

Via Federal Express

August 2, 2018

State of West Virginia  
Department of Environmental Protection  
Office of Oil & Gas  
601 57<sup>th</sup> Street  
Charleston, WV 25304

RECEIVED  
Office of Oil and Gas

AUG 3 2018

WV Department of  
Environmental Protection

**RE:** SWN Production Company, LLC  
Operator ID: 494512924  
Regulatory Filings: WR-34 & WR-35

To Whom It May Concern:

Please find enclosed forms WR-34 Discharge Monitoring Report and WR-35 Well Operator's Report of Well Work for the wells listed below.

API	Well Name
47-051-01936	Columbia Gas Transmission MSH 1H
47-051-01937	Columbia Gas Transmission MSH 6H
47-051-01942	Columbia Gas Transmission MSH 9H

If you have any questions or require additional information, please contact me via email at bobby\_willis@swn.com or telephone at (832) 796-2884.

Sincerely,



Bobby Willis  
Regulatory Analyst  
SW Appalachia Division

/bw  
Encl.

$\frac{R^2}{A} \rightarrow V^+$

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

API 47-51-01936 County MARSHALL District LIBERTY  
Quad CAMERON Pad Name COLUMBIA GAS TRANSMISSION PAD Field/Pool Name VICTORY FIELD WET  
Farm name COLUMBIA GAS TRANSMISSION, LLC Well Number COLUMBIA GAS TRANSMISSION MSH 1H  
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 4,400,582.23 Easting 532,970.24  
Landing Point of Curve Northing 4,400,342.20 Easting 532,657.66  
Bottom Hole Northing 4,401,661.22 Easting 531,352.21

Elevation (ft) 783.5 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 12/03/2017 Date drilling ceased 01/26/2018  
Date completion activities began 03/16/2018 Date completion activities ceased 05/14/2018  
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  
*Justin White* 8/13/18

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

API 47- 51 - 01936 Farm name COLUMBIA GAS TRANSMISSION, LLC Well number COLUMBIA GAS TRANSMISSION MSH 1H

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	350	NEW	J-55/54.50#		Y
Coal	SEE INTERMEDIATE						
Intermediate 1	12.25	9.625	2076	NEW	J-55/36#		Y, 98
Intermediate 2							
Intermediate 3							
Production	8.75/8.50	5.5	13208	NEW	HCP-110/20#		Y
Tubing		2.375	7110	NEW	P-110/4.7#		N
Packer type and depth set							

Comment Details \_\_\_\_\_

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	238	15.60	1.18	280.84	SURFACE	8
Coal	SEE INTERMEDIATE						
Intermediate 1	CLASS A	1,155	15.60	1.20	1,386	SURFACE	8
Intermediate 2							
Intermediate 3							
Production	CLASS A	2,355	15.60	1.18	2778.9	SURFACE	24
Tubing							

Drillers TD (ft) 13208 Loggers TD (ft) 13208  
 Deepest formation penetrated MARCELLUS Plug back to (ft) N/A  
 Plug back procedure N/A

Kick off depth (ft) 5885 RECEIVED  
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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 \_\_\_\_\_

API 47- 51 - 01936 Farm name COLUMBIA GAS TRANSMISSION, LLC Well number COLUMBIA GAS TRANSMISSION MSH 1H

PERFORATION RECORD

Stage No.	Perforation date	Perforated from MD ft.	Perforated to MD ft.	Number of Perforations	Formation(s)
	SEE	ATTACHMENT	1		

Please insert additional pages as applicable.

STIMULATION INFORMATION PER STAGE

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Complete a separate record for each stimulation stage.

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Stage No.	Stimulations 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 fluids)
		SEE	ATTACHMENT	2				

Please insert additional pages as applicable.

WR-35  
Rev. 8/23/13

API 47- 51 - 01936 Farm name COLUMBIA GAS TRANSMISSION, LLC Well number COLUMBIA GAS TRANSMISSION MSH 1H

<u>PRODUCING FORMATION(S)</u>	<u>DEPTHS</u>	
<u>MARCELLUS</u>	<u>6515</u> TVD	<u>6941</u> MD
_____	_____	_____
_____	_____	_____

Please insert additional pages as applicable.

GAS TEST  Build up  Drawdown  Open Flow OIL TEST  Flow  Pump  
 SHUT-IN PRESSURE Surface 1,709 psi Bottom Hole \_\_\_\_\_ psi DURATION OF TEST \_\_\_\_\_ hrs  
 OPEN FLOW Gas 11,039 mcfpd Oil 30 bpd NGL \_\_\_\_\_ bpd Water 81 bpd GAS MEASURED BY  Estimated  Orifice  Pilot

<u>LITHOLOGY/ FORMATION</u>	<u>TOP</u>		<u>BOTTOM</u>		<u>DESCRIBE ROCK TYPE AND RECORD QUANTITY AND TYPE OF FLUID (FRESHWATER, BRINE, OIL, GAS, H<sub>2</sub>S, ETC)</u>
	<u>DEPTH IN FT NAME TVD</u>	<u>DEPTH IN FT TVD</u>	<u>DEPTH IN FT MD</u>	<u>DEPTH IN FT MD</u>	
	<u>0</u>		<u>0</u>		
	<u>SEE</u>	<u>ATTACHMENT</u>	<u>3</u>		

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Please insert additional pages as applicable.

Drilling Contractor SWN DRILLING COMPANY  
Address PO BOX 12359 City SPRING State TX Zip 77391-2359

Logging Company BAKER HUGHES  
Address 9110 GROGANS MILL RD City THE WOODLANDS State TX Zip 77380

Cementing Company SCHLUMBERGER WELL SERVICES  
Address 110 SCHLUMBERGER DRIVE City SUGAR LAND State TX Zip 77478

Stimulating Company SWN WELL SERVICES  
Address PO BOX 12359 City SPRING State TX Zip 77391-2359

Please insert additional pages as applicable.

Completed by BOBBY WILLIS Telephone 832-796-2884  
Signature [Signature] Title REGULATORY ANALYST Date 08/01/2018

Submittal of Hydraulic Fracturing Chemical Disclosure Information Attach copy of FRACFOCUS Registry

# SOUTHWESTERN ENERGY

Location: Marshall County, WV

Field: Marshall

Facility: Columbia Gas Transmission MSH Pad

Well: Columbia Gas Transmission MSH 1H PWB

Slot: Slot 1H

Wellbore: Columbia Gas Transmission MSH 1H PWB

Grid System: NAD83 / UTM Zone 17 North, US feet

\* - Wellpath was transformed from a different geoidetic datum

Measured depths are referenced to SDC 42 (KB)

