

# Air Monitoring in New Jersey Changes and Challenges

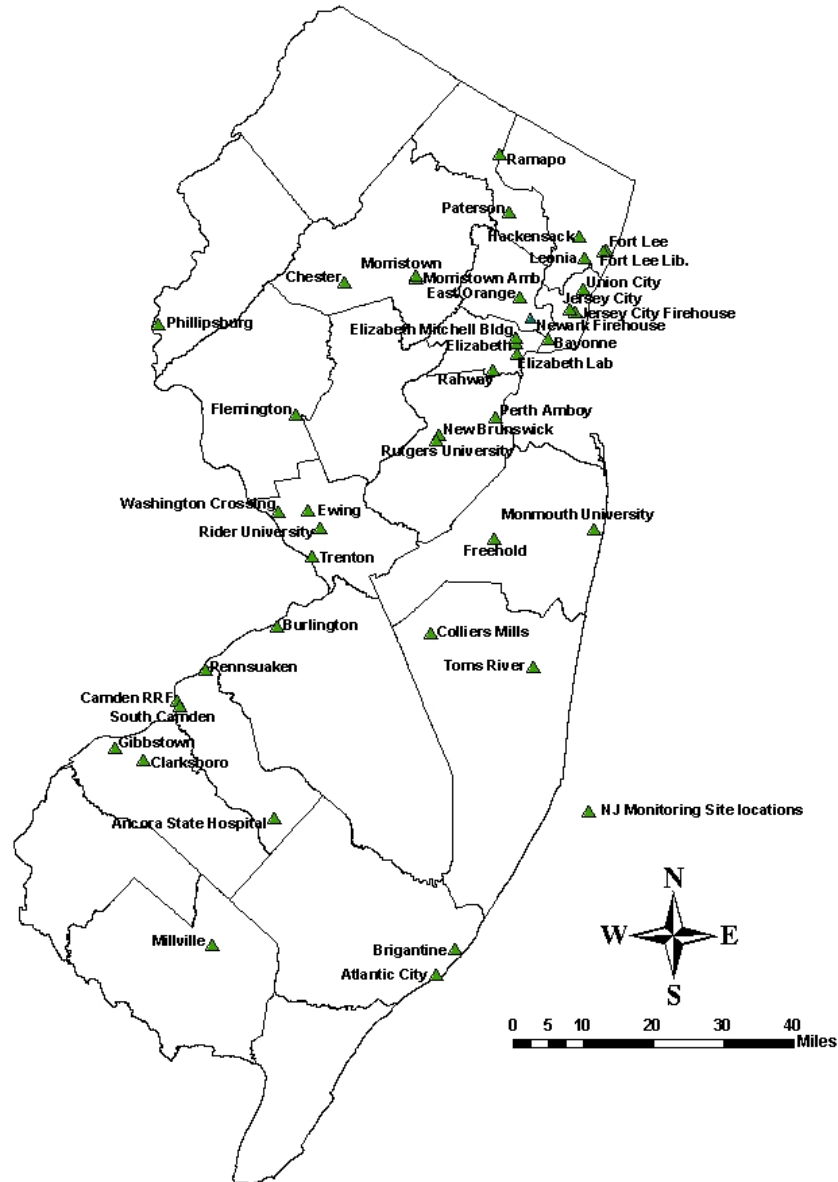
**Presented by Charles Pietarinen**

**To the New Jersey Clean Air Council**

**January 13, 2010**

Note: 2009 data is preliminary and likely to change

# New Jersey Air Monitoring Sites 2009 Network Summary



# Air Monitoring in New Jersey

## Real Time Measurements

- Carbon Monoxide
- Oxides of Nitrogen
- Ozone
- Particulates
- Sulfur Dioxide

# Air Monitoring in New Jersey

## Sample Collection and Analysis

- Particulates
  - Mass
  - Composition
- Hydrocarbons
  - Volatile Organic Compounds
  - Carbonyls
- Deposition

Example of An Air Monitoring Site  
Elizabeth, New Jersey



# The Good Old Days?





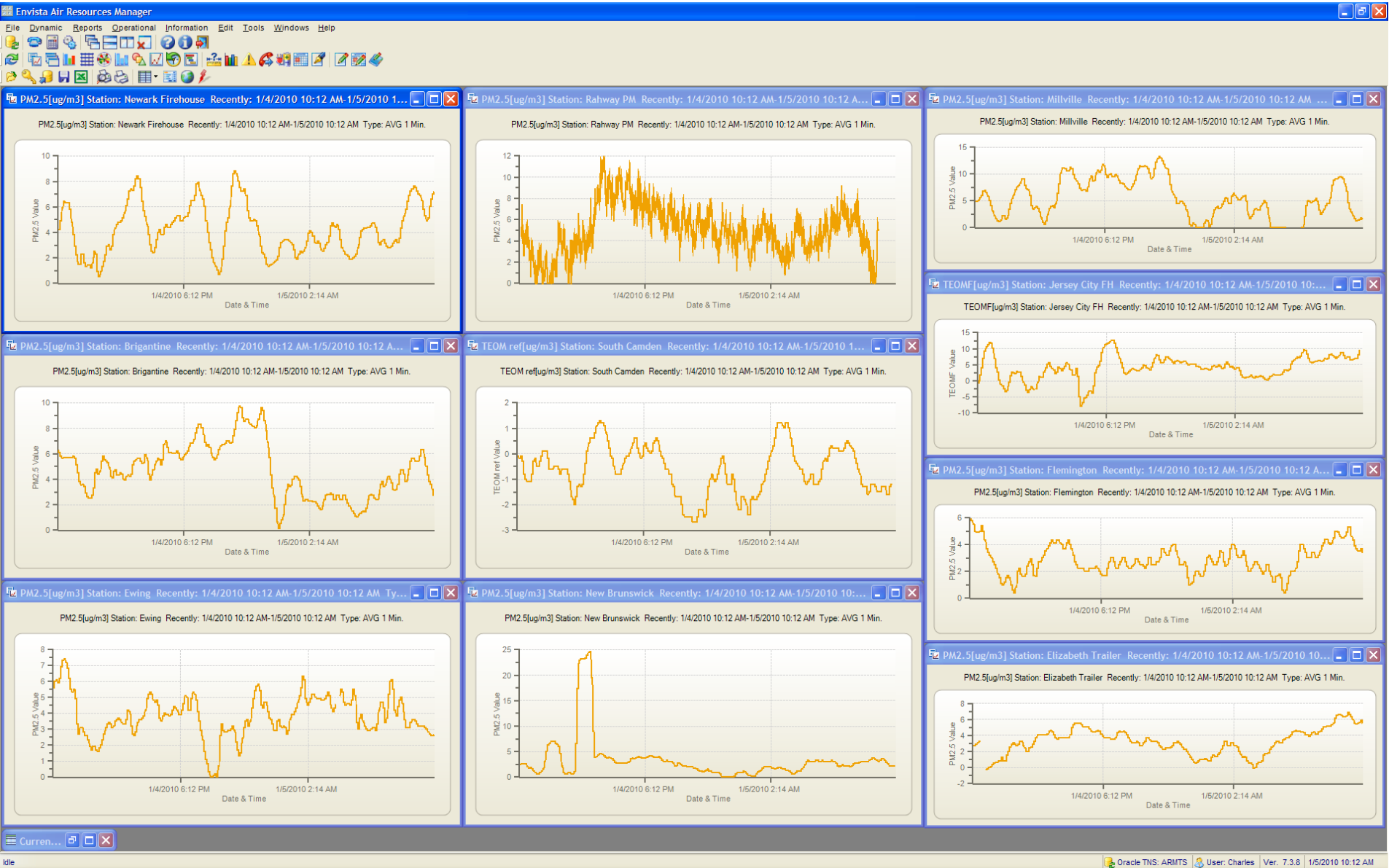
# First Generation Data Acquisition System Electro-mechanical Data Transmission



Air Monitoring Data Acquisition System  
Digital Wireless Data Transmission  
Faster/Cheaper



# Air Monitoring Data Management Software



# Data Acquisition Software

- Determine Network Status in Minutes
- On-the-fly QA
- Faster Data Validation
- Integrated Database (years of 1-minute data)
- Better Data Assessment Tools
- Distributes Data More Efficiently (web sites, Law and Public Safety, other states, EPA)

# New Jersey Air Monitoring Web Site

## www.njaqinow.net

NJ AIRNow - Mozilla Firefox

File Edit View History Bookmarks Tools Help

http://www.njaqinow.net/Default.htm

Most Visited Latest Headlines Customize Links Google Calendar U.S. Air Quality Windows Live Local Windows Media Windows Google SSD Fire Detection Pr... Envista - Air Resource...

NJ AIRNow Brigantine - Haze Cam Pollution Visibilit... PM2.5 Sampler Status Summary AIRNow - Homepage

newjersey **nidep** department of environmental protection

### Welcome to New Jersey's Air Monitoring Web Site!



**Current Air Quality**

- Current Statewide Readings
- Current Status
- Reports
- Information
- Publications
- Links
- Login

Close

**Site Statistics**

Total: 19877  
Current: 5  
User: Guest  
Last Update: 9/23/2009

**Index Legend**

- Good
- Moderate
- Unhealthy For Sensitive Groups
- Unhealthy
- Very Unhealthy
- Hazardous
- No Index Data

### Air Quality Forecasts and News

[New Mobile Site](#)  
The data from this web site is available for your mobile at : [www.njaqinow.mobi](http://www.njaqinow.mobi)

### Related Links

- [AQI Forecasts via E-mail](#)
- [www.njaqinow.mobi](http://www.njaqinow.mobi)

**This Site Has the Latest Air Quality Data and Forecasts For New Jersey:**

1. To see what air quality is like in your area now, click on "Current Air Quality" and select the area of interest.
2. Select "Current Status" to view a table summarizing which monitoring sites are currently operational.
3. Select "Report" to make your own report with data for any site and time period available.

**Preliminary data:** We update these Web pages hourly, every day, around the clock. Data labeled "current" on these pages are preliminary and subject to change.

Done

# New Jersey Air Monitoring Web Site

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NJ AIRNow - Mozilla Firefox

File Edit View History Bookmarks Tools Help

http://www.njaqinow.net/Default.htm

Most Visited Latest Headlines Customize Links Google Calendar U.S. Air Quality Windows Live Local Windows Media Windows Google SSD Fire Detection Pr... Envista - Air Resource...

NJ AIRNow Brigantine - Haze Cam Pollution Visibilit... PM2.5 Sampler Status Summary AIRNow - Homepage

 newjersey **nidep** department of environmental protection

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- Unhealthy
- Very Unhealthy
- Hazardous
- No Index Data

**Air Quality - All Sites**

Resolution 800 \* 600



40 miles

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Preliminary data: We update these Web pages hourly, every day, around the clock. Data labeled "current" on these pages are preliminary and subject to change.

Transferring data from ecn.t5.tiles.virtualearth.net...

# New Jersey Air Monitoring Web Site

## www.njaqinow.net

Untitled Page - Mozilla Firefox

File Edit View History Bookmarks Tools Help


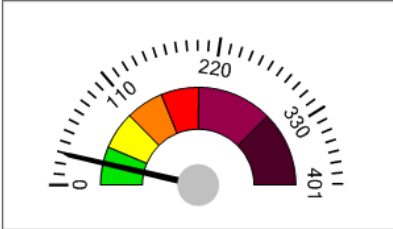
http://www.njaqinow.net/StationInfo.aspx?ST\_ID=11

Most Visited Latest Headlines Customize Links Google Calendar U.S. Air Quality Windows Live Local Windows Media Windows Google SSD Fire Detection Pr... Envista - Air Resource...

