Coalition for the Advancement of Regional Transportation

Comments to:

REDESIGNATION REQUEST AND MAINTENANCE PLAN FOR THE KENTUCKY PORTION OF THE LOUISVILLE, KY-IN 1997 ANNUAL PM2.5 NONATTAINMENT AREA,

February 3, 2012

Energy and Environment Cabinet
Kentucky Division of Air Quality
500 Mero Street 12th Floor Capital Plaza Twr.
Frankfort, KY 40601

Ms. Gwendolyn Keyes Fleming
Regional Administrator
US EPA, Region 4
Sam Nunn Atlanta Federal Center
61 Forsyth Street, SW
Atlanta, GA 30303

February 3, 2012

CART opposes the redesignation request:
REDESIGNATION REQUEST AND MAINTENANCE PLAN FOR THE KENTUCKY PORTION OF THE LOUISVILLE, KY-IN 1997 ANNUAL PM2.5 NONATTAINMENT AREA, Bullitt and Jefferson Counties, Kentucky Prepared by: Energy and Environment Cabinet, Division for Air Quality, December 2011. (hereinafter the Request).

SUMMARY

Today's comments support our conclusion that an EPA decision to redesignate Louisville as in attainment of the 1997 PM 2.5 NAAQS standards would be against the interest of public health protection.

Since 2007, the state has experienced an economic recession which produced a reduction in measured particulate emissions. The data shows a dip in 2008 as lost jobs, reduced construction and manufacturing, resulted in reduced particulate emissions. This produced a set of three year averaged particulate monitoring results that are offered as proof of attainment of the NAAQS standard of 15 $\mu g/m^3$

The documents supporting the request for redesignation rely on outdated measurements of the MASS or WEIGHT of fine particulate air pollution. Emerging science since 2000 has shown that a standard for particle COUNTS of more toxic ultrafine particulate must be established by EPA to protect the public.

The continued use of Federal Reference Method gravimetric analysis measuring the weight of filter pads to yield grams per cubic meter of air volume is inadequate to document public health risk and its sources at the places where people are exposed.

It is unacceptable and misleading to ignore the very high levels of ultrafine toxic particulates in the community while claiming attainment of NAAQS PM 2.5 standards.

Ultrafine particulate has emerged in the peer reviewed scientific literature as a public health threat caused by mobile source emissions and present in great concentrations on highways, in urban areas and around airports, but the established gravimetric analysis for PM 2.5 based on the

weight of larger particulate, fails to detect it. Engine combustion of gasoline and diesel produces particulate that is 91 % composed of particles sized well below the 2.5 micro meter width of the NAAQS standard. (20-130nm
for diesel engines (Morawska et a!., 1998a, b) and 20-60 nm for gasoline engines)

EPA revised the NAAQS particulate standards in 2006 with a significant body of peer reviewed studies demonstrating that the adopted standard did not go far enough to protect public health. Presently the Clean Air Scientific Advisory Committee (CASAC) Particulate Matter (PM) Review Panel that advises EPA on NAAQS standards is approaching a consensus that would lower the PM 2.5 standard to 10 $\mu g/m^3$
Redesignation to attainment against this scientific controversy would be misleading.

EPA must move forward to adopt a public health protection standard based on particle numbers per cubic centimeter. Because the redesignation request is based on data and calculations using the FRM gravimetric analysis method, it produces misleading predictions of future maintenance of NAAQS standards in tons per year of emitted PM 2.5. These maintenance targets are similarly misleading and unprotective of public health.

Ultrafine particulate is measured in nanometers width and penetrates more deeply into the lungs and crosses the lung epithelium and gets into the blood stream where it causes tissue damage. Our comments cite to a substantial number of peer reviewed journal articles identifying the public health risk from ultrafine particulate.

The network of monitors in Jefferson County is located away from busy highway interchanges, the airport, and major sources of particulate pollution where people are exposed. The monitor network gives a low estimate of the actual average $PM_{2.5}$ exposure of the public. It gives no information about particle counts of ultrafine particulate.

The monitoring network data was used in conjunction with old data from 2000 to create a travel demand model and emissions factors that were used in predicting future maintenance of the NAAQS standards. These predictions included a required 15 % safety margin. The model predictions are likely to be violated because they are not based on real world 2011 socio-economic data and current vehicle registrations.

Here then are the comments of CART opposing the redesignation to attainment status for particulate pollution because the people of Louisville deserve better more accurate reporting and monitoring of the actual risk of particulate pollution than we are getting.

Furnished CD ROM disk with full comments, appendix to coments and additional peer reviewed journal articles.

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Zhu, Y.,Hinds, W.,Kim, S. ,Shen, S., and Sioutas, C.,
Study of ultrafine particles near a major highway with heavy-duty diesel traffic,
Atmospheric Environment, Vol. 36, 4323-4335 (2002).
4324

Recent toxicological studies have concluded that ultrafine particles (diameter < 100 nm) are more toxic than larger particles with the same chemical composition and at the same mass concentration (Ferin et aI., 1990; Oberdorster, 1996, 2001; Donaldson et aI., 1998, 2001; Churg et aI., 1999; Brown et aI., 2000).

Currently, however, only the mass concentration of PM < 10 l-tm in aerodynamic diameter (PM10) and <2.5l-tm *(PM2.s)* are regulated. Information about ultrafine particles is usually not available. In fact, even though **ultrafine particles represent over 80% of particles** in terms of number concentration in an urban environment (Morawska et a!., 1998a, b), the less numerous but much heavier particles of the accumulation (0.1-2l-tm) and coarse (2.5-10 l-tm) modes dominate mass concentration measurements. Thus, **number concentration, together with the size distribution of ultrafine particles, is needed to better assess ambient air quality and its potential health effects.**

Emission inventories suggest that motor vehicles are the primary direct emission sources of fine and ultrafine particles to the atmosphere in urban areas (Schauer et a!., 1996; Shi et a!., 1999; Hitchins et a!., 2000).

Although traffic-related air pollution in urban environments has been of increasing concern, most studies have focused on gaseous pollutants, total mass concentration, or chemical composition of particulate pollutants (Kuhler et a!., 1994; Clairborn et aI., 1995; Williams and McCrae, 1995; Janssen et a!., 1997; Roorda-Knape et a!., 1998a, b; Wrobel et a!., 2000). Booker (1997) found that particle number concentration was strongly correlated with vehicle traffic while PM10 was essentially uncorrelated with traffic. Since the majority of particle number from vehicle exhaust are in the size range 20-130nm for diesel engines (Morawska et a!., 1998a, b) and 20-60 nm for gasoline engines (Ristovski et aI., 1998), it is **important and necessary to quantify ultrafine particle emission levels**, and to determine ultrafine particle behavior after emission as they are transported away from the emission source-busy roads and freeways.

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February 2, 2012

Comments for the Public Hearing on February 3, 2012 of:

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CART opposes the redesignation request:

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CART's comments principally address the following criteria for redesignation:

Section 107(d)(3)(E) of the CAA allows states to request nonattainment areas to be redesignated to attainment provided certain criteria are met. The following are the criteria that must be met in order for an area to be redesignated from nonattainment to attainment:

i) A determination that the area has attained the PM2.5 standard.

CART Comment:
CART argues that its members will suffer significant air pollution health effects by an erroneous determination of attainment of the PM 2.5 fine particulate standard by use of FRM gravimetric analysis that ignores 'mode shifting' of mobile source emissions to ultra fine particulate mode not detected by the FRM method. The public health risk is underestimated and the data demonstrating attainment is flawed, biased and unreliable.

ii) An approved State Implementation Plan (SIP) for the area under Section 110(k).

CART Comment:
CART argues that its members will suffer significant air pollution health effects because of erroneous adoption and approval of the SIP. The SIP uses erroneous emissions factors based on FRM gravimetric data that ignores PM 2.5 mode shifting to UFP and uses outdated socio-economic data and 2000 vehicle

registrations in the travel demand model to generate erroneous emissions predictions in tons per year of PM 2.5. Approval of the SIP would harm CART's interests by approving a plan that ignores rising public health risk from UFP emissions of mobile sources. These sources would actually be lowered by control measures using mass transit projects instead of ineffective emissions control based on FRM gravimetric analysis.

iii) A determination that the improvement in air quality is due to permanent and enforceable reductions in emissions resulting from implementation of the SIP and other federal requirements.

CART Comment:
CART argues that what has caused a transient dip in LMA PM 2.5 emissions is the economic slowdown or recession which has not yet ended. Trends charted from 2008 to 1010 are unreliable indicators of PM 2.5 declines achievable by the SIP and other measures. It is noted that EPA is in the early stages of the process of rulemaking to reduce further the NAAQS for PM2.5 and could adopt a new standard in five years as low as 10 $\mu g/m^3$ in recognition of the growing understanding of health impacts and public exposure to fine particulate. Enforceable reductions that ignore the principal mode of mobile source combustion emissions –UFP do not result in improved air quality. Such enforcement measures mask actual public health impacts and exposure. Recently the EPA has promulgated a requirement for near road monitoring evidencing a recognition of the highest concentrations of pollutants at the near roadway areas. Data based on this modeling will require revision of the PM 2.5 NAAQS and re-deployment of the LMA PM 2.5 network to more accurately reflect actual public exposure.

I. Demonstration of Attainment of the NAAQS standard.

Metro Louisville Jefferson County Air Pollution Control District operates a PM 2.5 monitoring network and has submitted averaged air monitoring data for three years to support the Request. To the extent the monitoring data is accurate and acceptable to EPA, averaged PM 2.5 gravimetric analysis data gathered from FRM monitors located more than 100 meters from busy highways, is insensitive to spatial variability in mobile source particulate emissions. Since 2000, EPA funded research has indicated a need to monitor particle count and mode size to accurately identify public health risk from mobile source emissions.