SDC 42 (KB) to Mean Sea Level: 809.5 feet

Mean Sea Level to Mud line (At Slot 1H): -763.5 feet

Coordinates are in feet referenced to Slot

Created by: thomazuc on 2018-01-30

Database: WA, Pennsylvania

API: 47-05-01936-0000

Job #: 8943584

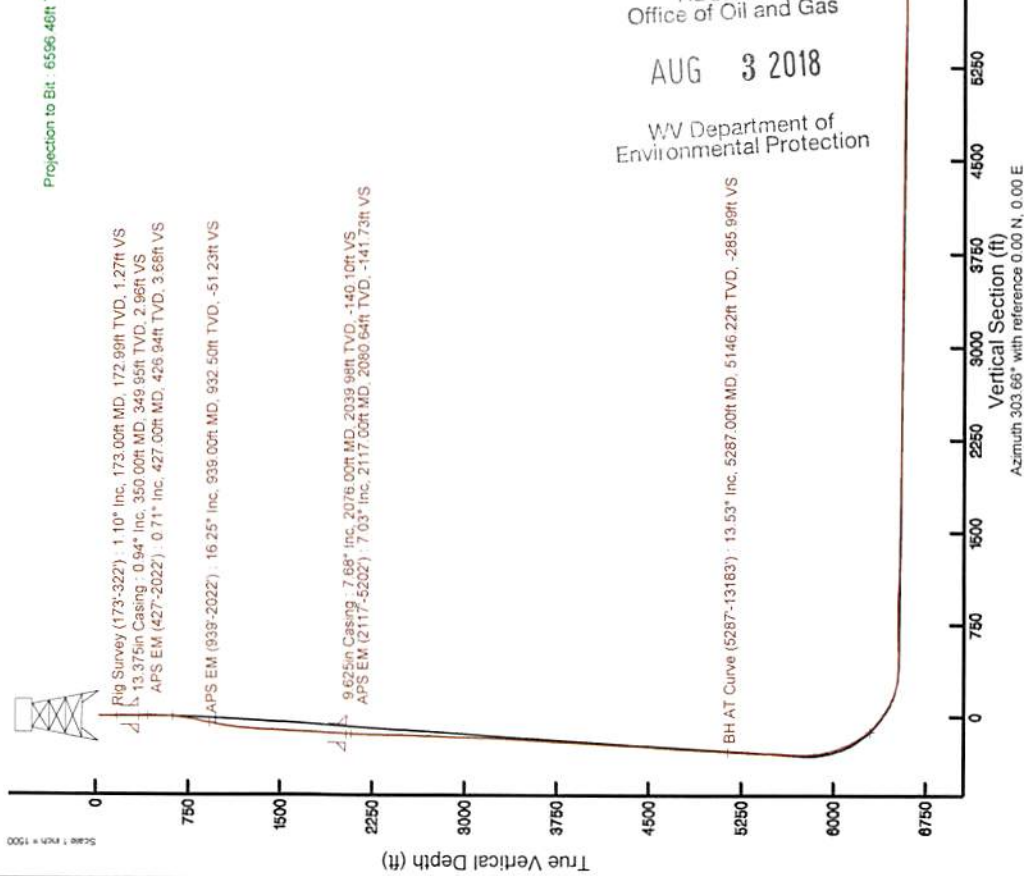
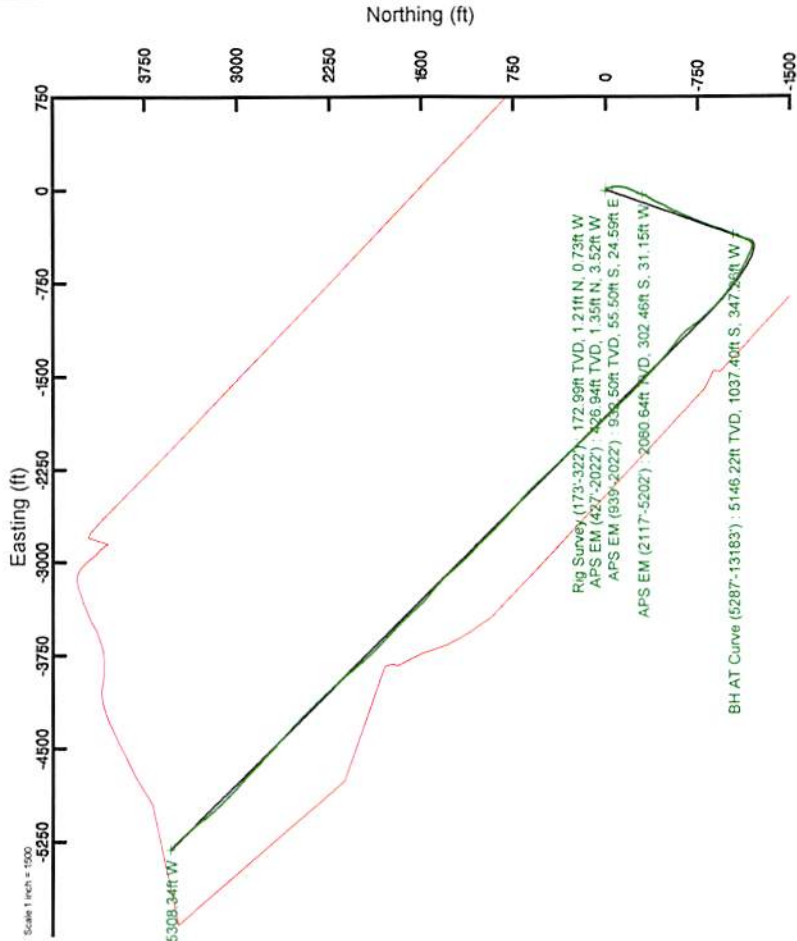
Rig: SDC 42

Duration: 01/02/2018 - 01/24/2018

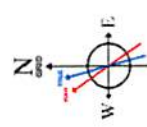


## Location Information

Facility Name	Grid East (US ft)	Grid North (US ft)	Latitude	Longitude
Columbia Gas Transmission MSH Pad	1748565.880	14437578.433	39°45'16.272" N	80°36'54.713" W
Slot	Local E (ft)	Local N (ft)	Latitude	Longitude
Slot 1H	-1.83	20.95	39°45'16.253" N	80°36'54.445" W
SDC 42 (KB) to Mud line (At Slot 1H)		14437576.600	26ft	
Mean Sea Level to Mud line (At Slot 1H)			-763.5ft	
SDC 42 (KB) to Mean Sea Level			809.5ft	



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# Actual Wellpath Report

Columbia Gas Transmission MSH 1H AWP Proj: 13208'MD  
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## REFERENCE WELLPATH IDENTIFICATION

Operator	SOUTHWESTERN ENERGY	Slot	Slot 1H
Area	Marshall County, WV	Well	Columbia Gas Transmission MSH 1H
Field	Marshall	Wellbore	Columbia Gas Transmission MSH 1H 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	1/30/2018 at 10:57:24 AM
Convergence at slot	0.25° East	Database/Source file	WA_Pennsylvania/Columbia_Gas_Transmission_MSH_1H_AWP_Proj_13208_MD.xml

## WELLPATH LOCATION

	Local coordinates		Grid coordinates		Geographic coordinates	
	North[ft]	East[ft]	Easting[US ft]	Northing[US ft]	Latitude	Longitude
Slot Location	-1.83	20.95	1748586.82	14437576.60	39°45'16.253"N	80°36'54.445"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	809.50ft
Horizontal Reference Pt	Slot	SDC 42 (KB) to Mean Sea Level	809.50ft
Vertical Reference Pt	SDC 42 (KB)	SDC 42 (KB) to Mud Line at Slot (Slot 1H)	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	303.66°

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Operator	SOUTHWESTERN ENERGY
Area	Marshall County, WV
Field	Marshall
Facility	Columbia Gas Transmission MSH Pad
Slot	Slot 1H
Well	Columbia Gas Transmission MSH 1H
Wellbore	Columbia Gas Transmission MSH 1H A/B

**REFERENCE WELLPATH IDENTIFICATION**

WELLPATH DATA (170 stations) † = interpolated/extrapolated station														
MD	Inclination	Azimuth	TVD	Vert Sect	North	East	Grid East	Grid North	Latitude	Longitude	Closure Dist	CLS	Build Rate	Turn Rate
(ft)	(°)	(°)	(ft)	(ft)	(ft)	(ft)	(US ft)	(US ft)	(°N)	(°W)	(ft)	(°/100ft)	(°/100ft)	(°/100ft)
0.00	0.00	329.030	26.00	0.00	0.00	0.00	1748586.82	14437576.60	39°45'16.253"N	80°36'54.445"W	0.00	0.00	0.00	0.00
26.00	0.00	329.030	172.99	1.27	1.21	-0.73	1748586.09	14437577.81	39°45'16.265"N	80°36'54.454"W	1.41	329.030	0.75	-21.07
260.00	2.300	212.230	259.97	1.99	0.45	-2.09	1748584.73	14437577.05	39°45'16.258"N	80°36'54.471"W	2.13	282.141	3.41	-134.25
322.00	1.100	321.95	321.95	2.51	-0.12	-3.09	1748583.73	14437576.48	39°45'16.252"N	80°36'54.484"W	3.09	267.865	4.69	-194
427.00	0.710	12.850	426.94	3.68	1.35	-3.52	1748583.30	14437577.95	39°45'16.266"N	80°36'54.490"W	3.77	290.911	0.78	-0.37
519.00	1.180	101.560	518.93	3.00	1.71	-2.47	1748584.35	14437578.31	39°45'16.270"N	80°36'54.476"W	3.00	304.749	1.48	0.51
610.00	4.350	129.920	609.81	-1.30	-0.69	1.10	1748587.92	14437575.91	39°45'16.246"N	80°36'54.431"W	1.30	122.190	3.69	3.48
691.00	7.410	141.430	690.38	-9.33	-6.75	6.71	1748593.53	14437569.85	39°45'16.186"N	80°36'54.359"W	9.52	135.153	4.03	3.78
773.00	10.250	155.770	771.41	-20.55	-17.54	13.00	1748599.82	14437559.07	39°45'16.079"N	80°36'54.279"W	21.83	143.443	4.36	3.46
856.00	14.490	163.280	852.47	-34.81	-34.23	19.03	1748605.84	14437542.39	39°45'15.914"N	80°36'54.203"W	39.16	150.931	5.45	5.11
939.00	16.250	167.180	932.50	-51.23	-55.50	24.59	1748611.40	14437521.13	39°45'15.703"N	80°36'54.133"W	60.70	156.102	2.46	2.12
1020.00	16.960	1010.52	-66.68	-76.80	28.97	1748615.78	14437499.83	39°45'15.493"N	80°36'54.078"W	82.08	159.332	1.85	-1.65	
1103.00	12.830	173.680	1091.10	-80.02	-96.47	31.90	1748618.70	14437480.17	39°45'15.298"N	80°36'54.042"W	101.60	161.704	2.76	-2.51
1184.00	10.980	180.800	1170.36	-89.99	-113.12	32.78	1748619.59	14437463.52	39°45'15.134"N	80°36'54.031"W	117.78	163.840	2.91	-2.28
1268.00	10.510	189.280	1282.89	-97.49	-128.68	31.43	1748618.24	14437447.97	39°45'14.980"N	80°36'54.049"W	132.47	166.274	1.96	-0.56
1352.00	11.600	193.870	1335.33	-103.51	-144.44	28.17	1748614.98	14437432.21	39°45'14.824"N	80°36'54.092"W	147.17	168.964	1.67	1.30
1435.00	12.950	195.510	1416.43	-109.23	-161.51	23.68	1748610.50	14437415.16	39°45'14.656"N	80°36'54.150"W	163.24	171.657	1.68	1.63
1519.00	15.240	198.700	1498.08	-114.83	-180.36	17.85	1748604.67	14437396.31	39°45'14.470"N	80°36'54.226"W	181.25	174.347	1.78	1.54
1601.00	16.650	204.160	1577.31	-119.26	-200.64	10.09	1748596.91	14437376.67	39°45'14.276"N	80°36'54.326"W	200.27	177.111	2.43	1.72
1685.00	15.630	204.500	1658.20	-122.94	-220.64	0.76	1748587.58	14437356.04	39°45'14.072"N	80°36'54.447"W	220.65	179.802	0.11	-0.02
1769.00	14.390	203.650	1739.33	-126.55	-240.50	-8.12	1748578.71	14437336.19	39°45'13.877"N	80°36'54.562"W	240.64	181.933	1.50	-1.48
1854.00	13.710	202.880	1821.79	-130.27	-259.46	-16.27	1748570.56	14437317.24	39°45'13.690"N	80°36'54.667"W	259.97	183.588	0.83	-0.80
1938.00	11.320	200.070	1903.79	-134.07	-276.38	-22.97	1748563.86	14437300.33	39°45'13.523"N	80°36'54.754"W	277.33	184.751	2.94	-2.85
2022.00	8.540	196.680	1986.52	-137.83	-290.10	-27.59	1748559.24	14437286.62	39°45'13.387"N	80°36'54.814"W	291.41	185.433	3.38	-3.31
2117.00	7.030	195.270	2080.64	-141.73	-302.46	-31.15	1748555.69	14437274.25	39°45'13.265"N	80°36'54.860"W	304.06	185.879	1.60	-1.59
2202.00	9.100	199.830	2162.82	-144.90	-313.54	-34.71	1748552.12	14437263.18	39°45'13.156"N	80°36'54.906"W	315.45	186.317	2.61	2.49
2282.00	11.690	207.930	2243.47	-147.28	-326.98	-40.80	1748546.03	14437249.75	39°45'13.023"N	80°36'54.985"W	329.52	187.113	3.62	3.16
2364.00	13.340	209.640	2323.52	-148.77	-342.54	-49.37	1748537.47	14437234.19	39°45'12.870"N	80°36'55.096"W	346.08	188.202	2.06	2.01
2449.00	13.760	210.990	2406.15	-149.93	-359.73	-59.43	1748527.42	14437217.01	39°45'12.700"N	80°36'55.225"W	364.61	189.380	0.62	0.49

