

Bay Area Emissions Inventory Summary Report: Criteria Air Pollutants

Base Year 2011



May 2014



939 Ellis Street
San Francisco, California 94109

BAY AREA EMISSIONS INVENTORY
SUMMARY REPORT: CRITERIA AIR POLLUTANTS

BASE YEAR 2011

BAY AREA AIR QUALITY MANAGEMENT DISTRICT

May 2014

Prepared by

Exposure Assessment and Emissions Inventory Section

**Amir K. Fanai
Sukarn J. Claire
Tan M. Dinh
Michael H. Nguyen
Stuart A. Schultz**

Reviewed by

Philip T. Martien, PhD, Section Manager

Approved by

Henry Hilken, Director of Planning and Research

TABLE OF CONTENTS

	Page
Introduction	1
Summary	2-4
Summary Tables and Figures	4-13
Discussion of Emission Trends	13-15
Additional Information	15
County Emissions by Source Category	16-24
Projected 2014 Air District Emissions	25
Major Emitting Facilities for 2011 (Permitted Stationary Sources)	26-28

LIST OF TABLES

	Page
Table 1 General Statistics.....	4
Table 2 County Statistics	5
Table 3 Emissions Summary	5
Table 4 Distribution of 2011 Annual Average Emissions.....	6
Table 5 Summary of Emissions by Source Category (Annual Average).....	7
Table 6 Summary of Emissions by Source Category (Summer).....	11
Table 7 Summary of Emissions by Source Category (Winter)	12
Table 8 Summary of Emissions by Source Category - Alameda County	16
Table 9 Summary of Emissions by Source Category - Contra Costa County ...	17
Table 10 Summary of Emissions by Source Category - Marin County	18
Table 11 Summary of Emissions by Source Category - Napa County	19
Table 12 Summary of Emissions by Source Category - San Francisco County ..	20
Table 13 Summary of Emissions by Source Category - San Mateo County	21
Table 14 Summary of Emissions by Source Category - Santa Clara County	22
Table 15 Summary of Emissions by Source Category - Solano County	23
Table 16 Summary of Emissions by Source Category - Sonoma County	24
Table 17 Summary of Emissions by Source Category - 2014 Projected	25
Table 18 Major Emitting Facilities - 2011 Annual Average Emissions	26-28

LIST OF FIGURES

	Page
Figure 1 Bay Area Real GRP, Population, VMT, Aggregate Emission & Concentrations	2
Figure 2 Emissions versus Concentrations	3
Figure 3 Distribution of 2011 Annual Average Emissions.....	6
Figure 4 Bay Area Annual Average 2011 Emissions by County.....	9
Figure 5 Bay Area Annual Average Emissions Trends.....	10

INTRODUCTION

This document summarizes the most recent emissions inventory of criteria pollutants for the Bay Area Air Quality Management District (Air District) based on year 2011.

To protect public health and the environment, EPA has established, and regularly reviews, national ambient air quality standards (NAAQS) for six principal air pollutants also known as criteria pollutants: ground-level ozone (O₃), particulate matter (PM), nitrogen dioxide (NO₂), carbon monoxide (CO), sulfur dioxide (SO₂), and lead (Pb)¹.

Some of these pollutants (CO, SO₂, and lead) are emitted directly from a variety of sources. Ozone is not directly emitted, but is formed when nitrogen oxides (NO_x) and reactive organic gases (ROG) react in the presence of sunlight. Some NO₂ is directly emitted but most is formed in the air through the oxidation of nitric oxide (NO). PM, also known as particle pollution, can be directly emitted or formed when gaseous emissions react in the atmosphere. Particle pollution is regulated as PM_{2.5}, or “fine particles” with diameters less than or equal to 2.5 micrometers (µm), and PM₁₀, which includes all particles with diameters less than or equal to 10 µm.

Included in the criteria emissions inventory are ROG, NO_x, PM₁₀, PM_{2.5}, SO₂ and CO. Lead emissions are not reported in this criteria pollutants report, as these are included as part of the toxic air contaminant (TAC) reporting process². A companion report to this criteria pollutants report provides emissions summaries for greenhouse gases³.

The emissions inventory is an important tool for developing strategies to improve air quality. The inventory provides information on the location, magnitude, and relative contribution of pollutant emissions in an air basin. The Bay Area emissions inventory is used by the Air District in air quality planning to develop emission control programs to attain clean air goals. The inventory also serves as a source of information to the general public, government agencies, developers, consultants, planners, and others engaged in studies related to air pollution.

In addition to this Summary Report, another related document, “*Base Year 2011, Emission Inventory Source Category Methodologies*”⁴, gives a detailed description of the methodologies used to develop this inventory. Tables and figures are available online used in this summary report⁵.

¹ <http://www.epa.gov/air/criteria.html>.

² “Toxic Air Contaminant Control Program Annual Report”, May 2013, web link: <http://www.baaqmd.gov/Divisions/Engineering/Air-Toxics/Toxic-Air-Contaminant-Control-Program-Annual-Report.aspx>.

³ “Source Inventory of Bay Area Greenhouse Gas Emissions”, April 2014, web link: <http://www.baaqmd.gov/Divisions/Planning-and-Research/Emission-Inventory/Greenhouse-Gases.aspx>

⁴ <http://www.baaqmd.gov/Divisions/Planning-and-Research/Emission-Inventory/Methods.aspx>

⁵ <http://www.baaqmd.gov/Divisions/Planning-and-Research/Emission-Inventory/Criteria-Pollutants.aspx>

SUMMARY

The Base Year 2011 inventory consists of emissions inventory estimates for the year 2011, plus historical and future year emission projections for the period 1990 through 2030. This inventory replaces the Air District's previous comprehensive emissions inventory, the Base Year 2008 Emissions Inventory, 2011⁶.

Figure 1 shows a 77% increase in the Bay Area's gross regional product (GRP), a 23% increase in population, and a 30% increase in vehicle miles traveled (VMT) between 1990 and 2011. However, there have been reductions in aggregate emissions and aggregate concentrations of nearly 62% and 56%, respectively. Aggregate emissions were calculated by the summation of each weighted criteria pollutant⁷ (PM₁₀, ROG, NO_x, SO₂ and CO) compared to its 1990 value. Similarly, this method of calculation was applied to aggregate concentrations. Ammonium nitrate and ammonium sulfate (both secondary PM), were not included in the direct particulate (PM_{2.5} and PM₁₀) emissions component of the aggregate concentrations. The 2011 - 2030 projections of GRP, population, VMT show increases of 66%, 18%, and 16%, respectively, from 2011 values. The aggregate emissions are estimated to decrease by 8% during the same time period with existing regulations.

Figure 1. Bay Area Real GRP, Population, VMT, Aggregate Emissions, Aggregate Concentrations

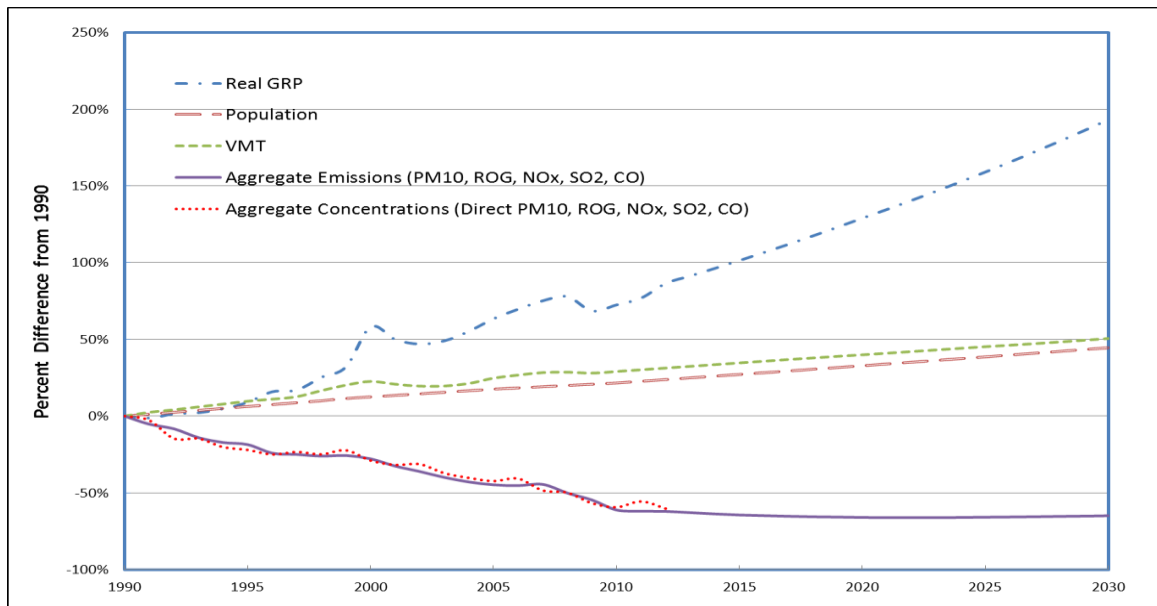


Figure 2 shows the percent difference from 1990 of PM_{2.5}, PM₁₀, ROG, NO_x, SO₂, and CO emissions versus the ambient concentrations of the same pollutants during the time period of 1990 – 2012. Ammonium nitrate and ammonium sulfate (both secondary PM), were not included in the direct particulate (PM_{2.5} and PM₁₀) emissions component of the aggregate concentrations.

The ambient concentration for each pollutant was calculated using the following method:

⁶ <http://www.baaqmd.gov/-/media/Files/Planning%20and%20Research/Emission%20Inventory/BY08SummaryReportFinal.ashx>

⁷ A weighted criteria pollutant emission value for a given year is the criteria emission value divided by its 1990 value.

- A set of air monitoring sites was identified for each pollutant for the years 1990-2012. The set of these chosen sites varied from pollutant to pollutant.
- Annual mean concentrations were computed for each site using quarterly averages. If quarterly averages were missing from a site, the annual mean concentrations were estimated using a two-way analysis of variance (ANOVA) approach.
- Then the mean average concentration across the sites for each pollutant was calculated for each year.

Figure 2. Emissions versus Concentrations

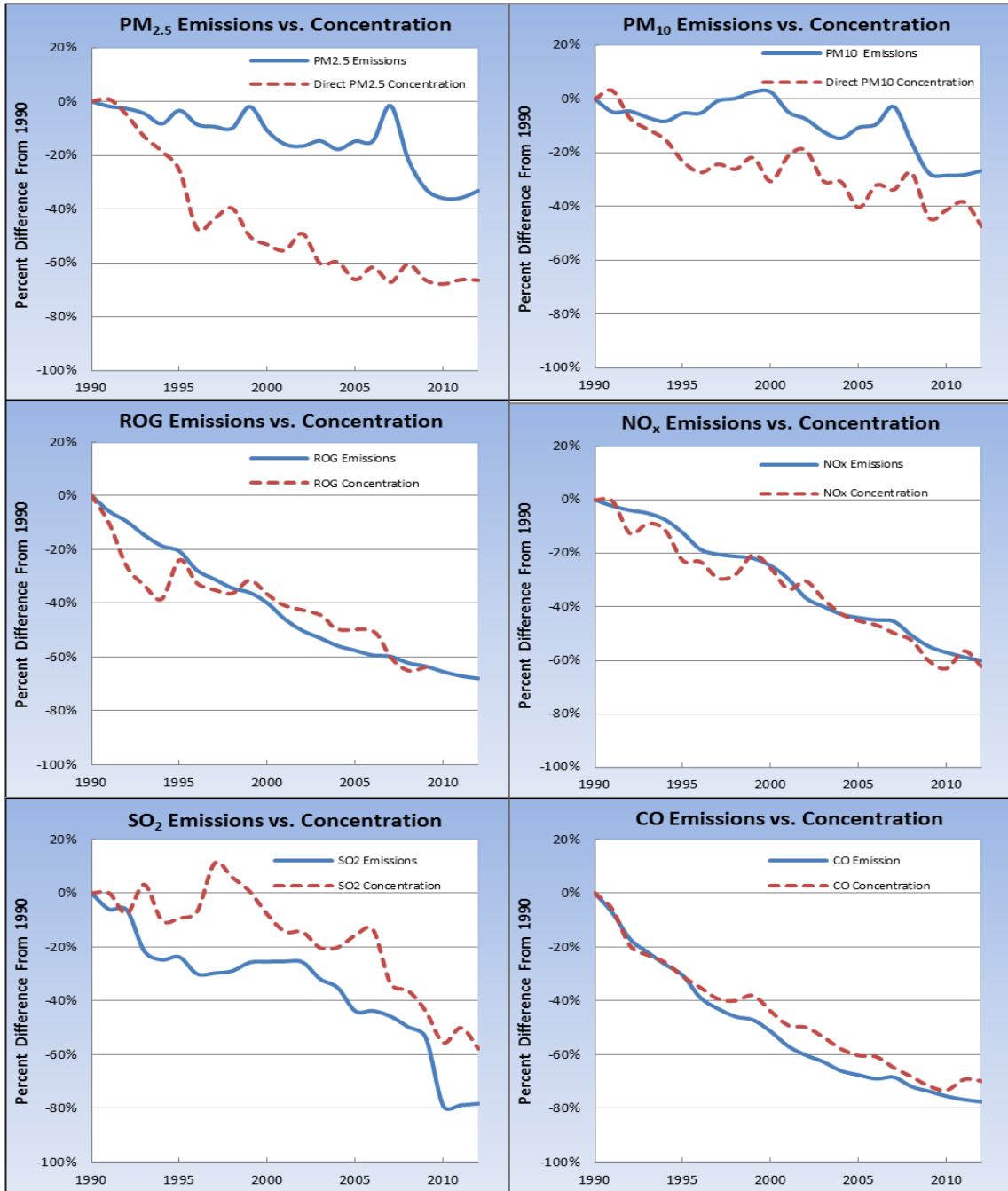


Figure 2 shows that ROG, NO_x, and CO trends are in close agreement. However, the PM_{2.5} and PM₁₀ emission trends are generally 10% to 50% higher than the respective direct PM_{2.5} and PM₁₀ concentration trends. The SO₂ emission trend is 10% to 30% lower than the SO₂ concentration trend. Further investigation is needed to understand and possibly correct the differences between emissions and concentration trends for PM and SO₂.

