

Appendix A
2007 Attainment Year Inventory

Appendix A-1
2007 Point Source Emissions

APP_A-1_EGU

FIPS	COUNTY	FACNAME	PLANTID	POINTID	STACKID	SCC	AEO FUEL	SO2 2007	NOX 2007	NH3 2007	PRI25 2007
24043	Washington	R. Paul Smith Power Station	043-0005	3-0005	S1	10100202	Coal	1,334.772	402.205	0.000	92.600
24043	Washington	R. Paul Smith Power Station	043-0005	3-0006	S2	10100212	Coal	4,201.002	996.206	0.000	217.500

APP_A-1_NonEGU

FIPS	CNTY NAME	NONATTAIN	NH3 2007	NOX 2007	P25 2007_TF	SO2 2007	FACNAME
24043	Washington	Hagerstown-Martinsburg, MD-WV	0.000	0.051	0.004	0.000	Xerxes Corporation
24043	Washington	Hagerstown-Martinsburg, MD-WV	0.000	0.051	0.004	0.000	Xerxes Corporation
24043	Washington	Hagerstown-Martinsburg, MD-WV	0.000	0.051	0.004	0.000	Xerxes Corporation
24043	Washington	Hagerstown-Martinsburg, MD-WV	0.000	0.051	0.004	0.000	Xerxes Corporation
24043	Washington	Hagerstown-Martinsburg, MD-WV	0.000	0.000	0.000	0.000	Xerxes Corporation
24043	Washington	Hagerstown-Martinsburg, MD-WV	0.000	0.000	0.000	0.000	Xerxes Corporation
24043	Washington	Hagerstown-Martinsburg, MD-WV	0.000	0.000	0.000	0.000	Fil-tec
24043	Washington	Hagerstown-Martinsburg, MD-WV	0.000	0.633	0.113	0.001	Fil-tec
24043	Washington	Hagerstown-Martinsburg, MD-WV	0.000	0.000	0.000	0.000	Fil-tec
24043	Washington	Hagerstown-Martinsburg, MD-WV	0.000	0.000	0.000	0.000	Fil-tec
24043	Washington	Hagerstown-Martinsburg, MD-WV	0.000	0.000	0.000	0.000	Fil-tec
24043	Washington	Hagerstown-Martinsburg, MD-WV	0.000	0.000	0.000	0.000	Fil-tec
24043	Washington	Hagerstown-Martinsburg, MD-WV	0.000	0.000	0.000	0.000	Fil-tec
24043	Washington	Hagerstown-Martinsburg, MD-WV	0.000	0.000	0.000	0.000	Fil-tec
24043	Washington	Hagerstown-Martinsburg, MD-WV	0.000	0.000	0.000	0.000	Fil-tec
24043	Washington	Hagerstown-Martinsburg, MD-WV	0.000	0.000	0.000	0.000	Fil-tec
24043	Washington	Hagerstown-Martinsburg, MD-WV	0.000	0.000	0.000	0.000	Fil-tec
24043	Washington	Hagerstown-Martinsburg, MD-WV	0.000	0.000	0.000	0.000	Fil-tec
24043	Washington	Hagerstown-Martinsburg, MD-WV	0.000	0.000	0.000	0.000	Fil-tec
24043	Washington	Hagerstown-Martinsburg, MD-WV	0.000	0.000	0.000	0.000	Fil-tec
24043	Washington	Hagerstown-Martinsburg, MD-WV	0.000	0.000	0.000	0.000	Fil-tec
24043	Washington	Hagerstown-Martinsburg, MD-WV	0.000	0.000	0.000	0.000	Fil-tec
24043	Washington	Hagerstown-Martinsburg, MD-WV	0.000	0.000	0.000	0.000	Fil-tec
24043	Washington	Hagerstown-Martinsburg, MD-WV	0.000	0.000	0.000	0.000	Fil-tec
24043	Washington	Hagerstown-Martinsburg, MD-WV	0.000	0.140	0.019	0.000	Fil-tec
24043	Washington	Hagerstown-Martinsburg, MD-WV	0.000	0.000	0.000	0.000	C. William Hetzer/beaver Creek Wst
24043	Washington	Hagerstown-Martinsburg, MD-WV	0.000	5.303	3.316	1.060	C. William Hetzer/beaver Creek Wst
24043	Washington	Hagerstown-Martinsburg, MD-WV	0.000	2.562	0.363	0.029	Engineered Polymer Solutions
24043	Washington	Hagerstown-Martinsburg, MD-WV	0.000	2.101	0.245	0.024	Engineered Polymer Solutions
24043	Washington	Hagerstown-Martinsburg, MD-WV	0.000	0.000	0.560	0.000	Engineered Polymer Solutions
24043	Washington	Hagerstown-Martinsburg, MD-WV	0.000	0.000	0.000	0.000	Engineered Polymer Solutions
24043	Washington	Hagerstown-Martinsburg, MD-WV	0.000	0.000	0.000	0.000	Engineered Polymer Solutions
24043	Washington	Hagerstown-Martinsburg, MD-WV	0.000	0.104	0.009	0.000	Phoenix Color
24043	Washington	Hagerstown-Martinsburg, MD-WV	0.000	0.104	0.009	0.000	Phoenix Color
24043	Washington	Hagerstown-Martinsburg, MD-WV	0.000	0.104	0.009	0.000	Phoenix Color
24043	Washington	Hagerstown-Martinsburg, MD-WV	0.000	0.000	0.000	0.000	Phoenix Color
24043	Washington	Hagerstown-Martinsburg, MD-WV	0.000	0.000	0.000	0.000	Phoenix Color

Appendix A-2
2007 Area Source Emissions

APP_A-2

FIPS	CNTY_NAME	NONATTAINMENT AREA	SCC	SCC_DESCRIPTION	NH3 2007	NOX 2007	P25 2007_TF	SO2 2007
24043	Washington	Hagerstown-Martinsburg, MD-WV	2103002000	Stationary Fuel Comb /Commercial/Institutional /Bituminous/Subbituminous Co	0.0201	7.3881	0.9672	51.0448
24043	Washington	Hagerstown-Martinsburg, MD-WV	2103004000	Stationary Fuel Comb /Commercial/Institutional /Distillate Oil /Total: Boil	0.8987	22.4700	2.3905	48.5300
24043	Washington	Hagerstown-Martinsburg, MD-WV	2103005000	Stationary Fuel Comb /Commercial/Institutional /Residual Oil /Total: All Bo	0.0136	0.9400	0.1155	5.4100
24043	Washington	Hagerstown-Martinsburg, MD-WV	2103006000	Stationary Fuel Comb /Commercial/Institutional /Natural Gas /Total: Boilers	0.3000	57.6400	0.0700	0.3700
24043	Washington	Hagerstown-Martinsburg, MD-WV	2103007000	Stationary Fuel Comb /Commercial/Institutional /Liquified Petroleum Gas /To	0.0105	2.7700	0.0000	0.0120
24043	Washington	Hagerstown-Martinsburg, MD-WV	2103011000	Stationary Fuel Comb /Commercial/Institutional /Kerosene /Total: All Combust	0.0310	0.7800	0.0804	1.6200
24043	Washington	Hagerstown-Martinsburg, MD-WV	2104002000	Stationary Fuel Comb /Residential /Bituminous/Subbituminous Coal /Total: Al	0.0345	0.1568	0.0662	1.0684
24043	Washington	Hagerstown-Martinsburg, MD-WV	2104004000	Stationary Fuel Comb /Residential /Distillate Oil /Total: All Combustor Typ	3.1689	57.0400	6.7495	136.9000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2104006000	Stationary Fuel Comb /Residential /Natural Gas /Total: All Combustor Types	7.4100	34.8300	0.1200	0.2200
24043	Washington	Hagerstown-Martinsburg, MD-WV	2104007000	Stationary Fuel Comb /Residential /Liquified Petroleum Gas /Total: All Comb	0.0596	15.7300	0.0100	0.0679
24043	Washington	Hagerstown-Martinsburg, MD-WV	2104008100	Stationary Fuel Comb /Residential /Wood /Fireplace: general	1.6145	2.3320	21.1674	0.3588
24043	Washington	Hagerstown-Martinsburg, MD-WV	2104008210	Stationary Fuel Comb /Residential /Wood /Woodstove: fireplace inserts; non-	1.5064	2.4812	27.1159	0.3545
24043	Washington	Hagerstown-Martinsburg, MD-WV	2104008220	Stationary Fuel Comb /Residential /Wood /Woodstove: fireplace inserts; EPA	0.2554	0.6470	5.5616	0.1135
24043	Washington	Hagerstown-Martinsburg, MD-WV	2104008230	Stationary Fuel Comb /Residential /Wood /Woodstove: fireplace inserts; EPA	0.0854	0.1897	1.9348	0.0379
24043	Washington	Hagerstown-Martinsburg, MD-WV	2104008310	Stationary Fuel Comb /Residential /Wood /Woodstove: freestanding, non-EPA c	3.1246	5.1464	56.2433	0.7352
24043	Washington	Hagerstown-Martinsburg, MD-WV	2104008320	Stationary Fuel Comb /Residential /Wood /Woodstove: freestanding, EPA certi	0.5311	1.3453	11.5652	0.2360
24043	Washington	Hagerstown-Martinsburg, MD-WV	2104008330	Stationary Fuel Comb /Residential /Wood /Woodstove: freestanding, EPA certi	0.1775	0.3944	4.0224	0.0789
24043	Washington	Hagerstown-Martinsburg, MD-WV	2104008400	Stationary Fuel Comb /Residential /Wood /Woodstove: pellet-fired, general (	0.0369	0.4677	0.3767	0.0394
24043	Washington	Hagerstown-Martinsburg, MD-WV	2104008510	Stationary Fuel Comb /Residential /Wood /Furnace: Indoor, cordwood-fired, n	1.0035	1.0265	15.3866	1.1317
24043	Washington	Hagerstown-Martinsburg, MD-WV	2104008610	Stationary Fuel Comb /Residential /Wood /Hydronic heater: outdoor	0.7538	0.7711	11.5587	0.8502
24043	Washington	Hagerstown-Martinsburg, MD-WV	2104009000	Stationary Fuel Comb /Residential /Firelog /Total: All Combustor Types		0.8073	2.9839	
24043	Washington	Hagerstown-Martinsburg, MD-WV	2104011000	Stationary Fuel Comb /Residential /Kerosene /Total: All Heater Types	0.2128	3.8300	0.4566	8.8600
24043	Washington	Hagerstown-Martinsburg, MD-WV	2294000000	Paved Roads /All Paved Roads /Total: Fugitives			25.8074	
24043	Washington	Hagerstown-Martinsburg, MD-WV	2296000000	Unpaved Roads /All Unpaved Roads /Total: Fugitives			1.0742	
24043	Washington	Hagerstown-Martinsburg, MD-WV	2302002100	Food & Kindred Products /Commercial Cooking - Charbroiling /Conveyorized Ch			4.7013	
24043	Washington	Hagerstown-Martinsburg, MD-WV	2302002200	Food & Kindred Products /Commercial Cooking - Charbroiling /Under-fired Cha			28.2537	
24043	Washington	Hagerstown-Martinsburg, MD-WV	2302003000	Food & Kindred Products /Commercial Cooking - Frying /Deep Fat Frying			0.0000	
24043	Washington	Hagerstown-Martinsburg, MD-WV	2302003100	Food & Kindred Products /Commercial Cooking - Frying /Flat Griddle Frying			5.7574	
24043	Washington	Hagerstown-Martinsburg, MD-WV	2302003200	Food & Kindred Products /Commercial Cooking - Frying /Clamshell Griddle Fry			0.5074	
24043	Washington	Hagerstown-Martinsburg, MD-WV	2302050000	Food & Kindred Products /Bakery Products /Total			0.0000	
24043	Washington	Hagerstown-Martinsburg, MD-WV	2302070001	Food & Kindred Products /Fermentation/Beverages /Breweries			0.0000	
24043	Washington	Hagerstown-Martinsburg, MD-WV	2311010000	Construction: SIC 15 - 17 /Residential /Total			0.7365	
24043	Washington	Hagerstown-Martinsburg, MD-WV	2311020000	Construction: SIC 15 - 17 /Industrial/Commercial/Institutional /Total			19.5684	
24043	Washington	Hagerstown-Martinsburg, MD-WV	2311030000	Construction: SIC 15 - 17 /Road Construction /Total			5.1193	
24043	Washington	Hagerstown-Martinsburg, MD-WV	2401002000	Surface Coating /Architectural Coatings - Solvent-based /Total: All Solvent			0.0000	
24043	Washington	Hagerstown-Martinsburg, MD-WV	2401003000	Surface Coating /Architectural Coatings - Water-based /Total: All Solvent T			0.0000	
24043	Washington	Hagerstown-Martinsburg, MD-WV	2401005000	Surface Coating /Auto Refinishing /Total: All Solvent Types			0.0000	
24043	Washington	Hagerstown-Martinsburg, MD-WV	2401008000	Surface Coating /Traffic Markings /Total: All Solvent Types			0.0000	
24043	Washington	Hagerstown-Martinsburg, MD-WV	2401015000	Surface Coating /Factory Finished Wood /Total: All Solvent Types			0.0000	
24043	Washington	Hagerstown-Martinsburg, MD-WV	2401020000	Surface Coating /Wood Furniture /Total: All Solvent Types			0.0000	
24043	Washington	Hagerstown-Martinsburg, MD-WV	2401025000	Surface Coating /Metal Furniture /Total: All Solvent Types			0.0000	
24043	Washington	Hagerstown-Martinsburg, MD-WV	2401030000	Surface Coating /Paper /Total: All Solvent Types			0.0000	
24043	Washington	Hagerstown-Martinsburg, MD-WV	2401040000	Surface Coating /Metal Cans /Total: All Solvent Types			0.0000	
24043	Washington	Hagerstown-Martinsburg, MD-WV	2401055000	Surface Coating /Machinery & Equipment /Total: All Solvent Types			0.0000	
24043	Washington	Hagerstown-Martinsburg, MD-WV	2401060000	Surface Coating /Large Appliances /Total: All Solvent Types			0.0000	

APP_A-2

FIPS	CNTY_NAME	NONATTAINMENT AREA	SCC	SCC_DESCRIPTION	NH3 2007	NOX 2007	P25 2007_TF	SO2 2007
24043	Washington	Hagerstown-Martinsburg, MD-WV	2401065000	Surface Coating /Electronic & Other Electrical /Total: All Solvent Types			0.0000	
24043	Washington	Hagerstown-Martinsburg, MD-WV	2401070000	Surface Coating /Motor Vehicles /Total: All Solvent Types			0.0000	
24043	Washington	Hagerstown-Martinsburg, MD-WV	2401075000	Surface Coating /Aircraft /Total: All Solvent Types			0.0000	
24043	Washington	Hagerstown-Martinsburg, MD-WV	2401080000	Surface Coating /Marine /Total: All Solvent Types			0.0000	
24043	Washington	Hagerstown-Martinsburg, MD-WV	2401085000	Surface Coating /Railroad /Total: All Solvent Types			0.0000	
24043	Washington	Hagerstown-Martinsburg, MD-WV	2401090000	Surface Coating /Misc Manufacturing /Total: All Solvent Types			0.0000	
24043	Washington	Hagerstown-Martinsburg, MD-WV	2401100000	Surface Coating /Industrial Maintenance Coatings /Total: All Solvent Types			0.0000	
24043	Washington	Hagerstown-Martinsburg, MD-WV	2401200000	Surface Coating /Other Special Purpose Coatings /Total: All Solvent Types			0.0000	
24043	Washington	Hagerstown-Martinsburg, MD-WV	2415300000	Degreasing /All Industries: Cold Cleaning /Total: All Solvent Types			0.0000	
24043	Washington	Hagerstown-Martinsburg, MD-WV	2420000000	Dry Cleaning /All Processes /Total: All Solvent Types			0.0000	
24043	Washington	Hagerstown-Martinsburg, MD-WV	2425000000	Graphic Arts /All Processes /Total: All Solvent Types			0.0000	
24043	Washington	Hagerstown-Martinsburg, MD-WV	2440020000	Misc Industrial /Adhesive (Industrial) Application /Total: All Solvent Type			0.0000	
24043	Washington	Hagerstown-Martinsburg, MD-WV	2460100000	Misc Non-indus: Consumer & Comm /All Personal Care Products /Total: All Sol			0.0000	
24043	Washington	Hagerstown-Martinsburg, MD-WV	2460200000	Misc Non-indus: Consumer & Comm /All Household Products /Total: All Solvent			0.0000	
24043	Washington	Hagerstown-Martinsburg, MD-WV	2460400000	Misc Non-indus: Consumer & Comm /All Auto Aftermarket Products /Total: All			0.0000	
24043	Washington	Hagerstown-Martinsburg, MD-WV	2460500000	Misc Non-indus: Consumer & Comm /All Coatings & Related Products /Total: Al			0.0000	
24043	Washington	Hagerstown-Martinsburg, MD-WV	2460600000	Misc Non-indus: Consumer & Comm /All Adhesives & Sealants /Total: All Solve			0.0000	
24043	Washington	Hagerstown-Martinsburg, MD-WV	2460800000	Misc Non-indus: Consumer & Comm /All FIFRA Related Products /Total: All Sol			0.0000	
24043	Washington	Hagerstown-Martinsburg, MD-WV	2460900000	Misc Non-indus: Consumer & Comm /Misc Products (Not Otherwise Covered) /Tot			0.0000	
24043	Washington	Hagerstown-Martinsburg, MD-WV	2461020000	Misc Non-industrial: Commercial /Asphalt Application: All Processes /Total:			0.0000	
24043	Washington	Hagerstown-Martinsburg, MD-WV	2461021000	Misc Non-industrial: Commercial /Cutback Asphalt /Total: All Solvent Types			0.0000	
24043	Washington	Hagerstown-Martinsburg, MD-WV	2461022000	Misc Non-industrial: Commercial /Emulsified Asphalt /Total: All Solvent Typ			0.0000	
24043	Washington	Hagerstown-Martinsburg, MD-WV	2461023000	Misc Non-industrial: Commercial /Asphalt Roofing /Total: All Solvent Types			0.0000	
24043	Washington	Hagerstown-Martinsburg, MD-WV	2461800000	Misc Non-industrial: Commercial /Pesticide Application: All Processes /Tota			0.0000	
24043	Washington	Hagerstown-Martinsburg, MD-WV	2501011011	Residential Portable Gas Cans /Permeation			0.0000	
24043	Washington	Hagerstown-Martinsburg, MD-WV	2501011012	Residential Portable Gas Cans /Evaporation (includes Diurnal losses)			0.0000	
24043	Washington	Hagerstown-Martinsburg, MD-WV	2501011013	Residential Portable Gas Cans /Spillage During Transport			0.0000	
24043	Washington	Hagerstown-Martinsburg, MD-WV	2501012011	Commercial Portable Gas Cans /Permeation			0.0000	
24043	Washington	Hagerstown-Martinsburg, MD-WV	2501012012	Commercial Portable Gas Cans /Evaporation (includes Diurnal losses)			0.0000	
24043	Washington	Hagerstown-Martinsburg, MD-WV	2501012013	Commercial Portable Gas Cans /Spillage During Transport			0.0000	
24043	Washington	Hagerstown-Martinsburg, MD-WV	2501060051	Gasoline Service Stations /Stage 1: Submerged Filling			0.0000	
24043	Washington	Hagerstown-Martinsburg, MD-WV	2501060053	Gasoline Service Stations /Stage 1: Balanced Submerged Filling			0.0000	
24043	Washington	Hagerstown-Martinsburg, MD-WV	2501060201	Gasoline Service Stations /Underground Tank: Breathing and Emptying			0.0000	
24043	Washington	Hagerstown-Martinsburg, MD-WV	2501080050	Petrol & Petrol Product Storage /Airports : Aviation Gasoline /Stage 1: Tot			0.0000	
24043	Washington	Hagerstown-Martinsburg, MD-WV	2501080100	Petrol & Petrol Product Storage /Airports : Aviation Gasoline /Stage 2: Tot			0.0000	
24043	Washington	Hagerstown-Martinsburg, MD-WV	2505020030	Petrol & Petrol Product Transport /Marine Vessel /Crude Oil			0.0000	
24043	Washington	Hagerstown-Martinsburg, MD-WV	2505020060	Petrol & Petrol Product Transport /Marine Vessel /Residual Oil			0.0000	
24043	Washington	Hagerstown-Martinsburg, MD-WV	2505020090	Petrol & Petrol Product Transport /Marine Vessel /Distillate Oil			0.0000	
24043	Washington	Hagerstown-Martinsburg, MD-WV	2505020120	Petrol & Petrol Product Transport /Marine Vessel /Gasoline			0.0000	
24043	Washington	Hagerstown-Martinsburg, MD-WV	2505020150	Petrol & Petrol Product Transport /Marine Vessel /Jet Naphtha			0.0000	
24043	Washington	Hagerstown-Martinsburg, MD-WV	2505020180	Petrol & Petrol Product Transport /Marine Vessel /Kerosene			0.0000	
24043	Washington	Hagerstown-Martinsburg, MD-WV	2505030120	Petrol & Petrol Product Transport /Truck /Gasoline			0.0000	
24043	Washington	Hagerstown-Martinsburg, MD-WV	2601000000	On-site Incineration /All Categories /Total		26.1400	0.0000	13.0400
24043	Washington	Hagerstown-Martinsburg, MD-WV	2610000100	Open Burning /All Categories /Yard Waste - Leaf Species Unspecified		1.7800	6.3000	0.2200
24043	Washington	Hagerstown-Martinsburg, MD-WV	2610000400	Open Burning /All Categories /Yard Waste - Brush Species Unspecified		1.6800	5.1000	0.5600

APP_A-2

FIPS	CNTY_NAME	NONATTAINMENT AREA	SCC	SCC_DESCRIPTION	NH3 2007	NOX 2007	P25 2007_TF	SO2 2007
24043	Washington	Hagerstown-Martinsburg, MD-WV	2610000500	Open Burning /All Categories /Land Clearing Debris (use 28-10-005-000 for L		31.8300	108.2300	0.0000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2610030000	Open Burning /Residential /Household Waste (use 26-10-000-xxx for Yard Wast		14.3800	83.3900	2.4000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2620030000	Landfills /Municipal /Total			0.0000	
24043	Washington	Hagerstown-Martinsburg, MD-WV	2630020000	Wastewater Treatment /Public Owned /Total Processed	3.7700		0.0000	
24043	Washington	Hagerstown-Martinsburg, MD-WV	2660000000	Leaking Underground Storage Tanks /Leaking Underground Storage Tanks /Total			0.0000	
24043	Washington	Hagerstown-Martinsburg, MD-WV	2801000003	Agric - Crops /Tilling			34.8742	
24043	Washington	Hagerstown-Martinsburg, MD-WV	2801700001	Agric - Crops /Fertilizer Application /Anhydrous Ammonia	0.0000		0.0000	
24043	Washington	Hagerstown-Martinsburg, MD-WV	2801700002	Agric - Crops /Fertilizer Application /Aqueous Ammonia	0.0000		0.0000	
24043	Washington	Hagerstown-Martinsburg, MD-WV	2801700003	Agric - Crops /Fertilizer Application /Nitrogen Solutions	68.2843		0.0000	
24043	Washington	Hagerstown-Martinsburg, MD-WV	2801700004	Agric - Crops /Fertilizer Application /Urea	84.8253		0.0000	
24043	Washington	Hagerstown-Martinsburg, MD-WV	2801700005	Agric - Crops /Fertilizer Application /Ammonium Nitrate	0.0000		0.0000	
24043	Washington	Hagerstown-Martinsburg, MD-WV	2801700006	Agric - Crops /Fertilizer Application /Ammonium Sulfate	1.1293		0.0000	
24043	Washington	Hagerstown-Martinsburg, MD-WV	2801700007	Agric - Crops /Fertilizer Application /Ammonium Thiosulfate	0.0000		0.0000	
24043	Washington	Hagerstown-Martinsburg, MD-WV	2801700010	Agric - Crops /Fertilizer Application /N-P-K (multi-grade nutrient fertiliz	17.1720		0.0000	
24043	Washington	Hagerstown-Martinsburg, MD-WV	2801700011	Agric - Crops /Fertilizer Application /Calcium Ammonium Nitrate	0.0000		0.0000	
24043	Washington	Hagerstown-Martinsburg, MD-WV	2801700012	Agric - Crops /Fertilizer Application /Potassium Nitrate	0.0000		0.0000	
24043	Washington	Hagerstown-Martinsburg, MD-WV	2801700013	Agric - Crops /Fertilizer Application /Diammonium Phosphate	0.8857		0.0000	
24043	Washington	Hagerstown-Martinsburg, MD-WV	2801700014	Agric - Crops /Fertilizer Application /Monoammonium Phosphate	0.1499		0.0000	
24043	Washington	Hagerstown-Martinsburg, MD-WV	2801700015	Agric - Crops /Fertilizer Application /Liquid Ammonium Polyphosphate	0.3135		0.0000	
24043	Washington	Hagerstown-Martinsburg, MD-WV	2801700099	Agric - Crops /Fertilizer Application /Miscellaneous Fertilizers	3.5311		0.0000	
24043	Washington	Hagerstown-Martinsburg, MD-WV	2805001100	Agric - Livestock /Beef cattle - finishing operations on feedlots (drylots	7.5906		0.0000	
24043	Washington	Hagerstown-Martinsburg, MD-WV	2805001200	Agric - Livestock /Beef cattle - finishing operations on feedlots (drylots	0.0030		0.0000	
24043	Washington	Hagerstown-Martinsburg, MD-WV	2805001300	Agric - Livestock /Beef cattle - finishing operations on feedlots (drylots	5.7657		0.0000	
24043	Washington	Hagerstown-Martinsburg, MD-WV	2805002000	Agric - Livestock /Beef cattle production composite /Not Elsewhere Classifi	29.2250		0.0000	
24043	Washington	Hagerstown-Martinsburg, MD-WV	2805003100	Agric - Livestock /Beef cattle - finishing operations on pasture/range /Co	20.7617		0.0000	
24043	Washington	Hagerstown-Martinsburg, MD-WV	2805007100	Agric - Livestock /Poultry production - layers with dry manure management s	112.8007		0.0000	
24043	Washington	Hagerstown-Martinsburg, MD-WV	2805007300	Agric - Livestock /Poultry production - layers with dry manure management s	5.0780		0.0000	
24043	Washington	Hagerstown-Martinsburg, MD-WV	2805008100	Agric - Livestock /Poultry production - layers with wet manure management s	1.6662		0.0000	
24043	Washington	Hagerstown-Martinsburg, MD-WV	2805008200	Agric - Livestock /Poultry production - layers with wet manure management s	5.7128		0.0000	
24043	Washington	Hagerstown-Martinsburg, MD-WV	2805008300	Agric - Livestock /Poultry production - layers with wet manure management s	0.9971		0.0000	
24043	Washington	Hagerstown-Martinsburg, MD-WV	2805009100	Agric - Livestock /Poultry production - broilers /Confinement	0.1587		0.0000	
24043	Washington	Hagerstown-Martinsburg, MD-WV	2805009200	Agric - Livestock /Poultry production - broilers /Manure handling and stora	0.0287		0.0000	
24043	Washington	Hagerstown-Martinsburg, MD-WV	2805009300	Agric - Livestock /Poultry production - broilers /Land application of manur	0.1295		0.0000	
24043	Washington	Hagerstown-Martinsburg, MD-WV	2805010100	Agric - Livestock /Poultry production - turkeys /Confinement	0.0719		0.0000	
24043	Washington	Hagerstown-Martinsburg, MD-WV	2805010200	Agric - Livestock /Poultry production - turkeys /Manure handling and storag	0.0129		0.0000	
24043	Washington	Hagerstown-Martinsburg, MD-WV	2805010300	Agric - Livestock /Poultry production - turkeys /Land application of manure	0.0648		0.0000	
24043	Washington	Hagerstown-Martinsburg, MD-WV	2805018000	Agric - Livestock /Dairy cattle composite /Not Elsewhere Classified	142.8192		0.0000	
24043	Washington	Hagerstown-Martinsburg, MD-WV	2805019100	Agric - Livestock /Dairy cattle - flush dairy /Confinement	6.2946		0.0000	
24043	Washington	Hagerstown-Martinsburg, MD-WV	2805019200	Agric - Livestock /Dairy cattle - flush dairy /Manure handling and storage	17.5879		0.0000	
24043	Washington	Hagerstown-Martinsburg, MD-WV	2805019300	Agric - Livestock /Dairy cattle - flush dairy /Land application of manure	1.6662		0.0000	
24043	Washington	Hagerstown-Martinsburg, MD-WV	2805021100	Agric - Livestock /Dairy cattle - scrape dairy /Confinement	74.5834		0.0000	
24043	Washington	Hagerstown-Martinsburg, MD-WV	2805021200	Agric - Livestock /Dairy cattle - scrape dairy /Manure handling and storage	81.7243		0.0000	
24043	Washington	Hagerstown-Martinsburg, MD-WV	2805021300	Agric - Livestock /Dairy cattle - scrape dairy /Land application of manure	163.9776		0.0000	
24043	Washington	Hagerstown-Martinsburg, MD-WV	2805022100	Agric - Livestock /Dairy cattle - deep pit dairy /Confinement	8.0005		0.0000	
24043	Washington	Hagerstown-Martinsburg, MD-WV	2805022200	Agric - Livestock /Dairy cattle - deep pit dairy /Manure handling and stora	0.3742		0.0000	

APP_A-2

FIPS	CNTY_NAME	NONATTAINMENT AREA	SCC	SCC_DESCRIPTION	NH3 2007	NOX 2007	P25 2007_TF	SO2 2007
24043	Washington	Hagerstown-Martinsburg, MD-WV	2805022300	Agric - Livestock /Dairy cattle - deep pit dairy /Land application of manur	4.4962		0.0000	
24043	Washington	Hagerstown-Martinsburg, MD-WV	2805023100	Agric - Livestock /Dairy cattle - drylot/pasture dairy /Confinement	54.4829		0.0000	
24043	Washington	Hagerstown-Martinsburg, MD-WV	2805023200	Agric - Livestock /Dairy cattle - drylot/pasture dairy /Manure handling and	0.8490		0.0000	
24043	Washington	Hagerstown-Martinsburg, MD-WV	2805023300	Agric - Livestock /Dairy cattle - drylot/pasture dairy /Land application of	72.7320		0.0000	
24043	Washington	Hagerstown-Martinsburg, MD-WV	2805025000	Agric - Livestock /Swine production composite /Not Elsewhere Classified (se	0.0000		0.0000	
24043	Washington	Hagerstown-Martinsburg, MD-WV	2805030000	Agric - Livestock /Poultry Waste Emissions /Not Elsewhere Classified (see a	0.0733		0.0000	
24043	Washington	Hagerstown-Martinsburg, MD-WV	2805030007	Agric - Livestock /Poultry Waste Emissions /Ducks	11.8619		0.0000	
24043	Washington	Hagerstown-Martinsburg, MD-WV	2805030008	Agric - Livestock /Poultry Waste Emissions /Geese	0.0152		0.0000	
24043	Washington	Hagerstown-Martinsburg, MD-WV	2805035000	Agric - Livestock /Horses & Ponies Waste Emissions /Not Elsewhere Classifie	15.6043		0.0000	
24043	Washington	Hagerstown-Martinsburg, MD-WV	2805039100	Agric - Livestock /Swine production - operations with lagoons (unspecified	5.1045		0.0000	
24043	Washington	Hagerstown-Martinsburg, MD-WV	2805039200	Agric - Livestock /Swine production - operations with lagoons (unspecified	12.7479		0.0000	
24043	Washington	Hagerstown-Martinsburg, MD-WV	2805039300	Agric - Livestock /Swine production - operations with lagoons (unspecified	0.8503		0.0000	
24043	Washington	Hagerstown-Martinsburg, MD-WV	2805040000	Agric - Livestock /Sheep & Lambs Waste Emissions /Total	5.8847		0.0000	
24043	Washington	Hagerstown-Martinsburg, MD-WV	2805045000	Agric - Livestock /Goats Waste Emissions /Not Elsewhere Classified	11.0553		0.0000	
24043	Washington	Hagerstown-Martinsburg, MD-WV	2805047100	Agric - Livestock /Swine production - deep-pit house operations (unspecifie	16.7945		0.0000	
24043	Washington	Hagerstown-Martinsburg, MD-WV	2805047300	Agric - Livestock /Swine production - deep-pit house operations (unspecifie	11.9942		0.0000	
24043	Washington	Hagerstown-Martinsburg, MD-WV	2805053100	Agric - Livestock /Swine production - outdoor operations (unspecified anima	0.1878		0.0000	
24043	Washington	Hagerstown-Martinsburg, MD-WV	2810001000	Forest Wildfires - Wildfires - Unspecified		0.2222	0.0000	
24043	Washington	Hagerstown-Martinsburg, MD-WV	2810005000	Managed Burning, Slash (Logging Debris) /Unspecified Burn Method (use 26100		0.0000	0.0000	
24043	Washington	Hagerstown-Martinsburg, MD-WV	2810015000	Prescribed Forest Burning /Unspecified		0.4640	1.8050	0.1270
24043	Washington	Hagerstown-Martinsburg, MD-WV	2810030000	Structure Fires /Unspecified		0.1803	0.0000	
24043	Washington	Hagerstown-Martinsburg, MD-WV	2810050000	Motor Vehicle Fires /Unspecified		0.0500	1.3000	

Appendix A-3
2007 On-Road Mobile Source Emissions

**Table: V - 2007 PM2.5 Re-designation Annual Emissions Summary
(Based on the SHA-PPSuite-MOVES Process)**

County	VMT	NOx	Total PM2.5	SO2	NH3
Washington County	2,090.10	6,022.00	217.80	45.30	91.80

Notes:

1. Emission Estimates are in short tons per year.
2. VMT estimates are in million miles per year.
3. Washington area estimates are being developed by MWCOG.
4. Totals may not add due to rounding errors.

Appendix A-4
2007 Off-Road Mobile Source Emissions

State	FIPS	CNTY_NAME	AREA	24-hr	Annual	SEC	SECTOR	SEC_DESCRIPTION	GROWTH_FACTOR_REFERENCE	GF_07_13	GF_07_17	GF_07_20	GF_07_25	CONTROL_FACTOR_REFERENCE	CO_2007	CO_13_60	CO_13_CF	CO_13_6C	CO_17_60	CO_17_CF	CO_17_6C	CO_20_60	CO_20_CF	CO_20_6C	CO_25_60	CO_25_CF	C
MD	24041	Washington	Hagerstown-Martinsburg, MD-WV	No	Yes	2265008005	AIR	Airport Ground Support Equipment, 4-Stroke Gasoline	FIA Terminal Forecast - Total Inherent Operations	1.025	1.058	1.084	1.129		6.666	6.832	1.000	6.832	7.054	1.000	7.054	7.226	1.000	7.226	7.526	1.000	
MD	24041	Washington	Hagerstown-Martinsburg, MD-WV	No	Yes	2267008005	AIR	Airport Ground Support Equipment, LPG	FIA Terminal Forecast - Total Inherent Operations	1.025	1.058	1.084	1.129		1.841	1.887	1.000	1.887	1.948	1.000	1.948	1.996	1.000	1.996	2.078	1.000	
MD	24041	Washington	Hagerstown-Martinsburg, MD-WV	No	Yes	2268008005	AIR	Airport Ground Support Equipment, CNG	FIA Terminal Forecast - Total Inherent Operations	1.025	1.058	1.084	1.129		0.518	0.531	1.000	0.531	0.548	1.000	0.548	0.561	1.000	0.561	0.585	1.000	
MD	24041	Washington	Hagerstown-Martinsburg, MD-WV	No	Yes	2270008005	AIR	Airport Ground Support Equipment, Diesel	FIA Terminal Forecast - Total Inherent Operations	1.025	1.058	1.084	1.129		31.693	32.485	1.000	32.485	33.537	1.000	33.537	34.358	1.000	34.358	35.782	1.000	
MD	24041	Washington	Hagerstown-Martinsburg, MD-WV	No	Yes	2275001000	AIR	Aircraft /Military Aircraft /Total	FIA Terminal Forecast - Inherent Military Operations	1.812	1.812	1.812	1.812		10.487	19.003	1.000	19.003	19.003	1.000	19.003	19.003	1.000	19.003	19.003	1.000	
MD	24041	Washington	Hagerstown-Martinsburg, MD-WV	No	Yes	2275020000	AIR	Aircraft /Commercial Aircraft /Total: All Types	FIA Terminal Forecast - Inherent Air Carrier Operations	1.000	1.000	1.000	1.000		7.813	7.813	1.000	7.813	7.813	1.000	7.813	7.813	1.000	7.813	7.813	1.000	
MD	24041	Washington	Hagerstown-Martinsburg, MD-WV	No	Yes	2275050000	AIR	Aircraft /General Aviation /Total	FIA Terminal Forecast - Inherent Air Taxi Aviation Operations	0.944	0.995	1.016	1.016		57.812	54.575	1.000	54.575	56.920	1.000	56.920	58.754	1.000	58.754	58.754	1.000	
MD	24041	Washington	Hagerstown-Martinsburg, MD-WV	No	Yes	2275060000	AIR	Aircraft /Air Taxi /Total	Operations	0.832	0.846	0.856	0.873		44.856	37.513	1.000	37.513	37.913	1.000	37.913	38.369	1.000	38.369	39.141	1.000	
MD	24041	Washington	Hagerstown-Martinsburg, MD-WV	No	Yes	2285002016	RAIL	Railroad Equipment /Diesel /Line Haul Locomotives: Class 1 Operations	AE2010 Table A.7 Freight Rail	0.950	1.010	1.051	1.092008	Final Locomotive-Marine Rule	36.450	35.544	1.000	35.544	37.310	1.000	37.310	38.592	1.000	38.592	40.142	1.000	
MD	24041	Washington	Hagerstown-Martinsburg, MD-WV	No	Yes	2285002017	RAIL	Railroad Equipment /Diesel /Line Haul Locomotives: Class 2 / 3 Operations	AE2010 Table A.7 Freight Rail	0.969	1.031	1.053	1.092008	Final Locomotive-Marine Rule	0.390	0.378	1.000	0.378	0.397	1.000	0.397	0.411	1.000	0.411	0.428	1.000	
MD	24041	Washington	Hagerstown-Martinsburg, MD-WV	No	Yes	2285002018	RAIL	Railroad Equipment /Diesel /Line Haul Locomotives: Passenger Trains (Annual)	AE2010 Table A.7 Passenger Rail	1.046	1.121	1.171	1.2412008	Final Locomotive-Marine Rule	0.000	0.000	0.946	0.000	0.000	0.917	0.000	0.895	0.000	0.861	0.000		
MD	24041	Washington	Hagerstown-Martinsburg, MD-WV	No	Yes	2285002019	RAIL	Railroad Equipment /Diesel /Line Haul Locomotives: Commuter Lines	AE2010 Table A.7 Passenger Rail	1.046	1.121	1.171	1.2412008	Final Locomotive-Marine Rule	0.960	1.004	0.946	0.950	1.076	0.937	0.987	1.124	0.895	1.006	1.193	0.861	
MD	24041	Washington	Hagerstown-Martinsburg, MD-WV	No	Yes	2285002010	RAIL	Railroad Equipment /Diesel /Freight Locomotives	AE2010 Table A.7 Freight Rail	0.950	1.038	1.053	1.092008	Final Locomotive-Marine Rule	3.190	3.227	1.000	3.227	3.390	1.000	3.390	3.506	1.000	3.506	3.656	1.000	

Appendix B

2017 Interim Year Projection Year Inventory

Appendix B-1
2017 Point Source Emissions

APP_B-1_EGU

FIPS	COUNTY	FACNAME	PLANTID	POINTID	STACKID	SCC	AEO FUEL	SO2 2017	NOX 2017	NH3 2017	PRI25 2017
24043	Washington	R. Paul Smith Power Station	043-0005	3-0005	S1	10100202	Coal	820.000	273.500	0.000	82.701
24043	Washington	R. Paul Smith Power Station	043-0005	3-0006	S2	10100212	Coal	3,770.000	1,116.500	0.000	194.249

APP_B-1_NonEGU

FIPS	CNTY NAME	NONATTAIN	NH3 2017	NOX 2017	P25 2017_TF	SO2 2017	FACNAME
24043	Washington	Hagerstown-Martinsburg, MD-WV	0.000	0.051	0.004	0.000	Xerxes Corporation
24043	Washington	Hagerstown-Martinsburg, MD-WV	0.000	0.051	0.004	0.000	Xerxes Corporation
24043	Washington	Hagerstown-Martinsburg, MD-WV	0.000	0.000	0.000	0.000	Xerxes Corporation
24043	Washington	Hagerstown-Martinsburg, MD-WV	0.000	0.000	0.000	0.000	Xerxes Corporation
24043	Washington	Hagerstown-Martinsburg, MD-WV	0.000	0.000	0.000	0.000	Fil-tec
24043	Washington	Hagerstown-Martinsburg, MD-WV	0.000	0.633	0.113	0.001	Fil-tec
24043	Washington	Hagerstown-Martinsburg, MD-WV	0.000	0.000	0.000	0.000	Fil-tec
24043	Washington	Hagerstown-Martinsburg, MD-WV	0.000	0.000	0.000	0.000	Fil-tec
24043	Washington	Hagerstown-Martinsburg, MD-WV	0.000	0.000	0.000	0.000	Fil-tec
24043	Washington	Hagerstown-Martinsburg, MD-WV	0.000	0.000	0.000	0.000	Fil-tec
24043	Washington	Hagerstown-Martinsburg, MD-WV	0.000	0.000	0.000	0.000	Fil-tec
24043	Washington	Hagerstown-Martinsburg, MD-WV	0.000	0.000	0.000	0.000	Fil-tec
24043	Washington	Hagerstown-Martinsburg, MD-WV	0.000	0.000	0.000	0.000	Fil-tec
24043	Washington	Hagerstown-Martinsburg, MD-WV	0.000	0.000	0.000	0.000	Fil-tec
24043	Washington	Hagerstown-Martinsburg, MD-WV	0.000	0.000	0.000	0.000	Fil-tec
24043	Washington	Hagerstown-Martinsburg, MD-WV	0.000	0.000	0.000	0.000	Fil-tec
24043	Washington	Hagerstown-Martinsburg, MD-WV	0.000	0.000	0.000	0.000	Fil-tec
24043	Washington	Hagerstown-Martinsburg, MD-WV	0.000	0.000	0.000	0.000	Fil-tec
24043	Washington	Hagerstown-Martinsburg, MD-WV	0.000	0.000	0.000	0.000	Fil-tec
24043	Washington	Hagerstown-Martinsburg, MD-WV	0.000	0.140	0.019	0.000	Fil-tec
24043	Washington	Hagerstown-Martinsburg, MD-WV	0.000	0.000	0.000	0.000	C. William Hetzer/beaver Creek Wst
24043	Washington	Hagerstown-Martinsburg, MD-WV	0.000	5.303	3.316	1.060	C. William Hetzer/beaver Creek Wst
24043	Washington	Hagerstown-Martinsburg, MD-WV	0.000	2.562	0.363	0.029	Engineered Polymer Solutions
24043	Washington	Hagerstown-Martinsburg, MD-WV	0.000	2.101	0.245	0.024	Engineered Polymer Solutions
24043	Washington	Hagerstown-Martinsburg, MD-WV	0.000	0.000	0.560	0.000	Engineered Polymer Solutions
24043	Washington	Hagerstown-Martinsburg, MD-WV	0.000	0.000	0.000	0.000	Engineered Polymer Solutions
24043	Washington	Hagerstown-Martinsburg, MD-WV	0.000	0.000	0.000	0.000	Engineered Polymer Solutions
24043	Washington	Hagerstown-Martinsburg, MD-WV	0.000	0.104	0.009	0.000	Phoenix Color
24043	Washington	Hagerstown-Martinsburg, MD-WV	0.000	0.104	0.009	0.000	Phoenix Color
24043	Washington	Hagerstown-Martinsburg, MD-WV	0.000	0.104	0.009	0.000	Phoenix Color
24043	Washington	Hagerstown-Martinsburg, MD-WV	0.000	0.000	0.000	0.000	Phoenix Color
24043	Washington	Hagerstown-Martinsburg, MD-WV	0.000	0.000	0.000	0.000	Phoenix Color

Appendix B-2
2017 Area Source Emissions

APP_B-2

FIPS	CNTY_NAME	NONATTAINMENT AREA	SCC	SCC_DESCRIPTION	NH3 2017	NOX 2017	P25 2017_TF	SO2 2017
24043	Washington	Hagerstown-Martinsburg, MD-WV	2103002000	Stationary Fuel Comb /Commercial/Institutional /Bituminous/Subbituminous Co	0.0215	7.8990	1.0341	54.5753
24043	Washington	Hagerstown-Martinsburg, MD-WV	2103004000	Stationary Fuel Comb /Commercial/Institutional /Distillate Oil /Total: Boil	0.9609	24.0241	2.3624	0.2594
24043	Washington	Hagerstown-Martinsburg, MD-WV	2103005000	Stationary Fuel Comb /Commercial/Institutional /Residual Oil /Total: All Bo	0.0145	1.0050	0.1235	1.4460
24043	Washington	Hagerstown-Martinsburg, MD-WV	2103006000	Stationary Fuel Comb /Commercial/Institutional /Natural Gas /Total: Boilers	0.3207	56.7150	0.0748	0.3956
24043	Washington	Hagerstown-Martinsburg, MD-WV	2103007000	Stationary Fuel Comb /Commercial/Institutional /Liquified Petroleum Gas /To	0.0112	2.9616	0.0000	0.0128
24043	Washington	Hagerstown-Martinsburg, MD-WV	2103011000	Stationary Fuel Comb /Commercial/Institutional /Kerosene /Total: All Combust	0.0331	0.8339	0.0860	0.0087
24043	Washington	Hagerstown-Martinsburg, MD-WV	2104002000	Stationary Fuel Comb /Residential /Bituminous/Subbituminous Coal /Total: Al	0.0400	0.1819	0.0768	1.2396
24043	Washington	Hagerstown-Martinsburg, MD-WV	2104004000	Stationary Fuel Comb /Residential /Distillate Oil /Total: All Combustor Typ	3.6769	66.1848	7.8316	0.7942
24043	Washington	Hagerstown-Martinsburg, MD-WV	2104006000	Stationary Fuel Comb /Residential /Natural Gas /Total: All Combustor Types	8.5980	40.4140	0.1392	0.2553
24043	Washington	Hagerstown-Martinsburg, MD-WV	2104007000	Stationary Fuel Comb /Residential /Liquified Petroleum Gas /Total: All Comb	0.0692	18.2519	0.0116	0.0788
24043	Washington	Hagerstown-Martinsburg, MD-WV	2104008100	Stationary Fuel Comb /Residential /Wood /Fireplace: general	1.7759	2.5652	23.2841	0.3946
24043	Washington	Hagerstown-Martinsburg, MD-WV	2104008210	Stationary Fuel Comb /Residential /Wood /Woodstove: fireplace inserts; non-	1.2051	1.9850	21.6927	0.2836
24043	Washington	Hagerstown-Martinsburg, MD-WV	2104008220	Stationary Fuel Comb /Residential /Wood /Woodstove: fireplace inserts; EPA	0.3065	0.7764	6.6739	0.1362
24043	Washington	Hagerstown-Martinsburg, MD-WV	2104008230	Stationary Fuel Comb /Residential /Wood /Woodstove: fireplace inserts; EPA	0.1024	0.2276	2.3217	0.0455
24043	Washington	Hagerstown-Martinsburg, MD-WV	2104008310	Stationary Fuel Comb /Residential /Wood /Woodstove: freestanding, non-EPA c	2.4997	4.1172	44.9947	0.5882
24043	Washington	Hagerstown-Martinsburg, MD-WV	2104008320	Stationary Fuel Comb /Residential /Wood /Woodstove: freestanding, EPA certi	0.6373	1.6144	13.8783	0.2832
24043	Washington	Hagerstown-Martinsburg, MD-WV	2104008330	Stationary Fuel Comb /Residential /Wood /Woodstove: freestanding, EPA certi	0.2130	0.4732	4.8269	0.0946
24043	Washington	Hagerstown-Martinsburg, MD-WV	2104008400	Stationary Fuel Comb /Residential /Wood /Woodstove: pellet-fired, general (	0.0443	0.5613	0.4520	0.0473
24043	Washington	Hagerstown-Martinsburg, MD-WV	2104008510	Stationary Fuel Comb /Residential /Wood /Furnace: Indoor, cordwood-fired, n	0.8028	0.8212	12.3093	0.9054
24043	Washington	Hagerstown-Martinsburg, MD-WV	2104008610	Stationary Fuel Comb /Residential /Wood /Hydronic heater: outdoor	0.8292	0.8483	12.7146	0.9352
24043	Washington	Hagerstown-Martinsburg, MD-WV	2104009000	Stationary Fuel Comb /Residential /Firelog /Total: All Combustor Types	0.0000	0.8881	3.2823	0.0000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2104011000	Stationary Fuel Comb /Residential /Kerosene /Total: All Heater Types	0.2469	4.4440	0.5298	0.0514
24043	Washington	Hagerstown-Martinsburg, MD-WV	2294000000	Paved Roads /All Paved Roads /Total: Fugitives	0.0000	0.0000	31.6776	0.0000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2296000000	Unpaved Roads /All Unpaved Roads /Total: Fugitives	0.0000	0.0000	1.0742	0.0000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2302002100	Food & Kindred Products /Commercial Cooking - Charbroiling /Conveyorized Ch	0.0000	0.0000	5.4701	0.0000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2302002200	Food & Kindred Products /Commercial Cooking - Charbroiling /Under-fired Cha	0.0000	0.0000	32.8742	0.0000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2302003000	Food & Kindred Products /Commercial Cooking - Frying /Deep Fat Frying	0.0000	0.0000	0.0000	0.0000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2302003100	Food & Kindred Products /Commercial Cooking - Frying /Flat Griddle Frying	0.0000	0.0000	6.6989	0.0000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2302003200	Food & Kindred Products /Commercial Cooking - Frying /Clamshell Griddle Fry	0.0000	0.0000	0.5904	0.0000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2302050000	Food & Kindred Products /Bakery Products /Total	0.0000	0.0000	0.0000	0.0000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2302070001	Food & Kindred Products /Fermentation/Beverages /Breweries	0.0000	0.0000	0.0000	0.0000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2311010000	Construction: SIC 15 - 17 /Residential /Total	0.0000	0.0000	0.9026	0.0000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2311020000	Construction: SIC 15 - 17 /Industrial/Commercial/Institutional /Total	0.0000	0.0000	20.9219	0.0000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2311030000	Construction: SIC 15 - 17 /Road Construction /Total	0.0000	0.0000	6.2740	0.0000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2401002000	Surface Coating /Architectural Coatings - Solvent-based /Total: All Solvent	0.0000	0.0000	0.0000	0.0000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2401003000	Surface Coating /Architectural Coatings - Water-based /Total: All Solvent T	0.0000	0.0000	0.0000	0.0000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2401005000	Surface Coating /Auto Refinishing /Total: All Solvent Types	0.0000	0.0000	0.0000	0.0000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2401008000	Surface Coating /Traffic Markings /Total: All Solvent Types	0.0000	0.0000	0.0000	0.0000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2401015000	Surface Coating /Factory Finished Wood /Total: All Solvent Types	0.0000	0.0000	0.0000	0.0000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2401020000	Surface Coating /Wood Furniture /Total: All Solvent Types	0.0000	0.0000	0.0000	0.0000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2401025000	Surface Coating /Metal Furniture /Total: All Solvent Types	0.0000	0.0000	0.0000	0.0000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2401030000	Surface Coating /Paper /Total: All Solvent Types	0.0000	0.0000	0.0000	0.0000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2401040000	Surface Coating /Metal Cans /Total: All Solvent Types	0.0000	0.0000	0.0000	0.0000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2401055000	Surface Coating /Machinery & Equipment /Total: All Solvent Types	0.0000	0.0000	0.0000	0.0000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2401060000	Surface Coating /Large Appliances /Total: All Solvent Types	0.0000	0.0000	0.0000	0.0000

APP_B-2

FIPS	CNTY_NAME	NONATTAINMENT AREA	SCC	SCC_DESCRIPTION	NH3 2017	NOX 2017	P25 2017_TF	SO2 2017
24043	Washington	Hagerstown-Martinsburg, MD-WV	2401065000	Surface Coating /Electronic & Other Electrical /Total: All Solvent Types	0.0000	0.0000	0.0000	0.0000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2401070000	Surface Coating /Motor Vehicles /Total: All Solvent Types	0.0000	0.0000	0.0000	0.0000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2401075000	Surface Coating /Aircraft /Total: All Solvent Types	0.0000	0.0000	0.0000	0.0000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2401080000	Surface Coating /Marine /Total: All Solvent Types	0.0000	0.0000	0.0000	0.0000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2401085000	Surface Coating /Railroad /Total: All Solvent Types	0.0000	0.0000	0.0000	0.0000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2401090000	Surface Coating /Misc Manufacturing /Total: All Solvent Types	0.0000	0.0000	0.0000	0.0000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2401100000	Surface Coating /Industrial Maintenance Coatings /Total: All Solvent Types	0.0000	0.0000	0.0000	0.0000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2401200000	Surface Coating /Other Special Purpose Coatings /Total: All Solvent Types	0.0000	0.0000	0.0000	0.0000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2415300000	Degreasing /All Industries: Cold Cleaning /Total: All Solvent Types	0.0000	0.0000	0.0000	0.0000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2420000000	Dry Cleaning /All Processes /Total: All Solvent Types	0.0000	0.0000	0.0000	0.0000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2425000000	Graphic Arts /All Processes /Total: All Solvent Types	0.0000	0.0000	0.0000	0.0000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2440020000	Misc Industrial /Adhesive (Industrial) Application /Total: All Solvent Type	0.0000	0.0000	0.0000	0.0000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2460100000	Misc Non-indus: Consumer & Comm /All Personal Care Products /Total: All Sol	0.0000	0.0000	0.0000	0.0000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2460200000	Misc Non-indus: Consumer & Comm /All Household Products /Total: All Solvent	0.0000	0.0000	0.0000	0.0000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2460400000	Misc Non-indus: Consumer & Comm /All Auto Aftermarket Products /Total: All	0.0000	0.0000	0.0000	0.0000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2460500000	Misc Non-indus: Consumer & Comm /All Coatings & Related Products /Total: Al	0.0000	0.0000	0.0000	0.0000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2460600000	Misc Non-indus: Consumer & Comm /All Adhesives & Sealants /Total: All Solve	0.0000	0.0000	0.0000	0.0000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2460800000	Misc Non-indus: Consumer & Comm /All FIFRA Related Products /Total: All Sol	0.0000	0.0000	0.0000	0.0000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2460900000	Misc Non-indus: Consumer & Comm /Misc Products (Not Otherwise Covered) /Tot	0.0000	0.0000	0.0000	0.0000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2461020000	Misc Non-industrial: Commercial /Asphalt Application: All Processes /Total:	0.0000	0.0000	0.0000	0.0000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2461021000	Misc Non-industrial: Commercial /Cutback Asphalt /Total: All Solvent Types	0.0000	0.0000	0.0000	0.0000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2461022000	Misc Non-industrial: Commercial /Emulsified Asphalt /Total: All Solvent Typ	0.0000	0.0000	0.0000	0.0000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2461023000	Misc Non-industrial: Commercial /Asphalt Roofing /Total: All Solvent Types	0.0000	0.0000	0.0000	0.0000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2461800000	Misc Non-industrial: Commercial /Pesticide Application: All Processes /Tota	0.0000	0.0000	0.0000	0.0000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2501011011	Residential Portable Gas Cans /Permeation	0.0000	0.0000	0.0000	0.0000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2501011012	Residential Portable Gas Cans /Evaporation (includes Diurnal losses)	0.0000	0.0000	0.0000	0.0000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2501011013	Residential Portable Gas Cans /Spillage During Transport	0.0000	0.0000	0.0000	0.0000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2501012011	Commercial Portable Gas Cans /Permeation	0.0000	0.0000	0.0000	0.0000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2501012012	Commercial Portable Gas Cans /Evaporation (includes Diurnal losses)	0.0000	0.0000	0.0000	0.0000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2501012013	Commercial Portable Gas Cans /Spillage During Transport	0.0000	0.0000	0.0000	0.0000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2501060051	Gasoline Service Stations /Stage 1: Submerged Filling	0.0000	0.0000	0.0000	0.0000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2501060053	Gasoline Service Stations /Stage 1: Balanced Submerged Filling	0.0000	0.0000	0.0000	0.0000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2501060201	Gasoline Service Stations /Underground Tank: Breathing and Emptying	0.0000	0.0000	0.0000	0.0000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2501080050	Petrol & Petrol Product Storage /Airports : Aviation Gasoline /Stage 1: Tot	0.0000	0.0000	0.0000	0.0000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2501080100	Petrol & Petrol Product Storage /Airports : Aviation Gasoline /Stage 2: Tot	0.0000	0.0000	0.0000	0.0000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2505020030	Petrol & Petrol Product Transport /Marine Vessel /Crude Oil	0.0000	0.0000	0.0000	0.0000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2505020060	Petrol & Petrol Product Transport /Marine Vessel /Residual Oil	0.0000	0.0000	0.0000	0.0000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2505020090	Petrol & Petrol Product Transport /Marine Vessel /Distillate Oil	0.0000	0.0000	0.0000	0.0000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2505020120	Petrol & Petrol Product Transport /Marine Vessel /Gasoline	0.0000	0.0000	0.0000	0.0000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2505020150	Petrol & Petrol Product Transport /Marine Vessel /Jet Naphtha	0.0000	0.0000	0.0000	0.0000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2505020180	Petrol & Petrol Product Transport /Marine Vessel /Kerosene	0.0000	0.0000	0.0000	0.0000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2505030120	Petrol & Petrol Product Transport /Truck /Gasoline	0.0000	0.0000	0.0000	0.0000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2601000000	On-site Incineration /All Categories /Total	0.0000	26.1400	0.0000	13.0400
24043	Washington	Hagerstown-Martinsburg, MD-WV	2610000100	Open Burning /All Categories /Yard Waste - Leaf Species Unspecified	0.0000	2.0654	7.3100	0.2553
24043	Washington	Hagerstown-Martinsburg, MD-WV	2610000400	Open Burning /All Categories /Yard Waste - Brush Species Unspecified	0.0000	1.9493	5.9176	0.6498

