Appendix 4-5:
Point and Area Sources
2023 Projection Emission Inventories

1.0 Introduction

1.1 Statutory Requirement

As discussed in Chapter 4, 2016 (2016version 2 and version 3 hybrid was chosen as the base emission inventory year for attainment demonstration modeling for compliance with the 70 ppb ozone standard. As required by the federal implementation rule, 2017 was chosen as the base year for the Reasonable Further Progress (RFP) demonstration.

Based on New Jersey's moderate classification for both of its northern and southern nonattainment areas, New Jersey is required to demonstrate RFP compliance by showing a 15 percent or greater reduction in ozone precursors from 2017 to 2023. As required for RFP, this SIP presents an estimated 2023 projection inventory from a 2017 base year for ozone precursor summer tons per day emissions. Additional details regarding the 2017 base inventory are discussed in Chapter 4.

1.2 Projection Emissions Inventories

To calculate future year inventory emissions, growth or decline in emissions is estimated as well as reductions achieved from any control measures, Federal or State, which were applicable after the base year and prior to or in the projection year. As discussed above, the base inventory for the projections is 2017 actual emission inventories for emissions in summer tons per day for volatile organic compounds (VOC), oxides of nitrogen (NO_x), and carbon monoxide (CO).

The United States Environmental Protection Agency (USEPA) preferred approach for projecting emissions growth incorporates locality-specific estimates such as population, employment, historical averaging; or other category-specific activity such as fuel consumption, product output, vehicle miles traveled, or equipment populations.[1]

In the non-Electric Generating Unit point (non-EGU point) and area source emission sectors, growth factors were calculated for a specific range of years and used in spreadsheets or databases to calculate future year emissions. Once the emission inventories were grown, the next step was to determine which control measures within each of the various emission sectors would be in place during or prior to that year and apply the emission reduction benefits from those control measures. The combined effects of growth and controls represent the inventory projection. Post-2017 control measure benefits (including benefits from pre-2017 measures that have future effective dates or equipment turnover) were applied to each emission sector as appropriate.

The 2023 projection emissions inventories for non-EGU point and area sources were prepared with the support of the Mid-Atlantic Regional Air Management Association (MARAMA). MARAMA's spreadsheet tools which were utilized for the 2016 based modeling platform were used to calculate growth factors from 2017 to 2023 for these sectors.

[1] Emissions Inventory Guidance for Implementation of Ozone and Particulate Matter National Ambient Air Quality Standards (NAAQS) and Regional Haze Regulations, U.S. Environmental Protection Agency, July 2017.

2.0 Point Sources

2.1 Electric Generation Unit (EGU) Point Source Growth and Control

For EGU point sources, the following methodology was used to estimate summer tons per day for the 2023 future projection year using the New Jersey 2017 Emission Statement Program data (ES) and the latest USEPA Clean Air Markets Division (CAMD) hourly data (https://ampd.epa.gov/ampd/).

To estimate 2023 NOx, VOC and CO summer tons per day where a unit was existing in the 2017 base year the following equations were used:

2017-2020 annual growth factor =
(2020 CAMD peak ozone season (summer) operating hours /
2017 CAMD peak ozone season (summer) operating hours)^(1/3)

NOx, VOC and CO unit 2023 emissions (summer tons per day) =
(2017 ES peak ozone season (summer) emissions)*
((2017-2020 annual growth factor)^6)

Where:
ES = Emissions from Emission Statements in summer tons per day
Peak ozone season (summer) = June, July, August

For new units operational after 2017 or units no operating in 2017, calculations were based on 2019 Emission statements.

These estimates are conservative as they do not account for reductions from the Federal CSAPR regulations.

The estimated EGU projection emissions are included in Attachment 1.

2.2 Non-Electric Generation Unit (non-EGU) Point Sources Growth

For the non-EGU point source sector, emission growth factors were estimated from 2017 to 2023 and applied to the 2017 inventory at the unit level. Each facility and unit were evaluated based on the North American Industry Classification System (NAICS) codes [2], the United States Environmental Protection Agency (USEPA) Source Classification Codes (SCC), and state specific information reported in New Jersey's emission statement program including: 1. New Jersey facility description; 2. New Jersey equipment type; and 3. New Jersey fuel type.