An early estimate of the 2011 emissions inventory was used to produce an emissions inventory for 2010 for Air District’s Particulate Matter State Implementation Plan (PM SIP) submittal in November 2012. For more details about this inventory, please refer to the Air District’s publication “Understanding Particulate Matter”, pages 81-99⁸.

The 2011 emissions inventory, covering over 1,100 source categories, is a detailed accounting of emission sources. All current, past, and future emissions have been reviewed or recalculated using the best available emission factors and methodologies. Because updated information has been used, the results reported in this report differ in places from earlier published inventories. Readers should note that emission rates reported are estimates based on tests, published emission factors, and engineering calculations. As new data and improved methodologies become available, inventory estimates change.

Summary Tables

- General statistics for the Bay Area and individual counties in Tables 1 and 2 show population, area, vehicle population; estimated vehicle miles travelled (VMT) and total gasoline sales.

Table 1
General Statistics
San Francisco Bay Area
Trends in Population, Number of Vehicles and Vehicle Miles Traveled (VMT)

All in Millions	1990	1995	2000	2005	2010	2015	2020	2025	2030
Population ¹	5.883	6.250	6.618	6.916	7.152	7.480	7.814	8.155	8.503
Number of Vehicles ¹	3.784	4.123	4.548	4.575	4.902	5.065	5.249	5.455	5.658
Daily VMT ²	134.997	148.108	165.491	168.375	174.235	181.799	188.906	196.062	203.246

¹ Within the Air District jurisdiction

² Vehicle Miles Travelled Based on CARB’s EMFAC2011-SG Version 1.1 (March 2013)

⁸ Understanding Particulate Matter: Protecting Public Health in the Bay Area, November 2010
http://www.baaqmd.gov/~media/Files/Planning%20and%20Research/Plans/PM%20Planning/ParticulatesMa tter_Nov%207.ashx

Table 2
2011 County Statistics

County	Population	Area (Square Miles)			Natural Gas Usage (ft ³)	Gasoline Usage (gallons)	Number of Vehicles	Daily VMT
		(Millions)	Land	Water				
Alameda	1.565	738	84	822	121	1,626	1.056	39.921
Contra Costa	1.098	720	82	802	607	966	0.749	27.926
Marin	0.257	520	308	828	22	336	0.204	6.497
Napa	0.140	754	35	789	12	140	0.127	5.117
San Francisco	0.816	47	185	232	98	402	0.413	13.563
San Mateo	0.740	449	292	741	62	777	0.563	21.101
Santa Clara	1.847	1,291	13	1,304	215	1,772	1.289	42.870
Solano ¹	0.316	370	64	434	55	543	0.198	7.780
Sonoma ¹	0.440	664	4	668	28	480	0.333	10.974
TOTAL	7.218	5,553	1,067	6,620	1,219	7,041	4.931	175.748

¹ Within the Air District jurisdiction

- Emissions summary for San Francisco Bay Area for 2011 is shown in Table 3.

Table 3
Emissions Summary
San Francisco Bay Area
Total 2011 Average Daily Emissions (tons/day)

Particulate Matter <10 Microns (PM ₁₀)	Particulate Matter <2.5 Microns (PM _{2.5})	Reactive Organic Gases (ROG)	Nitrogen Oxides (NO _x)	Sulfur Dioxide (SO ₂)	Carbon Monoxide (CO)
105	45	273	316	21	1,327

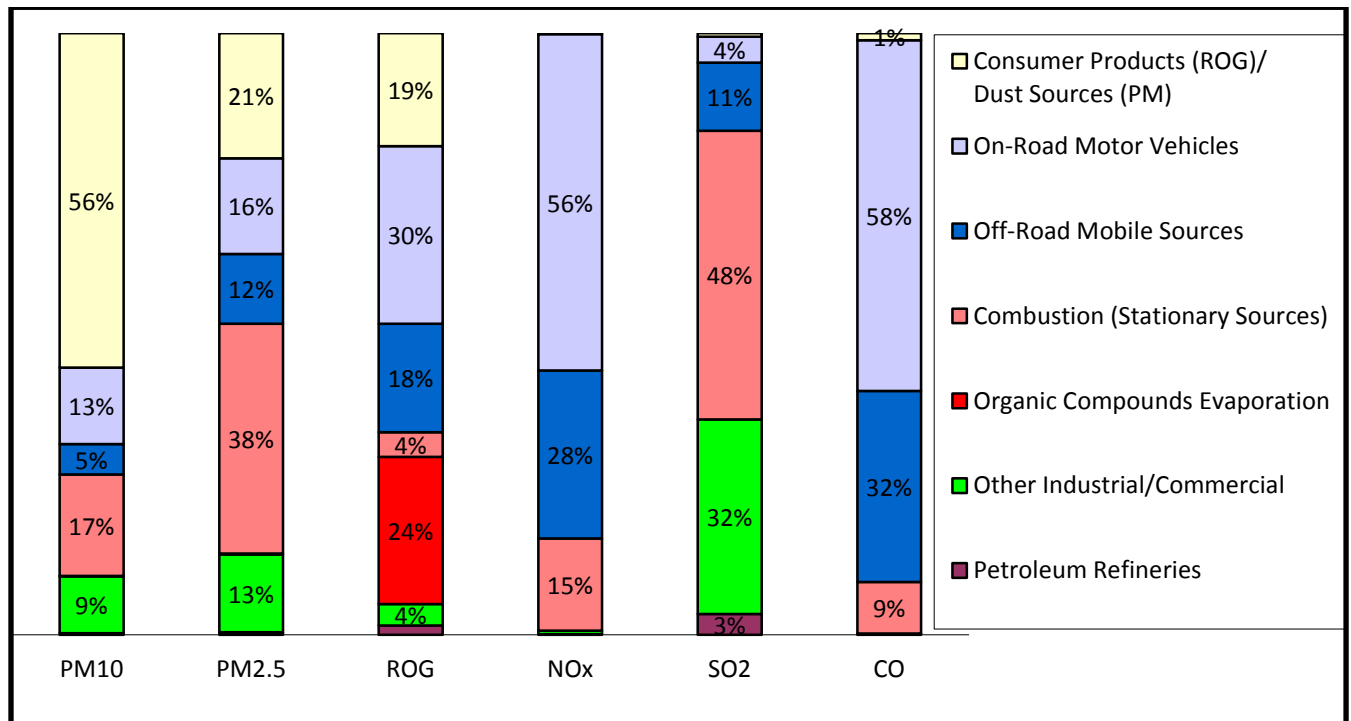
- Percent contribution from seven major source categories are shown in Table 4 and presented as a chart in Figure 3. These show that on-road motor vehicles produce about 29% of reactive organic gases (ROG) and 55% of nitrogen oxides (NO_x) emissions and therefore remain the single largest source of the ozone precursor emissions in the Bay Area. Off-road mobile sources are also important sources of ozone precursors, particularly of NO_x; off-road mobile sources produce 30% of the total NO_x. Combustion from stationary sources, off-road mobile sources and on-road motor vehicles are major sources of PM_{2.5}. Included in the dust sources category are two sources of PM_{2.5} of road dust produced by on-road motor vehicles traveling on paved and unpaved roads (9% of total PM_{2.5}), and construction and

farming operations (8% of total PM_{2.5}). Note that these are direct emissions only and do not include secondary PM_{2.5} such as ammonium nitrate and ammonium sulfate. SO₂ emissions from ships were reduced significantly due to the introduction of ultra-low sulfur fuel in 2009. As a result, SO₂ emissions are largely produced by combustion at stationary sources, particularly at refineries and during refinery operations. On-road motor vehicles are also major contributor to carbon monoxide (CO) emissions, accounting for 58% of the regional emissions.

Table 4
Distribution of 2011 Annual Average Emissions

Major Source Category	Percent					
	PM ₁₀	PM _{2.5}	ROG	NO _x	SO ₂	CO
Petroleum Refining Processes	0	0	2	0	3	0
Other Industrial/ Commercial Processes	9	13	4	1	32	--
Organic Compounds Evaporation	--	0	24	--	--	--
Combustion	17	38	4	15	48	9
Off-Road Mobile Sources	5	12	18	28	11	32
On-Road Motor Vehicles	13	16	30	56	4	58
Consumer Products/Dust Sources/Fires	56	21	19	0	1	1
GRAND TOTAL	100	100	100	100	100	100

Figure 3. Distribution of 2011 Annual Average Emissions



- Detailed daily 2011 annual average emissions for the Air District are shown in Table 5.

Table 5

Bay Area Air Quality Management District
 Summary of Emissions by Source Category
 Year 2011

Bay Area
 Annual Average Emissions (tons/day)

SOURCE CATEGORY	PM10	PM2.5	ROG	NOx	SO2	CO
PETROLEUM REFINING PROCESSES						
Petroleum Refining	0.3	0.2	0.1	--	0.3	--
Other Refining Processes	--	--	3.5	0.5	0.5	1.8
Fugitives	--	--	0.6	--	--	--
OTHER INDUSTRIAL/COMMERCIAL PROCESSES						
Chemical Manufacturing Processes	0.5	0.4	1.6	1.4	6.4	0.2
Food, Wine and Agricultural Processes	3.3	2.1	2.9	--	--	0.2
Metallurgical and Mineral Processes	3.5	2.4	0.4	0.3	0.5	0.5
Gas and Oil Production Fields	--	--	--	--	--	--
Waste Management	1.9	0.6	3.6	--	--	--
Semiconductor Manufacturing and Other Processes	0.8	0.5	1.3	--	--	--
ORGANIC COMPOUNDS: EVAPORATION						
Loading, Blending, Storage at Refineries	--	--	4.8	--	--	--
Natural Gas Distribution	--	--	0.6	--	--	--
Bulk Plants	--	--	0.7	--	--	--
Gasoline Filling Stations	--	--	5.2	--	--	--
Aircraft, Boats and Other Refueling	--	--	2.5	--	--	--
Solvent Cleaning	--	--	4.5	--	--	--
Dry Cleaners	--	--	0.6	--	--	--
Printing	--	--	4.0	--	--	--
Adhesives and Sealants	--	--	9.9	--	--	--
Structures Coating	--	--	18.4	--	--	--
Industrial/Commercial Coatings	--	--	7.6	--	--	--
Other Evaporation	--	--	8.3	--	--	--
COMBUSTION - STATIONARY SOURCES						
Domestic Combustion	12.0	11.6	5.5	13.8	0.4	82.3
Cogeneration	0.7	0.7	2.1	4.1	0.4	5.4
Power Plants	0.3	0.3	--	1.0	--	0.6
Refineries	2.5	2.4	1.0	8.2	5.0	3.8
Other Fuels Combustion	2.0	1.9	2.1	20.9	4.4	18.8
Waste Burning and Incineration	0.4	0.4	0.3	0.3	--	2.9
OFF-ROAD MOBILE SOURCES						
Lawn, Garden, and Utility Equipment	0.5	0.5	16.1	4.7	--	117.8
Industrial Equipment	0.2	0.2	1.3	6.3	--	60.1
Light Commercial Equipment	0.7	0.7	5.0	6.9	--	89.0
Oil Drilling Equipment	--	--	--	0.2	--	--
Farm and Construction Equipment	1.1	1.1	2.9	17.9	--	32.3
Locomotives	0.3	0.3	1.0	12.4	0.2	2.0
Off-Road Motorcycles and 4-Wheel Drives	--	--	1.0	--	--	5.3
Ships and Boats	2.3	2.3	17.9	27.3	1.1	87.6
Commercial Aircraft/Ground Support Equipment	0.2	0.2	3.1	9.9	0.9	14.9
General Aviation & Agricultural Aircraft	0.1	--	0.4	0.1	--	10.8
Military Aircraft	--	--	0.6	2.3	0.2	1.4
ON-ROAD MOTOR VEHICLES						
Passenger Cars/Light Duty Trucks<6000lbs	7.4	3.3	53.9	51.1	0.6	523.7
Medium and Heavy Duty Trucks <33000 lbs	2.9	1.7	16.7	57.1	0.3	172.6
Heavy Duty Diesel Trucks/Buses>33000 lbs	2.9	2.2	4.0	65.8	--	25.3
Motor-Homes	--	--	0.2	0.9	--	4.4
Motorcycles	--	--	6.0	1.7	--	47.9
MISCELLANEOUS						
Construction and Farming Operations	27.5	3.5	4.8	--	--	--
Paved and Unpaved Road Dust	29.1	4.2	--	--	--	--
Pesticides	--	--	5.9	--	--	--
Consumer Products (Excluding Pesticides)	--	--	39.6	--	--	--
Accidental Fires/Cigarette Smoking	1.9	1.8	0.9	0.5	0.1	15.0
GRAND TOTAL EMISSIONS	105	45	273	316	21	1327

