Appendix B2

Area and Non-Nonroad Model Inventory Document

(Virginia Department of Environmental Quality)

Virginia Department of Environmental Quality 2011 Area and Nonroad Sample Calculations

2102004000 **Small Stationary Source Industrial Distillate Oil Combustion** Inventory Year: 2011

This category covers non-point industrial stationary fuel combustion sources that consume distillate fuel oil for the operation of space heating, boilers, reciprocating engines, turbines, energy generation, and other industrial manufacturing purposes.

2011 statewide industrial distillate oil fuel consumption data was obtained from the Energy Information Administration. Point source fuel consumption associated with facilities with VDEQ air permits with a potential to emit greater than 100 tpy were subtracted from the EIA state total fuel consumption. The remaining statewide industrial distillate fuel consumption attributed to non-point sources was apportioned from a state level to a county level based on NAICS 31-33 employment data obtained from the Virginia Employment Commission. VDEQ point source with a potential to emit greater than 100 tons/year were identified in the VEC employment data and manually removed prior to apportionment.

County	Fairfax County	EPA_SECTOR:	Fuel Comb - Industrial Boilers, ICEs - Oil		
FIPs Code	51059	SCC_L1:	Stationary Source Fuel Combustion	Tier 1 Description:	Fuel Comb. Industrial
Pollutant:	VOC	SCC_L2:	Industrial	Tier 2 Description:	Oil
Scenario:	1	SCC_L3:	Distillate Oil	Tier 3 Description:	Distillate
		SCC_L4:	Total: Boilers and IC Engines		

EMISSION CALCULATION:

$$\text{ANNUAL EMISSIONS} = \frac{\text{(State Activity Level)(Fips Activity Level)(EF)(Reactivity)(1-(CE * RP * RE))}}{\text{(Fips Activity Level\_Total)}}$$

$$\text{ANNUAL EMISSIONS} = \frac{\text{(StIDisti)(NAICS Employment - Codes 31-33)(EF)(Reactivity)(1-(CE * RP * RE))}}{\text{(NAICS Employment - Codes 31-33)}}$$

$$\text{ANNUAL EMISSIONS} = \frac{\text{(12708thousand gallons)(10563Employees)(0.2lb/kgal)(1)(1-(0 * 0 * 0))}}{\text{(173334Employees)}}$$

ANNUAL EMISSIONS = 154.88549 lb/year VOC

ANNUAL EMISSIONS = 0.07744 tons/year VOC

DAILY EMISSIONS = ANNUAL EMISSIONS (tons/yr) * Seasonal Adjustment Factor/Peak Ozone Season / Days per Period

DAILY EMISSIONS = 0.07744 * 0.25 / 0.25 / 312

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DAILY EMISSIONS = 0.0002482 tons/day VOC

Virginia Department of Environmental Quality 2011 Area and Nonroad Sample Calculations

2102005000 **Small Stationary Source Industrial Residual Oil Combustion** Inventory Year: 2011

This category covers industrial stationary fuel combustion sources that consume residual fuel oil for the operation of space heating, boiler operation, reciprocating engines, turbines, energy generation, and other industrial manufacturing purposes.

2011 statewide industrial residual oil fuel consumption data was obtained from the Energy Information Administration. Point source fuel consumption associated with facilities with VDEQ air permits with a potential to emit greater than 100 tpy were was subtracted from the EIA total state fuel consumption value in order to avoid double counting fuel in the non-point source inventory that has already been accounted for in the VDEQ point source air emission inventory. The remaining statewide industrial residual oil consumption attributed to non-point sources was apportioned to a county level based on employment data for NAICS 31-33 which was obtained from the Virginia Employment Commission. VDEQ point sources with a potential to emit greater than 100 tons/year were identified in the VEC employment data and manually removed prior to apportionment.

County	Fairfax County	EPA_SECTOR:	Fuel Comb - Industrial Boilers, ICEs - Oil		
FIPs Code	51059	SCC_L1:	Stationary Source Fuel Combustion	Tier 1 Description:	Fuel Comb. Industrial
Pollutant:	VOC	SCC_L2:	Industrial	Tier 2 Description:	Oil
Scenario:	1	SCC_L3:	Residual Oil	Tier 3 Description:	Residual
		SCC_L4:	Total: All Boiler Types		

EMISSION CALCULATION:

$$\text{ANNUAL EMISSIONS} = \frac{\text{(State Activity Level)(Fips Activity Level)(EF)(Reactivity)(1-(CE * RP * RE))}}{\text{(Fips Activity Level\_Total)}}$$

$$\text{ANNUAL EMISSIONS} = \frac{\text{(StIResid)(NAICS Employment - Codes 31-33)(EF)(Reactivity)(1-(CE * RP * RE))}}{\text{(NAICS Employment - Codes 31-33)}}$$

$$\text{ANNUAL EMISSIONS} = \frac{\text{(5926kgal)(10563Employees)(0.28lb/kgal)(1)(1-(0 * 0 * 0))}}{\text{(173334Employees)}}$$

ANNUAL EMISSIONS = 101.11677 lb/year VOC

ANNUAL EMISSIONS = 0.05056 tons/year VOC

DAILY EMISSIONS = ANNUAL EMISSIONS (tons/yr) * Seasonal Adjustment Factor/Peak Ozone Season / Days per Period

DAILY EMISSIONS = 0.05056 * 0.25 / 0.25 / 312

DAILY EMISSIONS = 0.000162 tons/day VOC

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Virginia Department of Environmental Quality 2011 Area and Nonroad Sample Calculations

2102006000 **Small Stationary Source Industrial Natural Gas Combustion** Inventory Year: 2011

This category covers non-point industrial stationary fuel combustion sources that consume natural gas for the operation of space heating, boiler operation, reciprocating engines, turbines, energy generation, and other industrial manufacturing purposes.

2011 statewide industrial natural gas fuel consumption data was obtained from the Energy Information Administration. Point source fuel consumption associated with facilities with VDEQ air permits with a potential to emit greater than 100 tpy were was subtracted in order to avoid double counting emissions in the non-point source emission inventory that have already been accounted for in the VDEQ point source emission inventory. The remaining statewide industrial natural gas consumption attributed to non-point sources was apportioned to a county level based on NAICS 31-33 employment data obtained from the Virginia Employment Commission. VDEQ point sources with a potential to emit greater than 100 tons/year were identified in the VEC employment data and manually removed prior to apportionment.

County	Fairfax County	EPA_SECTOR:	Fuel Comb - Industrial Boilers, ICEs - Natural Gas		
FIPs Code	51059	SCC_L1:	Stationary Source Fuel Combustion	Tier 1 Description:	Fuel Comb. Industrial
Pollutant:	VOC	SCC_L2:	Industrial	Tier 2 Description:	Gas
Scenario:	1	SCC_L3:	Natural Gas	Tier 3 Description:	Natural
		SCC_L4:	Total: Boilers and IC Engines		

EMISSION CALCULATION:

$$\text{ANNUAL EMISSIONS} = \frac{\text{(State Activity Level)(Fips Activity Level)(EF)(Reactivity)(1-(CE * RP * RE))}}{\text{(Fips Activity Level\_Total)}}$$

$$\text{ANNUAL EMISSIONS} = \frac{\text{(StINGas)(NAICS Employment - Codes 31-33)(EF)(Reactivity)(1-(CE * RP * RE))}}{\text{(NAICS Employment - Codes 31-33)}}$$

$$\text{ANNUAL EMISSIONS} = \frac{\text{(21453million cubic feet)(10563Employees)(5.5lb/mil cubic ft)(0.48)(1-(0 * 0 * 0))}}{\text{(173334Employees)}}$$

ANNUAL EMISSIONS = 3451.4014 lb/year VOC

ANNUAL EMISSIONS = 1.7257 tons/year VOC

DAILY EMISSIONS = ANNUAL EMISSIONS (tons/yr) * Seasonal Adjustment Factor/Peak Ozone Season / Days per Period

DAILY EMISSIONS = 1.7257 * 0.25 / 0.25 / 312

DAILY EMISSIONS = 0.0055311 tons/day VOC

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Virginia Department of Environmental Quality 2011 Area and Nonroad Sample Calculations

2102008000 **Small Stationary Source Industrial Wood Combustion** Inventory Year: 2011

This emission inventory category covers industrial stationary fuel combustion sources that consume wood and wood waste used as a fuel for the operation of space heating, boiler operation, energy generation, and other industrial manufacturing purposes.

2011 statewide industrial wood and wood waste consumption data was obtained from the Energy Information Administration. Point source fuel consumption associated with facilities with VDEQ air permits with a potential to emit greater than 100 tpy were was subtracted from the EIA state fuel consumption total to avoid double counting emissions in the non-point source inventory that have already been accounted for in the VDEQ point source air emission inventory. The remaining statewide industrial wood and wood waste consumption attributed to non-point sources was apportioned to a county level based on NAICS 31-33 employment data obtained from the Virginia Employment Commission. VDEQ point source with a potential to emit greater than 100 tons/year were identified in the VEC employment data and manually removed prior to apportionment of the state non-point fuel consumption down to a county level.

County	Fairfax County	EPA_SECTOR:	Fuel Comb - Industrial Boilers, ICEs - Biomass		
FIPs Code	51059	SCC_L1:	Stationary Source Fuel Combustion	Tier 1 Description:	Fuel Comb. Industrial
Pollutant:	VOC	SCC_L2:	Industrial	Tier 2 Description:	Other
Scenario:	1	SCC_L3:	Wood	Tier 3 Description:	Wood/Bark Waste
		SCC_L4:	Total: All Boiler Types		

EMISSION CALCULATION:

$$\text{ANNUAL EMISSIONS} = \frac{\text{(State Activity Level)(Fips Activity Level)(ActCF)(EF)(Reactivity)(1-(CE * RP * RE))}}{\text{(Fips Activity Level\_Total)}}$$

$$\text{ANNUAL EMISSIONS} = \frac{\text{(StIWood)(NAICS Employment - Codes 31-33)(btu to tons)(EF)(Reactivity)(1-(CE * RP * RE))}}{\text{(NAICS Employment - Codes 31-33)}}$$

$$\text{ANNUAL EMISSIONS} = \frac{\text{(26342858553180btu)(10563Employees)(0.000000058tons/btu)(0.1768lb/ton)(1)(1-(0 * 0 * 0))}}{\text{(173334Employees)}}$$

ANNUAL EMISSIONS = 16461.77667 lb/year VOC

ANNUAL EMISSIONS = 8.23089 tons/year VOC

DAILY EMISSIONS = ANNUAL EMISSIONS (tons/yr) * Seasonal Adjustment Factor/Peak Ozone Season / Days per Period

DAILY EMISSIONS = 8.23089 * 0.25 / 0.25 / 312

DAILY EMISSIONS = 0.0263811 tons/day VOC

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Virginia Department of Environmental Quality 2011 Area and Nonroad Sample Calculations

2102011000 **Small Stationary Source Industrial Kerosene Combustion** Inventory Year: 2011

This category covers non-point industrial stationary fuel combustion sources that consume kerosene for the operation of space heating, boiler operation, reciprocating engines, turbines, energy generation and other industrial manufacturing purposes.

2011 statewide industrial kerosene consumption data was obtained from the Energy Information Administration. Point source fuel consumption associated with facilities with VDEQ air permits with a potential to emit greater than 100 tpy were was subtracted from the EIA statewide fuel consumption total to avoid double counting. The remaining statewide industrial kerosene consumption attributed to non-point sources was apportioned to a county level based on NAICS 31-33 employment data obtained from the Virginia Employment Commission. VDEQ point sources with a potential to emit greater than 100 tons/year were identified in the VEC employment data and manually removed prior to apportionment of the state total fuel consumption down to the county level.

County	Fairfax County	EPA_SECTOR:	Fuel Comb - Industrial Boilers, ICEs - Oil		
FIPs Code	51059	SCC_L1:	Stationary Source Fuel Combustion	Tier 1 Description:	Fuel Comb. Industrial
Pollutant:	VOC	SCC_L2:	Industrial	Tier 2 Description:	Other
Scenario:	1	SCC_L3:	Kerosene	Tier 3 Description:	Other
		SCC_L4:	Total: All Boiler Types		

EMISSION CALCULATION:

$$\text{ANNUAL EMISSIONS} = \frac{\text{(State Activity Level)(Fips Activity Level)(EF)(Reactivity)(1-(CE * RP * RE))}}{\text{(Fips Activity Level\_Total)}}$$

$$\text{ANNUAL EMISSIONS} = \frac{\text{(StIKero)(NAICS Employment - Codes 31-33)(EF)(Reactivity)(1-(CE * RP * RE))}}{\text{(NAICS Employment - Codes 31-33)}}$$

$$\text{ANNUAL EMISSIONS} = \frac{\text{(396thousand gallons)(10563Employees)(0.19lb/kgal)(1)(1-(0 * 0 * 0))}}{\text{(173334Employees)}}$$

ANNUAL EMISSIONS = 4.58514 lb/year VOC

ANNUAL EMISSIONS = 0.00229 tons/year VOC

DAILY EMISSIONS = ANNUAL EMISSIONS (tons/yr) * Seasonal Adjustment Factor/Peak Ozone Season / Days per Period

DAILY EMISSIONS = 0.00229 * 0.25 / 0.25 / 312

DAILY EMISSIONS = 0.0000073 tons/day VOC

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Virginia Department of Environmental Quality 2011 Area and Nonroad Sample Calculations

2103002000 **Small Stationary Source Commercial/Institutional Bituminous/Subbituminous Coal Combustion** Inventory Year: 2011

This emission inventory category covers commercial/institutional fuel combustion sources that consume bituminous and subbituminous coal for the operation of space heating, boilers, energy generation, and other commercial and institutional purposes.

2011 statewide commercial bituminous coal fuel consumption data was obtained from the Energy Information Administration. Point source fuel consumption associated with permitted facilities with a potential to emit greater than 100 tpy were was subtracted. The remaining statewide commercial bituminous coal consumption attributed to non-point sources was apportioned to a county level based on NAICS 42-81 employment data obtained from the Virginia Employment Commission. VDEQ point sources with a potential to emit greater than 100 tons/year were identified in the VEC employment data and manually removed in order to avoid double counting of the emissions from these sources in both the point source and non-point inventories.

County	Fairfax County	EPA_SECTOR:	Fuel Comb - Comm/Institutional - Coal		
FIPs Code	51059	SCC_L1:	Stationary Source Fuel Combustion	Tier 1 Description:	Fuel Comb. Other
Pollutant:	VOC	SCC_L2:	Commercial/Institutional	Tier 2 Description:	Commercial/Institutional Coal
Scenario:	1	SCC_L3:	Bituminous/Subbituminous Coal	Tier 3 Description:	Other
		SCC_L4:	Total: All Boiler Types		

EMISSION CALCULATION:

$$\text{ANNUAL EMISSIONS} = \frac{(\text{State Activity Level})(\text{Fips Activity Level})(EF)(\text{Reactivity})(1-(CE * RP * RE))}{(\text{Fips Activity Level\_Total})}$$

$$\text{ANNUAL EMISSIONS} = \frac{(\text{StCBit})(\text{NAICS Employment - Codes 42-81})(EF)(\text{Reactivity})(1-(CE * RP * RE))}{(\text{NAICS Employment - Codes 42-81})}$$

$$\text{ANNUAL EMISSIONS} = \frac{(34686\text{tons})(506572\text{Employees})(0.05\text{lb/ton})(1)(1-(0 * 0 * 0))}{(2781451\text{Employees})}$$

ANNUAL EMISSIONS = 315.85954 lb/year VOC

ANNUAL EMISSIONS = 0.15793 tons/year VOC

DAILY EMISSIONS = ANNUAL EMISSIONS (tons/yr) * Seasonal Adjustment Factor/Peak Ozone Season / Days per Period

DAILY EMISSIONS = 0.15793 * 0.0000665589 / 1 / 31

DAILY EMISSIONS = 0.0000003 tons/day VOC

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Virginia Department of Environmental Quality 2011 Area and Nonroad Sample Calculations

2103004000 **Small Stationary Source Commercial/Institutional Distillate Oil Combustion** Inventory Year: 2011

This category covers commercial/institutional stationary fuel combustion sources that consume distillate oil for the operation of space heating, boilers, reciprocating engines, turbines, energy generation and other commercial/institutional purposes.

2011 statewide commercial distillate oil fuel consumption data was obtained from the Energy Information Administration. Point source fuel consumption associated with facilities with VDEQ air permits with a potential to emit greater than 100 tpy were was subtracted from the EIA state total fuel consumption value to avoid double counting emissions in the non-point source inventory that have already been accounted for in the VDEQ point source air emission inventory. The remaining statewide commercial distillate oil consumption attributed to non-point sources was apportioned to a county level based on NAICS 42-81 employment data obtained from the Virginia Employment Commission. VDEQ point sources with a potential to emit greater than 100 tons/year were identified in the VEC employment data and manually removed prior to apportionment of the state total fuel consumption data down to a county level.

County	Fairfax County	EPA_SECTOR:	Fuel Comb - Comm/Institutional - Oil		
FIPs Code	51059	SCC_L1:	Stationary Source Fuel Combustion	Tier 1 Description:	Fuel Comb. Other
Pollutant:	VOC	SCC_L2:	Commercial/Institutional	Tier 2 Description:	Commercial/Institutional Oil
Scenario:	1	SCC_L3:	Distillate Oil	Tier 3 Description:	Other
		SCC_L4:	Total: Boilers and IC Engines		

EMISSION CALCULATION:

$$\text{ANNUAL EMISSIONS} = \frac{\text{(State Activity Level)(Fips Activity Level)(EF)(Reactivity)(1-(CE * RP * RE))}}{\text{(Fips Activity Level\_Total)}}$$

$$\text{ANNUAL EMISSIONS} = \frac{\text{(StCDisti)(NAICS Employment - Codes 42-81)(EF)(Reactivity)(1-(CE * RP * RE))}}{\text{(NAICS Employment - Codes 42-81)}}$$

$$\text{ANNUAL EMISSIONS} = \frac{\text{(19065.49kgal)(506572Employees)(0.34lb/kgal)(1)(1-(0 * 0 * 0))}}{\text{(2781451Employees)}}$$

ANNUAL EMISSIONS = 1180.58337 lb/year VOC

ANNUAL EMISSIONS = 0.59029 tons/year VOC

DAILY EMISSIONS = ANNUAL EMISSIONS (tons/yr) * Seasonal Adjustment Factor/Peak Ozone Season / Days per Period

DAILY EMISSIONS = 0.59029 * 0.0000665589 / 1 / 31

DAILY EMISSIONS = 0.0000013 tons/day VOC

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Virginia Department of Environmental Quality 2011 Area and Nonroad Sample Calculations

2103005000 **Small Stationary Source Commercial/Institutional Residual Oil Combustion** Inventory Year: 2011

This category covers commercial/institutional stationary fuel combustion sources that consume residual fuel oil for the operation of space heating, boilers, reciprocating engines, turbines, energy generation, and other commercial/institutional purposes.

2011 statewide commercial residual oil fuel consumption data was obtained from the Energy Information Administration. Point source fuel consumption associated with facilities with VDEQ air permits with a potential to emit greater than 100 tpy were was subtracted from the EIA state total fuel consumption estimate to prevent double counting emissions in the non-point source emission inventory that have already been accounted for in the VDEQ point source air emission inventory. The remaining statewide commercial residual consumption attributed to non-point sources was apportioned to a county level based on NAICS 42-81 employment data obtained from the Virginia Employment Commission. VDEQ point source with a potential to emit greater than 100 tons/year were identified in the VEC employment data and manually removed prior to apportionment of the state level fuel consumption estimate down to a county level.

County	Fairfax County	EPA_SECTOR:	Fuel Comb - Comm/Institutional - Oil		
FIPs Code	51059	SCC_L1:	Stationary Source Fuel Combustion	Tier 1 Description:	Fuel Comb. Other
Pollutant:	VOC	SCC_L2:	Commercial/Institutional	Tier 2 Description:	Commercial/Institutional Oil
Scenario:	1	SCC_L3:	Residual Oil	Tier 3 Description:	Other
		SCC_L4:	Total: All Boiler Types		

EMISSION CALCULATION:

$$\text{ANNUAL EMISSIONS} = \frac{\text{(State Activity Level)(Fips Activity Level)(EF)(Reactivity)(1-(CE * RP * RE))}}{\text{(Fips Activity Level\_Total)}}$$

$$\text{ANNUAL EMISSIONS} = \frac{\text{(StCResid)(NAICS Employment - Codes 42-81)(EF)(Reactivity)(1-(CE * RP * RE))}}{\text{(NAICS Employment - Codes 42-81)}}$$

$$\text{ANNUAL EMISSIONS} = \frac{\text{(504kgal)(506572Employees)(1.13lb/kgal)(1)(1-(0 * 0 * 0))}}{\text{(2781451Employees)}}$$

ANNUAL EMISSIONS = 103.72388 lb/year VOC

ANNUAL EMISSIONS = 0.05186 tons/year VOC

DAILY EMISSIONS = ANNUAL EMISSIONS (tons/yr) * Seasonal Adjustment Factor/Peak Ozone Season / Days per Period

DAILY EMISSIONS = 0.05186 * 0.0000665589 / 1 / 31

DAILY EMISSIONS = 0.0000001 tons/day VOC

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Virginia Department of Environmental Quality 2011 Area and Nonroad Sample Calculations

2103006000 **Small Stationary Source Commercial/Institutional Natural Gas Combustion** Inventory Year: 2011

This category covers commercial/institutional stationary fuel combustion sources that consume natural gas for the operation of space heating, boilers, reciprocating engines, turbines, energy generation and other commercial/institutional purposes.

2011 Statewide commercial natural gas fuel consumption data was obtained from the Energy Information Administration. Point source fuel consumption associated with facilities with VDEQ air permits with a potential to emit greater than 100 tpy were was subtracted from the EIA statewide fuel consumption total in order to avoid double counting emissions in the non-point source inventory that have already been accounted for in the VDEQ point source air emission inventory. The remaining statewide commercial natural gas consumption attributed to non-point sources was apportioned to a county level based on NAICS 42-81 employment data obtained from the Virginia Employment Commission. VDEQ point source with a potential to emit greater than 100 tons/year were identified in the VEC employment data and manually removed prior to apportionment of the state total fuel consumption value down to a county level.

County	Fairfax County	EPA_SECTOR:	Fuel Comb - Comm/Institutional - Natural Gas		
FIPs Code	51059	SCC_L1:	Stationary Source Fuel Combustion	Tier 1 Description:	Fuel Comb. Other
Pollutant:	VOC	SCC_L2:	Commercial/Institutional	Tier 2 Description:	Commercial/Institutional Gas
Scenario:	1	SCC_L3:	Natural Gas	Tier 3 Description:	Other
		SCC_L4:	Total: Boilers and IC Engines		

EMISSION CALCULATION:

$$\text{ANNUAL EMISSIONS} = \frac{\text{(State Activity Level)(Fips Activity Level)(EF)(Reactivity)(1-(CE * RP * RE))}}{\text{(Fips Activity Level\_Total)}}$$

$$\text{ANNUAL EMISSIONS} = \frac{\text{(StCNGas)(NAICS Employment - Codes 42-81)(EF)(Reactivity)(1-(CE * RP * RE))}}{\text{(NAICS Employment - Codes 42-81)}}$$

$$\text{ANNUAL EMISSIONS} = \frac{\text{(61001million cubic feet)(506572Employees)(5.5lb/mil cubic ft)(0.66)(1-(0 * 0 * 0))}}{\text{(2781451Employees)}}$$

ANNUAL EMISSIONS = 40328.6203 lb/year VOC

ANNUAL EMISSIONS = 20.16431 tons/year VOC

DAILY EMISSIONS = ANNUAL EMISSIONS (tons/yr) * Seasonal Adjustment Factor/Peak Ozone Season / Days per Period

DAILY EMISSIONS = 20.16431 * 0.0000665589 / 1 / 31

DAILY EMISSIONS = 0.0000433 tons/day VOC

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Virginia Department of Environmental Quality 2011 Area and Nonroad Sample Calculations

2103007000 **Small Stationary Source Commercial/Institutional Liquid Petroleum Gas Combustion** Inventory Year: 2011

This category covers commercial/institutional stationary fuel combustion sources that consume liquid petroleum gas for the operation of space heating, boilers, reciprocating engines, turbines, energy generation and other commercial/institutional purposes

2011 statewide commercial liquid petroleum gas consumption data was obtained from the Energy Information Administration. Point source fuel consumption associated with facilities with VDEQ air permits with a potential to emit greater than 100 tpy were was subtracted. The remaining statewide commercial liquid petroleum gas consumption attributed to non-point sources was apportioned to a county level based on NAICS 42-81 employment data obtained from the Virginia Employment Commission. VDEQ point source with a potential to emit greater than 100 tons/year were identified in the VEC employment data and manually removed prior to apportionment of the state level fuel consumption data down to a county level.

County	Fairfax County	EPA_SECTOR:	Fuel Comb - Comm/Institutional - Other		
FIPs Code	51059	SCC_L1:	Stationary Source Fuel Combustion	Tier 1 Description:	Fuel Comb. Other
Pollutant:	VOC	SCC_L2:	Commercial/Institutional	Tier 2 Description:	Misc. Fuel Comb. (Except Residential)
Scenario:	1	SCC_L3:	Liquified Petroleum Gas (LPG)	Tier 3 Description:	Other
		SCC_L4:	Total: All Combustor Types		

EMISSION CALCULATION:

$$\text{ANNUAL EMISSIONS} = \frac{\text{(State Activity Level)(Fips Activity Level)(EF)(Reactivity)(1-(CE * RP * RE))}}{\text{(Fips Activity Level\_Total)}}$$

$$\text{ANNUAL EMISSIONS} = \frac{\text{(StCLpGas)(NAICS Employment - Codes 42-81)(EF)(Reactivity)(1-(CE * RP * RE))}}{\text{(NAICS Employment - Codes 42-81)}}$$

$$\text{ANNUAL EMISSIONS} = \frac{\text{(56248kgal)(506572Employees)(0.52lb/kgal)(1)(1-(0 * 0 * 0))}}{\text{(2781451Employees)}}$$

ANNUAL EMISSIONS = 5326.96913 lb/year VOC

ANNUAL EMISSIONS = 2.66348 tons/year VOC

DAILY EMISSIONS = ANNUAL EMISSIONS (tons/yr) * Seasonal Adjustment Factor/Peak Ozone Season / Days per Period

DAILY EMISSIONS = 2.66348 * 0.0000665589 / 1 / 31

DAILY EMISSIONS = 0.0000057 tons/day VOC

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Virginia Department of Environmental Quality 2011 Area and Nonroad Sample Calculations

2103008000 **Small Stationary Source Commercial/Institutional Wood Combustion** Inventory Year: 2011

This emission inventory category covers non-point commercial/institutional stationary fuel combustion sources that consume wood and wood waste for the operation of space heating, boilers, energy generation, and other commercial/institutional purposes.

