



SO₂ Redesignation Request and Maintenance Plan

Appendix C

Stationary Source Projection Documentation

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TECHNICAL SUPPORT DOCUMENT

Stationary Source SO₂ Emissions Projections Interim 2026 and Maintenance 2035 Years Allegheny, PA

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TABLE OF CONTENTS

1. Overview	1
2. Point Sources	2
2.1 Combustion Sources	2
2.2 Non-Combustion Sources	8
2.3 Airport/Helipad Sources	16
2.4 New ACHD Sources	17
2.5 EGU Sources.....	17
3. Area Sources.....	18
3.1 Combustion Sources	18
3.2 Combustion Sources (Residential Wood).....	19
3.3 Non-Combustion Industrial/Commercial.....	21
3.4 Oil and Gas Sources.....	22
3.5 Mobile Marine and Locomotive	25
3.6 Fugitive Dust.....	26
3.7 Commercial Cooking.....	27
3.8 Solvent Use	27
3.9 Agriculture	28
3.10 Miscellaneous	29
3.11 Natural Sources.....	30

LIST OF TABLES

Table 2-1. AEO 2022 Growth Activity.....	2
Table 2-2. AEO Growth Codes and Usage.....	3
Table 2-3. Combustion Source SCC Codes and Growth Codes.....	5
Table 2-4. Pennsylvania Industry Employment Projections, 2018-2028.....	8
Table 2-5. Airport Terminal Data.....	17
Table 2-6. Invenenergy Permitted Emission Levels.....	17
Table 3-1. Combustion Area Source Sectors and AEO Growth Codes.....	18
Table 3-2. RWC Area Source SCCs and Growth Codes.....	19
Table 3-3. RWC Growth Codes and Projection Factors.....	20
Table 3-4. 2026 RWC Growth Factors by SCC.....	21
Table 3-5. 2035 RWC Growth Factors by SCC.....	21
Table 3-6. Industrial/Commercial Area Source Sectors and Growth Codes.....	21
Table 3-7. Projected Population Data.....	22
Table 3-8. Oil and Gas Area Source Sectors and Growth Codes.....	23
Table 3-9. Growth Data for Oil and Gas Area Sources.....	25
Table 3-10. Marine Vessel and Locomotive Area Source Sectors and Growth Codes.....	25
Table 3-11. Growth Data for Marine Vessels and Locomotives.....	25
Table 3-12. 2026 Marine/Locomotive Growth Factors by SCC.....	26
Table 3-13. 2035 Marine/Locomotive Growth Factors by SCC.....	26
Table 3-14. Fugitive Dust Area Source Sectors and Growth Codes.....	26
Table 3-15. Commercial Cooking Area Source Sectors and Growth Codes.....	27
Table 3-16. Solvent Area Source Sectors and Growth Codes.....	27
Table 3-17. Agriculture Area Source Sectors and Growth Codes.....	28
Table 3-18. Agriculture Growth Factors.....	29
Table 3-19. Miscellaneous Area Source Sectors and Growth Codes.....	29

1. Overview

This technical support document contains a summary of the methodologies used for the projected stationary point and area source emissions inventories for interim year 2026 and maintenance year 2035 for the Allegheny, PA nonattainment area for the 2010 SO₂ NAAQS.

The methodologies for these projections are identical to those developed for the “Redesignation Request and Maintenance Plan for the Liberty-Clairton, PA and Allegheny County, PA PM_{2.5} Nonattainment Areas for the 1997/2006/2012 NAAQS,” which included growth/control factors for SO₂ as a precursor to PM_{2.5}.

The attainment year 2017 emissions inventory was used as the “base year” inventory for the future year projections. Growth/control methodologies were developed by the Mid-Atlantic Regional Air Management Association, Inc. (MARAMA) and other sources, with revisions also made by the Allegheny County Health Department (ACHD) for specific sources/sectors.

Point sources in the inventory include only those facilities within the SO₂ nonattainment area. Area sources are derived as a percentage of the area source emissions for Allegheny County, based on population of the Allegheny, PA SO₂ nonattainment area.

Growth codes and factors have been included with each process/sector in the detailed inventory files. Electronic versions of the inventories and growth factor files used for the projections are available upon request from ACHD.

2. Point Sources

This section describes the methodologies used for the point source projections. Note that some point sources use the same growth factors as area sources for specific source classification codes (SCCs).

Below is a summary of the resources used for the point source projections, including links to the databases for the resources:

- Energy Information Agency (EIA) Annual Energy Outlook (AEO) projections
<https://www.eia.gov/outlooks/aeo/>
- Pennsylvania Industry Employment 2018-2028 Long-Term Projections
https://www.workstats.dli.pa.gov/Documents/Projections/Industrial/PA/PA_LTIP.pdf
- Federal Aviation Administration (FAA) Terminal Area Forecast (TAF)
https://www.faa.gov/data_research/aviation/taf
- ACHD emissions inventories and permitting
<https://www.alleghenycounty.us/healthdepartment>

The following sections describe the methodologies for specific point source types. Unless noted, growth factors were consistent for all pollutants and geographical areas for each corresponding SCC or source sector.

2.1 Combustion Sources

Non-EGU point source combustion processes that involve fuel burning were projected using EIA AEO projections. AEO fuel use sectors were first matched to SCC codes in the 2017 attainment inventory. Projections of fuel usage were available in the AEO to the direct future 2026 and 2035 years for Mid-Atlantic U.S. states. To derive growth factors, the future year (2026 or 2035) usage was divided by the attainment (base) year 2017 usage.

Table 2-1 shows the growth codes and names for each fuel sector; Table 2-2 shows the growth codes along with fuel usage for years 2017, 2026, and 2035. Table 2-3 shows the SCC codes in the Allegheny, PA 2017 attainment year inventory matched to corresponding growth codes.

Table 2-1. AEO 2022 Growth Activity

Growth Code	Growth Code Name
AEO2022_MA_COM_COAL	AEO2022, Mid-Atlantic, Commercial, Coal
AEO2022_MA_COM_DISTILLATE	AEO2022, Mid-Atlantic, Commercial, Distillate Fuel Oil
AEO2022_MA_COM_ELECTRICITY	AEO2022, Mid-Atlantic, Commercial, Electricity
AEO2022_MA_COM_GASOLINE	AEO2022, Mid-Atlantic, Commercial, Motor Gasoline with Ethanol
AEO2022_MA_COM_KEROSENE	AEO2022, Mid-Atlantic, Commercial, Kerosene
AEO2022_MA_COM_NATGAS	AEO2022, Mid-Atlantic, Commercial, Natural Gas
AEO2022_MA_COM_PROpane	AEO2022, Mid-Atlantic, Commercial, Propane
AEO2022_MA_COM_RENEWABLE	AEO2022, Mid-Atlantic, Commercial, Renewable Energy
AEO2022_MA_COM_RESIDUAL	AEO2022, Mid-Atlantic, Commercial, Residual Fuel Oil

Growth Code	Growth Code Name
AEO2022_MA_EGU_COAL	AEO2022, Mid-Atlantic, Electric Power, Coal Steam
AEO2022_MA_EGU_DISTILLATE	AEO2022, Mid-Atlantic, Electric Power, Distillate Fuel Oil
AEO2022_MA_EGU_NATGAS	AEO2022, Mid-Atlantic, Electric Power, Natural Gas
AEO2022_MA_EGU_NUCLEAR	AEO2022, Mid-Atlantic, Electric Power, Nuclear / Uranium
AEO2022_MA_EGU_RENEWABLE	AEO2022, Mid-Atlantic, Electric Power, Renewable Energy
AEO2022_MA_EGU_RESIDUAL	AEO2022, Mid-Atlantic, Electric Power, Residual Fuel Oil
AEO2022_MA_IND_BIOFUELS	AEO2022, Mid-Atlantic, Industrial, Biofuels Heat and Coproducts
AEO2022_MA_IND_COAL	AEO2022, Mid-Atlantic, Industrial, Coal, Other Industrial
AEO2022_MA_IND_DISTILLATE	AEO2022, Mid-Atlantic, Industrial, Distillate Fuel Oil
AEO2022_MA_IND_ELECTRICITY	AEO2022, Mid-Atlantic, Industrial, Electricity
AEO2022_MA_IND_GASOLINE	AEO2022, Mid-Atlantic, Industrial, Motor Gasoline with Ethanol
AEO2022_MA_IND_LEASEFUEL	AEO2022, Mid-Atlantic, Industrial, Lease and Plant Fuel
AEO2022_MA_IND_LPG	AEO2022, Mid-Atlantic, Industrial, Liquefied Petroleum Gases
AEO2022_MA_IND_NATGAS	AEO2022, Mid-Atlantic, Industrial, Natural Gas
AEO2022_MA_IND_PETROCHEM	AEO2022, Mid-Atlantic, Industrial, Petrochemical Feedstocks
AEO2022_MA_IND_RENEWABLE	AEO2022, Mid-Atlantic, Industrial, Renewable Energy
AEO2022_MA_IND_RESIDUAL	AEO2022, Mid-Atlantic, Industrial, Residual Fuel Oil
AEO2022_MA_RES_DISTILLATE	AEO2022, Mid-Atlantic, Residential, Distillate Fuel Oil
AEO2022_MA_RES_ELECTRICITY	AEO2022, Mid-Atlantic, Residential, Electricity
AEO2022_MA_RES_NATGAS	AEO2022, Mid-Atlantic, Residential, Natural Gas
AEO2022_MA_RES_PROpane	AEO2022, Mid-Atlantic, Residential, Propane
AEO2022_MA_RES_RENEWABLE	AEO2022, Mid-Atlantic, Residential, Renewable Energy (includes wood)
AEO2022_MA_TRANS_CNG	AEO2022, Mid-Atlantic, Transportation, Compressed / Liquefied Natural Gas
AEO2022_MA_TRANS_DIESEL	AEO2022, Mid-Atlantic, Transportation, Diesel fuel for on- and off- road use
AEO2022_MA_TRANS_E85	AEO2022, Mid-Atlantic, Transportation, E85
AEO2022_MA_TRANS_ELECTRICITY	AEO2022, Mid-Atlantic, Transportation, Electricity
AEO2022_MA_TRANS_GASOLINE	AEO2022, Mid-Atlantic, Transportation, Motor Gasoline with Ethanol
AEO2022_MA_TRANS_HYDROGEN	AEO2022, Mid-Atlantic, Transportation, Liquid Hydrogen
AEO2022_MA_TRANS_JETFUEL	AEO2022, Mid-Atlantic, Transportation, Jet Fuel
AEO2022_MA_TRANS_JETFUEL	AEO2022, Mid-Atlantic, Transportation, Other Petroleum (Includes aviation gasoline)
AEO2022_MA_TRANS_NATGAS	AEO2022, Mid-Atlantic, Transportation, Pipeline Fuel Natural Gas
AEO2022_MA_TRANS_PROpane	AEO2022, Mid-Atlantic, Transportation, Propane
AEO2022_MA_TRANS_RESIDUAL	AEO2022, Mid-Atlantic, Transportation, Residual

Table 2-2. AEO Growth Codes and Usage

Growth Code	Units/FIPS	2017	2026	2035
AEO2022_MA_COM_COAL	Quadrillion Btu	0.000887	0.000587	0.000719
AEO2022_MA_COM_DISTILLATE	Quadrillion Btu	0.072332	0.063566	0.057541
AEO2022_MA_COM_ELECTRICITY	Quadrillion Btu	0.529327	0.493145	0.481582
AEO2022_MA_COM_GASOLINE	Quadrillion Btu	0.040587	0.039463	0.039415