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FIPS	CNTY_NAME	NONATTAINMENT AREA	SCC	SCC_DESCRIPTION	NH3 2017	NOX 2017	P25 2017_TF	SO2 2017
24043	Washington	Hagerstown-Martinsburg, MD-WV	2610000500	Open Burning /All Categories /Land Clearing Debris (use 28-10-005-000 for L	0.0000	31.8300	108.2300	0.0000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2610030000	Open Burning /Residential /Household Waste (use 26-10-000-xxx for Yard Wast	0.0000	16.6854	96.7592	2.7848
24043	Washington	Hagerstown-Martinsburg, MD-WV	2620030000	Landfills /Municipal /Total	0.0000	0.0000	0.0000	0.0000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2630020000	Wastewater Treatment /Public Owned /Total Processed	4.3744	0.0000	0.0000	0.0000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2660000000	Leaking Underground Storage Tanks /Leaking Underground Storage Tanks /Total	0.0000	0.0000	0.0000	0.0000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2801000003	Agric - Crops /Tilling	0.0000	0.0000	34.8742	0.0000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2801700001	Agric - Crops /Fertilizer Application /Anhydrous Ammonia	0.0000	0.0000	0.0000	0.0000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2801700002	Agric - Crops /Fertilizer Application /Aqueous Ammonia	0.0000	0.0000	0.0000	0.0000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2801700003	Agric - Crops /Fertilizer Application /Nitrogen Solutions	68.2843	0.0000	0.0000	0.0000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2801700004	Agric - Crops /Fertilizer Application /Urea	84.8253	0.0000	0.0000	0.0000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2801700005	Agric - Crops /Fertilizer Application /Ammonium Nitrate	0.0000	0.0000	0.0000	0.0000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2801700006	Agric - Crops /Fertilizer Application /Ammonium Sulfate	1.1293	0.0000	0.0000	0.0000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2801700007	Agric - Crops /Fertilizer Application /Ammonium Thiosulfate	0.0000	0.0000	0.0000	0.0000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2801700010	Agric - Crops /Fertilizer Application /N-P-K (multi-grade nutrient fertiliz	17.1720	0.0000	0.0000	0.0000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2801700011	Agric - Crops /Fertilizer Application /Calcium Ammonium Nitrate	0.0000	0.0000	0.0000	0.0000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2801700012	Agric - Crops /Fertilizer Application /Potassium Nitrate	0.0000	0.0000	0.0000	0.0000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2801700013	Agric - Crops /Fertilizer Application /Diammonium Phosphate	0.8857	0.0000	0.0000	0.0000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2801700014	Agric - Crops /Fertilizer Application /Monoammonium Phosphate	0.1499	0.0000	0.0000	0.0000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2801700015	Agric - Crops /Fertilizer Application /Liquid Ammonium Polyphosphate	0.3135	0.0000	0.0000	0.0000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2801700099	Agric - Crops /Fertilizer Application /Miscellaneous Fertilizers	3.5311	0.0000	0.0000	0.0000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2805001100	Agric - Livestock /Beef cattle - finishing operations on feedlots (drylots	7.5906	0.0000	0.0000	0.0000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2805001200	Agric - Livestock /Beef cattle - finishing operations on feedlots (drylots	0.0030	0.0000	0.0000	0.0000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2805001300	Agric - Livestock /Beef cattle - finishing operations on feedlots (drylots	5.7657	0.0000	0.0000	0.0000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2805002000	Agric - Livestock /Beef cattle production composite /Not Elsewhere Classifi	29.2250	0.0000	0.0000	0.0000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2805003100	Agric - Livestock /Beef cattle - finishing operations on pasture/range /Co	20.7617	0.0000	0.0000	0.0000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2805007100	Agric - Livestock /Poultry production - layers with dry manure management s	112.8007	0.0000	0.0000	0.0000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2805007300	Agric - Livestock /Poultry production - layers with dry manure management s	5.0780	0.0000	0.0000	0.0000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2805008100	Agric - Livestock /Poultry production - layers with wet manure management s	1.6662	0.0000	0.0000	0.0000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2805008200	Agric - Livestock /Poultry production - layers with wet manure management s	5.7128	0.0000	0.0000	0.0000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2805008300	Agric - Livestock /Poultry production - layers with wet manure management s	0.9971	0.0000	0.0000	0.0000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2805009100	Agric - Livestock /Poultry production - broilers /Confinement	0.1587	0.0000	0.0000	0.0000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2805009200	Agric - Livestock /Poultry production - broilers /Manure handling and stora	0.0287	0.0000	0.0000	0.0000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2805009300	Agric - Livestock /Poultry production - broilers /Land application of manur	0.1295	0.0000	0.0000	0.0000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2805010100	Agric - Livestock /Poultry production - turkeys /Confinement	0.0719	0.0000	0.0000	0.0000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2805010200	Agric - Livestock /Poultry production - turkeys /Manure handling and storag	0.0129	0.0000	0.0000	0.0000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2805010300	Agric - Livestock /Poultry production - turkeys /Land application of manure	0.0648	0.0000	0.0000	0.0000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2805018000	Agric - Livestock /Dairy cattle composite /Not Elsewhere Classified	142.8192	0.0000	0.0000	0.0000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2805019100	Agric - Livestock /Dairy cattle - flush dairy /Confinement	6.2946	0.0000	0.0000	0.0000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2805019200	Agric - Livestock /Dairy cattle - flush dairy /Manure handling and storage	17.5879	0.0000	0.0000	0.0000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2805019300	Agric - Livestock /Dairy cattle - flush dairy /Land application of manure	1.6662	0.0000	0.0000	0.0000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2805021100	Agric - Livestock /Dairy cattle - scrape dairy /Confinement	74.5834	0.0000	0.0000	0.0000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2805021200	Agric - Livestock /Dairy cattle - scrape dairy /Manure handling and storage	81.7243	0.0000	0.0000	0.0000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2805021300	Agric - Livestock /Dairy cattle - scrape dairy /Land application of manure	163.9776	0.0000	0.0000	0.0000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2805022100	Agric - Livestock /Dairy cattle - deep pit dairy /Confinement	8.0005	0.0000	0.0000	0.0000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2805022200	Agric - Livestock /Dairy cattle - deep pit dairy /Manure handling and stora	0.3742	0.0000	0.0000	0.0000

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FIPS	CNTY_NAME	NONATTAINMENT AREA	SCC	SCC_DESCRIPTION	NH3 2017	NOX 2017	P25 2017_TF	SO2 2017
24043	Washington	Hagerstown-Martinsburg, MD-WV	2805022300	Agric - Livestock /Dairy cattle - deep pit dairy /Land application of manur	4.4962	0.0000	0.0000	0.0000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2805023100	Agric - Livestock /Dairy cattle - drylot/pasture dairy /Confinement	54.4829	0.0000	0.0000	0.0000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2805023200	Agric - Livestock /Dairy cattle - drylot/pasture dairy /Manure handling and	0.8490	0.0000	0.0000	0.0000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2805023300	Agric - Livestock /Dairy cattle - drylot/pasture dairy /Land application of	72.7320	0.0000	0.0000	0.0000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2805025000	Agric - Livestock /Swine production composite /Not Elsewhere Classified (se	0.0000	0.0000	0.0000	0.0000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2805030000	Agric - Livestock /Poultry Waste Emissions /Not Elsewhere Classified (see a	0.0733	0.0000	0.0000	0.0000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2805030007	Agric - Livestock /Poultry Waste Emissions /Ducks	11.8619	0.0000	0.0000	0.0000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2805030008	Agric - Livestock /Poultry Waste Emissions /Geese	0.0152	0.0000	0.0000	0.0000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2805035000	Agric - Livestock /Horses & Ponies Waste Emissions /Not Elsewhere Classifie	15.6043	0.0000	0.0000	0.0000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2805039100	Agric - Livestock /Swine production - operations with lagoons (unspecified	5.1045	0.0000	0.0000	0.0000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2805039200	Agric - Livestock /Swine production - operations with lagoons (unspecified	12.7479	0.0000	0.0000	0.0000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2805039300	Agric - Livestock /Swine production - operations with lagoons (unspecified	0.8503	0.0000	0.0000	0.0000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2805040000	Agric - Livestock /Sheep & Lambs Waste Emissions /Total	5.8847	0.0000	0.0000	0.0000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2805045000	Agric - Livestock /Goats Waste Emissions /Not Elsewhere Classified	11.0553	0.0000	0.0000	0.0000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2805047100	Agric - Livestock /Swine production - deep-pit house operations (unspecifie	16.7945	0.0000	0.0000	0.0000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2805047300	Agric - Livestock /Swine production - deep-pit house operations (unspecifie	11.9942	0.0000	0.0000	0.0000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2805053100	Agric - Livestock /Swine production - outdoor operations (unspecified anima	0.1878	0.0000	0.0000	0.0000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2810001000	Forest Wildfires - Wildfires - Unspecified	0.0000	0.2222	0.0000	0.0000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2810005000	Managed Burning, Slash (Logging Debris) /Unspecified Burn Method (use 26100	0.0000	0.0000	0.0000	0.0000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2810015000	Prescribed Forest Burning /Unspecified	0.0000	0.4640	1.8050	0.1270
24043	Washington	Hagerstown-Martinsburg, MD-WV	2810030000	Structure Fires /Unspecified	0.0000	0.2069	0.0000	0.0000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2810050000	Motor Vehicle Fires /Unspecified	0.0000	0.0574	1.4914	0.0000

Appendix B-3
2017 On-Road Mobile Source Emissions

Appendix B-4
2017 Off-Road Mobile Source Emissions

APP_B-4_MAR

FIPS	CNTY_NAME	AREA	SCC	SCC_DESCRIPTION	NH3 2017	NOX 2017	P25 2017
24043	Washington	Hagerstown-Martinsburg, MD-WV	2265008005	Airport Ground Support Equipment, 4-Stroke Gasoline	0.000	0.771	0.017
24043	Washington	Hagerstown-Martinsburg, MD-WV	2267008005	Airport Ground Support Equipment, LPG	0.000	0.213	0.005
24043	Washington	Hagerstown-Martinsburg, MD-WV	2268008005	Airport Ground Support Equipment, CNG	0.000	0.060	0.001
24043	Washington	Hagerstown-Martinsburg, MD-WV	2270008005	Airport Ground Support Equipment, Diesel	0.000	3.664	0.080
24043	Washington	Hagerstown-Martinsburg, MD-WV	2275001000	Aircraft /Military Aircraft /Total	0.000	0.628	0.000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2275020000	Aircraft /Commercial Aircraft /Total: All Types	0.000	0.431	0.000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2275050000	Aircraft /General Aviation /Total	0.000	1.878	0.000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2275060000	Aircraft /Air Taxi /Total	0.000	0.894	0.000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2285002006	Railroad Equipment /Diesel /Line Haul Locomotives: Class I Operations	0.000	155.222	3.844
24043	Washington	Hagerstown-Martinsburg, MD-WV	2285002007	Railroad Equipment /Diesel /Line Haul Locomotives: Class II / III Operations	0.000	2.482	0.072
24043	Washington	Hagerstown-Martinsburg, MD-WV	2285002008	Railroad Equipment /Diesel /Line Haul Locomotives: Passenger Trains (Amtrak)	0.000	0.000	0.000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2285002009	Railroad Equipment /Diesel /Line Haul Locomotives: Commuter Lines	0.000	2.987	0.099
24043	Washington	Hagerstown-Martinsburg, MD-WV	2285002010	Railroad Equipment /Diesel /Yard Locomotives	0.000	26.698	0.573

SO2

2017

0.033
0.009
0.003
0.155
0.234
0.110
0.701
0.313
0.010
0.000
0.000
0.000
0.001

APP_B-4_NMIM

FIPS	NAME	NONATTAIN	SCC	SHORT_NAME	NH3 2017	NOX 2017	PM25 2017	SO2 2017
24043	Washington	Hagerstown-Martinsburg, MD-WV	2260001010	Off-highway Gasoline, 2-Stroke /Recreational Equip /Motorcycles: Off-road	0.007	0.648	2.047	0.005
24043	Washington	Hagerstown-Martinsburg, MD-WV	2260001020	Off-highway Gasoline, 2-Stroke /Recreational Equip /Snowmobiles	0.000	0.000	0.000	0.000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2260001030	Off-highway Gasoline, 2-Stroke /Recreational Equip /All Terrain Vehicles	0.008	0.940	1.389	0.007
24043	Washington	Hagerstown-Martinsburg, MD-WV	2260001060	Off-highway Gasoline, 2-Stroke /Recreational Equip /Specialty Vehicles/Carts	0.001	0.239	0.013	0.002
24043	Washington	Hagerstown-Martinsburg, MD-WV	2260002006	Off-highway Gasoline, 2-Stroke /Construction & Mining Equip /Tampers/Rammers	0.000	0.047	0.268	0.000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2260002009	Off-highway Gasoline, 2-Stroke /Construction & Mining Equip /Plate Compactors	0.000	0.003	0.009	0.000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2260002021	Off-highway Gasoline, 2-Stroke /Construction & Mining Equip /Paving Equip	0.000	0.004	0.011	0.000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2260002027	Off-highway Gasoline, 2-Stroke /Construction & Mining Equip /Signal Boards/Ligh	0.000	0.000	0.000	0.000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2260002039	Off-highway Gasoline, 2-Stroke /Construction & Mining Equip /Concrete/Industria	0.001	0.124	0.700	0.001
24043	Washington	Hagerstown-Martinsburg, MD-WV	2260002054	Off-highway Gasoline, 2-Stroke /Construction & Mining Equip /Crushing/Processin	0.000	0.001	0.002	0.000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2260003030	Off-highway Gasoline, 2-Stroke /Industrial Equip /Sweepers/Scrubbers	0.000	0.000	0.002	0.000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2260003040	Off-highway Gasoline, 2-Stroke /Industrial Equip /Other General Industrial Equi	0.000	0.000	0.000	0.000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2260004015	Off-highway Gasoline, 2-Stroke /Lawn & Garden Equip /Rotary Tillers < 6 HP (Res	0.000	0.014	0.041	0.000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2260004016	Off-highway Gasoline, 2-Stroke /Lawn & Garden Equip /Rotary Tillers < 6 HP (Com	0.000	0.069	0.201	0.000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2260004020	Off-highway Gasoline, 2-Stroke /Lawn & Garden Equip /Chain Saws < 6 HP (Residen	0.001	0.192	0.557	0.001
24043	Washington	Hagerstown-Martinsburg, MD-WV	2260004021	Off-highway Gasoline, 2-Stroke /Lawn & Garden Equip /Chain Saws < 6 HP (Commerc	0.006	0.762	4.137	0.005
24043	Washington	Hagerstown-Martinsburg, MD-WV	2260004025	Off-highway Gasoline, 2-Stroke /Lawn & Garden Equip /Trimmers/Edgers/Brush Cutt	0.002	0.270	0.804	0.002
24043	Washington	Hagerstown-Martinsburg, MD-WV	2260004026	Off-highway Gasoline, 2-Stroke /Lawn & Garden Equip /Trimmers/Edgers/Brush Cutt	0.005	0.669	2.160	0.004
24043	Washington	Hagerstown-Martinsburg, MD-WV	2260004030	Off-highway Gasoline, 2-Stroke /Lawn & Garden Equip /Leafblowers/Vacuums (Resid	0.001	0.172	0.504	0.001
24043	Washington	Hagerstown-Martinsburg, MD-WV	2260004031	Off-highway Gasoline, 2-Stroke /Lawn & Garden Equip /Leafblowers/Vacuums (Comme	0.004	0.620	2.456	0.004
24043	Washington	Hagerstown-Martinsburg, MD-WV	2260004035	Off-highway Gasoline, 2-Stroke /Lawn & Garden Equip /Snowblowers (Residential)	0.001	0.056	0.174	0.001
24043	Washington	Hagerstown-Martinsburg, MD-WV	2260004036	Off-highway Gasoline, 2-Stroke /Lawn & Garden Equip /Snowblowers (Commercial)	0.002	0.147	0.457	0.001
24043	Washington	Hagerstown-Martinsburg, MD-WV	2260004071	Off-highway Gasoline, 2-Stroke /Lawn & Garden Equip /Turf Equip (Commercial)	0.000	0.000	0.001	0.000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2260005035	Off-highway Gasoline, 2-Stroke /Agricultural Equip /Sprayers	0.000	0.003	0.010	0.000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2260006005	Off-highway Gasoline, 2-Stroke /Commercial Equip /Generator Sets	0.000	0.020	0.061	0.000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2260006010	Off-highway Gasoline, 2-Stroke /Commercial Equip /Pumps	0.001	0.138	0.448	0.001
24043	Washington	Hagerstown-Martinsburg, MD-WV	2260006015	Off-highway Gasoline, 2-Stroke /Commercial Equip /Air Compressors	0.000	0.000	0.000	0.000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2260006035	Off-highway Gasoline, 2-Stroke /Commercial Equip /Hydro-power Units	0.000	0.001	0.003	0.000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2260007005	Off-highway Gasoline, 2-Stroke /Logging Equip /Chain Saws : 6 HP	0.000	0.010	0.060	0.000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2265001010	Off-highway Gasoline, 4-Stroke /Recreational Equip /Motorcycles: Off-road	0.002	0.457	0.050	0.003
24043	Washington	Hagerstown-Martinsburg, MD-WV	2265001030	Off-highway Gasoline, 4-Stroke /Recreational Equip /All Terrain Vehicles	0.026	3.712	0.499	0.027
24043	Washington	Hagerstown-Martinsburg, MD-WV	2265001050	Off-highway Gasoline, 4-Stroke /Recreational Equip /Golf Carts	0.004	0.546	0.032	0.004
24043	Washington	Hagerstown-Martinsburg, MD-WV	2265001060	Off-highway Gasoline, 4-Stroke /Recreational Equip /Specialty Vehicles/Carts	0.001	0.411	0.010	0.001
24043	Washington	Hagerstown-Martinsburg, MD-WV	2265002003	Off-highway Gasoline, 4-Stroke /Construction & Mining Equip /Pavers	0.000	0.043	0.002	0.000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2265002006	Off-highway Gasoline, 4-Stroke /Construction & Mining Equip /Tampers/Rammers	0.000	0.000	0.000	0.000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2265002009	Off-highway Gasoline, 4-Stroke /Construction & Mining Equip /Plate Compactors	0.000	0.076	0.007	0.001
24043	Washington	Hagerstown-Martinsburg, MD-WV	2265002015	Off-highway Gasoline, 4-Stroke /Construction & Mining Equip /Rollers	0.000	0.071	0.004	0.000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2265002021	Off-highway Gasoline, 4-Stroke /Construction & Mining Equip /Paving Equip	0.001	0.152	0.009	0.001
24043	Washington	Hagerstown-Martinsburg, MD-WV	2265002024	Off-highway Gasoline, 4-Stroke /Construction & Mining Equip /Surfacing Equip	0.000	0.060	0.004	0.000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2265002027	Off-highway Gasoline, 4-Stroke /Construction & Mining Equip /Signal Boards/Ligh	0.000	0.003	0.000	0.000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2265002030	Off-highway Gasoline, 4-Stroke /Construction & Mining Equip /Trenchers	0.001	0.136	0.008	0.001
24043	Washington	Hagerstown-Martinsburg, MD-WV	2265002033	Off-highway Gasoline, 4-Stroke /Construction & Mining Equip /Bore/Drill Rigs	0.000	0.073	0.004	0.000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2265002039	Off-highway Gasoline, 4-Stroke /Construction & Mining Equip /Concrete/Industria	0.002	0.265	0.015	0.002
24043	Washington	Hagerstown-Martinsburg, MD-WV	2265002042	Off-highway Gasoline, 4-Stroke /Construction & Mining Equip /Cement & Mortar Mi	0.001	0.152	0.008	0.001
24043	Washington	Hagerstown-Martinsburg, MD-WV	2265002045	Off-highway Gasoline, 4-Stroke /Construction & Mining Equip /Cranes	0.000	0.025	0.000	0.000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2265002054	Off-highway Gasoline, 4-Stroke /Construction & Mining Equip /Crushing/Processin	0.000	0.019	0.001	0.000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2265002057	Off-highway Gasoline, 4-Stroke /Construction & Mining Equip /Rough Terrain Fork	0.000	0.024	0.001	0.000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2265002060	Off-highway Gasoline, 4-Stroke /Construction & Mining Equip /Rubber Tire Loader	0.000	0.037	0.002	0.000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2265002066	Off-highway Gasoline, 4-Stroke /Construction & Mining Equip /Tractors/Loaders/B	0.001	0.085	0.004	0.001
24043	Washington	Hagerstown-Martinsburg, MD-WV	2265002072	Off-highway Gasoline, 4-Stroke /Construction & Mining Equip /Skid Steer Loaders	0.000	0.106	0.003	0.000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2265002078	Off-highway Gasoline, 4-Stroke /Construction & Mining Equip /Dumpers/Tenders	0.000	0.027	0.001	0.000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2265002081	Off-highway Gasoline, 4-Stroke /Construction & Mining Equip /Other Construction	0.000	0.042	0.001	0.000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2265003010	Off-highway Gasoline, 4-Stroke /Industrial Equip /Aerial Lifts	0.000	0.261	0.002	0.000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2265003020	Off-highway Gasoline, 4-Stroke /Industrial Equip /Forklifts	0.001	0.231	0.007	0.001
24043	Washington	Hagerstown-Martinsburg, MD-WV	2265003030	Off-highway Gasoline, 4-Stroke /Industrial Equip /Sweepers/Scrubbers	0.000	0.045	0.002	0.000

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24043	Washington	Hagerstown-Martinsburg, MD-WV	2265003040	Off-highway Gasoline, 4-Stroke /Industrial Equipt /Other General Industrial Equi	0.000	0.085	0.008	0.001
24043	Washington	Hagerstown-Martinsburg, MD-WV	2265003050	Off-highway Gasoline, 4-Stroke /Industrial Equipt /Other Material H&ling Equipt	0.000	0.013	0.000	0.000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2265003060	Off-highway Gasoline, 4-Stroke /Industrial Equipt /AC\Refrigeration	0.000	0.001	0.000	0.000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2265003070	Off-highway Gasoline, 4-Stroke /Industrial Equipt /Terminal Tractors	0.000	0.015	0.001	0.000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2265004010	Off-highway Gasoline, 4-Stroke /Lawn & Garden Equipt /Lawn Mowers (Residential)	0.015	2.282	0.258	0.016
24043	Washington	Hagerstown-Martinsburg, MD-WV	2265004011	Off-highway Gasoline, 4-Stroke /Lawn & Garden Equipt /Lawn Mowers (Commercial)	0.012	1.729	0.215	0.013
24043	Washington	Hagerstown-Martinsburg, MD-WV	2265004015	Off-highway Gasoline, 4-Stroke /Lawn & Garden Equipt /Rotary Tillers < 6 HP (Res	0.001	0.191	0.022	0.001
24043	Washington	Hagerstown-Martinsburg, MD-WV	2265004016	Off-highway Gasoline, 4-Stroke /Lawn & Garden Equipt /Rotary Tillers < 6 HP (Com	0.006	0.896	0.105	0.006
24043	Washington	Hagerstown-Martinsburg, MD-WV	2265004025	Off-highway Gasoline, 4-Stroke /Lawn & Garden Equipt /Trimmers/Edgers/Brush Cutt	0.000	0.012	0.001	0.000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2265004026	Off-highway Gasoline, 4-Stroke /Lawn & Garden Equipt /Trimmers/Edgers/Brush Cutt	0.000	0.040	0.004	0.000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2265004030	Off-highway Gasoline, 4-Stroke /Lawn & Garden Equipt /Leafblowers/Vacuums (Resid	0.000	0.023	0.003	0.000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2265004031	Off-highway Gasoline, 4-Stroke /Lawn & Garden Equipt /Leafblowers/Vacuums (Comme	0.011	1.784	0.090	0.012
24043	Washington	Hagerstown-Martinsburg, MD-WV	2265004035	Off-highway Gasoline, 4-Stroke /Lawn & Garden Equipt /Snowblowers (Residential)	0.001	0.402	0.009	0.002
24043	Washington	Hagerstown-Martinsburg, MD-WV	2265004036	Off-highway Gasoline, 4-Stroke /Lawn & Garden Equipt /Snowblowers (Commercial)	0.004	1.056	0.023	0.005
24043	Washington	Hagerstown-Martinsburg, MD-WV	2265004040	Off-highway Gasoline, 4-Stroke /Lawn & Garden Equipt /Rear Engine Riding Mowers	0.003	0.463	0.021	0.003
24043	Washington	Hagerstown-Martinsburg, MD-WV	2265004041	Off-highway Gasoline, 4-Stroke /Lawn & Garden Equipt /Rear Engine Riding Mowers	0.001	0.187	0.010	0.001
24043	Washington	Hagerstown-Martinsburg, MD-WV	2265004046	Off-highway Gasoline, 4-Stroke /Lawn & Garden Equipt /Front Mowers (Commercial)	0.001	0.288	0.011	0.002
24043	Washington	Hagerstown-Martinsburg, MD-WV	2265004051	Off-highway Gasoline, 4-Stroke /Lawn & Garden Equipt /Shredders < 6 HP (Commerci	0.001	0.105	0.012	0.001
24043	Washington	Hagerstown-Martinsburg, MD-WV	2265004055	Off-highway Gasoline, 4-Stroke /Lawn & Garden Equipt /Lawn & Garden Tractors (Re	0.039	6.198	0.288	0.041
24043	Washington	Hagerstown-Martinsburg, MD-WV	2265004056	Off-highway Gasoline, 4-Stroke /Lawn & Garden Equipt /Lawn & Garden Tractors (Co	0.018	2.545	0.136	0.019
24043	Washington	Hagerstown-Martinsburg, MD-WV	2265004066	Off-highway Gasoline, 4-Stroke /Lawn & Garden Equipt /Chippers/Stump Grinders (C	0.003	0.427	0.023	0.003
24043	Washington	Hagerstown-Martinsburg, MD-WV	2265004071	Off-highway Gasoline, 4-Stroke /Lawn & Garden Equipt /Turf Equipt (Commercial)	0.056	8.164	0.545	0.060
24043	Washington	Hagerstown-Martinsburg, MD-WV	2265004075	Off-highway Gasoline, 4-Stroke /Lawn & Garden Equipt /Other Lawn & Garden Equipt	0.001	0.254	0.018	0.001
24043	Washington	Hagerstown-Martinsburg, MD-WV	2265004076	Off-highway Gasoline, 4-Stroke /Lawn & Garden Equipt /Other Lawn & Garden Equipt	0.002	0.324	0.022	0.002
24043	Washington	Hagerstown-Martinsburg, MD-WV	2265005010	Off-highway Gasoline, 4-Stroke /Agricultural Equipt /2-Wheel Tractors	0.000	0.007	0.000	0.000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2265005015	Off-highway Gasoline, 4-Stroke /Agricultural Equipt /Agricultural Tractors	0.000	0.028	0.001	0.000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2265005020	Off-highway Gasoline, 4-Stroke /Agricultural Equipt /Combines	0.000	0.001	0.000	0.000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2265005025	Off-highway Gasoline, 4-Stroke /Agricultural Equipt /Balers	0.000	0.079	0.001	0.000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2265005030	Off-highway Gasoline, 4-Stroke /Agricultural Equipt /Agricultural Mowers	0.000	0.006	0.000	0.000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2265005035	Off-highway Gasoline, 4-Stroke /Agricultural Equipt /Sprayers	0.000	0.131	0.004	0.000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2265005040	Off-highway Gasoline, 4-Stroke /Agricultural Equipt /Tillers : 6 HP	0.001	0.227	0.006	0.001
24043	Washington	Hagerstown-Martinsburg, MD-WV	2265005045	Off-highway Gasoline, 4-Stroke /Agricultural Equipt /Swathers	0.000	0.126	0.001	0.000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2265005055	Off-highway Gasoline, 4-Stroke /Agricultural Equipt /Other Agricultural Equipt	0.000	0.148	0.002	0.000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2265005060	Off-highway Gasoline, 4-Stroke /Agricultural Equipt /Irrigation Sets	0.000	0.042	0.002	0.000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2265006005	Off-highway Gasoline, 4-Stroke /Commercial Equipt /Generator Sets	0.025	4.474	0.211	0.027
24043	Washington	Hagerstown-Martinsburg, MD-WV	2265006010	Off-highway Gasoline, 4-Stroke /Commercial Equipt /Pumps	0.006	1.135	0.077	0.007
24043	Washington	Hagerstown-Martinsburg, MD-WV	2265006015	Off-highway Gasoline, 4-Stroke /Commercial Equipt /Air Compressors	0.003	0.571	0.036	0.004
24043	Washington	Hagerstown-Martinsburg, MD-WV	2265006025	Off-highway Gasoline, 4-Stroke /Commercial Equipt /Welders	0.007	1.174	0.058	0.008
24043	Washington	Hagerstown-Martinsburg, MD-WV	2265006030	Off-highway Gasoline, 4-Stroke /Commercial Equipt /Pressure Washers	0.011	1.792	0.131	0.012
24043	Washington	Hagerstown-Martinsburg, MD-WV	2265006035	Off-highway Gasoline, 4-Stroke /Commercial Equipt /Hydro-power Units	0.001	0.083	0.005	0.001
24043	Washington	Hagerstown-Martinsburg, MD-WV	2265007010	Off-highway Gasoline, 4-Stroke /Logging Equipt /Shredders : 6 HP	0.000	0.030	0.001	0.000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2265007015	Off-highway Gasoline, 4-Stroke /Logging Equipt /Forest Equipt - Feller/Bunch/Ski	0.000	0.000	0.000	0.000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2265010010	Off-highway Gasoline, 4-Stroke /Industrial Equipt /Other Oil Field Equipt	0.000	0.016	0.001	0.000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2267001060	Off-highway LPG /Recreational Equipt /Specialty Vehicles/Carts	0.000	0.073	0.001	0.000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2267002003	Off-highway LPG /Construction & Mining Equipt /Pavers	0.000	0.011	0.000	0.000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2267002015	Off-highway LPG /Construction & Mining Equipt /Rollers	0.000	0.012	0.001	0.000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2267002021	Off-highway LPG /Construction & Mining Equipt /Paving Equipt	0.000	0.006	0.000	0.000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2267002024	Off-highway LPG /Construction & Mining Equipt /Surfacing Equipt	0.000	0.002	0.000	0.000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2267002030	Off-highway LPG /Construction & Mining Equipt /Trenchers	0.000	0.035	0.001	0.000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2267002033	Off-highway LPG /Construction & Mining Equipt /Bore/Drill Rigs	0.000	0.040	0.000	0.000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2267002039	Off-highway LPG /Construction & Mining Equipt /Concrete/Industrial Saws	0.000	0.019	0.001	0.000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2267002045	Off-highway LPG /Construction & Mining Equipt /Cranes	0.000	0.024	0.000	0.000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2267002054	Off-highway LPG /Construction & Mining Equipt /Crushing/Processing Equipt	0.000	0.004	0.000	0.000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2267002057	Off-highway LPG /Construction & Mining Equipt /Rough Terrain Forklifts	0.000	0.025	0.001	0.000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2267002060	Off-highway LPG /Construction & Mining Equipt /Rubber Tire Loaders	0.000	0.038	0.002	0.000

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24043	Washington	Hagerstown-Martinsburg, MD-WV	2267002066	Off-highway LPG /Construction & Mining Equipt /Tractors/Loaders/Backhoes	0.000	0.004	0.000	0.000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2267002072	Off-highway LPG /Construction & Mining Equipt /Skid Steer Loaders	0.000	0.083	0.002	0.000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2267002081	Off-highway LPG /Construction & Mining Equipt /Other Construction Equipt	0.000	0.043	0.001	0.000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2267003010	Off-highway LPG /Industrial Equipt /Aerial Lifts	0.000	0.639	0.010	0.002
24043	Washington	Hagerstown-Martinsburg, MD-WV	2267003020	Off-highway LPG /Industrial Equipt /Forklifts	0.000	19.198	0.972	0.181
24043	Washington	Hagerstown-Martinsburg, MD-WV	2267003030	Off-highway LPG /Industrial Equipt /Sweepers/Scrubbers	0.000	0.131	0.007	0.001
24043	Washington	Hagerstown-Martinsburg, MD-WV	2267003040	Off-highway LPG /Industrial Equipt /Other General Industrial Equipt	0.000	0.041	0.002	0.000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2267003050	Off-highway LPG /Industrial Equipt /Other Material H&Iing Equipt	0.000	0.028	0.001	0.000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2267003070	Off-highway LPG /Industrial Equipt /Terminal Tractors	0.000	0.073	0.005	0.001
24043	Washington	Hagerstown-Martinsburg, MD-WV	2267004066	Off-highway LPG /Lawn & Garden Equipt /Chippers/Stump Grinders (Commercial)	0.000	0.142	0.008	0.001
24043	Washington	Hagerstown-Martinsburg, MD-WV	2267005055	Off-highway LPG /Agricultural Equipt /Other Agricultural Equipt	0.000	0.001	0.000	0.000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2267005060	Off-highway LPG /Agricultural Equipt /Irrigation Sets	0.000	0.000	0.000	0.000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2267006005	Off-highway LPG /Commercial Equipt /Generator Sets	0.000	1.983	0.024	0.005
24043	Washington	Hagerstown-Martinsburg, MD-WV	2267006010	Off-highway LPG /Commercial Equipt /Pumps	0.000	0.271	0.006	0.001
24043	Washington	Hagerstown-Martinsburg, MD-WV	2267006015	Off-highway LPG /Commercial Equipt /Air Compressors	0.000	0.176	0.007	0.001
24043	Washington	Hagerstown-Martinsburg, MD-WV	2267006025	Off-highway LPG /Commercial Equipt /Welders	0.000	0.227	0.008	0.002
24043	Washington	Hagerstown-Martinsburg, MD-WV	2267006030	Off-highway LPG /Commercial Equipt /Pressure Washers	0.000	0.006	0.000	0.000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2267006035	Off-highway LPG /Commercial Equipt /Hydro-power Units	0.000	0.003	0.000	0.000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2268002081	Off-highway CNG /Construction & Mining Equipt /Other Construction Equipt	0.000	0.002	0.000	0.000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2268003020	Off-highway CNG /Industrial Equipt /Forklifts	0.000	1.378	0.067	0.012
24043	Washington	Hagerstown-Martinsburg, MD-WV	2268003030	Off-highway CNG /Industrial Equipt /Sweepers/Scrubbers	0.000	0.002	0.000	0.000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2268003040	Off-highway CNG /Industrial Equipt /Other General Industrial Equipt	0.000	0.001	0.000	0.000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2268003060	Off-highway CNG /Industrial Equipt /AC\Refrigeration	0.000	0.002	0.000	0.000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2268003070	Off-highway CNG /Industrial Equipt /Terminal Tractors	0.000	0.005	0.000	0.000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2268005055	Off-highway CNG /Agricultural Equipt /Other Agricultural Equipt	0.000	0.001	0.000	0.000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2268005060	Off-highway CNG /Agricultural Equipt /Irrigation Sets	0.000	0.000	0.000	0.000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2268006005	Off-highway CNG /Commercial Equipt /Generator Sets	0.000	0.603	0.006	0.001
24043	Washington	Hagerstown-Martinsburg, MD-WV	2268006010	Off-highway CNG /Commercial Equipt /Pumps	0.000	0.021	0.000	0.000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2268006015	Off-highway CNG /Commercial Equipt /Air Compressors	0.000	0.013	0.000	0.000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2268006020	Off-highway CNG /Commercial Equipt /Gas Compressors	0.000	0.290	0.018	0.003
24043	Washington	Hagerstown-Martinsburg, MD-WV	2268006035	Off-highway CNG /Commercial Equipt /Hydro-power Units	0.000	0.000	0.000	0.000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2268010010	Off-highway CNG /Industrial Equipt /Other Oil Field Equipt	0.000	0.010	0.001	0.000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2270001060	Off-highway Diesel /Recreational Equipt /Specialty Vehicles/Carts	0.001	1.120	0.137	0.001
24043	Washington	Hagerstown-Martinsburg, MD-WV	2270002003	Off-highway Diesel /Construction & Mining Equipt /Pavers	0.005	2.177	0.157	0.004
24043	Washington	Hagerstown-Martinsburg, MD-WV	2270002006	Off-highway Diesel /Construction & Mining Equipt /Tampers/Rammers	0.000	0.008	0.001	0.000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2270002009	Off-highway Diesel /Construction & Mining Equipt /Plate Compactors	0.000	0.134	0.011	0.000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2270002015	Off-highway Diesel /Construction & Mining Equipt /Rollers	0.013	6.133	0.482	0.009
24043	Washington	Hagerstown-Martinsburg, MD-WV	2270002018	Off-highway Diesel /Construction & Mining Equipt /Scrapers	0.014	5.978	0.347	0.010
24043	Washington	Hagerstown-Martinsburg, MD-WV	2270002021	Off-highway Diesel /Construction & Mining Equipt /Paving Equipt	0.001	0.426	0.033	0.001
24043	Washington	Hagerstown-Martinsburg, MD-WV	2270002024	Off-highway Diesel /Construction & Mining Equipt /Surfacing Equipt	0.000	0.360	0.023	0.000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2270002027	Off-highway Diesel /Construction & Mining Equipt /Signal Boards/Light Plants	0.001	1.297	0.088	0.001
24043	Washington	Hagerstown-Martinsburg, MD-WV	2270002030	Off-highway Diesel /Construction & Mining Equipt /Trenchers	0.006	4.053	0.273	0.004
24043	Washington	Hagerstown-Martinsburg, MD-WV	2270002033	Off-highway Diesel /Construction & Mining Equipt /Bore/Drill Rigs	0.005	4.831	0.255	0.004
24043	Washington	Hagerstown-Martinsburg, MD-WV	2270002036	Off-highway Diesel /Construction & Mining Equipt /Excavators	0.053	16.302	1.069	0.034
24043	Washington	Hagerstown-Martinsburg, MD-WV	2270002039	Off-highway Diesel /Construction & Mining Equipt /Concrete/Industrial Saws	0.000	0.292	0.021	0.000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2270002042	Off-highway Diesel /Construction & Mining Equipt /Cement & Mortar Mixers	0.000	0.201	0.015	0.000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2270002045	Off-highway Diesel /Construction & Mining Equipt /Cranes	0.012	5.880	0.268	0.008
24043	Washington	Hagerstown-Martinsburg, MD-WV	2270002048	Off-highway Diesel /Construction & Mining Equipt /Graders	0.013	4.084	0.276	0.009
24043	Washington	Hagerstown-Martinsburg, MD-WV	2270002051	Off-highway Diesel /Construction & Mining Equipt /Off-highway Trucks	0.045	20.967	0.711	0.028
24043	Washington	Hagerstown-Martinsburg, MD-WV	2270002054	Off-highway Diesel /Construction & Mining Equipt /Crushing/Processing Equipt	0.002	1.254	0.059	0.002
24043	Washington	Hagerstown-Martinsburg, MD-WV	2270002057	Off-highway Diesel /Construction & Mining Equipt /Rough Terrain Forklifts	0.017	8.535	0.800	0.012
24043	Washington	Hagerstown-Martinsburg, MD-WV	2270002060	Off-highway Diesel /Construction & Mining Equipt /Rubber Tire Loaders	0.057	29.338	1.791	0.040
24043	Washington	Hagerstown-Martinsburg, MD-WV	2270002066	Off-highway Diesel /Construction & Mining Equipt /Tractors/Loaders/Backhoes	0.035	25.013	3.547	0.026
24043	Washington	Hagerstown-Martinsburg, MD-WV	2270002069	Off-highway Diesel /Construction & Mining Equipt /Crawler Tractor/Dozers	0.052	22.346	1.363	0.036
24043	Washington	Hagerstown-Martinsburg, MD-WV	2270002072	Off-highway Diesel /Construction & Mining Equipt /Skid Steer Loaders	0.024	20.377	3.056	0.018

APP_B-4_NMIM

FIPS	NAME	NONATTAIN	SCC	SHORT_NAME	NH3 2017	NOX 2017	PM25 2017	SO2 2017
24043	Washington	Hagerstown-Martinsburg, MD-WV	2270002075	Off-highway Diesel /Construction & Mining Equip /Off-highway Tractors	0.006	3.639	0.168	0.004
24043	Washington	Hagerstown-Martinsburg, MD-WV	2270002078	Off-highway Diesel /Construction & Mining Equip /Dumpers/Tenders	0.000	0.066	0.010	0.000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2270002081	Off-highway Diesel /Construction & Mining Equip /Other Construction Equip	0.005	3.522	0.209	0.004
24043	Washington	Hagerstown-Martinsburg, MD-WV	2270003010	Off-highway Diesel /Industrial Equip /Aerial Lifts	0.001	1.302	0.178	0.001
24043	Washington	Hagerstown-Martinsburg, MD-WV	2270003020	Off-highway Diesel /Industrial Equip /Forklifts	0.020	5.870	0.190	0.013
24043	Washington	Hagerstown-Martinsburg, MD-WV	2270003030	Off-highway Diesel /Industrial Equip /Sweepers/Scrubbers	0.009	3.483	0.206	0.006
24043	Washington	Hagerstown-Martinsburg, MD-WV	2270003040	Off-highway Diesel /Industrial Equip /Other General Industrial Equip	0.009	4.606	0.277	0.006
24043	Washington	Hagerstown-Martinsburg, MD-WV	2270003050	Off-highway Diesel /Industrial Equip /Other Material H&ling Equip	0.000	0.310	0.032	0.000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2270003060	Off-highway Diesel /Industrial Equip /AC\Refrigeration	0.023	15.485	0.630	0.016
24043	Washington	Hagerstown-Martinsburg, MD-WV	2270003070	Off-highway Diesel /Industrial Equip /Terminal Tractors	0.013	3.010	0.166	0.008
24043	Washington	Hagerstown-Martinsburg, MD-WV	2270004031	Off-highway Diesel /Lawn & Garden Equip /Leafblowers/Vacuums (Commercial)	0.000	0.001	0.000	0.000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2270004036	Off-highway Diesel /Lawn & Garden Equip /Snowblowers (Commercial)	0.000	0.208	0.009	0.000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2270004046	Off-highway Diesel /Lawn & Garden Equip /Front Mowers (Commercial)	0.007	6.093	0.408	0.005
24043	Washington	Hagerstown-Martinsburg, MD-WV	2270004056	Off-highway Diesel /Lawn & Garden Equip /Lawn & Garden Tractors (Commercial)	0.001	1.297	0.095	0.001
24043	Washington	Hagerstown-Martinsburg, MD-WV	2270004066	Off-highway Diesel /Lawn & Garden Equip /Chippers/Stump Grinders (Commercial)	0.009	7.482	0.474	0.007
24043	Washington	Hagerstown-Martinsburg, MD-WV	2270004071	Off-highway Diesel /Lawn & Garden Equip /Turf Equip (Commercial)	0.001	0.613	0.032	0.001
24043	Washington	Hagerstown-Martinsburg, MD-WV	2270004076	Off-highway Diesel /Lawn & Garden Equip /Other Lawn & Garden Equip (Commercial)	0.000	0.024	0.002	0.000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2270005010	Off-highway Diesel /Agricultural Equip /2-Wheel Tractors	0.000	0.002	0.000	0.000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2270005015	Off-highway Diesel /Agricultural Equip /Agricultural Tractors	0.090	64.699	4.741	0.067
24043	Washington	Hagerstown-Martinsburg, MD-WV	2270005020	Off-highway Diesel /Agricultural Equip /Combines	0.008	7.161	0.540	0.006
24043	Washington	Hagerstown-Martinsburg, MD-WV	2270005025	Off-highway Diesel /Agricultural Equip /Balers	0.000	0.040	0.004	0.000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2270005030	Off-highway Diesel /Agricultural Equip /Agricultural Mowers	0.000	0.007	0.001	0.000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2270005035	Off-highway Diesel /Agricultural Equip /Sprayers	0.001	0.580	0.043	0.001
24043	Washington	Hagerstown-Martinsburg, MD-WV	2270005040	Off-highway Diesel /Agricultural Equip /Tillers : 6 HP	0.000	0.001	0.000	0.000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2270005045	Off-highway Diesel /Agricultural Equip /Swathers	0.001	0.553	0.058	0.000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2270005055	Off-highway Diesel /Agricultural Equip /Other Agricultural Equip	0.002	1.394	0.112	0.001
24043	Washington	Hagerstown-Martinsburg, MD-WV	2270005060	Off-highway Diesel /Agricultural Equip /Irrigation Sets	0.001	0.785	0.052	0.001
24043	Washington	Hagerstown-Martinsburg, MD-WV	2270006005	Off-highway Diesel /Commercial Equip /Generator Sets	0.012	10.594	0.752	0.009
24043	Washington	Hagerstown-Martinsburg, MD-WV	2270006010	Off-highway Diesel /Commercial Equip /Pumps	0.003	2.477	0.187	0.002
24043	Washington	Hagerstown-Martinsburg, MD-WV	2270006015	Off-highway Diesel /Commercial Equip /Air Compressors	0.008	4.706	0.298	0.006
24043	Washington	Hagerstown-Martinsburg, MD-WV	2270006020	Off-highway Diesel /Commercial Equip /Gas Compressors	0.000	0.000	0.000	0.000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2270006025	Off-highway Diesel /Commercial Equip /Welders	0.004	3.351	0.455	0.003
24043	Washington	Hagerstown-Martinsburg, MD-WV	2270006030	Off-highway Diesel /Commercial Equip /Pressure Washers	0.000	0.354	0.022	0.000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2270006035	Off-highway Diesel /Commercial Equip /Hydro-power Units	0.000	0.216	0.014	0.000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2270007010	Off-highway Diesel /Logging Equip /Shredders : 6 HP	0.000	0.000	0.000	0.000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2270007015	Off-highway Diesel /Logging Equip /Forest Equip - Feller/Bunch/Skidder	0.001	0.248	0.014	0.001
24043	Washington	Hagerstown-Martinsburg, MD-WV	2270009010	Off-highway Diesel /Underground Mining Equip /Other Underground Mining Equip	0.000	0.000	0.000	0.000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2270010010	Off-highway Diesel /Industrial Equip /Other Oil Field Equip	0.000	0.136	0.005	0.000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2282005010	Pleasure Craft /Gasoline 2-Stroke /Outboard	0.021	8.711	0.699	0.020
24043	Washington	Hagerstown-Martinsburg, MD-WV	2282005015	Pleasure Craft /Gasoline 2-Stroke /Personal Water Craft	0.008	3.855	0.135	0.009
24043	Washington	Hagerstown-Martinsburg, MD-WV	2282010005	Pleasure Craft /Gasoline 4-Stroke /Inboard/Sterndrive	0.006	3.944	0.034	0.006
24043	Washington	Hagerstown-Martinsburg, MD-WV	2282020005	Pleasure Craft /Diesel /Inboard/Sterndrive	0.003	4.174	0.089	0.013
24043	Washington	Hagerstown-Martinsburg, MD-WV	2282020010	Pleasure Craft /Diesel /Outboard	0.000	0.025	0.002	0.000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2285002015	Railroad Equip /Diesel /Railway Maintenance	0.002	1.318	0.146	0.001
24043	Washington	Hagerstown-Martinsburg, MD-WV	2285004015	Railroad Equip /Gasoline, 4-Stroke /Railway Maintenance	0.000	0.018	0.001	0.000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2285006015	Railroad Equip /LPG /Railway Maintenance	0.000	0.001	0.000	0.000

Appendix C
2025 Projection Year Inventory

Appendix C-1
2025 Point Source Emissions

APP_C-1_EGU

FIPS	COUNTY	FACNAME	PLANTID	POINTID	STACKID	SCC	AEO FUEL	SO2 2025	NOX 2025	NH3 2025	PRI25 2025
24043	Washington	R. Paul Smith Power Station	043-0005	3-0005	S1	10100202	Coal	820.000	273.500	0.000	89.378
24043	Washington	R. Paul Smith Power Station	043-0005	3-0006	S2	10100212	Coal	3,770.000	1,116.500	0.000	209.931

APP_C-1_NonEGU

FIPS	CNTY NAME	NONATTAIN	NH3 2025	NOX 2025	P25 2025_TF	SO2 2025	FACNAME
24043	Washington	Hagerstown-Martinsburg, MD-WV	0.000	0.051	0.004	0.000	Xerxes Corporation
24043	Washington	Hagerstown-Martinsburg, MD-WV	0.000	0.051	0.004	0.000	Xerxes Corporation
24043	Washington	Hagerstown-Martinsburg, MD-WV	0.000	0.000	0.000	0.000	Xerxes Corporation
24043	Washington	Hagerstown-Martinsburg, MD-WV	0.000	0.000	0.000	0.000	Xerxes Corporation
24043	Washington	Hagerstown-Martinsburg, MD-WV	0.000	0.000	0.000	0.000	Fil-tec
24043	Washington	Hagerstown-Martinsburg, MD-WV	0.000	0.633	0.113	0.001	Fil-tec
24043	Washington	Hagerstown-Martinsburg, MD-WV	0.000	0.000	0.000	0.000	Fil-tec
24043	Washington	Hagerstown-Martinsburg, MD-WV	0.000	0.000	0.000	0.000	Fil-tec
24043	Washington	Hagerstown-Martinsburg, MD-WV	0.000	0.000	0.000	0.000	Fil-tec
24043	Washington	Hagerstown-Martinsburg, MD-WV	0.000	0.000	0.000	0.000	Fil-tec
24043	Washington	Hagerstown-Martinsburg, MD-WV	0.000	0.000	0.000	0.000	Fil-tec
24043	Washington	Hagerstown-Martinsburg, MD-WV	0.000	0.000	0.000	0.000	Fil-tec
24043	Washington	Hagerstown-Martinsburg, MD-WV	0.000	0.000	0.000	0.000	Fil-tec
24043	Washington	Hagerstown-Martinsburg, MD-WV	0.000	0.000	0.000	0.000	Fil-tec
24043	Washington	Hagerstown-Martinsburg, MD-WV	0.000	0.000	0.000	0.000	Fil-tec
24043	Washington	Hagerstown-Martinsburg, MD-WV	0.000	0.000	0.000	0.000	Fil-tec
24043	Washington	Hagerstown-Martinsburg, MD-WV	0.000	0.000	0.000	0.000	Fil-tec
24043	Washington	Hagerstown-Martinsburg, MD-WV	0.000	0.000	0.000	0.000	Fil-tec
24043	Washington	Hagerstown-Martinsburg, MD-WV	0.000	0.000	0.000	0.000	Fil-tec
24043	Washington	Hagerstown-Martinsburg, MD-WV	0.000	0.140	0.019	0.000	Fil-tec
24043	Washington	Hagerstown-Martinsburg, MD-WV	0.000	0.000	0.000	0.000	C. William Hetzer/beaver Creek Wst
24043	Washington	Hagerstown-Martinsburg, MD-WV	0.000	5.303	3.316	1.060	C. William Hetzer/beaver Creek Wst
24043	Washington	Hagerstown-Martinsburg, MD-WV	0.000	2.562	0.363	0.029	Engineered Polymer Solutions
24043	Washington	Hagerstown-Martinsburg, MD-WV	0.000	2.101	0.245	0.024	Engineered Polymer Solutions
24043	Washington	Hagerstown-Martinsburg, MD-WV	0.000	0.000	0.560	0.000	Engineered Polymer Solutions
24043	Washington	Hagerstown-Martinsburg, MD-WV	0.000	0.000	0.000	0.000	Engineered Polymer Solutions
24043	Washington	Hagerstown-Martinsburg, MD-WV	0.000	0.000	0.000	0.000	Engineered Polymer Solutions
24043	Washington	Hagerstown-Martinsburg, MD-WV	0.000	0.104	0.009	0.000	Phoenix Color
24043	Washington	Hagerstown-Martinsburg, MD-WV	0.000	0.104	0.009	0.000	Phoenix Color
24043	Washington	Hagerstown-Martinsburg, MD-WV	0.000	0.104	0.009	0.000	Phoenix Color
24043	Washington	Hagerstown-Martinsburg, MD-WV	0.000	0.000	0.000	0.000	Phoenix Color
24043	Washington	Hagerstown-Martinsburg, MD-WV	0.000	0.000	0.000	0.000	Phoenix Color

Appendix C-2
2025 Area Source Emissions

APP_C-2

FIPS	CNTY_NAME	NONATTAINMENT AREA	SCC	SCC_DESCRIPTION	NH3 2025	NOX 2025	P25 2025_TF	SO2 2025
24043	Washington	Hagerstown-Martinsburg, MD-WV	2103002000	Stationary Fuel Comb /Commercial/Institutional /Bituminous/Subbituminous Co	0.0227	8.3078	1.0876	57.3996
24043	Washington	Hagerstown-Martinsburg, MD-WV	2103004000	Stationary Fuel Comb /Commercial/Institutional /Distillate Oil /Total: Boil	1.0106	25.2674	2.4846	0.2729
24043	Washington	Hagerstown-Martinsburg, MD-WV	2103005000	Stationary Fuel Comb /Commercial/Institutional /Residual Oil /Total: All Bo	0.0153	1.0570	0.1299	1.5209
24043	Washington	Hagerstown-Martinsburg, MD-WV	2103006000	Stationary Fuel Comb /Commercial/Institutional /Natural Gas /Total: Boilers	0.3373	59.6501	0.0787	0.4161
24043	Washington	Hagerstown-Martinsburg, MD-WV	2103007000	Stationary Fuel Comb /Commercial/Institutional /Liquified Petroleum Gas /To	0.0118	3.1149	0.0000	0.0135
24043	Washington	Hagerstown-Martinsburg, MD-WV	2103011000	Stationary Fuel Comb /Commercial/Institutional /Kerosene /Total: All Combust	0.0349	0.8771	0.0904	0.0091
24043	Washington	Hagerstown-Martinsburg, MD-WV	2104002000	Stationary Fuel Comb /Residential /Bituminous/Subbituminous Coal /Total: Al	0.0445	0.2026	0.0855	1.3805
24043	Washington	Hagerstown-Martinsburg, MD-WV	2104004000	Stationary Fuel Comb /Residential /Distillate Oil /Total: All Combustor Typ	4.0947	73.7048	8.7214	0.8845
24043	Washington	Hagerstown-Martinsburg, MD-WV	2104006000	Stationary Fuel Comb /Residential /Natural Gas /Total: All Combustor Types	9.5749	45.0059	0.1551	0.2843
24043	Washington	Hagerstown-Martinsburg, MD-WV	2104007000	Stationary Fuel Comb /Residential /Liquified Petroleum Gas /Total: All Comb	0.0770	20.3257	0.0129	0.0877
24043	Washington	Hagerstown-Martinsburg, MD-WV	2104008100	Stationary Fuel Comb /Residential /Wood /Fireplace: general	1.9051	2.7518	24.9775	0.4233
24043	Washington	Hagerstown-Martinsburg, MD-WV	2104008210	Stationary Fuel Comb /Residential /Wood /Woodstove: fireplace inserts; non-	0.9641	1.5880	17.3542	0.2269
24043	Washington	Hagerstown-Martinsburg, MD-WV	2104008220	Stationary Fuel Comb /Residential /Wood /Woodstove: fireplace inserts; EPA	0.3473	0.8799	7.5638	0.1544
24043	Washington	Hagerstown-Martinsburg, MD-WV	2104008230	Stationary Fuel Comb /Residential /Wood /Woodstove: fireplace inserts; EPA	0.1161	0.2580	2.6313	0.0516
24043	Washington	Hagerstown-Martinsburg, MD-WV	2104008310	Stationary Fuel Comb /Residential /Wood /Woodstove: freestanding, non-EPA c	1.9998	3.2937	35.9957	0.4705
24043	Washington	Hagerstown-Martinsburg, MD-WV	2104008320	Stationary Fuel Comb /Residential /Wood /Woodstove: freestanding, EPA certi	0.7222	1.8297	15.7287	0.3210
24043	Washington	Hagerstown-Martinsburg, MD-WV	2104008330	Stationary Fuel Comb /Residential /Wood /Woodstove: freestanding, EPA certi	0.2413	0.5363	5.4705	0.1073
24043	Washington	Hagerstown-Martinsburg, MD-WV	2104008400	Stationary Fuel Comb /Residential /Wood /Woodstove: pellet-fired, general (	0.0502	0.6361	0.5123	0.0536
24043	Washington	Hagerstown-Martinsburg, MD-WV	2104008510	Stationary Fuel Comb /Residential /Wood /Furnace: Indoor, cordwood-fired, n	0.6422	0.6570	9.8474	0.7243
24043	Washington	Hagerstown-Martinsburg, MD-WV	2104008610	Stationary Fuel Comb /Residential /Wood /Hydronic heater: outdoor	0.8895	0.9099	13.6393	1.0032
24043	Washington	Hagerstown-Martinsburg, MD-WV	2104009000	Stationary Fuel Comb /Residential /Firelog /Total: All Combustor Types	0.0000	0.9527	3.5211	0.0000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2104011000	Stationary Fuel Comb /Residential /Kerosene /Total: All Heater Types	0.2750	4.9490	0.5900	0.0572
24043	Washington	Hagerstown-Martinsburg, MD-WV	2294000000	Paved Roads /All Paved Roads /Total: Fugitives	0.0000	0.0000	36.3043	0.0000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2296000000	Unpaved Roads /All Unpaved Roads /Total: Fugitives	0.0000	0.0000	1.0742	0.0000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2302002100	Food & Kindred Products /Commercial Cooking - Charbroiling /Conveyorized Ch	0.0000	0.0000	6.0852	0.0000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2302002200	Food & Kindred Products /Commercial Cooking - Charbroiling /Under-fired Cha	0.0000	0.0000	36.5707	0.0000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2302003000	Food & Kindred Products /Commercial Cooking - Frying /Deep Fat Frying	0.0000	0.0000	0.0000	0.0000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2302003100	Food & Kindred Products /Commercial Cooking - Frying /Flat Griddle Frying	0.0000	0.0000	7.4522	0.0000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2302003200	Food & Kindred Products /Commercial Cooking - Frying /Clamshell Griddle Fry	0.0000	0.0000	0.6568	0.0000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2302050000	Food & Kindred Products /Bakery Products /Total	0.0000	0.0000	0.0000	0.0000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2302070001	Food & Kindred Products /Fermentation/Beverages /Breweries	0.0000	0.0000	0.0000	0.0000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2311010000	Construction: SIC 15 - 17 /Residential /Total	0.0000	0.0000	1.0355	0.0000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2311020000	Construction: SIC 15 - 17 /Industrial/Commercial/Institutional /Total	0.0000	0.0000	22.0046	0.0000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2311030000	Construction: SIC 15 - 17 /Road Construction /Total	0.0000	0.0000	7.1977	0.0000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2401002000	Surface Coating /Architectural Coatings - Solvent-based /Total: All Solvent	0.0000	0.0000	0.0000	0.0000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2401003000	Surface Coating /Architectural Coatings - Water-based /Total: All Solvent T	0.0000	0.0000	0.0000	0.0000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2401005000	Surface Coating /Auto Refinishing /Total: All Solvent Types	0.0000	0.0000	0.0000	0.0000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2401008000	Surface Coating /Traffic Markings /Total: All Solvent Types	0.0000	0.0000	0.0000	0.0000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2401015000	Surface Coating /Factory Finished Wood /Total: All Solvent Types	0.0000	0.0000	0.0000	0.0000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2401020000	Surface Coating /Wood Furniture /Total: All Solvent Types	0.0000	0.0000	0.0000	0.0000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2401025000	Surface Coating /Metal Furniture /Total: All Solvent Types	0.0000	0.0000	0.0000	0.0000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2401030000	Surface Coating /Paper /Total: All Solvent Types	0.0000	0.0000	0.0000	0.0000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2401040000	Surface Coating /Metal Cans /Total: All Solvent Types	0.0000	0.0000	0.0000	0.0000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2401055000	Surface Coating /Machinery & Equipment /Total: All Solvent Types	0.0000	0.0000	0.0000	0.0000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2401060000	Surface Coating /Large Appliances /Total: All Solvent Types	0.0000	0.0000	0.0000	0.0000

