



BLUE SKYWAYS

COLLABORATIVE

Ozone 101: What is ozone and why is it a problem for my community?

Webinar 1

June 2, 2010

Questions and Answers

Air Quality Standards and Ozone

Susan Stone

EPA's Office of Air Quality Planning and Standards

Q: How does the linkage between lung problems and ozone square with the decline in ozone levels at the same time as lung problems are increasing?

A: *There are many reasons that lung problems, such as asthma, are increasing. Outdoor air pollution, including ozone, is only one of many common asthma triggers. Some common triggers include: second hand cigarette smoke, cockroaches and other pests, mold, furry pets, cold viruses, outdoor air pollution, as well as others (<http://www.epa.gov/asthma>).*

The effects of ozone on people with asthma and other lung diseases have been well-studied. Based on a substantial body of new evidence from animal, controlled human exposure and epidemiological studies, the 2006 Criteria Document concludes that people with asthma and other preexisting pulmonary diseases are likely to be among those at increased risk from O₃ exposure. Altered physiological, morphological and biochemical states typical of respiratory diseases like asthma, COPD and chronic bronchitis render people sensitive to additional oxidative burden induced by O₃ exposure. Children and adults with asthma are the group that has been studied most extensively. Evidence from controlled human exposure studies indicates that asthmatics may exhibit larger lung function decrements in response to O₃ exposure than healthy controls. As discussed more fully in section II.A.4.b.ii of the January 2010 proposal (pages 2969-2971), asthmatics present a differential response profile for cellular, molecular, and biochemical parameters that are altered in response to acute O₃ exposure. They can have larger inflammatory responses, as manifested by larger increases in markers of inflammation such as white blood cells (e.g., PMNs) or inflammatory cytokines. Asthmatics, and people with allergic rhinitis, are more likely to mount an allergic-type response upon exposure to O₃, as manifested by increases in white blood cells associated with allergy (i.e., eosinophils) and related molecules, which increase inflammation in the airways. The increased inflammatory and allergic responses also may be associated with the larger late-phase responses that asthmatics can experience, which can include increased

bronchoconstrictor responses to irritant substances or allergens and additional inflammation. In addition to the experimental evidence of lung function decrements, respiratory symptoms, and other respiratory effects in asthmatic populations, two large U.S. epidemiological studies as well as several smaller U.S. and international studies, have reported fairly robust associations between ambient O₃ concentrations and measures of lung function and daily symptoms (e.g., chest tightness, wheeze, shortness of breath) in children with moderate to severe asthma and between O₃ and increased asthma medication use. These responses in asthmatics and others with lung disease provide biological plausibility for the more serious respiratory morbidity effects observed in epidemiological studies, such as emergency department visits and hospital admissions.

Q: Is there new "science" involved in the current proposal to reduce ozone standards?

A: No. The January 2010 proposal, which is a reconsideration of parts of the 2008 final rule, is based on the scientific and technical record from the 2008 rulemaking, including public comments and CASAC advice and recommendations. The information that was assessed during the 2008 rulemaking includes information in the 2006 Criteria Document (EPA, 2006a), the 2007 Policy Assessment of Scientific and Technical Information, referred to as the 2007 Staff Paper (EPA, 2007b), and related technical support documents including the 2007 REAs (U.S. EPA, 2007c; Abt Associates, 2007a,b). Scientific and technical information developed since the 2006 Criteria Document will be considered in the next periodic review, instead of this reconsideration rulemaking, allowing the new information to receive careful and comprehensive review by CASAC and the public before it is used as a basis in a rulemaking that determines whether to revise the NAAQS. The decision to reconsider parts of the 2008 final rule is discussed on pages 2943-2944 of the January 2010 proposal (75 FR 2938).

Implementing the Ozone Standard

Amy Bhesania

EPA Region 7

Q. Amy mentioned in her presentation that for the first time EPA is looking at a secondary standard between 7-15. If an area is in attainment by the primary standard, but fails the secondary "test"--will that area automatically be considered non-attainment?

A: The secondary standard is distinct and different from the primary standard. Specifically, the secondary standard is a 3-month cumulative standard and, depending, on the level of the standards; an area could be nonattainment for the primary standard, the secondary standard, or both. In the scenario listed above, any area that violates the secondary standard would be nonattainment even if it was in compliance for the primary standard.

Q: How is the classification for non-attainment determined?