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REFERENCE WELLPATH IDENTIFICATION			
Operator	SOUTHWESTERN ENERGY	Slot	Slot 1H
Area	Marshall County, WV	Well	Columbia Gas Transmission MSH 1H
Field	Marshall	Wellbore	Columbia Gas Transmission MSH 1H AWB
Facility	Columbia Gas Transmission MSH Pad		

WELLPATH DATA (170 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)	(ft)	(ft)	(ft)	(°)	(°/100ft)	(°/100ft)	(°/100ft)
2534.00	15.290	210.130	2488.43	-151.09	-378.09	-70.26	1748516.59	14437198.65	39°45'12.51"N	80°36'55.365"W	384.57	190.527	1.82	1.80	-1.01
2618.00	15.990	207.890	2569.32	-152.94	-397.90	-81.23	1748505.62	14437178.86	39°45'12.324"N	80°36'55.507"W	406.11	191.538	1.10	0.83	-2.67
2702.00	14.520	205.240	2650.36	-155.65	-417.65	-91.13	1748495.72	14437159.11	39°45'12.129"N	80°36'55.634"W	427.48	192.309	1.94	-1.75	-3.15
2782.00	14.650	205.920	2727.79	-158.48	-435.82	-99.83	1748487.03	14437140.95	39°45'11.950"N	80°36'55.747"W	447.11	192.902	0.27	0.16	0.85
2864.00	15.250	204.120	2807.01	-161.66	-454.99	-108.77	1748478.09	14437121.79	39°45'11.761"N	80°36'55.862"W	467.81	193.445	0.93	0.73	-2.20
2946.00	14.910	205.740	2886.19	-164.90	-474.34	-117.76	1748469.11	14437102.45	39°45'11.570"N	80°36'55.979"W	488.74	193.943	0.66	-0.41	1.98
3029.00	15.040	208.560	2966.37	-167.33	-493.41	-127.55	1748459.32	14437083.38	39°45'11.382"N	80°36'56.105"W	509.63	194.494	0.89	0.16	3.40
3111.00	15.390	206.890	3045.49	-169.56	-512.46	-137.55	1748449.32	14437064.34	39°45'11.194"N	80°36'56.234"W	530.60	195.025	0.68	0.43	-2.04
3196.00	15.600	205.680	3127.40	-172.48	-532.82	-147.61	1748439.27	14437043.98	39°45'10.994"N	80°36'56.364"W	552.89	195.484	0.45	0.25	-1.42
3280.00	14.500	204.940	3208.52	-175.64	-552.54	-156.94	1748429.94	14437024.28	39°45'10.799"N	80°36'56.484"W	574.39	195.856	1.33	-1.31	-0.88
3364.00	14.910	202.790	3289.77	-179.28	-572.04	-165.56	1748421.33	14437004.79	39°45'10.607"N	80°36'56.596"W	595.51	196.141	0.81	0.49	-2.56
3449.00	16.560	205.420	3371.58	-183.07	-593.06	-174.99	1748411.89	14436983.77	39°45'10.399"N	80°36'56.718"W	618.34	196.440	2.11	1.94	3.09
3533.00	16.680	203.250	3452.08	-186.97	-614.95	-184.89	1748402.00	14436964.89	39°45'10.184"N	80°36'56.846"W	642.14	196.734	0.75	0.14	-2.58
3616.00	15.420	201.010	3531.84	-191.54	-636.19	-193.55	1748393.35	14436940.65	39°45'09.974"N	80°36'56.958"W	664.98	196.921	1.69	-1.52	-2.70
3698.00	15.270	202.430	3610.92	-196.03	-656.35	-201.58	1748385.32	14436920.50	39°45'09.775"N	80°36'57.062"W	686.61	197.073	0.49	0.18	1.73
3782.00	15.230	201.660	3691.96	-200.48	-676.83	-209.87	1748377.03	14436900.03	39°45'09.573"N	80°36'57.169"W	708.62	197.228	0.25	-0.05	-0.92
3864.00	14.590	203.640	3771.20	-204.52	-696.30	-217.99	1748368.92	14436880.57	39°45'09.381"N	80°36'57.274"W	729.63	197.384	1.00	-0.78	2.41
3947.00	16.290	205.970	3851.20	-207.89	-716.35	-227.28	1748359.63	14436860.53	39°45'09.183"N	80°36'57.394"W	751.54	197.603	2.18	2.05	2.81
4030.00	16.200	204.180	3930.89	-211.36	-737.37	-237.12	1748349.79	14436839.51	39°45'08.976"N	80°36'57.521"W	774.56	197.826	0.61	-0.11	-2.16
4114.00	15.000	202.090	4011.79	-215.47	-758.14	-246.01	1748340.91	14436818.76	39°45'08.771"N	80°36'57.637"W	797.05	197.978	1.58	-1.43	-2.49
4195.00	13.790	197.440	4090.25	-220.27	-777.06	-252.84	1748334.08	14436799.84	39°45'08.584"N	80°36'57.725"W	817.16	198.024	2.06	-1.49	-5.74
4280.00	13.630	199.350	4172.83	-225.58	-796.18	-259.20	1748327.72	14436780.73	39°45'08.396"N	80°36'57.807"W	837.30	198.033	0.56	-0.19	2.25
4361.00	15.660	199.690	4251.19	-230.57	-815.47	-266.04	1748320.88	14436761.44	39°45'08.205"N	80°36'57.896"W	857.77	198.069	2.51	2.51	0.42
4445.00	17.260	202.760	4331.75	-235.67	-837.64	-274.68	1748312.24	14436739.28	39°45'07.987"N	80°36'58.008"W	881.53	198.156	2.17	1.90	3.65
4528.00	16.890	201.560	4411.09	-240.53	-860.21	-283.88	1748303.05	14436716.72	39°45'07.764"N	80°36'58.127"W	905.84	198.263	0.62	-0.45	-1.45
4611.00	16.220	200.220	4490.65	-245.75	-882.30	-292.32	1748294.62	14436694.64	39°45'07.546"N	80°36'58.236"W	929.47	198.331	0.93	-0.81	-1.61
4693.00	15.600	196.110	4569.51	-251.74	-903.64	-299.33	1748287.60	14436672.31	39°45'07.335"N	80°36'58.327"W	951.93	198.328	1.57	-0.76	-5.01
4777.00	13.820	196.190	4650.76	-258.15	-924.13	-305.27	1748281.67	14436652.83	39°45'07.133"N	80°36'58.404"W	973.24	198.280	2.12	-2.12	0.10
4861.00	13.580	197.320	4732.37	-263.94	-943.38	-311.00	1748275.94	14436633.79	39°45'06.945"N	80°36'58.478"W	993.13	198.249	0.43	-0.29	1.35
4946.00	14.140	201.880	4814.89	-268.87	-962.34	-317.84	1748269.10	14436614.63	39°45'06.756"N	80°36'58.567"W	1013.47	198.277	1.44	0.66	5.36

