

# **Pinellas County Air Quality Division 2008 Annual Air Quality Report**



OCTOBER 2009

*Department of Environmental Management  
Air Quality Division  
Pinellas County, Florida*

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This document was partially funded with federal U.S. EPA Section 105 Grant funds.

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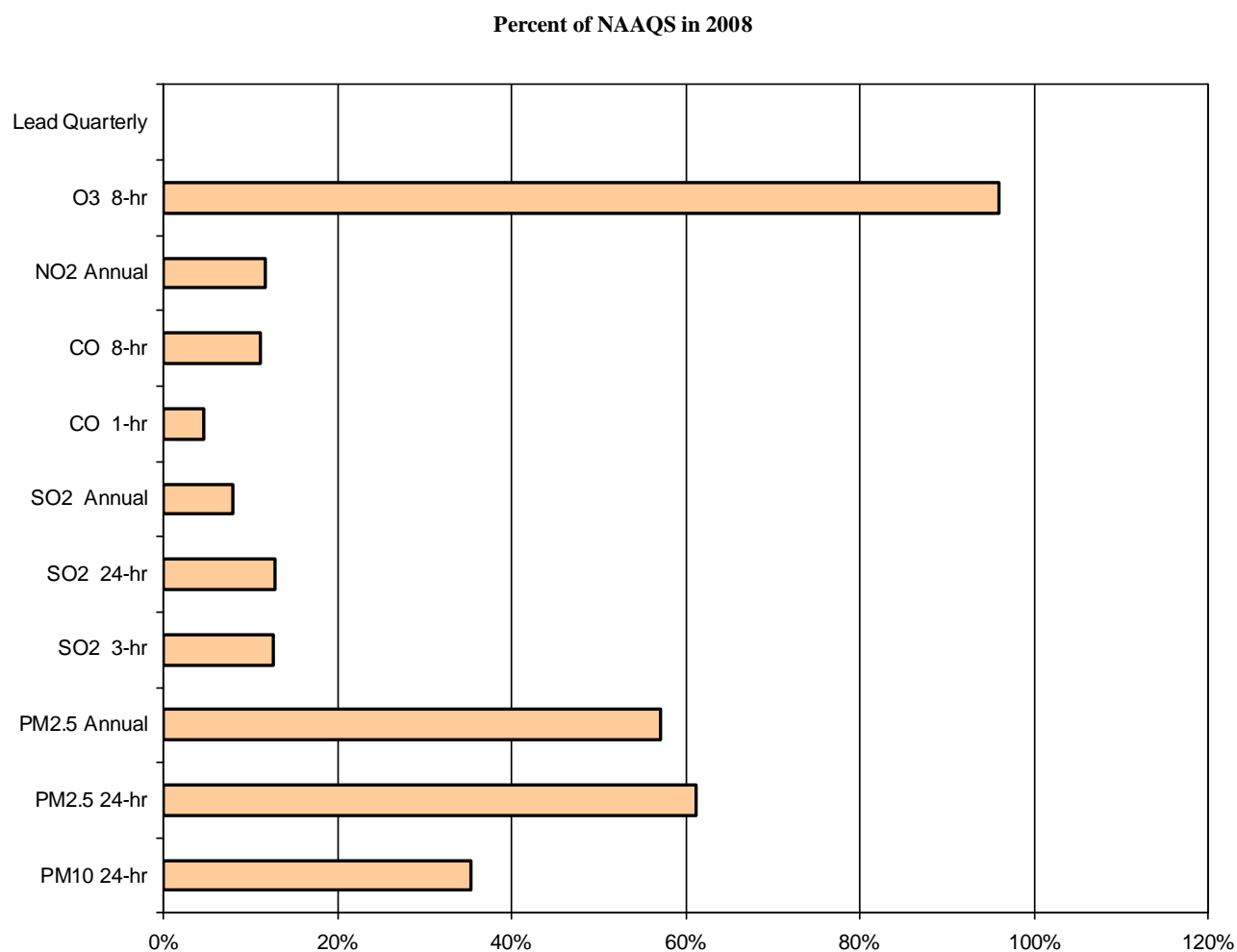
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## EXECUTIVE SUMMARY

The Air Quality Division is dedicated to protect, preserve and enhance the air quality within Pinellas County. The following items represent milestones accomplished during calendar year 2008.

- National Ambient Air Quality Standards (NAAQS) have been established for the following pollutants: Ozone (O<sub>3</sub>); Particulate Matter (fine and coarse/PM); Carbon Monoxide (CO); Sulfur Dioxide (SO<sub>2</sub>); Nitrogen Dioxide (NO<sub>2</sub>); and Lead (Pb). Ozone and fine particulate matter are the pollutants of concern for Pinellas County. As shown in the graph below, the County continues to be in compliance with all established NAAQS.





- The Air Quality Index (AQI) is a national standard for reporting daily air quality to the public in an understandable, health-related manner. The AQI has six categories: 1. Good; 2. Moderate; 3. Unhealthy for Sensitive Groups; 4. Unhealthy; 5. Very Unhealthy; and 6. Hazardous. AQI values that fall into category 3 and higher represent monitoring values higher than the NAAQS. These days are considered unhealthy air quality days and require public cautionary statements. The AQI is available daily in the St. Petersburg Times, by phone (464-3392), the Air Quality Division's Website ([www.pinellascounty.org/Environment/default.htm](http://www.pinellascounty.org/Environment/default.htm)), and EPA's AirNow Website ([www.airnow.gov](http://www.airnow.gov)). During 2008 the County had 323 Good days, 40 Moderate days, and 3 Unhealthy for Sensitive Groups days.
- The Division continued to conduct air toxics monitoring (metals, carbonyls, and volatile organic compounds) at two locations (Azalea Park and Skyview Elementary) during 2008. The Hillsborough County Environmental Protection Commission (EPC) remains a partner in the toxics monitoring program and had two additional monitoring sites in their jurisdiction. Each county agency shares data, performs cost effective sampling analysis, etc. In the future, the Division will continue monitoring for air toxics, however, as EPA develops and prioritizes the national air toxics program strategy, the number and locations of toxics monitoring sites may change. Of importance is the selection of a location for a national air toxics monitoring site (i.e. used to determine national trends and establish policy). Data analyses to date indicates that there are several chemicals (e.g. benzene and formaldehyde) in Pinellas County with concentrations above cancer benchmark levels that warrant continued investigation.
- The Division's Compliance and Enforcement Section continues to be aggressive in its compliance activities (facility inspections and enforcement activities), as well as response to citizen complaints. The Section conducted 380 inspections and responded to 287 citizen's complaints during 2008. In addition, reported stationary source emissions remained stable in 2008.
- The Air Monitoring Network was reviewed and revised in accordance with new EPA regulations. The changes were made to place emphasis on pollutants and monitors that impacted NAAQS compliance.
- Program Priority Areas:
  1. Air Toxics - Continue monitoring, data assessment, and implementation of toxic source programs/regulations as they are finalized by the Environmental Protection Agency (EPA).
  2. NAAQS Regulatory Program Changes - Work with EPA and the Florida Department of Environmental Protection (FDEP) to establish area NAAQS designation and implement the revised ozone and fine particulate matter standards (e.g. revise State Implementation Plan).
  3. Public Outreach – Continue and improve programs for forecasting ozone and particulate matter air quality.
  4. Compliance/Enforcement – Source Inspections (e.g. Title V and regulated toxic sources); the Asbestos and Maximum Achievable Control Technology (MACT)/Generally Achievable Control Technology (GACT) air toxic programs continue to require significant compliance and enforcement activity.
  5. Air Monitoring - Continued assessment of the monitoring network to implement new EPA regulations. This is a phased, multi-year effort.

# What is Air Pollution?

Air pollution is defined as the presence in the outdoor atmosphere of any one or more substance in quantities which may be harmful or injurious to human health or welfare, animal or plant life, or which may reasonably interfere with the enjoyment of life, including outdoor recreation, or property. Air pollution includes a vast array of substances, which may be introduced into our atmosphere in the form of vapors or particles from both natural and man-made sources.

## Health and Economic Effects

In most cases, air pollution frequently affects those who are least prepared to protect themselves, namely children and the elderly. Although the effects of air pollution vary by pollutant type and length of exposure, the major health concern associated with air pollution is the aggravation of existing respiratory and cardiovascular diseases.

Sustained exposure to air pollution can result in high morbidity rates and premature death. Studies performed by a variety of governmental agencies and private organizations estimate the total health cost lies in the range of tens of billions of dollars per year for the total population of the United States.

Although the major economic impact from air pollution includes the costs associated with medical treatments, morbidity, and reduced productivity, air pollutants are capable of causing significant economic impacts in other ways. For example, the remediation of air toxics such as asbestos, formaldehyde, benzene and other toxics compounds can result in significant removal and disposal costs.

## Conservation and Aesthetic Effects

Anthropogenic or man-made air pollution is generated primarily through the combustion of fossil fuels. In most cases, these fuels are derived from non-renewable natural resources like oil and coal. Thus, as we increase our demands for energy, air pollution will tend to increase without proper management, alternative fuels, or imposing additional controls.

Most of the air pollution generated within Pinellas County comes from transportation-related sources. The latest emission inventory updates (2005) indicate mobile sources continue to contribute approximately 50% of the total oxides of nitrogen and volatile organic compound emissions.

Aesthetic effects may include intangible factors that can not be easily quantified. Air pollution can result in impaired visibility, excessive amounts of dirt and soot and nauseous odors that decrease personal comfort and enjoyment of the environment.



## Climatology and Meteorology

Weather, climate and topography can play an important part in the formation and distribution of air pollution. The climate in Pinellas County can be described as sub-tropical with a primary wet season during the summer and a secondary wet season in the winter. During 2008, rainfall was extremely variable in the Tampa Bay area. Tampa International Airport was 1 inch below normal (normal = 45"/year) while St. Petersburg/Clearwater International Airport was 3 inches below normal (normal = 50"/year).

Sea breezes modify the sub-tropical climate; this along with daily afternoon thunderstorms (the Tampa Bay area is the lightning capital of the United States), keep summertime temperatures in the low 90's. Even with long, warm and humid summers, the winters are quite mild, with temperatures in the 50's to low 70's. There can be occurrences of freezing temperatures, however, during 2008 there was one day that recorded a temperature at or below 32 degrees at either Tampa or St. Petersburg/Clearwater International Airports.

Given the dynamic nature of our area's weather, climatological and meteorological analysis are indispensable components in our efforts to adequately evaluate air pollution and the appropriateness of ambient air quality monitoring sites.