Emissions associated with petroleum storage and transportation, and asphalt storage (evaporative emissions and emissions from natural gas pipeline compressors) were grown using the United States Department of Energy (USDOE) Energy Information Administration (EIA), Annual Energy Outlook (AEO). AEO fuel projections were used to calculate growth factors, and AEO categories were aligned with the best fit for the emission source.

[2] The North American Industry Classification System (NAICS) is the standard used by Federal statistical agencies in classifying business establishments for the purpose of collecting, analyzing, and publishing statistical data related to the U.S. business economy.

The remaining point source emissions were grown using employment projections from the New Jersey Department of Labor (NJDOL) and Workforce Development's Industry and Occupational Employment Projections[3]. Facilities are assigned NAICS codes at the five digit level. The NJDOL projections are at the three digit NAICS code level. NJDOL employment projections were used to calculate growth factors, and NJDOL NAICS categories were aligned with the best fit for the emission source.

The growth factors are shown in the non-EGU point source emission inventory by unit in Attachment 2. The non-EGU point source emission inventories by unit, source classification code (SCC) code and facility are included as Attachments 2, 3 and 4, respectively.

2.3 Non-Electric Generation Unit (non-EGU) Point Sources Control Factors

New Jersey and the USEPA have implemented control measures that reduce point source emissions of air pollutants. For non-EGU point sources, control factors for post-2017 rules were applied to the 2023 grown, uncontrolled non-EGU Point Source inventory in order to estimate the projected 2023 emissions inventory. The equation that was used to project emissions in a future year, y, incorporating growth and the application of new control measures between year x and year y is:

$$E_y = E_x * GF^{x-y} * [1 - (CE * RE * RP)^{x-y}]$$

where:

Ey = Controlled emissions in year y
Ex = Controlled emissions in year x
GF^{x-y} = Growth factor used to grow emissions from year x to year y
CE = Control efficiency factor for a control measure implemented between years X and Y
RE = Rule Effectiveness Factor
RP = Rule Penetration Factor
CF=Control Factor = $[1 - (CE * RE * RP)^{x-y}]$

The control factors (CF) applied to the 2017 non-EGU point source inventory are shown in Attachment 2.

2.4 Point Source Control Measures

The 2017 emission inventory was used as a base for the projection inventory. The existing control measures which reduce point source emissions for NO_x, VOC, and CO in the projection inventory from 2017 to 2023 for both the northern and southern nonattainment areas are shown in Table 1 and 2.

[3] Statewide Industry and Occupational Projections Tables 2016-2026, released October 2018, downloaded 2/28/2019. https://nj.gov/labor/lpa/employ/indoccpj/indoccpj_index.html

Table 1
Point Source Control Measures for the
Northern NJ-NY-CT Nonattainment Area

Federal or State	Control Measure	New Jersey Administrative Code	Pollutants
New Jersey	Petroleum Storage Tanks	7:27-16.2	VOC
New Jersey	Stationary Gas Compressor Turbines and Engines (NOx ACT)	7:27-19.5, 19.8	NOx
New Jersey	Surface coating CTGs (Fiberglass Boat Manufacturing Material, Metal and Plastic Parts Coatings, Paper, Film, and Foil Coatings)	7:27-16.7,16.14,16.15	VOC
Federal	Natural Gas Turbine NSPS NOx control compliance date 1/1/2023	NA	NOx
Federal	Petroleum Refineries NSPS	NA	VOC
Federal	EGU: CSAPR, CSAPR Update, Revised CSAPR Update	NA	NOx

Table 2
Point Source Control Measures for the
Southern NJ-PA-DE-MD Nonattainment Area

Federal or State	Control Measure	New Jersey Administrative Code	Pollutants
New Jersey	Petroleum Storage Tanks	7:27-16.2	VOC
New Jersey	Surface coating CTGs (Fiberglass Boat Manufacturing Material, Metal and Plastic Parts Coatings, Paper, Film, and Foil Coatings)	7:27-16.7,16.14,16.15	VOC
Federal	Petroleum Refineries NSPS	7:27-16.2	VOC
Federal	EGU: CSAPR, CSAPR Update, Revised CSAPR Update	NA	NOx

A discussion of the control measure control factors is included below. The rules are discussed in more detail in Chapter 3. The control factors used in the inventory are included in Attachment 2.