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**REFERENCE WELLPATH IDENTIFICATION**

Operator	SOUTHWESTERN ENERGY
Area	Marshall County, WV
Field	Marshall
Facility	Columbia Gas Transmission MSH Pad
Well	Columbia Gas Transmission MSH 1H
Wellbore	Columbia Gas Transmission MSH 1H AWB
Slot	Slot 1H

**WELLPATH DATA (170 stations)**

MD [ft]	Inclination [°]	Azimuth [°]	TVD [ft]	Vert Sect [ft]	North [ft]	East [ft]	Grid East [US ft]	Grid North [US ft]	Latitude [ft]	Longitude [ft]	Closure Dist [ft]	CLS [ft]	Build Rate [°/100ft]	Turn Rate [°/100ft]
5032.00	13.790	204.430	4898.35	-272.66	-981.42	-325.99	1748260.95	14436595.56	39°45'06.568"N	80°36'58.672"W	1034.15	198.375	0.82	-0.41
5118.00	13.490	199.770	4981.93	-276.71	-1000.19	-333.63	1748253.32	14436576.80	39°45'06.383"N	80°36'58.771"W	1054.37	198.447	1.32	-0.35
5202.00	13.610	200.240	5063.59	-281.36	-1018.69	-340.36	1748246.59	14436558.31	39°45'06.200"N	80°36'58.858"W	1074.04	198.475	0.19	0.14
5287.00	13.530	200.250	5146.22	-285.99	-1037.40	-347.26	1748239.70	14436539.60	39°45'06.015"N	80°36'58.948"W	1093.98	198.508	0.09	-0.09
5371.00	12.420	199.120	5228.07	-290.63	-1055.15	-353.62	1748233.34	14436521.86	39°45'05.840"N	80°36'59.030"W	1112.83	198.528	1.36	-1.32
5450.00	13.320	203.530	5305.09	-294.27	-1071.52	-360.04	1748226.92	14436505.49	39°45'05.679"N	80°36'59.113"W	1130.39	198.573	1.69	-1.14
5533.00	14.290	204.600	5385.69	-297.56	-1089.60	-368.12	1748218.85	14436487.42	39°45'05.500"N	80°36'59.218"W	1150.11	198.667	1.21	-1.17
5615.00	14.120	205.480	5465.18	-300.58	-1107.83	-376.63	1748210.33	14436469.20	39°45'05.321"N	80°36'59.328"W	1170.11	198.777	0.34	-0.21
5697.00	14.310	204.170	5544.67	-303.67	-1126.11	-385.09	1748201.88	14436450.93	39°45'05.140"N	80°36'59.437"W	1190.13	198.879	0.46	0.23
5777.00	14.380	201.920	5622.18	-307.33	-1144.35	-392.84	1748194.13	14436432.70	39°45'04.960"N	80°36'59.537"W	1209.90	198.947	0.70	0.09
5860.00	14.350	199.060	5702.58	-312.02	-1163.63	-400.05	1748186.93	14436413.42	39°45'04.770"N	80°36'59.631"W	1230.48	198.973	0.86	-0.04
5941.00	13.360	227.260	5781.32	-312.35	-1179.49	-410.21	1748176.77	14436397.47	39°45'04.614"N	80°36'59.762"W	1248.78	199.177	8.34	-1.22
6026.00	14.480	256.560	5863.92	-302.79	-1188.63	-427.78	1748159.20	14436388.43	39°45'04.424"N	80°36'59.987"W	1263.27	199.793	8.31	34.47
6110.00	14.590	267.740	5945.25	-287.07	-1191.49	-448.57	1748138.42	14436385.57	39°45'04.497"N	80°37'00.253"W	1273.13	200.630	3.34	0.13
6194.00	20.370	289.400	6025.42	-264.29	-1187.04	-472.98	1748114.03	14436390.02	39°45'04.542"N	80°37'00.566"W	1277.80	201.725	10.25	6.88
6276.00	23.920	296.600	6101.37	-233.95	-1174.85	-501.32	1748085.70	14436402.20	39°45'04.664"N	80°37'00.928"W	1277.34	203.108	5.44	4.33
6316.00	25.550	296.300	6137.70	-217.35	-1167.40	-516.30	1748070.72	14436409.65	39°45'04.738"N	80°37'01.119"W	1276.48	203.858	4.09	8.78
6367.00	28.750	297.030	6174.18	-198.78	-1159.00	-533.02	1748054.01	14436418.05	39°45'04.822"N	80°37'01.333"W	1275.69	204.697	7.85	7.80
6398.00	32.710	297.460	6209.41	-177.96	-1149.41	-551.64	1748035.40	14436427.64	39°45'04.917"N	80°37'01.571"W	1274.93	205.638	9.67	9.66
6441.00	35.810	297.500	6244.95	-153.90	-1138.24	-573.11	1748013.93	14436438.80	39°45'05.028"N	80°37'01.845"W	1274.38	206.726	7.21	7.21
6483.00	39.830	297.310	6278.12	-128.30	-1126.39	-595.97	1747991.08	14436450.65	39°45'05.147"N	80°37'02.137"W	1274.34	207.883	9.58	9.57
6525.00	43.290	297.250	6309.54	-100.62	-1113.62	-620.73	1747966.33	14436463.41	39°45'05.274"N	80°37'02.453"W	1274.93	209.135	8.24	8.24
6609.00	51.090	299.600	6366.57	-39.32	-1084.57	-655.03	1747912.05	14436492.45	39°45'05.563"N	80°37'03.147"W	1277.48	211.898	9.80	9.24
6650.00	55.760	303.030	6391.00	-6.44	-1067.44	-703.13	1747883.96	14436509.57	39°45'05.734"N	80°37'03.506"W	1278.21	213.373	13.22	11.39
6691.00	56.210	304.120	6413.94	27.54	-1048.65	-731.44	1747855.66	14436528.36	39°45'05.921"N	80°37'03.867"W	1278.54	214.896	2.46	1.10
6733.00	57.460	304.780	6436.91	62.70	-1028.76	-760.43	1747826.68	14436548.24	39°45'06.118"N	80°37'04.237"W	1279.30	216.471	3.25	2.98
6774.00	62.050	306.060	6457.56	98.09	-1008.23	-789.28	1747797.84	14436568.76	39°45'06.322"N	80°37'04.606"W	1280.43	218.055	11.52	11.20
6816.00	65.750	308.000	6476.04	135.73	-985.51	-819.38	1747767.76	14436591.47	39°45'06.548"N	80°37'04.990"W	1281.65	219.741	9.74	8.81
6858.00	69.970	310.010	6491.86	174.45	-961.03	-849.60	1747737.55	14436615.95	39°45'06.791"N	80°37'05.375"W	1282.73	221.478	10.98	10.05

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REFERENCE WELLPATH IDENTIFICATION			
Operator	SOUTHWESTERN ENERGY	Slot	Slot 1H
Area	Marshall County, WV	Well	Columbia Gas Transmission MSH 1H
Field	Marshall	Wellbore	Columbia Gas Transmission MSH 1H AWB
Facility	Columbia Gas Transmission MSH Pad		