Ozone is created through a very complicated photochemical reaction of volatile organic compounds (VOC's), oxides of nitrogen (NOX) and, to a lesser degree, carbon monoxide (CO) in the presence of sunlight. Stagnant high pressure systems, coastal recirculation patterns, high surface temperatures, relatively low surface wind speeds and abundant sunlight, which provides the solar radiation necessary for the photochemical process, are key factors in the formation of tropospheric ozone within Pinellas County.

Stationary high pressure systems create inversion conditions where air becomes stagnant and allows ozone precursors to accumulate. Our proximity to the coast and the various effects caused by the migration of convergence zones and thermal contrast in and around Tampa Bay and Gulf of Mexico, results in recirculating wind patterns promoting the accumulation and regional transport of ozone precursors.

Conversely, it is weather and relatively flat topography which prevents potential adverse air quality impacts from other air pollutants. For example, prevailing coastal winds that assure thorough transport of air parcels above the county and our relatively flat and coarse topography provides ample mixing and dilution of pollutants such as CO. Thus, elevated and sustained ambient concentrations of these pollutants in Pinellas County are uncommon.

There are also dichotomous relationships that exist between weather and climate and air pollution. For example, during the rainy season, sulfur dioxide (SO<sub>2</sub>) and nitrogen dioxide (NO<sub>2</sub>) are precipitated from our atmosphere. However, this same precipitation acts as a medium for wet deposition of acidic compounds into our lakes and streams.

# The Air Quality Program

## Mission

The Air Quality Division is dedicated to protect, preserve and enhance the air quality within Pinellas County. The Division will accomplish its mission by providing and maintaining for the citizens and visitors of Pinellas County standards that will ensure atmospheric purity and freedom of the air from contaminants, which threaten public health and welfare.

## Objective Strategy

Continued attainment of the National Ambient Air Quality Standards (NAAQS) for ozone and other pollutants is achieved through the implementation of air pollution control strategies consistent with authorization of the Clean Air Act Amendments of 1990.

- Maintain programs to protect the public from high risk sources of toxic and hazardous air pollutants.
- Continue to develop programs that serve and educate the public concerning air pollution issues.
- Maintain programs that will prevent the degradation of air quality where standards are being met.

## Public Education and Outreach

The Air Quality Division's Public Education and Outreach Program promotes awareness of current air quality issues. This is accomplished by using a multi-media approach to provide up-to-date air quality-related information to the public and private sectors. Air quality-related information is presented through public speaking engagements, educational programs and printed materials such as brochures, fact sheets, technical reports and the local newspaper. The Division strives to utilize any available media to enhance public awareness on air quality in an efficient and cost-effective manner.

Environmental awareness extends beyond the workplace. To promote this sense of awareness, the Air Quality Division prepares articles, as required, for county publications. In addition, Air Quality Division staff provides interviews and information for the County Communication television station, as well as local news media outlets. Air Quality personnel often speak at workshops, training sessions, and events organized for public awareness. As a result our message of promoting clean air activities and practices is sent to various environmental agencies, civic groups, county employees, and other interested parties.

Public Education and Outreach includes networking with other agencies, including the University of South Florida (USF) and various public and private schools. The Pinellas County Speakers Bureau has had numerous requests for speakers from the Division. In addition, the Air Quality Division participates in organizations such as the Air and Waste Management Association and the Pinellas County Science Fair.

Public Education and outreach activities conducted in 2008 included:

- Clean Air Month (May 2008); and
- Commuter Choices Week (October 2008).

In addition, Division staff participated in a number of projects that support grant activities. These projects and other partners include:

- Air toxics monitoring and assessment with the Hillsborough County Environmental Protection Commission (HCEPC);
- The Clean Air Partnership (CAP) with HCEPC. CAP is a program designed to promote commuter alternatives and alternative fuels; and
- Clean School Bus Program with the Pinellas County School Board. The School Bus Program's goal is to reduce general population and student exposure to emissions from diesel school buses.

Throughout the year, various air quality issues and policies come before our elected and appointed officials on the Board of County Commissioners and the Metropolitan Planning Organization. In these instances, the Division provides technical support and expertise at meetings, workshops and public hearings. Our purpose is to provide a clear understanding of the issues and their potential impact on Pinellas County.

## Criteria Pollutants

The U.S. Environmental Protection Agency (EPA) is responsible for establishing and maintaining the National Ambient Air Quality Standards (NAAQS) to protect health and welfare (Refer to Table 1).

The primary NAAQS are designed to protect the public health. The secondary NAAQS are designed to protect public welfare including the effects of air pollution on visibility, materials and vegetation.

**Table 1: National Ambient Air Quality Standards**

Pollutant	Primary Stds.	Averaging Times	Secondary Stds.
Carbon Monoxide	9 ppm (10 mg/m <sup>3</sup> )	8-hour <sup>1</sup>	None
	35 ppm (40 mg/m <sup>3</sup> )	1-hour <sup>1</sup>	None
Lead	1.5 µg/m <sup>3</sup>	Quarterly Average	Same as Primary
Nitrogen Dioxide	0.053 ppm (100 µg/m <sup>3</sup> )	Annual (Arithmetic Mean)	Same as Primary
Particulate Matter (PM <sub>10</sub> )	150 µg/m <sup>3</sup>	24-hour <sup>1</sup>	
Particulate Matter (PM <sub>2.5</sub> )	15.0 µg/m <sup>3</sup>	Annual <sup>2</sup> (Arith. Mean)	Same as Primary
	35 µg/m <sup>3</sup>	24-hour <sup>3</sup>	
Ozone	0.08 ppm/0.075 ppm (revised 3/08)	8-hour <sup>4</sup>	Same as Primary
	0.12 ppm	1-hour <sup>5</sup> (Not Applicable in Pinellas Co.)	Same as Primary
Sulfur Oxides	0.03 ppm	Annual (Arith. Mean)	-----
	0.14 ppm	24-hour <sup>1</sup>	-----
	-----	3-hour <sup>1</sup>	0.5 ppm (1300 µg/m <sup>3</sup> )

<sup>1</sup> Not to be exceeded more than once per year.

<sup>2</sup> To attain this standard, the 3-year average of the weighted annual mean PM<sub>2.5</sub> concentrations from single or multiple community-oriented monitors must not exceed 15.0 µg/m<sup>3</sup>

<sup>3</sup> To attain this standard, the 3-year average of the 98th percentile of 24-hour concentrations at each population-oriented monitor within an area must not exceed 35 µg/m<sup>3</sup>

<sup>4</sup> To attain this standard, the 3-year average of the fourth-highest daily maximum 8-hour average ozone concentrations measured at each monitor within an area over each year must not exceed 0.08 ppm. Standard revised to 0.075 ppm, compliance measure (3-year average of the fourth-highest daily maximum) remained the same.

<sup>5</sup> (a) The standard is attained when the expected number of days per calendar year with maximum hourly average concentrations above 0.12 ppm is ≤ 1.

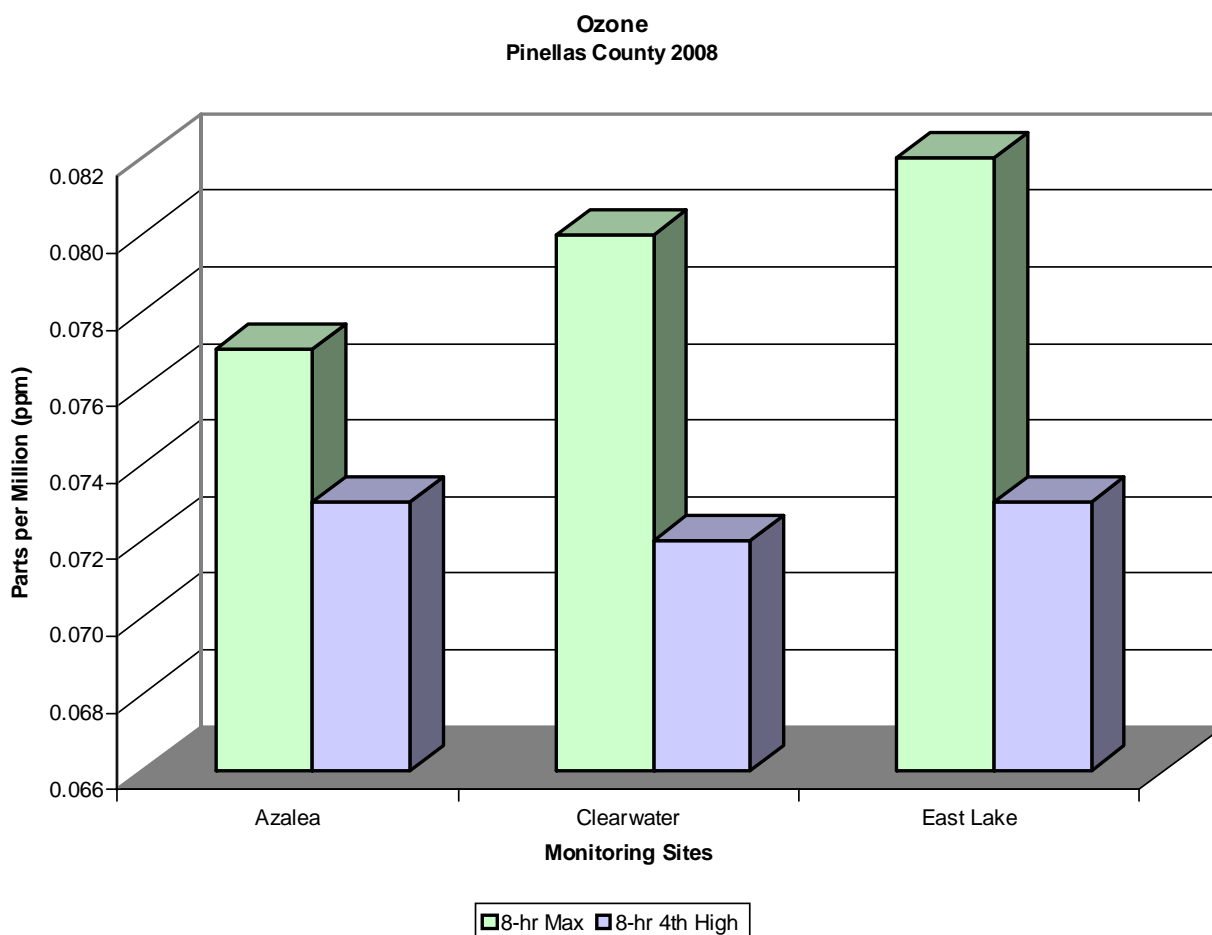
(b) As of June 15, 2005 EPA revoked the 1-hour ozone standard in all areas except the fourteen 8-hour ozone nonattainment Early Action Compact (EAC) Areas.