2011 statewide commercial wood fuel consumption data was obtained from the Energy Information Administration. Point source fuel consumption associated with facilities with VDEQ air permits with a potential to emit greater than 100 tpy were was subtracted. The remaining statewide commercial wood consumption attributed to non-point sources was apportioned to a county level based on NAICS 42-81 employment data obtained from the Virginia Employment Commission. VDEQ point source with a potential to emit greater than 100 tons/year were identified in the VEC employment data and manually removed prior to apportionment of the state total fuel consumption estimate down to a county level.

County	Fairfax County	EPA_SECTOR:	Fuel Comb - Comm/Institutional - Biomass		
FIPs Code	51059	SCC_L1:	Stationary Source Fuel Combustion	Tier 1 Description:	Fuel Comb. Other
Pollutant:	VOC	SCC_L2:	Commercial/Institutional	Tier 2 Description:	Misc. Fuel Comb. (Except Residential)
Scenario:	1	SCC_L3:	Wood	Tier 3 Description:	Other
		SCC_L4:	Total: All Boiler Types		

EMISSION CALCULATION:

$$\text{ANNUAL EMISSIONS} = \frac{(\text{State Activity Level})(\text{Fips Activity Level})(\text{ActCF})(\text{EF})(\text{Reactivity})(1-(\text{CE} * \text{RP} * \text{RE}))}{(\text{Fips Activity Level\_Total})}$$

$$\text{ANNUAL EMISSIONS} = \frac{(\text{StCWood})(\text{NAICS Employment - Codes 42-81})(\text{btu to tons})(\text{EF})(\text{Reactivity})(1-(\text{CE} * \text{RP} * \text{RE}))}{(\text{NAICS Employment - Codes 42-81})}$$

$$\text{ANNUAL EMISSIONS} = \frac{(2006403786000\text{btu})(506572\text{Employees})(0.000000058\text{tons/btu})(0.1768\text{lb/ton})(1)(1-(0 * 0 * 0))}{(2781451\text{Employees})}$$

ANNUAL EMISSIONS = 3747.12682 lb/year VOC

ANNUAL EMISSIONS = 1.87356 tons/year VOC

DAILY EMISSIONS = ANNUAL EMISSIONS (tons/yr) * Seasonal Adjustment Factor/Peak Ozone Season / Days per Period

DAILY EMISSIONS = 1.87356 * 0.0000665589 / 1 / 31

DAILY EMISSIONS = 0.000004 tons/day VOC

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Virginia Department of Environmental Quality 2011 Area and Nonroad Sample Calculations

2103011000 **Small Stationary Source Commercial/Institutional Kerosene Combustion** Inventory Year: 2011

This category covers non-point commercial/institutional stationary fuel combustion sources that consume kerosene for the operation of space heating, boilers, reciprocating engines, turbines, energy generation and other commercial/institutional purposes.

2011 statewide commercial kerosene fuel consumption data was obtained from the Energy Information Administration. Point source fuel consumption associated with facilities with VDEQ air permits with a potential to emit greater than 100 tpy were was subtracted from the EIA total fuel consumption estimate in order to avoid double counting of emissions in the non-point source emission inventory that have already been accounted for in the VDEQ point source air emission inventory. The remaining statewide commercial kerosene coal consumption attributed to non-point sources was apportioned to a county level based on NAICS 42-81 employment data obtained from the Virginia Employment Commission. VDEQ point source with a potential to emit greater than 100 tons/year were identified in the VEC employment data and manually removed prior to apportionment of the state fuel consumption total down to a county level.

County	Fairfax County	EPA_SECTOR:	Fuel Comb - Comm/Institutional - Oil		
FIPs Code	51059	SCC_L1:	Stationary Source Fuel Combustion	Tier 1 Description:	Fuel Comb. Other
Pollutant:	VOC	SCC_L2:	Commercial/Institutional	Tier 2 Description:	Misc. Fuel Comb. (Except Residential)
Scenario:	1	SCC_L3:	Kerosene	Tier 3 Description:	Other
		SCC_L4:	Total: All Combustor Types		

EMISSION CALCULATION:

$$\text{ANNUAL EMISSIONS} = \frac{\text{(State Activity Level)(Fips Activity Level)(EF)(Reactivity)(1-(CE * RP * RE))}}{\text{(Fips Activity Level\_Total)}}$$

$$\text{ANNUAL EMISSIONS} = \frac{\text{(StCKero)(NAICS Employment - Codes 42-81)(EF)(Reactivity)(1-(CE * RP * RE))}}{\text{(NAICS Employment - Codes 42-81)}}$$

$$\text{ANNUAL EMISSIONS} = \frac{\text{(1092kgal)(506572Employees)(0.33lb/kgal)(1)(1-(0 * 0 * 0))}}{\text{(2781451Employees)}}$$

ANNUAL EMISSIONS = 65.6306 lb/year VOC

ANNUAL EMISSIONS = 0.03282 tons/year VOC

DAILY EMISSIONS = ANNUAL EMISSIONS (tons/yr) * Seasonal Adjustment Factor/Peak Ozone Season / Days per Period

DAILY EMISSIONS = 0.03282 * 0.0000665589 / 1 / 31

DAILY EMISSIONS = 0.0000001 tons/day VOC

rev:062714a

Virginia Department of Environmental Quality 2011 Area and Nonroad Sample Calculations

2104002000 **Small Stationary Source Residential Bituminous/Subbituminous Coal Combustion** Inventory Year: 2011

This emission inventory category covers residential stationary fuel combustion sources that consume bituminous and subbituminous coal for the operation of space heating, boilers, energy generation and other residential purposes.

2011 Statewide residential bituminous coal fuel consumption data was obtained from the Energy Information Administration and apportioned to a county level based on 2011 county level population data.

County	Fairfax County	EPA_SECTOR:	Fuel Comb - Residential - Other		
FIPs Code	51059	SCC_L1:	Stationary Source Fuel Combustion	Tier 1 Description:	Fuel Comb. Other
Pollutant:	VOC	SCC_L2:	Residential	Tier 2 Description:	Residential Other
Scenario:	1	SCC_L3:	Bituminous/Subbituminous Coal	Tier 3 Description:	Bituminous/Subbituminous Coal
		SCC_L4:	Total: All Combustor Types		

EMISSION CALCULATION:

$$\text{ANNUAL EMISSIONS} = \frac{\text{(State Activity Level)(Fips Activity Level)(EF)(Reactivity)(1-(CE * RP * RE))}}{\text{(Fips Activity Level\_Total)}}$$

$$\text{ANNUAL EMISSIONS} = \frac{\text{(StRBit)(CoPop)(EF)(Reactivity)(1-(CE * RP * RE))}}{\text{(StPop)}}$$

$$\text{ANNUAL EMISSIONS} = \frac{\text{(9900tons)(1063957People)(10lb/ton)(1)(1-(0 * 0 * 0))}}{\text{(7816585People)}}$$

ANNUAL EMISSIONS = 13475.41708 lb/year VOC

ANNUAL EMISSIONS = 6.73771 tons/year VOC

DAILY EMISSIONS = ANNUAL EMISSIONS (tons/yr) * Seasonal Adjustment Factor/Peak Ozone Season / Days per Period

DAILY EMISSIONS = 6.73771 * 0.0000665589 / 1 / 31

DAILY EMISSIONS = 0.0000145 tons/day VOC

rev:062714a

Virginia Department of Environmental Quality 2011 Area and Nonroad Sample Calculations

2104004000 **Small Stationary Source Residential Distillate Oil Combustion** Inventory Year: 2011

This emission inventory category covers residential stationary fuel combustion sources that consume distillate fuel oil for the operation of space heating, boilers, reciprocating engines, turbines, energy generation, and other residential purposes.

2011 Statewide residential distillate fuel oil consumption data was obtained from the Energy Information Administration and apportioned to a county level based on 2011 county level population data.

County	Fairfax County	EPA_SECTOR:	Fuel Comb - Residential - Oil		
FIPs Code	51059	SCC_L1:	Stationary Source Fuel Combustion	Tier 1 Description:	Fuel Comb. Other
Pollutant:	VOC	SCC_L2:	Residential	Tier 2 Description:	Residential Other
Scenario:	1	SCC_L3:	Distillate Oil	Tier 3 Description:	Distillate Oil
		SCC_L4:	Total: All Combustor Types		

EMISSION CALCULATION:

$$\text{ANNUAL EMISSIONS} = \frac{\text{(State Activity Level)(Fips Activity Level)(EF)(Reactivity)(1-(CE * RP * RE))}}{\text{(Fips Activity Level\_Total)}}$$

$$\text{ANNUAL EMISSIONS} = \frac{\text{(StRDisti)(CoPop)(EF)(Reactivity)(1-(CE * RP * RE))}}{\text{(StPop)}}$$

$$\text{ANNUAL EMISSIONS} = \frac{\text{(118188thousand gallons)(1063957People)(0.7lb/kgal)(1)(1-(0 * 0 * 0))}}{\text{(7816585People)}}$$

ANNUAL EMISSIONS = 11261.03835 lb/year VOC

ANNUAL EMISSIONS = 5.63052 tons/year VOC

DAILY EMISSIONS = ANNUAL EMISSIONS (tons/yr) * Seasonal Adjustment Factor/Peak Ozone Season / Days per Period

DAILY EMISSIONS = 5.63052 * 0.0000665589 / 1 / 31

DAILY EMISSIONS = 0.0000121 tons/day VOC

rev:062714a

Virginia Department of Environmental Quality 2011 Area and Nonroad Sample Calculations

2104006000 **Small Stationary Source Residential Natural Gas Combustion** Inventory Year: 2011

This emission inventory category covers residential stationary fuel combustion sources that consume natural gas for the operation of space heating, boiler operation, reciprocating engines, turbines, energy generation, and other residential purposes.

2011 Statewide residential natural gas consumption data was obtained from the Energy Information Administration and apportioned to a county level based on 2011 county level population data.

County	Fairfax County	EPA_SECTOR:	Fuel Comb - Residential - Natural Gas		
FIPs Code	51059	SCC_L1:	Stationary Source Fuel Combustion	Tier 1 Description:	Fuel Comb. Other
Pollutant:	VOC	SCC_L2:	Residential	Tier 2 Description:	Residential Other
Scenario:	1	SCC_L3:	Natural Gas	Tier 3 Description:	Natural Gas
		SCC_L4:	Total: All Combustor Types		

EMISSION CALCULATION:

$$\text{ANNUAL EMISSIONS} = \frac{\text{(State Activity Level)(Fips Activity Level)(EF)(Reactivity)(1-(CE * RP * RE))}}{\text{(Fips Activity Level\_Total)}}$$

$$\text{ANNUAL EMISSIONS} = \frac{\text{(StRNGas)(CoPop)(EF)(Reactivity)(1-(CE * RP * RE))}}{\text{(StPop)}}$$

$$\text{ANNUAL EMISSIONS} = \frac{\text{(79301million cubic feet)(1063957People)(5.5lb/mil cubic ft)(0.66)(1-(0 * 0 * 0))}}{\text{(7816585People)}}$$

ANNUAL EMISSIONS = 39182.51671 lb/year VOC

ANNUAL EMISSIONS = 19.59126 tons/year VOC

DAILY EMISSIONS = ANNUAL EMISSIONS (tons/yr) * Seasonal Adjustment Factor/Peak Ozone Season / Days per Period

DAILY EMISSIONS = 19.59126 * 0.0000665589 / 1 / 31

DAILY EMISSIONS = 0.0000421 tons/day VOC

rev:062714a

Virginia Department of Environmental Quality 2011 Area and Nonroad Sample Calculations

2104007000 **Small Stationary Source Residential Liquid Petroleum Gas Combustion** Inventory Year: 2011

This category covers residential stationary fuel combustion sources that consume liquid petroleum gas for the operation of space heating, boiler operation, reciprocating engines, turbines, energy generation, and other residential purposes.

2011 Statewide residential liquid petroleum gas consumption data was obtained from the Energy Information Administration and apportioned to a county level based on2011 county level population data.

County	Fairfax County	EPA_SECTOR:	Fuel Comb - Residential - Other		
FIPs Code	51059	SCC_L1:	Stationary Source Fuel Combustion	Tier 1 Description:	Fuel Comb. Other
Pollutant:	VOC	SCC_L2:	Residential	Tier 2 Description:	Residential Other
Scenario:	1	SCC_L3:	Liquified Petroleum Gas (LPG)	Tier 3 Description:	Other
		SCC_L4:	Total: All Combustor Types		

EMISSION CALCULATION:

$$\text{ANNUAL EMISSIONS} = \frac{\text{(State Activity Level)(Fips Activity Level)(EF)(Reactivity)(1-(CE * RP * RE))}}{\text{(Fips Activity Level\_Total)}}$$

$$\text{ANNUAL EMISSIONS} = \frac{\text{(StRLpGas)(CoPop)(EF)(Reactivity)(1-(CE * RP * RE))}}{\text{(StPop)}}$$

$$\text{ANNUAL EMISSIONS} = \frac{\text{(142128kgal)(1063957People)(0.52lb/kgal)(1)(1-(0 * 0 * 0))}}{\text{(7816585People)}}$$

ANNUAL EMISSIONS = 10059.81499 lb/year VOC

ANNUAL EMISSIONS = 5.02991 tons/year VOC

DAILY EMISSIONS = ANNUAL EMISSIONS (tons/yr) * Seasonal Adjustment Factor/Peak Ozone Season / Days per Period

DAILY EMISSIONS = 5.02991 * 0.0000665589 / 1 / 31

DAILY EMISSIONS = 0.0000108 tons/day VOC

rev:062714a

Virginia Department of Environmental Quality 2011 Area and Nonroad Sample Calculations

2104008100 **Small Stationary Source Residential Wood Combustion, Fireplace: general** Inventory Year: 2011

This emission inventory category covers residential fireplaces in general where wood and wood wastes are used as a fuel primarily for the space heating.

2011 county level residential wood emission estimates that were estimated by the EPA Residential Wood Combustion Estimation Tool were obtained directly from the EPA 2011 National Emission Inventory and entered directly into the Virginia state inventory.

County	Fairfax County	EPA_SECTOR:	Fuel Comb - Residential - Wood		
FIPs Code	51059	SCC_L1:	Stationary Source Fuel Combustion	Tier 1 Description:	Fuel Comb. Other
Pollutant:	VOC	SCC_L2:	Residential	Tier 2 Description:	Residential Wood
Scenario:	1	SCC_L3:	Wood	Tier 3 Description:	Fireplaces
		SCC_L4:	Fireplace: general		

EMISSION CALCULATION:

$$\text{ANNUAL EMISSIONS} = \frac{\text{(Fips Activity Level)(EF)(Reactivity)(1-(CE * RP * RE))}}{}$$

$$\text{ANNUAL EMISSIONS} = \frac{\text{(ActualEmissions)(EF)(Reactivity)(1-(CE * RP * RE))}}{}$$

$$\text{ANNUAL EMISSIONS} = \frac{\text{(1year)(1138800lb/yr)(1)(1-(0 * 0 * 0))}}{}$$

ANNUAL EMISSIONS = 1138800 lb/year VOC

ANNUAL EMISSIONS = 569.4 tons/year VOC

DAILY EMISSIONS = ANNUAL EMISSIONS (tons/yr) * Seasonal Adjustment Factor/Peak Ozone Season / Days per Period

DAILY EMISSIONS = 569.4 * 0.0000665589 / 1 / 31

DAILY EMISSIONS = 0.0012225 tons/day VOC

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Virginia Department of Environmental Quality 2011 Area and Nonroad Sample Calculations

2104008210 **Small Stationary Source Residential Wood Combustion, Woodstove: fireplace inserts; non-EPA certified** Inventory Year: 2011

This emission inventory category covers non-EPA certified woodstove fireplace inserts where wood and wood wastes are used as a fuel primarily for the space heating.

2011 county level residential wood emission estimates that were estimated by the EPA Residential Wood Combustion Estimation Tool were obtained directly from the EPA 2011 National Emission Inventory and entered directly into the Virginia state inventory.

County	Fairfax County	EPA_SECTOR:	Fuel Comb - Residential - Wood		
FIPs Code	51059	SCC_L1:	Stationary Source Fuel Combustion	Tier 1 Description:	Fuel Comb. Other
Pollutant:	VOC	SCC_L2:	Residential	Tier 2 Description:	Residential Wood
Scenario:	1	SCC_L3:	Wood	Tier 3 Description:	Woodstoves
		SCC_L4:	Woodstove: fireplace inserts; non-EPA certified		

EMISSION CALCULATION:

$$\text{ANNUAL EMISSIONS} = \frac{\text{(Fips Activity Level)(EF)(Reactivity)(1-(CE * RP * RE))}}{}$$

$$\text{ANNUAL EMISSIONS} = \frac{\text{(ActualEmissions)(EF)(Reactivity)(1-(CE * RP * RE))}}{}$$

$$\text{ANNUAL EMISSIONS} = \frac{\text{(1year)(1372314lb/yr)(1)(1-(0 * 0 * 0))}}{}$$

ANNUAL EMISSIONS = 1372314 lb/year VOC

ANNUAL EMISSIONS = 686.157 tons/year VOC

DAILY EMISSIONS = ANNUAL EMISSIONS (tons/yr) * Seasonal Adjustment Factor/Peak Ozone Season / Days per Period

DAILY EMISSIONS = 686.157 * 0.0000665589 / 1 / 31

DAILY EMISSIONS = 0.0014732 tons/day VOC

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Virginia Department of Environmental Quality 2011 Area and Nonroad Sample Calculations

2104008220 **Small Stationary Source Residential Wood Combustion, Woodstove: fireplace inserts; EPA certified; non-catalytic** Inventory Year: 2011

This emission inventory category covers EPA certified non-catalytic woodstove fireplace inserts where wood and wood wastes are used as a fuel primarily for the space heating.

2011 county level residential wood emission estimates that were estimated by the EPA Residential Wood Combustion Estimation Tool were obtained directly from the EPA 2011 National Emission Inventory and entered directly into the Virginia state inventory.

County	Fairfax County	EPA_SECTOR:	Fuel Comb - Residential - Wood		
FIPs Code	51059	SCC_L1:	Stationary Source Fuel Combustion	Tier 1 Description:	Fuel Comb. Other
Pollutant:	VOC	SCC_L2:	Residential	Tier 2 Description:	Residential Wood
Scenario:	1	SCC_L3:	Wood	Tier 3 Description:	Woodstoves
		SCC_L4:	Woodstove: fireplace inserts; EPA certified; non-catalytic		

EMISSION CALCULATION:

$$\text{ANNUAL EMISSIONS} = \frac{\text{(Fips Activity Level)(EF)(Reactivity)(1-(CE * RP * RE))}}{}$$

$$\text{ANNUAL EMISSIONS} = \frac{\text{(ActualEmissions)(EF)(Reactivity)(1-(CE * RP * RE))}}{}$$

$$\text{ANNUAL EMISSIONS} = \frac{\text{(1year)(99132.4lb/yr)(1)(1-(0 * 0 * 0))}}{}$$

ANNUAL EMISSIONS = 99132.39844 lb/year VOC

ANNUAL EMISSIONS = 49.5662 tons/year VOC

DAILY EMISSIONS = ANNUAL EMISSIONS (tons/yr) * Seasonal Adjustment Factor/Peak Ozone Season / Days per Period

DAILY EMISSIONS = 49.5662 * 0.0000665589 / 1 / 31

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DAILY EMISSIONS = 0.0001064 tons/day VOC

Virginia Department of Environmental Quality 2011 Area and Nonroad Sample Calculations

2104008230 **Small Stationary Source Residential Wood Combustion, Woodstove: fireplace inserts; EPA certified; catalytic** Inventory Year: 2011

This emission inventory category covers EPA certified catalytic woodstove fireplace inserts where wood and wood wastes are used as a fuel primarily for the space heating.

2011 county level residential wood emission estimates that were estimated by the EPA Residential Wood Combustion Estimation Tool were obtained directly from the EPA 2011 National Emission Inventory and entered directly into the Virginia state inventory.

County	Fairfax County	EPA_SECTOR:	Fuel Comb - Residential - Wood		
FIPs Code	51059	SCC_L1:	Stationary Source Fuel Combustion	Tier 1 Description:	Fuel Comb. Other
Pollutant:	VOC	SCC_L2:	Residential	Tier 2 Description:	Residential Wood
Scenario:	1	SCC_L3:	Wood	Tier 3 Description:	Woodstoves
		SCC_L4:	Woodstove: fireplace inserts; EPA certified; catalytic		

EMISSION CALCULATION:

$$\text{ANNUAL EMISSIONS} = \frac{\text{(Fips Activity Level)(EF)(Reactivity)(1-(CE * RP * RE))}}{}$$

$$\text{ANNUAL EMISSIONS} = \frac{\text{(ActualEmissions)(EF)(Reactivity)(1-(CE * RP * RE))}}{}$$

$$\text{ANNUAL EMISSIONS} = \frac{\text{(1year)(41305.2lb/yr)(1)(1-(0 * 0 * 0))}}{}$$

ANNUAL EMISSIONS = 41305.19922 lb/year VOC

ANNUAL EMISSIONS = 20.6526 tons/year VOC

DAILY EMISSIONS = ANNUAL EMISSIONS (tons/yr) * Seasonal Adjustment Factor/Peak Ozone Season / Days per Period

DAILY EMISSIONS = 20.6526 * 0.0000665589 / 1 / 31

DAILY EMISSIONS = 0.0000443 tons/day VOC

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Virginia Department of Environmental Quality 2011 Area and Nonroad Sample Calculations

2104008310 **Small Stationary Source Residential Wood Combustion, Woodstove: freestanding, non-EPA certified** Inventory Year: 2011

This emission inventory category covers freestanding non-EPA certified woodstoves where wood and wood wastes are used as a fuel primarily for the space heating.

2011 county level residential wood emission estimates that were estimated by the EPA Residential Wood Combustion Estimation Tool were obtained directly from the EPA 2011 National Emission Inventory and entered directly into the Virginia state inventory.

County	Fairfax County	EPA_SECTOR:	Fuel Comb - Residential - Wood		
FIPs Code	51059	SCC_L1:	Stationary Source Fuel Combustion	Tier 1 Description:	Fuel Comb. Other
Pollutant:	VOC	SCC_L2:	Residential	Tier 2 Description:	Residential Wood
Scenario:	1	SCC_L3:	Wood	Tier 3 Description:	Woodstoves
		SCC_L4:	Woodstove: freestanding, non-EPA certified		

EMISSION CALCULATION:

$$\text{ANNUAL EMISSIONS} = \frac{\text{(Fips Activity Level)(EF)(Reactivity)(1-(CE * RP * RE))}}{}$$

$$\text{ANNUAL EMISSIONS} = \frac{\text{(ActualEmissions)(EF)(Reactivity)(1-(CE * RP * RE))}}{}$$

$$\text{ANNUAL EMISSIONS} = \frac{\text{(1year)(119305.2lb/yr)(1)(1-(0 * 0 * 0))}}{}$$

ANNUAL EMISSIONS = 119305.20312 lb/year VOC

ANNUAL EMISSIONS = 59.6526 tons/year VOC

DAILY EMISSIONS = ANNUAL EMISSIONS (tons/yr) * Seasonal Adjustment Factor/Peak Ozone Season / Days per Period

DAILY EMISSIONS = 59.6526 * 0.0000665589 / 1 / 31

DAILY EMISSIONS = 0.0001281 tons/day VOC

rev:062714a

Virginia Department of Environmental Quality 2011 Area and Nonroad Sample Calculations

2104008320 **Small Stationary Source Residential Wood Combustion, Woodstove: freestanding, EPA certified, non-catalytic** Inventory Year: 2011

This emission inventory category covers freestanding EPA certified non-catalytic woodstoves where wood and wood wastes are used as a fuel primarily for the space heating.

2011 county level residential wood emission estimates that were estimated by the EPA Residential Wood Combustion Estimation Tool were obtained directly from the EPA 2011 National Emission Inventory and entered directly into the Virginia state inventory.

County	Fairfax County	EPA_SECTOR:	Fuel Comb - Residential - Wood		
FIPs Code	51059	SCC_L1:	Stationary Source Fuel Combustion	Tier 1 Description:	Fuel Comb. Other
Pollutant:	VOC	SCC_L2:	Residential	Tier 2 Description:	Residential Wood
Scenario:	1	SCC_L3:	Wood	Tier 3 Description:	Woodstoves
		SCC_L4:	Woodstove: freestanding, EPA certified, non-catalytic		

EMISSION CALCULATION:

$$\text{ANNUAL EMISSIONS} = \frac{\text{(Fips Activity Level)(EF)(Reactivity)(1-(CE * RP * RE))}}{}$$

$$\text{ANNUAL EMISSIONS} = \frac{\text{(ActualEmissions)(EF)(Reactivity)(1-(CE * RP * RE))}}{}$$

$$\text{ANNUAL EMISSIONS} = \frac{\text{(1year)(8619.42lb/yr)(1)(1-(0 * 0 * 0))}}{}$$

ANNUAL EMISSIONS = 8619.41992 lb/year VOC

ANNUAL EMISSIONS = 4.30971 tons/year VOC

DAILY EMISSIONS = ANNUAL EMISSIONS (tons/yr) * Seasonal Adjustment Factor/Peak Ozone Season / Days per Period

DAILY EMISSIONS = 4.30971 * 0.0000665589 / 1 / 31

DAILY EMISSIONS = 0.0000093 tons/day VOC

rev:062714a

Virginia Department of Environmental Quality 2011 Area and Nonroad Sample Calculations

2104008330 **Small Stationary Source Residential Wood Combustion, Woodstove: freestanding, EPA certified, catalytic** Inventory Year: 2011

This emission inventory category covers freestanding EPA certified catalytic woodstoves where wood and wood wastes are used as a fuel primarily for the space heating.

2011 county level residential wood emission estimates that were estimated by the EPA Residential Wood Combustion Estimation Tool were obtained directly from the EPA 2011 National Emission Inventory and entered directly into the Virginia state inventory.