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FIPS	CNTY_NAME	NONATTAINMENT AREA	SCC	SCC_DESCRIPTION	NH3 2025	NOX 2025	P25 2025_TF	SO2 2025
24043	Washington	Hagerstown-Martinsburg, MD-WV	2401065000	Surface Coating /Electronic & Other Electrical /Total: All Solvent Types	0.0000	0.0000	0.0000	0.0000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2401070000	Surface Coating /Motor Vehicles /Total: All Solvent Types	0.0000	0.0000	0.0000	0.0000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2401075000	Surface Coating /Aircraft /Total: All Solvent Types	0.0000	0.0000	0.0000	0.0000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2401080000	Surface Coating /Marine /Total: All Solvent Types	0.0000	0.0000	0.0000	0.0000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2401085000	Surface Coating /Railroad /Total: All Solvent Types	0.0000	0.0000	0.0000	0.0000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2401090000	Surface Coating /Misc Manufacturing /Total: All Solvent Types	0.0000	0.0000	0.0000	0.0000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2401100000	Surface Coating /Industrial Maintenance Coatings /Total: All Solvent Types	0.0000	0.0000	0.0000	0.0000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2401200000	Surface Coating /Other Special Purpose Coatings /Total: All Solvent Types	0.0000	0.0000	0.0000	0.0000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2415300000	Degreasing /All Industries: Cold Cleaning /Total: All Solvent Types	0.0000	0.0000	0.0000	0.0000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2420000000	Dry Cleaning /All Processes /Total: All Solvent Types	0.0000	0.0000	0.0000	0.0000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2425000000	Graphic Arts /All Processes /Total: All Solvent Types	0.0000	0.0000	0.0000	0.0000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2440020000	Misc Industrial /Adhesive (Industrial) Application /Total: All Solvent Type	0.0000	0.0000	0.0000	0.0000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2460100000	Misc Non-indus: Consumer & Comm /All Personal Care Products /Total: All Sol	0.0000	0.0000	0.0000	0.0000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2460200000	Misc Non-indus: Consumer & Comm /All Household Products /Total: All Solvent	0.0000	0.0000	0.0000	0.0000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2460400000	Misc Non-indus: Consumer & Comm /All Auto Aftermarket Products /Total: All	0.0000	0.0000	0.0000	0.0000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2460500000	Misc Non-indus: Consumer & Comm /All Coatings & Related Products /Total: Al	0.0000	0.0000	0.0000	0.0000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2460600000	Misc Non-indus: Consumer & Comm /All Adhesives & Sealants /Total: All Solve	0.0000	0.0000	0.0000	0.0000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2460800000	Misc Non-indus: Consumer & Comm /All FIFRA Related Products /Total: All Sol	0.0000	0.0000	0.0000	0.0000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2460900000	Misc Non-indus: Consumer & Comm /Misc Products (Not Otherwise Covered) /Tot	0.0000	0.0000	0.0000	0.0000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2461020000	Misc Non-industrial: Commercial /Asphalt Application: All Processes /Total:	0.0000	0.0000	0.0000	0.0000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2461021000	Misc Non-industrial: Commercial /Cutback Asphalt /Total: All Solvent Types	0.0000	0.0000	0.0000	0.0000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2461022000	Misc Non-industrial: Commercial /Emulsified Asphalt /Total: All Solvent Typ	0.0000	0.0000	0.0000	0.0000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2461023000	Misc Non-industrial: Commercial /Asphalt Roofing /Total: All Solvent Types	0.0000	0.0000	0.0000	0.0000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2461800000	Misc Non-industrial: Commercial /Pesticide Application: All Processes /Tota	0.0000	0.0000	0.0000	0.0000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2501011011	Residential Portable Gas Cans /Permeation	0.0000	0.0000	0.0000	0.0000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2501011012	Residential Portable Gas Cans /Evaporation (includes Diurnal losses)	0.0000	0.0000	0.0000	0.0000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2501011013	Residential Portable Gas Cans /Spillage During Transport	0.0000	0.0000	0.0000	0.0000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2501012011	Commercial Portable Gas Cans /Permeation	0.0000	0.0000	0.0000	0.0000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2501012012	Commercial Portable Gas Cans /Evaporation (includes Diurnal losses)	0.0000	0.0000	0.0000	0.0000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2501012013	Commercial Portable Gas Cans /Spillage During Transport	0.0000	0.0000	0.0000	0.0000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2501060051	Gasoline Service Stations /Stage 1: Submerged Filling	0.0000	0.0000	0.0000	0.0000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2501060053	Gasoline Service Stations /Stage 1: Balanced Submerged Filling	0.0000	0.0000	0.0000	0.0000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2501060201	Gasoline Service Stations /Underground Tank: Breathing and Emptying	0.0000	0.0000	0.0000	0.0000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2501080050	Petrol & Petrol Product Storage /Airports : Aviation Gasoline /Stage 1: Tot	0.0000	0.0000	0.0000	0.0000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2501080100	Petrol & Petrol Product Storage /Airports : Aviation Gasoline /Stage 2: Tot	0.0000	0.0000	0.0000	0.0000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2505020030	Petrol & Petrol Product Transport /Marine Vessel /Crude Oil	0.0000	0.0000	0.0000	0.0000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2505020060	Petrol & Petrol Product Transport /Marine Vessel /Residual Oil	0.0000	0.0000	0.0000	0.0000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2505020090	Petrol & Petrol Product Transport /Marine Vessel /Distillate Oil	0.0000	0.0000	0.0000	0.0000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2505020120	Petrol & Petrol Product Transport /Marine Vessel /Gasoline	0.0000	0.0000	0.0000	0.0000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2505020150	Petrol & Petrol Product Transport /Marine Vessel /Jet Naphtha	0.0000	0.0000	0.0000	0.0000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2505020180	Petrol & Petrol Product Transport /Marine Vessel /Kerosene	0.0000	0.0000	0.0000	0.0000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2505030120	Petrol & Petrol Product Transport /Truck /Gasoline	0.0000	0.0000	0.0000	0.0000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2601000000	On-site Incineration /All Categories /Total	0.0000	26.1400	0.0000	13.0400
24043	Washington	Hagerstown-Martinsburg, MD-WV	2610000100	Open Burning /All Categories /Yard Waste - Leaf Species Unspecified	0.0000	2.3000	8.1406	0.2843
24043	Washington	Hagerstown-Martinsburg, MD-WV	2610000400	Open Burning /All Categories /Yard Waste - Brush Species Unspecified	0.0000	2.1708	6.5900	0.7236

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FIPS	CNTY_NAME	NONATTAINMENT AREA	SCC	SCC_DESCRIPTION	NH3 2025	NOX 2025	P25 2025_TF	SO2 2025
24043	Washington	Hagerstown-Martinsburg, MD-WV	2610000500	Open Burning /All Categories /Land Clearing Debris (use 28-10-005-000 for L	0.0000	31.8300	108.2300	0.0000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2610030000	Open Burning /Residential /Household Waste (use 26-10-000-xxx for Yard Wast	0.0000	18.5813	107.7532	3.1012
24043	Washington	Hagerstown-Martinsburg, MD-WV	2620030000	Landfills /Municipal /Total	0.0000	0.0000	0.0000	0.0000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2630020000	Wastewater Treatment /Public Owned /Total Processed	4.8714	0.0000	0.0000	0.0000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2660000000	Leaking Underground Storage Tanks /Leaking Underground Storage Tanks /Total	0.0000	0.0000	0.0000	0.0000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2801000003	Agric - Crops /Tilling	0.0000	0.0000	34.8742	0.0000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2801700001	Agric - Crops /Fertilizer Application /Anhydrous Ammonia	0.0000	0.0000	0.0000	0.0000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2801700002	Agric - Crops /Fertilizer Application /Aqueous Ammonia	0.0000	0.0000	0.0000	0.0000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2801700003	Agric - Crops /Fertilizer Application /Nitrogen Solutions	68.2843	0.0000	0.0000	0.0000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2801700004	Agric - Crops /Fertilizer Application /Urea	84.8253	0.0000	0.0000	0.0000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2801700005	Agric - Crops /Fertilizer Application /Ammonium Nitrate	0.0000	0.0000	0.0000	0.0000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2801700006	Agric - Crops /Fertilizer Application /Ammonium Sulfate	1.1293	0.0000	0.0000	0.0000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2801700007	Agric - Crops /Fertilizer Application /Ammonium Thiosulfate	0.0000	0.0000	0.0000	0.0000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2801700010	Agric - Crops /Fertilizer Application /N-P-K (multi-grade nutrient fertiliz	17.1720	0.0000	0.0000	0.0000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2801700011	Agric - Crops /Fertilizer Application /Calcium Ammonium Nitrate	0.0000	0.0000	0.0000	0.0000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2801700012	Agric - Crops /Fertilizer Application /Potassium Nitrate	0.0000	0.0000	0.0000	0.0000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2801700013	Agric - Crops /Fertilizer Application /Diammonium Phosphate	0.8857	0.0000	0.0000	0.0000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2801700014	Agric - Crops /Fertilizer Application /Monoammonium Phosphate	0.1499	0.0000	0.0000	0.0000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2801700015	Agric - Crops /Fertilizer Application /Liquid Ammonium Polyphosphate	0.3135	0.0000	0.0000	0.0000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2801700099	Agric - Crops /Fertilizer Application /Miscellaneous Fertilizers	3.5311	0.0000	0.0000	0.0000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2805001100	Agric - Livestock /Beef cattle - finishing operations on feedlots (drylots	7.5906	0.0000	0.0000	0.0000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2805001200	Agric - Livestock /Beef cattle - finishing operations on feedlots (drylots	0.0030	0.0000	0.0000	0.0000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2805001300	Agric - Livestock /Beef cattle - finishing operations on feedlots (drylots	5.7657	0.0000	0.0000	0.0000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2805002000	Agric - Livestock /Beef cattle production composite /Not Elsewhere Classifi	29.2250	0.0000	0.0000	0.0000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2805003100	Agric - Livestock /Beef cattle - finishing operations on pasture/range /Co	20.7617	0.0000	0.0000	0.0000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2805007100	Agric - Livestock /Poultry production - layers with dry manure management s	112.8007	0.0000	0.0000	0.0000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2805007300	Agric - Livestock /Poultry production - layers with dry manure management s	5.0780	0.0000	0.0000	0.0000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2805008100	Agric - Livestock /Poultry production - layers with wet manure management s	1.6662	0.0000	0.0000	0.0000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2805008200	Agric - Livestock /Poultry production - layers with wet manure management s	5.7128	0.0000	0.0000	0.0000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2805008300	Agric - Livestock /Poultry production - layers with wet manure management s	0.9971	0.0000	0.0000	0.0000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2805009100	Agric - Livestock /Poultry production - broilers /Confinement	0.1587	0.0000	0.0000	0.0000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2805009200	Agric - Livestock /Poultry production - broilers /Manure handling and stora	0.0287	0.0000	0.0000	0.0000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2805009300	Agric - Livestock /Poultry production - broilers /Land application of manur	0.1295	0.0000	0.0000	0.0000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2805010100	Agric - Livestock /Poultry production - turkeys /Confinement	0.0719	0.0000	0.0000	0.0000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2805010200	Agric - Livestock /Poultry production - turkeys /Manure handling and storag	0.0129	0.0000	0.0000	0.0000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2805010300	Agric - Livestock /Poultry production - turkeys /Land application of manure	0.0648	0.0000	0.0000	0.0000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2805018000	Agric - Livestock /Dairy cattle composite /Not Elsewhere Classified	142.8192	0.0000	0.0000	0.0000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2805019100	Agric - Livestock /Dairy cattle - flush dairy /Confinement	6.2946	0.0000	0.0000	0.0000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2805019200	Agric - Livestock /Dairy cattle - flush dairy /Manure handling and storage	17.5879	0.0000	0.0000	0.0000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2805019300	Agric - Livestock /Dairy cattle - flush dairy /Land application of manure	1.6662	0.0000	0.0000	0.0000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2805021100	Agric - Livestock /Dairy cattle - scrape dairy /Confinement	74.5834	0.0000	0.0000	0.0000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2805021200	Agric - Livestock /Dairy cattle - scrape dairy /Manure handling and storage	81.7243	0.0000	0.0000	0.0000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2805021300	Agric - Livestock /Dairy cattle - scrape dairy /Land application of manure	163.9776	0.0000	0.0000	0.0000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2805022100	Agric - Livestock /Dairy cattle - deep pit dairy /Confinement	8.0005	0.0000	0.0000	0.0000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2805022200	Agric - Livestock /Dairy cattle - deep pit dairy /Manure handling and stora	0.3742	0.0000	0.0000	0.0000

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FIPS	CNTY_NAME	NONATTAINMENT AREA	SCC	SCC_DESCRIPTION	NH3 2025	NOX 2025	P25 2025_TF	SO2 2025
24043	Washington	Hagerstown-Martinsburg, MD-WV	2805022300	Agric - Livestock /Dairy cattle - deep pit dairy /Land application of manur	4.4962	0.0000	0.0000	0.0000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2805023100	Agric - Livestock /Dairy cattle - drylot/pasture dairy /Confinement	54.4829	0.0000	0.0000	0.0000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2805023200	Agric - Livestock /Dairy cattle - drylot/pasture dairy /Manure handling and	0.8490	0.0000	0.0000	0.0000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2805023300	Agric - Livestock /Dairy cattle - drylot/pasture dairy /Land application of	72.7320	0.0000	0.0000	0.0000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2805025000	Agric - Livestock /Swine production composite /Not Elsewhere Classified (se	0.0000	0.0000	0.0000	0.0000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2805030000	Agric - Livestock /Poultry Waste Emissions /Not Elsewhere Classified (see a	0.0733	0.0000	0.0000	0.0000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2805030007	Agric - Livestock /Poultry Waste Emissions /Ducks	11.8619	0.0000	0.0000	0.0000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2805030008	Agric - Livestock /Poultry Waste Emissions /Geese	0.0152	0.0000	0.0000	0.0000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2805035000	Agric - Livestock /Horses & Ponies Waste Emissions /Not Elsewhere Classifie	15.6043	0.0000	0.0000	0.0000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2805039100	Agric - Livestock /Swine production - operations with lagoons (unspecified	5.1045	0.0000	0.0000	0.0000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2805039200	Agric - Livestock /Swine production - operations with lagoons (unspecified	12.7479	0.0000	0.0000	0.0000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2805039300	Agric - Livestock /Swine production - operations with lagoons (unspecified	0.8503	0.0000	0.0000	0.0000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2805040000	Agric - Livestock /Sheep & Lambs Waste Emissions /Total	5.8847	0.0000	0.0000	0.0000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2805045000	Agric - Livestock /Goats Waste Emissions /Not Elsewhere Classified	11.0553	0.0000	0.0000	0.0000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2805047100	Agric - Livestock /Swine production - deep-pit house operations (unspecifie	16.7945	0.0000	0.0000	0.0000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2805047300	Agric - Livestock /Swine production - deep-pit house operations (unspecifie	11.9942	0.0000	0.0000	0.0000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2805053100	Agric - Livestock /Swine production - outdoor operations (unspecified anima	0.1878	0.0000	0.0000	0.0000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2810001000	Forest Wildfires - Wildfires - Unspecified	0.0000	0.2222	0.0000	0.0000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2810005000	Managed Burning, Slash (Logging Debris) /Unspecified Burn Method (use 26100	0.0000	0.0000	0.0000	0.0000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2810015000	Prescribed Forest Burning /Unspecified	0.0000	0.4640	1.8050	0.1270
24043	Washington	Hagerstown-Martinsburg, MD-WV	2810030000	Structure Fires /Unspecified	0.0000	0.2263	0.0000	0.0000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2810050000	Motor Vehicle Fires /Unspecified	0.0000	0.0628	1.6317	0.0000

Appendix C-3
2025 On-Road Mobile Source Emissions

Appendix C-4
2025 Off-Road Mobile Source Emissions

APP_C-4_MAR

FIPS	CNTY_NAME	AREA	SCC	SCC_DESCRIPTION	NH3 2025	NOX 2025	P25 2025
24043	Washington	Hagerstown-Martinsburg, MD-WV	2265008005	Airport Ground Support Equipment, 4-Stroke Gasoline	0.000	0.822	0.018
24043	Washington	Hagerstown-Martinsburg, MD-WV	2267008005	Airport Ground Support Equipment, LPG	0.000	0.227	0.005
24043	Washington	Hagerstown-Martinsburg, MD-WV	2268008005	Airport Ground Support Equipment, CNG	0.000	0.064	0.001
24043	Washington	Hagerstown-Martinsburg, MD-WV	2270008005	Airport Ground Support Equipment, Diesel	0.000	3.909	0.085
24043	Washington	Hagerstown-Martinsburg, MD-WV	2275001000	Aircraft /Military Aircraft /Total	0.000	0.628	0.000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2275020000	Aircraft /Commercial Aircraft /Total: All Types	0.000	0.431	0.000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2275050000	Aircraft /General Aviation /Total	0.000	1.938	0.000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2275060000	Aircraft /Air Taxi /Total	0.000	0.923	0.000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2285002006	Railroad Equipment /Diesel /Line Haul Locomotives: Class I Operations	0.000	108.968	2.327
24043	Washington	Hagerstown-Martinsburg, MD-WV	2285002007	Railroad Equipment /Diesel /Line Haul Locomotives: Class II / III Operations	0.000	2.376	0.068
24043	Washington	Hagerstown-Martinsburg, MD-WV	2285002008	Railroad Equipment /Diesel /Line Haul Locomotives: Passenger Trains (Amtrak)	0.000	0.000	0.000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2285002009	Railroad Equipment /Diesel /Line Haul Locomotives: Commuter Lines	0.000	1.893	0.049
24043	Washington	Hagerstown-Martinsburg, MD-WV	2285002010	Railroad Equipment /Diesel /Yard Locomotives	0.000	21.657	0.463

SO2

2025

0.035
0.010
0.003
0.165
0.234
0.110
0.724
0.323
0.011
0.000
0.000
0.000
0.001

FIPS	NAME	NONATTAIN	SCC	SHORT_NAME	NH3 2025	NOX 2025	PM25 2025	SO2 2025
24043	Washington	Hagerstown-Martinsburg, MD-WV	2260001010	Off-highway Gasoline, 2-Stroke /Recreational Equipt /Motorcycles: Off-road	0.008	0.749	1.890	0.006
24043	Washington	Hagerstown-Martinsburg, MD-WV	2260001020	Off-highway Gasoline, 2-Stroke /Recreational Equipt /Snowmobiles	0.000	0.000	0.000	0.000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2260001030	Off-highway Gasoline, 2-Stroke /Recreational Equipt /All Terrain Vehicles	0.008	1.058	0.328	0.008
24043	Washington	Hagerstown-Martinsburg, MD-WV	2260001060	Off-highway Gasoline, 2-Stroke /Recreational Equipt /Specialty Vehicles/Carts	0.002	0.226	0.014	0.002
24043	Washington	Hagerstown-Martinsburg, MD-WV	2260002006	Off-highway Gasoline, 2-Stroke /Construction & Mining Equipt /Tampers/Rammers	0.000	0.048	0.274	0.000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2260002009	Off-highway Gasoline, 2-Stroke /Construction & Mining Equipt /Plate Compactors	0.000	0.003	0.010	0.000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2260002021	Off-highway Gasoline, 2-Stroke /Construction & Mining Equipt /Paving Equipt	0.000	0.004	0.012	0.000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2260002027	Off-highway Gasoline, 2-Stroke /Construction & Mining Equipt /Signal Boards/Ligh	0.000	0.000	0.000	0.000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2260002039	Off-highway Gasoline, 2-Stroke /Construction & Mining Equipt /Concrete/Industria	0.001	0.127	0.715	0.001
24043	Washington	Hagerstown-Martinsburg, MD-WV	2260002054	Off-highway Gasoline, 2-Stroke /Construction & Mining Equipt /Crushing/Processin	0.000	0.001	0.002	0.000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2260003030	Off-highway Gasoline, 2-Stroke /Industrial Equipt /Sweepers/Scrubbers	0.000	0.000	0.000	0.000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2260003040	Off-highway Gasoline, 2-Stroke /Industrial Equipt /Other General Industrial Equi	0.000	0.000	0.000	0.000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2260004015	Off-highway Gasoline, 2-Stroke /Lawn & Garden Equipt /Rotary Tillers < 6 HP (Res	0.000	0.014	0.041	0.000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2260004016	Off-highway Gasoline, 2-Stroke /Lawn & Garden Equipt /Rotary Tillers < 6 HP (Com	0.001	0.078	0.227	0.000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2260004020	Off-highway Gasoline, 2-Stroke /Lawn & Garden Equipt /Chain Saws < 6 HP (Residen	0.001	0.196	0.567	0.001
24043	Washington	Hagerstown-Martinsburg, MD-WV	2260004021	Off-highway Gasoline, 2-Stroke /Lawn & Garden Equipt /Chain Saws < 6 HP (Commerc	0.006	0.859	4.665	0.006
24043	Washington	Hagerstown-Martinsburg, MD-WV	2260004025	Off-highway Gasoline, 2-Stroke /Lawn & Garden Equipt /Trimmers/Edgers/Brush Cutt	0.002	0.274	0.818	0.002
24043	Washington	Hagerstown-Martinsburg, MD-WV	2260004026	Off-highway Gasoline, 2-Stroke /Lawn & Garden Equipt /Trimmers/Edgers/Brush Cutt	0.005	0.754	2.436	0.005
24043	Washington	Hagerstown-Martinsburg, MD-WV	2260004030	Off-highway Gasoline, 2-Stroke /Lawn & Garden Equipt /Leafblowers/Vacuums (Resid	0.001	0.175	0.512	0.001
24043	Washington	Hagerstown-Martinsburg, MD-WV	2260004031	Off-highway Gasoline, 2-Stroke /Lawn & Garden Equipt /Leafblowers/Vacuums (Comme	0.005	0.699	2.770	0.004
24043	Washington	Hagerstown-Martinsburg, MD-WV	2260004035	Off-highway Gasoline, 2-Stroke /Lawn & Garden Equipt /Snowblowers (Residential)	0.001	0.063	0.196	0.001
24043	Washington	Hagerstown-Martinsburg, MD-WV	2260004036	Off-highway Gasoline, 2-Stroke /Lawn & Garden Equipt /Snowblowers (Commercial)	0.002	0.166	0.515	0.002
24043	Washington	Hagerstown-Martinsburg, MD-WV	2260004071	Off-highway Gasoline, 2-Stroke /Lawn & Garden Equipt /Turf Equipt (Commercial)	0.000	0.000	0.001	0.000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2260005035	Off-highway Gasoline, 2-Stroke /Agricultural Equipt /Sprayers	0.000	0.004	0.011	0.000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2260006005	Off-highway Gasoline, 2-Stroke /Commercial Equipt /Generator Sets	0.000	0.024	0.071	0.000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2260006010	Off-highway Gasoline, 2-Stroke /Commercial Equipt /Pumps	0.001	0.162	0.526	0.001
24043	Washington	Hagerstown-Martinsburg, MD-WV	2260006015	Off-highway Gasoline, 2-Stroke /Commercial Equipt /Air Compressors	0.000	0.000	0.000	0.000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2260006035	Off-highway Gasoline, 2-Stroke /Commercial Equipt /Hydro-power Units	0.000	0.001	0.003	0.000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2260007005	Off-highway Gasoline, 2-Stroke /Logging Equipt /Chain Saws : 6 HP	0.000	0.012	0.072	0.000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2265001010	Off-highway Gasoline, 4-Stroke /Recreational Equipt /Motorcycles: Off-road	0.003	0.482	0.055	0.003
24043	Washington	Hagerstown-Martinsburg, MD-WV	2265001030	Off-highway Gasoline, 4-Stroke /Recreational Equipt /All Terrain Vehicles	0.026	3.508	0.514	0.028
24043	Washington	Hagerstown-Martinsburg, MD-WV	2265001050	Off-highway Gasoline, 4-Stroke /Recreational Equipt /Golf Carts	0.004	0.578	0.034	0.004
24043	Washington	Hagerstown-Martinsburg, MD-WV	2265001060	Off-highway Gasoline, 4-Stroke /Recreational Equipt /Specialty Vehicles/Carts	0.001	0.295	0.010	0.002
24043	Washington	Hagerstown-Martinsburg, MD-WV	2265002003	Off-highway Gasoline, 4-Stroke /Construction & Mining Equipt /Pavers	0.000	0.040	0.002	0.000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2265002006	Off-highway Gasoline, 4-Stroke /Construction & Mining Equipt /Tampers/Rammers	0.000	0.000	0.000	0.000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2265002009	Off-highway Gasoline, 4-Stroke /Construction & Mining Equipt /Plate Compactors	0.000	0.076	0.007	0.001
24043	Washington	Hagerstown-Martinsburg, MD-WV	2265002015	Off-highway Gasoline, 4-Stroke /Construction & Mining Equipt /Rollers	0.000	0.072	0.004	0.001
24043	Washington	Hagerstown-Martinsburg, MD-WV	2265002021	Off-highway Gasoline, 4-Stroke /Construction & Mining Equipt /Paving Equipt	0.001	0.141	0.009	0.001
24043	Washington	Hagerstown-Martinsburg, MD-WV	2265002024	Off-highway Gasoline, 4-Stroke /Construction & Mining Equipt /Surfacing Equipt	0.000	0.061	0.004	0.000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2265002027	Off-highway Gasoline, 4-Stroke /Construction & Mining Equipt /Signal Boards/Ligh	0.000	0.003	0.000	0.000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2265002030	Off-highway Gasoline, 4-Stroke /Construction & Mining Equipt /Trenchers	0.001	0.125	0.008	0.001
24043	Washington	Hagerstown-Martinsburg, MD-WV	2265002033	Off-highway Gasoline, 4-Stroke /Construction & Mining Equipt /Bore/Drill Rigs	0.000	0.056	0.004	0.000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2265002039	Off-highway Gasoline, 4-Stroke /Construction & Mining Equipt /Concrete/Industria	0.002	0.271	0.015	0.002
24043	Washington	Hagerstown-Martinsburg, MD-WV	2265002042	Off-highway Gasoline, 4-Stroke /Construction & Mining Equipt /Cement & Mortar Mi	0.001	0.124	0.008	0.001
24043	Washington	Hagerstown-Martinsburg, MD-WV	2265002045	Off-highway Gasoline, 4-Stroke /Construction & Mining Equipt /Cranes	0.000	0.011	0.000	0.000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2265002054	Off-highway Gasoline, 4-Stroke /Construction & Mining Equipt /Crushing/Processin	0.000	0.017	0.001	0.000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2265002057	Off-highway Gasoline, 4-Stroke /Construction & Mining Equipt /Rough Terrain Fork	0.000	0.013	0.001	0.000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2265002060	Off-highway Gasoline, 4-Stroke /Construction & Mining Equipt /Rubber Tire Loader	0.000	0.031	0.002	0.000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2265002066	Off-highway Gasoline, 4-Stroke /Construction & Mining Equipt /Tractors/Loaders/B	0.001	0.086	0.005	0.001
24043	Washington	Hagerstown-Martinsburg, MD-WV	2265002072	Off-highway Gasoline, 4-Stroke /Construction & Mining Equipt /Skid Steer Loaders	0.000	0.064	0.003	0.000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2265002078	Off-highway Gasoline, 4-Stroke /Construction & Mining Equipt /Dumpers/Tenders	0.000	0.020	0.001	0.000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2265002081	Off-highway Gasoline, 4-Stroke /Construction & Mining Equipt /Other Construction	0.000	0.018	0.001	0.000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2265003010	Off-highway Gasoline, 4-Stroke /Industrial Equipt /Aerial Lifts	0.000	0.056	0.001	0.000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2265003020	Off-highway Gasoline, 4-Stroke /Industrial Equipt /Forklifts	0.000	0.030	0.002	0.000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2265003030	Off-highway Gasoline, 4-Stroke /Industrial Equipt /Sweepers/Scrubbers	0.000	0.004	0.000	0.000

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24043	Washington	Hagerstown-Martinsburg, MD-WV	2265003040	Off-highway Gasoline, 4-Stroke /Industrial Equipt /Other General Industrial Equi	0.000	0.002	0.000	0.000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2265003050	Off-highway Gasoline, 4-Stroke /Industrial Equipt /Other Material H&ling Equipt	0.000	0.002	0.000	0.000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2265003060	Off-highway Gasoline, 4-Stroke /Industrial Equipt /AC\Refrigeration	0.000	0.000	0.000	0.000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2265003070	Off-highway Gasoline, 4-Stroke /Industrial Equipt /Terminal Tractors	0.000	0.002	0.000	0.000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2265004010	Off-highway Gasoline, 4-Stroke /Lawn & Garden Equipt /Lawn Mowers (Residential)	0.015	2.128	0.245	0.016
24043	Washington	Hagerstown-Martinsburg, MD-WV	2265004011	Off-highway Gasoline, 4-Stroke /Lawn & Garden Equipt /Lawn Mowers (Commercial)	0.013	1.956	0.243	0.014
24043	Washington	Hagerstown-Martinsburg, MD-WV	2265004015	Off-highway Gasoline, 4-Stroke /Lawn & Garden Equipt /Rotary Tillers < 6 HP (Res	0.001	0.178	0.021	0.001
24043	Washington	Hagerstown-Martinsburg, MD-WV	2265004016	Off-highway Gasoline, 4-Stroke /Lawn & Garden Equipt /Rotary Tillers < 6 HP (Com	0.007	0.978	0.115	0.007
24043	Washington	Hagerstown-Martinsburg, MD-WV	2265004025	Off-highway Gasoline, 4-Stroke /Lawn & Garden Equipt /Trimmers/Edgers/Brush Cutt	0.000	0.012	0.001	0.000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2265004026	Off-highway Gasoline, 4-Stroke /Lawn & Garden Equipt /Trimmers/Edgers/Brush Cutt	0.000	0.045	0.004	0.000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2265004030	Off-highway Gasoline, 4-Stroke /Lawn & Garden Equipt /Leafblowers/Vacuums (Resid	0.000	0.023	0.003	0.000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2265004031	Off-highway Gasoline, 4-Stroke /Lawn & Garden Equipt /Leafblowers/Vacuums (Comme	0.012	1.789	0.102	0.013
24043	Washington	Hagerstown-Martinsburg, MD-WV	2265004035	Off-highway Gasoline, 4-Stroke /Lawn & Garden Equipt /Snowblowers (Residential)	0.002	0.451	0.010	0.002
24043	Washington	Hagerstown-Martinsburg, MD-WV	2265004036	Off-highway Gasoline, 4-Stroke /Lawn & Garden Equipt /Snowblowers (Commercial)	0.004	1.185	0.026	0.005
24043	Washington	Hagerstown-Martinsburg, MD-WV	2265004040	Off-highway Gasoline, 4-Stroke /Lawn & Garden Equipt /Rear Engine Riding Mowers	0.003	0.415	0.022	0.003
24043	Washington	Hagerstown-Martinsburg, MD-WV	2265004041	Off-highway Gasoline, 4-Stroke /Lawn & Garden Equipt /Rear Engine Riding Mowers	0.001	0.209	0.011	0.002
24043	Washington	Hagerstown-Martinsburg, MD-WV	2265004046	Off-highway Gasoline, 4-Stroke /Lawn & Garden Equipt /Front Mowers (Commercial)	0.002	0.241	0.012	0.002
24043	Washington	Hagerstown-Martinsburg, MD-WV	2265004051	Off-highway Gasoline, 4-Stroke /Lawn & Garden Equipt /Shredders < 6 HP (Commerci	0.001	0.112	0.013	0.001
24043	Washington	Hagerstown-Martinsburg, MD-WV	2265004055	Off-highway Gasoline, 4-Stroke /Lawn & Garden Equipt /Lawn & Garden Tractors (Re	0.039	5.555	0.293	0.042
24043	Washington	Hagerstown-Martinsburg, MD-WV	2265004056	Off-highway Gasoline, 4-Stroke /Lawn & Garden Equipt /Lawn & Garden Tractors (Co	0.020	2.842	0.154	0.021
24043	Washington	Hagerstown-Martinsburg, MD-WV	2265004066	Off-highway Gasoline, 4-Stroke /Lawn & Garden Equipt /Chippers/Stump Grinders (C	0.003	0.461	0.026	0.004
24043	Washington	Hagerstown-Martinsburg, MD-WV	2265004071	Off-highway Gasoline, 4-Stroke /Lawn & Garden Equipt /Turf Equipt (Commercial)	0.064	9.196	0.615	0.068
24043	Washington	Hagerstown-Martinsburg, MD-WV	2265004075	Off-highway Gasoline, 4-Stroke /Lawn & Garden Equipt /Other Lawn & Garden Equipt	0.001	0.204	0.017	0.002
24043	Washington	Hagerstown-Martinsburg, MD-WV	2265004076	Off-highway Gasoline, 4-Stroke /Lawn & Garden Equipt /Other Lawn & Garden Equipt	0.002	0.287	0.024	0.002
24043	Washington	Hagerstown-Martinsburg, MD-WV	2265005010	Off-highway Gasoline, 4-Stroke /Agricultural Equipt /2-Wheel Tractors	0.000	0.007	0.000	0.000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2265005015	Off-highway Gasoline, 4-Stroke /Agricultural Equipt /Agricultural Tractors	0.000	0.026	0.001	0.000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2265005020	Off-highway Gasoline, 4-Stroke /Agricultural Equipt /Combines	0.000	0.000	0.000	0.000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2265005025	Off-highway Gasoline, 4-Stroke /Agricultural Equipt /Balers	0.000	0.048	0.001	0.000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2265005030	Off-highway Gasoline, 4-Stroke /Agricultural Equipt /Agricultural Mowers	0.000	0.006	0.000	0.000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2265005035	Off-highway Gasoline, 4-Stroke /Agricultural Equipt /Sprayers	0.000	0.094	0.004	0.000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2265005040	Off-highway Gasoline, 4-Stroke /Agricultural Equipt /Tillers : 6 HP	0.001	0.197	0.006	0.001
24043	Washington	Hagerstown-Martinsburg, MD-WV	2265005045	Off-highway Gasoline, 4-Stroke /Agricultural Equipt /Swathers	0.000	0.076	0.001	0.000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2265005055	Off-highway Gasoline, 4-Stroke /Agricultural Equipt /Other Agricultural Equipt	0.000	0.093	0.002	0.000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2265005060	Off-highway Gasoline, 4-Stroke /Agricultural Equipt /Irrigation Sets	0.000	0.044	0.003	0.000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2265006005	Off-highway Gasoline, 4-Stroke /Commercial Equipt /Generator Sets	0.029	4.447	0.248	0.032
24043	Washington	Hagerstown-Martinsburg, MD-WV	2265006010	Off-highway Gasoline, 4-Stroke /Commercial Equipt /Pumps	0.007	1.173	0.090	0.008
24043	Washington	Hagerstown-Martinsburg, MD-WV	2265006015	Off-highway Gasoline, 4-Stroke /Commercial Equipt /Air Compressors	0.004	0.597	0.042	0.004
24043	Washington	Hagerstown-Martinsburg, MD-WV	2265006025	Off-highway Gasoline, 4-Stroke /Commercial Equipt /Welders	0.008	1.289	0.069	0.009
24043	Washington	Hagerstown-Martinsburg, MD-WV	2265006030	Off-highway Gasoline, 4-Stroke /Commercial Equipt /Pressure Washers	0.013	2.029	0.154	0.014
24043	Washington	Hagerstown-Martinsburg, MD-WV	2265006035	Off-highway Gasoline, 4-Stroke /Commercial Equipt /Hydro-power Units	0.001	0.097	0.006	0.001
24043	Washington	Hagerstown-Martinsburg, MD-WV	2265007010	Off-highway Gasoline, 4-Stroke /Logging Equipt /Shredders : 6 HP	0.000	0.025	0.001	0.000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2265007015	Off-highway Gasoline, 4-Stroke /Logging Equipt /Forest Equipt - Feller/Bunch/Ski	0.000	0.000	0.000	0.000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2265010010	Off-highway Gasoline, 4-Stroke /Industrial Equipt /Other Oil Field Equipt	0.000	0.017	0.001	0.000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2267001060	Off-highway LPG /Recreational Equipt /Specialty Vehicles/Carts	0.000	0.042	0.001	0.000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2267002003	Off-highway LPG /Construction & Mining Equipt /Pavers	0.000	0.007	0.000	0.000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2267002015	Off-highway LPG /Construction & Mining Equipt /Rollers	0.000	0.012	0.001	0.000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2267002021	Off-highway LPG /Construction & Mining Equipt /Paving Equipt	0.000	0.003	0.000	0.000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2267002024	Off-highway LPG /Construction & Mining Equipt /Surfacing Equipt	0.000	0.001	0.000	0.000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2267002030	Off-highway LPG /Construction & Mining Equipt /Trenchers	0.000	0.023	0.001	0.000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2267002033	Off-highway LPG /Construction & Mining Equipt /Bore/Drill Rigs	0.000	0.023	0.000	0.000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2267002039	Off-highway LPG /Construction & Mining Equipt /Concrete/Industrial Saws	0.000	0.021	0.001	0.000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2267002045	Off-highway LPG /Construction & Mining Equipt /Cranes	0.000	0.011	0.000	0.000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2267002054	Off-highway LPG /Construction & Mining Equipt /Crushing/Processing Equipt	0.000	0.002	0.000	0.000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2267002057	Off-highway LPG /Construction & Mining Equipt /Rough Terrain Forklifts	0.000	0.015	0.001	0.000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2267002060	Off-highway LPG /Construction & Mining Equipt /Rubber Tire Loaders	0.000	0.035	0.002	0.000

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24043	Washington	Hagerstown-Martinsburg, MD-WV	2267002066	Off-highway LPG /Construction & Mining Equipt /Tractors/Loaders/Backhoes	0.000	0.004	0.000	0.000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2267002072	Off-highway LPG /Construction & Mining Equipt /Skid Steer Loaders	0.000	0.041	0.002	0.000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2267002081	Off-highway LPG /Construction & Mining Equipt /Other Construction Equipt	0.000	0.019	0.001	0.000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2267003010	Off-highway LPG /Industrial Equipt /Aerial Lifts	0.000	0.304	0.012	0.002
24043	Washington	Hagerstown-Martinsburg, MD-WV	2267003020	Off-highway LPG /Industrial Equipt /Forklifts	0.000	18.023	1.124	0.209
24043	Washington	Hagerstown-Martinsburg, MD-WV	2267003030	Off-highway LPG /Industrial Equipt /Sweepers/Scrubbers	0.000	0.138	0.009	0.002
24043	Washington	Hagerstown-Martinsburg, MD-WV	2267003040	Off-highway LPG /Industrial Equipt /Other General Industrial Equipt	0.000	0.042	0.003	0.000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2267003050	Off-highway LPG /Industrial Equipt /Other Material H&Iing Equipt	0.000	0.014	0.001	0.000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2267003070	Off-highway LPG /Industrial Equipt /Terminal Tractors	0.000	0.084	0.005	0.001
24043	Washington	Hagerstown-Martinsburg, MD-WV	2267004066	Off-highway LPG /Lawn & Garden Equipt /Chippers/Stump Grinders (Commercial)	0.000	0.139	0.009	0.002
24043	Washington	Hagerstown-Martinsburg, MD-WV	2267005055	Off-highway LPG /Agricultural Equipt /Other Agricultural Equipt	0.000	0.001	0.000	0.000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2267005060	Off-highway LPG /Agricultural Equipt /Irrigation Sets	0.000	0.000	0.000	0.000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2267006005	Off-highway LPG /Commercial Equipt /Generator Sets	0.000	1.241	0.030	0.006
24043	Washington	Hagerstown-Martinsburg, MD-WV	2267006010	Off-highway LPG /Commercial Equipt /Pumps	0.000	0.160	0.007	0.001
24043	Washington	Hagerstown-Martinsburg, MD-WV	2267006015	Off-highway LPG /Commercial Equipt /Air Compressors	0.000	0.138	0.009	0.002
24043	Washington	Hagerstown-Martinsburg, MD-WV	2267006025	Off-highway LPG /Commercial Equipt /Welders	0.000	0.173	0.011	0.002
24043	Washington	Hagerstown-Martinsburg, MD-WV	2267006030	Off-highway LPG /Commercial Equipt /Pressure Washers	0.000	0.003	0.000	0.000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2267006035	Off-highway LPG /Commercial Equipt /Hydro-power Units	0.000	0.002	0.000	0.000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2268002081	Off-highway CNG /Construction & Mining Equipt /Other Construction Equipt	0.000	0.001	0.000	0.000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2268003020	Off-highway CNG /Industrial Equipt /Forklifts	0.000	1.284	0.076	0.014
24043	Washington	Hagerstown-Martinsburg, MD-WV	2268003030	Off-highway CNG /Industrial Equipt /Sweepers/Scrubbers	0.000	0.001	0.000	0.000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2268003040	Off-highway CNG /Industrial Equipt /Other General Industrial Equipt	0.000	0.001	0.000	0.000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2268003060	Off-highway CNG /Industrial Equipt /AC\Refrigeration	0.000	0.002	0.000	0.000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2268003070	Off-highway CNG /Industrial Equipt /Terminal Tractors	0.000	0.006	0.000	0.000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2268005055	Off-highway CNG /Agricultural Equipt /Other Agricultural Equipt	0.000	0.000	0.000	0.000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2268005060	Off-highway CNG /Agricultural Equipt /Irrigation Sets	0.000	0.000	0.000	0.000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2268006005	Off-highway CNG /Commercial Equipt /Generator Sets	0.000	0.373	0.007	0.001
24043	Washington	Hagerstown-Martinsburg, MD-WV	2268006010	Off-highway CNG /Commercial Equipt /Pumps	0.000	0.011	0.000	0.000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2268006015	Off-highway CNG /Commercial Equipt /Air Compressors	0.000	0.009	0.001	0.000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2268006020	Off-highway CNG /Commercial Equipt /Gas Compressors	0.000	0.343	0.021	0.004
24043	Washington	Hagerstown-Martinsburg, MD-WV	2268006035	Off-highway CNG /Commercial Equipt /Hydro-power Units	0.000	0.000	0.000	0.000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2268010010	Off-highway CNG /Industrial Equipt /Other Oil Field Equipt	0.000	0.011	0.001	0.000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2270001060	Off-highway Diesel /Recreational Equipt /Specialty Vehicles/Carts	0.001	0.860	0.084	0.001
24043	Washington	Hagerstown-Martinsburg, MD-WV	2270002003	Off-highway Diesel /Construction & Mining Equipt /Pavers	0.006	1.054	0.029	0.004
24043	Washington	Hagerstown-Martinsburg, MD-WV	2270002006	Off-highway Diesel /Construction & Mining Equipt /Tampers/Rammers	0.000	0.009	0.001	0.000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2270002009	Off-highway Diesel /Construction & Mining Equipt /Plate Compactors	0.000	0.147	0.011	0.000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2270002015	Off-highway Diesel /Construction & Mining Equipt /Rollers	0.015	3.045	0.117	0.009
24043	Washington	Hagerstown-Martinsburg, MD-WV	2270002018	Off-highway Diesel /Construction & Mining Equipt /Scrapers	0.016	2.012	0.088	0.010
24043	Washington	Hagerstown-Martinsburg, MD-WV	2270002021	Off-highway Diesel /Construction & Mining Equipt /Paving Equipt	0.001	0.229	0.011	0.001
24043	Washington	Hagerstown-Martinsburg, MD-WV	2270002024	Off-highway Diesel /Construction & Mining Equipt /Surfacing Equipt	0.001	0.232	0.012	0.000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2270002027	Off-highway Diesel /Construction & Mining Equipt /Signal Boards/Light Plants	0.002	1.338	0.083	0.001
24043	Washington	Hagerstown-Martinsburg, MD-WV	2270002030	Off-highway Diesel /Construction & Mining Equipt /Trenchers	0.007	2.999	0.081	0.004
24043	Washington	Hagerstown-Martinsburg, MD-WV	2270002033	Off-highway Diesel /Construction & Mining Equipt /Bore/Drill Rigs	0.006	3.095	0.143	0.004
24043	Washington	Hagerstown-Martinsburg, MD-WV	2270002036	Off-highway Diesel /Construction & Mining Equipt /Excavators	0.061	6.479	0.201	0.036
24043	Washington	Hagerstown-Martinsburg, MD-WV	2270002039	Off-highway Diesel /Construction & Mining Equipt /Concrete/Industrial Saws	0.000	0.221	0.007	0.000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2270002042	Off-highway Diesel /Construction & Mining Equipt /Cement & Mortar Mixers	0.000	0.150	0.010	0.000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2270002045	Off-highway Diesel /Construction & Mining Equipt /Cranes	0.014	2.199	0.084	0.009
24043	Washington	Hagerstown-Martinsburg, MD-WV	2270002048	Off-highway Diesel /Construction & Mining Equipt /Graders	0.015	1.216	0.046	0.009
24043	Washington	Hagerstown-Martinsburg, MD-WV	2270002051	Off-highway Diesel /Construction & Mining Equipt /Off-highway Trucks	0.052	18.560	0.295	0.031
24043	Washington	Hagerstown-Martinsburg, MD-WV	2270002054	Off-highway Diesel /Construction & Mining Equipt /Crushing/Processing Equipt	0.002	0.691	0.020	0.002
24043	Washington	Hagerstown-Martinsburg, MD-WV	2270002057	Off-highway Diesel /Construction & Mining Equipt /Rough Terrain Forklifts	0.019	3.482	0.181	0.012
24043	Washington	Hagerstown-Martinsburg, MD-WV	2270002060	Off-highway Diesel /Construction & Mining Equipt /Rubber Tire Loaders	0.066	13.261	0.534	0.041
24043	Washington	Hagerstown-Martinsburg, MD-WV	2270002066	Off-highway Diesel /Construction & Mining Equipt /Tractors/Loaders/Backhoes	0.040	14.027	1.855	0.027
24043	Washington	Hagerstown-Martinsburg, MD-WV	2270002069	Off-highway Diesel /Construction & Mining Equipt /Crawler Tractor/Dozers	0.060	9.742	0.317	0.036
24043	Washington	Hagerstown-Martinsburg, MD-WV	2270002072	Off-highway Diesel /Construction & Mining Equipt /Skid Steer Loaders	0.028	16.349	1.734	0.019

APP_C-4_NMIM

FIPS	NAME	NONATTAIN	SCC	SHORT_NAME	NH3 2025	NOX 2025	PM25 2025	SO2 2025
24043	Washington	Hagerstown-Martinsburg, MD-WV	2270002075	Off-highway Diesel /Construction & Mining Equip /Off-highway Tractors	0.007	2.269	0.063	0.004
24043	Washington	Hagerstown-Martinsburg, MD-WV	2270002078	Off-highway Diesel /Construction & Mining Equip /Dumpers/Tenders	0.000	0.053	0.006	0.000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2270002081	Off-highway Diesel /Construction & Mining Equip /Other Construction Equip	0.006	1.728	0.097	0.004
24043	Washington	Hagerstown-Martinsburg, MD-WV	2270003010	Off-highway Diesel /Industrial Equip /Aerial Lifts	0.002	1.099	0.106	0.001
24043	Washington	Hagerstown-Martinsburg, MD-WV	2270003020	Off-highway Diesel /Industrial Equip /Forklifts	0.024	5.119	0.067	0.014
24043	Washington	Hagerstown-Martinsburg, MD-WV	2270003030	Off-highway Diesel /Industrial Equip /Sweepers/Scrubbers	0.010	1.684	0.045	0.006
24043	Washington	Hagerstown-Martinsburg, MD-WV	2270003040	Off-highway Diesel /Industrial Equip /Other General Industrial Equip	0.010	1.832	0.076	0.006
24043	Washington	Hagerstown-Martinsburg, MD-WV	2270003050	Off-highway Diesel /Industrial Equip /Other Material H&ling Equip	0.000	0.204	0.019	0.000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2270003060	Off-highway Diesel /Industrial Equip /AC\Refrigeration	0.025	16.567	0.250	0.016
24043	Washington	Hagerstown-Martinsburg, MD-WV	2270003070	Off-highway Diesel /Industrial Equip /Terminal Tractors	0.015	1.311	0.036	0.009
24043	Washington	Hagerstown-Martinsburg, MD-WV	2270004031	Off-highway Diesel /Lawn & Garden Equip /Leafblowers/Vacuums (Commercial)	0.000	0.001	0.000	0.000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2270004036	Off-highway Diesel /Lawn & Garden Equip /Snowblowers (Commercial)	0.000	0.133	0.006	0.000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2270004046	Off-highway Diesel /Lawn & Garden Equip /Front Mowers (Commercial)	0.008	6.394	0.330	0.006
24043	Washington	Hagerstown-Martinsburg, MD-WV	2270004056	Off-highway Diesel /Lawn & Garden Equip /Lawn & Garden Tractors (Commercial)	0.002	1.525	0.113	0.001
24043	Washington	Hagerstown-Martinsburg, MD-WV	2270004066	Off-highway Diesel /Lawn & Garden Equip /Chippers/Stump Grinders (Commercial)	0.011	4.992	0.287	0.008
24043	Washington	Hagerstown-Martinsburg, MD-WV	2270004071	Off-highway Diesel /Lawn & Garden Equip /Turf Equip (Commercial)	0.001	0.497	0.016	0.001
24043	Washington	Hagerstown-Martinsburg, MD-WV	2270004076	Off-highway Diesel /Lawn & Garden Equip /Other Lawn & Garden Equip (Commercial)	0.000	0.023	0.001	0.000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2270005010	Off-highway Diesel /Agricultural Equip /2-Wheel Tractors	0.000	0.002	0.000	0.000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2270005015	Off-highway Diesel /Agricultural Equip /Agricultural Tractors	0.103	37.182	2.195	0.067
24043	Washington	Hagerstown-Martinsburg, MD-WV	2270005020	Off-highway Diesel /Agricultural Equip /Combines	0.009	4.332	0.300	0.006
24043	Washington	Hagerstown-Martinsburg, MD-WV	2270005025	Off-highway Diesel /Agricultural Equip /Balers	0.000	0.031	0.002	0.000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2270005030	Off-highway Diesel /Agricultural Equip /Agricultural Mowers	0.000	0.004	0.000	0.000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2270005035	Off-highway Diesel /Agricultural Equip /Sprayers	0.001	0.363	0.024	0.001
24043	Washington	Hagerstown-Martinsburg, MD-WV	2270005040	Off-highway Diesel /Agricultural Equip /Tillers : 6 HP	0.000	0.001	0.000	0.000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2270005045	Off-highway Diesel /Agricultural Equip /Swathers	0.001	0.369	0.033	0.000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2270005055	Off-highway Diesel /Agricultural Equip /Other Agricultural Equip	0.002	0.801	0.057	0.001
24043	Washington	Hagerstown-Martinsburg, MD-WV	2270005060	Off-highway Diesel /Agricultural Equip /Irrigation Sets	0.001	0.356	0.018	0.001
24043	Washington	Hagerstown-Martinsburg, MD-WV	2270006005	Off-highway Diesel /Commercial Equip /Generator Sets	0.014	8.473	0.486	0.010
24043	Washington	Hagerstown-Martinsburg, MD-WV	2270006010	Off-highway Diesel /Commercial Equip /Pumps	0.003	1.919	0.120	0.002
24043	Washington	Hagerstown-Martinsburg, MD-WV	2270006015	Off-highway Diesel /Commercial Equip /Air Compressors	0.009	2.858	0.089	0.006
24043	Washington	Hagerstown-Martinsburg, MD-WV	2270006020	Off-highway Diesel /Commercial Equip /Gas Compressors	0.000	0.000	0.000	0.000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2270006025	Off-highway Diesel /Commercial Equip /Welders	0.005	2.994	0.254	0.003
24043	Washington	Hagerstown-Martinsburg, MD-WV	2270006030	Off-highway Diesel /Commercial Equip /Pressure Washers	0.000	0.280	0.015	0.000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2270006035	Off-highway Diesel /Commercial Equip /Hydro-power Units	0.000	0.147	0.005	0.000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2270007010	Off-highway Diesel /Logging Equip /Shredders : 6 HP	0.000	0.000	0.000	0.000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2270007015	Off-highway Diesel /Logging Equip /Forest Equip - Feller/Bunch/Skidder	0.001	0.066	0.002	0.001
24043	Washington	Hagerstown-Martinsburg, MD-WV	2270009010	Off-highway Diesel /Underground Mining Equip /Other Underground Mining Equip	0.000	0.000	0.000	0.000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2270010010	Off-highway Diesel /Industrial Equip /Other Oil Field Equip	0.000	0.070	0.002	0.000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2282005010	Pleasure Craft /Gasoline 2-Stroke /Outboard	0.021	9.104	0.237	0.022
24043	Washington	Hagerstown-Martinsburg, MD-WV	2282005015	Pleasure Craft /Gasoline 2-Stroke /Personal Water Craft	0.009	4.318	0.043	0.009
24043	Washington	Hagerstown-Martinsburg, MD-WV	2282010005	Pleasure Craft /Gasoline 4-Stroke /Inboard/Sterndrive	0.006	2.530	0.036	0.007
24043	Washington	Hagerstown-Martinsburg, MD-WV	2282020005	Pleasure Craft /Diesel /Inboard/Sterndrive	0.004	4.033	0.095	0.015
24043	Washington	Hagerstown-Martinsburg, MD-WV	2282020010	Pleasure Craft /Diesel /Outboard	0.000	0.022	0.002	0.000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2285002015	Railroad Equip /Diesel /Railway Maintenance	0.002	0.841	0.086	0.001
24043	Washington	Hagerstown-Martinsburg, MD-WV	2285004015	Railroad Equip /Gasoline, 4-Stroke /Railway Maintenance	0.000	0.018	0.001	0.000
24043	Washington	Hagerstown-Martinsburg, MD-WV	2285006015	Railroad Equip /LPG /Railway Maintenance	0.000	0.001	0.000	0.000

Appendix D
Emission Inventory Documentation

**Technical Support Document
for the
Development of the 2025
Emission Inventory
for PM Nonattainment Counties
in the MANE-VU Region
Version 3.3
Rev.2**

Prepared for:

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January 23, 2012
MARAMA Contract Agreement FY2011-004

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Note: Revision 1 includes a revision by New Jersey to Exhibit 7.7.

Revision 2 includes revised CT & VA NMIM runs. – By MARAMA, Mar. 2012

Acknowledgements

Funds for this CONTRACT are provided by MARAMA's Memorandum of Agreement with the Ozone Transport Commission (OTC), which is funded by USEPA grant agreement XA973181 – Regional Haze Planning in the Northeast and Mid-Atlantic States (CFDA 66.034). The purpose of that Memorandum of Agreement is to support the Mid-Atlantic / Northeast Visibility Union (MANE-VU) in developing programs to control regional haze or visibility impairment in the Northeast and Mid-Atlantic states.

About MARAMA

The Mid-Atlantic Regional Air Management Association, Inc. is a voluntary, non-profit association of ten state and local air pollution control agencies. MARAMA's mission is to strengthen the skills and capabilities of member agencies and to help them work together to prevent and reduce air pollution in the Mid-Atlantic Region. MARAMA provides cost-effective approaches to regional collaboration by pooling resources to develop and analyze data, share ideas, and train staff to implement common requirements.

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Acronyms and Abbreviations

Acronym	Description
CAA	Clean Air Act
CAMD	Clean Air Markets Division (USEPA)
CEM	Continuous emission monitoring
CMV	Commercial marine vessel
CO	Carbon monoxide
EGU	Electric generating unit
ERTAC	Eastern Regional Technical Advisory Committee
FIPS	Federal Information Processing Standard
GSE	Ground support equipment
MACT	Maximum achievable control technology
MANE-VU	Mid-Atlantic/Northeast Visibility Union
MANE-VU+VA	MANE-VU states plus Virginia
MAR	Marine, airport, rail
MARAMA	Mid-Atlantic Regional Air Management Association
MOBILE6	USEPA model
MOVES	Motor Vehicle Emissions Simulator model
NAAQS	National Ambient Air Quality Standards
NAICS	North American Industry Classification System code
NCD	National county database
NEI	National Emission Inventory
NESCAUM	Northeast States for Coordinated Air Use Management
NIF3.0	NEI Input Format Version 3.0
NMIM	National Mobile Input Model
NOF3.0	NEI Output Format Version 3.0
NONROAD	USEPA model
NO _x	Oxides of nitrogen
ORL	One-record-per-line (SMOKE format)
OTAQ	Office of Transportation and Air Quality (USEPA)
PFC	Portable fuel container
PM-CON	Primary PM, condensable portion only (< 1 micron)
PM-FIL	Primary PM, Filterable portion only
PM-PRI	Primary PM, includes filterable and condensable PM-PRI= PM-FIL + PM-CON
PM10-FIL	Primary PM10, filterable portion only
PM10-PRI	Primary PM10, includes filterable and condensable, PM10- PRI = PM0-FIL + PM-CON
PM25-FIL	Primary PM2.5, filterable portion only

Acronym	Description
PM25-PRI	Primary PM2.5, includes filterable and condensable PM25-PRI= PM25-FIL + PM-CON
RWC	Residential wood combustion
SEMAP	Southeast Modeling, Analysis and Planning
SIC	Standard Industrial Classification code
SIP	State Implementation Plan
SCC	Source classification code
S/L	State/local
SMOKE	Sparse Matrix Operator Kernel Emissions
SO ₂	Sulfur dioxide
TSD	Technical Support Document
USEPA	U.S. Environmental Protection Agency
VISTAS	Visibility Improvement State and Tribal Association of the Southeast
VMT	Vehicle miles traveled
VOC	Volatile organic compounds

1.0 INTRODUCTION

This technical support document (TSD) explains the data sources, methods, and results for preparing emission projections for 2025 for particulate matter (PM) nonattainment areas in the Mid-Atlantic / Northeast Visibility Union (MANE-VU) region. The MANE-VU region includes Connecticut, Delaware, the District of Columbia, Maine, Maryland, Massachusetts, New Hampshire, New Jersey, New York, Pennsylvania, Rhode Island, and Vermont. Virginia is not included in the MANE-VU region; however, several cities and counties in northern Virginia were included in this inventory as they are part of a nonattainment area that includes MANE-VU jurisdictions.