New Jersey Stationary Gas Turbines and Engines (NOx ACT)

At N.J.A.C. 7:27-19.5, NJDEP adopted new standards for NO_x emissions from existing simple cycle combustion turbines combusting natural gas compressing gaseous fuel at major NO_x facilities (compressor turbines). At N.J.A.C. 7:27-19.8, NJDEP adopted new standards for NO_x emissions from stationary reciprocating engines combusting natural gas and compressing gaseous fuel at major NO_x facilities (compressor engines). These rules address NOx RACT requirements by establishing new limits on NOx emissions from existing simple cycle combustion turbines combusting natural gas and compressing gaseous fuel at major NOx facilities (compressor turbines) and stationary reciprocating engines combusting natural gas and compressing gaseous fuel at major NOx facilities (compressor engines). The final rules are

effective November 6, 2017 (49 N.J.R. 3518.) The effective date of the NOx emission benefits is November 6, 2019.

Fiberglass Boat Manufacturing Materials (2008 Control Technique Guidelines)

USEPA issued a Control Technique Guideline (CTG) in 2008 that provided control recommendations for reducing VOC emissions from the use of gel coats, resins, and materials used to clean application equipment in fiberglass boat manufacturing operations. These control approaches are recommended for all fiberglass boat manufacturing facilities where total actual VOC emissions from all fiberglass boat manufacturing operations are equal to or exceed 15 pounds per day. The NJDEP proposed new rules at N.J.A.C. 7:27-16.14 on January 3, 2017. The final rules are effective November 6, 2017 (49 N.J.R. 3518.). The new rules are based on the USEPA CTG, which establish an applicability limit of actual VOC emissions, before add-on control, of 15 pounds per day from all fiberglass boat manufacturing operations. There were no fiberglassboat manufacturing operations identified in New Jersey's northern NAA that met the applicability limit.

New Jersey Industrial Cleaning Solvents (2006 Control Technique Guidelines)

USEPA issued a CTG for industrial cleaning solvents in 2006 that provided control recommendations for reducing VOC emissions from industrial cleaning solvents used by many industries. The recommended measures for controlling VOC emissions from the use, storage and disposal of industrial cleaning solvents includes work practice standards, limitations on VOC content of the cleaning materials, and an optional alternative limit on composite vapor pressure of the cleaning materials. The NJDEP proposed new rules at N.J.A.C. 7:27-16.24 on January 3, 2017. The final rules are effective November 6, 2017 (49 N.J.R. 3518.) This rule was estimated to reduce VOCs by 90% from these sources. A rule effectiveness of 100% and a rule penetration of 100% was applied.

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New Jersey Misc. Metal and Plastic Parts Coatings (2008 Control Technique Guidelines)

USEPA issued a CTG for miscellaneous metal and plastic parts coatings in 2008 that provided control recommendations for reducing VOC emissions from for miscellaneous metal and plastic parts coatings and associated work practices. The NJDEP proposed new rules at N.J.A.C. 7:27-16.15 on January 3, 2017. The final rules are effective November 6, 2017 (49 N.J.R. 3518.) The new rules are based on the USEPA CTG, which specify an applicability limit of 2.7 tons of actual VOC emissions during any consecutive 12-month period from all miscellaneous metal and plastic part coating operations, including related cleaning activities. This rule was estimated to reduce VOCs by 90% from these sources. A rule effectiveness of 100% and a rule penetration of 100% was applied.

New Jersey Paper, Film, and Foil Coatings (2007 Control Technique Guidelines)

USEPA issued CTG in 2008 that provided control recommendations for reducing VOC emissions from paper, film and foil coatings. USEPA recommended applying the control recommendations for coatings only to individual paper, film and foil surface coating lines with the potential to emit at least 25 tpy of VOC from coatings, prior to controls. The NJDEP proposed amendments to N.J.A.C. 7:27-16.7 on January 3, 2017. The final rules are effective November 6, 2017 (49 N.J.R. 3518.) The new rules are based on the CTG, which requires paper, film, and foil coating operations to implement best management practices if the actual VOC emissions exceed 15 pounds per day for all coating operations. This rule was estimated to reduce VOCs by 90% from these sources. A rule effectiveness of 100% and a rule penetration of 100% was applied.

New Jersey Petroleum Storage

The NJDEP adopted amendments to N.J.A.C. 7:27-16.2, on April 20, 2009, which established requirements to reduce VOC emissions from bulk petroleum storage facilities. The rule identified specific requirements and the State estimated VOC percent reduction for individual years between 2012 and 2020. The estimated % reductions from the rule are shown in the table below. A rule effectiveness of 80% and a rule penetration of 100% was applied. The control efficiencies are shown in Attachment 2.