County	Fairfax County	EPA_SECTOR:	Fuel Comb - Residential - Wood		
FIPs Code	51059	SCC_L1:	Stationary Source Fuel Combustion	Tier 1 Description:	Fuel Comb. Other
Pollutant:	VOC	SCC_L2:	Residential	Tier 2 Description:	Residential Wood
Scenario:	1	SCC_L3:	Wood	Tier 3 Description:	Woodstoves
		SCC_L4:	Woodstove: freestanding, EPA certified, catalytic		

EMISSION CALCULATION:

$$\text{ANNUAL EMISSIONS} = \frac{\text{(Fips Activity Level)(EF)(Reactivity)(1-(CE * RP * RE))}}{}$$

$$\text{ANNUAL EMISSIONS} = \frac{\text{(ActualEmissions)(EF)(Reactivity)(1-(CE * RP * RE))}}{}$$

$$\text{ANNUAL EMISSIONS} = \frac{\text{(1year)(3583.86lb/yr)(1)(1-(0 * 0 * 0))}}{}$$

ANNUAL EMISSIONS = 3583.86011 lb/year VOC

ANNUAL EMISSIONS = 1.79193 tons/year VOC

DAILY EMISSIONS = ANNUAL EMISSIONS (tons/yr) * Seasonal Adjustment Factor/Peak Ozone Season / Days per Period

DAILY EMISSIONS = 1.79193 * 0.0000665589 / 1 / 31

DAILY EMISSIONS = 0.0000038 tons/day VOC

rev:062714a

Virginia Department of Environmental Quality 2011 Area and Nonroad Sample Calculations

2104008400 **Small Stationary Source Residential Wood Combustion, Woodstove: pellet-fired, general (freestanding or FP insert)** Inventory Year: 2011

This emission inventory category covers freestanding and fireplace insert pellet-fired woodstoves where wood and wood wastes are used as a fuel primarily for the space heating.

2011 county level residential wood emission estimates that were estimated by the EPA Residential Wood Combustion Estimation Tool were obtained directly from the EPA 2011 National Emission Inventory and entered directly into the Virginia state inventory.

County	Fairfax County	EPA_SECTOR:	Fuel Comb - Residential - Wood		
FIPs Code	51059	SCC_L1:	Stationary Source Fuel Combustion	Tier 1 Description:	Fuel Comb. Other
Pollutant:	VOC	SCC_L2:	Residential	Tier 2 Description:	Residential Wood
Scenario:	1	SCC_L3:	Wood	Tier 3 Description:	Woodstoves
		SCC_L4:	Woodstove: pellet-fired, general (freestanding or FP insert)		

EMISSION CALCULATION:

$$\text{ANNUAL EMISSIONS} = \frac{\text{(Fips Activity Level)(EF)(Reactivity)(1-(CE * RP * RE))}}{}$$

$$\text{ANNUAL EMISSIONS} = \frac{\text{(ActualEmissions)(EF)(Reactivity)(1-(CE * RP * RE))}}{}$$

$$\text{ANNUAL EMISSIONS} = \frac{\text{(1year)(24.067lb/yr)(1)(1-(0 * 0 * 0))}}{}$$

ANNUAL EMISSIONS = 24.067 lb/year VOC

ANNUAL EMISSIONS = 0.01203 tons/year VOC

DAILY EMISSIONS = ANNUAL EMISSIONS (tons/yr) * Seasonal Adjustment Factor/Peak Ozone Season / Days per Period

DAILY EMISSIONS = 0.01203 * 0.0000665589 / 1 / 31

DAILY EMISSIONS = 0 tons/day VOC

rev:062714a

Virginia Department of Environmental Quality 2011 Area and Nonroad Sample Calculations

2104008510 **Small Stationary Source Residential Wood Combustion, Furnace: Indoor, cordwood-fired, non-EPA certified** Inventory Year: 2011

This emission inventory category covers indoor cordwood-fired non-EPA certified furnaces where wood and wood wastes are used as a fuel primarily for the space heating.

2011 county level residential wood emission estimates that were estimated by the EPA Residential Wood Combustion Estimation Tool were obtained directly from the EPA 2011 National Emission Inventory and entered directly into the Virginia state inventory.

County	Fairfax County	EPA_SECTOR:	Fuel Comb - Residential - Wood		
FIPs Code	51059	SCC_L1:	Stationary Source Fuel Combustion	Tier 1 Description:	Fuel Comb. Other
Pollutant:	VOC	SCC_L2:	Residential	Tier 2 Description:	Residential Wood
Scenario:	1	SCC_L3:	Wood	Tier 3 Description:	Other
		SCC_L4:	Furnace: Indoor, cordwood-fired, non-EPA certified		

EMISSION CALCULATION:

$$\text{ANNUAL EMISSIONS} = \frac{\text{(Fips Activity Level)(EF)(Reactivity)(1-(CE * RP * RE))}}{}$$

$$\text{ANNUAL EMISSIONS} = \frac{\text{(ActualEmissions)(EF)(Reactivity)(1-(CE * RP * RE))}}{}$$

$$\text{ANNUAL EMISSIONS} = \frac{\text{(1year)(49450.4lb/yr)(1)(1-(0 * 0 * 0))}}{}$$

ANNUAL EMISSIONS = 49450.39844 lb/year VOC

ANNUAL EMISSIONS = 24.7252 tons/year VOC

DAILY EMISSIONS = ANNUAL EMISSIONS (tons/yr) * Seasonal Adjustment Factor/Peak Ozone Season / Days per Period

DAILY EMISSIONS = 24.7252 * 0.0000665589 / 1 / 31

DAILY EMISSIONS = 0.0000531 tons/day VOC

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Virginia Department of Environmental Quality 2011 Area and Nonroad Sample Calculations

2104008700 **Small Stationary Source Residential Wood Combustion, Outdoor wood burning device, NEC (fire-pits, chimeas, etc)** Inventory Year: 2011

This emission inventory category covers fire-pits, chimeas and other miscellaneous outdoor wood burning devices where wood and wood wastes are used as a fuel primarily.

2011 county level residential wood emission estimates that were estimated by the EPA Residential Wood Combustion Estimation Tool were obtained directly from the EPA 2011 National Emission Inventory and entered directly into the Virginia state inventory.

County	Fairfax County	EPA_SECTOR:	Fuel Comb - Residential - Wood		
FIPs Code	51059	SCC_L1:	Stationary Source Fuel Combustion	Tier 1 Description:	Fuel Comb. Other
Pollutant:	VOC	SCC_L2:	Residential	Tier 2 Description:	Residential Wood
Scenario:	1	SCC_L3:	Wood	Tier 3 Description:	Other
		SCC_L4:	Outdoor wood burning device, NEC (fire-pits, chimeas, etc)		

EMISSION CALCULATION:

$$\text{ANNUAL EMISSIONS} = \frac{\text{(Fips Activity Level)(EF)(Reactivity)(1-(CE * RP * RE))}}{}$$

$$\text{ANNUAL EMISSIONS} = \frac{\text{(ActualEmissions)(EF)(Reactivity)(1-(CE * RP * RE))}}{}$$

$$\text{ANNUAL EMISSIONS} = \frac{\text{(1year)(8579.12lb/yr)(1)(1-(0 * 0 * 0))}}{}$$

ANNUAL EMISSIONS = 8579.12012 lb/year VOC

ANNUAL EMISSIONS = 4.28956 tons/year VOC

DAILY EMISSIONS = ANNUAL EMISSIONS (tons/yr) * Seasonal Adjustment Factor/Peak Ozone Season / Days per Period

DAILY EMISSIONS = 4.28956 * 0.0000665589 / 1 / 31

DAILY EMISSIONS = 0.0000092 tons/day VOC

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Virginia Department of Environmental Quality 2011 Area and Nonroad Sample Calculations

2104009000 **Small Stationary Source Residential Wood Combustion, Fireplace: Total: All Combustor Types** Inventory Year: 2011

This emission inventory category covers Fireplaces of all combustor types where wood and wood wastes are used as a fuel primarily.

2011 county level residential wood emission estimates that were estimated by the EPA Residential Wood Combustion Estimation Tool were obtained directly from the EPA 2011 National Emission Inventory and entered directly into the Virginia state inventory.

County	Fairfax County	EPA_SECTOR:	Fuel Comb - Residential - Wood		
FIPs Code	51059	SCC_L1:	Stationary Source Fuel Combustion	Tier 1 Description:	Fuel Comb. Other
Pollutant:	VOC	SCC_L2:	Residential	Tier 2 Description:	Residential Wood
Scenario:	1	SCC_L3:	Firelog	Tier 3 Description:	Other
		SCC_L4:	Total: All Combustor Types		

EMISSION CALCULATION:

$$\text{ANNUAL EMISSIONS} = \frac{\text{(Fips Activity Level)(EF)(Reactivity)(1-(CE * RP * RE))}}{}$$

$$\text{ANNUAL EMISSIONS} = \frac{\text{(ActualEmissions)(EF)(Reactivity)(1-(CE * RP * RE))}}{}$$

$$\text{ANNUAL EMISSIONS} = \frac{\text{(1year)(40820lb/yr)(1)(1-(0 * 0 * 0))}}{}$$

ANNUAL EMISSIONS = 40820 lb/year VOC

ANNUAL EMISSIONS = 20.41 tons/year VOC

DAILY EMISSIONS = ANNUAL EMISSIONS (tons/yr) * Seasonal Adjustment Factor/Peak Ozone Season / Days per Period

DAILY EMISSIONS = 20.41 * 0.0000665589 / 1 / 31

DAILY EMISSIONS = 0.0000438 tons/day VOC

rev:062714a

Virginia Department of Environmental Quality 2011 Area and Nonroad Sample Calculations

2104011000 **Small Stationary Source Residential Kerosene Combustion** Inventory Year: 2011

This emission inventory category covers residential stationary fuel combustion sources that consume kerosene for the operation of space heaters and/or boilers.

2011 Statewide residential kerosene fuel oil consumption data was obtained from the Energy Information Administration and apportioned to a county level based on 2011 county level population data.

County	Fairfax County	EPA_SECTOR:	Fuel Comb - Residential - Oil		
FIPs Code	51059	SCC_L1:	Stationary Source Fuel Combustion	Tier 1 Description:	Fuel Comb. Other
Pollutant:	VOC	SCC_L2:	Residential	Tier 2 Description:	Residential Other
Scenario:	1	SCC_L3:	Kerosene	Tier 3 Description:	Other
		SCC_L4:	Total: All Heater Types		

EMISSION CALCULATION:

$$\text{ANNUAL EMISSIONS} = \frac{\text{(State Activity Level)(Fips Activity Level)(EF)(Reactivity)(1-(CE * RP * RE))}}{\text{(Fips Activity Level\_Total)}}$$

$$\text{ANNUAL EMISSIONS} = \frac{\text{(StRKero)(CoPop)(EF)(Reactivity)(1-(CE * RP * RE))}}{\text{(StPop)}}$$

$$\text{ANNUAL EMISSIONS} = \frac{\text{(6510thousand gallons)(1063957People)(0.672lb/kgal)(1)(1-(0 * 0 * 0))}}{\text{(7816585People)}}$$

ANNUAL EMISSIONS = 595.46642 lb/year VOC

ANNUAL EMISSIONS = 0.29773 tons/year VOC

DAILY EMISSIONS = ANNUAL EMISSIONS (tons/yr) * Seasonal Adjustment Factor/Peak Ozone Season / Days per Period

DAILY EMISSIONS = 0.29773 * 0.0000665589 / 1 / 31

DAILY EMISSIONS = 0.0000006 tons/day VOC

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Virginia Department of Environmental Quality 2011 Area and Nonroad Sample Calculations

2275070000 **Aircraft Auxiliary Power Units** Inventory Year: 2011

This category covers the emissions associated with aircraft auxiliary power units

Aircraft auxiliary power units emissions calculated based on number of aircraft LTOs taking place at designated airfield

County	Loudoun County	EPA_SECTOR:	Mobile - Non-Road Equipment - Other		
FIPs Code	51107	SCC_L1:	Mobile Sources	Tier 1 Description:	Off-Highway
Pollutant:	VOC	SCC_L2:	Aircraft	Tier 2 Description:	Aircraft
Scenario:	1	SCC_L3:	Aircraft Auxiliary Power Units	Tier 3 Description:	Other
		SCC_L4:	Total		

EMISSION CALCULATION:

$$\text{ANNUAL EMISSIONS} = \frac{\text{(Fips Activity Level)(EF)(Reactivity)(1-(CE * RP * RE))}}{}$$

$$\text{ANNUAL EMISSIONS} = \frac{\text{(Aircraft /Auxiliary Power Unit)(EF)(Reactivity)(1-(CE * RP * RE))}}{}$$

$$\text{ANNUAL EMISSIONS} = \frac{\text{(13719LTOs)(0.1207947lb/LTO)(1)(1-(0 * 0 * 0))}}{}$$

ANNUAL EMISSIONS = 1657.18196 lb/year VOC

ANNUAL EMISSIONS = 0.82859 tons/year VOC

DAILY EMISSIONS = ANNUAL EMISSIONS (tons/yr) * Seasonal Adjustment Factor/Peak Ozone Season / Days per Period

DAILY EMISSIONS = 0.82859 * 0.25 / 0.25 / 365

DAILY EMISSIONS = 0.0022701 tons/day VOC

rev:062714a

Virginia Department of Environmental Quality 2011 Area and Nonroad Sample Calculations

2280002200 **Commercial Marine Vessels, Diesel, Underway** Inventory Year: 2011

This source category emission inventory covers emissions from commercial marine vessels powered by diesel engines while underway.

2011 county level commercial marine vessel emission estimates that were calculated by the EPA were downloaded from the EPA 2011 National Emission Inventory and entered directly into the Virginia state inventory.

County	Fairfax County	EPA_SECTOR:	Mobile - Commercial Marine Vessels		
FIPs Code	51059	SCC_L1:	Mobile Sources	Tier 1 Description:	Off-Highway
Pollutant:	VOC	SCC_L2:	Marine Vessels, Commercial	Tier 2 Description:	Marine Vessels
Scenario:	1	SCC_L3:	Diesel	Tier 3 Description:	Diesel
		SCC_L4:	Underway emissions		

EMISSION CALCULATION:

$$\text{ANNUAL EMISSIONS} = \frac{\text{(Fips Activity Level)(EF)(Reactivity)(1-(CE * RP * RE))}}{}$$

$$\text{ANNUAL EMISSIONS} = \frac{\text{(ActualEmissions)(EF)(Reactivity)(1-(CE * RP * RE))}}{}$$

$$\text{ANNUAL EMISSIONS} = \frac{\text{(1year)(156.75lb/yr)(1)(1-(0 * 0 * 0))}}{}$$

ANNUAL EMISSIONS = 156.74995 lb/year VOC

ANNUAL EMISSIONS = 0.07837 tons/year VOC

DAILY EMISSIONS = ANNUAL EMISSIONS (tons/yr) * Seasonal Adjustment Factor/Peak Ozone Season / Days per Period

DAILY EMISSIONS = 0.07837 * 0.25 / 0.25 / 365

DAILY EMISSIONS = 0.0002147 tons/day VOC

rev:062714a

Virginia Department of Environmental Quality 2011 Area and Nonroad Sample Calculations

2280003200 **Commercial Marine Vessels, Residual, Underway** Inventory Year: 2011

This source category emission inventory covers emissions from commercial marine vessels powered by residual fuel engines while underway.

2011 county level commercial marine vessel emission estimates that were calculated by the EPA were downloaded from the EPA 2011 National Emission Inventory and entered directly into the Virginia state inventory.

County	Fairfax County	EPA_SECTOR:	Mobile - Commercial Marine Vessels		
FIPs Code	51059	SCC_L1:	Mobile Sources	Tier 1 Description:	Off-Highway
Pollutant:	VOC	SCC_L2:	Marine Vessels, Commercial	Tier 2 Description:	Marine Vessels
Scenario:	1	SCC_L3:	Residual	Tier 3 Description:	Diesel
		SCC_L4:	Underway emissions		

EMISSION CALCULATION:

$$\text{ANNUAL EMISSIONS} = \frac{\text{(Fips Activity Level)(EF)(Reactivity)(1-(CE * RP * RE))}}{}$$

$$\text{ANNUAL EMISSIONS} = \frac{\text{(ActualEmissions)(EF)(Reactivity)(1-(CE * RP * RE))}}{}$$

$$\text{ANNUAL EMISSIONS} = \frac{\text{(1year)(497.212lb/yr)(1)(1-(0 * 0 * 0))}}{}$$

ANNUAL EMISSIONS = 497.21201 lb/year VOC

ANNUAL EMISSIONS = 0.24861 tons/year VOC

DAILY EMISSIONS = ANNUAL EMISSIONS (tons/yr) * Seasonal Adjustment Factor/Peak Ozone Season / Days per Period

DAILY EMISSIONS = 0.24861 * 0.25 / 0.25 / 365

DAILY EMISSIONS = 0.0006811 tons/day VOC

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Virginia Department of Environmental Quality 2011 Area and Nonroad Sample Calculations

2285002006 **Class I Line Haul Locomotive Engines** Inventory Year: 2011

This source category emission inventory covers the emissions from Class I locomotive engines.

2011 county level Class I line haul rail emission estimates that were calculated by the EPA were downloaded from the EPA 2011 National Emission Inventory and entered directly into the Virginia state inventory.

County	Prince William County	EPA_SECTOR:	Mobile - Locomotives		
FIPs Code	51153	SCC_L1:	Mobile Sources	Tier 1 Description:	Off-Highway
Pollutant:	VOC	SCC_L2:	Railroad Equipment	Tier 2 Description:	Railroads
Scenario:	1	SCC_L3:	Diesel	Tier 3 Description:	Other
		SCC_L4:	Line Haul Locomotives: Class I Operations		

EMISSION CALCULATION:

$$\text{ANNUAL EMISSIONS} = \frac{\text{(Fips Activity Level)(EF)(Reactivity)(1-(CE * RP * RE))}}{}$$

$$\text{ANNUAL EMISSIONS} = \frac{\text{(ActualEmissions)(EF)(Reactivity)(1-(CE * RP * RE))}}{}$$

$$\text{ANNUAL EMISSIONS} = \frac{\text{(1year)(21277.34lb/yr)(1)(1-(0 * 0 * 0))}}{}$$

ANNUAL EMISSIONS = 21277.33789 lb/year VOC

ANNUAL EMISSIONS = 10.63867 tons/year VOC

DAILY EMISSIONS = ANNUAL EMISSIONS (tons/yr) * Seasonal Adjustment Factor/Peak Ozone Season / Days per Period

DAILY EMISSIONS = 10.63867 * 0.25 / 0.25 / 365

DAILY EMISSIONS = 0.029147 tons/day VOC

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Virginia Department of Environmental Quality 2011 Area and Nonroad Sample Calculations

2285002008 **Passenger Rail Locomotive Engines** Inventory Year: 2011

This source category emission inventory covers the emissions from passenger rail locomotive engines operated by AMTRAK throughout portions of Virginia.

VDEQ staff collected CY 2011 passenger rail activity data and developed a comprehensive passenger rail emission inventory in-house.

County	Fairfax County	EPA_SECTOR:	Mobile - Locomotives		
FIPs Code	51059	SCC_L1:	Mobile Sources	Tier 1 Description:	Off-Highway
Pollutant:	VOC	SCC_L2:	Railroad Equipment	Tier 2 Description:	Railroads
Scenario:	1	SCC_L3:	Diesel	Tier 3 Description:	Other
		SCC_L4:	Line Haul Locomotives: Passenger Trains (Amtrak)		

EMISSION CALCULATION:

$$\text{ANNUAL EMISSIONS} = \frac{\text{(Fips Activity Level)(FuelLoadingFactor)(EF)(Reactivity)(1-(CE * RP * RE))}}{}$$

$$\text{ANNUAL EMISSIONS} = \frac{\text{(Train\_VMT\_Amtrak)(Amtrak Passenger Rail)(EF)(Reactivity)(1-(CE * RP * RE))}}{}$$

$$\text{ANNUAL EMISSIONS} = \frac{\text{(114322.726VMT)(2.12gallons per train mile traveled)(0.0179lb/gal)(1)(1-(0 * 0 * 0))}}{}$$

ANNUAL EMISSIONS = 4338.31866 lb/year VOC

ANNUAL EMISSIONS = 2.16916 tons/year VOC

DAILY EMISSIONS = ANNUAL EMISSIONS (tons/yr) * Seasonal Adjustment Factor/Peak Ozone Season / Days per Period

DAILY EMISSIONS = 2.16916 * 0.25 / 0.25 / 365

DAILY EMISSIONS = 0.0059429 tons/day VOC

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Virginia Department of Environmental Quality 2011 Area and Nonroad Sample Calculations

2285002009 **Commuter Rail Locomotive Engines** Inventory Year: 2011

This source category emission inventory covers the emission from commuter rail locomotives operated by the Virginia Rail Express in Northern Virginia

VDEQ obtained CY 2011 commuter rail fuel consumption data from VRE and allocated it to each county based on actual county specific locomotive VMT. In 2011, VRE replaced their entire fleet of tier 0 locomotives with new cleaner burning tier 2 locomotives. The new locomotives were phased-in over the course of the year. In CY 2011, approximately 1/2 the annual VMT were attributed to Tier 0 locomotives and the other 1/2 of the annual VMT were attributed to Tier 2 locomotives. Beginning in CY 2012, the entire fleet will be operating as Tier 2 locomotives.

County	Fairfax County	EPA_SECTOR:	Mobile - Locomotives		
FIPs Code	51059	SCC_L1:	Mobile Sources	Tier 1 Description:	Off-Highway
Pollutant:	VOC	SCC_L2:	Railroad Equipment	Tier 2 Description:	Railroads
Scenario:	1	SCC_L3:	Diesel	Tier 3 Description:	Other
		SCC_L4:	Line Haul Locomotives: Commuter Lines		

EMISSION CALCULATION:

$$\text{ANNUAL EMISSIONS} = \frac{\text{(Fips Activity Level)(FuelLoadingFactor)(EF)(Reactivity)(1-(CE * RP * RE))}}{}$$

$$\text{ANNUAL EMISSIONS} = \frac{\text{(CommuterRailMilesTraveled)(VRE Commuter Rail)(EF)(Reactivity)(1-(CE * RP * RE))}}{}$$

$$\text{ANNUAL EMISSIONS} = \frac{\text{(132114.656VMT)(4.55gallons per train mile traveled)(0.02981lb/gal)(1)(1-(0 * 0 * 0))}}{}$$

ANNUAL EMISSIONS = 17919.43755 lb/year VOC

ANNUAL EMISSIONS = 8.95972 tons/year VOC

DAILY EMISSIONS = ANNUAL EMISSIONS (tons/yr) * Seasonal Adjustment Factor/Peak Ozone Season / Days per Period

DAILY EMISSIONS = 8.95972 * 0.25 / 0.25 / 365

DAILY EMISSIONS = 0.0245472 tons/day VOC

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Virginia Department of Environmental Quality 2011 Area and Nonroad Sample Calculations

2302002100 **Conveyorized Commercial Cooking Charbroiling** Inventory Year: 2011

This non-point source emission inventory category covers the emissions from conveyorized commercial charbroiling cooking appliances.

2011 county commercial cooking emission estimates that were estimated by the EPA obtained directly from the EPA 2011 National Emission Inventory and entered directly into the Virginia state inventory.

County	Fairfax County	EPA_SECTOR:	Commercial Cooking		
FIPs Code	51059	SCC_L1:	Industrial Processes	Tier 1 Description:	Other Industrial Processes
Pollutant:	VOC	SCC_L2:	Food and Kindred Products: SIC 20	Tier 2 Description:	Agriculture, Food, & Kindred Products
Scenario:	1	SCC_L3:	Commercial Cooking - Charbroiling	Tier 3 Description:	Commercial Cooking
		SCC_L4:	Conveyorized Charbroiling		

EMISSION CALCULATION:

$$\text{ANNUAL EMISSIONS} = \frac{\text{(Fips Activity Level)(EF)(Reactivity)(1-(CE * RP * RE))}}{}$$

$$\text{ANNUAL EMISSIONS} = \frac{\text{(CoPop)(EF)(Reactivity)(1-(CE * RP * RE))}}{}$$

$$\text{ANNUAL EMISSIONS} = \frac{\text{(1063957People)(1.205601E-02lb/person)(1)(1-(0 * 0 * 0))}}{}$$

ANNUAL EMISSIONS = 12827.07607 lb/year VOC

ANNUAL EMISSIONS = 6.41354 tons/year VOC

DAILY EMISSIONS = ANNUAL EMISSIONS (tons/yr) * Seasonal Adjustment Factor/Peak Ozone Season / Days per Period

DAILY EMISSIONS = 6.41354 * 0.333333333 / 0.25 / 365

DAILY EMISSIONS = 0.0234284 tons/day VOC

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Virginia Department of Environmental Quality 2011 Area and Nonroad Sample Calculations

2302002200 **Under-fired Commercial Cooking Charbroiling** Inventory Year: 2011

This non-point source emission inventory category covers the emissions from under-fired conveyorized commercial charbroiling cooking appliances.

2011 county commercial cooking emission estimates that were estimated by the EPA obtained directly from the EPA 2011 National Emission Inventory and entered directly into the Virginia state inventory.

County	Fairfax County	EPA_SECTOR:	Commercial Cooking		
FIPs Code	51059	SCC_L1:	Industrial Processes	Tier 1 Description:	Other Industrial Processes
Pollutant:	VOC	SCC_L2:	Food and Kindred Products: SIC 20	Tier 2 Description:	Agriculture, Food, & Kindred Products
Scenario:	1	SCC_L3:	Commercial Cooking - Charbroiling	Tier 3 Description:	Commercial Cooking
		SCC_L4:	Under-fired Charbroiling		

EMISSION CALCULATION:

$$\text{ANNUAL EMISSIONS} = \frac{\text{(Fips Activity Level)(EF)(Reactivity)(1-(CE * RP * RE))}}{}$$

$$\text{ANNUAL EMISSIONS} = \frac{\text{(CoPop)(EF)(Reactivity)(1-(CE * RP * RE))}}{}$$

$$\text{ANNUAL EMISSIONS} = \frac{\text{(1063957People)(4.148031E-02lb/person)(1)(1-(0 * 0 * 0))}}{}$$

ANNUAL EMISSIONS = 44133.2625 lb/year VOC

ANNUAL EMISSIONS = 22.06663 tons/year VOC

DAILY EMISSIONS = ANNUAL EMISSIONS (tons/yr) * Seasonal Adjustment Factor/Peak Ozone Season / Days per Period

DAILY EMISSIONS = 22.06663 * 0.333333333 / 0.25 / 365

DAILY EMISSIONS = 0.0806087 tons/day VOC

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Virginia Department of Environmental Quality 2011 Area and Nonroad Sample Calculations

2302003000 **Commercial Deep Fat Frying Commercial Cooking** Inventory Year: 2011

This non-point source emission inventory category covers the emissions from commercial deep fat frying commercial cooking appliances.

2011 county commercial cooking emission estimates that were estimated by the EPA obtained directly from the EPA 2011 National Emission Inventory and entered directly into the Virginia state inventory.

