DOCUMENTATION FOR THE DRAFT 2002 NONPOINT SOURCE NATIONAL EMISSION INVENTORY FOR CRITERIA AND HAZARDOUS AIR POLLUTANTS (MARCH 2005 VERSION)

Prepared for:

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ACRONYMS AND ABBREVIATIONS

AHS	American Housing Survey
AvGas	aviation gasoline
BEIS	Biogenic Emission Inventory System
BELD	Biogenic Emissions Land Cover Database
BIA	Bureau of Indian Affairs
BLM	Bureau of Land Management
CAA	Clean Air Act
CAP	criteria air pollutant
CAS	Chemical Abstract Service (number)
CBP	*County Business Patterns*
CDD	cooling degree day
CE	control efficiency
CERR	Consolidated Emissions Reporting Rule
CMU	Carnegie Mellon University
CO	carbon monoxide
CON	condensible
D&B	Dun & Bradstreet
DOC	Department of Commerce
DOI	Department of Interior
EIG	Emissions Inventory Group
EIA	Energy Information Administration
EIIP	Emission Inventory Improvement Program
EPA	U.S. Environmental Protection Agency
ESD	Emission Standards Division
FHWA	Federal Highway Administration
FIL	filterable
FIRE	Factor Information REtrieval (database)
FIPS	Federal Information Processing Standards
FWS	Fish and Wildlife Service
HAP	hazardous air pollutant
HC	hydrocarbon
HDD	heating degree day
IARC	International Agency for Research on Cancer
IC	internal combustion
ICI	industrial, commercial, and institutional
LPG	liquified petroleum gas
LTO	landing-take off
MACT	maximum achievable control technology
MMGD	million gallons per day
MMT	manure management train
NAAQS	National Ambient Air Quality Standards
NAICS	North American Industrial Classification System
NAPAP	National Acid Precipitation Assessment Program
NASS	National Agricultural Statistics Service
NATA	National Air Toxics Assessment

ACRONYMS AND ABBREVIATIONS (continued)

NEI	National Emissions Inventory
NEMA	National Electrical Manufacturers Association
NFDC	National Fire Data Center
NH_3	ammonia
NICC	National Interagency Coordination Center
NIF	NEI Input Format
NMOC	nonmethane organic compounds
NO_2	nitrogen dioxide
NO_x	oxides of nitrogen
NPS	National Parks Service
NTI	National Toxics Inventory
O_3	ozone
PAD	Petroleum Administration District
PAH	polycyclic aromatic hydrocarbon
Pb	lead
PCB	polychlorinated biphenyl compound
PE	precipitation-evaporation
PM	particulate matter
PM2.5-PRI	primary particulate matter with a mass median aerodynamic diameter of 2.5 micrometers or less
PM10-PRI	primary particulate matter with a mass median aerodynamic diameter of 10 micrometers or less
RPO	Regional Planning Organization
POM	polycyclic organic matter
POTW	Publicly-Owned Treatment Works
QA	quality assurance
QC	quality control
RIPA	Reusable Industrial Packaging Association
RWC	residential wood combustion
SCAQMD	South Coast Air Quality Management District
SCC	source classification code
SIC	Standard Industrial Classification (code)
SIP	State Implementation Plan
S/L/T	State, Local, and Tribal
SO_2	sulfur dioxide
SOX	oxides of sulfur
TCDD	2,3,7,8-tetrachlorodibenzo-p-dioxin
TCDF	2,3,7,8-tetrachlorodibenzofuran
TEL	tetraethyl lead
TEQ	toxic equivalent
TOG	total organic gases
U.S.	United States
USDA	U.S. Department of Agriculture
USFS	U.S. Forest Service
USGS	U.S. Geological Survey
VOC	volatile organic compound

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1.0 INTRODUCTION

1.1 What Is the National Emissions Inventory?

The National Emissions Inventory (NEI) is a comprehensive inventory of the amount and types of air pollutants emitted into the atmosphere annually by various sources for all areas of the United States. The air pollutants maintained in the NEI include the pollutants that contribute to the formation of one or more of the six criteria air pollutants (CAPs) and regional haze, and the 188 hazardous air pollutants (HAPs) listed in the Clean Air Act (CAA). Sources include point source facility-specific data, mobile source data, and nonpoint (area) source data. The emission estimates are based on many factors, including actual monitored readings, levels of industrial activity, fuel consumption, vehicle miles traveled, and other activities that cause air pollution. The NEI is created by the Emissions Inventory Group (EIG) of the United States Environmental Protection Agency (EPA) in Research Triangle Park, North Carolina. This report presents an overview of how the March 2005 version of the nonpoint source component of the 2002 NEI was compiled.

1.2 What Are the Criteria and Hazardous Air Pollutants?

The CAA, as amended in 1990, established a list of 188 HAPs that cause or may cause cancer or other serious health effects in humans, and may also cause adverse environmental and ecological effects. The list of the 188 HAPs and their Chemical Abstract Service (CAS) numbers are available at, *http://www.epa.gov/ttn/atw/allabout.html#what*.

Under the CAA, EPA has established National Ambient Air Quality Standard (NAAQS) to protect the public health and public welfare. NAAQS have been established for ozone (O_3), nitrogen dioxide (NO_2), carbon monoxide (CO), sulfur dioxide (SO_2), primary particulate matter with a mass median aerodynamic diameter of 10 and 2.5 micrometers (PM10-PRI and PM25-PRI) or less, and lead (Pb). These pollutants are referred to as the "criteria air pollutants" or

CAPs (note that Pb is also included in the list of 188 HAPs and is typically tracked only as a HAP). The EPA includes in the NEI emissions for the pollutants that contribute to the formation of CAPs. These pollutants include volatile organic compounds (VOC), CO, oxides of nitrogen (NO_x), SO_2, PM10-PRI and PM25-PRI, ammonia (NH_3), and Pb. In addition, because PM10-PRI and PM25-PRI are the sum of the filterable (FIL) and condensible (CON) fractions of PM10-PRI and PM25-PRI; PM10-FIL, PM25-FIL, and PM-CON are carried in the NEI when (1) provided by State, Local, and Tribal (S/L/T) agencies; or (2) when calculated by EPA to support development of PM10-PRI or PM25-PRI emissions.

1.3 Why Did the EPA Create the NEI for Criteria and Hazardous Air Pollutants?

The EPA produces the NEI for CAPs and HAPs for various base years. These data are needed by EPA; Regional Planning Organizations (RPOs); and S/L/T agencies to evaluate emissions trends in each State and to compare emission trends between States. The NEI is also used as a basis for various modeling and regulatory analyses. The CAA, as amended in 1990, includes many mandates for the EPA related to CAPs and HAPs. The NEI is a tool that EPA uses to meet the CAA mandates. Also, the NEI is used by RPOs and S/L/T agencies to evaluate air pollution trends and regulatory programs. Finally, the NEI contains the data used to produce EPA's *Air Trends Reports*.

Prior to the 2002 base year, the NEI and predecessor inventories for CAPs and HAPs were prepared separately. Starting with the 2002 base year, EPA is synchronizing the methodologies for preparing the CAP and HAP emissions in order to base the emissions on the same activity basis. However, as discussed later in this report, 2002 activity data are not available for calculating CAP and HAP emissions for all nonpoint source categories. Consequently, for categories for which 2002 activity data are not available, emissions are carried forward from final Version 3 of the 1999 CAP and HAP NEI as place holders until 2002 activity data become available for these categories.

1.4 What Are Nonpoint Sources?

For emission inventory development purposes, EPA has traditionally used the term "area sources" to refer to stationary air pollutant emission sources that are not inventoried at the facility-level. The Consolidated Emissions Reporting Rule (CERR) specifies reporting thresholds for point and area CAPs, which vary depending on the pollutant and the attainment status of a county (see http://www.epa.gov/ttn/chief/cerr/ index.html). The CAA also includes a specific definition of area HAP sources for the purpose of identifying regulatory applicability. In particular, the CAA defines an area HAP source as "any stationary source . . . that emits or has the potential to emit considering controls, in the aggregate, less than 10 tons per year of any HAP or 25 tons per year of any combination of HAPs." Sources that emit HAPs above these thresholds are categorized as "major sources." To reduce confusion between these two sets of area source definitions, EPA has adopted the term "nonpoint" to refer to all CAP and HAP stationary emission sources that are not incorporated into the point source component of the NEI.

Tables 3-1 through 3-3 display the nonpoint source categories included in the March 2005 version of the 2002 NEI. The 2002 nonpoint source NEI includes approximately five hundred source classification codes (SCCs) with CAP and/or HAP emissions, culminating in over four million county-level records in the NEI Input Format (NIF) 3.0 Emission table. Like other emissions inventories, the nonpoint source NEI has limitations based on the availability of data for some source categories and pollutants. These limitations are discussed in Section 4 of this document, and it is important to review them before interpreting the nonpoint source NEI data.

1.5 Evolution of the 2002 Nonpoint Source NEI

The EPA is developing three versions of the 2002 nonpoint source NEI. These versions include the preliminary, draft, and final NEI. This section provides a brief overview of how EPA prepared the preliminary and draft nonpoint source NEI and plans to prepare the final NEI. For all three versions, EPA is placing emphasis on integrating the methods used to prepare the CAP

and HAP inventories to provide a consistent activity basis for estimating emissions for both types of pollutants.

1.5.1 Preliminary 2002 NEI (January 2004 Version)

The preliminary 2002 nonpoint NEI, that was released to the public during February 2004, is the first version of the 2002 nonpoint NEI (EPA, 2004a). The EPA prepared this inventory starting with nonpoint categories for which it prepared emissions using the most recent activity data available (i.e., 2000, 2001, or 2002). For all remaining categories, EPA carried forward the emissions data in final Version 3 of the 1999 NEI (EPA, 2003; EPA, 2004b). The preliminary 2002 NEI was provided to the S/L/T agencies to use as a starting point for preparing their 2002 inventories.

1.5.2 Draft 2002 NEI (March 2005 Version)

The draft 2002 NEI was prepared starting with the inventories that S/L/T agencies submitted to EPA by June 1, 2004. The EPA conducted QA review of the S/L/T inventories and communicated with the S/L/T agencies as needed to correct QA issues. August 11, 2004, EPA distributed via e-mail an Excel workbook file containing a series of spreadsheets that identified QA issues, and identified how EPA would correct the issues if the S/L/T agencies did not provide alternative corrections to the issues. The S/L/T inventories were revised to incorporate corrections provided by the agencies and to apply the default corrections to the inventories for which agencies did not respond to the issues identified. After correcting the inventories, the preliminary 2002 NEI was merged with the S/L/T inventories to fill in missing categories and pollutants.

After release of the preliminary 2002 NEI, EPA continued work on preparing 2002 inventories for several categories. The data for these category-specific inventories were used to replace the old inventory data that was carried forward from the 1999 NEI and included in the

preliminary 2002 NEI. The categories for which EPA prepared or updated inventories after the preliminary 2002 NEI was released are identified in Section 3 of this report.

1.5.3 Final 2002 NEI

The EPA will prepare the final 2002 NEI by revising the draft 2002 NEI to incorporate S/L/T agency comments on the draft. The final nonpoint NEI is scheduled to be finalized during the fall of 2005.

1.6 Uses of the Nonpoint Source NEI

The CERR required State and Local agencies to submit their 2002 base year inventories for CAPs to EPA by June 1, 2004 (http://www.epa.gov/ttn/chief/cerr/index.html). The agencies could voluntarily submit HAPs with their 2002 CAP inventories. The EPA prepared the preliminary 2002 NEI for the agencies to use in supplementing their inventories with data for categories for which the agencies did not prepare 2002 emissions estimates. Some states used the preliminary NEI entirely for their submittals. The EPA also used the preliminary nonpoint source NEI to add categories and pollutants missing from the S/L/T inventories. The EPA prepared the draft 2002 NEI for review and comment by S/L/T agencies prior to finalizing the 2002 NEI.

The final 2002 base year NEI will have multiple end uses. One of these uses is the production of EPA's *Air Trends Reports* available at, http://www.epa.gov/airtrends/reports.html. Also, for CAPs, the emissions data will be used to evaluate State Implementation Plans (SIPs) and support modeling studies for complying with the 8-hour ozone NAAQS, the fine PM NAAQS, and regional haze regulations. The EPA may also use the 2002 NEI as the basis for rulemaking support activities.

The NEI is a critical component of the EPA's National Air Toxics Program. The CAA presents a list of 188 HAPs for which EPA is to identify their sources, quantify their emissions by source category, develop regulations for each source category, and assess public health and environmental impacts after the regulations are put into effect. The initial objective is to make the data available to EPA modelers for use in the National Air Toxics Assessment (NATA). The goal of NATA is to identify those air toxics which are of greatest potential concern, in terms of contribution to population risk. The results will be used to set priorities for the collection of additional air toxics data (e.g., emissions data and ambient monitoring data). In addition, the emissions data compiled as part of this inventory effort will be used in residual risk assessments conducted by EPA.

1.7 Report Organization

This report is organized in the following structure:

Section 1. Provides background information on the NEI and its uses;

Section 2. Describes in general terms how the draft 2002 nonpoint source NEI was developed;

Section 3. Describes how the preliminary 2002 nonpoint source NEI was developed. The discussion covers inventory planning, emission estimation, and data management;

Section 4. Describes how the preliminary 2002 nonpoint source NEI was developed. Describes how to interpret and use the nonpoint source NEI results, including a discussion of the inventory limitations;

Section 5. Provides the references used in the previous sections;

Appendix A. Lists the nonpoint source categories for which 2002 emissions were calculated by EIG, and documents how nonpoint emission estimates were developed;

Appendix B. Documents electronic files containing data sets used to allocate 2002 national activity and emissions to States and counties; and

Appendix C. Documents electronic files containing the emission factors and county-level activity data used to calculate 2002 emissions for the nonpoint source categories.

Appendix D. Provides a tabular summary of the revisions that EPA made to S/L/T inventories to correct QA issues and to add source categories and pollutants missing from the S/L/T inventories.

2.0 DEVELOPMENT OF THE DRAFT 2002 NONPOINT SOURCE NEI

2.1 What is the Draft 2002 Nonpoint Source NEI?

The draft 2002 nonpoint source NEI includes the inventories that S/L/T agencies submitted to EPA by June 1, 2004. The preliminary 2002 NEI was merged with the S/L/T inventories to add source categories and pollutants (i.e., both CAPs and HAPs) missing from the S/L/T inventories. The draft NEI was prepared for review and comment by the S/L/T agencies prior to finalizing the 2002 nonpoint source NEI.

2.2 Who Submitted Nonpoint Source Inventories to EPA?

Table 2-1 shows the state and local agencies that submitted inventories to EPA. This table provides information on the geographic and pollutant coverage of each inventory. A total of 34 states and 12 local agencies submitted nonpoint source inventories to EPA. Table 2-2 shows the tribal inventories that are included in the draft 2002 nonpoint NEI. Two tribes submitted nonpoint source inventories to EPA. Three other tribes submitted data for the 1999 NEI that were carried forward and included in the draft 2002 nonpoint source NEI. All of the inventories were submitted to EPA in NIF 3.0.

2.3 What is EPA's Policy for Accepting State/Local/Tribal Inventories?

The EPA preferentially uses S/L/T nonpoint source data in the NEI. However, EPA did not accept inventories that some states submitted for portable fuel containers. The EPA's Office of Transportation and Air Quality (OTAQ) is preparing a national inventory for this nonpoint source category that EPA plans to use for the NEI. This is a new nonpoint category for the NEI and EPA wants to ensure consistency in both the methodology and geographic coverage of emissions for portable fuel containers.

Table 2-1. Summary of State and Local Agencies that Provided Annual Emissions Included in the Draft 2002 Nonpoint NEI

State	Geographic Coverage	Local Agency	FIPS Code[1]	Number of Counties in Inventory	Number of Counties in State	CAPs[2]	HAPs[2]	Notes
AL	Statewide		01	67	67	x		
AZ	Local	Maricopa County	04013	1	15			For HAPs, county submitted emissions for only lead. State agency did not submit any nonpoint source inventory data in time for inclusion in the draft 2002 NEI.
AR	Statewide		05	75	75	x	x	For HAPs, state submitted emissions for only lead and lead compounds.
CA	Statewide		06	58	58	x	x	
CO			08	63	64	x		State provided comments on the preliminary 2002 nonpoint NEI; unclear if state updated any preliminary NEI estimates to its own estimates for 2002.
CT	Statewide		09	8	8	x	x	For CAPs, state submitted emissions for only VOC, NOX, and CO.
DE	Statewide		10	3	3	x	x	
DC	Statewide		11	1	1	x	x	
FL	Statewide		12	67	67	x		
FL	Local	Broward County	12011	1	67		x	
FL	Local	Duval County	12031	1	67		x	Inventory was not included in the draft 2002 NEI due to QA issues; the inventory will be incorporated into the final 2002 NEI after the QA issues are resolved.
FL	Local	Pinellas County	12103	1	67		x	Inventory was not included in the draft 2002 NEI due to QA issues; the inventory will be incorporated into the final 2002 NEI after the QA issues are resolved.
GA	Statewide		13	159	159	x		
ID	Statewide		16	44	44	x	x	
IL	Statewide		17	102	102	x	x	
IN	Statewide		18	92	92	x	x	For HAPs, state submitted emissions for only lead.
KS	Statewide		20	105	105	x	x	
KY	Local	Jefferson County	21111	1	120	x		State agency did not submit any nonpoint source inventory data.
ME	Statewide		23	16	16	x	x	
MD	Statewide		24	24	24	x	x	
MA	Statewide		25	14	14	x	x	For HAPs, state submitted emissions for only mercury.
MI	Statewide		26	83	83	x		
MN	Statewide		27	87	87	x	x	
MS	Statewide		28	82	82	x		
MO	Statewide		29	115	115	x	x	
NE	Local	Lancaster County	31109	1	93	x		State's nonpoint source inventory consisted of small point sources. State withdrew its nonpoint source inventory and submitted the emissions in point source format.
NV	Local	Clark County	32003	1	17	x		State agency did not submit any nonpoint source inventory data.
NH	Statewide		33	10	10	x		
NJ	Statewide		34	21	21	x		
NM	Local	Bernalillo County	35001	1	33	x	x	State agency did not submit any nonpoint source inventory data.
NY	Statewide		36	62	62	x	x	
OH	Statewide		39	88	88	x	x	
OH	Local	Regional Air Pollution Control	39023, 39037, 39057, 39109,	6	88		x	For CAPs, inventory included VOC only. For HAPs, inventory contained emissions for trichloroethylene, tetrachloroethylene, and methylene chloride only.

Table 2-1 (continued)

State	Geographic Coverage	Local Agency	FIPS Code[1]	Number of Counties in Inventory	Number of Counties in State	CAPs[2]	HAPs[2]	Notes
		Agency	39113, 39135					
OK	Statewide		40	77	77	x		
OR	Statewide		41	36	36	x	x	
PA	Statewide		42	67	67	x	x	For HAPs, state submitted emissions for only lead
SC	Statewide		45	46	46	x		
TN	Local	Davidson County	47037	1	95			State agency did not submit any nonpoint source inventory data.
TN	Local	Knox County	47093	1	95	x	x	State agency did not submit any nonpoint source inventory data.
TX	Statewide		48	254	254	x	x	
UT	Statewide		49	29	29	x	x	
VT	Statewide		50	14	14	x	x	
VA	Statewide		51	134	134	x		For CAPs, state submitted emissions for only VOC, NOX, and CO.
WA	Statewide		53	35	39	x	x	
WA	Local	Puget Sound Clean Air Agency	53033, 53035, 53053, 53061	4	39	x	x	
WV	Statewide		54	55	55	x		
WI	Statewide		55	72	72	x	x	

[1] Federal Information Processing Standards (FIPS) code.
[2] An "x" in this column indicates the state or local agency included CAPs or HAPs in its inventory.

Table 2-2. Summary of Tribal Authorities Included in the Draft 2002 Nonpoint NEI

Tribal Agency	Tribal Code	CAP	HAP	Notes
Assiniboine and Sioux Tribes of the Fort Peck Indian Reservation, Montana	206	R-00-X	R-00-X	Tribal agency submitted inventory for 2002 draft NEI
Fond du Lac Band of the Minnesota Chippewa Tribe	405	R-01-X	R-01-X	Tribal agency submitted inventory for 2002 draft NEI
Confederated Tribes of the Umatilla Reservation, Oregon	143		R-98-F	Data carried forward from 1999 NEI
La Posta Band of Diegueno Mission Indians of the La Posta Indian Reservation, California	577	R-99-X		Data carried forward from 1999 NEI
Ute Mountain Tribe of the Ute Mountain Reservation, Colorado, New Mexico & Utah	751		R-99-F	Data carried forward from 1999 NEI

The EPA also replaced S/L/T NH_3 inventories for the animal husbandry and agricultural fertilizer source categories with the inventories generated from Version 3.6 of the Carnegie Mellon University (CMU) NH_3 model (http://www.cmu.edu/ammonia/).

2.3.1 Animal Husbandry NH3 Emissions

The preliminary NEI for this category is based on EPA's methodology for estimating NH_3 emissions as documented in the report for the preliminary NEI (EPA, 2004a). The inventory in the draft 2002 nonpoint source NEI is from Version 3.6 of the CMU NH_3 model. The CMU model was updated with 2002 activity data from the *Census of Agriculture* that was not available when the EPA inventory was prepared. Also, many states or their RPOs submitted inventories to EPA based on Version 6.2 of the CMU model that did not included the 2002 *Census of Agriculture* activity data. Therefore, for the draft NEI, EPA replaced all state NH_3 emissions (except for four states) and NH_3 emissions originating from the preliminary NEI with the NH_3 inventory developed from Version 3.6 of the CMU model. Note that the CMU model creates NIF 3.0 files containing only monthly emissions. The monthly emissions were summed to create annual emissions and the annual emissions were inserted into the draft 2002 NEI.

The exceptions are California, Kansas, Minnesota, and Missouri who requested that EPA keep their inventory in the draft 2002 NEI for this category. California believes its inventory is better than the inventory from the CMU model. In addition, California included emissions for PM10-FIL, PM25-FIL, VOC, and 11 HAPs along with NH_3 emissions for this category; therefore, by using California's data, the emissions for all of the pollutants are based on the same activity data. Kansas, Minnesota, and Missouri included NH_3 emissions for confined animal feeding operations in their point source inventories and adjusted their nonpoint source inventories to exclude the point source emissions. Therefore, their nonpoint source inventories were not replaced since the CMU model inventory is not adjusted for point source emissions. The EPA will evaluate the point source inventory for other states to determine if they included NH_3 emissions for animal husbandry in their point source inventories and will adjust the nonpoint source emissions accordingly for the final 2002 nonpoint source NEI. For the draft NEI, all CMU data for this category were assigned a data source code of P-02-X. In addition, the inventories for Kansas, Minnesota, and Missouri were assigned the same data source code (P-02-X) since their inventories were sponsored by their RPO.

Other state and local agencies included PM10-PRI or PM10-FIL and PM25-PRI or PM25-FIL in their animal husbandry inventories. The EPA kept the emissions for these pollutants in the draft since the CMU model does not provide estimates for these pollutants. The records for these pollutants were assigned the S-02-X data source code.

2.3.2 Animal Fertilizer NH3 Emissions

In the preliminary NEI, EPA elected to carry the inventory for this category forward from Version 3 of the 1999 NEI. For the draft 2002 NEI, EPA replaced all state NH_3 emissions and NH_3 emissions originating from the preliminary NEI with the NH_3 inventory developed from Version 3.6 of the CMU model. The EPA included only annual NH_3 emissions in the NEI. California did not provide any data for this category so the CMU model inventory for California was added in the draft NEI. All CMU data for this category were assigned a data source code of P-02-X. Oregon provided NOx emissions for this category that were kept in the draft NEI (and assigned the S-02-X data source code).

2.3.3 Natural Sources

The EPA did not include emissions associated with natural sources that agencies included in their inventory submittals. Table 2-3 lists the SCCs, pollutants, and states for which EPA did not include emissions associated with natural sources in the draft NEI.

2.3.4 Wildfires and Prescribed Burning

Some S/L/T agencies submitted point source inventories for wildfires and prescribed burning. The EPA plans to include these inventories in final point source NEI. However, for the draft NEI, EPA did not include the inventories in the point source sector and kept the NEI estimates for these categories in the nonpoint sector in order to maintain the categories in the draft NEI.

Table 2-3. Categories of Natural Sources (Biogenic and Geogenic) Removed from Draft 2002 Nonpoint NEI

SCC	SCC Description	State FIPS	State Name	Pollutant Code
2701010000	Natural Sources, Biogenic, Oak Forests, Total	48	TEXAS	NH3
2701020000	Natural Sources, Biogenic, Non-oak Forests, Total	48	TEXAS	NH3
2701400000	Natural Sources, Biogenic, Soil, Total	53	WASHINGTON	NH3
2701405000	Natural Sources , Biogenic , Unknown Land Use (Anderson Land Use Code 0) , Total	19	IOWA	NH3
2701405000	Natural Sources , Biogenic , Unknown Land Use (Anderson Land Use Code 0) , Total	20	KANSAS	NH3
2701405000	Natural Sources , Biogenic , Unknown Land Use (Anderson Land Use Code 0) , Total	22	LOUISIANA	NH3
2701405000	Natural Sources , Biogenic , Unknown Land Use (Anderson Land Use Code 0) , Total	31	NEBRASKA	NH3
2701405000	Natural Sources , Biogenic , Unknown Land Use (Anderson Land Use Code 0) , Total	40	OKLAHOMA	NH3
2701411000	Natural Sources , Biogenic , Urban or Built-Up Land/Residential (Anderson Land Use Code 11) , Total	19	IOWA	NH3
2701411000	Natural Sources , Biogenic , Urban or Built-Up Land/Residential (Anderson Land Use Code 11) , Total	20	KANSAS	NH3
2701411000	Natural Sources , Biogenic , Urban or Built-Up Land/Residential (Anderson Land Use Code 11) , Total	22	LOUISIANA	NH3
2701411000	Natural Sources , Biogenic , Urban or Built-Up Land/Residential (Anderson Land Use Code 11) , Total	31	NEBRASKA	NH3
2701411000	Natural Sources , Biogenic , Urban or Built-Up Land/Residential (Anderson Land Use Code 11) , Total	40	OKLAHOMA	NH3
2701412000	Natural Sources , Biogenic , Urban or Built-Up Land/Commercial Services (Anderson Land Use Code 12) , Total	19	IOWA	NH3
2701412000	Natural Sources , Biogenic , Urban or Built-Up Land/Commercial Services (Anderson Land Use Code 12) , Total	20	KANSAS	NH3
2701412000	Natural Sources , Biogenic , Urban or Built-Up Land/Commercial Services (Anderson Land Use Code 12) , Total	22	LOUISIANA	NH3
2701412000	Natural Sources , Biogenic , Urban or Built-Up Land/Commercial Services (Anderson Land Use Code 12) , Total	31	NEBRASKA	NH3
2701412000	Natural Sources , Biogenic , Urban or Built-Up Land/Commercial Services (Anderson Land Use Code 12) , Total	40	OKLAHOMA	NH3
2701413000	Natural Sources , Biogenic , Urban or Built-Up Land/Industrial (Anderson Land Use Code 13) , Total	19	IOWA	NH3
2701413000	Natural Sources , Biogenic , Urban or Built-Up Land/Industrial (Anderson Land Use Code 13) , Total	20	KANSAS	NH3
2701413000	Natural Sources , Biogenic , Urban or Built-Up Land/Industrial (Anderson Land Use Code 13) , Total	22	LOUISIANA	NH3
2701413000	Natural Sources , Biogenic , Urban or Built-Up Land/Industrial (Anderson Land Use Code 13) , Total	31	NEBRASKA	NH3
2701413000	Natural Sources , Biogenic , Urban or Built-Up Land/Industrial (Anderson Land Use Code 13) , Total	40	OKLAHOMA	NH3
2701414000	Natural Sources , Biogenic , Urban or Built-Up Land/Transportation, Communications (Anderson LUC14) , Total	19	IOWA	NH3
2701414000	Natural Sources , Biogenic , Urban or Built-Up Land/Transportation, Communications (Anderson LUC14) , Total	20	KANSAS	NH3
2701414000	Natural Sources , Biogenic , Urban or Built-Up Land/Transportation, Communications (Anderson LUC14) , Total	22	LOUISIANA	NH3
2701414000	Natural Sources , Biogenic , Urban or Built-Up Land/Transportation, Communications (Anderson LUC14) , Total	31	NEBRASKA	NH3
2701414000	Natural Sources , Biogenic , Urban or Built-Up Land/Transportation, Communications (Anderson LUC14) , Total	40	OKLAHOMA	NH3
2701415000	Natural Sources , Biogenic , Urban or Built-Up Land/Industrial and Commercial (Anderson LUC 15) , Total	19	IOWA	NH3
2701415000	Natural Sources , Biogenic , Urban or Built-Up Land/Industrial and Commercial (Anderson LUC 15) , Total	20	KANSAS	NH3
2701415000	Natural Sources , Biogenic , Urban or Built-Up Land/Industrial and Commercial (Anderson LUC 15) , Total	22	LOUISIANA	NH3
2701415000	Natural Sources , Biogenic , Urban or Built-Up Land/Industrial and Commercial (Anderson LUC 15) , Total	31	NEBRASKA	NH3
2701415000	Natural Sources , Biogenic , Urban or Built-Up Land/Industrial and Commercial (Anderson LUC 15) , Total	40	OKLAHOMA	NH3
2701416000	Natural Sources , Biogenic , Urban or Built-Up Land/Mixed Urban or Build-Up Land (Anderson LUC 16) , Total	19	IOWA	NH3
2701416000	Natural Sources , Biogenic , Urban or Built-Up Land/Mixed Urban or Build-Up Land (Anderson LUC 16) , Total	20	KANSAS	NH3
2701416000	Natural Sources , Biogenic , Urban or Built-Up Land/Mixed Urban or Build-Up Land (Anderson LUC 16) , Total	22	LOUISIANA	NH3
2701416000	Natural Sources , Biogenic , Urban or Built-Up Land/Mixed Urban or Build-Up Land (Anderson LUC 16) , Total	31	NEBRASKA	NH3
2701416000	Natural Sources , Biogenic , Urban or Built-Up Land/Mixed Urban or Build-Up Land (Anderson LUC 16) , Total	40	OKLAHOMA	NH3
2701417000	Natural Sources , Biogenic , Urban or Built-Up Land/Other Urban or Built-Up Land (Anderson LUC 17) , Total	19	IOWA	NH3
2701417000	Natural Sources , Biogenic , Urban or Built-Up Land/Other Urban or Built-Up Land (Anderson LUC 17) , Total	20	KANSAS	NH3
2701417000	Natural Sources , Biogenic , Urban or Built-Up Land/Other Urban or Built-Up Land (Anderson LUC 17) , Total	22	LOUISIANA	NH3
2701417000	Natural Sources , Biogenic , Urban or Built-Up Land/Other Urban or Built-Up Land (Anderson LUC 17) , Total	31	NEBRASKA	NH3
2701417000	Natural Sources , Biogenic , Urban or Built-Up Land/Other Urban or Built-Up Land (Anderson LUC 17) , Total	40	OKLAHOMA	NH3

Table 2-3 (continued)

SCC	SCC Description	State FIPS	State Name	Pollutant Code
2701420000	Natural Sources, Biogenic, Soil/Agriculture, Total	06	CALIFORNIA	PM, PM10-FIL, PM25-FIL, 7439921, 7439965, 7439976, 7440020, 7440360, 7440382, 7440439, 7440473, 7440484, 7723140, 7782492, 7782505
2701420000	Natural Sources, Biogenic, Soil/Agriculture, Total	25	MASSACHUSETTS	NH3
2701421000	Natural Sources , Biogenic , Agricultural Land/Cropland and Pasture (Anderson Land Use Code 21) , Total	19	IOWA	NH3
2701421000	Natural Sources , Biogenic , Agricultural Land/Cropland and Pasture (Anderson Land Use Code 21) , Total	20	KANSAS	NH3
2701421000	Natural Sources , Biogenic , Agricultural Land/Cropland and Pasture (Anderson Land Use Code 21) , Total	22	LOUISIANA	NH3
2701421000	Natural Sources , Biogenic , Agricultural Land/Cropland and Pasture (Anderson Land Use Code 21) , Total	31	NEBRASKA	NH3
2701421000	Natural Sources , Biogenic , Agricultural Land/Cropland and Pasture (Anderson Land Use Code 21) , Total	40	OKLAHOMA	NH3
2701422000	Natural Sources , Biogenic , Agricultural Land/Orchards, Groves, Vineyards, Nurseries (AndrsnLUC22) , Total	19	IOWA	NH3
2701422000	Natural Sources , Biogenic , Agricultural Land/Orchards, Groves, Vineyards, Nurseries (AndrsnLUC22) , Total	20	KANSAS	NH3
2701422000	Natural Sources , Biogenic , Agricultural Land/Orchards, Groves, Vineyards, Nurseries (AndrsnLUC22) , Total	22	LOUISIANA	NH3
2701422000	Natural Sources , Biogenic , Agricultural Land/Orchards, Groves, Vineyards, Nurseries (AndrsnLUC22) , Total	31	NEBRASKA	NH3
2701422000	Natural Sources , Biogenic , Agricultural Land/Orchards, Groves, Vineyards, Nurseries (AndrsnLUC22) , Total	40	OKLAHOMA	NH3
2701423000	Natural Sources , Biogenic , Agricultural Land/Confined Feeding Operations(Anderson LUC23) , Total	19	IOWA	NH3
2701423000	Natural Sources , Biogenic , Agricultural Land/Confined Feeding Operations(Anderson LUC23) , Total	20	KANSAS	NH3
2701423000	Natural Sources , Biogenic , Agricultural Land/Confined Feeding Operations(Anderson LUC23) , Total	22	LOUISIANA	NH3
2701423000	Natural Sources , Biogenic , Agricultural Land/Confined Feeding Operations(Anderson LUC23) , Total	31	NEBRASKA	NH3
2701423000	Natural Sources , Biogenic , Agricultural Land/Confined Feeding Operations(Anderson LUC23) , Total	40	OKLAHOMA	NH3
2701424000	Natural Sources , Biogenic , Agricultural Land/Other Agricultural Land (Anderson Land Use Code 24) , Total	19	IOWA	NH3
2701424000	Natural Sources , Biogenic , Agricultural Land/Other Agricultural Land (Anderson Land Use Code 24) , Total	20	KANSAS	NH3
2701424000	Natural Sources , Biogenic , Agricultural Land/Other Agricultural Land (Anderson Land Use Code 24) , Total	22	LOUISIANA	NH3
2701424000	Natural Sources , Biogenic , Agricultural Land/Other Agricultural Land (Anderson Land Use Code 24) , Total	31	NEBRASKA	NH3
2701424000	Natural Sources , Biogenic , Agricultural Land/Other Agricultural Land (Anderson Land Use Code 24) , Total	40	OKLAHOMA	NH3
2701431000	Natural Sources , Biogenic , Rangeland/Herbaceous Rangeland (Anderson Land Use Code 31) , Total	19	IOWA	NH3
2701431000	Natural Sources , Biogenic , Rangeland/Herbaceous Rangeland (Anderson Land Use Code 31) , Total	20	KANSAS	NH3
2701431000	Natural Sources , Biogenic , Rangeland/Herbaceous Rangeland (Anderson Land Use Code 31) , Total	22	LOUISIANA	NH3
2701431000	Natural Sources , Biogenic , Rangeland/Herbaceous Rangeland (Anderson Land Use Code 31) , Total	31	NEBRASKA	NH3
2701431000	Natural Sources , Biogenic , Rangeland/Herbaceous Rangeland (Anderson Land Use Code 31) , Total	40	OKLAHOMA	NH3
2701432000	Natural Sources , Biogenic , Rangeland/Shrub and Brush Rangeland (Anderson Land Use Code 32) , Total	19	IOWA	NH3
2701432000	Natural Sources , Biogenic , Rangeland/Shrub and Brush Rangeland (Anderson Land Use Code 32) , Total	20	KANSAS	NH3
2701432000	Natural Sources , Biogenic , Rangeland/Shrub and Brush Rangeland (Anderson Land Use Code 32) , Total	22	LOUISIANA	NH3
2701432000	Natural Sources , Biogenic , Rangeland/Shrub and Brush Rangeland (Anderson Land Use Code 32) , Total	31	NEBRASKA	NH3
2701432000	Natural Sources , Biogenic , Rangeland/Shrub and Brush Rangeland (Anderson Land Use Code 32) , Total	40	OKLAHOMA	NH3
2701433000	Natural Sources , Biogenic , Rangeland/Mixed Rangeland (Anderson Land Use Code 33) , Total	19	IOWA	NH3
2701433000	Natural Sources , Biogenic , Rangeland/Mixed Rangeland (Anderson Land Use Code 33) , Total	20	KANSAS	NH3
2701433000	Natural Sources , Biogenic , Rangeland/Mixed Rangeland (Anderson Land Use Code 33) , Total	22	LOUISIANA	NH3
2701433000	Natural Sources , Biogenic , Rangeland/Mixed Rangeland (Anderson Land Use Code 33) , Total	31	NEBRASKA	NH3
2701433000	Natural Sources , Biogenic , Rangeland/Mixed Rangeland (Anderson Land Use Code 33) , Total	40	OKLAHOMA	NH3
2701441000	Natural Sources , Biogenic , Forest Land/Deciduous Forest Land (Anderson Land Use Code 41) , Total	19	IOWA	NH3
2701441000	Natural Sources , Biogenic , Forest Land/Deciduous Forest Land (Anderson Land Use Code 41) , Total	20	KANSAS	NH3

Table 2-3 (continued)

SCC	SCC Description	State FIPS	State Name	Pollutant Code
2701441000	Natural Sources , Biogenic , Forest Land/Deciduous Forest Land (Anderson Land Use Code 41) , Total	22	LOUISIANA	NH3
2701441000	Natural Sources , Biogenic , Forest Land/Deciduous Forest Land (Anderson Land Use Code 41) , Total	31	NEBRASKA	NH3
2701441000	Natural Sources , Biogenic , Forest Land/Deciduous Forest Land (Anderson Land Use Code 41) , Total	40	OKLAHOMA	NH3
2701442000	Natural Sources , Biogenic , Forest Land/Evergreen Forest Land (Anderson Land Use Code 42) , Total	19	IOWA	NH3
2701442000	Natural Sources , Biogenic , Forest Land/Evergreen Forest Land (Anderson Land Use Code 42) , Total	20	KANSAS	NH3
2701442000	Natural Sources , Biogenic , Forest Land/Evergreen Forest Land (Anderson Land Use Code 42) , Total	22	LOUISIANA	NH3
2701442000	Natural Sources , Biogenic , Forest Land/Evergreen Forest Land (Anderson Land Use Code 42) , Total	31	NEBRASKA	NH3
2701442000	Natural Sources , Biogenic , Forest Land/Evergreen Forest Land (Anderson Land Use Code 42) , Total	40	OKLAHOMA	NH3
2701443000	Natural Sources , Biogenic , Forest Land/Mixed Forest Land (Anderson Land Use Code 43) , Total	19	IOWA	NH3
2701443000	Natural Sources , Biogenic , Forest Land/Mixed Forest Land (Anderson Land Use Code 43) , Total	20	KANSAS	NH3
2701443000	Natural Sources , Biogenic , Forest Land/Mixed Forest Land (Anderson Land Use Code 43) , Total	22	LOUISIANA	NH3
2701443000	Natural Sources , Biogenic , Forest Land/Mixed Forest Land (Anderson Land Use Code 43) , Total	31	NEBRASKA	NH3
2701443000	Natural Sources , Biogenic , Forest Land/Mixed Forest Land (Anderson Land Use Code 43) , Total	40	OKLAHOMA	NH3
2701451000	Natural Sources , Biogenic , Water/Streams and Canals (Anderson Land Use Code 51) , Total	19	IOWA	NH3
2701451000	Natural Sources , Biogenic , Water/Streams and Canals (Anderson Land Use Code 51) , Total	20	KANSAS	NH3
2701451000	Natural Sources , Biogenic , Water/Streams and Canals (Anderson Land Use Code 51) , Total	22	LOUISIANA	NH3
2701451000	Natural Sources , Biogenic , Water/Streams and Canals (Anderson Land Use Code 51) , Total	31	NEBRASKA	NH3
2701451000	Natural Sources , Biogenic , Water/Streams and Canals (Anderson Land Use Code 51) , Total	40	OKLAHOMA	NH3
2701452000	Natural Sources , Biogenic , Water/Lakes (Anderson Land Use Code 52) , Total	19	IOWA	NH3
2701452000	Natural Sources , Biogenic , Water/Lakes (Anderson Land Use Code 52) , Total	20	KANSAS	NH3
2701452000	Natural Sources , Biogenic , Water/Lakes (Anderson Land Use Code 52) , Total	22	LOUISIANA	NH3
2701452000	Natural Sources , Biogenic , Water/Lakes (Anderson Land Use Code 52) , Total	31	NEBRASKA	NH3
2701452000	Natural Sources , Biogenic , Water/Lakes (Anderson Land Use Code 52) , Total	40	OKLAHOMA	NH3
2701453000	Natural Sources , Biogenic , Water/Reservoirs (Anderson Land Use Code 53) , Total	19	IOWA	NH3
2701453000	Natural Sources , Biogenic , Water/Reservoirs (Anderson Land Use Code 53) , Total	20	KANSAS	NH3
2701453000	Natural Sources , Biogenic , Water/Reservoirs (Anderson Land Use Code 53) , Total	22	LOUISIANA	NH3
2701453000	Natural Sources , Biogenic , Water/Reservoirs (Anderson Land Use Code 53) , Total	31	NEBRASKA	NH3
2701453000	Natural Sources , Biogenic , Water/Reservoirs (Anderson Land Use Code 53) , Total	40	OKLAHOMA	NH3
2701454000	Natural Sources , Biogenic , Water/Bays and Estuaries (Anderson Land Use Code 54) , Total	19	IOWA	NH3
2701454000	Natural Sources , Biogenic , Water/Bays and Estuaries (Anderson Land Use Code 54) , Total	20	KANSAS	NH3
2701454000	Natural Sources , Biogenic , Water/Bays and Estuaries (Anderson Land Use Code 54) , Total	22	LOUISIANA	NH3
2701454000	Natural Sources , Biogenic , Water/Bays and Estuaries (Anderson Land Use Code 54) , Total	31	NEBRASKA	NH3
2701454000	Natural Sources , Biogenic , Water/Bays and Estuaries (Anderson Land Use Code 54) , Total	40	OKLAHOMA	NH3
2701461000	Natural Sources , Biogenic , Wetlands/Forested Wetlands (Anderson Land Use Code 61) , Total	19	IOWA	NH3
2701461000	Natural Sources , Biogenic , Wetlands/Forested Wetlands (Anderson Land Use Code 61) , Total	20	KANSAS	NH3
2701461000	Natural Sources , Biogenic , Wetlands/Forested Wetlands (Anderson Land Use Code 61) , Total	22	LOUISIANA	NH3
2701461000	Natural Sources , Biogenic , Wetlands/Forested Wetlands (Anderson Land Use Code 61) , Total	31	NEBRASKA	NH3
2701461000	Natural Sources , Biogenic , Wetlands/Forested Wetlands (Anderson Land Use Code 61) , Total	40	OKLAHOMA	NH3
2701462000	Natural Sources , Biogenic , Wetlands/Nonforested Wetlands (Anderson Land Use Code 62) , Total	19	IOWA	NH3
2701462000	Natural Sources , Biogenic , Wetlands/Nonforested Wetlands (Anderson Land Use Code 62) , Total	20	KANSAS	NH3
2701462000	Natural Sources , Biogenic , Wetlands/Nonforested Wetlands (Anderson Land Use Code 62) , Total	22	LOUISIANA	NH3
2701462000	Natural Sources , Biogenic , Wetlands/Nonforested Wetlands (Anderson Land Use Code 62) , Total	31	NEBRASKA	NH3
2701462000	Natural Sources , Biogenic , Wetlands/Nonforested Wetlands (Anderson Land Use Code 62) , Total	40	OKLAHOMA	NH3

Table 2-3 (continued)

SCC	SCC Description	State FIPS	State Name	Pollutant Code
2701471000	Natural Sources , Biogenic , Barren Land/Dry Salt Flats (Anderson Land Use Code 71) , Total	19	IOWA	NH3
2701471000	Natural Sources , Biogenic , Barren Land/Dry Salt Flats (Anderson Land Use Code 71) , Total	20	KANSAS	NH3
2701471000	Natural Sources , Biogenic , Barren Land/Dry Salt Flats (Anderson Land Use Code 71) , Total	22	LOUISIANA	NH3
2701471000	Natural Sources , Biogenic , Barren Land/Dry Salt Flats (Anderson Land Use Code 71) , Total	31	NEBRASKA	NH3
2701471000	Natural Sources , Biogenic , Barren Land/Dry Salt Flats (Anderson Land Use Code 71) , Total	40	OKLAHOMA	NH3
2701472000	Natural Sources , Biogenic , Barren Land/Beaches (Anderson Land Use Code 72) , Total	19	IOWA	NH3
2701472000	Natural Sources , Biogenic , Barren Land/Beaches (Anderson Land Use Code 72) , Total	20	KANSAS	NH3
2701472000	Natural Sources , Biogenic , Barren Land/Beaches (Anderson Land Use Code 72) , Total	22	LOUISIANA	NH3
2701472000	Natural Sources , Biogenic , Barren Land/Beaches (Anderson Land Use Code 72) , Total	31	NEBRASKA	NH3
2701472000	Natural Sources , Biogenic , Barren Land/Beaches (Anderson Land Use Code 72) , Total	40	OKLAHOMA	NH3
2701473000	Natural Sources , Biogenic , Barren Land/Sandy Areas Other than Beaches (Anderson Land Use Code 73) , Total	19	IOWA	NH3
2701473000	Natural Sources , Biogenic , Barren Land/Sandy Areas Other than Beaches (Anderson Land Use Code 73) , Total	20	KANSAS	NH3
2701473000	Natural Sources , Biogenic , Barren Land/Sandy Areas Other than Beaches (Anderson Land Use Code 73) , Total	22	LOUISIANA	NH3
2701473000	Natural Sources , Biogenic , Barren Land/Sandy Areas Other than Beaches (Anderson Land Use Code 73) , Total	31	NEBRASKA	NH3
2701473000	Natural Sources , Biogenic , Barren Land/Sandy Areas Other than Beaches (Anderson Land Use Code 73) , Total	40	OKLAHOMA	NH3
2701474000	Natural Sources , Biogenic , Barren Land/Bare Exposed Rock (Anderson Land Use Code 74) , Total	19	IOWA	NH3
2701474000	Natural Sources , Biogenic , Barren Land/Bare Exposed Rock (Anderson Land Use Code 74) , Total	20	KANSAS	NH3
2701474000	Natural Sources , Biogenic , Barren Land/Bare Exposed Rock (Anderson Land Use Code 74) , Total	22	LOUISIANA	NH3
2701474000	Natural Sources , Biogenic , Barren Land/Bare Exposed Rock (Anderson Land Use Code 74) , Total	31	NEBRASKA	NH3
2701474000	Natural Sources , Biogenic , Barren Land/Bare Exposed Rock (Anderson Land Use Code 74) , Total	40	OKLAHOMA	NH3
2701475000	Natural Sources , Biogenic , Barren Land/Strip Mines, Quarries, and Gravel Pits (Anderson LUC 75) , Total	19	IOWA	NH3
2701475000	Natural Sources , Biogenic , Barren Land/Strip Mines, Quarries, and Gravel Pits (Anderson LUC 75) , Total	20	KANSAS	NH3
2701475000	Natural Sources , Biogenic , Barren Land/Strip Mines, Quarries, and Gravel Pits (Anderson LUC 75) , Total	22	LOUISIANA	NH3
2701475000	Natural Sources , Biogenic , Barren Land/Strip Mines, Quarries, and Gravel Pits (Anderson LUC 75) , Total	31	NEBRASKA	NH3
2701475000	Natural Sources , Biogenic , Barren Land/Strip Mines, Quarries, and Gravel Pits (Anderson LUC 75) , Total	40	OKLAHOMA	NH3
2701476000	Natural Sources , Biogenic , Barren Land/Transitional Areas (Anderson Land Use Code 76) , Total	19	IOWA	NH3
2701476000	Natural Sources , Biogenic , Barren Land/Transitional Areas (Anderson Land Use Code 76) , Total	20	KANSAS	NH3
2701476000	Natural Sources , Biogenic , Barren Land/Transitional Areas (Anderson Land Use Code 76) , Total	22	LOUISIANA	NH3
2701476000	Natural Sources , Biogenic , Barren Land/Transitional Areas (Anderson Land Use Code 76) , Total	31	NEBRASKA	NH3
2701476000	Natural Sources , Biogenic , Barren Land/Transitional Areas (Anderson Land Use Code 76) , Total	40	OKLAHOMA	NH3
2701477000	Natural Sources , Biogenic , Barren Land/Mixed Barren Land (Anderson Land Use Code 77) , Total	19	IOWA	NH3
2701477000	Natural Sources , Biogenic , Barren Land/Mixed Barren Land (Anderson Land Use Code 77) , Total	20	KANSAS	NH3
2701477000	Natural Sources , Biogenic , Barren Land/Mixed Barren Land (Anderson Land Use Code 77) , Total	22	LOUISIANA	NH3
2701477000	Natural Sources , Biogenic , Barren Land/Mixed Barren Land (Anderson Land Use Code 77) , Total	31	NEBRASKA	NH3
2701477000	Natural Sources , Biogenic , Barren Land/Mixed Barren Land (Anderson Land Use Code 77) , Total	40	OKLAHOMA	NH3
2701481000	Natural Sources , Biogenic , Tundra/Shrub and Brush Tundra (Anderson Land Use Code 81) , Total	19	IOWA	NH3
2701481000	Natural Sources , Biogenic , Tundra/Shrub and Brush Tundra (Anderson Land Use Code 81) , Total	20	KANSAS	NH3
2701481000	Natural Sources , Biogenic , Tundra/Shrub and Brush Tundra (Anderson Land Use Code 81) , Total	22	LOUISIANA	NH3
2701481000	Natural Sources , Biogenic , Tundra/Shrub and Brush Tundra (Anderson Land Use Code 81) , Total	31	NEBRASKA	NH3
2701481000	Natural Sources , Biogenic , Tundra/Shrub and Brush Tundra (Anderson Land Use Code 81) , Total	40	OKLAHOMA	NH3
2701482000	Natural Sources , Biogenic , Tundra/Herbaceous Tundra (Anderson Land Use Code 82) , Total	19	IOWA	NH3
2701482000	Natural Sources , Biogenic , Tundra/Herbaceous Tundra (Anderson Land Use Code 82) , Total	20	KANSAS	NH3
2701482000	Natural Sources , Biogenic , Tundra/Herbaceous Tundra (Anderson Land Use Code 82) , Total	22	LOUISIANA	NH3

Table 2-3 (continued)

SCC	SCC Description	State FIPS	State Name	Pollutant Code
2701482000	Natural Sources , Biogenic , Tundra/Herbaceous Tundra (Anderson Land Use Code 82) , Total	31	NEBRASKA	NH3
2701482000	Natural Sources , Biogenic , Tundra/Herbaceous Tundra (Anderson Land Use Code 82) , Total	40	OKLAHOMA	NH3
2701483000	Natural Sources , Biogenic , Tundra/Bare Ground (Anderson Land Use Code 83) , Total	19	IOWA	NH3
2701483000	Natural Sources , Biogenic , Tundra/Bare Ground (Anderson Land Use Code 83) , Total	20	KANSAS	NH3
2701483000	Natural Sources , Biogenic , Tundra/Bare Ground (Anderson Land Use Code 83) , Total	22	LOUISIANA	NH3
2701483000	Natural Sources , Biogenic , Tundra/Bare Ground (Anderson Land Use Code 83) , Total	31	NEBRASKA	NH3
2701483000	Natural Sources , Biogenic , Tundra/Bare Ground (Anderson Land Use Code 83) , Total	40	OKLAHOMA	NH3
2701484000	Natural Sources , Biogenic , Tundra/Wet Tundra (Anderson Land Use Code 84) , Total	19	IOWA	NH3
2701484000	Natural Sources , Biogenic , Tundra/Wet Tundra (Anderson Land Use Code 84) , Total	20	KANSAS	NH3
2701484000	Natural Sources , Biogenic , Tundra/Wet Tundra (Anderson Land Use Code 84) , Total	22	LOUISIANA	NH3
2701484000	Natural Sources , Biogenic , Tundra/Wet Tundra (Anderson Land Use Code 84) , Total	31	NEBRASKA	NH3
2701484000	Natural Sources , Biogenic , Tundra/Wet Tundra (Anderson Land Use Code 84) , Total	40	OKLAHOMA	NH3
2701485000	Natural Sources , Biogenic , Tundra/Mixed Tundra (Anderson Land Use Code 85) , Total	19	IOWA	NH3
2701485000	Natural Sources , Biogenic , Tundra/Mixed Tundra (Anderson Land Use Code 85) , Total	20	KANSAS	NH3
2701485000	Natural Sources , Biogenic , Tundra/Mixed Tundra (Anderson Land Use Code 85) , Total	22	LOUISIANA	NH3
2701485000	Natural Sources , Biogenic , Tundra/Mixed Tundra (Anderson Land Use Code 85) , Total	31	NEBRASKA	NH3
2701485000	Natural Sources , Biogenic , Tundra/Mixed Tundra (Anderson Land Use Code 85) , Total	40	OKLAHOMA	NH3
2701491000	Natural Sources , Biogenic , Perennial Snow and Ice/Perennial Snowfields (Anderson LUC 91) , Total	19	IOWA	NH3
2701491000	Natural Sources , Biogenic , Perennial Snow and Ice/Perennial Snowfields (Anderson LUC 91) , Total	20	KANSAS	NH3
2701491000	Natural Sources , Biogenic , Perennial Snow and Ice/Perennial Snowfields (Anderson LUC 91) , Total	22	LOUISIANA	NH3
2701491000	Natural Sources , Biogenic , Perennial Snow and Ice/Perennial Snowfields (Anderson LUC 91) , Total	31	NEBRASKA	NH3
2701491000	Natural Sources , Biogenic , Perennial Snow and Ice/Perennial Snowfields (Anderson LUC 91) , Total	40	OKLAHOMA	NH3
2701492000	Natural Sources , Biogenic , Perennial Snow and Ice/Glaciers (Anderson Land Use Code 92) , Total	19	IOWA	NH3
2701492000	Natural Sources , Biogenic , Perennial Snow and Ice/Glaciers (Anderson Land Use Code 92) , Total	20	KANSAS	NH3
2701492000	Natural Sources , Biogenic , Perennial Snow and Ice/Glaciers (Anderson Land Use Code 92) , Total	22	LOUISIANA	NH3
2701492000	Natural Sources , Biogenic , Perennial Snow and Ice/Glaciers (Anderson Land Use Code 92) , Total	31	NEBRASKA	NH3
2701492000	Natural Sources , Biogenic , Perennial Snow and Ice/Glaciers (Anderson Land Use Code 92) , Total	40	OKLAHOMA	NH3
2730050000	Natural Sources, Geogenic, Geyser/Geothermal, Total	06	CALIFORNIA	VOC, 108883, 71432
2730100000	Natural Sources / Geogenic / Wind Erosion / Total	04013	ARIZONA, MARICOPA COUNTY	PM10-PRI, PM25-PRI
2730100000	Natural Sources / Geogenic / Wind Erosion / Total	05	ARKANSAS	PM10-PRI, PM25-PRI
2730100000	Natural Sources / Geogenic / Wind Erosion / Total	06	CALIFORNIA	PM, PM10-PRI, PM10-FIL, PM25-PRI, PM25-FIL, 7439921, 7439965, 7439976, 7440020, 7440360, 7440382, 7440439, 7440473, 7440484, 7723140, 7782492, 7782505

2.4 What did EPA do with the State/Local/Tribal Inventories?

2.4.1 Initial Processing and QA of Inventories

Upon receipt of each inventory, EPA ran its quality control/quality assurance (QC/QA) program on the inventory to identify format errors, missing data required in mandatory fields, duplicate records, and other referential integrity problems (EPA, 2004c). The EPA contacted the S/L/T agencies to resolve many of these issues in the Access database submittals. Then the S/L/T inventories were loaded into an Oracle database, and combined into a single data set in NIF 3.0. Appendix D of this report provides a tabular summary of the revisions made to S/L/T inventories to resolve QA issues. The following explains the procedures applied to the S/L/T inventories prior to merging the NEI into the S/L/T inventories to fill data gaps.

1. Changed Pollutant Codes as follows: oxides of sulfur (SOX) to SO2; nonmethane organic compounds (NMOC), hydrocarbon (HC), or total organic gases (TOG) to VOC; Chemical Abstract Number 7439921 to NH_3; and made all other pollutant codes upper case. In the NEI, VOC and SO2 are used exclusively, and all pollutants are upper case. If an agency provided NMOC, HC, or TOG emissions for the same data key (excluding the pollutant code) for which it provided VOC emissions, the NMOC, HC, or TOG emissions were removed from the NEI. Otherwise, the NMOC, HC, or TOG codes were changed to VOC. The routines for merging the NEI with S/L/T data in the Emission and Control Equipment tables match on the data key for the tables which include Pollutant Code. Where records matched on the data key, S/L/T data were used. The changes to the pollutant codes were made to avoid inserting NEI records that would otherwise double count emissions. In addition, the pollutant codes need to be consistent to generate reports of national emissions or by State.

2. After correcting pollutant codes in step 1, removed records from all tables associated with pollutant codes not in the NIF 3.0 pollutant code reference table. Also removed all nonroad source categories from nonpoint source inventories except for the paved and unpaved roads, unpaved air strips, and aircraft refueling source categories.

3. Identified and analyzed referential integrity issues (i.e., orphan and widow [childless parent] records). Corrected issues with mandatory field data to correct referential integrity issues. Then resolved remaining issues by adding parent records for orphans and adding the minimum required data to make the record valid. Widow records were removed from the tables, and stored in a separate file. A final analysis was conducted to confirm compliance with referential integrity. Additionally, if a S/L/T agency used the NIF 3.0 submittal flags to comment on the preliminary NEI, QA was performed to ensure compliance with submittal flag rules. In general, submittal flag issues were resolved as follows. If a record was coded with a submittal flag of "A" (add), but the record existed in the inventory, the submittal flag was altered to "RA". If the submittal flag was coded as "RA" but the record did not exist in the inventory, the submittal flag was recoded to "A". If records within a table were coded "A" and "D" by key values, these were changed to "RA" and "RD" as appropriate. If duplicates were found, and the record was a true duplicate (all fields were equal), the first record added to the inventory was kept. If it is an emission record, the record with the higher emission value was kept.

2.4.2 Feedback to the S/L/T Agencies

After completing the initial QA checks, EPA provided the inventories back to the S/L/T agencies on August 6, 2004. This provided the S/L/T agencies the opportunity to verify that EPA received their inventories and to review the initial changes EPA made to the inventories. In addition, EPA prepared two sets of summaries for the S/L/T agencies to review. The first summary was sent to the agencies on July 16, 2004 (file name 2002 State Nonpoint EI

Tracking_July1604.xls). This summary was prepared in an Excel workbook file with four spreadsheets that provided the following information:

- 2002 Nonpoint File Names: This spreadsheet documented names and formats of the files that EPA received from the S/L/T agencies and the dates on which they were transferred to the Contractor (Pechan).

- 2002 Nonpoint Summary: This spreadsheet documented the jurisdiction of the submitting agency (i.e., S/L/T agency), type of inventory (i.e., CAP, HAP, or both), a comparison of the number of the counties in the inventory to the total number of counties in the state to identify the geographic coverage of the inventory, a unique list of criteria air pollutant codes, and the total number of nonpoint source SCCs. This spreadsheet also indicated if any nonroad or onroad emissions data were moved from the agency's nonpoint source inventory to its nonroad or onroad inventory).

- 2002 Nonpoint Emission Sums: This spreadsheet summarized emissions by start date, end date, and emission type and assigned the appropriate code to the emission type period NIF plus field.

- 2002 Nonpoint Error Summary: This spreadsheet provided a copy of the "SummaryStats" table from the EPA QA program. This table provided the count of records for each NIF 3.0 table and identified the number of records with errors by type of error.

The second summary was sent to the S/L/T agencies on August 11, 2004. This summary was prepared in a text file that listed by state and NIF table the number of records with errors, and provided corrections for the errors. To support documentation of corrections to some of the errors in the text file, EPA prepared an Excel workbook file that summarized the following errors and corrections by state: invalid pollutants codes; invalid units; invalid maximum achievable

control technology (MACT) codes; and invalid and inactive SCCs. A spreadsheet was also included to show the mapping of Standard Industrial Classification (SIC) codes to North American Industrial Classification System (NAICS) codes.

The S/L/T agencies were requested to provide corrections to the errors identified in the second summary, and to communicate any data issues found in either of the two summaries. The EPA applied the corrections specified in the second summary unless a S/L/T agency provided direction on how to correct the errors identified.

The following explains how EPA resolved QA issues associated with SCCs, units, and material codes:

Source Classification Codes

The EPA's current master list of SCCs is located on the Clearinghouse for Inventories and Emission Factors (CHIEF) web site (http://www.epa.gov/ttn/chief/codes/index.html#scc). Several S/L inventories contained inactive codes (in EPA's master list but no longer used) and invalid codes (not in EPA's master list). The EPA worked with the agencies to map invalid and inactive SCCs to SCCs in its master list. However, EPA was unable to resolve all of the SCC issues during preparation of the draft NEI. The EPA will be working with the agencies with invalid and inactive SCCs in the draft in an effort to correct the SCC issues in the final NEI. Appendix D identifies SCCs that were corrected in the S/L/T inventories.

Units of Measure

Where units of measure were provided that were not consistent with NIF 3.0 standard units, the units were corrected as identified in the August 11, 2004 spreadsheet file that EPA distributed to the S/L/T agencies. In addition, if units were provided with no values (e.g., the actual throughput field was null but the throughput unit numerator field was not null; or, the factor

numeric value field was null and the factor unit numerator and/or factor unit denominator fields were not null) the units were removed from the inventory. In addition, if an inventory contained a value in the actual throughput field or factor numeric value field with no units the value was removed from the inventory. Finally, if an invalid unit could not be corrected it was removed from the inventory. Finally, if the S/L/T inventory contained numeric values Appendix D identifies records for which units were changed or set to null in order to comply with the NIF 3.0 standard units table.

2.4.3 Additional QA Review and Resolution of QA Issues

The following explains additional QA and data tracking that was performed on the S/L/T inventories:

- PM Emissions Consistency and Completeness;
- Control Device Codes and Control Efficiency Values;
- Start and End Dates; and
- Annual and Daily Emissions Comparison.

PM Emissions Consistency and Completeness Review

The following consistency checks were performed at the Emission table data key level (for annual emissions) to compare PM emissions:

- If an SCC was associated with a PM emission record, but was missing one or more of the following (as appropriate for the SCC [i.e., PM-CON is associated with fuel combustion only]): PM10-FIL, PM10-PRI, PM25-FIL, PM25-PRI, or PM-CON, the record was flagged for review.

- The following equations were used to determine consistency:

  PM10-FIL + PM-CON = PM10-PRI
  PM25-FIL + PM-CON = PM25-PRI

- The following comparisons were made to determine consistency:

  PM10-PRI >= PM10-FIL
  PM25-PRI >= PM25-FIL
  PM10-PRI >= PM-CON
  PM25-PRI >= PM-CON
  PM10-FIL >= PM25-FIL
  PM10-PRI >= PM25-PRI

If the data failed one of these checks it was diagnosed as an error. If a S/L/T agency did not provide corrections to these errors, the errors were corrected/filled in according to an augmentation procedure explained in section 2.9.

Control Device Type and Control Efficiency Data Review

The "Primary Device Type Code" and "Secondary Device Type Code" fields in the control Equipment (CE) table were reviewed to identify invalid codes (i.e., codes that did not exist in the NIF 3.0 reference table) and missing codes (e.g., records with a null or uncontrolled code of 000 but with control efficiency data). QA review of control efficiency data involved diagnosis of two types of errors. First, records were reviewed to identify control efficiency values that were reported as a decimal rather than as a percent value. Records with control efficiencies with decimal values were flagged as a potential error (although not necessarily an error, since the real control efficiency may be less than 1%). The second check identified records where 100% control was reported in the Control Equipment table, but the emissions in the Emission table

were greater than zero and the rule effectiveness value in the Emission table was null, zero, or 100% (implying 100% control of emissions). Because many agencies did not populate the rule effectiveness field or a default value of zero was assigned, records with null or zero rule effectiveness values were included where the Control Equipment was 100% and emissions were greater than zero. If these QA checks identified records with errors, EPA corrected the errors.

Start and End Date Checks

The values in the start date and end date fields in the Emission Period and Emission tables were reviewed to confirm consistency with the inventory year in the transmittal table, and to confirm that the end date reported was greater than the start date reported. For dates that contained a year other than 2002, the year provided by the S/L/T agency was recorded in the data source code and the year in the start and end date fields was changed to 2002.

Annual and Daily Emissions Comparison

The S/L/T inventories were reviewed to determine if any of the following conditions existed:

- Multiple records coded at the SCC level as emission type 30, but with different start and end dates. While not a true duplicate, this may indicate an error or inclusion of both annual and seasonal values.

- Multiple records coded at the SCC level as a daily emission type (27, 29, etc.) but with different start and end dates. While not a true duplicate, this may indicate an error or just inclusion of additional types of daily emissions.

- Multiple records coded at the SCC level with the same start and end date, but different emission types. While not a true duplicate, this may indicate an error or just inclusion of additional types of daily emissions.

- Any "DAILY" type record that was missing its associated "ANNUAL" record was removed from the NEI.

- Any "DAILY" type record that was greater than its associated "ANNUAL" record was removed from the NEI.

If these checks identified potential errors, EPA consulted with the S/L/T agency to determine if and how the errors should be corrected.

2.5 How do I Find My Inventory Data?

2.5.1 Summary Files

The EPA prepared the following summary files to assist agencies in reviewing the draft 2002 nonpoint source NEI:

- County level emissions by SCC with data source codes, annual emissions only for hazardous and criteria pollutants;
- County level emissions by SCC with data source codes, non-annual emissions only for hazardous and criteria pollutants;
- Emissions summed by SCC to the state level with data source codes for hazardous and criteria pollutants; and
- County level emission sums by SCC with data source codes, for the criteria pollutants only.

These files are available in MS Access and ASCII text. They have been zipped and each includes a README file. The summary files can be downloaded from the following web link: http://www.epa.gov/ttn/chief/net/2002inventory.html#summary.

2.5.2 Data Source Codes

Data source codes are included in the NIF plus field named "Data Source" of the Emission table in NIF 3.0 to document the origin of the emissions data. You should use these data source codes when reviewing the draft 2002 nonpoint source NEI to identify your data and identify data that originate from previous versions of the NEI or RPO inventories.

The data source codes are based on the following 9-character format:

[Data Origin]-[Year]-[Grown/Not Grown/Carried Forward]-[PM Augmentation Code]

Code	**Field Length**
Data Origin	1
Year	3 (including leading hyphen)
Grown/Not Grown/Carried Forward	2 (including leading hyphen)
PM Augmentation	3 (including leading hyphen)

Data Origin Codes

Code	Description
S	State agency-supplied data
L	Local agency-supplied data
R	Tribal agency-supplied data
P	RPO-generated data either supplied by the S/L agency or by an RPO
E	EIG-generated data for which the origin of the data is known
M	ESD-generated data for which the origin of the data is known

H	Rarely used - EPA historical data from the National Toxics Inventory (NTI) (e.g., 1993, 1995, 1996, 1998, or 1999) for which the origin of the H (HAP) data is unknown
C	Rarely used - EPA historical data from the criteria NEI (e.g., 1996, 1999, 2000, 2001) for which the origin of the C (criteria) data is unknown

Year Codes

Year for which data are supplied (e.g., Year = -02 for 2002), or from which prior year data are taken (e.g., Year = -99 for 1999).

Grown/Carried Forward/Not Grown Codes/Generate Parent Record

Code	Description
-G	Used when emissions in a pre-2002 inventory are grown to represent 2002 emissions.
-F	Used when emissions in a pre-2002 inventory are carried forward and included in the 2002 inventory without adjustment for growth.
-X	Used when the emissions are not grown or are not carried forward. For example, X is used when emissions are calculated for the 2002 inventory using 2002 activity, or when data are replaced with data that S/L/T agencies submit for inclusion in the 2002 base year inventory.
-GP	Used to identify records generated and added to the Emission Period table to fulfill referential integrity requirements. This code was used when a S/L/T inventory submitted to EPA contained an Emission table record but not a parent Emission Period table record. If necessary, an Emission Process table record was also added if missing from the S/L/T inventory.

PM Augmentation Codes

-PA PM Augmented Emissions: Record for PM_{10}/$PM_{2.5}$ emissions that was updated or added using ad-hoc updates.

-PC PM Augmented Emissions: Record added for PM_{10}/$PM_{2.5}$ emissions estimated using the PM Calculator.

-PR PM Augmented Emissions: Record added for PM_{10}/$PM_{2.5}$ emissions estimated using ratios of PM_{10}-to-PM or $PM_{2.5}$-to-PM_{10}.

Augmentation Codes for Industrial and Commercial/Institutional Fossil Fuel Combustion

If a S/L/T agency provided VOC, NOX, or SO2 emissions for one or more of the industrial or commercial/institutional fossil fuel combustion categories, EPA applied ratios to the agency-supplied emissions to calculate missing CAP and HAP emissions. To identify records containing emissions calculated from this ratio method, EPA added the following extensions to the VOC, NOX, or SO2 data source codes used as the base pollutant for estimating missing pollutant emissions:

-VR Record added for pollutant emissions missing from S/L/T inventory using ratio of missing pollutant emission factor to VOC emission factor times state-supplied VOC emissions.

-NR Record missing pollutant emissions using ratio of missing pollutant emission factor to NOX emission factor times state-supplied NOX emissions.

-SR Record missing pollutant emissions using ratio of missing pollutant emission factor to SO2 emission factor times state-supplied SO2 emissions.

For example, if a state supplied VOC emissions for 2002 the data source code for the VOC record in the Emission table is S-02-X. The data source code for emissions calculated by applying a ratio to the VOC emissions is S-02-X-VR.

The use of the H (HAP) and C (criteria) codes is limited to historical estimates for which the origin of the estimate is unknown or not readily trackable. For example, if 1999 estimates for a HAP source is carried forward for use in 2002, the data source code is E-99-F if it had emissions EIG calculated, or S-99-F if it had emissions submitted by a State. If the estimate is uncoded in the 1999 NEI and the origin is unknown, it is coded as H-99-F. If that estimate is grown from 1999 to 2002, the code is "-G" instead of "-F", such that now its code is E-99-G, S-99-G, or H-99-G.

In addition, for winter season emissions that cover the period from December 1 to February 28 (or 29 for a leap year), the Start Date and End Date is coded as usual. For example, for winter season emissions for 2002, the Start Date is December 1, 2001 and the End Date is February 28, 2002.

Using the coding scheme previously described, examples of how the data source codes are applied are as follows:

Code	Data Source
E-02-X	Data generated by EIG using EPA methods and 2002 or most recent activity data (e.g., 2002 activity and 2002 allocation factors) (E = EPA-generated data; -02 = year 2002; -X = emissions are not grown or carried forward). The documentation explains the source of the allocation factors.
H-96-F	Data taken from the 1996 NTI for which the origin of the data are unknown (H = EPA historical data from the NTI; -96 = year 1996 data; -F = emissions are carried forward for inclusion in the 2002 base year).
C-00-F	Data taken from the 2000 criteria NEI Version 2.0 for which the origin of the data are unknown; C = EPA historical data from the criteria NEI; -00 = year 2000 data; -F = emissions are carried forward for inclusion in the 2002 base year).

The following provides examples of how the data source codes were applied for S/L/T agency pre-2002 data (2002 S/L/T data will be incorporated later):

Code	Data Source
S-99-X	State-submitted data for 1999 that replaced EIG 1999 estimates for the source category (S = State data; -99 = year 1999 data; -X = emissions are not grown or carried forward).
L-99-X	Local-submitted data for 1999 that replaced 1996 NTI data (L = Local; -99 = year 1999 data; -X = emissions are not grown or carried forward).

2.6 How did EPA Merge the 2002 NEI and State/Local/Tribal Inventory Data?

The preliminary 2002 NEI was used to supplement the S/L/T inventories when the inventories did not include all of the nonpoint source categories and/or CAPs or HAPs included in the preliminary NEI. After merging NEI and S/L/T inventories, EPA conducted review of the inventory to identify double-counted emissions and then made corrections to remove the NEI data. The process involved creating a "merge" data set consisting of a subset of the inventory data in the preliminary 2002 NEI data. This NEI "merge" data set was then merged with the data set housing the S/L/T inventory data. The following explains the merge process:

Step 1: Remove Old NEI Data for Fossil Fuel Combustion Categories

The preliminary 2002 NEI contains data for industrial fossil fuel combustion (SCCs starting with 2102) and commercial/institutional fossil fuel combustion (SCCs starting with 2103) categories that were carried forward from the 1999 NEI. The data for these categories are most likely grown from an inventory much older than the 1999 NEI. Records for these categories were identified with the data source code of E-xx-F or M-xx-F, where "xx" is the year of the data. Records for these categories were removed from the NEI "merge" data set.

Step 2: Electronic Match on Emission Table Data Key

For records in the NEI "merge" data set that had an electronic match to records in the S/L/T inventories using the Emission table data key, EPA removed records from the NEI "merge" data set. The data key for the NIF 3.0 Emission table includes the following fields that together define a record as unique: State and County Federal Information Processing Standards (FIPS) code, Tribal Code; SCC, Pollutant Code, Start Date, End Date, and Emission Type. If there was no electronic match on the data key, the NEI data were kept in the "merge" data set for further review. For example, if a S/L/T agency did not provide all of the HAPs that the NEI includes for residential wood combustion, the HAP records from the NEI were kept in the "merge" data set.

Step 3: Manual Review of Data

For NEI records for which there was no electronic match to the Emission data key in the S/L/T inventories, EPA manually compared the two inventories to identify and review categories that were in both inventories. Examples of these categories include the following:

- Residential wood combustion
- Non-industrial consumer and commercial products
- Degreasing
- Gasoline service stations
- Animal livestock ammonia
- Agricultural fertilizer ammonia

For these cases, the NEI data were removed from the "merge" data set if the pollutant codes and temporal basis for the emissions (i.e., annual or daily emissions) matched. If the pollutant codes and temporal period of the emissions in the two inventories did not match, then the NEI records were kept in the "merge" data set. For the draft NEI, this process resulted in cases where, for the same source category, the S/L/T emissions are reported under SCCs that are different than those used in the NEI.

Step 4: Merge the NEI and S/L/T Inventories/QA Review

The records that remained in the NEI "merge" data set were electronically inserted into the data set holding the S/L/T inventories to create the draft 2002 nonpoint source NEI. Emission summaries were then prepared to compare emissions in the draft to the preliminary 2002 NEI and Version 3 of the 1999 NEI. By comparing emissions in the three inventories, EPA identified and removed NEI data in the draft that double-counted emissions in a S/L/T inventory.

2.7 How did EPA Add its New 2002 Solvent Inventory for VOC to State/Local/Tribal Inventories?

The EPA prepared an annual VOC emission inventory using 2002 activity data for most of the solvent utilization categories (EPA, 2005). The SCCs for which EPA prepared this inventory are provided in Section III (Table 3-1b) of this report. This inventory was not available until after the NEI was merged with the S/L/T inventories. The procedures used to merge the solvent inventory with the draft NEI are the same as those previously described in Section 2.6. The EPA used the new VOC inventory to replace VOC emissions originating from the preliminary 2002 NEI; S/L/T VOC emissions were kept in the draft NEI.

Step 3 (Manual Review of Data) of the merge process was especially challenging for the miscellaneous non-industrial solvent utilization categories (SCCs starting with 264) for which there are many SCCs under which S/L/T agencies can report emissions associated with consumer and/or commercial products. Although EPA made every effort to avoid double-counting of emissions, in some cases it was difficult to determine if the S/L/T agency's choice of SCCs accounted for emissions classified under EPA's choice of SCCs. Thus, the S/L/T agencies should review the draft 2002 NEI closely and provide comments if they believe that the EPA inventory is double-counting their emissions, or if EPA should add its inventory for a source category that is not included in the S/L/T agency's inventory. The EPA data are given a data source code of E-02-X in the draft 2002 nonpoint NEI.

Note that EPA's inventory includes annual VOC emissions only. Thus, HAP emissions originating from the preliminary 2002 NEI were maintained in the draft 2002 NEI if a S/L/T agency did not provide the HAP data. For the final 2002 NEI, EPA will revise the draft to incorporate S/L/T agency comments. The EPA is seeking funding to complete a new 2002 solvent utilization inventory for HAPs. If this inventory is funded and completed by late summer, EPA will use this inventory to replace old HAP data in the draft. If EPA does not complete the 2002 HAP inventory, EPA is considering a method to use the ratio of uncontrolled HAP and VOC emissions factors to estimate HAP emissions from 2002 VOC emissions to replace the old HAP emissions in the draft NEI.

2.8 How did EPA Add Emissions for Industrial, Commercial, and Institutional (ICI) Fossil Fuel Combustion to State/Local/Tribal Inventories?

The EPA used two methods for adding or updating emissions associated with ICI fossil fuel combustion. The following explains the two methods.

2.8.1 Method for Estimating Missing Pollutant Emissions from S/L/T-Supplied Emissions

If a S/L/T inventory included VOC, NOX, or SO2 emissions, EPA used the ratio of the uncontrolled emission factor for the missing pollutant to the uncontrolled emission factor for VOC, NOX, or SO2 and applied the ratio to the VOC, NOX, or SO2 emissions (in this order) to estimate emissions for the missing CAPs and/or HAPs. The records for which emissions were estimated using this ratio method were assigned the S/L/T agency data source code with an extension of -VR, NR, or -SR indicating that the ratio was applied to the S/L/T agency-supplied VOC, NOX, or SO2 emissions, respectively. The emission factors used to prepare the ratios are those documented in the NEI method for the ICI fossil fuel combustion categories (see Appendix A for the emissions factors).

The EPA has noticed that this approach results in some high emission values for some counties. The S/L/T agencies should review the records added to their inventory using this method and provide comments to correct emissions data if the method produced unrealistic emissions estimates.

2.8.2 Methods for Estimating Emissions in the Absence of Any S/L/T Data

If a S/L/T agency did not supply any data for an ICI fossil fuel combustion category, EPA added its own inventory to the draft NEI. Appendix A of this report documents the activity data and emission factors EPA used to prepare its inventories for the ICI fossil fuel combustion categories. However, EPA adjusted the activity and emissions data presented in Appendix A to account for point source emissions prior to adding the inventories to the draft NEI.

State-level point source fuel consumption was subtracted from the state-level fuel consumption obtained from the Energy Information Administration's State Energy Data (SED) reports. The EPA reviewed the S/L/T inventories and found that many S/L/T agencies did not report fuel consumption data. Consequently, EPA back-calculate point source fuel consumption by dividing the point source CO emissions in the draft 2002 point source NEI by the uncontrolled point source CO emission factors available in AP-42 and the Factor Information REtrieval (FIRE) system database. Emissions for CO were used to back-calculate fuel consumption because CO is typically not controlled for these ICI fossil fuel combustion categories. This calculation was performed for each SCC by summing CO emissions to the state-level, back-calculating the throughput, and subtracting the throughput from the state-level SED fuel consumption estimates. The SED reports provide total coal consumption by state. Thus, the back-calculated point source anthracite and bituminous/subbituminous coal consumption use was summed and subtracted from the SED fuel consumption. After adjusting the SED fuel consumption for point source fuel consumption, any remaining activity was allocated to counties using employment data (see Appendix A for details on the state-to-county allocation methods and Appendix B for employment data used in the allocation procedures). Note that if the fuel

consumption was negative or zero, the emissions for the nonpoint source inventory were set to zero and records were not added to the draft nonpoint source inventory.

2.9 How did EPA Add PM-Related Pollutant Emissions to State/Local/Tribal Inventories?

Procedures were developed to estimate missing pollutant data from data provided by the S/L/T agencies in order to develop a complete set of PM10-PRI and PM25-PRI emissions. The following discusses the procedures for fossil fuel combustion sources first followed by the procedures for all other nonpoint sources of PM emissions. Note that the use of the following procedures for the fossil fuel combustion categories was a time consuming method and that it was not applied to all states due to time and resource constraints. Thus, for the fossil fuel combustion categories, the ratio method described in Section 2.8.1 was applied if the more detailed QA review described in the following section could not be applied. You should use the data source codes to identify the method applied to estimate PM emissions added to your inventory. The data source codes will have extensions of -VR, -NR, or -SR if PM emissions were estimated using the ratio method described in Section 2.8. Otherwise, the data source codes have an extension of -PR or -PA if one of the following methods was applied to estimate PM emissions for your inventory.

2.9.1 Fossil Fuel Combustion Sources

Fossil fuel combustion sources include ICI and residential anthracite coal, bituminous and subbituminous coal, distillate, residual oil, kerosene, natural gas, and liquefied petroleum gas (LPG). All of these sources emit both filterable and condensible emissions. The QA review of the PM emissions data for these sources focused on verifying that the emissions reported in the S/L/T inventories included both filterable and condensible emissions. The emissions for these pollutants can be reported in S/L/T inventories individually (i.e., as filterable and condensible separately) or as primary emissions (i.e., the sum of the filterable and condensible emissions).

The QA review also focused on evaluating the emission factors reported in the S/L/T inventories to determine if they were reasonable.

To support the QA review effort, the uncontrolled PM emission factors shown in Table 2-4 were compiled from AP-42 and FIRE. The emission factors reported in the S/L/T inventories were compared to the emission factors in this table. Emission factors that appeared too high or too low were flagged for review. In addition, inventory data were flagged for review if the emissions were reported under the primary PM pollutant codes but the emission factors matched with the emission factors for filterable PM in Table 2-4. Finally, if emission factors were not reported in the S/L/T agency inventory, the emission factors were back-calculated using the throughput data (if available), emissions, rule effectiveness values, and control efficiency data (if available). The back-calculated emission factors were compared to the factors in Table 2-4 to identify data with major difference between the factors. It is emphasized that the uncontrolled emission factors in Table 2-4 were used as a reference for reviewing S/L/T inventory data. The emission factors in this table should not be construed to be the best available for all S/L/T agencies since the emission factors will vary depending on the composition of the boiler population in an agency's nonpoint source inventory.

Revisions to the NEI for residential LPG and kerosene were completed after the preliminary 2002 NEI was released in February 2004. For the draft NEI, preliminary NEI emissions that remained after the NEI was merged with the S/L/T inventories were replaced with the revised emissions unless an agency requested that the preliminary NEI emissions not be revised.

2.9.2 Other Sources of PM Emissions

For states that provided only PM10-FIL and PM25-FIL emissions, PM10-PRI emissions were set equal to PM10-FIL emissions and PM25-PRI emissions were set equal to PM25-FIL emissions. The PM10-PRI and PM25-PRI emissions that were added to the inventory were assigned a data source code of S-02-X-PR where S-02-X represents the code assigned to the

PM10-FIL and PM25-FIL emissions provided by the S/L/T agency and the "-PR" indicates that the ratio was applied to estimate the primary emissions (in this case, the ratio of primary to filterable emissions is "1").

PM25-PRI emissions missing from S/L/T inventories were estimated by applying a ratio of PM25-PRI to PM10-PRI emissions to the PM10-PRI emissions provided by the S/L/T agency. Table 2-5 identifies the agencies with SCCs for which ratios were applied to estimate PM25-PRI emissions. This table also shows the ratios and the reference for the ratios.

Table 2-4. Nonpoint Source Industrial, Commercial, Institutional, and Residential Fossil Fuel Combustion Uncontrolled Emission Factors for PM10-PRI/FIL, PM25-PRI/FIL, and PM-CON

Pollutant[1]	Uncontrolled Emission Factor (EF)	EF Numerator	EF Denominator	Calculated Uncontrolled EF	Reference
Industrial Boilers: Anthracite Coal (SCC 2102001000)					
PM10-FIL	2.3 x % Ash content of coal	LB	TON	30.77	AP-42 Table 1.2-4 EF calculated from formula of 2.3 * % Ash Content (13.38%). Reference for ash content is EPA, 2002.
PM25-FIL	0.6 x % Ash content of coal	LB	TON	8.03	AP-42 Table 1.2-4 EF calculated from formula of 0.6 * % Ash Content (13.38%) (used Commercial/Institutional emission factors). Reference for ash content is EPA, 2002.
PM-CON	0.08 x % Ash content of coal	LB	TON	1.07	AP-42 Table 1.2-3 Used formula for SCC 10300101, EF calculated from formula of .08 * % Ash Content (13.38%). Reference for ash content is EPA, 2002.
PM10-PRI		LB	TON	31.84	
PM25-PRI		LB	TON	9.10	
Industrial Boilers: Bituminous/Subbituminous Coal (SCC 2102002000)					
PM10-FIL	13.2	LB	TON	13.2	AP-42 Table 1.1-9 EF (used Commercial/Institutional emission factors)
PM25-FIL	4.6	LB	TON	4.6	AP-42 Table 1.1-9 EF (used Commercial/Institutional emission factors)
PM-CON	1.04	LB	TON	1.04	AP-42 Table 1.1-5 (used Commercial/Institutional emission factors)
PM10-PRI		LB	TON	14.24	
PM25-PRI		LB	TON	5.64	
Industrial Boilers and IC Engines: Distillate Oil (SCC 2102004000)					
PM10-FIL	1	LB	E3GAL	1	AP-42 Table 1.3-6
PM25-FIL	0.25	LB	E3GAL	0.25	AP-42 Table 1.3-6
PM-CON	1.3	LB	E3GAL	1.3	AP-42 Table 1.3-2
PM10-PRI		LB	E3GAL	2.30	
PM25-PRI		LB	E3GAL	1.55	
Industrial Boilers: Residual Oil (SCC 2102005000)					
PM10-FIL	7.17 x % Sulfur content of oil	LB	E3GAL	10.683	AP-42 Table 1.3-5. EF calculated from formula of 7.17(A); where A=1.12(S)+0.37; Assumed S=1% for purpose of calculating EF ratios.
PM25-FIL	4.67 x % Sulfur content of oil	LB	E3GAL	6.958	AP-42 Table 1.3-5. EF calculated from formula of 7.17(A); where A=1.12(S)+0.37; Assumed S=1% for purpose of calculating EF ratios.
PM-CON	1.5	LB	E3GAL	1.5	AP-42 Table 1.3-2
PM10-PRI		LB	E3GAL	12.18	
PM25-PRI		LB	E3GAL	8.46	
Industrial Boilers and IC Engines: Natural Gas (SCC 2102006000)					
PM10-FIL	1.9	LB	E6FT3	1.9	AP-42 Table 1.4-2
PM25-FIL	1.9	LB	E6FT3	1.9	AP-42 Table 1.4-2
PM-CON	5.7	LB	E6FT3	5.7	AP-42 Table 1.4-2
PM10-PRI	7.6	LB	E6FT3	7.60	
PM25-PRI	7.6	LB	E6FT3	7.60	
Industrial Boilers - Liquified Petroleum Gas (SCC 2102007000)					
PM10-FIL	0.6	LB	E3GAL	0.6	AP-42 Table 1.5-1
PM25-FIL	0.6	LB	E3GAL	0.6	AP-42 Table 1.5-1
PM-CON	0.506	LB	E3GAL	0.506	Used natural gas PM-CON emission factor of 5.7 lb/Million Cubic Feet (for all PM controls and uncontrolled). Used factor of 0.0887 to convert emission factor from lb/Million Cubic Feet of natural gas to lb/1,000 gallons of propane. Reference: AP-42, Table 1.4-2. Conversion factor assumes 1020 Btu/scf for natural gas (AP-42, Table 1.4-2) and 90,500 Btu/gallon for propane (AP-42, Appendix A, page A-5).
PM10-PRI		LB	E3GAL	1.11	
PM25-PRI		LB	E3GAL	1.11	

Table 2-4 (continued)

Pollutant[1]	Uncontrolled Emission Factor (EF)	EF Numerator	EF Denominator	Calculated Uncontrolled EF	Reference
Industrial Boilers: Kerosene (SCC 2102011000)					
PM10-FIL	1	LB	E3GAL	1	AP-42 Table 1.3-6
PM25-FIL	0.25	LB	E3GAL	0.25	AP-42 Table 1.3-6
PM-CON	1.3	LB	E3GAL	1.3	AP-42 Table 1.3-6
PM10-PRI		LB	E3GAL	2.30	
PM25-PRI		LB	E3GAL	1.55	
Commercial/Institutional Heating: Anthracite Coal (SCC 2103001000)					
PM10-FIL	2.3 x % Ash content of coal	LB	TON	30.77	AP-42 Table 1.2-4 EF calculated from formula of 2.3 * % Ash Content (13.38%). Reference for ash content is EPA, 2002.
PM25-FIL	0.6 x % Ash content of coal	LB	TON	8.03	AP-42 Table 1.2-4 EF calculated from formula of 0.6 * % Ash Content (13.38%). Reference for ash content is EPA, 2002.
PM-CON	0.08 x % Ash content of coal	LB	TON	1.07	AP-42 Table 1.2-3 Used formula for SCC 10300101, EF calculated from formula of 0.08 * % Ash Content (13.38%). Reference for ash content is EPA, 2002.
PM10-PRI		LB	TON	31.84	
PM25-PRI		LB	TON	9.10	
Commercial/Institutional Heating: Bituminous and Lignite (SCC 2103002000)					
PM10-FIL	13.2	LB	TON	13.2	AP-42 Table 1.1-9 EF
PM25-FIL	4.6	LB	TON	4.6	AP-42 Table 1.1-9 EF
PM-CON	1.04	LB	TON	1.04	AP-42 Table 1.1-5 (0.04 lb/MMBtu * 26MMBtu/ton=1.04)
PM10-PRI		LB	TON	14.24	
PM25-PRI		LB	TON	5.64	
Commercial/Institutional Heating: Distillate Oil (SCC 2103004000)					
PM10-FIL	1.08	LB	E3GAL	1.08	AP-42 Table 1.3-7
PM25-FIL	0.83	LB	E3GAL	0.83	AP-42 Table 1.3-7
PM-CON	1.3	LB	E3GAL	1.3	AP-42 Table 1.3-2
PM10-PRI		LB	E3GAL	2.38	
PM25-PRI		LB	E3GAL	2.13	
Commercial/Institutional Heating: Residual Oil (SCC 2103005000)					
PM10-FIL	5.17 x % Sulfur content of oil	LB	E3GAL	7.703	AP-42 Table 1.3-7. EF calculated from formula of 5.17(A); where A=1.12(S)+0.37; Assumed S=1% for purpose of calculating EF ratios.
PM25-FIL	1.92 x % Sulfur content of oil	LB	E3GAL	2.861	AP-42 Table 1.3-7. EF calculated from formula of 5.17(A); where A=1.12(S)+0.37; Assumed S=1% for purpose of calculating EF ratios.
PM-CON	1.5	LB	E3GAL	1.5	AP-42, Table 1.3-2
PM10-PRI		LB	E3GAL	9.20	
PM25-PRI		LB	E3GAL	4.36	
Commercial/Institutional Heating: Natural Gas (SCC 2103006000)					
PM10-FIL	1.9	LB	E6FT3	1.9	AP-42 Table 1.4-2
PM25-FIL	1.9	LB	E6FT3	1.9	AP-42 Table 1.4-2
PM-CON	5.7	LB	E6FT3	5.7	AP-42 Table 1.4-2
PM10-PRI		LB	E6FT3	7.60	
PM25-PRI		LB	E6FT3	7.60	

Table 2-4 (continued)

Pollutant[1]	Uncontrolled Emission Factor (EF)	EF Numerator	EF Denominator	Calculated Uncontrolled EF	Reference
Commercial/Institutional Heating: Liquified Petroleum Gas (SCC 2103007000)					
PM10-FIL	0.4	LB	E3GAL	0.4	AP-42 Table 1.5-1 (Propane for Commercial Boilers)
PM25-FIL	0.4	LB	E3GAL	0.4	AP-42 Table 1.5-1 (Propane for Commercial Boilers)
PM-CON	0.506	LB	E3GAL	0.506	Used natural gas PM-CON emission factor of 5.7 lb/Million Cubic Feet (for all PM controls and uncontrolled). Used factor of 0.0887 to convert emission factor from lb/Million Cubic Feet of natural gas to lb/1,000 gallons of propane. Reference: AP-42, Table 1.4-2. Conversion factor assumes 1020 Btu/scf for natural gas (AP-42, Table 1.4-2) and 90,500 Btu/gallon for propane (AP-42, Appendix A, page A-5).
PM10-PRI		LB	E3GAL	0.91	
PM25-PRI		LB	E3GAL	0.91	
Commercial/Institutional Heating: Kerosene (SCC 2103011000)					
PM10-FIL	1.08	LB	E3GAL	1.08	AP-42 Table 1.3-7 Used EF for Distillate Oil (per Emission Inventory Improvement Program [EIIP])
PM25-FIL	0.83	LB	E3GAL	0.83	AP-42 Table 1.3-7 Used EF for Distillate Oil (per EIIP)
PM-CON	1.3	LB	E3GAL	1.3	AP-42 Table 1.3-2 Used EF for Distillate Oil (per EIIP)
PM10-PRI		LB	E3GAL	2.38	
PM25-PRI		LB	E3GAL	2.13	
Residential Heating: Anthracite Coal (SCC 2104001000)					
PM10-FIL	10	LB	TON	10	EPA, 2002.
PM25-FIL	0.6 x % Ash content of coal	LB	TON	8.03	EF calculated from formula of 0.6 * % Ash Content (13.38%). Reference for EF and ash content is EPA, 2002.
PM-CON	0.08 x % Ash content of coal	LB	TON	1.07	EF calculated from formula of 0.08 * % Ash Content (13.38%). Reference for EF and ash content is EPA, 2002.
PM10-PRI		LB	TON	11.07	
PM25-PRI		LB	TON	9.10	
Residential Heating: Bituminous and Lignite Coal (SCC 2104002000)					
PM10-FIL	6.2	LB	TON	6.2	AP-42 Table 1.1-11
PM25-FIL	3.8	LB	TON	3.8	AP-42 Table 1.1-11
PM-CON	1.04	LB	TON	1.04	AP-42 Table 1.1-5 (0.04 lb/MMBtu * 26 MMBtu/ton=1.04)
PM10-PRI		LB	TON	7.24	
PM25-PRI		LB	TON	4.84	
Residential Heating: Distillate Oil (SCC 2104004000)					
PM10-FIL	1.08	LB	E3GAL	1.08	AP-42 Table 1.3-7 (Commercial/Institutional EF)
PM25-FIL	0.83	LB	E3GAL	0.83	AP-42 Table 1.3-7 (Commercial/Institutional EF)
PM-CON	1.3	LB	E3GAL	1.3	AP-42 Table 1.3-2
PM10-PRI		LB	E3GAL	2.38	
PM25-PRI		LB	E3GAL	2.13	
Residential Heating: Natural Gas - All types (SCC 2104006000)					
PM10-FIL	1.9	LB	E6FT3	1.9	AP-42 Table 1.4.2
PM25-FIL	1.9	LB	E6FT3	1.9	AP-42 Table 1.4.2
PM-CON	5.7	LB	E6FT3	5.7	AP-42 Table 1.4.2
PM10-PRI		LB	E6FT3	7.60	
PM25-PRI		LB	E6FT3	7.60	

Table 2-4 (continued)

Pollutant[1]	Uncontrolled Emission Factor (EF)	EF Numerator	EF Denominator	Calculated Uncontrolled EF	Reference
Residential Heating: Liquefied Petroleum Gas (SCC 2104007000)					
PM10-FIL	0.4	LB	E3GAL	0.4	AP-42 Table 1.5-1 (Same factor used for Propane for Commercial Boilers; based on EIIP)
PM25-FIL	0.4	LB	E3GAL	0.4	AP-42 Table 1.5-1 (Same factor used for Propane for Commercial Boilers; based on EIIP)
PM-CON	0.506	LB	E3GAL	0.506	Used natural gas PM-CON emission factor of 5.7 lb/Million Cubic Feet (for all PM controls and uncontrolled). Used factor of 0.0887 to convert emission factor from lb/Million Cubic Feet of natural gas to lb/1,000 gallons of propane. Reference: AP-42, Table 1.4-2. Conversion factor assumes 1020 Btu/scf for natural gas (AP-42, Table 1.4-2) and 90,500 Btu/gallon for propane (AP-42, Appendix A, page A-5).
PM10-PRI		LB	E3GAL	0.91	
PM25-PRI		LB	E3GAL	0.91	
Residential Heating: Kerosene (SCC 2104011000)					
PM10-FIL	1.08	LB	E3GAL	1.08	AP-42 Table 1.3-7 Used EF for Distillate Oil (per EIIP)
PM25-FIL	0.83	LB	E3GAL	0.83	AP-42 Table 1.3-7 Used EF for Distillate Oil (per EIIP)
PM-CON	1.3	LB	E3GAL	1.3	AP-42 Table 1.3-2 Used EF for Distillate Oil (per EIIP)
PM10-PRI		LB	E3GAL	2.38	
PM25-PRI		LB	E3GAL	2.13	

[1] PM10-PRI EF = sum of PM10-FIL and PM-CON EFs; PM25-PRI EF = sum of PM25-FIL and PM-CON EFs.

Table 2-5. SCCs for which PM25-PRI Emissions were Estimated by Applying a Ratio to the PM10-PRI Emissions in the S/L/T inventory

SCC	SCC Description	Ratio of PM25-PRI to PM10-PRI	Reference
2294000000	Mobile Sources : Paved Roads : All Paved Roads : Total: Fugitives	0.25	NEI Method.
2296000000	Mobile Sources : Unpaved Roads : All Unpaved Roads : Total: Fugitives	0.15	NEI Method.
2309100010	Industrial Processes: Fabricated Metals: SIC 34: Coating, Engraving, and Allied Services: Electroplating	0.947	AP-42 emission factors for hard chrome plating tank controlled with mist eliminator. AP-42 (Table 12.20-3) shows 94.7% of total PM as less than 2.35 micrometers. Applied factor to state-supplied PM10-PRI emissions to estimate PM25-PRI emissions.
2461023000	Solvent Utilization: Miscellaneous Non-industrial: Commercial: Asphalt Roofing: Total: All Solvent Types	1	No data available; assumed PM25-PRI equals PM10-PRI.
2505020000	Storage and Transport : Petroleum and Petroleum Product Transport : Marine Vessel : Total: All Products	1	No data available; assumed PM25-PRI equals PM10-PRI.
2535010000	Storage and Transport : Bulk Materials Transport : Rail Car : Total: All Products	1	No data available; assumed PM25-PRI equals PM10-PRI.
2601000000	Waste Disposal, Treatment, and Recovery: On-site Incineration: All Categories: Total	1	No data available; assumed PM25-PRI equals PM10-PRI.
2610000100	Waste Disposal, Treatment, and Recovery: On-site Incineration: All Categories: Yard Waste - Leaf Species Unspecified	1	No data available; assumed PM25-PRI equals PM10-PRI.
2810001000	Miscellaneous Area Sources: Other Combustion: Forest Wildfires: Total	1	No data available; assumed PM25-PRI equals PM10-PRI.
2810015000	Miscellaneous Area Sources: Other Combustion: Prescribed Burning for Forest Management: Total	1	No data available; assumed PM25-PRI equals PM10-PRI.
2810020000	Miscellaneous Area Sources: Other Combustion: Prescribed Burning of Rangeland: Total	0.86	Based on ratio of PM25-PRI to PM10-PRI for same SCC used by states in 2002 NEI.
2810030000	Miscellaneous Area Sources: Other Combustion: Structure Fires: Total	0.91	NEI Method.
2810050000	Miscellaneous Area Sources: Other Combustion: Motor Vehicle Fires: Total	0.91	NEI Method.