Year	% Reduction per year
2012	0.86%
2013	1.72%
2014	2.58%
2015	3.44%
2016	4.30%
2017	5.16%
2018	6.02%
2019	6.88%
2020	7.74%

Federal Petroleum Refineries NSPS

USEPA estimated reductions from Federal rules in the 2016 based modeling platform. The NSPS controls were applied to petroleum refineries for 2023. For storage tanks, a 49% control efficiency was applied. This control was applied to NO_X, SO_2, and VOC.

Federal CSAPR, CSAPR Update, Revised CSAPR Update

While the Eastern Regional Technical Advisory Committee (ERTAC) in cooperation with the Ozone Transport Commission (OTC) Modeling Committee developed a 2023 EGU projection inventory that estimated incorporation of the federal revised CSAPR Update for the 2016 modeling platform, New Jersey's 2023 RFP summer tons per day projection inventory does not incorporate the federal rule, and is therefore conservative.

2.5 Point Source Emission Inventory

Table 3 and 4 summarize the 2023 projected point source emission inventory by county for NO_x, VOC, and CO for each nonattainment area. Attachments 1 - 4, contain the detailed point source emission inventories. These attachments are only available electronically.

Table 3
2023 Point Source Emission Inventory by County and Pollutant
New Jersey's Northern NJ-NY-CT NAA

County	VOC	NO_x	CO
Non-EGU Point Peak Summer Tons Per Day			
Bergen	1.80	0.71	0.58
Essex	0.98	3.25	0.90
Hudson	1.60	0.28	0.15
Hunterdon	0.09	0.27	0.06
Middlesex	14.52	2.65	6.25
Monmouth	0.41	0.43	0.31
Morris	0.40	0.74	0.56
Passaic	0.73	0.16	0.19
Somerset	0.66	4.65	2.02
Sussex	0.16	0.10	1.33
Union	2.81	5.55	1.33
Warren	0.21	0.76	0.25
Non-EGU Total	**24.36**	**19.56**	**13.92**
EGU Summer Tons Per Day			
Bergen	0.04	1.03	0.24
Essex	0.04	1.01	0.06
Hudson	0.05	0.25	0.19
Hunterdon	0.01	0.96	2.09
Middlesex	0.18	1.82	1.47
Union	0.12	3.12	0.81
EGU Total	**0.43**	**8.17**	**4.86**
TOTAL POINT			
TOTAL POINT	**24.79**	**27.73**	**18.79**

Table 4
2023 Point Source Emission Inventory by County and Pollutant
New Jersey's Southern NJ-PA-DE-MD NAA

County	VOC	NOx	CO
Non-EGU Point Peak Summer Tons Per Day			
Atlantic	0.07	0.36	0.28
Burlington	0.63	1.61	1.12
Camden	0.55	2.10	0.61
Cape May	0.08	0.11	0.15
Cumberland	0.39	1.20	6.25
Gloucester	0.41	0.43	0.94
Mercer	0.33	1.04	0.66
Ocean	0.43	0.95	1.50
Salem	0.59	2.20	2.92
Non-EGU Total	**7.32**	**13.29**	**8.83**
EGU Summer Tons Per Day			
Atlantic	0.00	0.00	0.00
Burlington	0.00	0.03	0.03
Camden	0.05	1.65	0.12
Cape May	0.00	0.00	0.00
Cumberland	0.04	1.2	4.01
Gloucester	0.11	1.55	1.15
Mercer	0.00	0.00	0.00
Ocean	0.07	1.45	1.25
Salem	0.03	1.61	0.61
EGU Total	**0.3**	**7.49**	**7.17**
TOTAL POINT			
TOTAL POINT	**7.62**	**20.77**	**16.01**

3.0 Events

Wildfires and prescribed burns that occur during the inventory year are included in the USEPA NEI as "event sources". For more information on the events in the 2017 base inventory, see New Jersey's State Implementation Plan Revision dated November 18, 2021[4].

