7,090	4,125	210,440	3,309	0
40	4/19/2018	78	7,037	4,239	3,976	209,540	3,398	0
41	4/20/2018	75	7,095	7,456	4,023	207,740	3,293	0
42	4/20/2018	78	7,048	6,433	4,193	210,080	3,333	0
43	4/20/2018	78	6,951	7,221	4,307	211,700	3,798	0
44	4/21/2018	77	7,161	5,865	3,921	209,640	3,217	0
45	4/21/2018	78	7,027	7,107	3,792	208,160	3,266	0
46	4/22/2018	80	7,456	5,727	4,047	211,620	3,130	0
47	4/22/2018	75	7,175	5,931	4,006	207,480	3,276	0
48	4/22/2018	74	7,063	7,398	4,455	206,700	3,220	0
49	4/23/2018	73	6,874	7,282	4,118	206,280	3,236	0
50	4/23/2018	70	7,004	6,819	4,020	206,080	3,243	0
51	4/24/2018	77	6,857	6,414	3,682	203,980	3,155	0
52	4/25/2018	72	7,052	7,429	3,957	197,060	3,007	0
53	4/25/2018	74	7,128	7,233	3,790	206,040	3,135	0
54	4/25/2018	75	7,206	7,308	3,981	207,160	3,220	0
55	4/26/2018	74	7,370	6,983	3,835	206,960	3,083	0
56	4/26/2018	75	7,022	7,232	3,892	206,980	3,063	0
57	4/26/2018	74	7,378	6,965	4,542	207,920	3,020	0
58	4/27/2018	76	6,985	6,939	3,908	206,460	3,051	0
59	4/27/2018	77	7,179	6,933	4,167	207,060	2,970	0

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Attachment 3

Well Name: Columbia Gas Transmission UD MSH 9H

47051019420000

LITHOLOGY/FORMATION	TOP DEPTH, MD (FT)	TOP DEPTH, TVD (FT)	BOTTOM DEPTH, MD (FT)	BOTTOM DEPTH, TVD (FT)	QUANTITY AND TYPE OF FLUID
Base of Fresh Water	300.00	300.00			
Top of Salt Water	629.00	629.00	NA	NA	
Pittsburgh Coal	467.00	467.00	NA	NA	
Pottsville (ss)	628.00	628.00	648.00	648.00	
Mauch Chunk (shale)	780.00	780.00	1589.00	1589.00	
Raven Cliff (ss)	1137.00	1137.00	1362.00	1362.00	
Maxton (ss)	1362.00	1362.00	1589.00	1589.00	
Greenbriar (ls)	1589.00	1589.00	1641.00	1641.00	
Big Injun (ss)	1641.00	1641.00	2203.00	2203.00	
Berea (siltstone)	2203.00	2203.00	5996.00	5835.00	
Rhinestreet (shale)	5855.00	5833.00	6217.00	6149.00	
Cashaqua (shale)	6217.00	6149.00	6470.00	6301.00	
Middlesex (shale)	6470.00	6301.00	6667.00	6365.00	
Burket (shale)	6667.00	6365.00	NA	NA	GAS

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## Hydraulic Fracturing Fluid Product Component Information Disclosure

Job Start Date:	3/28/2018
Job End Date:	4/27/2018
State:	West Virginia
County:	Marshall
API Number:	47-051-01942-00-00
Operator Name:	Southwestern Energy
Well Name and Number:	Columbia Gas Transmission MSH 9
Latitude:	39.75450362
Longitude:	-80.61497393
Datum:	NAD83
Federal Well:	NO
Indian Well:	NO
True Vertical Depth:	6,429
Total Base Water Volume (gal):	8,366,446
Total Base Non Water Volume:	0



### Hydraulic Fracturing Fluid Composition:

Trade Name	Supplier	Purpose	Ingredients	Chemical Abstract Service Number (CAS #)	Maximum Ingredient Concentration in Additive (% by mass)**	Maximum Ingredient Concentration in HF Fluid (% by mass)**	Comments
Ecopol-FEAC	SWN Well Services	Iron Control					
				Listed Below			
BIOC11219A	Nalco	Biocide					
				Listed Below			

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Sand	SWN Well Services	Proppant					
				Listed Below			
HCL	SWN Well Services	Solvent					
				Listed Below			
Base Water	Operator	Base Fluid					
				Listed Below			
FLOJET DR 9000LPP	SWN Well Services	Friction Reducer					
				Listed Below			
SCAL16486A	Nalco	Scale Inhibitor					
				Listed Below			
Econo-CI200	SWN Well Services	Corrosion Inhibitor					
				Listed Below			

Items above are Trade Names with the exception of Base Water . Items below are the individual ingredients.

