
Air



Nonroad Engine and Vehicle Emission Study—Appendixes

Draft



**Nonroad Engine and Vehicle
Emission Study
Draft Appendixes**

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This is a draft and should not be quoted or cited.

EPA-21A-2001
Office of Air & Radiation
U.S. Environmental Protection Agency

Nonroad Engine and Vehicle Emission Study

List of Appendixes

The following appendixes provide background information for the Nonroad Engine and Vehicle Emission Study - Report. They are presented in their order of first occurrence in the text of the report.

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Appendix A. Glossary of Acronyms and Terms

The following acronyms have been used in the report or its appendixes.

Acronyms

AIRS	Aeromatic Information Retrieval System
AMS	Area and Mobile Source
BY	Base Year
BSFC	Brake Specific Fuel Consumption
CAA or the Act	Clean Air Act
CAAA	Clean Air Act Amendments
CARB	California Air Resources Board
CIMA	Construction Industries Manufacturing Association
CMSA	Consolidated Metropolitan Statistical Area
CO	Carbon Monoxide
CO ₂	Carbon Dioxide
CTG	Control Technology Guidelines
EEA	Energy and Environmental Analysis
EMA	Engine Manufacturers Association
EMI	Equipment Manufacturers Institute
EPA	Environmental Protection Agency
HC	Hydrocarbon
ISIA	International Snowmobile Industry Association
ITA	Industrial Truck Association
LMOS	Lake Michigan Oxidant Study
MECA	Manufacturers of Emission Controls Association
MSA	Metropolitan Statistical Area
NMMA	National Marine Manufacturers Association
NAAQS	National Ambient Air Quality Standards
NAPAP	National Acid Precipitation Assessment Program
NECMA	New England County Metropolitan Areas
NESCAUM	Northeast States Coordinated Air Use Management
NESHAPS	National Emissions Standards for Hazardous Air Pollutants
NO ₂	Nitrogen Dioxide
NO _x	Oxides of Nitrogen
O ₃	Ozone
OAR	Office of Air and Radiation
OAQPS	Office of Air Quality and Pollution Standards
OPEI	Outboard Power Equipment Institute
PM ₁₀	Particulate Matter (size specific)
ppb	parts per billion
PPEMA	Portable Power Equipment Manufacturers Association
ppm	parts per million
PSR	Power Systems Research

RACT	Reasonably Available Control Technology
ROM	Regional Oxidant Model
ROMNET	Regional Ozone Modeling for NorthEast Transport
rpm	revolutions per minute
SAE	Society of Automotive Engineers
SIP	State Implementation Plan
SEMA	Specialty Equipment Market Association
SO₂	Sulfur Dioxide
SO_x	Oxides of Sulfur
SwRI	Southwest Research Institute
TPD	Tons per Day
TPSD	Tons per Summer Day
TPWD	Tons per Winter Day
TPY	Tons per Year
TSD	Technical Support Document
TSDF	treatment, storage, and disposal facilities
VOC	Volatile Organic Compounds

Glossary of Terms

The following terms are defined as they were used in this report or its appendixes.

- Activity level:** Unit indicating the combined effect of population, annual hours of use, average-rated horsepower, and load factor. Determined by multiplying the population x annual hours of use x horsepower x load factor. The activity level is also the product of the population and the per-source usage rate.
- Airshed:** A geographical area which, because of topography, meteorology, and climate, shares the same air mass.
- Air toxic:** A compound in the air capable of causing adverse health effects. For the purpose of this report, the air toxics examined were limited to known or suspected carcinogens.
- Aldehydes:** A class of fast-reacting organic compounds containing oxygen, hydrogen, and carbon. They contain the group -CHO
- Annual hours of use:** Average number of hours a given equipment type is used in one year.
- Attainment area:** A region that meets the National Ambient Air Quality Standards for a criteria pollutant under the Clean Air Act.
- Control technology:** A combination of measures designated to achieve the aggregate reduction of emissions.
- Crankcase:** The part of the engine that surrounds the crankshaft; usually the lower section of the cylinder block.
- Crankcase emissions:** Pollution emitted into the atmosphere from any portion of the engine crankcase ventilating or lubricating system.
- Crankcase emissions control system:** A system of passages designed to convey gases from and/or to the crankcase of an engine. The system may or may not include means to regulate the flow(s)
- Criteria pollutants:** The Clean Air Act required the Environmental Protection Agency to set air quality standards for common and widespread pollutants after preparing "criteria documents" summarizing scientific knowledge on their health effects. Today there are standards in effect for six "criteria pollutants": sulfur dioxide, carbon monoxide, particulates, nitrogen dioxide, ozone and lead.

- Diurnal emissions:** Fuel vapors emitted as a result of a specified increase in fuel tank temperature in a specified time. For the purposes of this report, diurnal losses are those vapor emissions which occur while the equipment is not operating and are attributable to natural changes in ambient conditions (temperature, pressure, etc.).
- Duty cycle:** The ratio of the time "on" of a device or system divided by the total cycle time (i.e., "on" plus time "off"). For a device that normally runs intermittently rather than continuously; the amount of time a device operates as opposed to its idle time
- Emission factor:** Measure of the rate at which a particular type of equipment emits a particular pollutant under normal operating conditions. Emission factors are commonly mass-based and expressed in units of mass per unit of work.
- Emissions inventory:** A detailed listing of the amounts of pollution generated by different sources in an area during a specific period of time.
- Evaporative emissions:** Evaporative emissions are losses due to evaporation of unburned fuel. For the purposes of this report, evaporative emissions are subdivided into four groups: hot soak, diurnal, resting-loss, and running-loss emissions.
- Four-stroke cycle:** The four-piston strokes--intake, compression, power, and exhaust--that make up the complete cycle of events in the four-stroke-cycle engine. Also called four cycle and four stroke.
- Horsepower, used average rated:** The average of the maximum horsepower ratings for the engines in a given type of equipment.
- Hot-soak emissions:** Hot soak emissions are those emissions which occur after the equipment has been turned off and attributable to the elevated temperature of the equipment (e.g., evaporation from the carburetor bowl).
- Load factor:** The ratio of the engine power output during typical operating conditions to the engine rated horsepower.
- National Ambient Air Quality Standards (NAAQS):** Section 109 of the Clean Air Act requires EPA to set nationwide standards, the National Ambient Air Quality Standards, for widespread air pollutants. Currently, six pollutants are regulated by primary and secondary NAAQS--carbon monoxide, lead, nitrogen dioxide, ozone, particulate matter (PM-10), and sulfur dioxide See Criteria Pollutants.

- Nonattainment area:** A region that fails to meet Clean Air Act primary ambient air standards are designated as nonattainment areas. Most major cities in the United States are nonattainment areas for one or more of the criteria pollutants. These dirty air regions are subject to strict controls to bring them into compliance with the standards.
- Nonroad vehicles:** Vehicles or items of machinery that use an internal combustion engine but are not regulated as motor vehicles or airplanes under the Clean Air Act. Construction equipment is an examples of nonroad vehicles
- Per-source use rate:** Unit indicating the combined effect of annual hours of use, average-rated horsepower, and load factor. Determined by multiplying the annual hours of use x horsepower x load factor.
- Population:** Total number of units of a given equipment or engine type at a given point in time.
- Refueling emissions:** Hydrocarbon emissions that can occur during filling of the vehicle fuel tank. For the purposes of this report, there are two components of refueling emissions: spillage and vapor displacement.
- Reid Vapor Pressure:** The vapor pressure of gasoline at 100°F (37.8°C) determined in a special bomb in the presence of a volume of air which occupies four times the volume of liquid fuel (ASTM procedure D 323).
- Running loss emissions:** Running loss emissions are those emissions which do not pass through the combustion chamber while the source is in operation
- Spillage emissions:** Spillage emissions, or spillage, are those emissions resulting from spilled fuel incurred during the refueling process.
- Steady-state:** Constant operating conditions with no variation in fuel supply or load. A condition in which circuit values remain essentially constant, occurring after all initial transients or fluctuating conditions have settled down. Steady-state exists when periodic (or constant) vehicle responses to periodic (or constant) control and/or disturbance inputs do not change over an arbitrarily long time. The motion responses in steady-state are referred to as steady-state responses. This definition does not require the vehicle to be operating in a straight line or on a level road surface. It can also be in a turn of constant radius or on a road surface.
- Transient:** A phenomenon caused in a system by a sudden change in conditions and which persists for a relatively short time after the change.

Transient state: Transient state exists when the motion responses, the external forces relative to the vehicle, or the control positions are changing with time.

Vapor displacement: Vapor displacement emissions, or "displacement", are those emissions which result from displacing fuel vapors in the fuel tank with liquid fuel.

Volatile Organic Compounds (VOC): Any compound containing carbon and hydrogen or containing carbon and hydrogen in combination with any other element which has a vapor pressure of 1.5 pounds per square inch absolute or greater under actual storage conditions.

Appendix B

Appendix B. Ozone Formation

This appendix provides a brief explanation of the process by which ozone is formed, followed by a list of other sources expanding on the role of NO_x and VOCs

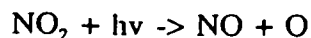
Description

The prediction of ozone (O₃) levels and the development of control strategies for ozone have been complicated by the fact that ozone is not directly emitted. Rather, it is formed in the lower atmosphere in the presence of sunlight through a complex series of reactions between volatile organic compounds (VOCs), oxides of nitrogen (NO_x), and ambient oxygen. The concentrations of ozone and its precursors are dynamic and nonlinear. Thus, ozone concentrations are not necessarily additive, but depend on the concentrations of all compounds involved in atmospheric chemistry. VOCs are emitted by anthropogenic sources, such as evaporation of gasoline and solvents, and by biogenic sources such as vegetation. Individual VOC species differ widely in their capacity to generate ozone. NO_x is formed primarily by combustion processes and can contribute to either the creation or destruction of ozone, depending on the amount of VOCs present.

Ozone is produced when atomic oxygen (O) reacts with molecular oxygen (O₂) in this reaction:

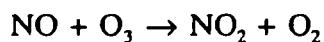


where M is a third body that removes the energy of the reaction and stabilizes the O₃ molecule. The atomic oxygen necessary for this reaction is produced primarily from the photodissociation of NO₂, according to this reaction.

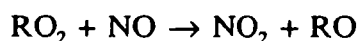


The photon (hν) in this reaction is in the blue-violet end of the visible spectrum which, when absorbed, produces a brown color. This is why a brown haze is associated with ozone pollution, even though ozone itself is a colorless gas. In the above reactions, NO_x is involved in creating ozone.

However, in the absence of other reactants, the ozone and nitrogen oxide (NO) produced in these reactions will combine to form nitrogen dioxide and molecular oxygen



Thus, oxides of nitrogen participate in both the creation of ozone and can retard creation of ozone. Put another way, in isolation equilibrium concentrations of ozone, nitrogen dioxide, and nitrogen oxide coexist. However, in the presence of organic peroxy radicals (RO₂), which are formed by the reaction of hydroxyl radicals (OH) with VOCs, nitrogen dioxide can be regenerated from nitrogen oxide without consuming ozone, as in this reaction:



Thus, the presence of VOCs in the atmosphere is crucial to allowing ozone to accumulate, instead of allowing ozone to stabilize at a relatively low concentration dictated by the equilibrium of NO and NO₂. Generally speaking, the presence of more organic peroxy radicals will allow more ozone molecules to persist in the air. The number of organic peroxy radicals formed from a single VOC varies, and thus the photochemical reactivity of VOCs varies.

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Appendix C

Appendix C. Ozone and CO Nonattainment and Air Toxic Risk Estimates

Two of the most persistent air quality problems in the United States are the nonattainment of National Ambient Air Quality Standards for carbon monoxide (CO) and ozone. Table C-01 lists the areas which are currently failing to meet standards for CO and ozone. In addition to these nonattainment problems, concern regarding the risks associated with motor vehicle air toxics is increasing. The cancer risks associated with the motor vehicle pollutants of most concern are shown in Table C-02.¹

Table C-01. Areas Not Meeting Standards for Carbon Monoxide and Ozone

<u>Metropolitan Area</u>	<u>Pollutant Category</u>	
	<u>CO</u>	<u>Ozone</u>
Albuquerque, NM	Moderate	
Anchorage, AK	Moderate	
Atlanta, GA		Serious
Atlantic City, NJ		Moderate
Bakersfield, CA		Serious
Baltimore, MD	Moderate	Severe
Baton Rouge, LA		Serious
Beaumont, Port Arthur, TX		Serious
Boston, MA	Moderate	Serious
Charleston, WV		Moderate
Charlotte, Rock Hill, Gastonia, NC-SC		Moderate
Chicago, Gary, Lake County, IL-IN-WI		Severe
Chico, CA	Moderate	
Cincinnati, Hamilton, OH-KY-IN		Moderate
Cleveland, OH	Moderate	Moderate
Colorado Springs, CO	Moderate	
Dallas, Fort Worth, TX		Moderate
Dayton, Springfield, OH		Moderate
Denver, Boulder, CO	Moderate	
Detroit, Ann Arbor, MI		Moderate

Metropolitan Area**Pollutant Category****CO Ozone**

Duluth, MN-WI	Moderate	
Edmonson Co., KY		Moderate
El Paso, TX	Moderate	Serious
Fairbanks, AK	Moderate	
Fort Collins, Loveland, CO	Moderate	
Fresno, CA	Moderate	Serious
Grand Rapids, MI		Moderate
Greater Connecticut	Moderate	Serious
Greensboro, Winston Salem, NC	Moderate	Moderate
Houston, Galveston, Brazoriz, TX		Severe
Huntington, Ashland, WV-KY-OH		Serious
Jefferson Co., NY		Moderate
Josephine Co., OR	Moderate	
Kewaunee Co., WI		Moderate
Klamath Co., OR (Klamath Falls)	Moderate	
Knox Co , ME		Moderate
Las Vegas, NV	Moderate	
Los Angeles, Anaheim, Riverside, CA	Serious	Extreme
Louisville, KY-IN		Moderate
Medford, OR	Moderate	
Memphis, TN-AR-MS	Moderate	Moderate
Miami, Fort Lauderdale, FL		Moderate
Milwaukee, WI		Severe
Minneapolis, St. Paul, MN-WI	Moderate	
Missoula, MT	Moderate	
Modesto, CA	Moderate	Moderate
Muskegon, MI		Severe
Nashville, TN		Moderate
New York, Long Island, NY-NJ	Moderate	Severe
Parkersburg, Marietta, WV-OH		Serious
Philadelphia, PA	Moderate	Severe
Phoenix, AZ	Moderate	
Pittsburgh, Beaver Valley, PA		Moderate
Portland, ME		Moderate
Portland, Vancouver, OR-WA	Moderate	
Portsmouth, Dover, Rochester, NH-ME		Serious
Providence, Pawtucket, Fall River, RI-MA		Serious

Metropolitan Area**Pollutant Category****CO Ozone**

Provo-Orem, UT	Moderate	
Raleigh-Durham, NC	Moderate	Moderate
Reading, PA		Moderate
Reno, NV	Moderate	
Richmond, Petersburg, VA		Moderate
Sacramento, CA	Moderate	Serious
Salt Lake City, Ogden, UT		Moderate
San Diego, CA	Moderate	Severe
San Francisco, Oakland, San Jose, CA	Moderate	Moderate
Santa Barbara, Santa Maria, Lompoc, CA		Moderate
Seattle, Tacoma, WA	Moderate	
Sheboygan, WI		Serious
Smyth Co., VA		Moderate
South Bend, Mishawaka, IN		Marginal
Spokane, WA	Moderate	
Springfield, MA		Serious
St. Louis, MO-IL		Moderate
Steubenville, Weirton, OH-WV	Serious	
Stockton, CA	Moderate	Marginal
Syracuse, NY		Moderate
Toledo, OH		Moderate
Visalia, Tulare, Porterville, CA		Moderate
Washington, DC-MD-VA	Moderate	Serious
Winnebago, Co., WI	Serious	
Worcester, MA		Moderate

Table C-02. Summary of Risk Estimates*

Motor Vehicle Pollutant	U.S. Cancer Incidences/Year**		
	1986	1995	2005
1,3-Butadiene	236-269	139-172	144-171
Diesel Particulate	178-860	106-662	104-518
Benzene	100-155	60-107	67-114
Formaldehyde	46-86	24-43	27-48
Gasoline Vapors	17-68	24-95	30-119
Asbestos	5-33	ND***	ND
Acetaldehyde	2	1	1
Gasoline Particulate	1-176	1-156	1-146
Ethylene Dibromide	1	<1	<1
Cadmium	<1	<1	<1
Dioxins	ND	ND	ND
Vehicle Interior Emissions	ND	ND	ND

* The risk estimates are 95% upper confidence limits.

** The risk estimates for asbestos, cadmium and ethylene dibromide are for urban exposure only Risks for the other pollutants include both urban and rural exposure

*** ND = Not Determined

Note: The risk estimates are upper bound estimates; therefore, they are not intended to represent actual numbers of cancer cases but rather can be used to rank the mobile source pollutants and to guide further study.

Projections do not account for the 1990 CAAA revisions. Risk estimates are currently being revised as part of the EPA study of "Mobile Source Related Air Toxics" required by Section 206 of the CAAA.

References

1. Adler, J.M., and P.M. Carey. "Air Toxics Emissions and Health Risks from Motor Vehicles," AWMA paper 89-34A.6 presented at the AWMA 82nd Annual Meeting, Anaheim, CA, June 1989.

Appendix D

Appendix D. Mobile Source Air Toxics

This appendix provides detailed lists of air toxics of concern to human health. These lists were used to help decide which toxics to include in the *Nonroad Engine and Vehicle Emission Study*.

Table D-01. Mobile Source Related Air Toxics for EPA Study.

Benzene	Metals:
Formaldehyde	Iron
Acetaldehyde	Copper
1,3-Butadiene	Selenium
Diesel Particulate	Platinum
Gasoline Particulate	Cerium
Gasoline Vapors	

Table D-02. Other Motor Vehicle Toxics from Title III of the 1990 Clean Air Act Amendments.*

Acetonitrile	Hexane
Acrolein	Lead compounds
Acrylic acid	Manganese compounds
Carbon Disulfide	Methanol
Carbonyl sulfide	Methyl ethyl ketone
Catechol	Methyl tert. butyl ether
Chlorine	Naphthalene
Cresols/Cresylic acid	Phenol
Dibenzofurans	Polycyclic organic matter
Diethyl sulfate	Propionaldehyde
Dimethyl sulfate	Styrene
1,4-Dioxane	Toluene
Ethyl benzene	2,2,4-Trimethylpentane
Ethylene dibromide	Xylenes
Ethylene dichloride	

* This list compiled by the Office of Mobile Sources in preparing the EPA study required by Section 206 of the CAAA

Table D-03. Southwest Research Institute Recommendations.

Benzene
Formaldehyde
Acetaldehyde
1,3-Butadiene
Gasoline Vapors
Diesel Particulate
Gasoline Particulate
Iron

Appendix E

Appendix E. Manufacturer Association Membership

This appendix provides a short description for the primary manufacturer associations for nonroad engines and vehicles. Where available, a list of the member companies is also provided.

Industrial Truck Association

The Industrial Truck Association (ITA) is the national, not-for-profit trade association of forklift truck manufacturers and their suppliers. ITA members collectively produce and sell 90 percent of all industrial forklift trucks in the United States.

Regular Members

Baker Material Handling Corp.
Barrett Industrial Trucks
Big Joe Manufacturing Co.
Caterpillar Industrial Inc.
Clark Material Handling, Inc.
Crown Equipment
Drexel Industries, Inc.
Elwell-Parker Electric Co
Hyster Company
K-D Manitou, Inc.
Kalmar AC
Komatsu Forklift Inc.
 USA
 Canada
Mitsubishi Heavy Industries
 USA
 Canada
Multiton MIC Corp.
Nissan Indust. Equip. Co.
 USA
 Canada
The Prime Mover Company (BT)
The Raymond Corporation
TCM America
 USA
 C. ITOH
 TCM
 Canada
 Delval Handling

Associate Members

Anderson Power Products
Aquila Corporation
Basiloid Products Corp.
C&D Power Systems
Cascade Corporation
Chloride/Pilot
Curtis Instruments, Inc.
East Penn Mfg. Co , Inc.
Engelhard Corporation
Erectoweld Co., Inc.
Exide Corporation
GNB Indust. Battery Co
Hercules Engines, Inc
Industrial Tires, Ltd.
K W Battery
Kenhar Products Inc
Kurdziel Industries
Long Reach Mfg. Corp
Prestolite Electric Inc.
Sevcon
Steel of West Virginia
Swing-Shift Mfg , Inc
Toyoshima
Vickers, Inc.

Toyota
USA
Canada
Yale Materials Handling Corp.

Portable Power Equipment Manufacturers Association

The Portable Power Equipment Manufacturers Association (PPEMA) is the national, not-for-profit trade association representing the manufacturers of small engine powered off-road equipment such as chain saws, string trimmers, brush cutters, blowers, hedge trimmers, generators and cut-off saws. PPEMA's members manufacture the engines used in the final products they produce.

Members

Allied Signal
BASF Corporation
Carlton Company
Dolmar U.S.A., Inc.
Echo, Inc.
Homelite Division of Textron, Inc.
Husqvarna Forest & Garden Company
Inertia Dynamics Corporation
Kawasaki Motor Corporation, U.S.A.
Komatsu Zenoah America, Inc.
Oregon Cutting Systems, Division of Blount, Inc.
Poulan/Weed Eater
R.E. Phelon Company, Inc.
Shakespeare Monofilament Company
Shindaiwa, Inc.
Stihl, Inc.
The Toro Company
Walbro Corporation
U.S.A. Zama, Inc.

Outdoor Power Equipment Institute, Inc.

The Outdoor Power Equipment Institute (OPEI) is the national trade association representing manufacturers of consumer and commercial outdoor power equipment and their major components. OPEI members produce the following types of equipment and products. walk-behind lawnmowers; rear engine riding mowers; lawn tractors; garden tractors; walk-behind tillers; walk-behind snow throwers; commercial turf care equipment; engines/attachments/components, shredders/grinders; lawn vacuums; flexible line trimmers; leaf blowers; log splitters; power brakes and thatchers; and lawn/edger/trimmers. In most cases, the goods manufactured by OPEI members are produced for the consumer market, and represent 86.9 percent of the U.S. market for lawn and garden equipment.

Regular Members

American Yard Products
Ariens Company
Consolidated
Atlas Power Equipment
Bunton Company
John Deere Horicon Works
Dixon Industries, Inc.
Exmark Mfg., Inc
Ferris Industries, Inc.
Garden Way, Inc.
Garden Way, Inc.-PW
Hoffco, Inc.
Homelite Div. of Textron
Honda Power Equip Mfg., Inc.
Howard Price Turf Equipment
Ingersoll Equip. Co., Inc.
F D. Kees Mfg. Co.
Kut-Kwick Corporation
Lambert Corporation
Lawn-Boy, Inc.
Maxim Mfg. Co.
MTD Products, Inc.
The Murray Ohio Mfg. Co.
NOMA Outdoor Products, Inc.
Power King/Div. of Support
Services International

Associate Members

Ataco Steel Products Corp.
Auburn
Industries, Inc. KTC
Briggs & Stratton Corp.
Brinly-Hardy Co , Inc.
Capro, Inc.
Carlisle Tire and Rubber Co
Dana Corporation
Delta Systems, Inc.
Dickey-John Corp.
DICO Tire, Inc.
Duramatic Products
Eaton Corporation
The Empire Plow Co., Inc.
Fisher Barton, Inc.
Geneco Mfg., (Div of PLP)
Kelch Corporation
Kohler Company
Lund International
Michigan Seat Company
Monsanto Plastics Co
New Hampshire Industries
Onan Corp.-Engine Division
Sauer-Sundstrand
Southern Mills, Inc.

Ransomes, Inc.
Roto-Hoe
Sarlo Power Mowers, Inc.
Scag Power Equipment, Inc.
Simplicity Mfg., Inc.
Equipment
Solo Incorporated
Southland Mower Corp.
Tornado Products
The Toro Company
Trailmate, Inc.
Wheeler Mfg. Co.
Yazoo Mfg., Inc.

J.W. Speaker Corporation
Tecumseh Products Company
Teledyne Total Power
Torrington Company
Transamerica Commercial Snapper Power
Finance Corp.
Tuff Torq Corporation
Wescon Products Company
Whirltronics, Inc.
Woods, Div. of Hesston
Yuasa-Exide Battery Corp.

Engine Manufacturers Association

The Engine Manufacturers Association (EMA) represents the manufacturers of engines for all applications other than aircraft and passenger cars. Membership includes both small and large engine manufacturers.

Members

American Honda
American Suzuki
Briggs & Stratton
Caterpillar Inc.
Cummins Engine Company
Deere & Company
Detroit Diesel Corporation
Deutz Corporation
Ford New Holland
General Electric
General Motors Corporation
Hino Motors, Ltd.
Isuzu Motors America, Inc.
Kawasaki Motors Corporation
Kohler Company
Yanmar Diesel America

Komatsu Ltd.
Kubota Corporation
Lister-Petter, Inc.
Mack Trucks, Inc.
Mercedes-Benz Truck
Mitsubishi Engine North
America, Inc.
Mitsubishi Motors America
Onan Corporation
Scania USA, Inc.
Tecumseh Products
Teledyne Total Power
Toyota Industrial Engines
Volvo GM Heavy Truck
Waukesha Engine Division
Dresser Industries

Equipment Manufacturers Institute

The Equipment Manufacturers Institute (EMI) is the principal association in the United States representing manufacturers of agricultural, construction, forestry, material handling and utility equipment.

Active Members

Aero-Lift Company
Agrequip, Inc.
Alamo, Group
Alfa-Laval Agri, Inc.
Allied Products Corporation
Alo USA Inc.
Alsea Industries Inc.,
Amerequip Corporation
American Coupler Systems, Inc.
American Trencher Inc.
Arts-Way Manufacturing Co.
Asplunch Mfg. Division
Auburn Consolidated Industries
Augers Unlimited, Inc.
Automatic Equipment Mfg Co

Babson Bros Company
Badger-Northland Inc.
Behlem Manufacturing Co.
Bolarus Machinery Inc.
Bor-It Mfg. Company Inc.
Bou-Matic, The Dairy Equipment
Div. of DEC Int., Inc.

Calavar Corporation
Carefift Equipment Ltd.
J I Case
Caterpillar Inc.
Charles Machine Works, Inc
Chief Industries Inc.
Class of America, Inc.
Clay Equipment Corporation
Crenlo, Inc.
Custom Products of Litchfield

Dahmer Fork Lift Ltd.

Leon-Ram Enterprises, Inc.
Lift-A-Loft Corporation
Livestock Monitoring Systems, Inc
Load Lifter Mfg. Ltd.
J.E. Love Company
Lowe Manufacturing Co , Inc
Lull Corporation

MacDon Industries Ltd.
Major Equipment Co., Inc.
Manitex, Inc.
Mark Industries Inc
Massey-Ferguson Inc.
Master Craft Industrial Equip. Corp
Mathews Company
Mayrath Industries Inc.
Mayville Engineering Co Inc
McConnell Tractors Ltd.
Ralph McKay (Canada) Ltd.
McLaughlin Mfg. Co
McMillen Div. of States Eng Corp
Meadows Products of Michigan
Melred Borzall Inc.
Melroe Company
MF Industrial
mfe/York Division
Miller St Nazianz Inc.
Mitsubishi Heavy Industries Ltd
Mustang Mfg. Co , Inc.

National Crane Corporation

Palm Industries Inc.
Patz Sales Inc.
Pertach, Inc.
Pettibone Michigan

Danuser Machine Co.
Deere & Company
Deutz-Allis Corporation
DICKKEY-john Corporation
Dunbar Manufacturing Inc.

Elliott Equipment Corp
Esco Corporation
Eversman, Inc.

Farmhand, Inc.
tfi Corporation
FMC Corporation
FMC Corporation/AG Mach. Div.
FMC Corp./Food Processing
Systems Div.
Ford New Holland Inc.
Franklin Equipment Company
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Equipment Management Magazine

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ZF of North America
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Construction Industry Manufacturers Association

The Construction Industry Manufacturers Association (CIMA) is an 80-year-old international trade association representing over 175 manufacturers of construction machines, components and attachments used around the world. The equipment is used primarily in the heavy construction, earthmoving, roadbuilding, housing, mining, material handling, maintenance, energy and forestry fields.

Members

The Aberdeen Group
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Gencor Industries Inc.
General Engines Co. Inc.
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Grasan Equipment Co., Inc
Griswold Machinery & Engineering
Grove Worldwide
Hayes Industrial Brake Inc.
Heavy Constrn News/Maclean
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Hendrix Mfg. Co., Inc.
Hercules Engine, Inc
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Jordan-Sitter Associates
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 RGC Construction Equipment

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 Rosco Manufacturing Company
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 Stephens Mfg. Co., Inc
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 Wisconsin Electrical Mfg. Co., Inc.
 Wyco Tool Company (The)

National Marine Manufacturers Association

The National Marine Manufacturers Association (NMMA) represents manufacturers of boats, marine engines, accessories and services. Marine engine manufacturers are represented by the Association of Marine Engine Manufacturers (AMEM), whose members are listed below.

Members

American Eagle Marine, Inc.
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American Suzuki Motor Corp
Baker Inc.
Caterpillar Inc.
Commander Marine Corp.
Crusader Engines
Cummins Engine Co, Inc.
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Eagle Engine Marine
Flagship Marine Engine Co., Inc
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Johnson & Towers, Inc.
Lister-Petter, Inc.
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Mariner Outboards
Mercruiser
Mercury Marine
Merlin Marine Engine Group
MTU of North America, Inc.
Nissan Marine & Power Products
Outboard Marine Corporation
Paxman Diesels
Peninsular Diesel, Inc.
Pleasurecraft Marine Engines
Stewart & Stevenson Services
U.S. Marine Power
Universal Motors-Medalist
Volvo Penta of America
Westerbeke Corporation
Yamaha Motor Corp.

Appendix F. Technical Review Group Representatives

The following groups and organizations external to EPA provided a technical reviewer to serve on a technical review panel. This panel provided feedback to staff on technical issues during the study.

California Air Resources Board (CARB)
Construction Industry Manufacturers Association (CIMA)
Engine Manufacturers Association (EMA)
Equipment Manufacturers Institute (EMI)
Industrial Truck Association (ITA)
National Marine Manufacturers Association (NMMA)
Northeast States for Coordinated Air Use Management (NESCAUM)
Outdoor Power Equipment Institute, Inc. (OPEI)
Portable Power Equipment Manufacturers Association (PPEMA)

Appendix G. Emission Inventories Developed Using SIP and CARB Data

As EPA began its study of nonroad emissions, one of the most comprehensive sources of data already available were emission inventories developed for State Implementation Plans (SIPs) EPA considered existing draft emission inventories developed by states in 1987 SIPs and recent inventories developed by the California Air Resources Board (CARB) for their SIPs. SIPs from eighteen geographical areas were used, as were CARB analyses for seven air basins in California. Table G-01 provides a list of these areas.

Table G-01. SIP and CARB Inventories Considered.

SIP Geographical Area	CARB Air Basin
Atlanta, GA MSA	Mountain Counties
Beaumont-Port Arthur, TX MSA	Sacramento Valley
Boston-Lawrence-Salem-Lowell-Brockton, MA NECMA	San Diego
Chicago-Gary-Lake County IL-IN-WI CMSA (IL portion)	San Francisco Bay Area
State of Connecticut	San Joaquin Valley
Dallas-Fort Worth, TX CMSA	South Central Coast
Denver-Boulder CO CMSA	South Coast
Duluth, MN-WI MSA (MN portion)	
El Paso, TX MSA	
Fort Collins-Loveland, CO MSA	
Hartford-New Britain-Middletown-Bristol, CT NECMA	
Houston-Galveston-Brazoria TX CMSA	
Louisville, KY CMSA (KY portion)	
Minneapolis-St Paul MN-WI MSA (MN portion)	
State of New Jersey	
State of Massachusetts	
Seattle-Tacoma WA CMSA	
Springfield, MA NECMA	

Certain gaps and inconsistencies, as well as outdated emission factors, in the SIP

inventories made it difficult to use inventories as available. However, the SIP inventories considered were developed in enough detail that it was possible to discern how activity levels for nonroad mobile sources were estimated. EPA resolved the inconsistencies where possible and substituted new emission factors in order to generate new inventories based on the SIP data. The emission inventories developed by CARB for nonroad mobile sources were much more detailed than those from the SIPs, and were summarized without revision by EPA.

EPA also contracted for the gathering and compiling of new, comprehensive emission inventories in 24 cities, as described in the body of this report. The SIP inventories categorized nonroad mobile sources in slightly different ways than EPA did in developing new emission inventories. In Table G-02, the SIP and CARB categories are compared with the ten equipment categories developed by EPA for this study

Table G-02. Different ways of categorizing nonroad mobile sources.

<u>SIPs</u>	<u>CARB</u>	<u>New EPA 24-City</u>
Construction Equipment	Heavy Duty Farm Equipment	Agricultural Equipment
Industrial Equipment	Heavy Duty Construction Equip	Logging Equipment
Lawn & Garden Equip.	Utility, Lawn, Garden Equip.	Construction Equipment
Off-Highway Motorcycles	Off-Highway Mobile Equipment	Light Commercial
Snowmobiles	Marine Vessels	Industrial Equipment
Recreational Boats		Airport Service Equipment
Commercial Marine Vessels		Lawn & Garden Equipment
		Recreational Equipment
		Recreational Marine
		Commercial Marine Vessels

The following section describes in greater detail the data obtained from SIPs and the methodology used in creating the inventories using this data.

SIP-Based Activity Levels

Emission inventories are developed as part of State Implementation Plans, or SIPs, which are submitted periodically to EPA by areas that do not comply with NAAQS. SIPs themselves outline means by which state authorities plan to meet the NAAQS. Generally, this includes a plan for emission reductions, which are projected based on the baseline emission inventory. State air quality planners generally develop emission inventories for

nonattainment areas following the methodologies outlined in the existing EPA guidance.¹

EPA provides information on preparing emission inventories for SIPs in a series of five documents entitled *Procedures for Emission Inventory Preparation* (henceforth simply *Procedures*). The first volume gives an overview of the methodologies and reporting requirements for emission inventories and subsequent volumes give the methodologies whereby activity levels may be estimated at the county level for point sources,² nonroad and highway mobile sources,³ and other area sources.⁴ Although all mobile sources are a subcategory of area sources, the term "mobile source" was often used in past SIP emission inventories to refer solely to highway vehicles. Emissions from all other mobile sources are, in such cases, often reported as "off-highway mobile sources" in the area source inventory. This is likely due to the fact that highway vehicles are already regulated and therefore much better characterized than nonroad mobile sources. Also, nonroad mobile source activity is often more similar to that of other area sources than is highway vehicle activity. For example, construction equipment activity can be characterized by considering the construction industry employment during the inventory period. Similarly, fuel consumption (e.g. heating oil) in commercial and industrial applications may be estimated using employment statistics in the applicable industries.

After activity levels for the various source types have been estimated, emission factors[†] must be applied to calculate emissions in mass per unit time for each of the pollutants being studied in the inventory area.

Inventories developed for SIPs are usually developed for a given base year (BY); hence emissions are expressed in tons per year (tpy). In areas where nonattainment is a seasonal problem, the inventories may also be temporally adjusted. In many areas, ozone nonattainment is predominately a summertime problem; therefore, emissions of ozone precursors are expressed in tons per summer day (tpsd). Similarly, because CO nonattainment is usually a wintertime problem,[‡] CO emissions are often expressed in tons per winter day (tpwd).

[†] Emission factors for nonroad mobile sources that are currently available from EPA guidance are given in *Compilation of Air Pollutant Emission Factors, Volume II Mobile Sources, Fourth Edition and Supplements, AP-42*, U.S. Environmental Protection Agency, Research Triangle, Park, NC, September 1985

[‡] There are notable exceptions, however. The following areas had two or more summertime CO exceedances between 1986 and 1988: Cleveland, Ohio; New York City, New York; St. Louis, Missouri, and Steubenville, Ohio

For this study, EPA has examined several of the draft SIP inventories developed by states for the 1987 and 1988 BY. Because of the CAAA requirement that states develop emission inventories for the 1990 BY, many of the 1987/1988 draft inventories have not been finalized at this time. However, because the 1990 BY inventories will not be completed in 1991, only the earlier inventories may be considered for this study, despite the fact that they are still in draft form.

In analyzing 1987 base year emission inventories from SIPs, EPA extracted the activity levels calculated for nonroad engines and vehicles. Because the activity levels were separated from the emission factors, it was possible to apply the emission factors developed as part of this study to the activity levels to develop revised emission inventories that have benefitted from improvements to the emission factors.

In adjusting the SIP emission inventories for seasonal activity variations, EPA determined what assumptions had been used in the original inventory and applied only those having to do with seasonal variations. Consequently, these seasonal temporal adjustments are different from those made in inventories that also considered day-to-day activity fluctuations or daily temporal adjustments.

Summaries of the analysis of SIP emission inventories are given in the following tables. Detailed results of the SIP emission inventories are given in *State Estimates of Nonroad Engine and Vehicle Emissions*,⁵ which documents for each nonattainment area studied the nonroad engine and vehicle activity levels derived, the emissions calculated, and the emissions from other sources (i.e., highway vehicles, other area and point sources)

Emission inventories prepared by the CARB are considered separately because inventories for some nonroad mobile source categories have recently been developed by CARB in support of California's proposed regulations applicable to such sources. These emission inventories are generally more refined than those that have been developed by states following the existing EPA guidance. Furthermore, they use different nonroad mobile source categories and are, therefore, not directly comparable to the draft SIP inventories.

Because of these differences from the SIP-based inventories, data from California's nonroad mobile source emission inventories were used as provided and compared to the highway and other source emissions given in the March 1990 version of the 1987 emission inventory prepared by CARB. The nonroad mobile source categories for which CARB has

recently developed emission inventories are: utility and lawn and garden equipment,⁶ heavy duty farm and construction equipment,⁷ and commercial marine vessels.⁸ ⁹ These inventories are also summarized in the following tables.

⁹Study continues for other categories. These reports were available for use in this study

Table G-03.

EMISSION INVENTORY SUMMARY

Geographical Area Springfield NECMA
 Base Year 1987
 Last Change to Activity Levels 07/03/91
 Last Emission Factor Changes 07/05/91

Category	HC tpy	NOx tpy	Summer		Summer	
			HC tpsd	NOx tpsd	% Total HC tpsd	% Total NOx tpsd
Farm Equipment	148	315	0.63	1.33	0.49%	2.01%
Construction Equipment	147	922	0.40	2.53	0.32%	3.81%
Industrial Equipment	306	589	0.84	1.62	0.66%	2.44%
Lawn & Garden Equipment	240	8	0.86	0.03	0.68%	0.05%
Off Highway Motorcycles	37	1	0.13	0.00	0.11%	0.00%
Snowmobiles	54	1	0.00	0.00	0.00%	0.00%
Recreational Boats	2,198	109	12.08	0.60	9.50%	0.90%
<u>Marine Vessels</u>	<u>0</u>	<u>0</u>	<u>0.00</u>	<u>0.00</u>	<u>0.00%</u>	<u>0.00%</u>
Nonroad Engines and Vehicles	3,130	1,944	14.94	6.11	11.76%	9.21%
Highway Mobile Sources			62.47	30.30	49.16%	45.63%
<u>Other Area and Point Sources</u>			<u>49.66</u>	<u>29.99</u>	<u>39.08%</u>	<u>45.16%</u>
All Area and Point Sources			127.07	66.41	100.00%	100.00%

EMISSION INVENTORY SUMMARY

Geographical Area Massachusetts
 Base Year 1987
 Last Change to Activity Levels 07/03/91
 Last Emission Factor Changes 07/05/91

Category	HC tpy	NOx tpy	CO tpy	Summer		Summer		Winter	
				HC tpsd	NOx tpsd	% Total HC tpsd	% Total NOx tpsd	CO tpwd	% Total CO tpwd
Farm Equipment	827	1,758	11,033	3.50	7.45	0.28%	0.96%	7.28	0.21%
Construction Equipment	1,791	11,239	22,173	4.92	30.88	0.39%	3.98%	60.92	1.72%
Industrial Equipment	3,059	5,889	53,659	8.40	16.18	0.66%	2.08%	147.41	4.17%
Lawn & Garden Equipment	2,335	82	17,969	8.34	0.29	0.66%	0.04%	0.00	0.00%
Off Highway Motorcycles	375	8	990	1.34	0.03	0.11%	0.00%	0.00	0.00%
Snowmobiles	535	8	789	0.00	0.00	0.00%	0.00%	5.19	0.15%
Recreational Boats	13,717	680	28,622	75.37	3.74	5.95%	0.48%	0.00	0.00%
<u>Marine Vessels</u>	<u>132</u>	<u>2,971</u>	<u>309</u>	<u>0.37</u>	<u>6.66</u>	<u>0.03%</u>	<u>0.86%</u>	<u>0.99</u>	<u>0.03%</u>
Nonroad Engines and Vehicles	22,771	22,634	135,544	102.25	65.22	8.07%	8.40%	221.79	6.27%
Highway Mobile Sources				670.22	335.35	52.88%	43.22%	2,372.62	67.05%
<u>Other Area and Point Sources</u>				<u>494.90</u>	<u>375.43</u>	<u>39.05%</u>	<u>48.38%</u>	<u>944.14</u>	<u>26.68%</u>
All Area and Point Sources				1,267.37	776.00	100.00%	100.00%	3,538.55	100.00%

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Table G-04.

EMISSION INVENTORY SUMMARY

Geographical Area Louisville, KY
 Base Year 1988
 Last Change to Activity Levels 05/09/91
 Last Emission Factor Changes 07/05/91

Category	HC tpy	NOx tpy	Summer		Summer	
			HC tpsd	NOx tpsd	% Total HC tpsd	% Total NOx tpsd
Farm Equipment	421	1,369	1.27	4.14	2.69%	14.75%
Construction Equipment	286	1,798	0.92	5.76	1.94%	20.55%
Industrial Equipment	369	710	1.18	2.28	2.50%	8.11%
Lawn & Garden Equipment	414	15	1.47	0.05	3.12%	0.18%
Off Highway Motorcycles	56	1	0.20	0.00	0.43%	0.01%
Snowmobiles	0	0	0.00	0.00	0.00%	0.00%
Recreational Boats	225	7	0.80	0.02	1.69%	0.09%
<u>Marine Vessels</u>	<u>0</u>	<u>0</u>	<u>0.00</u>	<u>0.00</u>	<u>0.00%</u>	<u>0.00%</u>
Nonroad Engines and Vehicles	1,771	3,900	5.84	12.26	12.36%	43.71%
Highway Mobile Sources			19.89	8.99	42.08%	32.06%
<u>Other Area and Point Sources</u>			<u>21.54</u>	<u>6.80</u>	<u>45.56%</u>	<u>24.23%</u>
All Area and Point Sources			47.27	28.04	100.00%	100.00%

EMISSION INVENTORY SUMMARY

Geographical Area Minneapolis/St Paul, MN
 Base Year 1987
 Last Change to Activity Levels 05/17/91
 Last Emission Factor Changes 07/05/91

Category	CO tpy	% Total CO tpy
Farm Equipment	13,548	1.64%
Construction Equipment	17,209	2.08%
Industrial Equipment	22,040	2.67%
Lawn & Garden Equipment	33,451	4.05%
Off Highway Motorcycles	1,630	0.20%
Snowmobiles	3,249	0.39%
Recreational Boats	37,148	4.50%
<u>Marine Vessels</u>	<u>28</u>	<u>0.00%</u>
Nonroad Engines and Vehicles	128,302	15.54%
Highway Mobile Sources	545,808	66.09%
<u>Other Area and Point Sources</u>	<u>151,775</u>	<u>18.38%</u>
All Area and Point Sources	825,885	100.00%

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Table G-05.

EMISSION INVENTORY SUMMARY

Geographical Area Connecticut-Hartford NECMA
 Base Year 1987
 Last Change to Activity Levels 07/03/91
 Last Emission Factor Changes 07/05/91

Category	HC tpy	NOx tpy	CO tpy	Summer		Summer		Winter	
				HC tpsd	NOx tpsd	% Total HC tpsd	% Total NOx tpsd	CO tpwd	% Total CO tpsd
Farm Equipment	218	266	3,295	0.90	1.09	0.34%	0.88%	0.00	0.00%
Construction Equipment	964	6,079	11,928	3.97	25.02	1.50%	20.18%	0.00	0.00%
Industrial Equipment	713	1,372	12,502	1.96	3.77	0.74%	3.04%	34.35	3.97%
Lawn & Garden Equipment	804	39	7,924	3.31	0.16	1.25%	0.13%	0.00	0.00%
Off Highway Motorcycles	204	4	539	2.24	0.05	0.85%	0.04%	0.00	0.00%
Snowmobiles	54	1	80	0.00	0.00	0.00%	0.00%	1.05	0.12%
Recreational Boats	542	18	1,098	4.48	0.15	1.70%	0.12%	0.00	0.00%
<u>Manne Vessels</u>	<u>11</u>	<u>260</u>	<u>29</u>	<u>0.03</u>	<u>0.71</u>	<u>0.01%</u>	<u>0.58%</u>	<u>0.08</u>	<u>0.01%</u>
Nonroad Engines and Vehicles	3,511	8,039	37,394	16.89	30.95	6.39%	24.96%	35.47	4.10%
Highway Mobile Sources				170.45	74.94	64.52%	60.45%	593.59	68.67%
<u>Other Area and Point Sources</u>				<u>76.85</u>	<u>18.08</u>	<u>29.09%</u>	<u>14.58%</u>	<u>235.38</u>	<u>27.23%</u>
All Area and Point Sources				264.18	123.97	100.00%	100.00%	864.44	100.00%

EMISSION INVENTORY SUMMARY

Geographical Area Houston-Galveston-Brazoria CMSA
 Base Year 1988
 Last Change to Activity Levels 05/29/91
 Last Emission Factor Changes 07/05/91

Category	HC tpy	NOx tpy	Summer		Summer	
			HC tpsd	NOx tpsd	% Total HC tpsd	% Total NOx tpsd
Farm Equipment	481	402	1.32	1.10	0.12%	0.04%
Construction Equipment	4,165	26,214	11.41	71.82	1.05%	2.67%
Industrial Equipment	1,443	2,779	3.95	7.61	0.37%	0.28%
Lawn & Garden Equipment	233	8	0.64	0.02	0.06%	0.00%
Off Highway Motorcycles	23	0	0.06	0.00	0.01%	0.00%
Snowmobiles	0	0	0.00	0.00	0.00%	0.00%
Recreational Boats	9,261	147	25.37	0.40	2.34%	0.01%
<u>Manne Vessels</u>	<u>1,149</u>	<u>26,327</u>	<u>3.14</u>	<u>72.13</u>	<u>0.29%</u>	<u>2.69%</u>
Nonroad Engines and Vehicles	16,755	55,878	45.90	153.09	4.24%	5.70%
Highway Mobile Sources			257.40	1,673.90	23.77%	62.31%
<u>Other Area and Point Sources</u>			<u>779.54</u>	<u>859.40</u>	<u>71.99%</u>	<u>31.99%</u>
All Area and Point Sources			1,082.84	2,686.39	100.00%	100.00%

Table G-06.

EMISSION INVENTORY SUMMARY

Geographical Area El Paso CMSA
 Base Year 1988
 Last Change to Activity Levels 05/29/91
 Last Emission Factor Changes 07/05/91

Category	HC tpy	NOx tpy	CO tpy	Summer		Summer		Winter	
				HC tpsd	NOx tpsd	% Total HC tpsd	% Total NOx tpsd	CO tpwd	% Total CO tpsd
Farm Equipment	83	281	1,032	0.23	0.77	0.25%	1.04%	2.83	0.73%
Construction Equipment	669	4,212	8,279	1.83	11.54	2.04%	15.65%	22.68	5.86%
Industrial Equipment	165	318	2,899	0.45	0.87	0.50%	1.18%	7.94	2.05%
Lawn & Garden Equipment	30	1	234	0.08	0.00	0.09%	0.00%	0.64	0.17%
Off Highway Motorcycles	26	1	68	0.07	0.00	0.08%	0.00%	0.19	0.05%
Snowmobiles	0	0	0	0.00	0.00	0.00%	0.00%	0.00	0.00%
Recreational Boats	0	0	0	0.00	0.00	0.00%	0.00%	0.00	0.00%
<u>Marine Vessels</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0.00</u>	<u>0.00</u>	<u>0.00%</u>	<u>0.00%</u>	<u>0.00</u>	<u>0.00%</u>
Nonroad Engines and Vehicles	974	4,813	12,513	2.67	13.19	2.97%	17.88%	34.28	8.86%
Highway Mobile Sources	0	0	0	53.60	35.70	59.69%	48.40%	337.10	87.15%
<u>Other Area and Point Sources</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>33.53</u>	<u>24.87</u>	<u>37.34%</u>	<u>33.72%</u>	<u>15.41</u>	<u>3.98%</u>
All Area and Point Sources	974	4,813	12,513	89.80	73.75	100.00%	100.00%	386.79	100.00%

EMISSION INVENTORY SUMMARY

Geographical Area Ft Collins/Greeley/Loveland
 Base Year: 1987
 Last Change to Activity Levels 07/03/91
 Last Emission Factor Changes 07/05/91

Category	CO tpy	Winter	
		CO tpwd	% Total CO tpsd
Farm Equipment	0	0.00	0.00%
Construction Equipment	1,307	1.44	0.61%
Industrial Equipment	2,594	7.13	3.01%
Lawn & Garden Equipment	0	0.00	0.00%
Off Highway Motorcycles	0	0.00	0.00%
Snowmobiles	0	0.00	0.00%
Recreational Boats	0	0.00	0.00%
<u>Marine Vessels</u>	<u>0</u>	<u>0.00</u>	<u>0.00%</u>
Nonroad Engines and Vehicles	3,901	8.56	3.62%
Highway Mobile Sources		198.21	83.76%
<u>Other Area and Point Sources</u>		<u>29.87</u>	<u>12.62%</u>
All Area and Point Sources		236.65	100.00%

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Table G-07.

EMISSION INVENTORY SUMMARY

Geographical Area Denver
 Base Year 1987
 Last Change to Activity Levels 07/03/91
 Last Emission Factor Changes 07/05/91

<u>Category</u>	<u>CO</u> <u>tpy</u>	Winter	
		<u>CO</u> <u>tpwd</u>	<u>% Total</u> <u>CO tpwd</u>
Farm Equipment	0	0 00	0 00%
Construction Equipment	7,473	8 21	0 50%
Industrial Equipment	17,478	48 02	2.94%
Lawn & Garden Equipment	0	0 00	0 00%
Off Highway Motorcycles	0	0 00	0 00%
Snowmobiles	0	0 00	0 00%
Recreational Boats	0	0 00	0 00%
<u>Marine Vessels</u>	<u>0</u>	<u>0.00</u>	<u>0.00%</u>
Nonroad Engines and Vehicles	24,951	56.23	3 44%
Highway Mobile Sources		1,416.60	86.70%
<u>Other Area and Point Sources</u>		<u>161.18</u>	<u>9 86%</u>
All Area and Point Sources		1,634 00	100 00%

EMISSION INVENTORY SUMMARY

Geographical Area Duluth, MN
 Base Year 1987
 Last Change to Activity Levels. 05/15/91
 Last Emission Factor Changes 07/05/91

<u>Category</u>	<u>CO</u> <u>tpy</u>	<u>% Total</u> <u>CO tpy</u>
Farm Equipment	0	0 00%
Construction Equipment	246	0.70%
Industrial Equipment	339	0 97%
Lawn & Garden Equipment	1,285	3 67%
Off Highway Motorcycles	57	0 16%
Snowmobiles	36	0 10%
Recreational Boats	166	0 47%
<u>Marine Vessels</u>	<u>3</u>	<u>0.01%</u>
Nonroad Engines and Vehicles	2,132	6 10%
Highway Mobile Sources	21,603	61 77%
<u>Other Area and Point Sources</u>	<u>11,237</u>	<u>32.13%</u>
All Area and Point Sources	34,972	100 00%

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EMISSION INVENTORY SUMMARY

Geographical Area Connecticut
 Base Year 1987
 Last Change to Activity Levels 07/03/91
 Last Emission Factor Changes 07/05/91

Category	HC tpy	NOx tpy	CO tpy	Summer		Summer		Winter	
				HC tpsd	NOx tpsd	% Total HC tpsd	% Total NOx tpsd	CO tpwd	% Total CO tpsd
Farm Equipment	602	728	9,022	2.48	3.00	0.31%	0.77%	0.00	0.00%
Construction Equipment	2,382	15,012	29,414	9.80	61.78	1.22%	15.81%	0.00	0.00%
Industrial Equipment	2,029	3,906	35,591	5.57	10.73	0.69%	2.75%	97.78	4.05%
Lawn & Garden Equipment	2,192	107	21,594	9.02	0.44	1.12%	0.11%	0.00	0.00%
Off Highway Motorcycles	577	12	1,525	6.34	0.13	0.79%	0.03%	0.00	0.00%
Snowmobiles	113	2	166	0.00	0.00	0.00%	0.00%	2.18	0.09%
Recreational Boats	6,060	410	13,051	50.09	3.39	6.23%	0.87%	0.00	0.00%
<u>Marine Vessels</u>	<u>17</u>	<u>386</u>	<u>43</u>	<u>0.05</u>	<u>1.07</u>	<u>0.01%</u>	<u>0.27%</u>	<u>0.12</u>	<u>0.00%</u>
Nonroad Engines and Vehicles	13,971	20,562	110,406	83.35	80.53	10.37%	20.61%	100.08	4.15%
Highway Mobile Sources				472.44	207.73	58.79%	53.16%	1,625.32	67.36%
<u>Other Area and Point Sources</u>				<u>247.76</u>	<u>102.52</u>	<u>30.83%</u>	<u>26.23%</u>	<u>687.39</u>	<u>28.49%</u>
All Area and Point Sources				803.55	390.78	100.00%	100.00%	2,412.79	100.00%

EMISSION INVENTORY SUMMARY

Geographical Area Dallas-Fort Worth CMSA
 Base Year 1988
 Last Change to Activity Levels 06/04/91
 Last Emission Factor Changes 07/05/91

Category	HC tpy	NOx tpy	Summer		Summer	
			HC tpsd	NOx tpsd	% Total HC tpsd	% Total NOx tpsd
Farm Equipment	1,082	3,439	2.96	9.42	0.51%	1.86%
Construction Equipment	3,052	19,209	8.36	52.63	1.43%	10.40%
Industrial Equipment	1,943	3,740	5.32	10.25	0.91%	2.03%
Lawn & Garden Equipment	252	9	0.69	0.02	0.12%	0.00%
Off Highway Motorcycles	26	1	0.07	0.00	0.01%	0.00%
Snowmobiles	0	0	0.00	0.00	0.00%	0.00%
Recreational Boats	1,830	21	5.01	0.06	0.86%	0.01%
<u>Marine Vessels</u>	<u>0</u>	<u>0</u>	<u>0.00</u>	<u>0.00</u>	<u>0.00%</u>	<u>0.00%</u>
Nonroad Engines and Vehicles	8,184	26,418	22.42	72.38	3.83%	14.30%
Highway Mobile Sources			324.82	269.26	55.51%	53.21%
<u>Other Area and Point Sources</u>			<u>237.87</u>	<u>164.37</u>	<u>40.65%</u>	<u>32.48%</u>
All Area and Point Sources			585.12	506.00	100.00%	100.00%

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Table G-09.

EMISSION INVENTORY SUMMARY

Geographical Area Boston NECMA
 Base Year 1987
 Last Change to Activity Levels 07/03/91
 Last Emission Factor Changes 07/05/91

Category				Summer		Summer		Winter	
	HC tpv	NOx tpv	CO tpv	HC tpsd	NOx tpsd	% Total HC tpsd	% Total NOx tpsd	CO tpwd	% Total CO tpsd
Farm Equipment	213	452	2,835	0.90	1.91	0.12%	0.46%	1.87	0.08%
Construction Equipment	1,375	9,782	16,097	3.78	26.87	0.49%	6.49%	44.22	2.00%
Industrial Equipment	1,730	1,151	33,408	4.75	3.16	0.62%	0.76%	91.78	4.15%
Lawn & Garden Equipment	1,331	47	10,241	4.75	0.17	0.62%	0.04%	0.00	0.00%
Off Highway Motorcycles	237	5	627	0.85	0.02	0.11%	0.00%	0.00	0.00%
Snowmobiles	339	5	500	0.00	0.00	0.00%	0.00%	3.29	0.15%
Recreational Boats	6,393	317	13,339	35.12	1.74	4.56%	0.42%	0.00	0.00%
<u>Manne Vessels</u>	<u>91</u>	<u>1,777</u>	<u>221</u>	<u>0.25</u>	<u>4.96</u>	<u>0.03%</u>	<u>1.20%</u>	<u>0.61</u>	<u>0.03%</u>
Nonroad Engines and Vehicles	11,708	13,535	77,268	50.41	38.83	6.55%	9.37%	141.77	6.41%
Highway Mobile Sources				414.98	206.93	53.90%	49.94%	1,470.29	66.51%
<u>Other Area and Point Sources</u>				<u>304.49</u>	<u>168.62</u>	<u>39.55%</u>	<u>40.69%</u>	<u>598.54</u>	<u>27.08%</u>
All Area and Point Sources				769.88	414.38	100.00%	100.00%	2,210.61	100.00%

EMISSION INVENTORY SUMMARY

Geographical Area CHICAGO CMSA ILLINOIS PORTION
 Base Year 1988
 Last Change to Activity Levels 07/03/91
 Last Emission Factor Changes 07/05/91

Category				Summer		Summer	
	HC tpv	NOx tpv	HC tpsd	NOx tpsd	% Total HC tpsd	% Total NOx tpsd	
Farm Equipment	322	787	1.06	2.60	0.05%	0.25%	
Construction Equipment	855	6,116	2.82	20.18	0.13%	1.95%	
Industrial Equipment	3,883	7,476	12.81	24.67	0.60%	2.39%	
Lawn & Garden Equipment	3,610	127	13.22	0.46	0.62%	0.04%	
Off Highway Motorcycles	1,017	21	5.59	0.11	0.26%	0.01%	
Snowmobiles	0	0	0.00	0.00	0.00%	0.00%	
Recreational Boats	8,421	534	64.78	4.11	3.02%	0.40%	
<u>Manne Vessels</u>	<u>420</u>	<u>9,635</u>	<u>1.16</u>	<u>26.47</u>	<u>0.05%</u>	<u>2.56%</u>	
Nonroad Engines and Vehicles	18,528	24,696	101.45	78.61	4.73%	7.60%	
Highway Mobile Sources			991.88	352.14	46.23%	34.06%	
<u>Other Area and Point Sources</u>			<u>1,052.19</u>	<u>603.01</u>	<u>49.04%</u>	<u>58.33%</u>	
All Area and Point Sources			2,145.52	1,033.76	100.00%	100.00%	

65-9

Table G-10.
EMISSION INVENTORY SUMMARY

Geographical Area Alanta
 Base Year 1987
 Last Change to Activity Levels 06/04/91
 Last Emission Factor Changes 07/05/91

Category	HC	NOx	% Total	% Total	Summer		Summer	
	<u>tpy</u>	<u>tpy</u>	<u>HC tpy</u>	<u>NOx tpy</u>	<u>HC tpsd</u>	<u>NOx tpsd</u>	<u>HC tpsd</u>	<u>NOx tpsd</u>
Farm Equipment	431	919	0.22%	0.53%	2.66	5.67	0.42%	1.12%
Construction Equipment	1,410	8,383	0.72%	4.83%	4.65	27.67	0.74%	5.48%
Industrial Equipment	1,239	2,387	0.63%	1.38%	3.40	6.56	0.54%	1.30%
Lawn & Garden Equipment	1,493	52	0.76%	0.03%	8.20	0.29	1.30%	0.06%
Off Highway Motorcycles	331	7	0.17%	0.00%	1.00	0.02	0.16%	0.00%
Snowmobiles	0	0	0.00%	0.00%	0.00	0.00	0.00%	0.00%
Recreational Boats	1,030	42	0.52%	0.02%	8.51	0.35	1.35%	0.07%
<u>Manne Vessels</u>	<u>0</u>	<u>0</u>	<u>0.00%</u>	<u>0.00%</u>	<u>0.00</u>	<u>0.00</u>	<u>0.00%</u>	<u>0.00%</u>
Nonroad Engines and Vehicles	5,934	11,791	3.02%	6.80%	28.43	40.56	4.52%	8.03%
Highway Mobile Sources	125,362	69,146	63.88%	39.86%	391.60	216.08	62.19%	42.80%
<u>Other Area and Point Sources</u>	<u>64,954</u>	<u>92,553</u>	<u>33.10%</u>	<u>53.35%</u>	<u>209.64</u>	<u>248.24</u>	<u>33.29%</u>	<u>49.17%</u>
All Area and Point Sources	196,250	173,490	100.00%	100.00%	629.67	504.88	100.00%	100.00%

EMISSION INVENTORY SUMMARY

Geographical Area Beaumont-Port Arthur CMSA
 Base Year 1988
 Last Change to Activity Levels 05/30/91
 Last Emission Factor Changes 07/05/91

Category	HC	NOx	HC	NOx	% Total	% Total
	<u>tpy</u>	<u>tpy</u>	<u>tpsd</u>	<u>tpsd</u>	<u>HC tpsd</u>	<u>NOx tpsd</u>
Farm Equipment	108	342	0.30	0.94	0.07%	0.32%
Construction Equipment	424	2,670	1.16	7.32	0.26%	2.50%
Industrial Equipment	118	227	0.32	0.62	0.07%	0.21%
Lawn & Garden Equipment	24	1	0.06	0.00	0.01%	0.00%
Off Highway Motorcycles	3	0	0.01	0.00	0.00%	0.00%
Snowmobiles	0	0	0.00	0.00	0.00%	0.00%
Recreational Boats	1,012	16	2.77	0.04	0.62%	0.02%
<u>Manne Vessels</u>	<u>680</u>	<u>15,572</u>	<u>1.86</u>	<u>42.67</u>	<u>0.42%</u>	<u>14.61%</u>
Nonroad Engines and Vehicles	2,368	18,828	6.48	51.59	1.45%	17.66%
Highway Mobile Sources			41.20	22.10	9.23%	7.57%
<u>Other Area and Point Sources</u>			<u>398.88</u>	<u>218.44</u>	<u>89.32%</u>	<u>74.78%</u>
All Area and Point Sources			446.56	292.13	100.00%	100.00%

G-5h

Table G-11.

EMISSION INVENTORY SUMMARY

Geographical Area State of New Jersey
 Base Year 1987
 Last Change to Activity Levels 07/03/91
 Last Emission Factor Changes 07/05/91

<u>Category</u>	<u>HC tpy</u>	<u>NOx tpy</u>	<u>CO tpy</u>	<u>% Total HC tpy</u>	<u>% Total NOx tpy</u>	<u>% Total CO tpy</u>
Farm Equipment	1,497	3,083	20,861	0.34%	0.89%	1.93%
Construction Equipment	436	2,744	5,401	0.10%	0.79%	0.50%
Industrial Equipment	5,079	9,780	89,108	1.14%	2.82%	8.25%
Lawn & Garden Equipment	2,355	83	18,124	0.53%	0.02%	1.68%
Off Highway Motorcycles	664	14	1,754	0.15%	0.00%	0.16%
Snowmobiles	142	2	209	0.03%	0.00%	0.02%
Recreational Boats	14,573	809	30,927	3.26%	0.23%	2.86%
<u>Manne Vessels</u>	<u>1,608</u>	<u>28,205</u>	<u>4,648</u>	<u>0.36%</u>	<u>8.13%</u>	<u>0.43%</u>
Nonroad Engines and Vehicles	26,354	44,719	171,033	5.90%	12.88%	15.84%
Highway Mobile Sources	229,246	145,139	798,091	51.32%	41.81%	73.90%
<u>Other Area and Point Sources</u>	<u>191,105</u>	<u>157,240</u>	<u>110,856</u>	<u>42.78%</u>	<u>45.30%</u>	<u>10.26%</u>
All Area and Point Sources	446,705	347,098	1,079,979	100.00%	100.00%	100.00%

EMISSION INVENTORY SUMMARY

Geographical Area Puget Sound (Seattle), WA
 Base Year 1988
 Last Change to Activity Levels 06/10/91
 Last Emission Factor Changes 07/05/91

<u>Category</u>	<u>CO tpy</u>	<u>% Total CO tpy</u>
Farm Equipment	1,142	0.14%
Construction Equipment	10,672	1.27%
Industrial Equipment	19,774	2.35%
Lawn & Garden Equipment	13,079	1.56%
Off Highway Motorcycles	1,514	0.18%
Snowmobiles	418	0.05%
Recreational Boats	23,157	2.76%
<u>Manne Vessels</u>	<u>4,108</u>	<u>0.49%</u>
Nonroad Engines and Vehicles	73,864	8.79%
Highway Mobile Sources	532,242	63.34%
<u>Other Area and Point Sources</u>	<u>234,161</u>	<u>27.87%</u>
All Area and Point Sources	840,266	100.00%

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Table G-12.

EMISSION INVENTORY SUMMARY

Geographical Area: Mountain Counties Air Basin

<u>Category</u>	<u>VOC tpd</u>	<u>NOx tpd</u>	<u>CO tpd</u>	<u>PM tpd</u>
Farm Equipment	0.87	3.48	11.97	0.16
Non-Farm Equipment	4.70	20.36	60.44	0.95
Lawn & Garden Equipment	1.60	0.08	11.13	0.04
Off Highway Vehicles				
<u>Marine Vessels</u>	<u>0.00</u>	<u>0.00</u>	<u>0.00</u>	<u>0.00</u>
Nonroad engines and vehicles (*)	7.17	23.92	83.54	1.15
Aircraft	0.10	0.00	0.00	0.00
<u>Railroads</u>	<u>1.10</u>	<u>3.80</u>	<u>1.30</u>	<u>0.30</u>
All Nonroad Mobile Sources	8.37	27.72	84.84	1.45
Highway Mobile Sources	25.00	30.00	180.00	4.20
<u>Other Area and Point Sources</u>	<u>120.00</u>	<u>20.00</u>	<u>1,100.00</u>	<u>380.00</u>
All Area and Point Sources	153.37	77.72	1,364.84	385.65

Category	% Total <u>VOC tpd</u>	% Total <u>NOx tpd</u>	% Total <u>CO tpd</u>	% Total <u>PM tpd</u>
<u>Nonroad Mobile Sources</u>				
Farm Equipment	0.57%	4.48%	0.88%	0.04%
Non-Farm Equipment	3.06%	26.20%	4.43%	0.25%
Lawn & Garden Equipment	1.04%	0.10%	0.82%	0.01%
Off Highway Vehicles	0.00%	0.00%	0.00%	0.00%
<u>Marine Vessels</u>	<u>0.00%</u>	<u>0.00%</u>	<u>0.00%</u>	<u>0.00%</u>
Nonroad engines and vehicles (*)	4.67%	30.77%	6.12%	0.30%
Aircraft	0.07%	0.00%	0.00%	0.00%
<u>Railroads</u>	<u>0.72%</u>	<u>4.89%</u>	<u>0.10%</u>	<u>0.08%</u>
All Nonroad Mobile Sources	5.46%	35.66%	6.22%	0.38%
Highway Mobile Sources	16.30%	38.60%	13.19%	1.09%
<u>Other Area and Point Sources</u>	<u>78.24%</u>	<u>25.73%</u>	<u>80.60%</u>	<u>98.53%</u>
All Area and Point Sources	100.00%	100.00%	100.00%	100.00%

Notes

(*) excludes railroad locomotives and aircraft

Table G-13

EMISSION INVENTORY SUMMARY

Geographical Area: Sacramento Valley Air Basin

<u>Category</u>	<u>VOC tpd</u>	<u>NOx tpd</u>	<u>CO tpd</u>	<u>PM tpd</u>
Farm Equipment	4.18	16.72	57.48	0.78
Non-Farm Equipment	6.67	28.89	85.79	1.35
Lawn & Garden Equipment	4.00	0.18	27.70	0.09
Off Highway Vehicles				
<u>Marine Vessels</u>	<u>0.27</u>	<u>3.41</u>	<u>0.47</u>	<u>0.21</u>
Nonroad engines and vehicles (*)	15.12	49.20	171.44	2.43
Aircraft	3.10	2.10	21.10	0.40
<u>Railroads</u>	<u>5.80</u>	<u>20.00</u>	<u>7.50</u>	<u>1.30</u>
All Nonroad Mobile Sources	24.02	71.30	200.04	4.13
Highway Mobile Sources	130.00	160.00	900.00	23.00
<u>Other Area and Point Sources</u>	<u>210.00</u>	<u>33.00</u>	<u>660.00</u>	<u>830.00</u>
All Area and Point Sources	364.02	264.30	1,760.04	857.13

<u>Category</u>	<u>% Total VOC tpd</u>	<u>% Total NOx tpd</u>	<u>% Total CO tpd</u>	<u>% Total PM tpd</u>
<u>Nonroad Mobile Sources</u>				
Farm Equipment	1.15%	6.33%	3.27%	0.09%
Non-Farm Equipment	1.83%	10.93%	4.87%	0.16%
Lawn & Garden Equipment	1.10%	0.07%	1.57%	0.01%
Off Highway Vehicles	0.00%	0.00%	0.00%	0.00%
<u>Marine Vessels</u>	<u>0.07%</u>	<u>1.29%</u>	<u>0.03%</u>	<u>0.02%</u>
Nonroad engines and vehicles (*)	4.15%	18.62%	9.74%	0.28%
Aircraft	0.85%	0.79%	1.20%	0.05%
<u>Railroads</u>	<u>1.59%</u>	<u>7.57%</u>	<u>0.43%</u>	<u>0.15%</u>
All Nonroad Mobile Sources	6.60%	26.98%	11.37%	0.48%
Highway Mobile Sources	35.71%	60.54%	51.14%	2.68%
<u>Other Area and Point Sources</u>	<u>57.69%</u>	<u>12.49%</u>	<u>37.50%</u>	<u>96.83%</u>
All Area and Point Sources	100.00%	100.00%	100.00%	100.00%

Notes

(*) excludes railroad locomotives and aircraft

Table G-14.

EMISSION INVENTORY SUMMARY

Geographical Area: San Diego Air Basin

<u>Category</u>	<u>VOC tpd</u>	<u>NOx tpd</u>	<u>CO tpd</u>	<u>PM tpd</u>
Farm Equipment	0.15	0.58	2.00	0.03
Non-Farm Equipment	6.86	29.71	88.20	1.39
Lawn & Garden Equipment	5.40	0.25	37.60	0.13
Off Highway Vehicles				
<u>Marine Vessels</u>	<u>2.50</u>	<u>41.11</u>	<u>6.75</u>	<u>2.34</u>
Nonroad engines and vehicles (*)	14.91	71.65	134.55	3.89
Aircraft	3.50	4.10	19.10	0.90
<u>Railroads</u>	<u>0.30</u>	<u>1.00</u>	<u>0.30</u>	<u>0.10</u>
All Nonroad Mobile Sources	18.71	76.75	153.95	4.89
Highway Mobile Sources	150.00	140.00	980.00	19.00
<u>Other Area and Point Sources</u>	<u>330.00</u>	<u>29.00</u>	<u>160.00</u>	<u>490.00</u>
All Area and Point Sources	498.71	245.75	1,293.95	513.89

<u>Category</u>	<u>% Total VOC tpd</u>	<u>% Total NOx tpd</u>	<u>% Total CO tpd</u>	<u>% Total PM tpd</u>
<u>Nonroad Mobile Sources</u>				
Farm Equipment	0.03%	0.24%	0.15%	0.01%
Non-Farm Equipment	1.38%	12.09%	6.82%	0.27%
Lawn & Garden Equipment	1.08%	0.10%	2.91%	0.03%
Off Highway Vehicles	0.00%	0.00%	0.00%	0.00%
<u>Marine Vessels</u>	<u>0.50%</u>	<u>16.73%</u>	<u>0.52%</u>	<u>0.46%</u>
Nonroad engines and vehicles (*)	2.99%	29.16%	10.40%	0.76%
Aircraft	0.70%	1.67%	1.48%	0.18%
<u>Railroads</u>	<u>0.06%</u>	<u>0.41%</u>	<u>0.02%</u>	<u>0.02%</u>
All Nonroad Mobile Sources	3.75%	31.23%	11.90%	0.95%
Highway Mobile Sources	30.08%	56.97%	75.74%	3.70%
<u>Other Area and Point Sources</u>	<u>66.17%</u>	<u>11.80%</u>	<u>12.37%</u>	<u>95.35%</u>
All Area and Point Sources	100.00%	100.00%	100.00%	100.00%

Notes

(*) excludes railroad locomotives and aircraft

Table G-15.

EMISSION INVENTORY SUMMARY

Geographical Area: San Francisco Bay Area Air Basin

<u>Category</u>	<u>VOC</u> <u>tpd</u>	<u>NOx</u> <u>tpd</u>	<u>CO</u> <u>tpd</u>	<u>PM</u> <u>tpd</u>
Farm Equipment	1.26	5.05	17.36	0.23
Non-Farm Equipment	11.46	48.99	148.59	2.29
Lawn & Garden Equipment	15.00	0.70	104.90	0.36
Off Highway Vehicles				
<u>Marine Vessels</u>	<u>7.00</u>	<u>81.45</u>	<u>11.77</u>	<u>5.69</u>
Nonroad engines and vehicles (*)	34.72	136.19	282.62	8.57
Aircraft	20.10	18.20	77.00	0.30
<u>Railroads</u>	<u>1.30</u>	<u>5.30</u>	<u>2.00</u>	<u>2.60</u>
All Nonroad Mobile Sources	56.12	159.69	361.62	11.47
Highway Mobile Sources	300.00	340.00	2,000.00	48.00
<u>Other Area and Point Sources</u>	<u>1,200.00</u>	<u>160.00</u>	<u>250.00</u>	<u>1,000.00</u>
All Area and Point Sources	1,556.12	659.69	2,611.62	1,059.47

<u>Category</u>	<u>% Total</u> <u>VOC tpd</u>	<u>% Total</u> <u>NOx tpd</u>	<u>% Total</u> <u>CO tpd</u>	<u>% Total</u> <u>PM tpd</u>
<u>Nonroad Mobile Sources</u>				
Farm Equipment	0.08%	0.77%	0.66%	0.02%
Non-Farm Equipment	0.74%	7.43%	5.69%	0.22%
Lawn & Garden Equipment	0.96%	0.11%	4.02%	0.03%
Off Highway Vehicles	0.00%	0.00%	0.00%	0.00%
<u>Marine Vessels</u>	<u>0.45%</u>	<u>12.35%</u>	<u>0.45%</u>	<u>0.54%</u>
Nonroad engines and vehicles (*)	2.23%	20.64%	10.82%	0.81%
Aircraft	1.29%	2.76%	2.95%	0.03%
<u>Railroads</u>	<u>0.08%</u>	<u>0.80%</u>	<u>0.08%</u>	<u>0.25%</u>
All Nonroad Mobile Sources	3.61%	24.21%	13.85%	1.08%
Highway Mobile Sources	19.28%	51.54%	76.58%	4.53%
<u>Other Area and Point Sources</u>	<u>77.11%</u>	<u>24.25%</u>	<u>9.57%</u>	<u>94.39%</u>
All Area and Point Sources	100.00%	100.00%	100.00%	100.00%

Notes

(*) excludes railroad locomotives and aircraft

Table G-16.

EMISSION INVENTORY SUMMARY

Geographical Area: San Joaquin Valley Air Basin

<u>Category</u>	<u>VOC</u> <u>tpd</u>	<u>NOx</u> <u>tpd</u>	<u>CO</u> <u>tpd</u>	<u>PM</u> <u>tpd</u>
Farm Equipment	8.96	35.80	123.05	1.68
Non-Farm Equipment	7.06	30.56	90.75	1.42
Lawn & Garden Equipment	6.00	0.28	42.10	0.14
Off Highway Vehicles				
<u>Marine Vessels</u>	<u>0.22</u>	<u>2.64</u>	<u>0.35</u>	<u>0.17</u>
Nonroad engines and vehicles (*)	22.24	69.28	256.25	3.41
Aircraft	15.60	4.70	75.00	3.40
<u>Railroads</u>	<u>6.50</u>	<u>22.00</u>	<u>8.20</u>	<u>1.50</u>
All Nonroad Mobile Sources	44.34	95.98	339.45	8.31
Highway Mobile Sources	150.00	240.00	1,100.00	37.00
<u>Other Area and Point Sources</u>	<u>1,000.00</u>	<u>220.00</u>	<u>600.00</u>	<u>2,000.00</u>
All Area and Point Sources	1,194.34	555.98	2,039.45	2,045.31

<u>Category</u>	<u>% Total</u> <u>VOC tpd</u>	<u>% Total</u> <u>NOx tpd</u>	<u>% Total</u> <u>CO tpd</u>	<u>% Total</u> <u>PM tpd</u>
<u>Nonroad Mobile Sources</u>				
Farm Equipment	0.75%	6.44%	6.03%	0.08%
Non-Farm Equipment	0.59%	5.50%	4.45%	0.07%
Lawn & Garden Equipment	0.50%	0.05%	2.06%	0.01%
Off Highway Vehicles	0.00%	0.00%	0.00%	0.00%
<u>Marine Vessels</u>	<u>0.02%</u>	<u>0.47%</u>	<u>0.02%</u>	<u>0.01%</u>
Nonroad engines and vehicles (*)	1.86%	12.46%	12.56%	0.17%
Aircraft	1.31%	0.85%	3.68%	0.17%
<u>Railroads</u>	<u>0.54%</u>	<u>3.96%</u>	<u>0.40%</u>	<u>0.07%</u>
All Nonroad Mobile Sources	3.71%	17.26%	16.64%	0.41%
Highway Mobile Sources	12.56%	43.17%	53.94%	1.81%
<u>Other Area and Point Sources</u>	<u>83.73%</u>	<u>39.57%</u>	<u>29.42%</u>	<u>97.78%</u>
All Area and Point Sources	100.00%	100.00%	100.00%	100.00%

Notes

(*) excludes railroad locomotives and aircraft

Table G-17.

EMISSION INVENTORY SUMMARYGeographical Area: **South Central Coast Air Basin**

<u>Category</u>	<u>VOC tpd</u>	<u>NOx tpd</u>	<u>CO tpd</u>	<u>PM tpd</u>
Farm Equipment	2.36	9.43	32.40	0.44
Non-Farm Equipment	2.53	10.96	32.55	0.51
Lawn & Garden Equipment	2.80	0.13	19.80	0.07
Off Highway Vehicles				
<u>Marine Vessels</u>	<u>0.00</u>	<u>0.00</u>	<u>0.00</u>	<u>0.00</u>
Nonroad engines and vehicles (*)	7.69	20.52	84.75	1.02
Aircraft	2.20	0.90	15.30	0.40
<u>Railroads</u>	<u>1.40</u>	<u>4.80</u>	<u>1.70</u>	<u>0.30</u>
All Nonroad Mobile Sources	11.29	26.22	101.75	1.72
Highway Mobile Sources	71.00	84.00	490.00	11.00
<u>Other Area and Point Sources</u>	<u>330.00</u>	<u>54.00</u>	<u>130.00</u>	<u>350.00</u>
All Area and Point Sources	412.29	164.22	721.75	362.72

<u>Category</u>	<u>% Total VOC tpd</u>	<u>% Total NOx tpd</u>	<u>% Total CO tpd</u>	<u>% Total PM tpd</u>
<u>Nonroad Mobile Sources</u>				
Farm Equipment	0.57%	5.74%	4.49%	0.12%
Non-Farm Equipment	0.61%	6.67%	4.51%	0.14%
Lawn & Garden Equipment	0.68%	0.08%	2.74%	0.02%
Off Highway Vehicles	0.00%	0.00%	0.00%	0.00%
<u>Marine Vessels</u>	<u>0.00%</u>	<u>0.00%</u>	<u>0.00%</u>	<u>0.00%</u>
Nonroad engines and vehicles (*)	1.87%	12.50%	11.74%	0.28%
Aircraft	0.53%	0.55%	2.12%	0.11%
<u>Railroads</u>	<u>0.34%</u>	<u>2.92%</u>	<u>0.24%</u>	<u>0.08%</u>
All Nonroad Mobile Sources	2.74%	15.97%	14.10%	0.47%
Highway Mobile Sources	17.22%	51.15%	67.89%	3.03%
<u>Other Area and Point Sources</u>	<u>80.04%</u>	<u>32.88%</u>	<u>18.01%</u>	<u>96.49%</u>
All Area and Point Sources	100.00%	100.00%	100.00%	100.00%

Notes

(*) excludes railroad locomotives and aircraft

Table G-18.

EMISSION INVENTORY SUMMARY

Geographical Area: South Coast Air Basin

<u>Category</u>	<u>VOC</u> <u>tpd</u>	<u>NOx</u> <u>tpd</u>	<u>CO</u> <u>tpd</u>	<u>PM</u> <u>tpd</u>
Farm Equipment	0.50	6.14	2.01	0.09
Non-Farm Equipment	28.55	123.65	367.13	5.78
Lawn & Garden Equipment	29.20	1.36	203.90	0.70
Off Highway Vehicles				
<u>Marine Vessels</u>	<u>7.33</u>	<u>68.38</u>	<u>10.48</u>	<u>4.15</u>
Nonroad engines and vehicles (*)	65.58	199.53	583.52	10.72
Aircraft	18.70	16.70	83.00	3.30
<u>Railroads</u>	<u>4.60</u>	<u>18.00</u>	<u>7.00</u>	<u>1.10</u>
All Nonroad Mobile Sources	88.88	234.23	673.52	15.12
Highway Mobile Sources	650.00	660.00	4,300.00	95.00
<u>Other Area and Point Sources</u>	<u>1,400.00</u>	<u>280.00</u>	<u>220.00</u>	<u>2,100.00</u>
All Area and Point Sources	2,138.88	1,174.23	5,193.52	2,210.12

<u>Category</u>	<u>% Total</u> <u>VOC tpd</u>	<u>% Total</u> <u>NOx tpd</u>	<u>% Total</u> <u>CO tpd</u>	<u>% Total</u> <u>PM tpd</u>
<u>Nonroad Mobile Sources</u>				
Farm Equipment	0.02%	0.52%	0.04%	0.00%
Non-Farm Equipment	1.33%	10.53%	7.07%	0.26%
Lawn & Garden Equipment	1.37%	0.12%	3.93%	0.03%
Off Highway Vehicles	0.00%	0.00%	0.00%	0.00%
<u>Marine Vessels</u>	<u>0.34%</u>	<u>5.82%</u>	<u>0.20%</u>	<u>0.19%</u>
Nonroad engines and vehicles (*)	3.07%	16.99%	11.24%	0.49%
Aircraft	0.87%	1.42%	1.60%	0.15%
<u>Railroads</u>	<u>0.22%</u>	<u>1.53%</u>	<u>0.13%</u>	<u>0.05%</u>
All Nonroad Mobile Sources	4.16%	19.95%	12.97%	0.68%
Highway Mobile Sources	30.39%	56.21%	82.80%	4.30%
<u>Other Area and Point Sources</u>	<u>65.45%</u>	<u>23.85%</u>	<u>4.24%</u>	<u>95.02%</u>
All Area and Point Sources	100.00%	100.00%	100.00%	100.00%

Notes

(*) excludes railroad locomotives and aircraft

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Appendix H. List of Equipment Types

EPA considered over 80 different equipment types in this study of emissions from nonroad sources. Some of these equipment types include more than one kind of equipment. For example, "aerial lifts" includes boom lifts and scissor lifts, and "commercial turf equipment" includes riding turf mowers, walk-behind multi-spindle mowers, and others kinds of equipment.

The equipment types included in each of 10 equipment categories are detailed below

Lawn and Garden Equipment

- trimmers/edgers/brush cutters
- lawnmowers
- leaf blowers/vacuums
- rear engine riding mowers
- front mowers
- chainsaws < 4 hp
- shredders < 5 HP
- tillers < 5 HP
- lawn and garden tractors
- wood splitters
- snowblowers
- chippers/stump grinders
- commercial turf equipment
 - hydro/seeder mulchers
 - riding turf mowers
 - thatchers/aerators
 - walk-behind multi-spindle mowers
 - other miscellaneous equipment
- other lawn and garden equipment
 - augers
 - sickel bar mowers
 - pruning towers
 - turf cutters

Airport Service Equipment

aircraft support equipment
aircraft load lifters
de-icing equipment/heat and start units
ground power units
utility service equipment
baggage conveyors
airport service vehicles

terminal tractors
push-back tractors
tow tractors
yard spotters

Recreational Equipment

all terrain vehicles (ATVs)
minibikes
off-road motorcycles
golf carts
snowmobiles
specialty vehicles/carts
snow grooming equipment
ice maintenance equipment
go-carts
industrial ATVs
industrial personnel carriers

Recreational Marine Equipment

vessels with inboard engines
vessels with outboard engines
vessels with sterndrive engines
sailboat auxiliary inboard engines
sailboat auxiliary outboard engines

Light Commercial Equipment

generator sets

- baseload generators
- co-generation generators
- marine generators
- military generators
- peaking generators
- portable generators
- RV generators
- stand-by generators

pumps

- portable pumps
- fire pumps
- industrial pumps
- mud/trash pumps
- concrete pumps

air compressors

- gas compressors

welders

- pressure washers

Industrial Equipment

aerial lifts

- boom lifts
- scissor lifts
- self propelled elevating platforms

forklifts

sweepers/scrubbers

- municipal sweepers
- industrial sweepers
- scrubbers

other general industrial equipment

- abrasive blasting equipment
- industrial blowers/vacuums
- industrial scrapers/strippers
- marine/industrial winches and hoists
- multipurpose tool carriers
- other miscellaneous industrial equipment
 - strippers
 - floor buffers
 - pipe corers

- other material handling equipment
 - conveyors
 - other miscellaneous material handling equipment
 - speed trucks
 - carriers
 - auto ramps

Construction Equipment

- asphalt pavers
- tampers/rammers
- plate compactors
- concrete pavers
- rollers
 - landfill compactors
 - static and vibratory rollers
- scrapers
- paving equipment
 - concrete finishers
 - concrete vibrators
 - other miscellaneous paving equipment
- surfacing equipment
 - asphalt/gravel planers
 - asphalt mixers/agitators
 - crack/joint routers
 - pumper kettles/melters
 - soil stabilizers
 - road reclaimers
 - pavement profilers
 - roofing equipment
 - other misc/ surfacing equipment
- signal boards
- trenchers
 - portable/walk-behind trenchers
 - riding trenchers
 - cable layers
 - wheel trenchers
- bore/drill rigs
 - horizontal boring machines
 - self propelled drills
 - truck-mounted drills
- excavators
 - dragline excavators
 - hydraulic excavators

- concrete/industrial saws
- cement and mortar mixers
- cranes
 - pedestal cranes
 - rough terrain cranes
 - shovel-type cranes
 - straddle cranes
 - truck mounted cranes
- graders
- off-highway trucks
- crushing/processing equipment
- rough terrain forklifts
- rubber tired loaders
- rubber tired dozers
- tractors/loaders/backhoes
- crawler tractors
- skid steer loaders
- off-highway tractors
- dumpers/tenders
- other construction equipment
 - concrete pumps
 - other miscellaneous construction equipment
 - concrete breakers
 - rod benders/cutters
 - highway repair equipment

Agricultural Equipment

- 2-wheel tractors
- agricultural tractors
- agricultural mowers
- combines
- sprayers
 - back pack sprayers
 - self propelled sprayers
 - towable/tractor-mounted sprayers
 - fertilizer spreaders
- balers
- tillers > 5 hp
- swathers
- hydro power units
- other agricultural equipment
 - harvesters
 - frost/wind mills

forage harvesters
leaf harvesters
fruit/nut harvesters
orchard pruners
detasslers
cotton strippers/pickers
other miscellaneous agricultural equipment
 drain augers
 wind fans
 bedding chippers

Logging Equipment

chainsaws > 4 hp
shredders > 5 hp
skidders
fellers/bunchers
 delimbers

Commercial Marine Vessels

commercial marine vessels

Appendix I. Emission Factor Development

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Appendix I. Emission Factor Development

This appendix details the origins of the emission factors used to calculate emission inventories for this study.

For this study, emissions from internal combustion engines are broadly grouped into one of four source categories based on the origin of the emission: tailpipe exhaust, refueling, evaporative, and crankcase emissions. Each of those categories is further divided by pollutant: HC, CO, NO_x, and other toxic pollutants including particulate matter, aldehydes, SO_x, benzene, and 1,3-butadiene. Since refueling and evaporative emissions are not a function of combustion, but are a function of fuel evaporation, only hydrocarbon emissions are considered for refueling and evaporative emissions. For each source category, pollutant, *and* nonroad equipment type (including fuel type and operating cycle), an emission factor is necessary to construct emission inventories. In simple terms, the emission factor is a measure of the rate at which a particular type of equipment emits a particular pollutant under normal operating conditions.

The remainder of this appendix describes how tailpipe, refueling, evaporative, and crankcase emission factors were developed. Adjustments were made to new engine emission factors to account for in-use effects and test cycle (steady state vs. transient) effects where appropriate. These adjustments are discussed in Chapter 2 of this appendix. Emission factors for particulate matter, aldehydes, and SO_x which were not available from the primary data sources described below were taken from AP-42¹ or from those recommended by Southwest Research Institute (SwRI).² Emission rates for nitrosamines, benzene, and 1,3-butadiene are discussed in separate chapters at the end of this appendix. Gasoline vapors are discussed in terms of the refueling and evaporative emissions. The emission factors used for calculating the SIP inventories are presented in Table I-01 and those used for calculating Inventories A and B are in Table I-02.

Tables I-01 through I-14 are located at the end of the appendix.

Chapter 1. Tailpipe Exhaust Emission Factors

A discussion of the development of tailpipe emission factors used in this study is presented below for the following categories: lawn and garden equipment, agricultural equipment, construction equipment, logging equipment, industrial equipment, light commercial equipment, recreational marine, commercial marine vessels, recreational equipment, and airport service equipment.

1.1. Lawn and Garden Equipment

1.1.1. Gasoline

The primary data source used in deriving the emission factors for gasoline lawn and garden equipment was the California Air Resources Board (CARB) technical support document (TSD) for lawn and garden equipment.³ The testing done for CARB was performed by manufacturers, Southwest Research Institute (SwRI),⁴ and Heiden Associates⁵ for the Portable Power Equipment Manufacturers Association (PPEMA). The test results represent the most up-to-date information available for this category which were aggregated into emission factors.

The emission factors for calculating State Implementation Plan (SIP) emission inventories required aggregation of the CARB data into a 4-stroke category and a 2-stroke category. The CARB data was weighted by the population horsepower hours data submitted to EPA by the Outdoor Power Equipment Institute, the Portable Power Equipment Manufacturers Association and by data contained in the Heiden report.⁶ Tables I-03 and I-04 show this aggregation for 4-stroke and 2-stroke equipment respectively. To be used in computing SIP emission inventories, it was necessary to convert the emission factors from units of g/hp-hr to g/gallon fuel consumed. Brake specific fuel consumption (BSFC) values shown in Tables I-03 and I-04 were used for the conversion. The origin of these values is also shown in the tables. All aldehyde emission factors were derived from SAE Paper 910560, "Emission Factors for Small Utility Engines."⁷

The emission factors necessary for calculating Inventories A and B also required some aggregation, although not to the extent necessary for the SIP inventory calculation. The

derivation of these emission factors is shown in Table I-05.