[4] The State of New Jersey, Department of Environmental Protection, State Implementation Plan Revision for the Attainment and Maintenance of the Ozone National Ambient Air Quality Standards, 2008 75 ppb 8-Hour Ozone Attainment Demonstration, Northern New Jersey-New York-Connecticut Nonattainment Area, 2008 75 ppb and 2015 70 ppb 8-Hour Ozone Reasonably Available Control Technology (RACT), November 18, 2021

New Jersey accepted USEPA's annual 2017 NEI wildfire and prescribed burn emissions, which incorporated inputs provided by New Jersey. New Jersey estimated summer tons per day emissions from the annual emissions using seasonal adjustment factors based on when the burns occurred.

The growth factors for smoldering forest wildfires(2810001001), flaming forest wildfires(2810001002), smoldering prescribed forest burning(2811015001), and flaming prescribed burning(2811015002) are "no growth". Therefore, the 2023 projected emissions will be the same as the 2017 emissions for both wildfire and prescribed burning.

4.0 Area Sources

4.1 Growth

Growth factors were calculated for area sources utilizing state population projections, USDOE fuel consumption projections, employment projections from the New Jersey Department of Labor, and state specific indicators such as vehicle miles traveled.

A summary table which shows the growth factors for each SCC category and the indicators and raw data for those growth factors is included as Attachment 5.

Population

Projected population is the most appropriate growth indicator to use for certain source categories whose emissions are calculated using population such as architectural coatings, consumer products and graphic arts.

Population projection data was obtained from the New Jersey Department of Labor and Workforce Development.

The data was combined and straight line interpolation was used to calculate population for the projection years. Statewide growth factors were then calculated using the following equations:

2017-2023 Growth Factor =
2023 Statewide Population / 2017 Statewide Population

2017-2023 Growth Rate (percent per year) =
{[(2017-2023 Growth Factor)^1/y] – 1} * 100 percent

Where:y = the # of years being analyzed (ex: y = 2023-2017 = 6)

A summary table of the population data is included in Attachment 5

Fuel Consumption

Projected fuel consumption data was obtained from the USDOE Energy Information Administration (EIA), Annual Energy Outlook Report. The growth factors were calculated in the same manner as the population growth factors, using the same equations, but substituting projected fuel consumption for projected population. A summary table of the fuel consumption data is included in Attachment 5.

Employment

Projected employment is the most appropriate growth indicator to use for certain source categories whose emissions are calculated using employment such as autobody refinishing and dry cleaning.

Projected employment data was obtained from the New Jersey Department of Labor website.[5] The growth factors were calculated in the same manner as the population growth factors, using the same equations, but substituting projected employment for projected population. A summary table of the employment data is included in Attachment 5.

Residential Wood Combustion

The estimated combined growth and control rates are the same as those used in USEPA's 2016 base year modeling platform and are included in Attachment 5. The factors account for the USEPA rule that sets new source performance standard (NSPS) for woodstoves. The factors are based on estimated turnover of the old stoves to the new stoves.

Refueling

VOC emissions from refueling were estimated in the onroad inventory by fuel type. These emissions were removed from New Jersey's onroad inventory and added to the area source inventory.

Agricultural VOC

Growth factors for the agricultural VOC categories were developed using the USEPA Greenhouse Gas Tool.[6] The growth factors and raw data for these categories are included in Attachment 5.

Breweries

Updated growth data for New Jersey's breweries was obtained from Forbes.[7]

4.2 No Growth

No growth was projected for the area source categories included in Table 5.

Table 5
Area Source Categories with No Growth from 2017-2023

SCC	Description	Pollutant
2102008000	Stationary Fuel Comb /Industrial /Wood /Total: All Boiler Types	VOC, NOx, CO

[5] NJ Employment: Statewide Industry and Occupational Projections Tables 2016-2026, released October 2018, accesed on 2/28/19 from: https://nj.gov/labor/lpa/employ/indoccpj/indoccpj_index.html
[6] USEPA Greenhouse Gas Tool New Jersey animal counts 2/13/19
[7] NJ Brewery Growth: https://www.forbes.com/sites/garystoller/2019/01/08/guess-which-states-had-most-craft-brewery-growth-its-not-the-ones-youd-expect/#6a2c4adf41b3

