

4705101154

CNX Gas Company,LLC

Marshall Co., WV

Cameron

MC-144

MC-144 Build & Center Leg

Survey: Survey #1

Standard Survey Report

09 September, 2008

RECEIVED
Office of Oil and Gas

SEP 25 2017

WV Department of
Environmental Protection

10/20/2017

SEP 25 2017

Survey Report

WV Department of Environmental Protection

Company:	CNX Gas Company, LLC	Local Co-ordinate Reference:	Site Cameron
Project:	Marshall Co., WV	TVD Reference:	WELL @ 0.00ft (Original Well Elev)
Site:	Cameron	MD Reference:	WELL @ 0.00ft (Original Well Elev)
Well:	MC-144	North Reference:	True
Wellbore:	MC-144 Build & Center Leg	Survey Calculation Method:	Minimum Curvature
Design:	As Drilled Center Leg	Database:	2003.21 Single User Dbase

Project	Marshall Co., WV		
Map System:	US State Plane 1983	System Datum:	Mean Sea Level
Geo Datum:	North American Datum 1983		
Map Zone:	West Virginia Northern Zone		Using geodetic scale factor

Site	Cameron		
Site Position:		Northing:	493,339.55 ft
From:	Map	Easting:	1,671,260.28 ft
Position Uncertainty:	0.00 ft	Slot Radius:	-
		Latitude:	39° 50' 58.760 N
		Longitude:	80° 33' 31.370 W
		Grid Convergence:	-0.68 °

Well	MC-144		
Well Position	+N/-S	0.00 ft	Northing: 493,339.55 ft
	+E/-W	0.00 ft	Easting: 1,671,260.28 ft
Position Uncertainty	0.00 ft	Wellhead Elevation:	ft
		Latitude:	39° 50' 58.760 N
		Longitude:	80° 33' 31.370 W
		Ground Level:	0.00 ft

Wellbore	MC-144 Build & Center Leg				
Magnetics	Model Name	Sample Date	Declination (T)	Dip Angle (T)	Field Strength (mT)
	IGRF2005	8/6/2008	-8.67	67.60	53,084

Design	As Drilled Center Leg			
Audit Notes:				
Version:	1.0	Phase:	ACTUAL	Tie On Depth: 0.00
Vertical Section:	Depth From (TVD) (ft)	+N/-S (ft)	+E/-W (ft)	Direction (T)
	0.00	0.00	0.00	16.02

Survey Program	Date 8/20/2008			
From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description
1,295.00	5,573.00	Survey #1 (MC-144 Build & Center Leg)		

Survey									
Measured Depth (ft)	Inclination (T)	Azimuth (T)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (T/100ft)	Build Rate (T/100ft)	Turn Rate (T/100ft)
1,295.00	89.28	21.12	803.57	569.21	140.41	585.86	0.00	0.00	0.00
1,301.00	89.00	21.50	803.66	574.80	142.59	591.83	7.75	-4.58	6.25
1,332.00	90.20	19.50	803.88	603.83	153.45	622.73	7.52	3.87	-6.45
1,384.00	89.30	15.90	804.02	634.31	163.17	654.71	11.60	-2.81	-11.25
1,394.00	88.80	12.40	804.51	663.39	170.50	684.69	11.78	-1.67	-11.67
1,428.00	91.30	12.50	804.48	696.59	177.83	718.62	7.36	7.35	0.29
1,460.00	92.20	13.00	803.51	727.79	184.89	750.55	3.22	2.81	1.56
1,493.00	90.80	12.40	802.64	759.97	192.15	783.48	4.62	-4.24	-1.82
1,525.00	88.30	13.00	802.89	791.18	199.18	815.43	8.03	-7.81	1.88
1,556.00	89.90	13.50	803.38	821.35	206.28	846.39	5.41	5.16	1.61
1,588.00	91.70	13.80	802.93	852.44	213.83	878.35	5.70	5.63	0.94
1,620.00	90.70	12.80	802.26	883.58	221.19	910.31	4.42	-3.13	-3.13
1,652.00	91.10	13.40	801.76	914.74	228.45	942.26	2.25	1.25	1.88

SEP 25 2017

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Wellbore:	MC-144 Build & Center Leg	Survey Calculation Method:	Minimum Curvature
Design:	As Drilled Center Leg	Database:	2003.21 Single User Dbase

Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N-S (ft)	+E-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
1,682.00	89.70	12.80	801.55	943.96	235.25	972.22	5.08	-4.67	-2.00
1,714.00	88.60	12.90	802.03	975.15	242.36	1,004.17	3.45	-3.44	0.31
1,746.00	89.40	14.30	802.59	1,006.25	249.88	1,036.14	5.04	2.50	4.38
1,778.00	90.40	14.20	802.64	1,037.27	257.76	1,068.12	3.14	3.13	-0.31
1,810.00	90.10	14.80	802.50	1,068.25	265.77	1,100.11	2.10	-0.94	1.88
1,841.00	89.10	12.10	802.72	1,098.39	272.98	1,131.07	9.29	-3.23	-8.71
1,873.00	90.50	10.70	802.83	1,129.76	279.31	1,162.97	6.19	4.38	-4.38
1,905.00	91.40	11.90	802.30	1,161.13	285.58	1,194.86	4.69	2.81	3.75
1,937.00	90.30	11.70	801.82	1,192.45	292.12	1,226.76	3.49	-3.44	-0.63
1,969.00	90.60	11.60	801.57	1,223.79	298.58	1,258.67	0.99	0.94	-0.31
2,001.00	88.30	11.10	801.88	1,255.16	304.88	1,290.56	7.36	-7.19	-1.56
2,032.00	89.80	12.80	802.39	1,285.48	311.30	1,321.48	7.31	4.84	5.48
2,064.00	91.40	13.70	802.06	1,316.63	318.63	1,353.44	5.74	5.00	2.81
2,096.00	91.60	13.80	801.22	1,347.70	326.23	1,385.40	0.70	0.63	0.31
2,128.00	90.80	13.60	800.55	1,378.78	333.81	1,417.37	2.58	-2.50	-0.63
2,160.00	89.80	12.90	800.38	1,409.93	341.14	1,449.33	3.81	-3.13	-2.19
2,192.00	91.10	13.20	800.13	1,441.10	348.37	1,481.28	4.17	4.06	0.94
2,222.00	91.50	13.30	799.45	1,470.30	355.24	1,511.24	1.37	1.33	0.33
2,254.00	90.30	13.20	798.95	1,501.44	362.58	1,543.20	3.76	-3.75	-0.31
2,286.00	88.30	13.90	799.34	1,532.55	370.07	1,575.17	6.62	-6.25	2.19
2,318.00	89.10	13.40	800.07	1,563.63	377.62	1,607.13	2.95	2.50	-1.56
2,350.00	89.70	13.30	800.40	1,594.77	385.01	1,639.09	1.90	1.88	-0.31
2,380.00	89.90	12.60	800.51	1,624.00	391.73	1,669.05	2.43	0.67	-2.33
2,411.00	90.90	14.00	800.29	1,654.17	398.87	1,700.01	5.55	3.23	4.52
2,443.00	89.40	14.80	800.21	1,685.16	406.82	1,732.00	5.31	-4.69	2.50
2,476.00	89.00	15.30	800.67	1,717.03	415.39	1,764.99	1.94	-1.21	1.52
2,508.00	88.80	14.20	801.28	1,747.97	423.54	1,796.98	3.49	-0.63	-3.44
2,540.00	88.70	13.90	801.98	1,779.00	431.30	1,828.95	0.99	-0.31	-0.94
2,572.00	90.10	14.80	802.31	1,810.00	439.23	1,860.93	5.20	4.38	2.61
2,604.00	89.30	15.50	802.48	1,840.89	447.60	1,892.93	3.32	-2.50	2.19
2,636.00	90.50	15.50	802.54	1,871.73	456.15	1,924.93	3.75	3.75	0.00
2,669.00	90.70	13.70	802.19	1,903.66	464.47	1,957.91	5.49	0.61	-5.45
2,700.00	90.30	13.30	801.92	1,933.80	471.70	1,988.88	1.82	-1.29	-1.29
2,732.00	89.10	13.10	802.09	1,964.95	479.01	2,020.84	3.80	-3.75	-0.63
2,764.00	90.30	13.80	802.26	1,996.07	486.45	2,052.81	4.34	3.75	2.19
2,796.00	91.10	13.10	801.87	2,027.19	493.89	2,084.78	3.32	2.50	-2.19
2,828.00	91.00	12.90	801.28	2,058.37	501.09	2,116.73	0.70	-0.31	-0.63
2,859.00	89.90	15.20	801.04	2,088.44	508.62	2,147.70	6.22	-3.55	7.42
2,891.00	88.80	15.00	801.40	2,119.33	516.95	2,179.70	3.49	-3.44	-0.63
2,923.00	90.10	14.70	801.71	2,150.26	525.15	2,211.69	4.17	4.06	-0.94
2,955.00	90.00	14.50	801.68	2,181.23	533.22	2,243.68	0.70	-0.31	-0.63
2,987.00	88.70	13.40	802.04	2,212.28	540.93	2,275.65	5.32	-4.06	-3.44
3,019.00	90.60	13.90	802.24	2,243.37	548.48	2,307.63	6.14	5.94	1.56
3,050.00	90.90	14.90	801.83	2,273.40	556.19	2,338.61	3.37	0.97	3.23
3,082.00	90.00	14.90	801.58	2,304.32	564.42	2,370.60	2.81	-2.81	0.00
3,114.00	91.00	14.40	801.30	2,335.28	572.51	2,402.59	3.49	3.13	-1.56
3,146.00	90.50	13.50	800.86	2,366.33	580.23	2,434.57	3.22	-1.56	-2.81
3,178.00	88.50	12.60	801.16	2,397.50	587.45	2,466.52	6.85	-6.25	-2.81
3,210.00	89.10	12.60	801.83	2,428.72	594.43	2,498.46	1.88	1.88	0.00
3,241.00	91.30	14.00	801.72	2,458.89	601.56	2,529.42	8.41	7.10	4.52
3,265.00	91.80	13.20	801.07	2,482.21	607.20	2,553.39	3.93	2.08	-3.33
3,297.00	89.30	13.90	800.77	2,513.31	614.70	2,585.36	8.11	-7.81	2.19
3,329.00	89.50	13.90	801.10	2,544.37	622.39	2,617.33	0.63	0.63	0.00
3,361.00	91.50	14.00	800.82	2,575.43	630.10	2,649.31	6.26	6.25	0.31

Survey Report

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Design:	As Drilled Center Leg	Database:	2003.21 Single User Dbase