NJ AIRNow Brigantine - Haze Cam Polluti... PM2.5 Sampler Status Summ... AIRNow - Homepage Untitled Page Untitled Page

### Station Information

#### Elizabeth Trailer

[Download API](#)

**Index Value :** 29

**Pollutants :**  
NO2,CO,SO2,SMOKE,PM  
2.5

**Dominant Pollution :** NO2

[Station Report](#) | 
 [StationDescription](#) | 
 [Pie Chart](#) | 
 [Pictures](#) | 
 [Online](#)

Last Received	CO	SMOKE	SO2	NO2	NO	PM2.5	WSPD	WDIR
	ppm	COHS	ppm	ppm	ppm	µg/m3	mph	Deg
1/5/2010 9:00 AM	0.4	0.21	0.001	0.031	0.034	5.9	2.1	276

Done

# State and Federal Agencies Work Together

## www.airnow.gov

AIRNow - Homepage - Mozilla Firefox

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http://airnow.gov/

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NJ AIRNow Page Load Error Newark, NYC - Haze Cam Pollutio... AIRNow - Homepage Untitled Page Untitled Page

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Search:  Go

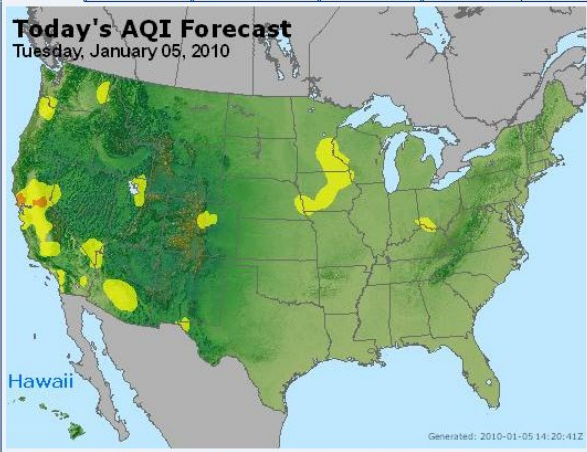
**LOCAL AIR QUALITY CONDITIONS AND FORECASTS**

Zip Code:  Go State: Alabama Go

[National Air Quality Summary \(text\)](#)

Forecast Current AQI AQI Animation Current Ozone Current PM2.5

**Today's AQI Forecast**  
Tuesday, January 05, 2010



Hawaii

Generated: 2010-01-05 14:20:41Z

Good Moderate USG Unhealthy Very Unhealthy Hazardous

**Highest 5:** [U.S. Air Quality Summary](#) | [Canada Air Quality](#)

Today's Forecasts Tomorrow's Forecasts Current AQI

<a href="#">Klamath Falls, OR</a>	Action Day!	USG
<a href="#">Elk Grove, CA</a>		USG
<a href="#">Folsom, CA</a>		USG
<a href="#">Napa, CA</a>		USG
<a href="#">Placerville, CA</a>		USG

**QUICK LINKS**

**Announcements**

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2010 National Air Quality Conferences [Registration](#)

Air Quality Maps Now Available for Canada [More](#)

**Headlines**

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 **EnviroFlash** provides air quality information such as forecasts and action day notifications via email for your area of interest. [Sign-Up](#)

**AQI in Google Earth**

**AirCompare**

**Publications | Publicaciones (en Español)**

**Air Quality Maps Archives**

**AIR QUALITY BASICS**

[Air Quality Index](#) | [Ozone](#) | [Particle Pollution](#) | [UV](#) | [Smoke from Fires](#) | [What You Can Do](#)

**HEALTH**

[Your Health](#) | [Health Providers](#) | [Wildfire Smoke](#)

**LEARNING CENTER**

[Health Providers](#) | [Kids](#) | [Students](#) | [Teachers](#) | [Older Adults](#) | [Weathercasters](#)

**Movies** **Visibility Cameras**

**PARTICLE POLLUTION**

<http://www.enviroflash.info/>

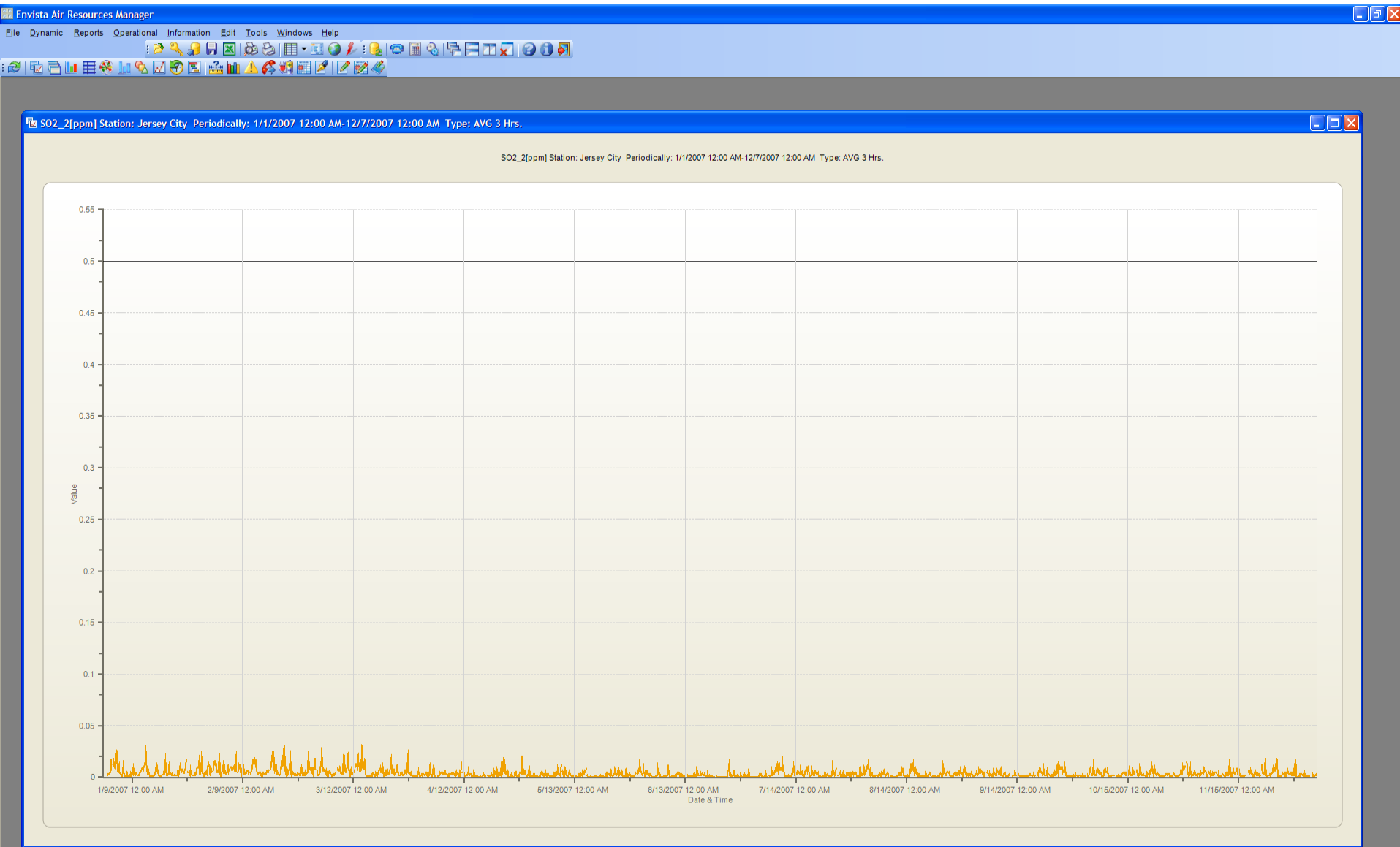
# What's Coming

- Network Assessments
- New Air Quality Standards With Changes to Monitoring Requirements
- Special Studies (School Study)
- Changes to the AQI

# Network Assessments

- First Assessment Due July 1, 2010
- Remove Redundant Sites and Add Sites Where Needed
- EPA Just Released the Guidance
- Public Comment Period Required
- Required and Enabled by Monitoring Regulations Revisions of October 17, 2006

# SO2 Data – Jersey City 2007



# No Minimum Network Requirements

- Carbon Monoxide
- Lead
- Nitrogen Dioxide
- Sulfur Dioxide

# CO Data – Jersey City 2007

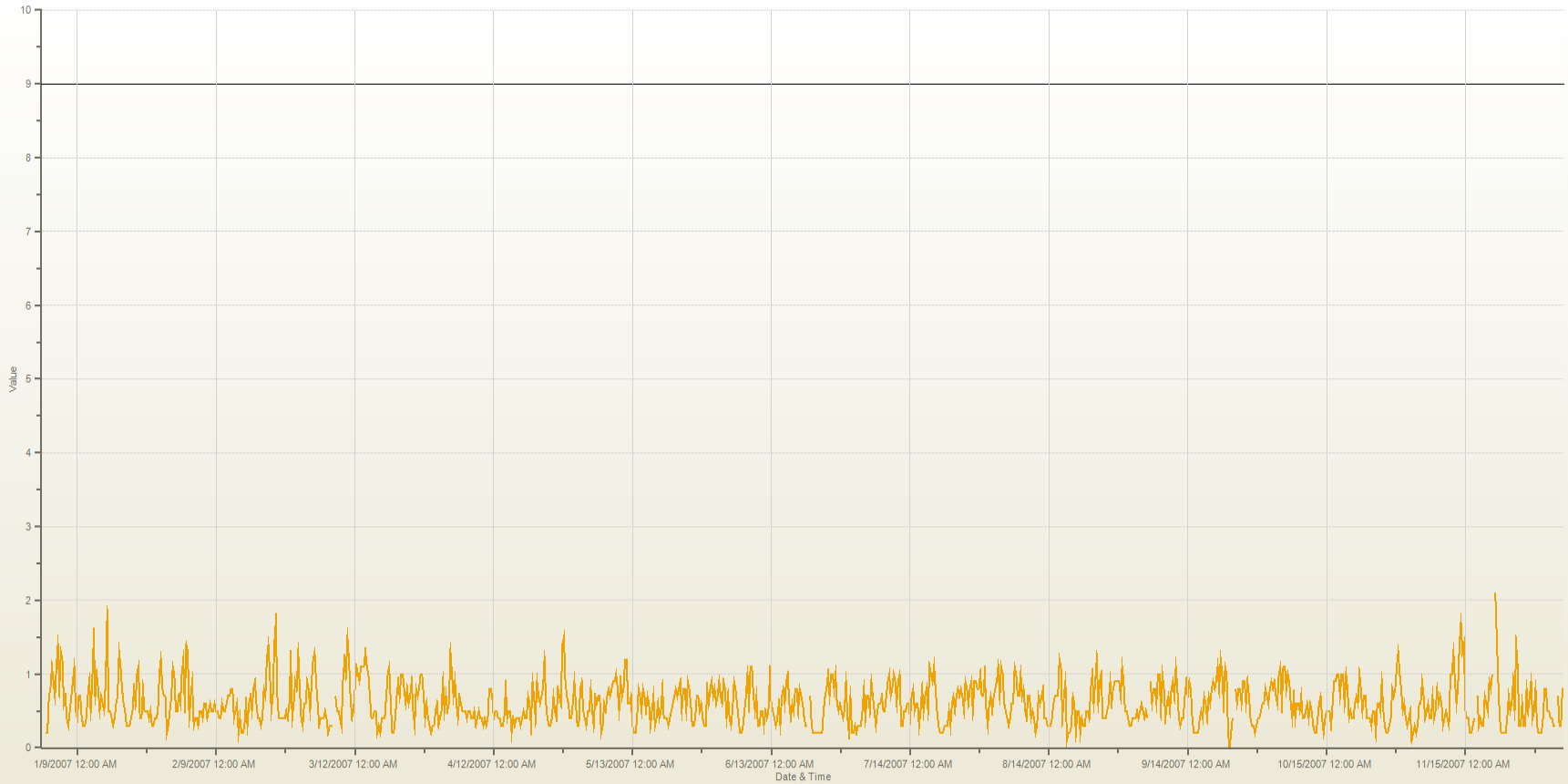
Envista Air Resources Manager

File Dynamic Reports Operational Information Edit Tools Windows Help



CO[ppm] Station: Jersey City Periodically: 1/1/2007 12:00 AM-12/7/2007 12:00 AM Type: AVG 8 Hrs.

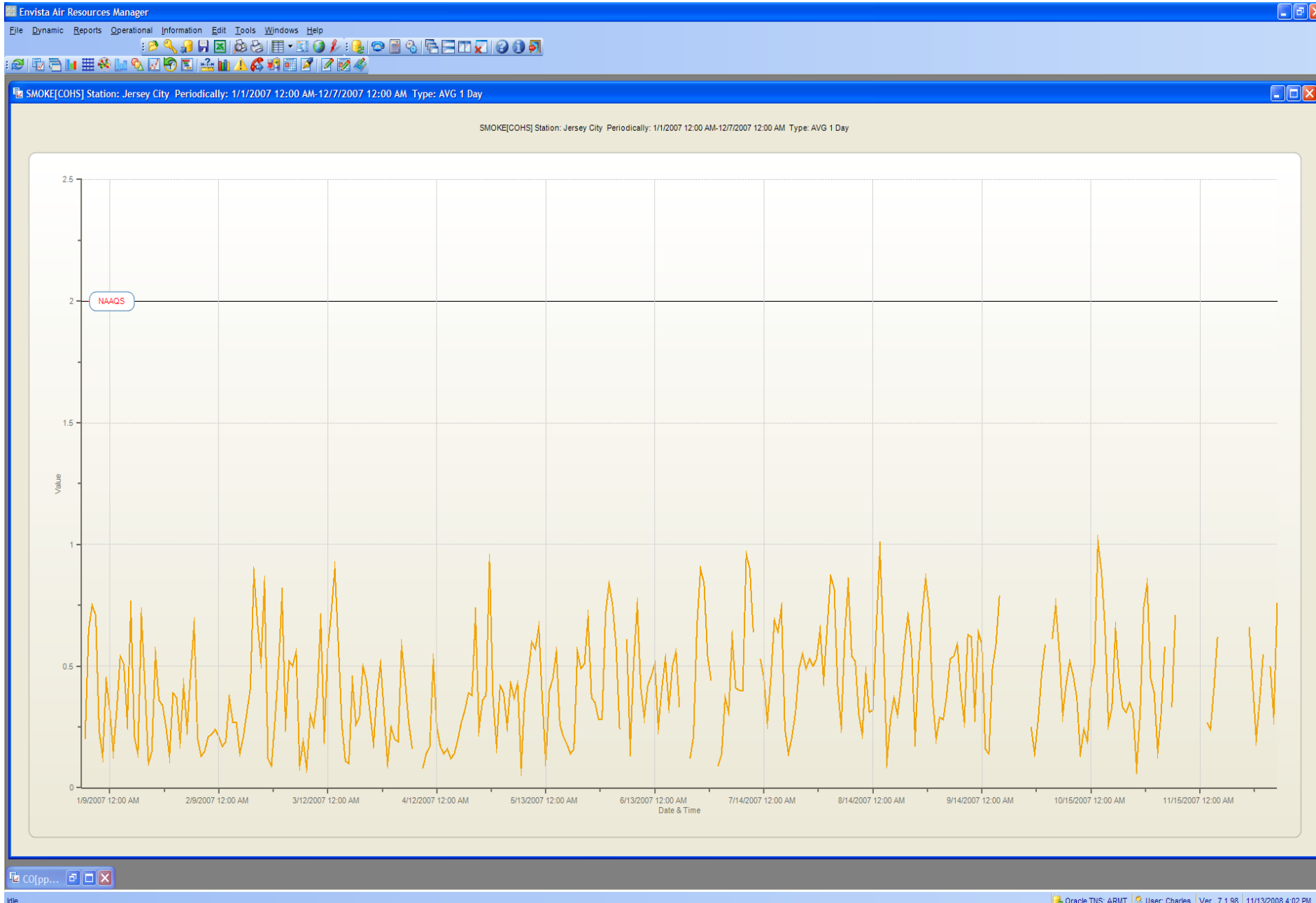
CO[ppm] Station: Jersey City Periodically: 1/1/2007 12:00 AM-12/7/2007 12:00 AM Type: AVG 8 Hrs.