County	Fairfax County	EPA_SECTOR:	Commercial Cooking		
FIPs Code	51059	SCC_L1:	Industrial Processes	Tier 1 Description:	Other Industrial Processes
Pollutant:	VOC	SCC_L2:	Food and Kindred Products: SIC 20	Tier 2 Description:	Agriculture, Food, & Kindred Products
Scenario:	1	SCC_L3:	Commercial Cooking - Frying	Tier 3 Description:	Commercial Cooking
		SCC_L4:	Deep Fat Fying		

EMISSION CALCULATION:

$$\text{ANNUAL EMISSIONS} = \frac{\text{(Fips Activity Level)(EF)(Reactivity)(1-(CE * RP * RE))}}{}$$

$$\text{ANNUAL EMISSIONS} = \frac{\text{(CoPop)(EF)(Reactivity)(1-(CE * RP * RE))}}{}$$

$$\text{ANNUAL EMISSIONS} = \frac{\text{(1063957People)(1.260815E-02lb/person)(1)(1-(0 * 0 * 0))}}{}$$

ANNUAL EMISSIONS = 13414.53046 lb/year VOC

ANNUAL EMISSIONS = 6.70727 tons/year VOC

DAILY EMISSIONS = ANNUAL EMISSIONS (tons/yr) * Seasonal Adjustment Factor/Peak Ozone Season / Days per Period

DAILY EMISSIONS = 6.70727 * 0.333333333 / 0.25 / 365

DAILY EMISSIONS = 0.0245014 tons/day VOC

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Virginia Department of Environmental Quality 2011 Area and Nonroad Sample Calculations

2302003100 **Commercial Flat Griddle Frying Commercial Cooking** Inventory Year: 2011

This non-point source emission inventory category covers the emissions from flat griddle frying commercial cooking appliances.

2011 county commercial cooking emission estimates that were estimated by the EPA obtained directly from the EPA 2011 National Emission Inventory and entered directly into the Virginia state inventory.

County	Fairfax County	EPA_SECTOR:	Commercial Cooking		
FIPs Code	51059	SCC_L1:	Industrial Processes	Tier 1 Description:	Other Industrial Processes
Pollutant:	VOC	SCC_L2:	Food and Kindred Products: SIC 20	Tier 2 Description:	Agriculture, Food, & Kindred Products
Scenario:	1	SCC_L3:	Commercial Cooking - Frying	Tier 3 Description:	Commercial Cooking
		SCC_L4:	Flat Griddle Frying		

EMISSION CALCULATION:

$$\text{ANNUAL EMISSIONS} = \frac{\text{(Fips Activity Level)(EF)(Reactivity)(1-(CE * RP * RE))}}{}$$

$$\text{ANNUAL EMISSIONS} = \frac{\text{(CoPop)(EF)(Reactivity)(1-(CE * RP * RE))}}{}$$

$$\text{ANNUAL EMISSIONS} = \frac{\text{(1063957People)(5.943282E-03lb/person)(1)(1-(0 * 0 * 0))}}{}$$

ANNUAL EMISSIONS = 6323.39604 lb/year VOC

ANNUAL EMISSIONS = 3.1617 tons/year VOC

DAILY EMISSIONS = ANNUAL EMISSIONS (tons/yr) * Seasonal Adjustment Factor/Peak Ozone Season / Days per Period

DAILY EMISSIONS = 3.1617 * 0.333333333 / 0.25 / 365

DAILY EMISSIONS = 0.0115496 tons/day VOC

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Virginia Department of Environmental Quality 2011 Area and Nonroad Sample Calculations

2302003200 **Commercial clamshell Griddle Frying Commercial Cooking** Inventory Year: 2011

This non-point source emission inventory category covers the emissions from clamshell griddle frying commercial cooking appliances.

2011 county commercial cooking emission estimates that were estimated by the EPA obtained directly from the EPA 2011 National Emission Inventory and entered directly into the Virginia state inventory.

County	Fairfax County	EPA_SECTOR:	Commercial Cooking		
FIPs Code	51059	SCC_L1:	Industrial Processes	Tier 1 Description:	Other Industrial Processes
Pollutant:	VOC	SCC_L2:	Food and Kindred Products: SIC 20	Tier 2 Description:	Agriculture, Food, & Kindred Products
Scenario:	1	SCC_L3:	Commercial Cooking - Frying	Tier 3 Description:	Commercial Cooking
		SCC_L4:	Clamshell Griddle Frying		

EMISSION CALCULATION:

$$\text{ANNUAL EMISSIONS} = \frac{\text{(Fips Activity Level)(EF)(Reactivity)(1-(CE * RP * RE))}}{}$$

$$\text{ANNUAL EMISSIONS} = \frac{\text{(CoPop)(EF)(Reactivity)(1-(CE * RP * RE))}}{}$$

$$\text{ANNUAL EMISSIONS} = \frac{\text{(1063957People)(2.31564E-04lb/person)(1)(1-(0 * 0 * 0))}}{}$$

ANNUAL EMISSIONS = 246.37411 lb/year VOC

ANNUAL EMISSIONS = 0.12319 tons/year VOC

DAILY EMISSIONS = ANNUAL EMISSIONS (tons/yr) * Seasonal Adjustment Factor/Peak Ozone Season / Days per Period

DAILY EMISSIONS = 0.12319 * 0.333333333 / 0.25 / 365

DAILY EMISSIONS = 0.00045 tons/day VOC

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Virginia Department of Environmental Quality 2011 Area and Nonroad Sample Calculations

2302050000 **Bakery** Inventory Year: 2011

This non-point category covers bakery non-point emissions

2011 county commercial cooking emission estimates that were estimated by the EPA obtained directly from the EPA 2011 National Emission Inventory and entered directly into the Virginia state inventory.

County	Fairfax County	EPA_SECTOR:	Industrial Processes - NEC		
FIPs Code	51059	SCC_L1:	Industrial Processes	Tier 1 Description:	Other Industrial Processes
Pollutant:	VOC	SCC_L2:	Food and Kindred Products: SIC 20	Tier 2 Description:	Agriculture, Food, & Kindred Products
Scenario:	1	SCC_L3:	Bakery Products	Tier 3 Description:	Feed Mills
		SCC_L4:	Total		

EMISSION CALCULATION:

$$\text{ANNUAL EMISSIONS} = \frac{\text{(Fips Activity Level)(EF)(Reactivity)(1-(CE * RP * RE))}}{}$$

$$\text{ANNUAL EMISSIONS} = \frac{\text{(CoPop)(EF)(Reactivity)(1-(CE * RP * RE))}}{}$$

$$\text{ANNUAL EMISSIONS} = \frac{\text{(1063957People)(0.31lb/person)(1)(1-(0 * 0 * 0))}}{}$$

ANNUAL EMISSIONS = 329826.67254 lb/year VOC

ANNUAL EMISSIONS = 164.91334 tons/year VOC

DAILY EMISSIONS = ANNUAL EMISSIONS (tons/yr) * Seasonal Adjustment Factor/Peak Ozone Season / Days per Period

DAILY EMISSIONS = 164.91334 * 0.25 / 0.25 / 260

DAILY EMISSIONS = 0.6342821 tons/day VOC

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Virginia Department of Environmental Quality 2011 Area and Nonroad Sample Calculations

2302070005 **Winery** Inventory Year: 2011

This non-point category covers the emissions associated with winery fermentation and bottling activities

2011 county commercial cooking emission estimates that were estimated by the EPA obtained directly from the EPA 2011 National Emission Inventory and entered directly into the Virginia state inventory.

County	Loudoun County	EPA_SECTOR:	Industrial Processes - NEC		
FIPs Code	51107	SCC_L1:	Industrial Processes	Tier 1 Description:	Other Industrial Processes
Pollutant:	VOC	SCC_L2:	Food and Kindred Products: SIC 20	Tier 2 Description:	Agriculture, Food, & Kindred Products
Scenario:	1	SCC_L3:	Fermentation/Beverages	Tier 3 Description:	Other
		SCC_L4:	Wineries		

EMISSION CALCULATION:

$$\text{ANNUAL EMISSIONS} = \frac{\text{(State Activity Level)(Fips Activity Level)(EF)(Reactivity)(1-(CE * RP * RE))}}{\text{(Fips Activity Level\_Total)}}$$

$$\text{ANNUAL EMISSIONS} = \frac{\text{(WineProduced)(WineryCount)(EF)(Reactivity)(1-(CE * RP * RE))}}{\text{(WineryCount)}}$$

$$\text{ANNUAL EMISSIONS} = \frac{\text{(1016469gallons)(34Facilities)(0.00374lb/gal)(1)(1-(0 * 0 * 0))}}{\text{(249facilities)}}$$

ANNUAL EMISSIONS = 519.09317 lb/year VOC

ANNUAL EMISSIONS = 0.25955 tons/year VOC

DAILY EMISSIONS = ANNUAL EMISSIONS (tons/yr) * Seasonal Adjustment Factor/Peak Ozone Season / Days per Period

DAILY EMISSIONS = 0.25955 * 0.25 / 0.25 / 260

DAILY EMISSIONS = 0.0009983 tons/day VOC

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Virginia Department of Environmental Quality 2011 Area and Nonroad Sample Calculations

2302070010 **Distillery** Inventory Year: 2011

This non-point category covers the emissions associated with distillery operations

2011 county commercial cooking emission estimates that were estimated by the EPA obtained directly from the EPA 2011 National Emission Inventory and entered directly into the Virginia state inventory.

County	Loudoun County	EPA_SECTOR:	Industrial Processes - NEC		
FIPs Code	51107	SCC_L1:	Industrial Processes	Tier 1 Description:	Other Industrial Processes
Pollutant:	VOC	SCC_L2:	Food and Kindred Products: SIC 20	Tier 2 Description:	Agriculture, Food, & Kindred Products
Scenario:	99	SCC_L3:	Fermentation/Beverages	Tier 3 Description:	Other
		SCC_L4:	Distilleries		

EMISSION CALCULATION:

$$\text{ANNUAL EMISSIONS} = \frac{\text{(Fips Activity Level)(EF)(Reactivity)(1-(CE * RP * RE))}}{}$$

$$\text{ANNUAL EMISSIONS} = \frac{\text{(ActualEmissions)(EF)(Reactivity)(1-(CE * RP * RE))}}{}$$

$$\text{ANNUAL EMISSIONS} = \frac{\text{(1year)(112.9986lb/yr)(1)(1-(0 * 0 * 0))}}{}$$

ANNUAL EMISSIONS = 112.9986 lb/year VOC

ANNUAL EMISSIONS = 0.0565 tons/year VOC

DAILY EMISSIONS = ANNUAL EMISSIONS (tons/yr) * Seasonal Adjustment Factor/Peak Ozone Season / Days per Period

DAILY EMISSIONS = 0.0565 * 0.25 / 0.25 / 365

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DAILY EMISSIONS = 0.0001548 tons/day VOC

Virginia Department of Environmental Quality 2011 Area and Nonroad Sample Calculations

2401001000 **Non-Industrial Architectural Surface Coatings** Inventory Year: 2011

This non-point source emission inventory category covers the emissions resulting from the application of non-industrial architectural surface coatings.

VDEQ developed 2011 county level architectural surface coating emission estimates using a per capita based emission factor.

County	Fairfax County	EPA_SECTOR:	Solvent - Non-Industrial Surface Coating		
FIPs Code	51059	SCC_L1:	Solvent Utilization	Tier 1 Description:	Solvent Utilization
Pollutant:	VOC	SCC_L2:	Surface Coating	Tier 2 Description:	Surface Coating
Scenario:	1	SCC_L3:	Architectural Coatings	Tier 3 Description:	Architectural
		SCC_L4:	Total: All Solvent Types		

EMISSION CALCULATION:

$$\text{ANNUAL EMISSIONS} = \frac{\text{(Fips Activity Level)(EF)(Reactivity)(1-(CE * RP * RE))}}{}$$

$$\text{ANNUAL EMISSIONS} = \frac{\text{(CoPop)(EF)(Reactivity)(1-(CE * RP * RE))}}{}$$

$$\text{ANNUAL EMISSIONS} = \frac{\text{(1063957People)(1.88lb/gal)(1)(1-(0 * 0 * 0))}}{}$$

ANNUAL EMISSIONS = 2000239.15493 lb/year VOC

ANNUAL EMISSIONS = 1000.11958 tons/year VOC

DAILY EMISSIONS = ANNUAL EMISSIONS (tons/yr) * Seasonal Adjustment Factor/Peak Ozone Season / Days per Period

DAILY EMISSIONS = 1000.11958 * 0.33 / 0.25 / 365

DAILY EMISSIONS = 3.6168708 tons/day VOC

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Virginia Department of Environmental Quality 2011 Area and Nonroad Sample Calculations

2401005000 **Surface Coating - Auto Refinishing** Inventory Year: 2011

This non-point source emission inventory category covers the emissions resulting from the application of automotive refinishing surface coating products.

VDEQ developed 2011 county level auto refinishing surface coating emission estimates using employment data from the Virginia Employment Commission and an employee based emission factor.

County	Fairfax County	EPA_SECTOR:	Solvent - Industrial Surface Coating & Solvent Use		
FIPs Code	51059	SCC_L1:	Solvent Utilization	Tier 1 Description:	Solvent Utilization
Pollutant:	VOC	SCC_L2:	Surface Coating	Tier 2 Description:	Surface Coating
Scenario:	1	SCC_L3:	Auto Refinishing: SIC 7532	Tier 3 Description:	Auto Refinishing
		SCC_L4:	Total: All Solvent Types		

EMISSION CALCULATION:

$$\text{ANNUAL EMISSIONS} = \frac{\text{(Fips Activity Level)(EF)(Reactivity)(1-(CE * RP * RE))}}{}$$

$$\text{ANNUAL EMISSIONS} = \frac{\text{(NAICS Employment - Auto Ref)(EF)(Reactivity)(1-(CE * RP * RE))}}{}$$

$$\text{ANNUAL EMISSIONS} = \frac{\text{(4891Employees)(94.69lb/emp)(1)(1-(0.36 * 1 * 1))}}{}$$

ANNUAL EMISSIONS = 296402.43324 lb/year VOC

ANNUAL EMISSIONS = 148.20122 tons/year VOC

DAILY EMISSIONS = ANNUAL EMISSIONS (tons/yr) * Seasonal Adjustment Factor/Peak Ozone Season / Days per Period

DAILY EMISSIONS = 148.20122 * 0.25 / 0.25 / 260

DAILY EMISSIONS = 0.5700047 tons/day VOC

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Virginia Department of Environmental Quality 2011 Area and Nonroad Sample Calculations

2401008000 **Traffic Markings** Inventory Year: 2011

This non-point source emission inventory category covers the emissions resulting from the application of lane markings to paved road surfaces.

VDEQ developed 2011 county level traffic markings surface coating emission estimates using an activity level of paved road miles and an emission factor that estimates emissions based on miles of roads lane markings applied.

County	Fairfax County	EPA_SECTOR:	Solvent - Industrial Surface Coating & Solvent Use		
FIPs Code	51059	SCC_L1:	Solvent Utilization	Tier 1 Description:	Solvent Utilization
Pollutant:	VOC	SCC_L2:	Surface Coating	Tier 2 Description:	Surface Coating
Scenario:	1	SCC_L3:	Traffic Markings	Tier 3 Description:	Traffic Markings
		SCC_L4:	Total: All Solvent Types		

EMISSION CALCULATION:

$$\text{ANNUAL EMISSIONS} = \frac{\text{(Fips Activity Level)(EF)(Reactivity)(1-(CE * RP * RE))}}{}$$

$$\text{ANNUAL EMISSIONS} = \frac{\text{(Road Miles)(EF)(Reactivity)(1-(CE * RP * RE))}}{}$$

$$\text{ANNUAL EMISSIONS} = \frac{\text{(3157.93305858833road miles)(21.576lb/road miles)(1)(1-(0 * 0 * 0))}}{}$$

ANNUAL EMISSIONS = 68135.56435 lb/year VOC

ANNUAL EMISSIONS = 34.06778 tons/year VOC

DAILY EMISSIONS = ANNUAL EMISSIONS (tons/yr) * Seasonal Adjustment Factor/Peak Ozone Season / Days per Period

DAILY EMISSIONS = 34.06778 * 0.25 / 0.25 / 260

DAILY EMISSIONS = 0.1310299 tons/day VOC

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Virginia Department of Environmental Quality 2011 Area and Nonroad Sample Calculations

2401015000 **Surface Coating - Factory Finished Wood** Inventory Year: 2011

This non-point source emission inventory category covers the emissions resulting from the application of surface coating products to factory finished wood.

VDEQ developed 2011 county level factory finished wood surface coating emission estimates using employment data from the Virginia Employment Commission and an employee based emission factor.

County	Loudoun County	EPA_SECTOR:	Solvent - Industrial Surface Coating & Solvent Use		
FIPs Code	51107	SCC_L1:	Solvent Utilization	Tier 1 Description:	Solvent Utilization
Pollutant:	VOC	SCC_L2:	Surface Coating	Tier 2 Description:	Surface Coating
Scenario:	1	SCC_L3:	Factory Finished Wood: SIC 2426 thru 242	Tier 3 Description:	Flatwood Products
		SCC_L4:	Total: All Solvent Types		

EMISSION CALCULATION:

$$\text{ANNUAL EMISSIONS} = \frac{\text{(Fips Activity Level)(EF)(Reactivity)(1-(CE * RP * RE))}}{}$$

$$\text{ANNUAL EMISSIONS} = \frac{\text{(NAICS Employment - Factory Finished Wood)(EF)(Reactivity)(1-(CE * RP * RE))}}{}$$

$$\text{ANNUAL EMISSIONS} = \frac{\text{(98Employees)(48.07lb/emp)(1)(1-(0 * 0 * 0))}}{}$$

ANNUAL EMISSIONS = 4710.85997 lb/year VOC

ANNUAL EMISSIONS = 2.35543 tons/year VOC

DAILY EMISSIONS = ANNUAL EMISSIONS (tons/yr) * Seasonal Adjustment Factor/Peak Ozone Season / Days per Period

DAILY EMISSIONS = 2.35543 * 0.25 / 0.25 / 260

DAILY EMISSIONS = 0.0090593 tons/day VOC

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Virginia Department of Environmental Quality 2011 Area and Nonroad Sample Calculations

2401020000 **Surface Coating - Wood Furniture** Inventory Year: 2011

This non-point source emission inventory category covers the emissions resulting from the application of surface coatings to wood furniture.

VDEQ developed 2011 county level wood furniture surface coating emission estimates using employment data from the Virginia Employment Commission and an employee based emission factor.

County	Fairfax County	EPA_SECTOR:	Solvent - Industrial Surface Coating & Solvent Use		
FIPs Code	51059	SCC_L1:	Solvent Utilization	Tier 1 Description:	Solvent Utilization
Pollutant:	VOC	SCC_L2:	Surface Coating	Tier 2 Description:	Surface Coating
Scenario:	1	SCC_L3:	Wood Furniture: SIC 25	Tier 3 Description:	Wood Furniture
		SCC_L4:	Total: All Solvent Types		

EMISSION CALCULATION:

$$\text{ANNUAL EMISSIONS} = \frac{\text{(Fips Activity Level)(EF)(Reactivity)(1-(CE * RP * RE))}}{}$$

$$\text{ANNUAL EMISSIONS} = \frac{\text{(NAICS Employment - Wood Furn)(EF)(Reactivity)(1-(CE * RP * RE))}}{}$$

$$\text{ANNUAL EMISSIONS} = \frac{\text{(394Employees)(524.1249lb/emp)(1)(1-(0 * 0 * 0))}}{}$$

ANNUAL EMISSIONS = 206505.2019 lb/year VOC

ANNUAL EMISSIONS = 103.2526 tons/year VOC

DAILY EMISSIONS = ANNUAL EMISSIONS (tons/yr) * Seasonal Adjustment Factor/Peak Ozone Season / Days per Period

DAILY EMISSIONS = 103.2526 * 0.25 / 0.25 / 260

DAILY EMISSIONS = 0.3971254 tons/day VOC

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Virginia Department of Environmental Quality 2011 Area and Nonroad Sample Calculations

2401025000 **Surface Coating - Metal Furniture** Inventory Year: 2011

This non-point source emission inventory category covers the emissions resulting from the application of surface coatings to metal furniture.

VDEQ developed 2011 county level metal furniture surface coating emission estimates using employment data from the Virginia Employment Commission and an employee based emission factor.

County	Fairfax County	EPA_SECTOR:	Solvent - Industrial Surface Coating & Solvent Use		
FIPs Code	51059	SCC_L1:	Solvent Utilization	Tier 1 Description:	Solvent Utilization
Pollutant:	VOC	SCC_L2:	Surface Coating	Tier 2 Description:	Surface Coating
Scenario:	1	SCC_L3:	Metal Furniture: SIC 25	Tier 3 Description:	Metal Furniture
		SCC_L4:	Total: All Solvent Types		

EMISSION CALCULATION:

$$\text{ANNUAL EMISSIONS} = \frac{\text{(Fips Activity Level)(EF)(Reactivity)(1-(CE * RP * RE))}}{}$$

$$\text{ANNUAL EMISSIONS} = \frac{\text{(NAICS Employment - Metal Furn)(EF)(Reactivity)(1-(CE * RP * RE))}}{}$$

$$\text{ANNUAL EMISSIONS} = \frac{\text{(158Employees)(887.8026lb/emp)(1)(1-(0 * 0 * 0))}}{}$$

ANNUAL EMISSIONS = 140272.8031 lb/year VOC

ANNUAL EMISSIONS = 70.1364 tons/year VOC

DAILY EMISSIONS = ANNUAL EMISSIONS (tons/yr) * Seasonal Adjustment Factor/Peak Ozone Season / Days per Period

DAILY EMISSIONS = 70.1364 * 0.25 / 0.25 / 260

DAILY EMISSIONS = 0.2697554 tons/day VOC

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Virginia Department of Environmental Quality 2011 Area and Nonroad Sample Calculations

2401030000 **Surface Coating - Paper, Foil, and Film** Inventory Year: 2011

This non-point source emission inventory category covers the emissions resulting from the application of surface coating products to paper, foil and film.

VDEQ developed 2011 county level paper, foil, and film coating emission estimates using employment data from the Virginia Employment Commission and an employee based emission factor.

County	Fairfax County	EPA_SECTOR:	Solvent - Industrial Surface Coating & Solvent Use		
FIPs Code	51059	SCC_L1:	Solvent Utilization	Tier 1 Description:	Solvent Utilization
Pollutant:	VOC	SCC_L2:	Surface Coating	Tier 2 Description:	Surface Coating
Scenario:	1	SCC_L3:	Paper: SIC 26	Tier 3 Description:	Paper
		SCC_L4:	Total: All Solvent Types		

EMISSION CALCULATION:

$$\text{ANNUAL EMISSIONS} = \frac{\text{(Fips Activity Level)(EF)(Reactivity)(1-(CE * RP * RE))}}{}$$

$$\text{ANNUAL EMISSIONS} = \frac{\text{(NAICS Employment - Paper, foil, and film)(EF)(Reactivity)(1-(CE * RP * RE))}}{}$$

$$\text{ANNUAL EMISSIONS} = \frac{\text{(14Employees)(609.3888lb/emp)(1)(1-(0 * 0 * 0))}}{}$$

ANNUAL EMISSIONS = 8531.44312 lb/year VOC

ANNUAL EMISSIONS = 4.26572 tons/year VOC

DAILY EMISSIONS = ANNUAL EMISSIONS (tons/yr) * Seasonal Adjustment Factor/Peak Ozone Season / Days per Period

DAILY EMISSIONS = 4.26572 * 0.25 / 0.25 / 260

DAILY EMISSIONS = 0.0164066 tons/day VOC

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Virginia Department of Environmental Quality 2011 Area and Nonroad Sample Calculations

2401040000 **Surface Coating - Metal Cans** Inventory Year: 2011

This non-point source emission inventory category covers the emissions resulting from the application of surface coating to metal cans.

VDEQ developed 2011 county metal cans surface coating emission estimates using employment data from the Virginia Employment Commission and an employee based emission factor.

County	Fairfax city	EPA_SECTOR:	Solvent - Industrial Surface Coating & Solvent Use		
FIPs Code	51600	SCC_L1:	Solvent Utilization	Tier 1 Description:	Solvent Utilization
Pollutant:	VOC	SCC_L2:	Surface Coating	Tier 2 Description:	Surface Coating
Scenario:	1	SCC_L3:	Metal Cans: SIC 341	Tier 3 Description:	Metal Cans
		SCC_L4:	Total: All Solvent Types		

EMISSION CALCULATION:

$$\text{ANNUAL EMISSIONS} = \frac{\text{(Fips Activity Level)(EF)(Reactivity)(1-(CE * RP * RE))}}{}$$

$$\text{ANNUAL EMISSIONS} = \frac{\text{(NAICS Employment - Metal Can Coating)(EF)(Reactivity)(1-(CE * RP * RE))}}{}$$

$$\text{ANNUAL EMISSIONS} = \frac{\text{(7Employees)(3035lb/emp)(1)(1-(0 * 0 * 0))}}{}$$

ANNUAL EMISSIONS = 21245 lb/year VOC

ANNUAL EMISSIONS = 10.6225 tons/year VOC

DAILY EMISSIONS = ANNUAL EMISSIONS (tons/yr) * Seasonal Adjustment Factor/Peak Ozone Season / Days per Period

DAILY EMISSIONS = 10.6225 * 0.25 / 0.25 / 260

DAILY EMISSIONS = 0.0408558 tons/day VOC

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Virginia Department of Environmental Quality 2011 Area and Nonroad Sample Calculations

2401055000 **Surface Coating - machinery and equipment** Inventory Year: 2011

This non-point source emission inventory category covers the emissions resulting from the application of surface coatings to machinery and equipment.

VDEQ developed 2011 county level machinery and equipment surface coating emission estimates using employment data from the Virginia Employment Commission and an employee based emission factor.

County	Fairfax County	EPA_SECTOR:	Solvent - Industrial Surface Coating & Solvent Use		
FIPs Code	51059	SCC_L1:	Solvent Utilization	Tier 1 Description:	Solvent Utilization
Pollutant:	VOC	SCC_L2:	Surface Coating	Tier 2 Description:	Surface Coating
Scenario:	1	SCC_L3:	Machinery and Equipment: SIC 35	Tier 3 Description:	Machinery
		SCC_L4:	Total: All Solvent Types		

EMISSION CALCULATION:

$$\text{ANNUAL EMISSIONS} = \frac{\text{(Fips Activity Level)(EF)(Reactivity)(1-(CE * RP * RE))}}{}$$

$$\text{ANNUAL EMISSIONS} = \frac{\text{(NAICS Employment - Machinery and Equipment)(EF)(Reactivity)(1-(CE * RP * RE))}}{}$$

$$\text{ANNUAL EMISSIONS} = \frac{\text{(1496Employees)(51.64lb/emp)(1)(1-(0 * 0 * 0))}}{}$$

ANNUAL EMISSIONS = 77253.43909 lb/year VOC

ANNUAL EMISSIONS = 38.62672 tons/year VOC

DAILY EMISSIONS = ANNUAL EMISSIONS (tons/yr) * Seasonal Adjustment Factor/Peak Ozone Season / Days per Period

DAILY EMISSIONS = 38.62672 * 0.25 / 0.25 / 260

DAILY EMISSIONS = 0.1485643 tons/day VOC

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Virginia Department of Environmental Quality 2011 Area and Nonroad Sample Calculations

2401065000 **Surface Coatings - Electrical and Electronic** Inventory Year: 2011

This non-point source emission inventory category covers the emissions resulting from the application of surface coatings to electrical and electronic products.

