VOLUME IIA

APPENDIX 9A

Updated Tables – July 2015

Table 9A-20A

Rover Fugitive Pipeline Emissions by County

		Pollutant (tpy)						
County	**Elements within county**	**CH4 (from pipeline leaks) (tons)**	**CH4 (from Blowdown and Equipment Venting) (tons)**	**CO2 (from Blowdown and Equipment Venting) (tons)[2]**	**CO2 (from CH4 oxidation) (tons)**	**CO2 (from pipeline leaks) (tons)**	**VOC (tons)**	**CO_{2e} (tons)[3]**
Emission Factors (lb/mile-yr)[1]		15.1	1729	19	1.3	0.9	0.336	--
Ohio								
Monroe	44mi lateral pipeline	0.320	36.653	0.407	0.028	0.010	0.007	924.780
Noble	5mi lateral pipeline	0.036	4.165	0.046	0.003	0.001	0.001	105.089
Belmont	36mi lateral pipeline	0.262	29.989	0.333	0.023	0.008	0.006	756.638
Harrison	8mi lateral pipeline, 17mi mainline pipeline	0.306	34.987	0.389	0.026	0.009	0.007	882.745
Jefferson	18mi lateral pipeline	0.131	14.995	0.167	0.011	0.004	0.003	378.319
Carroll	16mi lateral pipeline, 6mi mainline pipeline	0.204	23.325	0.259	0.018	0.006	0.005	588.497
Tuscarawas	14mi Mainline Pipeline	0.204	23.325	0.259	0.018	0.006	0.005	588.497
Stark	14mi Mainline Pipeline	0.204	23.325	0.259	0.018	0.006	0.005	588.497
Wayne	28mi Mainline Pipeline	0.407	46.650	0.518	0.035	0.013	0.009	1176.993
Ashland	17mi Mainline Pipeline	0.247	28.323	0.315	0.021	0.008	0.005	714.603
Richland	18mi Mainline Pipeline	0.262	29.989	0.333	0.023	0.008	0.006	756.638
Crawford	18mi Mainline Pipeline	0.262	29.989	0.333	0.023	0.008	0.006	756.638
Seneca	22mi Mainline Pipeline	0.320	36.653	0.407	0.028	0.010	0.007	924.780
Hancock	6mi Mainline Pipeline	0.087	9.996	0.111	0.008	0.003	0.002	252.213
Wood	20mi Mainline Pipeline	0.291	33.321	0.370	0.025	0.009	0.006	840.709
Henry	18mi Mainline Pipeline, 5 mi Market Pipeline	0.298	34.154	0.379	0.026	0.009	0.007	861.727
Defiance	9mi Mainline Pipeline, 5mi Market Pipeline	0.167	19.160	0.213	0.014	0.005	0.004	483.408
Fulton	18mi Market Pipeline	0.131	14.995	0.167	0.011	0.004	0.003	378.319

Table 9A-20A

Rover Fugitive Pipeline Emissions by County

		Pollutant (tpy)						
County	**Elements within county**	**CH4 (from pipeline leaks) (tons)**	**CH4 (from Blowdown and Equipment Venting) (tons)**	**CO2 (from Blowdown and Equipment Venting) (tons)[2]**	**CO2 (from CH4 oxidation) (tons)**	**CO2 (from pipeline leaks) (tons)**	**VOC (tons)**	**CO_{2e} (tons)[3]**
Emission Factors (lb/mile-yr)[1]		15.1	1729	19	1.3	0.9	0.336	--
West Virginia								
Doddridge	15mi lateral pipeline	0.109	12.495	0.139	0.009	0.003	0.002	315.266
Tyler	23mi lateral pipeline	0.167	19.160	0.213	0.014	0.005	0.004	483.408
Wetzel	2mi lateral pipeline	0.015	1.666	0.019	0.001	0.000	0.000	42.035
Marshall	12mi lateral pipeline	0.087	9.996	0.111	0.008	0.003	0.002	252.213
Hancock	6mi lateral pipeline	0.044	4.998	0.056	0.004	0.001	0.001	126.106
Pennsylvania								
Washington	10mi lateral pipeline	0.073	8.330	0.093	0.006	0.002	0.002	210.177
Michigan								
Lenawee	28mi Market Pipeline	0.204	23.325	0.259	0.018	0.006	0.005	588.497
Washtenaw	28mi Market Pipeline	0.204	23.325	0.259	0.018	0.006	0.005	588.497
Livingston	29mi Market Pipeline	0.211	24.158	0.268	0.018	0.007	0.005	609.514