Biogenic emissions are not included in this table

The symbol -- means less than 0.1 tons/day

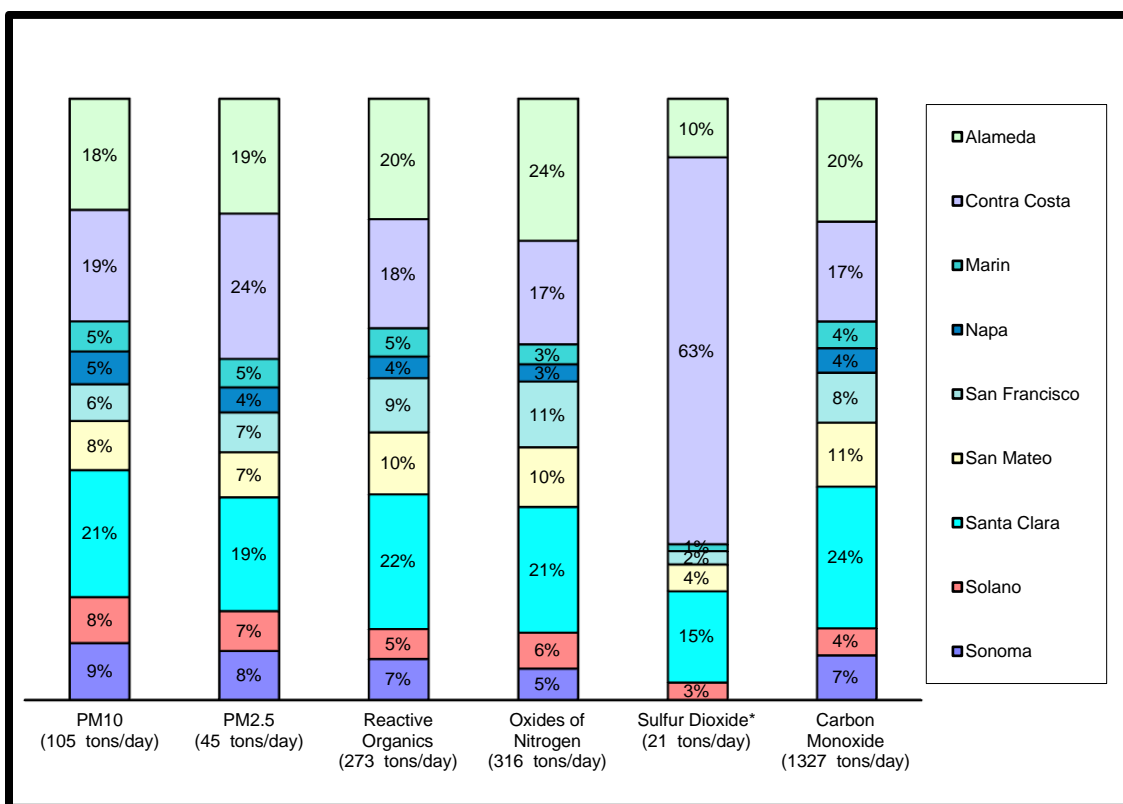
- Estimates for on-road motor vehicle emissions are based on California Air Resources Board (CARB) latest emissions factor model, EMFAC2011. In preparing EMFAC2011, CARB staff determined the population and compositions of medium and heavy duty diesel truck fleets (over 14,000 pounds gross vehicle weight, e.g. construction trucks, port trucks, in-state trucks, etc.), as well as their age distribution and VMT. Emission factors for medium and heavy duty diesel truck have been updated to reflect the major benefits of recent CARB regulations to reduce emissions from diesel trucks and buses. The EMFAC2011 model also includes the impact of the recent economic recession on both diesel and gasoline vehicle activity.
- CARB released the In-Use Off-Road Equipment (Construction, Industrial, Airport Ground Support and Oil Drilling) model in November, 2010⁹. The estimates included corrections to baseline assumptions, such as equipment population and activity data (hours of operation, load factor, etc.) as well as the impact of the recent recession and major revisions to CARB's In-use Off-Road Diesel regulation (AB1085). Construction equipment PM₁₀ and NO_x emissions were previously overestimated because equipment population, age and activity were over-estimated. The diesel fuel consumption in the Bay Area for this updated Off-Road model reflected consumption levels that were considerably lower than diesel fuel usage projected by the CARB's OFFROAD2007 model. As a result, the off-road diesel construction, industrial, and oil drilling equipment emission estimates have been reduced by 50% from the previous base year estimates. The updated version of CARB's Off-Road model did not provide estimates for SO₂, CO, and GHG emissions and other fuel types (gasoline and natural gas). Consequently, these emission factors and emissions for gasoline and natural gas equipment were obtained from CARB's OFFROAD2007 model.
- Ship emission estimates have been updated since the previous base year. CARB has updated the methodology to calculate emission from ships. Most notable, the emissions include updates to fuel regulation for ships and the 2007 Shore Power Regulation. Minor revisions and corrections to the emission estimate include updated auxiliary engine information, updated ship routing data, revised vessel speed reduction compliance rates, and adjustments to account for the economic recession. Ship emissions reported in this inventory are based on ship activity within 3 nautical miles of the coastline. Emissions estimates based on activity within 3-24 nautical miles and 24-100 nautical miles of the coastline are also available. However, these are not reported in this report as they are used for regulations and modeling.
- The overall pace of the economic recovery continues to affect the aviation activity in the San Francisco Bay Area. Between 2007 and 2011, the overall regional aviation activity has declined leading to decrease in emissions, with

⁹ http://www.arb.ca.gov/msei/categories.htm#offroad_motor_vehicles.

exception of San Francisco Airport, where number of aircraft operations has continued to increase. During this period combined aircraft operations at Oakland and San Jose Airports decreased by 18.2% and operations at San Francisco Airport increased by 8.5%.

- Charts of county emissions as a percentage of the total Bay Area emissions by pollutants are shown in Figure 4. Note that refinery operations in Contra Costa County, a cement plant in Santa Clara County, shipping activities associated with Port of Oakland in Alameda County cause large SO₂ emissions in those counties. Shipping activities in San Francisco, San Mateo and Marin Counties also contribute to higher than average SO₂ emissions in those counties.

Figure 4. Bay Area Annual Average 2011 Emissions by County



- Emission trends (1990-2030) for ROG, NO_x, PM₁₀, PM_{2.5}, SO₂ and CO are shown in Figure 5. Please refer to the Discussion section below for discussion of pollutant trends.
- Summer and winter emissions inventories are shown in Tables 6 and 7. Summer emissions are used for ozone planning, since ozone peaks in summer and winter emissions for PM planning, as PM peaks in winter. Emissions are higher in the summer for certain pollutants, such as evaporative ROG emissions, and higher in winter for other pollutants, such as PM₁₀ emissions from fireplaces.

Figure 5. Bay Area Annual Average Emissions Trends

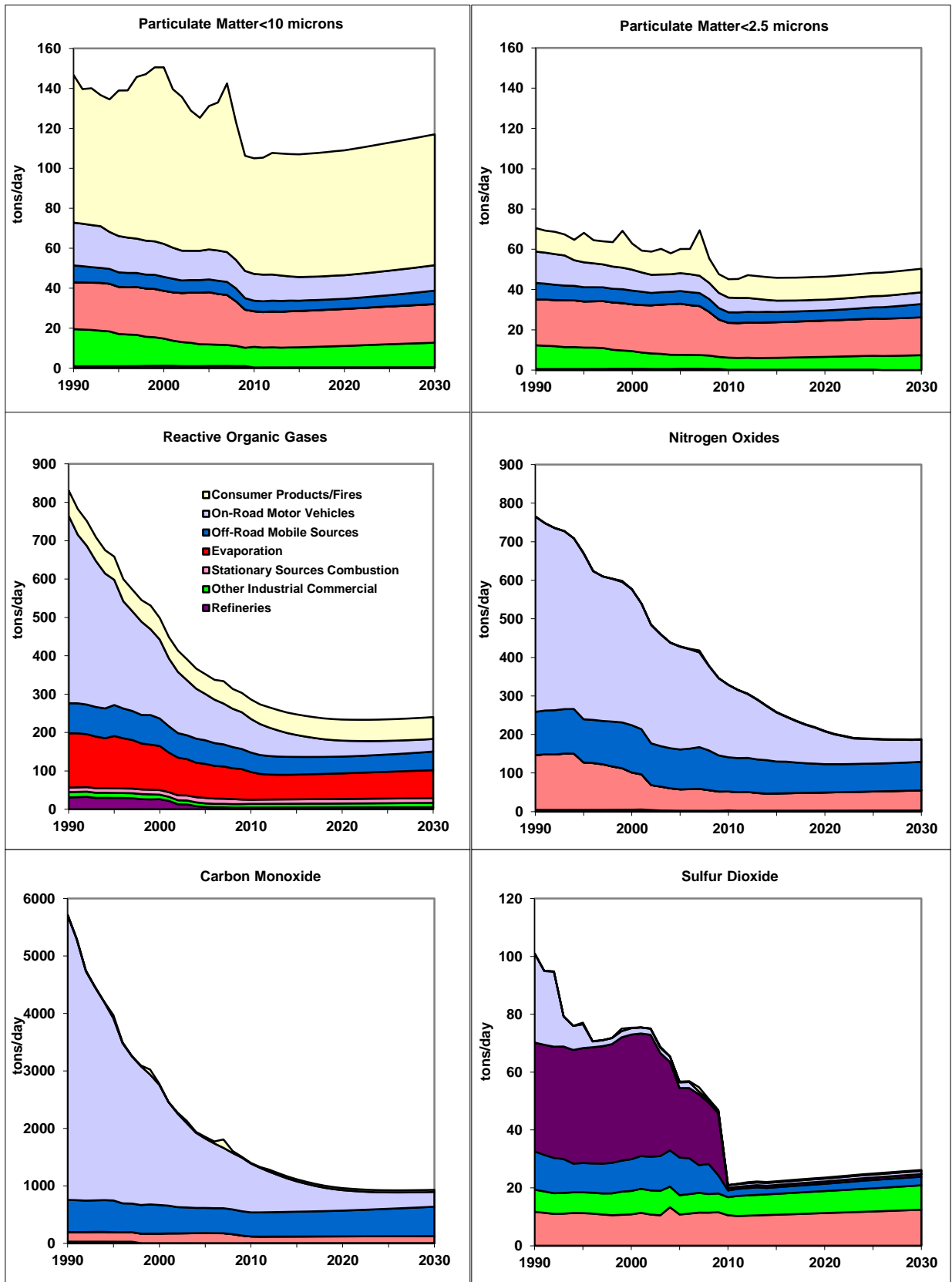


Table 6

Bay Area Air Quality Management District
 Summary of Emissions by Source Category
 Year 2011

Bay Area
 Summer Emissions (tons/day)

SOURCE CATEGORY	PM10	PM2.5	ROG	NOx	SO2	CO
PETROLEUM REFINING PROCESSES						
Petroleum Refining	0.3	0.2	0.1	--	0.3	--
Other Refining Processes	--	--	3.5	0.5	0.5	1.8
Fugitives	--	--	0.6	--	--	--
OTHER INDUSTRIAL/COMMERCIAL PROCESSES						
Chemical Manufacturing Processes	0.5	0.5	1.6	1.4	6.6	0.2
Food, Wine and Agricultural Processes	3.3	2.1	2.8	--	--	0.2
Metallurgical and Mineral Processes	3.9	2.6	0.4	0.3	0.5	0.6
Gas and Oil Production Fields	--	--	--	--	--	--
Waste Management	1.9	0.6	3.6	--	--	--
Semiconductor Manufacturing and Other Processes	0.8	0.5	1.3	--	--	--
ORGANIC COMPOUNDS EVAPORATION						
Loading, Blending, Storage at Refineries	--	--	4.8	--	--	--
Natural Gas Distribution	--	--	0.5	--	--	--
Bulk Plants	--	--	0.8	--	--	--
Gasoline Filling Stations	--	--	5.2	--	--	--
Aircraft, Boats and Other Refueling	--	--	2.6	--	--	--
Solvent Cleaning	--	--	4.9	--	--	--
Dry Cleaners	--	--	0.6	--	--	--
Printing	--	--	4.0	--	--	--
Adhesives and Sealants	--	--	9.9	--	--	--
Structures Coating	--	--	19.3	--	--	--
Industrial/Commercial Coatings	--	--	7.8	--	--	--
Other Evaporation	--	--	8.5	--	--	--
COMBUSTION - STATIONARY SOURCES						
Domestic Combustion	4.0	3.9	2.0	6.8	0.2	27.2
Cogeneration	0.7	0.7	2.1	4.1	0.4	5.4
Power Plants	0.3	0.3	--	1.0	--	0.7
Refineries	2.5	2.5	1.1	8.2	5.0	3.9
Other Fuels Combustion	2.0	2.0	2.1	21.4	4.4	19.3
Waste Burning and Incineration	0.3	0.3	0.3	0.3	--	2.5
OFF-ROAD MOBILE SOURCES						
Lawn, Garden, and Utility Equipment	0.5	0.5	17.9	5.0	--	130.5
Industrial Equipment	0.2	0.2	1.4	7.1	--	67.0
Light Commercial Equipment	0.8	0.8	5.6	7.8	--	99.2
Oil Drilling Equipment	--	--	--	0.2	--	--
Farm and Construction Equipment	1.2	1.2	3.2	19.6	--	36.2
Locomotives	0.3	0.3	1.0	12.4	0.2	2.0
Off-Road Motorcycles and 4-Wheel Drives	--	--	1.1	--	--	6.0
Ships and Boats	2.9	2.9	25.0	29.1	1.1	123.9
Commercial Aircraft/Ground Support Equipment	0.2	0.2	3.2	10.2	0.9	15.4
General Aviation & Agricultural Aircraft	0.2	0.1	0.6	0.1	--	13.8
Military Aircraft	--	--	0.6	2.3	0.2	1.4
ON-ROAD MOTOR VEHICLES						
Passenger Cars/Light Duty Trucks<6000lbs	7.4	3.3	57.2	45.3	0.6	522.0
Medium and Heavy Duty Trucks <33000 lbs	2.9	1.7	16.5	53.3	0.3	165.6
Heavy Duty Diesel Trucks/Buses>33000 lbs	2.9	2.2	4.0	63.3	--	24.0
Motor-Homes	--	--	0.2	0.8	--	4.3
Motorcycles	--	--	6.2	1.5	--	44.5
MISCELLANEOUS						
Construction and Farming Operations	31.5	4.0	5.8	--	--	--
Paved and Unpaved Road Dust	29.9	4.3	--	--	--	--
Pesticides	--	--	6.2	--	--	--
Consumer Products (Excluding Pesticides)	--	--	39.8	--	--	--
Accidental Fires/Cigarette Smoking	3.0	2.7	1.5	0.9	0.2	25.2
GRAND TOTAL EMISSIONS	105	40	287	303	22	1342