Growth Code	Units/FIPS	2017	2026	2035
AEO2022_MA_COM_KEROSENE	Quadrillion Btu	0.0003	0.000533	0.000448
AEO2022_MA_COM_NATGAS	Quadrillion Btu	0.628469	0.659895	0.661239
AEO2022_MA_COM_PROpane	Quadrillion Btu	0.017475	0.017589	0.018129
AEO2022_MA_COM_RENEWABLE	Quadrillion Btu	0.023917	-0.0018	-0.0018
AEO2022_MA_COM_RESIDUAL	Quadrillion Btu	0.002288	0.000882	0.000846
AEO2022_MA_EGU_COAL	Quadrillion Btu	0.52366	0.316138	0.29643
AEO2022_MA_EGU_DISTILLATE	Quadrillion Btu	0.00493	0.004899	0.002146
AEO2022_MA_EGU_NATGAS	Quadrillion Btu	1.19616	1.404562	1.099305
AEO2022_MA_EGU_NUCLEAR	Quadrillion Btu	1.641815	1.35599	1.199945
AEO2022_MA_EGU_RENEWABLE	Quadrillion Btu	0.453529	0.709805	1.211674
AEO2022_MA_EGU_RESIDUAL	Quadrillion Btu	0.00534	0.000738	0.000015
AEO2022_MA_IND_BIOFUELS	Quadrillion Btu	0.080901	0.094421	0.093122
AEO2022_MA_IND_COAL	Quadrillion Btu	0.037316	0.019354	0.018524
AEO2022_MA_IND_DISTILLATE	Quadrillion Btu	0.060731	0.0681	0.069712
AEO2022_MA_IND_ELECTRICITY	Quadrillion Btu	0.240917	0.255306	0.26467
AEO2022_MA_IND_GASOLINE	Quadrillion Btu	0.027436	0.028502	0.030145
AEO2022_MA_IND_LEASEFUEL	Quadrillion Btu	0.223472	0.295023	0.377037
AEO2022_MA_IND_LPG	Quadrillion Btu	0.110455	0.039014	0.042549
AEO2022_MA_IND_NATGAS	Quadrillion Btu	0.377492	0.449951	0.469969
AEO2022_MA_IND_PETROCHEM	Quadrillion Btu	0	0	0
AEO2022_MA_IND_RENEWABLE	Quadrillion Btu	0.080466	0.072921	0.072982
AEO2022_MA_IND_RESIDUAL	Quadrillion Btu	0.003828	0.002677	0.003308
AEO2022_MA_RES_DISTILLATE	Quadrillion Btu	0.230827	0.161404	0.139836
AEO2022_MA_RES_ELECTRICITY	Quadrillion Btu	0.437437	0.475082	0.482732
AEO2022_MA_RES_NATGAS	Quadrillion Btu	0.90507	0.968865	0.956829
AEO2022_MA_RES_PROpane	Quadrillion Btu	0.057955	0.04658	0.042845
AEO2022_MA_RES_RENEWABLE	Quadrillion Btu	0.038219	0.084457	0.072644
AEO2022_MA_TRANS_CNG	Quadrillion Btu	0.006369	0.008183	0.011332
AEO2022_MA_TRANS_DIESEL	Quadrillion Btu	0.554364	0.516168	0.484049
AEO2022_MA_TRANS_E85	Quadrillion Btu	0.000389	0.001436	0.001022
AEO2022_MA_TRANS_ELECTRICITY	Quadrillion Btu	0.014254	0.024592	0.041446
AEO2022_MA_TRANS_GASOLINE	Quadrillion Btu	1.722881	1.625146	1.480624
AEO2022_MA_TRANS_HYDROGEN	Quadrillion Btu	0.000029	0.000089	0.000313
AEO2022_MA_TRANS_JETFUEL	Quadrillion Btu	0.397985	0.511608	0.532895
AEO2022_MA_TRANS_JETFUEL	Quadrillion Btu	0.016942	0.015558	0.014835
AEO2022_MA_TRANS_NATGAS	Quadrillion Btu	0.093206	0.091831	0.105641
AEO2022_MA_TRANS_PROpane	Quadrillion Btu	0.000523	0.000877	0.000962
AEO2022_MA_TRANS_RESIDUAL	Quadrillion Btu	0.065458	0.013911	0.012944

Table 2-3. Combustion Source SCC Codes and Growth Codes

SCC	SCC Description	Growth Code
10100202	Ext Comb /Electric Gen /Bituminous Coal /Pulverized Coal: Dry Bottom	AEO2022_MA_EGU_COAL
10100212	Ext Comb /Electric Gen /Bituminous Coal /Pulverized Coal: Dry Bottom Tangential-fired	AEO2022_MA_EGU_COAL
10100401	Ext Comb /Electric Gen /Residual Oil /Grade 6 Oil: Normal Firing	AEO2022_MA_IND_RESIDUAL
10100501	Ext Comb /Electric Gen /Distillate Oil /Grades 1 and 2 Oil	AEO2022_MA_EGU_DISTILLATE
10100601	Ext Comb /Electric Gen /Natural Gas /Boilers : 100 Million Btu/hr except Tangent	AEO2022_MA_EGU_NATGAS
10100602	Ext Comb /Electric Gen /Natural Gas /Boilers < 100 Million Btu/hr except Tangent	AEO2022_MA_EGU_NATGAS
10100604	Ext Comb /Electric Gen /Natural Gas /Tangentially Fired Units	AEO2022_MA_EGU_NATGAS
10100702	Ext Comb /Electric Gen /Process Gas /Boilers < 100 Million Btu/hr	AEO2022_MA_EGU_NATGAS
10100903	Ext Comb /Electric Gen /Wood-fired Boiler - Wet Wood (:=20% moisture)	AEO2022_MA_EGU_RENEWABLE
10101002	Ext Comb /Electric Gen /LPG /Propane	AEO2022_MA_IND_LPG
10101201	Ext Comb /Electric Gen /Solid Waste /Specify Waste Material in Comments	AEO2022_MA_IND_NATGAS
10200104	Ext Comb /Industrial /Anthracite Coal /Traveling Grate (Overfeed) Stoker	AEO2022_MA_IND_COAL
10200202	Ext Comb /Industrial /Bitum Coal /Pulverized Coal: Dry Bottom	AEO2022_MA_IND_COAL
10200203	Ext Comb /Industrial /Bitum Coal /Cyclone Furnace	AEO2022_MA_IND_COAL
10200204	Ext Comb /Industrial /Bitum Coal /Spreader Stoker	AEO2022_MA_IND_COAL
10200205	Ext Comb /Industrial /Bitum Coal /Overfeed Stoker	AEO2022_MA_IND_COAL
10200206	Ext Comb /Industrial /Bitum Coal /Underfeed Stoker	AEO2022_MA_IND_COAL
10200401	Ext Comb /Industrial /Residual Oil /Grade 6 Oil	AEO2022_MA_IND_RESIDUAL
10200402	Ext Comb /Industrial /Residual Oil /10-100 Million Btu/hr **	AEO2022_MA_IND_RESIDUAL
10200404	Ext Comb /Industrial /Residual Oil /Grade 5 Oil	AEO2022_MA_IND_RESIDUAL
10200405	Ext Comb /Industrial /Residual Oil /Cogeneration	AEO2022_MA_IND_RESIDUAL
10200501	Ext Comb /Industrial /Distillate Oil /Grades 1 and 2 Oil	AEO2022_MA_IND_DISTILLATE
10200502	Ext Comb /Industrial /Distillate Oil /10-100 Million Btu/hr **	AEO2022_MA_IND_DISTILLATE
10200503	Ext Comb /Industrial /Distillate Oil /< 10 Million Btu/hr **	AEO2022_MA_IND_DISTILLATE
10200504	Ext Comb /Industrial /Distillate Oil /Grade 4 Oil	AEO2022_MA_IND_DISTILLATE
10200505	Ext Comb /Industrial /Distillate Oil /Cogeneration	AEO2022_MA_IND_DISTILLATE
10200601	Ext Comb /Industrial /Natural Gas /> 100 Million Btu/hr	AEO2022_MA_IND_NATGAS
10200602	Ext Comb /Industrial /Natural Gas /10-100 Million Btu/hr	AEO2022_MA_IND_NATGAS
10200603	Ext Comb /Industrial /Natural Gas /< 10 Million Btu/hr	AEO2022_MA_IND_NATGAS
10200604	Ext Comb /Industrial /Natural Gas /Cogeneration	AEO2022_MA_IND_NATGAS
10200701	Ext Comb /Industrial /Process Gas /Petroleum Refinery Gas	AEO2022_MA_IND_PETROCHEM
10200704	Ext Comb /Industrial /Process Gas /Blast Furnace Gas	AEO2022_MA_IND_NATGAS
10200707	Ext Comb /Industrial /Process Gas /Coke Oven Gas	AEO2022_MA_IND_NATGAS
10200711	Ext Comb /Industrial /Process Gas /Landfill Gas	AEO2022_MA_IND_RENEWABLE
10200799	Ext Comb /Industrial /Process Gas /Other: Specify in Comments	AEO2022_MA_IND_NATGAS
10200901	Ext Comb /Industrial /Bark-fired Boiler	AEO2022_MA_IND_RENEWABLE
10200902	Ext Comb /Industrial /Wood/Bark-fired Boiler	AEO2022_MA_IND_RENEWABLE
10200903	Ext Comb /Industrial /Wood-fired Boiler - Wet Wood (:=20% moisture)	AEO2022_MA_IND_RENEWABLE
10200906	Ext Comb /Industrial /Wood-fired Boiler (< 50,000 Lb Steam) **	AEO2022_MA_IND_RENEWABLE

SCC	SCC Description	Growth Code
10200907	Ext Comb /Industrial /Wood/Bark Waste /Wood Cogeneration	AEO2022_MA_IND_RENEWABLE
10201002	Ext Comb /Industrial /LPG /Propane	AEO2022_MA_IND_LPG
10201201	Ext Comb /Industrial /Solid Waste /Specify Waste Material in Comments	AEO2022_MA_IND_RENEWABLE
10201301	Ext Comb /Industrial /Liquid Waste /Specify Waste Material in Comments	AEO2022_MA_IND_DISTILLATE
10201302	Ext Comb /Industrial /Liquid Waste /Waste Oil	AEO2022_MA_IND_DISTILLATE
10201401	Ext Comb /Industrial /CO Boiler /Natural Gas	AEO2022_MA_IND_NATGAS
10201403	Ext Comb /Industrial /CO Boiler /Distillate Oil	AEO2022_MA_IND_DISTILLATE
10300102	Ext Comb /Comm-Inst /Anthracite Coal /Traveling Grate (Overfeed) Stoker	AEO2022_MA_COM_COAL
10300207	Ext Comb /Comm-Inst /Bituminous Coal /Overfeed Stoker	AEO2022_MA_COM_COAL
10300208	Ext Comb /Comm-Inst /Bituminous Coal /Underfeed Stoker	AEO2022_MA_COM_COAL
10300209	Ext Comb /Comm-Inst /Bituminous Coal /Spreader Stoker	AEO2022_MA_COM_COAL
10300217	Ext Comb /Comm-Inst /Bituminous Coal /Atmospheric Fluidized Bed Combustion: Bubbling Bed	AEO2022_MA_COM_COAL
10300218	Ext Comb /Comm-Inst /Bituminous Coal /Atmospheric Fluidized Bed Combustion: Circulating Bed	AEO2022_MA_COM_COAL
10300401	Ext Comb /Comm-Inst /Residual Oil /Grade 6 Oil	AEO2022_MA_IND_RESIDUAL
10300401	Ext Comb /Comm-Inst /Residual Oil /Grade 6 Oil	AEO2022_MA_EGU_NATGAS
10300402	Ext Comb /Comm-Inst /Residual Oil /10-100 Million Btu/hr **	AEO2022_MA_IND_RESIDUAL
10300404	Ext Comb /Comm-Inst /Residual Oil /Grade 5 Oil	AEO2022_MA_IND_RESIDUAL
10300501	Ext Comb /Comm-Inst /Distillate Oil /Grades 1 and 2 Oil	AEO2022_MA_COM_DISTILLATE
10300502	Ext Comb /Comm-Inst /Distillate Oil /10-100 Million Btu/hr **	AEO2022_MA_COM_DISTILLATE
10300503	Ext Comb /Comm-Inst /Distillate Oil /< 10 Million Btu/hr **	AEO2022_MA_COM_DISTILLATE
10300504	Ext Comb /Comm-Inst /Distillate Oil /Grade 4 Oil	AEO2022_MA_COM_DISTILLATE
10300601	Ext Comb /Comm-Inst /Natural Gas /> 100 Million Btu/hr	AEO2022_MA_COM_NATGAS
10300602	Ext Comb /Comm-Inst /Natural Gas /10-100 Million Btu/hr	AEO2022_MA_COM_NATGAS
10300603	Ext Comb /Comm-Inst /Natural Gas /< 10 Million Btu/hr	AEO2022_MA_COM_NATGAS
10300701	Ext Comb /Comm-Inst /Process Gas /POTW Digester Gas-fired Boiler	AEO2022_MA_COM_RENEWABLE
10300799	Ext Comb /Comm-Inst /Process Gas /Other Not Classified	AEO2022_MA_COM_RENEWABLE
10300902	Ext Comb /Comm-Inst /Wood/Bark-fired Boiler	AEO2022_MA_COM_RENEWABLE
10300903	Ext Comb /Comm-Inst /Wood-fired Boiler - Wet Wood (:=20% moisture)	AEO2022_MA_COM_RENEWABLE
10301002	Ext Comb /Comm-Inst /LPG /Propane	AEO2022_MA_COM_PROpane
10301201	Ext Comb /Comm-Inst /Solid Waste /Specify Waste Material in Comments	AEO2022_MA_COM_RENEWABLE
10500105	Ext Comb /Space Heater /Industrial /Distillate Oil	AEO2022_MA_IND_DISTILLATE
10500106	Ext Comb /Space Heater /Industrial /Natural Gas	AEO2022_MA_IND_NATGAS
10500110	Ext Comb /Space Heater /Industrial /Liquified Petroleum Gas (LPG)	AEO2022_MA_IND_LPG
10500113	Ext Comb /Space Heater /Industrial /Waste Oil: Air Atomized Burner	AEO2022_MA_IND_DISTILLATE
10500114	Ext Comb /Space Heater /Industrial /Waste Oil: Vaporizing Burner	AEO2022_MA_IND_DISTILLATE
10500205	Ext Comb /Space Heater /Comm-Inst /Distillate Oil	AEO2022_MA_COM_DISTILLATE
10500206	Ext Comb /Space Heater /Comm-Inst /Natural Gas	AEO2022_MA_COM_NATGAS
10500209	Ext Comb /Space Heater /Comm-Inst /Wood	AEO2022_MA_COM_RENEWABLE
10500210	Ext Comb /Space Heater /Comm-Inst /Liquified Petroleum Gas (LPG)	AEO2022_MA_COM_PROpane
10500214	Ext Comb /Space Heater /Comm-Inst /Waste Oil: Vaporizing Burner	AEO2022_MA_IND_DISTILLATE