VDEQ developed 2011 county level electrical and electronic surface coating emission estimates using employment data from the Virginia Employment Commission and an employee based emission factor.

County	Loudoun County	EPA_SECTOR:	Solvent - Industrial Surface Coating & Solvent Use		
FIPs Code	51107	SCC_L1:	Solvent Utilization	Tier 1 Description:	Solvent Utilization
Pollutant:	VOC	SCC_L2:	Surface Coating	Tier 2 Description:	Surface Coating
Scenario:	1	SCC_L3:	Electronic and Other Electrical: SIC 36 - 363	Tier 3 Description:	Electronic & Other Electrical
		SCC_L4:	Total: All Solvent Types		

EMISSION CALCULATION:

$$\text{ANNUAL EMISSIONS} = \frac{\text{(Fips Activity Level)(EF)(Reactivity)(1-(CE * RP * RE))}}{}$$

$$\text{ANNUAL EMISSIONS} = \frac{\text{(NAICS Employment - Electronic and other Electric Coatings)(EF)(Reactivity)(1-(CE * RP * RE))}}{}$$

$$\text{ANNUAL EMISSIONS} = \frac{\text{(2Employees)(24.7lb/emp)(1)(1-(0 * 0 * 0))}}{}$$

ANNUAL EMISSIONS = 49.4 lb/year VOC

ANNUAL EMISSIONS = 0.0247 tons/year VOC

DAILY EMISSIONS = ANNUAL EMISSIONS (tons/yr) * Seasonal Adjustment Factor/Peak Ozone Season / Days per Period

DAILY EMISSIONS = 0.0247 * 0.25 / 0.25 / 260

DAILY EMISSIONS = 0.000095 tons/day VOC

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Virginia Department of Environmental Quality 2011 Area and Nonroad Sample Calculations

2401065000 **Surface Coatings - Electrical and Electronic** Inventory Year: 2011

This non-point source emission inventory category covers the emissions resulting from the application of surface coatings to electrical and electronic products.

VDEQ developed 2011 county level electrical and electronic surface coating emission estimates using employment data from the Virginia Employment Commission and an employee based emission factor.

County	Fairfax County	EPA_SECTOR:	Solvent - Industrial Surface Coating & Solvent Use		
FIPs Code	51059	SCC_L1:	Solvent Utilization	Tier 1 Description:	Solvent Utilization
Pollutant:	VOC	SCC_L2:	Surface Coating	Tier 2 Description:	Surface Coating
Scenario:	1	SCC_L3:	Electronic and Other Electrical: SIC 36 - 363	Tier 3 Description:	Electronic & Other Electrical
		SCC_L4:	Total: All Solvent Types		

EMISSION CALCULATION:

$$\text{ANNUAL EMISSIONS} = \frac{\text{(Fips Activity Level)(EF)(Reactivity)(1-(CE * RP * RE))}}{}$$

$$\text{ANNUAL EMISSIONS} = \frac{\text{(NAICS Employment - Electronic and other Electric Coatings)(EF)(Reactivity)(1-(CE * RP * RE))}}{}$$

$$\text{ANNUAL EMISSIONS} = \frac{\text{(2Employees)(24.7lb/emp)(1)(1-(0 * 0 * 0))}}{}$$

ANNUAL EMISSIONS = 49.4 lb/year VOC

ANNUAL EMISSIONS = 0.0247 tons/year VOC

DAILY EMISSIONS = ANNUAL EMISSIONS (tons/yr) * Seasonal Adjustment Factor/Peak Ozone Season / Days per Period

DAILY EMISSIONS = 0.0247 * 0.25 / 0.25 / 260

DAILY EMISSIONS = 0.000095 tons/day VOC

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Virginia Department of Environmental Quality 2011 Area and Nonroad Sample Calculations

2401070000 **Surface Coatings - Motor Vehicles** Inventory Year: 2011

This non-point source emission inventory category covers the emissions resulting from the application of surface coatings to motor vehicles.

VDEQ developed 2011 county level motor vehicle surface coating emission estimates using employment data from the Virginia Employment Commission and an employee based emission factor.

County	Fairfax County	EPA_SECTOR:	Solvent - Industrial Surface Coating & Solvent Use		
FIPs Code	51059	SCC_L1:	Solvent Utilization	Tier 1 Description:	Solvent Utilization
Pollutant:	VOC	SCC_L2:	Surface Coating	Tier 2 Description:	Surface Coating
Scenario:	1	SCC_L3:	Motor Vehicles: SIC 371	Tier 3 Description:	Autos & Light Trucks
		SCC_L4:	Total: All Solvent Types		

EMISSION CALCULATION:

$$\text{ANNUAL EMISSIONS} = \frac{\text{(Fips Activity Level)(EF)(Reactivity)(1-(CE * RP * RE))}}{}$$

$$\text{ANNUAL EMISSIONS} = \frac{\text{(NAICS Employment - Motor Vehicles)(EF)(Reactivity)(1-(CE * RP * RE))}}{}$$

$$\text{ANNUAL EMISSIONS} = \frac{\text{(49Employees)(194.497lb/emp)(1)(1-(0 * 0 * 0))}}{}$$

ANNUAL EMISSIONS = 9530.35121 lb/year VOC

ANNUAL EMISSIONS = 4.76518 tons/year VOC

DAILY EMISSIONS = ANNUAL EMISSIONS (tons/yr) * Seasonal Adjustment Factor/Peak Ozone Season / Days per Period

DAILY EMISSIONS = 4.76518 * 0.25 / 0.25 / 260

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DAILY EMISSIONS = 0.0183276 tons/day VOC

Virginia Department of Environmental Quality 2011 Area and Nonroad Sample Calculations

2401075000 **Surface Coatings - Aircraft** Inventory Year: 2011

This non-point source emission inventory category covers the emissions resulting from the application of surface coatings to aircraft.

VDEQ developed 2011 county level aircraft surface coating emission estimates using employment data from the Virginia Employment Commission and an employee based emission factor.

County	Manassas city	EPA_SECTOR:	Solvent - Industrial Surface Coating & Solvent Use		
FIPs Code	51683	SCC_L1:	Solvent Utilization	Tier 1 Description:	Solvent Utilization
Pollutant:	VOC	SCC_L2:	Surface Coating	Tier 2 Description:	Surface Coating
Scenario:	1	SCC_L3:	Aircraft: SIC 372	Tier 3 Description:	Aircraft
		SCC_L4:	Total: All Solvent Types		

EMISSION CALCULATION:

$$\text{ANNUAL EMISSIONS} = \frac{\text{(Fips Activity Level)(EF)(Reactivity)(1-(CE * RP * RE))}}{}$$

$$\text{ANNUAL EMISSIONS} = \frac{\text{(NAICS Employment - Aircraft)(EF)(Reactivity)(1-(CE * RP * RE))}}{}$$

$$\text{ANNUAL EMISSIONS} = \frac{\text{(151Employees)(12.98lb/emp)(1)(1-(0 * 0 * 0))}}{}$$

ANNUAL EMISSIONS = 1959.97993 lb/year VOC

ANNUAL EMISSIONS = 0.97999 tons/year VOC

DAILY EMISSIONS = ANNUAL EMISSIONS (tons/yr) * Seasonal Adjustment Factor/Peak Ozone Season / Days per Period

DAILY EMISSIONS = 0.97999 * 0.25 / 0.25 / 260

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DAILY EMISSIONS = 0.0037692 tons/day VOC

Virginia Department of Environmental Quality 2011 Area and Nonroad Sample Calculations

2401075000 **Surface Coatings - Aircraft** Inventory Year: 2011

This non-point source emission inventory category covers the emissions resulting from the application of surface coatings to aircraft.

VDEQ developed 2011 county level aircraft surface coating emission estimates using employment data from the Virginia Employment Commission and an employee based emission factor.

County	Fairfax County	EPA_SECTOR:	Solvent - Industrial Surface Coating & Solvent Use		
FIPs Code	51059	SCC_L1:	Solvent Utilization	Tier 1 Description:	Solvent Utilization
Pollutant:	VOC	SCC_L2:	Surface Coating	Tier 2 Description:	Surface Coating
Scenario:	1	SCC_L3:	Aircraft: SIC 372	Tier 3 Description:	Aircraft
		SCC_L4:	Total: All Solvent Types		

EMISSION CALCULATION:

$$\text{ANNUAL EMISSIONS} = \frac{\text{(Fips Activity Level)(EF)(Reactivity)(1-(CE * RP * RE))}}{}$$

$$\text{ANNUAL EMISSIONS} = \frac{\text{(NAICS Employment - Aircraft)(EF)(Reactivity)(1-(CE * RP * RE))}}{}$$

$$\text{ANNUAL EMISSIONS} = \frac{\text{(151Employees)(12.98lb/emp)(1)(1-(0 * 0 * 0))}}{}$$

ANNUAL EMISSIONS = 1959.97993 lb/year VOC

ANNUAL EMISSIONS = 0.97999 tons/year VOC

DAILY EMISSIONS = ANNUAL EMISSIONS (tons/yr) * Seasonal Adjustment Factor/Peak Ozone Season / Days per Period

DAILY EMISSIONS = 0.97999 * 0.25 / 0.25 / 260

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DAILY EMISSIONS = 0.0037692 tons/day VOC

Virginia Department of Environmental Quality 2011 Area and Nonroad Sample Calculations

2401090000 **Surface Coatings - Miscellaneous Manufacturing** Inventory Year: 2011

This non-point source emission inventory category covers the emissions resulting from the application of surface coatings to miscellaneous manufacturing products.

VDEQ developed 2011 county level miscellaneous manufacturing surface coating emission estimates using employment data from the Virginia Employment Commission and an employee based emission factor.

County	Fairfax County	EPA_SECTOR:	Solvent - Industrial Surface Coating & Solvent Use		
FIPs Code	51059	SCC_L1:	Solvent Utilization	Tier 1 Description:	Solvent Utilization
Pollutant:	VOC	SCC_L2:	Surface Coating	Tier 2 Description:	Surface Coating
Scenario:	1	SCC_L3:	Miscellaneous Manufacturing	Tier 3 Description:	Other
		SCC_L4:	Total: All Solvent Types		

EMISSION CALCULATION:

$$\text{ANNUAL EMISSIONS} = \frac{\text{(Fips Activity Level)(EF)(Reactivity)(1-(CE * RP * RE))}}{}$$

$$\text{ANNUAL EMISSIONS} = \frac{\text{(NAICS Employment - Miscelaneous Manufacturing)(EF)(Reactivity)(1-(CE * RP * RE))}}{}$$

$$\text{ANNUAL EMISSIONS} = \frac{\text{(424Employees)(92.42051lb/person)(1)(1-(0 * 0 * 0))}}{}$$

ANNUAL EMISSIONS = 39186.29596 lb/year VOC

ANNUAL EMISSIONS = 19.59315 tons/year VOC

DAILY EMISSIONS = ANNUAL EMISSIONS (tons/yr) * Seasonal Adjustment Factor/Peak Ozone Season / Days per Period

DAILY EMISSIONS = 19.59315 * 0.25 / 0.25 / 260

DAILY EMISSIONS = 0.0753583 tons/day VOC

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Virginia Department of Environmental Quality 2011 Area and Nonroad Sample Calculations

2401100000 **Surface Coatings - Miscellaneous Maintenance** Inventory Year: 2011

This non-point source emission inventory category covers the emissions resulting from the application of surface coatings to industrial maintenance products.

VDEQ developed 2011 county level industrial maintenance surface coating emission estimates using 2011 county level population data and a per capita based emission factor.

County	Fairfax County	EPA_SECTOR:	Solvent - Industrial Surface Coating & Solvent Use		
FIPs Code	51059	SCC_L1:	Solvent Utilization	Tier 1 Description:	Solvent Utilization
Pollutant:	VOC	SCC_L2:	Surface Coating	Tier 2 Description:	Surface Coating
Scenario:	1	SCC_L3:	Industrial Maintenance Coatings	Tier 3 Description:	Maintenance Coatings
		SCC_L4:	Total: All Solvent Types		

EMISSION CALCULATION:

$$\text{ANNUAL EMISSIONS} = \frac{\text{(Fips Activity Level)(EF)(Reactivity)(1-(CE * RP * RE))}}{}$$

$$\text{ANNUAL EMISSIONS} = \frac{\text{(CoPop)(EF)(Reactivity)(1-(CE * RP * RE))}}{}$$

$$\text{ANNUAL EMISSIONS} = \frac{\text{(1063957People)(0.15lb/person)(1)(1-(0 * 0 * 0))}}{}$$

ANNUAL EMISSIONS = 159593.55634 lb/year VOC

ANNUAL EMISSIONS = 79.79678 tons/year VOC

DAILY EMISSIONS = ANNUAL EMISSIONS (tons/yr) * Seasonal Adjustment Factor/Peak Ozone Season / Days per Period

DAILY EMISSIONS = 79.79678 * 0.33 / 0.25 / 260

DAILY EMISSIONS = 0.4051221 tons/day VOC

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Virginia Department of Environmental Quality 2011 Area and Nonroad Sample Calculations

2401200000 **Surface Coatings - Other Special Purpose** Inventory Year: 2011

This non-point source emission inventory category covers the emissions resulting from the application of other special product coatings.

VDEQ developed 2011 county level other special purpose coatings , OSP, surface coating emission estimates using 2011 county level population data and a per capita based emission factor.

County	Fairfax County	EPA_SECTOR:	Solvent - Industrial Surface Coating & Solvent Use		
FIPs Code	51059	SCC_L1:	Solvent Utilization	Tier 1 Description:	Solvent Utilization
Pollutant:	VOC	SCC_L2:	Surface Coating	Tier 2 Description:	Surface Coating
Scenario:	1	SCC_L3:	Other Special Purpose Coatings	Tier 3 Description:	Other
		SCC_L4:	Total: All Solvent Types		

EMISSION CALCULATION:

$$\text{ANNUAL EMISSIONS} = \frac{\text{(Fips Activity Level)(EF)(Reactivity)(1-(CE * RP * RE))}}{}$$

$$\text{ANNUAL EMISSIONS} = \frac{\text{(CoPop)(EF)(Reactivity)(1-(CE * RP * RE))}}{}$$

$$\text{ANNUAL EMISSIONS} = \frac{\text{(1063957People)(6.42852E-03lb/person)(1)(1-(0 * 0 * 0))}}{}$$

ANNUAL EMISSIONS = 6839.66906 lb/year VOC

ANNUAL EMISSIONS = 3.41983 tons/year VOC

DAILY EMISSIONS = ANNUAL EMISSIONS (tons/yr) * Seasonal Adjustment Factor/Peak Ozone Season / Days per Period

DAILY EMISSIONS = 3.41983 * 0.33 / 0.25 / 260

DAILY EMISSIONS = 0.0173622 tons/day VOC

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Virginia Department of Environmental Quality 2011 Area and Nonroad Sample Calculations

2415000000 **Degreasing** Inventory Year: 2011

This non-point source emission inventory category covers emissions emitted from solvent degreasing.

VDEQ developed 2011 county level degreasing emission estimates using employment data from the Virginia Employment Commission and an employee based emission factor.

County	Fairfax County	EPA_SECTOR:	Solvent - Degreasing		
FIPs Code	51059	SCC_L1:	Solvent Utilization	Tier 1 Description:	Solvent Utilization
Pollutant:	VOC	SCC_L2:	Degreasing	Tier 2 Description:	Degreasing
Scenario:	1	SCC_L3:	All Processes/All Industries	Tier 3 Description:	Other
		SCC_L4:	Total: All Solvent Types		

EMISSION CALCULATION:

$$\text{ANNUAL EMISSIONS} = \frac{\text{(Fips Activity Level)(EF)(Reactivity)(1-(CE * RP * RE))}}{}$$

$$\text{ANNUAL EMISSIONS} = \frac{\text{(NAICS Employment - Degreasing)(EF)(Reactivity)(1-(CE * RP * RE))}}{}$$

$$\text{ANNUAL EMISSIONS} = \frac{\text{(21044Employees)(36.96504lb/person)(1)(1-(0 * 0 * 0))}}{}$$

ANNUAL EMISSIONS = 777892.34625 lb/year VOC

ANNUAL EMISSIONS = 388.94617 tons/year VOC

DAILY EMISSIONS = ANNUAL EMISSIONS (tons/yr) * Seasonal Adjustment Factor/Peak Ozone Season / Days per Period

DAILY EMISSIONS = 388.94617 * 0.25 / 0.25 / 312

DAILY EMISSIONS = 1.2466223 tons/day VOC

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Virginia Department of Environmental Quality 2011 Area and Nonroad Sample Calculations

2420000000 **Dry Cleaning** Inventory Year: 2011

This non-point source emission inventory category covers emissions from dry cleaning.

VDEQ developed 2011 county level dry cleaning emission estimates using employment data from the Virginia Employment Commission and an employee based emission factor.

County	Fairfax County	EPA_SECTOR:	Solvent - Dry Cleaning		
FIPs Code	51059	SCC_L1:	Solvent Utilization	Tier 1 Description:	Solvent Utilization
Pollutant:	VOC	SCC_L2:	Dry Cleaning	Tier 2 Description:	Dry Cleaning
Scenario:	1	SCC_L3:	All Processes	Tier 3 Description:	Other
		SCC_L4:	Total: All Solvent Types		

EMISSION CALCULATION:

$$\text{ANNUAL EMISSIONS} = \frac{\text{(Fips Activity Level)(EF)(Reactivity)(1-(CE * RP * RE))}}{}$$

$$\text{ANNUAL EMISSIONS} = \frac{\text{(NAICS Employment - Dry Cleaning)(EF)(Reactivity)(1-(CE * RP * RE))}}{}$$

$$\text{ANNUAL EMISSIONS} = \frac{\text{(1067Employees)(10lb/emp)(1)(1-(0 * 0 * 0))}}{}$$

ANNUAL EMISSIONS = 10670 lb/year VOC

ANNUAL EMISSIONS = 5.335 tons/year VOC

DAILY EMISSIONS = ANNUAL EMISSIONS (tons/yr) * Seasonal Adjustment Factor/Peak Ozone Season / Days per Period

DAILY EMISSIONS = 5.335 * 0.25 / 0.25 / 312

DAILY EMISSIONS = 0.0170994 tons/day VOC

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Virginia Department of Environmental Quality 2011 Area and Nonroad Sample Calculations

2425000000 **Graphic Arts** Inventory Year: 2011

This non-point source emission inventory category covers emissions from graphic art printing.

VDEQ developed 2011 county level graphic arts emission estimates using employment data from the Virginia Employment Commission and an employee based emission factor.

County	Fairfax County	EPA_SECTOR:	Solvent - Graphic Arts		
FIPs Code	51059	SCC_L1:	Solvent Utilization	Tier 1 Description:	Solvent Utilization
Pollutant:	VOC	SCC_L2:	Graphic Arts	Tier 2 Description:	Graphic Arts
Scenario:	1	SCC_L3:	All Processes	Tier 3 Description:	Other
		SCC_L4:	Total: All Solvent Types		

EMISSION CALCULATION:

$$\text{ANNUAL EMISSIONS} = \frac{\text{(Fips Activity Level)(EF)(Reactivity)(1-(CE * RP * RE))}}{}$$

$$\text{ANNUAL EMISSIONS} = \frac{\text{(NAICS Employment - Graphic Arts)(EF)(Reactivity)(1-(CE * RP * RE))}}{}$$

$$\text{ANNUAL EMISSIONS} = \frac{\text{(1022Employees)(201lb/emp)(1)(1-(0 * 0 * 0))}}{}$$

ANNUAL EMISSIONS = 205422 lb/year VOC

ANNUAL EMISSIONS = 102.711 tons/year VOC

DAILY EMISSIONS = ANNUAL EMISSIONS (tons/yr) * Seasonal Adjustment Factor/Peak Ozone Season / Days per Period

DAILY EMISSIONS = 102.711 * 0.25 / 0.25 / 260

DAILY EMISSIONS = 0.3950423 tons/day VOC

rev:062714a

Virginia Department of Environmental Quality 2011 Area and Nonroad Sample Calculations

2440020000 **Industrial Adhesives** Inventory Year: 2011

This non-point source emission inventory category covers emissions from the use of industrial adhesives.

2011 county miscellaneous industrial adhesives emission estimates that were estimated by the EPA were obtained from the EPA 2011 National Emission Inventory and entered directly into the Virginia state inventory.

County	Fairfax County	EPA_SECTOR:	Solvent - Industrial Surface Coating & Solvent Use		
FIPs Code	51059	SCC_L1:	Solvent Utilization	Tier 1 Description:	Solvent Utilization
Pollutant:	VOC	SCC_L2:	Miscellaneous Industrial	Tier 2 Description:	Surface Coating
Scenario:	1	SCC_L3:	Adhesive (Industrial) Application	Tier 3 Description:	Industrial Adhesives
		SCC_L4:	Total: All Solvent Types		

EMISSION CALCULATION:

$$\text{ANNUAL EMISSIONS} = \frac{\text{(Fips Activity Level)(EF)(Reactivity)(1-(CE * RP * RE))}}{}$$

$$\text{ANNUAL EMISSIONS} = \frac{\text{(ActualEmissions)(EF)(Reactivity)(1-(CE * RP * RE))}}{}$$

$$\text{ANNUAL EMISSIONS} = \frac{\text{(1year)(408194lb/yr)(1)(1-(0 * 0 * 0))}}{}$$

ANNUAL EMISSIONS = 408194 lb/year VOC

ANNUAL EMISSIONS = 204.097 tons/year VOC

DAILY EMISSIONS = ANNUAL EMISSIONS (tons/yr) * Seasonal Adjustment Factor/Peak Ozone Season / Days per Period

DAILY EMISSIONS = 204.097 * 0.28 / 0.25 / 365

DAILY EMISSIONS = 0.6262702 tons/day VOC

rev:062714a

Virginia Department of Environmental Quality 2011 Area and Nonroad Sample Calculations

2460100000 **Personal Care Products** Inventory Year: 2011

This non-point source emission inventory category covers emissions from personal care products.

VDEQ developed 2011 county level personal care products emission estimates using 2011 county level population data and a per capita based emission factor.

County	Fairfax County	EPA_SECTOR:	Solvent - Consumer & Commercial Solvent Use		
FIPs Code	51059	SCC_L1:	Solvent Utilization	Tier 1 Description:	Solvent Utilization
Pollutant:	VOC	SCC_L2:	Miscellaneous Non-industrial: Consumer and Commercial	Tier 2 Description:	Nonindustrial
Scenario:	1	SCC_L3:	All Personal Care Products	Tier 3 Description:	Consumer Solvents
		SCC_L4:	Total: All Solvent Types		

EMISSION CALCULATION:

$$\text{ANNUAL EMISSIONS} = \frac{\text{(Fips Activity Level)(EF)(Reactivity)(1-(CE * RP * RE))}}{}$$

$$\text{ANNUAL EMISSIONS} = \frac{\text{(CoPop)(EF)(Reactivity)(1-(CE * RP * RE))}}{}$$

$$\text{ANNUAL EMISSIONS} = \frac{\text{(1063957People)(1.9lb/person)(1)(1-(0 * 0 * 0))}}{}$$

ANNUAL EMISSIONS = 2021518.27463 lb/year VOC

ANNUAL EMISSIONS = 1010.75914 tons/year VOC

DAILY EMISSIONS = ANNUAL EMISSIONS (tons/yr) * Seasonal Adjustment Factor/Peak Ozone Season / Days per Period

DAILY EMISSIONS = 1010.75914 * 0.25 / 0.25 / 365

DAILY EMISSIONS = 2.7692031 tons/day VOC

rev:062714a

Virginia Department of Environmental Quality 2011 Area and Nonroad Sample Calculations

2460200000 **Household Products** Inventory Year: 2011

This non-point source emission inventory category covers emissions from household products.

VDEQ developed 2011 county level household products emission estimates using 2011 county level population data and a per capita based emission factor.

County	Fairfax County	EPA_SECTOR:	Solvent - Consumer & Commercial Solvent Use		
FIPs Code	51059	SCC_L1:	Solvent Utilization	Tier 1 Description:	Solvent Utilization
Pollutant:	VOC	SCC_L2:	Miscellaneous Non-industrial: Consumer and Commercial	Tier 2 Description:	Nonindustrial
Scenario:	1	SCC_L3:	All Household Products	Tier 3 Description:	Consumer Solvents
		SCC_L4:	Total: All Solvent Types		

EMISSION CALCULATION:

$$\text{ANNUAL EMISSIONS} = \frac{\text{(Fips Activity Level)(EF)(Reactivity)(1-(CE * RP * RE))}}{}$$

$$\text{ANNUAL EMISSIONS} = \frac{\text{(CoPop)(EF)(Reactivity)(1-(CE * RP * RE))}}{}$$

$$\text{ANNUAL EMISSIONS} = \frac{\text{(1063957People)(1.8lb/person)(1)(1-(0 * 0 * 0))}}{}$$

ANNUAL EMISSIONS = 1915122.54927 lb/year VOC

ANNUAL EMISSIONS = 957.56127 tons/year VOC

DAILY EMISSIONS = ANNUAL EMISSIONS (tons/yr) * Seasonal Adjustment Factor/Peak Ozone Season / Days per Period

DAILY EMISSIONS = 957.56127 * 0.25 / 0.25 / 365

DAILY EMISSIONS = 2.6234555 tons/day VOC

rev:062714a

Virginia Department of Environmental Quality 2011 Area and Nonroad Sample Calculations

2460400000 **Automotive Aftermarket Products** Inventory Year: 2011

This non-point source emission inventory category covers emissions from automotive aftermarket products.

VDEQ developed 2011 county level automotive aftermarket products emission estimates using 2011 county level population data and a per capita based emission factor.