1.1 INVENTORY PURPOSE

The Clean Air Act (CAA), as amended, requires each state with areas failing to meet the National Ambient Air Quality Standards (NAAQS) to develop State Implementation Plans (SIPs) to expeditiously attain and maintain the standards. The CAA allows states to request nonattainment areas to be re-designated to attainment provided certain criteria are met. For particulate matter, the U.S. Environmental Protection Agency's (USEPA's) re-designation guidance requires the submittal of a comprehensive inventory of direct PM_{2.5} emissions and emissions of PM precursors representative of the year when the area achieves attainment of the PM_{2.5} air quality standards. Another emission inventory related requirement includes a projection of the emission inventory to a year at least 10 years following re-designation.

To support state's efforts in developing PM_{2.5} maintenance plans and re-designation requests, MARAMA issued a contract to AMEC to assemble a comprehensive emission inventory for 2025. A workgroup was formed to guide the 2025 inventory development process. Participants included a member from each state with a PM_{2.5} nonattainment area, as follows: Paul Bodner (CT), Dave Fees and Jack Sipple (DE), Roger Thunell (MD), Judy Rand and Danny Wong (NJ), Ron Stannard (NY), Arleen Shulman (PA), and Doris McLeod (VA). The committee has met via teleconference on multiple occasions to discuss plans for the 2025 inventory. The 2025 inventory was developed using a combination of MARAMA's in-house resources, support from state agencies and contractor support from AMEC and SRA International, Inc.

1.2 SOURCE CATEGORIES

This report documents the development of annual emission projections for 2025 for each of these sectors, as follows:

- **EGU Point Sources** are units that generate electric power and sell most of the power generated to the electrical grid.
- **NonEGU Point Sources** are individual industrial, commercial, and institutional facilities and are further subdivided by stack, emission unit, and emission process.
- **Stationary Area Sources** include sources that in and of themselves are quite small, but in aggregate may contribute significant emissions. Examples include small industrial/commercial facilities, residential heating furnaces, VOCs volatilizing from house painting or consumer products, gasoline service stations, and agricultural fertilizer/pesticide application.
- **Non-road Mobile Sources** include internal combustion engines used to propel marine vessels, airplanes, and locomotives, or to operate equipment such as forklifts, lawn and garden equipment, portable generators, etc. For activities other than marine vessels, airplanes, and railroad locomotives (MAR), the inventory was developed using the most current version of USEPA's NONROAD model as embedded in the National Mobile Inventory Model (NMIM). Because the NONROAD model does not include emissions from MAR sources, these emissions were estimated based on data and methodologies used in recent USEPA regulatory impact analyses.
- **On-road Mobile Sources** are sources of air pollution from internal combustion engines used to propel cars, trucks, buses, and other vehicles on public roadways. Emission projections for on-road mobile sources were developed by MARAMA or state staff using USEPA's Motor Vehicle Emission Simulator (MOVES) model.

Biogenic/geogenic emissions are not included in this inventory.

1.3 GEOGRAPHIC AND TEMPORAL RESOLUTION

The geographic area for the 2025 inventory includes only those counties that are classified as nonattainment for the annual (1997) or daily (2006) particulate matter NAAQS. The inventory was developed at the county-level for non-point sources and at the process level for point sources.

Annual inventories are required for re-designation of areas designated as nonattainment for the 1997 and 2006 NAAQS. Other inventory elements required by USEPA (such as interim inventory years) are being addressed by individual states in their SIP submittals.

1.4 POLLUTANTS

The inventory includes emissions for directly emitted PM and PM-precursors (oxides of nitrogen {NO_x}, and sulfur dioxide {SO₂}). The PM species in the inventory are categorized as particles with an aerodynamic diameter less than or equal to a nominal 2.5 micrometers (PM₂₅-PRI), which includes both condensable particles (PM-CON) and filterable particles (PM₂₅-FIL).

1.5 DATA FORMATS

For each sector, we prepared easy-to-review spreadsheets that provide 2007 emissions and 2025 growth factors, control factors, and emissions. We also prepared county level and nonattainment area summaries for all PM nonattainment counties and areas. The summaries show the 2007 and 2025 emissions, along with the percent change in emissions from 2007 to 2025 for each source sector.

1.6 INVENTORY VERSIONS

The development of base and future year inventories is an iterative process that continually attempts to use the best data available to meet air quality planning needs, given time and resource constraints. The following subsections summarize the work completed to date.

1.6.1 Version 2 Modeling Inventories with Existing Controls

MARAMA developed comprehensive emission inventories to support air quality modeling in the region. MARAMA developed a calendar year 2007 (MARAMA 2011a) inventory for all sectors except the onroad sector. These inventories, completed in February of 2011, are referred to as Version 2 of the MANE-VU+VA 2007 base year inventory. The inventories were provided in formats required for air quality modeling. Under a separate effort, the Northeast States for Coordinated Air Use Management (NESCAUM) developed a 2007 onroad inventory using the MOVES model to support air quality modeling.

MARAMA also prepared emission projections for 2013/2017/2020 (MARAMA 2011b) for all sectors except the electric generation and onroad sectors. These projections reflect a scenario representing the best estimates for the future year, accounting for all in-place controls that are fully adopted into federal or individual state regulations or SIPs. In the past, this inventory is also referred to as the "on-the-books" inventory. Modelers often refer to this scenario as the "future base case".

1.6.2 Version 3 Modeling Inventories with Existing Controls

Beginning in the fall of 2011, MARAMA sponsored development of Version 3_3 of the 2007 base year modeling inventory to incorporate new paved road emission estimates,

revised modeling of nonroad and onroad sources, and other state-specific changes (MARAMA2012a). MARAMA developed Version 3_3 of the future year inventory to account for changes to the 2007 base year inventory and selected changes in growth and control factors identified by states (MARAMA2012b). The future year modeling inventories for electric generating units (EGUs) are currently being developed under a separate effort lead by the Eastern Regional Technical Advisory Committee (ERTAC). The future year modeling inventories for onroad sources are currently being developed by NESCAUM, MARAMA or individual states.

1.6.3 Version 3 2025 Inventory for PM Nonattainment Counties

The 2025 inventory for PM nonattainment counties was developed using Version 3_3 of the modeling inventory, with the following exceptions:

- Growth and control factors for 2025 were developed for the area, nonEGU point, and nonroad MAR sectors, using the same methodologies and data sources that were used to develop the 2017/2020 inventories with existing controls.
- For nonroad sources included in NMIM, Version 2 results were available for 2007, 2017, and 2020. MARAMA and New York made additional NMIM runs for 2025 based on Version 2 inputs. MARAMA made revisions to some of the inputs to NMIM for Version 3_3 of the modeling inventory; however, these revised NMIM runs were not used in the 2025 PM nonattainment county inventory due to time constraints.
- For onroad sources included in the MOVES model, MARAMA and states executed the model in the inventory mode for 2007 and 2025. Version 3_3 of the modeling inventory used results of the MOVES model executed in a manner to support air quality modeling.
- For EGU point sources, the results of the ERTAC EGU projection methodology are not currently available. An alternative methodology for projecting EGU emissions based on growth and control factors was used, as described in Section 4.
- Only counties classified as nonattainment for the PM_{2.5} annual or 24-hour NAAQS were included.

Exhibit 1-1 shows the data sources used for the 2025 PM nonattainment area inventory. Exhibit 1-2 lists the counties included in the 2025 PM nonattainment area inventory.

1.7 REPORT ORGANIZATION

Sections 2 to 6 describe the emission projection process for the following source sectors: area sources; point sources; nonroad mobile sources included in the NMIM model; other nonroad mobile sources (marine vessels, aircraft, and railroad locomotives); and onroad mobile sources included in the MOVES model. Section 7 provides nonattainment area emission pollutant summaries. Section 8 provides a description of the final deliverables, including the file names for all final deliverable products. References for the TSD are provided in Section 9.

Exhibit 1.1 – Comparison of Data Used for Version 3 of the Modeling Inventory and the 2025 PM Nonattainment Inventory

Sector	Modeling Inventory		2025 PM Nonattainment Inventory	
	2007	2017/2020	2007	2025
Area	Version 3_3	Version 3_3	Version 3_3	Version 3_3
Nonroad-NMIM	Version 3_3	Version 3_3	Version 2	2025 NMIM run based on Version 2 inputs (1)
Nonroad-MAR	Version 3_3	Version 3_3	Version 3_3	Version 3_3
Onroad	MOVES runs by NESCAUM to support AQ modeling	MOVES runs by NESCAUM to support AQ modeling	MOVES runs by MARAMA or states in inventory mode	MOVES runs by MARAMA or states in inventory mode
Point-EGU	Version 3_3	To be developed by ERTAC	Version 3_3	See section 4 for projection methodology
Point-nonEGU	Version 3_3	Version 3_3	Version 3_3	Version 3_3

(1) Except CT and VA where Version 3 inputs were used.

Exhibit 1.2 – List of PM Nonattainment Areas and Counties

Nonattainment Area	State	FIPS Code	County	PM Nonattainment?	
				2006 Daily NAAQS	1997 Annual NAAQS
Allentown, PA	PA	42077	Lehigh	Yes	Yes
	PA	42095	Northampton	Yes	Yes
Baltimore, MD	MD	24003	Anne Arundel	No	Yes
	MD	24005	Baltimore	No	Yes
	MD	24013	Carroll	No	Yes
	MD	24025	Harford	No	Yes
	MD	24027	Howard	No	Yes
	MD	24510	Baltimore City	No	Yes
Hagerstown-Martinsburg, MD-WV	MD	24043	Washington	No	Yes
Harrisburg-Lebanon-Carlisle-York, PA	PA	42041	Cumberland	Yes	Yes
	PA	42043	Dauphin	Yes	Yes
	PA	42075	Lebanon	Yes	Yes
	PA	42133	York*	Yes	No
Johnstown, PA	PA	42021	Cambria	Yes	Yes
	PA	42063	Indiana(P)	Yes	Yes
Lancaster, PA	PA	42071	Lancaster	Yes	Yes
New York-N. New Jersey-Long Island, NY-NJ-CT	CT	09001	Fairfield	Yes	Yes
	CT	09009	New Haven	Yes	Yes
	NJ	34003	Bergen	Yes	Yes
	NJ	34013	Essex	Yes	Yes
	NJ	34017	Hudson	Yes	Yes
	NJ	34021	Mercer	Yes	Yes
	NJ	34023	Middlesex	Yes	Yes
	NJ	34025	Monmouth	Yes	Yes
	NJ	34027	Morris	Yes	Yes
	NJ	34031	Passaic	Yes	Yes
	NJ	34035	Somerset	Yes	Yes
	NJ	34039	Union	Yes	Yes
	NY	36005	Bronx	Yes	Yes
	NY	36047	Kings	Yes	Yes
	NY	36059	Nassau	Yes	Yes
	NY	36061	New York	Yes	Yes
	NY	36071	Orange	Yes	Yes
	NY	36081	Queens	Yes	Yes
	NY	36085	Richmond	Yes	Yes
	NY	36087	Rockland	Yes	Yes
NY	36103	Suffolk	Yes	Yes	
NY	36119	Westchester	Yes	Yes	
Philadelphia-Wilmington, PA-NJ-DE	DE	10003	New Castle	Yes	Yes
	NJ	34005	Burlington	Yes	Yes
	NJ	34007	Camden	Yes	Yes
	NJ	34015	Gloucester	Yes	Yes
	PA	42017	Bucks	Yes	Yes

Nonattainment Area	State	FIPS Code	County	PM Nonattainment?	
				2006 Daily NAAQS	1997 Annual NAAQS
	PA	42029	Chester	Yes	Yes
	PA	42045	Delaware	Yes	Yes
	PA	42091	Montgomery	Yes	Yes
	PA	42101	Philadelphia	Yes	Yes
Pittsburgh-Beaver Valley, PA	PA	42003	Allegheny(P)	Yes	Yes
	PA	42005	Armstrong(P)	Yes	Yes
	PA	42007	Beaver	Yes	Yes
	PA	42019	Butler	Yes	Yes
	PA	42059	Greene(P)	Yes	Yes
	PA	42073	Lawrence(P)*	Yes	Yes
	PA	42125	Washington	Yes	Yes
	PA	42129	Westmoreland	Yes	Yes
Reading, PA	PA	42011	Berks	No	Yes
Washington, DC-MD-VA	DC	11001	Washington	No	Yes
	MD	24017	Charles	No	Yes
	MD	24021	Frederick	No	Yes
	MD	24031	Montgomery	No	Yes
	MD	24033	Prince George	No	Yes
	VA	51013	Arlington	No	Yes
	VA	51059	Fairfax	No	Yes
	VA	51107	Loudoun	No	Yes
	VA	51153	Prince William	No	Yes
	VA	51510	Alexandria	No	Yes
	VA	51600	Fairfax City	No	Yes
	VA	51610	Falls Church	No	Yes
	VA	51683	Manassas City	No	Yes
	VA	51685	Manassas Park	No	Yes
York, PA	PA	42133	York*	No	Yes

* York County, PA, is in one nonattainment area for the 2006 24-hour standard (Harrisburg-Lebanon-Carlisle-York, PA) and another for the 1997 annual standard (York, PA).

(P) indicates that only part of the county is in the nonattainment area; for this inventory, emissions for the entire county are included.

2.0 AREA SOURCES

2.1 AREA SOURCE CATEGORIES

The area source sector contains emissions estimates for sources which individually are too small in magnitude or too numerous to inventory as individual point sources, and which can often be estimated more accurately as a single aggregate source for a county.

Examples are emissions from home heating systems, house painting, consumer products usage, and small industrial/commercial operations that are not permitted as point sources.

There are 356 individual area source categories in the MANE-VU+VA inventory, categorized by a 10-digit SCC.

2.2 2007 INVENTORY DEVELOPMENT

The emission projections for the 2025 area source inventory were based on Version 3_3 of the 2007 MANE-VU+VA inventory and are fully documented in the TSD for that effort (MARAMA 2012a). The only adjustment to the 2007 Version 3_3 area source inventory was to apply “transport factors” to fugitive dust sources, as described in the following subsection.

2.2.1 Adjustments to the 2007 Inventory Used for the 2025 Projections

Grid air quality models consistently overestimate fugitive dust impacts as compared to ambient samples. USEPA developed a methodology to reduce fugitive dust emissions for use in grid modeling analyses. It is considered a logical step to improve the ability to account for the removal of particles near their emission source by vegetation and surface features and can be useful in grid-based modeling analyses.

In February 2011, MARAMA developed 2007 emission modeling files for area sources which applied the USEPA “transport factor” to reduce fugitive dust emissions to account for the removal of particles near their emission source by vegetation and surface features. The standard transport fractions and SCC assignments from USEPA’s CHIEF website (USEPA 2007a) were used to reduce the PM₂₅-PRI emissions in this inventory. Two files were used. Exhibit 2.1 shows the list of nonEGU SCCs for which the transport factor was applied. The major source categories included paved and unpaved roads, construction activity, agricultural crop land tilling, and agricultural livestock operations. Exhibit 2.2 lists the transport fractions for PM nonattainment counties which vary by county. For example, the transport factors ranges from 0.1375 in Camden, New Jersey to 0.80 in Suffolk County, New York. For Virginia, no transport fraction was provided for the City of Fairfax; Fairfax County’s transport fraction was used for this jurisdiction.

Exhibit 2.1 Area Source SCCs Affected by PM Transport Fraction

SCC	SCC Description
2294000000	Paved Roads: All Paved Roads: Total: Fugitives
2296000000	Unpaved Roads: All Unpaved Roads: Total: Fugitives
2311000000	Construction: All Processes: Total
2311010000	Construction: General Building Construction: Total
2311020000	Construction: Heavy Construction: Total
2311030000	Construction: Road Construction: Total
2801000000	Miscellaneous Area Sources;Agriculture Production - Crops;Agriculture - Crops;Total
2801000001	Ag crops: Agriculture - Crops: Land Breaking
2801000002	Ag crops: Agriculture - Crops: Planting
2801000003	Ag crops: Agriculture - Crops: Tilling
2801000004	Ag crops: Agriculture - Crops: Defoliation
2801000005	Ag crops: Agriculture - Crops: Harvesting
2801000006	Ag crops: Agriculture - Crops: Drying
2801000007	Ag crops: Agriculture - Crops: Loading
2801000008	Ag crops: Agriculture - Crops: Transport
2805000000	Ag livestock: Agriculture - Livestock: Total
2805001000	Ag livestock: Beef Cattle Feedlots: Total (also see 2805020000)
2805001001	Ag livestock: Beef Cattle Feedlots: Feed Preparation
2805005000	Ag livestock: Poultry Operations: Total
2805010000	Ag livestock: Dairy Operations: Total
2805015000	Ag livestock: Hog Operations: Total
2805020000	Ag livestock: Cattle and Calves Composite: Total
2805025000	Ag livestock: Hogs and Pigs Composite: Total
2805030000	Ag livestock: Poultry and Chickens Composite: Total
2805035000	Ag livestock: Horses and Ponies Composite: Total
2805040000	Ag livestock: Sheep and Lambs Composite: Total
2805045001	Ag livestock: Goats: Total

Exhibit 2.2 PM Transport Fractions for PM Nonattainment Counties

State	FIPS	County	PM Transport Fraction
CT	09001	FAIRFIELD	0.4347
CT	09009	NEW HAVEN	0.4442
DE	10003	NEW CASTLE	0.5087
DC	11001	WASHINGTON	0.3953
MD	24003	ANNE ARUNDEL	0.4874
MD	24005	BALTIMORE	0.4047
MD	24013	CARROLL	0.5641
MD	24017	CHARLES	0.4879
MD	24021	FREDERICK	0.4904
MD	24025	HARFORD	0.5147
MD	24027	HOWARD	0.2798
MD	24031	MONTGOMERY	0.3089
MD	24033	PRINCE GEORGES	0.2950
MD	24043	WASHINGTON	0.4003
MD	24510	BALTIMORE (CITY)	0.4874
NJ	34003	BERGEN	0.2657
NJ	34005	BURLINGTON	0.3008
NJ	34007	CAMDEN	0.1375
NJ	34013	ESSEX	0.3461
NJ	34015	GLOUCESTER	0.4361
NJ	34017	HUDSON	0.5286
NJ	34021	MERCER	0.3472
NJ	34023	MIDDLESEX	0.3273
NJ	34025	MONMOUTH	0.5468
NJ	34027	MORRIS	0.2297
NJ	34031	PASSAIC	0.1971
NJ	34035	SOMERSET	0.3635
NJ	34039	UNION	0.3117
NY	36005	BRONX	0.6145
NY	36059	NASSAU	0.6595
NY	36061	NEW YORK	0.6483
NY	36071	ORANGE	0.3803
NY	36081	QUEENS	0.6505
NY	36085	RICHMOND	0.7159
NY	36087	ROCKLAND	0.3556
NY	36103	SUFFOLK	0.7997
NY	36119	WESTCHESTER	0.3531
PA	42003	ALLEGHENY	0.2308
PA	42005	ARMSTRONG	0.3289
PA	42007	BEAVER	0.3141

State	FIPS	County	PM Transport Fraction
PA	42011	BERKS	0.4682
PA	42017	BUCKS	0.3980
PA	42019	BUTLER	0.3621
PA	42021	CAMBRIA	0.2253
PA	42029	CHESTER	0.4757
PA	42041	CUMBERLAND	0.4649
PA	42043	DAUPHIN	0.3438
PA	42045	DELAWARE	0.3515
PA	42059	GREENE	0.3224
PA	42063	INDIANA	0.2884
PA	42071	LANCASTER	0.6183
PA	42073	LAWRENCE	0.4422
PA	42075	LEBANON	0.4521
PA	42077	LEHIGH	0.4487
PA	42091	MONTGOMERY	0.3729
PA	42095	NORTHAMPTON	0.4306
PA	42101	PHILADELPHIA	0.3471
PA	42125	WASHINGTON	0.3436
PA	42129	WESTMORELAND	0.2875
PA	42133	YORK	0.5134
VA	51013	ARLINGTON	0.3534
VA	51059	FAIRFAX	0.2457
VA	51107	LOUDOUN	0.3345
VA	51153	PRINCE WILLIAM	0.1814
VA	51510	ALEXANDRIA	0.3745
VA	51610	FALLS CHURCH	0.3400
VA	51683	MANASSAS	0.3474
VA	51685	MANASSAS PARK	0.3551

Exhibit 2.3 – Comparison of 2007 Paved Road Dust PM10 Emission Estimates

Nonattainment Area	Without Transport Factor		With Transport Factor	
	Version2	Version 3 New Method	Version2	Version 3 New Method
Allentown	4,228	1,733	1,859	764
Baltimore	15,175	5,412	6,658	2,400
Hagerstown	1,490	263	596	105
Harrisburg-Lebanon-Carlisle-York	9,133	4,124	4,149	1,855
Johnstown	2,663	1,133	673	289
Lancaster	4,339	1,808	2,683	1,118
New York-Northern NJ-Long Island-CT	58,512	28,747	29,128	14,260
Philadelphia-Wilmington	29,379	12,644	11,070	4,801
Pittsburgh-Beaver Valley	14,470	6,173	4,491	1,920
Reading	3,346	1,423	1,567	666
Washington, DC-MD-VA	21,067	9,909	6,846	3,194
York	3,684	1,458	1,891	749

Exhibit 2.4 – Comparison of 2007 Paved Road Dust PM2.5 Emission Estimates

Nonattainment Area	Without Transport Factor		With Transport Factor	
	Version2	Version 3 New Method	Version2	Version 3 New Method
Allentown	264	433	116	191
Baltimore	1,770	1,328	782	589
Hagerstown	196	64	78	26
Harrisburg-Lebanon-Carlisle-York	605	1,031	277	464
Johnstown	198	283	50	72
Lancaster	295	452	182	280
New York-Northern NJ-Long Island-CT	2,400	7,173	1,252	3,547
Philadelphia-Wilmington	1,396	3,165	547	1,202
Pittsburgh-Beaver Valley	942	1,543	299	480
Reading	209	356	98	167
Washington, DC-MD-VA	1,713	2,432	594	784
York	257	365	132	187

2.3 2025 INVENTORY DEVELOPMENT

The general procedures and data used for projecting emissions for the area source sector are summarized in this section. Growth factors were applied to the MANE-VU+VA 2007 inventory to account for changes in fuel use, population, economic activity. Next, control factors were applied to account for future emission reductions from control regulations. The 2025 inventory accounts for post-2007 emission reductions from promulgated federal, State, local, and site-specific control programs and proposed control programs that are reasonably anticipated to result in post-2007 emission reductions.

2.3.1 Area Source Growth Factors

The area and nonEGU point source growth factors were developed using six sets of data:

- The Annual Energy Outlook (AEO) fuel consumption forecasts;
- County-level population projections;
- State-level employment projections by NAICS code;
- County-level vehicle miles travelled (VMT) projections;
- USEPA projections for livestock and residential wood combustion; and
- Other state-specific emission projection data.

The priority for applying these growth factors was to first use the state-supplied projection data (if available). If state-supplied data were not provided, then the AEO projection factors were used for fuel consumption sources, and the population/employment/VMT data were used for other source categories.

2.3.1.1 AEO Fuel Use Projection

The AEO is published annually by the U.S. Energy Information Administration (EIA). It presents long-term projections of energy supply, demand, and prices through 2035, based on results from EIA's National Energy Modeling System (NEMS). NEMS projects the production, imports, conversion, consumption, and prices of energy, subject to assumptions on macroeconomic and financial factors, world energy markets, resource availability and costs, behavioral and technological choice criteria, energy technology cost and performance characteristics, and demographics.

AEO provides regional fuel-use forecasts for various fuel types (e.g., coal, residual oil, distillate oil, natural gas) by end use sector (e.g., residential, commercial, industrial, transportation, and electric power). Energy use projections are reported at the Census division level. The census divisions grouped states as follows:

- South Atlantic - DE, DC, MD, VA
- Middle Atlantic - NJ, NY, PA
- New England - CT, ME, MA, NH, RI, VT

Appendices A1, A2, and A3 contain the AEO2010 fuel use projections for each of these three regions. Appendices A4, A5, and A6 contain the AEO2011 fuel use projections

Version 2 of the MANE-VU+VA future year inventories was developed using AEO2010 (EIA2010). After the release of Version 2, AEO2011 was published (EIA2011a). MARAMA reviewed the updated fuel forecasts and compared the AEO2010 and AEO2011 projections. Appendix A7 documents MARAMA's analysis. MARAMA calculated the difference in projected fuel usage between AEO2010 and AEO2011 for the residential, commercial, industrial, transportation, and electric power sector for the distillate fuel oil, residual fuel oil, coal, natural gas, and renewable fuel types. MARAMA identified thresholds for what constitutes a major change as follows:

- An increase or decrease of 1% or less is considered to be no change and did not warrant a change in the growth factors between Versions 2 and 3 of the inventory;
- An increase or decrease of between 1% and 5% is considered to be a minor change, and states agreed that these differences between AEO2010 and AEO2011 did not warrant a change in the growth factors between Versions 2 and 3 of the inventory;
- An increase or decrease above 5% is considered a major change, and warrants a change in the growth factors used in Version 3.

MARAMA recommended that the AEO2010 projections be retained for all residential, commercial, and industrial sector fuel use, except for industrial natural gas usage, where the AEO2011 projections will be used for Version 3 of the future year modeling inventory. New Jersey elected to use the more recent growth factors from AEO2011 instead of the AEO2010 growth factors for all area source fossil fuel use categories.

Exhibits 2.5 to 2.9 summarize the projected fuel use rates by source sector (residential, commercial, industrial, transportation) and AEO geographic area for the years 2007 to 2025. The unusual growth in commercial residual oil use in the South Atlantic region could not be explained; Maryland elected to use employment instead of the AEO2010 growth factor for commercial residual oil combustion, while Virginia and the District chose to assume flat growth in this sector.

2.3.1.2 Population Projections

States provided county-level historic population data and projections for future years. The historical and projection years varied from state to state, so values were interpolated, when necessary, to create population estimates for each year from 2007 to 2025. The population data were then normalized to create growth factors from 2007 for each year future year.

For example, Delaware had a population of 861,087 in 2007, and the projected population in 2017 is 953,204. Thus, the growth factor for 2017 is $953,204 / 861,087 = 1.107$.

Exhibit 2.10 summarizes the population growth factors by state and AEO2010 region. Population is projected to grow in every state between 2007 and 2025. The population growth in the New England states varies significantly by state. Population growth in the South Atlantic states is projected to be much higher than in the New England and Mid-Atlantic states. Appendix B contains the data used to develop the population projections.

2.3.1.3 Employment Projections

Every two years, the federal Bureau of Labor Statistics produces long-term industry and occupation forecasts for ten future years, and states are asked to do the same for their respective economies. The most recent projections are from state Departments of Labor for the period 2006 to 2016, most of which were published in 2008. These 10-year forecasts are updated every other year. The next set of state-specific projections will be for the period 2008 to 2018. Only the District of Columbia and Delaware were able to provide employment projections for 2008 to 2017; the 2008 to 2018 projections were not available for other states in time for use on this project. The employment projections are state-wide by 3-digit NAICS code. Exhibit 2.11 summarizes the manufacturing employment (NAICS sector 310) growth factors by state and AEO2010 region. States in the Northeast / Mid-Atlantic region show a marked decrease in manufacturing employment from 2007 forward. Appendix C contains the data that were used to develop the employment projections.

2.3.1.4 VMT Projections

States developed projections of vehicle miles traveled (VMT) for 2007 and 2025 which were used as the growth factor for projecting emissions from re-entrained road dust from travel on paved roads (SCC 22-94-000-000). The 2007 and 2025 VMT are identical to those used in the MOVES modeling discussed in Section 8. Exhibit 2.12 shows the county level VMT for 2007 and 2025, and the growth factor for projecting 2007 emissions to 2025. Growth factors for 2013, 2017, and 2020 were based on a linear interpolation of the 2007 and 2025 VMT. Appendix D contains additional information on the data used to develop the VMT growth factors.

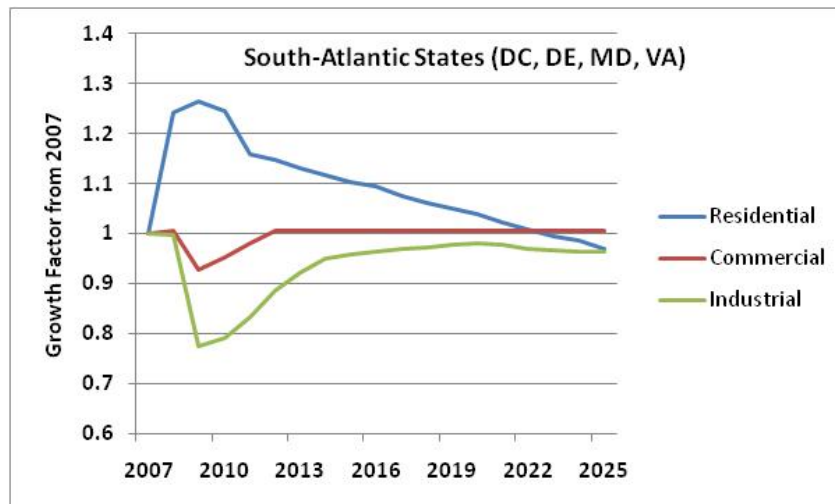
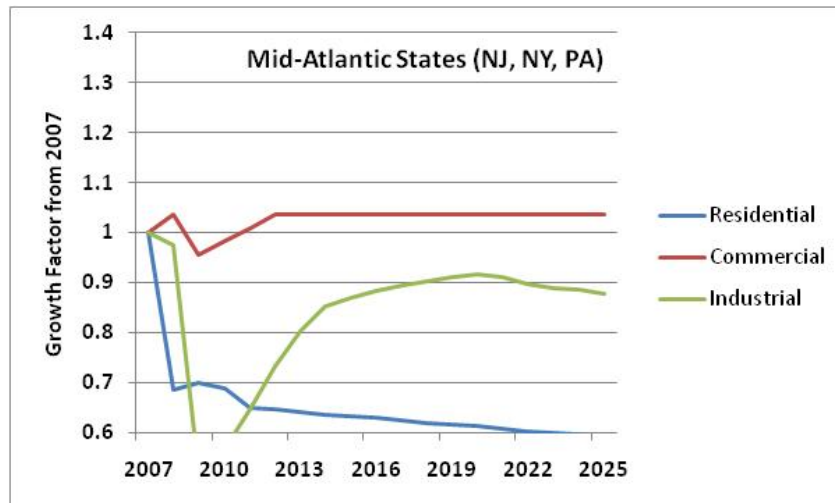
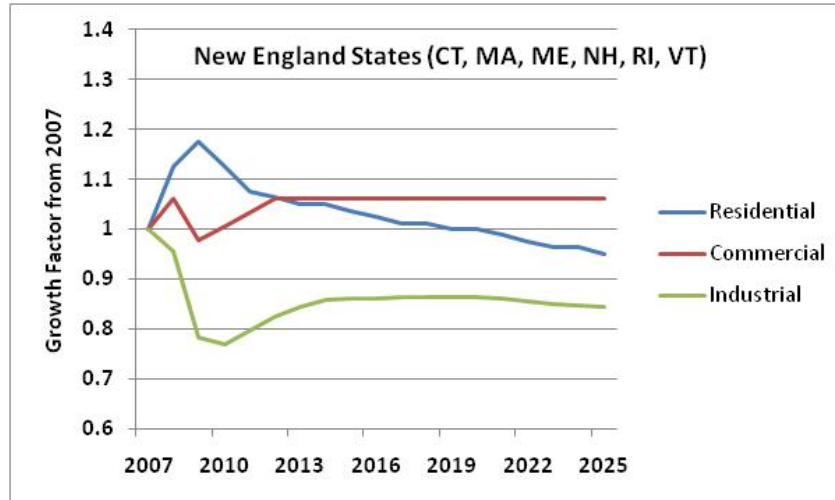


Exhibit 2.5 AEO2010 Growth Factors for Coal by AEO Region 2007 – 2025

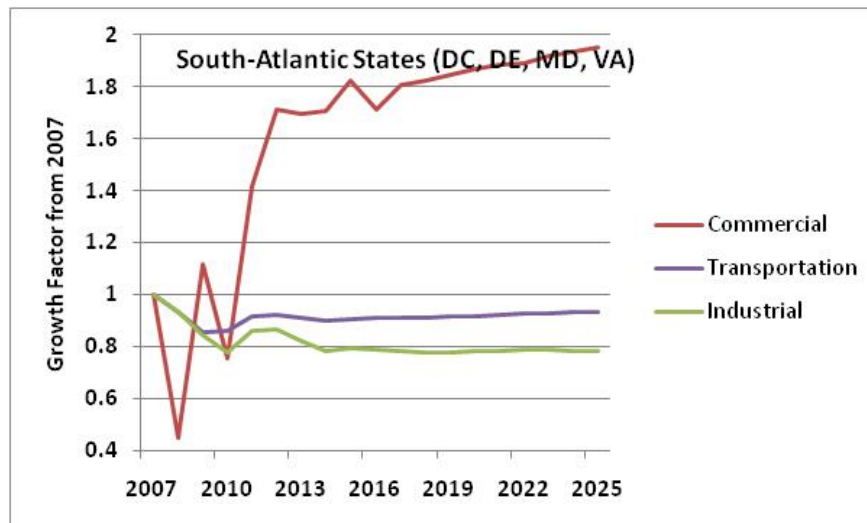
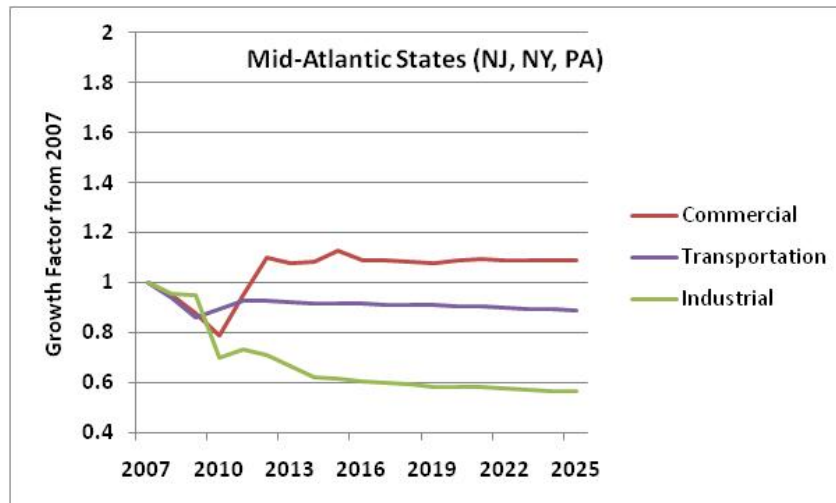
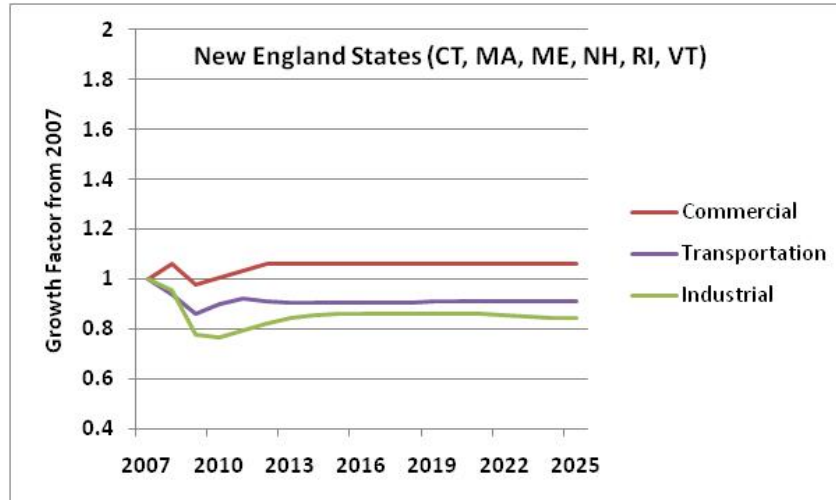


Exhibit 2.6 Growth Factors for Residual Oil by AEO Region 2007 – 2025

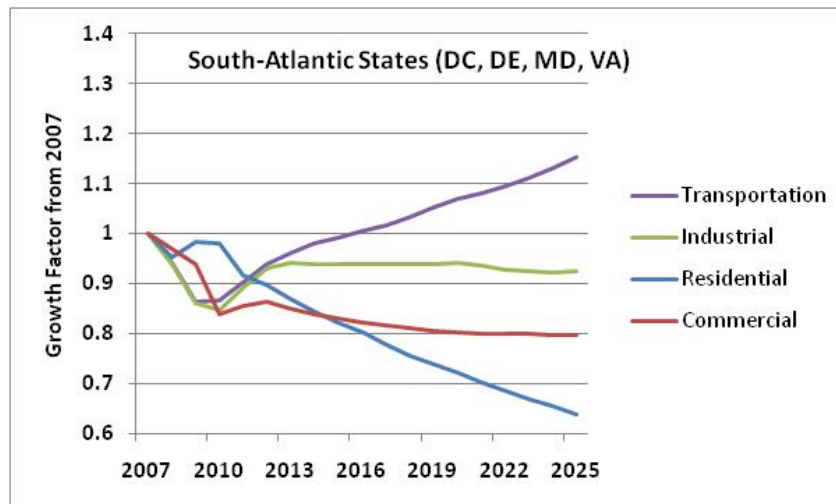
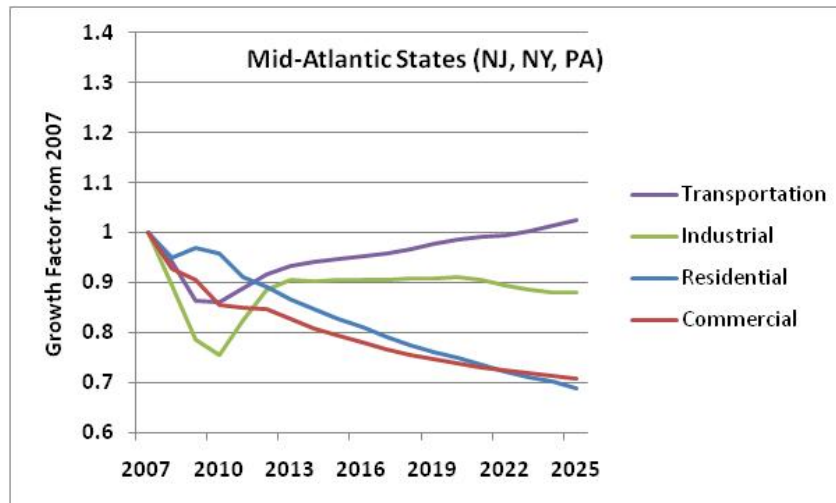
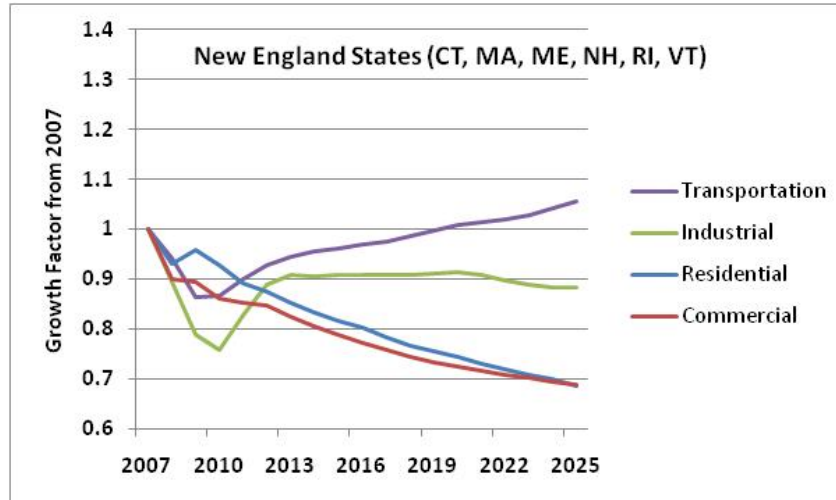
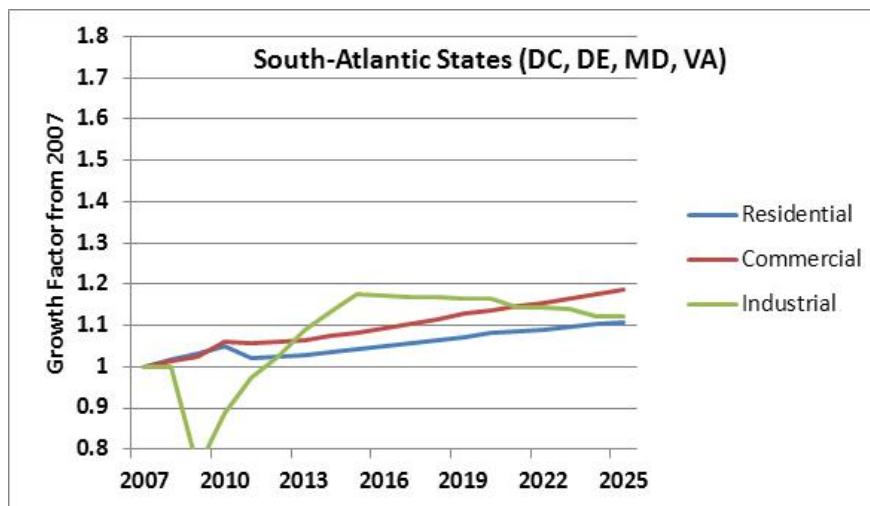
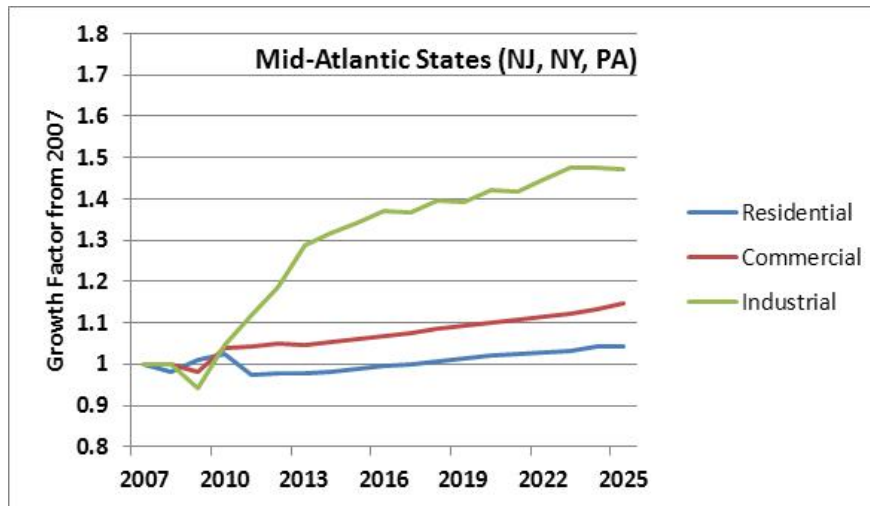
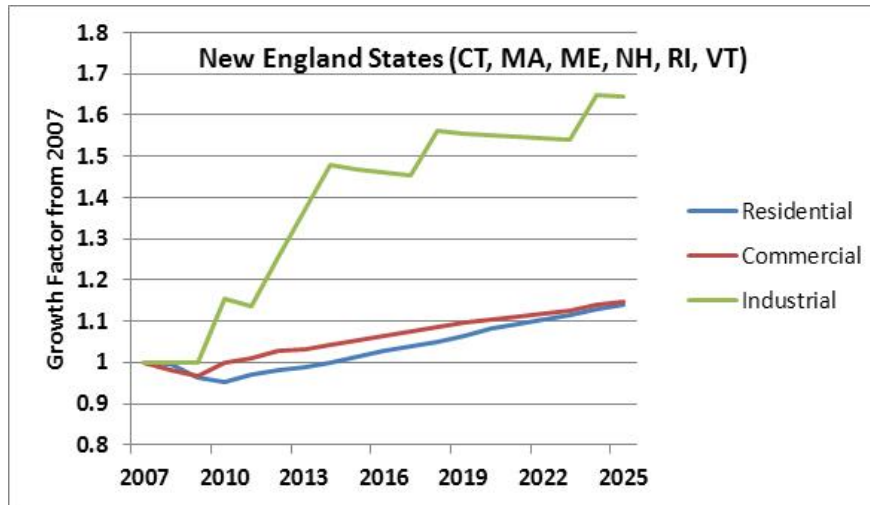


Exhibit 2.7 AEO2010 Growth Factors for Distillate Oil by AEO Region 2007 – 2025



**Exhibit 2.8 Growth Factors for Natural Gas by AEO Region 2007 – 2025
AEO2010 for Residential/Commercial, AEO2011 for Industrial**

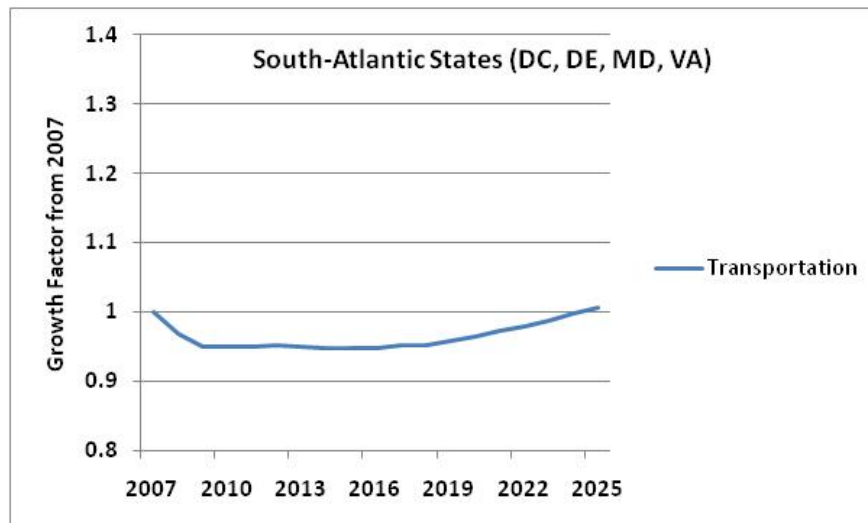
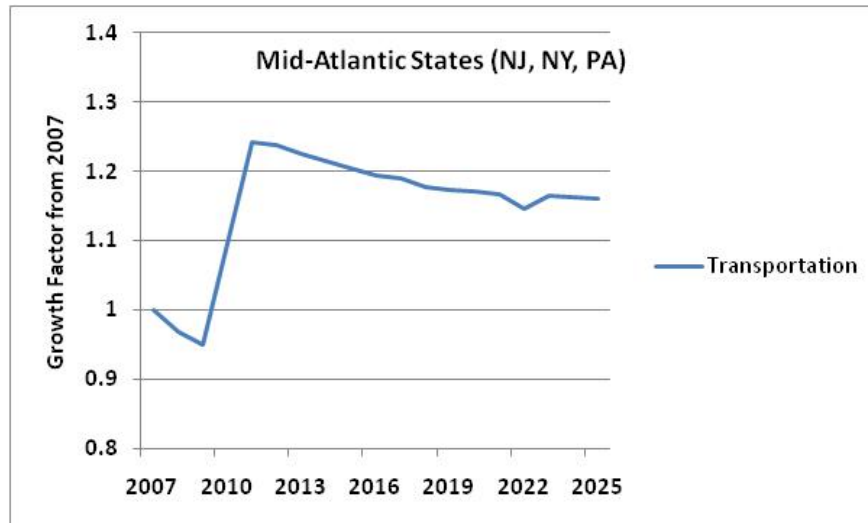
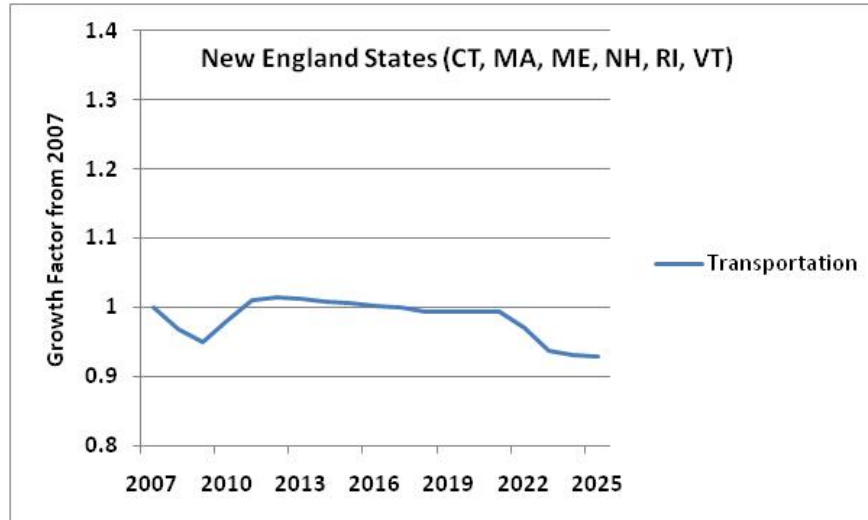


Exhibit 2.9 AEO2010 Growth Factors for Gasoline by AEO Region 2007 – 2025

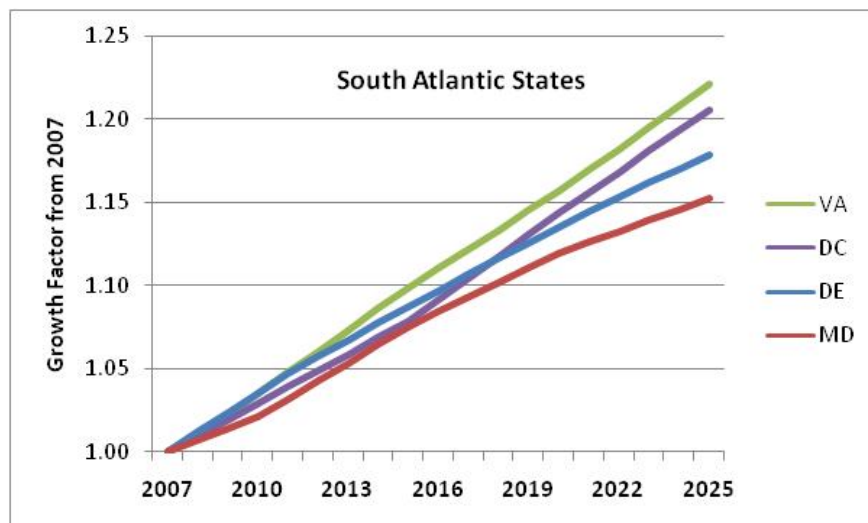
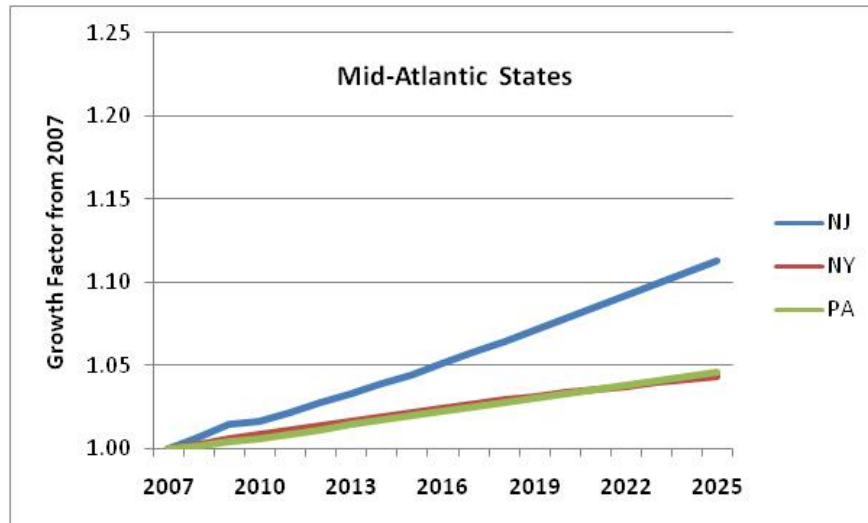
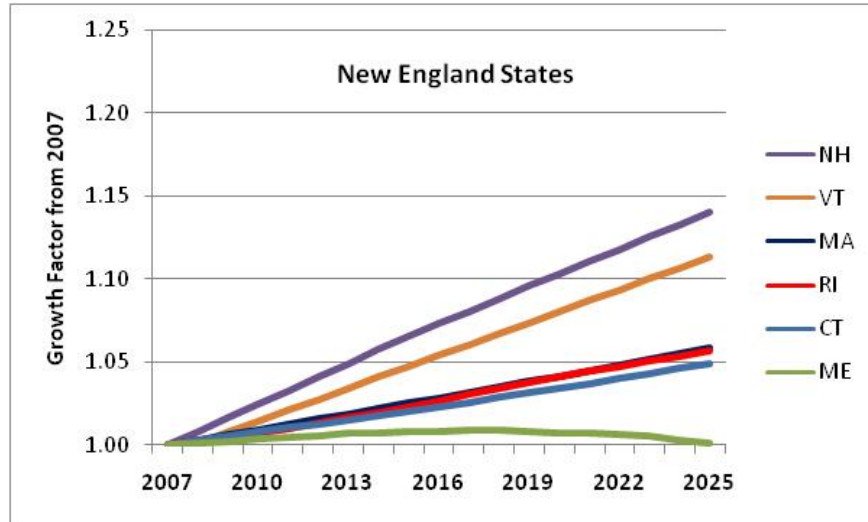


Exhibit 2.10 Population Growth Factors by AEO Region 2007 – 2025

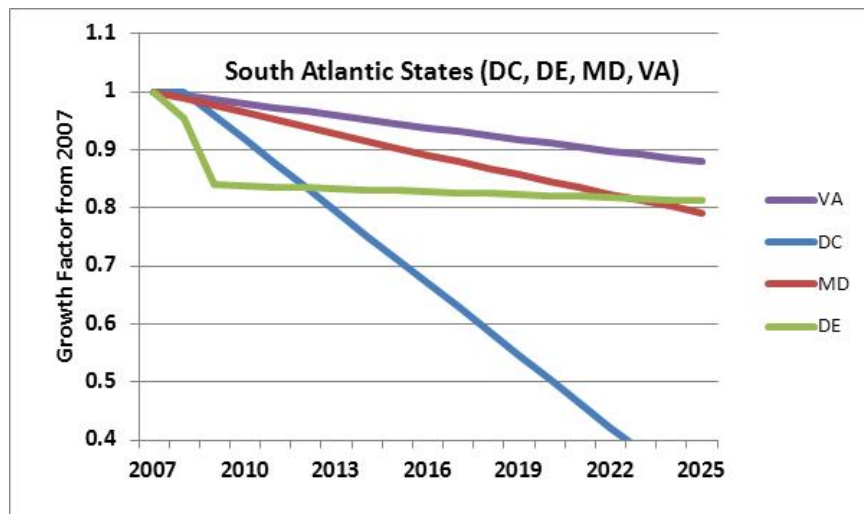
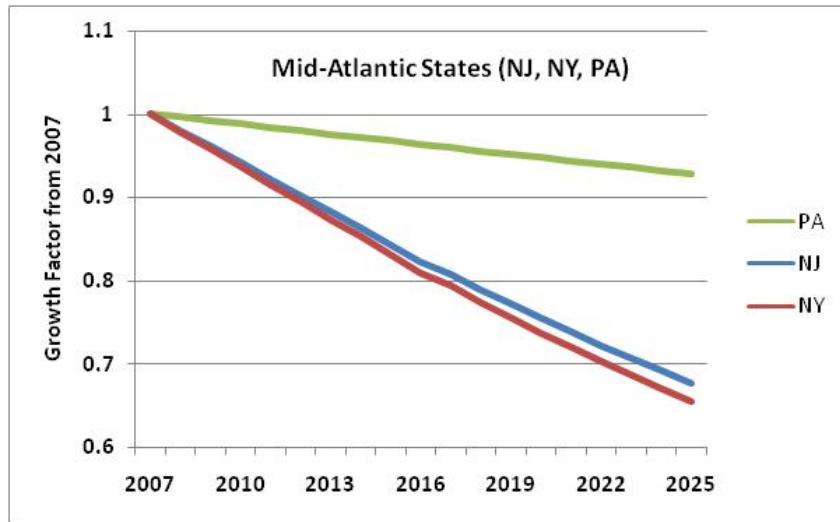
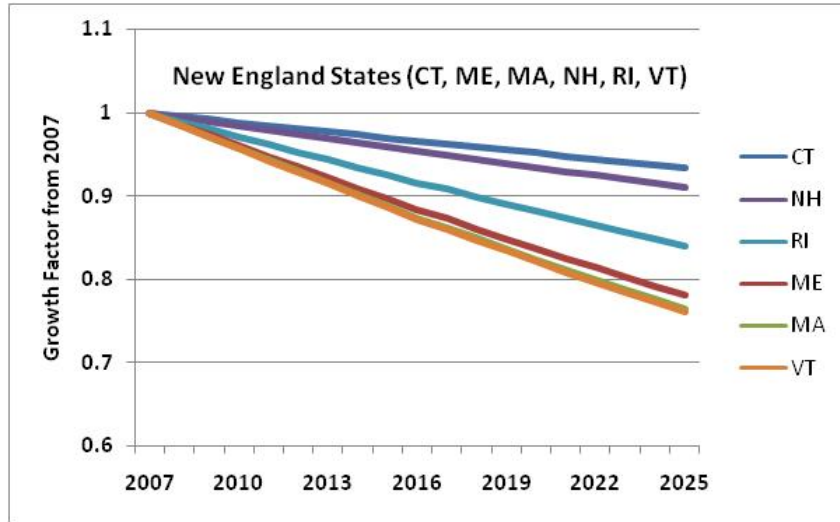


Exhibit 2.11 Manufacturing Employment Growth Factors by Region 2007 - 2025

Exhibit 2.12 2007 and 2025 VMT and the 2007-2025 Growth Factor

Nonattainment Area	County	FIPS	Million VMT		Growth 2007-2005
			2007	2025	
Allentown	Lehigh	42077	2,947	3,700	1.256
Allentown	Northampton	42095	2,020	2,629	1.301
Baltimore	Anne Arundel	24003	5,786	7,907	1.367
Baltimore	Baltimore	24005	8,261	10,330	1.251
Baltimore	Carroll	24013	1,296	1,766	1.363
Baltimore	Harford	24025	2,362	3,060	1.296
Baltimore	Howard	24027	3,815	6,059	1.588
Baltimore	Baltimore City	24510	3,626	4,150	1.145
Hagerstown	Washington	24043	2,090	2,940	1.407
Harrisburg-Lebanon-Carlisle-York	Cumberland	42041	2,861	3,704	1.295
Harrisburg-Lebanon-Carlisle-York	Dauphin	42043	3,072	3,689	1.201
Harrisburg-Lebanon-Carlisle-York	Lebanon	42075	1,209	1,507	1.247
Harrisburg-Lebanon-Carlisle-York	York	42133	3,304	4,209	1.274
Johnstown	Cambria	42021	1,157	1,110	0.959
Johnstown	Indiana	42063	844	928	1.100
Lancaster	Lancaster	42071	4,255	5,395	1.268
New York Metro NY/NJ/CT	Fairfield	9001	7,560	8,568	1.133
New York Metro NY/NJ/CT	New Haven	9009	6,856	8,085	1.179
New York Metro NY/NJ/CT	Bergen	34003	7,879	10,464	1.328
New York Metro NY/NJ/CT	Essex	34013	4,895	6,131	1.253
New York Metro NY/NJ/CT	Hudson	34017	2,313	2,801	1.211
New York Metro NY/NJ/CT	Mercer	34021	3,566	3,996	1.121
New York Metro NY/NJ/CT	Middlesex	34023	7,810	9,748	1.248
New York Metro NY/NJ/CT	Monmouth	34025	6,319	8,595	1.360
New York Metro NY/NJ/CT	Morris	34027	5,530	6,523	1.180
New York Metro NY/NJ/CT	Passaic	34031	2,918	3,490	1.196
New York Metro NY/NJ/CT	Somerset	34035	3,230	3,667	1.135
New York Metro NY/NJ/CT	Union	34039	4,623	5,730	1.239
New York Metro NY/NJ/CT	Bronx	36005	3,677	4,830	1.314
New York Metro NY/NJ/CT	Kings	36047	5,461	6,272	1.148
New York Metro NY/NJ/CT	Nassau	36059	11,780	14,705	1.248
New York Metro NY/NJ/CT	New York	36061	3,938	5,203	1.321
New York Metro NY/NJ/CT	Orange	36071	4,431	5,906	1.333
New York Metro NY/NJ/CT	Queens	36081	8,859	10,949	1.236
New York Metro NY/NJ/CT	Richmond	36085	2,152	3,354	1.558
New York Metro NY/NJ/CT	Rockland	36087	2,675	4,060	1.517
New York Metro NY/NJ/CT	Suffolk	36103	13,767	20,514	1.485
New York Metro NY/NJ/CT	Westchester	36119	8,201	11,811	1.490
Philadelphia PA/DE/NJ	New Castle	10003	5,544	6,959	1.255
Philadelphia PA/DE/NJ	Burlington	34005	4,704	5,062	1.076

Nonattainment Area	County	FIPS	Million VMT		Growth 2007-2005
			2007	2025	
Philadelphia PA/DE/NJ	Camden	34007	4,090	4,267	1.043
Philadelphia PA/DE/NJ	Gloucester	34015	2,723	3,284	1.206
Philadelphia PA/DE/NJ	Bucks	42017	5,047	6,516	1.291
Philadelphia PA/DE/NJ	Chester	42029	4,423	6,201	1.402
Philadelphia PA/DE/NJ	Delaware	42045	3,766	4,371	1.161
Philadelphia PA/DE/NJ	Montgomery	42091	7,075	8,220	1.162
Philadelphia PA/DE/NJ	Philadelphia	42101	5,973	6,337	1.061
Pittsburgh-Beaver Valley	Allegheny	42003	9,345	10,134	1.084
Pittsburgh-Beaver Valley	Armstrong	42005	628	672	1.071
Pittsburgh-Beaver Valley	Beaver	42007	1,487	1,585	1.066
Pittsburgh-Beaver Valley	Butler	42019	1,762	2,173	1.233
Pittsburgh-Beaver Valley	Greene	42059	464	504	1.086
Pittsburgh-Beaver Valley	Lawrence	42073	812	880	1.084
Pittsburgh-Beaver Valley	Washington	42125	2,245	2,531	1.127
Pittsburgh-Beaver Valley	Westmoreland	42129	3,512	3,898	1.110
Reading	Berks	42011	3,341	4,079	1.221
Washington DC/MD/VA	DC	11001	3,666	3,861	1.053
Washington DC/MD/VA	Charles	24017	1,284	1,825	1.421
Washington DC/MD/VA	Frederick	24021	3,009	4,442	1.476
Washington DC/MD/VA	Montgomery	24031	7,471	9,711	1.300
Washington DC/MD/VA	Prince George's	24033	8,754	11,616	1.327
Washington DC/MD/VA	Arlington	51013	1,663	1,917	1.153
Washington DC/MD/VA	Fairfax	51059	10,123	13,880	1.371
Washington DC/MD/VA	Loudoun	51107	2,403	3,741	1.557
Washington DC/MD/VA	Prince William	51153	3,202	4,643	1.450
Washington DC/MD/VA	Alexandria	51510	736	866	1.177
Washington DC/MD/VA	Fairfax	51600	193	220	1.143
Washington DC/MD/VA	Falls Church	51610	64	76	1.186
Washington DC/MD/VA	Manassas	51683	273	360	1.317
Washington DC/MD/VA	Manassas Park	51685	26	30	1.166

2.3.1.5 No Growth Assignment for Certain Area Source Categories

For several area source categories, it seems reasonable that emissions would not change from the 2007 values. No growth was applied to the 2007 emissions for the area source categories shown in Exhibit 2.13.