1.1.2. Diesel

Nearly all lawn and garden equipment is powered by gasoline engines. However, a small population of rear engine riding mowers, lawn and garden tractors, and wood splitters, chippers/stump grinders, and commercial turf equipment are powered by diesel engines. Since no emission data is available for diesel-powered lawn and garden equipment, the emission factors for diesel light commercial equipment (<50 hp) were assumed to be the best approximation and were used for the study (see "1.5. Light Commercial Equipment <50 HP").

1.2. Agricultural Equipment & Construction Equipment

1.2.1. Diesel

The most recent, up-to-date published emission factors for agricultural and construction diesel equipment are reported in the CAL/ERT report,⁸ and in a recent report to CARB by Energy and Environmental Analysis (EEA)⁹ on heavy duty construction equipment. In general, the emissions for the CAL/ERT report were measured on a 13-mode steady-state cycle and emission factors are reported in terms of equipment types. The EEA report presented general emission factors for HC, NO_x and particulate matter by model year.

In addition to these two sources, the Engine Manufacturers Association (EMA) submitted to EPA a list of recommended emission factors for diesel construction and agricultural equipment presented in Table I-06. The emission data was based on individual engine manufacturer submissions of emission data obtained from the 8-Mode Emission Test Procedure (ISO 8178) and related mode weighing factors. The emission factors were EMA's best estimates of in-the-field fleet population weighted factors. For agricultural equipment, EMA provided factors for only three equipment types (i.e. farm tractors, grain combine, and cotton pickers).

In general, the emission factors reported by the three sources are reasonably similar. For agricultural equipment, EPA has selected the factors presented in the CAL/ERT study since they are presented by specific equipment type. For the SIP inventories, the emission factors were aggregated to tractor and nontractor categories by the energy outputs reported in

the CAL/ERT report. The factors were converted from units of g/hp-hr to lb/1000 gallons of fuel consumed by using a BSFC of 0.4 lb/Hp-hr¹⁰ and diesel fuel density of 7.1 lb/gallon.¹¹ Table I-08 shows the aggregation of the emission factors in terms of g/hp-hr, while Table I-08 shows the lb/1000 gal derivation.

For construction equipment the EMA emission factors were selected to be used to calculate emission inventories. For some equipment types, EMA factors were not available. In these cases, the Fourth Edition of AP-42¹² factors which were derived from CAL/ERT¹³ factors were used. Table I-9 compares the AP-42 (CAL/ERT) and EMA emission factors for construction equipment

The EMA did not report emission factors for particulate matter. The particulate matter and aldehyde emission factors selected were those reported in the Fourth edition of AP-42 for the agricultural and construction equipment categories.

1.2.2. Gasoline

The emission factors for gasoline agricultural and construction equipment selected to be used in calculating emission inventories are from the Third Edition of AP-42. The other sources that reported emission factors for diesel equipment did not report gasoline equipment emission factors. The CAL/ERT report did suggest using 2.8 g/hp-hr HC, 163 g/hp-hr CO, and 7.8 g/hp-hr NO_x for gasoline powered equipment (Tables I-7(c) and I-8(c)). However, the emission factors in AP-42 are more specific to equipment type and will be used for the study.

The particulate emission factors in AP-42 were derived from particulate measurements on gasoline nonroad engines at SwRI in the mid-seventies.¹⁴ Leaded gasolines which generally contained between 1.5 and 2 grams of lead per gallon were used for the emission tests. This high lead fuel is not commercially available today. Even today's leaded fuel contains very little lead. Since particles consisting of lead oxides are the main particulate emission from leaded-gasoline fueled engines, the AP-42 emission factors are not representative of emission rates from equipment operating on currently available gasoline. Therefore, the values reported in AP-42 were not used in this study. Instead, a value of 1.64 lb/1000 gallons was used for the particulate emission factors for gasoline fueled equipment. This value is based on a recommendation from SwRI in the *Nonroad Emission Factors of An*

*Toxics*¹⁵ report to EPA. Where necessary, the 1.64 lb/1000 gallon was converted to 0.06 g/hp-hr by assuming BSFC 0.5 lb/hp-hr¹⁶ and density of gasoline of 6.2 lb/gallon.¹⁷ Aldehyde emission factors were taken from AP-42.

1.3. Logging Equipment

1.3.1. Chain Saws >4 HP

The emission factors for commercial chain saws reported in the CARB TSD¹⁸ are used for this category.

1.3.2. Shredders >5 HP

The emission factors reported in the CARB TSD for four-stroke commercial shredders/grinders are used for this category.

1.3.3 Skidders and Feller/Bunchers

The diesel emission factors for log skidders submitted to EPA by EMA (Table N-6) are used for these categories

1.4. Industrial Equipment

Emission factors for gasoline and diesel industrial equipment used for the study are those reported in Volume I of AP-42. These factors were derived by SwRI in 1973¹⁹ and were based on tests performed on eight diesel engines and four gasoline engines. No emissions data were available for LPG-powered aerial lifts, forklifts, and sweepers/scrubbers. The only emission data found for LPG-powered equipment is from two gasoline engines which were converted to operate on LPG. One engine was a 4.5 hp overhead valve walk behind mower engine tested by Southwest Research Institute.²⁰ Compared to the emissions when the engine was operated on gasoline, the engine emitted 38% less HC, 55% less CO, 147% more NO_x, 13% less PM, and approximately the same level of aldehydes when operated on LPG. The other engine was a 12.5 hp utility engine tested by Onan²¹ Compared to operation on gasoline, this engine emitted 72% less HC, 80% less CO, and

347% more NO_x when operated on LPG. Since neither of these engines are representative of the larger industrial equipment engines, the emission data cannot directly be used for developing an emission factor. However, the relative differences between the gasoline and LPG emission results for the two engines can be used to approximate the LPG emission factor. The above percentages were averaged resulting in a 55% reduction in HC, a 68% reduction in CO, a 247% increase in NO_x, and a 13% reduction in particulate matter compared to the gasoline baseline emission values when an engine is operated on propane. These percentages were applied to the gasoline emission factors to approximate the LPG emission factors.

1.5. Light Commercial Equipment <50 HP

Light commercial equipment includes generator sets, pumps, air compressors, gas compressors, welders and pressure washers. The emission factors recommended by SwRI²² for the continuous service diesel equipment will be used for the study. These factors are the refrigeration unit emission factors in the Radian report²³. Emission factors for gasoline light commercial equipment to be used in the study are taken from the CARB technical support document for utility and lawn and garden equipment²⁴ for *large* engines. Engines tested to develop the *large* engine emission factors included a 16 hp single cylinder side valve engine and two 18 hp 2-cylinder side valve engines. No emissions data were available for LPG powered pumps and gas compressors. Therefore, the gasoline emission factors for these equipment types were decreased by 55% for HC, decreased by 68% for CO, increased by 247% for NO_x, and decreased by 13% for particulate matter to approximate the LPG emission factors. This methodology is discussed in "1.4. Industrial Equipment" above.

1.6. Recreational Marine

1.6.1. Outboard Motors

The emission factors for outboard motors used in the study are from AP-42 which were derived from testing performed at Southwest Research Institute in 1973.²⁵ The

emission factors presented in AP-42 are the exhaust emissions less the emissions retained in the water, since most outboards have underwater exhausts. Although the environmental impact of outboard exhaust on water quality is not completely understood, the current International Council of Marine Industry Associations (ICOMIA) emission measurement standards are based on total exhaust; not accounting for water scrubbing. Therefore, for the purposes of this inventory study, EPA believes that outboard exhaust should be inventoried as total exhaust emissions before water scrubbing. The emission factors in AP-42 were recalculated to include both atmospheric and water phase emissions.

The National Marine Manufacturers Association submitted emission measurement data²⁶ from production engines tested using the ICOMIA standards. The emission results are presented as brake specific (g/kW hr) emissions versus engine power (kW) in graphical form. Also shown on the graphs are curves of the least squares fit. The HC, CO, and NO_x emission factors derived from the SwRI data, in general, were lower than those submitted by NMMA.

1.6.2. Inboard Gasoline

The emission factors used in the study for gasoline-fueled inboard engines are from AP-42. These factors were developed from tests of automotive engines and are considered only rough estimates. As with outboard engines, the emission factors were adjusted to represent total engine emissions. NMMA also has submitted emission measurements performed by member manufacturers.

1.6.3. Inboard Diesel

Few measurements have been performed on high speed diesel marine engines. The best currently available published estimates appear to be those from the Radian study²⁷ which are used for this study.

1.7. Commercial Marine Vessels

The AP-42 guidance document subdivides commercial motorships into waterway classifications for the purpose of calculating SIP emission inventories. The classifications are: coastal, great lakes, and river. The vessels operating in each of these waterways have similar

characteristics such as size, speed, engine design, and distance traveled. Emission factors for these classifications are contained in AP-42. These factors are used by states for calculating emission inventories by the fuel sales method described in the *Procedures for Emission Inventory Preparation, Volume IV: Mobile Sources*²⁸ guidance document published by EPA. Another set of emission factors for calculating emission inventories using a different method (the ship movement data method) is contained in the guidance document. The factors are in terms of size categories (draft). The emission factors used for the SIP inventory calculations will be those reported in AP-42 and the guidance document with the exception of the slow speed diesel emission factors. For slow speed diesel marine engines, the emission factors reported in a recent Booz Allen & Hamilton study²⁹ for CARB will be used. This source is thought to better represent actual NO_x emission factors for the reasons set forth in the report. Emission factors for medium speed diesels were also reported by Radian³⁰ to CARB in 1988. These factors were based on tests of locomotive engines. The NO_x emission factor reported by Radian is 533 lb/1000 gal which is substantially higher than the factors reported in AP-42 (approx. 300 lb/1000 gal)

1.8. Recreational Equipment

1.8.1. Off-Road Motorcycles

As part of a recent CARB proposal to control emissions from off-road motorcycles,³¹ CARB calculated emission factors for two-stroke and four-stroke engines. The factors are shown in Table I-10. To calculate SIP inventories, these factors were aggregated into composite factors by using a 68.5% two-stroke, 31.5% four-stroke distribution provided by EEA. The two-stroke and four-stroke emission factors for off-road motorcycles were also assumed for all terrain vehicles, minibikes, golf carts, and specialty vehicle carts

1.8.2. Snowmobiles

Very little data exists on emission rates from snowmobiles. The best currently available published data appears to be contained in AP-42. These emission factors were derived from testing performed by SwRI in 1974³² and are being considered for the study. The factors in terms of g/hr were converted to g/hp-hr for use in calculating emissions

inventories from the activity information provided by EEA. The power reported by SwRI for the various test engines was weighted in the same manner as the emission values to determine a composite power of 5.8 hp over the test cycle. The g/hr value was then divided by 5.8 to determine g/hp hr. In a recent response to CARB mail out #90-70 entitled *A Proposal to Establish Exhaust Emission Standards and Test Procedures for Off-Highway Light-Duty Vehicles and Recreational Vehicles*, the International Snowmobile Industry Association (ISIA) reported snowmobile emission factors of 216 g/hp-hr HC+NO_x, and 564 g/hp-hr for CO. These factors are substantially higher than those calculated from the AP-42 factors even though the same SwRI test procedures were used in both cases.

1.9. Airport Service Equipment

The emission factors for industrial equipment were assumed to apply to airport service equipment.

Chapter 2. Adjustments to Tailpipe Emission Factors

2.1. Adjustments for Test Cycle

To develop emission factors representative of in-use nonroad engines, the test cycle that the engines are operated on should simulate typical in-use operation. There is much debate regarding the appropriateness of using a steady-state test cycle or a transient test cycle for emission testing nonroad engines. A steady-state test is a series of fixed set points of speed and load held for a period of time (usually from two to ten minutes). Emission measurements are made at the end of the period when readings have stabilized. Currently, a transient cycle is used to certify heavy-duty highway engines. It is a continuously varying cycle of speeds and loads which may have brief periods of steady-state operation. Emission measurements are made continuously over all points.

The emission factors submitted by EMA for nonroad equipment were based on data generated using a standardized 8-mode steady-state test cycle. The 8-mode test cycle does not measure emissions during transition and stabilization between modes. This could understate the emissions of equipment that encounters transient operation in use. This is especially true for particulate emissions, which the 8-mode cycle does not provide a good measurement for equipment that encounters transient operation. On the other hand, the highway heavy-duty transient cycle may not be appropriate to simulate nonroad equipment transient operation. EPA expects that emission levels of nonroad equipment that encounters transient operation in use will fall somewhere between levels during a steady state test such as the 8-mode and the highway transient test.

For diesel powered equipment expected to encounter either transient speed or transient load conditions in-use, EPA adjusted the emission factors that were generated using a steady-state cycle. Data from a joint EPA/Industry program to assess test cycles for nonroad equipment was used to determine the ratio of the FTP transient test emissions to the 8-mode steady-state test emissions. Based on the currently available data (four engines) these ratios were: 1.3 for HC, 2.0 for CO, 1 for NO_x, and 1.7 for particulates. These ratios were then applied to the emission factors of the appropriate equipment types to determine the adjusted emission factors in Table I-2a.

2.2. Adjustments for In-Use Operation

The emission factors contained in Tables I-02a, I-02b, and I-02d were developed using data from testing new engines. Although many of the test procedures used for emission testing required an engine break-in period, the tests performed on new engines do not account for in-use impacts on emissions from engine malfunctions, improper maintenance, and engine wear. To assess the magnitude of these impacts, EPA contracted with Southwest Research Institute (SwRI) to emission test small in-use utility engines. EPA also used existing data on pre-controlled heavy duty engines to estimate in-use impacts on emission factors.

Southwest Research Institute procured five in-use utility engines (3 four-stroke engines and 2 two-stroke engines) and performed emission tests using the SAE J1088 procedure. A description of the engines and the emission test results are shown in Table I-11. The table also shows the emission factors used for the respective equipment types which were derived from new, properly operating engines. The ratio of the in-use engine test emissions to the new engine emission factor is also shown in the table and these values were averaged to determine an in-use adjustment factor which can be applied to new engine emission factors

2.2.1. Four-Stroke Gasoline Engines Under 20 HP

The four-stroke engines tested by SwRI showed twice the HC and CO emissions, 0.4 times the NO_x emissions, and 3.6 times the particulate emissions of new engine emissions (Table I-11). These engines exhibited problems of low power, head gasket leaks and others which are described in the SwRI report.³³ Although only a very small sample of 4-stroke engines were tested, the trend of high HC, CO, and particulates and low NO_x was consistent. Thus, the adjustment factors were applied to the emission factors of gasoline 4-stroke engines less than 20 hp. The resulting emission factors (Table I-2c) represent a rough approximation of in-use nonroad engine emission levels

2.2.2. Four-Stroke Gasoline Engines Over 20 HP

In 1983, the Engine Manufacturers Association (EMA) and the EPA conducted a joint in-use test program to develop in-use emission factors for heavy duty diesel and heavy duty gasoline engines. The program used 1979 and 1982 model year pre-controlled engines and is

the best available source of data for representing in-use nonroad engine emissions. Using this data, a linear regression analysis was performed and the emissions as a function of mileage was plotted. To estimate the in-use adjustment factors some broad assumptions were made. Typical in-use engines were assumed to have accumulated 55,000 miles, which is half of the useful life of 110,000 miles defined in the regulations for heavy-duty gasoline engines³⁴. The regression analysis was then used to calculate an in-use factor by dividing the emission value at 55,000 miles by that at 0 miles. The resulting factors of 1.5 for HC and 1.3 for CO were applied to the emission factors of gasoline 4-stroke engines over 20 hp to approximate in-use emission factors (Table I-2c). The NO_x emissions showed no significant change with mileage accumulation and therefore NO_x emission factors were not adjusted. Particulate four-stroke engine emission factors were not adjusted since no data was available.

2.2.3. Two-Stroke Gasoline Engines

As discussed above, SwRI tested 2 two-stroke in-use engines. One was from a walk behind mower (WBM) application and the other was from a string trimmer application. The eleven year old WBM engine exhibited HC, CO, and PM emissions similar to the new engine emission factors shown in Table I-11. This engine produced somewhat higher NO_x emission than the new engine factors show. The string trimmer engine, on the other hand, showed extremely high HC, CO, and PM levels and similar NO_x levels compared to the new engine emission factors. Since only two data points were available for two-stroke engines and these data were widely divergent, EPA did not estimate in-use adjustment factors based on these points. Instead, the factors used for four-stroke engines less than 20 hp were used for HC and CO emissions, as the two-stroke data bracketed the four-stroke results for these pollutants (i.e., one data point was much lower and one was much higher). The four-stroke NO_x adjustment factor of 0.4 did not seem appropriate to apply to two-strokes since both the two-stroke engines tested by SwRI showed nearly equal or higher emission levels than new engine emission factors. Therefore, no adjustment was made to NO_x new engine emission factors. Also, the four-stroke particulate adjustment factor of 3.6 did not seem appropriate since the new engine emission factor used as numerator of the factor ratio was very small compared to the new emission factor value for two-stroke engines. Therefore, no adjustment was made to the two-stroke PM new engine emission factor.

2.2.4. Diesel Engines

As discussed earlier, EMA and EPA conducted a joint program to assess the emission factors of pre-controlled heavy duty diesel and gasoline engines. For diesel engines, the data showed no increase in HC, NO_x, or PM with vehicle mileage. Therefore, the new engine diesel emission factors were not adjusted for in-use effects.

Chapter 3. Refueling and Evaporative Emission Factors

Hydrocarbon (HC) refueling and evaporative emission factors are presented in this section. A list of nonroad equipment and their evaporative and refueling emission factors may be found in Tables I-01, I-02, I-12 and I-13. Table I-12 and I-13 are also good summaries of how refueling and evaporative emission factors were calculated for gasoline and diesel fueled equipment, respectively.

This section on *refueling and evaporative emission factors* is divided into four sub-sections that (1) introduce the concept of refueling and evaporative emissions, (2) present the fuel tank volume values used in calculating refueling and evaporative emission factors, (3) present the methodology and data (except fuel tank volumes) used to calculate refueling emission factors, and (4) present the methodology and data (except fuel tank volumes) used to calculate evaporative emission factors. Fuel tank volumes are discussed separately to avoid duplication of discussion in the sections on refueling and evaporative emission factor methodology and data.

3.1. The Concepts of Refueling and Evaporative Emissions

The concepts of refueling and evaporative emissions are presented in this sub-section and are applicable to both gasoline and diesel fueled equipment although, perhaps more pertinent to gasoline fueled equipment than diesel fueled equipment.

3.1.1. Refueling Emissions

There are two components of refueling emissions: spillage and vapor displacement. Spillage emissions, or simply *spillage*, are those emissions resulting from spilled fuel incurred during the refueling process. For example, spillage includes those vapors generated from fuel spilled while filling a storage container from a gas station pump and vapors generated from fuel spilled while transferring the fuel from the container to the equipment. Vapor displacement emissions, or *displacement*, are those emissions that result from displacing fuel vapors in the fuel tank with liquid fuel. For example, if one gallon of gasoline is poured into a container which already contains some gasoline, one gallon of fuel vapor is displaced to the

atmosphere by the incoming fuel. For the purposes of this study, *only fuel lost while refueling the equipment is considered*. One would expect, however, that displacement emissions resulting from the refueling of storage containers would be on the same order of magnitude as the displacement emissions from equipment.

3.1.2. Evaporative Emissions

Evaporative emissions are losses due to evaporation of unburned fuel. Evaporative emissions do not pass through the combustion chamber but, rather, the primary sources of evaporative emissions are the carburetor and fuel tank. Similar to their on-road counterparts, evaporative emissions from nonroad sources can be subdivided into four groups: hot soak, diurnal, running loss, and resting loss emissions. Each category accounts for emissions during specific operating conditions of the equipment and various mechanisms of emission. Hot soak emissions are those emissions which occur after the equipment has been turned off and are attributable to the elevated temperature of the equipment (e.g., evaporation from the carburetor bowl). Diurnal losses are those vapor emissions which occur while the equipment is not operating and are attributable to natural changes in ambient conditions (temperature, pressure, etc). Running loss emissions are those emissions which do not pass through the combustion chamber while the source is in operation. Resting loss emissions are those emissions which occur that are not already identified by another category. For example, emissions which are due to permeation of fuel through fuel lines and fuel tank, and leakage in the fuel system are resting-loss emissions. For the purposes of this study, only diurnal emissions will be considered due to the lack of data for hot-soak, resting loss and running loss emissions.

3.2. Developing Effective Fuel Tank Volumes

This sub-section will present those data and assumptions which were used to arrive at effective fuel tank volumes for specific gasoline and diesel equipment. Fuel tank volumes are not discussed along side the presentation of other data because both evaporative and refueling emission factors use fuel tank volumes as part of their calculation. A separate discussion of fuel tanks will avoid tedious duplication of discussion later

This sub-section on *developing effective fuel tank volumes* is divided into two sections. The first section presents effective fuel tank volumes for gasoline equipment and the second section presents effective fuel tank volumes for diesel equipment.

3.2.1. Gasoline Fuel Tank Volumes

Data used to calculate gasoline fuel tank volumes may be broadly categorized into two groups. data supplied by manufacturers and manufacturers' sales brochures, and data generated by EPA. Effective fuel tank volumes generated from each of these sources is discussed below

Manufacturers' Fuel Tank Data -- Manufacturers were asked to supply fuel tank volumes for several pieces of equipment. When data supplied by manufacturers matched an equipment category exactly, the data was used directly. However, the fuel tank volumes provided often did not quite match the equipment categories used by EPA in this study and aggregation was required. When possible, a weighted average of the fuel tank volumes was used to generate an *effective* fuel tank volume.

Effective fuel tank volumes are not necessarily constant for a particular equipment type. A weighing factor may be important when finding an average fuel tank volume to be used to calculate diurnal emissions but, that same weighing factor may not be important when calculating refueling emissions, or vice-versa. Diurnal emissions are influenced by the population and the length of season (assuming the equipment is used every few days). Refueling emissions are influenced by amount of fuel consumed which is a function of population, horsepower, load factor, brake specific fuel consumption and usage rate. Therefore, the purpose for which the average fuel tank volume is calculated dictates how individual fuel tank volumes are weighted.

For instance, walk behind lawnmowers have a range of fuel tank volumes of 0.37 to 0.68 gallons. It is known that the smaller fuel tank volumes tend to be used by consumers while equipment with larger tanks tend to be used commercially. Furthermore, although there may be fewer commercial lawnmowers, their usage rate is much higher and their season length is probably longer. When calculating the diurnal emission factors, the effective fuel tank volume should account for these factors. Other weighing factors are used when

calculating an effective fuel tank volume for refueling emission factors.

Unfortunately, calculated effective fuel tank volumes are the same for refueling and evaporative emission factor development because so many of the weighing factors were not available. The weighings were often reduced to mere population weighings or averages (i.e., if a particular weighing factor is not known, then the category is assumed to be homogeneous with respect to that weighing factor). As a result, the fuel tank volumes used for calculation of evaporative emissions are the same as those used for refueling emission factors unless specifically indicated.

The discussion below presents effective fuel tank volumes for each equipment type where fuel tank volume data was available from the manufacturer but not in direct usable form. Fuel tank weighings for calculation of gasoline refueling emission factors are discussed first and fuel tank weighings used in calculating gasoline evaporative emission factors are discussed afterwards where different from those presented for refueling emission factors. As mentioned earlier, Tables I-12 and I-13 are good summary sheets of the calculations discussed below.

Gasoline Fuel Tank Volumes for Calculation of Refueling Emission Factors -- Ideally, effective fuel tank volumes for generation of refueling emission factors are weighted by the amount of fuel consumed which is a function of population, horsepower, load factor, brake specific fuel consumption, and usage rate. As will be seen, tank volumes are very seldom weighted ideally.

Trimmers/Edgers/Brush Cutters - a straight average of fuel tank volumes from edge, hedge and string trimmers as presented in Table I-12 is used:

$$\frac{0.29 \text{ gal} + 0.11 \text{ gal} + 0.14 \text{ gal}}{3} = 0.18 \text{ gal}$$

Lawnmowers - a population and usage weighted³⁵ average of consumer and commercial walk behind mowers is used (i.e., horsepowers, load factors and BSFC are assumed homogeneous):

Lawnmowers	Pop. (%)	Usage Ratio	Vol. (gal)	Product (hrs-g/yr-gal)
Consumer	90	1	0.37	33.3
Commercial	10	16	0.68	108.8
Totals	250			142.1
Composite Gas Tank Volume =			0.57	

Leaf Blowers/Vacuums - A population, usage, and horsepower weighted average³⁶ of consumer and commercial walk behind mowers is used:

Leaf Blowers/ Vacuums	Pop (%)	Usage (hrs/yr)	HP (hp)	L F	Tank Volume (gal)	Product (hrs-g-hp/yr-gal)
Cons. Hand Held	92.83	9	.8	.47	0.16	50
Comm. Hand Held	1.84	197	.8	.47	0.16	22
Cons. Wk Behind	0.77	12	3.0	.47	0.83	11
Comm. Wk Behind	4.56	293	3.0	.47	0.83	1,564
Totals	2,347.33					1,647
Composite Gas Tank Volume =					0.70	

Lawn and Garden Tractors - a population³⁷ and usage³⁸ weighted average of lawn and garden tractors is used:

Lawn and Garden Tractors	Pop. (%)	Usage (hrs/yr)	Volume (gal)	Product (hrs-g/yr-gal)
Lawn	75	40	1.94	5,820.0
Garden	25	50	3.69	4,612.5
Totals	4,250			10,432.5
Composite Gas Tank Volume =			2.45	

Terminal Tractors - a population³⁹ weighted average of aircraft and baggage tow tractors is used:

	% Sales	Vol.	
aircraft:	17	* 7.70	= 1.31
baggage:	83	* 5.30	= 4.40
		<u>Total</u>	= 5.71 gal

Generator Sets - an average of small and portable generators is used:

$$\frac{0.88 \text{ gal} + 1.13 \text{ gal}}{2} = 1.0 \text{ gal}$$

Rollers - an average of rollers and vibratory rollers is used:

$$\frac{16 \text{ gal} + 21 \text{ gal}}{2} = 18.5 \text{ gal}$$

Surfacing Equipment - an average of pavement profiler and road reclaimer values was population weighted with soil stabilizers to determine an appropriate refueling emission factor:

$$\frac{\frac{(5.59+5.6)}{2} \frac{g}{gal} \times 130 \text{ units} + 5.60 \frac{g}{gal} \times 35 \text{ units}}{130 + 35 \text{ units}} = 5.60 \frac{g}{gal}$$

Tractors/Loaders/Backhoes - an average of backhoes and tractors is used:

$$\frac{28.5 \text{ gal} + 18.0 \text{ gal}}{2} = 23.3 \text{ gal}$$

Gasoline Fuel Tank Volumes for Calculation of Evaporative Emission Factors

Effective fuel tank volumes used for evaporative emission factor development which are different from those as shown for refueling emission factor development are listed below. Ideally, when aggregating equipment fuel tank volumes for evaporative (diurnal only) emission factor generation, the values would be weighted by population and days of in-use season. However, days of in-use season are not available and, therefore, could not be used. This should not significantly bias the data because aggregated equipment tend to have similar season lengths

Walk Behind Lawnmowers - a population weighted⁴⁰ average of values presented for consumer and commercial walk behind mowers is used:

	% Pop.	Vol.	
consumer:	90	* .37 =	333
commercial.	<u>10</u>	<u>* .68 =</u>	<u>.068</u>
		Total =	.401 gal

Leaf Blowers/Vacuums - a population weighted⁴¹ average of consumer and commercial walk behind mowers is used:

	% Pop.	Vol.	
hand held:	93.6	* 0.16 =	0.150
walk behind:	<u>6.4</u>	<u>* 0.83 =</u>	<u>0.053</u>
		Total =	0.203 gal

Lawn and Garden Tractors - a population weighted⁴² average of lawn and garden tractors is used.

	% Pop.	Vol.	
lawn:	75	* 1.94 =	1.455
garden.	<u>25</u>	<u>* 3.69 =</u>	<u>0.923</u>
		Total =	2.376 gal

Woodsplitter - assume the same as walk behind mowers (0.401 gal).

Other Lawn and Garden Equipment - assume the same as walk behind mowers (0.401 gal)

2-Wheel Tractors - assume the same as lawn and garden tractors (2.376 gal).

3.2.2. EPA Generated Fuel Tank Volumes

For most equipment types, the fuel tank volume data are estimates based on engineering judgement from industry representatives or values found in sales brochures. Several fuel tank volumes, however, were not provided by industry and alternative methods of approximating the fuel tank volumes were necessary.

Three alternatives were identified to approximate missing fuel tank volume data. The first alternative is to substitute fuel tank values from equipment that use similar engines. For example, the fuel tank volume for *Generator Sets* is also used for *Signal Boards* because signal boards use generators. If a substitution is not possible or justifiable then, the second alternative is to calculate fuel tank volumes based on regression analysis. A regression of known tank volumes versus net engine horsepowers was created by EPA and is described in detail later in this sub-section. The third alternative is the use of fuel tank volumes based on the engineering judgement of EPA personnel which have also been accepted by industry representatives. For all equipment, manufacturer suggested values were used if available and if not, then the first, second and third alternatives were used, respectively.

Volumes Based on Equipment with Similar Engines -- Fuel tank volumes which were assumed based on the known values of equipment that use similar engines are shown below. The names of equipment categories included in this study are italicized distinguish them from equipment types used by manufacturers in communicating data to EPA.

Woodsplitter - assume equivalent to *Lawnmowers* (0.57 gal).

Commercial Turf Equipment - Wide area walk behind lawnmowers comprise the majority of this category and therefore, the wide area walk behind lawnmower spillage value is used (5.0 gal). Hydro-seeders/mulchers, although a part of this category, were not incorporated into this number due to unknown weighing factors and relatively insignificant populations

Other Lawn and Garden Equipment - assume equivalent to *Lawnmowers* (0.57 gal)

Specialty Vehicles Carts - assume equivalent to *Golf Carts* (6 gal).

Air Compressors - assume equivalent to small compressors (1.13 gal).

Pressure Washers - assume equivalent to *Pumps* (0.75 gal)

Tampers/Rammers - assume equivalent to *Plate Compactors* (0.94 gal).

Paving Equipment - assume equivalent to vibrators/finishers (10 gal). Note that this is a good assumption for the gasoline portion of paving equipment only

Signal Boards - assume equivalent to *Generator Sets* (1.0 gal).

2-Wheel Tractors - assume equivalent to *Lawn and Garden Tractors* (2.45 gal).

Agricultural Mowers - assume equivalent to *Lawn and Garden Tractors* (2.45 gal)

Sprayers - assume equivalent to crop/turf sprayers (1.5 gal). Fertilizer spreaders were not included in this category because there is not adequate means to weigh their impact.

Volumes based on Regression Line -- A regression of fuel tank volume versus net engine horsepower from John Deere farm, construction and utility engines was created by EPA from John Deere product literature. The regression line is only applicable to those equipment with engines of 15 Hp or more.⁴³ The result of that regression is:

$$\text{Fuel Tank Vol} = 0.51 \times \text{Net HP} \quad ; \quad R^2 = 0.82$$

Articulated tractors and feller-bunchers were excluded from the regression due to their exceptionally high fuel tank volumes. A list of equipment type, model, engine, net hp and fuel tank volume for all equipment used in that regression as well as a plot of the data is presented in Table I-14.

As indicated in Table I-14, most of the equipment used to create the above regression line are diesel fueled. There may be some concern that fuel tank volumes of similar diesel and gasoline equipment do not approximate each other because a particular piece of gasoline equipment tends to be smaller and have a smaller fuel tank than its diesel counterpart. This should not be the case when comparing gasoline and diesel equipment of similar horsepower. Diesel equipment tend to have larger fuel tanks because they tend to have larger engines. When the influence of the size of engine is removed, as done by the regression, that difference should be minimal. On the contrary, a larger mass of gasoline is required to do the same amount of work as done by a diesel fueled piece of equipment (i.e., the brake specific fuel consumption of gasoline equipment tends to be higher) and, therefore, gasoline fuel tanks would necessarily be larger to accommodate the same amount of work. Thus, use of this

regression may slightly overestimate gasoline spillage emissions but, underestimate gasoline diurnal emissions.

Due to the lack of similarity of much of the equipment, the regression line was used extensively. The gasoline equipment for which fuel tank volumes were calculated from the regression are shown below (hp in parenthesis).

Chippers/Stump Grinders (62)	Cranes (55)
Aircraft Support Equipment (48)	Crushing/Proc. Equipment (60)
Vessels w/Inboard Engines (170)	Rough Terrain Forklifts (88)
Aerial Lifts (36)	Other Construction Equipment (150)
Sweepers/Scrubbers (39)	Asphalt Pavers (31)
Other General Industrial Equipment (19)	Swathers (106)
Gas Compressors (30)	Bore Drill Rigs (54)
Rollers (17)	Rubber Tired Loaders (67)
Excavators (80)	Agricultural Tractors (87)
Combines (131)	Other Agricultural Equipment (55)
Other Material Handling Equipment (51)	

The diesel equipment for which fuel tank volumes were calculated using the regression are too numerous to list here but, they are indicated in Table I-13.

Fuel Tank Volumes Based on EPA Assumptions -- EPA was forced to make assumptions regarding the fuel tank size of "Sailboat Auxiliary Inboard Engines" (6 gal), "Sailboat Auxiliary Outboard Engines" (6 gal.) and Vessels w/Sterndrive Engines" (21 gal) because data for those categories was not available. These values were presented to the National Marine Manufacturers Association (NMMA) and deemed to be acceptable estimates based on available data.⁴⁴

Diesel Fuel Tank Volumes -- Fuel tank volumes for most diesel equipment were found from the regression line developed by EPA from John Deere equipment as described above in the section on gasoline fuel tank volumes. Fuel tanks for some equipment were taken from other sources and the reader is referred to Table I-13 for those details

3.3. Methodology Used to Calculate Refueling Emission Factors

This section will present the methodology and data used to calculate refueling emission factors. Refueling emissions are composed of spillage and displacement emissions and this section will present each individually for both gasoline and diesel equipment.

3.3.1. Gasoline Refueling Emission Factors

Spillage -- Very little work has been done to quantify the amount of fuel spilled while refueling nonroad engines. The only known spillage values have been presented by Briggs & Stratton and OPEI for lawn and garden equipment (primarily standard walk behind lawnmowers). Briggs & Stratton has presented a value of 45 grams (approximately 1.5 oz.) per refueling and suggested that the value be reduced to 22.5 g/refueling as the user becomes familiar with the equipment.⁴⁵ OPEI reported in a study completed in September of 1991 that 17 grams of fuel were spilled during a typical refueling incident. All of these values are much higher than the spillage value which may be *backed out* of Mobile4 for on-highway vehicles which is roughly 3.6 g/refueling ($0.31 \text{ g/gal} * 11.5 \text{ gal/refuel}$).⁴⁶

The discrepancy between the Mobile4 value and the OPEI and Briggs & Stratton value is most likely due to the fact that (1) many nonroad engines are refueled from fuel containers which are more difficult to use than gasoline pumps, (2) fuel containers do not have automatic shut off capability and (3) equipment fuel tanks are not as accessible. Therefore, the numbers provided by OPEI and Briggs & Stratton are probably closer to the true value for nonroad engines which are typically refueled from a portable, hand-held fuel container. When deriving the emission factors presented in this study, EPA has assumed that 17 g of fuel is spilled per refueling when a portable fuel container is used and, for nonroad equipment that is refueled from a gasoline pump, spillage is assumed to be 3.6 g/refueling. EPA chose the OPEI over the Briggs & Stratton value because it is based on substantially more data.

The method of refueling (pump or container) is discerned by application and fuel tank size. Lawn and garden (except chippers/stump grinders), recreational, and light commercial equipment are assumed to be refueled from portable fuel containers. In addition, any other equipment with fuel tank volumes less than 6 gallons⁴⁷ are assumed to be refueled primarily from portable fuel containers regardless of category (except baggage tow tractors). All other

equipment are assumed to be refueled from a fuel pump. In either case, the amount of fuel spilled per gallon of gasoline consumed may be calculated by:

$$Spillage_{portable\ container} \left[\frac{g}{gal} \right] = \frac{17.0 \left[\frac{g}{refuel.} \right]}{Tank\ Vol. \left[\frac{gal}{refuel.} \right]}$$

$$Spillage_{fuel\ pump} \left[\frac{g}{gal} \right] = \frac{3.6 \left[\frac{g}{refuel.} \right]}{Tank\ Vol. \left[\frac{gal}{refuel.} \right]}$$

where *Tank Vol.* is the fuel tank volume. All refuelings are assumed to be *fill-ups* of an empty tank and thus, these spillage estimates are conservative (low).

Vapor Displacement -- No estimates for vapor displacement emissions from nonroad engines can be found in literature. However, on-road and nonroad displacement values should be similar since the gasoline composition for both is the same. Therefore, EPA has implemented a model proposed by Rothman and Johnson of the EPA to predict displacement emissions⁴⁸:

$$Disp. = -5.909 - 0.0949 \times dT + 0.0884 \times Td + 0.485 \times RVP$$

where: $Disp. = Displacement \left(\frac{g}{gal} \right)$
 $dT = Temp\ of\ Tank - Temp\ of\ Dispensed\ Fuel\ (^{\circ}F)$
 $Td = Temp\ of\ Dispensed\ Fuel\ (^{\circ}F)$
 $RVP = Reid\ Vapor\ Pressure$

Rothman and Johnson also recommend national average values for the parameters depending on the season of year. EPA has used the Rothman and Johnson national average parameter suggestions and matched equipment types to the national average parameters for the particular

season of the year in which the equipment is most likely to operate (refer to Table I-12). The equipment tank temperature, dispensed fuel temperature and delta T values suggested by Rothman and Johnson are shown in the table below for equipment which are refueled from a gas pump⁴⁹ Rothman and Johnson's summer and annual RVP values are not used in anticipation of the new RVP standards which limit RVP to 10.5 during the summer months. The annual average RVP was therefore recalculated based on the new summer RVP (5 months) and the winter RVP (7 months) from Rothman and Johnson. The table shows that there is relatively little overall effect on displacement emissions by season of the year.

Refueling Method	Season	Equip. Tank Temp.	Dispensed Temp. (Td)	dT (°F)	RVP	DISP (g/gal)
Fuel Pump	Annual Average	73.3	68.9	4.40	12.5	5.83
	Summer Average	85.0	76.2	8.80	10.5	5.08
	Winter Average	59.5	60.3	-0.80	13.9	6.09
Portable Container	Annual Average	73.3	73.3	0.00	12.5	6.63
	Summer Average	85.0	85.0	0.00	10.5	6.70
	Winter Average	59.5	59.5	0.00	13.9	6.09

The temperature differences between the equipment's fuel tank and the dispensed fuel (dT) as well as the actual dispensed fuel temperature (Td) shown above are representative of fuel dispensed from underground storage tanks. It is unlikely that the temperature of fuel dispensed from a portable fuel container will match that of fuel dispensed from an underground storage tank. Rather, the fuel temperature from a portable container will most likely match that of the fuel in the equipment since both the container and equipment are exposed to the same ambient conditions. Therefore, the values suggested by Rothman and Johnson as shown above are used only for equipment refueled from gasoline pumps. For equipment refueled from fuel containers, the values are identical except that dT is assumed

equal to zero and Td (the temperature of the dispensed fuel) is assumed equal to the temperature of the fuel in the tank (dT + Td).

It can be correctly argued that the dispensed fuel temperature for many nonattainment areas will be dissimilar to those values presented above--especially the winter time values. While recognizing this deficiency, EPA is unable to incorporate *city-by-city* emission factors due to the immense size of that task.

As stated earlier, lawn and garden (except chippers/stump grinders), recreational, and light commercial equipment are assumed to be refueled from a portable gas container and therefore have a dT value equal to zero. In addition, any other equipment (regardless of category) with fuel tank volumes less than 6 gallons are also assumed to be refueled primarily from fuel containers (except baggage tow tractors) and have dT equal to zero. All other equipment are assumed to be refueled from a gasoline pump and have a dT value as shown in the table above. A list of various equipment and the associated displacement emission factors as well as total refueling emission factors is located in Table I-12.

To make the refueling emission factors compatible with the populations and usage rates used in the study, the units were changed from grams per gallon to grams per horsepower hour (except some recreational equipment which are expressed in g/hr). To facilitate that change, assumptions regarding the brake specific fuel consumption (BSFC) were necessary. BSFC data provided by SWRI and CARB were used to estimate BSFC for equipment with average horsepower of 8 hp and less, 8 hp to 20 hp and above 20 hp. The values assumed are 0.219⁵⁰, 0.15⁵¹, or 0.0806⁵² gal/hp-hr, respectively. Thus, refueling emission factors were easily transformed to units of grams per brake horsepower hour. For example, if the original spillage value is 49.78 g/gal (walk behind lawnmower; avg hp = 4.0) then,

$$49.78 \text{ g/gal} * 0.219 \text{ gal/hp-hr} = 10.90 \text{ g/hp-hr}$$

Refueling emission factors for all recreational equipment except snowmobiles are expressed in units of g/hr, instead of g/hp-hr. The conversion was made by multiplying the original value in g/hp-hr by the average horsepower and load factor supplied by EEA. For example, the conversion for minibikes is.

$$11.26 \frac{\text{g}}{\text{hp-hr}} \times 4 \text{ hp} \times 0.62 = 12.92 \frac{\text{g}}{\text{hr}}$$

3.3.2. Diesel Refueling Emission Factors

Refueling emissions from diesel fueled equipment are not as significant as those from gasoline fueled equipment because diesel fuel has a relatively high initial boiling temperature of 350 °F which impedes its evaporation. Gasoline, on the other hand, has initial boiling temperatures of 60 - 80 °F depending on the season of year (RVP) and, therefore, evaporates more readily.⁵³ As a result, very little work has been done to quantify diesel refueling emissions. Indeed, EPA is not aware of any studies of emissions from spilled diesel fuel. However, work has been done by F Peter Hutchins of the EPA to quantify displacement emissions from diesel fuel.⁵⁴ Hutchins' work has shown the displacement emissions from diesel fuel to be 0.041 grams per gallon of fuel dispensed for dispensed fuel and fuel tank temperatures of approximately 80 °F. For the purposes of the present study, all diesel equipment are assumed to emit HC vapors at a rate of 0.041 grams per gallon of fuel dispensed. EPA is not aware of any other data pertaining to refueling or evaporative emissions from diesel fueled equipment and, therefore, several emission sources are not included in this study.

Just as was needed for the gasoline refueling emission factors, the diesel refueling emission factors were adjusted to be compatible with the populations and usage rates used in the study. The units were changed from grams per gallon to grams per horsepower hour (except some recreational equipment which are expressed in g/hr). To facilitate that change, assumptions regarding the brake specific fuel consumption (BSFC) were necessary. Recognizing that diesel equipment generally has a higher BSFC than gasoline equipment, the factors above were multiplied by 0.8. Therefore, the BSFCs assumed in this report for diesel equipment are 0.175, 0.12, and 0.065 gal/hp-hr, for engines under 8 hp, between 8 and 20 hp, and over 20 hp, respectively. Refueling emission factors for all recreational equipment except snowmobiles are expressed in units of g/hr, instead of g/hp-hr. The conversion was made by multiplying the original value in g/hp-hr by the average horsepower and load factor supplied by EEA.

3.4. Methodology Used to Calculate Evaporative Emission Factors

This section will present the methodology and data used to calculate evaporative emission factors for gasoline and diesel equipment. Evaporative emissions are composed of diurnal, hot-soak, resting loss and running loss emissions and this section will present each individually.

3.4.1. Gasoline Evaporative Emission Factors

Diurnal -- The most comprehensive data available for diurnal emissions appears to be contained in two reports written by Charles T. Hare and Karl J. Springer of Southwest Research Institute.^{55,56} Both CARB and AP-42 refer to their work for diurnal emissions. In summary, Southwest developed diurnal emission factors of 2 g/gal/day⁵⁷ and 4 g/gal/day for protected (shaded) and unprotected fuel tanks, respectively, during the in-use season. This report will assume the average of the two estimates 3 g/gal/day because of the difficulty in determining what percentage of each type of equipment has protected or unprotected fuel tanks. Diurnal emission factors, in units of grams per day of possible use, are calculated using the fuel tank volumes supplied by manufacturers and are presented in Table I-12. Diurnal losses occur only during those portions of the year when the equipment is used relatively regularly (every few days).⁵⁸ In other words, if the equipment is not used regularly, then diurnal emissions become negligible.

Hot-Soak -- After reviewing SAE papers and SwRI reports regarding evaporative emissions and referring with several manufacturers, EPA found no appropriate values for hot-soak emission factors for off-road engines. Hot-soak emission values for on-highway engines do exist, but they are not representative of off-road engines due to the different size, design, packaging and carburetors that each employs. Therefore, this study does not account for hot-soak emissions.

Resting Loss -- Resting loss emissions are not included in this study due to the lack of available data. However, to obtain a *feel* for the potential magnitude of this type of emission, one can consider the amount of fuel a plastic storage container is permitted to lose and still meet the standards devised by the American Society for Testing and Materials (ASTM). A non-metallic fuel container passes the standards set by ASTM if it loses less than 1% of its mass over 30 days at a temperature of 75 °F. The test fuel used is a 70%

isooctane, 30% toluene mixture (by volume). Assuming that the test fuel and *regular* gasoline behave the same, the standard indicates the fuel container could loose up to 28 grams of fuel per month.

Running Loss -- Just as for hot-soak emissions, no data on the subject of running loss emissions for nonroad engines was found and on-highway values would not be representative. Therefore, running loss emissions are not accounted for in this study.

3.4.2. Diesel Evaporative Emission Factors

EPA is not aware of any diesel evaporative emission data and therefore, diesel evaporative emissions are not included in this study. On a qualitative basis, however, it can be said that evaporative emissions from diesel equipment should be much less than evaporative emissions from gasoline equipment because diesel fuel has a relatively high initial boiling temperature of 350 °F which impedes its evaporation. Gasoline, on the other hand, has initial boiling temperatures of 60 - 80 °F depending on the season of year (RVP) and, therefore, evaporates more readily⁵⁹

Chapter 4. Crankcase Emission Factors

Crankcase emission factors are presented in this section for gasoline and diesel nonroad equipment after a brief introduction of crankcase emissions.

Crankcase emissions are those exhaust gases which, upon leaving the combustion chamber, do not pass through the exhaust valve. Rather, the gases discharge into the crankcase via the clearance between the piston and cylinder wall. Eventually, these gases may escape from the crankcase to the atmosphere, hence, they are named *crankcase emissions* and the crankcase is said to be *open*. Some manufacturers produce crankcases which route vapors to the air intake system of the equipment. Those crankcases are called *closed* crankcases. Crankcase emissions, together with evaporative, refueling, and tailpipe emissions, constitute the total emissions from an engine

The rest of this section is separated into two parts. The first part introduces crankcase emission factors for 4-stroke gasoline fueled engines and the second introduces crankcase emission factors for 4-stroke diesel fueled engines. Several documents have been referenced and the best available emission factors have been identified for use in the nonroad study.⁶⁰

4.1. Gasoline Crankcase Emission Factors

This section will present crankcase emission factors for nonroad gasoline engines and describe the methodology for developing them.

Crankcase emission data for nonroad engines do not exist. For hydrocarbon (HC) nonroad crankcase emission factors, estimates are based on on-highway data. No emission estimates for crankcase carbon monoxide (CO) or oxides of nitrogen (NO_x) are available and therefore, those pollutants are not considered for gasoline nonroad crankcase emissions. The following paragraphs will present crankcase HC emission factors for gasoline nonroad engines.

Probably the most widely accepted values for nonroad crankcase HC emissions are those found in AP-42.⁶¹ AP-42 reports crankcase HC emissions for farm and construction equipment based on work performed by Southwest Research Institute (SwRI) in the early 1970's.⁶² The SwRI work on crankcase HC emissions suggests that "crankcase hydrocarbon

emissions are equivalent to about 20 percent of those in the exhaust . . ."⁶³ This generalization is based on work performed by Charles M. Heinen⁶⁴ and P. A. Bennett, et al⁶⁵ on on-highway vehicles. However, when calculating crankcase emissions, Hare and Springer misinterpreted the Heinen and Bennett reports. Bennett estimated crankcase emissions to be approximately 70% of exhaust emissions (40% of total HC emissions) based on testing five cars.⁶⁶ Heinen, on the other hand, chose the value of 33% of exhaust emissions (20% of total HC emissions) which was estimated by Fred W. Bowditch of General Motors.⁶⁷ Heinen chose Bowditch's number as the best compromise of competing values supplied by CARB (31% of uncontrolled HC exhaust; 20% of total).⁶⁸ the Federal Government (49% of uncontrolled HC exhaust; 26% of total)⁶⁹ and Bowditch (see chart below). The origins of the values supplied by the Federal Government and CARB are unknown while the crankcase emission values put forth by Mr. Bowditch (33% of uncontrolled HC exhaust emissions and 20% of total emissions) appear to be educated estimates based on General Motors "quality audit data". After updating AP-42 using Bowditch's number, the values for crankcase emissions for agricultural equipment are 42.2 g/hr and 47.2 g/hr for tractors and nontractors, respectively.

Emis. Type	<u>CARB</u>		<u>Federal</u>		<u>Bowditch</u>		<u>Bennett</u>	
	% Tot	% Exh	% Tot	% Exh	% Tot	% Exh	% Tot	% Exh
Crank.	20	31	26	49	20	33	40	70
Evap.	15	23	21	40	20	33	--	--
Exhaust	65	100	53	100	60	100	60	100

The corrected AP-42 estimates closely agree with an EPA study of crankcase HC emissions from nine on-highway vehicles with disabled PCV systems and disconnected fresh air hoses on a gram/hour basis.⁷⁰ The EPA found that the nine vehicles studied emitted, on average, 1.92 grams of HC per mile (37.6 g/hr based on 3 bag FTP with average speed of 19.6 mph) over the first three bags of the FTP driving schedule with PCV and fresh air hose disconnected. This value (37.6 g/hr) compares reasonably well with the updated AP-42

estimates of 42.24 and 47.2 g/hr for tractor and nontractor farm equipment, respectively, run over a steady-state mode test.⁷¹

Aside from being an estimate, there may be other concerns regarding the reliability of Bowditch's crankcase number (33% of uncontrolled HC exhaust) for use with today's nonroad engines. The relationship between on-highway crankcase emissions and nonroad crankcase emissions has never been documented for current year on- and nonroad engines. Differences in operating cycles, machining tolerances, fuel delivery systems, etc., of on- and nonroad engines compromise the ability to use existing on-highway engine exhaust and crankcase emissions to generate nonroad emission factors. For instance, technological advances in combustion design for on-highway vehicles may not have been applied to nonroad engines to date. In addition, those advances may decrease exhaust and/or crankcase emissions but, perhaps disproportionately. Based on available data, there are two ways that EPA can proceed to estimate nonroad crankcase emissions. First, EPA can adopt the number provided by Bennett (70% of untreated exhaust HC emissions) or, second, EPA can apply Bowditch's estimate (33% of untreated exhaust HC emissions). Despite the legitimate concerns mentioned above, EPA believes that the Bowditch number remains the best available estimate for crankcase emissions because it has been corroborated by EPA in 460/3-84-011. In addition, it is more conservative than Bennett's number which has not been corroborated by other sources. For purposes of estimating total emissions from the nonroad population, EPA uses the "33% of untreated exhaust" value for all gasoline engines without *closed* crankcases. Four-stroke engines with closed crankcases and all two-stroke engines are assumed to have no crankcase emissions.

4.2. Diesel Crankcase Emission Factors

This section will present the best available HC, CO, and NO_x emission factors for nonroad diesel engines and describe the methodology for developing them.

Data for crankcase emissions from diesel engines is limited. In fact, no studies which explicitly investigate crankcase emissions from nonroad diesel engines have been found. However, studies have been found for on-highway crankcase emissions. The most recent and comprehensive paper has been published by Charles T Hare and Thomas M. Baines.⁷² Hare

and Baines studied three engines of which two were approximately half way between overhauls and the other was relatively new. They found that hydrocarbon crankcase emissions represent approximately 0.3 to 4.0 percent of corresponding exhaust hydrocarbon emissions (0.006 to 0.017 g/kW-hr) when tested over the 13-mode test procedure. These values are consistent with earlier studies conducted by Chevalier⁷³ (approximate average value = 0.0395 g/kW-hr⁷⁴) of heavily worn diesel engines and Caterpillar (0.017 g/kW-hr).⁷⁵ The condition of the Caterpillar engine was not reported.

For the purposes of EPA's nonroad study, diesel crankcase HC emissions will be assumed to be 2 percent (the mean of the range found by Hare and Baines) of untreated exhaust hydrocarbon emissions unless a *closed* crankcase is implemented. In cases where the crankcase is closed, EPA assumes zero diesel crankcase emissions. CO and NO_x emissions from diesel crankcases have only been reported by Hare and Baines, and Caterpillar. Hare and Baines reported CO and NO_x emission rates of 0.015 to 0.43 percent and 0.006 to 0.1 percent of exhaust emissions, respectively. Their numbers are corroborated by Caterpillar who reported CO and NO_x emission rates of 0.23 and 0.076 of exhaust emission rates. For the purposes of EPA's nonroad study, CO and NO_x crankcase emissions from diesel engines will be assumed to be 0.2 percent and 0.05 percent (the mean of the values reported by Hare and Baines) of exhaust emissions, respectively

Chapter 5. Benzene

Based on review of the limited available data for toxic emissions of benzene and 1,3-butadiene, EPA found it most appropriate in these cases to calculate emission rates as a weight percentage of the total hydrocarbon emissions. Benzene exhaust emissions are expressed as roughly 3 percent by weight of tailpipe exhaust hydrocarbons and crankcase hydrocarbons for both gasoline and diesel engines. Only four studies of benzene emissions were available for data applicable to nonroad configurations (i.e., non-catalyst).⁷⁶ Analysis of the data indicated that while there were large differences in the benzene emissions with power and driving cycle when expressed in milligrams per hour, milligram per horsepower hour, or milligrams per mile, the differences were far less when expressed as a percent of total exhaust hydrocarbon emissions, as presented in the SwRI report.⁷⁷ Refueling emissions, which consist of spillage and vapor displacement, were assumed to consist of 1.7% (weight) benzene which is the average summer and winter grade benzene content of in-use gasoline (diesels were assumed to have negligible refueling emissions).

Chapter 6. 1,3-Butadiene

EPA has also chosen to express 1,3-butadiene emissions as a weight percent of tailpipe exhaust hydrocarbons plus crankcase hydrocarbons. The respective percentages used in this study for nonroad diesel and gasoline engines are 1.6% and 1.3%.⁷⁸ Emissions of 1,3-butadiene were almost never measured in engine exhaust prior to the late 1980's, because the procedures for doing so are relatively new. Only one study was available with measurement from diesel engines and one study with measurements from non-catalyst gasoline automobiles tested on unleaded gasoline. None of the studies found involved measurement from nonroad equipment and duty cycles. However, due to the lack of additional information, EPA did apply these emission rates to all categories.

Chapter 7. Nitrosamines

In addition to HC, CO and NO_x emissions, it has been documented that nitrosamines, which have been found to be carcinogenic in animals, are emitted from vented diesel crankcases.⁷⁹ While the contribution of motor vehicle emissions to the nitrosamine concentration is not known for certain, Thomas M. Baines of EPA reports that three researchers (Gordon,⁸⁰ Shapley⁸¹ and Pellizzari⁸²) have identified nitrosamines near roadways and two of the three suspected automobiles as a source.⁸³ Gordon reported nitrosamine concentrations as high as 1.1 micrograms per cubic meter in the Los Angeles basin. In his technical report, Baines proposes 109 cancer incidents per year if 1.5 million people are exposed to 1.1 micrograms per cubic meter for 2 hours per day. Undoubtedly, crankcase emissions of nitrosamines contribute to those cancer incidents. The reader is referred to EPA's Integrated Risk Information System (IRIS) for a more complete risk analysis and the technical report written by Thomas M. Baines for a more in depth analysis of nitrosamines from diesel crankcase emissions and car interiors.

TABLE I-01
EMISSION FACTORS USED FOR SIP INVENTORIES

a) FARM EQUIPMENT

		HC				CO	NOx	PM	ALDEHYDES	SOx
		EXHAUST	CRANK	EVAP LB/YR	REFUELING					
GASOLINE TRACTORS	LB/1000GAL	125.00	41.25	23.20	12.60	3260.00	151.00	8.00	6.80	5.31
GASOLINE NONTRACTORS	LB/1000GAL	135.00	44.55	5.19	12.60	4100.00	98.50	6.86	4.10	5.28
DIESEL TRACTORS	LB/1000GAL	62.30	1.25	0.00	0.00	174.90	438.60	45.70	12.00	31.20
DIESEL NONTRACTORS	LB/1000GAL	71.10	1.42	0.00	0.00	170.90	435.00	51.30	10.20	5.28

b) CONSTRUCTION EQUIPMENT

		HC				CO	NOx	PM	ALDEHYDES	SOx
		EXHAUST	CRANK	EVAP	REFUELING					
GASOLINE										
TRACKED TRACTORS	G/HP-HR	NA	NA	NA	NA	NA	NA	NA	NA	NA
TRACKED LOADERS	G/HP-HR	NA	NA	NA	NA	NA	NA	NA	NA	NA
MOTOR GRADERS	G/HP-HR	6.32	2.09	1.02	0.45	187.00	4.90	0.33	0.29	0.25
SCRAPERS	G/HP-HR	NA	NA	NA	NA	NA	NA	NA	NA	NA
OFF HIGHWAY TRUCKS	G/HP-HR	NA	NA	NA	NA	NA	NA	NA	NA	NA
WHEELED LOADERS	G/HP-HR	5.56	1.83	1.43	0.45	163.00	5.42	0.31	0.22	0.24
WHEELED TRACTORS	G/HP-HR	5.34	1.76	0.38	0.47	142.00	6.37	0.36	0.25	0.23
ROLLERS	G/HP-HR	9.25	3.05	2.59	0.47	202.00	5.28	0.39	0.26	0.28
WHEELED DOZERS	G/HP-HR	NA	NA	NA	NA	NA	NA	NA	NA	NA
MISCELLANEOUS	G/HP-HR	6.49	2.14	0.65	0.46	198.00	4.79	0.30	0.22	0.26
DIESEL										
TRACKED TRACTORS	G/HP-HR	0.90	0.02	0.00	0.00	2.40	10.30	0.69	0.17	0.85
TRACKED LOADERS	G/HP-HR	0.60	0.01	0.00	0.00	2.40	10.00	0.66	0.10	0.85
MOTOR GRADERS	G/HP-HR	1.10	0.02	0.00	0.00	1.90	9.60	0.63	0.12	0.87
SCRAPERS	G/HP-HR	0.50	0.01	0.00	0.00	2.50	8.70	0.79	0.28	0.90
OFF HIGHWAY TRUCKS	G/HP-HR	0.37	0.01	0.00	0.00	2.28	8.15	0.50	0.22	0.89
WHEELED LOADERS	G/HP-HR	0.60	0.01	0.00	0.00	2.40	10.30	0.81	0.20	0.86
WHEELED TRACTORS	G/HP-HR	1.76	0.04	0.00	0.00	7.34	11.91	1.27	0.28	0.85
ROLLERS	G/HP-HR	0.80	0.02	0.00	0.00	3.10	9.30	0.78	0.20	1.00
WHEELED DOZERS	G/HP-HR	0.37	0.01	0.00	0.00	2.28	8.15	0.41	0.16	0.89
MISCELLANEOUS	G/HP-HR	1.01	0.02	0.00	0.00	4.60	11.01	0.90	0.20	0.93

c) INDUSTRIAL EQUIPMENT

		HC				CO	NOx	PM	ALDEHYDES	SOx
		EXHAUST	CRANK	EVAP	REFUELING					
GASOLINE	G/HP-HR	6.68	2.20	0.30	0.49	199.00	5.16	0.33	0.22	0.27
DIESEL	G/HP-HR	1.12	0.02	0.00	0.00	3.03	14.00	1.00	0.21	0.93

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TABLE I-01 (cont)

d) LAWN & GARDEN EQUIPMENT

		EXHAUST	HC CRANK	EVAP	REFUELING	CO	NO _x	PM	ALDEHYDES	SO _x
4-CYCLE	G/GAL	110.71	36.53	3.98	22.50	2070.00	11.50	2.08	3.14	2.37
2-CYCLE	G/GAL	927.51	0.00	11.48	22.50	2683.00	3.38	23.85	6.79	1.80

e) OFF HIGHWAY MOTORCYCLE

		EXHAUST	HC CRANK	EVAP G/MILE	REFUELING	CO	NO _x	PM	ALDEHYDES	SO _x
	G/MILE	17.70	1.84	0.36	0.45	34.20	0.15	0.15	0.07	0.03

f) SNOWMOBILES

		EXHAUST	HC CRANK	EVAP	REFUELING	CO	NO _x	PM	ALDEHYDES	SO _x
	G/YR	37800.00	0.00	1454.40	1981.00	58700.00	600.00	1670.00	552.00	51.00

g) RECREATIONAL BOATS

		EXHAUST	HC CRANK	EVAP	REFUELING G/GAL	CO	NO _x	PM	ALDEHYDES	SO _x
OUTBOARD	LB/1000GAL	1760.00	0.00		10.16	3470.00	7.80			6.80
INBOARD GASOLINE	LB/1000GAL	137.00				1305.00	139.00	1.64	6.77	6.80
INBOARD DIESEL	LB/1000GAL	32.00	0.64	0.00	0.00	119.00	436.00	24.00	2.03	27.00

h) COMMERCIAL MARINE VESSELS

		EXHAUST	HC CRANK	EVAP	REFUELING	CO	NO _x	PM	ALDEHYDES	SO _x
COASTAL	LB/1000GAL	24.00	0.48	0.00	0.00	61.00	550.00	33.00		27.00
GREAT LAKES	LB/1000GAL	59.00	1.18	0.00	0.00	110.00	260.00	17.00		27.00
RIVER	LB/1000GAL	50.00	1.00	0.00	0.00	100.00	280.00	17.00		27.00
STEAMSHIPS HOTELLING	LB/1000GAL	3.20		0.00	0.00	NA	36.40	10.00		318.00
STEAMSHIPS CRUISE	LB/1000GAL	0.70		0.00	0.00	3.45	55.80	20.00		318.00
<6 DRAFT	LB/1000GAL	51.10	1.02	0.00	0.00	47.30	389.30	17.00		27.00
6-12 DRAFT	LB/1000GAL	44.50	0.89	0.00	0.00	99.70	338.60	17.00		27.00
12-18 DRAFT	LB/1000GAL	16.80	0.34	0.00	0.00	62.20	167.20	17.00		27.00
>18 DRAFT	LB/1000GAL	24.00	0.48	0.00	0.00	61.00	550.00	33.00		27.00
STEAMSHIP CRUISE	LB/1000GAL	0.70		0.00	0.00	3.50	55.80	20.00		318.00

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Table I-02. (cont.)

d) GASOLINE 2-STROKE EQUIPMENT (grams/hp-hr)
Not Adjusted for In-Use Effects

HC

Class	Equipment Types	EXHAUST	CRANK	EVAP g/day	REFUELC g/hp-hr	CO	NOx	PM ALDEHYDE	SOX	
1	Trimmers/Edgers/Brush Cutters	224 13	NA	0 55	21 67	721 91	0 90	3 99	2 04	0 54
1	Lawn Mowers	208 00	NA	1 19	7 89	488 00	0 29	7 70	2 04	0 54
1	Leaf Blowers/Vacuums	215 29	NA	0 62	6 61	716 81	0 98	3 60	2 04	0 54
1	Rear Engine Riding Mowers	NA	NA	NA	NA	NA	NA	NA	NA	NA
1	Front Mowers	NA	NA	NA	NA	NA	NA	NA	NA	NA
1	Chainsaws <4 HP	298 00	NA	0 37	31 69	699 00	0 98	3 60	1 60	0 54
1	Shredders <5 HP	208 00	NA	1 75	7 68	488 00	0 29	7 70	2 04	0 54
1	Tillers <5 HP	208 00	NA	1 38	9 39	488 00	0 29	7 70	2 04	0 54
1	Lawn & Garden Tractors	NA	NA	NA	NA	NA	NA	NA	NA	NA
1	Wood Splitters	NA	NA	NA	NA	NA	NA	NA	NA	NA
1	Snowblowers	208 00	NA	2 50	5 82	488 00	0 29	7 70	2 04	0 54
1	Chippers/Stump Grinders	NA	NA	NA	NA	NA	NA	NA	NA	NA
1	Commercial Turf Equipment	208 00	NA	15 00	1 40	488 00	0 29	7 70	2 04	0 54
1	Other Lawn & Garden Equipment	208 00	NA	1 19	6 81	488 00	0 29	7 70	2 04	0 54
3	All Terrain Vehicles (ATVs)	600 00	NA	6 00	2 16	800 00	1 50	8 20	2 75	0 95
3	Minibikes	NA	NA	NA	NA	NA	NA	NA	NA	NA
3	Off Road Motorcycles	600 00	NA	6 00	1 16	800 00	1 50	8 20	2 75	0 95
3	Golf Carts	600 00	NA	18 00	1 31	800 00	1 50	8 20	2 75	0 95
3	Snowmobiles	109 00	NA	24 24	0 67	169 00	1 70	4 80	0 40	0 15
3	Specialty Vehicles Carts	600 00	NA	18 00	1 35	800 00	1 50	8 20	2 75	0 95
5	Generator Sets <50 HP	208 00	NA	3 00	3 49	488 00	0 29	7 70	2 04	0 27
5	Pumps <50 HP	4 28	1 41	2 25	6 33	113 00	7 04	0 05	0 22	0 00
5	Air Compressors <50 HP	NA	NA	NA	NA	NA	NA	NA	NA	NA
5	Gas Compressors <50 HP	4 28	1 41	45 90	0 59	113 00	7 04	0 05	0 22	0 00
5	Welders <50 HP	NA	NA	NA	NA	NA	NA	NA	NA	NA
5	Pressure Washers <50 HP	NA	NA	NA	NA	NA	NA	NA	NA	NA
6	Aerial Lifts	3 00	0 99	55 08	0 49	63 70	17 90	0 05	0 22	0 00
6	Forklifts	3 00	0 99	54 00	0 49	63 70	17 90	0 05	0 22	0 00
6	Sweepers/Scrubbers	3 00	0 99	59 67	0 48	63 70	17 90	0 05	0 22	0 00
6	Other General Industrial Equipment	208 00	NA	29 07	0 93	488 00	0 29	7 70	2 04	0 27
6	Other Material Handling Equipment	NA	NA	NA	NA	NA	NA	NA	NA	NA
7	Asphalt Pavers	NA	NA	NA	NA	NA	NA	NA	NA	NA
7	Tampers/Rammers	208 00	NA	2 81	2 21	488 00	0 29	7 70	2 04	0 25
7	Plate Compactors	208 00	NA	2 81	2 21	488 00	0 29	7 70	2 04	0 25
7	Concrete Pavers	NA	NA	NA	NA	NA	NA	NA	NA	NA
7	Rollers	NA	NA	NA	NA	NA	NA	NA	NA	NA
7	Scrapers	NA	NA	NA	NA	NA	NA	NA	NA	NA
7	Paving Equipment	208 00	NA	3 00	5 02	488 00	0 29	7 70	2 04	0 25
7	Surfacing Equipment	NA	NA	NA	NA	NA	NA	NA	NA	NA
7	Signal Boards	NA	NA	NA	NA	NA	NA	NA	NA	NA
7	Trenchers	NA	NA	NA	NA	NA	NA	NA	NA	NA
7	Bore/Drill Rigs	208 00	NA	82 62	0 42	488 00	0 29	7 70	2 04	0 25
7	Excavators	NA	NA	NA	NA	NA	NA	NA	NA	NA
7	Concrete/Industrial Saws	NA	NA	NA	NA	NA	NA	NA	NA	NA
7	Cement and Mortar Mixers	NA	NA	NA	NA	NA	NA	NA	NA	NA
7	Cranes	NA	NA	NA	NA	NA	NA	NA	NA	NA
7	Graders	NA	NA	NA	NA	NA	NA	NA	NA	NA
7	Off-Highway Trucks	NA	NA	NA	NA	NA	NA	NA	NA	NA
7	Crushing/Proc Equipment	NA	NA	NA	NA	NA	NA	NA	NA	NA
7	Rough Terrain Forklifts	NA	NA	NA	NA	NA	NA	NA	NA	NA
7	Rubber Tired Loaders	NA	NA	NA	NA	NA	NA	NA	NA	NA
7	Rubber Tired Dozers	NA	NA	NA	NA	NA	NA	NA	NA	NA
7	Tractors/Loaders/Backhoes	NA	NA	NA	NA	NA	NA	NA	NA	NA
7	Crawler Tractors	NA	NA	NA	NA	NA	NA	NA	NA	NA
7	Skid Steer Loaders	NA	NA	NA	NA	NA	NA	NA	NA	NA
7	Off Highway Tractors	NA	NA	NA	NA	NA	NA	NA	NA	NA
7	Dumpers/Tenders	NA	NA	NA	NA	NA	NA	NA	NA	NA
7	Other Construction Equipment	NA	NA	NA	NA	NA	NA	NA	NA	NA
8	2-Wheel Tractors	NA	NA	NA	NA	NA	NA	NA	NA	NA
8	Agricultural Tractors	NA	NA	NA	NA	NA	NA	NA	NA	NA
8	Agricultural Mowers	NA	NA	NA	NA	NA	NA	NA	NA	NA
8	Combines	NA	NA	NA	NA	NA	NA	NA	NA	NA
8	Sprayers	NA	NA	NA	NA	NA	NA	NA	NA	NA
8	Balers	NA	NA	NA	NA	NA	NA	NA	NA	NA
8	Irrigation Sets	3 00	0 99	166 77	0 42	63 70	17 90	0 05	0 22	0 00
8	Tillers >5 HP	NA	NA	NA	NA	NA	NA	NA	NA	NA
8	Swathers	NA	NA	NA	NA	NA	NA	NA	NA	NA
8	Hydro Power Units	NA	NA	NA	NA	NA	NA	NA	NA	NA
8	Other Agricultural Equipment	NA	NA	NA	NA	NA	NA	NA	NA	NA
9	Chainsaws >4 HP	152 00	NA	0 75	16 19	513 00	0 96	3 60	1 60	0 37
9	Shredders >5 HP	NA	NA	NA	NA	NA	NA	NA	NA	NA
9	Skidders	NA	NA	NA	NA	NA	NA	NA	NA	NA
9	Fellers/Bunchers	NA	NA	NA	NA	NA	NA	NA	NA	NA
2	Aircraft Support Equipment	NA	NA	NA	NA	NA	NA	NA	NA	NA
2	Terminal Tractors	3 00	0 99	17 12	0 52	63 70	17 90	0 05	0 22	0 00
4	Vessels w/Inboard Engines	135 00	NA	260 10	0 41	265 00	0 59	ND	ND	0 52
4	Vessels w/Outboard Engines	135 00	NA	18 00	0 71	265 00	0 59	ND	ND	0 52
4	Vessels w/Stemdrive Engines	135 00	NA	260 10	0 42	265 00	0 59	ND	ND	0 52
4	Sailboat Auxiliary Inboard Engines	NA	NA	NA	NA	NA	NA	NA	NA	NA
4	Sailboat Auxiliary Outboard Engines	135 00	NA	18 00	1 92	265 00	0 59	ND	ND	0 52

* g/hr
** Emission factors for 4-stroke propane-fueled equipment
NA = Not applicable
ND = No data available

Table I-02 (cont)

e) GASOLINE 2-STROKE EQUIPMENT - IN-USE ADJUSTED (grams/hp-hr)
Adjusted for In-Use Effects HC

Class	Equipment Types		EXHAUST	CRANK	EVAP g/day	REFUELING g/hp-hr	CO	NOx	PM ALDEHYDE	SOX	
1	Trimmers/Edgers/Brush Cutters	d	470 87	NA	0 55	21 67	1371 63	0 90	3 99	2 04	0 54
1	Lawn Mowers	d	438 80	NA	1 19	7 89	923 40	0 29	7 70	2 04	0 54
1	Leaf Blowers/Vacuums	d	452.11	NA	0 62	6 61	1361 94	0 96	3 60	2 04	0 54
1	Rear Engine Riding Mowers		NA	NA	NA	NA	NA	NA	NA	NA	NA
1	Front Mowers		NA	NA	NA	NA	NA	NA	NA	NA	NA
1	Chainsaws <4 HP	d	625 80	NA	0.37	31 69	1328 10	0 96	3 60	1 60	0 54
1	Shredders <5 HP	d	438 80	NA	1 75	7 68	923 40	0 29	7 70	2 04	0 54
1	Tillers <5 HP	d	438 80	NA	1.38	9 39	923 40	0 29	7 70	2 04	0 54
1	Lawn & Garden Tractors		NA	NA	NA	NA	NA	NA	NA	NA	NA
1	Wood Splitters		NA	NA	NA	NA	NA	NA	NA	NA	NA
1	Snowblowers	d	438 80	NA	2.50	5 82	923 40	0 29	7 70	2 04	0 54
1	Chippers/Stub Grinders		NA	NA	NA	NA	NA	NA	NA	NA	NA
1	Commercial Turf Equipment	d	438 80	NA	15 00	1 40	923 40	0 29	7 70	2 04	0 54
1	Other Lawn & Garden Equipment	d	438 80	NA	1 19	6 81	923 40	0 29	7 70	2 04	0 54
3	All Terrain Vehicles (ATVs)	* d	1260 00	NA	6 00	2 16	1520 00	1 50	8 20	2 75	0 95
3	Minibikes		NA	NA	NA	NA	NA	NA	NA	NA	NA
3	Off-Road Motorcycles	* d	1260 00	NA	6 00	1 16	1520 00	1 50	8 20	2 75	0 95
3	Golf Carts	* d	1260 00	NA	18 00	1 31	1520 00	1 50	8 20	2 75	0 95
3	Snowmobiles	d	228 90	NA	24.24	0 67	321 10	1 70	4 80	0 40	0 15
3	Specialty Vehicles Carts	* d	1260 00	NA	18 00	1 35	1520 00	1 50	8 20	2 75	0 95
5	Generator Sets <50 HP	d	438 80	NA	3 00	3 49	923 40	0 29	7 70	2 04	0 27
5	Pumps <50 HP	** b	8 99	1 41	2 25	6 33	214 70	2.82	0 18	0 22	0 00
5	Air Compressors <50 HP		NA	NA	NA	NA	NA	NA	NA	NA	NA
5	Gas Compressors <50 HP	** c	6 42	1 41	45 90	0 59	146 90	7 04	0 05	0 22	0 00
5	Welders <50 HP		NA	NA	NA	NA	NA	NA	NA	NA	NA
5	Pressure Washers <50 HP		NA	NA	NA	NA	NA	NA	NA	NA	NA
6	Aerial Lifts	** c	4 50	1 49	55 08	0 49	82.81	17 90	0 05	0 22	0 00
6	Forklifts	** c	4 50	1 49	54 00	0 49	82 81	17 90	0 05	0 22	0 00
6	Sweepers/Scrubbers	** c	4 50	1 49	59 67	0 48	82.81	17 90	0 05	0 22	0 00
6	Other General Industrial Equipment	c	312 00	NA	29 07	0 93	631 80	0 29	7 70	2 04	0 27
6	Other Material Handling Equipment		NA	NA	NA	NA	NA	NA	NA	NA	NA
7	Asphalt Pavers		NA	NA	NA	NA	NA	NA	NA	NA	NA
7	Tampers/Flammers	d	438 80	NA	2 81	2 21	923 40	0 29	7 70	2 04	0 25
7	Plate Compactors	d	438 80	NA	2 81	2 21	923 40	0 29	7 70	2 04	0 25
7	Concrete Pavers		NA	NA	NA	NA	NA	NA	NA	NA	NA
7	Rollers		NA	NA	NA	NA	NA	NA	NA	NA	NA
7	Scrapers		NA	NA	NA	NA	NA	NA	NA	NA	NA
7	Paving Equipment	d	438 80	NA	3 00	5 02	923 40	0 29	7 70	2 04	0 25
7	Surfacing Equipment		NA	NA	NA	NA	NA	NA	NA	NA	NA
7	Signal Boards		NA	NA	NA	NA	NA	NA	NA	NA	NA
7	Trenchers		NA	NA	NA	NA	NA	NA	NA	NA	NA
7	Bore/Drill Rigs	d	438 80	NA	82 62	0 42	923 40	0 29	7 70	2 04	0 25
7	Excavators		NA	NA	NA	NA	NA	NA	NA	NA	NA
7	Concrete/Industrial Saws		NA	NA	NA	NA	NA	NA	NA	NA	NA
7	Cement and Mortar Mixers		NA	NA	NA	NA	NA	NA	NA	NA	NA
7	Cranes		NA	NA	NA	NA	NA	NA	NA	NA	NA
7	Graders		NA	NA	NA	NA	NA	NA	NA	NA	NA
7	Off-Highway Trucks		NA	NA	NA	NA	NA	NA	NA	NA	NA
7	Crushing/Proc Equipment		NA	NA	NA	NA	NA	NA	NA	NA	NA
7	Rough Terrain Forklifts		NA	NA	NA	NA	NA	NA	NA	NA	NA
7	Rubber Tired Loaders		NA	NA	NA	NA	NA	NA	NA	NA	NA
7	Rubber Tired Dozers		NA	NA	NA	NA	NA	NA	NA	NA	NA
7	Tractors/Loaders/Backhoes		NA	NA	NA	NA	NA	NA	NA	NA	NA
7	Crawler Tractors		NA	NA	NA	NA	NA	NA	NA	NA	NA
7	Skid Steer Loaders		NA	NA	NA	NA	NA	NA	NA	NA	NA
7	Off-Highway Tractors		NA	NA	NA	NA	NA	NA	NA	NA	NA
7	Dumpers/Tenders		NA	NA	NA	NA	NA	NA	NA	NA	NA
7	Other Construction Equipment		NA	NA	NA	NA	NA	NA	NA	NA	NA
8	2 Wheel Tractors		NA	NA	NA	NA	NA	NA	NA	NA	NA
8	Agricultural Tractors		NA	NA	NA	NA	NA	NA	NA	NA	NA
8	Agricultural Mowers		NA	NA	NA	NA	NA	NA	NA	NA	NA
8	Combines		NA	NA	NA	NA	NA	NA	NA	NA	NA
8	Sprayers		NA	NA	NA	NA	NA	NA	NA	NA	NA
8	Balers		NA	NA	NA	NA	NA	NA	NA	NA	NA
8	Irrigation Sets	** c	4 50	0 99	168 77	0 42	82.81	17 90	0 05	0 22	0 00
8	Tillers >5 HP		NA	NA	NA	NA	NA	NA	NA	NA	NA
8	Swathers		NA	NA	NA	NA	NA	NA	NA	NA	NA
8	Hydro Power Units		NA	NA	NA	NA	NA	NA	NA	NA	NA
8	Other Agricultural Equipment		NA	NA	NA	NA	NA	NA	NA	NA	NA
9	Chainsaws >4 HP	d	319 20	NA	0 75	16 19	974 70	0 96	12 96	1 60	0 37
9	Shredders >5 HP		NA	NA	NA	NA	NA	NA	NA	NA	NA
9	Skidders		NA	NA	NA	NA	NA	NA	NA	NA	NA
9	Fellers/Bunchers		NA	NA	NA	NA	NA	NA	NA	NA	NA
2	Aircraft Support Equipment		NA	NA	NA	NA	NA	NA	NA	NA	NA
2	Terminal Tractors	** c	4 50	0 99	17 12	0 52	82 81	17 90	0 05	0 22	0 00
4	Vessels w/Inboard Engines	c	202 50	NA	260 10	0 41	344 50	0 59	ND	ND	0 52
4	Vessels w/Outboard Engines	c	202 50	NA	18 00	0 71	344 50	0 59	ND	ND	0 52
4	Vessels w/Stemdrive Engines	c	202 50	NA	260 10	0 42	344 50	0 59	ND	ND	0 52
4	Sailboat Auxiliary Inboard Engines		NA	NA	NA	NA	NA	NA	NA	NA	NA
4	Sailboat Auxiliary Outboard Engines	c	202 50	NA	18 00	1 92	344 50	0 59	ND	ND	0 52

* g/hr

** Emission factors for 4-stroke propane-fueled equipment

b = adjusted for in-use effects using small utility engine data

c = adjusted for in-use effects using heavy duty engine data

d = adjusted for in use effects using small utility engine data except no NOx or PM adjustment

NA = Not applicable

ND = No data available

TABLE I-03
EMISSION FACTORS FOR FOUR-STROKE UTILITY, LAWN & GARDEN EQUIPMENT

	NATIONAL POPULATION	HOURS/YR	AVG HP	LOAD FACTOR	HP HOURS PER YEAR	HP HRS FRACTION	CARB TSD EMISSION FACTORS					CARB TSD EMISSION FACTORS j			
							HC G/HP-HR	CO G/HP-HR	NOX G/HP-HR	PM G/HP-HR	BSFC LB/HP-HR	HC G/GALLON	CO G/GALLON	NOX G/GALLON	PM G/GALLON
CONSUMER WBM	27360000 a	23	3.5	0.36	792892800	0.1428	37.7	430	2.02	0.74	1.36 g	171.87	1960.29	9.21	3.37
COMMERCIAL WBM	2720000 b	368	4	0.36	1441382400	0.2597	37.7	430	2.02	0.74	1.36	171.87	1960.29	9.21	3.37
MULTI-SPINDLE WBM (COMM)	100000	800	13	0.42	436800000	0.0787	9.3	353	2.03	0.05	0.928 h	62.13	2358.41	13.56	0.33
RIDING MOWERS (CONSUMER)	2000000	36	13	0.42	393120000	0.0708	9.3	353	2.03	0.05	0.928	62.13	2358.41	13.56	0.33
LAWN TRACTORS (CONSUMER)	4000000	40	15	0.6	1440000000	0.2594	9.6	357	2.3	0.21	1.05 i	56.69	2108.00	13.58	1.24
GARDEN TRACTORS (CONSUMER)	1333000	53	15	0.6	635841000	0.1145	9.6	357	2.3	0.21	1.05	56.69	2108.00	13.58	1.24
CONSUMER TILLERS	1980000 c	18	5	0.4	71280000	0.0128	37.7	430	2.02	0.74	1.36	171.87	1960.29	9.21	3.37
COMMERCIAL TILLERS	1320000 d	72	6	0.4	228096000	0.0411	37.7	430	2.02	0.74	1.36	171.87	1960.29	9.21	3.37
CONSUMER MISC L & G	1368000 e	23	3.5	0.36	39644640	0.0071	37.7	430	2.02	0.74	1.36	171.87	1960.29	9.21	3.37
COMMERCIAL MISC L & G	136000 f	368	4	0.36	72069120	0.0130	9.3	353	2.03	0.05	1.36	42.40	1609.26	9.25	0.23
TOTAL	42317000				5551125960	1									
POPULATION WEIGHTED EMISSION FACTORS (G/HP-HR)							22.58	390.19	2.13	0.43					
POPULATION WEIGHTED EMISSION FACTORS (G/GALLON)							110.71	2070.49	11.50	2.08					

a assuming 90% consumer 95% 4-stroke

b assuming 10% commercial 85% 4-stroke

c assuming 60% consumer

d assuming 40% commercial

e assuming 90% consumer, 95% 4-stroke

f assuming 10% commercial 85% 4-stroke

g assuming 95% side valve 5% OHV from page 60 of CARB TSD small engine

h assuming 90% side valve 10% OHV from page 60 of CARB TSD midsize engine

i source = SwRI SAE 910560 pg 132 18 hp engine

j density of gasoline assumed to be 6.2 lb/gallon

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TABLE I-04
EMISSION FACTORS FOR TWO-STROKE UTILITY, LAWN & GARDEN EQUIPMENT

	NATIONAL POPULATION	HOURS/YR	AVG HP	LOAD FACTOR	HP HOURS PER YEAR	HP HRS FRACTION	CARB TSD EMISSION FACTORS				BSFC LB/HP-HR	CARB TSD EMISSION FACTORS f			
							HC G/HP-HR	CO G/HP-HR	NOX G/HP-HR	PM G/HP-HR		HC G/GALLON	CO G/GALLON	NOX G/GALLON	PM G/GALLON
CONSUMER WBM	1440000 a	23	3.5	0.36	41731200	0.0484	208	486	0.29	7.7	1.32 e	976.97	2282.73	1.36	36.17
COMMERCIAL WBM	480000 b	368	4	0.36	254361600	0.2948	208	486	0.29	7.7	1.32	976.97	2282.73	1.36	36.17
WB CONSUMER MISC L & G	72000 c	23	3.5	0.36	2086560	0.0024	208	486	0.29	7.7	1.32	976.97	2282.73	1.36	36.17
WB COMMERCIAL MISC L & G	24000 d	368	4	0.36	12718080	0.0147	208	486	0.29	7.7	1.32	976.97	2282.73	1.36	36.17
HH CONSUMER CHAIN SAWS	7553754	7	1.5	0.5	39657208.5	0.0460	298	699	0.96	3.6	1.32	1399.70	3283.18	4.51	16.91
HH COMMERCIAL CHAIN SAWS	314740	405	4.1	0.5	261312885	0.3028	152	513	0.96	3.6	1.32	713.94	2409.55	4.51	16.91
HH CONSUMER TRIMMERS/BRUSHCUT	12531470	10	0.7	0.5	43860145	0.0508	287	920	0.96	3.6	1.32	1348.03	4321.21	4.51	16.91
HH COMMERCIAL TRIMMERS/BRUSHCUT	596737	170	1.9	0.5	96373025.5	0.1117	198	668	0.96	3.6	1.32	930.00	3137.58	4.51	16.91
HH CONSUMER BLOWERS	3146857	9	0.8	0.5	11328685.2	0.0131	283	908	0.96	3.6	1.32	1329.24	4264.85	4.51	16.91
HH COMMERCIAL BLOWERS	49662	197	0.8	0.5	3913365.6	0.0045	283	908	0.96	3.6	1.32	1329.24	4264.85	4.51	16.91
HH CONSUMER BACKPACK BLOWER	25855	12	3	0.5	465390	0.0005	198	668	0.96	3.6	1.32	930.00	3137.58	4.51	16.91
HH COMMERCIAL BACKPACK BLOWER	134781	293	3	0.5	59236249.5	0.0686	198	668	0.96	3.6	1.32	930.00	3137.58	4.51	16.91
HH CONSUMER HEDGETRIMMER	178682	7	0.7	0.5	437770.9	0.0005	287	920	0.96	3.6	1.32	1348.03	4321.21	4.51	16.91
HH COMMERCIAL HEDGETRIMMER	268874	75	1.9	0.5	19157272.5	0.0222	198	668	0.96	3.6	1.32	930.00	3137.58	4.51	16.91
HH COMMERCIAL CUT-OFF SAW	70404	113	4.1	0.5	16309086.6	0.0189	152	513	0.96	3.6	1.32	713.94	2409.55	4.51	16.91
TOTAL	26887816				862948524										
POPULATION WEIGHTED EMISSION FACTORS (G/HP-HR)							197.47	571.16	0.72	5.08					
POPULATION WEIGHTED EMISSION FACTORS (G/GALLON)							927.51	2682.74	3.38	23.85					

a assuming 90% consumer, 5% 2-stroke

b assuming 10% commercial, 15% 2-stroke

c assuming 90% consumer, 5% 2-stroke

d assuming 10% commercial, 15% 2-stroke

e SWRI SAE 910560 PG 133 & 134

f density of gasoline assumed to be 6.2 lb/gallon

WB = walk behind

HH = hand held

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TABLE I-05
LAWN AND GARDEN EQUIPMENT EMISSION FACTOR DERIVATION FOR INVENTORIES A AND B

TRIMMERS/EDGERS/BRUSHCUTTERS

<u>FOUR STROKE</u>	NATIONAL POPULATION	HOURS/YR	AVG HP	LOAD FACTOR	HP HOURS PER YEAR	HP HRS FRACTION	HC G/HP-HR	CO G/HP-HR	NOX G/HP-HR	PM G/HP-HR	
CONSUMER MISC L & G	1368000 a	23	3.5	0.36	39644640	0.3549	37.7	430	2.02	0.74	
COMMERCIAL MISC L & G	136000 b	368	4	0.36	72069120	0.6451	9.3	353	2.03	0.05	
TOTAL	1504000				111713760	1					
POPULATION WEIGHTED EMISSION FACTORS (G/HP-HR)							19.38	380.33	2.03	0.29	
a assuming 90% consumer, 95% 4-stroke											
b assuming 10% commercial, 85% 4-stroke											
<u>TWO STROKE</u>	NATIONAL POPULATION	HOURS/YR	AVG HP	LOAD FACTOR	HP HOURS PER YEAR	HP HRS FRACTION	HC G/HP-HR	CO G/HP-HR	NOX G/HP-HR	PM G/HP-HR	
WB CONSUMER MISC L & G	72000 c	23	3.5	0.36	2086560	0.0135	208	486	0.29	7.7	
WB COMMERCIAL MISC L & G	24000 d	368	4	0.36	12718080	0.0820	208	486	0.29	7.7	
HH CONSUMER TRIMMERS	12531470	10	0.7	0.5	43860145	0.2829	287	920	0.96	3.6	
HH COMMERCIAL TRIMMERS	596737	170	1.9	0.5	96373025.5	0.6216	198	668	0.96	3.6	
TOTAL	13224207				155037810.5	1					
POPULATION WEIGHTED EMISSION FACTORS (G/HP-HR)							224.13	721.91	0.90	3.99	
c assuming 90% consumer, 5% 2-stroke											
d assuming 10% commercial, 15% 2-stroke											

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TABLE I-05 (cont)

LEAF BLOWERS/VACUUMS

<u>FOUR STROKE - SEE TRIMMERS/EDGERS/BRUSHCUTTERS</u>							HC	CO	NOX	PM
							G/HP-HR	G/HP-HR	G/HP-HR	G/HP-HR
POPULATION WEIGHTED EMISSION FACTORS (G/HP-HR)							19.38	380.33	2.03	0.29
<u>TWO STROKE</u>	NATIONAL POPULATION	HOURS/YR	AVG HP	LOAD FACTOR	HP HOURS PER YEAR	HP HRS FRACTION	HC G/HP-HR	CO G/HP-HR	NOX G/HP-HR	PM G/HP-HR
HH CONSUMER BLOWERS	3146857	9	0.8	0.5	11328685.2	0.1512	283	908	0.96	3.6
HH COMMERCIAL BLOWERS	49662	197	0.8	0.5	3913365.6	0.0522	283	908	0.96	3.6
CONSUMER BACKPACK BLOWERS	25855	12	3	0.5	465390	0.0062	198	668	0.96	3.6
COMMERCIAL BACKPACK BLOWERS	134781	293	3	0.5	59236249.5	0.7904	198	668	0.96	3.6
TOTAL	3357155				74943690.3	1				
POPULATION WEIGHTED EMISSION FACTORS (G/HP-HR)							215.29	716.81	0.96	3.60

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REAR RIDING MOWERS

FRONT MOWERS

SOURCE: CARB TSD MID SIZE ENGINE

HC	CO	NOx	PM
9.3	353	2.03	0.05

CHAIN SAWS <5HP

SOURCE: CARB TSD CONSUMER CHAIN SAWS

HC	CO	NOx	PM
298	699	0.96	3.6

SHREDDERS <5HP

TILLERS <5HP

SOURCE: CARB TSD SMALL ENGINE

HC	CO	NOx	PM
37.7	430	2.02	0.74

TABLE I-06

ENGINE MANUFACTURERS ASSOCIATION

NON-ROAD DIESEL-POWERED EQUIPMENT EMISSION FACTORS

All manufacturers' data collected using the 8 Mode Emissions Test Cycle and Weighting Factors (ISO-8178)

Equipment Category	Engine Population Weighted Emissions (g/bhp-hr)		
	NOx	HC	CO
1. CRAWLER TRACTOR	10.3	0.9	2.4
2. CRAWLER LOADER	10.0	0.6	2.4
3. WHEEL LOADER	10.3	0.6	2.4
4. SCRAPER	8.7	0.5	2.5
5. MOTOR GRADER	9.6	1.1	1.9
6. DUMPER	8.1	0.6	1.4
7. CRAWLER EXCAVATOR	10.5	0.6	2.5
8. WHEEL EXCAVATOR	11.0	0.4	2.8
9. BACKHOE LOADER	10.1	1.0	3.4
10. SKID STEER LOADER	9.6	1.5	4.5
11. LOG SKIDDER	11.3	0.6	2.6
12. CRANE	10.3	0.9	2.1
13. ROLLER & COMPACTOR	9.3	0.8	3.1
14. PAVER	10.3	0.6	3.2
15. FARM TRACTOR	10.5	0.7	3.2
16. GRAIN COMBINE	11.5	0.9	2.1
17. COTTON PICKER	12.0	0.5	2.2

TABLE I-07
CAL/ERT AGRICULTURAL EQUIPMENT EMISSION FACTORS

G/BHP-HR

a.) DIESEL TRACTORS

	%ENERGY OUTPUT	%ENERGY TRACTOR	EFs G/BHP-HR			TRACTOR ENERGY WEIGHT		
			HC	CO	NOX	HC	CO	NOX
2WD 100+ HP	33.0%	39.1%	1.84	4.23	11.59	0.71858	1.65195	4.52627
4WD	29.5%	34.9%	0.89	3.28	10.98	0.31071	1.14509	3.83325
2WD 20-90 HP	22.0%	26.0%	2.16	6.42	10.94	0.56237	1.67148	2.84828
WEIGHTED EMISSION FACTORS						1.59	4.47	11.21

b.) DIESEL NONTRACTORS

	%ENERGY OUTPUT	%ENERGY NONTRAC	EFs G/BHP-HR			NONTRACTOR ENERGY WEIGHT		
			HC	CO	NOX	HC	CO	NOX
COMBINES	5.8%	37.4%	1.9	3.25	13.36	0.71097	1.21613	4.99923
WINDROWER	4.3%	27.7%	2.21	6.85	10.5	0.6131	1.90032	2.9129
FORAGE HARVESTER SWEET CORN HARVESTER	2.0%	12.9%	0.96	2.84	9.98	0.12387	0.36645	1.28774
BALERS COTTON PICKERS COTTON STRIPPERS ORCHARD SPRAYERS	1.7%	11.0%	2.23	3.78	7.78	0.24458	0.41458	0.85329
MOWER CONDITIONER COMPACT LOADERS	1.7%	11.0%	1.13	4.29	9.69	0.12394	0.47052	1.06277
WEIGHTED EMISSION FACTORS						1.82	4.37	11.12

c.) GASOLINE

	EFs G/BHP-HR		
	HC	CO	NOX
TRACTOR	2.8	163	7.8
NONTRACTOR	2.8	163	7.8

TABLE I-08
CAL/ERT AGRICULTURAL EQUIPMENT EMISSION FACTORS

LB/KGAL*

a.) DIESEL TRACTORS

	%ENERGY OUTPUT	%ENERGY TRACTOR	EFs LB/1000GAL*			TRACTOR ENERGY WEIGHT		
			HC	CO	NOX	HC	CO	NOX
2WD 100+ HP	33.0%	39.1%	72.0034	165.529	453.543	28.1197	64.6446	177.123
4WD	29.5%	34.9%	34.8277	128.354	429.672	12.1588	44.8099	150.004
2WD 20-90 HP	22.0%	26.0%	84.5257	251.229	428.107	22.0067	65.4088	111.46
WEIGHTED EMISSION FACTORS						62.29	174.86	438.59

b.) DIESEL NONTRACTORS

	%ENERGY OUTPUT	%ENERGY NONTRAC	EFs LB/1000GAL*			NONTRACTOR ENERGY WEIGHT		
			HC	CO	NOX	HC	CO	NOX
COMBINES	5.8%	37.4%	74.3513	127.18	522.807	27.8218	47.5899	195.631
WINDROWER	4.3%	27.7%	86.4823	268.056	410.889	23.9919	74.3639	113.988
FORAGE HARVESTER SWEET CORN HARVESTER	2.0%	12.9%	37.567	111.136	390.54	4.84735	14.3401	50.3922
BALERS COTTON PICKERS COTTON STRIPPERS ORCHARD SPRAYERS	1.7%	11.0%	87.2649	147.92	304.449	9.57099	16.2235	33.3912
MOWER CONDITIONER COMPACT LOADERS	1.7%	11.0%	44.2194	167.877	379.192	4.84988	18.4124	41.5888
WEIGHTED EMISSION FACTORS						71.08	170.93	434.99

* [(G/BHP-HR)/(0.4 LB FUEL/HP-HR)] [(1 LB/453.59G) [(7.1 LB FUEL/1 GAL) [(1000)]]]

c.) GASOLINE

	EFs LB/1000GAL**		
	HC	CO	NOX
TRACTOR	76.5449	4456.01	213.232
NONTRACTOR	76.5449	4456.01	213.232

** [(G/BHP-HR)/(0.5 LB FUEL/HP-HR)] [(1 LB/453.59G) [(6.2 LB FUEL/1 GAL) [(1000)]]]

**TABLE I-09
COMPARISON OF AP-42 (CAL/ERT) AND EMA CONSTRUCTION EQUIPMENT EMISSION FACTORS**

DIESEL G/HP-HR

AP-42	EMA	HC		CO		NOX	
		AP-42	EMA	AP-42	EMA	AP-42	EMA
TRACKED TRACTORS	CRAWLER TRACTOR	0.75	0.9	2.15	2.4	7.81	10.3
TRACKED LOADERS	CRAWLER LOADER	1.11	0.6	2.26	2.4	9.3	10.3
MOTOR GRADERS	MOTOR GRADER	0.36	1.1	1.54	1.9	7.14	9.6
SCRAPERS	SCRAPER	0.55	0.5	2.45	2.5	7.46	8.7
OFF HIGHWAY TRUCKS	DUMPER	0.37	0.6	2.28	1.4	8.15	9.6
PAVEMENT COLD PLANERS							
WHEEL DOZERS							
WHEELED LOADERS	WHEEL LOADER	0.97	0.6	2.71	2.4	8.81	10.3
WHEELED TRACTORS		1.76		7.34		11.91	
ROLLERS	ROLLER & COMPACTOR	0.97	0.8	6.03	3.1	13.05	9.3
WHEELED DOZERS		0.37		2.28		8.15	
MISCELLANEOUS		1.01		4.6		11.01	
LOG SKIDDERS	LOG SKIDDERS	0.61	0.6	3.18	2.6	9.82	11.3
HYD EXCAV./CRAWLERS	CRAWLER EXCAVATOR	1.22	0.6	3.18	2.5	11.01	10.5
TRENCHERS		1.1		4.57		10.02	
CONCRETE PAVERS		1.1		4.57		10.02	
COMPACT LOADERS	BACKHOE LOADERS	1.1	1	4.57	3.4	10.02	10.1
	SKID STEER LOADER		1.5		4.5		9.6
CRANE LATTICE BOOMS		0.59		4.99		12.45	
CRANES	CRANE	0.8	0.9	7.8	2.1	14.69	10.3
HYD EXCAV WHEELS	WHEEL EXCAVATOR	1.22	0.4	3.18	2.8	11.01	11.1
BITUMINOUS PAVERS	PAVER	0.99	0.6	5.19	3.2	11.18	10.3

**TABLE I-10
MOTORCYCLE EMISSION FACTORS REPORTED IN CARB MAIL-OUT #90-58**

Vehicle Type	Engine Type	HC	g/mile		NOx
			CO		
On-road Motorcycles	4-Stroke	2.12	13		1.06
Off-Road Motorcycles	4-Stroke	4	39		0.36
Off-Road Motorcycles	2-stroke	24	32		0.06

TABLE I-11
SOUTHWEST RESEARCH INSTITUTE IN-USE SMALL UTILITY ENGINE TEST RESULTS

Engine	Test	HC g/hp-hr	HC test/EF	CO g/hp-hr	CO test/EF	NOx g/hp-hr	NOx test/EF	PM g/hp-hr	PM test/EF
<u>FOUR-STROKE</u>									
2yr WBM	1A	67.9	1.80	650	1.51	0.94	0.47	1.35	1.80
4yr WBM	1A	83.9	2.23	928	2.16	0.37	0.18	1.11	1.48
	2A	112.6	2.99	1033	2.40	0.47	0.23	2.05	2.73
8yr WBM	1A	VOID	0.00						
	2A	77.3	2.05	835	1.94	0.9	0.45	6.27	8.36
	3A	74.9	1.99	829	1.93	0.71	0.35	4.08	5.44
New engine emission factors		37.7		430		2.02		0.75	
In-use adjustment (average test/EF)			2.10		1.9		0.4		3.6
<u>TWO-STROKE</u>									
11yr WBM	1	187	0.90	415	0.85	0.51	1.76	5.75	0.75
	2	177	0.85	418	0.86	0.52	1.79	6.61	0.86
New engine emission factors		208		486		0.29		7.7	
4 yr String trimmer	1	1369	6.11	2244	3.11	0.77	0.86	61.3	15.36
	2	1205	5.38	1936	2.68	0.69	0.77	54.3	13.61
New engine emission factors		224		722		0.9		3.99	

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Table I-14. Fuel Tank vs Net Engine HP Regression

Fuel tank sizes of various John Deere farm, construction and utility engines regressed against gross and net engine power, and displacement. All values taken from 1989-90 sales brochures.