## Ozone

Ozone (O<sub>3</sub>) is a colorless and highly unstable molecular form of oxygen that is associated with the presence of photochemical smog. Ozone is not emitted directly into the air from any source. Instead, it is formed by chemical reactions involving volatile organic compounds (VOC's) and oxides of nitrogen (NO<sub>x</sub>) in the presence of sunlight. NO<sub>x</sub> is emitted from sources of high temperature combustion. VOC's are emitted primarily from transportation sources such as cars and trucks. Maximum values for ozone in 2008 are shown in Figure 1 (Reference Site Locations page 17).

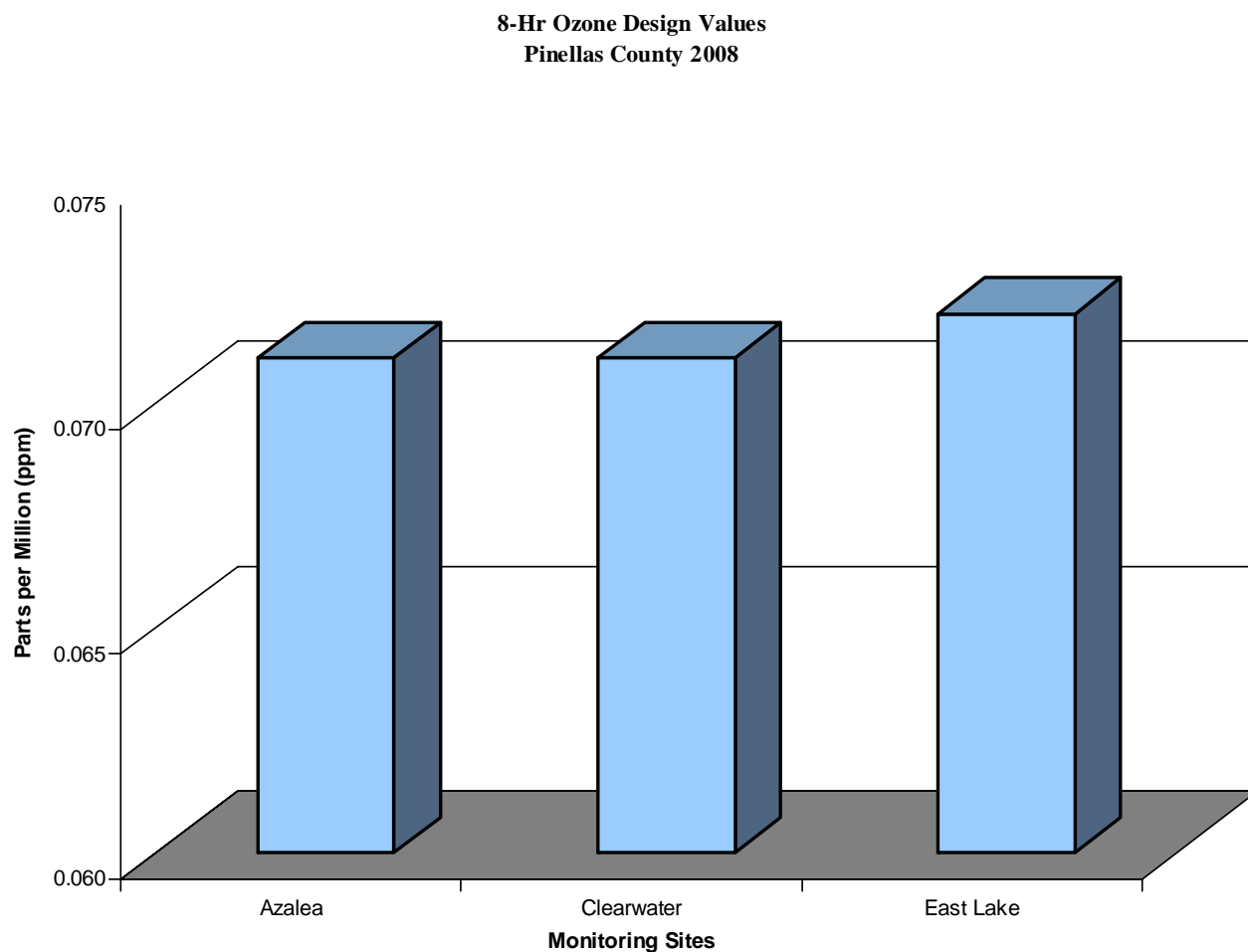
The highly reactive nature of ozone can cause health problems by damaging biological tissues and cells. High ambient levels of ozone can result in impaired breathing, coughing, nausea and pulmonary congestion. High levels of ozone can also cause noticeable foliar and ecosystem damage, reduce agricultural crop yields, and degrade paints, dyes and rubber products. The Pinellas County Air Quality Division operates three ozone monitoring sites throughout the county. On occasions, measured levels approach the National Ambient Air Quality Standards (NAAQS).

**Figure 1: Ambient Ozone Levels**



In July 1997, EPA changed the ozone standard from a maximum 1-hour concentration (0.12ppm) to an 8-hour average concentration standard (0.08ppm) that is more protective of public health. Once the 8-hour standard was adopted, the 1-hour standard was revoked. Once again in March 2008 the 8-hour standard was lowered to further protect public health and the environment. The new standard is 0.075 ppm and the form of the standard is the same (an exceedance will occur when the 3-year average of the 4<sup>th</sup> highest daily maximum 8-hour concentration at a single site is above the standard). The design values for 2008 (Figure 2), for the period 2006-2008, show that Pinellas County is designated as being in attainment for the 8-hour standard.

**Figure 2: 8-hour Ozone Design Values (Average 2006-2008)**





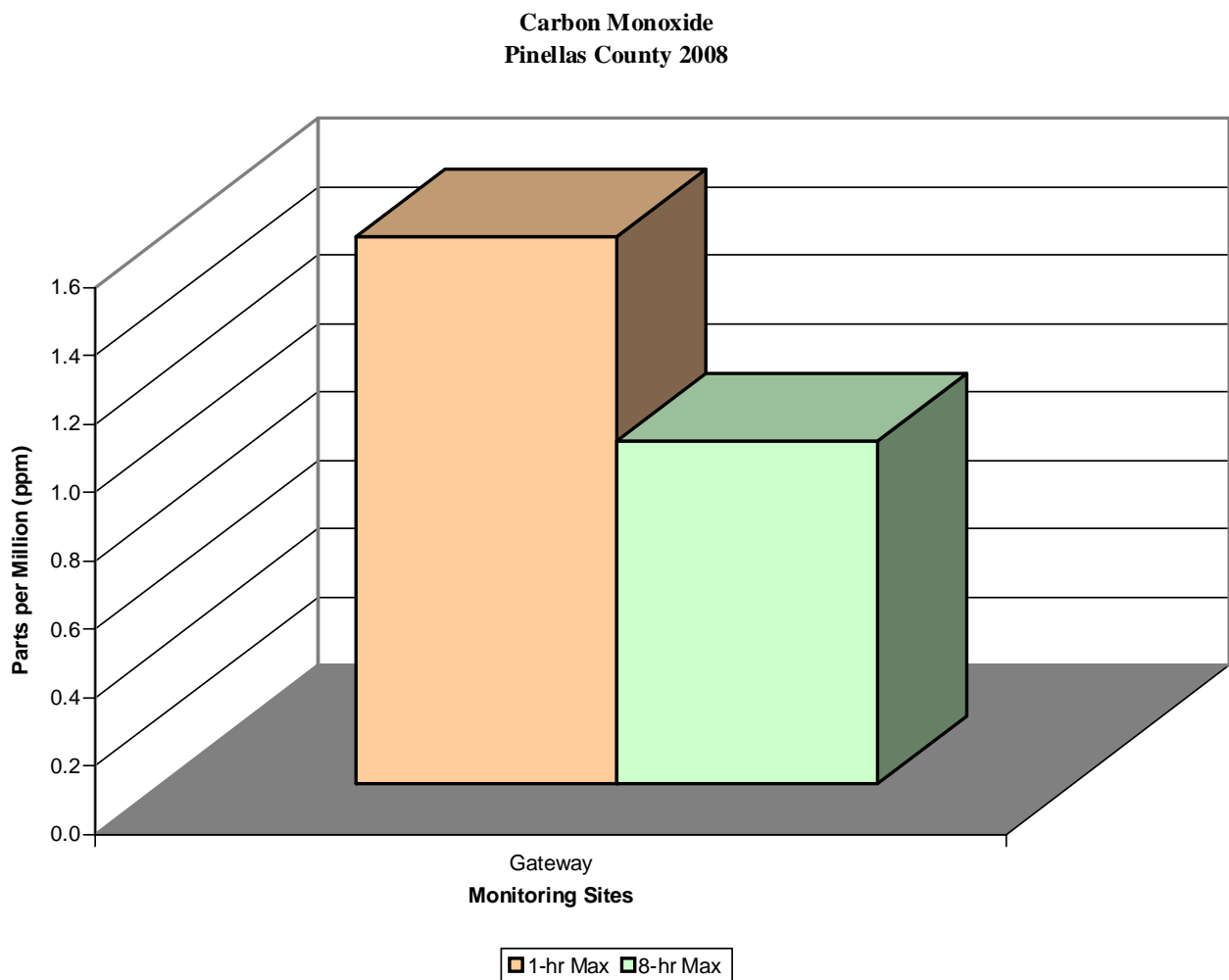
## Carbon Monoxide

Carbon Monoxide (CO) is a by-product of the incomplete combustion of fuels. Transportation-related sources account for the majority of all CO pollution in the county.

Carbon monoxide exposure can disrupt the delivery of oxygen to the body's organs and tissues. The health threat from CO is greater for those individuals who suffer from cardiovascular disease. Elevated levels of CO have been associated with impaired vision, loss of manual dexterity and the loss of short-term memory. Health effects from exposure to high levels of carbon monoxide can result in reduced productivity with impairment of work capacity, learning ability and performance of complex tasks. There is one CO monitoring sites located throughout the county.

The NAAQS for carbon monoxide is expressed as a 1-hour maximum of 35ppm and an 8-hour average of 9ppm. Figure 3 shows the maximum values for 2008.