Exhibit 2.13 Area Source Categories with No Growth Assignment

SCC	SCC Description
2296000000	Unpaved Roads /All Unpaved Roads /Total: Fugitives
2401008000	Surface Coating /Traffic Markings /Total: All Solvent Types
2461020000	Misc Non-industrial: Commercial /Asphalt Application: All Processes /Total: All
2461021000	Misc Non-industrial: Commercial /Cutback Asphalt /Total: All Solvent Types
2461022000	Misc Non-industrial: Commercial /Emulsified Asphalt /Total: All Solvent Types
2461023000	Misc Non-industrial: Commercial /Asphalt Roofing /Total: All Solvent Types
2601000000	On-site Incineration /All Categories /Total
2601010000	On-site Incineration /Industrial /Total
2601010000	On-site Incineration /Industrial /Total
2601020000	On-site Incineration /Commercial/Institutional /Total
2601020000	On-site Incineration /Commercial/Institutional /Total
2601030000	On-site Incineration /Residential /Total
2610000100	Open Burning /All Categories /Yard Waste - Leaf Species Unspecified
2610000400	Open Burning /All Categories /Yard Waste - Brush Species Unspecified
2610000500	Open Burning /All Categories /Land Clearing Debris (use 28-10-005-000 for Logging
2610030000	Open Burning /Residential /Household Waste (use 26-10-000-xxx for Yard Wastes)
2610040400	Open Burning /Municipal (from residences, parks, other for central burn)
2660000000	Leaking Underground Storage Tanks /Leaking Underground Storage Tanks /Total: All
2680001000	Composting /100% Biosolids (e.g., sewage sludge, manure, mixtures of these matls
2680002000	Composting /Mixed Waste (e.g., a 50:50 mixture of biosolids and green wastes)
2806010000	Domestic Animals Waste Emissions /Cats /Total
2806015000	Domestic Animals Waste Emissions /Dogs /Total
2807020001	Wild Animals Waste Emissions /Bears /Black Bears
2807020002	Wild Animals Waste Emissions /Bears /Grizzly Bears
2807025000	Wild Animals Waste Emissions /Elk /Total
2807030000	Wild Animals Waste Emissions /Deer /Total
2807040000	Wild Animals Waste Emissions /Birds /Total
2810001000	Forest Wildfires - Wildfires – Unspecified
2810003000	Cigarette Smoke /Total
2810005000	Managed Burning, Slash (Logging Debris) /Unspecified Burn Method
2810010000	Human Perspiration and Respiration /Total
2810014000	Prescribed Burning /Generic - Unspecified land cover, ownership, class/purpose

SCC	SCC Description
2810015000	Prescribed Forest Burning /Unspecified
2810020000	Prescribed Rangeland Burning /Unspecified
2810030000	Structure Fires /Unspecified
2810035000	Firefighting Training /Total
2810050000	Motor Vehicle Fires /Unspecified
2810060200	Cremation /Animals
2810090000	Open Fire /Not categorized
2820010000	Cooling Towers /Process Cooling Towers /Total
2830000000	Catastrophic/Accidental Releases /All Catastrophic/Accidental Releases /Total
2830010000	Catastrophic/Accidental Releases /Transportation Accidents /Total

2.3.1.6 USEPA 2020 Projections for Residential Wood

USEPA made available its 2020 emissions projections associated with its 2005-based v4 modeling platform. MARAMA decided to use USEPA emission projection parameters for residential wood combustion. USEPA's methodology and data sources are summarized below (USEPA 2010a).

USEPA projected residential wood combustion emissions are based on the expected increase in the number of low-emitting wood stoves and the corresponding decrease in other types of wood stoves. As newer, cleaner woodstoves replace older, more polluting stoves, there will be an overall reduction of emissions from this category. The approach used by USEPA was developed as part of a modeling exercise to estimate the expected benefits of the woodstove change-out program. This methodology uses a combination growth and control factors and is based on activity not pollutant. The growth and control are accounted for in a single factor for each residential wood SCC (certain SCCs represent controlled equipment, while other SCCs represent uncontrolled equipment). Control factors are indirectly incorporated based on which stove is used. The specific assumptions USEPA made were:

- Fireplaces, SCC=2104008001: increase 1%/year;
- Old woodstoves, SCC=2104008002, 2104008010, 2104008051: decrease 2%/year;
- New woodstoves, SCC=2104008003, 2104008004, 2104008030, 2104008050, 2104008052 or 2104008053: increase 2%/year.

For the general woodstoves and fireplaces category (SCC 2104008000) USEPA computed a weighted average distribution based on 19.4% fireplaces, 71.6% old woodstoves, 9.1% new woodstoves using 2002 Platform emissions for PM_{2.5}. These fractions are based on the fraction of emissions from these processes in the states that did not have the "general

woodstoves and fireplaces” SCC in the 2002 NEI. This approach results in an overall decrease of 1.056% per year for this source category. Appendix E contains the residential wood projection data from USEPA.

2.3.1.7 SCC, SIC, NAICS and Growth Parameter Crosswalk

Since the employment projections were based on 3-digit NAICS code, it was necessary to map NAICS codes to SCCs and SIC codes that were used by states. Employment projections at the more specific 4-digit or 6-digit NAICS codes were not available.

The first step for developing a comprehensive crosswalk between the different source classification codes (SCC, SIC, and NAICS codes) and emission activity growth indicators was to compile a complete list of the NAICS codes in the 2007 point source inventory. Some states use the SIC code while other use the NAICS code. Still other states use both the SIC and NAICS codes. When the NAICS code was not available SIC codes were converted to NAICS codes. The 6-digit NAICS code was truncated to a 3-digit code, which represents major industry subsectors of the economy. A U.S. Census Bureau document was used to perform this conversion (CENSUS 2000).

The next step was to review parameters that could be used as the emission activity growth indicator for each SCC or NAICS. We initially relied on two USEPA crosswalks (USEPA 2004a, USEPA 2004b) to match area and nonEGU point source SCCs to AEO2010 categories, employment NAICS codes, and population.

2.3.1.8 Final Version 2 Growth Factors for Area Sources

The previous sections described the initial growth factors recommended to develop projected future year emissions inventories for area and non-EGU sources. Draft growth and control factors, and a draft technical support document, were circulated for review by MARAMA and state agencies. During the review, it was noted that several emissions categories show negative growth into the future, particularly categories related to fossil fuel combustion and manufacturing employment.

Many of the growth factors used to project emissions for area and non-EGU sources were based on the AEO2010 fuel consumption forecasts and state-level employment projections. The AEO2010 forecasts show declining trends for many fuel consumption sectors, especially industrial, residential, and commercial distillate fuel oil use. Similarly, the employment projections show declines in the predicted number of employees for many sectors of the economy. This is particularly true for the manufacturing sector, which is of interest because this sector is often associated with higher emissions than those for other sectors. By contrast, the employment projections show increasing trends in retail and

service-related sectors. However, these sectors are not typically associated with significant emissions.

Predicted declines in fuel use and employment resulted in growth factors less than unity (i.e., represent negative growth) for many area and non-EGU point source categories. Consequently, for some categories, emissions were initially projected to be lower for the projected future years than for the base year, even before the application of control assumptions (i.e., the future "growth only" emissions are lower than the base year emissions). A conference call was held to discuss the negative growth issue, and states were polled as to whether or not they felt that the current set of proposed growth factors - including the negative growth factors - were realistic for their state. In reply, some representatives mentioned that they have observed historic state-specific data that supports the trends displayed by the proposed growth factors. Other representatives mentioned that they feel comfortable with the growth factors and don't have a technical basis to change them or suggest others. Some states will supply their own factors or make their own assumptions.

As a result of these discussions, each state provided guidance on how to handle projections when negative growth is indicated. Exhibit 2.14 shows the state recommendations for area sources.

2.3.1.9 Version 3 Update to New Jersey Growth Factors for Area Sources

New Jersey provided updated growth factors for area source for use in developing the 2025 inventory for PM nonattainment counties. One of the key revisions was to use the more recent data from AEO2011 for energy consumption instead of the AEO2010 projections. New Jersey also provided updated employment, paved road, pesticide and agricultural livestock growth factors.

2.3.1.10 Version 3 Update to Growth Factors for the District of Columbia

The District of Columbia provided updated employment growth factors based on DC Department of Labor forecasts for the period 2008 to 2018.

**Exhibit 2-14 State Recommendations to Address Negative Growth
and Other Growth Factors for the Area Source Sector**

State	AEO2010 Growth Factors	Employment Growth Factors	Population Growth Factors
CT	Use AEO2010 growth rates	Use state DOL employment projections by 3-digit NAICS	Use county-level population projections
DE	Use AEO2010 growth rates; no growth for suspect AEO2010 projection for commercial / institutional residual oil	For 2013, use state DOL employment projections by 3-digit NAICS; For 2017 and 2020, use no growth (growth factor=1) when employment growth is negative; otherwise use employment if positive growth	Use county-level population projections
DC	Use AEO2010 growth rates; no growth for suspect AEO2010 projection for commercial / institutional residual oil	Use DOL employment growth for NAICS 722 for food and kindred product SCC; otherwise use 2008-2018 data	For dry cleaning, use employment growth for NAICS 812 instead of population
MD	Not using AEO2010; used employment for commercial & institutional fuel; used housing units for residential fuel	Provided updated employment projections; changed cross-walk between NAICS code and SCC for selected source categories	Provided updated population projections by county
NJ	NJ submitted state specific growth factors. For fuel combustion categories only, used AEO2011 growth rates except for residual oil (use no growth)	NJ submitted state specific growth factors.	NJ submitted state specific growth factors and provided population projections by county
NY	Use AEO2010 growth rates	Use state DOL employment projections by 3-digit NAICS	Use county-level population projections
PA	Use AEO2010 growth rates	Use state DOL employment projections by 3-digit NAICS	Use county-level population projections
VA	Use AEO2010 growth rates; no growth for suspect AEO2010 projection for commercial / institutional residual oil	Use state DOL employment projections by 3-digit NAICS	Use county-level population projections

2.3.2 Area Source Control Factors

Control factors were developed to estimate post-2007 emission reductions resulting from on-the-books regulations and other emission reduction measures. Control factors were developed for the following national, regional and state measures:

- Federal Rules Affecting Area Sources
- Federal MACT Rules
- OTC 2001 Model Rules
- OTC 2006 Model Rules
- MANE-VU Sulfur in Fuel Oil Limitations

These control programs, including their impact on PM_{2.5} and PM precursor emissions, are discussed in the following subsections.

2.3.2.1 Federal Rules Affecting Area Sources

USEPA made available its 2020 emissions projections associated with its 2005-based v4 modeling platform (USEPA 2010a). USEPA accounted for control strategies for four area source categories, only one of which reduced emissions of PM_{2.5} or PM_{2.5} precursors. USEPA developed projection factors to account for the replacement of retired woodstoves that were installed before promulgation of the new source performance standard (NSPS). We used USEPA's latest methodology which uses a combination growth and control factor and is based on activity and not pollutant. The growth and control are accounted for in a single factor for specific SCCs that account for the turnover from pre-NSPS to post-NSPS woodstove.

2.3.2.2 Federal MACT Rules

USEPA developed guidance for estimating VOC and NO_x emission changes from MACT Rules (USEPA 2007b). We reviewed the guidance to identify area source controls associated with the federal maximum achievable control technology (MACT) standards for controlling hazardous air pollutants (HAPs). Although designed to reduce HAPs, many of the MACT standards also provide a reduction in criteria air pollutants. USEPA's guidance document provides an estimate of the percent reduction in VOC and NO_x from each standard, and the compliance date for the standard. The information concerning MACT compliance periods provided was used to determine whether the MACT standard provided post-2007 emission reductions. For example, if a compliance period of a MACT standard was 2007 or earlier, then we assumed that the emission reductions from the MACT standard should be reflected in the baseline year and not as an additional post-2007 credit.

Only one area source category was listed in USEPA's guidance document - municipal solid waste landfills. As the compliance date for this standard was January 2004, no post-2007 reductions were applied because the emission reductions from the MACT standard should be reflected in the 2007 inventory and not as an additional post-2007 credit.

USEPA has or will soon develop MACT standards for about 70 area source categories. We reviewed USEPA's 2020 emissions projections described in the previous section and found that USEPA did not include emission reductions from recent area source MACT standards. We conducted a review of USEPA's air toxic website and found that USEPA determined that many area source MACT standards would result in nationwide reductions in criteria air pollutants in addition to the reductions in HAP emissions. However, many States in the MANE-VU+VA region already have emission standards for many categories that are as stringent as the Federal area source MACT standards. For example, many states in the MANE-VU+VA region already have requirements as stringent as the Gasoline Distribution MACT and GACT (generally achievable control technology) standards, and little additional VOC reductions would be realized in the region. Given the resources allocated to this project, it was beyond the scope to conduct an analysis of the area source MACT requirements and state-by-state emission regulations to determine whether there would be emission reductions resulting from the area source MACT standards.

The only exception to the above discussion of area source MACT standards pertains to the recently promulgated rules for reciprocating internal combustion engines (RICE). USEPA made available an estimate of the percent reduction in emissions attributable to the RICE MACT rule in 2012 and 2014 (USEPA 2010b). These reductions by SCC are shown in Exhibit 2-15. The USEPA 2014 estimates were used for the MANE-VU+VA 2017, 2020 and 2025 inventories.

2.3.2.3 OTC Model Rules for VOC Sources

The Ozone Transport Commission (OTC) developed model rules for its member states in 2002 for several area source VOC categories: consumer products, architectural and industrial maintenance (AIM) coatings, portable fuel containers (PFCs), mobile equipment repair and refinishing, and solvent cleaning (OTC 2001). In 2006 the OTC introduced model rules for two additional area source categories (adhesives/sealants and asphalt paving) and more stringent requirements for consumer products and portable fuel containers (OTC 2007). These rules resulted in reductions of VOC emissions. Because VOC emissions are generally not considered to be significant PM precursors, and these rules did not result in reductions in PM_{2.5} or precursor emissions, no further discussion of the OTC model rules for VOC sources is warranted.

Exhibit 2-15 USEPA Estimated Percent Reductions for RICE MACT Standard

SCC	NO _x	PM _{2.5}	SCC Description
2101004000		7.57	Electric Utility;Distillate Oil;Total: Boilers and IC Engines
2101004002		11.81	Electric Utility;Distillate Oil;All IC Engine Types
2101006000	7.97		Electric Utility;Natural Gas;Total: Boilers and IC Engines
2101006002	9.87		Electric Utility;Natural Gas;All IC Engine Types
2102004000		7.57	Industrial;Distillate Oil;Total: Boilers and IC Engines
2102006000	7.97		Industrial;Natural Gas;Total: Boilers and IC Engines
2102006002	9.87		Industrial;Natural Gas;All IC Engine Types
2103004000		7.57	Commercial/Institutional;Distillate Oil;Total: Boilers and IC Engines
2103006000	7.97		Commercial/Institutional;Natural Gas;Total: Boilers and IC Engines
2199004000		7.57	Area Source Fuel Combustion;Distillate Oil;Total: Boilers and IC Engines
2199004002		11.81	Area Source Fuel Combustion;Distillate Oil;All IC Engine Types
2199006000	7.97		Area Source Fuel Combustion;Natural Gas;Total: Boilers and IC Engines
2310000000	12.53		Oil and Gas Production: All Processes;Total: All Processes
2310000220	12.53		Oil and Gas Exploration/Production; Drill Rigs
2310000440	12.53		Oil and Gas Exploration/Production; Saltwater Disposal Engines
2310001000	12.53		Oil and Gas Production: SIC 13; On-shore;Total: All Processes
2310002000	12.53		Oil and Gas Production: SIC 13; Off-shore;Total: All Processes
2310020000	12.53		Oil and Gas Production: SIC 13;Natural Gas;Total: All Processes
2310020600	12.53		Oil and Gas Exploration and Production;Natural Gas;Compressor Engines
2310023000	12.53		Oil and Gas Exploration and Production;Natural Gas;Cbm Gas Well - Dewatering Pump Engines

2.3.2.4 OTC Model Rule for ICI Boilers

The OTC recommended that member states pursue state-specific rulemakings or other implementation methods to achieve NO_x emission reduction for industrial, commercial, and institutional (ICI) boilers based on guidelines that varied by boiler size and fuel type. States were polled to determine whether they have adopted a rule that would achieve reductions equivalent to the 2006 OTC recommendations and whether the estimated reduction in NO_x emissions should be applied in 2013, 2017, and 2020.

All but one state, New Jersey, indicated that they have not adopted rules for area sources equivalent to the 2006 OTC recommendations. New Jersey specified that the state has post-2007 ICI boiler rules that reduce NO_x emissions and provided the estimates of the

reductions in NO_x emissions by SCC resulting from boiler tune-up requirements, as shown in Exhibit 2.16:

**Exhibit 2.16 Area Source Emission Reductions from
New Jersey ICI Boiler NO_x Rules**

SCC	SOURCE CATEGORY	Percent Reduction from Tune-ups 2007-2013	Rule Effectiveness	Rule Penetration	Overall Percent Reduction 2007-2013
2102004000	Industrial: Distillate	25%	80%	30%	6%
2102005000	Industrial: Residual	25%	80%	30%	6%
2102006000	Industrial: Nat Gas	25%	80%	30%	6%
2102007000	Industrial: LPG	25%	80%	30%	6%
2103004000	Comm/Inst: Distillate	25%	80%	30%	6%
2103005000	Comm/Inst: Residual	25%	80%	30%	6%
2103006000	Comm/Inst: Nat Gas	25%	80%	30%	6%
2103007000	Comm/Inst - LPG	25%	80%	30%	6%

2.3.2.5 MANE-VU Fuel Oil Sulfur Strategy

MANE-VU developed a low sulfur fuel oil strategy to help states develop Regional Haze SIPs (MANE_VU 2007). The sulfur in fuel oil recommendations are shown in Exhibit 2.17 and vary by state, type of fuel oil, and year of implementation.

Exhibit 2.17 MANE-VU Low Sulfur Fuel Oil Strategy

Inner Zone States (DE, NJ, NY, PA)		
Fuel Oil Type	Sulfur Content 2012	Sulfur Content 2016
Distillate	500 ppm	15 ppm
#4 Residual	0.25 %	0.25 %
#6 Residual	0.3 to 0.5 %	0.3 to 0.5 %
Outer Zone States (CT, DC, MD)		
Fuel Oil Type	Sulfur Content 2014	Sulfur Content 2018
Distillate	500 ppm	15 ppm
#4 Residual	n/a	0.25 to 0.5 %
#6 Residual	n/a	0.5 %

Each state was polled and asked to provide guidance as to when, if at all, the MANE-VU strategy would be incorporated into their state rules. States were also asked to provide the 2007 sulfur contents for each fuel type by county in order to calculate the percent reduction in emissions for the future years. Three states (MD, NJ, NY) have adopted or are committed to adopting the strategy into their rules. Four jurisdictions (CT, DC, DE, PA) indicated that not enough regulatory development progress has been made to include the reductions in future years with absolute certainty. One state (VA) has no plans to adopt the low sulfur fuel oil strategy. The response from each jurisdiction is summarized below:

- **Connecticut** will not include the reductions from MANE-VU low sulfur fuel oil strategy at this time for official SIP inventories used for the PM_{2.5} redesignation effort. Section 16a-21a of the Connecticut General Statutes (as amended by PA 10-74) conditions implementation of number two heating oil sulfur limitation (50 ppm beginning 7/1/2011 and 15 ppm beginning 7/1/2014) on similar implementation in NY, MA and RI. NY has taken action, but the other states have not done so yet. CTDEP expects that 15ppm residential heating oil will be in place in CT by the "MANE-VU Ask" 2018 target date. However, until the other states act, SIP emission inventories will not be approvable with the 15 ppm value. Therefore, at this time CT elects to retain the 2007 sulfur value through 2025. For residual oil, Section 22a-174-19a of the Regulations of CT State Agencies (RCSA) limits sources ≥ 15 MW and boilers ≥ 250 mmBtu/hr to 0.5% and further limits any of those sources that are also Title IV acid rain sources to 0.3%. For affected sources, these limits are consistent with the "MANE-VU Ask", and should be reflected in the actual emissions incorporated into the 2007 point source inventory. Other sources (including most area sources) not otherwise restricted by permit/order are limited to 1.0% by RCSA 22a-174-19. As both of these regulations have not changed after 2007, there are no new controls (i.e., post 2007 control factors are 1.0) for residual oil.
- The **District of Columbia** does not have a low sulfur rule in place yet. They do have a draft, and anticipate adopting a rule by 2014, but are inclined not to take credit for reductions at this point in time.
- **Delaware's** low-sulfur fuel regulation development is running behind schedule and will not be promulgated done in time to include in the re-designation requests/maintenance plans. Emission reductions from MANE-VU low sulfur fuel oil strategy are not included in the 2025 inventory at this time.
- **Maryland** expects to revise COMAR 26.11.09.07 (Sulfur Content Limitations for Fuel) by 2014 to adopt the limits in the MANE-VU low sulfur fuel oil strategy.

- **New Jersey** has revised N.J.A.C. 7:27-9.2 (Sulfur content standards) to adopt the 2016 sulfur content limits and schedule shown in Exhibit 2.19. All of the PM nonattainment counties in New Jersey already meet the MANE-VU limits for residual oil.
- **New York** adopted a law that limits the sulfur content of No. 2 heating oil to no more than 15 parts per million starting in July 2012, down from the current range of 2,000 to 15,000 parts per million. New York expects to revise 6 NYCRR Subpart 225-1 (Fuel Composition and Use - Sulfur Limitations) to lower the sulfur content of distillate fuel oil for all stationary sources (including home heating) and stationary internal combustion engines. Nearly all of the PM nonattainment counties in New York already meet the MANE-VU limits for residual oil. For the two counties (Orange and Suffolk), compliance with the MANE-VU limits is expected by 2017.
- **Pennsylvania** low-sulfur fuel regulation development is running behind schedule and will not be promulgated done in time to include in the re-designation requests/maintenance plans. Emission reductions from MANE-VU low sulfur fuel oil strategy are not included in the 2025 inventory at this time.
- **Virginia** will not include the emission reductions from low sulfur fuel oil, as it is not part of MANE-VU and has no plans to adopt the low sulfur fuel oil strategy.

The state responses regarding the currently adopted sulfur contents for home heating oil, distillate oil, and residual oil are summarized in Exhibits 2.18, 2.19 and 2.20, respectively. For the purposes of developing the 2025 inventory that will be used for re-designations and maintenance plans, the sulfur contents and control factors shown in the Exhibits were used on a county-by-county basis to account for the emission reductions from the MANE-VU low sulfur fuel oil strategy. There are separate columns in the detailed area source inventory spreadsheet that specify SO₂ control factors and emissions for each projection year for a “currently adopted” scenario that includes reductions for states (MD, NJ, NY) that have or are committed to having rules in place. No emission reductions are applied for the other states (CT, DC, DE, PA, VA) in the “currently adopted” scenario.

For other air quality planning purposes, we accounted separately for emission reductions that would occur assuming all states fully adopt the MANE-VU low sulfur fuel limits by 2025. There are separate columns for SO₂ control factors and emissions for a “fully adopted” scenario where all states (except Virginia) have the MANE-VU low sulfur fuel oil limits in place.

Exhibit 2.18 Currently Adopted Sulfur Content and Control Factors for Residential Fuel Oil Combustion

STATE	FIPS	CNTY_NAME	Sulfur Content (ppm)					Control Factor			
			2007	2013	2017	2020	2025	CF_07_13	CF_07_17	CF_07_20	CF_07_25
CT	09001	Fairfield	3000	3000	3000	3000	3000	1.000	1.000	1.000	1.000
CT	09009	New Haven	3000	3000	3000	3000	3000	1.000	1.000	1.000	1.000
DE	10003	New Castle	3000	3000	3000	3000	3000	1.000	1.000	1.000	1.000
DC	11001	Washington	1000	1000	1000	1000	1000	1.000	1.000	1.000	1.000
MD	24003	Anne Arundel	3000	3000	15	15	15	1.000	0.005	0.005	0.005
MD	24005	Baltimore	3000	3000	15	15	15	1.000	0.005	0.005	0.005
MD	24013	Carroll	3000	3000	15	15	15	1.000	0.005	0.005	0.005
MD	24017	Charles	3000	3000	15	15	15	1.000	0.005	0.005	0.005
MD	24021	Frederick	3000	3000	15	15	15	1.000	0.005	0.005	0.005
MD	24025	Harford	3000	3000	15	15	15	1.000	0.005	0.005	0.005
MD	24027	Howard	3000	3000	15	15	15	1.000	0.005	0.005	0.005
MD	24031	Montgomery	3000	3000	15	15	15	1.000	0.005	0.005	0.005
MD	24033	Prince Georges	3000	3000	15	15	15	1.000	0.005	0.005	0.005
MD	24043	Washington	3000	3000	15	15	15	1.000	0.005	0.005	0.005
MD	24510	Baltimore City	3000	3000	15	15	15	1.000	0.005	0.005	0.005
NJ	34003	Bergen	2000	2000	15	15	15	1.000	0.0075	0.0075	0.0075
NJ	34005	Burlington	2000	2000	15	15	15	1.000	0.0075	0.0075	0.0075
NJ	34007	Camden	2000	2000	15	15	15	1.000	0.0075	0.0075	0.0075
NJ	34013	Essex	2000	2000	15	15	15	1.000	0.0075	0.0075	0.0075
NJ	34015	Gloucester	2000	2000	15	15	15	1.000	0.0075	0.0075	0.0075
NJ	34017	Hudson	2000	2000	15	15	15	1.000	0.0075	0.0075	0.0075
NJ	34021	Mercer	2000	2000	15	15	15	1.000	0.0075	0.0075	0.0075
NJ	34023	Middlesex	2000	2000	15	15	15	1.000	0.0075	0.0075	0.0075
NJ	34025	Monmouth	2000	2000	15	15	15	1.000	0.0075	0.0075	0.0075
NJ	34027	Morris	2000	2000	15	15	15	1.000	0.0075	0.0075	0.0075
NJ	34031	Passaic	2000	2000	15	15	15	1.000	0.0075	0.0075	0.0075

STATE	FIPS	CNTY_NAME	Sulfur Content (ppm)					Control Factor			
			2007	2013	2017	2020	2025	CF_07_13	CF_07_17	CF_07_20	CF_07_25
NJ	34035	Somerset	2000	2000	15	15	15	1.000	0.0075	0.0075	0.0075
NJ	34039	Union	2000	2000	15	15	15	1.000	0.0075	0.0075	0.0075
NY	36005	Bronx	2000	15	15	15	15	0.007	0.007	0.007	0.007
NY	36047	Kings	2000	15	15	15	15	0.007	0.007	0.007	0.007
NY	36059	Nassau	3700	15	15	15	15	0.004	0.004	0.004	0.004
NY	36061	New York	2000	15	15	15	15	0.007	0.007	0.007	0.007
NY	36071	Orange	3700	15	15	15	15	0.004	0.004	0.004	0.004
NY	36081	Queens	2000	15	15	15	15	0.007	0.007	0.007	0.007
NY	36085	Richmond	2000	15	15	15	15	0.007	0.007	0.007	0.007
NY	36087	Rockland	3700	15	15	15	15	0.004	0.004	0.004	0.004
NY	36103	Suffolk	3700	15	15	15	15	0.004	0.004	0.004	0.004
NY	36119	Westchester	3700	15	15	15	15	0.004	0.004	0.004	0.004
PA	42003	Allegheny	3000	3000	3000	3000	3000	1.000	1.000	1.000	1.000
PA	42005	Armstrong	3000	3000	3000	3000	3000	1.000	1.000	1.000	1.000
PA	42007	Beaver	3000	3000	3000	3000	3000	1.000	1.000	1.000	1.000
PA	42011	Berks	3000	3000	3000	3000	3000	1.000	1.000	1.000	1.000
PA	42017	Bucks	3000	3000	3000	3000	3000	1.000	1.000	1.000	1.000
PA	42019	Butler	3000	3000	3000	3000	3000	1.000	1.000	1.000	1.000
PA	42021	Cambria	3000	3000	3000	3000	3000	1.000	1.000	1.000	1.000
PA	42029	Chester	3000	3000	3000	3000	3000	1.000	1.000	1.000	1.000
PA	42041	Cumberland	3000	3000	3000	3000	3000	1.000	1.000	1.000	1.000
PA	42043	Dauphin	3000	3000	3000	3000	3000	1.000	1.000	1.000	1.000
PA	42045	Delaware	3000	3000	3000	3000	3000	1.000	1.000	1.000	1.000
PA	42059	Greene	3000	3000	3000	3000	3000	1.000	1.000	1.000	1.000
PA	42063	Indiana	3000	3000	3000	3000	3000	1.000	1.000	1.000	1.000
PA	42071	Lancaster	3000	3000	3000	3000	3000	1.000	1.000	1.000	1.000
PA	42073	Lawrence	3000	3000	3000	3000	3000	1.000	1.000	1.000	1.000
PA	42075	Lebanon	3000	3000	3000	3000	3000	1.000	1.000	1.000	1.000

STATE	FIPS	CNTY_NAME	Sulfur Content (ppm)					Control Factor			
			2007	2013	2017	2020	2025	CF_07_13	CF_07_17	CF_07_20	CF_07_25
PA	42077	Lehigh	3000	3000	3000	3000	3000	1.000	1.000	1.000	1.000
PA	42091	Montgomery	3000	3000	3000	3000	3000	1.000	1.000	1.000	1.000
PA	42095	Northampton	3000	3000	3000	3000	3000	1.000	1.000	1.000	1.000
PA	42101	Philadelphia	3000	3000	3000	3000	3000	1.000	1.000	1.000	1.000
PA	42125	Washington	3000	3000	3000	3000	3000	1.000	1.000	1.000	1.000
PA	42129	Westmoreland	3000	3000	3000	3000	3000	1.000	1.000	1.000	1.000
PA	42133	York	3000	3000	3000	3000	3000	1.000	1.000	1.000	1.000
VA	51013	Arlington	3000	3000	3000	3000	3000	1.000	1.000	1.000	1.000
VA	51059	Fairfax	3000	3000	3000	3000	3000	1.000	1.000	1.000	1.000
VA	51107	Loudoun	3000	3000	3000	3000	3000	1.000	1.000	1.000	1.000
VA	51153	Prince William	3000	3000	3000	3000	3000	1.000	1.000	1.000	1.000
VA	51510	Alexandria	3000	3000	3000	3000	3000	1.000	1.000	1.000	1.000
VA	51600	Fairfax City	3000	3000	3000	3000	3000	1.000	1.000	1.000	1.000
VA	51610	Falls Church	3000	3000	3000	3000	3000	1.000	1.000	1.000	1.000
VA	51683	Manassas City	3000	3000	3000	3000	3000	1.000	1.000	1.000	1.000
VA	51685	Manassas Park City	3000	3000	3000	3000	3000	1.000	1.000	1.000	1.000

Exhibit 2.19 Currently Adopted Sulfur Content and Control Factors for Distillate Fuel Oil Combustion

STATE	FIPS	CNTY_NAME	Sulfur Content (% S)					Control Factor			
			2007	2013	2017	2020	2025	CF_07_13	CF_07_17	CF_07_20	CF_07_25
CT	09001	Fairfield	3000	3000	3000	3000	3000	1.000	1.000	1.000	1.000
CT	09009	New Haven	3000	3000	3000	3000	3000	1.000	1.000	1.000	1.000
DE	10003	New Castle	3000	3000	3000	3000	3000	1.000	1.000	1.000	1.000
DC	11001	Washington	1000	1000	1000	1000	1000	1.000	1.000	1.000	1.000
MD	24003	Anne Arundel	3000	3000	15	15	15	1.000	0.005	0.005	0.005
MD	24005	Baltimore	3000	3000	15	15	15	1.000	0.005	0.005	0.005
MD	24013	Carroll	3000	3000	15	15	15	1.000	0.005	0.005	0.005
MD	24017	Charles	3000	3000	15	15	15	1.000	0.005	0.005	0.005
MD	24021	Frederick	3000	3000	15	15	15	1.000	0.005	0.005	0.005
MD	24025	Harford	3000	3000	15	15	15	1.000	0.005	0.005	0.005
MD	24027	Howard	3000	3000	15	15	15	1.000	0.005	0.005	0.005
MD	24031	Montgomery	3000	3000	15	15	15	1.000	0.005	0.005	0.005
MD	24033	Prince Georges	3000	3000	15	15	15	1.000	0.005	0.005	0.005
MD	24043	Washington	3000	3000	15	15	15	1.000	0.005	0.005	0.005
MD	24510	Baltimore City	3000	3000	15	15	15	1.000	0.005	0.005	0.005
NJ	34003	Bergen	2000	2000	15	15	15	1.000	0.0075	0.0075	0.0075
NJ	34005	Burlington	2000	2000	15	15	15	1.000	0.0075	0.0075	0.0075
NJ	34007	Camden	2000	2000	15	15	15	1.000	0.0075	0.0075	0.0075
NJ	34013	Essex	2000	2000	15	15	15	1.000	0.0075	0.0075	0.0075
NJ	34015	Gloucester	2000	2000	15	15	15	1.000	0.0075	0.0075	0.0075
NJ	34017	Hudson	2000	2000	15	15	15	1.000	0.0075	0.0075	0.0075
NJ	34021	Mercer	2000	2000	15	15	15	1.000	0.0075	0.0075	0.0075
NJ	34023	Middlesex	2000	2000	15	15	15	1.000	0.0075	0.0075	0.0075
NJ	34025	Monmouth	2000	2000	15	15	15	1.000	0.0075	0.0075	0.0075
NJ	34027	Morris	2000	2000	15	15	15	1.000	0.0075	0.0075	0.0075
NJ	34031	Passaic	2000	2000	15	15	15	1.000	0.0075	0.0075	0.0075

STATE	FIPS	CNTY_NAME	Sulfur Content (% S)					Control Factor			
			2007	2013	2017	2020	2025	CF_07_13	CF_07_17	CF_07_20	CF_07_25
NJ	34035	Somerset	2000	2000	15	15	15	1.000	0.0075	0.0075	0.0075
NJ	34039	Union	2000	2000	15	15	15	1.000	0.0075	0.0075	0.0075
NY	36005	Bronx	2000	2000	15	15	15	1.000	0.007	0.007	0.007
NY	36047	Kings	2000	2000	15	15	15	1.000	0.007	0.007	0.007
NY	36059	Nassau	3700	3700	15	15	15	1.000	0.004	0.004	0.004
NY	36061	New York	2000	2000	15	15	15	1.000	0.007	0.007	0.007
NY	36071	Orange	3700	3700	15	15	15	1.000	0.004	0.004	0.004
NY	36081	Queens	2000	2000	15	15	15	1.000	0.007	0.007	0.007
NY	36085	Richmond	2000	2000	15	15	15	1.000	0.007	0.007	0.007
NY	36087	Rockland	3700	3700	15	15	15	1.000	0.004	0.004	0.004
NY	36103	Suffolk	3700	3700	15	15	15	1.000	0.004	0.004	0.004
NY	36119	Westchester	3700	3700	15	15	15	1.000	0.004	0.004	0.004
PA	42003	Allegheny	3000	3000	3000	3000	3000	1.000	1.000	1.000	1.000
PA	42005	Armstrong	3000	3000	3000	3000	3000	1.000	1.000	1.000	1.000
PA	42007	Beaver	3000	3000	3000	3000	3000	1.000	1.000	1.000	1.000
PA	42011	Berks	3000	3000	3000	3000	3000	1.000	1.000	1.000	1.000
PA	42017	Bucks	3000	3000	3000	3000	3000	1.000	1.000	1.000	1.000
PA	42019	Butler	3000	3000	3000	3000	3000	1.000	1.000	1.000	1.000
PA	42021	Cambria	3000	3000	3000	3000	3000	1.000	1.000	1.000	1.000
PA	42029	Chester	3000	3000	3000	3000	3000	1.000	1.000	1.000	1.000
PA	42041	Cumberland	3000	3000	3000	3000	3000	1.000	1.000	1.000	1.000
PA	42043	Dauphin	3000	3000	3000	3000	3000	1.000	1.000	1.000	1.000
PA	42045	Delaware	3000	3000	3000	3000	3000	1.000	1.000	1.000	1.000
PA	42059	Greene	3000	3000	3000	3000	3000	1.000	1.000	1.000	1.000
PA	42063	Indiana	3000	3000	3000	3000	3000	1.000	1.000	1.000	1.000
PA	42071	Lancaster	3000	3000	3000	3000	3000	1.000	1.000	1.000	1.000
PA	42073	Lawrence	3000	3000	3000	3000	3000	1.000	1.000	1.000	1.000
PA	42075	Lebanon	3000	3000	3000	3000	3000	1.000	1.000	1.000	1.000

STATE	FIPS	CNTY_NAME	Sulfur Content (% S)					Control Factor			
			2007	2013	2017	2020	2025	CF_07_13	CF_07_17	CF_07_20	CF_07_25
PA	42077	Lehigh	3000	3000	3000	3000	3000	1.000	1.000	1.000	1.000
PA	42091	Montgomery	3000	3000	3000	3000	3000	1.000	1.000	1.000	1.000
PA	42095	Northampton	3000	3000	3000	3000	3000	1.000	1.000	1.000	1.000
PA	42101	Philadelphia	3000	3000	3000	3000	3000	1.000	1.000	1.000	1.000
PA	42125	Washington	3000	3000	3000	3000	3000	1.000	1.000	1.000	1.000
PA	42129	Westmoreland	3000	3000	3000	3000	3000	1.000	1.000	1.000	1.000
PA	42133	York	3000	3000	3000	3000	3000	1.000	1.000	1.000	1.000
VA	51013	Arlington	3000	3000	3000	3000	3000	1.000	1.000	1.000	1.000
VA	51059	Fairfax	3000	3000	3000	3000	3000	1.000	1.000	1.000	1.000
VA	51107	Loudoun	3000	3000	3000	3000	3000	1.000	1.000	1.000	1.000
VA	51153	Prince William	3000	3000	3000	3000	3000	1.000	1.000	1.000	1.000
VA	51510	Alexandria	3000	3000	3000	3000	3000	1.000	1.000	1.000	1.000
VA	51600	Fairfax City	3000	3000	3000	3000	3000	1.000	1.000	1.000	1.000
VA	51610	Falls Church	3000	3000	3000	3000	3000	1.000	1.000	1.000	1.000
VA	51683	Manassas City	3000	3000	3000	3000	3000	1.000	1.000	1.000	1.000
VA	51685	Manassas Park City	3000	3000	3000	3000	3000	1.000	1.000	1.000	1.000

Exhibit 2.20 Currently Adopted Sulfur Content and Control Factors for Residual Fuel Oil Combustion

STATE	FIPS	CNTY_NAME	Sulfur Content (% S)					Control Factor			
			2007	2013	2017	2020	2025	CF_07_13	CF_07_17	CF_07_20	CF_07_25
CT	09001	Fairfield	1.0	1.0	1.0	1.0	1.0	1.000	1.000	1.000	1.000
CT	09009	New Haven	1.0	1.0	1.0	1.0	1.0	1.000	1.000	1.000	1.000
DE	10003	New Castle	1.0	1.0	1.0	1.0	1.0	1.000	1.000	1.000	1.000
DC	11001	Washington	1.0	1.0	1.0	1.0	1.0	1.000	1.000	1.000	1.000
MD	24003	Anne Arundel	1.0	1.0	0.5	0.5	0.5	1.000	0.500	0.500	0.500
MD	24005	Baltimore	1.0	1.0	0.5	0.5	0.5	1.000	0.500	0.500	0.500
MD	24013	Carroll	1.0	1.0	0.5	0.5	0.5	1.000	0.500	0.500	0.500
MD	24017	Charles	2.0	2.0	0.5	0.5	0.5	1.000	0.250	0.250	0.250
MD	24021	Frederick	2.0	2.0	0.5	0.5	0.5	1.000	0.250	0.250	0.250
MD	24025	Harford	1.0	1.0	0.5	0.5	0.5	1.000	0.500	0.500	0.500
MD	24027	Howard	1.0	1.0	0.5	0.5	0.5	1.000	0.500	0.500	0.500
MD	24031	Montgomery	1.0	1.0	0.5	0.5	0.5	1.000	0.500	0.500	0.500
MD	24033	Prince Georges	1.0	1.0	0.5	0.5	0.5	1.000	0.500	0.500	0.500
MD	24043	Washington	2.0	2.0	0.5	0.5	0.5	1.000	0.250	0.250	0.250
MD	24510	Baltimore City	1.0	1.0	0.5	0.5	0.5	1.000	0.500	0.500	0.500
NJ	34003	Bergen	0.3	0.3	0.3	0.3	0.3	1.000	1.000	1.000	1.000
NJ	34005	Burlington	0.5	0.5	0.5	0.5	0.5	1.000	1.000	1.000	1.000
NJ	34007	Camden	0.5	0.5	0.5	0.5	0.5	1.000	1.000	1.000	1.000
NJ	34013	Essex	0.3	0.3	0.3	0.3	0.3	1.000	1.000	1.000	1.000
NJ	34015	Gloucester	0.5	0.5	0.5	0.5	0.5	1.000	1.000	1.000	1.000
NJ	34017	Hudson	0.3	0.3	0.3	0.3	0.3	1.000	1.000	1.000	1.000
NJ	34021	Mercer	0.5	0.5	0.5	0.5	0.5	1.000	1.000	1.000	1.000
NJ	34023	Middlesex	0.3	0.3	0.3	0.3	0.3	1.000	1.000	1.000	1.000
NJ	34025	Monmouth	0.3	0.3	0.3	0.3	0.3	1.000	1.000	1.000	1.000
NJ	34027	Morris	0.3	0.3	0.3	0.3	0.3	1.000	1.000	1.000	1.000
NJ	34031	Passaic	0.3	0.3	0.3	0.3	0.3	1.000	1.000	1.000	1.000

STATE	FIPS	CNTY_NAME	Sulfur Content (% S)					Control Factor			
			2007	2013	2017	2020	2025	CF_07_13	CF_07_17	CF_07_20	CF_07_25
NJ	34035	Somerset	0.3	0.3	0.3	0.3	0.3	1.000	1.000	1.000	1.000
NJ	34039	Union	0.3	0.3	0.3	0.3	0.3	1.000	1.000	1.000	1.000
NY	36005	Bronx	0.3	0.3	0.3	0.3	0.3	1.000	1.000	1.000	1.000
NY	36047	Kings	0.3	0.3	0.3	0.3	0.3	1.000	1.000	1.000	1.000
NY	36059	Nassau	0.37	0.37	0.37	0.37	0.37	1.000	1.000	1.000	1.000
NY	36061	New York	0.3	0.3	0.3	0.3	0.3	1.000	1.000	1.000	1.000
NY	36071	Orange	1.5	1.5	0.5	0.5	0.5	1.000	0.333	0.333	0.333
NY	36081	Queens	0.3	0.3	0.3	0.3	0.3	1.000	1.000	1.000	1.000
NY	36085	Richmond	0.3	0.3	0.3	0.3	0.3	1.000	1.000	1.000	1.000
NY	36087	Rockland	0.37	0.37	0.37	0.37	0.37	1.000	1.000	1.000	1.000
NY	36103	Suffolk	1	1	0.5	0.5	0.5	1.000	0.500	0.500	0.500
NY	36119	Westchester	0.37	0.37	0.37	0.37	0.37	1.000	1.000	1.000	1.000
PA	42003	Allegheny	2.8	2.8	2.8	2.8	2.8	1.000	1.000	1.000	1.000
PA	42005	Armstrong	2.8	2.8	2.8	2.8	2.8	1.000	1.000	1.000	1.000
PA	42007	Beaver	2.8	2.8	2.8	2.8	2.8	1.000	1.000	1.000	1.000
PA	42011	Berks	2.0	2.0	2.0	2.0	2.0	1.000	1.000	1.000	1.000
PA	42017	Bucks	1.0	1.0	1.0	1.0	1.0	1.000	1.000	1.000	1.000
PA	42019	Butler	2.8	2.8	2.8	2.8	2.8	1.000	1.000	1.000	1.000
PA	42021	Cambria	2.0	2.0	2.0	2.0	2.0	1.000	1.000	1.000	1.000
PA	42029	Chester	1.0	1.0	1.0	1.0	1.0	1.000	1.000	1.000	1.000
PA	42041	Cumberland	2.8	2.8	2.8	2.8	2.8	1.000	1.000	1.000	1.000
PA	42043	Dauphin	2.8	2.8	2.8	2.8	2.8	1.000	1.000	1.000	1.000
PA	42045	Delaware	1.0	1.0	1.0	1.0	1.0	1.000	1.000	1.000	1.000
PA	42059	Greene	2.8	2.8	2.8	2.8	2.8	1.000	1.000	1.000	1.000
PA	42063	Indiana	2.8	2.8	2.8	2.8	2.8	1.000	1.000	1.000	1.000
PA	42071	Lancaster	2.0	2.0	2.0	2.0	2.0	1.000	1.000	1.000	1.000
PA	42073	Lawrence	2.8	2.8	2.8	2.8	2.8	1.000	1.000	1.000	1.000
PA	42075	Lebanon	2.8	2.8	2.8	2.8	2.8	1.000	1.000	1.000	1.000

STATE	FIPS	CNTY_NAME	Sulfur Content (% S)					Control Factor			
			2007	2013	2017	2020	2025	CF_07_13	CF_07_17	CF_07_20	CF_07_25
PA	42077	Lehigh	2.0	2.0	2.0	2.0	2.0	1.000	1.000	1.000	1.000
PA	42091	Montgomery	1.0	1.0	1.0	1.0	1.0	1.000	1.000	1.000	1.000
PA	42095	Northampton	2.0	2.0	2.0	2.0	2.0	1.000	1.000	1.000	1.000
PA	42101	Philadelphia	1.0	1.0	1.0	1.0	1.0	1.000	1.000	1.000	1.000
PA	42125	Washington	2.8	2.8	2.8	2.8	2.8	1.000	1.000	1.000	1.000
PA	42129	Westmoreland	2.8	2.8	2.8	2.8	2.8	1.000	1.000	1.000	1.000
PA	42133	York	2.8	2.8	2.8	2.8	2.8	1.000	1.000	1.000	1.000
VA	51013	Arlington	2.25	2.25	2.25	2.25	2.25	1.000	1.000	1.000	1.000
VA	51059	Fairfax	2.25	2.25	2.25	2.25	2.25	1.000	1.000	1.000	1.000
VA	51107	Loudoun	2.25	2.25	2.25	2.25	2.25	1.000	1.000	1.000	1.000
VA	51153	Prince William	2.25	2.25	2.25	2.25	2.25	1.000	1.000	1.000	1.000
VA	51510	Alexandria	2.25	2.25	2.25	2.25	2.25	1.000	1.000	1.000	1.000
VA	51600	Fairfax City	2.25	2.25	2.25	2.25	2.25	1.000	1.000	1.000	1.000
VA	51610	Falls Church	2.25	2.25	2.25	2.25	2.25	1.000	1.000	1.000	1.000
VA	51683	Manassas City	2.25	2.25	2.25	2.25	2.25	1.000	1.000	1.000	1.000
VA	51685	Manassas Park City	2.25	2.25	2.25	2.25	2.25	1.000	1.000	1.000	1.000

3.0 POINT SOURCES

3.1 POINT SOURCE CATEGORIES

States were asked to classify units in the 2007 MANE-VU+VA point source emissions inventory as either EGU or nonEGU. Most, but not all, units that report hourly emissions to USEPA's Clean Air Markets Division (CAMD) are classified as EGUs.

CAMD implements USEPA's rule found in Volume 40 Part 75 of the Code of Federal Regulations (CFR), which requires an hourly accounting of emissions from each affected unit - i.e., sources participating in an emissions cap and trade program under the Acid Rain Control Program, the NO_x Budget Trading Program, or the Clean Air Interstate Rule. Most of the CAMD sources are traditional power plants that sell electricity to the electrical grid. However, there are other types of sources that report to CAMD that are not considered to be EGUs, such as petroleum refineries and cement kilns.

The following criteria was provided to states to classify a unit as an EGU:

- An EGU sells most of the power generated to the electrical grid;
- An EGU burns mostly commercial fuel. Commercial fuel in this case means natural gas, oil, and coal. Wood is not considered a commercial fuel because some states identify wood as renewable. Therefore, to avoid double counting, units that burn wood and other renewable sources (depending on each state's own definition) should not be considered as an EGU (unless it is already in the CAMD database).

The following units were not considered EGUs for emission projections: (1) a unit that generates power for a facility but occasionally sells to the grid; (2) emergency generators; or (3) distributed generation units.

The emission projection methodology for units classified as nonEGUs is discussed in Section 3.3. The emission projection methodology for EGUs is discussed in Section 3.4.

3.2 2007 INVENTORY DEVELOPMENT

The emission projections for the 2025 point source were based on Version 3_3 of the 2007 MANE-VU+VA inventory and are fully documented in the TSD for that effort (MARAMA 2012a). The only adjustment to the 2007 Version 3_3 point source source inventory was to apply "transport factors" to fugitive dust sources, as described in the following subsection.

3.2.1 Adjustments to the 2007 Inventory Used for the 2025 Projections

As described previously in Section 2.2.1.1, PM_{2.5} emissions for point sources were adjusted using the USEPA PM transport fractions for fugitive dust sources. Exhibit 3.1 shows the list of nonEGU SCCs for which the transport factor was applied. The major source categories included various operations in the mineral products and construction industries. Exhibit 2.2 in the previous Section 2 shows the transport fractions for each PM nonattainment county.

Exhibit 3.1 NonEGU Point Source SCCs Affected by PM Transport Fraction

SCC	SCC Description
30300519	Prim Metal Prod: Primary Copper Smelting: Unpaved Road Traffic: Fug Emiss
30300831	Prim Metal Prod: Iron Production: Unpaved Roads: Light Duty Vehicles
30300832	Prim Metal Prod: Iron Production: Unpaved Roads: Med Duty Vehicles
30300833	Prim Metal Prod: Iron Production: Unpaved Roads: Heavy Duty Vehicles
30300834	Prim Metal Prod: Iron Production: Paved Roads: All Vehicle Types
30302321	Prim Metal Prod: Taconite Iron Ore Processing: Haul Road: Rock
30302322	Prim Metal Prod: Taconite Iron Ore Processing: Haul Road: Taconite
30500290	Industrial Processes;Mineral Products;Asphalt Concrete;Haul Roads: General
30501024	Mineral Products: Coal Mining, Cleaning, & Mat'l Handling: Hauling
30501030	Industrial Processes;Mineral Products;Coal Mining, Cleaning, and Material Handling (See 305310);Tops
30501031	Mineral Products: Coal Mining, Cleaning, & Mat'l Handling: Scrapers: Travel Mode
30501039	Mineral Products: Coal Mining, Cleaning, & Mat'l Handling: Hauling: Haul Trucks
30501045	Mineral Products: Coal Mining, Cleaning, & Mat'l Handling: Bulldozing: Overburden
30501046	Mineral Products: Coal Mining, Cleaning, & Mat'l Handling: Bulldozing: Coal
30501047	Mineral Products: Coal Mining, Cleaning, & Mat'l Handling: Grading
30501048	Industrial Processes;Mineral Products;Coal Mining, Cleaning, and Material Handling (See 305310);Over
30501049	Industrial Processes;Mineral Products;Coal Mining, Cleaning, and Material Handling (See 305310);Wind
30501050	Mineral Products: Coal Mining, Cleaning, & Mat'l Handling: Vehicle Traffic: Light/Medium Vehicles
30501090	Mineral Products: Coal Mining, Cleaning, & Mat'l Handling: Haul Roads: General
30501640	Mineral Products: Lime Manufacture: Vehicle Traffic
30502011	Mineral Products: Stone Quarrying - Processing: Hauling
30502504	Mineral Products: Construction Sand and Gravel: Hauling
30531090	Mineral Products: Coal Mining, Cleaning, & Mat'l Handling: Haul Roads: General
31100101	Building Const: Construction: Building Contractors: Site Preparation: Topsoil Removal
31100102	Building Const: Construction: Building Contractors: Site Prep: Earth Moving (Cut and Fill)

SCC	SCC Description
31100103	Building Const: Construction: Building Contractors: Site Prep: Aggregate Hauling (On Dirt)
31100205	Building Const: Demolitions/Special Trade Contracts: On-site Truck Traffic
31100206	Building Const: Demolitions/Special Trade Contracts: On-site Truck Traffic
50100401	Waste Disposal;Solid Waste Disposal - Government;Landfill Dump;Unpaved Road Traffic

3.3 2025 NONEGU INVENTORY DEVELOPMENT

3.3.1 NonEGU Growth Factors

NonEGU point source growth factors were developed using three sets of data:

- Annual Energy Outlook fuel consumption forecasts;
- State-level employment projections by NAICS code; and
- Other state-specific emission projection data.

The priority for applying these growth factors was to first use the state-supplied projection data (if available). If no state-supplied data are available, then we used AEO projection factors for fuel consumption sources and employment data for other source categories.

The AEO fuel consumption forecasts and employment projections by NAICS code used for area sources were also used for nonEGU point sources. See Section 2.3.1 of this report for a description of these data sets.

Section 2 described the growth factors used to develop projected future year emissions inventories for both area and non-EGU sources. Draft growth and control factors, and a draft technical support document, were circulated for review by MARAMA and state agencies. During the review, it was noted that several emissions categories show negative growth into the future, particularly categories related to fossil fuel combustion and manufacturing employment. The AEO forecasts show declining trends for many fuel consumption sectors, especially industrial, residential, and commercial distillate fuel oil use. Similarly, the employment projections show declines in the predicted number of employees for many sectors of the economy. This is particularly true for the manufacturing sector, which is of interest because this sector is often associated with higher emissions than those for other sectors. By contrast, the employment projections show increasing trends in retail and service-related sectors.

Predicted declines in fuel use and employment resulted in growth factors less than unity (i.e., represent negative growth) for many area and non-EGU point source categories. Consequently, for some categories, emissions are lower for the projected future years than

for the base year, even before the application of control assumptions (i.e., the future "growth only" emissions are lower than the base year emissions). The MARAMA emissions inventory workgroup met on several occasions via conference calls and email exchanges to discuss whether the negative growth projections were realistic, and what additional assumptions should be made. A topic of particular concern is negative growth for non-EGU point sources versus the treatment of Emissions Reduction Credits (ERCs) in the future year inventories.