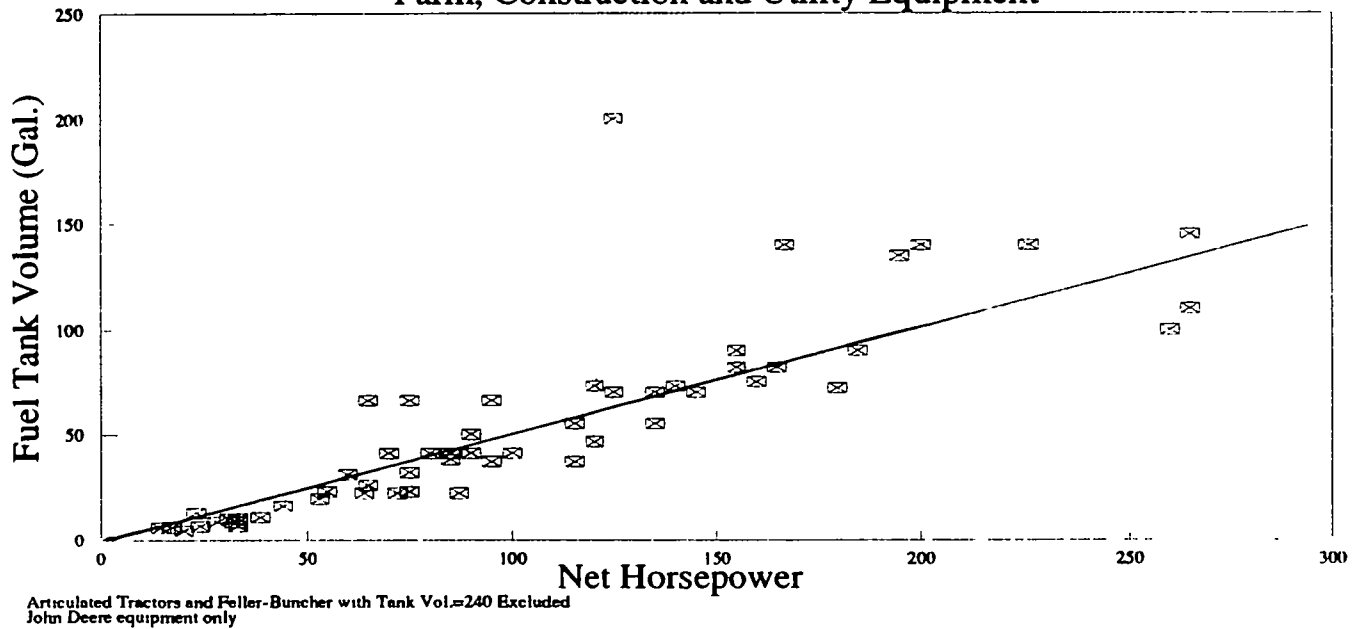
Engine	Application	Model	Type	Fuel	Net	Gallons
3TNA72UJ	Tractor (Compact)	755	Utility	d	20.0	4.4
Yanmar 3TNA78-RJB	Excavator (Compact)	15	Utility	d	14.5	5.8
Yanmar 3TN66	Skid-Steer Loader	375	Utility	g?	17.0	6.0
3TN84RJ	Tractor (Compact)	955	Utility	d	33.0	6.6
3TN75RJ	Tractor (Compact)	855	Utility	d	24.0	6.6
	Tractor (Compact)	970	Utility	d	33.0	8.5
	Tractor (Compact)	870	Utility	d	28.0	8.5
Continental TM13	Skid-Steer Loader	570	Utility	g	31.0	10.0
Yanmar 3TNA82	Skid-Steer Loader	575	Utility	d	33.0	10.0
	Tractor (Compact)	1070	Utility	d	38.5	10.6
Yanmar 3TNA72-UJB	Excavator (Compact)	25	Utility	d	23.0	12.9
Yanmar 4TNA82	Skid-Steer Loader	675B	Utility	d	44.0	16.1
J.D. 3-179D	Tractor (General Purpose)	2155	Utility	d	53.0	19.5
J.D. 4-239D	Tractor (General Purpose)	2555	Utility	d	72.0	22.2
J.D. 4-239D	Tractor (General Purpose)	2355	Utility	d	64.0	22.2
J.D. 4-239T	Tractor (General Purpose)	2755	Utility	d	87.0	22.2
4239D	Backhoe Loader	210C	Utility	d	55.0	23.0
4276D	Backhoe Loader	410C	Utility	d	75.0	23.0
4239D	Landscape Loader	210C	Utility	d	55.0	23.0
4239D	Backhoe Loader	310C	Utility	d	65.0	26.0
4239D	Crawler Dozer	400G	Forest	d	60.0	31.0
4276D	Log Loader	344E	Forest	d	75.0	32.0
4276D	Wheel Loader	344E	Const	d	75.0	32.0
6359T	Backhoe Loader	710C	Utility	d	115.0	37.0
4276T	Log Loader	444E	Forest	d	95.0	37.0
4276T	Wheel Loader	444E	Const	d	95.0	37.0
4276T	Backhoe Loader	510C	Utility	d	85.0	38.0
4276T	Crawler Dozer	650G	Forest	d	90.0	41.0
4276T	Crawler Dozer	550G	Forest	d	80.0	41.0
4276D	Crawler Dozer	450G	Forest	d	70.0	41.0
4276T	Crawler Dozer	650G	Const	d	90.0	41.0
4276D	Crawler Loader	455G	Forest	d	70.0	41.0
4276T	Crawler Loader	555G	Forest	d	90.0	41.0
4276T	Skidder	440D	Forest	d	85.0	41.0
4276T	Skidder	540D, 548D/7	Forest	d	100.0	41.0
6414T	Skidder	640D	Forest	d	120.0	46.5
6414T	Skidder (grapple)	648D/7413	Forest	d	120.0	46.5
6359D	Graders	570B	Const	d	90.0	50.0
6359T	Log Loader	544E	Forest	d	115.0	55.0
6414T	Log Loader	624E	Forest	d	135.0	55.0
6414T	Wheel Loader	624E	Const	d	135.0	55.0
6359T	Wheel Loader	544E	Const	d	115.0	55.0
4239D	Excavator	290D	Utility	d	65.0	66.0
4276T	Excavators	490D	Const	d	75.0	66.0
4276T	Excavators	495D, 590D,	Const	d	95.0	66.0
4276D	Feller-Buncher	493D	Forest	d	75.0	66.0
6414T	Delimber	693D	Forest	d	125.0	70.0
6414T	Excavators	690D, 690D-L	Const	d	125.0	70.0
6414A	Feller-Buncher	643	Forest	d	145.0	70.0
6414T	Graders	670B, 672B	Const	d	135.0	70.0
6466A	Scrapers	762B	Const	d	180.0	72.0
6414T	Crawler Dozer	750B	Const	d	120.0	73.0
6414T	Crawler Dozer	750B	Const	d	140.0	73.0
6414T	Crawler Loader	665B	Const	d	120.0	73.0
6414T	Crawler Loader	755B	Const	d	140.0	73.0
6076T	Log Loader	644E	Forest	d	160.0	75.0
6076T	Wheel Loader	644E	Const	d	160.0	75.0
6466A	Crawler Dozer	850B	Const	d	165.0	82.0
6466A	Excavators	790D	Const	d	155.0	82.0
6466A	Graders	770B-H, 772E	Const	d	185.0	90.0
6466T	Graders	770B, 772B	Const	d	155.0	90.0
8955T	Wheel Loader	844	Const	d	260.0	100.0
6619A	Scrapers	862B	Const	d	265.0	110.0

6466A	Excavators	892D-LC	Const	d	195.0	135.0
	Combine	9500	Farming	d	200.0	140.0
	Combine	9600	Farming	d	226.0	140.0
	Combine	9400	Farming	d	167.0	140.0
6619A	Excavators	992D-LC	Const	d	265.0	145.0
6414A	Feller-Buncher	693D	Forest	d	125.0	200.0
	Tractor (Articulated)	8560	Farming	d	235.0	220.0
	Tractor (Articulated)	8760	Farming	d	300.0	220.0
	Tractor (Articulated)	8960	Farming	d	370.0	220.0
6466A	Feller-Buncher	793D	Forest	d	155.0	240.0

Regression of Net Power vs Fuel Tank Size	
Constant	0
Std Err of Y Est	15.3
R Squared	0.82
No. of Observations	68
Degrees of Freedom	67
X Coefficient(s)	0.510631
Std Err of Coef.	0.015467

Net Horsepower vs Fuel Tank Size

Farm, Construction and Utility Equipment



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37. Populations supplied by OPEI report titled, *Information Regarding Selected Outdoor Power Equipment*, presented at the OPEI/EPA meeting on April 25, 1991. Consumer and commercial usage rates were supplied by OPEI in their letter of May 24, 1991, to Clare Ryan of the EPA.
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Appendix J

Appendix J. Additional Data Submissions

The following manufacturers, state agencies, and manufacturer associations submitted data to EPA for analysis and review. Copies of the data are available in the public docket (#A-91-24).

Briggs & Stratton
California Air Resources Board
Caterpillar
Engine Manufacturers Association
Equipment Manufacturers Institute
Ford/New Holland
Ford
Gardenway
Homelite
Industrial Truck Association
International Snowmobile Industry Association
John Deere
Kohler
Lawn-Boy
Manufacturers of Emission Controls Association
McCulloch
Motorcycle Industry Council, Inc.
Murray
National Marine Manufacturers Association
Onan
Outdoor Power Equipment Institute, Inc
Portable Power Equipment Manufacturers Association
Tecumseh Products Company
Weedeaters

Appendix K. Adjustments to Data in Developing Inventory A

In developing Inventory A, EPA made several adjustments to annual hours of use, load factor, and population data that are not reflected in the final reports from EPA contractors. These adjustments are detailed below.

1. Annual Hours of Use

Annual hours of use data provided to EPA from the PSR data-base were largely based on the assumption that the use of various equipment types is either consumer or commercial. In order to adjust for equipment types with a mixture of consumer and commercial use, EPA adjusted the data by multiplying the regional hours of use reported by the contractor by factors based on data submitted to EPA by OPEI,¹ PPEMA,² and CARB:³

<u>Equipment Type</u>	<u>Adjustment Factor</u>
Lawnmowers	2.5 (OPEI)
Tillers	2.2 (OPEI)
Trimmers/edgers/brush cutters	1.8 (PPEMA)
Leaf Blowers/vacuums	2.5 (PPEMA)
Snowblowers	1.5 (CARB)

These factors were calculated using the following general equation:

$$\text{Adjustment Factor} = (\% \text{ consumer}) \times (\text{consumer hrs}) + (\% \text{ commercial}) \times (\text{commercial hrs})$$

In the case of trimmers/edgers/brushcutters, it was necessary to also weight by population the annual hours of use for string and hedge trimmers, for which PPEMA submitted separate estimates. Similarly, the value computed for leaf blowers/vacuums incorporates both handheld and backpack versions

2. Load Factors

Load factor data provided to EPA from the PSR data base were in some cases too high and in others too low. To correct the data, EPA substituted load factors determined by CARB for the entire lawn and garden equipment category,⁴ and data supplied by EMI for crawler tractors and rubber tired loaders.⁵ Load factor adjustments in the recreational marine category are based on data from SAE paper 901596.⁶

<u>Equipment Type</u>	<u>Load Factor</u>
Leaf blowers/vacuums	50%
Trimmers/edgers/Brush cutters	50%
Chainsaws > 4 hp	50%
Chainsaws < 4 hp	50%
Lawnmowers	36%
Rear engine riding mowers	38%
Lawn and garden tractors	47%
Front mowers	50%
Tillers < 5 hp	40%
Snowblowers	35%
Commercial turf equipment	50%
Other lawn and garden equipment	50%
Crawler tractors	58%
Rubber tired loaders	54%
Vessels with inboard engines	20%
Vessels with outboard engines	22%
Vessels with sterndrive engines	20%
Sailboat auxiliary inboard engines	27%
Sailboat auxiliary outboard engines	27%

3. Populations--Agricultural Equipment

For Inventory A, regional agricultural equipment populations were determined by multiplying PSR national population estimates by the ratio of local over national census data

Census data exists for some types of agricultural equipment at the local level.

However, census counts do not differentiate between equipment that is inoperative or seldom used and equipment used for agricultural activity. National population estimates from the PSR data base are better estimates of equipment used regularly in agricultural activity than the census counts. However, the census counts are accurate indicators of local distribution of the equipment.

4. Populations--Recreational Marine Equipment

EPA used survey information provided by NMMA and local boat registrations obtained from State Authorities by EEA to calculate the populations of boats at the CMSA level. The NMMA survey data provided estimates of the proportion of boats registered in a nonattainment area that are actually used in that area. The survey also estimated the proportion of boats used in a nonattainment area that are registered outside of that area. These proportions, coupled with local boat registration data, made it possible to estimate the number of boats actually used in the nonattainment.

References

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Appendix L

Appendix L. Regional and Seasonal Adjustments to Inventories

Annual hours of use data provided to EPA from the PSR data-base reflect different usage patterns for different regions of the country.** In developing Inventory A, EPA made several adjustments to this data.

As ozone exceedances are typically a summertime problem and CO exceedances a wintertime problem, EPA developed seasonal adjustment factors to reflect the use of equipment depending on the season of the year

This appendix describes the assumptions made by EPA in calculating regional hours of use and summertime and wintertime emissions.

1. Regional Adjustments

EPA has allocated the nonattainment areas studied to eight regions. Table-01 indicates the nonattainment areas that fall into these eight regions, as well as the seasonal designations for each region.

**This regional annual hours of use data is documented in the Energy and Environmental Analysis final report, "Methodology to Estimate Nonroad Equipment Populations by Nonattainment Areas," available in the public docket.

Table L-01. Regional and Seasonal Designations

Region	Nonattainment Areas	Seasonal Designation
Northeast	Springfield, Hartford, Boston, New York	Cold
Southeast	Atlanta, Baton Rouge, Miami	Warm
Mid-Atlantic Coast	Baltimore, Philadelphia, Washington D.C.	Medium
Great Lakes	Chicago, Cleveland, Milwaukee, Minneapolis, St. Louis	Cold
Southwest	El Paso, Houston	Warm
Rocky Mountains	Denver, Spokane, Provo-Orem	Cold
Northwest	Seattle	Medium
West Coast	South Coast California, San Diego, San Joaquin	Warm

In constructing Inventory A, EPA used annual hours of use data for each region as supplied from the PSR data-base, as indicated in the EEA final report, except for the following:

- EPA created a "Mid-Atlantic Coast" region. The annual hours of use rates for equipment in this region are determined by taking the average of the data for the Northeast and Southeast regions.
- EPA created a "Rocky Mountains" region. The annual hours of use rates for equipment in this region are determined by taking the average of the data for the Great Lakes and the Northwest regions.

Regional assumptions for commercial marine vessels were not necessary as commercial marine equipment inventories were calculated directly at the regional level

2. Seasonal Adjustment Factors

The following tables list seasonal adjustment factors used to determine summertime VOC and NO_x emissions and wintertime CO emissions from nonroad engines and vehicles. Yearly emissions (tons per year) were adjusted according to the following formula:

$$tpsd = tpy \times SAF_{summer} \quad tpwd = tpy \times SAF_{winter}$$

where the seasonal adjustment factors (SAFs) are defined as follows:

$$SAF_{summer} = 4 \times \frac{\% \text{ activity during summer}}{365 \text{ days}}$$

$$SAF_{winter} = 4 \times \frac{\% \text{ activity during winter}}{365 \text{ days}}$$

In this analysis, the nation was divided for seasonal adjustment into three regions based on average January temperatures:

- Cold: < 35° F
- Medium: 35-44° F
- Warm: > 45° F

The cold, medium, and warm regions correspond to northern, central and southern regions as defined in a 1973 report by Hare and Springer¹

- Northern: 43° north latitude and north
- Central: from 37° to 43°
- Southern: 37° and south

EPA seasonal adjustment factors have been calculated based on data from Hare and Springer, the CARB Technical Support Document for proposed regulations applicable to lawn and garden equipment,² 1987 SIP emission inventories, and the Motorcycle Industry Council (MIC),³ and the NMMA,⁴ as detailed below. Seasonal activity percentages were estimated for the 3-month summer and winter periods as shown in Table L-02.

Table L-02. Summer and Winter Percentages of Yearly Activity.

Equipment Category	Cold/Northern		Medium/Central		Warm/Southern	
	Summer	Winter	Summer	Winter	Summer	Winter
Agricultural	50%	6%	40%	6%	34%	6%
Construction	43%	10%	38%	15%	33%	20%
Industrial	30%	20%	25%	25%	25%	25%
Lawn & Garden (excl. chainsaws)	50%	6%	40%	6%	34%	6%
Snowblowers/Snowmobiles	0%	100%	0%	100%	0%	100%
Commercial Marine	25%	25%	25%	25%	25%	25%
Airport Service	25%	25%	25%	25%	25%	25%
Logging (including chainsaws)	25%	25%	25%	25%	25%	25%

Hare and Springer reported construction seasons of 7, 8, and 9 months for the north, central, and southern regions, respectively. This corresponds to summer activity percentages of 43%, 38%, and 33% in the same regions. The 1987 SIP emission inventories for Denver and Atlanta reported wintertime activity percentages of 10% and 20%, respectively. These figures were applied to areas in the northern and southern regions. In this study, it was estimated that the wintertime activity percentage in the central region was 15%.

Hare and Springer also reported agricultural seasons of 180, 225, and 270 days for the northern, central, and southern regions, respectively. This corresponds to summer activity percentages of 50%, 40%, and 34% in the same regions. The 1987 SIP emission inventories for both Boston and Atlanta reported that 90% of agricultural equipment activity occurs between April and October, yielding a wintertime activity percentage of 6% in both areas. This figure was herein applied to all nonattainment areas to estimate wintertime agricultural equipment activity.

Because of similarities in the growing seasons, summertime activity percentages for lawn and garden equipment (excluding chain saws) were estimated to be the same as those for agricultural equipment. CARB estimated in the Technical Support Document for its proposed regulations applicable to lawn and garden equipment that wintertime activity

accounted for about 6% of yearly activity. This figure was applied to the southern region, and the wintertime activity percentages in the central and northern regions were estimated to be 3% and 0%. However, it was assumed that all snowblower activity occurs during the winter. The industrial equipment seasonal activity percentages listed above are based on seasonal adjustments used in several 1987 SIP emission inventories. Of those considered in this study, only that for Chicago reported any nonuniformity of industrial equipment activity - the summer portion of yearly activity was reported to be 30%. This figure was applied to the northern region, and the wintertime activity percentage was consequently estimated to be 20%. Activity in the central and southern regions was estimated to be uniformly distributed across the year.

Due to the year-round nature of equipment use, no seasonal adjustments were made to activity for commercial marine vessels, airport service vehicles and logging equipment (including all chain saws). The survey conducted by NMMA of recreation boat owners included information on seasonal boat usage. These results were used to establish seasonal adjustments for each of the eight regions used for regional hours of use adjustment as shown in Table L-03.

Table L-03. Summer and Winter Percentages of Yearly Activity for Recreational Marine Equipment

Region	% During Summer	% During Winter
Northeast	68	1
Southeast	48	7
Mid-Atlantic Coast	57	2
Great Lakes	70	0
Southwest	48	7
Rocky Mountains	69	0
Northwest	57	5
West Coast	48	7

For recreational land-based equipment (e.g. off-highway motorcycles, ATVs, minibikes) other than snowmobiles, survey data submitted to EPA by the Motorcycle Industry Council (MIC) was used. This survey divided the nation into 12 regions as shown in Table L-04.

Table L-04. Summer and Winter Percentages of Yearly Activity for Recreational Equipment.

Region	% During Summer	% During Winter
East	42%	12%
Midwest	46%	8%
South	36%	15%
West	44%	11%
New England	44%	14%
Mid Atlantic Coast	41%	12%
East Central	48%	9%
West Central	44%	8%
Southeast	35%	17%

Southwest	37%	12%
Rocky Mountains	44%	8%
Pacific	43%	13%
National Average	42%	12%

The following tables show the seasonal adjustment factors used for each equipment type in each nonattainment area studied by EPA. To ease interpretation, they are expressed as SAF⁻¹. Using this notation, the following percentages of annual use occurring during a three month season would translate into the following factors:

Table L-05. Examples of Seasonal Activity Percentages and Corresponding Values for SAF and SAF⁻¹

Percent During Season	SAF	SAF ⁻¹
10%	0.00110	909
25%	0.00274	365
35%	0.00384	260
50%	0.00548	183

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- 3 Burke Marketing Research. *1990 Survey of Motorcycle Ownership and Usage Final Results Waves 1-12, Volume II* Conducted for the Motorcycle Industry Council, Inc. May 1991.
- 4 Irwin Broh & Associates, Inc. *NMMA Boat Usage Survey* Prepared for the National Marine Manufacturers Association, Des Plaines, IL, August 1991.

Appendix M

Appendix M. Emission Inventory A

Inventory A is presented in two sets of tables which summarize emissions from nonroad engines and vehicles, highway vehicles, and other area and point sources of emissions. Each set of tables summarizes emissions in each of the 24 nonattainment areas included in this study, as well as national emissions.

In the first set of summary tables, nonroad emissions are calculated using new engine emission factors. In the second set of summary tables, nonroad emissions are calculated using in-use emission factors.

USA
Inventory A
Emission Inventory Summary - Air Toxics and SOx

Equipment Category	tpy					
	PM	Aldehydes	Benzene	1,3 But.	Gas Vap	SOx
Lawn & Garden	10,919	5,901	18,496	7,613	89,798	5,462
Airport Service	12,408	529	440	222	296	6,894
Recreational	12,466	1,481	10,465	4,518	11,059	579
Recreational Marine	3,497	3,532	42,623	18,386	254,842	9,606
Light Commercial	3,663	1,468	2,739	1,042	24,599	4,398
Industrial	20,255	4,037	2,575	1,141	7,051	12,715
Construction	128,672	18,844	4,052	2,087	4,377	89,303
Agricultural	192,444	30,787	6,745	3,465	7,397	79,816
Logging	10,752	1,522	510	225	1,755	6,481
<u>Marine Vessels</u>	<u>33,070</u>	<u>0</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>20,485</u>
Nonroad Engines and Vehicles	428,147	68,101	88,644	38,699	401,173	235,739
Highway Vehicles	1,265,460	0	—	—	—	514,018
<u>Other Area and Point Sources</u>	<u>6,189,510</u>	<u>0</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>22,407,185</u>
All Sources	7,883,117	NA	NA	NA	NA	23,156,942

USA
Inventory A
Emission Inventory Summary - Air Toxics and SOx
Percent of Total Inventory

Equipment Category	% total tpy					
	PM	Aldehydes	Benzene	1,3 But.	Gas Vap	SOx
Lawn & Garden	0.14%	NA	NA	NA	NA	0.02%
Airport Service	0.16%	NA	NA	NA	NA	0.03%
Recreational	0.16%	NA	NA	NA	NA	0.00%
Recreational Marine	0.04%	NA	NA	NA	NA	0.04%
Light Commercial	0.05%	NA	NA	NA	NA	0.02%
Industrial	0.26%	NA	NA	NA	NA	0.05%
Construction	1.63%	NA	NA	NA	NA	0.39%
Agricultural	2.44%	NA	NA	NA	NA	0.34%
Logging	0.14%	NA	NA	NA	NA	0.03%
<u>Marine Vessels</u>	<u>0.42%</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>0.09%</u>
Nonroad Engines and Vehicles	5.43%	NA	NA	NA	NA	1.02%
Highway Vehicles	16.05%	NA	NA	NA	NA	2.22%
<u>Other Area and Point Sources</u>	<u>78.52%</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>96.76%</u>
All Sources	100.00%	NA	NA	NA	NA	100.00%

Atlanta MSA Inventory A
Emission Inventory Summary - VOC, NOx, CO

Equipment Category	tpy			tpsd		tpwd CO
	VOC	NOx	CO	VOC	NOx	
Lawn & Garden	9,300	468	58,023	34	2	43
Airport Service	294	2,073	2,518	1	6	7
Recreational	365	11	1,380	1	0	3
Recreational Marine	9,646	684	19,732	50	4	15
Light Commercial	1,284	314	16,931	4	1	46
Industrial	606	1,324	9,944	2	4	27
Construction	1,916	14,205	11,592	7	51	25
Agricultural	388	1,676	2,536	1	6	2
Logging	0	0	0	0	0	0
<u>Marine Vessels</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>
Nonroad Engines and Vehicles	23,799	20,755	122,656	99	73	169
Highway Vehicles	0	69,146	0	319	208	0
<u>Other Area and Point Sources</u>	<u>0</u>	<u>92,553</u>	<u>0</u>	<u>287</u>	<u>248</u>	<u>0</u>
All Sources	NA	182,454	NA	705	530	NA

Atlanta MSA Inventory A
Emission Inventory Summary - VOC, NOx, CO
Percent of Total Inventory

Equipment Category	% total tpy			% total tpsd		% total tpwd CO
	VOC	NOx	CO	VOC	NOx	
Lawn & Garden	NA	0.26%	NA	4.78%	0.33%	NA
Airport Service	NA	1.14%	NA	0.11%	1.07%	NA
Recreational	NA	0.01%	NA	0.20%	0.01%	NA
Recreational Marine	NA	0.38%	NA	7.07%	0.68%	NA
Light Commercial	NA	0.17%	NA	0.51%	0.16%	NA
Industrial	NA	0.73%	NA	0.24%	0.68%	NA
Construction	NA	7.79%	NA	0.98%	9.70%	NA
Agricultural	NA	0.92%	NA	0.21%	1.18%	NA
Logging	NA	0.00%	NA	0.00%	0.00%	NA
<u>Marine Vessels</u>	<u>NA</u>	<u>0.00%</u>	<u>NA</u>	<u>0.00%</u>	<u>0.00%</u>	<u>NA</u>
Nonroad Engines and Vehicles	NA	11.38%	NA	14.10%	13.81%	NA
Highway Vehicles	NA	37.90%	NA	45.20%	39.33%	NA
<u>Other Area and Point Sources</u>	<u>NA</u>	<u>50.73%</u>	<u>NA</u>	<u>40.69%</u>	<u>46.86%</u>	<u>NA</u>
All Sources	NA	100.00%	NA	100.00%	100.00%	NA

Atlanta MSA Inventory A
Emission Inventory Summary - Air Toxics and SOx
Percent of Total Inventory

Equipment Category	% total tpy					
	PM	Aldehydes	Benzene	1,3 But	Gas Vap	SOx
Lawn & Garden	NA	NA	NA	NA	NA	NA
Airport Service	NA	NA	NA	NA	NA	NA
Recreational	NA	NA	NA	NA	NA	NA
Recreational Manne	NA	NA	NA	NA	NA	NA
Light Commercial	NA	NA	NA	NA	NA	NA
Industrial	NA	NA	NA	NA	NA	NA
Construction	NA	NA	NA	NA	NA	NA
Agricultural	NA	NA	NA	NA	NA	NA
Logging	NA	NA	NA	NA	NA	NA
<u>Marine Vessels</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>
Nonroad Engines and Vehicles	NA	NA	NA	NA	NA	NA
Highway Vehicles	NA	NA	NA	NA	NA	NA
<u>Other Area and Point Sources</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>
All Sources	NA	NA	NA	NA	NA	NA

Atlanta MSA Inventory A
Emission Inventory Summary - Air Toxics and SOx

Equipment Category	tpy					
	PM	Aldehydes	Benzene	1,3 But	Gas Vap	SOx
Lawn & Garden	152	83	259	107	1,113	77
Airport Service	247	11	9	4	6	137
Recreational	4	2	10	5	17	1
Recreational Manne	19	20	259	112	1,052	56
Light Commercial	48	16	35	14	210	38
Industrial	135	27	17	8	46	85
Construction	1,770	260	56	29	59	1,236
Agricultural	322	52	11	6	11	134
Logging	0	0	0	0	0	0
<u>Marine Vessels</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>
Nonroad Engines and Vehicles	2 697	471	657	284	2,514	1,764
Highway Vehicles	0	0	0	0	0	0
<u>Other Area and Point Sources</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>
All Sources	NA	NA	NA	NA	NA	NA

Baltimore MSA Inventory A
Emission Inventory Summary - VOC, NOx, CO

Equipment Category	tpy			tpsd		tpwd CO
	VOC	NOx	CO	VOC	NOx	
Lawn & Garden	5,929	292	35,975	24	1	21
Airport Service	279	1,962	2,388	1	5	7
Recreational	644	12	1,303	1	0	9
Recreational Marine	3,199	369	6,404	19	2	1
Light Commercial	1,022	231	12,903	3	1	35
Industrial	529	1,162	8,735	1	3	24
Construction	1,249	9,286	7,513	5	39	12
Agricultural	505	2,187	3,220	2	10	2
Logging	0	0	0	0	0	0
<u>Marine Vessels</u>	<u>1,623</u>	<u>5,970</u>	<u>30,333</u>	<u>4</u>	<u>16</u>	<u>83</u>
Nonroad Engines and Vehicles	14,980	21,471	108,775	60	77	195
Highway Vehicles	0	54,317	0	200	164	1,328
<u>Other Area and Point Sources</u>	<u>0</u>	<u>59,976</u>	<u>34,462</u>	<u>226</u>	<u>164</u>	<u>226</u>
All Sources	NA	135,764	NA	486	405	1,748

Baltimore MSA Inventory A
Emission Inventory Summary - VOC, NOx, CO
Percent of Total Inventory

Equipment Category	% total tpy			% total tpsd		% total tpwd CO
	VOC	NOx	CO	VOC	NOx	
Lawn & Garden	NA	0.22%	NA	4.95%	0.31%	1.21%
Airport Service	NA	1.44%	NA	0.16%	1.33%	0.37%
Recreational	NA	0.01%	NA	0.15%	0.01%	0.50%
Recreational Marine	NA	0.27%	NA	3.84%	0.57%	0.08%
Light Commercial	NA	0.17%	NA	0.58%	0.16%	2.02%
Industrial	NA	0.86%	NA	0.30%	0.79%	1.37%
Construction	NA	6.84%	NA	1.07%	9.54%	0.71%
Agricultural	NA	1.61%	NA	0.45%	2.36%	0.12%
Logging	NA	0.00%	NA	0.00%	0.00%	0.00%
<u>Marine Vessels</u>	<u>NA</u>	<u>4.40%</u>	<u>NA</u>	<u>0.91%</u>	<u>4.03%</u>	<u>4.75%</u>
Nonroad Engines and Vehicles	NA	15.81%	NA	12.42%	19.09%	11.14%
Highway Vehicles	NA	40.01%	NA	41.12%	40.38%	75.94%
<u>Other Area and Point Sources</u>	<u>NA</u>	<u>44.18%</u>	<u>NA</u>	<u>46.46%</u>	<u>40.53%</u>	<u>12.92%</u>
All Sources	NA	100.00%	NA	100.00%	100.00%	100.00%

Baltimore MSA Inventory A
Emission Inventory Summary - Air Toxics and SOx

Equipment Category	tpy					
	PM	Aldehydes	Benzene	1,3 But	Gas Vap	SOx
Lawn & Garden	96	52	163	67	790	48
Airport Service	234	10	8	4	6	130
Recreational	22	3	19	8	20	1
Recreational Manne	11	11	74	32	734	22
Light Commercial	37	13	28	11	157	28
Industrial	118	24	15	7	41	74
Construction	1,164	170	37	19	40	808
Agricultural	420	67	15	8	16	174
Logging	0	0	0	0	0	0
<u>Marine Vessels</u>	<u>302</u>	<u>0</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>1,719</u>
Nonroad Engines and Vehicles	2,404	349	359	156	1,804	3,004
Highway Vehicles	0	0	—	—	—	0
<u>Other Area and Point Sources</u>	<u>0</u>	<u>0</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>0</u>
All Sources	NA	NA	NA	NA	NA	NA

Baltimore MSA Inventory A
Emission Inventory Summary - Air Toxics and SOx
Percent of Total Inventory

Equipment Category	% total tpy					
	PM	Aldehydes	Benzene	1,3 But.	Gas Vap	SOx
Lawn & Garden	NA	NA	NA	NA	NA	NA
Airport Service	NA	NA	NA	NA	NA	NA
Recreational	NA	NA	NA	NA	NA	NA
Recreational Manne	NA	NA	NA	NA	NA	NA
Light Commercial	NA	NA	NA	NA	NA	NA
Industrial	NA	NA	NA	NA	NA	NA
Construction	NA	NA	NA	NA	NA	NA
Agricultural	NA	NA	NA	NA	NA	NA
Logging	NA	NA	NA	NA	NA	NA
<u>Marine Vessels</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>
Nonroad Engines and Vehicles	NA	NA	NA	NA	NA	NA
Highway Vehicles	NA	NA	NA	NA	NA	NA
<u>Other Area and Point Sources</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>
All Sources	NA	NA	NA	NA	NA	NA

Baton Rouge CMSA Inventory A
Emission Inventory Summary - VOC, NOx, CO

Equipment Category	tpy			tpsd		tpwd
	VOC	NOx	CO	VOC	NOx	CO
Lawn & Garden	1,723	87	10,752	6	0	8
Airport Service	214	1,510	1,833	1	4	5
Recreational	312	9	1,180	1	0	2
Recreational Marine	3,765	104	7,364	20	1	6
Light Commercial	516	126	6,808	1	0	19
Industrial	151	330	2,480	0	1	7
Construction	954	7,075	5,774	3	26	13
Agricultural	129	557	842	0	2	1
Logging	31	129	203	0	0	1
<u>Marine Vessels</u>	<u>143</u>	<u>2,394</u>	<u>528</u>	<u>0</u>	<u>7</u>	<u>1</u>
Nonroad Engines and Vehicles	7,938	12,322	37,763	34	41	61
Highway Vehicles	0	14,555	0	64	44	0
<u>Other Area and Point Sources</u>	<u>0</u>	<u>82,744</u>	<u>0</u>	<u>270</u>	<u>227</u>	<u>0</u>
All Sources	NA	109,621	NA	368	311	NA

Baton Rouge CMSA Inventory A
Emission Inventory Summary - VOC, NOx, CO
Percent of Total Inventory

Equipment Category	% total tpy			% total tpsd		% total tpwd
	VOC	NOx	CO	VOC	NOx	CO
Lawn & Garden	NA	0.08%	NA	1.70%	0.10%	NA
Airport Service	NA	1.38%	NA	0.16%	1.33%	NA
Recreational	NA	0.01%	NA	0.34%	0.01%	NA
Recreational Marine	NA	0.09%	NA	5.34%	0.18%	NA
Light Commercial	NA	0.12%	NA	0.39%	0.11%	NA
Industrial	NA	0.30%	NA	0.11%	0.29%	NA
Construction	NA	6.45%	NA	0.94%	8.22%	NA
Agricultural	NA	0.51%	NA	0.13%	0.67%	NA
Logging	NA	0.12%	NA	0.02%	0.11%	NA
<u>Marine Vessels</u>	<u>NA</u>	<u>2.18%</u>	<u>NA</u>	<u>0.11%</u>	<u>2.11%</u>	<u>NA</u>
Nonroad Engines and Vehicles	NA	11.24%	NA	9.24%	13.12%	NA
Highway Vehicles	NA	13.28%	NA	17.39%	14.08%	NA
<u>Other Area and Point Sources</u>	<u>NA</u>	<u>75.48%</u>	<u>NA</u>	<u>73.37%</u>	<u>72.79%</u>	<u>NA</u>
All Sources	NA	100.00%	NA	100.00%	100.00%	NA

Baton Rouge CMSA Inventory A
Emission Inventory Summary - Air Toxics and SOx

Equipment Category	tpy					
	PM	Aldehydes	Benzene	1,3 But	Gas Vap	SOx
Lawn & Garden	28	15	48	20	206	14
Airport Service	180	8	6	3	4	100
Recreational	3	2	9	4	14	1
Recreational Marine	3	3	107	46	215	17
Light Commercial	19	7	14	6	85	15
Industrial	34	7	4	2	11	21
Construction	882	130	28	14	29	616
Agricultural	107	17	4	2	4	44
Logging	18	3	1	0	3	11
<u>Marine Vessels</u>	<u>141</u>	<u>0</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>975</u>
Nonroad Engines and Vehicles	1,414	190	221	97	572	1,814
Highway Vehicles	0	0	—	—	—	0
<u>Other Area and Point Sources</u>	<u>0</u>	<u>0</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>0</u>
All Sources	NA	NA	NA	NA	NA	NA

Baton Rouge CMSA Inventory A
Emission Inventory Summary - Air Toxics and SOx
Percent of Total Inventory

Equipment Category	% total tpy					
	PM	Aldehydes	Benzene	1,3 But	Gas Vap	SOx
Lawn & Garden	NA	NA	NA	NA	NA	NA
Airport Service	NA	NA	NA	NA	NA	NA
Recreational	NA	NA	NA	NA	NA	NA
Recreational Marine	NA	NA	NA	NA	NA	NA
Light Commercial	NA	NA	NA	NA	NA	NA
Industrial	NA	NA	NA	NA	NA	NA
Construction	NA	NA	NA	NA	NA	NA
Agricultural	NA	NA	NA	NA	NA	NA
Logging	NA	NA	NA	NA	NA	NA
<u>Marine Vessels</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>
Nonroad Engines and Vehicles	NA	NA	NA	NA	NA	NA
Highway Vehicles	NA	NA	NA	NA	NA	NA
<u>Other Area and Point Sources</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>
All Sources	NA	NA	NA	NA	NA	NA

Boston CMSA Inventory A
Emission Inventory Summary - VOC, NOx, CO

Equipment Category	tpy			tpsd		tpwd
	VOC	NOx	CO	VOC	NOx	CO
Lawn & Garden	6,404	308	37,020	33	2	14
Airport Service	355	2,496	3,036	1	7	8
Recreational	2,979	51	5,388	2	0	44
Recreational Manne	8,485	834	14,454	54	6	2
Light Commercial	2,440	511	29,618	7	1	81
Industrial	1,667	3,679	27,693	5	10	76
Construction	1,582	11,807	9,439	7	56	10
Agricultural	133	579	815	1	3	1
Logging	0	0	0	0	0	0
<u>Marine Vessels</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>5</u>	<u>1</u>
Nonroad Engines and Vehicles	24,044	20,266	127,464	110	90	236
Highway Vehicles	0	0	0	415	207	1,470
<u>Other Area and Point Sources</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>304</u>	<u>169</u>	<u>599</u>
All Sources	NA	NA	NA	830	466	2,305

Boston CMSA Inventory A
Emission Inventory Summary - VOC, NOx, CO
Percent of Total Inventory

Equipment Category	% total tpy			% total tpsd		% total tpwd
	VOC	NOx	CO	VOC	NOx	CO
Lawn & Garden	NA	NA	NA	3.95%	0.36%	0.59%
Airport Service	NA	NA	NA	0.12%	1.47%	0.36%
Recreational	NA	NA	NA	0.26%	0.01%	1.92%
Recreational Manne	NA	NA	NA	6.56%	1.34%	0.07%
Light Commercial	NA	NA	NA	0.82%	0.30%	3.52%
Industrial	NA	NA	NA	0.56%	2.16%	3.29%
Construction	NA	NA	NA	0.90%	11.95%	0.45%
Agricultural	NA	NA	NA	0.09%	0.68%	0.02%
Logging	NA	NA	NA	0.00%	0.00%	0.00%
<u>Manne Vessels</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>0.03%</u>	<u>1.07%</u>	<u>0.03%</u>
Nonroad Engines and Vehicles	NA	NA	NA	13.29%	19.34%	10.25%
Highway Vehicles	NA	NA	NA	50.01%	44.44%	63.78%
<u>Other Area and Point Sources</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>36.70%</u>	<u>36.22%</u>	<u>25.97%</u>
All Sources	NA	NA	NA	100.00%	100.00%	100.00%

Boston CMSA Inventory A
Emission Inventory Summary - Air Toxics and SOx

Equipment Category	tpy					
	PM	Aldehydes	Benzene	1,3 But	Gas. Vap	SOx
Lawn & Garden	101	54	171	70	990	50
Airport Service	297	13	11	5	7	165
Recreational	113	12	87	38	77	4
Recreational Manne	24	25	167	72	2,941	50
Light Commercial	88	30	68	27	353	62
Industrial	373	74	47	21	132	235
Construction	1,491	217	46	24	53	1,026
Agricultural	111	18	4	2	5	46
Logging	0	0	0	0	0	0
<u>Marine Vessels</u>	<u>173</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>
Nonroad Engines and Vehicles	2,771	442	601	260	4,558	1,640
Highway Vehicles	0	0				0
<u>Other Area and Point Sources</u>	<u>0</u>	<u>0</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>0</u>
All Sources	NA	NA	NA	NA	NA	NA

Boston CMSA Inventory A
Emission Inventory Summary - Air Toxics and SOx
Percent of Total Inventory

Equipment Category	% total tpy					
	PM	Aldehydes	Benzene	1,3 But	Gas Vap	SOx
Lawn & Garden	NA	NA	NA	NA	NA	NA
Airport Service	NA	NA	NA	NA	NA	NA
Recreational	NA	NA	NA	NA	NA	NA
Recreational Manne	NA	NA	NA	NA	NA	NA
Light Commercial	NA	NA	NA	NA	NA	NA
Industrial	NA	NA	NA	NA	NA	NA
Construction	NA	NA	NA	NA	NA	NA
Agncultural	NA	NA	NA	NA	NA	NA
Logging	NA	NA	NA	NA	NA	NA
<u>Marine Vessels</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>
Nonroad Engines and Vehicles	NA	NA	NA	NA	NA	NA
Highway Vehicles	NA	NA	NA	NA	NA	NA
<u>Other Area and Point Sources</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>
All Sources	NA	NA	NA	NA	NA	NA

Chicago CMSA Inventory A
Emission Inventory Summary - VOC, NOx, CO

Equipment Category	tpy			tpsd		tpwd
	VOC	NOx	CO	VOC	NOx	CO
Lawn & Garden	11,997	574	69,079	61	3	25
Airport Service	720	5,063	6,153	2	14	17
Recreational	4,436	76	8,022	4	0	64
Recreational Marine	8,360	336	14,932	60	3	0
Light Commercial	4,120	862	49,973	11	2	137
Industrial	3,207	7,060	53,226	9	19	146
Construction	3,242	24,197	19,336	15	114	21
Agricultural	831	3,612	5,076	5	20	3
Logging	0	0	0	0	0	0
<u>Marine Vessels</u>	<u>0</u>	<u>608</u>	<u>0</u>	<u>1</u>	<u>26</u>	<u>0</u>
Nonroad Engines and Vehicles	36,913	42,389	225,797	168	202	414
Highway Vehicles	0	153,215	0	588	462	0
<u>Other Area and Point Sources</u>	<u>0</u>	<u>302,107</u>	<u>0</u>	<u>1,029</u>	<u>603</u>	<u>0</u>
All Sources	NA	497,711	NA	1,785	1,266	NA

Chicago CMSA Inventory A
Emission Inventory Summary - VOC, NOx, CO
Percent of Total Inventory

Equipment Category	% total tpy			% total tpsd		% total tpwd
	VOC	NOx	CO	VOC	NOx	CO
Lawn & Garden	NA	0.12%	NA	3.44%	0.25%	NA
Airport Service	NA	1.02%	NA	0.11%	1.10%	NA
Recreational	NA	0.02%	NA	0.20%	0.01%	NA
Recreational Marine	NA	0.07%	NA	3.34%	0.20%	NA
Light Commercial	NA	0.17%	NA	0.64%	0.19%	NA
Industrial	NA	1.42%	NA	0.50%	1.53%	NA
Construction	NA	4.86%	NA	0.86%	9.00%	NA
Agricultural	NA	0.73%	NA	0.25%	1.56%	NA
Logging	NA	0.00%	NA	0.00%	0.00%	NA
<u>Marine Vessels</u>	<u>NA</u>	<u>0.12%</u>	<u>NA</u>	<u>0.06%</u>	<u>2.09%</u>	<u>NA</u>
Nonroad Engines and Vehicles	NA	8.52%	NA	9.41%	15.92%	NA
Highway Vehicles	NA	30.78%	NA	32.93%	36.46%	NA
<u>Other Area and Point Sources</u>	<u>NA</u>	<u>60.70%</u>	<u>NA</u>	<u>57.66%</u>	<u>47.62%</u>	<u>NA</u>
All Sources	NA	100.00%	NA	100.00%	100.00%	NA

Chicago CMSA Inventory A
Emission Inventory Summary - Air Toxics and SOx

Equipment Category	tpy					
	PM	Aldehydes	Benzene	1,3 But	Gas Vap	SOx
Lawn & Garden	189	100	319	132	1,889	94
Airport Service	603	26	21	11	15	335
Recreational	168	17	130	56	117	7
Recreational Manne	9	9	208	90	1,444	38
Light Commercial	148	51	114	46	601	105
Industrial	716	143	91	40	259	451
Construction	3,056	446	95	49	110	2,103
Agricultural	695	111	24	12	33	287
Logging	0	0	0	0	0	0
<u>Marine Vessels</u>	<u>300</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>
Nonroad Engines and Vehicles	5,884	903	1,003	436	4,467	3,419
Highway Vehicles	113,525	0				0
<u>Other Area and Point Sources</u>	<u>181,246</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>
All Sources	300,655	NA	NA	NA	NA	NA

Chicago CMSA Inventory A
Emission Inventory Summary - Air Toxics and SOx
Percent of Total Inventory

Equipment Category	% total tpy					
	PM	Aldehydes	Benzene	1,3 But	Gas Vap	SOx
Lawn & Garden	0.06%	NA	NA	NA	NA	NA
Airport Service	0.20%	NA	NA	NA	NA	NA
Recreational	0.06%	NA	NA	NA	NA	NA
Recreational Manne	0.00%	NA	NA	NA	NA	NA
Light Commercial	0.05%	NA	NA	NA	NA	NA
Industrial	0.24%	NA	NA	NA	NA	NA
Construction	1.02%	NA	NA	NA	NA	NA
Agricultural	0.23%	NA	NA	NA	NA	NA
Logging	0.00%	NA	NA	NA	NA	NA
<u>Marine Vessels</u>	<u>0.10%</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>
Nonroad Engines and Vehicles	1.96%	NA	NA	NA	NA	NA
Highway Vehicles	37.76%	NA	NA	NA	NA	NA
<u>Other Area and Point Sources</u>	<u>60.28%</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>
All Sources	100.00%	NA	NA	NA	NA	NA

Cleveland CMSA Inventory A
Emission Inventory Summary - VOC, NOx, CO

Equipment Category	tpy			tpsd		tpwd
	VOC	NOx	CO	VOC	NOx	CO
Lawn & Garden	4 502	215	25,922	23	1	10
Airport Service	305	2,151	2,608	1	6	7
Recreational	672	11	1 215	1	0	10
Recreational Manne	5,013	385	8,617	34	3	0
Light Commercial	1 651	346	20,032	5	1	55
Industrial	1 498	3,297	24,858	4	9	68
Construction	1 113	8,309	6,639	5	39	7
Agricultural	378	1,644	2,311	2	9	2
Logging	0	0	0	0	0	0
<u>Marine Vessels</u>	<u>0</u>	<u>109</u>	<u>3,757</u>	<u>0</u>	<u>0</u>	<u>0</u>
Nonroad Engines and Vehicles	15,133	16,467	95 960	74	68	158
Highway Vehicles	0	64,808	412,340	242	195	2 360
<u>Other Area and Point Sources</u>	<u>0</u>	<u>62,301</u>	<u>88,401</u>	<u>369</u>	<u>171</u>	<u>252</u>
All Sources	NA	143,576	596,701	685	434	2 770

Cleveland CMSA Inventory A
Emission Inventory Summary - VOC, NOx, CO
Percent of Total Inventory

Equipment Category	% total tpy			% total tpsd		% total tpwd
	VOC	NOx	CO	VOC	NOx	CO
Lawn & Garden	NA	0 15%	4 34%	3 36%	0 27%	0 35%
Airport Service	NA	1 50%	0 44%	0 12%	1 36%	0 26%
Recreational	NA	0 01%	0 20%	0 08%	0 00%	0 35%
Recreational Manne	NA	0 27%	1 44%	4 94%	0 68%	0 00%
Light Commercial	NA	0 24%	3 36%	0 67%	0 22%	1 98%
Industrial	NA	2 30%	4 17%	0 61%	2 08%	2 46%
Construction	NA	5 79%	1 11%	0 76%	9 01%	0 26%
Agricultural	NA	1 15%	0 39%	0 30%	2 07%	0 05%
Logging	NA	0 00%	0 00%	0 00%	0 00%	0 00%
<u>Manne Vessels</u>	<u>NA</u>	<u>0 08%</u>	<u>0 63%</u>	<u>0 00%</u>	<u>0 07%</u>	<u>0 00%</u>
Nonroad Engines and Vehicles	NA	11 47%	16 08%	10 85%	15 76%	5 71%
Highway Vehicles	NA	45 14%	69 10%	35 29%	44 95%	85 20%
<u>Other Area and Point Sources</u>	<u>NA</u>	<u>43 39%</u>	<u>14 81%</u>	<u>53 86%</u>	<u>39 29%</u>	<u>9 08%</u>
All Sources	NA	100 00%	100 00%	100 00%	100 00%	100 00%

Cleveland CMSA Inventory A
Emission Inventory Summary - Air Toxics and SOx
Percent of Total Inventory

Equipment Category	% total tpy					
	PM	Aldehydes	Benzene	1,3 But	Gas Vap	SOx
Lawn & Garden	0.06%	NA	NA	NA	NA	NA
Airport Service	0.23%	NA	NA	NA	NA	NA
Recreational	0.02%	NA	NA	NA	NA	NA
Recreational Marine	0.01%	NA	NA	NA	NA	NA
Light Commercial	0.05%	NA	NA	NA	NA	NA
Industrial	0.30%	NA	NA	NA	NA	NA
Construction	0.93%	NA	NA	NA	NA	NA
Agricultural	0.28%	NA	NA	NA	NA	NA
Logging	0.00%	NA	NA	NA	NA	NA
<u>Marine Vessels</u>	<u>0.00%</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>
Nonroad Engines and Vehicles	1.88%	NA	NA	NA	NA	NA
Highway Vehicles	41.30%	NA	NA	NA	NA	NA
<u>Other Area and Point Sources</u>	<u>56.82%</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>
All Sources	100.00%	NA	NA	NA	NA	NA

Cleveland CMSA Inventory A
Emission Inventory Summary - Air Toxics and SOx

Equipment Category	tpy					
	PM	Aldehydes	Benzene	1,3 But	Gas Vap	SOx
Lawn & Garden	71	38	120	49	709	35
Airport Service	256	11	9	5	6	142
Recreational	25	3	20	9	18	1
Recreational Marine	11	11	107	46	1,453	27
Light Commercial	59	20	46	18	241	42
Industrial	335	67	42	19	121	210
Construction	1,049	153	33	17	38	722
Agricultural	316	51	11	6	15	131
Logging	0	0	0	0	0	0
<u>Marine Vessels</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>
Nonroad Engines and Vehicles	2,123	353	388	168	2,600	1,311
Highway Vehicles	46,729	0	0	0	0	0
<u>Other Area and Point Sources</u>	<u>64,287</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>
All Sources	113,139	NA	NA	NA	NA	NA

Denver CMSA Inventory A
Emission Inventory Summary - VOC, NOx, CO

Equipment Category	tpy			tpsd		tpwd CO
	VOC	NOx	CO	VOC	NOx	
Lawn & Garden	6,661	323	38,939	35	2	10
Airport Service	226	1,591	1,931	1	4	5
Recreational	1,896	33	3,601	2	0	27
Recreational Marine	475	113	903	3	1	0
Light Commercial	2,023	457	25,486	6	1	70
Industrial	847	1,857	13,966	2	5	38
Construction	1,661	12,377	10,010	8	58	11
Agricultural	221	958	1,399	1	5	1
Logging	0	0	0	0	0	0
<u>Marine Vessels</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>
Nonroad Engines and Vehicles	14,010	17,708	96,236	57	77	161
Highway Vehicles	0	0	417,406	0	0	2,371
<u>Other Area and Point Sources</u>	<u>0</u>	<u>0</u>	<u>58,870</u>	<u>0</u>	<u>0</u>	<u>168</u>
All Sources	NA	NA	572,512	NA	NA	2,700

Denver CMSA Inventory A
Emission Inventory Summary - VOC, NOx, CO
Percent of Total Inventory

Equipment Category	% total tpy			% total tpsd		% total tpwd CO
	VOC	NOx	CO	VOC	NOx	
Lawn & Garden	NA	NA	6.80%	NA	NA	0.36%
Airport Service	NA	NA	0.34%	NA	NA	0.20%
Recreational	NA	NA	0.63%	NA	NA	0.98%
Recreational Marine	NA	NA	0.16%	NA	NA	0.00%
Light Commercial	NA	NA	4.45%	NA	NA	2.59%
Industrial	NA	NA	2.44%	NA	NA	1.42%
Construction	NA	NA	1.75%	NA	NA	0.41%
Agricultural	NA	NA	0.24%	NA	NA	0.03%
Logging	NA	NA	0.00%	NA	NA	0.00%
<u>Marine Vessels</u>	<u>NA</u>	<u>NA</u>	<u>0.00%</u>	<u>NA</u>	<u>NA</u>	<u>0.00%</u>
Nonroad Engines and Vehicles	NA	NA	16.81%	NA	NA	5.98%
Highway Vehicles	NA	NA	72.91%	NA	NA	87.82%
<u>Other Area and Point Sources</u>	<u>NA</u>	<u>NA</u>	<u>10.28%</u>	<u>NA</u>	<u>NA</u>	<u>6.21%</u>
All Sources	NA	NA	100.00%	NA	NA	100.00%

Denver CMSA Inventory A
Emission Inventory Summary - Air Toxics and SOx

Equipment Category	tpy					
	PM	Aldehydes	Benzene	1,3 But.	Gas Vap	SOx
Lawn & Garden	105	57	181	74	938	53
Airport Service	189	8	7	3	5	105
Recreational	69	8	56	24	51	3
Recreational Marine	3	3	6	3	266	5
Light Commercial	74	25	56	22	312	56
Industrial	189	38	24	11	67	118
Construction	1,552	227	49	25	53	1,077
Agricultural	184	29	6	3	7	76
Logging	0	0	0	0	0	0
<u>Marine Vessels</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>
Nonroad Engines and Vehicles	2,366	395	384	166	1,699	1,493
Highway Vehicles	32,716	0				0
<u>Other Area and Point Sources</u>	<u>146,677</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>
All Sources	181,759	NA	NA	NA	NA	NA

Denver CMSA Inventory A
Emission Inventory Summary - Air Toxics and SOx
Percent of Total Inventory

Equipment Category	% total tpy					
	PM	Aldehydes	Benzene	1,3 But.	Gas Vap	SOx
Lawn & Garden	0.06%	NA	NA	NA	NA	NA
Airport Service	0.10%	NA	NA	NA	NA	NA
Recreational	0.04%	NA	NA	NA	NA	NA
Recreational Marine	0.00%	NA	NA	NA	NA	NA
Light Commercial	0.04%	NA	NA	NA	NA	NA
Industrial	0.10%	NA	NA	NA	NA	NA
Construction	0.85%	NA	NA	NA	NA	NA
Agricultural	0.10%	NA	NA	NA	NA	NA
Logging	0.00%	NA	NA	NA	NA	NA
<u>Marine Vessels</u>	<u>0.00%</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>
Nonroad Engines and Vehicles	1.30%	NA	NA	NA	NA	NA
Highway Vehicles	18.00%	NA	NA	NA	NA	NA
<u>Other Area and Point Sources</u>	<u>80.70%</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>
All Sources	100.00%	NA	NA	NA	NA	NA

El Paso MSA Inventory A
Emission Inventory Summary - VOC, NOx, CO

Equipment Category	tpy			tpsd		tpwd
	VOC	NOx	CO	VOC	NOx	CO
Lawn & Garden	1,418	70	8,799	5	0	7
Airport Service	67	470	575	0	1	2
Recreational	281	8	1,053	1	0	1
Recreational Marine	321	20	645	2	0	0
Light Commercial	504	127	6,699	1	0	18
Industrial	304	667	5,005	1	2	14
Construction	447	3,295	2,719	2	12	6
Agricultural	45	193	296	0	1	0
Logging	0	0	0	0	0	0
<u>Marine Vessels</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>
Nonroad Engines and Vehicles	3,387	4,851	25,791	12	16	48
Highway Vehicles	0	11,156	320,700	36	34	756
<u>Other Area and Point Sources</u>	<u>0</u>	<u>20,382</u>	<u>18,000</u>	<u>60</u>	<u>25</u>	<u>24</u>
All Sources	NA	36,389	364,491	108	75	828

El Paso MSA Inventory A
Emission Inventory Summary - VOC, NOx, CO
Percent of Total Inventory

Equipment Category	% total tpy			% total tpsd		% total tpwd
	VOC	NOx	CO	VOC	NOx	CO
Lawn & Garden	NA	0.19%	2.41%	4.74%	0.35%	0.79%
Airport Service	NA	1.29%	0.16%	0.17%	1.72%	0.19%
Recreational	NA	0.02%	0.29%	1.05%	0.04%	0.17%
Recreational Marine	NA	0.06%	0.18%	1.53%	0.14%	0.06%
Light Commercial	NA	0.35%	1.84%	1.29%	0.46%	2.22%
Industrial	NA	1.83%	1.37%	0.78%	2.44%	1.66%
Construction	NA	9.05%	0.75%	1.49%	15.89%	0.72%
Agricultural	NA	0.53%	0.08%	0.15%	0.96%	0.02%
Logging	NA	0.00%	0.00%	0.00%	0.00%	0.00%
<u>Marine Vessels</u>	<u>NA</u>	<u>0.00%</u>	<u>0.00%</u>	<u>0.00%</u>	<u>0.00%</u>	<u>0.00%</u>
Nonroad Engines and Vehicles	NA	13.33%	7.08%	11.22%	22.00%	5.83%
Highway Vehicles	NA	30.66%	87.99%	33.47%	44.83%	91.24%
<u>Other Area and Point Sources</u>	<u>NA</u>	<u>56.01%</u>	<u>4.94%</u>	<u>55.32%</u>	<u>33.16%</u>	<u>2.94%</u>
All Sources	NA	100.00%	100.00%	100.00%	100.00%	100.00%

El Paso MSA Inventory A
Emission Inventory Summary - Air Toxics and SOx

Equipment Category	PM	Aldehydes	Benzene	tpy 1,3 But	Gas Vap	SOx
Lawn & Garden	23	13	39	16	172	12
Airport Service	56	2	2	1	1	31
Recreational	3	2	8	3	13	1
Recreational Manne	1	1	9	4	36	2
Light Commercial	19	6	14	6	81	15
Industrial	68	14	9	4	23	43
Construction	413	61	13	7	13	287
Agrncultural	37	6	1	1	1	15
Logging	0	0	0	0	0	0
<u>Marine Vessels</u>	<u>0</u>	<u>0</u>				<u>0</u>
Nonroad Engines and Vehicles	620	104	95	41	340	405
Highway Vehicles	7,278	0				0
<u>Other Area and Point Sources</u>	<u>129,939</u>	<u>0</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>0</u>
All Sources	137,837	NA	NA	NA	NA	NA

El Paso MSA Inventory A
Emission Inventory Summary - Air Toxics and SOx
Percent of Total Inventory

Equipment Category	PM	Aldehydes	Benzene	% total tpy 1,3 But.	Gas Vap	SOx
Lawn & Garden	0.02%	NA	NA	NA	NA	NA
Airport Service	0.04%	NA	NA	NA	NA	NA
Recreational	0.00%	NA	NA	NA	NA	NA
Recreational Manne	0.00%	NA	NA	NA	NA	NA
Light Commercial	0.01%	NA	NA	NA	NA	NA
Industrial	0.05%	NA	NA	NA	NA	NA
Construction	0.30%	NA	NA	NA	NA	NA
Agrncultural	0.03%	NA	NA	NA	NA	NA
Logging	0.00%	NA	NA	NA	NA	NA
<u>Marine Vessels</u>	<u>0.00%</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>
Nonroad Engines and Vehicles	0.45%	NA	NA	NA	NA	NA
Highway Vehicles	5.28%	NA	NA	NA	NA	NA
<u>Other Area and Point Sources</u>	<u>94.27%</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>
All Sources	100.00%	NA	NA	NA	NA	NA

Hartford NECMA Inventory A
Emission Inventory Summary - VOC, NOx, CO

Equipment Category	tpy			tpsd		tpwd
	VOC	NOx	CO	VOC	NOx	CO
Lawn & Garden	2,136	103	12,349	11	1	5
Airport Service	256	1,800	2,188	1	5	6
Recreational	1,285	22	2,325	1	0	19
Recreational Marine	1,854	130	3,244	12	1	0
Light Commercial	597	125	7,249	2	0	20
Industrial	611	1,348	10,148	2	4	28
Construction	585	4,370	3,494	3	21	4
Agricultural	115	499	703	1	3	0
Logging	0	0	0	0	0	0
<u>Marine Vessels</u>	<u>11</u>	<u>260</u>	<u>29</u>	<u>0</u>	<u>1</u>	<u>0</u>
Nonroad Engines and Vehicles	7,451	8,657	41,728	32	35	82
Highway Vehicles	0	29,311	108,380	189	88	590
<u>Other Area and Point Sources</u>	<u>0</u>	<u>11,650</u>	<u>51,997</u>	<u>77</u>	<u>18</u>	<u>210</u>
All Sources	NA	49,618	202,105	297	141	882

Hartford NECMA Inventory A
Emission Inventory Summary - VOC, NOx, CO
Percent of Total Inventory

Equipment Category	% total tpy			% total tpsd		% total tpwd
	VOC	NOx	CO	VOC	NOx	CO
Lawn & Garden	NA	0.21%	6.11%	3.68%	0.39%	0.52%
Airport Service	NA	3.63%	1.08%	0.24%	3.50%	0.68%
Recreational	NA	0.04%	1.15%	0.32%	0.02%	2.16%
Recreational Marine	NA	0.26%	1.61%	4.18%	0.69%	0.04%
Light Commercial	NA	0.25%	3.59%	0.56%	0.24%	2.25%
Industrial	NA	2.72%	5.02%	0.58%	2.62%	3.15%
Construction	NA	8.81%	1.73%	0.93%	14.61%	0.43%
Agricultural	NA	1.01%	0.35%	0.21%	1.94%	0.05%
Logging	NA	0.00%	0.00%	0.00%	0.00%	0.00%
<u>Marine Vessels</u>	<u>NA</u>	<u>0.52%</u>	<u>0.01%</u>	<u>0.01%</u>	<u>0.50%</u>	<u>0.01%</u>
Nonroad Engines and Vehicles	NA	17.45%	20.65%	10.69%	24.51%	9.30%
Highway Vehicles	NA	59.07%	53.63%	63.44%	62.66%	66.89%
<u>Other Area and Point Sources</u>	<u>NA</u>	<u>23.48%</u>	<u>25.73%</u>	<u>25.86%</u>	<u>12.83%</u>	<u>23.81%</u>
All Sources	NA	100.00%	100.00%	100.00%	100.00%	100.00%

Hartford NECMA Inventory A
Emission Inventory Summary - Air Toxics and SOx

Equipment Category	tpy					
	PM	Aldehydes	Benzene	1,3 But	Gas Vap	SOx
Lawn & Garden	34	18	57	23	330	17
Airport Service	214	9	8	4	5	119
Recreational	49	5	38	16	33	2
Recreational Marine	4	4	42	18	475	10
Light Commercial	22	7	17	7	87	15
Industrial	137	27	17	8	48	86
Construction	552	80	17	9	19	380
Agricultural	96	15	3	2	4	40
Logging	0	0	0	0	0	0
<u>Marine Vessels</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>
Nonroad Engines and Vehicles	1,106	166	198	86	1,002	668
Highway Vehicles	0	0				0
<u>Other Area and Point Sources</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>
All Sources	NA	NA	NA	NA	NA	NA

Hartford NECMA Inventory A
Emission Inventory Summary - Air Toxics and SOx
Percent of Total Inventory

Equipment Category	% total tpy					
	PM	Aldehydes	Benzene	1,3 But.	Gas Vap	SOx
Lawn & Garden	NA	NA	NA	NA	NA	NA
Airport Service	NA	NA	NA	NA	NA	NA
Recreational	NA	NA	NA	NA	NA	NA
Recreational Marine	NA	NA	NA	NA	NA	NA
Light Commercial	NA	NA	NA	NA	NA	NA
Industrial	NA	NA	NA	NA	NA	NA
Construction	NA	NA	NA	NA	NA	NA
Agricultural	NA	NA	NA	NA	NA	NA
Logging	NA	NA	NA	NA	NA	NA
<u>Marine Vessels</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>
Nonroad Engines and Vehicles	NA	NA	NA	NA	NA	NA
Highway Vehicles	NA	NA	NA	NA	NA	NA
<u>Other Area and Point Sources</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>
All Sources	NA	NA	NA	NA	NA	NA

Houston CMSA Inventory A
Emission Inventory Summary - VOC, NOx, CO

Equipment Category	tpy			tpsd		tpwd
	VOC	NOx	CO	VOC	NOx	CO
Lawn & Garden	17,501	859	108,598	63	3	81
Airport Service	389	2,739	3,331	1	8	9
Recreational	911	27	3,419	4	0	4
Recreational Marine	14,701	1,044	29,734	76	5	23
Light Commercial	4,549	1,148	60,413	13	3	166
Industrial	1,437	3,151	23,631	4	9	65
Construction	5,251	38,709	31,941	19	140	70
Agricultural	769	3,322	5,084	3	12	3
Logging	55	255	367	0	1	1
<u>Marine Vessels</u>	<u>631</u>	<u>12,227</u>	<u>1,709</u>	<u>2</u>	<u>33</u>	<u>5</u>
Nonroad Engines and Vehicles	46,194	63,480	268,226	185	215	427
Highway Vehicles	0	100,865	0	442	304	0
<u>Other Area and Point Sources</u>	<u>0</u>	<u>440,925</u>	<u>0</u>	<u>1,391</u>	<u>859</u>	<u>0</u>
All Sources	NA	605,270	NA	2,018	1,378	NA

Houston CMSA Inventory A
Emission Inventory Summary - VOC, NOx, CO
Percent of Total Inventory

Equipment Category	% total tpy			% total tpsd		% total tpwd
	VOC	NOx	CO	VOC	NOx	CO
Lawn & Garden	NA	0.14%	NA	3.14%	0.23%	NA
Airport Service	NA	0.45%	NA	0.05%	0.54%	NA
Recreational	NA	0.00%	NA	0.18%	0.01%	NA
Recreational Marine	NA	0.17%	NA	3.76%	0.40%	NA
Light Commercial	NA	0.19%	NA	0.63%	0.23%	NA
Industrial	NA	0.52%	NA	0.20%	0.63%	NA
Construction	NA	6.40%	NA	0.94%	10.16%	NA
Agricultural	NA	0.55%	NA	0.14%	0.90%	NA
Logging	NA	0.04%	NA	0.01%	0.05%	NA
<u>Marine Vessels</u>	<u>NA</u>	<u>2.02%</u>	<u>NA</u>	<u>0.09%</u>	<u>2.43%</u>	<u>NA</u>
Nonroad Engines and Vehicles	NA	10.49%	NA	9.14%	15.58%	NA
Highway Vehicles	NA	16.66%	NA	21.92%	22.06%	NA
<u>Other Area and Point Sources</u>	<u>NA</u>	<u>72.85%</u>	<u>NA</u>	<u>68.93%</u>	<u>62.36%</u>	<u>NA</u>
All Sources	NA	100.00%	NA	100.00%	100.00%	NA

Houston CMSA Inventory A
Emission Inventory Summary - Air Toxics and SOx

Equipment Category	tpy					
	PM	Aldehydes	Benzene	1,3 But	Gas Vap	SOx
Lawn & Garden	288	156	487	200	2,118	142
Airport Service	326	14	12	6	7	181
Recreational	10	6	26	11	43	2
Recreational Manne	29	30	390	168	1,779	85
Light Commercial	173	58	125	50	733	139
Industrial	321	64	41	18	106	201
Construction	4,847	713	154	79	159	3,370
Agricultural	638	102	23	12	20	266
Logging	35	5	2	1	5	21
<u>Marine Vessels</u>	<u>731</u>	<u>0</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>5,075</u>
Nonroad Engines and Vehicles	7,398	1,149	1,259	545	4,971	9,483
Highway Vehicles	0	0	—	—	—	0
<u>Other Area and Point Sources</u>	<u>0</u>	<u>0</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>0</u>
All Sources	NA	NA	NA	NA	NA	NA

Houston CMSA Inventory A
Emission Inventory Summary - Air Toxics and SOx
Percent of Total Inventory

Equipment Category	% total tpy					
	PM	Aldehydes	Benzene	1,3 But	Gas Vap	SOx
Lawn & Garden	NA	NA	NA	NA	NA	NA
Airport Service	NA	NA	NA	NA	NA	NA
Recreational	NA	NA	NA	NA	NA	NA
Recreational Manne	NA	NA	NA	NA	NA	NA
Light Commercial	NA	NA	NA	NA	NA	NA
Industrial	NA	NA	NA	NA	NA	NA
Construction	NA	NA	NA	NA	NA	NA
Agricultural	NA	NA	NA	NA	NA	NA
Logging	NA	NA	NA	NA	NA	NA
<u>Marine Vessels</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>
Nonroad Engines and Vehicles	NA	NA	NA	NA	NA	NA
Highway Vehicles	NA	NA	NA	NA	NA	NA
<u>Other Area and Point Sources</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>
All Sources	NA	NA	NA	NA	NA	NA

Miami CMSA Inventory A
Emission Inventory Summary - VOC, NOx, CO
Percent of Total Inventory

Equipment Category	% total tpy			% total tpsd		% total tpwd CO
	VOC	NOx	CO	VOC	NOx	
Lawn & Garden	NA	0.40%	NA	5.22%	0.50%	NA
Airport Service	NA	1.06%	NA	0.08%	0.97%	NA
Recreational	NA	0.02%	NA	0.38%	0.02%	NA
Recreational Manne	NA	0.72%	NA	7.70%	1.28%	NA
Light Commercial	NA	0.32%	NA	0.66%	0.29%	NA
Industrial	NA	1.49%	NA	0.35%	1.37%	NA
Construction	NA	9.94%	NA	0.89%	12.09%	NA
Agricultural	NA	0.72%	NA	0.11%	0.90%	NA
Logging	NA	0.00%	NA	0.00%	0.00%	NA
<u>Marine Vessels</u>	<u>NA</u>	<u>1.12%</u>	<u>NA</u>	<u>0.00%</u>	<u>0.00%</u>	<u>NA</u>
Nonroad Engines and Vehicles	NA	15.77%	NA	15.38%	17.42%	NA
Highway Vehicles	NA	53.97%	NA	47.91%	54.70%	NA
<u>Other Area and Point Sources</u>	<u>NA</u>	<u>30.25%</u>	<u>NA</u>	<u>36.70%</u>	<u>27.88%</u>	<u>NA</u>
All Sources	NA	100.00%	NA	100.00%	100.00%	NA

Miami CMSA Inventory A
Emission Inventory Summary - VOC, NOx, CO

Equipment Category	tpy			tpsd		tpwd CO
	VOC	NOx	CO	VOC	NOx	
Lawn & Garden	9,223	464	57,538	33	2	43
Airport Service	176	1,239	1,501	0	3	4
Recreational	638	19	2,414	2	0	4
Recreational Manne	9,569	845	19,868	49	4	15
Light Commercial	1,508	369	19,885	4	1	54
Industrial	798	1,744	13,101	2	5	36
Construction	1,572	11,655	9,511	6	42	21
Agricultural	195	842	1,274	1	3	1
Logging	0	0	0	0	0	0
<u>Manne Vessels</u>	<u>0</u>	<u>1,310</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>
Nonroad Engines and Vehicles	23,679	18,487	125,092	99	61	179
Highway Vehicles	0	63,266	0	307	191	0
<u>Other Area and Point Sources</u>	<u>0</u>	<u>35,464</u>	<u>0</u>	<u>235</u>	<u>97</u>	<u>0</u>
All Sources	NA	117,217	NA	640	349	NA

Miami CMSA Inventory A
Emission Inventory Summary - Air Toxics and SOx
Percent of Total Inventory

Equipment Category	% total tpy					
	PM	Aldehydes	Benzene	1,3 But	Gas Vap	SOx
Lawn & Garden	NA	NA	NA	NA	NA	NA
Airport Service	NA	NA	NA	NA	NA	NA
Recreational	NA	NA	NA	NA	NA	NA
Recreational Marine	NA	NA	NA	NA	NA	NA
Light Commercial	NA	NA	NA	NA	NA	NA
Industrial	NA	NA	NA	NA	NA	NA
Construction	NA	NA	NA	NA	NA	NA
Agricultural	NA	NA	NA	NA	NA	NA
Logging	NA	NA	NA	NA	NA	NA
<u>Marine Vessels</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>
Nonroad Engines and Vehicles	NA	NA	NA	NA	NA	NA
Highway Vehicles	NA	NA	NA	NA	NA	NA
<u>Other Area and Point Sources</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>
All Sources	NA	NA	NA	NA	NA	NA

Miami CMSA Inventory A
Emission Inventory Summary - Air Toxics and SOx

Equipment Category	tpy					
	PM	Aldehydes	Benzene	1,3 But	Gas Vap	SOx
Lawn & Garden	151	83	257	106	1 104	76
Airport Service	148	6	5	3	3	82
Recreational	7	4	18	8	29	2
Recreational Marine	24	25	251	108	1,265	61
Light Commercial	56	19	41	17	247	45
Industrial	178	35	23	10	61	111
Construction	1,453	213	46	24	48	1,014
Agricultural	162	26	6	3	5	67
Logging	0	0	0	0	0	0
<u>Marine Vessels</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>
Nonroad Engines and Vehicles	2,177	411	647	277	2,763	1,458
Highway Vehicles	0	0				0
<u>Other Area and Point Sources</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>
All Sources	NA	NA	NA	NA	NA	NA

Milwaukee CMSA Inventory A
Emission Inventory Summary - VOC, NOx, CO

Equipment Category	tpy			tpsd		tpwd CO
	VOC	NOx	CO	VOC	NOx	
Lawn & Garden	2,403	115	13,839	12	1	5
Airport Service	168	1,182	1,435	0	3	4
Recreational	751	13	1,358	1	0	11
Recreational Marine	4,390	163	7,869	31	1	0
Light Commercial	737	154	8,935	2	0	24
Industrial	729	1,604	12,094	2	4	33
Construction	559	4,171	3,333	3	20	4
Agricultural	377	1,640	2,305	2	9	2
Logging	0	0	0	0	0	0
Marine Vessels	0	398	0	0	1	0
Nonroad Engines and Vehicles	10,113	9,441	51,167	54	40	83
Highway Vehicles	0	33,493	0	106	101	0
<u>Other Area and Point Sources</u>	<u>0</u>	<u>39,621</u>	<u>0</u>	<u>195</u>	<u>109</u>	<u>0</u>
All Sources	NA	82,555	NA	354	249	NA

Milwaukee CMSA Inventory A
Emission Inventory Summary - VOC, NOx, CO
Percent of Total Inventory

Equipment Category	% total tpy			% total tpsd		% total tpwd CO
	VOC	NOx	CO	VOC	NOx	
Lawn & Garden	NA	0.14%	NA	3.47%	0.25%	NA
Airport Service	NA	1.43%	NA	0.13%	1.30%	NA
Recreational	NA	0.02%	NA	0.16%	0.01%	NA
Recreational Marine	NA	0.20%	NA	8.88%	0.50%	NA
Light Commercial	NA	0.19%	NA	0.58%	0.17%	NA
Industrial	NA	1.94%	NA	0.58%	1.76%	NA
Construction	NA	5.05%	NA	0.74%	7.89%	NA
Agricultural	NA	1.99%	NA	0.58%	3.61%	NA
Logging	NA	0.00%	NA	0.00%	0.00%	NA
Marine Vessels	NA	0.48%	NA	0.00%	0.44%	NA
Nonroad Engines and Vehicles	NA	11.44%	NA	15.12%	15.93%	NA
Highway Vehicles	NA	40.57%	NA	29.84%	40.51%	NA
<u>Other Area and Point Sources</u>	<u>NA</u>	<u>47.99%</u>	<u>NA</u>	<u>55.04%</u>	<u>43.56%</u>	<u>NA</u>
All Sources	NA	100.00%	NA	100.00%	100.00%	NA

Milwaukee CMSA Inventory A
Emission Inventory Summary - Air Toxics and SOx

Equipment Category	tpy					
	PM	Aldehydes	Benzene	1,3 But.	Gas Vap.	SOx
Lawn & Garden	38	20	64	26	378	19
Airport Service	141	6	5	3	3	78
Recreational	28	3	22	10	20	1
Recreational Marine	4	5	111	48	715	19
Light Commercial	27	9	20	8	107	19
Industrial	163	32	21	9	59	102
Construction	527	77	16	8	19	362
Agricultural	316	50	11	6	15	130
Logging	0	0	0	0	0	0
<u>Marine Vessels</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>
Nonroad Engines and Vehicles	1,243	202	270	118	1,317	732
Highway Vehicles	0	0				0
<u>Other Area and Point Sources</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>
All Sources	NA	NA	NA	NA	NA	NA

Milwaukee CMSA Inventory A
Emission Inventory Summary - Air Toxics and SOx
Percent of Total Inventory

Equipment Category	% total tpy					
	PM	Aldehydes	Benzene	1,3 But.	Gas Vap	SOx
Lawn & Garden	NA	NA	NA	NA	NA	NA
Airport Service	NA	NA	NA	NA	NA	NA
Recreational	NA	NA	NA	NA	NA	NA
Recreational Marine	NA	NA	NA	NA	NA	NA
Light Commercial	NA	NA	NA	NA	NA	NA
Industrial	NA	NA	NA	NA	NA	NA
Construction	NA	NA	NA	NA	NA	NA
Agricultural	NA	NA	NA	NA	NA	NA
Logging	NA	NA	NA	NA	NA	NA
<u>Marine Vessels</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>
Nonroad Engines and Vehicles	NA	NA	NA	NA	NA	NA
Highway Vehicles	NA	NA	NA	NA	NA	NA
<u>Other Area and Point Sources</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>
All Sources	NA	NA	NA	NA	NA	NA

Minneapolis MSA Inventory A
Emission Inventory Summary - VOC, NOx, CO

Equipment Category	tpy			tpsd		tpwd CO
	VOC	NOx	CO	VOC	NOx	
Lawn & Garden	3,633	174	20,918	19	1	8
Airport Service	259	1,825	2,219	1	5	6
Recreational	1,102	19	1,993	1	0	16
Recreational Marine	19,584	601	35,659	142	5	0
Light Commercial	1,352	283	16,396	4	1	45
Industrial	1,137	2,503	18,867	3	7	52
Construction	1,208	9,014	7,203	6	42	8
Agricultural	1,073	4,663	6,552	6	26	4
Logging	0	0	0	0	0	0
<u>Marine Vessels</u>	<u>0</u>	<u>0</u>	<u>28</u>	<u>0</u>	<u>0</u>	<u>0</u>
Nonroad Engines and Vehicles	29,348	19,081	109,834	181	86	139
Highway Vehicles	0	0	419,140	0	0	2,422
<u>Other Area and Point Sources</u>	<u>0</u>	<u>63,307</u>	<u>125,911</u>	<u>0</u>	<u>173</u>	<u>357</u>
All Sources	NA	NA	654,885	NA	NA	2,917

Minneapolis MSA Inventory A
Emission Inventory Summary - VOC, NOx, CO
Percent of Total Inventory

Equipment Category	% total tpy			% total tpsd		% total tpwd CO
	VOC	NOx	CO	VOC	NOx	
Lawn & Garden	NA	NA	3.19%	NA	NA	0.26%
Airport Service	NA	NA	0.34%	NA	NA	0.21%
Recreational	NA	NA	0.30%	NA	NA	0.55%
Recreational Marine	NA	NA	5.45%	NA	NA	0.00%
Light Commercial	NA	NA	2.50%	NA	NA	1.54%
Industrial	NA	NA	2.88%	NA	NA	1.77%
Construction	NA	NA	1.10%	NA	NA	0.27%
Agricultural	NA	NA	1.00%	NA	NA	0.15%
Logging	NA	NA	0.00%	NA	NA	0.00%
<u>Marine Vessels</u>	<u>NA</u>	<u>NA</u>	<u>0.00%</u>	<u>NA</u>	<u>NA</u>	<u>0.00%</u>
Nonroad Engines and Vehicles	NA	NA	16.77%	NA	NA	4.75%
Highway Vehicles	NA	NA	64.00%	NA	NA	83.02%
<u>Other Area and Point Sources</u>	<u>NA</u>	<u>NA</u>	<u>19.23%</u>	<u>NA</u>	<u>NA</u>	<u>12.23%</u>
All Sources	NA	NA	100.00%	NA	NA	100.00%

Minneapolis MSA Inventory A
Emission Inventory Summary - Air Toxics and SOx

Equipment Category	PM	Aldehydes	Benzene	tpy 1,3 But	Gas Vap	SOx
Lawn & Garden	57	30	97	40	572	28
Airport Service	217	9	8	4	5	121
Recreational	42	4	32	14	29	2
Recreational Marine	15	16	511	221	2,617	84
Light Commercial	49	17	38	15	197	35
Industrial	254	51	32	14	92	160
Construction	1,138	166	35	18	41	783
Agricultural	897	143	31	16	43	371
Logging	0	0	0	0	0	0
<u>Marine Vessels</u>	<u>8</u>	<u>0</u>				<u>0</u>
Nonroad Engines and Vehicles	2,678	437	784	342	3,595	1,584
Highway Vehicles	42,282	0				0
<u>Other Area and Point Sources</u>	<u>214,398</u>	<u>0</u>				<u>0</u>
All Sources	259,358	NA	NA	NA	NA	NA

Minneapolis MSA Inventory A
Emission Inventory Summary - Air Toxics and SOx
Percent of Total Inventory