CO[pp...]

Idle

# Smoke Shade Data – Jersey City 2007



# New Air Quality Standards

- EPA is Adhering to 5-year Review Cycle
- Proposed Changes Have Been Significant
- New Standards Often Change Monitoring Requirements
- New Approaches in Some Cases (Secondary Standards)
- New AQI Provisions
- May Affect the Assessments

# Ozone Standards

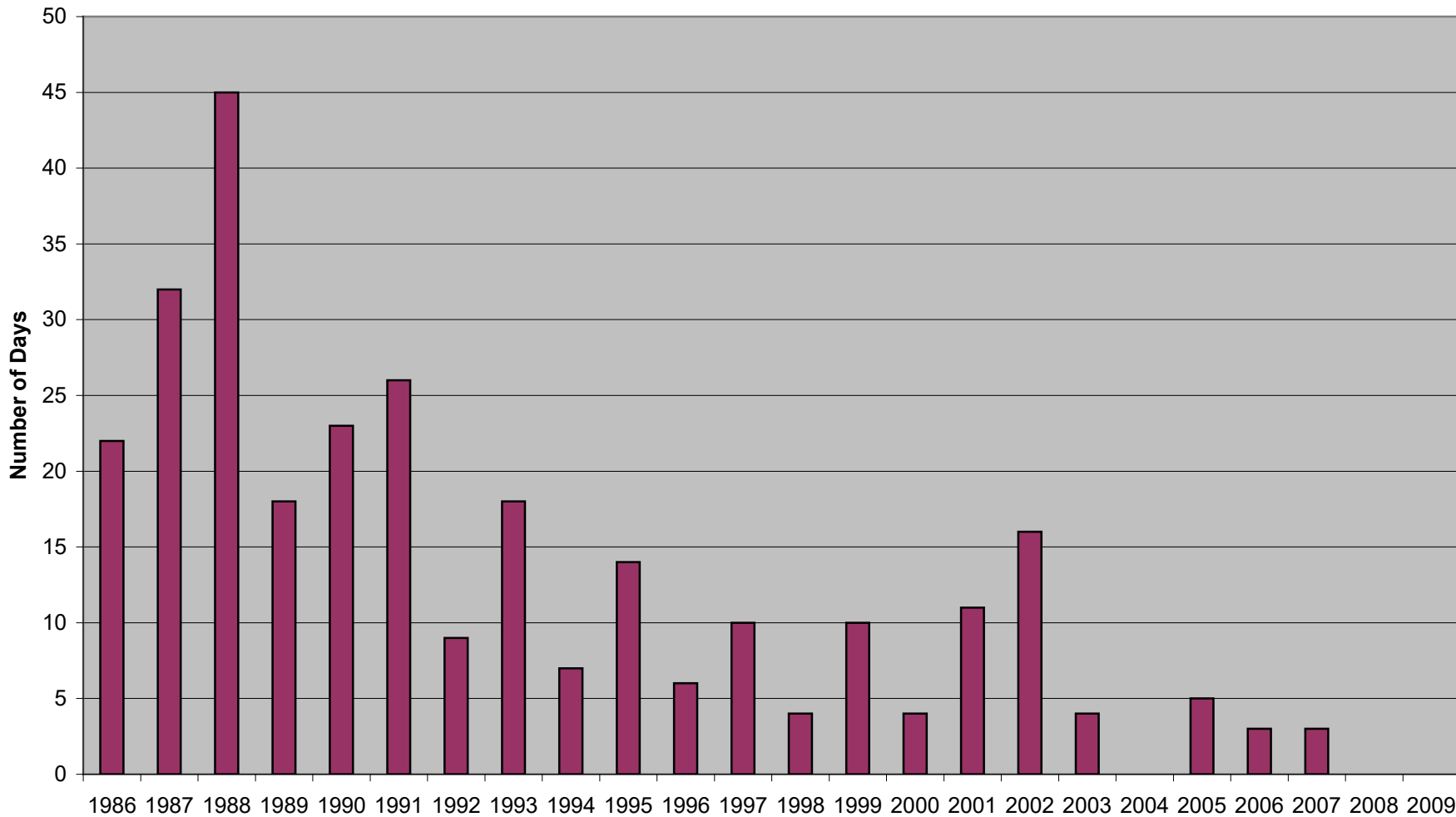
- 1-Hour Standard: 0.12 ppm
- 1997: Revised to an 8 – Hour Standard of 0.08 ppm
- 2008: 8 – Hour Standard Lowered to 0.075 ppm
- January 6, 2010: Proposed Lowering to 0.060 – 0.070 ppm and Adding A Secondary Standard

# Proposed Secondary Ozone Standard

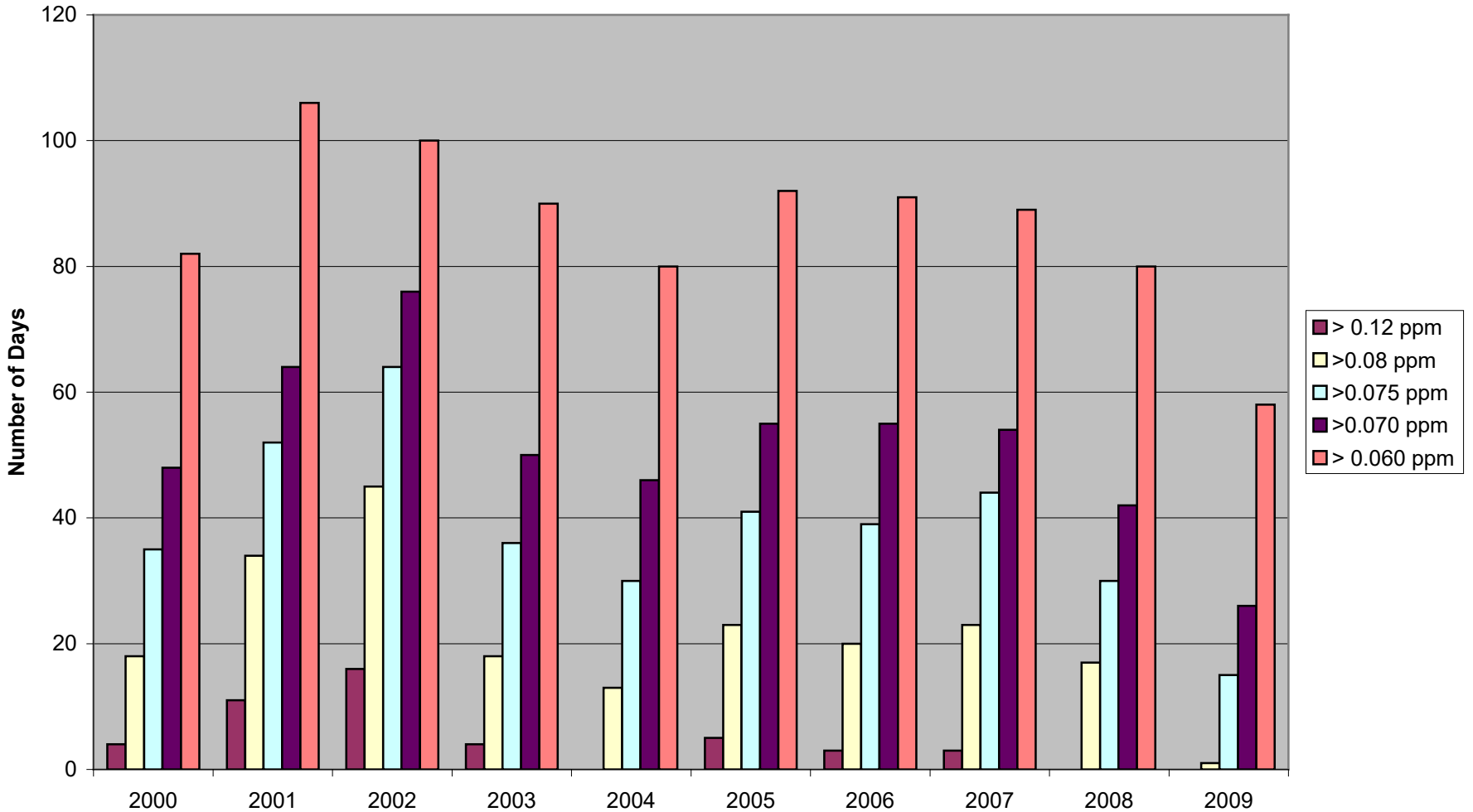
- W 126 Index in Range of 7 to 15 ppm-hours
- *Daily W126 Index*: sum of the sigmoidally weighted hourly ozone concentrations during the 12-hour daylight period, 8:00 a.m. to 7:59 p.m.
- Highest 3 – Month Sum

**Number of Day Ozone Standards  
Have Been Exceeded in New Jersey  
1986 - 2009**

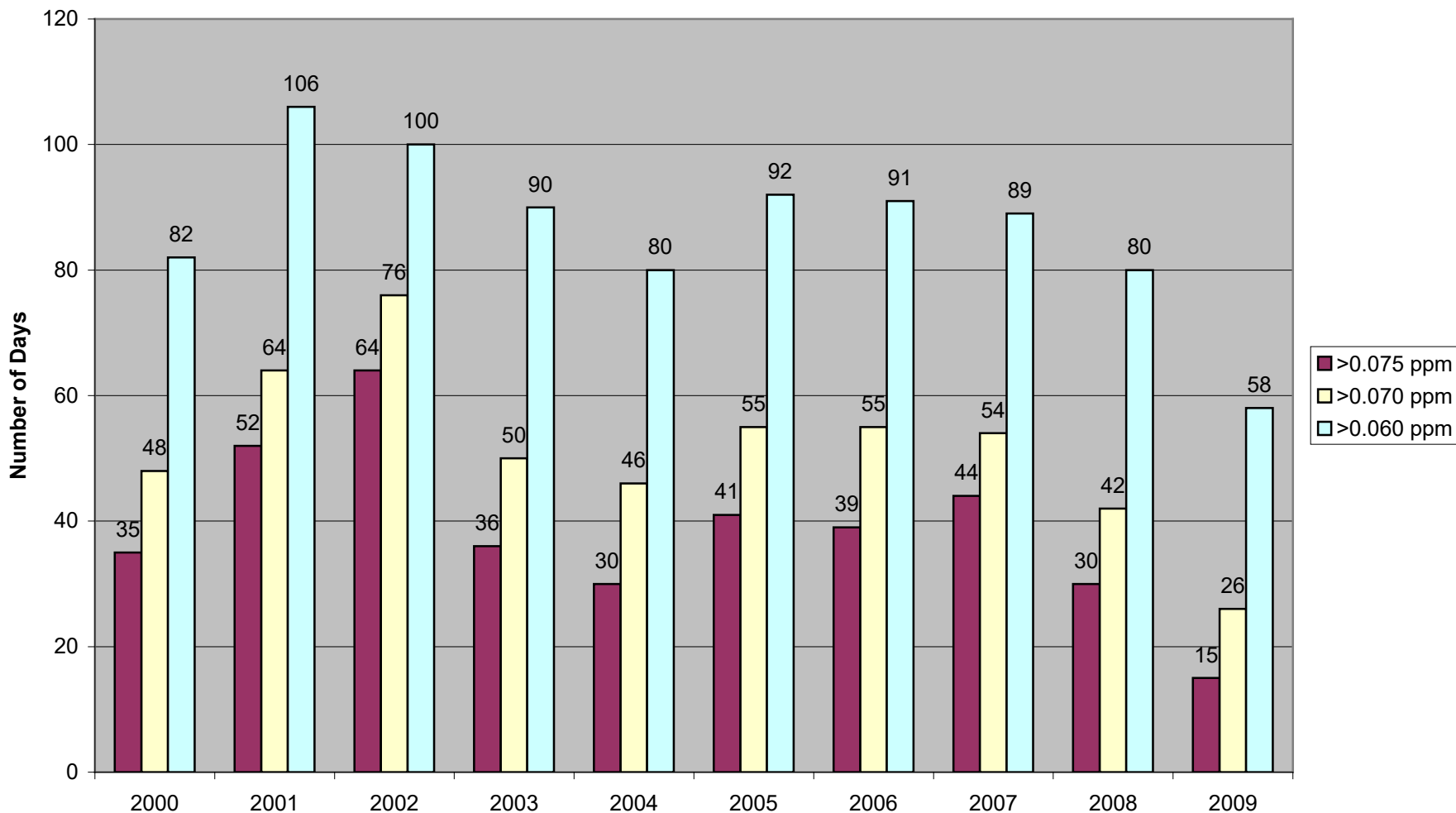
Old Federal Standard of 0.12 ppm



# Comparison of Previous, Current and Proposed Ozone Standards Number of Days Standard Exceeded in New Jersey 2000 - 2009