1) Emission Factors derived from INGAA Greenhouse Gas Emission Estimation Guidelines for Natural Gas and Storage; Volume 1 - GHG Estimation Methodologies and Procedures; Table 4-4: Tier 3 Emission Factors for Fugitive Emissions from Transmission; for Protected Steel Pipeline, and Table 3-6: Emission Factors for Blowdown and Equipment Venting Events.

2) Emissions Factor for CO2 from Blowdown and Equipment Venting based on Emission Factors for CH4 from Blowdown and Equipment Venting and ratio of CO2 to CH4 in Rover Pipeline gas mixture.

3) CO2e based on global warming potential of CO2=1, CH4=25

Table 9A-20A

Rover Fugitive Pipeline Emissions by County

Sample Calculations - Monroe County

CH4 (from pipeline leaks)=	miles of pipeline (mi) * INGAA EF (lbs/mi-yr) * Rover CH4 (%) / INGAA CH4 (%) / 2000 (lb/ton)
CH4 (from pipeline leaks)=	44mi * 15.1lb/mi-yr * 90%/93.4% / 2000lb/ton
CH4 (from pipeline leaks)=	0.320 ton/yr
CH4 (from blowdown and equipment venting)=	miles of pipeline (mi) * INGAA EF (lbs/mi-yr) * Rover CH4 (%) / INGAA CH4 (%) / 2000 (lb/ton)
CH4 (from blowdown and equipment venting)=	44mi * 1729lb/mi-yr * 90%/93.4% / 2000lb/ton
CH4 (from blowdown and equipment venting)=	36.653 ton/yr
CO2 (from blowdown and equipment venting)=	miles of pipeline (mi) * INGAA EF (lbs/mi-yr) * Rover CO2 (%) / INGAA CH4 (%) * Rover CH4 (%) / INGAA CH4 (%) / 2000 (lb/ton)
CO2 (from blowdown and equipment venting)=	44mi * 1729lb/mi-yr * 1%/90% * 90%/93.4% / 2000lb/ton
CO2 (from blowdown and equipment venting)=	0.407 ton/yr
CO2 (from CH4 oxidation)=	miles of pipeline (mi) * INGAA EF (lbs/mi-yr) * Rover CH4 (%) / INGAA CH4 (%) / 2000 (lb/ton)
CO2 (from CH4 oxidation)=	44mi * 1.3lb/mi-yr * 90%/93.4% / 2000lb/ton
CO2 (from CH4 oxidation)=	0.028 ton/yr
CO2 (from leaks)=	miles of pipeline (mi) * INGAA EF (lbs/mi-yr) * Rover CO2 (%) / INGAA CO2 (%) / 2000 (lb/ton)
CO2 (from leaks)=	44mi * 0.9lb/mi-yr * 1%/2% / 2000lb/ton
CO2 (from leaks)=	0.010 ton/yr
VOC=	miles of pipeline (mi) * Rover CH4 EF (tons/mi-yr) * Rover VOC (%) / Rover CH4 (%)
VOC=	44mi * 15.1lb/mi-yr * 90%/93.4% / 2000lb/ton * 2%/90%
VOC=	0.007 ton/yr
CO2e=	25 * CH4 (from pipeline leaks) (tons) + 25 * CH4 (from blowdown and equipment venting) (tons) + CO2 (from blowdown and equipment venting) (tons) + CO2 (from CH4 oxidation) (tons) + CO2 (from leaks) (tons)
CO2e=	25 * 0.320 tons + 25* 36.653 tons + 0.407 tons + 0.028 tons + 0.010 tons
CO2e=	924.780 tons