			Water	7732-18-5	100.00000	83.77099	Density = 8.345
			Crystalline Silica, quartz	14808-60-7	100.00000	14.42710	
			Water	7732-18-5	85.00000	1.47394	
			Hydrochloric Acid	7647-01-0	15.00000	0.25391	
			Petroleum Distillates, Hydrotreated	64742-47-8	45.00000	0.03078	
			Methanol	67-56-1	60.00000	0.01233	
			Ethylene glycol	107-21-1	10.00000	0.00942	
			Benzyl-(C12-C16 Alky)-Dimethyl-Ammonium	68424-85-1	30.00000	0.00616	

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			Acetic Acid	64-19-7	37.50000	0.00338	
			Amine Triphosphate	Proprietary	30.00000	0.00258	
			Methanol	67-56-1	80.00000	0.00208	
			Chloride Glutaraldehyde	111-30-8	10.00000	0.00205	
			Citric Acid	77-92-9	22.50000	0.00203	
			Fatty alcohols ethoxylated	Proprietary	2.00000	0.00137	
			Alcohols, C12- C16, Ethoxylated propoxylated	68213-24-1	2.00000	0.00137	
			Oxyalkylated fatty acid	68951-67-7	9.67400	0.00025	
			Fatty acids	61790-12-3	5.02700	0.00013	
			Modified thiourea polymer	68527-49-1	4.74600	0.00012	
			Potassium acetate	127-08-2	0.02200	0.00000	
			Formaldehyde	50-00-0	0.00400	0.00000	

\* Total Water Volume sources may include various types of water including fresh water, produced water, and recycled water

\*\* Information is based on the maximum potential for concentration and thus the total may be over 100%

\*\*\* If you are calculating a percentage of total ingredients do not add the water volume below the green line to the water volume above the green line

Note: For Field Development Products (products that begin with FDP), MSDS level only information has been provided.

Ingredient information for chemicals subject to 29 CFR 1910.1200(i) and Appendix D are obtained from suppliers Material Safety Data Sheets (MSDS)

WV Department of  
Environmental Protection  
AUG 3 2018  
OFFICE OF CHEMICAL GAS  
REGULATIONS

**ELK LAKE SERVICES, LLC**

280 Indian Springs Road,  
Suite 123 Indiana, PA 15701  
Phone: (724) 463-7303



**NOTES ON SURVEY**

1. SURFACE AND ROYALTY OWNER INFORMATION AND THEIR BOUNDARIES SHOWN HEREON WERE PLOTTED FROM DEEDS AND/OR TAX PARCEL MAPS PROVIDED BY CLIENT AND/OR FIELD LOCATIONS.
2. THIS PLAT DOES NOT REPRESENT A BOUNDARY SURVEY OF THE PARCELS SHOWN HEREON.
3. ALL INSETS ARE GRID NORTH UNLESS OTHERWISE DEPICTED.

**LEGEND:**

- PROPOSED SURFACE HOLE / BOTTOM HOLE
- EXISTING / PRODUCING WELLHEAD
- LANDING POINT LOCATION
- FLOOD PLAIN
- ACCESS ROAD
- PUBLIC ROAD
- ACCESS ROAD TO PREV. SITE
- LEASE BOUNDARY
- EXISTING PATH
- PROPOSED PATH

WELL OPERATOR:  
SWN PRODUCTION COMPANY, LLC  
ADDRESS:  
P.O. BOX 1300 JANE LEW, WV 26378  
SURFACE OWNER:  
COLUMBIA GAS TRANSMISSION, LLC