FRM gravimetric data misrepresents actual public exposure to particulate pollution at places where people live work and play when low mass particle counts of UFP are in elevated levels such as near busy streets, at school driveways and major highway areas. At this juncture, the request for redesignation should be denied because the data in the Request is unreliable, underestimates public health risk, and EPA is in the process of reconsidering further reductions of PM 2.5 NAAQS based on the discovery that the present standards are insufficient to protect public health. Continued use and reliance on the FRM gravimetric method that ignores UFP counts, violates the Clean Air Act:

"[T]he Clean Air Act govern[s] the establishment and revision of the NAAQS (42 U.S.C. 7401 to 7671q, as amended). Section 108 (42 U.S.C. 7408) directs the Administrator to identify pollutants that "may reasonably be anticipated to endanger public health and welfare" and to issue air quality criteria for them. These air quality criteria are intended to "accurately reflect the latest scientific knowledge useful in indicating the kind and extent of identifiable effects on public health or welfare which may be expected from the presence of [a] pollutant in ambient air . . . ."

<u>Review of the National Ambient Air Quality Standards for Particulate Matter</u>:
Policy Assessment of Scientific and Technical Information
OAQPS Staff Paper, June 2001 Preliminary Draft

In July 1997, EPA promulgated the National Ambient Air Quality Standards for Fine Particles (PM-2.5). The annual standard is a level of 15 micrograms per cubic meter, based on the 3-year average of annual mean $PM_{2.5}$ concentrations. The 24-hour standard is a level of 65 micrograms per cubic meter, based on the 3-year average of the 98th percentile of 24-hour concentrations.

In September 2006, EPA issued revised national air quality standards for fine particle pollution. EPA significantly strengthened the previous daily fine particle standard from 65 micrograms of particles per cubic meter to 35 micrograms of particles per cubic meter of air. This standard increases protection of the public from short-term exposure to fine particles. The Clean Air Fine Particle Implementation Rule does not specifically address implementation of this recently revised standard.

The EPA is considering revision of the PM 2.5 standard in the next round of revisions:
In order to facilitate a comprehensive and timely review of the newly available science, the Administrator has directed EPA staff to begin the next review of the PM NAAQS immediately.
40 CFR Part 50 National Ambient Air Quality Standards for Particulate Matter; Final Rule [71 FR 61224, 61149, Oct. 17, 2006]

"The Second Draft estimates risk reductions for different air quality scenarios involving specified values of 24-hr and annual standards. Five alternative sets of standards are considered, with the lowest scenario being an annual standard of 12 μg/m3 combined with a 24-hour standard of 25 μg/m3. Two additional scenarios were presented at the March 2010 CASAC meeting with pairings of 10/35 and 10/25 μg/m3. The reduction of the annual standard to10 μg/m3 showed additional benefits beyond those estimated for the scenarios in the RA."

Letter to EPA, April 15, 2010 , The Honorable Lisa P. Jackson, Administrator, Re: CASAC Review of *Quantitative Health Risk Assessment for Particulate Matter – Second External Review Draft* (February 2010), Dr. Jonathan M. Samet Chair, Clean Air Scientific Advisory Committee.

Further, EPA is issuing revised NO_2 monitoring requirements for near road monitoring that anticipate additional required monitoring for fine particulate in particle count (number/cm^3). This is a recognition by the agency that distantly located monitoring, such as Louisville's MAPCD network, produces data that does not represent the significant exposure of the public to highway pollution, including fine particulate.

Near Road NO2 Monitoring, Technical Assistance Document, Draft, August 11, 2011. (75 FR 6474)

42 U.S.C. § 7409 (b) **Protection of public health and welfare**
(1) National primary ambient air quality standards, prescribed under subsection (a) of this section shall be ambient air quality standards the attainment and maintenance of which in the judgment of the Administrator, based on such criteria and allowing an adequate margin of safety, are requisite to protect the public health. Such primary standards may be revised in the same manner as promulgated.

Karner, A.A., Eisinger, D.S., and Niemeier, D.A., Near Roadway Air Quality: Sythesizing the Findings from Real World Data, Environmental Science & Technology, Vol. 44, 5334-5344 (2010).

5338
The curves indicate (ignoring ozone) that concentrations of certain pollutants are elevated near roadways and decrease as the distance increases, while other pollutants show no roadway influence. These background normalized results suggest that a range of approximately 160-400 m is sufficient to reach background concentrations for the majority of pollutants.

Figure 3 (above) shows CO, benzene, EC, NO, NOX, NO2, PM2.5, and UF1 particle number, UF2 particle number, and VOC1 all decreased as distance from road increased. PM10, fine particle number, and VOC2 showed ambiguous or little to no trend with distance.

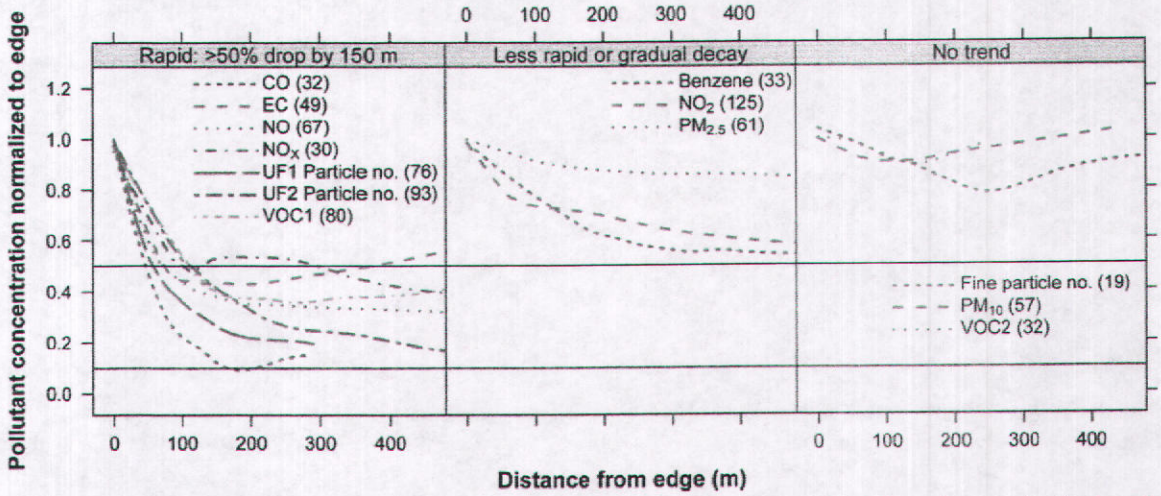


FIGURE 3. Local regression of edge normalized concentrations on distance. The horizontal black lines show a reduction from the edge-of-road concentration of 90% (at 0.1) and 50% (at 0.5). A loess smoother (alpha = 0.70, degree = 1) was fitted to pollutant data which was placed in one of three groups. The regression sample size, n, is given in parentheses after each pollutant. The n includes an estimated (not in the literature) edge-of-road value to facilitate normalization.

II. Reliability of the $PM_{2.5}$ Data

The application must demonstrate that the area has attained the PM2.5 standard. (CAA Section 107(d)(3)(E)(i))

There are two components involved in making this demonstration. The first component relies on ambient air quality data. The data that are used to demonstrate attainment should be the product of ambient monitoring that is ***representative of the area of highest concentration.*** *The data should be collected and quality-assured in accordance with 40 CFR 58 and recorded in the Air Quality System (AQS) in order for it to be available to the public for review.*

Submitted with this set of comments is an Appendix containing photos of the Louisville PM 2.5 monitoring sites.

"At least one monitoring station is to be sited in a **population-oriented area of expected maximum concentration**. 40 CFR 58 Appendix D Section 4.7 Fine Particulate Matter ($PM_{2.5}$) Design Criteria

"For areas with more than one required SLAMS, a **monitoring station is to be sited in an area of poor air quality**." 40 CFR 58 Appendix D Section 4.7 Fine Particulate Matter ($PM_{2.5}$) Design Criteria

Monitoring Data for the Louisville, KY-IN area for 2008 – 2010

Site ID	Site Name	County, State	Annual Standard			
			Year			Average
			2008	2009	2010	2008-2010
21-029-0006	Shepherdsville	Bullitt, KY	12.84	11.81	13.43	12.69
21-111-0043	Southern Avenue	Jefferson, KY	13.17	12.21	13.47	12.95
21-111-0044	Wyandotte Park		13.41	12.45	13.74	13.20
21-111-0048	Barret Avenue		13.44			13.44[1]
21-111-0051	Watson Elementary		12.78	11.59	14.83	13.07
21-111-0067	Cannons Lane			11.67	13.27	12.47[2]
18-019-0006	Walnut Street	Clark, IN	14.48	13.01	14.67	14.10
18-019-0008	Charlestown State Park		13.44	10.84	12.45	12.20
18-043-1004	New Albany	Floyd, IN	12.70	11.91	13.80	12.80

[1] Based on One Year of Data

[2] Based on Two Years of Data

The Barrett Avenue monitor discontinued operation on December 31, 2008.

The Cannons Lane monitor began operation on January 1, 2009.

The Charlestown State Park Monitor began operation on July 2, 2008.

On March 9, 2011, EPA published a final rule which determined that Louisville has attained the 1997 annual average $PM_{2.5}$ NAAQS [76 FR 12860].

Source: U.S. EPA Air Quality System (AQS); http://www.epa.gov/ttn/airs/airsaqs/index.htm

21-111-0044 Wyandotte site has no co-location monitor for PM 2.5 to validate the results. The Wyandotte Park PM 2.5 monitor has been subjected to repeated vandalism and MAPCD has applied to EPA allow it to close the station. That data set should be disallowed.

21-111-0043 Southwick at Southern Avenue, has a co-located FRM PM 2.5.