3.0 DEVELOPMENT OF AND UPDATES TO THE PRELIMINARY 2002 NONPOINT SOURCE NEI

3.1 What is the Preliminary 2002 Nonpoint Source NEI?

The preliminary 2002 nonpoint NEI is the first version of the 2002 nonpoint source NEI (EPA, 2004a). It was released to the public during February 2004 for use by S/L/T agencies in preparing their own 2002 base year inventories. After release of the preliminary 2002 nonpoint source NEI, EPA continued work on preparing 2002 inventories for selected nonpoint source categories. The EPA merged the preliminary 2002 nonpoint source NEI (and updates to the emissions data for categories in the preliminary nonpoint NEI) with S/L/T inventories for source categories and pollutants (CAPs and HAPs) that S/L/T agencies did not include in their inventory submittals to EPA.

This section of the report originates from Section 2 of the preliminary 2002 nonpoint source NEI report (EPA, 2004a). The section has been revised to identify the categories for which EPA prepared estimates between January 2004 and January 2005 to replace the emissions in the preliminary NEI. In addition, certain parts of Section 2 of the preliminary 2002 nonpoint source NEI report (e.g., documentation of data source codes) were revised and moved to Section 2 of this report for the draft NEI.

3.2 How Were the Nonpoint Source Emissions Estimated?

The development of the 2002 nonpoint source inventory proceeds through these steps:

- Planning;
- Gathering information;
- Estimating emissions;
- Performing quality assurance (QA)/quality control (QC) checks; and
- Compiling the data into a single final inventory database.

The goal for the nonpoint source NEI was to compile as many CAP and HAP emission estimates for 2002 for as many source categories as possible within time and resource constraints.

The planning phase focused on identifying source categories for which data were available for estimating emissions. The nonpoint source categories included in the 1999 NEI were used as the starting point to identify source categories to include in the 2002 inventory. In the planning phase, QA/QC needs were also identified, and decisions were made on the database structure that would be used to compile and store the inventory data.

During the data-gathering phase, EIG reviewed the available literature and compiled a list of all emissions factors for each identified source category and pollutant. EIG personnel reviewed the list to ensure the validity and accuracy of each emission factor. This phase also involved gathering the emissions activity and allocation data to estimate emissions. Activity data represent the amount of emissions-producing activity that is performed in a given source sector. For example, the amount of natural gas burned by households in the United States is the activity data for the residential heating sector. Allocation data represent data that are used to allocate emissions estimated using national-, regional-, or State-level activity data to the county-level.

For many of the source categories identified, calendar year 2002 activity data and/or allocation data were not available during the time-frame for completing this project. For these categories, EIG decided to carry forward the emissions estimates contained in final Version 3 of the 1999 nonpoint source NEI (http://www.epa.gov/ttn/chief/net/1999inventory.html).

Table 3-1a presents the source categories for which 2002 nonpoint source emissions were calculated for the preliminary 2002 nonpoint source NEI. Table 3-1b presents the source categories for which EPA revised the preliminary NEI emissions. Both of these tables also identify the categories for which emissions were estimated for the territories of Puerto Rico and U.S. Virgin Islands. Emission activity data are not available for these territories for most source categories. Section 3.5 discusses the procedure that was used to estimate emissions for these U.S. territories when activity data were not available.

Table 3-1a. Source Categories for which 2002 Emissions were Developed for the Preliminary 2002 NEI

Source Category	Source Classification Code (SCC)	Maximum Achievable Control Technology (MACT) Category	Potential Point Source Component	Emissions for Puerto Rico and U.S. Virgin Islands
Agricultural Tilling	2801000003		No	
Animal Husbandry (Ammonia Emissions)	2805001100 - 2805053100		Yes[1]	
Aviation Gasoline Distribution: Stage I	2501080050	601	No	
Aviation Gasoline Distribution: Stage II	2501080100		No	
Commercial Cooking	2302002100, 2302002200, 2302003000, 2302003100, 2302003200		No	
Cotton Ginning[2]	2801000000		Yes[1]	
Drum and Barrel Reclamation	2461160000		Yes[1]	
Fluorescent Lamp Recycling	31301200		N/A	
General Laboratory Activities	31503001		N/A	Puerto Rico and U.S. Virgin Islands
Lamp Breakage	2861000000		No	U.S. Virgin Islands
Open Burning				
Scrap Tires	2830000000		No	
Household Waste	2610030000		No	
Yard Waste - Leaves	2610000100		No	
Yard Waste - Brush	2610000400		No	
Prescribed Burning for Forest and Habitat Management	2810015000		No	Puerto Rico
Wildfires	2810001000		No	
Publically Owned Treatment Works	2630020000	803	Yes[1]	Puerto Rico and U.S. Virgin Islands
Residential Heating				
Anthracite Coal	2104001000		No	
Bituminous & Lignite	2104002000		No	
Distillate Oil	2104004000		No	
Natural Gas	2104006000		No	
Wood	2104008001, 2104008002, 2104008003, 2104008004, 2104008010, 2104008030, 2104008050		No	
Construction: Residential	2311010000		Yes[1]	
Solvent Utilization				
Surface Coating: Architectural	2401001000		No	Puerto Rico and U.S. Virgin Islands
Commercial and Consumer Product Usage: Adhesive and Sealants	2460600000		No	Puerto Rico and U.S. Virgin Islands
Commercial and Consumer Product Usage: Automotive Aftermarket Products	2460400000		No	Puerto Rico and U.S. Virgin Islands
Commercial and Consumer Product Usage: Coatings and Related Products	2460500000		No	Puerto Rico and U.S. Virgin Islands
Commercial and Consumer Product Usage: Household Products	2460200000		No	Puerto Rico and U.S. Virgin Islands
Commercial and Consumer Product Usage: Miscellaneous	2460900000		No	Puerto Rico and U.S. Virgin Islands
Commercial and Consumer Product Usage: Personal Care Products	2460100000		No	Puerto Rico and U.S. Virgin Islands
Commercial and Consumer Product Usage: FIFRA-Regulated Products	2460800000		No	Puerto Rico and U.S. Virgin Islands

N/A - not applicable (point SCC used to house nonpoint source emissions in nonpoint NEI)

[1] See Appendix A for discussion of point SCCs associated with these emission processes.

[2] Note that to facilitate incorporation in NIF 3.0, EPA carried forward 1999 NEI nonpoint HAP emissions reported by Texas for SCC 30200410 into the 2002 nonpoint NEI rather than consolidating these estimates with the CAP emissions reported in SCC 2801000000.

Table 3-1b. Source Categories for which EPA Updated Emissions in the Preliminary 2002 NEI

Source Category	SCC	Maximum Achievable Control Technology (MACT) Category	Potential Point Source Component	Emissions for Puerto Rico and U.S. Virgin Islands
Animal Husbandry (Ammonia Emissions)	2805001100 - 2805053100		Yes	
Commercial/Institutional Fossil Fuel Combustion				
Anthracite Coal (Total: All Boiler Types)	2103001000	0107-1	Yes	
Bituminous/ Subbituminous Coal (Total: All Boiler Types)	2103002000	0107-1	Yes	Puerto Rico and U.S. Virgin Islands
Distillate Oil (Total: Boilers and Internal Combustion [IC] Engines)	2103004000	0107-3	Yes	Puerto Rico and U.S. Virgin Islands
Residual Oil (Total: All Boiler Types)	2103005000	0107-3	Yes	Puerto Rico and U.S. Virgin Islands
Natural Gas (Total: Boilers and IC Engines)	2103006000	0107-2	Yes	Puerto Rico and U.S. Virgin Islands
Kerosene (Total: All Combustor Types)	2103011000			
Construction				
Non-Residential	2311020000		No	
Roadway	2311030000		No	
Fertilizer Application	2801700001, 2801700002, 2801700003, 2801700004, 2801700005, 2801700006, 2801700007, 2801700008, 2801700009, 2801700010,		No	
Gasoline Marketing[1]				
Gasoline Distribution Stage I - Bulk Terminals and Plants	2501050120	601	Yes	Puerto Rico and U.S. Virgin Islands
Gasoline Distribution Stage I - Tank Trucks in Transit	2505030120	601	Yes	Puerto Rico and U.S. Virgin Islands
Gasoline Distribution Stage I - Pipelines	2505040120	601	Yes	Puerto Rico
Gasoline Distribution Stage I - Gasoline Service Station Unloading: Submerged Fill	2501060051	601	Yes	
Gasoline Distribution Stage I - Gasoline Service Station Unloading: Splash Fill	2501060052	601	Yes	Puerto Rico and U.S. Virgin Islands
Gasoline Distribution Stage I - Gasoline Service Station Unloading: Balanced Submerged Fill	2501060053	601	Yes	
Gasoline Distribution Stage I - Gasoline Service Stations, Underground Tank: Breathing and Emptying	2501060201	601	Yes	Puerto Rico and U.S. Virgin Islands
Industrial Fossil Fuel Combustion				
Anthracite Coal (Total: All Boiler Types)	2102001000			
Bituminous/Subbituminous Coal (Total: All Boiler Types)	2102002000	0107-1	Yes	Puerto Rico and U.S. Virgin Islands
Distillate Oil (Total: Boilers and IC Engines)	2102004000	0107-3	Yes	Puerto Rico and U.S. Virgin Islands
Residual Oil (Total: All Boiler Types)	2102005000	0107-3	Yes	Puerto Rico and U.S. Virgin Islands
Natural Gas (Total: Boilers and IC Engines)	2102006000	0107-2	Yes	Puerto Rico and U.S. Virgin Islands
Liquified Petroleum Gas (LPG) (Total: All Boiler Types)	2102007000	107	Yes	
Kerosene (Total: All Boiler Types)	2102011000			
Open Burning of Land Clearing Debris	2610000500		No	

Table 3-1b (continued)

Source Category	SCC	Maximum Achievable Control Technology (MACT) Category	Potential Point Source Component	Emissions for Puerto Rico and U.S. Virgin Islands
Residential Heating				
Kerosene	2104011000		No	
Liquified Petroleum Gas (LPG)	2104007000		No	
Wood	2104008001, 2104008002, 2104008003, 2104008004, 2104008010, 2104008030, 2104008050		No	
Solvent Utilization				
Autobody Refinishing Paint Application, all solvents	2401005000			Puerto Rico and U.S. Virgin Islands
Commercial Pesticide Application - agricultural pesticides, total	2461850000			Puerto Rico and U.S. Virgin Islands
Consumer and Commercial Products Usage: Household Products, all types	2460200000			Puerto Rico and U.S. Virgin Islands
Consumer Products Usage - All products/processes, all solvent types	2465000000			
Consumer Products Usage - Automotive Aftermarket Products	2465400000			
Consumer Products Usage - Household Products	2465200000			
Consumer Products Usage - Personal Care Products	2465100000			
Consumer Products Usage - Pesticide Application	2465800000			
Degreasing - All Industries: Cold Cleaning, all solvent types	2415300000			
Degreasing - All Industries: Open Top, all solvent types	2415100000			
Graphic Arts	2425000000			
Industrial Adhesive Application	2440020000			
Miscellaneous Industrial Solvent Usage: All Solvent Types	2440000000			
Pharmaceutical Manufacturing	2301030000			
Solvent Use on Rubber/Plastics	2430000000			
Surface Coatings: Architectural, all coating types	2401001000			Puerto Rico and U.S. Virgin Islands
Surface Coatings: Electronic and Other Electrical, all coating types	2401065000			
Surface Coatings: Factory-finished Wood, all coating types	2401015000			
Surface Coating: Industrial Maintenance	2401100000			Puerto Rico and U.S. Virgin Islands
Surface Coatings: Large Appliances	2401060000			
Surface Coatings: Machinery and Equipment, all coating types	2401055000			
Surface Coatings: Marine, all coating types	2401080000			
Surface Coatings: Metal Cans	2401040000			
Surface Coatings: Metal Furniture, all coating types	2401025000			
Surface Coatings: Miscellaneous Finished Parts	2401050000			
Surface Coatings: Miscellaneous Metals Manufacturing	2401090000			
Surface Coatings: Motor Vehicles	2401070000			
Surface Coatings: Other Special Purpose Coatings	2401200000			
Surface Coatings: Paper, all coating types	2401030000			
Surface Coatings: Traffic Markings, all coating types	2401008000			Puerto Rico and U.S. Virgin Islands
Surface Coatings: Wood Furniture, all coating types	2401020000			

[1] Emissions for SCC (2501060100) Gasoline Distribution Stage II will be included in the onroad inventory

Tables 3-2 and 3-3 present the source categories for which emissions from final Version 3 of the 1999 nonpoint source NEI were included in the 2002 nonpoint source in the absence of S/L/T agency data. Table 3-2 identifies categories for which EPA has previously developed NEI emission estimates, while Table 3-3 displays categories for which S/L/T agencies have previously developed HAP NEI emission estimates. The EPA carried forward both HAP and CAP annual emissions for the categories identified in Table 3-2 if no S/L/T data were available for 2002. The EPA also carried forward S/L/T-supplied HAP and CAP daily, monthly, and seasonal emissions included in final Version 3 of the 1999 NEI for the SCCs listed in Table 3-3 if the S/L/T agency did not provide 2002 data in their inventory submittals to EPA.

Emissions are estimated using various types of data and calculations depending on the source category. Appendix A presents the methodology used to estimate 2002 emissions for the source categories listed in Tables 3-1a and 3-1b. The appendix provides detailed descriptions of the emission factors, the activity and allocation data information sources, and the procedures used to estimate county-level emissions. The allocation data are provided in an Access 2000 database described in Appendix B. The county-level activity data and the emission factors for each nonpoint source category used to calculate 2002 emissions are provided in an Access 2000 database described in Appendix C. Note that EPA did not merge the gasoline marketing inventory into the draft 2002 NEI. Instead, EPA is requesting that S/L/T agencies review and comment on the inventory before adding it to the NEI. The documentation of methods for this category are available at, ftp://ftp.epa.gov/EmisInventory/draftnei2002/nonpoint/gasoline_ marketing/gasdistributioninstructions.pdf.

Tables 3-1a, 3-1b, and 3-2 also identify the maximum achievable control technology (MACT) source categories included in the 2002 nonpoint source NEI. The emission factors, activity data, and/or emissions data for many of these source categories were provided by EPA's Emission Standards Division (ESD).

Table 3-2. Source Categories for Which 1999 NEI Emissions Were Carried Forward to the 2002 NEI (1999 NEI Emissions Estimated by EPA)

Source Category	SCC	Rationale for Carrying Forward	Maximum Achievable Control Technology (MACT) Category
Asphalt Paving	2461020000, 2461021000	See Footnote 2	
Asphalt Roofing Materials Manufacturing	2306010000	Emission Standards Division (ESD) estimates	418
Asphalt Concrete Manufacturing	2305070000	ESD estimates	
Beef Cattle Feedlots (Fugitive Dust Emissions)[3]	2805001000	See Footnote 2	
Chromic Acid Anodizing	2309100050	See Footnote 2	1607
Commercial/Institutional Fuel Combustion: Wood (Total: All Boiler Types)	2103008000	ESD estimates grown from 1996 to 1999	0107-4
Cremation - Human	2810060100	See Footnote 2	
Cremation - Animal	2810060200	See Footnote 2	
Decorative Chromium Electroplating	2309100030	See Footnote 2	1610
Dental Preparation and Use	31502500 [1]	See Footnote 2	
Flexible Polyurethane Foam Fabrication Operations	30101880 [1]	ESD estimates	1341
Flexible Polyurethane Foam Production	30801005 [1]	ESD estimates	1314
Grain Elevators: Terminal	30200512 [1]	See Footnote 2	
Halogenated Solvent Cleaners	2415000000	See Footnote 2	1614
Hard Chromium Electroplating	2309100010	See Footnote 2	1615
Hospital Sterilization	2850000010	See Footnote 2	1644
Industrial Boilers: Distillate Oil	10200501 [1]	ESD estimates	0107-3
Industrial Boilers: Waste Oil	10201302 [1]	ESD estimates	
Institutional/Commercial Heating: Public Owned Treatment Works (POTW) Digester Gas	10300701 [1]	ESD estimates	107
Mining and Quarrying	2325000000	See Footnote 2	
Miscellaneous Organic Chemical Processes[4]	30199999 [1]	ESD estimates	1640
Natural Gas Transmission and Storage	31000299 [1]	ESD estimates	504
Oil and Natural Gas Production	2310000000, 2310010000, 2310020000, 2310030000	ESD estimates	501
Paint Stripping Operations	68240059 [1]	ESD estimates	1621
Perchloroethylene Dry Cleaning	2420000055	See Footnote 2	1643
Refractories Manufacturing	2305000000	ESD estimates	406
Steel Pickling with Hydrochloric Acid (HCL)	2303000000	ESD estimates	310
Structure Fires	2810030000	See Footnote 2	
Swimming Pools	2862000000	See Footnote 2	

[1] EPA did not carry forward 1999 criteria pollutant emissions for these point source categories because it is unclear that these emissions should be incorporated into the nonpoint source inventory. To estimate nonpoint source emissions for these categories, EPA will first estimate total (point and nonpoint) year 2002 emissions activity. Then EPA will estimate 2002 nonpoint source emissions activity by subtracting year 2002 point source emissions activity from 2002 total emissions activity.

[2] Emissions not estimated due to budget limitations.

[3] For the draft NEI, the 1999 PM10-PRI/-FIL and PM25-PRI/-FIL emissions for the beef cattle feedlots category were not carried forward because of the uncertainty with the default NEI estimates prepared by EPA. For the draft NEI, S/L/T data are included if submitted to EPA.

[4] This category was included in the preliminary 2002 NEI but EPA removed the category from the draft 2002 NEI because the emissions for the category are accounted for in the draft 2002 point source NEI.

Table 3-3. Source Categories for Which 1999 NEI Emissions Were Carried Forward to the 2002 NEI (1999 NEI Emissions Estimated By State/Local/Tribal [S/L/T] Agencies)

SCC	SCC1 Description	SCC3 Description	SCC6 Description	SCC8 Description	Record Count	State Count
10200901	External Combustion Boilers	Industrial	Wood/Bark Waste	Bark-fired Boiler	52	1
2308000000	Industrial Processes	Rubber/Plastics: SIC 30	All Processes	Total	24	1
2399000000	Industrial Processes	Industrial Processes: NEC	Industrial Processes: NEC	Total	18	1
2401005235	Solvent Utilization	Surface Coating	Auto Refinishing: SIC 7532	Glycol Ethers: All Types	1	1
2401005275	Solvent Utilization	Surface Coating	Auto Refinishing: SIC 7532	Methyl Ethyl Ketone	1	1
2401005285	Solvent Utilization	Surface Coating	Auto Refinishing: SIC 7532	Methyl Isobutyl Ketone	1	1
2401010000	Solvent Utilization	Surface Coating	Textile Products: SIC 22	Total: All Solvent Types	13	1
2401015000	Solvent Utilization	Surface Coating	Factory Finished Wood: SIC 2426 thru 242	Total: All Solvent Types	358	2
2401020000	Solvent Utilization	Surface Coating	Wood Furniture: SIC 25	Total: All Solvent Types	260	3
2401025000	Solvent Utilization	Surface Coating	Metal Furniture: SIC 25	Total: All Solvent Types	23	1
2401030000	Solvent Utilization	Surface Coating	Paper: SIC 26	Total: All Solvent Types	17	1
2401035000	Solvent Utilization	Surface Coating	Plastic Products: SIC 308	Total: All Solvent Types	168	1
2401040000	Solvent Utilization	Surface Coating	Metal Cans: SIC 341	Total: All Solvent Types	245	2
2401050000	Solvent Utilization	Surface Coating	Miscellaneous Finished Metals: SIC 34 - (341 + 3498)	Total: All Solvent Types	225	1
2401055000	Solvent Utilization	Surface Coating	Machinery and Equipment: SIC 35	Total: All Solvent Types	272	2
2401060000	Solvent Utilization	Surface Coating	Large Appliances: SIC 363	Total: All Solvent Types	243	3
2401065000	Solvent Utilization	Surface Coating	Electronic and Other Electrical: SIC 36 - 363	Total: All Solvent Types	169	3
2401075000	Solvent Utilization	Surface Coating	Aircraft: SIC 372	Total: All Solvent Types	335	2
2401080000	Solvent Utilization	Surface Coating	Marine: SIC 373	Total: All Solvent Types	211	2
2401090000	Solvent Utilization	Surface Coating	Miscellaneous Manufacturing	Total: All Solvent Types	419	3
2401200000	Solvent Utilization	Surface Coating	Other Special Purpose Coatings	Total: All Solvent Types	26	1
2401990000[1]	Solvent Utilization	Surface Coating	All Surface Coating Categories	Total: All Solvent Types	9	1
2401990235[1]	Solvent Utilization	Surface Coating	All Surface Coating Categories	Glycol Ethers: All Types	1	1
2401990275[1]	Solvent Utilization	Surface Coating	All Surface Coating Categories	Methyl Ethyl Ketone	1	1
2401990285[1]	Solvent Utilization	Surface Coating	All Surface Coating Categories	Methyl Isobutyl Ketone	1	1
2401990370[1]	Solvent Utilization	Surface Coating	All Surface Coating Categories	Special Naphthas	1	1
2415030000	Solvent Utilization	Degreasing	Electronic and Other Elec. (SIC 36): All Processes	Total: All Solvent Types	5	1
2415045000	Solvent Utilization	Degreasing	Miscellaneous Manufacturing (SIC 39): All Processes	Total: All Solvent Types	5	1
2415065000	Solvent Utilization	Degreasing	Auto Repair Services (SIC 75): All Processes	Total: All Solvent Types	5	1
2415125385	Solvent Utilization	Degreasing	Industrial Machinery & Equip (SIC 35): Open Top Degreasing	Trichloroethylene	1	1

Table 3-3 (Continued)

SCC	SCC1 Description	SCC3 Description	SCC6 Description	SCC8 Description	Record Count	State Count
2415305000	Solvent Utilization	Degreasing	Furniture and Fixtures (SIC 25): Cold Cleaning	Total: All Solvent Types	24	1
2415310000	Solvent Utilization	Degreasing	Primary Metal Industries (SIC 33): Cold Cleaning	Total: All Solvent Types	12	1
2415320000	Solvent Utilization	Degreasing	Fabricated Metal Products (SIC 34): Cold Cleaning	Total: All Solvent Types	17	1
2415325000	Solvent Utilization	Degreasing	Industrial Machinery and Equipment (SIC 35): Cold Cleaning	Total: All Solvent Types	9	1
2415330000	Solvent Utilization	Degreasing	Electronic and Other Elec. (SIC 36): Cold Cleaning	Total: All Solvent Types	6	1
2415335000	Solvent Utilization	Degreasing	Transportation Equipment (SIC 37): Cold Cleaning	Total: All Solvent Types	18	1
2415340000	Solvent Utilization	Degreasing	Instruments and Related Products (SIC 38): Cold Cleaning	Total: All Solvent Types	3	1
2415345000	Solvent Utilization	Degreasing	Miscellaneous Manufacturing (SIC 39): Cold Cleaning	Total: All Solvent Types	18	1
2415355000	Solvent Utilization	Degreasing	Automotive Dealers (SIC 55): Cold Cleaning	Total: All Solvent Types	35	1
2415360000	Solvent Utilization	Degreasing	Auto Repair Services (SIC 75): Cold Cleaning	Total: All Solvent Types	40	1
2415365000	Solvent Utilization	Degreasing	Miscellaneous Repair Services (SIC 76): Cold Cleaning	Total: All Solvent Types	37	1
2420000000	Solvent Utilization	Dry Cleaning	All Processes	Total: All Solvent Types	56	1
2420010000	Solvent Utilization	Dry Cleaning	Commercial/Industrial Cleaners	Total: All Solvent Types	77	1
2420010055	Solvent Utilization	Dry Cleaning	Commercial/Industrial Cleaners	Perchloroethylene	109	3
2420020055	Solvent Utilization	Dry Cleaning	Coin-operated Cleaners	Perchloroethylene	53	1
2461022000	Solvent Utilization	Miscellaneous Non-industrial: Commercial	Emulsified Asphalt	Total: All Solvent Types	82	2
2461800000	Solvent Utilization	Miscellaneous Non-industrial: Commercial	Pesticide Application: All Processes	Total: All Solvent Types	137	3
2461850001	Solvent Utilization	Miscellaneous Non-industrial: Commercial	Pesticide Application: Agricultural	Herbicides, Corn	87	1
2461850051	Solvent Utilization	Miscellaneous Non-industrial: Commercial	Pesticide Application: Agricultural	Other Pesticides, Corn	176	2
2501060000	Storage and Transport	Petroleum and Petroleum Product Storage	Gasoline Service Stations	Total: All Gasoline/All Processes	149	3
2501060050	Storage and Transport	Petroleum and Petroleum Product Storage	Gasoline Service Stations	Stage 1: Total	168	2
2501060051	Storage and Transport	Petroleum and Petroleum Product Storage	Gasoline Service Stations	Stage 1: Submerged Filling	815	2
2501060052	Storage and Transport	Petroleum and Petroleum Product Storage	Gasoline Service Stations	Stage 1: Splash Filling	911	3

Table 3-3 (Continued)

SCC	SCC1 Description	SCC3 Description	SCC6 Description	SCC8 Description	Record Count	State Count
2501060101	Storage and Transport	Petroleum and Petroleum Product Storage	Gasoline Service Stations	Stage 2: Displacement Loss/Uncontrolled	25	2
2501060103	Storage and Transport	Petroleum and Petroleum Product Storage	Gasoline Service Stations	Stage 2: Spillage	8	1
2501060200	Storage and Transport	Petroleum and Petroleum Product Storage	Gasoline Service Stations	Underground Tank: Total	12	2
2501060201	Storage and Transport	Petroleum and Petroleum Product Storage	Gasoline Service Stations	Underground Tank: Breathing and Emptying	256	2
2505000000	Storage and Transport	Petroleum and Petroleum Product Transport	All Transport Types	Total: All Products	40	1
2505020030	Storage and Transport	Petroleum and Petroleum Product Transport	Marine Vessel	Crude Oil	8	1
2505020090	Storage and Transport	Petroleum and Petroleum Product Transport	Marine Vessel	Distillate Oil	8	1
2505020120	Storage and Transport	Petroleum and Petroleum Product Transport	Marine Vessel	Gasoline	16	2
2505020150	Storage and Transport	Petroleum and Petroleum Product Transport	Marine Vessel	Jet Naphtha	16	2
2505020180	Storage and Transport	Petroleum and Petroleum Product Transport	Marine Vessel	Kerosene	8	1
2505030120	Storage and Transport	Petroleum and Petroleum Product Transport	Truck	Gasoline	138	3
2515020000	Storage and Transport	Organic Chemical Transport	Marine Vessel	Total: All Products	21	1
2601000000	Waste Disposal, Treatment, and Recovery	On-site Incineration	All Categories	Total	16	1
2601020000	Waste Disposal, Treatment, and Recovery	On-site Incineration	Commercial/Institutional	Total	1352	1
2610000300	Waste Disposal, Treatment, and Recovery	Open Burning	All Categories	Yard Waste - Weed Species Unspecified (incl Grass)	17	1
2620000000	Waste Disposal, Treatment, and Recovery	Landfills	All Categories	Total	270	1
2620030000	Waste Disposal, Treatment, and Recovery	Landfills	Municipal	Total	39	3
2630000000[2]	Waste Disposal, Treatment, and Recovery	Wastewater Treatment	All Categories	Total Processed	2148	4
2630020001	Waste Disposal, Treatment, and Recovery	Wastewater Treatment	Public Owned	Flaring of Gases	2	1

Table 3-3 (Continued)

SCC	SCC1 Description	SCC3 Description	SCC6 Description	SCC8 Description	Record Count	State Count
2640000000	Waste Disposal, Treatment, and Recovery	TSDFs	All TSDF Types	Total: All Processes	6	1
2801500000	Miscellaneous Area Sources	Agriculture Production - Crops	Agricultural Field Burning - whole field set on fire	Total, all crop types	3	1
2801500100	Miscellaneous Area Sources	Agriculture Production - Crops	Agricultural Field Burning - whole field set on fire	Field Crops Unspecified	17	1
2801500170	Miscellaneous Area Sources	Agriculture Production - Crops	Agricultural Field Burning - whole field set on fire	Field Crop is Grasses: Burning Techniques Not Important	17	1
2801500300	Miscellaneous Area Sources	Agriculture Production - Crops	Agricultural Field Burning - whole field set on fire	Orchard Crop Unspecified	1	1
2801500360	Miscellaneous Area Sources	Agriculture Production - Crops	Agricultural Field Burning - whole field set on fire	Orchard Crop is Citrus (orange, lemon)	17	1
2801500420	Miscellaneous Area Sources	Agriculture Production - Crops	Agricultural Field Burning - whole field set on fire	Orchard Crop is Pear	13	1
2801500430	Miscellaneous Area Sources	Agriculture Production - Crops	Agricultural Field Burning - whole field set on fire	Orchard Crop is Prune	11	1
2801500440	Miscellaneous Area Sources	Agriculture Production - Crops	Agricultural Field Burning - whole field set on fire	Orchard Crop is Walnut	9	1
2801500450	Miscellaneous Area Sources	Agriculture Production - Crops	Agricultural Field Burning - whole field set on fire	Orchard Crop is Filbert (Hazelnut)	10	1
2801600000	Miscellaneous Area Sources	Agriculture Production - Crops	Country Grain Elevators	Total	1	1
2810005000	Miscellaneous Area Sources	Other Combustion	Managed Burning, Slash (Logging Debris)	Total	66	1
2810010000	Miscellaneous Area Sources	Other Combustion	Human Perspiration and Respiration	Total	195	1
2810050000	Miscellaneous Area Sources	Other Combustion	Motor Vehicle Fires	Total	13	1
30100802	Industrial Processes	Chemical Manufacturing	Chloro-alkali Production	Liquefaction (Mercury Cell Process)	2	1
30200756	Industrial Processes	Food and Agriculture	Grain Millings	Wet Corn Milling: Milling	1	1
30500201	Industrial Processes	Mineral Products	Asphalt Concrete	Rotary Dryer: Conventional Plant (see 3-05-002-50 to -53 for subtypes)	1147	1
30500205	Industrial Processes	Mineral Products	Asphalt Concrete	Drum Dryer: Drum Mix Plant (see 3-05-002-55 thru -63 for subtypes)	1	1
30500799	Industrial Processes	Mineral Products	Cement Manufacturing (Wet Process)	Other Not Classified	1	1
30900199	Industrial Processes	Fabricated Metal Products	General Processes	Other Not Classified	6	1
30901006	Industrial Processes	Fabricated Metal Products	Electroplating Operations	Entire Process: Chrome	4	1
30906001	Industrial Processes	Fabricated Metal Products	Porcelain Enamel/Ceramic Glaze Spraying	Spray Booth	1	1
31301001	Industrial Processes	Electrical Equipment	Light Bulb Manufacture	Light Bulb Glass to Socket Base Lubrication with SO2	1	1
31401501	Industrial Processes	Transportation Equipment	Boat Manufacturing	General	9	1

Table 3-3 (Continued)

SCC	SCC1 Description	SCC3 Description	SCC6 Description	SCC8 Description	Record Count	State Count
31502088	Industrial Processes	Photo Equip/Health Care/Labs/Air Condit/SwimPools	Health Care - Hospitals	Laboratory Fugitive Emissions	15	1
33000198	Industrial Processes	Textile Products	Miscellaneous	Other Not Classified	1	1
39092050	Industrial Processes	In-process Fuel Use	Fuel Storage - Pressure Tanks	Natural Gas: Withdrawal Loss	17	1
40202301	Petroleum and Solvent Evaporation	Surface Coating Operations	Large Ships	Prime Coating Operation	5	1
40600162	Petroleum and Solvent Evaporation	Transportation and Marketing of Petroleum Products	Tank Cars and Trucks	Gasoline: Loaded with Fuel (Transit Losses)	567	1
50100701	Waste Disposal	Solid Waste Disposal - Government	Sewage Treatment	Entire Plant	795	1
50490004	Waste Disposal	Site Remediation		General Incinerators: Process Gas	20	1

[1] EPA requests that States review emissions in this source category to ensure there is no double-counting with 2002 EPA estimates for Architectural Surface Coating (SCC 2401001000).
[2] EPA requests that States review emissions in this source category to ensure there is no double-counting with 2002 EPA estimates for Public Owned Treatment Works (SCC 2630020000).

SIC - Standard Industrial Classification (code)

For the draft 2002 NEI, EPA updated 2002 inventories in the preliminary NEI for some of the solvent utilization categories and the residential wood combustion category. Thus, these categories are included in both Tables 3-1a and 3-1b. As discussed in Section 2 of this report, EPA added the VOC emissions to the draft NEI if a S/L/T agency did not provide VOC emissions for one or more of the solvent utilization categories. The EPA also replaced the VOC emissions for which it calculated emissions for the preliminary NEI (see Table 3-1a) or carried forward from Version 3 of the 1999 NEI (see Table 3-2). For HAPs, the emissions in the preliminary NEI are included in the draft NEI if not supplied by a S/L/T agency. Appendix A provides the NEI methods for the HAP emissions associated with the categories listed in Table 3-1a. The methods for the new VOC inventory are provided in EPA, 2005. For the final 2002 nonpoint source NEI, EPA plans to revise the HAP inventory for the solvent utilization categories listed in Table 3-1b.

For the residential wood combustion category, the preliminary 2002 NEI emissions were revised to:

- Correct the CO, PM10-PRI, and PM25-PRI emission factors for fireplaces without inserts (this change doubled the emission factors associated with correcting an error in converting the values from g/kg to lb/ton);

- Correct the climate zone map for allocating national activity to states;

- Replace 1997 total residential wood consumption with 2001 estimates (this change reduced wood consumption for fireplaces with inserts and woodstoves);

- Update urban/rural population data to reflect 2002 estimates based on year 2002 total county population and year 2000 county ratios of urban/rural population to total population; and

- Change the data source code from E-02-X (this was incorrect) to E-01-X to reflect 2001 activity data adjusted to 2002.

3.3 What Adjustments Were Made to These Data?

Tables 3-1a and 3-1b identify whether each nonpoint source category also has a point source component. Appendix A describes the point SCCs that are analogous to these nonpoint source categories. The EPA adjusted the nonpoint activity and emissions to account for point source emissions for both CAP and HAP emissions for the ICI fossil fuel combustion categories and VOC emissions for the solvent utilization categories. However, for the remaining source categories in Tables 3-1a and 3-1b, EPA did not adjust the total activity and emissions for point source activity and emissions for the draft NEI. For the final 2002 nonpoint source NEI, EPA will revise the emissions to remove emissions associated with point sources after the point source NEI is finalized.

3.4 How Were the Emissions Allocated to the County Level?

For most source categories, emissions activity data are not available at the county-level. Therefore, it was necessary to allocate National-, Regional, or State-level activity data to the county-level using a number of allocation factors, such as population and employment within certain industries. A detailed discussion of spatial allocation methods is provided in Appendix A for source categories for which National-, Regional, or State-level emissions activity was allocated to counties.

In 2001, the State of Colorado created Broomfield County (FIPS code 08014) from areas within four counties (Adams, Boulder, Jefferson, and Weld) that contained the City of Broomfield. The portion of the population in the City of Broomfield that was part of each of these counties was obtained from the State of Colorado (CDLA, 2002). Using these data, EIG estimated ratios, which are displayed in Table 3-4, representing the proportion of Broomfield's

population that was previously included in each of these four counties. These ratios, which are displayed in Table 3-4, were applied to the 2002 activity data for Adams, Boulder, Jefferson, and Weld counties to estimate the 2002 Broomfield County emissions activity for source categories for which 2002 activity data were not available.

Table 3-4. Ratios of Broomfield Population to Population of Four Counties From Which Broomfield County Was Created

County	Population Ratio
Adams County (001)	0.041882
Boulder County (013)	0.073721
Jefferson County (059)	0.002939
Weld County (123)	0.000055

3.5 How Were Emissions Estimated for the Puerto Rico and the U.S. Virgin Islands?

The source categories for which EIG estimated 2002 emissions for Puerto Rico and the U.S. Virgin Islands are shown in Tables 3-1a and 3-1b. Emissions were estimated for a category if 2002 activity data were available for Puerto Rico and/or the U.S. Virgin Islands, or if estimates were developed for the territory as part of a 1996 HAP inventory effort (EPA, 1999). For categories that were included in the 1996 HAP inventory, but for which 2002 emissions activity data were not available, EIG applied an emissions estimation approach similar to the one used to prepare the 1996 HAP inventory for these two territories (EPA, 1999). The approach relies on 2002 emissions data developed for surrogate counties in Florida. Broward County, Florida was used as the surrogate county for Puerto Rico. Monroe County, Florida was used as the surrogate county for the U.S. Virgin Islands. Year 2002 emissions in each surrogate county were divided by the 2002 population of the surrogate county, which was obtained from the U.S. Census Bureau, to develop a per capita emission factor for each category. The per capita emission factor developed for Broward County was then multiplied by the population in each county of Puerto Rico to estimate county-level emissions for Puerto Rico. A similar per capita emission factor

procedure was used to develop county-level emissions for the U.S. Virgin Islands based on Monroe County emission estimates and population.

3.6 How Were Groups of HAPs Handled?

The CAA list of 188 HAPs includes several HAP groups in addition to individual chemicals. Examples of some HAP groups are metal compounds, cresols/cresylic acid (isomers and mixture), polycyclic organic matter (POM), dioxins, and furans. The nonpoint source NEI was created so that information on the individual chemicals in these HAP groups could be retained, and their emissions could be reported either as the individual chemicals or as a combination of emissions that represent the entire HAP group. In the nonpoint source NEI, emissions were estimated for the individual HAPs, and not grouped together. However, if only a HAP group estimate was available, no attempt was made to disaggregate the HAP group emissions into the individual HAPs.

For POM, emissions are listed in the nonpoint source NEI as either the more general POM HAP group, individual POM HAPs, or as two subsets of the POM groups that EPA developed for other national inventories. The first subset consists of 7 polycyclic aromatic hydrocarbons (PAHs), and the other consists of 15 PAHs. Individual POM chemicals that are not in either the 7-PAH or 15-PAH groups, or emissions defined simply as POM, are reported as POM in the nonpoint source component of the NEI.

The compounds listed below constitute the 7-PAH (marked with asterisks) and the 15-PAH compounds. The 7-PAH compounds have been determined by the International Agency for Research on Cancer (IARC) to be animal carcinogens. The sum of these 7 compounds represents the 7-PAH emission subset that is used in this inventory, and the sum of the 15 compounds represents the 15-PAH emission subset used in this inventory.

Acenaphthene	Benzo(b)fluoranthene*	Fluoranthene
Acenaphthylene	Benzo(ghi)perylene	Fluorene
Anthracene	Benzo(k)fluoranthene*	Indeno(1,2,3-cd)pyrene*
Benz(a)anthracene*	Chrysene*	Phenanthrene
Benzo(a)pyrene*	Dibenz(a,h)anthracene*	Pyrene

Thus, an estimate of the emissions for all the POM compounds in the nonpoint source NEI is the sum of the 15-PAH (group or individual), the non-15-PAH individual HAPs, and the unspeciated POM emissions.

For dioxins and furans, emissions are presented as individual congeners, 2,3,7,8-tetrachlorodibenzo-p-dioxin (TCDD) toxic equivalents (TEQs), and dibenzofurans. EIG's goal for this inventory is to report emissions for individual congeners whenever sufficient information exists.

3.7 How Were the Inventory Data Compiled into the NEI Database?

The 2002 nonpoint source NEI is housed in NIF Version 3.0 as designed by EPA. NIF 3.0 allows for a variety of data transfer mechanisms to be used and is flexible enough to be supported by many different database programs. More detailed information about the NIF can be found at http://www.epa.gov/ttn/chief/nif/index.html. For categories for which 2002 nonpoint source emissions were estimated (see Tables 3-1a and 3-1b), activity and allocation data were received in various electronic formats and software. The data were either loaded into an Access 2000 database or Excel spreadsheet, which was used to estimate county-level emissions from the applicable county allocation data and emission factors. The data for all categories were then loaded to a common flat file format using NIF 3.0 fields. The data in the flat file were then converted to NIF 3.0.

For the carry forward categories (see Tables 3-2 and 3-3), final Version 3 of the 1999 HAP NEI is in NIF 3.0. Therefore, the pollutant-specific emissions data in the Emission table and control data in the Control Equipment table were extracted from the 1999 HAP NEI and

appended to the NIF 3.0 Emission and Control Equipment tables for the 2002 NEI. For final Version 3 of the 1999 CAP NEI, the emissions data in the Emission table and control data in the Control Equipment table were converted from NIF 2.0 to NIF 3.0 and appended to the NIF 3.0 Emission and Control Equipment tables for the 2002 NEI.

As a result of extracting data from separate data sets for the carry-forward categories, duplicate records occurred in the Emission Process and Emission Period tables because these tables do not include the pollutant code field that is a part of the data key that defines unique records in the Emission and Control Equipment tables. Therefore, the Emission Process and Emission Period tables were created by selecting the unique set of records from the 1999 HAP and CAP inventories using the data key in each table, and removing data for non-data key fields. In the Emission Process table, non-data key fields for which data were removed include the temporal allocation (e.g., seasonal throughput) fields, the heat and sulfur content fields, and the process MACT compliance status fields. In the Emission Period table, non-data key fields for which data were removed include the actual throughput and throughput unit numerator fields, the start date and end date fields, the material and material IO fields, and the period-specific (e.g., period days per week) fields. The data were removed from the non-data key fields because some records contained State data while others contained EPA data for the same data key record.

The Transmittal Record table was generated from the unique list of State and county FIPS codes and Tribal codes. The EPA contact information is used only if all of the nonpoint source inventory data for a state originates from the preliminary 2002 nonpoint source NEI (with EPA updates to selected source categories) either because the state used the preliminary NEI in its submittal to EPA or because the preliminary NEI was used because the state did not submit a nonpoint source inventory to EPA.

3.8 What QA Procedures Were Used?

The QA procedures used for this inventory cover three main preparation steps:

- Methods selection and data gathering;
- Emissions calculation; and
- Data handling and transfer.

Methods selection – Methods were researched and chosen based on previous work, availability of newer EPA and State methodologies, and the availability of emission and activity factors. Options for available data were identified. Decisions were peer reviewed before proceeding.

Emissions calculation – All emission calculations were developed using spreadsheets and peer reviewed when complete. Samples of the emission calculations for each source category were verified using manual calculations.

Data handling and transfer – Quality control checks were used to catch data handling errors at every major step of the process. Use of spreadsheets and direct links to the database reduced the potential for errors in transfer. The EPA's QA software was run on the NIF 3.0 data files to identify data format and data quality issues. The issues were then resolved. Maintenance of referential integrity to the NIF Version 3.0 primary keys and field lengths was also quality assured.

4.0 INTERPRETATION AND USE OF THE 2002 NONPOINT SOURCE INVENTORY

4.1 What Are the Limitations to the Source Categories Included Here?

General – Nonpoint source inventories contain emission estimates for the smaller and more diffuse sources within a geographic area of study. Any nonpoint source inventory can have limitations, usually due to a lack of emission activity data and emission factors for some CAPs and HAPs and source categories. Planning for this inventory began with compiling a list of potential nonpoint source categories. The primary resource for this list was Version 3 of the 1999 nonpoint source NEI. As the information-gathering phase progressed, it was determined that emissions could not be estimated for some of the categories because of budget limitations.

Non-2002 Data – For source categories where 2002 base year emissions could not be estimated, data for other base years were used if S/L/T data were not submitted to EPA. In many cases, the 1999 NEI data were carried forward in the 2002 NEI (see Tables 3-2 and 3-3). For some of these carry-forward source categories, ESD provided emissions data for a year other than 1999 and noted that the data are the best available to represent 1999. For MACT source categories, the 1996 nonpoint source NEI was also used to fill these gaps (EPA, 2001). For other source categories, activity data or emission estimates from a different year were used that should approximate 1999. For these non-MACT source categories, a variety of resources was used to best estimate emissions. Table 4-1 provides a list of the 2002 NEI carry-forward source categories with data from a base year other than 1999.

Table 4-1. 2002 NEI Nonpoint Carry Forward Source Categories That Do Not Have a 1999 Base Year

Source Category Group	Year
Asphalt Concrete Manufacturing[1]	1996[2]
Asphalt Roofing and Processing	1996
Flexible Polyurethane Foam Fabrication Operations	1993
Flexible Polyurethane Foam Production	1993
Gasoline Service Stations: Stage I[3]	1996
Industrial Boilers: Waste Oil[1]	1996
Institutional/Commercial Heating: POTW Digester Gas	1996
Miscellaneous Organic Chemical Processes (MON)	1995
Natural Gas Transmission and Storage	1998
Oil and Natural Gas Production	1993
Paint Stripping Operations	1998
Refractory Products Manufacturing	1996
Steel Pickling HCl Process	1991

[1] Non-MACT Source Category Groups.
[2] Tribal data for 1998 also included.
[3] For Puerto Rico and U.S. Virgin Islands only (all other area's data are from 1999)

Categories not included – During preparation of the preliminary NEI, EPA did not run an evaluation to determine if there were any categories with CAPs in the 1999 NEI that were not carried forward and included in the preliminary 2002 NEI. Subsequently, residential kerosene and LPG combustion were identified as categories in the 1999 CAP NEI that were not included in the preliminary NEI. For the draft 2002 NEI, EPA prepared 2002 inventories for these categories. Time and resource constraints have limited further evaluations to determine if there were any additional categories in the 1999 NEI that are not included in the preliminary or draft 2002 NEI.

Coverage gaps – For some source categories, there may be gaps in the coverage of pollutants, or the available activity data may only partially represent the category.

A notable example is the source category for open burning of scrap tires. The activity estimate for this category was very difficult to obtain and most likely underestimates activity for a given State or county. For this inventory, a literature search via the internet and Lexis-Nexis®

provided major incidences of open burning of scrap tires, which were used to estimate activity data for specific counties.

Category double counting – The categories for which EPA prepared 2002 inventories, Tables 3-1a and 3-1b identify the categories for which emissions may also be included in the draft 2002 point source NEI. The EPA adjusted the nonpoint estimates for the ICI fossil fuel combustion categories and for VOC emissions for the solvent utilization categories. Thus, double-counting of emissions may exist for the remaining categories. For the draft 2002 NEI, EPA will use the emissions data in the final 2002 point source NEI to adjust nonpoint source emissions to address double-counting issues.

For the carry-forward categories, double counting of emissions may occur when, for example, a S/L/T agency's inventory is included in the 1999 point NEI, but the S/L/T agency did not provide an inventory for the 1999 nonpoint NEI. In this example, the 1999 nonpoint NEI would have been grown from a prior year inventory (e.g., 1996) which may account for emissions that the agency included in its 1999 point source inventory.

As noted earlier, Tables 3-1a and 3-1b present the list of source categories for which EPA prepared 2002 emission estimates. To identify source categories for which 2002 estimates were not developed, but estimates were included in the 1999 NEI, EPA compared the list of 1999 NEI HAP source categories with the categories in Tables 3-1a and 3-1b. Emissions for the 1999 NEI HAP source categories that are listed in Tables 3-1a and 3-1b were not carried forward to the 2002 NEI. In several cases, the 1999 HAP NEI reported emissions for the categories in Tables 3-1a and 3-1b, but these emissions were reported in similar but different SCCs. To eliminate the possibility of double-counting in the 2002 NEI for these categories, EPA did not carry forward their 1999 NEI emissions. For example, the 1999 NEI includes emission estimates for the Residential Natural Gas combustion source category in both SCC 2014006000 (Residential Natural Gas, Total: All Combustor Types) and in SCC 2104006010 (Residential Furnaces). The SCC 2014006010 emissions were not carried forward to the 2002 NEI because

EPA estimated and reported 2002 emissions for the Residential Natural Gas combustion source category under SCC 2014006000.

As noted in the footnotes to Table 3-3, it was unclear whether a few of the 1999 NEI SCCs may include emissions activity that is incorporated in the Tables 3-1a and 3-1b source categories. For example, emission activity included in the All Surface Coating Category SCCs (2401990000 through 2401990370) may overlap with the activity included in the Residential Architectural Surface Coating category (2401001000). The EPA requests that S/L/T agencies review the emission estimates incorporated from the 1999 NEI for the footnoted Table 3-3 SCCs to identify potential double-counting issues. If necessary, S/L/T agencies should provide EPA with instructions on how these SCCs' emissions should be revised or removed from the draft 2002 NEI to eliminate double-counting.

4.2 What Are the Limitations of the Emissions Data?

Methods – Nonpoint source methods and emission factors necessarily simplify processes and emissions. When national-level emissions are calculated, the methods and factors cannot take into account local variations or use locally available activity data. Emissions estimated using national-level methods calculate average emissions, not true local emissions. Emission factors may not reflect materials used or controls in place within a particular locality.

Facility double counting – Double counting can also occur when facility-specific data (from the 2002 point source NEI) overlaps with nonpoint source categories that have emissions estimated using top-down methods. A potential example of this type of double-counting is the Publicly-Owned Treatment Works (POTW) nonpoint source category (SCC 2630020000) overlapping with POTW-related point SCCs (50100701 through 50100781 and 50100791 through 50182599).

Spatial allocation – National- and State-level emissions in the nonpoint source NEI were allocated to the county level using allocation factors. An allocation factor was identified for each source category, with typical allocation factors being county-level population or employment within a certain industry. Category emissions attributed to a specific county were assigned only where the county information was available. Detailed discussions of the spatial allocation procedures are in Appendix A. Appendix B provides spatial allocation data used for many nonpoint source categories.

Emission Reductions Due to State/Local Regulations – A national-level inventory consists of emissions typically calculated for the entire United States, using national activity factors, national average emission factors, and considering only national regulations. It generally does not take into account emission reductions due to State and Local regulations. The methods in Appendix A indicate if State or Local regulations were incorporated into the estimate of 2002 emissions for a source category.

4.3 How Does This Inventory Comply with the Information Quality Guidelines?

4.3.1 Purpose

The NEI is a comprehensive inventory covering all CAPs and HAPs for all areas of the United States. The 2002 base year NEI will be used to support emission trends analyses, air quality modeling, and other activities. To this end, the EPA established a goal to compile a comprehensive, 2002 base year nonpoint source inventory, in addition to facility-specific point source data, and mobile source data.

4.3.2 Product Content - Inputs, Methodologies, and Outputs

The scope of the inventory effort was to compile 2002 base year CAP and HAP emissions data for nonpoint sources in the United States and its territories. If 2002 activity data were not available for a source category, emissions from final Version 3 of the 1999 NEI were incorporated into the 2002 inventory. The 2002 NEI is compiled in the NIF 3.0 database structure.

For the categories for which 2002 emissions were calculated, the county-level activity and emissions data were compiled into a common flat file format using NIF 3.0 fields. The data were then converted to NIF 3.0. The categories for which emissions were carried forward from final Version 3 of the 1999 CAP NEI were in NIF 2.0 in an Oracle database. The 1999 CAP NEI was converted to NIF 3.0 in an Access database. The categories for which emissions were carried forward from final Version 3 of the 1999 HAP NEI were in NIF 3.0. The 1999 CAP and HAP inventory data and the 2002 inventory data were combined into a single NIF 3.0 data set. The EPA's QA software was run on the NIF 3.0 data files to identify data format and data quality issues. The issues were then resolved.

The EPA's file transfer protocol (ftp) site has separate nonpoint source 2002 NEI files for each State and Washington, DC, Puerto Rico, and the U.S. Virgin Islands. These files are provided in NIF Version 3.0 tables. The posted files include an inventory documentation file summarizing how the NEI was developed, and a READ ME file describing the different files posted on the site and how they can be used.

4.3.3 Product Limitations and Caveats

The March 2005 version of the draft 2002 nonpoint source NEI is a composite of emission estimates developed by EPA. Because the estimates originated from a variety of sources and estimation methods, as well as differing purposes, they will in turn vary in quality,

including pollutant coverage, level of detail, and geographic coverage. However, this compilation of emissions estimates represents the best available information to date.

For some source categories, emissions estimates were not available for 2002. In these cases, data were carried froward from the 1999 NEI. Within the 1999 NEI, data for other base years were used as well. When data are reported for a year other than 2002, it is noted in the data source code field of the Emission table of the NEI.

Users of the data should consider that pollutants emitted from a particular source may have little impact on the immediate geographic area, and the amount of pollutants emitted does not indicate whether the source is complying with applicable regulations.

4.3.4 Contact Information

NEI nonpoint source questions should be forwarded to:

Mr. Roy Huntley
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919-541-1060

U.S. Environmental Protection Agency
Emissions Inventory Group
Emissions Monitoring and Analysis Division (D205-01)
Office of Air Quality Planning and Standards
Research Triangle Park, North Carolina 27711

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Appendix A

Criteria and HAP Emissions Estimation Methodology

AGRICULTURAL TILLING
SCC: 2801000003

2002 Methodology

Primary PM_{10} emissions estimates for agricultural tilling for calendar year 2002 are grown from 1998 PM_{10} emissions. Emissions for this source category are all filterable; there are no condensible emissions. The 1998 PM_{10} particulate matter emissions are calculated using a database containing county-level data on the number acres planted by type of tilling and crop type that was purchased by EPA from the Conservation Technology Information Center at Purdue University.[1] PM_{10} emissions from agricultural tilling are a function of the acres planted, the PM emission factors, the silt content of the surface soil, and the number of passes or tillings in a year.[2]

Emission estimates for 2002 are grown from national-level data on the number of acres tilled by tilling type. Puerto Rico and the U.S. Virgin Islands are assumed not to have emissions from agriculture tilling. The *2002 National Crop Residue Management Survey*[2] presents the total number of acres planted in the United States for 1998 and 2002 by type of tilling. The five types of tilling used in growing emissions are: No Tilling, Mulch Tilling, Ridge Tilling, Reduced-Tilling (15 to 30 percent residue tilling), and Intensive Tilling (zero to 15 percent residue tilling). The growth factor for 2002 emissions is determined by dividing the number of acres tilled by tillage type in 2002 by the number of acres tilled in 1998. Table 1 presents the acres tilled by type for 1998 and 2002 and the calculated growth factor.

Table 1. Acres Planted and Growth Factor for 2002

	Actual National Number of Acres Planted (Million Acres)		2002 Growth
Tillage System	**1998**	**2002**	**Factor**
No-Till/Strip Till	47.8	55.3	1.1569
Ridge-Till	3.5	2.8	0.8000
Mulch-Till	57.9	45	0.7772
Conservation	109.2	103.1	N/A[a]
Reduced-Till (15-30% cover)	78.1	64.1	0.8207
Intensive-Till (<15% cover)	106.1	114.1	1.0754
Total	293.4[b]	281.4[b]	

[a] Conservation is not utilized to calculate emissions.
[b] Totals do not include acreage for conservation tillage system.

For each type of tillage and crop type, the county-level 1998 PM_{10} emissions were multiplied by the 2002 growth factors from Table 1 to obtain PM_{10} emissions by tillage type for 2002. These emissions were summed to get total county-level PM_{10} emissions. Once PM_{10} estimates were developed, $PM_{2.5}$ emissions were estimated by applying a particle size multiplier of 0.20 to PM_{10} emissions.[3] Table 2 presents a summary of the 2002 national emissions for agricultural tilling.

AGRICULTURAL TILLING (continued)
SCC: 2801000003

Table 2. National Criteria Pollutant Emissions Summary

Pollutant	1998 National Emissions (tons)	2002 Growth Factor	2002 National Activity for Tilling (acres tilled)	2002 National Emissions (tons)
PM10-PRI[a]	4,366,404	See Table 1	281.4	4,202,411
PM25-PRI	873,281	Not Applicable	281.4	840,482

[a] Emissions are all filterable; there are no condensible emission.

1998 Methodology

The basis of agricultural tilling emission estimates was the number of acres of crops tilled in each county by crop type and tillage type. This data was obtained from the *National Crop Residue Management Survey*, developed by the Conservation Technology Information Center (CTIC).[4] The survey is released in November of even numbered years. Data summarizations are available on the CTIC web site at: http://www.ctic.purdue.edu/CTIC/CTIC.html

The five types of tilling for which emissions estimates are calculated are as follows:

Conservation Till	Conventional Till
No till/strip till	0 to 15 percent residue till (Intensive Till)
Mulch till	15 to 30 percent residue till (Reduced till)
Ridge till	

Note that for the 1998 activity data for Highly Erodable Land (HEL) is a total of the amount of land in a county that is HEL or Treated HEL for all crop types. That is, this data overlaps the other crop-type-specific data. The HEL and Treated HEL data is not included for the calculation of emissions estimates.

Emission Factors

The emission factors for agricultural tilling (in lbs per acre) are calculated using the following equation:[5,6]

$$EF = 4.8 \cdot k \cdot s^{0.6} \cdot p$$

where:

k = dimensionless particle size multiplier (PM_{10} = 0.21; $PM_{2.5}$ = 0.042),
s = silt content of surface soil (%),
p = number of passes or tillings in a year.

The silt content of surface soil is defined as the percentage of particles (mass basis) of diameter smaller than 25 micrometers (m) found in the soil to a depth of 10 centimeters (cm). Silt contents were assigned by comparing the USDA surface soil survey map to a USDA county map and assigning a soil type to each county. Table 3 shows silt content assumed for each soil type.

Table 3. Silt content for soil types in USDA surface soil map.

Soil Type	Silt Content (%)
Silt Loam	52
Sandy Loam	33
Sand	12
Loamy Sand	12
Clay	29
Clay Loam	29
Organic Material	10-82
Loam	40

Table 4 shows the number of passes or tillings in a year for each crop for conservation use and conventional use.[7] No till, mulch till, and ridge till tillage systems are classified as conservation use, while 0 to 15 percent residue and 15 to 30 percent residue tillage systems are classified as conventional use.

Table 4. Number of Passes or Tillings Per Year.

Crop	Conservation Use	Conventional Use
Corn	2	6
Spring Wheat	1	4
Rice	5	5
Fall-Seeded Small Grain	3	5
Soybeans	1	6
Cotton	5	8
Sorghum	1	6
Forage	3	3
Permanent Pasture	1	1
Other Crops	3	3
Fallow	1	1

1998 Emissions

The following equation[5,6] was used to determine the emissions from agricultural tilling for 1998. The county-level activity data is the acres of land tilled. The equation is adjusted to estimate PM10-FIL and PM25-FIL using the following parameters: the silt content of the surface soil, a particle size multiplier, and the number of tillings per year.

$$E = c \times k \times s^{0.6} \times p \times a$$

AGRICULTURAL TILLING (continued)
SCC: 2801000003

where:	E	=	PM10-FIL or PM25-FIL emissions
	c	=	constant 4.8 lbs/acre-pass
	k	=	dimensionless particle size multiplier (PM_{10}=0.21; $PM_{2.5}$=0.042)
	s	=	percent silt content of surface soil, defined as the mass fraction of particles smaller than 75 μm diameter found in soil to a depth of 10 cm
	p	=	number of passes or tillings in a year
	a	=	acres of land tilled (activity data)

The EPA's Temporal Allocation Factor File (TAFF) was used to calculate seasonal activity. Daily emissions for agricultural tilling are calculated for the summer season (i.e., June through August), a time span of 92 days. For SCC 2801000003, the TAFF assumes that 25% of the emissions occur during the summer season. Thus, the county-level annual emissions were multiplied by the ratio of 0.25/92 to calculate daily emissions.

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AVIATION GASOLINE DISTRIBUTION: STAGE I
SCC: 2501080050

Aviation gasoline (also called "AvGas") is the only aviation fuel that contains tetraethyl lead (TEL) as a knock-out component for small reciprocating, piston-engine crafts in civil aviation.[1] Commercial and military aviation rarely use this fuel. AvGas is shipped to airports and is filled into bulk terminals, and then into tanker trucks. These processes fall under the definition of stage I, displacement vapors during the transfer of gasoline from tank trucks to storage tanks, and vice versa. These processes are subject to EPA's maximum available control technology (MACT) standards for gasoline distribution.[2]

The amount of AvGas consumed was obtained from the Petroleum Supply Annual[3] for designated Petroleum Administration Districts, or PADs. A nationwide total of 6,682,000 barrels of AvGas were consumed in 2002[3] (Table 1). This information was used to calculate national-level emissions estimates for one criteria pollutant and ten hazardous air pollutants (HAPs). Assumptions for bulk plant processes are summarized in Table 2. Emission factors were provided by ESD and EIG publications[1,4,5,6] (Tables 3 and 4). The national-level emissions estimates were first allocated based on consumption reported for each PAD, and then allocated to the counties within the PADs based on 2002 Landing-Take Off (LTO) data for General aviation flights.[7] Appendix B contains this data in database format. General aviation flights were used in this allocation because they are the primary consumers of AvGas.

There are five PADs across the United States[8]
PAD 1 comprises seventeen states plus the District of Columbia along the Atlantic Coast;
PAD 2 comprises fifteen states in the Midwest;
PAD 3 comprises six states in South Central U.S.;
PAD 4 comprises five states in the Rocky Mountains; and
PAD 5 comprises seven states along the West Coast.

Table 1 - Summary of AvGas Consumed and LTOs by PAD in 2002

PAD	AvGas Consumed (barrels)	LTOs
1	1,019,000	204,000
2	2,391,000	186,368
3	1,757,000	138,401
4	399,000	20,625
5	1,116,000	184,271
	6,682,000	733,665

National-Level Calculations

Amount of AvGas consumed in 2002 (barrels) = 6,682,000

Conversion: *1 barrel = 42 gallons*
1 gallon = 3.78 liters
1 kg = 2.205 lb
1 kg = 1,000,000 mg
1 ton = 2000 lb

AVIATION GASOLINE DISTRIBUTION: STAGE I (continued)
SCC: 2501080050

Step 1 - Convert AvGas consumption into gallons and liters using conversion factors.

Amount of AvGas consumed in 2002 (gallons) = 6,682,000 barrels * 42 gallons/barrel
Amount of AvGas consumed in 2002 (gallons) = 280,644,000

Amount of AvGas consumed in 2002 (liters) = 280,644,000 gallons * 3.78 liters/gal
Amount of AvGas consumed in 2002 (liters) = 1,060,834,320

Step 2 - Use the liters of AvGas consumed and apply the non-fugitive VOC emission factors in Table 3 to calculate non-fugitive VOC estimates. VOC emission factors for the four non-fugitive processes are listed in Table 3.

Unloading/Tank Filling: tank fill VOC emissions = 1081 mg/L * 1,060,834,320 L * 1.1025E-9 ton/mg
Unloading/Tank Filling: tank fill VOC emissions = **1,264.30** tpy

Unloading/Tank Filling: Storage tank VOC emissions = (432 mg/L) * 1,060,834,320 L * 1.1025E-9 ton/mg
Unloading/Tank Filling: Storage tank VOC emissions = **505.25** tpy

Tank Truck Filling - Composite VOC Emissions = (1235 mg/L) * 1,060,834,320 L * 1.1025E-9 ton/mg
Tank Truck Filling - Composite VOC Emissions = **1,444.42** tpy

Storage Tank - Breathing losses VOC Emissions = (203 mg/L) * 1,060,834,320 L * 1.1025E-9 ton/mg
Storage Tank - Breathing losses VOC Emissions = **237.42** tpy

Total non-fugitive VOC emissions = 1,264.30 tpy + 505.25 tpy + 1,444.42 tpy + 237.42 tpy = 3,451.39 tpy

Step 3 - Use the assumptions in Table 2 and the fugitive VOC emission factors in Table 3 to generate fugitive VOC emissions.

AvGas - Fugitive from valves VOC Emissions = (# Bulk Plant Equivalents)*(#valves/plant)*EF*days
AvGas - Fugitive from valves VOC Emissions = (2442 plants) * (50 valves/plant) * (0.26 kg/valve/day)* 300 days * 1.1025E-3 ton/kg
AvGas - Fugitive from valves VOC Emissions = **10,499.99** tpy

AvGas - Fugitive from pumps VOC Emissions = (# Bulk Plant Equivalents)*(#pumps/plant)* (#seals/pump) * EF * days
AvGas - Fugitive from pumps VOC Emissions = (2442 plants) * (2 pumps/plant) * (4 seals/pump) * (2.7 kg/seal/day)* 300 days * 1.1025E-3 ton/kg
AvGas - Fugitive from pumps VOC Emissions = **17,446.14** tpy

Total fugitive VOC emissions = 10,499.99 tpy + 17,446.14 tpy
Total fugitive VOC emissions = 27,946.04 tpy

Step 4 - Sum the fugitive and non-fugitive VOC emissions together for total VOC emissions.

Total VOC emissions = 3,451.39 tpy + 27,946.04 tpy = 31,397.43 tpy

Step 5 - Apply the speciation emission factors in Table 4 for tetraethyl lead, 2,2,4-trimethylpentane, benzene, cumene, ethylbenzene, hexane, naphthalene, toluene, and xylene to calculate HAP emissions.

Tetraethyl Lead emissions = 31,397.43 tpy VOC * 0.000978 % = 0.31 tpy
2,2,4-Trimethylpentane emissions = 31,397.43 tpy VOC * 0.8 % = 251.18 tpy
Benzene emissions = 31,397.43 tpy VOC * 0.9 % = 282.58 tpy

AVIATION GASOLINE DISTRIBUTION: STAGE I (continued)
SCC: 2501080050

Cumene emissions = 31,397.43 tpy VOC * 0.01 % = 3.14 tpy
Ethylbenzene emissions = 31,397.43 tpy VOC * 0.10 % = 31.40 tpy
Hexane emissions = 31,397.43 tpy VOC * 1.60 % = 502.36 tpy
Naphthalene emissions = 31,397.43 tpy VOC * 0.05 % = 15.70 tpy
Toluene emissions = 31,397.43 tpy VOC * 1.30 % = 408.17 tpy
Xylene emissions = 31,397.43 tpy VOC * 0.5 % = 156.99 tpy

Step 6 - Use the ethylene dichloride emission factor in Table 4 to calculate ethylene dichloride emissions.

Ethylene dichloride emissions = 280,644,000 gal * 2.167E-6 LB/gal * ton/2000 LB = 0.30 tpy

Data Tables

Table 2 - Assumptions Used For Bulk Terminals Using AvGas

Parameter	Data	Reference
Number of Bulk Plant Equivalents (U.S.)	2,442 plants	1
Number of valves per bulk plant	50 valves/plant	
Number of pumps per bulk plant	2 pumps/plant	
Number of seals per bulk plant	4 seals/pump	
Number of days per year used	300 days	

Table 3 - VOC Emission Factors and National-Level Emissions

Pollutant	Emission Source	Emission Factor	Emission Factor Units	Emissions (tpy)	Factor Reference
VOC	Aviation Gas Unloading/ Tank Filling - tank fill	1081	mg/L AvGas	**31,397.43**	1
	Aviation Gas Unloading/ Tank Filling - Storage tank working	432			
	Aviation Gas Tank Truck Filling - Composite	1235			
	Aviation Gas Storage Tank - Breathing losses	203			
	Aviation Gas - Fugitive from valves	0.26	kg/valve/day		
	Aviation Gas - Fugitive from pumps	2.7	kg/seal/day		

AVIATION GASOLINE DISTRIBUTION: STAGE I (continued)
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Table 4 - HAP Emission Factors and National-Level Emissions

Pollutant	Emission Source	Emission Factor	Emission Factor Units	Emissions (tpy)	Factor Reference
Ethylene Dichloride	All processes	2.167 E-6	lb/gal AvGas	0.30	4
Tetraethyl Lead (TEL)	All processes	9.78 E-6	kg/kg VOC	0.31	1
2,2,4-Trimethylpentane	All processes	0.80	lb/100 lb VOC	251.18	5
Benzene	All processes	0.90		282.58	
Cumene	All processes	0.01		3.14	6
Ethylbenzene	All processes	0.10		31.40	5
Hexane	All processes	1.60		502.36	
Naphthalene	All processes	0.05		15.70	
Toluene	All processes	1.30		408.17	
Xylene	All processes	0.50		156.99	

Example Calculations for Wake County, NC

Wake County VOC emissions = (National VOC emissions) * (PAD 1 consumption/Total consumption) * (Wake County LTOs/PAD 1 LTOs)

Wake County VOC emissions = (31,397.43 tpy) * (1,019,000 bbl/6,682,000 bbl) * (4,387 LTOs/204,000 LTOs)

Wake County VOC emissions = **102.97** tpy

Wake County Benzene Emissions = (Wake County VOC emissions)*(Benzene Emission Factor)

Wake County Benzene Emissions = (102.97 tpy VOC) * (0.90 lb benzene/100 lb VOC)* (2000 lb VOC/2000 lb benzene)

Wake County Benzene Emissions = **0.93** tpy

References

1. TRC Environmental Corporation. *Estimation of Alkylated Lead Emissions, Final Report.* Prepared for U.S. Environmental Protection Agency, Office of Air Quality Planning and Standards. RTP, NC 1993.

2. U.S. Environmental Protection Agency. National Emission Standards for Source Categories: Gasoline Distribution (Stage I). 40 CFR Part 63. Office of Air Quality Planning and Standards. RTP, NC. February 28, 1997. Pages 9087-9093.

3. Energy Information Administration. U.S. Department of Energy. *Petroleum Annual Supply, 2002*. Tables 2, 4, 6, 8, 10, and 12. Department Of Energy. Washington, D.C. August 2003. (Internet address: http://www.eia.doe.gov/oil_gas/petroleum/data_publications/petroleum_supply_annual/psa_volume1/psa_volume1.html)

AVIATION GASOLINE DISTRIBUTION: STAGE I (continued)
SCC: 2501080050

4. U.S. Environmental Protection Agency. *Locating and Estimating Air Emissions from Sources of Ethylene Dichloride*. EPA-450/4-84-007d. RTP, NC. March 1984.

5. Memorandum from Greg LaFlam and Tracy Johnson (PES) to Stephen Shedd (EPA/OAQPS). *Speciated Hazardous Air Pollutants - Baseline Emissions and Emissions Reductions Under the Gasoline Distribution NESHAP*. August 9, 1996.

6. Personal Communication via e-mail from Stephen Shedd (EPA/OAQPS) to Laurel Driver (EPA/OAQPS). E-mail dated May 29, 2002.

8. Federal Aviation Administration (FAA). Air Traffic Activity Data System (ATADS) for General Aviation, Year 2002. FAA. 2003.

9. Energy Information Administration. U.S. Department of Energy. *Petroleum Annual Supply, 2002*. Appendix A. Department Of Energy. Washington, D.C. August 2003. (Internet address: http://www.eia.doe.gov/oil_gas/petroleum/data_publications/petroleum_supply_annual/psa_volume1/psa_volume1.html)

AVIATION GASOLINE DISTRIBUTION: STAGE II
SCC: 2501080100

AvGas is the only aviation fuel that contains TEL as a knock-out component for small reciprocating, piston-engine crafts in civil aviation.[1] Commercial and military aviation rarely use this fuel. AvGas is shipped to airports and is filled into bulk terminals, and then into tanker trucks. These transfer processes fall under the definition of stage I, and are subject to MACT standards for gasoline distribution.[2] Stage II, discussed here, involves the transfer of fuel from the tanker trucks into general aviation aircraft.

The amount of AvGas consumed was retrieved from the Petroleum Supply Annual for designated PADs. A nationwide total of 6,682,000 barrels of AvGas were consumed in 2002[3] (Table 1). This information was used to calculate national-level emissions estimates for one criteria pollutant and ten HAPs. Emission factors were obtained from ESD and the EIG publications[1,4,5,6] (Table 2). The national-level emissions estimates were first allocated based on consumption reported for each PAD, and then allocated to the counties within the PADs based on 2002 LTO data for General aviation flights.[7] Appendix B contains this data in database format. General aviation flights were used in this allocation because they are the primary consumers of AvGas.

There are five PADs across the United States[8] (Figure A-1):
PAD 1 comprises seventeen states plus the District of Columbia along the Atlantic Coast;
PAD 2 comprises fifteen states in the Midwest;
PAD 3 comprises six states in South Central U.S.;
PAD 4 comprises five states in the Rocky Mountains; and
PAD 5 comprises seven states along the West Coast.

Table 1 - Summary of AvGas Consumed and LTOs by PAD in 2002

PAD	AvGas Consumed (barrels)	LTOs
1	1,019,000	204,000
2	2,391,000	186,368
3	1,757,000	138,401
4	399,000	20,625
5	1,116,000	184,271
	6,682,000	733,665

National-Level Calculations

Amount of AvGas consumed in 2002 (barrels) = 6,682,000

Conversion: *1 barrel = 42 gallons*
1 gallon = 3.78 liters
1 kg = 2.205 lb
1 kg = 1,000,000 mg
1 ton = 2000 lb

AVIATION GASOLINE DISTRIBUTION: STAGE II (continued)
SCC: 2501080100

Step 1 - Convert AVGas consumption into gallons and liters using conversion factors.

Amount of AvGas consumed in 2002 (gallons) = 6,682,000 barrels * 42 gallons/barrel
Amount of AvGas consumed in 2002 (gallons) = 280,644,000

Amount of AvGas consumed in 2002 (liters) = 280,644,000 gallons * 3.78 liters/gal
Amount of AvGas consumed in 2002 (liters) = 1,060,834,320

Step 2 - Use the gallons of AvGas consumed and apply the refueling VOC emission factors to first calculate refueling VOC estimates.

AvGas Refueling VOC emissions = (1.36 E-2 LB/gal AvGas) * 280,644,000 gallons * 1 ton/2000 LB
AvGas Refueling VOC emissions = **1,908.38** tpy

Step 3 - Apply the HAP speciation emission factors in Table 2 for 2,2,4-trimethylpentane, benzene, cumene, ethylbenzene, hexane, naphthalene, toluene, and xylene to calculate HAP emissions. The VOC estimate is then speciated to yield the HAP estimate.

2,2,4-Trimethylpentane emissions = 1,908.38 tpy VOC * 0.8 % = 15.27 tpy
Benzene emissions = 1,908.38 tpy VOC * 0.9 % = 17.18 tpy
Cumene emissions = 1,908.38 tpy VOC * 0.01 % = 0.19 tpy
Ethylbenzene emissions = 1,908.38 tpy VOC * 0.10 % = 1.91 tpy
Hexane emissions = 1,908.38 tpy VOC * 1.60 % = 30.53 tpy
Naphthalene emissions = 1,908.38 tpy VOC * 0.05 % = 0.95 tpy
Toluene emissions = 1,908.38 tpy VOC * 1.30 % = 24.81 tpy
Xylene emissions = 1,908.38 tpy VOC * 0.5 % = 9.54 tpy

Step 4 - Use the ethylene dichloride and tetraethyl lead emission factors in Table 2 to calculate ethylene dichloride and tetraethyl lead emissions.

Ethylene dichloride emissions = 280,644,000 gal * 1.883 E-6 LB/gal * ton/2000 LB = 0.26 tpy
Tetraethyl Lead emissions = 1,060,834,320 L * 1.59 E-2 mg/L * 1.1025E-9 ton/mg = 0.019 tpy

Table 2 - Emission Factors and National-Level Emissions

Pollutant	Emission Factor	Emission Factor Units	Emissions (tpy)	Factor Reference
VOC	1.36 E-2	lb/gal AvGas	1,908.38	1
2,2,4-Trimethylpentane	0.80	lb/100 lb VOC	15.27	5
Benzene	0.90		17.18	
Cumene	0.01		0.19	6
Ethylbenzene	0.10		1.91	5
Hexane	1.60		30.53	
Naphthalene	0.05		0.95	
Toluene	1.30		24.81	
Xylene	0.50		9.54	
Ethylene Dichloride	1.883 E-6	lb/gal AvGas	0.26	4
Tetraethyl Lead (TEL)	1.59 E-2	mg/L AvGas	0.019	1

AVIATION GASOLINE DISTRIBUTION: STAGE II (continued)
SCC: 2501080100

Example Calculations for Wake County, NC

Wake County VOC emissions = (National VOC emissions) * (PAD 1 consumption/Total consumption) * (Wake County LTOs/PAD 1 LTOs)

Wake County VOC emissions = (1,908.38 tpy) * (1,019,000 bbl/6,682,000 bbl) * (4,387 LTOs/204,000 LTOs)

Wake County VOC emissions = **6.26** tpy

Wake County Benzene Emissions = (Wake County VOC emissions)*(Benzene Emission Factor)

Wake County Benzene Emissions = (6.26 tpy VOC) * (0.90 lb benzene/100 lb VOC)* (2000 lb VOC/2000 lb benzene)

Wake County Benzene Emissions = **0.056** tpy

References

1. TRC Environmental Corporation. *Estimation of Alkylated Lead Emissions, Final Report.* Prepared for U.S. Environmental Protection Agency, Office of Air Quality Planning and Standards. RTP, NC 1993.

2. U.S. Environmental Protection Agency. National Emission Standards for Source Categories: Gasoline Distribution (Stage I). 40 CFR Part 63. Office of Air Quality Planning and Standards. RTP, NC. February 28, 1997. Pages 9087-9093.

3. Energy Information Administration. U.S. Department of Energy. *Petroleum Annual Supply, 2002*. Tables 2, 4, 6, 8, 10, and 12. Department Of Energy. Washington, D.C. August 2003. (Internet address: http://www.eia.doe.gov/oil_gas/petroleum/data_publications/petroleum_supply_annual/psa_volume1/psa_volume1.html)

4. U.S. Environmental Protection Agency. *Locating and Estimating Air Emissions from Sources of Ethylene Dichloride*. EPA-450/4-84-007d. RTP, NC. March 1984.

5. Memorandum from Greg LaFlam and Tracy Johnson (PES) to Stephen Shedd (EPA/OAQPS). *Speciated Hazardous Air Pollutants - Baseline Emissions and Emissions Reductions Under the Gasoline Distribution NESHAP*. August 9, 1996.

6. Personal Communication via e-mail from Stephen Shedd (EPA/OAQPS) to Laurel Driver (EPA/OAQPS). E-mail dated May 29, 2002.

7. Federal Aviation Administration (FAA). Air Traffic Activity Data System (ATADS) for General Aviation, Year 2002. FAA. 2003.

8. Energy Information Administration. U.S. Department of Energy. *Petroleum Annual Supply, 2002*. Appendix A. Department Of Energy. Washington, D.C. August 2003. (Internet address: http://www.eia.doe.gov/oil_gas/petroleum/data_publications/petroleum_supply_annual/psa_volume1/psa_volume1.html)

COMMERCIAL AND CONSUMER PRODUCTS USAGE - ADHESIVE AND SEALANT PRODUCTS
SCC: 2460600000

Adhesive and Sealant Products is one of seven categories within Commercial and Consumer Products Usage. Criteria pollutant and HAP emission estimates for Adhesive and Sealant Products are assumed to be a function of the U.S. population.[1] EPA developed per capita emission factors for the criteria pollutant VOC and for the 20 HAPs associated with this SCC.[1]

Emission factors used in the 2002 inventory for this SCC are adjusted to reflect the promulgation of a national VOC rule in 1998. The rule calls for a 20% reduction in VOC emissions for certain consumer products.[2] Two consumer products in this SCC are affected by the rule. An adjusted VOC emission factor for this SCC is obtained from the 1999 Nonpoint Source NEI for HAPs.[3] Using this method, both the VOC emission factor and HAP emission factors are reduced by 8.30%.

The adjusted per capita emission factors are multiplied by the 2002 U.S. Census Bureau estimate of the population in each County to obtain the county-level emissions.[4] Appendix B contains population data in database format. Emission estimates include activity in Puerto Rico and the U.S. Virgin Islands.

Table 1. 2002 National Emissions Summary for Adhesive and Sealant Products

Pollutant	Original Emission Factor (lbs per capita)	Emission Factor Reference	Adjustment to Emission Factor	Revised Emission Factor (lbs per capita)	2002 Activity Level Population	2002 National Emissions (tons)
2-NITROPROPANE	2.12E-06	Reference 1	8.30%	1.9400E-06	292,336,314	2.8357E-01
ACRYLIC ACID	3.94E-09	Reference 1	8.30%	3.6100E-09	292,336,314	5.2767E-04
DIBENZOFURAN	8.07E-06	Reference 1	8.30%	7.4000E-06	292,336,314	1.0816E+00
ETHYL BENZENE	1.36E-05	Reference 1	8.30%	1.2500E-05	292,336,314	1.8271E+00
FORMALDEHYDE	2.51E-05	Reference 1	8.30%	2.3000E-05	292,336,314	3.3619E+00
GLYCOL ETHERS	1.28E-04	Reference 1	8.30%	1.1700E-04	292,336,314	1.7102E+01
HEXANE	7.83E-02	Reference 1	8.30%	7.1800E-02	292,336,314	1.0495E+04
METHANOL	6.82E-04	Reference 1	8.30%	6.2500E-04	292,336,314	9.1355E+01
METHYL CHLOROFORM	2.14E-01	Reference 1	8.30%	1.9600E-01	292,336,314	2.8649E+04
METHYL ETHYL KETONE	3.91E-02	Reference 1	8.30%	3.5900E-02	292,336,314	5.2474E+03
METHYL ISOBUTYL KETONE	1.24E-03	Reference 1	8.30%	1.1400E-03	292,336,314	1.6663E+02
METHYLENE CHLORIDE	8.78E-03	Reference 1	8.30%	8.0500E-03	292,336,314	1.1767E+03
N,N-DIMETHYLFORMAMIDE	2.29E-07	Reference 1	8.30%	2.1000E-07	292,336,314	3.0695E-02
NAPHTHALENE	1.07E-04	Reference 1	8.30%	9.8100E-05	292,336,314	1.4339E+01
P-DIOXANE	1.09E-05	Reference 1	8.30%	1.0000E-05	292,336,314	1.4617E+00
TETRACHLOROETHYLENE	6.75E-04	Reference 1	8.30%	6.1900E-04	292,336,314	9.0478E+01
TOLUENE	8.43E-02	Reference 1	8.30%	7.7300E-02	292,336,314	1.1299E+04
TRICHLOROETHYLENE	3.88E-05	Reference 1	8.30%	3.5600E-05	292,336,314	5.2036E+00
VINYL ACETATE	4.94E-08	Reference 1	8.30%	4.5300E-08	292,336,314	6.6214E-03
XYLENES	9.76E-03	Reference 1	8.30%	8.9500E-03	292,336,314	1.3082E+03
VOC	5.66E-01	Reference 1	8.30%	5.2270E-01	292,336,314	7.6402E+04

COMMERCIAL AND CONSUMER PRODUCTS USAGE - ADHESIVE AND SEALANT PRODUCTS (continued)
SCC: 2460600000

Example Calculation: Vinyl Acetate

$$Emissions = \left(1 - \frac{Adjustment}{100}\right) \frac{Per\ Capita\ Emission\ Factor \frac{lb}{person} \times 2002\ Population}{2000\ lb / ton}$$

$$Emissions = \left(1 - \frac{8.03\%}{100}\right) \frac{4.94 \times 10^{-8} \frac{lb}{person} \times 292{,}336{,}314\ people}{2000\ lb / ton} = 6.6214 \times 10^{-3}\ tons$$

References:

1. U.S. Environmental Protection Agency. August 1996. *Emission Inventory Improvement Program: Preferred and Alternative Methods for Estimating Air Emissions.* Volume III, Chapter 5. Research Triangle Park, North Carolina.

2. 63FR48819. National Volatile Organic Compound Emission Standards for Consumer Products. Final Rule. September 11, 1998.

3. U.S. Environmental Protection Agency. "Documentation for the Final 1999 Nonpoint Area Source National Emission Inventory for Hazardous Air Pollutants (Version 3)." Prepared by ERG, Inc. Research Triangle Park, NC. July 9, 2003.

4. U.S. Census Bureau. *7/1/2002 County Population Estimates File and Components of Change*, [Data file], April 17, 2003. Available from Population Estimates Branch Web site http://eire.census.gov/popest/estimates_dataset.php

COMMERCIAL AND CONSUMER PRODUCTS USAGE - AUTOMOTIVE AFTERMARKET PRODUCTS
SCC: 2460400000

Automotive Aftermarket Products is one of seven categories within Commercial and Consumer Products Usage. Criteria pollutant and HAP emission estimates for Automotive Aftermarket Products are assumed to be a function of the U.S. population.[1] EPA developed per capita emission factors for the criteria pollutant VOC and for the eighteen HAPs associated with this SCC.[1]

Emission factors used in the 2002 inventory for this SCC are adjusted to reflect the promulgation of a national VOC rule in 1998. The rule calls for a 20% reduction in VOC emissions for certain consumer products.[2] Four consumer products in this SCC are affected by the rule. An adjusted VOC emission factor for this SCC that reflects the reduction in emissions is obtained from the 1999 Nonpoint Source NEI for HAPs.[3] Using this method, both the VOC emission factor and HAP emission factors are reduced by 8.97 %.

The adjusted per capita emission factors are multiplied by the 2002 U.S. Census Bureau estimate of the population in each County to obtain the county-level emissions.[4] Appendix B contains population data in database format. Emission estimates include activity in Puerto Rico and the U.S. Virgin Islands.

Table 1. 2002 National Emissions Summary for Automotive Aftermarket Products

Pollutant	Original Emission Factor (lbs per capita)	Emission Factor Reference	Adjustment to Emission Factor	Revised Emission Factor (lbs per capita)	2002 Activity Level Population	2002 National Emissions (tons)
BENZENE	4.72E-06	Reference 1	8.97%	4.3000E-06	292,336,314	6.2852E-01
CHLOROFORM	3.60E-05	Reference 1	8.97%	3.2800E-05	292,336,314	4.7943E+00
ETHYL BENZENE	7.51E-05	Reference 1	8.97%	6.8400E-05	292,336,314	9.9979E+00
GLYCOL ETHERS	2.69E-02	Reference 1	8.97%	2.4500E-02	292,336,314	3.5811E+03
HEXANE	3.53E-03	Reference 1	8.97%	3.2100E-03	292,336,314	4.6920E+02
HYDROGEN FLUORIDE	1.41E-05	Reference 1	8.97%	1.2800E-05	292,336,314	1.8710E+00
METHANOL	6.61E-01	Reference 1	8.97%	6.0200E-01	292,336,314	8.7993E+04
METHYL CHLOROFORM	7.63E-02	Reference 1	8.97%	6.9500E-02	292,336,314	1.0159E+04
METHYL ETHYL KETONE	3.04E-03	Reference 1	8.97%	2.7700E-03	292,336,314	4.0489E+02
METHYL ISOBUTYL KETONE	8.73E-04	Reference 1	8.97%	7.9500E-04	292,336,314	1.1620E+02
METHYL TERT-BUTYL ETHER	2.36E-05	Reference 1	8.97%	2.1500E-05	292,336,314	3.1426E+00
METHYLENE CHLORIDE	4.83E-03	Reference 1	8.97%	4.4000E-03	292,336,314	6.4314E+02
N,N-DIMETHYLFORMAMIDE	2.78E-08	Reference 1	8.97%	2.5300E-08	292,336,314	3.6981E-03
NAPHTHALENE	2.26E-06	Reference 1	8.97%	2.0600E-06	292,336,314	3.0111E-01
TETRACHLOROETHYLENE	2.35E-02	Reference 1	8.97%	2.1400E-02	292,336,314	3.1280E+03
TOLUENE	2.49E-02	Reference 1	8.97%	2.2700E-02	292,336,314	3.3180E+03
TRICHLOROETHYLENE	2.67E-04	Reference 1	8.97%	2.4300E-04	292,336,314	3.5519E+01
XYLENES	1.20E-02	Reference 1	8.97%	1.0900E-02	292,336,314	1.5932E+03
VOC	1.35E+00	Reference 1	8.97%	1.2380E+00	292,336,314	1.8096E+05

COMMERCIAL AND CONSUMER PRODUCTS USAGE - AUTOMOTIVE AFTERMARKET PRODUCTS (continued)
SCC: 2460400000

Example Calculation: Toluene

$$Emissions = \left(1 - \frac{Adjustment}{100}\right) \frac{Per\ Capita\ Emission\ Factor \frac{lb}{person} \times 2002\ Population}{2000\ lb/ton}$$

$$Emissions = \left(1 - \frac{8.97\%}{100}\right) \frac{2.49 \times 10^{-2} \frac{lb}{person} \times 292{,}336{,}314\ people}{2000\ lb/ton} = 3.318 \times 10^{3} tons$$

References:

1. U.S. Environmental Protection Agency. August 1996. *Emission Inventory Improvement Program: Preferred and Alternative Methods for Estimating Air Emissions.* Volume III, Chapter 5. Research Triangle Park, North Carolina.

2. 63FR48819. National Volatile Organic Compound Emission Standards for Consumer Products. Final Rule. September 11, 1998.

3. U.S. Environmental Protection Agency. "Documentation for the Final 1999 Nonpoint Area Source National Emission Inventory for Hazardous Air Pollutants (Version 3)." Prepared by ERG, Inc. Research Triangle Park, NC. July 9, 2003.

4. U.S. Census Bureau. *7/1/2002 County Population Estimates File and Components of Change*, [Data file], April 17, 2003. Available from Population Estimates Branch Web site http://eire.census.gov/popest/estimates_dataset.php

COMMERCIAL AND CONSUMER PRODUCTS USAGE - COATINGS AND RELATED PRODUCTS
SCC: 2460500000

Coatings and Related Products is one of seven categories within Commercial and Consumer Products Usage. Criteria pollutant and HAP emission estimates for Coatings and Related Products are assumed to be a function of the U.S. population.[1] EPA developed per capita emission factors for the criteria pollutant VOC and for the nineteen HAPs associated with this SCC.[1]

Emission factors used in the 2002 inventory for Commercial and Consumer Products are adjusted to reflect the promulgation of a national VOC rule in 1998. The rule calls for a 20% reduction in VOC emissions for certain consumer products.[2] No consumer products in this SCC are affected by the rule, therefore, emission factors are not adjusted.

The adjusted per capita emission factors are multiplied by the 2002 U.S. Census Bureau estimate of the population in each County to obtain the county-level emissions.[3] Appendix B contains population data in database format. Emission estimates include activity in Puerto Rico and the U.S. Virgin Islands

Table 1. 2002 National Emissions Summary for Coatings and Related Products

Pollutant	Emission Factor (lbs per capita)	Emission Factor Reference	Adjustment to Emission Factor	2002 Activity Level Population	2002 National Emissions (tons)
ACETOPHENONE	8.53E-06	Reference 1	N/A	292,336,314	1.2468E+00
CARBON TETRACHLORIDE	4.10E-10	Reference 1	N/A	292,336,314	5.9929E-05
CHLOROBENZENE	1.51E-05	Reference 1	N/A	292,336,314	2.2071E+00
CHLOROFORM	9.55E-04	Reference 1	N/A	292,336,314	1.3959E+02
ETHYL BENZENE	6.86E-04	Reference 1	N/A	292,336,314	1.0027E+02
FORMALDEHYDE	8.55E-04	Reference 1	N/A	292,336,314	1.2497E+02
GLYCOL ETHERS	2.24E-03	Reference 1	N/A	292,336,314	3.2742E+02
HEXANE	2.39E-03	Reference 1	N/A	292,336,314	3.4934E+02
METHANOL	1.60E-02	Reference 1	N/A	292,336,314	2.3387E+03
METHYL CHLOROFORM	7.69E-03	Reference 1	N/A	292,336,314	1.1240E+03
METHYL ETHYL KETONE	7.94E-03	Reference 1	N/A	292,336,314	1.1606E+03
METHYL ISOBUTYL KETONE	5.26E-03	Reference 1	N/A	292,336,314	7.6884E+02
METHYLENE CHLORIDE	1.97E-02	Reference 1	N/A	292,336,314	2.8795E+03
NAPHTHALENE	5.75E-06	Reference 1	N/A	292,336,314	8.4047E-01
TETRACHLOROETHYLENE	1.48E-04	Reference 1	N/A	292,336,314	2.1633E+01
TOLUENE	3.16E-01	Reference 1	N/A	292,336,314	4.6189E+04
TRICHLOROETHYLENE	1.37E-04	Reference 1	N/A	292,336,314	2.0025E+01
TRIETHYLAMINE	5.26E-04	Reference 1	N/A	292,336,314	7.6884E+01
XYLENES	4.05E-02	Reference 1	N/A	292,336,314	5.9198E+03
VOC	9.50E-01	Reference 1	N/A	292,336,314	1.3886E+05

COMMERCIAL AND CONSUMER PRODUCTS USAGE - COATINGS AND RELATED PRODUCTS (continued)
SCC: 2460500000

Example Calculation: VOC

$$Emissions = \frac{Per\ Capita\ Emission\ Factor \frac{lb}{person} \times 2002\ Population}{2000\ lb/ton}$$

$$Emissions = \frac{9.5 \times 10^{-1} \frac{lb}{person} \times 292{,}336{,}314\ people}{2000\ lb/ton} = 138{,}860\ tons$$

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References:

1. U.S. Environmental Protection Agency. August 1996. *Emission Inventory Improvement Program: Preferred and Alternative Methods for Estimating Air Emissions.* Volume III, Chapter 5. Research Triangle Park, North Carolina.

2. 63FR48819. National Volatile Organic Compound Emission Standards for Consumer Products. Final Rule. September 11, 1998.

3. U.S. Census Bureau. *7/1/2002 County Population Estimates File and Components of Change*, [Data file], April 17, 2003. Available from Population Estimates Branch Web site http://eire.census.gov/popest/estimates_dataset.php

COMMERCIAL AND CONSUMER PRODUCTS USAGE - FIFRA-REGULATED PRODUCTS
SCC: 2460800000

FIFRA-Regulated Products is one of seven categories within Commercial and Consumer Products Usage. Criteria pollutant and HAP emission estimates for FIFRA-Regulated Products are assumed to be a function of the U.S. population.[1] EPA developed per capita emission factors for the criteria pollutant VOC and for the twenty HAPs associated with this SCC.[1]

Emission factors used in the 2002 inventory for this SCC are adjusted to reflect the promulgation of a national VOC rule in 1998. The rule calls for a 20% reduction in VOC emissions for certain consumer products.[2] Seven consumer products in this SCC are affected by the rule. The emissions for the products affected by the rule are reduced by 20%, and an adjusted VOC emission factor for this SCC was calculated reflecting the impact of the project-level reductions on SCC-level emissions. Using this method, both the VOC emission factor and HAP emission factors are reduced by 5.08% for this SCC.

The adjusted per capita emission factors are multiplied by the 2002 U.S. Census Bureau estimate of the population in each County to obtain the county-level emissions.[3] Appendix B contains population data in database format. Emission estimates include activity in Puerto Rico and the U.S. Virgin Islands.

Table 1. 2002 National Emissions Summary for FIFRA-Regulated Products

Pollutant	Original Emission Factor (lbs per capita)	Emission Factor Reference	Adjustment to Emission Factor	Revised Emission Factor (lbs per capita)	2002 Activity Level Population	2002 National Emissions (tons)
1,3-DICHLOROPROPENE	3.52E-02	Reference 1	5.08%	1.4437E-01	292,336,314	2.1102E+04
1,4-DICHLOROBENZENE	1.60E-01	Reference 1	5.08%	3.1818E-02	292,336,314	4.6508E+03
CHLOROBENZENE	7.16E-02	Reference 1	5.08%	6.4776E-02	292,336,314	9.4682E+03
ETHYL BENZENE	1.30E-03	Reference 1	5.08%	1.1778E-03	292,336,314	1.7216E+02
FORMALDEHYDE	3.81E-04	Reference 1	5.08%	3.4480E-04	292,336,314	5.0399E+01
GLYCOL ETHERS	5.65E-03	Reference 1	5.08%	5.1099E-03	292,336,314	7.4690E+02
ISOPHORONE	9.47E-04	Reference 1	5.08%	8.5670E-04	292,336,314	1.2522E+02
METHANOL	9.48E-04	Reference 1	5.08%	8.5770E-04	292,336,314	1.2537E+02
METHYL BROMIDE	2.22E-01	Reference 1	5.08%	2.0136E-01	292,336,314	2.9432E+04
METHYL CHLOROFORM	5.99E-02	Reference 1	5.08%	5.4234E-02	292,336,314	7.9272E+03
METHYL ETHYL KETONE	2.01E-05	Reference 1	5.08%	1.8200E-05	292,336,314	2.6603E+00
METHYL ISOBUTYL KETONE	9.01E-05	Reference 1	5.08%	8.1600E-05	292,336,314	1.1927E+01
METHYLENE CHLORIDE	6.81E-04	Reference 1	5.08%	6.1640E-04	292,336,314	9.0098E+01
NAPHTHALENE	4.60E-02	Reference 1	5.08%	4.1601E-02	292,336,314	6.0808E+03
TETRACHLOROETHYLENE	1.92E-04	Reference 1	5.08%	1.7380E-04	292,336,314	2.5404E+01
TRIETHYLAMINE	3.13E-04	Reference 1	5.08%	2.8300E-04	292,336,314	4.1366E+01
XYLENES	1.37E-01	Reference 1	5.08%	1.2442E-01	292,336,314	1.8187E+04
VOC	1.78E+00	Reference 1	5.08%	1.6896E+00	292,336,314	2.4696E+05

COMMERCIAL AND CONSUMER PRODUCTS USAGE - FIFRA-REGULATED PRODUCTS (continued)
SCC: 2460800000

Example Calculation: Chlorobenzene

$$Emissions = \left(1 - \frac{Adjustment}{100}\right) \frac{Per\ Capita\ Emission\ Factor \frac{lb}{person} \times 2002\ Population}{2000\ lb / ton}$$

$$Emissions = \left(1 - \frac{5.08\%}{100}\right) \frac{7.16 \times 10^{-3} \frac{lb}{person} \times 292{,}336{,}314\ people}{2000\ lb / ton} = 9.4682 \times 10^{3}\ tons$$

References:

1. U.S. Environmental Protection Agency. August 1996. *Emission Inventory Improvement Program: Preferred and Alternative Methods for Estimating Air Emissions.* Volume III, Chapter 5. Research Triangle Park, North Carolina.