**Comparison of Current and Proposed Ozone Standards  
Number of Days Standard Exceeded in New Jersey  
2000 - 2009**



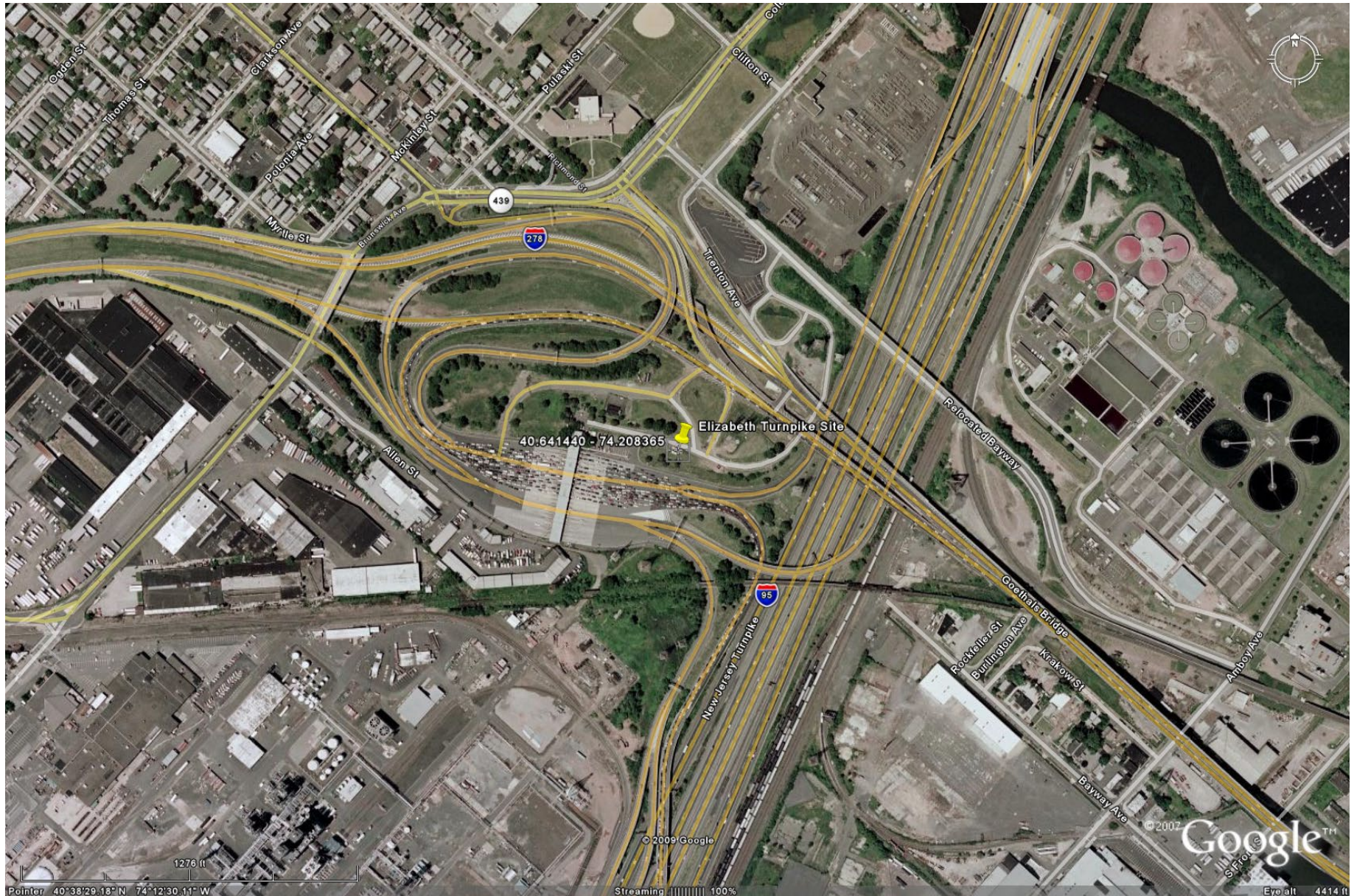
# Lead Standards

- Standard was 1.5 ug/m<sup>3</sup> maximum quarterly average
- Revised on 11/12/08 to a maximum quarterly average of 0.15 ug/m<sup>3</sup>
  - Monitoring required near any Lead source greater than 1 ton/year (no NJ sources)
  - EPA proposed lowering monitoring threshold to ½ ton/year on 12/23/09 (Morristown & Teterboro Airports and Essex RRF)

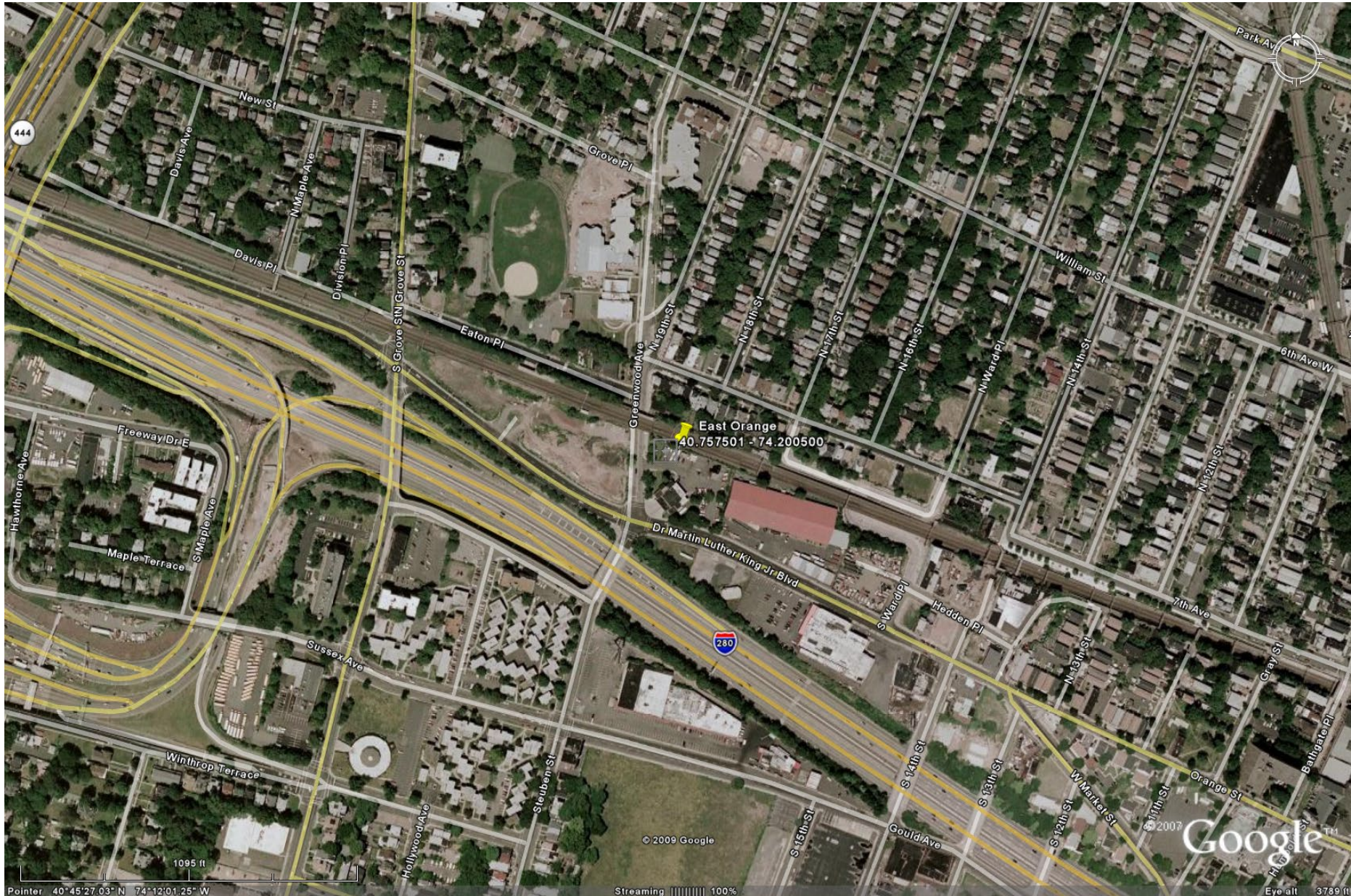
# Nitrogen Dioxide Standards

- Existing Standard is an Annual Average of 53 ppb
- EPA Proposed New Standard of 80 to 100 ppb over 1-hour
  - EPA would require monitors to be located within 50 meters of major roadways

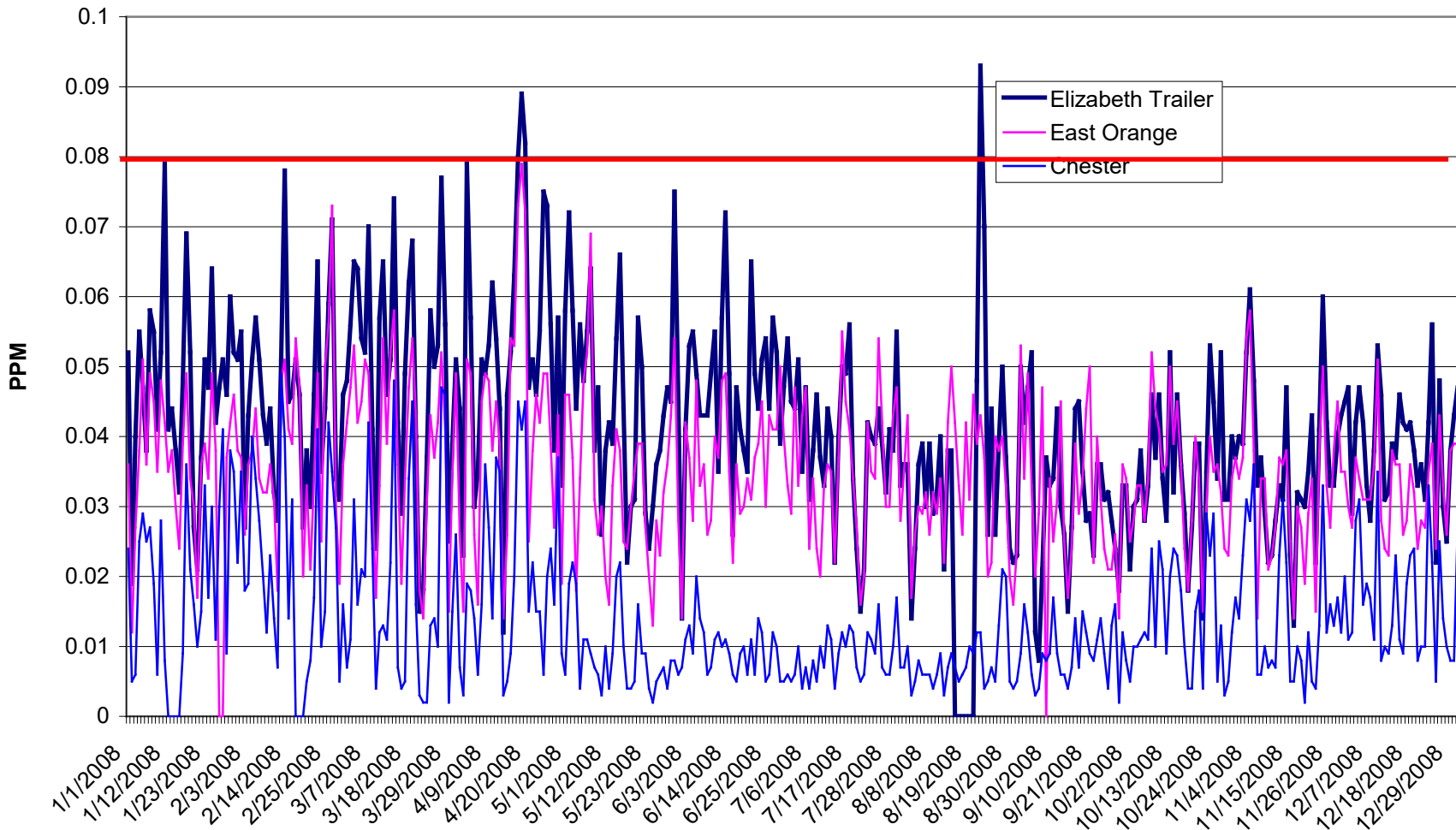
# Elizabeth (NJ Turnpike) Monitoring Site