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Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
3,392.00	89.20	14.10	800.63	2,605.50	637.62	2,680.29	7.43	-7.42	0.32
3,425.00	86.70	13.50	801.81	2,637.52	645.49	2,713.24	7.79	-7.58	-1.82
3,456.00	87.70	13.60	803.33	2,667.62	652.75	2,744.17	3.24	3.23	0.32
3,490.00	90.10	14.20	803.98	2,700.62	660.91	2,778.14	7.28	7.06	1.76
3,519.00	91.40	13.90	803.60	2,728.75	667.95	2,807.12	4.60	4.48	-1.03
3,550.00	90.00	13.50	803.22	2,758.86	675.29	2,838.09	4.70	-4.52	-1.29
3,582.00	88.90	13.00	803.53	2,790.01	682.63	2,870.05	3.78	-3.44	-1.56
3,613.00	90.50	13.70	803.69	2,820.17	689.78	2,901.02	5.63	5.16	2.26
3,645.00	91.30	13.70	803.19	2,851.25	697.36	2,932.99	2.50	2.50	0.00
3,679.00	90.60	14.10	802.62	2,884.25	705.53	2,966.96	2.37	-2.06	1.18
3,710.00	89.70	13.40	802.54	2,914.36	712.90	2,997.93	3.68	-2.90	-2.26
3,742.00	88.80	12.30	802.96	2,945.56	720.01	3,029.88	4.44	-2.81	-3.44
3,774.00	89.70	12.90	803.38	2,976.79	726.99	3,061.82	3.38	2.81	1.88
3,810.00	90.40	13.40	803.35	3,011.84	735.18	3,097.78	2.39	1.94	1.39
3,838.00	90.40	13.20	803.15	3,039.09	741.62	3,125.74	0.71	0.00	-0.71
3,870.00	89.60	12.30	803.15	3,070.30	748.69	3,157.69	3.76	-2.50	-2.81
3,903.00	88.00	12.50	803.85	3,102.52	755.77	3,190.62	4.89	-4.85	0.61
3,935.00	87.40	12.80	805.13	3,133.72	762.77	3,222.54	2.10	-1.88	0.94
3,967.00	88.60	12.50	806.25	3,164.92	769.78	3,254.46	3.87	3.75	-0.94
3,998.00	90.30	12.70	806.54	3,195.17	776.54	3,285.40	5.52	5.48	0.65
4,030.00	90.10	13.60	806.43	3,226.33	783.82	3,317.36	2.88	-0.63	2.81
4,062.00	90.40	14.00	806.29	3,257.41	791.45	3,349.34	1.56	0.94	1.25
4,094.00	90.90	13.10	805.93	3,288.52	798.95	3,381.31	3.22	1.56	-2.81
4,124.00	91.20	12.10	805.38	3,317.79	805.49	3,411.25	3.48	1.00	-3.33
4,154.00	90.50	11.60	804.94	3,347.15	811.65	3,441.17	2.87	-2.33	-1.67
4,186.00	90.50	13.10	804.66	3,378.40	818.49	3,473.10	4.69	0.00	4.69
4,218.00	89.00	14.50	804.80	3,409.48	826.13	3,505.07	6.41	-4.69	4.38
4,250.00	90.10	14.00	805.05	3,440.49	834.00	3,537.06	3.78	3.44	-1.56
4,282.00	91.00	13.80	804.74	3,471.55	841.69	3,569.03	2.88	2.81	-0.63
4,314.00	89.70	13.20	804.54	3,502.67	849.16	3,601.00	4.47	-4.06	-1.88
4,345.00	90.20	13.10	804.57	3,532.85	856.21	3,631.96	1.64	1.61	-0.32
4,377.00	91.20	12.00	804.18	3,564.09	863.16	3,663.90	4.65	3.13	-3.44
4,409.00	89.80	11.50	803.90	3,595.41	869.68	3,695.81	4.65	-4.38	-1.56
4,441.00	89.30	13.20	804.15	3,626.67	876.52	3,727.74	5.54	-1.56	5.31
4,472.00	90.00	12.80	804.34	3,656.88	883.50	3,758.70	2.60	2.26	-1.29
4,504.00	90.00	14.00	804.34	3,688.00	890.91	3,790.66	3.75	0.00	3.75
4,536.00	90.80	13.20	804.12	3,719.11	898.44	3,822.63	3.54	2.50	-2.50
4,568.00	90.10	13.50	803.87	3,750.24	905.83	3,854.60	2.38	-2.19	0.94
4,599.00	89.40	13.00	804.00	3,780.41	912.93	3,885.56	2.77	-2.26	-1.61
4,631.00	89.90	11.90	804.20	3,811.66	919.83	3,917.50	3.78	1.56	-3.44
4,663.00	90.30	10.50	804.14	3,843.05	926.04	3,949.38	4.55	1.25	-4.38
4,695.00	89.30	10.70	804.25	3,874.50	931.93	3,981.24	3.19	-3.13	0.63
4,727.00	89.10	11.80	804.70	3,905.89	938.17	4,013.13	3.49	-0.63	3.44
4,760.00	89.80	11.10	805.02	3,938.23	944.72	4,046.02	3.00	2.12	-2.12
4,793.00	90.40	10.90	804.96	3,970.62	951.02	4,078.89	1.92	1.82	-0.61
4,825.00	92.00	11.20	804.29	4,002.02	957.15	4,110.76	5.09	5.00	0.94
4,857.00	91.90	11.60	803.20	4,033.37	963.47	4,142.64	1.29	-0.31	1.25
4,888.00	90.70	11.50	802.50	4,063.73	969.68	4,173.54	3.88	-3.87	-0.32
4,920.00	90.10	10.90	802.27	4,095.12	975.89	4,205.43	2.65	-1.88	-1.88
4,952.00	89.70	11.10	802.33	4,126.53	982.00	4,237.30	1.40	-1.25	0.63
4,983.00	90.40	11.30	802.30	4,156.94	988.02	4,268.19	2.35	2.26	0.65
5,015.00	89.70	11.70	802.27	4,188.30	994.40	4,300.09	2.52	-2.19	1.25
5,047.00	90.40	11.60	802.25	4,219.64	1,000.86	4,332.00	2.21	2.19	-0.31
5,077.00	90.40	11.70	802.04	4,249.02	1,006.92	4,361.91	0.33	0.00	0.33