WELL (FARM) NAME: COLUMBIA GAS TRANSMISSION UD MSH	WELL # 9H	SERIAL # XXXX
COUNTY MARSHALL COUNTY - 51	DISTRICT: LIBERTY	
USGS 7 1/2 QUADRANGLE MAP NAME CAMERON, WV		

Latitude: 39°47'30"

SURFACE HOLE 8896'

Latitude: 39°45'00" BOTTOM HOLE

4180'

# ELK LAKE SERVICES, LLC

280 Indian Springs Road,  
Suite 123 Indiana, PA 15701  
Phone: (724) 463-7303

### SURFACE HOLE LOCATION (SHL):

UTM (NAD83, ZONE 17, METERS):  
NORTHING: 4,400,581.00  
EASTING: 532,983.08

### LANDING POINT (LPL):

UTM (NAD83, ZONE 17, METERS):  
NORTHING: 4,400,405.70  
EASTING: 533,025.04

### BOTTOM HOLE LOCATION (BHL):

UTM (NAD83, ZONE 17, METERS):  
NORTHING: 4,399,143.87  
EASTING: 534,426.76

### SURFACE HOLE LOCATION (SHL):

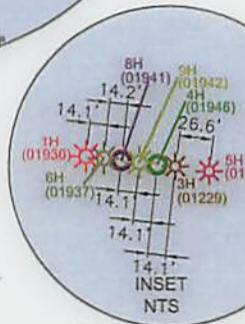
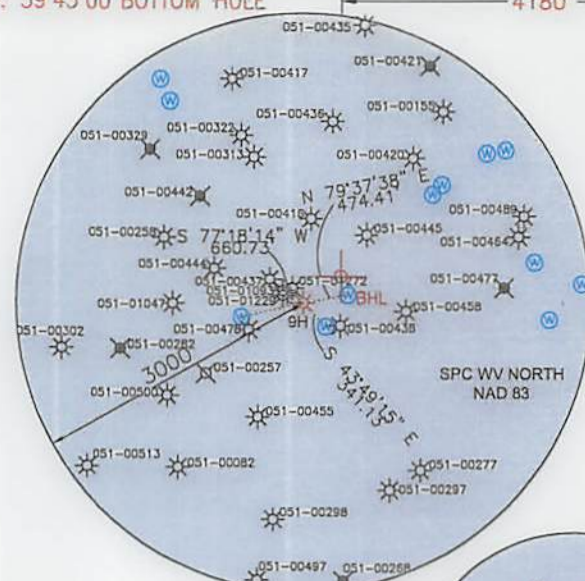
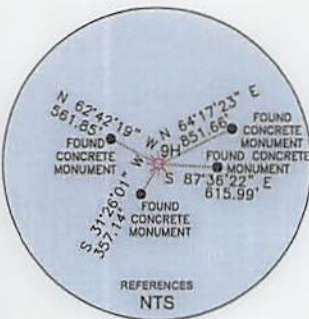
UTM (NAD83, ZONE 17, METERS):  
NORTHING: 4,400,580.96  
EASTING: 532,983.15

### LANDING POINT (LPL):

UTM (NAD83, ZONE 17, METERS):  
NORTHING: 4,400,410.34  
EASTING: 533,019.79

### BOTTOM HOLE LOCATION (BHL):

UTM (NAD83, ZONE 17, METERS):  
NORTHING: 4,399,143.90  
EASTING: 534,426.38



TRACT	SURFACE OWNER (S) / ROYALTY OWNER (R)	TAX PARCEL	ACRES
1	COLUMBIA GAS TRANSMISSION, LLC (S) WILMA M GATTEN, F/K/A WILMA G KESTNER, A WIDOW (R)	7-19-10	55.150000
2	CAROLYN BETH FRANCIS	07-19-7	2.400000
3	CAROLYN JO MORRIS	07-19-8	1.304000
4	MICHAEL L. WHITEBURN & CARLA M. ALLEY	07-19-9	4.000000
5	CAROLYN BETH FRANCIS	07-19-39	0.500000
6	CAROLYN BETH FRANCIS	07-19-41	1.544000
7	CAROLYN BETH FRANCIS	07-19-40	0.913400
8	CAROLYN BETH FRANCIS	07-19-42	1.800000
9	WAGON OAK FARM, LLC	07-19-88	30.000000
10	JOHN M AND TERESA L HORNER, HIS WIFE	07-19-12	75.000000
11	PEGGY M. CHIBBEN	07-19-29	115.400000
12	REVOCABLE LIVING TRUST OF M. PEGGY CHIBBEN	07-19-28	112.160000