# East Orange Monitoring Site



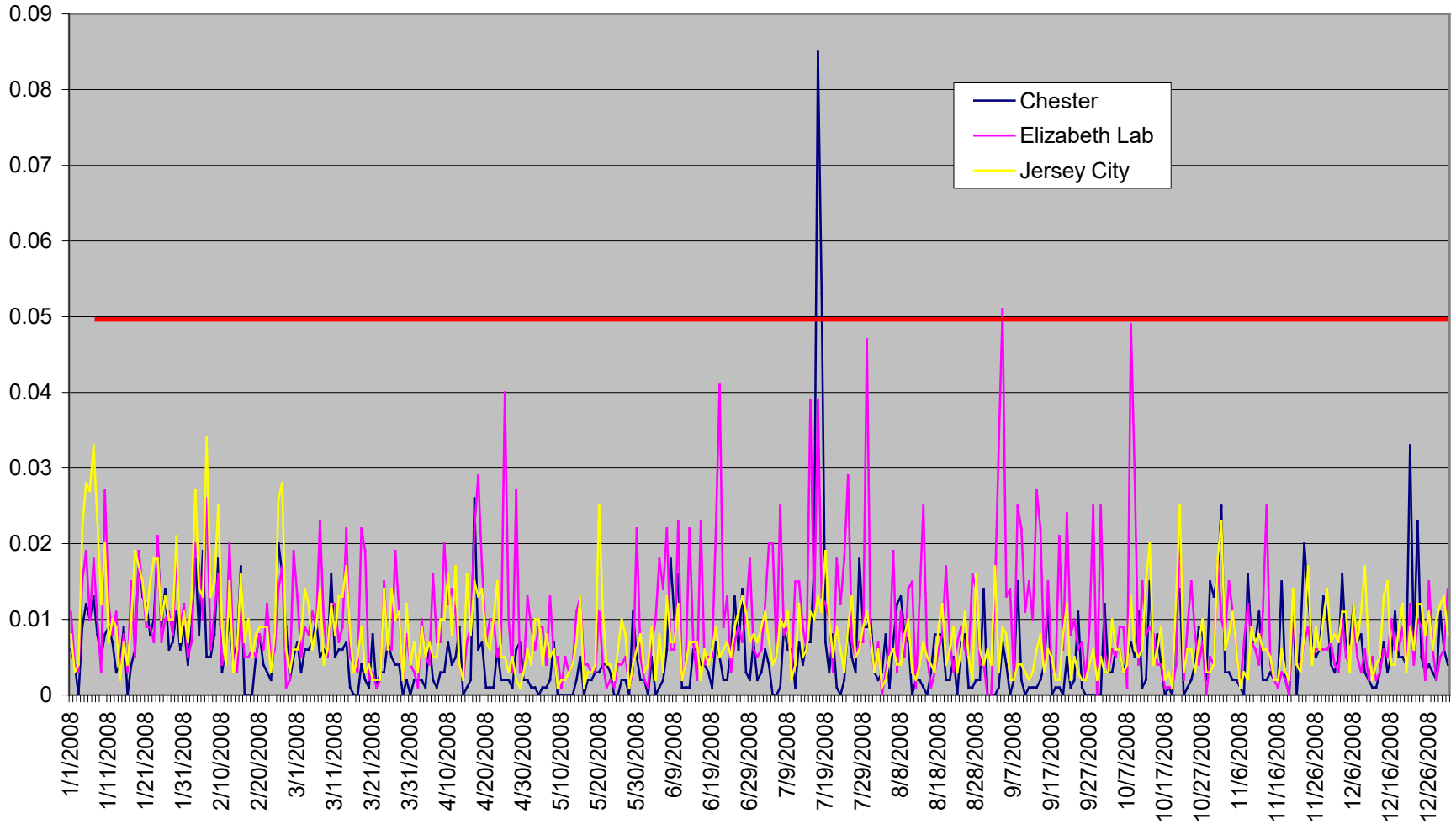
# Daily Maximum NO2 Concentrations Urban and Background Sites in New Jersey 2008



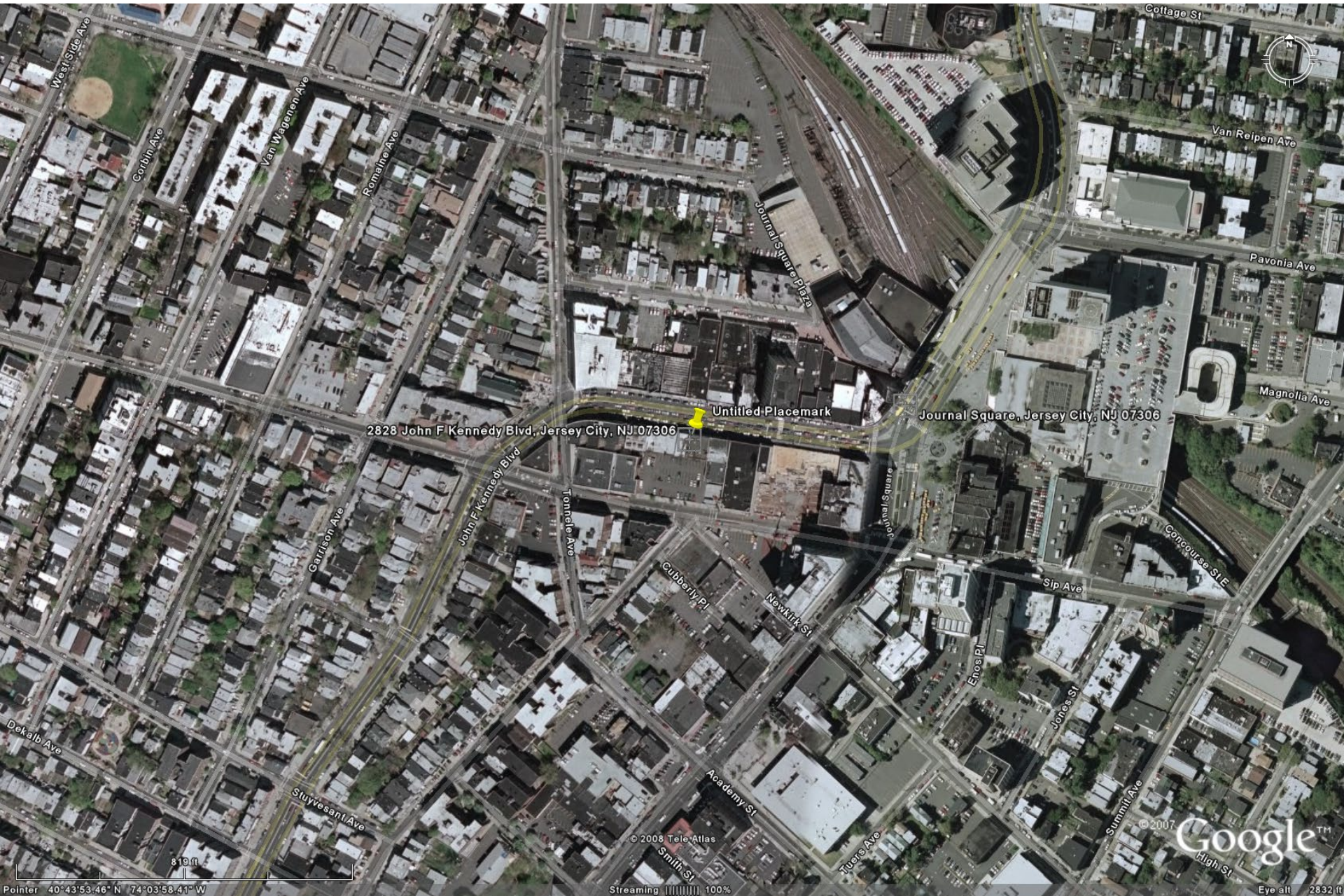
# Sulfur Dioxide Standards

- Existing Standards
  - 140 ppb over 24 – hours
  - 30 ppm Annual Average
- EPA proposed new standard between 50 to 100 ppb averaged over 1-hour
  - Monitoring would be emissions and population based
  - All sites would be in areas of expected maximum concentrations
  - Report Hourly and 5-minute Data

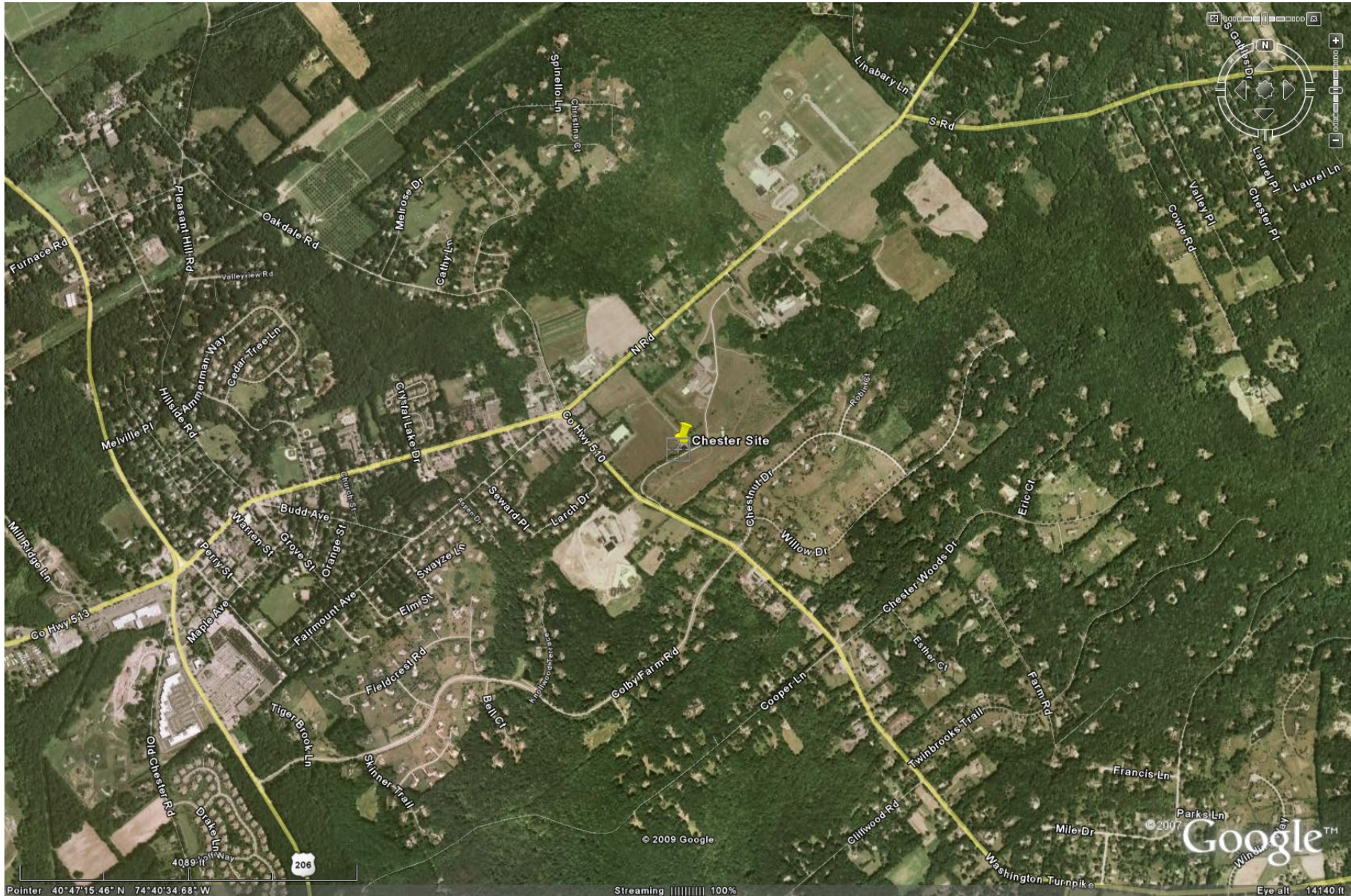
# Maximum Daily 1-Hour SO2 Three Sites In New Jersey 2008