Equipment Category	PM	Aldehydes	Benzene	% total tpy 1,3 But.	Gas Vap	SOx
Lawn & Garden	0.02%	NA	NA	NA	NA	NA
Airport Service	0.08%	NA	NA	NA	NA	NA
Recreational	0.02%	NA	NA	NA	NA	NA
Recreational Marine	0.01%	NA	NA	NA	NA	NA
Light Commercial	0.02%	NA	NA	NA	NA	NA
Industrial	0.10%	NA	NA	NA	NA	NA
Construction	0.44%	NA	NA	NA	NA	NA
Agricultural	0.35%	NA	NA	NA	NA	NA
Logging	0.00%	NA	NA	NA	NA	NA
<u>Marine Vessels</u>	<u>0.00%</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>
Nonroad Engines and Vehicles	1.03%	NA	NA	NA	NA	NA
Highway Vehicles	16.30%	NA	NA	NA	NA	NA
<u>Other Area and Point Sources</u>	<u>82.66%</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>
All Sources	100.00%	NA	NA	NA	NA	NA

New York NECMA Inventory A
Emission Inventory Summary - VOC, NOx, CO

Equipment Category	tpy			tpsd		tpwd
	VOC	NOx	CO	VOC	NOx	CO
Lawn & Garden	26,226	1,263	151,614	134	7	56
Airport Service	542	3,818	4,634	1	10	13
Recreational	5,553	95	10,046	4	0	82
Recreational Marine	31,113	2,459	53,971	205	18	6
Light Commercial	11,578	2,425	140,558	32	7	385
Industrial	6,634	14,638	110,185	19	40	302
Construction	7,571	56,517	45,182	36	266	50
Agricultural	670	2,913	4,100	4	16	3
Logging	0	0	0	0	0	0
<u>Marine Vessels</u>	<u>789</u>	<u>12,991</u>	<u>2,458</u>	<u>2</u>	<u>36</u>	<u>7</u>
Nonroad Engines and Vehicles	90,675	97,120	522,747	437	400	902
Highway Vehicles	0	317,257	3,129,400	1,114	956	7,373
<u>Other Area and Point Sources</u>	<u>0</u>	<u>232,882</u>	<u>546,500</u>	<u>1,578</u>	<u>638</u>	<u>804</u>
All Sources	NA	647,259	4,198,647	3,129	1,995	9,080

New York NECMA Inventory A
Emission Inventory Summary - VOC, NOx, CO
Percent of Total Inventory

Equipment Category	% total tpy			% total tpsd		% total tpwd
	VOC	NOx	CO	VOC	NOx	CO
Lawn & Garden	NA	0.20%	3.61%	4.29%	0.34%	0.62%
Airport Service	NA	0.59%	0.11%	0.05%	0.52%	0.14%
Recreational	NA	0.01%	0.24%	0.12%	0.01%	0.90%
Recreational Marine	NA	0.38%	1.29%	6.56%	0.92%	0.07%
Light Commercial	NA	0.37%	3.35%	1.03%	0.33%	4.24%
Industrial	NA	2.26%	2.62%	0.59%	2.01%	3.32%
Construction	NA	8.73%	1.08%	1.14%	13.35%	0.55%
Agricultural	NA	0.45%	0.10%	0.12%	0.80%	0.03%
Logging	NA	0.00%	0.00%	0.00%	0.00%	0.00%
<u>Marine Vessels</u>	<u>NA</u>	<u>2.01%</u>	<u>0.06%</u>	<u>0.07%</u>	<u>1.78%</u>	<u>0.07%</u>
Nonroad Engines and Vehicles	NA	15.00%	12.45%	13.97%	20.07%	9.94%
Highway Vehicles	NA	49.02%	74.53%	35.60%	47.94%	81.21%
<u>Other Area and Point Sources</u>	<u>NA</u>	<u>35.98%</u>	<u>13.02%</u>	<u>50.43%</u>	<u>31.99%</u>	<u>8.85%</u>
All Sources	NA	100.00%	100.00%	100.00%	100.00%	100.00%

New York NECMA Inventory A
Emission Inventory Summary - Air Toxics and SOx

Equipment Category	tpy					
	PM	Aldehydes	Benzene	1,3 But	Gas Vap	SOx
Lawn & Garden	413	220	700	289	4,054	207
Airport Service	455	19	16	8	11	252
Recreational	210	22	163	70	143	8
Recreational Marine	70	72	670	289	8,910	170
Light Commercial	417	142	322	129	1,677	297
Industrial	1,486	296	188	83	526	934
Construction	7,135	1,041	222	114	252	4,912
Agricultural	560	90	19	10	26	232
Logging	0	0	0	0	0	0
<u>Marine Vessels</u>	<u>620</u>	<u>0</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>4,240</u>
Nonroad Engines and Vehicles	11,366	1,902	2,300	993	15,599	11,252
Highway Vehicles	232,769	0	—	—	—	0
<u>Other Area and Point Sources</u>	<u>119,873</u>	<u>0</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>0</u>
All Sources	364,008	NA	NA	NA	NA	NA

New York NECMA Inventory A
Emission Inventory Summary - Air Toxics and SOx
Percent of Total Inventory

Equipment Category	% total tpy					
	PM	Aldehydes	Benzene	1,3 But	Gas Vap	SOx
Lawn & Garden	0.11%	NA	NA	NA	NA	NA
Airport Service	0.12%	NA	NA	NA	NA	NA
Recreational	0.06%	NA	NA	NA	NA	NA
Recreational Marine	0.02%	NA	NA	NA	NA	NA
Light Commercial	0.11%	NA	NA	NA	NA	NA
Industrial	0.41%	NA	NA	NA	NA	NA
Construction	1.96%	NA	NA	NA	NA	NA
Agricultural	0.15%	NA	NA	NA	NA	NA
Logging	0.00%	NA	NA	NA	NA	NA
<u>Marine Vessels</u>	<u>0.17%</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>
Nonroad Engines and Vehicles	3.12%	NA	NA	NA	NA	NA
Highway Vehicles	63.95%	NA	NA	NA	NA	NA
<u>Other Area and Point Sources</u>	<u>32.93%</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>
All Sources	100.00%	NA	NA	NA	NA	NA

Philadelphia MSA Inventory A
Emission Inventory Summary - VOC, NOx, CO

Equipment Category	tpy			tpsd		tpwd
	VOC	NOx	CO	VOC	NOx	CO
Lawn & Garden	16,244	799	98,331	66	3	60
Airport Service	275	1,936	2,352	1	5	6
Recreational	1,395	26	2,822	2	0	19
Recreational Manne	11,744	895	23,064	70	6	5
Light Commercial	2,892	653	36,509	8	2	100
Industrial	2,119	4,651	34,973	6	13	96
Construction	2,757	20,499	16,585	11	85	27
Agricultural	943	4,087	6,018	4	18	4
Logging	0	0	0	0	0	0
<u>Marine Vessels</u>	<u>494</u>	<u>9,181</u>	<u>1,377</u>	<u>1</u>	<u>25</u>	<u>4</u>
Nonroad Engines and Vehicles	38,863	42,728	222,032	169	157	322
Highway Vehicles	0	123,720	568,888	432	373	0
<u>Other Area and Point Sources</u>	<u>0</u>	<u>137,579</u>	<u>178,772</u>	<u>911</u>	<u>377</u>	<u>0</u>
All Sources	NA	304,027	969,692	1,511	907	NA

Philadelphia MSA Inventory A
Emission Inventory Summary - VOC, NOx, CO
Percent of Total Inventory

Equipment Category	% total tpy			% total tpsd		% total tpwd
	VOC	NOx	CO	VOC	NOx	CO
Lawn & Garden	NA	0.26%	10.14%	4.35%	0.38%	NA
Airport Service	NA	0.64%	0.24%	0.05%	0.58%	NA
Recreational	NA	0.01%	0.29%	0.10%	0.00%	NA
Recreational Manne	NA	0.29%	2.38%	4.63%	0.62%	NA
Light Commercial	NA	0.21%	3.77%	0.53%	0.20%	NA
Industrial	NA	1.53%	3.61%	0.39%	1.40%	NA
Construction	NA	6.74%	1.71%	0.76%	9.41%	NA
Agricultural	NA	1.34%	0.62%	0.27%	1.97%	NA
Logging	NA	0.00%	0.00%	0.00%	0.00%	NA
<u>Marine Vessels</u>	<u>NA</u>	<u>3.02%</u>	<u>0.14%</u>	<u>0.09%</u>	<u>2.77%</u>	<u>NA</u>
Nonroad Engines and Vehicles	NA	14.05%	22.90%	11.18%	17.35%	NA
Highway Vehicles	NA	40.69%	58.67%	28.55%	41.10%	NA
<u>Other Area and Point Sources</u>	<u>NA</u>	<u>45.25%</u>	<u>18.44%</u>	<u>60.27%</u>	<u>41.55%</u>	<u>NA</u>
All Sources	NA	100.00%	100.00%	100.00%	100.00%	NA

Philadelphia MSA Inventory A
Emission Inventory Summary - Air Toxics and SOx

Equipment Category	tpy					
	PM	Aldehydes	Benzene	1,3 But	Gas Vap	SOx
Lawn & Garden	263	142	445	183	2,161	131
Airport Service	230	10	8	4	5	128
Recreational	49	6	41	18	43	2
Recreational Marine	25	26	297	128	1,910	68
Light Commercial	106	36	80	32	444	79
Industrial	473	94	60	27	164	297
Construction	2,569	376	81	42	87	1,783
Agricultural	786	126	28	14	30	326
Logging	0	0	0	0	0	0
<u>Marine Vessels</u>	<u>553</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>4,366</u>
Nonroad Engines and Vehicles	5,053	816	1,039	447	4,845	7,182
Highway Vehicles	0	0	0	0	0	0
<u>Other Area and Point Sources</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>
All Sources	NA	NA	NA	NA	NA	NA

Philadelphia MSA Inventory A
Emission Inventory Summary - Air Toxics and SOx
Percent of Total Inventory

Equipment Category	% total tpy					
	PM	Aldehydes	Benzene	1,3 But	Gas Vap	SOx
Lawn & Garden	NA	NA	NA	NA	NA	NA
Airport Service	NA	NA	NA	NA	NA	NA
Recreational	NA	NA	NA	NA	NA	NA
Recreational Marine	NA	NA	NA	NA	NA	NA
Light Commercial	NA	NA	NA	NA	NA	NA
Industrial	NA	NA	NA	NA	NA	NA
Construction	NA	NA	NA	NA	NA	NA
Agricultural	NA	NA	NA	NA	NA	NA
Logging	NA	NA	NA	NA	NA	NA
<u>Marine Vessels</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>
Nonroad Engines and Vehicles	NA	NA	NA	NA	NA	NA
Highway Vehicles	NA	NA	NA	NA	NA	NA
<u>Other Area and Point Sources</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>
All Sources	NA	NA	NA	NA	NA	NA

Provo-Orem MSA Inventory A
Emission Inventory Summary - VOC, NOx, CO

Equipment Category	tpy			tpsd		tpwd CO
	VOC	NOx	CO	VOC	NOx	
Lawn & Garden	960	46	5,609	5	0	1
Airport Service	0	0	0	0	0	0
Recreational	395	7	751	0	0	6
Recreational Manne	73	9	135	0	0	0
Light Commercial	76	17	952	0	0	3
Industrial	58	127	959	0	0	3
Construction	82	612	495	0	3	1
Agnrcultural	114	493	721	1	3	0
Logging	0	0	0	0	0	0
<u>Marine Vessels</u>	<u>0</u>	<u>0</u>	<u>315</u>	<u>0</u>	<u>0</u>	<u>0</u>
Nonroad Engines and Vehicles	1,757	1,312	9,937	7	6	13
Highway Vehicles	0	0	73,804	0	0	440
<u>Other Area and Point Sources</u>	<u>0</u>	<u>0</u>	<u>38,273</u>	<u>0</u>	<u>0</u>	<u>38</u>
All Sources	NA	NA	122,014	NA	NA	492

Provo-Orem MSA Inventory A
Emission Inventory Summary - VOC, NOx, CO
Percent of Total Inventory

Equipment Category	% total tpy			% total tpsd		% total tpwd CO
	VOC	NOx	CO	VOC	NOx	
Lawn & Garden	NA	NA	4.60%	NA	NA	0.28%
Airport Service	NA	NA	0.00%	NA	NA	0.00%
Recreational	NA	NA	0.62%	NA	NA	1.12%
Recreational Manne	NA	NA	0.11%	NA	NA	0.00%
Light Commercial	NA	NA	0.78%	NA	NA	0.53%
Industrial	NA	NA	0.79%	NA	NA	0.53%
Construction	NA	NA	0.41%	NA	NA	0.11%
Agnrcultural	NA	NA	0.59%	NA	NA	0.10%
Logging	NA	NA	0.00%	NA	NA	0.00%
<u>Marine Vessels</u>	<u>NA</u>	<u>NA</u>	<u>0.26%</u>	<u>NA</u>	<u>NA</u>	<u>0.00%</u>
Nonroad Engines and Vehicles	NA	NA	8.14%	NA	NA	2.68%
Highway Vehicles	NA	NA	60.49%	NA	NA	89.52%
<u>Other Area and Point Sources</u>	<u>NA</u>	<u>NA</u>	<u>31.37%</u>	<u>NA</u>	<u>NA</u>	<u>7.80%</u>
All Sources	NA	NA	100.00%	NA	NA	100.00%

Provo-Orem MSA Inventory A
Emission Inventory Summary - Air Toxics and SOx

Equipment Category	tpy					
	PM	Aldehydes	Benzene	1,3 But	Gas Vap	SOx
Lawn & Garden	15	8	26	11	135	8
Airport Service	0	0	0	0	0	0
Recreational	14	2	12	5	11	1
Recreational Marine	0	0	1	1	23	0
Light Commercial	3	1	2	1	12	2
Industrial	13	3	2	1	5	8
Construction	77	11	2	1	3	53
Agricultural	95	15	3	2	4	39
Logging	0	0	0	0	0	0
<u>Marine Vessels</u>	<u>0</u>	<u>0</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>0</u>
Nonroad Engines and Vehicles	217	40	49	21	192	111
Highway Vehicles	3,668	0	—	—	—	0
<u>Other Area and Point Sources</u>	<u>45,615</u>	<u>0</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>0</u>
All Sources	49,500	NA	NA	NA	NA	NA

Provo-Orem MSA Inventory A
Emission Inventory Summary - Air Toxics and SOx
Percent of Total Inventory

Equipment Category	% total tpy					
	PM	Aldehydes	Benzene	1,3 But	Gas Vap	SOx
Lawn & Garden	0.03%	NA	NA	NA	NA	NA
Airport Service	0.00%	NA	NA	NA	NA	NA
Recreational	0.03%	NA	NA	NA	NA	NA
Recreational Marine	0.00%	NA	NA	NA	NA	NA
Light Commercial	0.01%	NA	NA	NA	NA	NA
Industrial	0.03%	NA	NA	NA	NA	NA
Construction	0.15%	NA	NA	NA	NA	NA
Agricultural	0.19%	NA	NA	NA	NA	NA
Logging	0.00%	NA	NA	NA	NA	NA
<u>Marine Vessels</u>	<u>0.00%</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>
Nonroad Engines and Vehicles	0.44%	NA	NA	NA	NA	NA
Highway Vehicles	7.41%	NA	NA	NA	NA	NA
<u>Other Area and Point Sources</u>	<u>92.15%</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>
All Sources	100.00%	NA	NA	NA	NA	NA

Saint Louis MSA Inventory A
Emission Inventory Summary - VOC, NOx, CO

Equipment Category	tpy			tpsd		tpwd
	VOC	NOx	CO	VOC	NOx	CO
Lawn & Garden	4,121	197	23,730	21	1	9
Airport Service	188	1,321	1,607	1	4	4
Recreational	984	17	1,780	1	0	14
Recreational Marine	4,921	206	8,821	35	2	0
Light Commercial	1,195	250	14,492	3	1	40
Industrial	1,094	2,409	18,162	3	7	50
Construction	1,300	9,703	7,754	6	46	8
Agricultural	887	3,855	5,417	5	21	4
Logging	0	0	0	0	0	0
<u>Marine Vessels</u>	<u>0</u>	<u>1,820</u>	<u>0</u>	<u>0</u>	<u>5</u>	<u>0</u>
Nonroad Engines and Vehicles	14,691	19,779	81,763	75	85	129
Highway Vehicles	0	62,039	0	208	187	1,710
<u>Other Area and Point Sources</u>	<u>0</u>	<u>158,510</u>	<u>0</u>	<u>360</u>	<u>434</u>	<u>441</u>
All Sources	NA	240,328	NA	643	707	2 280

Saint Louis MSA Inventory A
Emission Inventory Summary - VOC, NOx, CO
Percent of Total Inventory

Equipment Category	% total tpy			% total tpsd		% total tpwd
	VOC	NOx	CO	VOC	NOx	CO
Lawn & Garden	NA	0 08%	NA	3 28%	0 15%	0 38%
Airport Service	NA	0 55%	NA	0 08%	0 51%	0 19%
Recreational	NA	0 01%	NA	0 11%	0 00%	0 63%
Recreational Marine	NA	0 09%	NA	5 47%	0 22%	0 00%
Light Commercial	NA	0 10%	NA	0 52%	0 10%	1 74%
Industrial	NA	1 00%	NA	0 48%	0 93%	2 18%
Construction	NA	4 04%	NA	0 95%	6 47%	0 37%
Agricultural	NA	1 60%	NA	0 75%	2 99%	0 16%
Logging	NA	0 00%	NA	0 00%	0 00%	0 00%
<u>Marine Vessels</u>	<u>NA</u>	<u>0 76%</u>	<u>NA</u>	<u>0 00%</u>	<u>0 71%</u>	<u>0 00%</u>
Nonroad Engines and Vehicles	NA	8 23%	NA	11 64%	12 09%	5 66%
Highway Vehicles	NA	25 81%	NA	32 33%	26 46%	74 99%
<u>Other Area and Point Sources</u>	<u>NA</u>	<u>65 96%</u>	<u>NA</u>	<u>56 03%</u>	<u>61 46%</u>	<u>19 35%</u>
All Sources	NA	100 00%	NA	100 00%	100 00%	100 00%

Saint Louis MSA Inventory A
Emission Inventory Summary - Air Toxics and SOx

Equipment Category	tpy					
	PM	Aldehydes	Benzene	1,3 But.	Gas Vap	SOx
Lawn & Garden	65	34	110	45	649	32
Airport Service	157	7	6	3	4	87
Recreational	37	4	29	12	26	1
Recreational Marine	6	6	123	53	853	22
Light Commercial	43	15	33	13	174	31
Industrial	244	49	31	14	88	154
Construction	1,226	179	38	20	44	843
Agricultural	742	118	26	13	35	307
Logging	0	0	0	0	0	0
<u>Marine Vessels</u>	<u>184</u>	<u>0</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>0</u>
Nonroad Engines and Vehicles	2,704	411	394	173	1,874	1,478
Highway Vehicles	38,099	0	—	—	—	0
<u>Other Area and Point Sources</u>	<u>89,636</u>	<u>0</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>0</u>
All Sources	130,439	NA	NA	NA	NA	NA

Saint Louis MSA Inventory A
Emission Inventory Summary - Air Toxics and SOx
Percent of Total Inventory

Equipment Category	% total tpy					
	PM	Aldehydes	Benzene	1,3 But.	Gas Vap	SOx
Lawn & Garden	0.05%	NA	NA	NA	NA	NA
Airport Service	0.12%	NA	NA	NA	NA	NA
Recreational	0.03%	NA	NA	NA	NA	NA
Recreational Marine	0.00%	NA	NA	NA	NA	NA
Light Commercial	0.03%	NA	NA	NA	NA	NA
Industrial	0.19%	NA	NA	NA	NA	NA
Construction	0.94%	NA	NA	NA	NA	NA
Agricultural	0.57%	NA	NA	NA	NA	NA
Logging	0.00%	NA	NA	NA	NA	NA
<u>Marine Vessels</u>	<u>0.14%</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>
Nonroad Engines and Vehicles	2.07%	NA	NA	NA	NA	NA
Highway Vehicles	29.21%	NA	NA	NA	NA	NA
<u>Other Area and Point Sources</u>	<u>68.72%</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>
All Sources	100.00%	NA	NA	NA	NA	NA

San Diego AB Inventory A
Emission Inventory Summary - VOC, NOx, CO

Equipment Category	tpy			tpsd		tpwd CO
	VOC	NOx	CO	VOC	NOx	
Lawn & Garden	11,329	556	70,261	41	2	53
Airport Service	204	1,439	1,750	1	4	5
Recreational	1,116	33	4,181	5	0	6
Recreational Manne	5,027	841	10,859	25	4	8
Light Commercial	942	238	12,505	3	1	34
Industrial	653	1,430	10,721	2	4	29
Construction	1,952	14,383	11,868	7	52	26
Agricultural	304	1,311	2,008	1	5	1
Logging	0	0	0	0	0	0
<u>Marine Vessels</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>3</u>	<u>41</u>	<u>7</u>
Nonroad Engines and Vehicles	21,526	20,231	124,153	87	113	169
Highway Vehicles	0	47,136	570,100	130	142	1 343
<u>Other Area and Point Sources</u>	<u>0</u>	<u>0</u>	<u>94,000</u>	<u>271</u>	<u>34</u>	<u>154</u>
All Sources	NA	NA	788,253	487	289	1 666

San Diego AB Inventory A
Emission Inventory Summary - VOC, NOx, CO
Percent of Total Inventory

Equipment Category	% total tpy			% total tpsd		% total tpwd CO
	VOC	NOx	CO	VOC	NOx	
Lawn & Garden	NA	NA	8 91%	8 43%	0 72%	3 15%
Airport Service	NA	NA	0 22%	0 12%	1 36%	0 29%
Recreational	NA	NA	0 53%	0 93%	0 05%	0 36%
Recreational Manne	NA	NA	1 38%	5 19%	1 53%	0 50%
Light Commercial	NA	NA	1 59%	0 54%	0 22%	2 06%
Industrial	NA	NA	1 36%	0 37%	1 35%	1 76%
Construction	NA	NA	1 51%	1 45%	17 98%	1 56%
Agricultural	NA	NA	0 25%	0 23%	1 69%	0 08%
Logging	NA	NA	0 00%	0 00%	0 00%	0 00%
<u>Marine Vessels</u>	<u>NA</u>	<u>NA</u>	<u>0 00%</u>	<u>0 51%</u>	<u>14 21%</u>	<u>0 41%</u>
Nonroad Engines and Vehicles	NA	NA	15 75%	17 78%	39 11%	10 16%
Highway Vehicles	NA	NA	72 32%	26 61%	49 10%	80 62%
<u>Other Area and Point Sources</u>	<u>NA</u>	<u>NA</u>	<u>11 93%</u>	<u>55 61%</u>	<u>11 79%</u>	<u>9 22%</u>
All Sources	NA	NA	100 00%	100 00%	100 00%	100 00%

San Diego AB Inventory A
Emission Inventory Summary - Air Toxics and SOx

Equipment Category	tpy					
	PM	Aldehydes	Benzene	1,3 But.	Gas Vap	SOx
Lawn & Garden	186	101	315	129	1,377	92
Airport Service	171	7	6	3	4	95
Recreational	12	7	32	14	53	3
Recreational Manne	24	25	112	48	1,342	44
Light Commercial	36	12	26	10	152	29
Industrial	146	29	19	8	49	91
Construction	1,801	265	57	29	59	1,252
Agricultural	252	40	9	5	8	105
Logging	0	0	0	0	0	0
<u>Marine Vessels</u>	<u>854</u>	<u>0</u>				<u>6,979</u>
Nonroad Engines and Vehicles	3,483	487	575	247	3,045	8,690
Highway Vehicles	6,935	0				2,409
<u>Other Area and Point Sources</u>	<u>179,215</u>	<u>0</u>				<u>3,723</u>
All Sources	189,633	NA	NA	NA	NA	14,822

San Diego AB Inventory A
Emission Inventory Summary - Air Toxics and SOx
Percent of Total Inventory

Equipment Category	% total tpy					
	PM	Aldehydes	Benzene	1,3 But	Gas Vap	SOx
Lawn & Garden	0.10%	NA	NA	NA	NA	0.62%
Airport Service	0.09%	NA	NA	NA	NA	0.64%
Recreational	0.01%	NA	NA	NA	NA	0.02%
Recreational Manne	0.01%	NA	NA	NA	NA	0.30%
Light Commercial	0.02%	NA	NA	NA	NA	0.19%
Industrial	0.08%	NA	NA	NA	NA	0.62%
Construction	0.95%	NA	NA	NA	NA	8.45%
Agricultural	0.13%	NA	NA	NA	NA	0.71%
Logging	0.00%	NA	NA	NA	NA	0.00%
<u>Marine Vessels</u>	<u>0.45%</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>47.09%</u>
Nonroad Engines and Vehicles	1.84%	NA	NA	NA	NA	58.63%
Highway Vehicles	3.66%	NA	NA	NA	NA	16.25%
<u>Other Area and Point Sources</u>	<u>94.51%</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>25.12%</u>
All Sources	100.00%	NA	NA	NA	NA	100.00%

San Joaquin AB Inventory A
Emission Inventory Summary - VOC, NOx, CO

Equipment Category	tpy			tpsd		tpwd
	VOC	NOx	CO	VOC	NOx	CO
Lawn & Garden	6,392	314	39,641	23	1	30
Airport Service	23	163	202	0	0	1
Recreational	227	7	852	1	0	1
Recreational Marine	1,080	288	2,460	5	2	2
Light Commercial	992	250	13,166	3	1	36
Industrial	531	1,164	8,727	1	3	24
Construction	1,534	11,303	9,326	6	41	20
Agricultural	4,175	18,021	27,605	16	67	18
Logging	31	145	207	0	0	1
<u>Marine Vessels</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>3</u>	<u>0</u>
Nonroad Engines and Vehicles	14,986	31,654	102,185	55	118	133
Highway Vehicles	0	0	0	150	240	1,100
<u>Other Area and Point Sources</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>1,022</u>	<u>249</u>	<u>683</u>
All Sources	NA	NA	NA	1,227	607	1,916

San Joaquin AB Inventory A
Emission Inventory Summary - VOC, NOx, CO
Percent of Total Inventory

Equipment Category	% total tpy			% total tpsd		% total tpwd
	VOC	NOx	CO	VOC	NOx	CO
Lawn & Garden	NA	NA	NA	1.89%	0.19%	1.55%
Airport Service	NA	NA	NA	0.01%	0.07%	0.03%
Recreational	NA	NA	NA	0.09%	0.01%	0.06%
Recreational Marine	NA	NA	NA	0.43%	0.25%	0.10%
Light Commercial	NA	NA	NA	0.22%	0.11%	1.88%
Industrial	NA	NA	NA	0.12%	0.53%	1.25%
Construction	NA	NA	NA	0.45%	6.74%	1.07%
Agricultural	NA	NA	NA	1.27%	11.07%	0.95%
Logging	NA	NA	NA	0.01%	0.07%	0.03%
<u>Marine Vessels</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>0.02%</u>	<u>0.44%</u>	<u>0.02%</u>
Nonroad Engines and Vehicles	NA	NA	NA	4.51%	19.46%	6.93%
Highway Vehicles	NA	NA	NA	12.22%	39.55%	57.41%
<u>Other Area and Point Sources</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>83.27%</u>	<u>40.99%</u>	<u>35.66%</u>
All Sources	NA	NA	NA	100.00%	100.00%	100.00%

San Joaquin AB Inventory A
Emission Inventory Summary - Air Toxics and SOx

Equipment Category	tpy					
	PM	Aldehydes	Benzene	1,3 But	Gas Vap	SOx
Lawn & Garden	105	57	178	73	777	52
Airport Service	19	1	1	0	0	11
Recreational	2	1	7	3	11	1
Recreational Marine	9	9	19	8	458	13
Light Commercial	38	13	27	11	160	30
Industrial	119	24	15	7	40	74
Construction	1,415	208	45	23	47	984
Agricultural	3,462	555	123	63	111	1,441
Logging	20	3	1	0	3	12
<u>Marine Vessels</u>	<u>62</u>	<u>0</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>402</u>
Nonroad Engines and Vehicles	5,251	870	415	188	1,608	3,019
Highway Vehicles	13,505	0	—	—	—	9,125
<u>Other Area and Point Sources</u>	<u>731,789</u>	<u>0</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>16,790</u>
All Sources	750,545	NA	NA	NA	NA	28,934

San Joaquin AB Inventory A
Emission Inventory Summary - Air Toxics and SOx
Percent of Total Inventory

Equipment Category	% total tpy					
	PM	Aldehydes	Benzene	1,3 But	Gas Vap	SOx
Lawn & Garden	0.01%	NA	NA	NA	NA	0.18%
Airport Service	0.00%	NA	NA	NA	NA	0.04%
Recreational	0.00%	NA	NA	NA	NA	0.00%
Recreational Marine	0.00%	NA	NA	NA	NA	0.04%
Light Commercial	0.01%	NA	NA	NA	NA	0.10%
Industrial	0.02%	NA	NA	NA	NA	0.26%
Construction	0.19%	NA	NA	NA	NA	3.40%
Agricultural	0.46%	NA	NA	NA	NA	4.98%
Logging	0.00%	NA	NA	NA	NA	0.04%
<u>Marine Vessels</u>	<u>0.01%</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>1.39%</u>
Nonroad Engines and Vehicles	0.70%	NA	NA	NA	NA	10.43%
Highway Vehicles	1.80%	NA	NA	NA	NA	31.54%
<u>Other Area and Point Sources</u>	<u>97.50%</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>58.03%</u>
All Sources	100.00%	NA	NA	NA	NA	100.00%

Seattle-Tacoma MSA Inventory A
Emission Inventory Summary - VOC, NOx, CO

Equipment Category	tpy			tpsd		tpwd
	VOC	NOx	CO	VOC	NOx	CO
Lawn & Garden	7,723	384	46,085	31	2	23
Airport Service	184	1,295	1,577	1	4	4
Recreational	792	21	2,525	3	0	7
Recreational Marine	6,079	649	12,059	36	4	7
Light Commercial	1,093	268	14,370	3	1	39
Industrial	736	1,606	12,058	2	4	33
Construction	1,742	12,958	10,571	7	54	17
Agricultural	306	1,324	1,980	1	6	1
Logging	371	1,511	2,323	1	4	6
<u>Marine Vessels</u>	<u>2,194</u>	<u>17,253</u>	<u>31,940</u>	<u>6</u>	<u>47</u>	<u>88</u>
Nonroad Engines and Vehicles	21,220	37,270	135,487	91	126	225
Highway Vehicles	0	0	267,670	0	0	1,515
<u>Other Area and Point Sources</u>	<u>0</u>	<u>0</u>	<u>199,979</u>	<u>0</u>	<u>0</u>	<u>565</u>
All Sources	NA	NA	603,136	NA	NA	2,305

Seattle-Tacoma MSA Inventory A
Emission Inventory Summary - VOC, NOx, CO
Percent of Total Inventory

Equipment Category	% total tpy			% total tpsd		% total tpwd
	VOC	NOx	CO	VOC	NOx	CO
Lawn & Garden	NA	NA	7.64%	NA	NA	1.00%
Airport Service	NA	NA	0.26%	NA	NA	0.19%
Recreational	NA	NA	0.42%	NA	NA	0.28%
Recreational Marine	NA	NA	2.00%	NA	NA	0.29%
Light Commercial	NA	NA	2.38%	NA	NA	1.71%
Industrial	NA	NA	2.00%	NA	NA	1.43%
Construction	NA	NA	1.75%	NA	NA	0.75%
Agricultural	NA	NA	0.33%	NA	NA	0.06%
Logging	NA	NA	0.39%	NA	NA	0.28%
<u>Marine Vessels</u>	<u>NA</u>	<u>NA</u>	<u>5.30%</u>	<u>NA</u>	<u>NA</u>	<u>3.80%</u>
Nonroad Engines and Vehicles	NA	NA	22.46%	NA	NA	9.78%
Highway Vehicles	NA	NA	44.38%	NA	NA	65.72%
<u>Other Area and Point Sources</u>	<u>NA</u>	<u>NA</u>	<u>33.16%</u>	<u>NA</u>	<u>NA</u>	<u>24.51%</u>
All Sources	NA	NA	100.00%	NA	NA	100.00%

Seattle-Tacoma MSA Inventory A
Emission Inventory Summary - Air Toxics and SOx

Equipment Category	tpy					
	PM	Aldehydes	Benzene	1,3 But	Gas Vap	SOx
Lawn & Garden	121	67	213	88	991	63
Airport Service	154	7	5	3	4	86
Recreational	15	4	23	10	34	2
Recreational Marine	19	19	143	62	1,336	41
Light Commercial	41	14	30	12	179	32
Industrial	164	33	21	9	57	103
Construction	1,616	237	51	26	54	1,128
Agricultural	254	41	9	5	9	106
Logging	209	30	11	5	36	126
<u>Marine Vessels</u>	<u>1,017</u>	<u>0</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>7,576</u>
Nonroad Engines and Vehicles	3,610	451	506	219	2,701	9,261
Highway Vehicles	30,151	0	—	—	—	0
<u>Other Area and Point Sources</u>	<u>37,878</u>	<u>0</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>0</u>
All Sources	71,639	NA	NA	NA	NA	NA

Seattle-Tacoma MSA Inventory A
Emission Inventory Summary - Air Toxics and SOx
Percent of Total Inventory

Equipment Category	% total tpy					
	PM	Aldehydes	Benzene	1,3 But	Gas Vap	SOx
Lawn & Garden	0.17%	NA	NA	NA	NA	NA
Airport Service	0.22%	NA	NA	NA	NA	NA
Recreational	0.02%	NA	NA	NA	NA	NA
Recreational Marine	0.03%	NA	NA	NA	NA	NA
Light Commercial	0.06%	NA	NA	NA	NA	NA
Industrial	0.23%	NA	NA	NA	NA	NA
Construction	2.26%	NA	NA	NA	NA	NA
Agricultural	0.36%	NA	NA	NA	NA	NA
Logging	0.29%	NA	NA	NA	NA	NA
<u>Marine Vessels</u>	<u>1.42%</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>
Nonroad Engines and Vehicles	5.04%	NA	NA	NA	NA	NA
Highway Vehicles	42.09%	NA	NA	NA	NA	NA
<u>Other Area and Point Sources</u>	<u>52.87%</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>
All Sources	100.00%	NA	NA	NA	NA	NA

South Coast AB Inventory A
Emission Inventory Summary - VOC, NOx, CO

Equipment Category	tpy			tpsd		tpwd
	VOC	NOx	CO	VOC	NOx	CO
Lawn & Garden	56,526	2,776	350,563	205	10	262
Airport Service	773	5,447	6,618	2	15	18
Recreational	4,028	119	15,099	16	0	22
Recreational Manne	23,009	3,850	49,702	116	20	38
Light Commercial	7,583	1,913	100,670	21	5	276
Industrial	6,479	14,195	106,430	18	39	292
Construction	9,308	68,596	56,599	34	248	124
Agricultural	690	2,978	4,561	3	11	3
Logging	16	73	105	0	0	0
<u>Marine Vessels</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>7</u>	<u>68</u>	<u>10</u>
Nonroad Engines and Vehicles	108,412	99,946	690,348	422	418	1,045
Highway Vehicles	0	0	0	650	660	9,732
<u>Other Area and Point Sources</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>1,400</u>	<u>334</u>	<u>255</u>
All Sources	NA	NA	NA	2,472	1,412	11,042

South Coast AB Inventory A
Emission Inventory Summary - VOC, NOx, CO
Percent of Total Inventory

Equipment Category	% total tpy			% total tpsd		% total tpwd
	VOC	NOx	CO	VOC	NOx	CO
Lawn & Garden	NA	NA	NA	8.29%	0.73%	2.37%
Airport Service	NA	NA	NA	0.09%	1.06%	0.16%
Recreational	NA	NA	NA	0.66%	0.03%	0.19%
Recreational Manne	NA	NA	NA	4.69%	1.44%	0.35%
Light Commercial	NA	NA	NA	0.85%	0.37%	2.50%
Industrial	NA	NA	NA	0.73%	2.75%	2.64%
Construction	NA	NA	NA	1.37%	17.57%	1.12%
Agricultural	NA	NA	NA	0.10%	0.79%	0.03%
Logging	NA	NA	NA	0.00%	0.01%	0.00%
<u>Marine Vessels</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>0.30%</u>	<u>4.84%</u>	<u>0.09%</u>
Nonroad Engines and Vehicles	NA	NA	NA	17.08%	29.60%	9.46%
Highway Vehicles	NA	NA	NA	26.29%	46.75%	88.14%
<u>Other Area and Point Sources</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>56.63%</u>	<u>23.65%</u>	<u>2.40%</u>
All Sources	NA	NA	NA	100.00%	100.00%	100.00%

South Coast AB Inventory A
Emission Inventory Summary - Air Toxics and SOx

Equipment Category	tpy					
	PM	Aldehydes	Benzene	1,3 But.	Gas Vap	SOx
Lawn & Garden	930	505	1,572	646	6,873	459
Airport Service	648	28	23	12	15	360
Recreational	44	25	116	50	191	10
Recreational Marine	112	115	510	220	6,142	200
Light Commercial	289	96	209	83	1,225	231
Industrial	1,447	288	184	82	484	906
Construction	8,589	1,265	274	141	283	5,972
Agricultural	572	92	20	10	18	238
Logging	10	1	0	0	2	6
<u>Marine Vessels</u>	<u>1,515</u>	<u>0</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>12,797</u>
Nonroad Engines and Vehicles	14,156	2,415	2,908	1,243	15,233	21,180
Highway Vehicles	34,675	0	—	—	—	11,680
<u>Other Area and Point Sources</u>	<u>766,500</u>	<u>0</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>18,214</u>
All Sources	815,331	NA	NA	NA	NA	51,074

South Coast AB Inventory A
Emission Inventory Summary - Air Toxics and SOx
Percent of Total Inventory

Equipment Category	% total tpy					
	PM	Aldehydes	Benzene	1,3 But.	Gas Vap	SOx
Lawn & Garden	0.11%	NA	NA	NA	NA	0.90%
Airport Service	0.08%	NA	NA	NA	NA	0.71%
Recreational	0.01%	NA	NA	NA	NA	0.02%
Recreational Marine	0.01%	NA	NA	NA	NA	0.39%
Light Commercial	0.04%	NA	NA	NA	NA	0.45%
Industrial	0.18%	NA	NA	NA	NA	1.77%
Construction	1.05%	NA	NA	NA	NA	11.69%
Agricultural	0.07%	NA	NA	NA	NA	0.47%
Logging	0.00%	NA	NA	NA	NA	0.01%
<u>Marine Vessels</u>	<u>0.19%</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>25.06%</u>
Nonroad Engines and Vehicles	1.74%	NA	NA	NA	NA	41.47%
Highway Vehicles	4.25%	NA	NA	NA	NA	22.87%
<u>Other Area and Point Sources</u>	<u>94.01%</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>35.66%</u>
All Sources	100.00%	NA	NA	NA	NA	100.00%

Spokane MSA Inventory A
Emission Inventory Summary - VOC, NOx, CO

Equipment Category	tpy			tpsd		tpwd
	VOC	NOx	CO	VOC	NOx	CO
Lawn & Garden	753	37	4,466	4	0	0
Airport Service	26	178	221	0	0	1
Recreational	142	4	432	0	0	1
Recreational Marine	514	14	970	4	0	0
Light Commercial	170	38	2,136	0	0	6
Industrial	67	146	1,100	0	0	3
Construction	141	1,049	848	1	5	1
Agricultural	157	681	994	1	4	1
Logging	0	0	0	0	0	0
<u>Marine Vessels</u>	<u>0</u>	<u>0</u>	<u>245</u>	<u>0</u>	<u>0</u>	<u>0</u>
Nonroad Engines and Vehicles	1,968	2,148	11,413	11	10	12
Highway Vehicles	0	0	9,026	0	0	251
<u>Other Area and Point Sources</u>	<u>0</u>	<u>0</u>	<u>77,748</u>	<u>0</u>	<u>0</u>	<u>224</u>
All Sources	NA	NA	98,187	NA	NA	487

Spokane MSA Inventory A
Emission Inventory Summary - VOC, NOx, CO
Percent of Total Inventory

Equipment Category	% total tpy			% total tpsd		% total tpwd
	VOC	NOx	CO	VOC	NOx	CO
Lawn & Garden	NA	NA	4.55%	NA	NA	0.02%
Airport Service	NA	NA	0.23%	NA	NA	0.12%
Recreational	NA	NA	0.44%	NA	NA	0.21%
Recreational Marine	NA	NA	0.99%	NA	NA	0.00%
Light Commercial	NA	NA	2.18%	NA	NA	1.20%
Industrial	NA	NA	1.12%	NA	NA	0.62%
Construction	NA	NA	0.86%	NA	NA	0.19%
Agricultural	NA	NA	1.01%	NA	NA	0.13%
Logging	NA	NA	0.00%	NA	NA	0.00%
<u>Marine Vessels</u>	<u>NA</u>	<u>NA</u>	<u>0.25%</u>	<u>NA</u>	<u>NA</u>	<u>0.00%</u>
Nonroad Engines and Vehicles	NA	NA	11.62%	NA	NA	2.51%
Highway Vehicles	NA	NA	9.19%	NA	NA	51.56%
<u>Other Area and Point Sources</u>	<u>NA</u>	<u>NA</u>	<u>79.18%</u>	<u>NA</u>	<u>NA</u>	<u>45.93%</u>
All Sources	NA	NA	100.00%	NA	NA	100.00%

Spokane MSA Inventory A
Emission Inventory Summary - Air Toxics and SOx

Equipment Category	% total tpy					
	PM	Aldehydes	Benzene	1,3 But	Gas Vap	SOx
Lawn & Garden	12	6	20	8	105	6
Airport Service	21	1	1	0	1	12
Recreational	3	1	4	2	7	0
Recreational Marine	0	0	14	6	47	2
Light Commercial	6	2	5	2	26	5
Industrial	15	3	2	1	5	9
Construction	132	19	4	2	5	91
Agricultural	131	21	5	2	5	54
Logging	0	0	0	0	0	0
<u>Marine Vessels</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>
Nonroad Engines and Vehicles	320	54	55	24	200	180
Highway Vehicles	3,881	0				0
<u>Other Area and Point Sources</u>	<u>9,837</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>
All Sources	14,038	NA	NA	NA	NA	NA

Spokane MSA Inventory A
Emission Inventory Summary - Air Toxics and SOx
Percent of Total Inventory

Equipment Category	% total tpy					
	PM	Aldehydes	Benzene	1,3 But	Gas Vap	SOx
Lawn & Garden	0.08%	NA	NA	NA	NA	NA
Airport Service	0.15%	NA	NA	NA	NA	NA
Recreational	0.02%	NA	NA	NA	NA	NA
Recreational Marine	0.00%	NA	NA	NA	NA	NA
Light Commercial	0.04%	NA	NA	NA	NA	NA
Industrial	0.11%	NA	NA	NA	NA	NA
Construction	0.94%	NA	NA	NA	NA	NA
Agricultural	0.93%	NA	NA	NA	NA	NA
Logging	0.00%	NA	NA	NA	NA	NA
<u>Marine Vessels</u>	<u>0.00%</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>
Nonroad Engines and Vehicles	2.28%	NA	NA	NA	NA	NA
Highway Vehicles	27.65%	NA	NA	NA	NA	NA
<u>Other Area and Point Sources</u>	<u>70.08%</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>
All Sources	100.00%	NA	NA	NA	NA	NA

Springfield MSA Inventory A
Emission Inventory Summary - VOC, NOx, CO

Equipment Category	tpy			tpsd		tpwd CO
	VOC	NOx	CO	VOC	NOx	
Lawn & Garden	957	46	5,535	5	0	2
Airport Service	0	0	0	0	0	0
Recreational	532	9	962	0	0	8
Recreational Manne	790	78	1,345	5	1	0
Light Commercial	280	59	3,397	1	0	9
Industrial	240	529	3,983	1	1	11
Construction	188	1,404	1,122	1	7	1
Agricultural	84	366	516	0	2	0
Logging	0	0	0	0	0	0
<u>Marine Vessels</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>
Nonroad Engines and Vehicles	3,071	2,491	16,861	13	11	32
Highway Vehicles	0	0	0	62	30	0
<u>Other Area and Point Sources</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>50</u>	<u>30</u>	<u>0</u>
All Sources	NA	NA	NA	125	71	NA

Springfield MSA Inventory A
Emission Inventory Summary - VOC, NOx, CO
Percent of Total Inventory

Equipment Category	% total tpy			% total tpsd		% total tpwd CO
	VOC	NOx	CO	VOC	NOx	
Lawn & Garden	NA	NA	NA	3.92%	0.35%	NA
Airport Service	NA	NA	NA	0.00%	0.00%	NA
Recreational	NA	NA	NA	0.31%	0.02%	NA
Recreational Manne	NA	NA	NA	4.04%	0.81%	NA
Light Commercial	NA	NA	NA	0.62%	0.22%	NA
Industrial	NA	NA	NA	0.54%	2.03%	NA
Construction	NA	NA	NA	0.71%	9.27%	NA
Agricultural	NA	NA	NA	0.37%	2.81%	NA
Logging	NA	NA	NA	0.00%	0.00%	NA
<u>Marine Vessels</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>0.00%</u>	<u>0.00%</u>	<u>NA</u>
Nonroad Engines and Vehicles	NA	NA	NA	10.50%	15.51%	NA
Highway Vehicles	NA	NA	NA	49.86%	42.46%	NA
<u>Other Area and Point Sources</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>39.64%</u>	<u>42.03%</u>	<u>NA</u>
All Sources	NA	NA	NA	100.00%	100.00%	NA

Springfield MSA Inventory A
Emission Inventory Summary - Air Toxics and SOx

Equipment Category	tpy					
	PM	Aldehydes	Benzene	1,3 But	Gas Vap	SOx
Lawn & Garden	15	8	26	11	148	8
Airport Service	0	0	0	0	0	0
Recreational	20	2	16	7	14	1
Recreational Marine	2	2	16	7	274	5
Light Commercial	10	3	8	3	41	7
Industrial	54	11	7	3	19	34
Construction	177	26	6	3	6	122
Agricultural	70	11	2	1	3	29
Logging	0	0	0	0	0	0
<u>Marine Vessels</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>
Nonroad Engines and Vehicles	349	64	79	34	504	205
Highway Vehicles	0	0				0
<u>Other Area and Point Sources</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>
All Sources	NA	NA	NA	NA	NA	NA

Springfield MSA Inventory A
Emission Inventory Summary - Air Toxics and SOx
Percent of Total Inventory

Equipment Category	% total tpy					
	PM	Aldehydes	Benzene	1,3 But	Gas Vap	SOx
Lawn & Garden	NA	NA	NA	NA	NA	NA
Airport Service	NA	NA	NA	NA	NA	NA
Recreational	NA	NA	NA	NA	NA	NA
Recreational Marine	NA	NA	NA	NA	NA	NA
Light Commercial	NA	NA	NA	NA	NA	NA
Industrial	NA	NA	NA	NA	NA	NA
Construction	NA	NA	NA	NA	NA	NA
Agricultural	NA	NA	NA	NA	NA	NA
Logging	NA	NA	NA	NA	NA	NA
<u>Marine Vessels</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>
Nonroad Engines and Vehicles	NA	NA	NA	NA	NA	NA
Highway Vehicles	NA	NA	NA	NA	NA	NA
<u>Other Area and Point Sources</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>
All Sources	NA	NA	NA	NA	NA	NA

Washington DC MSA Inventory A
Emission Inventory Summary - VOC, NOx, CO

Equipment Category	tpy			tpsd		tpwd
	VOC	NOx	CO	VOC	NOx	CO
Lawn & Garden	10,013	501	61,208	41	2	30
Airport Service	368	2,589	3,148	1	7	9
Recreational	843	19	2,312	2	0	8
Recreational Marine	2,554	268	5,096	15	2	1
Light Commercial	1,211	274	15,296	3	1	42
Industrial	442	970	7,294	1	3	20
Construction	2,405	17,885	14,470	10	74	24
Agricultural	585	2,536	3,735	3	11	2
Logging	0	0	0	0	0	0
Marine Vessels	0	227	2,820	0	1	0
Nonroad Engines and Vehicles	18,422	25,268	115,379	77	101	136
Highway Vehicles	0	83,068	398,686	345	250	2,161
<u>Other Area and Point Sources</u>	<u>0</u>	<u>88,336</u>	<u>59,024</u>	<u>202</u>	<u>242</u>	<u>167</u>
All Sources	NA	196,672	573,089	624	593	2,464

Washington DC MSA Inventory A
Emission Inventory Summary - VOC, NOx, CO
Percent of Total Inventory

Equipment Category	% total tpy			% total tpsd		% total tpwd
	VOC	NOx	CO	VOC	NOx	CO
Lawn & Garden	NA	0.25%	10.68%	6.61%	0.37%	1.22%
Airport Service	NA	1.32%	0.55%	0.16%	1.20%	0.35%
Recreational	NA	0.01%	0.40%	0.34%	0.01%	0.34%
Recreational Marine	NA	0.14%	0.89%	2.40%	0.28%	0.05%
Light Commercial	NA	0.14%	2.67%	0.54%	0.13%	1.70%
Industrial	NA	0.49%	1.27%	0.20%	0.45%	0.81%
Construction	NA	9.09%	2.52%	1.61%	12.56%	0.97%
Agricultural	NA	1.29%	0.65%	0.41%	1.88%	0.10%
Logging	NA	0.00%	0.00%	0.00%	0.00%	0.00%
Marine Vessels	NA	0.12%	0.49%	0.00%	0.10%	0.00%
Nonroad Engines and Vehicles	NA	12.85%	20.13%	12.28%	16.97%	5.54%
Highway Vehicles	NA	42.24%	69.57%	55.33%	42.22%	87.69%
<u>Other Area and Point Sources</u>	<u>NA</u>	<u>44.92%</u>	<u>10.30%</u>	<u>32.40%</u>	<u>40.81%</u>	<u>6.77%</u>
All Sources	NA	100.00%	100.00%	100.00%	100.00%	100.00%

Washington DC MSA Inventory A
Emission Inventory Summary - Air Toxics and SOx

Equipment Category	tpy					
	PM	Aldehydes	Benzene	1,3 But	Gas Vap	SOx
Lawn & Garden	161	88	275	113	1,317	82
Airport Service	308	13	11	5	7	171
Recreational	21	4	24	11	35	2
Recreational Marine	8	8	61	26	536	17
Light Commercial	44	15	33	13	186	33
Industrial	99	20	13	6	34	62
Construction	2,241	328	71	36	76	1,555
Agricultural	488	78	17	9	19	202
Logging	0	0	0	0	0	0
<u>Marine Vessels</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>
Nonroad Engines and Vehicles	3,369	554	505	220	2,211	2,125
Highway Vehicles	0	0				0
<u>Other Area and Point Sources</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>
All Sources	NA	NA	NA	NA	NA	NA

Washington DC MSA Inventory A
Emission Inventory Summary - Air Toxics and SOx
Percent of Total Inventory

Equipment Category	% total tpy					
	PM	Aldehydes	Benzene	1,3 But	Gas Vap	SOx
Lawn & Garden	NA	NA	NA	NA	NA	NA
Airport Service	NA	NA	NA	NA	NA	NA
Recreational	NA	NA	NA	NA	NA	NA
Recreational Marine	NA	NA	NA	NA	NA	NA
Light Commercial	NA	NA	NA	NA	NA	NA
Industrial	NA	NA	NA	NA	NA	NA
Construction	NA	NA	NA	NA	NA	NA
Agricultural	NA	NA	NA	NA	NA	NA
Logging	NA	NA	NA	NA	NA	NA
<u>Marine Vessels</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>
Nonroad Engines and Vehicles	NA	NA	NA	NA	NA	NA
Highway Vehicles	NA	NA	NA	NA	NA	NA
<u>Other Area and Point Sources</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>
All Sources	NA	NA	NA	NA	NA	NA

USA
Inventory A (in-use est)
Emission Inventory Summary - Air Toxics and SOx

Equipment Category	tpy					
	PM	Aldehydes	Benzene	1,3 But.	Gas Vap	SOx
Lawn & Garden	19,393	5,901	34,734	14,650	89,798	5,462
Airport Service	12,408	529	482	240	296	6,894
Recreational	13,239	1,481	21,181	9,162	11,059	579
Recreational Marine	3,497	3,532	63,762	27,546	254,842	9,606
Light Commercial	4,520	1,468	4,643	1,868	24,599	4,398
Industrial	20,255	4,037	3,336	1,471	7,051	12,715
Construction	128,778	18,844	4,459	2,264	4,377	89,303
Agricultural	192,781	30,787	7,291	3,702	7,397	79,816
Logging	11,309	1,522	843	369	1,755	6,481
<u>Marine Vessels</u>	<u>33,070</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>20,485</u>
Nonroad Engines and Vehicles	439,250	68,101	140,732	61,271	401,173	235,739
Highway Vehicles	1,265,460	0				514,018
<u>Other Area and Point Sources</u>	<u>6,189,510</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>22,407,185</u>
All Sources	7,894,220	NA	NA	NA	NA	23,156,942

USA
Inventory A (in-use est)
Emission Inventory Summary - Air Toxics and SOx
Percent of Total Inventory

Equipment Category	% total tpy					
	PM	Aldehydes	Benzene	1,3 But.	Gas Vap	SOx
Lawn & Garden	0.25%	NA	NA	NA	NA	0.02%
Airport Service	0.16%	NA	NA	NA	NA	0.03%
Recreational	0.17%	NA	NA	NA	NA	0.00%
Recreational Marine	0.04%	NA	NA	NA	NA	0.04%
Light Commercial	0.06%	NA	NA	NA	NA	0.02%
Industrial	0.26%	NA	NA	NA	NA	0.05%
Construction	1.63%	NA	NA	NA	NA	0.39%
Agricultural	2.44%	NA	NA	NA	NA	0.34%
Logging	0.14%	NA	NA	NA	NA	0.03%
<u>Marine Vessels</u>	<u>0.42%</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>0.09%</u>
Nonroad Engines and Vehicles	5.56%	NA	NA	NA	NA	1.02%
Highway Vehicles	16.03%	NA	NA	NA	NA	2.22%
<u>Other Area and Point Sources</u>	<u>78.41%</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>96.76%</u>
All Sources	100.00%	NA	NA	NA	NA	100.00%

Atlanta MSA Inventory A (in-use est)
Emission Inventory Summary - VOC, NOx, CO

Equipment Category	tpy			tpsd		tpwd CO
	VOC	NOx	CO	VOC	NOx	
Lawn & Garden	16,857	322	109,492	61	1	82
Airport Service	322	2,073	3,009	1	6	8
Recreational	704	5	2,603	3	0	5
Recreational Marine	13,932	684	25,630	72	4	20
Light Commercial	2,271	259	31,903	6	1	87
Industrial	777	1,324	12,787	2	4	35
Construction	2,116	14,176	14,025	8	51	31
Agricultural	419	1,676	3,012	2	6	2
Logging	0	0	0	0	0	0
<u>Marine Vessels</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>
Nonroad Engines and Vehicles	37,397	20,519	202,462	154	72	270
Highway Vehicles	0	69,146	0	319	208	0
<u>Other Area and Point Sources</u>	<u>0</u>	<u>92,553</u>	<u>0</u>	<u>287</u>	<u>248</u>	<u>0</u>
All Sources	NA	182,218	NA	760	529	NA

Atlanta MSA Inventory A (in-use est)
Emission Inventory Summary - VOC, NOx, CO
Percent of Total Inventory

Equipment Category	% total tpy			% total tpsd		% total tpwd CO
	VOC	NOx	CO	VOC	NOx	
Lawn & Garden	NA	0.18%	NA	7.98%	0.23%	NA
Airport Service	NA	1.14%	NA	0.12%	1.07%	NA
Recreational	NA	0.00%	NA	0.36%	0.00%	NA
Recreational Marine	NA	0.38%	NA	9.53%	0.68%	NA
Light Commercial	NA	0.14%	NA	0.83%	0.13%	NA
Industrial	NA	0.73%	NA	0.28%	0.69%	NA
Construction	NA	7.78%	NA	1.01%	9.69%	NA
Agricultural	NA	0.92%	NA	0.21%	1.18%	NA
Logging	NA	0.00%	NA	0.00%	0.00%	NA
<u>Marine Vessels</u>	<u>NA</u>	<u>0.00%</u>	<u>NA</u>	<u>0.00%</u>	<u>0.00%</u>	<u>NA</u>
Nonroad Engines and Vehicles	NA	11.26%	NA	20.31%	13.68%	NA
Highway Vehicles	NA	37.95%	NA	41.94%	39.39%	NA
<u>Other Area and Point Sources</u>	<u>NA</u>	<u>50.79%</u>	<u>NA</u>	<u>37.75%</u>	<u>46.93%</u>	<u>NA</u>
All Sources	NA	100.00%	NA	100.00%	100.00%	NA

Atlanta MSA Inventory A (in-use est)
Emission Inventory Summary - Air Toxics and SOx

Equipment Category	PM	Aldehydes	Benzene	tpy 1,3 But	Gas Vap	SOx
Lawn & Garden	272	83	486	205	1,113	77
Airport Service	247	11	10	5	6	137
Recreational	7	2	21	9	17	1
Recreational Marine	19	20	388	167	1,052	56
Light Commercial	55	16	65	27	210	38
Industrial	135	27	22	10	46	85
Construction	1,772	260	62	32	59	1,236
Agricultural	323	52	12	6	11	134
Logging	0	0	0	0	0	0
<u>Marine Vessels</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>
Nonroad Engines and Vehicles	2,830	471	1,065	460	2,514	1,764
Highway Vehicles	0	0				0
<u>Other Area and Point Sources</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>
All Sources	NA	NA	NA	NA	NA	NA

Atlanta MSA Inventory A (in-use est)
Emission Inventory Summary - Air Toxics and SOx
Percent of Total Inventory

Equipment Category	PM	Aldehydes	Benzene	% total tpy 1,3 But.	Gas Vap	SOx
Lawn & Garden	NA	NA	NA	NA	NA	NA
Airport Service	NA	NA	NA	NA	NA	NA
Recreational	NA	NA	NA	NA	NA	NA
Recreational Marine	NA	NA	NA	NA	NA	NA
Light Commercial	NA	NA	NA	NA	NA	NA
Industrial	NA	NA	NA	NA	NA	NA
Construction	NA	NA	NA	NA	NA	NA
Agricultural	NA	NA	NA	NA	NA	NA
Logging	NA	NA	NA	NA	NA	NA
<u>Marine Vessels</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>
Nonroad Engines and Vehicles	NA	NA	NA	NA	NA	NA
Highway Vehicles	NA	NA	NA	NA	NA	NA
<u>Other Area and Point Sources</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>
All Sources	NA	NA	NA	NA	NA	NA

Baltimore MSA
 Inventory A (in-use est)
 Emission Inventory Summary - VOC, NOx, CO
 Percent of Total Inventory

Equipment Category	% total tpy			% total tpsd		% total tpsd
	VOC	NOx	CO	VOC	NOx	CO
Lawn & Garden	NA	0 15%	NA	8 32%	0 22%	2 20%
Airport Service	NA	1 45%	NA	0 16%	1 33%	0 43%
Recreational	NA	0 01%	NA	0 26%	0 00%	0 90%
Recreational Manne	NA	0 27%	NA	5 09%	0 57%	0 10%
Light Commercial	NA	0 14%	NA	0 98%	0 13%	3 67%
Industrial	NA	0 86%	NA	0 37%	0 79%	1 69%
Construction	NA	6 83%	NA	1 11%	9 53%	0 82%
Agricultural	NA	1 61%	NA	0 46%	2 37%	0 14%
Logging	NA	0 00%	NA	0 00%	0 00%	0 00%
<u>Marine Vessels</u>	<u>NA</u>	<u>4 40%</u>	<u>NA</u>	<u>0 86%</u>	<u>4 04%</u>	<u>4 57%</u>
Nonroad Engines and Vehicles	NA	15 72%	NA	17 61%	18 97%	14 52%
Highway Vehicles	NA	40 05%	NA	38 68%	40 44%	73 05%
<u>Other Area and Point Sources</u>	<u>NA</u>	<u>44 23%</u>	<u>NA</u>	<u>43 71%</u>	<u>40 59%</u>	<u>12 43%</u>
All Sources	NA	100 00%	NA	100 00%	100 00%	100 00%

Baltimore MSA
 Inventory A (in-use est)
 Emission Inventory Summary - VOC, NOx, CO

Equipment Category	tpy			tpsd		tpsd
	VOC	NOx	CO	VOC	NOx	CO
Lawn & Garden	10,681	203	67,811	43	1	40
Airport Service	305	1,962	2,855	1	5	8
Recreational	1,286	9	2,442	1	0	16
Recreational Manne	4,426	369	8,313	26	2	2
Light Commercial	1,828	189	24,329	5	1	67
Industrial	677	1,162	11,233	2	3	31
Construction	1,372	9,268	9,029	6	39	15
Agricultural	544	2,186	3,815	2	10	3
Logging	0	0	0	0	0	0
<u>Marine Vessels</u>	<u>1,623</u>	<u>5,970</u>	<u>30,333</u>	<u>4</u>	<u>16</u>	<u>83</u>
Nonroad Engines and Vehicles	22,742	21 318	160 160	91	77	264
Highway Vehicles	0	54,317	0	200	164	1 328
<u>Other Area and Point Sources</u>	<u>0</u>	<u>59,976</u>	<u>34,462</u>	<u>226</u>	<u>164</u>	<u>226</u>
All Sources	NA	135,611	NA	517	405	1 817

Baltimore MSA Inventory A (in-use est)
Emission Inventory Summary - Air Toxics and SOx

Equipment Category	tpy					
	PM	Aldehydes	Benzene	1,3 But	Gas Vap	SOx
Lawn & Garden	170	52	305	129	790	48
Airport Service	234	10	9	5	6	130
Recreational	24	3	38	16	20	1
Recreational Marine	11	11	111	48	734	22
Light Commercial	43	13	52	22	157	28
Industrial	118	24	19	9	41	74
Construction	1,165	170	40	20	40	808
Agricultural	421	67	16	8	16	174
Logging	0	0	0	0	0	0
<u>Marine Vessels</u>	<u>302</u>	<u>0</u>				<u>1,719</u>
Nonroad Engines and Vehicles	2,487	349	592	257	1,804	3,004
Highway Vehicles	0	0				0
<u>Other Area and Point Sources</u>	<u>0</u>	<u>0</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>0</u>
All Sources	NA	NA	NA	NA	NA	NA

Baltimore MSA Inventory A (in-use est)
Emission Inventory Summary - Air Toxics and SOx
Percent of Total Inventory

Equipment Category	% total tpy					
	PM	Aldehydes	Benzene	1 3 But	Gas Vap	SOx
Lawn & Garden	NA	NA	NA	NA	NA	NA
Airport Service	NA	NA	NA	NA	NA	NA
Recreational	NA	NA	NA	NA	NA	NA
Recreational Marine	NA	NA	NA	NA	NA	NA
Light Commercial	NA	NA	NA	NA	NA	NA
Industrial	NA	NA	NA	NA	NA	NA
Construction	NA	NA	NA	NA	NA	NA
Agricultural	NA	NA	NA	NA	NA	NA
Logging	NA	NA	NA	NA	NA	NA
<u>Marine Vessels</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>
Nonroad Engines and Vehicles	NA	NA	NA	NA	NA	NA
Highway Vehicles	NA	NA	NA	NA	NA	NA
<u>Other Area and Point Sources</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>
All Sources	NA	NA	NA	NA	NA	NA

Baton Rouge CMSA Inventory A (in-use est)
Emission Inventory Summary - VOC NOx CO

Equipment Category	tpy			tpsd		tpwd CO
	VOC	NOx	CO	VOC	NOx	
Lawn & Garden	3,124	60	20,289	11	0	15
Airport Service	234	1,510	2,190	1	4	6
Recreational	601	4	2,225	2	0	3
Recreational Marine	5,538	104	9,570	29	1	7
Light Commercial	913	104	12,828	3	0	35
Industrial	194	330	3,189	1	1	9
Construction	1,054	7,061	6,986	4	26	15
Agricultural	139	557	1,001	1	2	1
Logging	50	129	333	0	0	1
<u>Marine Vessels</u>	<u>143</u>	<u>2,394</u>	<u>528</u>	<u>0</u>	<u>7</u>	<u>1</u>
Nonroad Engines and Vehicles	11,990	12,253	59,138	51	41	94
Highway Vehicles	0	14,555	0	64	44	0
<u>Other Area and Point Sources</u>	<u>0</u>	<u>82,744</u>	<u>0</u>	<u>270</u>	<u>227</u>	<u>0</u>
All Sources	NA	109,552	NA	385	311	NA

Baton Rouge CMSA Inventory A (in-use est)
Emission Inventory Summary - VOC, NOx, CO
Percent of Total Inventory

Equipment Category	% total tpy			% total tpsd		% total tpwd CO
	VOC	NOx	CO	VOC	NOx	
Lawn & Garden	NA	0 05%	NA	2 92%	0 07%	NA
Airport Service	NA	1 38%	NA	0 17%	1 33%	NA
Recreational	NA	0 00%	NA	0 63%	0 01%	NA
Recreational Marine	NA	0 09%	NA	7 52%	0 18%	NA
Light Commercial	NA	0 09%	NA	0 66%	0 09%	NA
Industrial	NA	0 30%	NA	0 14%	0 29%	NA
Construction	NA	6 45%	NA	0 99%	8 21%	NA
Agricultural	NA	0 51%	NA	0 14%	0 67%	NA
Logging	NA	0 12%	NA	0 04%	0 11%	NA
<u>Marine Vessels</u>	<u>NA</u>	<u>2 18%</u>	<u>NA</u>	<u>0 10%</u>	<u>2 11%</u>	<u>NA</u>
Nonroad Engines and Vehicles	NA	11 18%	NA	13 30%	13 06%	NA
Highway Vehicles	NA	13 29%	NA	16 61%	14 10%	NA
<u>Other Area and Point Sources</u>	<u>NA</u>	<u>75 53%</u>	<u>NA</u>	<u>70 09%</u>	<u>72 85%</u>	<u>NA</u>
All Sources	NA	100 00%	NA	100 00%	100 00%	NA

Baton Rouge CMSA Inventory A (in-use est)
Emission Inventory Summary - Air Toxics and SOx

Equipment Category	tpy					
	PM	Aldehydes	Benzene	1,3 But.	Gas Vap	SOx
Lawn & Garden	50	15	90	38	206	14
Airport Service	180	8	7	3	4	100
Recreational	6	2	18	8	14	1
Recreational Manne	3	3	160	69	215	17
Light Commercial	22	7	26	11	85	15
Industrial	34	7	6	2	11	21
Construction	883	130	31	16	29	616
Agrncultural	107	17	4	2	4	44
Logging	19	3	1	1	3	11
<u>Marine Vessels</u>	<u>141</u>	<u>0</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>975</u>
Nonroad Engines and Vehicles	1,444	190	343	150	572	1,814
Highway Vehicles	0	0	—	—	—	0
<u>Other Area and Point Sources</u>	<u>0</u>	<u>0</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>0</u>
All Sources	NA	NA	NA	NA	NA	NA

Baton Rouge CMSA Inventory A (in-use est)
Emission Inventory Summary - Air Toxics and SOx
Percent of Total Inventory

Equipment Category	% total tpy					
	PM	Aldehydes	Benzene	1,3 But	Gas Vap	SOx
Lawn & Garden	NA	NA	NA	NA	NA	NA
Airport Service	NA	NA	NA	NA	NA	NA
Recreational	NA	NA	NA	NA	NA	NA
Recreational Manne	NA	NA	NA	NA	NA	NA
Light Commercial	NA	NA	NA	NA	NA	NA
Industrial	NA	NA	NA	NA	NA	NA
Construction	NA	NA	NA	NA	NA	NA
Agrncultural	NA	NA	NA	NA	NA	NA
Logging	NA	NA	NA	NA	NA	NA
<u>Manne Vessels</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>
Nonroad Engines and Vehicles	NA	NA	NA	NA	NA	NA
Highway Vehicles	NA	NA	NA	NA	NA	NA
<u>Other Area and Point Sources</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>
All Sources	NA	NA	NA	NA	NA	NA

Boston CMSA Inventory A (in-use est.)
Emission Inventory Summary - VOC, NOx, CO

Equipment Category	tpy			tpsd		tpwd
	VOC	NOx	CO	VOC	NOx	CO
Lawn & Garden	11,430	218	69,605	59	1	26
Airport Service	388	2,496	3,630	1	7	10
Recreational	5,980	44	10,084	4	0	82
Recreational Marine	11,243	834	18,763	75	6	2
Light Commercial	4,407	416	55,880	12	1	153
Industrial	2,130	3,679	35,612	6	10	98
Construction	1,724	11,786	11,235	8	56	12
Agricultural	143	579	962	1	3	1
Logging	0	0	0	0	0	0
<u>Marine Vessels</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>5</u>	<u>1</u>
Nonroad Engines and Vehicles	37,446	20,053	205,769	166	89	385
Highway Vehicles	0	0	0	415	207	1,470
<u>Other Area and Point Sources</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>304</u>	<u>169</u>	<u>599</u>
All Sources	NA	NA	NA	886	465	2,453

Boston CMSA Inventory A (in-use est.)
Emission Inventory Summary - VOC, NOx, CO
Percent of Total Inventory

Equipment Category	% total tpy			% total tpsd		% total tpwd
	VOC	NOx	CO	VOC	NOx	CO
Lawn & Garden	NA	NA	NA	6.64%	0.26%	1.06%
Airport Service	NA	NA	NA	0.12%	1.47%	0.41%
Recreational	NA	NA	NA	0.46%	0.01%	3.36%
Recreational Marine	NA	NA	NA	8.47%	1.34%	0.08%
Light Commercial	NA	NA	NA	1.37%	0.25%	6.24%
Industrial	NA	NA	NA	0.67%	2.17%	3.98%
Construction	NA	NA	NA	0.92%	11.95%	0.50%
Agricultural	NA	NA	NA	0.09%	0.68%	0.03%
Logging	NA	NA	NA	0.00%	0.00%	0.00%
<u>Marine Vessels</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>0.03%</u>	<u>1.07%</u>	<u>0.02%</u>
Nonroad Engines and Vehicles	NA	NA	NA	18.76%	19.19%	15.68%
Highway Vehicles	NA	NA	NA	46.86%	44.53%	59.92%
<u>Other Area and Point Sources</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>34.38%</u>	<u>36.28%</u>	<u>24.40%</u>
All Sources	NA	NA	NA	100.00%	100.00%	100.00%

Boston CMSA Inventory A (in-use est)
Emission Inventory Summary - Air Toxics and SOx

Equipment Category	tpy					
	PM	Aldehydes	Benzene	1,3 But	Gas Vap	SOx
Lawn & Garden	176	54	322	136	990	50
Airport Service	297	13	12	6	7	165
Recreational	117	12	177	77	77	4
Recreational Marine	24	25	250	108	2,941	50
Light Commercial	100	30	127	53	353	62
Industrial	373	74	61	27	132	235
Construction	1,492	217	51	26	53	1,026
Agricultural	112	18	4	2	5	46
Logging	0	0	0	0	0	0
<u>Marine Vessels</u>	<u>173</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>
Nonroad Engines and Vehicles	2,863	442	1,003	434	4,558	1,640
Highway Vehicles	0	0				0
<u>Other Area and Point Sources</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>
All Sources	NA	NA	NA	NA	NA	NA

Boston CMSA Inventory A (in-use est)
Emission Inventory Summary - Air Toxics and SOx
Percent of Total Inventory

Equipment Category	% total tpy					
	PM	Aldehydes	Benzene	1,3 But	Gas Vap	SOx
Lawn & Garden	NA	NA	NA	NA	NA	NA
Airport Service	NA	NA	NA	NA	NA	NA
Recreational	NA	NA	NA	NA	NA	NA
Recreational Marine	NA	NA	NA	NA	NA	NA
Light Commercial	NA	NA	NA	NA	NA	NA
Industrial	NA	NA	NA	NA	NA	NA
Construction	NA	NA	NA	NA	NA	NA
Agricultural	NA	NA	NA	NA	NA	NA
Logging	NA	NA	NA	NA	NA	NA
<u>Marine Vessels</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>
Nonroad Engines and Vehicles	NA	NA	NA	NA	NA	NA
Highway Vehicles	NA	NA	NA	NA	NA	NA
<u>Other Area and Point Sources</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>
All Sources	NA	NA	NA	NA	NA	NA

Chicago CMSA Inventory A (in-use est)
Emission Inventory Summary - VOC, NOx, CO

Equipment Category	tpy			tpsd		tpwd CO
	VOC	NOx	CO	VOC	NOx	
Lawn & Garden	21,384	406	129,878	110	2	48
Airport Service	787	5,063	7,355	2	14	20
Recreational	8,903	65	15,013	7	0	120
Recreational Marine	11,811	336	19,402	86	3	0
Light Commercial	7,438	703	94,279	21	2	258
Industrial	4,097	7,060	68,447	11	19	188
Construction	3,533	24,154	23,006	17	114	25
Agricultural	893	3,610	5,967	5	20	4
Logging	0	0	0	0	0	0
Marine Vessels	0	608	0	1	26	0
Nonroad Engines and Vehicles	58,846	42,006	363,367	259	200	664
Highway Vehicles	0	153,215	0	588	462	0
<u>Other Area and Point Sources</u>	<u>0</u>	<u>302,107</u>	<u>0</u>	<u>1,029</u>	<u>603</u>	<u>0</u>
All Sources	NA	497,328	NA	1,876	1,265	NA

Chicago CMSA Inventory A (in-use est)
Emission Inventory Summary - VOC, NOx, CO
Percent of Total Inventory

Equipment Category	% total tpy			% total tpsd		% total tpwd CO
	VOC	NOx	CO	VOC	NOx	
Lawn & Garden	NA	0.08%	NA	5.86%	0.17%	NA
Airport Service	NA	1.02%	NA	0.12%	1.10%	NA
Recreational	NA	0.01%	NA	0.35%	0.00%	NA
Recreational Marine	NA	0.07%	NA	4.60%	0.20%	NA
Light Commercial	NA	0.14%	NA	1.09%	0.15%	NA
Industrial	NA	1.42%	NA	0.61%	1.53%	NA
Construction	NA	4.86%	NA	0.89%	9.00%	NA
Agricultural	NA	0.73%	NA	0.26%	1.56%	NA
Logging	NA	0.00%	NA	0.00%	0.00%	NA
Marine Vessels	NA	0.12%	NA	0.06%	2.09%	NA
Nonroad Engines and Vehicles	NA	8.45%	NA	13.83%	15.82%	NA
Highway Vehicles	NA	30.81%	NA	31.32%	36.51%	NA
<u>Other Area and Point Sources</u>	<u>NA</u>	<u>60.75%</u>	<u>NA</u>	<u>54.85%</u>	<u>47.68%</u>	<u>NA</u>
All Sources	NA	100.00%	NA	100.00%	100.00%	NA

Chicago CMSA Inventory A (in-use est)
Emission Inventory Summary - Air Toxics and SOx

Equipment Category	tpy					
	PM	Aldehydes	Benzene	1,3 But.	Gas. Vap	SOx
Lawn & Garden	329	100	601	254	1,889	94
Airport Service	603	26	23	12	15	335
Recreational	174	17	264	114	117	7
Recreational Marine	9	9	312	135	1,444	38
Light Commercial	168	51	214	89	601	105
Industrial	716	143	117	52	259	451
Construction	3,058	446	104	53	110	2,103
Agricultural	696	111	26	13	33	287
Logging	0	0	0	0	0	0
<u>Marine Vessels</u>	<u>300</u>	<u>0</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>0</u>
Nonroad Engines and Vehicles	6,053	903	1,661	721	4,467	3,419
Highway Vehicles	113,525	0	—	—	—	0
<u>Other Area and Point Sources</u>	<u>181,246</u>	<u>0</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>0</u>
All Sources	300,824	NA	NA	NA	NA	NA

Chicago CMSA Inventory A (in-use est)
Emission Inventory Summary - Air Toxics and SOx
Percent of Total Inventory

Equipment Category	% total tpy					
	PM	Aldehydes	Benzene	1,3 But	Gas Vap.	SOx
Lawn & Garden	0.11%	NA	NA	NA	NA	NA
Airport Service	0.20%	NA	NA	NA	NA	NA
Recreational	0.06%	NA	NA	NA	NA	NA
Recreational Marine	0.00%	NA	NA	NA	NA	NA
Light Commercial	0.06%	NA	NA	NA	NA	NA
Industrial	0.24%	NA	NA	NA	NA	NA
Construction	1.02%	NA	NA	NA	NA	NA
Agricultural	0.23%	NA	NA	NA	NA	NA
Logging	0.00%	NA	NA	NA	NA	NA
<u>Marine Vessels</u>	<u>0.10%</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>
Nonroad Engines and Vehicles	2.01%	NA	NA	NA	NA	NA
Highway Vehicles	37.74%	NA	NA	NA	NA	NA
<u>Other Area and Point Sources</u>	<u>60.25%</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>
All Sources	100.00%	NA	NA	NA	NA	NA

Cleveland CMSA Inventory A (in-use est)
Emission Inventory Summary - VOC, NOx, CO

Equipment Category	tpy			tpsd		tpwd
	VOC	NOx	CO	VOC	NOx	CO
Lawn & Garden	8,024	152	48,737	41	1	18
Airport Service	334	2,151	3,118	1	6	9
Recreational	1,348	10	2,274	1	0	18
Recreational Manne	6,786	385	11,190	47	3	0
Light Commercial	2,982	282	37,792	8	1	104
Industrial	1,913	3,297	31,967	5	9	88
Construction	1,213	8,294	7,899	6	39	9
Agricultural	407	1,644	2,726	2	9	2
Logging	0	0	0	0	0	0
<u>Marine Vessels</u>	<u>0</u>	<u>109</u>	<u>3,757</u>	<u>0</u>	<u>0</u>	<u>0</u>
Nonroad Engines and Vehicles	23,008	16,323	149,460	112	68	246
Highway Vehicles	0	64,808	412,340	242	195	2,360
<u>Other Area and Point Sources</u>	<u>0</u>	<u>62,301</u>	<u>88,401</u>	<u>369</u>	<u>171</u>	<u>252</u>
All Sources	NA	143,432	650,201	723	434	2,858

Cleveland CMSA Inventory A (in-use est)
Emission Inventory Summary - VOC, NOx, CO
Percent of Total Inventory

Equipment Category	% total tpy			% total tpsd		% total tpwd
	VOC	NOx	CO	VOC	NOx	CO
Lawn & Garden	NA	0.11%	7.50%	5.71%	0.19%	0.64%
Airport Service	NA	1.50%	0.48%	0.13%	1.36%	0.30%
Recreational	NA	0.01%	0.35%	0.14%	0.00%	0.64%
Recreational Manne	NA	0.27%	1.72%	6.57%	0.68%	0.00%
Light Commercial	NA	0.20%	5.81%	1.14%	0.18%	3.62%
Industrial	NA	2.30%	4.92%	0.74%	2.08%	3.06%
Construction	NA	5.78%	1.21%	0.79%	9.01%	0.30%
Agricultural	NA	1.15%	0.42%	0.31%	2.08%	0.06%
Logging	NA	0.00%	0.00%	0.00%	0.00%	0.00%
<u>Marne Vessels</u>	<u>NA</u>	<u>0.08%</u>	<u>0.58%</u>	<u>0.00%</u>	<u>0.07%</u>	<u>0.00%</u>
Nonroad Engines and Vehicles	NA	11.38%	22.99%	15.51%	15.64%	8.62%
Highway Vehicles	NA	45.18%	63.42%	33.45%	45.02%	82.57%
<u>Other Area and Point Sources</u>	<u>NA</u>	<u>43.44%</u>	<u>13.60%</u>	<u>51.04%</u>	<u>39.34%</u>	<u>8.80%</u>
All Sources	NA	100.00%	100.00%	100.00%	100.00%	100.00%

Cleveland CMSA Inventory A (in-use est)
Emission Inventory Summary - Air Toxics and SOx

Equipment Category	% total tpy					
	PM	Aldehydes	Benzene	1,3 But.	Gas Vap	SOx
Lawn & Garden	123	38	225	95	709	35
Airport Service	256	11	10	5	6	142
Recreational	26	3	40	17	18	1
Recreational Marine	11	11	161	69	1,453	27
Light Commercial	67	20	86	36	241	42
Industrial	335	67	55	24	121	210
Construction	1,050	153	36	18	38	722
Agricultural	317	51	12	6	15	131
Logging	0	0	0	0	0	0
<u>Marine Vessels</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>
Nonroad Engines and Vehicles	2,186	353	624	271	2,600	1,311
Highway Vehicles	46,729	0				0
<u>Other Area and Point Sources</u>	<u>64,287</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>
All Sources	113,202	NA	NA	NA	NA	NA

Cleveland CMSA Inventory A (in-use est)
Emission Inventory Summary - Air Toxics and SOx
Percent of Total Inventory

Equipment Category	% total tpy					
	PM	Aldehydes	Benzene	1,3 But.	Gas Vap	SOx
Lawn & Garden	0.11%	NA	NA	NA	NA	NA
Airport Service	0.23%	NA	NA	NA	NA	NA
Recreational	0.02%	NA	NA	NA	NA	NA
Recreational Marine	0.01%	NA	NA	NA	NA	NA
Light Commercial	0.06%	NA	NA	NA	NA	NA
Industrial	0.30%	NA	NA	NA	NA	NA
Construction	0.93%	NA	NA	NA	NA	NA
Agricultural	0.28%	NA	NA	NA	NA	NA
Logging	0.00%	NA	NA	NA	NA	NA
<u>Marine Vessels</u>	<u>0.00%</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>
Nonroad Engines and Vehicles	1.93%	NA	NA	NA	NA	NA
Highway Vehicles	41.28%	NA	NA	NA	NA	NA
<u>Other Area and Point Sources</u>	<u>56.79%</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>
All Sources	100.00%	NA	NA	NA	NA	NA

Denver CMSA Inventory A (in-use est)
Emission Inventory Summary - VOC, NOx, CO

Equipment Category	tpy			tpsd		tpwd
	VOC	NOx	CO	VOC	NOx	CO
Lawn & Garden	11,983	228	73,295	63	1	18
Airport Service	247	1,591	2,309	1	4	6
Recreational	3,799	28	6,743	3	0	49
Recreational Marine	577	113	1,170	4	1	0
Light Commercial	3,617	374	48,054	10	1	132
Industrial	1,084	1,857	17,960	3	5	49
Construction	1,819	12,353	12,005	9	58	13
Agricultural	237	957	1,651	1	5	1
Logging	0	0	0	0	0	0
<u>Marine Vessels</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>
Nonroad Engines and Vehicles	23,363	17,501	163,187	93	76	269
Highway Vehicles	0	0	417,406	0	0	2,371
<u>Other Area and Point Sources</u>	<u>0</u>	<u>0</u>	<u>58,870</u>	<u>0</u>	<u>0</u>	<u>168</u>
All Sources	NA	NA	639,463	NA	NA	2,808

Denver CMSA Inventory A (in-use est)
Emission Inventory Summary - VOC, NOx, CO
Percent of Total Inventory

Equipment Category	% total tpy			% total tpsd		% total tpwd
	VOC	NOx	CO	VOC	NOx	CO
Lawn & Garden	NA	NA	11.46%	NA	NA	0.65%
Airport Service	NA	NA	0.36%	NA	NA	0.23%
Recreational	NA	NA	1.05%	NA	NA	1.76%
Recreational Marine	NA	NA	0.18%	NA	NA	0.00%
Light Commercial	NA	NA	7.51%	NA	NA	4.69%
Industrial	NA	NA	2.81%	NA	NA	1.75%
Construction	NA	NA	1.88%	NA	NA	0.47%
Agricultural	NA	NA	0.26%	NA	NA	0.04%
Logging	NA	NA	0.00%	NA	NA	0.00%
<u>Marine Vessels</u>	<u>NA</u>	<u>NA</u>	<u>0.00%</u>	<u>NA</u>	<u>NA</u>	<u>0.00%</u>
Nonroad Engines and Vehicles	NA	NA	25.52%	NA	NA	9.58%
Highway Vehicles	NA	NA	65.27%	NA	NA	84.45%
<u>Other Area and Point Sources</u>	<u>NA</u>	<u>NA</u>	<u>9.21%</u>	<u>NA</u>	<u>NA</u>	<u>5.97%</u>
All Sources	NA	NA	100.00%	NA	NA	100.00%

Denver CMSA Inventory A (in-use est)
Emission Inventory Summary - Air Toxics and SOx

Equipment Category	tpy					
	PM Aldehydes	Benzene	1,3 But	Gas Vap	SOx	
Lawn & Garden	182	57	340	144	938	53
Airport Service	189	8	7	4	5	105
Recreational	73	8	113	49	51	3
Recreational Marine	3	3	9	4	266	5
Light Commercial	84	25	104	43	312	56
Industrial	189	38	31	14	67	118
Construction	1,553	227	53	27	53	1,077
Agricultural	184	29	7	4	7	76
Logging	0	0	0	0	0	0
<u>Marine Vessels</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>
Nonroad Engines and Vehicles	2,458	395	665	288	1,699	1,493
Highway Vehicles	32,716	0				0
<u>Other Area and Point Sources</u>	<u>146,677</u>	<u>0</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>0</u>
All Sources	181,851	NA	NA	NA	NA	NA

Denver CMSA Inventory A (in-use est.)
Emission Inventory Summary - Air Toxics and SOx
Percent of Total Inventory

Equipment Category	% total tpy					
	PM Aldehydes	Benzene	1 3 But	Gas Vap	SOx	
Lawn & Garden	0.10%	NA	NA	NA	NA	NA
Airport Service	0.10%	NA	NA	NA	NA	NA
Recreational	0.04%	NA	NA	NA	NA	NA
Recreational Marine	0.00%	NA	NA	NA	NA	NA
Light Commercial	0.05%	NA	NA	NA	NA	NA
Industrial	0.10%	NA	NA	NA	NA	NA
Construction	0.85%	NA	NA	NA	NA	NA
Agricultural	0.10%	NA	NA	NA	NA	NA
Logging	0.00%	NA	NA	NA	NA	NA
<u>Marine Vessels</u>	<u>0.00%</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>
Nonroad Engines and Vehicles	1.35%	NA	NA	NA	NA	NA
Highway Vehicles	17.99%	NA	NA	NA	NA	NA
<u>Other Area and Point Sources</u>	<u>80.66%</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>
All Sources	100.00%	NA	NA	NA	NA	NA

El Paso MSA Inventory A (in-use est)
Emission Inventory Summary - VOC, NOx, CO

Equipment Category	tpy			tpsd		tpwd
	VOC	NOx	CO	VOC	NOx	CO
Lawn & Garden	2,567	48	16,598	9	0	12
Airport Service	73	470	688	0	1	2
Recreational	542	4	1,985	2	0	3
Recreational Manne	463	20	838	2	0	1
Light Commercial	893	105	12,627	2	0	35
Industrial	390	667	6,436	1	2	18
Construction	495	3,288	3,295	2	12	7
Agrncultural	48	193	351	0	1	0
Logging	0	0	0	0	0	0
<u>Marine Vessels</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>
Nonroad Engines and Vehicles	5,472	4,795	42,818	20	16	77
Highway Vehicles	0	11,156	320,700	36	34	756
<u>Other Area and Point Sources</u>	<u>0</u>	<u>20,382</u>	<u>18,000</u>	<u>60</u>	<u>25</u>	<u>24</u>
All Sources	NA	36,333	381,518	116	75	857

El Paso MSA Inventory A (in-use est)
Emission Inventory Summary - VOC, NOx, CO
Percent of Total Inventory

Equipment Category	% total tpy			% total tpsd		% total tpwd
	VOC	NOx	CO	VOC	NOx	CO
Lawn & Garden	NA	0.13%	4.35%	7.98%	0.24%	1.45%
Airport Service	NA	1.29%	0.18%	0.17%	1.72%	0.22%
Recreational	NA	0.01%	0.52%	1.90%	0.02%	0.30%
Recreational Manne	NA	0.06%	0.22%	2.08%	0.14%	0.07%
Light Commercial	NA	0.29%	3.31%	2.13%	0.39%	4.04%
Industrial	NA	1.84%	1.69%	0.94%	2.44%	2.06%
Construction	NA	9.05%	0.86%	1.55%	15.90%	0.84%
Agricultural	NA	0.53%	0.09%	0.16%	0.96%	0.03%
Logging	NA	0.00%	0.00%	0.00%	0.00%	0.00%
<u>Marine Vessels</u>	<u>NA</u>	<u>0.00%</u>	<u>0.00%</u>	<u>0.00%</u>	<u>0.00%</u>	<u>0.00%</u>
Nonroad Engines and Vehicles	NA	13.20%	11.22%	16.90%	21.81%	9.01%
Highway Vehicles	NA	30.70%	84.06%	31.33%	44.94%	88.15%
<u>Other Area and Point Sources</u>	<u>NA</u>	<u>56.10%</u>	<u>4.72%</u>	<u>51.78%</u>	<u>33.25%</u>	<u>2.84%</u>
All Sources	NA	100.00%	100.00%	100.00%	100.00%	100.00%

El Paso MSA Inventory A (in-use est)
Emission Inventory Summary - Air Toxics and SOx

Equipment Category	% total tpy					
	PM	Aldehydes	Benzene	1,3 But.	Gas Vap	SOx
Lawn & Garden	42	13	74	31	172	12
Airport Service	56	2	2	1	1	31
Recreational	6	2	16	7	13	1
Recreational Marine	1	1	13	6	36	2
Light Commercial	22	6	26	11	81	15
Industrial	68	14	11	5	23	43
Construction	413	61	15	7	13	287
Agricultural	37	6	1	1	1	15
Logging	0	0	0	0	0	0
<u>Marine Vessels</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>
Nonroad Engines and Vehicles	644	104	158	68	340	405
Highway Vehicles	7,278	0				0
<u>Other Area and Point Sources</u>	<u>129,939</u>	<u>0</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>0</u>
All Sources	137,861	NA	NA	NA	NA	NA

El Paso MSA Inventory A (in-use est)
Emission Inventory Summary - Air Toxics and SOx
Percent of Total Inventory

Equipment Category	% total tpy					
	PM	Aldehydes	Benzene	1,3 But.	Gas Vap	SOx
Lawn & Garden	0.03%	NA	NA	NA	NA	NA
Airport Service	0.04%	NA	NA	NA	NA	NA
Recreational	0.00%	NA	NA	NA	NA	NA
Recreational Marine	0.00%	NA	NA	NA	NA	NA
Light Commercial	0.02%	NA	NA	NA	NA	NA
Industrial	0.05%	NA	NA	NA	NA	NA
Construction	0.30%	NA	NA	NA	NA	NA
Agricultural	0.03%	NA	NA	NA	NA	NA
Logging	0.00%	NA	NA	NA	NA	NA
<u>Marine Vessels</u>	<u>0.00%</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>
Nonroad Engines and Vehicles	0.47%	NA	NA	NA	NA	NA
Highway Vehicles	5.28%	NA	NA	NA	NA	NA
<u>Other Area and Point Sources</u>	<u>94.25%</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>
All Sources	100.00%	NA	NA	NA	NA	NA

Hartford NECMA Inventory A (in-use est)
Emission Inventory Summary - VOC, NOx, CO