SCC	SCC Description	Growth Code
20100101	Int Comb /Electric Gen /Distillate Oil (Diesel) /Turbine	AEO2022_MA_EGU_DISTILLATE
20100102	Int Comb /Electric Gen /Distillate Oil (Diesel) /Reciprocating	AEO2022_MA_EGU_DISTILLATE
20100106	Int Comb /Electric Gen /Distillate Oil (Diesel) /Reciprocating: Evap Losses (Fuel Storage and Delivery System)	AEO2022_MA_EGU_DISTILLATE
20100107	Int Comb /Electric Gen /Distillate Oil (Diesel) /Reciprocating: Exhaust	AEO2022_MA_EGU_DISTILLATE
20100201	Int Comb /Electric Gen /Natural Gas /Turbine	AEO2022_MA_EGU_NATGAS
20100202	Int Comb /Electric Gen /Natural Gas /Reciprocating	AEO2022_MA_EGU_NATGAS
20100802	Int Comb /Electric Gen /Landfill Gas /Reciprocating	AEO2022_MA_EGU_RENEWABLE
20100807	Int Comb /Electric Gen /Landfill Gas /Reciprocating: Exhaust	AEO2022_MA_EGU_RENEWABLE
20200101	Int Comb /Industrial /Distillate Oil (Diesel) /Turbine	AEO2022_MA_IND_DISTILLATE
20200102	Int Comb /Industrial /Distillate Oil (Diesel) /Reciprocating	AEO2022_MA_IND_DISTILLATE
20200103	Int Comb /Industrial /Distillate Oil (Diesel) /Turbine: Cogeneration	AEO2022_MA_IND_DISTILLATE
20200104	Int Comb /Industrial /Distillate Oil (Diesel) /Reciprocating: Cogeneration	AEO2022_MA_IND_DISTILLATE
20200106	Int Comb /Industrial /Distillate Oil (Diesel) /Reciprocating: Evap Losses (Fuel Storage and Delivery System)	AEO2022_MA_IND_DISTILLATE
20200107	Int Comb /Industrial /Distillate Oil (Diesel) /Reciprocating: Exhaust	AEO2022_MA_IND_DISTILLATE
20200201	Int Comb /Industrial /Natural Gas /Turbine	AEO2022_MA_IND_NATGAS
20200202	Int Comb /Industrial /Natural Gas /Reciprocating	AEO2022_MA_IND_NATGAS
20200203	Int Comb /Industrial /Natural Gas /Turbine: Cogeneration	AEO2022_MA_IND_NATGAS
20200204	Int Comb /Industrial /Natural Gas /Reciprocating: Cogeneration	AEO2022_MA_IND_NATGAS
20200207	Int Comb /Industrial /Natural Gas /Reciprocating: Exhaust	AEO2022_MA_IND_NATGAS
20200252	Int Comb /Industrial /Natural Gas /2-cycle Lean Burn	AEO2022_MA_IND_NATGAS
20200253	Int Comb /Industrial /Natural Gas /4-cycle Rich Burn	AEO2022_MA_IND_NATGAS
20200254	Int Comb /Industrial /Natural Gas /4-cycle Lean Burn	AEO2022_MA_IND_NATGAS
20200401	Int Comb /Industrial /Large Bore Engine /Diesel	AEO2022_MA_IND_DISTILLATE
20200402	Int Comb /Industrial /Large Bore Engine /Dual Fuel (Oil/Gas)	AEO2022_MA_IND_DISTILLATE
20200501	Int Comb /Industrial /Residual-Crude Oil /Reciprocating	AEO2022_MA_IND_RESIDUAL
20200901	Int Comb /Industrial /Kerosene/Naphtha (Jet Fuel) /Turbine	AEO2022_MA_IND_DISTILLATE
20200902	Int Comb /Industrial /Kerosene/Naphtha (Jet Fuel) /Reciprocating	AEO2022_MA_IND_DISTILLATE
20201001	Int Comb /Industrial /Liquified Petroleum Gas /Propane: Reciprocating	AEO2022_MA_IND_LPG
20201702	Int Comb /Industrial /Gasoline /Reciprocating Engine	AEO2022_MA_IND_GASOLINE
20300101	Int Comb /Comm-Inst /Distillate Oil (Diesel) /Reciprocating	AEO2022_MA_COM_DISTILLATE
20300102	Int Comb /Comm-Inst /Distillate Oil (Diesel) /Turbine	AEO2022_MA_COM_DISTILLATE
20300107	Int Comb /Comm-Inst /Distillate Oil (Diesel) /Reciprocating: Exhaust	AEO2022_MA_COM_DISTILLATE
20300201	Int Comb /Comm-Inst /Natural Gas /Reciprocating	AEO2022_MA_COM_NATGAS
20300202	Int Comb /Comm-Inst /Natural Gas /Turbine	AEO2022_MA_IND_NATGAS
20300202	Int Comb /Comm-Inst /Natural Gas /Turbine	AEO2022_MA_COM_NATGAS
20300203	Int Comb /Comm-Inst /Natural Gas /Turbine: Cogeneration	AEO2022_MA_COM_NATGAS
20300204	Int Comb /Comm-Inst /Natural Gas /Reciprocating: Cogeneration	AEO2022_MA_COM_NATGAS
20300207	Int Comb /Comm-Inst /Natural Gas /Reciprocating: Exhaust	AEO2022_MA_COM_NATGAS
20300301	Int Comb /Comm-Inst /Gasoline /Reciprocating	AEO2022_MA_COM_GASOLINE
20300307	Int Comb /Comm-Inst /Gasoline /Reciprocating: Exhaust	AEO2022_MA_COM_GASOLINE

SCC	SCC Description	Growth Code
20300702	Int Comb /Comm-Inst /Digester Gas /Reciprocating: POTW Digester Gas	AEO2022_MA_COM_RENEWABLE
20300901	Int Comb /Comm-Inst /Kerosene/Naphtha (Jet Fuel) /Turbine: JP-4	AEO2022_MA_COM_KEROSENE
20301001	Int Comb /Comm-Inst /Liquified Petroleum Gas /Propane: Reciprocating	AEO2022_MA_COM_PROpane
20400102	Int Comb /Engine Testing /Aircraft Engine Testing /Turboshaft	AEO2022_MA_TRANS_JETFUEL
20400110	Int Comb /Engine Testing /Aircraft Engine Testing /Jet A Fuel	AEO2022_MA_TRANS_JETFUEL
20400302	Int Comb /Engine Testing /Turbine /Diesel/Kerosene	AEO2022_MA_IND_DISTILLATE
20400401	Int Comb /Engine Testing /Reciprocating Engine /Gasoline	AEO2022_MA_COM_GASOLINE
20400402	Int Comb /Engine Testing /Reciprocating Engine /Diesel/Kerosene	AEO2022_MA_IND_DISTILLATE
20400403	Int Comb /Engine Testing /Reciprocating Engine /Distillate Oil	AEO2022_MA_IND_DISTILLATE
27000320	Off-highway Diesel Engines /Industrial Fork Lift	AEO2022_MA_IND_DISTILLATE
27300320	Off-highway LPG-fueled Engines /Industrial Fork Lift	AEO2022_MA_IND_LPG
39999994	Misc Manuf / Indus Processes /Other Not Classified	AEO2022_MA_EGU_NATGAS

2.2 Non-Combustion Sources

For industrial, commercial, or institutional processes that do not involve the burning of fuel, state-wide employment data were used for emissions projections. Population and employment data are available from other sources, such as Southwestern Pennsylvania Commission (SPC), but not to the level of detail as the state-wide industry employment projections.

Industry sectors from the Pennsylvania Industry Employment 2018-2028 Long-Term Projections were first assigned to growth codes based on the first three digits of the North American Industry Classification System (NAICS) for each process. Table 2-4 shows the industry employment projections along with growth codes assigned by MARAMA. Employment is shown in terms of number of employees in the Commonwealth of Pennsylvania.

Table 2-4. Pennsylvania Industry Employment Projections, 2018-2028

Growth Code	NAICS	Industry Title	Employment	
			2018	2028
		TOTAL ALL INDUSTRIES	6,329,070	6,647,750
		GOODS-PRODUCING	915,650	929,980
	11	Agriculture, Forestry, Fishing & Hunting	61,980	63,290
EMP_42_NAICS=111	111	Crop Production	35,310	36,640
EMP_42_NAICS=112	112	Animal Production	22,290	22,100
EMP_42_NAICS=113	113	Forestry & Logging	840	830
	1131	Timber Tract Operations	70	80
	1133	Logging	740	730
EMP_42_NAICS=115	115	Agriculture & Forestry Support Activity	3,490	3,670
	1151	Support Activities for Crop Production	2,000	2,130
	1152	Support Activities for Animal Production	1,250	1,260
	1153	Support Activities for Forestry	240	290
	21	Mining, Quarrying & Oil & Gas Extraction	27,950	28,640
EMP_42_NAICS=211	211	Oil & Gas Extraction	4,500	4,770

Growth Code	NAICS	Industry Title	Employment	
			2018	2028
	2111	Oil & Gas Extraction	4,500	4,770
EMP_42_NAICS=212	212	Mining (except Oil & Gas)	9,810	9,060
	2121	Coal Mining	4,970	4,350
EMP_42_NAICS=213	213	Support Activities for Mining	13,650	14,820
	2131	Support Activities for Mining	13,650	14,820
	23	Construction	255,910	276,800
EMP_42_NAICS=236	236	Construction of Buildings	59,360	63,970
	2361	Residential Building Construction	28,870	30,620
	2362	Nonresidential Building Construction	30,490	33,350
EMP_42_NAICS=237	237	Heavy & Civil Engineering Construction	42,160	46,820
	2371	Utility System Construction	25,440	28,590
	2372	Land Subdivision	990	970
	2373	Highway, Street & Bridge Construction	13,480	14,850
	2379	Other Heavy Construction	2,250	2,410
EMP_42_NAICS=238	238	Specialty Trade Contractors	154,390	166,010
	2381	Building Foundation/Exterior Contractors	26,570	28,860
	2382	Building Equipment Contractors	73,950	79,030
	2383	Building Finishing Contractors	23,930	26,000
	2389	Other Specialty Trade Contractors	29,940	32,110
	31-33	Manufacturing	569,810	561,240
EMP_42_NAICS=311	311	Food Manufacturing	72,810	74,140
	3111	Animal Food Manufacturing	3,930	4,020
	3113	Sugar/Confectionery Product Manufacture	10,280	10,130
	3114	Fruit, Vegetable & Specialty Foods Mfg	6,860	6,470
	3115	Dairy Product Manufacturing	6,480	6,420
	3116	Animal Slaughtering & Processing	17,690	18,960
	3118	Bakeries & Tortilla Manufacturing	14,080	13,950
	3119	Other Food Manufacturing	12,440	13,200
EMP_42_NAICS=312	312	Beverage & Tobacco Product Manufacturing	10,590	11,100
	3121	Beverage Manufacturing	10,130	10,780
	3122	Tobacco Manufacturing	460	330
EMP_42_NAICS=313	313	Textile Mills	3,520	3,340
	3131	Fiber, Yarn & Thread Mills	390	390
	3132	Fabric Mills	2,510	2,420
	3133	Textile & Fabric Finishing & Fabric	620	530
EMP_42_NAICS=314	314	Textile Product Mills	3,670	3,300
	3141	Textile Furnishings Mills	1,020	960
	3149	Other Textile Product Mills	2,650	2,340
EMP_42_NAICS=315	315	Apparel Manufacturing	4,060	2,930
	3151	Apparel Knitting Mills	170	130
	3152	Cut & Sew Apparel Manufacturing	3,410	2,290
	3159	Accessories & Other Apparel Mfg	480	510
EMP_42_NAICS=316	316	Leather & Allied Product Manufacturing	730	650
	3169	Other Leather Product Manufacturing	250	230