Survey Report

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5,110.00	89.30	11.40	802.12	4,281.35	1,013.53	4,394.81	3.46	-3.33	-0.91	
5,142.00	89.20	10.80	802.54	4,312.75	1,019.69	4,426.69	1.90	-0.31	-1.88	
5,174.00	89.90	9.80	802.79	4,344.24	1,025.41	4,458.53	3.81	2.19	-3.13	
5,206.00	89.90	11.00	802.85	4,375.71	1,031.19	4,490.38	3.75	0.00	3.75	
5,238.00	90.30	11.40	802.79	4,407.10	1,037.40	4,522.26	1.77	1.25	1.25	
5,270.00	90.50	11.50	802.57	4,438.46	1,043.75	4,554.16	0.70	0.63	0.31	
5,301.00	89.30	11.00	802.62	4,468.87	1,049.80	4,585.05	4.19	-3.87	-1.61	
5,333.00	90.00	11.30	802.82	4,500.26	1,055.99	4,616.94	2.38	2.19	0.94	
5,363.00	90.70	11.30	802.64	4,529.68	1,061.87	4,646.83	2.33	2.33	0.00	
5,397.00	88.40	10.90	802.90	4,563.04	1,068.41	4,680.71	6.87	-6.76	-1.18	
5,429.00	87.90	10.90	803.94	4,594.45	1,074.46	4,712.56	1.56	-1.56	0.00	
5,461.00	89.20	10.30	804.75	4,625.89	1,080.34	4,744.41	4.47	4.06	-1.88	
5,500.00	90.00	10.30	805.02	4,664.26	1,087.32	4,783.21	2.05	2.05	0.00	
5,532.00	90.70	9.40	804.82	4,695.79	1,092.79	4,815.03	3.56	2.19	-2.81	
5,547.00	90.90	7.20	804.61	4,710.63	1,094.96	4,829.89	14.73	1.33	-14.67	
5,573.00	90.90	7.20	804.21	4,736.42	1,098.22	4,855.58	0.00	0.00	0.00	

Checked By: _____ Approved By: _____ Date: _____

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SEP 25 2017
WV Department of
Environmental Protection

CNX Gas Company, LLC

**Marshall Co., WV
Cameron
MC-144**

MC-144 East Leg

Design: As Drilled East Leg

Standard Survey Report

09 September, 2008

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Office of Oil and Gas

SEP 25 2017

WV Department of
Environmental Protection

SEP 25 2017

Survey Report

WV Department of
Environmental Protection

Company:	CNX Gas Company, LLC	Local Co-ordinate Reference:	Site Cameron
Project:	Marshall Co., WV	TVD Reference:	WELL @ 0.00ft (Original Well Elev)
Site:	Cameron	MD Reference:	WELL @ 0.00ft (Original Well Elev)
Well:	MC-144	North Reference:	True
Wellbore:	MC-144 East Leg	Survey Calculation Method:	Minimum Curvature
Design:	As Drilled East Leg	Database:	2003.21 Single User Dbase

Project	Marshall Co., WV		
Map System:	US State Plane 1983	System Datum:	Mean Sea Level
Geo Datum:	North American Datum 1983		
Map Zone:	West Virginia Northern Zone		Using geodetic scale factor

Site	Cameron		
Site Position:		Northing:	493,339.55ft
From:	Map	Easting:	1,671,260.28ft
Position Uncertainty:	0.00 ft	Slot Radius:	*
		Latitude:	39° 50' 58.760 N
		Longitude:	80° 33' 31.370 W
		Grid Convergence:	-0.68 °

Well	MC-144		
Well Position	+N-S	0.00 ft	Northing: 493,339.55 ft
	+E-W	0.00 ft	Easting: 1,671,260.28 ft
Position Uncertainty		0.00 ft	Wellhead Elevation: ft
			Latitude: 39° 50' 58.760 N
			Longitude: 80° 33' 31.370 W
			Ground Level: 0.00ft

Wellbore	MC-144 East Leg				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF200510	8/7/2008	-8.50	67.79	53,252

Design	As Drilled East Leg			
Audit Notes:				
Version:	1.0	Phase:	ACTUAL	Tie On Depth: 0.00
Vertical Section:	Depth From (TVD) (ft)	+N-S (ft)	+E-W (ft)	Direction (°)
	0.00	0.00	0.00	38.21

Survey Program	Date 8/15/2008		
From (ft)	To (ft)	Survey (Wellbore)	Tool Name
50.00	5,303.00	Survey #1 (MC-144 East Leg)	
		Description	