Biogenic emissions are not included in this table

The symbol -- means less than 0.1 tons/day

Table 7

Bay Area Air Quality Management District
Summary of Emissions by Source Category
Year 2011

Bay Area
Winter Emissions (tons/day)

SOURCE CATEGORY	PM10	PM2.5	ROG	NOx	SO2	CO
PETROLEUM REFINING PROCESSES						
Petroleum Refining	0.3	0.2	0.1	--	0.3	--
Other Refining Processes	--	--	3.5	0.5	0.5	1.7
Fugitives	--	--	0.6	--	--	--
OTHER INDUSTRIAL/COMMERCIAL PROCESSES						
Chemical Manufacturing Processes	0.5	0.4	1.5	1.4	6.3	0.2
Food, Wine and Agricultural Processes	3.2	2.0	3.0	--	--	0.2
Metallurgical and Mineral Processes	3.1	2.1	0.4	0.3	0.4	0.5
Gas and Oil Production Fields	--	--	--	--	--	--
Waste Management	1.9	0.5	3.6	--	--	--
Semiconductor Manufacturing and Other Processes	0.7	0.4	1.3	--	--	--
ORGANIC COMPOUNDS EVAPORATION						
Loading, Blending, Storage at Refineries	--	--	4.8	--	--	--
Natural Gas Distribution	--	--	0.8	--	--	--
Bulk Plants	--	--	0.7	--	--	--
Gasoline Filling Stations	--	--	5.1	--	--	--
Aircraft, Boats and Other Refueling	--	--	2.3	--	--	--
Solvent Cleaning	--	--	4.2	--	--	--
Dry Cleaners	--	--	0.6	--	--	--
Printing	--	--	4.0	--	--	--
Adhesives and Sealants	--	--	9.9	--	--	--
Structures Coating	--	--	17.4	--	--	--
Industrial/Commercial Coatings	--	--	7.4	--	--	--
Other Evaporation	--	--	8.1	--	--	--
COMBUSTION - STATIONARY SOURCES						
Domestic Combustion	19.9	19.2	9.1	20.8	0.7	137.4
Cogeneration	0.7	0.7	2.1	4.1	0.4	5.4
Power Plants	0.2	0.2	--	1.0	--	0.5
Refineries	2.4	2.4	1.0	8.2	5.0	3.7
Other Fuels Combustion	1.9	1.9	2.1	20.9	4.4	18.6
Waste Burning and Incineration	0.4	0.4	0.4	0.3	--	3.4
OFF-ROAD MOBILE SOURCES						
Lawn, Garden and Utility Equipment	0.5	0.5	14.4	4.5	--	105.2
Industrial Equipment	0.2	0.2	1.1	5.6	--	53.3
Light Commercial Equipment	0.6	0.6	4.4	6.1	--	78.9
Oil Drilling Equipment	--	--	--	0.2	--	--
Farm and Construction Equipment	1.0	1.0	2.6	16.2	--	28.4
Locomotives	0.3	0.3	1.0	12.4	0.2	2.0
Off-Road Motorcycles and 4-Wheel Drives	--	--	0.8	--	--	4.6
Ships and Boats	1.7	1.7	10.7	25.5	1.1	51.4
Commercial Aircraft/Ground Support Equipment	0.1	0.1	2.9	9.6	0.9	14.4
General Aviation & Agricultural Aircraft	--	--	0.3	--	--	7.8
Military Aircraft	--	--	0.6	2.3	0.2	1.4
ON-ROAD MOTOR VEHICLES						
Passenger Cars/Light Duty Trucks <6000lbs	7.4	3.3	58.7	55.7	0.6	565.3
Medium and Heavy Duty Trucks <33000 lbs	2.9	1.7	18.2	59.5	0.3	188.3
Heavy Duty Diesel Trucks/Buses >33000 lbs	2.9	2.2	4.1	66.7	--	26.9
Motor-Homes	--	--	0.2	0.9	--	4.5
Motorcycles	--	--	6.4	1.9	--	53.1
MISCELLANEOUS						
Construction and Farming Operations	23.5	2.9	3.9	--	--	--
Paved and Unpaved Road Dust	28.3	4.1	--	--	--	--
Pesticides	--	--	5.7	--	--	--
Consumer Products (Excluding Pesticides)	--	--	39.4	--	--	--
Accidental Fires/Cigarette Smoking	0.9	0.9	0.2	0.1	--	4.9
GRAND TOTAL EMISSIONS	106	50	270	325	21	1362

Biogenic emissions are not included in this table
The symbol -- means less than 0.1 tons/day

- Tabulated 2011 emissions for each of the nine counties are shown in Tables 8-16.
- Projected 2014 Air District emissions are shown in Table 17. Emission reductions compared to 2011 are around 8% for ROG, 13% for NO_x, and CO. SO₂ and PM emissions show modest increases (1%-3%) due to a projected increase in shipping activity. Emissions from shipping activity out to three nautical miles from the coast were included in the emissions inventory.
- Emissions from major emitting stationary sources are shown in Table 18.

DISCUSSION OF EMISSION TRENDS

Charts of historical and projected future emissions in Figure 5 show the combined effects of growth and regulatory controls. Projected emissions are based on the assumption that the Bay Area population and economy will continue to grow. The projected growth is based on various estimates, including data from the Association of Bay Area Governments (ABAG) Projections 2009¹⁰ and past trends.

Reactive Organic Gas Emissions

- ROG emissions have declined significantly due to Air District regulatory controls on industrial sources such as petroleum refining, surface coating and solvent use.
- CARB regulations on mobile sources have also significantly reduced ROG emissions. On-road motor vehicle emissions have declined over the years despite annual increases in Vehicle Miles Travelled (VMT). This is due to the fleet turnover, with newer, lower emitting vehicles replacing older, higher emitting ones. The introduction of Reformulated Gasoline Phase II (RFGII) in 1996 and the introduction of Enhanced Inspection and Maintenance program (Smog Check II) in the Bay Area, which started in October 2004, have resulted in further reductions.
- ROG emissions are projected to decline by an average of 1.6% per year until 2020. This is due to continuing turnover of the vehicle fleet and associated benefits of CARB's on-road motor vehicle regulations. Other state-mandated regulations, including those on off-road mobile sources and consumer products, together with Air District regulations on stationary sources, also contribute to projected ROG emission reductions. For example, in 2011 and 2012, Air District regulations on some architectural coatings resulted in a total of 5.6 tons/day decrease in ROG emissions.
- After 2020, ROG emissions are projected to remain constant and then increase very slightly beginning 2025. This projection is based on regulations in place as of January 1, 2012. However, with the introduction of additional regulations, further reductions are expected to occur.

¹⁰ <http://www.abag.ca.gov/planning/currentfcst/>

Oxides of Nitrogen Emissions

- Reductions in NO_x emissions prior to 2011 were due in part to Air District regulations on combustion sources including refineries and power plants.
- Tighter emission controls on motor vehicles also significantly reduce NO_x emissions. Smog Check II, introduced in the Bay Area in 2004, played an important role in achieving NO_x reductions, as it requires that vehicles are tested and that failing vehicles are repaired.
- NO_x emissions from on-road motor vehicles will continue to decline due to fleet turnover. CARB's aggressive regulations on on-road heavy duty diesel trucks, buses, and construction equipment will continue to reduce NO_x and diesel particulate matter.
- Total NO_x emissions are expected to decline by an average of about 2.0% per year until 2027. After 2027, NO_x emissions are projected to increase very slightly due to projected growth in industrial activity and VMT. However, with the introduction of additional regulations currently being considered by CARB, further reductions will likely occur. Additional Air District regulations on stationary sources will also further reduce NO_x emissions.

Particulate Matter Emissions

- PM emissions, from stationary and mobile combustion sources, have declined due to Air District and CARB regulations.
- PM emissions are projected to increase modestly relative to 2011. The increase is mainly due to expected growth in industrial activity. Modest increases are also expected due to off-road mobile sources activity and VMT.
- Fluctuations in PM₁₀ and PM_{2.5} emissions follow construction activity. For example, during mid-nineties there was steady increase in PM emissions. The impact of the recent economic recession can be seen in significant PM emissions reductions beginning in 2008.
- Sharp increments in PM₁₀ and PM_{2.5} emissions are linked to wildfires in specific years, for example in 2007.

Sulfur Dioxide Emissions

- There were large reductions of SO₂ emissions in 2002 and 2003 attributed to a voluntary decrease in flaring activities by refineries. SO₂ emissions decreased further in 2004 due to the implementation of a Flare Monitoring Rule passed in 2003.
- In 2010 a large reduction of SO₂ was achieved from refinery emissions due to the installation of an abatement device at Valero refinery in Benicia. Since the

installment of this device, SO₂ emissions have been effectively reduced by more than 95% at this refinery.

- SO₂ emissions from ships were reduced significantly due to the introduction of ultra-low sulfur fuel in 2009.
- Flare emissions of SO₂ are assumed to grow in line with other refinery emissions of approximately 1% per annum. This growth is based on the assumption that refineries will continue to operate at normal conditions while increasing output to meet the growing demand for fuel.
- Overall, SO₂ emissions are also expected to increase by approximately 1% per year, due to expected growth and increased off-road motor vehicles usage, particularly ships.

Carbon Monoxide Emissions

- CO emissions have decreased significantly, and are expected to continue to decline until 2026 and then increase very slightly.
- By 2017, CO emission due to off-road motor vehicle usage is expected to equal that from on-road motor vehicles. After that, increasing use of off-road motor vehicles will contribute to a small increasing trend in overall CO emissions beginning 2027.
- Overall CO emissions are expected to drop by around 85% in the 1990-2030 time period.

As new controls from the Bay Area 2010 Multi-Pollutant Plan and regulations by CARB and EPA are adopted and implemented, further emission reductions will be achieved from the baseline emissions shown in these graphs. Currently, all stationary source measures adopted by the Air District as of January 1, 2012 are included in these projections.

ADDITIONAL INFORMATION

- The tables and figures in the Summary report are available online¹¹.
- More detail on methods applied in developing emissions estimates is available in an on line report "*Base Year 2011, Emission Inventory Source Category Methodologies*"¹².

More detailed emissions data are available to the public upon request. Annual average, summer and winter emissions for years 1990 through 2030, on a regional basis only, are also available for all source categories. For more information, please contact Amir Fanai at afanai@baaqmd.gov.