# Jersey City Site



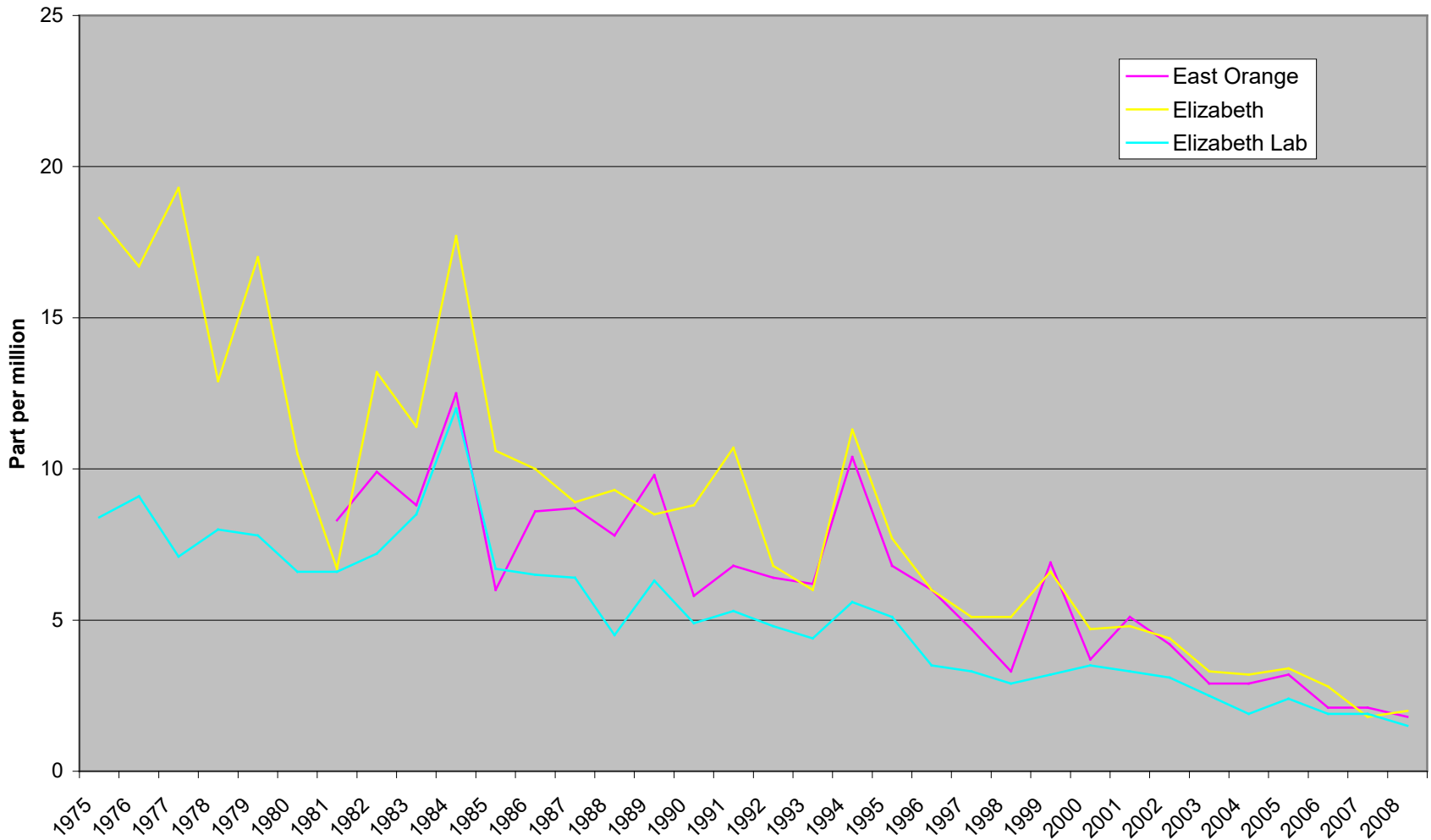
# Chester Monitoring Site



# Carbon Monoxide Standards

- Existing Standards
  - 9 ppm For 8 Hours
  - 35 ppm For 1 Hour
- New Standards
  - Coming Soon

**Carbon Monoxide Trends  
Three New Jersey Urban Sites  
Second High 8-Hour Average  
1975 - 2008**



# CO Data – Jersey City 2007

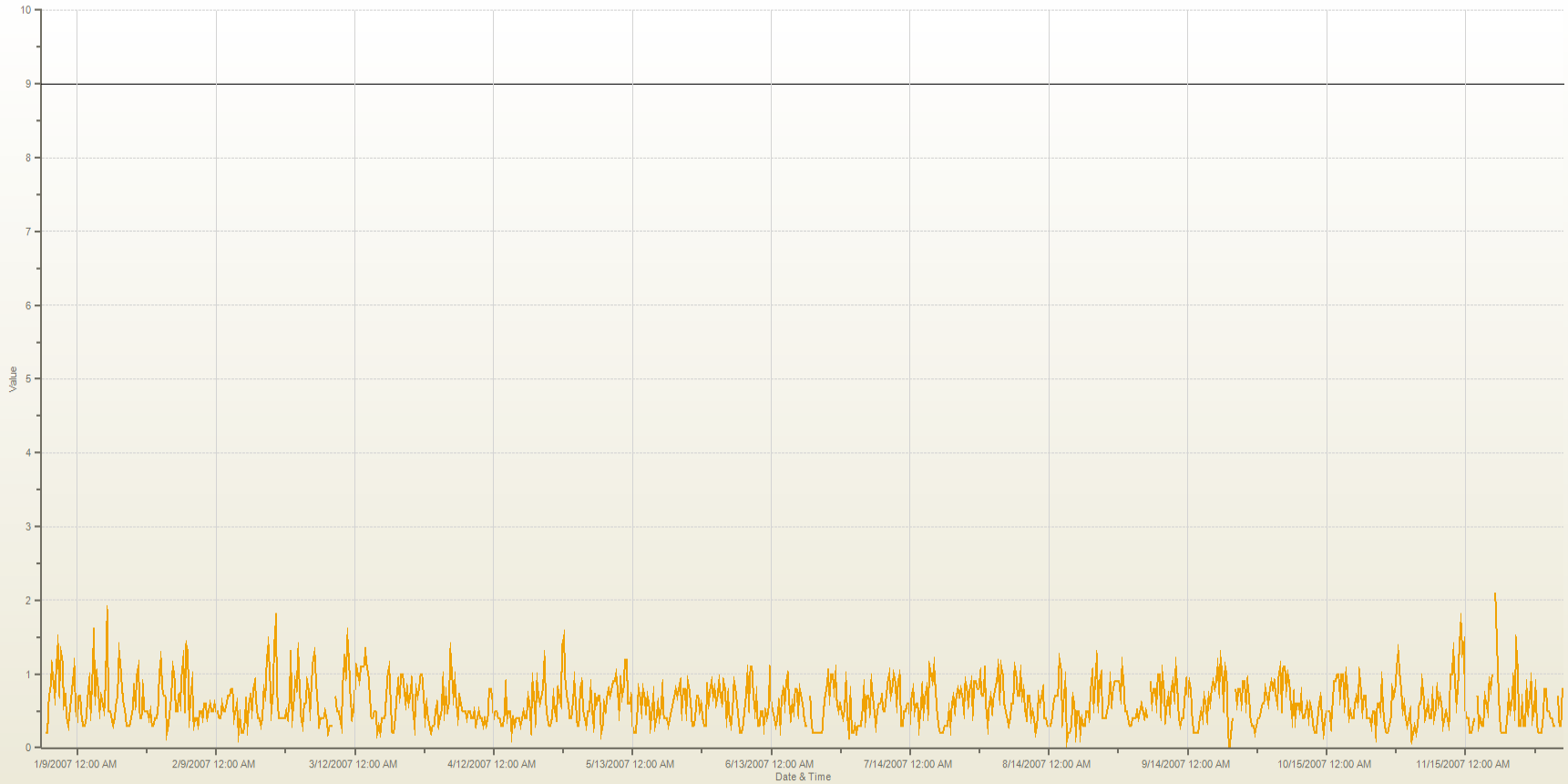
Envista Air Resources Manager

File Dynamic Reports Operational Information Edit Tools Windows Help



CO[ppm] Station: Jersey City Periodically: 1/1/2007 12:00 AM-12/7/2007 12:00 AM Type: AVG 8 Hrs.

CO[ppm] Station: Jersey City Periodically: 1/1/2007 12:00 AM-12/7/2007 12:00 AM Type: AVG 8 Hrs.



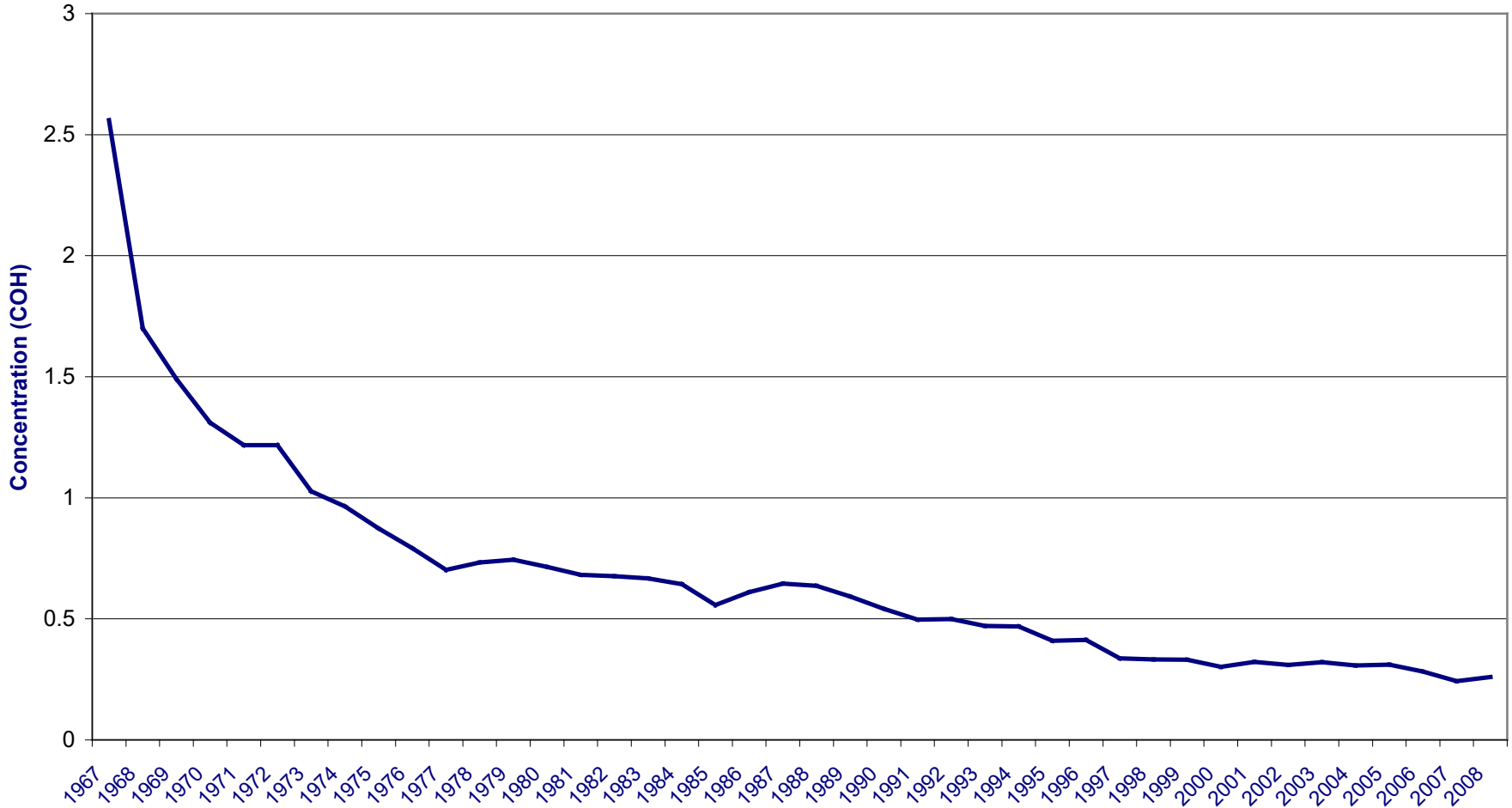
CO[pp...]

Idle

# Fine Particle Standards

- Standards Set in 1997
  - Annual Average of 15  $\mu\text{g}/\text{m}^3$
  - 24 Hour Average of 65  $\mu\text{g}/\text{m}^3$
- Revised in 2006
  - 24 Hour Standard Lowered to 35  $\mu\text{g}/\text{m}^3$

**Trend In Particulate Levels  
in New Jersey  
1967 - 2008**



# PM2.5 Design Values 2006 - 2008

<u>Site</u>	<u>24 Hour</u>	<u>Annual</u>
Atlantic City	29.8	11.1
Camden Lab	33.0	13.1
Chester	28.0	9.4
Eizabeth Site	35.2	12.6
<b>Elizabeth Lab</b>	<b>36.2</b>	13.6
Fort Lee	35.0	12.2
Gibbstown	27.5	11.7
<b>Jersey City</b>	<b>36.0</b>	12.9
Morristown	28.9	10.3
New Brunswick	30.7	11.3
Newark Cultural Center	34.5	13.0
Paterson	32.9	12.3
Pennsauken	33.6	12.7
Phillipsburg	31.1	11.8
Rawway	33.6	12.3
Toms River	28.6	10.2
Trenton	33.2	11.9
<b>Union City</b>	<b>37.8</b>	14.1
Washington Crossing	28.1	10.1

# The AQI and Urban Air Pollution

# Current Index

- Includes most criteria pollutants
- NJ has adapted for NO<sub>2</sub> using California standard
- Only 2 (Ozone and PM<sub>2.5</sub>) of any consequence in NJ
- Does not really have an indicator of pollution levels in urban areas

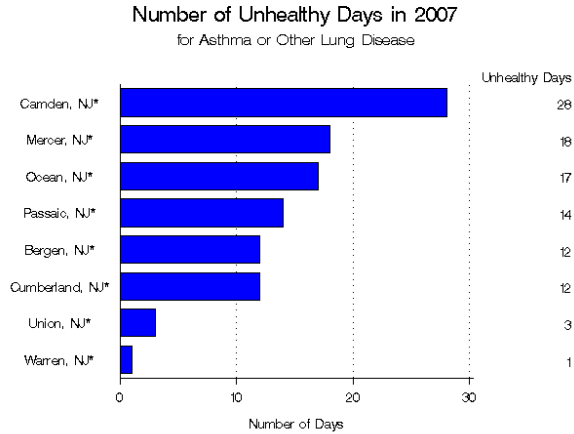
## AIRNOW Quality of Air Means Quality of Life

- [AirNOW Home](#)
- [AirCompare Home](#)
- [County Comparisons](#)
- [State Summaries](#)
- [Monthly Averages](#)
- [Basic Information](#)
- [Health Concerns Affect the Comparison](#)
- [About the Data](#)
- [Frequently Asked Questions](#)
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### County Comparisons

The chart below shows the number of unhealthy days for each location you selected. This count is based on the most recent, complete year of data. Because air quality can vary from one year to the next, it is very important to look at recent changes. The [historical profiles](#) for these locations can tell you if the air quality is improving.