21-111-0051 Watson Lane has FRM PM 2.5 and a TEOM PM 2.5. The 2010 annual average for Watson Lane at 14.83 $\mu g/m^3$ is the highest annual average and very close to the present 15 $\mu g/m^3$ NAAQS limit.

21-111-0048 850 Barret Avenue. Station closed on December 31, 2008. It measured a different air mass from the Cannons Lane location that began operation January 1, 2009. The data is not complete for 2009 and 2010 and should be disallowed.

21-111-0067 2730 Cannons Lane, Bowman Field. To use the Barret and Cannons Lane stations to make up three continuous years of monitoring requires spatial variability averaging. The coefficient of variability calculated for the two stations exceeds the allowable 10%. Barret Avenue and Cannons Lane data should be disallowed from the Request.

[71 FR 61224, 61150, Oct. 17, 2006]

The spatial averaged annual mean of the LMA sites in the request is 13.001 $\mu g/m^3$ using just the 7 sites

with 3 years of monitoring data and excluding the one year from Barrett (13.44) and two years from Cannons (12.47). The difference in the highest and lowest values in the data set from all stations is 1.90 (14.10-12.20 = 1.90). The calculated coefficient of spatial variability is therefore 1.90/13.001 = .146 or 14.6 % and exceeds the allowable criteria for spatial averaging in the network.
Appendix N, pursuant to 40 C.F.R. § 50.13 (b)

40 C.F.R. § 50.13 National primary and secondary ambient air quality standards for PM2.5.
(b) The annual primary and secondary $PM_{2.5}$standards are met when the annual arithmetic mean concentration, as determined in accordance with appendix N of this part, is less than or equal to 15.0 $\mu g/m^3$.

The EPA is revising the form of the annual PM2.5 standard with regard to the criteria for spatial averaging, such that averaging across monitoring sites is allowed if the annual mean concentration at each monitoring site is ***within 10 percent of the spatially averaged annual mean****, and the daily values for each monitoring site pair yield a correlation coefficient of at least 0.9 for each calendar quarter.*

Appendix N of 40 CFR 50

(1) The 3-year average of annual means for a single monitoring site or a group of monitoring sites (referred to as the " *annual standard design value* "). If spatial averaging has been approved by EPA for a group of sites which meet the criteria specified in section 2(b) of this appendix and section 4.7.5 of appendix D of 40 CFR part 58, then 3 years of spatially averaged annual means will be averaged to derive the *annual standard design value* for that group of sites (further referred to as the " *spatially averaged annual standard design value* "). Otherwise, the annual standard design value will represent the 3-year average of annual means for a single site (further referred to as the " *single site annual standard design value* ").

2.0 Monitoring Considerations.
(a) Section 58.30 of this chapter specifies which monitoring locations are eligible for making comparisons with the $PM_{2.5}$standards.
(b) To qualify for spatial averaging, monitoring sites must meet the criterion specified in section 4.7.5 of appendix D of 40 CFR part 58 as well as the following requirements:
(1) The annual mean concentration at each site shall be within 10 percent of the spatially averaged annual mean.
(2) The daily values for each site pair among the 3-year period shall yield a correlation coefficient of at least 0.9 for each calendar quarter.
(3) All of the monitoring sites should principally be affected by the same major emission sources of $PM_{2.5}$. For example, this could be demonstrated by site-specific chemical speciation profiles confirming all major component concentration averages to be within 10 percent for each calendar quarter.
(4) The requirements in paragraphs (b)(1) through (3) of this section shall be met for 3 consecutive years in order to produce a valid spatially averaged annual standard design value. **Otherwise, the individual (single) site annual standard design values shall be compared directly to the level of the annual NAAQS**.
Request, Page 9 Chapter 3

"three complete years of monitoring data are required to demonstrate attainment at a monitoring site."

Three years of data from Barret Avenue and Cannons Lane are required.

Thunder over Louisville

IDEM operates three monitors in the area. The data from the New Albany monitoring station is available

online for review. When the date of April 18 for 2011 is used, particulate readings show a large increase into the following day. On April 19, at 1:00 pm the PM 2.5 reading is 60.08 $\mu g/m^3$ The other IDEM stations data are not available online. Attempts to determine PM readings for other Thunder Over Louisville dates in 2008 through 2010 yielded monitor not in service messages.

Louisville in 2011 detonated 60 tons of fireworks explosives containing perchlorate and metals over the Ohio River and proximate to the Jeffersonville, Walnut Street PM monitor. Indian PM monitors seem to have outages coincident with the Thunder event. The Charlestown PM data and Jeffersonville data are not online.

None of the Louisville daily readings was available online, only monthly averages. None of the co-located monitor information was available for comment and calculation of variability coefficients. The issue of PM data reliability is removed from public review and the failure of the MAPCD or IDEM to publicly report and specifically monitor the detonation of 60 tons of fireworks releasing huge clouds of particulate matter, raises a question of the reliability of the data and the monitoring network.

18-043-1004 New Albany, Indiana 2230 Green Valley Road/Green Valley Elementary School monitor appears manipulated during Thunder Over Louisville

18-043-1004 12500 St. Rd. 62, Charlestown State Park/ Indiana Armory data not complete for 2008, data not available for PM2.5

18-019-0006 Walnut Street Jeffersonville, Indiana data not available for PM2.5

The criteria for spatial variability is exceeded Appendix A to Part 58—Quality Assurance Requirements for SLAMS, SPMs and PSD Air Monitoring

2.3.1.1 Measurement Uncertainty for Automated and Manual $PM_{2.5}$Methods. The goal for acceptable measurement uncertainty is defined as 10 percent coefficient of variation (CV) for total precision and plus or minus 10 percent for total bias.

1.2 Measurement Uncertainty. Measurement uncertainty is a term used to describe deviations from a true concentration or estimate that are related to the measurement process and not to spatial or temporal population attributes of the air being measured

Multiple months in 2008 to 2010 exceeded the standard 15 $\mu g/m^3$ including:
3 months in 2008 - July, 18.1 $\mu g/m^3$, August, 17.1 $\mu g/m^3$, and September 17.6 $\mu g/m^3$
4 months in 2010 - Feb 16.3 $\mu g/m^3$, July 16.0 $\mu g/m^3$, August 16.4 $\mu g/m^3$, October 17.0 $\mu g/m^3$
3 months in 2011 - Jan 15.2 $\mu g/m^3$, July 19.7 $\mu g/m^3$, August 16.2 $\mu g/m^3$

In 2010, four of the monthly averages of all monitors exceeded the NAAQS standard.
In 2011, three of the monthly averages of all monitors exceeded the NAAQS standard.

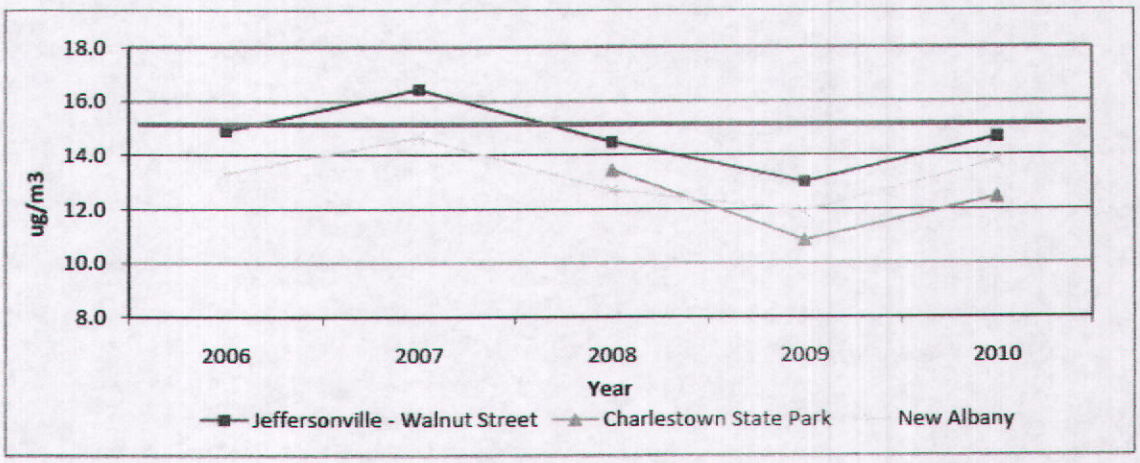
The highest average from all MAPCD monitors occurred in July 2011 with a reading of 19.7$\mu g/m^3$ for the month.

Generally, the monitoring stations in the LMA network are located away from high traffic volume highways by at least 300 meters and generally located in large parks or grassy areas with surrounding foliage, trees or other local structures that may affect air pollution data. The Louisville International Airport and expanding Worldport UPS shipping hub are located at the intersection of I-65

and I-264, in the middle of Jefferson County, Kentucky, surely an area of poor air quality and expected maximum concentration, but the nearest PM 2.5 monitor is a mile and a half away. (Wynadotte Park) MAPCD has no monitors at the neighborhood level in this area.