¹¹ <http://www.baaqmd.gov/Divisions/Planning-and-Research/Emission-Inventory/Criteria-Pollutants.aspx>

¹² <http://www.baaqmd.gov/Divisions/Planning-and-Research/Emission-Inventory/Methods.aspx>

Table 8

Bay Area Air Quality Management District
Summary of Emissions by Source Category
Year 2011

ALAMEDA

Annual Average Emissions (tons/day)

SOURCE CATEGORY	PM10	PM2.5	ROG	NOx	SO2	CO
PETROLEUM REFINING PROCESSES						
Petroleum Refining	--	--	--	--	--	--
Other Refining Processes	--	--	--	--	--	--
Fugitives	--	--	--	--	--	--
OTHER INDUSTRIAL/COMMERCIAL PROCESSES						
Chemical Manufacturing Processes	0.2	0.2	0.6	--	--	--
Food, Wine and Agricultural Processes	0.7	0.5	0.7	--	--	--
Metallurgical and Mineral Processes	1.7	1.3	0.2	--	0.4	0.2
Gas and Oil Production Fields	--	--	--	--	--	--
Waste Management	0.8	0.2	0.6	--	--	--
Semiconductor Manufacturing and Other Processes	0.1	--	0.2	--	--	--
ORGANIC COMPOUNDS EVAPORATION						
Loading, Blending, Storage at Refineries	--	--	--	--	--	--
Natural Gas Distribution	--	--	--	--	--	--
Bulk Plants	--	--	--	--	--	--
Gasoline Filling Stations	--	--	1.2	--	--	--
Aircraft, Boats and Other Refueling	--	--	0.6	--	--	--
Solvent Cleaning	--	--	1.1	--	--	--
Dry Cleaners	--	--	--	--	--	--
Printing	--	--	1.3	--	--	--
Adhesives and Sealants	--	--	1.9	--	--	--
Structures Coating	--	--	4.0	--	--	--
Industrial/Commercial Coatings	--	--	2.1	--	--	--
Other Evaporation	--	--	1.8	--	--	--
COMBUSTION - STATIONARY SOURCES						
Domestic Combustion	1.7	1.6	0.7	2.7	--	11.7
Cogeneration	--	--	0.6	0.4	0.1	1.1
Power Plants	--	--	--	--	--	--
Refineries	--	--	--	--	--	--
Other Fuels Combustion	0.3	0.3	0.3	2.9	0.6	3.4
Waste Burning and Incineration	--	--	--	--	--	--
OFF-ROAD MOBILE SOURCES						
Lawn, Garden and Utility Equipment	0.1	0.1	3.6	1.1	--	26.3
Industrial Equipment	--	--	0.2	1.1	--	10.0
Light Commercial Equipment	0.1	0.1	1.0	1.4	--	18.4
Oil Drilling Equipment	--	--	--	--	--	--
Farm and Construction Equipment	0.2	0.2	0.5	3.0	--	5.7
Locomotives	--	--	0.2	2.9	--	0.5
Off-Road Motorcycles and 4-Wheel Drives	--	--	0.1	--	--	0.6
Ships and Boats	0.3	0.3	1.8	4.9	0.4	8.2
Commercial Aircraft/Ground Support Equipment	--	--	0.5	1.8	0.2	3.6
General Aviation & Agricultural Aircraft	--	--	0.1	--	--	2.8
Military Aircraft	--	--	--	--	--	--
ON-ROAD MOTOR VEHICLES						
Passenger Cars/Light Duty Trucks <6000lbs	1.7	0.7	12.0	11.8	0.1	120.5
Medium and Heavy Duty Trucks <33000 lbs	0.7	0.4	3.6	13.3	--	36.9
Heavy Duty Diesel Trucks/Buses >33000 lbs	1.1	0.9	1.5	26.5	--	7.7
Motor-Homes	--	--	--	0.2	--	1.0
Motorcycles	--	--	1.2	0.3	--	9.5
MISCELLANEOUS						
Construction and Farming Operations	3.9	0.4	0.7	--	--	--
Paved and Unpaved Road Dust	5.3	0.8	--	--	--	--
Pesticides	--	--	1.1	--	--	--
Consumer Products (Excluding Pesticides)	--	--	8.6	--	--	--
Accidental Fires/Cigarette Smoking	0.4	0.4	0.2	0.1	--	3.2
GRAND TOTAL EMISSIONS	19	9	55	75	2	271

Biogenic emissions are not included in this table

The symbol -- means less than 0.1 tons/day

Table 9

Bay Area Air Quality Management District
 Summary of Emissions by Source Category
 Year 2011

CONTRA COSTA
 Annual Average Emissions (tons/day)

SOURCE CATEGORY	PM10	PM2.5	ROG	NOx	SO2	CO
PETROLEUM REFINING PROCESSES						
Petroleum Refining	0.3	0.2	0.1	--	0.3	--
Other Refining Processes	--	--	3.4	0.5	0.3	1.6
Fugitives	--	--	0.6	--	--	--
OTHER INDUSTRIAL/COMMERCIAL PROCESSES						
Chemical Manufacturing Processes	0.3	0.3	0.7	1.4	6.4	0.2
Food, Wine and Agricultural Processes	0.4	0.2	0.3	--	--	0.1
Metallurgical and Mineral Processes	0.3	0.1	--	--	--	--
Gas and Oil Production Fields	--	--	--	--	--	--
Waste Management	0.1	--	0.4	--	--	--
Semiconductor Manufacturing and Other Processes	0.5	0.3	0.2	--	--	--
ORGANIC COMPOUNDS EVAPORATION						
Loading, Blending, Storage at Refineries	--	--	4.3	--	--	--
Natural Gas Distribution	--	--	0.3	--	--	--
Bulk Plants	--	--	0.3	--	--	--
Gasoline Filling Stations	--	--	0.7	--	--	--
Aircraft, Boats and Other Refueling	--	--	0.3	--	--	--
Solvent Cleaning	--	--	0.3	--	--	--
Dry Cleaners	--	--	0.1	--	--	--
Printing	--	--	0.5	--	--	--
Adhesives and Sealants	--	--	0.9	--	--	--
Structures Coating	--	--	2.8	--	--	--
Industrial/Commercial Coatings	--	--	0.8	--	--	--
Other Evaporation	--	--	1.5	--	--	--
COMBUSTION - STATIONARY SOURCES						
Domestic Combustion	3.3	3.2	1.4	2.2	--	23.0
Cogeneration	0.4	0.4	1.0	2.0	0.2	2.3
Power Plants	0.1	0.1	--	0.5	--	0.2
Refineries	2.3	2.3	1.0	6.4	4.9	3.5
Other Fuels Combustion	0.8	0.7	0.7	4.5	0.8	4.8
Waste Burning and Incineration	--	--	--	0.1	--	--
OFF-ROAD MOBILE SOURCES						
Lawn, Garden and Utility Equipment	--	--	2.5	0.7	--	17.9
Industrial Equipment	--	--	--	0.3	--	3.3
Light Commercial Equipment	--	--	0.6	0.8	--	9.9
Oil Drilling Equipment	--	--	--	--	--	--
Farm and Construction Equipment	0.2	0.2	0.4	2.7	--	4.9
Locomotives	--	--	0.2	2.8	--	0.5
Off-Road Motorcycles and 4-Wheel Drives	--	--	0.2	--	--	1.0
Ships and Boats	0.3	0.3	3.6	3.8	0.4	22.1
Commercial Aircraft/Ground Support Equipment	--	--	--	--	--	--
General Aviation & Agricultural Aircraft	--	--	--	--	--	1.2
Military Aircraft	--	--	--	--	--	--
ON-ROAD MOTOR VEHICLES						
Passenger Cars/Light Duty Trucks <6000lbs	1.2	0.5	8.1	8.0	--	81.9
Medium and Heavy Duty Trucks <33000 lbs	0.4	0.2	2.7	8.5	--	28.7
Heavy Duty Diesel Trucks/Buses >33000 lbs	0.4	0.3	0.5	8.6	--	3.4
Motor-Homes	--	--	--	0.2	--	0.7
Motorcycles	--	--	0.9	0.3	--	7.8
MISCELLANEOUS						
Construction and Farming Operations	2.9	0.4	0.6	--	--	--
Paved and Unpaved Road Dust	5.0	0.7	--	--	--	--
Pesticides	--	--	0.9	--	--	--
Consumer Products (Excluding Pesticides)	--	--	5.8	--	--	--
Accidental Fires/Cigarette Smoking	0.2	0.2	--	--	--	1.3
GRAND TOTAL EMISSIONS	20	11	50	54	14	220

Biogenic emissions are not included in this table
 The symbol -- means less than 0.1 tons/day

Table 10

Bay Area Air Quality Management District
Summary of Emissions by Source Category
Year 2011

MARIN
Annual Average Emissions (tons/day)

SOURCE CATEGORY	PM10	PM2.5	ROG	NOx	SO2	CO
PETROLEUM REFINING PROCESSES						
Petroleum Refining	--	--	--	--	--	--
Other Refining Processes	--	--	--	--	--	--
Fugitives	--	--	--	--	--	--
OTHER INDUSTRIAL/COMMERCIAL PROCESSES						
Chemical Manufacturing Processes	--	--	--	--	--	--
Food, Wine and Agricultural Processes	0.1	--	--	--	--	--
Metallurgical and Mineral Processes	--	--	--	--	--	--
Gas and Oil Production Fields	--	--	--	--	--	--
Waste Management	0.3	--	0.2	--	--	--
Semiconductor Manufacturing and Other Processes	--	--	--	--	--	--
ORGANIC COMPOUNDS EVAPORATION						
Loading, Blending, Storage at Refineries	--	--	--	--	--	--
Natural Gas Distribution	--	--	--	--	--	--
Bulk Plants	--	--	--	--	--	--
Gasoline Filling Stations	--	--	0.2	--	--	--
Aircraft, Boats and Other Refueling	--	--	0.2	--	--	--
Solvent Cleaning	--	--	--	--	--	--
Dry Cleaners	--	--	--	--	--	--
Printing	--	--	--	--	--	--
Adhesives and Sealants	--	--	0.3	--	--	--
Structures Coating	--	--	0.7	--	--	--
Industrial/Commercial Coatings	--	--	0.2	--	--	--
Other Evaporation	--	--	0.3	--	--	--
COMBUSTION - STATIONARY SOURCES						
Domestic Combustion	0.8	0.8	0.5	0.7	--	5.0
Cogeneration	--	--	--	--	--	0.1
Power Plants	--	--	--	--	--	--
Refineries	--	--	--	--	--	--
Other Fuels Combustion	--	--	--	0.2	0.1	0.3
Waste Burning and Incineration	--	--	--	--	--	0.1
OFF-ROAD MOBILE SOURCES						
Lawn, Garden and Utility Equipment	--	--	0.9	0.2	--	6.8
Industrial Equipment	--	--	--	--	--	0.7
Light Commercial Equipment	--	--	0.3	0.4	--	4.6
Oil Drilling Equipment	--	--	--	--	--	--
Farm and Construction Equipment	--	--	0.1	0.7	--	1.2
Locomotives	--	--	--	--	--	--
Off-Road Motorcycles and 4-Wheel Drives	--	--	--	--	--	0.3
Ships and Boats	0.4	0.4	2.8	1.8	--	8.8
Commercial Aircraft/Ground Support Equipment	--	--	--	--	--	--
General Aviation & Agricultural Aircraft	--	--	--	--	--	0.8
Military Aircraft	--	--	--	--	--	--
ON-ROAD MOTOR VEHICLES						
Passenger Cars/Light Duty Trucks <6000lbs	0.3	0.1	2.2	1.9	--	19.5
Medium and Heavy Duty Trucks <33000 lbs	0.1	--	0.6	2.0	--	6.5
Heavy Duty Diesel Trucks/Buses >33000 lbs	0.1	--	0.1	2.2	--	1.0
Motor-Homes	--	--	--	--	--	0.2
Motorcycles	--	--	0.3	--	--	2.5
MISCELLANEOUS						
Construction and Farming Operations	1.3	0.2	0.8	--	--	--
Paved and Unpaved Road Dust	1.7	0.2	--	--	--	--
Pesticides	--	--	0.2	--	--	--
Consumer Products (Excluding Pesticides)	--	--	1.4	--	--	--
Accidental Fires/Cigarette Smoking	--	--	--	--	--	0.7
GRAND TOTAL EMISSIONS	5	2	13	10	0	59

Biogenic emissions are not included in this table

The symbol -- means less than 0.1 tons/day

Table 11

Bay Area Air Quality Management District
 Summary of Emissions by Source Category
 Year 2011

NAPA
 Annual Average Emissions (tons/day)

SOURCE CATEGORY	PM10	PM2.5	ROG	NOx	SO2	CO
PETROLEUM REFINING PROCESSES						
Petroleum Refining	--	--	--	--	--	--
Other Refining Processes	--	--	--	--	--	--
Fugitives	--	--	--	--	--	--
OTHER INDUSTRIAL/COMMERCIAL PROCESSES						
Chemical Manufacturing Processes	--	--	0.2	--	--	--
Food, Wine and Agricultural Processes	--	--	0.5	--	--	--
Metallurgical and Mineral Processes	0.1	--	--	--	--	--
Gas and Oil Production Fields	--	--	--	--	--	--
Waste Management	--	--	0.1	--	--	--
Semiconductor Manufacturing and Other Processes	--	--	--	--	--	--
ORGANIC COMPOUNDS EVAPORATION						
Loading, Blending, Storage at Refineries	--	--	--	--	--	--
Natural Gas Distribution	--	--	--	--	--	--
Bulk Plants	--	--	--	--	--	--
Gasoline Filling Stations	--	--	0.1	--	--	--
Aircraft, Boats and Other Refueling	--	--	0.1	--	--	--
Solvent Cleaning	--	--	0.1	--	--	--
Dry Cleaners	--	--	--	--	--	--
Printing	--	--	--	--	--	--
Adhesives and Sealants	--	--	0.2	--	--	--
Structures Coating	--	--	0.4	--	--	--
Industrial/Commercial Coatings	--	--	0.1	--	--	--
Other Evaporation	--	--	0.2	--	--	--
COMBUSTION - STATIONARY SOURCES						
Domestic Combustion	0.4	0.4	0.2	0.3	--	3.0
Cogeneration	--	--	--	--	--	--
Power Plants	--	--	--	--	--	--
Refineries	--	--	--	--	--	--
Other Fuels Combustion	--	--	--	0.2	--	0.4
Waste Burning and Incineration	--	--	--	--	--	0.4
OFF-ROAD MOBILE SOURCES						
Lawn, Garden and Utility Equipment	--	--	0.4	0.1	--	2.6
Industrial Equipment	--	--	--	--	--	0.7
Light Commercial Equipment	--	--	--	0.1	--	1.6
Oil Drilling Equipment	--	--	--	--	--	--
Farm and Construction Equipment	--	--	0.2	1.2	--	1.7
Locomotives	--	--	--	0.5	--	--
Off-Road Motorcycles and 4-Wheel Drives	--	--	0.2	--	--	0.4
Ships and Boats	0.2	0.2	2.1	0.6	--	12.5
Commercial Aircraft/ Ground Support Equipment	--	--	--	--	--	--
General Aviation & Agricultural Aircraft	--	--	--	--	--	0.7
Military Aircraft	--	--	--	--	--	--
ON-ROAD MOTOR VEHICLES						
Passenger Cars/Light Duty Trucks <6000lbs	0.2	--	1.7	1.7	--	17.9
Medium and Heavy Duty Trucks <33000 lbs	0.1	--	0.7	2.4	--	7.5
Heavy Duty Diesel Trucks/Buses >33000 lbs	--	--	0.1	1.5	--	0.9
Motor-Homes	--	--	--	--	--	0.2
Motorcycles	--	--	0.2	--	--	1.4
MISCELLANEOUS						
Construction and Farming Operations	2.9	0.4	0.6	--	--	--
Paved and Unpaved Road Dust	1.1	0.2	--	--	--	--
Pesticides	--	--	0.2	--	--	--
Consumer Products (Excluding Pesticides)	--	--	0.8	--	--	--
Accidental Fires/Cigarette Smoking	0.3	0.2	0.1	--	--	2.3
GRAND TOTAL EMISSIONS	6	2	10	9	0	54