Table 9A-20B

Rover Fugitive Station Emissions by County

		Pollutant (tpy)						
		Compressor Station Emission[1]		M&R Station Emissions				Total
County	Elements within county	$CO2_e$ from venting & blowdowns (tons)	$CO2_e$ from fugitives (tons)	CH4 from venting and blowdowns (tons)[2]	CO2 from venting and blowdowns (tons)	CH4 from fugitives (tons)	CO2 from Fugitives (tons)	$CO2_e$ (tons)[3]
Emission Factors (lb/station-yr)[4]		--	--	29817	331.30	2533	146.34	--
Ohio								
Monroe	Clarington CS[5], Hall Receipt, Gulfport Receipt, Berne Receipt	298.84	374.50	100.561	1.117	8.543	0.256	3402.296
Noble	Seneca CS, Seneca Receipt, Rex Delivery	435.81	1,350.92	28.732	0.319	2.441	0.073	2574.094
Harrison	Cadiz CS[5]	406.07	1,350.92	28.732	0.319	2.441	0.073	2544.354
Carroll	Mainline CS1	908.02	1,350.92	--	--	--	--	2258.940
Wayne	Mainline CS2	1,142.32	1,350.92	--	--	--	--	2493.240
Crawford	Mainline CS3	1,040.42	1,350.92	--	--	--	--	2391.340
Defiance	Defiance CS, PEPL Delivery, ANR Delivery	710.14	1,350.92	28.732	0.319	2.441	0.073	2848.424
West Virginia								
Doddridge	Sherwood CS, Sherwood Receipt, CGT Delivery	382.83	288.83	28.732	0.319	2.441	0.073	1459.024
Marshall	Majorsville CS, Majorsville receipt	229.92	205.11	14.366	0.160	1.220	0.037	828.712
Pennsylvania								
Washington	Burgettstown CS, Burgettstown Receipt	188.49	290.78	14.366	0.160	1.220	0.037	872.952

Table 9A-20B

Rover Fugitive Station Emissions by County

		Pollutant (tpy)						
		Compressor Station Emission[1]		M&R Station Emissions				Total
County	Elements within county	$CO2_e$ from venting & blowdowns (tons)	$CO2_e$ from fugitives (tons)	CH4 from venting and blowdowns (tons)[2]	CO2 from venting and blowdowns (tons)	CH4 from fugitives (tons)	CO2 from Fugitives (tons)	$CO2_e$ (tons)[3]
Emission Factors (lb/station-yr)[4]		--	--	29817	331.30	2533	146.34	--
Michigan								
Washtenaw	Consumer Energy Delivery	--	--	14.366	0.160	1.220	0.037	393.682
Livingston	Vector Delivery	--	--	14.366	0.160	1.220	0.037	393.682

1) Compressor Station Emissions provided in Tables 9A-9A through 9A-18A

2) Emissions Factor for CO2 from Blowdown and Equipment Venting based on Emission Factor for CH4 from Blowdown and Equipment Venting and ratio of CO2 to CH4 in Rover Pipeline gas mixture.

3) CO2e based on global warming potential of CO2=1, CH4=25

4) Emission Factors derived from INGAA Greenhouse Gas Emission Estimation Guidelines for Natural Gas and Storage; Volume 1 - GHG Estimation Methodologies and Procedures; Table 3-6: Emission Factors for Blowdown and Equipment Venting Events, and Table 4-3: Tier 2 Emission Factors for Fugitive Emissions.

5) The Clarington Compressor Station will contain two receipt meters and two bidirectional meters.

6) The Cadiz Compressor Station will contain two receipt meters

Table 9A-20B

Rover Fugitive Station Emissions by County

Sample Calculations - Monroe County

CH4 from venting and blowdowns=	# of M&R stations * INGAA EF (lbs/station-yr) * Rover CH4 (%) / INGAA CH4 (%) / 2000 (lb/ton)
CH4 from venting and blowdowns=	7 stations * 29817lb/station-yr * 90%/93.4% / 2000lb/ton
CH4 from venting and blowdowns=	100.561 ton/yr
CO2 from venting and blowdowns=	# of M&R stations * INGAA EF (lbs/station-yr) * Rover CO2 (%) / INGAA CH4 (%) * Rover CH4 (%) / INGAA CH4 (%) / 2000 (lb/ton)
CO2 from venting and blowdowns=	7 stations * 29817lb/station-yr * 1%/90% * 90%/93.4% / 2000lb/ton
CO2 from venting and blowdowns=	1.117 ton/yr
CH4 from fugitives=	# of M&R stations * INGAA EF (lbs/station-yr) * Rover CH4 (%) / INGAA CH4 (%) / 2000 (lb/ton)
CH4 from fugitives=	7 stations * 2533lb/station-yr * 90%/93.4% / 2000lb/ton
CH4 from fugitives=	8.543 ton/yr
CO2 from fugitives=	# of M&R stations * INGAA EF (lbs/station-yr) * Rover CO2 (%) / INGAA CO2 (%) / 2000 (lb/ton)
CO2 from fugitives=	7 stations * 146.34lb/station-yr * 1%/2% / 2000lb/ton
CO2 from fugitives=	0.256 ton/yr
Total CO2e=	$CO2_e$ from Compressor Stations (tons) + 25 * (CH4 from venting and blowdowns (tons) + CH4 from fugitives (tons)) + CO2 from venting and blowdowns (tons) + CO2 from fugitives (tons)
Total CO2e=	298.84 tons + 374.50 tons + 25 * (100.561 tons + 8.543 tons) + 1.117 tons + 0.146 tons
Total CO2e=	3402.296 tons