Equipment Category	tpy			tpsd		tpwd
	VOC	NOx	CO	VOC	NOx	CO
Lawn & Garden	3,813	73	23,219	20	0	9
Airport Service	280	1,800	2,615	1	5	7
Recreational	2,580	19	4,351	2	0	36
Recreational Manne	2,542	130	4,213	18	1	0
Light Commercial	1 079	102	13,676	3	0	37
Industrial	781	1,348	13,049	2	4	36
Construction	638	4,362	4,158	3	21	5
Agricultural	123	499	829	1	3	1
Logging	0	0	0	0	0	0
<u>Marine Vessels</u>	<u>11</u>	<u>260</u>	<u>29</u>	<u>0</u>	<u>1</u>	<u>0</u>
Nonroad Engines and Vehicles	11,846	8,593	66,141	49	34	130
Highway Vehicles	0	29,311	108,380	189	88	590
<u>Other Area and Point Sources</u>	<u>0</u>	<u>11,650</u>	<u>51,997</u>	<u>77</u>	<u>18</u>	<u>210</u>
All Sources	NA	49,554	226,518	314	141	930

Hartford NECMA Inventory A (in-use est)
Emission Inventory Summary - VOC, NOx, CO
Percent of Total Inventory

Equipment Category	% total tpy			% total tpsd		% total tpwd
	VOC	NOx	CO	VOC	NOx	CO
Lawn & Garden	NA	0 15%	10 25%	6 25%	0 28%	0 93%
Airport Service	NA	3 63%	1 15%	0 24%	3 50%	0 77%
Recreational	NA	0 04%	1 92%	0 55%	0 01%	3 82%
Recreational Manne	NA	0 26%	1 86%	5 59%	0 69%	0 05%
Light Commercial	NA	0 21%	6 04%	0 95%	0 20%	4 03%
Industrial	NA	2 72%	5 76%	0 69%	2 63%	3 84%
Construction	NA	8 80%	1 84%	0 96%	14 61%	0 49%
Agricultural	NA	1 01%	0 37%	0 21%	1 94%	0 06%
Logging	NA	0 00%	0 00%	0 00%	0 00%	0 00%
<u>Marne Vessels</u>	<u>NA</u>	<u>0 52%</u>	<u>0 01%</u>	<u>0 01%</u>	<u>0 50%</u>	<u>0 01%</u>
Nonroad Engines and Vehicles	NA	17 34%	29 20%	15 46%	24 37%	14 00%
Highway Vehicles	NA	59 15%	47 85%	60 06%	62 78%	63 42%
<u>Other Area and Point Sources</u>	<u>NA</u>	<u>23 51%</u>	<u>22 95%</u>	<u>24 49%</u>	<u>12 85%</u>	<u>22 57%</u>
All Sources	NA	100 00%	100 00%	100 00%	100 00%	100 00%

Hartford NECMA Inventory A (in-use est)
Emission Inventory Summary - Air Toxics and SOx

Equipment Category	tpy					
	PM	Aldehydes	Benzene	1,3 But	Gas. Vap	SOx
Lawn & Garden	59	18	107	45	330	17
Airport Service	214	9	8	4	5	119
Recreational	50	5	77	33	33	2
Recreational Marine	4	4	62	27	475	10
Light Commercial	24	7	31	13	87	15
Industrial	137	27	22	10	48	86
Construction	552	80	19	10	19	380
Agricultural	96	15	4	2	4	40
Logging	0	0	0	0	0	0
<u>Marine Vessels</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>
Nonroad Engines and Vehicles	1,136	166	330	144	1,002	668
Highway Vehicles	0	0				0
<u>Other Area and Point Sources</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>
All Sources	NA	NA	NA	NA	NA	NA

Hartford NECMA Inventory A (in-use est)
Emission Inventory Summary - Air Toxics and SOx
Percent of Total Inventory

Equipment Category	% total tpy					
	PM	Aldehydes	Benzene	1,3 But.	Gas. Vap	SOx
Lawn & Garden	NA	NA	NA	NA	NA	NA
Airport Service	NA	NA	NA	NA	NA	NA
Recreational	NA	NA	NA	NA	NA	NA
Recreational Marine	NA	NA	NA	NA	NA	NA
Light Commercial	NA	NA	NA	NA	NA	NA
Industrial	NA	NA	NA	NA	NA	NA
Construction	NA	NA	NA	NA	NA	NA
Agricultural	NA	NA	NA	NA	NA	NA
Logging	NA	NA	NA	NA	NA	NA
<u>Marine Vessels</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>
Nonroad Engines and Vehicles	NA	NA	NA	NA	NA	NA
Highway Vehicles	NA	NA	NA	NA	NA	NA
<u>Other Area and Point Sources</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>
All Sources	NA	NA	NA	NA	NA	NA

Houston CMSA Inventory A (in-use est)
Emission Inventory Summary - VOC, NOx, CO

Equipment Category	tpy			tpsd		tpwd CO
	VOC	NOx	CO	VOC	NOx	
Lawn & Garden	31,683	588	204,846	114	2	153
Airport Service	425	2,739	3,982	1	8	11
Recreational	1,759	12	6,446	7	0	8
Recreational Marine	21,144	1,044	38,621	110	5	30
Light Commercial	8,050	949	113,871	22	3	312
Industrial	1,842	3,151	30,386	5	9	83
Construction	5,812	38,629	38,708	21	140	85
Agricultural	831	3,320	6,032	3	12	4
Logging	89	255	592	0	1	2
Marine Vessels	631	12,227	1,709	2	33	5
Nonroad Engines and Vehicles	72,265	62,914	445,192	286	213	693
Highway Vehicles	0	100,865	0	442	304	0
<u>Other Area and Point Sources</u>	<u>0</u>	<u>440,925</u>	<u>0</u>	<u>1,391</u>	<u>859</u>	<u>0</u>
All Sources	NA	604,704	NA	2,119	1,376	NA

Houston CMSA Inventory A (in-use est)
Emission Inventory Summary - VOC, NOx, CO
Percent of Total Inventory

Equipment Category	% total tpy			% total tpsd		% total tpwd CO
	VOC	NOx	CO	VOC	NOx	
Lawn & Garden	NA	0.10%	NA	5.38%	0.16%	NA
Airport Service	NA	0.45%	NA	0.06%	0.55%	NA
Recreational	NA	0.00%	NA	0.34%	0.00%	NA
Recreational Marine	NA	0.17%	NA	5.18%	0.40%	NA
Light Commercial	NA	0.16%	NA	1.05%	0.19%	NA
Industrial	NA	0.52%	NA	0.24%	0.63%	NA
Construction	NA	6.39%	NA	0.99%	10.15%	NA
Agricultural	NA	0.55%	NA	0.15%	0.90%	NA
Logging	NA	0.04%	NA	0.01%	0.05%	NA
Marine Vessels	NA	2.02%	NA	0.08%	2.43%	NA
Nonroad Engines and Vehicles	NA	10.40%	NA	13.48%	15.46%	NA
Highway Vehicles	NA	16.68%	NA	20.88%	22.09%	NA
<u>Other Area and Point Sources</u>	<u>NA</u>	<u>72.92%</u>	<u>NA</u>	<u>65.64%</u>	<u>62.45%</u>	<u>NA</u>
All Sources	NA	100.00%	NA	100.00%	100.00%	NA

Houston CMSA Inventory A (in-use est)
Emission Inventory Summary - Air Toxics and SOx

Equipment Category	tpy					
	PM	Aldehydes	Benzene	1,3 But	Gas Vap	SOx
Lawn & Garden	523	156	912	385	2,118	142
Airport Service	326	14	13	6	7	181
Recreational	18	6	52	22	43	2
Recreational Marine	29	30	583	252	1,779	85
Light Commercial	198	58	230	95	733	139
Industrial	321	64	53	23	106	201
Construction	4,851	713	171	87	159	3,370
Agricultural	639	102	24	12	20	266
Logging	37	5	3	1	5	21
<u>Marine Vessels</u>	<u>731</u>	<u>0</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>5,075</u>
Nonroad Engines and Vehicles	7,673	1,149	2,041	884	4,971	9,483
Highway Vehicles	0	0	—	—	—	0
<u>Other Area and Point Sources</u>	<u>0</u>	<u>0</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>0</u>
All Sources	NA	NA	NA	NA	NA	NA

Houston CMSA Inventory A (in-use est)
Emission Inventory Summary - Air Toxics and SOx
Percent of Total Inventory

Equipment Category	% total tpy					
	PM	Aldehydes	Benzene	1,3 But	Gas Vap	SOx
Lawn & Garden	NA	NA	NA	NA	NA	NA
Airport Service	NA	NA	NA	NA	NA	NA
Recreational	NA	NA	NA	NA	NA	NA
Recreational Marine	NA	NA	NA	NA	NA	NA
Light Commercial	NA	NA	NA	NA	NA	NA
Industrial	NA	NA	NA	NA	NA	NA
Construction	NA	NA	NA	NA	NA	NA
Agricultural	NA	NA	NA	NA	NA	NA
Logging	NA	NA	NA	NA	NA	NA
<u>Marine Vessels</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>
Nonroad Engines and Vehicles	NA	NA	NA	NA	NA	NA
Highway Vehicles	NA	NA	NA	NA	NA	NA
<u>Other Area and Point Sources</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>
All Sources	NA	NA	NA	NA	NA	NA

Miami CMSA Inventory A (in-use est)
Emission Inventory Summary - VOC, NOx, CO

Equipment Category	tpy			tpsd		tpwd CO
	VOC	NOx	CO	VOC	NOx	
Lawn & Garden	16,716	320	108,577	60	1	81
Airport Service	192	1,239	1,794	1	3	5
Recreational	1,231	8	4,552	5	0	8
Recreational Marine	13,708	845	25,800	71	4	20
Light Commercial	2,668	304	37,469	7	1	103
Industrial	1,023	1,744	16,847	3	5	46
Construction	1,736	11,631	11,507	6	42	25
Agricultural	211	841	1,513	1	3	1
Logging	0	0	0	0	0	0
<u>Marine Vessels</u>	<u>0</u>	<u>1,310</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>
Nonroad Engines and Vehicles	37,484	18,243	208,060	154	60	290
Highway Vehicles	0	63,266	0	307	191	0
<u>Other Area and Point Sources</u>	<u>0</u>	<u>35,464</u>	<u>0</u>	<u>235</u>	<u>97</u>	<u>0</u>
All Sources	NA	116,973	NA	696	348	NA

Miami CMSA Inventory A (in-use est)
Emission Inventory Summary - VOC, NOx, CO
Percent of Total Inventory

Equipment Category	% total tpy			% total tpsd		% total tpwd CO
	VOC	NOx	CO	VOC	NOx	
Lawn & Garden	NA	0.27%	NA	8.65%	0.34%	NA
Airport Service	NA	1.06%	NA	0.08%	0.98%	NA
Recreational	NA	0.01%	NA	0.68%	0.01%	NA
Recreational Marine	NA	0.72%	NA	10.22%	1.28%	NA
Light Commercial	NA	0.26%	NA	1.06%	0.24%	NA
Industrial	NA	1.49%	NA	0.41%	1.37%	NA
Construction	NA	9.94%	NA	0.90%	12.10%	NA
Agricultural	NA	0.72%	NA	0.11%	0.90%	NA
Logging	NA	0.00%	NA	0.00%	0.00%	NA
<u>Marine Vessels</u>	<u>NA</u>	<u>1.12%</u>	<u>NA</u>	<u>0.00%</u>	<u>0.00%</u>	<u>NA</u>
Nonroad Engines and Vehicles	NA	15.60%	NA	22.11%	17.22%	NA
Highway Vehicles	NA	54.09%	NA	44.11%	54.84%	NA
<u>Other Area and Point Sources</u>	<u>NA</u>	<u>30.32%</u>	<u>NA</u>	<u>33.78%</u>	<u>27.94%</u>	<u>NA</u>
All Sources	NA	100.00%	NA	100.00%	100.00%	NA

Miami CMSA Inventory A (in-use est)
Emission Inventory Summary - Air Toxics and SOx

Equipment Category	tpy					
	PM	Aldehydes	Benzene	1.3 But	Gas Vap	SOx
Lawn & Garden	270	83	482	203	1,104	76
Airport Service	148	6	6	3	3	82
Recreational	13	4	36	16	29	2
Recreational Marine	24	25	375	162	1,265	61
Light Commercial	64	19	76	32	247	45
Industrial	178	35	29	13	61	111
Construction	1,454	213	51	26	48	1,014
Agricultural	162	26	6	3	5	67
Logging	0	0	0	0	0	0
<u>Marine Vessels</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>
Nonroad Engines and Vehicles	2,312	411	1,061	457	2,763	1,458
Highway Vehicles	0	0				0
<u>Other Area and Point Sources</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>
All Sources	NA	NA	NA	NA	NA	NA

Miami CMSA Inventory A (in-use est)
Emission Inventory Summary - Air Toxics and SOx
Percent of Total Inventory

Equipment Category	% total tpy					
	PM	Aldehydes	Benzene	1.3 But	Gas Vap	SOx
Lawn & Garden	NA	NA	NA	NA	NA	NA
Airport Service	NA	NA	NA	NA	NA	NA
Recreational	NA	NA	NA	NA	NA	NA
Recreational Marine	NA	NA	NA	NA	NA	NA
Light Commercial	NA	NA	NA	NA	NA	NA
Industrial	NA	NA	NA	NA	NA	NA
Construction	NA	NA	NA	NA	NA	NA
Agricultural	NA	NA	NA	NA	NA	NA
Logging	NA	NA	NA	NA	NA	NA
<u>Marine Vessels</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>
Nonroad Engines and Vehicles	NA	NA	NA	NA	NA	NA
Highway Vehicles	NA	NA	NA	NA	NA	NA
<u>Other Area and Point Sources</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>
All Sources	NA	NA	NA	NA	NA	NA

Milwaukee CMSA Inventory A (in-use est)
Emission Inventory Summary - VOC, NOx, CO

Equipment Category	tpy			tpsd		tpwd CO
	VOC	NOx	CO	VOC	NOx	
Lawn & Garden	4,283	81	26,019	22	0	10
Airport Service	184	1,182	1,715	1	3	5
Recreational	1,507	11	2,541	1	0	20
Recreational Marine	6,224	163	10,224	46	1	0
Light Commercial	1,330	126	16,857	4	0	46
Industrial	931	1,604	15,553	3	4	43
Construction	609	4,164	3,966	3	20	4
Agricultural	406	1,639	2,718	2	9	2
Logging	0	0	0	0	0	0
<u>Marine Vessels</u>	<u>0</u>	<u>398</u>	<u>0</u>	<u>0</u>	<u>1</u>	<u>0</u>
Nonroad Engines and Vehicles	15,473	9,369	79,592	80	39	130
Highway Vehicles	0	33,493	0	106	101	0
<u>Other Area and Point Sources</u>	<u>0</u>	<u>39,621</u>	<u>0</u>	<u>195</u>	<u>109</u>	<u>0</u>
All Sources	NA	82,483	NA	381	249	NA

Milwaukee CMSA Inventory A (in-use est)
Emission Inventory Summary - VOC, NOx, CO
Percent of Total Inventory

Equipment Category	% total tpy			% total tpsd		% total tpwd CO
	VOC	NOx	CO	VOC	NOx	
Lawn & Garden	NA	0.10%	NA	5.78%	0.18%	NA
Airport Service	NA	1.43%	NA	0.13%	1.30%	NA
Recreational	NA	0.01%	NA	0.27%	0.00%	NA
Recreational Marine	NA	0.20%	NA	11.96%	0.50%	NA
Light Commercial	NA	0.15%	NA	0.96%	0.14%	NA
Industrial	NA	1.94%	NA	0.68%	1.77%	NA
Construction	NA	5.05%	NA	0.75%	7.88%	NA
Agricultural	NA	1.99%	NA	0.58%	3.61%	NA
Logging	NA	0.00%	NA	0.00%	0.00%	NA
<u>Marine Vessels</u>	<u>NA</u>	<u>0.48%</u>	<u>NA</u>	<u>0.00%</u>	<u>0.44%</u>	<u>NA</u>
Nonroad Engines and Vehicles	NA	11.36%	NA	21.11%	15.82%	NA
Highway Vehicles	NA	40.61%	NA	27.73%	40.56%	NA
<u>Other Area and Point Sources</u>	<u>NA</u>	<u>48.04%</u>	<u>NA</u>	<u>51.16%</u>	<u>43.62%</u>	<u>NA</u>
All Sources	NA	100.00%	NA	100.00%	100.00%	NA

Milwaukee CMSA Inventory A (in-use est)
Emission Inventory Summary - Air Toxics and SOx

Equipment Category	tpy					
	PM	Aldehydes	Benzene	1,3 But	Gas Vap	SOx
Lawn & Garden	66	20	120	51	378	19
Airport Service	141	6	5	3	3	78
Recreational	29	3	45	19	20	1
Recreational Marine	4	5	166	72	715	19
Light Commercial	30	9	38	16	107	19
Industrial	163	32	27	12	59	102
Construction	527	77	18	9	19	362
Agricultural	316	50	12	6	15	130
Logging	0	0	0	0	0	0
<u>Marine Vessels</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>
Nonroad Engines and Vehicles	1,276	202	431	187	1,317	732
Highway Vehicles	0	0				0
<u>Other Area and Point Sources</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>
All Sources	NA	NA	NA	NA	NA	NA

Milwaukee CMSA Inventory A (in-use est)
Emission Inventory Summary - Air Toxics and SOx
Percent of Total Inventory

Equipment Category	% total tpy					
	PM	Aldehydes	Benzene	1,3 But	Gas Vap	SOx
Lawn & Garden	NA	NA	NA	NA	NA	NA
Airport Service	NA	NA	NA	NA	NA	NA
Recreational	NA	NA	NA	NA	NA	NA
Recreational Marine	NA	NA	NA	NA	NA	NA
Light Commercial	NA	NA	NA	NA	NA	NA
Industrial	NA	NA	NA	NA	NA	NA
Construction	NA	NA	NA	NA	NA	NA
Agricultural	NA	NA	NA	NA	NA	NA
Logging	NA	NA	NA	NA	NA	NA
<u>Marine Vessels</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>
Nonroad Engines and Vehicles	NA	NA	NA	NA	NA	NA
Highway Vehicles	NA	NA	NA	NA	NA	NA
<u>Other Area and Point Sources</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>
All Sources	NA	NA	NA	NA	NA	NA

Minneapolis MSA Inventory A (in-use est)
Emission Inventory Summary - VOC NOx CO

Equipment Category	tpy			tpsd		tpwd CO
	VOC	NOx	CO	VOC	NOx	
Lawn & Garden	6,475	123	39,328	33	1	15
Airport Service	284	1,825	2,653	1	5	7
Recreational	2,212	16	3,730	1	0	30
Recreational Marine	28,057	601	46,339	207	5	0
Light Commercial	2,440	231	30,932	7	1	85
Industrial	1,452	2,503	24,262	4	7	66
Construction	1,316	8,998	8,570	6	42	9
Agricultural	1,153	4,661	7,729	6	26	5
Logging	0	0	0	0	0	0
<u>Marine Vessels</u>	<u>0</u>	<u>0</u>	<u>28</u>	<u>0</u>	<u>0</u>	<u>0</u>
Nonroad Engines and Vehicles	43,389	18,957	163,570	266	86	217
Highway Vehicles	0	0	419,140	0	0	2,422
<u>Other Area and Point Sources</u>	<u>0</u>	<u>63,307</u>	<u>125,911</u>	<u>0</u>	<u>173</u>	<u>357</u>
All Sources	NA	NA	708,621	NA	NA	2,996

Minneapolis MSA Inventory A (in-use est)
Emission Inventory Summary - VOC NOx, CO
Percent of Total Inventory

Equipment Category	% total tpy			% total tpsd		% total tpwd CO
	VOC	NOx	CO	VOC	NOx	
Lawn & Garden	NA	NA	5.55%	NA	NA	0.49%
Airport Service	NA	NA	0.37%	NA	NA	0.24%
Recreational	NA	NA	0.53%	NA	NA	0.99%
Recreational Marine	NA	NA	6.54%	NA	NA	0.00%
Light Commercial	NA	NA	4.37%	NA	NA	2.83%
Industrial	NA	NA	3.42%	NA	NA	2.22%
Construction	NA	NA	1.21%	NA	NA	0.31%
Agricultural	NA	NA	1.09%	NA	NA	0.17%
Logging	NA	NA	0.00%	NA	NA	0.00%
<u>Marine Vessels</u>	<u>NA</u>	<u>NA</u>	<u>0.00%</u>	<u>NA</u>	<u>NA</u>	<u>0.00%</u>
Nonroad Engines and Vehicles	NA	NA	23.08%	NA	NA	7.26%
Highway Vehicles	NA	NA	59.15%	NA	NA	80.84%
<u>Other Area and Point Sources</u>	<u>NA</u>	<u>NA</u>	<u>17.77%</u>	<u>NA</u>	<u>NA</u>	<u>11.91%</u>
All Sources	NA	NA	100.00%	NA	NA	100.00%

Minneapolis MSA Inventory A (in-use est)
Emission Inventory Summary - Air Toxics and SOx

Equipment Category	tpy					
	PM	Aldehydes	Benzene	1,3 But	Gas Vap	SOx
Lawn & Garden	99	30	182	77	572	28
Airport Service	217	9	8	4	5	121
Recreational	43	4	66	28	29	2
Recreational Marine	15	16	765	331	2,617	84
Light Commercial	55	17	70	29	197	35
Industrial	254	51	42	18	92	160
Construction	1,139	166	39	20	41	783
Agricultural	899	143	33	17	43	371
Logging	0	0	0	0	0	0
<u>Marine Vessels</u>	<u>8</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>
Nonroad Engines and Vehicles	2,731	437	1,205	524	3,595	1,584
Highway Vehicles	42,282	0				0
<u>Other Area and Point Sources</u>	<u>214,398</u>	<u>0</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>0</u>
All Sources	259,411	NA	NA	NA	NA	NA

Minneapolis MSA Inventory A (in-use est)
Emission Inventory Summary - Air Toxics and SOx
Percent of Total Inventory

Equipment Category	% total tpy					
	PM	Aldehydes	Benzene	1,3 But	Gas Vap	SOx
Lawn & Garden	0.04%	NA	NA	NA	NA	NA
Airport Service	0.08%	NA	NA	NA	NA	NA
Recreational	0.02%	NA	NA	NA	NA	NA
Recreational Marine	0.01%	NA	NA	NA	NA	NA
Light Commercial	0.02%	NA	NA	NA	NA	NA
Industrial	0.10%	NA	NA	NA	NA	NA
Construction	0.44%	NA	NA	NA	NA	NA
Agricultural	0.35%	NA	NA	NA	NA	NA
Logging	0.00%	NA	NA	NA	NA	NA
<u>Marine Vessels</u>	<u>0.00%</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>
Nonroad Engines and Vehicles	1.05%	NA	NA	NA	NA	NA
Highway Vehicles	16.30%	NA	NA	NA	NA	NA
<u>Other Area and Point Sources</u>	<u>82.65%</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>
All Sources	100.00%	NA	NA	NA	NA	NA

New York NECMA Inventory A (in-use est)
Emission Inventory Summary - VOC NOx, CO

Equipment Category	tpy			tpsd		tpwd
	VOC	NOx	CO	VOC	NOx	CO
Lawn & Garden	46,813	894	285,068	241	5	106
Airport Service	593	3,818	5,539	2	10	15
Recreational	11,148	82	18,799	7	0	152
Recreational Manne	42,174	2,459	70,082	288	18	8
Light Commercial	20,915	1,976	265,184	58	5	727
Industrial	8,476	14,638	141,691	24	40	388
Construction	8,251	56,417	53,779	39	266	59
Agricultural	720	2,911	4,837	4	16	3
Logging	0	0	0	0	0	0
<u>Marine Vessels</u>	<u>789</u>	<u>12,991</u>	<u>2,458</u>	<u>2</u>	<u>36</u>	<u>7</u>
Nonroad Engines and Vehicles	139,878	96,188	847,438	663	397	1,465
Highway Vehicles	0	317,257	3,129,400	1,114	956	7,373
<u>Other Area and Point Sources</u>	<u>0</u>	<u>232,882</u>	<u>546,500</u>	<u>1,578</u>	<u>638</u>	<u>804</u>
All Sources	NA	646,327	4,523,338	3,356	1,991	9,642

New York NECMA Inventory A (in-use est)
Emission Inventory Summary - VOC, NOx, CO
Percent of Total Inventory

Equipment Category	% total tpy			% total tpsd		% total tpwd
	VOC	NOx	CO	VOC	NOx	CO
Lawn & Garden	NA	0.14%	6.30%	7.17%	0.24%	1.10%
Airport Service	NA	0.59%	0.12%	0.05%	0.53%	0.16%
Recreational	NA	0.01%	0.42%	0.21%	0.00%	1.58%
Recreational Manne	NA	0.38%	1.55%	8.58%	0.92%	0.08%
Light Commercial	NA	0.31%	5.86%	1.72%	0.27%	7.53%
Industrial	NA	2.26%	3.13%	0.70%	2.01%	4.03%
Construction	NA	8.73%	1.19%	1.16%	13.35%	0.61%
Agricultural	NA	0.45%	0.11%	0.12%	0.80%	0.03%
Logging	NA	0.00%	0.00%	0.00%	0.00%	0.00%
<u>Marine Vessels</u>	<u>NA</u>	<u>2.01%</u>	<u>0.05%</u>	<u>0.06%</u>	<u>1.79%</u>	<u>0.07%</u>
Nonroad Engines and Vehicles	NA	14.88%	18.73%	19.77%	19.92%	15.19%
Highway Vehicles	NA	49.09%	69.18%	33.20%	48.03%	76.47%
<u>Other Area and Point Sources</u>	<u>NA</u>	<u>36.03%</u>	<u>12.08%</u>	<u>47.03%</u>	<u>32.05%</u>	<u>8.34%</u>
All Sources	NA	100.00%	100.00%	100.00%	100.00%	100.00%

New York NECMA Inventory A (in-use est)
Emission Inventory Summary - Air Toxics and SOx

Equipment Category	tpy					
	PM	Aldehydes	Benzene	1,3 But	Gas Vap.	SOx
Lawn & Garden	719	220	1,318	556	4,054	207
Airport Service	455	19	18	9	11	252
Recreational	217	22	331	143	143	8
Recreational Marine	70	72	1,002	433	8,910	170
Light Commercial	473	142	602	251	1,677	297
Industrial	1,486	296	243	107	526	934
Construction	7,140	1,041	242	123	252	4,912
Agricultural	561	90	21	11	26	232
Logging	0	0	0	0	0	0
<u>Marine Vessels</u>	<u>620</u>	<u>0</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>4,240</u>
Nonroad Engines and Vehicles	11,742	1,902	3,776	1,633	15,599	11,252
Highway Vehicles	232,769	0	—	—	—	0
<u>Other Area and Point Sources</u>	<u>119,873</u>	<u>0</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>0</u>
All Sources	364,384	NA	NA	NA	NA	NA

New York NECMA Inventory A (in-use est)
Emission Inventory Summary - Air Toxics and SOx
Percent of Total Inventory

Equipment Category	% total tpy					
	PM	Aldehydes	Benzene	1,3 But.	Gas. Vap.	SOx
Lawn & Garden	0.20%	NA	NA	NA	NA	NA
Airport Service	0.12%	NA	NA	NA	NA	NA
Recreational	0.06%	NA	NA	NA	NA	NA
Recreational Marine	0.02%	NA	NA	NA	NA	NA
Light Commercial	0.13%	NA	NA	NA	NA	NA
Industrial	0.41%	NA	NA	NA	NA	NA
Construction	1.96%	NA	NA	NA	NA	NA
Agricultural	0.15%	NA	NA	NA	NA	NA
Logging	0.00%	NA	NA	NA	NA	NA
<u>Marine Vessels</u>	<u>0.17%</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>
Nonroad Engines and Vehicles	3.22%	NA	NA	NA	NA	NA
Highway Vehicles	63.88%	NA	NA	NA	NA	NA
<u>Other Area and Point Sources</u>	<u>32.90%</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>
All Sources	100.00%	NA	NA	NA	NA	NA

Philadelphia MSA Inventory A (in-use est)
Emission Inventory Summary - VOC, NOx, CO

Equipment Category	tpy			tpsd		tpwd
	VOC	NOx	CO	VOC	NOx	CO
Lawn & Garden	29,273	555	185,344	117	2	114
Airport Service	301	1,936	2,812	1	5	8
Recreational	2,785	20	5,290	3	0	35
Recreational Marine	16,646	895	29,955	101	6	7
Light Commercial	5,172	535	68,838	14	1	189
Industrial	2,711	4,651	44,972	8	13	123
Construction	3,028	20,460	19,932	13	85	33
Agricultural	1,017	4,085	7,130	4	18	5
Logging	0	0	0	0	0	0
<u>Marine Vessels</u>	<u>494</u>	<u>9,181</u>	<u>1,377</u>	<u>1</u>	<u>25</u>	<u>4</u>
Nonroad Engines and Vehicles	61,428	42,319	365,649	262	156	517
Highway Vehicles	0	123,720	568,888	432	373	0
<u>Other Area and Point Sources</u>	<u>0</u>	<u>137,579</u>	<u>178,772</u>	<u>911</u>	<u>377</u>	<u>0</u>
All Sources	NA	303,618	1,113,309	1,605	906	NA

Philadelphia MSA Inventory A (in-use est)
Emission Inventory Summary - VOC, NOx, CO
Percent of Total Inventory

Equipment Category	% total tpy			% total tpsd		% total tpwd
	VOC	NOx	CO	VOC	NOx	CO
Lawn & Garden	NA	0.18%	16.65%	7.32%	0.27%	NA
Airport Service	NA	0.64%	0.25%	0.05%	0.59%	NA
Recreational	NA	0.01%	0.48%	0.18%	0.00%	NA
Recreational Marine	NA	0.29%	2.69%	6.27%	0.62%	NA
Light Commercial	NA	0.18%	6.18%	0.89%	0.16%	NA
Industrial	NA	1.53%	4.04%	0.47%	1.41%	NA
Construction	NA	6.74%	1.79%	0.79%	9.41%	NA
Agricultural	NA	1.35%	0.64%	0.28%	1.98%	NA
Logging	NA	0.00%	0.00%	0.00%	0.00%	NA
<u>Marine Vessels</u>	<u>NA</u>	<u>3.02%</u>	<u>0.12%</u>	<u>0.08%</u>	<u>2.78%</u>	<u>NA</u>
Nonroad Engines and Vehicles	NA	13.94%	32.84%	16.33%	17.20%	NA
Highway Vehicles	NA	40.75%	51.10%	26.89%	41.17%	NA
<u>Other Area and Point Sources</u>	<u>NA</u>	<u>45.31%</u>	<u>16.06%</u>	<u>56.77%</u>	<u>41.62%</u>	<u>NA</u>
All Sources	NA	100.00%	100.00%	100.00%	100.00%	NA

Philadelphia MSA Inventory A (in-use est)
Emission Inventory Summary - Air Toxics and SOx

Equipment Category	tpy					
	PM	Aldehydes	Benzene	1,3 But	Gas Vap	SOx
Lawn & Garden	467	142	836	353	2,161	131
Airport Service	230	10	9	4	5	128
Recreational	52	6	82	36	43	2
Recreational Marine	25	26	444	192	1,910	68
Light Commercial	121	36	148	62	444	79
Industrial	473	94	78	34	164	297
Construction	2,571	376	89	45	87	1,783
Agricultural	787	126	30	15	30	326
Logging	0	0	0	0	0	0
<u>Marine Vessels</u>	<u>553</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>4,366</u>
Nonroad Engines and Vehicles	5,279	816	1,716	741	4,845	7,182
Highway Vehicles	0	0				0
<u>Other Area and Point Sources</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>
All Sources	NA	NA	NA	NA	NA	NA

Philadelphia MSA Inventory A (in-use est)
Emission Inventory Summary - Air Toxics and SOx
Percent of Total Inventory

Equipment Category	% total tpy					
	PM	Aldehydes	Benzene	1,3 But	Gas Vap	SOx
Lawn & Garden	NA	NA	NA	NA	NA	NA
Airport Service	NA	NA	NA	NA	NA	NA
Recreational	NA	NA	NA	NA	NA	NA
Recreational Marine	NA	NA	NA	NA	NA	NA
Light Commercial	NA	NA	NA	NA	NA	NA
Industrial	NA	NA	NA	NA	NA	NA
Construction	NA	NA	NA	NA	NA	NA
Agricultural	NA	NA	NA	NA	NA	NA
Logging	NA	NA	NA	NA	NA	NA
<u>Marine Vessels</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>
Nonroad Engines and Vehicles	NA	NA	NA	NA	NA	NA
Highway Vehicles	NA	NA	NA	NA	NA	NA
<u>Other Area and Point Sources</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>
All Sources	NA	NA	NA	NA	NA	NA

Provo-Orem MSA Inventory A (in-use est)
Emission Inventory Summary - VOC, NOx, CO

Equipment Category	tpy			tpsd		tpwd
	VOC	NOx	CO	VOC	NOx	CO
Lawn & Garden	1,726	33	10,558	9	0	3
Airport Service	0	0	0	0	0	0
Recreational	792	6	1,407	1	0	10
Recreational Marine	97	9	175	1	0	0
Light Commercial	135	14	1,795	0	0	5
Industrial	74	127	1,233	0	0	3
Construction	90	611	593	0	3	1
Agricultural	122	493	850	1	3	1
Logging	0	0	0	0	0	0
<u>Marine Vessels</u>	<u>0</u>	<u>0</u>	<u>315</u>	<u>0</u>	<u>0</u>	<u>0</u>
Nonroad Engines and Vehicles	3,038	1,293	16,927	12	6	22
Highway Vehicles	0	0	73,804	0	0	440
<u>Other Area and Point Sources</u>	<u>0</u>	<u>0</u>	<u>38,273</u>	<u>0</u>	<u>0</u>	<u>38</u>
All Sources	NA	NA	129,004	NA	NA	501

Provo-Orem MSA Inventory A (in-use est)
Emission Inventory Summary - VOC, NOx, CO

Percent of Total Inventory

Equipment Category	% total tpy			% total tpsd		% total tpwd
	VOC	NOx	CO	VOC	NOx	CO
Lawn & Garden	NA	NA	8.18%	NA	NA	0.52%
Airport Service	NA	NA	0.00%	NA	NA	0.00%
Recreational	NA	NA	1.09%	NA	NA	2.06%
Recreational Marine	NA	NA	0.14%	NA	NA	0.00%
Light Commercial	NA	NA	1.39%	NA	NA	0.98%
Industrial	NA	NA	0.96%	NA	NA	0.67%
Construction	NA	NA	0.46%	NA	NA	0.13%
Agricultural	NA	NA	0.66%	NA	NA	0.11%
Logging	NA	NA	0.00%	NA	NA	0.00%
<u>Marine Vessels</u>	<u>NA</u>	<u>NA</u>	<u>0.24%</u>	<u>NA</u>	<u>NA</u>	<u>0.00%</u>
Nonroad Engines and Vehicles	NA	NA	13.12%	NA	NA	4.48%
Highway Vehicles	NA	NA	57.21%	NA	NA	87.86%
<u>Other Area and Point Sources</u>	<u>NA</u>	<u>NA</u>	<u>29.67%</u>	<u>NA</u>	<u>NA</u>	<u>7.66%</u>
All Sources	NA	NA	100.00%	NA	NA	100.00%

Provo-Orem MSA Inventory A (in-use est)
Emission Inventory Summary - Air Toxics and SOx

Equipment Category	tpy					
	PM	Aldehydes	Benzene	1,3 But.	Gas Vap	SOx
Lawn & Garden	26	8	49	21	135	8
Airport Service	0	0	0	0	0	0
Recreational	15	2	23	10	11	1
Recreational Manne	0	0	2	1	23	0
Light Commercial	3	1	4	2	12	2
Industrial	13	3	2	1	5	8
Construction	77	11	3	1	3	53
Agricultural	95	15	4	2	4	39
Logging	0	0	0	0	0	0
<u>Marine Vessels</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>
Nonroad Engines and Vehicles	229	40	87	38	192	111
Highway Vehicles	3,668	0				0
<u>Other Area and Point Sources</u>	<u>45,615</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>
All Sources	49,512	NA	NA	NA	NA	NA

Provo-Orem MSA Inventory A (in-use est)
Emission Inventory Summary - Air Toxics and SOx
Percent of Total Inventory

Equipment Category	% total tpy					
	PM	Aldehydes	Benzene	1,3 But	Gas Vap	SOx
Lawn & Garden	0.05%	NA	NA	NA	NA	NA
Airport Service	0.00%	NA	NA	NA	NA	NA
Recreational	0.03%	NA	NA	NA	NA	NA
Recreational Manne	0.00%	NA	NA	NA	NA	NA
Light Commercial	0.01%	NA	NA	NA	NA	NA
Industrial	0.03%	NA	NA	NA	NA	NA
Construction	0.16%	NA	NA	NA	NA	NA
Agricultural	0.19%	NA	NA	NA	NA	NA
Logging	0.00%	NA	NA	NA	NA	NA
<u>Marine Vessels</u>	<u>0.00%</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>
Nonroad Engines and Vehicles	0.46%	NA	NA	NA	NA	NA
Highway Vehicles	7.41%	NA	NA	NA	NA	NA
<u>Other Area and Point Sources</u>	<u>92.13%</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>
All Sources	100.00%	NA	NA	NA	NA	NA

Saint Louis MSA Inventory A (in-use est.)
Emission Inventory Summary - VOC, NOx, CO

Equipment Category	tpy			tpsd		tpwd
	VOC	NOx	CO	VOC	NOx	CO
Lawn & Garden	7,346	139	44,617	38	1	17
Airport Service	205	1,321	1,921	1	4	5
Recreational	1,976	14	3,332	1	0	27
Recreational Marine	6,951	206	11,461	51	2	0
Light Commercial	2,157	204	27,341	6	1	75
Industrial	1,398	2,409	23,356	4	7	64
Construction	1,417	9,686	9,226	7	46	10
Agricultural	954	3,853	6,390	5	21	4
Logging	0	0	0	0	0	0
<u>Marine Vessels</u>	<u>0</u>	<u>1,820</u>	<u>0</u>	<u>0</u>	<u>5</u>	<u>0</u>
Nonroad Engines and Vehicles	22,404	19,653	127,642	112	85	202
Highway Vehicles	0	62,039	0	208	187	1,710
<u>Other Area and Point Sources</u>	<u>0</u>	<u>158,510</u>	<u>0</u>	<u>360</u>	<u>434</u>	<u>441</u>
All Sources	NA	240,202	NA	680	706	2,352

Saint Louis MSA Inventory A (in-use est.)
Emission Inventory Summary - VOC, NOx, CO
Percent of Total Inventory

Equipment Category	% total tpy			% total tpsd		% total tpwd
	VOC	NOx	CO	VOC	NOx	CO
Lawn & Garden	NA	0.06%	NA	5.55%	0.11%	0.71%
Airport Service	NA	0.55%	NA	0.08%	0.51%	0.22%
Recreational	NA	0.01%	NA	0.20%	0.00%	1.13%
Recreational Marine	NA	0.09%	NA	7.46%	0.22%	0.00%
Light Commercial	NA	0.08%	NA	0.88%	0.08%	3.18%
Industrial	NA	1.00%	NA	0.57%	0.93%	2.72%
Construction	NA	4.03%	NA	0.98%	6.46%	0.43%
Agricultural	NA	1.60%	NA	0.76%	2.99%	0.18%
Logging	NA	0.00%	NA	0.00%	0.00%	0.00%
<u>Marine Vessels</u>	<u>NA</u>	<u>0.76%</u>	<u>NA</u>	<u>0.00%</u>	<u>0.71%</u>	<u>0.00%</u>
Nonroad Engines and Vehicles	NA	8.18%	NA	16.49%	12.02%	8.57%
Highway Vehicles	NA	25.83%	NA	30.55%	26.48%	72.68%
<u>Other Area and Point Sources</u>	<u>NA</u>	<u>65.99%</u>	<u>NA</u>	<u>52.96%</u>	<u>61.50%</u>	<u>18.75%</u>
All Sources	NA	100.00%	NA	100.00%	100.00%	100.00%

Saint Louis MSA Inventory A (in-use est)
Emission Inventory Summary - Air Toxics and SOx

Equipment Category	tpy					
	PM	Aldehydes	Benzene	1,3 But	Gas. Vap.	SOx
Lawn & Garden	113	34	206	87	649	32
Airport Service	157	7	6	3	4	87
Recreational	39	4	59	25	26	1
Recreational Marine	6	6	183	79	853	22
Light Commercial	49	15	62	26	174	31
Industrial	244	49	40	18	88	154
Construction	1,226	179	42	21	44	843
Agricultural	743	118	28	14	35	307
Logging	0	0	0	0	0	0
<u>Marine Vessels</u>	<u>184</u>	<u>0</u>				<u>0</u>
Nonroad Engines and Vehicles	2,761	411	626	274	1,874	1,478
Highway Vehicles	38,099	0				0
<u>Other Area and Point Sources</u>	<u>89,636</u>	<u>0</u>				<u>0</u>
All Sources	130,496	NA	NA	NA	NA	NA

Saint Louis MSA Inventory A (in-use est)
Emission Inventory Summary - Air Toxics and SOx
Percent of Total Inventory

Equipment Category	% total tpy					
	PM	Aldehydes	Benzene	1,3 But	Gas. Vap	SOx
Lawn & Garden	0.09%	NA	NA	NA	NA	NA
Airport Service	0.12%	NA	NA	NA	NA	NA
Recreational	0.03%	NA	NA	NA	NA	NA
Recreational Marine	0.00%	NA	NA	NA	NA	NA
Light Commercial	0.04%	NA	NA	NA	NA	NA
Industrial	0.19%	NA	NA	NA	NA	NA
Construction	0.94%	NA	NA	NA	NA	NA
Agricultural	0.57%	NA	NA	NA	NA	NA
Logging	0.00%	NA	NA	NA	NA	NA
<u>Marine Vessels</u>	<u>0.14%</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>
Nonroad Engines and Vehicles	2.12%	NA	NA	NA	NA	NA
Highway Vehicles	29.20%	NA	NA	NA	NA	NA
<u>Other Area and Point Sources</u>	<u>68.69%</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>
All Sources	100.00%	NA	NA	NA	NA	NA

San Diego AB Inventory A (in-use est)
Emission Inventory Summary - VOC, NOx, CO

Equipment Category	tpy			tpsd		tpwd
	VOC	NOx	CO	VOC	NOx	CO
Lawn & Garden	20,504	381	132,531	74	1	99
Airport Service	224	1,439	2,092	1	4	6
Recreational	2,152	15	7,883	9	0	11
Recreational Marine	6,856	841	14,088	35	4	11
Light Commercial	1,667	196	23,572	5	1	65
Industrial	836	1,430	13,785	2	4	38
Construction	2,160	14,354	14,381	8	52	32
Agricultural	328	1,311	2,383	1	5	2
Logging	0	0	0	0	0	0
<u>Marine Vessels</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>3</u>	<u>41</u>	<u>7</u>
Nonroad Engines and Vehicles	34,727	19,966	210,715	137	112	269
Highway Vehicles	0	47,136	570,100	130	142	1,343
<u>Other Area and Point Sources</u>	<u>0</u>	<u>0</u>	<u>94,000</u>	<u>271</u>	<u>34</u>	<u>154</u>
All Sources	NA	NA	874,815	537	288	1,766

San Diego AB Inventory A (in-use est)
Emission Inventory Summary - VOC, NOx, CO
Percent of Total Inventory

Equipment Category	% total tpy			% total tpsd		% total tpwd
	VOC	NOx	CO	VOC	NOx	CO
Lawn & Garden	NA	NA	15.15%	13.74%	0.49%	5.62%
Airport Service	NA	NA	0.24%	0.11%	1.37%	0.32%
Recreational	NA	NA	0.90%	1.63%	0.02%	0.64%
Recreational Marine	NA	NA	1.61%	6.50%	1.54%	0.61%
Light Commercial	NA	NA	2.69%	0.86%	0.19%	3.66%
Industrial	NA	NA	1.58%	0.43%	1.36%	2.14%
Construction	NA	NA	1.64%	1.46%	18.00%	1.78%
Agricultural	NA	NA	0.27%	0.23%	1.69%	0.09%
Logging	NA	NA	0.00%	0.00%	0.00%	0.00%
<u>Marine Vessels</u>	<u>NA</u>	<u>NA</u>	<u>0.00%</u>	<u>0.47%</u>	<u>14.26%</u>	<u>0.38%</u>
Nonroad Engines and Vehicles	NA	NA	24.09%	25.43%	38.91%	15.24%
Highway Vehicles	NA	NA	65.17%	24.14%	49.26%	76.06%
<u>Other Area and Point Sources</u>	<u>NA</u>	<u>NA</u>	<u>10.75%</u>	<u>50.43%</u>	<u>11.83%</u>	<u>8.70%</u>
All Sources	NA	NA	100.00%	100.00%	100.00%	100.00%

San Diego AB Inventory A (in-use est)
Emission Inventory Summary - Air Toxics and SOx

Equipment Category	tpy					
	PM	Aldehydes	Benzene	1,3 But	Gas Vap	SOx
Lawn & Garden	338	101	590	249	1,377	92
Airport Service	171	7	7	3	4	95
Recreational	22	7	63	27	53	3
Recreational Marine	24	25	166	72	1,342	44
Light Commercial	41	12	48	20	152	29
Industrial	146	29	24	11	49	91
Construction	1,803	265	64	32	59	1,252
Agricultural	252	40	10	5	8	105
Logging	0	0	0	0	0	0
<u>Marine Vessels</u>	<u>854</u>	<u>0</u>	<u>---</u>	<u>---</u>	<u>---</u>	<u>6,979</u>
Nonroad Engines and Vehicles	3,651	487	972	419	3,045	8,690
Highway Vehicles	6,935	0	---	---	---	2,409
<u>Other Area and Point Sources</u>	<u>179,215</u>	<u>0</u>	<u>---</u>	<u>---</u>	<u>---</u>	<u>3,723</u>
All Sources	189,801	NA	NA	NA	NA	14,822

San Diego AB Inventory A (in-use est)
Emission Inventory Summary - Air Toxics and SOx
Percent of Total Inventory

Equipment Category	% total tpy					
	PM	Aldehydes	Benzene	1,3 But	Gas Vap.	SOx
Lawn & Garden	0.18%	NA	NA	NA	NA	0.62%
Airport Service	0.09%	NA	NA	NA	NA	0.64%
Recreational	0.01%	NA	NA	NA	NA	0.02%
Recreational Marine	0.01%	NA	NA	NA	NA	0.30%
Light Commercial	0.02%	NA	NA	NA	NA	0.19%
Industrial	0.08%	NA	NA	NA	NA	0.62%
Construction	0.95%	NA	NA	NA	NA	8.45%
Agricultural	0.13%	NA	NA	NA	NA	0.71%
Logging	0.00%	NA	NA	NA	NA	0.00%
<u>Marine Vessels</u>	<u>0.45%</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>47.09%</u>
Nonroad Engines and Vehicles	1.92%	NA	NA	NA	NA	58.63%
Highway Vehicles	3.65%	NA	NA	NA	NA	16.25%
<u>Other Area and Point Sources</u>	<u>94.42%</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>25.12%</u>
All Sources	100.00%	NA	NA	NA	NA	100.00%

San Joaquin AB Inventory A (in-use est)
Emission Inventory Summary - VOC, NOx, CO

Equipment Category	tpy			tpsd		tpwd
	VOC	NOx	CO	VOC	NOx	CO
Lawn & Garden	11,568	215	74,773	42	1	56
Airport Service	25	163	241	0	0	1
Recreational	438	3	1,606	2	0	2
Recreational Marine	1,387	288	3,188	7	2	2
Light Commercial	1,755	207	24,817	5	1	68
Industrial	681	1,164	11,221	2	3	31
Construction	1,698	11,280	11,302	6	41	25
Agricultural	4,510	18,014	32,754	17	67	22
Logging	50	144	334	0	0	1
<u>Marine Vessels</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>3</u>	<u>0</u>
Nonroad Engines and Vehicles	22,113	31,477	160,238	81	117	208
Highway Vehicles	0	0	0	150	240	1,100
<u>Other Area and Point Sources</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>1,022</u>	<u>249</u>	<u>683</u>
All Sources	NA	NA	NA	1,253	606	1,991

San Joaquin AB Inventory A (in-use est)
Emission Inventory Summary - VOC, NOx, CO
Percent of Total Inventory

Equipment Category	% total tpy			% total tpsd		% total tpwd
	VOC	NOx	CO	VOC	NOx	CO
Lawn & Garden	NA	NA	NA	3.33%	0.13%	2.81%
Airport Service	NA	NA	NA	0.01%	0.07%	0.03%
Recreational	NA	NA	NA	0.16%	0.00%	0.11%
Recreational Marine	NA	NA	NA	0.55%	0.25%	0.12%
Light Commercial	NA	NA	NA	0.39%	0.09%	3.42%
Industrial	NA	NA	NA	0.15%	0.53%	1.54%
Construction	NA	NA	NA	0.49%	6.73%	1.24%
Agricultural	NA	NA	NA	1.34%	11.07%	1.08%
Logging	NA	NA	NA	0.01%	0.07%	0.05%
<u>Marine Vessels</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>0.02%</u>	<u>0.44%</u>	<u>0.02%</u>
Nonroad Engines and Vehicles	NA	NA	NA	6.45%	19.38%	10.43%
Highway Vehicles	NA	NA	NA	11.97%	39.59%	55.25%
<u>Other Area and Point Sources</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>81.58%</u>	<u>41.03%</u>	<u>34.32%</u>
All Sources	NA	NA	NA	100.00%	100.00%	100.00%

San Joaquin AB Inventory A (in-use est)
Emission Inventory Summary - Air Toxics and SOx

Equipment Category	tpy					
	PM	Aldehydes	Benzene	1,3 But	Gas Vap.	SOx
Lawn & Garden	191	57	333	140	777	52
Airport Service	19	1	1	0	0	11
Recreational	5	1	13	6	11	1
Recreational Marine	9	9	28	12	458	13
Light Commercial	43	13	50	21	160	30
Industrial	119	24	20	9	40	74
Construction	1,417	208	50	25	47	984
Agricultural	3,467	555	133	67	111	1,441
Logging	21	3	1	1	3	12
<u>Marine Vessels</u>	<u>62</u>	<u>0</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>402</u>
Nonroad Engines and Vehicles	5,351	870	629	281	1,608	3,019
Highway Vehicles	13,505	0	—	—	—	9,125
<u>Other Area and Point Sources</u>	<u>731,789</u>	<u>0</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>16,790</u>
All Sources	750,645	NA	NA	NA	NA	28,934

San Joaquin AB Inventory A (in-use est)
Emission Inventory Summary - Air Toxics and SOx
Percent of Total Inventory

Equipment Category	% total tpy					
	PM	Aldehydes	Benzene	1,3 But	Gas Vap	SOx
Lawn & Garden	0.03%	NA	NA	NA	NA	0.18%
Airport Service	0.00%	NA	NA	NA	NA	0.04%
Recreational	0.00%	NA	NA	NA	NA	0.00%
Recreational Marine	0.00%	NA	NA	NA	NA	0.04%
Light Commercial	0.01%	NA	NA	NA	NA	0.10%
Industrial	0.02%	NA	NA	NA	NA	0.26%
Construction	0.19%	NA	NA	NA	NA	3.40%
Agricultural	0.46%	NA	NA	NA	NA	4.98%
Logging	0.00%	NA	NA	NA	NA	0.04%
<u>Marine Vessels</u>	<u>0.01%</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>1.39%</u>
Nonroad Engines and Vehicles	0.71%	NA	NA	NA	NA	10.43%
Highway Vehicles	1.80%	NA	NA	NA	NA	31.54%
<u>Other Area and Point Sources</u>	<u>97.49%</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>58.03%</u>
All Sources	100.00%	NA	NA	NA	NA	100.00%

Seattle-Tacoma MSA Inventory A (in-use est.)
Emission Inventory Summary - VOC, NOx, CO

Equipment Category	tpy			tpsd		tpwd
	VOC	NOx	CO	VOC	NOx	CO
Lawn & Garden	13,982	272	86,798	57	1	43
Airport Service	201	1,295	1,885	1	4	5
Recreational	1,544	11	4,756	5	0	12
Recreational Marine	8,440	649	15,655	50	4	9
Light Commercial	1,934	221	27,076	5	1	74
Industrial	943	1,606	15,505	3	4	42
Construction	1,913	12,932	12,749	8	54	21
Agricultural	329	1,324	2,338	1	6	2
Logging	613	1,508	3,790	2	4	10
<u>Marine Vessels</u>	<u>2,194</u>	<u>17,253</u>	<u>31,940</u>	<u>6</u>	<u>47</u>	<u>88</u>
Nonroad Engines and Vehicles	32,093	37,071	202,492	138	125	306
Highway Vehicles	0	0	267,670	0	0	1,515
<u>Other Area and Point Sources</u>	<u>0</u>	<u>0</u>	<u>199,979</u>	<u>0</u>	<u>0</u>	<u>565</u>
All Sources	NA	NA	670,141	NA	NA	2,386

Seattle-Tacoma MSA Inventory A (in-use est.)
Emission Inventory Summary - VOC, NOx, CO
Percent of Total Inventory

Equipment Category	% total tpy			% total tpsd		% total tpwd
	VOC	NOx	CO	VOC	NOx	CO
Lawn & Garden	NA	NA	12.95%	NA	NA	1.82%
Airport Service	NA	NA	0.28%	NA	NA	0.22%
Recreational	NA	NA	0.71%	NA	NA	0.51%
Recreational Marine	NA	NA	2.34%	NA	NA	0.36%
Light Commercial	NA	NA	4.04%	NA	NA	3.11%
Industrial	NA	NA	2.31%	NA	NA	1.78%
Construction	NA	NA	1.90%	NA	NA	0.88%
Agricultural	NA	NA	0.35%	NA	NA	0.06%
Logging	NA	NA	0.57%	NA	NA	0.44%
<u>Marine Vessels</u>	<u>NA</u>	<u>NA</u>	<u>4.77%</u>	<u>NA</u>	<u>NA</u>	<u>3.67%</u>
Nonroad Engines and Vehicles	NA	NA	30.22%	NA	NA	12.84%
Highway Vehicles	NA	NA	39.94%	NA	NA	63.48%
<u>Other Area and Point Sources</u>	<u>NA</u>	<u>NA</u>	<u>29.84%</u>	<u>NA</u>	<u>NA</u>	<u>23.67%</u>
All Sources	NA	NA	100.00%	NA	NA	100.00%

Seattle-Tacoma MSA Inventory A (in-use est)
Emission Inventory Summary - Air Toxics and SOx

Equipment Category	tpy					
	PM	Aldehydes	Benzene	1,3 But	Gas Vap	SOx
Lawn & Garden	207	67	400	169	991	63
Airport Service	154	7	6	3	4	86
Recreational	21	4	45	20	34	2
Recreational Marine	19	19	214	92	1,336	41
Light Commercial	47	14	55	23	179	32
Industrial	164	33	27	12	57	103
Construction	1,618	237	56	29	54	1,128
Agricultural	255	41	10	5	9	106
Logging	221	30	18	8	36	126
<u>Marine Vessels</u>	<u>1,017</u>	<u>0</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>7,576</u>
Nonroad Engines and Vehicles	3,721	451	832	360	2,701	9,261
Highway Vehicles	30,151	0	—	—	—	0
<u>Other Area and Point Sources</u>	<u>37,878</u>	<u>0</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>0</u>
All Sources	71,750	NA	NA	NA	NA	NA

Seattle-Tacoma MSA Inventory A (in-use est)
Emission Inventory Summary - Air Toxics and SOx
Percent of Total Inventory

Equipment Category	% total tpy					
	PM	Aldehydes	Benzene	1,3 But	Gas Vap	SOx
Lawn & Garden	0.29%	NA	NA	NA	NA	NA
Airport Service	0.21%	NA	NA	NA	NA	NA
Recreational	0.03%	NA	NA	NA	NA	NA
Recreational Marine	0.03%	NA	NA	NA	NA	NA
Light Commercial	0.07%	NA	NA	NA	NA	NA
Industrial	0.23%	NA	NA	NA	NA	NA
Construction	2.25%	NA	NA	NA	NA	NA
Agricultural	0.35%	NA	NA	NA	NA	NA
Logging	0.31%	NA	NA	NA	NA	NA
<u>Marine Vessels</u>	<u>1.42%</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>
Nonroad Engines and Vehicles	5.19%	NA	NA	NA	NA	NA
Highway Vehicles	42.02%	NA	NA	NA	NA	NA
<u>Other Area and Point Sources</u>	<u>52.79%</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>
All Sources	100.00%	NA	NA	NA	NA	NA

South Coast AB Inventory A (in-use est)
Emission Inventory Summary - VOC, NOx, CO

Equipment Category	tpy			tpsd		tpwd
	VOC	NOx	CO	VOC	NOx	CO
Lawn & Garden	102,306	1,899	661,259	368	7	495
Airport Service	846	5,447	7,911	2	15	22
Recreational	7,772	53	28,465	32	0	41
Recreational Marine	31,382	3,850	64,484	160	20	49
Light Commercial	13,416	1,582	189,752	37	4	520
Industrial	8,304	14,195	136,855	23	39	375
Construction	10,302	68,455	68,586	37	248	150
Agricultural	745	2,977	5,412	3	11	4
Logging	25	73	170	0	0	0
<u>Marine Vessels</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>7</u>	<u>68</u>	<u>10</u>
Nonroad Engines and Vehicles	175,098	98,530	1,162,894	670	413	1,666
Highway Vehicles	0	0	0	650	660	9,732
<u>Other Area and Point Sources</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>1,400</u>	<u>334</u>	<u>265</u>
All Sources	NA	NA	NA	2,720	1,407	11,663

South Coast AB Inventory A (in-use est)
Emission Inventory Summary - VOC, NOx, CO
Percent of Total Inventory

Equipment Category	% total tpy			% total tpsd		% total tpwd
	VOC	NOx	CO	VOC	NOx	CO
Lawn & Garden	NA	NA	NA	13.55%	0.50%	4.24%
Airport Service	NA	NA	NA	0.09%	1.06%	0.19%
Recreational	NA	NA	NA	1.16%	0.02%	0.35%
Recreational Marine	NA	NA	NA	5.88%	1.44%	0.42%
Light Commercial	NA	NA	NA	1.36%	0.31%	4.46%
Industrial	NA	NA	NA	0.85%	2.76%	3.21%
Construction	NA	NA	NA	1.37%	17.60%	1.29%
Agricultural	NA	NA	NA	0.10%	0.79%	0.03%
Logging	NA	NA	NA	0.00%	0.01%	0.00%
<u>Marine Vessels</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>0.27%</u>	<u>4.86%</u>	<u>0.09%</u>
Nonroad Engines and Vehicles	NA	NA	NA	24.63%	29.35%	14.29%
Highway Vehicles	NA	NA	NA	23.90%	46.92%	83.44%
<u>Other Area and Point Sources</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>51.47%</u>	<u>23.73%</u>	<u>2.27%</u>
All Sources	NA	NA	NA	100.00%	100.00%	100.00%

South Coast AB Inventory A (in-use est)
Emission Inventory Summary - Air Toxics and SOx

Equipment Category	tpy					
	PM	Aldehydes	Benzene	1,3 But	Gas Vap.	SOx
Lawn & Garden	1,685	505	2,945	1,241	6,873	459
Airport Service	648	28	25	12	15	360
Recreational	80	25	228	99	191	10
Recreational Marine	112	115	762	328	6,142	200
Light Commercial	330	96	384	159	1,225	231
Industrial	1,447	288	239	105	484	906
Construction	8,597	1,265	304	154	283	5,972
Agricultural	573	92	22	11	18	238
Logging	11	1	1	0	2	6
<u>Marine Vessels</u>	<u>1,515</u>	<u>0</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>12,797</u>
Nonroad Engines and Vehicles	14,998	2,415	4,909	2,110	15,233	21,180
Highway Vehicles	34,675	0	—	—	—	11,680
<u>Other Area and Point Sources</u>	<u>766,500</u>	<u>0</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>18,214</u>
All Sources	816,173	NA	NA	NA	NA	51,074

South Coast AB Inventory A (in-use est)
Emission Inventory Summary - Air Toxics and SOx

Percent of Total Inventory

Equipment Category	% total tpy					
	PM	Aldehydes	Benzene	1,3 But	Gas. Vap	SOx
Lawn & Garden	0.21%	NA	NA	NA	NA	0.90%
Airport Service	0.08%	NA	NA	NA	NA	0.71%
Recreational	0.01%	NA	NA	NA	NA	0.02%
Recreational Marine	0.01%	NA	NA	NA	NA	0.39%
Light Commercial	0.04%	NA	NA	NA	NA	0.45%
Industrial	0.18%	NA	NA	NA	NA	1.77%
Construction	1.05%	NA	NA	NA	NA	11.69%
Agricultural	0.07%	NA	NA	NA	NA	0.47%
Logging	0.00%	NA	NA	NA	NA	0.01%
<u>Marine Vessels</u>	<u>0.19%</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>25.06%</u>
Nonroad Engines and Vehicles	1.84%	NA	NA	NA	NA	41.47%
Highway Vehicles	4.25%	NA	NA	NA	NA	22.87%
<u>Other Area and Point Sources</u>	<u>93.91%</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>35.66%</u>
All Sources	100.00%	NA	NA	NA	NA	100.00%

Spokane MSA Inventory A (in-use est)
Emission Inventory Summary - VOC, NOx, CO

Equipment Category	tpy			tpsd		tpwd
	VOC	NOx	CO	VOC	NOx	CO
Lawn & Garden	1,354	27	8,404	7	0	0
Airport Service	28	178	265	0	0	1
Recreational	276	2	814	1	0	2
Recreational Marine	748	14	1,260	6	0	0
Light Commercial	303	31	4,028	1	0	11
Industrial	85	146	1,415	0	0	4
Construction	154	1,047	1,017	1	5	1
Agricultural	169	680	1,173	1	4	1
Logging	0	0	0	0	0	0
<u>Marine Vessels</u>	<u>0</u>	<u>0</u>	<u>245</u>	<u>0</u>	<u>0</u>	<u>0</u>
Nonroad Engines and Vehicles	3,117	2,126	18,622	17	10	20
Highway Vehicles	0	0	9,026	0	0	251
<u>Other Area and Point Sources</u>	<u>0</u>	<u>0</u>	<u>77,748</u>	<u>0</u>	<u>0</u>	<u>224</u>
All Sources	NA	NA	105,396	NA	NA	495

Spokane MSA Inventory A (in-use est)
Emission Inventory Summary - VOC, NOx, CO

Percent of Total Inventory

Equipment Category	% total tpy			% total tpsd		% total tpwd
	VOC	NOx	CO	VOC	NOx	CO
Lawn & Garden	NA	NA	7.97%	NA	NA	0.04%
Airport Service	NA	NA	0.25%	NA	NA	0.15%
Recreational	NA	NA	0.77%	NA	NA	0.40%
Recreational Marine	NA	NA	1.20%	NA	NA	0.00%
Light Commercial	NA	NA	3.82%	NA	NA	2.23%
Industrial	NA	NA	1.34%	NA	NA	0.78%
Construction	NA	NA	0.97%	NA	NA	0.23%
Agricultural	NA	NA	1.11%	NA	NA	0.16%
Logging	NA	NA	0.00%	NA	NA	0.00%
<u>Marine Vessels</u>	<u>NA</u>	<u>NA</u>	<u>0.23%</u>	<u>NA</u>	<u>NA</u>	<u>0.00%</u>
Nonroad Engines and Vehicles	NA	NA	17.67%	NA	NA	3.98%
Highway Vehicles	NA	NA	8.56%	NA	NA	50.78%
<u>Other Area and Point Sources</u>	<u>NA</u>	<u>NA</u>	<u>73.77%</u>	<u>NA</u>	<u>NA</u>	<u>45.24%</u>
All Sources	NA	NA	100.00%	NA	NA	100.00%

Spokane MSA Inventory A (in-use est)
Emission Inventory Summary - Air Toxics and SOx

Equipment Category	tpy					
	PM	Aldehydes	Benzene	1,3 But.	Gas Vap	SOx
Lawn & Garden	20	6	39	16	105	6
Airport Service	21	1	1	0	1	12
Recreational	4	1	8	4	7	0
Recreational Manne	0	0	21	9	47	2
Light Commercial	7	2	9	4	26	5
Industrial	15	3	2	1	5	9
Construction	132	19	5	2	5	91
Agricultural	131	21	5	3	5	54
Logging	0	0	0	0	0	0
<u>Marine Vessels</u>	<u>0</u>	<u>0</u>				<u>0</u>
Nonroad Engines and Vehicles	330	54	89	39	200	180
Highway Vehicles	3,881	0				0
<u>Other Area and Point Sources</u>	<u>9,837</u>	<u>0</u>				<u>0</u>
All Sources	14,048	NA	NA	NA	NA	NA

Spokane MSA Inventory A (in-use est)
Emission Inventory Summary - Air Toxics and SOx
Percent of Total Inventory

Equipment Category	% total tpy					
	PM	Aldehydes	Benzene	1,3 But	Gas Vap	SOx
Lawn & Garden	0.14%	NA	NA	NA	NA	NA
Airport Service	0.15%	NA	NA	NA	NA	NA
Recreational	0.03%	NA	NA	NA	NA	NA
Recreational Manne	0.00%	NA	NA	NA	NA	NA
Light Commercial	0.05%	NA	NA	NA	NA	NA
Industrial	0.11%	NA	NA	NA	NA	NA
Construction	0.94%	NA	NA	NA	NA	NA
Agricultural	0.93%	NA	NA	NA	NA	NA
Logging	0.00%	NA	NA	NA	NA	NA
<u>Marine Vessels</u>	<u>0.00%</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>
Nonroad Engines and Vehicles	2.35%	NA	NA	NA	NA	NA
Highway Vehicles	27.63%	NA	NA	NA	NA	NA
<u>Other Area and Point Sources</u>	<u>70.02%</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>
All Sources	100.00%	NA	NA	NA	NA	NA

Springfield MSA Inventory A (in-use est)
Emission Inventory Summary - VOC, NOx, CO

Equipment Category	tpy			tpsd		tpwd
	VOC	NOx	CO	VOC	NOx	CO
Lawn & Garden	1,709	33	10,406	9	0	4
Airport Service	0	0	0	0	0	0
Recreational	1,068	8	1,801	1	0	15
Recreational Marine	1,047	78	1,747	7	1	0
Light Commercial	506	48	6,409	1	0	18
Industrial	306	529	5,122	1	1	14
Construction	205	1,401	1,336	1	7	1
Agricultural	91	366	608	0	2	0
Logging	0	0	0	0	0	0
<u>Marine Vessels</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>
Nonroad Engines and Vehicles	4,931	2,462	27,429	20	11	52
Highway Vehicles	0	0	0	62	30	0
<u>Other Area and Point Sources</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>50</u>	<u>30</u>	<u>0</u>
All Sources	NA	NA	NA	132	71	NA

Springfield MSA Inventory A (in-use est)
Emission Inventory Summary - VOC, NOx, CO
Percent of Total Inventory

Equipment Category	% total tpy			% total tpsd		% total tpwd
	VOC	NOx	CO	VOC	NOx	CO
Lawn & Garden	NA	NA	NA	6 64%	0 25%	NA
Airport Service	NA	NA	NA	0 00%	0 00%	NA
Recreational	NA	NA	NA	0 54%	0 01%	NA
Recreational Marine	NA	NA	NA	5 28%	0 81%	NA
Light Commercial	NA	NA	NA	1 05%	0 18%	NA
Industrial	NA	NA	NA	0 65%	2 04%	NA
Construction	NA	NA	NA	0 73%	9 27%	NA
Agricultural	NA	NA	NA	0 37%	2 82%	NA
Logging	NA	NA	NA	0 00%	0 00%	NA
<u>Marine Vessels</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>0 00%</u>	<u>0 00%</u>	<u>NA</u>
Nonroad Engines and Vehicles	NA	NA	NA	15 26%	15 37%	NA
Highway Vehicles	NA	NA	NA	47 21%	42 53%	NA
<u>Other Area and Point Sources</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>37 53%</u>	<u>42 10%</u>	<u>NA</u>
All Sources	NA	NA	NA	100 00%	100 00%	NA

Springfield MSA Inventory A (in-use est)
Emission Inventory Summary - Air Toxics and SOx

Equipment Category	tpy					
	PM	Aldehydes	Benzene	1,3 But	Gas Vap	SOx
Lawn & Garden	26	8	48	20	148	8
Airport Service	0	0	0	0	0	0
Recreational	21	2	32	14	14	1
Recreational Marine	2	2	23	10	274	5
Light Commercial	11	3	15	6	41	7
Industrial	54	11	9	4	19	34
Construction	177	26	6	3	6	122
Agricultural	71	11	3	1	3	29
Logging	0	0	0	0	0	0
<u>Marine Vessels</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>
Nonroad Engines and Vehicles	362	64	135	58	504	205
Highway Vehicles	0	0				0
<u>Other Area and Point Sources</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>
All Sources	NA	NA	NA	NA	NA	NA

Springfield MSA Inventory A (in-use est)
Emission Inventory Summary - Air Toxics and SOx
Percent of Total Inventory

Equipment Category	% total tpy					
	PM	Aldehydes	Benzene	1,3 But	Gas Vap	SOx
Lawn & Garden	NA	NA	NA	NA	NA	NA
Airport Service	NA	NA	NA	NA	NA	NA
Recreational	NA	NA	NA	NA	NA	NA
Recreational Marine	NA	NA	NA	NA	NA	NA
Light Commercial	NA	NA	NA	NA	NA	NA
Industrial	NA	NA	NA	NA	NA	NA
Construction	NA	NA	NA	NA	NA	NA
Agricultural	NA	NA	NA	NA	NA	NA
Logging	NA	NA	NA	NA	NA	NA
<u>Marine Vessels</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>
Nonroad Engines and Vehicles	NA	NA	NA	NA	NA	NA
Highway Vehicles	NA	NA	NA	NA	NA	NA
<u>Other Area and Point Sources</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>
All Sources	NA	NA	NA	NA	NA	NA

Washington DC MSA Inventory A (in-use est.)
Emission Inventory Summary - VOC, NOx, CO

Equipment Category	tpy			tpsd		tpwd
	VOC	NOx	CO	VOC	NOx	CO
Lawn & Garden	18,052	349	115,360	74	2	57
Airport Service	402	2,589	3,763	1	7	10
Recreational	1,657	12	4,351	4	0	16
Recreational Manne	3,559	268	6,616	21	2	1
Light Commercial	2,167	224	28,840	6	1	79
Industrial	565	970	9,379	2	3	26
Construction	2,642	17,850	17,389	11	74	29
Agricultural	631	2,535	4,425	3	11	3
Logging	0	0	0	0	0	0
<u>Marine Vessels</u>	<u>0</u>	<u>227</u>	<u>2,820</u>	<u>0</u>	<u>1</u>	<u>0</u>
Nonroad Engines and Vehicles	29,675	25,023	192,944	122	100	221
Highway Vehicles	0	83,068	398,686	345	250	2,161
<u>Other Area and Point Sources</u>	<u>0</u>	<u>88,336</u>	<u>59,024</u>	<u>202</u>	<u>242</u>	<u>167</u>
All Sources	NA	196,427	650,654	669	592	2,548

Washington DC MSA Inventory A (in-use est.)
Emission Inventory Summary - VOC, NOx, CO
Percent of Total Inventory

Equipment Category	% total tpy			% total tpsd		% total tpwd
	VOC	NOx	CO	VOC	NOx	CO
Lawn & Garden	NA	0.18%	17.73%	11.04%	0.26%	2.24%
Airport Service	NA	1.32%	0.58%	0.17%	1.20%	0.40%
Recreational	NA	0.01%	0.67%	0.61%	0.00%	0.62%
Recreational Manne	NA	0.14%	1.02%	3.18%	0.28%	0.06%
Light Commercial	NA	0.11%	4.43%	0.89%	0.10%	3.10%
Industrial	NA	0.49%	1.44%	0.24%	0.45%	1.01%
Construction	NA	9.09%	2.67%	1.65%	12.56%	1.12%
Agricultural	NA	1.29%	0.68%	0.41%	1.88%	0.11%
Logging	NA	0.00%	0.00%	0.00%	0.00%	0.00%
<u>Marine Vessels</u>	<u>NA</u>	<u>0.12%</u>	<u>0.43%</u>	<u>0.00%</u>	<u>0.11%</u>	<u>0.00%</u>
Nonroad Engines and Vehicles	NA	12.74%	29.65%	18.19%	16.83%	8.66%
Highway Vehicles	NA	42.29%	61.27%	51.60%	42.29%	84.79%
<u>Other Area and Point Sources</u>	<u>NA</u>	<u>44.97%</u>	<u>9.07%</u>	<u>30.21%</u>	<u>40.88%</u>	<u>6.54%</u>
All Sources	NA	100.00%	100.00%	100.00%	100.00%	100.00%

Washington DC MSA Inventory A (in-use est.)
Emission Inventory Summary - Air Toxics and SOx

Equipment Category	tpy					
	PM	Aldehydes	Benzene	1,3 But.	Gas Vap.	SOx
Lawn & Garden	285	88	516	218	1,317	82
Airport Service	308	13	12	6	7	171
Recreational	25	4	49	21	35	2
Recreational Marine	8	8	91	39	536	17
Light Commercial	50	15	62	26	186	33
Industrial	99	20	16	7	34	62
Construction	2,243	328	78	39	76	1,555
Agricultural	489	78	18	9	19	202
Logging	0	0	0	0	0	0
<u>Marine Vessels</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>
Nonroad Engines and Vehicles	3,506	554	842	366	2,211	2,125
Highway Vehicles	0	0				0
<u>Other Area and Point Sources</u>	<u>0</u>	<u>0</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>0</u>
All Sources	NA	NA	NA	NA	NA	NA

Washington DC MSA Inventory A (in-use est.)
Emission Inventory Summary - Air Toxics and SOx
Percent of Total Inventory

Equipment Category	% total tpy					
	PM	Aldehydes	Benzene	1,3 But.	Gas Vap.	SOx
Lawn & Garden	NA	NA	NA	NA	NA	NA
Airport Service	NA	NA	NA	NA	NA	NA
Recreational	NA	NA	NA	NA	NA	NA
Recreational Marine	NA	NA	NA	NA	NA	NA
Light Commercial	NA	NA	NA	NA	NA	NA
Industrial	NA	NA	NA	NA	NA	NA
Construction	NA	NA	NA	NA	NA	NA
Agricultural	NA	NA	NA	NA	NA	NA
Logging	NA	NA	NA	NA	NA	NA
<u>Marine Vessels</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>
Nonroad Engines and Vehicles	NA	NA	NA	NA	NA	NA
Highway Vehicles	NA	NA	NA	NA	NA	NA
<u>Other Area and Point Sources</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>
All Sources	NA	NA	NA	NA	NA	NA

Appendix N. EPA Use of Manufacturer Data In Inventory B

In developing activity levels for Inventory B, EPA used data supplied by manufacturers or manufacturer associations where it was available. In some cases, EPA had to adjust data for use in the inventory.

The kinds of data supplied and the adjustments to the data are detailed below. Part I is a general overview of the data supplied by manufacturers and used by EPA in constructing Inventory B. Part II contains more detailed adjustments made to the data for use in the inventory.

1. General Overview

1.1. Equipment Manufacturers Institute (EMI)

EMI provided population data for several types of agricultural and construction equipment. These equipment types are listed in Table N-01. Estimates of average engine-rated horsepower were also available for these equipment types.

EMI estimates for crawler loaders were considered together with crawler tractors as fitting within the Inventory A estimate for crawler tractors. Because cotton pickers were included in Inventory A under "other agricultural equipment, EMI's cotton picker estimates were only considered in areas where the populations were higher than the Inventory A estimate for other agricultural equipment.

There were several equipment types for which population estimates were not provided by EMI, but for which EPA incorporated horsepower, annual use, and load factor estimates from EMI in developing Inventory B. These included swathers ("windrowers"), mobile elevating work platforms ("aerial lifts"), landfill compactors ("crushing/processing equipment"), and square balers and bale wagons ("balers"). Because of either negligible equipment populations or the absence of any matching equipment type, data for the following equipment types was not considered: leaf loaders, milling machines, horizontal earth borers, forage harvesters, augers, and cranes.

Additional adjustments to EMI data are detailed below in Part II.

Table N-01. EMI Agricultural and Construction Equipment Data

Equipment Type	EMI Data
Crawler tractors	Crawler tractors Crawler loaders
Rubber tired loaders	Wheeled loaders
Scrapers	Scrapers
Graders	Motor graders
Off-highway trucks	Dumpers
Excavators	Crawler excavators Wheeled excavators
Tractors/loaders/backhoes	Backhoe loaders
Skid steer loaders	Skid steer loaders
Skidder (logging)	Log skidders
Rollers	Rollers and Compactors
Asphalt pavers	Pavers
Agricultural tractors	Farm Tractors <40 HP Farm Tractors >40 HP
Combines	Grain combine
Other Agricultural Equip.	Cotton pickers

1.2. Outdoor Power Equipment Institute, Inc. (OPEI)

OPEI provided data on nonhandheld equipment types shown below in Table N-02. EPA combined OPEI's separate estimates for lawn tractors and garden tractors to replace the data for lawn and garden tractors from Inventory A.

OPEI did not provide load factor data. However, OPEI expressed general agreement with the data given in the Technical Support Document for CARB's proposed utility engine

regulations. Therefore, EPA used the CARB load factors in Inventory B.

Because OPEI reported separate annual hours of use estimates for commercial and consumer use, EPA used OPEI's reported percentages of such use to construct weighted average annual hours of use estimates. These and other adjustments to OPEI data are detailed in a later section.

Table N-02. OPEI Nonhandheld Lawn and Garden Equipment Data

Equipment Type	OPEI Data
Lawnmowers	Walk behind mowers
Rear engine riding mowers	Riding mowers
Lawn and garden tractors	Lawn tractors Garden Tractors
Tillers <5hp	Walk behind tillers

1.3. Portable Power Equipment Manufacturers Association (PPEMA)

PPEMA provided national population data for those types of handheld equipment shown in Table N-03.

Table N-03. PPEMA Handheld Lawn & Garden Equipment Data

Equipment Type	PPEMA Data
Leaf blowers/vacuums (2-stroke)	Backpack blowers Hand blowers
Trimmers/edgers/brushcutters (2-stroke)	Hedgetrimmers Trimmer/brushcutter
Chainsaws <4hp Chainsaws >4hp	Consumer chainsaws Commercial chainsaws

PPEMA also provided annual hours of use, horsepower, and load factor data. EPA's use of this data is detailed in a later section.

1.4. Industrial Truck Association (ITA)

ITA provided load factor, annual hours of use, and CMSA-level population estimates for industrial forklifts which were used in Inventory B as provided.

1.5. International Snowmobile Industry Association (ISIA)

ISIA provided national population and annual hours of use estimates for snowmobiles. To obtain CMSA-level populations, EPA multiplied CMSA-level populations from Inventory A by the ratio of ISIA national populations to Inventory A national populations.

1.6. National Marine Manufacturers Association (NMMA)

NMMA provided EPA with survey information which was used to calculate annual hours of use, average rated horsepower, load factors, and the ratio of boat use to boat registration within nonattainment areas. CMSA-level populations were calculated by multiplying local boat registrations by this ratio.

2. Detailed Adjustments

2.1. Equipment Manufacturers Institute (EMI)

EMI supplied load factor, horsepower, annual hours of use, national and CMSA-level population data for various types of agricultural equipment. The data supplied and the adjustments made to the data are detailed below.

Equipment Type

EMI Data and Adjustment

Crawler Tractor	EMI supplied national horsepower and load factor, as well as national and CMSA level populations and hours/year separately for crawler loaders and tractors. National hours/year were estimated by population weighting the regional values supplied by EMI over all 24 areas. To estimate aggregated hours/year for all crawler loaders and tractors at the regional level, EPA population weighted the regional values for both equipment types. To estimate aggregated horsepower and load factor at the national level, EPA weighted data for both types by (population)(hours/year) and (population)(hours/year)(horsepower), respectively.
Rubber Tired Loader	For wheel loaders EMI supplied national population, horsepower, and load factor, as well as CMSA level populations and hours/year. EPA estimated national hours of use by population weighting regional values over 23 nonattainment areas.
Scraper	For scrapers, EMI supplied data as for rubber tired loaders.
Graders	For motor graders, EMI supplied data as for rubber tired loaders.
Off-Highway Trucks	For dumpers (off-road haulers), EMI supplied data as for rubber tired loaders.
Excavators	EMI supplied national horsepower and load factor, as well as CMSA level populations and hours/year separately for crawler and wheel excavators. EMI also supplied national populations for all excavators - EPA assumed a uniform national distribution of crawler and wheel versions. National hours/year were estimated by population weighting the regional values supplied by EMI over all 24 areas. To estimate aggregated hours/year for all excavators at the regional level, EPA population weighted the regional values for both types of excavators. To estimate aggregated horsepower and load factor at the national level, EPA weighted crawler and wheel data by (population)(hours/year) and (population)(hours/year)(horsepower), respectively.
Tractor/Loaders/Backhoes	EMI supplied data for backhoe loaders as for rubber tired loaders.
Skid Steer Loaders	EMI supplied data for skid steer loaders as for rubber tired loaders.

Equipment Type (cont.)

EMI Data and Adjustment

Skidder (logging)	EMI supplied data for log skidders as for rubber tired loaders, except that national populations were not provided.
Rollers	EMI supplied data for rollers and compactors as for rubber tired loaders.
Asphalt pavers	EMI supplied data for asphalt pavers as for rubber tired loaders.
Concrete pavers	EMI supplied only a national population estimate for concrete pavers.
Cranes	EMI supplied only a national population estimate for cranes.
Trenchers	EMI supplied only estimates of the national population, average rated horsepower, and load factor for trenchers.
Rough Terrain Forklifts	EMI supplied data for rough terrain forklifts as for trenchers.
Agricultural Tractor	EMI supplied national populations (based on census data), horsepower ratings, and load factors, as well as CMSA level populations and hours/year separately for tractors above and below 40 HP. To estimate national hours/year for both versions individually, EPA weighted regional values over all 24 areas. EPA estimated aggregated hours/year for all tractors at the regional level by population weighting regional values. At the national level, EPA estimated aggregated hours/year, horsepower, and load factor by weighting regional values by population, (population)(hours/year), and (population)(hours/year) (horsepower), respectively.
Combines	EMI supplied data for combines as for rubber tired loaders.
Other Agri. Equip.	EMI supplied data for cotton pickers as for rubber tired loaders.
Balers	EMI supplied local population and annual use estimates for square balers and bale wagons, as well as national data for horsepower and load factor. EPA aggregated data for these two equipment types in the same fashion as in for agricultural tractors.
Aerial Lifts	EMI supplied only horsepower and load factor data for mobile work platforms.

2.2. PPEMA Data

Population data -- Population data were taken from a Heiden report* for 2-stroke gasoline "Trimmers/Edgers/Brush Cutters"†, "Leaf Blowers/Vacuums", "Chain Saws <4 HP", and "Chain Saws >4 HP". The populations were distributed to each CMSA based on the EEA methodology. That is to say, the ratio of EEA's local (CMSA), 2-stroke, gasoline population to EEA's national 2-stroke, gasoline population was applied to the national population supplied by PPEMA:

$$\left(\frac{EEA \text{ CMSA Pop.}}{EEA \text{ Nat. Pop.}} \right)_{2\text{-stroke, gas}} \times PPEMA \text{ Nat. Pop.} = PPEMA \text{ CMSA Pop.}_{2\text{-stroke, gas}}$$

The PPEMA chainsaw population was distributed to both the over and under 4 HP categories based on the percentage of total chain saw population as reported by EEA.

Usage Data -- Usage data for hand blowers, back blowers, trimmers/brushcutters, hedgetrimmers, chain saws and cut off saws for commercial (professional) and consumer were supplied by PPEMA in an earlier Heiden report.‡ That data was population weighted to obtain average annual hours of use values for "Trimmers/Edgers/Brushcutters", "Leaf Blowers/Vacuums", "Chainsaws <4 HP" and "Chainsaws >4 HP". National population data are given in the second Heiden report (see Population Data above). Calculations for each of these equipment types are shown below:

* "A Preliminary Review of the Draft EPA/EEA Off-Road Equipment Emissions Inventory Methodology" prepared by Heiden Associates, Inc. for PPEMA, July 31, 1991, Exhibit 1

† Quotes (" ") identify equipment types which are included in EEA's final equipment list. Equipment types not written in quotes are manufacturer or otherwise defined.

‡ "A 1989 California Baseline Emissions Inventory for Total Hydrocarbon & Carbon Monoxide Emissions from Portable Two-Stroke Power Equipment" prepared by Heiden Associates, Inc. for PPEMA, July 24, 1990

Leaf Blowers/Vacuums

$$\begin{aligned}
 & 62,114 \text{ Comm Hand Blwrs} \times 197 \text{ hrs} \\
 & + 3,134,445 \text{ Cons Hand Blwrs} \times 9 \text{ hrs} \\
 & + 154,052 \text{ Comm Back Blwrs} \times 293 \text{ hrs} \\
 & + 25,815 \text{ Cons Back Blwrs} \times 12 \text{ hrs} \\
 \hline
 & 62,114 + 3,134,445 + 154,052 + 25,815 = 25.4 \text{ hrs}
 \end{aligned}$$

Trimmers/Edgers/Brush Cutters

$$\begin{aligned}
 & 695,274 \text{ Comm L Trimmers/B Cutters} \times 170 \text{ hrs} \\
 & + 12,531,475 \text{ Cons L Trimmers/B Cutters} \times 10 \text{ hrs} \\
 & + 179,259 \text{ Comm Hedgetrimmers} \times 75 \text{ hrs} \\
 & + 47,649 \text{ Cons Hedgetrimmers} \times 7 \text{ hrs} \\
 \hline
 & 695,274 + 12,531,475 + 179,259 + 47,649 = 19.1 \text{ hrs}
 \end{aligned}$$

Chain saws >4 hp

Chain saws over 4 hp are assumed to operate the same number of hours as commercial chain saws (405 hrs/yr).

Chain saws, <4 hp

The hours of use value for chain saws <4 hp were obtained by default through the calculation of average horsepower for chain saws <4 hp. The calculation of average horsepower and subsequent back calculation of hours of use is shown below.

From PPEMA data:

	Population	Usage	HP	Product
Commercial Chain saws	344,599	405	4.1	572,206,640
Consumer Chain saws	7,576,254	7	1.5	79,550,667
		192,596,373		651,757,307
Average Horsepower = 3.38				

From data supplied by EEA:

- 0.32% of chainsaws have engines greater than 4 hp.
- 99.68% of chainsaws have engines less than 4 hp.
- For those that are >4 hp, the average horsepower is 6.4 hp.

Therefore, by subtracting the number of hp-hrs attributable to the over 4 hp chain saws from the total number of hp-hrs, an average hp and an average hours of use value may be obtained:

$$651,757,306 \frac{HP-hrs}{yr} - 0.0032 \times 7,920,853 \times 405 \frac{hrs}{yr} \times 6.4 HP = 586,057,882 \frac{HP-hrs}{yr}$$

Solving for average horsepower:

$$\frac{586,057,882 \frac{HP-hrs}{yr}}{182,330,838 \frac{hrs}{yr}} = 3.21 HP$$

Solving for average hours of use

$$\frac{182,330,838 \text{unit-hrs}}{0.9968 \times 7,920,853 \text{units}} = 23.1 \text{hrs}$$

Horsepower Data -- Horsepower data for chainsaws, trimmers/brushcutters, hand blowers, back blowers and hedgetrimmers are taken from the 1990 Hieden report (page 18). The horsepower for chain saws over 4 hp has been provided by EEA (6.4 hp). The average horsepower value used for chainsaws less than 4 hp is 3.21 hp. This value was derived in the discussion earlier regarding the hours of use for chain saws less than 4 hp. The other horsepowers have been population and usage weighted to provide average horsepowers for "Timmers/Edgers/ Brush Cutters" and "Leaf Blowers/Vacuums" as shown below:

Trimmers/Edgers/Brush Cutters	Population	Usage	HP	
Comm. Trim/Brush Cut.	695,274	170	1.9	224,573,502
Comm. Hedgetrimmers	179,259	75	1.9	25,544,408
Cons. Trim/Brush Cut.	12,531,475	10	.7	87,720,325
Cons. Hedgetrimmers	47,649	7	.7	233,480
			257,289,298	338,071,715
Average horsepower =			1.31	

Leaf Blowers/Vacuums	Population	Usage	HP	
Comm. Hand Blowers	62,114	197	.8	9,789,166
Comm. Bkpk Blowers	154,052	293	3.0	135,411,708
Cons. Hand Blowers	3,134,445	9	.8	22,568,004
Cons. Bkpk Blowers	25,815	12	3.0	929,340
			85,893,479	168,698,168
Average Horsepower =			1.96	

Load Factor Data -- Heiden suggested in the same report⁵ that most portable two-stroke gasoline equipment operated at 50% of rated speed and full load. Therefore, a load factor of 50% is assumed for "Trimmers/Edgers/Brushcutters", "Leaf Blowers/Vacuums", "Chain saws <4 HP" and "Chain saws >4 HP".

2.3. OPEI Data

Population Data -- CMSA population data for lawn mowers, riding mowers, lawn

⁵ Ibid page 6.

tractors, garden tractors and tillers were supplied by OPEI^f. However, because these categories do not fully match those equipment types used in the nonroad study, some aggregation and disaggregation was necessary. Lawn tractors and garden tractors were combined to obtain a value for "Lawn and Garden Tractors". The tiller population was disaggregated into "Tillers <5 HP" and "Tillers >5 HP" and the riding mower population was disaggregated into "Front Mowers" and "Rear Engine Riding Mowers". In addition, all equipment populations were disaggregated into 2- and 4-stroke diesel and gasoline equipment types per EEA's methodology for each CMSA** as shown below.

Tillers <5 HP and Tillers >5 HP

For each tiller type, the following calculation was made:

$$\left(\frac{\text{Stroke type, Fuel type, HP Range}}{\text{Tiller total}} \right)_{EEA\ CMSA} \times (\text{Tiller total})_{OPEI\ CMSA} = (\text{Stroke type, Fuel type, HP Range})_{OPEI\ CMSA}$$

Lawn and Garden Tractors

$$\left(\frac{(L+G\ Population)_{Stroke, Fuel}}{\text{Lawn} + \text{Garden total}} \right)_{EEA\ CMSA} \times (\text{Lawn Pop} + \text{Garden Pop})_{OPEI\ CMSA} = ((L+G\ Population)_{Stroke, Fuel})_{OPEI\ CMSA}$$

Front Mowers and Rear Engine Riding Mowers

Lawn Mowers

Lawn mower populations were taken directly from the OPEI report for each CMSA when

^f "Information Regarding Selected Outdoor Power Equipment", prepared by OPEI for EPA, April 25, 1991, plus addendum. According to Mary Washburn this data includes diesel as well as gasoline equipment (conversation of Sept 9, 1991).

** Two EPA CMSAs (i.e., South Coast and San Joaquin) don't match OPEI's regions. For the San Joaquin Valley, EEA population numbers were used and for the South Coast Air Basin CMSA, OPEI's L A populations were used.

$$\left(\frac{\text{Stroke type, Fuel type, Equip. Type}}{\text{Front+ Rear Engine Riding Mower Tot.}} \right)_{EEA\ CMSA} \times (\text{Riding Mower Tot.})_{OPEI\ CMSA}$$

$$= (\text{Stroke type, Fuel type, Equip. Type})_{OPEI\ CMSA}$$

available and disaggregated into 2- and 4-stroke engines as specified in the addendum of their report. OPEI reported that 90% of lawn mowers are consumer and of those, 90% are 4-stroke and 10% are 2-stroke.^{††} OPEI also reported that 10% of all lawn mowers are used commercially and 85% of those are 4-stroke and 15% are 2-stroke. Therefore, the percentages of 2- and 4 stroke lawn mowers are:

$$\begin{aligned} \text{2-stroke:} & \quad 90\% \times 10\% + 10\% \times 15\% = 10.5\% \\ \text{4-stroke:} & \quad 90\% \times 90\% + 10\% \times 85\% = 89.5\% \end{aligned}$$

These percentages were applied to the CMSA populations supplied by OPEI to disaggregate 2- and 4-stroke lawn mowers.