TRACT	SURFACE OWNER	TAX PARCEL	ACRES
A	MASON DIXON FARMS, LLC	7-16-7	84.7320
B	JOHN DEAN BRIGGS, ET UX	7-16-4	81.2500
C	TAMARA L. CHELETTE	7-16-9	11.2000
D	EDWARD I. GILBERT	7-19-12	1.0000
E	MARY LESTER GRAM, LIFE ESTATE	7-19-01	4.8334
F	THOMAS A. & KAREN S. BUKOSKY	7-19-06	0.8500
G	DIANE LEE RINE	7-19-03	7.8183
H	JEREMIAH & ANDREA MAGERS	7-19-01	3.0000
I	DIANE LEE RINE	7-19-11	1.7800
J	JEREMIAH & ANDREA MAGERS	7-19-02	1.9700
K	JOHN C. & SONIA M. RICHARDS	7-19-13	5.4800
L	JOHN C. & SONIA M. RICHARDS	7-19-14	1.8700
M	STEVEN D. & SHERRI A. ZELIC	7-19-10	1.0000
N	JOHN M. & TERESA L. HORNER	7-19-05	1.0000
O	NICK ZELIC, ET UX	7-19-27	38.0000
P	WVA DEPT OF HIGHWAYS	7-19-29.1	0.3810
Q	CHURCH OF CHRIST, TRUSTEES	7-19-25	0.7500
R	JAMES F. REGIE SR., ET AL	7-19-24	0.0800
S	JAMES F. REGIE SR., ET AL	7-19-23	1.1700
T	JAMES F. JR. & GINGER E. REGIE	7-19-23.2	2.3800
U	JAMES F. & JAMIE ANN DRUSCHEL	7-19-23.1	4.4200
V	GAIL CUMPTON	7-19-20	14.7300
W	ROBERT THOMAS BARR	7-19-09	79.7000
X	BRAD FROMHART, ET UX, LIFE ESTATE	7-20-41	57.0000
Y	WVA WILDLIFE RESOURCES	7-24-1	1842.2800
Z	JAMES F. MORGAN, LIFE ESTATE	7-26-14	73.8600
AA	JENNIFER L. & VICTOR A. ROMACK	7-19-08	48.8100
AB	DELORCA A. HORNER, LIFE ESTATE	7-19-20	119.850000
AC	MASON DIXON FARMS, LLC	7-19-11	160.487
AD	MASON DIXON FARMS, LLC	7-17-33	217.0000
AE	MASON DIXON FARMS, LLC	7-19-09	6.0700
AF	MICHAEL E. & DONNA D. RICHARDS	7-19-02	1.7000
AG	TERESA LYNETTE POPPE	7-19-07	0.5500
AH	MICHAEL E. & DONNA D. RICHARDS	7-19-03	0.5100
AI	CAROLYN JO MORRIS	7-19-5	1.3700
AJ	JACK J. BRIGGS	7-16-5	37.8800

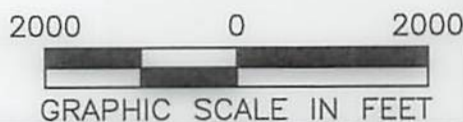
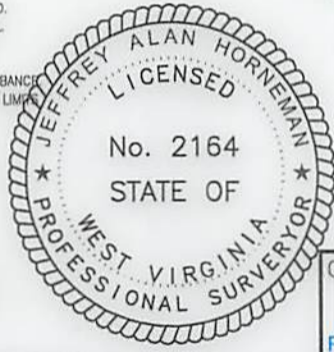
### WELL RESTRICTIONS