2. 63FR48819. National Volatile Organic Compound Emission Standards for Consumer Products. Final Rule. September 11, 1998.

3. U.S. Census Bureau. *7/1/2002 County Population Estimates File and Components of Change*, [Data file], April 17, 2003. Available from Population Estimates Branch Web site http://eire.census.gov/popest/estimates_dataset.php

COMMERCIAL AND CONSUMER PRODUCTS USAGE - HOUSEHOLD PRODUCTS
SCC: 2460200000

Household Products is one of seven categories within Commercial and Consumer Products Usage. Criteria pollutant and HAP emission estimates for Automotive Aftermarket Products are assumed to be a function of the U.S. population.[1] EPA developed per capita emission factors for the criteria pollutant VOC and for the eighteen HAPs associated with this SCC.[1]

Emission factors used in the 2002 inventory for this SCC are adjusted to reflect the promulgation of a national VOC rule in 1998. The rule calls for a 20% reduction in VOC emissions for certain consumer products.[2] Eighteen consumer products in this SCC are affected by the rule. An adjusted VOC emission factor for this SCC that reflects the reduction in emissions is obtained from the 1999 Nonpoint Source NEI for HAPs.[3] Using this method, both the VOC emission factor and HAP emission factors are reduced by 10.94%.

The adjusted per capita emission factors are multiplied by the 2002 U.S. Census Bureau estimate of the population in each County to obtain the county-level emissions.[4] Appendix B contains population data in database format. Emission estimates include activity in Puerto Rico and the U.S. Virgin Islands.

Table 1. 2002 National Emissions Summary for Household Products

Pollutant	Original Emission Factor (lbs per capita)	Emission Factor Reference	Adjustment to Emission Factor	Revised Emission Factor (lbs per capita)	2002 Activity Level Population	2002 National Emissions (tons)
1,4-DICHLOROBENZENE	4.79E-02	Reference 1	10.94%	4.2660E-02	292,336,314	6.2355E+03
ETHYL BENZENE	2.56E-06	Reference 1	10.94%	2.2799E-06	292,336,314	3.3325E-01
ETHYLENE DICHLORIDE	3.52E-08	Reference 1	10.94%	3.1349E-08	292,336,314	4.5822E-03
FORMALDEHYDE	6.74E-06	Reference 1	10.94%	6.0026E-06	292,336,314	8.7740E-01
GLYCOL ETHERS	5.31E-03	Reference 1	10.94%	4.7291E-03	292,336,314	6.9124E+02
HEXANE	2.09E-03	Reference 1	10.94%	1.8614E-03	292,336,314	2.7207E+02
HYDROCHLORIC ACID	1.75E-06	Reference 1	10.94%	1.5586E-06	292,336,314	2.2781E-01
HYDROGEN FLUORIDE	8.75E-08	Reference 1	10.94%	7.7928E-08	292,336,314	1.1391E-02
METHANOL	6.66E-04	Reference 1	10.94%	5.9314E-04	292,336,314	8.6698E+01
METHYL CHLOROFORM	2.85E-02	Reference 1	10.94%	2.5382E-02	292,336,314	3.7101E+03
METHYL ETHYL KETONE	4.49E-04	Reference 1	10.94%	3.9988E-04	292,336,314	5.8450E+01
METHYL ISOBUTYL KETONE	1.08E-04	Reference 1	10.94%	9.6185E-05	292,336,314	1.4059E+01
METHYLENE CHLORIDE	2.39E-03	Reference 1	10.94%	2.1285E-03	292,336,314	3.1112E+02
NAPHTHALENE	5.52E-07	Reference 1	10.94%	4.9161E-07	292,336,314	7.1858E-02
TETRACHLOROETHYLENE	2.96E-03	Reference 1	10.94%	2.6362E-03	292,336,314	3.8532E+02
TOLUENE	5.82E-04	Reference 1	10.94%	5.1833E-04	292,336,314	7.5763E+01
TRICHLOROETHYLENE	4.34E-05	Reference 1	10.94%	3.8652E-05	292,336,314	5.6497E+00
XYLENES	3.28E-03	Reference 1	10.94%	2.9212E-03	292,336,314	4.2698E+02
VOC	7.81E-01	Reference 1	10.94%	7.0360E-01	292,336,314	1.0284E+05

COMMERCIAL AND CONSUMER PRODUCTS USAGE - HOUSEHOLD PRODUCTS (continued)
SCC: 2460200000

Example Calculation: Napthalene

$$Emissions = \left(1 - \frac{Adjustment}{100}\right) \frac{Per\ Capita\ Emission\ Factor \frac{lb}{person} \times 2002\ Population}{2000\ lb / ton}$$

$$Emissions = \left(1 - \frac{10.94\%}{100}\right) \frac{5.52 \times 10^{-7} \frac{1b}{\text{person}} \times 292{,}336{,}314\ people}{2000\ lb / ton} = 7.1858 \times 10^{-3}\ tons$$

References:

1. U.S. Environmental Protection Agency. August 1996. *Emission Inventory Improvement Program: Preferred and Alternative Methods for Estimating Air Emissions.* Volume III, Chapter 5. Research Triangle Park, North Carolina.

2. 63FR48819. National Volatile Organic Compound Emission Standards for Consumer Products. Final Rule. September 11, 1998.

3. U.S. Environmental Protection Agency. "Documentation for the Final 1999 Nonpoint Area Source National Emission Inventory for Hazardous Air Pollutants (Version 3)." Prepared by ERG, Inc. Research Triangle Park, NC. July 9, 2003.

4. U.S. Census Bureau. *7/1/2002 County Population Estimates File and Components of Change*, [Data file], April 17, 2003. Available from Population Estimates Branch Web site http://eire.census.gov/popest/estimates_dataset.php

COMMERCIAL AND CONSUMER PRODUCTS USAGE - MISCELLANEOUS
SCC: 2460900000

Miscellaneous Products is one of seven categories within Commercial and Consumer Products Usage. Criteria pollutant and HAP emission estimates for Miscellaneous Products are assumed to be a function of the U.S. population.[1] EPA developed per capita emission factors for the criteria pollutant VOC and for the eighteen HAPs associated with this SCC.[1]

Emission factors used in the 2002 inventory for Commercial and Consumer Products are adjusted to reflect the promulgation of a national VOC rule in 1998. The rule calls for a 20% reduction in VOC emissions for certain consumer products.[2] No consumer products in this SCC are affected by the rule, therefore, emission factors are not adjusted.

The adjusted per capita emission factors are multiplied by the 2002 U.S. Census Bureau estimate of the population in each County to obtain the county-level emissions.[3] Appendix B contains population data in database format. Emission estimates include activity in Puerto Rico and the U.S. Virgin Islands.

Table 1. 2002 National Emissions Summary for Miscellaneous Products

Pollutant	Original Emission Factor (lbs per capita)	Emission Factor Reference	Adjustment to Emission Factor	2002 Activity Level Population	2002 National Emissions (tons)
GLYCOL ETHERS	2.42E-04	Reference 1	N/A	292,336,314	3.5373E+01
METHANOL	1.84E-02	Reference 1	N/A	292,336,314	2.6895E+03
METHYL CHLOROFORM	2.46E-04	Reference 1	N/A	292,336,314	3.5957E+01
METHYL ETHYL KETONE	1.01E-05	Reference 1	N/A	292,336,314	1.4763E+00
METHYLENE CHLORIDE	2.38E-05	Reference 1	N/A	292,336,314	3.4788E+00
N,N-DIMETHYLFORMAMIDE	7.43E-06	Reference 1	N/A	292,336,314	1.0860E+00
TETRACHLOROETHYLENE	7.53E-04	Reference 1	N/A	292,336,314	1.1006E+02
TOLUENE	2.46E-06	Reference 1	N/A	292,336,314	3.5957E-01
XYLENES	4.31E-04	Reference 1	N/A	292,336,314	6.2998E+01
VOC	7.00E-02	Reference 1	N/A	292,336,314	1.0232E+04

Example Calculation: Methanol

$$Emissions = \frac{Per\ Capita\ Emission\ Factor \frac{lb}{person} \times 2002\ Population}{2000\ lb/ton}$$

$$Emissions = \frac{1.84 \times 10^{-2} \frac{lb}{person} \times 292{,}336{,}314 people}{2000\ lb/ton} = 2.6895 \times 10^{3}\ tons$$

References:

1. U.S. Environmental Protection Agency. August 1996. *Emission Inventory Improvement Program: Preferred and Alternative Methods for Estimating Air Emissions.* Volume III, Chapter 5. Research Triangle Park, North Carolina.

2. 63FR48819. National Volatile Organic Compound Emission Standards for Consumer Products. Final Rule. September 11, 1998.

3. U.S. Census Bureau. *7/1/2002 County Population Estimates File and Components of Change*, [Data file], April 17, 2003. Available from Population Estimates Branch Web site http://eire.census.gov/popest/estimates_dataset

COMMERCIAL AND CONSUMER PRODUCTS USAGE - PERSONAL CARE PRODUCTS
SCC: 2460100000

Personal Care Products is one of seven categories within Commercial and Consumer Products Usage. Criteria pollutant and HAP emission estimates for Personal Care Products are assumed to be a function of the U.S. population.[1] EPA developed per capita emission factors for the criteria pollutant VOC and for the eight HAPs associated with this SCC.[1]

Emission factors used in the 2002 inventory for this SCC are adjusted to reflect the promulgation of a national VOC rule in 1998. The rule calls for a 20% reduction in VOC emissions for certain consumer products.[2] Eight consumer products in this SCC are affected by the rule. An adjusted VOC emission factor for this SCC that reflects the reduction in emissions is obtained from the 1999 Nonpoint Source NEI for HAPs.[3] Using this method, both the VOC emission factor and HAP emission factors are reduced by 12.11%.

The adjusted per capita emission factors are multiplied by the 2002 U.S. Census Bureau estimate of the population in each County to obtain the county-level emissions.[4] Appendix B contains population data in database format. Emission estimates include activity in Puerto Rico and the U.S. Virgin Islands.

Table 1. 2002 National Emissions Summary for Personal Care Products

Pollutant	Original Emission Factor (lbs per capita)	Emission Factor Reference	Adjustment to Emission Factor	Revised Emission Factor (lbs per capita)	2002 Activity Level Population	National Emissions (tons)
ACETAMIDE	1.38E-07	Reference 1	12.11%	1.2129E-07	292,336,314	1.7728E-02
ETHYLENE DICHLORIDE	4.62E-06	Reference 1	12.11%	4.0605E-06	292,336,314	5.9352E-01
GLYCOL ETHERS	1.52E-05	Reference 1	12.11%	1.3359E-05	292,336,314	1.9527E+00
METHANOL	5.67E-07	Reference 1	12.11%	4.9834E-07	292,336,314	7.2841E-02
METHYL CHLOROFORM	7.45E-04	Reference 1	12.11%	6.5478E-04	292,336,314	9.5708E+01
METHYL ETHYL KETONE	1.75E-05	Reference 1	12.11%	1.5381E-05	292,336,314	2.2482E+00
N,N-DIMETHYLFORMAMIDE	2.71E-05	Reference 1	12.11%	2.3818E-05	292,336,314	3.4815E+00
TOLUENE	3.41E-03	Reference 1	12.11%	2.9970E-03	292,336,314	4.3807E+02
VOC	2.29E+00	Reference 1	12.11%	2.0400E+00	292,336,314	2.9818E+05

Example Calculation: Acetamide

$$Emissions = \left(1 - \frac{Adjustment}{100}\right) \frac{Per\ Capita\ Emission\ Factor \frac{lb}{person} \times 2002\ Population}{2000\ lb/ton}$$

$$Emissions = \left(1 - \frac{12.11\%}{100}\right) \frac{1.38 \times 10^{-7} \frac{\text{lb}}{\text{person}} \times 292{,}336{,}314\ people}{2000\ lb/ton} = 1.7728 \times 10^{-2} tons$$

COMMERCIAL AND CONSUMER PRODUCTS USAGE - PERSONAL CARE PRODUCTS (continued)
SCC: 2460100000

References:

1. U.S. Environmental Protection Agency. August 1996. *Emission Inventory Improvement Program: Preferred and Alternative Methods for Estimating Air Emissions.* Volume III, Chapter 5. Research Triangle Park, North Carolina.

2. 63FR48819. National Volatile Organic Compound Emission Standards for Consumer Products. Final Rule. September 11, 1998.

3. U.S. Environmental Protection Agency. "Documentation for the Final 1999 Nonpoint Area Source National Emission Inventory for Hazardous Air Pollutants (Version 3)." Prepared by ERG, Inc. Research Triangle Park, NC. July 9, 2003.

4. U.S. Census Bureau. *7/1/2002 County Population Estimates File and Components of Change*, [Data file], April 17, 2003. Available from Population Estimates Branch Web site http://eire.census.gov/popest/estimates_dataset.php

COMMERCIAL COOKING
SCCs: 2302002100, 2302002200, 2302003000, 2302003100, & 2302003200

Commercial cooking emissions were estimated for five source categories, which are based on equipment type. The equipment types include: chain-driven (conveyorized) charbroilers (SCC 2302002100), under-fired charbroilers (2302002200), deep-fat fryers (2302003000), flat griddles (2302003100), and clamshell griddles (2302003200). Source categories comprise emissions from all meat types for a particular piece of equipment. The following types of meat are included: hamburger, steak, fish, pork, and chicken. Emissions for deep-fat frying of french fries were also estimated.

With the exception of deep-fat frying of french fries, commercial cooking activity was developed from survey data obtained from a Public Research Institute (PRI) report on charbroiling activity estimation in the State of California.[1] Table 1 presents the average pounds of meat cooked on each type of equipment per week. Tables 2 and 3 provide data from the PRI survey that were also used to construct the activity data. Table 2 presents the percent of restaurants by restaurant type with each cooking equipment type. Table 3 presents the average number of equipment pieces by restaurant type. Weekly commercial cooking activity data for meat were estimated by first multiplying the county number of restaurants in Dun & Bradstreet (D&B) industry classifications that use commercial cooking equipment by the percentage of restaurants with each type of cooking equipment (Table 2).[2] The resulting product is then multiplied by the number average number of equipment pieces by restaurant type (Table 3), and then by the average weekly pounds of meat cooked by equipment type (Table 1). Table 4 presents the D&B restaurant classifications used in this procedure. Commercial cooking activity data for each combination of equipment type and meat type were developed for each of the five restaurant types, and then summed to get county-level pounds of meat cooked on each type of equipment for all restaurants.

The mass of frozen potatoes sold in 2001 (6,736,530 lbs) was obtained from the U.S. Department of Agriculture (USDA).[3] French fries sold by fast food restaurants account for 91 percent (6,130,242 lbs) of frozen potatoes sold; 9,338 lbs of french fries were sold by other restaurant types.[4] County-level activity data for deep fat frying of french fries at fast food restaurants were developed by applying county-to-national proportions to the national amount of french fries sold by these restaurants. These proportions were compiled using the number of fast food restaurants reported by D&B. County-level activity data for deep fat frying of french fries at all other restaurants were estimated by applying similar county-to-national proportions to the 9,338 lbs of french fries sold nationally by these restaurants. The D&B count of the number of these other restaurants was used to calculate these proportions.

The activity data were converted to tons of meat and french fries cooked on each type of equipment by dividing by 2000. The NIF allows only one entry for activity data for each SCC and county combination. Due to this limitation, county-level composite activity data were calculated by first summing the activity to get county-level tons of all food cooked on each type of equipment per week. Tons of food cooked per week were then converted to annual tons by multiplying by 52 weeks/year.

Table 1. Average Weekly Pounds of Meat Cooked by Equipment Type

Type of Meat	Chain-Driven Charbroilers	Underfired Charbroilers	Deep-Fat Fryers	Flat Griddles	Clamshell Griddles
Steak	236	180	181	166	94
Hamburger	798	270	274	362	1314
Poultry, With Skin	147	144	365	88	113
Poultry, Skinless	266	179	208	111	108
Pork	57.6	148	58.6	112	118
Seafood	119	143	159	92.1	632
Other	-	41.5	274	57.5	-

Table 2. Percent of Restaurants with Each Type of Cooking Equipment

Restaurant Category	Chain-Driven Charbroilers	Underfired Charbroilers	Deep-Fat Fryers	Flat Griddles	Clamshell Griddles
Ethnic	3.5	47.5	81.9	62.7	4
Family	10.1	60.9	91.4	82.9	1.4
Fast Food	18.6	30.8	96.8	51.9	14.7
Seafood	0	52.6	100	36.8	10.5
Steak & BBQ	6.9	55.2	82.8	89.7	0

Table 3. Average Number of Equipment Pieces by Restaurant Type[1]

Restaurant Category	Chain-Driven Charbroilers	Underfired Charbroilers	Deep-Fat Fryers	Flat Griddles	Clamshell Griddles
Ethnic	1.62	1.54	1.63	1.88	1.8
Family	1.71	1.29	2.34	2.03	–[1]
Fast Food	1.07	1.58	3.1	1.43	2.09
Seafood	–	1.1	2.47	1.11	1.5
Steak & BBQ	–[2,3]	1.63	2.42	1.35	–

[1] Average number of equipment pieces only for the segment of restaurants estimated as having such equipment.
[2] Not clear why the number of pieces of equipment was not reported for this category.
[3] Steak and BBQ restaurants are not likely to employ chain-driven charbroilers.

Table 4. Dun & Bradstreet Restaurant Classifications

Restaurant Type	Dun & Bradstreet Code
Ethnic food	5812-01
Fast food	5812-03
Family	5812-05
Seafood	5812-07
Steak & Barbecue	5812-08

To develop emissions (in lb/year), the mass of meat and french fries cooked on each equipment type was multiplied by an appropriate emission factor. Emissions were then divided by 1ton/2000 lb to convert the emissions to ton/year. Commercial cooking criteria air pollutant and HAP emission factors can be found in the EPA report *Methods for Developing a National Emission Inventory for Commercial Cooking Processes: Technical Memorandum*.[5] The emission factors are expressed in lb/ton and g/kg, and are by equipment and food type. The NIF allows only one emission factor for each SCC and pollutant combination. Due to this limitation, weighted composite emission factors, in lb/ton, were calculated by dividing emissions by the mass of meat and french fries cooked, multiplying by 2000 lb/ton; and then incorporated into the NIF.

COMMERCIAL COOKING (continued)
SCCs: 2302002100, 2302002200, 2302003000, 2302003100, & 2302003200

The only known area with controls in place for commercial charbroiling is the South Coast Air Quality Management District (SCAQMD) in California. Controls consistent with the requirements of Rule 1138 currently only affect chain-driven charbroilers.[6] A control efficiency (CE) of 86% was applied for VOC and a CE of 83% was applied for PM10-PRI and PM2.5-PRI to uncontrolled chain-driven charbroiler emissions in the following SCAQMD counties: Los Angeles, Orange, Riverside, and San Bernardino. The CE that was used to estimate controlled VOC emissions or the CE used to estimate controlled PM10-PRI and PM2.5-PRI emissions was applied to the uncontrolled HAP emissions in these counties. Controlled emissions of volatile organic HAP species were estimated by using the VOC CE, while those associated with PM10-PRI and PM2.5-PRI were estimated using the PM10-PRI CE. Table 5 lists each HAP and the CE assumption that was used to estimate controlled HAP emissions. Rule effectiveness for the four controlled counties was set to 100%. Los Angeles and Orange counties are assumed to have 100% rule penetration. San Bernardino and Riverside counties were assumed to have 80% rule penetration, since about 80% of the population of these counties resides within the SCAQMD.

Table 5. HAP Pollutants and CE

Pollutant	Pollutant Code	CE Used	Pollutant	Pollutant Code	CE Used
4-Nitrophenol	100027	PM_{10}	Fluorene	86737	PM_{10}
Acenaphthene	83329	PM_{10}	Formaldehyde	50000	VOC
Acenaphthylene	208968	PM_{10}	Indeno[1,2,3-c,d]Pyrene	193395	PM_{10}
Acetaldehyde	75070	VOC	m,p-xylenes	1330207	VOC
Acetophenone	98862	VOC	Naphthalene	91203	VOC
Anthracene	120127	PM_{10}	o-Cresol	95487	VOC
Benz[a]Anthracene	56553	PM_{10}	o-Xylene	95476	VOC
Benzene	71432	VOC	p-Cresol	106445	VOC
Benzo[a]Pyrene	50328	PM_{10}	Phenanthrene	85018	PM_{10}
Benzo[g,h,i,]Perylene	191242	PM_{10}	Phenol	108952	VOC
Biphenyl	92524	PM_{10}	Propionaldehyde	123386	VOC
Dibutyl Phthalate	84742	PM_{10}	Pyrene	129000	PM_{10}
Ethyl Benzene	100414	VOC	Styrene	100425	VOC
Ethylene Dichloride	107062	VOC	Toluene	108883	VOC
Fluoranthene	206440	PM_{10}	Total PAH	234	PM_{10}

Table 6 summarizes the national CAP and HAP composite emission factors, annual activity, and emissions by SCC and pollutant

Table 6. National Emissions Summary

SCC	Cooking Device	Pollutant	Composite Emission Factor (lb/ton)	Emission Factor Reference	Annual Activity (ton)	National Emissions (tons)
2302002100	Conveyorized Charbroiling	VOC	4.002084	See footnote a	1,107,492	2,116.1
2302002100	Conveyorized Charbroiling	CO	13.364824	See footnote a	1,107,492	7,400.7
2302002100	Conveyorized Charbroiling	PM10-PRI	15.996058	See footnote a	1,107,492	8,857.7
2302002100	Conveyorized Charbroiling	PM25-PRI	15.506208	See footnote a	1,107,492	8,586.6
2302002100	Conveyorized Charbroiling	4-NITROPHENOL	0.003826	See footnote a	1,107,492	2.1
2302002100	Conveyorized Charbroiling	ACENAPHTHENE	0.000415	See footnote a	1,107,492	0.2
2302002100	Conveyorized Charbroiling	ACENAPHTHYLENE	0.007423	See footnote a	1,107,492	4.1
2302002100	Conveyorized Charbroiling	ACETALDEHYDE	0.163475	See footnote a	1,107,492	90.5
2302002100	Conveyorized Charbroiling	ACETOPHENONE	0.001409	See footnote a	1,107,492	0.8
2302002100	Conveyorized Charbroiling	ANTHRACENE	0.001669	See footnote a	1,107,492	0.9
2302002100	Conveyorized Charbroiling	BENZ[A]ANTHRACENE	0.000477	See footnote a	1,107,492	0.3
2302002100	Conveyorized Charbroiling	BENZENE	0.292169	See footnote a	1,107,492	161.8
2302002100	Conveyorized Charbroiling	BENZO[A]PYRENE	0.000275	See footnote a	1,107,492	0.2
2302002100	Conveyorized Charbroiling	BENZO[G,H,I,]PERYLENE	0.000256	See footnote a	1,107,492	0.1
2302002100	Conveyorized Charbroiling	BIPHENYL	0.003623	See footnote a	1,107,492	2.0
2302002100	Conveyorized Charbroiling	DIBUTYL PHTHALATE	0.001113	See footnote a	1,107,492	0.6
2302002100	Conveyorized Charbroiling	ETHYL BENZENE	0.023188	See footnote a	1,107,492	12.8
2302002100	Conveyorized Charbroiling	ETHYLENE DICHLORIDE	0.008116	See footnote a	1,107,492	4.5
2302002100	Conveyorized Charbroiling	FLUORANTHENE	0.001863	See footnote a	1,107,492	1.0
2302002100	Conveyorized Charbroiling	FLUORENE	0.001806	See footnote a	1,107,492	1.0
2302002100	Conveyorized Charbroiling	FORMALDEHYDE	0.227822	See footnote a	1,107,492	126.2
2302002100	Conveyorized Charbroiling	INDENO[1,2,3-C,D]PYRENE	0.000162	See footnote a	1,107,492	0.1
2302002100	Conveyorized Charbroiling	NAPHTHALENE	0.034368	See footnote a	1,107,492	19.0
2302002100	Conveyorized Charbroiling	O-CRESOL	0.000974	See footnote a	1,107,492	0.5
2302002100	Conveyorized Charbroiling	O-XYLENE	0.019130	See footnote a	1,107,492	10.6
2302002100	Conveyorized Charbroiling	PAH, TOTAL	0.081077	See footnote a	1,107,492	44.9
2302002100	Conveyorized Charbroiling	P-CRESOL	0.001988	See footnote a	1,107,492	1.1
2302002100	Conveyorized Charbroiling	PHENANTHRENE	0.008221	See footnote a	1,107,492	4.6
2302002100	Conveyorized Charbroiling	PHENOL	0.013333	See footnote a	1,107,492	7.4
2302002100	Conveyorized Charbroiling	PROPIONALDEHYDE	0.044057	See footnote a	1,107,492	24.4
2302002100	Conveyorized Charbroiling	PYRENE	0.002508	See footnote a	1,107,492	1.4
2302002100	Conveyorized Charbroiling	STYRENE	0.110143	See footnote a	1,107,492	61.0
2302002100	Conveyorized Charbroiling	TOLUENE	0.115940	See footnote a	1,107,492	64.2
2302002100	Conveyorized Charbroiling	XYLENES	0.016232	See footnote a	1,107,492	9.0
2302002200	Under-fired Charbroiling	VOC	3.918318	See footnote a	3,692,145	7,233.5
2302002200	Under-fired Charbroiling	CO	12.817540	See footnote a	3,692,145	23,662.1
2302002200	Under-fired Charbroiling	PM10-PRI	32.666124	See footnote a	3,692,145	60,304.0
2302002200	Under-fired Charbroiling	PM25-PRI	31.577929	See footnote a	3,692,145	58,295.1
2302002200	Under-fired Charbroiling	4-NITROPHENOL	0.005624	See footnote a	3,692,145	10.4
2302002200	Under-fired Charbroiling	ACENAPHTHENE	0.000219	See footnote a	3,692,145	0.4
2302002200	Under-fired Charbroiling	ACENAPHTHYLENE	0.005542	See footnote a	3,692,145	10.2
2302002200	Under-fired Charbroiling	ACETALDEHYDE	0.340875	See footnote a	3,692,145	629.3
2302002200	Under-fired Charbroiling	ACETOPHENONE	0.002804	See footnote a	3,692,145	5.2
2302002200	Under-fired Charbroiling	ANTHRACENE	0.001622	See footnote a	3,692,145	3.0
2302002200	Under-fired Charbroiling	BENZ[A]ANTHRACENE	0.000441	See footnote a	3,692,145	0.8
2302002200	Under-fired Charbroiling	BENZENE	0.586544	See footnote a	3,692,145	1,082.8
2302002200	Under-fired Charbroiling	BENZO[A]PYRENE	0.000187	See footnote a	3,692,145	0.3
2302002200	Under-fired Charbroiling	BENZO[G,H,I,]PERYLENE	0.000196	See footnote a	3,692,145	0.4
2302002200	Under-fired Charbroiling	BIPHENYL	0.002233	See footnote a	3,692,145	4.1

Table 6. National Emissions Summary (continued)

SCC	Cooking Device	Pollutant	Composite Emission Factor (lb/ton)	Emission Factor Reference	Annual Activity (ton)	National Emissions (tons)
2302002200	Under-fired Charbroiling	DIBUTYL PHTHALATE	0.002049	See footnote a	3,692,145	3.8
2302002200	Under-fired Charbroiling	ETHYL BENZENE	0.044503	See footnote a	3,692,145	82.2
2302002200	Under-fired Charbroiling	ETHYLENE DICHLORIDE	0.018742	See footnote a	3,692,145	34.6
2302002200	Under-fired Charbroiling	FLUORANTHENE	0.002287	See footnote a	3,692,145	4.2
2302002200	Under-fired Charbroiling	FLUORENE	0.001698	See footnote a	3,692,145	3.1
2302002200	Under-fired Charbroiling	FORMALDEHYDE	0.469920	See footnote a	3,692,145	867.5
2302002200	Under-fired Charbroiling	INDENO[1,2,3-C,D]PYRENE	0.000115	See footnote a	3,692,145	0.2
2302002200	Under-fired Charbroiling	NAPHTHALENE	0.022748	See footnote a	3,692,145	42.0
2302002200	Under-fired Charbroiling	O-CRESOL	0.001799	See footnote a	3,692,145	3.3
2302002200	Under-fired Charbroiling	O-XYLENE	0.037336	See footnote a	3,692,145	68.9
2302002200	Under-fired Charbroiling	PAH, TOTAL	0.066015	See footnote a	3,692,145	121.9
2302002200	Under-fired Charbroiling	P-CRESOL	0.003632	See footnote a	3,692,145	6.7
2302002200	Under-fired Charbroiling	PHENANTHRENE	0.007460	See footnote a	3,692,145	13.8
2302002200	Under-fired Charbroiling	PHENOL	0.026010	See footnote a	3,692,145	48.0
2302002200	Under-fired Charbroiling	PROPIONALDEHYDE	0.092009	See footnote a	3,692,145	169.9
2302002200	Under-fired Charbroiling	PYRENE	0.003087	See footnote a	3,692,145	5.7
2302002200	Under-fired Charbroiling	STYRENE	0.222409	See footnote a	3,692,145	410.6
2302002200	Under-fired Charbroiling	TOLUENE	0.232132	See footnote a	3,692,145	428.5
2302002200	Under-fired Charbroiling	XYLENES	0.033076	See footnote a	3,692,145	61.1
2302003000	Deep Fat Frying	VOC	0.129029	See footnote a	18,180,911	1,172.9
2302003100	Flat Griddle Frying	VOC	0.355080	See footnote a	5,294,678	940.0
2302003100	Flat Griddle Frying	CO	0.733239	See footnote a	5,294,678	1,941.1
2302003100	Flat Griddle Frying	PM10-PRI	5.922517	See footnote a	5,294,678	15,678.9
2302003100	Flat Griddle Frying	PM25-PRI	4.501113	See footnote a	5,294,678	11,916.0
2302003100	Flat Griddle Frying	ACENAPHTHENE	0.000055	See footnote a	5,294,678	0.1
2302003100	Flat Griddle Frying	ACENAPHTHYLENE	0.000271	See footnote a	5,294,678	0.7
2302003100	Flat Griddle Frying	ANTHRACENE	0.000478	See footnote a	5,294,678	1.3
2302003100	Flat Griddle Frying	BENZ[A]ANTHRACENE	0.000158	See footnote a	5,294,678	0.4
2302003100	Flat Griddle Frying	BENZO[A]PYRENE	0.000030	See footnote a	5,294,678	0.1
2302003100	Flat Griddle Frying	BIPHENYL	0.000153	See footnote a	5,294,678	0.4
2302003100	Flat Griddle Frying	FLUORANTHENE	0.001409	See footnote a	5,294,678	3.7
2302003100	Flat Griddle Frying	FLUORENE	0.000362	See footnote a	5,294,678	1.0
2302003100	Flat Griddle Frying	NAPHTHALENE	0.007855	See footnote a	5,294,678	20.8
2302003100	Flat Griddle Frying	PAH, TOTAL	0.015412	See footnote a	5,294,678	40.8
2302003100	Flat Griddle Frying	PHENANTHRENE	0.003628	See footnote a	5,294,678	9.6
2302003100	Flat Griddle Frying	PYRENE	0.001878	See footnote a	5,294,678	5.0
2302003200	Clamshell Griddle Frying	VOC	0.036472	See footnote a	2,132,336	38.9
2302003200	Clamshell Griddle Frying	PM10-PRI	1.006137	See footnote a	2,132,336	1,072.7
2302003200	Clamshell Griddle Frying	PM25-PRI	0.852257	See footnote a	2,132,336	908.6

a - Composite emission factor developed by dividing national emissions by the national mass of meat and french fries cooked, then multiplying by 2000 lb/ton. Emission factors that were used to estimate national emissions are in Tables 1A, 2A, 1B, and 2B of the EPA document *Methods for Developing a National Emission Inventory for Commercial Cooking Processes: Technical Memorandum* (Reference 5).

COMMERCIAL COOKING (continued)
SCCs: 2302002100, 2302002200, 2302003000, 2302003100, & 2302003200

Sample Calculations

The following sample calculations illustrate how activity data (pounds of meat) were estimated for SCC 2302002200 (Under-fired Charbroiling) for one county. The facility counts for each type of restaurant in the county were used with the survey data in the above tables to estimate activity. The steps in this process are:

Step 1. Multiply county-level facility counts by the fraction of each restaurant type with each type of cooking equipment:

$$N_{ethnic} * f_{ethnic,\ ufc} = N_{ethnic,\ ufc}$$

where: N_{ethnic} = Number of ethnic food restaurants in county;
$f_{ethnic,\ ufc}$ = fraction of ethnic food rest. with under-fired charbroilers; and
$N_{ethnic,\ ufc}$ = Number of ethnic food rest. with under-fired charbroilers.

538 restaurants x 0.475 = 256 ethnic food rest. with under-fired charbroilers

Step 2. Multiply number of restaurants with each type of cooking equipment by number of pieces of equipment:

$$N_{ethnic,\ ufc} * e_{ethnic,\ ufc} = E_{ethnic,\ ufc}$$

where: $N_{ethnic,\ ufc}$ = Number of ethnic food rest. with under-fired charbroilers;
$e_{ethnic,\ ufc}$ = Number of under-fired charbroilers at ethnic food restaurants with at least one under-fired charbroiler;
$E_{ethnic,\ ufc}$ = Total number of under-fired charbroilers at ethnic food restaurants.

256 ethnic food rest. with under-fired charbroilers * 1.54 *under-fired charbroilers*
= 394 under-fired charbroilers *at ethnic food restaurants*

Step 3. Sum number of pieces of cooking equipment across restaurant types:

$$E_{ethnic,ufc} + E_{family,ufc} + E_{fast,ufc} + E_{seafood,ufc} + E_{S\&B,ufc} = E_{all,ufc}$$

where: $E_{ethnic,ufc}$ = Total number of under-fired charbroilers at ethnic food restaurants;
$E_{family,ufc}$ = Total number of under-fired charbroilers at family restaurants;
$E_{fast,ufc}$ = Total number of under-fired charbroilers at fast food restaurants;
$E_{seafood,ufc}$ = Total number of under-fired charbroilers at seafood restaurants;
$E_{S\&B,ufc}$ = Total number of under-fired charbroilers at steak & barbecue restaurants; and
$E_{all,ufc}$ = Total number of under-fired charbroilers at all restaurants.

394 ethnic + 238 family + 62 fast food + 14 seafood + 32 steak & barbecue
= 737 under-fired charbroilers at all restaurants

COMMERCIAL COOKING (continued)
SCCs: 2302002100, 2302002200, 2302003000, 2302003100, & 2302003200

Step 4. Multiply total number of under-fired charbroilers by average pounds of meat cooked on each type of equipment per week:

$$E_{all,ufc} * m_{steak,ufc} = M_{steak,ufc}$$

where: $E_{all,ufc}$ = Total number of under-fired charbroilers at all restaurants
$m_{steak,ufc}$ = Average pounds per week of steak cooked on one under-fired charbroiler
$M_{steak,ufc}$ = Total pounds per week of steak cooked on all under-fired charbroilers in the county

(737 under-fired charbroilers x 180.06 lbs/week) / (2000 lbs/ton)
= 66.4 tons of steak per week

Step 5. The mass of meat was then multiplied by the appropriate emission factor to estimate annual emissions.

$$M_{steak,ufc} * EF_{steak,ufc} = \mathrm{EM}_{steak,ufc}$$

where: $M_{steak,ufc}$ = Total tons per week of steak cooked on all under-fired charbroilers in the county
$EF_{steak,ufc}$ = VOC emission factor for steak cooked on all under-fired charbroilers
$\mathrm{EM}_{steak,ufc}$ = Annual VOC emissions from steak cooked on all under-fired charbroilers in the county

*(66.4 tons of steak per week x 0.86 lb/ton) * (52 weeks/year) / (2000 lb/ton)*
= 1.48 tons of VOC emitted per year

References

1. Public Research Institute, *Charbroiling Activity Estimation, Draft Report*, prepared for California Environmental Protection Agency, California Air Resources Board, March 2003.

2. Dun & Bradstreet, *MarketPlace* CD-ROM, Jan-Mar, 2002.

3. U.S. Department of Agriculture, "U.S. Pack of Frozen Potato Products," American Frozen Food Institute, 2001.

4. G. Lucier, U.S. Department of Agriculture, personal communication with P. Hemmer, E.H. Pechan & Associates, Inc., May 2003.

5. U.S. Environmental Protection Agency, Office of Air Quality Planning and Standards, *Methods for Developing a National Emission Inventory for Commercial Cooking Processes: Technical Memorandum*, prepared by E.H. Pechan & Associates, Inc., Research Triangle Park, NC. September 2003.

6. South Coast Air Quality Management District (SCAQMD), Perryman, Pamela and Peter Votlucka, "Staff Report for Proposed Rule 1138 - Control of Emissions from Restaurant Operations," October 10, 1997.

COMMERCIAL/INSTITUTIONAL FUEL COMBUSTION: ANTHRACITE AND BITUMINOUS COAL
SCCs: 2103001000 and 2103002000

The mass of coal consumed by commercial/institutional combustion in the U.S. was used to estimate emissions. Coal consumption by energy use sector is presented in State Energy Data 2001 Consumption tables published by the Energy Information Administration (EIA).[1] Year 2001 consumption data were used to estimate 2002 emissions because year 2001 data were the latest data available when this inventory was prepared during November 2004.

EIA data do not distinguish between anthracite and bituminous coal consumption estimates. The EIA table "Domestic and Foreign Distribution of U.S. Coal by State of Origin, 2001," provides state-level residential and commercial coal distribution data for 2001 that was used to estimate anthracite and bituminous coal consumption.[2] The residential and commercial sectors were combined in the EIA table. The 2001 ratio of anthracite (and bituminous) coal consumption to total coal consumption was used to distribute the EIA's total commercial/institutional sector coal consumption data by coal type. Table 1 presents the 2001 anthracite and bituminous coal ratios for each state.

Table 1. 2001 Anthracite and Bituminous Coal Distribution for the Residential and Commercial Sectors

State	Ratio of Bituminous	Ratio of Anthracite	State	Ratio of Bituminous	Ratio of Anthracite
Alaska	1	0	Montana	1	0
Alabama	1	0	North Carolina	1	0
Arkansas	0	0	North Dakota	1	0
Arizona	1	0	Nebraska	1	0
California	0	0	New Hampshire	0	1
Colorado	0.976	0.024	New Jersey	0	1
Connecticut	0	1	New Mexico	1	0
District of Columbia	1	0	Nevada	1	0
Delaware	0	1	New York	0.667	0.333
Florida	1	0	Ohio	0.978	0.022
Georgia	1	0	Oklahoma	1	0
Hawaii	0	0	Oregon	0	0
Iowa	1	0	Pennsylvania	0.424	0.576
Idaho	1	0	Rhode Island	0	1
Illinois	1	0	South Carolina	0	0
Indiana	0.964	0.036	South Dakota	1	0
Kansas	0	0	Tennessee	1	0
Kentucky	1	0	Texas	1	0
Louisiana	0	0	Utah	1	0
Massachusetts	0.375	0.625	Virginia	1	0
Maryland	0.974	0.026	Vermont	0	1
Maine	0	1	Washington	1	0
Michigan	0.889	0.111	Wisconsin	1	0
Minnesota	1	0	West Virginia	0.979	0.021
Missouri	1	0	Wyoming	1	0
Mississippi	0	0			

COMMERCIAL/INSTITUTIONAL FUEL COMBUSTION: ANTHRACITE AND BITUMINOUS COAL (continued)

SCCs: 2103001000 and 2103002000

State-level coal consumption was allocated to each county using *County Business Patterns* employment data for 2001 for NAICS codes 42, 44-45, 51-54, 56, 61-62, 71-72, and 81.[3] State coal consumption was allocated to each county using the ratio of the number of commercial/institutional sector employees in each county to the total number of commercial/institutional sector employees in the state. Year 2001 employment data were used to estimate 2002 emissions because year 2001 data were the latest data available when this inventory was prepared during November 2004. Refer to Appendices B and C for more details on this allocation.

In some cases (see Table 2 below), SO_2, PM_{10}, and $PM_{2.5}$ emission factors required information on the sulfur and/or ash content of the coal burned. State-specific sulfur and ash content of anthracite and bituminous coal was obtained from data compiled in preparing the 1999 residential coal combustion emissions inventory estimates.[4] This study mostly relied on data obtained from USGS COALQUAL database. States not included in the database but that reported coal usage were assigned values based on their proximity to coal seams or using an average value for Pennsylvania (see report for details of the analysis). Table 3 presents the bituminous coal sulfur and ash content values used for each state. For anthracite coal, an ash content value of 13.38 and a sulfur content of 0.89 were applied to all states except New Mexico (ash content 16.61%, sulfur content 0.77%), Washington (ash content 12%, sulfur content 0.9%), and Virginia (ash content 13.38%, sulfur content 0.43%).

Table 2. SO_2 and PM Emission Factors for Commercial/Institutional Anthracite and Bituminous Coal Combustion

Pollutant	Emission Factor (lb/ton)	AP-42 Table
Anthracite Emission Factors (SCC 2103001000)		
PM-CON	0.08	1.2-3
PM10-FIL	1.1 * % Ash	1.2-4
PM25-FIL	0.48 * % Ash	1.2-4
PM10-PRI	1.1 * % Ash + 0.08	1.2-3 and 1.2-4
PM25-PRI	0.48 * % Ash + 0.08	1.2-3 and 1.2-4
Sulfur Dioxide	39 * % Sulfur	1.2-1
Bituminous Emission Factors (SCC 2103002000)		
PM-CON	1.04	1.1-5
PM10-FIL	12	1.1-9
PM25-FIL	1.4	1.1-9
PM10-PRI	13.04	1.1-5 and 1.1-9
PM25-PRI	2.44	1.1-5 and 1.1-9
Sulfur Dioxide	38 * % Sulfur	1.1-3

Note: PM_{10}, $PM_{2.5}$, and condensible PM emission factors for bituminous coal do not require ash content, nor does the condensible PM emission factor for anthracite coal.

COMMERCIAL/INSTITUTIONAL FUEL COMBUSTION: ANTHRACITE AND BITUMINOUS COAL (continued)
SCCs: 2103001000 and 2103002000

Table 3. State-Specific Sulfur Content for Bituminous Coal (SCC 2103002000)

State	Percent Sulfur Content	State	Percent Sulfur Content
Alabama	2.08	Montana	0.60
Alaska	0.31	Nebraska	2.43
Arizona	0.47	Nevada	2.30
Arkansas	1.20	New Hampshire	2.42
California	0.47	New Jersey	2.42
Colorado	0.61	New Mexico	0.75
Connecticut	2.42	New York	2.42
Delaware	1.67	North Carolina	1.62
District of Columbia	1.67	North Dakota	0.97
Florida	1.28	Ohio	3.45
Georgia	1.28	Oklahoma	3.08
Hawaii	1.00	Oregon	0.50
Idaho	0.31	Pennsylvania	2.42
Illinois	3.48	Rhode Island	2.42
Indiana	2.49	South Carolina	1.28
Iowa	4.64	South Dakota	0.97
Kansas	5.83	Tennessee	1.62
Kentucky	1.93	Texas	1.14
Louisiana	0.86	Utah	0.80
Maine	2.42	Vermont	2.42
Maryland	1.67	Virginia	1.19
Massachusetts	2.42	Washington	0.50
Michigan	1.20	West Virginia	1.25
Minnesota	0.97	Wisconsin	1.00
Mississippi	1.24	Wyoming	0.87
Missouri	3.39		

PM10-FIL/PRI and PM25-FIL/PRI emission factors for Commercial/Institutional Anthracite Coal are based on boilers controlled by multiple cyclones and multiple cyclone with fly ash reinjection. CE records were added to the NEI using the primary device type codes 121 (multiple cyclones) and 077 (multiple cyclone with fly ash reinjection). Due to a lack of control efficiency data, the control efficiency fields were left blank in the NEI.

PM10-FIL/PRI and PM25-FIL/PRI emission factors for Commercial/Institutional Bituminous Coal are based on boilers controlled by multiple cyclone with fly ash reinjection. CE records were added to the NEI using the primary device type code 077 (multiple cyclone with fly ash reinjection). Due to a lack of control efficiency data, the control efficiency fields were left blank in the NEI.

The criteria air pollutant and HAP emissions were calculated by multiplying the total coal consumed in each county per year by an emission factor. All emission factors, except for Ammonia, are from AP-42.[5] Ammonia emission factors are from EPA's *Estimating Ammonia Emissions from Anthropogenic Sources, Draft Report*.[6] Table 4 presents a summary of the emission factors, total weight (nationally) of coal burned and the national emissions from commercial/institutional anthracite coal combustion (SCC 2103001000). Table 5 presents a summary of the emission factors, total weight (nationally) of coal burned and the national emissions from commercial/institutional bituminous coal combustion (SCC 2103002000). For Puerto Rico and the U.S. Virgin Islands, commercial/institutional coal combustion emissions were estimated but the emissions are not included in Tables 4 and 5 (see section 2.5 of this report for the methodology used to estimate emissions).

COMMERCIAL/INSTITUTIONAL FUEL COMBUSTION: ANTHRACITE AND BITUMINOUS COAL (continued)
SCCs: 2103001000 and 2103002000

Table 4. National Criteria and HAP Emissions Summary for Commercial/Institutional Anthracite Coal Combustion (SCC 2103001000): Not Adjusted for Point Source Fuel Consumption

Pollutant	Emission Factor (lb/ton)	Emission Factor Reference	National Throughput (tons)	National Emissions (tons/year)
Ammonia	0.030	Reference 6		
Arsenic	0.00019	Reference 5 (Table 1.2-7)	484,759.41	4.61E-02
Beryllium	0.00031	Reference 5 (Table 1.2-7)	484,759.41	7.51E-02
Biphenyl	0.025	Reference 5 (Table 1.2-5)	484,759.41	6.06E+00
Cadmium	7.10e-05	Reference 5 (Table 1.2-7)	484,759.41	1.72E-02
Carbon Monoxide	0.6	Reference 5 (Table 1.2-2)	484,759.41	1.45E+02
Chromium	0.028	Reference 5 (Table 1.2-7)	484,759.41	6.79E+00
Lead	0.0089	Reference 5 (Table 1.2-3)	484,759.41	2.16E+00
Manganese	0.0036	Reference 5 (Table 1.2-7)	484,759.41	8.73E-01
Mercury	0.00013	Reference 5 (Table 1.2-7)	484,759.41	3.15E-02
Naphthalene	0.13	Reference 5 (Table 1.2-5)	484,759.41	3.15E+01
Nickel	0.026	Reference 5 (Table 1.2-7)	484,759.41	6.30E+00
Nitrogen Oxides	9	Reference 5 (Table 1.2-1)	484,759.41	2.18E+03
Phenanthrene	0.0068	Reference 5 (Table 1.2-5)	484,759.41	1.65E+00
PM-CON	0.08	Reference 5 (Table 1.2-3)	484,759.41	1.94E+01
PM10-FIL	1.1*state-specific % ash content	Reference 5 (Table 1.2-4)	484,759.41	3.57E+03
PM25-FIL	0.48*state-specific % ash content	Reference 5 (Table 1.2-4)	484,759.41	1.56E+03
PM10-PRI	1.1*state-specific % ash content + 0.08	Reference 5 (Tables 1.2-3 and 1.2-4)	484,759.41	3.59E+03
PM25-PRI	0.48*state-specific % ash content + 0.08	Reference 5 (Tables 1.2-3 and 1.2-4)	484,759.41	1.58E+03
Selenium	0.0013	Reference 5 (Table 1.2-7)	484,759.41	3.15E-01
Sulfur Dioxide	39*state-specific % sulfur content	Reference 5 (Table 1.2-1)	484,759.41	8.41E+03
Volatile Organic Compounds	0.3	Reference 5 (Table 1.2-6)	484,759.41	7.27E+01

COMMERCIAL/INSTITUTIONAL FUEL COMBUSTION: ANTHRACITE AND BITUMINOUS COAL (continued)
SCCs: 2103001000 and 2103002000

Table 5. National Criteria and HAP Emissions Summary for Commercial/Institutional Bituminous Coal Combustion (SCC 2103002000): Not Adjusted for Point Source Fuel Consumption

Pollutant	Emission Factor (lb/ton)	Emission Factor Reference	National Throughput (tons)	National Emissions (tons/year)
Ammonia	0.030	Reference 6		
Arsenic	0.010478	Reference 5 (Table 1.1-17)	3,403,989.62	1.78E+01
Cadmium	0.000832	Reference 5 (Table 1.1-17)	3,403,989.62	1.42E+00
Carbon Monoxide	5	Reference 5 (Table 1.1-3)	3,403,989.62	8.51E+03
Chromium	0.032656	Reference 5 (Table 1.1-17)	3,403,989.62	5.56E+01
Formaldehyde	0.005746	Reference 5 (Table 1.1-17)	3,403,989.62	9.78E+00
Hydrochloric Acid	1.2	Reference 5 (Table 1.1-15)	3,403,989.62	2.04E+03
Hydrogen Fluoride	0.15	Reference 5 (Table 1.1-15)	3,403,989.62	2.55E+02
Lead	0.013182	Reference 5 (Table 1.1-17)	3,403,989.62	2.24E+01
Nitrogen Oxides	11	Reference 5 (Table 1.1-3)	3,403,989.62	1.87E+04
PM-CON	1.04	Reference 5 (Table 1.1-5)	3,403,989.62	1.77E+03
PM10-FIL	12	Reference 5 (Table 1.1-9)	3,403,989.62	2.04E+04
PM25-FIL	1.4	Reference 5 (Table 1.1-9)	3,403,989.62	2.38E+03
PM10-PRI	13.04	Reference 5 (Tables 1.1-5 and 1.1-9)	3,403,989.62	2.22E+04
PM25-PRI	2.44	Reference 5 (Tables 1.1-5 and 1.1-9)	3,403,989.62	4.15E+03
Sulfur Dioxide	38*state-specific % sulfur content	Reference 5 (Table 1.1-3)	3,403,989.62	1.26E+05
Volatile Organic Compounds	0.05	Reference 5 (Table 1.1-19)	3,403,989.62	8.51E+01

COMMERCIAL/INSTITUTIONAL FUEL COMBUSTION: ANTHRACITE AND BITUMINOUS COAL (continued)

SCCs: 2103001000 and 2103002000

Example Calculation:

$$National\ Emissions\left(\frac{tons}{year}\right) = \frac{Emission\ Factor\left(\frac{lb}{ton\ coal}\right) \times National\ Activity\left(\frac{tons\ coal\ burned}{year}\right)}{2000\ \frac{lb}{ton}}$$

$$National\ selenium\ emissions\ \text{from anthracite coal combustion} = \frac{\frac{1.3\times10^{-1}\ lb}{ton} \times\ 484{,}759.4079\ tons}{2000\ \frac{lb}{ton}} = 3.151\times10^{-1}\ tons$$

References:

1. U.S. Department of Energy, Energy Information Administration (EIA). State Energy Data 2001 Consumption. Washington, DC 2004. Internet Address: http://www.eia.doe.gov/emeu/states/sep_fuel/html/fuel_use_cl.html accessed November 2004.

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3. DOC, 2003: U.S. Department of Commerce, Bureau of the Census, 2001 *County Business Patterns*, C1-E01-CBPX-01-US1 [Electronic files], Washington, DC. Issued April 2003.

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COMMERCIAL/INSTITUTIONAL FUEL COMBUSTION: DISTILLATE OIL
SCC: 2103004000

The state-level volume of distillate oil consumed by commercial/institutional combustion in the U.S. was used to estimate emissions. Distillate oil consumption by energy use sector is presented in State Energy Data 2001 Consumption tables published by the Energy Information Administration (EIA).[1] Because 2002 consumption data were not yet available when this inventory was prepared in November 2004, year 2001 consumption data were used to estimate 2002 emissions.

State-level distillate oil consumption was allocated to each county using *County Business Patterns* employment data for 2001 for NAICS codes 42, 44-45, 51-54, 56, 61-62, 71-72, and 81.[2] State distillate oil consumption was allocated to each county using the ratio of the number of commercial/institutional sector employees in each county to the total number of commercial/institutional sector employees in the state. Year 2001 employment data were used to estimate 2002 emissions because year 2001 data were the latest data available when this inventory was prepared during November 2004. Refer to Appendices B and C for more details on this allocation.

Criteria pollutant emission factors for distillate oil are from AP-42.[3] For all counties in the United States, the distillate oil consumed by commercial/institutional combustion is assumed to be No. 2 fuel oil with a heating value of 140,000 Btu per gallon and a sulfur content of 0.30%.[4] Dioxin/furan and HAP emission factors are from "Documentation of Emissions Estimation methods for Year 2000 and 2001 Mobile Source and Nonpoint Source Dioxin Inventories"[5] and "Documentation for the 1999 Base Year Nonpoint Area Source National Emission Inventory for Hazardous Air Pollutants,"[6] respectively. Sulfur content was 0.30% and was obtained from data compiled in preparing the 1999 residential coal combustion emissions estimates.[7] The ammonia emission factor is from EPA's *Estimating Ammonia Emissions from Anthropogenic Sources, Draft Report*.[8]

County-level pollutant emissions were calculated by multiplying the total distillate oil consumed in each county per year by an emission factor. Table 1 is a national summary of the emissions data that contains the emissions factors, total volume of distillate oil burned, and national emissions from commercial/institutional combustion of distillate oil. For Puerto Rico and the U.S. Virgin Islands, commercial/institutional distillate oil combustion emissions were estimated but the emissions are not included in Tables 4 and 5 (see section 2.5 of this report for the methodology used to estimate emissions).

Table 1. National Emissions Summary for Commercial/Institutional Distillate Oil Combustion: Not Adjusted for Point Source Fuel Consumption

Pollutant	Emission Factor (lb/thousand gallons)	Emission Factor Reference	National Throughput (thousands of gallons)	National Emissions (tons/year)
1,2,3,4,6,7,8-Heptachlorodibenzofuran	1.39e-09	Reference 5	3,665,448.71	2.55E-06
1,2,3,4,6,7,8-Heptachlorodibenzo-p-Dioxin	3.49e-09	Reference 5	3,665,448.71	6.39E-06
1,2,3,4,7,8,9-Heptachlorodibenzofuran	7.47e-10	Reference 5	3,665,448.71	1.37E-06
1,2,3,4,7,8-Hexachlorodibenzofuran	7.74e-10	Reference 5	3,665,448.71	1.42E-06
1,2,3,4,7,8-Hexachlorodibenzo-p-Dioxin	1.16e-09	Reference 5	3,665,448.71	2.13E-06

Table 1 (continued)

Pollutant	Emission Factor (lb/thousand gallons)	Emission Factor Reference	National Throughput (thousands of gallons)	National Emissions (tons/year)
1,2,3,6,7,8-Hexachlorodibenzofuran	4.31e-10	Reference 5	3,665,448.71	7.91E-07
1,2,3,6,7,8-Hexachlorodibenzo-p-Dioxin	6.79e-10	Reference 5	3,665,448.71	1.24E-06
1,2,3,7,8,9-Hexachlorodibenzofuran	4.34e-10	Reference 5	3,665,448.71	7.95E-07
1,2,3,7,8,9-Hexachlorodibenzo-p-Dioxin	9.54e-10	Reference 5	3,665,448.71	1.75E-06
1,2,3,7,8-Pentachlorodibenzofuran	5.89e-10	Reference 5	3,665,448.71	1.08E-06
1,2,3,7,8-Pentachlorodibenzo-p-Dioxin	5.37e-10	Reference 5	3,665,448.71	9.84E-07
2,3,4,6,7,8-Hexachlorodibenzofuran	4.58e-10	Reference 5	3,665,448.71	8.40E-07
2,3,4,7,8-Pentachlorodibenzofuran	5.65e-10	Reference 5	3,665,448.71	1.03E-06
2,3,7,8-TCDD	4.88e-10	Reference 5	3,665,448.71	8.95E-07
2,3,7,8-TCDF	3.46e-10	Reference 5	3,665,448.71	6.35E-07
Acenaphthene	0.000021	Reference 6	3,665,448.71	3.85E-02
Acenaphthylene	2.52e-07	Reference 6	3,665,448.71	4.62E-04
Acetaldehyde	0.0049	Reference 6	3,665,448.71	8.98E+00
Ammonia	0.8	Reference 8		
Anthracene	1.218e-06	Reference 6	3,665,448.71	2.23E-03
Arsenic	0.00056	Reference 6	3,665,448.71	1.03E+00
Benz[a]Anthracene	4.06e-06	Reference 6	3,665,448.71	7.44E-03
Benzene	0.00021	Reference 6	3,665,448.71	3.85E-01
Benzo[b+k]Fluoranthene	1.54e-06	Reference 6	3,665,448.71	2.82E-03
Benzo[g,h,i,]Perylene	2.24e-06	Reference 6	3,665,448.71	4.11E-03
Beryllium	4.20e-04	Reference 6	3,665,448.71	7.70E-01
Cadmium	4.20e-04	Reference 6	3,665,448.71	7.70E-01
Carbon Monoxide	5	Reference 3 (Table 1.3-1)	3,665,448.71	9.16E+03
Chromium	4.20e-04	Reference 6	3,665,448.71	7.70E-01
Chrysene	2.38e-06	Reference 6	3,665,448.71	4.36E-03
Dibenzo[a,h]Anthracene	1.68e-06	Reference 6	3,665,448.71	3.08E-03
Fluoranthene	4.90e-06	Reference 6	3,665,448.71	8.98E-03
Fluorene	4.48e-06	Reference 6	3,665,448.71	8.21E-03
Formaldehyde	0.0336	Reference 6	3,665,448.71	6.16E+01
Indeno[1,2,3-c,d]Pyrene	2.10e-06	Reference 6	3,665,448.71	3.85E-03
Lead	0.00126	Reference 6	3,665,448.71	2.31E+00
Manganese	0.00084	Reference 6	3,665,448.71	1.54E+00
Mercury	0.00042	Reference 6	3,665,448.71	7.70E-01
Naphthalene	0.001134	Reference 6	3,665,448.71	2.08E+00
Nickel	0.00042	Reference 6	3,665,448.71	7.70E-01
Nitrogen Oxides	20	Reference 3 (Table 1.3-1)	3,665,448.71	3.67E+04
OCDD	1.03e-08	Reference 5	3,665,448.71	1.89E-05

Table 1 (continued)

Pollutant	Emission Factor (lb/thousand gallons)	Emission Factor Reference	National Throughput (thousands of gallons)	National Emissions (tons/year)
OCDF	7.47e-10	Reference 5	3,665,448.71	1.37E-06
Phenanthrene	1.05e-05	Reference 6	3,665,448.71	1.92E-02
PM-CON	1.3	Reference 3 (Table 1.3-2)	3,665,448.71	2.38E+03
PM10-FIL	1.08	Reference 3 (Table 1.3-7)	3,665,448.71	1.98E+03
PM25-FIL	0.83	Reference 3 (Table 1.3-7)	3,665,448.71	1.52E+03
PM10-PRI	2.38	Reference 3 (Tables 1.3-2 and 1.3-7)	3,665,448.71	4.36E+03
PM25-PRI	2.13	Reference 3 (Tables 1.3-2 and 1.3-7)	3,665,448.71	3.90E+03
Pyrene	4.20e-06	Reference 6	3,665,448.71	7.70E-03
Selenium	0.0021	Reference 6	3,665,448.71	3.85E+00
Sulfur Dioxide	142* % sulfur content	Reference 3 (Table 1.3-1)	3,665,448.71	7.81E+04
Volatile Organic Compounds	0.34	Reference 3 (Table 1.3-3)	3,665,448.71	6.23E+02

Example Calculation:

$$National\ Emissions\left(\frac{tons}{year}\right) = \frac{Emission\ Factor\left(\frac{lb}{MM\ Btu\ Oil}\right) \times \frac{0.14\ MMBtu}{gal} \times \frac{1000\ gallons}{1 thousand\ gallons} \times National\ Activity\left(\frac{thousands\ of\ gal\ oil\ burned}{year}\right)}{2000\ \frac{lb}{ton}}$$

$$National\ selenium\ emissions = \frac{\frac{1.5 \times 10^{-5}\ lb}{MMBtu} \times \frac{0.14\ MMBtu}{gallon} \times \frac{1000\ gallons}{1 thousand\ gallons} \times 3{,}665{,}448.709\ thousand\ gal}{2000\ \frac{lb}{ton}} = 3.85\ tons$$

COMMERCIAL/INSTITUTIONAL FUEL COMBUSTION: DISTILLATE OIL (continued)
SCC: 2103004000

References:

1. U.S. Department of Energy, Energy Information Administration (EIA). State Energy Data 2001 Consumption. Washington, D.C. 2004. Internet Address: http://www.eia.doe.gov/emeu/states/sep_fuel/html/fuel_use_df.html accessed November 2004.

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3. U.S. Environmental Protection Agency. Compilation of Air Pollutant Emission Factors, 5th Edition, AP-42, Volume I: Stationary Point and Area Sources. Research Triangle Park, North Carolina. 1996.

4. U.S. Environmental Protection Agency. Emission Factor and Inventory Group. Final Summary of the Development and Results of a Methodology for Calculating Area Source Emissions from Residential Fuel Combustion. Prepared by Pacific Environmental Services, Inc. Research Triangle Park, NC. September 2002. Internet address: http://www.epa.gov/ttn/chief/eiip/techreport/volume03/draft1999_residfuel_inven_apr2003.zip accessed November 2004.

5. U.S. Environmental Protection Agency, Office of Air Quality Planning and Standards. "Documentation of Emissions Estimation methods for Year 2000 and 2001 Mobile Source and Nonpoint Source Dioxin Inventories." Prepared by E.H. Pechan & Associates, Inc., Durham, NC. May 2003.

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7. U.S. Environmental Protection Agency. Emission Factor and Inventory Group. Final Summary of the Development and Results of a Methodology for Calculating Area Source Emissions from Residential Fuel Combustion. Prepared by Pacific Environmental Services, Inc. Research Triangle Park, NC. September 2002. Internet address: http://www.epa.gov/ttn/chief/eiip/techreport/volume03/draft1999_residfuel_inven_apr2003.zip accessed November 2004.

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COMMERCIAL/INSTITUTIONAL FUEL COMBUSTION: KEROSENE
SCC: 2103011000

The state-level volume of kerosene consumed by commercial/institutional combustion in the U.S. was used to estimate emissions. Kerosene consumption by energy use sector is available from the Energy Information Administration (EIA).[1] Because 2002 emissions data were not yet available when this inventory was prepared in November 2004, year 2001 consumption data were used to estimate 2002 emissions.

State-level kerosene consumption was allocated to each county using *County Business Patterns* employment data for 2001 for NAICS codes 42, 44-45, 51-54, 56, 61-62, 71-72, and 81.[2] State kerosene consumption was allocated to each county using the ratio of the number of commercial/institutional sector employees in each county to the total number of commercial/institutional sector employees in the state. Year 2001 employment data were used to estimate 2002 emissions because year 2001 data were the latest data available when this inventory was prepared during November 2004. Refer to Appendices B and C for more details on this allocation.

Emission factors for distillate oil were used for kerosene, but the distillate oil emission factors were multiplied by a factor of 135/140 to convert them for this use. This factor is based on the ratio of the heat content of kerosene (135,000 Btu/gallon) to the heat content of distillate oil (140,000 Btu/gallon).[3] Criteria pollutant emission factors are from AP-42.[4] Dioxin/furan and HAP emission factors are from "Documentation of Emissions Estimation methods for Year 2000 and 2001 Mobile Source and Nonpoint Source Dioxin Inventories"[5] and "Documentation for the 1999 Base Year Nonpoint Area Source National Emission Inventory for Hazardous Air Pollutants,"[6] respectively. Distillate sulfur content (0.30%) was used for kerosene as well.[7] The ammonia emission factor is from EPA's *Estimating Ammonia Emissions from Anthropogenic Sources, Draft Report*.[8]

County-level pollutant emissions were calculated by multiplying the total kerosene consumed in each county per year by an emission factor. Table 1 is a national summary of the emissions data that contains the emissions factors, total volume of kerosene burned, and national emissions from commercial/institutional combustion of kerosene. For Puerto Rico and the U.S. Virgin Islands, commercial/institutional kerosene combustion emissions were estimated but the emissions are not included in Tables 4 and 5 (see section 2.5 of this report for the methodology used to estimate emissions).

Table 1. National Emissions Summary for Commercial/Institutional Kerosene Combustion: Not Adjusted for Point Source Fuel Consumption

Pollutant	Emission Factor (lb/thousand gallons)	Emission Factor Reference	National Throughput (thousands of gallons)	National Emissions (tons/year)
1,2,3,4,6,7,8-Heptachlorodibenzofuran	1.34e-09	Reference 5	232,607.73	1.56E-07
1,2,3,4,6,7,8-Heptachlorodibenzo-p-Dioxin	3.36e-09	Reference 5	232,607.73	3.91E-07
1,2,3,4,7,8,9-Heptachlorodibenzofuran	7.20e-10	Reference 5	232,607.73	8.38E-08
1,2,3,4,7,8-Hexachlorodibenzofuran	7.46e-10	Reference 5	232,607.73	8.68E-08
1,2,3,4,7,8-Hexachlorodibenzo-p-Dioxin	1.12e-09	Reference 5	232,607.73	1.30E-07
1,2,3,6,7,8-Hexachlorodibenzofuran	4.16e-10	Reference 5	232,607.73	4.84E-08
1,2,3,6,7,8-Hexachlorodibenzo-p-Dioxin	6.55e-10	Reference 5	232,607.73	7.62E-08
1,2,3,7,8,9-Hexachlorodibenzofuran	4.18e-10	Reference 5	232,607.73	4.87E-08
1,2,3,7,8,9-Hexachlorodibenzo-p-Dioxin	9.20e-10	Reference 5	232,607.73	1.07E-07
1,2,3,7,8-Pentachlorodibenzofuran	5.68e-10	Reference 5	232,607.73	6.60E-08

COMMERCIAL/INSTITUTIONAL FUEL COMBUSTION: KEROSENE (continued)
SCC: 2103011000

Table 1 (continued)

Pollutant	Emission Factor (lb/thousand gallons)	Emission Factor Reference	National Throughput (thousands of gallons)	National Emissions (tons/year)
1,2,3,7,8-Pentachlorodibenzo-p-Dioxin	5.18e-10	Reference 5	232,607.73	6.02E-08
2,3,4,6,7,8-Hexachlorodibenzofuran	4.42e-10	Reference 5	232,607.73	5.14E-08
2,3,4,7,8-Pentachlorodibenzofuran	5.44e-10	Reference 5	232,607.73	6.33E-08
2,3,7,8-TCDD	4.71e-10	Reference 5	232,607.73	5.48E-08
2,3,7,8-TCDF	3.34e-10	Reference 5	232,607.73	3.88E-08
Acenaphthene	2.025e-05	Reference 6	232,607.73	2.36E-03
Acenaphthylene	2.43e-07	Reference 6	232,607.73	2.83E-05
Acetaldehyde	0.004725	Reference 6	232,607.73	5.50E-01
Ammonia	0.771428571	Reference 8		
Anthracene	1.1745e-06	Reference 6	232,607.73	1.37E-04
Arsenic	0.00054	Reference 6	232,607.73	6.28E-02
Benz[a]Anthracene	3.915e-06	Reference 6	232,607.73	4.55E-04
Benzene	0.0002025	Reference 6	232,607.73	2.36E-02
Benzo[b+k]Fluoranthene	1.485e-06	Reference 6	232,607.73	1.73E-04
Benzo[g,h,i,]Perylene	2.16e-06	Reference 6	232,607.73	2.51E-04
Beryllium	0.000405	Reference 6	232,607.73	4.71E-02
Cadmium	0.000405	Reference 6	232,607.73	4.71E-02
Carbon Monoxide	4.821428571	Reference 4 (Table 1.3-1)	232,607.73	5.61E+02
Chromium	0.000405	Reference 6	232,607.73	4.71E-02
Chrysene	2.295e-06	Reference 6	232,607.73	2.67E-04
Dibenzo[a,h]Anthracene	1.62e-06	Reference 6	232,607.73	1.88E-04
Fluoranthene	4.725e-06	Reference 6	232,607.73	5.50E-04
Fluorene	4.32e-06	Reference 6	232,607.73	5.02E-04
Formaldehyde	0.0324	Reference 6	232,607.73	3.77E+00
Indeno[1,2,3-c,d]Pyrene	0.000002025	Reference 6	232,607.73	2.36E-04
Lead	0.001215	Reference 6	232,607.73	1.41E-01
Manganese	0.00081	Reference 6	232,607.73	9.42E-02
Mercury	0.000405	Reference 6	232,607.73	4.71E-02
Naphthalene	0.0010935	Reference 6	232,607.73	1.27E-01
Nickel	0.000405	Reference 6	232,607.73	4.71E-02
Nitrogen Oxides	19.28571429	Reference 4 (Table 1.3-1)	232,607.73	2.24E+03
OCDD	9.93e-09	Reference 5	232,607.73	1.15E-06
OCDF	7.20e-10	Reference 5	232,607.73	8.38E-08
Phenanthrene	0.000010125	Reference 6	232,607.73	1.18E-03
PM-CON	1.253571429	Reference 4 (Table 1.3-2)	232,607.73	1.46E+02
PM10-FIL	1.041428571	Reference 4 (Table 1.3-7)	232,607.73	1.21E+02
PM25-FIL	0.800357143	Reference 4 (Table 1.3-7)	232,607.73	9.31E+01
PM10-PRI	2.295	Reference 4 (Tables 1.3-2 and 1.3-7)	232,607.73	2.67E+02

COMMERCIAL/INSTITUTIONAL FUEL COMBUSTION: KEROSENE (continued)
SCC: 2103011000

Table 1 (continued)

Pollutant	Emission Factor (lb/thousand gallons)	Emission Factor Reference	National Throughput (thousands of gallons)	National Emissions (tons/year)
PM25-PRI	2.053928572	Reference 4 (Tables 1.3-2 and 1.3-7)	232,607.73	2.39E+02
Pyrene	4.05e-06	Reference 6	232,607.73	4.71E-04
Selenium	0.002025	Reference 6	232,607.73	2.36E-01
Sulfur Dioxide	142 * % sulfur content	Reference 4 (Table 1.3-1)	232,607.73	4.78E+03
Volatile Organic Compounds	0.327857143	Reference 4 (Table 1.3-3)	232,607.73	3.81E+01

Example Calculation:

$$National\ Emissions\left(\frac{lbs}{year}\right) = Distillate\ Emission\ Factor\left(\frac{lb}{million\ Btu}\right) \times \frac{14\ million\ Btu}{gallon} \times \frac{1000\ gallons}{1\ thousand\ gallons} \times Distillate\ to\ Kerosene\ Conversion\left(\frac{135}{140}\right) \times National\ Activity\left(\frac{1000\ barrels}{year}\right) \times \frac{1\ ton}{2000\ lbs}$$

$$National\ Selenium\ Emissions = \frac{1.5 \times 10^{-5}\ lb}{1\ million\ Btu} \times \frac{0.14\ million\ Btu}{gallon} \times \frac{1000\ gallons}{1\ thousand\ gallons} \times \frac{135}{140} \times 232{,}607.732\ thousands\ of\ gallons \times \frac{1\ ton}{2000\ lbs} = 2.355 \times 10^{-1}\ tons$$

References:

1. U.S. Department of Energy, Energy Information Administration (EIA). State Energy Data 2001 Consumption. Washington, D.C. 2004. Internet Address: http://www.eia.doe.gov/emeu/states/sep_fuel/html/fuel_ks.html accessed November 2004.

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COMMERCIAL/INSTITUTIONAL FUEL COMBUSTION: LIQUEFIED PETROLEUM GAS
SCC: 2103007000

Commercial/institutional liquefied petroleum gas (LPG) combustion emissions were calculated using the volume of LPG consumed in the United States. State-level LPG consumption by sector is available from the Energy Information Administration (EIA).[1] Year 2001 consumption data were used to estimate 2002 emissions because these were the latest data available when this inventory was prepared during November 2004.

State-level LPG consumption was allocated to each county using *County Business Patterns* employment data for 2001 for NAICS codes 42, 44-45, 51-54, 56, 61-62, 71-72, and 81.[2] State LPG consumption was allocated to each county using the ratio of the number of commercial/institutional sector employees in each county to the total number of commercial/institutional sector employees in the state. Year 2001 employment data were used to estimate 2002 emissions because year 2001 data were the latest data available when this inventory was prepared during November 2004. Refer to Appendices B and C for more details on this allocation.

Pollutant emission factors for commercial/institutional LPG are based on the commercial/institutional natural gas emission factors.[3,4,5,7] For all counties in the United States, the natural gas consumed by commercial/institutional combustion is assumed to have a heating value of 1,050 Btu per cubic foot and a sulfur content of 2,000 grains per million cubic feet.[3] Those natural gas emission factors originally presented in the units "pounds per million cubic feet" were converted to energy-based units using the 1050 Btu/cubic foot conversion factor. Once all the natural gas emission factors were converted to energy-based units, the natural gas emission factors were converted to LPG emission factors by multiplying by 91,330 Btu/gallon.[6] See Appendix C for the detailed, stepwise, natural-gas-to-LPG emission factor conversion process.

County-level criteria pollutant and HAP emissions were calculated by multiplying the total annual amount of LPG consumed in each county by an emission factor. Table 1 is a national summary of the emissions data that displays the emission factors, total volume of LPG burned, and national criteria pollutant and HAP emissions from commercial/institutional combustion of LPG. For Puerto Rico and the U.S. Virgin Islands, commercial/institutional LPG combustion emissions were estimated but the emissions are not included in Tables 4 and 5 (see section 2.5 of this report for the methodology used to estimate emissions).

Table 1. National Criteria Pollutant and HAP Emissions Summary for Commercial/Institutional LPG Combustion: Not Adjusted for Point Source Fuel Consumption

Pollutant	Emission Factor (lb/thousands of barrels)	Emission Factor Reference	National Throughput (thousands of barrels)	National Emissions (tons/year)
Acetaldehyde	4.98662e-05	Reference 4	26,134.98	6.52E-04
Ammonia	1.790068	Reference 7		
Benzene	0.00767172	Reference 3 (Table 1.4-3)	26,134.98	1.00E-01
Carbon Monoxide	306.8688	Reference 3 (Table 1.4-1)	26,134.98	4.01E+03
Fluoranthene	1.15076e-05	Reference 4	26,134.98	1.50E-04
Fluorene	1.07404e-05	Reference 4	26,134.98	1.40E-04
Formaldehyde	0.2876895	Reference 4	26,134.98	3.76E+00
Lead	0.0018266	Reference 3 (Table 1.4-2)	26,134.98	2.39E-02
Naphthalene	0.002339875	Reference 4	26,134.98	3.06E-02
Nitrogen Oxides	365.32	Reference 3 (Table 1.4-1)	26,134.98	4.77E+03
Phenanthrene	6.52096e-05	Reference 4	26,134.98	8.52E-04
PM-CON	20.82324	Reference 3 (Table 1.4-2)	26,134.98	2.72E+02
PM10-FIL	6.94108	Reference 3 (Table 1.4-2)	26,134.98	9.07E+01
PM25-FIL	6.94108	Reference 3 (Table 1.4-2)	26,134.98	9.07E+01
PM10-PRI	27.76432	Reference 3 (Table 1.4-2)	26,134.98	3.63E+02
PM25-PRI	27.76432	Reference 3 (Table 1.4-2)	26,134.98	3.63E+02
Pyrene	1.91793e-05	Reference 4	26,134.98	2.51E-04
Sulfur Dioxide	2.19192	Reference 3 (Table 1.4-2)	26,134.98	2.86E+01
Volatile Organic Compounds	20.0926	Reference 3 (Table 1.4-2)	26,134.98	2.63E+02

COMMERCIAL/INSTITUTIONAL FUEL COMBUSTION: LIQUEFIED PETROLEUM GAS (continued)
SCC: 2103007000

Example Calculation:

$$National\ Emissions = Natural\ Gas\ Emission\ Factor\left(\frac{lb}{million\ Btu}\right) \times \frac{91{,}330\ million\ Btu}{million\ gallons\ (LPG)} \times \frac{7.4805\ million\ gallons}{million\ cubic\ feet} \times National\ Activity\left(\frac{million\ cubic\ feet}{year}\right)$$

$$National\ fluorene\ emissions = \frac{2.8 \times 10^{-9}\ lb}{million\ Btu} \times \frac{91{,}330\ million\ Btu}{million\ gallons} \times \frac{7.4805\ million\ gallons}{million\ cubic\ feet} \times \frac{146.737\ million\ cubic\ feet}{year}$$

$$= 1.402 \times 10^{-4}\ tons$$

References:

1. U.S. Department of Energy, Energy Information Administration (EIA). State Energy Data 2001 Consumption. Washington, D.C. 2004. Internet Address: http://www.eia.doe.gov/emeu/states/sep_fuel/html/fuel_lg.html accessed November 2004.

2. DOC, 2003: U.S. Department of Commerce, Bureau of the Census, 2001 *County Business Patterns*, C1-E01-CBPX-01-US1 [Electronic files], Washington, DC. Issued April 2003.

3. U.S. Environmental Protection Agency. Compilation of Air Pollutant Emission Factors, 5th Edition, AP-42, Volume I: Stationary Point and Area Sources. Research Triangle Park, North Carolina. 1996.

4. U.S. Environmental Protection Agency, Emission Factors and Inventory Group. "Documentation for the 1999 Base Year Nonpoint Area Source National Emission Inventory for Hazardous Air Pollutants." Prepared by Eastern Research Group, Inc. Morrisville, NC. September 2002.

5. U.S. Environmental Protection Agency. Emission Factor and Inventory Group. Final Summary of the Development and Results of a Methodology for Calculating Area Source Emissions from Residential Fuel Combustion. Prepared by Pacific Environmental Services, Inc. Research Triangle Park, NC. September 2002. Internet address: http://www.epa.gov/ttn/chief/eiip/techreport/volume03/draft1999_residfuel_inven_apr2003.zip accessed November 2004.

6. U.S. Department of Energy, Energy Information Administration, *2001 Glossary*, available from http://www.eia.doe.gov/emeu/recs/glossary.html accessed September 2004.

7. U.S. Environmental Protection Agency. Emission Factor and Inventory Group. Estimating Ammonia Emissions from Anthropogenic Sources, Draft Report. Prepared by E.H. Pechan and Associates, Inc. Research Triangle Park, NC. September 2003.

COMMERCIAL/INSTITUTIONAL FUEL COMBUSTION: NATURAL GAS
SCC: 2103006000

The state-level volume of natural gas consumed by commercial/institutional combustion in the United States was used to estimate emissions. Natural gas consumption by energy use sector is presented in State Energy Data 2001 Consumption tables published by the EIA.[1] Year 2001 consumption data were used to estimate 2002 emissions because these data were the latest data available when this inventory was prepared during November 2004.

State-level natural gas consumption was allocated to each county using *County Business Patterns* employment data for 2001 for NAICS codes 42, 44-45, 51-54, 56, 61-62, 71-72, and 81.[2] State natural gas consumption was allocated to each county using the ratio of the number of commercial/institutional sector employees in each county to the total number of commercial/institutional sector employees in the state. Year 2001 employment data were used to estimate 2002 emissions because year 2001 data were the latest data available when this inventory was prepared during November 2004. Refer to Appendices B and C for more details on this allocation.

Criteria pollutant emission factors for natural gas are from AP-42.[3] HAP emission factors are from AP-42 and "Documentation for the 1999 Base Year Nonpoint Area Source National Emission Inventory for Hazardous Air Pollutants."[4] According to AP-42 (maximum value provided)[3], natural gas has a heat content of 1050 million Btus per million cubic feet. This value was required to convert those emission factors originally given in units "pounds per million Btu" to units "pounds per million cubic feet." (For an illustration of this conversion factor's implementation, See the example calculation below.) 2000 grains of sulfur per million cubic feet are assumed.[5] The ammonia emission factor is from EPA's *Estimating Ammonia Emissions from Anthropogenic Sources, Draft Report.*[6]

County-level criteria pollutant and HAP emissions were calculated by multiplying the total natural gas consumed in each county per year by an emission factor. Table 1 is a national summary of the emissions data that contains the emissions factors, total volume of natural gas burned, and national criteria pollutant and HAP emissions from commercial/institutional combustion of natural gas. For Puerto Rico and the U.S. Virgin Islands, commercial/institutional natural gas combustion emissions were estimated but the emissions are not included in Tables 4 and 5 (see section 2.5 of this report for the methodology used to estimate emissions).

COMMERCIAL/INSTITUTIONAL FUEL COMBUSTION: NATURAL GAS (continued)
SCC: 2103006000

Table 1. National Criteria Pollutant and HAP Emissions Summary for Commercial/Institutional Natural Gas Combustion: Not Adjusted for Point Source Fuel Consumption

Pollutant	Emission Factor (lb/million cubic feet)	Emission Factor Reference	National Throughput (millions of cubic feet)	National Emissions (tons/year)
Acetaldehyde	0.00001365	Reference 4	3,037,452	2.07E-02
Ammonia	0.49	Reference 6		
Benzene	0.0021	Reference 3 (Table 1.4-3)	3,037,452	3.19E+00
Carbon Monoxide	84	Reference 3 (Table 1.4-1)	3,037,452	1.28E+05
Fluoranthene	3.15e-06	Reference 4	3,037,452	4.78E-03
Fluorene	2.94e-06	Reference 4	3,037,452	4.47E-03
Formaldehyde	0.07875	Reference 4	3,037,452	1.20E+02
Lead	0.0005	Reference 3 (Table 1.4-2)	3,037,452	7.59E-01
Naphthalene	0.0006405	Reference 4	3,037,452	9.73E-01
Nitrogen Oxides	100	Reference 3 (Table 1.4-1)	3,037,452	1.52E+05
Phenanthrene	0.00001785	Reference 4	3,037,452	2.71E-02
PM-CON	5.7	Reference 3 (Table 1.4-2)	3,037,452	8.66E+03
PM10-FIL	1.9	Reference 3 (Table 1.4-2)	3,037,452	2.89E+03
PM25-FIL	1.9	Reference 3 (Table 1.4-2)	3,037,452	2.89E+03
PM10-PRI	7.6	Reference 3 (Table 1.4-2)	3,037,452	1.15E+04
PM25-PRI	7.6	Reference 3 (Table 1.4-2)	3,037,452	1.15E+04
Pyrene	5.25e-06	Reference 4	3,037,452	7.97E-03
Sulfur Dioxide	0.6	Reference 3 (Table 1.4-2)	3,037,452	9.11E+02
Volatile Organic Compounds	5.5	Reference 3 (Table 1.4-2)	3,037,452	8.35E+03

COMMERCIAL/INSTITUTIONAL FUEL COMBUSTION: NATURAL GAS (continued)
SCC: 2103006000

Example Calculation:

$$National\ fluorene\ emissions = \frac{\frac{2.8\times10^{-9}\ lb}{MMBtu}\times\frac{1050\ MMBtu}{million\ ft^3}\times 3{,}037{,}452\ million\ ft^3}{2000\ \frac{tons}{yr}} = 4.465\times10^{-3}\ tons$$

$$National\ Emissions\left(\frac{tons}{year}\right) = \frac{Emission\ Factor\left(\frac{lb}{MMBtu}\right)\times\frac{1050\ MMBtu}{million\ ft^3}\times National\ Activity\left(\frac{million\ ft^3\ nat\ gas}{year}\right)}{2000\ \frac{lb}{ton}}$$

References:

1. U.S. Department of Energy, Energy Information Administration (EIA). State Energy Data 2001 Consumption. Washington, D.C. 2004. Internet Address: http://www.eia.doe.gov/emeu/states/sep_fuel/html/fuel_use_ng.html accessed November 2004.

2. DOC, 2003: U.S. Department of Commerce, Bureau of the Census, 2001 *County Business Patterns*, C1-E01-CBPX-01-US1 [Electronic files], Washington, DC. Issued April 2003.

3. U.S. Environmental Protection Agency. Compilation of Air Pollutant Emission Factors, 5th Edition, AP-42, Volume I: Stationary Point and Area Sources. Research Triangle Park, North Carolina. 1996.

4. U.S. Environmental Protection Agency, Emission Factors and Inventory Group. "Documentation for the 1999 Base Year Nonpoint Area Source National Emission Inventory for Hazardous Air Pollutants." Prepared by Eastern Research Group, Inc. Morrisville, NC. September 2002.

5. U.S. Environmental Protection Agency. Emission Factor and Inventory Group. Final Summary of the Development and Results of a Methodology for Calculating Area Source Emissions from Residential Fuel Combustion. Prepared by Pacific Environmental Services, Inc. Research Triangle Park, NC. September 2002. Internet address: http://www.epa.gov/ttn/chief/eiip/techreport/volume03/draft1999_residfuel_inven_apr2003.zip accessed November 2004.

6. U.S. Environmental Protection Agency. Emission Factor and Inventory Group. Estimating Ammonia Emissions from Anthropogenic Sources, Draft Report. Prepared by E.H. Pechan and Associates, Inc. Research Triangle Park, NC. September 2003.

COMMERCIAL/INSTITUTIONAL FUEL COMBUSTION: RESIDUAL OIL
SCC: 2103005000

The volume of residual oil consumed by the commercial/institutional sector in the U.S. was used to estimate emissions. Residual oil consumption by energy use sector is presented in State Energy Data 2001 Consumption tables published by the Energy Information Administration (EIA).[1] Year 2001 consumption data were used to estimate 2002 emissions because year 2001data were the latest data available when this inventory was prepared during November 2004.

State-level residual oil consumption was allocated to each county using *County Business Patterns* employment data for 2001 for NAICS codes 42, 44-45, 51-54, 56, 61-62, 71-72, and 81.[2] State residual oil consumption was allocated to each county using the ratio of the number of commercial/institutional sector employees in each county to the total number of commercial/institutional sector employees in the state. Year 2001 employment data were used to estimate 2002 emissions because year 2001 data were the latest data available when this inventory was prepared during November 2004. Refer to Appendices B and C for more details on this allocation.

Criteria pollutant emission factors for residual oil are from AP-42.[3] Dioxin/furan and HAP emission factors are from "Documentation of Emissions Estimation methods for Year 2000 and 2001 Mobile Source and Nonpoint Source Dioxin Inventories"[4] and "Documentation for the 1999 Base Year Nonpoint Area Source National Emission Inventory for Hazardous Air Pollutants,"[5] respectively. According to AP-42 (page 1.3-8)[3], #4, #5, and #6 residual oil have a heat content of 150 million Btus per thousand gallons. Those emission factors that were originally provided on a Btu basis were converted to physical units using this factor (the example calculation below shows an instance in which this conversion was performed). Sulfur content was 2.25% and was the midpoint of the range of values provided in Appendix A of AP-42.[3] The ammonia emission factor is from EPA's *Estimating Ammonia Emissions from Anthropogenic Sources, Draft Report*.[6]

County-level pollutant emissions were calculated by multiplying the total residual oil consumed in each county per year by an emission factor. Table 1 is a national summary of the emissions data that contains the emissions factors, total volume of residual oil burned, and national emissions from commercial/institutional combustion of residual oil. For Puerto Rico and the U.S. Virgin Islands, commercial/institutional residual oil combustion emissions were estimated but the emissions are not included in Tables 4 and 5 (see section 2.5 of this report for the methodology used to estimate emissions).

Table 1. National Emissions Summary for Commercial/Institutional Residual Oil Combustion: Not Adjusted for Point Source Fuel Consumption

Pollutant	Emission Factor (lb/thousand gallons)	Emission Factor Reference	National Throughput (thousands of gallons)	National Emissions (tons/year)
1,2,3,4,6,7,8-Heptachlorodibenzofuran	1.39e-09	Reference 4	466,673.50	3.24E-07
1,2,3,4,6,7,8-Heptachlorodibenzo-p-Dioxin	3.49e-09	Reference 4	466,673.50	8.14E-07
1,2,3,4,7,8,9-Heptachlorodibenzofuran	7.47e-10	Reference 4	466,673.50	1.74E-07
1,2,3,4,7,8-Hexachlorodibenzofuran	7.74e-10	Reference 4	466,673.50	1.81E-07
1,2,3,4,7,8-Hexachlorodibenzo-p-Dioxin	1.16e-09	Reference 4	466,673.50	2.71E-07
1,2,3,6,7,8-Hexachlorodibenzofuran	4.31e-10	Reference 4	466,673.50	1.01E-07
1,2,3,6,7,8-Hexachlorodibenzo-p-Dioxin	6.79e-10	Reference 4	466,673.50	1.59E-07
1,2,3,7,8,9-Hexachlorodibenzofuran	4.34e-10	Reference 4	466,673.50	1.01E-07
1,2,3,7,8,9-Hexachlorodibenzo-p-Dioxin	9.54e-10	Reference 4	466,673.50	2.23E-07
1,2,3,7,8-Pentachlorodibenzofuran	5.89e-10	Reference 4	466,673.50	1.37E-07
1,2,3,7,8-Pentachlorodibenzo-p-Dioxin	5.37e-10	Reference 4	466,673.50	1.25E-07
2,3,4,6,7,8-Hexachlorodibenzofuran	4.58e-10	Reference 4	466,673.50	1.07E-07
2,3,4,7,8-Pentachlorodibenzofuran	5.65e-10	Reference 4	466,673.50	1.32E-07
2,3,7,8-TCDD	4.88e-10	Reference 4	466,673.50	1.14E-07
2,3,7,8-TCDF	3.46e-10	Reference 4	466,673.50	8.08E-08
Acenaphthene	2.25e-05	Reference 5	466,673.50	5.25E-03
Acenaphthylene	2.70e-07	Reference 5	466,673.50	6.30E-05
Acetaldehyde	0.00525	Reference 5	466,673.50	1.23E+00
Ammonia	0.8	Reference 6		

COMMERCIAL/INSTITUTIONAL FUEL COMBUSTION: RESIDUAL OIL (continued)
SCC: 2103005000

Table 1 (continued)

Pollutant	Emission Factor (lb/thousand gallons)	Emission Factor Reference	National Throughput (thousands of gallons)	National Emissions (tons/year)
Anthracene	1.305e-06	Reference 5	466,673.50	3.05E-04
Arsenic	0.00141	Reference 5	466,673.50	3.29E-01
Benz[a]Anthracene	4.35e-06	Reference 5	466,673.50	1.02E-03
Benzene	0.000225	Reference 5	466,673.50	5.25E-02
Benzo[b+k]Fluoranthene	1.65e-06	Reference 5	466,673.50	3.85E-04
Benzo[g,h,i,]Perylene	2.40e-06	Reference 5	466,673.50	5.60E-04
Beryllium	3.00e-05	Reference 5	466,673.50	7.00E-03
Cadmium	4.20e-04	Reference 5	466,673.50	9.80E-02
Carbon Monoxide	5	Reference 3 (Table 1.3-1)	466,673.50	1.17E+03
Chromium	0.0009	Reference 5	466,673.50	2.10E-01
Chrysene	2.55e-06	Reference 5	466,673.50	5.95E-04
Dibenzo[a,h]Anthracene	1.80e-06	Reference 5	466,673.50	4.20E-04
Fluoranthene	5.25e-06	Reference 5	466,673.50	1.23E-03
Fluorene	4.80e-06	Reference 5	466,673.50	1.12E-03
Formaldehyde	0.036	Reference 5	466,673.50	8.40E+00
Indeno[1,2,3-c,d]Pyrene	2.25e-06	Reference 5	466,673.50	5.25E-04
Lead	0.00165	Reference 5	466,673.50	3.85E-01
Manganese	0.00315	Reference 5	466,673.50	7.35E-01
Mercury	0.0001215	Reference 5	466,673.50	2.84E-02
Naphthalene	0.001215	Reference 5	466,673.50	2.84E-01
Nickel	0.09	Reference 5	466,673.50	2.10E+01
Nitrogen Oxides	55	Reference 5	466,673.50	1.28E+04
OCDD	1.03e-08	Reference 4	466,673.50	2.40E-06
OCDF	7.47e-10	Reference 4	466,673.50	1.74E-07
Phenanthrene	1.125e-05	Reference 5	466,673.50	2.63E-03
PM-CON	1.5	Reference 3 (Table 1.3-2)	466,673.50	3.50E+02
PM10-FIL	5.17 * (1.12 * % sulfur content + 0.37)	Reference 3 (Table 1.3-7)	466,673.50	3.49E+03
PM25-FIL	1.92 * (1.12 * % sulfur content + 0.37)	Reference 3 (Table 1.3-7)	466,673.50	1.29E+03
PM10-PRI	5.17 * (1.12 * % sulfur content + 0.37) + 1.5	Reference 3 (Tables 1.3-2 and 1.3-7)	466,673.50	3.84E+03
PM25-PRI	1.92 * (1.12 * % sulfur content + 0.37) + 1.5	Reference 3 (Tables 1.3-2 and 1.3-7)	466,673.50	1.64E+03
Pyrene	0.0000045	Reference 5	466,673.50	1.05E-03
Selenium	0.000735	Reference 5	466,673.50	1.72E-01
Sulfur Dioxide	157 * % sulfur content	Reference 3 (Table 1.3-1)	466,673.50	8.24E+04
Volatile Organic Compounds	1.13	Reference 3 (Table 1.3-3)	466,673.50	2.64E+02

COMMERCIAL/INSTITUTIONAL FUEL COMBUSTION: RESIDUAL OIL (continued)
SCC: 2103005000

Example Calculation:

$$National\ Emissions\left(\frac{tons}{year}\right) = \frac{Emission\ Factor\left(\frac{lb}{MMBtu}\right) \times \frac{150\ MMBtu}{thousand\ gallons} \times National\ Activity\left(\frac{thousands\ of\ gal\ oil\ burned}{year}\right)}{2000\ \frac{lb}{ton}}$$

$$National\ selenium\ emissions = \frac{\frac{.0000049\ lb}{MMBtu} \times \frac{150 MMBtu}{thousand\ gallons} \times\ 466{,}673.502\ thousand\ gal}{2000\ \frac{lb}{ton}} = 1.715 \times 10^{-1}\ tons$$

References:

1. U.S. Department of Energy, Energy Information Administration (EIA). State Energy Data 2001 Consumption. Washington, D.C. 2004. Internet Address: http://www.eia.doe.gov/emeu/states/sep_fuel/html/fuel_rf.html accessed November 2004.

2. DOC, 2003: U.S. Department of Commerce, Bureau of the Census, 2001 *County Business Patterns*, C1-E01-CBPX-01-US1 [Electronic files], Washington, DC. Issued April 2003.

3. U.S. Environmental Protection Agency. Compilation of Air Pollutant Emission Factors, 5th Edition, AP-42, Volume I: Stationary Point and Area Sources. Research Triangle Park, North Carolina. 1996.

4. U.S. Environmental Protection Agency, Office of Air Quality Planning and Standards. "Documentation of Emissions Estimation methods for Year 2000 and 2001 Mobile Source and Nonpoint Source Dioxin Inventories." Prepared by E.H. Pechan & Associates, Inc., Durham, NC. May 2003.

5. U.S. Environmental Protection Agency, Emission Factors and Inventory Group. "Documentation for the 1999 Base Year Nonpoint Area Source National Emission Inventory for Hazardous Air Pollutants." Prepared by Eastern Research Group, Inc. Morrisville, NC. September 2002.

6. U.S. Environmental Protection Agency. Emission Factor and Inventory Group. Estimating Ammonia Emissions from Anthropogenic Sources, Draft Report. Prepared by E.H. Pechan and Associates, Inc. Research Triangle Park, NC. September 2003.

COTTON GINNING
SCC: 2801000000

Filterable PM_{10} and $PM_{2.5}$ (PM10-FIL and PM25-FIL) emissions estimates for 2002 were developed for cotton ginning. Emissions from cotton ginning are a function of the number of bales of cotton ginned.[1] Ginning activity occurs in 16 States. The USDA Cotton Ginning reports present the amount of cotton ginned by State, district, and county for each crop year. The following data files were obtained from the USDA National Agricultural Statistics Service [2]:

NASS_01-2002.txt	Activity data for period August/September 2002 through January 25, 2002.
NASS_01-2003.txt	Activity data for period August/September 2002 through March 22, 2002.
NASS_01-2002.txt	Activity data for period August/September 2003 through January 23, 2003.

Appendix B contains a compilation of these data files into a one table in database format.

A crop year begins in August/September 2002 through March 2003, covering parts of two calendar years. Since the activity data are reported as running totals for the growing season, the number of bales ginned for a calendar year needs to be determined using data from two crop years. The amount of cotton ginned from January 1 to the end of the season (March) for calendar year x (crop year x) and the amount of cotton ginned from the beginning of the season (August/September) for calendar year x (crop year y) is summed to get the calendar year x total. To determine the amount ginned from January 1 to the end of the season, the amount ginned before January 1 (in the early January Cotton Ginnings report) was subtracted from the total reported in the end of season (March) Cotton Ginnings report. To determine the amount ginned from the beginning of the season to January 1, the total recorded by January 1 in the early January Cotton Ginnings report was used.

The Cotton Ginnings report may not show detailed data for a county, but may include those data in the district, State, or U.S. totals. Data for a gin may be considered confidential if (1) there are fewer than three gins operating in the county, or (2) more than 60 percent of the cotton ginned in the county is ginned at one mill. The standard Cotton Ginnings report lists the following four codes to its table of running bales ginned:

1/ withheld to avoid disclosing individual gins
2/ withheld to avoid disclosing individual gins, but included in State total
3/ excludes some gins' data to avoid disclosing individual gins, but included in the State total
4/ withheld to avoid disclosing individual gins but included in the U.S. total

The following methodology is used for estimating the number of bales ginned in counties with confidential data.

(1) If all counties in the district show confidentiality, but there is a district total, divide district total by the number of counties to get individual county estimates.

(2) If some (but not all) counties in a district show confidentiality and there is a district total, subtract county totals from district total and divide the remainder by the number of counties showing confidentiality to get estimates for the "confidential" counties.

(3) If both county and district totals are considered confidential within a State, divide the State total by the number of counties to get individual county estimates.

(4) If some (but not all) districts show confidentiality, subtract recorded district totals from the State total and divide the remainder by the number of counties showing confidentiality to get estimates for the "confidential" counties.

In some cases, data in the March report differed from earlier reports for the crop year in both total number of bales ginned and counties where ginning occurred. The January reports showed higher totals for some counties, and subtracting the January totals from the March totals for these counties yielded a negative number. In these cases, the

activity for the county for that time period was considered zero. In instances where counties were recorded in the March final report, but not in earlier reports, the activity was assumed to have occurred sometime before January.

These counties were then added to the January listing as confidential counties, and distribution of ginning activity was then performed.

Kansas has only one small gin operating in the State, and this gin does not operate every year. Since the amount of cotton ginned at this facility is considered insignificant (less than 0.005 percent of the total cotton ginned in the United States in 1995), no emissions for Kansas were calculated.