In some cases OPEI did not provide data for a particular CMSA, and EPA used data from Inventory A. These cases are identified below:

^{††} Note that these values do not match the values given by OPEI in their addendum exactly. The numbers presented here reflect changes requested by OPEI after they submitted their report.

<u>Walk behind lawn mowers</u>	<u>Garden Tractors</u>
Fresno, CA	Bakersfield, CA
Provo-Orem, UT	El Paso, Tx
	Fresno, CA
<u>Riding Mowers</u>	Miami, FL
Bakersfield, CA	Provo-Orem, UT
Fresno, CA	Spokane, WA
Provo-Orem, UT	
San Diego, CA	<u>Walk behind tillers</u>
	Bakersfield, CA
<u>Lawn Tractors</u>	Baton Rouge, LA
Bakersfield, CA	Miami, FL
Fresno, CA	Minneapolis-St. Paul, MN
Provo-Orem, UT	Provo-Orem, UT
San Diego, CA	Springfield, MA

Hours of Use -- Hours of use data were taken from the OPEI report to EPA^{**}
Additional assumptions specific to the equipment type are described below.

Lawn and Garden Tractors

Hours of use for lawn tractors and garden tractors were population weighted based on OPEI CMSA populations to get annual hours of use for "Lawn and Garden Tractors" for each CMSA. For example, the Baltimore CMSA 4 stroke diesel lawn and garden tractor annual usage number is:

$$\frac{40,000 \text{ lawn tractors} \times 41 \text{ hrs} + 29,326 \text{ garden tractors} \times 56 \text{ hrs}}{40,000 + 29,326} = 47.3 \text{ hrs}$$

^{**} The average of Bakersfield and Fresno values were taken for the San Joaquin Valley and L A values were assumed for the South Coast Air Basin CMSA

Tillers <5 HP and Tillers >5 HP

Hours of use for tillers were weighted by commercial and consumer populations provided by OPEI in the addendum to their report. OPEI suggested that 40% of all tillers are used commercially and that 60% are used by consumers. Commercially used tillers are assumed to operate 4 times as much as consumer tillers. For example, the average hours of use for tillers in Atlanta is:

$$\frac{0.60 \times 18 \text{ hrs} + 0.40 \times (18 \text{ hrs} \times 4)}{39.6 \text{ hrs}}$$

Tillers above and below 5 HP were assumed to have the same usage characteristics.

Front Mowers and Rear Engine Riding Mowers

Hours of use for "Front Mowers" and "Rear Engine Riding Mowers" were assumed equal to the riding mower value supplied by OPEI for each CMSA. This assumption will probably underestimate the annual hours of use for "Front Mowers" because they are used commercially while "Rear Engine Riding Mowers" are not.

Lawn Mowers

Hours of use for lawn mowers are also weighted by commercial and consumer populations as well as 2 stroke and 4 stroke populations. OPEI suggests that 90% of all lawn mowers are consumer and 10% are commercial with commercial mowers operating 16 times as much as consumer mowers. Of the consumer lawn mowers, 90% are 4-stroke and 10% are 2-stroke. Of the commercial lawn mowers, 85% are 4-stroke and 15% are 2-stroke. For example, the average hours of use for 2-stroke lawn mowers in Atlanta is:

$$\frac{0.90 \times 0.10 \times 28 \text{ hrs} + 0.10 \times 0.15 \times (28 \text{ hrs} \times 16)}{(0.90 \times 0.10) + (0.10 \times 0.15)} = 88 \text{ hrs}$$

The average hours of use for 4-stroke lawn mowers in Atlanta is:

$$\frac{0.90 \times 0.90 \times 28 \text{ hrs} + 0.10 \times 0.85 \times (28 \text{ hrs} \times 16)}{(0.90 \times 0.90) + (0.10 \times 0.85)} = 68 \text{ hrs}$$

Horsepower -- Horsepower data for "Lawn Mowers", "Rear Engine Riding Mowers", "Lawn and Garden Tractors", and tillers were taken from the OPEI report by population weighing only because hours of use were not available. The calculations are shown below:

Walk-Behind Lawn Mowers

$$\begin{array}{r} 3.0 (+ \textit{less}) \times 0.08 \\ + 3.5 \quad \quad \quad \times 0.60 \\ + 4.5 \quad \quad \quad \times 0.20 \\ + 5.0 (+ \textit{more}) \times 0.12 \\ \hline 3.84 \text{ HP} \end{array}$$

Rear Engine Riding Mowers and Front Mowers

$$\begin{array}{r} 8.0 (+ \textit{less}) \times 0.13 \\ + 9.0 \quad \quad \quad \times 0.34 \\ + 11.0 \quad \quad \quad \times 0.26 \\ + 12.0 (+ \textit{more}) \times 0.27 \\ \hline 10.2 \text{ HP} \end{array}$$

Lawn and Garden Tractors

$$\begin{array}{r} 12.0 (+ \textit{less}) \times 0.19 \\ + 13.0 \quad \quad \quad \times 0.30 \\ + 15.0 \quad \quad \quad \times 0.08 \\ + 17.0 \quad \quad \quad \times 0.11 \\ + 19.0 \quad \quad \quad \times 0.21 \\ + 20.0 (+ \textit{more}) \times 0.11 \\ \hline 15.44 \text{ HP} \end{array}$$

Tillers <5 HP

Tillers below 5 HP had to be disaggregated as follows:

$$\frac{\begin{array}{r} 3.9 (+ \textit{less}) \times 0.14 \\ + 4.5 \qquad \qquad \times \frac{0.77}{2} \end{array}}{0.14 + \frac{0.77}{2}} = 4.34 \textit{ HP}$$

Tillers >5 HP

Tillers above 5 HP had to be disaggregated as follows:

$$\frac{\begin{array}{r} 6.0 (+ \textit{more}) \times 0.09 \\ + 5.5 \qquad \qquad \times \frac{0.77}{2} \end{array}}{0.09 + \frac{0.77}{2}} = 5.59 \textit{ HP}$$

Commercial Turf Equipment

The population weighted average horsepower of multi-spindle walk behind mowers was assumed for the "Commercial Turf Equipment" category:

$$\frac{\begin{array}{r} 8.0 (+ \textit{less}) \times 0.04 \\ + 10.5 \qquad \qquad \times 0.58 \\ + 13.1 (+ \textit{more}) \times 0.38 \end{array}}{11.4 \textit{ HP}}$$

Data for weighing the horsepowers by usage was not available.

2.4. Other Sources of Data

CARB Data -- All CARB data has been taken from the Technical Support Document (TSD) attachment C. Only where OPEI or PPEMA have not submitted values has CARB data been used when available.

Hours of Use

Shredders >5 HP and Shredders <5 HP

All shredders are assumed to have the same usage rate, regardless of horsepower. The usage has been weighed by consumer and commercial populations:

$$\begin{array}{r} \text{Cons: } .64 \times 16.5 \text{ hrs} \\ \text{Comm: } + .34 \times 190 \text{ hrs} \\ \hline 75.2 \text{ hrs} \end{array}$$

Snowblowers

Snowblowers are assumed the same as snowthrowers.

$$\begin{array}{r} \text{Cons: } .90 \times 10 \text{ hrs} \\ \text{Comm: } + .10 \times 60 \text{ hrs} \\ \hline 15 \text{ hrs} \end{array}$$

Commercial Turf Equipment

The specialized turf care value supplied by CARB is utilized since both categories are predominately wide area walk behind mowers. The value is 800 hours per year.

Horsepower

Carb reports a value for snowthrowers which is assumed identical to snowblowers. The horsepower value is population and usage rate weighted:

$$\begin{array}{r} \text{Cons: } .90 \times 10 \text{ hrs} \times 4.5 \text{ HP} \\ \text{Comm: } + .10 \times 60 \text{ hrs} \times 6.0 \text{ HP} \\ \hline (.90 \times 10) + (.10 \times 60) = 5.1 \text{ HP} \end{array}$$

Load Factors

Load factors were taken from the tables on page 26 of CARB's TSD. Load factors were weighted by population, hours of use and horsepower when possible. Load factors for "Trimmers/Edgers/Brush Cutters" and "Leaf Blowers/Vacuums" are also shown below although a value has already been supplied by PPEMA of 50%. As can be seen, there is good agreement between the CARB and PPEMA values.

Trimmers/Edgers/Brush Cutters

The CARB categories *4-cyc Edgers/Trimmers* and *2-cyc Edgers/Trimmers* were weighted by commercial and consumer population, hours of use and horsepower:

Trimmers/Edgers/Brush Cutters	Population in Calif.	Usage	HP	Load Factor	
Comm. 2-stroke	97,932	170	2.	.50	16,648,440
Comm. 4-stroke	11,242	190	5.	.36	3,844,764
Cons. 2-stroke	843,225	10	.8	.50	3,372,900
Cons. 4-stroke	41,737	10	3.5	.36	525,886
			52,183,375		24,391,990
Average Load Factor =				0.47	

Leaf Blowers/Vacuums

The CARB categories *4-cyc Blowers/Vacuums* and *2-cyc Blowers/Vacuums* were weighted by commercial and consumer population, hours of use and horsepower:

Leaf Blowers/ Vacuums	Population in Calif.	Usage	HP	Load Factor	
Comm. 2-stroke	33,190	275	3.	.50	13,690,875
Comm. 4-stroke	895	190	8.	.36	489,744
Cons 2-stroke	312,374	10	.8	.50	1,249,496
Cons. 4-stroke	2,744	10	3.5	.36	34,574
		31,337,182			15,464,689
Average Load Factor =				0.49	

Lawn and Garden Tractors

The CARB categories riding mower (front engine) and garden tractors were weighted by commercial and consumer population, hours of use, and horsepower:

Lawn and Garden Tractors	Population in Calif.	Usage	HP	Load Factor	
Comm. Riding Mower (F E.)	2,192	380	13	.42	4,547,962
Comm. Garden Tractor	1,176	180	15	.60	1,905,120
Cons. Riding Mower (F E.)	70,860	38	13	.42	14,702,033
Cons. Garden Tractor	38,026	56	15	.60	19,165,104
		80,950,360			40,320,219
Average Load Factor =				0.50	

The remaining load factors were not weighted, but assumed based on the following equivalencies:

Equipment Type	CARB Equipment	CARB Load Factor
Lawn Mower	Walk Behind Mower	.36
Rear Engine Riding Mower	Riding Mower (Rear Eng)	.42
Shredders <5 HP	Shredders/Grinders	.36
Shredders >5 HP	Shredders/Grinders	.36
Tillers <5 HP	Tillers	.40
Tillers >5 HP	Tillers	.40
Commercial Turf Equipment	Specialized Turf Care	.50
Snowblowers	Snowthrowers	.35

Appendix O. Emission Inventory B

Inventory B is presented in two sets of tables which summarize emissions from nonroad engines and vehicles, highway vehicles, and other area and point sources of emissions. Each set of tables summarizes emissions in each of the 24 nonattainment areas included in this study, as well as national emissions.

In the first set of summary tables, nonroad emissions are calculated using new engine emission factors. In the second set of summary tables, nonroad emissions are calculated using in-use emission factors.

USA
Inventory B
Emission Inventory Summary - Air Toxics and SOx

Equipment Category	tpy					
	PM	Aldehydes	Benzene	1,3 But.	Gas Vap	SOx
Lawn & Garden	9,753	5,281	16,998	7,026	77,124	3,948
Airport Service	12,408	529	440	222	296	6,894
Recreational	12,596	1,284	9,763	4,216	13,376	493
Recreational Manne	1,959	3,518	41,182	17,755	254,839	8,885
Light Commercial	3,663	1,468	2,739	1,042	24,599	4,398
Industrial	13,743	4,577	2,967	1,270	11,868	8,560
Construction	111,916	17,284	3,211	1,660	3,086	77,443
Agnicultural	346,224	51,661	9,826	5,132	6,321	138,050
Logging	8,640	1,190	319	146	789	5,193
<u>Marine Vessels</u>	<u>33,070</u>	<u>0</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>20,485</u>
Nonroad Engines and Vehicles	553,970	86,792	87,445	38,470	392,298	274,349
Highway Vehicles	1,265,460	0	—	—	—	514,018
<u>Other Area and Point Sources</u>	<u>6,189,510</u>	<u>0</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>22,407,185</u>
All Sources	8,008,940	NA	NA	NA	NA	23,195,552

USA
Inventory B
Emission Inventory Summary - Air Toxics and SOx
Percent of Total Inventory

Equipment Category	% total tpy					
	PM	Aldehydes	Benzene	1,3 But.	Gas Vap	SOx
Lawn & Garden	0.12%	NA	NA	NA	NA	0.02%
Airport Service	0.15%	NA	NA	NA	NA	0.03%
Recreational	0.16%	NA	NA	NA	NA	0.00%
Recreational Manne	0.02%	NA	NA	NA	NA	0.04%
Light Commercial	0.05%	NA	NA	NA	NA	0.02%
Industrial	0.17%	NA	NA	NA	NA	0.04%
Construction	1.40%	NA	NA	NA	NA	0.33%
Agnicultural	4.32%	NA	NA	NA	NA	0.60%
Logging	0.11%	NA	NA	NA	NA	0.02%
<u>Marine Vessels</u>	<u>0.41%</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>0.09%</u>
Nonroad Engines and Vehicles	6.92%	NA	NA	NA	NA	1.18%
Highway Vehicles	15.80%	NA	NA	NA	NA	2.22%
<u>Other Area and Point Sources</u>	<u>77.28%</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>96.60%</u>
All Sources	100.00%	NA	NA	NA	NA	100.00%

Atlanta MSA
Emission Inventory Summary - VOC, NOx, CO

Inventory B

Equipment Category	tpy			tpsd		tpwd CO
	VOC	NOx	CO	VOC	NOx	
Lawn & Garden	9,185	365	58,740	33	1	44
Airport Service	294	2,073	2,518	1	6	7
Recreational	200	5	661	1	0	1
Recreational Marine	7,409	403	14,745	38	2	11
Light Commercial	1,284	314	16,931	4	1	46
Industrial	1,771	4,286	28,547	5	12	78
Construction	1,682	13,617	9,154	6	49	20
Agricultural	484	2,219	2,781	2	8	2
Logging	8	111	51	0	0	0
<u>Marine Vessels</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>
Nonroad Engines and Vehicles	22,316	23,393	134,127	90	80	210
Highway Vehicles	0	69,146	0	319	208	0
<u>Other Area and Point Sources</u>	<u>0</u>	<u>92,553</u>	<u>0</u>	<u>287</u>	<u>248</u>	<u>0</u>
All Sources	NA	185,092	NA	695	536	NA

Atlanta MSA
Emission Inventory Summary - VOC, NOx, CO
Percent of Total Inventory

Inventory B

Equipment Category	% total tpy			% total tpsd		% total tpwd CO
	VOC	NOx	CO	VOC	NOx	
Lawn & Garden	NA	0.20%	NA	4.81%	0.25%	NA
Airport Service	NA	1.12%	NA	0.12%	1.06%	NA
Recreational	NA	0.00%	NA	0.11%	0.00%	NA
Recreational Marine	NA	0.22%	NA	5.48%	0.40%	NA
Light Commercial	NA	0.17%	NA	0.51%	0.16%	NA
Industrial	NA	2.32%	NA	0.72%	2.19%	NA
Construction	NA	7.36%	NA	0.88%	9.18%	NA
Agricultural	NA	1.20%	NA	0.26%	1.54%	NA
Logging	NA	0.06%	NA	0.00%	0.06%	NA
<u>Marine Vessels</u>	<u>NA</u>	<u>0.00%</u>	<u>NA</u>	<u>0.00%</u>	<u>0.00%</u>	<u>NA</u>
Nonroad Engines and Vehicles	NA	12.64%	NA	12.89%	14.84%	NA
Highway Vehicles	NA	37.36%	NA	45.84%	38.86%	NA
<u>Other Area and Point Sources</u>	<u>NA</u>	<u>50.00%</u>	<u>NA</u>	<u>41.27%</u>	<u>46.29%</u>	<u>NA</u>
All Sources	NA	100.00%	NA	100.00%	100.00%	NA

Atlanta MSA
Emission Inventory Summary - Air Toxics and SOx

Inventory B

Equipment Category	tpy					
	PM	Aldehydes	Benzene	1,3 But.	Gas. Vap.	SOx
Lawn & Garden	145	83	251	103	1,228	66
Airport Service	247	11	9	4	6	137
Recreational	2	1	6	2	15	0
Recreational Marine	8	15	192	83	1,034	40
Light Commercial	48	16	35	14	210	38
Industrial	150	70	49	21	205	99
Construction	1,707	267	50	26	42	1,192
Agricultural	428	68	14	7	22	176
Logging	15	2	0	0	0	9
<u>Marine Vessels</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>
Nonroad Engines and Vehicles	2,749	533	606	261	2,762	1,759
Highway Vehicles	0	0				0
<u>Other Area and Point Sources</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>
All Sources	NA	NA	NA	NA	NA	NA

Atlanta MSA
Emission Inventory Summary - Air Toxics and SOx
Percent of Total Inventory

Inventory B

Equipment Category	% total tpy					
	PM	Aldehydes	Benzene	1,3 But.	Gas Vap.	SOx
Lawn & Garden	NA	NA	NA	NA	NA	NA
Airport Service	NA	NA	NA	NA	NA	NA
Recreational	NA	NA	NA	NA	NA	NA
Recreational Marine	NA	NA	NA	NA	NA	NA
Light Commercial	NA	NA	NA	NA	NA	NA
Industrial	NA	NA	NA	NA	NA	NA
Construction	NA	NA	NA	NA	NA	NA
Agricultural	NA	NA	NA	NA	NA	NA
Logging	NA	NA	NA	NA	NA	NA
<u>Marine Vessels</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>
Nonroad Engines and Vehicles	NA	NA	NA	NA	NA	NA
Highway Vehicles	NA	NA	NA	NA	NA	NA
<u>Other Area and Point Sources</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>
All Sources	NA	NA	NA	NA	NA	NA

Baltimore MSA Inventory B
Emission Inventory Summary - VOC, NOx, CO

Equipment Category	tpy			tpsd		tpwd CO
	VOC	NOx	CO	VOC	NOx	
Lawn & Garden	5,143	206	31,508	21	1	19
Airport Service	279	1,962	2,388	1	5	7
Recreational	606	10	1,052	0	0	9
Recreational Manne	3,465	341	7,283	20	2	2
Light Commercial	1,022	231	12,903	3	1	35
Industrial	963	2,407	15,272	3	7	42
Construction	1,070	8,785	5,913	4	37	10
Agricultural	771	3,868	4,124	3	17	3
Logging	1	8	4	0	0	0
<u>Marine Vessels</u>	<u>1,623</u>	<u>5,970</u>	<u>30,333</u>	<u>4</u>	<u>16</u>	<u>83</u>
Nonroad Engines and Vehicles	14,943	23,788	110,780	60	86	209
Highway Vehicles	0	54,317	0	200	164	1,328
<u>Other Area and Point Sources</u>	<u>0</u>	<u>59,976</u>	<u>34,462</u>	<u>226</u>	<u>164</u>	<u>226</u>
All Sources	NA	138,081	NA	486	414	1,762

Baltimore MSA Inventory B
Emission Inventory Summary - VOC, NOx, CO
Percent of Total Inventory

Equipment Category	% total tpy			% total tpsd		% total tpwd CO
	VOC	NOx	CO	VOC	NOx	
Lawn & Garden	NA	0.15%	NA	4.23%	0.22%	1.10%
Airport Service	NA	1.42%	NA	0.16%	1.30%	0.37%
Recreational	NA	0.01%	NA	0.09%	0.00%	0.50%
Recreational Manne	NA	0.25%	NA	4.18%	0.51%	0.09%
Light Commercial	NA	0.17%	NA	0.58%	0.15%	2.01%
Industrial	NA	1.74%	NA	0.56%	1.59%	2.37%
Construction	NA	6.36%	NA	0.92%	8.85%	0.55%
Agricultural	NA	2.80%	NA	0.70%	4.10%	0.15%
Logging	NA	0.01%	NA	0.00%	0.01%	0.00%
<u>Marine Vessels</u>	<u>NA</u>	<u>4.32%</u>	<u>NA</u>	<u>0.92%</u>	<u>3.96%</u>	<u>4.72%</u>
Nonroad Engines and Vehicles	NA	17.23%	NA	12.34%	20.69%	11.86%
Highway Vehicles	NA	39.34%	NA	41.16%	39.58%	75.32%
<u>Other Area and Point Sources</u>	<u>NA</u>	<u>43.44%</u>	<u>NA</u>	<u>46.51%</u>	<u>39.73%</u>	<u>12.82%</u>
All Sources	NA	100.00%	NA	100.00%	100.00%	100.00%

Baltimore MSA Inventory B
Emission Inventory Summary - Air Toxics and SOx

Equipment Category	tpy					
	PM	Aldehydes	Benzene	1,3 But.	Gas Vap	SOx
Lawn & Garden	77	45	141	58	668	37
Airport Service	234	10	8	4	6	130
Recreational	23	2	18	8	24	1
Recreational Marine	7	13	82	35	739	24
Light Commercial	37	13	28	11	157	28
Industrial	98	40	27	11	110	63
Construction	1,107	171	32	16	28	764
Agricultural	758	116	23	12	21	306
Logging	1	0	0	0	0	1
<u>Marine Vessels</u>	<u>302</u>	<u>0</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>1,719</u>
Nonroad Engines and Vehicles	2,644	410	358	156	1,754	3,071
Highway Vehicles	0	0	—	—	—	0
<u>Other Area and Point Sources</u>	<u>0</u>	<u>0</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>0</u>
All Sources	NA	NA	NA	NA	NA	NA

Baltimore MSA Inventory B
Emission Inventory Summary - Air Toxics and SOx
Percent of Total Inventory

Equipment Category	% total tpy					
	PM	Aldehydes	Benzene	1,3 But.	Gas Vap	SOx
Lawn & Garden	NA	NA	NA	NA	NA	NA
Airport Service	NA	NA	NA	NA	NA	NA
Recreational	NA	NA	NA	NA	NA	NA
Recreational Marine	NA	NA	NA	NA	NA	NA
Light Commercial	NA	NA	NA	NA	NA	NA
Industrial	NA	NA	NA	NA	NA	NA
Construction	NA	NA	NA	NA	NA	NA
Agricultural	NA	NA	NA	NA	NA	NA
Logging	NA	NA	NA	NA	NA	NA
<u>Marine Vessels</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>
Nonroad Engines and Vehicles	NA	NA	NA	NA	NA	NA
Highway Vehicles	NA	NA	NA	NA	NA	NA
<u>Other Area and Point Sources</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>
All Sources	NA	NA	NA	NA	NA	NA

Baton Rouge CMSA Inventory B
Emission Inventory Summary - VOC, NOx, CO

Equipment Category	tpy			tpsd		tpwd CO
	VOC	NOx	CO	VOC	NOx	
Lawn & Garden	1,930	93	14,612	7	0	11
Airport Service	214	1,510	1,833	1	4	5
Recreational	171	4	566	1	0	1
Recreational Marine	2,867	89	5,672	15	0	4
Light Commercial	516	126	6,808	1	0	19
Industrial	229	580	3,588	1	2	10
Construction	417	2,599	2,610	2	9	6
Agricultural	121	540	800	0	2	1
Logging	16	95	83	0	0	0
<u>Marine Vessels</u>	<u>143</u>	<u>2,394</u>	<u>528</u>	<u>0</u>	<u>7</u>	<u>1</u>
Nonroad Engines and Vehicles	6,625	8,030	37,100	28	25	57
Highway Vehicles	0	14,555	0	64	44	0
<u>Other Area and Point Sources</u>	<u>0</u>	<u>82,744</u>	<u>0</u>	<u>270</u>	<u>227</u>	<u>0</u>
All Sources	NA	105,329	NA	362	296	NA

Baton Rouge CMSA Inventory B
Emission Inventory Summary - VOC, NOx, CO
Percent of Total Inventory

Equipment Category	% total tpy			% total tpsd		% total tpwd CO
	VOC	NOx	CO	VOC	NOx	
Lawn & Garden	NA	0.09%	NA	1.96%	0.12%	NA
Airport Service	NA	1.43%	NA	0.16%	1.40%	NA
Recreational	NA	0.00%	NA	0.19%	0.01%	NA
Recreational Marine	NA	0.08%	NA	4.12%	0.16%	NA
Light Commercial	NA	0.12%	NA	0.40%	0.12%	NA
Industrial	NA	0.55%	NA	0.18%	0.54%	NA
Construction	NA	2.47%	NA	0.42%	3.18%	NA
Agricultural	NA	0.51%	NA	0.13%	0.68%	NA
Logging	NA	0.09%	NA	0.01%	0.09%	NA
<u>Marine Vessels</u>	<u>NA</u>	<u>2.27%</u>	<u>NA</u>	<u>0.11%</u>	<u>2.22%</u>	<u>NA</u>
Nonroad Engines and Vehicles	NA	7.62%	NA	7.67%	8.50%	NA
Highway Vehicles	NA	13.82%	NA	17.69%	14.83%	NA
<u>Other Area and Point Sources</u>	<u>NA</u>	<u>78.56%</u>	<u>NA</u>	<u>74.63%</u>	<u>76.67%</u>	<u>NA</u>
All Sources	NA	100.00%	NA	100.00%	100.00%	NA

Baton Rouge CMSA Inventory B
Emission Inventory Summary - Air Toxics and SOx

Equipment Category	% total tpy					
	PM	Aldehydes	Benzene	1,3 But.	Gas Vap.	SOx
Lawn & Garden	29	18	52	21	294	17
Airport Service	180	8	6	3	4	100
Recreational	2	1	5	2	13	0
Recreational Marine	2	3	80	35	211	13
Light Commercial	19	7	14	6	85	15
Industrial	25	10	6	3	26	16
Construction	352	51	12	6	21	226
Agricultural	104	16	4	2	4	43
Logging	13	2	0	0	1	8
<u>Marine Vessels</u>	<u>141</u>	<u>0</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>975</u>
Nonroad Engines and Vehicles	868	115	180	78	659	1,414
Highway Vehicles	0	0	—	—	—	0
<u>Other Area and Point Sources</u>	<u>0</u>	<u>0</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>0</u>
All Sources	NA	NA	NA	NA	NA	NA

Baton Rouge CMSA Inventory B
Emission Inventory Summary - Air Toxics and SOx
Percent of Total Inventory

Equipment Category	% total tpy					
	PM	Aldehydes	Benzene	1,3 But.	Gas Vap.	SOx
Lawn & Garden	NA	NA	NA	NA	NA	NA
Airport Service	NA	NA	NA	NA	NA	NA
Recreational	NA	NA	NA	NA	NA	NA
Recreational Marine	NA	NA	NA	NA	NA	NA
Light Commercial	NA	NA	NA	NA	NA	NA
Industrial	NA	NA	NA	NA	NA	NA
Construction	NA	NA	NA	NA	NA	NA
Agricultural	NA	NA	NA	NA	NA	NA
Logging	NA	NA	NA	NA	NA	NA
<u>Marine Vessels</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>
Nonroad Engines and Vehicles	NA	NA	NA	NA	NA	NA
Highway Vehicles	NA	NA	NA	NA	NA	NA
<u>Other Area and Point Sources</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>
All Sources	NA	NA	NA	NA	NA	NA

Boston CMSA Inventory B
Emission Inventory Summary - VOC, NOx, CO

Equipment Category	tpy			tpsd		tpwd
	VOC	NOx	CO	VOC	NOx	CO
Lawn & Garden	8,046	252	42,880	42	1	12
Airport Service	355	2,496	3,036	1	7	8
Recreational	2,166	34	3,623	1	0	32
Recreational Marine	11,457	1,368	24,525	77	10	3
Light Commercial	2,440	511	29,618	7	1	81
Industrial	1,517	4,128	23,055	4	11	63
Construction	2,426	19,407	13,084	11	91	14
Agricultural	456	2,140	2,497	2	12	2
Logging	9	133	61	0	0	0
<u>Marine Vessels</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>5</u>	<u>1</u>
Nonroad Engines and Vehicles	28,870	30,469	142,381	146	140	216
Highway Vehicles	0	0	0	415	207	1,470
<u>Other Area and Point Sources</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>304</u>	<u>169</u>	<u>599</u>
All Sources	NA	NA	NA	866	515	2,284

Boston CMSA Inventory B
Emission Inventory Summary - VOC, NOx, CO
Percent of Total Inventory

Equipment Category	% total tpy			% total tpsd		% total tpwd
	VOC	NOx	CO	VOC	NOx	CO
Lawn & Garden	NA	NA	NA	4.86%	0.26%	0.51%
Airport Service	NA	NA	NA	0.11%	1.33%	0.36%
Recreational	NA	NA	NA	0.17%	0.01%	1.40%
Recreational Marine	NA	NA	NA	8.85%	1.98%	0.12%
Light Commercial	NA	NA	NA	0.78%	0.27%	3.55%
Industrial	NA	NA	NA	0.49%	2.20%	2.77%
Construction	NA	NA	NA	1.32%	17.75%	0.63%
Agricultural	NA	NA	NA	0.29%	2.28%	0.07%
Logging	NA	NA	NA	0.00%	0.07%	0.01%
<u>Marine Vessels</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>0.03%</u>	<u>0.96%</u>	<u>0.03%</u>
Nonroad Engines and Vehicles	NA	NA	NA	16.90%	27.11%	9.44%
Highway Vehicles	NA	NA	NA	47.93%	40.16%	64.35%
<u>Other Area and Point Sources</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>35.17%</u>	<u>32.73%</u>	<u>26.20%</u>
All Sources	NA	NA	NA	100.00%	100.00%	100.00%

Boston CMSA
 Emission Inventory Summary - Air Toxics and SOx
 Percent of Total Inventory

Equipment Category	% total tpy					
	PM	Aldehydes	Benzene	1,3 But.	Gas Vap.	SOx
Lawn & Garden	NA	NA	NA	NA	NA	NA
Airport Service	NA	NA	NA	NA	NA	NA
Recreational	NA	NA	NA	NA	NA	NA
Recreational Manne	NA	NA	NA	NA	NA	NA
Light Commercial	NA	NA	NA	NA	NA	NA
Industrial	NA	NA	NA	NA	NA	NA
Construction	NA	NA	NA	NA	NA	NA
Agrncultural	NA	NA	NA	NA	NA	NA
Logging	NA	NA	NA	NA	NA	NA
<u>Marine Vessels</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>
Nonroad Engines and Vehicles	NA	NA	NA	NA	NA	NA
Highway Vehicles	NA	NA	NA	NA	NA	NA
<u>Other Area and Point Sources</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>
All Sources	NA	NA	NA	NA	NA	NA

Boston CMSA
 Emission Inventory Summary - Air Toxics and SOx

Equipment Category	tpy					
	PM	Aldehydes	Benzene	1,3 But.	Gas Vap	SOx
Lawn & Garden	130	67	219	90	1,107	48
Airport Service	297	13	11	5	7	165
Recreational	82	8	63	27	88	3
Recreational Manne	27	53	256	110	3,002	87
Light Commercial	88	30	68	27	353	62
Industrial	224	68	42	18	170	137
Construction	2,629	360	72	38	36	1,683
Agrncultural	410	65	13	7	20	168
Logging	18	2	0	0	0	11
<u>Marne Vessels</u>	<u>173</u>	<u>0</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>0</u>
Nonroad Engines and Vehicles	4,078	666	743	323	4,784	2,363
Highway Vehicles	0	0	—	—	—	0
<u>Other Area and Point Sources</u>	<u>0</u>	<u>0</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>0</u>
All Sources	NA	NA	NA	NA	NA	NA

Chicago CMSA Inventory B
Emission Inventory Summary - VOC, NOx, CO

Equipment Category	tpy			tpsd		tpwd CO
	VOC	NOx	CO	VOC	NOx	
Lawn & Garden	14,481	413	71,242	76	2	22
Airport Service	720	5,063	6,153	2	14	17
Recreational	3,320	52	5,483	2	0	49
Recreational Marine	9,907	702	20,504	72	5	0
Light Commercial	4,120	862	49,973	11	2	137
Industrial	3,266	8,774	50,093	9	24	137
Construction	1,891	13,554	11,150	9	64	12
Agricultural	1,754	9,626	8,512	10	53	6
Logging	0	1	1	0	0	0
<u>Marine Vessels</u>	<u>0</u>	<u>608</u>	<u>0</u>	<u>1</u>	<u>26</u>	<u>0</u>
Nonroad Engines and Vehicles	39,459	39,656	223,111	192	191	379
Highway Vehicles	0	153,215	0	588	462	0
<u>Other Area and Point Sources</u>	<u>0</u>	<u>302,107</u>	<u>0</u>	<u>1,029</u>	<u>603</u>	<u>0</u>
All Sources	NA	494,978	NA	1,809	1,256	NA

Chicago CMSA Inventory B
Emission Inventory Summary - VOC, NOx, CO
Percent of Total Inventory

Equipment Category	% total tpy			% total tpsd		% total tpwd CO
	VOC	NOx	CO	VOC	NOx	
Lawn & Garden	NA	0.08%	NA	4.19%	0.18%	NA
Airport Service	NA	1.02%	NA	0.11%	1.10%	NA
Recreational	NA	0.01%	NA	0.12%	0.00%	NA
Recreational Marine	NA	0.14%	NA	3.96%	0.43%	NA
Light Commercial	NA	0.17%	NA	0.63%	0.19%	NA
Industrial	NA	1.77%	NA	0.51%	1.91%	NA
Construction	NA	2.74%	NA	0.49%	5.09%	NA
Agricultural	NA	1.94%	NA	0.53%	4.20%	NA
Logging	NA	0.00%	NA	0.00%	0.00%	NA
<u>Marine Vessels</u>	<u>NA</u>	<u>0.12%</u>	<u>NA</u>	<u>0.06%</u>	<u>2.11%</u>	<u>NA</u>
Nonroad Engines and Vehicles	NA	8.01%	NA	10.61%	15.21%	NA
Highway Vehicles	NA	30.95%	NA	32.50%	36.77%	NA
<u>Other Area and Point Sources</u>	<u>NA</u>	<u>61.03%</u>	<u>NA</u>	<u>56.90%</u>	<u>48.02%</u>	<u>NA</u>
All Sources	NA	100.00%	NA	100.00%	100.00%	NA

Chicago CMSA Inventory B
Emission Inventory Summary - Air Toxics and SOx

Equipment Category	% total tpy					
	PM	Aldehydes	Benzene	1,3 But.	Gas Vap.	SOx
Lawn & Garden	239	119	399	165	1,814	79
Airport Service	603	26	21	11	15	335
Recreational	127	12	96	41	136	5
Recreational Marine	14	27	254	110	1,479	60
Light Commercial	148	51	114	46	601	105
Industrial	455	144	90	39	369	280
Construction	1,834	267	55	28	75	1,179
Agricultural	1,918	284	51	27	43	760
Logging	0	0	0	0	0	0
Marine Vessels	300	0	0	0	0	0
Nonroad Engines and Vehicles	5,638	929	1,082	467	4,531	2,802
Highway Vehicles	113,525	0	0	0	0	0
<u>Other Area and Point Sources</u>	<u>181,246</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>
All Sources	300,409	NA	NA	NA	NA	NA

Chicago CMSA Inventory B
Emission Inventory Summary - Air Toxics and SOx
Percent of Total Inventory

Equipment Category	% total tpy					
	PM	Aldehydes	Benzene	1,3 But.	Gas Vap.	SOx
Lawn & Garden	0.08%	NA	NA	NA	NA	NA
Airport Service	0.20%	NA	NA	NA	NA	NA
Recreational	0.04%	NA	NA	NA	NA	NA
Recreational Marine	0.00%	NA	NA	NA	NA	NA
Light Commercial	0.05%	NA	NA	NA	NA	NA
Industrial	0.15%	NA	NA	NA	NA	NA
Construction	0.61%	NA	NA	NA	NA	NA
Agricultural	0.64%	NA	NA	NA	NA	NA
Logging	0.00%	NA	NA	NA	NA	NA
Marine Vessels	0.10%	NA	NA	NA	NA	NA
Nonroad Engines and Vehicles	1.88%	NA	NA	NA	NA	NA
Highway Vehicles	37.79%	NA	NA	NA	NA	NA
<u>Other Area and Point Sources</u>	<u>60.33%</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>
All Sources	100.00%	NA	NA	NA	NA	NA

Cleveland CMSA Inventory B
Emission Inventory Summary - VOC, NOx, CO

Equipment Category	tpy			tpsd		tpwd CO
	VOC	NOx	CO	VOC	NOx	
Lawn & Garden	7,415	225	40,610	39	1	8
Airport Service	305	2,151	2,608	1	6	7
Recreational	503	8	830	0	0	7
Recreational Manne	6,816	637	14,119	48	5	0
Light Commercial	1,651	346	20,032	5	1	55
Industrial	1,418	3,831	21,630	4	10	59
Construction	685	5,165	3,983	3	24	4
Agrncultural	722	3,821	3,583	4	21	2
Logging	1	8	4	0	0	0
<u>Marine Vessels</u>	<u>0</u>	<u>109</u>	<u>3,757</u>	<u>0</u>	<u>0</u>	<u>0</u>
Nonroad Engines and Vehicles	19,516	16,300	111,156	104	69	144
Highway Vehicles	0	64,808	412,340	242	195	2,360
<u>Other Area and Point Sources</u>	<u>0</u>	<u>62,301</u>	<u>88,401</u>	<u>369</u>	<u>171</u>	<u>252</u>
All Sources	NA	143,409	611,897	715	435	2,755

Cleveland CMSA Inventory B
Emission Inventory Summary - VOC, NOx, CO
Percent of Total Inventory

Equipment Category	% total tpy			% total tpsd		% total tpwd CO
	VOC	NOx	CO	VOC	NOx	
Lawn & Garden	NA	0.16%	6.64%	5.47%	0.28%	0.30%
Airport Service	NA	1.50%	0.43%	0.12%	1.35%	0.26%
Recreational	NA	0.01%	0.14%	0.05%	0.00%	0.27%
Recreational Manne	NA	0.44%	2.31%	6.68%	1.13%	0.00%
Light Commercial	NA	0.24%	3.27%	0.64%	0.22%	1.99%
Industrial	NA	2.67%	3.53%	0.56%	2.41%	2.15%
Construction	NA	3.60%	0.65%	0.45%	5.59%	0.16%
Agrncultural	NA	2.66%	0.59%	0.55%	4.81%	0.09%
Logging	NA	0.01%	0.00%	0.00%	0.00%	0.00%
<u>Marine Vessels</u>	<u>NA</u>	<u>0.08%</u>	<u>0.61%</u>	<u>0.00%</u>	<u>0.07%</u>	<u>0.00%</u>
Nonroad Engines and Vehicles	NA	11.37%	18.17%	14.52%	15.87%	5.21%
Highway Vehicles	NA	45.19%	67.39%	33.84%	44.89%	85.66%
<u>Other Area and Point Sources</u>	<u>NA</u>	<u>43.44%</u>	<u>14.45%</u>	<u>51.64%</u>	<u>39.23%</u>	<u>9.13%</u>
All Sources	NA	100.00%	100.00%	100.00%	100.00%	100.00%

Cleveland CMSA Inventory B
Emission Inventory Summary - Air Toxics and SOx

Equipment Category	% total tpy					
	PM	Aldehydes	Benzene	1,3 But	Gas Vap.	SOx
Lawn & Garden	127	63	202	83	1,041	44
Airport Service	256	11	9	5	6	142
Recreational	19	2	15	6	21	1
Recreational Marine	13	25	161	69	1,483	46
Light Commercial	59	20	46	18	241	42
Industrial	204	63	39	17	160	125
Construction	677	101	20	10	26	448
Agricultural	759	113	21	11	23	302
Logging	1	0	0	0	0	1
<u>Marine Vessels</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>
Nonroad Engines and Vehicles	2,115	398	512	220	2,999	1,150
Highway Vehicles	46,729	0				0
<u>Other Area and Point Sources</u>	<u>64,287</u>	<u>0</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>0</u>
All Sources	113,131	NA	NA	NA	NA	NA

Cleveland CMSA Inventory B
Emission Inventory Summary - Air Toxics and SOx
Percent of Total Inventory

Equipment Category	% total tpy					
	PM	Aldehydes	Benzene	1,3 But.	Gas Vap.	SOx
Lawn & Garden	0.11%	NA	NA	NA	NA	NA
Airport Service	0.23%	NA	NA	NA	NA	NA
Recreational	0.02%	NA	NA	NA	NA	NA
Recreational Marine	0.01%	NA	NA	NA	NA	NA
Light Commercial	0.05%	NA	NA	NA	NA	NA
Industrial	0.18%	NA	NA	NA	NA	NA
Construction	0.60%	NA	NA	NA	NA	NA
Agricultural	0.67%	NA	NA	NA	NA	NA
Logging	0.00%	NA	NA	NA	NA	NA
<u>Marine Vessels</u>	<u>0.00%</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>
Nonroad Engines and Vehicles	1.87%	NA	NA	NA	NA	NA
Highway Vehicles	41.31%	NA	NA	NA	NA	NA
<u>Other Area and Point Sources</u>	<u>56.83%</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>
All Sources	100.00%	NA	NA	NA	NA	NA

Denver CMSA Inventory B
Emission Inventory Summary - VOC, NOx, CO

Equipment Category	tpy			tpsd		tpwd
	VOC	NOx	CO	VOC	NOx	CO
Lawn & Garden	5,887	242	32,829	31	1	8
Airport Service	226	1,591	1,931	1	4	5
Recreational	1,469	23	2,480	1	0	21
Recreational Marine	466	86	900	3	1	0
Light Commercial	2,023	457	25,486	6	1	70
Industrial	589	1,662	8,601	2	5	24
Construction	841	5,689	5,032	4	27	6
Agricultural	381	1,943	1,931	2	11	1
Logging	0	1	0	0	0	0
<u>Marine Vessels</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>
Nonroad Engines and Vehicles	11,881	11,694	79,191	49	50	135
Highway Vehicles	0	0	417,406	0	0	2,371
<u>Other Area and Point Sources</u>	<u>0</u>	<u>0</u>	<u>58,870</u>	<u>0</u>	<u>0</u>	<u>168</u>
All Sources	NA	NA	555,467	NA	NA	2,674

Denver CMSA Inventory B
Emission Inventory Summary - VOC, NOx, CO
Percent of Total Inventory

Equipment Category	% total tpy			% total tpsd		% total tpwd
	VOC	NOx	CO	VOC	NOx	CO
Lawn & Garden	NA	NA	5.91%	NA	NA	0.31%
Airport Service	NA	NA	0.35%	NA	NA	0.20%
Recreational	NA	NA	0.45%	NA	NA	0.79%
Recreational Marine	NA	NA	0.16%	NA	NA	0.00%
Light Commercial	NA	NA	4.59%	NA	NA	2.61%
Industrial	NA	NA	1.55%	NA	NA	0.88%
Construction	NA	NA	0.91%	NA	NA	0.21%
Agricultural	NA	NA	0.35%	NA	NA	0.05%
Logging	NA	NA	0.00%	NA	NA	0.00%
<u>Marine Vessels</u>	<u>NA</u>	<u>NA</u>	<u>0.00%</u>	<u>NA</u>	<u>NA</u>	<u>0.00%</u>
Nonroad Engines and Vehicles	NA	NA	14.26%	NA	NA	5.04%
Highway Vehicles	NA	NA	75.15%	NA	NA	88.69%
<u>Other Area and Point Sources</u>	<u>NA</u>	<u>NA</u>	<u>10.60%</u>	<u>NA</u>	<u>NA</u>	<u>6.27%</u>
All Sources	NA	NA	100.00%	NA	NA	100.00%

Denver CMSA Inventory B
Emission Inventory Summary - Air Toxics and SOx

Equipment Category	% total tpy					
	PM	Aldehydes	Benzene	1,3 But.	Gas. Vap	SOx
Lawn & Garden	91	50	162	67	740	42
Airport Service	189	8	7	3	5	105
Recreational	56	6	42	18	59	2
Recreational Marine	2	3	6	3	266	4
Light Commercial	74	25	56	22	312	56
Industrial	104	27	16	7	64	62
Construction	768	111	24	12	37	498
Agricultural	374	58	11	6	19	154
Logging	0	0	0	0	0	0
<u>Marine Vessels</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>
Nonroad Engines and Vehicles	1,657	288	325	139	1,502	922
Highway Vehicles	32,716	0				0
<u>Other Area and Point Sources</u>	<u>146,677</u>	<u>0</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>0</u>
All Sources	181,050	NA	NA	NA	NA	NA

Denver CMSA Inventory B
Emission Inventory Summary - Air Toxics and SOx
Percent of Total Inventory

Equipment Category	% total tpy					
	PM	Aldehydes	Benzene	1,3 But	Gas Vap	SOx
Lawn & Garden	0.05%	NA	NA	NA	NA	NA
Airport Service	0.10%	NA	NA	NA	NA	NA
Recreational	0.03%	NA	NA	NA	NA	NA
Recreational Marine	0.00%	NA	NA	NA	NA	NA
Light Commercial	0.04%	NA	NA	NA	NA	NA
Industrial	0.06%	NA	NA	NA	NA	NA
Construction	0.42%	NA	NA	NA	NA	NA
Agricultural	0.21%	NA	NA	NA	NA	NA
Logging	0.00%	NA	NA	NA	NA	NA
<u>Marine Vessels</u>	<u>0.00%</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>
Nonroad Engines and Vehicles	0.92%	NA	NA	NA	NA	NA
Highway Vehicles	18.07%	NA	NA	NA	NA	NA
<u>Other Area and Point Sources</u>	<u>81.01%</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>
All Sources	100.00%	NA	NA	NA	NA	NA

El Paso MSA Inventory B
Emission Inventory Summary - VOC, NOx, CO

Equipment Category	tpy			tpsd		tpwd
	VOC	NOx	CO	VOC	NOx	CO
Lawn & Garden	1,240	54	7,592	4	0	6
Airport Service	67	470	575	0	1	2
Recreational	153	4	502	1	0	1
Recreational Manne	253	13	498	1	0	0
Light Commercial	504	127	6,699	1	0	18
Industrial	331	867	5,050	1	2	14
Construction	242	1,730	1,444	1	6	3
Agricultural	70	318	430	0	1	0
Logging	0	3	2	0	0	0
<u>Marine Vessels</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>
Nonroad Engines and Vehicles	2,860	3,586	22,793	10	12	44
Highway Vehicles	0	11,156	320,700	36	34	756
<u>Other Area and Point Sources</u>	<u>0</u>	<u>20,382</u>	<u>18,000</u>	<u>60</u>	<u>25</u>	<u>24</u>
All Sources	NA	35,124	361,493	106	70	824

El Paso MSA Inventory B
Emission Inventory Summary - VOC, NOx, CO
Percent of Total Inventory

Equipment Category	% total tpy			% total tpsd		% total tpwd
	VOC	NOx	CO	VOC	NOx	CO
Lawn & Garden	NA	0.15%	2.10%	4.22%	0.29%	0.70%
Airport Service	NA	1.34%	0.16%	0.17%	1.83%	0.19%
Recreational	NA	0.01%	0.14%	0.59%	0.02%	0.08%
Recreational Manne	NA	0.04%	0.14%	1.22%	0.10%	0.05%
Light Commercial	NA	0.36%	1.85%	1.32%	0.50%	2.23%
Industrial	NA	2.47%	1.40%	0.88%	3.38%	1.68%
Construction	NA	4.93%	0.40%	0.82%	8.91%	0.38%
Agricultural	NA	0.91%	0.12%	0.25%	1.69%	0.03%
Logging	NA	0.01%	0.00%	0.00%	0.01%	0.00%
<u>Marine Vessels</u>	<u>NA</u>	<u>0.00%</u>	<u>0.00%</u>	<u>0.00%</u>	<u>0.00%</u>	<u>0.00%</u>
Nonroad Engines and Vehicles	NA	10.21%	6.31%	9.47%	16.72%	5.34%
Highway Vehicles	NA	31.76%	88.72%	34.13%	47.87%	91.71%
<u>Other Area and Point Sources</u>	<u>NA</u>	<u>58.03%</u>	<u>4.98%</u>	<u>56.41%</u>	<u>35.41%</u>	<u>2.95%</u>
All Sources	NA	100.00%	100.00%	100.00%	100.00%	100.00%

El Paso MSA Inventory B
Emission Inventory Summary - Air Toxics and SOx

Equipment Category	PM	Aldehydes	Benzene	tpy 1,3 But	Gas Vap	SOx
Lawn & Garden	21	11	34	14	149	9
Airport Service	56	2	2	1	1	31
Recreational	2	1	4	2	12	0
Recreational Marine	0	0	7	3	35	1
Light Commercial	19	6	14	6	81	15
Industrial	44	14	9	4	36	27
Construction	224	36	7	4	10	154
Agricultural	60	10	2	1	3	25
Logging	0	0	0	0	0	0
<u>Marine Vessels</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>
Nonroad Engines and Vehicles	426	81	79	34	328	264
Highway Vehicles	7,278	0				0
<u>Other Area and Point Sources</u>	<u>129,939</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>
All Sources	137,643	NA	NA	NA	NA	NA

El Paso MSA Inventory B
Emission Inventory Summary - Air Toxics and SOx
Percent of Total Inventory

Equipment Category	PM	Aldehydes	Benzene	% total tpy 1,3 But	Gas. Vap.	SOx
Lawn & Garden	0.01%	NA	NA	NA	NA	NA
Airport Service	0.04%	NA	NA	NA	NA	NA
Recreational	0.00%	NA	NA	NA	NA	NA
Recreational Marine	0.00%	NA	NA	NA	NA	NA
Light Commercial	0.01%	NA	NA	NA	NA	NA
Industrial	0.03%	NA	NA	NA	NA	NA
Construction	0.16%	NA	NA	NA	NA	NA
Agricultural	0.04%	NA	NA	NA	NA	NA
Logging	0.00%	NA	NA	NA	NA	NA
<u>Marine Vessels</u>	<u>0.00%</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>
Nonroad Engines and Vehicles	0.31%	NA	NA	NA	NA	NA
Highway Vehicles	5.29%	NA	NA	NA	NA	NA
<u>Other Area and Point Sources</u>	<u>94.40%</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>
All Sources	100.00%	NA	NA	NA	NA	NA

Hartford NECMA Inventory B
Emission Inventory Summary - VOC, NOx, CO

Equipment Category	tpy			tpsd		tpwd CO
	VOC	NOx	CO	VOC	NOx	
Lawn & Garden	3,768	105	19,648	20	1	4
Airport Service	256	1,800	2,188	1	5	6
Recreational	935	15	1,564	1	0	14
Recreational Manne	2,883	261	6,156	20	2	1
Light Commercial	597	125	7,249	2	0	20
Industrial	425	1,212	6,270	1	3	17
Construction	797	7,529	4,447	4	35	5
Agncultural	360	1,766	1,854	2	10	1
Logging	2	33	15	0	0	0
<u>Marine Vessels</u>	<u>11</u>	<u>260</u>	<u>29</u>	<u>0</u>	<u>1</u>	<u>0</u>
Nonroad Engines and Vehicles	10,034	13,106	49,421	50	57	68
Highway Vehicles	0	29,311	108,380	189	88	590
<u>Other Area and Point Sources</u>	<u>0</u>	<u>11,650</u>	<u>51,997</u>	<u>77</u>	<u>18</u>	<u>210</u>
All Sources	NA	54,067	209,798	315	163	868

Hartford NECMA Inventory B
Emission Inventory Summary - VOC, NOx, CO
Percent of Total Inventory

Equipment Category	% total tpy			% total tpsd		% total tpwd CO
	VOC	NOx	CO	VOC	NOx	
Lawn & Garden	NA	0.19%	9.37%	6.32%	0.35%	0.45%
Airport Service	NA	3.33%	1.04%	0.22%	3.02%	0.69%
Recreational	NA	0.03%	0.75%	0.20%	0.01%	1.59%
Recreational Manne	NA	0.48%	2.93%	6.37%	1.19%	0.08%
Light Commercial	NA	0.23%	3.46%	0.53%	0.21%	2.29%
Industrial	NA	2.24%	2.99%	0.38%	2.03%	1.98%
Construction	NA	13.92%	2.12%	1.19%	21.70%	0.56%
Agncultural	NA	3.27%	0.88%	0.62%	5.92%	0.14%
Logging	NA	0.06%	0.01%	0.00%	0.06%	0.00%
<u>Marine Vessels</u>	<u>NA</u>	<u>0.48%</u>	<u>0.01%</u>	<u>0.01%</u>	<u>0.43%</u>	<u>0.01%</u>
Nonroad Engines and Vehicles	NA	24.24%	23.56%	15.84%	34.91%	7.79%
Highway Vehicles	NA	54.21%	51.66%	59.78%	54.03%	68.00%
<u>Other Area and Point Sources</u>	<u>NA</u>	<u>21.55%</u>	<u>24.78%</u>	<u>24.37%</u>	<u>11.06%</u>	<u>24.20%</u>
All Sources	NA	100.00%	100.00%	100.00%	100.00%	100.00%

Hartford NECMA Inventory B
Emission Inventory Summary - Air Toxics and SOx

Equipment Category	tpy					
	PM	Aldehydes	Benzene	1,3 But.	Gas. Vap	SOx
Lawn & Garden	67	32	103	42	509	21
Airport Service	214	9	8	4	5	119
Recreational	36	3	27	12	38	1
Recreational Marine	5	10	72	31	490	19
Light Commercial	22	7	17	7	87	15
Industrial	75	20	12	5	47	45
Construction	974	138	24	12	13	640
Agricultural	341	54	11	6	10	138
Logging	4	1	0	0	0	3
<u>Marine Vessels</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>
Nonroad Engines and Vehicles	1,738	274	272	119	1,198	1,002
Highway Vehicles	0	0				0
<u>Other Area and Point Sources</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>
All Sources	NA	NA	NA	NA	NA	NA

Hartford NECMA Inventory B
Emission Inventory Summary - Air Toxics and SOx
Percent of Total Inventory

Equipment Category	% total tpy					
	PM	Aldehydes	Benzene	1,3 But.	Gas. Vap	SOx
Lawn & Garden	NA	NA	NA	NA	NA	NA
Airport Service	NA	NA	NA	NA	NA	NA
Recreational	NA	NA	NA	NA	NA	NA
Recreational Marine	NA	NA	NA	NA	NA	NA
Light Commercial	NA	NA	NA	NA	NA	NA
Industrial	NA	NA	NA	NA	NA	NA
Construction	NA	NA	NA	NA	NA	NA
Agricultural	NA	NA	NA	NA	NA	NA
Logging	NA	NA	NA	NA	NA	NA
<u>Marine Vessels</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>
Nonroad Engines and Vehicles	NA	NA	NA	NA	NA	NA
Highway Vehicles	NA	NA	NA	NA	NA	NA
<u>Other Area and Point Sources</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>
All Sources	NA	NA	NA	NA	NA	NA

Houston CMSA Inventory B
Emission Inventory Summary - VOC, NOx, CO

Equipment Category	tpy			tpsd		tpwd CO
	VOC	NOx	CO	VOC	NOx	
Lawn & Garden	13,415	469	72,509	48	2	57
Airport Service	389	2,739	3,331	1	8	9
Recreational	498	12	1,629	2	0	2
Recreational Marine	11,745	585	22,834	60	3	18
Light Commercial	4,549	1,148	60,413	13	3	166
Industrial	1,845	4,753	28,545	5	13	78
Construction	2,450	15,852	15,198	9	57	33
Agricultural	955	4,675	5,508	4	17	4
Logging	30	188	157	0	1	0
<u>Marine Vessels</u>	<u>631</u>	<u>12,227</u>	<u>1,709</u>	<u>2</u>	<u>33</u>	<u>5</u>
Nonroad Engines and Vehicles	36,508	42,647	211,832	144	137	372
Highway Vehicles	0	100,865	0	442	304	0
<u>Other Area and Point Sources</u>	<u>0</u>	<u>440,925</u>	<u>0</u>	<u>1,391</u>	<u>859</u>	<u>0</u>
All Sources	NA	584,437	NA	1,977	1,301	NA

Houston CMSA Inventory B
Emission Inventory Summary - VOC, NOx, CO
Percent of Total Inventory

Equipment Category	% total tpy			% total tpsd		% total tpwd CO
	VOC	NOx	CO	VOC	NOx	
Lawn & Garden	NA	0.08%	NA	2.44%	0.13%	NA
Airport Service	NA	0.47%	NA	0.05%	0.58%	NA
Recreational	NA	0.00%	NA	0.10%	0.00%	NA
Recreational Marine	NA	0.10%	NA	3.05%	0.24%	NA
Light Commercial	NA	0.20%	NA	0.64%	0.24%	NA
Industrial	NA	0.81%	NA	0.26%	1.00%	NA
Construction	NA	2.71%	NA	0.45%	4.41%	NA
Agricultural	NA	0.80%	NA	0.18%	1.34%	NA
Logging	NA	0.03%	NA	0.00%	0.04%	NA
<u>Marine Vessels</u>	<u>NA</u>	<u>2.09%</u>	<u>NA</u>	<u>0.09%</u>	<u>2.58%</u>	<u>NA</u>
Nonroad Engines and Vehicles	NA	7.30%	NA	7.27%	10.56%	NA
Highway Vehicles	NA	17.26%	NA	22.38%	23.37%	NA
<u>Other Area and Point Sources</u>	<u>NA</u>	<u>75.44%</u>	<u>NA</u>	<u>70.35%</u>	<u>66.07%</u>	<u>NA</u>
All Sources	NA	100.00%	NA	100.00%	100.00%	NA

Houston CMSA Inventory B
Emission Inventory Summary - Air Toxics and SOx

Equipment Category	tpy					
	PM	Aldehydes	Benzene	1,3 But.	Gas Vap.	SOx
Lawn & Garden	220	117	377	156	1,424	85
Airport Service	326	14	12	6	7	181
Recreational	5	3	14	6	39	1
Recreational Marine	11	22	301	130	1,752	61
Light Commercial	173	58	125	50	733	139
Industrial	225	78	51	22	206	140
Construction	2,115	314	71	36	116	1,380
Agricultural	902	141	28	15	26	372
Logging	26	4	1	0	2	16
<u>Marine Vessels</u>	<u>731</u>	<u>0</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>5,075</u>
Nonroad Engines and Vehicles	4,734	750	980	420	4,304	7,450
Highway Vehicles	0	0	—	—	—	0
<u>Other Area and Point Sources</u>	<u>0</u>	<u>0</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>0</u>
All Sources	NA	NA	NA	NA	NA	NA

Houston CMSA Inventory B
Emission Inventory Summary - Air Toxics and SOx
Percent of Total Inventory

Equipment Category	% total tpy					
	PM	Aldehydes	Benzene	1,3 But.	Gas. Vap	SOx
Lawn & Garden	NA	NA	NA	NA	NA	NA
Airport Service	NA	NA	NA	NA	NA	NA
Recreational	NA	NA	NA	NA	NA	NA
Recreational Marine	NA	NA	NA	NA	NA	NA
Light Commercial	NA	NA	NA	NA	NA	NA
Industrial	NA	NA	NA	NA	NA	NA
Construction	NA	NA	NA	NA	NA	NA
Agricultural	NA	NA	NA	NA	NA	NA
Logging	NA	NA	NA	NA	NA	NA
<u>Marine Vessels</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>
Nonroad Engines and Vehicles	NA	NA	NA	NA	NA	NA
Highway Vehicles	NA	NA	NA	NA	NA	NA
<u>Other Area and Point Sources</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>
All Sources	NA	NA	NA	NA	NA	NA

Miami CMSA Inventory B
Emission Inventory Summary - VOC, NOx, CO

Equipment Category	tpy			tpsd		tpwd CO
	VOC	NOx	CO	VOC	NOx	
Lawn & Garden	7,816	349	48,008	28	1	36
Airport Service	176	1,239	1,501	0	3	4
Recreational	349	9	1,156	1	0	2
Recreational Manne	7,478	559	15,380	38	3	12
Light Commercial	1,508	369	19,885	4	1	54
Industrial	1,403	3,507	22,137	4	10	61
Construction	1,212	10,164	6,938	4	37	15
Agricultural	282	1,191	1,852	1	4	1
Logging	0	0	0	0	0	0
<u>Manne Vessels</u>	<u>0</u>	<u>1,310</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>
Nonroad Engines and Vehicles	20,224	18,697	116,858	82	59	186
Highway Vehicles	0	63,266	0	307	191	0
<u>Other Area and Point Sources</u>	<u>0</u>	<u>35,464</u>	<u>0</u>	<u>235</u>	<u>97</u>	<u>0</u>
All Sources	NA	117,427	NA	624	347	NA

Miami CMSA Inventory B
Emission Inventory Summary - VOC, NOx, CO
Percent of Total Inventory

Equipment Category	% total tpy			% total tpsd		% total tpwd CO
	VOC	NOx	CO	VOC	NOx	
Lawn & Garden	NA	0.30%	NA	4.52%	0.37%	NA
Airport Service	NA	1.06%	NA	0.08%	0.98%	NA
Recreational	NA	0.01%	NA	0.22%	0.01%	NA
Recreational Manne	NA	0.48%	NA	6.14%	0.85%	NA
Light Commercial	NA	0.31%	NA	0.67%	0.29%	NA
Industrial	NA	2.99%	NA	0.63%	2.77%	NA
Construction	NA	8.66%	NA	0.70%	10.58%	NA
Agricultural	NA	1.01%	NA	0.17%	1.28%	NA
Logging	NA	0.00%	NA	0.00%	0.00%	NA
<u>Manne Vessels</u>	<u>NA</u>	<u>1.12%</u>	<u>NA</u>	<u>0.00%</u>	<u>0.00%</u>	<u>NA</u>
Nonroad Engines and Vehicles	NA	15.92%	NA	13.14%	17.13%	NA
Highway Vehicles	NA	53.88%	NA	49.19%	54.90%	NA
<u>Other Area and Point Sources</u>	<u>NA</u>	<u>30.20%</u>	<u>NA</u>	<u>37.68%</u>	<u>27.98%</u>	<u>NA</u>
All Sources	NA	100.00%	NA	100.00%	100.00%	NA

Miami CMSA Inventory B
Emission Inventory Summary - Air Toxics and SOx

Equipment Category	PM	Aldehydes	Benzene	tpy 1,3 But	Gas. Vap.	SOx
Lawn & Garden	129	70	218	90	899	60
Airport Service	148	6	5	3	3	82
Recreational	4	2	10	4	26	1
Recreational Marine	11	21	188	81	1,250	46
Light Commercial	56	19	41	17	247	45
Industrial	145	58	39	17	159	93
Construction	1,287	203	36	18	35	888
Agricultural	225	37	8	4	17	94
Logging	0	0	0	0	0	0
<u>Marine Vessels</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>
Nonroad Engines and Vehicles	2,005	417	545	233	2,637	1,308
Highway Vehicles	0	0				0
<u>Other Area and Point Sources</u>	<u>0</u>	<u>0</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>0</u>
All Sources	NA	NA	NA	NA	NA	NA

Miami CMSA Inventory B
Emission Inventory Summary - Air Toxics and SOx
Percent of Total Inventory

Equipment Category	PM	Aldehydes	Benzene	% total tpy 1,3 But.	Gas Vap	SOx
Lawn & Garden	NA	NA	NA	NA	NA	NA
Airport Service	NA	NA	NA	NA	NA	NA
Recreational	NA	NA	NA	NA	NA	NA
Recreational Marine	NA	NA	NA	NA	NA	NA
Light Commercial	NA	NA	NA	NA	NA	NA
Industrial	NA	NA	NA	NA	NA	NA
Construction	NA	NA	NA	NA	NA	NA
Agricultural	NA	NA	NA	NA	NA	NA
Logging	NA	NA	NA	NA	NA	NA
<u>Marine Vessels</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>
Nonroad Engines and Vehicles	NA	NA	NA	NA	NA	NA
Highway Vehicles	NA	NA	NA	NA	NA	NA
<u>Other Area and Point Sources</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>
All Sources	NA	NA	NA	NA	NA	NA

Milwaukee CMSA Inventory B
Emission Inventory Summary - VOC, NOx, CO

Equipment Category	tpy			tpsd		tpwd CO
	VOC	NOx	CO	VOC	NOx	
Lawn & Garden	4,031	132	23,435	21	1	4
Airport Service	168	1,182	1,435	0	3	4
Recreational	564	9	936	0	0	8
Recreational Manne	4,748	293	9,532	34	2	0
Light Commercial	737	154	8,935	2	0	24
Industrial	850	2,231	13,187	2	6	36
Construction	381	2,972	2,282	2	14	3
Agricultural	797	4,179	3,952	4	23	3
Logging	0	0	0	0	0	0
<u>Marine Vessels</u>	<u>0</u>	<u>398</u>	<u>0</u>	<u>0</u>	<u>1</u>	<u>0</u>
Nonroad Engines and Vehicles	12,275	11,550	63,693	67	51	82
Highway Vehicles	0	33,493	0	106	101	0
<u>Other Area and Point Sources</u>	<u>0</u>	<u>39,621</u>	<u>0</u>	<u>195</u>	<u>109</u>	<u>0</u>
All Sources	NA	84,664	NA	368	260	NA

Milwaukee CMSA Inventory B
Emission Inventory Summary - VOC, NOx, CO
Percent of Total Inventory

Equipment Category	% total tpy			% total tpsd		% total tpwd CO
	VOC	NOx	CO	VOC	NOx	
Lawn & Garden	NA	0.16%	NA	5.78%	0.28%	NA
Airport Service	NA	1.40%	NA	0.13%	1.24%	NA
Recreational	NA	0.01%	NA	0.10%	0.00%	NA
Recreational Manne	NA	0.35%	NA	9.31%	0.87%	NA
Light Commercial	NA	0.18%	NA	0.56%	0.16%	NA
Industrial	NA	2.64%	NA	0.65%	2.35%	NA
Construction	NA	3.51%	NA	0.49%	5.38%	NA
Agricultural	NA	4.94%	NA	1.18%	8.80%	NA
Logging	NA	0.00%	NA	0.00%	0.00%	NA
<u>Manne Vessels</u>	<u>NA</u>	<u>0.47%</u>	<u>NA</u>	<u>0.00%</u>	<u>0.42%</u>	<u>NA</u>
Nonroad Engines and Vehicles	NA	13.64%	NA	18.20%	19.50%	NA
Highway Vehicles	NA	39.56%	NA	28.75%	38.79%	NA
<u>Other Area and Point Sources</u>	<u>NA</u>	<u>46.80%</u>	<u>NA</u>	<u>53.05%</u>	<u>41.71%</u>	<u>NA</u>
All Sources	NA	100.00%	NA	100.00%	100.00%	NA

Milwaukee CMSA Inventory B
Emission Inventory Summary - Air Toxics and SOx
Percent of Total Inventory

Equipment Category	% total tpy					
	PM	Aldehydes	Benzene	1,3 But.	Gas. Vap.	SOx
Lawn & Garden	NA	NA	NA	NA	NA	NA
Airport Service	NA	NA	NA	NA	NA	NA
Recreational	NA	NA	NA	NA	NA	NA
Recreational Marine	NA	NA	NA	NA	NA	NA
Light Commercial	NA	NA	NA	NA	NA	NA
Industrial	NA	NA	NA	NA	NA	NA
Construction	NA	NA	NA	NA	NA	NA
Agricultural	NA	NA	NA	NA	NA	NA
Logging	NA	NA	NA	NA	NA	NA
<u>Marine Vessels</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>
Nonroad Engines and Vehicles	NA	NA	NA	NA	NA	NA
Highway Vehicles	NA	NA	NA	NA	NA	NA
<u>Other Area and Point Sources</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>
All Sources	NA	NA	NA	NA	NA	NA

Milwaukee CMSA Inventory B
Emission Inventory Summary - Air Toxics and SOx

Equipment Category	tpy					
	PM	Aldehydes	Benzene	1,3 But.	Gas Vap.	SOx
Lawn & Garden	67	35	109	45	591	25
Airport Service	141	6	5	3	3	78
Recreational	22	2	16	7	23	1
Recreational Marine	6	11	121	52	727	27
Light Commercial	27	9	20	8	107	19
Industrial	108	37	24	10	97	67
Construction	409	58	11	6	13	258
Agricultural	825	125	24	12	15	330
Logging	0	0	0	0	0	0
<u>Marine Vessels</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>
Nonroad Engines and Vehicles	1,604	282	330	143	1,576	805
Highway Vehicles	0	0				0
<u>Other Area and Point Sources</u>	<u>0</u>	<u>0</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>0</u>
All Sources	NA	NA	NA	NA	NA	NA

Minneapolis MSA Inventory B
Emission Inventory Summary - VOC, NOx, CO

Equipment Category	tpy			tpsd		tpwd CO
	VOC	NOx	CO	VOC	NOx	
Lawn & Garden	5,649	195	33,701	30	1	7
Airport Service	259	1,825	2,219	1	5	6
Recreational	828	13	1,374	1	0	12
Recreational Manne	27,337	941	53,345	202	7	0
Light Commercial	1,352	283	16,396	4	1	45
Industrial	798	2,271	11,793	2	6	32
Construction	822	5,806	4,709	4	27	5
Agricultural	2,176	11,617	10,825	12	64	7
Logging	0	4	2	0	0	0
<u>Marine Vessels</u>	<u>0</u>	<u>0</u>	<u>28</u>	<u>0</u>	<u>0</u>	<u>0</u>
Nonroad Engines and Vehicles	39,220	22,955	134,391	255	111	114
Highway Vehicles	0	0	419,140	0	0	2,422
<u>Other Area and Point Sources</u>	<u>0</u>	<u>63,307</u>	<u>125,911</u>	<u>0</u>	<u>173</u>	<u>357</u>
All Sources	NA	NA	679,442	NA	NA	2,893

Minneapolis MSA Inventory B
Emission Inventory Summary - VOC, NOx, CO
Percent of Total Inventory

Equipment Category	% total tpy			% total tpsd		% total tpwd CO
	VOC	NOx	CO	VOC	NOx	
Lawn & Garden	NA	NA	4.96%	NA	NA	0.23%
Airport Service	NA	NA	0.33%	NA	NA	0.21%
Recreational	NA	NA	0.20%	NA	NA	0.42%
Recreational Manne	NA	NA	7.85%	NA	NA	0.00%
Light Commercial	NA	NA	2.41%	NA	NA	1.55%
Industrial	NA	NA	1.74%	NA	NA	1.12%
Construction	NA	NA	0.69%	NA	NA	0.18%
Agricultural	NA	NA	1.59%	NA	NA	0.25%
Logging	NA	NA	0.00%	NA	NA	0.00%
<u>Marine Vessels</u>	<u>NA</u>	<u>NA</u>	<u>0.00%</u>	<u>NA</u>	<u>NA</u>	<u>0.00%</u>
Nonroad Engines and Vehicles	NA	NA	19.78%	NA	NA	3.95%
Highway Vehicles	NA	NA	61.69%	NA	NA	83.72%
<u>Other Area and Point Sources</u>	<u>NA</u>	<u>NA</u>	<u>18.53%</u>	<u>NA</u>	<u>NA</u>	<u>12.33%</u>
All Sources	NA	NA	100.00%	NA	NA	100.00%

Minneapolis MSA Inventory B
Emission Inventory Summary - Air Toxics and SOx

Equipment Category	tpy					
	PM	Aldehydes	Benzene	1,3 But.	Gas Vap	SOx
Lawn & Garden	92	49	152	62	849	37
Airport Service	217	9	8	4	5	121
Recreational	32	3	24	10	34	1
Recreational Marine	17	33	743	321	2,684	129
Light Commercial	49	17	38	15	197	35
Industrial	140	37	22	10	88	84
Construction	803	113	24	12	28	508
Agricultural	2,308	345	64	34	38	917
Logging	1	0	0	0	0	0
<u>Marine Vessels</u>	<u>8</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>
Nonroad Engines and Vehicles	3,665	606	1,074	468	3,923	1,831
Highway Vehicles	42,282	0				0
<u>Other Area and Point Sources</u>	<u>214,398</u>	<u>0</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>0</u>
All Sources	260,345	NA	NA	NA	NA	NA

Minneapolis MSA Inventory B
Emission Inventory Summary - Air Toxics and SOx
Percent of Total Inventory

Equipment Category	% total tpy					
	PM	Aldehydes	Benzene	1,3 But.	Gas. Vap	SOx
Lawn & Garden	0.04%	NA	NA	NA	NA	NA
Airport Service	0.08%	NA	NA	NA	NA	NA
Recreational	0.01%	NA	NA	NA	NA	NA
Recreational Marine	0.01%	NA	NA	NA	NA	NA
Light Commercial	0.02%	NA	NA	NA	NA	NA
Industrial	0.05%	NA	NA	NA	NA	NA
Construction	0.31%	NA	NA	NA	NA	NA
Agricultural	0.89%	NA	NA	NA	NA	NA
Logging	0.00%	NA	NA	NA	NA	NA
<u>Marine Vessels</u>	<u>0.00%</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>
Nonroad Engines and Vehicles	1.41%	NA	NA	NA	NA	NA
Highway Vehicles	16.24%	NA	NA	NA	NA	NA
<u>Other Area and Point Sources</u>	<u>82.35%</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>
All Sources	100.00%	NA	NA	NA	NA	NA

New York NECMA Inventory B
Emission Inventory Summary - VOC, NOx, CO

Equipment Category	tpy			tpsd		tpwd
	VOC	NOx	CO	VOC	NOx	CO
Lawn & Garden	25,311	749	120,568	131	4	48
Airport Service	542	3,818	4,634	1	10	13
Recreational	4,039	64	6,764	3	0	59
Recreational Marine	40,913	3,836	84,339	278	29	9
Light Commercial	11,578	2,425	140,558	32	7	385
Industrial	5,869	16,147	88,791	17	44	243
Construction	4,370	32,185	25,301	21	152	28
Agricultural	1,092	4,630	7,289	6	25	5
Logging	4	64	29	0	0	0
<u>Marine Vessels</u>	<u>789</u>	<u>12,991</u>	<u>2,458</u>	<u>2</u>	<u>36</u>	<u>7</u>
Nonroad Engines and Vehicles	94,507	76,909	480,730	491	307	797
Highway Vehicles	0	317,257	3,129,400	1,114	956	7,373
<u>Other Area and Point Sources</u>	<u>0</u>	<u>232,882</u>	<u>546,500</u>	<u>1,578</u>	<u>638</u>	<u>804</u>
All Sources	NA	627,048	4,156,630	3,183	1,901	8,974

New York NECMA Inventory B
Emission Inventory Summary - VOC, NOx, CO
Percent of Total Inventory

Equipment Category	% total tpy			% total tpsd		% total tpwd
	VOC	NOx	CO	VOC	NOx	CO
Lawn & Garden	NA	0.12%	2.90%	4.13%	0.21%	0.53%
Airport Service	NA	0.61%	0.11%	0.05%	0.55%	0.14%
Recreational	NA	0.01%	0.16%	0.08%	0.00%	0.66%
Recreational Marine	NA	0.61%	2.03%	8.75%	1.51%	0.10%
Light Commercial	NA	0.39%	3.38%	1.01%	0.35%	4.29%
Industrial	NA	2.58%	2.14%	0.52%	2.33%	2.71%
Construction	NA	5.13%	0.61%	0.65%	7.98%	0.31%
Agricultural	NA	0.74%	0.18%	0.19%	1.33%	0.05%
Logging	NA	0.01%	0.00%	0.00%	0.01%	0.00%
<u>Marine Vessels</u>	<u>NA</u>	<u>2.07%</u>	<u>0.06%</u>	<u>0.07%</u>	<u>1.87%</u>	<u>0.08%</u>
Nonroad Engines and Vehicles	NA	12.27%	11.57%	15.43%	16.14%	8.88%
Highway Vehicles	NA	50.60%	75.29%	35.00%	50.30%	82.17%
<u>Other Area and Point Sources</u>	<u>NA</u>	<u>37.14%</u>	<u>13.15%</u>	<u>49.57%</u>	<u>33.56%</u>	<u>8.96%</u>
All Sources	NA	100.00%	100.00%	100.00%	100.00%	100.00%

New York NECMA Inventory B
Emission Inventory Summary - Air Toxics and SOx

Equipment Category	tpy					
	PM	Aldehydes	Benzene	1,3 But.	Gas. Vap.	SOx
Lawn & Garden	393	204	700	290	3,025	140
Airport Service	455	19	16	8	11	252
Recreational	154	15	117	50	164	6
Recreational Marine	77	147	962	414	9,080	273
Light Commercial	417	142	322	129	1,677	297
Industrial	899	265	163	70	654	546
Construction	4,219	633	128	65	172	2,788
Agricultural	879	141	30	15	94	365
Logging	9	1	0	0	0	5
<u>Marine Vessels</u>	<u>620</u>	<u>0</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>4,240</u>
Nonroad Engines and Vehicles	8,121	1,568	2,437	1,043	14,877	8,911
Highway Vehicles	232,769	0	—	—	—	0
<u>Other Area and Point Sources</u>	<u>119,873</u>	<u>0</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>0</u>
All Sources	360,763	NA	NA	NA	NA	NA

New York NECMA Inventory B
Emission Inventory Summary - Air Toxics and SOx
Percent of Total Inventory

Equipment Category	% total tpy					
	PM	Aldehydes	Benzene	1,3 But.	Gas. Vap.	SOx
Lawn & Garden	0.11%	NA	NA	NA	NA	NA
Airport Service	0.13%	NA	NA	NA	NA	NA
Recreational	0.04%	NA	NA	NA	NA	NA
Recreational Marine	0.02%	NA	NA	NA	NA	NA
Light Commercial	0.12%	NA	NA	NA	NA	NA
Industrial	0.25%	NA	NA	NA	NA	NA
Construction	1.17%	NA	NA	NA	NA	NA
Agricultural	0.24%	NA	NA	NA	NA	NA
Logging	0.00%	NA	NA	NA	NA	NA
<u>Marine Vessels</u>	<u>0.17%</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>
Nonroad Engines and Vehicles	2.25%	NA	NA	NA	NA	NA
Highway Vehicles	64.52%	NA	NA	NA	NA	NA
<u>Other Area and Point Sources</u>	<u>33.23%</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>
All Sources	100.00%	NA	NA	NA	NA	NA

Philadelphia MSA Inventory B
Emission Inventory Summary - VOC, NOx, CO

Equipment Category	tpy			tpsd		tpwd CO
	VOC	NOx	CO	VOC	NOx	
Lawn & Garden	14,735	544	85,055	59	2	55
Airport Service	275	1,936	2,352	1	5	6
Recreational	1,314	21	2,278	1	0	19
Recreational Manne	11,565	836	23,649	69	5	5
Light Commercial	2,892	653	36,509	8	2	100
Industrial	2,503	6,537	38,643	7	18	106
Construction	2,035	15,289	11,215	8	64	18
Agricultural	1,396	6,906	7,513	6	30	5
Logging	1	10	5	0	0	0
<u>Marine Vessels</u>	<u>494</u>	<u>9,181</u>	<u>1,377</u>	<u>1</u>	<u>25</u>	<u>4</u>
Nonroad Engines and Vehicles	37,209	41,914	208,596	161	152	318
Highway Vehicles	0	123,720	568,888	432	373	0
<u>Other Area and Point Sources</u>	<u>0</u>	<u>137,579</u>	<u>178,772</u>	<u>911</u>	<u>377</u>	<u>0</u>
All Sources	NA	303,213	956,256	1,503	902	NA

Philadelphia MSA Inventory B
Emission Inventory Summary - VOC, NOx, CO
Percent of Total Inventory

Equipment Category	% total tpy			% total tpsd		% total tpwd CO
	VOC	NOx	CO	VOC	NOx	
Lawn & Garden	NA	0.18%	8.89%	3.92%	0.26%	NA
Airport Service	NA	0.64%	0.25%	0.05%	0.59%	NA
Recreational	NA	0.01%	0.24%	0.07%	0.00%	NA
Recreational Manne	NA	0.28%	2.47%	4.58%	0.58%	NA
Light Commercial	NA	0.22%	3.82%	0.53%	0.20%	NA
Industrial	NA	2.16%	4.04%	0.47%	1.99%	NA
Construction	NA	5.04%	1.17%	0.56%	7.06%	NA
Agricultural	NA	2.28%	0.79%	0.41%	3.36%	NA
Logging	NA	0.00%	0.00%	0.00%	0.00%	NA
<u>Manne Vessels</u>	<u>NA</u>	<u>3.03%</u>	<u>0.14%</u>	<u>0.09%</u>	<u>2.79%</u>	<u>NA</u>
Nonroad Engines and Vehicles	NA	13.82%	21.81%	10.68%	16.83%	NA
Highway Vehicles	NA	40.80%	59.49%	28.71%	41.36%	NA
<u>Other Area and Point Sources</u>	<u>NA</u>	<u>45.37%</u>	<u>18.69%</u>	<u>60.61%</u>	<u>41.81%</u>	<u>NA</u>
All Sources	NA	100.00%	100.00%	100.00%	100.00%	NA

Philadelphia MSA Inventory B
Emission Inventory Summary - Air Toxics and SOx

Equipment Category	tpy					
	PM	Aldehydes	Benzene	1,3 But.	Gas. Vap.	SOx
Lawn & Garden	227	126	401	166	1,983	99
Airport Service	230	10	8	4	5	128
Recreational	49	5	38	16	52	2
Recreational Marine	16	32	291	125	1,919	69
Light Commercial	106	36	80	32	444	79
Industrial	318	108	69	30	281	198
Construction	1,920	288	60	31	62	1,324
Agricultural	1,348	208	41	21	43	547
Logging	1	0	0	0	0	1
<u>Marine Vessels</u>	<u>553</u>	<u>0</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>4,366</u>
Nonroad Engines and Vehicles	4,769	813	988	426	4,789	6,813
Highway Vehicles	0	0	—	—	—	0
<u>Other Area and Point Sources</u>	<u>0</u>	<u>0</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>0</u>
All Sources	NA	NA	NA	NA	NA	NA

Philadelphia MSA Inventory B
Emission Inventory Summary - Air Toxics and SOx
Percent of Total Inventory

Equipment Category	% total tpy					
	PM	Aldehydes	Benzene	1,3 But.	Gas Vap.	SOx
Lawn & Garden	NA	NA	NA	NA	NA	NA
Airport Service	NA	NA	NA	NA	NA	NA
Recreational	NA	NA	NA	NA	NA	NA
Recreational Marine	NA	NA	NA	NA	NA	NA
Light Commercial	NA	NA	NA	NA	NA	NA
Industrial	NA	NA	NA	NA	NA	NA
Construction	NA	NA	NA	NA	NA	NA
Agricultural	NA	NA	NA	NA	NA	NA
Logging	NA	NA	NA	NA	NA	NA
<u>Marine Vessels</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>
Nonroad Engines and Vehicles	NA	NA	NA	NA	NA	NA
Highway Vehicles	NA	NA	NA	NA	NA	NA
<u>Other Area and Point Sources</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>
All Sources	NA	NA	NA	NA	NA	NA

Provo-Orem MSA Inventory B
Emission Inventory Summary - VOC, NOx, CO

Equipment Category	tpy			tpsd		tpwd CO
	VOC	NOx	CO	VOC	NOx	
Lawn & Garden	1,050	39	5,824	6	0	1
Airport Service	0	0	0	0	0	0
Recreational	307	5	517	0	0	4
Recreational Marine	85	14	205	1	0	0
Light Commercial	76	17	952	0	0	3
Industrial	34	101	489	0	0	1
Construction	68	588	396	0	3	0
Agricultural	191	935	1,002	1	5	1
Logging	0	0	0	0	0	0
<u>Marine Vessels</u>	<u>0</u>	<u>0</u>	<u>315</u>	<u>0</u>	<u>0</u>	<u>0</u>
Nonroad Engines and Vehicles	1,811	1,700	9,700	8	9	11
Highway Vehicles	0	0	73,804	0	0	440
<u>Other Area and Point Sources</u>	<u>0</u>	<u>0</u>	<u>38,273</u>	<u>0</u>	<u>0</u>	<u>38</u>
All Sources	NA	NA	121,777	NA	NA	489

Provo-Orem MSA Inventory B
Emission Inventory Summary - VOC, NOx, CO
Percent of Total Inventory

Equipment Category	% total tpy			% total tpsd		% total tpwd CO
	VOC	NOx	CO	VOC	NOx	
Lawn & Garden	NA	NA	4.78%	NA	NA	0.24%
Airport Service	NA	NA	0.00%	NA	NA	0.00%
Recreational	NA	NA	0.42%	NA	NA	0.90%
Recreational Marine	NA	NA	0.17%	NA	NA	0.00%
Light Commercial	NA	NA	0.78%	NA	NA	0.53%
Industrial	NA	NA	0.40%	NA	NA	0.27%
Construction	NA	NA	0.32%	NA	NA	0.09%
Agricultural	NA	NA	0.82%	NA	NA	0.13%
Logging	NA	NA	0.00%	NA	NA	0.00%
<u>Marine Vessels</u>	<u>NA</u>	<u>NA</u>	<u>0.26%</u>	<u>NA</u>	<u>NA</u>	<u>0.00%</u>
Nonroad Engines and Vehicles	NA	NA	7.97%	NA	NA	2.17%
Highway Vehicles	NA	NA	60.61%	NA	NA	89.98%
<u>Other Area and Point Sources</u>	<u>NA</u>	<u>NA</u>	<u>31.43%</u>	<u>NA</u>	<u>NA</u>	<u>7.84%</u>
All Sources	NA	NA	100.00%	NA	NA	100.00%

Provo-Orem MSA Inventory B
Emission Inventory Summary - Air Toxics and SOx

Equipment Category	% total tpy					
	PM	Aldehydes	Benzene	1,3 But.	Gas. Vap	SOx
Lawn & Garden	17	9	29	12	138	7
Airport Service	0	0	0	0	0	0
Recreational	12	1	9	4	12	0
Recreational Marine	0	1	2	1	24	1
Light Commercial	3	1	2	1	12	2
Industrial	7	2	1	0	4	4
Construction	77	11	2	1	2	52
Agricultural	181	28	6	3	7	74
Logging	0	0	0	0	0	0
<u>Marine Vessels</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>
Nonroad Engines and Vehicles	297	53	50	22	198	140
Highway Vehicles	3,668	0				0
<u>Other Area and Point Sources</u>	<u>45,615</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>
All Sources	49,580	NA	NA	NA	NA	NA

Provo-Orem MSA Inventory B
Emission Inventory Summary - Air Toxics and SOx
Percent of Total Inventory

Equipment Category	% total tpy					
	PM	Aldehydes	Benzene	1,3 But.	Gas. Vap	SOx
Lawn & Garden	0.03%	NA	NA	NA	NA	NA
Airport Service	0.00%	NA	NA	NA	NA	NA
Recreational	0.02%	NA	NA	NA	NA	NA
Recreational Marine	0.00%	NA	NA	NA	NA	NA
Light Commercial	0.01%	NA	NA	NA	NA	NA
Industrial	0.01%	NA	NA	NA	NA	NA
Construction	0.16%	NA	NA	NA	NA	NA
Agricultural	0.37%	NA	NA	NA	NA	NA
Logging	0.00%	NA	NA	NA	NA	NA
<u>Marine Vessels</u>	<u>0.00%</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>
Nonroad Engines and Vehicles	0.60%	NA	NA	NA	NA	NA
Highway Vehicles	7.40%	NA	NA	NA	NA	NA
<u>Other Area and Point Sources</u>	<u>92.00%</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>
All Sources	100.00%	NA	NA	NA	NA	NA

Saint Louis MSA Inventory B
Emission Inventory Summary - VOC, NOx, CO

Equipment Category	tpy			tpsd		tpwd CO
	VOC	NOx	CO	VOC	NOx	
Lawn & Garden	7,012	213	38,714	37	1	7
Airport Service	188	1,321	1,607	1	4	4
Recreational	739	12	1,227	0	0	11
Recreational Manne	6,861	366	13,773	50	3	0
Light Commercial	1,195	250	14,492	3	1	40
Industrial	1,031	2,792	15,724	3	8	43
Construction	866	6,543	4,866	4	31	5
Agricultural	1,794	10,051	8,813	10	55	6
Logging	0	1	1	0	0	0
<u>Marine Vessels</u>	<u>0</u>	<u>1,820</u>	<u>0</u>	<u>0</u>	<u>5</u>	<u>0</u>
Nonroad Engines and Vehicles	19,686	23,369	99,216	108	107	117
Highway Vehicles	0	62,039	0	208	187	1,710
<u>Other Area and Point Sources</u>	<u>0</u>	<u>158,510</u>	<u>0</u>	<u>360</u>	<u>434</u>	<u>441</u>
All Sources	NA	243,918	NA	676	728	2,267

Saint Louis MSA Inventory B
Emission Inventory Summary - VOC, NOx, CO
Percent of Total Inventory

Equipment Category	% total tpy			% total tpsd		% total tpwd CO
	VOC	NOx	CO	VOC	NOx	
Lawn & Garden	NA	0.09%	NA	5.48%	0.16%	0.33%
Airport Service	NA	0.54%	NA	0.08%	0.50%	0.19%
Recreational	NA	0.00%	NA	0.07%	0.00%	0.48%
Recreational Manne	NA	0.15%	NA	7.40%	0.39%	0.00%
Light Commercial	NA	0.10%	NA	0.49%	0.09%	1.75%
Industrial	NA	1.14%	NA	0.43%	1.05%	1.90%
Construction	NA	2.68%	NA	0.60%	4.23%	0.24%
Agricultural	NA	4.12%	NA	1.45%	7.56%	0.26%
Logging	NA	0.00%	NA	0.00%	0.00%	0.00%
<u>Marine Vessels</u>	<u>NA</u>	<u>0.75%</u>	<u>NA</u>	<u>0.00%</u>	<u>0.68%</u>	<u>0.00%</u>
Nonroad Engines and Vehicles	NA	9.58%	NA	16.01%	14.67%	5.14%
Highway Vehicles	NA	25.43%	NA	30.73%	25.68%	75.40%
<u>Other Area and Point Sources</u>	<u>NA</u>	<u>64.98%</u>	<u>NA</u>	<u>53.26%</u>	<u>59.65%</u>	<u>19.46%</u>
All Sources	NA	100.00%	NA	100.00%	100.00%	100.00%

Saint Louis MSA Inventory B
Emission Inventory Summary - Air Toxics and SOx

Equipment Category	% total tpy					
	PM	Aldehydes	Benzene	1,3 But.	Gas Vap.	SOx
Lawn & Garden	122	60	191	79	954	41
Airport Service	157	7	6	3	4	87
Recreational	28	3	21	9	30	1
Recreational Marine	7	14	180	78	876	37
Light Commercial	43	15	33	13	174	31
Industrial	149	46	29	12	116	91
Construction	842	129	25	13	30	571
Agricultural	2,019	295	53	28	29	794
Logging	0	0	0	0	0	0
<u>Marine Vessels</u>	<u>184</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>
Nonroad Engines and Vehicles	3,552	568	539	235	2,213	1,654
Highway Vehicles	38,099	0				0
<u>Other Area and Point Sources</u>	<u>89,636</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>
All Sources	131,287	NA	NA	NA	NA	NA

Saint Louis MSA Inventory B
Emission Inventory Summary - Air Toxics and SOx
Percent of Total Inventory