- NO OCCUPIED DWELLINGS > 2500 SQ FT. WITHIN 625 FEET OF CENTER OF PAD.
- NO AGRICULTURE BUILDINGS > 2500 SQ FT. WITHIN 625 FEET OF CENTER OF PAD.
- WATER WELLS OR DEVELOPED SPRINGS ARE WITHIN 342 FEET OF PROPOSED WELL.
- PERENNIAL STREAMS, LAKES, PONDS, OR RESERVOIRS ARE WITHIN THE LIMITS OF DISTURBANCE.
- NO NATURALLY PRODUCING TROUT STREAM WITHIN 300 FEET OF LIMITS OF DISTURBANCE.
- NO GROUND INTAKE OR PUBLIC WATER SUPPLY WITHIN 1000 FEET OF WELL PAD, LIMITS OF DISTURBANCE, E & S CONTROLS OR PUBLIC WATER SUPPLY.

### NOTES ON SURVEY

- SURFACE AND ROYALTY OWNER INFORMATION AND THEIR BOUNDARIES SHOWN HEREIN WERE PLOTTED FROM DEEDS AND/OR TAX PARCEL MAPS PROVIDED BY CLIENT AND/OR FIELD LOCATIONS.
  - THIS PLAT DOES NOT REPRESENT A BOUNDARY SURVEY OF THE PARCELS SHOWN HEREIN.
  - ALL INSETS ARE GRID NORTH UNLESS OTHERWISE DEPICTED.
- I, THE UNDERSIGNED, HEREBY CERTIFY THAT THIS PLAT IS CORRECT TO THE BEST OF MY KNOWLEDGE AND BELIEF AND SHOWS ALL THE INFORMATION REQUIRED BY LAW AND REGULATIONS ISSUED AND PRESCRIBED BY THE DEPARTMENT OF ENVIRONMENTAL PROTECTION.

P.S. 2164



COMPANY: **SWN** Production Company, LLC

(+) DENOTES LOCATION OF WELL ON UNITED STATES TOPOGRAPHIC MAPS

WVDEP  
OFFICE OF OIL & GAS  
601 57TH STREET  
CHARLESTON, WV 25034

MINIMUM DEGREE OF ACCURACY: 1/200

PROVEN SURVEY SOURCE OF ELEVATION: GRADE GPS (NAVD 88, US FT)

COLUMBIA GAS TRANSMISSION UD MSH  
OPERATOR'S WELL #: 9H

API WELL #: 47 051 01942  
STATE COUNTY PERMIT

WELL TYPE: OIL  WASTE DISPOSAL  PRODUCTION  DEEP  GAS  LIQUID INJECTION  STORAGE  SHALLOW

WATERSHED: UPPER OHIO SOUTH ELEVATION: 783.8'

DISTRICT: LIBERTY COUNTY: MARSHALL COUNTY QUADRANGLE: CAMERON, WV

SURFACE OWNER: COLUMBIA GAS TRANSMISSION, LLC ACREAGE: ±55.150000

OIL & GAS ROYALTY OWNER: WILMA M GATTEN, F/K/A WILMA G KESTNER, A WIDOW ACREAGE: ±55.150000

DRILL  DRILL DEEPER  REDRILL  FRACTURE OR STIMULATE  PLUG OFF OLD FORMATION  PERFORATE NEW FORMATION

CONVERT  PLUG & ABANDON  CLEAN OUT & REPLUG  OTHER CHANGE  (SPECIFY) AS-DRILLED

TARGET FORMATION: UPPER DEVONIAN ESTIMATED DEPTH: 6,527' TVD 13,019' TMD

WELL OPERATOR: SWN PRODUCTION COMPANY, LLC DESIGNATED AGENT: BRITTANY WOODY  
ADDRESS: P.O. BOX 1300 ADDRESS: P.O. BOX 1300  
CITY: JANE LEW STATE: WV ZIP CODE: 26378 CITY: JANE LEW STATE: WV ZIP CODE: 26378

LEGEND:	REVISIONS:	DATE:
○ PROPOSED SURFACE HOLE / BOTTOM HOLE	— SURVEYED BOUNDARY	07-27-2018
⊗ EXISTING / PRODUCING WELLHEAD	— DRILLING UNIT	FILE NO: 16-54
⊘ ABANDONED WELL	— LEASE BOUNDARY	DRAWN BY: JMB
⊗ PLUGGED & ABANDONED WELL	— EXISTING PATH	SCALE: 1" = 2000'
LPL LANDING POINT LOCATION	— PROPOSED PATH	DRAWING NO: 1
	⊗ EXISTING WATER WELL	WELL LOCATION PLAT 1
	⊗ EXISTING SPRING	