WELLPATH DATA (170 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)			(ft)	(ft)	(°/100ft)	(°/100ft)	(°/100ft)	
6899.00	311.700	6504.22	213.22	-935.46	-879.15	1747708.01	14436641.51	39°45'07.045"N	80°37'05.752"W	1283.74	223.223	12.74	12.74	4.12	4.12	3.43
6941.00	313.140	6514.50	253.47	-907.99	-909.21	1747677.97	14436668.96	39°45'07.318"N	80°37'06.135"W	1284.95	225.038	5.37	5.37	3.48	3.48	3.69
7025.00	316.150	6529.86	334.50	-850.00	-967.95	1747619.25	14436726.93	39°45'07.894"N	80°37'06.884"W	1288.19	228.112	7.74	7.74	3.69	3.69	3.94
7110.00	318.460	6535.98	416.82	-787.73	-1025.39	1747561.83	14436789.17	39°45'08.511"N	80°37'07.616"W	1293.04	232.468	8.85	8.85	4.42	4.42	6.93
7192.00	324.140	6534.46	494.91	-723.78	-1076.62	1747510.61	14436853.10	39°45'09.146"N	80°37'08.269"W	1297.30	236.088	7.97	7.97	6.93	6.93	7.27
7276.00	319.920	6531.23	574.66	-657.63	-1128.25	1747459.00	14436919.23	39°45'09.802"N	80°37'08.926"W	1305.92	239.763	5.15	5.15	7.27	7.27	7.74
7359.00	309.050	6528.91	655.93	-599.58	-1187.36	1747399.92	14436977.25	39°45'10.378"N	80°37'09.680"W	1330.16	243.208	13.09	13.09	7.74	7.74	8.42
7441.00	307.390	6526.72	737.64	-548.87	-1251.76	1747335.55	14437027.95	39°45'10.882"N	80°37'10.502"W	1366.80	246.324	2.03	2.03	8.42	8.42	9.48
7523.00	310.670	6525.56	819.25	-497.24	-1315.44	1747271.89	14437079.55	39°45'11.394"N	80°37'11.314"W	1406.28	249.293	4.40	4.40	9.48	9.48	10.48
7608.00	311.660	6527.23	901.52	-442.63	-1377.90	1747209.45	14437134.15	39°45'11.937"N	80°37'12.111"W	1447.25	252.191	3.16	3.16	10.48	10.48	11.48
7688.00	312.280	6531.06	982.57	-387.85	-1438.80	1747148.58	14437188.90	39°45'12.481"N	80°37'12.888"W	1490.16	254.914	1.07	1.07	11.48	11.48	12.48
7772.00	312.200	6535.67	1065.50	-331.47	-1500.90	1747086.51	14437245.26	39°45'13.040"N	80°37'13.680"W	1537.06	257.546	0.37	0.37	12.48	12.48	13.48
7855.00	315.150	6540.18	1147.11	-274.24	-1560.83	1747026.59	14437302.47	39°45'13.609"N	80°37'14.444"W	1584.74	260.035	3.57	3.57	13.48	13.48	14.48
7939.00	314.230	6544.58	1229.44	-215.25	-1620.47	1746966.98	14437361.44	39°45'14.194"N	80°37'15.204"W	1634.70	262.434	1.10	1.10	14.48	14.48	15.48
8022.00	316.930	6547.68	1310.59	-156.02	-1678.51	1746908.96	14437420.64	39°45'14.782"N	80°37'15.944"W	1685.75	264.690	3.92	3.92	15.48	15.48	16.48
8106.00	317.890	6549.26	1392.17	-94.19	-1735.35	1746852.15	14437482.45	39°45'15.395"N	80°37'16.669"W	1737.90	266.893	1.20	1.20	16.48	16.48	17.48
8190.00	315.720	6550.61	1473.95	-32.96	-1792.83	1746794.68	14437543.65	39°45'16.003"N	80°37'17.402"W	1793.14	268.947	2.58	2.58	17.48	17.48	18.48
8272.00	315.870	6551.53	1554.11	25.82	-1850.00	1746737.54	14437602.41	39°45'16.586"N	80°37'18.130"W	1850.18	270.800	0.70	0.70	18.48	18.48	19.48
8356.00	315.720	6552.16	1636.23	86.03	-1908.57	1746678.99	14437662.60	39°45'17.184"N	80°37'18.877"W	1910.51	272.581	0.23	0.23	19.48	19.48	20.48
8439.00	316.740	6552.33	1717.24	145.97	-1965.98	1746621.60	14437722.51	39°45'17.778"N	80°37'19.609"W	1971.39	274.246	1.52	1.52	20.48	20.48	21.48
8520.00	316.430	6552.05	1796.19	204.81	-2021.65	1746565.95	14437781.33	39°45'18.362"N	80°37'20.318"W	2032.00	275.785	0.40	0.40	21.48	21.48	22.48
8600.00	317.460	6551.90	1874.05	263.26	-2076.27	1746511.36	14437839.76	39°45'18.942"N	80°37'21.015"W	2092.89	277.226	1.29	1.29	22.48	22.48	23.48
8683.00	316.240	6551.73	1954.86	323.81	-2133.03	1746454.62	14437900.29	39°45'19.543"N	80°37'21.738"W	2157.47	278.632	1.48	1.48	23.48	23.48	24.48
8766.00	316.370	6551.78	2035.85	383.82	-2190.37	1746397.30	14437960.27	39°45'20.138"N	80°37'22.469"W	2223.74	279.939	0.54	0.54	24.48	24.48	25.48
8849.00	316.430	6552.16	2116.80	443.93	-2247.61	1746340.09	14438020.36	39°45'20.735"N	80°37'23.199"W	2291.03	281.173	0.08	0.08	25.48	25.48	26.48
8933.00	316.850	6552.55	2198.66	505.00	-2305.28	1746282.44	14438081.40	39°45'21.341"N	80°37'23.934"W	2359.94	282.356	0.50	0.50	26.48	26.48	27.48
9013.00	317.540	6552.79	2276.43	563.69	-2359.64	1746228.10	14438140.08	39°45'21.923"N	80°37'24.627"W	2426.03	283.436	0.89	0.89	27.48	27.48	28.48
9097.00	312.720	6553.24	2358.73	623.21	-2418.88	1746168.88	14438199.57	39°45'22.513"N	80°37'25.382"W	2497.87	284.448	5.76	5.76	28.48	28.48	29.48
9181.00	309.960	6554.04	2441.97	678.68	-2481.94	1746105.85	14438255.02	39°45'23.064"N	80°37'26.186"W	2573.06	285.294	3.29	3.29	29.48	29.48	30.48

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# Actual Wellpath Report

Columbia Gas Transmission MSH 1H AWP Proj: 13208'MD  
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REFERENCE WELLPATH IDENTIFICATION			
Operator	SOUTHWESTERN ENERGY	Slot	Slot 1H
Area	Marshall County, WV	Well	Columbia Gas Transmission MSH 1H
Field	Marshall	Wellbore	Columbia Gas Transmission MSH 1H AWB
Facility	Columbia Gas Transmission MSH Pad		

WELLPATH DATA (170 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]
9265.00	89.320	312.700	6554.97	2525.20	734.15	-2545.01	1746042.80	14438310.46	39°45'23.615"N	80°37'26.991"W	2648.78	286.091	3.26	-0.12	3.26
9348.00	89.690	312.320	6555.68	2607.21	790.23	-2606.19	1745981.64	14438366.52	39°45'24.172"N	80°37'27.771"W	2723.36	286.868	0.64	0.45	-0.46
9431.00	89.480	312.660	6556.29	2689.22	846.29	-2667.39	1745920.47	14438422.56	39°45'24.728"N	80°37'28.552"W	2798.43	287.603	0.48	-0.25	0.41
9514.00	89.450	314.890	6557.06	2770.93	903.71	-2727.32	1745860.56	14438479.96	39°45'25.298"N	80°37'29.316"W	2873.14	288.333	2.69	-0.04	2.69
9598.00	89.600	316.930	6557.76	2853.01	964.04	-2785.76	1745802.15	14438540.26	39°45'25.897"N	80°37'30.061"W	2947.85	289.089	2.44	0.18	2.43
9682.00	89.720	315.150	6558.26	2935.05	1024.50	-2844.06	1745743.86	14438600.70	39°45'26.497"N	80°37'30.805"W	3022.96	289.810	2.12	0.14	-2.12
9764.00	89.420	314.460	6558.87	3015.50	1082.28	-2902.24	1745685.71	14438658.46	39°45'27.070"N	80°37'31.546"W	3097.47	290.451	0.92	-0.37	-0.84
9847.00	89.660	315.240	6559.54	3096.92	1140.81	-2961.08	1745626.89	14438716.97	39°45'27.651"N	80°37'32.297"W	3173.24	291.070	0.98	0.29	0.94
9930.00	89.660	318.830	6560.03	3177.65	1201.54	-3017.64	1745570.35	14438777.67	39°45'28.254"N	80°37'33.018"W	3248.05	291.711	4.33	0.00	4.33
10015.00	89.510	318.330	6560.65	3259.79	1265.28	-3073.87	1745514.14	14438841.39	39°45'28.886"N	80°37'33.734"W	3324.10	292.373	0.61	-0.18	-0.59
10097.00	89.690	314.840	6561.22	3339.70	1324.83	-3130.22	1745457.82	14438900.92	39°45'29.477"N	80°37'34.453"W	3399.04	292.940	4.26	0.22	-4.26
10181.00	89.510	310.510	6561.81	3422.64	1381.75	-3191.96	1745396.10	14438957.82	39°45'30.042"N	80°37'35.240"W	3478.20	293.407	5.16	-0.21	-5.15
10263.00	89.350	308.690	6562.62	3504.19	1434.02	-3255.14	1745332.95	14439010.06	39°45'30.561"N	80°37'36.046"W	3557.01	293.775	2.23	-0.20	-2.22
10348.00	89.350	314.100	6563.59	3588.38	1490.20	-3318.87	1745269.24	14439066.22	39°45'31.119"N	80°37'36.859"W	3638.08	294.180	6.36	0.00	6.36
10431.00	89.910	318.880	6564.12	3669.28	1550.38	-3376.00	1745212.13	14439126.37	39°45'31.716"N	80°37'37.588"W	3714.97	294.666	5.80	0.67	5.76
10515.00	89.540	317.020	6564.53	3750.68	1612.75	-3432.26	1745155.90	14439188.72	39°45'32.335"N	80°37'38.305"W	3792.27	295.168	2.26	-0.44	-2.21
10598.00	89.510	314.590	6565.21	3831.81	1672.25	-3490.11	1745098.07	14439248.20	39°45'32.925"N	80°37'39.042"W	3870.05	295.601	2.93	-0.04	-2.93
10680.00	89.480	313.080	6565.94	3912.52	1729.04	-3549.26	1745038.94	14439304.97	39°45'33.489"N	80°37'39.797"W	3948.01	295.973	1.84	-0.04	-1.84
10763.00	89.450	314.790	6566.71	3994.18	1786.62	-3609.02	1744979.20	14439362.53	39°45'34.060"N	80°37'40.559"W	4027.04	296.337	2.06	-0.04	2.06
10846.00	89.380	313.980	6567.56	4075.73	1844.68	-3668.33	1744919.91	14439420.56	39°45'34.636"N	80°37'41.315"W	4106.03	296.696	0.98	-0.08	-0.98
10928.00	89.450	315.250	6568.40	4156.23	1902.26	-3726.70	1744861.57	14439478.12	39°45'35.208"N	80°37'42.060"W	4184.13	297.042	1.55	0.09	1.55
11010.00	89.450	319.060	6569.18	4235.95	1962.37	-3782.45	1744805.84	14439538.21	39°45'35.804"N	80°37'42.770"W	4261.20	297.421	4.65	0.00	4.65
11093.00	89.540	320.550	6569.92	4315.67	2025.77	-3836.01	1744752.30	14439601.58	39°45'36.433"N	80°37'43.453"W	4338.06	297.838	1.80	0.11	1.80
11176.00	89.630	319.800	6570.52	4395.24	2089.51	-3889.17	1744699.16	14439665.30	39°45'37.065"N	80°37'44.130"W	4414.94	298.248	0.91	0.11	-0.90
11260.00	89.540	318.770	6571.13	4476.13	2153.18	-3943.96	1744644.39	14439728.94	39°45'37.696"N	80°37'44.828"W	4493.44	298.632	1.23	-0.11	-1.23
11343.00	89.690	318.170	6571.68	4556.38	2215.31	-3998.99	1744589.39	14439791.05	39°45'38.313"N	80°37'45.530"W	4571.60	298.985	0.75	0.18	-0.72
11427.00	89.570	317.280	6572.23	4637.86	2277.46	-4055.49	1744532.90	14439853.18	39°45'38.929"N	80°37'46.250"W	4651.22	299.317	1.07	-0.14	-1.06
11511.00	89.570	316.380	6572.86	4719.64	2338.72	-4112.96	1744475.46	14439914.41	39°45'39.537"N	80°37'46.982"W	4731.39	299.624	1.07	0.00	-1.07
11592.00	89.510	315.480	6573.51	4798.79	2396.92	-4169.30	1744419.14	14439972.59	39°45'40.115"N	80°37'47.701"W	4809.18	299.894	1.11	-0.07	-1.11
11677.00	89.690	314.700	6574.10	4882.10	2457.31	-4229.30	1744359.16	14440032.76	39°45'40.712"N	80°37'48.466"W	4891.26	300.155	0.94	0.21	-0.92