Growth Code	NAICS	Industry Title	Employment	
			2018	2028
EMP_42_NAICS=321	321	Wood Product Manufacturing	22,550	22,290
	3211	Sawmills & Wood Preservation	4,250	4,160
	3212	Veneer & Engineered Wood Products	2,840	2,800
	3219	Other Wood Product Manufacturing	15,470	15,330
EMP_42_NAICS=322	322	Paper Manufacturing	22,010	21,270
	3221	Pulp, Paper & Paperboard Mills	2,920	2,680
	3222	Converted Paper Product Manufacturing	19,090	18,590
EMP_42_NAICS=323	323	Printing & Related Support Activities	22,980	18,710
	3231	Printing & Related Support Activities	22,980	18,710
EMP_42_NAICS=324	324	Petroleum & Coal Products Manufacturing	6,160	5,810
	3241	Petroleum & Coal Products Manufacturing	6,160	5,810
EMP_42_NAICS=325	325	Chemical Manufacturing	40,810	41,430
	3250A1	Chemical Mfg (3251, 3252, 3253, & 3259)	13,560	13,400
	3250A2	Chemical Mfg (3255 & 3256)	9,180	9,620
	3254	Pharmaceutical & Medicine Manufacturing	18,070	18,400
EMP_42_NAICS=326	326	Plastics & Rubber Products Manufacturing	40,110	40,980
	3261	Plastics Product Manufacturing	35,110	35,950
	3262	Rubber Product Manufacturing	4,990	5,030
EMP_42_NAICS=327	327	Nonmetallic Mineral Product Mfg	20,770	20,020
EMP_42_NAICS=331	331	Primary Metal Manufacturing	35,750	33,180
	3311	Iron & Steel Mills & Ferroalloys	11,780	10,050
	3312	Purchased Steel Product Manufacturing	5,710	5,380
	3313	Alumina & Aluminum Production	3,630	3,720
	3314	Other Nonferrous Metal Production	5,710	5,530
	3315	Foundries	8,920	8,480
EMP_42_NAICS=332	332	Fabricated Metal Product Manufacturing	82,180	81,070
	3320A1	Fabricated Metal Product Mfg (3321, 3322, 3325, 3326, & 3329)	27,970	26,440
	3320A2	Fabricated Metal Product Mfg (3323 & 3324)	26,660	26,450
	3327	Machine Shops & Threaded Products	21,580	22,200
	3328	Coating, Engraving & Heat Treating Metal	5,980	5,980
EMP_42_NAICS=333	333	Machinery Manufacturing	45,660	44,740
	3330A1	Machinery Mfg (3331, 3332, 3334, & 3339)	30,550	30,750
	3333	Commercial & Service Industry Machinery	2,510	2,200
	3335	Metalworking Machinery Manufacturing	10,200	9,480
	3336	Turbine & Power Transmission Equipment	2,390	2,310
	334	Computer & Electronic Product Mfg	29,690	28,670
EMP_42_NAICS=334	3341	Computers & Peripheral Equipment	1,420	1,250
	3342	Communications Equipment Manufacturing	2,910	2,360
	3343	Audio & Video Equipment Manufacturing	380	360
	3344	Semiconductor & Electronic Components	9,800	9,170
	3345	Electronic Instrument Manufacturing	14,940	15,380
	3346	Magnetic Media Manufacture & Reproducing	240	150
	335	Electrical Equipment & Appliances	26,880	27,400
EMP_42_NAICS=335	3351	Electric Lighting Equipment Mfg	1,660	1,540

Growth Code	NAICS	Industry Title	Employment	
			2018	2028
	3352	Household Appliance Manufacturing	660	670
	3353	Electrical Equipment Manufacturing	7,680	7,810
	3359	Other Electrical Equipment & Components	16,890	17,380
EMP_42_NAICS=336	336	Transportation Equipment Manufacturing	37,390	38,820
	3362	Motor Vehicle Body & Trailer Mfg	6,940	7,360
	3363	Motor Vehicle Parts Manufacturing	8,040	8,190
	3364	Aerospace Product & Parts Manufacturing	9,540	10,110
	3365	Railroad Rolling Stock Manufacturing	4,910	4,950
	3369	Other Transportation Equipment Mfg	4,200	4,150
EMP_42_NAICS=337	337	Furniture & Related Product Mfg	16,320	16,100
	3370A1	Furniture & Related Product Mfg (3371 & 3372)	15,370	15,200
	3379	Other Furniture Related Product Mfg	960	900
EMP_42_NAICS=339	339	Miscellaneous Manufacturing	25,170	25,310
	3391	Medical Equipment & Supplies Mfg	13,620	14,130
	3399	Other Miscellaneous Manufacturing	11,550	11,180
		SERVICES-PROVIDING	5,091,410	5,387,720
	22	Utilities	23,710	23,540
EMP_42_NAICS=221	221	Utilities	23,710	23,540
	2211	Power Generation & Supply	16,210	16,060
	2212	Natural Gas Distribution	4,940	4,740
	2213	Water, Sewage & Other Systems	2,560	2,740
	42	Wholesale Trade	217,400	219,790
EMP_42_NAICS=423	423	Merchant Wholesalers, Durable Goods	107,400	107,470
	4230A1	Merchant Whsle, Durable Goods (4232, 4233, 4235, 4236, 4237, & 4239)	48,740	50,250
	4231	Motor Vehicle/Part Merchant Wholesalers	15,290	14,970
	4234	Commercial Goods Merchant Wholesalers	19,250	18,810
	4238	Machinery & Supply Merchant Wholesalers	24,120	23,440
EMP_42_NAICS=424	424	Merchant Wholesalers, Nondurable Goods	65,680	66,000
	4240A1	Merchant Whsle, Nondurable Goods (4244 & 4248)	31,180	32,260
	4240A2	Merchant Whsle, Nondurable Goods (4242 & 4246)	14,370	14,580
	4240A3	Merchant Whsle, Nondurable Goods (4241, 4247, & 4249)	16,630	15,590
	4243	Apparel/Piece Goods Merchant Wholesalers	2,800	2,820
	4245	Farm Product Merchant Wholesalers	700	740
EMP_42_NAICS=425	425	Electronic Markets & Agents/Brokers	44,320	46,320
	4251	Electronic Markets & Agents/Brokers	44,320	46,320
	44-45	Retail Trade	619,510	609,490
EMP_42_NAICS=441	441	Motor Vehicle & Parts Dealers	79,840	82,590
	4411	Automobile Dealers	56,870	59,270
	4412	Other Motor Vehicle Dealers	4,450	4,680
	4413	Auto Parts, Accessories & Tire Stores	18,520	18,650
EMP_42_NAICS=442	442	Furniture & Home Furnishings Stores	16,140	15,770
	4421	Furniture Stores	7,790	7,290
	4422	Home Furnishings Stores	8,350	8,480
EMP_42_NAICS=443	443	Electronics & Appliance Stores	15,720	15,640
	4431	Electronics & Appliance Stores	15,720	15,640

Growth Code	NAICS	Industry Title	Employment	
			2018	2028
EMP_42_NAICS=444	444	Building Material & Garden Supply Stores	45,760	46,320
	4441	Building Material & Supplies Dealers	38,930	39,200
	4442	Lawn & Garden Equipment/Supplies Stores	6,830	7,120
EMP_42_NAICS=445	445	Food & Beverage Stores	137,660	136,080
	4450A1	Food & Beverage Stores (4451 & 4452)	132,340	130,520
	4453	Beer, Wine & Liquor Stores	5,320	5,550
EMP_42_NAICS=446	446	Health & Personal Care Stores	44,050	44,350
	4461	Health & Personal Care Stores	44,050	44,350
EMP_42_NAICS=447	447	Gasoline Stations	40,860	43,340
	4471	Gasoline Stations	40,860	43,340
EMP_42_NAICS=448	448	Clothing & Clothing Accessories Stores	44,650	38,340
	4481	Clothing Stores	32,160	27,000
	4482	Shoe Stores	7,480	7,440
	4483	Jewelry, Luggage & Leather Goods Stores	5,010	3,900
EMP_42_NAICS=451	451	Sporting Goods/Hobby/Book/Music Stores	21,760	19,990
	4511	Sporting Goods/Musical Instrument Stores	18,490	17,960
	4512	Book, Periodical & Music Stores	3,270	2,030
EMP_42_NAICS=452	452	General Merchandise Stores	111,640	107,140
EMP_42_NAICS=453	453	Miscellaneous Store Retailers	33,650	31,590
	4530A1	Miscellaneous Store Retailers (4532 & 4533)	15,970	13,900
	4531	Florists	3,120	2,540
	4539	Other Miscellaneous Store Retailers	14,560	15,160
EMP_42_NAICS=454	454	Nonstore Retailers	27,780	28,350
	4541	Electronic Shopping & Mail-Order Houses	17,310	18,580
	4542	Vending Machine Operators	1,570	1,320
	4543	Direct Selling Establishments	8,900	8,460
	48-49	Transportation & Warehousing	267,810	291,540
EMP_42_NAICS=481	481	Air Transportation	13,190	13,800
	4811	Scheduled Air Transportation	12,060	12,630
	4812	Nonscheduled Air Transportation	1,130	1,170
EMP_42_NAICS=482	482	Rail Transportation	11,390	10,990
	4821	Rail Transportation	11,390	10,990
EMP_42_NAICS=483	483	Water Transportation	720	720
	4831	Sea, Coastal & Great Lakes Transport	230	190
	4832	Inland Water Transportation	490	520
EMP_42_NAICS=484	484	Truck Transportation	67,870	71,980
EMP_42_NAICS=485	485	Transit & Ground Passenger Transport	34,600	37,000
	4851	Urban Transit Systems	270	210
	4852	Interurban & Rural Bus Transportation	840	830
	4853	Taxi & Limousine Service	1,950	1,610
	4854	School & Employee Bus Transportation	24,900	26,550
	4855	Charter Bus Industry	2,110	2,130
	4859	Other Ground Passenger Transportation	4,530	5,670
EMP_42_NAICS=486	486	Pipeline Transportation	2,390	2,510

Growth Code	NAICS	Industry Title	Employment	
			2018	2028
	4862	Pipeline Transportation of Natural Gas	1,860	1,930
	4869	Other Pipeline Transportation	540	570
EMP_42_NAICS=487	487	Scenic & Sightseeing Transportation	770	810
	4871	Scenic/Sightseeing Transportation, Land	470	530
EMP_42_NAICS=488	488	Support Activities for Transportation	17,570	18,960
	4881	Support Activities for Air Transport	3,940	4,390
	4882	Support Activities for Rail Transport	1,350	1,530
	4883	Support Activities for Water Transport	1,860	1,840
	4884	Support Activities, Road Transportation	3,420	3,830
	4885	Freight Transportation Arrangement	5,800	6,210
	4889	Other Support Activities for Transport	1,210	1,160
EMP_42_NAICS=492	492	Couriers & Messengers	32,290	34,840
	4921	Couriers	29,940	31,750
	4922	Local Messengers & Local Delivery	2,350	3,090
EMP_42_NAICS=493	493	Warehousing & Storage	87,000	99,940
	4931	Warehousing & Storage	87,000	99,940
	51	Information	85,970	83,310
EMP_42_NAICS=511	511	Publishing Industries	24,120	22,610
	5111	Newspaper, Book & Directory Publishers	14,690	11,300
	5112	Software Publishers	9,430	11,310
EMP_42_NAICS=512	512	Motion Picture & Sound Recording Ind	8,370	8,870
	5121	Motion Picture & Video Industries	7,960	8,450
	5122	Sound Recording Industries	400	430
EMP_42_NAICS=515	515	Broadcasting (except Internet)	7,800	7,610
	5151	Radio & Television Broadcasting	7,540	7,390
	5152	Cable & Other Subscription Programming	260	220
EMP_42_NAICS=517	517	Telecommunications	27,350	24,020
EMP_42_NAICS=518	518	Data Processing, Hosting	9,410	10,370
	5182	Data Processing & Related Services	9,410	10,370
EMP_42_NAICS=519	519	Other Information Services	8,930	9,840
	5191	Other Information Services	8,930	9,840
	52	Finance & Insurance	260,250	265,060
EMP_42_NAICS=522	522	Credit Intermediation & Related Activity	91,970	90,060
	5220A1	Credit Intermediation & Related Activities (5221 & 5223)	80,560	77,950
	5222	Nondepository Credit Intermediation	11,420	12,110
EMP_42_NAICS=523	523	Financial Investment & Related Activity	43,910	47,500
EMP_42_NAICS=524	524	Insurance Carriers & Related Activities	123,320	126,460
	5241	Insurance Carriers	71,220	71,830
	5242	Insurance Agencies, Brokerages & Support	52,100	54,640
	5251	Insurance & Employee Benefit Funds	120	120
	53	Real Estate & Rental & Leasing	64,880	67,750
EMP_42_NAICS=531	531	Real Estate	43,940	45,570
EMP_42_NAICS=532	532	Rental & Leasing Services	20,420	21,660
	5320A1	Rental & Leasing Services (5322, 5323, & 5324)	12,830	13,610

Growth Code	NAICS	Industry Title	Employment	
			2018	2028
	5321	Automotive Equipment Rental & Leasing	7,590	8,050
EMP_42_NAICS=533	533	Lessors, Nonfinancial Intangible Assets	520	530
	5331	Lessors, Nonfinancial Intangible Assets	520	530
	54	Professional & Technical Services	355,080	383,860
EMP_42_NAICS=541	541	Professional & Technical Services	355,080	383,860
	5411	Legal Services	49,600	50,270
	5412	Accounting & Bookkeeping Services	35,680	36,580
	5413	Architectural & Engineering Services	58,570	63,060
	5414	Specialized Design Services	4,130	4,380
	5415	Computer Systems Design & Rel Services	70,920	80,060
	5416	Management & Technical Consulting Svc	51,250	57,340
	5417	Scientific Research & Development Svc	36,390	38,530
	5418	Advertising, Public Relations & Related Services	17,210	18,260
	5419	Other Professional & Technical Services	31,330	35,400
	55	Management of Companies & Enterprises	136,820	145,120
EMP_42_NAICS=551	551	Management of Companies & Enterprises	136,820	145,120
	5511	Management of Companies & Enterprises	136,820	145,120
	56	Administrative & Waste Services	314,660	333,790
EMP_42_NAICS=561	561	Administrative & Support Services	296,240	313,330
	5611	Office Administrative Services	3,060	3,240
	5612	Facilities Support Services	7,490	8,600
	5613	Employment Services	117,950	125,110
	5614	Business Support Services	27,830	29,250
	5615	Travel Arrangement & Reservation Service	7,580	6,780
	5616	Investigation & Security Services	36,130	38,320
	5617	Services to Buildings & Dwellings	77,970	82,710
	5619	Other Support Services	18,230	19,340
EMP_42_NAICS=562	562	Waste Management & Remediation Service	18,420	20,460
	5621	Waste Collection	8,890	10,310
	5622	Waste Treatment & Disposal	3,540	3,560
	5629	Remediation & Other Waste Services	5,990	6,580
	61	Educational Services	484,250	513,760
EMP_42_NAICS=611	611	Educational Services	484,250	513,760
	6111	Elementary & Secondary Schools	287,580	305,030
	6112	Junior Colleges	16,920	17,040
	6113	Colleges & Universities	151,880	161,090
	6114	Business, Computer & Management Training	2,050	1,910
	6115	Technical & Trade Schools	4,410	4,390
	6116	Other Schools & Instruction	14,790	16,750
	6117	Educational Support Services	6,620	7,550
	62	Health Care & Social Assistance	1,030,280	1,167,490
EMP_42_NAICS=621	621	Ambulatory Health Care Services	339,690	405,560
	6211	Offices of Physicians	117,860	133,600
	6212	Offices of Dentists	34,230	36,310
	6213	Offices of Other Health Practitioners	44,020	52,010