Biogenic emissions are not included in this table

The symbol -- means less than 0.1 tons/day

Table 12

Bay Area Air Quality Management District
Summary of Emissions by Source Category
Year 2011

SAN FRANCISCO
Annual Average Emissions (tons/day)

SOURCE CATEGORY	PM10	PM2.5	ROG	NOx	SO2	CO
PETROLEUM REFINING PROCESSES						
Petroleum Refining	--	--	--	--	--	--
Other Refining Processes	--	--	--	--	--	--
Fugitives	--	--	--	--	--	--
OTHER INDUSTRIAL/COMMERCIAL PROCESSES						
Chemical Manufacturing Processes	--	--	--	--	--	--
Food, Wine and Agricultural Processes	0.6	0.4	0.3	--	--	--
Metallurgical and Mineral Processes	--	--	--	--	--	--
Gas and Oil Production Fields	--	--	--	--	--	--
Waste Management	--	--	--	--	--	--
Semiconductor Manufacturing and Other Processes	--	--	--	--	--	--
ORGANIC COMPOUNDS EVAPORATION						
Loading, Blending, Storage at Refineries	--	--	--	--	--	--
Natural Gas Distribution	--	--	--	--	--	--
Bulk Plants	--	--	--	--	--	--
Gasoline Filling Stations	--	--	0.4	--	--	--
Aircraft, Boats and Other Refueling	--	--	0.1	--	--	--
Solvent Cleaning	--	--	0.3	--	--	--
Dry Cleaners	--	--	--	--	--	--
Printing	--	--	0.4	--	--	--
Adhesives and Sealants	--	--	1.8	--	--	--
Structures Coating	--	--	2.1	--	--	--
Industrial/Commercial Coatings	--	--	0.6	--	--	--
Other Evaporation	--	--	0.8	--	--	--
COMBUSTION - STATIONARY SOURCES						
Domestic Combustion	0.4	0.3	0.2	1.7	--	2.2
Cogeneration	--	--	--	0.3	--	0.2
Power Plants	--	--	--	--	--	--
Refineries	--	--	--	--	--	--
Other Fuels Combustion	0.1	0.1	0.3	1.1	--	0.6
Waste Burning and Incineration	--	--	--	--	--	--
OFF-ROAD MOBILE SOURCES						
Lawn, Garden and Utility Equipment	--	--	1.7	0.5	--	12.5
Industrial Equipment	--	--	0.1	0.6	--	5.2
Light Commercial Equipment	0.1	0.1	0.9	1.3	--	16.4
Oil Drilling Equipment	--	--	--	--	--	--
Farm and Construction Equipment	0.1	0.1	0.3	2.0	--	4.1
Locomotives	--	--	--	1.3	--	0.1
Off-Road Motorcycles and 4-Wheel Drives	--	--	--	--	--	0.2
Ships and Boats	0.6	0.6	2.5	13.2	0.3	10.5
Commercial Aircraft/Ground Support Equipment	--	--	--	--	--	--
General Aviation & Agricultural Aircraft	--	--	--	--	--	--
Military Aircraft	--	--	--	--	--	--
ON-ROAD MOTOR VEHICLES						
Passenger Cars/Light Duty Trucks<6000lbs	0.6	0.3	4.3	3.8	--	40.4
Medium and Heavy Duty Trucks <33000 lbs	0.2	0.1	1.0	4.3	--	9.7
Heavy Duty Diesel Trucks/Buses>33000 lbs	0.2	0.1	0.3	4.4	--	2.8
Motor-Homes	--	--	--	--	--	0.2
Motorcycles	--	--	0.7	0.2	--	4.5
MISCELLANEOUS						
Construction and Farming Operations	0.9	0.1	--	--	--	--
Paved and Unpaved Road Dust	2.1	0.3	--	--	--	--
Pesticides	--	--	0.6	--	--	--
Consumer Products (Excluding Pesticides)	--	--	4.5	--	--	--
Accidental Fires/Cigarette Smoking	0.1	0.1	--	--	--	0.5
GRAND TOTAL EMISSIONS	6	3	25	35	0	110

Biogenic emissions are not included in this table

The symbol -- means less than 0.1 tons/day

Table 13

Bay Area Air Quality Management District
 Summary of Emissions by Source Category
 Year 2011

SAN MATEO
 Annual Average Emissions (tons/day)

SOURCE CATEGORY	PM10	PM2.5	ROG	NOx	SO2	CO
PETROLEUM REFINING PROCESSES						
Petroleum Refining	--	--	--	--	--	--
Other Refining Processes	--	--	--	--	--	--
Fugitives	--	--	--	--	--	--
OTHER INDUSTRIAL/COMMERCIAL PROCESSES						
Chemical Manufacturing Processes	--	--	--	--	--	--
Food, Wine and Agricultural Processes	0.3	0.2	0.2	--	--	--
Metallurgical and Mineral Processes	0.2	0.1	--	--	--	--
Gas and Oil Production Fields	--	--	--	--	--	--
Waste Management	0.2	--	0.3	--	--	--
Semiconductor Manufacturing and Other Processes	--	--	--	--	--	--
ORGANIC COMPOUNDS EVAPORATION						
Loading, Blending, Storage at Refineries	--	--	--	--	--	--
Natural Gas Distribution	--	--	--	--	--	--
Bulk Plants	--	--	--	--	--	--
Gasoline Filling Stations	--	--	0.6	--	--	--
Aircraft, Boats and Other Refueling	--	--	0.4	--	--	--
Solvent Cleaning	--	--	0.5	--	--	--
Dry Cleaners	--	--	0.1	--	--	--
Printing	--	--	0.7	--	--	--
Adhesives and Sealants	--	--	1.1	--	--	--
Structures Coating	--	--	1.9	--	--	--
Industrial/Commercial Coatings	--	--	0.7	--	--	--
Other Evaporation	--	--	0.9	--	--	--
COMBUSTION - STATIONARY SOURCES						
Domestic Combustion	0.8	0.7	0.4	1.6	--	5.0
Cogeneration	--	--	--	--	--	0.2
Power Plants	--	--	--	--	--	--
Refineries	--	--	--	--	--	--
Other Fuels Combustion	0.1	0.1	0.2	1.0	0.1	0.8
Waste Burning and Incineration	--	--	--	--	--	0.5
OFF-ROAD MOBILE SOURCES						
Lawn, Garden and Utility Equipment	--	--	1.7	0.5	--	12.4
Industrial Equipment	--	--	--	0.5	--	4.3
Light Commercial Equipment	--	--	0.6	0.8	--	10.1
Oil Drilling Equipment	--	--	--	--	--	--
Farm and Construction Equipment	--	--	0.2	1.5	--	2.8
Locomotives	--	--	--	1.1	--	0.2
Off-Road Motorcycles and 4-Wheel Drives	--	--	--	--	--	0.6
Ships and Boats	0.2	0.2	1.2	1.9	--	3.5
Commercial Aircraft/Ground Support Equipment	0.1	0.1	2.4	7.0	0.6	9.8
General Aviation & Agricultural Aircraft	--	--	--	--	--	1.4
Military Aircraft	--	--	--	--	--	--
ON-ROAD MOTOR VEHICLES						
Passenger Cars/Light Duty Trucks <6000lbs	0.9	0.4	6.1	6.2	--	62.3
Medium and Heavy Duty Trucks <33000 lbs	0.3	0.2	1.7	6.1	--	18.6
Heavy Duty Diesel Trucks/Buses >33000 lbs	0.2	0.1	0.2	2.9	--	1.7
Motor-Homes	--	--	--	--	--	0.4
Motorcycles	--	--	0.7	0.2	--	5.7
MISCELLANEOUS						
Construction and Farming Operations	1.7	0.2	0.1	--	--	--
Paved and Unpaved Road Dust	3.0	0.4	--	--	--	--
Pesticides	--	--	0.6	--	--	--
Consumer Products (Excluding Pesticides)	--	--	4.1	--	--	--
Accidental Fires/Cigarette Smoking	0.2	0.1	--	--	--	1.1
GRAND TOTAL EMISSIONS	9	3	28	31	1	141

Biogenic emissions are not included in this table
 The symbol -- means less than 0.1 tons/day

Table 14

Bay Area Air Quality Management District
Summary of Emissions by Source Category
Year 2011

SANTA CLARA
Annual Average Emissions (tons/day)

SOURCE CATEGORY	PM10	PM2.5	ROG	NOx	SO2	CO
PETROLEUM REFINING PROCESSES						
Petroleum Refining	--	--	--	--	--	--
Other Refining Processes	--	--	--	--	--	--
Fugitives	--	--	--	--	--	--
OTHER INDUSTRIAL/COMMERCIAL PROCESSES						
Chemical Manufacturing Processes	--	--	--	--	--	--
Food, Wine and Agricultural Processes	0.7	0.4	0.4	--	--	--
Metallurgical and Mineral Processes	0.7	0.5	0.2	0.3	--	0.3
Gas and Oil Production Fields	--	--	--	--	--	--
Waste Management	0.3	--	1.6	--	--	--
Semiconductor Manufacturing and Other Processes	--	--	0.7	--	--	--
ORGANIC COMPOUNDS EVAPORATION						
Loading, Blending, Storage at Refineries	--	--	--	--	--	--
Natural Gas Distribution	--	--	0.1	--	--	--
Bulk Plants	--	--	0.2	--	--	--
Gasoline Filling Stations	--	--	1.3	--	--	--
Aircraft, Boats and Other Refueling	--	--	0.5	--	--	--
Solvent Cleaning	--	--	1.7	--	--	--
Dry Cleaners	--	--	0.1	--	--	--
Printing	--	--	0.5	--	--	--
Adhesives and Sealants	--	--	3.1	--	--	--
Structures Coating	--	--	4.7	--	--	--
Industrial/Commercial Coatings	--	--	1.8	--	--	--
Other Evaporation	--	--	1.8	--	--	--
COMBUSTION - STATIONARY SOURCES						
Domestic Combustion	2.5	2.5	1.1	3.1	0.1	17.6
Cogeneration	0.2	0.2	0.4	1.0	--	1.4
Power Plants	0.1	0.1	--	0.5	--	0.4
Refineries	--	--	--	--	--	--
Other Fuels Combustion	0.3	0.3	0.3	8.5	2.6	6.4
Waste Burning and Incineration	0.1	0.1	--	--	--	0.8
OFF-ROAD MOBILE SOURCES						
Lawn, Garden and Utility Equipment	0.1	0.1	4.0	1.1	--	28.9
Industrial Equipment	0.1	0.1	0.7	3.5	--	32.8
Light Commercial Equipment	0.2	0.2	1.2	1.6	--	20.7
Oil Drilling Equipment	--	--	--	--	--	--
Farm and Construction Equipment	0.2	0.2	0.6	3.6	--	6.7
Locomotives	--	--	0.2	2.6	--	0.4
Off-Road Motorcycles and 4-Wheel Drives	--	--	0.2	--	--	1.2
Ships and Boats	--	--	1.1	0.4	--	9.1
Commercial Aircraft/Ground Support Equipment	--	--	0.2	1.1	--	1.6
General Aviation & Agricultural Aircraft	--	--	0.1	--	--	2.7
Military Aircraft	--	--	--	--	--	0.2
ON-ROAD MOTOR VEHICLES						
Passenger Cars/Light Duty Trucks <6000lbs	1.8	0.8	13.5	12.2	0.1	123.5
Medium and Heavy Duty Trucks <33000 lbs	0.6	0.4	4.0	12.1	--	40.2
Heavy Duty Diesel Trucks/Buses >33000 lbs	0.6	0.5	0.8	13.6	--	5.2
Motor-Homes	--	--	--	0.2	--	1.1
Motorcycles	--	--	1.3	0.4	--	9.9
MISCELLANEOUS						
Construction and Farming Operations	5.9	0.7	0.6	--	--	--
Paved and Unpaved Road Dust	7.3	1.0	--	--	--	--
Pesticides	--	--	1.7	--	--	--
Consumer Products (Excluding Pesticides)	--	--	10.2	--	--	--
Accidental Fires/Cigarette Smoking	0.3	0.2	--	--	--	1.7
GRAND TOTAL EMISSIONS	22	9	61	66	3	313