III. Application for Redesignation uses lower emissions caused by temporary economic slowdown

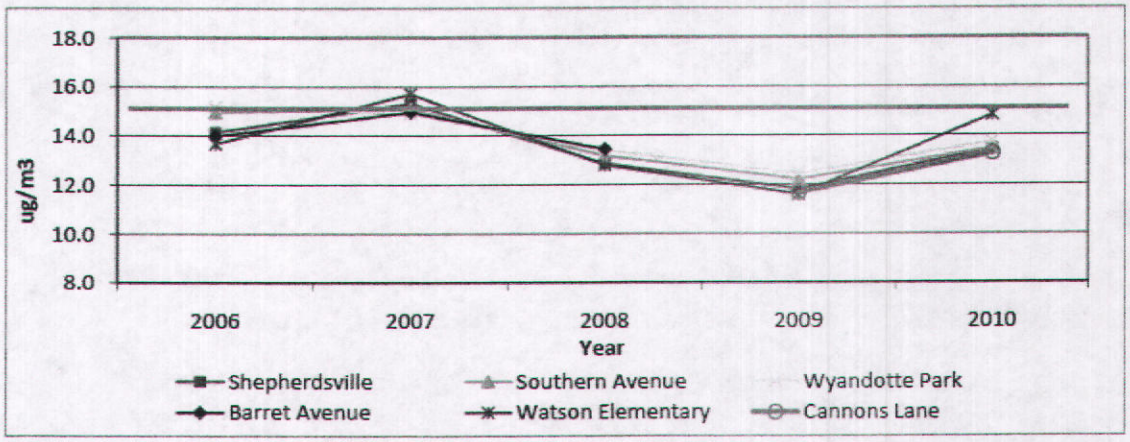
Graph 3.3
Annual Fine Particle Trends for Indiana's Portion of the Louisville Area, 2006 through 2010



Red line represents the annual standard for fine particles of 15 μg/m³.

The Charlestown State Park monitor began operation on July 2, 2008.

Graph 3.4
Annual Fine Particle Trends for Kentucky's Portion of the Louisville Area, 2006 through 2010



Red line represents the annual standard for fine particles of 15 μg/m³.

Based on the MAPCD monthly averaged PM 2.5 data available online, a clear imprint of the economic recession is seen in the data. Motor vehicle usage tax and fuel tax experienced an 18.4 % and .2 % decline in the period 2008-2009 according to the Kentucky Transportation Cabinet. As all economic indicators

show, the nation experienced a recession from 2008 to 2011 that is only just beginning to turn around. Across the LMA, emissions fell as a product or reduced commercial activity, lost jobs, factories closing and fewer trucks on the road. This Request comes in the trough of low emissions caused by the economic slowdown and PM 2.5 ambient concentrations will begin to rise with the economic turnaround anticipated over the next two years. Two years from now would be a better time to review the request when measures to spark economic expansion have brought growth and improved monitoring can demonstrate attainment in highest concentration areas.

> *Comment:* Population growth, employment, commuting, and VMT information from the 2010 Census and related sources is not available at a sufficiently small level of geography to be able to quantify the impacts of socioeconomic changes. County-level information does indicate that although the region has suffered from the recent economic downturn, there is still growth in socioeconomic attributes and VMT. Regional planning cannot be based on short-term events like the economic downturn. Therefore, growth in travel must be expected once the economy improves. When it does, MVEBs must be large enough to account for future growth in VMT. (LC)

Indiana Request Appendix K – Public Participation documents
Larry D. Chaney, MPO Director KIPDA, May 26, 2011 Public Hearing

"Kentucky has lost more than 113,000 jobs since the recession began two years ago. The statewide jobless rate is at 10.6 percent, and some rural counties have unemployment rates that double that. By the last measurement, Magoffin County's rate was 21.1 percent."
Kentucky Governor Beshears state of the state address, January 6, 2010.

"In 2008, the Commonwealth of Kentucky consumed 51,934,110 barrels of gasoline (2,181,232,620 gallons), with almost 99% of this amount related to the transportation sector. Compared with 2007, total gasoline consumption in Kentucky fell by 4% in 2008."

MOTOR FUELS NORMAL USE AND SURTAX				MOTOR VEHICLE USAGE TAX		
Fiscal Year	Receipts		Percent Change	Fiscal Year	Receipts	Percent Change
2009-10	$ 99,814,565		2.6	2009-10	$ 304,033,388	-0.03
2008-09	97,288,275		-0.2	2008-09	304,135,002	-18.4
2007-08	97,501,444		8.0	2007-08	372,656,227	-1.0
2006-07	89,921,643	*	67.9	2006-07	377,321,335	1.91
2005-06	53,552,154	**	158.2	2005-06	363,976,577	-2.4
2004-05	20,741,625		14.2	2004-05	373,034,898	-4.6
2003-04	18,168,653		21.4	2003-04	390,976,367	0.5
2002-03	14,968,974		6.0	2002-03	388,959,153	2.0
2001-02	14,121,403		-8.7	2001-02	381,401,576	10.5
2000-01	15,473,908		-2.7	2000-01	345,120,799	-4.0

*Effective July 1, 2006, Motor Fuel Taxes were increased 1.2 cent pursuant to KRS 138.220.

**Effective July 1,2005, Motor Fuel Taxes were increased 1.1 cent pursuant to KRS 138.220.

"Topping the list, of course, is Ford Motor Co.'s decision to invest $1.2 billion in its two assembly plants in Louisville. That project, in fact, was voted the top deal in the United States in 2011 by Business Facilities magazine. The now completed makeover of Louisville Assembly Plant into what Ford terms the most advanced and flexible vehicle manufacturing site in the world already has brought two new work shifts and 3,000-plus jobs. The renovators show up at Ford's Kentucky Truck Plant next."
Kentucky Governor Beshears state of the state address, January 6, 2010.

Louisville will not maintain NAAQS standards after the recession ends, after current socio economic data is used in the modeling and after EPA requires near road monitoring under a lowered PM NAAQS standard.

IV. SIP revisions use eleven year old data and allow significant deterioration of air quality

Motor vehicle emissions budgets based on modeled emissions of PM 2.5 in grams per mile, and older traffic demand 2000 census data, render inaccurate and unreliable model predictions of tons per year emissions, that fails to report the increasing public health exposure to UFP on busy highways, at curbside in urban areas, at schools and airports and riding bicycles in traffic.

42 USC § 7505a Maintenance Plans
(a) **Plan revision**
Each State which submits a request under section 7407 (d) of this title for redesignation of a nonattainment area for any air pollutant as an area which has attained the national primary ambient air quality standard for that air pollutant shall also submit a revision of the applicable State implementation plan to provide for the maintenance of the national primary ambient air quality standard for such air pollutant in the area concerned for at least 10 years after the redesignation. The plan shall contain such additional measures, if any, as may be necessary to ensure such maintenance.

42 USC § 7410
Each State shall, after reasonable notice and public hearings, adopt and submit to the Administrator . . . a plan which provides for implementation, maintenance, and enforcement of such primary standard in each air quality control region (or portion thereof) within such State.

(2) Each implementation plan submitted by a State under this chapter shall be adopted by the State after reasonable notice and public hearing. Each such plan shall—
(A) include enforceable emission limitations and other control measures, means, or techniques (including economic incentives such as fees, marketable permits, and auctions of emissions rights), as well as schedules and timetables for compliance, as may be necessary or appropriate to meet the applicable requirements of this chapter;
(B) provide for establishment and operation of appropriate devices, methods, systems, and procedures necessary to—
(i) monitor, compile, and analyze data on ambient air quality, and

(D) contain adequate provisions—
(i) prohibiting, consistent with the provisions of this subchapter, any source or other type of emissions activity within the State from emitting any air pollutant in amounts which will—
(I) contribute significantly to nonattainment in, or interfere with maintenance by, any other State with respect to any such national primary or secondary ambient air quality standard, or
(II) interfere with measures required to be included in the applicable implementation plan for any other State under part C of this subchapter to **prevent significant deterioration of air quality** or to protect visibility,

From the Indiana Redesignation Request:

"5.0 TRANSPORTATION CONFORMITY BUDGETS
U.S. EPA requirements outlined in 40 CFR 93.118(e)(4) stipulate that motor vehicle emission budgets (MVEBs) for direct PM2.5 and NOx be established as part of a SIP. The MVEBs are necessary to demonstrate conformance of transportation plans and improvement programs with the SIP.

Broadly described, MOVES is used to generate "emission factors", which are the average emissions per mile (**grams/mile**) for fine particle precursors, including NOx, SO2, and direct PM2.5. There are numerous variables that can affect the emission factors. The vehicle fleet (vehicles on the road), age, and the vehicle types have a major effect on the emission factors.

The facility-type on which vehicles are traveling (MOVES facility types are Freeway, Arterial, Local, and Ramp) and the vehicle speeds also affect the emission factor values. Meteorological factors such as air temperature and humidity affect emission factors, as does fuel type, such as low Reid Vapor Pressure gasoline. These data are estimated using the *best available data* to create emission factors for NOx, SO2, and direct PM2.5. **After emission factors are generated, they must be multiplied by the VMT to determine the quantity [tons/year] of vehicle-related emissions**. This information is derived from the travel demand model (TDM)."

SIP MVEB development was initiated in January, 2010. As of that date, the KIPDA regional travel demand model had been last updated and calibrated during 2005. This update established 2000 as the new base year for the model. The model update utilized the information incorporated into the travel model during previous updates, in particular, information from the 2000 Census and the 2000 KIPDA Household Travel Survey.

Page 16 Louisville Request
The result of the update was a travel model that replicated travel in the Louisville area for 2000. The subsequent 2011 update and calibration of the TDFM (setting 2007 as a base year) was initiated after work for the PM2.5 redesignation SIP had begun and, therefore, could not be incorporated into the MOVES model runs.

> *Comment:* There is sufficient uncertainty associated with several variables used in the analysis of regional air quality that establishing motor vehicle emission budgets (MVEBs) for $PM_{2.5}$ and NO_x based on 15% margins of safety will be too low. Establishing MVEBs that are too low (i.e. too stringent) will increase the probability that a conformity failure will occur. If this occurs, the metropolitan transportation plan (MTP) and transportation improvement plan (TIP) cannot be updated or amended. This would hinder the progress in implementing transportation projects some of which have the potential to reduce pollutant emissions and presumably improve local air quality. (LC)

Indiana Request Appendix K – Public Participation documents
Larry D. Chaney, MPO Director KIPDA, May 26, 2011 Public Hearing

KIPDA worried in its comments to the Indiana request, that a 15 % safety margin was not sufficient to avoid a conformity violation when 2011 auto registration data was plugged into the MOVES data. KIPDA as much as admits the MVEB are not reliable and cannot achieve maintenance of the NAAQS

standard for PM 2.5, under the Horizon 2030 Plan and when updated 2011 vehicle registration and household travel changes are introduced.