County	Fairfax County	EPA_SECTOR:	Solvent - Consumer & Commercial Solvent Use		
FIPs Code	51059	SCC_L1:	Solvent Utilization	Tier 1 Description:	Solvent Utilization
Pollutant:	VOC	SCC_L2:	Miscellaneous Non-industrial: Consumer and Commercial	Tier 2 Description:	Nonindustrial
Scenario:	1	SCC_L3:	All Automotive Aftermarket Products	Tier 3 Description:	Consumer Solvents
		SCC_L4:	Total: All Solvent Types		

EMISSION CALCULATION:

$$\text{ANNUAL EMISSIONS} = \frac{\text{(Fips Activity Level)(EF)(Reactivity)(1-(CE * RP * RE))}}{}$$

$$\text{ANNUAL EMISSIONS} = \frac{\text{(CoPop)(EF)(Reactivity)(1-(CE * RP * RE))}}{}$$

$$\text{ANNUAL EMISSIONS} = \frac{\text{(1063957People)(1.36lb/person)(1)(1-(0 * 0 * 0))}}{}$$

ANNUAL EMISSIONS = 1446981.53522 lb/year VOC

ANNUAL EMISSIONS = 723.49077 tons/year VOC

DAILY EMISSIONS = ANNUAL EMISSIONS (tons/yr) * Seasonal Adjustment Factor/Peak Ozone Season / Days per Period

DAILY EMISSIONS = 723.49077 * 0.25 / 0.25 / 365

DAILY EMISSIONS = 1.9821665 tons/day VOC

rev:062714a

Virginia Department of Environmental Quality 2011 Area and Nonroad Sample Calculations

2460500000 **Commercial and Consumer Solvents** Inventory Year: 2011

This non-point source emission inventory category covers emissions from consumer and commercial solvents.

VDEQ developed 2011 county level miscellaneous non-industrial consumer and commercial products emission estimates using 2011 county level population data and a per capita based emission factor.

County	Fairfax County	EPA_SECTOR:	Solvent - Consumer & Commercial Solvent Use		
FIPs Code	51059	SCC_L1:	Solvent Utilization	Tier 1 Description:	Solvent Utilization
Pollutant:	VOC	SCC_L2:	Miscellaneous Non-industrial: Consumer and Commercial	Tier 2 Description:	Nonindustrial
Scenario:	1	SCC_L3:	All Coatings and Related Products	Tier 3 Description:	Consumer Solvents
		SCC_L4:	Total: All Solvent Types		

EMISSION CALCULATION:

$$\text{ANNUAL EMISSIONS} = \frac{\text{(Fips Activity Level)(EF)(Reactivity)(1-(CE * RP * RE))}}{}$$

$$\text{ANNUAL EMISSIONS} = \frac{\text{(CoPop)(EF)(Reactivity)(1-(CE * RP * RE))}}{}$$

$$\text{ANNUAL EMISSIONS} = \frac{\text{(1063957People)(0.95lb/person)(1)(1-(0 * 0 * 0))}}{}$$

ANNUAL EMISSIONS = 1010759.13732 lb/year VOC

ANNUAL EMISSIONS = 505.37957 tons/year VOC

DAILY EMISSIONS = ANNUAL EMISSIONS (tons/yr) * Seasonal Adjustment Factor/Peak Ozone Season / Days per Period

DAILY EMISSIONS = 505.37957 * 0.25 / 0.25 / 365

DAILY EMISSIONS = 1.3846016 tons/day VOC

rev:062714a

Virginia Department of Environmental Quality 2011 Area and Nonroad Sample Calculations

2460600000 **Adhesives and Sealants** Inventory Year: 2011

This non-point source emission inventory category covers emissions from commercial and consumer adhesives and sealants.

VDEQ developed 2011 county level adhesives and sealants emission estimates using 2011 county level population data and a per capita based emission factor.

County	Fairfax County	EPA_SECTOR:	Solvent - Consumer & Commercial Solvent Use		
FIPs Code	51059	SCC_L1:	Solvent Utilization	Tier 1 Description:	Solvent Utilization
Pollutant:	VOC	SCC_L2:	Miscellaneous Non-industrial: Consumer and Commercial	Tier 2 Description:	Nonindustrial
Scenario:	1	SCC_L3:	All Adhesives and Sealants	Tier 3 Description:	Adhesives
		SCC_L4:	Total: All Solvent Types		

EMISSION CALCULATION:

$$\text{ANNUAL EMISSIONS} = \frac{\text{(Fips Activity Level)(EF)(Reactivity)(1-(CE * RP * RE))}}{}$$

$$\text{ANNUAL EMISSIONS} = \frac{\text{(CoPop)(EF)(Reactivity)(1-(CE * RP * RE))}}{}$$

$$\text{ANNUAL EMISSIONS} = \frac{\text{(1063957People)(0.57lb/person)(1)(1-(0 * 0 * 0))}}{}$$

ANNUAL EMISSIONS = 606455.48239 lb/year VOC

ANNUAL EMISSIONS = 303.22774 tons/year VOC

DAILY EMISSIONS = ANNUAL EMISSIONS (tons/yr) * Seasonal Adjustment Factor/Peak Ozone Season / Days per Period

DAILY EMISSIONS = 303.22774 * 0.25 / 0.25 / 365

DAILY EMISSIONS = 0.8307609 tons/day VOC

rev:062714a

Virginia Department of Environmental Quality 2011 Area and Nonroad Sample Calculations

2460800000 **FIFRA Regulated Pesticide Products** Inventory Year: 2011

This non-point source emission inventory category covers all FIFRA related commercial and consumer pesticide products.

VDEQ developed 2011 county level all FIFRA related products emission estimates using 2011 county level population data and a per capita based emission factor.

County	Fairfax County	EPA_SECTOR:	Solvent - Consumer & Commercial Solvent Use		
FIPs Code	51059	SCC_L1:	Solvent Utilization	Tier 1 Description:	Solvent Utilization
Pollutant:	VOC	SCC_L2:	Miscellaneous Non-industrial: Consumer and Commercial	Tier 2 Description:	Nonindustrial
Scenario:	1	SCC_L3:	All FIFRA Related Products	Tier 3 Description:	Pesticide Application
		SCC_L4:	Total: All Solvent Types		

EMISSION CALCULATION:

$$\text{ANNUAL EMISSIONS} = \frac{\text{(Fips Activity Level)(EF)(Reactivity)(1-(CE * RP * RE))}}{}$$

$$\text{ANNUAL EMISSIONS} = \frac{\text{(CoPop)(EF)(Reactivity)(1-(CE * RP * RE))}}{}$$

$$\text{ANNUAL EMISSIONS} = \frac{\text{(1063957People)(1.78lb/person)(1)(1-(0 * 0 * 0))}}{}$$

ANNUAL EMISSIONS = 1893843.42956 lb/year VOC

ANNUAL EMISSIONS = 946.92171 tons/year VOC

DAILY EMISSIONS = ANNUAL EMISSIONS (tons/yr) * Seasonal Adjustment Factor/Peak Ozone Season / Days per Period

DAILY EMISSIONS = 946.92171 * 0.25 / 0.25 / 365

DAILY EMISSIONS = 2.5943061 tons/day VOC

rev:062714a

Virginia Department of Environmental Quality 2011 Area and Nonroad Sample Calculations

2460900000 **Miscellaneous Pesticide Products** Inventory Year: 2011

This non-point source emission inventory category covers miscellaneous non-FIFRA commercial and consumer pesticide products.

VDEQ developed 2011 county level miscellaneous non-industrial consumer and commercial products not otherwise covered emission estimates using 2011 county level population data and a per capita based emission factor.

County	Fairfax County	EPA_SECTOR:	Solvent - Consumer & Commercial Solvent Use		
FIPs Code	51059	SCC_L1:	Solvent Utilization	Tier 1 Description:	Solvent Utilization
Pollutant:	VOC	SCC_L2:	Miscellaneous Non-industrial: Consumer and Commercial	Tier 2 Description:	Nonindustrial
Scenario:	1	SCC_L3:	Miscellaneous Products (Not Otherwise Covered)	Tier 3 Description:	Pesticide Application
		SCC_L4:	Total: All Solvent Types		

EMISSION CALCULATION:

$$\text{ANNUAL EMISSIONS} = \frac{\text{(Fips Activity Level)(EF)(Reactivity)(1-(CE * RP * RE))}}{}$$

$$\text{ANNUAL EMISSIONS} = \frac{\text{(CoPop)(EF)(Reactivity)(1-(CE * RP * RE))}}{}$$

$$\text{ANNUAL EMISSIONS} = \frac{\text{(1063957People)(0.07lb/person)(1)(1-(0 * 0 * 0))}}{}$$

ANNUAL EMISSIONS = 74476.99032 lb/year VOC

ANNUAL EMISSIONS = 37.2385 tons/year VOC

DAILY EMISSIONS = ANNUAL EMISSIONS (tons/yr) * Seasonal Adjustment Factor/Peak Ozone Season / Days per Period

DAILY EMISSIONS = 37.2385 * 0.25 / 0.25 / 365

DAILY EMISSIONS = 0.1020233 tons/day VOC

rev:062714a

Virginia Department of Environmental Quality 2011 Area and Nonroad Sample Calculations

2461021000 **Cutback Asphalt Paving** Inventory Year: 2011

This non-point source emission inventory category covers emissions from cutback asphalt paving.

VDEQ estimated 2011 cutback asphalt emissions by apportioning statewide cutback asphalt consumption to a county level based on paved road miles and then by applying an emission factor of 88 lbs VOC per barrel of cutback asphalt consumed.

County	Fairfax County	EPA_SECTOR:	Solvent - Consumer & Commercial Solvent Use		
FIPs Code	51059	SCC_L1:	Solvent Utilization	Tier 1 Description:	Solvent Utilization
Pollutant:	VOC	SCC_L2:	Miscellaneous Non-industrial: Commercial	Tier 2 Description:	Nonindustrial
Scenario:	1	SCC_L3:	Cutback Asphalt	Tier 3 Description:	Cutback Asphalt
		SCC_L4:	Total: All Solvent Types		

EMISSION CALCULATION:

$$\text{ANNUAL EMISSIONS} = \frac{\text{(State Activity Level)(Fips Activity Level)(EF)(Reactivity)(1-(CE * RP * RE))}}{\text{(Fips Activity Level\_Total)}}$$

$$\text{ANNUAL EMISSIONS} = \frac{\text{(Cutback Paving Asphalt)(Paved Roads VMT)(EF)(Reactivity)(1-(CE * RP * RE))}}{\text{(Paved Roads VMT)}}$$

$$\text{ANNUAL EMISSIONS} = \frac{\text{(8602bbl)(10528.9Million Miles)(88lb/bbl)(1)(1-(0 * 0 * 0))}}{\text{(76659Million Miles)}}$$

ANNUAL EMISSIONS = 103968.54389 lb/year VOC

ANNUAL EMISSIONS = 51.98427 tons/year VOC

DAILY EMISSIONS = ANNUAL EMISSIONS (tons/yr) * Seasonal Adjustment Factor/Peak Ozone Season / Days per Period

DAILY EMISSIONS = 51.98427 * 0.389286078 / 0.25 / 260

DAILY EMISSIONS = 0.3113347 tons/day VOC

rev:062714a

Virginia Department of Environmental Quality 2011 Area and Nonroad Sample Calculations

2461022000 **Emulsified Asphalt Paving** Inventory Year: 2011

This non-point source emission inventory category covers emissions from emulsified asphalt paving

VDEQ estimated 2011 emulsified asphalt emissions by apportioning statewide emulsified asphalt consumption to a county level based on paved road miles and then by applying an emission factor of 88 lbs VOC per barrel of cutback asphalt consumed.

County	Fairfax County	EPA_SECTOR:	Solvent - Consumer & Commercial Solvent Use		
FIPs Code	51059	SCC_L1:	Solvent Utilization	Tier 1 Description:	Solvent Utilization
Pollutant:	VOC	SCC_L2:	Miscellaneous Non-industrial: Commercial	Tier 2 Description:	Nonindustrial
Scenario:	1	SCC_L3:	Emulsified Asphalt	Tier 3 Description:	Other Asphalt
		SCC_L4:	Total: All Solvent Types		

EMISSION CALCULATION:

$$\text{ANNUAL EMISSIONS} = \frac{\text{(State Activity Level)(Fips Activity Level)(EF)(Reactivity)(1-(CE * RP * RE))}}{\text{(Fips Activity Level\_Total)}}$$

$$\text{ANNUAL EMISSIONS} = \frac{\text{(Emulsified Paving Asphalt)(Paved Roads VMT)(EF)(Reactivity)(1-(CE * RP * RE))}}{\text{(Paved Roads VMT)}}$$

$$\text{ANNUAL EMISSIONS} = \frac{\text{(349853bbl)(10528.9Million Miles)(9.2lb/bbl)(1)(1-(0 * 0 * 0))}}{\text{(76659Million Miles)}}$$

ANNUAL EMISSIONS = 442072.26827 lb/year VOC

ANNUAL EMISSIONS = 221.03613 tons/year VOC

DAILY EMISSIONS = ANNUAL EMISSIONS (tons/yr) * Seasonal Adjustment Factor/Peak Ozone Season / Days per Period

DAILY EMISSIONS = 221.03613 * 0.389286078 / 0.25 / 260

DAILY EMISSIONS = 1.3237891 tons/day VOC

rev:062714a

Virginia Department of Environmental Quality 2011 Area and Nonroad Sample Calculations

2461800000 **I/C/G Pesticide Application** Inventory Year: 2011

This non-point source emission inventory category covers emissions resulting from the application of institutional/commercial/governmental pesticide.

VDEQ estimated emissions for this category by apportioning national institutional/commercial/governmental pesticide consumption to a county level and then applying an appropriate emission factor.

County	Fairfax County	EPA_SECTOR:	Solvent - Consumer & Commercial Solvent Use		
FIPs Code	51059	SCC_L1:	Solvent Utilization	Tier 1 Description:	Solvent Utilization
Pollutant:	VOC	SCC_L2:	Miscellaneous Non-industrial: Commercial	Tier 2 Description:	Nonindustrial
Scenario:	1	SCC_L3:	Pesticide Application: All Processes	Tier 3 Description:	Pesticide Application
		SCC_L4:	Total: All Solvent Types		

EMISSION CALCULATION:

$$\text{ANNUAL EMISSIONS} = \frac{\text{(National Acttivity Level)(State Activity Level)(Fips Activity Level)(EF)(Reactivity)(1-(CE * RP * RE))}}{\text{(State Activity Level Total)(Fips Activity Level\_Total)}}$$

$$\text{ANNUAL EMISSIONS} = \frac{\text{(PESTI\_I/C/G\_USA)(I/C/G\_PesticideApplicators\_State)(CoPop)(EF)(Reactivity)(1-(CE * RP * RE))}}{\text{(I/C/G\_PesticideApplicators\_USA)(StPop)}}$$

$$\text{ANNUAL EMISSIONS} = \frac{\text{(129000000lbs)(7220Employees)(1063957People)(2.45lb/lb)(1)(1-(0 * 0 * 0))}}{\text{(413361Employees)(7816585People)}}$$

ANNUAL EMISSIONS = 751398.84443 lb/year VOC

ANNUAL EMISSIONS = 375.69942 tons/year VOC

DAILY EMISSIONS = ANNUAL EMISSIONS (tons/yr) * Seasonal Adjustment Factor/Peak Ozone Season / Days per Period

DAILY EMISSIONS = 375.69942 * 0.25 / 0.25 / 312

DAILY EMISSIONS = 1.2041648 tons/day VOC

rev:062714a

Virginia Department of Environmental Quality 2011 Area and Nonroad Sample Calculations

2461850000 **Agricultural Pesticide Application** Inventory Year: 2011

This non-point source emission inventory category covers emissions resulting from agricultural pesticide application.

VDEQ estimated emissions for this category by apportioning national agricultural pesticide consumption to a county level based on acres of cultivated farmland and then applying an appropriate emission factor.

County	Loudoun County	EPA_SECTOR:	Solvent - Consumer & Commercial Solvent Use		
FIPs Code	51107	SCC_L1:	Solvent Utilization	Tier 1 Description:	Solvent Utilization
Pollutant:	VOC	SCC_L2:	Miscellaneous Non-industrial: Commercial	Tier 2 Description:	Nonindustrial
Scenario:	1	SCC_L3:	Pesticide Application: Agricultural	Tier 3 Description:	Pesticide Application
		SCC_L4:	All Processes		

EMISSION CALCULATION:

$$\text{ANNUAL EMISSIONS} = \frac{\text{(National Acttivity Level)(Fips Activity Level)(EF)(Reactivity)(1-(CE * RP * RE))}}{\text{(State Activity Level Total)}}$$

$$\text{ANNUAL EMISSIONS} = \frac{\text{(PESTI\_Ag\_USA)(FarmAcres)(EF)(Reactivity)(1-(CE * RP * RE))}}{\text{(UsaFarmAcres)}}$$

$$\text{ANNUAL EMISSIONS} = \frac{\text{(877000000lbs)(142452Acres)(2.45lb/lb)(1)(1-(0 * 0 * 0))}}{\text{(919990000Acres)}}$$

ANNUAL EMISSIONS = 332698.72037 lb/year VOC

ANNUAL EMISSIONS = 166.34936 tons/year VOC

DAILY EMISSIONS = ANNUAL EMISSIONS (tons/yr) * Seasonal Adjustment Factor/Peak Ozone Season / Days per Period

DAILY EMISSIONS = 166.34936 * 0.25 / 0.25 / 312

DAILY EMISSIONS = 0.533171 tons/day VOC

rev:062714a

Virginia Department of Environmental Quality 2011 Area and Nonroad Sample Calculations

2465800000 **Consumer Pesticide application** Inventory Year: 2011

This non-point source emission inventory category covers emissions resulting from consumer pesticide application.

VDEQ estimated emissions for this category by apportioning national consumer pesticide consumption to a county level using population and household data and then applying an appropriate emission factor.

County	Fairfax County	EPA_SECTOR:	Solvent - Consumer & Commercial Solvent Use		
FIPs Code	51059	SCC_L1:	Solvent Utilization	Tier 1 Description:	Solvent Utilization
Pollutant:	VOC	SCC_L2:	Miscellaneous Non-industrial: Consumer	Tier 2 Description:	Nonindustrial
Scenario:	1	SCC_L3:	Pesticide Application	Tier 3 Description:	Pesticide Application
		SCC_L4:	Total: All Solvent Types		

EMISSION CALCULATION:

$$\text{ANNUAL EMISSIONS} = \frac{\text{(National Acttivity Level)(State Activity Level)(Fips Activity Level)(EF)(Reactivity)(1-(CE * RP * RE))}}{\text{(State Activity Level Total)(Fips Activity Level\_Total)}}$$

$$\text{ANNUAL EMISSIONS} = \frac{\text{(PESTI\_HG\_US)(StPop)(Households)(EF)(Reactivity)(1-(CE * RP * RE))}}{\text{(UsaPop)(Households)}}$$

$$\text{ANNUAL EMISSIONS} = \frac{\text{(127000000lbs)(8038612People)(222612Households)(2.45lb/lb)(1)(1-(0 * 0 * 0))}}{\text{(311591917People)(1772227households)}}$$

ANNUAL EMISSIONS = 1008309.64255 lb/year VOC

ANNUAL EMISSIONS = 504.15482 tons/year VOC

DAILY EMISSIONS = ANNUAL EMISSIONS (tons/yr) * Seasonal Adjustment Factor/Peak Ozone Season / Days per Period

DAILY EMISSIONS = 504.15482 * 0.25 / 0.25 / 312

DAILY EMISSIONS = 1.6158808 tons/day VOC

rev:062714a

Virginia Department of Environmental Quality 2011 Area and Nonroad Sample Calculations

2501011011 **Residential Portable Gas Can Permeation Losses** Inventory Year: 2011

This non-point source emission inventory category covers permeation emissions resulting from residential portable gas cans.

2011 county level portable fuel container emission estimates that were calculated by the EPA were downloaded from the EPA 2011 National Emission Inventory and entered directly into the Virginia state inventory.

County	Fairfax County	EPA_SECTOR:	Miscellaneous Non-Industrial NEC		
FIPs Code	51059	SCC_L1:	Storage and Transport	Tier 1 Description:	Storage & Transport
Pollutant:	VOC	SCC_L2:	Petroleum and Petroleum Product Storage	Tier 2 Description:	Petroleum & Petroleum Product Storage
Scenario:	1	SCC_L3:	Residential Portable Gas Cans	Tier 3 Description:	Area Source: Gasoline
		SCC_L4:	Permeation		

EMISSION CALCULATION:

$$\text{ANNUAL EMISSIONS} = \frac{\text{(Fips Activity Level)(EF)(Reactivity)(1-(CE * RP * RE))}}{}$$

$$\text{ANNUAL EMISSIONS} = \frac{\text{(ActualEmissions)(EF)(Reactivity)(1-(CE * RP * RE))}}{}$$

$$\text{ANNUAL EMISSIONS} = \frac{\text{(1year)(115897.1lb/yr)(1)(1-(0 * 0 * 0))}}{}$$

ANNUAL EMISSIONS = 115897.07031 lb/year VOC

ANNUAL EMISSIONS = 57.94854 tons/year VOC

DAILY EMISSIONS = ANNUAL EMISSIONS (tons/yr) * Seasonal Adjustment Factor/Peak Ozone Season / Days per Period

DAILY EMISSIONS = 57.94854 * 0.377893245 / 0.25 / 365

DAILY EMISSIONS = 0.239982 tons/day VOC

rev:062714a

Virginia Department of Environmental Quality 2011 Area and Nonroad Sample Calculations

2501011012 **Residential Portable Gas Can Evaporation and Diurnal Losses** Inventory Year: 2011

This non-point source emission inventory category covers evaporation and diurnal losses from residential portable gas cans.

2011 county level portable fuel container emission estimates that were calculated by the EPA were downloaded from the EPA 2011 National Emission Inventory and entered directly into the Virginia state inventory.

County	Fairfax County	EPA_SECTOR:	Miscellaneous Non-Industrial NEC		
FIPs Code	51059	SCC_L1:	Storage and Transport	Tier 1 Description:	Storage & Transport
Pollutant:	VOC	SCC_L2:	Petroleum and Petroleum Product Storage	Tier 2 Description:	Petroleum & Petroleum Product Storage
Scenario:	1	SCC_L3:	Residential Portable Gas Cans	Tier 3 Description:	Area Source: Gasoline
		SCC_L4:	Evaporation (includes Diurnal losses)		

EMISSION CALCULATION:

$$\text{ANNUAL EMISSIONS} = \frac{\text{(Fips Activity Level)(EF)(Reactivity)(1-(CE * RP * RE))}}{}$$

$$\text{ANNUAL EMISSIONS} = \frac{\text{(ActualEmissions)(EF)(Reactivity)(1-(CE * RP * RE))}}{}$$

$$\text{ANNUAL EMISSIONS} = \frac{\text{(1year)(226285lb/yr)(1)(1-(0 * 0 * 0))}}{}$$

ANNUAL EMISSIONS = 226285 lb/year VOC

ANNUAL EMISSIONS = 113.1425 tons/year VOC

DAILY EMISSIONS = ANNUAL EMISSIONS (tons/yr) * Seasonal Adjustment Factor/Peak Ozone Season / Days per Period

DAILY EMISSIONS = 113.1425 * 0.377893245 / 0.25 / 365

DAILY EMISSIONS = 0.4685566 tons/day VOC

rev:062714a

Virginia Department of Environmental Quality 2011 Area and Nonroad Sample Calculations

2501011013 **Residential Portable Gas Can Spillage During Transport Losses** Inventory Year: 2011

This non-point source emission inventory category covers emissions resulting from residential portable fuel can spillage that occurs during transport.

2011 county level portable fuel container emission estimates that were calculated by the EPA were downloaded from the EPA 2011 National Emission Inventory and entered directly into the Virginia state inventory.

County	Fairfax County	EPA_SECTOR:	Miscellaneous Non-Industrial NEC		
FIPs Code	51059	SCC_L1:	Storage and Transport	Tier 1 Description:	Storage & Transport
Pollutant:	VOC	SCC_L2:	Petroleum and Petroleum Product Storage	Tier 2 Description:	Petroleum & Petroleum Product Transport
Scenario:	1	SCC_L3:	Residential Portable Gas Cans	Tier 3 Description:	Other
		SCC_L4:	Spillage During Transport		

EMISSION CALCULATION:

$$\text{ANNUAL EMISSIONS} = \frac{\text{(Fips Activity Level)(EF)(Reactivity)(1-(CE * RP * RE))}}{}$$

$$\text{ANNUAL EMISSIONS} = \frac{\text{(ActualEmissions)(EF)(Reactivity)(1-(CE * RP * RE))}}{}$$

$$\text{ANNUAL EMISSIONS} = \frac{\text{(1year)(119813.5lb/yr)(1)(1-(0 * 0 * 0))}}{}$$

ANNUAL EMISSIONS = 119813.48438 lb/year VOC

ANNUAL EMISSIONS = 59.90674 tons/year VOC

DAILY EMISSIONS = ANNUAL EMISSIONS (tons/yr) * Seasonal Adjustment Factor/Peak Ozone Season / Days per Period

DAILY EMISSIONS = 59.90674 * 0.377893245 / 0.25 / 365

DAILY EMISSIONS = 0.2480915 tons/day VOC

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Virginia Department of Environmental Quality 2011 Area and Nonroad Sample Calculations

2501011014 **Residential Portable Gas Can Vapor Displacement At the Pump Losses** Inventory Year: 2011

This non-point source emission inventory category covers emissions resulting from vapor displacement at the pump that take place while the residential gas cans are being filled.

2011 county level portable fuel container emission estimates that were calculated by the EPA were downloaded from the EPA 2011 National Emission Inventory and entered directly into the Virginia state inventory.

County	Fairfax County	EPA_SECTOR:	Miscellaneous Non-Industrial NEC		
FIPs Code	51059	SCC_L1:	Storage and Transport	Tier 1 Description:	Storage & Transport
Pollutant:	VOC	SCC_L2:	Petroleum and Petroleum Product Storage	Tier 2 Description:	Service Stations: Stage II
Scenario:	1	SCC_L3:	Residential Portable Gas Cans	Tier 3 Description:	Other
		SCC_L4:	Refilling at the Pump - Vapor Displacement		

EMISSION CALCULATION:

$$\text{ANNUAL EMISSIONS} = \frac{\text{(Fips Activity Level)(EF)(Reactivity)(1-(CE * RP * RE))}}{}$$

$$\text{ANNUAL EMISSIONS} = \frac{\text{(ActualEmissions)(EF)(Reactivity)(1-(CE * RP * RE))}}{}$$

$$\text{ANNUAL EMISSIONS} = \frac{\text{(1year)(42525.01lb/yr)(1)(1-(0 * 0 * 0))}}{}$$

ANNUAL EMISSIONS = 42525.00781 lb/year VOC

ANNUAL EMISSIONS = 21.2625 tons/year VOC

DAILY EMISSIONS = ANNUAL EMISSIONS (tons/yr) * Seasonal Adjustment Factor/Peak Ozone Season / Days per Period

DAILY EMISSIONS = 21.2625 * 0.377893245 / 0.25 / 365

DAILY EMISSIONS = 0.0880543 tons/day VOC

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Virginia Department of Environmental Quality 2011 Area and Nonroad Sample Calculations

2501011015 **Residential Portable Gas Can Spillage At The Pump** Inventory Year: 2011

This non-point source emission inventory category covers emissions resulting from residential portable fuel can spillage that at the pump.