Once all the cotton ginning activity was distributed using the methodologies above, PM10-FIL and PM25-FIL emissions were calculated. Table 1 presents the emission factors for cotton ginning. There are 2 sets of emission factors, one set for full PM controls (high-efficiency cyclone) and one set for conventional PM controls (screened drums or cages). For each state, a certain percentage of cotton ginning is assumed to apply conventional controls and full controls.[3] Table 2 shows the estimated percentage of crop by emission control method for each state. The equation for calculating emissions is:

$$E = \left[EF_c\left(Pc \times B\right)\right] + \left[EFf\left(Pf \times B\right)\right]$$

where Pc = percent crop full controls,
Pf = percent crop conventional controls,
B = number of bales ginned,
EFc = full controls emission factor, and
EFf = conventional controls emission factor.

It is important to note that the cotton ginning values represent total emissions. When the 2002 point source NEI is released, it will be necessary to determine whether there are point source emissions in SCCs 30200401 through 30200499 that will need to be subtracted to yield the nonpoint source emission estimates for this category.

Table 1. Cotton Ginning Emission Factors [1]

Control Type	PM-FIL (lb/bale)	PM10-FIL (lb/bale)	PM25-FIL (lb/bale)
Full controls (high-efficiency cyclone)	2.4	0.82	0.024
Conventional controls (screened drums or cages)	3.1	1.2	0.031

Table 2. Estimated Percentage of Crop By Emission Control Method [3]

State	Percentage of Crop		State	Percentage of Crop	
	Full Controls	Conventional Controls		Full Controls	Conventional Controls
Alabama	20	80	Missouri	20	80
Arizona	50	50	New Mexico	20	80
Arkansas	30	70	North	30	70
California	72	28	Oklahoma	20	80
Florida	20	80	South Carolina	20	80
Georgia	30	70	Tennessee	20	80
Louisiana	20	80	Texas	30	70
Mississippi	20	80	Virginia	20	80

Table 3. National Emissions Summary

Pollutant	Emissions Factors (lb/bale)		Percentage of Crop [a] (National Average)		Emission Factor and Crop Percentage References	National Activity Level (Reference 2) (No. of Bales Ginned)	National Emissions (tons/year)
	Full Controls	Conventional Controls	Full Controls	Conventional Controls			
PM10-FIL	0.82	1.2	35	65	Reference 1 Reference 3	16,790,805	9,026
PM25-FIL	0.024	0.031	35	65	Reference 1 Reference 3	16,790,805	241

[a] Average is based on the average crop (average total bales ginned per year) from 1991 to 1995 for these States.

References

1. United States Environmental Protection Agency, Office of Air Quality Planning and Standards. "Compilation of Air Pollutant Emission Factors, AP-42, Fifth Edition, Volume I: Stationary Point and Area Sources, Section 9.3.1 Cotton Harvesting." Research Triangle Park, NC. 1995.

2. U.S. Department of Agriculture, National Agricultural Statistics Service. "Reports by Commodity - Cotton Ginnings." 2002. http://www.usda.gov/nass/pubs/estindx1.htm#cotton

3. Johnson, 1996: Memorandum from Fred Johnson, National Cotton Council, Memphis, TN, to Bill Mayfield, U.S. Department of Agriculture, Memphis, TN. "Estimated Percent of Crop by Emission Control Method," July 23, 1996.

DRUM AND BARREL RECLAMATION
SCC: 2461160000

A number of facilities in the United States recondition used industrial packaging, including drums and barrels, for reuse. Approximately 35 million 55-barrel drums are reclaimed annually. As part of the reclamation process, many of these drums and barrels are placed in a furnace to burn off any residue remaining from prior use. This reclamation process results in CAP and HAP emissions. The emissions are assumed to be a function of the number of drums and barrels burned.

The Reusable Industrial Packaging Association (RIPA) was contacted to provide data on the number of drums and barrels reclaimed in furnaces. No calendar year 2002 data were available; the most recent data available were from surveys of reclamation companies for calendar year 2000. However, RIPA estimates that 20 million 55-gallon barrels were reclaimed using furnaces in the United States in 2002.[1]

The 2002 national emission estimates for drum and barrel reclamation were developed by multiplying the appropriate emission factors by the national activity estimate. Emission factors for most of the HAPs are from the U.S. Environmental Protection Agency's *Locating and Estimating Air Emissions From Sources of Polycyclic Organic Matter*.[2] The emission factor for lead is taken from *Locating and Estimating Air Emissions from Sources of Lead and Lead Compounds*.[3] The emission factors for the dioxin and furan congeners are taken from *Locating and Estimating Air Emissions from Sources of Dioxins and Furans*.[4] Emission factors for NO_x and PM10-FIL were taken from EPA's Factor Information REtrieval (FIRE) database.[5] Emission factors for PM25-PRI and PM25-FIL are not available. Consequently, in order to include PM25-PRI and PM25-FIL emissions in the NEI, the PM25-PRI emission factor was set equal to the PM10-PRI emission factor, and the PM25-FIL emission factor was set equal to the PM10-FIL emission factor.

Eleven drum reclamation facilities that utilize furnaces were identified during the 112(c)(6) inventory effort.[6] Table 1 lists the nine counties where these facilities are located. Because furnace throughput for each facility is not available, national drum reclamation activity was allocated evenly among the 11 facilities. Table 2 presents the national summary of activity data, emission factors, and emissions for each pollutant. It is important to note that these values represent total emissions.

The nonpoint source emissions for IL and MD are not included in the draft nonpoint source NEI because the emissions for the category are included in their point source inventories. The final nonpoint and point source NEI will be reviewed to determine if the nonpoint source emissions will need to be adjusted to remove potential double counting of point source emissions. Point source emissions are classified under SCC 30902501 (Drum Cleaning/Reclamation, Drum Burning Furnace).

Table 1. Counties with Drum Reclamation Facilities

FIPS Code	State	County	Number of Facilities	National Activity Allocation Ratio
17031	IL	Cook	1	0.09091
19163	IA	Scott	1	0.09091
20015	KS	Butler	1	0.09091
20209	KS	Wyandotte	2	0.18182
24510	MD	Baltimore City	2	0.18182
27053	MN	Hennepin	1	0.09091
42003	PA	Allegheny	1	0.09091
42101	PA	Philadelphia	1	0.09091
45019	SC	Charleston	1	0.09091

Table 2. National Criteria and Hazardous Pollutant Emissions Summary

Pollutant	Emission Factor ($lb/10^3$ barrels)[1]	Emission Factor Reference	Converted Emission Factor ($lb/10^3$ barrels)	National Activity (barrels)	National Emissions (tons/yr)
2,3,7,8-TCDF	8.05E-08	Reference 4		20,000,000	8.05E-07
2,3,7,8-TCDD	4.61E-09	Reference 4		20,000,000	4.61E-08
Acenaphthene	2.85E-06	Reference 2		20,000,000	2.85E-05
Acenaphthylene	7.07E-07	Reference 2		20,000,000	7.07E-06
Anthracene	2.63E-06	Reference 2		20,000,000	2.63E-05
Benz[a]anthracene	3.54E-07	Reference 2		20,000,000	3.54E-06
Benzo[b]fluoranthene	1.33E-07	Reference 2		20,000,000	1.33E-06
Chrysene	6.63E-08	Reference 2		20,000,000	6.63E-07
Fluoranthene	5.30E-07	Reference 2		20,000,000	5.30E-06
Fluorene	6.32E-06	Reference 2		20,000,000	6.32E-05
Lead	3.50E-04	Reference 3	3.50E-01	20,000,000	3.50E+00
Naphthalene	1.67E-05	Reference 2		20,000,000	1.67E-04
NO_X	2.30E-03	Reference 5	2.30E+00	20,000,000	2.30E+01
Phenanthrene	4.66E-06	Reference 2		20,000,000	4.66E-05
PM10-PRI	2.00E-02	Reference 5	2.00E+01	20,000,000	2.00E+02
PM10-FIL	2.00E-02	Reference 5	2.00E+01	20,000,000	2.00E+02
PM25-PRI	2.00E-02	Reference 5	2.00E+01	20,000,000	2.00E+02
PM25-FIL	2.00E-02	Reference 5	2.00E+01	20,000,000	2.00E+02
Pyrene	6.63E-07	Reference 2		20,000,000	6.63E-06
Total HpCDD	1.18E-07	Reference 4		20,000,000	1.18E-06
Total HpCDF	1.81E-07	Reference 4		20,000,000	1.81E-06
Total HxCDD	7.10E-08	Reference 4		20,000,000	7.10E-07
Total HxCDF	2.69E-07	Reference 4		20,000,000	2.69E-06
Total PeCDD	6.44E-08	Reference 4		20,000,000	6.44E-07
Total PeCDF	5.58E-07	Reference 4		20,000,000	5.58E-06
Total OCDD	8.27E-08	Reference 4		20,000,000	8.27E-07
Total OCDF	4.94E-08	Reference 4		20,000,000	4.94E-07

[1] All emission factors reported in $lb/10^3$ barrels except lead, NO_X, and PM10-FIL, which are reported in lb/barrel.

[2] Emission factors for PM25-PRI and PM25-FIL are not available. The PM25-PRI emission factor was set equal to the PM10-PRI emission factor, and the PM25-FIL emission factor was set equal to the PM10-FIL emission factor.

Sample Calculation: 2,3,7,8-TCDD

$$Emissions = \frac{Emission\ Factor\ (\frac{lb}{10^3\ barrel}) * 2002\ Activity\ (10^3 barrels)}{2000\ lb/ton}$$

$$Emissions = \frac{4.61E-09 \frac{lb}{10^3 barrel} * 20{,}000\ 10^3 barrels}{2000\ lb\ /\ ton} = 4.61\ E-08\ tons$$

DRUM AND BARREL RECLAMATION (continued)
SCC: 2461160000

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3. U.S. Environmental Protection Agency. 1998 *Locating and Estimating Air Emissions From Sources of Lead and Lead Compounds*. Office of Air Quality Planning and Standards. Research Triangle Park, NC.

4. U.S. Environmental Protection Agency. 1997 *Locating and Estimating Air Emissions From Sources of Dioxins and Furans*. Office of Air Quality Planning and Standards. Research Triangle Park, NC

5. U.S. Environmental Protection Agency. Factor Information Retrieval (FIRE) System. Office of Air Quality Planning and Standards. Research Triangle Park, NC, accessed 2002.

6. U.S. Environmental Protection Agency. *1990 Emissions Inventory of Section 112(c)(6) Pollutants: Polycyclic Organic Matter (POM), 2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD)/2,3,7,8-Tetrachlorodibenzofuran (TCDF), Polychlorinated Biphenyl Compounds (PCBs), Hexachlorobenzene, Mercury, and Alkylated Lead*. Office of Air Quality Planning and Standards. Research Triangle Park, NC. 1998.

FLUORESCENT LAMP RECYCLING
SCC: 31301200

National level mercury (Hg) estimates for 2002 from fluorescent lamp recycling were determined by multiplying the number of lamps recycled by an emission factor. The National Electrical Manufacturers Association (NEMA) reported that 660 million lamps were discarded in the United States during 2002.[1] According to NEMA, 142 million of the discarded lamps were recycled. EPA estimates that 0.00088 mg of mercury are released from the recycling process per lamp recycled.[2]

Emissions estimate:

Total 2002 fluorescent lamps recycled = 142,000,000

Total 2002 Hg emissions from recycled lamps = No. of lamps recycled × mg Hg released/lamp recycled
= 142,000,000 lamps × 0.00088 mg Hg/lamp
= 124,960 mg Hg
= 0.000137 tons Hg

Emissions were allocated to the county-level by the county proportion of the national population.[3] Mercury emissions from general laboratory activity in Puerto Rico and the U.S. Virgin Islands was not estimated.

Table 1. National HAP Pollutant Emissions Summary for Fluorescent Lamp Recycling

Pollutant	Emission Factor (mg Hg/ lamp recycled)	Emission Factor Reference	National Activity Level (lamps)	National Emissions (tons/yr)
Mercury	0.00088	Reference 2	142,000,000	1.3774E-04

References:

1. Erdheim, 2003. National Electrical Manufacturers Association (NEMA), Government Affairs, personal communication with Paula Hemmer, E.H. Pechan & Associates, Inc., August, 2003.

2. U.S. Environmental Protection Agency, "Locating and Estimating Air Emissions from Sources of Mercury and Mercury Compounds." December 1997.

3. U.S. Census Bureau. *7/1/2002 County Population Estimates File and Components of Change*, [Data file], April 17, 2003. Available from Population Estimates Branch Web site http://eire.census.gov/popest/estimates_dataset.php

FUGITIVE DUST FROM PAVED ROADS
SCC: 2294000000

Fugitive dust emissions from paved road traffic were estimated for PM10-PRI, PM10-FIL, PM25-PRI, and PM25-FIL. Since there are no PM-CON emissions for this category, PM10-PRI emissions are equal to PM10-FIL emissions and PM25-PRI emissions are equal to PM25-FIL. Table 1 provides a national summary of the 2002 annual vehicle miles traveled (VMT) activity and emissions by pollutant.

Table 1. 2002 National Criteria Air Pollutant Emissions Summary for Fugitive Dust from Paved Roads

Pollutant	Emission Factor Reference	National Activity (Million Miles)	National Emissions (tons/yr)
PM10-FIL	Reference 1	2,762,373	2,073,974
PM10-PRI	Reference 1	2,762,373	2,073,974
PM25-FIL	Reference 1	2,762,373	309,389
PM25-PRI	Reference 1	2,762,373	309,389

Uncontrolled paved road emissions were calculated at the state level by roadway class and month. This was done by multiplying the state/roadway class VMT by the appropriate monthly temporal allocation factor and by the paved road emission factor. After the paved road dust emissions were calculated at the state/road class/monthly level of detail, the uncontrolled emissions were then allocated to the county level using total VMT as a surrogate. Next, control factors were applied to the paved road emissions in PM_{10} nonattainment area counties. Emissions and VMT by roadway class were then totaled to the county level for reporting in the NEI. The following provides further details on the emission factor equation, temporal and spatial allocation procedures, and controls.

Emission Factor Equation

Reentrained road dust emissions for paved roads were estimated using paved road VMT and the emission factor equation from AP-42:[1]

$$E = [k * (sL/2)^{0.65} * (W/3)^{1.5} - C] * [1 - P/(4*N)]$$

where: E = paved road dust emission factor (gram [g]/VMT)
k = particle size multiplier (7.3 g/VMT for PM10-PRI/-FIL and 1.8 g/VMT for PM25-PRI/-FIL)
sL = road surface silt loading (g/square meter [m^2])
W = average weight (tons) of all vehicles traveling the road
C = emission factor for 1980's vehicle fleet exhaust, brake wear, and tire wear
N = number of days in the month
P = number of days in the month with at least 0.01 inches of precipitation

The uncontrolled PM10-PRI/-FIL and PM25-PRI/-FIL emission factors are provided in Appendix C by state, roadway class, and month.

Paved road silt loadings were assigned to each of the twelve functional roadway classes (six urban and six rural) based on the average annual traffic volume of each functional system by state.[2] The resulting paved road silt loadings calculated from the average annual traffic volume data are shown in Table 2.

The AP-42 equation listed above includes a correction factor to adjust for the number of days with measurable precipitation in each month. The factor of "4" in the precipitation adjustment accounts for the fact that paved roads dry more quickly than unpaved roads and that precipitation may not occur over the entire 24-hour day period. The number of days with at least 0.01 inches of precipitation in each month by state was obtained from the National Climatic Data Center.[3] Data were collected from a meteorological station selected to be representative of urban areas within each state. The precipitation data are presented in Appendix C by state and month.

There are cases where the emission factor calculated using the equation above ends up negative due to the subtraction of the C term that accounts for vehicle exhaust, brake wear, and tire wear. In these cases, the emission factor was reset to 0, under the assumption that the emissions have been accounted for in the onroad emission inventory.

Activity

Total annual VMT estimates by state and roadway class were obtained from the Federal Highway Administration's (FHWA) annual Highway Statistics report.[2] Paved road VMT was calculated by subtracting the state/roadway class unpaved road VMT from total state/roadway class VMT.

Allocation

The paved road VMT estimates by state/roadway class were first temporally allocated by season using the National Acid Precipitation Assessment Program (NAPAP) Inventory seasonal temporal allocations factors for VMT.[4] These factors are included in Appendix B. The seasonal VMT values were then multiplied by the ratio of the number of days in a month to the number of days in a season to adjust to monthly VMT. The emission factors were then applied to estimate emissions by month.

The paved road activity and emissions were spatially allocated to counties according to the fraction of total VMT in each county for the specific roadway class as shown by the following equation:

$$EMIS_{x,y} = EMIS_{ST,y} * VMT_{x,y} / VMT_{ST,y}$$

where: $EMIS_{x,y}$ = paved road emissions (tons) for county x and roadway class y
$EMIS_{ST,y}$ = paved road emissions (tons) for the entire state for roadway class y
$VMT_{x,y}$ = total VMT (million miles) in county x and roadway class y
$VMT_{ST,y}$ = total VMT (million miles) in entire state for roadway class y

The county-level VMT by roadway class developed to calculate onroad mobile source emissions was used in this equation.[5] The county-level allocation factors are provided in Appendix B. Note that because of differences in the methodologies for calculating total and unpaved road VMT, there are rural counties where unpaved road VMT was higher than total VMT. For these counties, unpaved VMT was reduced to total VMT and paved road VMT was assigned a value of zero.

Controls

Paved road dust controls were applied by county to urban and rural roads in serious PM_{10} nonattainment areas and to urban roads in moderate PM_{10} nonattainment areas. The assumed control measure is vacuum sweeping of paved roads twice per month. A control efficiency of 79 percent was assumed for this control measure.[6] The assumed rule penetration varies by roadway class and PM_{10} nonattainment area classification (serious or moderate).[6] The rule penetration rates are shown in Table 3. Rule effectiveness was assumed to be 100% for all counties where this control was applied.

Note that the controls were applied at the county/roadway class level, and the controls differ by roadway class. In the NIF 3.0 emissions table, the emissions for all roadway classes were summed to the county level. Therefore, the emissions at the county level can represent several different control, rule effectiveness, and rule penetration levels. As a result, the control efficiency, rule effectiveness, and rule penetration values were reported in the control equipment table as a composite, overall control level for each county; the rule effectiveness and rule penetration values were not reported separately in the emission table.

Table 2. 2002 Silt Loadings by State and Roadway Class Modeled in Paved Road Emission Factor Calculations (g/m^2)

	Rural Roadway Classes						Urban Roadway Classes					
State	Inter-state	Other Principal Arterial	Minor Arterial	Major Collector	Minor Collector	Local	Inter-state	Freeways & Express-ways	Other Principal Arterial	Minor Arterial	Collector	Local
Alabama	0.015	0.06	0.2	0.2	0.2	0.6	0.015	0.015	0.03	0.06	0.2	0.2
Alaska	0.015	0.2	0.2	0.2	0.6	0.6	0.015	0.015	0.03	0.03	0.2	0.2
Arizona	0.015	0.06	0.2	0.2	0.2	0.6	0.015	0.015	0.03	0.03	0.06	0.2
Arkansas	0.015	0.06	0.2	0.2	0.6	0.6	0.015	0.015	0.03	0.06	0.2	0.6
California	0.015	0.03	0.2	0.2	0.2	0.6	0.015	0.015	0.03	0.03	0.2	0.2
Colorado	0.015	0.06	0.2	0.2	0.6	0.6	0.015	0.015	0.03	0.06	0.2	0.2
Connecticut	0.015	0.03	0.2	0.2	0.2	0.6	0.015	0.015	0.03	0.06	0.2	0.2
Delaware	0.015	0.03	0.03	0.2	0.2	0.2	0.015	0.015	0.03	0.03	0.06	0.2
Dist. of Columbia	0.015	0.6	0.6	0.6	0.6	0.6	0.015	0.015	0.03	0.03	0.06	0.2
Florida	0.015	0.03	0.06	0.2	0.2	0.2	0.015	0.015	0.03	0.03	0.06	0.2
Georgia	0.015	0.06	0.2	0.2	0.2	0.6	0.015	0.015	0.03	0.03	0.06	0.2
Hawaii	0.015	0.03	0.06	0.2	0.2	0.2	0.015	0.015	0.03	0.03	0.06	0.2
Idaho	0.015	0.2	0.2	0.2	0.6	0.6	0.015	0.015	0.03	0.06	0.2	0.2
Illinois	0.015	0.06	0.2	0.2	0.6	0.6	0.015	0.015	0.03	0.03	0.06	0.2
Indiana	0.015	0.06	0.06	0.2	0.2	0.6	0.015	0.015	0.03	0.06	0.2	0.2
Iowa	0.015	0.2	0.2	0.2	0.6	0.6	0.015	0.015	0.03	0.06	0.2	0.2
Kansas	0.015	0.2	0.2	0.6	0.6	0.6	0.015	0.015	0.03	0.06	0.2	0.2
Kentucky	0.015	0.06	0.2	0.2	0.2	0.6	0.015	0.015	0.03	0.03	0.2	0.2
Louisiana	0.015	0.06	0.06	0.2	0.2	0.6	0.015	0.015	0.03	0.06	0.2	0.6
Maine	0.015	0.06	0.2	0.2	0.2	0.6	0.015	0.015	0.03	0.06	0.2	0.2
Maryland	0.015	0.03	0.06	0.2	0.2	0.6	0.015	0.015	0.03	0.03	0.06	0.2
Massachusetts	0.015	0.03	0.06	0.2	0.2	0.6	0.015	0.015	0.03	0.06	0.2	0.2
Michigan	0.015	0.06	0.2	0.2	0.2	0.6	0.015	0.015	0.03	0.03	0.2	0.2
Minnesota	0.015	0.06	0.2	0.2	0.6	0.6	0.015	0.015	0.03	0.06	0.2	0.2
Mississippi	0.015	0.06	0.2	0.2	0.2	0.6	0.015	0.015	0.03	0.06	0.2	0.2
Missouri	0.015	0.06	0.2	0.2	0.6	0.6	0.015	0.015	0.03	0.06	0.2	0.2
Montana	0.015	0.2	0.2	0.6	0.6	0.6	0.015	0.015	0.03	0.06	0.2	0.2
Nebraska	0.015	0.2	0.2	0.6	0.6	0.6	0.015	0.015	0.03	0.06	0.2	0.2
Nevada	0.015	0.2	0.2	0.2	0.6	0.6	0.015	0.015	0.03	0.03	0.06	0.2
New Hampshire	0.015	0.03	0.06	0.2	0.2	0.6	0.015	0.015	0.03	0.06	0.2	0.2
New Jersey	0.015	0.03	0.06	0.2	0.2	0.2	0.015	0.015	0.03	0.06	0.2	0.2
New Mexico	0.015	0.2	0.2	0.2	0.2	0.6	0.015	0.015	0.03	0.06	0.2	0.2
New York	0.015	0.06	0.2	0.2	0.2	0.6	0.015	0.015	0.03	0.03	0.06	0.2
North Carolina	0.015	0.03	0.06	0.2	0.2	0.6	0.015	0.015	0.03	0.06	0.2	0.2
North Dakota	0.015	0.2	0.2	0.6	0.6	0.6	0.015	0.015	0.03	0.2	0.2	0.2
Ohio	0.015	0.03	0.2	0.2	0.2	0.6	0.015	0.015	0.03	0.06	0.2	0.2
Oklahoma	0.015	0.06	0.2	0.2	0.6	0.6	0.015	0.015	0.03	0.06	0.2	0.2
Oregon	0.015	0.2	0.2	0.2	0.6	0.6	0.015	0.015	0.03	0.06	0.2	0.2
Pennsylvania	0.015	0.03	0.2	0.2	0.2	0.6	0.015	0.015	0.03	0.06	0.2	0.2
Rhode Island	0.015	0.03	0.06	0.2	0.2	0.6	0.015	0.015	0.03	0.06	0.2	0.6
South Carolina	0.015	0.06	0.06	0.2	0.2	0.6	0.015	0.015	0.03	0.03	0.2	0.6
South Dakota	0.015	0.2	0.2	0.6	0.6	0.6	0.015	0.015	0.03	0.06	0.2	0.6
Tennessee	0.015	0.06	0.2	0.2	0.2	0.6	0.015	0.015	0.03	0.06	0.2	0.2
Texas	0.015	0.06	0.2	0.2	0.6	0.6	0.015	0.015	0.03	0.06	0.2	0.6
Utah	0.015	0.2	0.2	0.2	0.6	0.6	0.015	0.015	0.03	0.03	0.06	0.2
Vermont	0.015	0.06	0.2	0.2	0.2	0.2	0.015	0.015	0.03	0.06	0.2	0.2
Virginia	0.015	0.03	0.2	0.2	0.2	0.6	0.015	0.015	0.03	0.03	0.2	0.2
Washington	0.015	0.06	0.2	0.2	0.6	0.6	0.015	0.015	0.03	0.06	0.2	0.2
West Virginia	0.015	0.06	0.2	0.2	0.2	0.6	0.015	0.015	0.03	0.06	0.2	0.2
Wisconsin	0.015	0.06	0.2	0.2	0.6	0.6	0.015	0.015	0.03	0.06	0.2	0.2
Wyoming	0.015	0.2	0.2	0.2	0.6	0.6	0.015	0.015	0.06	0.2	0.2	0.2

Table 3. Penetration Rate of Paved Road Vacuum Sweeping

PM_{10} Nonattainment Status	Roadway Class	Vacuum Sweeping Penetration Rate
Moderate	Urban Interstate	0.42
Moderate	Urban Freeway & Expressway	0.67
Moderate	Urban Other Principal Arterial	0.90
Moderate	Urban Minor Arterial	0.67
Moderate	Urban Collector	0.64
Moderate	Urban Local	0.88
Serious	Rural Interstate	0.55
Serious	Rural Other Principal Arterial	0.37
Serious	Rural Minor Arterial	0.71
Serious	Rural Major Collector	0.83
Serious	Rural Minor Collector	0.59
Serious	Rural Local	0.35
Serious	Urban Interstate	0.42
Serious	Urban Freeway & Expressway	0.67
Serious	Urban Other Principal Arterial	0.90
Serious	Urban Minor Arterial	0.67
Serious	Urban Collector	0.64
Serious	Urban Local	0.88

References

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FUGITIVE DUST FROM UNPAVED ROADS
SCC: 2296000000

Fugitive dust emissions from unpaved road traffic were estimated for PM10-PRI, PM10-FIL, PM25-PRI, and PM25-FIL. Since there are no PM-CON emissions for this category, PM10-PRI emissions are equal to PM10-FIL emissions and PM25-PRI emissions are equal to PM25-FIL. Table 1 provides a national summary of the 2002 annual VMT activity and emissions by pollutant.

Table 1. 2002 National Criteria Air Pollutant Emissions Summary for Fugitive Dust from Unpaved Roads

Pollutant	Emission Factor Reference	National Activity (Million Miles)	National Emissions (tons/yr)
PM10-FIL	Reference 1	41,041	8,585,509
PM10-PRI	Reference 1	41,041	8,585,509
PM25-FIL	Reference 1	41,041	1,286,432
PM25-PRI	Reference 1	41,041	1,286,432

Uncontrolled unpaved road emissions were calculated at the state level by roadway class and month. This was done by multiplying the state/roadway class unpaved roadway VMT by the appropriate monthly temporal allocation factor and by the monthly unpaved road emission factor. After the unpaved road dust emissions were calculated at the state/roadway class/monthly level of detail, the uncontrolled emissions were then allocated to the county level using 1990 rural population data as a surrogate. Next, control factors were applied to the unpaved road emissions in PM_{10} nonattainment area counties. Emissions and VMT by roadway class were then totaled to the county level for reporting in the NEI. The following provides further details on the emission factor equation, temporal and spatial allocation procedures, and controls.

Emission Factor Equation

Reentrained road dust emissions for unpaved roads were estimated using unpaved road VMT and the emission factor equation from AP-42:[1]

$$E = [k * (s/12)^a * (SPD/30)^b] / (M/0.5)^c - C$$

where k, a, b, and c are empirical constants given in Table 2, and

E = size specific emission factor (lb/VMT)
s = surface material silt content (%)
SPD = mean vehicle speed (mph)
M = surface material moisture content (%)
C = emission factor for 1980's vehicle fleet exhaust, brake wear, and tire wear (lb/VMT)

The uncontrolled emission factors are provided in Appendix C by state, roadway class, and month.

Average state-level unpaved road silt content values, developed as part of the 1985 NAPAP Inventory, were obtained from the Illinois State Water Survey.[2] Silt contents of over 200 unpaved roads from over 30 states were obtained. Average silt contents of unpaved roads were calculated for each sate that had three or more samples for that state. For states that did not have three or more samples, the average for all samples from all states was used as a default value. Appendix C provides a table of the silt content values by state, and identifies if the values were based on a sample average or default value.

Table 2. Constants for Unpaved Roads Reentrained Dust Emission Factor Equation[1]

Constant	PM25-PRI/ PM25-FIL	PM10-PRI/ PM10-FIL
k (lb/VMT)	0.27	1.8
a	1	1
b	0.5	0.5
c	0.2	0.2
C	0.00036	0.00047

Table 3 lists the speeds modeled on the unpaved roads by roadway class. These speeds were determined based on the average speeds modeled for onroad emission calculations and weighted to determine a single average speed for each of the roadway classes. The value of 0.5 percent for M was chosen as the national default as sufficient resources were not available at the time the emissions were calculated to determine more locally-specific values for this variable.

Table 3. Speeds Modeled by Roadway Type on Unpaved Roads

Unpaved Roadway Type	Speed (mph)
Rural Minor Arterial	39
Rural Major Collector	34
Rural Minor Collector	30
Rural Local	30
Urban Other Principal Arterial	20
Urban Minor Arterial	20
Urban Collector	20
Urban Local	20

Correction factors were applied to the emission factors to account for the number of days with a sufficient amount of precipitation to prevent road dust resuspension. Monthly corrected emission factors by state and roadway classification were calculated using the following equation:

$$E_{corr} = E * [(D-p)/D]$$

where: E_{corr} = unpaved road dust emission factor corrected for precipitation effects
E = uncorrected emission factor
D = number of days in the month
p = number of days in the month with at least 0.01 inches of precipitation

FUGITIVE DUST FROM UNPAVED ROADS (continued)
SCC: 2296000000

The number of days with at least 0.01 inches of precipitation in each month was obtained from the National Climatic Data Center.[3] Data were collected from a meteorological station selected to be representative of rural areas within the state. The monthly precipitation data used by state for 2002 are included in Appendix C.

Activity

Unpaved roadway mileage estimates were obtained from the FHWA's annual Highway Statistics report.[4] Unpaved mileage data for 2001 were used, as data for 2002 were not yet available. Separate calculations of VMT were performed for county- and noncounty- (state or federally) maintained roadways. State-level, county-maintained roadway mileage was organized by surface type (rural and urban) and the average daily traffic volume (ADTV) groups shown in Table 4. From these data, state-level unpaved roadway mileage estimates were made. The following equation was then used to calculate state-level unpaved road VMT estimates.

$$VMTUP = ADTV * FSRM * 365 \text{ days/year}$$

where: VMTUP = VMT on unpaved roads (miles/year)
ADTV = average daily traffic volume (vehicles/day/mile)
FSRM = functional system roadway mileage (miles)

State and federally maintained roadway mileage was categorized by arterial classification, not roadway traffic volume; therefore, the VMT was calculated differently than for county-maintained roadways. The ADTV was assumed to not vary by roadway maintenance responsibility, so the ADTV calculated from county-maintained VMT and mileage (ADTV = VMT / Mileage) was used with noncounty-maintained roadway mileage to calculate VMT in the above equation.

Table 4. Assumed Values for Average Daily Traffic Volume (ADTV) by Volume Group

Rural Roads				
Volume Category (vehicles per day per mile)	< 50	50-199	200-499	> 500
Assumed ADTV	5*	125**	350**	550***
Urban Roads				
Volume Category (vehicles per day per mile)	< 200	200-499	500-1999	> 2000
Assumed ADTV	20*	350**	1250**	2200***

Notes: *10% of volume group's maximum range endpoint.
** Average of volume group's range endpoints.
*** 110% of volume group's minimum range endpoint.

Allocation

The unpaved road VMT estimates by state/roadway class were first temporally allocated by season using the NAPAP Inventory seasonal temporal allocations factors for VMT.[5] These factors are included in Appendix B. The seasonal VMT values were then multiplied by the ratio of the number of days in a month to the number of days in a season to adjust to monthly VMT. The emission factors were then applied to estimate emissions by month.

FUGITIVE DUST FROM UNPAVED ROADS (continued)
SCC: 2296000000

The state/roadway class unpaved road emissions were then spatially allocated to each county using estimates of the ratio of 1990 county rural population to the state rural population from the U.S. Census Bureau[6] as shown by the following equation:

$$EMIS_{x,y} = (CL_x / SL) * EMIS_{,y}$$

where: $EMIS_{x,y}$ = unpaved road emissions (tons) for county x and roadway class y
CL_x = rural population in county x
SL = rural population in the state
$EMIS_{,y}$ = unpaved road emissions in entire state for roadway class y

The county-level allocation factors are provided in Appendix B.

Controls

The controls assumed for unpaved roads varied by PM_{10} nonattainment area classification and by urban and rural areas. On urban unpaved roads in moderate PM_{10} nonattainment areas, paving of the unpaved road was assumed, and a control efficiency of 96 percent and a rule penetration of 50 percent were applied. Chemical stabilization, with a control efficiency or 75 percent and a rule penetration of 50 percent, was assumed for rural areas in serious PM_{10} nonattainment areas. A combination of paving and chemical stabilization, with a control efficiency of 90 percent and a rule penetration of 75 percent, was assumed for urban unpaved roads in serious PM_{10} nonattainment areas.[7]

Note that the controls were applied at the county/roadway class level, and the controls differ by roadway class. In the NIF 3.0 emissions table, the emissions for all roadway classes were summed to the county level. Therefore, the emissions at the county level can represent several different control, rule effectiveness, and rule penetration levels. As a result, the control efficiency, rule effectiveness, and rule penetration values were reported in the control equipment table as a composite, overall control level for each county; the rule effectiveness and rule penetration values were not reported separately in the emissions table.

References

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2. W. Barnard, G. Stensland, and D. Gatz, Illinois State Water Survey, "Evaluation of Potential Improvements in the Estimation of Unpaved Road Fugitive Emission Inventories," paper 87-58.1, presented at the 80th Annual Meeting of the APCA . New York, New York. June 21-26, 1987.

3. U.S. Department of Commerce, National Oceanic and Atmospheric Administration. Summary of the Day Element TD-3200, 2002 data provided on CD. National Climatic Data Center. 2003.

4. U.S. Department of Transportation, Federal Highway Administration. *Highway Statistics 2001.* Office of Highway Policy Information. Washington, DC. 2002. Available at http://www.fhwa.dot.gov/ohim/hs01/index.htm.

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6. U.S. Department of Commerce. "1990 Census of Population , Volume I Characteristics of Population," Bureau of the Census. Washington, DC. July 1992.

7. E.H. Pechan & Associates, Inc. "Phase II Regional Particulate Strategies; Task 4: Particulate Control Technology Characterization," draft report prepared for U.S. Environmental Protection Agency, Office of Policy, Planning and Evaluation. Washington, DC. June 1995.

GENERAL LABORATORY ACTIVITIES
SCC: 31503001

National mercury emissions from general laboratory activities are calculated by multiplying the tons of mercury consumed by laboratories by an emission factor. According to the U.S. Geological Survey, (USGS) laboratories in the United States consumed 8 Mg of mercury during the year 2002.[1] EPA estimates that for every Mg of mercury used in laboratories, 40 kg of mercury are emitted.[2]

Emissions estimate:

Total mercury emitted from laboratories = total mercury consumed by laboratories × Emission Factor

Total mercury emitted from laboratories = 8 Mg total mercury × 40 kg mercury released/Mg total mercury

Total mercury emitted from laboratories = 320 kg mercury released = 0.3527 tons mercury released

Emissions were allocated to the county-level by the county proportion of the national population.[3] Appendix B contains population data in database format.

The estimate of mercury consumed in the United States does not include the amount of mercury consumed in Puerto Rico or the U.S. Virgin Islands. Emissions for Puerto Rico and the U.S. Virgin Islands were estimated using the approach outlined in the report text. Broward County in Florida is assumed to be the surrogate county for Puerto Rico. Monroe County in Florida is assumed to be the surrogate for the U.S. Virgin Islands. Emissions for mercury in the surrogate counties were divided by the population of the surrogate counties obtained from the U.S. Census Bureau to estimate emissions on a per capita basis.[3] The per capita emissions were then multiplied by the population in each county of Puerto Rico and the U.S. Virgin Islands to estimate emissions. Using this methodology, EPA estimated 0.00485 tons of mercury was emitted in Puerto Rico and the U.S. Virgin Islands during 2002 from general laboratory activities.

Table 1. National HAP Pollutant Emissions Summary for General Laboratory Activities

Pollutant	Emission Factor (Kg of Hg per Mg of Hg consumed)	Emission Factor Reference	2002 National Activity Level (Mg of Hg consumed)	2002 National Emissions [a] (tons/year)
Mercury	40	Reference 2	8	0.3576

[a] Includes Puerto Rico and the U.S. Virgin Islands

References:

1. Goonan, 2003. Thomas Goonan from the U.S. Geological Survey, U.S. Dept. of Interior, personal communication to Paula Hemmer, E.H. Pechan & Associates, Inc., July 10, 2003.

2. U.S. Environmental Protection Agency, "Mercury Study Report to Congress, Volume II: An Inventory of Anthropogenic Mercury Emissions in the United States. December 1997. EPA-452/R-97-004.

3. U.S. Census Bureau. *7/1/2002 County Population Estimates File and Components of Change*, [Data file], April 17, 2003. Available from Population Estimates Branch Web site http://eire.census.gov/popest/estimates_dataset.php

INDUSTRIAL FUEL COMBUSTION: ANTHRACITE AND BITUMINOUS COAL
SCCs: 2102001000 and 2102002000

The mass of coal consumed by industrial combustion in the U.S. was used to estimate emissions. Coal consumption by energy use sector is presented in State Energy Data 2001 Consumption tables published by the Energy Information Administration (EIA).[1] Year 2001 consumption data were used to estimate 2002 emissions because year 2001 data were the latest data available when this inventory was prepared during November 2004.

EIA data do not distinguish between anthracite and bituminous coal consumption estimates. The EIA table "Domestic and Foreign Distribution of U.S. Coal by State of Origin, 2001," provides state-level industrial coal distribution data for 2001 that was used to estimate anthracite and bituminous coal consumption.[2] The 2001 ratio of anthracite (and bituminous) coal consumption to total coal consumption was used to distribute the EIA's total industrial sector coal consumption data by coal type. Table 1 presents the 2001 anthracite and bituminous coal ratios for each state.

Table 1. 2001 Anthracite and Bituminous Coal Distribution for the Industrial Sector

State	Ratio of Bituminous	Ratio of Anthracite	State	Ratio of Bituminous	Ratio of Anthracite
Alaska	1	0	Montana	0.993	0.007
Alabama	0.9997	0.0003	North Carolina	0.993	0.007
Arkansas	0.973	0.027	North Dakota	1	0
Arizona	1	0	Nebraska	1	0
California	1	0	New Hampshire	0	0
Colorado	0.952	0.048	New Jersey	0.741	0.259
Connecticut	0	0	New Mexico	1	0
District of Columbia	0	0	Nevada	1	0
Delaware	0.958	0.042	New York	0.997	0.003
Florida	1	0	Ohio	0.998	0.002
Georgia	1	0	Oklahoma	1	0
Hawaii	1	0	Oregon	0	0
Iowa	0.985	0.015	Pennsylvania	0.944	0.056
Idaho	1	0	Rhode Island	0	0
Illinois	0.9992	0.0008	South Carolina	0.988	0.012
Indiana	1	0	South Dakota	1	0
Kansas	0.991	0.009	Tennessee	0.996	0.004
Kentucky	0.997	0.003	Texas	0.9998	0.0002
Louisiana	1	0	Utah	1	0
Massachusetts	1	0	Virginia	0.9994	0.0006
Maryland	0.913	0.087	Vermont	0	0
Maine	1	0	Washington	1	0
Michigan	0.9992	0.0008	Wisconsin	0.996	0.004
Minnesota	0.998	0.002	West Virginia	0.996	0.004
Missouri	1	0	Wyoming	0.9994	0.0006
Mississippi	1	0			

INDUSTRIAL FUEL COMBUSTION: ANTHRACITE AND BITUMINOUS COAL (continued)
SCCs: 2102001000 and 2102002000

State-level coal consumption was allocated to each county using *County Business Patterns* employment data for 2001 for NAICS codes 31-33.[3] State coal consumption was allocated to each county using the ratio of the number of industrial sector employees in each county to the total number of industrial sector employees in the state. Year 2001 employment data were used to estimate 2002 emissions because year 2001 data were the latest data available when this inventory was prepared during November 2004. Refer to Appendices B and C for more details on this allocation.

In some cases (see Table 2 below), SO_2 and PM emission factors required information on the sulfur and/or ash content of the coal burned. State-specific sulfur and ash content of anthracite and bituminous coal was obtained from data compiled in preparing the 1999 residential coal combustion emissions estimates.[4] This study mostly relied on data obtained from USGS COALQUAL database. States not included in the database but that reported coal usage were assigned values based on their proximity to coal seams or using an average value for Pennsylvania (see report for details of the analysis). Table 3 presents the bituminous coal sulfur and ash content values used for each state. For anthracite coal, an ash content value of 13.38 and a sulfur content of 0.89 were applied to all states except New Mexico (ash content 16.61%, sulfur content 0.77%), Washington (ash content 12%, sulfur content 0.9%), and Virginia (ash content 13.38%, sulfur content 0.43%).

Table 2. SO_2 and PM Emission Factors for Industrial Anthracite and Bituminous Coal Combustion

Pollutant	Emission Factor (lb/ton)	AP-42 Table
Anthracite Emission Factors (SCC 2102001000)		
PM-CON	0.08	1.2-3
PM10-FIL	1.1 * % Ash	1.2-4
PM25-FIL	0.48 * % Ash	1.2-4
PM10-PRI	1.1 * % Ash + 0.08	1.2-3 and 1.2-4
PM25-PRI	0.48 * % Ash + 0.08	1.2-3 and 1.2-4
Sulfur Dioxide	39 * % Sulfur	1.2-1
Bituminous Emission Factors (SCC 2102002000)		
PM-CON	1.04	1.1-5
PM10-FIL	12	1.1-9
PM25-FIL	1.4	1.1-9
PM10-PRI	13.04	1.1-5 and 1.1-9
PM25-PRI	2.44	1.1-5 and 1.1-9
Sulfur Dioxide	38 * % Sulfur	1.1-3

Note: PM_{10}, $PM_{2.5}$, and condensible PM emission factors for bituminous coal do not require ash content, nor does the condensible PM emission factor for anthracite coal.

Table 3. State-Specific Sulfur Content for Bituminous Coal (SCC 2102002000)

State	Percent Sulfur Content	State	Percent Sulfur Content
Alabama	2.08	Montana	0.60
Alaska	0.31	Nebraska	2.43
Arizona	0.47	Nevada	2.30
Arkansas	1.20	New Hampshire	2.42
California	0.47	New Jersey	2.42
Colorado	0.61	New Mexico	0.75
Connecticut	2.42	New York	2.42
Delaware	1.67	North Carolina	1.62
District of Columbia	1.67	North Dakota	0.97
Florida	1.28	Ohio	3.45
Georgia	1.28	Oklahoma	3.08
Hawaii	1.00	Oregon	0.50
Idaho	0.31	Pennsylvania	2.42
Illinois	3.48	Rhode Island	2.42
Indiana	2.49	South Carolina	1.28
Iowa	4.64	South Dakota	0.97
Kansas	5.83	Tennessee	1.62
Kentucky	1.93	Texas	1.14
Louisiana	0.86	Utah	0.80
Maine	2.42	Vermont	2.42
Maryland	1.67	Virginia	1.19
Massachusetts	2.42	Washington	0.50
Michigan	1.20	West Virginia	1.25
Minnesota	0.97	Wisconsin	1.00
Mississippi	1.24	Wyoming	0.87
Missouri	3.39		

PM10-FIL/PRI and PM25-FIL/PRI emission factors for Industrial Anthracite Coal are based on boilers controlled by multiple cyclones. CE records were added to the NEI using the primary device type code 121 (multiple cyclones). Due to a lack of control efficiency data, the control efficiency fields were left blank in the NEI.

PM10-FIL/PRI and PM25-FIL/PRI emission factors for Industrial Bituminous Coal are based on boilers controlled by multiple cyclone with fly ash reinjection. CE records were added to the NEI using the primary device type code 077 (multiple cyclone with fly ash reinjection). Due to a lack of control efficiency data, the control efficiency fields were left blank in the NEI.

The remaining criteria pollutant and HAP emissions were calculated by multiplying the total coal consumed in each county per year by an emission factor. All emission factors, except for Ammonia, are from AP-42.[5] Ammonia emission factors are from EPA's *Estimating Ammonia Emissions from Anthropogenic Sources, Draft Report*.[6] Table 4 presents a summary of the emission factors, total weight (nationally) of coal burned and the national emissions from industrial anthracite coal combustion (SCC 2103001000). Table 5 presents a summary of the emission factors, total weight (nationally) of coal burned and the national emissions from industrial bituminous coal combustion (SCC 2103002000). For Puerto Rico and the U.S. Virgin Islands, industrial coal combustion emissions were estimated but the emissions are not included in Tables 4 and 5 (see section 2.5 of this report for the methodology used to estimate emissions).

Table 4. National Criteria and HAP Emissions Summary for Industrial Anthracite Coal Combustion (SCC 2102001000): Not Adjusted for Point Source Fuel Consumption

Pollutant	Emission Factor (lb/ton)	Emission Factor Reference	National Throughput (tons)	National Emissions (tons/year)
Ammonia	0.30	Reference 6		
Arsenic	0.00019	Reference 5 (Table 1.2-7)	830,520.49	7.89E-02
Beryllium	0.00031	Reference 5 (Table 1.2-7)	830,520.49	1.29E-01
Biphenyl	0.025	Reference 5 (Table 1.2-5)	830,520.49	1.04E+01
Cadmium	7.10e-05	Reference 5 (Table 1.2-7)	830,520.49	2.95E-02
Carbon Monoxide	0.6	Reference 5 (Table 1.2-2)	830,520.49	2.49E+02
Chromium	0.028	Reference 5 (Table 1.2-7)	830,520.49	1.16E+01
Lead	0.0089	Reference 5 (Table 1.2-3)	830,520.49	3.70E+00
Manganese	0.0036	Reference 5 (Table 1.2-7)	830,520.49	1.49E+00
Mercury	1.30e-04	Reference 5 (Table 1.2-7)	830,520.49	5.40E-02
Naphthalene	0.13	Reference 5 (Table 1.2-5)	830,520.49	5.40E+01
Nickel	0.026	Reference 5 (Table 1.2-7)	830,520.49	1.08E+01
Nitrogen Oxides	9	Reference 5 (Table 1.2-1)	830,520.49	3.74E+03
Phenanthrene	0.0068	Reference 5 (Table 1.2-5)	830,520.49	2.82E+00
PM-CON	0.08	Reference 5 (Table 1.2-3)	830,520.49	3.32E+01
PM10-FIL	1.1*state-specific % ash content	Reference 5 (Table 1.2-4)	830,520.49	6.11E+03
PM25-FIL	0.48*state-specific % ash content	Reference 5 (Table 1.2-4)	830,520.49	2.67E+03
PM10-PRI	1.1*state-specific % ash content + 0.08	Reference 5 (Tables 1.2-3 and 1.2-4)	830,520.49	6.15E+03
PM25-PRI	0.48*state-specific % ash content + 0.08	Reference 5 (Tables 1.2-3 and 1.2-4)	830,520.49	2.70E+03
Selenium	0.0013	Reference 5 (Table 1.2-7)	830,520.49	5.40E-01
Sulfur Dioxide	39*state-specific % sulfur content	Reference 5 (Table 1.2-1)	830,520.49	1.44E+04
Volatile Organic Compounds	0.3	Reference 5 (Table 1.2-6)	830,520.49	1.25E+02

Table 5. National Criteria and HAP Emissions Summary for Industrial Bituminous Coal Combustion (SCC 2102002000): Not Adjusted for Point Source Fuel Consumption

Pollutant	Emission Factor (lb/ton)	Emission Factor Reference	National Throughput (tons)	National Emissions (tons/year)
Ammonia	0.30	Reference 6		
Arsenic	0.010478	Reference 5 (Table 1.1-17)	90,512,991.52	4.74E+02
Cadmium	0.000832	Reference 5 (Table 1.1-17)	90,512,991.52	3.77E+01
Carbon Monoxide	5	Reference 5 (Table 1.1-3)	90,512,991.52	2.26E+05
Chromium	0.032656	Reference 5 (Table 1.1-17)	90,512,991.52	1.48E+03
Formaldehyde	0.005746	Reference 5 (Table 1.1-17)	90,512,991.52	2.60E+02
Hydrochloric Acid	1.2	Reference 5 (Table 1.1-15)	90,512,991.52	5.43E+04
Hydrogen Fluoride	0.15	Reference 5 (Table 1.1-15)	90,512,991.52	6.79E+03
Lead	0.013182	Reference 5 (Table 1.1-17)	90,512,991.52	5.97E+02
Nitrogen Oxides	11	Reference 5 (Table 1.1-3)	90,512,991.52	4.98E+05
PM-CON	1.04	Reference 5 (Table 1.1-5)	90,512,991.52	4.71E+04
PM10-FIL	12	Reference 5 (Table 1.1-9)	90,512,991.52	5.43E+05
PM25-FIL	1.4	Reference 5 (Table 1.1-9)	90,512,991.52	6.34E+04
PM10-PRI	13.04	Reference 5 (Tables 1.1-5 and 1.1-9)	90,512,991.52	5.90E+05
PM25-PRI	2.44	Reference 5 (Tables 1.1-5 and 1.1-9)	90,512,991.52	1.10E+05
Sulfur Dioxide	38*state-specific % sulfur content	Reference 5 (Table 1.1-3)	90,512,991.52	3.36E+06
Volatile Organic Compounds	0.05	Reference 5 (Table 1.1-19)	90,512,991.52	2.26E+03

Example Calculation:

$$National\ Emissions\left(\frac{tons}{year}\right) = \frac{Emission\ Factor\left(\frac{lb}{ton\ coal}\right) \times National\ Activity\left(\frac{tons\ coal\ burned}{year}\right)}{2000\ \frac{lb}{ton}}$$

$$National\ selenium\ emissions\ from\ anthracite\ coal\ combustion = \frac{\frac{1.3\times10^{-1}\ lb}{ton} \times 830{,}520.4948\ tons}{2000\ \frac{lb}{ton}} = 5.40\times10^{-1}\ tons$$

References:

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INDUSTRIAL FUEL COMBUSTION: DISTILLATE OIL
SCC: 2102004000

The state-level volume of distillate oil consumed by industrial combustion in the U.S. was used to estimate emissions. Distillate oil consumption by energy use sector is presented in State Energy Data 2001 Consumption tables published by the Energy Information Administration (EIA).[1] Because 2002 consumption data were not yet available when this inventory was prepared in November 2004, year 2001 consumption data were used to estimate 2002 emissions.

State-level distillate oil consumption was allocated to each county using *County Business Patterns* employment data for 2001 for NAICS codes 31-33.[2] State distillate oil consumption was allocated to each county using the ratio of the number of industrial sector employees in each county to the total number of industrial sector employees in the state. Year 2001 employment data were used to estimate 2002 emissions because year 2001 data were the latest data available when this inventory was prepared during November 2004. Refer to Appendices B and C for more details on this allocation.

Criteria pollutant emission factors for distillate oil are from AP-42.[3] For all counties in the United States, the distillate oil consumed by industrial combustion is assumed to be No. 2 fuel oil with a heating value of 140,000 Btu per gallon and a sulfur content of 0.30%.[4] Dioxin/furan and HAP emission factors are from "Documentation of Emissions Estimation methods for Year 2000 and 2001 Mobile Source and Nonpoint Source Dioxin Inventories"[5] and "Documentation for the 1999 Base Year Nonpoint Area Source National Emission Inventory for Hazardous Air Pollutants,"[6] respectively. Sulfur content was 0.30% and was obtained from data compiled in preparing the 1999 residential coal combustion emissions estimates.[7] The Ammonia emission factor is from EPA's *Estimating Ammonia Emissions from Anthropogenic Sources, Draft Report*.[8]

County-level pollutant emissions were calculated by multiplying the total distillate oil consumed in each county per year by an emission factor. Table 1 is a national summary of the emissions data that contains the emissions factors, total volume of distillate oil burned, and national emissions from industrial combustion of distillate oil. For Puerto Rico and the U.S. Virgin Islands, industrial distillate oil combustion emissions were estimated but the emissions are not included in Tables 4 and 5 (see section 2.5 of this report for the methodology used to estimate emissions).

Table 1. National Emissions Summary for Industrial Distillate Oil Combustion: Not Adjusted for Point Source Fuel Consumption

Pollutant	Emission Factor (lb/thousand gallons)	Emission Factor Reference	National Throughput (thousands of gallons)	National Emissions (tons/year)
1,2,3,4,6,7,8-Heptachlorodibenzofuran	1.39e-09	Reference 5	9,372,397.49	6.51E-06
1,2,3,4,6,7,8-Heptachlorodibenzo-p-Dioxin	3.49e-09	Reference 5	9,372,397.49	1.63E-05
1,2,3,4,7,8,9-Heptachlorodibenzofuran	7.47e-10	Reference 5	9,372,397.49	3.50E-06
1,2,3,4,7,8-Hexachlorodibenzofuran	7.74e-10	Reference 5	9,372,397.49	3.63E-06
1,2,3,4,7,8-Hexachlorodibenzo-p-Dioxin	1.16e-09	Reference 5	9,372,397.49	5.44E-06
1,2,3,6,7,8-Hexachlorodibenzofuran	4.31e-10	Reference 5	9,372,397.49	2.02E-06
1,2,3,6,7,8-Hexachlorodibenzo-p-Dioxin	6.79e-10	Reference 5	9,372,397.49	3.18E-06
1,2,3,7,8,9-Hexachlorodibenzofuran	4.34e-10	Reference 5	9,372,397.49	2.03E-06
1,2,3,7,8,9-Hexachlorodibenzo-p-Dioxin	9.54e-10	Reference 5	9,372,397.49	4.47E-06
1,2,3,7,8-Pentachlorodibenzofuran	5.89e-10	Reference 5	9,372,397.49	2.76E-06
1,2,3,7,8-Pentachlorodibenzo-p-Dioxin	5.37e-10	Reference 5	9,372,397.49	2.52E-06
2,3,4,6,7,8-Hexachlorodibenzofuran	4.58e-10	Reference 5	9,372,397.49	2.15E-06
2,3,4,7,8-Pentachlorodibenzofuran	5.65e-10	Reference 5	9,372,397.49	2.65E-06
2,3,7,8-TCDD	4.88e-10	Reference 5	9,372,397.49	2.29E-06
2,3,7,8-TCDF	3.46e-10	Reference 5	9,372,397.49	1.62E-06
Acenaphthene	2.10e-05	Reference 6	9,372,397.49	9.84E-02
Acenaphthylene	2.52e-07	Reference 6	9,372,397.49	1.18E-03
Acetaldehyde	0.0049	Reference 6	9,372,397.49	2.30E+01

INDUSTRIAL FUEL COMBUSTION: DISTILLATE OIL (continued)
SCC: 2102004000

Table 1 (continued)

Pollutant	Emission Factor (lb/thousand gallons)	Emission Factor Reference	National Throughput (thousands of gallons)	National Emissions (tons/year)
Ammonia	0.8	Reference 8		
Anthracene	1.218e-06	Reference 6	9,372,397.49	5.71E-03
Arsenic	5.60e-04	Reference 6	9,372,397.49	2.62E+00
Benz[a]Anthracene	4.06e-06	Reference 6	9,372,397.49	1.90E-02
Benzene	2.10e-04	Reference 6	9,372,397.49	9.84E-01
Benzo[b+k]Fluoranthene	1.54e-06	Reference 6	9,372,397.49	7.22E-03
Benzo[g,h,i,]Perylene	2.24e-06	Reference 6	9,372,397.49	1.05E-02
Beryllium	4.20e-04	Reference 6	9,372,397.49	1.97E+00
Cadmium	4.20e-04	Reference 6	9,372,397.49	1.97E+00
Carbon Monoxide	5	Reference 3 (Table 1.3-1)	9,372,397.49	2.34E+04
Chromium	4.20e-04	Reference 6	9,372,397.49	1.97E+00
Chrysene	2.38e-06	Reference 6	9,372,397.49	1.12E-02
Dibenzo[a,h]Anthracene	1.68e-06	Reference 6	9,372,397.49	7.87E-03
Fluoranthene	4.90e-06	Reference 6	9,372,397.49	2.30E-02
Fluorene	4.48e-06	Reference 6	9,372,397.49	2.10E-02
Formaldehyde	0.0336	Reference 6	9,372,397.49	1.57E+02
Indeno[1,2,3-c,d]Pyrene	2.10e-06	Reference 6	9,372,397.49	9.84E-03
Lead	1.26e-03	Reference 6	9,372,397.49	5.90E+00
Manganese	8.40e-04	Reference 6	9,372,397.49	3.94E+00
Mercury	4.20e-04	Reference 6	9,372,397.49	1.97E+00
Naphthalene	0.001134	Reference 6	9,372,397.49	5.31E+00
Nickel	0.00042	Reference 6	9,372,397.49	1.97E+00
Nitrogen Oxides	20	Reference 3 (Table 1.3-1)	9,372,397.49	9.37E+04
OCDD	1.03e-08	Reference 5	9,372,397.49	4.83E-05
OCDF	7.47e-10	Reference 5	9,372,397.49	3.50E-06
Phenanthrene	1.05e-05	Reference 6	9,372,397.49	4.92E-02
PM-CON	1.3	Reference 3 (Table 1.3-2)	9,372,397.49	6.09E+03
PM10-FIL	1	Reference 3 (Table 1.3-6)	9,372,397.49	4.69E+03
PM25-FIL	0.25	Reference 3 (Table 1.3-6)	9,372,397.49	1.17E+03
PM10-PRI	2.3	Reference 3 (Tables 1.3-2 and 1.3-6)	9,372,397.49	1.08E+04
PM25-PRI	1.55	Reference 3 (Tables 1.3-2 and 1.3-6)	9,372,397.49	7.26E+03
Pyrene	4.20e-06	Reference 6	9,372,397.49	1.97E-02
Selenium	0.0021	Reference 6	9,372,397.49	9.84E+00
Sulfur Dioxide	142 * % sulfur content	Reference 3 (Table 1.3-1)	9,372,397.49	2.00E+05
Volatile Organic Compounds	0.2	Reference 3 (Table 1.3-3)	9,372,397.49	9.37E+02

Example Calculation:

$$National\ Emissions\left(\frac{tons}{year}\right) = \frac{Emission\ Factor\left(\frac{lb}{MM\ Btu\ Oil}\right) \times \frac{0.14\ MMBtu}{gal} \times \frac{1000\ gallons}{1 thousand\ gallons} \times National\ Activity\left(\frac{thousands\ of\ gal\ oil\ burned}{year}\right)}{2000\ \frac{lb}{ton}}$$

$$National\ selenium\ emissions = \frac{\frac{1.5 \times 10^{-1}\ lb}{MMBtu} \times \frac{0.14\ MMBtu}{gallon} \times \frac{1000\ gallons}{1 thousand\ gallons} \times 9{,}372{,}397.49 thousand\ gal}{2000\ \frac{lb}{ton}} = 9.84\ tons$$

References:

1. U.S. Department of Energy, Energy Information Administration (EIA). State Energy Data 2001 Consumption. Washington, D.C. 2004. Internet Address: http://www.eia.doe.gov/emeu/states/sep_fuel/html/fuel_use_df.html accessed November 2004.

2. DOC, 2003: U.S. Department of Commerce, Bureau of the Census, 2001 *County Business Patterns*, C1-E01-CBPX-01-US1 [Electronic files], Washington, DC. Issued April 2003.

3. U.S. Environmental Protection Agency. Compilation of Air Pollutant Emission Factors, 5th Edition, AP-42, Volume I: Stationary Point and Area Sources. Research Triangle Park, North Carolina. 1996.

4. U.S. Environmental Protection Agency. Emission Factor and Inventory Group. Final Summary of the Development and Results of a Methodology for Calculating Area Source Emissions from Residential Fuel Combustion. Prepared by Pacific Environmental Services, Inc. Research Triangle Park, NC. September 2002. Internet address: http://www.epa.gov/ttn/chief/eiip/techreport/volume03/draft1999_residfuel_inven_apr2003.zip accessed November 2004.

5. U.S. Environmental Protection Agency, Office of Air Quality Planning and Standards. "Documentation of Emissions Estimation methods for Year 2000 and 2001 Mobile Source and Nonpoint Source Dioxin Inventories." Prepared by E.H. Pechan & Associates, Inc., Durham, NC. May 2003.

6. U.S. Environmental Protection Agency, Emission Factors and Inventory Group. "Documentation for the 1999 Base Year Nonpoint Area Source National Emission Inventory for Hazardous Air Pollutants." Prepared by Eastern Research Group, Inc. Morrisville, NC. September 2002.

7. U.S. Environmental Protection Agency. Emission Factor and Inventory Group. Final Summary of the Development and Results of a Methodology for Calculating Area Source Emissions from Residential Fuel Combustion. Prepared by Pacific Environmental Services, Inc. Research Triangle Park, NC. September 2002. Internet address: http://www.epa.gov/ttn/chief/eiip/techreport/volume03/draft1999_residfuel_inven_apr2003.zip accessed November 2004.

8. U.S. Environmental Protection Agency. Emission Factor and Inventory Group. Estimating Ammonia Emissions from Anthropogenic Sources, Draft Report. Prepared by E.H. Pechan and Associates, Inc. Research Triangle Park, NC. September 2003.

INDUSTRIAL FUEL COMBUSTION: KEROSENE
SCC: 2102011000

The state-level volume of kerosene consumed by industrial combustion in the U.S. was used to estimate emissions. Kerosene consumption by energy use sector is available from the Energy Information Administration (EIA).[1] Because 2002 consumption data were not yet available when this inventory was prepared in November 2004, year 2001 consumption data were used to estimate 2002 emissions.

State-level kerosene consumption was allocated to each county using *County Business Patterns* for 2001 for NAICS codes 31-33.[2] State kerosene consumption was allocated to each county using the ratio of the number of industrial sector employees in each county to the total number of industrial sector employees in the state. Year 2001 employment data were used to estimate 2002 emissions because year 2001 data were the latest data available when this inventory was prepared during November 2004. Refer to Appendices B and C for more details on this allocation.

Emission factors for distillate oil were used for kerosene, but the distillate oil emission factors were multiplied by a factor of 135/140 to convert them for this use. This factor is based on the ratio of the heat content of kerosene (135,000 Btu/gallon) to the heat content of distillate oil (140,000 Btu/gallon).[3] Criteria pollutant emission factors are from AP-42.[4] Dioxin/furan and HAP emission factors are from "Documentation of Emissions Estimation methods for Year 2000 and 2001 Mobile Source and Nonpoint Source Dioxin Inventories"[5] and "Documentation for the 1999 Base Year Nonpoint Area Source National Emission Inventory for Hazardous Air Pollutants,"[6] respectively. Distillate sulfur content (0.30%) was used for kerosene as well.[7] The Ammonia emission factor is from EPA's *Estimating Ammonia Emissions from Anthropogenic Sources, Draft Report*.[8]

County-level pollutant emissions were calculated by multiplying the total kerosene consumed in each county per year by an emission factor. Table 1 is a national summary of the emissions data that contains the emissions factors, total volume of kerosene burned, and national emissions from industrial combustion of kerosene. For Puerto Rico and the U.S. Virgin Islands, industrial kerosene combustion emissions were estimated but the emissions are not included in Tables 4 and 5 (see section 2.5 of this report for the methodology used to estimate emissions).

Table 1. National Emissions Summary for Industrial Kerosene Combustion: Not Adjusted for Point Source Fuel Consumption

Pollutant	Emission Factor (lb/thousand gallons)	Emission Factor Reference	National Throughput (thousands of gallons)	National Emissions (tons/year)
1,2,3,4,6,7,8-Heptachlorodibenzofuran	1.34e-09	Reference 5	172,013.63	1.15E-07
1,2,3,4,6,7,8-Heptachlorodibenzo-p-Dioxin	3.36e-09	Reference 5	172,013.63	2.89E-07
1,2,3,4,7,8,9-Heptachlorodibenzofuran	7.20e-10	Reference 5	172,013.63	6.19E-08
1,2,3,4,7,8-Hexachlorodibenzofuran	7.46e-10	Reference 5	172,013.63	6.42E-08
1,2,3,4,7,8-Hexachlorodibenzo-p-Dioxin	1.12e-09	Reference 5	172,013.63	9.63E-08
1,2,3,6,7,8-Hexachlorodibenzofuran	4.16e-10	Reference 5	172,013.63	3.58E-08
1,2,3,6,7,8-Hexachlorodibenzo-p-Dioxin	6.55e-10	Reference 5	172,013.63	5.63E-08
1,2,3,7,8,9-Hexachlorodibenzofuran	4.18e-10	Reference 5	172,013.63	3.60E-08
1,2,3,7,8,9-Hexachlorodibenzo-p-Dioxin	9.20e-10	Reference 5	172,013.63	7.91E-08
1,2,3,7,8-Pentachlorodibenzofuran	5.68e-10	Reference 5	172,013.63	4.88E-08
1,2,3,7,8-Pentachlorodibenzo-p-Dioxin	5.18e-10	Reference 5	172,013.63	4.45E-08

INDUSTRIAL FUEL COMBUSTION: KEROSENE (continued)
SCC: 2102011000

Table 1 (continued)

Pollutant	Emission Factor (lb/thousand gallons)	Emission Factor Reference	National Throughput (thousands of gallons)	National Emissions (tons/year)
2,3,4,6,7,8-Hexachlorodibenzofuran	4.42e-10	Reference 5	172,013.63	3.80E-08
2,3,4,7,8-Pentachlorodibenzofuran	5.44e-10	Reference 5	172,013.63	4.68E-08
2,3,7,8-TCDD	4.71e-10	Reference 5	172,013.63	4.05E-08
2,3,7,8-TCDF	3.34e-10	Reference 5	172,013.63	2.87E-08
Acenaphthene	2.025e-05	Reference 6	172,013.63	1.74E-03
Acenaphthylene	2.43e-07	Reference 6	172,013.63	2.09E-05
Acetaldehyde	0.004725	Reference 6	172,013.63	4.06E-01
Ammonia	0.771428571	Reference 8		
Anthracene	1.1745e-06	Reference 6	172,013.63	1.01E-04
Arsenic	0.00054	Reference 6	172,013.63	4.64E-02
Benz[a]Anthracene	3.915e-06	Reference 6	172,013.63	3.37E-04
Benzene	0.0002025	Reference 6	172,013.63	1.74E-02
Benzo[b+k]Fluoranthene	1.49e-06	Reference 6	172,013.63	1.28E-04
Benzo[g,h,i,]Perylene	2.16e-06	Reference 6	172,013.63	1.86E-04
Beryllium	0.000405	Reference 6	172,013.63	3.48E-02
Cadmium	0.000405	Reference 6	172,013.63	3.48E-02
Carbon Monoxide	4.821428571	Reference 4 (Table 1.3-1)	172,013.63	4.15E+02
Chromium	0.000405	Reference 6	172,013.63	3.48E-02
Chrysene	2.30e-06	Reference 6	172,013.63	1.97E-04
Dibenzo[a,h]Anthracene	1.62e-06	Reference 6	172,013.63	1.39E-04
Fluoranthene	4.725e-06	Reference 6	172,013.63	4.06E-04
Fluorene	4.32e-06	Reference 6	172,013.63	3.72E-04
Formaldehyde	0.0324	Reference 6	172,013.63	2.79E+00
Indeno[1,2,3-c,d]Pyrene	2.025e-06	Reference 6	172,013.63	1.74E-04
Lead	0.001215	Reference 6	172,013.63	1.04E-01
Manganese	0.00081	Reference 6	172,013.63	6.97E-02
Mercury	0.000405	Reference 6	172,013.63	3.48E-02
Naphthalene	0.0010935	Reference 6	172,013.63	9.40E-02
Nickel	0.000405	Reference 6	172,013.63	3.48E-02
Nitrogen Oxides	19.28571429	Reference 4 (Table 1.3-1)	172,013.63	1.66E+03
OCDD	9.93e-09	Reference 5	172,013.63	8.54E-07
OCDF	7.20e-10	Reference 5	172,013.63	6.19E-08
Phenanthrene	0.000010125	Reference 6	172,013.63	8.71E-04
PM-CON	1.253571429	Reference 4 (Table 1.3-2)	172,013.63	1.08E+02
PM10-FIL	0.964285714	Reference 4 (Table 1.3-6)	172,013.63	8.29E+01
PM25-FIL	0.241071429	Reference 4 (Table 1.3-6)	172,013.63	2.07E+01
PM10-PRI	2.217857143	Reference 4 (Tables 1.3-2 and 1.3-6)	172,013.63	1.91E+02
PM25-PRI	1.494642858	Reference 4 (Tables 1.3-2 and 1.3-6)	172,013.63	1.29E+02
Pyrene	4.05e-06	Reference 6	172,013.63	3.48E-04

INDUSTRIAL FUEL COMBUSTION: KEROSENE (continued)
SCC: 2102011000

Table 1 (continued)

Pollutant	Emission Factor (lb/thousand gallons)	Emission Factor Reference	National Throughput (thousands of gallons)	National Emissions (tons/year)
Selenium	0.002025	Reference 6	172,013.63	1.74E-01
Sulfur Dioxide	142 * % sulfur content	Reference 4 (Table 1.3-1)	172,013.63	3.53E+03
Volatile Organic Compounds	0.192857143	Reference 4 (Table 1.3-3)	172,013.63	1.66E+01

Example Calculation:

$$National\ Selenium\ Emissions = \frac{1.5 \times 10^{-5}\ lb}{1\ million\ Btu} \times \frac{0.14\ million\ Btu}{gallon} \times \frac{1000\ gallons}{1\ thousand\ gallons}$$

$$\times \frac{135}{140} \times 172{,}013.6275\ thousands\ of\ gallons \times \frac{1\ ton}{2000\ lbs} = 1.74 \times 10^{-1}\ tons$$

$$National\ Emissions\left(\frac{lbs}{year}\right) = Distillate\ Emission\ Factor\left(\frac{lb}{million\ Btu}\right) \times \frac{.14\ million\ Btu}{gallon} \times \frac{1000\ gallons}{1\ thousand\ gallons} \times$$

$$Distillate\ to\ Kerosene\ Conversion\left(\frac{135}{140}\right) \times National\ Activity\left(\frac{1000\ barrels}{year}\right) \times \frac{1\ ton}{2000\ lbs}$$

INDUSTRIAL FUEL COMBUSTION: KEROSENE (continued)
SCC: 2102011000

References:

1. U.S. Department of Energy, Energy Information Administration (EIA). State Energy Data 2001 Consumption. Washington, D.C. 2004. Internet Address: http://www.eia.doe.gov/emeu/states/sep_fuel/html/fuel_ks.html accessed November 2004.

2. DOC, 2003: U.S. Department of Commerce, Bureau of the Census, 2001 *County Business Patterns*, C1-E01-CBPX-01-US1 [Electronic files], Washington, DC. Issued April 2003.

3. U.S. Environmental Protection Agency. Emission Factor and Inventory Group. Final Summary of the Development and Results of a Methodology for Calculating Area Source Emissions from Residential Fuel Combustion. Prepared by Pacific Environmental Services, Inc. Research Triangle Park, NC. September 2002. Internet address: http://www.epa.gov/ttn/chief/eiip/techreport/volume03/draft1999_ residfuel_inven_apr2003.zip accessed November 2004.

4. U.S. Environmental Protection Agency. Compilation of Air Pollutant Emission Factors, 5th Edition, AP-42, Volume I: Stationary Point and Area Sources. Research Triangle Park, North Carolina. 1996.

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6. U.S. Environmental Protection Agency, Emission Factors and Inventory Group. "Documentation for the 1999 Base Year Nonpoint Area Source National Emission Inventory for Hazardous Air Pollutants." Prepared by Eastern Research Group, Inc. Morrisville, NC. September 2002.

7. U.S. Environmental Protection Agency. Emission Factor and Inventory Group. Final Summary of the Development and Results of a Methodology for Calculating Area Source Emissions from Residential Fuel Combustion. Prepared by Pacific Environmental Services, Inc. Research Triangle Park, NC. September 2002. Internet address: http://www.epa.gov/ttn/chief/eiip/techreport/volume03/draft1999_ residfuel_inven_apr2003.zip accessed November 2004.

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INDUSTRIAL FUEL COMBUSTION: NATURAL GAS
SCC: 2102006000

The state-level volume of natural gas consumed by industrial combustion in the United States was used to estimate emissions. Natural gas consumption by energy use sector is presented in State Energy Data 2001 Consumption tables published by the EIA.[1] Year 2001 consumption data were used to estimate 2002 emissions because these data were the latest data available when this inventory was prepared during November 2004.

State-level natural gas consumption was allocated to each county using *County Business Patterns* for 2001 for NAICS codes 31-33.[2] State natural gas consumption was allocated to each county using the ratio of the number of industrial sector employees in each county to the total number of industrial sector employees in the state. Year 2001 employment data were used to estimate 2002 emissions because year 2001 data were the latest data available when this inventory was prepared during November 2004. Refer to Appendices B and C for more details on this allocation.

Criteria pollutant emission factors for natural gas are from AP-42.[3] HAP emission factors are from AP-42 and "Documentation for the 1999 Base Year Nonpoint Area Source National Emission Inventory for Hazardous Air Pollutants."[4] According to AP-42 (maximum value provided)[3], natural gas has a heat content of 1050 million Btus per million cubic feet. This value was required to convert those emission factors originally given in units "pounds per million Btu" to units "pounds per million cubic feet." (For an illustration of this conversion factor's implementation, See the example calculation below.) 2000 grains of sulfur per million cubic feet are assumed.[5] The Ammonia emission factor is from EPA's *Estimating Ammonia Emissions from Anthropogenic Sources, Draft Report*.[6]

County-level criteria pollutant and HAP emissions were calculated by multiplying the total natural gas consumed in each county per year by an emission factor. Table 1 is a national summary of the emissions data that contains the emissions factors, total volume of natural gas burned, and national criteria pollutant and HAP emissions from industrial combustion of natural gas. For Puerto Rico and the U.S. Virgin Islands, industrial natural gas combustion emissions were estimated but the emissions are not included in Tables 4 and 5 (see section 2.5 of this report for the methodology used to estimate emissions).

Table 1. National Criteria Pollutant and HAP Emissions Summary for Industrial Natural Gas Combustion: Not Adjusted for Point Source Fuel Consumption

Pollutant	Emission Factor (lb/million cubic feet)	Emission Factor Reference	National Throughput (millions of cubic feet)	National Emissions (tons/year)
Acetaldehyde	0.00001365	Reference 4	8,451,855	5.77E-02
Ammonia	7.74	Reference 6		
Benzene	0.0021	Reference 3 (Table 1.4-3)	8,451,855	8.87E+00
Carbon Monoxide	84	Reference 3 (Table 1.4-1)	8,451,855	3.55E+05
Fluoranthene	3.15e-06	Reference 4	8,451,855	1.33E-02
Fluorene	2.94e-06	Reference 4	8,451,855	1.24E-02
Formaldehyde	0.07875	Reference 4	8,451,855	3.33E+02
Lead	0.0005	Reference 3 (Table 1.4-2)	8,451,855	2.11E+00
Naphthalene	0.0006405	Reference 4	8,451,855	2.71E+00
Nitrogen Oxides	100	Reference 3 (Table 1.4-1)	8,451,855	4.23E+05
Phenanthrene	0.00001785	Reference 4	8,451,855	7.54E-02

INDUSTRIAL FUEL COMBUSTION: NATURAL GAS (continued)
SCC: 2102006000

Table 1 (continued)

Pollutant	Emission Factor (lb/million cubic feet)	Emission Factor Reference	National Throughput (millions of cubic feet)	National Emissions (tons/year)
PM-CON	5.7	Reference 3 (Table 1.4-2)	8,451,855	2.41E+04
PM10-FIL	1.9	Reference 3 (Table 1.4-2)	8,451,855	8.03E+03
PM25-FIL	1.9	Reference 3 (Table 1.4-2)	8,451,855	8.03E+03
PM10-PRI	7.6	Reference 3 (Table 1.4-2)	8,451,855	3.21E+04
PM25-PRI	7.6	Reference 3 (Table 1.4-2)	8,451,855	3.21E+04
Pyrene	5.25e-06	Reference 4	8,451,855	2.22E-02
Sulfur Dioxide	0.6	Reference 3 (Table 1.4-2)	8,451,855	2.54E+03
Volatile Organic Compounds	5.5	Reference 3 (Table 1.4-2)	8,451,855	2.32E+04

Example Calculation:

$$National\ Emissions\left(\frac{tons}{year}\right) = \frac{Emission\ Factor\left(\frac{lb}{MMBtu}\right) \times \frac{1050\ MMBtu}{million\ ft^3} \times National\ Activity\left(\frac{million\ ft^3\ nat\ gas}{year}\right)}{2000\ \frac{lb}{ton}}$$

$$National\ fluorene\ emissions = \frac{\frac{2.8 \times 10^{-9}\ lb}{MMBtu} \times \frac{1050\ MMBtu}{million\ ft^3} \times\ 8{,}451{,}855\ million\ ft^3}{2000\ \frac{tons}{yr}} = 1.24 \times 10^{-2}\ tons$$

INDUSTRIAL FUEL COMBUSTION: NATURAL GAS (continued)
SCC: 2102006000

References:

1. U.S. Department of Energy, Energy Information Administration (EIA). State Energy Data 2001 Consumption. Washington, D.C. 2004. Internet Address: http://www.eia.doe.gov/emeu/states/sep_fuel/html/fuel_use_ng.html accessed November 2004.

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4. U.S. Environmental Protection Agency, Emission Factors and Inventory Group. "Documentation for the 1999 Base Year Nonpoint Area Source National Emission Inventory for Hazardous Air Pollutants." Prepared by Eastern Research Group, Inc. Morrisville, NC. September 2002.

5. U.S. Environmental Protection Agency. Emission Factor and Inventory Group. Final Summary of the Development and Results of a Methodology for Calculating Area Source Emissions from Residential Fuel Combustion. Prepared by Pacific Environmental Services, Inc. Research Triangle Park, NC. September 2002. Internet address: http://www.epa.gov/ttn/chief/eiip/techreport/volume03/draft1999_ residfuel_inven_apr2003.zip accessed November 2004.

6. U.S. Environmental Protection Agency. Emission Factor and Inventory Group. Estimating Ammonia Emissions from Anthropogenic Sources, Draft Report. Prepared by E.H. Pechan and Associates, Inc. Research Triangle Park, NC. September 2003.

INDUSTRIAL FUEL COMBUSTION: RESIDUAL OIL
SCC: 2102005000

The volume of residual oil consumed by the industrial sector in the U.S. was used to estimate emissions. Residual oil consumption by energy use sector is presented in State Energy Data 2001 Consumption tables published by the Energy Information Administration (EIA).[1] Year 2001 consumption data were used to estimate 2002 emissions because year 2001 data were the latest data available when this inventory was prepared during November 2004.

State-level residual oil consumption was allocated to each county using *County Business Patterns* employment data for 2001 for NAICS codes 31-33.[2] State residual oil consumption was allocated to each county using the ratio of the number of industrial sector employees in each county to the total number of industrial sector employees in the state. Year 2001 employment data were used to estimate 2002 emissions because year 2001 data were the latest data available when this inventory was prepared during November 2004. Refer to Appendices B and C for more details on this allocation.

Criteria pollutant emission factors for residual oil are from AP-42.[3] Dioxin/furan and HAP emission factors are from "Documentation of Emissions Estimation methods for Year 2000 and 2001 Mobile Source and Nonpoint Source Dioxin Inventories"[4] and "Documentation for the 1999 Base Year Nonpoint Area Source National Emission Inventory for Hazardous Air Pollutants,"[5] respectively. According to AP-42 (page 1.3-8)[3], #4, #5, and #6 residual oil have a heat content of 150 million Btus per thousand gallons. Those emission factors that were originally provided on a Btu basis were converted to physical units using this factor (the example calculation below shows an instance in which this conversion was performed). Sulfur content was 2.25% and was the midpoint of the range of values provided in Appendix A of AP-42.[3] The Ammonia emission factor is from EPA's *Estimating Ammonia Emissions from Anthropogenic Sources, Draft Report*.[6]

County-level pollutant emissions were calculated by multiplying the total residual oil consumed in each county per year by an emission factor. Table 1 is a national summary of the emissions data that contains the emissions factors, total volume of residual oil burned, and national emissions from industrial combustion of residual oil. For Puerto Rico and the U.S. Virgin Islands, industrial residual oil combustion emissions were estimated but the emissions are not included in Tables 4 and 5 (see section 2.5 of this report for the methodology used to estimate emissions).

Table 1. National Emissions Summary for Industrial Residual Oil Combustion: Not Adjusted for Point Source Fuel Consumption

Pollutant	Emission Factor (lb/thousand gallons)	Emission Factor Reference	National Throughput (thousands of gallons)	National Emissions (tons/year)
1,2,3,4,6,7,8-Heptachlorodibenzofuran	1.39e-09	Reference 4	1,357,817.10	9.43E-07
1,2,3,4,6,7,8-Heptachlorodibenzo-p-Dioxin	3.49e-09	Reference 4	1,357,817.10	2.37E-06
1,2,3,4,7,8,9-Heptachlorodibenzofuran	7.47e-10	Reference 4	1,357,817.10	5.07E-07
1,2,3,4,7,8-Hexachlorodibenzofuran	7.74e-10	Reference 4	1,357,817.10	5.25E-07
1,2,3,4,7,8-Hexachlorodibenzo-p-Dioxin	1.16e-09	Reference 4	1,357,817.10	7.88E-07
1,2,3,6,7,8-Hexachlorodibenzofuran	4.31e-10	Reference 4	1,357,817.10	2.93E-07
1,2,3,6,7,8-Hexachlorodibenzo-p-Dioxin	6.79e-10	Reference 4	1,357,817.10	4.61E-07
1,2,3,7,8,9-Hexachlorodibenzofuran	4.34e-10	Reference 4	1,357,817.10	2.95E-07
1,2,3,7,8,9-Hexachlorodibenzo-p-Dioxin	9.54e-10	Reference 4	1,357,817.10	6.48E-07
1,2,3,7,8-Pentachlorodibenzofuran	5.89e-10	Reference 4	1,357,817.10	4.00E-07
1,2,3,7,8-Pentachlorodibenzo-p-Dioxin	5.37e-10	Reference 4	1,357,817.10	3.65E-07

Table 1 (continued)

Pollutant	Emission Factor (lb/thousand gallons)	Emission Factor Reference	National Throughput (thousands of gallons)	National Emissions (tons/year)
2,3,4,6,7,8-Hexachlorodibenzofuran	4.58e-10	Reference 4	1,357,817.10	3.11E-07
2,3,4,7,8-Pentachlorodibenzofuran	5.65e-10	Reference 4	1,357,817.10	3.83E-07
2,3,7,8-TCDD	4.88e-10	Reference 4	1,357,817.10	3.31E-07
2,3,7,8-TCDF	3.46e-10	Reference 4	1,357,817.10	2.35E-07
Acenaphthene	2.25e-05	Reference 5	1,357,817.10	1.53E-02
Acenaphthylene	2.70e-07	Reference 5	1,357,817.10	1.83E-04
Acetaldehyde	0.00525	Reference 5	1,357,817.10	3.56E+00
Ammonia	0.8	Reference 6		
Anthracene	1.305e-06	Reference 5	1,357,817.10	8.86E-04
Arsenic	0.00141	Reference 5	1,357,817.10	9.57E-01
Benz[a]Anthracene	4.35e-06	Reference 5	1,357,817.10	2.95E-03
Benzene	0.000225	Reference 5	1,357,817.10	1.53E-01
Benzo[b+k]Fluoranthene	1.65e-06	Reference 5	1,357,817.10	1.12E-03
Benzo[g,h,i,]Perylene	2.40e-06	Reference 5	1,357,817.10	1.63E-03
Beryllium	3.00e-05	Reference 5	1,357,817.10	2.04E-02
Cadmium	4.20e-04	Reference 5	1,357,817.10	2.85E-01
Carbon Monoxide	5	Reference 3 (Table 1.3-1)	1,357,817.10	3.39E+03
Chromium	9.00e-04	Reference 5	1,357,817.10	6.11E-01
Chrysene	2.55e-06	Reference 5	1,357,817.10	1.73E-03
Dibenzo[a,h]Anthracene	1.80e-06	Reference 5	1,357,817.10	1.22E-03
Fluoranthene	5.25e-06	Reference 5	1,357,817.10	3.56E-03
Fluorene	4.80e-06	Reference 5	1,357,817.10	3.26E-03
Formaldehyde	3.60e-02	Reference 5	1,357,817.10	2.44E+01
Indeno[1,2,3-c,d]Pyrene	2.25e-06	Reference 5	1,357,817.10	1.53E-03
Lead	1.65e-03	Reference 5	1,357,817.10	1.12E+00
Manganese	3.15e-03	Reference 5	1,357,817.10	2.14E+00
Mercury	0.0001215	Reference 5	1,357,817.10	8.25E-02
Naphthalene	0.001215	Reference 5	1,357,817.10	8.25E-01
Nickel	0.09	Reference 5	1,357,817.10	6.11E+01
Nitrogen Oxides	55	Reference 3 (Table 1.3-1)	1,357,817.10	3.73E+04
OCDD	1.03e-08	Reference 4	1,357,817.10	6.99E-06
OCDF	7.47e-10	Reference 4	1,357,817.10	5.07E-07
Phenanthrene	1.125e-05	Reference 5	1,357,817.10	7.64E-03

Table 1 (continued)

Pollutant	Emission Factor (lb/thousand gallons)	Emission Factor Reference	National Throughput (thousands of gallons)	National Emissions (tons/year)
PM-CON	1.5	Reference 3 (Table 1.3-2)	1,357,817.10	1.02E+03
PM10-FIL	7.17*(1.12 * % sulfur content + 0.37)	Reference 3 (Table 1.3-5)	1,357,817.10	1.41E+04
PM25-FIL	4.67*(1.12 * % sulfur content + 0.37)	Reference 3 (Table 1.3-5)	1,357,817.10	9.16E+03
PM10-PRI	7.17*(1.12 * % sulfur content + 0.37) + 1.5	Reference 3 (Tables 1.3-2 and 1.3-5)	1,357,817.10	1.51E+04
PM25-PRI	4.67*(1.12 * % sulfur content + 0.37) + 1.5	Reference 3 (Tables 1.3-2 and 1.3-5)	1,357,817.10	1.02E+04
Pyrene	0.0000045	Reference 5	1,357,817.10	3.06E-03
Selenium	0.000735	Reference 5	1,357,817.10	4.99E-01
Sulfur Dioxide	157 * % sulfur content	Reference 3 (Table 1.3-1)	1,357,817.10	2.40E+05
Volatile Organic Compounds	0.28	Reference 3 (Table 1.3-3)	1,357,817.10	1.90E+02

Example Calculation:

$$National\ Emissions\left(\frac{tons}{year}\right) = \frac{Emission\ Factor\left(\frac{lb}{MMBtu}\right) \times \frac{150\ MMBtu}{thousand\ gallons} \times National\ Activity\left(\frac{thousands\ of\ gal\ oil\ burned}{year}\right)}{2000\ \frac{lb}{ton}}$$

$$National\ selenium\ emissions = \frac{\frac{0.0000049\ lb}{MMBtu} \times \frac{150\ MMBtu}{thousand\ gallons} \times 1{,}357{,}817.104 thousand\ gal}{2000\ \frac{lb}{ton}} = 4.99 \times 10^{-1}\ tons$$

INDUSTRIAL FUEL COMBUSTION: RESIDUAL OIL (continued)
SCC: 2102005000

References:

1. U.S. Department of Energy, Energy Information Administration (EIA). State Energy Data 2001 Consumption. Washington, D.C. 2004. Internet Address: http://www.eia.doe.gov/emeu/states/sep_fuel/html/fuel_rf.html accessed November 2004.

2. DOC, 2003: U.S. Department of Commerce, Bureau of the Census, 2001 *County Business Patterns*, C1-E01-CBPX-01-US1 [Electronic files], Washington, DC. Issued April 2003.

3. U.S. Environmental Protection Agency. Compilation of Air Pollutant Emission Factors, 5th Edition, AP-42, Volume I: Stationary Point and Area Sources. Research Triangle Park, North Carolina. 1996.

4. U.S. Environmental Protection Agency, Office of Air Quality Planning and Standards. "Documentation of Emissions Estimation methods for Year 2000 and 2001 Mobile Source and Nonpoint Source Dioxin Inventories." Prepared by E.H. Pechan & Associates, Inc., Durham, NC. May 2003.

5. U.S. Environmental Protection Agency, Emission Factors and Inventory Group. "Documentation for the 1999 Base Year Nonpoint Area Source National Emission Inventory for Hazardous Air Pollutants." Prepared by Eastern Research Group, Inc. Morrisville, NC. September 2002.

6. U.S. Environmental Protection Agency. Emission Factor and Inventory Group. Estimating Ammonia Emissions from Anthropogenic Sources, Draft Report. Prepared by E.H. Pechan and Associates, Inc. Research Triangle Park, NC. September 2003.

LAMP BREAKAGE
SCC: 2861000000

According to NEMA, 660 million lamps containing 9 tons of mercury were either discarded into landfills or recycled in the year 2002.[1] NEMA estimated that approximately 142 million broken lamps were recycled and 518 million were sent to landfills. EPA estimates that of all lamps sent to landfills, only 6.6% of the mercury contained in the lamps is released into the atmosphere.[4]

Emissions estimate:

Percentage of lamps sent to landfills	= 518 million/660 million × 100% = 78.5%
Amount of Hg sent to landfills	= 9 tons Hg × 78.5% = 7.0636 tons Hg discarded to landfills
National Emissions	= 7.0636 tons Hg sent to landfills × 6.6% Hg released = 0.4662 tons Hg released

Mercury emissions are not subject to the proposed Municipal Solid Waste Landfills MACT[2], and any control devices required by the MACT do not effectively control mercury emissions.[3] Therefore, mercury emissions from landfills are not assumed to have any controls.

Mercury emissions are allocated to the county-level by county proportion of the national population.[5] Appendix B contains population data in database format.

The estimate of mercury consumed in the United States does not include the amount of mercury consumed in Puerto Rico or the U.S. Virgin Islands. Emissions were not estimated for Puerto Rico because this category did not appear in the 1996 HAP inventory for this territory. Emissions for the U.S. Virgin Islands were estimated using the approach outlined in the report text. Monroe County in Florida is assumed to be the surrogate for the U.S. Virgin Islands. Emissions for mercury in Monroe County were divided by the population obtained from the U.S. Census Bureau to estimate emissions on a per capita basis.[3] The per capita emissions estimate was then multiplied by the population in each county of the U.S. Virgin Islands to estimate emissions. Using this methodology, EPA estimated 0.0001759 tons of mercury was emitted in the U.S. Virgin Islands during 2002 from lamp breakage.

Table 1. National HAP Pollutant Emissions Summary for Lamp Breakage

Pollutant	Emission Factor (% of Hg in lamps)	Emission Factor Reference	2002 National Activity Level (tons of Hg in lamps)	2002 National Emissions [a] (tons/yr)
Mercury	6.6	Reference 2	7.065	0.4664

[a] Includes the U.S. Virgin Islands

References:

1. Erdheim, 2003. National Electrical Manufacturers Association (NEMA), Government Affairs, personal communication with Paula Hemmer, E.H. Pechan & Associates, Inc., August, 2003.

2. National Emission Standards for Hazardous Air Pollutants: Proposed Standards for Municipal Solid Waste Landfills. Federal Register 58. Pages 66672-66685.

3. U.S. Environmental Protection Agency. Section 2.4 of Compilation of Air Pollutant Emissions Factors, 5th Edition, AP-42, Volume I: Stationary Point and Area Sources. Research Triangle Park, North Carolina. 1996.

LAMP BREAKAGE (continued)
SCC: 2861000000

4. U.S. Environmental Protection Agency, "Mercury Study Report to Congress, Volume II: An Inventory of Anthropogenic Mercury Emissions in the United States. December 1997. EPA-452/R-97-004.

5. U.S. Census Bureau. *7/1/2002 County Population Estimates File and Components of Change*, [Data file], April 17, 2003. Available from Population Estimates Branch Web site http://eire.census.gov/popest/estimates_dataset.php

6. National Electrical Manufacturer's Association, "Environmental Impact Analysis: Spent Mercury-Containing Lamps." January 2000.

NON-RESIDENTIAL CONSTRUCTION
SCC: 2311020000

Primary PM_{10} and $PM_{2.5}$ area source emissions were estimated for non-residential construction. Emissions for this source category are all primary; there are no condensible emissions. Emissions from non-residential construction activity are a function of the acreage disturbed for non-residential construction.[1] Non-residential construction activity is developed from data obtained from the U.S. Department of Commerce (DOC)'s Bureau of the Census.[2] Emissions from non-residential construction in Puerto Rico and the U.S. Virgin Islands was not estimated.

The national value of non-residential construction put in place (in millions of dollars) was allocated to counties using county-level non-residential construction (NAICS Code 2362) employment data obtained from the Bureau of Labor Statistics (BLS) Quarterly Census of Employment and Wages (QCEW) program.[3] For many counties, employment data from the BLS was withheld (not reported). In these cases, the BLS county employment data was supplemented with Dun & Bradstreet (D&B) county non-residential construction employment data.[4] State non-residential construction employment totals from the BLS included employment numbers for the counties where county-level employment data was withheld. A ratio of D&B county-to-state employment was applied to the BLS State employment totals to estimate county-level non-residential construction employment for those counties where employment data was withheld. Appendix B contains the non-residential construction employment data by county.

To estimate the number of acres disturbed by non-residential construction, a conversion factor of 1.55 acres/10^6 dollars was applied to the county-level construction valuation data. This conversion factor was developed by adjusting the 1999 value of 2 acres/10^6 dollars to 2002 constant dollars using the Price and Cost Indices for Construction.[5]

Emission Factors

Initial PM_{10} emissions from construction of non-residential buildings are calculated using an emission factor of 0.19 tons/acre/month. The duration of construction activity for non-residential construction is assumed to be 11 months.

Adjustments

Regional variances in construction emissions are corrected using soil moisture level, silt content, and control efficiency. These correction parameters are applied to initial PM_{10} emissions from non-residential construction to develop the final emissions inventory.

To account for the soil moisture level, the PM_{10} emissions are weighted using the precipitation-evaporation (PE) values from Thornthwaite's PE Index. Average precipitation evaporation values for each State were estimated based on PE values for specific climatic divisions within a State. These values range from 7 to 41.

To account for the silt content, thePM_{10} emissions are weighted using average silt content for each county. A data base containing county-level dry silt values was complied. These values were derived by applying a correction factor developed by the California Air Resources Board to convert wet silt values to dry silt values.[6]

The equation for PM_{10} emissions corrected for soil moisture and silt content is:

$$Corrected\ E_{PM10} = Initial\ E_{PM10} \times \frac{24}{PE} \times \frac{S}{9\%}$$

where: Corrected E_{PM10} = PM_{10} emissions corrected for soil moisture and silt content,
PE = precipitation-evaporation value for each State,

NON-RESIDENTIAL CONSTRUCTION (continued)
SCC: 2311020000

S = % dry silt content in soil for area being inventoried.

Nonattainment areas are assumed to require controls for PM emissions from non-residential construction activity. A control efficiency of 50 percent is assumed for both PM_{10} and $PM_{2.5}$ in nonattainment areas.

Once PM_{10} estimates are developed, $PM_{2.5}$ emissions are estimated by applying a particle size multiplier of 0.20 to PM_{10} emissions.[1]

It is important to note that the non-residential construction values represent total emissions. When the 2002 point source NEI is released, it will be necessary to determine whether there are point source emissions in SCCs 31100101 through 31100103 that may need to be subtracted to yield the nonpoint source emission estimates for this category.

Table 1. National Emissions Summary for Non-Residential Construction

Pollutant	Emission Factor	Emission Factor Reference	National Activity Level (Reference 2,3)	National Emissions (tons/year)
PM10-PRI	0.19	Reference 1	258,980	622,723
PM25-PRI	0.038	Reference 1	258,980	124,545

References:

1. U.S. Environmental Protection Agency, Office of Air Quality Planning and Standards. "Technical Memorandum: Revised Methodology for Estimating Emissions from Construction." Prepared by E.H. Pechan & Associates. Research Triangle Park, NC. September 2000.

2. U.S. Department of Commerce, Bureau of the Census. Construction Statistics. *Annual Value of Construction Put in Place in the U.S. 1998-2002*. 2002.

3. U.S. Department of Labor, Bureau of Labor Statistics, Quarterly Census of Employment and Wages Program. *County Employment and Wages, 2002*. 2002.

4. Dun & Bradstreet, *MarketPlace* CD-ROM, Jan-Mar, 2002.

5. U.S. Department of Commerce, Bureau of the Census. Construction Statistics. *Annual Construction Cost Indexes (1964 to 2002)*. 2002.

6. Campbell, 1996: Campbell, S.G., D.R. Shimp, and S.R. Francis. *Spatial Distribution of PM-10 Emissions from Agricultural Tilling in the San Joaquin Valley*, pp. 119-127 in Geographic Information Systems in Environmental Resources Management, Air and Waste Management Association, Reno, NV. 1996.

OPEN BURNING - FOREST WILDFIRES
SCC: 2810001000

2002 wildfire emission estimates were calculated as follows.

(1) Obtained acres burned data at the State-level from the following sources: a) U.S. Department of Interior (DOI) Bureau of Land Management (BLM); b) the National Parks Service (NPS); c) the U.S. Fish and Wildlife Service (FWS); d) U.S. Forest Service (USFS); and e) State/private lands (from USFS). DOI's Bureau of Indian Affairs (BIA) regional-level acres burned data were obtained from the National Interagency Coordination Center's (NICC) end-of-year Incident Management Report (27-Dec-2002). These data were allocated to the State-level by determining the NICC region for each State with tribal land and then developing a region-to-State proportion using the number of acres of tribal land in each State. Table 1 shows the State-level number of wildfire acres burned by land ownership category;

(2) Allocated the activity to the county-level. This was accomplished using acreage data for rural and urban forest categories and from brush and grass in the miscellaneous category, which were obtained from Version 2 of the Biogenic Emissions Land Cover Database (BELD2) within EPA's Biogenic Emission Inventory System (BEIS). Activity data from all agencies were totaled by State and allocated to the county-level with the BELD2 factors. Because BELD2 does not contain land cover data for Alaska and Hawaii, State-to-county factors were derived from data contained in the allocation factor file used for the 1996 NTI for these two States;

(3) Calculated emissions activity throughput by multiplying (see Equation 1) the acres data from step 2 by the applicable state-average fuel consumption factor (i.e., the amount actually consumed in the fire). Emissions activity includes a conversion factor of 0.0005 ton/lb and are reported in ton^2/lb (so the final emissions are in tons) in the 2002 NEI actual throughput field. The fuel consumption factor for Alaska was derived from AP-42. The fuel consumption factor for California was used for Hawaii, since they are in the same USFS region. Table 2 shows the State-average fuel consumption factors that were used;

(4) Estimated emissions by multiplying (see Equation 1) the county-level emissions activity throughput from step 3 by emission factors. Criteria pollutants and the 17 dioxin and furan congeners emission factor were augmented by the State-average smoldering factors shown in Table 2. The smoldering augmentation factor for California was used for Hawaii, since they are in the same USFS region. Twenty-nine other HAP emission factors developed from the 1996 NTI methodology for wildfires were not augmented because these factors were developed based on a weighted average that already accounts for smoldering (75% of the flaming fuel type emission factor and 25% of the smoldering fuel type emission factor). Tables 3 and 4 show the national emissions summary for criteria pollutants and HAPs, respectively.