SCC	Description	Pollutant
2102011000	Stationary Fuel Comb /Industrial /Kerosene /Total: All Boiler Types	VOC, NOx, CO
2103001000	Stationary Fuel Comb /Commercial/Institutional /Anthracite Coal /Total: All Boiler Types	VOC, NOx, CO
2103002000	Stationary Fuel Comb /Commercial/Institutional /Bituminous/Subbituminous Coal /Total: All Boiler Types	VOC, NOx, CO
2103008000	Stationary Fuel Comb /Commercial/Institutional /Wood /Total: All Boiler Types	VOC, NOx, CO
2104008530	Furnace: Indoor, pellet -fired, non-EPA certified	VOC, NOx, CO
2104008620	Hydronic heater: indoor	VOC, NOx, CO
2104008630	Hydronic heater: pellet fired	VOC, NOx, CO
2302070010	Food & Kindred Products /Fermentation/Beverages /Distilleries	VOC
2401008000	Traffic Paint	VOC
2401070000	Surface Coating /Motor Vehicles /Total: All Solvent Types	VOC
2461020000	Misc Non-industrial: Commercial /Asphalt Application: All Processes /Total: All Solvent Types	VOC
2461021000	Misc Non-industrial: Commercial /Cutback Asphalt /Total: All Solvent Types	VOC
2461022000	Misc Non-industrial: Commercial /Emulsified Asphalt /Total: All Solvent Types	VOC
2461023000	Misc Non-industrial: Commercial /Asphalt Roofing /Total: All Solvent Types	VOC
2601000000	On-site Incineration /All Categories /Total	VOC, NOx, CO
2601010000	On-site Incineration /Industrial /Total	VOC, NOx, CO
2601020000	On-site Incineration /Commercial/Institutional /Total	VOC, NOx, CO
2610000100	Open Burning /All Categories /Yard Waste - Leaf Species Unspecified	VOC, NOx, CO
2610000400	Open Burning /All Categories /Yard Waste - Brush Species Unspecified	VOC, NOx, CO
2610030000	Open Burning /Residential /Household Waste (use 26-10-000-xxx for Yard Wastes)	VOC, NOx, CO
2620030000	Waste Disposal /Treatment /Recovery /Landfills; Municipal; Total	VOC

SCC	Description	Pollutant
2660000000	Leaking Underground Storage Tanks /Leaking Underground Storage Tanks /Total: All Storage Types	VOC
2680003000	Composting	VOC
2801500000	Agricultural Field Burning of Infested Matter	VOC, NOx, CO
2801500170	Agricultural Field Burning of Herbacous Matter	VOC, NOx, CO
2801500300	Agricultural Field Burning of Orchards	VOC, NOx, CO
2801500600	Agricultural Field Burning- Land Clearing	VOC, NOx, CO
2810003000	Cigarette Smoke /Total	VOC, NOx, CO
2810030000	Structural Fires	VOC, NOx, CO
2810050000	Motor Vehicle Fires /Unspecified	VOC, NOx, CO
2810060200	Cremation /Animal	VOC, NOx, CO

4.3 Area Source Control Measures

Overview

New Jersey and the USEPA have developed and will develop rules that require control measures to reduce area source emissions of air pollutants. In developing the 2017 emissions inventory, control efficiency factors for the NJDEP pre-2017 rules were included in the 2017 emissions inventory. Control efficiency factors (CEs) reflecting post-2017 rules, relative to existing rules, were applied to the grown emissions inventories, and emission reduction benefits were calculated. The CEs were applied to the grown inventory, to determine emission reduction benefits from the New Jersey rules, relative to the existing rules. These benefits grow in future years in direct relation to the growth factor for the respective emission categories. The equation that was used to project emissions in a future year, y, incorporating growth and the application of new control measures between year x and year y is:

$$E_y = E_x * GF_{x-y} * [1 - (CE * RE * RP)_{x-y}]$$

where:
- Ey = Controlled emissions in year y
- Ex = Controlled emissions in year x
- GFx-y = Growth factor used to grow emissions from year x to year y
- CE = Control efficiency factor for a control measure implemented between years X and Y
- RE = Rule Effectiveness Factor
- RP = Rule Penetration Factor
- CF=Control Factor = [1 – (CE * RE * RP)x-y]

The control factors (CF) applied to the 2023 inventory are shown in the area source emission inventory in Attachment 6. The 2017 emission inventory was used as a base for the projection inventory. The existing control measures which reduce area source emissions for VOC and NO_x in the projection inventory from 2017 to 2023 are shown in Table 6.