Table 9A-21

Rover Construction Emissions – Summary

	Criteria Pollutant (tpy)						
	NOx (tons)	**VOC (tons)**	**CO (tons)**	**SO2 (tons)**	**PM10 (tons)**	**PM2.5 (tons)**	**CO_{2e} (tons)**
Mainline A & B Pipeline							
Construction Activities Fugitive Dust Emissions	--	--	--	--	343.1	71.4	--
Travel on Unpaved Roads Fugitive Dust Emissions	--	--	--	--	394.9	39.5	--
Construction Equipment Tailpipe Emissions	505.0	59.9	1,129.1	140.1	56.8	54.9	264,743.0
On-Road Tailpipe Emissions - Commuter and Truck	39.3	60.5	624.3	0.4	5.2	4.7	19,525.2
Mainline A & B Pipeline Emission Totals	**544.3**	**120.4**	**1,753.4**	**140.5**	**799.9**	**170.4**	**284,268.2**
Market Segment Pipeline							
Construction Activities Fugitive Dust Emissions	--	--	--	--	185.2	38.5	--
Travel on Unpaved Roads Fugitive Dust Emissions	--	--	--	--	198.4	19.8	--
Construction Equipment Tailpipe Emissions	252.5	30.0	564.5	70.0	28.4	27.4	132,371.5
On-Road Tailpipe Emissions - Commuter and Truck	19.6	30.2	312.2	0.2	2.6	2.3	9,762.6
Market Segment Pipeline Emission Totals	**272.2**	**60.2**	**876.7**	**70.2**	**414.6**	**88.1**	**142,134.1**
Lateral Pipelines							
Construction Activities Fugitive Dust Emissions	--	--	--	--	326.3	67.9	--
Travel on Unpaved Roads Fugitive Dust Emissions	--	--	--	--	394.9	39.5	--
Construction Equipment Tailpipe Emissions	505.0	59.9	1,129.1	140.1	56.8	54.9	264,743.0
On-Road Tailpipe Emissions - Commuter and Truck	39.3	60.5	624.3	0.4	5.2	4.7	19,525.2
Lateral Pipelines Emission Totals	**544.3**	**120.4**	**1,753.4**	**140.5**	**783.2**	**166.9**	**284,268.2**
Mainline CS 1 Compressor Station							
Construction Activities Fugitive Dust Emissions	--	--	--	--	1.8	0.4	--
Travel on Unpaved Roads Fugitive Dust Emissions	--	--	--	--	14.1	1.4	--
Construction Equipment Tailpipe Emissions	5.7	0.8	26.9	1.6	0.7	0.7	2,791.3
On-Road Tailpipe Emissions - Commuter and Truck	4.2	3.6	33.3	0.0	0.3	0.3	1,863.7
Mainline CS 1 Compressor Station Emission Totals	**9.9**	**4.4**	**60.2**	**1.6**	**17.0**	**2.8**	**4,654.9**
Mainline CS 2 Compressor Station							
Construction Activities Fugitive Dust Emissions	--	--	--	--	1.5	0.3	--
Travel on Unpaved Roads Fugitive Dust Emissions	--	--	--	--	14.1	1.4	--
Construction Equipment Tailpipe Emissions	5.7	0.8	26.9	1.6	0.7	0.7	2,791.3
On-Road Tailpipe Emissions - Commuter and Truck	4.2	3.6	33.3	0.0	0.3	0.3	1,863.7