**Table 1. 2002 Activity Data for Wildfires by State:
Number of Acres Burned by Land Ownership Category**

State	NPS	BLM	FWS	USFS	S & P	BIA	Total
Alabama	0.0	0.0	12.7	1,307.3	37,351.0	2.4	38,673.4
Alaska	73,793.3	736,737.5	330,099.5	16.2	802,516.1	18.0	1,943,180.6
Arizona	1,621.0	8,450.0	6,374.3	85,921.5	46,645.0	229,383.9	378,395.7
Arkansas	30.2	0.0	86.6	1,770.8	14,350.0	0.0	16,237.6
California	5,047.4	39,669.5	1,105.8	220,449.7	118,427.0	11,014.0	395,713.4
Colorado	7,931.0	22,046.7	17.4	194,802.2	226,506.0	7,816.4	459,119.7
Connecticut	0.0	0.0	0.3	0.0	701.0	5.7	707.0
Delaware	0.0	0.0	1,250.0	0.0	1,700.0	0.0	2,950.0
Dist. Columbia	1.0	0.0	0.0	0.0	0.0	0.0	1.0
Florida	2,265.9	0.0	389.4	1,414.4	56,839.0	1,610.5	62,519.2
Georgia	0.0	0.0	117,821.9	8.5	36,093.0	0.8	153,924.2
Hawaii	6,656.6	0.0	0.0	0.0	2,378.0	0.0	9,034.6
Idaho	0.3	43,040.5	773.0	13,574.5	7,972.0	1,719.3	67,079.6
Illinois	0.0	0.0	0.0	63.8	444.0	0.0	507.8
Indiana	506.2	0.0	0.0	11.1	1,900.0	0.0	2,417.3
Iowa	0.0	0.0	24.8	0.0	2,773.0	38.8	2,836.6
Kansas	0.0	0.0	336.2	0.0	93,017.0	205.6	93,558.8
Kentucky	2.8	0.0	0.0	1,563.3	23,541.0	0.0	25,107.1
Louisiana	0.0	0.0	14,634.3	1,570.0	14,619.0	6.2	30,829.5
Maine	2.7	0.0	11.2	0.1	791.0	1,351.6	2,156.6
Maryland	0.0	0.0	111.1	0.0	7,538.0	0.0	7,649.1
Massachusetts	0.0	0.0	0.0	0.0	2,615.0	0.1	2,615.1
Michigan	0.3	0.0	0.0	77.6	780.0	1,805.6	2,663.5
Minnesota	0.3	0.0	564.0	217.4	32,559.0	23,443.9	56,784.6
Mississippi	38.3	0.0	220.0	1,979.3	31,976.0	216.1	34,429.7
Missouri	85.0	0.0	716.0	2,116.2	54,397.0	7.2	57,321.4
Montana	48.3	8,690.2	934.7	51,641.1	28,811.0	10,865.2	100,990.5
Nebraska	19.9	0.0	287.2	133.8	90,562.0	152.2	91,155.1
Nevada	88.8	35,258.9	459.5	10,163.2	2,833.0	316.0	49,119.4
New Hampshire	0.0	0.0	0.0	5.7	179.0	0.0	184.7
New Jersey	0.1	0.0	0.0	0.0	6,881.0	3.2	6,884.3
New Mexico	11,394.6	24,798.5	70.1	34,378.9	226,493.0	81,725.3	378,860.4
New York	118.9	0.0	1.5	0.1	2,018.0	661.3	2,799.8
North Carolina	9.8	0.0	3,764.3	1,460.0	27,496.0	592.2	33,322.3
North Dakota	1.5	0.0	736.8	246.7	29,042.0	2,915.4	32,942.4
Ohio	0.0	0.0	0.0	28.6	5,787.0	0.0	5,815.6
Oklahoma	0.0	0.0	870.6	146.6	25,804.0	15,361.8	42,183.0
Oregon	15.5	152,686.3	1,144.1	746,682.6	98,648.0	3,789.8	1,002,966.3
Pennsylvania	56.5	0.0	0.0	2.9	6,755.0	0.0	6,814.4
Rhode Island	0.0	0.0	0.0	0.0	317.0	17.6	334.6
South Carolina	0.0	0.0	39.1	3,953.7	42,058.0	7.5	46,058.3
South Dakota	48.8	0.0	283.2	13,669.6	166,927.6	27,932.1	208,861.3
Tennessee	35.3	0.0	0.0	1,891.5	14,785.0	0.0	16,711.8
Texas	74.8	0.0	13,890.2	286.3	24,067.0	51.4	38,369.7
Utah	34.6	63,029.4	0.0	98,597.2	68,534.0	3,276.3	233,471.5
Vermont	0.0	0.0	0.0	3.2	146.0	0.0	149.2
Virginia	5,978.7	0.0	0.2	5,023.2	13,325.0	14.1	24,341.2
Washington	76.8	4,359.2	975.6	50,149.3	10,063.0	14,576.2	80,200.1
West Virginia	0.9	0.0	0.0	93.5	95,993.0	0.0	96,087.4
Wisconsin	0.0	0.0	380.8	1.5	947.0	4,634.0	5,963.3
Wyoming	12,877.8	31,988.8	22.8	26,065.3	163,227.0	19,852.4	254,034.1

Table 2. Wildfire Fuel Consumption and Smoldering Augmentation Factors

State	Fuel Consumption Factor (tons/acre)	State-Average Smoldering Augmentation Factor	Reference
Alabama	7.6	0.140	Reference 1
Alaska	16.0	0	Reference 2
Arizona	17.7	0.126	Reference 1
Arkansas	10.1	0.167	Reference 1
California	15.5	0.047	Reference 1
Colorado	12.6	0.143	Reference 1
Connecticut	3.1	0.170	Reference 1
Delaware	7.7	0.060	Reference 1
Wash. DC	3.1	0.170	Reference 1
Florida	15.3	0.167	Reference 1
Georgia	10.1	0.161	Reference 1
Hawaii	15.5	0.047	Reference 1 (used CA value)
Idaho	8.1	0.155	Reference 1
Illinois	3.1	0.166	Reference 1
Indiana	2.4	0.154	Reference 1
Iowa	2.8	0.165	Reference 1
Kansas	1.0	0.038	Reference 1
Kentucky	2.7	0.159	Reference 1
Louisiana	9.1	0.128	Reference 1
Maine	27.8	0.170	Reference 1
Maryland	5.4	0.160	Reference 1
Massachusetts	24	0.170	Reference 1
Michigan	10.1	0.169	Reference 1
Minnesota	13.6	0.168	Reference 1
Mississippi	7.6	0.130	Reference 1
Missouri	2.7	0.156	Reference 1
Montana	4.7	0.102	Reference 1
Nebraska	1.1	0.013	Reference 1
Nevada	3.0	0	Reference 1
New Hampshire	33.4	0.170	Reference 1
New Jersey	11.6	0.066	Reference 1
New Mexico	14.1	0.134	Reference 1
New York	20.3	0.170	Reference 1
North Carolina	8.6	0.164	Reference 1
North Dakota	0.5	0.134	Reference 1
Ohio	3.0	0.166	Reference 1
Oklahoma	2.7	0.079	Reference 1
Oregon	12.5	0.155	Reference 1
Pennsylvania	3.2	0.166	Reference 1
Rhode Island	3.1	0.170	Reference 1
South Carolina	7.9	0.157	Reference 1
South Dakota (Lawrence Co.)	16.0	0	Reference 3
South Dakota (Pennington Co.)	16.0	0	Reference 3
South Dakota (Custer Co.)	16.0	0	Reference 3
South Dakota(all other counties)	2.0	0	Reference 3
Tennessee	3.8	0.161	Reference 1
Texas	3.5	0.058	Reference 1
Utah	9.6	0.116	Reference 1
Vermont	51.3	0.170	Reference 1
Virginia	7.2	0.168	Reference 1
Washington	2.6	0.117	Reference 1
West Virginia	4.2	0.169	Reference 1
Wisconsin	7.4	0.168	Reference 1
Wyoming	5.0	0.112	Reference 1

Table 3. National Criteria Pollutant Emissions Summary for Wildfires

Pollutant	Emission Factor (lb/ton)	Emission Factor Reference	2002 National Emissions (ton/year)
CO	289.0	Reference 1	1.25E+07
NH_3	1.3	Reference 1	5.61E+04
NO_x	6.2	Reference 1	2.68E+05
PM10-PRI	28.1	Reference 1	1.21E+06
PM2.5-PRI	24.1	Reference 1	1.04E+06
SO_2	1.7	Reference 1	7.34E+04
VOC	13.6	Reference 1	5.87E+05

OPEN BURNING - FOREST WILDFIRES (continued)
SCC: 2810001000

Table 4. National HAP Emissions Summary for Wildfires

Pollutant	Emission Factor (lb/ton)	Emission Factor Reference	2002 National Emissions (ton/year)
2,3,7,8-TCDD	2.30E-09	Reference 4	9.91E-05
1,2,3,7,8-PeCDD	7.66E-09	Reference 4	3.30E-04
1,2,3,4,7,8-HxCDD	1.14E-08	Reference 4	4.90E-04
1,2,3,6,7,8-HxCDD	2.14E-08	Reference 4	9.23E-04
1,2,3,7,8,9-HxCDD	3.47E-08	Reference 4	1.50E-03
1,2,3,4,6,7,8-HpCDD	3.33E-07	Reference 4	1.43E-02
OCDD	1.33E-06	Reference 4	5.73E-02
2,3,7,8-TCDF	1.40E-08	Reference 4	6.03E-04
1,2,3,7,8-PeCDF	1.27E-08	Reference 4	5.47E-04
2,3,4,7,8-PeCDF	2.02E-08	Reference 4	8.71E-04
1,2,3,4,7,8-HxCDF	3.34E-08	Reference 4	1.44E-03
1,2,3,6,7,8-HxCDF	1.43E-08	Reference 4	6.16E-04
1,2,3,7,8,9-HxCDF	2.23E-09	Reference 4	9.62E-05
2,3,4,6,7,8-HxCDF	1.96E-08	Reference 4	8.46E-04
1,2,3,4,6,7,8-HpCDF	5.08E-08	Reference 4	2.19E-03
1,2,3,4,7,8,9-HpCDF	6.12E-09	Reference 4	2.64E-04
OCDF	2.05E-08	Reference 4	8.86E-04
1,3-butadiene	4.05E-01	Reference 5	1.62E+04
1-methylpyrene	9.05E-03	Reference 5	3.62E+02
acetaldehyde	4.08E-01	Reference 5	1.63E+04
acrolein	4.24E-01	Reference 5	1.70E+04
anthracene	5.00E-03	Reference 5	2.00E+02
benz(a)anthracene	6.20E-03	Reference 5	2.48E+02
benzene	1.13E+00	Reference 5	4.51E+04
benzo(a)fluoranthene	2.60E-03	Reference 5	1.04E+02
benzo(a)pyrene	1.48E-03	Reference 5	5.93E+01
benzo(a)phenanthrene	3.90E-03	Reference 5	1.56E+02
benzo(e)pyrene	2.66E-03	Reference 5	1.07E+02
benzo(ghi)perylene	5.08E-03	Reference 5	2.03E+02
benzo(k)fluoranthene	2.60E-03	Reference 5	1.04E+02
benzofluoranthenes	5.14E-03	Reference 5	2.06E+02
carbonyl sulfide	5.34E-04	Reference 5	2.14E+01
chrysene	6.20E-03	Reference 5	2.48E+02
fluoranthene	6.73E-03	Reference 5	2.70E+02
formaldehyde	2.58E+00	Reference 5	1.03E+05
hexane	1.64E-02	Reference 5	6.57E+02
indeno(1,2,3-cd)pyrene	3.41E-03	Reference 5	1.37E+02
methyl chloride	1.28E-01	Reference 5	5.14E+03
methylanthracene	8.23E-03	Reference 5	3.30E+02
methylbenzopyrenes	2.96E-03	Reference 5	1.19E+02
methylchrysene	7.90E-03	Reference 5	3.16E+02
o,m,p-xylene	2.42E-01	Reference 5	9.69E+03
perylene	8.56E-04	Reference 5	3.43E+01
phenanthrene	5.00E-03	Reference 5	2.00E+02
pyrene	9.29E-03	Reference 5	3.72E+02
toluene	5.68E-01	Reference 5	2.28E+04

OPEN BURNING - FOREST WILDFIRES (continued)
SCC: 2810001000

Equation 1 displays the emission estimation calculations described in steps 3 and 4 above.

$$\text{State-level wildfire emissions} = \text{Wildfire acres burned} \times \text{Wildfire emission factor} \times \text{State-level wildfire fuel Consumption} \times \left(1 + \text{State-level smoldering augmentation factor} \right) \quad \text{(Eq. 1)}$$

References

1. EC/R, Incorporated, "Data Needs and Availability for Wildland Fire Emissions Inventories - Short-term Improvements to the Wildland Fire Component of the National Emissions Inventory," prepared for the U.S. Environmental Protection Agency, Office of Air Quality Planning and Standards, Emission Factor and Inventory Group, Emissions, Monitoring and Analysis Division. November 2003.

2. U.S. Environmental Protection Agency, "Compilation of Air Pollutant Emission Factors, AP-42, 5th Edition," October 1996.

3. Personal communication via e-mail from Laurel Driver, EPA/EIG to Roy Huntley, EPA/EIG. E-mail dated June 6, 2003.

4. Gullet, B.K. and T. Abderrahmne, "PCDD/F Emissions from Forest Fire Simulations," *Atmospheric Environment*, Vol. 37, No. 6, pp. 803-813. February 2003.

5. U.S. Environmental Protection Agency, "Documentation for the 1996 Base Year National Toxics Inventory for Area Sources," Office of Air Quality and Planning Standards, Emissions Monitoring and Analysis Division, Emission Factor and Inventory Group, 2001.

OPEN BURNING - LAND CLEARING DEBRIS
SCC: 2610000500

Criteria pollutant and HAP emission estimates for land clearing debris burning are a function of the amount of material or fuel subject to burning per year. The amount of material burned was estimated using the county-level total number of acres disturbed by residential, non-residential, and road construction. County-level weighted loading factors were applied to the total number of construction acres to convert acres to tons of available fuel.

Version 2 of the Biogenic Emissions Land cover Database (BELD2) within EPA's Biogenic Emission Inventory System (BEIS) was used to identify the acres of hardwoods, softwoods, and grasses in each county. Table 1 presents the average fuel loading factors by vegetation type. The average loading factors for slash hardwood and slash softwood were adjusted by a factor of 1.5 to account for the mass of tree that is below the soil surface that would be subject to burning once the land is cleared.[1] Weighted average county-level loading factors were calculated by multiplying the average loading factors by the percent contribution of each type of vegetation class to the total land area for each county.

Table 1. Fuel Loading Factors by Vegetation Type

Vegetation Type	Unadjusted Average Fuel Loading Factor (Ton/acre)	Adjusted Average Fuel Loading Factor (Ton/acre)
Hardwood	66	99
Softwood	38	57
Grass	4.5	Not Applicable

Controls for land clearing debris burning are generally in the form of a ban on open burning of waste in a given municipality or county. Counties that were more than 80% urban were assumed not to practice any open burning. Appendix B contains the counties with a population more than 80% urban. Therefore, criteria pollutant and HAP emissions from yard waste burning are zero in these counties. In addition, the State of Colorado implemented a state-wide ban on open burning. Emissions from open burning of land clearing debris in all Colorado counties were assumed to be zero.

County-level criteria pollutant and HAP emissions (in lb/year) were calculated by multiplying the total mass of land clearing debris burned per year by an emission factor.[1,2,3] Emissions were then converted to ton/year by dividing the emissions by 1 ton/2000 lb. Forest fire simulation emission factors were used to estimate emissions for 17 Dioxin congeners.[4] The Dioxin emission factors were multiplied by 0.002 to convert from mg/kg to lb/ton. Table 2 contains the emissions factors, total mass of land clearing debris burned and national criteria pollutants and HAP emissions from burning of land clearing debris.

References

1. Ward, D.E., C.C. Hardy, D.V. Sandberg, and T.E. Reinhardt. "Mitigation of Prescribed Fire Atmospheric Pollution Through Increased Utilization of Hardwoods, Piled Residues, and Long-Needled Conifers." Final Report. USDA Forest Service, Pacific Northwest Research Station, Fire and Air Resource Management. 1989.

2. U.S. Environmental Protection Agency, Compilation of Air Pollutant Emission Factors, AP-42, Fifth Edition, Volume I: Stationary Point and Area Sources, Section 13.1 Prescribed Burning,, Table 13.1.3 October 1992.

3. U.S. Environmental Protection Agency, *Evaluation of Emissions from the Open Burning of Household Waste in Barrels*, EPA-600/R-97-134a, Control Technology Center. November 1997.

4. Gullet, B.K. and T. Abderrahmne, "PCDD/F Emissions from Forest Fire Simulations," *Atmospheric Environment*, Vol. 37, No. 6, pp. 803-813. February 2003.

Table 2. National Emissions Summary for Open Burning of Land Clearing Debris (SCC 2610000500)

Pollutant	Emission Factor (lb/ton)	Emission Factor Reference	2002 National Activity Level (tons burned/year)	2002 National Emissions (tons/year)
VOC	1.16E+01	Reference 1	1.35E+07	7.81E+04
NOX	5.00E+00	Reference 2	1.35E+07	3.37E+04
CO	1.69E+02	Reference 1	1.35E+07	1.14E+06
PM10-FIL	1.70E+01	Reference 1	1.35E+07	1.14E+05
PM25-FIL	1.70E+01	Reference 1	1.35E+07	1.14E+05
PM10-PRI	1.70E+01	Reference 1	1.35E+07	1.14E+05
PM25-PRI	1.70E+01	Reference 1	1.35E+07	1.14E+05
1,2,3,4,6,7,8-HpCDD	3.33E-07	Reference 4	1.35E+07	2.24E-03
1,2,3,4,6,7,8-HpCDF	5.08E-08	Reference 4	1.35E+07	3.42E-04
1,2,3,4,7,8,9-HpCDF	6.12E-09	Reference 4	1.35E+07	4.11E-05
1,2,3,4,7,8-HxCDD	1.14E-08	Reference 4	1.35E+07	7.64E-05
1,2,3,4,7,8-HxCDF	3.34E-08	Reference 4	1.35E+07	2.25E-04
1,2,3,6,7,8-HxCDD	2.14E-08	Reference 4	1.35E+07	1.44E-04
1,2,3,6,7,8-HxCDF	1.43E-08	Reference 4	1.35E+07	9.60E-05
1,2,3,7,8,9-HxCDD	3.47E-08	Reference 4	1.35E+07	2.34E-04
1,2,3,7,8,9-HxCDF	2.23E-09	Reference 4	1.35E+07	1.49E-05
1,2,3,7,8-PeCDD	7.66E-09	Reference 4	1.35E+07	5.15E-05
1,2,3,7,8-PeCDF	1.27E-08	Reference 4	1.35E+07	8.53E-05
2,3,4,6,7,8-HxCDF	1.96E-08	Reference 4	1.35E+07	1.32E-04
2,3,4,7,8-PeCDF	2.02E-08	Reference 4	1.35E+07	1.36E-04
2,3,7,8-TCDD	2.30E-09	Reference 4	1.35E+07	1.54E-05
2,3,7,8-TCDF	1.40E-08	Reference 4	1.35E+07	9.39E-05
Cumene	1.33E-02	Reference 3	1.35E+07	8.92E+01
Dibenzofuran	6.75E-03	Reference 3	1.35E+07	4.55E+01
Ethyl Benzene	4.80E-02	Reference 3	1.35E+07	3.23E+02
Methyl Ethyl Ketone	6.70E-02	Reference 3	1.35E+07	4.51E+02
OCDD	1.33E-06	Reference 4	1.35E+07	8.94E-03
OCDF	2.05E-08	Reference 4	1.35E+07	1.38E-04
Phenol	1.15E-01	Reference 3	1.35E+07	7.75E+02
Styrene	1.02E-01	Reference 3	1.35E+07	6.84E+02

OPEN BURNING - PRESCRIBED BURNINGS
SCC: 2810015000

2002 prescribed fire emission estimates were calculated as follows:

(1) Obtained acres burned data at the State-level from the following sources: a) DOI BLM; b) the NPS; c) the U.S. FWS; and d) USFS. DOI's BIA and State/private land regional-level acres burned data were obtained from the NICC end-of-year Incident Management Report (27-Dec-2002). The BIA data were allocated to the State-level by determining the NICC region for each State with tribal land and then developing a region-to-State proportion using the number of acres of tribal land in each State. The State/private land activity data were allocated to the State-level using land cover type acreage for the rural forest category plus the acreage for brush and grass in the miscellaneous category. The land cover acreage was obtained from Version 2 of the BELD2 within BEIS. NICC regions were matched to USFS regions, and factors were then developed to allocate the data to the State-level. The region-to-State allocation factors were developed from data in Version 2 of BELD2. Note that to calculate the region-to State-proportions, BELD2 data for California were replaced with that from the 1996 NTI, since the USFS's Region 5 contains both Hawaii and California. Table 1 shows the State-level number of prescribed acres burned by land ownership category;

(2) Allocated the activity to the county-level. This was accomplished using acreage data for the rural forest category plus the acreage for brush and grass in the miscellaneous category, which were obtained from BELD2, Version 2. Activity data from all agencies were totaled by State and allocated to the county-level with the BELD2 factors. Because BELD2 does not contain land cover data for Alaska and Hawaii, State-to-county factors were derived from data contained in the allocation factor file used for the 1996 NTI for these two States;

(3) Calculated emissions activity throughput by multiplying (see Equation 2) the acres data from step 2 by the applicable state-average fuel consumption factor (i.e., the amount actually consumed in the fire). Emissions activity includes a conversion factor of 0.0005 ton/lb and are reported in ton^2/lb (so the final emissions are in tons). The fuel consumption factor for Alaska was derived from AP-42 and the NTI methodologies for wildfires and prescribed fires. The NTI assumes a fuel loading of 10.4 tons/acre for wildfires, and assumes a fuel loading of 8.2 tons/acre for prescribed fires. Thus, the prescribed fire fuel loading factor for Alaska is the result of multiplying the AP-42 wildfires fuel loading factor (16) by the ratio of 8.2/10.4. The fuel consumption factor for California was used for Hawaii, since they are in the same USFS region. Table 2 shows the State-average fuel consumption factors that were used;

(4) Estimated emissions by multiplying (see Equation 2) the county-level emissions activity throughput from step 3 by emission factors. Criteria pollutant emission factors were calculated using prescribed burning pile and non-pile emission factors (see Table 3 and Equation 1). Criteria pollutants and 17 dioxin and furan congener emission factors were augmented by the State-average smoldering factors shown in Table 2. The smoldering augmentation factor for California was used for Hawaii, since they are in the same USFS region. Twenty-nine other HAP emission factors developed from the 1996 NTI methodology for wildfires were not augmented because these factors were developed based on a weighted average that already accounts for smoldering (75% of the flaming fuel type emission factor and 25% of the smoldering fuel type emission factor). Tables 3 and 4 show the national emissions summary for criteria pollutants and HAPs, respectively..

The above prescribed fire acreage estimates do not reflect Puerto Rico or the U.S. Virgin Islands. Prescribed burning emissions were not estimated for the U.S. Virgin Islands because this category did not appear in the 1996 HAP inventory for this territory. Emissions for Puerto Rico were estimated using the approach outlined in the report text. Broward County in Florida is assumed to be the surrogate for Puerto Rico. The Broward County prescribed burning 2002 emissions estimate was divided by Broward County population iin 2002 (obtained from the U.S. Census Bureau) to estimate emissions on a per capita basis.[2] The per capita emissions estimate was then multiplied by the population in each county in Puerto Rico to estimate prescribed burning emissions in this territory.

Table 1. 2002 Activity Data for Prescribed Burning by State: Number of Acres Burned by Land Ownership Category

State	BLM	FWS	NPS	BIA	USFS	S & P	Total
Alabama	0.0	89.0	790.0	1.5	63,396.0	68,950.3	133,226.8
Alaska	15.0	1,085.0	0.0	0.0	27.0	0.0	1,127.0
Arizona	12,805.0	5,418.1	2,082.0	30,982.0	35,066.0	2,881.1	89,234.2
Arkansas	0.0	320.0	5,031.0	0.0	100,278.0	55,926.4	161,555.4
California	2,169.9	25,663.2	7,356.1	272.0	54,258.0	0.0	89,719.2
Colorado	2,961.0	0.0	431.2	73.4	12,225.0	752.6	16,443.2
Connecticut	0.0	0.0	0.0	1.6	0.0	733.7	735.3
Delaware	0.0	250.0	0.0	0.0	0.0	170.1	420.1
Dist. Columbia	0.0	0.0	0.0	0.0	0.0	0.1	0.1
Florida	0.0	46,408.8	94,429.6	998.7	151,721.0	59,787.1	353,345.2
Georgia	0.0	9,324.0	0.0	0.5	19,231.0	75,828.5	104,384.0
Hawaii	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Idaho	29,215.6	25.0	0.0	37.0	29,155.0	2,088.3	60,520.9
Illinois	0.0	887.6	0.0	0.0	67.0	1,780.5	2,735.1
Indiana	0.0	5,423.0	289.0	0.0	386.0	1,860.5	7,958.5
Iowa	0.0	4,485.0	32.5	10.6	0.0	996.8	5,524.9
Kansas	0.0	5,230.7	7,150.0	1.9	0.0	228.4	12,611.0
Kentucky	0.0	0.0	110.0	0.0	9,426.0	40,617.1	50,153.1
Louisiana	0.0	21,468.3	0.0	3.8	97,628.0	45,502.4	164,602.5
Maine	0.0	267.1	0.0	368.2	24.0	6,958.8	7,618.1
Maryland	0.0	3,765.5	0.0	0.0	0.0	1,090.6	4,856.1
Massachusetts	0.0	0.5	8.8	0.0	0.0	1,273.5	1,282.8
Michigan	0.0	0.0	0.0	491.9	1,216.0	6,970.3	8,678.2
Minnesota	0.0	28,234.3	130.0	6,386.6	4,866.0	6,673.2	46,290.1
Mississippi	0.0	6,864.0	512.5	134.0	215,419.0	53,910.7	276,840.2
Missouri	0.0	1,352.7	736.0	2.0	9,949.0	5,704.2	17,743.9
Montana	5,645.0	963.6	28.0	543.5	19,451.0	3,634.9	30,266.0
Nebraska	0.0	7,719.1	653.0	1.4	360.0	238.1	8,971.6
Nevada	4,731.0	3,812.2	58.0	0.0	5.0	1,933.2	10,539.4
New Hampshire	0.0	9.0	0.0	0.0	122.0	1,904.1	2,035.1
New Jersey	0.0	80.0	0.0	0.9	0.0	831.5	912.4
New Mexico	11,114.0	5,691.3	0.0	11,038.3	19,177.0	3,518.9	50,539.5
New York	0.0	293.4	0.0	180.2	128.0	6,080.0	6,681.6
North Carolina	0.0	17,262.0	0.0	367.2	20,583.0	60,594.0	98,806.2
North Dakota	0.0	13,623.3	3,040.7	145.8	1,766.0	395.8	18,971.6
Ohio	0.0	0.0	0.0	0.0	0.0	3,313.4	3,313.4
Oklahoma	0.0	2,321.3	440.0	9,526.6	360.0	55,725.3	68,373.2
Oregon	31,682.1	8,249.4	3,128.0	1,586.4	37,479.0	182.1	82,307.0
Pennsylvania	0.0	98.0	0.0	0.0	150.0	6,754.1	7,002.1
Rhode Island	0.0	0.0	0.0	4.8	0.0	159.4	164.2
South Carolina	0.0	16,723.0	1,182.3	4.6	45,104.0	38,494.0	101,507.9
South Dakota	0.0	6,366.0	5,899.5	262.5	7,163.0	363.5	20,054.5
Tennessee	0.0	0.0	837.7	0.0	10,053.0	42,541.8	53,432.5
Texas	0.0	37,473.5	2,947.0	18.9	51,952.0	322,844.9	415,236.3
Utah	2,694.0	425.0	1,211.0	4.3	44,230.0	1,568.8	50,133.1
Vermont	0.0	32.0	0.0	0.0	0.0	1,727.5	1,759.5
Virginia	0.0	308.1	193.3	8.7	5,997.0	50,229.5	56,736.6
Washington	0.0	3,332.4	163.6	6,101.6	6,019.0	109.9	15,726.5
West Virginia	0.0	180.0	1.6	0.0	60.0	4,749.3	4,990.9
Wisconsin	0.0	4,285.4	0.0	1,262.4	575.0	6,092.7	12,215.5
Wyoming	3,132.0	0.0	4,107.0	178.1	8,320.0	805.4	16,542.5

Table 2. Prescribed Burning Fuel Consumption Factors, Smoldering Augmentation Factors and Piled Fuel Fractions

State or County	Fuel Consumption Factor (tons/acre)	State-Average Smoldering Augmentation Factor	Piled Fuel Fraction	Reference
Alabama	5.8	0.070		Reference 1
Alaska	12.6154	0		Reference 2
Arizona	8.7	0.063	0.51	Reference 1
Arkansas	6.8	0.084		Reference 1
California	6.3	0.024	0.16	Reference 1
Colorado	6.9	0.071	0.26	Reference 1
Connecticut	3.1	0.085		Reference 1
Delaware	7.5	0.030		Reference 1
Wash. DC	3.1	0.085		Reference 1
Florida	14.7	0.083		Reference 1
Georgia	8.0	0.081		Reference 1
Hawaii	6.3	0.024		Reference 1 (used CA value)
Idaho	12.3	0.078	0.41	Reference 1
Illinois	3.0	0.083		Reference 1
Indiana	2.4	0.077		Reference 1
Iowa	2.8	0.082		Reference 1
Kansas	1.0	0.019		Reference 1
Kentucky	2.4	0.080		Reference 1
Louisiana	6.6	0.064		Reference 1
Maine	11.0	0.085		Reference 1
Maryland	4.4	0.080		Reference 1
Massachusetts	9.8	0.085		Reference 1
Michigan	5.2	0.084		Reference 1
Minnesota	6.3	0.084		Reference 1
Mississippi	5.5	0.065		Reference 1
Missouri	2.6	0.078		Reference 1
Montana	9.3	0.051	0.73	Reference 1
Nebraska	1.1	0.007		Reference 1
Nevada	5.7	0	0.04	Reference 1
New Hampshire	12.8	0.085		Reference 1
New Jersey	11.3	0.033		Reference 1
New Mexico	6.4	0.067	0.06	Reference 1
New York	8.6	0.085		Reference 1
North Carolina	5.9	0.082		Reference 1
North Dakota	2.0	0.067	0	Reference 3
Ohio	2.9	0.083		Reference 1
Oklahoma	2.3	0.039		Reference 1
Oregon	8.6	0.077	0.59	Reference 1
Pennsylvania	3.1	0.083		Reference 1
Rhode Island	3.1	0.085		Reference 1
South Carolina	5.5	0.079		Reference 1
South Dakota (Lawrence Co.)	16.0	0	0	Reference 4
South Dakota (Pennington Co.)	16.0	0	0	Reference 4
South Dakota (Custer Co.)	16.0	0	0	Reference 4
South Dakota (all other counties)	2.0	0	0	Reference 4
Tennessee	3.0	0.081		Reference 1
Texas	2.9	0.029		Reference 1
Utah	3.0	0.058	0	Reference 1
Vermont	18.5	0.085		Reference 1
Virginia	5.1	0.084		Reference 1
Washington	4.5	0.058	0.76	Reference 1
West Virginia	3.4	0.085		Reference 1
Wisconsin	4.3	0.084		Reference 1
Wyoming	4.5	0.056	0	Reference 1

OPEN BURNING - PRESCRIBED BURNINGS (continued)
SCC: 2810015000

Table 3. National Criteria Pollutant Emissions Summary for Prescribed Burning

Pollutant	Pile Emission Factor (lb/ton)	Non-pile Emission Factor (lb/ton)	Emission Factor Reference	2002 National Emissions (ton/year)
CO	74.3	289.0	Reference 1	2.67E+06
NH_3	0.5	1.3	Reference 1	1.21E+04
NO_x	6.2	6.2	Reference 1	6.10E+04
PM10-PRI	8.0	28.1	Reference 1	2.60E+05
PM25-PRI	8.0	24.1	Reference 1	2.24E+05
SO_2	1.7	1.7	Reference 1	1.67E+04
VOC	6.3	13.6	Reference 1	1.28E+05

OPEN BURNING - PRESCRIBED BURNINGS (continued)
SCC: 2810015000

Table 4. National HAP Emissions Summary for Prescribed Burning

Pollutant	Emission Factor (lb/ton)	Emission Factor Reference	2002 National Emissions (ton/year)
2,3,7,8-TCDD	2.30E-09	Reference 5	2.26E-05
1,2,3,7,8-PeCDD	7.66E-09	Reference 5	7.53E-05
1,2,3,4,7,8-HxCDD	1.14E-08	Reference 5	1.12E-04
1,2,3,6,7,8-HxCDD	2.14E-08	Reference 5	2.10E-04
1,2,3,7,8,9-HxCDD	3.47E-08	Reference 5	3.41E-04
1,2,3,4,6,7,8-HpCDD	3.33E-07	Reference 5	3.27E-03
OCDD	1.33E-06	Reference 5	1.31E-02
2,3,7,8-TCDF	1.40E-08	Reference 5	1.37E-04
1,2,3,7,8-PeCDF	1.27E-08	Reference 5	1.25E-04
2,3,4,7,8-PeCDF	2.02E-08	Reference 5	1.99E-04
1,2,3,4,7,8-HxCDF	3.34E-08	Reference 5	3.29E-04
1,2,3,6,7,8-HxCDF	1.43E-08	Reference 5	1.40E-04
1,2,3,7,8,9-HxCDF	2.23E-09	Reference 5	2.19E-05
2,3,4,6,7,8-HxCDF	1.96E-08	Reference 5	1.93E-04
1,2,3,4,6,7,8-HpCDF	5.08E-08	Reference 5	4.99E-04
1,2,3,4,7,8,9-HpCDF	6.12E-09	Reference 5	6.02E-05
OCDF	2.05E-08	Reference 5	2.02E-04
1,3-butadiene	4.05E-01	Reference 6	3.72E+03
1-methylpyrene	9.05E-03	Reference 6	8.31E+01
acetaldehyde	4.08E-01	Reference 6	3.75E+03
acrolein	4.24E-01	Reference 6	3.90E+03
anthracene	5.00E-03	Reference 6	4.59E+01
benz(a)anthracene	6.20E-03	Reference 6	5.70E+01
benzene	1.13E+00	Reference 6	1.03E+04
benzo(a)fluoranthene	2.60E-03	Reference 6	2.39E+01
benzo(a)pyrene	1.48E-03	Reference 6	1.36E+01
benzo(a)phenanthrene	3.90E-03	Reference 6	3.58E+01
benzo(e)pyrene	2.66E-03	Reference 6	2.44E+01
benzo(ghi)perylene	5.08E-03	Reference 6	4.67E+01
benzo(k)fluoranthene	2.60E-03	Reference 6	2.39E+01
benzofluoranthenes	5.14E-03	Reference 6	4.72E+01
carbonyl sulfide	5.34E-04	Reference 6	4.91E+00
chrysene	6.20E-03	Reference 6	5.70E+01
fluoranthene	6.73E-03	Reference 6	6.18E+01
formaldehyde	2.58E+00	Reference 6	2.37E+04
hexane	1.64E-02	Reference 6	1.51E+02
indeno(1,2,3-cd)pyrene	3.41E-03	Reference 6	3.13E+01
methyl chloride	1.28E-01	Reference 6	1.18E+03
methylanthracene	8.23E-03	Reference 6	7.56E+01
methylbenzopyrenes	2.96E-03	Reference 6	2.72E+01
methylchrysene	7.90E-03	Reference 6	7.26E+01
o,m,p-xylene	2.42E-01	Reference 6	2.22E+03
perylene	8.56E-04	Reference 6	7.86E+00
phenanthrene	5.00E-03	Reference 6	4.59E+01
pyrene	9.29E-03	Reference 6	8.53E+01
toluene	5.68E-01	Reference 6	5.22E+03

OPEN BURNING - PRESCRIBED BURNINGS (continued)
SCC: 2810015000

Equations 1 and 2 display the emission estimation calculations described in steps 3 and 4 above.

$$\text{State-level average prescribed fire emission factor} = \text{Pile fraction} \times \text{Pile emission factor} + (1 - \text{Pile fraction}) \times \text{Non-pile emission factor} \quad \text{(Eq. 1)}$$

$$\text{State-level prescribed fire emissions} = \text{Prescribed fire acres burned} \times \text{State-level average prescribed fire emission factor} \times \text{State-level prescribed fire fuel consumption} \times \left(1 + \text{State-level smoldering augmentation factor}\right) \quad \text{(Eq. 2)}$$

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1. EC/R, Incorporated, "Data Needs and Availability for Wildland Fire Emissions Inventories - Short-term Improvements to the Wildland Fire Component of the National Emissions Inventory," prepared for the U.S. Environmental Protection Agency, Office of Air Quality Planning and Standards, Emission Factor and Inventory Group, Emissions, Monitoring and Analysis Division. June 2003.

2. U.S. Environmental Protection Agency, "Compilation of Air Pollutant Emission Factors, AP-42, 5th Edition," October 1996.

3. Personal communication via e-mail from Tom Bachman, North Dakota Department of Health, Division of Air Quality to Roy Huntley, EPA/EIG. E-mail dated February 24, 2003.

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5. Gullet, B.K. and T. Abderrahmne, "PCDD/F Emissions from Forest Fire Simulations," *Atmospheric Environment*, Vol. 37, No. 6, pp. 803-813. February 2003.

6. U.S. Environmental Protection Agency, "Documentation for the 1996 Base Year National Toxics Inventory for Area Sources", Office of Air Quality and Planning Standards, Emissions Monitoring and Analysis Division, Emission Factor and Inventory Group, 2001.

OPEN BURNING - RESIDENTIAL HOUSEHOLD WASTE
SCC: 2610030000

Criteria pollutant and HAP emission estimates for residential municipal solid waste burning are a function of the amount of household waste burned per year. The amount of household waste burned was estimated using data from EPA's report *Municipal Solid Waste in the United States*.[1] The report presents the total mass of waste generated in the United States by type of waste for the calendar year 2000. This information was used to calculate a daily estimate of the per capita household waste subject to burning, 3.37 lbs/person/day. Non-combustibles waste, such as glass and metals was not considered to be waste subject to burning. Burning of yard waste is included in SCC 2610000100 and SCC 2610000400, therefore, it is not part of residential household waste. Approximately 25 to 32 percent of all waste that is subject to open burning is actually burned.[2] A median value of 28 percent is assumed to burned in all counties in the United States.

The per capita estimate was then multiplied by the 2002 population in each county that is expected to burn waste. Since open burning is generally not practiced in urban areas, only the rural population of each county was assumed to practice open burning. The ratio of urban to rural population was obtained from 2000 U.S. Census data.[7] This ratio was then multiplied by the 2002 U.S. Census Bureau estimate of the population in each county to obtain the county-level rural population for 2002.[6] Appendix B contains the urban and rural population data in database format.

Controls for residential municipal solid waste burning are generally in the form of a ban on open burning of waste in a given municipality or county. Counties that were more than 80% urban were assumed not to practice any open burning. Therefore, criteria pollutant and HAP emissions from residential municipal solid waste burning are zero in these counties. In addition, the State of Colorado implemented a state-wide bun on open burning. Emissions from open burning of residential waste in all Colorado counties were assumed to be zero. Emissions that were set to zero due to burning bans excluded from the NEI. Table 1 contains the national emissions summary for both HAP and criteria pollutants.

County-level criteria pollutant and HAP emissions were calculated by multiplying the total amount of residential municipal solid waste burned per year by an emission factor.[3,4] Residential MSW open burning emissions factors for VOC, NO_x, CO, and SO_2 were obtained from AP-42 (Table 2.5-1 (Municipal Refuse).[3] Residential MSW open burning emission factors for PM_{10} and $PM_{2.5}$ were obtained from Table 3-11 in the report "Evaluation of Emissions from the Open Burning of Household Waste in Barrels."[4] The emission factors were calculated by taking the average of test numbers 4 and 5 (non-recycler) PM_{10} and $PM_{2.5}$ emissions. The emission factors for the 17 dioxin congeners were obtained from an EPA dioxin report.[5] Tables 1 contains the emissions factors, total mass of yard waste burned and national criteria pollutants and HAP emissions from residential municipal solid waste.

Emission from residential municipal solid waste burning in Puerto Rico and the U.S. Virgin Islands were estimated according to the methodology outlined in the report text. The surrogate counties for Puerto Rico and the U.S. Virgin Islands, Broward County, and Monroe County in Florida, are more than 80% urban, therefore, the emissions are zero. The emissions from residential municipal solid waste burning in Puerto Rico and the U.S. Virgin Islands were assumed to be zero as well.

OPEN BURNING - RESIDENTIAL HOUSEHOLD WASTE (continued)

SCC: 2610030000

Table 1. National Emissions Summary

Pollutant	Emission Factor (lb/ton)	Emission Factor Reference	National Activity Level (Reference 4) (tons of waste burned/yr)	National Emissions (tons/year)
CO	8.50E+01	Reference 3	8.73E+06	3.68E+05
NOX	6.00E+00	Reference 3	8.73E+06	2.60E+04
PM10-FIL	3.80E+01	Reference 4	8.73E+06	1.64E+05
PM10-PRI	3.80E+01	Reference 4	8.73E+06	1.64E+05
PM25-FIL	3.48E+01	Reference 4	8.73E+06	1.51E+05
PM25-PRI	3.48E+01	Reference 4	8.73E+06	1.51E+05
SO2	1.00E+00	Reference 3	8.73E+06	4.33E+03
VOC	3.00E+01	Reference 3	8.73E+06	1.30E+05
1,2,3,4,6,7,8-heptachlorodibenzofuran	2.48E-07	Reference 5	8.73E+06	1.07E-03
1,2,3,4,6,7,8-heptachlorodibenzo-p-dioxin	7.96E-08	Reference 5	8.73E+06	3.44E-04
1,2,3,4,7,8,9-heptachlorodibenzofuran	3.00E-08	Reference 5	8.73E+06	1.30E-04
1,2,3,4,7,8-hexachlorodibenzofuran	2.28E-07	Reference 5	8.73E+06	9.86E-04
1,2,3,4,7,8-hexachlorodibenzo-p-dioxin	1.28E-08	Reference 5	8.73E+06	5.54E-05
1,2,3,6,7,8-hexachlorodibenzofuran	7.70E-08	Reference 5	8.73E+06	3.33E-04
1,2,3,6,7,8-hexachlorodibenzo-p-dioxin	1.94E-08	Reference 5	8.73E+06	8.39E-05
1,2,3,7,8,9-hexachlorodibenzofuran	5.00E-09	Reference 5	8.73E+06	2.16E-05
1,2,3,7,8,9-hexachlorodibenzo-p-dioxin	3.80E-08	Reference 5	8.73E+06	1.64E-04
1,2,3,7,8-pentachlorodibenzofuran	7.44E-08	Reference 5	8.73E+06	3.22E-04
1,2,3,7,8-pentachlorodibenzo-p-dioxin	1.62E-08	Reference 5	8.73E+06	7.01E-05
1,2,4-trichlorobenzene	2.20E-04	Reference 4	8.73E+06	9.52E-01
1,4-dichlorobenzene	3.20E-04	Reference 4	8.73E+06	1.38E+00
2,3,4,6,7,8-hexachlorodibenzofuran	1.24E-07	Reference 5	8.73E+06	5.36E-04
2,3,4,7,8-pentachlorodibenzofuran	1.30E-07	Reference 5	8.73E+06	5.64E-04
2,3,7,8-tetrachlorodibenzofuran	9.12E-08	Reference 5	8.73E+06	3.95E-04
2,3,7,8-tetrachlorodibenzo-p-dioxin	5.40E-09	Reference 5	8.73E+06	2.34E-05
Acenaphthene	1.54E-03	Reference 4	8.73E+06	6.64E+00
Acenaphthylene	2.26E-02	Reference 4	8.73E+06	9.78E+01
Anthracene	3.66E-03	Reference 4	8.73E+06	1.58E+01
Benz[a]anthracene	4.48E-03	Reference 4	8.73E+06	1.94E+01
Benzene	2.48E+00	Reference 4	8.73E+06	1.07E+04
Benzo[a]pyrene	4.24E-03	Reference 4	8.73E+06	1.84E+01
Benzo[b]fluoranthene	5.26E-03	Reference 4	8.73E+06	2.28E+01
Benzo[g,h,i,]Perylene	3.95E-03	Reference 4	8.73E+06	1.71E+01
Benzo[k]fluoranthene	2.05E-03	Reference 4	8.73E+06	8.87E+00
Chlorobenzene	8.48E-04	Reference 4	8.73E+06	3.67E+00
Chrysene	5.07E-03	Reference 4	8.73E+06	2.19E+01
Dibenzo[a,h]anthracene	6.46E-04	Reference 4	8.73E+06	2.79E+00
Fluoranthene	8.14E-03	Reference 4	8.73E+06	3.52E+01
Fluorene	7.31E-03	Reference 4	8.73E+06	3.16E+01
Hexachlorobenzene	4.40E-05	Reference 4	8.73E+06	1.90E-01
Hydrochloric Acid	5.68E-01	Reference 4	8.73E+06	2.46E+03
Hydrogen Cyanide	9.36E-01	Reference 4	8.73E+06	4.05E+03
Indeno[1,2,3-c,d]pyrene	3.75E-03	Reference 4	8.73E+06	1.62E+01
Naphthalene	3.51E-02	Reference 4	8.73E+06	1.52E+02
Octachlorodibenzofuran	7.28E-08	Reference 5	8.73E+06	3.15E-04
Octachlorodibenzo-p-dioxin	9.94E-08	Reference 5	8.73E+06	4.30E-04
Pentachlorophenol	1.06E-04	Reference 4	8.73E+06	4.59E-01
Phenanthrene	1.46E-02	Reference 4	8.73E+06	6.34E+01
Phenol	2.80E-01	Reference 4	8.73E+06	1.21E+03
Polychlorinated Biphenyls	5.72E-03	Reference 4	8.73E+06	2.47E+01
Pyrene	9.66E-03	Reference 4	8.73E+06	4.18E+01
Styrene	1.48E+00	Reference 4	8.73E+06	6.40E+03

References

1. U.S. Environmental Protection Agency, Office of Solid Waste and Emergency Response. "Municipal Solid Waste Generation, Recycling and Disposal in the United States: 2000 Facts and Figures." June 2002.

2. U.S. Environmental Protection Agency, Region V. "Emission Characteristics of Burn Barrels." Prepared by Two Rivers Regional Council of Public Officials and Patrick Engineering, Inc. June 1994.

3. United States Environmental Protection Agency, Office of Air Quality Planning and Standards. *Compilation of Air Pollutant Emission Factors, AP-42, Fifth Edition, Volume I: Stationary Point and Area Sources, Section 2.5 Open Burning*. Research Triangle Park, NC. October 1992.

4. U.S. Environmental Protection Agency, Control Technology Center. "Evaluation of Emissions from the Open Burning of Household Waste in Barrels." EPA-600/R-97-134a. November 1997.

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6. U.S. Census Bureau. *7/1/2002 County Population Estimates File and Components of Change*, [Data file], April 17, 2003. Available from Population Estimates Branch Web site http://eire.census.gov/popest/estimates_dataset.php

7. U.S. Census Bureau, Decennial Censuses, 2000 Census: SF1, Table P2

OPEN BURNING - SCRAP TIRES
SCC: 2830000000

The 2002 National Emissions for "Open Burning: Scrap Tires" are based on EPA-approved emission factors[1,2] multiplied by the number of tires burned. The national number of tires was found by summing up the number of tires burned by county which were based on a literature search for incidences of tire fires in 2002. Table 1 provides a summary of tire fires found, which also includes the date and number of tires burned. Emissions were allocated to each of these counties by the number of tires burned.

Table 1 - Summary of 2002 Tire Fires Found

County Location	State	Date of Fire	Number of Tires Burned	Reference
Saratoga County	NY	March 28, 2002	700,000	3
Roanoke City	VA	March 23, 2002	3,000,000[a]	4
Otoe County	NE	January 23, 2002	50,000	5
Keokuk County	IA	November 25, 2002	50,000	6
St. Lucie County	FL	October 13, 2002	1,800,000[b]	7
St. Mary	MD	June 12, 2002	5,000[c]	8
Luzerne County	PA	August 26, 2002	175,000[d]	9
Bernalillo County	NM	January 22, 2002	100	10
El Paso	CO	January 3, 2002	30,000	11
Androscoggin County	ME	June 30, 2002	2,250	12
Suffolk	VA	June 22, 2002	35,000	13
Etowah	AL	May 25, 2002	1,250	14
2002 National Number of Tires Burned			**5,848,600**	

[a] Estimates ranged from 2 to 4 million tires. An average of 3,000,000 was assumed.
[b] Number of tires burned not available. However, an estimate on the number of tires was generated using information on the volume of the pile of tire chips: 1.5 million cubic ft. (Reference 7), average loose density of tire shreds, 24 lb/cubic ft (Reference 15), and assumed weight of a tire (20 pounds/tire).
[c] Assumed 5,000. Report stated "several thousand tires were on fire."
[d] Estimates ranged from 150,000 to 200,000 tires. An average of 175,000 was assumed.

Calculations

It was assumed that each tire burned weighed approximately 20 pounds. Thus,

Amount of tires burned = Number of tires * assumed weight of tire = (5,848,600 tires) * (20 pounds/tire)

Amount of tires burned = 116,960,000 pounds = 58,480 tons = 58.480 thousand tons (10E3)

For comparison, in 1999, 16,179,540 tires burned in twelve counties.[16]

OPEN BURNING - SCRAP TIRES (continued)
SCC: 2830000000

Tables 2 and 3 list the EPA-approved emission factors from AP-42 and the ORD report for HAPs and criteria pollutants. Two types of emission factors are reported: chunk and shredded. An average emission factor was calculated and applied to the national number of tires burned. Emission factors for PM25-PRI and PM25-FIL are not available. Consequently, in order to include PM25-PRI and PM25-FIL emissions in the NEI, the PM25-PRI emission factor was set equal to the PM10-PRI emission factor, and the PM25-FIL emission factor was set equal to the PM10-FIL emission factor.

Table 2 - Emission Factors and National-Level Emissions for Criteria (PM, VOCs) Pollutants

Pollutant	Reference	Chunk (lb/1000 tons)	Shredded (lb/1000 tons)	Average (lb/1000 tons)	Emissions (tpy)
PM10-PRI	1	227,000	298,000	262,500	7,676.288
PM10-FIL	1	227,000	298,000	262,500	7,676.288
PM25-PRI	1	227,000	298,000	262,500	7,676.288
PM25-FIL	1	227,000	298,000	262,500	7,676.288
VOC	2	22,364	26,136	24,250	709.143

[1] Emission factors for PM25-PRI and PM25-FIL are not available. The PM25-PRI emission factor was set equal to the PM10-PRI emission factor, and the PM25-FIL emission factor was set equal to the PM10-FIL emission factor.

Table 3- Emission Factors and National-Level Emissions for HAPs (Metals, PAH, Others)

	Pollutant	Reference	Chunk (lb/1000 tons)	Shredded (lb/1000 tons)	Average (lb/1000 tons)	Emissions (tpy)
Metals	Antimony	1	5.88	4.73	5.31	0.155
	Arsenic	1	0.10	0.40	0.25	0.007
	Chromium	1	3.94	3.43	3.69	0.108
	Lead	1	0.67	0.20	0.44	0.013
	Nickel	1	4.74	2.15	3.45	0.101
	Selenium	1	0.13	0.40	0.27	0.008
PAHs	Acenaphthene	2	580.60	4891.40	2736.00	80.009
	Acenaphthylene	2	1494.50	1093.00	1293.75	37.833
	Anthracene	2	113.00	99.00	106.00	3.100
	Benzo(a)pyrene	2	170.00	227.80	198.90	5.816
	Benzon(b)fluoranthene	2	139.00	177.00	158.00	4.620
	Benzo(g,h,i)perylene	2	132.00	318.80	225.40	6.591
	Benzo(k)fluoranthene	2	149.00	199.00	174.00	5.088
	Benz(a)anthracene	2	164.00	204.80	184.40	5.392
	Chrysene	2	142.00	183.00	162.50	4.752
	Dibenz(a,h)anthracene	2	2.20	0.00	1.10	0.032
	Fluoranthene	2	677.40	916.00	796.70	23.298
	Fluorene	2	521.00	373.60	447.30	13.080
	Indeno(1,2,3-cd)pyrene	2	103.00	171.00	137.00	4.006
	Naphthalene	2	1632.00	972.00	1302.00	38.074
	Phenanthrene	2	475.00	505.00	490.00	14.329
	Pyrene	2	67.60	303.40	185.50	5.425
Other	Benzene	2	4312.60	4410	4361.30	127.537
	Biphenyl	2	419.00	660.20	539.60	15.778
	1,3-Butadiene	2	616.80	320.00	468.40	13.697
	Ethylbenzene	2	921.60	590.20	755.90	22.105
	Phenol	2	1.00	29.00	15.00	0.439
	Styrene	2	1320.00	1291.00	1305.50	38.177

OPEN BURNING - SCRAP TIRES (continued)
SCC: 2830000000

References

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OPEN BURNING - YARD WASTE - LEAF AND BRUSH SPECIES
SCC: 2610000100 & 2610000400

Criteria pollutant and HAP emission estimates for leaf and brush waste burning are a function of the amount of waste burned per year. The amount of leaf and brush waste burned was estimated using data from EPA's report *Municipal Solid Waste in the United States.*[1] The report presents the total mass of waste generated in the United States by type of waste, including yard waste, for the calendar year 2000. This information was used to calculate a daily estimate of the per capita yard waste, 0.54 lbs/person/day. Of the total amount of yard waste generated, the yard waste composition was assumed to be 25 percent leaves, 25 percent brush, and 50 percent grass by weight.[2]

Open burning of grass clippings is not typically practiced by homeowners, and as such only estimates for leaf burning and brush burning were developed. Approximately 25 to 32 percent of all waste is actually burned.[2] It was assumed that 28 percent of the leaf and brush yard waste generated is burned.

The per capita estimate was then multiplied by the 2002 population in each county that is expected to burn waste. Since open burning is generally not practiced in urban areas, only the rural population of each county was assumed to practice open burning. The ratio of urban to rural population was obtained from 2000 U.S. Census data [7]. This ratio was then multiplied by the 2002 U.S. Census Bureau estimate of the population in each county to obtain the county-level rural population for 2002 6. Appendix B contains both the total population and urban and rural population data in database format.

The percentage of forested acres from Version 2 of BELD2 within BEIS was used to adjust for variations in vegetation. The percentage of forested acres per county (including rural forest and urban forest) was then determined. To better account for the native vegetation that would likely be occurring in the residential yards of farming States, agricultural land acreage was subtracted before calculating the percentage of forested acres. Table 1 presents the ranges that were used to make adjustments to the amount of yard waste that is assumed to be generated per county.

Table 1. Adjustment for Percentage of Forested Acres

Percent Forested Acres per County	Adjustment for Yard Waste Generated
< 10%	0% generated
>= 10%, and < 50%	50% generated
>= 50%	100% generated

Controls for yard waste burning are generally in the form of a ban on open burning of waste in a given municipality or county. Counties that were more than 80% urban were assumed not to practice any open burning. Therefore, criteria pollutant and HAP emissions from residential municipal solid waste burning are zero in these counties. In addition, the State of Colorado implemented a state-wide bun on open burning. Emissions from open burning of residential waste in all Colorado counties were assumed to be zero. Emissions that were set to zero due to burning bans excluded from the NEI.

County-level criteria pollutant and HAP emissions were calculated by multiplying the total amount of yard waste (leaf and brush) burned per year by an emission factor.[3,4] Emissions for leaves and residential brush were calculated separately, since emission factors vary by yard waste type. Forest fire simulation emission factors were used to estimate emissions for 17 Dioxin congeners.[5] Tons of debris burned were converted to kilograms (kg) by multiplying by 907.18474. Tables 2 and 3 contain the emissions factors, total mass of yard waste burned and national criteria pollutants and HAP emissions from burning of leaves and brush, respectively.

Example Calculations:

2000 Leaf Burning activity, kg/year = 2.55E+08

2000 Leaf Burning 2,3,7,8-TCDD emissions, mg/year = 2.55E+08 * 1.15E-06 = 2.93E+02

Table 2. National Emissions Summary for Leaf Species (SCC 2610000100)

Pollutant	Emission Factor (lb/ton)	Emission Factor Reference	2002 National Activity Level (tons burned/year)	2002 National Emissions (tons/year)
CO	1.12E+02	Reference 4	2.87E+05	1.59E+04
PM10-FIL	3.80E+01	Reference 4	2.87E+05	5.41E+03
PM10-PRI	3.80E+01	Reference 5	2.87E+05	5.41E+03
PM25-FIL	3.80E+01	Reference 5	2.87E+05	5.41E+03
PM25-PRI	3.80E+01	Reference 4	2.87E+05	5.41E+03
VOC	2.80E+01	Reference 4	2.87E+05	3.99E+03
Ethyl Benzene	4.80E-02	Reference 3	2.87E+05	6.83E+00
Styrene	1.02E-01	Reference 3	2.87E+05	1.44E+01
Phenol	1.15E-01	Reference 3	2.87E+05	1.64E+01
2,3,7,8-tetrachlorodibenzo-p-dioxin	2.30E-09	Reference 3	2.87E+05	3.27E-07
1,2,3,7,8,9-hexachlorodibenzo-p-dioxin	3.46E-08	Reference 3	2.87E+05	4.92E-06
Octachlorodibenzo-p-dioxin	1.33E-06	Reference 3	2.87E+05	1.89E-04
1,2,3,4,6,7,8-heptachlorodibenzo-p-dioxin	3.32E-07	Reference 5	2.87E+05	4.73E-05
Octachlorodibenzofuran	2.06E-08	Reference 5	2.87E+05	2.93E-06
1,2,3,4,7,8-hexachlorodibenzo-p-dioxin	1.14E-08	Reference 5	2.87E+05	1.62E-06
1,2,3,7,8-pentachlorodibenzo-p-dioxin	7.66E-09	Reference 5	2.87E+05	1.09E-06
2,3,7,8-tetrachlorodibenzofuran	1.40E-08	Reference 5	2.87E+05	1.99E-06
1,2,3,4,7,8,9-heptachlorodibenzofuran	6.12E-09	Reference 5	2.87E+05	8.71E-07
2,3,4,7,8-pentachlorodibenzofuran	2.02E-08	Reference 5	2.87E+05	2.87E-06
1,2,3,7,8-pentachlorodibenzofuran	1.27E-06	Reference 5	2.87E+05	1.80E-04
1,2,3,6,7,8-hexachlorodibenzofuran	1.43E-08	Reference 5	2.87E+05	2.03E-06
1,2,3,6,7,8-hexachlorodibenzo-p-dioxin	2.14E-08	Reference 5	2.87E+05	3.05E-06
2,3,4,6,7,8-hexachlorodibenzofuran	1.96E-08	Reference 5	2.87E+05	2.79E-06
1,2,3,4,6,7,8-heptachlorodibenzofuran	5.08E-08	Reference 5	2.87E+05	7.23E-06
1,2,3,4,7,8-hexachlorodibenzofuran	3.34E-08	Reference 5	2.87E+05	4.75E-06
1,2,3,7,8,9-hexachlorodibenzofuran	2.22E-09	Reference 5	2.87E+05	3.16E-07
Methyl Ethyl Ketone	6.70E-02	Reference 5	2.87E+05	9.54E+00
Cumene	1.33E-02	Reference 4	2.87E+05	1.89E+00

Table 3. National Emissions Summary for Brush Species (SCC 2610000400)

Pollutant	Emission Factor (lb/ton)	Emission Factor Reference	2002 National Activity Level (tons burned/year)	2002 National Emissions (tons/year)
CO	1.40E+02	Reference 5	2.87E+05	1.99E+04
PM10-PRI	1.70E+01	Reference 4	2.87E+05	2.42E+03
PM10-FIL	1.70E+01	Reference 4	2.87E+05	2.42E+03
PM25-PRI	1.70E+01	Reference 5	2.87E+05	2.42E+03
PM25-FIL	1.70E+01	Reference 5	2.87E+05	2.42E+03
VOC	1.90E+01	Reference 4	2.87E+05	2.70E+03
1,2,3,4,6,7,8-heptachlorodibenzofuran	5.08E-08	Reference 3	2.87E+05	7.23E-06
1,2,3,4,6,7,8-heptachlorodibenzo-p-dioxin	3.32E-07	Reference 3	2.87E+05	4.73E-05
1,2,3,4,7,8,9-heptachlorodibenzofuran	6.12E-09	Reference 3	2.87E+05	8.71E-07
1,2,3,4,7,8-hexachlorodibenzofuran	3.34E-08	Reference 3	2.87E+05	4.75E-06
1,2,3,4,7,8-hexachlorodibenzo-p-dioxin	1.14E-08	Reference 3	2.87E+05	1.62E-06
1,2,3,6,7,8-hexachlorodibenzofuran	1.43E-08	Reference 3	2.87E+05	2.03E-06
1,2,3,6,7,8-hexachlorodibenzo-p-dioxin	2.14E-08	Reference 5	2.87E+05	3.05E-06
1,2,3,7,8,9-hexachlorodibenzofuran	2.22E-09	Reference 5	2.87E+05	3.16E-07
1,2,3,7,8,9-hexachlorodibenzo-p-dioxin	3.46E-08	Reference 5	2.87E+05	4.92E-06
1,2,3,7,8-pentachlorodibenzofuran	1.27E-06	Reference 5	2.87E+05	1.80E-04
1,2,3,7,8-pentachlorodibenzo-p-dioxin	7.66E-09	Reference 5	2.87E+05	1.09E-06
2,3,4,6,7,8-hexachlorodibenzofuran	1.96E-08	Reference 5	2.87E+05	2.79E-06
2,3,4,7,8-pentachlorodibenzofuran	2.02E-08	Reference 5	2.87E+05	2.87E-06
2,3,7,8-tetrachlorodibenzofuran	1.40E-08	Reference 5	2.87E+05	1.99E-06
2,3,7,8-tetrachlorodibenzo-p-dioxin	2.30E-09	Reference 5	2.87E+05	3.27E-07
Cumene	1.33E-02	Reference 5	2.87E+05	1.89E+00
Ethyl Benzene	4.80E-02	Reference 5	2.87E+05	6.83E+00
Methyl Ethyl Ketone	6.70E-02	Reference 5	2.87E+05	9.54E+00
Octachlorodibenzofuran	2.06E-08	Reference 5	2.87E+05	2.93E-06
Octachlorodibenzo-p-dioxin	1.33E-06	Reference 5	2.87E+05	1.89E-04
Phenol	1.15E-01	Reference 4	2.87E+05	1.64E+01
Styrene	1.02E-01	Reference 4	2.87E+05	1.44E+01

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PUBLICLY OWNED TREATMENT WORKS (POTWS)
SCC: 2630020000

Publicly owned treatment works (POTW) facilities are owned by a municipality, state, an intermunicipality or interstate agency, and departments/agencies of the federal government. The definition of a POTW facility includes intercepting sewers, outfall sewers, sewage collection systems, pumping, power, and other equipment. The wastewater treated by these POTWs is generated by industrial, commercial, and domestic sources.[1] The national emission estimates for POTW facilities were calculated using an interpolated nationwide flow rate for baseyear 2002, and then applying emission factors for VOCs, ammonia, and 53 HAPs. Nationwide projected flow rates for 2000 and 2005 were available from an EPA report[2], and are summarized in Table 1. In 2000, flow rate was estimated to be 34,710 million gallons per day (MMGD); in 2005, flow rate was estimated to be 37,085 MMGD. The interpolated 2002 nationwide flow rate (using a linear regression) was calculated at 35,660 MMGD, or 13,015,900 million gallons annually.

The ammonia emission factor was obtained from a report to EPA[3], while the VOC emission factor was retrieved from FIRE program.[4] Emission factors for the 53 HAPs were derived using 1996 area source emissions estimates that were provided by ESD[5] and the 1996 nationwide flow rate.[6] Table 2 lists the 53 HAPs, the 1996 area source emissions, and the derived emission factor in pounds per million gallons treated. It was assumed that the emission factors derived from the 1996 information are applicable for the year 2002. Emissions were allocated to the county-level by the county proportion of the U.S. population.[7] Appendix B contains the total population data in database format.

It is important to note that the emission estimates for this category represent total emissions. When the 2002 point source NEI is released, it will be necessary to determine whether there are point source emissions in SCCs 50100701 through 50100781 and 50100791 through 50182599 that will need to be subtracted to yield the nonpoint source emission estimates for this category.

The national POTW flow rate estimate does not include Puerto Rico or the U.S. Virgin Islands. Emissions for Puerto Rico and the U.S. Virgin Islands were estimated using the approach outlined in the report text. Broward County in Florida is assumed to be the surrogate county for Puerto Rico. Monroe County in Florida is assumed to be the surrogate for the U.S. Virgin Islands. POTW emissions in the surrogate counties were divided by the population of the surrogate counties obtained from the U.S. Census Bureau to estimate emissions on a per capita basis.[7] The per capita emissions were then multiplied by the population in each county of Puerto Rico and the U.S. Virgin Islands to estimate emissions. The emissions data reported in Table 2 include the emission estimates for Puerto Rico and the U.S. Virgin Islands.

Example Calculations:

The 1996 flow rate per day was 32,175 MMGD. (1996 was a leap year.) Annually, this computes to:

32,175 MMGD treated * 366 days = 11,776,050 million gallons treated

Benzene emissions in 1996 for area source POTWs were estimated to be 461.44 tons per year. The derived benzene emission factor is calculated as follows:

Benzene emission factor = (461.44 tons * 2000 lb/ton)/(11,776,050 million gallons treated)

Benzene emission factor = 0.078369 lb/million gallons treated

Benzene estimates for 2002 for area source POTWs (exluding Puerto Rico and U.S. Virgin Islands) are calculated as follows:

2002 Benzene emissions = (35,660 MMGD * 365 days) * (0.078369 lb/million gallons treated)

2002 Benzene emissions = 1,020,043 pounds = 510.02 tons/year

PUBLICLY OWNED TREATMENT WORKS (POTWS) (continued)
SCC: 2630020000

Data Parameters

Table 1 - National Flow Rates, 1996-2005

Year	Flow rate (MMGD)	Reference
1996	32,175	6
2000	34,710	2
2002	35,660	interpolated by linear regression
2005	37,085	2

Table 2 - Emission Factors and National-Level Estimates

Pollutant	1996 Emissions (tpy)	Derived Emission Factor (lb/MMGAL)	2002 Emissions (tpy) [1]
1,1,2,2-Tetrachloroethane	0.12	2.0380E-05	0.1335
1,1,2-Trichloroethane	0.08	1.3587E-05	0.0890
1,2,4-Trichlorobenzene	5.92	1.0054E-03	6.5839
1,3-Butadiene	1.72	2.9212E-04	1.9129
1,4-Dichlorobenzene	14.76	2.5068E-03	16.4152
1-Chloro-2,3-Epoxypropane	0.31	5.2649E-05	0.3448
2,4-Dinitrotoluene	3.3	5.6046E-04	3.6701
2-Nitropropane	0.02	3.3967E-06	0.0222
Acetaldehyde	21.27	3.6124E-03	23.6552
Acetonitrile	23.67	4.0200E-03	26.3244
Acrolein	26.3	4.4667E-03	29.2493
Acrylonitrile	26.47	4.4956E-03	29.4384
Allyl Chloride	1.33	2.2588E-04	1.4791
Ammonia	NA	1.90E+01 [2]	124,417.9275
Benzene	461.44	7.8369E-02	513.1862
Benzyl Chloride	0.56	9.5108E-05	0.6228
Biphenyl	5.16	8.7636E-04	5.7386
Carbon Disulfide	296.41	5.0341E-02	329.6496
Carbon Tetrachloride	77.35	1.3137E-02	86.0241
Chlorobenzene	33.13	5.6267E-03	36.8452
Chloroform	441.89	7.5049E-02	491.4438
Chloroprene	1.63	2.7683E-04	1.8128
Cresols (includes o,m,p)	0.11	1.8682E-05	0.1223
Dimethyl Sulfate	0.09	1.5285E-05	0.1001
Ethyl Acrylate	0.12	2.0380E-05	0.1335
Ethyl benzene	525.48	8.9246E-02	584.4077
Ethylene Oxide	15.22	2.5849E-03	16.9268
Formaldehyde	1.35	2.2928E-04	1.5014

PUBLICLY OWNED TREATMENT WORKS (POTWS) (continued)
SCC: 2630020000

Table 2 (continued)

Pollutant	1996 Emissions (tpy)	Derived Emission Factor (lb/MMGAL)	2002 Emissions (tpy) [1]
Glycol Ethers	788.86	1.3398E-01	877.3233
Hexachlorobutadiene	0.05	8.4918E-06	0.0556
Hexachlorocyclopentadiene	0.04	6.7935E-06	0.0445
Methanol	782.48	1.3289E-01	870.2278
Methyl Chloroform (1,1,1-Trichloroethane)	38.62	6.5591E-03	42.9509
Methyl Ethyl Ketone (2-Butanone)	195.16	3.3145E-02	217.0454
Methyl Isobutyl Ketone (Hexone)	184.45	3.1326E-02	205.1343
Methyl Methacrylate	21.31	3.6192E-03	23.6997
Methyl tert-Butyl Ether	4.37	7.4218E-04	4.8601
Methylene Chloride	625.92	1.0630E-01	696.1111
N,N-Dimethylaniline	22.10	3.7534E-03	24.5783
Naphthalene	90.00	1.5285E-02	100.0927
Nitrobenzene	0.45	7.6426E-05	0.5005
o-Toluidine	0.12	2.0380E-05	0.1335
P-Dioxane	1.23	2.0890E-04	1.3679
Propionaldehyde	0.24	4.0761E-05	0.2669
Propylene Dichloride	0.79	1.3417E-04	0.8786
Propylene Oxide	50.21	8.5275E-03	55.8406
Styrene	187.35	3.1819E-02	208.3596
Tetrachloroethylene	292.47	4.9672E-02	325.2678
Toluene	839.51	1.4258E-01	933.6532
Trichloroethylene	20.98	3.5632E-03	23.3327
Vinyl Acetate	5.25	8.9164E-04	5.8387
Vinyl Chloride	0.46	7.8125E-05	0.5116
Vinylidene Chloride	29.01	4.9269E-03	32.2632
VOC	NA	9.90E+00 [2]	64,828.2886
Xylenes (includes o, m, and p)	4100.05	6.9634E-01	4,559.8322

[1] Includes estimates for Puerto Rico and the U.S. Virgin Islands.
[2] Actual emission factor, not derived.

PUBLICLY OWNED TREATMENT WORKS (POTWS) (continued)
SCC: 2630020000

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RESIDENTIAL CONSTRUCTION
SCC: 2311010000

Primary PM_{10} and $PM_{2.5}$ area source emissions were estimated for residential construction. Emissions for this source category are all filterable; there are no condensible emissions. Emissions from residential construction activity are a function of the acreage disturbed and volume of soil excavated for residential construction.[1] Residential construction activity is developed from data obtained from the U.S. Department of Commerce (DOC)'s Bureau of the Census. Emissions from residential construction in Puerto Rico and the U.S. Virgin Islands was not estimated.

Annual regional housing starts data by housing category (1-unit, 2 to 4-units, 5-units or more) are developed from the 2002 New Privately Owned Housing Units Started.[2] Table 1 presents the housing starts data obtained from the DOC. The resulting annual regional housing starts for each housing category are then converted from 'number of units' data into 'number of structures' data. The regional number of structures started in 2002 is then allocated to counties. The Permits by County[3] data for 2002 is used to calculate the ratio of the number of building permits in each county to the total number of building permits in the region. This ratio is then used to estimate the number of structures started in each county. Appendix B contains the permit data by county.

Table 1. New Privately Owned Housing Units Started in 2002 (thousands) [2]

Month	Total	1 unit	2 to 4 units	5 or more units	Northeast Total	Midwest Total	South Total	West Total	Northeast 1 unit	Midwest 1 unit	South 1 unit	West 1 unit
Jan	110.4	84.7	4.7	21.1	8.9	18.1	57.0	26.4	6.4	13.4	44.2	20.6
Feb	120.4	99.1	2.9	18.4	7.8	20.6	61.7	30.2	6.6	17.1	51.2	24.2
Mar	138.2	109.5	3.7	25.0	13.1	25.6	65.0	34.5	10.1	19.9	50.7	28.8
Apr	148.8	122.2	2.3	24.2	11.3	27.4	74.4	35.7	9.1	24.6	58.9	29.6
May	165.5	133.7	3.2	28.5	15.5	36.0	74.8	39.1	12.3	27.6	61.8	32.1
Jun	160.3	130.1	4.0	26.2	17.5	35.4	70.3	37.1	13.6	31.0	54.9	30.5
Jul	155.9	125.2	2.9	27.8	14.9	35.5	68.2	37.2	9.2	28.5	55.6	31.9
Aug	147.0	111.4	2.9	32.6	16.5	31.0	67.3	32.1	12.0	21.4	52.0	26.0
Sep	155.6	124.0	3.2	28.4	15.9	34.5	67.5	37.8	10.8	25.9	55.6	31.7
Oct	146.8	118.8	3.2	24.9	13.4	30.7	60.7	42.0	10.5	23.9	52.4	32.0
Nov	133.0	102.6	2.9	27.5	12.0	30.5	59.5	31.1	9.0	23.8	46.8	23.1
Dec	123.1	97.2	2.6	23.3	11.6	24.4	54.9	32.2	8.1	19.7	44.1	25.3

The percentage of one family houses with basements is obtained from the U.S. Census Bureau in the report *Characteristics of New Houses,* Type of Foundation in New One Family Houses Completed.[4] Table 2 presents the percentage of one-family homes with basements for each region. The percentages are applied to 1-unit structures to obtain the number of structures with basements in each county.

Table 2. Type of Foundation in New One Family Houses Completed in 2002 [4]

Region	Total	Full or Partial Basement	Slab or other Type	Crawl Space	Percent Basements
Northeast	113	100	9	4	0.8850
South	615	90	403	122	0.1463
Midwest	272	205	46	21	0.7537
West	325	60	203	62	0.1846
United States	1,325	455	661	208	0.3434

RESIDENTIAL CONSTRUCTION (continued)
SCC: 2311010000

The county-level housing starts by structure type is used to estimate the acreage disturbed due to residential construction. The total area disturbed in each county is calculated by assuming an average acreage disturbed for each type of structure as given below:

- 1-Unit - 1/4 acre/structure
- 2-Unit - 1/3 acre/structure
- Apartment - 1/2 acre/structure

The U.S. Census Bureau no longer reports separate data for 2-unit structures, but groups them into a 2 to 4-units category. However, the Census Bureau was contacted to request the number of 2-unit structure starts and number of 3 to 4-unit structure starts. The available national data are displayed in Table 3. The ratio of number of 2-unit structure starts and number of 3 to-4 unit structure sarts to number of 2 to 4-unit structure starts was then computed as shown in Table 3. These ratios were used to allocate the number of 2 to 4-unit starts in each region to 2-unit starts and 3 to 4-unit starts.

Table 3. National Number of Housing Starts for 2-units and 3 to 4-units

	2 units	3-4 units	Total
National Starts (thousands)	14	24	38
Ratios	0.368	0.632	

The cubic yards of dirt excavated for 1-unit structures with basements is also estimated. This estimation assumes all single-family homes are 2,000 square feet in area, have a basement depth of 8 feet, and have additional peripheral dirt removed amounting to 10% of the basement volume. Table 4 summarizes the activity data for residential construction.

Table 4. Summary of National Activity Data for Residential Construction

Type of Structure	Units	Activity
Apartments	acres disturbed	12,828
2-Unit Structures	acres disturbed	2,363
1-Unit Structures w/o Basements	acres disturbed	222,950
1-unit Structures with Basements	acres disturbed	116,676
	cubic yards excavated	304,221,375

Emission Factors

Initial PM_{10} emissions from construction of single family, two family, and apartments structures are calculated using the emission factors given in Table 5. The duration of construction activity for houses is assumed to be 6 months and the duration of construction for apartments is assumed to be 12 months. For single-unit houses with basements, emissions are calculated assuming best available control measures (BACM).[6] The BACM Level 2 emission factor equation is applied to the acreage disturbed and the cubic yards of dirt excavated.

RESIDENTIAL CONSTRUCTION (continued)
SCC: 2311010000

Table 5. Emission Factors for Residential Construction

Type of Structure	Emission Factor	Duration of Construction
Apartments	0.11 tons PM10/acre-month	12 months
2-Unit Structures	0.032 tons PM10/acre-month	6 months
1-Unit Structures w/o Basements	0.032 tons PM10/acre-month	6 months
1-unit Structures with Basements	0.011 tons PM10/acre-month	6 months
	0.059 tons PM10/1000 cubic yards	

Adjustments

Regional variances in construction emissions are corrected using soil moisture level, silt content, and control efficiency. These correction parameters are applied to initial PM_{10} emissions from residential construction to develop the final emissions inventory.

To account for the soil moisture level, the PM_{10} emissions are weighted using the precipitation-evaporation (PE) values from Thornthwaite's PE Index. Average precipitation evaporation values for each State were estimated based on PE values for specific climatic divisions within a State. These values range from 7 to 41.

To account for the silt content, thePM_{10} emissions are weighted using average silt content for each county. A data base containing county-level dry silt values was complied. These values were derived by applying a correction factor developed by the California Air Resources Board to convert wet silt values to dry silt values.[7]

The equation for PM_{10} emissions corrected for soil moisture and silt content is:

$$Corrected\ E_{PM10} = Initial\ E_{PM10} \times \frac{24}{PE} \times \frac{S}{9\%}$$

where: Corrected E_{PM10} = PM_{10} emissions corrected for soil moisture and silt content,
PE = precipitation-evaporation value for each State,
S = % dry silt content in soil for area being inventoried.

Nonattainment areas are assumed to require controls for PM emissions from residential construction activity. A control efficiency of 50 percent is assumed for both PM_{10} and $PM_{2.5}$ in nonattainment areas.

Once PM_{10} estimates are developed, $PM_{2.5}$ emissions are estimated by applying a particle size multiplier of 0.20 to PM_{10} emissions.[1]

It is important to note that the residential construction values represent total emissions. When the 2002 point source NEI is released, it will be necessary to determine whether there are point source emissions in SCCs 31100101 through 31100103 that may need to be subtracted to yield the nonpoint source emission estimates for this category.

RESIDENTIAL CONSTRUCTION (continued)
SCC: 2311010000

Table 6. National Emissions Summary for Residential Construction

Pollutant	Emission Factor	Emission Factor Reference	National Activity Level (Reference 2,3,4)	National Emissions (tons/year)
PM10-PRI	See Table 2	Reference 1	See Table 1	100,109
PM25-PRI	See Table 2	Reference 1	See Table 1	20,021

References:

1. U.S. Environmental Protection Agency, Office of Air Quality Planning and Standards, "Technical Memorandum: Revised Methodology for Estimating Emissions from Construction." Prepared by E.H. Pechan & Associates. Research Triangle Park, NC. September 2000.

2. U.S. Department of Commerce, Bureau of the Census. Construction Statistics. *Housing Starts - New Privately Owned Housing Units Started*. 2002.

3. U.S. Department of Commerce, Bureau of the Census. Construction Statistics. *Annual Characteristics of New Housing - Type of Foundation in New One-Family Houses Completed*, 2002.

4. U.S. Department of Commerce, Bureau of the Census. Construction Statistics. *Annual Housing Units Authorized by Building Permits - Permits by County*. 2002.

5. U.S. Census Bureau, Residential Construction Branch, personal communication with P. Hemmer of E.H. Pechan & Associates, Inc., June 2003.

6. Midwest Research Institute. Improvement of Specific Emission Factors (BACM Project No. 1). Prepared for South Coast Air Quality Management District. March 29, 1996.

7. Campbell, 1996: Campbell, S.G., D.R. Shimp, and S.R. Francis. *Spatial Distribution of PM-10 Emissions from Agricultural Tilling in the San Joaquin Valley*, pp. 119-127 in Geographic Information Systems in Environmental Resources Management, Air and Waste Management Association, Reno, NV. 1996.

RESIDENTIAL HEATING: ANTHRACITE AND BITUMINOUS COAL
SCC: 2104001000 and 2104002000

The mass of coal consumed for residential heating in the U.S. is used to estimate emissions. Coal consumption by energy use sector is presented in the State Energy Data 2000 Consumption published by the Energy Information Administration (EIA).[1] Year 2000 consumption data (452 thousand tons) were used to estimate 2002 consumption because year 2000 data were the latest data available.

The State Energy Data Report does not distinguish between anthracite and bituminous coal consumption estimates. EPA's report "Final Summary of the Development and Results of a Methodology for Calculating Area Source Emissions from Residential Fuel Combustion," uses State-level anthracite and bituminous coal consumption estimates for 1999 that were obtained directly from EIA.[2] The 1999 ratio of anthracite and bituminous coal consumption to total coal consumption is used to distribute the 2000 coal consumption data by coal type. Table 1 presents the 1999 ratio between anthracite and bituminous coal consumption in each State.

Table 1. 1999 State Distribution of Anthracite and Bituminous Coal Consumed for Residential Heating

State	Ratio of Bituminous	Ratio of Anthracite	State	Ratio of Bituminous	Ratio of Anthracite
Alabama	1.00000	0.00000	Montana	1.00000	0.00000
Alaska	1.00000	0.00000	Nebraska	0.00000	0.00000
Arizona	0.00000	0.00000	Nevada	0.00000	0.00000
Arkansas	0.00000	0.00000	New Hampshire	0.00000	1.00000
California	1.00000	0.00000	New Jersey	0.00000	1.00000
Colorado	1.00000	0.00000	New Mexico	1.00000	0.00000
Connecticut	0.00000	1.00000	New York	0.63636	0.36364
Delaware	0.00000	1.00000	North Carolina	1.00000	0.00000
District of Columbia	1.00000	0.00000	North Dakota	1.00000	0.00000
Florida	1.00000	0.00000	Ohio	0.98430	0.01570
Georgia	1.00000	0.00000	Oklahoma	1.00000	0.00000
Hawaii	0.00000	0.00000	Oregon	0.00000	0.00000
Idaho	1.00000	0.00000	Pennsylvania	0.19450	0.80550
Illinois	1.00000	0.00000	Rhode Island	0.00000	1.00000
Indiana	0.97527	0.02473	South Carolina	1.00000	0.00000
Iowa	1.00000	0.00000	South Dakota	1.00000	0.00000
Kansas	1.00000	0.00000	Tennessee	1.00000	0.00000
Kentucky	1.00000	0.00000	Texas	1.00000	0.00000
Louisiana	1.00000	0.00000	Utah	1.00000	0.00000
Maine	0.00000	1.00000	Vermont	0.00000	1.00000
Maryland	0.92771	0.07229	Virginia	0.98625	0.01375
Massachusetts	0.61165	0.38835	Washington	1.00000	0.00000
Michigan	0.91724	0.08276	West Virginia	1.00000	0.00000
Minnesota	1.00000	0.00000	Wisconsin	1.00000	0.00000
Mississippi	0.00000	0.00000	Wyoming	1.00000	0.00000
Missouri	0.97746	0.02254			

RESIDENTIAL HEATING: ANTHRACITE AND BITUMINOUS COAL (continued)
SCC: 2104001000 and 2104002000

State-level coal consumption was allocated to each county using the U.S. Census Bureau's 2000 Census Detailed Housing Information.[3] These data include the number of housing units using a specific type of fuel for residential heating. Appendix B provides these data in database format. State coal consumption was allocated to each county using the ratio of the number of houses burning coal in each county to the total number of houses burning coal in the State. Refer to Appendices B and C for more details on this allocation.

Calculation of SO_2 and PM emissions requires sulfur content and ash content of the coal burned. Table 2 presents SO_2 and sulfur content of PM emission factors for anthracite and bituminous coal. State -specific sulfur and ash content of anthracite and bituminous coal is obtained from EPA's report "Final Summary of the Development and Results of a Methodology for Calculating Area Source Emissions from Residential Fuel Combustion"[2] This report presents an analysis of the sulfur content and ash content in each state with a coal seam based on data obtained from USGS COALQUAL database. States that are not included in the database but reported coal usage are assigned values based on their proximity to coal seams or using an average value for Pennsylvania (see report for details of the analysis). Table 3 presents the sulfur and ash content by coal type for each State.

Table 2. Emission Factors for Residential Anthracite and Bituminous Coal Combustion

Pollutant	Emission Factor (lb/ton)	AP-42 Table
Anthracite Emission Factors		
SO_2	39 x % Sulfur	1.2-1
PM_{10} (Filterable)	10.0	1.2-3
$PM_{2.5}$ (Filterable)	0.6 x % Ash	1.2-4
PM Condensible	0.08 x % Ash	1.2-3
Bituminous Emission Factors		
SO_2	31 x % Sulfur	1.1-3
PM_{10} (Filterable)	6.2	1.1-4
$PM_{2.5}$ (Filterable)	3.8	1.1-10
PM Condensible	0.04	1.1-5

Note: PM_{10}, $PM_{2.5}$, and condensible PM emission factors for bituminous coal do not require ash content.

Table 3. State-Specific Sulfur and Ash Content for Anthracite and Bituminous Coal

Anthracite			Bituminous			
State	Percent Ash Content	Percent Sulfur Content	State	Percent Sulfur Content	State	Percent Sulfur Content
Connecticut	13.38	0.89	Alabama	2.08	Montana	0.6
Delaware	13.38	0.89	Alaska	0.31	New Mexico	0.75
Indiana	13.38	0.89	California	0.47	New York	2.42
Maine	13.38	0.89	Colorado	0.61	North Carolina	1.62
Maryland	13.38	0.89	Dist. Columbia	1.67	North Dakota	0.97
Massachusetts	13.38	0.89	Florida	1.28	Ohio	3.45
Michigan	13.38	0.89	Georgia	1.28	Oklahoma	3.08
Missouri	13.38	0.89	Idaho	0.31	Pennsylvania	2.42
New Hampshire	13.38	0.89	Illinois	3.48	South Carolina	1.28
New Jersey	13.38	0.89	Indiana	2.49	South Dakota	0.97
New York	13.38	0.89	Iowa	4.64	Tennessee	1.62
Ohio	13.38	0.89	Kansas	5.83	Texas	1.14
Pennsylvania	13.38	0.89	Kentucky	1.93	Utah	0.8
Rhode Island	13.38	0.89	Maryland	1.67	Virginia	1.19
Vermont	13.38	0.89	Massachusetts	2.42	Washington	0.5
Virginia	27.6	0.43	Michigan	1.2	West Virginia	1.25
			Minnesota	0.97	Wisconsin	1
			Missouri	3.39	Wyoming	0.87

The remaining criteria pollutant and HAP emissions were calculated by multiplying the total coal consumed in each county per year by an emission factor. Emissions for anthracite and bituminous coal were calculated separately, since emission factors vary by coal type. Table 4 presents a summary of the CAP emissions factors, total mass of coal burned and the national CAP emissions. Table 5 presents HAP emissions factors, total mass of coal burned and the national HAP emissions. Emissions from residential heating by coal in the Puerto Rico and the U.S. Virgin Islands were not estimated for the 2002 NEI.

Table 4. National Criteria Pollutant Emissions Summary for Residential Heating with Anthracite and Bituminous Coal

Pollutant	Emission Factor (lb/ton)	Emission Factor Reference	National Activity Level (thousand short tons)	National Emissions (tons/yr)
Anthracite				
CO	275	Reference 2	74.45	10,237
NOX	3	Reference 2	74.45	112
PM10-FIL	See Table 2	Reference 2	74.45	4,989
PM-CON	See Table 2	Reference 2	74.45	39.9
PM25-FIL	See Table 2	Reference 2	74.45	299
SO2	See Table 2	Reference 2	74.45	1,291
VOC	10	Reference 2	74.45	372
Bituminous				
CO	275	Reference 2	377.55	51,913
NOX	9.1	Reference 2	377.55	1,718
PM10-FIL	6.2	Reference 2	377.55	1,170
PM25-FIL	3.8	Reference 2	377.55	717
PM-CON	0.04	Reference 2	377.55	7.6
SO2	See Table 2	Reference 2	377.55	11,388
VOC	10	Reference 2	377.55	1,888

Table 5. National HAP Emissions Summary for Residential Heating with Anthracite and Bituminous Coal

Pollutant	Emission Factor (lb/ton)	Emission Factor Reference	National Activity Level (thousand short tons)	National Emissions (tons/yr)
Anthracite				
Acenaphthene	5.10e-07	Reference 5	74.45	1.90e-05
Acenaphthylene	2.50e-07	Reference 5	74.45	9.31e-06
Acetaldehyde	5.70e-04	Reference 4,5	74.45	2.12e-02
Acetophenone	1.50e-05	Reference 4,5	74.45	5.58e-04
Acrolein	2.90e-04	Reference 4,5	74.45	1.08e-02
Anthracene	2.10e-07	Reference 5	74.45	7.82e-06
Antimony	1.80e-05	Reference 4,5	74.45	6.70e-04
Arsenic	4.10e-04	Reference 4,5	74.45	1.53e-02
Benz[a]Anthracene	8.00e-08	Reference 5	74.45	2.98e-06
Benzene	1.30e-03	Reference 4,5	74.45	4.84e-02
Benzo[a]Pyrene	3.80e-08	Reference 5	74.45	1.41e-06
Benzo[g,h,i,]Perylene	2.70e-08	Reference 5	74.45	1.01e-06
Benzofluoranthenes	1.10e-07	Reference 5	74.45	4.09e-06
Beryllium	2.10e-05	Reference 4,5	74.45	7.82e-04
Bis(2-Ethylhexyl)Phthalate	7.30e-05	Reference 4,5	74.45	2.72e-03
Cadmium	5.10e-05	Reference 4,5	74.45	1.90e-03
Carbon Disulfide	1.30e-04	Reference 4,5	74.45	4.84e-03
Chlorobenzene	2.20e-05	Reference 4,5	74.45	8.19e-04
Chromium	2.64e-04	Reference 4,5	74.45	9.83e-03
Chrysene	1.00e-07	Reference 5	74.45	3.72e-06
Cobalt	1.00e-04	Reference 4,5	74.45	3.72e-03
Dioxins/Furans as 2,3,7,8-TCDD TEQs - I/89	4.20e-15	Reference 6	74.45	1.56e-13
Ethyl Benzene	9.40e-05	Reference 4,5	74.45	3.50e-03
Ethylene Dichloride	4.00e-05	Reference 4,5	74.45	1.49e-03
Fluoranthene	7.10e-07	Reference 5	74.45	2.64e-05
Fluorene	9.10e-07	Reference 5	74.45	3.39e-05
Formaldehyde	2.40e-04	Reference 4,5	74.45	8.93e-03
Hexane	6.70e-05	Reference 4,5	74.45	2.49e-03
Hydrochloric Acid	1.20e+00	Reference 4,5	74.45	4.47e+01
Hydrogen Fluoride	1.50e-01	Reference 5	74.45	5.58e+00
Indeno[1,2,3-c,d]Pyrene	6.10e-08	Reference 5	74.45	2.27e-06
Isophorone	5.80e-04	Reference 4,5	74.45	2.16e-02
Lead	4.20e-04	Reference 4,5	74.45	1.56e-02
Manganese	4.90e-04	Reference 4,5	74.45	1.82e-02
Mercury	8.30e-05	Reference 4,5	74.45	3.09e-03
Methyl Bromide	1.60e-04	Reference 4,5	74.45	5.96e-03
Methyl Chloride	5.30e-04	Reference 4,5	74.45	1.97e-02
Methyl Ethyl Ketone	3.90e-04	Reference 4,5	74.45	1.45e-02
Methylene Chloride	2.90e-04	Reference 4,5	74.45	1.08e-02
Naphthalene	1.30e-05	Reference 5	74.45	4.84e-04
Nickel	2.80e-04	Reference 4,5	74.45	1.04e-02
Phenanthrene	2.70e-06	Reference 5	74.45	1.01e-04
Phenol	1.60e-05	Reference 5	74.45	5.96e-04
Propionaldehyde	3.80e-04	Reference 4,5	74.45	1.41e-02
Pyrene	3.30e-07	Reference 5	74.45	1.23e-05
Selenium	1.30e-03	Reference 4,5	74.45	4.84e-02
Styrene	2.50e-05	Reference 4,5	74.45	9.31e-04
Tetrachloroethylene	4.30e-05	Reference 4,5	74.45	1.60e-03

Table 5 (continued)

Pollutant	Emission Factor (lb/ton)	Emission Factor Reference	National Activity Level (thousand short tons)	National Emissions (tons/yr)
Toluene	2.40e-04	Reference 4,5	74.45	8.93e-03
Bituminous				
Acetaldehyde	5.70e-04	Reference 4,5	377.55	1.08e-01
Acetophenone	1.50e-05	Reference 4,5	377.55	2.83e-03
Acrolein	2.90e-04	Reference 4,5	377.55	5.47e-02
Antimony	1.80e-05	Reference 4,5	377.55	3.40e-03
Arsenic	4.10e-04	Reference 4,5	377.55	7.74e-02
Benz[a]Anthracene	8.00e-08	Reference 5	377.55	1.51e-05
Benzene	1.30e-03	Reference 4,5	377.55	2.45e-01
Benzo[b]Fluoranthene	1.10e-07	Reference 5	377.55	2.08e-05
Benzo[g,h,i,]Perylene	2.70e-08	Reference 5	377.55	5.10e-06
Beryllium	2.10e-05	Reference 4,5	377.55	3.96e-03
Bis(2-Ethylhexyl)Phthalate	7.30e-05	Reference 4,5	377.55	1.38e-02
Cadmium	5.10e-05	Reference 4,5	377.55	9.63e-03
Carbon Disulfide	1.30e-04	Reference 4,5	377.55	2.45e-02
Chlorobenzene	2.20e-05	Reference 4,5	377.55	4.15e-03
Chromium	2.60e-04	Reference 4,5	377.55	4.91e-02
Chrysene	1.00e-07	Reference 4	377.55	1.89e-05
Cobalt	1.00e-04	Reference 4,5	377.55	1.89e-02
Dioxins/Furans as 2,3,7,8-TCDD TEQs - I/89	1.50e-14	Reference 6	377.55	2.83e-12
Ethyl Benzene	9.40e-05	Reference 4,5	377.55	1.77e-02
Ethylene Dichloride	4.00e-05	Reference 4,5	377.55	7.55e-03
Formaldehyde	2.40e-04	Reference 4,5	377.55	4.53e-02
Hexane	6.70e-05	Reference 4,5	377.55	1.27e-02
Indeno[1,2,3-c,d]Pyrene	6.10e-08	Reference 5	377.55	1.15e-05
Isophorone	5.80e-04	Reference 4,5	377.55	1.09e-01
Lead	4.20e-04	Reference 4,5	377.55	7.93e-02
Manganese	4.90e-04	Reference 4,5	377.55	9.25e-02
Mercury	8.30e-05	Reference 4,5	377.55	1.57e-02
Methyl Bromide	1.60e-04	Reference 4,5	377.55	3.02e-02
Methyl Chloride	5.30e-04	Reference 4,5	377.55	1.00e-01
Methyl Ethyl Ketone	3.90e-04	Reference 4,5	377.55	7.36e-02
Methylene Chloride	2.90e-04	Reference 4,5	377.55	5.47e-02
Nickel	2.80e-04	Reference 4,5	377.55	5.29e-02
Phenol	1.60e-05	Reference 5	377.55	3.02e-03
Propionaldehyde	3.80e-04	Reference 4,5	377.55	7.17e-02
Pyrene	3.30e-07	Reference 5	377.55	6.23e-05
Selenium	1.30e-03	Reference 4,5	377.55	2.45e-01
Styrene	2.50e-05	Reference 4,5	377.55	4.72e-03
Tetrachloroethylene	4.30e-05	Reference 4,5	377.55	8.12e-03
Toluene	2.40e-04	Reference 4,5	377.55	4.53e-02

RESIDENTIAL HEATING: ANTHRACITE AND BITUMINOUS COAL (continued)
SCC: 2104001000 and 2104002000

Example Calculations

$$National\ Emissions\left(\frac{tons}{year}\right) = \frac{Emission\ Factor\left(\frac{lb}{ton\ coal}\right) \times National\ Activity\left(\frac{tons\ coal\ burned}{year}\right)}{2000\ \frac{lb}{ton}}$$

$$National\ selenium\ emissions\ \text{from bituminous coal combustion} = \frac{\frac{1.3\times10^{-3}\ lb}{ton} \times\ 377.55\times10^{3}\ ton}{2000\ \frac{lb}{ton}} = .024541\ tons$$

References:

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2. U.S. Environmental Protection Agency, Emission Factors and Inventory Group. "Final Summary of the Development and Results of a Methodology for Calculating Area Source Emissions from Residential Fuel Combustion." Research Triangle Park, NC. September 2002. http://www.epa.gov/ttn/chief/eiip/techreport/volume03/draft1999_residfuel_inven_apr2003.zip

3. U.S. Census Bureau. "Table H40. House Heating Fuel Type", Census 2000: Summary File 3, [Data file], March, 2003.

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RESIDENTIAL HEATING: DISTILLATE OIL
SCC: 2104004000

The State-level volume of distillate oil consumed for residential heating in the U.S. is used to estimate emissions. Distillate Oil consumption by energy use sector is presented in the State Energy Data 2000 Consumption published by the Energy Information Administration (EIA).[1] Because 2002 consumption data were not yet available, year 2000 consumption data (6,175,092 thousand gallons) were used to estimate 2002 consumption.