<b>WELL LOCATION PLAT 1</b>	<b>DRAWING NO: 1</b>	<b>SCALE: 1" = 2000'</b>	<b>DRAWN BY: JMB</b>	<b>FILE NO: 16-24</b>	<b>DATE: 07-27-2018</b>
<b>LEGEND:</b>	<b>WELL OPERATOR:</b> SWN PRODUCTION COMPANY, LLC	<b>DESIGNATED AGENT:</b> BRITANY WOODY	<b>REVISIONS:</b>	<b>CITY:</b> JANE LEW	<b>STATE:</b> WV
<b>○</b> PROPOSED SURFACE HOLE / BOTTOM HOLE	<b>ADDRESS:</b> P.O. BOX 1300	<b>ZIP CODE:</b> 26378	<b>OTHER CHANGE</b> <input checked="" type="checkbox"/> (SPECIFY AS-DRILLED)	<b>CITY:</b> JANE LEW	<b>STATE:</b> WV
<b>⊙</b> EXISTING PRODUCING WELLS	<b>FRACUTRE OR STIMULATE</b> <input type="checkbox"/>	<b>REDRILL</b> <input type="checkbox"/>	<b>PLUG &amp; ABANDON</b> <input type="checkbox"/>	<b>FRACUTRE OR STIMULATE</b> <input type="checkbox"/>	<b>PLUG OFF OLD FORMATION</b> <input type="checkbox"/>
<b>⊙</b> EXISTING WELLS	<b>CLEAN OUT &amp; REPLUG</b> <input type="checkbox"/>	<b>OTHER CHANGE</b> <input checked="" type="checkbox"/> (SPECIFY AS-DRILLED)	<b>PERFORATE NEW FORMATION</b> <input type="checkbox"/>	<b>PERFORATE NEW FORMATION</b> <input type="checkbox"/>	<b>PERFORATE NEW FORMATION</b> <input type="checkbox"/>
<b>⊙</b> PLUGGED & ABANDONED WELL	<b>ESTIMATED DEPTH:</b> 6237' TVD 13019' TMD	<b>ACREAGE:</b> ±52.150000	<b>ACREAGE:</b> ±52.150000	<b>ACREAGE:</b> ±52.150000	<b>ACREAGE:</b> ±52.150000
<b>⊙</b> LANDING POINT LOCATION	<b>WATERSHED:</b> UPPER OHIO SOUTH	<b>COUNTY:</b> MARSHALL COUNTY	<b>COUNTY:</b> MARSHALL COUNTY	<b>COUNTY:</b> MARSHALL COUNTY	<b>COUNTY:</b> MARSHALL COUNTY
<b>⊙</b> EXISTING SPRING	<b>WELL TYPE:</b> OIL <input type="checkbox"/> LIQUID INJECTION <input type="checkbox"/> STORAGE <input type="checkbox"/> SHALLOW <input checked="" type="checkbox"/>	<b>WASTAGE OWNER:</b> COLUMBIA GAS TRANSMISSION, LLC	<b>WASTAGE OWNER:</b> WILMA M GATTEN, F/K/A WILMA G KESTNER, A WIDOW	<b>WASTAGE OWNER:</b> WILMA M GATTEN, F/K/A WILMA G KESTNER, A WIDOW	<b>WASTAGE OWNER:</b> WILMA M GATTEN, F/K/A WILMA G KESTNER, A WIDOW
<b>⊙</b> EXISTING WATER WELL	<b>DEGREE OF ACCURACY:</b> 1/200	<b>DEGREE OF ACCURACY:</b> 1/200	<b>DEGREE OF ACCURACY:</b> 1/200	<b>DEGREE OF ACCURACY:</b> 1/200	<b>DEGREE OF ACCURACY:</b> 1/200
<b>⊙</b> PROPOSED PATH	<b>PROVEN SOURCE OF GRADE GPS</b>	<b>PROVEN SOURCE OF GRADE GPS</b>	<b>PROVEN SOURCE OF GRADE GPS</b>	<b>PROVEN SOURCE OF GRADE GPS</b>	<b>PROVEN SOURCE OF GRADE GPS</b>
<b>⊙</b> EXISTING WELLS	<b>ELEVATION: (NAD 83 US FT)</b>	<b>ELEVATION: (NAD 83 US FT)</b>	<b>ELEVATION: (NAD 83 US FT)</b>	<b>ELEVATION: (NAD 83 US FT)</b>	<b>ELEVATION: (NAD 83 US FT)</b>
<b>⊙</b> SURVEYED BOUNDARY	<b>API WELL #:</b> 47	<b>API WELL #:</b> 47	<b>API WELL #:</b> 47	<b>API WELL #:</b> 47	<b>API WELL #:</b> 47
<b>⊙</b> DRILLING UNIT	<b>OPERATOR'S WELL #:</b> 9H	<b>OPERATOR'S WELL #:</b> 9H	<b>OPERATOR'S WELL #:</b> 9H	<b>OPERATOR'S WELL #:</b> 9H	<b>OPERATOR'S WELL #:</b> 9H
<b>⊙</b> LEASE BOUNDARY	<b>MINIMUM DEGREE OF ACCURACY:</b> 1/200	<b>MINIMUM DEGREE OF ACCURACY:</b> 1/200	<b>MINIMUM DEGREE OF ACCURACY:</b> 1/200	<b>MINIMUM DEGREE OF ACCURACY:</b> 1/200	<b>MINIMUM DEGREE OF ACCURACY:</b> 1/200
<b>⊙</b> SURFACE HOLE / BOTTOM HOLE	<b>UNITED STATES TOPOGRAPHIC MAPS</b>	<b>UNITED STATES TOPOGRAPHIC MAPS</b>	<b>UNITED STATES TOPOGRAPHIC MAPS</b>	<b>UNITED STATES TOPOGRAPHIC MAPS</b>	<b>UNITED STATES TOPOGRAPHIC MAPS</b>