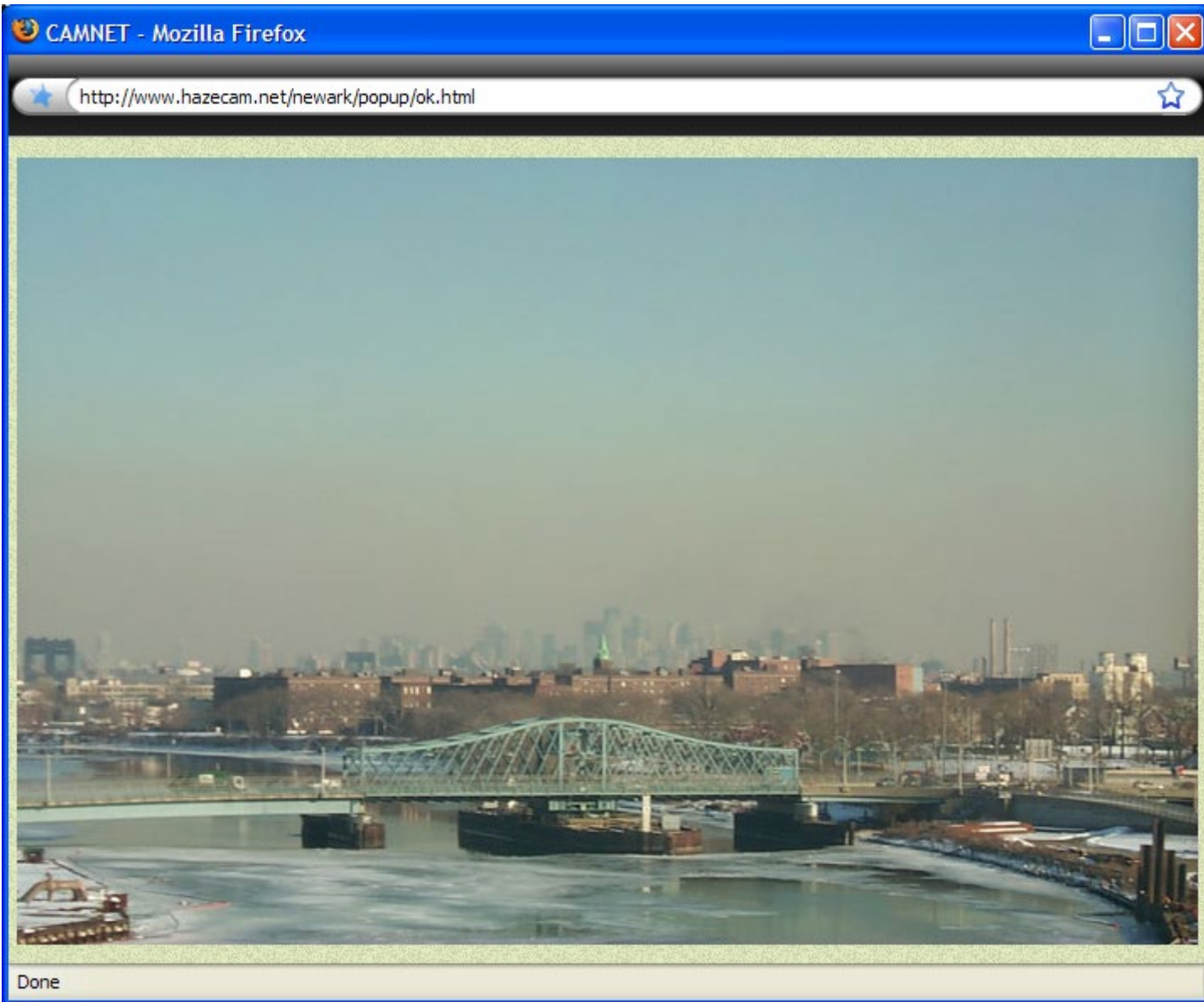
Choose a different health concern: [General Population](#) | [Heart disease](#) | [Older adults and children](#) | [Active Outdoors](#)



[Which pollutants are of concern for Asthma or other lung disease ?](#)

- Notes:
1. This chart is based on available monitoring data. Some counties may not measure every pollutant related to your health concern. And the number of days each pollutant is measured may vary from one county to another. This [table](#) shows the number of days each pollutant was measured in 2007.
  2. Be sure to contact the [local air quality offices](#) to find out if there are additional considerations regarding local air quality and your health concern.
  3. Counties denoted with an asterisk (\*) are part of an air quality [nonattainment area](#).

# How's the Air Quality Today?



# New Jersey's Old Model for Urban Sites

- Central Business District
- Usually Micro or Middle Scale
- Three Basic Pollutants
  - Carbon Monoxide
  - Sulfur Dioxide
  - Smoke Shade



*Fine Jewelry*  
**no Jewelry**

World's Best  
C.C.