Table 6
Area Source VOC and NO_x Control Measures

Control Measures	Sector	Pollutant	Area Source Category
New Jersey Portable Fuel Containers	Area	VOC	Residential Portable Gas Cans
Federal Residential Woodstove New Source Performance Standards (NSPS)	Area	VOC, NO_x	Residential Wood Burning
Federal RICE MACT	Point and Area		Industrial Distillate Engines, Commercial Distillate Engines

A discussion of the control measure control factors is included below. The control factors used in the inventory are included in Attachment 6.

Control Factors

New Jersey Portable Fuel Containers

New Jersey adopted amendments to its rule limiting VOC emissions from portable fuel containers (PFCs) on December 1, 2008. The rule requires that PFCs and/or spouts have a permeability mot to exceed 0.4 grams/gallon/day, be equipped with an automatic shut-off device and an automatic device that closes and seals when it is removed from the fuel tank. The rule also requires that a PFC have a fuel flow rate and fill level standards.

The rule applies to new containers, and thus the anticipated reductions depend on the turnover of older non-compliant containers to new, lower-emitting containers. The emission reduction calculations assume a 10-year turnover period. Emission reduction percentage were calculated by CSRA International, Inc. for each year.

Federal Residential Woodstove NSPS

As discussed above, the estimated combined growth and control rates are the same as those used in USEPA's 2016 base year modeling platform and are included in Attachment 5. The factors account for the USEPA rule that sets new source performance standard (NSPS) for woodstoves. The factors are based on estimated turnover of the old stoves to the new stoves.

Federal RICE MACT

USEPA developed control factors for three NESHAP rulemakings for RICE. These rules reduce HAPs from existing and new RICE sources. In order to meet the standards, existing sources with certain types of engines will need to install controls. These rules apply to Industrial Distillate Engines and Commercial Distillate Engines and went into effect January 2017. These controls were not applied to the base inventory, so controls were applied to the 2023 projection. The percent reductions are based on the USEPA 2016-based Modeling Platform and can be found in Attachment 5.

3.3 Area Source Emission Inventory

Table 7 summarizes the 2023 projected area source emission inventory by county for VOC, NO_x and CO for each nonattainment area. Attachment 6 contains the detailed area source emission inventories. These attachments are only available electronically.

Table 7
2023 Area Source Emission Inventory by County and Pollutant

County	VOC Summer Tons Per Day	NO_x Summer Tons per Day	CO Summer Tons per Day
New Jersey Portion of Northern NJ-NY-CT NAA			
Bergen	24.77	2.88	4.06
Essex	18.39	2.28	3
Hudson	15.95	1.82	2.19
Hunterdon	4.05	0.38	1.2
Middlesex	23.31	2.58	2.02
Monmouth	17.06	1.86	3.02
Morris	14.52	1.79	3.04
Passaic	12.45	1.26	1.81
Somerset	9.80	1.18	1.85
Sussex	3.91	0.40	1.45
Union	14.40	1.50	2.12
Warren	3.36	0.29	0.97
Total	**161.98**	**18.22**	**26.73**
New Jersey Portion of Southern NJ-PA-DE-MD NAA			
Atlantic	7.43	0.82	1.58
Burlington	14.01	1.34	2.48
Camden	12.81	1.44	2.14
Cape May	3.05	0.30	0.62
Cumberland	6.31	0.42	0.98
Gloucester	14.76	0.79	1.5
Mercer	10.49	1.41	2.02
Ocean	14.89	1.34	2.55
Salem	2.74	0.19	0.54
Total	**86.50**	**8.05**	**14.39**
Statewide Total	**248.48**	**26.27**	**41.12**

4.4 Overall Growth Rate Summary

The overall growth rate (with growth and controls) for area sources statewide from 2017 to 2023 is approximately 0.31 percent per year for VOC, 0.03 percent per year for NO_x, and 0.17 percent per year for CO. The average growth rates from 2017 to 2023 vary within the individual SCC categories and pollutants from approximately negative 13.7 percent per year for residential

kerosene combustion to 13.9 percent per year for industrial liquefied petroleum gas for all three pollutants.

The growth rates for all of the SCCs in the 2017 to 2023 projection inventory are included in Attachment 5.

VOC Growth Rate Summary

Overall, the VOC categories showing the most negative growth (largest decreases) from 2017-2023 are non-EPA certified indoor cordwood fired furnaces, residential kerosene combustion, commercial distillate combustion, residential liquefied petroleum gas combustion, waste emissions from horses, residential distillate oil combustion, and waste emissions from sheep. The growth for these categories ranges from negative 39.67 percent to negative 14.47 percent, respectively, from 2017 to 2023.