Survey										
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N-S (ft)	+E-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)	
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
50.00	0.81	312.00	50.00	0.24	-0.26	0.02	1.62	1.62	0.00	
100.00	0.93	310.60	99.99	0.74	-0.83	0.06	0.24	0.24	-2.80	
150.00	0.86	298.80	149.99	1.18	-1.47	0.02	0.39	-0.14	-23.60	
200.00	0.81	281.20	199.98	1.43	-2.15	-0.20	0.52	-0.10	-35.20	
250.00	0.75	254.70	249.98	1.41	-2.81	-0.63	0.72	-0.12	-53.00	
300.00	0.69	241.70	299.97	1.18	-3.39	-1.17	0.35	-0.12	-26.00	
350.00	0.74	242.40	349.97	0.89	-3.94	-1.74	0.10	0.10	1.40	
400.00	0.52	243.90	399.97	0.64	-4.43	-2.24	0.44	-0.44	3.00	
450.00	0.53	238.70	449.96	0.42	-4.83	-2.66	0.10	0.02	-10.40	
500.00	0.37	197.40	499.96	0.15	-5.08	-3.02	0.70	-0.32	-82.60	
550.00	0.74	188.10	549.96	-0.33	-5.17	-3.45	0.76	0.74	-18.60	
593.00	0.50	223.90	592.96	-0.74	-5.34	-3.88	1.03	-0.56	83.26	

SEP 25 2017

Survey Report

WV Department of
Environmental Protection

Company:	CNX Gas Company, LLC	Local Co-ordinate Reference:	Site Cameron
Project:	Marshall Co., WV	TVD Reference:	WELL @ 0.00ft (Original Well Elev)
Site:	Cameron	MD Reference:	WELL @ 0.00ft (Original Well Elev)
Well:	MC-144	North Reference:	True
Wellbore:	MC-144 East Leg	Survey Calculation Method:	Minimum Curvature
Design:	As Drilled East Leg	Database:	2003.21 Single User Dbase

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N-S (ft)	+E-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
623.00	7.30	3.50	622.88	1.08	-5.31	-2.44	25.63	22.67	465.33
655.00	18.10	4.90	654.05	8.08	-4.76	3.40	33.76	33.75	4.38
687.00	28.50	6.50	683.40	20.65	-3.47	14.08	32.56	32.50	5.00
719.00	38.70	10.60	710.02	38.12	-0.76	29.48	32.64	31.88	12.81
751.00	48.30	13.80	733.21	59.61	3.94	49.27	30.77	30.00	10.00
784.00	58.40	14.10	752.88	85.27	10.32	73.38	30.61	30.61	0.91
815.00	64.20	13.10	767.76	111.68	16.71	98.09	18.92	18.71	-3.23
847.00	69.00	12.60	780.47	140.31	23.23	124.62	15.07	15.00	-1.56
880.00	74.80	12.80	790.72	170.90	30.13	152.92	17.59	17.58	0.61
912.00	80.30	13.20	797.61	201.33	37.15	181.18	17.23	17.19	1.25
925.00	83.20	12.20	799.48	213.88	39.98	192.79	23.57	22.31	-7.69
942.00	86.70	10.90	800.98	230.47	43.37	207.92	21.95	20.59	-7.65
958.00	87.90	10.40	801.73	246.17	46.32	222.09	8.12	7.50	-3.13
975.00	87.80	9.90	802.37	262.90	49.32	237.08	3.00	-0.59	-2.94
990.00	88.20	10.30	802.89	277.66	51.95	250.30	3.77	2.67	2.67
1,007.00	89.40	11.80	803.25	294.34	55.20	265.42	11.30	7.06	8.82
1,017.00	89.80	12.70	803.32	304.11	57.33	274.41	9.85	4.00	9.00
1,039.00	89.40	15.00	803.47	325.47	62.59	294.45	10.61	-1.82	10.45
1,047.00	89.60	16.40	803.54	333.17	64.76	301.84	17.68	2.50	17.50
1,079.00	89.90	16.10	803.68	363.89	73.71	331.52	1.33	0.94	-0.94
1,111.00	90.60	16.70	803.54	394.59	82.75	361.23	2.88	2.19	1.88
1,142.00	91.10	17.10	803.08	424.24	91.76	390.10	2.07	1.61	1.29
1,174.00	92.20	17.40	802.16	454.79	101.24	419.97	3.56	3.44	0.94
1,195.00	91.10	17.90	801.55	474.79	107.61	439.63	5.75	-5.24	2.38
1,206.00	90.50	18.30	801.40	485.25	111.02	449.96	6.56	-5.45	3.64
1,236.00	87.70	18.80	801.87	513.68	120.57	478.20	9.48	-9.33	1.67
1,269.00	88.30	19.50	803.02	544.84	131.38	509.37	2.79	1.82	2.12
1,301.00	89.50	21.50	803.64	574.80	142.59	539.85	7.29	3.75	6.25
1,333.00	90.20	24.10	803.72	604.30	154.99	570.69	8.41	2.19	8.13
1,365.00	89.90	26.70	803.69	633.20	168.71	601.90	8.18	-0.94	8.13
1,397.00	89.60	30.00	803.83	661.36	183.91	633.42	10.35	-0.94	10.31
1,429.00	89.70	33.40	804.03	688.58	200.72	665.21	10.63	0.31	10.63
1,460.00	89.90	36.70	804.14	713.96	218.52	696.15	10.66	0.65	10.65
1,492.00	91.10	40.80	803.86	738.91	238.54	728.14	13.35	3.75	12.81
1,524.00	92.20	41.90	802.94	762.92	259.67	760.08	4.86	3.44	3.44
1,557.00	89.90	41.10	802.33	787.63	281.53	793.02	7.38	-6.97	-2.42
1,589.00	88.90	41.10	802.67	811.74	302.57	824.98	3.13	-3.13	0.00
1,621.00	90.10	41.60	802.95	835.76	323.71	856.93	4.06	3.75	1.56
1,652.00	90.40	41.70	802.81	858.93	344.31	887.87	1.02	0.97	0.32
1,683.00	90.70	41.60	802.51	882.09	364.91	918.81	1.02	0.97	-0.32
1,715.00	89.20	41.70	802.54	906.00	386.18	950.76	4.70	-4.69	0.31
1,747.00	89.10	41.60	803.02	929.91	407.44	982.69	0.44	-0.31	-0.31
1,778.00	89.00	41.40	803.53	953.12	427.98	1,013.64	0.72	-0.32	-0.65
1,810.00	90.10	41.70	803.78	977.07	449.20	1,045.58	3.56	3.44	0.94
1,842.00	89.60	40.90	803.86	1,001.11	470.32	1,077.54	2.95	-1.56	-2.50
1,874.00	91.20	41.40	803.64	1,025.20	491.38	1,109.49	5.24	5.00	1.56
1,906.00	90.90	40.70	803.05	1,049.33	512.39	1,141.45	2.38	-0.94	-2.19
1,938.00	90.00	40.30	802.80	1,073.66	533.17	1,173.42	3.08	-2.81	-1.25
1,969.00	88.30	41.00	803.26	1,097.18	553.36	1,204.39	5.93	-5.48	2.26
2,001.00	87.80	41.30	804.35	1,121.26	574.41	1,236.33	1.82	-1.56	0.94
2,033.00	89.40	40.10	805.13	1,145.51	595.27	1,268.28	6.25	5.00	-3.75
2,065.00	90.10	39.40	805.27	1,170.11	615.73	1,300.27	3.09	2.19	-2.19
2,097.00	90.30	40.30	805.16	1,194.68	636.23	1,332.26	2.88	0.63	2.81
2,129.00	89.70	42.10	805.16	1,218.76	657.31	1,364.21	5.93	-1.88	5.63