A few states cited the importance of the negative growth issue for non-EGUs and how it relates to their ERC programs which are critical to new businesses being able to locate in those states. Because businesses could apply for and sell ERCs at the level of the base year inventory, it would not be realistic to show negative growth for non-EGU point sources. During an economic downturn, a facility could shut down and sell its ERCs, making the effective level of future year emissions equal to (i.e., no lower than) the base year. Therefore, a recommended conservative approach for addressing negative growth for non-EGU point sources is to set a minimum growth rate of 1 (no growth).

During the conference call held on July 23, 2010 to discuss the negative growth issue, state agency representatives were polled as to whether or not they felt that the current set of proposed growth factors - including the negative growth factors - were realistic for their state or district. In reply, some representatives mentioned that they have observed historic state-specific data that supports the trends displayed by the proposed growth factors. Other representatives mentioned that they feel comfortable with the growth factors and don't have a technical basis to change them or suggest others. Some states will supply their own factors or make their own assumptions.

As a result of these discussions, each state provided guidance on how to handle projections when negative growth is indicated. Exhibit 3.2 shows the state recommendations for nonEGU point sources.

**Exhibit 3.2 State Recommendations to Address Negative Growth
for the NonEGU Point Source Sector**

State	AEO2010 Growth Factors	Employment Growth Factors
CT	Use no growth (growth factor=1) when AEO growth is negative; otherwise use AEO2010 if positive growth	Use state DOL employment projections by 3-digit NAICS
DE	Use AEO2010 growth rates	For 2013, use state DOL employment projections by 3-digit NAICS; For 2017 and 2020, use no growth (growth factor=1) when employment growth is

State	AEO2010 Growth Factors	Employment Growth Factors
		negative; otherwise use employment if positive growth
DC	Use AEO2010 growth rates	Use state 2008-2018 DOL employment projections by 3-digit NAICS; no growth when employment is projected to decrease
MD	Not using AEO2010 growth factors (except for the electric power generation SCCs); Use MD DOL employment projections for industrial and commercial fuel use SCCs, unless employment growth rate is negative, in which case use no growth (growth factor=1)	Use updated state DOL employment projections by 3-digit NAICS; For DoD facilities, account for impacts of Base Realignment and Closure; For source that have closed, account for emission reduction credits
NJ	New Jersey submitted state specific growth factors. Used either state specific growth factors, no growth (growth factor=1) when state AEO growth is negative or AEO if positive growth	NJ submitted state specific growth factors. Used either state specific factors, no growth (growth factor=1) when state DOL employment growth is negative or employment if positive growth
NY	Use no growth (growth factor=1) when AEO growth is negative; otherwise use AEO2010 if positive growth	Use no growth (growth factor=1) when employment growth is negative; otherwise use employment if positive growth
PA	Use no growth (growth factor=1) when AEO growth is negative; otherwise use AEO2010 if positive growth	Use no growth (growth factor=1) when employment growth is negative; otherwise use employment if positive growth
VA	Use no growth (growth factor=1) when AEO growth is negative; otherwise use AEO2010 if positive growth	Use no growth (growth factor=1) when employment growth is negative; otherwise use employment if positive growth

3.3.2 Emission Reduction Credits

Multiple states (Connecticut, Maryland, and New Jersey) added county level records account for account emission reduction credits (ERCs) issued to stationary sources pursuant to state regulations. States provided ERCs on a county-by-county basis. Fictitious facilities with an identifier of "OFFSET99999" were created for each county using SCC 23-99-000-000 (miscellaneous industrial processes: not elsewhere classified). Stack data were developed that assumed that emissions were released at the county centroid with an assumed release height of 10 feet. For the 2017 and 2020 inventories, ERC emissions were set to the amount of banked emissions available in 2007.

Delaware included the banked credits at the specific locations that they were generated. New York and Pennsylvania did not explicitly provide any information on ERCs.

The District of Columbia and Virginia do not have a formal banking and trading program. They used growth rates of 1 for those SCCs in the point source emissions inventory that showed a negative growth. In addition, for units that have or are projected to have shut

down, they preserved the 2007 emissions in the inventory to account for potential use as offsets or credits.

3.3.3 NonEGU Control Factors

Control factors were developed for both on-the-books regulations and proposed regulations and other actions to estimate emission reductions in future years. Control factors were considered for the following national or regional control measures:

- Federal Rules Affecting NonEGU Point Sources
- OTC 2001 Model Rules
- OTC 2006 Model Rules
- MANE-VU Sulfur in Fuel Oil Strategy

These control programs are discussed in the following subsections.

3.3.3.1 Federal Actions Affecting NonEGU Point Sources

USEPA made available its 2020 emissions projections associated with its 2005-based v4 modeling platform (USEPA 2010a). These categories, and how they were accounted for in the MANE-VU+VA emission projection inventories, are described below:

- MACT Standards - USEPA developed guidance for estimating VOC and NO_x emission changes from MACT Rules (USEPA 2007b). We reviewed the guidance to identify nonEGU source controls associated with MACT standards for controlling HAPs. The information concerning MACT compliance periods was used to determine whether the MACT standard resulted in post-2007 emission reductions. Because major source categories had a compliance period of 2007 or earlier, we assumed that the emission reductions from the MACT standard should be reflected in the baseline year and not as an additional post-2007 credit. The only exception to the above discussion of area source MACT standards pertains to the recently promulgated rules for reciprocating internal combustion engines. USEPA made available an estimate of the percent reduction in emissions attributable to the RICE MACT rule in 2012 and 2014 (USEPA 2010b). These reductions by SCC are shown in Exhibit 3.3. The USEPA 2014 estimates were used for the MANE-VU+VA 2017, 2020 and 2025 inventories.
- Industrial, Commercial, and Institutional Boilers and Process Heaters MACT Standard - USEPA's 2020 control factor file identified a number of solid fuel-burning SCCs for which they estimated an 87% reduction in both PM₁₀ and PM_{2.5}. These were used for 2025 also for the affected SCCs.

- Petroleum refinery enforcement settlements - For the facilities identified by USEPA located in New Jersey and Pennsylvania we applied post-2007 estimated reductions for NO_x, PM₁₀, PM_{2.5}, and SO₂ to affected units.

Exhibit 3.3 USEPA Estimated Percent Reductions for RICE MACT Standard

SCC	NO _x	PM _{2.5}	SCC Description
20100102		15.14	Electric Generation;Distillate Oil (Diesel);Reciprocating
20100105		15.14	Electric Generation;Distillate Oil (Diesel);Reciprocating: Crankcase Blowby
20100107		15.14	Electric Generation;Distillate Oil (Diesel);Reciprocating: Exhaust
20100202	12.53		Electric Generation;Natural Gas;Reciprocating
20100207	12.53		Electric Generation;Natural Gas;Reciprocating: Exhaust
20200102		15.14	Industrial;Distillate Oil (Diesel);Reciprocating
20200104		15.14	Industrial;Distillate Oil (Diesel);Reciprocating: Cogeneration
20200107		15.14	Industrial;Distillate Oil (Diesel);Reciprocating: Exhaust
20200202	12.53		Industrial;Natural Gas;Reciprocating
20200204	12.53		Industrial;Natural Gas;Reciprocating: Cogeneration
20200207	12.53		Industrial;Natural Gas;Reciprocating: Exhaust
20200253	37.96		Industrial;Natural Gas;4-cycle Rich Burn
20200301	37.96		Industrial;Gasoline;Reciprocating
20200307	37.96		Industrial;Gasoline;Reciprocating: Exhaust
20201001	12.53		Industrial;Liquified Petroleum Gas (LPG);Propane
20201002	12.53		Industrial;Liquified Petroleum Gas (LPG);Butane
20201702	37.96		Industrial;Gasoline;Reciprocating Engine
20201707	37.96		Industrial;Gasoline;Reciprocating: Exhaust
20300101		15.14	Commercial/Institutional;Distillate Oil (Diesel);Reciprocating
20300105		15.14	Commercial/Institutional;Distillate Oil (Diesel);Reciprocating: Crankcase Blowby
20300106		15.14	Commercial/Institutional;Distillate Oil (Diesel);Reciprocating: Evaporative Losses
20300107		15.14	Commercial/Institutional;Distillate Oil (Diesel);Reciprocating: Exhaust
20300201	12.53		Commercial/Institutional;Natural Gas;Reciprocating
20300204	12.53		Commercial/Institutional;Natural Gas;Cogeneration
20300207	12.53		Commercial/Institutional;Natural Gas;Reciprocating: Exhaust
20300301	37.96		Commercial/Institutional;Gasoline;Reciprocating
20300307	37.96		Commercial/Institutional;Gasoline;Reciprocating: Exhaust
20301001	12.53		Commercial/Institutional;Liquified Petroleum Gas (LPG);Propane
20301002	12.53		Commercial/Institutional;Liquified Petroleum Gas (LPG);Butane
20400401	37.96		Engine Testing;Reciprocating Engine;Gasoline

SCC	NO _x	PM _{2.5}	SCC Description
20400402		15.14	Engine Testing;Reciprocating Engine;Diesel/Kerosene
20400403		15.14	Engine Testing;Reciprocating Engine;Distillate Oil: Cl: Cl: VOC 2005cr = 0
31000203	12.53		Oil and Gas Production;Natural Gas Production;Compressors
50100421	12.53		Solid Waste Disposal;Landfill Dump;Waste Gas Recovery: Internal Combustion Device

3.3.3.2 OTC 2001 Model Rules for NonEGUs

The OTC developed NO_x control measures for industrial, commercial, and institutional (ICI) boilers and distributed generation units in 2001 (OTC 2001). We reviewed the OTC's status reports to identify states status in adopting the OTC 2001 model rules (OTC 2009a). Most states have adopted the OTC model rules with compliance dates in 2007 or earlier. As a result, we assumed that the emission reductions from the 2001 OTC model rules for nonEGUs are already reflected in the 2007 inventory and no post- 2007 reductions were applied.

3.3.3.3 OTC 2006 Model Rules for NonEGUs

In 2006, the OTC introduced model rules (OTC 2007) for one nonEGU VOC source category (adhesives/sealants) and new/more stringent requirements for several NO_x source categories (asphalt production plants, cement kilns, glass/fiberglass furnaces, and industrial, commercial, and institutional {ICI} boilers). We reviewed the OTC's status reports to identify where state status in adopting the OTC 2006 model rules (OTC 2009b). To obtain further clarification of each state's status, states were polled to determine whether they have adopted a rule that would achieve reductions equivalent to the OTC model rule, whether credit for each rule was already accounted for in the 2007 inventory, and whether the estimated reduction in emissions should be applied in 2013, 2017, 2020 and 2025. The following paragraphs describe the control factors applied for each rule by state and future year.

3.3.3.3.1 OTC 2006 Model Rule for Asphalt Production Plants

The OTC recommended that member states pursue state-specific rulemakings or other implementation methods that would achieve a 35 percent reduction in NO_x emissions. States were polled to determine whether they have adopted a rule that would achieve reductions equivalent to the 2006 OTC model rule and whether the estimated reduction in NO_x emissions should be applied in 2013, 2017, 2020 and 2025. Only New Jersey indicated that the reductions should be applied. New York did not provide guidance, and it

was assumed that the NO_x reductions should be applied in New York for three future years. All other states indicated that the NO_x reductions should not be applied in the future years. For those states that indicated they wanted to include the reductions, a 35 percent reduction in NO_x emissions was applied for SCC 3-05-002-xx.

3.3.3.3.2 OTC 2006 Model Rule for Cement Manufacturing Plants

Cement kilns are located in Maryland, New York, and Pennsylvania. Virginia has one cement kiln, which is not located in a PM nonattainment county. The OTC recommended state-specific rulemakings or other implementation methods that would result in about a 60 percent reduction in uncontrolled levels NO_x emissions. This emission reduction for cement kilns was calculated using the methodology previously developed and documented in the OTC report (OTC 2007). Cement kilns are already subject to NO_x controls as part of Phase I of the NO_x SIP call. Emission reductions resulting from the NO_x SIP call are already accounted for in the 2007 inventory.

The following methods were used to calculate the additional reductions from the OTC 2006 Control Measure in each state:

- Maryland indicated controls will become effective in 2011 for the two facilities in the state. Maryland specified a 25 percent reduction for the Holcim facility and a 40 percent reduction for the Lehigh facility. No reductions were specified for the two kilns at the Essroc facility.
- New York did not provide guidance regarding cement kilns. We used the percent reductions previously developed and documented in the previous round of emission projections developed for MARAMA (MARAMA 2007). An incremental control efficiency of 40 percent was used for New York cement kilns in that inventory.
- Pennsylvania provided kiln-specific projected future year NO_x emissions for 2013, 2017, and 2020. The 2020 controlled emissions were also used for 2025. A kiln-specific control factor was calculated based on the ratio of the future year emissions to the 2007 emissions.

3.3.3.3.3 OTC 2006 Model Rule for Glass and Fiberglass Furnaces

The OTC recommended state-specific rulemakings or other implementation methods to achieve an approximately 85 percent reduction in NO_x emissions from uncontrolled levels. Emission reductions for glass and fiberglass furnaces were calculated using the methodology previously developed and documented in the OTC report (OTC 2007). Glass and fiberglass furnaces are located in Maryland, New Jersey, New York, and Pennsylvania. There are no other States with facilities in a PM nonattainment county.

The following methods were used to calculate the additional reductions from the OTC 2006 Control Measure in each state:

- Maryland indicated that a 48 percent reduction should be applied to the single glass manufacturing facility in Maryland.
- New Jersey indicated that a 50 percent reduction in NO_x emissions should be applied to glass and fiberglass furnaces in 2013, 2017, 2020 and 2025.
- New York did not provide guidance regarding glass or fiberglass furnaces. We used the percent reductions developed and documented in the previous round of emission projections developed for MARAMA (MARAMA 2007). An incremental control efficiency of 70 percent was used for New York glass and fiberglass furnaces in that inventory.
- Pennsylvania provided furnace-specific projected future year NO_x emissions for 2017 and 2020 for all facilities, including those in Allegheny County. The 2020 controlled emissions were also used for 2025. A furnace-specific control factor was calculated based on the ratio of the future year emissions to the 2007 emissions.
- For the three glass manufacturing facilities in Allegheny County, we used the percent reductions previously developed and documented in the previous round of emission projections developed for MARAMA (MARAMA 2007). An incremental control efficiency of 86 percent was used for Allegheny County glass and fiberglass furnaces in that inventory.

3.3.3.3.4 OTC 2006 Model Rule for ICI Boilers

The OTC recommended that member states pursue state-specific rulemakings or other implementation methods to achieve NO_x emission reduction for industrial, commercial, and institutional (ICI) boilers based on guidelines that varied by boiler size and fuel type. States were polled to determine whether they have adopted a rule that would achieve reductions equivalent to the 2006 OTC recommendations and whether the estimated reduction in NO_x emissions should be applied in 2013, 2017, 2020, and 2025.

Most states have not adopted rules equivalent to the 2006 OTC recommendations. These states indicated that they will likely depend on a USEPA national rule for possible inclusion in the BOTW inventory. Specifically, the OTC Resolution 10-01 (June, 2010) called on USEPA for national regulations for ICI boilers.

New Jersey provided NO_x percent reductions that varied by heat input rate and fuel/boiler type and included an 80 percent rule effectiveness adjustment, as shown in Exhibit 3.4.

Exhibit 3.4 NonEGU Point Source Emission Reductions from New Jersey ICI Boiler NO_x Rules

Heat Input Rate (mmBtu/hr)	Fuel/Boiler Type	Overall % Reduction 2007-2025
at least 5 but < 10	All	20%
at least 10 but < 20	All	20%
at least 25 but < 50	Natural gas only	40%
	No. 2 Fuel oil only	40%
	Refinery fuel gas and other gaseous fuels	40%
	Other liquid fuels	40%
	Duel Fuel using fuel oil and/or natural gas	40%
at least 50 but < 100	Natural gas only	40%
	No. 2 Fuel oil only	27%
	Other liquid fuels	27%
	Duel Fuel using fuel oil and/or natural gas	40%
at least 100 or greater	No. 2 Fuel oil only	40%

The NIF file submitted by New Jersey for this project did not include the boiler design capacity. This data gap was filled using the boiler design capacities previously developed for the OTC study in 2006, if available; otherwise the SCC description was used to assign a default boiler design capacity.

New York specified that a 50 percent reduction should be applied in the existing controls inventory for all boilers with greater than 25 mmBtu/hour design capacity. The NIF file submitted by New York for this project did not include the boiler design capacity. This data gap was filled using the boiler design capacities previously developed for the OTC study in 2006, if available; otherwise the SCC description was used to assign a default boiler design capacity.

3.3.3.4 MANE-VU Fuel Oil Sulfur Strategy

MANE-VU developed a low sulfur fuel oil strategy to help states develop Regional Haze SIPs (MANE-VU 2007). The sulfur in fuel oil recommendations were previously shown in Section 2.3.2.5 and vary by state, fuel oil type, and implementation year.

3.3.3.5 State-specific NonEGU Control Factors

The following state-specific nonEGU control factors were provided:

- **Bellefield Boiler Plant, Allegheny County.** Allegheny County indicated that this facility changed their fuel source from coal to natural gas in July 2009 and future year emissions were changed to reflect the fuel switch.
- **USS Clairton Works, Allegheny County.** The facility will remove Batteries 7-9 and have Battery C operational by 2013, resulting in a change in PM emissions in 2013. Also, USS Clairton Works will remove Batteries 1-3 and have Battery D operational in 2015, resulting in a change in PM emissions in 2017, 2020 and 2025.
- **Chrysler, Delaware.** The Chrysler facility (ID 1000300128) shut down in 2009. Delaware specified that only a 25 percent reduction should be taken for all pollutants as some emissions will be banked for future use by other sources.
- **OSG Ship Management (ID 1000500093), Delaware.** Delaware provided source-specific growth factors and percent reductions in VOC emissions for 2013, 2017, and 2020 from the lightering operations at OSG Ship Management (ID 1000500093). The 2025 emissions were expected to be the same as the 2020 emissions.
- **Control Technology Guidance (CTG) Documents, Delaware.** Delaware determined that VOC emission reductions from new CTG recommendations would be very small. Although the new CTGs set up new recommendations for higher control efficiencies, the actual VOC reductions would be minimum, if not none, because most DE's existing facilities are not affected by the new requirements and emissions from those facilities are relatively small (based on 2002 inventory).
- **Unit Shutdowns, Delaware.** Delaware identified several emission units that have shut down at the following facilities: Dow Reichhold Specialty latex (ID 1000100016), SPI Poly-Ols (ID 1000300426), and Invistas (ID 1000500002). Emissions for all pollutants were set to zero for these units.
- **Premcor Refinery NO_x Plantwide Cap, Delaware.** The refinery was sold to the Delaware City Refining Company and an agreement was reached with DNREC's Secretary that allows plant-wide applicability limit (cap) for NO_x. Delaware decided to divide the NO_x -cap to each stack equally. Delaware estimated a plantwide reduction of 10.05 percent in 2013 and 41.22 percent in 2017, 2020 and 2025.
- **PEPCO Benning Road, District of Columbia.** This facility is scheduled for deactivation in 2012. All emissions were set to zero in the projection inventories.

- **2009 New Jersey Rule for NO_x for Municipal Solid Waste Incinerators.** This rule will achieve a 27 percent reduction from one facility - Camden County Energy Recovery Associates, L.P. (ID 3400751614).
- **New Jersey Rule for VOC Storage Tanks.** New Jersey provided expected VOC emission reductions resulting from post-2007 rules for VOC storage tanks. For refinery floating roof storage tanks (SCC 4-03-011-xx), the reductions are 75 percent for 2013, 82 percent for 2017, and 85 percent for 2020. For bulk terminal tanks (SCC 4-04-001-xx), the reductions are 20 percent for 2013, 40 percent for 2017, and 50 percent for 2020. For pipeline breakout stations (SCCs 4-04-002-xx and 4-06-005-xx), the reductions are 26 percent for 2013, 52 percent for 2017, and 65 percent for 2020 and 2025.

3.4 2025 EGU INVENTORY DEVELOPMENT

An emission projection methodology for EGUs is being developed as part of an inter-RPO coordination effort under the direction of ERTAC. The computer code to implement the ERTAC methodology will not be available in time for use in state's re-designation requests or maintenance plans. An interim approach for projecting EGU emissions is discussed in the following paragraph.

Annual 2007 EGU point emissions were grown to 2025 based on electricity generation projections that are delineated by region and fuel. Growth factors are based on AEO2011 Table 96 - Electricity Generation by Electricity Market Module Region and Fuel Source (see Appendix F). The 2007 emissions were extracted for those units flagged as EGUs in the MANE-VU+VA 2007 inventory. The appropriate AEO2011 growth factor was applied to the 2007 emissions to calculate a "growth only" emission value for 2025. The following key assumptions were made:

- Growth beyond unit capacity or permit limits was not considered (e.g., fuel consumption was allowed to grow beyond a unit's physical capacity or permit limit);
- Generation from specific new units that are anticipated to operate in 2025 but did not in 2007 is not explicitly accounted for, but instead is assumed to be accounted for in the AEO2011 growth forecasts;
- Similarly, generation from specific units that have or are anticipated to shut down after 2007 is not explicitly accounted for, but instead are assumed to be accounted for in the AEO2011 growth forecasts.

- States indicated where post-2007 controls or shut downs were to be applied on a unit by unit basis. The control factors were applied to the grown emissions to calculate a “growth and control” emission value for 2025.

Details on the growth and control factors are provided in the following sections.

3.4.1 EGU Growth Factors

Table 96 of the AEO2011 provides electricity generation projections by electricity market module region and fuel source for the years 2007 to 2035 (EIA 2011b). AEO2011 disaggregates generation to 22 sub-regions for electricity planning and dispatch. This is a new approach started in AEO2011. Disaggregation of the Electricity Market Module (EMM) is intended to reduce errors that result from aggregation and averaging, to better represent environmental and regional issues, and thus to improve the projections of capacity additions and fuels consumed for generation. Exhibit 4.1 identifies the 22 sub-regions.



1. ERCT	ERCOT All	12. SRDA	SERC Delta
2. FRCC	FRCC All	13. SRGW	SERC Gateway
3. MROE	MRO East	14. SRSE	SERC Southeastern
4. MROW	MRO West	15. SRCE	SERC Central
5. NEW	NPCC New England	16. SRVC	SERC VACAR
6. NYCW	NPCC NYC/Westchester	17. SPNO	SPP North
7. NYLI	NPCC Long Island	18. SPSO	SPP South
8. NYUP	NPCC Upstate NY	19. AZNM	WECC Southwest
9. RFCE	RFC East	20. CAMX	WECC California
10. RFCM	RFC Michigan	21. NWPP	WECC Northwest
11. RFCW	RFC West	22. RMPA	WECC Rockies

Exhibit 3.5 Electricity Market Module Regions

The EIA provided a file that assigns each EGU to an EMM region. Units in the PM nonattainment counties included in this analysis reside in one of the following seven EMM regions:

- Northeast Power Coordinating Council / Northeast (NEWE)
- Northeast Power Coordinating Council / NYC Westchester (NYCW)
- Northeast Power Coordinating Council / Long Island (NYLI)
- Northeast Power Coordinating Council / Upstate New York (NYUP)
- Reliability First Corporation / East (RFCE)
- Reliability First Corporation / West (RFCW)
- SERC Reliability Corporation / Virginia Carolina (SRVC)

Exhibit 3.6 shows the growth factors for electricity generation for coal. The AEO2011 shows zero generation from coal in the NYC Westchester and Long Island regions. Generation from coal is projected to decline significantly in the Northeast and Upstate New York regions. Generation from coal is expected to decline slightly in the RFC East, RFC West, and SERC Virginia-Carolina regions.

Exhibit 3.7 shows the growth factors for electricity generation for petroleum. The AEO2011 shows that the growth factors vary widely by EMM region. A positive growth rate (e.g., growth factor > 1) from 2007 to 2025 is projected for the RFC East and SERC Virginia-Carolina regions. In all other EMM regions in the study area, generation from petroleum is projected to decline (e.g., growth factor < 1).

Exhibit 3.8 shows the growth factors for electricity generation for natural gas. The AEO2011 shows that the growth factors vary widely by EMM region. A negative growth rate (e.g., growth factor < 1) from 2007 to 2025 is projected for the NYC Westchester and SERC Virginia-Carolina regions. In all other EMM regions in the study area, generation from natural gas is projected to increase (e.g., growth factor > 1).

Exhibit 3.9 shows the growth factors for electricity generation for renewables. The AEO2011 shows that the growth factors vary widely by EMM region. A large increase in generation from renewables from 2007 to 2025 is projected for the RFC East, RFC West and SERC Virginia-Carolina regions. A more modest increase in renewable is projected for the Northeast and Upstate New York regions. A slight decline is projected for the NYC Westchester and Long Island regions.

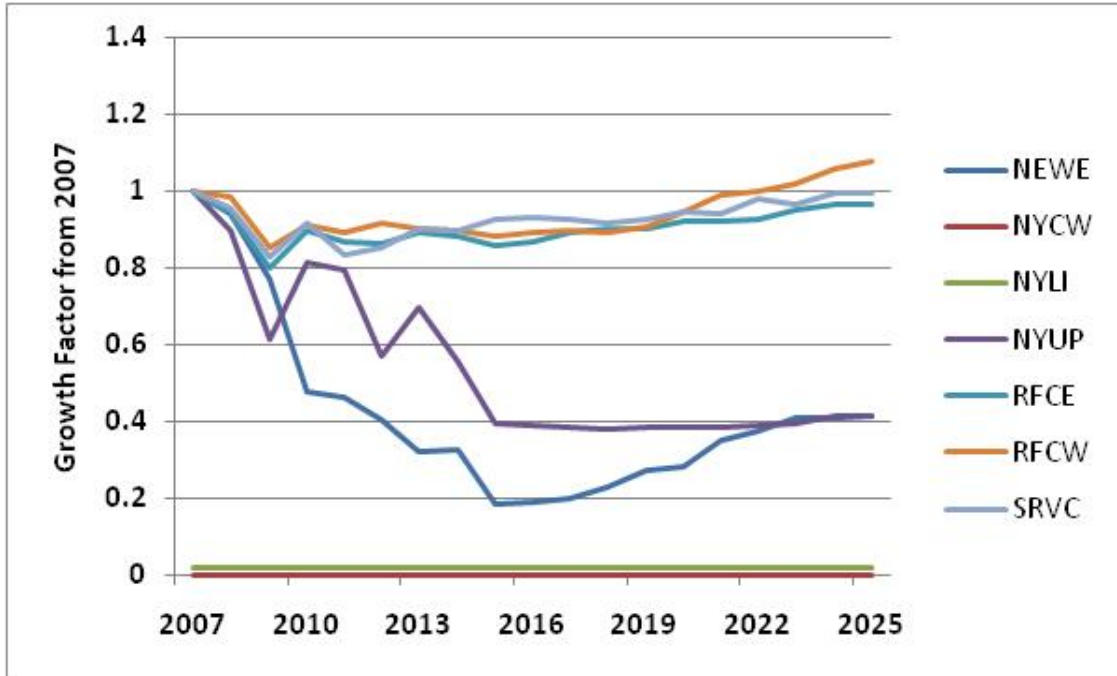


Exhibit 3.6 Electricity Generation Growth Factors for Coal

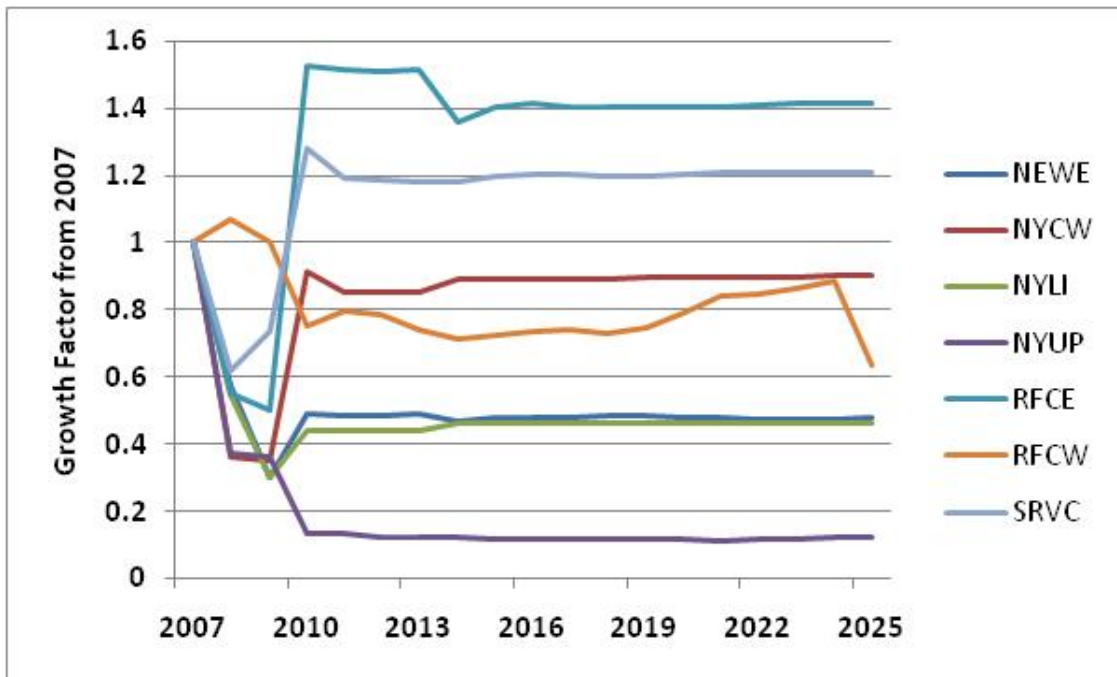


Exhibit 3.7 Electricity Generation Growth Factors for Petroleum

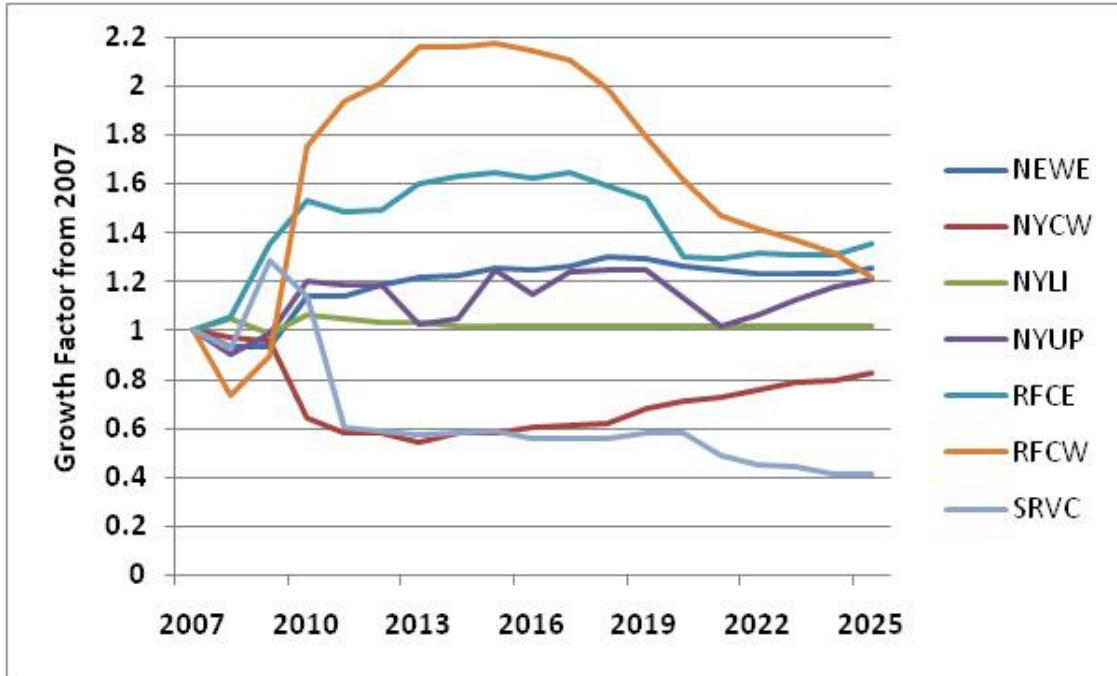


Exhibit 3.8 Electricity Generation Growth Factors for Natural Gas

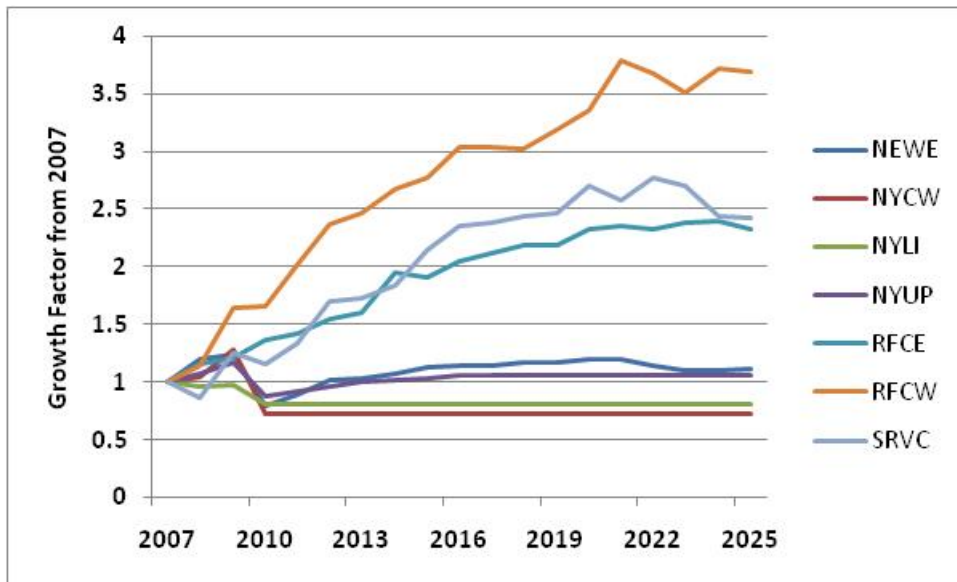


Exhibit 3.9 Electricity Generation Growth Factors for Renewables

After reviewing the AEO growth factors, New York had doubts about the AEO projections. To be conservative, New York specified that a growth factor of 1.0 should be used for any unit where AEO growth was projected to be negative.

3.4.2 EGU Control Factors

States provided information on post-2007 controls or shut downs to be applied on a unit by unit basis for the 2025 inventory. This control information was provided in a format that is being used by the ERTAC EGU Projection Methodology (Appendix G UAF NEEDS Control FileMASTER92211.xls).

In addition to the ERTAC control file, the following comments were received:

- Delaware – The Edge Moor facility (ORIS=593) plans to switch from coal to natural gas/# 6 oil. However, the Title V permit is not yet approved. Delaware made the decision to assume the facility still is burning coal in 2025 for the purposes of this PM re-designation inventory. Delaware may change the EGU estimates at a future date when the SIP submittal is written.
- District of Columbia – The PEPCO Benning Road facility (ORIS=603) is scheduled to shut down permanently in 2012 and all future year emissions have been set to zero.
- Maryland – The Healthy Air Act sets unit-specific emission caps (tons/year) for SO₂ and NO_x. Maryland provided unit specific control factors to ensure that the future year emissions were equal to the Healthy Air Act emission caps. Affected facilities include CP Crane, Herbert A Wagner, R. Paul Smith, Chalk Point, Dickerson, Morgantown, and Brandon Shores.
- New Jersey – Control factors for SO₂ and NO_x for each unit were calculated based on the ratio of the future controlled emission rate (lbs/mmBtu) to the 2007 actual emission rate (lbs/mmBtu). Large reductions in SO₂ emissions are expected from the installation of control equipment at the Hudson and Mercer generating stations. NO_x controls were also installed at the Hudson generating station in 2010.
- Pennsylvania – RRI's Portland Generating Station is under a USEPA Order to reduce SO₂ emissions. SO₂ emissions beyond 013 were reduced by 95 percent to address the ordered emission reductions. SO₂ controls were installed at RRI Keystone, PPL Brunner Island, and Allegheny Energy Hatfields Ferry in 2010. SO₂ controls at the Cheswick Station were installed in 2011. Units 1 and 2 at PPL Martins Creek, Units 1 and 2 at Exelon Cromby, and Units 1 and 2 at Exelon

Eddystone are or will be permanently shut down by 2013 and the emissions for all pollutants were set to zero for 2017/2020/2025. The future operation of Unit 1 at Exelon Schuylkill are projected to be about 250 hours, compared to 1,037 hours in 2007. Future emissions for this unit were reduced by 75 percent to reflect this lowered operating capacity.

- Virginia – Dry scrubbers at the Potomac River Generating Station were installed in 2008. In 2008, the facility received a federally enforceable facility-wide permit that placed limits on the facility's annual potential to emit of both NO_x and SO₂.

3.4.3 Consideration of CSAPR Emission Allowances

On July 6, 2011, the USEPS finalized the Cross-State Air Pollution Rule (CSAPR) that requires 27 states to reduce power plant emissions that contribute to ozone and/or fine particle pollution in other states. This final rule replaces the 2005 Clean Air Interstate Rule (CAIR). Under the final rule, USEPA distributes a annual SO₂ and NO_x emission allowances to covered units in each state, the sum of which equals the annual SO₂ and NO_x budgets for those states (allowing for a two percent set-aside for new units).

USEPA provided allocations for each affected unit. States initially considered whether these unit-level allocations for SO₂ and NO_x provided a more realistic estimate of future year emissions than the growth and control methodology described in Sections 4.3.1 and 4.3.2 of this report. However, the United States Court of Appeals for the District of Columbia issued an order staying CSAPR on December 31, 2011, pending the resolution of an appeal of the rule. Because of the uncertainty regarding implementation of CSAPR, states decided to use the growth and control methodology described in Sections 4.3.1 and 4.3.2 rather than the proposed CSAPR caps for SO₂ and NO_x.

4.0 NONROAD MOBILE SOURCES INCLUDED IN NMIM

4.1 NONROAD MODEL CATEGORIES

USEPA's NONROAD model estimates emissions from equipment such as recreational marine vessels, recreational land-based vehicles, farm and construction machinery, lawn and garden equipment, aircraft ground support equipment (GSE) and rail maintenance equipment. This equipment is powered by diesel, gasoline, compressed natural gas (CNG) or liquefied petroleum gas (LPG) engines.

NMIM was developed by USEPA to develop county-level emission estimates for certain types of nonroad equipment. NMIM uses the current version the NONROAD model to develop emission estimates and was used to develop the projection inventories discussed here. The NMIM national county database contains monthly input data to reflect county specific fuel parameters and temperatures. Most of the work associated with executing NMIM involved updating the NMIM county database with state-specific information.

4.2 2007 INVENTORY DEVELOPMENT

MARAMA used the NMIM model to develop county level emission estimates by SCC for 2007 (see {MARAMA 2011a} for complete documentation). For this analysis, the NMIM2008 software (version NMIM20090504), the NMIM County Database (version NCD20090531), and NONROAD2008a (July 2009 version) were used as starting points (USEPA 2009a). Changes were made to the NCD20090531 based on state review and comment.

A summary of the major adjustments to the default NMIM County Database for the 2007 NMIM model runs includes:

- State review and adjustments to fuel characteristics (Reid Vapor Pressure, sulfur and oxygenate fractions) to better represent county-specific fuel characteristics in 2007; and
- States identified discrepancies in the housing and population data contained in the NONROAD model and these data were updated using 2007 housing information and updated 2007 population estimates.
- The recreational marine vessel populations were revised using population data provided by the National Marine Manufacturers Association (NMMA). Total state populations for each of the three major categories contained in the NONROAD model (outboard, inboard/sterndrive and personal watercraft) were provided.

Because the population files used by the NONROAD model (and thus NMIM) were configured with population values for various horsepower categories, AMEC determined the fraction of the total for each marine vessel type in each horsepower category from the NONROAD default population files. These fractions were then used to allocate the total state population obtained from NMMA to the various horsepower categories.

4.3 2025 INVENTORY DEVELOPMENT

MARAMA ran the NMIM model for 2025 for six jurisdictions (VA, CT, DE, DC, MD, PA). One state, New York, did their own NONROAD modeling and provided 2025 NMIM results for the affected counties.

4.4 REMOVAL OF AIRPORT GROUND SUPPORT EQUIPMENT

The NMIM/NONROAD model includes emissions from airport ground support equipment. Emissions from airport ground support equipment is also included in USEPA's aircraft inventory that was prepared using the Federal Aviation Administration's Emissions and Dispersion Modeling System (EDMS). Correspondence with USEPA indicated that USEPA considers the emissions calculated by EDMS to be better than those calculated by NONROAD. For this reason, all emissions calculated by NMIM/NONROAD for airport ground support equipment were removed from both the 2007 and 2025 inventories to avoid double counting emissions.

4.5 NMIM/NONROAD GROWTH AND CONTROL INFORMATION

In estimating future year emissions, the NMIM/NONROAD model includes growth and scrappage rates for equipment in addition to a variety of control programs. It is not possible to separate out the future year emissions due to "growth only" or "control only" in a single run. That is, the model run provides a single future year estimate that is a "growth and control" scenario.

The growth data used in the NMIM/NONROAD model is documented in a USEPA report (USEPA 2004c). The GROWTH packet of the NONROAD model cross-references each SCC to a growth indicator code. The indicator is an arbitrary code that identifies an actual predicted value such as human population or employment that is used to estimate the future year equipment population. The GROWTH packet also defines the scrappage curves used to estimate the future year model year distribution.

The NMIM/NONROAD model also accounts for all USEPA emission standards for nonroad equipment. There are multiple standards that vary by equipment type, rated

power, model year, and pollutant. Exhibit 4.1 is a summary of the emission control programs accounted for in the NMIM/NONROAD model. A complete summary of the nonroad equipment emission standards can be found on USEPA's nonroad emission standards reference guide website (USEPA 2011).

Exhibit 4.1 Control Programs Included in the NMIM/NONROAD Model

Regulation	Description
<p><i>Control of Air Pollution; Determination of Significance for Nonroad Sources and Emission Standards for New Nonroad Compression Ignition Engines At or Above 37 Kilowatts</i> 59 FR 31036 June 17, 1994</p>	<p>This rule establishes Tier 1 exhaust emission standards for HC, NO_x, CO, and PM for nonroad compression-ignition (CI) engines ≥37kW (≥50hp). Marine engines are not included in this rule. The start dates and pollutants affected vary by hp category as follows: 50-100 hp: Tier 1, 1998; NO_x only 100-175 hp: Tier 1, 1997; NO_x only 175-750 hp: Tier 1, 1996; HC, CO, NO_x, PM >750 hp: Tier 1, 2000; HC, CO, NO_x, PM</p>
<p><i>Emissions for New Nonroad Spark-Ignition Engines At or Below 19 Kilowatts; Final Rule</i> 60 FR 34581 July 3, 1995</p>	<p>This rule establishes Phase 1 exhaust emission standards for HC, N NO_x Ox, and CO for nonroad spark-ignition engines ≤19kW (≤25hp). This rule includes both handheld (HH) and non-hand-held (NHH) engines. The Phase 1 standards become effective in 1997 for : Class I NHH engines (<225cc), Class II NHH engines (≥225cc), Class III HH engines (<20cc), and Class IV HH engines (≥20cc and <50cc). The Phase 1 standards become effective in 1998 for: Class V HH engines (≥50cc)</p>
<p><i>Final Rule for New Gasoline Spark-Ignition Marine Engines; Exemptions for New Nonroad Compression-Ignition Engines at or Above 37 Kilowatts and New Nonroad Spark-Ignition Engines at or Below 19 Kilowatts</i> 61 FR 52088 October 4, 1996</p>	<p>This rule establishes exhaust emission standards for HC+NO_x for personal watercraft and outboard (PWC/OB) marine SI engines. The standards are phased in from 1998-2006.</p>
<p><i>Control of Emissions of Air Pollution From Nonroad Diesel Engines</i> 63 FR 56967 October 23, 1998</p>	<p>This final rule sets Tier 1 standards for engines under 50 hp, phasing in from 1999 to 2000. It also phases in more stringent Tier 2 standards for all engine sizes from 2001 to 2006, and yet more stringent Tier 3 standards for engines rated over 50 hp from 2006 to 2008. The Tier 2 standards apply to NMHC+ NO_x, CO, and PM, whereas the Tier 3 standards apply to NMHC+ NO_x and CO. The start dates by hp category and tier are as follows: hp<25: Tier 1, 2000; Tier 2, 2005; no Tier 3 25-50 hp: Tier 1, 1999; Tier 2, 2004; no Tier 3 50-100 hp: Tier 2, 2004; Tier 3, 2008 100-175 hp: Tier 2, 2003; Tier 3, 2007 175-300 hp: Tier 2, 2003; Tier 3, 2006 300-600 hp: Tier 2, 2001, Tier 3, 2006 600-750 hp: Tier 2, 2002; Tier 3, 2006 >750 hp: Tier 2, 2006, no Tier 3 This rule does not apply to marine diesel engines above 50 hp.</p>

Regulation	Description
<p><i>Phase 2: Emission Standards for New Nonroad Nonhandheld Spark Ignition Engines At or Below 19 Kilowatts</i> 64 FR 15207 March 30, 1999</p>	<p>This rule establishes Phase 2 exhaust emission standards for HC+ NO_x for nonroad nonhandheld (NHH) spark-ignition engines ≤19kW (≤25hp). The Phase 2 standards for Class I NHH engines (<225cc) become effective on August 1, 2007 (or August 1, 2003 for any engine initially produced on or after that date). The Phase 2 standards for Class II NHH engines (≥225cc) are phased in from 2001-2005.</p>
<p><i>Phase 2: Emission Standards for New Nonroad Spark-Ignition Handheld Engines At or Below 19 Kilowatts and Minor Amendments to Emission Requirements Applicable to Small Spark-Ignition Engines and Marine Spark-Ignition Engines; Final Rule</i> 65 FR 24268 April 25, 2000</p>	<p>This rule establishes Phase 2 exhaust emission standards for HC+ NO_x for nonroad handheld (HH) spark-ignition engines ≤19kW (≤25hp). The Phase 2 standards are phased in from 2002-2005 for Class III and Class IV engines and are phased in from 2004-2007 for Class V engines.</p>
<p><i>Control of Emissions From Nonroad Large Spark-Ignition Engines and Recreational Engines (Marine and Land-Based); Final Rule</i> 67 FR 68241 November 8, 2002</p>	<p>This rule establishes exhaust and evaporative standards for several nonroad categories:</p> <ol style="list-style-type: none"> 1) Two tiers of emission standards are established for large spark-ignition engines over 19 kW. Tier 1 includes exhaust standards for HC+ NO_x and CO and is phased in from 2004-2006. Tier 2 becomes effective in 2007 and includes exhaust standards for HC+ NO_x and CO, as along with evaporative controls affecting fuel line permeation, diurnal emissions and running loss emissions. 2) Exhaust and evaporative emission standards are established for recreational vehicles, which include snowmobiles, off-highway motorcycles, and all-terrain vehicles (ATVs). For snowmobiles, HC and CO exhaust standards are phased-in from 2006-2012. For off-highway motorcycles, HC+ NO_x and CO exhaust emission standards are phased in from 2006-2007. For ATVs, HC+NO_x and CO exhaust emission standards are phased in from 2006-2007. Evaporative emission standards for fuel tank and hose permeation apply to all recreational vehicles beginning in 2008. 3) Exhaust emission standards for HC+ NO_x, CO, and PM for recreational marine diesel engines over 50 hp begin in 2006-2009, depending on the engine displacement. These are “Tier 2” equivalent standards.
<p><i>Control of Emissions of Air Pollution From Nonroad Diesel Engines and Fuel; Final Rule (Clean Air Nonroad Diesel Rule – Tier 4)</i> 69 FR 38958 June 29, 2004</p>	<p>This final rule sets Tier 4 exhaust standards for CI engines covering all hp categories (except marine and locomotives), and also regulates nonroad diesel fuel sulfur content.</p> <ol style="list-style-type: none"> 1) The Tier 4 start dates and pollutants affected vary by hp and tier as follows: <ul style="list-style-type: none"> hp<25: 2008, PM only 25-50 hp: Tier 4 transitional, 2008, PM only; Tier 4 final, 2013, NMHC+ NO_x and PM

Regulation	Description
	<p>50-75 hp: Tier 4 transitional, 2008; PM only; Tier 4 final, 2013, NMHC+ NO_x and PM</p> <p>75-175 hp: Tier 4 transitional, 2012, HC, NO_x, and PM; Tier 4 final, 2014, HC, NO_x,PM</p> <p>175-750 hp: Tier 4 transitional, 2011, HC, NO_x, and PM; Tier 4 final, 2014, HC, NO_x,PM</p> <p>>750 hp: Tier 4 transitional, 2011, HC, NO_x, and PM; Tier 4 final, 2015, HC, NO_x,PM</p> <p>2) This rule will reduce nonroad diesel fuel sulfur levels in two steps. First, starting in 2007, fuel sulfur levels in nonroad diesel fuel will be limited to a maximum of 500 ppm, the same as for current highway diesel fuel. Second, starting in 2010, fuel sulfur levels in most nonroad diesel fuel will be reduced to 15 ppm.</p>
<p><i>Control of Emissions From Nonroad Spark-Ignition Engines and Equipment; Final Rule (Bond Rule)</i> 73 FR 59034 October 8, 2008</p>	<p>This rule establishes exhaust and evaporative standards for small SI engines and marine SI engines:</p> <p>1) Phase 3 HC+ NO_x exhaust emission standards are established for Class I NHH engines starting in 2012 and for Class II NHH engines starting in 2011. There are no new exhaust emission standards for handheld engines. New evaporative standards are adopted for both handheld and nonhandheld equipment. The new evaporative standards control fuel tank permeation, fuel hose permeation, and diffusion losses. The evaporative standards begin in 2012 for Class I NHH engines and 2011 for Class II NHH engines. For handheld engines, the evaporative standards are phased-in from 2012-2016.</p> <p>2) More stringent HC+ NO_x and CO standards are established for marine SI PWC/OB engines beginning in 2010. In addition, new exhaust HC+ NO_x and CO standards are established for sterndrive and inboard (SD/I) marine SI engines also beginning in 2010. High performance SD/I engines are subject to separate HC+ NO_x and CO exhaust standards that are phased-in from 2010-2011. New evaporative standards were also adopted for all marine SI engines that control fuel hose permeation, diurnal emissions, and fuel tank permeation emissions. The hose permeation, diurnal, and tank permeation standards take effect in 2009, 2010, and 2011, respectively.</p>

Source: USEPA 2010c

5.0 MARINE VESSELS, AIRPORTS, AND RAILROADS

5.1 MAR INVENTORY CATEGORIES

This category of sources is collectively referred to as the MAR (marine, airports, railroads) sector. It includes nonroad engines associated with the following activities:

- **Marine Vessels** - The Commercial Marine Vehicle (CMV) sector includes all boats and ships used either directly or indirectly in the conduct of commerce or military activity. The majority of these vessels are powered by diesel engines that are either fueled with distillate or residual fuel oil blends. For the purpose of this inventory it is assumed that Category 3 vessels primarily use residual blends, while Category 1 and 2 vessels typically used distillate fuels.
- **Airports** - The aircraft sector includes all aircraft types used for public, private, and military purposes. This includes four types of aircraft 1) Commercial; 2) Air Taxis; 3) General Aviation; and 4) Military. Ground support equipment (GSE) and auxiliary power units (APU) are also included.
- **Railroads** - The railroad sector includes railroad locomotives powered by diesel-electric engines. Locomotives are divided into Class I line haul, Class II/III line haul, commuter/passenger and Class I yard.

5.2 2007 INVENTORY DEVELOPMENT

The emission projections for the 2025 point source were based on Version 3_3 of the 2007 MANE-VU+VA inventory and are fully documented in the TSD for that effort (MARAMA 2012a). There were no adjustment to the 2007 Version 3_3 MAR inventory for this analysis.

5.3 2025 INVENTORY DEVELOPMENT

Appendix H contains the data that were used to develop growth and control factors for the commercial marine vessel, airport, and railroad sectors.

5.3.1 Commercial Marine Vessels

For the purpose of emission calculations, marine vessel engines are divided into three categories based on displacement (swept volume) per cylinder. Category 1 and Category 2 marine diesel engines typically range in size from about 500 to 8,000 kW (700 to 11,000 hp). These engines are used to provide propulsion power on many kinds of vessels including tugboats, pushboats, supply vessels, fishing vessels, and other commercial

vessels in and around ports. They are also used as stand-alone generators for auxiliary electrical power on vessels. Category 3 marine diesel engines typically range in size from 2,500 to 70,000 kW (3,000 to 100,000 hp). These are very large marine diesel engines used for propulsion power on ocean-going vessels such as container ships, oil tankers, bulk carriers, and cruise ships.

The majority of marine vessels are powered by diesel engines that are either fueled with distillate or residual fuel oil blends. For the purpose of emission inventories, USEPA has assumed that Category 3 vessels primarily use residual blends, while Category 1 and 2 vessels typically use distillate fuels.

USEPA developed national emission inventories for Category 1 and 2 vessels and Category 3 vessels for calendar years 2002 through 2040 as part of its effort to develop emission standards for these vessels. The methodologies used to develop the emission projections (for both a baseline and controlled scenario) are documented in three regulatory impact assessments (USEPA 2008b, USEPA 2009c, USEPA 2009d). The USEPA data and methodologies from these RIAs were used to develop separate growth and control factors for Category 1 and 2 vessels (diesel) and Category 3 vessels (residual).

5.3.1.1 CMV Diesel Growth Factors

For Category 1 and 2 diesel vessels, USEPA used projection data for domestic shipping from the AEO2006 (EIA 2006). The annual growth rate reported in the RIA is 0.9%. More recent growth data for domestic shipping is available in the AEO2010 (EIA 2010). Because Category 1 and 2 vessels primarily account for activity data for ships that carry domestic cargo, we decided to use the recent growth data for domestic shipping available in the AEO2010. We used Table A-7 of the AEO2010 for domestic shipping to calculate the growth factor for 2007-2025 to be 1.064. This growth factor was used for CMV diesel port emissions (SCC 22-80-002-100) and CMV diesel underway emissions (SCC 22-80-002-200).

5.3.1.2 CMV Diesel Control Factors

In developing their emission projections, USEPA developed two scenarios that accounted for both the 2004 nonroad diesel rule and the 2008 diesel marine vessel rule:

- USEPA's baseline (pre-control) inventory accounted for:
 1. the 0.9 percent annual growth in fuel use based on AEO2006,
 2. the impact of existing engine regulations that took effect in 2008,
 3. the 2004 Clean Air Nonroad Diesel Rule that will decrease the allowable levels of sulfur in fuel beginning in 2012, and
 4. fleet turnover.

- USEPA’s controlled inventory accounted for:
 1. the 0.9 percent annual growth in fuel use based on AEO2006;
 2. the reductions included in the baseline inventory, and the reductions from USEPA’s 2008 rule Final Locomotive-Marine rule for Tier 3 and 4 engines;
 3. The 2008 final rule that includes the first-ever national emission standards for existing marine diesel engines, applying to engines larger than 600kW when they are remanufactured. The rule also sets Tier 3 emissions standards for newly-built engines that are phasing in from 2009. Finally, the rule establishes Tier 4 standards for newly-built commercial marine diesel engines above 600kW, phasing in beginning in 2014.

To calculate a control factor that accounts for reductions included in the USEPA controlled inventory, it was necessary to first calculate a “growth only” scenario applying USEPA’s 0.9 percent annual growth rate to the 2007 base emissions. Once the growth rate was applied, then a control factor for each pollutant was calculated by dividing the future year controlled emissions by the future year “growth only” emissions. Exhibit 5.1 shows the control factors for 2013, 2017, 2020, and 2025 for diesel commercial marine vessels.

Exhibit 5.1 CMV Diesel Control Factors by Year and Pollutant

Year	NOx	PM2.5	SO2
2013	0.787	0.747	0.464
2017	0.642	0.550	0.076
2020	0.537	0.460	0.032
2025	0.401	0.353	0.031

5.3.1.3 CMV Residual Oil Growth Factors

For Category 3 residual oil vessels, data from a USEPA-sponsored study was used to develop an annualized growth factor of 4.5 percent for the region. A few states considered the growth rate to be extremely high and not reflective of recent economic conditions. Because USEPA’s Category 3 vessel inventory is primarily based on activity data for ships that carry foreign cargo, we decided to use the recent growth data for international shipping available in the AEO2010. We used data from Table A-7 of the AEO2010 for international shipping to calculate the growth factor for 2007-2025 to be 0.956. These growth factors were used for CMV residual oil port emissions (SCC 22-80-003-100) and CMV residual oil underway emissions (SCC 22-80-003-200).

5.3.1.4 CMV Residual Oil Control Factors

On December 22, 2009, USEPA announced final emission standards under the Clean Air Act for new marine diesel engines with per-cylinder displacement at or above 30 liters (called Category 3 marine diesel engines) installed on U.S.-flagged vessels. The final engine standards are equivalent to those adopted in the amendments to Annex VI to the International Convention for the Prevention of Pollution from Ships (a treaty called "MARPOL"). The emission standards apply in two stages: near-term standards for newly-built engines will apply beginning in 2011, and long-term standards requiring an 80 percent reduction in NO_x will begin in 2016. USEPA also adopted changes to the diesel fuel program to allow for the production and sale of diesel fuel with no more than 1,000 ppm sulfur for use in Category 3 marine vessels. The regulations generally forbid production and sale of fuels with more than 1,000 ppm sulfur for use in most U.S. waters, unless operators achieve equivalent emission reductions in other ways.

On March 26, 2010, the International Maritime Organization (IMO) officially designated waters off North American coasts as an emissions control area (ECA) in which stringent international emission standards will apply to ships. In practice, implementation of the ECA means that ships entering the designated area would need to use compliant fuel for the duration of their voyage that is within that area, including time in port and voyages whose routes pass through the area without calling on a port. The North American ECA includes waters adjacent the Atlantic extending up to 200 nautical miles from east coast of the US. The quality of fuel that complies with the ECA standard will change over time. From the effective date in 2012 until 2015, fuel used by vessels operating in designated areas cannot exceed 1.0 percent sulfur (10,000 ppm). Beginning in 2015, fuel used by vessels operating in these areas cannot exceed 0.1 percent sulfur (1000 ppm). Beginning in 2016, NO_x after treatment requirements become applicable.

To calculate a control factor that accounted for reductions included in the USEPA controlled inventory, it was necessary to first calculate a "growth only" scenario applying USEPA's 4.5 percent annual growth rate to the 2007 base emissions. Once the growth rate was applied, then a control factor for each pollutant was calculated by dividing the future year controlled emissions by the future year "growth only" emissions.

Exhibit 5.2 shows the control factors for 2013, 2017, and 2020 for residual oil commercial marine vessels.