Overall, the VOC categories showing the largest increases from 2017 to 2023 are industrial liquefied petroleum gas combustion, breweries, waste emissions from goats, bakeries, wineries, poultry production, and fireplaces. The growth for these categories range from 47.8 percent to 6.14 percent, respectively, from 2017 to 2023.

NOx Growth Rate Summary

Overall, the NOx categories showing the most negative growth (largest decreases) from 2017 to 2023 are non-EPA certified indoor cordwood fired furnaces, residential kerosene combustion, residential liquefied petroleum, residential distillate oil combustion, commercial fuel combustion for engines and boilers, and commercial kerosene. The growth for these categories ranges from negative 39.47 percent to negative 7.51 percent, respectively, from 2017 to 2023.

Overall, the NOx categories showing the largest increase from 2017 to 2023 is industrial liquefied petroleum gas combustion with 47.8 percent growth from 2017 to 2023. All other NOx categories show growth of 6.14 percent or less from 2017 to 2023.

CO Growth Rate Summary

Overall, the CO categories showing the most negative growth (largest decreases) from 2017 to 2023 are non-EPA certified indoor cordwood fired furnaces, residential kerosene combustion, residential liquefied petroleum gas combustion, residential and commercial distillate oil combustion. The growth for these categories ranges from negative 47.8 percent to negative 20.08 percent from 2017 to 2023.

Overall, the CO category showing the largest increase from 2017 to 2023 is industrial liquefied petroleum gas combustion with 47.8 percent growth from 2017 to 2023. All other CO categories show growth of 6.14 percent or less from 2017 to 2023.

4.5 Overall Emissions Growth Summary

Overall emissions for area sources statewide from 2017 to 2023 (with growth and controls) have increased 4.48 tons per summer day (tpd) for VOC, 0.05 tpd for NOx, and 0.44 tpd for CO. The growth or decline of emissions vary for the different SCC categories and pollutants discussed further below.

VOC Emissions Growth Summary

Overall, the VOC categories showing the largest decrease in emissions from 2017 to 2023 are Residential Portable Gas Cans, Stage 1 Gasoline, Waste from Horses, Commercial Distillate Oil Combustion for IC Engines, Residential Distillate Oil Combustion, and Non-EPA certified Indoor Cordwood Furnace. The decrease in emissions for these categories ranges from 0.8 tpd to 0.02 tpd, respectively, from 2017 to 2023.

Overall, the VOC categories showing the largest increase in emissions from 2017 to 2023 are Consumer Products, Architectural Surface Coatings, Graphic Arts, Bakeries, Degreasing, Auto Refinishing, and Industrial Maintenance Coatings. The increase in emissions for these categories ranges from 1.90 tpd to 0.22 tpd, respectively, from 2017 to 2023.

NOx Emissions Growth Summary

Overall, the NOx categories showing the largest decrease in emissions from 2017 to 2023 are Residential Distillate Oil Combustion, Residential Liquified Petroleum Gas, Residential Natural Gas Combustion, and Commercial/Institutional Distillate Oil Combustion for IC Engines. The decrease in emissions for these categories ranges from 0.8 tpd to 0.1 tpd, respectively, from 2017 to 2023.

Overall, the NOx categories showing the largest increase in emissions from 2017 to 2023 are Commercial/Institutional Natural Gas Boilers and IC Engines Combustion and Industrial Liquified Petroleum Gas Combustion. The increase in emissions for these categories are 0.27 tpd and 0.17 tpd, respectively. All other NOx categories increased less than 0.009 tpd from 2017 to 2023.

CO Emissions Growth Summary

Overall, the CO categories showing the largest decrease in emissions from 2017 to 2023 are Non-EPA Indoor Cordwood Furnace, Residential Distillate Oil Combustion, and Residential Liquified Petroleum Gas Combustion. The decrease in emissions for these categories ranges from 0.1 tpd to 0.06 tpd, respectively, from 2017 to 2023.

Overall, the CO categories showing the largest increase in emissions from 2017 to 2023 are Commercial Natural Gas for Boilers and IC Engines, Residential Grilling, Industrial Liquified Petroleum Combustion, Fireplaces, Under Fired Charbroiling Cooking, and Conveyorized Charbroiling. The increase in emissions for these categories ranges from 0.23 tpd to 0.02 tpd, respectively, from 2017 to 2023.