A: Historically, EPA has used the level of the standard and percentages above the standard to determine the classification for areas. The 1997 ozone standard structure

was based on the 1990 Clean Air Act and its specific designation of areas with particular design value concentrations. The classification and corresponding control requirements increase as air quality worsens with respect to the air quality standard.

Q: What is estimated "natural background" ozone concentration (assuming no human activity).

A: It would vary depending on the region of the country, which would have different climate and amounts of natural biogenic emissions.

Q: Is there any county in the nation that contains a noncompliant monitor that is designated as attainment or unclassifiable?

A: Historically, counties with violating monitors and counties that contribute to these violations that were recommended as attainment or unclassifiable have been designated as nonattainment.

Section 107(d) of the CAA requires states to make designations recommendations to EPA recommending as:

- 1. nonattainment, any area that does not meet (or that contributes to ambient air quality in a nearby area that does not meet) the NAAQS primary/secondary standard for that pollutant.*
- 2. attainment, any area (other than an area identified in clause (1)) that meets the NAAQS primary/secondary standard for that pollutant, or*
- 3. unclassifiable, any area that cannot be classified on the basis of available information as meeting or not meeting the NAAQS primary/secondary for that pollutant.*

Another consideration is that some areas that have previously been nonattainment can be redesignated as "maintenance areas". This type of designation means that EPA has found the area will attain the standard by implementation of local, state, or national emission controls. However, if this area violates the standard again, the Act provides an opportunity to implement additional control requirements called contingency measures to address the violation without an immediate nonattainment designation. Another issue regarding noncompliant monitoring could be a very recent violation that has not been addressed by the state or EPA.

Q: If you there is concern about losing the health benefits of the 2008 standards, why not implement them and then work on new standards?

A: Environmental organizations have expressed a concern about losing health benefits by delaying implementation of the 2008 standard. EPA weighed these concerns along with feedback from the states regarding the level/amount of work that would have to be redone or duplicated with the revision of the standard. EPA determined that the accelerated schedule approach would be the best option to ensure implementation of the standard in a timely manner balanced against the workloads for the states.

The State Implementation Plan (SIP)

Guy Donaldson

EPA Region 6

Q: Has any thought been given to Rural strategies - approaches? What works in cities will not be effective here in the sticks.

A: EPA has not designed ozone reduction programs specifically for rural areas. However, some rural areas may have “area sources” or large “stationary sources” that have little if any required controls that may be implemented. Examples of area sources could be oil or gas gathering facilities, or petroleum storage tanks. An example of a large stationary source might be a single power plant or manufacturing facility. Some rural areas may have to rely on emission reductions obtained in up-wind urban areas to come into attainment. Federal measures that impact the manufacture of new non-road equipment along with cleaner non-road fuels may also play a role.

Q: You cite several programs that make sense for urban areas. Any ideas for rural areas?

A: EPA has not designed ozone reduction programs specifically for rural areas. However, some rural areas may have “area sources” or large “stationary sources” that have little if any required controls that may be implemented. Examples of area sources could be oil or gas gathering facilities, or petroleum storage tanks. An example of a large stationary source might be a single power plant or manufacturing facility. Some rural areas may have to rely on emission reductions obtained in up-wind urban areas to come into attainment. Federal measures that impact the manufacture of new non-road equipment along with cleaner non-road fuels may also play a role.

Q: Did I understand correctly? If you're a Marginal area but do not achieve attainment in 3 years then you'll automatically be considered moderate regardless of monitor readings?

A: If an area doesn't reach attainment by its attainment date, it would be reclassified, or bumped up to the next higher level. In the case of a marginal area, if it doesn't attain in 3 years, then it would be reclassified to moderate. New deadlines would be set for the area to submit the moderate area requirements.

Determinations of attainment are based on three consecutive years of “clean data.” Monitoring data for three consecutive ozone seasons is used to calculate a design value for the area. The design value for the area must meet the National Ambient Air Quality Standard for that pollutant for the area to be considered attaining the standard.

Under the 1-hour standard and the 1997 8-hour ozone standard, in certain circumstances if an area had 1 year of clean data in its attainment year, the State could petition for a 1 year extension to the attainment date. Up to two 1 year extensions could be granted if

the area continued to maintain clean data so that the area could accumulate 3 years of clean data without having to be reclassified. It is likely that the implementation rules for the new 8 hour standard will have a similar allowance.

Q: At 60 ppb, a possible standard as of August 31, 2010, over 95% of monitors will be out of compliance. Does this pass the common sense test? Is 95% of the country really breathing unsafe air?