**Figure 3: Ambient Carbon Monoxide Levels**



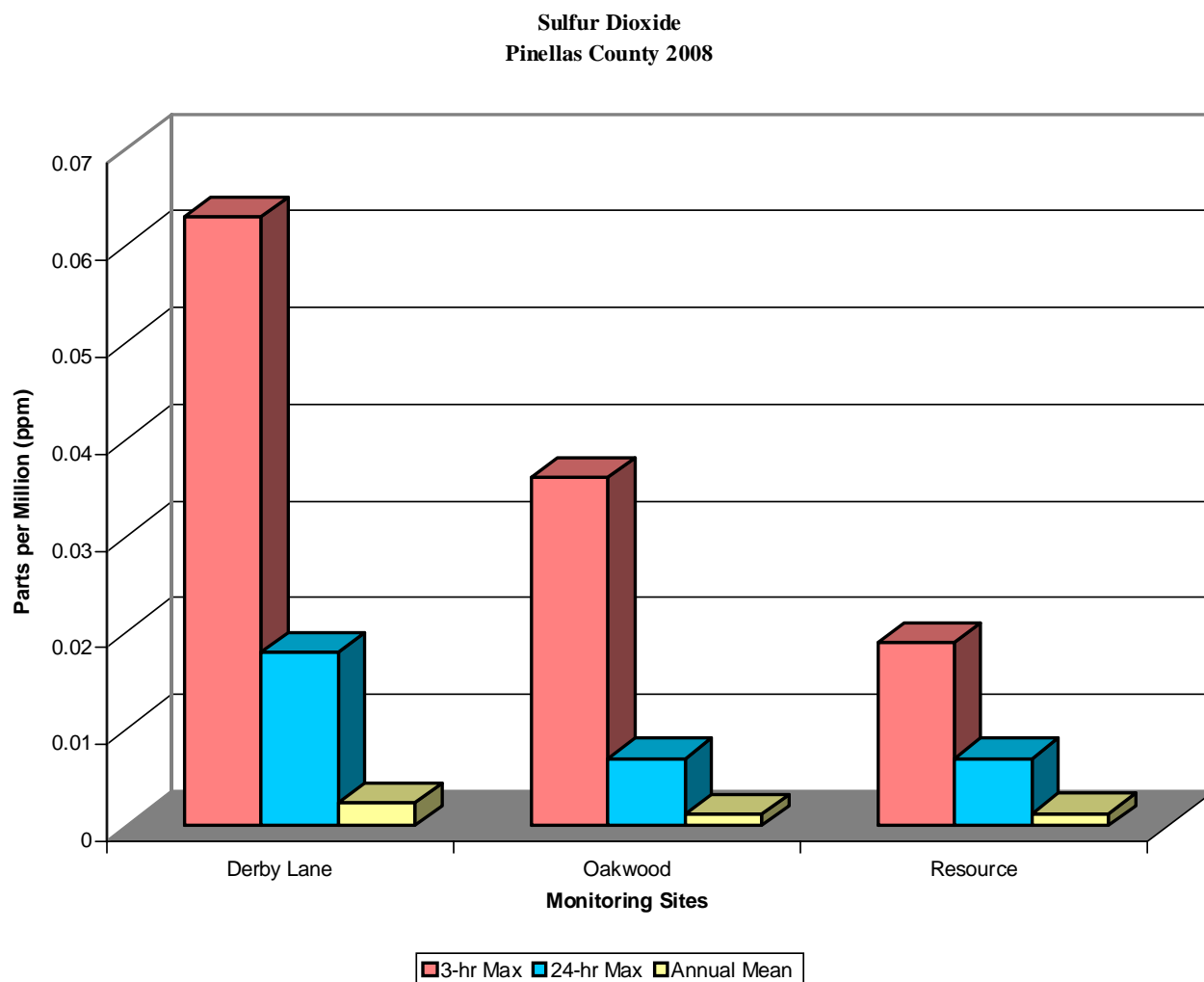
## Sulfur Dioxide

Sulfur Dioxide (SO<sub>2</sub>) is emitted primarily from steam power and steam-electric power generating facilities that consume sulfur-containing fossil fuels such as coal and oil.

Asthmatics and others with respiratory diseases such as bronchitis, influenza and emphysema can be at risk when exposed to higher than normal ambient concentrations of sulfur dioxide. The Air Quality Division operates three SO<sub>2</sub> monitoring sites located throughout the county.

The NAAQS for SO<sub>2</sub> is expressed as an annual mean of 0.03ppm, a maximum 24-hour average of 0.14ppm, or a maximum 3-hour average of 0.5ppm. Figure 4 shows the maximum values for 2008.

**Figure 4: Ambient Sulfur Dioxide Levels**



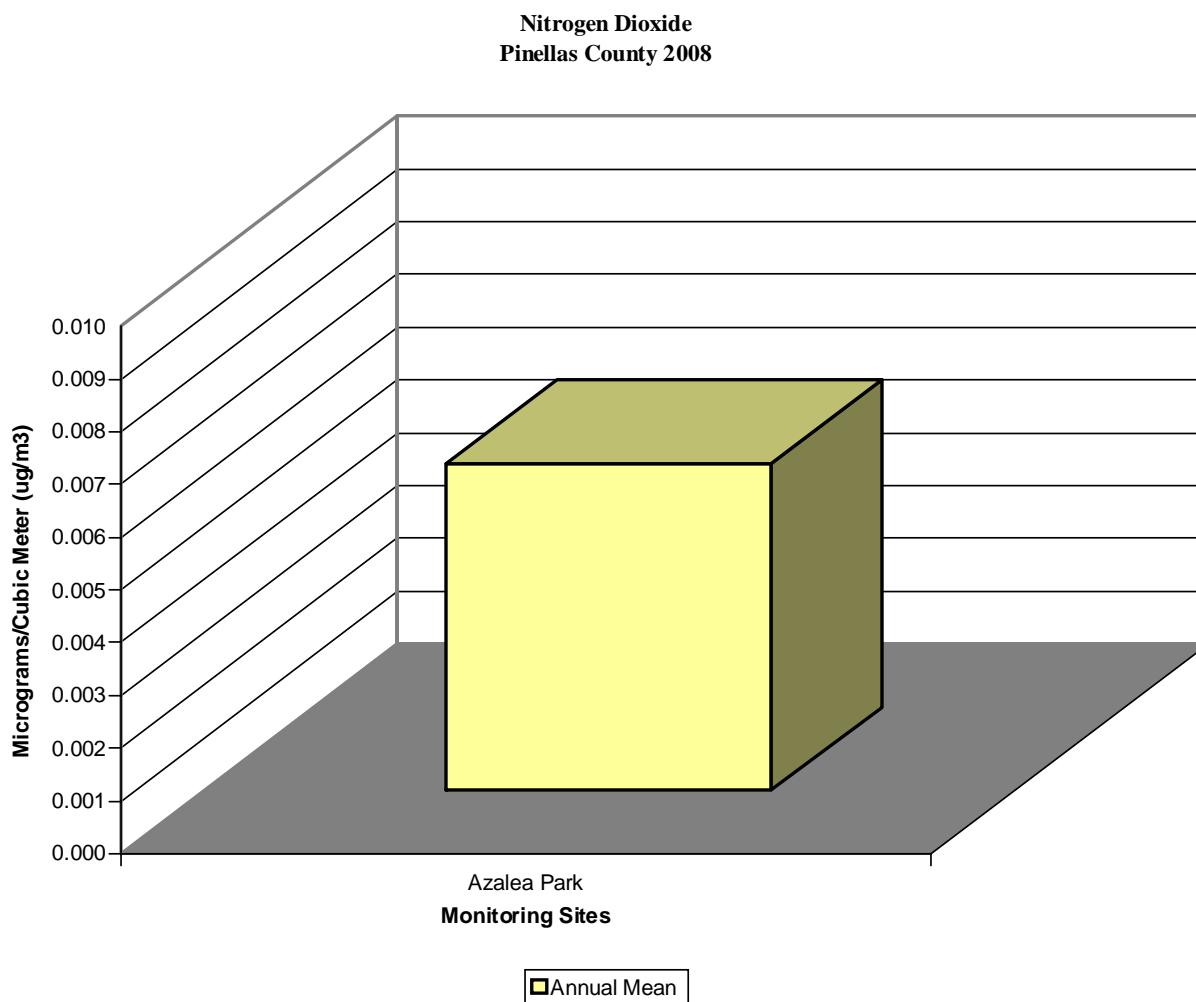
## Nitrogen Dioxide

Much of the nitrogen dioxide (NO<sub>2</sub>) in the atmosphere is formed from nitrogen oxide (NO) released during high temperature combustion of fuels. Primary sources of NO and NO<sub>2</sub> are coal- and oil-fired electric utility boilers and transportation sources such as gasoline and diesel powered cars, trucks and buses.

Asthmatics and others with respiratory diseases such as bronchitis, influenza and emphysema can be at risk when exposed to higher than normal ambient concentrations of nitrogen dioxide. There is one NO<sub>2</sub> monitoring site located in a high transportation area of the county and it produces annual measurements generally in the range of 15% of the ambient air quality standard.

The NAAQS for nitrogen dioxide is expressed as an annual arithmetic mean of 0.05ppm. Figure 5 shows the maximum values for 2008.

**Figure 5: Ambient Nitrogen Dioxide Levels**



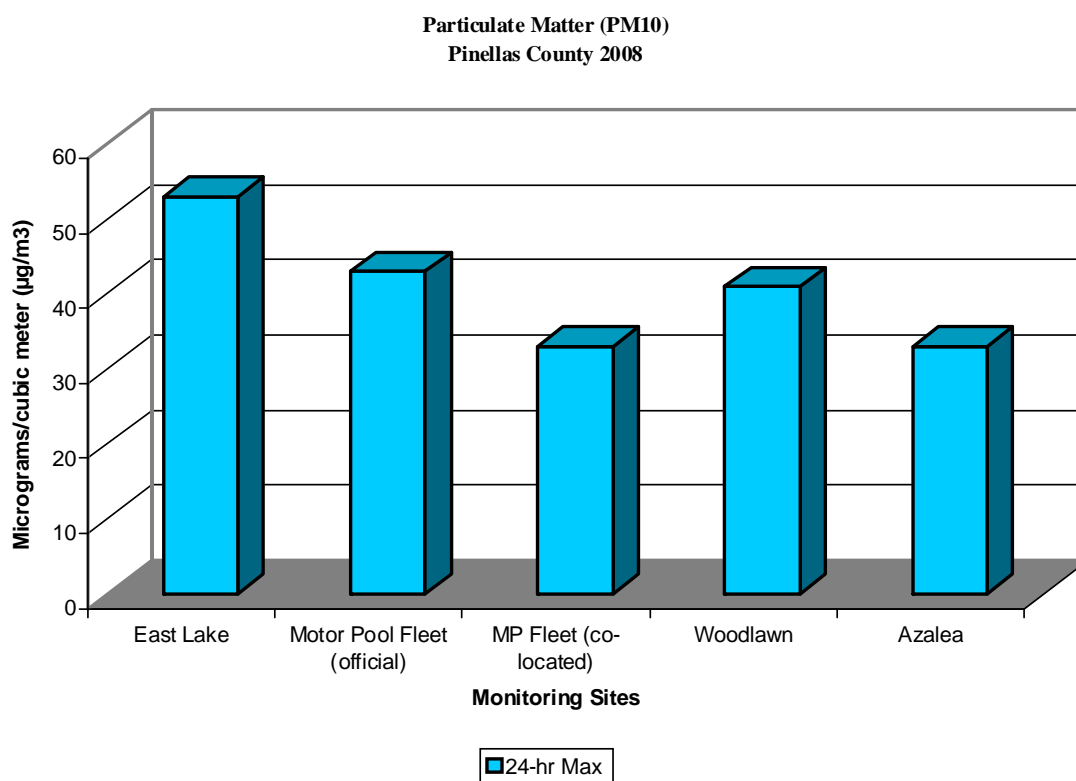
## Particulate Matter

The characteristics, sources, and potential health effects of larger or “coarse” particles (from 2.5 to 10 micrometers in diameter) and smaller or “fine” particles (smaller than 2.5 micrometers in diameter) are very different. Coarse particles (PM<sub>10</sub>) come from sources such as windblown dust from agricultural fields, grinding operations, and dust kicked up on unpaved roads by vehicle traffic. Fine particles (PM<sub>2.5</sub>) are generally emitted from activities such as industrial and residential combustion, open burning of trash and garbage, and from vehicle exhaust. Fine particles are also formed in the atmosphere when gases such as sulfur dioxide, nitrogen oxides and volatile organic compounds, emitted by combustion activities, are transformed by chemical reactions in the air.