SEP 25 2017

Survey Report

WV Department of
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Company: CNX Gas Company, LLC
Project: Marshall Co., WV
Site: Cameron
Well: MC-144
Wellbore: MC-144 East Leg
Design: As Drilled East Leg

Local Co-ordinate Reference: Site Cameron
TVD Reference: WELL @ 0.00ft (Original Well Elev)
MD Reference: WELL @ 0.00ft (Original Well Elev)
North Reference: True
Survey Calculation Method: Minimum Curvature
Database: 2003.21 Single User Dbase

Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
2,160.00	89.00	41.90	805.51	1,241.79	678.05	1,395.14	2.35	-2.26	-0.65
2,192.00	90.60	42.60	805.63	1,265.48	699.57	1,427.06	5.46	5.00	2.19
2,224.00	90.40	42.30	805.35	1,289.09	721.16	1,458.97	1.13	-0.63	-0.94
2,256.00	90.00	43.90	805.23	1,312.45	743.03	1,490.86	5.15	-1.25	5.00
2,288.00	89.20	44.10	805.46	1,335.47	765.26	1,522.69	2.58	-2.50	0.63
2,320.00	89.80	43.90	805.74	1,358.49	787.49	1,554.53	1.98	1.88	-0.63
2,351.00	88.90	42.40	806.09	1,381.10	808.68	1,585.41	5.64	-2.90	-4.84
2,382.00	89.70	41.80	806.47	1,404.10	829.47	1,616.34	3.23	2.58	-1.94
2,413.00	90.20	42.60	806.49	1,427.07	850.29	1,647.26	3.04	1.61	2.58
2,444.00	89.00	43.00	806.71	1,449.81	871.35	1,678.16	4.08	-3.87	1.29
2,476.00	89.70	42.90	807.07	1,473.23	893.15	1,710.05	2.21	2.19	-0.31
2,508.00	90.30	42.70	807.07	1,496.71	914.89	1,741.94	1.98	1.88	-0.63
2,540.00	90.00	42.30	806.99	1,520.31	936.51	1,773.85	1.56	-0.94	-1.25
2,573.00	90.40	43.70	806.87	1,544.44	959.02	1,806.74	4.41	1.21	4.24
2,605.00	90.10	43.20	806.74	1,567.67	981.03	1,838.60	1.82	-0.94	-1.56
2,637.00	89.80	42.50	806.76	1,591.13	1,002.79	1,870.50	2.38	-0.94	-2.19
2,669.00	90.60	43.30	806.65	1,614.57	1,024.57	1,902.39	3.54	2.50	2.50
2,701.00	90.50	42.50	806.34	1,638.01	1,046.35	1,934.28	2.52	-0.31	-2.50
2,733.00	89.10	42.00	806.46	1,661.70	1,067.87	1,966.20	4.65	-4.38	-1.56
2,765.00	89.00	41.60	806.99	1,685.55	1,089.19	1,998.13	1.29	-0.31	-1.25
2,797.00	89.40	42.40	807.43	1,709.33	1,110.60	2,030.06	2.79	1.25	2.50
2,828.00	89.80	41.90	807.65	1,732.31	1,131.41	2,060.99	2.07	1.29	-1.61
2,860.00	89.30	41.10	807.90	1,756.28	1,152.61	2,092.93	2.95	-1.56	-2.50
2,892.00	90.30	40.60	808.01	1,780.48	1,173.54	2,124.90	3.49	3.13	-1.56
2,924.00	90.80	39.70	807.71	1,804.94	1,194.17	2,156.88	3.22	1.56	-2.81
2,956.00	91.40	39.00	807.09	1,829.68	1,214.46	2,188.87	2.88	1.88	-2.19
2,988.00	90.50	40.00	806.56	1,854.37	1,234.81	2,220.85	4.20	-2.81	3.13
3,019.00	89.80	41.30	806.48	1,877.89	1,255.00	2,251.82	4.76	-2.26	4.19
3,051.00	90.50	42.90	806.40	1,901.63	1,276.45	2,283.75	5.46	2.19	5.00
3,083.00	89.80	44.20	806.31	1,924.82	1,298.50	2,315.61	4.61	-2.19	4.06
3,115.00	89.50	43.50	806.51	1,947.90	1,320.67	2,347.45	2.38	-0.94	-2.19
3,147.00	90.60	42.50	806.48	1,971.30	1,342.49	2,379.34	4.65	3.44	-3.13
3,178.00	88.90	41.40	806.61	1,994.35	1,363.21	2,410.27	6.53	-5.48	-3.55
3,210.00	87.50	42.00	807.62	2,018.23	1,384.49	2,442.20	4.76	-4.38	1.88
3,242.00	88.80	41.70	808.65	2,042.06	1,405.83	2,474.11	4.17	4.06	-0.94
3,274.00	90.50	41.20	808.85	2,066.04	1,427.01	2,506.06	5.54	5.31	-1.56
3,298.00	91.50	40.30	808.43	2,084.22	1,442.67	2,530.03	5.61	4.17	-3.75
3,330.00	90.10	41.30	807.98	2,108.44	1,463.58	2,562.00	5.38	-4.38	3.13
3,363.00	88.90	43.10	808.27	2,132.88	1,485.75	2,594.91	6.56	-3.64	5.45
3,394.00	89.50	43.30	808.70	2,155.48	1,506.96	2,625.79	2.04	1.94	0.65
3,427.00	91.00	44.60	808.56	2,179.24	1,529.87	2,658.62	6.01	4.55	3.94
3,465.00	89.70	44.80	808.33	2,206.25	1,556.59	2,696.38	3.46	-3.42	0.53
3,497.00	89.40	43.30	808.58	2,229.24	1,578.84	2,728.21	4.78	-0.94	-4.69
3,522.00	90.50	43.00	808.60	2,247.48	1,595.94	2,753.12	4.56	4.40	-1.20
3,555.00	90.40	44.00	808.34	2,271.42	1,618.65	2,785.98	3.05	-0.30	3.03
3,584.00	89.70	45.10	808.32	2,292.09	1,639.00	2,814.80	4.50	-2.41	3.79
3,615.00	90.40	45.10	808.29	2,313.97	1,660.96	2,845.57	2.26	2.26	0.00
3,648.00	89.10	44.10	808.43	2,337.46	1,684.13	2,878.37	4.97	-3.94	-3.03
3,680.00	89.80	43.60	808.74	2,360.54	1,706.29	2,910.21	2.69	2.19	-1.56
3,711.00	90.40	44.90	808.69	2,382.74	1,727.82	2,941.04	4.62	1.94	4.19
3,743.00	89.20	44.90	808.80	2,405.41	1,750.51	2,972.82	3.75	-3.75	0.00
3,774.00	89.00	44.00	809.28	2,427.54	1,772.22	3,003.63	2.97	-0.65	-2.90
3,808.00	89.90	43.40	809.61	2,452.12	1,795.71	3,037.47	3.18	2.65	-1.76
3,839.00	88.70	43.80	809.99	2,474.56	1,817.08	3,068.33	4.08	-3.87	1.29