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Operator	SOUTHWESTERN ENERGY
Area	Marshall County, WV
Field	Marshall
Facility	Columbia Gas Transmission MSH Pad
Slot	Wellbore
Slot 1H	Columbia Gas Transmission MSH 1H

## REFERENCE WELLPATH IDENTIFICATION

WELLPATH DATA (170 stations)															
MD	Inclination	Azimuth	TVD	Vert Sect	North	East	Grid East	Grid North	Latitude	Longitude	Closure Dist	Dir	DLS	Build Rate	Turn Rate
[ft]	[°]	[°]	[ft]	[ft]	[ft]	[ft]	[US ft]	[US ft]	[ft]	[ft]	[ft]	[°]	[%/100ft]	[%/100ft]	[%/100ft]
11757.00	89.540	313.360	6574.64	4960.79	2512.71	-4286.82	1744301.67	14440088.34	39°45'41.264"N	80°37'49.200"W	4968.96	300.377	1.69	-0.19	-1.68
11840.00	89.110	312.620	6575.61	5042.69	2569.30	-4347.53	1744240.98	14440144.91	39°45'41.825"N	80°37'49.974"W	5049.98	300.582	1.03	-0.52	-0.89
11924.00	88.830	312.920	6577.12	5125.62	2626.34	-4409.18	1744179.35	14440201.92	39°45'42.392"N	80°37'50.760"W	5132.11	300.780	0.49	-0.33	0.36
12008.00	88.860	312.880	6578.82	5208.51	2683.51	-4470.70	1744117.86	14440259.06	39°45'42.959"N	80°37'51.545"W	5214.25	300.974	0.06	0.04	-0.05
12091.00	88.860	313.280	6580.47	5290.37	2740.18	-4531.31	1744057.27	14440315.72	39°45'43.522"N	80°37'52.318"W	5295.41	301.162	0.48	0.00	0.48
12175.00	88.890	311.960	6582.12	5373.33	2797.05	-4593.11	1743995.49	14440372.56	39°45'44.086"N	80°37'53.107"W	5377.75	301.340	1.57	0.04	-1.57
12260.00	88.520	313.970	6584.04	5457.19	2854.97	-4655.29	1743933.34	14440430.46	39°45'44.661"N	80°37'53.900"W	5461.00	301.520	2.40	-0.44	2.36
12342.00	88.620	314.270	6586.09	5537.80	2912.03	-4714.14	1743874.51	14440487.50	39°45'45.227"N	80°37'54.650"W	5541.03	301.705	0.39	0.12	0.37
12426.00	88.580	311.550	6588.14	5620.68	2969.20	-4775.64	1743813.04	14440544.65	39°45'45.795"N	80°37'55.435"W	5623.42	301.871	3.24	-0.05	-3.24
12510.00	89.380	312.360	6589.63	5703.78	3025.35	-4838.10	1743750.60	14440600.77	39°45'46.352"N	80°37'56.232"W	5706.13	302.018	1.36	0.95	0.96
12594.00	89.290	314.320	6590.61	5786.58	3082.99	-4899.18	1743689.54	14440658.40	39°45'46.924"N	80°37'57.011"W	5788.51	302.182	2.34	-0.11	2.33
12675.00	89.170	316.640	6591.70	5865.85	3140.74	-4955.97	1743632.78	14440716.12	39°45'47.497"N	80°37'57.735"W	5867.35	302.364	2.87	-0.15	2.86
12758.00	89.200	318.640	6592.88	5946.38	3202.06	-5011.88	1743576.89	14440777.42	39°45'48.106"N	80°37'58.448"W	5947.45	302.574	2.41	0.04	2.41
12843.00	89.320	323.060	6593.98	6027.56	3267.96	-5065.53	1743523.26	14440843.29	39°45'48.759"N	80°37'59.131"W	6028.19	302.828	5.20	0.14	5.20
12927.00	89.690	322.330	6594.70	6106.96	3334.77	-5116.44	1743472.37	14440910.07	39°45'49.421"N	80°37'59.780"W	6107.26	303.095	0.97	0.44	-0.87
13010.00	90.150	317.150	6594.82	6186.69	3398.09	-5170.06	1743418.77	14440973.36	39°45'50.049"N	80°38'00.463"W	6186.80	303.315	6.27	0.55	-6.24
13095.00	89.320	315.590	6595.21	6269.60	3459.61	-5228.70	1743360.15	14441034.86	39°45'50.660"N	80°38'01.211"W	6269.63	303.491	2.08	-0.98	-1.84
13177.00	89.420	314.960	6596.11	6349.91	3517.86	-5286.40	1743302.47	14441093.10	39°45'51.238"N	80°38'01.947"W	6349.92	303.642	0.78	0.12	-0.77
13183.00	89.350	314.960	6596.18	6355.80	3522.10	-5290.65	1743298.23	14441097.33	39°45'51.280"N	80°38'02.001"W	6355.80	303.653	1.17	-1.17	0.00
13208.00	89.350	314.960	6596.46	6380.31	3539.77	-5308.34	1743280.54	14441114.99	39°45'51.455"N	80°38'02.226"W	6380.31	303.697	0.00	0.00	0.00

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REFERENCE WELLPATH IDENTIFICATION			
Operator	SOUTHWESTERN ENERGY	Slot	Slot 1H
Area	Marshall County, WV	Well	Columbia Gas Transmission MSH 1H
Field	Marshall	Wellbore	Columbia Gas Transmission MSH 1H AWB
Facility	Columbia Gas Transmission MSH Pad		

HOLE & CASING SECTIONS										
- Ref Wellbore: Columbia Gas Transmission MSH 1H AWB				Ref Wellpath: Columbia Gas Transmission MSH 1H AWP Proj: 13208'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]	
17.5in Open Hole	126.00	370.00	244.00	126.00	369.94	0.56	-0.34	0.60	-3.47	
13.375in Casing	26.00	350.00	324.00	26.00	349.95	0.00	0.00	0.31	-3.35	
12.25in Open Hole	370.00	2094.00	1724.00	369.94	2057.82	0.60	-3.47	-299.68	-30.38	
9.625in Casing	26.00	2076.00	2050.00	26.00	2039.98	0.00	0.00	-297.41	-29.73	
8.75in Open Hole	2094.00	5354.00	3260.00	2057.82	5211.48	-299.68	-30.38	-1051.67	-352.40	
8.5in Open Hole	5354.00	13208.00	7854.00	5211.48	6596.46	-1051.67	-352.40	3539.77	-5308.34	