Coarse particles can accumulate in the respiratory system and aggravate health problems such as asthma. Fine particulates are a health threat because of their ability to penetrate deep into the lungs, causing premature mortality and increased hospital admissions. These fine particles are so small that several thousand of them could fit on the period at the end of a sentence. The elderly, children, asthmatics and individuals with pre-existing heart or lung disease are most at risk from particulate matter exposure.

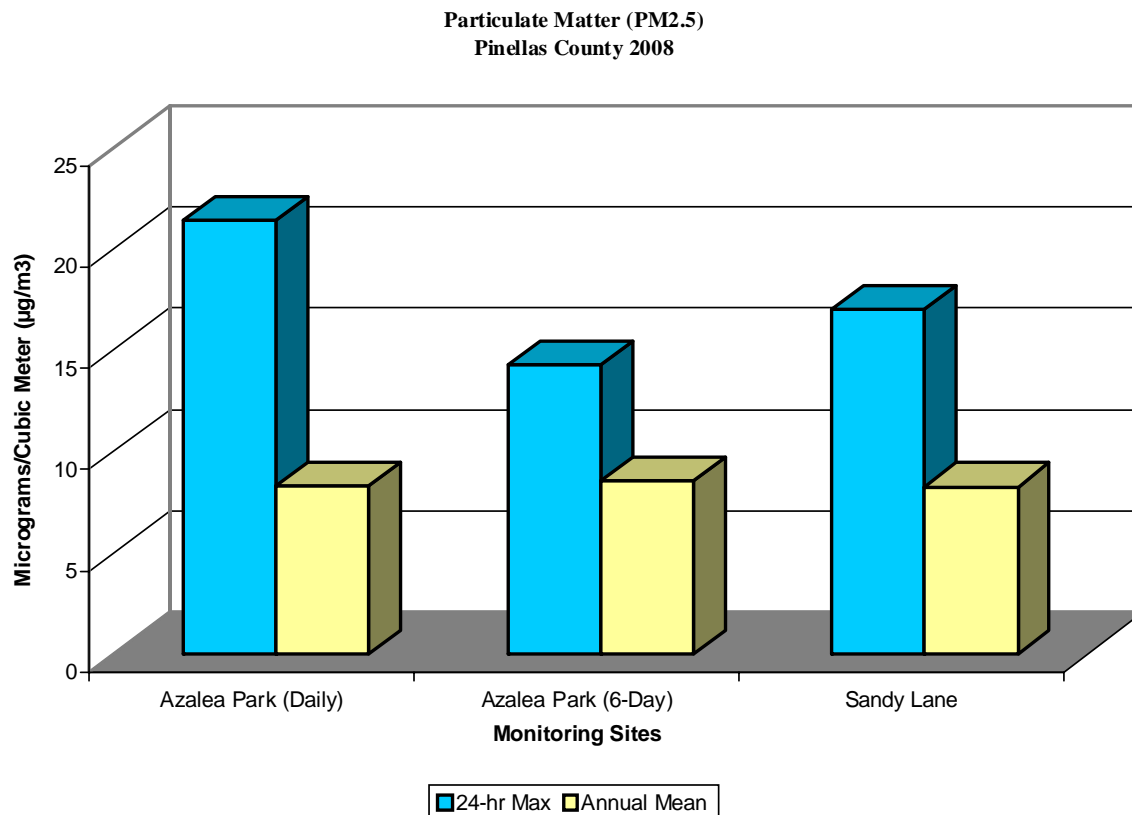
The same fine particles linked to serious health effects are also a major cause of visibility impairment in many parts of the U.S. – causing the visual range to be reduced up to 70% from natural conditions. In the east, the current range is only 14-24 miles vs. a natural visibility of 90 miles. The particles can remain suspended in the air and travel long distances. Emissions from diesel trucks on I-95 can end up on the beaches of the Gulf Coast.

**Figure 6: Ambient Particulate (PM<sub>10</sub>) Levels**



There are four PM10 monitoring sites and two PM2.5 sites located in Pinellas County to measure particulate emissions. The NAAQS for PM10 is expressed as a 24-hour maximum mean of 150 $\mu\text{g}/\text{m}^3$ , while PM2.5 has an annual mean of 15 $\mu\text{g}/\text{m}^3$  and a 24-hour maximum of 35 $\mu\text{g}/\text{m}^3$ . Figures 6 and 7, pages 11 and 12, respectively, show the maximum values for 2008.

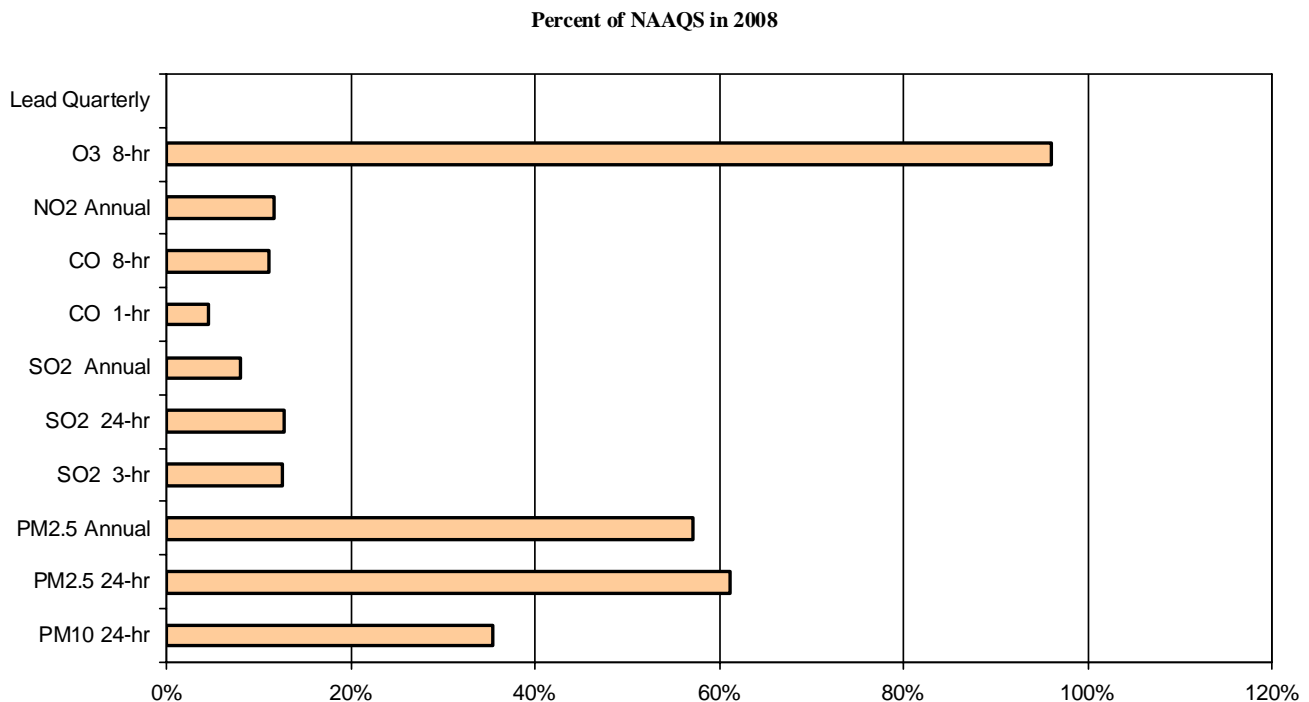
**Figure 7: Ambient Particulate (PM2.5) Levels**



## Comparison of All Criteria Pollutants

The following chart, Figure 8, shows the percentage of each pollutant to its respective standard. At this time, Pinellas County is within the standard for all the criteria pollutants.

**Figure 8: Percent of National Ambient Air Quality Standards For 2008**



## Air Quality Index

The Air Quality Index (AQI), is a nation-wide standard method developed by the U.S. Environmental Protection Agency (EPA) for reporting daily air quality to the public in a health-related manner. The index tells you how clean your air is, and the associated index level health concerns. The AQI describes ambient air quality concentration levels for sulfur dioxide (SO<sub>2</sub>), ozone (O<sub>3</sub>), carbon monoxide (CO), nitrogen dioxide (NO<sub>2</sub>), and particulate matter (PM) in terms of a concentration index for the highest pollutant level in a previous time period. The pollutant concentrations are measured and converted to numbers based on a mathematical formula that transforms ambient pollutant concentrations onto a scale where an AQI of 101 would be equal to the National Ambient Air Quality Standard (NAAQS) for all criteria pollutants except PM<sub>2.5</sub>, where an AQI of 151 would indicate a NAAQS exceedance. Table 2 provides the AQI health descriptor scale and cautionary statements.



**Table 2: Air Quality Index Descriptive**

Air Quality Index Levels of Health Concern	Numerical Value	Meaning
Good	0-50	Air quality is considered satisfactory, and air pollution poses little or no risk.
Moderate	51-100	Air quality is acceptable; however, for some pollutants there may be a moderate health concern for a very small number of people who are unusually sensitive to air pollution.
Unhealthy for Sensitive Groups	101-150	Members of sensitive groups may experience health effects. The general public is not likely to be affected.
Unhealthy	151-200	Everyone may begin to experience health effects; members of sensitive groups may experience more serious health effects.
Very Unhealthy	201-300	Health alert: everyone may experience more serious health effects.
Hazardous	> 300	Health warnings of emergency conditions. The entire population is more likely to be affected.

