

MATES-III

Protocol for Emission Inventory Development

Tom Chico
March 31, 2004

Overview

- Inventory based on 2003 AQMP
- 1997 base year
- Projected to 2004 using growth and control factors from the 2003 AQMP
- Point source emissions based on FY 2002-2003 activity
- 2 km by 2 km gridded inventory

Overview (continued)

- “Bottom-up” inventories for
 - Gas stations
 - Perchloroethylene dry cleaners
 - Metal Plating and Finishing facilities
- Incorporate PoLA & PoLB inventories

Point Sources – Data & Methods

- AER facilities
 - 3000+ facilities report annually
 - Criteria pollutants & 24 TACs
 - 24 TACs estimated from source activity & emission factors
 - Important unreported compounds estimated using representative fuel/equipment emission factors

AER Reported Pollutants

SO _x	Cadmium	Lead
VOC	Carbon tetrachloride	Methylene chloride
SPOG	Dioxins & furans	Nickel
NO _x	1,4-Dioxane	Perchloroethylene
PM	Ethylene dibromide	PAHs
CO	Ethylene dichloride	Trichloroethylene
Asbestos	Ethylene oxide	Vinyl chloride
Benzene	Formaldehyde	Chlorofluorcarbons
Beryllium	Hexavalent chromium	1,1,1-Trichloroethane
1,3-Butadiene	Inorganic arsenic	Ammonia

Point Sources – Data & Methods (continued)

- AB2588 facilities
 - 700+ facilities report quadrennially
 - 170+ toxics reported
 - Toxic emissions estimated from source activity & emission factors

AB 2588 Reported Pollutants

Acetaldehyde	Copper	Glycol ethers	Methyl ethyl ketone	Selenium
Acrolein	Crystalline silica	Hexachlorobenzene	Methyl isobutyl ketone	Sodium hydroxide
Acrylonitrile	DEHP	Hexachlorocyclohexanes	MTBE	Styrene
Ammonia	Dioxins & furans	Hexane	Methylene chloride	1,1,2,2-Tetrachloroethane
Arsenic	1,2-Dichloropropane	Hydrazine	Nickel	Sulfuric acid & oleum
Asbestos	1,3-Dichloropropene	Hydrochloric acid	p-Dichlorobenzene	Toluene
Benzene	Diesel PM	Hydrogen fluoride	PAHs	1,1,2-Trichloroethane
Beryllium	Dimethyl phthalate	Hydrogen sulfide	PCBs	Trichloroethylene
1,3-Butadiene	1,4-Dioxane	Isocyanites & diisocyanates	Pentachlorophenol	1,2,4-Trimethylbenzene
Cadmium	Ethyl benzene	Lead	Perchloroethylene	Urethane
Carbon tetrachloride	Ethylene dibromide	Manganese	Phosphorous	Vinyl chloride
Carbonyl sulfide	Ethylene dichloride	Mercury	Phosphorous compounds	Xylenes
Chlorine	Ethylene oxide	Methanol	POMs & PAH derivatives	Chlorodifluoromethane
Chloroform	Fluorocarbons	Methyl chloride	Propylene oxide	
Hex. chrome	Formaldehyde	Methyl chloroform	Quinoline	

Emission Factors (lbs/MMcf) for External Combustion of Natural Gas

TAC Code	Pollutant	CAS	< 10 MMBtu	10-100 MMBtu	> 100 MMBtu
2	Benzene	71432	0.0080	0.0058	0.0017
12	Formaldehyde	50000	0.0170	0.0123	0.0036
19	PAHs (excl. naphthalene)	1151	0.0001	0.0001	0.0001
19	Naphthalene	91203	0.0003	0.0003	0.0003
29	Acetaldehyde	75070	0.0043	0.0031	0.0009
30	Acrolein	107028	0.0027	0.0027	0.0008
40	Ethyl benzene	100414	0.0095	0.0069	0.0020
44	Hexane	110543	0.0063	0.0046	0.0013
68	Toluene	108883	0.0366	0.0265	0.0078
70	Xylene	1330207	0.0272	0.0197	0.0058

Area Sources – Data & Methods

- For area source categories estimated by ARB, statewide emission estimates apportioned to county levels
- For area source categories estimated by SCAQMD, emissions estimated at the county level
- Emissions allocated to 2 km by 2 km grid cells using spatial surrogates
- Toxics emissions estimated from VOC & PM emissions using source-specific speciation profiles

Area Sources – Data & Methods

(continued)

- Emissions based of 2003 AQMP (1997 baseline)
- Emissions projected to year of interest
- “Bottom-up” inventories for
 - Gas stations
 - Perchloroethylene dry cleaners
 - Metal Plating and Finishing facilities

On-Road Sources – Data & Methods

- EMFAC2002 – ARB's on-road emission factor model
- Toxics emissions estimated from VOC & PM emissions using source-specific speciation profiles
- Emissions allocated to 2 km by 2 km grids based on link activity using DTIM
- Emissions based on 2003 AQMP

Off-Road Sources – Data & Methods

- Majority of off-road source categories estimated by ARB's OFFROAD model
- Aircraft emissions estimated by SCAQMD
- Toxics emissions estimated from VOC & PM emissions using source-specific speciation profiles

Off-Road Sources – Data & Methods (continued)

- Emissions allocated to 2 km by 2 km grid cells using spatial surrogates
- Emissions based on 2003 AQMP
- Incorporate PoLA & PoLB inventories

Schedule

Task	Description	Schedule
1	Emission Inventory Protocol	Mar 2004
2	Development of point source inventory	Feb to Jul 2004
3	Development of basin-wide toxic inventory	Jul to Sep 2004
4	Presentation of basin-wide inventory at meeting	Oct 2004
5	Development of gridded toxic inventory	Oct to Dec 2004
6	Presentation of gridded toxic inventory at meeting	Jan 2005
7	Presentation of outline for inventory report at meeting	Jan 2005
8	Draft inventory report	Mar 2005
9	Final inventory report	May 2005