TARGETS									
Name	TVD [ft]	North [ft]	East [ft]	Grid East [US ft]	Grid North [US ft]	Latitude	Longitude	Shape	
Columbia Gas Transmission MSH 1H LP Rev-1	6534.00	-802.64	-1022.89	1747564.33	14436774.27	39°45'08.364"N	80°37'07.585"W	point	
Columbia Gas Transmission MSH 1H BHL Rev-1	6596.00	3536.82	-5310.92	1743277.96	14441112.05	39°45'51.426"N	80°38'02.260"W	point	

WELLPATH COMPOSITION - Ref Wellbore: Columbia Gas Transmission MSH 1H AWB						Ref Wellpath: Columbia Gas Transmission MSH 1H AWP Proj: 13208'MD
Start MD [ft]	End MD [ft]	Positional Uncertainty Model	Log Name/Comment	Wellbore		
26.00	322.00	OWSG MWD rev2 + HRGM	01 Rig Survey <17.5">(173'-322')	Columbia Gas Transmission MSH 1H AWB		
322.00	2022.00	BHI NaviTrak (Axial)	02 APS EM <12.25"> (260')(427'-2022')	Columbia Gas Transmission MSH 1H AWB		
2022.00	5202.00	BHI NaviTrak (Axial)	03 APS EM <8.75"> (2022')(2117'-5202')	Columbia Gas Transmission MSH 1H AWB		
5202.00	13183.00	BHI AutoTrak Curve (Short)	04 BH AT Curve <8.5"> (5202')(5287'-13183')	Columbia Gas Transmission MSH 1H AWB		
13183.00	13208.00	Blind Drilling (std)	Projection to bit	Columbia Gas Transmission MSH 1H AWB		

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# Actual Wellpath Report

Columbia Gas Transmission MSH 1H AWP Proj: 13208'MD  
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REFERENCE WELLPATH IDENTIFICATION			
Operator	SOUTHWESTERN ENERGY	Slot	Slot 1H
Area	Marshall County, WV	Well	Columbia Gas Transmission MSH 1H
Field	Marshall	Wellbore	Columbia Gas Transmission MSH 1H AWB
Facility	Columbia Gas Transmission MSH Pad		

COMMENTS
<b>Wellpath general comments</b> API: 47-051-01936-0000 Job #: 8943584 Rig: SDC 42 Duration: 01/02/2018 - 01/24/2018

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

STAGE NUM	Perf Date	Perf Top MD	Perf Bottom MD	# SHOTS PER STG
1	1/25/2018	13,119	13,022	36
2	3/16/2018	12,958	12,826	33
3	3/17/2018	12,763	12,631	33
4	3/17/2018	12,568	12,436	33
5	3/18/2018	12,373	12,241	33
6	3/18/2018	12,178	12,046	33
7	3/18/2018	11,983	11,851	33
8	3/19/2018	11,788	11,656	33
9	3/18/2018	11,593	11,461	33
10	3/20/2018	11,398	11,266	33
11	3/20/2018	11,203	11,071	33
12	3/20/2018	11,008	10,876	33
13	3/20/2018	10,813	10,681	33
14	3/21/2018	10,618	10,486	33
15	3/22/2018	10,423	10,291	33
16	3/21/2018	10,228	10,096	33
17	3/23/2018	10,033	9,901	33
18	3/25/2018	9,838	9,706	33
19	3/26/2018	9,643	9,511	33
20	3/28/2018	9,448	9,316	33
21	3/29/2018	9,253	9,121	33
22	3/30/2018	9,058	8,926	33
23	3/30/2018	8,863	8,731	33
24	3/31/2018	8,668	8,536	33
25	3/31/2018	8,473	8,341	55
26	4/1/2018	8,278	8,146	33
27	4/2/2018	8,083	7,951	33
28	4/2/2018	7,888	7,756	33
29	4/3/2018	7,693	7,561	33
30	4/3/2018	7,498	7,366	33
31	4/3/2018	7,303	7,171	33

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**COLUMBIA GAS TRANSMISSION MSH 1H  
ATTACHMENT 2  
STIM REPORT**

STAGE NUM	Stim Date	Ave Pump Rate (BPM)	Ave Treatment	Max Breakdown	ISIP (PSI)	Amount of Proppant (lbs)	Amount of water bbls	Amount of nitrogen/othe
1	3/16/2018	72	8,008	6,618	4,443	400,880	6,630	0
2	3/17/2018	66	8,221	6,689	5,193	319,920	6,043	0
3	3/17/2018	68	7,876	6,675	4,832	408,160	6,603	0
4	3/18/2018	63	7,857	6,439	5,248	363,960	6,391	0
5	3/18/2018	74	8,151	5,889	4,801	411,720	6,796	0
6	3/18/2018	76	8,225	5,858	5,560	405,660	6,124	0
7	3/19/2018	75	8,021	6,341	5,886	409,580	6,633	0
8	3/19/2018	73	7,554	6,104	5,178	396,740	6,057	0
9	3/20/2018	71	7,725	7,052	5,055	409,200	6,081	0
10	3/20/2018	70	7,775	6,460	5,069	410,360	5,890	0
11	3/20/2018	79	7,841	6,170	5,055	410,940	6,276	0
12	3/21/2018	78	7,711	6,554	4,872	406,300	6,247	0
13	3/22/2018	79	7,957	6,575	4,920	410,440	6,350	0
14	3/22/2018	74	7,798	6,556	5,357	398,760	7,342	0
15	3/23/2018	80	7,951	6,305	4,873	393,820	5,991	0
16	3/23/2018	77	7,714	6,149	4,573	385,760	5,653	0
17	3/23/2018	74	7,307	6,640	4,522	389,920	5,673	0
18	3/26/2018	78	7,438	6,530	5,033	394,410	5,793	0
19	3/27/2018	78	7,797	5,985	5,766	385,580	5,808	0
20	3/29/2018	79	7,203	6,315	4,966	404,960	5,709	0
21	3/29/2018	80	7,300	6,144	4,831	394,000	6,367	0
22	3/30/2018	79	7,488	5,776	4,953	397,780	5,519	0
23	3/30/2018	79	7,553	6,861	5,232	403,620	5,597	0
24	3/31/2018	78	7,611	6,055	4,842	384,280	5,459	0
25	4/1/2018	69	7,063	5,615	5,222	391,200	7,878	0
26	4/1/2018	75	7,121	5,904	5,012	399,860	5,470	0
27	4/2/2018	75	7,374	6,092	4,538	396,740	5,477	0
28	4/2/2018	71	7,231	6,793	4,493	395,260	5,447	0
29	4/3/2018	77	7,524	7,159	4,805	398,540	5,605	0
30	4/3/2018	72	7,458	6,716	4,832	404,720	5,458	0
31	4/4/2018	75	7,730	7,098	5,128	396,640	5,790	0

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Attachment 3

Well Name: Columbia Gas Transmission MSH 1H

47051019360000

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)	5996.00	5835.00	6331.00	6151.00	
Cashaqua (shale)	6331.00	6151.00	6473.00	6270.00	
Middlesex (shale)	6473.00	6270.00	6605.00	6364.00	
Burket (shale)	6605.00	6364.00	6646.00	6389.00	
Tully (ls)	6646.00	6389.00	6689.00	6413.00	
Mahantango (shale)	6689.00	6413.00	6941.00	6515.00	
Marcellus (shale)	6941.00	6515.00	NA	NA	GAS

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# Hydraulic Fracturing Fluid Product Component Information Disclosure

Job Start Date:	3/16/2018
Job End Date:	4/4/2018
State:	West Virginia
County:	Marshall
API Number:	47-051-01936-00-00
Operator Name:	Southwestern Energy
Well Name and Number:	Columbia Gas Transmission MSH 1
Latitude:	39.75451472
Longitude:	-80.61512351
Datum:	NAD83
Federal Well:	NO
Indian Well:	NO
True Vertical Depth:	6,564
Total Base Water Volume (gal):	7,803,594
Total Base Non Water Volume:	99,000



## 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
HCL	SWN Well Services	Solvent					
				Listed Below			
Ecopol-FEAC	SWN Well Services	Iron Control					
				Listed Below			

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Base Water	Operator	Base Fluid					
				Listed Below			
Sand	SWN Well Services	Proppant					
				Listed Below			
SCAL16486A	Nalco	Scale Inhibitor					
				Listed Below			
BIOC11219A	Nalco	Biocide					
				Listed Below			
Econo-CI200	SWN Well Services	Corrosion Inhibitor					
				Listed Below			
FLOJET DR 9000LPP	SWN Well Services	Friction Reducer					
				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	83.05543	Density = 8.345
			Crystalline Silica, quartz	14808-60-7	100.00000	15.66156	
			Water	7732-18-5	85.00000	1.01276	
			Hydrochloric Acid	7647-01-0	15.00000	0.16912	
			Petroleum Distillates, Hydrotreated	64742-47-8	45.00000	0.05334	
			Ethylene glycol	107-21-1	10.00000	0.01443	
			Methanol	67-56-1	60.00000	0.01243	
			Benzyl-(C12-C16 Alky)-Dimethyl-Ammonium	68424-85-1	30.00000	0.00622	

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			Amine Triphosphate	Proprietary	30.00000	0.00258	
			Alcohols, C12-C16, Ethoxylated propoxylated	68213-24-1	2.00000	0.00237	
			Fatty alcohols ethoxylated	Proprietary	2.00000	0.00237	
			Acetic Acid	64-19-7	37.50000	0.00225	
			Chloride Glutaraldehyde	111-30-8	10.00000	0.00207	
			Methanol	67-56-1	80.00000	0.00138	
			Citric Acid	77-92-9	22.50000	0.00135	
			Oxyalkylated fatty acid	68951-67-7	9.67400	0.00017	
			Fatty acids	61790-12-3	5.02700	0.00009	
			Modified thiourea polymer	68527-49-1	4.74600	0.00008	
			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)

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Office of Oil and Gas  
AUG 3 2018  
WV Department of  
Environmental Protection

**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 PLAN DOES NOT REPRESENT A BOUNDARY SURVEY OF THE PARCELS SHOWN HEREON.
3. ALL INSERTS ARE GRID NORTH UNLESS OTHERWISE DEPICTED.