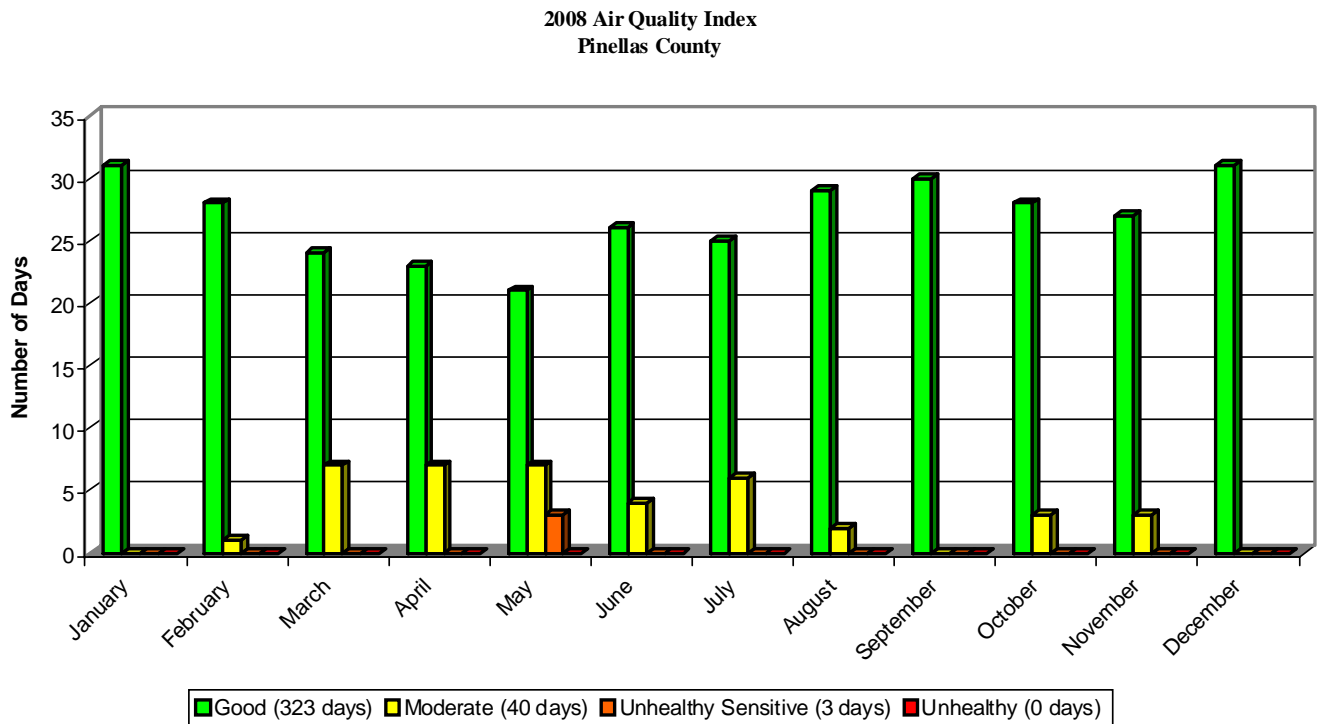
The higher the AQI value, the greater the level of air pollution and the greater the health danger. AQI values below 100 are generally thought of as satisfactory. When AQI values are above 100, air quality is considered to be unhealthy. Sensitive groups of people (children who are active outdoors, adults involved in moderate or strenuous outdoor activities, individuals with respiratory disease such as asthma, and individuals with unusual susceptibility to ozone) are impacted first, then as AQI values get higher everyone is impacted. Figures 9 and 10 illustrate the monthly trend during 2008 and the previous ten-year trend, respectively. Changes in the ozone standard in 1999 from a 1-hour to an 8-hour standard make data comparisons difficult, however since 1999 the AQI has improved with more days in the good category and fewer in both the moderate and unhealthy categories.

The Air Quality Division's Air Monitoring and Planning Sections forecast the current and next day AQI Monday through Friday at approximately 11:00 a.m. The daily air quality forecast is updated, as needed, at 4:00 p.m. and a forecast for Sunday is made on Friday. The forecast can be obtained from the following sources:

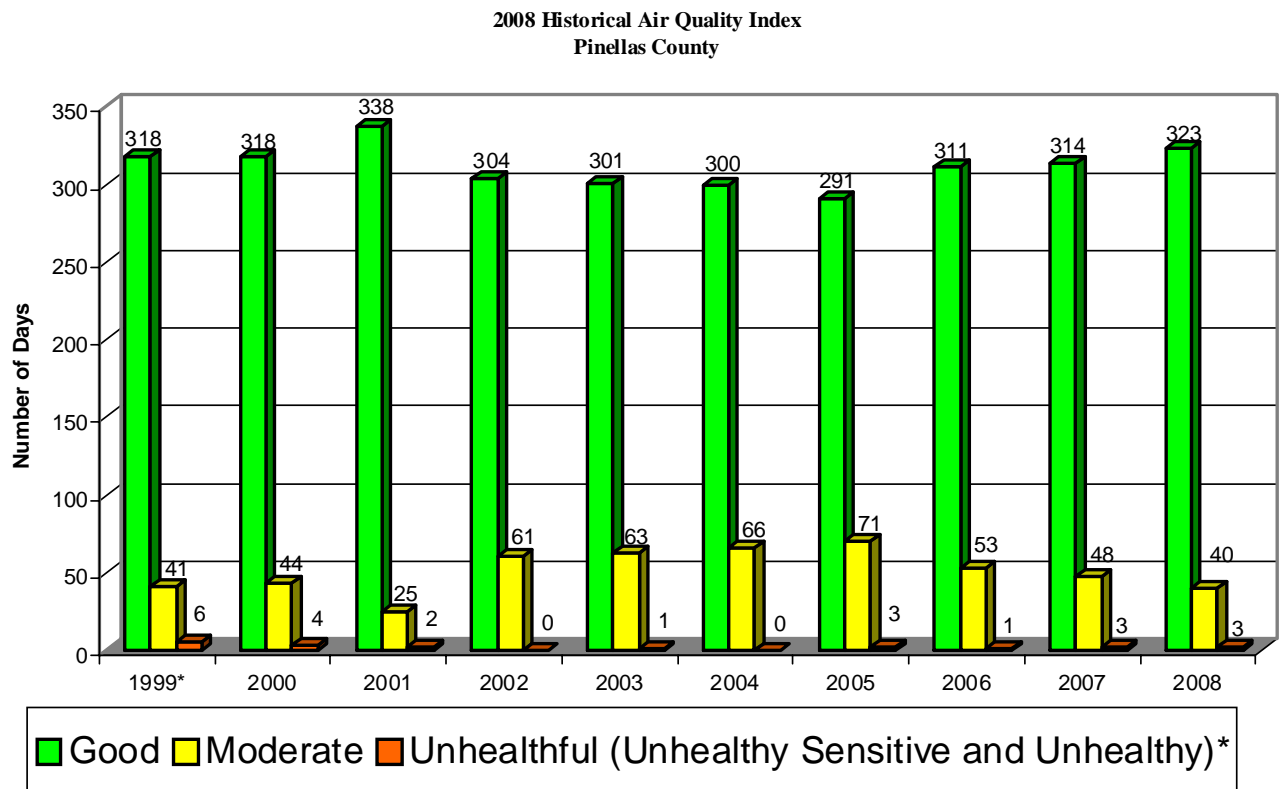
- Pre-recorded message at (727) 464-3392;
- Pinellas County website at [www.pinellascounty.org](http://www.pinellascounty.org);
- EPA AirNow website at [www.airnow.gov](http://www.airnow.gov)

In addition, the St. Petersburg Times prints the previous day's AQI every day in the weather section.

**Figure 9: AQI Monthly Trend During Calendar Year 2008**



**Figure 10: Historical AQI 10-year Annual Trend**



\* In 1999, the unhealthful category was divided into 2 subgroups, unhealthy for sensitive groups and unhealthy.

## Program Operations

### Air Monitoring

The framework for a well developed air quality management strategy begins with a balanced ambient monitoring network. A fully approved monitoring network must comply with uniform criteria for network design, measurement methodology, instrument siting and spatial representation, as defined in the code of Federal Regulations.

The monitoring of ambient air quality in Pinellas County is conducted through a system of periodic and continuous sampling stations around the county. The data collected from these networks provide the basis for developing the daily Air Quality Index, reviewing air pollution permits and evaluating the overall effectiveness of air pollution control strategies. These monitoring sites are part of what is known as the National Ambient Monitoring Stations (NAMS) and the State and Local Air Monitoring Stations (SLAMS).

The county's air monitoring network is an EPA-approved program that has been in operation since 1975. The Air Monitoring Program measures air pollution concentration levels by operating two networks of air sampling stations or air monitors located throughout the County. Air pollutants from businesses, industry, and transportation sources are monitored in areas of expected maximum as well as typical concentrations. All monitoring data is subjected to a rigorous quality assurance program to ensure that the data are valid, representative, complete and known precision and accuracy. In addition, the Air Monitoring Program is subject to state and federal audits.

The Air Monitoring Environmental Laboratory is responsible for sampling and identification for lead, asbestos, acid deposition, particulates, volatile organic compounds and provides technical information to the public and private sectors on issues related to air pollution.

Air Monitoring staff also participate in the preparation and publishing of the daily Air Quality Index (AQI), conducts monitoring to provide a basis to evaluate permit review for special projects. Figure 11 displays the location of monitoring sites in the county and Table 3 is a summary of the monitoring station's analytical technique and location.

### Air Toxics Monitoring

Title III of the 1990 Clean Air Act Amendments list Hazardous Air Pollutants (HAP's), also called toxic air pollutants, and requires that source emissions for these pollutants be regulated. HAP's are of interest not only because they may pose adverse health and environmental effects, but also because a great deal remains to be learned about these pollutants due to the limited amount of available ambient monitoring studies. A significant number of the pollutants monitored by Pinellas County's Air Toxic Monitoring Program are HAP's. For 2008, these pollutants were measured at two monitoring sites (Azalea and Skyview Elementary) and included volatile organic compounds (VOC's, e.g. benzene), metals (e.g. arsenic), and carbonyls (e.g. aldehydes).

The primary method for sampling HAP metals will be the collection of PM<sub>10</sub> samples utilizing size selective inlet (SSI) high volume samplers. All nonvolatile compounds (metals) are sampled and analyzed using EPA Compendium Method IO-3.5. These compounds are analyzed as "total" metals. Samples are collected on 8X10 inch, quartz fiber filters utilizing PM<sub>10</sub> SSI hi-volume samplers. The HCEPC laboratory performs the chemical analysis using ICP.