A. The administrator is required to set a standard that protects public health with an adequate margin of safety. She will consider available evidence and the public comment on the rule in determining what the appropriate level of the Standard should be to achieve the Act's goal.

Q: If a rural area is marginal, what can it do to achieve the 3 year time frame?

A. Obviously, the three year time frame is short and the measures that will have the biggest impact are those that are already in motion such as new federal vehicle standards and NOx transport regulations (like the Clean Air Transport Rule). On the other hand, if stakeholders are brought together early, ideas are likely to come forward that can help such as: accelerating already planned controls, public out-reach, encouragement of car and van pooling, or use of mass transit and ozone alert days. Each area will have to examine what specific measures might be possible and practical for that area. There is no single answer to this question. Nonetheless, early planning activities are important and necessary to begin the ozone planning process in every area.

Q: Has EPA considered a phased implementation with the accelerated schedule only applicable to areas which were addressing possible violations of 2008 and following a normal schedule for areas which may be affected by a more stringent proposed standard? This is a significant issue for local governments and states may need more time for input to EPA.

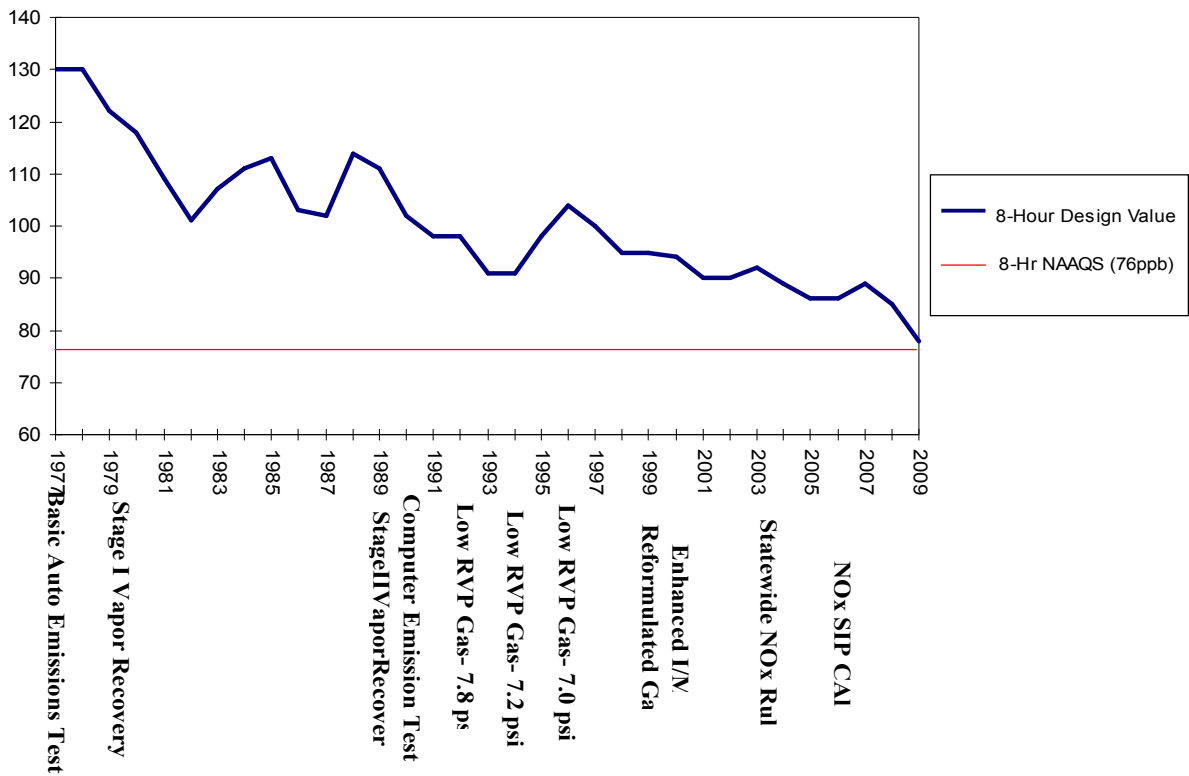
A. The EPA took comment on the schedule for designations under the new standard as part of the proposal for the new standard. We received comment regarding the impact of the accelerated schedule on State and Local Governments. We are sensitive to those concerns but must balance them against the need to bring the needed health protections. The final standard will have the schedule for designations.