Growth Code	NAICS	Industry Title	Employment	
			2018	2028
	6214	Outpatient Care Centers	45,360	55,870
	6215	Medical & Diagnostic Laboratories	10,800	11,450
	6216	Home Health Care Services	66,170	91,830
	6219	Other Ambulatory Health Care Services	21,250	24,490
EMP_42_NAICS=622	622	Hospitals	277,150	291,940
	6221	General Medical & Surgical Hospitals	240,780	251,410
	6222	Psychiatric & Substance Abuse Hospitals	13,670	14,500
	6223	Other Hospitals	22,700	26,030
EMP_42_NAICS=623	623	Nursing & Residential Care Facilities	203,480	225,880
	6231	Nursing Care Facilities	72,760	73,250
	6232	Residential Mental Health Facilities	54,610	60,970
	6233	Community Care Facility for the Elderly	68,950	84,580
	6239	Other Residential Care Facilities	7,160	7,080
EMP_42_NAICS=624	624	Social Assistance	209,970	244,100
	6241	Individual & Family Services	147,630	179,060
	6242	Emergency & Other Relief Services	7,310	7,750
	6243	Vocational Rehabilitation Services	11,130	10,090
	6244	Child Day Care Services	43,890	47,190
	71	Arts, Entertainment & Recreation	97,960	104,600
EMP_42_NAICS=711	711	Performing Arts & Spectator Sports	19,250	19,750
	7111	Performing Arts Companies	4,690	4,530
	7112	Spectator Sports	6,460	6,720
	7113	Performing Arts & Sports Promoters	6,540	6,940
	7114	Agents & Managers for Public Figures	210	220
	7115	Independent Artists/Writers/Performers	1,340	1,350
EMP_42_NAICS=712	712	Museums, Parks & Historical Sites	7,960	8,450
	7121	Museums, Parks & Historical Sites	7,960	8,450
EMP_42_NAICS=713	713	Amusement, Gambling & Recreation Ind	70,750	76,400
	7131	Amusement Parks & Arcades	8,730	9,330
	7132	Gambling Industries	8,950	9,500
	7139	Other Amusement & Recreation Industries	53,070	57,570
	72	Accommodation & Food Services	473,840	515,260
EMP_42_NAICS=721	721	Accommodation	60,980	63,080
	7211	Traveler Accommodation	57,060	58,760
	7212	RV Parks & Recreational Camps	3,760	4,160
	7213	Rooming & Boarding Houses	160	160
EMP_42_NAICS=722	722	Food Services & Drinking Places	412,860	452,180
	7223	Special Food Services	40,230	43,660
	7224	Drinking Places (Alcoholic Beverages)	16,860	16,140
	7225	Restaurants & Other Eating Places	355,770	392,380
	81	Other Services, Ex. Public Admin	290,380	297,410
EMP_42_NAICS=811	811	Repair & Maintenance	52,800	55,640
	8111	Automotive Repair & Maintenance	36,180	37,580
	8112	Electronic Equipment Repair/Maintenance	5,070	5,110
	8113	Commercial Machinery Repair/Maintenance	9,420	10,880

Growth Code	NAICS	Industry Title	Employment	
			2018	2028
	8114	Household Goods Repair & Maintenance	2,120	2,070
EMP_42_NAICS=812	812	Personal & Laundry Services	69,860	76,380
	8121	Personal Care Services	40,180	45,650
	8122	Death Care Services	7,230	7,320
	8123	Drycleaning & Laundry Services	9,980	9,560
	8129	Other Personal Services	12,480	13,860
EMP_42_NAICS=813	813	Membership Organizations & Associations	137,580	136,040
	8131	Religious Organizations	73,230	71,380
	8132	Grantmaking & Giving Services	6,030	6,360
	8133	Social Advocacy Organizations	8,150	8,640
	8134	Civic & Social Organizations	32,580	32,430
	8139	Professional & Similar Organizations	17,600	17,230
EMP_42_NAICS=814	814	Private Households	30,130	29,350
	8141	Private Households	30,130	29,350
	99	Government	368,630	365,970
	4911	Postal Service	27,880	24,320
	9991	Federal, Except USPS	69,070	69,600
	9992	State Gov't, Except Education & Hospitals	90,930	90,080
	9993	Local Gov't, Except Education & Hospitals	180,760	181,980
		Self-Employed Workers	322,010	330,050

Notes: Data may not add to totals due to rounding. Confidential data and industries with employment less than 50 are not shown but are included in all sub-total and total employment values.

From the long-term projections, annual growth was determined by interpolating the data between 2018 and 2028. Year 2026 employment was calculated by interpolation, and years 2017 and 2035 were extrapolated based on the annual growth between 2018 and 2028. Growth factors were then calculated as the future year employees divided by the attainment year 2017 employees.

2.3 Airport/Helipad Sources

EPA adds airport and helipad point source emissions to each National Emissions Inventory (NEI) based on estimated takeoff, landing, and taxiing emissions. Note: These emissions are not related to inventoried ACHD point sources that are located at or near the airports/helipads.

For the airport/helipad projections, the FAA TAF Pennsylvania and/or Allegheny County passenger enplanements were used to calculate growth factors. Table 2-5 shows the terminal forecast data, which was available directly to years 2017, 2026, and 2035. Growth factors were calculated as the future years divided by the attainment year 2017 values.

Allegheny County Airport (AGC) is the only airport within the Allegheny, PA SO₂ nonattainment area, and Jefferson Hospital has the only hospital helipad within the area.

Table 2-5. Airport Terminal Data

Growth Code	Growth Code Name	2017	2026	2035
FAA2021_42000_AT	FAA2021 TAF Pennsylvania Statewide Air Taxi	327814	175255	181210
FAA2021_42000_COM	FAA2021 TAF Pennsylvania Statewide Commercial	349029	511694	581614
FAA2021_42000_GA	FAA2021 TAF Pennsylvania Statewide General Aviation	1441148	1557730	1666436
FAA2021_42000_MIL	FAA2021 TAF Pennsylvania Statewide Military	62366	62082	64295
FAA2021_AGC_AT	FAA2021 TAF Allegheny County Air Taxi	22856	21315	22798
FAA2021_AGC_COM	FAA2021 TAF Allegheny County Commercial	5	12	12
FAA2021_AGC_GA	FAA2021 TAF Allegheny County General Aviation	38807	41714	41714
FAA2021_AGC_MIL	FAA2021 TAF Allegheny County Military	504	276	276

2.4 New ACHD Sources

For new or expected point source facilities since the 2017 attainment inventory, ACHD added emissions to the projected inventories based on recent inventories or on expected emissions.

For Invenergy Allegheny Energy Center (AEC), which is a proposed combined cycle natural gas-fired EGU in the Allegheny, PA nonattainment area, actual emissions are expected to be similar to other combined cycle power plants. As a high-end estimate of emissions, the permitted level was used for the projected inventories. Table 2-6 shows the permitted SO₂ emissions level (plant-wide) for Invenergy, which was added to both the 2026 and 2035 projected inventories.

Table 2-6. Invenergy Permitted Emission Levels

Facility	SO ₂
Invenergy	23.89

2.5 EGU Sources

For electricity generating units (EGUs), emissions are projected by the Eastern Regional Technical Advisory Committee (ERTAC) emission projection tool. The Allegheny, PA SO₂ nonattainment area does not contain any existing EGUs in the latest CONUSv16.2 version of the ERTAC tool.

3. Area Sources

This section describes the methodologies used for the area source projections. Below is a summary of the resources used for the point source projections, including links to the databases for the resources:

- Energy Information Agency (EIA) Annual Energy Outlook (AEO) projections
<https://www.eia.gov/outlooks/aeo/>
- Pennsylvania Industry Employment 2018-2028 Long-Term Projections
https://www.workstats.dli.pa.gov/Documents/Projections/Industrial/PA/PA_LTIP.pdf
- Collaborative 2016 Emission Modeling Platform (EMP)
<http://views.cira.colostate.edu/wiki/wiki/10202>
<https://www.epa.gov/air-emissions-modeling/2016v2-platform>
- Pennsylvania population projections
<https://www.spcregion.org/wp-content/uploads/2020/03/Cycle-11-by-munic-2015-2045.pdf>
<https://www.rural.pa.gov/data/population-projections>

The following sections describe the methodologies for specific area source sectors. Unless noted, growth factors were consistent for all pollutants and geographical areas for each corresponding SCC or source sector.

3.1 Combustion Sources

Similar to the combustion point sources, area sources that involve fuel burning were projected using EIA AEO projections. AEO fuel use sectors were first matched to area source SCC codes in the 2017 attainment inventory. Projections of fuel usage were available in the AEO to the direct future 2026 and 2035 years for Mid-Atlantic U.S. states. To derive growth factors, the future year (2026 or 2035) usage was divided by the attainment (base) year 2017 usage.

Table 3-1 shows the growth codes for each area source sector. The 2017, 2026, and 2035 usages for each growth code are identical to those given above in the point source section (see Table 2-2).

Table 3-1. Combustion Area Source Sectors and AEO Growth Codes

Area Source Sector	SCC	SCC Level Description	Growth Code
Fuel Comb - Industrial Boilers, ICEs - Coal	2102001000	Anthracite Coal /Total: All Boiler Types	AEO2022_MA_IND_COAL
Fuel Comb - Industrial Boilers, ICEs - Coal	2102002000	Bituminous/Subbituminous Coal /Total: All Boiler Types	AEO2022_MA_IND_COAL
Fuel Comb - Industrial Boilers, ICEs - Oil	2102004001	Distillate Oil /All Boiler Types	AEO2022_MA_IND_DISTILLATE
Fuel Comb - Industrial Boilers, ICEs - Oil	2102004002	Distillate Oil /All IC Engine Types	AEO2022_MA_IND_DISTILLATE
Fuel Comb - Industrial Boilers, ICEs - Oil	2102005000	Residual Oil /Total: All Boiler Types	AEO2022_MA_IND_RESIDUAL
Fuel Comb - Industrial Boilers, ICEs - Natural Gas	2102006000	Natural Gas /Total: Boilers and IC Engines	AEO2022_MA_IND_NATGAS
Fuel Comb - Industrial Boilers, ICEs - Other	2102007000	Liquefied Petroleum Gas /Total: All Boiler Types	AEO2022_MA_IND_LPG
Fuel Comb - Industrial Boilers, ICEs - Biomass	2102008000	Wood /Total: All Boiler Types	AEO2022_MA_IND_RENEWABLE
Fuel Comb - Industrial Boilers, ICEs - Oil	2102011000	Kerosene /Total: All Boiler Types	AEO2022_MA_IND_DISTILLATE
Fuel Comb - Comm/Institutional - Coal	2103001000	Anthracite Coal /Total: All Boiler Types	AEO2022_MA_COM_COAL

Area Source Sector	SCC	SCC Level Description	Growth Code
Fuel Comb - Comm/Institutional - Coal	2103002000	Bituminous/Subbituminous Coal /Total: All Boiler Types	AEO2022_MA_COM_COAL
Fuel Comb - Comm/Institutional - Oil	2103004001	Distillate Oil /Boilers	AEO2022_MA_COM_DISTILLATE
Fuel Comb - Comm/Institutional - Oil	2103004002	Distillate Oil /IC Engines	AEO2022_MA_COM_DISTILLATE
Fuel Comb - Comm/Institutional - Oil	2103005000	Residual Oil /Total: All Boiler Types	AEO2022_MA_COM_RESIDUAL
Fuel Comb - Comm/Institutional - Natural Gas	2103006000	Natural Gas /Total: Boilers and IC Engines	AEO2022_MA_COM_NATGAS
Fuel Comb - Comm/Institutional - Other	2103007000	Liquified Petroleum Gas /Total: All Combustor Types	AEO2022_MA_COM_PROPANE
Fuel Comb - Comm/Institutional - Biomass	2103008000	Wood /Total: All Boiler Types	AEO2022_MA_COM_RENEWABLE
Fuel Comb - Comm/Institutional - Oil	2103011000	Kerosene /Total: All Combustor Types	AEO2022_MA_COM_KEROSENE
Fuel Comb - Residential - Other	2104001000	Anthracite Coal /Total: All Combustor Types	AEO2022_MA_RES_COAL
Fuel Comb - Residential - Other	2104002000	Bituminous/Subbituminous Coal /Total: All Combustor Types	AEO2022_MA_RES_COAL
Fuel Comb - Residential - Oil	2104004000	Distillate Oil /Total: All Combustor Types	AEO2022_MA_RES_DISTILLATE
Fuel Comb - Residential - Natural Gas	2104006000	Natural Gas /Total: All Combustor Types	AEO2022_MA_RES_NATGAS
Fuel Comb - Residential - Other	2104007000	Liquified Petroleum Gas /Total: All Combustor Types	AEO2022_MA_RES_PROPANE
Fuel Comb - Residential - Oil	2104011000	Kerosene /Total: All Heater Types	AEO2022_MA_RES_DISTILLATE

One growth code (AEO2022_MA_COM_RENEWABLE) has negative future use (see Table 2-2 above). Rather than assume zero future year emissions based on negative activity projections, the growth code for a similar sector (AEO2022_MA_IND_RENEWABLE) was used.