Since 2000, billions of dollars of economic expansion has occurred including the expansion of Worldport, the UPS Hub and the Westport Road Ford plant. With the additional emissions caused by the Two Bridges project and a recovering economy, the PM attainment will not be maintained. The SIP revisions are based on old inaccurate data that gives a false prediction of maintenance.

V. The underdeveloped transit system remains underdeveloped and abandoned as a pollution control method:

For transit data the results of the 2004 TARC on-board survey was used to supplement the previous information. This was deemed acceptable for several reasons. The primary reason was ***that the transit network envisioned by Horizon 2030 is essentially the same as the existing one****. In addition, the number of total trips from the two models was similar. Therefore, the use of the transit trip information from previous travel models did not change significantly the proportion of trips allocated to transit. Finally, the proportion of trips utilizing transit is less than* ***2%*** *of the total trips. So small differences in the number of transit trips should provide a negligible effect on overall travel.*

VI. An increasing number of published, peer reviewed studies demonstrate ultrafine particles are more toxic and particulate numbers must be controlled by standards.

The following is exerpted from:

Aggarwal, Jain, Marshal, Real-time prediction of size-resolved ultrafine PM on freeways, Environmental Science & Technology, just accepted manuscript, January 31, 2012.

While there are no US regulations for PM 0.1 ("ultrafine particles", UFP; diameter less than 0.1 μm), recent research raises the concern that these particles may be especially toxic (1,2)

1. Oberdörster, G. Pulmonary effects of inhaled ultrafine particles. *Int. Arch. Occup. Environ. Health* 2000, *74*, 1-8.

2. Ibald-Mulli, A.; Wichmann, H.E.; Kreyling, W.; Peters, A. Epidemiological evidence on health effects of ultrafine particles. *J. Aersol Med.* 2002, *15*, 189-201.

UFP can penetrate deeply into the lung and can cross the lung lining (3, 4), *which is ~ 0.1-20 μm thick* (5).

3. Geiser, M.; Rothen-Rutishauser, B.; Kapp, N.; Schu¨rch, S.; Kreyling, W.; Schulz, H.; Semmler, M.; Im Hof, V.; Heyder, J.; Gehr, P. Ultrafine particles cross cellular membranes by nonphagocytic mechanisms in lungs and in cultured cells. *Environ. Health Perspect.* 2005, *113*, 1555-60.

4. Choi, H.S.; Ashitate, Y.; Lee, J.H.; Kim, S.H.; Matsui, A.; Insin, N.; Bawendi, M.G.; Semmler-Behnke, M.; Frangioni, J.V.; Tsuda, A. Rapid translocation of nanoparticles from the lung airspaces to the body. *Nat. Biotechnol.* 2010, doi:10.1038/nbt.1696.

5. Crapo, J.D.; Barry, B.E.; Gehr, P.; Bachofen, M.; Weibel, E.R. Cell number and cell characteristics of the normal human lung. *Am. Rev. Respir. Dis.* 1982, *126*, 332-337.

The European Union has proposed to regulate tailpipe number concentrations as part of Euro 5 and Euro 6 standards for light passenger and commercial vehicles. In typical ambient and on-roadway

conditions, UFPs have high number concentrations but low mass concentrations, relative to other particles (6).

6. Tuch, T.; Brand, P.; Wichmann, H.E.; Heyder, J. Variation of particle number and mass concentration in various size ranges of ambient aerosols in Eastern Germany. *Atmos. Environ.* 1997, *31,* 4193-4197.

Vehicles and other combustion sources are important contributors to urban UFP. UFP concentrations (particle number per volume of air) can be an order of magnitude higher on freeways than in background urban air (7-9).

7. Hu, S.; Fruin, S.; Kozawa, K.; Mara, S.; Paulson, S.E.; Winer, A.M. A wide area of air pollutant impact downwind of a freeway during pre-sunrise hours. *Atmos. Environ.* 2009, *43,* 2541-2549.

8. Westerdahl, D.; Fruin, S.; Sax, T.; Fine, P.M.; Sioutas, C. Mobile platform measurements of ultrafine particles and associated pollutant concentrations on freeways and residential streets in Los Angeles. *Atmos. Environ.* 2005, *39,* 3597-3610.

9. Zhu, Y.; Hinds, W.C.; Kim, S.; Shen, S.; Sioutas, C. Study of ultrafine particles near a major highway with heavy-duty diesel traffic. *Atmos. Environ.* 2002, *36,* 4323-4335.

Variations in vehicle speed and density, type and age of vehicles, roadway topography, meteorology, and particle dynamics create spatially and temporally heterogeneous distributions of UFPs. Real-time estimation of UFP concentration on freeways is important for understanding UFP exposures and for identifying UFP hotspots.

Murray A. Mittleman, Annette Peters, David Siscovick, Sidney C. Smith, Jr, Laurie Bhatnagar, Ana V. Diez-Roux, Fernando Holguin, Yuling Hong, Russell V. Luepker, Robert D. Brook, Sanjay Rajagopalan, C. Arden Pope III, Jeffrey R. Brook, Aruni

Particulate Matter Air Pollution and Cardiovascular Disease : An Update to the Scientific Statement From the American Heart Association

free full text at: <http://circ.ahajournals.org/content/121/21/2331.full>
Several new studies have also demonstrated that residing in locations with higher long-term average PM levels elevates the risk for cardiovascular morbidity and mortality. Some recent evidence also implicates other size fractions, such as ultrafine particles (UFPs) <0.1 μm, gaseous co-pollutants (eg, ozone and nitrogen oxides [NO_x]), and specific sources of pollution (eg, traffic).
In addition, there have been many insights into the mechanisms whereby PM could prove capable of promoting CVDs (cardiovascular diseases).

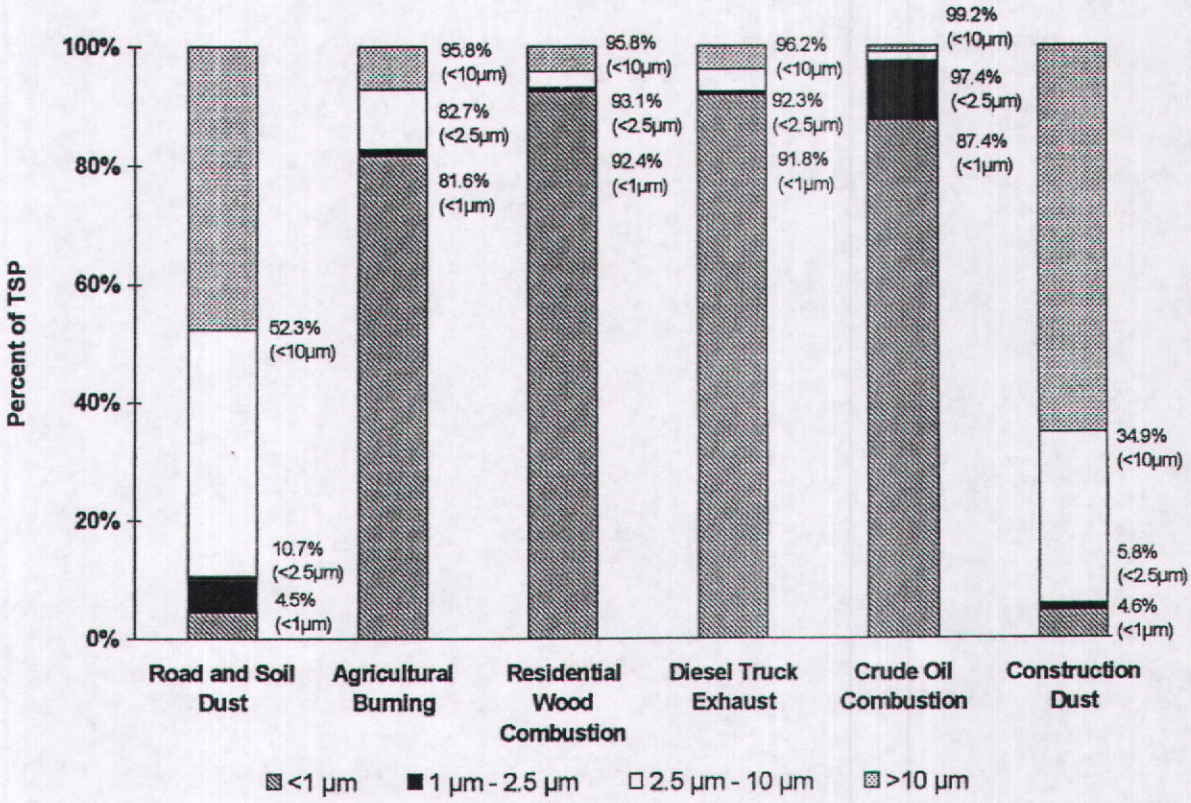


Figure 2.1.3. Size distributions of several particulate source emissions (Ahuja *et al.* 1989; Houck *et al.*, 1989, 1990).

This graphic shows that 91 % of mobile source combustion emission particles are sized less than 1 micro meter and mass gravimetric Federal Reference Method measurements do not provide an adequate measure of high counts of low mass ultrafine particulate.

"Particulate matter (PM) in ambient air is an important risk factor for acute and long-term adverse effects related to pulmonary and cardiovascular diseases, cancer, and mortality (Pope and Dockery 2006). Traffic-related PM may be particularly relevant to these health effects, as indicated by studies on both acute and long-term effects (Hoek et al. 2002; Peters et al. 2004). The ultrafine particle (UFP) fraction of PM with a diameter of < 100 nm typically consists of "fresh" combustion emissions of which vehicle engines are the primary source in urban areas (Sioutas et al. 2005). For UFPs, the size, surface area, chemical composition, and ability to translocate through the epithelium of terminal bronchioles and alveoli are thought to be important in relation to adverse health effects (Delfino et al. 2005; Oberdörster et al. 2005). The mechanisms of action of PM are thought to involve inflammation and oxidative stress, with small particles being more potent than larger particles because of their higher surface area and reactivity (Borm et al. 2004; Knaapen et al. 2004)."