State-level distillate oil consumption was allocated to each county using the U.S. Census Bureau's 2000 Census Detailed Housing Information.[2] These data include the number of housing units using a specific type of fuel for residential heating. Appendix B provides these data in database format. State distillate oil consumption was allocated to each county using ratio of number of houses burning distillate oil in each county to the total number of houses burning distillate oil in the state.

Criteria pollutant emission factors for distillate oil are from "Final Summary of the Development and Results of a Methodology for Calculating Area Source Emissions from Residential Fuel Combustion."[3] For all counties in the U.S., the distillate oil consumed for residential heating is assumed to be No. 2 fuel oil with a heating value of 140,000 Btu per gallon and a sulfur content of 0.30%.[3]

County-level criteria pollutant and HAP emissions were calculated by multiplying the total distillate oil consumed in each county per year by an emission factor. Table 1 is a national summary of the emissions data that contains the emissions factors, total volume of distillate oil burned, and national criteria pollutant and HAP emissions from residential heating with distillate oil. Emissions from residential heating by distillate oil in the Puerto Rico and the U.S. Virgin Islands were not estimated for the 2002 NEI.

RESIDENTIAL HEATING: DISTILLATE OIL (continued)
SCC: 2104004000

Table 1. National Criteria Pollutant and HAP Emissions Summary for Residential Heating with Distillate Oil

Pollutant	Emission Factor (lb/1,000 gal)	Emission Factor Reference	National Activity Level Distillate Oil Consumption (thousand gallons)	National Emissions (lb/yr)
Acenaphthene	2.11e-05	Reference 5	6,175,092	6.51E-02
Acenaphthylene	2.53e-07	Reference 5	6,175,092	7.81E-04
Acetaldehyde	4.92e-03	Reference 5	6,175,092	1.52E+01
Anthracene	1.22e-06	Reference 5	6,175,092	3.77E-03
Arsenic	5.62e-04	Reference 4, 5	6,175,092	1.73E+00
Benz[a]Anthracene	4.07e-06	Reference 5	6,175,092	1.26E-02
Benzene	2.11e-04	Reference 4, 5	6,175,092	6.51E-01
Benzo[b+k]Fluoranthene	1.55e-06	Reference 5	6,175,092	4.77E-03
Benzo[g,h,i,]Perylene	2.25e-06	Reference 5	6,175,092	6.94E-03
Beryllium	4.21e-04	Reference 4, 5	6,175,092	1.30E+00
Cadmium	4.21e-04	Reference 4, 5	6,175,092	1.30E+00
Chromium	4.21e-04	Reference 4, 5	6,175,092	1.30E+00
Chrysene	2.39e-06	Reference 5	6,175,092	7.37E-03
Dibenzo[a,h]Anthracene	1.69e-06	Reference 5	6,175,092	5.20E-03
Fluoranthene	4.92e-06	Reference 5	6,175,092	1.52E-02
Fluorene	4.50e-06	Reference 5	6,175,092	1.39E-02
Formaldehyde	3.37e-02	Reference 4, 5	6,175,092	1.04E+02
Indeno[1,2,3-c,d]Pyrene	2.11e-06	Reference 5	6,175,092	6.51E-03
Lead	1.26e-03	Reference 4, 5	6,175,092	3.90E+00
Manganese	8.43e-04	Reference 4, 5	6,175,092	2.60E+00
Mercury	4.21e-04	Reference 4, 5	6,175,092	1.30E+00
Naphthalene	1.14e-03	Reference 5	6,175,092	3.51E+00
Nickel	4.21e-04	Reference 4, 5	6,175,092	1.30E+00
OCDD	5.49e-10	Reference 4, 5	6,175,092	1.70E-06
OCDF	2.50e-10	Reference 4, 5	6,175,092	7.71E-07
Phenanthrene	1.05e-05	Reference 5	6,175,092	3.25E-02
Pyrene	4.21e-06	Reference 5	6,175,092	1.30E-02
Selenium	2.11e-03	Reference 4, 5	6,175,092	6.51E+00
2,3,7,8-TCDD	4.66e-10	Reference 6	6,175,092	1.44E-06
2,3,7,8-TCDF	4.41e-10	Reference 6	6,175,092	1.36E-06
Total HpCDD	5.24e-10	Reference 6	6,175,092	1.62E-06
Total HpCDF	6.07e-10	Reference 6	6,175,092	1.88E-06
Total HxCDD	5.49e-10	Reference 6	6,175,092	1.70E-06
Total HxCDF	1.41e-09	Reference 6	6,175,092	4.37E-06
Total PeCDD	6.82e-10	Reference 6	6,175,092	2.11E-06
Total PeCDF	3.49e-09	Reference 6	6,175,092	1.08E-05
CO	5.00e-00	Reference 3	6,175,092	1.54E+04
NOX	1.80e+01	Reference 3	6,175,092	5.56E+04
PM10-FIL	1.08e+00	Reference 3	6,175,092	3.33E+03
PM25-FIL	8.30e-01	Reference 3	6,175,092	2.56E+03
PM-CON	1.30e+00	Reference 3	6,175,092	4.01E+03
SO2	4.26e+01	Reference 3	6,175,092	1.32E+05
VOC	7.00e-01	Reference 3	6,175,092	2.16E+03

RESIDENTIAL HEATING: DISTILLATE OIL (continued)
SCC: 2104004000

Example Calculation

$$National\ Emissions\left(\frac{tons}{year}\right) = \frac{Emission\ Factor\left(\frac{lb}{MM\ Btu\ Oil}\right) \times \frac{0.14\ MMBtu}{gal} \times National\ Activity\left(\frac{gal\ oil\ burned}{year}\right)}{2000\ \frac{lb}{ton}}$$

$$National\ selenium\ emissions = \frac{\frac{15 \times 10^{-8}\ lb}{MMBtu} \times \frac{014\ MMBtu}{gal} \times\ 6{,}175092 \times 10^{9}\ gal}{2000\ \frac{lb}{ton}} = 651\ tons$$

References:

1. U.S. Department of Energy, Energy Information Administration (EIA). State Energy Data 2000 Consumption. Washington, D.C. 2003. Internet Address: http://www.eia.doe.gov/emeu/states/_use_multistate.html

2. U.S. Census Bureau. "Table H40. House Heating Fuel Type", Census 2000: Summary File 3, [Data file], March, 2003.

3. U.S. Environmental Protection Agency, Emission Factors and Inventory Group. "Final Summary of the Development and Results of a Methodology for Calculating Area Source Emissions from Residential Fuel Combustion." September 2002. http://www.epa.gov/ttn/chief/eiip/techreport/volume03/draft1999_residfuel_inven_apr2003.zip

4. Porter, Fred, U.S. Environmental Protection Agency, Emission Standards Division. Note to Anne Pope, U.S. Environmental Protection Agency/Emissions Monitoring and Analysis Division. Comments on Industrial Boiler information in the "Baseline Emission Inventory of HAP Emissions from MACT Sources – Interim Final Report," September 18, 1998. November 13, 1998.

5. U.S. Environmental Protection Agency. Compilation of Air Pollutant Emission Factors, 5th Edition, AP-42, Volume I: Stationary Point and Area Sources. Research Triangle Park, North Carolina. 1996.

6. U.S. Environmental Protection Agency, Office of Air Quality Planning and Standards. "Documentation of Emissions Estimation methods for Year 2000 and 2001 Mobile Source and NonPoint Source Dioxin Inventories." Prepared by E.H. Pechan & Associates. Research Triangle Park, NC. May 2003.

RESIDENTIAL HEATING: KEROSENE
SCC: 2104011000

The State-level volume of kerosene consumed for residential heating in the United States is used to estimate emissions. Kerosene consumption by energy use sector is available from the Energy Information Administration (EIA).[1] Because 2002 consumption data were not yet available, year 2000 consumption data were used to estimate 2002 consumption.

State-level kerosene consumption was allocated to each county using the U.S. Census Bureau's 2000 Census detailed housing data.[2] These data provide the number of housing units using fuel oil/kerosene for residential heating. Appendix B provides these data in database format. Kerosene consumption ratios were calculated using the ratio of the number of houses burning kerosene in each county to the total number of houses burning kerosene in the state. These consumption ratios were used to calculate county-level kerosene consumption.

Pollutant emission factors for residential kerosene combustion are based on the the emission factors for residential distillate oil combustion.[3,4,5,6] Because the heating value of kerosene is approximately 135,000 Btu/gallon and the heating value of distillate fuel oil is approximately 140,000 Btu/gallon, the kerosene emission factors were estimated by multiplying the distillate fuel oil emission factors by 135/140.[7]

County-level criteria pollutant and HAP emissions were calculated by multiplying the total annual amount of kerosene consumed in each county by an emission factor. Table 1 is a national summary of the emissions data that displays the emission factors, total volume of kerosene burned, and national criteria pollutant and HAP emissions from residential heating with kerosene. Emissions from residential heating by kerosene in Puerto Rico and the U.S. Virgin Islands were not estimated for the 2002 NEI.

RESIDENTIAL HEATING: KEROSENE (continued)
SCC: 2104011000

Table 1. National Criteria Pollutant and HAP Emissions Summary for Residential Heating with Kerosene

Pollutant	Emission Factor (lb/1,000 barrels)	Emission Factor Reference	National Activity Level Kerosene Consumption (thousand barrels)	National Emissions (tons/yr)
Acenaphthene	8.53E-04	Reference 5,7	16,679	7.12E-03
Acenaphthylene	1.02E-05	Reference 5,7	16,679	8.54E-05
Acetaldehyde	1.99E-01	Reference 5,7	16,679	1.66E+00
Anthracene	4.95E-05	Reference 5,7	16,679	4.13E-04
Arsenic	2.28E-02	Reference 4,5,7	16,679	1.90E-01
Benz[a]Anthracene	1.65E-04	Reference 5,7	16,679	1.38E-03
Benzene	8.53E-03	Reference 4,5,7	16,679	7.12E-02
Benzo[b+k]Fluoranthene	6.26E-05	Reference 5,7	16,679	5.22E-04
Benzo[g,h,i,]Perylene	9.10E-05	Reference 5,7	16,679	7.59E-04
Beryllium	1.71E-02	Reference 4,5,7	16,679	1.42E-01
Cadmium	1.71E-02	Reference 4,5,7	16,679	1.42E-01
Chromium	1.71E-02	Reference 4,5,7	16,679	1.42E-01
Chrysene	9.67E-05	Reference 5,7	16,679	8.07E-04
Dibenzo[a,h]Anthracene	6.83E-05	Reference 5,7	16,679	5.69E-04
Fluoranthene	1.99E-04	Reference 5,7	16,679	1.66E-03
Fluorene	1.82E-04	Reference 5,7	16,679	1.52E-03
Formaldehyde	1.37E+00	Reference 4,5,7	16,679	1.14E+01
Indeno[1,2,3-c,d]Pyrene	8.53E-05	Reference 5,7	16,679	7.12E-04
Lead	5.12E-02	Reference 4,5,7	16,679	4.27E-01
Manganese	3.41E-02	Reference 4,5,7	16,679	2.85E-01
Mercury	1.71E-02	Reference 4,5,7	16,679	1.42E-01
Naphthalene	4.61E-02	Reference 5,7	16,679	3.84E-01
Nickel	1.71E-02	Reference 4,5,7	16,679	1.42E-01
OCDD	2.22E-08	Reference 4,5,7	16,679	1.85E-07
OCDF	1.01E-08	Reference 4,5,7	16,679	8.43E-08
Phenanthrene	4.27E-04	Reference 5,7	16,679	3.56E-03
Pyrene	1.71E-04	Reference 5,7	16,679	1.42E-03
Selenium	8.53E-02	Reference 4,5,7	16,679	7.12E-01
2,3,7,8-TCDD	1.89E-08	Reference 6,7	16,679	1.57E-07
2,3,7,8-TCDF	1.79E-08	Reference 6,7	16,679	1.49E-07
Total HpCDD	2.12E-08	Reference 6,7	16,679	1.77E-07
Total HpCDF	2.46E-08	Reference 6,7	16,679	2.05E-07
Total HxCDD	2.22E-08	Reference 6,7	16,679	1.85E-07
Total HxCDF	5.73E-08	Reference 6,7	16,679	4.78E-07
Total PeCDD	2.76E-08	Reference 6,7	16,679	2.30E-07
Total PeCDF	1.42E-07	Reference 6,7	16,679	1.18E-06
CO	2.03E+02	Reference 3,7	16,679	1,688.78
NOX	7.29E+02	Reference 3,7	16,679	6,079.62
PM10-FIL	4.37E+01	Reference 3,7	16,679	364.78
PM25-FIL	3.36E+01	Reference 3,7	16,679	280.34
PM-CON	5.27E+01	Reference 3,7	16,679	439.08
SO2	1.73E+03	Reference 3,7	16,679	14,388.42
VOC	2.84E+01	Reference 3,7	16,679	236.43

RESIDENTIAL HEATING: KEROSENE (continued)
SCC: 2104011000

Example Calculation

$$National\ Emissions\left(\frac{lbs}{year}\right) = Distillate\ Emission\ Factor\left(\frac{1b}{1000\ gallons}\right) \times \frac{135}{140} \times \frac{42\ gallons}{barrel} \times National\ Activity\left(\frac{1000\ barrels}{year}\right) \times \frac{1ton}{2000\ lbs}$$

$$National\ Selenium\ Emissions = \frac{0.002107\ lb}{1000\ gallons} \times \frac{135}{140} \times \frac{42}{1} \times 16{,}679.33\ thousand\ barrels \times \frac{1ton}{2000\ lbs}$$

$$= 0.712\ tons / year$$

References:

1. U.S. Department of Energy, Energy Information Administration (EIA). State Energy Data 2000 Consumption. Washington, D.C. 2003. Internet Address: http://www.eia.doe.gov/emeu/states/_use_multistate.html

2. U.S. Census Bureau. "Table H40. House Heating Fuel Type", Census 2000: Summary File 3, [Data file], March, 2003.

3. U.S. Environmental Protection Agency, Emission Factors and Inventory Group. "Final Summary of the Development and Results of a Methodology for Calculating Area Source Emissions from Residential Fuel Combustion." September 2002. http://www.epa.gov/ttn/chief/eiip/techreport/volume03/drat1999_residfuel_inven_apr2003.zip

4. Porter, Fred, U.S. Environmental Protection Agency, Emission Standards Division. Note to Anne Pope, U.S. Environmental Protection Agency/Emissions Monitoring and Analysis Division. Comments on Industrial Boiler information in the "Baseline Emission Inventory of HAP Emissions from MACT Sources – Interim Final Report," September 18, 1998. November 13, 1998.

5. U.S. Environmental Protection Agency. Compilation of Air Pollutant Emission Factors, 5th Edition, AP-42, Volume I: Stationary Point and Area Sources. Research Triangle Park, North Carolina. 1996.

6. U.S. Environmental Protection Agency, Office of Air Quality Planning and Standards. "Documentation of Emissions Estimation Methods for Year 2000 and 2001 Mobile Source and Nonpoint Source Dioxin Inventories." Prepared by E.H. Pechan & Associates. Research Triangle Park, NC. July 2003.

7. U.S. Department of Energy, Energy Information Administration, *Commercial Buildings Glossary*, available from http://www.eia.doe.gov/emeu/cbecs/gloss.html, accessed September 2004.

RESIDENTIAL HEATING: LIQUEFIED PETROLEUM GAS
SCC: 2104007000

Residential liquefied petroleum gas (LPG) combustion emissions were calculated using the volume of LPG consumed in the United States. State-level LPG consumption by sector is available from the Energy Information Administration (EIA).[1] Year 2000 consumption data were used to estimate 2002 consumption because these data were the latest data available.

State-level LPG consumption was allocated to each county using the U.S. Census Bureau's 2000 Census detailed housing data.[2] These data report the number of housing units using "bottled, tank, or LP gas" for residential heating. Appendix B provides these data in database format. State LPG consumption was allocated to each county using the ratio of number of houses burning LPG in each county to the total number of houses burning LPG in the state.

Pollutant emission factors for residential LPG are based on the residential natural gas emission factors.[3,4,5] For all counties in the United States, the natural gas consumed for residential heating is assumed to have a heating value of 1,050 Btu per cubic foot and a sulfur content of 2,000 grains per million cubic feet.[3] The natural gas emission factors (in lb/million Btu) were converted to LPG emission factors (in lb/million gallons) by multiplying by 91,330 Btu/gallon.[6]

County-level criteria pollutant and HAP emissions were calculated by multiplying the total annual amount of LPG consumed in each county by an emission factor. Table 1 is a national summary of the emissions data that displays the emission factors, total volume of LPG burned, and national criteria pollutant and HAP emissions from residential heating with LPG. Emissions from residential heating by LPG in Puerto Rico and the U.S. Virgin Islands were not estimated for the 2002 NEI.

Table 1. National Criteria Pollutant and HAP Emissions Summary for Residential Heating with LPG

Pollutant	Emission Factor (lb/thousand barrels)	Emission Factor Reference	National Activity LPG (Thousand barrels)	National Emissions (tons/yr)
Formaldehyde	2.88E-01	Reference 4,6	156,280	2.25E+01
Benzene	8.07E-03	Reference 4,6	156,280	6.31E-01
Acetaldehyde	5.00E-05	Reference 4,6	156,280	3.91E-03
Pyrene	1.92E-05	Reference 5,6	156,280	1.50E-03
Phenanthrene	6.54E-05	Reference 5,6	156,280	5.11E-03
Fluoranthene	1.15E-05	Reference 5,6	156,280	8.99E-04
Fluorene	1.07E-05	Reference 5,6	156,280	8.39E-04
Naphthalene	2.34E-03	Reference 5,6	156,280	1.83E-01
CO	1.46E+02	Reference 3,6	156,280	1.14E+04
NOX	3.43E+02	Reference 3,6	156,280	2.68E+04
PM10-FIL	6.94E+00	Reference 3,6	156,280	5.42E+02
PM25-FIL	6.94E+00	Reference 3,6	156,280	5.42E+02
PM-CON	2.08E+01	Reference 3,6	156,280	1.63E+03
SO2	2.19E+00	Reference 3,6	156,280	1.71E+02
VOC	2.01E+01	Reference 3,6	156,280	1.57E+03

RESIDENTIAL HEATING: LIQUEFIED PETROLEUM GAS (continued)
SCC: 2104007000

Example Calculation:

$$National\ Emissions = Natural\ Gas\ Emission\ Factor\left(\frac{lb}{million\ cubic\ ft}\right) \times \frac{1\ million\ cubic\ ft\ (Natural\ Gas)}{1{,}050\ million\ Btu} \times \frac{91{,}330\ Btu}{gallon\ (LPG)} \times \frac{42\ gallons}{barrel} \times \frac{1\ million\ barrels}{1000\ thousand\ barrels} \times National\ Activity\left(\frac{thousand\ barrels}{year}\right) \times \frac{1\ ton}{2000\ lbs}$$

References:

$$National\ fluorene\ emissions = \frac{2.94\text{E-}06\ lb}{million\ cubic\ feet} \times \frac{1\ million\ cubic\ feet}{1{,}050\ million\ Btu} \times \frac{91{,}330\ Btu}{gallon} \times \frac{42\ gallons}{barrel} \times \frac{1\ million\ barrels}{1000\ thousand\ barrels} \times \frac{156{,}280.15003\ thousand\ barrels}{year} \times \frac{1\ ton}{2000\ lbs}$$

$$8.39 \times 10^{-4}\ tons / year$$

1. U.S. Department of Energy, Energy Information Administration (EIA). State Energy Data 2000 Consumption. Washington, D.C. 2003. Internet Address: http://www.eia.doe.gov/emeu/states/_use_multistate.html

2. U.S. Census Bureau. "Table H40. House Heating Fuel Type", Census 2000: Summary File 3, [Data file], March, 2003.

3. U.S. Environmental Protection Agency. Emission Factor and Inventory Group. Final Summary of the Development and Results of a Methodology for Calculating Area Source Emissions from Residential Fuel Combustion. September 2002. Internet address: http://www.epa.gov/ttn/chief/eiip/techreport/volume03/drat1999_residfuel_inven_apr2003.zip

4. Porter, Fred, U.S. Environmental Protection Agency, Emission Standards Division. Note to Anne Pope, U.S. Environmental Protection Agency/Emissions Monitoring and Analysis Division. Comments on Industrial Boiler information in the "Baseline Emission Inventory of HAP Emissions from MACT Sources – Interim Final Report," September 18, 1998. November 13, 1998.

5. U.S. Environmental Protection Agency. Compilation of Air Pollutant Emission Factors, 5th Edition, AP-42, Volume I: Stationary Point and Area Sources. Research Triangle Park, North Carolina. 1996.

6. U.S. Department of Energy, Energy Information Administration, *2001 Glossary*, available from http://www.eia.doe.gov/emeu/recs/glossary.html, accessed September 2004.

RESIDENTIAL HEATING: NATURAL GAS
SCC: 2104006000

The State-level volume of natural gas consumed for residential heating in the United States is used to estimate emissions. Natural gas consumption by energy use sector is presented in the State Energy Data 2000 Consumption published by the EIA.[1] Year 2000 consumption data (4,991,678 million cubic feet) were used to estimate 2002 consumption because these data were the latest data available.

State-level natural gas consumption was allocated to each county using the U.S. Census Bureau's 2000 Census Detailed Housing Information.[2] These data include the number of housing units using a specific type of fuel for residential heating. Appendix B contains the fuel type data in database format. State distillate oil consumption was allocated to each county using ratio of number of houses burning distillate oil in each county to the total number of houses burning distillate oil in the state.

Criteria pollutant emission factors for natural gas are from "Final Summary of the Development and Results of a Methodology for Calculating Area Source Emissions from Residential Fuel Combustion."[3] For all counties in the United States, the natural gas consumed for residential heating is assumed to have a heating value of 1,050 Btu per cubic foot and a sulfur content of 2,000 grains per million cubic feet.[3]

County-level criteria pollutant and HAP emissions were calculated by multiplying the total natural gas consumed in each county per year by an emission factor. Table 1 is a national summary of the emissions data that contains the emissions factors, total volume of natural gas burned, and national criteria pollutant and HAP emissions from residential heating with natural gas. Emissions from residential heating by natural gas in the Puerto Rico and the U.S. Virgin Islands were not estimated for the 2002 NEI.

Table 1. National Criteria Pollutant and HAP Emissions Summary for Residential Heating with Natural Gas

Pollutant	Emission Factor (lb/million cubic ft)	Emission Factor Reference	National Activity Natural Gas (million cubic feet)	National Emissions (tons/yr)
Formaldehyde	7.88e-02	Reference 4	4,991,678	1.97e+02
Benzene	2.21e-03	Reference 4	4,991,678	5.51e+00
Acetaldehyde	1.37e-05	Reference 4	4,991,678	3.41e-02
Pyrene	5.25e-06	Reference 5	4,991,678	1.31e-02
Phenanthrene	1.79e-05	Reference 5	4,991,678	4.46e-02
Fluoranthene	3.15e-06	Reference 5	4,991,678	7.86e-03
Fluorene	2.94e-06	Reference 5	4,991,678	7.34e-03
Naphthalene	6.41e-04	Reference 5	4,991,678	1.60e+00
CO	4.00E+01	Reference 3	4,991,678	9.98E+04
NOX	9.40E+01	Reference 3	4,991,678	2.35E+05
PM10-FIL	1.90E+00	Reference 3	4,991,678	4.74E+03
PM25-FIL	1.90E+00	Reference 3	4,991,678	4.74E+03
PM-CON	5.70E+00	Reference 3	4,991,678	1.42E+04
SO2	6.00E-01	Reference 3	4,991,678	1.50E+03
VOC	5.50E+00	Reference 3	4,991,678	1.37E+04

RESIDENTIAL HEATING: NATURAL GAS (continued)
SCC: 2104006000

Example Calculation:

$$National\ Emissions\left(\frac{tons}{year}\right) = \frac{Emission\ Factor\left(\frac{lb}{MMBtu}\right) \times \frac{1050\ MMBtu}{million\ ft^3} \times National\ Activity\left(\frac{million\ ft^3\ nat\ gas}{year}\right)}{2000\ \frac{lb}{ton}}$$

$$National\ fluorene\ emissions = \frac{\frac{2.8 \times 10^{-9}\ lb}{MMBtu} \times \frac{1050\ MMBtu}{million\ ft^3} \times 4,991,678\ million\ ft^3}{2000\ \frac{tons}{yr}} = 7.34e-03\ tons$$

References:

1. U.S. Department of Energy, Energy Information Administration (EIA). State Energy Data 2000 Consumption. Washington, D.C. 2003. Internet Address: http://www.eia.doe.gov/emeu/states/_use_multistate.html

2. U.S. Census Bureau. "Table H40. House Heating Fuel Type", Census 2000: Summary File 3, [Data file], March, 2003.

3. U.S. Environmental Protection Agency. Emission Factor and Inventory Group. Final Summary of the Development and Results of a Methodology for Calculating Area Source Emissions from Residential Fuel Combustion. September 2002. Internet address: http://www.epa.gov/ttn/chief/eiip/techreport/volume03/draft1999_residfuel_inven_apr2003.zip

4. Porter, Fred, U.S. Environmental Protection Agency, Emission Standards Division. Note to Anne Pope, U.S. Environmental Protection Agency/Emissions Monitoring and Analysis Division. Comments on Industrial Boiler information in the "Baseline Emission Inventory of HAP Emissions from MACT Sources – Interim Final Report," September 18, 1998. November 13, 1998.

5. U.S. Environmental Protection Agency. Compilation of Air Pollutant Emission Factors, 5th Edition, AP-42, Volume I: Stationary Point and Area Sources. Research Triangle Park, North Carolina. 1996.

RESIDENTIAL HEATING USING WOOD (FIREPLACES, INSERTS, AND WOODSTOVES)
SCCs: 2104008001, 2104008002, 2104008003, 2104008004, 2104008010, 2104008030, and 2104008050

The emission estimation methodology for this source category was taken directly from the results of a study by EIG.[1] Emissions associated with residential heating with wood are estimated for seven types of equipment and reported under the following SCCs:

Fireplaces: Without Inserts (SCC = 2104008001);
Fireplaces: Inserts - Catalytic, non-EPA-certified (SCC = 2104008002);
Fireplaces: Inserts - Non-catalytic, EPA-certified (SCC = 2104008003);
Fireplaces: Inserts - Catalytic, EPA-certified (SCC = 2104008004);
Woodstoves - Conventional (SCC = 2104008010);
Woodstoves - Catalytic (SCC = 2104008030); and,
Woodstoves - Non-catalytic (SCC = 2104008050)

The following is a summary of the study's methods.

Activity Data

Appendix C contains the final activity data, wood consumption by type of combustion device, that was developed for residential heating using wood. The following steps were taken to estimate the national and county-level activity data for this category:

1. ***Use the 2001 national activity data to extrapolate national activity data for 2002***. The activity data for residential wood combustion (RWC) were estimated based on the type of combustion unit. Table 1 identifies the steps followed to estimate the national number of fireplaces without inserts, and the national amount of cordwood burned in the fireplaces. Table 2 shows the steps followed to estimate the national number of woodstoves and fireplaces with inserts, and the national amount of cordwood burned in these combustion units. The national number of fireplaces without inserts, fireplaces with inserts, and woodstoves was taken from the 2001 *American Housing Survey for the United States* (AHS)[2], which is released every two years. The national numbers were adjusted to account for the number of usable fireplaces and woodstoves that are used to burn wood (see Tables 1 and 2). Cordwood consumption was then estimated for each of these three types of equipment. The 2001 national cordwood consumption was then adjusted to 2002 national cordwood consumption using a ratio of national heating demand for both years (see Tables 1 and 2).[3]

2. ***Group all counties into one of five climate zones to address wood consumption differences due to temperature***. The extent of wood consumption in residential combustion units is directly related to temperature – in colder climates more wood is consumed. The second step in the method was to use historical climate data to assign each county in the country to one of five climate zones. The climate zones are defined by the National Climatic Data Center and are based on heating degree day (HDD) and cooling degree day (CDD) data. The database used for climate zone assignments was revised in May 2004. Each climate zone was then assigned a percentage of total national wood consumption based on information contained in the Energy Information Administration's Residential Energy Consumption database.[4] The following shows the percentage of national wood consumption allocated to each climate zone:

Climate Zone	Percent of Wood Consumed
1 (>7000 HDD)	36
2 (5500-7000 HDD)	19
3 (4000-5499 HDD)	21
4 (<4000 HDD and <2000 CDD)	15
5 (<4000 HDD and >2000 CDD)	9

RESIDENTIAL HEATING USING WOOD (FIREPLACES, INSERTS, AND WOODSTOVES) (continued)
SCCs: 2104008001, 2104008002, 2104008003, 2104008004, 2104008010, 2104008030, and 2104008050

Table 1. Methods for Estimating National Wood Consumption for Fireplaces Without Inserts

Step	Description	Calculation Step	Reference	Total
1	Number of homes with usable fireplaces (inserts and no inserts)		2001 American Housing Survey (Table 2-25; Selected Amenities, Usable Fireplaces) (http://www.census.gov/hhes/www/housing/ahs/ahs01/tab225.html)	35,097,000
2	Number of usable fireplaces (inserts and no inserts)	Multiply Step 1 by factor (1.17) for more than 1 unit per home	US Consumer Product Safety Commission, March 1989	41,063,490
3	Number of usable fireplaces burning wood (as opposed to gas)	Multiply Step 2 by factor (0.74) to estimate number of units burning wood	Houck, Based on industry sales data from Hearth Products, Vista Marketing, and Industry reps.	30,386,983
4	Number of wood burning, usable fireplaces actually in use	Multiply Step 3 by factor (0.58) to estimate the number of fireplaces in use	Houck, Based on five local surveys, Vista Marketing Research survey, US Consumer Product Safety report and on a 3/97 Housing economics article.	17,624,450
5	Number of homes with fireplaces with inserts, used for main heating		2001 American Housing Survey (Table 2-4) (http://www.census.gov/hhes/www/housing/ahs/ahs01/tab24.html)	145,000
6	Number of homes with fireplaces with inserts, used for other heating		2001 American Housing Survey (Table 2-4) (http://www.census.gov/hhes/www/housing/ahs/ahs01/tab24.html)	4,937,000
7	Total number of homes with fireplaces with inserts, used for heating	Sum of Steps 5 and 6		5,082,000
8	Total number of fireplaces with inserts, used for heating	Multiply Step 7 by factor (1.10) for more than 1 unit per home	US Consumer Product Safety Commission, March 1989	5,590,200
9	Total fireplaces without inserts burning wood	Step 4 minus Step 8		12,034,250
10	Number of homes with fireplaces (no inserts) used for main heating		2001 American Housing Survey (Table 2-4) (http://www.census.gov/hhes/www/housing/ahs/ahs01/tab24.html)	64,000
11	Number of homes with fireplaces (no inserts) used for other heating		2001 American Housing Survey (Table 2-4) (http://www.census.gov/hhes/www/housing/ahs/ahs01/tab24.html)	4,055,000
12	Total number of homes with fireplaces (no inserts) used for heating	Sum of Steps 10 and 11		4,119,000
13	Total number of fireplaces (no inserts) used for heating	Multiply Step 12 by factor (1.17) for more than 1 unit per home	US Consumer Product Safety Commission, March 1989	4,819,230
14	Number of fireplaces used for aesthetics and pleasure	Step 9 minus Step 13		7,215,020

RESIDENTIAL HEATING USING WOOD (FIREPLACES, INSERTS, AND WOODSTOVES) (continued)
SCCs: 2104008001, 2104008002, 2104008003, 2104008004, 2104008010, 2104008030, and 2104008050

Table 1 (continued)

Step	Description	Calculation Step	Reference	Total
15	Cords consumed in fireplaces without inserts used for heating	Step 13 times 0.656 cords/unit/yr (wood consumption rate for fireplaces w/o inserts used for heating)		3,161,415
16	Cords consumed in fireplaces without inserts used for aesthetics and pleasure	Step 14 times 0.069 cords/unit/yr (wood consumption rate for fireplaces w/o inserts used for aesthetics and pleasure)		497,836
17	Total cords consumed in fireplaces without inserts	Sum of Steps 15 and 16		3,659,251
18	Dry weight wax/sawdust fireplace logs (tons)	Calculating the 2 year percentage increase from 1997 to 1999 then applying that increase to estimate 2001.	Houck 2001b. *Recommended Procedure for Compiling Emission Inventory Data For Manufactured Wax/Sawdust Fireplace Logs.*	263,695
19	Approximate cordwood equivalent value for wax/sawdust fireplace logs used in 2001 (dry tons)	Multiply Step 18 by 4.49	Houck 2001b. *Recommended Procedure for Compiling Emission Inventory Data For Manufactured Wax/Sawdust Fireplace Logs.*	1,183,991
20	Cordwood value adjusted for wax/sawdust fireplace log use 2001	Subtract Step 19 from 17		2,475,261
21	Cordwood value adjusted for wax/sawdust fireplace log use 2002	Multiply Step 20 times amount of cordwood used in 2002/2001 (350/407 Trillion BTU)	EIA. Estimated Renewable Energy Consumption: Residential and Commercial Sectors. Table 10.2a. Monthly Energy Review. August, 2003. This table has both the 2001 and 2002 fuel consumption from residential wood (in trillion BTU)	2,128,603

RESIDENTIAL HEATING USING WOOD (FIREPLACES, INSERTS, AND WOODSTOVES) (continued)
SCCs: 2104008001, 2104008002, 2104008003, 2104008004, 2104008010, 2104008030, and 2104008050

Table 2. Methods for Estimating National Wood Consumption for Fireplaces with Inserts and Woodstoves

Step	Description	Calculation Step	Reference	Total
1	Number of homes with woodstoves used for main heating		2001 American Housing Survey (Table 2-4) (http://www.census.gov/hhes/www/housing/ahs/ahs01/tab24.html)	1,137,000
2	Number of homes with woodstoves used for other heating		2001 American Housing Survey (Table 2-4) (http://www.census.gov/hhes/www/housing/ahs/ahs01/tab24.html)	4,834,000
3	Total number of homes with woodstoves used for heating	Sum of Steps 1 and 2		5,971,000
4	Total number of woodstoves used for heating	Multiply Step 3 by factor (1.09) for more than 1 unit per home	US Consumer Product Safety Commission, March 1989	6,508,390
5	Number of homes with fireplaces with inserts, used for main heating		From Table 1, Step 5	145,000
6	Number of homes with fireplaces with inserts, used for other heating		From Table 1, Step 6	4,937,000
7	Total number of homes with fireplaces with inserts	Sum of Steps 5 and 6	From Table 1, Step 7	5,082,000
8	Total number fireplaces with inserts	Multiply Step 7 by factor (1.10) for more than 1 unit per home	US Consumer Product Safety Commission, March 1989	5,590,200
9	Total number of fireplaces with inserts and woodstoves	Sum of Steps 4 plus 8		12,098,590
10	Total cords of wood consumed by residential sector (doesn't include consumption for aesthetics or pleasure)	Multiply 1997 data (21,700,000 cords) by 2001/1997 ratio of residential wood Btus (407 trillion Btus/433 trillion Btus)	1997 cords of wood data from EIA Renewable Energy Annual (Dec. 1998). 2001 Btu data from Table 7 of Renewable Energy Annual 2002 (Nov. 2003); 1997 Btu data from Table 7 of Renewable Energy Annual 2001 (Nov. 2002).	20,396,998
11	Cords consumed in fireplaces without inserts used for heating		From Table 1, Step 15	3,161,415
12	Total cords of wood consumed by residential sector in woodstoves/fireplaces with inserts	Step 10 minus Step 11		17,235,583
13	Cords consumed per woodstove/insert unit per year	Step 12 divided by Step 9		1.425
14	Cords consumed in fireplaces with inserts in 2001	Step 13 times Step 8		7,963,767
15	Cords consumed in woodstoves in 2001	Step 13 times Step 4		9,271,816
16	Cords consumed in fireplaces with inserts in 2002	Multiply Step 14 times amount of cordwood used in 2002/2001 (350/407 Trillion BTU)	EIA. Estimated Renewable Energy Consumption: Residential and Commercial Sectors. Table 10.2a. Monthly Energy Review. August, 2003. This table has both the 2001 and 2002 fuel consumption from residential wood (in trillion BTU)	6,848,449

Step	Description	Calculation Step	Reference	Total
17	Cords consumed in woodstoves in 2002	Multiply Step 15 times amount of cordwood used in 2002/2001 (350/407 Trillion BTU)	EIA. Estimated Renewable Energy Consumption: Residential and Commercial Sectors. Table 10.2a. Monthly Energy Review. August, 2003. This table has both the 2001 and 2002 fuel consumption from residential wood (in trillion BTU)	7,973,306

3. ***Allocate the consumption level in each zone to individual counties in that zone***. The next step in the procedure was to allocate the wood consumption in each climate zone to individual counties in that zone. This was accomplished using the relative percent of detached single-family homes in each county compared to the number of detached single-family homes in the entire climate zone. The number of detached single-family homes by county was obtained from year 2000 Census data.[5] The county-level housing data are presented in Appendix B by state and county FIPS and climate zone.

4. ***Designate each county as urban or rural***. Each county was then designated as urban or rural in order to reflect equipment usage patterns. The U.S. Bureau of Census classifies a county as rural if less than 50% of its population is located in cities and towns, and urban if more than 50% of its population is located in cities and towns. Estimated 2002 urban/rural population data were used for this classification. These data were developed by multiplying the year 2000 ratios of U.S. Census Bureau urban and rural population to total population by the year 2002 U.S. Census Bureau total population in each county.[6]

5. ***Adjust urban and rural wood consumption to match AHS data***. In each zone, the total urban and rural county wood consumption was summed. If the urban and rural totals did not match the expected percent split for that combustion unit as described in the AHS data, then an adjustment was made within the zone for each county's consumption. The 2001 AHS shows that each type of combustion unit occurs preferentially in urban and rural areas.[2] The percent of combustion units found in urban and rural areas was used as a surrogate for wood consumption. AHS estimated that 73% of fireplaces without inserts are found in urban areas compared to 27% in rural areas. For woodstoves, AHS estimated that 65% of the woodstoves are found in rural areas compared to 35% in urban areas. For fireplaces with inserts, AHS estimated that 57% of the inserts are found in urban areas compared ro 43% in rural areas. The following Table 3 shows how the percentages were derived from the 2001 AHS data:

Table 3. Calculation of Urban Versus Rural Distribution of Fireplaces Without Inserts, Fireplaces With Inserts, and Woodstoves

Type of Heating/ Geographic Location		2001 National Number of Occupied Housing Units (1,000)		
		Fireplaces Without Inserts	Fireplaces With Inserts	Woodstoves
Main	Urban	33	61	192
	Rural	31	84	939
Other Heating	Urban	2,985	2,840	1,910
	Rural	1,071	2,097	2,924
Total Heating	Urban	3,018	2,901	2,102
	Rural	1,102	2,181	3,863
	% Urban	73%	57%	35%
	% Rural	27%	43%	65%

From second page of Table 2-4 (Selected Equipment and Plumbing Occupied Units) of 2001 *American Housing Survey for the United States* (pdf file).

6. ***Allocate wood consumption to equipment types designated by SCC***. Wood consumption in fireplaces without inserts was placed on SCC 2104008001. Total wood consumption for woodstoves and fireplaces with inserts were apportioned as follows:

Type of Device	SCCs for Fireplaces with Inserts	SCCs for Woodstoves	Percent of Total Wood Consumption
Non-certified	2104008002	2104008010	92
Certified non-catalytic	2104008003	2104008050	5.7
Certified catalytic	2104008004	2104008030	2.3

The steps described above resulted in final cordwood consumption by county. Cordwood was converted to tons of wood before estimating emissions using a conversion factor of one cord of wood equaling 1.163 tons.[7] The wood consumption estimates for stoves and inserts were further divided to account for the different designs of units that exist in the marketplace. The different designs of stoves/inserts have been found to have different levels of emissions. Based on data received from the Hearth Products Association,[8] three primary types of units are in use: non-certified, which constitute 92% of the stoves manufactured; certified, non-catalytic (5.7%); and catalytic (2.3%). These splits were applied to the national, state, and county cordwood consumption estimates prior to the application of emission factors. National-level usage by SCC was computed as follows:

SCC 2104008001 = 2,475,565 tons;
SCC 2104008002 = 7,327,566 tons;
SCC 2104008003 = 453,991 tons;
SCC 2104008004 = 183,189 tons;
SCC 2104008010 = 8,531,118 tons;
SCC 2104008030 = 213,278 tons; and
SCC 2104008050 = 528,558 tons.

RESIDENTIAL HEATING USING WOOD (FIREPLACES, INSERTS, AND WOODSTOVES) (continued)
SCCs: 2104008001, 2104008002, 2104008003, 2104008004, 2104008010, 2104008030, and 2104008050

Emission Factors

The majority of the emission factors used to determine national emission estimates for RWC were obtained from EPA's AP-42 document (Tables 1.9-1, 1.10-3, and 1.10-4).[9] Some of the stove and insert factors were adjusted based on new data developed in the reference *Review of Wood Heater and Fireplace Emission Factors*.[10] The emission factors generated by Houck, et. al.[10] for 7-PAH and 16-PAH were lower than the associated AP-42 emission factors. Therefore, the AP-42 PAH emission factors were adjusted downward by 62% for conventional woodstoves, 51% for catalytic woodstoves, and 40% for non-catalytic woodstoves. The dioxin and furan emission factors were retrieved from an EPA report.[11] Tables 4-10 summarize the emission factors and emissions used for the HAP and criteria pollutants.

Seasonal Throughput Data

Default seasonal throughput values prepared during development of the RWC methodology are listed as follows by National Climate Data Center climate zone:

Climate Zone	Winter	Spring	Summer	Fall	
5	100		0	0	0
4	70		15	0	15
3	50		25	0	25
2	40		30	0	30
1	33.33		33.33	0	33.33

These seasonal throughput percentage values were included in the Emission Process table of the inventory. The climate zone to which each state and county was assigned is available in the Appendix B table containing the year 2000 detached single-family housing data.

Table 4 - Emission Factors and National-Level Emissions for SCC 2104008001

Pollutant	Emission Factor	Emission Factor Units	Emission Factor Reference	Emissions (tons/year)
1,2,3,4,6,7,8-Heptachlorodibenzofuran	1.50E-07	mg/kg	11	3.71E-07
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin	1.58E-07	mg/kg	11	3.91E-07
1,2,3,4,7,8,9-Heptachlorodibenzofuran	1.17E-07	mg/kg	11	2.90E-07
1,2,3,4,7,8-Hexachlorodibenzofuran	1.78E-07	mg/kg	11	4.41E-07
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin	1.25E-07	mg/kg	11	3.09E-07
1,2,3,6,7,8-Hexachlorodibenzofuran	1.10E-07	mg/kg	11	2.72E-07
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin	1.25E-07	mg/kg	11	3.09E-07
1,2,3,7,8,9-Hexachlorodibenzofuran	9.92E-08	mg/kg	11	2.46E-07
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin	1.25E-07	mg/kg	11	3.09E-07
1,2,3,7,8-Pentachlorodibenzofuran	2.28E-07	mg/kg	11	5.64E-07
1,2,3,7,8-Pentachlorodibenzo-p-dioxin	1.29E-07	mg/kg	11	3.19E-07
2,3,4,6,7,8-Hexachlorodibenzofuran	9.25E-08	mg/kg	11	2.04E-07
2,3,4,7,8-Pentachlorodibenzofuran	3.22E-07	mg/kg	11	7.97E-07
2,3,7,8-Tetrachlorodibenzofuran	6.25E-07	mg/kg	11	1.55E-06
2,3,7,8-Tetrachlorodibenzo-p-dioxin	1.14E-07	mg/kg	11	2.82E-07
Carbon Monoxide	1.28E+02	lb/ton	10	1.59E+05
Nitrogen Oxides	2.60E+00	lb/ton	9	3.22E+03
Octachlorodibenzofuran	8.33E-08	mg/kg	11	2.06E-07
Octachlorodibenzo-p-dioxin	3.33E-07	mg/kg	11	8.24E-07
Primary PM_{10},total	2.36E+01	lb/ton	10	2.92E+04
Primary $PM_{2.5}$, total	2.36E+01	lb/ton	10	2.92E+04
Sulfur Dioxide	4.00E-01	lb/ton	9	4.95E+02
Volatile Organic Compounds	2.29E+02	lb/ton	9	2.83E+05

Table 5 - Emission Factors and National-Level Emissions for SCC 2104008002

Pollutant	Emission Factor	Emission Factor Units	Emission Factor Reference	Emissions (tons/year)
1,2,3,4,6,7,8-Heptachlorodibenzofuran	1.50E-07	mg/kg	11	1.10E-06
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin	1.58E-07	mg/kg	11	1.16E-06
1,2,3,4,7,8,9-Heptachlorodibenzofuran	1.17E-07	mg/kg	11	8.57E-07
1,2,3,4,7,8-Hexachlorodibenzofuran	1.78E-07	mg/kg	11	1.30E-06
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin	1.25E-07	mg/kg	11	9.16E-07
1,2,3,6,7,8-Hexachlorodibenzofuran	1.10E-07	mg/kg	11	8.06E-07
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin	1.25E-07	mg/kg	11	9.16E-07
1,2,3,7,8,9-Hexachlorodibenzofuran	9.92E-08	mg/kg	11	7.27E-07
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin	1.25E-07	mg/kg	11	9.16E-07
1,2,3,7,8-Pentachlorodibenzofuran	2.28E-07	mg/kg	11	1.67E-06
1,2,3,7,8-Pentachlorodibenzo-p-dioxin	1.29E-07	mg/kg	11	9.45E-07
2,3,4,6,7,8-Hexachlorodibenzofuran	8.25E-08	mg/kg	11	6.04E-07
2,3,4,7,8-Pentachlorodibenzofuran	3.22E-07	mg/kg	11	2.36E-06
2,3,7,8-Tetrachlorodibenzofuran	6.25E-07	mg/kg	11	4.58E-06
2,3,7,8-Tetrachlorodibenzo-p-dioxin	1.14E-07	mg/kg	11	8.35E-07
Acenaphthene	6.21E-03	lb/ton	9,10	2.28E+01
Acenaphthylene	1.32E-01	lb/ton	9,10	4.84E+02
Anthracene	8.69E-03	lb/ton	9,10	3.18E+01
Benz(a)anthracene	1.24E-02	lb/ton	9,10	4.54E+01
Benzene	1.94E+00	lb/ton	9	7.10E+03
Benzo(a)pyrene	2.48E-03	lb/ton	9,10	9.09E+00
Benzo(b)fluoranthene	3.73E-03	lb/ton	9,10	1.37E+01
Benzo(e)pyrene	7.45E-03	lb/ton	9,10	2.73E+01
Benzo(g,h,i)perylene	2.48E-03	lb/ton	9,10	9.09E+00
Benzo(k)fluoranthene	1.24E-03	lb/ton	9,10	4.54E+00
Cadmium	2.20E-05	lb/ton	9	8.06E-02
Carbon Monoxide	2.31E+02	lb/ton	9	8.46E+05
Chrysene	7.45E-03	lb/ton	9,10	2.73E+01
Fluoranthene	1.24E-02	lb/ton	9,10	4.54E+01
Fluorene	1.49E-02	lb/ton	9,10	5.46E+01
Manganese	1.70E-04	lb/ton	9	6.23E-01
Methyl Ethyl Ketone	2.90E-01	lb/ton	9	1.06E+03
Naphthalene	1.79E-01	lb/ton	9,10	6.56E+02
Nickel	1.40E-05	lb/ton	9	5.13E-02
Nitrogen Oxides	2.80E+00	lb/ton	9	1.03E+04
Octachlorodibenzofuran	8.33E-08	mg/kg	11	6.10E-07
Octachlorodibenzo-p-dioxin	3.33E-07	mg/kg	11	2.44E-06
O-xylene	2.02E-01	lb/ton	9	7.40E+02
Phenanthrene	4.84E-02	lb/ton	9,10	1.77E+02
Primary PM_{10},total	3.06E+01	lb/ton	9	1.12E+05
Primary $PM_{2.5}$, total	3.06E+01	lb/ton	9	1.12E+05
Pyrene	1.49E-02	lb/ton	9,10	5.46E+01
Sulfur Dioxide	4.00E-01	lb/ton	9	1.47E+03
Toluene	7.30E-01	lb/ton	9	2.67E+03
Volatile Organic Compounds	5.30E+01	lb/ton	9	1.94E+05

Table 6 - Emission Factors and National-Level Emissions for SCC 2104008003

Pollutant	Emission Factor	Emission Factor Units	Emission Factor Reference	Emissions (tons/year)
1,2,3,4,6,7,8-Heptachlorodibenzofuran	1.50E-07	mg/kg	11	6.81E-08
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin	1.58E-07	mg/kg	11	7.17E-08
1,2,3,4,7,8,9-Heptachlorodibenzofuran	1.17E-07	mg/kg	11	5.31E-08
1,2,3,4,7,8-Hexachlorodibenzofuran	1.78E-07	mg/kg	11	8.08E-08
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin	1.25E-07	mg/kg	11	5.67E-08
1,2,3,6,7,8-Hexachlorodibenzofuran	1.10E-07	mg/kg	11	4.99E-08
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin	1.25E-07	mg/kg	11	5.67E-08
1,2,3,7,8,9-Hexachlorodibenzofuran	9.92E-08	mg/kg	11	4.50E-08
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin	1.25E-07	mg/kg	11	5.67E-08
1,2,3,7,8-Pentachlorodibenzofuran	2.28E-07	mg/kg	11	1.03E-07
1,2,3,7,8-Pentachlorodibenzo-p-dioxin	1.29E-07	mg/kg	11	5.86E-08
2,3,4,6,7,8-Hexachlorodibenzofuran	8.25E-08	mg/kg	11	3.74E-08
2,3,4,7,8-Pentachlorodibenzofuran	3.22E-07	mg/kg	11	1.46E-07
2,3,7,8-Tetrachlorodibenzofuran	6.25E-07	mg/kg	11	2.84E-07
2,3,7,8-Tetrachlorodibenzo-p-dioxin	1.14E-07	mg/kg	11	5.17E-08
7,12-Dimethyl/benz(a)anthracene	1.62E-03	lb/ton	9,10	3.68E-01
Acenaphthene	4.04E-03	lb/ton	9,10	9.17E-01
Acenaphthylene	1.29E-02	lb/ton	9,10	2.93E+00
Anthracene	3.64E-03	lb/ton	9,10	8.26E-01
Benzo(a)pyrene	2.42E-03	lb/ton	9,10	5.49E-01
Benzo(b)fluoranthene	1.62E-03	lb/ton	9,10	3.68E-01
Benzo(e)pyrene	8.08E-04	lb/ton	9,10	1.83E-01
Benzo(g,h,i)Fluoranthene	1.13E-02	lb/ton	9,10	2.57E+00
Benzo(g,h,i)perylene	8.08E-03	lb/ton	9,10	1.83E+00
Biphenyl	8.89E-03	lb/ton	9,10	2.02E+00
Cadmium	2.00E-05	lb/ton	9	4.54E-03
Carbon Monoxide	1.41E+02	lb/ton	9	3.20E+04
Chrysene	4.04E-03	lb/ton	9,10	9.17E-01
Dibenzo(a,h)anthracene	1.62E-03	lb/ton	9,10	3.68E-01
Fluoranthene	3.23E-03	lb/ton	9,10	7.33E-01
Fluorene	5.66E-03	lb/ton	9,10	1.28E+00
Indeno(1,2,3-cd)pyrene	8.08E-03	lb/ton	9,10	1.83E+00
Manganese	1.40E-04	lb/ton	9	3.18E-02
Naphthalene	5.82E-02	lb/ton	9,10	1.32E+01
Nickel	2.00E-05	lb/ton	9	4.54E-03
Octachlorodibenzofuran	8.33E-08	mg/kg	11	3.78E-08
Octachlorodibenzo-p-dioxin	3.33E-07	mg/kg	11	1.51E-07
Perylene	8.08E-04	lb/ton	9,10	1.83E-01
Phenanthrene	4.77E-02	lb/ton	9,10	1.08E+01
PRIMARY PM_{10}, total	1.96E+01	lb/ton	9	4.45E+03
PRIMARY $PM_{2.5}$, total	1.96E+01	lb/ton	9	4.45E+03
Pyrene	3.23E-03	lb/ton	9,10	7.33E-01
Sulfur Dioxide	4.00E-01	lb/ton	9	9.08E+01
Volatile Organic Compounds	1.20E+01	lb/ton	9	2.72E+03

Table 7 - Emission Factors and National-Level Emissions for SCC 2104008004

Pollutant	Emission Factor	Emission Factor Units	Emission Factor Reference	Emissions (tons/year)
1,2,3,4,6,7,8-Heptachlorodibenzofuran	1.50E-07	mg/kg	11	2.75E-08
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin	1.58E-07	mg/kg	11	2.89E-08
1,2,3,4,7,8,9-Heptachlorodibenzofuran	1.17E-07	mg/kg	11	2.14E-08
1,2,3,4,7,8-Hexachlorodibenzofuran	1.78E-07	mg/kg	11	3.26E-08
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin	1.25E-07	mg/kg	11	2.29E-08
1,2,3,6,7,8-Hexachlorodibenzofuran	1.10E-07	mg/kg	11	2.01E-08
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin	1.25E-07	mg/kg	11	2.29E-08
1,2,3,7,8,9-Hexachlorodibenzofuran	9.92E-08	mg/kg	11	1.82E-08
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin	1.25E-07	mg/kg	11	2.29E-08
1,2,3,7,8-Pentachlorodibenzofuran	2.28E-07	mg/kg	11	4.18E-08
1,2,3,7,8-Pentachlorodibenzo-p-dioxin	1.29E-07	mg/kg	11	2.36E-08
2,3,4,6,7,8-Hexachlorodibenzofuran	8.25E-08	mg/kg	11	1.51E-08
2,3,4,7,8-Pentachlorodibenzofuran	3.22E-07	mg/kg	11	5.90E-08
2,3,7,8-Tetrachlorodibenzofuran	6.25E-07	mg/kg	11	1.14E-07
2,3,7,8-Tetrachlorodibenzo-p-dioxin	1.14E-07	mg/kg	11	2.09E-08
Acenaphthene	3.08E-03	lb/ton	9,10	2.82E-01
Acenaphthylene	3.49E-02	lb/ton	9,10	3.20E+00
Anthracene	4.10E-03	lb/ton	9,10	3.76E-01
Benz(a)anthracene	1.23E-02	lb/ton	9,10	1.13E+00
Benzene	1.46E+00	lb/ton	9	1.34E+02
Benzo(a)pyrene	2.05E-03	lb/ton	9,10	1.88E-01
Benzo(b)fluoranthene	2.05E-03	lb/ton	9,10	1.88E-01
Benzo(e)pyrene	2.05E-03	lb/ton	9,10	1.88E-01
Benzo(g,h,i)Fluoranthene	3.08E-03	lb/ton	9,10	2.82E-01
Benzo(g,h,i)perylene	1.03E-03	lb/ton	9,10	9.43E-02
Benzo(k)fluoranthene	1.03E-03	lb/ton	9,10	9.43E-02
Carbon Monoxide	1.04E+02	lb/ton	9	9.56E+03
Chrysene	5.13E-03	lb/ton	9,10	4.70E-01
Dibenzo(a,h)anthracene	1.03E-03	lb/ton	9,10	9.43E-02
Fluoranthene	6.16E-03	lb/ton	9,10	5.64E-01
Fluorene	7.18E-03	lb/ton	9,10	6.58E-01
Indeno(1,2,3-cd)pyrene	2.05E-03	lb/ton	9,10	1.88E-01
Methyl Ethyl Ketone	6.20E-02	lb/ton	9	5.68E+00
Naphthalene	9.54E-02	lb/ton	9,10	8.74E+00
Nitrogen Oxides	2.00E+00	lb/ton	9	1.83E+02
Octachlorodibenzofuran	8.33E-08	mg/kg	11	1.53E-08
Octachlorodibenzo-p-dioxin	3.33E-07	mg/kg	11	6.10E-08
O-xylene	1.86E-01	lb/ton	9	1.70E+01
Phenanthrene	2.46E-02	lb/ton	9,10	2.25E+00
PRIMARY PM_{10}, total	2.04E+01	lb/ton	9	1.87E+03
PRIMARY $PM_{2.5}$, total	2.04E+01	lb/ton	9	1.87E+03
Pyrene	5.13E-03	lb/ton	9,10	4.70E-01
Sulfur Dioxide	4.00E-01	lb/ton	9	3.66E+01
Toluene	5.20E-01	lb/ton	9	4.76E+01
Volatile Organic Compounds	1.50E+01	lb/ton	9	1.37E+03

Table 8 - Emission Factors and National-Level Emissions for SCC 2104008010

Pollutant	Emission Factor	Emission Factor Units	Emission Factor Reference	Emissions (tons/year)
1,2,3,4,6,7,8-Heptachlorodibenzofuran	1.50E-07	mg/kg	11	1.28E-06
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin	1.58E-07	mg/kg	11	1.35E-06
1,2,3,4,7,8,9-Heptachlorodibenzofuran	1.17E-07	mg/kg	11	9.98E-07
1,2,3,4,7,8-Hexachlorodibenzofuran	1.78E-07	mg/kg	11	1.52E-06
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin	1.25E-07	mg/kg	11	1.07E-06
1,2,3,6,7,8-Hexachlorodibenzofuran	1.10E-07	mg/kg	11	9.38E-07
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin	1.25E-07	mg/kg	11	1.07E-06
1,2,3,7,8,9-Hexachlorodibenzofuran	9.92E-08	mg/kg	11	8.46E-07
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin	1.25E-07	mg/kg	11	1.07E-06
1,2,3,7,8-Pentachlorodibenzofuran	2.28E-07	mg/kg	11	1.94E-06
1,2,3,7,8-Pentachlorodibenzo-p-dioxin	1.29E-07	mg/kg	11	1.10E-06
2,3,4,6,7,8-Hexachlorodibenzofuran	8.25E-08	mg/kg	11	7.04E-07
2,3,4,7,8-Pentachlorodibenzofuran	3.22E-07	mg/kg	11	2.75E-06
2,3,7,8-Tetrachlorodibenzofuran	6.25E-07	mg/kg	11	5.33E-06
2,3,7,8-Tetrachlorodibenzo-p-dioxin	1.14E-07	mg/kg	11	9.72E-07
Acenaphthene	6.21E-03	lb/ton	9,10	2.65E+01
Acenaphthylene	1.32E-01	lb/ton	9,10	5.63E+02
Anthracene	8.69E-03	lb/ton	9,10	3.71E+01
Benz(a)anthracene	1.24E-02	lb/ton	9,10	5.29E+01
Benzene	1.94E+00	lb/ton	9	8.27E+03
Benzo(a)pyrene	2.48E-03	lb/ton	9,10	1.06E+01
Benzo(b)fluoranthene	3.73E-03	lb/ton	9,10	1.59E+01
Benzo(e)pyrene	7.45E-03	lb/ton	9,10	3.18E+01
Benzo(g,h,i)perylene	2.48E-03	lb/ton	9,10	1.06E+01
Benzo(k)fluoranthene	1.24E-03	lb/ton	9,10	5.29E+00
Cadmium	2.20E-05	lb/ton	9	9.38E-02
Carbon Monoxide	2.31E+02	lb/ton	9	9.84E+05
Chrysene	7.45E-03	lb/ton	9,10	3.18E+01
Fluoranthene	1.24E-02	lb/ton	9,10	5.29E+01
Fluorene	1.49E-02	lb/ton	9,10	6.36E+01
Manganese	1.70E-04	lb/ton	9	7.25E-01
Methyl Ethyl Ketone	2.90E-01	lb/ton	9	1.24E+03
Naphthalene	1.79E-01	lb/ton	9,10	7.64E+02
Nickel	1.40E-05	lb/ton	9	5.97E-02
Nitrogen Oxides	2.80E+00	lb/ton	9	1.19E+04
Octachlorodibenzofuran	8.33E-08	mg/kg	11	7.11E-07
Octachlorodibenzo-p-dioxin	3.33E-07	mg/kg	11	2.84E-06
O-xylene	2.02E-01	lb/ton	9	8.62E+02
Phenanthrene	4.84E-02	lb/ton	9,10	2.06E+02
PRIMARY PM_{10}, Total	3.06E+01	lb/ton	9	1.31E+05
PRIMARY $PM_{2.5}$, Total	3.06E+01	lb/ton	9	1.31E+05
Pyrene	1.49E-02	lb/ton	9,10	6.36E+01
Sulfur Dioxide	4.00E-01	lb/ton	9	1.71E+03
Toluene	7.30E-01	lb/ton	9	3.11E+03
Volatile Organic Compounds	5.30E+01	lb/ton	9	2.26E+05

Table 9 - Emission Factors and National-Level Emissions for SCC 2104008030

Pollutant	Emission Factor	Emission Factor Units	Emission Factor Reference	Emissions (tons/year)
1,2,3,4,6,7,8-Heptachlorodibenzofuran	1.50E-07	mg/kg	11	3.20E-08
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin	1.58E-07	mg/kg	11	3.37E-08
1,2,3,4,7,8,9-Heptachlorodibenzofuran	1.17E-07	mg/kg	11	2.49E-08
1,2,3,4,7,8-Hexachlorodibenzofuran	1.78E-07	mg/kg	11	3.80E-08
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin	1.25E-07	mg/kg	11	2.67E-08
1,2,3,6,7,8-Hexachlorodibenzofuran	1.10E-07	mg/kg	11	2.35E-08
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin	1.25E-07	mg/kg	11	2.67E-08
1,2,3,7,8,9-Hexachlorodibenzofuran	9.92E-08	mg/kg	11	2.12E-08
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin	1.25E-07	mg/kg	11	2.67E-08
1,2,3,7,8-Pentachlorodibenzofuran	2.28E-07	mg/kg	11	4.86E-08
1,2,3,7,8-Pentachlorodibenzo-p-dioxin	1.29E-07	mg/kg	11	2.75E-08
2,3,4,6,7,8-Hexachlorodibenzofuran	8.25E-08	mg/kg	11	1.76E-08
2,3,4,7,8-Pentachlorodibenzofuran	3.22E-07	mg/kg	11	6.87E-08
2,3,7,8-Tetrachlorodibenzofuran	6.25E-07	mg/kg	11	1.33E-07
2,3,7,8-Tetrachlorodibenzo-p-dioxin	1.14E-07	mg/kg	11	2.43E-08
Acenaphthene	3.08E-03	lb/ton	9,10	3.28E-01
Acenaphthylene	3.49E-02	lb/ton	9,10	3.72E+00
Anthracene	4.10E-03	lb/ton	9,10	4.37E-01
Benz(a)anthracene	1.23E-02	lb/ton	9,10	1.31E+00
Benzene	1.46E+00	lb/ton	9	1.56E+02
Benzo(a)pyrene	2.05E-03	lb/ton	9,10	2.19E-01
Benzo(b)fluoranthene	2.05E-03	lb/ton	9,10	2.19E-01
Benzo(e)pyrene	2.05E-03	lb/ton	9,10	2.19E-01
Benzo(g,h,i)Fluoranthene	3.08E-03	lb/ton	9,10	3.28E-01
Benzo(g,h,i)perylene	1.03E-03	lb/ton	9,10	1.10E-01
Benzo(k)fluoranthene	1.03E-03	lb/ton	9,10	1.10E-01
Carbon Monoxide	1.04E+02	lb/ton	9	1.11E+04
Chrysene	5.13E-03	lb/ton	9,10	5.47E-01
Dibenzo(a,h)anthracene	1.03E-03	lb/ton	9,10	1.10E-01
Fluoranthene	6.16E-03	lb/ton	9,10	6.57E-01
Fluorene	7.18E-03	lb/ton	9,10	7.66E-01
Indeno(1,2,3-cd)pyrene	2.05E-03	lb/ton	9,10	2.19E-01
Methyl Ethyl Ketone	6.20E-02	lb/ton	9	6.61E+00
Naphthalene	9.54E-02	lb/ton	9,10	1.02E+01
Nitrogen Oxides	2.00E+00	lb/ton	9	2.13E+02
Octachlorodibenzofuran	8.33E-08	mg/kg	11	1.78E-08
Octachlorodibenzo-p-dioxin	3.33E-07	mg/kg	11	7.10E-08
O-xylene	1.86E-01	lb/ton	9	1.98E+01
Phenanthrene	2.46E-02	lb/ton	9,10	2.62E+00
PRIMARY PM_{10}, Total	2.04E+01	lb/ton	9	2.18E+03
PRIMARY $PM_{2.5}$, Total	2.04E+01	lb/ton	9	2.18E+03
Pyrene	5.13E-03	lb/ton	9,10	5.47E-01
Sulfur Dioxide	4.00E-01	lb/ton	9	4.27E+01
Toluene	5.20E-01	lb/ton	9	5.55E+01
Volatile Organic Compounds	1.50E+01	lb/ton	9	1.60E+03

Table 10 - Emission Factors and National-Level Emissions for SCC 2104008050

Pollutant	Emission Factor	Emission Factor Units	Emission Factor Reference	Emissions (tons/year)
1,2,3,4,6,7,8-Heptachlorodibenzofuran	1.50E-07	mg/kg	11	7.93E-08
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin	1.58E-07	mg/kg	11	8.35E-08
1,2,3,4,7,8,9-Heptachlorodibenzofuran	1.17E-07	mg/kg	11	6.18E-08
1,2,3,4,7,8-Hexachlorodibenzofuran	1.78E-07	mg/kg	11	9.41E-08
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin	1.25E-07	mg/kg	11	6.61E-08
1,2,3,6,7,8-Hexachlorodibenzofuran	1.10E-07	mg/kg	11	5.81E-08
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin	1.25E-07	mg/kg	11	6.61E-08
1,2,3,7,8,9-Hexachlorodibenzofuran	9.92E-08	mg/kg	11	5.24E-08
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin	1.25E-07	mg/kg	11	6.61E-08
1,2,3,7,8-Pentachlorodibenzofuran	2.28E-07	mg/kg	11	1.20E-07
1,2,3,7,8-Pentachlorodibenzo-p-dioxin	1.29E-07	mg/kg	11	6.82E-08
2,3,4,6,7,8-Hexachlorodibenzofuran	8.25E-08	mg/kg	11	4.36E-08
2,3,4,7,8-Pentachlorodibenzofuran	3.22E-07	mg/kg	11	1.70E-07
2,3,7,8-Tetrachlorodibenzofuran	6.25E-07	mg/kg	11	3.30E-07
2,3,7,8-Tetrachlorodibenzo-p-dioxin	1.14E-07	mg/kg	11	6.02E-08
7,12-Dimethyl/benz(a)anthracene	1.62E-03	lb/ton	9,10	4.28E-01
Acenaphthene	4.04E-03	lb/ton	9,10	1.07E+00
Acenaphthylene	1.29E-02	lb/ton	9,10	3.41E+00
Anthracene	3.64E-03	lb/ton	9,10	9.62E-01
Benzo(a)pyrene	2.42E-03	lb/ton	9,10	6.40E-01
Benzo(b)fluoranthene	1.62E-03	lb/ton	9,10	4.28E-01
Benzo(e)pyrene	8.08E-04	lb/ton	9,10	2.14E-01
Benzo(g,h,i)Fluoranthene	1.13E-02	lb/ton	9,10	2.99E+00
Benzo(g,h,i)perylene	8.08E-03	lb/ton	9,10	2.14E+00
Biphenyl	8.89E-03	lb/ton	9,10	2.35E+00
Cadmium	2.00E-05	lb/ton	9	5.29E-03
Carbon Monoxide	1.41E+02	lb/ton	9	3.72E+04
Chrysene	4.04E-03	lb/ton	9,10	1.07E+00
Dibenzo(a,h)anthracene	1.62E-03	lb/ton	9,10	4.28E-01
Fluoranthene	3.23E-03	lb/ton	9,10	8.54E-01
Fluorene	5.66E-03	lb/ton	9,10	1.50E+00
Indeno(1,2,3-cd)pyrene	8.08E-03	lb/ton	9,10	2.14E+00
Manganese	1.40E-04	lb/ton	9	3.70E-02
Naphthalene	5.82E-02	lb/ton	9,10	1.54E+01
Nickel	2.00E-05	lb/ton	9	5.29E-03
Octachlorodibenzofuran	8.33E-08	mg/kg	11	4.40E-08
Octachlorodibenzo-p-dioxin	3.33E-07	mg/kg	11	1.76E-07
Perylene	8.08E-04	lb/ton	9,10	2.14E-01
Phenanthrene	4.77E-02	lb/ton	9,10	1.26E+01
PRIMARY PM_{10}, Total	1.96E+01	lb/ton	9	5.18E+03
PRIMARY $PM_{2.5}$, Total	1.96E+01	lb/ton	9	5.18E+03
Pyrene	3.23E-03	lb/ton	9,10	8.54E-01
Sulfur Dioxide	4.00E-01	lb/ton	9	1.06E+02
Volatile Organic Compounds	1.20E+01	lb/ton	9	3.17E+03

RESIDENTIAL HEATING USING WOOD (FIREPLACES, INSERTS, AND WOODSTOVES) (continued)
SCCs: 2104008001, 2104008002, 2104008003, 2104008004, 2104008010, 2104008030, and 2104008050

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ROAD CONSTRUCTION
SCC: 2311030000

Primary PM_{10} and $PM_{2.5}$ area source emissions were estimated for road construction. Emissions for this source category are all primary; there are no condensible emissions. Emissions from road construction activity are a function of the acreage disturbed for road construction.[1] Road construction activity is developed from data obtained from the Federal Highway Administration (FHWA). Emissions from road construction in Puerto Rico and the U.S. Virgin Islands was not estimated.

State-level new miles of road constructed are estimated by first obtaining 2002 FHWA State expenditure for capital outlay data , in thousands of dollars, according to the following six classifications:[2]

1. Interstate, urban
2. Interstate, rural
3. Other arterial, urban
4. Other arterial, rural
5. Collectors, urban
6. Collectors, rural

The State expenditure data are then converted to new miles of road constructed using $/mile conversions obtained from the North Carolina Department of Transportation (NCDOT).[3] A conversion of $4 million/mile is applied to the interstate expenditures. This conversion corresponds to freeways and interstate projected listed for: 1) new location; 2) widen existing 2-land shoulder section; and 30 widen existing 4-lane median. For expenditures on other arterial and collectors, a conversion factor of $1.9 million/mile is applied, which corresponds to all other projects (excluding freeway and interstate projects) listed for: 1) new location; 2) widen existing 2-land shoulder section; and 30 widen existing 4-lane median.

The new miles of road constructed is used to estimate the acreage disturbed due to road construction. The total area disturbed in each state is calculated by converting the new miles of road constructed to acres using an acres disturbed/mile conversion factor for each road type as given below:[1]

1. Interstate, urban and rural; Other arterial, urban - 15.2 acres/mile
2. Other arterial, rural - 12.7 acres/mile
3. Collectors, urban - 9.8 acres/mile
4. Collectors, rural - 7.9 acres/mile

Residential building starts are used to allocate the state-level acres disturbed by road construction to the county. A ratio of the number of building starts in each county to the total number of building starts in each state is applied to the state-level acres disturbed to estimate the total number of acres disturbed by road construction in each county.

Emission Factors

Initial PM_{10} emissions from construction of roads are calculated using an emission factor of 0.42 tons/acre/month. Since most road construction consists of grading and leveling of land, the higher emission factor more accurately reflects the high level of cut and fill activity that occurs at road construction sites. The duration of construction activity for road construction is assumed to be 12 months.

Adjustments

Regional variances in construction emissions are corrected using soil moisture level, silt content, and control efficiency. These correction parameters are applied to initial PM_{10} emissions from road construction to develop the final emissions inventory.

ROAD CONSTRUCTION (continued)
SCC: 2311030000

To account for the soil moisture level, the PM_{10} emissions are weighted using the precipitation-evaporation (PE) values from Thornthwaite's PE Index. Average precipitation evaporation values for each State were estimated based on PE values for specific climatic divisions within a State. These values range from 7 to 41.

To account for the silt content, thePM_{10} emissions are weighted using average silt content for each county. A data base containing county-level dry silt values was complied. These values were derived by applying a correction factor developed by the California Air Resources Board to convert wet silt values to dry silt values.[4]

The equation for PM_{10} emissions corrected for soil moisture and silt content is:

$$Corrected\ E_{PM10} = Initial\ E_{PM10} \times \frac{24}{PE} \times \frac{S}{9\%}$$

where: Corrected E_{PM10} = PM_{10} emissions corrected for soil moisture and silt content,
PE = precipitation-evaporation value for each State,
S = % dry silt content in soil for area being inventoried.

Nonattainment areas are assumed to require controls for PM emissions from road construction activity. A control efficiency of 50 percent is assumed for both PM_{10} and $PM_{2.5}$ in nonattainment areas.

Once PM_{10} estimates are developed, $PM_{2.5}$ emissions are estimated by applying a particle size multiplier of 0.20 to PM_{10} emissions.[1]

It is important to note that the road construction values represent total emissions. When the 2002 point source NEI is released, it will be necessary to determine whether there are point source emissions in SCCs 31100101 through 31100103 that may need to be subtracted to yield the nonpoint source emission estimates for this category.

Table 6. National Emissions Summary for Road Construction

Pollutant	Emission Factor	Emission Factor Reference	National Activity Level (Reference 2,3)	National Emissions (tons/year)
PM10-PRI	0.42	Reference 1	239,682	1,369,212
PM25-PRI	0.084	Reference 1	239,682	273,842

References:

1. U.S. Environmental Protection Agency, Office of Air Quality Planning and Standards. "Technical Memorandum: Revised Methodology for Estimating Emissions from Construction." Prepared by E.H. Pechan & Associates. Research Triangle Park, NC. September 2000.

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SURFACE COATINGS - ARCHITECTURAL
SCC: 2401001000

Emissions from Architectural Surface Coatings are those emitted from the application of coating such as paint, primer, varnish or laquer to architectural surfaces, and the use of solvents as thinners and for cleanup.[1] Table 1 present U.S. Census Bureau data on the quantity of solvent- and water-based architectural coatings shipped in 2002.[2] These data are used to estimate criteria and HAP emissions from the use of architectural coatings.

Table 1. Architectural Coatings Shipped in 2002 [1]

Type of Coating	Solvent Based (SB) (gal/yr)	Water Based (WB) (gal/yr)
Exterior Coatings	70,967,000	182,423,000
Interior Coatings	48,947,000	407,104,000
Total	119,914,000	589,527,000

Per capita usage factors for solvent-based and water-based coatings are estimated by dividing the total volume of each type of coating shipped by the 2002 U.S. Population, 288,368,698.[2] Table 2 presents the usage factors calculated for year 2002.

Table 2. Usage Factors for Architectural Coatings

Type of Coating	Usage Factor (gal/person/year)
Solvent-Based Coatings:	0.4158
Water-Based Coatings:	2.0444

Solvent-based and water-based coatings contain different amounts of VOC and HAP constituents. Therefore, there are separate VOC and HAP emissions factors for each type of coating. EPA developed VOC emission factors based on the VOC content of each type of coating which are given below.[3]

Solvent-based coatings - 3.87 lb VOC per gallon
Water-based coatings - 0.74 lb VOC per gallon

Starting in September 1999, manufacturers and importers of architectural surface coatings are required to limit the VOC content of architectural coatings manufactured for use in the United States.[3] Because information is not available to estimate updated solvent and water-based coating emission factors, it is assumed that the impact of these regulations is reflected though the Census Bureau data indicating decreases in solvent-based coatings shipments and increases in water-based coatings shipments over the last several years.

HAP emissions factors are calculated as the VOC emission factor multiplied by the weight fraction of each HAP in the coating as given in the following equation.[4]

$$\text{HAP Emission Factor} = \text{VOC Emission Factor} \times \text{HAP Weight Fraction}$$

Table 3 presents the VOC and HAP emission factors for solvent-based and water-based coatings.

Table 3. VOC Speciation Factors and Emissions Factors for HAPs [4]

Pollutant	Weight Fraction	Emissions Factor (lb/gal)
Solvent-Based Coatings		
N,N-Dimethylformamide	0.005	0.01935
Ethylbenzene	0.043	0.16641
Ethylene Glycol	0.006	0.02322
Hexane	0.207	0.80109
Isomers of Xylene	0.026	0.10062
Methyl Ethyl Ketone	0.056	0.21672
Methyl Isobutyl Ketone	0.006	0.02322
Toluene	0.052	0.20124
VOC	1.000	3.87
Water-Based Coatings		
Benzene	0.003	0.00222
Methylene Chloride	0.055	0.0407
Ethyl Chloride	0.006	0.00444
Ethylene Glycol	0.005	0.0037
Methyl Chloride	0.005	0.0037
VOC	1.000	0.74

Emissions are calculated by multiplying the emissions factor for each pollutant and coating type by the usage factor calculated for each coating type and the U.S. population. Appendix B contains population data in database format. The equation for estimating emissions is:

Emissions (lbs/year) = Emission Factor (lbs/gal) × Usage factor (gal/person/year) × U.S. Population

Emissions from solvent based coatings and water based coatings are estimated separately, then added together resulting in national-level emissions from the use of architectural surface coatings. National emissions are allocated to each county in the United States using the ratio of the county proportion to the national population.[2] Appendix B contains population data in database format.

The national architectural coating shipments data does not include Puerto Rico or U.S. Virgin Islands shipments. Emissions for Puerto Rico and the U.S. Virgin Islands were estimated using the approach outlined in the report text. Broward County in Florida is assumed to be the surrogate county for Puerto Rico. Monroe County in Florida is assumed to be the surrogate for the U.S. Virgin Islands. VOC and HAP emissions in the surrogate counties were divided by the population of the surrogate counties obtained from the U.S. Census Bureau to estimate emissions on a per capita basis.[2] Appendix B contains population data in database format. The per capita emissions were then multiplied by the population in each county of Puerto Rico and the U.S. Virgin Islands to estimate emissions.

Table 4 presents the national emissions for VOC and HAPs by coating type. Total emissions for the United States, Puerto Rico and the U.S. Virgin Island are also presented.

Table 4. National Emissions Summary for Water-Based and Solvent-Based Architectural Coatings

Pollutant	Usage Factor	Emission Factor	Emission Factor Reference	2002 National Activity	Solvent-Based Emissions [a] (ton/yr)	Water-Based Emissions [a] (ton/yr)	Total Emissions [b] (ton/yr)
Benzene	See Table 2	See Table 3	Reference 3	See Table 1	0.0	654.4	6.63E+02
Ethyl Benzene	See Table 2	See Table 3	Reference 3	See Table 1	9,977.4	0.0	1.01E+04
Ethyl Chloride	See Table 2	See Table 3	Reference 3	See Table 1	0.0	1,308.7	1.33E+03
Ethylene Glycol	See Table 2	See Table 3	Reference 3	See Table 1	1,392.2	1,090.6	2.52E+03
Hexane	See Table 2	See Table 3	Reference 3	See Table 1	48,031	0.0	4.87E+04
Methyl Chloride	See Table 2	See Table 3	Reference 3	See Table 1	0.0	1,090.6	1.11E+03
Methyl Ethyl Ketone	See Table 2	See Table 3	Reference 3	See Table 1	12,993.0	0.0	1.32E+04
Methyl Isobutyl Ketone	See Table 2	See Table 3	Reference 3	See Table 1	1,392.2	0.0	1.41E+03
Methylene Chloride	See Table 2	See Table 3	Reference 3	See Table 1	0.0	11,996.9	1.22E+04
N,N-Dimethylformamide	See Table 2	See Table 3	Reference 3	See Table 1	1,160.2	0.0	1.18E+03
Toluene	See Table 2	See Table 3	Reference 3	See Table 1	12,065.7	0.0	1.22E+04
Xylenes	See Table 2	See Table 3	Reference 3	See Table 1	6,032.9	0.0	6.12E+03
VOC	See Table 2	See Table 3	Reference 3	See Table 1	232,033.6	218,125	4.56E+05

[a] Includes the United States only
[b] Includes the United States, Puerto Rico, and the U.S. Virgin Islands

Example Calculation for Ethylene Glycol

Solvent Based Coatings:

Speciated VOC Emission Factors = (3.87 lb VOC/ gal SB Coatings) x (Weight Fraction VOC, SB coatings)
= (3.87 lb VOC / gal SB Coatings) x (.006)
= 0.02322 lb ethylene glycol / gal. SB coatings

Emissions = (288,368,698 people) x (0.415 gal SB/person/yr) x (.0232 lb / gal. SB coatings)
= 2,784,403.08 lb ethylene glycol, SB coatings

Water Based Coatings:

Speciated VOC Emission Factors = (0.74 lb VOC/ gal WB Coatings) x (Weight Fraction VOC, WB coatings)
= (0.74 lb VOC / gal WB Coatings) x (.005) = 0.0037 lb ethylene glycol / gal. WB coatings

Emissions = (288,368,698 people) x (2.0444 gal WB/person/yr) x (.0037 lb / gal. WB coatings)
= 2,181,249.90 lb ethylene glycol, WB coatings

Total Emissions = ethylene glycol from SB coatings (lb/year) + ethylene glycol from WB coatings (lb/yr) / 2000 (lb/ton)
= (2,784,403.08 lb + 2,181,249.90 lb) / 2000 lb/ton
= 2,482.83 tons ethylene glycol, from SB and WB architectural surface coatings

SURFACE COATINGS - ARCHITECTURAL (continued)
SCC: 2401001000

References:

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2. U.S. Census Bureau. *7/1/2002 County Population Estimates File and Components of Change*, [Data file], April 17, 2003. Available from Population Estimates Branch Web site http://eire.census.gov/popest/estimates_dataset.php

3. 63 FR 48848. "National Volatile Organic Compound Emission Standards for Architectural Coatings, Final Rule." September 11, 1998.

4. Introduction to Area Source Emission Inventory Development. "Volume III: Chapter 3, Architectural Surface Coating." Prepared by Eastern Research Group for the Emission Inventory Improvement Program Area Source Committee. November 1995.

Appendix B

Electronic Appendix Containing Data Sets Used to Spatially Allocate National Activity Data and Emissions to Counties

The data sets used to allocate 2002 activity data to counties for the nonpoint source NEI are included in an Access 2000 database named "Appendix B." The database is located at the following link on the web: http://www.epa.gov/ttn/chief/net/2002inventory.html

This database contains the following tables:

Table Name	Description
T01 - 2002 Landings and Takeoffs	General Aviation LTO data for 2002 computed from FAA's ATADS for Instrument Operations
T02- 2002 Bales of Cotton Ginned	U.S. Department of Agriculture, National Agricultural Statistics Service. "Reports by Commodity - Cotton Ginnings." 2002. http://www.usda.gov/nass/pubs/estindx1.htm#cotton
T03 - 2002 Number of Building Permits	U.S. Department of Commerce, Bureau of the Census. Construction Statistics. Annual Housing Units Authorized by Building Permits - Permits by County. 2002.
T04 - 2000 Number of Houses Heating By Fuel Type	U.S. Census Bureau. "Table H40. House Heating Fuel Type", Census 2000: Summary File 3, [Data file], March, 2003.
T05 - 2002 Population	U.S. Census Bureau. 7/1/2002 County Population Estimates File and Components of Change. April 17, 2003.
T06 - 2002 Urban/Rural Population	2000 - U.S. Census Bureau, Decennial Censuses, 2000 Census: SF1, Table P2; 2002 - estimated urban/rural populations (ERG,2004).
T07 - 2002 Number of Restaurants	Dun & Bradstreet, Inc., *MarketPlace* CD-ROM, January-March, 2002.
T08 - Detached Single-Family Housing Data Data from 2000 Census	U.S. Census Bureau. 2003. American FactFinder, Data from 2000 Census Sets, Census 2000 Summary File 3, Quick Tables. Internet address: http://factfinder.census.gov. Data Retrieved for each U.S. County on June 30, 2003.
T09 - PavedRoad_02_emis_alloc_fac	2002 Paved Road Fugitive Dust County/Road Type-level Emission Allocation Factors
T10 - UnpavedRoad_02_emis_alloc_fac	2002 Unpaved Road Fugitive Dust County-level Emission Allocation Factors
T11 - Paved_UnpavedRoad_VMTtempfactors	Paved and Unpaved Road VMT Seasonal Temporal Allocation Factors from NAPAP
T12 - 2002 Non-ResConstruction Employment Data	U.S. Bureau of Labor Statistics. Annual Average Employment for NAICS 2362. Withheld BLS Data supplemented with Non-ResConstruction employment data from Dun & Bradstreet, MarketPlace CD-ROM, Jan-Mar, 2002.

Table Name	Description
T13 - 2001 Comm/Inst County Business Patterns Employment Data	From County Business Patterns 2001
T14 - 2001 Industrial County Business Patterns Employment Data	From County Business Patterns 2001
T15 - 2001 NAICS Code 42271 County Business Patterns Employment Data	From County Business Patterns 2001

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Appendix C

Emission Factors and County-Level Activity Data Used to Calculate 2002 Emissions by Category

The activity data sets and emission factors used to calculate county-level 2002 emissions for the nonpoint source NEI are included in two Access 2000 databases. The Access database named "Appendix C1" contains the emission factors and county-level activity data for all categories for which 2002 emissions were calculated except for wildfires and prescribed burning. The activity data, allocation data, and emission factors for wildfires and prescribed burning are included in the Access 2000 database named "Appendix C2." These databases are located at the following link on the web: http://www.epa.gov/ttn/chief/net/2002inventory.html

This database named Appendix C1 contains the following tables:

Table Name	Description
AvGasStageII_Activity Data	2002 Activity Data for Aviation Gasoline Distribution: Stage II Source Category
AvGasStageII_Emiss Factors	2002 Emission Factors for Aviation Gasoline Distribution: Stage II Source Category
AvGasStageI_Activity Data	2002 Activity Data for Aviation Gasoline Distribution: Stage I Source Category
AvGasStageI_Emiss Fact Composite	2002 Composite Emission Factors for Aviation Gasoline Distribution: Stage I Source Category
AvGasStageI_Emiss Fact Original	2002 Original Emission Factors for Aviation Gasoline Distribution: Stage I Source Category
BulkPlant_Emission Factors	2002 Emission Factors for Bulk Plants
BulkPlants_Activity Data	2002 Activity Data for Bulk Plants
BulkTerminals_Activity Data	2002 Activity Data for Bulk Terminals
BulkTerminals_Emission Factors	2002 Emissions Factors for Bulk Terminals
ComCook_Activity Data Composite	2002 Composite Activity Data for Commercial Charbroiling Source Categories (sum of original activity to the SCC-level)
ComCook_Activity Data Original	2002 Original Activity Data for Commercial Cooking Source Categories (in tons/week)
ComCook_Emission Factors	2002 Emission Factors for Commercial Cooking Source Categories
ConsumerProducts_Activity Data	2002 Activity Data for Commercial & Consumer Products Usage Source Categories
ConsumerProducts_Emission Factors	2002 Emission Factors for Commercial & Consumer Products Usage Source Categories
CottonGin_Activity Data	2002 Activity Data for Cotton Ginning Source Category
CottonGin_Emission Factors	2002 Emission Factors for Cotton Ginning Source Category
DrumReclam_Activity Data	2002 Activity Data for Drum and Barrel Reclamation Source Category

Table Name	Description
DrumReclam_Emission Factors	2002 Emission Factors for Drum and Barrel Reclamation Source Category
FuelCombustion_Activity Data	2001 County-Level Activity Data for Commercial/Institutional and Industrial Fuel Combustion Categories
FuelCombustion_Emission Factors	2002 State-Level Emission Factors for Commercial/Institutional and Industrial Fuel Combustion Categories
Hg Categories_Activity Data	2002 Activity Data for Lamp Breakage, Fluorescent Lamp Recycling, and General Laboratory Activities Source Categories
Hg Categories_Emission Factors	2002 Emission Factors for Lamp Breakage, Fluorescent Lamp Recycling, and General Laboratory Activities Source Categories
HwyConstruction_Activity Data	2002 Activity Data for Highway Construction Source Category
HwyConstruction_Emission Factors	2002 Emission Factors for Highway Construction Source Category
Non-ResConstruction_Activity Data	2002 Activity Data for Non-Residential Construction Source Category
Non-ResConstruction_Emission Factors	2002 Emission Factors for Non-Residential Construction Source Category
OpenBurnLandClearing_Activity Data	2002 Activity Data for Open Burning of Land Clearing Debris Source Category
OpenBurnLandClearing_Emission	2002 Emission Factors for Open Burning of Land Clearing Debris Source Factors Category
OpenBurnMSW_Activity Data	2002 Activity Data for Open Burning of Residential Municipal Solid Waste Source Category
OpenBurnMSW_Emission Factors	2002 Emission Factors for Open Burning of Residential Municipal Solid Waste Source Category
OpenBurnTires_Activity Data	2002 Activity Data for Open Burning of Scrap Tires Source Category
OpenBurnTires_Emission Factors	2002 Emission Factors for Open Burning of Scrap Tires Source Category
OpenBurnYW_Activty Data	2002 Activity Data for Open Burning of Yard Waste Source Categories, Leaves & Brush
OpenBurnYW_Emission Factors	2002 Emission Factors for Open Burning of Yard Waste Source Categories, Leaves & Brush
Paved_UnpavedRoad_Control_Factors	Paved and Unpaved Road Fugitive Dust Control Factors
PavedRoad_Precipitation_02_Data	Number of days with at least 0.01 inches of precipitation by month in 2002 for paved roads

Table Name	Description
PavedRoad_Uncontrolled_PM10_EFs	2002 Paved Road Fugitive Dust Uncontrolled PM10-PRI/-FIL Emission Factors by State, Road Class, and Month
PavedRoad_Uncontrolled_PM25_EFs	2002 Paved Road Fugitive Dust Uncontrolled PM25-PRI/-FIL Emission Factors by State, Road Class, and Month
Pipelines_Activity Data	2002 Activity Data for Pipelines
Pipelines_Emission Factors	2002 Emission Factors for Pipelines
POTW_Activity Data	2002 Activity Data for Publicly Owned Treatment Works Source Category
POTW_Emission Factors	2002 Emission Factors for Publicly Owned Treatment Works Source Category
ResConstruction_Activity Data	2002 Activity Data for Residential Construction Source Category
ResConstruction_Emission Factors	2002 Emission Factors for Residential Construction Source Category
ResHeatCoal_Activity Data	2002 Activity Data for Residential Heating: Anthracite and Bituminous & Lignite Source Categories
ResHeatCoal_Emission Factors	2002 Emission Factors for Residential Heating: Anthracite and Bituminous & Lignite Source Categories
ResHeatDistill_Activity Data	2002 Activity Data for Residential Heating: Distillate Oil Source Category
ResHeatDistill_Emission Factors	2002 Emission Factors for Residential Heating: Distillate Oil Source Category
ResHeatNatGas_Activity Data	2002 Activity Data for Residential Heating: Natural Gas Source Category
ResHeatNatGas_Emission Factors	2002 Activity Data for Residential Heating: Natural Gas Source Category
ResKerosene_Activity Data	2000 county-level residential kerosene consumption in thousands of barrels
ResKerosene_Activity Data_state_level	2000 state-level residential kerosene consumption in thousands of barrels
ResKerosene_Emission Factors	Residential kerosene emission factors in pounds per thousand barrels
ResLPG_Activity Data	2000 county-level residential LPG consumption in thousands of barrels
ResLPG_Activity Data_state_level	2000 state-level residential LPG consumption in thousands of barrels
ResLPG_Emission Factors	Residential LPG emission factors in pounds per thousand barrels
ResWoodComb_Activity Data	2002 Activity Data for Residential Wood Combustion Source Categories

Table Name	Description
ResWoodComb_Emission Factors	2002 Emission Factors for Residential Wood Combustion Source Categories
StageIServiceStation_Activity Data 2002	Activity data for Stage I Service Stations: Stage I Source Category
StageIServiceStation_Emission Factors_county_level	2002 Emissions Factors, County Level MTBE and Benzene, for Stage I Service Stations: Stage I Source Category
StageIServiceStations_Emission Factors_national_level	2002 Emissions Factors, National Level, for Stage I Service Stations: Stage I Source Category
SurCoatArch_Activity Data	2002 Activity Data for Architectural Surface Coating Source Category
SurCoatArch_Emission Factors	2002 Emission Factors for Architectural Surface Coating Source Category
TankTruck_Activity Data	2002 Activity Data for Tank Trucks in Transit
TankTruck_Emission Factors	2002 Emission Factors for Tank Trucks in Transit
UnpavedRoad_Precipitation_02_Data	Number of days with at least 0.01 inches of precipitation by month in 2002 for unpaved roads
UnpavedRoad_Silt_Content_by_State	Silt Content Values Used in Unpaved Road Fugitive Dust Emission Calculations
UnpavedRoad_Uncontrolled_PM10_EFs	2002 Unpaved Road Fugitive Dust Uncontrolled PM10-PRI/-FIL Emission Factors by State, Road Class, and Month
UnpavedRoad_Uncontrolled_PM25_EFs	2002 Unpaved Road Fugitive Dust Uncontrolled PM25-PRI/-FIL Emission Factors by State, Road Class, and Month
USTEmptying&Breathing_Activity Data	2002 Activity Data for UST Emptying and Breathing
USTEmptying&Breathing_Emission Factors	2002 Emission Factors for UST Emptying and Breathing

The database named Appendix C2 contains the following tables for the wildfire and prescribed burning categories:

Table Name	Description
01-WF_BELD2	Wildfire BELD2 Factors used to prepare allocation factors.
02-PB_BELD2	Prescribed Burning BELD2 Factors used to prepare allocation factors.
03-BIA_Region_2002	Wildfire & Prescribed Burning BIA regional acres burned from the 12/27/02 NICC Incident Management Report.
04-BIA_Region2State	BIA NICC Region to State proportions developed for 2002 estimates.
05-BIA - Final by State	Wildfire & Prescribed Burning State-level 2002 BIA acres burned.
06-PB2002_S&P_NICC_IMR	State & Private 2002 Acres Burned from NICC end-of-year (27-Dec-02) Incident Management Report.
07-PB2002_S&P_Region2State	State & Private Land USFS Region to State Allocations.
08-WF_Activity	Wildfire 2002 State-level acres burned.
09-WF_Proportions	Wildfire BELD2 allocation factors and final County-level acres burned.
10-PB_Activity	Prescribed Burning 2002 State-level acres burned.
11-PB_Proportions	Prescribed Burning BELD2 allocation factors and final County-level acres burned.
12-Fuel_Consumption_Factor	Wildfire & Prescribed Burning fuel consumption factors and smoldering augmentation factors.
13-EFs_WFCriteria	Wildfire criteria pollutant emission factors.
14-EFs_PBCriteria_WRAP_Pile	Prescribed Burning calculation table for criteria pollutant emission factors based on State pile and non-pile emission factors.
15-EFs_PBCriteria	Prescribed Burning criteria pollutant emission factors by State.
16-EFs_HAP	Wildfire and Prescribed Burning HAP emission factors. Dioxins which are augmented for smoldering are flagged.
17-Wildfire_2002	Final 2002 County-level Wildfire emissions estimates.
18-PrescribedFire_2002	Final 2002 County-level Prescribed Burning emissions estimates.