3.2 Combustion Sources (Residential Wood)

For residential wood combustion (RWC) area sources, MARAMA developed a spreadsheet tool to estimate growth factors. (The MARAMA tool is available upon request.) The methodology is based on the EPA 2011 EMP, described at the following web site: https://www.epa.gov/sites/default/files/2016-09/documents/2011v6_3_2017_emismod_tsd_aug2016_final.pdf.

Table 3-2 shows the shows the growth codes matched to the RWC area source sector. Table 3-3 shows the projection factors for RWC growth codes, which also varied by pollutant, based on the spreadsheet tool. Projections factors were available directly for years 2017 and 2025; years 2026 and 2035 were based on extrapolation of the annual growth determined by interpolation of 2017 and 2025 factors. The ratio of future case projection factors to 2017 projection factors were used as growth factors for each SCC.

Table 3-2. RWC Area Source SCCs and Growth Codes

Area Source Sector	SCC	SCC Level Description	Growth Code
Fuel Comb - Residential - Wood	2104008100	Wood /Fireplace: general	EPA_RWC_FIREPLACE
Fuel Comb - Residential - Wood	2104008210	Wood /Woodstove: fireplace inserts; non-EPA certified	EPA_RWC_INSERTS_NONCERT
Fuel Comb - Residential - Wood	2104008220	Wood /Woodstove: fireplace inserts; EPA certified; non-catalytic	EPA_RWC_INSERTS_CERT_NONCAT
Fuel Comb - Residential - Wood	2104008230	Wood /Woodstove: fireplace inserts; EPA certified; catalytic	EPA_RWC_INSERTS_CERT_CAT
Fuel Comb - Residential - Wood	2104008310	Wood /Woodstove: freestanding, non-EPA certified	EPA_RWC_FREESTAND_NONCERT
Fuel Comb - Residential - Wood	2104008320	Wood /Woodstove: freestanding, EPA certified, non-catalytic	EPA_RWC_FREESTAND_CERT_NONCAT

Area Source Sector	SCC	SCC Level Description	Growth Code
Fuel Comb - Residential - Wood	2104008330	Wood /Woodstove: freestanding, EPA certified, catalytic	EPA_RWC_FREESTAND_CERT_CAT
Fuel Comb - Residential - Wood	2104008400	Wood /Woodstove: pellet-fired, general (freestanding or FP insert)	EPA_RWC_PELLET
Fuel Comb - Residential - Wood	2104008510	Wood /Furnace: Indoor, cordwood-fired, non-EPA certified	EPA_RWC_FURNACE_NONCERT
Fuel Comb - Residential - Wood	2104008530	Wood /Furnace: Indoor, pellet-fired, general	EPA_RWC_PELLET
Fuel Comb - Residential - Wood	2104008610	Wood /Hydronic heater: outdoor	EPA_RWC_HYDRONIC
Fuel Comb - Residential - Wood	2104008620	Wood /Hydronic heater: indoor	EPA_RWC_HYDRONIC
Fuel Comb - Residential - Wood	2104008630	Wood /Hydronic heater: pellet-fired	EPA_RWC_HYDRONIC
Fuel Comb - Residential - Wood	2104008700	Wood /Outdoor wood burning equipment	EPA_RWC_OUTDOOR
Fuel Comb - Residential - Wood	2104009000	Wood /Firelog	EPA_RWC_FIRELOG

Table 3-3. RWC Growth Codes and Projection Factors

Growth Code	Growth Data Source	Units	2017	2026	2035
EPA_RWC_FIRELOG	EPA RWC V6.2 Methodology with revised NSPS Table 4.22	Projection Factor	1.06200	1.15988	1.25775
EPA_RWC_FIREPLACE	EPA RWC V6.2 Methodology with revised NSPS Table 4.22	Projection Factor	1.06200	1.15988	1.25775
EPA_RWC_FREESTAND_CERT_CAT	EPA RWC V6.2 Methodology with revised NSPS Table 4.22	Projection Factor	1.17100	1.33525	1.49950
EPA_RWC_FREESTAND_CERT_NONCAT	EPA RWC V6.2 Methodology with revised NSPS Table 4.22	Projection Factor	1.17100	1.27113	1.37125
EPA_RWC_FREESTAND_NONCERT	EPA RWC V6.2 Methodology with revised NSPS Table 4.22	Projection Factor	0.93200	0.77788	0.62375
EPA_RWC_FURNACE_NONCERT	EPA RWC V6.2 Methodology with revised NSPS Table 4.22	Projection Factor	0.74600	0.04175	-0.66250
EPA_RWC_HYDRONIC	EPA RWC V6.2 Methodology with revised NSPS Table 4.22	Projection Factor	1.06200	1.03500	1.00800
EPA_RWC_INSERTS_CERT_CAT	EPA RWC V6.2 Methodology with revised NSPS Table 4.22	Projection Factor	1.17100	1.33525	1.49950
EPA_RWC_INSERTS_CERT_NONCAT	EPA RWC V6.2 Methodology with revised NSPS Table 4.22	Projection Factor	1.17100	1.27113	1.37125
EPA_RWC_INSERTS_NONCERT	EPA RWC V6.2 Methodology with revised NSPS Table 4.22	Projection Factor	0.90300	0.73538	0.56775
EPA_RWC_OUTDOOR	EPA RWC V6.2 Methodology with revised NSPS Table 4.22	Projection Factor	1.06200	1.15988	1.25775
EPA_RWC_PELLET	EPA RWC V6.2 Methodology with revised NSPS Table 4.22	Projection Factor	1.55000	2.00225	2.45450

Tables 3-4 and 3-5 show the calculated SO₂ growth factors by specific SCC for 2026 and 2035.

Table 3-4. 2026 RWC Growth Factors by SCC

SCC	SO ₂
2104008220	1.085504
2104008230	1.140265
2104008310	0.834630
2104008320	1.085504
2104008330	1.140265
2104008400	1.291774
2104008510	0.055965
2104008530	1.291774
2104008610	0.974576
2104008620	0.974576
2104008630	0.974576

Table 3-5. 2035 RWC Growth Factors by SCC

SCC	SO ₂
2104008220	1.171008
2104008230	1.280529
2104008310	0.669260
2104008320	1.171008
2104008330	1.280529
2104008400	1.583548
2104008510	0.000000
2104008530	1.583548
2104008610	0.949153
2104008620	0.949153
2104008630	0.949153

3.3 Non-Combustion Industrial/Commercial

Various non-combustion industrial/commercial area sources include mining, bulk gasoline terminals, gasoline stations/transport, and waste disposal. Table 3-6 shows the growth codes for each industrial/commercial area source sector/SCC.

Table 3-6. Industrial/Commercial Area Source Sectors and Growth Codes

Area Source Sector	SCC	SCC Level Description	Growth Code
Industrial Processes - Mining	2325000000	Mining &Quarrying /All Processes /Total	EMP_42_NAICS=212
Bulk Gasoline Terminals	2501050120	Bulk Terminals /All Evaporative Losses /Gasoline	AEO2022_MA_TRANS_GASOLINE
Bulk Gasoline Terminals	2501055120	Bulk Plants /All Evaporative Losses /Gasoline	AEO2022_MA_TRANS_GASOLINE
Gas Stations	2501060051	Stage 1: Submerged Filling	AEO2022_MA_TRANS_GASOLINE
Gas Stations	2501060052	Stage 1: Splash Filling	AEO2022_MA_TRANS_GASOLINE

Area Source Sector	SCC	SCC Level Description	Growth Code
Gas Stations	2501060053	Stage 1: Balanced Submerged Filling	AEO2022_MA_TRANS_GASOLINE
Gas Stations	2501060201	Underground Tank: Breathing and Emptying	AEO2022_MA_TRANS_GASOLINE
Gas Stations	2501080050	Airports: Aviation Gasoline /Stage 1: Total	AEO2022_MA_TRANS_JETFUEL
Gas Stations	2501080100	Airports: Aviation Gasoline /Stage 2: Total	AEO2022_MA_TRANS_JETFUEL
Industrial Processes - Storage and Transfer	2505030120	Transport /Truck /Gasoline	AEO2022_MA_TRANS_GASOLINE
Industrial Processes - Storage and Transfer	2505040120	Transport /Pipeline /Gasoline	AEO2022_MA_TRANS_GASOLINE
Waste Disposal	2630020000	Wastewater Treatment /Public Owned /Total Processed	POP_42003_HIGH
Waste Disposal	2680003000	Composting /100% Green Waste /All Processes	NOGROWTH

For the industrial/commercial area sources related to fuel, the AEO-based methodology for growth factors has been used (see above sections). For the mining area source (non-oil and gas), the methodology for growth factors is based on employment, similar to non-combustion point sources (see above Section 2.2). For composting, no growth was selected.

For wastewater treatment plants, growth factors were developed from population projections. Two sources were available for population projections for Pennsylvania: SPC Cycle 11 and the Center for Rural PA. The projections are similar from both resources, with the Cycle 11 estimates showing lower increases in population through 2035 than the Center for Rural PA projections. (Note: The Cycle 11 projections are also a more recent data set.)

Population projections were available at 5-year intervals, and interpolation was used to determine 2017 and 2026 population estimates. Growth factors were calculated by dividing the projected year populations by the 2017 populations. Table 3-7 shows the population data from 2015 through 2035.

Table 3-7. Projected Population Data

Growth Code	Growth Code Name	Units	2015	2017	2020	2025	2026	2030	2035
POP_42003_LOW	Allegheny County population from SPC-Cycle-11-by-munic-2015-2045	People	1231145	1230295	1229020	1250185	1257301	1285766	1323036
POP_42003_HIGH	Allegheny County population from Center for Rural Growth	People	1244699	1253187	1265919	1286990	1291123	1307654	1326558

3.4 Oil and Gas Sources

For oil and gas area sources, growth factors were based on state-wide growth factors developed by the collaborative 2016 emissions modeling platform (EMP). In late 2017, a group of state, local, tribal, regional, and federal air planning agencies initiated a collaborative process to build a national emissions modeling platform for simulating air quality in the U.S.

Growth factors for the collaborative 2016 EMP were developed from a base year of 2016 and projected to years 2023, 2028, and 2032. For the Allegheny, PA area years, the EMP growth factors were first interpolated and extrapolated. Like described in previous sections, growth factors were then derived as the future case factors divided by the 2017 factors.

Table 3-8 shows the area source sectors and growth codes from the collaborative 2016 EMP for oil and gas area sources. Table 3-9 shows the growth data for each growth code, starting from the 2016 EMP base year. A few oil and gas SCCs in 2017 NEI were not included in the collaborative 2016 EMP; for these SCCs, growth codes for similar activities were assigned as high-end estimates.