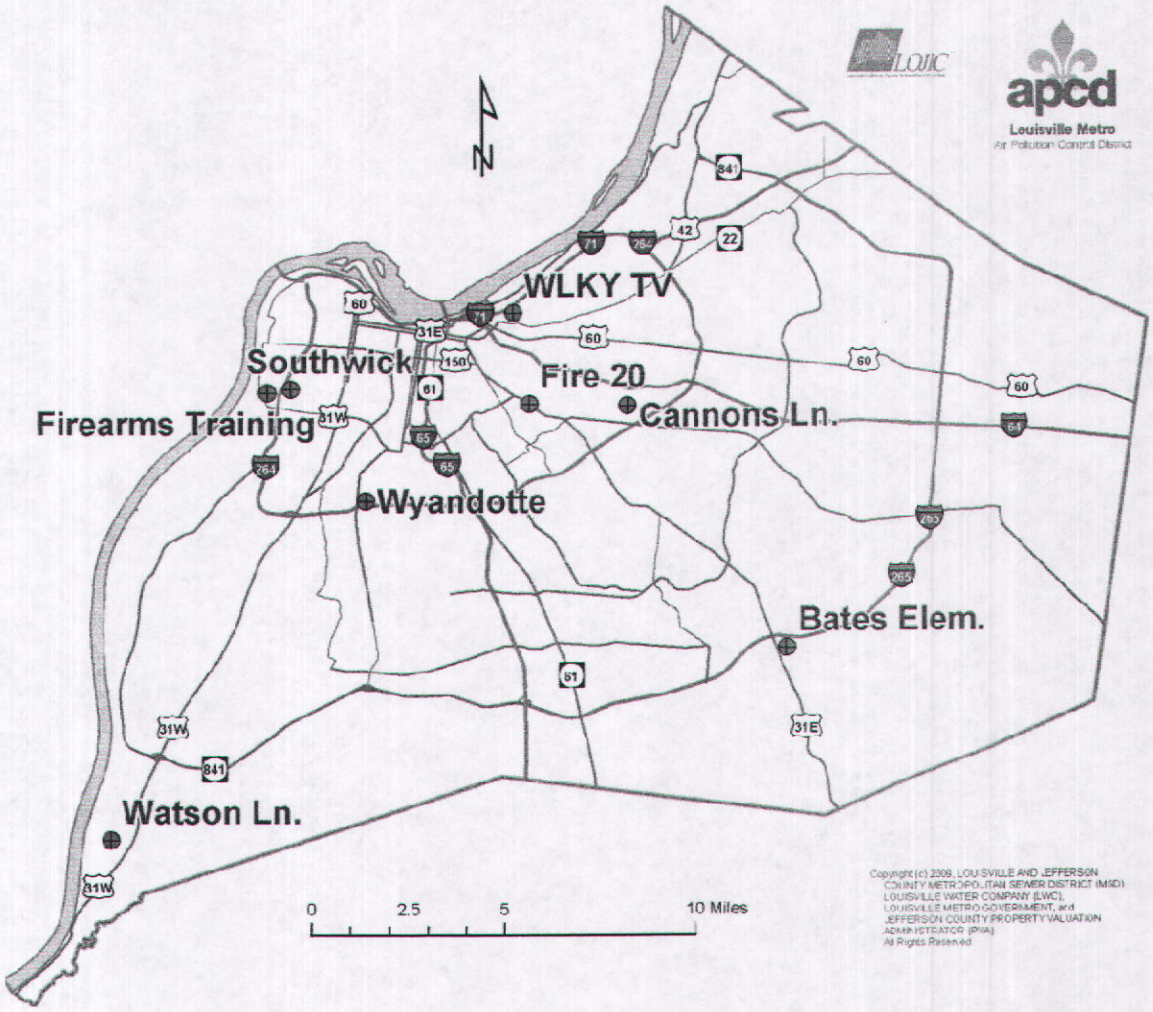
Brauner, Forchhammer, Møller, Simonsen, Glasius, Wåhlin, Raaschou-Nielsen, and Loft, Exposure to Ultrafine Particles from Ambient Air and Oxidative Stress–Induced DNA Damage, Environmental Health Perspectives, p. 1177, Volume 115, Number 8, August 2007

Valavanidis A, Fiotakis K, Vlachogianni T., Airborne particulate matter and human health: toxicological assessment and importance of size and composition of particles for oxidative damage and carcinogenic mechanisms. J Environ Sci Health C Environ Carcinog Ecotoxicol Rev. 2008 Oct-Dec;26(4):339-62.

In this review, the results of the most recent epidemiological and toxicological studies are summarized. In general, the evaluation of most of these studies shows that the smaller the size of PM the higher the toxicity through mechanisms of oxidative stress and inflammation.

These Comments prepared by Clarence Hixson
Attorney at Law for CART

Appendix: Photos of PM 2.5 Monitoring network
Attachment to Comments of CART
REDESIGNATION REQUEST AND MAINTENANCE PLAN FOR THE KENTUCKY PORTION OF THE LOUISVILLE, KY-IN 1997 ANNUAL PM2.5 NONATTAINMENT AREA

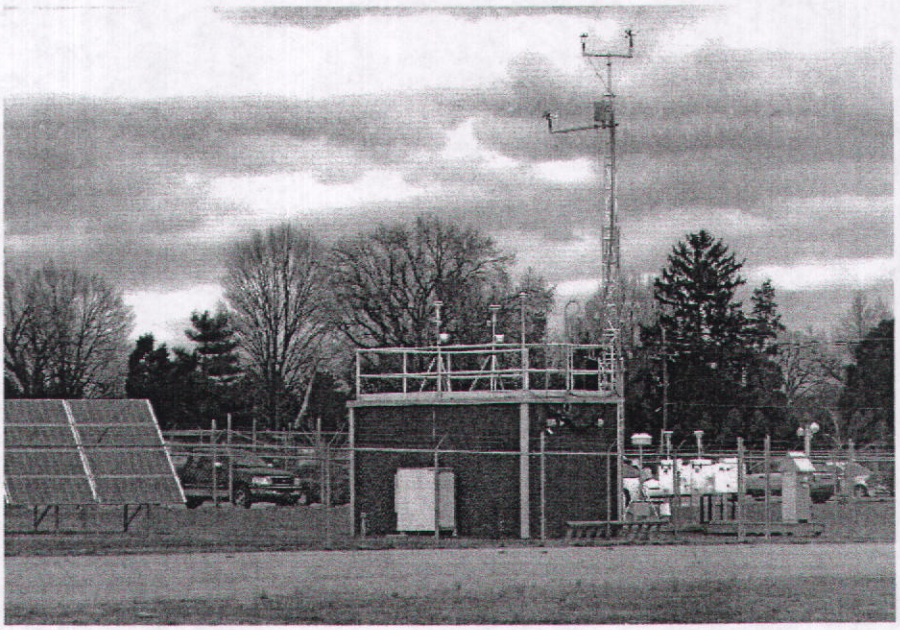


http://www.louisvilleky.gov/APCD/Monitoring/MonitoringSites.htm

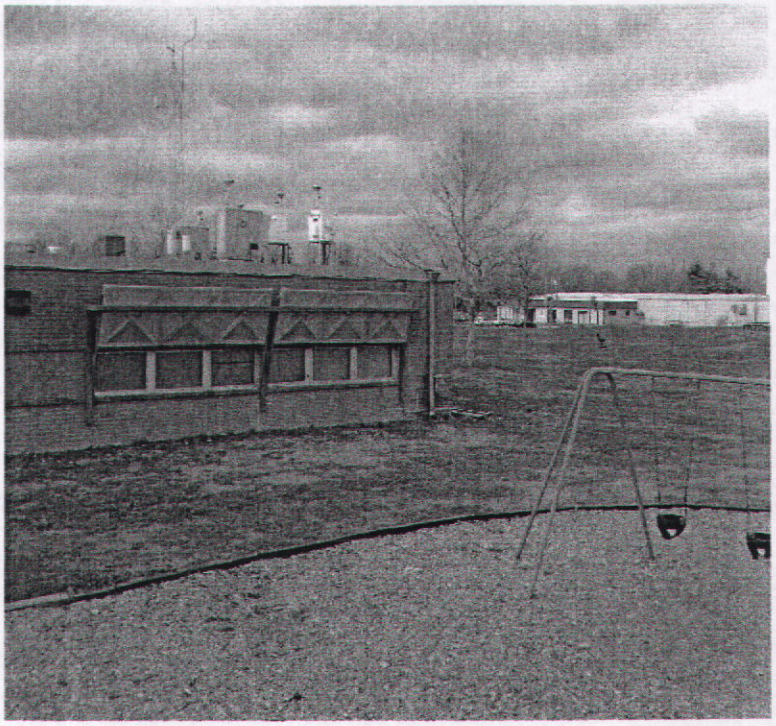
Site Name	Location	Objective(s)	Year Estab.	Parameters Monitored
Bates Elementary	7601 Bardstown Rd	Population exposure	1973	Ozone, $PM_{2.5}$
Cannons Lane	2730 Cannons Ln	National Core Monitoring Station (NCore), urban scale, population exposure	2009	Ozone, $PM_{2.5}$, PM_{10}, SO_2, NO_X, CO, Lead, Meteorological data, $PM_{2.5}$ speciation, Radiation, NO_y, PM_{coarse}
Fire Station 20	1735 Bardstown Rd	Maximum concentration	1973	CO
Firearms Training	4201 Algonquin Pkwy	Population exposure	1978	SO_2
Southwick Community Center	3621 Southern Ave	Population exposure	1983	$PM_{2.5}$, PM_{10}, Meteorological data
Watson Lane Elementary	7201 Watson Ln	Population exposure	1992	Ozone, $PM_{2.5}$, SO_2, Meteorological data
Wyandotte Park	1104 Beecher Ave	Population exposure	1983	$PM_{2.5}$, PM_{10}