<b>WELL RESTRICTIONS</b>	<b>NOTES ON SURVEY</b>
1. NO OCCUPIED DWELLINGS > 2500 SQ FT WITHIN 825 FEET OF CENTER OF PAD.	1. SURFACE AND ROYALTY OWNER INFORMATION AND THEIR BOUNDARIES SHOWN HEREON WERE PLOTTED FROM DEEDS AND/OR TAX PARCEL MAPS PROVIDED BY CLIENT AND/OR FIELD LOCATIONS.
2. NO AGRICULTURE BUILDINGS > 2500 SQ FT WITHIN 825 FEET OF CENTER OF PAD.	2. THE PLAT DOES NOT REPRESENT A BOUNDARY SURVEY OF THE PARCELS SHOWN HEREON.
3. WATER WELLS OR DEVELOPED SPRINGS ARE WITHIN 245 FEET OF PROPOSED WELL.	3. ALL INSETS ARE GRID NORTH UNLESS OTHERWISE SPECIFIED.
4. PERMANENT STREAMS, LAKES, PONDS, OR RESERVOIRS ARE WITHIN THE LIMITS OF DISTURBANCE.	4. THE UNDERSIGNED, HEREBY CERTIFY THAT THIS PLAT IS CORRECT TO THE BEST OF MY KNOWLEDGE AND BELIEF AND SHOWS ALL THE INFORMATION REQUIRED BY LAW AND REGULATIONS ISSUED AND PREPARED BY THE DEPARTMENT OF ENVIRONMENTAL PROTECTION.
5. NO NATURALLY PRODUCING THRU STREAM WITHIN 300 FEET OF LIMITS OF DISTURBANCE.	
6. NO GROUND INTAKE OR PUBLIC WATER SUPPLY WITHIN 1000 FEET OF WELL PAD LIMITS OF DISTURBANCE & 2 CONTIGUOUS OR PUBLIC WATER SUPPLY.	

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 LICENSED

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<b>ADJOINING OWNERS</b>	<b>ADJOINING OWNERS</b>
1. JACK N. BRIDGES	1. JACK N. BRIDGES
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