Exhibit 5.2 CMV Residual Oil Control Factors by Year and Pollutant

Year	NOx	PM2.5	SO2
2013	0.736	0.353	0.270
2017	0.654	0.216	0.120
2020	0.597	0.137	0.036
2025	0.480	0.137	0.036

5.3.1.5 Military Vessels Growth and Control Factors

Virginia reported emissions for military vessels, but did not distinguish between diesel or residual fuels. An assumption of “no growth” for military vessel activity and emissions in Virginia was made so that emissions remain at 2007 levels in 2025. Virginia was the only state to report emission from military vessels.

5.3.1.6 State-specific CMV Updates for 2025

New Jersey provided updated CMV emission estimates for 2007, 2013, 2017, 2020, and 2025, and growth and control factors for 2013, 2017, 2020, and 2025. These data were used to replace the emission estimates previously used for the 2007 MANE-VU+VA base year inventory and the MANE-VU+VA future year inventories.

5.3.2 Airports

Aircraft emissions in the 2007 MANE-VU+VA inventory are available on either a county-by-county or airport-by-airport basis for six types of aircraft operations:

- Air carrier operations represent landings and take-offs (LTOs) of commercial aircraft with seating capacity of more than 60 seats;
- Commuter/air taxi operations are one category. Commuter operations include LTOs by aircraft with 60 or fewer seats that transport regional passengers on scheduled commercial flights. Air taxi operations include LTOs by aircraft with 60 or fewer seats conducted on non-scheduled or for-hire flights;
- General aviation represents all civil aviation LTOs not classified as commercial;
- Military operations represent LTOs by military aircraft;
- Ground Support Equipment (GSE) typically includes aircraft refueling and baggage handling vehicles and equipment, aircraft towing vehicles, and passenger buses;
- Auxiliary power units (APUs) provide power to start the main engines and run the heating, cooling, and ventilation systems prior to starting the main engines.

5.3.2.1 Airport Growth Factors

Aircraft operations were projected to future years by applying activity growth using data on itinerant (ITN) operations at airports as reported in the Federal Aviation Administration's (FAA) Terminal Area Forecast (TAF) System for 2009-2030 (FAA 2010). The ITN operations are defined as aircraft take-offs or landings. This information is available for approximately 3300 individual airports. Actual LTOs are reported for 2007 and projected LTOs are provided for all years up to 2030.

The data was aggregated and applied at the county level for the four operation types: commercial, general, air taxi, military. A growth factor was computed for each operation type by dividing future-year ITN by 2007-year ITN. Inventory SCCs were assigned factors based on the operation type, as shown in Exhibit 5.3.

Exhibit 5.3 Crosswalk between SCC and FAA Operations Type

SCC	SCC Description	FAA Operation Type Used for Growth Factor
2265008005	Airport Ground Support Equipment, 4-Stroke Gas	Total Itinerant Operations
2267008005	Airport Ground Support Equipment, LPG	Total Itinerant Operations
2268008005	Airport Ground Support Equipment, CNG	Total Itinerant Operations
2270008000	Airport Ground Support Equipment, Diesel	Total Itinerant Operations
2270008005	Airport Ground Support Equipment, Diesel	Total Itinerant Operations
2275001000	Aircraft /Military Aircraft /Total	Itinerant Military Operations
2275020000	Aircraft /Commercial Aircraft /Total: All Types	Itinerant Air Carrier Operations
2275050000	Aircraft /General Aviation /Total	Itinerant General Aviation Operations
2275050011	Aircraft /General Aviation /Piston	Itinerant General Aviation Operations
2275050012	Aircraft /General Aviation /Turbine	Itinerant General Aviation Operations
2275060000	Aircraft /Air Taxi /Total	Itinerant Air Taxi Operations
2275060011	Aircraft /Air Taxi /Piston	Itinerant Air Taxi Operations
2275060012	Aircraft /Air Taxi /Turbine	Itinerant Air Taxi Operations
2275070000	Aircraft /Aircraft Auxiliary Power Units /Total	Total Itinerant Operations

Exhibit 5.4 summarizes the region-wide growth factors by FAA operation type. The growth factor for individual airports/counties may deviate substantially from these region-wide growth factors.

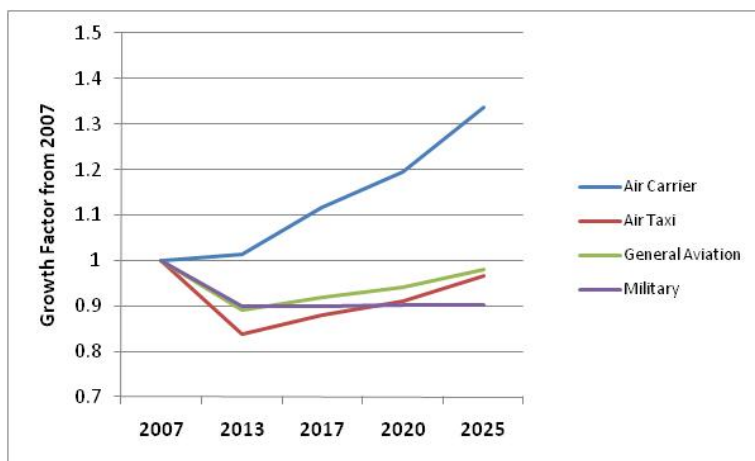


Exhibit 5.4 Region-wide Growth Factors from 2007 by FAA Operations Type

5.3.2.2 Aircraft Control Factors

The NO_x aircraft engine emissions standards adopted by USEPA in November 2005 (USEPA 2005) were reviewed. The standards are equivalent to the NO_x emission standards (adopted in 1999 for implementation beginning in 2004) of the United Nations International Civil Aviation Organization (ICAO), and will bring the US aircraft standards into alignment with the international standards. The standards apply to new aircraft engines used on commercial aircraft including small regional jets, single-aisle and twin-aisle aircraft, and 747s and larger aircraft. The standards also apply to general aviation and military aircraft, which sometimes use commercial engines. For example, small regional jet engines are used in executive general aviation aircraft, and larger commercial aircraft engines may be used in military transport aircraft.

Nearly all previously certified or in-production engine models currently meet or perform better than the standards USEPA adopted in the November 2005 rule. In addition, manufacturers have already been developing improved technology in response to the ICAO standards. According to USEPA's recent analysis for the proposed transport rule (USEPA 2010b), this rule is expected to reduce NO_x emissions by approximately 2 percent in 2015 and 3 percent in 2020. Because of the relatively small amount of NO_x reductions, our aircraft emission projections do not account for this control program.

USEPA has also issued an Advance Notice of Proposed Rulemaking (ANPR) on lead emissions from piston-engine aircraft using leaded aviation gasoline (USEPA 2010c). However, this rule has not yet been adopted and co-benefits for criteria air pollutants are likely to be small. Therefore, the effects of this rule were not included in the future-year emissions projections.

5.3.2.3 State-specific Airport Updates for 2025

After reviewing the growth factors described in the previous section, Connecticut provided state-specific growth factors for 2025 by SCC and county. These state-specific factors were used instead of the factors described in the previous section.

New Jersey provided updated aircraft growth factors and emission estimates for 2007, 2013, 2017, 2020, and 2025. These data were used to replace the emission estimates previously used for the 2007 MANE-VU+VA base year inventory and the MANE-VU+VA future year inventories.

5.3.3 Railroad Locomotives

Railroad locomotive engine emissions in the 2007 MARAMA inventory are classified into the following categories:

- Class I line haul locomotives are operated by large freight railroad companies and are used to power freight train operations over long distances (SCC 22-85-002-006);
- Class II/III line haul locomotives are operated by smaller freight railroad companies and are used to power freight train operations over long distances (SCC 22-85-002-007);
- Inter-city passenger train locomotives are operated primarily by Amtrak to provide inter-city passenger transport (SCC 22-85-002-008);
- Independent commuter rail systems operate locomotives that provide passenger transport within a metropolitan area (SCC 22-85-002-009); and
- Yard/switch locomotives are used in freight yards to assemble and disassemble trains, or for short hauls of trains that are made up of only a few cars (SCC 22-85-002-010).

5.3.3.1 Railroad Growth Factors

In March 2008, USEPA finalized a three part program that will dramatically reduce emissions from diesel locomotives of all types -- line-haul, switch, and passenger rail. As part of this work USEPA developed a national emission inventory for calendar years 2002 through 2040. Emission projections methodologies for a baseline and controlled scenario were developed and documented (USEPA 2008b). USEPA used projection data from the AEO2006 (EIA 2006). Table A-7 of AEO2006 showed that freight rail energy use will grow 1.6 percent annually.

More recent growth data is available in the AEO2010 which was published in May 2010. There are separate projections for passenger rail and freight rail energy use. For the MANE VU+VA inventory the more recent AEO2010 growth projections were used.

Passenger rail data from AEO2010 Table A-7 was used to calculate the growth factor for 2007-2025 to be 1.241. These growth factors were applied to inter-city passenger train locomotives (SCC 22-85-002-008) and independent commuter rail systems (SCC 22-85-002-009).

For freight rail, the data from AEO2010 Table A-7 was used to calculate the growth factor for 2007-2025 to be 1.098. The freight rail annual growth factors for Class I line haul (SCC 22-85-002-006), Class II/III line haul (SCC 22-85-002-007), and yard switch (SCC 22-85-002-010) locomotives were used.

5.3.3.2 Railroad Control Factors

USEPA developed two scenarios that accounted for both the 2004 nonroad diesel rule and the 2008 diesel locomotive rule:

- USEPA's baseline (pre-control) inventory accounted for
 1. AEO2006 annual growth in fuel use,
 2. The impact of existing regulations for Tier 0, 1, and 2 locomotive engines that take effect in 2008,
 3. The 2004 Clean Air Nonroad Diesel Rule that will decrease allowable levels of sulfur in locomotives fuel beginning in 2012, and
 4. Fleet turnover.
- USEPA's controlled inventory accounted for
 1. AEO2006 annual growth in fuel use,
 2. Reductions included in the baseline inventory, and
 3. Reductions from USEPA's 2008 rule Final Locomotive-Marine rule for Tier 3 and 4 engines. This rule lowered diesel sulfur content and tightened emission standards for existing and new locomotives.
 4. Voluntary retrofits under the National Clean Diesel Campaign are not included in our projections.

To calculate a factor that accounted for reductions included in the USEPA controlled inventory, it was necessary to first calculate a "growth only" scenario applying USEPA's 1.6% annual growth rate to the 2006 base emissions. Once the growth rate was applied, then a control factor for each pollutant was calculated by dividing the future year controlled emissions by the future year "growth only" emissions.

Exhibit 5.5 shows the control factors for 2013, 2017, 2020, and 2025 for the five locomotive classifications and pollutants.

5.3.3.3 State-specific Railroad Updates for 2025

New Jersey provided updated railroad growth factors, control factors, and emission estimates for 2007, 2013, 2017, 2020, and 2025. These data were used to replace the emission estimates previously used for the 2007 MANE-VU+VA base year inventory and the MANE-VU+VA future year inventories.

Exhibit 5.5 Rail Control Factors by Year, Pollutant, and SCC

Year	NOx	PM2.5	SO2
SCC 22-85-002-006 Line Haul Class I Operations			
2013	0.771	0.595	0.003
2017	0.633	0.449	0.003
2020	0.547	0.364	0.003
2025	0.412	0.252	0.003
SCC 22-85-002-007 Line Haul Class II / III Operations			
2013	1.000	0.829	0.003
2017	0.960	0.791	0.003
2020	0.920	0.752	0.003
2025	0.852	0.688	0.003
SCC 22-85-002-008 Inter-City Passenger			
2013	0.571	0.566	0.003
2017	0.421	0.402	0.003
2020	0.340	0.294	0.003
2025	0.241	0.180	0.003
SCC 22-85-002-009 Commuter Rail			
2013	0.571	0.566	0.003
2017	0.421	0.402	0.003
2020	0.340	0.294	0.003
2025	0.241	0.180	0.003
SCC 22-85-002-010 Yard / Switch			
2013	0.912	0.777	0.003
2017	0.843	0.712	0.003
2020	0.771	0.650	0.003
2025	0.634	0.534	0.003

6.0 ONROAD MOBILE SOURCES INCLUDED IN MOVES

See onroad mobile appendix for this data.

[REDACTED]

[REDACTED]

[REDACTED]

7.0 EMISSION SUMMARIES

Exhibits 7.1 to 7.12 summarize PM_{2.5} and PM precursor emissions by PM nonattainment area and source sector for 2007 and 2025. Some general observations by pollutant include:

- PM_{2.5} emissions are projection to decrease between 2007 and 2025 in all PM nonattainment areas. The reductions are due to the turnover to cleaner onroad vehicles, nonroad engines, and residential wood combustion equipment. The PM_{2.5} emissions shown account for the application of the PM transport factor (see discussion in Section 2.2.1.1 of this TSD).
- NO_x emissions decline in all PM nonattainment areas between 2007 and 2025 and by more than 50 percent in a few areas. Most of the decline results from the turnover of the onroad vehicle fleet to vehicles with improved emission controls and fuel efficiency. Reductions in nonroad sources are also substantial. Three areas (Baltimore, NY/NJ/CT, and Washington DC/MD/VA) also show substantial reductions due to controls on EGUs.
- SO₂ emissions decrease in all PM nonattainment areas. All areas are showing reductions due to the lower sulfur contents of fuels used by onroad vehicles and nonroad equipment. Additional reductions in areas located in Maryland, New Jersey, and New York are due to the lower sulfur content regulations in those state for home heating, distillate oil, and residual oil. Connecticut, Delaware, the District of Columbia, Pennsylvania, and Virginia did not take credit for any reductions for low sulfur fuel oils since they have not adopted the MANE-VU recommendations into their regulations (see discussion in Section 2.3.2.5 of the TSD). Especially large reductions are found in areas where controls are projected to be in place on EGUs (Allentown, Baltimore, Harrisburg, Metro New York, Philadelphia, Pittsburgh, Washington DC/MD/VA, and York, PA).

County-by-county emissions for 2007 and 2025 are available on the MARAMA ftp site.

**Exhibit 7.1 Comparison of 2007 and 2025 PM_{2.5} and PM Precursor Emissions
Nonattainment Area: Allentown, PA**

SECTOR	Annual (tons) 2007	Annual (tons) 2025	Change (tpy) from 2007 to 2025	Change (%) from 2007 to 2025
Oxides of Nitrogen (NOx)				
Area	1,987	1,936	-51	-2.6%
Nonroad MAR	516	277	-239	-46.3%
Nonroad NMIM	2,661	1,007	-1,654	-62.1%
██████████	██████████	██████████	██████████	██████████
Point EGU	7,763	5,837	-1,927	-24.8%
Point nonEGU	5,900	2,114	-3,786	-64.2%
	34,480	15,362	-19,117	-55.4%
Direct PM_{2.5}				
Area	2,150	1,958	-192	-8.9%
Nonroad MAR	26	15	-11	-42.3%
Nonroad NMIM	229	113	-117	-51.0%
██████████	██████████	██████████	██████████	██████████
Point EGU	2,264	2,138	-125	-5.5%
Point nonEGU	1,301	1,227	-75	-5.7%
	6,498	5,640	-858	-13.2%
Sulfur Dioxide (SO₂)				
Area	2,552	1,118	-1,434	-56.2%
Nonroad MAR	12	4	-8	-70.4%
Nonroad NMIM	147	4	-143	-97.3%
██████████	██████████	██████████	██████████	██████████
Point EGU	48,203	3,962	-44,241	-91.8%
Point nonEGU	5,868	5,875	7	0.1%
	56,900	11,005	-45,895	-80.7%

Nonroad MAR – includes commercial marine vessels, airports, and railroad locomotives

Nonroad NMIM – includes equipment included in USEPA's NMIM/NONROAD model

Onroad MOVES – includes emissions calculated by USEPA's MOVES model

**Exhibit 7.2 Comparison of 2007 and 2025 PM_{2.5} and PM Precursor Emissions
Nonattainment Area: Baltimore, MD**

SECTOR	Annual (tons) 2007	Annual (tons) 2025	Change (tpy) from 2007 to 2025	Change (%) From 2007 to 2025
Oxides of Nitrogen (NOx)				
Area	4,732	5,167	435	9.2%
Nonroad MAR	16,703	8,521	-8,182	-49.0%
Nonroad NMIM	10,466	4,265	-6,201	-59.2%
██████████	██████████	██████████	██████████	██████████
Point EGU	23,572	8,939	-14,634	-62.1%
Point nonEGU	11,981	13,362	1,380	11.5%
	111,394	56,154	-55,240	-49.6%
Direct PM_{2.5}				
Area	5,004	5,197	193	3.9%
Nonroad MAR	572	201	-371	-64.8%
Nonroad NMIM	969	519	-450	-46.4%
██████████	██████████	██████████	██████████	██████████
Point EGU	6,677	7,134	456	6.8%
Point nonEGU	2,296	2,366	71	3.1%
	17,022	16,166	-855	-5.0%
Sulfur Dioxide (SO₂)				
Area	2,316	315	-2,001	-86.4%
Nonroad MAR	1,803	268	-1,535	-85.1%
Nonroad NMIM	581	15	-566	-97.4%
██████████	██████████	██████████	██████████	██████████
Point EGU	93,665	18,922	-74,744	-79.8%
Point nonEGU	4,759	4,867	108	2.3%
	103,499	24,766	-78,733	-76.1%

Nonroad MAR – includes commercial marine vessels, airports, and railroad locomotives

Nonroad NMIM – includes equipment included in USEPA's NMIM/NONROAD model

Onroad MOVES – includes emissions calculated by USEPA's MOVES model

**Exhibit 7.3 Comparison of 2007 and 2025 PM_{2.5} and PM Precursor Emissions
Nonattainment Area: Hagerstown Martinsburg, MD-WV**

SECTOR	Annual (tons) 2007	Annual (tons) 2025	Change (tpy) from 2007 to 2025	Change (%) from 2007 to 2025
Oxides of Nitrogen (NOx)				
Area	296	339	43	14.5%
Nonroad MAR	289	144	-145	-50.2%
Nonroad NMIM	793	301	-492	-62.0%
██████████	██████████	██████████	██████████	██████████
Point EGU	1,398	1,390	-8	-0.6%
Point nonEGU	1,982	1,518	-465	-23.4%
	9,883	5,657	-4,225	-42.8%
Direct PM_{2.5}				
Area	501	538	37	7.3%
Nonroad MAR	10	3	-7	-68.6%
Nonroad NMIM	74	33	-41	-55.6%
██████████	██████████	██████████	██████████	██████████
Point EGU	310	299	-11	-3.5%
Point nonEGU	188	188	0	0.1%
	1,269	1,131	-138	-10.9%
Sulfur Dioxide (SO₂)				
Area	274	83	-191	-69.7%
Nonroad MAR	5	2	-4	-69.4%
Nonroad NMIM	45	1	-44	-97.6%
██████████	██████████	██████████	██████████	██████████
Point EGU	5,536	4,590	-946	-17.1%
Point nonEGU	1,277	1,271	-6	-0.5%
	7,182	5,993	-1,189	-16.5%

Nonroad MAR – includes commercial marine vessels, airports, and railroad locomotives

Nonroad NMIM – includes equipment included in USEPA's NMIM/NONROAD model

Onroad MOVES – includes emissions calculated by USEPA's MOVES model

Note: only includes emissions for Washington County, MD; emissions for West Virginia portion of the nonattainment area will be provided by Maryland in their SIP submittal.

**Exhibit 7.4 Comparison of 2007 and 2025 PM_{2.5} and PM Precursor Emissions
Nonattainment Area: Harrisburg-Lebanon-Carlisle-York, PA**

SECTOR	Annual (tons) 2007	Annual (tons) 2025	Change (tpy) from 2007 to 2025	Change (%) From 2007 to 2025
Oxides of Nitrogen (NOx)				
Area	3,874	3,705	-169	-4.4%
Nonroad MAR	1,775	981	-793	-44.7%
Nonroad NMIM	5,329	2,055	-3,274	-61.4%
Onroad MOVES	36,440	9,338	-27,102	-74.4%
Point EGU	15,985	15,531	-454	-2.8%
Point nonEGU	10,965	9,646	-1,319	-12.0%
	74,368	41,255	-33,113	-44.5%
Direct PM_{2.5}				
Area	5,452	5,201	-251	-4.6%
Nonroad MAR	74	35	-39	-52.3%
Nonroad NMIM	474	211	-263	-55.4%
Onroad MOVES	1,225	346	-879	-71.8%
Point EGU	2,123	2,060	-63	-3.0%
Point nonEGU	923	915	-8	-0.9%
	10,272	8,769	-1,503	-14.6%
Sulfur Dioxide (SO₂)				
Area	4,900	2,763	-2,136	-43.6%
Nonroad MAR	30	15	-15	-50.2%
Nonroad NMIM	293	8	-285	-97.3%
Onroad MOVES	255	89	-165	-64.9%
Point EGU	106,189	5,179	-101,010	-95.1%
Point nonEGU	11,520	11,539	19	0.2%
	123,186	19,593	-103,593	-84.1%

Nonroad MAR – includes commercial marine vessels, airports, and railroad locomotives

Nonroad NMIM – includes equipment included in USEPA's NMIM/NONROAD model

Onroad MOVES – includes emissions calculated by USEPA's MOVES model

**Exhibit 7.5 Comparison of 2007 and 2025 PM_{2.5} and PM Precursor Emissions
Nonattainment Area: Johnstown, PA**

SECTOR	Annual (tons) 2007	Annual (tons) 2025	Change (tpy) from 2007 to 2025	Change (%) From 2007 to 2025
Oxides of Nitrogen (NOx)				
Area	861	822	-39	-4.5%
Nonroad MAR	1,132	568	-564	-49.8%
Nonroad NMIM	909	366	-543	-59.7%
Onroad MOVES	6,017	1,217	-4,800	-79.8%
Point EGU	41,440	40,004	-1,435	-3.5%
Point nonEGU	932	1,097	165	17.7%
	51,291	44,074	-7,216	-14.1%
Direct PM_{2.5}				
Area	1,198	1,114	-84	-7.0%
Nonroad MAR	45	18	-27	-60.6%
Nonroad NMIM	84	36	-48	-56.9%
Onroad MOVES	195	43	-152	-78.2%
Point EGU	2,867	2,768	-99	-3.4%
Point nonEGU	231	234	3	1.4%
	4,619	4,212	-407	-8.8%
Sulfur Dioxide (SO₂)				
Area	1,179	593	-586	-49.7%
Nonroad MAR	13	1	-12	-95.9%
Nonroad NMIM	51	1	-50	-97.4%
Onroad MOVES	45	12	-32	-72.3%
Point EGU	143,303	141,481	-1,821	-1.3%
Point nonEGU	30	35	4	14.7%
	144,621	142,123	-2,498	-1.7%

Nonroad MAR – includes commercial marine vessels, airports, and railroad locomotives

Nonroad NMIM – includes equipment included in USEPA's NMIM/NONROAD model

Onroad MOVES – includes emissions calculated by USEPA's MOVES model

Note: summary includes emissions for all of Indiana County; however, only part of the county is in the nonattainment area.

**Exhibit 7.6 Comparison of 2007 and 2025 PM_{2.5} and PM Precursor Emissions
Nonattainment Area: Lancaster, PA**

SECTOR	Annual (tons) 2007	Annual (tons) 2025	Change (tpy) from 2007 to 2025	Change (%) From 2007 to 2025
Oxides of Nitrogen (NOx)				
Area	1,827	1,704	-122	-6.7%
Nonroad MAR	293	140	-153	-52.1%
Nonroad NMIM	2,880	1,170	-1,710	-59.4%
Onroad MOVES	14,163	3,779	-10,384	-73.3%
Point EGU	0	0	0	0.0%
Point nonEGU	1,147	1,383	236	20.5%
	20,310	8,177	-12,133	-59.7%
Direct PM_{2.5}				
Area	1,827	1,704	-122	-6.7%
Nonroad MAR	293	140	-153	-52.1%
Nonroad NMIM	2,880	1,170	-1,710	-59.4%
Onroad MOVES	14,163	3,779	-10,384	-73.3%
Point EGU	0	0	0	0.0%
Point nonEGU	1,147	1,383	236	20.5%
	20,310	8,177	-12,133	-59.7%
Sulfur Dioxide (SO₂)				
Area	3,030	1,766	-1,264	-41.7%
Nonroad MAR	4	0	-3	-87.6%
Nonroad NMIM	144	5	-139	-96.8%
Onroad MOVES	104	38	-66	-63.4%
Point EGU	0	0	0	0.0%
Point nonEGU	102	120	18	17.5%
	3,384	1,929	-1,454	-43.0%

Nonroad MAR – includes commercial marine vessels, airports, and railroad locomotives

Nonroad NMIM – includes equipment included in USEPA's NMIM/NONROAD model

Onroad MOVES – includes emissions calculated by USEPA's MOVES model

Exhibit 7.7 Comparison of 2007 and 2025 PM2.5 and PM Precursor Emissions
Nonattainment Area: Metro New York/Northern New Jersey/Long Island NY/NJ/CT

SECTOR	Annual (tons) 2007	Annual (tons) 2025	Change (tpy) from 2007 to 2025	Change (%) From 2007 to 2025
Oxides of Nitrogen (NOx)				
Area	64,044	56,873	-7,170	-11.2%
Nonroad MAR	46,842	31,820	-15,023	-32.1%
Nonroad NMIM	70,841	13,603	-57,238	-80.8%
Onroad MOVES	252,723	74,474	-178,249	-70.5%
Point EGU	36,928	33,841	-3,087	-8.4%
Point nonEGU	20,117	20,881	765	3.8%
	491,675	231,660	-260,014	-52.9%
Direct PM2.5				
Area	18,512	19,318	805	4.4%
Nonroad MAR	1,705	755	-950	-55.7%
Nonroad NMIM	5,873	1,534	-4,339	-73.9%
Onroad MOVES	10,189	4,878	-5,311	-52.1%
Point EGU	6,267	4,274	-1,994	-31.8%
Point nonEGU	1,530	1,704	174	11.4%
	44,131	32,457	-11,674	-26.5%
Sulfur Dioxide (SO2)				
Area	42,122	10,353	-31,768	-75.4%
Nonroad MAR	11,823	1,957	-9,865	-83.4%
Nonroad NMIM	3,720	56	-3664	-98.5%
Onroad MOVES	1,750	1,564	-186	-10.6%
Point EGU	63,236	44,139	-19,097	-30.2%
Point nonEGU	5,293	5,351	59	1.1%
	126,427	63,420	-63,005	-43.7%

Nonroad MAR – includes commercial marine vessels, airports, and railroad locomotives

Nonroad NMIM – includes equipment included in USEPA's NMIM/NONROAD model

Onroad MOVES – includes emissions calculated by USEPA's MOVES model

Note: 2025 NMIM emissions for New York counties are missing from the above summaries.

Note 2: New Jersey made changes to Point EGU values in this table after AMEC finalized the project. The changes were made by MARAMA.

Note 3: GSE Emissions were removed from 2025 total for consistency.

Note 4: 2007 and 2025 Connecticut NMIM was updated with runs that use Version 3 inputs, including revisions to the Pleasurecraft population file.

**Exhibit 7.8 Comparison of 2007 and 2025 PM_{2.5} and PM Precursor Emissions
Nonattainment Area: Philadelphia-Wilmington, PA/DE/NJ**

SECTOR	Annual (tons) 2007	Annual (tons) 2025	Change (tpy) from 2007 to 2025	Change (%) From 2007 to 2025
Oxides of Nitrogen (NOx)				
Area	18,043	17,741	-302	-1.7%
Nonroad MAR	12,271	9,357	-2,913	-23.7%
Nonroad NMIM	19,579	8,305	-11,274	-57.6%
Onroad MOVES	106,315	26,648	-79,668	-74.9%
Point EGU	12,616	4,873	-7,743	-61.4%
Point nonEGU	19,143	14,944	-4,199	-21.9%
	187,967	81,869	-106,099	-56.4%
Direct PM_{2.5}				
Area	13,811	12,983	-829	-6.0%
Nonroad MAR	658	299	-360	-54.7%
Nonroad NMIM	1,808	1,059	-749	-41.4%
Onroad MOVES	3,795	1,443	-2,352	-62.0%
Point EGU	1,048	813	-236	-22.5%
Point nonEGU	3,524	3,062	-462	-13.1%
	24,644	19,657	-4,987	-20.2%
Sulfur Dioxide (SO₂)				
Area	16,763	9,756	-7,007	-41.8%
Nonroad MAR	5,136	677	-4,459	-86.8%
Nonroad NMIM	998	32	-966	-96.7%
Onroad MOVES	773	422	-351	-45.4%
Point EGU	20,665	4,563	-16,102	-77.9%
Point nonEGU	14,370	8,990	-5,380	-37.4%
	58,705	24,440	-34,265	-58.4%

Nonroad MAR – includes commercial marine vessels, airports, and railroad locomotives

Nonroad NMIM – includes equipment included in USEPA's NMIM/NONROAD model

Onroad MOVES – includes emissions calculated by USEPA's MOVES model

**Exhibit 7.9 Comparison of 2007 and 2025 PM_{2.5} and PM Precursor Emissions
Nonattainment Area: Pittsburgh-Beaver Valley, PA**

SECTOR	Annual (tons) 2007	Annual (tons) 2025	Change (tpy) from 2007 to 2025	Change (%) From 2007 to 2025
Oxides of Nitrogen (NOx)				
Area	8,608	8,613	5	0.1%
Nonroad MAR	14,258	7,116	-7,142	-50.1%
Nonroad NMIM	9,827	4,223	-5,605	-57.0%
Onroad MOVES	56,652	12,725	-43,927	-77.5%
Point EGU	82,657	84,453	1,795	2.2%
Point nonEGU	20,217	18,760	-1,456	-7.2%
	192,219	135,890	-56,330	-29.3%
Direct PM_{2.5}				
Area	7,562	6,835	-728	-9.6%
Nonroad MAR	467	196	-271	-58.1%
Nonroad NMIM	880	432	-448	-50.9%
Onroad MOVES	1,905	531	-1,374	-72.1%
Point EGU	6,293	6,348	55	0.9%
Point nonEGU	5,108	5,109	1	0.0%
	22,216	19,450	-2,766	-12.4%
Sulfur Dioxide (SO₂)				
Area	13,589	10,791	-2,798	-20.6%
Nonroad MAR	260	95	-165	-63.4%
Nonroad NMIM	529	15	-514	-97.2%
Onroad MOVES	419	141	-278	-66.4%
Point EGU	429,186	93,130	-336,056	-78.3%
Point nonEGU	13,247	13,699	451	3.4%
	457,230	117,871	-339,359	-74.2%

Nonroad MAR – includes commercial marine vessels, airports, and railroad locomotives

Nonroad NMIM – includes equipment included in USEPA's NMIM/NONROAD model

Onroad MOVES – includes emissions calculated by USEPA's MOVES model

Note: summary includes emissions for all of Allegheny, Armstrong, Greene and Lawrence counties; however, only parts of those counties are in the nonattainment area.

**Exhibit 7.10 Comparison of 2007 and 2025 PM_{2.5} and PM Precursor Emissions
Nonattainment Area: Reading, PA**

SECTOR	Annual (tons) 2007	Annual (tons) 2025	Change (tpy) from 2007 to 2025	Change (%) From 2007 to 2025
Oxides of Nitrogen (NOx)				
Area	1,289	1,114	-175	-13.6%
Nonroad MAR	621	307	-314	-50.5%
Nonroad NMIM	1,911	696	-1,215	-63.6%
Onroad MOVES	11,370	2,831	-8,538	-75.1%
Point EGU	2,506	2,432	-74	-2.9%
Point nonEGU	3,288	1,919	-1,369	-41.6%
	20,983	9,298	-11,685	-55.7%
Direct PM_{2.5}				
Area	1,859	1,727	-132	-7.1%
Nonroad MAR	30	15	-15	-51.5%
Nonroad NMIM	161	72	-88	-54.9%
Onroad MOVES	379	96	-284	-74.7%
Point EGU	947	921	-26	-2.7%
Point nonEGU	325	331	6	1.8%
	3,701	3,161	-540	-14.6%
Sulfur Dioxide (SO₂)				
Area	2,389	1,223	-1,166	-48.8%
Nonroad MAR	7	1	-7	-92.6%
Nonroad NMIM	99	3	-96	-97.1%
Onroad MOVES	81	27	-53	-66.3%
Point EGU	14,491	13,990	-501	-3.5%
Point nonEGU	649	660	11	1.7%
	17,716	15,903	-1,812	-10.2%

Nonroad MAR – includes commercial marine vessels, airports, and railroad locomotives

Nonroad NMIM – includes equipment included in USEPA's NMIM/NONROAD model

Onroad MOVES – includes emissions calculated by USEPA's MOVES model

Exhibit 7.11 Comparison of 2007 and 2025 PM2.5 and PM Precursor Emissions**Nonattainment Area: Washington DC/MD/VA**

SECTOR	Annual (tons) 2007	Annual (tons) 2025	Change (tpy) from 2007 to 2025	Change (%) From 2007 to 2025
Oxides of Nitrogen (NOx)				
Area	8,936	9,342	406	4.5%
Nonroad MAR	6,700	6,711	11	0.2%
Nonroad NMIM	20,097	8,000	-12,097	-60.2%
Onroad MOVES	42,971	14,067	-28,904	-67.3%
Point EGU	29,029	13,919	-15,109	-52.0%
Point nonEGU	8,826	11,253	2,427	27.5%
	116,643	63,295	-53,348	-45.7%
Direct PM2.5				
Area	9,528	9,725	198	2.1%
Nonroad MAR	201	160	-40	-20.2%
Nonroad NMIM	2,005	1,110	-895	-44.7%
Onroad MOVES	1,467	728	-739	-50.4%
Point EGU	4,984	4,996	12	0.2%
Point nonEGU	563	594	32	5.6%
	18,746	17,316	-1,430	-7.6%
Sulfur Dioxide (SO2)				
Area	5,733	3,862	-1,871	-32.6%
Nonroad MAR	416	488	72	17.3%
Nonroad NMIM	1,233	28	-1,205	-97.8%
Onroad MOVES	387	347	-40	-10.4%
Point EGU	179,243	24,694	-154,549	-86.2%
Point nonEGU	4,206	3,570	-636	-15.1%
	191,215	32,990	-158,225	-82.7%

Nonroad MAR – includes commercial marine vessels, airports, and railroad locomotives

Nonroad NMIM – includes equipment included in USEPA's NMIM/NONROAD model

Onroad MOVES – includes emissions calculated by USEPA's MOVES model

Note: 2007 and 2025 MOVES onroad emissions for Virginia counties are missing from the above summaries.

Note2: GSE Emissions were removed from 2025 total for consistency.

**Exhibit 7.12 Comparison of 2007 and 2025 PM_{2.5} and PM Precursor Emissions
Nonattainment Area: York, PA**

SECTOR	Annual (tons) 2007	Annual (tons) 2025	Change (tpy) from 2007 to 2025	Change (%) From 2007 to 2025
Oxides of Nitrogen (NOx)				
Area	1,680	1,678	-2	-0.1%
Nonroad MAR	198	104	-93	-47.2%
Nonroad NMIM	2,463	836	-1,627	-66.1%
Onroad MOVES	10,519	2,740	-7,779	-74.0%
Point EGU	15,760	15,226	-534	-3.4%
Point nonEGU	6,404	6,431	28	0.4%
	37,024	27,015	-10,008	-27.0%
Direct PM_{2.5}				
Area	2,394	2,325	-69	-2.9%
Nonroad MAR	13	7	-6	-48.7%
Nonroad NMIM	189	77	-112	-59.4%
Onroad MOVES	348	121	-227	-65.2%
Point EGU	2,098	2,026	-72	-3.4%
Point nonEGU	364	365	1	0.3%
	5,407	4,921	-486	-9.0%
Sulfur Dioxide (SO₂)				
Area	1,684	1,059	-625	-37.1%
Nonroad MAR	2	0	-2	-88.4%
Nonroad NMIM	132	3	-129	-97.5%
Onroad MOVES	79	28	-50	-63.8%
Point EGU	106,158	5,136	-101,021	-95.2%
Point nonEGU	9,743	9,749	6	0.1%
	117,798	15,977	-101,821	-86.4%

Nonroad MAR – includes commercial marine vessels, airports, and railroad locomotives

Nonroad NMIM – includes equipment included in USEPA's NMIM/NONROAD model

Onroad MOVES – includes emissions calculated by USEPA's MOVES model

8.0 DELIVERABLES

Files are stored on MARAMA ftp site:

Address: [ftp.marama.org](ftp://marama.org)

Login ID: regionalei

Password: marama2007

Folder: /2025/Final 2025 (Version 3_3)

Exhibit 8.1 lists the file names for all final deliverables.

Exhibit 8.1 Final Deliverables

File Name	Description
TSD V3_3 MANE-VU 2025 Inventory PM Nonattainment Counties.docx	Technical Support Document for 2025 emission inventory for PM nonattainment counties
Appendix A1 AEO2010 New England.xls	AEO2010 Energy Consumption by Sector and Source for New England Region (CT, MA, ME, NH, RI, VT) and calculated growth factors
Appendix A2 AEO2010 Mid Atlantic.xls	AEO2010 Energy Consumption by Sector and Source for Mid-Atlantic Region (NJ, NY, PA) and calculated growth factors
Appendix A3 AEO2010 South Atlantic.xls	AEO2010 Energy Consumption by Sector and Source for South Atlantic Region (DC, DE, MD, VA) and calculated growth factors
Appendix A4 AEO2011 New England.xls	AEO2011 Energy Consumption by Sector and Source for New England Region (CT, MA, ME, NH, RI, VT) and calculated growth factors
Appendix A5 AEO2011 Mid Atlantic.xls	AEO2011 Energy Consumption by Sector and Source for Mid-Atlantic Region (NJ, NY, PA) and calculated growth factors
Appendix A6 AEO2011 South Atlantic.xls	AEO2011 Energy Consumption by Sector and Source for South Atlantic Region (DC, DE, MD, VA) and calculated growth factors
Appendix A7 AEO2010 vs AEO2011 Comparison.docx	Technical Memorandum comparing AEO2010 and AEO2011 energy consumption projections
Appendix B Population_Factors.xls	County-level population growth factors as provided by states

File Name	Description
Appendix C Employment_Factors.xls	State-level employment growth factors provided by states
Appendix D VMT GF Nonattainment Counties.xls	County-level VMT for 2007 and 2025
Appendix E EPA2020 Res Wood.xls	USEPA growth factor formulas by SCC for residential wood combustion
Appendix F AEO2011-Electricity Generation by EMM.xlsx	AEO 2011 Electricity Generation by Electricity Market Module Region and Source, Reference case, and associated growth factors
Appendix G UAF NEEDS Control FileMASTER92211.xls	State information on future EGU controls and emission rates
Appendix H MAR Growth and Control.xls	USEPA and FAA data used to develop growth and control factors for commercial marine vessels, airports, and railroads
V3_3 Area_07_25 PM Nonattainment.xlsx	County and SCC-level emissions and growth/control factors for area sources
V3_3 EGU_07_25 PM Nonattainment.xlsx	Unit level emissions and growth/control factors for EGUs
V3_3 MAR_07_25 PM Nonattainment.xlsx	County and SCC-level emissions and growth/control factors for commercial marine vessels, airports, and railroad locomotives
V3_3 MOVES_07_25 PM Nonattainment.xlsx	County level emissions for onroad vehicles included in USEPA's MOVES model
V3_3 NMIM_07_25 PM Nonattainment.xlsx	County and SCC-level emissions for nonroad equipment included in USEPA's NMIM/NONROAD model
V3_3 NonEGU_07_25 PM Nonattainment.xlsx	Unit level emissions and growth/control factors for nonEGUs
V3_3 Summaries_07_25 PM Nonattainment.xlsx	Emission summaries by county and nonattainment area

9.0 REFERENCES

- EIA 2006.** U.S. Department of Energy, Energy Information Administration. *Annual Energy Outlook with Projections to 2030 (AEO2006)*. DOE/EIA-0383(2006). February 2006. [http://www.eia.doe.gov/oiaf/archive/aeo06/pdf/0383\(2006\).pdf](http://www.eia.doe.gov/oiaf/archive/aeo06/pdf/0383(2006).pdf)
- EIA 2010.** U.S. Department of Energy, Energy Information Administration. *Annual Energy Outlook with Projections to 2035 (AEO2010)*; DOE/EIA-0383(2010). April 2010. [http://www.eia.doe.gov/oiaf/aeo/assumption/pdf/0554\(2010\).pdf](http://www.eia.doe.gov/oiaf/aeo/assumption/pdf/0554(2010).pdf)
- EIA 2011a.** U.S. Department of Energy, Energy Information Administration. *Annual Energy Outlook with Projections to 2035 (AEO2011)*; DOE/EIA-0383(2011). April 2011. [http://www.eia.gov/forecasts/aeo/pdf/0383\(2011\).pdf](http://www.eia.gov/forecasts/aeo/pdf/0383(2011).pdf)
- EIA 2011b.** U.S. Department of Energy, Energy Information Administration. *Annual Energy Outlook with Projections to 2035 (AEO2011) – Table 96 Electricity Generation by Electricity Market Module Region and Source, Reference case*; DOE/EIA-0383(2011). April 2011. [http://www.eia.gov/forecasts/aeo/pdf/0383\(2011\).pdf](http://www.eia.gov/forecasts/aeo/pdf/0383(2011).pdf)
- FAA 2010.** Federal Aviation Administration. *Terminal Area Forecast 2009-2030*. Database file (APO100_TAF_Final_2010.zip) downloaded July 2010. <http://aspm.faa.gov/main/taf.asp>
- MANE-VU 2007.** Mid-Atlantic / Northeast Visibility. *Statement of the Mid-Atlantic/Northeast Visibility Union Concerning a Course of Action within MANE-VU Toward Assuring Reasonable Progress*. June 20, 2007. <http://www.otcair.org/manevu/document.asp?fview=Formal%20Actions>
- MARAMA 2007.** Prepared by MACTEC Federal Programs, Inc. for the Mid-Atlantic Regional Air Management Association. *Development of Emissions Projections for 2009, 2012, and 2018 for NonEGU Point, Area, and Nonroad Sources in the MANE-VU Region*. February 2007. <http://www.marama.org/technical-center/emissions-inventory/2002-inventory-and-projections/mane-vu-future-year-emissions-inventory>
- MARAMA 2011a.** Prepared by MACTEC Engineering and Consulting, Inc. for the Mid-Atlantic Regional Air Management Association. *Technical Support Document for the Development of the 2007 Emission Inventory for Regional Air Quality Modeling in the Northeast / Mid-Atlantic Region*. February 27, 2011.
- MARAMA 2011b.** Prepared by MACTEC Engineering and Consulting, Inc. for the Mid-Atlantic Regional Air Management Association. *Technical Support Document for the*

Development of the 2013/2017/2020 Emission Inventories for Regional Air Quality Modeling in the Northeast / Mid-Atlantic Region. February 27, 2011.

MARAMA 2012a. Prepared by AMEC Environment and Infrastructure and SRA International for the Mid-Atlantic Regional Air Management Association. *Technical Support Document for the Development of the 2007 Emission Inventory for Regional Air Quality Modeling in the Northeast / Mid-Atlantic Region Version 3_3.* January 23, 2012.

MARAMA 2012b. Prepared by AMEC Environment and Infrastructure and SRA International for the Mid-Atlantic Regional Air Management Association. *Technical Support Document for the Development of the 2013/2017/2020 Emission Inventories for Regional Air Quality Modeling in the Northeast / Mid-Atlantic Region Version 3_3.* January 23, 2012

OTC 2001. Prepared by E.H. Pechan & Associates, Inc. for the Ozone Transport Commission. *Control Measure Development Support Analysis of Ozone Transport Commission Model Rules.* March 31, 2001.

<http://www.otcair.org/Document.asp?fview=Report#>

OTC 2007. Prepared by MACTEC Federal Programs, Inc. for the Ozone Transport Commission. *Identification and Evaluation of Candidate Control Measures – Final Technical Support Document.* February 28, 2007.

<http://www.otcair.org/Document.asp?fview=Report#>

OTC 2009a. Ozone Transport Commission. *Status Report on OTC States' Efforts to Promulgate Regulations Based on OTC 2001 Model Rules.* October 19, 2009.

<http://www.otcair.org/interest.asp?Fview=stationary>

OTC 2009b. Ozone Transport Commission. *Status Report on OTC States' Efforts to Promulgate Regulations Based on OTC 2006 Model Rules.* October 19, 2009.

<http://www.otcair.org/interest.asp?Fview=stationary>

USEPA 2004a. E.H. Pechan & Associates, Inc. for the U.S. Environmental Protection Agency *Crosswalk Between Source Classification Code (SCC) and Emission Activity Growth Factors – Final Technical Memorandum.* September 9, 2004.

<http://www.epa.gov/ttn/ecas/SCCcrosswalk.pdf>

USEPA 2004b. E.H. Pechan & Associates, Inc. for the U.S. Environmental Protection Agency *Crosswalk Between Standard Industrial Classification (SIC) Codes and Emission Activity Growth Factors – Final Technical Memorandum.* September 9, 2004.

<http://www.epa.gov/ttn/ecas/SICcrosswalk.pdf>

USEPA 2004c. U.S. Environmental Protection Agency. *Nonroad Engine Growth Estimates*. EPA-420/P-04-08. April 2004.

<http://www.epa.gov/otaq/models/nonrdmdl/nonrdmdl2004/420p04008.pdf>

USEPA 2005a. U.S. Environmental Protection Agency. *Control of Air Pollution From Aircraft and Aircraft Engines; Emission Standards and Test Procedures: Final Rule*.

November 17, 2005. [http://www.epa.gov/fedrgstr/EPA-AIR/2005/November/Day-](http://www.epa.gov/fedrgstr/EPA-AIR/2005/November/Day-17/a22704.pdf)

[17/a22704.pdf](http://www.epa.gov/fedrgstr/EPA-AIR/2005/November/Day-17/a22704.pdf)

USEPA 2007a. U.S. Environmental Protection Agency. *Emissions Modeling Clearinghouse - Fugitive Dust Fractions*. February 2007.

<http://www.epa.gov/ttn/chief/emch/dustfractions>)

USEPA 2007b. U.S. Environmental Protection Agency. *Guidance for Estimating VOC and NOx Emission Changes from MACT Rules*. EPA-457/B-07-001. May 2007.

http://www.epa.gov/ttn/naaqs/ozone/o3imp8hr/documents/guidance/200705_epa457_b-07-001_emission_changes_mact_rules.pdf

USEPA 2008a. U.S. Environmental Protection Agency. *Control Techniques Guidelines*.

<http://www.epa.gov/ttncaaa1/tlctg.html>

USEPA 2008b. U.S. Environmental Protection Agency. *Regulatory Impact Analysis: Control or Emissions of Air Pollution from Locomotive Engines and Marine Compression Engines Less than 30 Liters Per Cylinder*. EPA420-R-08-001a. May 2008.

<http://www.epa.gov/otaq/regs/nonroad/420r08001a.pdf>

USEPA 2009a. U.S. Environmental Protection Agency. *National Mobile Inventory Model*. <http://www.epa.gov/otaq/nmim.htm>

USEPA 2009c. U.S. Environmental Protection Agency. *Regulatory Impact Analysis: Control of Emissions of Air Pollution from Category 3 Marine Diesel Engines*. EPA420-R-09-019. December 2009. <http://www.epa.gov/otaq/regs/nonroad/marine/ci/420r09019.pdf>

USEPA 2009d. U.S. Environmental Protection Agency. *Proposal to Designate an Emissions Control Area for Nitrogen Oxides, Sulfur Oxides, and Particulate Matter*. EPA-420-R-09-007. April 2009. <http://www.epa.gov/otaq/regs/nonroad/marine/ci/420r09007-chap2.pdf>

USEPA 2010a. U.S. Environmental Protection Agency. *2020 Emissions Data from EPA's 2005-based V4 Modeling Platform; Projection and Control Factors*. Provided by Rich Mason on April 15, 2010.

http://ftp.epa.gov/EmisInventory/2005v4/projection_control_packets

USEPA 2010b. U.S. Environmental Protection Agency. *Transport Rule Emission Inventories Notice of Data Availability (NODA)*. Docket ID No. EPA-HQ-OAR-2009-0491. October 27, 2010. TR_EI_NODA_relevant_CoSTpackets_and_inventories.xls ftp://ftp.epa.gov/EmisInventory/2005v4/tr_ei_noda

USEPA 2010c. U.S. Environmental Protection Agency. *Advance Notice of Proposed Rulemaking on Lead Emissions from Piston-Engine Aircraft Using Leaded Aviation Gasoline*. April 2010. <http://www.epa.gov/oms/regs/nonroad/aviation/420f10013.pdf>

USEPA 2011. U.S. Environmental Protection Agency. *Emission Standards Reference Guide*. <http://www.epa.gov/otaq/standards/index.htm>

Appendix E
Emission Inventory Detail Spreadsheet

Appendix E: Emission Inventory Detail Spreadsheet

The file size of the data document in Appendix E is 1.5 MB with many individual spreadsheets that are interlinked and very large. Due to the difficulty of transferring this document into a readable format for the Web, it is not available for immediate download via the MDE Web site. Copies of this appendix may be quickly obtained from the following

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Appendix F
Onroad Mobile MOVES Documentation, Conformity
Data and Budgets

**On-Road (Highway)
Mobile Emissions Inventory Documentation
for the
Washington County, Maryland PM_{2.5} Nonattainment Area**



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Mobile Sources Control Program
Maryland Department of the Environment

April 2013

**The Washington County, Maryland PM_{2.5} Non-Attainment Area
On-Road (Highway) Mobile Emissions Inventory Documentation**

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OVERVIEW

This document provides the on-road (highway) mobile source emissions inventory for the Washington County, Maryland (MD) PM_{2.5} non-attainment area using Environmental Protection Agency (EPA)'s Motor Vehicle Emission Simulator (MOVES) model. The document includes a summary of the methodology and data assumptions used for the analysis. As shown in Exhibit 1, appendices have been provided with additional detail regarding the MOVES input parameters, vehicle miles traveled (VMT) and emission results for the nonattainment area.

Exhibit 1: Summary of Appendices

Appendix	Title	Description
A	(PM _{2.5} , VOC, NO _x , SO ₂ , and NH ₃) Emission Results	Provides annual emission exhibits by county, road type, and source type categories in 2002, 2007, 2017 and 2025.
B	MOVES Sample Input File	Provides example of the MOVES input files.
C	MOVES Input Parameter Summary	Provides a summary of input parameters related to traffic data sources, fuel, weather, I/M, and other MOVES related input data.

Background:

The emissions inventory was developed using EPA's emissions model, MOVES2010. MOVES is now EPA's state-of-the-art tool for estimating emissions from highway vehicles. Compared to previous tools, MOVES incorporates the latest emissions data, more sophisticated calculation algorithms, increased user flexibility, new software design, and significant new capabilities. EPA announced the release of MOVES2010 in March 2010 (75 Federal Register 9411), and released a minor revision as MOVES2010a in September 2010. In April 2012, EPA released MOVES2010b to allow MOVES users to benefit from several improvements to general model performance. MOVES2010b does not affect the criteria pollutant emissions results of MOVES2010a and therefore is not a new model. Based on the timing of the analysis, this highway emissions inventory utilizes the MOVES2010a model.

Highway Emissions:

Exhibit 2 summarizes the highway emissions inventory for the Washington nonattainment area. The emission estimates for all pollutants have been developed using the MOVES2010a emission model and latest planning assumptions. Emissions have been estimated for the 2002, 2007, 2017 and 2025 analysis years. The 2002 and 2007 emission estimates were developed and provided by Maryland Department of the Environment (MDE).

Exhibit 2: Summary of Highway Emissions Inventory for Washington County Annual Emissions (Short tons/year)

County	VMT	VOC	NO _x	PM _{2.5}	SO ₂	NH ₃
2002	1,886,010,533	2,556.74	9,163.19	285.62	262.57	110.63
2007	2,090,061,547	1,656.90	6,021.95	217.77	45.33	91.77
2017	2,315,331,295	947.56	3,380.83	124.70	19.09	67.68
2025	2,786,455,965	725.46	2,312.19	77.79	20.82	74.45

A safety margin was applied to the emissions totals for the 2017 and 2025 analysis years to establish Motor Vehicle Emission Budgets (MVEBs) for transportation conformity. The safety margin was determined through consultation with MDE, Maryland Department of Transportation (MDOT) and

Hagerstown/ Eastern Panhandle Metropolitan Planning Organization (HEPMPO). **Exhibit 3** summarizes the MVEBs for Washington County.

Exhibit 3: Transportation Conformity Emission Budgets for Washington County

<i>Emissions (Short Tons/Year)</i>	NOx	PM_{2.5}
2017	4,057.00	149.63
2025	2,774.63	93.35

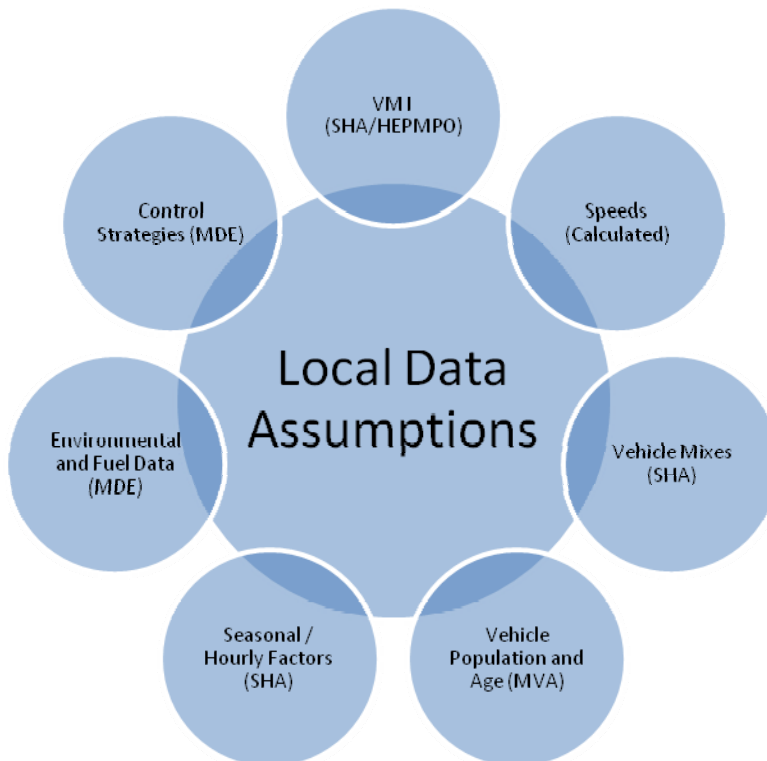
Analysis Methodology:

Guidance documents from EPA were used to develop the highway emissions inventory. They include:

- *Policy Guidance on the Use of MOVES2010 and Subsequent Minor Revisions for SIP Development, Transportation Conformity, and Other Purposes*, US EPA Office of Air and Radiation, EPA-420-B-12-010, April 2012.
- *Using MOVES to prepare Emission Inventories in State Implementation Plans and Transportation Conformity: Technical Guidance for MOVES2010, 2010a and 2010b*. US EPA Office of Air and Radiation, and Office of Transportation and Air Quality, EPA-420-B-12-028, April 2012.
- *Motor Vehicle Emission Simulator, User Guide for MOVES2010a*, EPA-420-B-10-036, August 2010.

The methodologies used to produce the emission data conform to the recommendations provided in EPA’s Technical Guidance. A mix of local data and national default (internal to MOVES2010a) data has been used for this submission. As illustrated in Exhibit 4, local data has been used for the primary data items that have a significant impact on emissions. Local data inputs to the analysis process reflect the latest available planning assumptions using data obtained from MDE, Motor Vehicle Administration (MVA), Maryland State Highway Administration (SHA), HEPMPO and other local/national sources.

Exhibit 4: Local Data Inputs Used for Emissions Inventory



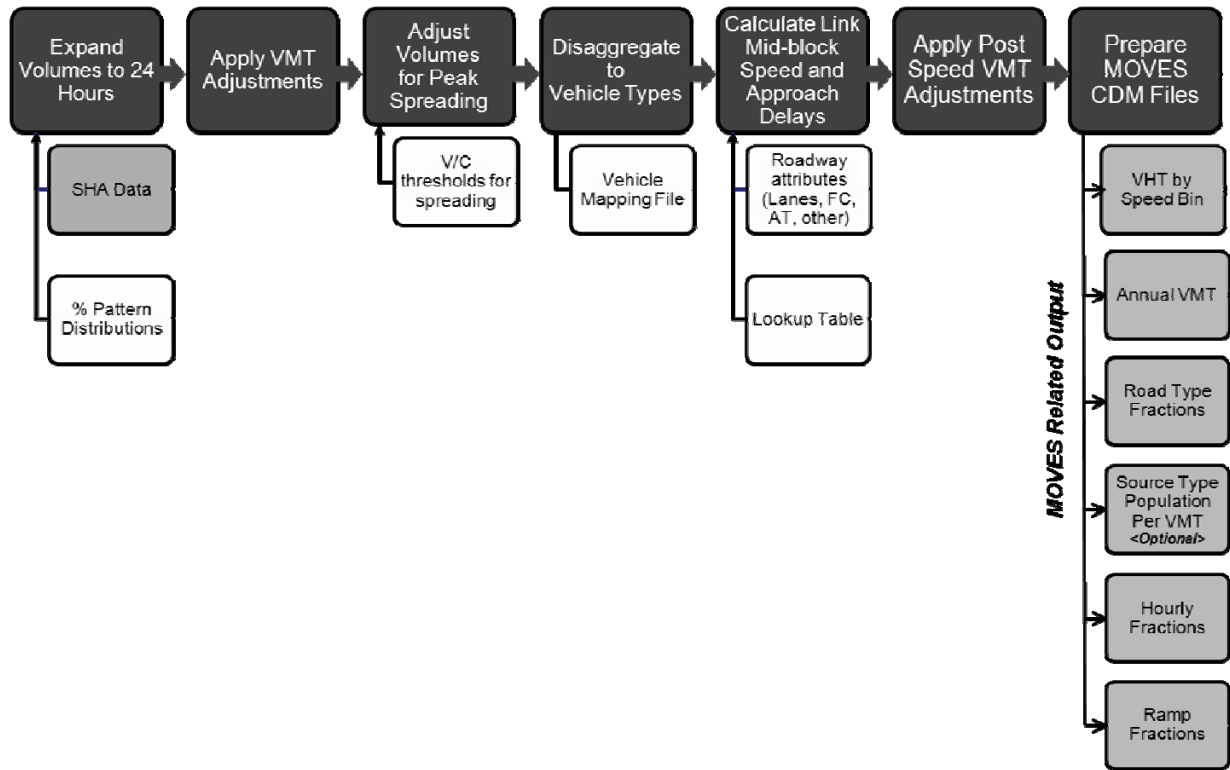
The analysis methodology is consistent with past statewide inventory efforts including the 2008 National Emissions Inventory (NEI) submission. This includes the use of statewide traffic roadway data and custom post-processing software (PPSUITE) to calculate hourly speeds and prepare key traffic input files to the MOVES2010a emission model. PPSUITE consists of a set of programs that perform the following functions:

- Analyzes highway operating conditions.
- Calculates highway speeds.
- Compiles VMT and vehicle type mix data.
- Prepares MOVES runs and processes MOVES outputs.