$PM_{2.5}$ Monthly Averages Tracking Table for 1999-2011

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Months >15.0 µg/m³
1999	14.7	13.8	12.4	12.7	18.1	23.4	26.6	19.5	15.6	17.4	16.1	12.6	7
2000	15.8	16.4	13.4	13.6	17.1	17.7	23.5	21.2	13.3	19.7	15.6	17.1	9
2001	21.9	13.9	15.2	13.3	17.7	20.5	24.6	27.4	16.1	13.8	15.8	12.4	8
2002	13.1	10.0	12.3	11.4	15.9	22.3	30.4	23.8	21.7	13.2	11.8	15.6	6
2003	12.2	16.3	15.0	14.6	13.1	18.6	21.7	23.0	17.3	12.5	12.0	10.6	5
2004	10.5	15.7	10.1	11.3	13.4	15.9	17.1	18.4	17.6	13.8	11.1	11.1	5
2005	11.7	17.1	14.3	13.1	14.9	19.6	20.2	19.8	24.1	16.1	12.6	15.5	7
2006	10.3	13.0	12.5	12.6	11.9	18.1	23.9	22.5	13.6	10.1	13.6	11.1	3
2007	9.3	12.2	14.9	11.2	18.4	19.9	18.3	22.8	16.9	11.1	12.5	14.1	5
2008	11.8	12.0	11.9	11.6	12.1	11.8	18.1	17.1	17.6	10.6	14.3	9.4	3
2009	14.6	11.1	11.3	9.3	10.3	13.9	13.1	12.6	12.1	8.9	13.8	12.9	0
2010	13.3	16.3	12.2	12.2	11.0	14.1	16.0	16.4	11.0	17.0	12.6	13.7	4
2011	15.2	10.6	9.7	8.6	12.1	14.1	19.7	16.2	11.5	9.0	7.6	9.9	3
Average	13.4	13.7	12.7	12.0	14.3	17.7	21.0	20.1	16.0	13.3	13.0	12.8	0