**LEGEND:**

- PROPOSED SURFACE HOLE / BOTTOM HOLE
- ★ EXISTING / PRODUCING WELLS
- ✱ L.P.L. LANDING POINT LOCATION
- PROPOSED SURFACE HOLE / BOTTOM HOLE
- PUBLIC ROAD
- ACCESS ROAD TO PREV. SITE
- LEASE BOUNDARY
- EXISTING PATH
- PROPOSED PATH
- FLOOD PLAN

**WELL OPERATOR:** SWN PRODUCTION COMPANY, LLC  
**ADDRESS:** P.O. BOX 1300 JANE LEW, WV 26378  
**SURFACE OWNER:** COLUMBIA GAS TRANSMISSION, LLC  
**COUNTY:** MARSHALL COUNTY - 51  
**DISTRICT:** LIBERTY  
**USGS 7 1/2 QUADRANGLE MAP NAME:** CAMERON, WV  
**WELL (FARM) NAME:** COLUMBIA GAS TRANSMISSION MSH  
**WELL #:** 1H  
**SERIAL #:** XXXX

**PROPERTY NUMBER 2501166140**  
**PAD ID 3001155714**  
 WV DEP REGULATORY PLAN  
 U:\2016\SOUTHWESTERN ENERGY\16-54 COLUMBIA GAS TRANSMISSION\AS DRILLED\H\AS DRILLED COLUMBIA GAS TRANSMISSION MSH 1H.DWG  
 THURSDAY JULY 26 2016 03:20PM

Latitude: 39°47'30"

SURFACE HOLE 8938'

Latitude: 39°47'30" BOTTOM HOLE

2519'

# 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: 4,400,582.23  
EASTING: 532,970.24

### LANDING POINT (LPL):

UTM (NAD83, ZONE 17, METERS):  
NORTHING: 4,400,342.20  
EASTING: 532,657.66

### BOTTOM HOLE LOCATION (BHL):

UTM (NAD83, ZONE 17, METERS):  
NORTHING: 4,401,661.22  
EASTING: 531,352.21

### SURFACE HOLE LOCATION (SHL):

UTM (NAD83, ZONE 17, METERS):  
NORTHING: 4,400,582.15  
EASTING: 532,970.33

### LANDING POINT (LPL):

UTM (NAD83, ZONE 17, METERS):  
NORTHING: 4,400,337.60  
EASTING: 532,658.67

### BOTTOM HOLE LOCATION (BHL):

UTM (NAD83, ZONE 17, METERS):  
NORTHING: 4,401,659.76  
EASTING: 531,352.18

TRACT	SURFACE OWNER (S) / ROYALTY OWNER (R)	TAX PARCEL	ACRES
1	COLUMBIA GAS TRANSMISSION, LLC (S)	7-19-10	55.150000
2	WILMA M GATTEN, F/K/A WILMA G KESTNER, A WIDOW(R)	7-19-8	1.926000
3	MASON DIXON FARMS, LLC	7-19-7	2.400000
4	MASON DIXON FARMS, LLC	7-19-8.8	60.000000
5	MASON DIXON FARMS, LLC	7-19-1	138.750000
6	MASON DIXON FARMS, LLC	7-17-33	221.140000
7	MASON DIXON FARMS, LLC	7-17-35	60.000000

TRACT	SURFACE OWNER	TAX PARCEL	ACRES
A	MASON DIXON FARMS LLC	7-19-8.7	77.59368681
B	MANUFACTURERS LIGHT & HEAT	7-19-10	18.74335444
C	CHARLES C. COOK	7-18-9	12.81315087
D	EDWARD L. GILBERT	7-19-12.1	1.66007947
E	MARY ESTHER GRIMM - LIFE	7-19-10.1	4.633449518
F	RODNEY J. WALLACE, ET UX	7-19-40	0.639969493
G	WALTER A. GIZEK JR., ET AL	7-19-41	0.95835677
H	LAWRENCE PAUL CHAMBERS	7-19-39	0.3788359
I	MICHAEL T. AND CARLA M. WHITTEMORE	7-19-8.7	2.28924892
J	THOMAS A. AND KAREN S. BUKOSKY	7-19-9	2.04701182
K	THOMAS A. AND KAREN S. BUKOSKY	7-19-8.1	4.00323574
L	JOHN M. AND TERESA L. HORNER	7-18-12	74.89724223
M	DELROSE A. & CHARLES E. HORNER DOROTHY S. & MITCHELL J. PRICE	7-19-30	119.8400
N	JOHN & TERESA L. HORNER	7-19-32	90.7600
O	MASON DIXON FARMS, LLC	7-18-7	91.0600
P	MASON DIXON FARMS, LLC	7-18-6	95.5000
Q	MASON DIXON FARMS, LLC	7-17-36	140.0000
R	JAMES ROBERT AND TIMOTHY WARREN	7-17-34	4.96033682
S	DAVID M. MCGEE AND MADISON GRACE	7-17-37.4	20.0000
T	RODNEY J. AND DIANNA L. WALLACE (NO NAME ON ASSESSMENT)	7-17-37.3	6.157224007
U	(NO NAME ON ASSESSMENT)	7-17-11	10.82812567
V	BETTY TAYLOR MCCULLLEY, ET VIR	7-17-8	1.0000
W	DAVID BARTSCH	7-17-12	4.0000
X	MASON DIXON FARMS, LLC	7-17-16.1	1.5000
Y	ROBERT S. AND SHEILA D. SIMMS	7-17-16	3.528329756
Z	ALEXANDER FAMILY TRUST	7-17-34.1	11.0000
AA	ROBERT C. BLAKE, ET UX	7-17-34.2	0.9600
BB	MICHAEL BELCHER	7-17-33.1	0.5400
CC	ROBERT S. AND SHEILA D. SIMMS	7-17-18	13.7070
DD	MASON DIXON FARMS LLC	7-17-19	20.50218449
EE	MASON DIXON FARMS LLC	7-17-19.1	19.24913255
FF	MASON DIXON FARMS LLC	7-17-20	1.17483308
GG	CHRISTINA Y. RICHMOND	7-17-21	0.581694136
HH	KEVIN B. MCELWEE	7-17-22	0.324043221
II	KEVIN B. MCELWEE	7-17-23	0.50754737
JJ	NORMAN L. DERROW, ET UX	7-17-26.2	0.2300
KK	GAIL & KAREN HUAN	7-17-27	0.1500
LL	RALPH MARTIN TAYLOR	7-17-29	0.4600
MM	ESTATE OF JAMES STEPHEN BARKER	7-17-30	0.2200
NN	JERRY S. AND CYNTHIA C. WHORTON	7-17-31	0.1300
OO	JERRY S. AND CYNTHIA C. WHORTON	7-17-32	0.1300
PP	JERRY S. AND CYNTHIA C. WHORTON	7-16-7.1	0.3100
QQ	MICHAEL E. & DONNA D. RICHARDS	7-19-3	0.5100

### WELL RESTRICTIONS

- NO OCCUPIED DWELLINGS > 2500 SQ FT. WITHIN 825 FEET OF CENTER OF PAD.
- NO AGRICULTURE BUILDINGS > 2500 SQ FT. WITHIN 825 FEET OF CENTER OF PAD.
- WATER WELLS OR DEVELOPED SPRINGS ARE WITHIN 375 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 HEREON.
- 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



(+) 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)

COMPANY: **SWN** Production Company, LLC

COLUMBIA GAS TRANSMISSION MSH  
OPERATOR'S WELL #: 1H  
API WELL #: 47 STATE 051 COUNTY PERMIT 01936

WELL TYPE: OIL  WASTE DISPOSAL  PRODUCTION  DEEP  GAS  LIQUID INJECTION  STORAGE  SHALLOW   
WATERSHED: UPPER OHIO SOUTH  
DISTRICT: LIBERTY COUNTY: MARSHALL COUNTY  
SURFACE OWNER: COLUMBIA GAS TRANSMISSION, LLC  
OIL & GAS ROYALTY OWNER: WILMA M GATTEN, F/K/A WILMA G KESTNER, A WIDOW  
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: MARCELLUS ESTIMATED DEPTH: 6,596' TVD 13,208' TMD

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

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