PPSUITE is a widely used and accepted tool for estimating speeds and processing emissions rates. It has been used for past State Implementation Plan (SIP) highway inventories in MD, Pennsylvania, and New Jersey. The software is based upon accepted transportation engineering methodologies. For example, PPSUITE utilizes speed and delay estimation procedures based on planning methods provided in the Highway Capacity Manual, a report prepared by the Transportation Research Board (TRB) summarizing current knowledge and analysis techniques for capacity and level-of-service analyses of the transportation system.

The PPSUITE process is integral to producing key input files to the MOVES emission model. Exhibit 5 summarizes the key functions of PPSUITE and the traffic-related input files prepared for MOVES.

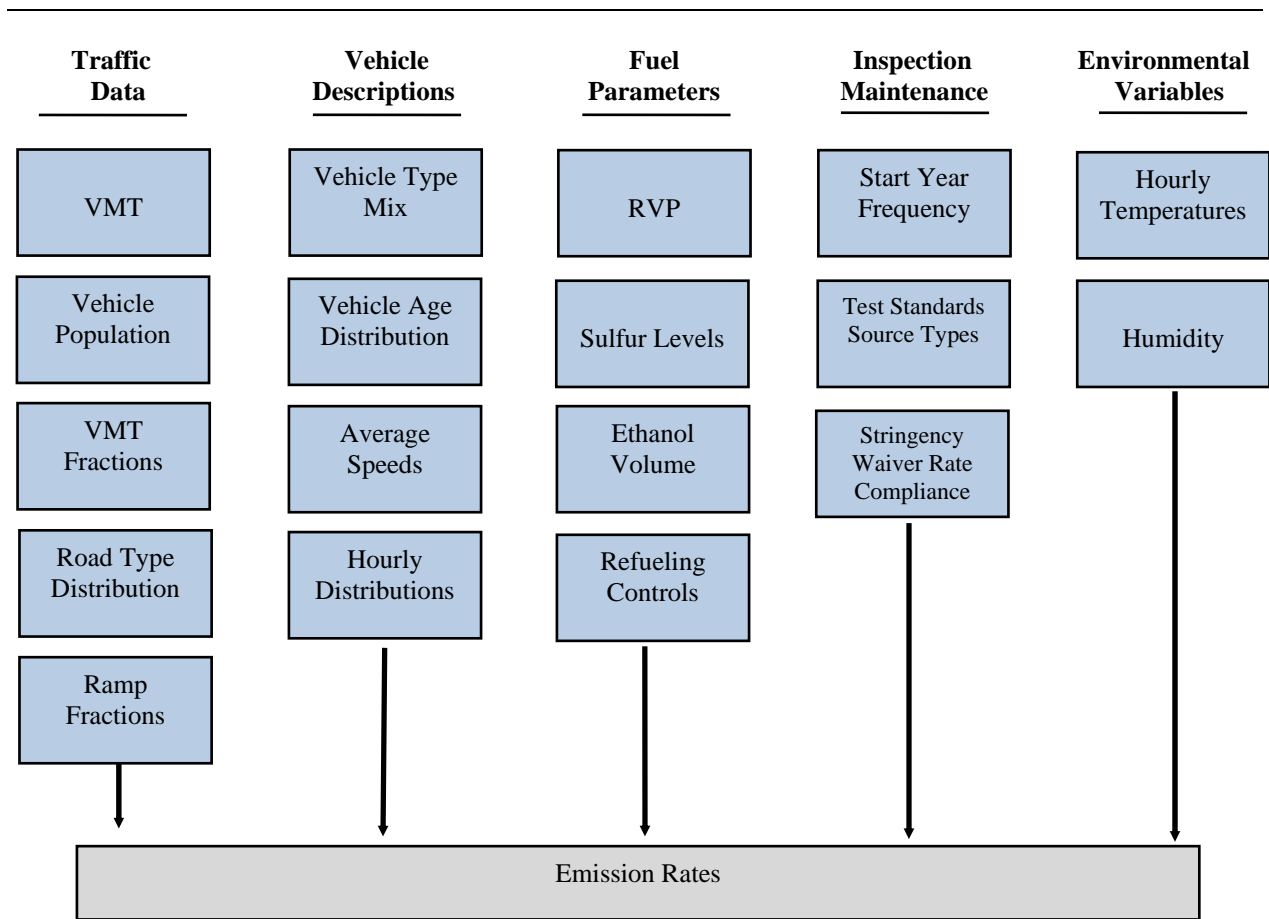
Exhibit 5: Emission Calculation Process



DESCRIPTION OF INPUT DATA

A large number of inputs to MOVES are needed to fully account for the numerous vehicle and environmental parameters that affect emissions. These include traffic flow characteristics, vehicle descriptions, fuel parameters, Inspection/Maintenance Program parameters, and environmental variables as shown in Exhibit 6.

Exhibit 6: Examples of Key MOVES Input Data



MOVES includes a default national database of meteorology, vehicle fleet, vehicle activity, fuel, and emission control program data for every county; but EPA cannot certify that the default data is the most current or best available information for any specific area. As a result, local data is recommended for use in SIP's analyses.

A mix of local and default data is used for this inventory. Local data sources are used for all inputs that have a significant impact on calculated emission rates. These data items are discussed in the following sections.

Roadway Data:

The roadway data input to emissions calculations for this inventory is based on information from the “universal” highway database maintained by the Maryland SHA. SHA obtains this information from periodic visual and electronic traffic counts. The SHA’s data is dynamic, since it is continually reviewed and updated from new traffic counts. Information on roadways included in the National Highway System is reviewed at least annually, while information on other roadways is reviewed at least biennially.

On a triennial basis, a current “snapshot” of the SHA’s database is taken and downloaded to provide an up-to-date record of the state’s highway system for estimating emissions. This emissions inventory is based on 2011 data which is the most current “snapshot” of the SHA’s data. The following information is extracted from the database for emission calculations:

- lanes
- distances
- volumes representing Average Annual Daily Traffic (AADT)
- truck percentages
- urban/rural classifications
- functional class codes

The volumes and distances are used in calculating highway VMT totals for each county. As discussed in the next section, adjustments are needed to convert the volumes to reflect annual conditions. In addition, the traffic volumes must be forecast to support future year emission inventories. The lane values, area type, and functional class are important inputs for determining the congestion and speeds for individual highway segments. Truck percentages are used in the speed determination process and are used to split volumes to individual vehicle types used by the MOVES software.

MD classifies its road segments by function, as well as whether it is located in an urban or rural area, as indicated below in Exhibit 7. The urban/rural (UR) and functional classes (FC) are important indicators of the type and function of each roadway segment. These values are also used to determine the MOVES Road Type classification that has an important impact on the emission factors for each roadway segment. Equivalencies between the SHA and MOVES indices are discussed in later sections.

Exhibit 7: MDOT Urban/Rural and Functional Class Codes

Urban/Rural Code	1=Rural 2=Small Urban 3=Urban	
Functional Class	Rural Functional Classes Used For Rural Areas ----- 1=Rural Freeway 2=Rural Other Principal Arterial 6=Rural Minor Arterial 7=Rural Major Collector 8=Rural Minor Collector 9=Rural Local	Urban Functional Classes Used For Urban Areas ----- 11=Urban Freeway 12=Urban Expressway 14=Urban Principal Arterial 16=Urban Minor Arterial 17=Urban Collector 19=Urban Local

The PPSUITE processing software allows for many additional variables other than those available in the SHA's database. Using these variables improves the calculation of congested speeds. Such variables include information regarding free-flow speeds and capacities and other physical roadway features (e.g. traffic signals) that can affect a roadway's calculated congested speed. This data can be determined from lookup tables based on a roadway segment's urban/rural code and functional class. Much of the lookup table data was developed from information contained in the Highway Capacity Manual.

Traffic Volumes Growth Rates:

Traffic volume projections are needed to support the forecast emission inventories. Growth factors are applied to the base year traffic volumes in the SHA's database. These growth factors are determined through an assessment of:

- Historic VMT growth from the Highway Performance Monitoring System (HPMS)
- Travel model forecasts obtained from the HEPMPO regional travel demand model
- Assessment of other factors affecting regional growth not represented in the above sources

The development and selection of growth rates has included consultation between MDOT, HEPMPO and MDE. Forecasted traffic volumes are used within the post-processing methodologies to estimate future year congested speeds.

Other Supporting Traffic Data:

Other traffic data is used to adjust and disaggregate traffic volumes. Key sources used in these processes include the following:

HPMS VMT: According to EPA's guidance, baseline inventory VMT computed from the SHA's highway segment volumes must be adjusted to be consistent with HPMS VMT totals. Although it has some limitations, the HPMS system is currently in use in all 50 states and is being improved under Federal Highway Administration (FHWA)'s direction. Adjustment factors are calculated which adjust the base year 2011 SHA's downloaded VMT to be consistent with the reported 2011 HPMS totals for that year. These factors are applied to all counties, urban/rural code, and facility group combinations within the region. These adjustments are important for accounting for missing local roadway VMT that is not contained within or represented by the state-owned roadway system.

Seasonal Factors: The SHA contains AADT volumes that are an average of all days in the year, including weekends and holidays. PM and CO analyses require volumes representing monthly average conditions (needed for producing annual totals). Therefore, the SHA's volumes must be seasonally adjusted. The seasonal factors were developed based on the 2011 report, *ATR Station Reports in the Traffic Trends System Report Module* from the SHA's website. These factors are applied to the existing SHA's AADT volumes to produce the monthly volumes. The same factors are also used to develop the MOVES daily and monthly VMT fraction files.

Hourly Patterns: Speeds and emissions vary considerably depending on the time of day. Therefore, it is important to estimate the pattern by which roadway volume varies by hour of the day. Pattern data is in the form of a percentage of the daily volumes for each hour. Distributions are provided for all the counties within the region and by each facility type grouping. This data was developed from 2011 24-hour count data obtained from the SHA's website. The same factors are also used to develop the MOVES hourly fraction file.

Vehicle Class Data:

Emission rates within MOVES vary significantly by the type of vehicle. The MOVES model produces emissions and rates by thirteen MOVES vehicle source types. However, VMT is input to MOVES by six HPMS vehicle groups. Exhibit 8 summarizes the distinction between each classification scheme.

Exhibit 8: MOVES Source Types and HPMS Vehicle Groups

<u>SOURCE TYPES</u>		<u>HPMS Class Groups</u>	
11	Motorcycle	10	Motorcycle
21	Passenger Car	20	Passenger Car
31	Passenger Truck	30	Passenger/Light Truck
32	Light Commercial Truck	40	Buses
41	Intercity Bus	50	Single Unit Trucks
42	Transit Bus	60	Combination Trucks
43	School bus		
51	Refuse Truck		
52	Single Unit Short-haul Truck		
53	Single Unit Long-haul Truck		
54	Motor Home		
61	Combination Short-haul Truck		
62	Combination Long-haul Truck		

For this regional inventory, vehicle type pattern data was developed for each county and functional class combination based on SHA's classification counts and internal MOBILE6.2 and MOVES defaults. As the first step, SHA's count data was used to develop percentage splits to the following four vehicle groups:

- Autos
- Heavy trucks
- Motorcycles
- Buses

Following procedures used for previous SIP's efforts, the vehicle groups were expanded to the 28 MOBILE6.2 weight-based vehicle types. Using procedures provided in EPA's Technical Guidance, the MOBILE6.2 vehicle classes were mapped to the MOVES source types and HPMS class groups.

The vehicle type percentages are also provided to the capacity analysis section of PPSUITE to adjust the speeds in response to trucks. That is, a given number of larger trucks take up more roadway space than a given number of cars, and this is accounted for in the speed estimation process by adjusting capacity using information from the Highway Capacity Manual.

Vehicle Ages:

Vehicle age distributions are input to MOVES for each county by the thirteen source types. The distributions reflect the percentage of vehicles in the fleet up to 31 years old. The vehicle age distributions were prepared by MDE based on information obtained from MVA registration data.

The age distributions are based on 2011 MVA registration data that included cleaning of duplicate, expired, and non-eligible vehicles (from the emission standpoint such as trailers, farm tractors). The data

was transformed into two sets of MOBILE6 vehicle types; one conforming to MOBILE6-28 vehicle type and the other to MOBILE6-16 composite vehicle type system using a SAS-based computer program.

The MOVES model input age distributions were produced utilizing the available EPA's MS-Excel-based vehicle registration converter tool. This tool assisted in converting the MOBILE6.2-based data into the MOVES source type categories.

Vehicle Population Data:

The information on the vehicle fleet including the number and age of vehicles impacts forecasted start and evaporative emissions within MOVES. MOVES model requires the population of vehicles by the thirteen source type categories. This data was prepared and provided by MDE for the analysis year 2011 utilizing another SAS-based computer program similar to the one discussed in the previous vehicle age section. MD's county vehicle registration data was used to estimate vehicle population for light-duty and heavy-duty vehicles for all counties in the region.

For the analysis years 2017 and 2025, the vehicle population was forecasted based on projected household and population growth obtained from state and Metropolitan Planning Organization (MPO)'s sources. The growth rate methodology included:

- Choosing the highest growth rate between population, households and VMT growth.
- Default VMT/Population ratio for Trucks i.e. Truck population growth based on Truck VMT.

Environmental and Fuel Data:

Information on environmental, fuel, vehicle technology and other control strategy assumptions were determined based on a review of MOVES2010a default information by MDE.

Fuel Data: MDE obtains monthly fuel data reports regularly from the MD Fuel Laboratory which is under the jurisdiction of MD Fuel Tax Division of the Office of the Comptroller of MD. These fuel reports are generated by testing samples collected in the field (gas stations) for the purpose of fuel regulation enforcement. It covers all counties in MD. Since the data entry of these samples is a huge task, compilation of fuel data to yield input parameters for MOBILE or MOVES modeling is confined only to the years for which emission inventories are due for submission to EPA on a triennial basis beginning with the baseline year of 1990. 2011 happens to be a year of such periodic emission inventories. As such 2011 fuel data was compiled and fuel data parameters were developed separately for the 14 MD counties with EPA's mandates to dispense only reformulated gasoline requirements and the 10 remaining counties dispensing conventional gasoline.

Two sets of fuel data inputs (Fuel Formulation and Fuel Supply tables) required by MOVES model were developed in-house for every county in MD. The fuel parameters changed from the MOVES defaults are as follows:

fuelFormulationID	Unique ID used for easy recognition
fuelSubtypeID	Selected per guidance based on ethanol content of gasoline
sulfurLevel	Computed from the local fuel data
ETOHVolume	Computed from the local fuel data
aromaticContent	Computed from the local fuel data
olefinContent	Computed from the local fuel data
benzineContent	Computed from the local fuel data
E200	Computed from the local fuel data

E300
RVP

Computed from the local fuel data
Computed from the local fuel data

Meteorological Data: Evaporative emissions are influenced significantly by the temperatures of the surrounding air. PM analysis temperature and humidity values were determined by MDE using the procedures documented in EPA's Technical Guidance. On a triennial basis, meteorology data including hourly temperature and relative humidity is compiled to be used for periodic emission inventories and hence this data was obtained for the year 2011. The month by month raw hourly-data sets were obtained from the National Climate Data Center of National Oceanic and Atmospheric Administration (NOAA) based on weather data collected at the Hagerstown Regional Airport situated in the Washington County. Hourly average temperature and humidity computations were developed from the 24 hourly values for every hour in a given month for Washington County.

Other Vehicle Technology and Control Strategy Data:

The MOVES2010a default I/M data was reviewed and updated by MDE for all the counties in the region. The current I/M Program known as Vehicle Emission Inspection Program (VEIP)'s assumption for these analysis runs is described below.

MD Vehicle Emission Inspection Program: This Program tests model year 1977 and newer gasoline powered vehicles weighing up to 26,000 lb. The test is done biennially, and on change of ownership. There is a two year grace period for new vehicles. Light duty vehicles model year 1996 and newer, and model year 2008 and newer vehicles weighing up to 14,000 lb get the OBD test. All other vehicles get an idle test with a gas cap pressure test and a visual check for the presence of a catalytic converter. The compliance factors reflect the observed fail and waiver rates observed in this Program, combined with an assumed 96% compliance rate for vehicles showing up for testing. Heavy duty vehicles have an additional factor, reflecting the fraction of vehicles in the weight range covered by the Program. This was derived from documentation comparing the MOVES and MOBILE vehicle classes. The significantly higher compliance rate for the gas cap check reflects the much higher retest pass rate for this check.

Federal Programs: Current federal vehicle emissions control and fuel programs are incorporated into the MOVES2010a software. These include the National Program standards covering model year vehicles through 2016. Modifications of default emission rates are required to reflect the early implementation of the National Low Emission Vehicle (NLEV) Program in MD. To reflect these impacts, EPA has released instructions and input files that can be used to model these impacts. This inventory utilized the August 2010 version of the files (<http://www.epa.gov/oms/models/moves/tools.htm>).

State Vehicle Technology Programs:

MD Clean Car Program: Under the MD Clean Cars Act of 2007, MD adopted the California Low Emission Vehicle (CAL LEV II) Program. This Program began implementation in 2011 and requires all 2011 model year and newer vehicles (GVWR up to 14,000 lbs.) registered in MD to meet California emission standards for both criteria and greenhouse gas pollutants. This Program also contains a zero emission vehicles component that requires the manufacturers to produce a certain percentage of zero emission vehicles (electric, fuel cell, etc.) for purchase in the state. California has just adopted new amendments to the Low-Emission Vehicle (LEV) regulation entitled LEV III (third generation low emission vehicle standards). These amendments create more stringent emission standards for new motor vehicles. These new standards will be phased-in over the 2015-2025 model years.

The impacts of this Program were modeled for all analysis years using EPA's guidance document, *Instructions for Using LEV and NLEV Inputs for MOVES*, EPA-420-B-10-003 January, 2010. EPA provided input files to reflect the CAL LEVII Program with the standard phase-in schedules for new

emission standards. Modifications to those schedules were done as per EPA's instructions, to reflect a later start for the State of MD beginning with vehicle model year 2011.

ANALYSIS METHODOLOGY

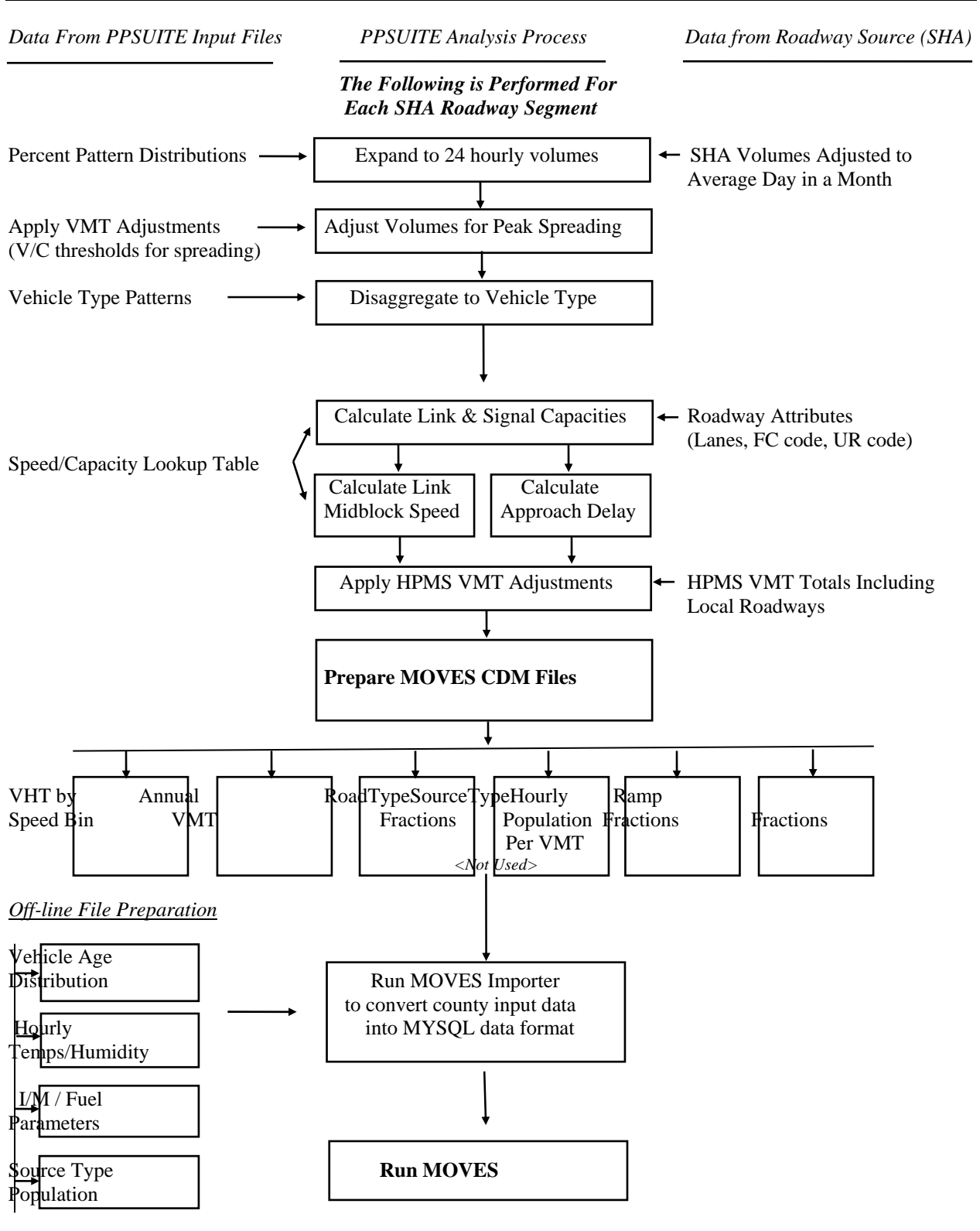
The previous sections have summarized the input data used for computing speeds and emission rates for this highway emissions inventory. This section explains how PPSUITE and MOVES uses that input data to produce emission estimates. Exhibit 9 provides a more detailed overview of the PPSUITE analysis procedure using the available traffic data information described in the previous section.

VMT Preparation:

Producing an emissions inventory with PPSUITE requires a process of disaggregation and aggregation. Data is available and used on a very small scale -- individual ½ mile roadway segments for each of the 24 hours of the day. This data needs to be processed individually to determine the distribution of vehicle hours traveled (VHT) by speed and then aggregated by vehicle class to determine the input VMT to the MOVES emission model. Key steps in the preparation of VMT include:

- *Apply Growth Factors* - The SHA's database contains the base year volumes. However, to conduct a future year analysis, these volumes must be factored to the year being analyzed. Growth factors have been prepared for each county and functional class grouping. These growth factors are applied to the base year SHA's volumes to obtain future year estimates that can be utilized by PPSUITE.
- *Apply Seasonal Adjustments* - PPSUITE takes the input daily volumes from SHA (which represents AADT traffic) and adjusts the volumes to an average day in a month. This adjustment utilizes factors developed for each functional class and urban/rural code. VMT can then be calculated for each link using the adjusted average day volumes.
- *Disaggregate to Hours* - After adjusting the link volume, the volume is split to each hour of the day. This allows for more accurate speed calculations (effects of congested hours) and allows PPSUITE to prepare the hourly VMT and speeds for input to the MOVES model.
- *Peak Spreading* - After dividing the daily volumes to each hour of the day, PPSUITE identifies hours that are unreasonably congested. For those hours, PPSUITE then spreads a portion of the volume to other hours within the same peak period, thereby approximating the "peak spreading" that normally occurs in such over-capacity conditions.
- *Disaggregation to Vehicle Types* - EPA requires VMT estimates to be prepared by source type, reflecting specific local characteristics. As a result, for MD's emission inventory runs, the hourly volumes are disaggregated to the six HPMS MOVES vehicle grouping based on count data assembled by SHA in combination with MOVES defaults as described in the previous section.
- *Apply HPMS VMT Adjustments* - Volumes must also be adjusted to account for differences with the HPMS VMT totals, as described previously. VMT adjustment factors are provided as input to PPSUITE, and are applied to each of the roadway segment volumes. These factors were developed from the latest HPMS download (conducted triennially); however, they are also applied to any future year runs. The VMT added or subtracted to the SHA's database assumes he speeds calculated using the original volumes for each roadway segment for each hour of the day.

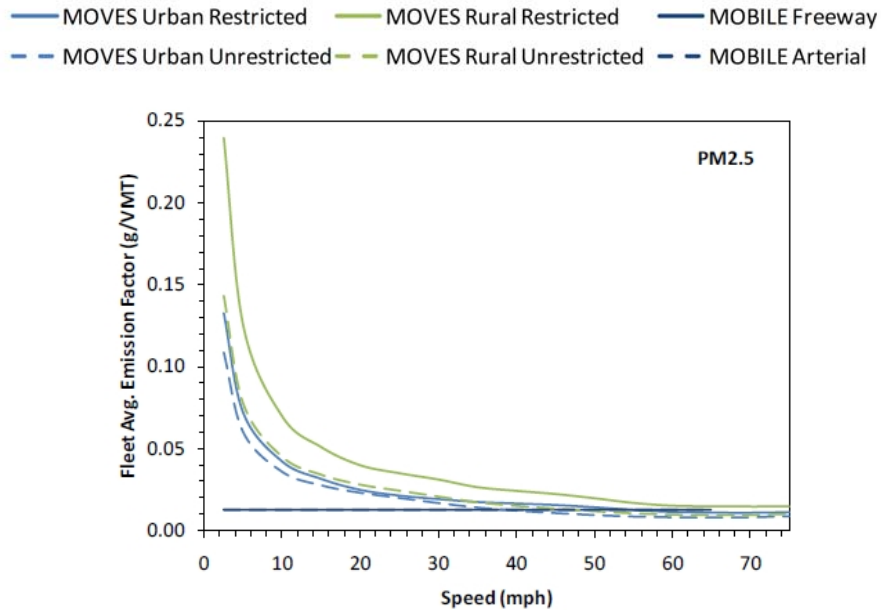
Exhibit 9: PPSUITE Speed/Emission Estimation Procedure



Speed Estimation:

Emissions for many pollutants (including PM and precursors) vary significantly with travel speed. For PM, higher emission rates are associated with lower speeds and lower rates are associated with higher speeds, as illustrated in Exhibit 10.

Exhibit 10: Emission Factor vs. Speed Variances (PM_{2.5})



Source: Figure 3 from *Implications of the MOVES2010 Model on Mobile Source Emission Estimates*, Air & Waste Management Association, July 2010.

EPA recognizes that the estimation of vehicle speeds is a difficult and complex process. Because emissions are so sensitive to speeds, EPA recommends that special attention be given to developing reasonable and consistent speed estimates; it also recommends that VMT be disaggregated into subsets that have roughly equal speed, with separate emission factors for each subset. At a minimum, speeds should be estimated separately by road type.

The computational framework used for this analysis meets and exceeds that recommendation. Speeds are individually calculated for each roadway segment per hour and include the estimated delays encountered at signals. Rather than accumulating the roadway segments into a particular road type and calculating an average speed, each individual link hourly speed is represented in the MOVES VHT by speed bin file. This MOVES input file allows the specification of a distribution of hourly speeds. For example, if 5% of a county's arterial VHT operates at 5 mph during the AM peak hour and the remaining 95% operates at 65mph, this can be represented in the MOVES speed input file. For the highway emissions inventory, distributions of speeds are input to MOVES by road type and source type by each hour of the day.

To calculate speeds, PPSUITE first obtains initial capacities (how much volume the roadway can serve before heavy congestion) and free-flow speeds (speeds assuming no congestion) from the speed/capacity lookup data. As described in previous sections, this data contains default roadway information indexed by the urban/rural code and functional class. For areas with known characteristics, values can be directly coded to the SHA's database and the speed/capacity data can be overridden. However, for most areas where known information is not available, the speed/capacity lookups provide valuable default information regarding speeds, capacities, signal characteristics, and other capacity adjustment information

used for calculating congested delays and speeds. The result of this process is an estimated average travel time for each hour of the day for each highway segment. The average time multiplied by the volume produces VHT.

Developing the MOVES Traffic Input Files:

The PPSUITE software is responsible for producing the following MOVES input files during any analysis run:

- VMT by HPMS vehicle class
- VHT by speed bin
- Road type distributions
- Ramp fractions

These files are text formatted files with a *.csv extension. The files are provided as inputs within the MOVES county data importer.

VMT Input File: VMT is the primary traffic input that affects emission results. The roadway segment distances and traffic volumes are used to prepare estimates of VMT. PPSUITE performs these calculations and outputs the MOVES annual VMT input file to the County Data Manager (CDM).

VHT by Speed Bin File: As described in the previous section, the PPSUITE software prepares the MOVES VHT by speed bin file which summarizes the distribution of speeds across all links into each of the 16 MOVES speed bins for each hour of the day by road type. This robust process ensures that MOVES emission rates are used to the fullest extent and is consistent with the methods and recommendations provided in EPA's Technical Guidance.

Road Type Distributions: In MOVES, typical drive cycles and associated operating conditions vary by the type of roadway. MOVES defines five different road types as follows:

- 1 Off-Network
- 2 Rural Restricted Access
- 3 Rural Unrestricted Access
- 4 Urban Restricted Access
- 5 Urban Unrestricted Access

For this inventory, the MOVES road type distribution file is automatically generated by PPSUITE using defined equivalencies. The off-network road type includes emissions from vehicle starts, extended idle activity, and evaporative emissions. Off-network activity in MOVES is primarily determined by the Source Type Population input. The remaining distribution among road types is determined by equating the functional class with each MOVES road type as follows:

- MOVES Road Type (2) = SHA Functional Class (1)
- MOVES Road Type (3) = SHA Functional Class (2,6,7,8,9)
- MOVES Road Type (4) = SHA Functional Class (11,12)
- MOVES Road Type (5) = SHA Functional Class (14,16,17,19)

Ramp Fractions: Since ramps are not directly represented within the SHA's database information, it is assumed that 8% of the Freeway VHT is ramp VHT. This is consistent with national default values within MOVES and recommendations provided in EPA's Technical Guidance.

MOVES Runs:

After computing speeds and aggregating VMT and VHT, PPSUITE prepares traffic-related inputs needed to run EPA's MOVES2010a software. Additional required MOVES inputs are prepared external to the processing software and include temperatures, I/M Program parameters, fuel characteristics, vehicle fleet age distributions and source type population.

The MOVES county importer is run in batch mode. This program converts all data files into the MYSQL formats used by the MOVES model. At that point a MOVES run specification file (*.mrs) is created which specifies options and key data locations for the run. MOVES is then executed in batch mode.

MOVES can be executed using either the *inventory* or *rate-based* approaches. For this highway emissions inventory, MOVES is applied using the *inventory-based* approach. Under this method, actual VMT and population are provided as inputs to the model; MOVES is responsible for producing the total emissions for the region. Under the rate-based approach, MOVES would produce emission factors, after which PPSUITE would apply the emission factors to the link data and calculate total regional emissions.

Appendices B and C provide a summary of the 13 MOVES CDM input files as well as the MOVES run specification file.

RESOURCES

MOVES Model

Modeling Page within EPA's Office of Mobile Sources Website (<http://www.epa.gov/omswww/models.htm>) contains a downloadable model, MOVES users guide and other information.

Policy Guidance on the Use of MOVES2010 and Subsequent Minor Revisions for SIP Development, Transportation Conformity, and Other Purposes, US EPA Office of Air and Radiation, EPA-420-B-12-010, April 2012.

Using MOVES to prepare Emission Inventories in State Implementation Plans and Transportation Conformity: Technical Guidance for MOVES2010, 2010a and 2010b. US EPA Office of Air and Radiation, and Office of Transportation and Air Quality, EPA-420-B-12-028, April 2012.

Motor Vehicle Emission Simulator, User Guide for MOVES2010a, EPA-420-B-10-036, August 2010.

Traffic Engineering

Highway Capacity Manual, Transportation Research Board presents current knowledge and techniques for analyzing the transportation system.

Traffic Trends System Report Module, 2011 Data, State Highway Administration

Highway Vehicle Inventory Glossary

AADT: Average Annual Daily Traffic, average of ALL days.

County Data Manager (CDM): User interface developed to simplify importing specific local data for a single county or a user-defined custom domain without requiring direct interaction with the underlying MySQL database.

Emission rate or factor: Expresses the amount of pollution emitted per unit of activity. For highway vehicles, pollutant is usually emitted in grams per mile driven.

FC: Functional code, applied in data management to road segments to identify their type (freeway, local, etc.).

Growth factor: Factor used to convert volumes to future years.

HPMS: Highway Performance Monitoring System, MDOT's official source of highway information and a subset of SHA.

I/M: Vehicle Emission Inspection/Maintenance Program ensures that vehicle emission controls are in good working order throughout the life of the vehicle. This Program requires vehicles to be tested for emissions. Most vehicles that do not pass must be repaired.

MOVES: The latest model EPA has developed with which MD uses to estimate emissions from highway vehicles.

Pattern data: Extrapolations of traffic patterns (such as how traffic volume on road segment types varies by time of day, or what kinds of vehicles tend to use a road segment type) from segments with observed data to similar segments.

PPSUITE: Post-Processor for Air Quality, a set of programs that estimate speeds and processes MOBILE emission rates.

Road Type: Functional code, applied in data management to road segments to identify their type (rural/urban highways, rural/urban arterials, etc.)

Source Type: One of thirteen vehicle types used in MOVES modeling.

UR: Urban/rural code, applied in data management to identify whether a road segment is urban, small urban or rural.

VHT: Vehicle hours traveled.

VMT: Vehicle miles traveled. In modeling terms, it is the simulated traffic volumes multiply by link length.

APPENDIX A

Washington County, MD Area Emission Summary Tables

Appendix A1 **2002 Annual Emissions**

Emission Summary
Emission Summary by Road Type
Emission Summary by Source Type
Emission Summary by Process

Appendix A2 **2007 Annual Emissions**

Emission Summary
Emission Summary by Road Type
Emission Summary by Source Type
Emission Summary by Process

Appendix A3 **2017 Annual Emissions**

Emission Summary
Emission Summary by Road Type
Emission Summary by Source Type
Emission Summary by Process

Appendix A4 **2025 Annual Emissions**

Emission Summary
Emission Summary by Road Type
Emission Summary by Source Type
Emission Summary by Process

Appendix A1
2002 Washington County Emission Summary
Annual (Tons/Year)

County	VMT	VOC	NOX	PM2.5	SO2	NH3
Washington	1,886,010,533	2,556.74	9,163.19	285.62	262.57	110.63

Appendix A1
2002 Washington County Emission Summary by Road Type
Annual (Tons/Year)

Area	Road Type	VMT	VOC	NOX	PM2.5	SO2	NH3
Washington	Off-Network	0	1,239.09	806.57	22.03	8.10	0.01
	Rural Restricted Access	688,603,444	386.48	3,849.25	120.17	109.53	41.62
	Rural Unrestricted Access	510,340,319	360.19	1,568.07	46.57	51.61	29.19
	Urban Restricted Access	249,760,757	142.03	1,525.80	48.76	43.09	14.78
	Urban Unrestricted Access	437,306,012	428.95	1,413.49	48.09	50.23	25.04
	Total	1,886,010,533	2,556.74	9,163.19	285.62	262.57	110.63

Appendix A1
2002 Washington County Emission Summary by Source Type
Annual (Tons/Year)

County	Sourcetype	VMT		VOC		NOX		PM2.5		SO2		NH3	
		Miles	Pct.	Emissions	Pct	Emissions	Pct.	Emissions	Pct.	Emissions	Pct.	Emissions	Pct.
Washington	Motorcycle	9,034,893	0.5%	35.31	1.4%	18.14	0.2%	0.49	0.2%	0.59	0.2%	0.22	0.2%
	Passenger Car	814,506,065	43.2%	1,120.68	43.8%	1,559.51	17.0%	37.32	13.1%	52.55	20.0%	50.61	45.7%
	Passenger Truck	648,996,338	34.4%	872.68	34.1%	1,929.02	21.1%	34.72	12.2%	58.05	22.1%	41.49	37.5%
	Light Commercial Truck	215,293,372	11.4%	291.39	11.4%	712.83	7.8%	19.76	6.9%	21.92	8.3%	12.67	11.5%
	Intercity Bus	4,119,687	0.2%	3.02	0.1%	118.22	1.3%	5.62	2.0%	2.75	1.0%	0.10	0.1%
	Transit Bus	1,537,750	0.1%	1.09	0.0%	34.58	0.4%	1.42	0.5%	0.77	0.3%	0.03	0.0%
	School Bus	4,774,864	0.3%	8.76	0.3%	66.62	0.7%	3.16	1.1%	1.61	0.6%	0.11	0.1%
	Refuse Truck	1,541,541	0.1%	1.13	0.0%	36.71	0.4%	1.37	0.5%	0.98	0.4%	0.04	0.0%
	Single Unit Short-haul Truck	42,654,561	2.3%	63.93	2.5%	410.71	4.5%	16.77	5.9%	12.40	4.7%	1.26	1.1%
	Single Unit Long-haul Truck	3,161,421	0.2%	4.57	0.2%	28.55	0.3%	1.24	0.4%	0.86	0.3%	0.09	0.1%
	Motor Home	2,171,953	0.1%	6.28	0.2%	21.55	0.2%	0.66	0.2%	0.49	0.2%	0.08	0.1%
	Combination Short-haul Truck	73,636,735	3.9%	52.75	2.1%	2,077.25	22.7%	78.93	27.6%	55.85	21.3%	2.05	1.9%
	Combination Long-haul Truck	64,581,354	3.4%	95.15	3.7%	2,149.49	23.5%	84.18	29.5%	53.75	20.5%	1.85	1.7%
	Total	1,886,010,533	100.0%	2,556.74	100.0%	9,163.19	100.0%	285.62	100.0%	262.57	100.0%	110.63	100.0%

Appendix A1
2002 Washington County Emission Summary by Process
Annual (Tons/Year)

County	Process	VOC		NOX		PM2.5		SO2		NH3	
		Emissions	Pct	Emissions	Pct.	Emissions	Pct.	Emissions	Pct.	Emissions	Pct.
Washington	Running Exhaust	1,037.89	40.6%	8,354.17	91.2%	219.97	77.0%	231.61	88.2%	110.62	100.0%
	Start Exhaust	955.81	37.4%	626.87	6.8%	17.81	6.2%	5.43	2.1%	0.00	0.0%
	Brakewear	0.00	0.0%	0.00	0.0%	6.90	2.4%	0.00	0.0%	0.00	0.0%
	Tirewear	0.00	0.0%	0.00	0.0%	3.10	1.1%	0.00	0.0%	0.00	0.0%
	Evap Permeation	53.07	2.1%	0.00	0.0%	0.00	0.0%	0.00	0.0%	0.00	0.0%
	Evap Fuel Vapor Venting	380.54	14.9%	0.00	0.0%	0.00	0.0%	0.00	0.0%	0.00	0.0%
	Evap Fuel Leaks	53.33	2.1%	0.00	0.0%	0.00	0.0%	0.00	0.0%	0.00	0.0%
	Crankcase Running Exhaust	14.38	0.6%	2.45	0.0%	33.63	11.8%	22.85	8.7%	0.00	0.0%
	Crankcase Start Exhaust	12.66	0.5%	0.02	0.0%	0.33	0.1%	0.11	0.0%	0.00	0.0%
	Crankcase Extended Idle Exhaust	0.96	0.0%	0.09	0.0%	0.65	0.2%	0.43	0.2%	0.00	0.0%
	Refueling Displacement Vapor Loss	0.00	0.0%	0.00	0.0%	0.00	0.0%	0.00	0.0%	0.00	0.0%
	Refueling Spillage Loss	0.00	0.0%	0.00	0.0%	0.00	0.0%	0.00	0.0%	0.00	0.0%
	Extended Idle Exhaust	48.10	1.9%	179.59	2.0%	3.24	1.1%	2.13	0.8%	0.01	0.0%
	Total	2,556.74	100.0%	9,163.19	100.0%	285.62	100.0%	262.57	100.0%	110.63	100.0%

Appendix A2
2007 Washington County Emission Summary
Annual (Tons/Year)

County	VMT	VOC	NOX	PM2.5	SO2	NH3
Washington	2,090,061,547	1,656.90	6,021.95	217.77	45.33	91.77

Appendix A2
2007 Washington County Emission Summary by Road Type
Annual (Tons/Year)

Area	Road Type	VMT	VOC	NOX	PM2.5	SO2	NH3
Washington	Off-Network	0	1,019.54	754.33	18.02	1.92	0.00
	Rural Restricted Access	569,679,236	151.92	1,784.38	64.75	11.36	25.92
	Rural Unrestricted Access	520,393,980	150.15	865.95	32.27	10.49	22.09
	Urban Restricted Access	502,585,658	138.39	1,729.68	63.77	9.98	22.49
	Urban Unrestricted Access	497,402,672	196.91	887.61	38.96	11.58	21.28
	Total	2,090,061,547	1,656.90	6,021.95	217.77	45.33	91.77

Appendix A2
2007 Washington County Emission Summary by Source Type
Annual (Tons/Year)

County	Sourcetype	VMT		VOC		NOX		PM2.5		SO2		NH3	
		Miles	Pct.			Emissions	Pct.	Emissions	Pct.	Emissions	Pct.	Emissions	Pct.
Washington	Motorcycle	9,824,726	0.5%	35.94	2.2%	11.46	0.2%	0.53	0.2%	0.20	0.4%	0.41	0.4%
	Passenger Car	894,850,789	42.8%	723.66	43.7%	907.48	15.1%	31.45	14.4%	16.89	37.3%	41.63	45.4%
	Passenger Truck	717,909,013	34.3%	504.94	30.5%	1,143.38	19.0%	25.87	11.9%	18.42	40.6%	32.90	35.9%
	Light Commercial Truck	238,794,664	11.4%	179.67	10.8%	491.78	8.2%	15.19	7.0%	5.52	12.2%	10.40	11.3%
	Intercity Bus	1,474,394	0.1%	1.05	0.1%	30.81	0.5%	1.45	0.7%	0.02	0.0%	0.04	0.0%
	Transit Bus	498,097	0.0%	0.34	0.0%	8.01	0.1%	0.34	0.2%	0.01	0.0%	0.01	0.0%
	School Bus	10,104,644	0.5%	9.15	0.6%	103.24	1.7%	5.09	2.3%	0.13	0.3%	0.22	0.2%
	Refuse Truck	1,511,086	0.1%	0.86	0.1%	20.76	0.3%	0.90	0.4%	0.03	0.1%	0.04	0.0%
	Single Unit Short-haul Truck	48,230,863	2.3%	47.09	2.8%	316.09	5.2%	12.98	6.0%	1.02	2.3%	1.39	1.5%
	Single Unit Long-haul Truck	4,989,042	0.2%	4.75	0.3%	31.50	0.5%	1.36	0.6%	0.10	0.2%	0.14	0.2%
	Motor Home	2,411,407	0.1%	4.47	0.3%	17.62	0.3%	0.51	0.2%	0.09	0.2%	0.08	0.1%
	Combination Short-haul Truck	76,722,330	3.7%	43.59	2.6%	1,233.20	20.5%	52.37	24.1%	1.33	2.9%	2.14	2.3%
	Combination Long-haul Truck	82,740,491	4.0%	101.41	6.1%	1,706.64	28.3%	69.72	32.0%	1.57	3.5%	2.37	2.6%
	Total	2,090,061,547	100.0%	1,656.90	100.0%	6,021.95	100.0%	217.77	100.0%	45.33	100.0%	91.77	100.0%

Appendix A2
2007 Washington County Emission Summary by Process
Annual (Tons/Year)

County	Process	VOC		NOX		PM2.5		SO2		NH3	
		Emissions	Pct	Emissions	Pct.	Emissions	Pct.	Emissions	Pct.	Emissions	Pct.
Washington	Running Exhaust	487.31	29.4%	5,265.93	87.4%	163.62	75.1%	42.51	93.8%	91.77	100.0%
	Start Exhaust	748.05	45.1%	516.38	8.6%	13.97	6.4%	1.83	4.0%	0.00	0.0%
	Brakewear	0.00	0.0%	0.00	0.0%	7.63	3.5%	0.00	0.0%	0.00	0.0%
	Tirewear	0.00	0.0%	0.00	0.0%	3.44	1.6%	0.00	0.0%	0.00	0.0%
	Evap Permeation	75.14	4.5%	0.00	0.0%	0.00	0.0%	0.00	0.0%	0.00	0.0%
	Evap Fuel Vapor Venting	218.15	13.2%	0.00	0.0%	0.00	0.0%	0.00	0.0%	0.00	0.0%
	Evap Fuel Leaks	58.13	3.5%	0.00	0.0%	0.00	0.0%	0.00	0.0%	0.00	0.0%
	Crankcase Running Exhaust	7.20	0.4%	1.68	0.0%	25.06	11.5%	0.90	2.0%	0.00	0.0%
	Crankcase Start Exhaust	9.92	0.6%	0.02	0.0%	0.27	0.1%	0.02	0.0%	0.00	0.0%
	Crankcase Extended Idle Exhaust	1.04	0.1%	0.12	0.0%	0.63	0.3%	0.01	0.0%	0.00	0.0%
	Refueling Displacement Vapor Loss	0.00	0.0%	0.00	0.0%	0.00	0.0%	0.00	0.0%	0.00	0.0%
	Refueling Spillage Loss	0.00	0.0%	0.00	0.0%	0.00	0.0%	0.00	0.0%	0.00	0.0%
	Extended Idle Exhaust	51.96	3.1%	237.81	3.9%	3.15	1.4%	0.06	0.1%	0.00	0.0%
	Total		1,656.90	100.0%	6,021.95	100.0%	217.77	100.0%	45.33	100.0%	91.77	100.0%

Appendix A3
2017 Washington County Emission Summary
Annual (Tons/Year)

County	VMT	VOC	NOX	PM2.5	SO2	NH3
Washington	2,315,331,295	947.56	3,380.83	124.70	19.09	67.68

**2017 Washington County Emission Summary by Road Type
Annual (Tons/Year)**

County	Road Type	VMT	VOC	NOX	PM2.5	SO2	NH3
Washington	Off-Network	0	621.08	680.87	10.67	0.69	0.00
	Rural Restricted Access	604,230,975	74.48	903.21	33.49	4.73	18.54
	Rural Unrestricted Access	581,689,679	73.78	471.10	21.40	4.28	15.93
	Urban Restricted Access	539,324,619	67.25	805.12	30.38	4.17	16.32
	Urban Unrestricted Access	590,086,022	110.96	520.53	28.75	5.21	16.90
	Total	2,315,331,295	947.56	3,380.83	124.70	19.09	67.68

Appendix A3
2017 Washington County Emission Summary by Source Type
Annual (Tons/Year)

County	Sourcetype	VMT		VOC		NOX		PM2.5		SO2		NH3	
		Miles	Pct.	EM	Pct	EM	Pct.	EM	Pct.	EM	Pct.	EM	Pct.
Washington	Motorcycle	9,929,539	0.4%	40.41	4.3%	8.16	0.2%	0.51	0.4%	0.08	0.4%	0.56	0.8%
	Passenger Car	1,137,842,700	49.1%	415.46	43.8%	542.70	16.1%	24.20	19.4%	7.84	41.1%	33.35	49.3%
	Passenger Truck	591,735,180	25.6%	227.89	24.1%	427.88	12.7%	15.34	12.3%	5.46	28.6%	17.31	25.6%
	Light Commercial Truck	201,363,970	8.7%	82.80	8.7%	202.11	6.0%	6.57	5.3%	1.75	9.2%	5.95	8.8%
	Intercity Bus	1,513,152	0.1%	0.68	0.1%	18.02	0.5%	0.80	0.6%	0.02	0.1%	0.04	0.1%
	Transit Bus	3,438,794	0.1%	1.60	0.2%	28.35	0.8%	1.26	1.0%	0.03	0.1%	0.07	0.1%
	School Bus	8,468,466	0.4%	1.53	0.2%	23.68	0.7%	0.94	0.8%	0.05	0.3%	0.18	0.3%
	Refuse Truck	890,434	0.0%	0.20	0.0%	4.32	0.1%	0.18	0.1%	0.01	0.0%	0.02	0.0%
	Single Unit Short-haul Truck	124,392,330	5.4%	71.38	7.5%	428.59	12.7%	13.87	11.1%	1.18	6.2%	3.52	5.2%
	Single Unit Long-haul Truck	17,415,842	0.8%	10.20	1.1%	61.46	1.8%	2.18	1.7%	0.16	0.8%	0.50	0.7%
	Motor Home	1,018,773	0.0%	1.38	0.1%	5.31	0.2%	0.12	0.1%	0.02	0.1%	0.03	0.0%
	Combination Short-haul Truck	91,070,185	3.9%	18.31	1.9%	494.66	14.6%	20.71	16.6%	0.99	5.2%	2.54	3.8%
	Combination Long-haul Truck	126,251,930	5.5%	75.71	8.0%	1,135.58	33.6%	38.02	30.5%	1.51	7.9%	3.61	5.3%
	Total	2,315,331,295	100.0%	947.56	100.0%	3,380.83	100.0%	124.70	100.0%	19.09	100.0%	67.68	100.0%

Appendix A3
2017 Washington County Emission Summary by Process
Annual (Tons/Year)

County	Process	VOC		NOX		PM2.5		SO2		NH3	
		Emissions	Pct	Emissions	Pct.	Emissions	Pct.	Emissions	Pct.	Emissions	Pct.
Washington	Running Exhaust	241.18	25.5%	2,699.30	79.8%	88.62	71.1%	18.09	94.7%	67.68	100.0%
	Start Exhaust	388.58	41.0%	326.73	9.7%	8.47	6.8%	0.62	3.2%	0.00	0.0%
	Brakewear	0.00	0.0%	0.00	0.0%	9.98	8.0%	0.00	0.0%	0.00	0.0%
	Tirewear	0.00	0.0%	0.00	0.0%	4.07	3.3%	0.00	0.0%	0.00	0.0%
	Evap Permeation	49.93	5.3%	0.00	0.0%	0.00	0.0%	0.00	0.0%	0.00	0.0%
	Evap Fuel Vapor Venting	121.09	12.8%	0.00	0.0%	0.00	0.0%	0.00	0.0%	0.00	0.0%
	Evap Fuel Leaks	89.76	9.5%	0.00	0.0%	0.00	0.0%	0.00	0.0%	0.00	0.0%
	Crankcase Running Exhaust	3.45	0.4%	0.66	0.0%	11.35	9.1%	0.31	1.6%	0.00	0.0%
	Crankcase Start Exhaust	5.11	0.5%	0.01	0.0%	0.12	0.1%	0.01	0.0%	0.00	0.0%
	Crankcase Extended Idle Exhaust	0.49	0.1%	0.06	0.0%	0.29	0.2%	0.00	0.0%	0.00	0.0%
	Refueling Displacement Vapor Loss	0.00	0.0%	0.00	0.0%	0.00	0.0%	0.00	0.0%	0.00	0.0%
	Refueling Spillage Loss	0.00	0.0%	0.00	0.0%	0.00	0.0%	0.00	0.0%	0.00	0.0%
	Extended Idle Exhaust	47.94	5.1%	354.07	10.5%	1.80	1.4%	0.07	0.3%	0.00	0.0%
	Total	947.56	100.0%	3,380.83	100.0%	124.70	100.0%	19.09	100.0%	67.68	100.0%

Appendix A4
2025 Washington County Emission Summary
Annual (Tons/Year)

County	VMT	VOC	NOX	PM2.5	SO2	NH3
Washington	2,786,455,965	725	2,312.19	77.79	20.82	74.45

Appendix A4
2025 Washington County Emission Summary by Road Type
Annual (Tons/Year)

Area	Road Type	VMT	VOC	NOX	PM2.5	SO2	NH3
Washington	Off-Network	0	485.20	689.22	8.64	0.74	0.40
	Rural Restricted Access	727,192,808	50.02	531.69	16.77	5.11	20.14
	Rural Unrestricted Access	700,097,140	53.27	289.32	14.45	4.57	17.02
	Urban Restricted Access	649,040,157	45.17	470.89	15.44	4.49	17.64
	Urban Unrestricted Access	710,125,860	91.79	331.07	22.49	5.91	19.26
	Total	2,786,455,965	725.46	2,312.19	77.79	20.82	74.45

Appendix A4
2025 Washington County Emission Summary by Source Type
Annual (Tons/Year)

County	Sourcetype	VMT		VOC		NOX		PM2.5		SO2		NH3	
		Miles	Pct.	EM	Pct	EM	Pct.	EM	Pct.	EM	Pct.	EM	Pct.
Washington	Motorcycle	12,147,350	0.4%	48.64	6.7%	9.66	0.4%	0.64	0.8%	0.10	0.5%	0.72	1.0%
	Passenger Car	1,369,351,900	49.1%	334.96	46.2%	371.14	16.1%	23.40	30.1%	8.59	41.3%	35.67	47.9%
	Passenger Truck	712,136,400	25.6%	157.15	21.7%	291.33	12.6%	16.96	21.8%	5.66	27.2%	18.35	24.6%
	Light Commercial Truck	242,329,490	8.7%	57.98	8.0%	148.60	6.4%	5.82	7.5%	1.84	8.9%	6.49	8.7%
	Intercity Bus	1,858,886	0.1%	0.29	0.0%	7.97	0.3%	0.34	0.4%	0.02	0.1%	0.05	0.1%
	Transit Bus	3,942,878	0.1%	0.54	0.1%	12.48	0.5%	0.44	0.6%	0.03	0.1%	0.08	0.1%
	School Bus	9,737,258	0.3%	0.97	0.1%	14.41	0.6%	0.53	0.7%	0.06	0.3%	0.21	0.3%
	Refuse Truck	1,034,442	0.0%	0.10	0.0%	2.20	0.1%	0.07	0.1%	0.01	0.0%	0.03	0.0%
	Single Unit Short-haul Truck	149,173,600	5.4%	51.34	7.1%	325.60	14.1%	6.89	8.9%	1.40	6.7%	4.30	5.8%
	Single Unit Long-haul Truck	21,746,813	0.8%	7.40	1.0%	47.71	2.1%	1.13	1.5%	0.19	0.9%	0.63	0.8%
	Motor Home	1,184,480	0.0%	0.88	0.1%	4.21	0.2%	0.09	0.1%	0.02	0.1%	0.04	0.1%
	Combination Short-haul Truck	105,285,738	3.8%	6.60	0.9%	235.90	10.2%	7.31	9.4%	1.10	5.3%	2.96	4.0%
	Combination Long-haul Truck	156,526,730	5.6%	58.61	8.1%	840.98	36.4%	14.18	18.2%	1.80	8.6%	4.92	6.6%
Total		2,786,455,965	100.0%	725.46	100.0%	2,312.19	100.0%	77.79	100.0%	20.82	100.0%	74.45	100.0%

Appendix A4
2025 Washington County Emission Summary by Process
Annual (Tons/Year)

County	Process	VOC		NOX		PM2.5		SO2		NH3	
		Emissions	Pct	Emissions	Pct.	Emissions	Pct.	Emissions	Pct.	Emissions	Pct.
Washington	Running Exhaust	159.81	22.0%	1,622.81	70.2%	48.12	61.9%	19.88	95.5%	74.05	99.5%
	Start Exhaust	267.04	36.8%	235.95	10.2%	7.53	9.7%	0.65	3.1%	0.00	0.0%
	Brakewear	0.00	0.0%	0.00	0.0%	13.49	17.3%	0.00	0.0%	0.00	0.0%
	Tirewear	0.00	0.0%	0.00	0.0%	5.01	6.4%	0.00	0.0%	0.00	0.0%
	Evap Permeation	38.06	5.2%	0.00	0.0%	0.00	0.0%	0.00	0.0%	0.00	0.0%
	Evap Fuel Vapor Venting	96.60	13.3%	0.00	0.0%	0.00	0.0%	0.00	0.0%	0.00	0.0%
	Evap Fuel Leaks	110.36	15.2%	0.00	0.0%	0.00	0.0%	0.00	0.0%	0.00	0.0%
	Crankcase Running Exhaust	1.93	0.3%	0.15	0.0%	2.54	3.3%	0.19	0.9%	0.00	0.0%
	Crankcase Start Exhaust	3.45	0.5%	0.01	0.0%	0.08	0.1%	0.01	0.0%	0.00	0.0%
	Crankcase Extended Idle Exhaust	0.13	0.0%	0.02	0.0%	0.06	0.1%	0.00	0.0%	0.00	0.0%
	Refueling Displacement Vapor Loss	0.00	0.0%	0.00	0.0%	0.00	0.0%	0.00	0.0%	0.00	0.0%
	Refueling Spillage Loss	0.00	0.0%	0.00	0.0%	0.00	0.0%	0.00	0.0%	0.00	0.0%
	Extended Idle Exhaust	48.08	6.6%	453.25	19.6%	0.97	1.2%	0.09	0.4%	0.40	0.5%
	Total	725.46	100.0%	2,312.19	100.0%	77.79	100.0%	20.82	100.0%	74.45	100.0%

Appendix G
Information Addressing *NRDC v. EPA*, Case No. 08-1250

APPENDIX G: Information Addressing *NRDC v. EPA*, Case No. 08-1250

On January 4, 2013, in *Natural Resources Defense Council v. EPA*, the U.S. Court of Appeals for the District of Columbia Circuit remanded to EPA the Final Clean Air Fine Particle Implementation Rule (72 FR 20586, April 25, 2007) and the Implementation of the New Source Review (NSR) Program for Particulate Matter Less than 2.5 Micrometers (PM_{2.5}) (73 FR 28321, May 16, 2008); No. 08-1250 (D.C. Cir. January 3, 2013). The Court found that EPA erred in implementing the 1997 PM_{2.5} NAAQS pursuant to the general implementation provisions of subpart 1 of part D of Title I of the Act, rather than the particulate-matter specific provisions of subpart 4 of part D of Title I. EPA is interpreting this court decision and its potential implications for redesignation requests and maintenance plans, as well as for motor vehicle emissions budgets.

Maryland is providing additional information to address all PM_{2.5} precursor pollutants pursuant to the court decision. The table and graph below shows a downward trend in emission levels when all PM_{2.5} precursor pollutants are included in the analysis.

Pollutant	2007	2017	2025
NOX	10,780.70	7,909.14	6,466.01
SO2	7,183.28	5,962.06	5,967.45
PM2.5-PRI	1,431.84	1,190.65	1,155.01
VOC	4,662.26	3,471.65	3,265.60
NH3	1,205.70	1,183.54	1,191.89
All Precursors	25,263.77	19,717.05	18,045.97