Missouri Community Outreach
Jeffery Bennett
Missouri Department of Natural Resources

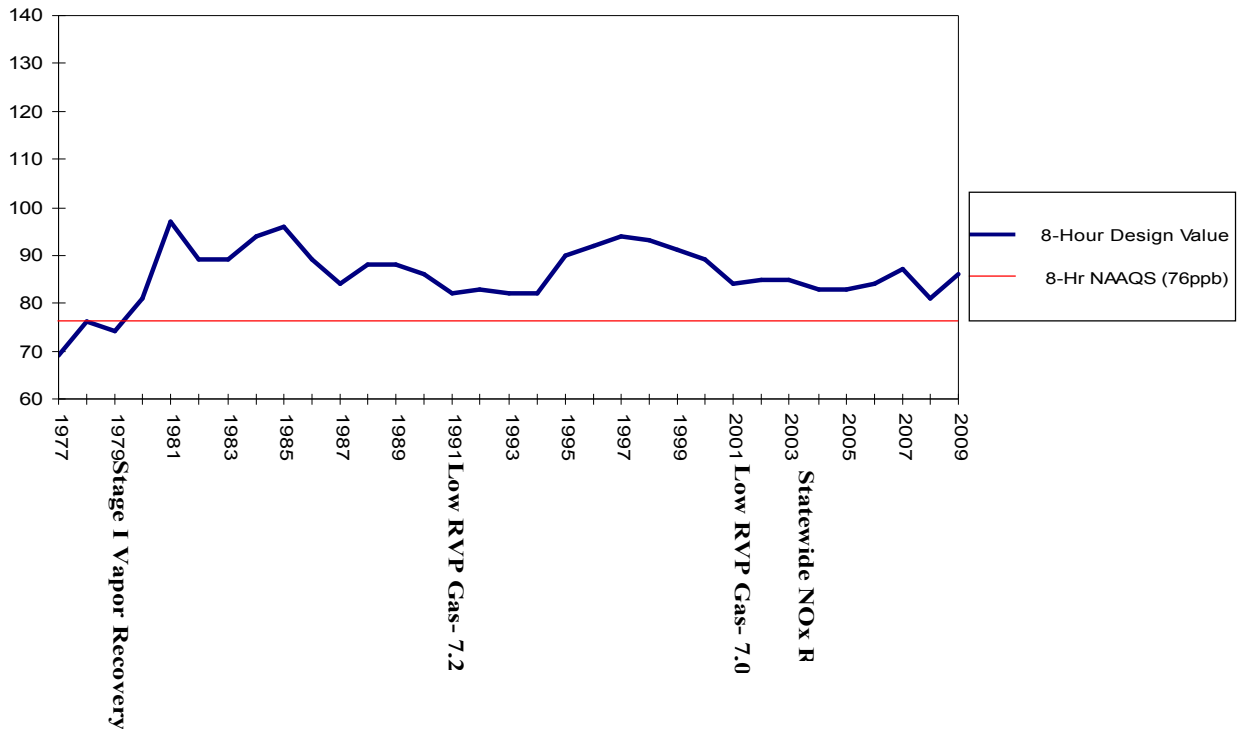
Q: Have you or others attempted to quantify the actual air quality improvement or outcome of control strategies implemented? What do you believe has been the most effective in St Louis and Kansas City area?

A: The actual air quality improvements over time have been substantial in both St. Louis and Kansas City. Attached you will find two figures with design values in both cities and the corresponding local control measures implemented over the years. This trend has also been seen in many different areas in the Midwest. The biggest improvements in St. Louis air quality have been from several different mobile source measures implemented nationally and locally along with local and regional point source control of VOC and NOx. The trend line for design values is not directly tied to emission reductions due to the meteorological nature of ozone formation (e.g. some years have more days with “high ozone weather” than others). In the last 5-10 years, the most effective controls to date have been regional NOx control (utility and large non-utility control) and mobile source control from national regulations.

St. Louis Design Value and Control Measures



Kansas City Design Value and Control Measures



Co-benefits of Improving Air Quality

Neelam Patel

EPA Headquarters, State and Local Climate and Energy Program

Q: Do you have a publication that covers the quantification tools? It would be helpful as we refine our Clean Air Action Plan.

A: For quantification tools, check out EPA's State and Local website at <http://www.epa.gov/statelocalclimate/resources/index.html>. It includes greenhouse gas quantification tools as well as criteria pollutants that contribute to ozone.