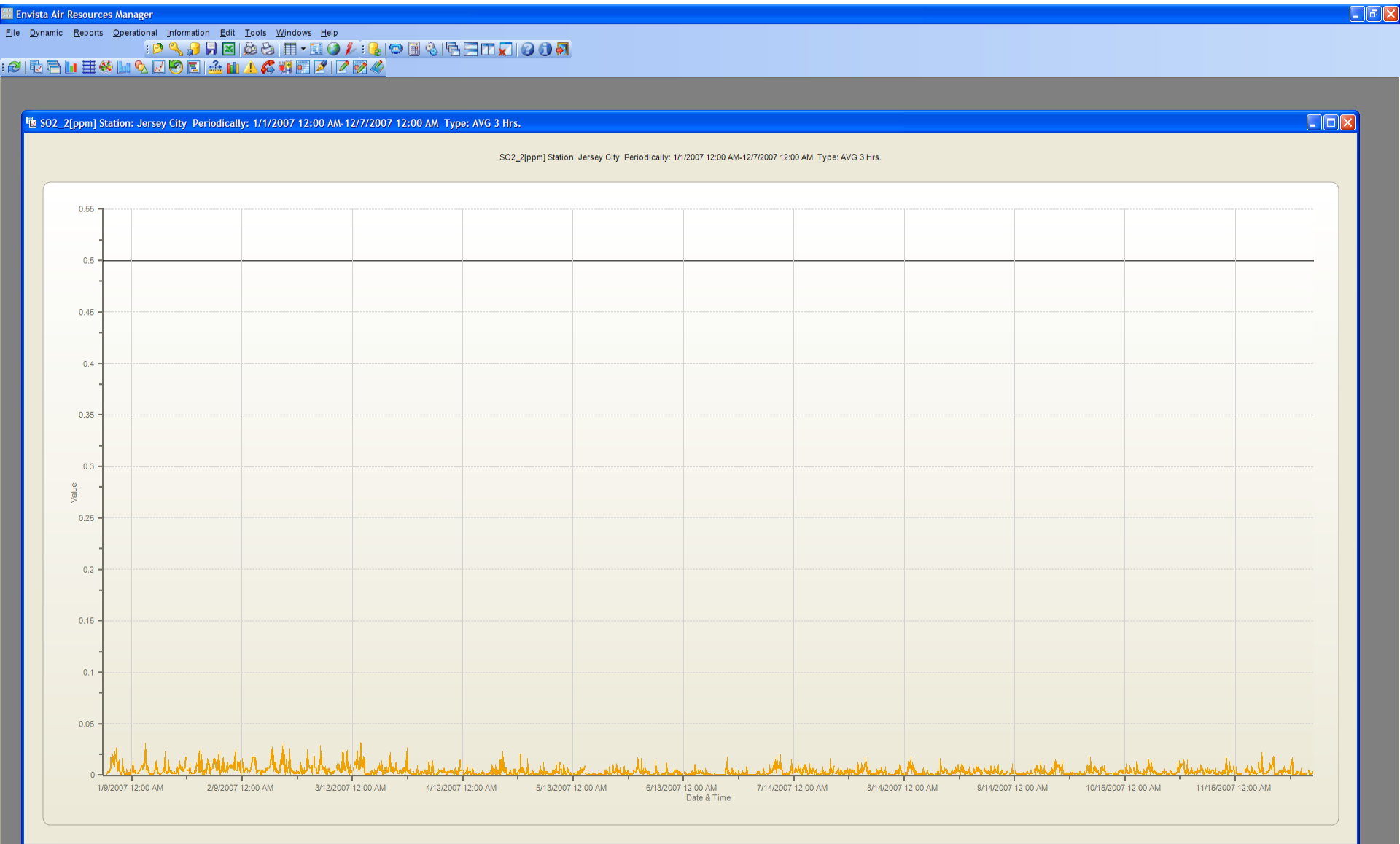
**WIRE ACCESSORIES**  
WIRE ACCESSORIES  
WIRE ACCESSORIES

**VIDEO GAMES ELECTRONICS DVD MUSIC**

**MUSIC STATION**

MIXTE

# SO2 Data – Jersey City 2007



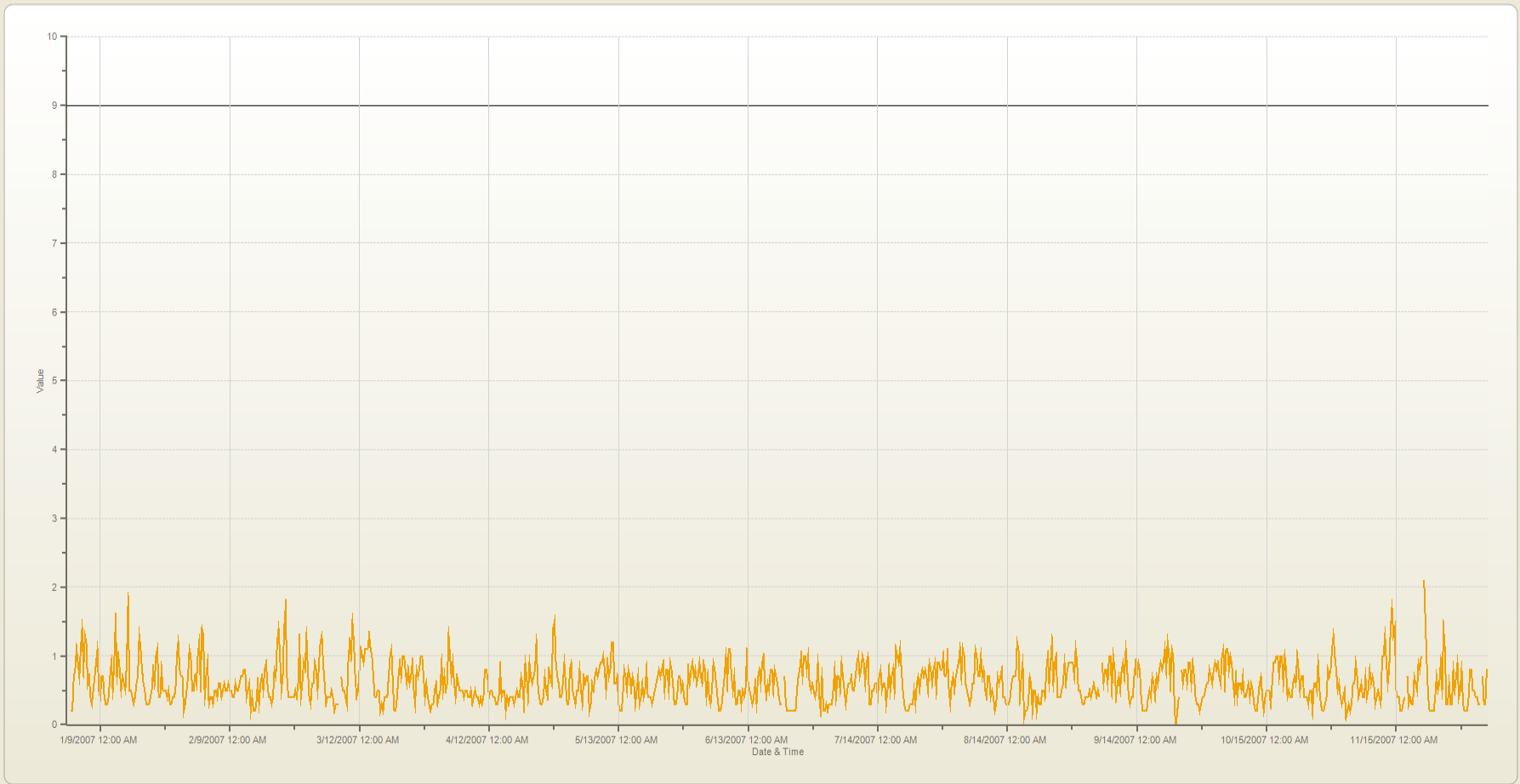
# CO Data – Jersey City 2007

Envista Air Resources Manager

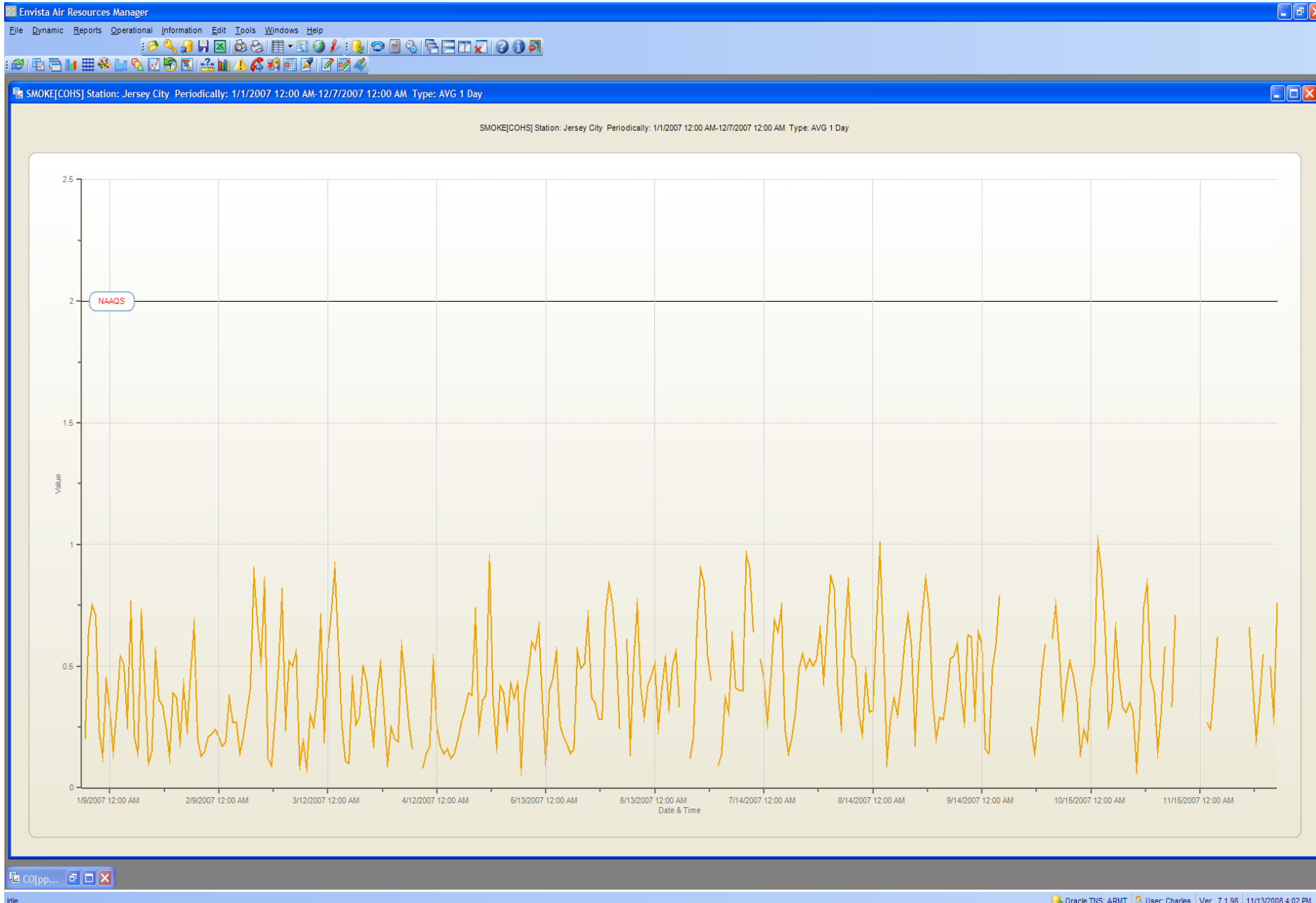
File Dynamic Reports Operational Information Edit Tools Windows Help

CO[ppm] Station: Jersey City Periodically: 1/1/2007 12:00 AM-12/7/2007 12:00 AM Type: AVG 8 Hrs.

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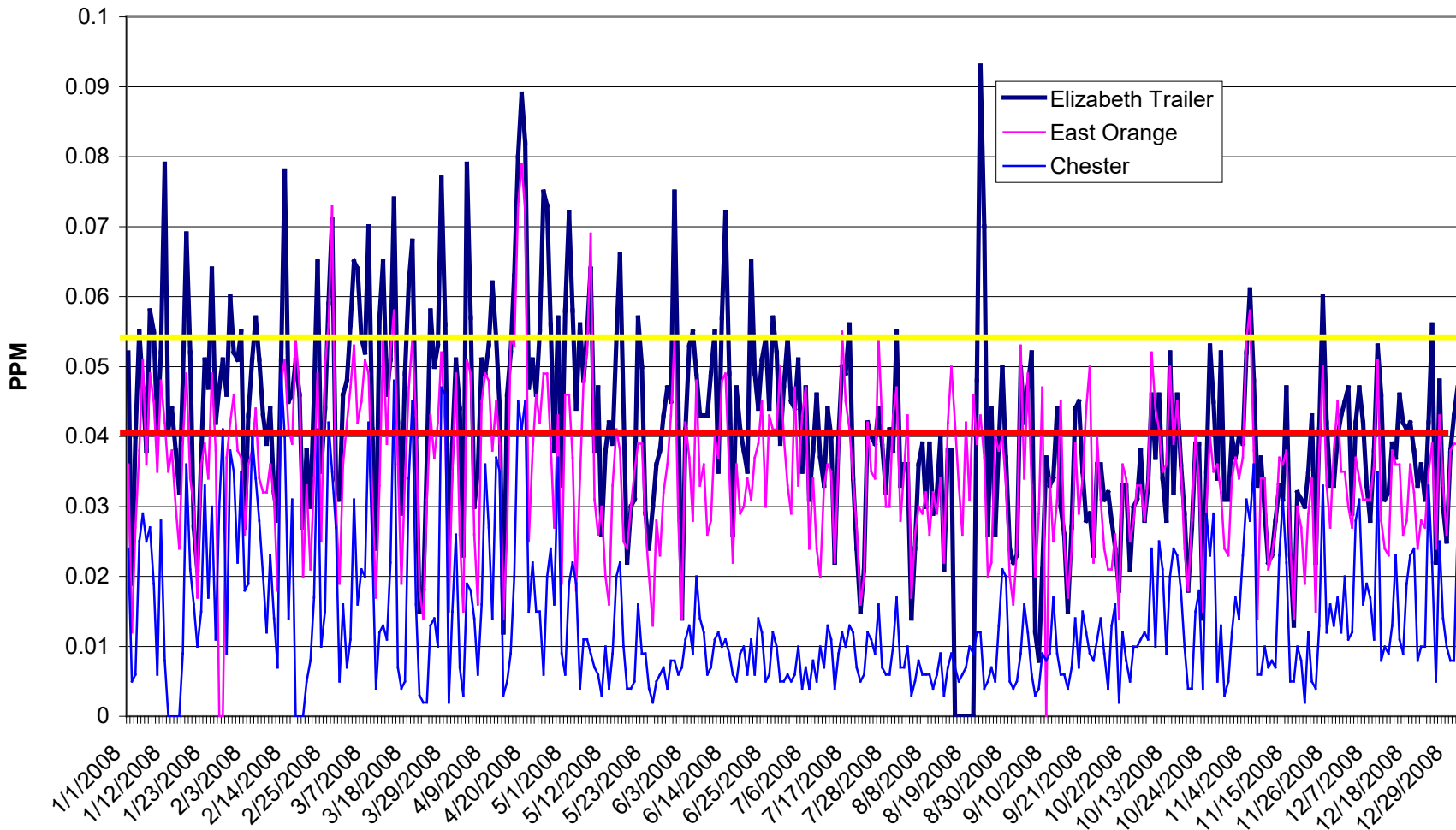


# Smoke Shade Data – Jersey City 2007

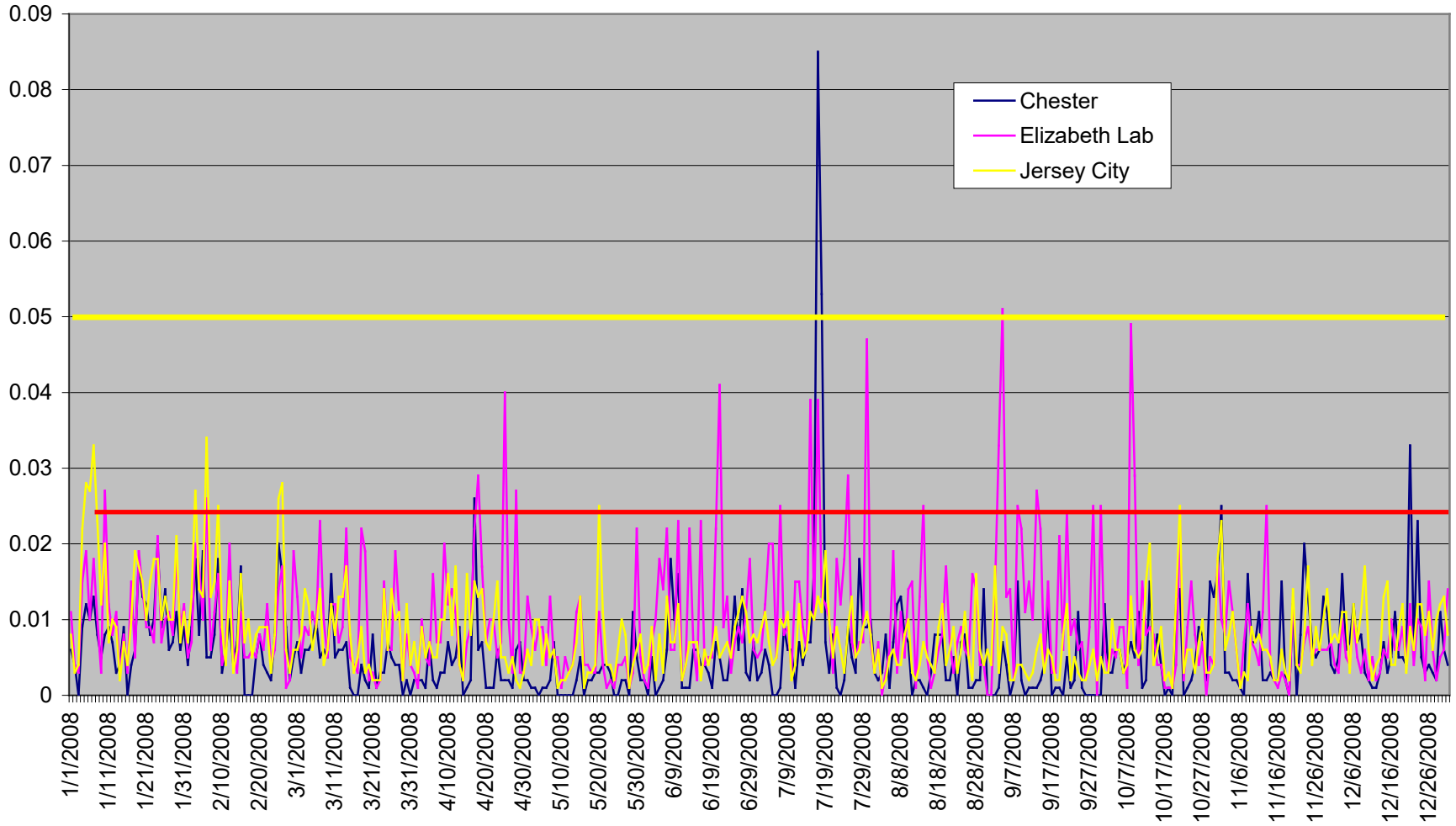


How Might the New Standards  
Affect the AQI?

# Daily Maximum NO2 Concentrations Urban and Background Sites in New Jersey 2008



# Maximum Daily 1-Hour SO2 Three Sites In New Jersey 2008



# Should There be A New Model for Urban Monitoring?

- Total VOCs
- BTX
- Black Carbon
- NO, NO<sub>2</sub> – or other nitrogen measurement
- PM<sub>2.5</sub>