Equipment Category	% total tpy					
	PM	Aldehydes	Benzene	1,3 But.	Gas Vap.	SOx
Lawn & Garden	0.09%	NA	NA	NA	NA	NA
Airport Service	0.12%	NA	NA	NA	NA	NA
Recreational	0.02%	NA	NA	NA	NA	NA
Recreational Marine	0.01%	NA	NA	NA	NA	NA
Light Commercial	0.03%	NA	NA	NA	NA	NA
Industrial	0.11%	NA	NA	NA	NA	NA
Construction	0.64%	NA	NA	NA	NA	NA
Agricultural	1.54%	NA	NA	NA	NA	NA
Logging	0.00%	NA	NA	NA	NA	NA
<u>Marine Vessels</u>	<u>0.14%</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>
Nonroad Engines and Vehicles	2.71%	NA	NA	NA	NA	NA
Highway Vehicles	29.02%	NA	NA	NA	NA	NA
<u>Other Area and Point Sources</u>	<u>68.27%</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>
All Sources	100.00%	NA	NA	NA	NA	NA

San Diego AB Inventory B
Emission Inventory Summary - VOC, NOx, CO

Equipment Category	tpy			tpsd		tpwd CO
	VOC	NOx	CO	VOC	NOx	
Lawn & Garden	6,621	362	43,493	23	1	35
Airport Service	204	1,439	1,750	1	4	5
Recreational	618	15	2,024	3	0	3
Recreational Marine	4,295	613	9,366	21	3	7
Light Commercial	942	238	12,505	3	1	34
Industrial	732	1,915	11,193	2	5	31
Construction	992	6,556	6,111	4	24	13
Agricultural	368	1,579	2,439	1	6	2
Logging	0	0	0	0	0	0
<u>Marine Vessels</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>3</u>	<u>41</u>	<u>7</u>
Nonroad Engines and Vehicles	14,772	12,718	88,883	60	85	136
Highway Vehicles	0	47,136	570,100	130	142	1,343
<u>Other Area and Point Sources</u>	<u>0</u>	<u>0</u>	<u>94,000</u>	<u>271</u>	<u>34</u>	<u>154</u>
All Sources	NA	NA	752,983	461	261	1,633

San Diego AB Inventory B
Emission Inventory Summary - VOC, NOx, CO
Percent of Total Inventory

Equipment Category	% total tpy			% total tpsd		% total tpwd CO
	VOC	NOx	CO	VOC	NOx	
Lawn & Garden	NA	NA	5.78%	5.10%	0.51%	2.13%
Airport Service	NA	NA	0.23%	0.12%	1.51%	0.29%
Recreational	NA	NA	0.27%	0.55%	0.02%	0.18%
Recreational Marine	NA	NA	1.24%	4.65%	1.24%	0.44%
Light Commercial	NA	NA	1.66%	0.57%	0.25%	2.10%
Industrial	NA	NA	1.49%	0.45%	2.01%	1.88%
Construction	NA	NA	0.81%	0.78%	9.07%	0.82%
Agricultural	NA	NA	0.32%	0.30%	2.25%	0.10%
Logging	NA	NA	0.00%	0.00%	0.00%	0.00%
<u>Marine Vessels</u>	<u>NA</u>	<u>NA</u>	<u>0.00%</u>	<u>0.54%</u>	<u>15.73%</u>	<u>0.41%</u>
Nonroad Engines and Vehicles	NA	NA	11.80%	13.06%	32.59%	8.35%
Highway Vehicles	NA	NA	75.71%	28.14%	54.36%	82.25%
<u>Other Area and Point Sources</u>	<u>NA</u>	<u>NA</u>	<u>12.48%</u>	<u>58.80%</u>	<u>13.05%</u>	<u>9.41%</u>
All Sources	NA	NA	100.00%	100.00%	100.00%	100.00%

San Diego AB Inventory B
Emission Inventory Summary - Air Toxics and SOx

Equipment Category				tpy		SOx
	PM	Aldehydes	Benzene	1,3 But.	Gas Vap	
Lawn & Garden	93	59	183	76	774	59
Airport Service	171	7	6	3	4	95
Recreational	7	4	17	7	48	1
Recreational Marine	12	24	90	38	1,338	36
Light Commercial	36	12	26	10	152	29
Industrial	96	32	20	9	81	59
Construction	890	129	29	15	43	570
Agricultural	300	49	11	5	18	126
Logging	0	0	0	0	0	0
<u>Marine Vessels</u>	<u>854</u>	<u>0</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>6,979</u>
Nonroad Engines and Vehicles	2,460	315	382	164	2,458	7,954
Highway Vehicles	6,935	0	—	—	—	2,409
<u>Other Area and Point Sources</u>	<u>179,215</u>	<u>0</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>3,723</u>
All Sources	188,610	NA	NA	NA	NA	14,086

San Diego AB Inventory B
Emission Inventory Summary - Air Toxics and SOx
Percent of Total Inventory

Equipment Category				% total tpy		SOx
	PM	Aldehydes	Benzene	1,3 But.	Gas Vap	
Lawn & Garden	0.05%	NA	NA	NA	NA	0.42%
Airport Service	0.09%	NA	NA	NA	NA	0.68%
Recreational	0.00%	NA	NA	NA	NA	0.01%
Recreational Marine	0.01%	NA	NA	NA	NA	0.25%
Light Commercial	0.02%	NA	NA	NA	NA	0.20%
Industrial	0.05%	NA	NA	NA	NA	0.42%
Construction	0.47%	NA	NA	NA	NA	4.04%
Agricultural	0.16%	NA	NA	NA	NA	0.89%
Logging	0.00%	NA	NA	NA	NA	0.00%
<u>Marine Vessels</u>	<u>0.45%</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>49.55%</u>
Nonroad Engines and Vehicles	1.30%	NA	NA	NA	NA	56.47%
Highway Vehicles	3.68%	NA	NA	NA	NA	17.10%
<u>Other Area and Point Sources</u>	<u>95.02%</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>26.43%</u>
All Sources	100.00%	NA	NA	NA	NA	100.00%

San Joaquin AB Inventory B
Emission Inventory Summary - VOC, NOx, CO

Equipment Category	tpy			tpsd		tpwd
	VOC	NOx	CO	VOC	NOx	CO
Lawn & Garden	4,761	224	29,611	17	1	23
Airport Service	23	163	202	0	0	1
Recreational	126	3	412	1	0	1
Recreational Marine	1,039	266	2,681	5	1	2
Light Commercial	992	250	13,166	3	1	36
Industrial	415	1,678	5,102	1	5	14
Construction	927	6,605	5,452	3	24	12
Agricultural	5,911	28,251	33,241	22	105	22
Logging	15	73	74	0	0	0
<u>Marine Vessels</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>3</u>	<u>0</u>
Nonroad Engines and Vehicles	14,209	37,513	89,941	52	140	111
Highway Vehicles	0	0	0	150	240	1,100
<u>Other Area and Point Sources</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>1,022</u>	<u>249</u>	<u>683</u>
All Sources	NA	NA	NA	1,225	629	1,894

San Joaquin AB Inventory B
Emission Inventory Summary - VOC, NOx, CO
Percent of Total Inventory

Equipment Category	% total tpy			% total tpsd		% total tpwd
	VOC	NOx	CO	VOC	NOx	CO
Lawn & Garden	NA	NA	NA	1 40%	0 13%	1 21%
Airport Service	NA	NA	NA	0 01%	0 07%	0 03%
Recreational	NA	NA	NA	0 05%	0 00%	0 03%
Recreational Marine	NA	NA	NA	0 41%	0 22%	0 11%
Light Commercial	NA	NA	NA	0 23%	0 11%	1 90%
Industrial	NA	NA	NA	0 10%	0 73%	0 74%
Construction	NA	NA	NA	0 27%	3 80%	0 63%
Agricultural	NA	NA	NA	1 80%	16 74%	1 15%
Logging	NA	NA	NA	0 00%	0 03%	0 01%
<u>Marine Vessels</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>0 02%</u>	<u>0 42%</u>	<u>0 02%</u>
Nonroad Engines and Vehicles	NA	NA	NA	4 28%	22 26%	5 84%
Highway Vehicles	NA	NA	NA	12 25%	38 18%	58 09%
<u>Other Area and Point Sources</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>83 47%</u>	<u>39 56%</u>	<u>36 08%</u>
All Sources	NA	NA	NA	100 00%	100 00%	100 00%

San Joaquin AB Inventory B
Emission Inventory Summary - Air Toxics and SOx

Equipment Category	tpy					
	PM	Aldehydes	Benzene	1,3 But.	Gas Vap.	SOx
Lawn & Garden	75	42	131	54	581	38
Airport Service	19	1	1	0	0	11
Recreational	1	1	3	2	10	0
Recreational Marine	6	10	18	8	462	13
Light Commercial	38	13	27	11	160	30
Industrial	136	26	12	5	40	76
Construction	864	128	27	14	34	576
Agricultural	5,375	860	174	91	137	2,243
Logging	10	1	0	0	1	6
<u>Marine Vessels</u>	<u>62</u>	<u>0</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>402</u>
Nonroad Engines and Vehicles	6,585	1,082	394	185	1,425	3,395
Highway Vehicles	13,505	0	—	—	—	9,125
<u>Other Area and Point Sources</u>	<u>731,789</u>	<u>0</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>16,790</u>
All Sources	751,879	NA	NA	NA	NA	29,310

San Joaquin AB Inventory B
Emission Inventory Summary - Air Toxics and SOx
Percent of Total Inventory

Equipment Category	% total tpy					
	PM	Aldehydes	Benzene	1,3 But.	Gas Vap.	SOx
Lawn & Garden	0.01%	NA	NA	NA	NA	0.13%
Airport Service	0.00%	NA	NA	NA	NA	0.04%
Recreational	0.00%	NA	NA	NA	NA	0.00%
Recreational Marine	0.00%	NA	NA	NA	NA	0.04%
Light Commercial	0.01%	NA	NA	NA	NA	0.10%
Industrial	0.02%	NA	NA	NA	NA	0.26%
Construction	0.11%	NA	NA	NA	NA	1.96%
Agricultural	0.71%	NA	NA	NA	NA	7.65%
Logging	0.00%	NA	NA	NA	NA	0.02%
<u>Marine Vessels</u>	<u>0.01%</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>1.37%</u>
Nonroad Engines and Vehicles	0.88%	NA	NA	NA	NA	11.58%
Highway Vehicles	1.80%	NA	NA	NA	NA	31.13%
<u>Other Area and Point Sources</u>	<u>97.33%</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>57.28%</u>
All Sources	100.00%	NA	NA	NA	NA	100.00%

Seattle-Tacoma MSA Inventory B
Emission Inventory Summary - VOC, NOx, CO

Equipment Category	tpy			tpsd		tpwd CO
	VOC	NOx	CO	VOC	NOx	
Lawn & Garden	9,181	298	50,427	38	1	23
Airport Service	184	1,295	1,577	1	4	4
Recreational	501	11	1,303	2	0	4
Recreational Marine	6,722	770	14,937	40	5	8
Light Commercial	1,093	268	14,370	3	1	39
Industrial	1,115	2,823	17,442	3	8	48
Construction	888	6,135	5,463	4	26	9
Agricultural	392	1,816	2,226	2	8	1
Logging	159	587	752	0	2	2
<u>Marine Vessels</u>	<u>2,194</u>	<u>17,253</u>	<u>31,940</u>	<u>6</u>	<u>47</u>	<u>88</u>
Nonroad Engines and Vehicles	22,430	31,257	140,438	98	101	228
Highway Vehicles	0	0	267,670	0	0	1,515
<u>Other Area and Point Sources</u>	<u>0</u>	<u>0</u>	<u>199,979</u>	<u>0</u>	<u>0</u>	<u>565</u>
All Sources	NA	NA	608,087	NA	NA	2,307

Seattle-Tacoma MSA Inventory B
Emission Inventory Summary - VOC, NOx, CO
Percent of Total Inventory

Equipment Category	% total tpy			% total tpsd		% total tpwd CO
	VOC	NOx	CO	VOC	NOx	
Lawn & Garden	NA	NA	8.29%	NA	NA	1.02%
Airport Service	NA	NA	0.26%	NA	NA	0.19%
Recreational	NA	NA	0.21%	NA	NA	0.19%
Recreational Marine	NA	NA	2.46%	NA	NA	0.35%
Light Commercial	NA	NA	2.36%	NA	NA	1.71%
Industrial	NA	NA	2.87%	NA	NA	2.07%
Construction	NA	NA	0.90%	NA	NA	0.39%
Agricultural	NA	NA	0.37%	NA	NA	0.06%
Logging	NA	NA	0.12%	NA	NA	0.09%
<u>Marine Vessels</u>	<u>NA</u>	<u>NA</u>	<u>5.25%</u>	<u>NA</u>	<u>NA</u>	<u>3.79%</u>
Nonroad Engines and Vehicles	NA	NA	23.09%	NA	NA	9.86%
Highway Vehicles	NA	NA	44.02%	NA	NA	65.65%
<u>Other Area and Point Sources</u>	<u>NA</u>	<u>NA</u>	<u>32.89%</u>	<u>NA</u>	<u>NA</u>	<u>24.48%</u>
All Sources	NA	NA	100.00%	NA	NA	100.00%

Seattle-Tacoma MSA Inventory B
Emission Inventory Summary - Air Toxics and SOx

Equipment Category	tpy					
	PM	Aldehydes	Benzene	1,3 But.	Gas Vap	SOx
Lawn & Garden	158	80	255	105	1,081	56
Airport Service	154	7	5	3	4	86
Recreational	11	2	14	6	33	1
Recreational Manne	16	30	162	70	1,357	51
Light Commercial	41	14	30	12	179	32
Industrial	124	46	31	13	126	78
Construction	818	116	26	13	39	528
Agricultural	347	56	11	6	16	144
Logging	82	12	5	2	14	49
<u>Manne Vessels</u>	<u>1,017</u>	<u>0</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>7,576</u>
Nonroad Engines and Vehicles	2,768	362	540	230	2,849	8,601
Highway Vehicles	30,151	0	—	—	—	0
<u>Other Area and Point Sources</u>	<u>37,878</u>	<u>0</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>0</u>
All Sources	70,797	NA	NA	NA	NA	NA

Seattle-Tacoma MSA Inventory B
Emission Inventory Summary - Air Toxics and SOx
Percent of Total Inventory

Equipment Category	% total tpy					
	PM	Aldehydes	Benzene	1,3 But.	Gas Vap	SOx
Lawn & Garden	0.22%	NA	NA	NA	NA	NA
Airport Service	0.22%	NA	NA	NA	NA	NA
Recreational	0.02%	NA	NA	NA	NA	NA
Recreational Manne	0.02%	NA	NA	NA	NA	NA
Light Commercial	0.06%	NA	NA	NA	NA	NA
Industrial	0.18%	NA	NA	NA	NA	NA
Construction	1.16%	NA	NA	NA	NA	NA
Agricultural	0.49%	NA	NA	NA	NA	NA
Logging	0.12%	NA	NA	NA	NA	NA
<u>Manne Vessels</u>	<u>1.44%</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>
Nonroad Engines and Vehicles	3.91%	NA	NA	NA	NA	NA
Highway Vehicles	42.59%	NA	NA	NA	NA	NA
<u>Other Area and Point Sources</u>	<u>53.50%</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>
All Sources	100.00%	NA	NA	NA	NA	NA

South Coast AB Inventory B
Emission Inventory Summary - VOC, NOx, CO

Equipment Category	tpy			tpsd		tpwd
	VOC	NOx	CO	VOC	NOx	CO
Lawn & Garden	27,409	1,072	137,132	96	4	121
Airport Service	773	5,447	6,618	2	15	18
Recreational	2,234	55	7,327	9	0	10
Recreational Marine	19,658	2,808	42,872	98	15	33
Light Commercial	7,583	1,913	100,670	21	5	276
Industrial	5,062	20,513	62,229	14	56	170
Construction	4,497	28,666	27,559	16	104	60
Agricultural	1,026	4,122	7,334	4	15	5
Logging	7	28	33	0	0	0
<u>Marine Vessels</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>7</u>	<u>68</u>	<u>10</u>
Nonroad Engines and Vehicles	68,250	64,623	391,774	268	283	705
Highway Vehicles	0	0	0	650	660	9 732
<u>Other Area and Point Sources</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>1,400</u>	<u>334</u>	<u>265</u>
All Sources	NA	NA	NA	2,318	1,277	10,702

South Coast AB Inventory B
Emission Inventory Summary - VOC, NOx, CO
Percent of Total Inventory

Equipment Category	% total tpy			% total tpsd		% total tpwd
	VOC	NOx	CO	VOC	NOx	CO
Lawn & Garden	NA	NA	NA	4.13%	0.31%	1.13%
Airport Service	NA	NA	NA	0.09%	1.17%	0.17%
Recreational	NA	NA	NA	0.39%	0.02%	0.10%
Recreational Marine	NA	NA	NA	4.24%	1.16%	0.31%
Light Commercial	NA	NA	NA	0.91%	0.41%	2.58%
Industrial	NA	NA	NA	0.61%	4.40%	1.59%
Construction	NA	NA	NA	0.70%	8.12%	0.56%
Agricultural	NA	NA	NA	0.17%	1.20%	0.05%
Logging	NA	NA	NA	0.00%	0.01%	0.00%
<u>Marine Vessels</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>0.31%</u>	<u>5.36%</u>	<u>0.10%</u>
Nonroad Engines and Vehicles	NA	NA	NA	11.56%	22.15%	6.58%
Highway Vehicles	NA	NA	NA	28.04%	51.70%	90.94%
<u>Other Area and Point Sources</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>60.40%</u>	<u>26.15%</u>	<u>2.48%</u>
All Sources	NA	NA	NA	100.00%	100.00%	100.00%

South Coast AB Inventory B
Emission Inventory Summary - Air Toxics and SOx

Equipment Category	tpy					
	PM	Aldehydes	Benzene	1,3 But.	Gas. Vap	SOx
Lawn & Garden	373	228	780	326	2,373	181
Airport Service	648	28	23	12	15	360
Recreational	24	13	62	27	174	5
Recreational Marine	57	110	410	176	6,123	164
Light Commercial	289	96	209	83	1,225	231
Industrial	1,659	317	142	64	484	933
Construction	3,814	563	131	66	206	2,490
Agricultural	773	126	28	14	88	326
Logging	4	1	0	0	1	2
<u>Marine Vessels</u>	<u>1,515</u>	<u>0</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>12,797</u>
Nonroad Engines and Vehicles	9,157	1,482	1,786	768	10,688	17,490
Highway Vehicles	34,675	0	—	—	—	11,680
<u>Other Area and Point Sources</u>	<u>766,500</u>	<u>0</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>18,214</u>
All Sources	810,332	NA	NA	NA	NA	47,384

South Coast AB Inventory B
Emission Inventory Summary - Air Toxics and SOx
Percent of Total Inventory

Equipment Category	% total tpy					
	PM	Aldehydes	Benzene	1,3 But.	Gas Vap	SOx
Lawn & Garden	0.05%	NA	NA	NA	NA	0.38%
Airport Service	0.08%	NA	NA	NA	NA	0.76%
Recreational	0.00%	NA	NA	NA	NA	0.01%
Recreational Marine	0.01%	NA	NA	NA	NA	0.35%
Light Commercial	0.04%	NA	NA	NA	NA	0.49%
Industrial	0.20%	NA	NA	NA	NA	1.97%
Construction	0.47%	NA	NA	NA	NA	5.25%
Agricultural	0.10%	NA	NA	NA	NA	0.69%
Logging	0.00%	NA	NA	NA	NA	0.00%
<u>Marine Vessels</u>	<u>0.19%</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>27.01%</u>
Nonroad Engines and Vehicles	1.13%	NA	NA	NA	NA	36.91%
Highway Vehicles	4.28%	NA	NA	NA	NA	24.65%
<u>Other Area and Point Sources</u>	<u>94.59%</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>38.44%</u>
All Sources	100.00%	NA	NA	NA	NA	100.00%

Spokane MSA Inventory B
Emission Inventory Summary - VOC, NOx, CO

Equipment Category	tpy			tpsd		tpwd
	VOC	NOx	CO	VOC	NOx	CO
Lawn & Garden	1,620	48	8,682	9	0	0
Airport Service	26	178	221	0	0	1
Recreational	92	2	230	0	0	1
Recreational Marine	570	22	1,138	4	0	0
Light Commercial	170	38	2,136	0	0	6
Industrial	89	230	1,383	0	1	4
Construction	93	694	533	0	3	1
Agricultural	260	1,414	1,372	1	8	1
Logging	1	16	7	0	0	0
Marine Vessels	0	0	245	0	0	0
Nonroad Engines and Vehicles	2,921	2,643	15,948	16	13	13
Highway Vehicles	0	0	9,026	0	0	251
<u>Other Area and Point Sources</u>	<u>0</u>	<u>0</u>	<u>77,748</u>	<u>0</u>	<u>0</u>	<u>224</u>
All Sources	NA	NA	102,722	NA	NA	488

Spokane MSA Inventory B
Emission Inventory Summary - VOC, NOx, CO
Percent of Total Inventory

Equipment Category	% total tpy			% total tpsd		% total tpwd
	VOC	NOx	CO	VOC	NOx	CO
Lawn & Garden	NA	NA	8.45%	NA	NA	0.02%
Airport Service	NA	NA	0.22%	NA	NA	0.12%
Recreational	NA	NA	0.22%	NA	NA	0.15%
Recreational Marine	NA	NA	1.11%	NA	NA	0.00%
Light Commercial	NA	NA	2.08%	NA	NA	1.20%
Industrial	NA	NA	1.35%	NA	NA	0.78%
Construction	NA	NA	0.52%	NA	NA	0.12%
Agricultural	NA	NA	1.34%	NA	NA	0.19%
Logging	NA	NA	0.01%	NA	NA	0.00%
Marine Vessels	NA	NA	0.24%	NA	NA	0.00%
Nonroad Engines and Vehicles	NA	NA	15.53%	NA	NA	2.58%
Highway Vehicles	NA	NA	8.79%	NA	NA	51.52%
<u>Other Area and Point Sources</u>	<u>NA</u>	<u>NA</u>	<u>75.69%</u>	<u>NA</u>	<u>NA</u>	<u>45.90%</u>
All Sources	NA	NA	100.00%	NA	NA	100.00%

Spokane MSA
Emission Inventory Summary - Air Toxics and SOx

Inventory B

Equipment Category	tpy					
	PM	Aldehydes	Benzene	1,3 But.	Gas. Vap.	SOx
Lawn & Garden	31	14	45	18	207	9
Airport Service	21	1	1	0	1	12
Recreational	2	0	3	1	7	0
Recreational Marine	0	1	16	7	48	3
Light Commercial	6	2	5	2	26	5
Industrial	11	4	2	1	10	7
Construction	91	13	3	1	3	60
Agricultural	285	41	8	4	6	112
Logging	2	0	0	0	0	1
<u>Marine Vessels</u>	<u>0</u>	<u>0</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>0</u>
Nonroad Engines and Vehicles	449	77	81	35	308	209
Highway Vehicles	3,881	0	—	—	—	0
<u>Other Area and Point Sources</u>	<u>9,837</u>	<u>0</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>0</u>
All Sources	14,167	NA	NA	NA	NA	NA

Spokane MSA
Emission Inventory Summary - Air Toxics and SOx
Percent of Total Inventory

Inventory B

Equipment Category	% total tpy					
	PM	Aldehydes	Benzene	1,3 But.	Gas. Vap.	SOx
Lawn & Garden	0.22%	NA	NA	NA	NA	NA
Airport Service	0.15%	NA	NA	NA	NA	NA
Recreational	0.01%	NA	NA	NA	NA	NA
Recreational Marine	0.00%	NA	NA	NA	NA	NA
Light Commercial	0.04%	NA	NA	NA	NA	NA
Industrial	0.07%	NA	NA	NA	NA	NA
Construction	0.64%	NA	NA	NA	NA	NA
Agricultural	2.01%	NA	NA	NA	NA	NA
Logging	0.02%	NA	NA	NA	NA	NA
<u>Marine Vessels</u>	<u>0.00%</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>
Nonroad Engines and Vehicles	3.17%	NA	NA	NA	NA	NA
Highway Vehicles	27.40%	NA	NA	NA	NA	NA
<u>Other Area and Point Sources</u>	<u>69.44%</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>
All Sources	100.00%	NA	NA	NA	NA	NA

Springfield MSA
Emission Inventory Summary - VOC, NOx, CO

Inventory B

Equipment Category	tpy			tpsd		tpwd
	VOC	NOx	CO	VOC	NOx	CO
Lawn & Garden	1,536	49	8,154	8	0	2
Airport Service	0	0	0	0	0	0
Recreational	387	6	647	0	0	6
Recreational Marine	1,020	112	2,104	7	1	0
Light Commercial	280	59	3,397	1	0	9
Industrial	242	648	3,713	1	2	10
Construction	174	1,450	966	1	7	1
Agricultural	149	697	829	1	4	1
Logging	2	31	14	0	0	0
<u>Marine Vessels</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>
Nonroad Engines and Vehicles	3,789	3,052	19,825	18	14	29
Highway Vehicles	0	0	0	62	30	0
<u>Other Area and Point Sources</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>50</u>	<u>30</u>	<u>0</u>
All Sources	NA	NA	NA	130	74	NA

Springfield MSA
Emission Inventory Summary - VOC, NOx, CO
Percent of Total Inventory

Inventory B

Equipment Category	% total tpy			% total tpsd		% total tpwd
	VOC	NOx	CO	VOC	NOx	CO
Lawn & Garden	NA	NA	NA	6.21%	0.36%	NA
Airport Service	NA	NA	NA	0.00%	0.00%	NA
Recreational	NA	NA	NA	0.20%	0.01%	NA
Recreational Marine	NA	NA	NA	5.20%	1.13%	NA
Light Commercial	NA	NA	NA	0.60%	0.22%	NA
Industrial	NA	NA	NA	0.52%	2.40%	NA
Construction	NA	NA	NA	0.63%	9.23%	NA
Agricultural	NA	NA	NA	0.62%	5.15%	NA
Logging	NA	NA	NA	0.00%	0.11%	NA
<u>Marine Vessels</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>0.00%</u>	<u>0.00%</u>	<u>NA</u>
Nonroad Engines and Vehicles	NA	NA	NA	13.98%	18.60%	NA
Highway Vehicles	NA	NA	NA	47.92%	40.91%	NA
<u>Other Area and Point Sources</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>38.09%</u>	<u>40.49%</u>	<u>NA</u>
All Sources	NA	NA	NA	100.00%	100.00%	NA

Springfield MSA Inventory B
Emission Inventory Summary - Air Toxics and SO_x

Equipment Category	PM	Aldehydes	Benzene	tpy 1,3 But.	Gas Vap	SO _x
Lawn & Garden	27	13	42	17	216	9
Airport Service	0	0	0	0	0	0
Recreational	15	1	11	5	16	1
Recreational Marine	2	4	22	10	278	7
Light Commercial	10	3	8	3	41	7
Industrial	34	11	7	3	27	21
Construction	187	27	5	3	4	125
Agricultural	134	21	4	2	5	55
Logging	4	1	0	0	0	3
<u>Marine Vessels</u>	<u>0</u>	<u>0</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>0</u>
Nonroad Engines and Vehicles	413	82	99	43	587	227
Highway Vehicles	0	0	—	—	—	0
<u>Other Area and Point Sources</u>	<u>0</u>	<u>0</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>0</u>
All Sources	NA	NA	NA	NA	NA	NA

Springfield MSA Inventory B
Emission Inventory Summary - Air Toxics and SO_x
Percent of Total Inventory

Equipment Category	PM	Aldehydes	Benzene	% total tpy 1,3 But	Gas Vap.	SO _x
Lawn & Garden	NA	NA	NA	NA	NA	NA
Airport Service	NA	NA	NA	NA	NA	NA
Recreational	NA	NA	NA	NA	NA	NA
Recreational Marine	NA	NA	NA	NA	NA	NA
Light Commercial	NA	NA	NA	NA	NA	NA
Industrial	NA	NA	NA	NA	NA	NA
Construction	NA	NA	NA	NA	NA	NA
Agricultural	NA	NA	NA	NA	NA	NA
Logging	NA	NA	NA	NA	NA	NA
<u>Marine Vessels</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>
Nonroad Engines and Vehicles	NA	NA	NA	NA	NA	NA
Highway Vehicles	NA	NA	NA	NA	NA	NA
<u>Other Area and Point Sources</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>
All Sources	NA	NA	NA	NA	NA	NA

Washington DC MSA Inventory B
Emission Inventory Summary - VOC, NOx, CO

Equipment Category	tpy			tpsd		tpwd CO
	VOC	NOx	CO	VOC	NOx	
Lawn & Garden	15,861	1,037	158,175	67	5	62
Airport Service	368	2,589	3,148	1	7	9
Recreational	668	13	1,469	1	0	8
Recreational Marine	2,498	215	5,068	15	1	1
Light Commercial	1,211	274	15,296	3	1	42
Industrial	749	1,886	11,834	2	5	32
Construction	1,634	12,070	9,238	7	50	15
Agricultural	873	4,159	5,165	4	18	3
Logging	2	25	11	0	0	0
<u>Marine Vessels</u>	<u>0</u>	<u>227</u>	<u>2,820</u>	<u>0</u>	<u>1</u>	<u>0</u>
Nonroad Engines and Vehicles	23,865	22,493	212,225	100	88	173
Highway Vehicles	0	83,068	398,686	345	250	2,161
<u>Other Area and Point Sources</u>	<u>0</u>	<u>88,336</u>	<u>59,024</u>	<u>202</u>	<u>242</u>	<u>167</u>
All Sources	NA	193,897	669,935	647	580	2,500

Washington DC MSA Inventory B
Emission Inventory Summary - VOC, NOx, CO
Percent of Total Inventory

Equipment Category	% total tpy			% total tpsd		% total tpwd CO
	VOC	NOx	CO	VOC	NOx	
Lawn & Garden	NA	0.53%	23.61%	10.30%	0.78%	2.50%
Airport Service	NA	1.34%	0.47%	0.16%	1.22%	0.34%
Recreational	NA	0.01%	0.22%	0.19%	0.01%	0.30%
Recreational Marine	NA	0.11%	0.76%	2.26%	0.23%	0.04%
Light Commercial	NA	0.14%	2.28%	0.52%	0.13%	1.68%
Industrial	NA	0.97%	1.77%	0.33%	0.89%	1.30%
Construction	NA	6.22%	1.38%	1.05%	8.66%	0.61%
Agricultural	NA	2.15%	0.77%	0.59%	3.14%	0.14%
Logging	NA	0.01%	0.00%	0.00%	0.01%	0.00%
<u>Marine Vessels</u>	<u>NA</u>	<u>0.12%</u>	<u>0.42%</u>	<u>0.00%</u>	<u>0.11%</u>	<u>0.00%</u>
Nonroad Engines and Vehicles	NA	11.60%	31.68%	15.41%	15.18%	6.91%
Highway Vehicles	NA	42.84%	59.51%	53.35%	43.13%	86.42%
<u>Other Area and Point Sources</u>	<u>NA</u>	<u>45.56%</u>	<u>8.81%</u>	<u>31.24%</u>	<u>41.69%</u>	<u>6.67%</u>
All Sources	NA	100.00%	100.00%	100.00%	100.00%	100.00%

Washington DC MSA Inventory B
Emission Inventory Summary - Air Toxics and SOx

Equipment Category	% total tpy					
	PM	Aldehydes	Benzene	1,3 But	Gas. Vap	SOx
Lawn & Garden	203	157	396	162	3,406	180
Airport Service	308	13	11	5	7	171
Recreational	20	3	19	8	36	1
Recreational Marine	4	8	59	26	537	16
Light Commercial	44	15	33	13	186	33
Industrial	79	31	21	9	85	50
Construction	1,555	234	48	25	54	1,050
Agricultural	809	126	25	13	32	329
Logging	3	0	0	0	0	2
<u>Marine Vessels</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>
Nonroad Engines and Vehicles	3,026	588	613	261	4,344	1,834
Highway Vehicles	0	0	0	0	0	0
<u>Other Area and Point Sources</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>
All Sources	NA	NA	NA	NA	NA	NA

Washington DC MSA Inventory B
Emission Inventory Summary - Air Toxics and SOx
Percent of Total Inventory

Equipment Category	% total tpy					
	PM	Aldehydes	Benzene	1,3 But.	Gas Vap.	SOx
Lawn & Garden	NA	NA	NA	NA	NA	NA
Airport Service	NA	NA	NA	NA	NA	NA
Recreational	NA	NA	NA	NA	NA	NA
Recreational Marine	NA	NA	NA	NA	NA	NA
Light Commercial	NA	NA	NA	NA	NA	NA
Industrial	NA	NA	NA	NA	NA	NA
Construction	NA	NA	NA	NA	NA	NA
Agricultural	NA	NA	NA	NA	NA	NA
Logging	NA	NA	NA	NA	NA	NA
<u>Marine Vessels</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>
Nonroad Engines and Vehicles	NA	NA	NA	NA	NA	NA
Highway Vehicles	NA	NA	NA	NA	NA	NA
<u>Other Area and Point Sources</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>
All Sources	NA	NA	NA	NA	NA	NA

USA Inventory B (in-use est.)
Emission Inventory Summary - Air Toxics and SOx

Equipment Category				% total tpy		
	PM	Aldehydes	Benzene	1,3 But.	Gas Vap.	SOx
Lawn & Garden	15,444	5,281	32,502	13,745	77,124	3,948
Airport Service	12,408	529	482	240	296	6,894
Recreational	12,971	1,284	19,853	8,589	13,376	493
Recreational Manne	1,959	3,518	61,632	26,617	254,839	8,885
Light Commercial	4,520	1,468	4,643	1,868	24,599	4,398
Industrial	13,743	4,577	4,041	1,735	11,868	8,560
Construction	112,001	17,284	3,530	1,799	3,086	77,443
Agricultural	346,354	51,661	10,228	5,306	6,321	138,050
Logging	8,983	1,190	509	228	789	5,193
<u>Marine Vessels</u>	<u>33,070</u>	<u>0</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>20,485</u>
Nonroad Engines and Vehicles	561,452	86,792	137,421	60,126	392,298	274,349
Highway Vehicles	1,265,460	0	—	—	—	514,018
<u>Other Area and Point Sources</u>	<u>6,189,510</u>	<u>0</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>22,407,185</u>
All Sources	8,016,422	NA	NA	NA	NA	23,195,552

USA Inventory B (in-use est.)
Emission Inventory Summary - Air Toxics and SOx
Percent of Total Inventory

Equipment Category				% total tpy		
	PM	Aldehydes	Benzene	1,3 But.	Gas Vap.	SOx
Lawn & Garden	0.19%	NA	NA	NA	NA	0.02%
Airport Service	0.15%	NA	NA	NA	NA	0.03%
Recreational	0.16%	NA	NA	NA	NA	0.00%
Recreational Manne	0.02%	NA	NA	NA	NA	0.04%
Light Commercial	0.06%	NA	NA	NA	NA	0.02%
Industrial	0.17%	NA	NA	NA	NA	0.04%
Construction	1.40%	NA	NA	NA	NA	0.33%
Agricultural	4.32%	NA	NA	NA	NA	0.60%
Logging	0.11%	NA	NA	NA	NA	0.02%
<u>Marine Vessels</u>	<u>0.41%</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>0.09%</u>
Nonroad Engines and Vehicles	7.00%	NA	NA	NA	NA	1.18%
Highway Vehicles	15.79%	NA	NA	NA	NA	2.22%
<u>Other Area and Point Sources</u>	<u>77.21%</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>96.60%</u>
All Sources	100.00%	NA	NA	NA	NA	100.00%

Atlanta MSA Inventory B (in-use est)
Emission Inventory Summary - VOC, NOx, CO

Equipment Category	tpy			tpsd		tpwd CO
	VOC	NOx	CO	VOC	NOx	
Lawn & Garden	16,677	215	110,916	60	1	82
Airport Service	322	2,073	3,009	1	6	8
Recreational	384	2	1,254	1	0	2
Recreational Manne	10,592	403	19,162	55	2	15
Light Commercial	2,271	259	31,903	6	1	87
Industrial	2,392	4,286	36,966	7	12	101
Construction	1,840	13,594	10,833	7	49	24
Agrncultural	510	2,218	3,189	2	8	2
Logging	8	111	51	0	0	0
<u>Marine Vessels</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>
Nonroad Engines and Vehicles	34,996	23,161	217,283	139	79	322
Highway Vehicles	0	69,146	0	319	208	0
<u>Other Area and Point Sources</u>	<u>0</u>	<u>92,553</u>	<u>0</u>	<u>287</u>	<u>248</u>	<u>0</u>
All Sources	NA	184,860	NA	745	535	NA

Atlanta MSA Inventory B (in-use est)
Emission Inventory Summary - VOC, NOx, CO

Percent of Total Inventory

Equipment Category	% total tpy			% total tpsd		% total tpwd CO
	VOC	NOx	CO	VOC	NOx	
Lawn & Garden	NA	0.12%	NA	8.09%	0.15%	NA
Airport Service	NA	1.12%	NA	0.12%	1.06%	NA
Recreational	NA	0.00%	NA	0.20%	0.00%	NA
Recreational Manne	NA	0.22%	NA	7.37%	0.40%	NA
Light Commercial	NA	0.14%	NA	0.84%	0.13%	NA
Industrial	NA	2.32%	NA	0.90%	2.19%	NA
Construction	NA	7.35%	NA	0.89%	9.18%	NA
Agrncultural	NA	1.20%	NA	0.26%	1.54%	NA
Logging	NA	0.06%	NA	0.00%	0.06%	NA
<u>Marine Vessels</u>	<u>NA</u>	<u>0.00%</u>	<u>NA</u>	<u>0.00%</u>	<u>0.00%</u>	<u>NA</u>
Nonroad Engines and Vehicles	NA	12.53%	NA	18.67%	14.72%	NA
Highway Vehicles	NA	37.40%	NA	42.80%	38.92%	NA
<u>Other Area and Point Sources</u>	<u>NA</u>	<u>50.07%</u>	<u>NA</u>	<u>38.53%</u>	<u>46.36%</u>	<u>NA</u>
All Sources	NA	100.00%	NA	100.00%	100.00%	NA

Atlanta MSA Inventory B (in-use est.)
Emission Inventory Summary - Air Toxics and SOx

Equipment Category	PM	Aldehydes	Benzene	tpy 1,3 But	Gas. Vap.	SOx
Lawn & Garden	242	83	476	201	1,228	66
Airport Service	247	11	10	5	6	137
Recreational	4	1	11	5	15	0
Recreational Marine	8	15	288	124	1,034	40
Light Commercial	55	16	65	27	210	38
Industrial	150	70	68	29	205	99
Construction	1,708	267	54	28	42	1,192
Agricultural	429	68	15	8	22	176
Logging	15	2	0	0	0	9
<u>Marine Vessels</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>
Nonroad Engines and Vehicles	2,857	533	986	426	2,762	1,759
Highway Vehicles	0	0	0	0	0	0
<u>Other Area and Point Sources</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>
All Sources	NA	NA	NA	NA	NA	NA

Atlanta MSA Inventory B (in-use est.)
Emission Inventory Summary - Air Toxics and SOx
Percent of Total Inventory

Equipment Category	PM	Aldehydes	Benzene	% total tpy 1,3 But.	Gas Vap.	SOx
Lawn & Garden	NA	NA	NA	NA	NA	NA
Airport Service	NA	NA	NA	NA	NA	NA
Recreational	NA	NA	NA	NA	NA	NA
Recreational Marine	NA	NA	NA	NA	NA	NA
Light Commercial	NA	NA	NA	NA	NA	NA
Industrial	NA	NA	NA	NA	NA	NA
Construction	NA	NA	NA	NA	NA	NA
Agricultural	NA	NA	NA	NA	NA	NA
Logging	NA	NA	NA	NA	NA	NA
<u>Marine Vessels</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>
Nonroad Engines and Vehicles	NA	NA	NA	NA	NA	NA
Highway Vehicles	NA	NA	NA	NA	NA	NA
<u>Other Area and Point Sources</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>
All Sources	NA	NA	NA	NA	NA	NA

Baltimore MSA Inventory B (in-use est.)
Emission Inventory Summary - VOC, NOx, CO

Equipment Category	tpy			tpsd		tpwd CO
	VOC	NOx	CO	VOC	NOx	
Lawn & Garden	9,409	128	59,361	37	1	37
Airport Service	305	1,962	2,855	1	5	8
Recreational	1,211	9	1,970	1	0	16
Recreational Marine	4,825	341	9,462	29	2	2
Light Commercial	1,828	189	24,329	5	1	67
Industrial	1,295	2,407	19,758	4	7	54
Construction	1,166	8,771	6,950	5	37	11
Agricultural	797	3,867	4,570	3	17	3
Logging	1	8	4	0	0	0
<u>Marine Vessels</u>	<u>1,623</u>	<u>5,970</u>	<u>30,333</u>	<u>4</u>	<u>16</u>	<u>83</u>
Nonroad Engines and Vehicles	22,458	23,653	159,591	89	85	281
Highway Vehicles	0	54,317	0	200	164	1,328
<u>Other Area and Point Sources</u>	<u>0</u>	<u>59,976</u>	<u>34,462</u>	<u>226</u>	<u>164</u>	<u>226</u>
All Sources	NA	137,946	NA	515	413	1,835

Baltimore MSA Inventory B (in-use est.)
Emission Inventory Summary - VOC, NOx, CO
Percent of Total Inventory

Equipment Category	% total tpy			% total tpsd		% total tpwd CO
	VOC	NOx	CO	VOC	NOx	
Lawn & Garden	NA	0.09%	NA	7.24%	0.13%	2.00%
Airport Service	NA	1.42%	NA	0.16%	1.30%	0.43%
Recreational	NA	0.01%	NA	0.16%	0.00%	0.89%
Recreational Marine	NA	0.25%	NA	5.59%	0.52%	0.11%
Light Commercial	NA	0.14%	NA	0.98%	0.13%	3.63%
Industrial	NA	1.75%	NA	0.70%	1.60%	2.95%
Construction	NA	6.36%	NA	0.94%	8.84%	0.62%
Agricultural	NA	2.80%	NA	0.68%	4.10%	0.16%
Logging	NA	0.01%	NA	0.00%	0.01%	0.00%
<u>Marine Vessels</u>	<u>NA</u>	<u>4.33%</u>	<u>NA</u>	<u>0.86%</u>	<u>3.96%</u>	<u>4.53%</u>
Nonroad Engines and Vehicles	NA	17.15%	NA	17.33%	20.59%	15.33%
Highway Vehicles	NA	39.38%	NA	38.81%	39.63%	72.36%
<u>Other Area and Point Sources</u>	<u>NA</u>	<u>43.48%</u>	<u>NA</u>	<u>43.86%</u>	<u>39.78%</u>	<u>12.31%</u>
All Sources	NA	100.00%	NA	100.00%	100.00%	100.00%

Baltimore MSA Inventory B (in-use est.)
Emission Inventory Summary - Air Toxics and SOx

Equipment Category	PM	Aldehydes	Benzene	tpy 1,3 But.	Gas Vap.	SOx
Lawn & Garden	121	45	269	114	668	37
Airport Service	234	10	9	5	6	130
Recreational	23	2	36	15	24	1
Recreational Marine	7	13	123	53	739	24
Light Commercial	43	13	52	22	157	28
Industrial	98	40	37	16	110	63
Construction	1,108	171	34	18	28	764
Agricultural	758	116	23	12	21	306
Logging	1	0	0	0	0	1
<u>Marine Vessels</u>	<u>302</u>	<u>0</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>1,719</u>
Nonroad Engines and Vehicles	2,695	410	583	254	1,754	3,071
Highway Vehicles	0	0	—	—	—	0
<u>Other Area and Point Sources</u>	<u>0</u>	<u>0</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>0</u>
All Sources	NA	NA	NA	NA	NA	NA

Baltimore MSA Inventory B (in-use est.)
Emission Inventory Summary - Air Toxics and SOx
Percent of Total Inventory

Equipment Category	PM	Aldehydes	Benzene	% total tpy 1,3 But	Gas Vap.	SOx
Lawn & Garden	NA	NA	NA	NA	NA	NA
Airport Service	NA	NA	NA	NA	NA	NA
Recreational	NA	NA	NA	NA	NA	NA
Recreational Marine	NA	NA	NA	NA	NA	NA
Light Commercial	NA	NA	NA	NA	NA	NA
Industrial	NA	NA	NA	NA	NA	NA
Construction	NA	NA	NA	NA	NA	NA
Agricultural	NA	NA	NA	NA	NA	NA
Logging	NA	NA	NA	NA	NA	NA
<u>Marine Vessels</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>
Nonroad Engines and Vehicles	NA	NA	NA	NA	NA	NA
Highway Vehicles	NA	NA	NA	NA	NA	NA
<u>Other Area and Point Sources</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>
All Sources	NA	NA	NA	NA	NA	NA

Baton Rouge CMSA Inventory B (in-use est)
Emission Inventory Summary - VOC, NOx, CO

Equipment Category	tpy			tpsd		tpwd CO
	VOC	NOx	CO	VOC	NOx	
Lawn & Garden	3,458	52	27,632	13	0	20
Airport Service	234	1,510	2,190	1	4	6
Recreational	328	2	1,074	1	0	1
Recreational Manne	4,193	89	7,373	22	0	6
Light Commercial	913	104	12,828	3	0	35
Industrial	308	580	4,639	1	2	13
Construction	496	2,588	3,447	2	9	8
Agricultural	129	539	941	0	2	1
Logging	26	95	119	0	0	0
<u>Marine Vessels</u>	<u>143</u>	<u>2,394</u>	<u>528</u>	<u>0</u>	<u>7</u>	<u>1</u>
Nonroad Engines and Vehicles	10,229	7,953	60,771	43	25	91
Highway Vehicles	0	14,555	0	64	44	0
<u>Other Area and Point Sources</u>	<u>0</u>	<u>82,744</u>	<u>0</u>	<u>270</u>	<u>227</u>	<u>0</u>
All Sources	NA	105,252	NA	377	295	NA

Baton Rouge CMSA Inventory B (in-use est.)
Emission Inventory Summary - VOC, NOx, CO
Percent of Total Inventory

Equipment Category	% total tpy			% total tpsd		% total tpwd CO
	VOC	NOx	CO	VOC	NOx	
Lawn & Garden	NA	0 05%	NA	3 34%	0 07%	NA
Airport Service	NA	1 43%	NA	0 17%	1 40%	NA
Recreational	NA	0 00%	NA	0 35%	0 00%	NA
Recreational Manne	NA	0 08%	NA	5 82%	0 16%	NA
Light Commercial	NA	0 10%	NA	0 67%	0 10%	NA
Industrial	NA	0 55%	NA	0 23%	0 54%	NA
Construction	NA	2 46%	NA	0 48%	3 17%	NA
Agricultural	NA	0 51%	NA	0 13%	0 68%	NA
Logging	NA	0 09%	NA	0 02%	0 09%	NA
<u>Marine Vessels</u>	<u>NA</u>	<u>2,27%</u>	<u>NA</u>	<u>0,10%</u>	<u>2,22%</u>	<u>NA</u>
Nonroad Engines and Vehicles	NA	7 56%	NA	11 30%	8 42%	NA
Highway Vehicles	NA	13 83%	NA	17 00%	14 85%	NA
<u>Other Area and Point Sources</u>	<u>NA</u>	<u>78 62%</u>	<u>NA</u>	<u>71 70%</u>	<u>76 74%</u>	<u>NA</u>
All Sources	NA	100 00%	NA	100 00%	100 00%	NA

Baton Rouge CMSA Inventory B (in-use est.)
Emission Inventory Summary - Air Toxics and SOx

Equipment Category	tpy					
	PM	Aldehydes	Benzene	1,3 But.	Gas Vap.	SOx
Lawn & Garden	51	18	98	41	294	17
Airport Service	180	8	7	3	4	100
Recreational	3	1	9	4	13	0
Recreational Marine	2	3	120	52	211	13
Light Commercial	22	7	26	11	85	15
Industrial	25	10	9	4	26	16
Construction	352	51	15	7	21	226
Agricultural	105	16	4	2	4	43
Logging	14	2	1	0	1	8
<u>Marine Vessels</u>	<u>141</u>	<u>0</u>				<u>975</u>
Nonroad Engines and Vehicles	894	115	288	124	659	1,414
Highway Vehicles	0	0				0
<u>Other Area and Point Sources</u>	<u>0</u>	<u>0</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>0</u>
All Sources	NA	NA	NA	NA	NA	NA

Baton Rouge CMSA Inventory B (in-use est.)
Emission Inventory Summary - Air Toxics and SOx
Percent of Total Inventory

Equipment Category	% total tpy					
	PM	Aldehydes	Benzene	1,3 But.	Gas Vap.	SOx
Lawn & Garden	NA	NA	NA	NA	NA	NA
Airport Service	NA	NA	NA	NA	NA	NA
Recreational	NA	NA	NA	NA	NA	NA
Recreational Marine	NA	NA	NA	NA	NA	NA
Light Commercial	NA	NA	NA	NA	NA	NA
Industrial	NA	NA	NA	NA	NA	NA
Construction	NA	NA	NA	NA	NA	NA
Agricultural	NA	NA	NA	NA	NA	NA
Logging	NA	NA	NA	NA	NA	NA
<u>Marine Vessels</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>
Nonroad Engines and Vehicles	NA	NA	NA	NA	NA	NA
Highway Vehicles	NA	NA	NA	NA	NA	NA
<u>Other Area and Point Sources</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>
All Sources	NA	NA	NA	NA	NA	NA

Boston CMSA Inventory B (in-use est)
Emission Inventory Summary - VOC, NOx, CO

Equipment Category	tpy			tpsd		tpwd
	VOC	NOx	CO	VOC	NOx	CO
Lawn & Garden	14,752	155	80,780	77	1	22
Airport Service	388	2,496	3,630	1	7	10
Recreational	4,324	31	6,779	3	0	60
Recreational Manne	15,673	1,368	31,860	108	10	3
Light Commercial	4,407	416	55,880	12	1	153
Industrial	2,014	4,128	29,745	6	11	81
Construction	2,535	19,390	14,295	12	91	16
Agricultural	471	2,140	2,770	3	12	2
Logging	9	133	61	0	0	0
<u>Marine Vessels</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>5</u>	<u>1</u>
Nonroad Engines and Vehicles	44,574	30,258	225,800	222	139	348
Highway Vehicles	0	0	0	415	207	1,470
<u>Other Area and Point Sources</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>304</u>	<u>169</u>	<u>599</u>
All Sources	NA	NA	NA	941	514	2 417

Boston CMSA Inventory B (in-use est.)
Emission Inventory Summary - VOC, NOx, CO
Percent of Total Inventory

Equipment Category	% total tpy			% total tpsd		% total tpwd
	VOC	NOx	CO	VOC	NOx	CO
Lawn & Garden	NA	NA	NA	8 23%	0 16%	0 91%
Airport Service	NA	NA	NA	0 11%	1 33%	0 41%
Recreational	NA	NA	NA	0.27%	0 00%	2 47%
Recreational Manne	NA	NA	NA	11 48%	1 99%	0 14%
Light Commercial	NA	NA	NA	1 29%	0 22%	6 34%
Industrial	NA	NA	NA	0 60%	2 20%	3 37%
Construction	NA	NA	NA	1 27%	17 77%	0 65%
Agricultural	NA	NA	NA	0 27%	2 28%	0 08%
Logging	NA	NA	NA	0 00%	0 07%	0 01%
<u>Marine Vessels</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>0 03%</u>	<u>0 96%</u>	<u>0 03%</u>
Nonroad Engines and Vehicles	NA	NA	NA	23.56%	26 98%	14 40%
Highway Vehicles	NA	NA	NA	44 09%	40 23%	60 83%
<u>Other Area and Point Sources</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>32 35%</u>	<u>32 78%</u>	<u>24 77%</u>
All Sources	NA	NA	NA	100 00%	100 00%	100 00%

Boston CMSA Inventory B (in-use est.)
Emission Inventory Summary - Air Toxics and SOx

Equipment Category	tpy					
	PM	Aldehydes	Benzene	1,3 But.	Gas. Vap	SOx
Lawn & Garden	208	67	420	177	1,107	48
Airport Service	297	13	12	6	7	165
Recreational	84	8	127	55	88	3
Recreational Marine	27	53	382	165	3,002	87
Light Commercial	100	30	127	53	353	62
Industrial	224	68	57	25	170	137
Construction	2,630	360	75	39	36	1,683
Agricultural	410	65	14	7	20	168
Logging	18	2	0	0	0	11
<u>Marine Vessels</u>	<u>173</u>	<u>0</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>0</u>
Nonroad Engines and Vehicles	4,172	666	1,214	527	4,784	2,363
Highway Vehicles	0	0	—	—	—	0
<u>Other Area and Point Sources</u>	<u>0</u>	<u>0</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>0</u>
All Sources	NA	NA	NA	NA	NA	NA

Boston CMSA Inventory B (in-use est.)
Emission Inventory Summary - Air Toxics and SOx
Percent of Total Inventory

Equipment Category	% total tpy					
	PM	Aldehydes	Benzene	1,3 But.	Gas Vap.	SOx
Lawn & Garden	NA	NA	NA	NA	NA	NA
Airport Service	NA	NA	NA	NA	NA	NA
Recreational	NA	NA	NA	NA	NA	NA
Recreational Marine	NA	NA	NA	NA	NA	NA
Light Commercial	NA	NA	NA	NA	NA	NA
Industrial	NA	NA	NA	NA	NA	NA
Construction	NA	NA	NA	NA	NA	NA
Agricultural	NA	NA	NA	NA	NA	NA
Logging	NA	NA	NA	NA	NA	NA
<u>Marine Vessels</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>
Nonroad Engines and Vehicles	NA	NA	NA	NA	NA	NA
Highway Vehicles	NA	NA	NA	NA	NA	NA
<u>Other Area and Point Sources</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>
All Sources	NA	NA	NA	NA	NA	NA

Cleveland CMSA Inventory B (in-use est)
Emission Inventory Summary - VOC, NOx, CO

Equipment Category	tpy			tpsd		tpwd CO
	VOC	NOx	CO	VOC	NOx	
Lawn & Garden	13,553	130	76,672	72	1	15
Airport Service	334	2,151	3,118	1	6	9
Recreational	1,004	7	1,554	1	0	14
Recreational Manne	9,478	637	18,344	68	5	0
Light Commercial	2,982	282	37,792	8	1	104
Industrial	1,884	3,831	27,913	5	10	76
Construction	762	5,154	4,833	4	24	5
Agricultural	745	3,820	3,935	4	21	3
Logging	1	8	4	0	0	0
<u>Marine Vessels</u>	<u>0</u>	<u>109</u>	<u>3,757</u>	<u>0</u>	<u>0</u>	<u>0</u>
Nonroad Engines and Vehicles	30,742	16,128	177,920	163	68	226
Highway Vehicles	0	64,808	412,340	242	195	2,360
<u>Other Area and Point Sources</u>	<u>0</u>	<u>62,301</u>	<u>88,401</u>	<u>369</u>	<u>171</u>	<u>252</u>
All Sources	NA	143,237	678,661	773	434	2,837

Cleveland CMSA Inventory B (in-use est.)
Emission Inventory Summary - VOC, NOx, CO
Percent of Total Inventory

Equipment Category	% total tpy			% total tpsd		% total tpwd CO
	VOC	NOx	CO	VOC	NOx	
Lawn & Garden	NA	0.09%	11.30%	9.28%	0.16%	0.54%
Airport Service	NA	1.50%	0.46%	0.12%	1.36%	0.30%
Recreational	NA	0.01%	0.23%	0.08%	0.00%	0.49%
Recreational Manne	NA	0.44%	2.70%	8.82%	1.13%	0.00%
Light Commercial	NA	0.20%	5.57%	1.06%	0.18%	3.65%
Industrial	NA	2.67%	4.11%	0.68%	2.42%	2.70%
Construction	NA	3.60%	0.71%	0.46%	5.59%	0.19%
Agricultural	NA	2.67%	0.58%	0.52%	4.82%	0.09%
Logging	NA	0.01%	0.00%	0.00%	0.00%	0.00%
<u>Marine Vessels</u>	<u>NA</u>	<u>0.08%</u>	<u>0.55%</u>	<u>0.00%</u>	<u>0.07%</u>	<u>0.00%</u>
Nonroad Engines and Vehicles	NA	11.26%	26.22%	21.03%	15.73%	7.95%
Highway Vehicles	NA	45.25%	60.76%	31.26%	44.97%	83.18%
<u>Other Area and Point Sources</u>	<u>NA</u>	<u>43.50%</u>	<u>13.03%</u>	<u>47.71%</u>	<u>39.30%</u>	<u>8.87%</u>
All Sources	NA	100.00%	100.00%	100.00%	100.00%	100.00%

Cleveland CMSA Inventory B (in-use est.)
Emission Inventory Summary - Air Toxics and SOx

Equipment Category	tpy					
	PM	Aldehydes	Benzene	1,3 But.	Gas Vap.	SOx
Lawn & Garden	212	63	386	163	1,041	44
Airport Service	256	11	10	5	6	142
Recreational	20	2	30	13	21	1
Recreational Marine	13	25	241	104	1,483	46
Light Commercial	67	20	86	36	241	42
Industrial	204	63	53	23	160	125
Construction	678	101	22	11	26	448
Agricultural	760	113	22	11	23	302
Logging	1	0	0	0	0	1
<u>Marine Vessels</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>
Nonroad Engines and Vehicles	2,210	398	849	366	2,999	1,150
Highway Vehicles	46,729	0				0
<u>Other Area and Point Sources</u>	<u>64,287</u>	<u>0</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>0</u>
All Sources	113,226	NA	NA	NA	NA	NA

Cleveland CMSA Inventory B (in-use est.)
Emission Inventory Summary - Air Toxics and SOx
Percent of Total Inventory

Equipment Category	% total tpy					
	PM	Aldehydes	Benzene	1,3 But.	Gas Vap	SOx
Lawn & Garden	0.19%	NA	NA	NA	NA	NA
Airport Service	0.23%	NA	NA	NA	NA	NA
Recreational	0.02%	NA	NA	NA	NA	NA
Recreational Marine	0.01%	NA	NA	NA	NA	NA
Light Commercial	0.06%	NA	NA	NA	NA	NA
Industrial	0.18%	NA	NA	NA	NA	NA
Construction	0.60%	NA	NA	NA	NA	NA
Agricultural	0.67%	NA	NA	NA	NA	NA
Logging	0.00%	NA	NA	NA	NA	NA
<u>Marine Vessels</u>	<u>0.00%</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>
Nonroad Engines and Vehicles	1.95%	NA	NA	NA	NA	NA
Highway Vehicles	41.27%	NA	NA	NA	NA	NA
<u>Other Area and Point Sources</u>	<u>56.78%</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>
All Sources	100.00%	NA	NA	NA	NA	NA

Denver CMSA Inventory B (in-use est)
Emission Inventory Summary - VOC, NOx, CO

Equipment Category	tpy			tpsd		tpwd CO
	VOC	NOx	CO	VOC	NOx	
Lawn & Garden	10,832	166	61,714	57	1	16
Airport Service	247	1,591	2,309	1	4	6
Recreational	2,934	21	4,643	2	0	40
Recreational Marine	565	86	1,168	3	1	0
Light Commercial	3,617	374	48,054	10	1	132
Industrial	777	1,662	11,075	2	5	30
Construction	962	5,671	6,383	5	27	7
Agricultural	393	1,943	2,135	2	11	1
Logging	0	1	0	0	0	0
Marine Vessels	0	0	0	0	0	0
Nonroad Engines and Vehicles	20,327	11,515	137,482	82	49	232
Highway Vehicles	0	0	417,406	0	0	2,371
<u>Other Area and Point Sources</u>	<u>0</u>	<u>0</u>	<u>58,870</u>	<u>0</u>	<u>0</u>	<u>168</u>
All Sources	NA	NA	613,758	NA	NA	2,771

Denver CMSA Inventory B (in-use est)
Emission Inventory Summary - VOC, NOx, CO
Percent of Total Inventory

Equipment Category	% total tpy			% total tpsd		% total tpwd CO
	VOC	NOx	CO	VOC	NOx	
Lawn & Garden	NA	NA	10.06%	NA	NA	0.56%
Airport Service	NA	NA	0.38%	NA	NA	0.23%
Recreational	NA	NA	0.76%	NA	NA	1.43%
Recreational Marine	NA	NA	0.19%	NA	NA	0.00%
Light Commercial	NA	NA	7.83%	NA	NA	4.75%
Industrial	NA	NA	1.80%	NA	NA	1.10%
Construction	NA	NA	1.04%	NA	NA	0.25%
Agricultural	NA	NA	0.35%	NA	NA	0.05%
Logging	NA	NA	0.00%	NA	NA	0.00%
Marine Vessels	NA	NA	0.00%	NA	NA	0.00%
Nonroad Engines and Vehicles	NA	NA	22.40%	NA	NA	8.37%
Highway Vehicles	NA	NA	68.01%	NA	NA	85.59%
<u>Other Area and Point Sources</u>	<u>NA</u>	<u>NA</u>	<u>9.59%</u>	<u>NA</u>	<u>NA</u>	<u>6.05%</u>
All Sources	NA	NA	100.00%	NA	NA	100.00%

Denver CMSA Inventory B (in-use est.)
Emission Inventory Summary - Air Toxics and SOx

Equipment Category	tpy					
	PM	Aldehydes	Benzene	1,3 But.	Gas Vap.	SOx
Lawn & Garden	137	50	310	131	740	42
Airport Service	189	8	7	4	5	105
Recreational	57	6	86	37	59	2
Recreational Manne	2	3	9	4	266	4
Light Commercial	84	25	104	43	312	56
Industrial	104	27	22	10	64	62
Construction	769	111	28	14	37	498
Agricultural	374	58	11	6	19	154
Logging	0	0	0	0	0	0
<u>Marine Vessels</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>
Nonroad Engines and Vehicles	1,717	288	578	249	1,502	922
Highway Vehicles	32,716	0				0
<u>Other Area and Point Sources</u>	<u>146,677</u>	<u>0</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>0</u>
All Sources	181,110	NA	NA	NA	NA	NA

Denver CMSA Inventory B (in-use est.)
Emission Inventory Summary - Air Toxics and SOx
Percent of Total Inventory

Equipment Category	% total tpy					
	PM	Aldehydes	Benzene	1,3 But	Gas Vap	SOx
Lawn & Garden	0.08%	NA	NA	NA	NA	NA
Airport Service	0.10%	NA	NA	NA	NA	NA
Recreational	0.03%	NA	NA	NA	NA	NA
Recreational Manne	0.00%	NA	NA	NA	NA	NA
Light Commercial	0.05%	NA	NA	NA	NA	NA
Industrial	0.06%	NA	NA	NA	NA	NA
Construction	0.42%	NA	NA	NA	NA	NA
Agricultural	0.21%	NA	NA	NA	NA	NA
Logging	0.00%	NA	NA	NA	NA	NA
<u>Marine Vessels</u>	<u>0.00%</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>
Nonroad Engines and Vehicles	0.95%	NA	NA	NA	NA	NA
Highway Vehicles	18.06%	NA	NA	NA	NA	NA
<u>Other Area and Point Sources</u>	<u>80.99%</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>
All Sources	100.00%	NA	NA	NA	NA	NA

El Paso MSA Inventory B (in-use est.)
Emission Inventory Summary - VOC, NOx, CO

Equipment Category	tpy			tpsd		tpwd CO
	VOC	NOx	CO	VOC	NOx	
Lawn & Garden	2,271	35	14,310	8	0	11
Airport Service	73	470	688	0	1	2
Recreational	295	2	952	1	0	1
Recreational Marine	361	13	648	2	0	0
Light Commercial	893	105	12,627	2	0	35
Industrial	442	867	6,521	1	2	18
Construction	280	1,725	1,846	1	6	4
Agricultural	74	318	496	0	1	0
Logging	0	3	2	0	0	0
<u>Marine Vessels</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>
Nonroad Engines and Vehicles	4,689	3,538	38,090	16	12	71
Highway Vehicles	0	11,156	320,700	36	34	756
<u>Other Area and Point Sources</u>	<u>0</u>	<u>20,382</u>	<u>18,000</u>	<u>60</u>	<u>25</u>	<u>24</u>
All Sources	NA	35,076	376,790	113	70	851

El Paso MSA Inventory B (in-use est.)
Emission Inventory Summary - VOC, NOx, CO
Percent of Total Inventory

Equipment Category	% total tpy			% total tpsd		% total tpwd CO
	VOC	NOx	CO	VOC	NOx	
Lawn & Garden	NA	0.10%	3.80%	7.24%	0.19%	1.27%
Airport Service	NA	1.34%	0.18%	0.18%	1.84%	0.22%
Recreational	NA	0.00%	0.25%	1.06%	0.01%	0.15%
Recreational Marine	NA	0.04%	0.17%	1.66%	0.10%	0.06%
Light Commercial	NA	0.30%	3.35%	2.19%	0.41%	4.06%
Industrial	NA	2.47%	1.73%	1.10%	3.39%	2.10%
Construction	NA	4.92%	0.49%	0.90%	8.90%	0.48%
Agricultural	NA	0.91%	0.13%	0.25%	1.69%	0.04%
Logging	NA	0.01%	0.00%	0.00%	0.01%	0.00%
<u>Marine Vessels</u>	<u>NA</u>	<u>0.00%</u>	<u>0.00%</u>	<u>0.00%</u>	<u>0.00%</u>	<u>0.00%</u>
Nonroad Engines and Vehicles	NA	10.09%	10.11%	14.57%	16.54%	8.38%
Highway Vehicles	NA	31.81%	85.11%	32.20%	47.98%	88.77%
<u>Other Area and Point Sources</u>	<u>NA</u>	<u>58.11%</u>	<u>4.78%</u>	<u>53.23%</u>	<u>35.49%</u>	<u>2.86%</u>
All Sources	NA	100.00%	100.00%	100.00%	100.00%	100.00%

El Paso MSA Inventory B (in-use est.)
Emission Inventory Summary - Air Toxics and SOx

Equipment Category	tpy					
	PM	Aldehydes	Benzene	1,3 But.	Gas. Vap	SOx
Lawn & Garden	33	11	65	28	149	9
Airport Service	56	2	2	1	1	31
Recreational	3	1	8	4	12	0
Recreational Manne	0	0	10	4	35	1
Light Commercial	22	6	26	11	81	15
Industrial	44	14	13	5	36	27
Construction	224	36	8	4	10	154
Agricultural	60	10	2	1	3	25
Logging	0	0	0	0	0	0
<u>Marine Vessels</u>	<u>0</u>	<u>0</u>				<u>0</u>
Nonroad Engines and Vehicles	443	81	134	58	328	264
Highway Vehicles	7,278	0				0
<u>Other Area and Point Sources</u>	<u>129,939</u>	<u>0</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>0</u>
All Sources	137,660	NA	NA	NA	NA	NA

El Paso MSA Inventory B (in-use est.)
Emission Inventory Summary - Air Toxics and SOx
Percent of Total Inventory

Equipment Category	% total tpy					
	PM	Aldehydes	Benzene	1,3 But.	Gas Vap	SOx
Lawn & Garden	0.02%	NA	NA	NA	NA	NA
Airport Service	0.04%	NA	NA	NA	NA	NA
Recreational	0.00%	NA	NA	NA	NA	NA
Recreational Manne	0.00%	NA	NA	NA	NA	NA
Light Commercial	0.02%	NA	NA	NA	NA	NA
Industrial	0.03%	NA	NA	NA	NA	NA
Construction	0.16%	NA	NA	NA	NA	NA
Agricultural	0.04%	NA	NA	NA	NA	NA
Logging	0.00%	NA	NA	NA	NA	NA
<u>Marine Vessels</u>	<u>0.00%</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>
Nonroad Engines and Vehicles	0.32%	NA	NA	NA	NA	NA
Highway Vehicles	5.29%	NA	NA	NA	NA	NA
<u>Other Area and Point Sources</u>	<u>94.39%</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>
All Sources	100.00%	NA	NA	NA	NA	NA

Hartford NECMA Inventory B (in-use est.)
Emission Inventory Summary - VOC, NOx, CO

Equipment Category	tpy			tpsd		tpwd CO
	VOC	NOx	CO	VOC	NOx	
Lawn & Garden	6,910	61	37,100	37	0	7
Airport Service	280	1,800	2,615	1	5	7
Recreational	1,866	13	2,927	1	0	26
Recreational Marine	4,078	261	7,998	29	2	1
Light Commercial	1,079	102	13,676	3	0	37
Industrial	560	1,212	8,075	2	3	22
Construction	837	7,522	4,895	4	35	5
Agricultural	369	1,766	2,016	2	10	1
Logging	2	33	15	0	0	0
<u>Marine Vessels</u>	<u>11</u>	<u>260</u>	<u>29</u>	<u>0</u>	<u>1</u>	<u>0</u>
Nonroad Engines and Vehicles	15,992	13,030	79,348	78	57	108
Highway Vehicles	0	29,311	108,380	189	88	590
<u>Other Area and Point Sources</u>	<u>0</u>	<u>11,650</u>	<u>51,997</u>	<u>77</u>	<u>18</u>	<u>210</u>
All Sources	NA	53,991	239,725	343	163	908

Hartford NECMA Inventory B (in-use est.)
Emission Inventory Summary - VOC, NOx, CO
Percent of Total Inventory

Equipment Category	% total tpy			% total tpsd		% total tpwd CO
	VOC	NOx	CO	VOC	NOx	
Lawn & Garden	NA	0.11%	15.48%	10.68%	0.20%	0.81%
Airport Service	NA	3.33%	1.09%	0.22%	3.02%	0.79%
Recreational	NA	0.02%	1.22%	0.32%	0.00%	2.84%
Recreational Marine	NA	0.48%	3.34%	8.44%	1.20%	0.10%
Light Commercial	NA	0.19%	5.71%	0.87%	0.17%	4.13%
Industrial	NA	2.24%	3.37%	0.46%	2.04%	2.44%
Construction	NA	13.93%	2.04%	1.15%	21.73%	0.59%
Agricultural	NA	3.27%	0.84%	0.59%	5.93%	0.15%
Logging	NA	0.06%	0.01%	0.00%	0.06%	0.00%
<u>Marine Vessels</u>	<u>NA</u>	<u>0.48%</u>	<u>0.01%</u>	<u>0.01%</u>	<u>0.44%</u>	<u>0.01%</u>
Nonroad Engines and Vehicles	NA	24.13%	33.10%	22.74%	34.78%	11.85%
Highway Vehicles	NA	54.29%	45.21%	54.88%	54.14%	65.01%
<u>Other Area and Point Sources</u>	<u>NA</u>	<u>21.58%</u>	<u>21.69%</u>	<u>22.38%</u>	<u>11.08%</u>	<u>23.14%</u>
All Sources	NA	100.00%	100.00%	100.00%	100.00%	100.00%

Hartford NECMA Inventory B (in-use est.)
Emission Inventory Summary - Air Toxics and SOx

Equipment Category	tpy					
	PM	Aldehydes	Benzene	1,3 But	Gas Vap	SOx
Lawn & Garden	112	32	197	83	509	21
Airport Service	214	9	8	4	5	119
Recreational	36	3	55	24	38	1
Recreational Marine	5	10	108	47	490	19
Light Commercial	24	7	31	13	87	15
Industrial	75	20	16	7	47	45
Construction	974	138	25	13	13	640
Agricultural	341	54	11	6	10	138
Logging	4	1	0	0	0	3
<u>Marine Vessels</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>
Nonroad Engines and Vehicles	1,788	274	451	196	1,198	1,002
Highway Vehicles	0	0				0
<u>Other Area and Point Sources</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>
All Sources	NA	NA	NA	NA	NA	NA

Hartford NECMA Inventory B (in-use est.)
Emission Inventory Summary - Air Toxics and SOx
Percent of Total Inventory

Equipment Category	% total tpy					
	PM	Aldehydes	Benzene	1,3 But	Gas Vap.	SOx
Lawn & Garden	NA	NA	NA	NA	NA	NA
Airport Service	NA	NA	NA	NA	NA	NA
Recreational	NA	NA	NA	NA	NA	NA
Recreational Marine	NA	NA	NA	NA	NA	NA
Light Commercial	NA	NA	NA	NA	NA	NA
Industrial	NA	NA	NA	NA	NA	NA
Construction	NA	NA	NA	NA	NA	NA
Agricultural	NA	NA	NA	NA	NA	NA
Logging	NA	NA	NA	NA	NA	NA
<u>Marine Vessels</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>
Nonroad Engines and Vehicles	NA	NA	NA	NA	NA	NA
Highway Vehicles	NA	NA	NA	NA	NA	NA
<u>Other Area and Point Sources</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>
All Sources	NA	NA	NA	NA	NA	NA

Houston CMSA Inventory B (in-use est.)
Emission Inventory Summary - VOC, NOx, CO

Equipment Category	tpy			tpsd		tpwd CO
	VOC	NOx	CO	VOC	NOx	
Lawn & Garden	24,845	307	136,395	89	1	107
Airport Service	425	2,739	3,982	1	8	11
Recreational	957	5	3,092	4	0	4
Recreational Marine	16,736	585	29,675	87	3	23
Light Commercial	8,050	949	113,871	22	3	312
Industrial	2,471	4,753	36,884	7	13	101
Construction	2,897	15,789	19,917	11	57	44
Agricultural	993	4,674	6,209	4	17	4
Logging	47	188	220	0	1	1
<u>Marine Vessels</u>	<u>631</u>	<u>12,227</u>	<u>1,709</u>	<u>2</u>	<u>33</u>	<u>5</u>
Nonroad Engines and Vehicles	58,052	42,215	351,953	226	136	611
Highway Vehicles	0	100,865	0	442	304	0
<u>Other Area and Point Sources</u>	<u>0</u>	<u>440,925</u>	<u>0</u>	<u>1,391</u>	<u>859</u>	<u>0</u>
All Sources	NA	584,005	NA	2,059	1,299	NA

Houston CMSA Inventory B (in-use est.)
Emission Inventory Summary - VOC, NOx, CO
Percent of Total Inventory

Equipment Category	% total tpy			% total tpsd		% total tpwd CO
	VOC	NOx	CO	VOC	NOx	
Lawn & Garden	NA	0.05%	NA	4.31%	0.09%	NA
Airport Service	NA	0.47%	NA	0.06%	0.58%	NA
Recreational	NA	0.00%	NA	0.19%	0.00%	NA
Recreational Marine	NA	0.10%	NA	4.21%	0.24%	NA
Light Commercial	NA	0.16%	NA	1.08%	0.20%	NA
Industrial	NA	0.81%	NA	0.34%	1.00%	NA
Construction	NA	2.70%	NA	0.51%	4.39%	NA
Agricultural	NA	0.80%	NA	0.18%	1.34%	NA
Logging	NA	0.03%	NA	0.01%	0.04%	NA
<u>Marine Vessels</u>	<u>NA</u>	<u>2.09%</u>	<u>NA</u>	<u>0.08%</u>	<u>2.58%</u>	<u>NA</u>
Nonroad Engines and Vehicles	NA	7.23%	NA	10.96%	10.46%	NA
Highway Vehicles	NA	17.27%	NA	21.49%	23.40%	NA
<u>Other Area and Point Sources</u>	<u>NA</u>	<u>75.50%</u>	<u>NA</u>	<u>67.56%</u>	<u>66.14%</u>	<u>NA</u>
All Sources	NA	100.00%	NA	100.00%	100.00%	NA

Houston CMSA Inventory B (in-use est.)
Emission Inventory Summary - Air Toxics and SOx
Percent of Total Inventory

Equipment Category	PM	Aldehydes	Benzene	1,3 But.	Gas Vap	SOx
Lawn & Garden	NA	NA	NA	NA	NA	NA
Airport Service	NA	NA	NA	NA	NA	NA
Recreational	NA	NA	NA	NA	NA	NA
Recreational Marine	NA	NA	NA	NA	NA	NA
Light Commercial	NA	NA	NA	NA	NA	NA
Industrial	NA	NA	NA	NA	NA	NA
Construction	NA	NA	NA	NA	NA	NA
Agricultural	NA	NA	NA	NA	NA	NA
Logging	NA	NA	NA	NA	NA	NA
<u>Marine Vessels</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>
Nonroad Engines and Vehicles	NA	NA	NA	NA	NA	NA
Highway Vehicles	NA	NA	NA	NA	NA	NA
<u>Other Area and Point Sources</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>
All Sources	NA	NA	NA	NA	NA	NA

Houston CMSA Inventory B (in-use est.)
Emission Inventory Summary - Air Toxics and SOx

Equipment Category	PM	Aldehydes	Benzene	1,3 But.	Gas. Vap.	SOx
Lawn & Garden	341	117	719	305	1,424	85
Airport Service	326	14	13	6	7	181
Recreational	9	3	28	12	39	1
Recreational Marine	11	22	451	195	1,752	61
Light Commercial	198	58	230	95	733	139
Industrial	225	78	70	30	206	140
Construction	2,119	314	85	42	116	1,380
Agricultural	902	141	29	15	26	372
Logging	27	4	1	1	2	16
<u>Marine Vessels</u>	<u>731</u>	<u>0</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>5,075</u>
Nonroad Engines and Vehicles	4,888	750	1,626	701	4,304	7,450
Highway Vehicles	0	0	—	—	—	0
<u>Other Area and Point Sources</u>	<u>0</u>	<u>0</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>0</u>
All Sources	NA	NA	NA	NA	NA	NA

Miami CMSA Inventory B (in-use est.)
Emission Inventory Summary - VOC, NOx, CO

Equipment Category	tpy			tpsd		tpwd
	VOC	NOx	CO	VOC	NOx	CO
Lawn & Garden	14,347	231	90,510	51	1	69
Airport Service	192	1,239	1,794	1	3	5
Recreational	671	4	2,193	3	0	4
Recreational Marine	10,586	559	19,985	55	3	15
Light Commercial	2,668	304	37,469	7	1	103
Industrial	1,887	3,507	28,635	5	10	78
Construction	1,342	10,146	8,316	5	37	18
Agricultural	300	1,191	2,163	1	4	1
Logging	0	0	0	0	0	0
<u>Marine Vessels</u>	<u>0</u>	<u>1,310</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>
Nonroad Engines and Vehicles	31,992	18,490	191,065	128	59	294
Highway Vehicles	0	63,266	0	307	191	0
<u>Other Area and Point Sources</u>	<u>0</u>	<u>35,464</u>	<u>0</u>	<u>235</u>	<u>97</u>	<u>0</u>
All Sources	NA	117,220	NA	670	347	NA

Miami CMSA Inventory B (in-use est.)
Emission Inventory Summary - VOC, NOx, CO
Percent of Total Inventory

Equipment Category	% total tpy			% total tpsd		% total tpwd
	VOC	NOx	CO	VOC	NOx	CO
Lawn & Garden	NA	0.20%	NA	7.69%	0.25%	NA
Airport Service	NA	1.06%	NA	0.08%	0.98%	NA
Recreational	NA	0.00%	NA	0.39%	0.00%	NA
Recreational Marine	NA	0.48%	NA	8.16%	0.85%	NA
Light Commercial	NA	0.26%	NA	1.10%	0.24%	NA
Industrial	NA	2.99%	NA	0.79%	2.77%	NA
Construction	NA	8.66%	NA	0.73%	10.59%	NA
Agricultural	NA	1.02%	NA	0.17%	1.28%	NA
Logging	NA	0.00%	NA	0.00%	0.00%	NA
<u>Marine Vessels</u>	<u>NA</u>	<u>1.12%</u>	<u>NA</u>	<u>0.00%</u>	<u>0.00%</u>	<u>NA</u>
Nonroad Engines and Vehicles	NA	15.77%	NA	19.09%	16.96%	NA
Highway Vehicles	NA	53.97%	NA	45.81%	55.01%	NA
<u>Other Area and Point Sources</u>	<u>NA</u>	<u>30.25%</u>	<u>NA</u>	<u>35.09%</u>	<u>28.03%</u>	<u>NA</u>
All Sources	NA	100.00%	NA	100.00%	100.00%	NA

Miami CMSA Inventory B (in-use est)
Emission Inventory Summary - Air Toxics and SOx

Equipment Category	PM	Aldehydes	Benzene	tpy 1,3 But.	Gas Vap	SOx
Lawn & Garden	206	70	414	175	899	60
Airport Service	148	6	6	3	3	82
Recreational	7	2	19	8	26	1
Recreational Marine	11	21	281	121	1,250	46
Light Commercial	64	19	76	32	247	45
Industrial	145	58	53	23	159	93
Construction	1,288	203	40	20	35	888
Agricultural	225	37	9	4	17	94
Logging	0	0	0	0	0	0
<u>Marine Vessels</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>
Nonroad Engines and Vehicles	2,094	417	898	386	2,637	1,308
Highway Vehicles	0	0				0
<u>Other Area and Point Sources</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>
All Sources	NA	NA	NA	NA	NA	NA

Miami CMSA Inventory B (in-use est)
Emission Inventory Summary - Air Toxics and SOx
Percent of Total Inventory

Equipment Category	PM	Aldehydes	Benzene	% total tpy 1,3 But.	Gas Vap	SOx
Lawn & Garden	NA	NA	NA	NA	NA	NA
Airport Service	NA	NA	NA	NA	NA	NA
Recreational	NA	NA	NA	NA	NA	NA
Recreational Marine	NA	NA	NA	NA	NA	NA
Light Commercial	NA	NA	NA	NA	NA	NA
Industrial	NA	NA	NA	NA	NA	NA
Construction	NA	NA	NA	NA	NA	NA
Agricultural	NA	NA	NA	NA	NA	NA
Logging	NA	NA	NA	NA	NA	NA
<u>Marine Vessels</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>
Nonroad Engines and Vehicles	NA	NA	NA	NA	NA	NA
Highway Vehicles	NA	NA	NA	NA	NA	NA
<u>Other Area and Point Sources</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>
All Sources	NA	NA	NA	NA	NA	NA

Milwaukee CMSA Inventory B (in-use est.)
Emission Inventory Summary - VOC, NOx, CO

Equipment Category	tpy			tpsd		tpwd
	VOC	NOx	CO	VOC	NOx	CO
Lawn & Garden	7,333	75	44,266	39	0	8
Airport Service	184	1,182	1,715	1	3	5
Recreational	1,126	8	1,751	1	0	15
Recreational Marine	6,756	293	12,387	50	2	0
Light Commercial	1,330	126	16,857	4	0	46
Industrial	1,134	2,231	17,035	3	6	47
Construction	420	2,966	2,708	2	14	3
Agricultural	821	4,179	4,312	4	23	3
Logging	0	0	0	0	0	0
<u>Marine Vessels</u>	<u>0</u>	<u>398</u>	<u>0</u>	<u>0</u>	<u>1</u>	<u>0</u>
Nonroad Engines and Vehicles	19,103	11,457	101,031	103	50	127
Highway Vehicles	0	33,493	0	106	101	0
<u>Other Area and Point Sources</u>	<u>0</u>	<u>39,621</u>	<u>0</u>	<u>195</u>	<u>109</u>	<u>0</u>
All Sources	NA	84,571	NA	404	260	NA

Milwaukee CMSA Inventory B (in-use est.)
Emission Inventory Summary - VOC, NOx, CO

Percent of Total Inventory

Equipment Category	% total tpy			% total tpsd		% total tpwd
	VOC	NOx	CO	VOC	NOx	CO
Lawn & Garden	NA	0.09%	NA	9.62%	0.16%	NA
Airport Service	NA	1.40%	NA	0.13%	1.25%	NA
Recreational	NA	0.01%	NA	0.16%	0.00%	NA
Recreational Marine	NA	0.35%	NA	12.31%	0.87%	NA
Light Commercial	NA	0.15%	NA	0.91%	0.13%	NA
Industrial	NA	2.64%	NA	0.79%	2.35%	NA
Construction	NA	3.51%	NA	0.49%	5.38%	NA
Agricultural	NA	4.94%	NA	1.11%	8.81%	NA
Logging	NA	0.00%	NA	0.00%	0.00%	NA
<u>Marine Vessels</u>	<u>NA</u>	<u>0.47%</u>	<u>NA</u>	<u>0.00%</u>	<u>0.42%</u>	<u>NA</u>
Nonroad Engines and Vehicles	NA	13.55%	NA	25.51%	19.37%	NA
Highway Vehicles	NA	39.60%	NA	26.18%	38.85%	NA
<u>Other Area and Point Sources</u>	<u>NA</u>	<u>46.85%</u>	<u>NA</u>	<u>48.31%</u>	<u>41.78%</u>	<u>NA</u>
All Sources	NA	100.00%	NA	100.00%	100.00%	NA

Milwaukee CMSA Inventory B (in-use est)
Emission Inventory Summary - Air Toxics and SOx

Equipment Category	tpy					
	PM	Aldehydes	Benzene	1,3 But.	Gas. Vap	SOx
Lawn & Garden	114	35	208	88	591	25
Airport Service	141	6	5	3	3	78
Recreational	22	2	33	14	23	1
Recreational Marine	6	11	182	78	727	27
Light Commercial	30	9	38	16	107	19
Industrial	108	37	32	14	97	67
Construction	409	58	12	6	13	258
Agricultural	826	125	24	13	15	330
Logging	0	0	0	0	0	0
<u>Marine Vessels</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>
Nonroad Engines and Vehicles	1,655	282	535	232	1,576	805
Highway Vehicles	0	0				0
<u>Other Area and Point Sources</u>	<u>0</u>	<u>0</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>0</u>
All Sources	NA	NA	NA	NA	NA	NA

Milwaukee CMSA Inventory B (in-use est.)
Emission Inventory Summary - Air Toxics and SOx
Percent of Total Inventory

Equipment Category	% total tpy					
	PM	Aldehydes	Benzene	1,3 But.	Gas. Vap	SOx
Lawn & Garden	NA	NA	NA	NA	NA	NA
Airport Service	NA	NA	NA	NA	NA	NA
Recreational	NA	NA	NA	NA	NA	NA
Recreational Marine	NA	NA	NA	NA	NA	NA
Light Commercial	NA	NA	NA	NA	NA	NA
Industrial	NA	NA	NA	NA	NA	NA
Construction	NA	NA	NA	NA	NA	NA
Agricultural	NA	NA	NA	NA	NA	NA
Logging	NA	NA	NA	NA	NA	NA
<u>Marine Vessels</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>
Nonroad Engines and Vehicles	NA	NA	NA	NA	NA	NA
Highway Vehicles	NA	NA	NA	NA	NA	NA
<u>Other Area and Point Sources</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>
All Sources	NA	NA	NA	NA	NA	NA

Minneapolis MSA Inventory B (in-use est.)
Emission Inventory Summary - VOC, NOx, CO
Percent of Total Inventory

Equipment Category	% total tpy			% total tpsd		% total tpsd
	VOC	NOx	CO	VOC	NOx	CO
Lawn & Garden	NA	NA	8.52%	NA	NA	0.42%
Airport Service	NA	NA	0.36%	NA	NA	0.25%
Recreational	NA	NA	0.34%	NA	NA	0.76%
Recreational Marine	NA	NA	9.28%	NA	NA	0.00%
Light Commercial	NA	NA	4.14%	NA	NA	2.86%
Industrial	NA	NA	2.03%	NA	NA	1.41%
Construction	NA	NA	0.75%	NA	NA	0.21%
Agricultural	NA	NA	1.58%	NA	NA	0.26%
Logging	NA	NA	0.00%	NA	NA	0.00%
<u>Marine Vessels</u>	<u>NA</u>	<u>NA</u>	<u>0.00%</u>	<u>NA</u>	<u>NA</u>	<u>0.00%</u>
Nonroad Engines and Vehicles	NA	NA	27.02%	NA	NA	6.17%
Highway Vehicles	NA	NA	56.12%	NA	NA	81.79%
<u>Other Area and Point Sources</u>	<u>NA</u>	<u>NA</u>	<u>16.86%</u>	<u>NA</u>	<u>NA</u>	<u>12.05%</u>
All Sources	NA	NA	100.00%	NA	NA	100.00%

Minneapolis MSA Inventory B (in-use est.)
Emission Inventory Summary - VOC, NOx, CO

Equipment Category	tpy			tpsd		tpwd
	VOC	NOx	CO	VOC	NOx	CO
Lawn & Garden	10,257	111	63,636	54	1	12
Airport Service	284	1,825	2,653	1	5	7
Recreational	1,652	12	2,571	1	0	23
Recreational Marine	39,652	941	69,334	297	7	0
Light Commercial	2,440	231	30,932	7	1	85
Industrial	1,052	2,271	15,188	3	6	42
Construction	905	5,793	5,631	4	27	6
Agricultural	2,240	11,615	11,813	12	64	8
Logging	0	4	2	0	0	0
<u>Marine Vessels</u>	<u>0</u>	<u>0</u>	<u>28</u>	<u>0</u>	<u>0</u>	<u>0</u>
Nonroad Engines and Vehicles	58,482	22,803	201,788	379	111	183
Highway Vehicles	0	0	419,140	0	0	2,422
<u>Other Area and Point Sources</u>	<u>0</u>	<u>63,307</u>	<u>125,911</u>	<u>0</u>	<u>173</u>	<u>357</u>
All Sources	NA	NA	746,839	NA	NA	2,961

Minneapolis MSA Inventory B (in-use est.)
Emission Inventory Summary - Air Toxics and SOx

Equipment Category	tpy					
	PM	Aldehydes	Benzene	1,3 But.	Gas. Vap	SOx
Lawn & Garden	153	49	290	122	849	37
Airport Service	217	9	8	4	5	121
Recreational	32	3	49	21	34	1
Recreational Manne	17	33	1,112	481	2,684	129
Light Commercial	55	17	70	29	197	35
Industrial	140	37	30	13	88	84
Construction	803	113	27	14	28	508
Agncultural	2,309	345	66	35	38	917
Logging	1	0	0	0	0	0
<u>Manne Vessels</u>	<u>8</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>
Nonroad Engines and Vehicles	3,736	606	1,652	718	3,923	1,831
Highway Vehicles	42,282	0				0
<u>Other Area and Point Sources</u>	<u>214,398</u>	<u>0</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>0</u>
All Sources	260,416	NA	NA	NA	NA	NA

Minneapolis MSA Inventory B (in-use est.)
Emission Inventory Summary - Air Toxics and SOx
Percent of Total Inventory

Equipment Category	% total tpy					
	PM	Aldehydes	Benzene	1,3 But.	Gas. Vap.	SOx
Lawn & Garden	0.06%	NA	NA	NA	NA	NA
Airport Service	0.08%	NA	NA	NA	NA	NA
Recreational	0.01%	NA	NA	NA	NA	NA
Recreational Manne	0.01%	NA	NA	NA	NA	NA
Light Commercial	0.02%	NA	NA	NA	NA	NA
Industrial	0.05%	NA	NA	NA	NA	NA
Construction	0.31%	NA	NA	NA	NA	NA
Agncultural	0.89%	NA	NA	NA	NA	NA
Logging	0.00%	NA	NA	NA	NA	NA
<u>Manne Vessels</u>	<u>0.00%</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>
Nonroad Engines and Vehicles	1.43%	NA	NA	NA	NA	NA
Highway Vehicles	16.24%	NA	NA	NA	NA	NA
<u>Other Area and Point Sources</u>	<u>82.33%</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>
All Sources	100.00%	NA	NA	NA	NA	NA

New York NECMA Inventory B (in-use est.)
Emission Inventory Summary - VOC, NOx, CO