Table 9A-21

Rover Construction Emissions – Summary

	Criteria Pollutant (tpy)						
	NOx (tons)	**VOC (tons)**	**CO (tons)**	**SO2 (tons)**	**PM10 (tons)**	**PM2.5 (tons)**	**CO_{2e} (tons)**
Mainline CS 2 Compressor Station Emission Totals	**9.9**	**4.4**	**60.2**	**1.6**	**16.7**	**2.7**	**4,654.9**
Mainline CS 3 Compressor Station							
Construction Activities Fugitive Dust Emissions	--	--	--	--	1.7	0.4	--
Travel on Unpaved Roads Fugitive Dust Emissions	--	--	--	--	14.1	1.4	--
Construction Equipment Tailpipe Emissions	5.7	0.8	26.9	1.6	0.7	0.7	2,791.3
On-Road Tailpipe Emissions - Commuter and Truck	4.2	3.6	33.3	0.0	0.3	0.3	1,863.7
Mainline CS 3 Compressor Station Emission Totals	**9.9**	**4.4**	**60.2**	**1.6**	**16.9**	**2.8**	**4,654.9**
Defiance Compressor Station							
Construction Activities Fugitive Dust Emissions	--	--	--	--	1.5	0.3	--
Travel on Unpaved Roads Fugitive Dust Emissions	--	--	--	--	14.1	1.4	--
Construction Equipment Tailpipe Emissions	5.7	0.8	26.9	1.6	0.7	0.7	2,791.3
On-Road Tailpipe Emissions - Commuter and Truck	4.2	3.6	33.3	0.0	0.3	0.3	1,863.7
Defiance Compressor Station Emission Totals	**9.9**	**4.4**	**60.2**	**1.6**	**16.7**	**2.7**	**4,654.9**
Stand-Alone Metering Stations							
Construction Activities Fugitive Dust Emissions	--	--	--	--	0.3	0.1	--
Travel on Unpaved Roads Fugitive Dust Emissions	--	--	--	--	12.7	1.3	--
Construction Equipment Tailpipe Emissions	5.1	0.7	24.2	1.4	0.7	0.6	2,512.1
On-Road Tailpipe Emissions - Commuter and Truck	2.0	1.8	16.5	0.0	0.2	0.1	876.1
Stand-Alone Metering Stations Emission Totals	**7.1**	**2.5**	**40.7**	**1.4**	**13.9**	**2.1**	**3,388.3**
Sherwood Compressor Station							
Construction Activities Fugitive Dust Emissions	--	--	--	--	3.1	0.6	--
Travel on Unpaved Roads Fugitive Dust Emissions	--	--	--	--	8.2	0.8	--
Construction Equipment Tailpipe Emissions	5.1	0.7	24.2	1.4	0.7	0.6	2,512.1
On-Road Tailpipe Emissions - Commuter and Truck	2.5	2.1	18.9	0.0	0.2	0.2	1,084.8
Sherwood Compressor Station Emission Totals	**7.6**	**2.8**	**43.1**	**1.4**	**12.1**	**2.3**	**3,597.0**
Seneca Compressor Station							
Construction Activities Fugitive Dust Emissions	--	--	--	--	1.3	0.3	--
Travel on Unpaved Roads Fugitive Dust Emissions	--	--	--	--	8.2	0.8	--
Construction Equipment Tailpipe Emissions	5.1	0.7	24.2	1.4	0.7	0.6	2,512.1
On-Road Tailpipe Emissions - Commuter and Truck	2.5	2.1	18.9	0.0	0.2	0.2	1,084.8