2011 county level portable fuel container emission estimates that were calculated by the EPA were downloaded from the EPA 2011 National Emission Inventory and entered directly into the Virginia state inventory.

County	Fairfax County	EPA_SECTOR:	Miscellaneous Non-Industrial NEC		
FIPs Code	51059	SCC_L1:	Storage and Transport	Tier 1 Description:	Storage & Transport
Pollutant:	VOC	SCC_L2:	Petroleum and Petroleum Product Storage	Tier 2 Description:	Service Stations: Stage II
Scenario:	1	SCC_L3:	Residential Portable Gas Cans	Tier 3 Description:	Other
		SCC_L4:	Refilling at the Pump - Spillage		

EMISSION CALCULATION:

$$\text{ANNUAL EMISSIONS} = \frac{\text{(Fips Activity Level)(EF)(Reactivity)(1-(CE * RP * RE))}}{}$$

$$\text{ANNUAL EMISSIONS} = \frac{\text{(ActualEmissions)(EF)(Reactivity)(1-(CE * RP * RE))}}{}$$

$$\text{ANNUAL EMISSIONS} = \frac{\text{(1year)(3968.615lb/yr)(1)(1-(0 * 0 * 0))}}{}$$

ANNUAL EMISSIONS = 3968.61475 lb/year VOC

ANNUAL EMISSIONS = 1.98431 tons/year VOC

DAILY EMISSIONS = ANNUAL EMISSIONS (tons/yr) * Seasonal Adjustment Factor/Peak Ozone Season / Days per Period

DAILY EMISSIONS = 1.98431 * 0.377893245 / 0.25 / 365

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DAILY EMISSIONS = 0.0082176 tons/day VOC

Virginia Department of Environmental Quality 2011 Area and Nonroad Sample Calculations

2501012011 **Commercial Portable Gas Can Permeation Losses** Inventory Year: 2011

This non-point source emission inventory category covers permeation emissions resulting from commercial portable gas cans.

2011 county level portable fuel container emission estimates that were calculated by the EPA were downloaded from the EPA 2011 National Emission Inventory and entered directly into the Virginia state inventory.

County	Fairfax County	EPA_SECTOR:	Miscellaneous Non-Industrial NEC		
FIPs Code	51059	SCC_L1:	Storage and Transport	Tier 1 Description:	Storage & Transport
Pollutant:	VOC	SCC_L2:	Petroleum and Petroleum Product Storage	Tier 2 Description:	Petroleum & Petroleum Product Storage
Scenario:	1	SCC_L3:	Commercial Portable Gas Cans	Tier 3 Description:	Area Source: Gasoline
		SCC_L4:	Permeation		

EMISSION CALCULATION:

$$\text{ANNUAL EMISSIONS} = \frac{\text{(Fips Activity Level)(EF)(Reactivity)(1-(CE * RP * RE))}}{}$$

$$\text{ANNUAL EMISSIONS} = \frac{\text{(ActualEmissions)(EF)(Reactivity)(1-(CE * RP * RE))}}{}$$

$$\text{ANNUAL EMISSIONS} = \frac{\text{(1year)(3701.778lb/yr)(1)(1-(0 * 0 * 0))}}{}$$

ANNUAL EMISSIONS = 3701.77783 lb/year VOC

ANNUAL EMISSIONS = 1.85089 tons/year VOC

DAILY EMISSIONS = ANNUAL EMISSIONS (tons/yr) * Seasonal Adjustment Factor/Peak Ozone Season / Days per Period

DAILY EMISSIONS = 1.85089 * 0.377893245 / 0.25 / 365

DAILY EMISSIONS = 0.0076651 tons/day VOC

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Virginia Department of Environmental Quality 2011 Area and Nonroad Sample Calculations

2501012012 **Commercial Portable Gas Can Evaporation and Diurnal Losses** Inventory Year: 2011

This non-point source emission inventory category covers evaporation and diurnal losses from commercial portable gas cans.

2011 county level portable fuel container emission estimates that were calculated by the EPA were downloaded from the EPA 2011 National Emission Inventory and entered directly into the Virginia state inventory.

County	Fairfax County	EPA_SECTOR:	Miscellaneous Non-Industrial NEC		
FIPs Code	51059	SCC_L1:	Storage and Transport	Tier 1 Description:	Storage & Transport
Pollutant:	VOC	SCC_L2:	Petroleum and Petroleum Product Storage	Tier 2 Description:	Petroleum & Petroleum Product Storage
Scenario:	1	SCC_L3:	Commercial Portable Gas Cans	Tier 3 Description:	Area Source: Gasoline
		SCC_L4:	Evaporation (includes Diurnal losses)		

EMISSION CALCULATION:

$$\text{ANNUAL EMISSIONS} = \frac{\text{(Fips Activity Level)(EF)(Reactivity)(1-(CE * RP * RE))}}{}$$

$$\text{ANNUAL EMISSIONS} = \frac{\text{(ActualEmissions)(EF)(Reactivity)(1-(CE * RP * RE))}}{}$$

$$\text{ANNUAL EMISSIONS} = \frac{\text{(1year)(7227.593lb/yr)(1)(1-(0 * 0 * 0))}}{}$$

ANNUAL EMISSIONS = 7227.59326 lb/year VOC

ANNUAL EMISSIONS = 3.6138 tons/year VOC

DAILY EMISSIONS = ANNUAL EMISSIONS (tons/yr) * Seasonal Adjustment Factor/Peak Ozone Season / Days per Period

DAILY EMISSIONS = 3.6138 * 0.377893245 / 0.25 / 365

DAILY EMISSIONS = 0.0149658 tons/day VOC

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Virginia Department of Environmental Quality 2011 Area and Nonroad Sample Calculations

2501012013 **Commercial Portable Gas Can Spillage During Transport Losses** Inventory Year: 2011

This non-point source emission inventory category covers emissions resulting from commercial portable fuel can spillage that occurs during transport.

2011 county level portable fuel container emission estimates that were calculated by the EPA were downloaded from the EPA 2011 National Emission Inventory and entered directly into the Virginia state inventory.

County	Fairfax County	EPA_SECTOR:	Miscellaneous Non-Industrial NEC		
FIPs Code	51059	SCC_L1:	Storage and Transport	Tier 1 Description:	Storage & Transport
Pollutant:	VOC	SCC_L2:	Petroleum and Petroleum Product Storage	Tier 2 Description:	Petroleum & Petroleum Product Transport
Scenario:	1	SCC_L3:	Commercial Portable Gas Cans	Tier 3 Description:	Other
		SCC_L4:	Spillage During Transport		

EMISSION CALCULATION:

$$\text{ANNUAL EMISSIONS} = \frac{\text{(Fips Activity Level)(EF)(Reactivity)(1-(CE * RP * RE))}}{}$$

$$\text{ANNUAL EMISSIONS} = \frac{\text{(ActualEmissions)(EF)(Reactivity)(1-(CE * RP * RE))}}{}$$

$$\text{ANNUAL EMISSIONS} = \frac{\text{(1year)(163444.1lb/yr)(1)(1-(0 * 0 * 0))}}{}$$

ANNUAL EMISSIONS = 163444.0625 lb/year VOC

ANNUAL EMISSIONS = 81.72203 tons/year VOC

DAILY EMISSIONS = ANNUAL EMISSIONS (tons/yr) * Seasonal Adjustment Factor/Peak Ozone Season / Days per Period

DAILY EMISSIONS = 81.72203 * 0.377893245 / 0.25 / 365

DAILY EMISSIONS = 0.3384351 tons/day VOC

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Virginia Department of Environmental Quality 2011 Area and Nonroad Sample Calculations

2501012014 **Commercial Portable Gas Can Vapor Displacement At the Pump Losses** Inventory Year: 2011

This non-point source emission inventory category covers emissions resulting from vapor displacement at the pump that take place while the commercial gas cans are being filled.

2011 county level portable fuel container emission estimates that were calculated by the EPA were downloaded from the EPA 2011 National Emission Inventory and entered directly into the Virginia state inventory.

County	Fairfax County	EPA_SECTOR:	Miscellaneous Non-Industrial NEC		
FIPs Code	51059	SCC_L1:	Storage and Transport	Tier 1 Description:	Storage & Transport
Pollutant:	VOC	SCC_L2:	Petroleum and Petroleum Product Storage	Tier 2 Description:	Service Stations: Stage II
Scenario:	1	SCC_L3:	Commercial Portable Gas Cans	Tier 3 Description:	Other
		SCC_L4:	Refilling at the Pump - Vapor Displacement		

EMISSION CALCULATION:

$$\text{ANNUAL EMISSIONS} = \frac{\text{(Fips Activity Level)(EF)(Reactivity)(1-(CE * RP * RE))}}{}$$

$$\text{ANNUAL EMISSIONS} = \frac{\text{(ActualEmissions)(EF)(Reactivity)(1-(CE * RP * RE))}}{}$$

$$\text{ANNUAL EMISSIONS} = \frac{\text{(1year)(81954.96lb/yr)(1)(1-(0 * 0 * 0))}}{}$$

ANNUAL EMISSIONS = 81954.96094 lb/year VOC

ANNUAL EMISSIONS = 40.97748 tons/year VOC

DAILY EMISSIONS = ANNUAL EMISSIONS (tons/yr) * Seasonal Adjustment Factor/Peak Ozone Season / Days per Period

DAILY EMISSIONS = 40.97748 * 0.377893245 / 0.25 / 365

DAILY EMISSIONS = 0.1696999 tons/day VOC

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Virginia Department of Environmental Quality 2011 Area and Nonroad Sample Calculations

2501012015 **Commercial Portable Gas Can Spillage At The Pump** Inventory Year: 2011

This non-point source emission inventory category covers emissions resulting from commercial portable fuel can spillage that at the pump.

2011 county level portable fuel container emission estimates that were calculated by the EPA were downloaded from the EPA 2011 National Emission Inventory and entered directly into the Virginia state inventory.

County	Fairfax County	EPA_SECTOR:	Miscellaneous Non-Industrial NEC		
FIPs Code	51059	SCC_L1:	Storage and Transport	Tier 1 Description:	Storage & Transport
Pollutant:	VOC	SCC_L2:	Petroleum and Petroleum Product Storage	Tier 2 Description:	Service Stations: Stage II
Scenario:	1	SCC_L3:	Commercial Portable Gas Cans	Tier 3 Description:	Other
		SCC_L4:	Refilling at the Pump - Spillage		

EMISSION CALCULATION:

$$\text{ANNUAL EMISSIONS} = \frac{\text{(Fips Activity Level)(EF)(Reactivity)(1-(CE * RP * RE))}}{}$$

$$\text{ANNUAL EMISSIONS} = \frac{\text{(ActualEmissions)(EF)(Reactivity)(1-(CE * RP * RE))}}{}$$

$$\text{ANNUAL EMISSIONS} = \frac{\text{(1year)(7635.947lb/yr)(1)(1-(0 * 0 * 0))}}{}$$

ANNUAL EMISSIONS = 7635.94727 lb/year VOC

ANNUAL EMISSIONS = 3.81797 tons/year VOC

DAILY EMISSIONS = ANNUAL EMISSIONS (tons/yr) * Seasonal Adjustment Factor/Peak Ozone Season / Days per Period

DAILY EMISSIONS = 3.81797 * 0.377893245 / 0.25 / 365

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DAILY EMISSIONS = 0.0158114 tons/day VOC

Virginia Department of Environmental Quality 2011 Area and Nonroad Sample Calculations

2501050120 **Petroleum Bulk Terminals and Plants, Gasoline** Inventory Year: 2011

This non-point source emission inventory category estimates the emissions associated with gasoline petroleum bulk terminals and plants.

VDEQ used data from the Army Corps of Engineers 'Waterborne Commerce' reports to developed an emission inventory to quantify the air emissions of ocean going petroleum tankers involved in the transport of gasoline.

County	Prince William County	EPA_SECTOR:	Bulk Gasoline Terminals		
FIPs Code	51153	SCC_L1:	Storage and Transport	Tier 1 Description:	Storage & Transport
Pollutant:	VOC	SCC_L2:	Petroleum and Petroleum Product Storage	Tier 2 Description:	Bulk Terminals & Plants
Scenario:	1	SCC_L3:	Bulk Terminals: All Evaporative Losses	Tier 3 Description:	Area Source: Gasoline
		SCC_L4:	Gasoline		

EMISSION CALCULATION:

$$\text{ANNUAL EMISSIONS} = \frac{\text{(State Activity Level)(Fips Activity Level)(EF)(Reactivity)(1-(CE * RP * RE))}}{\text{(Fips Activity Level\_Total)}}$$

$$\text{ANNUAL EMISSIONS} = \frac{\text{(Motor Gasoline)(NAICS Employment - 42471)(EF)(Reactivity)(1-(CE * RP * RE))}}{\text{(NAICS Employment - 42471)}}$$

$$\text{ANNUAL EMISSIONS} = \frac{\text{(53970kgal)(42.6938775510204Employees)(127.8218lb/kgal)(1)(1-(0 * 0 * 0))}}{\text{(1178Employees)}}$$

ANNUAL EMISSIONS = 250021.59879 lb/year VOC

ANNUAL EMISSIONS = 125.0108 tons/year VOC

DAILY EMISSIONS = ANNUAL EMISSIONS (tons/yr) * Seasonal Adjustment Factor/Peak Ozone Season / Days per Period

DAILY EMISSIONS = 125.0108 * 0.377893245 / 0.25 / 365

DAILY EMISSIONS = 0.5177067 tons/day VOC

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Virginia Department of Environmental Quality 2011 Area and Nonroad Sample Calculations

2501050120 **Petroleum Bulk Terminals and Plants, Gasoline** Inventory Year: 2011

This non-point source emission inventory category estimates the emissions associated with gasoline petroleum bulk terminals and plants.

VDEQ used data from the Army Corps of Engineers 'Waterborne Commerce' reports to developed an emission inventory to quantify the air emissions of ocean going petroleum tankers involved in the transport of gasoline.

County	Fairfax County	EPA_SECTOR:	Bulk Gasoline Terminals		
FIPs Code	51059	SCC_L1:	Storage and Transport	Tier 1 Description:	Storage & Transport
Pollutant:	VOC	SCC_L2:	Petroleum and Petroleum Product Storage	Tier 2 Description:	Bulk Terminals & Plants
Scenario:	1	SCC_L3:	Bulk Terminals: All Evaporative Losses	Tier 3 Description:	Area Source: Gasoline
		SCC_L4:	Gasoline		

EMISSION CALCULATION:

$$\text{ANNUAL EMISSIONS} = \frac{\text{(State Activity Level)(Fips Activity Level)(EF)(Reactivity)(1-(CE * RP * RE))}}{\text{(Fips Activity Level\_Total)}}$$

$$\text{ANNUAL EMISSIONS} = \frac{\text{(Motor Gasoline)(NAICS Employment - 42471)(EF)(Reactivity)(1-(CE * RP * RE))}}{\text{(NAICS Employment - 42471)}}$$

$$\text{ANNUAL EMISSIONS} = \frac{\text{(53970kgal)(42.6938775510204Employees)(127.8218lb/kgal)(1)(1-(0 * 0 * 0))}}{\text{(1178Employees)}}$$

ANNUAL EMISSIONS = 250021.59879 lb/year VOC

ANNUAL EMISSIONS = 125.0108 tons/year VOC

DAILY EMISSIONS = ANNUAL EMISSIONS (tons/yr) * Seasonal Adjustment Factor/Peak Ozone Season / Days per Period

DAILY EMISSIONS = 125.0108 * 0.377893245 / 0.25 / 365

DAILY EMISSIONS = 0.5177067 tons/day VOC

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Virginia Department of Environmental Quality 2011 Area and Nonroad Sample Calculations

2501055120 **Bulk Plant Evaporative Losses, Gasoline** Inventory Year: 2011

This non-point source emission inventory category covers the emissions as a result of evaporative losses from gasoline product at bulk terminals and plants.

2011 county level gasoline bulk plant evaporative losses emission estimates that were calculated by the EPA were downloaded from the EPA 2011 National Emission Inventory and entered directly into the Virginia state inventory.

County	Arlington County	EPA_SECTOR:	Bulk Gasoline Terminals		
FIPs Code	51013	SCC_L1:	Storage and Transport	Tier 1 Description:	Storage & Transport
Pollutant:	VOC	SCC_L2:	Petroleum and Petroleum Product Storage	Tier 2 Description:	Bulk Terminals & Plants
Scenario:	1	SCC_L3:	Bulk Plants: All Evaporative Losses	Tier 3 Description:	Area Source: Gasoline
		SCC_L4:	Gasoline		

EMISSION CALCULATION:

$$\text{ANNUAL EMISSIONS} = \frac{\text{(Fips Activity Level)(EF)(Reactivity)(1-(CE * RP * RE))}}{}$$

$$\text{ANNUAL EMISSIONS} = \frac{\text{(ActualEmissions)(EF)(Reactivity)(1-(CE * RP * RE))}}{}$$

$$\text{ANNUAL EMISSIONS} = \frac{\text{(1year)(12254.34lb/yr)(1)(1-(0 * 0 * 0))}}{}$$

ANNUAL EMISSIONS = 12254.33984 lb/year VOC

ANNUAL EMISSIONS = 6.12717 tons/year VOC

DAILY EMISSIONS = ANNUAL EMISSIONS (tons/yr) * Seasonal Adjustment Factor/Peak Ozone Season / Days per Period

DAILY EMISSIONS = 6.12717 * 0.377893245 / 0.25 / 365

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DAILY EMISSIONS = 0.0253744 tons/day VOC

Virginia Department of Environmental Quality 2011 Area and Nonroad Sample Calculations

2501055120 **Bulk Plant Evaporative Losses, Gasoline** Inventory Year: 2011

This non-point source emission inventory category covers the emissions as a result of evaporative losses from gasoline product at bulk terminals and plants.

2011 county level gasoline bulk plant evaporative losses emission estimates that were calculated by the EPA were downloaded from the EPA 2011 National Emission Inventory and entered directly into the Virginia state inventory.

County	Alexandria city	EPA_SECTOR:	Bulk Gasoline Terminals		
FIPs Code	51510	SCC_L1:	Storage and Transport	Tier 1 Description:	Storage & Transport
Pollutant:	VOC	SCC_L2:	Petroleum and Petroleum Product Storage	Tier 2 Description:	Bulk Terminals & Plants
Scenario:	1	SCC_L3:	Bulk Plants: All Evaporative Losses	Tier 3 Description:	Area Source: Gasoline
		SCC_L4:	Gasoline		

EMISSION CALCULATION:

$$\text{ANNUAL EMISSIONS} = \frac{\text{(Fips Activity Level)(EF)(Reactivity)(1-(CE * RP * RE))}}{}$$

$$\text{ANNUAL EMISSIONS} = \frac{\text{(ActualEmissions)(EF)(Reactivity)(1-(CE * RP * RE))}}{}$$

$$\text{ANNUAL EMISSIONS} = \frac{\text{(1year)(12254.34lb/yr)(1)(1-(0 * 0 * 0))}}{}$$

ANNUAL EMISSIONS = 12254.33984 lb/year VOC

ANNUAL EMISSIONS = 6.12717 tons/year VOC

DAILY EMISSIONS = ANNUAL EMISSIONS (tons/yr) * Seasonal Adjustment Factor/Peak Ozone Season / Days per Period

DAILY EMISSIONS = 6.12717 * 0.377893245 / 0.25 / 365

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DAILY EMISSIONS = 0.0253744 tons/day VOC

Virginia Department of Environmental Quality 2011 Area and Nonroad Sample Calculations

2501060053 **Stage 1 Refueling, Submerged Filling** Inventory Year: 2011

This non-point source emission inventory category covers the Stage 1 emissions that take place when gasoline tank trucks transfer fuel into gas station gasoline storage tanks equipped with balanced submerged filling equipment.

Where gasoline Stage 1 balanced submerged filling applied, VDEQ apportioned state total fuel sales data to a county level based on county level sales tax data obtained from Va Division of Motor Vehicles and the applied the appropriate emission factor.

County	Fairfax County	EPA_SECTOR:	Gas Stations		
FIPs Code	51059	SCC_L1:	Storage and Transport	Tier 1 Description:	Storage & Transport
Pollutant:	VOC	SCC_L2:	Petroleum and Petroleum Product Storage	Tier 2 Description:	Service Stations: Stage I
Scenario:	1	SCC_L3:	Gasoline Service Stations	Tier 3 Description:	Other
		SCC_L4:	Stage 1: Balanced Submerged Filling		

EMISSION CALCULATION:

$$\text{ANNUAL EMISSIONS} = \frac{\text{(State Activity Level)(Fips Activity Level)(EF)(Reactivity)(1-(CE * RP * RE))}}{\text{(Fips Activity Level\_Total)}}$$

$$\text{ANNUAL EMISSIONS} = \frac{\text{(StGasolineMotorFuelTaxed)(CoGasSales)(EF)(Reactivity)(1-(CE * RP * RE))}}{\text{(StGasSales)}}$$

$$\text{ANNUAL EMISSIONS} = \frac{\text{(3867030.279kgal)(1144257Gas Sales (\$1,000))(5.955217lb/kgal)(1)(1-(0.958481674194336 * 0.8 * 0.8))}}{\text{(14237780Gas Sales (\$1,000))}}$$

ANNUAL EMISSIONS = 559354.75185 lb/year VOC

ANNUAL EMISSIONS = 279.67738 tons/year VOC

DAILY EMISSIONS = ANNUAL EMISSIONS (tons/yr) * Seasonal Adjustment Factor/Peak Ozone Season / Days per Period

DAILY EMISSIONS = 279.67738 * 0.262525702 / 0.25 / 365

DAILY EMISSIONS = 0.8046301 tons/day VOC

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Virginia Department of Environmental Quality 2011 Area and Nonroad Sample Calculations

2501060100 **Stage II Automobile Refueling, Gasoline** Inventory Year: 2011

This non-point source emission inventory category covers the Stage II emissions that take place when vehicles are fueled with gasoline.

VDEQ estimated Stage II refueling emissions using the EPA Mobile Model and entered the emission estimates directly into the state inventory system.

County	Fairfax County	EPA_SECTOR:	Gas Stations		
FIPs Code	51059	SCC_L1:	Storage and Transport	Tier 1 Description:	Storage & Transport
Pollutant:	VOC	SCC_L2:	Petroleum and Petroleum Product Storage	Tier 2 Description:	Service Stations: Stage II
Scenario:	1	SCC_L3:	Gasoline Service Stations	Tier 3 Description:	Other
		SCC_L4:	Stage 2: Total		

EMISSION CALCULATION:

$$\text{ANNUAL EMISSIONS} = \frac{\text{(Fips Activity Level)(EF)(Reactivity)(1-(CE * RP * RE))}}{}$$

$$\text{ANNUAL EMISSIONS} = \frac{\text{(AnnualVMT)(EF)(Reactivity)(1-(CE * RP * RE))}}{}$$

$$\text{ANNUAL EMISSIONS} = \frac{\text{(10860.4588790001Million VMT)(31.99795lb/MilVMT)(1)(1-(0 * 0 * 0))}}{}$$

ANNUAL EMISSIONS = 347512.39513 lb/year VOC

ANNUAL EMISSIONS = 173.7562 tons/year VOC

DAILY EMISSIONS = ANNUAL EMISSIONS (tons/yr) * Seasonal Adjustment Factor/Peak Ozone Season / Days per Period

DAILY EMISSIONS = 173.7562 * 0.262525702 / 0.25 / 365

DAILY EMISSIONS = 0.4998955 tons/day VOC

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Virginia Department of Environmental Quality 2011 Area and Nonroad Sample Calculations

2501060201 **Underground Storage Tank Breathing Losses** Inventory Year: 2011

This non-point source emission inventory category covers the emissions from underground storage tank breathing losses that result from internal vapor pressure inside the tanks needing to be vented.

VDEQ apportioned state total fuel consumption data to a county level based on county level sales tax data obtained from Va Division of Motor Vehicles and the applied the appropriate emission factor.

County	Fairfax County	EPA_SECTOR:	Gas Stations		
FIPs Code	51059	SCC_L1:	Storage and Transport	Tier 1 Description:	Storage & Transport
Pollutant:	VOC	SCC_L2:	Petroleum and Petroleum Product Storage	Tier 2 Description:	Service Stations: Breathing & Emptying
Scenario:	1	SCC_L3:	Gasoline Service Stations	Tier 3 Description:	Other
		SCC_L4:	Underground Tank: Breathing and Emptying		

EMISSION CALCULATION:

$$\text{ANNUAL EMISSIONS} = \frac{\text{(State Activity Level)(Fips Activity Level)(EF)(Reactivity)(1-(CE * RP * RE))}}{\text{(Fips Activity Level\_Total)}}$$

$$\text{ANNUAL EMISSIONS} = \frac{\text{(StMotorFuelTaxed)(CoGasSales)(EF)(Reactivity)(1-(CE * RP * RE))}}{\text{(StGasSales)}}$$

$$\text{ANNUAL EMISSIONS} = \frac{\text{(5495997kgal)(1144257Gas Sales (\$1,000))(0.8764497lb/kgal)(1)(1-(0 * 0 * 0))}}{\text{(14237780Gas Sales (\$1,000))}}$$

ANNUAL EMISSIONS = 387128.17987 lb/year VOC

ANNUAL EMISSIONS = 193.56409 tons/year VOC

DAILY EMISSIONS = ANNUAL EMISSIONS (tons/yr) * Seasonal Adjustment Factor/Peak Ozone Season / Days per Period

DAILY EMISSIONS = 193.56409 * 0.262525702 / 0.25 / 365

DAILY EMISSIONS = 0.5568827 tons/day VOC

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Virginia Department of Environmental Quality 2011 Area and Nonroad Sample Calculations

2501070100 **Stage II Automobile Refueling, Diesel** Inventory Year: 2011

This non-point source emission inventory category covers the Stage II emissions that take place when vehicles are fueled with diesel.

2011 county level Stage II diesel emission estimates that were calculated by the EPA were downloaded from the EPA 2011 National Emission Inventory and entered directly into the Virginia state inventory.