All carbonyl compounds sampled and analyzed for the project (except acrolein) utilize the EPA Compendium Method TO-11A. Samples are collected on 2,4-dinitrophenylhydrazine cartridges and analyzed using high performance liquid chromatography. The Eastern Research Group (ERG), an EPA National Program contractor, provides technical and analytical support in accordance with their approved quality assurance plan. Acrolein is sampled and analyzed with volatile organic compounds (VOCs) using EPA Method TO-15.

The VOCs are sampled and analyzed using EPA Compendium Method TO-15. Samplers are assembled using commercially available parts. They are collected in canisters and analyzed using gas chromatography/mass spectrometry (MS in SIM mode) by the Pinellas County Department of Environmental Management (PCDEM), Air Quality Division laboratory. Method detection limits (MDL) are determined using 40 CFR Appendix B to part 135. All concentrations are to be submitted as their actual (uncensored) numerical value. MDLs are submitted with each VOC data reading. Additional VOCs are extracted from the TO-15 method because there is no additional cost to sample or analyze these compounds. The TO-15, TO-11A, and IO-3 analyses provide additional data for HAPs not included in the Urban HAP list with minimal expenses for data management.

PCDEM also measures elemental carbon (EC) using an aethalometer. This is a continuous instrument that draws samples through quartz tape. The EC particles are trapped on the tape and analyzed real time via spectrophotometry at 880 and 370 nm. The data are recorded on the site ESC data logger and polled to the central agency database. Data is also stored on an internal drive and retrieved during site visits.

PAHs/SVOCs (e.g. naphthalene, benzo(a)pyrene) will be analyzed using EPA Compendium Method TO-13A/ASTM D 6209.

TSP Hexavalent chromium will be analyzed using CARB Method 039.

PM2.5 speciation samples are analyzed in accordance with the RTI (EPA National Program contractor) quality assurance plan.

**Figure 11/Table 3: Monitoring Site Information**

Analytical Techniques and Pollutants		
POLLUTANT	ANALYTICAL TECHNIQUE	
PM <sub>10</sub>	Gravimetric	
Sulfur Dioxide	Fluorescence	
Oxides of Nitrogen	Chemiluminescence	
Ozone	Ultraviolet Photometry	
Carbon Monoxide	Infrared Gas Filter Correlation	
Toxic VOC's	GC – MS	
PM <sub>2.5</sub>	Gravimetric	
SITE NAME	POLLUTANT MONITORED	
Oakwood	SO <sub>2</sub>	
East Lake Tarpon	O <sub>3</sub> , PM <sub>10</sub> , PM <sub>2.5</sub>	
Sandy Lane	PM <sub>2.5</sub>	
SPC/Clearwater Campus	O <sub>3</sub>	
Motor Pool	PM <sub>10</sub>	
Gateway	CO	
Resource Recovery	SO <sub>2</sub>	
Derby Lane	SO <sub>2</sub>	
Azalea Park	O <sub>3</sub> , PM <sub>10</sub> , Air Toxics, PM <sub>2.5</sub>	
Woodlawn	PM <sub>10</sub>	
Skyview	Air Toxics, Black Carbon, PM <sub>2.5</sub> Speciation, NO <sub>2</sub>	

## Permitting and Compliance

The Permitting and Compliance Program oversees both permitted and unpermitted sources of air pollution in Pinellas County. State permit applications are reviewed for air pollution sources to ensure compliance with control standards. Reviews are conducted for both major and minor sources. A major facility is one that emits 100 tons/year of criteria pollutants, 10 tons/year of any single hazardous air pollutant, or 25 tons of any combination of hazardous air pollutants. A minor facility is one that emits less than the major threshold levels. The program consists of the Toxics and Stationary Source Sections. The inspections include toxic and hazardous sources, as well as oil-fired power plants, waste incineration facilities, gasoline stations, paint and coating operations, and other sources that emit regulated pollutants.

Stationary sources staff inspect permitted and unpermitted sources, investigate citizen's complaints, compile annual stationary source emission inventories for air pollutants, review compliance test reports, inspect gasoline stations and tanker trucks for vapor recovery, and enforce the County's Comprehensive Air Quality Ordinance.

The Air Quality Asbestos/Air Toxics staff inspects permitted and unpermitted sources, investigates complaints, inspects demolition and renovation projects for proper removal and disposal of asbestos material, and cooperates with state and local agencies for asbestos notifications. Other activities include computer modeling to evaluate potential air toxic emission impacts, development of an air toxics control program, and special section projects. Refer to Table 5 for 2008 citizen's complaint information.

During the calendar year 2008, compliance activities resulted in the processing of 99 advisory, warning and notice of violation letters, and 58 consent orders. Consent orders are an enforcement action that requires the facility to make corrective changes and/or pay a penalty. Additional compliance activities for 2008 can be seen in Table 4. Total penalties collected in calendar year 2008 were \$110,852.00. Penalty revenues are deposited into the County Air Pollution Recovery Trust Fund and are used only for Division programs related to the control of emissions, air quality monitoring, facility inspections, and other such purposes related to the Permitting and Compliance program.

**Table 4: Compliance Activities**

<b>2008 Compliance Activities</b>	
<b>Type</b>	<b>Quantity</b>
Asbestos Investigations	80
Asbestos Removal/Demolition Projects	321
Compliance Inspections (Unpermitted)	21
Compliance Inspections (Permitted)	334
Gasoline Service Station Inspections	25
Gasoline Tanker Drops	0
Test Report Reviews	134
Consent Orders	58
Warning Letters	99
Penalties Collected	\$ 110,852

**Table 5: Citizen's Complaints**

<b>2008 Citizen's Complaints</b>	
<b>Type</b>	<b>Quantity</b>
Asbestos	22
Fugitive Dust	35
Miscellaneous	0
Odor	159
Open Burning & Smoke	22
Paint Fumes	43
Sandblasting	1
VOC Fumes	5
Mobile Sources	0
<b>Total Complaints</b>	<b>287</b>

# Point Source Inventory

The Air Quality Division prepares an annual emissions inventory of all permitted stationary point sources, which are required to submit an annual operating report. Minor sources, such as concrete batch plants, animal crematories, and human crematories, are not required to submit annual reports. Estimates of actual emissions of particulates, oxides of sulfur, oxides of nitrogen, carbon monoxide, and volatile organic compounds in tons per year were derived from activity levels provided in each source's Annual Operating Report and, when available, from specific source testing or continuous emission monitoring information. Quality assurance checks of input data include reviews from completeness, accuracy, and reasonableness. EPA's Compilation of Emissions Factors Manual (AP-42) and Source Codes and Emission Factor Listing for Criteria Pollutants (FIRE v5.0) were used to provide the appropriate emission factors on a "best fit" basis. (See Table 6).

**Table 6: 2008 Permitted Point Source Inventory**

<b>2008 EMISSION INVENTORY OF STATIONARY POINT SOURCES PINELLAS COUNTY, FLORIDA<sup>1</sup></b>						
<b>Pollutant Type *****</b>	<b>Particulate</b>	<b>Particulate</b>	<b>Oxides of Sulfur</b>	<b>Oxides of Nitrogen</b>	<b>Carbon Monoxide</b>	<b>Volatile Organic Compound</b>
<b>Source Category</b>	<b>(PM)</b>	<b>(PM10)</b>	<b>(SOx)</b>	<b>(NOx)</b>	<b>(CO)</b>	<b>(VOC)</b>
<b>Manufacturing Process</b>						
Fiberglass Boat Mfg.	0.1 <sup>3</sup>	2.3 <sup>4</sup>	0.0	0.0	0.0	512.8
Misc. Manufacturing	0.8 <sup>3</sup>	0.5 <sup>3</sup>	6.3	13.3	26.6	130.1
<b>Surface Coating</b>						
Coil Coating	0.1 <sup>3</sup>	0.1 <sup>3</sup>	0.0	0.9	5.9	2.6
Paper Coating	0.2 <sup>3</sup>	0.0 <sup>3</sup>	0.0	2.6	2.2	5.6
Plastic Coating	0.0	0.0	0.0	0.0	0.0	6.3
Misc. Surface Coating	1.3 <sup>4</sup>	1.1 <sup>4</sup>	0.0	0.0	0.0	54.8
<b>Solvent Use</b>						
Graphic Arts	0.1 <sup>3</sup>	0.1 <sup>3</sup>	0.0	1.5	0.2	113.3
Asphalt Plants	2.2 <sup>4</sup>	0.7 <sup>3</sup>	7.4	7.0	17.0	6.2 <sup>2</sup>
Misc. Solvent Use	0.3 <sup>3</sup>	0.3 <sup>4</sup>	0.0	0.0	0.0	101.5
<b>Combustion Sources</b>						
Electric Utilities	907.9 <sup>4</sup>	634.5 <sup>4</sup>	12,581.5	2968.6	313.2	40.2
Municipal Waste	33.7 <sup>3</sup>	33.7 <sup>5</sup>	103.4	1,446.4	109.8	29.2
Misc. Combustion	2.1 <sup>3</sup>	2.1 <sup>4</sup>	2.2	31.5	18.1	1.8
<b>TOTAL</b>	<b>948.8</b>	<b>675.4</b>	<b>12,700.8</b>	<b>4,471.8</b>	<b>493.0</b>	<b>1,004.4</b>

1. Emissions are reported in tons per year (tpy)
3. Total PM or PM10
5. PM10 not specified for Municipal Waste

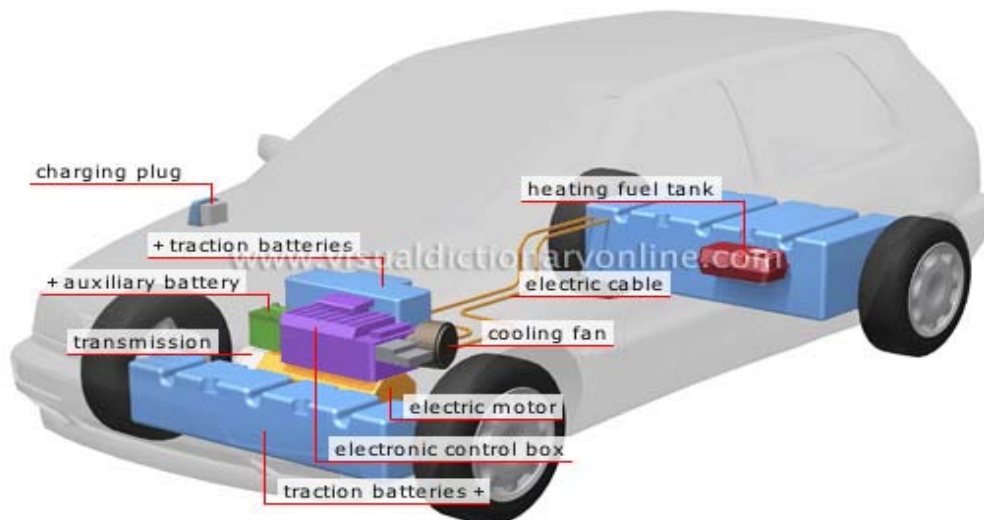
2. TOC (Total Organic Compounds) not VOC
4. Filterable PM or PM10