Appendix D

Electronic Appendix Summary of Changes Made to State, Local, and Tribal (S/L/T) Inventory Data to Prepare the Draft 2002 Nonpoint Source NEI

Documentation of revisions that EPA made to S/L/T inventories are summarized by state and tribe in this Appendix D. Appendix D is also provided in the Excel file named "Appendix D.xls." The spreadsheet is located at the following link on the web: http://www.epa.gov/ttn/chief/net/2002inventory.html

Table D-1. Revisions to State, Local, and Tribal (S/L/T) Agency Inventories

State FIPS or Tribal Code	State Name or Tribal Name	Local Agency FIPS Code	Description of Revision	Record Count					Date of Revision	Revision Tracking Number
				TR Table	EP Table	PE Table	EM Table	CE Table		
1	ALABAMA		Set Factor Numeric Value to null where Factor Unit Numerator and/or Factor Unit Denominator was null				6,582		1/23/72	21009
01	ALABAMA		Replaced paved and unpaved road inventory with NEI inventory to account for updates to paved and unpaved road emission factors		134	268	1,072		10/21/68	10461
01	ALABAMA		For SCCs 2805xxxxxx (animal husbandry) and 28017xxxxx (ag fertilizer), replaced state data with data from latest version of Carnegie Mellon University (CMU) Model (Version 3.6)		938	12,194	12,194		4/16/69	10489
01	ALABAMA		Removed SCC 30199999 (Industrial Processes / Chemical Manufacturing / Other Not Classified / Specify in Comments Field) because this category covered in point inventory		37	37	4,625		2/4/96	10498
01	ALABAMA		Removed process MACT code 1807-2 for human and animal crematories per EPA request		96				5/1/11	10680
01	ALABAMA		Removed Old Solvent Utilization SCCs originating from pre 1999 NEI per request of EPA				1,087		1/12/64	10958
01	ALABAMA		Inserted records for EPA 2002 VOC solvent emissions inventory		258	258	324		8/30/13	11253
01	ALABAMA		Removed invalid pollutant codes elemental carbon (EC) and organic carbon (OC)				268		11/24/46	11256
01	ALABAMA		For open burning SCCs originating from NEI, corrected Primary Device Type in CE table from 099 to 000 and control description to uncontrolled					2,816	7/17/81	11261
01	ALABAMA		Added EPA's 2002 inventory for industrial and/or commercial/institutional fossil fuel combustion if source category was missing from state or local inventory, or, if state or local agency used inventory from preliminary 2002 NEI, the preliminary 2002 NEI inventory was replaced with the new 2002 inventory.		134	134	7,102		11/4/59	11278
01	ALABAMA		Set invalid NAICS code to Null		1,000				9/14/10	11304
01	ALABAMA		Updated contact information	67					12/27/23	11310
01	ALABAMA		Nulled actual throughput and throughput unit numerator where either column is null			2,333			6/4/64	11314
01	ALABAMA		Filled in emission process description where null		7,290				8/2/78	11315
02	ALASKA		Updated Factor Unit Numerator and Throughput Unit Numerator from HEAD-YR to HEAD for SCCs 2805001100, 2805001200, 2805001300, 2805002000, 2805003100, 2805018000, 2805019100, 2805019200, 2805019300, 2805021100, 2805021200, 2805021300, 2805022100, 2805022200, 2805022300, 2805023100, 2805023200, 2805023300, 2805025000, 2805035000, 2805040000, 2805045000				50		11/21/78	10458
02	ALASKA		Removed SCC 30199999 (Industrial Processes / Chemical Manufacturing / Other Not Classified / Specify in Comments Field) because this category covered in point inventory		3	3	375		2/4/96	10498

Table D-1 (continued)

State FIPS or Tribal Code	State Name or Tribal Name	Local Agency FIPS Code	Description of Revision	Record Count					Date of Revision	Revision Tracking Number
				TR Table	EP Table	PE Table	EM Table	CE Table		
2	ALASKA		Removed process MACT code 1807-2 for human and animal crematories per EPA request		29				5/1/11	10680
02	ALASKA		Removed Old Solvent Utilization SCCs originating from pre 1999 NEI per request of EPA				162		1/12/64	10958
02	ALASKA		Inserted records for EPA 2002 VOC solvent emissions inventory		327	327	432		8/30/13	11253
02	ALASKA		Added EPA's 2002 inventory for industrial and/or commercial/institutional fossil fuel combustion if source category was missing from state or local inventory, or, if state or local agency used inventory from preliminary 2002 NEI, the preliminary 2002 NEI inventory was replaced with the new 2002 inventory.		207	207	7,347	108	11/4/59	11278
02	ALASKA		Set invalid NAICS code to Null		96				9/14/10	11304
02	ALASKA		Nulled actual throughput and throughput unit numerator where either column is null			8			6/4/64	11314
04	ARIZONA	013	SCCs changed per spreadsheet provided to Roy Huntley by Matt Poppen on Aug 17 (changed SCC 2610000000 to 2610000500, changed SCC 2805000000 to 2805018000, and changed SCC 31502102 to 2810060100)		3	7	32		9/16/46	20262
04	ARIZONA	013	Updated Emission Numeric Value and Emission Ton Value per Matthew Poppin's request to Roy Huntley on Aug 18				1		7/13/55	20281
04	ARIZONA	013	Nulled out Factor Numeric Value and Factor Unit Numerator per request to Roy Huntley on Aug 18				6		4/18/56	20282
04	ARIZONA	013	Added PM25-PRI records for vehicle fires				4		3/16/08	21092
04	ARIZONA	013	Changed PM10-PRI to PM10-FIL and PM25-PRI to PM25-FIL pollutant codes to reflect basis of emission factor				4		6/19/32	21096
04	ARIZONA	013	Added PM records for kerosene and distillate oil combustion developed from PM augmentation procedure				6,433		12/10/91	21102
04	ARIZONA	013	Updated Factor Unit Numerator and Throughput Unit Numerator from HEAD-YR to HEAD for SCCs 2805001100, 2805001200, 2805001300, 2805003100, 2805018000, 2805019100, 2805019200, 2805019300, 2805021100, 2805021200, 2805021300, 2805022100, 2805022200, 2805022300, 2805023100, 2805023200, 2805023300, 2805025000, 2805035000, 2805039100, 2805039200, 2805039300, 2805040000, 2805045000, 2805047100, 2805047300, 2805053100				231		11/21/78	10458
04	ARIZONA		For SCCs 2805xxxxxx (animal husbandry) and 28017xxxxx (ag fertilizer), replaced state data with data from latest version of Carnegie Mellon University (CMU) Model (Version 3.6)		210	2,730	2,730		4/16/69	10489
04	ARIZONA		Removed SCC 30199999 (Industrial Processes / Chemical Manufacturing / Other Not Classified / Specify in Comments Field) because this category covered in point inventory		9	9	1,125		2/4/96	10498

Table D-1 (continued)

State FIPS or Tribal Code	State Name or Tribal Name	Local Agency FIPS Code	Description of Revision	Record Count					Date of Revision	Revision Tracking Number
				TR Table	EP Table	PE Table	EM Table	CE Table		
04	ARIZONA	013	Added PM10-FIL and PM25-FIL where missing for SCC 2294000000 and 2296000000				8		9/10/18	10515
04	ARIZONA	013	Added missing PM10-FIL and PM25-FIL records for 2325030000				4		4/21/53	10517
04	ARIZONA	013	Added missing PM10-FIL and PM25-FIL records for Ag Harvesting (2801000005)				8		9/2/38	10519
04	ARIZONA	013	Removed SCC 2730100000 (Windblown Erosion) per EPA direction		1	1	4		5/27/02	10535
04	ARIZONA		Removed process MACT code 1807-2 for human and animal crematories per EPA request		22				5/1/11	10680
04	ARIZONA		Removed Old Solvent Utilization SCCs originating from pre 1999 NEI per request of EPA				241		1/12/64	10958
04	ARIZONA		Inserted records for EPA 2002 VOC solvent emissions inventory		164	164	342		8/30/13	11253
04	ARIZONA		For open burning SCCs originating from NEI, corrected Primary Device Type in CE table from 099 to 000 and control description to uncontrolled					448	7/17/81	11261
04	ARIZONA		Added EPA's 2002 inventory for industrial and/or commercial/institutional fossil fuel combustion if source category was missing from state or local inventory, or, if state or local agency used inventory from preliminary 2002 NEI, the preliminary 2002 NEI inventory was replaced with the new 2002 inventory.		146	146	5,196	120	11/4/59	11278
04	ARIZONA		Set invalid NAICS code to Null		57				9/14/10	11304
04	ARIZONA		Filled in emission process description where null		840				8/2/78	11315
04	ARIZONA		For records in preliminary 2002 NEI that were merged with state, local, and tribal inventories, updated null data source code on PE where corresponding EM records had more than one data source. PE data source selected from available EM data sources using the following order: Select Local or Tribal data source code when State and/or EPA data source was also available; select State data source code when EPA data source was also available. Also, updated actual throughput to null since activity for EM records varies depending on source of data.			2			9/27/37	11473
04	ARIZONA		Removed old solvent PE records			105			8/9/43	11495
04	ARIZONA		Inserted replacement PE records for solvent SCCs in EPA's 2002 inventory			105			11/22/43	11496
05	ARKANSAS		Added PM25-PRI records for vehicle fires				450		3/16/08	21092
05	ARKANSAS		Removed records marked for deletion by AR		402	1,155	2,136	780	9/24/94	21103
05	ARKANSAS		Added records per direction from AR		1,786	1,786	2,833	2,833	8/27/96	21104
05	ARKANSAS		Updated tables per Direction from AR		519	669	2,463		4/14/08	21105
05	ARKANSAS		Removed duplicate records for SCC 2399000000		4	4			4/29/39	21261
05	ARKANSAS		Removed duplicate records for SCC 2805018000			65			1/2/40	21262
05	ARKANSAS		Updated Factor Unit Denominator from acre-mo to acre-month				68		1/14/36	10468
05	ARKANSAS		Added PM10-FIL and PM25-FIL where missing				332		11/30/52	10478

Table D-1 (continued)

State FIPS or Tribal Code	State Name or Tribal Name	Local Agency FIPS Code	Description of Revision	Record Count					Date of Revision	Revision Tracking Number
				TR Table	EP Table	PE Table	EM Table	CE Table		
05	ARKANSAS		For SCCs 2805xxxxxx (animal husbandry) and 28017xxxxx (ag fertilizer), replaced state data with data from latest version of Carnegie Mellon University (CMU) Model (Version 3.6)		1,050	13,650	13,650		4/16/69	10489
05	ARKANSAS		Removed SCC 30199999 (Industrial Processes / Chemical Manufacturing / Other Not Classified / Specify in Comments Field) because this category covered in point inventory		42	42	5,250		2/4/96	10498
05	ARKANSAS		Added PM10-FIL and PM25-FIL where missing for SCC 2294000000 and 2296000000				900		9/10/18	10515
05	ARKANSAS		Removed SCC 2730100000 (Windblown Erosion) per EPA direction		75	162	324	150	5/27/02	10535
05	ARKANSAS		Removed process MACT code 1807-2 for human and animal crematories per EPA request		103				5/1/11	10680
05	ARKANSAS		Removed Old Solvent Utilization SCCs originating from pre 1999 NEI per request of EPA				1,311		1/12/64	10958
05	ARKANSAS		Inserted records for EPA 2002 VOC solvent emissions inventory		464	464	465		8/30/13	11253
05	ARKANSAS		For open burning SCCs originating from NEI, corrected Primary Device Type in CE table from 099 to 000 and control description to uncontrolled					3,212	7/17/81	11261
05	ARKANSAS		Added EPA's 2002 inventory for industrial and/or commercial/institutional fossil fuel combustion if source category was missing from state or local inventory, or, if state or local agency used inventory from preliminary 2002 NEI, the preliminary 2002 NEI inventory was replaced with the new 2002 inventory.		150	150	7,950		11/4/59	11278
05	ARKANSAS		Set invalid NAICS code to Null		410				9/14/10	11304
05	ARKANSAS		Filled in emission process description where null		4,200				8/2/78	11315
05	ARKANSAS		For records in preliminary 2002 NEI that were merged with state, local, and tribal inventories, updated null data source code on PE where corresponding EM records had more than one data source. PE data source selected from available EM data sources using the following order: Select Local or Tribal data source code when State and/or EPA data source was also available; select State data source code when EPA data source was also available. Also, updated actual throughput to null since activity for EM records varies depending on source of data.			4			9/27/37	11473
06	CALIFORNIA		Added PM25-PRI records for vehicle fires				102		3/16/08	21092
06	CALIFORNIA		Removed records with invalid PM Pollutant Codes (e.g., PM-PRI, PM25)				26		7/14/14	21095
06	CALIFORNIA		Added PM records for coal and residual oil combustion developed from PM augmentation procedure				15		7/23/64	21101
06	CALIFORNIA		Added PM records for kerosene and distillate oil combustion developed from PM augmentation procedure				78		12/10/91	21102
06	CALIFORNIA		Removed PM records for Natural Gas and LPG				149		12/4/93	21106

Table D-1 (continued)

State FIPS or Tribal Code	State Name or Tribal Name	Local Agency FIPS Code	Description of Revision	Record Count					Date of Revision	Revision Tracking Number
				TR Table	EP Table	PE Table	EM Table	CE Table		
06	CALIFORNIA		Added PM records for natural gas and LPG combustion developed from PM augmentation procedure				447		8/10/13	21257
06	CALIFORNIA		CA's inventory contained the same emission records with two different emission types (i.e., 01 and 30). Removed records with an emission type = 01 that would otherwise create duplicates if the emission type was changed to 30.				478		4/1/48	3149
06	CALIFORNIA		Changed Emission Type from 01 to 30				41,678		7/25/62	3150
06	CALIFORNIA		Updated Emission Numeric Value, Factor Unit Numerator, Factor Unit Denominator where Emission Numeric Value is Null				149		4/24/09	3169
6	CALIFORNIA		Added PM10-PRI and PM25-PRI Records to CA for SCCs 2104008001, 2104008010, 2294000000, 2296000000, 2302000000, 2302002000, 2302050000, 2302070001, 2302080000, 2304000000, 2305000000, 2305070000, 2305080000, 2307000000, 2308000000, 2311010000, 2311030000, 2325030000, 2399000000, 2401005000, 2425000000, 2440000000, 2461023000, 2620030000, 2640000000, 2730100000, 2801000003, 2801500000, 2810001000, 2810015000, and 2810030000				1,987		8/6/23	3171
06	CALIFORNIA		Removed HAPs for paved roads per EPA request				1,387		1/26/69	10463
06	CALIFORNIA		Removed HAPs for Ag tilling per EPA request				661		5/4/60	10480
06	CALIFORNIA		Removed SCC 30199999 (Industrial Processes / Chemical Manufacturing / Other Not Classified / Specify in Comments Field) because this category covered in point inventory		35	35	4,340		2/4/96	10498
06	CALIFORNIA		Generated EP and PE records to correct RI errors		319	320			8/3/00	10534
06	CALIFORNIA		Removed SCC 2730100000 (Windblown Erosion) per EPA direction		132	114	968	626	5/27/02	10535
06	CALIFORNIA		Removed EP and PE where no corresponding EM record		2	2			7/19/34	10543
06	CALIFORNIA		Removed biogenic SCCs (2701420000, 2730050000)		159	99	635	438	7/26/05	10547
06	CALIFORNIA		Removed pollutant PM				1,393		12/3/63	10607
06	CALIFORNIA		Added missing PM10-PRI and PM25-PRI records for SCCs 2101006000, 2102006000, 2103005000, 2103006000, 2104004000, 2104006010, and 2104007000				292		8/28/66	10608
06	CALIFORNIA		Removed duplicate EP and PE records (chose CAP inventory submission over HAP)		3,587	3,286			6/25/09	11240
06	CALIFORNIA		Inserted records for EPA 2002 VOC solvent emissions inventory		627	627	639		8/30/13	11253
06	CALIFORNIA		Removed invalid pollutant code 1151				160		8/16/60	11262
06	CALIFORNIA		Added EPA's 2002 inventory for industrial and/or commercial/institutional fossil fuel combustion if source category was missing from state or local inventory, or, if state or local agency used inventory from preliminary 2002 NEI, the preliminary 2002 NEI inventory was replaced with the new 2002 inventory.		298	298	11,808	220	11/4/59	11278
06	CALIFORNIA		Removed Duplicate TR records	58					5/31/05	11294

Table D-1 (continued)

State FIPS or Tribal Code	State Name or Tribal Name	Local Agency FIPS Code	Description of Revision	Record Count					Date of Revision	Revision Tracking Number
				TR Table	EP Table	PE Table	EM Table	CE Table		
06	CALIFORNIA		Set invalid NAICS code to Null		74				9/14/10	11304
06	CALIFORNIA		Filled in emission process description where null		4,099				8/2/78	11315
06	CALIFORNIA		Inserted PM10-PRI and PM25-PRI for SCC 2102007000				10		11/24/13	11378
06	CALIFORNIA		For records in preliminary 2002 NEI that were merged with state, local, and tribal inventories, updated null data source code on PE where corresponding EM records had more than one data source. PE data source selected from available EM data sources using the following order: Select Local or Tribal data source code when State and/or EPA data source was also available; select State data source code when EPA data source was also available. Also, updated actual throughput to null since activity for EM records varies depending on source of data.			11			9/27/37	11473
08	COLORADO		Corrected invalid commercial cooking-frying SCCs to valid SCCs: 2302002300 changed to 2302003100, 2302002400 changed to 2302003200, 2302002500 changed to 2302003000		27	27	154		6/25/68	20270
08	COLORADO		Updated Actual Throughput and Throughput Unit Numerator to remove invalid units (Changed unit from TON2/LB to TON and multiplied actual throughput by 2000)			162			9/22/07	20886
08	COLORADO		Removed records where state provided inventory records with submittal flag was RD		1,052	1,052	22,922	108	9/20/32	21089
08	COLORADO		Removed records where state provided inventory records with submittal flag was RD		924	1,052	22,922	108	9/20/32	21089
08	COLORADO		Removed duplicate records involving Broomfield County, CO (08014)				39		6/11/46	21141
08	COLORADO		Inserted records to sum components of Broomfield County (014)				19		10/7/47	21142
08	COLORADO		Removed duplicate records		128				2/11/47	21265
08	COLORADO		Removed duplicate records in Broomfield County					8	10/8/67	21276
08	COLORADO		Updated PM10-PRI and PM25-PRI records for CO				14		8/23/55	3157
08	COLORADO		Updated Factor Unit Numerator and Throughput Unit Numerator from HEAD-YR to HEAD for SCCs 2805001100, 2805001200, 2805001300, 2805003100, 2805018000, 2805019100, 2805019200, 2805019300, 2805021100, 2805021200, 2805021300, 2805022100, 2805022200, 2805022300, 2805023100, 2805023200, 2805023300, 2805025000, 2805035000, 2805039100, 2805039200, 2805039300, 2805040000, 2805045000, 2805047100, 2805047300, 2805053100				115		11/21/78	10458
08	COLORADO		For SCCs 2805xxxxxx (animal husbandry) and 28017xxxxx (ag fertilizer), replaced state data with data from latest version of Carnegie Mellon University (CMU) Model (Version 3.6)		882	11,466	11,466		4/16/69	10489
08	COLORADO		Added missing PM10-FIL and PM25-FIL records for 2311010000				10		4/21/53	10517
08	COLORADO		Inserted records for EPA 2002 VOC solvent emissions inventory		1,224	1,224	1,240		8/30/13	11253

Table D-1 (continued)

State FIPS or Tribal Code	State Name or Tribal Name	Local Agency FIPS Code	Description of Revision	Record Count					Date of Revision	Revision Tracking Number
				TR Table	EP Table	PE Table	EM Table	CE Table		
08	COLORADO		Added EPA's 2002 inventory for industrial and/or commercial/institutional fossil fuel combustion if source category was missing from state or local inventory, or, if state or local agency used inventory from preliminary 2002 NEI, the preliminary 2002 NEI inventory was replaced with the new 2002 inventory.		512	512	18,496	512	11/4/59	11278
08	COLORADO		Set invalid NAICS code to Null		20				9/14/10	11304
08	COLORADO		Filled in emission process description where null		3,528				8/2/78	11315
08	COLORADO		For records in preliminary 2002 NEI that were merged with state, local, and tribal inventories, updated null data source code on PE where corresponding EM records had more than one data source. PE data source selected from available EM data sources using the following order: Select Local or Tribal data source code when State and/or EPA data source was also available; select State data source code when EPA data source was also available. Also, updated actual throughput to null since activity for EM records varies depending on source of data.			2			1/15/42	11494
09	CONNECTICUT		Removed invalid pollutant code PCBTEQ				32		8/14/62	21023
09	CONNECTICUT		Updated Actual Throughput and Throughput Unit Numerator to remove invalid units (Changed unit from TON2/LB to TON and multiplied actual throughput by 2000)			80			11/28/77	21030
09	CONNECTICUT		Changed SCC from 2420000999 to 2420000370		8	16	16		6/18/76	21121
09	CONNECTICUT		Updated PM10-FIL, PM10-PRI, PM25-FIL, PM25-PRI records for Open Burning of Land Clearing Debris (2610000500)				32		2/3/46	3166
09	CONNECTICUT		Merged preliminary 2002 NEI data with state inventory to fill data gaps		88	88	2,888	64	7/8/50	3187
09	CONNECTICUT		Removed duplicate records for residential kerosene combustion		8	8	360		6/29/22	10452
09	CONNECTICUT		Replaced paved and unpaved road inventory with MANE-VU-sponsored inventory per state's request		16	16	64	8	7/4/24	10456
09	CONNECTICUT		Updated Factor Unit Numerator and Throughput Unit Numerator from HEAD-YR to HEAD for SCCs 2805001100, 2805001200, 2805001300, 2805002000, 2805003100, 2805007100, 2805007300, 2805008100, 2805008200, 2805008300, 2805010100, 2805010200, 2805010300, 2805018000, 2805019100, 2805019200, 2805019300, 2805021100, 2805021200, 2805021300, 2805022100, 2805022200, 2805022300, 2805023100, 2805023200, 2805023300, 2805025000, 2805030000, 2805035000, 2805040000, 2805045000				189		11/21/78	10458
09	CONNECTICUT		For SCCs 2805xxxxxx (animal husbandry) and 28017xxxxx (ag fertilizer), replaced state data with data from latest version of Carnegie Mellon University (CMU) Model (Version 3.6)		112	1,456	1,456		4/16/69	10489
09	CONNECTICUT		Removed SCC 30199999 (Industrial Processes / Chemical Manufacturing / Other Not Classified / Specify in Comments Field) because this category covered in point inventory		8	8	1,000		2/4/96	10498

Table D-1 (continued)

State FIPS or Tribal Code	State Name or Tribal Name	Local Agency FIPS Code	Description of Revision	Record Count					Date of Revision	Revision Tracking Number
				TR Table	EP Table	PE Table	EM Table	CE Table		
09	CONNECTICUT		Removed daily emissions for paved and unpaved roads where state annual emissions inventory was replaced with MANE-VU-sponsored annual emissions inventory			16	64		2/4/28	10503
09	CONNECTICUT		Removed process MACT code 1807-2 for human and animal crematories per EPA request		14				5/1/11	10680
09	CONNECTICUT		Removed Old Solvent Utilization SCCs originating from pre 1999 NEI per request of EPA				144		1/12/64	10958
09	CONNECTICUT		Inserted records for EPA 2002 VOC solvent emissions inventory		143	143	151		8/30/13	11253
09	CONNECTICUT		Added EPA's 2002 inventory for industrial and/or commercial/institutional fossil fuel combustion if source category was missing from state or local inventory, or, if state or local agency used inventory from preliminary 2002 NEI, the preliminary 2002 NEI inventory was replaced with the new 2002 inventory.		80	80	3,176	32	11/4/59	11278
09	CONNECTICUT		Upper case source type Area in TR table	8					11/4/78	11286
09	CONNECTICUT		Set invalid NAICS code to Null		40				9/14/10	11304
09	CONNECTICUT		Filled in emission process description where null		598				8/2/78	11315
10	DELAWARE		Removed invalid pollutant code 67641				220	18	2/18/64	21028
10	DELAWARE		Updated Actual Throughput and Throughput Unit Numerator to remove invalid units (Changed unit from TON2/LB to TON and multiplied actual throughput by 2000)			42			11/28/77	21030
10	DELAWARE		Removed duplicate records for SCC 2102006000				9		4/13/39	9111
10	DELAWARE		Inactivated SCCs 2801700020, 2801700021, 2801700022, 2801700023, 2801700024, 2801700025, 2801700026, 2805038100, 2805038200, 2805038300, 2805046100, 2805046300, 2805052100, 2801001001, 2801001005, 2801001009, 2801001013, 2801001017, 2801001021, 2801002001, 2801002002, 2801002003, 2801002004, 2801002005, and 2801002006 in preparation for grouping to more general categories		75	186	510		5/26/41	9113
10	DELAWARE		Added records with more general SCCs (2801000003, 2801000005, 2801700099, and 2805025000)		12	20	84		3/4/44	9114
10	DELAWARE		Fixed incorrect PM10-PRI and PM25-PRI values for SCC 2102002000				10		4/18/00	10432
10	DELAWARE		Corrected invalid SCCs for gasoline marketing		12	24	186		5/31/12	10447
10	DELAWARE		Replaced paved and unpaved road inventory with MANE-VU-sponsored inventory per state's request		3	3	12		7/4/24	10456
10	DELAWARE		Removed HAPs for paved roads per EPA request				96		4/7/69	10464
10	DELAWARE		For SCCs 2805xxxxxx (animal husbandry) and 28017xxxxx (ag fertilizer), replaced state data with data from latest version of Carnegie Mellon University (CMU) Model (Version 3.6)		42	546	546		4/16/69	10489
10	DELAWARE		Removed EP and PE records for Dover Speedway as approved by state		1	3			9/5/38	10492

Table D-1 (continued)

State FIPS or Tribal Code	State Name or Tribal Name	Local Agency FIPS Code	Description of Revision	Record Count					Date of Revision	Revision Tracking Number
				TR Table	EP Table	PE Table	EM Table	CE Table		
10	DELAWARE		Removed daily emissions for paved and unpaved roads where state annual emissions inventory was replaced with MANE-VU-sponsored annual emissions inventory			6	24		2/4/28	10503
10	DELAWARE		Updated PM10-PRI emissions to equal sum of PM10-FIL and PM-CON emissions and PM25-PRI emissions to equal sum of PM25-FIL and PM-CON emissions for 2102002000				8		2/3/91	10676
10	DELAWARE		Removed invalid SCC 2501080100 and placed emissions on valid SCCs 2501060100 and 2501080050				58		5/3/95	11199
10	DELAWARE		Added EPA's 2002 inventory for industrial and/or commercial/institutional fossil fuel combustion if source category was missing from state or local inventory, or, if state or local agency used inventory from preliminary 2002 NEI, the preliminary 2002 NEI inventory was replaced with the new 2002 inventory.		15	15	702	12	11/4/59	11278
10	DELAWARE		Filled in emission process description where null		232				8/2/78	11315
11	DC		Updated Actual Throughput and Throughput Unit Numerator to remove invalid units (Changed unit from TON2/LB to TON and multiplied actual throughput by 2000)			3			11/28/77	21030
11	DC		Merged preliminary 2002 NEI data with state inventory to fill data gaps		3	3	25	8	7/10/50	3188
11	DC		Inserted updated NEI data for res wood combustion		7	7	291		9/3/48	10454
11	DC		Replaced paved and unpaved road inventory with MANE-VU-sponsored inventory per state's request		1	1	4		7/4/24	10456
11	DC		Removed SCC 30199999 (Industrial Processes / Chemical Manufacturing / Other Not Classified / Specify in Comments Field) because this category covered in point inventory		1	1	125		2/4/96	10498
11	DC		Removed daily emissions for paved and unpaved roads where state annual emissions inventory was replaced with MANE-VU-sponsored annual emissions inventory			1	4		2/4/28	10503
11	DC		Removed process MACT code 1807-2 for human and animal crematories per EPA request		1				5/1/11	10680
11	DC		Inserted records for EPA 2002 VOC solvent emissions inventory		11	11	14		8/30/13	11253
11	DC		Removed invalid pollutant code CH4				4	4	10/16/49	11257
11	DC		Added EPA's 2002 inventory for industrial and/or commercial/institutional fossil fuel combustion if source category was missing from state or local inventory, or, if state or local agency used inventory from preliminary 2002 NEI, the preliminary 2002 NEI inventory was replaced with the new 2002 inventory.		4	4	178		11/4/59	11278
11	DC		Set invalid NAICS code to Null		5				9/14/10	11304
11	DC		Filled in emission process description where null		44				8/2/78	11315

Table D-1 (continued)

State FIPS or Tribal Code	State Name or Tribal Name	Local Agency FIPS Code	Description of Revision	Record Count					Date of Revision	Revision Tracking Number
				TR Table	EP Table	PE Table	EM Table	CE Table		
11	DC		For records in preliminary 2002 NEI that were merged with state, local, and tribal inventories, updated null data source code on PE where corresponding EM records had more than one data source. PE data source selected from available EM data sources using the following order: Select Local or Tribal data source code when State and/or EPA data source was also available; select State data source code when EPA data source was also available. Also, updated actual throughput to null since activity for EM records varies depending on source of data.			68			1/15/42	11494
12	FLORIDA	011	Changed Source Type to AREA as noted in the spreadsheet file distributed by Roy Huntley, EPA to S/L/T agencies on August 11, 2004	1					11/8/52	20263
12	FLORIDA		Updated Actual Throughput and Throughput Unit Numerator to remove invalid units (Changed unit from TON2/LB to TON and multiplied actual throughput by 2000)			201			9/22/07	20886
12	FLORIDA		Set Factor Numeric Value to null where Factor Unit Numerator and/or Factor Unit Denominator was null				335		1/29/65	21003
12	FLORIDA	011	Updated seasonal throughputs from all being 100 to all being 25		26				1/12/80	21031
12	FLORIDA	103	Updated pollutant code to NIF 3.0 compliant values (changed PM10-F to PM10-FIL, PM25F to PM25-FIL, PM25P to PM25-PRI)				17	17	5/14/30	21065
12	FLORIDA	103	Added PM25-PRI records for vehicle fires				4		3/16/08	21092
12	FLORIDA	103	Removed records with invalid PM Pollutant Codes (e.g., PM-PRI, PM25)				1		7/14/14	21095
12	FLORIDA	103	Updated PM-PRI to PM-FIL to reflect basis of emission factor				4		6/19/32	21096
12	FLORIDA	103	Removed records for PM-PRI				2		10/26/62	21099
12	FLORIDA	103	Added PM records for kerosene and distillate oil combustion developed from PM augmentation procedure				2		12/10/91	21102
12	FLORIDA	103	Updated PM records for Natural Gas and LPG				4		8/8/96	21107
12	FLORIDA	103	Removed Nonroad SCCs (2260000000, 2265000000, 2267000000, 2268000000, 2270000000, 2275001000, 2275020000, 2275050000, and 2275060000)		6	42	43	27	11/13/07	21256
12	FLORIDA	103	Added PM records for natural gas and LPG combustion developed from PM augmentation procedure				13		8/10/13	21257
12	FLORIDA	103	Removed all duplicate records for FL		32	96			11/13/63	21273
12	FLORIDA	103	Removed duplicate records in CE table					10	9/28/68	21277
12	FLORIDA	103	Updated PM10-PRI, PM10-FIL, PM25-PRI for 2104011000				3		11/13/14	21968
12	FLORIDA	103	Removed invalid pollutants: B_PAH, DIOX, H096, and PAH				11	11	12/23/00	3142
12	FLORIDA	103	Removed duplicate records from Pinellas County Inventory				35		6/19/03	3151
12	FLORIDA	103	Removed all records associated with Pinellas County, FL inventory due to data issues. County will supply revised inventory during review period.		79	55	694	748	9/17/98	3155

Table D-1 (continued)

State FIPS or Tribal Code	State Name or Tribal Name	Local Agency FIPS Code	Description of Revision	Record Count					Date of Revision	Revision Tracking Number
				TR Table	EP Table	PE Table	EM Table	CE Table		
12	FLORIDA		Replaced paved and unpaved road inventory with NEI inventory to account for updates to paved and unpaved road emission factors		134	268	1,072		10/21/68	10461
12	FLORIDA		For SCCs 2805xxxxxx (animal husbandry) and 28017xxxxx (ag fertilizer), replaced state data with data from latest version of Carnegie Mellon University (CMU) Model (Version 3.6)		938	12,194	12,194		4/16/69	10489
12	FLORIDA		Removed SCC 30199999 (Industrial Processes / Chemical Manufacturing / Other Not Classified / Specify in Comments Field) because this category covered in point inventory		168	168	5,500		2/4/96	10498
12	FLORIDA	011, 103	Generated EP and PE records to correct RI errors		5	6			8/3/00	10534
12	FLORIDA	011	Removed EP and PE records where no corresponding EM record		1	3			2/5/33	10541
12	FLORIDA	011	changed start_date from 0131 to 0101 to match EM record			1			7/10/33	10542
12	FLORIDA		Removed process MACT code 1807-2 for human and animal crematories per EPA request		93				5/1/11	10680
12	FLORIDA		Removed Old Solvent Utilization SCCs originating from pre 1999 NEI per request of EPA				1,244		1/12/64	10958
12	FLORIDA	011, 103	Removed duplicate EP and PE records (10200501, 2305070000, and 31000299)		22	23			8/2/09	11241
12	FLORIDA		Inserted records for EPA 2002 VOC solvent emissions inventory		91	91	157		8/30/13	11253
12	FLORIDA		Removed pollutants EC and OC				268		11/24/46	11256
12	FLORIDA		For open burning SCCs originating from NEI, corrected Primary Device Type in CE table from 099 to 000 and control description to uncontrolled					1,848	7/17/81	11261
12	FLORIDA	011	Changed emission type from 01 to 30				264		3/20/99	11263
12	FLORIDA	011	Removed invalid pollutant codes 78633, 127784, 12784, and 98861				8		9/9/08	11268
12	FLORIDA		Added EPA's 2002 inventory for industrial and/or commercial/institutional fossil fuel combustion if source category was missing from state or local inventory, or, if state or local agency used inventory from preliminary 2002 NEI, the preliminary 2002 NEI inventory was replaced with the new 2002 inventory.		47	47	799	188	11/4/59	11278
12	FLORIDA	011	Changed REPORT CERTIFIED to REPORT CERTIFIER in affiliation type	1					2/3/80	11288
12	FLORIDA	011	Set SIC code 0750 to null because invalid - description indicates SIC needed for animal and human cremations		2				12/16/87	11290
12	FLORIDA	011,103	Removed Duplicate TR records	4					2/5/07	11302
12	FLORIDA		Set invalid NAICS code to Null		974				9/14/10	11304
12	FLORIDA	011	For Broward County, removed invalid SCC 2501080 50. Changing SCC to 2501080050 resulted in duplicate records in agency's inventory.		1	1	1		12/29/11	11306
12	FLORIDA		Nulled actual throughput and throughput unit numerator where either column is null			67			6/4/64	11314

Table D-1 (continued)

State FIPS or Tribal Code	State Name or Tribal Name	Local Agency FIPS Code	Description of Revision	Record Count					Date of Revision	Revision Tracking Number
				TR Table	EP Table	PE Table	EM Table	CE Table		
12	FLORIDA		Filled in emission process description where null		6,758				8/2/78	11315
12	FLORIDA		For records in preliminary 2002 NEI that were merged with state, local, and tribal inventories, updated null data source code on PE where corresponding EM records had more than one data source. PE data source selected from available EM data sources using the following order: Select Local or Tribal data source code when State and/or EPA data source was also available; select State data source code when EPA data source was also available. Also, updated actual throughput to null since activity for EM records varies depending on source of data.			7			1/15/42	11494
13	GEORGIA		Changed PM10-PRI to PM10-FIL and PM25-PRI to PM25-FIL to reflect basis of emission factor for SCC 2102004000				318		6/19/32	21096
13	GEORGIA		Changed PM Pollutant Codes in state inventory from Primary to Filterable				636		5/12/63	21100
13	GEORGIA		Added PM records for coal and residual oil combustion developed from PM augmentation procedure				954		7/23/64	21101
13	GEORGIA		Added PM records for kerosene and distillate oil combustion developed from PM augmentation procedure				477		12/10/91	21102
13	GEORGIA		Updated PM records for Natural Gas and LPG				159		8/8/96	21107
13	GEORGIA		Added PM records for natural gas and LPG combustion developed from PM augmentation procedure				159		8/10/13	21257
13	GEORGIA		Updated Factor Unit Numerator and Throughput Unit Numerator from HEAD-YR to HEAD for SCCs 2805001100, 2805001200, 2805001300, 2805003100, 2805018000, 2805019100, 2805019200, 2805019300, 2805021100, 2805021200, 2805021300, 2805022100, 2805022200, 2805022300, 2805023100, 2805023200, 2805023300, 2805025000, 2805035000, 2805039100, 2805039200, 2805039300, 2805040000, 2805045000, 2805047100, 2805047300, 2805053100				2,717		11/21/78	10458
13	GEORGIA		Replaced paved and unpaved road inventory with NEI inventory to account for updates to paved and unpaved road emission factors		318	636	2,544		10/21/68	10461
13	GEORGIA		For SCCs 2805xxxxxx (animal husbandry) and 28017xxxxx (ag fertilizer), replaced state data with data from latest version of Carnegie Mellon University (CMU) Model (Version 3.6)		2,226	28,938	28,938		4/16/69	10489
13	GEORGIA		Removed SCC 30199999 (Industrial Processes / Chemical Manufacturing / Other Not Classified / Specify in Comments Field) because this category covered in point inventory		75	75	9,375		2/4/96	10498
13	GEORGIA		Removed process MACT code 1807-2 for human and animal crematories per EPA request		197				5/1/11	10680
13	GEORGIA		Removed Old Solvent Utilization SCCs originating from pre 1999 NEI per request of EPA				1,248		1/12/64	10958

Table D-1 (continued)

State FIPS or Tribal Code	State Name or Tribal Name	Local Agency FIPS Code	Description of Revision	Record Count					Date of Revision	Revision Tracking Number
				TR Table	EP Table	PE Table	EM Table	CE Table		
13	GEORGIA		Inserted records for EPA 2002 VOC solvent emissions inventory		1,028	1,028	1,250		8/30/13	11253
13	GEORGIA		For open burning SCCs originating from NEI, corrected Primary Device Type in CE table from 099 to 000 and control description to uncontrolled					8,176	7/17/81	11261
13	GEORGIA		Added EPA's 2002 inventory for industrial and/or commercial/institutional fossil fuel combustion if source category was missing from state or local inventory, or, if state or local agency used inventory from preliminary 2002 NEI, the preliminary 2002 NEI inventory was replaced with the new 2002 inventory.		631	631	28,037		11/4/59	11278
13	GEORGIA		Set invalid NAICS code to Null		675				9/14/10	11304
13	GEORGIA		Nulled actual throughput and throughput unit numerator where either column is null			18			6/4/64	11314
13	GEORGIA		Filled in emission process description where null		13,197				8/2/78	11315
13	GEORGIA		For records in preliminary 2002 NEI that were merged with state, local, and tribal inventories, updated null data source code on PE where corresponding EM records had more than one data source. PE data source selected from available EM data sources using the following order: Select Local or Tribal data source code when State and/or EPA data source was also available; select State data source code when EPA data source was also available. Also, updated actual throughput to null since activity for EM records varies depending on source of data.			47			9/27/37	11473
13	GEORGIA		Removed old solvent PE records			111			8/9/43	11495
13	GEORGIA		Inserted replacement PE records for solvent SCCs in EPA's 2002 inventory			111			11/22/43	11496
15	HAWAII		Updated Factor Unit Numerator and Throughput Unit Numerator from HEAD-YR to HEAD for SCCs 2805001100, 2805001200, 2805001300, 2805003100, 2805018000, 2805019100, 2805019200, 2805019300, 2805021100, 2805021200, 2805021300, 2805022100, 2805022200, 2805022300, 2805023100, 2805023200, 2805023300, 2805025000, 2805035000, 2805039100, 2805039200, 2805039300, 2805040000, 2805045000, 2805047100, 2805047300, 2805053100				120		11/21/78	10458
15	HAWAII		Removed SCC 30199999 (Industrial Processes / Chemical Manufacturing / Other Not Classified / Specify in Comments Field) because this category covered in point inventory		4	4	500		2/4/96	10498
15	HAWAII		Removed process MACT code 1807-2 for human and animal crematories per EPA request		7				5/1/11	10680
15	HAWAII		Removed Old Solvent Utilization SCCs originating from pre 1999 NEI per request of EPA				72		1/12/64	10958
15	HAWAII		Inserted records for EPA 2002 VOC solvent emissions inventory		88	88	114		8/30/13	11253

Table D-1 (continued)

State FIPS or Tribal Code	State Name or Tribal Name	Local Agency FIPS Code	Description of Revision	Record Count					Date of Revision	Revision Tracking Number
				TR Table	EP Table	PE Table	EM Table	CE Table		
15	HAWAII		Added EPA's 2002 inventory for industrial and/or commercial/institutional fossil fuel combustion if source category was missing from state or local inventory, or, if state or local agency used inventory from preliminary 2002 NEI, the preliminary 2002 NEI inventory was replaced with the new 2002 inventory.		36	36	1,356	16	11/4/59	11278
15	HAWAII		Set invalid NAICS code to Null		19				9/14/10	11304
15	HAWAII		Nulled actual throughput and throughput unit numerator where either column is null			1			6/4/64	11314
16	IDAHO		Added PM25-PRI records for structure fires				78		7/8/59	21082
16	IDAHO		Added PM25-PRI records for vehicle fires				156		3/16/08	21092
16	IDAHO		Removed records with invalid PM Pollutant Codes (e.g., PM-PRI, PM25)				129		7/14/14	21095
16	IDAHO		Added PM records for coal and residual oil combustion developed from PM augmentation procedure				110		7/23/64	21101
16	IDAHO		Added PM records for kerosene and distillate oil combustion developed from PM augmentation procedure				344		12/10/91	21102
16	IDAHO		Updated PM records for Natural Gas and LPG				226		8/8/96	21107
16	IDAHO		Added PM records for natural gas and LPG combustion developed from PM augmentation procedure				482		8/10/13	21257
16	IDAHO		Updated incorrectly calculated PM10-FIL, PM10-PRI, PM25-PRI records for SCCs 2102004000, 2103004000, 2104004000			44	125		8/16/16	21969
16	IDAHO		Replaced PM10-PRI and PM25-PRI records for SCCs 2102002000, 2102005000, 2102008000, 2103008000, and 2104006010 to address QA issues with PM emissions				344	345	4/28/69	3162
16	IDAHO		Updated PM-PRI to PM10-PRI and PM-FIL to PM10-FIL for SCCs 2102002000 and 2104006010				91	91	8/1/01	3167
16	IDAHO		Updated Emission Numeric Value, Factor Unit Numerator, Factor Unit Denominator where Emission Numeric Value is Null				127		4/24/09	3169
16	IDAHO		Added missing PM25-PRI records for Ag tilling; PM25-PRI emissions set equal to agency's PM25-FIL emissions				44		3/5/50	10477
16	IDAHO		Added PM10-FIL and PM25-FIL where missing				88		11/30/52	10478
16	IDAHO		For SCCs 2805xxxxxx (animal husbandry) and 28017xxxxx (ag fertilizer), replaced state data with data from latest version of Carnegie Mellon University (CMU) Model (Version 3.6)		616	8,008	8,008		4/16/69	10489
16	IDAHO		Removed SCC 30199999 (Industrial Processes / Chemical Manufacturing / Other Not Classified / Specify in Comments Field) because this category covered in point inventory		17	17	2,125		2/4/96	10498
16	IDAHO		Added missing PM25-PRI records for Ag Harvesting (2801000005)				42		7/9/53	10518

Table D-1 (continued)

State FIPS or Tribal Code	State Name or Tribal Name	Local Agency FIPS Code	Description of Revision	Record Count					Date of Revision	Revision Tracking Number
				TR Table	EP Table	PE Table	EM Table	CE Table		
16	IDAHO		Added missing PM10-FIL and PM25-FIL records for Ag Harvesting (2801000005)				84		9/2/38	10519
16	IDAHO		Added missing PM25-PRI records for SCCs 2104008000, 2805001000, and 2810015000				132		1/26/97	10530
16	IDAHO		Removed CE records with no corresponding EM records (SCCs 2104004000, 2104006010, and 2104007000)					89	9/25/26	10537
16	IDAHO		Added missing PM10-FIL and PM10-PRI for 2103008000				4		10/24/67	10609
16	IDAHO		Inserted records for EPA 2002 VOC solvent emissions inventory		313	313	368		8/30/13	11253
16	IDAHO		Added EPA's 2002 inventory for industrial and/or commercial/institutional fossil fuel combustion if source category was missing from state or local inventory, or, if state or local agency used inventory from preliminary 2002 NEI, the preliminary 2002 NEI inventory was replaced with the new 2002 inventory.		93	93	4,929		11/4/59	11278
16	IDAHO		Updated contact information	37					12/27/23	11310
16	IDAHO		Nulled actual throughput and throughput unit numerator where either column is null			44			6/4/64	11314
16	IDAHO		Filled in emission process description where null		2,464				8/2/78	11315
16	IDAHO		Inserted PM10-PRI and PM25-PRI for SCC 2461021000				88		9/16/13	11323
17	ILLINOIS		Changed Emission Type from 30 to 29 per email from Buzz Asselmeier on Aug 6				2		6/18/16	19779
17	ILLINOIS		Corrected invalid commercial cooking SCCs and goat waste SCCs as noted in the spreadsheet file distributed by Roy Huntley, EPA to S/L/T agencies on August 11, 2004		408	408	2,448		4/4/58	20266
17	ILLINOIS		Changed PM10-PRI to PM10-FIL and PM25-PRI to PM25-FIL to reflect basis of emission factor for SCCs 2102004000, 2104004000, and 2104011000				612		6/19/32	21096
17	ILLINOIS		Changed PM Pollutant Codes in state inventory from Primary to Filterable				612		5/12/63	21100
17	ILLINOIS		Added PM records for coal and residual oil combustion developed from PM augmentation procedure				918		7/23/64	21101
17	ILLINOIS		Added PM records for kerosene and distillate oil combustion developed from PM augmentation procedure				918		12/10/91	21102
17	ILLINOIS		Updated PM records for Natural Gas and LPG				408		8/8/96	21107
17	ILLINOIS		Added PM records for natural gas and LPG combustion developed from PM augmentation procedure				612		8/10/13	21257
17	ILLINOIS		Updated PM-CON, PM10-PRI, PM10-FIL, PM25-PRI records for SCCs 2102004000, 2102005000, 2102006001, 2103004000, 2103005000, 2103006000, 2103007000, and 2103011000				75		11/5/55	3159
17	ILLINOIS		Updated Emission Numeric Value, Factor Unit Numerator, Factor Unit Denominator where Emission Numeric Value is Null				204		4/24/09	3169

Table D-1 (continued)

State FIPS or Tribal Code	State Name or Tribal Name	Local Agency FIPS Code	Description of Revision	Record Count					Date of Revision	Revision Tracking Number
				TR Table	EP Table	PE Table	EM Table	CE Table		
17	ILLINOIS		Removed SCCs for portable fuel containers per EPA request		204	204	204		9/23/70	10474
17	ILLINOIS		For SCCs 2805xxxxxx (animal husbandry) and 28017xxxxx (ag fertilizer), replaced state data with data from latest version of Carnegie Mellon University (CMU) Model (Version 3.6)		1,428	18,564	18,564		4/16/69	10489
17	ILLINOIS		Removed SCC 30199999 (Industrial Processes / Chemical Manufacturing / Other Not Classified / Specify in Comments Field) because this category covered in point inventory		40	40	5,000		2/4/96	10498
17	ILLINOIS		Added missing PM10-FIL and PM25-FIL records for 2311010000, 2311020000, and 2311030000				612		4/21/53	10517
17	ILLINOIS		Removed daily records for SCCs 2102004000, 2102005000, 2102006001, 2103005000, 2103006000, 2415000000, 2420000055, 2505020000, 2505020900, 2610030000, 2810001000 because the emissions were greater than the annual record				333		4/4/26	10955
17	ILLINOIS		Removed Old Solvent Utilization SCCs originating from pre 1999 NEI per request of EPA				939		1/12/64	10958
17	ILLINOIS		Inserted records for EPA 2002 VOC solvent emissions inventory		966	966	1,110		8/30/13	11253
17	ILLINOIS		Removed invalid pollutant codes 173, 180, 236, and 237				408		10/16/08	11269
17	ILLINOIS		Added EPA's 2002 inventory for industrial and/or commercial/institutional fossil fuel combustion if source category was missing from state or local inventory, or, if state or local agency used inventory from preliminary 2002 NEI, the preliminary 2002 NEI inventory was replaced with the new 2002 inventory.		408	408	11,118	1,224	11/4/59	11278
17	ILLINOIS		Set invalid NAICS code to Null		204				9/14/10	11304
17	ILLINOIS		Nulled actual throughput and throughput unit numerator where either column is null			298			6/4/64	11314
17	ILLINOIS		Removed invalid pollutant code 174				102		8/19/71	11317
17	ILLINOIS		Filled in emission process description where null		5,712				8/2/78	11315
17	ILLINOIS		Removed old solvent PE records			144			8/9/43	11495
17	ILLINOIS		Inserted replacement PE records for solvent SCCs in EPA's 2002 inventory			144			11/22/43	11496
18	INDIANA		Removed invalid SCC 2601030000		92	92	644		10/10/11	20775
18	INDIANA		Removed records with invalid PM Pollutant Codes (e.g., PM-PRI, PM25)				276		7/14/14	21095
18	INDIANA		Changed PM10-PRI to PM10-FIL and PM25-PRI to PM25-FIL to reflect basis of emission factor for SCCs 2102004000 and 2103004000				552		6/19/32	21096
18	INDIANA		Removed records for PM-PRI				184		10/26/62	21099
18	INDIANA		Changed PM Pollutant Codes in state inventory from Primary to Filterable				368		5/12/63	21100
18	INDIANA		Added PM records for coal and residual oil combustion developed from PM augmentation procedure				552		7/23/64	21101

Table D-1 (continued)

State FIPS or Tribal Code	State Name or Tribal Name	Local Agency FIPS Code	Description of Revision	Record Count					Date of Revision	Revision Tracking Number
				TR Table	EP Table	PE Table	EM Table	CE Table		
18	INDIANA		Added PM records for kerosene and distillate oil combustion developed from PM augmentation procedure				828		12/10/91	21102
18	INDIANA		Removed PM records for Natural Gas and LPG				276		12/4/93	21106
18	INDIANA		Updated PM records for Natural Gas and LPG				552		8/8/96	21107
18	INDIANA		Added PM records for natural gas and LPG combustion developed from PM augmentation procedure				828		8/10/13	21257
18	INDIANA		Removed duplicate EP records for SCC 2630020000		92				1/14/41	21263
18	INDIANA		Updated Emission Numeric Value, Factor Unit Numerator, Factor Unit Denominator where Emission Numeric Value is Null				276		4/24/09	3169
18	INDIANA		Removed childless EP and PE records submitted by state		301	301			6/30/64	10473
18	INDIANA		Removed PM-PRI for ag tilling				92		12/26/55	10479
18	INDIANA		For SCCs 2805xxxxxx (animal husbandry) and 28017xxxxx (ag fertilizer), replaced state data with data from latest version of Carnegie Mellon University (CMU) Model (Version 3.6)		1,288	16,744	16,744		4/16/69	10489
18	INDIANA		Removed SCC 30199999 (Industrial Processes / Chemical Manufacturing / Other Not Classified / Specify in Comments Field) because this category covered in point inventory		52	52	6,500		2/4/96	10498

Table D-1 (continued)

State FIPS or Tribal Code	State Name or Tribal Name	Local Agency FIPS Code	Description of Revision	Record Count					Date of Revision	Revision Tracking Number
				TR Table	EP Table	PE Table	EM Table	CE Table		
18	INDIANA		Removed process MACT code 1807-2 for human and animal crematories per EPA request		131				5/1/11	10680
18	INDIANA		Removed Old Solvent Utilization SCCs originating from pre 1999 NEI per request of EPA				1,794		1/12/64	10958
18	INDIANA		Inserted records for EPA 2002 VOC solvent emissions inventory		574	574	574		8/30/13	11253
18	INDIANA		For open burning SCCs originating from NEI, corrected Primary Device Type in CE table from 099 to 000 and control description to uncontrolled					3,652	7/17/81	11261
18	INDIANA		Added EPA's 2002 inventory for industrial and/or commercial/institutional fossil fuel combustion if source category was missing from state or local inventory, or, if state or local agency used inventory from preliminary 2002 NEI, the preliminary 2002 NEI inventory was replaced with the new 2002 inventory.		184	184	9,752		11/4/59	11278
18	INDIANA		Removed Duplicate TR records	92					6/21/05	11295
18	INDIANA		Set invalid NAICS code to Null		92				9/14/10	11304
18	INDIANA		Nulled actual throughput and throughput unit numerator where either column is null			1			6/4/64	11314
18	INDIANA		Filled in emission process description where null		5,520				8/2/78	11315
19	IOWA		Updated of IA SCCs per email from Marnie Stein on Aug 11		310	310	310		12/15/99	19936
19	IOWA		Updated Emission Numeric Value and Emission Ton Value to 667.03 per email from Marnie Stein on Aug 11				1		2/7/96	20151
19	IOWA		Combined duplicate records as authorized by Marnie Stein on Aug 26			2	2		3/3/46	20763
19	IOWA		Changed SCCs per email from Marnie Stein on Aug 26		2	2	2		1/14/92	20771
19	IOWA		Removed SCC 2630020000 because NEI data being used instead		99	1,188	144		8/9/49	21070
19	IOWA		Removed SCC 2810001000 because NEI data being used instead		99	1,188	636		10/13/49	21071
19	IOWA		Removed SCC 2630020000 because NEI data being used instead				1,044		9/11/92	21074
19	IOWA		Removed SCC 2630020000 because NEI data being used instead			99	99		12/7/92	21075
19	IOWA		Updated Data Source Code to E-02-X where 2610000500 and data source is null				2,970		2/13/62	21108
19	IOWA		Added CENRAP-sponsored inventory for planned burning SCCs (except AR; TX; and Lancaster County, NE) per request of state		219	219	1,530		10/30/92	21134
19	IOWA		Added CENRAP-sponsored inventory for Ag Tilling (except AR) per request of state		99	99	396		1/26/06	21136
19	IOWA		Removed duplicate records		185	183			11/30/44	21264
19	IOWA		Removed duplicate PE records			2			10/30/66	21275
19	IOWA		For SCCs 2805xxxxxx (animal husbandry) and 28017xxxxx (ag fertilizer), replaced state data with data from latest version of Carnegie Mellon University (CMU) Model (Version 3.6)		1,386	18,018	18,018		4/16/69	10489

Table D-1 (continued)

State FIPS or Tribal Code	State Name or Tribal Name	Local Agency FIPS Code	Description of Revision	Record Count					Date of Revision	Revision Tracking Number
				TR Table	EP Table	PE Table	EM Table	CE Table		
19	IOWA		Removed SCC 30199999 (Industrial Processes / Chemical Manufacturing / Other Not Classified / Specify in Comments Field) because this category covered in point inventory		41	41	5,125		2/4/96	10498
19	IOWA		Removed biogenic SCCs (2701405000, 2701411000, 2701412000, 2701413000, 2701414000, 2701415000, 2701416000, 2701417000, 2701421000, 2701422000, 2701423000, 2701424000, 2701431000, 2701432000, 2701433000, 2701441000, 2701442000, 2701443000, 2701451000, 2701452000, 2701453000, 2701454000, 2701461000, 2701462000, 2701471000, 2701472000, 2701473000, 2701474000, 2701475000, 2701476000, 2701477000, 2701481000, 2701482000, 2701483000, 2701484000, 2701485000, 2701491000, 2701492000)		3,762	48,906	48,906		7/26/05	10547
19	IOWA		Removed process MACT code 1807-2 for human and animal crematories per EPA request		153				5/1/11	10680
19	IOWA		Removed Old Solvent Utilization SCCs originating from pre 1999 NEI per request of EPA				1,875		1/12/64	10958
19	IOWA		Inserted records for EPA 2002 VOC solvent emissions inventory		1,126	1,126	2,146		8/30/13	11253
19	IOWA		For open burning SCCs originating from NEI, corrected Primary Device Type in CE table from 099 to 000 and control description to uncontrolled					4,480	7/17/81	11261
19	IOWA		Added EPA's 2002 inventory for industrial and/or commercial/institutional fossil fuel combustion if source category was missing from state or local inventory, or, if state or local agency used inventory from preliminary 2002 NEI, the preliminary 2002 NEI inventory was replaced with the new 2002 inventory.		792	792	28,314	396	11/4/59	11278
19	IOWA		Set invalid NAICS code to Null		369				9/14/10	11304
19	IOWA		Filled in emission process description where null		6,410				8/2/78	11315
19	IOWA		For records in preliminary 2002 NEI that were merged with state, local, and tribal inventories, updated null data source code on PE where corresponding EM records had more than one data source. PE data source selected from available EM data sources using the following order: Select Local or Tribal data source code when State and/or EPA data source was also available; select State data source code when EPA data source was also available. Also, updated actual throughput to null since activity for EM records varies depending on source of data.			1			9/27/37	11473
19	IOWA		Removed old solvent PE records			440			8/9/43	11495
19	IOWA		Inserted replacement PE records for solvent SCCs in EPA's 2002 inventory			440			11/22/43	11496
20	KANSAS		Removed SCC 2630020000 because NEI data being used instead			1,260	1,260		9/11/92	21074
20	KANSAS		Removed SCC 2630020000 because NEI data being used instead			105	105		12/7/92	21075
20	KANSAS		Updated Data Source Code to E-02-X where 2610000500 and data source is null				3,090		2/13/62	21108

Table D-1 (continued)

State FIPS or Tribal Code	State Name or Tribal Name	Local Agency FIPS Code	Description of Revision	Record Count					Date of Revision	Revision Tracking Number
				TR Table	EP Table	PE Table	EM Table	CE Table		
20	KANSAS		Added CENRAP-sponsored inventory for planned burning SCCs (except AR; TX; and Lancaster County, NE) per request of state		591	591	4,075		10/30/92	21134
20	KANSAS		Added CENRAP-sponsored inventory for Ag Tilling (except AR) per request of state		105	105	420		1/26/06	21136
20	KANSAS		Updated incorrect PM25-FIL values for 2102004000				7		4/25/49	3156
20	KANSAS		Added Annual NH3 record for 2810001000 by multiplying daily record by 365				1		12/20/29	3174
20	KANSAS		Updated contact information in Transmittal table from Wendy Vit to Andy Hawkins	105					11/23/37	4942
20	KANSAS		Removed SCC 30199999 (Industrial Processes / Chemical Manufacturing / Other Not Classified / Specify in Comments Field) because this category covered in point inventory		27	27	3,375		2/4/96	10498
20	KANSAS		Removed biogenic SCCs (2701405000, 2701411000, 2701412000, 2701413000, 2701414000, 2701415000, 2701416000, 2701417000, 2701421000, 2701422000, 2701423000, 2701424000, 2701431000, 2701432000, 2701433000, 2701441000, 2701442000, 2701443000, 2701451000, 2701452000, 2701453000, 2701454000, 2701461000, 2701462000, 2701471000, 2701472000, 2701473000, 2701474000, 2701475000, 2701476000, 2701477000, 2701481000, 2701482000, 2701483000, 2701484000, 2701485000, 2701491000, 2701492000)		3,990	51,870	51,870		7/26/05	10547
20	KANSAS		Removed process MACT code 1807-2 for human and animal crematories per EPA request		147				5/1/11	10680
20	KANSAS		Removed Old Solvent Utilization SCCs originating from pre 1999 NEI per request of EPA				1,785		1/12/64	10958
20	KANSAS		Inserted records for EPA 2002 VOC solvent emissions inventory		886	886	1,796		8/30/13	11253
20	KANSAS		Added EPA's 2002 inventory for industrial and/or commercial/institutional fossil fuel combustion if source category was missing from state or local inventory, or, if state or local agency used inventory from preliminary 2002 NEI, the preliminary 2002 NEI inventory was replaced with the new 2002 inventory.		1,137	1,137	42,819	816	11/4/59	11278
20	KANSAS		Set invalid NAICS code to Null		263				9/14/10	11304
20	KANSAS		Nulled actual throughput and throughput unit numerator where either column is null			18			6/4/64	11314
20	KANSAS		Filled in emission process description where null		4,517				8/2/78	11315

Table D-1 (continued)

State FIPS or Tribal Code	State Name or Tribal Name	Local Agency FIPS Code	Description of Revision	Record Count					Date of Revision	Revision Tracking Number
				TR Table	EP Table	PE Table	EM Table	CE Table		
20	KANSAS		For records in preliminary 2002 NEI that were merged with state, local, and tribal inventories, updated null data source code on PE where corresponding EM records had more than one data source. PE data source selected from available EM data sources using the following order: Select Local or Tribal data source code when State and/or EPA data source was also available; select State data source code when EPA data source was also available. Also, updated actual throughput to null since activity for EM records varies depending on source of data.			50			9/27/37	11473
20	KANSAS		Removed old solvent PE records			449			8/9/43	11495
20	KANSAS		Inserted replacement PE records for solvent SCCs in EPA's 2002 inventory			449			11/22/43	11496
21	KENTUCKY	111	Changed Source Type to AREA as noted in the spreadsheet file distributed by Roy Huntley, EPA to S/L/T agencies on August 11, 2004	1					11/8/52	20263
21	KENTUCKY	111	Corrected invalid commercial cooking-frying SCCs to valid SCCs: 2302002300 changed to 2302003100, 2302002400 changed to 2302003200, 2302002500 changed to 2302003000		3	3			6/20/60	20267
21	KENTUCKY	111	Changed State and County FIPS Code from 2111 to 21111					1	9/1/77	20273
21	KENTUCKY	111	Updated Actual Throughput and Throughput Unit Numerator to remove invalid units (Changed unit from TON2/LB to TON and multiplied actual throughput by 2000)			5			9/22/07	20886
21	KENTUCKY	111	Set Factor Numeric Value to null where Factor Unit Numerator and/or Factor Unit Denominator was null				18		3/9/67	21004
21	KENTUCKY	111	Updated Factor Unit Numerator and Throughput Unit Numerator from HEAD-YR to HEAD for SCCs 2805001100, 2805001200, 2805001300, 2805003100, 2805018000, 2805019100, 2805019200, 2805019300, 2805021100, 2805021200, 2805021300, 2805022100, 2805022200, 2805022300, 2805023100, 2805023200, 2805023300, 2805025000, 2805035000, 2805039100, 2805039200, 2805039300, 2805040000, 2805045000, 2805047100, 2805047300, 2805053100				2,241		11/21/78	10458
21	KENTUCKY		Replaced paved and unpaved road inventory with NEI inventory to account for updates to paved and unpaved road emission factors		240	480	1,920		10/21/68	10461
21	KENTUCKY		For SCCs 2805xxxxxx (animal husbandry) and 28017xxxxx (ag fertilizer), replaced state data with data from latest version of Carnegie Mellon University (CMU) Model (Version 3.6)		1,680	21,840	21,840		4/16/69	10489
21	KENTUCKY		Removed SCC 30199999 (Industrial Processes / Chemical Manufacturing / Other Not Classified / Specify in Comments Field) because this category covered in point inventory		30	30	3,750		2/4/96	10498
21	KENTUCKY	111	Added missing PM25-PRI record for SCC 2311010000				1		4/9/44	10516
21	KENTUCKY	111	Added missing PM10-FIL and PM25-FIL records for 2311010000				2		4/21/53	10517

Table D-1 (continued)

State FIPS or Tribal Code	State Name or Tribal Name	Local Agency FIPS Code	Description of Revision	Record Count					Date of Revision	Revision Tracking Number
				TR Table	EP Table	PE Table	EM Table	CE Table		
21	KENTUCKY		Removed process MACT code 1807-2 for human and animal crematories per EPA request		145				5/1/11	10680
21	KENTUCKY		Removed Old Solvent Utilization SCCs originating from pre 1999 NEI per request of EPA				1,792		1/12/64	10958
21	KENTUCKY		Inserted records for EPA 2002 VOC solvent emissions inventory		1,240	1,240	2,444		8/30/13	11253
21	KENTUCKY		For open burning SCCs originating from NEI, corrected Primary Device Type in CE table from 099 to 000 and control description to uncontrolled					6,496	7/17/81	11261
21	KENTUCKY		Added EPA's 2002 inventory for industrial and/or commercial/institutional fossil fuel combustion if source category was missing from state or local inventory, or, if state or local agency used inventory from preliminary 2002 NEI, the preliminary 2002 NEI inventory was replaced with the new 2002 inventory.		1,428	1,428	51,286	1,424	11/4/59	11278
21	KENTUCKY	111	Set invalid NAICS code to Null		485				9/14/10	11304
21	KENTUCKY	111	Nulled actual throughput and throughput unit numerator where either column is null			39			6/4/64	11314
21	KENTUCKY	111	Filled in emission process description where null		6,720				8/2/78	11315
21	KENTUCKY		For records in preliminary 2002 NEI that were merged with state, local, and tribal inventories, updated null data source code on PE where corresponding EM records had more than one data source. PE data source selected from available EM data sources using the following order: Select Local or Tribal data source code when State and/or EPA data source was also available; select State data source code when EPA data source was also available. Also, updated actual throughput to null since activity for EM records varies depending on source of data.			20			9/27/37	11473
21	KENTUCKY		Removed old solvent PE records			547			8/9/43	11495
21	KENTUCKY		Inserted replacement PE records for solvent SCCs in EPA's 2002 inventory			547			11/22/43	11496
22	LOUISIANA		Updated Data Source Code from S-02-X to P-02-X to identify NH3 inventory records in CENRAP-sponsored inventory that state included in its inventory submittal to EPA		5,064	60,680	4		11/16/73	20149
22	LOUISIANA		Added Affiliation Type and Organization Name to TR record	64					9/8/74	20150
22	LOUISIANA		Removed SCC 2630020000 because NEI data being used instead		64	768			8/19/51	21072
22	LOUISIANA		Removed SCC 2630020000 because NEI data being used instead				768		9/11/92	21074
22	LOUISIANA		Removed SCC 2630020000 because NEI data being used instead			64	64		12/7/92	21075
22	LOUISIANA		Updated Data Source Code to E-02-X where 2610000500 and data source is null				1,920		2/13/62	21108
22	LOUISIANA		Added CENRAP-sponsored inventory for planned burning SCCs (except AR; TX; and Lancaster County, NE) per request of state		265	265	1,803		10/30/92	21134

Table D-1 (continued)

State FIPS or Tribal Code	State Name or Tribal Name	Local Agency FIPS Code	Description of Revision	Record Count					Date of Revision	Revision Tracking Number
				TR Table	EP Table	PE Table	EM Table	CE Table		
22	LOUISIANA		Added CENRAP-sponsored inventory for Ag Tilling (except AR) per request of state		64	64	256		1/26/06	21136
22	LOUISIANA		Added missing PM records for Range Burning				1		10/10/51	121067
22	LOUISIANA		For SCCs 2805xxxxxx (animal husbandry) and 28017xxxxx (ag fertilizer), replaced state data with data from latest version of Carnegie Mellon University (CMU) Model (Version 3.6)		896	11,648	11,648		4/16/69	10489
22	LOUISIANA		Removed SCC 30199999 (Industrial Processes / Chemical Manufacturing / Other Not Classified / Specify in Comments Field) because this category covered in point inventory		31	31	3,875		2/4/96	10498
22	LOUISIANA		Removed biogenic SCCs (2701405000, 2701411000, 2701412000, 2701413000, 2701414000, 2701415000, 2701416000, 2701417000, 2701421000, 2701422000, 2701423000, 2701424000, 2701431000, 2701432000, 2701433000, 2701441000, 2701442000, 2701443000, 2701451000, 2701452000, 2701453000, 2701454000, 2701461000, 2701462000, 2701471000, 2701472000, 2701473000, 2701474000, 2701475000, 2701476000, 2701477000, 2701481000, 2701482000, 2701483000, 2701484000, 2701485000, 2701491000, 2701492000)		2,432	31,616	31,616		7/26/05	10547
22	LOUISIANA		Removed process MACT code 1807-2 for human and animal crematories per EPA request		86				5/1/11	10680
22	LOUISIANA		Removed Old Solvent Utilization SCCs originating from pre 1999 NEI per request of EPA				1,121		1/12/64	10958
22	LOUISIANA		Inserted records for EPA 2002 VOC solvent emissions inventory		721	721	1,463		8/30/13	11253
22	LOUISIANA		Added EPA's 2002 inventory for industrial and/or commercial/institutional fossil fuel combustion if source category was missing from state or local inventory, or, if state or local agency used inventory from preliminary 2002 NEI, the preliminary 2002 NEI inventory was replaced with the new 2002 inventory.		384	384	11,520	256	11/4/59	11278
22	LOUISIANA		Set invalid NAICS code to Null		287				9/14/10	11304
22	LOUISIANA		Nulled actual throughput and throughput unit numerator where either column is null			6			6/4/64	11314
22	LOUISIANA		Filled in emission process description where null		4,104				8/2/78	11315

Table D-1 (continued)

State FIPS or Tribal Code	State Name or Tribal Name	Local Agency FIPS Code	Description of Revision	Record Count					Date of Revision	Revision Tracking Number
				TR Table	EP Table	PE Table	EM Table	CE Table		
22	LOUISIANA		For records in preliminary 2002 NEI that were merged with state, local, and tribal inventories, updated null data source code on PE where corresponding EM records had more than one data source. PE data source selected from available EM data sources using the following order: Select Local or Tribal data source code when State and/or EPA data source was also available; select State data source code when EPA data source was also available. Also, updated actual throughput to null since activity for EM records varies depending on source of data.			25			9/27/37	11473
22	LOUISIANA		Removed old solvent PE records			315			8/9/43	11495
22	LOUISIANA		Inserted replacement PE records for solvent SCCs in EPA's 2002 inventory			315			11/22/43	11496
23	MAINE		Removed invalid pollutant code PCBTEQ				64		12/27/62	21024
23	MAINE		Updated Actual Throughput and Throughput Unit Numerator to remove invalid units (Changed unit from TON2/LB to TON and multiplied actual throughput by 2000)			81			11/28/77	21030
23	MAINE		As directed by ME, removed records for slash burning from counties where activity did not occur (records removed originated from preliminary 2002 NEI)		30	30	45	45	10/29/65	3153
23	MAINE		Merged preliminary 2002 NEI data with state inventory to fill data gaps		47	47	396	124	7/10/50	3189
23	MAINE		Added missing PM25 records for SCC 2401040000				2		8/12/00	10433
23	MAINE		Removed gas transport SCC because ME used a more general SCC as well		16	17	17	1	2/13/04	10438
23	MAINE		Replaced paved and unpaved road inventory with MANE-VU-sponsored inventory per state's request		32	32	128	8	7/4/24	10456
23	MAINE		Updated Factor Unit Numerator and Throughput Unit Numerator from HEAD-YR to HEAD for SCCs 2805001100, 2805001200, 2805001300, 2805002000, 2805003100, 2805018000, 2805019100, 2805019200, 2805019300, 2805021100, 2805021200, 2805021300, 2805022100, 2805022200, 2805022300, 2805023100, 2805023200, 2805023300, 2805025000, 2805035000, 2805040000, 2805045000				345		11/21/78	10458
23	MAINE		For SCCs 2805xxxxxx (animal husbandry) and 28017xxxxx (ag fertilizer), replaced state data with data from latest version of Carnegie Mellon University (CMU) Model (Version 3.6)		224	2,912	2,912		4/16/69	10489
23	MAINE		Changed Emission Type Period from annual to daily where Emission Type was 29				6		1/18/20	10490
23	MAINE		Removed SCC 30199999 (Industrial Processes / Chemical Manufacturing / Other Not Classified / Specify in Comments Field) because this category covered in point inventory		9	9	1,125		2/4/96	10498
23	MAINE		Removed daily emissions for paved and unpaved roads where state annual emissions inventory was replaced with MANE-VU-sponsored annual emissions inventory			32	128		2/4/28	10503

Table D-1 (continued)

State FIPS or Tribal Code	State Name or Tribal Name	Local Agency FIPS Code	Description of Revision	Record Count					Date of Revision	Revision Tracking Number
				TR Table	EP Table	PE Table	EM Table	CE Table		
23	MAINE		Generated EP and PE records to correct RI errors		2	21			8/3/00	10534
23	MAINE		Removed EP and PE records for 2810015000 where no activity occurred		1	1			7/9/30	10540
23	MAINE		Added PM-PRI, PM10-PRI, PM25-PRI records for 2810005000 (slash burning)				3		8/8/21	10954
23	MAINE		Removed Old Solvent Utilization SCCs originating from pre 1999 NEI per request of EPA				112		1/12/64	10958
23	MAINE		Removed daily records for gas transport for SCC 2501060050 and 2505000000 because the SCCs had no annual emissions (daily records were old state data originating from 1999 NEI)				19		7/19/96	11210
23	MAINE		Inserted records for EPA 2002 VOC solvent emissions inventory		63	63	123		8/30/13	11253
23	MAINE		For open burning SCCs originating from NEI, corrected Primary Device Type in CE table from 099 to 000 and control description to uncontrolled					1,728	7/17/81	11261
23	MAINE		Added EPA's 2002 inventory for industrial and/or commercial/institutional fossil fuel combustion if source category was missing from state or local inventory, or, if state or local agency used inventory from preliminary 2002 NEI, the preliminary 2002 NEI inventory was replaced with the new 2002 inventory.		112	112	4,352	64	11/4/59	11278
23	MAINE		Set invalid NAICS code to Null		46				9/14/10	11304
23	MAINE		Filled in emission process description where null		1,685				8/2/78	11315
23	MAINE		For records in preliminary 2002 NEI that were merged with state, local, and tribal inventories, updated null data source code on PE where corresponding EM records had more than one data source. PE data source selected from available EM data sources using the following order: Select Local or Tribal data source code when State and/or EPA data source was also available; select State data source code when EPA data source was also available. Also, updated actual throughput to null since activity for EM records varies depending on source of data.			249			1/15/42	11494
23	MAINE		Removed old solvent PE records			44			8/9/43	11495
23	MAINE		Inserted replacement PE records for solvent SCCs in EPA's 2002 inventory			44			11/22/43	11496
23	MAINE		Updated year to reflect year in data source				3		9/14/26	11499
24	MARYLAND		Removed invalid pollutant code PCBTEQ				96		2/14/63	21025
24	MARYLAND		Updated fuel combustion records with revisions provided by state				12,960		10/2/96	21078
24	MARYLAND		Added PM25-PRI records for structure fires				48		7/8/59	21082
24	MARYLAND		Updated and added PM records for fossil fuel combustion developed from PM augmentation procedure				2,664		11/19/92	21083
24	MARYLAND		Added Ag Fertilizer NH3 emissions provided by MD		336	4,368	4,368		3/16/06	21091
24	MARYLAND		Added PM25-PRI records for vehicle fires				216		3/16/08	21092
24	MARYLAND		Updated PM25-PRI records for SCCs 2103007000 and 2104007000				144		12/9/55	3160

Table D-1 (continued)

State FIPS or Tribal Code	State Name or Tribal Name	Local Agency FIPS Code	Description of Revision	Record Count					Date of Revision	Revision Tracking Number
				TR Table	EP Table	PE Table	EM Table	CE Table		
24	MARYLAND		Updated records for open burning inventory provided by MD		24	48	2,088	696	5/18/19	3164
24	MARYLAND		Added PM10-PRI and PM25-PRI records for SCCs 2601000000, 2801000003, 2810001000, 2810005000, and 2810015000				289	73	9/28/40	3165
24	MARYLAND		Updated PM * FIL records for 2610000500				24		2/24/33	9109
24	MARYLAND		Added PM records for MD				289	73	4/13/34	9110
24	MARYLAND		Added replacement records for bakery SCC 2302050000				72		9/6/39	10441
24	MARYLAND		Updated records for metal can surface coating				2		2/2/42	10443
24	MARYLAND		Removed duplicate PM25-PRI records for Ag Tilling (2801000003)				1	1	7/15/75	10449
24	MARYLAND		Removed duplicate PM25-PRI records for slash burning (2810005000)					24	6/4/19	10451
24	MARYLAND		Replaced paved and unpaved road inventory with MANE-VU-sponsored inventory per state's request		47	47	188		7/4/24	10456
24	MARYLAND		Updated Factor Unit Numerator and Throughput Unit Numerator from HEAD-YR to HEAD for SCCs 2805001100, 2805001200, 2805001300, 2805003100, 2805018000, 2805019100, 2805019200, 2805019300, 2805021100, 2805021200, 2805021300, 2805022100, 2805022200, 2805022300, 2805023100, 2805023200, 2805023300, 2805025000, 2805035000, 2805039100, 2805039200, 2805039300, 2805040000, 2805045000, 2805047100, 2805047300, 2805053100			502	502		11/21/78	10458
24	MARYLAND		Inserted replacement records for Fuel Oil				12,960		9/6/06	10466
24	MARYLAND		For SCCs 2805xxxxxx (animal husbandry) and 28017xxxxx (ag fertilizer), replaced state data with data from latest version of Carnegie Mellon University (CMU) Model (Version 3.6)		336	4,368	4,368		4/16/69	10489
24	MARYLAND		Removed SCC 30199999 (Industrial Processes / Chemical Manufacturing / Other Not Classified / Specify in Comments Field) because this category covered in point inventory		16	16	2,000		2/4/96	10498
24	MARYLAND		Removed daily emissions for paved and unpaved roads where state annual emissions inventory was replaced with MANE-VU-sponsored annual emissions inventory			47	188		2/4/28	10503
24	MARYLAND		Added missing PM10-FIL and PM25-FIL records for 2311010000, 2311020000, and 2311030000				288		4/21/53	10517
24	MARYLAND		Removed process MACT code 1807-2 for human and animal crematories per EPA request		33				5/1/11	10680
24	MARYLAND		Removed Old Solvent Utilization SCCs originating from pre 1999 NEI per request of EPA				144		1/12/64	10958
24	MARYLAND		Inserted records for EPA 2002 VOC solvent emissions inventory		211	211	211		8/30/13	11253
24	MARYLAND		Removed invalid pollutant code CH4				144	72	10/16/49	11257

Table D-1 (continued)

State FIPS or Tribal Code	State Name or Tribal Name	Local Agency FIPS Code	Description of Revision	Record Count					Date of Revision	Revision Tracking Number
				TR Table	EP Table	PE Table	EM Table	CE Table		
24	MARYLAND		Per direction from state, removed records for lead (195) for auto body refinishing (SCC 2401005000); emissions were exceptionally high				72	24	8/22/99	11264
24	MARYLAND		Added EPA's 2002 inventory for industrial and/or commercial/institutional fossil fuel combustion if source category was missing from state or local inventory, or, if state or local agency used inventory from preliminary 2002 NEI, the preliminary 2002 NEI inventory was replaced with the new 2002 inventory.		96	96	2,664	192	11/4/59	11278
24	MARYLAND		Set invalid NAICS code to Null		192				9/14/10	11304
24	MARYLAND		Removed invalid SCC 2401008999 by summing emissions for invalid SCC with valid SCC 2401008000 and removing records with invalid SCC 2401008999				3		1/31/38	11312
24	MARYLAND		Nulled actual throughput and throughput unit numerator where either column is null			1,038			6/4/64	11314
24	MARYLAND		Filled in emission process description where null		1,344				8/2/78	11315
25	MASSACHUSETTS		State submitted a mercury (Hg) inventory separate from its CAP_HAP inventory. The CAP_HAP inventory contained Hg emissions. Removed Hg records from CAP_HAP inventory that matched with records in the Hg inventory to avoid double-counting of emissions.		26	26	26		1/27/60	21013
25	MASSACHUSETTS		Removed invalid pollutant code PCBTEQ				56		4/11/63	21026
25	MASSACHUSETTS		Updated Actual Throughput and Throughput Unit Numerator to remove invalid units (Changed unit from TON2/LB to TON and multiplied actual throughput by 2000)			14			11/28/77	21030
25	MASSACHUSETTS		Updated CAPs for Industrial Coal (2102002000)			28	112		3/2/02	21051
25	MASSACHUSETTS		Updated natural gas emissions per revised inventory from state			84	252		10/20/58	21055
25	MASSACHUSETTS		Set PM25-PRI=PM10-PRI for Commercial/Inst LPG				28		11/27/38	21068
25	MASSACHUSETTS		Changed PM10-PRI to PM10-FIL and PM25-PRI to PM25-FIL and emission factors for SCCs 2102002000, 2102004000, 2102005000, 2102006000, 2102007000, 2102008000, 2102011000, 2103004000, 2103005000, 2103006000, 2103007000, and 2103008000				336		5/13/60	21076
25	MASSACHUSETTS		Added PM10-PRI, PM25-PRI, PM-CON records for SCCs 2102002000, 2102004000, 2102005000, 2102006000, 2102007000, 2102008000, 2102011000, 2103004000, 2103005000, 2103006000, 2103007000, and 2103008000				504		2/14/63	21077
25	MASSACHUSETTS		Added PM25-PRI records for vehicle fires				28		3/16/08	21092

Table D-1 (continued)

State FIPS or Tribal Code	State Name or Tribal Name	Local Agency FIPS Code	Description of Revision	Record Count					Date of Revision	Revision Tracking Number
				TR Table	EP Table	PE Table	EM Table	CE Table		
25	MASSACHUSETTS		Added missing Emission Process records for residential coal combustion		26				5/23/73	21094
25	MASSACHUSETTS		Added PM25 for asphalt roofing				14		4/9/60	10436
25	MASSACHUSETTS		Replaced paved and unpaved road inventory with MANE-VU-sponsored inventory per state's request		27	27	108		7/4/24	10456
25	MASSACHUSETTS		Updated Factor Unit Numerator and Throughput Unit Numerator from HEAD-YR to HEAD for SCCs 2805001100, 2805001200, 2805001300, 2805003100, 2805018000, 2805019100, 2805019200, 2805019300, 2805021100, 2805021200, 2805021300, 2805022100, 2805022200, 2805022300, 2805023100, 2805023200, 2805023300, 2805025000, 2805035000, 2805039100, 2805039200, 2805039300, 2805040000, 2805045000, 2805047100, 2805047300, 2805053100				203		11/21/78	10458
25	MASSACHUSETTS		Added PM10-FIL and PM25-FIL where missing				28		11/30/52	10478
25	MASSACHUSETTS		For SCCs 2805xxxxxx (animal husbandry) and 28017xxxxx (ag fertilizer), replaced state data with data from latest version of Carnegie Mellon University (CMU) Model (Version 3.6)		196	2,548	2,548		4/16/69	10489
25	MASSACHUSETTS		Removed SCC 30199999 (Industrial Processes / Chemical Manufacturing / Other Not Classified / Specify in Comments Field) because this category covered in point inventory		10	10	1,250		2/4/96	10498
25	MASSACHUSETTS		Updated Emission Numeric Value and Emission Ton Value, and Revision Date for natural gas combustion				84		6/19/27	10501
25	MASSACHUSETTS		Added missing PM10-FIL and PM25-FIL records for 2311010000, 2311020000, 2311030000, and 2325000000				112		4/21/53	10517
25	MASSACHUSETTS		Removed EP and PE record for county with no unpaved roads		1	1			3/4/51	10546
25	MASSACHUSETTS		Removed biogenic SCC (2701420000)		14	14	14		7/26/05	10547
25	MASSACHUSETTS		Removed process MACT code 1807-2 for human and animal crematories per EPA request		7				5/1/11	10680
25	MASSACHUSETTS		Removed Old Solvent Utilization SCCs originating from pre 1999 NEI per request of EPA				252		1/12/64	10958
25	MASSACHUSETTS		Inserted records for EPA 2002 VOC solvent emissions inventory		84	84	84		8/30/13	11253
25	MASSACHUSETTS		Removed invalid pollutant code CH4				56	56	10/16/49	11257

Table D-1 (continued)

State FIPS or Tribal Code	State Name or Tribal Name	Local Agency FIPS Code	Description of Revision	Record Count					Date of Revision	Revision Tracking Number
				TR Table	EP Table	PE Table	EM Table	CE Table		
25	MASSACHUSETTS		For open burning SCCs originating from NEI, corrected Primary Device Type in CE table from 099 to 000 and control description to uncontrolled					144	7/17/81	11261
25	MASSACHUSETTS		Added EPA's 2002 inventory for industrial and/or commercial/institutional fossil fuel combustion if source category was missing from state or local inventory, or, if state or local agency used inventory from preliminary 2002 NEI, the preliminary 2002 NEI inventory was replaced with the new 2002 inventory.		14	14	742		11/4/59	11278
25	MASSACHUSETTS		Set invalid NAICS code to Null		28				9/14/10	11304
25	MASSACHUSETTS		Updated contact information	14					12/27/23	11310
25	MASSACHUSETTS		Nulled actual throughput and throughput unit numerator where either column is null			154			6/4/64	11314
25	MASSACHUSETTS		Filled in emission process description where null		1,538				8/2/78	11315
26	MICHIGAN		Changed Emission type from 30 to 27 per email from Allan Ostrander on Aug 10				581		4/18/18	19780
26	MICHIGAN		Updated emission type from 30 to 27 for June-August records for solvent SCCs (2460*)				664		5/1/22	21058
26	MICHIGAN		Changed PM10-PRI to PM10-FIL and PM25-PRI to PM25-FIL to reflect basis of emission factor for SCCs 2102004000 and 2103004000				664		6/19/32	21096
26	MICHIGAN		Changed PM Pollutant Codes in state inventory from Primary to Filterable				332		5/12/63	21100
26	MICHIGAN		Added PM records for coal and residual oil combustion developed from PM augmentation procedure				498		7/23/64	21101
26	MICHIGAN		Added PM records for kerosene and distillate oil combustion developed from PM augmentation procedure				996		12/10/91	21102
26	MICHIGAN		For SCCs 2805xxxxxx (animal husbandry) and 28017xxxxx (ag fertilizer), replaced state data with data from latest version of Carnegie Mellon University (CMU) Model (Version 3.6)		1,162	15,106	15,106		4/16/69	10489
26	MICHIGAN		Removed SCC 30199999 (Industrial Processes / Chemical Manufacturing / Other Not Classified / Specify in Comments Field) because this category covered in point inventory		41	41	4,877		2/4/96	10498
26	MICHIGAN		Added missing PM25-PRI records for leaking underground storage tanks (2660000000)				166		11/7/12	10520
26	MICHIGAN		Removed process MACT code 1807-2 for human and animal crematories per EPA request		116				5/1/11	10680
26	MICHIGAN		Removed Old Solvent Utilization SCCs originating from pre 1999 NEI per request of EPA				999		1/12/64	10958

Table D-1 (continued)

State FIPS or Tribal Code	State Name or Tribal Name	Local Agency FIPS Code	Description of Revision	Record Count					Date of Revision	Revision Tracking Number
				TR Table	EP Table	PE Table	EM Table	CE Table		
26	MICHIGAN		Removed daily records for SCC 2810030000 where daily emissions were greater than the annual emissions				3		10/30/73	11014
26	MICHIGAN		Inserted records for EPA 2002 VOC solvent emissions inventory		522	522	652		8/30/13	11253
26	MICHIGAN		For open burning SCCs originating from NEI, corrected Primary Device Type in CE table from 099 to 000 and control description to uncontrolled					4,200	7/17/81	11261
26	MICHIGAN		Added EPA's 2002 inventory for industrial and/or commercial/institutional fossil fuel combustion if source category was missing from state or local inventory, or, if state or local agency used inventory from preliminary 2002 NEI, the preliminary 2002 NEI inventory was replaced with the new 2002 inventory.		83	83	1,826	332	11/4/59	11278
26	MICHIGAN		Removed Duplicate TR records	83					7/19/05	11296
26	MICHIGAN		Set invalid NAICS code to Null		712				9/14/10	11304
26	MICHIGAN		Nulled actual throughput and throughput unit numerator where either column is null			2,988			6/4/64	11314
26	MICHIGAN		Filled in emission process description where null		5,063				8/2/78	11315
26	MICHIGAN		For records in preliminary 2002 NEI that were merged with state, local, and tribal inventories, updated null data source code on PE where corresponding EM records had more than one data source. PE data source selected from available EM data sources using the following order: Select Local or Tribal data source code when State and/or EPA data source was also available; select State data source code when EPA data source was also available. Also, updated actual throughput to null since activity for EM records varies depending on source of data.			14			9/27/37	11473
26	MICHIGAN		Removed old solvent PE records			130			8/9/43	11495
26	MICHIGAN		Inserted replacement PE records for solvent SCCs in EPA's 2002 inventory			130			11/22/43	11496
27	MINNESOTA		Updated Data Source Code to E-02-X where 2610000500 and data source is null				2,610		2/13/62	21108
27	MINNESOTA		Removed SCC 2810015000 in nonpoint for pollutants that are in point				609		1/14/94	21110
27	MINNESOTA		Appending new records for 2102 and 2103 for Minnesota per request		982	982	48,044		4/27/88	21119
27	MINNESOTA		Added CENRAP-sponsored inventory for planned burning SCCs (except AR; TX; and Lancaster County, NE) per request of state		135	135	945		10/30/92	21134
27	MINNESOTA		Added CENRAP-sponsored inventory for Ag Tilling (except AR) per request of state		87	87	348		1/26/06	21136
27	MINNESOTA		Inserted replacement files sent by MN on Oct 12		773	773	34,368		12/17/29	21259
27	MINNESOTA		For SCCs 2805xxxxxx (animal husbandry) and 28017xxxxx (ag fertilizer), replaced state data with data from latest version of Carnegie Mellon University (CMU) Model (Version 3.6)		1,218	15,834	15,834		4/16/69	10489

Table D-1 (continued)

State FIPS or Tribal Code	State Name or Tribal Name	Local Agency FIPS Code	Description of Revision	Record Count					Date of Revision	Revision Tracking Number
				TR Table	EP Table	PE Table	EM Table	CE Table		
27	MINNESOTA		Removed SCC 30199999 (Industrial Processes / Chemical Manufacturing / Other Not Classified / Specify in Comments Field) because this category covered in point inventory		42	42	5,250		2/4/96	10498
27	MINNESOTA		Added new asphalt paving inventory (SCCs 2461020000 and 2461021000) provided by state. This inventory replaced the inventory from the preliminary 2002 NEI that was merged with the state's inventory.		87	87	783		9/21/61	10507
27	MINNESOTA		Replaced commercial/institutional fuel combustion emissions (SCCs 2103002000, 2103004000, 2103005000, 2103006000, 2103007000, 2103008000, 2103011000) with state supplied replacement		582	582	29,369		1/14/62	10509
27	MINNESOTA		Inactivated CE records for 2461020000 which have no EM record					261	2/15/29	10538
27	MINNESOTA		Removed process MACT code 1807-2 for human and animal crematories per EPA request		1				5/1/11	10680
27	MINNESOTA		Removed Old Solvent Utilization SCCs originating from pre 1999 NEI per request of EPA				257		1/12/64	10958
27	MINNESOTA		Inserted records for EPA 2002 VOC solvent emissions inventory		377	377	963		8/30/13	11253
27	MINNESOTA		For open burning SCCs originating from NEI, corrected Primary Device Type in CE table from 099 to 000 and control description to uncontrolled					3,528	7/17/81	11261
27	MINNESOTA		Added EPA's 2002 inventory for industrial and/or commercial/institutional fossil fuel combustion if source category was missing from state or local inventory, or, if state or local agency used inventory from preliminary 2002 NEI, the preliminary 2002 NEI inventory was replaced with the new 2002 inventory.		231	231	8,102	380	11/4/59	11278
27	MINNESOTA		Inserted CAP pollutants from preliminary NEI for SCC 2810001000				522		10/16/98	11292
27	MINNESOTA		Set invalid NAICS code to Null		107				9/14/10	11304
27	MINNESOTA		Filled in emission process description where null		3,402				8/2/78	11315
27	MINNESOTA		For records in preliminary 2002 NEI that were merged with state, local, and tribal inventories, updated null data source code on PE where corresponding EM records had more than one data source. PE data source selected from available EM data sources using the following order: Select Local or Tribal data source code when State and/or EPA data source was also available; select State data source code when EPA data source was also available. Also, updated actual throughput to null since activity for EM records varies depending on source of data.			24			9/27/37	11473
27	MINNESOTA		Removed old solvent PE records			520			8/9/43	11495
27	MINNESOTA		Inserted replacement PE records for solvent SCCs in EPA's 2002 inventory			520			11/22/43	11496
28	MISSISSIPPI		Updated Actual Throughput and Throughput Unit Numerator to remove invalid units (Changed unit from TON2/LB to TON and multiplied actual throughput by 2000)			473			9/22/07	20886

Table D-1 (continued)

State FIPS or Tribal Code	State Name or Tribal Name	Local Agency FIPS Code	Description of Revision	Record Count					Date of Revision	Revision Tracking Number
				TR Table	EP Table	PE Table	EM Table	CE Table		
28	MISSISSIPPI		Set Factor Numeric Value to null where Factor Unit Numerator and/or Factor Unit Denominator was null				370		7/31/68	21005
28	MISSISSIPPI		Replaced paved and unpaved road inventory with NEI inventory to account for updates to paved and unpaved road emission factors		164	328	1,312		10/21/68	10461
28	MISSISSIPPI		For SCCs 2805xxxxxx (animal husbandry) and 28017xxxxx (ag fertilizer), replaced state data with data from latest version of Carnegie Mellon University (CMU) Model (Version 3.6)		1,148	14,924	14,924		4/16/69	10489
28	MISSISSIPPI		Removed SCC 30199999 (Industrial Processes / Chemical Manufacturing / Other Not Classified / Specify in Comments Field) because this category covered in point inventory		28	28	3,500		2/4/96	10498
28	MISSISSIPPI		Removed process MACT code 1807-2 for human and animal crematories per EPA request		106				5/1/11	10680
28	MISSISSIPPI		Removed Old Solvent Utilization SCCs originating from pre 1999 NEI per request of EPA				1,258		1/12/64	10958
28	MISSISSIPPI		Inserted records for EPA 2002 VOC solvent emissions inventory		286	286	450		8/30/13	11253
28	MISSISSIPPI		Removed pollutants EC and OC				264		11/24/46	11256
28	MISSISSIPPI		For open burning SCCs originating from NEI, corrected Primary Device Type in CE table from 099 to 000 and control description to uncontrolled					3,544	7/17/81	11261
28	MISSISSIPPI		Added EPA's 2002 inventory for industrial and/or commercial/institutional fossil fuel combustion if source category was missing from state or local inventory, or, if state or local agency used inventory from preliminary 2002 NEI, the preliminary 2002 NEI inventory was replaced with the new 2002 inventory.		616	616	24,156	324	11/4/59	11278
28	MISSISSIPPI		Set invalid NAICS code to Null		813				9/14/10	11304
28	MISSISSIPPI		Nulled actual throughput and throughput unit numerator where either column is null			72			6/4/64	11314
28	MISSISSIPPI		Filled in emission process description where null		8,905				8/2/78	11315
29	MISSOURI		Changed SCC per email from Jill Wade on Aug 20, 2004		65	65	65		2/3/00	20764
29	MISSOURI		Removed SCC per email from Jill Wade on Aug 25, 2004		109	109	433		9/9/07	20765
29	MISSOURI		Set Factor Numeric Value to null where Factor Unit Numerator and/or Factor Unit Denominator was null				79		8/27/69	21006
29	MISSOURI		Updated state's fossil fuel combustion inventory to add PM-CON emissions, revised PM10-PRI and PM25-PRI emissions, and correct other issues as directed by state		1		1,988		3/25/15	21064
29	MISSOURI		Removed SCC 2630020000 because NEI data being used instead				1,380		9/11/92	21074
29	MISSOURI		Removed SCC 2630020000 because NEI data being used instead			115	115		12/7/92	21075
29	MISSOURI		Added PM25-PRI records for structure fires				115		7/8/59	21082

Table D-1 (continued)

State FIPS or Tribal Code	State Name or Tribal Name	Local Agency FIPS Code	Description of Revision	Record Count					Date of Revision	Revision Tracking Number
				TR Table	EP Table	PE Table	EM Table	CE Table		
29	MISSOURI		Added PM25-PRI records for vehicle fires				345		3/16/08	21092
29	MISSOURI		Updated Data Source Code to E-02-X where 2610000500 and data source is null				3,330		2/13/62	21108
29	MISSOURI		Update PM10-PRI Emission Numeric Values, Emission Ton Values, Factor Numeric Values, Submittal Flags, and Revision Date for corrected Factor Numeric Values for Missouri				108		2/1/79	21116
29	MISSOURI		Insert PM10-FIL, PM25-FIL, PM25-PRI for Missouri PM augmentation				324		8/10/79	21117
29	MISSOURI		Added CENRAP-sponsored inventory for planned burning SCCs (except AR; TX; and Lancaster County, NE) per request of state		340	340	2,367		10/30/92	21134
29	MISSOURI		Added CENRAP-sponsored inventory for Ag Tilling (except AR) per request of state		115	115	460		1/26/06	21136
29	MISSOURI		Added PM25-PRI records for 2505020000				32		9/22/03	3173
29	MISSOURI		For SCCs 2805xxxxxx (animal husbandry) and 28017xxxxx (ag fertilizer), replaced state data with data from latest version of Carnegie Mellon University (CMU) Model (Version 3.6)		1,610	20,930	20,930		4/16/69	10489
29	MISSOURI		Removed SCC 30199999 (Industrial Processes / Chemical Manufacturing / Other Not Classified / Specify in Comments Field) because this category covered in point inventory		45	45	5,625		2/4/96	10498
29	MISSOURI		Replaced industrial surface coating emissions (SCCs 2401015000, 2401020000, 2401040000, 2401050000, 2401055000, 2401060000, 2401065000, 2401070000, 2401080000) with state supplied emissions to correct for double-counting of VOC emissions in state's original inventory				1,035		5/1/62	10511
29	MISSOURI		Removed Old Solvent Utilization SCCs originating from pre 1999 NEI per request of EPA				1,932		1/12/64	10958
29	MISSOURI		Inserted records for EPA 2002 VOC solvent emissions inventory		197	197	642		8/30/13	11253
29	MISSOURI		For open burning SCCs originating from NEI, corrected Primary Device Type in CE table from 099 to 000 and control description to uncontrolled					5,992	7/17/81	11261
29	MISSOURI		Added EPA's 2002 inventory for industrial and/or commercial/institutional fossil fuel combustion if source category was missing from state or local inventory, or, if state or local agency used inventory from preliminary 2002 NEI, the preliminary 2002 NEI inventory was replaced with the new 2002 inventory.		460	460	24,380		11/4/59	11278
29	MISSOURI		Inserted PM10-PRI and PM25-PRI records from preliminary NEI for SCC 2810001000				230		11/25/98	11293
29	MISSOURI		Set invalid NAICS code to Null		115				9/14/10	11304
29	MISSOURI		Nulled actual throughput and throughput unit numerator where either column is null			332			6/4/64	11314
29	MISSOURI		Filled in emission process description where null		4,491				8/2/78	11315

Table D-1 (continued)

State FIPS or Tribal Code	State Name or Tribal Name	Local Agency FIPS Code	Description of Revision	Record Count					Date of Revision	Revision Tracking Number
				TR Table	EP Table	PE Table	EM Table	CE Table		
29	MISSOURI		For records in preliminary 2002 NEI that were merged with state, local, and tribal inventories, updated null data source code on PE where corresponding EM records had more than one data source. PE data source selected from available EM data sources using the following order: Select Local or Tribal data source code when State and/or EPA data source was also available; select State data source code when EPA data source was also available. Also, updated actual throughput to null since activity for EM records varies depending on source of data.			3			9/27/37	11473
29	MISSOURI		Removed old solvent PE records			158			8/9/43	11495
29	MISSOURI		Inserted replacement PE records for solvent SCCs in EPA's 2002 inventory			158			11/22/43	11496
30	MONTANA		Updated Factor Unit Numerator and Throughput Unit Numerator from HEAD-YR to HEAD for SCCs 2805001100, 2805001200, 2805001300, 2805003100, 2805018000, 2805019100, 2805019200, 2805019300, 2805021100, 2805021200, 2805021300, 2805022100, 2805022200, 2805022300, 2805023100, 2805023200, 2805023300, 2805025000, 2805035000, 2805039100, 2805039200, 2805039300, 2805040000, 2805045000, 2805047100, 2805047300, 2805053100				732		11/21/78	10458
30	MONTANA		For SCCs 2805xxxxxx (animal husbandry) and 28017xxxxx (ag fertilizer), replaced state data with data from latest version of Carnegie Mellon University (CMU) Model (Version 3.6)		798	10,374	10,374		4/16/69	10489
30	MONTANA		Removed SCC 30199999 (Industrial Processes / Chemical Manufacturing / Other Not Classified / Specify in Comments Field) because this category covered in point inventory		17	17	2,125		2/4/96	10498
30	MONTANA		Removed process MACT code 1807-2 for human and animal crematories per EPA request		83				5/1/11	10680
30	MONTANA		Removed Old Solvent Utilization SCCs originating from pre 1999 NEI per request of EPA				594		1/12/64	10958
30	MONTANA		Inserted records for EPA 2002 VOC solvent emissions inventory		568	568	950		8/30/13	11253
30	MONTANA		For open burning SCCs originating from NEI, corrected Primary Device Type in CE table from 099 to 000 and control description to uncontrolled					1,680	7/17/81	11261
30	MONTANA		Added EPA's 2002 inventory for industrial and/or commercial/institutional fossil fuel combustion if source category was missing from state or local inventory, or, if state or local agency used inventory from preliminary 2002 NEI, the preliminary 2002 NEI inventory was replaced with the new 2002 inventory.		545	545	17,708	648	11/4/59	11278
30	MONTANA		Removed invalid State and County FIPS 30113 from NH3 inventory - emissions are zero; emissions are from CMU model		56	728	728		7/6/68	11282
30	MONTANA		Set invalid NAICS code to Null		190				9/14/10	11304
30	MONTANA		Nulled actual throughput and throughput unit numerator where either column is null			23			6/4/64	11314

Table D-1 (continued)