Survey Report

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Design:	As Drilled East Leg	Database:	2003.21 Single User Dbase

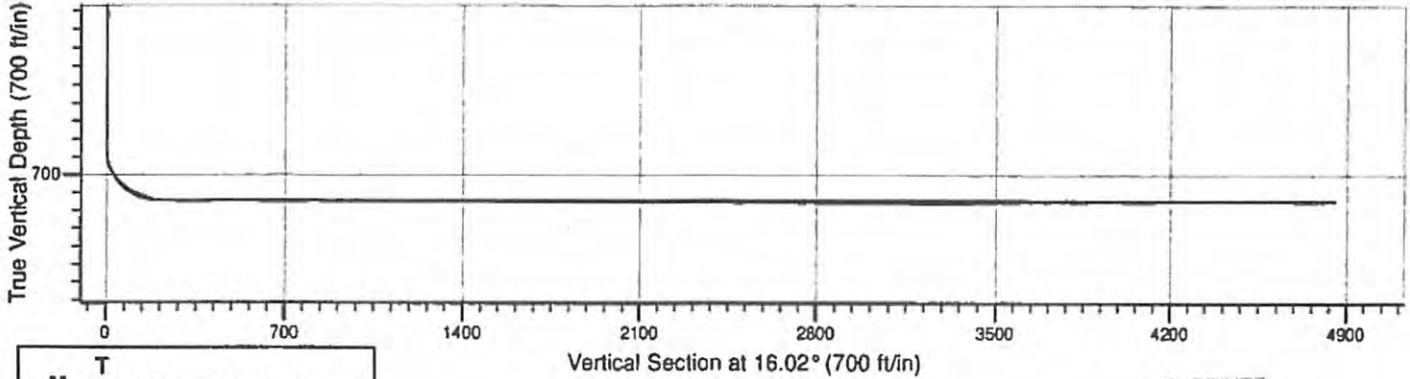
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N-S (ft)	+E-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
3,871.00	89.90	43.40	810.38	2,497.73	1,839.15	3,100.19	3.95	3.75	-1.25
3,902.00	90.90	44.40	810.16	2,520.07	1,860.64	3,131.03	4.56	3.23	3.23
3,934.00	89.60	44.40	810.02	2,542.93	1,883.03	3,162.85	4.06	-4.06	0.00
3,965.00	89.50	45.10	810.27	2,564.95	1,904.86	3,193.64	2.28	-0.32	2.26
3,998.00	90.90	44.40	810.15	2,588.38	1,928.09	3,226.43	4.74	4.24	-2.12
4,029.00	89.80	45.10	809.96	2,610.40	1,949.91	3,257.23	4.21	-3.55	2.26
4,060.00	89.70	44.70	810.10	2,632.36	1,971.79	3,288.01	1.33	-0.32	-1.29
4,093.00	89.70	44.30	810.27	2,655.89	1,994.92	3,320.82	1.21	0.00	-1.21
4,125.00	88.50	44.20	810.77	2,678.81	2,017.25	3,352.63	3.76	-3.75	-0.31
4,157.00	87.00	43.70	812.03	2,701.83	2,039.44	3,384.45	4.94	-4.69	-1.56
4,187.00	88.70	44.40	813.16	2,723.38	2,060.28	3,414.27	6.13	5.67	2.33
4,218.00	89.00	45.30	813.78	2,745.35	2,082.14	3,445.05	3.06	0.97	2.90
4,252.00	90.20	45.50	814.02	2,769.22	2,106.35	3,478.79	3.58	3.53	0.59
4,283.00	90.20	45.40	813.91	2,790.97	2,128.44	3,509.54	0.32	0.00	-0.32
4,314.00	91.10	45.10	813.56	2,812.79	2,150.45	3,540.30	3.06	2.90	-0.97
4,347.00	89.80	44.00	813.30	2,836.31	2,173.60	3,573.10	5.16	-3.94	-3.33
4,378.00	90.50	43.30	813.22	2,858.74	2,195.00	3,603.96	3.19	2.26	-2.26
4,410.00	90.60	44.30	812.91	2,881.83	2,217.15	3,635.80	3.14	0.31	3.13
4,443.00	93.50	45.40	811.73	2,905.21	2,240.40	3,668.56	9.40	8.79	3.33
4,475.00	92.20	44.50	810.14	2,927.83	2,262.98	3,700.30	4.94	-4.06	-2.81
4,506.00	91.90	43.90	809.03	2,950.04	2,284.58	3,731.11	2.16	-0.97	-1.94
4,539.00	90.50	43.90	808.34	2,973.81	2,307.46	3,763.94	4.24	-4.24	0.00
4,571.00	91.00	44.10	807.92	2,996.83	2,329.68	3,795.77	1.68	1.56	0.63
4,603.00	90.20	44.10	807.58	3,019.81	2,351.95	3,827.60	2.50	-2.50	0.00