County	Fairfax County	EPA_SECTOR:	Gas Stations		
FIPs Code	51059	SCC_L1:	Storage and Transport	Tier 1 Description:	Storage & Transport
Pollutant:	VOC	SCC_L2:	Petroleum and Petroleum Product Storage	Tier 2 Description:	Service Stations: Stage II
Scenario:	1	SCC_L3:	Diesel Service Stations	Tier 3 Description:	Other
		SCC_L4:	Stage 2: Total		

EMISSION CALCULATION:

$$\text{ANNUAL EMISSIONS} = \frac{\text{(Fips Activity Level)(EF)(Reactivity)(1-(CE * RP * RE))}}{}$$

$$\text{ANNUAL EMISSIONS} = \frac{\text{(ActualEmissions)(EF)(Reactivity)(1-(CE * RP * RE))}}{}$$

$$\text{ANNUAL EMISSIONS} = \frac{\text{(1year)(11620lb/yr)(1)(1-(0 * 0 * 0))}}{}$$

ANNUAL EMISSIONS = 11620 lb/year VOC

ANNUAL EMISSIONS = 5.81 tons/year VOC

DAILY EMISSIONS = ANNUAL EMISSIONS (tons/yr) * Seasonal Adjustment Factor/Peak Ozone Season / Days per Period

DAILY EMISSIONS = 5.81 * 0.262525702 / 0.25 / 365

DAILY EMISSIONS = 0.0167153 tons/day VOC

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Virginia Department of Environmental Quality 2011 Area and Nonroad Sample Calculations

2501080050 **Stage 1 Airport Refueling, Gasoline** Inventory Year: 2011

This non-point source emission inventory category covers the Stage 1 emissions that take place when aviation gasoline is delivered to airport fueling stations.

2011 county level Stage I aviation gasoline distribution emission estimates that were calculated by the EPA were downloaded from the EPA 2011 National Emission Inventory and entered directly into the Virginia state inventory.

County	Loudoun County	EPA_SECTOR:	Gas Stations		
FIPs Code	51107	SCC_L1:	Storage and Transport	Tier 1 Description:	Storage & Transport
Pollutant:	VOC	SCC_L2:	Petroleum and Petroleum Product Storage	Tier 2 Description:	Petroleum & Petroleum Product Storage
Scenario:	2	SCC_L3:	Airports : Aviation Gasoline	Tier 3 Description:	Other
		SCC_L4:	Stage 1: Total		

EMISSION CALCULATION:

$$\text{ANNUAL EMISSIONS} = \frac{\text{(Fips Activity Level)(EF)(Reactivity)(1-(CE * RP * RE))}}{}$$

$$\text{ANNUAL EMISSIONS} = \frac{\text{(Aviation Gasoline Distribution - Stage I)(EF)(Reactivity)(1-(CE * RP * RE))}}{}$$

$$\text{ANNUAL EMISSIONS} = \frac{\text{(83775lbs VOC)(1LB / LB VOC)(1)(1-(0 * 0 * 0))}}{}$$

ANNUAL EMISSIONS = 83775 lb/year VOC

ANNUAL EMISSIONS = 41.8875 tons/year VOC

DAILY EMISSIONS = ANNUAL EMISSIONS (tons/yr) * Seasonal Adjustment Factor/Peak Ozone Season / Days per Period

DAILY EMISSIONS = 41.8875 * 0.26 / 0.25 / 300

DAILY EMISSIONS = 0.14521 tons/day VOC

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Virginia Department of Environmental Quality 2011 Area and Nonroad Sample Calculations

2501080100 **Stage II Airport Refueling, Gasoline** Inventory Year: 2011

This non-point source emission inventory category covers the Stage II emissions that take place when aircraft are fueled with gasoline.

VDEQ apportioned state total aviation gasoline consumption data to a county level based on aircraft LTO activity data and then applied the appropriate emission factor.

County	Loudoun County	EPA_SECTOR:	Gas Stations		
FIPs Code	51107	SCC_L1:	Storage and Transport	Tier 1 Description:	Storage & Transport
Pollutant:	VOC	SCC_L2:	Petroleum and Petroleum Product Storage	Tier 2 Description:	Petroleum & Petroleum Product Storage
Scenario:	1	SCC_L3:	Airports : Aviation Gasoline	Tier 3 Description:	Other
		SCC_L4:	Stage 2: Total		

EMISSION CALCULATION:

$$\text{ANNUAL EMISSIONS} = \frac{\text{(Regional Activity Level)(Fips Activity Level)(EF)(Reactivity)(1-(CE * RP * RE))}}{\text{(Regional Activity Level)}}$$

$$\text{ANNUAL EMISSIONS} = \frac{\text{(AvGas)(LTOs)(EF)(Reactivity)(1-(CE * RP * RE))}}{\text{(LTOs)}}$$

$$\text{ANNUAL EMISSIONS} = \frac{\text{(43638000Gal)(128832.621768LTOs)(0.0136lb / gal)(1)(1-(0 * 0 * 0))}}{\text{(LTOsGal)}}$$

ANNUAL EMISSIONS = 4347.02835 lb/year VOC

ANNUAL EMISSIONS = 2.17351 tons/year VOC

DAILY EMISSIONS = ANNUAL EMISSIONS (tons/yr) * Seasonal Adjustment Factor/Peak Ozone Season / Days per Period

DAILY EMISSIONS = 2.17351 * 0.26 / 0.25 / 300

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DAILY EMISSIONS = 0.0075348 tons/day VOC

Virginia Department of Environmental Quality 2011 Area and Nonroad Sample Calculations

2505030120 **Tank Trucks in Transit** Inventory Year: 2011

This non-point source emission inventory category estimates the emissions that result from the venting of internal vapor pressure of on-board gasoline storage tanks of tank trucks while in transit.

VDEQ apportioned state total fuel consumption data to a county level based on county level sales tax data obtained from Va Division of Motor Vehicles and then applied the appropriate emission factor.

County	Fairfax County	EPA_SECTOR:	Industrial Processes - Storage and Transfer		
FIPs Code	51059	SCC_L1:	Storage and Transport	Tier 1 Description:	Storage & Transport
Pollutant:	VOC	SCC_L2:	Petroleum and Petroleum Product Transport	Tier 2 Description:	Petroleum & Petroleum Product Transport
Scenario:	1	SCC_L3:	Truck	Tier 3 Description:	Other
		SCC_L4:	Gasoline		

EMISSION CALCULATION:

$$\text{ANNUAL EMISSIONS} = \frac{\text{(State Activity Level)(Fips Activity Level)(FuelLoadingFactor)(EF)(Reactivity)(1-(CE * RP * RE))}}{\text{(Fips Activity Level\_Total)}}$$

$$\text{ANNUAL EMISSIONS} = \frac{\text{(StMotorFuelTaxed)(CoGasSales)(TTIT\_FuelTransported)(EF)(Reactivity)(1-(CE * RP * RE))}}{\text{(StGasSales)}}$$

$$\text{ANNUAL EMISSIONS} = \frac{\text{195997kgal)(1144257Gas Sales (\$1,000))(1.25gallons transported per gallon taxed)(0.04895lb/kgal)(1)(1-(0 * 0 * (}}{\text{(14237780Gas Sales (\$1,000))}}$$

ANNUAL EMISSIONS = 27026.54376 lb/year VOC

ANNUAL EMISSIONS = 13.51327 tons/year VOC

DAILY EMISSIONS = ANNUAL EMISSIONS (tons/yr) * Seasonal Adjustment Factor/Peak Ozone Season / Days per Period

DAILY EMISSIONS = 13.51327 * 0.262525702 / 0.25 / 312

DAILY EMISSIONS = 0.0454818 tons/day VOC

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Virginia Department of Environmental Quality 2011 Area and Nonroad Sample Calculations

2505040120 **Pipeline Emissions** Inventory Year: 2011

This non-point source emission inventory category estimates the emissions from gasoline pipelines.

VDEQ apportioned national pipeline emission data to a county level and then applied the appropriate emission factor.

County	Prince William County	EPA_SECTOR:	Industrial Processes - Storage and Transfer		
FIPs Code	51153	SCC_L1:	Storage and Transport	Tier 1 Description:	Storage & Transport
Pollutant:	VOC	SCC_L2:	Petroleum and Petroleum Product Transport	Tier 2 Description:	Petroleum & Petroleum Product Transport
Scenario:	1	SCC_L3:	Pipeline	Tier 3 Description:	Other
		SCC_L4:	Gasoline		

EMISSION CALCULATION:

$$\text{ANNUAL EMISSIONS} = \frac{\text{(National Acttivity Level)(Regional Activity Level)(Fips Activity Level)(EF)(Reactivity)(1-(CE * RP * RE))}}{\text{(State Activity Level Total)(Regional Activity Level)}}$$

$$\text{ANNUAL EMISSIONS} = \frac{\text{VOC Emissions)(Gasoline Moved By Pipeline)(NAICS Emp - Petroleum Bulk Stations and Terminals)(EF)(Reactivity)}}{\text{(Gasoline Moved By Pipeline)(NAICS Emp - Petroleum Bulk Stations and Terminals)}}$$

$$\text{ANNUAL EMISSIONS} = \frac{\text{(191688239lbs VOC)(404750Thousand Barrels)(42.6938775510204Employees)(1LB / LB VOC)(1)(1-(0 * 0 * 0))}}{\text{(1139500thousand barrels)(EmployeesThousand Barrels)}}$$

ANNUAL EMISSIONS = 180745.10057 lb/year VOC

ANNUAL EMISSIONS = 90.37255 tons/year VOC

DAILY EMISSIONS = ANNUAL EMISSIONS (tons/yr) * Seasonal Adjustment Factor/Peak Ozone Season / Days per Period

DAILY EMISSIONS = 90.37255 * 0.25 / 0.25 / 312

DAILY EMISSIONS = 0.2896556 tons/day VOC

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Virginia Department of Environmental Quality 2011 Area and Nonroad Sample Calculations

2505040120 **Pipeline Emissions** Inventory Year: 2011

This non-point source emission inventory category estimates the emissions from gasoline pipelines.

VDEQ apportioned national pipeline emission data to a county level and then applied the appropriate emission factor.

County	Fairfax County	EPA_SECTOR:	Industrial Processes - Storage and Transfer		
FIPs Code	51059	SCC_L1:	Storage and Transport	Tier 1 Description:	Storage & Transport
Pollutant:	VOC	SCC_L2:	Petroleum and Petroleum Product Transport	Tier 2 Description:	Petroleum & Petroleum Product Transport
Scenario:	1	SCC_L3:	Pipeline	Tier 3 Description:	Other
		SCC_L4:	Gasoline		

EMISSION CALCULATION:

$$\text{ANNUAL EMISSIONS} = \frac{\text{(National Acttivity Level)(Regional Activity Level)(Fips Activity Level)(EF)(Reactivity)(1-(CE * RP * RE))}}{\text{(State Activity Level Total)(Regional Activity Level)}}$$

$$\text{ANNUAL EMISSIONS} = \frac{\text{VOC Emissions)(Gasoline Moved By Pipeline)(NAICS Emp - Petroleum Bulk Stations and Terminals)(EF)(Reactivity)}}{\text{(Gasoline Moved By Pipeline)(NAICS Emp - Petroleum Bulk Stations and Terminals)}}$$

$$\text{ANNUAL EMISSIONS} = \frac{\text{(191688239lbs VOC)(404750Thousand Barrels)(42.6938775510204Employees)(1LB / LB VOC)(1)(1-(0 * 0 * 0))}}{\text{(1139500thousand barrels)(EmployeesThousand Barrels)}}$$

ANNUAL EMISSIONS = 180745.10057 lb/year VOC

ANNUAL EMISSIONS = 90.37255 tons/year VOC

DAILY EMISSIONS = ANNUAL EMISSIONS (tons/yr) * Seasonal Adjustment Factor/Peak Ozone Season / Days per Period

DAILY EMISSIONS = 90.37255 * 0.25 / 0.25 / 312

DAILY EMISSIONS = 0.2896556 tons/day VOC

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Virginia Department of Environmental Quality 2011 Area and Nonroad Sample Calculations

2601020000 **On-site Incineration, Commercial/Institutional** Inventory Year: 2011

This non-point source emission inventory category estimates the emissions from on-site commercial and institutional waste disposal incineration.

Virginia DEQ estimated 2011 emissions for this category based on 2011 county level employment data, a per person activity factor of 0.054 tons per person an appropriate emission factor.

County	Fairfax County	EPA_SECTOR:	Waste Disposal		
FIPs Code	51059	SCC_L1:	Waste Disposal, Treatment, and Recovery	Tier 1 Description:	Waste Disposal & Recycling
Pollutant:	VOC	SCC_L2:	On-site Incineration	Tier 2 Description:	Incineration
Scenario:	1	SCC_L3:	Commercial/Institutional	Tier 3 Description:	Commercial/Institutional
		SCC_L4:	Total		

EMISSION CALCULATION:

$$\text{ANNUAL EMISSIONS} = \frac{\text{(Fips Activity Level)(FuelLoadingFactor)(EF)(Reactivity)(1-(CE * RP * RE))}}{}$$

$$\text{ANNUAL EMISSIONS} = \frac{\text{(CoPop)(INCINI\_CI)(EF)(Reactivity)(1-(CE * RP * RE))}}{}$$

$$\text{ANNUAL EMISSIONS} = \frac{\text{(1063957People)(0.054tons per capita)(5.94lb/ton)(1)(1-(0 * 0 * 0))}}{}$$

ANNUAL EMISSIONS = 341274.85061 lb/year VOC

ANNUAL EMISSIONS = 170.63743 tons/year VOC

DAILY EMISSIONS = ANNUAL EMISSIONS (tons/yr) * Seasonal Adjustment Factor/Peak Ozone Season / Days per Period

DAILY EMISSIONS = 170.63743 * 0.25 / 0.25 / 365

DAILY EMISSIONS = 0.4674998 tons/day VOC

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Virginia Department of Environmental Quality 2011 Area and Nonroad Sample Calculations

2640000000 **Industrial Wastewater Treatment Plants, IWW** Inventory Year: 2011

This non-point source emission inventory category estimates the emissions from industrial wastewater treatment plants.

Virginia DEQ estimated 2011 industrial wastewater treatment emissions based on volume of industrial wastewater treated per county multiplied by an appropriate emission factor.

County	Fairfax County	EPA_SECTOR:	Waste Disposal		
FIPs Code	51059	SCC_L1:	Waste Disposal, Treatment, and Recovery	Tier 1 Description:	Waste Disposal & Recycling
Pollutant:	VOC	SCC_L2:	TSDFs	Tier 2 Description:	TSDF
Scenario:	1	SCC_L3:	All TSDF Types	Tier 3 Description:	Other
		SCC_L4:	Total: All Processes		

EMISSION CALCULATION:

$$\text{ANNUAL EMISSIONS} = \frac{\text{(Fips Activity Level)(EF)(Reactivity)(1-(CE * RP * RE))}}{}$$

$$\text{ANNUAL EMISSIONS} = \frac{\text{(IndustrialWastewaterTreated)(EF)(Reactivity)(1-(CE * RP * RE))}}{}$$

$$\text{ANNUAL EMISSIONS} = \frac{\text{(184.66138197Million Gallons)(21.44986lb/Mgal)(1)(1-(0 * 0 * 0))}}{}$$

ANNUAL EMISSIONS = 3960.96072 lb/year VOC

ANNUAL EMISSIONS = 1.98048 tons/year VOC

DAILY EMISSIONS = ANNUAL EMISSIONS (tons/yr) * Seasonal Adjustment Factor/Peak Ozone Season / Days per Period

DAILY EMISSIONS = 1.98048 * 0.25 / 0.25 / 365

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DAILY EMISSIONS = 0.005426 tons/day VOC

Virginia Department of Environmental Quality 2011 Area and Nonroad Sample Calculations

2660000000 **Leaking Underground Storage Tanks** Inventory Year: 2011

This non-point source emission inventory category estimates the emissions from the remediation of leaking underground storage tanks.

Virginia estimated emissions from remediation of leaking underground storage tanks by estimating the volume of soil remediated during the leaking tank removals multiplied by an appropriate emission factor.

County	Fairfax County	EPA_SECTOR:	Waste Disposal		
FIPs Code	51059	SCC_L1:	Waste Disposal, Treatment, and Recovery	Tier 1 Description:	Waste Disposal & Recycling
Pollutant:	VOC	SCC_L2:	Leaking Underground Storage Tanks	Tier 2 Description:	Other
Scenario:	13	SCC_L3:	Leaking Underground Storage Tanks	Tier 3 Description:	Other
		SCC_L4:	Total: All Storage Types		

EMISSION CALCULATION:

$$\text{ANNUAL EMISSIONS} = \frac{\text{(Fips Activity Level)(ActCF)(EF)(Reactivity)(1-(CE * RP * RE))}}{}$$

$$\text{ANNUAL EMISSIONS} = \frac{\text{(UST Soil Remediated)(ppm to ppp)(EF)(Reactivity)(1-(CE * RP * RE))}}{}$$

$$\text{ANNUAL EMISSIONS} = \frac{\text{(1810703.7037037lbs)(0.000001n/a)(176ppmw)(1)(1-(0 * 0 * 0))}}{}$$

ANNUAL EMISSIONS = 318.68385 lb/year VOC

ANNUAL EMISSIONS = 0.15934 tons/year VOC

DAILY EMISSIONS = ANNUAL EMISSIONS (tons/yr) * Seasonal Adjustment Factor/Peak Ozone Season / Days per Period

DAILY EMISSIONS = 0.15934 * 0.25 / 0.25 / 365

DAILY EMISSIONS = 0.0004366 tons/day VOC

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Virginia Department of Environmental Quality 2011 Area and Nonroad Sample Calculations

2801500000 **Agricultural Burning** Inventory Year: 2011

This non-point source emission inventory category estimates the emissions from agricultural burning which generally involves the burning off of whole fields which are set on fire to clear residual plant matter in preparation for the next crop.

Virginia estimated emissions from agricultural land burning based on the estimate annual agricultural land burned per county multiplied by an appropriate emission factor.

County	Loudoun County	EPA_SECTOR:	Fires - Agricultural Field Burning		
FIPs Code	51107	SCC_L1:	Miscellaneous Area Sources	Tier 1 Description:	Miscellaneous
Pollutant:	VOC	SCC_L2:	Agriculture Production - Crops - as nonpoint	Tier 2 Description:	Other Combustion
Scenario:	1	SCC_L3:	Agricultural Field Burning - whole field set on fire	Tier 3 Description:	Agricultural Fires
		SCC_L4:	Unspecified crop type and Burn Method		

EMISSION CALCULATION:

$$\text{ANNUAL EMISSIONS} = \frac{\text{(Fips Activity Level)(EF)(Reactivity)(1-(CE * RP * RE))}}{}$$

$$\text{ANNUAL EMISSIONS} = \frac{\text{(Agricultural Land Burned)(EF)(Reactivity)(1-(CE * RP * RE))}}{}$$

$$\text{ANNUAL EMISSIONS} = \frac{\text{(2159.23Acres)(18.20515lb/acre)(1)(1-(0 * 0 * 0))}}{}$$

ANNUAL EMISSIONS = 39309.0991 lb/year VOC

ANNUAL EMISSIONS = 19.65455 tons/year VOC

DAILY EMISSIONS = ANNUAL EMISSIONS (tons/yr) * Seasonal Adjustment Factor/Peak Ozone Season / Days per Period

DAILY EMISSIONS = 19.65455 * 0.25 / 0.25 / 365

DAILY EMISSIONS = 0.0538481 tons/day VOC

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Virginia Department of Environmental Quality 2011 Area and Nonroad Sample Calculations

2810001000 **Forest Wildfires** Inventory Year: 2011

Emissions from each wildfire 'event' taking place in Virginia are estimated on an individual fire by fire basis.

2011 county level wildfire emissions that were estimated by the EPA were obtained directly from the EPA 2011 National Emission Inventory and entered directly into the Virginia state inventory.

County	Loudoun County	EPA_SECTOR:	Fires - Wildfires		
FIPs Code	51107	SCC_L1:	Miscellaneous Area Sources	Tier 1 Description:	Miscellaneous
Pollutant:	voc	SCC_L2:	Other Combustion	Tier 2 Description:	Other Combustion
Scenario:	1	SCC_L3:	Forest Wildfires	Tier 3 Description:	Forest Wildfires
		SCC_L4:	Wildfires		

EMISSION CALCULATION:

$$\text{ANNUAL EMISSIONS} = \frac{\text{(Fips Activity Level)(EF)(Reactivity)(1-(CE * RP * RE))}}{}$$

$$\text{ANNUAL EMISSIONS} = \frac{\text{(ActualEmissions)(EF)(Reactivity)(1-(CE * RP * RE))}}{}$$

$$\text{ANNUAL EMISSIONS} = \frac{\text{(1year)(26277.22lb/yr)(1)(1-(0 * 0 * 0))}}{}$$

ANNUAL EMISSIONS = 26277.22461 lb/year voc

ANNUAL EMISSIONS = 13.13861 tons/year voc

DAILY EMISSIONS = ANNUAL EMISSIONS (tons/yr) * Seasonal Adjustment Factor/Peak Ozone Season / Days per Period

DAILY EMISSIONS = 13.13861 * 0.25 / 0.25 / 365

DAILY EMISSIONS = 0.0359962 tons/day voc

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Virginia Department of Environmental Quality 2011 Area and Nonroad Sample Calculations

2810030000 **Structural Fires** Inventory Year: 2011

This non-point source emission inventory category estimates emissions resulting from structural fires.

VDEQ staff obtained the number of structural fires that occurred in each county in 2011 and applied a per fire fuel burned factor of 1.15 tons/fire multiplied by an appropriate emission factor to estimate structural fire emissions.

County	Fairfax County	EPA_SECTOR:	Miscellaneous Non-Industrial NEC		
FIPs Code	51059	SCC_L1:	Miscellaneous Area Sources	Tier 1 Description:	Miscellaneous
Pollutant:	VOC	SCC_L2:	Other Combustion	Tier 2 Description:	Other Combustion
Scenario:	1	SCC_L3:	Structure Fires	Tier 3 Description:	Structural Fires
		SCC_L4:	Unspecified		

EMISSION CALCULATION:

$$\text{ANNUAL EMISSIONS} = \frac{\text{(Fips Activity Level)(FuelLoadingFactor)(EF)(Reactivity)(1-(CE * RP * RE))}}{}$$

$$\text{ANNUAL EMISSIONS} = \frac{\text{(StructuralFires)(StructuralFires)(EF)(Reactivity)(1-(CE * RP * RE))}}{}$$

$$\text{ANNUAL EMISSIONS} = \frac{\text{(215Fires)(1.15tons/fire)(11lb/ton)(1)(1-(0 * 0 * 0))}}{}$$

ANNUAL EMISSIONS = 2719.75 lb/year VOC

ANNUAL EMISSIONS = 1.35987 tons/year VOC

DAILY EMISSIONS = ANNUAL EMISSIONS (tons/yr) * Seasonal Adjustment Factor/Peak Ozone Season / Days per Period

DAILY EMISSIONS = 1.35987 * 0.2 / 0.25 / 365

DAILY EMISSIONS = 0.0029805 tons/day VOC

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Virginia Department of Environmental Quality 2011 Area and Nonroad Sample Calculations

2810060100 **Human Cremation** Inventory Year: 2011

This non-point source emission inventory category estimates emissions resulting from human cremation.

VDEQ estimated emissions for this category by multiplying the number of human bodies cremated per county in 2011 by an average weight of 0.0842 tons per body times an appropriate emission factor.

County	Fairfax County	EPA_SECTOR:	Miscellaneous Non-Industrial NEC		
FIPs Code	51059	SCC_L1:	Miscellaneous Area Sources	Tier 1 Description:	Miscellaneous
Pollutant:	VOC	SCC_L2:	Other Combustion	Tier 2 Description:	Other Combustion
Scenario:	1	SCC_L3:	Cremation	Tier 3 Description:	Other
		SCC_L4:	Humans		

EMISSION CALCULATION:

$$\text{ANNUAL EMISSIONS} = \frac{\text{(Fips Activity Level)(FuelLoadingFactor)(EF)(Reactivity)(1-(CE * RP * RE))}}{}$$

$$\text{ANNUAL EMISSIONS} = \frac{\text{(Bodies Cremated)(Human Cremation)(EF)(Reactivity)(1-(CE * RP * RE))}}{}$$

$$\text{ANNUAL EMISSIONS} = \frac{\text{(3041Bodies)(0.084265929tons per body)(8.333334E-02lb/ton)(1)(1-(0 * 0 * 0))}}{}$$

ANNUAL EMISSIONS = 21.35439 lb/year VOC

ANNUAL EMISSIONS = 0.01068 tons/year VOC

DAILY EMISSIONS = ANNUAL EMISSIONS (tons/yr) * Seasonal Adjustment Factor/Peak Ozone Season / Days per Period

DAILY EMISSIONS = 0.01068 * 0.3 / 0.25 / 312

DAILY EMISSIONS = 0.0000411 tons/day VOC

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Virginia Department of Environmental Quality 2011 Area and Nonroad Sample Calculations

2811015000 **Prescribed Burning** Inventory Year: 2011

This non-point source emission inventory category estimates the emissions resulting from prescribed burning.

2011 county level prescribed burning emissions that were estimated by the EPA were obtained directly from the EPA 2011 National Emission Inventory and entered directly into the Virginia state inventory.

County	Prince William County	EPA_SECTOR:	Fires - Prescribed Fires		
FIPs Code	51153	SCC_L1:	Miscellaneous Area Sources	Tier 1 Description:	Miscellaneous
Pollutant:	voc	SCC_L2:	Other Combustion - as Event	Tier 2 Description:	Other Combustion
Scenario:	1	SCC_L3:	Prescribed Forest Burning	Tier 3 Description:	Prescribed Burning
		SCC_L4:	Unspecified Burn Method		

EMISSION CALCULATION:

$$\text{ANNUAL EMISSIONS} = \frac{\text{(Fips Activity Level)(EF)(Reactivity)(1-(CE * RP * RE))}}{}$$

$$\text{ANNUAL EMISSIONS} = \frac{\text{(ActualEmissions)(EF)(Reactivity)(1-(CE * RP * RE))}}{}$$

$$\text{ANNUAL EMISSIONS} = \frac{\text{(1year)(1092067lb/ton)(1)(1-(0 * 0 * 0))}}{}$$

ANNUAL EMISSIONS = 1092067.375 lb/year voc

ANNUAL EMISSIONS = 546.03369 tons/year voc

DAILY EMISSIONS = ANNUAL EMISSIONS (tons/yr) * Seasonal Adjustment Factor/Peak Ozone Season / Days per Period

DAILY EMISSIONS = 546.03369 * 0.25 / 0.25 / 365

DAILY EMISSIONS = 1.4959827 tons/day voc

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