Table 9A-21

Rover Construction Emissions – Summary

	Criteria Pollutant (tpy)						
	NOx (tons)	**VOC (tons)**	**CO (tons)**	**SO2 (tons)**	**PM10 (tons)**	**PM2.5 (tons)**	**CO_{2e} (tons)**
Seneca Compressor Station Emission Totals	**7.6**	**2.8**	**43.1**	**1.4**	**10.4**	**1.9**	**3,597.0**
Clarington Compressor Station							
Construction Activities Fugitive Dust Emissions	--	--	--	--	2.1	0.4	--
Travel on Unpaved Roads Fugitive Dust Emissions	--	--	--	--	8.2	0.8	--
Construction Equipment Tailpipe Emissions	5.1	0.7	24.2	1.4	0.7	0.6	2,512.1
On-Road Tailpipe Emissions - Commuter and Truck	2.5	2.1	18.9	0.0	0.2	0.2	1,084.8
Clarington Compressor Station Emission Totals	**7.6**	**2.8**	**43.1**	**1.4**	**11.2**	**2.1**	**3,597.0**
Majorsville Compressor Station							
Construction Activities Fugitive Dust Emissions	--	--	--	--	1.8	0.4	--
Travel on Unpaved Roads Fugitive Dust Emissions	--	--	--	--	8.2	0.8	--
Construction Equipment Tailpipe Emissions	5.1	0.7	24.2	1.4	0.7	0.6	2,512.1
On-Road Tailpipe Emissions - Commuter and Truck	2.5	2.1	18.9	0.0	0.2	0.2	1,084.8
Majorsville Compressor Station Emission Totals	**7.6**	**2.8**	**43.1**	**1.4**	**10.9**	**2.0**	**3,597.0**
Cadiz Compressor Station							
Construction Activities Fugitive Dust Emissions	--	--	--	--	1.1	0.2	--
Travel on Unpaved Roads Fugitive Dust Emissions	--	--	--	--	8.2	0.8	--
Construction Equipment Tailpipe Emissions	5.1	0.7	24.2	1.4	0.7	0.6	2,512.1
On-Road Tailpipe Emissions - Commuter and Truck	2.5	2.1	18.9	0.0	0.2	0.2	1,084.8
Cadiz Compressor Station Emission Totals	**7.6**	**2.8**	**43.1**	**1.4**	**10.2**	**1.9**	**3,597.0**
Burgettstown Compressor Station							
Construction Activities Fugitive Dust Emissions	--	--	--	--	0.7	0.1	--
Travel on Unpaved Roads Fugitive Dust Emissions	--	--	--	--	8.2	0.8	--
Construction Equipment Tailpipe Emissions	5.1	0.7	24.2	1.4	0.7	0.6	2,512.1
On-Road Tailpipe Emissions - Commuter and Truck	2.5	2.1	18.9	0.0	0.2	0.2	1,084.8
Burgettstown Compressor Station Emission Totals	**7.6**	**2.8**	**43.1**	**1.4**	**9.8**	**1.8**	**3,597.0**

Rover Project Total Construction Emissions	**1,453.1**	**337.8**	**4,923.2**	**367.4**	**2,137.1**	**448.8**	**754,260.2**