4,635.00	90.00	44.90	807.53	3,042.63	2,374.38	3,859.41	2.58	-0.63	2.50
4,666.00	91.00	44.80	807.26	3,064.59	2,396.26	3,890.19	3.23	3.23	0.00
4,698.00	90.00	44.30	806.98	3,087.37	2,418.73	3,921.99	3.64	-3.13	-1.88
4,730.00	90.70	42.70	806.78	3,110.58	2,440.76	3,953.86	5.46	2.19	-5.00
4,761.00	90.00	44.10	806.59	3,133.11	2,462.05	3,984.73	5.05	-2.26	4.52
4,793.00	90.60	44.60	806.42	3,155.99	2,484.42	4,016.54	2.44	1.88	1.56
4,825.00	89.80	44.50	806.31	3,178.79	2,506.87	4,048.35	2.52	-2.50	-0.31
4,857.00	89.40	44.40	806.54	3,201.63	2,529.28	4,080.16	1.29	-1.25	-0.31
4,888.00	90.20	44.50	806.64	3,223.76	2,550.99	4,110.97	2.60	2.58	0.32
4,920.00	90.20	44.30	806.53	3,246.63	2,573.38	4,142.78	0.62	0.00	-0.63
4,950.00	91.30	43.30	806.14	3,268.28	2,594.14	4,172.64	4.96	3.67	-3.33
4,982.00	90.20	43.40	805.72	3,291.54	2,616.10	4,204.51	3.45	-3.44	0.31
5,014.00	90.70	44.20	805.47	3,314.64	2,638.25	4,236.35	2.95	1.56	2.50
5,046.00	90.80	44.50	805.05	3,337.52	2,660.62	4,268.17	0.99	0.31	0.94
5,079.00	89.60	44.20	804.94	3,361.12	2,683.69	4,300.98	3.75	-3.64	-0.91
5,111.00	88.40	44.80	805.49	3,383.94	2,706.11	4,332.78	4.19	-3.75	1.88
5,143.00	88.60	44.40	806.33	3,406.71	2,728.57	4,364.57	1.40	0.63	-1.25
5,175.00	89.30	45.30	806.92	3,429.40	2,751.14	4,396.35	3.56	2.19	2.81
5,207.00	91.10	45.00	806.81	3,451.96	2,773.82	4,428.11	5.70	5.63	-0.94
5,235.00	90.70	44.60	806.37	3,471.83	2,793.55	4,455.92	2.02	-1.43	-1.43
5,277.00	91.00	45.30	805.74	3,501.55	2,823.22	4,497.63	1.81	0.71	1.67
5,303.00	91.00	45.30	805.29	3,519.84	2,841.70	4,523.43	0.00	0.00	0.00

Checked By: _____ Approved By: _____ Date: _____



CNX Gas Company, LLC

Project: Marshall Co., WV
 Site: Cameron
 Well: MC-144
 Wellbore: MC-144 Build & Center Leg
 Design: As Drilled Center Leg



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 Office of Oil and Gas

SEP 25 2017

WV Department of
 Environmental Protection

Azimuths to True North
 Magnetic North: -8.67°
 Magnetic Field
 Strength: 53084.3snT
 Dip Angle: 67.60°
 Date: 8/6/2008
 Model: IGRF2005