State FIPS or Tribal Code	State Name or Tribal Name	Local Agency FIPS Code	Description of Revision	Record Count					Date of Revision	Revision Tracking Number
				TR Table	EP Table	PE Table	EM Table	CE Table		
30	MONTANA		Filled in emission process description where null		3,136				8/2/78	11315
30	MONTANA		For records in preliminary 2002 NEI that were merged with state, local, and tribal inventories, updated null data source code on PE where corresponding EM records had more than one data source. PE data source selected from available EM data sources using the following order: Select Local or Tribal data source code when State and/or EPA data source was also available; select State data source code when EPA data source was also available. Also, updated actual throughput to null since activity for EM records varies depending on source of data.			10			9/27/37	11473
30	MONTANA		Removed old solvent PE records			157			8/9/43	11495
30	MONTANA		Inserted replacement PE records for solvent SCCs in EPA's 2002 inventory			157			11/22/43	11496
31	NEBRASKA		Updated Data Source Code to E-02-X where 2610000500 and data source is null				2,490		2/13/62	21108
31	NEBRASKA		Added CENRAP-sponsored inventory for planned burning SCCs (except AR; TX; and Lancaster County, NE) per request of state		367	367	2,462		10/30/92	21134
31	NEBRASKA		Added CENRAP-sponsored inventory for Ag Tilling (except AR) per request of state		93	93	372		1/26/06	21136
31	NEBRASKA		Removed duplicate records for POTWS (2630020000)		93	1,209	92		9/13/20	21138
31	NEBRASKA	109	Updated incorrect PM25-FIL values for 2102004000				13		4/25/49	3156
31	NEBRASKA	109	Added PM25-PRI record for 2535010000				1	1	9/22/03	3173
31	NEBRASKA	109	Added missing PM records for Range Burning				1		10/10/51	121067
31	NEBRASKA		For SCCs 2805xxxxxx (animal husbandry) and 28017xxxxx (ag fertilizer), replaced state data with data from latest version of Carnegie Mellon University (CMU) Model (Version 3.6)		1,302	16,926	16,926		4/16/69	10489
31	NEBRASKA	109	Updated pollutant code from SOX to SO2					3	11/10/64	10495
31	NEBRASKA		Removed SCC 30199999 (Industrial Processes / Chemical Manufacturing / Other Not Classified / Specify in Comments Field) because this category covered in point inventory		14	14	1,750		2/4/96	10498
31	NEBRASKA	109	Added PM25-PRI for Lincoln Co Rocket engine testing (2810040000)				1		5/24/57	10529

Table D-1 (continued)

State FIPS or Tribal Code	State Name or Tribal Name	Local Agency FIPS Code	Description of Revision	Record Count					Date of Revision	Revision Tracking Number
				TR Table	EP Table	PE Table	EM Table	CE Table		
31	NEBRASKA	109	Removed biogenic SCCs (2701405000, 2701411000, 2701412000, 2701413000, 2701414000, 2701415000, 2701416000, 2701417000, 2701421000, 2701422000, 2701423000, 2701424000, 2701431000, 2701432000, 2701433000, 2701441000, 2701442000, 2701443000, 2701451000, 2701452000, 2701453000, 2701454000, 2701461000, 2701462000, 2701471000, 2701472000, 2701473000, 2701474000, 2701475000, 2701476000, 2701477000, 2701481000, 2701482000, 2701483000, 2701484000, 2701485000, 2701491000, 2701492000)		3,534	45,942	45,942		7/26/05	10547
31	NEBRASKA		Removed process MACT code 1807-2 for human and animal crematories per EPA request		146				5/1/11	10680
31	NEBRASKA		Removed Old Solvent Utilization SCCs originating from pre 1999 NEI per request of EPA				1,364		1/12/64	10958
31	NEBRASKA		Inserted records for EPA 2002 VOC solvent emissions inventory		833	833	1,581		8/30/13	11253
31	NEBRASKA		For open burning SCCs originating from NEI, corrected Primary Device Type in CE table from 099 to 000 and control description to uncontrolled					1,232	7/17/81	11261
31	NEBRASKA		Added EPA's 2002 inventory for industrial and/or commercial/institutional fossil fuel combustion if source category was missing from state or local inventory, or, if state or local agency used inventory from preliminary 2002 NEI, the preliminary 2002 NEI inventory was replaced with the new 2002 inventory.		978	978	36,282	708	11/4/59	11278
31	NEBRASKA	109	Update transaction type from 01 to 00 for Lincoln county 31109	1					8/17/77	11285
31	NEBRASKA	109	Set invalid NAICS code to Null		218				9/14/10	11304
31	NEBRASKA	109	Nulled actual throughput and throughput unit numerator where either column is null			20			6/4/64	11314
31	NEBRASKA	109	Filled in emission process description where null		5,962				8/2/78	11315
31	NEBRASKA		For records in preliminary 2002 NEI that were merged with state, local, and tribal inventories, updated null data source code on PE where corresponding EM records had more than one data source. PE data source selected from available EM data sources using the following order: Select Local or Tribal data source code when State and/or EPA data source was also available; select State data source code when EPA data source was also available. Also, updated actual throughput to null since activity for EM records varies depending on source of data.			98			9/27/37	11473
31	NEBRASKA		Removed old solvent PE records			298			8/9/43	11495
31	NEBRASKA		Inserted replacement PE records for solvent SCCs in EPA's 2002 inventory			298			11/22/43	11496
32	NEVADA	003	Updated SCC as noted in the spreadsheet file distributed by Roy Huntley, EPA to S/L/T agencies on August 11, 2004		1	1	1		5/9/63	20269

Table D-1 (continued)

State FIPS or Tribal Code	State Name or Tribal Name	Local Agency FIPS Code	Description of Revision	Record Count					Date of Revision	Revision Tracking Number
				TR Table	EP Table	PE Table	EM Table	CE Table		
32	NEVADA	003	Changed PM10-PRI to PM10-FIL to reflect basis of emission factor for SCCs 2102004000 and 2103004000				2		6/19/32	21096
32	NEVADA	003	Added PM records for kerosene and distillate oil combustion developed from PM augmentation procedure				8		12/10/91	21102
32	NEVADA	003	Removed duplicate VOC record for SCC 2401001000				1		1/2/33	21140
32	NEVADA	003	Added PM records for natural gas and LPG combustion developed from PM augmentation procedure				3		8/10/13	21257
32	NEVADA	003	Removed records for invalid SCC 210200700 because valid SCC 2102007000 existed in inventory		1	1			2/10/66	21274
32	NEVADA	003	Updated Factor Unit Numerator and Throughput Unit Numerator from HEAD-YR to HEAD for SCCs 2805001100, 2805001200, 2805001300, 2805002000, 2805003100, 2805018000, 2805019100, 2805019200, 2805019300, 2805021100, 2805021200, 2805021300, 2805022100, 2805022200, 2805022300, 2805023100, 2805023200, 2805023300, 2805025000, 2805035000, 2805040000, 2805045000				228		11/21/78	10458
32	NEVADA		For SCCs 2805xxxxxx (animal husbandry) and 28017xxxxx (ag fertilizer), replaced state data with data from latest version of Carnegie Mellon University (CMU) Model (Version 3.6)		238	3,094	3,094		4/16/69	10489
32	NEVADA		Removed SCC 30199999 (Industrial Processes / Chemical Manufacturing / Other Not Classified / Specify in Comments Field) because this category covered in point inventory		7	7	875		2/4/96	10498
32	NEVADA	003	Added missing PM25-PRI records for SCCs 2325000000 and 2325030000				2		4/9/44	10516
32	NEVADA	003	Added missing PM10-FIL and PM25-FIL records for SCCs 2325000000 and 2325030000				4		4/21/53	10517
32	NEVADA	003	Added missing PM25-PRI for SCCs 2102001000, 2301010000, 2302000000, 2302040000, 2305000000, 2305070000, 2305080000, 2307000000, 2399000000, 2401001000, 2401005000, 2425000000, and 2620030000				13		9/19/16	10521
32	NEVADA		Removed process MACT code 1807-2 for human and animal crematories per EPA request		21				5/1/11	10680
32	NEVADA		Removed Old Solvent Utilization SCCs originating from pre 1999 NEI per request of EPA				198		1/12/64	10958
32	NEVADA		Inserted records for EPA 2002 VOC solvent emissions inventory		202	202	338		8/30/13	11253
32	NEVADA		For open burning SCCs originating from NEI, corrected Primary Device Type in CE table from 099 to 000 and control description to uncontrolled					112	7/17/81	11261
32	NEVADA		Added EPA's 2002 inventory for industrial and/or commercial/institutional fossil fuel combustion if source category was missing from state or local inventory, or, if state or local agency used inventory from preliminary 2002 NEI, the preliminary 2002 NEI inventory was replaced with the new 2002 inventory.		146	146	4,954	128	11/4/59	11278

Table D-1 (continued)

State FIPS or Tribal Code	State Name or Tribal Name	Local Agency FIPS Code	Description of Revision	Record Count					Date of Revision	Revision Tracking Number
				TR Table	EP Table	PE Table	EM Table	CE Table		
32	NEVADA	003	Set invalid NAICS code to Null		60				9/14/10	11304
32	NEVADA	003	Nulled actual throughput and throughput unit numerator where either column is null			11			6/4/64	11314
32	NEVADA	003	Filled in emission process description where null		952				8/2/78	11315
32	NEVADA		For records in preliminary 2002 NEI that were merged with state, local, and tribal inventories, updated null data source code on PE where corresponding EM records had more than one data source. PE data source selected from available EM data sources using the following order: Select Local or Tribal data source code when State and/or EPA data source was also available; select State data source code when EPA data source was also available. Also, updated actual throughput to null since activity for EM records varies depending on source of data.			4			9/27/37	11473
32	NEVADA		Removed old solvent PE records			62			8/9/43	11495
32	NEVADA		Inserted replacement PE records for solvent SCCs in EPA's 2002 inventory			62			11/22/43	11496
33	NEW HAMPSHIRE		Removed invalid pollutant code PCBTEQ				40	20	5/28/63	21027
33	NEW HAMPSHIRE		Updated Actual Throughput and Throughput Unit Numerator to remove invalid units (Changed unit from TON2/LB to TON and multiplied actual throughput by 2000)			70			11/28/77	21030
33	NEW HAMPSHIRE		Added PM25-PRI records for vehicle fires				40		3/16/08	21092
33	NEW HAMPSHIRE		Merged preliminary 2002 NEI data with state inventory to fill data gaps		20	20	80	80	7/12/50	3190
33	NEW HAMPSHIRE		Removed daily record				1		9/18/80	10444
33	NEW HAMPSHIRE		Added an Annual VOC record				1		11/16/80	10445
33	NEW HAMPSHIRE		Replaced paved and unpaved road inventory with MANE-VU-sponsored inventory per state's request		20	20	80		7/4/24	10456
33	NEW HAMPSHIRE		For SCCs 2805xxxxxx (animal husbandry) and 28017xxxxx (ag fertilizer), replaced state data with data from latest version of Carnegie Mellon University (CMU) Model (Version 3.6)		140	1,820	1,820		4/16/69	10489
33	NEW HAMPSHIRE		Removed SCC 30199999 (Industrial Processes / Chemical Manufacturing / Other Not Classified / Specify in Comments Field) because this category covered in point inventory		6	6	750		2/4/96	10498
33	NEW HAMPSHIRE		Removed daily emissions for paved and unpaved roads where state annual emissions inventory was replaced with MANE-VU-sponsored annual emissions inventory			20	80		2/4/28	10503

Table D-1 (continued)

State FIPS or Tribal Code	State Name or Tribal Name	Local Agency FIPS Code	Description of Revision	Record Count					Date of Revision	Revision Tracking Number
				TR Table	EP Table	PE Table	EM Table	CE Table		
33	NEW HAMPSHIRE		Added missing PM10-FIL and PM25-FIL records for 2311010000				20		4/21/53	10517
33	NEW HAMPSHIRE		Removed process MACT code 1807-2 for human and animal crematories per EPA request		10				5/1/11	10680
33	NEW HAMPSHIRE		Removed Old Solvent Utilization SCCs originating from pre 1999 NEI per request of EPA				90		1/12/64	10958
33	NEW HAMPSHIRE		Inserted records for EPA 2002 VOC solvent emissions inventory		35	35	91		8/30/13	11253
33	NEW HAMPSHIRE		For open burning SCCs originating from NEI, corrected Primary Device Type in CE table from 099 to 000 and control description to uncontrolled					500	7/17/81	11261
33	NEW HAMPSHIRE		Added EPA's 2002 inventory for industrial and/or commercial/institutional fossil fuel combustion if source category was missing from state or local inventory, or, if state or local agency used inventory from preliminary 2002 NEI, the preliminary 2002 NEI inventory was replaced with the new 2002 inventory.		30	30	1,250		11/4/59	11278
33	NEW HAMPSHIRE		Set invalid NAICS code to Null		29				9/14/10	11304
33	NEW HAMPSHIRE		Filled in emission process description where null		560				8/2/78	11315
33	NEW HAMPSHIRE		For records in preliminary 2002 NEI that were merged with state, local, and tribal inventories, updated null data source code on PE where corresponding EM records had more than one data source. PE data source selected from available EM data sources using the following order: Select Local or Tribal data source code when State and/or EPA data source was also available; select State data source code when EPA data source was also available. Also, updated actual throughput to null since activity for EM records varies depending on source of data.			9			1/15/42	11494
33	NEW HAMPSHIRE		Removed old solvent PE records			37			8/9/43	11495
33	NEW HAMPSHIRE		Inserted replacement PE records for solvent SCCs in EPA's 2002 inventory			37			11/22/43	11496
34	NEW JERSEY		Updated Actual Throughput and Throughput Unit Numerator to remove invalid units (Changed unit from TON2/LB to TON and multiplied actual throughput by 2000)			264			11/28/77	21030
34	NEW JERSEY		Added PM records for fossil fuel combustion developed from PM augmentation procedure				1,945		10/19/94	21084
34	NEW JERSEY		Added PM25-PRI records for vehicle fires				126		3/16/08	21092
34	NEW JERSEY		Updated PM10-PRI and PM25-PRI for 2296000000 and VOC for SCCs 2401001000, 2401005000, 2401008000, 2401100000, 2401200000, 2415000000, and 2465000000		84		567	378	9/15/73	21966

Table D-1 (continued)

State FIPS or Tribal Code	State Name or Tribal Name	Local Agency FIPS Code	Description of Revision	Record Count					Date of Revision	Revision Tracking Number
				TR Table	EP Table	PE Table	EM Table	CE Table		
34	NEW JERSEY		Updated PM10-PRI and PM25-PRI records for 2102004000, 2102007000, 2102011000, 2103004000, 2103005000, 2103007000, 2103011000, 2104004000, 2104007000, 2104011000				840		10/4/55	3158
34	NEW JERSEY		Removed duplicate VOC records for SCC 2401005000					21	6/4/19	10451
34	NEW JERSEY		Replaced paved and unpaved road inventory with MANE-VU-sponsored inventory per state's request		21	21	84		7/4/24	10456
34	NEW JERSEY		Updated Annual PM10-PRI and PM25-PRI records to correct a rounding issue for SCC 2296000000				2		8/15/51	10457
34	NEW JERSEY		Updated Factor Unit Numerator and Throughput Unit Numerator from HEAD-YR to HEAD for SCCs 2805001100, 2805001200, 2805001300, 2805002000, 2805003100, 2805018000, 2805019100, 2805019200, 2805019300, 2805021100, 2805021200, 2805021300, 2805022100, 2805022200, 2805022300, 2805023100, 2805023200, 2805023300, 2805025000, 2805035000, 2805040000, 2805045000				347		11/21/78	10458
34	NEW JERSEY		Updated emissions where dailies > annuals				1,890		7/10/97	10435
34	NEW JERSEY		Added PM10-FIL and PM25-FIL where missing				126		11/30/52	10478
34	NEW JERSEY		For SCCs 2805xxxxxx (animal husbandry) and 28017xxxxx (ag fertilizer), replaced state data with data from latest version of Carnegie Mellon University (CMU) Model (Version 3.6)		294	3,822	3,822		4/16/69	10489
34	NEW JERSEY		Removed SCC 30199999 (Industrial Processes / Chemical Manufacturing / Other Not Classified / Specify in Comments Field) because this category covered in point inventory		19	19	2,375		2/4/96	10498
34	NEW JERSEY		Removed daily emissions for paved and unpaved roads where state annual emissions inventory was replaced with MANE-VU-sponsored annual emissions inventory			42	84		2/4/28	10503
34	NEW JERSEY		Added PM10-FIL and PM25-FIL where missing for SCC 2294000000 and 2296000000				126		9/10/18	10515
34	NEW JERSEY		Added missing PM10-FIL and PM25-FIL records for 2311010000, 2311020000, 2311030000, and 2325000000				504		4/21/53	10517
34	NEW JERSEY		Removed process MACT code 1807-2 for human and animal crematories per EPA request		42				5/1/11	10680
34	NEW JERSEY		Removed Old Solvent Utilization SCCs originating from pre 1999 NEI per request of EPA				432		1/12/64	10958
34	NEW JERSEY		Inserted records for EPA 2002 VOC solvent emissions inventory		47	47	47		8/30/13	11253
34	NEW JERSEY		For open burning SCCs originating from NEI, corrected Primary Device Type in CE table from 099 to 000 and control description to uncontrolled					176	7/17/81	11261
34	NEW JERSEY		Set invalid NAICS code to Null		21				9/14/10	11304

Table D-1 (continued)

State FIPS or Tribal Code	State Name or Tribal Name	Local Agency FIPS Code	Description of Revision	Record Count					Date of Revision	Revision Tracking Number
				TR Table	EP Table	PE Table	EM Table	CE Table		
34	NEW JERSEY		Nulled actual throughput and throughput unit numerator where either column is null			24			6/4/64	11314
34	NEW JERSEY		Filled in emission process description where null		3,066				8/2/78	11315
35	NEW MEXICO	001	Changed Process MACT Code from 1640 to 1641 as noted in the spreadsheet file distributed by Roy Huntley, EPA to S/L/T agencies on August 11, 2004		1				1/13/55	20265
35	NEW MEXICO	001	Updated SCCs as noted in the spreadsheet file distributed by Roy Huntley, EPA to S/L/T agencies on August 11, 2004		4	4	25		3/5/64	20268
35	NEW MEXICO	001	Updated Actual Throughput and Throughput Unit Numerator to remove invalid units (Changed unit from TON2/LB to TON and multiplied actual throughput by 2000)			16			9/22/07	20886
35	NEW MEXICO	001	Removed invalid pollutant codes 119, 852, 853, and 10883				4		12/8/65	21029
35	NEW MEXICO	001	Added PM25-PRI records for vehicle fires				4		3/16/08	21092
35	NEW MEXICO	001	Updated PM records for Natural Gas and LPG			1	1		8/8/96	21107
35	NEW MEXICO	001	Added PM records for natural gas and LPG combustion developed from PM augmentation procedure				4		8/10/13	21257
35	NEW MEXICO	001	Added PM10-PRI and PM25-PRI Records to 2810015000				2		8/6/23	3171
35	NEW MEXICO	001	Added missing PM25-Fil and PM25-PRI records for SCC 2830000000				2		8/12/00	10433
35	NEW MEXICO	001	Updated Factor Unit Numerator and Throughput Unit Numerator from HEAD-YR to HEAD for SCCs 2805001100, 2805001200, 2805001300, 2805002000, 2805003100, 2805018000, 2805019100, 2805019200, 2805019300, 2805021100, 2805021200, 2805021300, 2805022100, 2805022200, 2805022300, 2805023100, 2805023200, 2805023300, 2805025000, 2805035000, 2805040000, 2805045000				441		11/21/78	10458
35	NEW MEXICO		For SCCs 2805xxxxxx (animal husbandry) and 28017xxxxx (ag fertilizer), replaced state data with data from latest version of Carnegie Mellon University (CMU) Model (Version 3.6)		462	6,006	6,006		4/16/69	10489
35	NEW MEXICO		Removed SCC 30199999 (Industrial Processes / Chemical Manufacturing / Other Not Classified / Specify in Comments Field) because this category covered in point inventory		12	12	1,501		2/4/96	10498
35	NEW MEXICO	001	Added missing PM10-FIL and PM25-FIL records for 2311010000				2		4/21/53	10517
35	NEW MEXICO	001	Removed EP record where no EM record exists		1				6/30/35	10544
35	NEW MEXICO		Removed process MACT code 1807-2 for human and animal crematories per EPA request		40				5/1/11	10680
35	NEW MEXICO		Removed Old Solvent Utilization SCCs originating from pre 1999 NEI per request of EPA				450		1/12/64	10958
35	NEW MEXICO		Inserted records for EPA 2002 VOC solvent emissions inventory		370	370	651		8/30/13	11253
35	NEW MEXICO	001	Removed invalid pollutant code PM				18		5/30/59	11259

Table D-1 (continued)

State FIPS or Tribal Code	State Name or Tribal Name	Local Agency FIPS Code	Description of Revision	Record Count					Date of Revision	Revision Tracking Number
				TR Table	EP Table	PE Table	EM Table	CE Table		
35	NEW MEXICO	001	Changed pollutant PM10 to PM10-FIL				20		11/18/59	11260
35	NEW MEXICO		For open burning SCCs originating from NEI, corrected Primary Device Type in CE table from 099 to 000 and control description to uncontrolled					728	7/17/81	11261
35	NEW MEXICO		Added EPA's 2002 inventory for industrial and/or commercial/institutional fossil fuel combustion if source category was missing from state or local inventory, or, if state or local agency used inventory from preliminary 2002 NEI, the preliminary 2002 NEI inventory was replaced with the new 2002 inventory.		289	289	10,769	256	11/4/59	11278
35	NEW MEXICO	001	Set invalid NAICS code to Null		95				9/14/10	11304
35	NEW MEXICO	001	Nulled actual throughput and throughput unit numerator where either column is null			16			6/4/64	11314
35	NEW MEXICO	001	Filled in emission process description where null		1,848				8/2/78	11315
35	NEW MEXICO		For records in preliminary 2002 NEI that were merged with state, local, and tribal inventories, updated null data source code on PE where corresponding EM records had more than one data source. PE data source selected from available EM data sources using the following order: Select Local or Tribal data source code when State and/or EPA data source was also available; select State data source code when EPA data source was also available. Also, updated actual throughput to null since activity for EM records varies depending on source of data.			4			9/27/37	11473
35	NEW MEXICO		Removed old solvent PE records			127			8/9/43	11495
35	NEW MEXICO		Inserted replacement PE records for solvent SCCs in EPA's 2002 inventory			127			11/22/43	11496
36	NEW YORK		Updated Actual Throughput and Throughput Unit Numerator to remove invalid units (Changed unit from TON2/LB to TON and multiplied actual throughput by 2000)			369			11/28/77	21030
36	NEW YORK		Added PM25-PRI emissions for NY Structure Fires				124		7/16/44	21052
36	NEW YORK		Replaced state's wildfire inventory with new inventory provided by state to incorporate use of emission factors used in NEI method for wildfires (this corrected PM emission issues in state's original inventory)				1,527		6/21/41	21988
36	NEW YORK		Merged preliminary 2002 NEI data with state inventory to fill data gaps		124	124	496	496	7/27/50	3191
36	NEW YORK		Added missing PM25-Fil and PM25-PRI records for SCC 2830000000				2		8/12/00	10433
36	NEW YORK		Added PM25 records for LPG				62		8/20/60	10437
36	NEW YORK		Added missing PM25-PRI records for chrome plating				62		2/17/40	10442
36	NEW YORK		Replaced paved and unpaved road inventory with MANE-VU-sponsored inventory per state's request		119	119	476	4	7/4/24	10456
36	NEW YORK		For SCCs 2805xxxxxx (animal husbandry) and 28017xxxxx (ag fertilizer), replaced state data with data from latest version of Carnegie Mellon University (CMU) Model (Version 3.6)		868	11,284	11,284		4/16/69	10489

Table D-1 (continued)

State FIPS or Tribal Code	State Name or Tribal Name	Local Agency FIPS Code	Description of Revision	Record Count					Date of Revision	Revision Tracking Number
				TR Table	EP Table	PE Table	EM Table	CE Table		
36	NEW YORK		Removed EP and PE records where no open burning occurred		54	54			8/1/43	10493
36	NEW YORK		Removed SCC 30199999 (Industrial Processes / Chemical Manufacturing / Other Not Classified / Specify in Comments Field) because this category covered in point inventory		43	43	5,375		2/4/96	10498
36	NEW YORK		Removed daily emissions for paved and unpaved roads where state annual emissions inventory was replaced with MANE-VU-sponsored annual emissions inventory			119	476		2/4/28	10503
36	NEW YORK		Removed process MACT code 1807-2 for human and animal crematories per EPA request		32				5/1/11	10680
36	NEW YORK		Removed Old Solvent Utilization SCCs originating from pre 1999 NEI per request of EPA				961		1/12/64	10958
36	NEW YORK		Inserted records for EPA 2002 VOC solvent emissions inventory		453	453	566		8/30/13	11253
36	NEW YORK		Removed invalid pollutant code CH4				248	248	10/16/49	11257
36	NEW YORK		For open burning SCCs originating from NEI, corrected Primary Device Type in CE table from 099 to 000 and control description to uncontrolled					1,728	7/17/81	11261
36	NEW YORK		Added EPA's 2002 inventory for industrial and/or commercial/institutional fossil fuel combustion if source category was missing from state or local inventory, or, if state or local agency used inventory from preliminary 2002 NEI, the preliminary 2002 NEI inventory was replaced with the new 2002 inventory.		124	124	6,572		11/4/59	11278
36	NEW YORK		Set invalid NAICS code to Null		184				9/14/10	11304
36	NEW YORK		Nulled actual throughput and throughput unit numerator where either column is null			32			6/4/64	11314
36	NEW YORK		Filled in emission process description where null		3,472				8/2/78	11315
36	NEW YORK		For records in preliminary 2002 NEI that were merged with state, local, and tribal inventories, updated null data source code on PE where corresponding EM records had more than one data source. PE data source selected from available EM data sources using the following order: Select Local or Tribal data source code when State and/or EPA data source was also available; select State data source code when EPA data source was also available. Also, updated actual throughput to null since activity for EM records varies depending on source of data.			109			1/15/42	11494
36	NEW YORK		Removed old solvent PE records			113			8/9/43	11495
36	NEW YORK		Inserted replacement PE records for solvent SCCs in EPA's 2002 inventory			113			11/22/43	11496

Table D-1 (continued)

State FIPS or Tribal Code	State Name or Tribal Name	Local Agency FIPS Code	Description of Revision	Record Count					Date of Revision	Revision Tracking Number
				TR Table	EP Table	PE Table	EM Table	CE Table		
37	NORTH CAROLINA		Updated Factor Unit Numerator and Throughput Unit Numerator from HEAD-YR to HEAD for SCCs 2805001100, 2805001200, 2805001300, 2805003100, 2805018000, 2805019100, 2805019200, 2805019300, 2805021100, 2805021200, 2805021300, 2805022100, 2805022200, 2805022300, 2805023100, 2805023200, 2805023300, 2805025000, 2805035000, 2805039100, 2805039200, 2805039300, 2805040000, 2805045000, 2805047100, 2805047300, 2805053100				2,329		11/21/78	10458
37	NORTH CAROLINA		Replaced paved and unpaved road inventory with NEI inventory to account for updates to paved and unpaved road emission factors		200	400	1,600		10/21/68	10461
37	NORTH CAROLINA		For SCCs 2805xxxxxx (animal husbandry) and 28017xxxxx (ag fertilizer), replaced state data with data from latest version of Carnegie Mellon University (CMU) Model (Version 3.6)		1,400	18,200	18,200		4/16/69	10489
37	NORTH CAROLINA		Removed SCC 30199999 (Industrial Processes / Chemical Manufacturing / Other Not Classified / Specify in Comments Field) because this category covered in point inventory		57	57	7,125		2/4/96	10498
37	NORTH CAROLINA		Removed process MACT code 1807-2 for human and animal crematories per EPA request		132				5/1/11	10680
37	NORTH CAROLINA		Removed Old Solvent Utilization SCCs originating from pre 1999 NEI per request of EPA				2,187		1/12/64	10958
37	NORTH CAROLINA		Inserted records for EPA 2002 VOC solvent emissions inventory		1,091	1,091	2,457		8/30/13	11253
37	NORTH CAROLINA		For open burning SCCs originating from NEI, corrected Primary Device Type in CE table from 099 to 000 and control description to uncontrolled					5,208	7/17/81	11261
37	NORTH CAROLINA		Added EPA's 2002 inventory for industrial and/or commercial/institutional fossil fuel combustion if source category was missing from state or local inventory, or, if state or local agency used inventory from preliminary 2002 NEI, the preliminary 2002 NEI inventory was replaced with the new 2002 inventory.		900	900	33,900	400	11/4/59	11278
37	NORTH CAROLINA		Set invalid NAICS code to Null		489				9/14/10	11304
37	NORTH CAROLINA		Filled in emission process description where null		5,600				8/2/78	11315
37	NORTH CAROLINA		Removed old solvent PE records			743			8/9/43	11495
37	NORTH CAROLINA		Inserted replacement PE records for solvent SCCs in EPA's 2002 inventory			743			11/22/43	11496

Table D-1 (continued)

State FIPS or Tribal Code	State Name or Tribal Name	Local Agency FIPS Code	Description of Revision	Record Count					Date of Revision	Revision Tracking Number
				TR Table	EP Table	PE Table	EM Table	CE Table		
38	NORTH DAKOTA		Updated Factor Unit Numerator and Throughput Unit Numerator from HEAD-YR to HEAD for SCCs 2805001100, 2805001200, 2805001300, 2805003100, 2805018000, 2805021100, 2805021200, 2805021300, 2805022100, 2805022200, 2805022300, 2805023100, 2805023200, 2805023300, 2805025000, 2805030000, 2805035000, 2805039100, 2805039200, 2805039300, 2805040000, 2805045000, 2805047100, 2805047300, 2805053100				770		11/21/78	10458
38	NORTH DAKOTA		For SCCs 2805xxxxxx (animal husbandry) and 28017xxxxx (ag fertilizer), replaced state data with data from latest version of Carnegie Mellon University (CMU) Model (Version 3.6)		742	9,646	9,646		4/16/69	10489
38	NORTH DAKOTA		Removed SCC 30199999 (Industrial Processes / Chemical Manufacturing / Other Not Classified / Specify in Comments Field) because this category covered in point inventory		8	8	1,000		2/4/96	10498
38	NORTH DAKOTA		Removed process MACT code 1807-2 for human and animal crematories per EPA request		69				5/1/11	10680
38	NORTH DAKOTA		Removed Old Solvent Utilization SCCs originating from pre 1999 NEI per request of EPA				718		1/12/64	10958
38	NORTH DAKOTA		Inserted records for EPA 2002 VOC solvent emissions inventory		441	441	856		8/30/13	11253
38	NORTH DAKOTA		For open burning SCCs originating from NEI, corrected Primary Device Type in CE table from 099 to 000 and control description to uncontrolled					896	7/17/81	11261
38	NORTH DAKOTA		Added EPA's 2002 inventory for industrial and/or commercial/institutional fossil fuel combustion if source category was missing from state or local inventory, or, if state or local agency used inventory from preliminary 2002 NEI, the preliminary 2002 NEI inventory was replaced with the new 2002 inventory.		510	510	19,790	404	11/4/59	11278
38	NORTH DAKOTA		Set invalid NAICS code to Null		180				9/14/10	11304
38	NORTH DAKOTA		Nulled actual throughput and throughput unit numerator where either column is null			11			6/4/64	11314
38	NORTH DAKOTA		Filled in emission process description where null		2,968				8/2/78	11315
38	NORTH DAKOTA		For records in preliminary 2002 NEI that were merged with state, local, and tribal inventories, updated null data source code on PE where corresponding EM records had more than one data source. PE data source selected from available EM data sources using the following order: Select Local or Tribal data source code when State and/or EPA data source was also available; select State data source code when EPA data source was also available. Also, updated actual throughput to null since activity for EM records varies depending on source of data.			4			9/27/37	11473

Table D-1 (continued)

State FIPS or Tribal Code	State Name or Tribal Name	Local Agency FIPS Code	Description of Revision	Record Count					Date of Revision	Revision Tracking Number
				TR Table	EP Table	PE Table	EM Table	CE Table		
38	NORTH DAKOTA		Removed old solvent PE records			151			8/9/43	11495
38	NORTH DAKOTA		Inserted replacement PE records for solvent SCCs in EPA's 2002 inventory			151			11/22/43	11496
39	OHIO		Removed state submitted records covered by RAPCA Submission				20		4/1/74	21050
39	OHIO		Added PM25-PRI records for structure fires				88		7/8/59	21082
39	OHIO		Changed PM10-PRI to PM10-FIL to reflect basis of emission factor for SCCs 2102004000 and 2104004000				176		6/19/32	21096
39	OHIO		Changed PM Pollutant Codes in state inventory from Primary to Filterable				176		5/12/63	21100
39	OHIO		Added PM records for coal and residual oil combustion developed from PM augmentation procedure				704		7/23/64	21101
39	OHIO		Added PM records for kerosene and distillate oil combustion developed from PM augmentation procedure				704		12/10/91	21102
39	OHIO		Added PM records for natural gas and LPG combustion developed from PM augmentation procedure				352		8/10/13	21257
39	OHIO		For SCCs 2805xxxxxx (animal husbandry) and 28017xxxxx (ag fertilizer), replaced state data with data from latest version of Carnegie Mellon University (CMU) Model (Version 3.6)		1,232	16,016	16,016		4/16/69	10489
39	OHIO		Removed SCC 30199999 (Industrial Processes / Chemical Manufacturing / Other Not Classified / Specify in Comments Field) because this category covered in point inventory		68	68	8,500		2/4/96	10498
39	OHIO		Added missing PM25-PRI for SCCs 2104008000 and 2601020000				176		9/23/17	10522
39	OHIO		Removed process MACT code 1807-2 for human and animal crematories per EPA request		134				5/1/11	10680
39	OHIO		Removed Old Solvent Utilization SCCs originating from pre 1999 NEI per request of EPA				602		1/12/64	10958
39	OHIO		Inserted records for EPA 2002 VOC solvent emissions inventory		510	510	572		8/30/13	11253
39	OHIO		For open burning SCCs originating from NEI, corrected Primary Device Type in CE table from 099 to 000 and control description to uncontrolled					4,256	7/17/81	11261
39	OHIO		Added EPA's 2002 inventory for industrial and/or commercial/institutional fossil fuel combustion if source category was missing from state or local inventory, or, if state or local agency used inventory from preliminary 2002 NEI, the preliminary 2002 NEI inventory was replaced with the new 2002 inventory.		704	704	22,528	1,408	11/4/59	11278
39	OHIO		Removed Duplicate TR records	94					10/11/05	11297
39	OHIO		Set invalid NAICS code to Null		253				9/14/10	11304
39	OHIO		Nulled actual throughput and throughput unit numerator where either column is null			90			6/4/64	11314

Table D-1 (continued)

State FIPS or Tribal Code	State Name or Tribal Name	Local Agency FIPS Code	Description of Revision	Record Count					Date of Revision	Revision Tracking Number
				TR Table	EP Table	PE Table	EM Table	CE Table		
39	OHIO		Filled in emission process description where null		5,280				8/2/78	11315
39	OHIO		For records in preliminary 2002 NEI that were merged with state, local, and tribal inventories, updated null data source code on PE where corresponding EM records had more than one data source. PE data source selected from available EM data sources using the following order: Select Local or Tribal data source code when State and/or EPA data source was also available; select State data source code when EPA data source was also available. Also, updated actual throughput to null since activity for EM records varies depending on source of data.			23			9/27/37	11473
39	OHIO		Removed old solvent PE records			62			8/9/43	11495
39	OHIO		Inserted replacement PE records for solvent SCCs in EPA's 2002 inventory			62			11/22/43	11496
40	OKLAHOMA		Corrected invalid commercial cooking-frying SCCs to valid SCCs: 2302002300 changed to 2302003100, 2302002400 changed to 2302003200, 2302002500 changed to 2302003000		224	224	1,508		6/24/69	20271
40	OKLAHOMA		Changed actual_throughput and throughput_unit_numerator from TON2/LB to TON			1,211			8/21/37	21002
40	OKLAHOMA		Set Factor Numeric Value to null where Factor Unit Numerator and/or Factor Unit Denominator was null				1,303		10/28/72	21010
40	OKLAHOMA		OK submitted a copy of the preliminary 2002 NEI that contained zero emissions as a result of rounding. OK's nonpoint inventory was updated using non-rounded emission numeric values in the preliminary 2002 NEI.		74	128	301		12/22/70	21011
40	OKLAHOMA		Updated Data Source Code to E-02-X where 2610000500 and data source is null				2,280		2/13/62	21108
40	OKLAHOMA		Added CENRAP-sponsored inventory for planned burning SCCs (except AR; TX; and Lancaster County, NE) per request of state		266	266	1,852		10/30/92	21134
40	OKLAHOMA		Added CENRAP-sponsored inventory for Ag Tilling (except AR) per request of state		77	77	308		1/26/06	21136
40	OKLAHOMA		Removed duplicate records for SCC 2630020000		77	1,001	77		9/13/20	21138
40	OKLAHOMA		Removed duplicate records for SCC 2310000000		74	74	73		1/1/21	21139
40	OKLAHOMA		Updated incorrect PM10-PRI and PM25-PRI values for SCCs 2102004000, 2102005000, 2102006000, and 2103006000				18		4/25/49	3156
40	OKLAHOMA		Updated Organization Name from EPA to state	77					8/9/37	4941
40	OKLAHOMA		For SCCs 2805xxxxxx (animal husbandry) and 28017xxxxx (ag fertilizer), replaced state data with data from latest version of Carnegie Mellon University (CMU) Model (Version 3.6)		1,078	14,014	14,014		4/16/69	10489

Table D-1 (continued)

State FIPS or Tribal Code	State Name or Tribal Name	Local Agency FIPS Code	Description of Revision	Record Count					Date of Revision	Revision Tracking Number
				TR Table	EP Table	PE Table	EM Table	CE Table		
40	OKLAHOMA		Removed SCC 30199999 (Industrial Processes / Chemical Manufacturing / Other Not Classified / Specify in Comments Field) because this category covered in point inventory		27	27	3,375		2/4/96	10498
40	OKLAHOMA		Removed biogenic SCCs (2701405000, 2701411000, 2701412000, 2701413000, 2701414000, 2701415000, 2701416000, 2701417000, 2701421000, 2701422000, 2701423000, 2701424000, 2701431000, 2701432000, 2701433000, 2701441000, 2701442000, 2701443000, 2701451000, 2701452000, 2701453000, 2701454000, 2701461000, 2701462000, 2701471000, 2701472000, 2701473000, 2701474000, 2701475000, 2701476000, 2701477000, 2701481000, 2701482000, 2701483000, 2701484000, 2701485000, 2701491000, 2701492000)		2,926	38,038	38,038		7/26/05	10547
40	OKLAHOMA		Removed PE records for 2310000000 where no EM records exist			2			7/10/06	10548
40	OKLAHOMA		Removed process MACT code 1807-2 for human and animal crematories per EPA request		117				5/1/11	10680
40	OKLAHOMA		Removed Old Solvent Utilization SCCs originating from pre 1999 NEI per request of EPA				1,036		1/12/64	10958
40	OKLAHOMA		Inserted records for EPA 2002 VOC solvent emissions inventory		872	872	1,559		8/30/13	11253
40	OKLAHOMA		For open burning SCCs originating from NEI, corrected Primary Device Type in CE table from 099 to 000 and control description to uncontrolled					2,744	7/17/81	11261
40	OKLAHOMA		Added EPA's 2002 inventory for industrial and/or commercial/institutional fossil fuel combustion if source category was missing from state or local inventory, or, if state or local agency used inventory from preliminary 2002 NEI, the preliminary 2002 NEI inventory was replaced with the new 2002 inventory.		537	537	17,869	308	11/4/59	11278
40	OKLAHOMA		Set invalid NAICS code to Null		413				9/14/10	11304
40	OKLAHOMA		Nulled actual throughput and throughput unit numerator where either column is null			9			6/4/64	11314
40	OKLAHOMA		Filled in emission process description where null		4,929				8/2/78	11315
40	OKLAHOMA		For records in preliminary 2002 NEI that were merged with state, local, and tribal inventories, updated null data source code on PE where corresponding EM records had more than one data source. PE data source selected from available EM data sources using the following order: Select Local or Tribal data source code when State and/or EPA data source was also available; select State data source code when EPA data source was also available. Also, updated actual throughput to null since activity for EM records varies depending on source of data.			271			9/27/37	11473
41	OREGON		Changed Telephone Number Type Name from null to OFFICE	36					10/3/53	20264
41	OREGON		Changed SCC 2302080001 to 2302080000		36	36	72	72	5/4/19	20887

Table D-1 (continued)

State FIPS or Tribal Code	State Name or Tribal Name	Local Agency FIPS Code	Description of Revision	Record Count					Date of Revision	Revision Tracking Number
				TR Table	EP Table	PE Table	EM Table	CE Table		
41	OREGON		Changed PMFIL to PM-FIL to reflect basis of emission factor for SCCs 2103004000 and 2104004000				108		6/19/32	21096
41	OREGON		Changed PM Pollutant Codes in state inventory from Primary to Filterable				72		5/12/63	21100
41	OREGON		Added PM records for coal and residual oil combustion developed from PM augmentation procedure				288		7/23/64	21101
41	OREGON		Added PM records for kerosene and distillate oil combustion developed from PM augmentation procedure				540		12/10/91	21102
41	OREGON		Updated PM records for Natural Gas and LPG			211	278		8/8/96	21107
41	OREGON		Removed Pollutant 246 for SCC 2801500320 with the lower emission value				1		1/2/33	21140
41	OREGON		Added PM records for natural gas and LPG combustion developed from PM augmentation procedure				777		8/10/13	21257
41	OREGON		Updated invalid pollutant codes as noted in the spreadsheet file distributed by Roy Huntley, EPA to S/L/T agencies on August 11, 2004				1,191	1,300	12/29/04	22026
41	OREGON		Removed pollutants TOC, TOG, NMOC where there is a VOC record				491	491	8/4/05	22027
41	OREGON		Removed lower emission of duplicate records for SCCs 2102004000, 2102005000, 2102006000, 2102007000, 2103004000, 2103005000, 2103006000, 2103007000, 2104004000, 2104006000, and 2104007000				319		12/29/47	22028
41	OREGON		Added PM10-FIL records for 2102006000 and 2104006000				67		5/24/91	3143
41	OREGON		Added NOX to OR for SCCs 2102006000 and 2102007000				72	72	5/30/09	3144
41	OREGON		Updated MM CU FT B to E6FT3				3,836		2/12/27	3147
41	OREGON		Updated Factor Unit Numerator and Throughput Unit Numerator from HEAD-YR to HEAD for SCCs 2805001100, 2805001200, 2805001300, 2805002000, 2805003100, 2805007100, 2805007300, 2805008100, 2805008200, 2805008300, 2805009100, 2805009200, 2805009300, 2805010100, 2805010200, 2805010300, 2805018000, 2805019100, 2805019200, 2805019300, 2805021100, 2805021200, 2805021300, 2805022100, 2805022200, 2805022300, 2805023100, 2805023200, 2805023300, 2805025000, 2805030000, 2805035000, 2805039100, 2805039200, 2805039300, 2805040000, 2805045000, 2805047100, 2805047300, 2805053100				877		11/21/78	10458
41	OREGON		Changed Throughput Unit Numerator and Factor Unit Denominator from 1000 GALLO to E3GAL			463	11,661		2/29/16	10467
41	OREGON		Added PM25-FIL records for OR SCC 2102006000				36		4/7/69	10484
41	OREGON		For SCCs 2805xxxxxx (animal husbandry) and 28017xxxxx (ag fertilizer), replaced state data with data from latest version of Carnegie Mellon University (CMU) Model (Version 3.6)		504	6,552	6,552		4/16/69	10489

Table D-1 (continued)

State FIPS or Tribal Code	State Name or Tribal Name	Local Agency FIPS Code	Description of Revision	Record Count					Date of Revision	Revision Tracking Number
				TR Table	EP Table	PE Table	EM Table	CE Table		
41	OREGON		Removed SCC 30199999 (Industrial Processes / Chemical Manufacturing / Other Not Classified / Specify in Comments Field) because this category covered in point inventory		19	19	2,375		2/4/96	10498
41	OREGON		Added missing PM25-PRI for SCCs , 2104008001, 2104008030, 2104008050, 2104008051, and 2620030000				102		2/5/39	10523
41	OREGON		Added missing PM25-PRI for SCCs 2302002000 and 2302080000				72		5/17/51	10524
41	OREGON		Generated EP and PE records to correct RI errors		5				8/3/00	10534
41	OREGON		Inactivated CE records which have no corresponding EM record (SCCs 2104006000, 2620030000, and 2801520010)					155	4/14/29	10539
41	OREGON		Removed childless EP and PE records for 2620030000		4	4			4/9/36	10545
41	OREGON		Changed factor unit denominator to valid NIF 3.0 units per spreadsheet sent to states				13,493		4/21/42	10562
41	OREGON		Updated throughput unit numerator to valid NIF 3.0 codes as noted in the spreadsheet file distributed by Roy Huntley, EPA to S/L/T agencies on August 11, 2004			750			7/20/71	10613
41	OREGON		Nulled factor numeric value, factor unit numerator, factor unit denominator, actual throughput and throughput unit numerator where units are not valid as noted in the spreadsheet file distributed by Roy Huntley, EPA to S/L/T agencies on August 11, 2004			1,769	19,861		10/11/71	10612
41	OREGON		Removed process MACT code 1807-2 for human and animal crematories per EPA request		56				5/1/11	10680
41	OREGON		Removed Old Solvent Utilization SCCs originating from pre 1999 NEI per request of EPA				216		1/12/64	10958
41	OREGON		Inserted records for EPA 2002 VOC solvent emissions inventory		83	83	172		8/30/13	11253
41	OREGON		For open burning SCCs originating from NEI, corrected Primary Device Type in CE table from 099 to 000 and control description to uncontrolled					952	7/17/81	11261
41	OREGON		Added EPA's 2002 inventory for industrial and/or commercial/institutional fossil fuel combustion if source category was missing from state or local inventory, or, if state or local agency used inventory from preliminary 2002 NEI, the preliminary 2002 NEI inventory was replaced with the new 2002 inventory.		71	71	3,763		11/4/59	11278
41	OREGON		Changed EI MANAGER affiliation type to REPORT CERTIFIER	36					10/4/79	11287
41	OREGON		Set invalid NAICS code to Null		65				9/14/10	11304
41	OREGON		Nulled actual throughput and throughput unit numerator where either column is null			37			6/4/64	11314
41	OREGON		Filled in emission process description where null		5,242				8/2/78	11315
41	OREGON		Removed CE records with no primary device type or other efficiency information					48,816	4/4/33	11437

Table D-1 (continued)

State FIPS or Tribal Code	State Name or Tribal Name	Local Agency FIPS Code	Description of Revision	Record Count					Date of Revision	Revision Tracking Number
				TR Table	EP Table	PE Table	EM Table	CE Table		
41	OREGON		For records in preliminary 2002 NEI that were merged with state, local, and tribal inventories, updated null data source code on PE where corresponding EM records had more than one data source. PE data source selected from available EM data sources using the following order: Select Local or Tribal data source code when State and/or EPA data source was also available; select State data source code when EPA data source was also available. Also, updated actual throughput to null since activity for EM records varies depending on source of data.			1			1/15/42	11494
41	OREGON		Removed old solvent PE records			53			8/9/43	11495
41	OREGON		Inserted replacement PE records for solvent SCCs in EPA's 2002 inventory			53			11/22/43	11496
42	PENNSYLVANIA		Updated Actual Throughput and Throughput Unit Numerator to remove invalid units (Changed unit from TON2/LB to TON and multiplied actual throughput by 2000)			1,016			11/28/77	21030
42	PENNSYLVANIA		Updated PA emissions to reflect new EF for PM10-PRI and PM25-PRI for SCC 2103005000				402		3/20/39	21059
42	PENNSYLVANIA		Merged preliminary 2002 NEI data with state inventory to fill data gaps		198	198	2,534	2,534	7/30/50	3192
42	PENNSYLVANIA		Added missing PM25-FIL and PM25-PRI records for SCC 2830000000				2		8/12/00	10433
42	PENNSYLVANIA		Added missing PM25-PRI and PM25-FIL records for tank and drum cleaning				4		1/6/02	10434
42	PENNSYLVANIA		Inserted updated NEI data for residential wood combustion		469	469	19,497		9/3/48	10454
42	PENNSYLVANIA		Replaced paved and unpaved road inventory with MANE-VU-sponsored inventory per state's request		133	133	532	8	7/4/24	10456
42	PENNSYLVANIA		Removed SCCs for portable fuel containers per EPA request		67	134	134		9/23/70	10474
42	PENNSYLVANIA		For SCCs 2805xxxxxx (animal husbandry) and 28017xxxxx (ag fertilizer), replaced state data with data from latest version of Carnegie Mellon University (CMU) Model (Version 3.6)		938	12,194	12,194		4/16/69	10489
42	PENNSYLVANIA		Removed SCC 30199999 (Industrial Processes / Chemical Manufacturing / Other Not Classified / Specify in Comments Field) because this category covered in point inventory		37	37	4,625		2/4/96	10498
42	PENNSYLVANIA		Removed daily emissions for paved and unpaved roads where state annual emissions inventory was replaced with MANE-VU-sponsored annual emissions inventory			133	532		2/4/28	10503
42	PENNSYLVANIA		Removed process MACT code 1807-2 for human and animal crematories per EPA request		112				5/1/11	10680
42	PENNSYLVANIA		Removed Old Solvent Utilization SCCs originating from pre 1999 NEI per request of EPA				1,385		1/12/64	10958
42	PENNSYLVANIA		Inserted records for EPA 2002 VOC solvent emissions inventory		241	241	354		8/30/13	11253

Table D-1 (continued)

State FIPS or Tribal Code	State Name or Tribal Name	Local Agency FIPS Code	Description of Revision	Record Count					Date of Revision	Revision Tracking Number
				TR Table	EP Table	PE Table	EM Table	CE Table		
42	PENNSYLVANIA		Added EPA's 2002 inventory for industrial and/or commercial/institutional fossil fuel combustion if source category was missing from state or local inventory, or, if state or local agency used inventory from preliminary 2002 NEI, the preliminary 2002 NEI inventory was replaced with the new 2002 inventory.		335	335	10,973	536	11/4/59	11278
42	PENNSYLVANIA		Set invalid NAICS code to Null		129				9/14/10	11304
42	PENNSYLVANIA		Filled in emission process description where null		3,752				8/2/78	11315
42	PENNSYLVANIA		Removed old solvent PE records			113			8/9/43	11495
42	PENNSYLVANIA		Inserted replacement PE records for solvent SCCs in EPA's 2002 inventory			113			11/22/43	11496
44	RHODE ISLAND		Updated Actual Throughput and Throughput Unit Numerator to remove invalid units (Changed unit from TON2/LB to TON and multiplied actual throughput by 2000)			70			11/28/77	21030
44	RHODE ISLAND		Merged preliminary 2002 NEI data with state inventory to fill data gaps		15	15	125	40	8/1/50	3193
44	RHODE ISLAND		Inserted updated NEI data for res wood combustion		35	35	1,455		9/3/48	10454
44	RHODE ISLAND		Replaced paved and unpaved road inventory with MANE-VU-sponsored inventory per state's request		10	10	40		7/4/24	10456
44	RHODE ISLAND		Updated Factor Unit Numerator and Throughput Unit Numerator from HEAD-YR to HEAD for SCCs 2805001100, 2805001200, 2805001300, 2805002000, 2805003100, 2805018000, 2805019100, 2805019200, 2805019300, 2805021100, 2805021200, 2805021300, 2805022100, 2805022200, 2805022300, 2805023100, 2805023200, 2805023300, 2805025000, 2805035000, 2805040000, 2805045000				45		11/21/78	10458
44	RHODE ISLAND		For SCCs 2805xxxxxx (animal husbandry) and 28017xxxxx (ag fertilizer), replaced state data with data from latest version of Carnegie Mellon University (CMU) Model (Version 3.6)		70	910	910		4/16/69	10489
44	RHODE ISLAND		Removed SCC 30199999 (Industrial Processes / Chemical Manufacturing / Other Not Classified / Specify in Comments Field) because this category covered in point inventory		5	5	625		2/4/96	10498
44	RHODE ISLAND		Removed daily emissions for paved and unpaved roads where state annual emissions inventory was replaced with MANE-VU-sponsored annual emissions inventory			10	40		2/4/28	10503
44	RHODE ISLAND		Removed process MACT code 1807-2 for human and animal crematories per EPA request		6				5/1/11	10680
44	RHODE ISLAND		Removed Old Solvent Utilization SCCs originating from pre 1999 NEI per request of EPA				90		1/12/64	10958
44	RHODE ISLAND		Inserted records for EPA 2002 VOC solvent emissions inventory		110	110	142		8/30/13	11253
44	RHODE ISLAND		For open burning SCCs originating from NEI, corrected Primary Device Type in CE table from 099 to 000 and control description to uncontrolled					108	7/17/81	11261

Table D-1 (continued)

State FIPS or Tribal Code	State Name or Tribal Name	Local Agency FIPS Code	Description of Revision	Record Count					Date of Revision	Revision Tracking Number
				TR Table	EP Table	PE Table	EM Table	CE Table		
44	RHODE ISLAND		Added EPA's 2002 inventory for industrial and/or commercial/institutional fossil fuel combustion if source category was missing from state or local inventory, or, if state or local agency used inventory from preliminary 2002 NEI, the preliminary 2002 NEI inventory was replaced with the new 2002 inventory.		45	45	1,720	20	11/4/59	11278
44	RHODE ISLAND		Removed Duplicate TR records	5					11/24/05	11298
44	RHODE ISLAND		Set invalid NAICS code to Null		30				9/14/10	11304
44	RHODE ISLAND		Filled in emission process description where null		280				8/2/78	11315
44	RHODE ISLAND		For records in preliminary 2002 NEI that were merged with state, local, and tribal inventories, updated null data source code on PE where corresponding EM records had more than one data source. PE data source selected from available EM data sources using the following order: Select Local or Tribal data source code when State and/or EPA data source was also available; select State data source code when EPA data source was also available. Also, updated actual throughput to null since activity for EM records varies depending on source of data.			30			1/15/42	11494
45	SOUTH CAROLINA		Updated Actual Throughput and Throughput Unit Numerator to remove invalid units (Changed unit from TON2/LB to TON and multiplied actual throughput by 2000)			134			9/22/07	20886
45	SOUTH CAROLINA		Set Factor Numeric Value to null where Factor Unit Numerator and/or Factor Unit Denominator was null				230		3/14/70	21007
45	SOUTH CAROLINA		Replaced paved and unpaved road inventory with NEI inventory to account for updates to paved and unpaved road emission factors		92	184	736		10/21/68	10461
45	SOUTH CAROLINA		For SCCs 2805xxxxxx (animal husbandry) and 28017xxxxx (ag fertilizer), replaced state data with data from latest version of Carnegie Mellon University (CMU) Model (Version 3.6)		644	8,372	8,372		4/16/69	10489
45	SOUTH CAROLINA		Removed SCC 30199999 (Industrial Processes / Chemical Manufacturing / Other Not Classified / Specify in Comments Field) because this category covered in point inventory		24	24	3,000		2/4/96	10498
45	SOUTH CAROLINA		Removed process MACT code 1807-2 for human and animal crematories per EPA request		66				5/1/11	10680
45	SOUTH CAROLINA		Removed Old Solvent Utilization SCCs originating from pre 1999 NEI per request of EPA				960		1/12/64	10958
45	SOUTH CAROLINA		Inserted records for EPA 2002 VOC solvent emissions inventory		155	155	201		8/30/13	11253
45	SOUTH CAROLINA		Removed pollutants EC and OC				184		11/24/46	11256
45	SOUTH CAROLINA		For open burning SCCs originating from NEI, corrected Primary Device Type in CE table from 099 to 000 and control description to uncontrolled					1,892	7/17/81	11261

Table D-1 (continued)

State FIPS or Tribal Code	State Name or Tribal Name	Local Agency FIPS Code	Description of Revision	Record Count					Date of Revision	Revision Tracking Number
				TR Table	EP Table	PE Table	EM Table	CE Table		
45	SOUTH CAROLINA		Added EPA's 2002 inventory for industrial and/or commercial/institutional fossil fuel combustion if source category was missing from state or local inventory, or, if state or local agency used inventory from preliminary 2002 NEI, the preliminary 2002 NEI inventory was replaced with the new 2002 inventory.		186	186	6,868	184	11/4/59	11278
45	SOUTH CAROLINA		Set invalid NAICS code to Null		688				9/14/10	11304
45	SOUTH CAROLINA		Nulled actual throughput and throughput unit numerator where either column is null			46			6/4/64	11314
45	SOUTH CAROLINA		Filled in emission process description where null		5,880				8/2/78	11315
46	SOUTH DAKOTA		Updated Factor Unit Numerator and Throughput Unit Numerator from HEAD-YR to HEAD for SCCs 2805001100, 2805001200, 2805001300, 2805003100, 2805007100, 2805007300, 2805008100, 2805008200, 2805008300, 2805010100, 2805010200, 2805010300, 2805018000, 2805019100, 2805019200, 2805019300, 2805021100, 2805021200, 2805021300, 2805022100, 2805022200, 2805022300, 2805023100, 2805023200, 2805023300, 2805025000, 2805030000, 2805035000, 2805039100, 2805039200, 2805039300, 2805040000, 2805045000, 2805047100, 2805047300, 2805053100				1,614		11/21/78	10458
46	SOUTH DAKOTA		For SCCs 2805xxxxxx (animal husbandry) and 28017xxxxx (ag fertilizer), replaced state data with data from latest version of Carnegie Mellon University (CMU) Model (Version 3.6)		924	12,012	12,012		4/16/69	10489
46	SOUTH DAKOTA		Removed SCC 30199999 (Industrial Processes / Chemical Manufacturing / Other Not Classified / Specify in Comments Field) because this category covered in point inventory		13	13	1,625		2/4/96	10498
46	SOUTH DAKOTA		Removed process MACT code 1807-2 for human and animal crematories per EPA request		85				5/1/11	10680
46	SOUTH DAKOTA		Removed Old Solvent Utilization SCCs originating from pre 1999 NEI per request of EPA				930		1/12/64	10958
46	SOUTH DAKOTA		Inserted records for EPA 2002 VOC solvent emissions inventory		567	567	1,091		8/30/13	11253
46	SOUTH DAKOTA		For open burning SCCs originating from NEI, corrected Primary Device Type in CE table from 099 to 000 and control description to uncontrolled					448	7/17/81	11261
46	SOUTH DAKOTA		Added EPA's 2002 inventory for industrial and/or commercial/institutional fossil fuel combustion if source category was missing from state or local inventory, or, if state or local agency used inventory from preliminary 2002 NEI, the preliminary 2002 NEI inventory was replaced with the new 2002 inventory.		570	570	23,562	240	11/4/59	11278
46	SOUTH DAKOTA		Set invalid NAICS code to Null		224				9/14/10	11304

Table D-1 (continued)

State FIPS or Tribal Code	State Name or Tribal Name	Local Agency FIPS Code	Description of Revision	Record Count					Date of Revision	Revision Tracking Number
				TR Table	EP Table	PE Table	EM Table	CE Table		
46	SOUTH DAKOTA		Nulled actual throughput and throughput unit numerator where either column is null			14			6/4/64	11314
46	SOUTH DAKOTA		Filled in emission process description where null		3,696				8/2/78	11315
46	SOUTH DAKOTA		For records in preliminary 2002 NEI that were merged with state, local, and tribal inventories, updated null data source code on PE where corresponding EM records had more than one data source. PE data source selected from available EM data sources using the following order: Select Local or Tribal data source code when State and/or EPA data source was also available; select State data source code when EPA data source was also available. Also, updated actual throughput to null since activity for EM records varies depending on source of data.			1			9/27/37	11473
46	SOUTH DAKOTA		Removed old solvent PE records			187			8/9/43	11495
46	SOUTH DAKOTA		Inserted replacement PE records for solvent SCCs in EPA's 2002 inventory			187			11/22/43	11496
47	TENNESSEE	037	Added PM25-PRI records for structure fires				1		7/8/59	21082
47	TENNESSEE	093	Changed PM10-PRI to PM10-FIL to reflect basis of emission factor for SCC 2103011000				1		6/19/32	21096
47	TENNESSEE	037	Changed PM Pollutant Codes in state inventory from Primary to Filterable				2		5/12/63	21100
47	TENNESSEE	037	Added PM records for coal and residual oil combustion developed from PM augmentation procedure				8		7/23/64	21101
47	TENNESSEE	093	Added PM records for kerosene and distillate oil combustion developed from PM augmentation procedure				4		12/10/91	21102
47	TENNESSEE	037	Added PM records for natural gas and LPG combustion developed from PM augmentation procedure				2		8/10/13	21257
47	TENNESSEE		Updated Factor Unit Numerator and Throughput Unit Numerator from HEAD-YR to HEAD for SCCs 2805001100, 2805001200, 2805001300, 2805003100, 2805007100, 2805007300, 2805008100, 2805008200, 2805008300, 2805009100, 2805009200, 2805009300, 2805018000, 2805019100, 2805019200, 2805019300, 2805021100, 2805021200, 2805021300, 2805022100, 2805022200, 2805022300, 2805023100, 2805023200, 2805023300, 2805025000, 2805030000, 2805035000, 2805039100, 2805039200, 2805039300, 2805040000, 2805045000, 2805047100, 2805047300, 2805053100				1,861		11/21/78	10458
47	TENNESSEE		Replaced paved and unpaved road inventory with NEI inventory to account for updates to paved and unpaved road emission factors		190	380	1,520		10/21/68	10461
47	TENNESSEE	037	Added missing PM25-PRI records for Ag tilling; PM25-PRI emissions set equal to agency's PM25-FIL emissions				1		3/5/50	10477

Table D-1 (continued)

State FIPS or Tribal Code	State Name or Tribal Name	Local Agency FIPS Code	Description of Revision	Record Count					Date of Revision	Revision Tracking Number
				TR Table	EP Table	PE Table	EM Table	CE Table		
47	TENNESSEE		For SCCs 2805xxxxxx (animal husbandry) and 28017xxxxx (ag fertilizer), replaced state data with data from latest version of Carnegie Mellon University (CMU) Model (Version 3.6)		1,330	17,290	17,290		4/16/69	10489
47	TENNESSEE		Removed SCC 30199999 (Industrial Processes / Chemical Manufacturing / Other Not Classified / Specify in Comments Field) because this category covered in point inventory		43	43	5,374		2/4/96	10498
47	TENNESSEE	093	Added missing PM10-FIL and PM25-FIL records for 2325000000				2		4/21/53	10517
47	TENNESSEE	037	Added missing PM25-PRI for SCCs 2104004000, 2104008000, 2199004001, 2199006001, 2302000000, 2401055000, 2440000000, 2440020000, and 2601000000				13		10/20/51	10525
47	TENNESSEE		Removed process MACT code 1807-2 for human and animal crematories per EPA request		131				5/1/11	10680
47	TENNESSEE		Removed Old Solvent Utilization SCCs originating from pre 1999 NEI per request of EPA				1,647		1/12/64	10958
47	TENNESSEE		Inserted records for EPA 2002 VOC solvent emissions inventory		1,037	1,037	2,188		8/30/13	11253
47	TENNESSEE		For open burning SCCs originating from NEI, corrected Primary Device Type in CE table from 099 to 000 and control description to uncontrolled					5,096	7/17/81	11261
47	TENNESSEE		Added EPA's 2002 inventory for industrial and/or commercial/institutional fossil fuel combustion if source category was missing from state or local inventory, or, if state or local agency used inventory from preliminary 2002 NEI, the preliminary 2002 NEI inventory was replaced with the new 2002 inventory.		842	842	28,808	752	11/4/59	11278
47	TENNESSEE		Set invalid NAICS code to Null		313				9/14/10	11304
47	TENNESSEE		Nulled actual throughput and throughput unit numerator where either column is null			22			6/4/64	11314
47	TENNESSEE		Filled in emission process description where null		5,320				8/2/78	11315
47	TENNESSEE		For records in preliminary 2002 NEI that were merged with state, local, and tribal inventories, updated null data source code on PE where corresponding EM records had more than one data source. PE data source selected from available EM data sources using the following order: Select Local or Tribal data source code when State and/or EPA data source was also available; select State data source code when EPA data source was also available. Also, updated actual throughput to null since activity for EM records varies depending on source of data.			4			9/27/37	11473
47	TENNESSEE		Removed old solvent PE records			593			8/9/43	11495
47	TENNESSEE		Inserted replacement PE records for solvent SCCs in EPA's 2002 inventory			593			11/22/43	11496
48	TEXAS		Corrected invalid commercial cooking-frying SCCs to valid SCCs: 2302002300 changed to 2302003100, 2302002400 changed to 2302003200, 2302002500 changed to 2302003000		735	735	1,959		8/16/69	20272

Table D-1 (continued)

State FIPS or Tribal Code	State Name or Tribal Name	Local Agency FIPS Code	Description of Revision	Record Count					Date of Revision	Revision Tracking Number
				TR Table	EP Table	PE Table	EM Table	CE Table		
48	TEXAS		Added records for NH3 and oil and gas inventory provided by state		6,924	18,379	36,376		10/21/76	21054
48	TEXAS		Updated Data Source Code to reflect grown data as directed by TX		8,942	17,364	36,063		2/16/59	21081
48	TEXAS		Added PM25-PRI records for structure fires				1		7/8/59	21082
48	TEXAS		Added PM25-PRI records for vehicle fires				1,518		3/16/08	21092
48	TEXAS		Added CENRAP-sponsored inventory for Ag Tilling (except AR) per request of state		254	254	1,016		1/26/06	21136
48	TEXAS		Removed duplicated records from HAP inventory			12,035			4/5/58	21268
48	TEXAS		Rounded PM10-FIL values so that PM25-FIL would not be greater than PM10-FIL				216		8/29/10	21278
48	TEXAS		Fixed VOC numbers for asphalt paving (SCCs 2461021000, 2461022000, and 2461022999) in Terrel County 48443					4	11/6/57	121042
48	TEXAS		Updated emissions of PM10-FIL, PM10-PRI, PM25-FIL, PM25-PRI, and PM-CON for SCCs 2102004000, 2102005000, 2102006000, 2102007000, 2103001000, 2103002000, 2103004000, 2103006000, 2104002000, 2104004000, 2104006000, and 2601020000				2,904		9/26/02	3168
48	TEXAS		Added PM-CON, PM25-PRI, PM25-FIL records for SCCs (2102006000, and 2103006000)				568		9/1/20	3170
48	TEXAS		Added PM10-PRI and PM25-PRI records for SCCs 2104002000, 2610000100, 2610030000, 2801000000, 2801500000, 2805001000, 2810001000, 2810005000, 2810020000, and 2810030000				1,764		12/6/89	3172
48	TEXAS		Added PM records for cotton ginning				4		3/8/58	3178
48	TEXAS		Revised PM records for cotton ginning				278		10/20/65	4944
48	TEXAS		For SCCs 2805xxxxxx (animal husbandry) and 28017xxxxx (ag fertilizer), replaced state data with data from latest version of Carnegie Mellon University (CMU) Model (Version 3.6)		3,556	46,228	46,228		4/16/69	10489
48	TEXAS		Removed SCC 30199999 (Industrial Processes / Chemical Manufacturing / Other Not Classified / Specify in Comments Field) because this category covered in point inventory		83	83	10,368		2/4/96	10498

Table D-1 (continued)

State FIPS or Tribal Code	State Name or Tribal Name	Local Agency FIPS Code	Description of Revision	Record Count					Date of Revision	Revision Tracking Number
				TR Table	EP Table	PE Table	EM Table	CE Table		
48	TEXAS		For the following SCCs, replaced state data grown from the preliminary 2002 NEI (that originated from the 1999 NEI) with more recent inventories prepared by EPA: 2104002000, 2104004000, 2104006000, 2104007000, 2104008001, 2104008002, 2104008003, 2104008004, 2104008010, 2104008030, 2104008050, 2294000000, 2296000000, 2311010000, 2311020000, 2311030000, 2501080050, 2501080100, 2610000100, 2610000400, 2610030000, 2801000000		2,711	2,715	97,054	7,642	5/9/61	10505
48	TEXAS		Added missing PM10-FIL and PM25-FIL records for 2311010000				112		4/21/53	10517
48	TEXAS		Removed daily PM10-PRI and PM10-FIL records which have no Corresponding PM25-FIL or PM25-PRI records (SCCs 2102004000, 2102005000, 2102006000, 2102007000, 2103004000, 2399000000, 2601020000, 2801000000, and 2801500000)			19	242		8/5/52	10528
48	TEXAS		Removed biogenic SCCs (2701010000, 2701020000)		86	172	172		7/26/05	10547
48	TEXAS		Removed SCC 2311010000 in preparation for replacement with NEI data				112		2/10/08	10549
48	TEXAS		Inserted NEI data for SCCs 2104004000, 2104006000, 2294000000, 2296000000, 2311010000, 2311030000, 2501080050, 2501080100, 2610000100, 2610000400, 2610030000, and 2801000000		2,190	2,698	40,176	16,408	2/5/09	10550
48	TEXAS		Inserted NEI data for SCC 2104002000		32	32	1,536		1/29/63	10599
48	TEXAS		Removed daily records for SCCs 2103007000, 2810005000, 2810015000 because the emissions were greater than the annual record				3		7/13/26	10956
48	TEXAS		Inserted records for EPA 2002 VOC solvent emissions inventory		1,360	1,360	2,945		8/30/13	11253
48	TEXAS		For open burning SCCs originating from NEI, corrected Primary Device Type in CE table from 099 to 000 and control description to uncontrolled					4,480	7/17/81	11261
48	TEXAS		Added EPA's 2002 inventory for industrial and/or commercial/institutional fossil fuel combustion if source category was missing from state or local inventory, or, if state or local agency used inventory from preliminary 2002 NEI, the preliminary 2002 NEI inventory was replaced with the new 2002 inventory.		1,231	1,231	47,999	1,856	11/4/59	11278
48	TEXAS		Removed Duplicate TR records	254					12/19/05	11299
48	TEXAS		Set invalid NAICS code to Null		254				9/14/10	11304
48	TEXAS		Nulled actual throughput and throughput unit numerator where either column is null			59			6/4/64	11314
48	TEXAS		Filled in emission process description where null		35,224				8/2/78	11315

Table D-1 (continued)

State FIPS or Tribal Code	State Name or Tribal Name	Local Agency FIPS Code	Description of Revision	Record Count					Date of Revision	Revision Tracking Number
				TR Table	EP Table	PE Table	EM Table	CE Table		
48	TEXAS		For records in preliminary 2002 NEI that were merged with state, local, and tribal inventories, updated null data source code on PE where corresponding EM records had more than one data source. PE data source selected from available EM data sources using the following order: Select Local or Tribal data source code when State and/or EPA data source was also available; select State data source code when EPA data source was also available. Also, updated actual throughput to null since activity for EM records varies depending on source of data.			9			1/15/42	11494
48	TEXAS		Updated year to reflect year in data source				413		9/14/26	11499
49	UTAH		Updated Emission Type Period to ANNUAL per email from Carol A. Nielsen on Aug 19				3,351		3/2/60	20009
49	UTAH		Added PM25-PRI records for structure fires				29		7/8/59	21082
49	UTAH		Added PM25-PRI records for vehicle fires				87		3/16/08	21092
49	UTAH		Removed records with invalid PM Pollutant Codes (e.g., PM-PRI, PM25)				116		7/14/14	21095
49	UTAH		Added PM records for kerosene and distillate oil combustion developed from PM augmentation procedure				232		12/10/91	21102
49	UTAH		Removed PM records for Natural Gas and LPG				58		12/4/93	21106
49	UTAH		Updated PM records for Natural Gas and LPG				116		8/8/96	21107
49	UTAH		Added PM records for natural gas and LPG combustion developed from PM augmentation procedure				116		8/10/13	21257
49	UTAH		Added PRI extension to PM10 and PM25				493		2/4/38	118876
49	UTAH		Updated start date from 20021001 to 20020101 on EM and PE records			58	2,668		4/16/33	3146
49	UTAH		Removed duplicate PE records resulting from changing start date from 20021001 to 20020101			27			8/18/34	3148
49	UTAH		Merged 2002 NEI data for construction SCCs with state inventory to fill data gaps		58	58	232	116	8/28/70	10470
49	UTAH		For SCCs 2805xxxxxx (animal husbandry) and 28017xxxxx (ag fertilizer), replaced state data with data from latest version of Carnegie Mellon University (CMU) Model (Version 3.6)		406	5,278	5,278		4/16/69	10489
49	UTAH		Removed SCC 30199999 (Industrial Processes / Chemical Manufacturing / Other Not Classified / Specify in Comments Field) because this category covered in point inventory		9	9	1,125		2/4/96	10498
49	UTAH		Added missing PM25-PRI records for SCCs like 2296*				29		2/25/11	10514
49	UTAH		Added PM10-FIL and PM25-FIL where missing for SCC 2294000000 and 2296000000				58		9/10/18	10515

Table D-1 (continued)

State FIPS or Tribal Code	State Name or Tribal Name	Local Agency FIPS Code	Description of Revision	Record Count					Date of Revision	Revision Tracking Number
				TR Table	EP Table	PE Table	EM Table	CE Table		
49	UTAH		Added missing PM10-FIL and PM25-FIL records for Ag Harvesting (2801000005)				58		9/2/38	10519
49	UTAH		Added missing PM25-PRI and FIL for res natural gas (2104006000)				58		1/7/52	10526
49	UTAH		Added PM10-PRI records for 2103005000				29		12/5/67	10610
49	UTAH		Added PM10-PRI records for 2103002000 and 2104002000				58		1/27/68	10611
49	UTAH		Removed process MACT code 1807-2 for human and animal crematories per EPA request		43				5/1/11	10680
49	UTAH		Removed Old Solvent Utilization SCCs originating from pre 1999 NEI per request of EPA				35		1/12/64	10958
49	UTAH		Inserted records for EPA 2002 VOC solvent emissions inventory		183	183	237		8/30/13	11253
49	UTAH		Removed invalid pollutant code 9036195				174		3/23/09	11273
49	UTAH		Added EPA's 2002 inventory for industrial and/or commercial/institutional fossil fuel combustion if source category was missing from state or local inventory, or, if state or local agency used inventory from preliminary 2002 NEI, the preliminary 2002 NEI inventory was replaced with the new 2002 inventory.		170	170	6,064	112	11/4/59	11278
49	UTAH		Set invalid NAICS code to Null		309				9/14/10	11304
49	UTAH		Filled in emission process description where null		1,624				8/2/78	11315
49	UTAH		For records in preliminary 2002 NEI that were merged with state, local, and tribal inventories, updated null data source code on PE where corresponding EM records had more than one data source. PE data source selected from available EM data sources using the following order: Select Local or Tribal data source code when State and/or EPA data source was also available; select State data source code when EPA data source was also available. Also, updated actual throughput to null since activity for EM records varies depending on source of data.			33			9/27/37	11473
49	UTAH		Removed old solvent PE records			54			8/9/43	11495
49	UTAH		Inserted replacement PE records for solvent SCCs in EPA's 2002 inventory			54			11/22/43	11496
50	VERMONT		Updated Actual Throughput and Throughput Unit Numerator to remove invalid units (Changed unit from TON2/LB to TON and multiplied actual throughput by 2000)			166			11/28/77	21030
50	VERMONT		Added PM records for fossil fuel combustion developed from PM augmentation procedure			28	238		6/2/24	21086
50	VERMONT		Merged preliminary 2002 NEI data with state inventory to fill data gaps		42	42	532	532	8/2/50	3194
50	VERMONT		Removed records for natural gas combustion in counties with preliminary NEI data but do not have natural gas supplied to them as directed by state		28	28	221		5/6/53	3195
50	VERMONT		Replaced paved and unpaved road inventory with MANE-VU-sponsored inventory per state's request		28	28	112		7/4/24	10456

Table D-1 (continued)

State FIPS or Tribal Code	State Name or Tribal Name	Local Agency FIPS Code	Description of Revision	Record Count					Date of Revision	Revision Tracking Number
				TR Table	EP Table	PE Table	EM Table	CE Table		
50	VERMONT		Updated Factor Unit Numerator and Throughput Unit Numerator from HEAD-YR to HEAD for SCCs 2805001100, 2805001200, 2805001300, 2805002000, 2805003100, 2805018000, 2805019100, 2805019200, 2805019300, 2805021100, 2805021200, 2805021300, 2805022100, 2805022200, 2805022300, 2805023100, 2805023200, 2805023300, 2805025000, 2805035000, 2805040000, 2805045000				291		11/21/78	10458
50	VERMONT		For SCCs 2805xxxxxx (animal husbandry) and 28017xxxxx (ag fertilizer), replaced state data with data from latest version of Carnegie Mellon University (CMU) Model (Version 3.6)		196	2,548	2,548		4/16/69	10489
50	VERMONT		Removed SCC 30199999 (Industrial Processes / Chemical Manufacturing / Other Not Classified / Specify in Comments Field) because this category covered in point inventory		7	7	875		2/4/96	10498
50	VERMONT		Removed daily emissions for paved and unpaved roads where state annual emissions inventory was replaced with MANE-VU-sponsored annual emissions inventory			28	112		2/4/28	10503
50	VERMONT		Added missing PM10-FIL and PM25-FIL records for 2311010000				28		4/21/53	10517
50	VERMONT		Removed process MACT code 1807-2 for human and animal crematories per EPA request		7				5/1/11	10680
50	VERMONT		Removed Old Solvent Utilization SCCs originating from pre 1999 NEI per request of EPA				228		1/12/64	10958
50	VERMONT		Inserted records for EPA 2002 VOC solvent emissions inventory		158	158	335		8/30/13	11253
50	VERMONT		Removed invalid pollutant code CH4				42	42	10/16/49	11257
50	VERMONT		For open burning SCCs originating from NEI, corrected Primary Device Type in CE table from 099 to 000 and control description to uncontrolled					504	7/17/81	11261
50	VERMONT		Added EPA's 2002 inventory for industrial and/or commercial/institutional fossil fuel combustion if source category was missing from state or local inventory, or, if state or local agency used inventory from preliminary 2002 NEI, the preliminary 2002 NEI inventory was replaced with the new 2002 inventory.		90	90	4,132	56	11/4/59	11278
50	VERMONT		Set invalid NAICS code to Null		54				9/14/10	11304
50	VERMONT		Filled in emission process description where null		798				8/2/78	11315
50	VERMONT		For records in preliminary 2002 NEI that were merged with state, local, and tribal inventories, updated null data source code on PE where corresponding EM records had more than one data source. PE data source selected from available EM data sources using the following order: Select Local or Tribal data source code when State and/or EPA data source was also available; select State data source code when EPA data source was also available. Also, updated actual throughput to null since activity for EM records varies depending on source of data.			4			9/27/37	11473
50	VERMONT		Removed old solvent PE records			146			8/9/43	11495

Table D-1 (continued)

State FIPS or Tribal Code	State Name or Tribal Name	Local Agency FIPS Code	Description of Revision	Record Count					Date of Revision	Revision Tracking Number
				TR Table	EP Table	PE Table	EM Table	CE Table		
50	VERMONT		Inserted replacement PE records for solvent SCCs in EPA's 2002 inventory			146			11/22/43	11496
50	VERMONT		Changed data source from E-99-F to E-98-F			4			9/20/45	11497
51	VIRGINIA		Corrected invalid independent city code for South Boston by (1) adding emissions for South Boston to those for Halifax County for records that matched on Emission table data key and removed records for South Boston, and (2) changed South Boston FIPS code to that for Halifax County for Clifton Forge records that did not match on data key for Halifax County records.	1	87	174	556	139	12/31/42	20260
51	VIRGINIA		Corrected invalid independent city code for Clifton Forge by (1) adding emissions for Clifton Forge to those for Allegheny County for records that matched on Emission table data key and removed records for Clifton Forge, and (2) changed Clifton Forge FIPS code to that for Allegheny County for Clifton Forge records that did not match on data key for Allegheny County records.	1	87	174	556	139	8/26/56	20261
51	VIRGINIA		Removed invalid SCCs 2601030000 and 2610020000		268	536	1,608	804	7/12/09	20774
51	VIRGINIA		Updated Factor Unit Numerator and Throughput Unit Numerator from HEAD-YR to HEAD for SCCs 2805001100, 2805001200, 2805001300, 2805002000, 2805003100, 2805007100, 2805007300, 2805008100, 2805008200, 2805008300, 2805009100, 2805009200, 2805009300, 2805010100, 2805010200, 2805010300, 2805018000, 2805019100, 2805019200, 2805019300, 2805021100, 2805021200, 2805021300, 2805022100, 2805022200, 2805022300, 2805023100, 2805023200, 2805023300, 2805025000, 2805030000, 2805035000, 2805039100, 2805039200, 2805039300, 2805040000, 2805045000, 2805047100, 2805047300, 2805053100				2,087		11/21/78	10458
51	VIRGINIA		Replaced paved and unpaved road inventory with NEI inventory to account for updates to paved and unpaved road emission factors		245	490	1,960		10/21/68	10461
51	VIRGINIA		For SCCs 2805xxxxxx (animal husbandry) and 28017xxxxx (ag fertilizer), replaced state data with data from latest version of Carnegie Mellon University (CMU) Model (Version 3.6)		1,904	24,752	24,752		4/16/69	10489
51	VIRGINIA		Removed SCC 30199999 (Industrial Processes / Chemical Manufacturing / Other Not Classified / Specify in Comments Field) because this category covered in point inventory		59	59	7,375		2/4/96	10498
51	VIRGINIA		Removed process MACT code 1807-2 for human and animal crematories per EPA request		158				5/1/11	10680
51	VIRGINIA		Removed Old Solvent Utilization SCCs originating from pre 1999 NEI per request of EPA				1,976		1/12/64	10958
51	VIRGINIA		Removed daily records for SCCs 2620030000 and 2501060103 where daily emissions were greater than the annual emissions				45		12/18/72	11012
51	VIRGINIA		Inserted records for EPA 2002 VOC solvent emissions inventory		591	591	725		8/30/13	11253

Table D-1 (continued)

State FIPS or Tribal Code	State Name or Tribal Name	Local Agency FIPS Code	Description of Revision	Record Count					Date of Revision	Revision Tracking Number
				TR Table	EP Table	PE Table	EM Table	CE Table		
51	VIRGINIA		For open burning SCCs originating from NEI, corrected Primary Device Type in CE table from 099 to 000 and control description to uncontrolled					4,928	7/17/81	11261
51	VIRGINIA		Added EPA's 2002 inventory for industrial and/or commercial/institutional fossil fuel combustion if source category was missing from state or local inventory, or, if state or local agency used inventory from preliminary 2002 NEI, the preliminary 2002 NEI inventory was replaced with the new 2002 inventory.		268	268	14,204		11/4/59	11278
51	VIRGINIA		Corrected invalid county FIPS for South Boston: Added the emissions for South Boston to Halifax County for data key matches, and changed county FIPS from South Boston to Halifax County where no match on SCC.		56	728	1,456		10/30/68	11283
51	VIRGINIA		Corrected invalid county FIPS for Clifton Forge: Added the emissions for Clifton Forge to Allegheny County for data key matches, and changed county FIPS from Clifton Forge to Allegheny County where no match on SCC.		56	728	1,456		3/15/69	11284
51	VIRGINIA		Set invalid NAICS code to Null		378				9/14/10	11304
51	VIRGINIA		Nulled actual throughput and throughput unit numerator where either column is null			1			6/4/64	11314
51	VIRGINIA		Filled in emission process description where null		19,162				8/2/78	11315
53	WASHINGTON		Changed Emission Type Period to SEASONAL per email from Sally Otterson on Aug 16				752		4/12/41	19781
53	WASHINGTON		Changed Source Type to AREA as noted in the spreadsheet file distributed by Roy Huntley, EPA to S/L/T agencies on August 11, 2004	35					11/8/52	20263
53	WASHINGTON		Updated Factor Unit Numerator and Throughput Unit Numerator from HEAD-YR to HEAD for SCCs 2805001100, 2805001200, 2805001300, 2805003100, 2805007100, 2805007300, 2805008100, 2805008200, 2805008300, 2805009100, 2805009200, 2805009300, 2805018000, 2805019100, 2805019200, 2805019300, 2805021100, 2805021200, 2805021300, 2805022100, 2805022200, 2805022300, 2805023100, 2805023200, 2805023300, 2805025000, 2805030000, 2805035000, 2805039100, 2805039200, 2805039300, 2805040000, 2805045000, 2805047100, 2805047300, 2805053100				608		11/21/78	10458
53	WASHINGTON		For SCCs 2805xxxxxx (animal husbandry) and 28017xxxxx (ag fertilizer), replaced state data with data from latest version of Carnegie Mellon University (CMU) Model (Version 3.6)		546	7,098	7,098		4/16/69	10489
53	WASHINGTON		Removed SCC 30199999 (Industrial Processes / Chemical Manufacturing / Other Not Classified / Specify in Comments Field) because this category covered in point inventory		27	27	3,375		2/4/96	10498
53	WASHINGTON		Added PM10-FIL and PM25-FIL where missing for SCC 2294000000 and 2296000000				700		9/10/18	10515
53	WASHINGTON		Removed biogenic SCC (2701400000)		35	175	175		7/26/05	10547

Table D-1 (continued)

State FIPS or Tribal Code	State Name or Tribal Name	Local Agency FIPS Code	Description of Revision	Record Count					Date of Revision	Revision Tracking Number
				TR Table	EP Table	PE Table	EM Table	CE Table		
53	WASHINGTON		Removed process MACT code 1807-2 for human and animal crematories per EPA request		62				5/1/11	10680
53	WASHINGTON		Removed Old Solvent Utilization SCCs originating from pre 1999 NEI per request of EPA				789		1/12/64	10958
53	WASHINGTON		Inserted records for EPA 2002 VOC solvent emissions inventory		261	261	715		8/30/13	11253
53	WASHINGTON		For open burning SCCs originating from NEI, corrected Primary Device Type in CE table from 099 to 000 and control description to uncontrolled					493	7/17/81	11261
53	WASHINGTON	033, 035, 053, 061	Removed Duplicate TR records	4					1/22/06	11300
53	WASHINGTON		Set invalid NAICS code to Null		91				9/14/10	11304
53	WASHINGTON		Filled in emission process description where null		2,184				8/2/78	11315
53	WASHINGTON		For records in preliminary 2002 NEI that were merged with state, local, and tribal inventories, updated null data source code on PE where corresponding EM records had more than one data source. PE data source selected from available EM data sources using the following order: Select Local or Tribal data source code when State and/or EPA data source was also available; select State data source code when EPA data source was also available. Also, updated actual throughput to null since activity for EM records varies depending on source of data.			17			9/27/37	11473
53	WASHINGTON		Removed old solvent PE records			235			8/9/43	11495
53	WASHINGTON		Inserted replacement PE records for solvent SCCs in EPA's 2002 inventory			235			11/22/43	11496
54	WEST VIRGINIA		Updated Actual Throughput and Throughput Unit Numerator to remove invalid units (Changed unit from TON2/LB to TON and multiplied actual throughput by 2000)			216			9/22/07	20886
54	WEST VIRGINIA		Set Factor Numeric Value to null where Factor Unit Numerator and/or Factor Unit Denominator was null				239		5/13/70	21008
54	WEST VIRGINIA		Replaced paved and unpaved road inventory with NEI inventory to account for updates to paved and unpaved road emission factors		110	220	880	16	10/21/68	10461
54	WEST VIRGINIA		For SCCs 2805xxxxxx (animal husbandry) and 28017xxxxx (ag fertilizer), replaced state data with data from latest version of Carnegie Mellon University (CMU) Model (Version 3.6)		770	10,010	10,010		4/16/69	10489
54	WEST VIRGINIA		Removed SCC 30199999 (Industrial Processes / Chemical Manufacturing / Other Not Classified / Specify in Comments Field) because this category covered in point inventory		13	13	1,625		2/4/96	10498
54	WEST VIRGINIA		Removed process MACT code 1807-2 for human and animal crematories per EPA request		72				5/1/11	10680

Table D-1 (continued)

State FIPS or Tribal Code	State Name or Tribal Name	Local Agency FIPS Code	Description of Revision	Record Count					Date of Revision	Revision Tracking Number
				TR Table	EP Table	PE Table	EM Table	CE Table		
54	WEST VIRGINIA		Removed Old Solvent Utilization SCCs originating from pre 1999 NEI per request of EPA				799		1/12/64	10958
54	WEST VIRGINIA		Inserted records for EPA 2002 VOC solvent emissions inventory		34	34	34		8/30/13	11253
54	WEST VIRGINIA		For open burning SCCs originating from NEI, corrected Primary Device Type in CE table from 099 to 000 and control description to uncontrolled					2,420	7/17/81	11261
54	WEST VIRGINIA		Set invalid NAICS code to Null		55				9/14/10	11304
54	WEST VIRGINIA		Nulled actual throughput and throughput unit numerator where either column is null			46			6/4/64	11314
54	WEST VIRGINIA		Filled in emission process description where null		6,442				8/2/78	11315
55	WISCONSIN		Changed Pollutant Code from PB to 7439921 as noted in the spreadsheet file distributed by Roy Huntley, EPA to S/L/T agencies on August 11, 2004				1,080		8/23/01	20274
55	WISCONSIN		Changed PM10-PRI to PM10-FIL and PM25-PRI to PM25-FIL to reflect basis of emission factor for SCCs 2104004000 and 2104011000				864		6/19/32	21096
55	WISCONSIN		Changed PM Pollutant Codes in state inventory from Primary to Filterable				1,296		5/12/63	21100
55	WISCONSIN		Added PM records for coal and residual oil combustion developed from PM augmentation procedure				1,944		7/23/64	21101
55	WISCONSIN		Added PM records for kerosene and distillate oil combustion developed from PM augmentation procedure				1,296		12/10/91	21102
55	WISCONSIN		Updated PM records for Natural Gas and LPG				864		8/8/96	21107
55	WISCONSIN		Added PM records for natural gas and LPG combustion developed from PM augmentation procedure				1,296		8/10/13	21257
55	WISCONSIN		Removed duplicate records caused by separate HAP submission		922	922			1/29/34	21260
55	WISCONSIN		Updated Emission Numeric Value, Factor Unit Numerator, Factor Unit Denominator where Emission Numeric Value is Null				432		4/24/09	3169
55	WISCONSIN		For SCCs 2805xxxxxx (animal husbandry) and 28017xxxxx (ag fertilizer), replaced state data with data from latest version of Carnegie Mellon University (CMU) Model (Version 3.6)		1,008	13,104	13,104		4/16/69	10489
55	WISCONSIN		Removed SCC 30199999 (Industrial Processes / Chemical Manufacturing / Other Not Classified / Specify in Comments Field) because this category covered in point inventory		38	38	4,750		2/4/96	10498
55	WISCONSIN		Added missing PM25-PRI for SCCs 2305000000 and 2306010000				432		5/29/52	10527
55	WISCONSIN		Removed process MACT code 1807-2 for human and animal crematories per EPA request		71				5/1/11	10680
55	WISCONSIN		Removed Old Solvent Utilization SCCs originating from pre 1999 NEI per request of EPA				307		1/12/64	10958

Table D-1 (continued)

State FIPS or Tribal Code	State Name or Tribal Name	Local Agency FIPS Code	Description of Revision	Record Count					Date of Revision	Revision Tracking Number
				TR Table	EP Table	PE Table	EM Table	CE Table		
55	WISCONSIN		Removed daily records for SCC 2401025000 where daily emissions were greater than the annual emissions				8		9/25/73	11013
55	WISCONSIN		Inserted records for EPA 2002 VOC solvent emissions inventory		207	207	319		8/30/13	11253
55	WISCONSIN		Removed Duplicate TR records	72					2/17/06	11301
55	WISCONSIN		Set invalid NAICS code to Null		208				9/14/10	11304
55	WISCONSIN		Nulled actual throughput and throughput unit numerator where either column is null			8,425			6/4/64	11314
55	WISCONSIN		Filled in emission process description where null		4,392				8/2/78	11315
55	WISCONSIN		Removed old solvent PE records			112			8/9/43	11495
55	WISCONSIN		Inserted replacement PE records for solvent SCCs in EPA's 2002 inventory			112			11/22/43	11496
56	WYOMING		Updated Factor Unit Numerator and Throughput Unit Numerator from HEAD-YR to HEAD for SCCs 2805001100, 2805001200, 2805001300, 2805003100, 2805018000, 2805019100, 2805019200, 2805019300, 2805021100, 2805021200, 2805021300, 2805022100, 2805022200, 2805022300, 2805023100, 2805023200, 2805023300, 2805025000, 2805030000, 2805035000, 2805039100, 2805039200, 2805039300, 2805040000, 2805045000, 2805047100, 2805047300, 2805053100				259		11/21/78	10458
56	WYOMING		For SCCs 2805xxxxxx (animal husbandry) and 28017xxxxx (ag fertilizer), replaced state data with data from latest version of Carnegie Mellon University (CMU) Model (Version 3.6)		322	4,186	4,186		4/16/69	10489
56	WYOMING		Removed SCC 30199999 (Industrial Processes / Chemical Manufacturing / Other Not Classified / Specify in Comments Field) because this category covered in point inventory		7	7	875		2/4/96	10498
56	WYOMING		Removed process MACT code 1807-2 for human and animal crematories per EPA request		38				5/1/11	10680
56	WYOMING		Removed Old Solvent Utilization SCCs originating from pre 1999 NEI per request of EPA				342		1/12/64	10958
56	WYOMING		Inserted records for EPA 2002 VOC solvent emissions inventory		284	284	489		8/30/13	11253
56	WYOMING		For open burning SCCs originating from NEI, corrected Primary Device Type in CE table from 099 to 000 and control description to uncontrolled					672	7/17/81	11261
56	WYOMING		Set invalid NAICS code to Null		88				9/14/10	11304
56	WYOMING		Nulled actual throughput and throughput unit numerator where either column is null			1			6/4/64	11314
56	WYOMING		Filled in emission process description where null		1,288				8/2/78	11315

Table D-1 (continued)

State FIPS or Tribal Code	State Name or Tribal Name	Local Agency FIPS Code	Description of Revision	Record Count					Date of Revision	Revision Tracking Number
				TR Table	EP Table	PE Table	EM Table	CE Table		
56	WYOMING		For records in preliminary 2002 NEI that were merged with state, local, and tribal inventories, updated null data source code on PE where corresponding EM records had more than one data source. PE data source selected from available EM data sources using the following order: Select Local or Tribal data source code when State and/or EPA data source was also available; select State data source code when EPA data source was also available. Also, updated actual throughput to null since activity for EM records varies depending on source of data.			5			9/27/37	11473
56	WYOMING		Removed old solvent PE records			83			8/9/43	11495
56	WYOMING		Inserted replacement PE records for solvent SCCs in EPA's 2002 inventory			83			11/22/43	11496
72	PUERTO RICO		Removed SCC 30199999 (Industrial Processes / Chemical Manufacturing / Other Not Classified / Specify in Comments Field) because this category covered in point inventory		78	78	9,750		2/4/96	10498
72	PUERTO RICO		Removed process MACT code 1807-2 for human and animal crematories per EPA request		156				5/1/11	10680
72	PUERTO RICO		Added EPA's 2002 inventory for industrial and/or commercial/institutional fossil fuel combustion if source category was missing from state or local inventory, or, if state or local agency used inventory from preliminary 2002 NEI, the preliminary 2002 NEI inventory was replaced with the new 2002 inventory.		858	858	31,044	624	9/7/61	11280
72	PUERTO RICO		Set invalid NAICS code to Null		156				9/14/10	11304
78	U.S. VIRGIN ISLANDS		Removed SCC 30199999 (Industrial Processes / Chemical Manufacturing / Other Not Classified / Specify in Comments Field) because this category covered in point inventory		3	3	375		2/4/96	10498
78	U.S. VIRGIN ISLANDS		Removed process MACT code 1807-2 for human and animal crematories per EPA request		6				5/1/11	10680
78	U.S. VIRGIN ISLANDS		Added EPA's 2002 inventory for industrial and/or commercial/institutional fossil fuel combustion if source category was missing from state or local inventory, or, if state or local agency used inventory from preliminary 2002 NEI, the preliminary 2002 NEI inventory was replaced with the new 2002 inventory.		33	33	1,194	24	9/7/61	11280
78	U.S. VIRGIN ISLANDS		Set invalid NAICS code to Null		6				9/14/10	11304
206	FORT PECK TRIBE		Changed year in Start Date and End Date from 2000 to 2002, and reported year 2000 in Data Source = R-00-X	1	13	13	42		2/20/61	20769
206	FORT PECK TRIBE		Removed PM records for Natural Gas and LPG (2104007000)				2		12/4/93	21106
206	FORT PECK TRIBE		Updated PM-PRI and PM10-PRI records for Natural Gas and LPG(2103006000, 2104006000, 2104007000)			4	4		8/8/96	21107
206	FORT PECK TRIBE		Added PM-10-PRI, PM25-PRI, PM25-FIL, PM-CON records for natural gas(2104007000) developed from PM augmentation procedure				4		8/10/13	21257

Table D-1 (continued)

State FIPS or Tribal Code	State Name or Tribal Name	Local Agency FIPS Code	Description of Revision	Record Count					Date of Revision	Revision Tracking Number
				TR Table	EP Table	PE Table	EM Table	CE Table		
206	FORT PECK TRIBE		Added missing PM25-PRI records for Ag tilling; PM25-PRI emissions set equal to agency's PM25-FIL emissions				1		3/5/50	10477
206	FORT PECK TRIBE		Added PM10-FIL and PM25-FIL where missing				2		11/30/52	10478
206	FORT PECK TRIBE		Added missing PM25-PRI record for SCC 2294000000				1		2/25/11	10514
206	FORT PECK TRIBE		Added PM10-FIL and PM25-FIL where missing for SCC 2294000000 and 2296000000				2		9/10/18	10515
206	FORT PECK TRIBE		Added missing PM25-PRI record for SCC 2325030000				1		4/9/44	10516
206	FORT PECK TRIBE		Added missing PM10-FIL and PM25-FIL records for 2325030000				2		4/21/53	10517
206	FORT PECK TRIBE		Added missing PM25-PRI records for SCC 2810001000				1		3/7/97	10531
206	FORT PECK TRIBE		Updated year to reflect year in data source				2		9/14/26	11499
405	FOND DU LAC TRIBE		Changed year in Start Date and End Date from 2001 to 2002, and reported year 2001 in Data Source = R-01-X	1	4	4	8		2/26/58	20767
405	FOND DU LAC TRIBE		Added PM10-FIL and PM25-FIL where missing for SCC 2294000000 and 2296000000				4		9/10/18	10515
577	LA POSTA TRIBE		Changed year in Start Date and End Date from 1999 to 2002, and reported year 1999 in Data Source = R-99-X	1	5	5	9		6/19/60	20768
577	LA POSTA TRIBE		Removed PM records for Natural Gas and LPG (2104007000)				1		12/4/93	21106
577	LA POSTA TRIBE		Updated PM10-PRI records for Natural Gas (2104007000)			2	2		8/8/96	21107
577	LA POSTA TRIBE		Added PM-10-PRI, PM25-PRI, PM25-FIL, PM-CON records for natural gas (2104007000) developed from PM augmentation procedure				4		8/10/13	21257