Cannons Lane NCore station at Bowman Field



Southwick Community Center

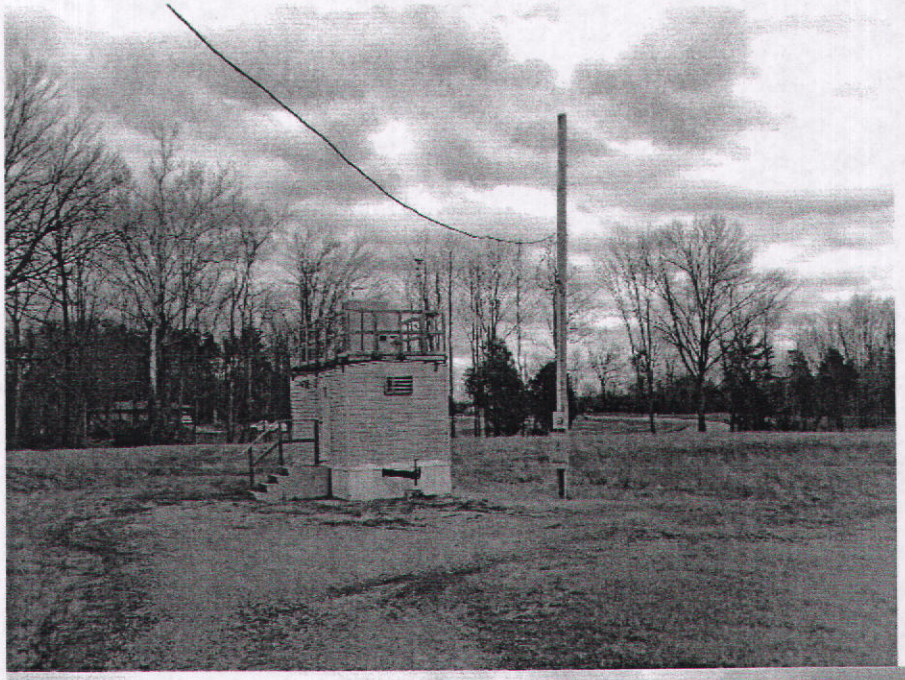
Southwick looking west to I-264

looking west from Southwick

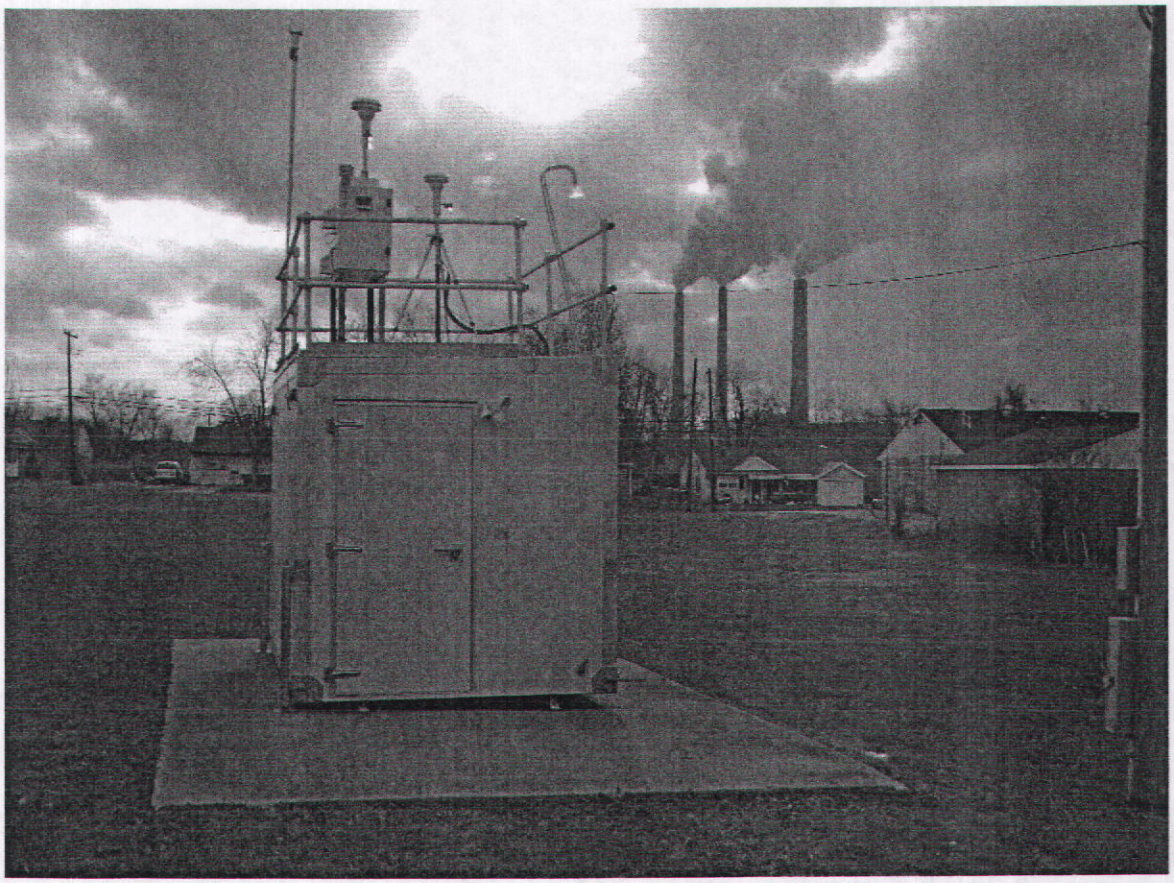
Wyandotte Park

Two views of Wyandotte Park station

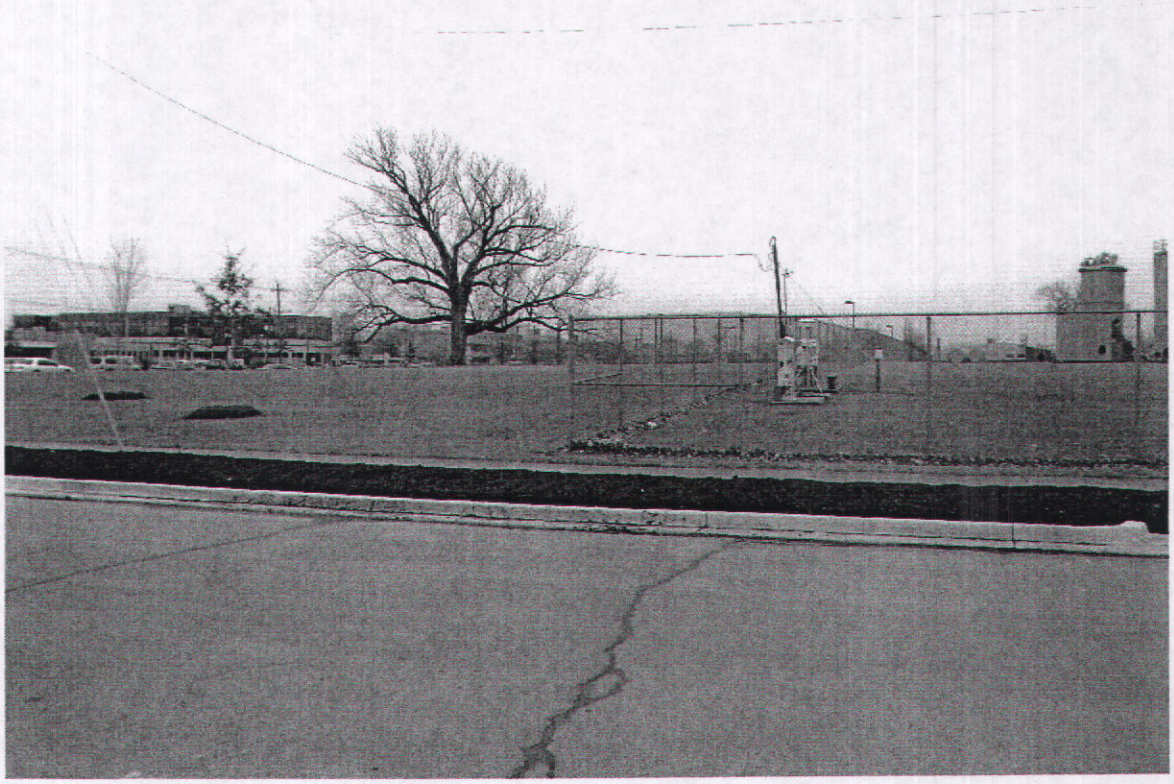
Bates Elementary



Watson Lane Elementary School station



Walnut Street Jeffersonville, Indiana



Walnut Street Jeffersonville, Indiana

Title 40: Protection of Environment
PART 58—AMBIENT AIR QUALITY SURVEILLANCE
Subpart G—Federal Monitoring
Browse Previous | Browse Next
Appendix D to Part 58—Network Design Criteria for Ambient Air Quality Monitoring

1.1.1 In order to support the air quality management work indicated in the three basic air monitoring objectives, a network must be designed with a variety of types of monitoring sites. Monitoring sites must be capable of informing managers about many things including the peak air pollution levels, typical levels in populated areas, air pollution transported into and outside of a city or region, and air pollution levels near specific sources. To summarize some of these sites, here is a listing of six general site types:
(a) Sites located to determine the highest concentrations expected to occur in the area covered by the network.
(b) Sites located to measure typical concentrations in areas of high population density.
(c) Sites located to determine the impact of significant sources or source categories on air quality.

(d) In some cases, the physical location of a site is determined from joint consideration of both the basic monitoring objective and the type of monitoring site desired, or required by this appendix. For example, to determine $PM_{2.5}$concentrations which are typical over a geographic area having relatively high $PM_{2.5}$concentrations, a neighborhood scale site is more appropriate. Such a site would likely be located in a residential or commercial area having a high overall $PM_{2.5}$emission density but not in the immediate vicinity of any single dominant source. Note that in this example, the desired scale of representativeness was an important factor in determining the physical location of the monitoring site.

(1) *Neighborhood scale* —Measurements in this category represent conditions throughout some reasonably homogeneous urban sub-region, with dimensions of a few kilometers. Homogeneity refers to pollutant concentrations. Neighborhood scale data will provide valuable information for developing, testing, and revising concepts and models that describe urban/regional concentration patterns. These data will be useful to the understanding and definition of processes that take periods of hours to occur and hence involve considerable mixing and transport. Under stagnation conditions, a site located in the neighborhood scale may also experience peak concentration levels within a metropolitan area.

(3) *Neighborhood scale* —Measurements in this category would represent conditions throughout some reasonably homogeneous urban sub-region with dimensions of a few kilometers and of generally more regular shape than the middle scale. Homogeneity refers to the particulate matter concentrations, as well as the land use and land surface characteristics. Much of the $PM_{2.5}$exposures are expected to be associated with this scale of measurement. In some cases, a location carefully chosen to provide neighborhood scale data would represent the immediate neighborhood as well as neighborhoods of the same type in other parts of the city. $PM_{2.5}$sites of this kind provide good information about trends and compliance with standards because they often represent **conditions in areas where people commonly live and work** for periods comparable to those specified in the NAAQS. In general, most $PM_{2.5}$monitoring in urban areas should have this scale.

(4) *Urban scale* —This class of measurement would be used to characterize the particulate matter concentration over an entire metropolitan or rural area ranging in size from 4 to 50 kilometers. Such measurements would be useful for assessing trends in area-wide air quality, and hence, the effectiveness of large scale air pollution control strategies. Community-oriented $PM_{2.5}$sites may have this scale.

Thunder Over Louisville 2011 60 tons of fireworks New Albany monitor

CAMS 3 New Albany **Select a different site**

Month: April **Day:** 18 **Year:** 2011 **Time Format:** 12 Hour (AM/PM) Generate Report

Ozone Highlights: ☑ Moderate ☑ Unhealthy for Sensitives ☑ Unhealthy ☑ Very Unhealthy

PM-2.5 Highlights: ☑ Moderate ☑ Unhealthy for Sensitives ☑ Unhealthy ☑ Very Unhealthy ☑ Hazardous

☑ Highlight validated data

The table below contains hourly averages for all the pollutants and meteorological conditions measured at New Albany for **Monday, April 18, 2011**. All times shown are in EST.

Parameter Measured	Morning												Afternoon	
	Mid	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	Noon	1:00
Sulfur Dioxide	3.1	3.0	4.2	2.9	***1.8***	3.4	2.7	2.7	4.0	1.9	2.2	2.8	2.9	2.3
Ozone	34	28	30	34	36	***19***	33	32	35	46	52	56	59	60
PM-2.5 (Local Conditions)	12.68	12.02	13.09	10.37	11.12	13.08	11.47	10.57	10.08	***9.13***	12.28	11.21	14.00	PMA
Parameter Measured	Mid	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	Noon	1:00
	Morning												Afternoon	
	x.xx	Indicates the data has been validated.												
	Maximum values for each parameter are **bold** within the table. Minimum values are ***bold ita***													
	R - Data from this instrument meets EPA quality assurance criteria for regulatory purposes.													

CAMS 3 New Albany **Select a different site**

Month: April **Day:** 18 **Year:** 2011 **Time Format:** 12 Hour (AM/PM) Generate Report

Ozone Highlights: ☑ Moderate ☑ Unhealthy for Sensitives ☑ Unhealthy ☑ Very Unhealthy

PM-2.5 Highlights: ☑ Moderate ☑ Unhealthy for Sensitives ☑ Unhealthy ☑ Very Unhealthy ☑ Hazardous

☑ Highlight validated data

The table below contains hourly averages for all the pollutants and meteorological conditions measured at New Albany for **Monday, April 18, 2011**. All times shown are in EST.

	Afternoon												Parameter Measured	POC
11:00	Noon	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00		
2.8	2.9	2.3	3.9	4.8	2.9	2.3	7.1	10.0	3.3	7.8	**11.8**	4.7	Sulfur Dioxide	1 R
56	59	60	63	64	**65**	61	52	41	39	41	39	35	Ozone	1 R
11.21	14.00	PMA	PMA	PMA	**20.51**	19.52	17.16	18.55	16.20	16.55	18.87	19.09	PM-2.5 (Local Conditions)	3
11:00	Noon	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	Parameter Measured	POC
	Afternoon													
values are ***bold italic***.														
egulatory purposes.														

CAMS 3 New Albany **Select a different site**

Month: April **Day:** 19 **Year:** 2011 **Time Format:** 12 Hour (AM/PM) Generate Report

Ozone Highlights: ☑ Moderate ☑ Unhealthy for Sensitives ☑ Unhealthy ☑ Very Unhealthy

PM-2.5 Highlights: ☑ Moderate ☑ Unhealthy for Sensitives ☑ Unhealthy ☑ Very Unhealthy ☑ Hazardous

☑ Highlight validated data

The table below contains hourly averages for all the pollutants and meteorological conditions measured at New Albany for **Tuesday, April 19, 2011**. All times shown are in EST.

	Afternoon												Parameter Measured	POC
1:00	Noon	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00		
.2	8.1	13.0	8.1	6.9	8.5	4.5	5.7	4.9	5.6	**15.1**	14.5	3.8	Sulfur Dioxide	1 R
7	***21***	26	33	36	33	35	31	26	27	27	30	**40**	Ozone	1 R
3.18	58.73	**60.08**	52.72	54.77	54.12	58.80	53.29	48.74	45.26	47.26	43.34	20.75	PM-2.5 (Local Conditions)	3
1:00	Noon	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	Parameter Measured	POC
	Afternoon													

alues are ***bold italic***.

ulatory purposes.

CAMS 3 New Albany **Select a different site**

Month: April **Day:** 19 **Year:** 2011 **Time Format:** 12 Hour (AM/PM) Generate Report

Ozone Highlights: ☑ Moderate ☑ Unhealthy for Sensitives ☑ Unhealthy ☑ Very Unhealthy

PM-2.5 Highlights: ☑ Moderate ☑ Unhealthy for Sensitives ☑ Unhealthy ☑ Very Unhealthy ☑ Hazardous

☑ Highlight validated data

The table below contains hourly averages for all the pollutants and meteorological conditions measured at New Albany for **Tuesday, April 19, 2011**. All times shown are in EST.

Parameter Measured	Morning												Afternoon	
	Mid	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	Noon	1:00
Sulfur Dioxide	6.7	12.2	6.1	8.7	5.4	2.2	9.9	3.3	1.5	1.4	***0.9***	4.2	8.1	13.0
Ozone	32	33	33	28	31	30	22	29	30	30	31	27	***21***	26
PM-2.5 (Local Conditions)	21.80	***19.38***	26.57	31.69	39.20	MAL	MAL	42.64	48.95	47.35	51.45	53.18	58.73	**60.08**
Parameter Measured	Mid	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	Noon	1:00
	Morning												Afternoon	
	x.xx	Indicates the data has been validated.												
	Maximum values for each parameter are **bold** within the table. Minimum values are ***bold ita***													
	R - Data from this instrument meets EPA quality assurance criteria for regulatory purposes.													