Q: Is lead still an issue since it's out of gasoline?

A: Yes, for some areas of the country. Many of these areas are being impacted by large point sources of lead like battery recyclers or smelters along with other metal production facilities (e.g. steel). More info available at <http://www.epa.gov/air/lead/>

Drivers and Opportunities for Improving Air Quality and Reducing Greenhouse Gasses

Carrie Reese

North Central Texas Council of Governments

Q: Have car & vanpools contributed to ozone improvements?

Carpools and vanpools have been long-standing strategies in our State Implementation Plan (SIP) for ozone. Analysis for our last SIP revision, submitted in 2007, indicated the following ozone precursor emissions reductions in tons per day (tpd) in March 2009:

<i>Strategy</i>	<i>NOx reduction (tpd)</i>	<i>VOC reduction (tpd)</i>
<i>Vanpool Projects</i>	<i>0.08</i>	<i>0.06</i>
<i>Employee Trip Reduction*</i>	<i>0.43</i>	<i>0.28</i>

**carpool is a component*

Further discussion and information on methodology can be found in Chapter 4 and Appendix H of the Dallas-Fort Worth Attainment Demonstration SIP (5/23/2007) at http://www.tceq.com/implementation/air/sip/dfw_revisions.html#narratives. In addition, the North Central Texas Council of Governments (NCTCOG) has launched www.TryParkingIt.com to encourage ridesharing and to gather observed data to support our estimates.

"Q: What specific ""efficiencies"" were realized with the E-85 program, given that fuel mileage is typically reduced?

While the NCTCOG’s primary focus at this time is reducing NOx and VOC emissions to attain the ozone standard, we do consider multi-pollutant benefits, greenhouse gas reductions, petroleum displacement, and with Recovery Act funding, job preservation/creation, when selecting projects. With third-party funding it is especially important to integrate the funding agency’s goals with our own.

The NCTCOG awarded three E-85 projects recently with Department of Energy Recovery (DOE) Act funds. The benefits analysis for these projects was conducted, as required, using the GREET model from Argonne National Laboratory. Results are outlined in the table below; this represents total lifecycle emissions impact (as opposed to tailpipe emissions). Positive numbers indicate an emissions or petroleum reduction, whereas negative numbers indicate an increase in the pollutant over the fuel lifecycle.

Fuel Type	Petroleum Displacement	GHG Emissions Impact	NOx Emissions Impact	PM_{2.5} Emissions Impact	CO Emissions Impact	VOC Emissions Impact
<i>Ethanol (E85)</i>	<i>68.1%</i>	<i>19.9%</i>	<i>-53.7%</i>	<i>-163.1%</i>	<i>-1.7%</i>	<i>-25.7%</i>

As illustrated above, E85 produces mixed results in a lifecycle analysis. However, information on tailpipe emissions only yields a very different result. The DOE Alternative Fuels and Advanced Vehicles Data Center (AFDC) outlines tailpipe emissions of E85 in the emissions section of their web site at www.afdc.energy.gov/afdc/vehicles/emissions_e85.html. Highlights from this web site are as follows:

- Lifecycle greenhouse gas emissions reduction (corn-based ethanol): 17-23%*
- Tailpipe nitrogen oxides (NOx) reduction: average of approximately 18%*
- Tailpipe particulate matter reduction: average of approximately 34%*

Q: Will a transition to electric vehicles promote greater coal use?

A: The answer to this question will depend upon your geographic location. Per the Electric Reliability Council of Texas, electricity generation in 2009 in Texas was 42% from natural gas, 37% from coal, and 21% from other sources, with the greatest installed capacity being in natural gas. NCTCOG also understands that 66% of new generation requests under review are from wind and other renewable resources (48,300 MW); new generation requests for coal are significantly less at 7% (5,100 MW). Therefore, while electric vehicles will increase electricity consumption and associated feedstock, we are optimistic that Texas feedstock will continue to move in a renewable direction.

Although there is still much research being done, several studies across the United States have indicated that though there may be movement of pollutant emissions from one source to another (tailpipe to smokestack) with the introduction of electric vehicles, the overall emissions reduction will still be positive. The NCTCOG will be happy to provide more information on applicable research upon request.

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Q: Climate change? How will this help in the coming ice age?

A: By conserving fuel sources now in the name of climate change, there will be more available to use in a future cooling period. Any new fuel technology that is developed now will be available then and possibly pave the way toward development of even newer fuel technologies.