Equipment Category	tpy			tpsd		tpwd
	VOC	NOx	CO	VOC	NOx	CO
Lawn & Garden	47,083	509	226,256	245	3	90
Airport Service	593	3,818	5,539	2	10	15
Recreational	8,063	58	12,656	4	0	111
Recreational Manne	56,795	3,836	109,576	397	29	12
Light Commercial	20,915	1,976	265,184	58	5	727
Industrial	7,781	16,147	114,515	22	44	314
Construction	4,894	32,106	31,096	23	151	34
Agricultural	1,162	4,629	8,531	6	25	6
Logging	4	64	29	0	0	0
<u>Marine Vessels</u>	<u>789</u>	<u>12,991</u>	<u>2,458</u>	<u>2</u>	<u>36</u>	<u>7</u>
Nonroad Engines and Vehicles	148,079	76,135	775,841	759	304	1,315
Highway Vehicles	0	317,257	3,129,400	1,114	956	7,373
<u>Other Area and Point Sources</u>	<u>0</u>	<u>232,882</u>	<u>546,500</u>	<u>1,578</u>	<u>638</u>	<u>804</u>
All Sources	NA	626,274	4,451,741	3,451	1,898	9,492

New York NECMA Inventory B (in-use est.)
Emission Inventory Summary - VOC, NOx, CO
Percent of Total Inventory

Equipment Category	% total tpy			% total tpsd		% total tpwd
	VOC	NOx	CO	VOC	NOx	CO
Lawn & Garden	NA	0.08%	5.08%	7.10%	0.15%	0.95%
Airport Service	NA	0.61%	0.12%	0.05%	0.55%	0.16%
Recreational	NA	0.01%	0.28%	0.13%	0.00%	1.17%
Recreational Manne	NA	0.61%	2.46%	11.50%	1.51%	0.13%
Light Commercial	NA	0.32%	5.96%	1.67%	0.29%	7.65%
Industrial	NA	2.58%	2.57%	0.63%	2.33%	3.31%
Construction	NA	5.13%	0.70%	0.67%	7.97%	0.36%
Agricultural	NA	0.74%	0.19%	0.18%	1.34%	0.06%
Logging	NA	0.01%	0.00%	0.00%	0.01%	0.00%
<u>Marine Vessels</u>	<u>NA</u>	<u>2.07%</u>	<u>0.05%</u>	<u>0.06%</u>	<u>1.88%</u>	<u>0.07%</u>
Nonroad Engines and Vehicles	NA	12.16%	17.43%	22.00%	16.01%	13.85%
Highway Vehicles	NA	50.66%	70.30%	32.28%	50.37%	77.68%
<u>Other Area and Point Sources</u>	<u>NA</u>	<u>37.19%</u>	<u>12.28%</u>	<u>45.72%</u>	<u>33.61%</u>	<u>8.47%</u>
All Sources	NA	100.00%	100.00%	100.00%	100.00%	100.00%

New York NECMA Inventory B (in-use est.)
Emission Inventory Summary - Air Toxics and SOx

Equipment Category	tpy					
	PM	Aldehydes	Benzene	1,3 But	Gas. Vap	SOx
Lawn & Garden	585	204	1,353	573	3,025	140
Airport Service	455	19	18	9	11	252
Recreational	157	15	237	103	164	6
Recreational Marine	77	147	1,438	620	9,080	273
Light Commercial	473	142	602	251	1,677	297
Industrial	899	265	220	95	654	546
Construction	4,223	633	143	72	172	2,788
Agricultural	879	141	32	16	94	365
Logging	9	1	0	0	0	5
<u>Marine Vessels</u>	<u>620</u>	<u>0</u>				<u>4,240</u>
Nonroad Engines and Vehicles	8,377	1,568	4,044	1,739	14,877	8,911
Highway Vehicles	232,769	0				0
<u>Other Area and Point Sources</u>	<u>119,873</u>	<u>0</u>				<u>0</u>
All Sources	361,019	NA	NA	NA	NA	NA

New York NECMA Inventory B (in-use est.)
Emission Inventory Summary - Air Toxics and SOx
Percent of Total Inventory

Equipment Category	% total tpy					
	PM	Aldehydes	Benzene	1,3 But	Gas. Vap.	SOx
Lawn & Garden	0.16%	NA	NA	NA	NA	NA
Airport Service	0.13%	NA	NA	NA	NA	NA
Recreational	0.04%	NA	NA	NA	NA	NA
Recreational Marine	0.02%	NA	NA	NA	NA	NA
Light Commercial	0.13%	NA	NA	NA	NA	NA
Industrial	0.25%	NA	NA	NA	NA	NA
Construction	1.17%	NA	NA	NA	NA	NA
Agricultural	0.24%	NA	NA	NA	NA	NA
Logging	0.00%	NA	NA	NA	NA	NA
<u>Marine Vessels</u>	<u>0.17%</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>
Nonroad Engines and Vehicles	2.32%	NA	NA	NA	NA	NA
Highway Vehicles	64.48%	NA	NA	NA	NA	NA
<u>Other Area and Point Sources</u>	<u>33.20%</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>
All Sources	100.00%	NA	NA	NA	NA	NA

Philadelphia MSA Inventory B (in-use est)
Emission Inventory Summary - VOC, NOx, CO

Equipment Category	tpy			tpsd		tpwd CO
	VOC	NOx	CO	VOC	NOx	
Lawn & Garden	26,923	341	160,226	107	1	104
Airport Service	301	1,936	2,812	1	5	8
Recreational	2,622	19	4,266	2	0	35
Recreational Manne	16,381	836	30,730	99	5	7
Light Commercial	5,172	535	68,838	14	1	189
Industrial	3,344	6,537	49,916	9	18	137
Construction	2,248	15,258	13,503	9	64	22
Agricultural	1,443	6,904	8,338	6	30	5
Logging	1	10	5	0	0	0
<u>Marine Vessels</u>	<u>494</u>	<u>9,181</u>	<u>1,377</u>	<u>1</u>	<u>25</u>	<u>4</u>
Nonroad Engines and Vehicles	58,929	41,558	340,012	249	150	510
Highway Vehicles	0	123,720	568,888	432	373	0
<u>Other Area and Point Sources</u>	<u>0</u>	<u>137,579</u>	<u>178,772</u>	<u>911</u>	<u>377</u>	<u>0</u>
All Sources	NA	302,857	1,087,672	1,592	900	NA

Philadelphia MSA Inventory B (in-use est.)
Emission Inventory Summary - VOC, NOx, CO
Percent of Total Inventory

Equipment Category	% total tpy			% total tpsd		% total tpwd CO
	VOC	NOx	CO	VOC	NOx	
Lawn & Garden	NA	0.11%	14.73%	6.71%	0.16%	NA
Airport Service	NA	0.64%	0.26%	0.05%	0.59%	NA
Recreational	NA	0.01%	0.39%	0.11%	0.00%	NA
Recreational Manne	NA	0.28%	2.83%	6.22%	0.58%	NA
Light Commercial	NA	0.18%	6.33%	0.90%	0.16%	NA
Industrial	NA	2.16%	4.59%	0.59%	1.99%	NA
Construction	NA	5.04%	1.24%	0.59%	7.06%	NA
Agricultural	NA	2.28%	0.77%	0.40%	3.36%	NA
Logging	NA	0.00%	0.00%	0.00%	0.00%	NA
<u>Marine Vessels</u>	<u>NA</u>	<u>3.03%</u>	<u>0.13%</u>	<u>0.09%</u>	<u>2.79%</u>	<u>NA</u>
Nonroad Engines and Vehicles	NA	13.72%	31.26%	15.65%	16.71%	NA
Highway Vehicles	NA	40.85%	52.30%	27.11%	41.42%	NA
<u>Other Area and Point Sources</u>	<u>NA</u>	<u>45.43%</u>	<u>16.44%</u>	<u>57.24%</u>	<u>41.87%</u>	<u>NA</u>
All Sources	NA	100.00%	100.00%	100.00%	100.00%	NA

Philadelphia MSA Inventory B (in-use est)
Emission Inventory Summary - Air Toxics and SOx

Equipment Category	tpy					
	PM	Aldehydes	Benzene	1,3 But.	Gas. Vap.	SOx
Lawn & Garden	356	126	767	324	1,983	99
Airport Service	230	10	9	4	5	128
Recreational	50	5	77	33	52	2
Recreational Marine	16	32	436	188	1,919	69
Light Commercial	121	36	148	62	444	79
Industrial	318	108	95	41	281	198
Construction	1,922	288	66	34	62	1,324
Agricultural	1,348	208	42	22	43	547
Logging	1	0	0	0	0	1
<u>Marine Vessels</u>	<u>553</u>	<u>0</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>4,366</u>
Nonroad Engines and Vehicles	4,916	813	1,640	708	4,789	6,813
Highway Vehicles	0	0	—	—	—	0
<u>Other Area and Point Sources</u>	<u>0</u>	<u>0</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>0</u>
All Sources	NA	NA	NA	NA	NA	NA

Philadelphia MSA Inventory B (in-use est)
Emission Inventory Summary - Air Toxics and SOx
Percent of Total Inventory

Equipment Category	% total tpy					
	PM	Aldehydes	Benzene	1,3 But	Gas. Vap.	SOx
Lawn & Garden	NA	NA	NA	NA	NA	NA
Airport Service	NA	NA	NA	NA	NA	NA
Recreational	NA	NA	NA	NA	NA	NA
Recreational Marine	NA	NA	NA	NA	NA	NA
Light Commercial	NA	NA	NA	NA	NA	NA
Industrial	NA	NA	NA	NA	NA	NA
Construction	NA	NA	NA	NA	NA	NA
Agricultural	NA	NA	NA	NA	NA	NA
Logging	NA	NA	NA	NA	NA	NA
<u>Marine Vessels</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>
Nonroad Engines and Vehicles	NA	NA	NA	NA	NA	NA
Highway Vehicles	NA	NA	NA	NA	NA	NA
<u>Other Area and Point Sources</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>
All Sources	NA	NA	NA	NA	NA	NA

Provo-Orem MSA Inventory B (in-use est.)
Emission Inventory Summary - VOC, NOx, CO

Equipment Category	tpy			tpsd		tpwd
	VOC	NOx	CO	VOC	NOx	CO
Lawn & Garden	1,924	26	10,971	10	0	2
Airport Service	0	0	0	0	0	0
Recreational	612	4	969	0	0	8
Recreational Marine	116	14	266	1	0	0
Light Commercial	135	14	1,795	0	0	5
Industrial	45	101	628	0	0	2
Construction	74	587	462	0	3	1
Agricultural	198	935	1,112	1	5	1
Logging	0	0	0	0	0	0
<u>Marine Vessels</u>	<u>0</u>	<u>0</u>	<u>315</u>	<u>0</u>	<u>0</u>	<u>0</u>
Nonroad Engines and Vehicles	3,104	1,682	16,518	13	8	18
Highway Vehicles	0	0	73,804	0	0	440
<u>Other Area and Point Sources</u>	<u>0</u>	<u>0</u>	<u>38,273</u>	<u>0</u>	<u>0</u>	<u>38</u>
All Sources	NA	NA	128,595	NA	NA	497

Provo-Orem MSA Inventory B (in-use est.)
Emission Inventory Summary - VOC, NOx, CO

Percent of Total Inventory

Equipment Category	% total tpy			% total tpsd		% total tpwd
	VOC	NOx	CO	VOC	NOx	CO
Lawn & Garden	NA	NA	8.53%	NA	NA	0.45%
Airport Service	NA	NA	0.00%	NA	NA	0.00%
Recreational	NA	NA	0.75%	NA	NA	1.66%
Recreational Marine	NA	NA	0.21%	NA	NA	0.00%
Light Commercial	NA	NA	1.40%	NA	NA	0.99%
Industrial	NA	NA	0.49%	NA	NA	0.35%
Construction	NA	NA	0.36%	NA	NA	0.10%
Agricultural	NA	NA	0.86%	NA	NA	0.15%
Logging	NA	NA	0.00%	NA	NA	0.00%
<u>Marine Vessels</u>	<u>NA</u>	<u>NA</u>	<u>0.24%</u>	<u>NA</u>	<u>NA</u>	<u>0.00%</u>
Nonroad Engines and Vehicles	NA	NA	12.84%	NA	NA	3.69%
Highway Vehicles	NA	NA	57.39%	NA	NA	88.59%
<u>Other Area and Point Sources</u>	<u>NA</u>	<u>NA</u>	<u>29.76%</u>	<u>NA</u>	<u>NA</u>	<u>7.72%</u>
All Sources	NA	NA	100.00%	NA	NA	100.00%

Provo-Orem MSA Inventory B (in-use est.)
Emission Inventory Summary - Air Toxics and SOx

Equipment Category	tpy					
	PM	Aldehydes	Benzene	1,3 But.	Gas. Vap.	SOx
Lawn & Garden	27	9	55	23	138	7
Airport Service	0	0	0	0	0	0
Recreational	12	1	18	8	12	0
Recreational Marine	0	1	3	1	24	1
Light Commercial	3	1	4	2	12	2
Industrial	7	2	1	1	4	4
Construction	77	11	2	1	2	52
Agricultural	181	28	6	3	7	74
Logging	0	0	0	0	0	0
<u>Marine Vessels</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>
Nonroad Engines and Vehicles	308	53	89	39	198	140
Highway Vehicles	3,668	0				0
<u>Other Area and Point Sources</u>	<u>45,615</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>
All Sources	49,591	NA	NA	NA	NA	NA

Provo-Orem MSA Inventory B (in-use est.)
Emission Inventory Summary - Air Toxics and SOx
Percent of Total Inventory

Equipment Category	% total tpy					
	PM	Aldehydes	Benzene	1,3 But	Gas Vap	SOx
Lawn & Garden	0.06%	NA	NA	NA	NA	NA
Airport Service	0.00%	NA	NA	NA	NA	NA
Recreational	0.02%	NA	NA	NA	NA	NA
Recreational Marine	0.00%	NA	NA	NA	NA	NA
Light Commercial	0.01%	NA	NA	NA	NA	NA
Industrial	0.01%	NA	NA	NA	NA	NA
Construction	0.16%	NA	NA	NA	NA	NA
Agricultural	0.37%	NA	NA	NA	NA	NA
Logging	0.00%	NA	NA	NA	NA	NA
<u>Marine Vessels</u>	<u>0.00%</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>
Nonroad Engines and Vehicles	0.62%	NA	NA	NA	NA	NA
Highway Vehicles	7.40%	NA	NA	NA	NA	NA
<u>Other Area and Point Sources</u>	<u>91.98%</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>
All Sources	100.00%	NA	NA	NA	NA	NA

Saint Louis MSA Inventory B (in-use est.)
Emission Inventory Summary - VOC, NOx, CO

Equipment Category	tpy			tpsd		tpwd CO
	VOC	NOx	CO	VOC	NOx	
Lawn & Garden	12,855	122	73,111	68	1	14
Airport Service	205	1,321	1,921	1	4	5
Recreational	1,476	11	2,296	1	0	20
Recreational Marine	9,850	366	17,899	73	3	0
Light Commercial	2,157	204	27,341	6	1	75
Industrial	1,370	2,792	20,291	4	8	56
Construction	956	6,530	5,858	4	31	6
Agricultural	1,835	10,049	9,514	10	55	6
Logging	0	1	1	0	0	0
<u>Marine Vessels</u>	<u>0</u>	<u>1,820</u>	<u>0</u>	<u>0</u>	<u>5</u>	<u>0</u>
Nonroad Engines and Vehicles	30,704	23,216	158,231	167	106	183
Highway Vehicles	0	62,039	0	208	187	1,710
<u>Other Area and Point Sources</u>	<u>0</u>	<u>158,510</u>	<u>0</u>	<u>360</u>	<u>434</u>	<u>441</u>
All Sources	NA	243,765	NA	735	727	2,333

Saint Louis MSA Inventory B (in-use est.)
Emission Inventory Summary - VOC, NOx, CO
Percent of Total Inventory

Equipment Category	% total tpy			% total tpsd		% total tpwd CO
	VOC	NOx	CO	VOC	NOx	
Lawn & Garden	NA	0.05%	NA	9.28%	0.09%	0.61%
Airport Service	NA	0.54%	NA	0.08%	0.50%	0.23%
Recreational	NA	0.00%	NA	0.11%	0.00%	0.86%
Recreational Marine	NA	0.15%	NA	9.94%	0.39%	0.00%
Light Commercial	NA	0.08%	NA	0.81%	0.08%	3.21%
Industrial	NA	1.15%	NA	0.52%	1.05%	2.38%
Construction	NA	2.68%	NA	0.61%	4.23%	0.28%
Agricultural	NA	4.12%	NA	1.37%	7.57%	0.27%
Logging	NA	0.00%	NA	0.00%	0.00%	0.00%
<u>Marine Vessels</u>	<u>NA</u>	<u>0.75%</u>	<u>NA</u>	<u>0.00%</u>	<u>0.69%</u>	<u>0.00%</u>
Nonroad Engines and Vehicles	NA	9.52%	NA	22.73%	14.59%	7.83%
Highway Vehicles	NA	25.45%	NA	28.27%	25.70%	73.27%
<u>Other Area and Point Sources</u>	<u>NA</u>	<u>65.03%</u>	<u>NA</u>	<u>49.00%</u>	<u>59.70%</u>	<u>18.90%</u>
All Sources	NA	100.00%	NA	100.00%	100.00%	100.00%

Saint Louis MSA Inventory B (in-use est.)
Emission Inventory Summary - Air Toxics and SOx

Equipment Category	PM	Aldehydes	Benzene	tpy 1,3 But.	Gas Vap	SOx
Lawn & Garden	202	60	367	155	954	41
Airport Service	157	7	6	3	4	87
Recreational	29	3	43	19	30	1
Recreational Marine	7	14	270	117	876	37
Light Commercial	49	15	62	26	174	31
Industrial	149	46	39	17	116	91
Construction	843	129	28	14	30	571
Agricultural	2,019	295	54	28	29	794
Logging	0	0	0	0	0	0
<u>Marine Vessels</u>	<u>184</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>
Nonroad Engines and Vehicles	3,639	568	869	379	2,213	1,654
Highway Vehicles	38,099	0				0
<u>Other Area and Point Sources</u>	<u>89,636</u>	<u>0</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>0</u>
All Sources	131,374	NA	NA	NA	NA	NA

Saint Louis MSA Inventory B (in-use est.)
Emission Inventory Summary - Air Toxics and SOx

Percent of Total Inventory

Equipment Category	PM	Aldehydes	Benzene	% total tpy 1,3 But.	Gas Vap.	SOx
Lawn & Garden	0.15%	NA	NA	NA	NA	NA
Airport Service	0.12%	NA	NA	NA	NA	NA
Recreational	0.02%	NA	NA	NA	NA	NA
Recreational Marine	0.01%	NA	NA	NA	NA	NA
Light Commercial	0.04%	NA	NA	NA	NA	NA
Industrial	0.11%	NA	NA	NA	NA	NA
Construction	0.64%	NA	NA	NA	NA	NA
Agricultural	1.54%	NA	NA	NA	NA	NA
Logging	0.00%	NA	NA	NA	NA	NA
<u>Marine Vessels</u>	<u>0.14%</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>
Nonroad Engines and Vehicles	2.77%	NA	NA	NA	NA	NA
Highway Vehicles	29.00%	NA	NA	NA	NA	NA
<u>Other Area and Point Sources</u>	<u>68.23%</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>
All Sources	100.00%	NA	NA	NA	NA	NA

San Diego AB Inventory B (in-use est.)
Emission Inventory Summary - VOC, NOx, CO

Equipment Category	tpy			tpsd		tpwd CO
	VOC	NOx	CO	VOC	NOx	
Lawn & Garden	12,133	253	81,718	43	1	65
Airport Service	224	1,439	2,092	1	4	6
Recreational	1,187	7	3,840	5	0	5
Recreational Manne	5,768	613	12,166	29	3	9
Light Commercial	1,667	196	23,572	5	1	65
Industrial	978	1,915	14,455	3	5	40
Construction	1,158	6,533	7,865	4	24	17
Agricultural	390	1,579	2,841	1	6	2
Logging	0	0	0	0	0	0
<u>Marine Vessels</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>3</u>	<u>41</u>	<u>7</u>
Nonroad Engines and Vehicles	23,504	12,536	148,550	93	85	216
Highway Vehicles	0	47,136	570,100	130	142	1,343
<u>Other Area and Point Sources</u>	<u>0</u>	<u>0</u>	<u>94,000</u>	<u>271</u>	<u>34</u>	<u>154</u>
All Sources	NA	NA	812,650	494	261	1,713

San Diego AB Inventory B (in-use est.)
Emission Inventory Summary - VOC, NOx, CO

Percent of Total Inventory

Equipment Category	% total tpy			% total tpsd		% total tpwd CO
	VOC	NOx	CO	VOC	NOx	
Lawn & Garden	NA	NA	10.06%	8.64%	0.36%	3.82%
Airport Service	NA	NA	0.26%	0.12%	1.51%	0.33%
Recreational	NA	NA	0.47%	0.98%	0.01%	0.32%
Recreational Manne	NA	NA	1.50%	5.92%	1.24%	0.54%
Light Commercial	NA	NA	2.90%	0.93%	0.21%	3.77%
Industrial	NA	NA	1.78%	0.55%	2.01%	2.31%
Construction	NA	NA	0.97%	0.85%	9.06%	1.01%
Agricultural	NA	NA	0.35%	0.30%	2.26%	0.11%
Logging	NA	NA	0.00%	0.00%	0.00%	0.00%
<u>Marine Vessels</u>	<u>NA</u>	<u>NA</u>	<u>0.00%</u>	<u>0.51%</u>	<u>15.77%</u>	<u>0.39%</u>
Nonroad Engines and Vehicles	NA	NA	18.28%	18.81%	32.43%	12.61%
Highway Vehicles	NA	NA	70.15%	26.28%	54.49%	78.42%
<u>Other Area and Point Sources</u>	<u>NA</u>	<u>NA</u>	<u>11.57%</u>	<u>54.91%</u>	<u>13.08%</u>	<u>8.97%</u>
All Sources	NA	NA	100.00%	100.00%	100.00%	100.00%

San Diego AB Inventory B (in-use est.)
Emission Inventory Summary - Air Toxics and SOx

Equipment Category	tpy					
	PM	Aldehydes	Benzene	1,3 But.	Gas. Vap.	SOx
Lawn & Garden	134	59	349	148	774	59
Airport Service	171	7	7	3	4	95
Recreational	11	4	34	15	48	1
Recreational Marine	12	24	134	58	1,338	36
Light Commercial	41	12	48	20	152	29
Industrial	96	32	28	12	81	59
Construction	891	129	34	17	43	570
Agricultural	300	49	11	6	18	126
Logging	0	0	0	0	0	0
<u>Marine Vessels</u>	<u>854</u>	<u>0</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>6,979</u>
Nonroad Engines and Vehicles	2,511	315	644	278	2,458	7,954
Highway Vehicles	6,935	0	—	—	—	2,409
<u>Other Area and Point Sources</u>	<u>179,215</u>	<u>0</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>3,723</u>
All Sources	188,661	NA	NA	NA	NA	14,086

San Diego AB Inventory B (in-use est.)
Emission Inventory Summary - Air Toxics and SOx
Percent of Total Inventory

Equipment Category	% total tpy					
	PM	Aldehydes	Benzene	1,3 But	Gas Vap.	SOx
Lawn & Garden	0.07%	NA	NA	NA	NA	0.42%
Airport Service	0.09%	NA	NA	NA	NA	0.68%
Recreational	0.01%	NA	NA	NA	NA	0.01%
Recreational Marine	0.01%	NA	NA	NA	NA	0.25%
Light Commercial	0.02%	NA	NA	NA	NA	0.20%
Industrial	0.05%	NA	NA	NA	NA	0.42%
Construction	0.47%	NA	NA	NA	NA	4.04%
Agricultural	0.16%	NA	NA	NA	NA	0.89%
Logging	0.00%	NA	NA	NA	NA	0.00%
<u>Marine Vessels</u>	<u>0.45%</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>49.55%</u>
Nonroad Engines and Vehicles	1.33%	NA	NA	NA	NA	56.47%
Highway Vehicles	3.68%	NA	NA	NA	NA	17.10%
<u>Other Area and Point Sources</u>	<u>94.99%</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>26.43%</u>
All Sources	100.00%	NA	NA	NA	NA	100.00%

San Joaquin AB Inventory B (in-use est)
Emission Inventory Summary - VOC, NOx, CO

Equipment Category	tpy			tpsd		tpwd CO
	VOC	NOx	CO	VOC	NOx	
Lawn & Garden	8,709	151	55,743	31	1	43
Airport Service	25	163	241	0	0	1
Recreational	242	1	782	1	0	1
Recreational Marine	1,325	266	3,480	7	1	3
Light Commercial	1,755	207	24,817	5	1	68
Industrial	529	1,678	6,490	1	5	18
Construction	1,058	6,586	6,830	4	24	15
Agricultural	6,157	28,245	37,386	23	105	25
Logging	25	73	111	0	0	0
<u>Marine Vessels</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>3</u>	<u>0</u>
Nonroad Engines and Vehicles	19,823	37,371	135,882	72	139	174
Highway Vehicles	0	0	0	150	240	1,100
<u>Other Area and Point Sources</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>1,022</u>	<u>249</u>	<u>683</u>
All Sources	NA	NA	NA	1,244	628	1,957

San Joaquin AB Inventory B (in-use est)
Emission Inventory Summary - VOC, NOx, CO
Percent of Total Inventory

Equipment Category	% total tpy			% total tpsd		% total tpwd CO
	VOC	NOx	CO	VOC	NOx	
Lawn & Garden	NA	NA	NA	2.49%	0.09%	2.21%
Airport Service	NA	NA	NA	0.01%	0.07%	0.03%
Recreational	NA	NA	NA	0.09%	0.00%	0.06%
Recreational Marine	NA	NA	NA	0.53%	0.22%	0.14%
Light Commercial	NA	NA	NA	0.39%	0.09%	3.47%
Industrial	NA	NA	NA	0.12%	0.73%	0.91%
Construction	NA	NA	NA	0.31%	3.79%	0.77%
Agricultural	NA	NA	NA	1.85%	16.75%	1.26%
Logging	NA	NA	NA	0.01%	0.03%	0.02%
<u>Marine Vessels</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>0.02%</u>	<u>0.42%</u>	<u>0.02%</u>
Nonroad Engines and Vehicles	NA	NA	NA	5.81%	22.20%	8.88%
Highway Vehicles	NA	NA	NA	12.05%	38.21%	56.21%
<u>Other Area and Point Sources</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>82.14%</u>	<u>39.59%</u>	<u>34.91%</u>
All Sources	NA	NA	NA	100.00%	100.00%	100.00%

San Joaquin AB Inventory B (in-use est.)
Emission Inventory Summary - Air Toxics and SOx

Equipment Category	tpy					
	PM	Aldehydes	Benzene	1,3 But.	Gas Vap	SOx
Lawn & Garden	116	42	250	106	581	38
Airport Service	19	1	1	0	0	11
Recreational	2	1	7	3	10	0
Recreational Marine	6	10	26	11	462	13
Light Commercial	43	13	50	21	160	30
Industrial	136	26	15	7	40	76
Construction	865	128	31	16	34	576
Agricultural	5,378	860	181	94	137	2,243
Logging	11	1	1	0	1	6
<u>Marine Vessels</u>	<u>62</u>	<u>0</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>402</u>
Nonroad Engines and Vehicles	6,637	1,082	562	258	1,425	3,395
Highway Vehicles	13,505	0	—	—	—	9,125
<u>Other Area and Point Sources</u>	<u>731,789</u>	<u>0</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>16,790</u>
All Sources	751,931	NA	NA	NA	NA	29,310

San Joaquin AB Inventory B (in-use est.)
Emission Inventory Summary - Air Toxics and SOx

Percent of Total Inventory

Equipment Category	% total tpy					
	PM	Aldehydes	Benzene	1,3 But.	Gas Vap.	SOx
Lawn & Garden	0.02%	NA	NA	NA	NA	0.13%
Airport Service	0.00%	NA	NA	NA	NA	0.04%
Recreational	0.00%	NA	NA	NA	NA	0.00%
Recreational Marine	0.00%	NA	NA	NA	NA	0.04%
Light Commercial	0.01%	NA	NA	NA	NA	0.10%
Industrial	0.02%	NA	NA	NA	NA	0.26%
Construction	0.12%	NA	NA	NA	NA	1.96%
Agricultural	0.72%	NA	NA	NA	NA	7.65%
Logging	0.00%	NA	NA	NA	NA	0.02%
<u>Marine Vessels</u>	<u>0.01%</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>1.37%</u>
Nonroad Engines and Vehicles	0.88%	NA	NA	NA	NA	11.58%
Highway Vehicles	1.80%	NA	NA	NA	NA	31.13%
<u>Other Area and Point Sources</u>	<u>97.32%</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>57.28%</u>
All Sources	100.00%	NA	NA	NA	NA	100.00%

Seattle-Tacoma MSA Inventory B (in-use est)
Emission Inventory Summary - VOC, NOx, CO

Equipment Category	tpy			tpsd		tpwd
	VOC	NOx	CO	VOC	NOx	CO
Lawn & Garden	16,916	182	95,101	70	1	44
Airport Service	201	1,295	1,885	1	4	5
Recreational	975	6	2,463	3	0	8
Recreational Marine	9,398	770	19,405	56	5	11
Light Commercial	1,934	221	27,076	5	1	74
Industrial	1,497	2,823	22,552	4	8	62
Construction	1,021	6,115	6,942	4	25	11
Agricultural	409	1,816	2,510	2	8	2
Logging	271	587	1,186	1	2	3
<u>Marine Vessels</u>	<u>2,194</u>	<u>17,253</u>	<u>31,940</u>	<u>6</u>	<u>47</u>	<u>88</u>
Nonroad Engines and Vehicles	34,816	31,068	211,060	152	100	308
Highway Vehicles	0	0	267,670	0	0	1,515
<u>Other Area and Point Sources</u>	<u>0</u>	<u>0</u>	<u>199,979</u>	<u>0</u>	<u>0</u>	<u>565</u>
All Sources	NA	NA	678,709	NA	NA	2,388

Seattle-Tacoma MSA Inventory B (in-use est)
Emission Inventory Summary - VOC, NOx, CO
Percent of Total Inventory

Equipment Category	% total tpy			% total tpsd		% total tpwd
	VOC	NOx	CO	VOC	NOx	CO
Lawn & Garden	NA	NA	14.01%	NA	NA	1.86%
Airport Service	NA	NA	0.28%	NA	NA	0.22%
Recreational	NA	NA	0.36%	NA	NA	0.35%
Recreational Marine	NA	NA	2.86%	NA	NA	0.45%
Light Commercial	NA	NA	3.99%	NA	NA	3.11%
Industrial	NA	NA	3.32%	NA	NA	2.59%
Construction	NA	NA	1.02%	NA	NA	0.48%
Agricultural	NA	NA	0.37%	NA	NA	0.07%
Logging	NA	NA	0.17%	NA	NA	0.14%
<u>Marine Vessels</u>	<u>NA</u>	<u>NA</u>	<u>4.71%</u>	<u>NA</u>	<u>NA</u>	<u>3.66%</u>
Nonroad Engines and Vehicles	NA	NA	31.10%	NA	NA	12.91%
Highway Vehicles	NA	NA	39.44%	NA	NA	63.44%
<u>Other Area and Point Sources</u>	<u>NA</u>	<u>NA</u>	<u>29.46%</u>	<u>NA</u>	<u>NA</u>	<u>23.66%</u>
All Sources	NA	NA	100.00%	NA	NA	100.00%

Seattle-Tacoma MSA Inventory B (in-use est.)
Emission Inventory Summary - Air Toxics and SOx

Equipment Category	tpy					
	PM	Aldehydes	Benzene	1,3 But.	Gas. Vap.	SOx
Lawn & Garden	257	80	487	206	1,081	56
Airport Service	154	7	6	3	4	86
Recreational	14	2	28	12	33	1
Recreational Marine	16	30	242	105	1,357	51
Light Commercial	47	14	55	23	179	32
Industrial	124	46	42	18	126	78
Construction	819	116	30	15	39	528
Agricultural	347	56	12	6	16	144
Logging	88	12	8	3	14	49
<u>Marine Vessels</u>	<u>1,017</u>	<u>0</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>7,576</u>
Nonroad Engines and Vehicles	2,882	362	911	391	2,849	8,601
Highway Vehicles	30,151	0	—	—	—	0
<u>Other Area and Point Sources</u>	<u>37,878</u>	<u>0</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>0</u>
All Sources	70,911	NA	NA	NA	NA	NA

Seattle-Tacoma MSA Inventory B (in-use est.)
Emission Inventory Summary - Air Toxics and SOx
Percent of Total Inventory

Equipment Category	% total tpy					
	PM	Aldehydes	Benzene	1,3 But.	Gas. Vap.	SOx
Lawn & Garden	0.36%	NA	NA	NA	NA	NA
Airport Service	0.22%	NA	NA	NA	NA	NA
Recreational	0.02%	NA	NA	NA	NA	NA
Recreational Marine	0.02%	NA	NA	NA	NA	NA
Light Commercial	0.07%	NA	NA	NA	NA	NA
Industrial	0.18%	NA	NA	NA	NA	NA
Construction	1.16%	NA	NA	NA	NA	NA
Agricultural	0.49%	NA	NA	NA	NA	NA
Logging	0.12%	NA	NA	NA	NA	NA
<u>Marine Vessels</u>	<u>1.43%</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>
Nonroad Engines and Vehicles	4.06%	NA	NA	NA	NA	NA
Highway Vehicles	42.52%	NA	NA	NA	NA	NA
<u>Other Area and Point Sources</u>	<u>53.42%</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>
All Sources	100.00%	NA	NA	NA	NA	NA

South Coast AB Inventory B (in-use est)
Emission Inventory Summary - VOC, NOx, CO

Equipment Category	tpy			tpsd		tpwd
	VOC	NOx	CO	VOC	NOx	CO
Lawn & Garden	51,348	801	256,125	178	3	227
Airport Service	846	5,447	7,911	2	15	22
Recreational	4,290	25	13,901	17	0	20
Recreational Marine	26,402	2,808	55,687	134	15	43
Light Commercial	13,416	1,582	189,752	37	4	520
Industrial	6,458	20,513	79,164	18	56	217
Construction	5,291	28,553	35,922	19	103	79
Agricultural	1,100	4,121	8,676	4	15	6
Logging	12	28	52	0	0	0
<u>Marine Vessels</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>7</u>	<u>68</u>	<u>10</u>
Nonroad Engines and Vehicles	109,162	63,877	647,190	417	280	1,143
Highway Vehicles	0	0	0	650	660	9,732
<u>Other Area and Point Sources</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>1,400</u>	<u>334</u>	<u>265</u>
All Sources	NA	NA	NA	2,467	1,274	11,140

South Coast AB Inventory B (in-use est)
Emission Inventory Summary - VOC, NOx, CO
Percent of Total Inventory

Equipment Category	% total tpy			% total tpsd		% total tpwd
	VOC	NOx	CO	VOC	NOx	CO
Lawn & Garden	NA	NA	NA	7.22%	0.23%	2.04%
Airport Service	NA	NA	NA	0.09%	1.17%	0.19%
Recreational	NA	NA	NA	0.71%	0.01%	0.18%
Recreational Marine	NA	NA	NA	5.42%	1.16%	0.38%
Light Commercial	NA	NA	NA	1.50%	0.34%	4.67%
Industrial	NA	NA	NA	0.73%	4.41%	1.95%
Construction	NA	NA	NA	0.78%	8.10%	0.71%
Agricultural	NA	NA	NA	0.17%	1.21%	0.05%
Logging	NA	NA	NA	0.00%	0.01%	0.00%
<u>Marine Vessels</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>0.30%</u>	<u>5.37%</u>	<u>0.09%</u>
Nonroad Engines and Vehicles	NA	NA	NA	16.91%	22.00%	10.26%
Highway Vehicles	NA	NA	NA	26.35%	51.80%	87.36%
<u>Other Area and Point Sources</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>56.74%</u>	<u>26.20%</u>	<u>2.38%</u>
All Sources	NA	NA	NA	100.00%	100.00%	100.00%

South Coast AB Inventory B (in-use est)
Emission Inventory Summary - Air Toxics and SOx

Equipment Category	tpy					
	PM	Aldehydes	Benzene	1,3 But.	Gas. Vap	SOx
Lawn & Garden	488	228	1,499	637	2,373	181
Airport Service	648	28	25	12	15	360
Recreational	41	13	124	54	174	5
Recreational Marine	57	110	613	264	6,123	164
Light Commercial	330	96	384	159	1,225	231
Industrial	1,659	317	184	82	484	933
Construction	3,820	563	155	76	206	2,490
Agricultural	773	126	31	15	88	326
Logging	4	1	0	0	1	2
<u>Marine Vessels</u>	<u>1,515</u>	<u>0</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>12,797</u>
Nonroad Engines and Vehicles	9,336	1,482	3,013	1,300	10,688	17,490
Highway Vehicles	34,675	0	—	—	—	11,680
<u>Other Area and Point Sources</u>	<u>766,500</u>	<u>0</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>18,214</u>
All Sources	810,511	NA	NA	NA	NA	47,384

South Coast AB Inventory B (in-use est.)
Emission Inventory Summary - Air Toxics and SOx
Percent of Total Inventory

Equipment Category	% total tpy					
	PM	Aldehydes	Benzene	1,3 But.	Gas Vap	SOx
Lawn & Garden	0.06%	NA	NA	NA	NA	0.38%
Airport Service	0.08%	NA	NA	NA	NA	0.76%
Recreational	0.01%	NA	NA	NA	NA	0.01%
Recreational Marine	0.01%	NA	NA	NA	NA	0.35%
Light Commercial	0.04%	NA	NA	NA	NA	0.49%
Industrial	0.20%	NA	NA	NA	NA	1.97%
Construction	0.47%	NA	NA	NA	NA	5.25%
Agricultural	0.10%	NA	NA	NA	NA	0.69%
Logging	0.00%	NA	NA	NA	NA	0.00%
<u>Marine Vessels</u>	<u>0.19%</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>27.01%</u>
Nonroad Engines and Vehicles	1.15%	NA	NA	NA	NA	36.91%
Highway Vehicles	4.28%	NA	NA	NA	NA	24.65%
<u>Other Area and Point Sources</u>	<u>94.57%</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>38.44%</u>
All Sources	100.00%	NA	NA	NA	NA	100.00%

Spokane MSA Inventory B (in-use est)
Emission Inventory Summary - VOC, NOx, CO

Equipment Category	tpy			tpsd		tpwd CO
	VOC	NOx	CO	VOC	NOx	
Lawn & Garden	2,970	28	16,418	16	0	0
Airport Service	28	178	265	0	0	1
Recreational	178	1	434	0	0	1
Recreational Marine	830	22	1,479	6	0	0
Light Commercial	303	31	4,028	1	0	11
Industrial	119	230	1,788	0	1	5
Construction	104	693	648	0	3	1
Agricultural	273	1,414	1,548	1	8	1
Logging	1	16	7	0	0	0
<u>Marine Vessels</u>	<u>0</u>	<u>0</u>	<u>245</u>	<u>0</u>	<u>0</u>	<u>0</u>
Nonroad Engines and Vehicles	4,806	2,613	26,860	26	13	20
Highway Vehicles	0	0	9,026	0	0	251
<u>Other Area and Point Sources</u>	<u>0</u>	<u>0</u>	<u>77,748</u>	<u>0</u>	<u>0</u>	<u>224</u>
All Sources	NA	NA	113,634	NA	NA	495

Spokane MSA Inventory B (in-use est.)
Emission Inventory Summary - VOC, NOx, CO
Percent of Total Inventory

Equipment Category	% total tpy			% total tpsd		% total tpwd CO
	VOC	NOx	CO	VOC	NOx	
Lawn & Garden	NA	NA	14.45%	NA	NA	0.04%
Airport Service	NA	NA	0.23%	NA	NA	0.15%
Recreational	NA	NA	0.38%	NA	NA	0.28%
Recreational Marine	NA	NA	1.30%	NA	NA	0.00%
Light Commercial	NA	NA	3.54%	NA	NA	2.23%
Industrial	NA	NA	1.57%	NA	NA	0.99%
Construction	NA	NA	0.57%	NA	NA	0.14%
Agricultural	NA	NA	1.36%	NA	NA	0.21%
Logging	NA	NA	0.01%	NA	NA	0.00%
<u>Marine Vessels</u>	<u>NA</u>	<u>NA</u>	<u>0.22%</u>	<u>NA</u>	<u>NA</u>	<u>0.00%</u>
Nonroad Engines and Vehicles	NA	NA	23.64%	NA	NA	4.04%
Highway Vehicles	NA	NA	7.94%	NA	NA	50.75%
<u>Other Area and Point Sources</u>	<u>NA</u>	<u>NA</u>	<u>68.42%</u>	<u>NA</u>	<u>NA</u>	<u>45.21%</u>
All Sources	NA	NA	100.00%	NA	NA	100.00%

Spokane MSA Inventory B (in-use est)
Emission Inventory Summary - Air Toxics and SOx

Equipment Category	tpy					
	PM	Aldehydes	Benzene	1,3 But.	Gas Vap	SOx
Lawn & Garden	53	14	85	36	207	9
Airport Service	21	1	1	0	1	12
Recreational	3	0	5	2	7	0
Recreational Marine	0	1	24	10	48	3
Light Commercial	7	2	9	4	26	5
Industrial	11	4	3	1	10	7
Construction	91	13	3	2	3	60
Agricultural	285	41	8	4	6	112
Logging	2	0	0	0	0	1
<u>Marine Vessels</u>	<u>0</u>	<u>0</u>				<u>0</u>
Nonroad Engines and Vehicles	473	77	138	60	308	209
Highway Vehicles	3,881	0				0
<u>Other Area and Point Sources</u>	<u>9,837</u>	<u>0</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>0</u>
All Sources	14,191	NA	NA	NA	NA	NA

Spokane MSA Inventory B (in-use est)
Emission Inventory Summary - Air Toxics and SOx
Percent of Total Inventory

Equipment Category	% total tpy					
	PM	Aldehydes	Benzene	1,3 But.	Gas. Vap	SOx
Lawn & Garden	0.37%	NA	NA	NA	NA	NA
Airport Service	0.15%	NA	NA	NA	NA	NA
Recreational	0.02%	NA	NA	NA	NA	NA
Recreational Marine	0.00%	NA	NA	NA	NA	NA
Light Commercial	0.05%	NA	NA	NA	NA	NA
Industrial	0.07%	NA	NA	NA	NA	NA
Construction	0.64%	NA	NA	NA	NA	NA
Agricultural	2.01%	NA	NA	NA	NA	NA
Logging	0.02%	NA	NA	NA	NA	NA
<u>Marine Vessels</u>	<u>0.00%</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>
Nonroad Engines and Vehicles	3.33%	NA	NA	NA	NA	NA
Highway Vehicles	27.35%	NA	NA	NA	NA	NA
<u>Other Area and Point Sources</u>	<u>69.32%</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>
All Sources	100.00%	NA	NA	NA	NA	NA

Springfield MSA Inventory B (in-use est.)
Emission Inventory Summary - VOC, NOx, CO

Equipment Category	tpy			tpsd		tpwd
	VOC	NOx	CO	VOC	NOx	CO
Lawn & Garden	2,806	30	15,387	15	0	3
Airport Service	0	0	0	0	0	0
Recreational	772	6	1,211	0	0	11
Recreational Marine	1,390	112	2,734	10	1	0
Light Commercial	506	48	6,409	1	0	18
Industrial	322	648	4,792	1	2	13
Construction	187	1,448	1,110	1	7	1
Agricultural	156	697	931	1	4	1
Logging	2	31	14	0	0	0
<u>Marine Vessels</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>
Nonroad Engines and Vehicles	6,140	3,019	32,589	29	14	47
Highway Vehicles	0	0	0	62	30	0
<u>Other Area and Point Sources</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>50</u>	<u>30</u>	<u>0</u>
All Sources	NA	NA	NA	141	74	NA

Springfield MSA Inventory B (in-use est.)
Emission Inventory Summary - VOC, NOx, CO
Percent of Total Inventory

Equipment Category	% total tpy			% total tpsd		% total tpwd
	VOC	NOx	CO	VOC	NOx	CO
Lawn & Garden	NA	NA	NA	10 53%	0 22%	NA
Airport Service	NA	NA	NA	0 00%	0 00%	NA
Recreational	NA	NA	NA	0 32%	0 00%	NA
Recreational Marine	NA	NA	NA	6 77%	1 13%	NA
Light Commercial	NA	NA	NA	0 99%	0 18%	NA
Industrial	NA	NA	NA	0 64%	2 40%	NA
Construction	NA	NA	NA	0 62%	9 23%	NA
Agricultural	NA	NA	NA	0 60%	5 16%	NA
Logging	NA	NA	NA	0 00%	0 11%	NA
<u>Marine Vessels</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>0 00%</u>	<u>0 00%</u>	<u>NA</u>
Nonroad Engines and Vehicles	NA	NA	NA	20 48%	18 45%	NA
Highway Vehicles	NA	NA	NA	44 30%	40 99%	NA
<u>Other Area and Point Sources</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>35 22%</u>	<u>40 57%</u>	<u>NA</u>
All Sources	NA	NA	NA	100 00%	100 00%	NA

Springfield MSA Inventory B (in-use est.)
Emission Inventory Summary - Air Toxics and SOx

Equipment Category	tpy					
	PM	Aldehydes	Benzene	1,3 But.	Gas Vap	SOx
Lawn & Garden	44	13	80	34	216	9
Airport Service	0	0	0	0	0	0
Recreational	15	1	23	10	16	1
Recreational Marine	2	4	34	14	278	7
Light Commercial	11	3	15	6	41	7
Industrial	34	11	9	4	27	21
Construction	187	27	6	3	4	125
Agricultural	134	21	5	2	5	55
Logging	4	1	0	0	0	3
<u>Marine Vessels</u>	<u>0</u>	<u>0</u>				<u>0</u>
Nonroad Engines and Vehicles	432	82	170	73	587	227
Highway Vehicles	0	0				0
<u>Other Area and Point Sources</u>	<u>0</u>	<u>0</u>				<u>0</u>
All Sources	NA	NA	NA	NA	NA	NA

Springfield MSA Inventory B (in-use est.)
Emission Inventory Summary - Air Toxics and SOx
Percent of Total Inventory

Equipment Category	% total tpy					
	PM	Aldehydes	Benzene	1,3 But.	Gas Vap	SOx
Lawn & Garden	NA	NA	NA	NA	NA	NA
Airport Service	NA	NA	NA	NA	NA	NA
Recreational	NA	NA	NA	NA	NA	NA
Recreational Marine	NA	NA	NA	NA	NA	NA
Light Commercial	NA	NA	NA	NA	NA	NA
Industrial	NA	NA	NA	NA	NA	NA
Construction	NA	NA	NA	NA	NA	NA
Agricultural	NA	NA	NA	NA	NA	NA
Logging	NA	NA	NA	NA	NA	NA
<u>Marine Vessels</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>
Nonroad Engines and Vehicles	NA	NA	NA	NA	NA	NA
Highway Vehicles	NA	NA	NA	NA	NA	NA
<u>Other Area and Point Sources</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>
All Sources	NA	NA	NA	NA	NA	NA

Washington DC MSA Inventory B (in-use est)
Emission Inventory Summary - VOC, NOx, CO

Equipment Category	tpy			tpsd		tpwd CO
	VOC	NOx	CO	VOC	NOx	
Lawn & Garden	27,294	542	299,618	114	2	118
Airport Service	402	2,589	3,763	1	7	10
Recreational	1,315	9	2,767	2	0	14
Recreational Marine	3,477	215	6,585	21	1	1
Light Commercial	2,167	224	28,840	6	1	79
Industrial	1,006	1,886	15,306	3	5	42
Construction	1,820	12,043	11,235	8	50	18
Agricultural	915	4,158	5,881	4	18	4
Logging	2	25	11	0	0	0
<u>Marine Vessels</u>	<u>0</u>	<u>227</u>	<u>2,820</u>	<u>0</u>	<u>1</u>	<u>0</u>
Nonroad Engines and Vehicles	38,398	21,917	376,826	159	86	287
Highway Vehicles	0	83,068	398,686	345	250	2 161
<u>Other Area and Point Sources</u>	<u>0</u>	<u>88,336</u>	<u>59,024</u>	<u>202</u>	<u>242</u>	<u>167</u>
All Sources	NA	193,321	834,536	706	578	2,615

Washington DC MSA Inventory B (in-use est)
Emission Inventory Summary - VOC, NOx, CO

Percent of Total Inventory

Equipment Category	% total tpy			% total tpsd		% total tpwd CO
	VOC	NOx	CO	VOC	NOx	
Lawn & Garden	NA	0.28%	35.90%	16.14%	0.41%	4.52%
Airport Service	NA	1.34%	0.45%	0.16%	1.23%	0.39%
Recreational	NA	0.00%	0.33%	0.34%	0.00%	0.54%
Recreational Marine	NA	0.11%	0.79%	2.94%	0.23%	0.06%
Light Commercial	NA	0.12%	3.46%	0.85%	0.11%	3.02%
Industrial	NA	0.98%	1.83%	0.40%	0.89%	1.60%
Construction	NA	6.23%	1.35%	1.07%	8.68%	0.71%
Agricultural	NA	2.15%	0.70%	0.57%	3.15%	0.15%
Logging	NA	0.01%	0.00%	0.00%	0.01%	0.00%
<u>Marine Vessels</u>	<u>NA</u>	<u>0.12%</u>	<u>0.34%</u>	<u>0.00%</u>	<u>0.11%</u>	<u>0.00%</u>
Nonroad Engines and Vehicles	NA	11.34%	45.15%	22.47%	14.82%	10.99%
Highway Vehicles	NA	42.97%	47.77%	48.90%	43.31%	82.63%
<u>Other Area and Point Sources</u>	<u>NA</u>	<u>45.69%</u>	<u>7.07%</u>	<u>28.63%</u>	<u>41.87%</u>	<u>6.38%</u>
All Sources	NA	100.00%	100.00%	100.00%	100.00%	100.00%

Washington DC MSA Inventory B (in-use est.)
Emission Inventory Summary - Air Toxics and SOx

Equipment Category	tpy					
	PM	Aldehydes	Benzene	1,3 But.	Gas. Vap	SOx
Lawn & Garden	377	157	739	311	3,406	180
Airport Service	308	13	12	6	7	171
Recreational	22	3	38	17	36	1
Recreational Marine	4	8	89	38	537	16
Light Commercial	50	15	62	26	186	33
Industrial	79	31	28	12	85	50
Construction	1,557	234	54	27	54	1,050
Agricultural	809	126	27	14	32	329
Logging	3	0	0	0	0	2
<u>Marine Vessels</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>
Nonroad Engines and Vehicles	3,210	588	1,049	450	4,344	1,834
Highway Vehicles	0	0				0
<u>Other Area and Point Sources</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>
All Sources	NA	NA	NA	NA	NA	NA

Washington DC MSA Inventory B (in-use est.)
Emission Inventory Summary - Air Toxics and SOx

Percent of Total Inventory

Equipment Category	% total tpy					
	PM	Aldehydes	Benzene	1,3 But.	Gas. Vap	SOx
Lawn & Garden	NA	NA	NA	NA	NA	NA
Airport Service	NA	NA	NA	NA	NA	NA
Recreational	NA	NA	NA	NA	NA	NA
Recreational Marine	NA	NA	NA	NA	NA	NA
Light Commercial	NA	NA	NA	NA	NA	NA
Industrial	NA	NA	NA	NA	NA	NA
Construction	NA	NA	NA	NA	NA	NA
Agricultural	NA	NA	NA	NA	NA	NA
Logging	NA	NA	NA	NA	NA	NA
<u>Marine Vessels</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>
Nonroad Engines and Vehicles	NA	NA	NA	NA	NA	NA
Highway Vehicles	NA	NA	NA	NA	NA	NA
<u>Other Area and Point Sources</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>
All Sources	NA	NA	NA	NA	NA	NA

Appendix P. Transport and Nonroad Emissions

"Transport" refers to the phenomenon of windborne ozone and ozone precursors causing elevated concentrations of ozone in adjacent air basins or areas hundreds of miles away from the source of the precursors. Observations of high ozone levels downwind from significant sources of ozone precursors and covering large areas has led to increased interest in the long-range transport of ozone and its precursors. In the context of this study, determining whether emissions can affect ozone levels some distance downwind from the source of the emissions is particularly important in assessing the impact of emissions from nonroad engines operated outside the boundaries of nonattainment areas. For example, one question this study sought to address is "Could categories of nonroad equipment, such as agricultural or marine pleasure craft, operated outside a nonattainment area, have an effect on the level of a pollutant in the nonattainment area?" Questions like this need to be addressed in order to determine and develop the most effective pollution control policy

Separate studies have concluded that transported pollution is a significant contributor to ozone levels in the Northeast¹ and in California.² EPA and several Midwestern States are beginning work on a major study of ozone transport across Lake Michigan; smaller studies of pollution in western Michigan suggest that transported pollutants may be an overwhelming contributor to ozone nonattainment there.³ Recent studies have found that pollution from Los Angeles may contribute to haze in the Grand Canyon, approximately 250 miles downwind.^{4 5} Elevated levels of ozone also are indicated causing crop damage in relatively remote areas.⁶ Even without the completion of all of these studies, Congress acknowledged the role of ozone transport in providing in the CAAA for the creation of regional transport commissions in areas where "interstate transport . . . contributes significantly to a violation of a national ambient air quality standard" (Section 176A(a)). Congress recognized that interstate transport is significant in the northeast by explicitly creating a regional transport commission encompassing 11 northeastern states and the District of Columbia.

In "1 Transport Studies," the major studies to date are summarized and their results discussed. "2. The Effect of Transported Nonroad Emissions" focuses attention on EPA's analysis of these studies in terms of the relationship between transport and nonroad emissions

Finally, "3. Transport Conclusions" focuses on some conclusions regarding transport.

1. Transport Studies

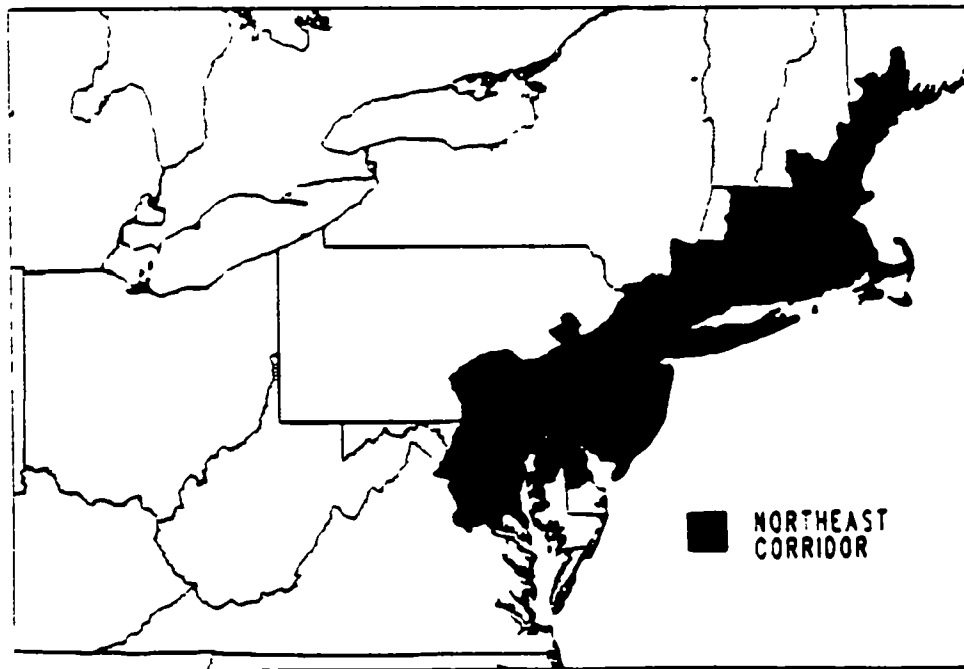
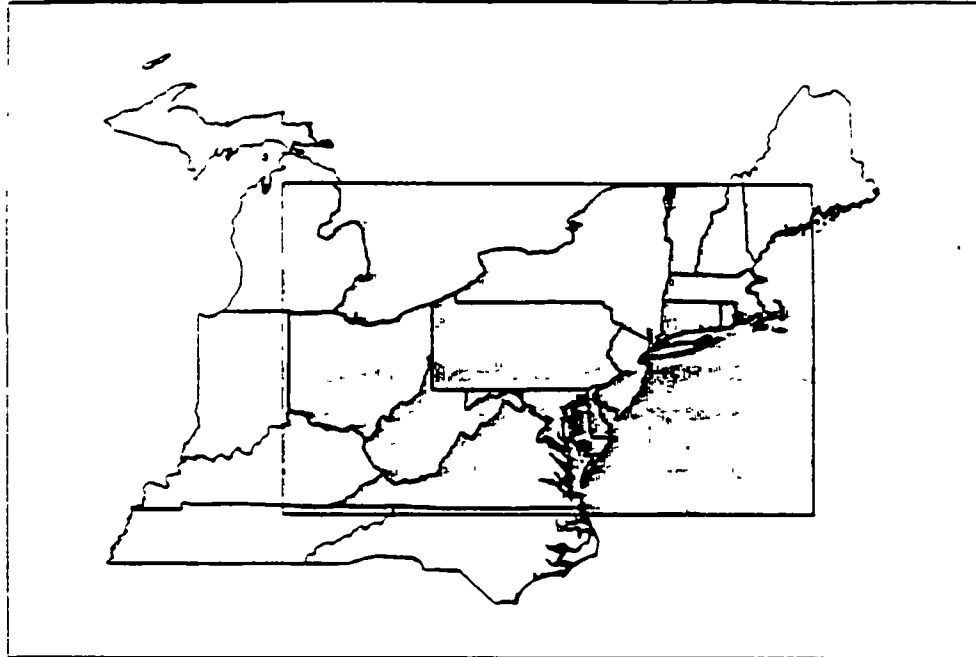
The major transport studies to date include the ROMNET (Regional Oxidant Modeling for Northeast Transport) report, a joint effort among EPA and state and local air officials from the Northeast and Midwest, and "Assessment and Mitigation of the Impacts of Transported Pollutants on Ozone Concentrations within California," a report prepared by the California Air Resources Board as required by the California Clean Air Act. The results of these studies and their implications for the assessment of the impact of nonroad sources on nonattainment are summarized below. This chapter also describes a smaller study addressing the transport of ozone over Lake Michigan and ongoing studies of transport over Lake Michigan and elsewhere.

1.1. Transport in the Northeast

The Regional Oxidant Model for Northeast Transport (ROMNET) project was begun in 1987 as a cooperative effort between state and local air pollution officials and EPA. The primary goals of ROMNET have been to assess the impact of transported ozone and ozone precursors on nonattainment in the Northeast, especially the heavily urbanized Northeast Corridor, and to develop a regional-scale photochemical model that will be used by nonattainment areas to predict the effects of different strategies for attainment. The primary relevance of the ROMNET work to the nonroad issue is its assessment of the overall significance of transport in reducing ozone levels in the Northeast and the role of NO_x in ozone formation in that region.

Maps of the ROMNET region and the Northeast Corridor appear in Chart P-01. The inventories of anthropogenic (manmade) emissions used in the model are based on the 1985 National Acid Precipitation Assessment Program (NAPAP) inventories. The ROMNET model

Chart P-01. The ROMNET Region and the Northeast Corridor.



takes into account both anthropogenic and biogenic emissions; the reactivity of different VOC emissions; the impact of seasonal, temporal, and day of the week on emission levels; and the impacts of meteorology and topography on ozone formation and transport. The study includes assessments of several different strategies for reducing ozone levels, including a draft of the Clean Air Act and various combinations of VOC and NO_x reductions.

To determine the ozone-forming potential of the emission inventory under "real-world" conditions, the model incorporated meteorological data from actual historical ozone episodes. Two recent serious multi-day ozone episodes were chosen for the model based on the presence of "typical" ozone-generating characteristics. Most of the ROMNET results are based on a model of the meteorological conditions during the severe ozone episode of July 4-18, 1988.

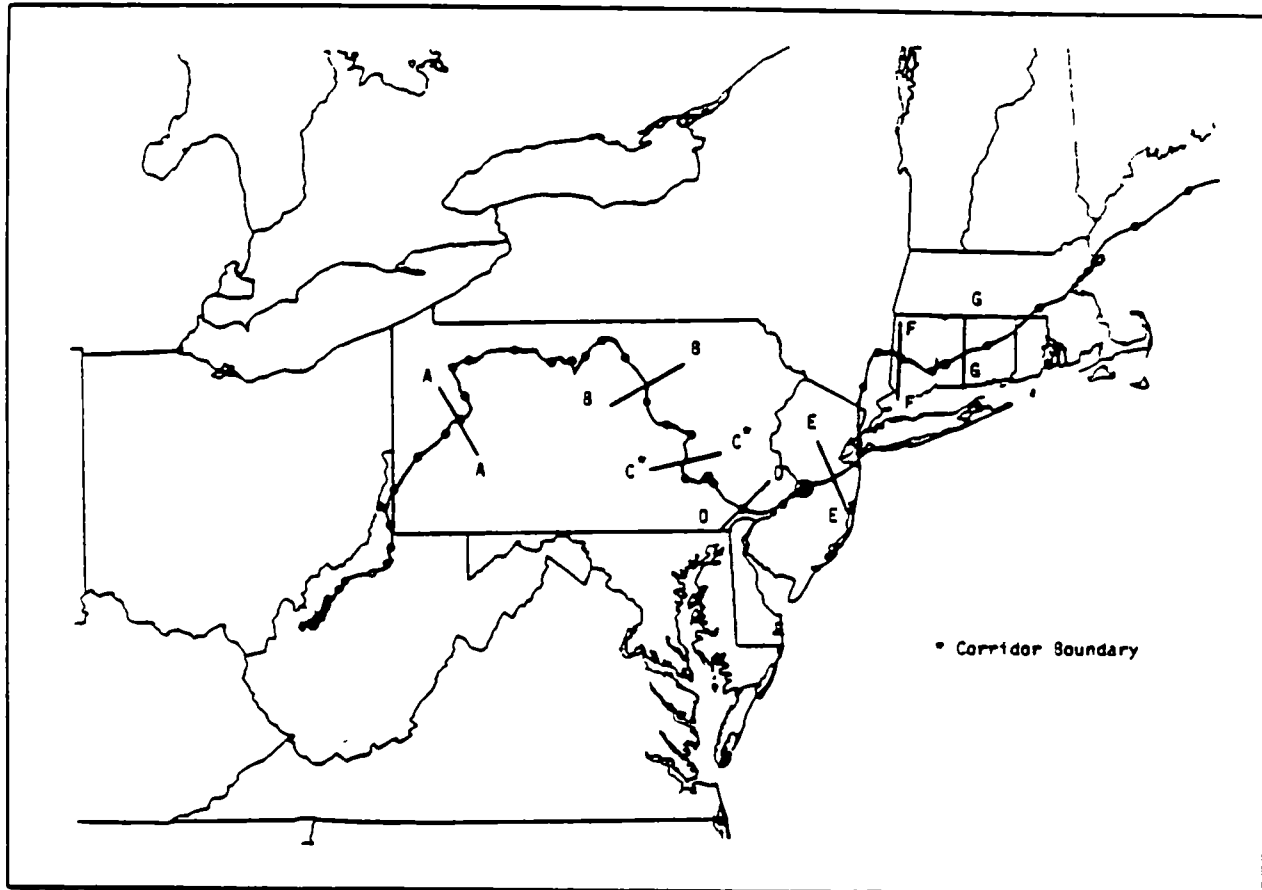
In evaluating the impact of various control strategies on reducing ozone in the Northeast Corridor, including the strategy of reducing transported emission, the baseline 1985 emission inventories were projected to the year 2005. The emission from the different source categories were assumed to increase according to predicted growth in highly correlated indicators such as population or employment in the relevant industrial sector. In applying emission control technologies to the source categories, it was generally assumed that the controls could be completely in place and generating 100% of their theoretical effectiveness by 2005, assumptions which are probably quite optimistic. One of the scenarios modeled assessed the impact of relaxing these assumptions.

Three control scenarios were used to assess the impact of transport on the nonattainment areas in the Northeast Corridor. One applied maximum control technology for NO_x and VOC to the 2005 inventories over the entire ROMNET area. Another applied the controls only to sources within the Corridor itself. The third scenario applied maximum control technologies only to sources that were outside the Corridor, yet were inside the U.S. portion of the ROMNET region. As an example of how these scenarios compare to the version modeled in the Clean Air Act, the maximum control technology was assumed to reduce, on average, overall VOC emission by 63% and NO_x emission by 57% from the 2005 baseline level. The CAA version would reduce VOC emission by 32% and NO_x emissions by 32% over the same region. In one scenario where controls were applied only outside the Corridor, a packet of air was tracked from an origin in West Virginia up through the

Massachusetts coast. Ozone and ozone precursor levels along its route were modeled and compared to baseline (pre-control) levels. This comparison can be used to suggest the distance over which transported pollutants can be expected to have a measurable impact on ozone levels. The path of the air packet and the difference in pollutant levels between the scenarios along that path are shown in Charts P-02 and P-03. As can be seen from these figures, the effect of reducing ozone precursors outside the Northeast Corridor was still noticeable two days after the air packet had passed into the highly polluted Corridor. By the time the air packet reached central Connecticut, it had traveled approximately 340 miles from its point of entry into the Corridor, and yet the reduction in non-Corridor emissions still reduced the predicted ozone level in Connecticut by approximately 5 ppb.

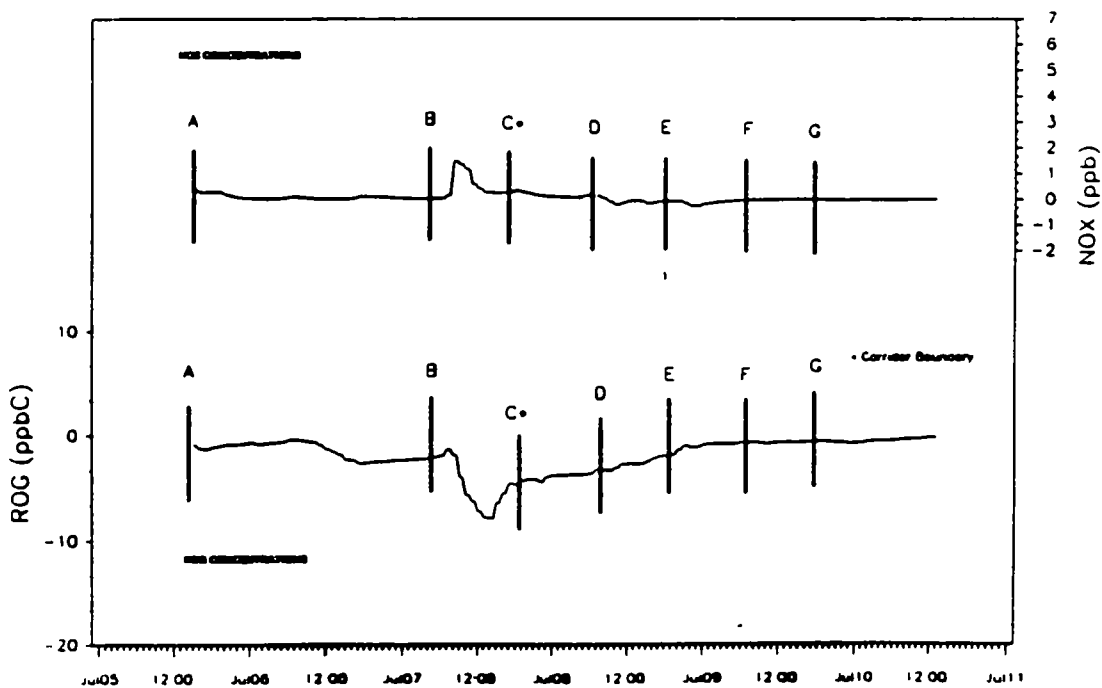
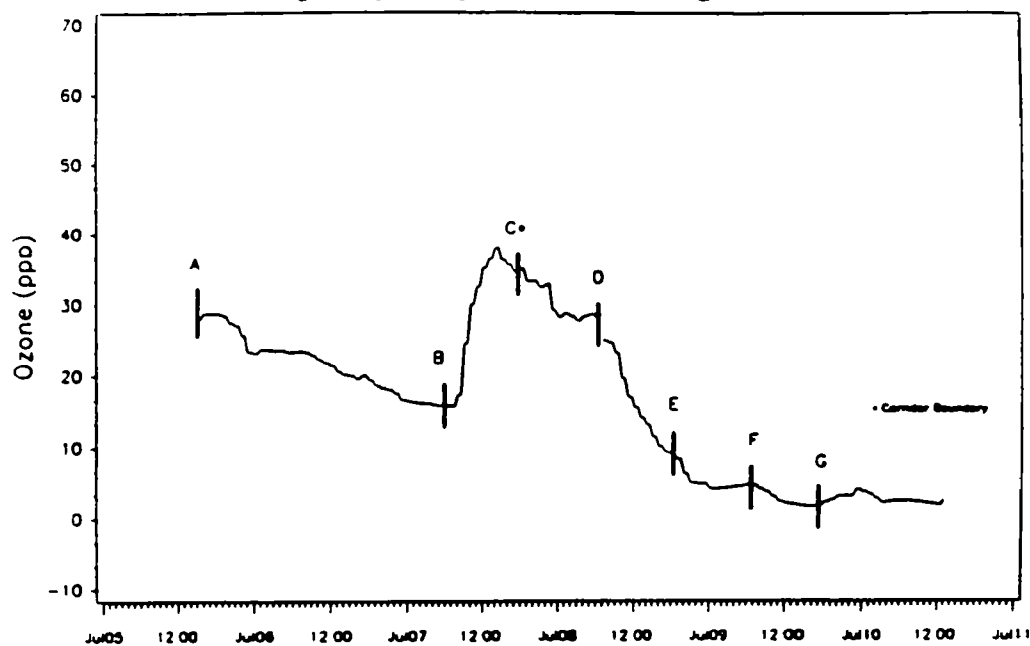
Another assessment of upwind controls on specific nonattainment areas can be made by comparing the ozone levels predicted in the Corridor nonattainment areas under the different scenarios. The effect on these cities of reducing emissions from upwind sources is shown in Tables P-01 and P-02. Table P-01 shows the impact of reducing only non-Corridor emissions on ozone concentrations in Corridor cities. Table P-02 shows the difference in predicted ozone levels for several cities between the scenarios with controls only in the Corridor and controls over the entire ROMNET region. Not surprisingly, the effect is most pronounced for those Corridor cities closest to the Corridor boundary, such as the Washington/Baltimore area and Philadelphia.

Chart P-02. Path of Air Packet from West Virginia to Massachusetts



ROM layer 2 trajectory for the transport case study (trajectory markers are at 4-h intervals).

Chart P-03. Differences in Ozone and Precursor Concentrations in Air Packet Along Trajectory from West Virginia to Massachusetts



Note: A - G refer to areas indicated on Chart P-02

**Table P-01. Reductions in Corridor Ozone from Uncontrolled
2005 Levels Due to Non-Corridor Controls**

<u>City</u>	<u>Ozone Level(ppb)</u>		<u>Reduction (%)</u>
	<u>before control</u>	<u>after</u>	
Baltimore	149	136	9%
Philadelphia	148	138	7%
New York City	160	152	5%
Connecticut	140	133	5%
Boston	158	153	3%

Note: National Ambient Air Quality Standard (NAAQS) for Ozone = 124 ppb

**Table P-02. Reductions in Ozone from Imposing Non-Corridor Controls
in Addition to Corridor Controls**

<u>City</u>	<u>Ozone Level(ppb)</u>		<u>Reduction (%)</u>
	<u>Corridor-only control</u>	<u>Region-wide</u>	
Baltimore/Washington	139	122	12%
Philadelphia	123	115	7%
New York City	123	118	4%
Boston	113	107	5%

Note: National Ambient Air Quality Standard (NAAQS) for Ozone = 124 ppb

The results show that a reduction of 65% of the non-Corridor VOC inventory and 60% of the non-Corridor NO_x inventory resulted in an average peak ozone reduction of 8.6 ppb in the Corridor as a whole and 11.5 ppb average peak ozone reduction in the two western-most nonattainment areas of Washington/Baltimore and Philadelphia. Very roughly, this implies that 1% of the non-Corridor VOC and NO_x inventories account for 0.14 ppb of the peak ozone concentration in the Corridor cities on average and about 0.18 ppb of the peak ozone concentration in the Washington/Baltimore and Philadelphia areas.

While the reductions in ozone levels due to reduction in transported non-Corridor emissions may not appear large, they should be compared to the reductions predicted for other programs. For example, the ROMNET study also assessed the impact of a control strategy that would convert the entire motor vehicle fleet in the Northeast Corridor to methanol (methanol vehicles have less photochemically reactive emissions) and also reduce the reactivity of solvent emissions throughout the Corridor. Average reductions in ozone levels for the Northeast Corridor cities were approximately 5-8 ppb under this reactivity-based control scenario. These reductions are similar to the reductions predicted for reducing non-Corridor emissions using maximum control technology for VOC and NO_x. Neither measure alone could reduce emissions enough to bring the Corridor into attainment.

According to the ROMNET report, "The results suggest that without stringent upward controls, ozone levels in parts of the Corridor may not be reduced to below the level specified in the NAAQS even with stringent controls along the entire length of the Corridor." (ES-11) Attainment of the ozone standard across the entire region may require not only maximum control technology across the entire region, but additional substantial across-the-board reductions in VOC emissions in New York City. Again, we should note that the maximum control technologies modeled here were assumed to achieve roughly twice the reduction in VOC and NO_x emissions that are predicted to result from implementation of the minimum requirements of the Clean Air Act. The report goes on to warn: "Considering rule effectiveness and a more realistic representation of control programs, results show predicted episode maximum ozone levels of just above 125 ppb in most sections of the Northeast Corridor with the most stringent VOC/NO_x/reactivity strategy simulated." (ES-11)

1.2. Transport in California

Section 39610(b) of the California Clean Air Act required the CARB to assess the relative contribution of upwind emissions to downwind ozone levels. In June 1990, the Board issued a staff report "Assessment and Mitigation of the Impacts of Transported Pollutants on Ozone Concentrations within California," which assessed the impact of transport for 14 upwind-downwind area pairs.

The California report differs from the ROMNET report in several aspects. For ten of the upwind-downwind area pairs, transport was not assessed using a complete regional air quality model. In these cases, the CARB staff analyzed emission inventories for the upwind and downwind areas, wind patterns that prevailed during nonattainment episodes, the timing of downwind ozone peaks relative to peak precursor-generating periods upwind (e.g. morning and afternoon rush hours), and other available information to determine whether the nonattainment was due primarily to upwind or downwind emissions.

Obviously, this method does not allow for quantitative precision about the impact of upwind emissions on downwind ozone levels. The staff therefore limited its conclusions to categorizing the impact of transport on the downwind area in each transport pair as either overwhelming, significant, or inconsequential. "Overwhelming" impact is defined in the CARB report as situations in which "ozone exceedances in the downwind area (other than very near the boundary between upwind and downwind areas) occurred without any emission contribution or with only a very small emission contribution from the downwind area." (I.2) "Significant" transport impact was found in cases where "emissions from both the upwind and downwind areas contributed to exceedances of the state standard," (I.2) and "inconsequential" impact was found in areas for which "the staff determined that upwind emissions did not contribute significantly to exceedances of the state ozone standard in the downwind area." (I.2) Some upwind-downwind pairs fell in more than one category; that is, the importance of transport varied substantially depending on meteorology so that transport might be judged substantial under some conditions and inconsequential under others.

The CARB results are shown in Table P-03. For all the transport pairs studied, transport was an "overwhelming" or "significant" contributor under at least some of the meteorological conditions that typically prevailed during ozone exceedances. Transported

ozone and ozone precursors have an "overwhelming" impact on nonattainment in five California nonattainment areas under some conditions and a "significant" effect in ten nonattainment areas under some conditions. Some of these areas fall into both the "overwhelming" and "significant" categories due to varying meteorological patterns among ozone exceedance episodes. Most upwind sources of transported pollutants are urban areas, but rural areas also may contribute to downwind nonattainment.

The proportion of VOC and NO_x inventories from nonroad sources in six upwind areas are shown in Tables P-04 - P-09. These tables show what is contributed from each of 5 nonroad categories, as well as the total nonroad contribution and total contribution from all area and point sources. From this, an indication of the proportion of transported pollutants from nonroad sources which impact the downwind area can be drawn.

Table P-03. The Findings of the Impact of Transported Air Pollutants from Upwind Areas on Downwind Ozone Levels

Transport Couple	Overwhelming	Significant	Inconsequential
San Joaquin Valley to Great Basin Valleys*	X		
Broader Sacramento to San Joaquin Valley		X	X
San Joaquin Valley to Broader Sacramento		X	X
Broader Sacramento to Upper Sacramento Valley		X	X
Broader Sacramento to San Francisco Bay Area		X	X
San Francisco Bay Area to Broader Sacramento		X	X
San Francisco Bay Area to North Central Coast	X	X	
San Francisco Bay Area to San Joaquin Valley		X	X
San Joaquin Valley to Southeast Desert*	X		X
South Coast to Southeast Desert	X		X
South Coast to San Diego	X	X	X
South Coast to South Central Coast		X	X
South Central Coast to South Coast		X	X
Coastal Waters to South Central Coast		X	

* Areas currently in attainment of the ozone standard.

Table P-04. South Coast Air Basin Summary

The South Coast Air Basin is an extreme ozone nonattainment area. Under some conditions, emissions from the South Coast overwhelmingly or significantly contribute to ozone levels in the San Diego nonattainment area. Under some conditions, the South Coast contributes significantly to ozone levels in the South Central Coast nonattainment area.

<u>Category</u>	<u>VOC</u> <u>tpd</u>	<u>NO_x</u> <u>tpd</u>
Farm Equipment	0.50	6.14
Non-Farm Equipment	28.55	123.65
Lawn & Garden Equipment	29.20	1.36
Off Highway Vehicles	0.00	0.00
<u>Marine Vessels</u>	<u>7.33</u>	<u>68.38</u>
Nonroad Mobile Sources(*)	65.58	199.53
All Area and Point Sources	2,138.88	1,174.23

<u>Category</u>	<u>% Total</u> <u>VOC</u>	<u>% Total</u> <u>NO_x</u>
Farm Equipment	0.02%	0.52%
Non-Farm Equipment	1.33%	10.53%
Lawn & Garden Equipment	1.37%	0.12%
Off Highway Vehicles	0.00%	0.00%
<u>Marine Vessels</u>	<u>0.34%</u>	<u>5.82%</u>
Nonroad Mobile sources(*)	3.07%	16.99%

Notes: (*) excluding railroad locomotives and aircraft.

Table P-05. San Joaquin Valley Air Basin Summary

The San Joaquin Valley is an ozone nonattainment area. Under some conditions, the Valley significantly contributes to ozone levels in the Sacramento nonattainment area. Under some conditions, emissions in the San Francisco Bay Area or Sacramento significantly affect ozone levels in the Valley.

<u>Category</u>	<u>VOC tpd</u>	<u>NO_x tpd</u>
Farm Equipment	8.96	35.80
Non-Farm Equipment	7.06	30.56
Lawn & Garden Equipment	6.00	0.28
Off Highway Vehicles	0.00	0.00
<u>Marine Vessels</u>	<u>0.22</u>	<u>2.64</u>
Nonroad Mobile Sources(*)	22.24	69.28
All Area and Point Sources	1,194.34	555.98

<u>Category</u>	<u>% Total VOC</u>	<u>% Total NO_x</u>
Farm Equipment	0.75%	6.44%
Non-Farm Equipment	0.59%	5.50%
Lawn & Garden Equipment	0.50%	0.05%
Off Highway Vehicles	0.00%	0.00%
<u>Marine Vessel</u>	<u>0.02%</u>	<u>0.47%</u>
Nonroad Mobile Sources (*)	1.86%	12.46%

Notes: (*) excluding railroad locomotives and aircraft

Table P-06. San Francisco Bay Area Air Basin Summary

The San Francisco Bay area is an ozone nonattainment area. Under some conditions, emissions from the Bay area overwhelmingly contribute to ozone levels in the North Central coast nonattainment area. Under some conditions, emissions from the Bay area significantly contribute to ozone levels in the Broader Sacramento and San Joaquin Valley nonattainment area. Ozone levels in the Bay are significantly affected by emissions from Sacramento under some conditions.

<u>Category</u>	<u>VOC</u> <u>tpd</u>	<u>NO_x</u> <u>tpd</u>
Farm Equipment	1.26	5.05
Non-Farm Equipment	11.46	48.99
Lawn & Garden Equipment	15.00	0.70
Off Highway Vehicles	0.00	0.00
<u>Marine Vessels</u>	<u>7.00</u>	<u>81.45</u>
Nonroad Mobile Sources(*)	34.72	136.19
All Area and Point Sources	1,556.12	659.69

<u>Category</u>	<u>% Total</u> <u>VOC</u>	<u>% Total</u> <u>NO_x</u>
Farm Equipment	0.08%	0.77%
Non-Farm Equipment	0.74%	7.43%
Lawn & Garden Equipment	0.96%	0.11%
Off Highway Vehicles	0.00%	0.00%
<u>Marine Vessels</u>	<u>0.45%</u>	<u>12.35%</u>
Nonroad Mobile Sources(*)	2.23%	20.64%

Notes: (*) excluding railroad locomotives and aircraft

Table P-07. South Central Coast Air Basin Summary

One county (Santa Barbara) of the South Central Coast Air Basin is in nonattainment. The South Central Coast Air Basin is a significant contributor to nonattainment in the South Coast Air Basin under some conditions. The South Coast and the Coastal Waters significantly contribute to nonattainment in the South Central Coast under some conditions

<u>Category</u>	<u>VOC</u> <u>tpd</u>	<u>NO_x</u> <u>tpd</u>
Farm Equipment	2.36	9.43
Non-Farm Equipment	2.53	10.96
Lawn & Garden Equipment	2.80	0.13
Off Highway Vehicles	0.00	0.00
<u>Marine Vessels</u>	<u>0.00</u>	<u>0.00</u>
Nonroad Mobile Sources(*)	7.69	20.52
All Area and Point Sources	412.29	164.22

<u>Category</u>	<u>% Total</u> <u>VOC</u>	<u>% Total</u> <u>NO_x</u>
Farm Equipment	0.57%	5.74%
Non-Farm Equipment	0.61%	6.67%
Lawn & Garden Equipment	0.68%	0.08%
Off Highway Vehicles	0.00%	0.00%
<u>Marine Vessels</u>	<u>0.00%</u>	<u>0.00%</u>
Nonroad Mobile Sources (*)	1.87%	12.50%

Notes: (*) excluding railroad locomotives and aircraft

Table P-08. Sacramento Valley Air Basin Summary

The Sacramento Valley Air Basin is an ozone nonattainment area. Under some conditions, emissions from the Sacramento Valley significantly contribute to ozone levels in the San Joaquin Valley and San Francisco Bay nonattainment areas. Under some conditions, these areas significantly contribute to ozone levels in Sacramento.

<u>Category</u>	<u>VOC tpd</u>	<u>NO_x tpd</u>
Farm Equipment	4.18	16.72
Non-Farm Equipment	6.67	28.89
Lawn & Garden Equipment	4.00	0.18
Off Highway Vehicles	0.00	0.00
<u>Marine Vessels</u>	<u>0.27</u>	<u>3.41</u>
Nonroad Mobile Sources(*)	15.12	49.20
All Area and Point Sources	364.02	264.30
<u>Category</u>	<u>% Total VOC</u>	<u>% Total NO_x</u>
Farm Equipment	1.15%	6.33%
Non-Farm Equipment	1.83%	10.93%
Lawn & Garden Equipment	1.10%	0.07%
Off Highway Vehicles	0.00%	0.00%
<u>Marine Vessels</u>	<u>0.07%</u>	<u>1.29%</u>
Nonroad Mobile Sources(*)	4.15%	18.62%

Notes: (*)excluding railroad locomotive and aircraft

Table P-09. San Diego Air Basin Summary

San Diego is an ozone nonattainment area. Under some conditions, emissions from the South Coast Air Basin overwhelmingly or significantly contribute to ozone levels in San Diego.

Category	VOC <u>tpd</u>	NO_x <u>tpd</u>
Farm Equipment	0.15	0.58
Non-Farm Equipment	6.86	29.71
Lawn & Garden Equipment	5.40	0.25
Off Highway Vehicles	0.00	0.00
<u>Marine Vessels</u>	<u>2.50</u>	<u>41.11</u>
Nonroad Mobile Sources(*)	14.91	71.65
All Area and Point Sources	498.71	245.75

<u>Category</u>	<u>% Total VOC</u>	<u>% Total NO_x</u>
Farm Equipment	0.03%	0.24%
Non-Farm Equipment	1.38%	12.09%
Lawn & Garden Equipment	1.08%	0.10%
Off Highway Vehicles	0.00%	0.00%
<u>Marine Vessels</u>	<u>0.50%</u>	<u>16.73%</u>
Nonroad Mobile Sources(*)	2.99%	29.16%

Notes: (*)excluding railroad locomotive and aircraft

1.3. Transport in the Lake Michigan Areas

Another area in which transport is believed to have a significant impact on ozone nonattainment is Muskegon, Michigan. Muskegon is a city of 160,000 on the eastern shore of Lake Michigan, approximately 185 km (115 mi) northeast of Chicago. Its persistent nonattainment problems appear to be largely due to emissions from the Chicago area. In July 1988, during a high ozone episode for Muskegon, an instrumented research vessel recorded ozone levels and wind patterns over Lake Michigan to determine if the high ozone levels were being transported over the lake. High ozone levels were observed over the lake and along the shore south of Muskegon. Back trajectories of the air parcels containing the ozone levels showed that these air parcels originated along the heavily industrialized urban southern shore of Lake Michigan. Further evidence of the importance of transport in causing this exceedance is the fact that Grand Rapids, a much larger and more heavily industrialized city than Muskegon approximately 50 km east of Muskegon, approached, but did not exceed, the NAAQS for ozone, although meteorological data were favorable for ozone formation in both Muskegon and Grand Rapids. Back trajectories of the air parcels entering Grand Rapids on this day indicated that they passed over the southern shore of Lake Michigan outside of the urban, industrialized Chicago-Gary area.

EPA's Region V currently is coordinating the development of an Urban Airshed Model that will encompass the greater Lake Michigan area. The Lake Michigan Oxidant Study (LMOS) will assess the transport of ozone precursor emissions and ozone across the lake to better explain the effect of emissions from eastern Wisconsin and the Chicago/Gary area on ozone levels in Michigan. The study will include many new inventories to be developed by EPA and the states bordering Lake Michigan. The Lake Michigan Oxidant Study will be completed in 1993.

2. The Effect of Transported Nonroad Emissions

The fact that ozone is a regional and not a local problem has been demonstrated by studies described previously and is widely understood and accepted. Congress demonstrated their understanding and acceptance of this concept by mandating the creation of regional

transport commissions in the CAAA. Transport work now concentrates on assessing the factors impacting transport and developing a way to model and quantify the transport effect

For the purposes of this study, EPA has used information gathered in developing ROMNET to tentatively quantify the effect of transported nonroad emissions on air quality in the Northeast Corridor. The impact of nonroad non-Corridor emissions may be roughly assessed by looking at the proportion of the non-Corridor inventory generated by the nonroad source categories. These categories are: nonroad diesel, nonroad gasoline, military aviation, civilian (commercial) aviation, general aviation, gasoline vessels, diesel vessels, and residual-fuel vessels. Their proportions of the inventory are shown in Table P-10

Table P-10. 1985 Nonroad Proportion of Non-Corridor Base Year Inventories (%)

	<u>VOC</u>	<u>NO_x</u>
Nonroad diesel	0.24	3.01
Nonroad gasoline	1.51	0.94
Vessels		
gasoline	0.46	0.04
diesel	0.04	0.35
residual fuel	----	0.03
<hr/> Total Nonroad	<hr/> 2.26	<hr/> 4.38

Several caveats should be observed in interpreting these numbers. First, the inventory proportions quoted in Table P-03 are for the base year 1985, not 2005, the year for which the control scenarios were modeled. Inventories for 2005 were not available from the ROMNET calculations because of the way in which inventory numbers were aggregated, speciated, and adjusted by the model during its projections. Also, the myriad meteorological and photochemical assumptions built into the ozone level predictions quoted in the last chapter make quantitative generalizations about the effects of changes in transport on ozone levels somewhat hazardous. Nonetheless, these calculations can help to illustrate the relative magnitude of the effect of transported pollutants from nonroad sources on several important nonattainment areas. Taken together, the categories of nonroad engines within the scope of

this report accounted for 2.3% of the non-Corridor VOC inventory and 4.4% of the non-Corridor NO_x inventory in 1985. Given the correlation of non-Corridor inventory reductions and Corridor peak ozone reductions posited above,¹ it appears that transported pollutants from nonroad sources account for roughly 0.5 ppb of the peak ozone concentrations in the Corridor cities as a whole and 0.6 ppb of the peak ozone concentration in the Baltimore/Washington and Philadelphia areas. One context for assessing the importance of these impacts on urban ozone would be to compare the magnitude of the effect of transported nonroad sources to the levels of ozone predicted in the major northeastern cities after the implementation of the Clean Air Act mandates modeled by ROMNET. As shown in Table P-11, transported pollutants from non-Corridor nonroad sources would account for roughly 0.3-0.45% of the ozone level along the East Coast during ozone nonattainment episodes.

Table P-11. Clean Air Act Scenario

	<u>Post-CAA Ozone Level</u>	<u>% from Noncorridor Nonroad</u>
Baltimore	134	0.45
Philadelphia	135	0.44
New York City	184	0.27
Boston	131	0.38

3. Transport Conclusions

An analysis of ROMNET study finds the following:

¹ One percent of non-Corridor emissions roughly account for 0.14 ppb of the peak ozone concentration in the corridor cities on average, and about 0.18 ppb of the peak ozone concentration of the Washington/Baltimore and Philadelphia areas.

1. Transport from all sources from non-Corridor areas into the Northeast Corridor contributes to nonattainment in several cities in the Northeast.
2. Currently, nonroad emissions outside the Corridor area account for approximately 2.3% of the VOC non-corridor inventory and 4.4% of the NO_x non-corridor inventory (see Table P-10).
3. In the absence of regulation of nonroad sources, the proportions listed in 2 above will probably increase in the future, as regulations are applied to more of the remaining source categories and are further tightened on categories already subject to emission regulation.
4. Nonroad sources cannot be discounted as insignificant merely because they are outside the boundaries of nonattainment areas.

Again, as the studies quoted in this chapter have demonstrated, ozone is a regional and not a local problem. Airborne transport of ozone and its precursors does not stop at city, county, or state boundaries. Apparently, it is not uncommon for transported pollutants to impact ozone levels 200 miles from the source of the emissions. At this time, it is difficult to quantify precisely the distance ozone and ozone precursors typically travel, but clearly a complete list of sources contributing to urban nonattainment cannot stop at the nonattainment area's border. Thus, nonroad sources outside nonattainment areas may be assumed to contribute to urban nonattainment.

EPA and state officials are continuing to study the role of transport in nonattainment. Therefore, our understanding of transport should be considerably expanded within the next few years. EPA's Office of Air Quality Planning and Standards (OAQPS) is currently working on extensions to the results presented in the ROMNET draft study. These include applying the regional oxidant model to the Southeast and Midwest, in addition to modeling the effect of the Clean Air Act, as actually passed, on the Northeast. Much of this work will provide support to states containing nonattainment areas in their efforts to comply with the inventory and air quality modeling requirements of the Clean Air Act. OAQPS will also be

working with the Northeast transport commission required by the Clean Air Act to help them develop strategies for attainment. These regional models will continue to use existing national emission inventories, which, as discussed above, have some shortcomings in the area of nonroad emissions. Currently, efforts are underway to establish a new national inventory for nonroad engines and other area and mobile sources, called the Aerometric Information Retrieval System/Area and Mobile Source file (AIRS/AMS). The results of these regional models will be re-evaluated using the new inventories as soon as they are available in 1993

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