Biogenic emissions are not included in this table

The symbol -- means less than 0.1 tons/day

Table 15

Bay Area Air Quality Management District
 Summary of Emissions by Source Category
 Year 2011

SOLANO
 Annual Average Emissions (tons/day)

SOURCE CATEGORY	PM10	PM2.5	ROG	NOx	SO2	CO
PETROLEUM REFINING PROCESSES						
Petroleum Refining	--	--	--	--	--	--
Other Refining Processes	--	--	--	--	0.2	0.1
Fugitives	--	--	--	--	--	--
OTHER INDUSTRIAL/COMMERCIAL PROCESSES						
Chemical Manufacturing Processes	--	--	--	--	--	--
Food, Wine and Agricultural Processes	0.1	--	0.1	--	--	--
Metallurgical and Mineral Processes	0.1	--	--	--	--	--
Gas and Oil Production Fields	--	--	--	--	--	--
Waste Management	0.2	--	0.1	--	--	--
Semiconductor Manufacturing and Other Processes	--	--	--	--	--	--
ORGANIC COMPOUNDS EVAPORATION						
Loading, Blending, Storage at Refineries	--	--	0.4	--	--	--
Natural Gas Distribution	--	--	--	--	--	--
Bulk Plants	--	--	--	--	--	--
Gasoline Filling Stations	--	--	0.4	--	--	--
Aircraft, Boats and Other Refueling	--	--	0.2	--	--	--
Solvent Cleaning	--	--	0.1	--	--	--
Dry Cleaners	--	--	--	--	--	--
Printing	--	--	0.4	--	--	--
Adhesives and Sealants	--	--	0.2	--	--	--
Structures Coating	--	--	0.8	--	--	--
Industrial/Commercial Coatings	--	--	0.7	--	--	--
Other Evaporation	--	--	0.5	--	--	--
COMBUSTION - STATIONARY SOURCES						
Domestic Combustion	0.6	0.6	0.2	0.5	--	4.1
Cogeneration	--	--	--	0.1	--	--
Power Plants	--	--	--	--	--	--
Refineries	0.2	0.2	0.1	1.8	--	0.4
Other Fuels Combustion	0.2	0.2	0.2	2.0	--	1.6
Waste Burning and Incineration	--	--	--	--	--	0.2
OFF-ROAD MOBILE SOURCES						
Lawn, Garden and Utility Equipment	--	--	0.5	0.2	--	3.5
Industrial Equipment	--	--	--	--	--	0.8
Light Commercial Equipment	--	--	0.1	0.2	--	2.5
Oil Drilling Equipment	--	--	--	0.2	--	--
Farm and Construction Equipment	--	--	0.3	1.5	--	2.2
Locomotives	--	--	--	0.6	--	0.1
Off-Road Motorcycles and 4-Wheel Drives	--	--	--	--	--	0.2
Ships and Boats	0.2	0.2	1.4	0.4	--	5.0
Commercial Aircraft/Ground Support Equipment	--	--	--	--	--	--
General Aviation & Agricultural Aircraft	--	--	--	--	--	--
Military Aircraft	--	--	0.5	2.2	0.2	1.1
ON-ROAD MOTOR VEHICLES						
Passenger Cars/Light Duty Trucks<6000lbs	0.3	0.1	2.1	2.1	--	21.3
Medium and Heavy Duty Trucks <33000 lbs	0.1	--	0.8	2.6	--	8.4
Heavy Duty Diesel Trucks/Buses>33000 lbs	0.2	0.1	0.3	4.1	--	1.5
Motor-Homes	--	--	--	--	--	0.2
Motorcycles	--	--	0.3	--	--	2.9
MISCELLANEOUS						
Construction and Farming Operations	3.7	0.6	0.3	--	--	--
Paved and Unpaved Road Dust	1.6	0.2	--	--	--	--
Pesticides	--	--	0.2	--	--	--
Consumer Products (Excluding Pesticides)	--	--	1.7	--	--	--
Accidental Fires/Cigarette Smoking	0.3	0.3	0.2	0.1	--	3.1
GRAND TOTAL EMISSIONS	8	3	14	19	1	60

Biogenic emissions are not included in this table

The symbol -- means less than 0.1 tons/day

Table 16

Bay Area Air Quality Management District
 Summary of Emissions by Source Category
 Year 2011

SONOMA
 Annual Average Emissions (tons/day)

SOURCE CATEGORY	PM10	PM2.5	ROG	NOx	SO2	CO
PETROLEUM REFINING PROCESSES						
Petroleum Refining	--	--	--	--	--	--
Other Refining Processes	--	--	--	--	--	--
Fugitives	--	--	--	--	--	--
OTHER INDUSTRIAL/COMMERCIAL PROCESSES						
Chemical Manufacturing Processes	--	--	--	--	--	--
Food, Wine and Agricultural Processes	0.3	0.2	0.3	--	--	--
Metallurgical and Mineral Processes	0.3	0.1	--	--	--	--
Gas and Oil Production Fields	--	--	--	--	--	--
Waste Management	--	--	0.2	--	--	--
Semiconductor Manufacturing and Other Processes	--	--	--	--	--	--
ORGANIC COMPOUNDS EVAPORATION						
Loading, Blending, Storage at Refineries	--	--	--	--	--	--
Natural Gas Distribution	--	--	--	--	--	--
Bulk Plants	--	--	--	--	--	--
Gasoline Filling Stations	--	--	0.3	--	--	--
Aircraft, Boats and Other Refueling	--	--	0.2	--	--	--
Solvent Cleaning	--	--	0.3	--	--	--
Dry Cleaners	--	--	--	--	--	--
Printing	--	--	0.2	--	--	--
Adhesives and Sealants	--	--	0.4	--	--	--
Structures Coating	--	--	1.1	--	--	--
Industrial/Commercial Coatings	--	--	0.6	--	--	--
Other Evaporation	--	--	0.5	--	--	--
COMBUSTION - STATIONARY SOURCES						
Domestic Combustion	1.6	1.5	0.8	0.9	--	10.8
Cogeneration	--	--	--	--	--	0.1
Power Plants	--	--	--	--	--	--
Refineries	--	--	--	--	--	--
Other Fuels Combustion	--	--	--	0.4	--	0.5
Waste Burning and Incineration	--	--	--	--	--	0.8
OFF-ROAD MOBILE SOURCES						
Lawn, Garden and Utility Equipment	--	--	1.0	0.3	--	7.0
Industrial Equipment	--	--	--	0.3	--	2.5
Light Commercial Equipment	--	--	0.3	0.4	--	4.9
Oil Drilling Equipment	--	--	--	--	--	--
Farm and Construction Equipment	0.1	0.1	0.3	1.8	--	2.9
Locomotives	--	--	--	0.6	--	0.1
Off-Road Motorcycles and 4-Wheel Drives	--	--	--	--	--	0.7
Ships and Boats	0.1	0.1	1.4	0.4	--	7.9
Commercial Aircraft/Ground Support Equipment	--	--	--	--	--	--
General Aviation & Agricultural Aircraft	--	--	--	--	--	1.1
Military Aircraft	--	--	--	--	--	--
ON-ROAD MOTOR VEHICLES						
Passenger Cars/Light Duty Trucks <6000lbs	0.4	0.2	4.0	3.5	--	36.6
Medium and Heavy Duty Trucks <33000 lbs	0.3	0.2	1.7	5.7	--	16.2
Heavy Duty Diesel Trucks/Buses >33000 lbs	--	--	0.1	1.9	--	1.3
Motor-Homes	--	--	--	--	--	0.4
Motorcycles	--	--	0.5	0.1	--	3.8
MISCELLANEOUS						
Construction and Farming Operations	4.3	0.6	1.0	--	--	--
Paved and Unpaved Road Dust	2.1	0.3	--	--	--	--
Pesticides	--	--	0.4	--	--	--
Consumer Products (Excluding Pesticides)	--	--	2.4	--	--	--
Accidental Fires/Cigarette Smoking	0.1	0.1	--	--	--	1.0
GRAND TOTAL EMISSIONS	10	4	19	16	0	99

Biogenic emissions are not included in this table

The symbol -- means less than 0.1 tons/day

Table 17

Bay Area Air Quality Management District
Summary of Emissions by Source Category
Year 2014

Projected Bay Area
Annual Average Emissions (tons/day)

SOURCE CATEGORY	PM10	PM2.5	ROG	NOx	SO2	CO
PETROLEUM REFINING PROCESSES						
Petroleum Refining	0.3	0.2	0.1	--	0.3	--
Other Refining Processes	--	--	3.6	0.5	0.5	1.8
Fugitives	--	--	0.6	--	--	--
OTHER INDUSTRIAL/COMMERCIAL PROCESSES						
Chemical Manufacturing Processes	0.5	0.5	1.6	1.5	6.6	0.2
Food, Wine and Agricultural Processes	3.1	1.9	3.0	--	--	0.2
Metallurgical and Mineral Processes	3.7	2.5	0.4	0.3	0.5	0.6
Gas and Oil Production Fields	--	--	--	--	--	--
Waste Management	1.9	0.6	3.7	--	--	--
Semiconductor Manufacturing and Other Processes	0.8	0.5	1.3	--	--	--
ORGANIC COMPOUNDS EVAPORATION						
Loading, Blending, Storage at Refineries	--	--	3.8	--	--	--
Natural Gas Distribution	--	--	0.7	--	--	--
Bulk Plants	--	--	0.7	--	--	--
Gasoline Filling Stations	--	--	5.0	--	--	--
Aircraft, Boats and Other Refueling	--	--	2.5	--	--	--
Solvent Cleaning	--	--	4.7	--	--	--
Dry Cleaners	--	--	0.5	--	--	--
Printing	--	--	4.1	--	--	--
Adhesives and Sealants	--	--	10.4	--	--	--
Structures Coating	--	--	17.1	--	--	--
Industrial/Commercial Coatings	--	--	6.9	--	--	--
Other Evaporation	--	--	7.7	--	--	--
COMBUSTION - STATIONARY SOURCES						
Domestic Combustion	12.0	11.6	5.6	14.2	0.4	82.5
Cogeneration	0.8	0.8	2.2	4.2	0.4	5.6
Power Plants	0.4	0.4	--	1.5	--	0.9
Refineries	2.6	2.5	1.1	8.5	5.1	4.0
Other Fuels Combustion	2.0	2.0	2.1	15.7	4.5	19.3
Waste Burning and Incineration	0.4	0.4	0.3	0.3	--	3.2
OFF-ROAD MOBILE SOURCES						
Lawn, Garden and Utility Equipment	0.4	0.4	14.6	4.4	--	118.4
Industrial Equipment	0.2	0.2	1.1	5.7	--	62.9
Light Commercial Equipment	0.6	0.6	4.2	6.1	--	88.9
Oil Drilling Equipment	--	--	--	0.2	--	--
Farm and Construction Equipment	1.0	0.9	2.5	15.3	--	32.0
Locomotives	0.3	0.3	1.0	13.0	0.2	2.1
Off-Road Motorcycles and 4-Wheel Drives	--	--	1.0	--	--	5.7
Ships and Boats	2.5	2.5	17.4	26.7	0.6	88.3
Commercial Aircraft/Ground Support Equipment	0.2	0.2	3.5	11.3	1.0	17.2
General Aviation & Agricultural Aircraft	0.1	--	0.5	0.1	--	11.0
Military Aircraft	--	--	1.0	3.8	0.3	2.1
ON-ROAD MOTOR VEHICLES						
Passenger Cars/Light Duty Trucks<6000lbs	7.4	3.2	38.5	35.9	0.6	370.7
Medium and Heavy Duty Trucks <33000 lbs	2.6	1.4	15.0	47.2	0.3	144.0
Heavy Duty Diesel Trucks/Buses>33000 lbs	2.0	1.3	2.9	54.1	--	19.5
Motor-Homes	--	--	0.1	0.7	--	2.6
Motorcycles	--	--	5.5	1.8	--	42.5
MISCELLANEOUS						
Construction and Farming Operations	28.1	3.5	4.9	--	--	--
Paved and Unpaved Road Dust	29.1	4.2	--	--	--	--
Pesticides	--	--	6.0	--	--	--
Consumer Products (Excluding Pesticides)	--	--	40.3	--	--	--
Accidental Fires/Cigarette Smoking	4.0	3.6	2.2	1.2	0.3	36.0
GRAND TOTAL EMISSIONS	107	46	252	274	22	1162

Biogenic emissions are not included in this table

The symbol -- means less than 0.1 tons/day

Table 18

MAJOR EMITTING FACILITIES

The following list shows the facilities that emit more than 0.05 tons/day of any criteria pollutant in 2011. The emissions are the total for the facility at the site indicated. The sole purpose of this list is to show major facilities; it is NOT a list of those who violate the District's regulations.

2011 Annual Average Emissions

The symbol -- indicates a quantity less than 0.01 tons/day.