Table 9A-22

Rover Construction Emissions - Summary by County

		Criteria Pollutant (tpy[1])						
County	**Elements within county**	**NOx (tons)**	**VOC (tons)**	**CO (tons)**	**SO2 (tons)**	**PM10 (tons)**	**PM2.5 (tons)**	**CO_{2e} (tons)**
Ohio								
Monroe	44mi lateral pipeline, Clarington CS[4,5], Hall Receipt, Gulfport Receipt, Berne Receipt	133.1	30.9	454.0	33.6	192.1	40.3	69010.1
Noble	5mi lateral pipeline, Seneca CS, Seneca Receipt[4], Rex Delivery4	21.6	5.9	88.0	5.0	30.4	6.2	10885.9
Belmont	36mi lateral pipeline	100.5	22.2	323.7	25.9	143.6	30.6	52480.3
Harrison	8mi lateral pipeline, 17mi mainline pipeline, Cadiz CS[4,6]	74.6	17.6	259.0	18.7	107.7	22.6	38604.9
Jefferson	18mi lateral pipeline	50.2	11.1	161.9	13.0	71.8	15.3	26240.1
Carroll	16mi lateral pipeline, 6mi mainline pipeline, Mainline CS1	70.3	17.8	254.8	17.2	104.0	21.3	36219.2
Tuscarawas	14mi Mainline Pipeline	36.8	8.1	118.6	9.5	54.0	11.5	19225.9
Stark	14mi Mainline Pipeline	36.8	8.1	118.6	9.5	54.0	11.5	19225.9
Wayne	28mi Mainline Pipeline, Mainline CS2	83.5	20.7	297.3	20.6	124.7	25.7	43106.7
Ashland	17mi Mainline Pipeline	44.7	9.9	144.0	11.5	65.5	13.9	23345.7
Richland	18mi Mainline Pipeline	47.3	10.5	152.5	12.2	69.4	14.8	24719.0
Crawford	18mi Mainline Pipeline, Mainline CS3	57.2	14.9	212.6	13.8	86.4	17.6	29373.9
Seneca	22mi Mainline Pipeline	57.8	12.8	186.4	14.9	84.8	18.0	30212.1
Hancock	6mi Mainline Pipeline	15.8	3.5	50.8	4.1	23.1	4.9	8239.7
Wood	20mi Mainline Pipeline	52.6	11.6	169.4	13.6	77.1	16.4	27465.5
Henry	18mi Mainline Pipeline, 5 mi Market Pipeline	59.4	13.1	191.3	15.3	87.7	18.7	31008.1
Defiance	9mi Mainline Pipeline, 5mi Market Pipeline, Defiance CS, PEPL Delivery[4], ANR Delivery	46.5	12.6	180.3	11.0	71.6	14.3	23727.1
Fulton	18mi Market Pipeline	43.4	9.6	139.7	11.2	66.0	14.0	22640.8
West Virginia								
Doddridge	15mi lateral pipeline, Sherwood CS, Sherwood Reciept[4], CGT Delivery	50.4	12.3	183.0	12.4	73.8	15.3	25887.3
Tyler	23mi lateral pipeline	64.2	14.2	206.8	16.6	91.8	19.5	33529.1
Wetzel	2mi lateral pipeline	5.6	1.2	18.0	1.4	8.0	1.7	2915.6
Marshall[2]	12mi lateral pipeline, Majorsville CS, Majorsville receipt	36.4	9.3	138.1	8.8	52.6	10.8	18598.3
Hancock	6mi lateral pipeline	16.7	3.7	54.0	4.3	23.9	5.1	8746.7
Pennsylvania								
Washington[3]	10mi lateral pipeline; Burgettstown CS, Burgettstown Receipt[4]	35.5	8.9	133.0	8.6	49.7	10.3	18174.8

Table 9A-22

Rover Construction Emissions - Summary by County

		Criteria Pollutant (tpy[1])						
County	**Elements within county**	**NOx (tons)**	**VOC (tons)**	**CO (tons)**	**SO2 (tons)**	**PM10 (tons)**	**PM2.5 (tons)**	**CO_{2e} (tons)**
Michigan								
Lenawee	28mi Market Pipeline	67.4	14.9	217.2	17.4	102.7	21.8	35219.1
Washtenaw	28mi Market Pipeline, Consumer Energy Deliver	68.3	15.2	222.3	17.6	104.5	22.1	35642.6
Livingston	29mi Market Pipeline, Vector Delivery	70.7	15.8	230.1	18.2	108.2	22.9	36900.4

[1] All construction activity and associated emissions are projected to take place in year 2016.

[2] Parts of Marshall County WV are designated nonattainment for SO2, however, the Majorsville Compressor Station will be located in the attainment portion of the county.

[3] Washington County, Pennsylvania is non-attainment for 8-hr Ozone and 24-hr PM2.5.

[4] Meter station will be located within the associated compressor station.

[5] The Clarington Compressor Station will contain two receipt meters and two bidirectional meters.

[6] The Cadiz Compressor Station will contain two receipt meters.

Table 9A-22

Rover Construction Emissions - Summary by County

Sample Calculations: Estimates by county were made by pro-rating the total construction emission by pipeline mileage and number of sites within a given county.

Sample Calculations - Monroe County

PM10= 44mi Lateral Pipeline PM10 + Clarington CS PM10 + Hall Receipt PM10 + Gulfport Receipt PM10 + Berne Receipt PM10

PM10= (44mi/200 total lateral miles)*778.1 tons (Lateral Pipeline PM10 Emission Total) + 11.2 tons (Clarington CS PM10 Emission Total) + (3/8 stand-alone stations)*14.3 tons (Stand-alone Metering Station PM10 Emission Total)

PM10= 192.1 tons

Belmont County NOx emissions

NOx= 36mi Lateral Pipeline NOx

NOx= (36mi/200 total lateral miles)*544.3 tons (Lateral Pipeline NOx Emission total)

NOx= 100.5 tons