Table 3-8. Oil and Gas Area Source Sectors and Growth Codes

Area Source Sector	SCC	SCC Level Description	Growth Code
Industrial Processes - Oil & Gas Production	2310000551	All Processes /Produced Water CBM Wells	OILGAS_COALBED_METHANE_42000
Industrial Processes - Oil & Gas Production	2310000552	All Processes /Produced Water Gas Wells	OILGAS_NONPOINT_GAS_42000
Industrial Processes - Oil & Gas Production	2310000553	All Processes /Produced Water Oil Wells	OILGAS_NONPOINT_OIL_42000
Industrial Processes - Oil & Gas Production	2310000660	All Processes /Hydraulic Fracturing Engines	OILGAS_NONPOINT_GAS_42000
Industrial Processes - Oil & Gas Production	2310010100	Crude Petroleum /Oil Well Heaters	OILGAS_NONPOINT_OIL_42000
Industrial Processes - Oil & Gas Production	2310010200	Crude Petroleum /Oil Well Tanks - Flashing & Standing/Working/Breathing	OILGAS_NONPOINT_OIL_42000
Industrial Processes - Oil & Gas Production	2310010300	Crude Petroleum /Oil Well Pneumatic Devices	OILGAS_NONPOINT_OIL_42000
Industrial Processes - Oil & Gas Production	2310011001	On-Shore Oil /Associated Gas Venting	OILGAS_NONPOINT_OIL_42000
Industrial Processes - Oil & Gas Production	2310011201	On-Shore Oil /Tank Truck/Railcar Loading: Crude Oil	OILGAS_NONPOINT_OIL_42000
Industrial Processes - Oil & Gas Production	2310011501	On-Shore Oil /Fugitives: Connectors	OILGAS_NONPOINT_OIL_42000
Industrial Processes - Oil & Gas Production	2310011502	On-Shore Oil /Fugitives: Flanges	OILGAS_NONPOINT_OIL_42000
Industrial Processes - Oil & Gas Production	2310011503	On-Shore Oil /Fugitives: Open Ended Lines	OILGAS_NONPOINT_OIL_42000
Industrial Processes - Oil & Gas Production	2310011505	On-Shore Oil /Fugitives: Valves	OILGAS_NONPOINT_OIL_42000
Industrial Processes - Oil & Gas Production	2310011600	On-Shore Oil /Artificial Lift Engines	OILGAS_NONPOINT_OIL_42000
Industrial Processes - Oil & Gas Production	2310021030	On-Shore Gas /Tank Truck/Railcar Loading: Condensate	OILGAS_NONPOINT_GAS_42000
Industrial Processes - Oil & Gas Production	2310021102	On-Shore Gas /NG-Fired 2Cycle Lean Burn Compressor Engines 50-499 HP	OILGAS_NONPOINT_GAS_42000
Industrial Processes - Oil & Gas Production	2310021202	On-Shore Gas /NG-Fired 4Cycle Lean Burn Compressor Engines 50-499 HP	OILGAS_NONPOINT_GAS_42000
Industrial Processes - Oil & Gas Production	2310021251	On-Shore Gas /Lateral Compressors 4 Cycle Lean Burn	OILGAS_NONPOINT_GAS_42000
Industrial Processes - Oil & Gas Production	2310021300	On-Shore Gas /Gas Well Pneumatic Devices	OILGAS_NONPOINT_GAS_42000
Industrial Processes - Oil & Gas Production	2310021302	On-Shore Gas /NG-Fired 4Cycle Rich Burn Compressor Engines 50-499 HP	OILGAS_NONPOINT_GAS_42000
Industrial Processes - Oil & Gas Production	2310021310	On-Shore Gas /Gas Well Pneumatic Pumps	OILGAS_NONPOINT_GAS_42000
Industrial Processes - Oil & Gas Production	2310021351	On-Shore Gas /Lateral Compressors 4 Cycle Rich Burn	OILGAS_NONPOINT_GAS_42000
Industrial Processes - Oil & Gas Production	2310021500	On-Shore Gas /Gas Well Completion - Flaring	OILGAS_NONPOINT_GAS_42000
Industrial Processes - Oil & Gas Production	2310021501	On-Shore Gas /Fugitives: Connectors	OILGAS_NONPOINT_GAS_42000
Industrial Processes - Oil & Gas Production	2310021502	On-Shore Gas /Fugitives: Flanges	OILGAS_NONPOINT_GAS_42000
Industrial Processes - Oil & Gas Production	2310021503	On-Shore Gas /Fugitives: Open Ended Lines	OILGAS_NONPOINT_GAS_42000
Industrial Processes - Oil & Gas Production	2310021505	On-Shore Gas /Fugitives: Valves	OILGAS_NONPOINT_GAS_42000
Industrial Processes - Oil & Gas Production	2310021506	On-Shore Gas /Fugitives: Other	OILGAS_NONPOINT_GAS_42000
Industrial Processes - Oil & Gas Production	2310021509	On-Shore Gas /Fugitives: All Processes	OILGAS_NONPOINT_GAS_42000

Area Source Sector	SCC	SCC Level Description	Growth Code
Industrial Processes - Oil & Gas Production	2310023000	Coal Bed Methane NG /Dewatering Pump Engines	OILGAS_COALBED_METHANE_42000
Industrial Processes - Oil & Gas Production	2310023010	Coal Bed Methane NG /Condensate Tanks	OILGAS_COALBED_METHANE_42000
Industrial Processes - Oil & Gas Production	2310023030	Coal Bed Methane NG /Truck/Rail Load Condensate	OILGAS_COALBED_METHANE_42000
Industrial Processes - Oil & Gas Production	2310023100	Coal Bed Methane NG /Well Heater	OILGAS_COALBED_METHANE_42000
Industrial Processes - Oil & Gas Production	2310023102	Coal Bed Methane NG /CBM-Fired 2Cycle Lean Burn Compr Eng 50-499 HP	OILGAS_COALBED_METHANE_42000
Industrial Processes - Oil & Gas Production	2310023202	Coal Bed Methane NG /CBM-Fired 4Cycle Lean Burn Compr Eng 50-499 HP	OILGAS_COALBED_METHANE_42000
Industrial Processes - Oil & Gas Production	2310023251	Coal Bed Methane NG /Lateral Compressors 4 Cycle Lean Burn	OILGAS_COALBED_METHANE_42000
Industrial Processes - Oil & Gas Production	2310023300	Coal Bed Methane NG /Pneumatic Devices	OILGAS_COALBED_METHANE_42000
Industrial Processes - Oil & Gas Production	2310023302	Coal Bed Methane NG /Pneumatic Pumps	OILGAS_COALBED_METHANE_42000
Industrial Processes - Oil & Gas Production	2310023310	Coal Bed Methane NG /Dehydrators	OILGAS_COALBED_METHANE_42000
Industrial Processes - Oil & Gas Production	2310023351	Coal Bed Methane NG /Amine Units	OILGAS_COALBED_METHANE_42000
Industrial Processes - Oil & Gas Production	2310023400	Coal Bed Methane NG /Fugitives	OILGAS_COALBED_METHANE_42000
Industrial Processes - Oil & Gas Production	2310023511	Coal Bed Methane NG /Venting - Initial Completions	OILGAS_COALBED_METHANE_42000
Industrial Processes - Oil & Gas Production	2310023512	Coal Bed Methane NG /Venting - Re-completions	OILGAS_COALBED_METHANE_42000
Industrial Processes - Oil & Gas Production	2310023513	Coal Bed Methane NG /Venting - Blowdowns	OILGAS_COALBED_METHANE_42000
Industrial Processes - Oil & Gas Production	2310023515	Coal Bed Methane NG /Venting - Compressor Startup	OILGAS_COALBED_METHANE_42000
Industrial Processes - Oil & Gas Production	2310023516	Coal Bed Methane NG /Venting - Compressor Shutdown	OILGAS_COALBED_METHANE_42000
Industrial Processes - Oil & Gas Production	2310023600	Coal Bed Methane NG /CBM Well Completion: All Processes	OILGAS_COALBED_METHANE_42000
Industrial Processes - Oil & Gas Production	2310023603	Coal Bed Methane NG /CBM Well Venting - Blowdowns	OILGAS_COALBED_METHANE_42000
Industrial Processes - Oil & Gas Production	2310023606	Coal Bed Methane NG /CBM Mud Degassing	OILGAS_COALBED_METHANE_42000
Industrial Processes - Oil & Gas Production	2310111100	On-Shore Oil Exploration /Mud Degassing	OILGAS_NONPOINT_OIL_42000
Industrial Processes - Oil & Gas Production	2310111401	On-Shore Oil Exploration /Pneumatic Pumps	OILGAS_NONPOINT_OIL_42000
Industrial Processes - Oil & Gas Production	2310111700	On-Shore Oil Exploration /Oil Well Completion	OILGAS_NONPOINT_OIL_42000
Industrial Processes - Oil & Gas Production	2310121100	On-Shore Gas Exploration /Mud Degassing	OILGAS_NONPOINT_GAS_42000
Industrial Processes - Oil & Gas Production	2310121401	On-Shore Gas Exploration /Pneumatic Pumps	OILGAS_NONPOINT_GAS_42000
Industrial Processes - Oil & Gas Production	2310121700	On-Shore Gas Exploration /Gas Well Completion	OILGAS_NONPOINT_GAS_42000
Industrial Processes - Oil & Gas Production	2310300220	All Processes Conventional /Drill Rigs	OILGAS_NONPOINT_GAS_42000
Industrial Processes - Oil & Gas Production	2310321010	On-Shore Gas Conventional /Condensate Tanks	OILGAS_NONPOINT_GAS_42000
Industrial Processes - Oil & Gas Production	2310321100	On-Shore Gas Conventional /Well Heaters	OILGAS_NONPOINT_GAS_42000
Industrial Processes - Oil & Gas Production	2310321400	On-Shore Gas Conventional /Well Dehydrators	OILGAS_NONPOINT_GAS_42000
Industrial Processes - Oil & Gas Production	2310321603	On-Shore Gas Conventional /Well Venting - Blowdowns	OILGAS_NONPOINT_GAS_42000
Industrial Processes - Oil & Gas Production	2310400220	All Processes Unconventional /Drill Rigs	OILGAS_NONPOINT_GAS_42000
Industrial Processes - Oil & Gas Production	2310421010	On-Shore Gas Unconventional /Condensate Tanks	OILGAS_NONPOINT_GAS_42000

Area Source Sector	SCC	SCC Level Description	Growth Code
Industrial Processes - Oil & Gas Production	2310421100	On-Shore Gas Unconventional /Well Heaters	OILGAS_NONPOINT_GAS_42000
Industrial Processes - Oil & Gas Production	2310421603	On-Shore Gas Unconventional /Well Venting - Blowdowns	OILGAS_NONPOINT_GAS_42000

Table 3-9. Growth Data for Oil and Gas Area Sources

Growth Code	Growth Data Source	Units	2016	2017	2026	2035
OILGAS_COALBED_METHANE_42000	Growth factors from Collaborative 2016 EMP	EMP Growth Factor	1.00000	0.97486	0.81000	0.67650
OILGAS_NONPOINT_OIL_42000	Growth factors from Collaborative 2016 EMP	EMP Growth Factor	1.00000	1.06714	1.58600	1.59500
OILGAS_NONPOINT_GAS_42000	Growth factors from Collaborative 2016 EMP	EMP Growth Factor	1.00000	1.07300	1.70600	1.78850

To derive growth data to the 2017/2026 years, growth was interpolated from years 2016/2023/2028 from the EMP. For 2035, growth was extrapolated based on the growth between 2028 and 2032 from the EMP. Growth factors were then calculated by the future years divided by the 2017 growth data.

3.5 Mobile Marine and Locomotive

Mobile marine vessels and locomotives were developed by the collaborative 2016 EMP and include varying factors by pollutant. Table 3-10 shows the marine vessel and locomotive area sources and growth codes, and Table 3-11 shows the growth data (in terms of projection factors or emissions) for each growth code, specific to SO₂. Marine vessels included both growth and control incorporated into the projection factors. Similar to above, the growth factors were determined first by interpolated/extrapolated growth data, then by ratios of the 2026 and 2035 growth data to the 2017 growth data.

Table 3-10. Marine Vessel and Locomotive Area Source Sectors and Growth Codes

Area Source Sector	SCC	SCC Level Description	Growth Code
Mobile - Commercial Marine Vessels	2280002101	Diesel /C1C2 Port emissions: Main Engine	CMV_C1C2
Mobile - Commercial Marine Vessels	2280002102	Diesel /C1C2 Port emissions: Auxiliary Engine	CMV_C1C2
Mobile - Commercial Marine Vessels	2280002201	Diesel /C1C2 Underway emissions: Main Engine	CMV_C1C2
Mobile - Commercial Marine Vessels	2280002202	Diesel /C1C2 Underway emissions: Auxiliary Engine	CMV_C1C2
Mobile - Locomotives	2285002006	Diesel /Line Haul Locomotives: Class I Operations	RAIL_C1
Mobile - Locomotives	2285002007	Diesel /Line Haul Locomotives: Class II / III Operations	RAIL_C2C3
Mobile - Locomotives	2285002008	Diesel /Line Haul Locomotives: Passenger Trains (Amtrak)	RAIL_Pass

Table 3-11. Growth Data for Marine Vessels and Locomotives

Growth Code	Growth Data Source	Units	2016	2017	2026	2035
CMV_C1C2_SO2	Combined growth & control factors from Collaborative 2016 EMP	Projection Factor	1.00000	0.90671	0.34300	0.33400
RAIL_C1_SO2	Emissions from Collaborative 2016 EMP	tons/year	0.88816	0.88946	0.91791	0.89314
RAIL_C2C3_SO2	Emissions from Collaborative 2016 EMP	tons/year	0.06667	0.06673	0.06730	0.06614
RAIL_Pass_SO2	Emissions from Collaborative 2016 EMP	tons/year	0.01656	0.01673	0.01839	0.01981

Tables 3-12 and 3-13 show the calculated growth factors by SCC for SO₂ for 2026 and 2035.

Table 3-12. 2026 Marine/Locomotive Growth Factors by SCC

SCC	SO ₂
2280002101	0.378289
2280002102	0.378289
2280002201	0.378289
2280002202	0.378289
2285002006	1.031981
2285002007	1.008469
2285002008	1.098952

Table 3-13. 2035 Marine/Locomotive Growth Factors by SCC

SCC	SO ₂
2280002101	0.368363
2280002102	0.368363
2280002201	0.368363
2280002202	0.368363
2285002006	1.004137
2285002007	0.991096
2285002008	1.183596

3.6 Fugitive Dust

Fugitive dust growth factors were calculated using vehicle miles traveled (VMTs) for each year (from the MOVES3 modeling) or by employment (see above sections for methodology). Fugitive dust for unpaved roads was held constant, since no new unpaved roads (or increased unpaved road use) would be expected for future years. Table 3-14 shows the fugitive dust area sources and growth codes.