## Planning and Analysis

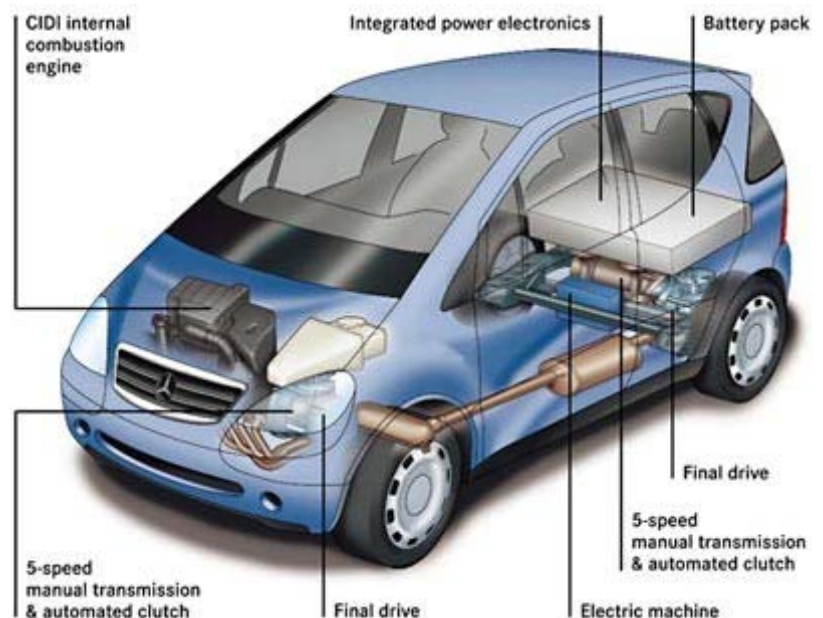
The Air Quality Planning and Analysis Program is responsible for development reviews, policy analysis, air monitoring site analysis and coordination of the Division's public education and outreach program, which develops public information material and provides public speakers. Other planning activities include projects such as preparing the Division's annual report, air quality transportation analysis, development of emission inventories, and special research projects.

Program staff review proposed changes to federal, state, and local regulations and provide both comment and analysis on the impact of the regulatory changes. In addition, the Program supports various regulatory agencies and governmental bodies including the Board of County Commissioners, Metropolitan Planning Organization and the Florida Department of Environmental Protection. Program staff provides technical information and testimony, as needed, at various workshops and public meetings.



Electric  
Automobile

Hybrid Automobile



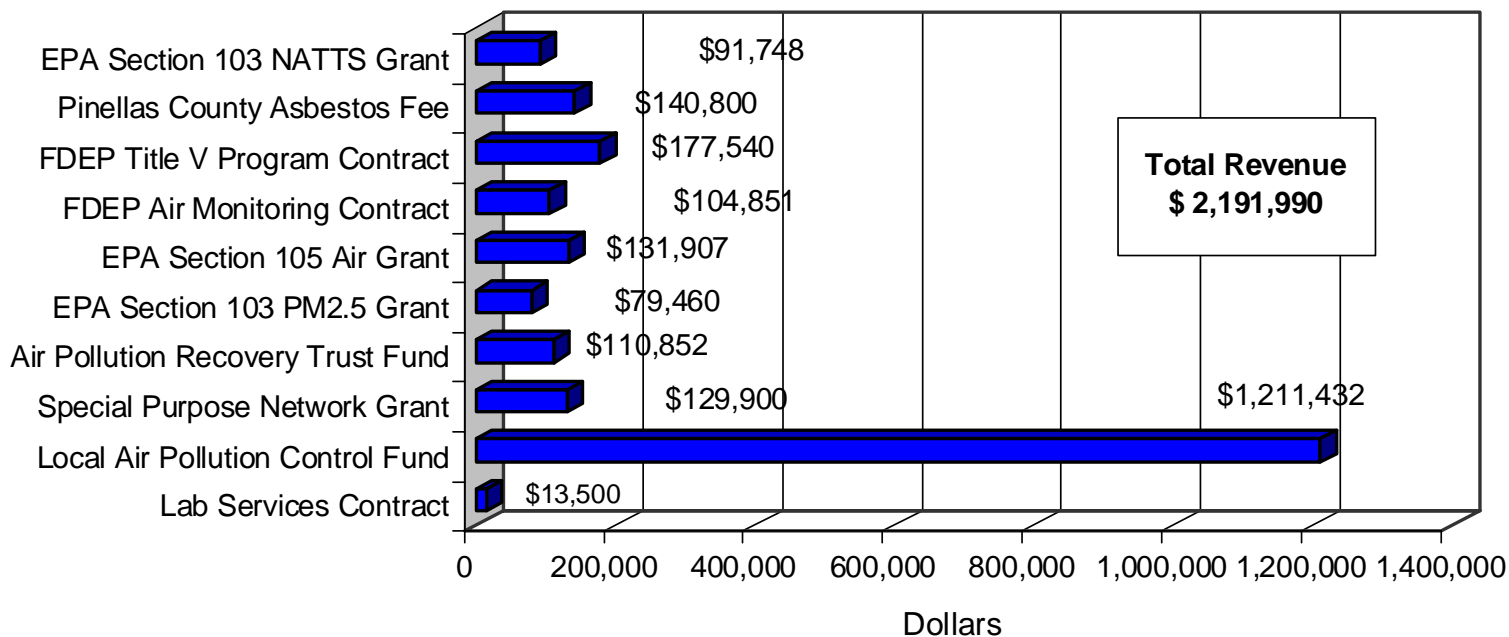
## Administration

Administration supports key administrative and daily operational needs. Staff is responsible for maintaining the division's budget and federal grants, program and policy development, interagency coordination, media relations and clerical support. Table 7 and Figure 12 show the Expenses and Revenues generated for 2008.

**Table 7: Fiscal Year 2008 Expenses**

<b>Local Air Pollution Control Fund (License Plate Fee)</b>	
Personnel Services	\$ 917,468
Operating Expense	\$ 253,988
Capital Outlay	\$ <u>10,925</u>
Subtotal	1,182,381
<b>Air Pollution Recovery Fund</b>	
Operating Expense	\$ 47,928
Capital Outlay	\$ <u>38,654</u>
Subtotal	86,582
<b>Air Quality General Fund</b>	
Personnel Services	\$1,174,696
Operating Expense	\$ <u>20,800</u>
Subtotal	1,195,496

**Figure 12: Revenue/External Funding Sources (Fiscal Year 2007/2008)**



# Regulations and Special Projects

## Regulatory Updates for 2008

The U.S. Environmental Protection Agency (EPA) continued to develop rules to control specific sources of air emissions. In addition, the EPA continued to work on regional and national scale programs such as:

- EPA established a new ozone standard in March that is more protective of health and the environment. The standard was lowered from 80 parts per billion to 75 parts per billion. New attainment area designations must be made by March of 2009;
- Rules for diesel locomotive and marine engines are finalized and will reduce particulate matter emissions by 90% and emissions from oxides of nitrogen by 80%. Health savings will be between \$8.4 and \$12 billion;
- EPA established a new lead standard designed to reduce lead emissions by 80% (1,300 tons per year). The standard was revised from a calendar quarter average of 1.5 micrograms/cubic meter to a rolling three month average of 0.15 micrograms/cubic meter; and
- Tougher petroleum refinery standards for air toxic emissions will reduce these pollutants by 2,250 tons per year. In addition, volatile organic compound emissions will be reduced by 19,000 tons per year.

## NAAQS Status

The EPA annually reviews ambient air monitoring data collected in counties nationwide. The data is used to determine a county's compliance with National Ambient Air Quality Standards (NAAQS) for ozone, particulate matter, sulfur dioxide, carbon monoxide, nitrogen dioxide, and lead. Pinellas County continues to be in compliance with all established NAAQS.

In 1997, EPA promulgated a new NAAQS for ozone, based on an 8-hour average, that would be more protective of public health than the 1-hour ozone standard. EPA's authority to implement the new standard was challenged in court, however the issue was decided recently in EPA's favor. During 2005 EPA made its final area designations for the eight-hour ozone standard and revoked the one-hour standard. Despite revoking the one-hour standard certain regulatory programs will remain in effect to prevent a backsliding or deterioration of the progress made under the old one-hour standard. Once again in March 2008 the 8-hour standard was lowered to further protect public health and the environment. The new standard is 0.075 ppm and the form of the standard is the same (an exceedance will occur when the 3-year average of the 4<sup>th</sup> highest daily maximum 8-hour concentration at a single site is above the standard). Based on the most recent three years ozone data Pinellas County was classified as achieving attainment for the eight-hour ozone standard (See Figure 8).

## National and Local Air Toxics Assessment

The 2007 annual report stated that screening level analysis of 2005 monitor data indicated six hazardous air pollutants (HAPs) above the lowest EPA cancer benchmark of one excess cancer per million lifetime residents. Full-scale analysis of 2005 monitor data was completed in 2008 and has subsequently indicated that there were ten HAPs above this benchmark in 2005. The previous screening level analysis had indicated acrylonitrile, benzene, butadiene, carbon tetrachloride, arsenic and chromium VI above this benchmark in 2005. The full scale analysis of 2005 monitor data indicated these same six HAPs above this benchmark again, as well as 1,1,2,2-tetrachloroethane, ethylene dibromide, acetaldehyde and 1,4-dichlorobenzene. A recent full scale analysis of 2007 monitor data indicated that 8 of these 10 HAPs remain above the lowest EPA cancer benchmark. From 2005 to 2007 chromium VI and 1,4-dichlorobenzene concentrations decreased below this benchmark, while hexachlorobutadiene and ethylene dichloride concentrations increased to levels slightly above this benchmark, for a total of ten HAPs above the lowest EPA cancer benchmark. Although the number of HAPs above this benchmark has remained the same from 2005 to 2007, the concentrations of HAPs in 2007 decreased substantially since 2005 and the total cancer risk was cut approximately in half. There are no Pinellas County HAPs above or near the EPA action level benchmark of ten excess cancers per million lifetime residents.

There is one HAP, acrolein, above the EPA non-cancer reference concentration (RfC). No other HAP was more than 15% of its non-cancer RfC as of 2007. The concentration of acrolein in 2007 monitor data was approximately 25 times higher than its RfC. There are no EPA health risk figures associated with RfCs, rather concentrations above RfCs suggest an increased possibility for adverse health effects. Exposure to acrolein above the RfC can cause respiratory congestion and irritation. Acrolein emissions in Pinellas County are limited to mobile sources, primarily cars and trucks.

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