COUNTY/CITY	PLANT #	PLANT NAME	ZIPCODE	tons/day					
				PM ₁₀	PM _{2.5}	ROG	NO _x	SO ₂	CO
Alameda									
Berkeley	12071	Bayer Healthcare LLC	94710	--	--	0.01	0.05	--	0.01
	1603	Pacific Steel Casting Co-Plant	94710	0.10	0.06	0.01	--	0.01	0.03
	11326	PE Berkeley, Inc	94720	0.04	0.04	0.08	0.13	--	0.58
Fremont	18469	Transcontinental, Northern California	94538	--	--	0.06	--	--	--
	2246	Tri-Cities Recycling	94538	0.02	--	0.09	0.04	0.01	0.21
Hayward	837	Gillig LLC	94545	--	--	0.13	--	--	--
	1009	Hayward Waste Water Treatment	94545	0.02	0.02	0.03	0.11	--	0.05
	13631	Morgan Advanced Ceramics	94544	--	--	--	0.05	--	0.01
Livermore	17967	G S Cosmeceutical USA, Inc	94551	--	--	0.11	--	--	--
	5095	Republic Services Vasco Road, LLC	94550	0.43	0.09	0.11	0.09	0.10	0.35
	2066	Waste Management of Alameda County	94551	0.31	0.09	0.26	0.25	0.03	0.58
Newark	20177	Bemis Flexible Packaging-Milprint	94560	0.02	0.01	0.06	--	--	--
	94	Cargill Salt	94560	0.13	0.12	--	0.02	--	0.02
	1190	Evergreen Oil, Inc	94560	--	--	0.06	0.05	--	0.02
	79	Morton Salt, Inc	94560	0.06	0.06	--	0.01	--	0.05
Oakland	62	A B & I Foundry	94621	--	--	0.01	0.10	0.13	0.85
	2743	CEMEX Construction Materials Pacific	94606	0.11	0.07	--	--	--	--
	532	Earthgrains Baking Companies	94606	--	--	0.07	--	--	--
	591	East Bay Municipal Utility District	94607	0.01	0.01	0.54	0.15	0.09	0.42
	30	Owens-Brockway Glass Container	94601	0.35	0.34	--	0.60	0.39	0.03
Pleasanton	705	Vulcan Materials/Calmat Company	94588	--	--	0.03	0.02	--	0.07
San Leandro	2773	Davis Street SMART	94577	0.05	0.05	--	--	--	--
	167	Maxwell House, Div. of Kraft Foods	94578	0.03	0.02	0.01	0.04	--	0.10
	10960	Strategic Materials, Inc	94577	0.09	0.09	--	--	--	--
San Lorenzo	1067	Oro Loma Sanitary District	94580	--	--	0.02	0.02	0.03	0.06
Union City	1209	Union Sanitary District	94587	--	--	0.04	0.04	--	0.05
	83	United States Pipe & Foundry Company, LLC	94587	0.02	0.01	0.07	0.16	0.20	0.04
Contra Costa									
Antioch	1258	Delta Diablo Sanitation District	94509	--	--	0.01	0.02	0.01	0.11
	18143	Gateway Generating Station	94509	0.05	0.05	--	0.19	0.02	0.03
	3245	GWF Power Systems, LP (Site 3)	94509	0.02	0.01	--	0.11	0.12	0.06
	3981	GWF Power Systems, LP (Site 4)	94509	0.02	0.01	--	0.09	0.07	0.10
	9029	Kie-Con Inc	94509	0.01	--	--	0.05	--	0.01
	18	NRG Delta, LLC	94509	0.01	0.01	--	0.02	--	0.12
Brentwood	12676	Precision Cabinets & Trim	94513	--	--	0.09	--	--	--
Concord	541	Pacific Gas & Electric Co	94520	--	--	0.01	0.11	--	0.07
	4022	SFPP, LP	94520	--	--	0.06	--	--	--
Crockett	17315	C & H Sugar Company, Inc	94525	0.09	0.06	0.02	0.02	--	0.12
	8664	Crockett Cogeneration, A Cal L	94525	0.10	0.10	0.10	0.37	0.02	0.16
Martinez	10295	Air Products & Chemicals, Inc	94553	0.03	0.02	0.02	--	--	0.19
	907	Central Contra Costa Sanitary	94553	0.01	0.01	0.09	0.19	--	0.06

COUNTY/CITY	PLANT #	PLANT NAME	ZIPCODE	tons/day					
				PM ₁₀	PM _{2.5}	ROG	NO _x	SO ₂	CO
	1820	Martinez Cogen, LP	94553	0.05	0.05	0.12	0.30	--	0.08
	17559	Plains Products Terminals LLC	94553	--	--	0.19	0.02	--	--
	11661	Rhodia Inc	94553	0.03	0.02	--	0.03	0.96	--
	11	Shell Martinez Refinery	94553	1.15	1.07	3.64	2.70	3.43	3.36
	14628	Tesoro Refining and Marketing	94553	0.23	0.18	1.57	2.28	1.81	0.95
Oakley	19771	Contra Costa Generating Station	94561	0.07	0.04	--	--	--	--
Pittsburg	17667	Ameresco Keller Canyon LLC	94565	0.01	0.01	0.04	0.07	--	0.20
	227	Criterion Catalysts Company LP	94565	0.04	0.04	0.03	0.05	--	0.10
	12095	Delta Energy Center	94565	0.09	0.09	0.07	0.33	0.02	1.44
	31	Dow Chemical Company	94565	0.02	0.02	0.08	0.02	--	--
	3243	GWF Power Systems, LP (Site 1)	94565	0.02	0.01	--	0.11	0.11	0.05
	3244	GWF Power Systems, LP (Site 2)	94565	--	--	--	0.15	0.17	0.02
	3246	GWF Power Systems, LP (Site 5)	94565	0.02	0.01	--	0.16	0.22	0.07
	4618	Keller Canyon Landfill Company	94565	0.06	0.02	0.10	0.02	--	0.07
	11866	Los Medanos Energy Center	94565	0.06	0.06	0.02	0.30	0.02	0.04
	2371	USS-POSCO Industries	94565	0.04	0.02	0.02	0.16	--	0.05
Richmond	13637	BP West Coast Products, LLC	94804	--	--	0.07	--	--	--
	10	Chevron Products Company	94802	1.35	1.29	3.39	2.40	1.02	--
	23	General Chemical West LLC	94801	0.01	--	--	--	0.60	0.02
	13002	Kinder Morgan Liquids Terminal	94804	--	--	0.05	--	--	--
	935	Levin Richmond Terminal Corporation	94804	0.23	0.14	--	--	--	--
	93	Safeway Stores Inc, Bakery Plant	94804	--	--	0.09	--	--	--
	1840	West Contra Costa County Landfill	94801	0.05	0.05	0.20	0.07	0.02	0.26
Rodeo	17419	Air Liquide Large Industries US LP	94572	0.04	0.04	0.04	--	--	0.07
	21360	Phillips 66 Carbon Plant	94572	0.10	0.10	--	1.32	3.12	0.04
	21359	Phillips 66 Company - San Francisco	94572	0.16	0.16	0.47	0.85	1.08	0.67
Walnut Creek	10742	John Muir Medical Center	94598	--	--	--	0.05	--	0.01
Marin									
Corte Madera	18198	New WinCup Holdings, Inc	94925	--	--	0.06	0.04	--	--
Novato	1179	Redwood Landfill Inc	94948	0.24	0.07	0.16	0.06	0.13	0.20
San Rafael	653	Central Marin Sanitation Agency	94901	--	--	0.02	0.04	--	0.10
Napa									
American Canyon	11671	Gas Recovery Systems, Inc	94558	--	--	0.01	0.04	--	0.09
	12557	The Coca Cola Company, Inc	94503	--	--	0.03	0.02	--	0.08
Napa	10198	CertainTeed Gypsum and Ceiling	94558	0.05	0.03	--	--	--	--
	1634	Napa State Hospital	94558	--	--	--	0.07	--	0.02
	2158	Syar Industries Inc	94558	0.09	0.02	--	0.01	--	0.02
San Francisco									
	3288	BAE Systems San Francisco Ship	94107	--	--	0.07	--	--	--
	16151	NRG Energy Center LLC	94103	--	--	--	0.05	--	0.05
	2404	Pan-Glo Services, Inc	94124	--	--	0.10	--	--	--
	1784	San Francisco International Airport	94128	--	--	--	0.06	--	0.02
	568	San Francisco South East Treatment Plant	94124	--	--	0.18	0.20	0.02	0.05
	4116	San Francisco, City & County, PUC	94132	--	--	0.04	0.05	--	0.02
	51	United Airlines, SF Maintenance Center	94128	0.06	0.06	0.14	0.17	--	0.08
San Mateo									
Burlingame	1351	City of Burlingame, Wastewater Treatment	94010	--	--	0.01	0.02	--	0.06
Daly City	1507	North San Mateo County Sanitation	94015	--	--	0.07	--	--	--
Half Moon Bay	2266	Browning-Ferris Industries of California	94019	0.16	0.02	0.18	--	--	--

COUNTY/CITY	PLANT #	PLANT NAME	ZIPCODE	tons/day					
				PM ₁₀	PM _{2.5}	ROG	NO _x	SO ₂	CO
Menlo Park	11668	Gas Recovery Systems, Inc	94025	--	--	--	0.09	--	0.02
	3011	IPT SRI Cogeneration Inc	94025	--	--	0.02	0.05	--	0.07
Millbrae	7911	World Journal	94030	--	--	0.06	--	--	--
San Mateo	861	San Mateo Water Quality Control	94404	--	--	0.02	0.01	0.08	--
South San Francisco	1579	Granite Rock Company	94080	--	--	--	0.01	--	0.06
Santa Clara									
Coyote	12183	Metcalf Energy Center	95013	0.03	0.03	0.01	0.15	--	0.26
Cupertino	17	Lehigh Southwest Cement Company	95014	0.11	0.08	0.21	5.99	2.55	3.57
Gilroy	11180	Calpine Gilroy Cogen, LP & Gilroy Energy Cente	95020	0.03	0.03	--	0.07	--	0.03
	13566	Recology Pacheco Pass	95021	--	--	0.08	0.01	--	0.07
Milpitas	9013	International Disposal Corpora	95035	0.12	0.02	0.14	0.02	--	--
Morgan Hill	1812	Kirby Canyon Recycling and Dis	95037	0.04	--	0.07	0.04	--	0.19
Mountain View	2740	City of Mountain View (Shoreline Landfill)	94043	0.01	0.01	0.05	0.05	0.01	0.13
	15982	Google Inc	94043	--	--	0.01	0.02	--	0.07
Palo Alto	15128	Cardinal Cogen Inc	94305	0.07	0.07	0.14	0.32	--	0.29
	617	Palo Alto Regional Water Quality	94303	--	--	0.01	0.06	--	--
San Jose	110	Burke Industries, Inc	95112	--	--	0.05	0.02	--	--
	49	Chevron Products Company	95133	--	--	0.08	--	--	--
	5582	Eggo Company	95116	--	--	0.09	--	--	--
	11670	Gas Recovery Systems, Inc	95134	--	--	--	0.15	--	0.29
	11669	Guadalupe Energy Holdings, LLC	95120	--	--	0.03	0.10	--	0.31
	6044	O L S Energy-Agnews	95134	0.03	0.03	0.06	0.08	--	0.06
	20562	Orchard Supply Hardware	95118	--	--	--	--	--	0.07
	7265	San Jose State University (Cogen Plant)	95192	--	--	0.02	0.10	--	0.07
Santa Clara	778	San Jose/Santa Clara Water Pollution Control	95134	0.02	0.02	0.16	0.27	0.02	0.43
	4020	SFPP, LP	95131	--	--	0.13	--	--	--
	19158	Ameresco Santa Clara LLC	95054	--	--	--	0.06	--	0.02
Sunnyvale	621	City of Santa Clara	95050	0.01	0.01	0.04	0.15	--	0.11
	14991	Donald Von Raesfeld Power Plan	95054	0.07	0.07	--	0.19	--	0.11
	19441	Graphic Packaging International	95050	0.03	0.03	0.20	0.19	--	0.63
	41	Owens Corning Insulating Systems, LLC	95050	0.26	0.26	0.01	0.08	--	0.14
	17987	TTM Technologies, Inc	95050	--	--	0.06	--	--	--
Sunnyvale	733	City of Sunnyvale Water Pollution Control	94089	--	--	0.03	0.08	--	0.09
	55	Lockheed Martin Corporation	94089	--	--	0.04	0.06	--	0.01
Solano									
Benicia	12004	Delta Steel Erectors	94510	--	--	--	0.01	--	0.05
	15574	NuStar Logistics, LP	94510	--	--	0.05	--	--	--
	12626	Valero Refining Company - California	94510	0.33	0.33	0.39	3.07	0.32	1.25
Fairfield	606	Anheuser-Busch LLC	94533	--	--	0.05	0.01	--	0.11
	148	Ball Metal Beverage Container	94533	--	--	0.42	0.03	--	--
Suisun City	2039	Potrero Hills Landfill, Inc	94585	0.20	0.03	0.07	0.05	--	0.10
Sonoma									
Petaluma	1889	Hunt And Behrens, Inc	94952	0.10	0.06	--	--	--	--
	2254	Sonoma County Department of Public Works	94952	0.03	0.01	0.09	0.09	0.01	0.24
Santa Rosa	1403	City of Santa Rosa Wastewater Treatment	95407	--	--	0.03	0.06	--	0.14
Windsor	4982	Standard Structures Inc	95492	0.02	0.01	0.08	--	--	0.03
Total				8	6	16	27	17	22