Table 3-14. Fugitive Dust Area Source Sectors and Growth Codes

Area Source Sector	SCC	SCC Level Description	Growth Code
Dust - Paved Road Dust	2294000000	Mobile All Paved Fugitive Dust / Total: Fugitives	VMT_42003
Dust - Unpaved Road Dust	2296000000	Mobile All Unpaved Fugitive Dust / Total: Fugitives	NOGROWTH
Dust - Construction Dust	2311010000	Residential /Total	EMP_42_NAICS=236
Dust - Construction Dust	2311030000	Road Construction /Total	EMP_42_NAICS=237

Note that industrial/commercial/institutional construction dust (SCC: 2311020000) was not included in the attainment or projected inventories (see the summary of the inventories in Appendix B of this document). Growth factors for this SCC would be 1.070 for 2026 and 1.086 for 2035.

3.7 Commercial Cooking

Growth codes for commercial cooking were based on population (see earlier tables for factors). Table 3-15 shows the commercial cooking sources and growth codes.

Table 3-15. Commercial Cooking Area Source Sectors and Growth Codes

Area Source Sector	SCC	SCC Level Description	Growth Code
Commercial Cooking	2302002200	Charbroiling /Underfired Charbroiling	POP_42003_LOW
Commercial Cooking	2302002100	Charbroiling /Conveyorized Charbroiling	POP_42003_HIGH
Commercial Cooking	2302003000	Charbroiling /Frying / Deep Fat	POP_42003_HIGH
Commercial Cooking	2302003100	Charbroiling /Frying / Flat Griddle	POP_42003_HIGH
Commercial Cooking	2302003200	Charbroiling /Frying / Clamshell Griddle	POP_42003_HIGH

The underfired charbroiling used the SPC Cycle 11 population projection (the lower population projection), since this SCC includes a considerable amount of PM_{2.5} and the SPC Cycle 11 data are the more recently compiled data set. For the other cooking SCCs, population estimates from the Center for Rural PA projections were used as high-end estimates.

3.8 Solvent Use

Growth codes for solvent use were based on population or employment (see earlier tables for factors). Asphalt, pesticides, and traffic marking were assigned no growth for the future years. Table 3-16 shows the solvent area sources and growth codes.

Table 3-16. Solvent Area Source Sectors and Growth Codes

Area Source Sector	SCC	SCC Level Description	Growth Code
Solvent - Non-Industrial Surface Coating	2401001000	Architectural Coatings /Total: All Solvent Types	POP_42003_HIGH
Solvent - Industrial Surface Coating & Solvent Use	2401005000	Auto Refinishing /Total: All Solvent Types	EMP_42_NAICS=811
Solvent - Industrial Surface Coating & Solvent Use	2401008000	Traffic Markings /Total: All Solvent Types	NOGROWTH
Solvent - Industrial Surface Coating & Solvent Use	2401015000	Factory Finished Wood /Total: All Solvent Types	EMP_42_NAICS=321
Solvent - Industrial Surface Coating & Solvent Use	2401020000	Wood Furniture /Total: All Solvent Types	EMP_42_NAICS=337
Solvent - Industrial Surface Coating & Solvent Use	2401025000	Metal Furniture /Total: All Solvent Types	EMP_42_NAICS=337
Solvent - Industrial Surface Coating & Solvent Use	2401055000	Machinery & Equip /Total: All Solvent Types	EMP_42_NAICS=333
Solvent - Industrial Surface Coating & Solvent Use	2401060000	Large Appliances /Total: All Solvent Types	EMP_42_NAICS=335
Solvent - Industrial Surface Coating & Solvent Use	2401065000	Electronic & Other Electrical /Total: All Solvent Types	EMP_42_NAICS=334
Solvent - Industrial Surface Coating & Solvent Use	2401070000	Motor Vehicles /Total: All Solvent Types	EMP_42_NAICS=336
Solvent - Industrial Surface Coating & Solvent Use	2401075000	Aircraft /Total: All Solvent Types	EMP_42_NAICS=336
Solvent - Industrial Surface Coating & Solvent Use	2401085000	Railroad /Total: All Solvent Types	EMP_42_NAICS=336
Solvent - Industrial Surface Coating & Solvent Use	2401090000	Misc Manuf /Total: All Solvent Types	EMP_42_NAICS=339
Solvent - Industrial Surface Coating & Solvent Use	2401100000	Industrial Maintenance /Total: All Solvent Types	POP_42003_HIGH
Solvent - Industrial Surface Coating & Solvent Use	2401200000	Other Special Purpose /Total: All Solvent Types	POP_42003_HIGH

Area Source Sector	SCC	SCC Level Description	Growth Code
Solvent - Degreasing	2415000000	All Processes /Total: All Solvent Types	EMP_42_NAICS=31-33_441_811
Solvent - Dry Cleaning	2420000000	All Processes /Total: All Solvent Types	EMP_42_NAICS=812
Solvent - Graphic Arts	2425000000	All Processes /Total: All Solvent Types	POP_42003_HIGH
Solvent - Consumer & Commercial Solvent Use	2460100000	Personal Care Products/Total: All Solvent Types	POP_42003_HIGH
Solvent - Consumer & Commercial Solvent Use	2460200000	Household Products /Total: All Solvent Types	POP_42003_HIGH
Solvent - Consumer & Commercial Solvent Use	2460400000	Auto Aftermarket /Total: All Solvent Types	POP_42003_HIGH
Solvent - Consumer & Commercial Solvent Use	2460500000	Coatings and Related /Total: All Solvent Types	POP_42003_HIGH
Solvent - Consumer & Commercial Solvent Use	2460600000	Adhesives and Sealants /Total: All Solvent Types	POP_42003_HIGH
Solvent - Consumer & Commercial Solvent Use	2460800000	FIFRA Related /Total: All Solvent Types	POP_42003_HIGH
Solvent - Consumer & Commercial Solvent Use	2460900000	Misc (non-covered) /Total: All Solvent Types	POP_42003_HIGH
Solvent - Consumer & Commercial Solvent Use	2461021000	Cutback Asphalt /Total: All Solvent Types	NOGROWTH
Solvent - Consumer & Commercial Solvent Use	2461022000	Emulsified Asphalt /Total: All Solvent Types	NOGROWTH
Solvent - Consumer & Commercial Solvent Use	2461850000	Pesticide /All Processes	NOGROWTH

3.9 Agriculture

Most growth factors for agriculture were derived from collaborative 2016 EMP growth data. Table 3-17 shows area source SCCs and growth codes; Table 3-18 shows the growth factors for each growth code.

Table 3-17. Agriculture Area Source Sectors and Growth Codes

Area Source Sector	SCC	SCC Level Description	Growth Code
Agriculture - Crops & Livestock Dust	2801000003	Crops /Tilling	EPA2018_AG_TILLING
Agriculture - Fertilizer Application	2801700099	Crops /Fertilizer /Misc	NOGROWTH
Agriculture - Crops & Livestock Dust	2805001000	Livestock /Dust kicked up /beef cattle finishing operations feedlots	EPA_AG_BEEF
Agriculture - Crops & Livestock Dust	2805001010	Livestock /Dust kicked up /dairy cattle	EPA_AG_DAIRY
Agriculture - Crops & Livestock Dust	2805001020	Livestock /Dust kicked up /broilers	EPA_AG_BROILERS
Agriculture - Crops & Livestock Dust	2805001030	Livestock /Dust kicked up /layers	EPA_AG_LAYERS
Agriculture - Crops & Livestock Dust	2805001040	Livestock /Dust kicked up /swine	EPA_AG_SWINE
Agriculture - Crops & Livestock Dust	2805001050	Livestock /Dust kicked up /turkey	EPA_AG_TURKEYS
Agriculture - Livestock Waste	2805002000	Beef cattle production composite /NEC	EPA_AG_BEEF
Agriculture - Livestock Waste	2805007100	Poultry /Layers with dry manure management confinement	EPA_AG_LAYERS
Agriculture - Livestock Waste	2805009100	Poultry /Broilers confinement	EPA_AG_BROILERS
Agriculture - Livestock Waste	2805010100	Poultry /Turkeys confinement	EPA_AG_TURKEYS
Agriculture - Livestock Waste	2805018000	Dairy cattle composite /NEC	EPA_AG_DAIRY
Agriculture - Livestock Waste	2805025000	Swine production composite /NEC	EPA_AG_SWINE
Agriculture - Livestock Waste	2805035000	Horses & Ponies Waste Emissions /NEC	EPA_AG_HORSES
Agriculture - Livestock Waste	2805040000	Sheep & Lambs Waste Emissions /Total	EPA_AG_SHEEP
Agriculture - Livestock Waste	2805045000	Goats Waste Emissions /NEC	EPA_AG_GOATS

Table 3-18. Agriculture Growth Factors

Growth Code	Growth Code Name	Units	2016	2017	2026	2035
EPA_AG_BEEF	Growth factors from Collaborative 2016 EMP based on animal counts	EMP Growth Factor	--	1.00000	1.00608	1.01043
EPA_AG_BROILERS	Growth factors from Collaborative 2016 EMP based on animal counts	EMP Growth Factor	--	1.00000	1.12675	1.01776
EPA_AG_DAIRY	Growth factors from Collaborative 2016 EMP based on animal counts	EMP Growth Factor	--	1.00000	1.01280	1.00666
EPA_AG_LAYERS	Growth factors from Collaborative 2016 EMP based on animal counts	EMP Growth Factor	--	1.00000	1.12597	1.03860
EPA_AG_SWINE	Growth factors from Collaborative 2016 EMP based on animal counts	EMP Growth Factor	--	1.00000	1.12503	0.97304
EPA_AG_TURKEYS	Growth factors from Collaborative 2016 EMP based on animal counts	EMP Growth Factor	--	1.00000	1.02522	1.01330
EPA_AG_HORSES	NO GROWTH (from Collaborative 2016 EMP 2016 + FY inventories)	--	1.00000	1.00000	1.00000	1.00000
EPA_AG_SHEEP	NO GROWTH (from Collaborative 2016 EMP 2016 + FY inventories)	--	1.00000	1.00000	1.00000	1.00000
EPA_AG_GOATS	NO GROWTH (from Collaborative 2016 EMP 2016 + FY inventories)	--	1.00000	1.00000	1.00000	1.00000
EPA2018_AG_TILLING	Growth factors from 2011 platform (EPA)	--	1.00000	1.00113	1.01130	1.02140

Data for horses, sheep, and goats included no growth. Additionally, the tilling area source used EPA 2011 EMP growth factors, which were calculated similarly to the collaborative 2016 EMP factors.

3.10 Miscellaneous

Miscellaneous non-industrial area sources were projected using population growth factors, except for animal cremation (assigned no growth). Table 3-19 shows the miscellaneous area source SCCs and growth codes. Additionally, for residential and commercial gas cans, a control factor of 10.821% reduction was applied to the future years based on federal rules for gas cans 2018 and later.

Table 3-19. Miscellaneous Area Source Sectors and Growth Codes

Area Source Sector	SCC	SCC Level Description	Growth Code
Miscellaneous Non-Industrial NEC	2501011011	Residential Gas Cans /Permeable	POP_42003_HIGH
Miscellaneous Non-Industrial NEC	2501011012	Residential Gas Cans /Evaporation	POP_42003_HIGH
Miscellaneous Non-Industrial NEC	2501011013	Residential Gas Cans /Spillage	POP_42003_HIGH
Miscellaneous Non-Industrial NEC	2501011014	Residential Gas Cans /Refilling Vapor	POP_42003_HIGH
Miscellaneous Non-Industrial NEC	2501011015	Residential Gas Cans /Refilling Spillage	POP_42003_HIGH
Miscellaneous Non-Industrial NEC	2501012011	Commercial Gas Cans /Permeable	POP_42003_HIGH
Miscellaneous Non-Industrial NEC	2501012012	Commercial Gas Cans /Evaporation	POP_42003_HIGH
Miscellaneous Non-Industrial NEC	2501012013	Commercial Gas Cans /Spillage	POP_42003_HIGH
Miscellaneous Non-Industrial NEC	2501012014	Commercial Gas Cans /Refilling Vapor	POP_42003_HIGH
Miscellaneous Non-Industrial NEC	2501012015	Commercial Gas Cans /Refilling Spillage	POP_42003_HIGH
Miscellaneous Non-Industrial NEC	2810025000	Charcoal Grilling: Residential /Total	POP_42003_HIGH
Miscellaneous Non-Industrial NEC	2810060100	Cremation /Humans	POP_42003_HIGH
Miscellaneous Non-Industrial NEC	2810060200	Cremation /Animals	NOGROWTH

3.11 Natural Sources

Emissions from natural sources (wildfires and biogenics) were held constant from 2017 through the projected 2026 and 2035 years. For the attainment and projection inventory totals, these source sectors have been shown separately; for the detailed inventory listings, these source sectors have been included with area sources.